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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 1, 1987 Volume 1082 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Decision Without Hearing as of July 1987

Chemical Discipline	– April 8, 1986
Mechanical Discipline	– January 8, 1985
Electrical Discipline	– May 3, 1985

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of July 1987

Chemical	– May 6, 1985
Electrical	– November 6, 1984
Mechanical	– October 7, 1984

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of July 1987

Affirmed	233
Affirmed-in-Part	34
Reversed	109
Total Decided	376

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 28, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,467,475 through 4,468,814
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 14, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,387,474	06/304,844	6/14/83
4,387,477	06/302,314	6/14/83
4,387,491	06/288,630	6/14/83
4,387,517	06/233,562	6/14/83
4,387,518	06/271,550	6/14/83
4,387,522	06/370,104	6/14/83
4,387,525	06/283,505	6/14/83
4,387,527	06/241,911	6/14/83
4,387,529	06/220,414	6/14/83
4,387,530	06/232,395	6/14/83
4,387,532	06/244,407	6/14/83
4,387,534	06/291,300	6/14/83
4,387,538	06/308,856	6/14/83
4,387,540	06/298,587	6/14/83
4,387,559	06/263,288	6/14/83
4,387,566	06/242,452	6/14/83
4,387,587	06/274,416	6/14/83
4,387,591	06/256,327	6/14/83
4,387,603	06/306,162	6/14/83
4,387,604	06/228,779	6/14/83
4,387,613	06/230,439	6/14/83
4,387,615	06/321,403	6/14/83
4,387,623	06/301,384	6/14/83
4,387,636	06/266,793	6/14/83
4,387,637	06/292,955	6/14/83
4,387,638	06/340,293	6/14/83
4,387,657	06/287,292	6/14/83
4,387,658	06/340,667	6/14/83
4,387,662	06/354,486	6/14/83
4,387,669	06/362,913	6/14/83
4,387,671	06/283,068	6/14/83
4,387,688	06/409,248	6/14/83
4,387,689	06/263,922	6/14/83
4,387,692	06/226,234	6/14/83
4,387,698	06/245,774	6/14/83
4,387,700	06/265,852	6/14/83
4,387,702	06/244,515	6/14/83
4,387,706	06/252,951	6/14/83
4,387,708	06/264,970	6/14/83
4,387,709	06/282,432	6/14/83
4,387,713	06/284,409	6/14/83
4,387,719	06/314,455	6/14/83
4,387,722	06/251,713	6/14/83
4,387,733	06/265,340	6/14/83
4,387,735	06/348,832	6/14/83
4,387,736	06/314,703	6/14/83
4,387,743	06/252,041	6/14/83
4,387,750	06/313,968	6/14/83
4,387,752	06/296,576	6/14/83
4,387,761	06/216,539	6/14/83
4,387,765	06/332,877	6/14/83
4,387,772	06/302,055	6/14/83
4,387,778	06/298,276	6/14/83
4,387,779	06/280,951	6/14/83
4,387,781	06/230,866	6/14/83
4,387,802	06/286,329	6/14/83
4,387,804	06/346,512	6/14/83
4,387,806	06/273,623	6/14/83
4,387,807	06/308,416	6/14/83
4,387,817	06/312,804	6/14/83
4,387,828	06/307,807	6/14/83

Patent Number	Serial Number	Issue Date
4,387,831	06/217,552	6/14/83
4,387,833	06/216,191	6/14/83
4,387,835	06/250,382	6/14/83
4,387,836	06/281,888	6/14/83
4,387,837	06/295,703	6/14/83
4,387,838	06/303,201	6/14/83
4,387,839	06/268,568	6/14/83
4,387,844	06/269,139	6/14/83
4,387,850	06/220,379	6/14/83
4,387,852	06/301,404	6/14/83
4,387,872	06/274,435	6/14/83
4,387,876	06/279,408	6/14/83
4,387,881	06/280,062	6/14/83
4,387,884	06/341,151	6/14/83
4,387,885	06/375,962	6/14/83
4,387,890	06/282,923	6/14/83
4,387,892	06/306,109	6/14/83
4,387,903	06/251,610	6/14/83
4,387,908	06/259,405	6/14/83
4,387,909	06/222,983	6/14/83
4,387,919	06/300,435	6/14/83
4,387,921	06/264,836	6/14/83
4,387,922	06/270,648	6/14/83
4,387,938	06/245,278	6/14/83
4,387,962	06/308,976	6/14/83
4,387,974	06/262,152	6/14/83
4,387,976	06/276,818	6/14/83
4,387,981	06/219,511	6/14/83
4,387,992	06/266,137	6/14/83
4,387,998	06/265,511	6/14/83
4,388,005	06/257,479	6/14/83
4,388,006	06/239,981	6/14/83
4,388,008	06/237,516	6/14/83
4,388,011	06/253,178	6/14/83
4,388,020	06/298,471	6/14/83
4,388,026	06/258,973	6/14/83
4,388,028	06/221,345	6/14/83
4,388,035	06/261,766	6/14/83
4,388,037	06/231,604	6/14/83
4,388,050	06/248,494	6/14/83
4,388,054	06/255,732	6/14/83
4,388,060	06/328,234	6/14/83
4,388,071	06/324,613	6/14/83
4,388,077	06/291,188	6/14/83
4,388,080	06/348,468	6/14/83
4,388,082	06/317,748	6/14/83
4,388,090	06/278,555	6/14/83
4,388,105	06/287,350	6/14/83
4,388,109	06/264,724	6/14/83
4,388,130	06/326,768	6/14/83
4,388,143	06/317,682	6/14/83
4,388,144	06/245,113	6/14/83
4,388,152	06/341,381	6/14/83
4,388,153	06/323,182	6/14/83
4,388,159	06/264,311	6/14/83
4,388,165	06/298,343	6/14/83
4,388,167	06/413,133	6/14/83
4,388,182	06/295,150	6/14/83
4,388,184	06/418,046	6/14/83
4,388,187	06/359,293	6/14/83
4,388,205	06/318,691	6/14/83
4,388,207	06/366,081	6/14/83
4,388,223	06/251,434	6/14/83
4,388,239	06/324,201	6/14/83
4,388,260	06/223,465	6/14/83
4,388,286	06/343,046	6/14/83
4,388,315	06/307,117	6/14/83
4,388,340	06/308,710	6/14/83
4,388,357	06/273,403	6/14/83
4,388,361	06/221,638	6/14/83
4,388,389	06/321,656	6/14/83
4,388,409	06/337,680	6/14/83
4,388,410	06/223,856	6/14/83
4,388,424	06/318,472	6/14/83
4,388,427	06/301,152	6/14/83
4,388,435	06/320,020	6/14/83
4,388,438	06/224,476	6/14/83
4,388,458	06/334,118	6/14/83
4,388,462	06/284,896	6/14/83
4,388,468	06/293,853	6/14/83
4,388,478	06/316,800	6/14/83
4,388,484	06/307,794	6/14/83
4,388,485	06/247,078	6/14/83
4,388,487	06/333,914	6/14/83
4,388,494	06/222,475	6/14/83
4,388,507	06/306,153	6/14/83
4,388,510	06/273,233	6/14/83
4,388,511	06/265,358	6/14/83
4,388,516	06/248,632	6/14/83
4,388,533	06/246,118	6/14/83
4,388,536	06/390,359	6/14/83
4,388,561	06/237,269	6/14/83
4,388,567	06/238,089	6/14/83
4,388,569	06/307,944	6/14/83
4,388,580	06/321,580	6/14/83
4,388,588	06/242,086	6/14/83
4,388,605	06/312,893	6/14/83
4,388,613	06/335,977	6/14/83
4,388,614	06/216,103	6/14/83
[illegible]	06/240,646	6/14/83
[illegible]	06/222,480	6/14/83
4,388,622	06/254,237	6/14/83
4,388,631	06/243,055	6/14/83
4,388,654	06/244,665	6/14/83
4,388,698	06/276,277	6/14/83
4,388,711	06/287,959	6/14/83
4,388,714	06/293,152	6/14/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,305,763, Re. S.N. 075,838, Filed July 20, 1987, Cl. 148/12.7A, METHOD OF PRODUCING AN ALUMINUM ALLOY PRODUCT, William E. Quist, et al., Owner of Record: *Boeing Co., Seattle, Wash.,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 111

4,444,800, Re. S.N. 064,192, Filed June 19, 1987, Cl. 426/582, NON-CULTURED SIMULATED CHEESE CONTAINING RENNET CASEIN, Howard H. Bixby, et al., Owner of Record: *Schreiber Food, Inc., Green Bay, Wis.,* Attorney or Agent: Roy E. Hofer, et al., Ex. Gp.: 132

4,492,161, Re. S.N. 004,181, Filed Jan. 8, 1987, Cl. 101/109, HIGH SPEED DOCUMENT ENCODING SYSTEM, Gerald L. Johnson, et al., Owner of Record: *Banctec, Inc., Dallas, Tex.,* Attorney or Agent: Kenneth R. Glaser, et al., Ex. Gp.: 337

4,503,062, Re. S.N. 021,220, Filed June 23, 1987, Cl. 514/383, AZOLYL SUBSTITUTED ALICYCLIC ALCOHOLS, Michael B. Gravestock, Owner of Record: *Imperial Chemical Industries PLC, London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 125

4,528,953, Re. S.N. 071,738, Filed July 9, 1987, Cl. 123/413, THROTTLE AND TIMING LINKAGE, John D. Flaig, et al., Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 342

4,529,454, Re. S.N. 071,709, Filed July 8, 1987, Cl. 148/36, LOW C-CR-MO STEEL USED UNDER WET STEAM, Fumio Hataya, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan; Kawasaki Steel Corp., Kobe City, Japan,* Attorney or Agent: George F. Dvorak, et al., Ex. Gp.: 111

4,552,873, Re. S.N. 052,849, Filed May 20, 1987, Cl. 514/210, CARBAPENEM COMPOUNDS, AND CONTAINING THEM, Tetsuo Miyadera, Owner of Record: *Sankyo Co., Ltd., Tokyo, Japan,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 125

4,554,308, Re. S.N. 059,262, Filed June 5, 1987, Cl. 524/591, CROSSLINKED POLYURETHANE DISPERSIONS, Andrea Russiello, Owner of Record: *Wilmington Chemical Corp., Wilmington, Del.,* Attorney or Agent: John M. Webb, et al., Ex. Gp.: 155

4,579,854, Re. S.N. 071,741, Filed July 9, 1987, Cl. 514/312, BRONCHODILATING 8-HYDROXY-5-HYDROXY-5[(IR)-1-HYDROXY-2[N-(CIR)-2-(P-METHOXYPHENYL)-1-METHYL-ETHYL) - AMINO]ETHYL] CARBOSTYRIL, Takeo Iwakuma, et al., Owner of Record: *Tanabe Seiyaku Co., Ltd., Osaka-Shi, Japan,* Attorney or Agent: John F. Scully, et al., Ex. Gp.: 125

4,604,557, Re. S.N. 071,993, Filed July 7, 1987, Cl. 65/135, VENDING MACHINE POWER SWITCHING APPARATUS, John C. Cowles, Owner of Record: *Mars Inc., McLean, Va.,* Attorney or Agent: John B. Pegram, et al., Ex. Gp.: 133

4,614,648, Re. S.N. 071,991, Filed July 10, 1987, Cl. 424/44, PROCESS FOR MANUFACTURING EFFERVESCENT GRANULES AND TABLETS, Jean Bru, Owner of Record: *Inventor,* Attorney or Agent: Sidney G. Faber, et al., Ex. Gp.: 125

4,616,605, Re. S.N. 071,734, Filed July 7, 1987, Cl. 123/65, TWO-CYCLE ENGINE WITH IMPROVED SCAVENGING, Herbert E. Kline, Owner of Record: *Cummings Engine Co., Inc., Columbus, Ind.,* Attorney or Agent: Charles M. Leedom, Jr., et al., Ex. Gp.: 342

4,633,859, Re. S.N. 075,340, Filed July 20, 1987, Cl. 128/205.26, INERT GAS ENVIRONMENTAL CONTROL SYSTEM FOR A HYPERBARIC CHAMBER AND A METHOD FOR DOING SAME, Raymond P. Reneau, Owner of Record: *Keyes Offshore, Inc., Sugar Land, Tex.,* Attorney or Agent: A. H. Evans, et al., Ex. Gp.: 355

4,647,544, Re. S.N. 072,699, Filed July 13, 1987, Cl. 436/518, IMMUNOASSAY USING OPTICAL INTERFERENCE DETECTION, David F. Nicoli, et al., Owner of Record: *Inventor,* Attorney or Agent: Charles H. Schwartz, et al., Ex. Gp.: 128

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 29,909, Reexam. No. 90/001,286, Requested: July 13, 1987, Cl. 252/89, METHOD OF CLEANING CONTAMINATED WOUNDS, Leonard D. Kurtz, Owner of Record: *The University of Virginia Alumni Foundation, Charlottesville, Va.,* Attorney or Agent: Larson & Taylor, Ex. Gp.: 110, Requester: Owner

Re. 31,998, Reexam. No. 90/001,290, Requested: July 27, 1987, Cl. 3/13, POSTERIOR CHAMBER LENS IMPLANT, William D. Myers, Owner of Record: *Dr. William D. Myers, Birmingham, Mich.,* Attorney or Agent: S. W. Sprinkle, Ex. Gp.: 330, Requester: Surgidev Corp., Goleta, Calif.

3,485,383, Reexam. No. 90/001,291, Requested: July 28, 1987, Cl. 212/195, AUXILIARY SUPPORT FOR CRANES, Daniel E. Beduhn, Owner of Record: *The Manitowoc Co., Inc., Manitowoc, Wis.,* Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: American Hoist & Derrick Co., St. Paul, Minn.

3,994,711, Reexam. No. 90/001,288, Requested: July 16, 1987, Cl. 65/163, GLASS TEMPERING SYSTEM INCLUDING OSCILLATING ROLLER FURNACE, Harold A. McMaster, Owner of Record: *Glasstech, Inc., Perrysburgh, Ohio,* Attorney or Agent: E. L. Brooks, Ex. Gp.: 130, Requester: Becker & Becker, Dayton, Ohio

4,290,208, Reexam. No. 90/001,285, Requested: July 16, 1987, Cl. 34/9, PROCESS FOR THE DEHUMIDIFICATION OF MOIST AIR OR SATURATED WATER VAPOR, Lars-Gunnar Hellman, Owner of Record: *Inventor, Stockholm, Sweden,* Attorney or Agent: Cohen, Pontani, et al., Ex. Gp.: 340, Requester: Owner

4,330,574, Reexam. No. 90/001,287, Requested: July 15, 1987, Cl. 427/319, FINISHING METHOD FOR CONVENTIONAL HOT DIP COATING OF A FERROUS BASE METAL STRIP WITH A MOLTEN COATING METAL, Marvin B. Pierson, et al., Owner of Record: *Armco, Inc., Middletown, Ohio,* Attorney or Agent: Forst & Jacobs, Ex. Gp.: 150, Requester: Owner

4,436,684, Reexam. No. 90/001,283, Requested: July 13,1987, Cl. 264/138, METHOD OF FORMING IMPLANTABLE PROSTHESIS FOR RECONSTRUCTIVE SURGERY, David N. White, Owner of Record: *Cemax Medical Products Ltd., Santa Clara, Calif.,* Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: Techmedica, Inc., Camarillo, Calif.

4,474,612, Reexam. No. 90/001,282, Requested: July 7, 1987, Cl. 204/252, VERTICALLY EXTENDING PLATE ELECTRODE FOR GAS-FORMING ELECTROLYZERS, Karl Lohrberg, Owner of Record: *Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany,* Attorney or Agent: Felfe & Lynch, Ex. Gp.: 110, Requester: Eltech Systems Corp., Fairport Harbor, Ohio

4,517,283, Reexam. No. 90/001,284, Requested: July 13, 1987, Cl. 430/512, COLOR-PHOTOGRAPHIC RECORDING MATERIAL, David G. Leppard, et al., Owner of Record: *Ciba-Geigy AG, Basle, Switzerland,* Attorney or Agent: Wenderoth, Lind, et al., Ex. Gp.: 150, Requester: Owner

4,608,187, Reexam. No. 90/001,289, Requested: July 20, 1987, Cl. 252/90, RUBBER TOUGHENED POLYVINYL ALCOHOL FILM COMPOSITIONS, Daniel M. Chang, Owner of Record: *The Clorox Co., Oakland, Calif.,* Attorney or Agent: J. S. Siebert, Ex. Gp.: 110, Requester: Owner

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of June 16, 1987, were listed inadvertently:

1,442,618	TM 188	June 16, 1987
1,442,619	TM 188	June 16, 1987
1,442,620	TM 188	June 16, 1987
1,442,621	TM 188	June 16, 1987
1,442,626	TM 188	June 16, 1987
1,442,657	TM 189	June 16, 1987
1,442,658	TM 189	June 16, 1987
1,442,659	TM 189	June 16, 1987
1,442,662	TM 189	June 16, 1987
1,442,663	TM 189	June 16, 1987
1,442,693	TM 190	June 16, 1987
1,442,694	TM 190	June 16, 1987
1,442,695	TM 190	June 16, 1987

1,442,696	TM 190	June 16, 1987	1,443,254	TM 201	June 16, 1987
1,442,697	TM 190	June 16, 1987	1,443,255	TM 201	June 16, 1987
1,442,721	TM 190	June 16, 1987	1,443,256	TM 201	June 16, 1987
1,442,722	TM 190	June 16, 1987	1,443,257	TM 201	June 16, 1987
1,442,771	TM 191	June 16, 1987	1,443,258	TM 201	June 16, 1987
1,442,772	TM 191	June 16, 1987	1,443,270	TM 201	June 16, 1987
1,442,773	TM 191	June 16, 1987	1,443,271	TM 201	June 16, 1987
1,442,774	TM 191	June 16, 1987	1,443,272	TM 201	June 16, 1987
1,442,775	TM 191	June 16, 1987	1,443,273	TM 201	June 16, 1987
1,442,776	TM 191	June 16, 1987	1,443,274	TM 201	June 16, 1987
1,442,777	TM 191	June 16, 1987	1,443,275	TM 201	June 16, 1987
1,442,778	TM 191	June 16, 1987	1,443,276	TM 201	June 16, 1987
1,442,779	TM 191	June 16, 1987	1,443,277	TM 201	June 16, 1987
1,442,790	TM 192	June 16, 1987	1,443,278	TM 201	June 16, 1987
1,442,948	TM 195	June 16, 1987	1,443,279	TM 201	June 16, 1987
1,442,949	TM 195	June 16, 1987	1,443,280	TM 201	June 16, 1987
1,442,950	TM 195	June 16, 1987	1,443,281	TM 201	June 16, 1987
1,442,951	TM 195	June 16, 1987	1,443,324	TM 202	June 16, 1987
1,442,952	TM 195	June 16, 1987	1,443,325	TM 202	June 16, 1987
1,442,953	TM 195	June 16, 1987	1,443,327	TM 202	June 16, 1987
1,442,954	TM 195	June 16, 1987	1,443,328	TM 202	June 16, 1987
1,442,955	TM 195	June 16, 1987	1,443,329	TM 202	June 16, 1987
1,442,956	TM 195	June 16, 1987	1,443,330	TM 202	June 16, 1987
1,442,957	TM 195	June 16, 1987	1,443,331	TM 202	June 16, 1987
1,442,958	TM 195	June 16, 1987	1,443,332	TM 202	June 16, 1987
1,442,959	TM 195	June 16, 1987	1,443,418	TM 204	June 16, 1987
1,442,960	TM 195	June 16, 1987	1,443,419	TM 204	June 16, 1987
1,442,961	TM 195	June 16, 1987	1,443,420	TM 204	June 16, 1987
1,442,962	TM 195	June 16, 1987	1,443,421	TM 204	June 16, 1987
1,442,963	TM 195	June 16, 1987	1,443,422	TM 204	June 16, 1987
1,442,964	TM 195	June 16, 1987	1,443,423	TM 204	June 16, 1987
1,442,965	TM 195	June 16, 1987	1,443,424	TM 204	June 16, 1987
1,442,979	TM 195	June 16, 1987	1,443,425	TM 204	June 16, 1987
1,442,980	TM 195	June 16, 1987	1,443,426	TM 204	June 16, 1987
1,442,981	TM 195	June 16, 1987	1,443,427	TM 204	June 16, 1987
1,442,982	TM 195	June 16, 1987	1,443,428	TM 204	June 16, 1987
1,442,983	TM 195	June 16, 1987	1,443,429	TM 204	June 16, 1987
1,442,984	TM 195	June 16, 1987	1,443,430	TM 204	June 16, 1987
1,442,985	TM 195	June 16, 1987	1,443,431	TM 204	June 16, 1987
1,442,986	TM 195	June 16, 1987	1,443,432	TM 204	June 16, 1987
1,443,022	TM 196	June 16, 1987	1,443,433	TM 204	June 16, 1987
1,443,023	TM 196	June 16, 1987	1,443,434	TM 204	June 16, 1987
1,443,058	TM 197	June 16, 1987	1,443,435	TM 204	June 16, 1987
1,443,066	TM 197	June 16, 1987	1,443,436	TM 204	June 16, 1987
1,443,071	TM 197	June 16, 1987	1,443,437	TM 204	June 16, 1987
1,443,146	TM 199	June 16, 1987	1,443,438	TM 204	June 16, 1987
1,443,147	TM 199	June 16, 1987	1,443,439	TM 204	June 16, 1987
1,443,148	TM 199	June 16, 1987	1,443,440	TM 204	June 16, 1987
1,443,149	TM 199	June 16, 1987	1,443,470	TM 205	June 16, 1987
1,443,150	TM 199	June 16, 1987	1,443,477	TM 205	June 16, 1987
1,443,151	TM 199	June 16, 1987	1,443,478	TM 205	June 16, 1987
1,443,152	TM 199	June 16, 1987	1,443,479	TM 205	June 16, 1987
1,443,153	TM 199	June 16, 1987	1,443,486	TM 205	June 16, 1987
1,443,154	TM 199	June 16, 1987	1,443,487	TM 205	June 16, 1987
1,443,155	TM 199	June 16, 1987	1,443,496	TM 206	June 16, 1987
1,443,156	TM 199	June 16, 1987	1,443,499	TM 206	June 16, 1987
1,443,157	TM 199	June 16, 1987	1,443,552	TM 207	June 16, 1987
1,443,158	TM 199	June 16, 1987	1,443,583	TM 208	June 16, 1987
1,443,159	TM 199	June 16, 1987			
1,443,160	TM 199	June 16, 1987			
1,443,161	TM 199	June 16, 1987			
1,443,162	TM 199	June 16, 1987			
1,443,163	TM 199	June 16, 1987			
1,443,164	TM 199	June 16, 1987			
1,443,165	TM 199	June 16, 1987			
1,443,166	TM 199	June 16, 1987			
1,443,167	TM 199	June 16, 1987			
1,443,168	TM 199	June 16, 1987			
1,443,175	TM 199	June 16, 1987			
1,443,181	TM 199	June 16, 1987			
1,443,210	TM 200	June 16, 1987			
1,443,211	TM 200	June 16, 1987			
1,443,212	TM 200	June 16, 1987			
1,443,213	TM 200	June 16, 1987			
1,443,214	TM 200	June 16, 1987			
1,443,215	TM 200	June 16, 1987			
1,443,216	TM 200	June 16, 1987			
1,443,217	TM 200	June 16, 1987			
1,443,218	TM 200	June 16, 1987			

Consequently, the certificates of registration bearing the above-identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
July 21, 1987. *Administrator for Trademark Operations.*

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "BROWNING"

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12) for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "BROWNING" used by Browning, a corporation organized under the laws of the State of Utah, located at Rte. 1, Morgan, Utah 84050.

The application states that the trade name is used in connection with hunting, camping and sporting goods equipment and accessories and sportswear including shotguns, rifles, black powder rifles, pistols, pistol cases, pistol holsters, flexible gun cases, fitted luggage cases, recoil pads, sight beads, chokes for shotguns, scope mount rings and bases, rifle slings and swivels, magazine plugs, gun oil, gun cleaners, gun safes, pocket knives, knife sharpeners, fishing and hunting knives, knife sheaths, knife honing oil, sleeping bags, coats, jackets, parkas, vests, insulated hunting suits, hoods, rain jackets, rain coats, rain pants, rain suits, rain parkas, underwear, hunting trousers, hunting vests, gloves, mittens, shooting gloves, hats, shirts, belts, belt buckles, insulated boots, waterproof boots, boot laces, boot dressings, socks, wool fleece bedding, archery bows, cross bows, archery gloves, shooting tabs, arm guards, quivers, nontelescopic bow sights and slings, bow cases, target faces, bow strings, fishing rods, rod blanks and cases, hand-pulled golf carts, golf clubs, golf bags and golf club head covers, manufactured in Belgium, France, England, Italy, West Germany, Portugal and Canada.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken in the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Oct. 2, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

JOHN F. ATWOOD,
July 23, 1987. *Acting Chief, Entry, Licensing and Restricted Merchandise Branch.*

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "TWO'S COMPANY"

Action: Notice of application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "TWO'S COMPANY", a corporation organized under the laws of the State of New York, located at 33 Bertel Ave., Mount Vernon, N.Y. 10550.

The application states that the trade name is used in connection with acrylic and glass vases; stirrers; glass picture frames; glass products; floral accessories; commercial flower containers; Christmas ornaments; silver and silver plated products; napkin rings and vinyl products manufactured in Taiwan, Hong Kong and Japan.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Oct. 2, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (Rm. 2345).

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchanise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

JOHN F. ATWOOD,
July 23, 1987. *Acting Chief, Entry, Licensing and Restricted Merchandise Branch.*

U.S. Department of Commerce
Patent and Trademark Office

Special Status for Patent Applications Relating to Superconductivity

In his Remarks of July 28, 1987, to the Federal Conference On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that "to most of us laymen, superconductivity was a completely new term, but it wasn't long before we learned of the great promise it held out to alter our world for the better — a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

DONALD J. QUIGG,
Aug. 5, 1987. *Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 1, 1987

D. 287,883	4,628,456	4,649,863	4,661,997
D. 289,132	4,629,209	4,650,165	4,662,074
4,324,869	4,630,581	4,651,378	4,662,114
4,377,048	4,631,298	4,652,106	4,662,450
4,432,121	4,631,375	4,652,275	4,662,788
4,438,558	4,631,669	4,653,125	4,663,024
4,487,256	4,632,181	4,653,309	4,663,059
4,489,117	4,632,349	4,653,514	4,663,277
4,498,211	4,632,599	4,654,349	4,663,744
4,513,618	4,633,605	4,654,551	4,664,385
4,533,880	4,633,809	4,654,871	4,664,651
4,538,740	4,634,091	4,656,097	4,664,701
4,557,804	4,636,217	4,656,208	4,664,828
4,558,044	4,637,812	4,656,611	4,664,891
4,569,673	4,638,633	4,656,644	4,664,982
4,587,310	4,639,071	4,657,356	4,665,021
4,588,800	4,639,098	4,657,496	4,665,072
4,591,469	4,639,488	4,657,586	4,665,264
4,591,791	4,639,877	4,658,027	4,666,481
4,591,894	4,640,552	4,658,619	4,667,209
4,593,190	4,642,915	4,658,665	4,667,292
4,593,483	4,643,704	4,658,731	4,667,852
4,594,342	4,643,994	4,658,852	4,667,876
4,597,220	4,644,837	4,659,174	4,667,941
4,600,418	4,645,033	4,659,309	4,668,941
4,604,654	4,645,507	4,659,415	4,669,074
4,608,127	4,645,923	4,659,446	4,669,410
4,608,331	4,646,160	4,659,659	4,669,941
4,615,046	4,646,513	4,659,687	4,670,170
4,617,281	4,646,567	4,660,020	4,670,473
4,618,564	4,646,729	4,660,056	4,670,496
4,619,220	4,646,890	4,660,754	4,670,527
4,620,146	4,647,215	4,660,791	4,670,584
4,621,430	4,647,266	4,661,158	4,670,734
4,623,496	4,647,671	4,661,189	4,671,799
4,624,193	4,649,042	4,661,389	4,673,724
4,624,766	4,649,159	4,661,703	
4,626,099	4,649,333	4,661,769	

Patent and Trademark Office

[Docket No. 70470-7070]

Electronic Data Dissemination Polices and Guidelines

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Amendment of Electronic Patent Data Dissemination Policies and Guidelines; Request for Public Comment.

SUMMARY: The U.S. Patent and Trademark Office (PTO) issues this notice to request comments on policies and guidelines for the dissemination and distribution of electronic patent and trademark data by the PTO. The purposes of this notice are (1) to inform the public of the PTO's intention to amend its pricing policy for data base products, and to expand the scope of its dissemination policies and guidelines to encompass patent and trademark electronic data; (2) to explain the current situation with regard to public access to automated patent and trademark search rooms and libraries; and (3) to solicit public comments on the intended proposals. The proposed pricing would amend the policies and guideliness published in 49 FR 24585 on June 14, 1984.

DATE: Comments should be submitted no later than September 21, 1987.

ADDRESS: Comments should be addressed to: Donald J. Quigg, Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, DC 20231.

FOR FURTHER INFORMATION CONTACT: Bradford R. Huther at 703-557-1572.

SUPPLEMENTARY INFORMATION: This notice follows the form of a notice of proposed rulemaking in that the text of the amendment of policies and guidelines is accompanied by this Supplementary Information section containing introductory and background material.

The Patent and Trademark Office has determined that this notice is not a major rule within the meaning of section 1(b) of Executive Order 12291. Therefore, a Regulatory Impact Analysis has not will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this amended policy statement by the Administrative Procedure Act under 5 U.S.C. 553(b)(A); no initial or final Regulatory Flexibility Analysis has to be or will be prepared. This notice does not contain a collection of information for purposes of the Paperwork Reduction Act.

It is the intention of the PTO to revise immediately its pricing policy for the sale of its data base products in compliance with OMB Circular A-130 entitled "Management of Federal Information Resources." Under the revised pricing policy, PTO would recover only the marginal cost (i.e., that amount that is sufficient to cover the costs of reproduction and dissemination). This will result in a lowering of most fees charged for data base products. It is also the intention of the PTO to explain the situation under Pub. L. 99-607, the 1986 legislation authorizing appropriations for the PTO, with regard to public access to the patent or trademark search rooms and libraries, and to solicit public comments on alternatives for funding public access to those search rooms and libraries. Such comments will be considered by the PTO in formulating further modifications to the PTO's current information guidelines and policies, which modifications will be published at a later date in the form of a separate proposed rulemaking.

Background

In response to Pub. L. 96-517, the 1980 legislation which amended patent and trademark laws, the PTO prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would replace the PTO's all-paper patent and trademark files, and thereby improve their intergrity and quality; and (2) would support searches, examinations, office actions and other office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and within calendar year 1987 will be fully operational to retrieve and display all information as substitute for paper file searches.

An Automated Patent System (APS) is being installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS—large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with dual resolution display graphics control devices and laser printers—were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group. Optical disk storage units were subsedquently installed to house the test data base of digital images of U.S. and foreign patents. Other equipment that will be needed to simulate the system's performance under full workload conditions will be installed and evaluated during 1987.

The text of U.S. patents issued since 1975 was entered in the system to provide the data base for use with full text searching capabilities of APS. Images of all U.S. and relected foreign patents in the testbed group's search files have been converted to digital form and are being placed on optical disks for use in electronic classification and combined text classification searches. Work has begun to digitize the entire backfile of U.S. patents. Through exchange agreements with the European and Japanese Patent Offices, European patents issued since 1920 and all Japanese patents have been or will be converted to a common facsimile standard and key patent will be entered for on-line retrieval.

Text search capabilities of APS are now being made available to all PTO examiners. A decision on the deployment of the digital image retrieval and other electronic searching capabilities is planned to be made in 1988. Additional system capabilities for office automation and other administrative support will be added to those already installed in the testbed over the next several months to supplement the search and retrieval capabilities. Examiners will be provided with access to commercial data bases, such as industry-specific data bases, through APS, from the electronic workstations.

At the present time, neither the trademark nor the patent automated systems has been deployed to the public search rooms. It is expected that the trademark automated system could be ready for public deployment prior to the end of the current authorization cycle, which is September 30, 1988. According to the 1987 edition of the Automation Master Plan, full deployment of the automated patent system to the public search room is scheduled for fiscal year 1991. Public evaluation of the automated patent system is scheduled to begin in fiscal year 1987.

Under the provisions of Pub. L. 99-607, which authorizes appropriations through

September 30, 1988, "The Commissioner of Patent and Trademarks may not impose a fee for use of public patent or trademark search rooms and libraries. The costs of such rooms and libraries shall come from amounts appropriated by Congress." In anticipation of the need to propose authorizing legislation for fiscal years 1989 through 1991, comments are being requested regarding three potential funding alternatives to support the automated public search rooms. They are:

(1) *Use of taxpayer revenues.* The costs of supporting the automated public search rooms could be covered by funds appropriated specifically for that purpose by Congress. No statutory changes would be required for this option. Presently, the paper search rooms are being supported with appropriated funds. Under current funding levels and, in the absence of authority to charge fees for this purpose, the public's access to automated search rooms would be restricted.

(2) *Use of general fee revenues.* The marginal costs of supporting the automated public search rooms could be apportioned as a cost of prosecuting an application or derived from the total available fee revenues collected by the PTO. Under this alternative, the costs for the automated public search rooms would be borne by all users of the patent and trademark systems. The user charge prohibition in Pub. L. 99-607 would have to be modified to permit this option.

(3) *Establish specific user charges for access to the public search rooms.* Under this alternative such charges for access to the automated trademark and patent systems in the public search rooms would be consistent with the guidelines of OMB Circular A-130, and would be established through the rulemaking process. The marginal costs for the public search rooms under this alternative would be borne only by those who actually use the public search rooms. The user charge prohibition in Pub. L. 99-607 would have to be rescinded to permit this option.

Electronic Data Dissemination Policies and Guidelines

The Patent and Trademark Office proposes to amend its notice entitled Electronic Patent Data Dissemination Policies and Guidelines, published in 49 FR 24565 on June 14, 1984, as follows:

The title of the guidelines would be changed to read Electronic Data Dissemination Policies and Guidelines.

Guideline III, paragraphs C and D would be amended to read:

C. Fees charged to commercial data base vendors for bulk data developed by the PTO will be based on the marginal cost of providing such distribution services.

D. Normally, arrangements with commercial data base vendors will be non-exclusive. Bulk resale of PTO data by commercial data base vendors will be permitted subject to the terms of each bulk data sales agreement.

A new Guideline V, entitled Data Base Product Pricing would be added as follows:

V. Data Base Product Pricing

Fees charged to the public for U.S. patent and trademark data products will be based on the marginal cost of providing such products.

Dated: August 17, 1987.

Rene D. Tegtmeyer,

Assistant Commissioner for Patents.

[FR Doc. 87-19056 Filed 8-19-87; 8:45 am]

BILLING CODE 3510-16-M

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 1, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-10-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-26-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

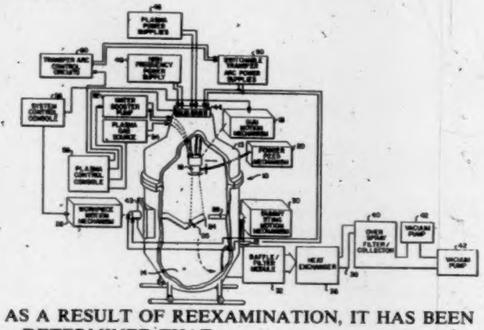
Patents ..... Numbers 3,522,401 to 3,526,003, inclusive
Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 1, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,328,257 (753rd)
SYSTEM AND METHOD FOR PLASMA COATING
Erich Muehlberger, San Clemente, and Roland D. Kremith, Newport Beach, both of Calif., assignors to Electro-Plasma, Inc., Irvine, Calif.
Reexamination Request No. 90/001,030, Jun. 9, 1986.
Reexamination Certificate for Patent No. 4,328,257, issued May 4, 1982, Ser. No. 97,723, Nov. 26, 1979.
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** and **27–40** is confirmed.

Claims **16** and **22** are cancelled.

Claims **15, 17, 18, 20, 21** and **23** are determined to be patentable as amended.

Claims **19** and **24–26**, dependent on an amended claim, are determined to be patentable.

1. A transfer arc plasma system comprising:
a plasma gun positioned in operative relation to a workpiece and providing a supersonic plasma stream of substantially inert gas;
enclosure means providing a low static pressure environment about the plasma gun and workpiece;
means coupled to the workpiece for selectively establishing both a cathodic and an anodic relationship of the workpiece relative to the plasma gun and including means for selectively switching between the cathodic and anodic relationships; and
means for injecting spray powder into the plasma stream for deposition on the workpiece.

STATUTORY INVENTION REGISTRATIONS

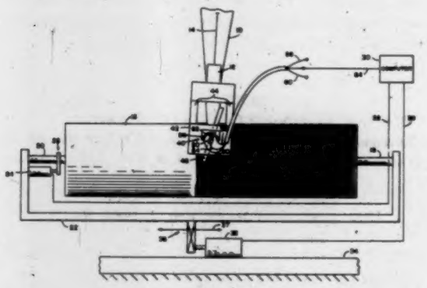
PUBLISHED SEPTEMBER 1, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H323
ELECTROMECHANICAL LAG ANGLE DETECTOR

Gregory S. Graham, Sylvania, and Harold V. White, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1986, Ser. No. 861,197
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R **3 Claims**



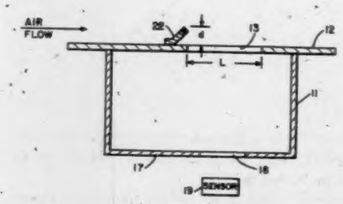
1. An electromechanical lag angle detector device comprising a fixed head mounting fixture with an eyelet mounted thereon with an opening through the eyelet and a fiber mounted through the opening of the eyelet, a support member mounted on the fixed head and a feeler arm pivotally mounted relative to said support member, said feeler arm having a slot therethrough that is aligned with the opening through said eyelet and a contact arm on said feeler arm with a contact of a potentiometer connected thereto for being rotated as the contact arm is rotated by said feeler arm, said support structure also having variable resistor structure of said potentiometer mounted thereon with said contact being in electrical engagement with said variable resistor structure, a power source connected across opposite ends of said variable resistor and said fiber extending through said slot in said feeler arm so that as the fiber is wound on a bobbin, said feeler arm will be actuated by said fiber and thereby actuate said electrical contact of said contact arm to produce an output which is proportional to the variation in lag angle of the fiber that is being wound on the bobbin.

H324
FENCE FOR REDUCING TURBULENCE

Donald V. Rubin, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 23,492
Int. Cl.[4] B64C *1/00, 30/00*
U.S. Cl. 244—117 R **3 Claims**

1. A system for lowering the level of turbulance in an opening through a wall over which air is flowing at a subsonic velocity; said opening having a predetermined length, L; comprising a fence secured to the aircraft wall at a location adjacent and parallel to a leading edge of said opening; said fence



having only distal portion thereof a plurality, said apertures making up to 50 percent of the area of said distal portion

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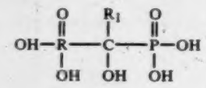
H325
ELECTROLESS DEPOSITION OF TRANSITION METALS

Glenn O. Mallory, Jr., Los Angeles, and Conrad E. Johnson, Santa Ana, both of Calif., assignors to Richardson Chemical Company

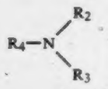
Continuation of Ser. No. 690,822, Jan. 11, 1985, abandoned, which is a continuation of Ser. No. 479,108, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 283,872, Jul. 16, 1981, abandoned, which is a continuation of Ser. No. 173,909, Jul. 30, 1980, abandoned. This application Nov. 26, 1985, Ser. No. 802,078
Int. Cl.[4] C23C *18/38*
U.S. Cl. 106—1.23 **14 Claims**

1. In a method for electrolessly depositing copper upon a substrate from a bath which includes in admixture: a source of copper cation, a reducing agent and a complexing agent, and which is characterized by said complexing agent rendering said bath operable through a wide range of pH values between about 4 and about 14, the pH value being selected to be the optimum value for the bath, for the substrate and for a selected one of a variety of reducing agents which is selected from the group consisting of formaldehyde, a hypophosphite compound, a boron-nitrogen compound, a borohydride, and an alkylamine borane, the improvement for electrolessly depositing copper at said wide range of pH values comprising:

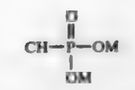
including within the electroless copper bath an organophosphorus complexing agent selected from the group consisting of compounds having the general formulas:



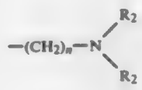
wherein R_1 is alkyl having from 1 to 5 carbon atoms, alkali metal and ammonium salts of said compounds, and



wherein R_2 is



R_3 is selected from the class consisting of R_2 and $—CH_2CH_2OH$, and R_4 is selected from the group consisting of R_2, $—CH_2CH_2OH$, and



wherein each M is independently selected from the group consisting of H, NH_4 and alkali metal, and "n" is an integer from 1 to 6 inclusive; and

immersing the substrate within the bath while operating the electroless copper deposition bath at said optimum pH value to maintain optimum deposition conditions for the substrate and for the selected reducing agent.

H326
Mn-Fe BASE AND Mn-Cr-Fe BASE AUSTENITIC ALLOYS

Howard R. Bürger, and Francis A. Garner, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 612,771, May 22, 1984. This application Jun. 23, 1986, Ser. No. 878,501
Int. Cl.[4] C22C *38/04, 38/06, 38/38;* G21B *1/00*
U.S. Cl. 420—63 **46 Claims**

1. In elevated temperature, neutron irradiation environments encountered in a LMFBR core and a fusion reactor first wall, an alloy characterized by an austenitic microstructure, and said alloy consisting essentially of:

25 to 40 wt. % Mn;

5 to 15 wt. % Cr;

about 0.4 to about 3.0 wt. % Si;

an austenitic stabilizing element selected from the group consisting of C, and N, alone or in combination with each other, and in an amount effective to stabilize said austenitic microstructure, but less than about 0.7 wt. % C, and less than about 0.3 wt. % N;

up to about 0.1 wt. % P;

up to about 0.01 wt. % B;

up to about 3.0 wt. % Al;

up to about 0.5 wt. % Ni;

up to about 2.0 wt. % W;

up to about 1.0 wt. % Ti;

up to about 1.0 wt. % Ta;

up to about 2.5 wt. % V;

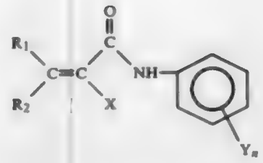
with the remainder being essential iron and wherein Mo and Nb, if present, are at most incidental impurities.

H327
NEMATICIDAL ALKENANILIDES

Carmine P. DiSanzo, and Clinton J. Peake, both of Medina, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 349,421, Feb. 16, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 549,215
Int. Cl.[4] C07C *103/60*
U.S. Cl. 564—207 **5 Claims**

1. A method for the control of nematodes by applying to the soil at the situs of infestation a nematicidally effective amount of a nematicidal composition containing as active ingredient a compound of the formula:



wherein R_1 and R_2 are indendently hydrogen, lower alkyl, or halogen;

X is hydrogen or halogen, with the proviso that at least one of R_1, R_2 and X must be halogen;

n is 1 or 2;

Y is hydrogen, lower alkyl, halogen, trifluoromethyl, lower alkoxy, lower alkylthio, and nitro when n is 1, and halogen when n is 2.

H328
PURIFICATION OF CEPHALOSPORINS

Hiroaki Koizumi; Satoru Kawatake, and Kanji Tokuyama, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 30, 1985, Ser. No. 696,430
Claims priority, application Japan, Feb. 2, 1984, 59-17699
Int. Cl.[4] C07D *265/12*
U.S. Cl. 544—90 **6 Claims**

1. A process for purifying oxacephalosporins which comprises contacting an aqueous solution of oxacephalosporin carboxylic acid (at pH lower than its pKa) with a macroporous polymeric adsorbent (specific gravity is higher than 1.05; and saturated adsorption capacity for cephalosporin C is larger than 60 mg/ml) to adsorb and thereby separate the oxacephalosporin carboxylic acid from non-adsorbable contaminants, and then eluting the adsorbed oxacephalosporin carboxylic acid with an aqueous hydrophilic organic solvent to elute and thereby separate the oxacephalosporin carboxylic acid from non-eluting contaminants.

H329
AERODYNAMIC HOUSING

Thomas Bahnck, Ottsville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,822
Int. Cl.[4] H04B *1/59;* F42B *25/00*
U.S. Cl. 367—3 **7 Claims**



1. An aerodynamic housing for a free-falling article, comprising:

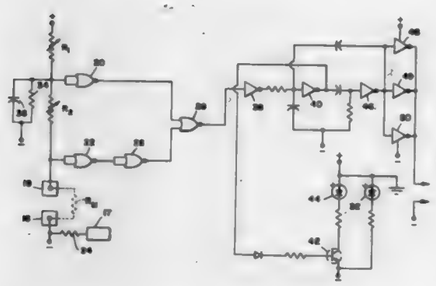
a cylindrical member adapted to contain the article at the forward end thereof and having a plurality of longitudinal channels located along the rearward end, said channels being radially equidistant and formed obliquely to the outer wall of said member to provide each channel with a leading edge in the shape of a truncated ellipse; and

a ring member mounted about the rearward end of said cylindrical member, said ring member being a continuous section of the outer wall of said cylindrical member to cover said channels aft of the leading edges thereof thereby forming recessed air ducts extending to the rearward end of said cylindrical member.

H330
PERSONNEL GROUNDING SYSTEM TESTER

Lawrence R. Burich, and Thomas O. Balcer, both of San Jose, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 627,133
Int. Cl.[4] G01R *31/02;* G08B *21/00;* H02H *3/20*
U.S. Cl. 324—500 **8 Claims**



1. Apparatus for testing a personnel grounding system of the type used to prevent the buildup of electrostatic charges on the body and clothing of a worker engaged in the handling of charge-sensitive electronic devices, said personnel grounding system including first connector means electrically coupled to the body of said worker and means for coupling said first connector means through a safety resistance to a grounding connector means, said grounding connector means being adapted to connected to a grounding terminal which is coupled to earth ground, said apparatus determining whether the resistance of said personnel grounding system, measured from said first connector means through the body of said worker to said grounding connector means, is between two preselected values and providing an indicating signal when the resistance of said personnel grounding system is between said two preselected values, said apparatus comprising:

(a) a voltage source having a first polarity and a second polarity;

(b) a test connector for receiving said grounding connector means, said first polarity of said voltage source being connected to said test connector;

(c) a first resistance, said first resistance being coupled to the second polarity of said voltage source;

(d) a conductive pad disposed so that it may be touched by said worker while being electrically coupled to said first connector means;

(e) a second resistance coupled between said first resistance and said conductive pad, said second resistance being less than the first resistance;

(f) first voltage sensing means coupled between said first and second resistances for providing a high output when a voltage at its input is above a selected voltage and low output when a voltage at its input is below said selected voltage;

(g) second voltage sensing means coupled between said second resistance and said conductive pad for providing a high output when a voltage at its input is above a selected voltage and a low output when a voltage at its input is below a selected voltage;

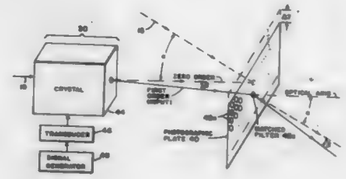
(h) means for providing an indicating signal when said first voltage sensing means provides a high output signal and said second voltage sensing means provides a low output signal; and

(i) the values of said first and second resistances being selected to provide a voltage at the input of said first voltage sensing means which is above said selected voltage and a voltage at the input of said second voltage sensing means which is below said selected voltage when the value of a resistance measured between said test connector and said conductive pad is between said two preselected values.

H331
LARGE MEMORY ACOUSTO-OPTICALLY ADDRESSED PATTERN RECOGNITION

Don A. Gregory; Joseph G. M. Duthie, and Laura L. Huckabee, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 750,611
Int. Cl.[4] G06K *9/76*
U.S. Cl. 382—31 **2 Claims**



1. A method of addressing the Fourier transform of stored optical images for optical pattern recognition comprising the steps of:

placing a transparent optical image in the path of a laser beam;

passing a laser beam along a predetermined path through the image for superimposing the image on the beam;

transforming the beam with the superimposed image by Fourier transformation;

spatially modulating the transformed optical images to deflect the images at selectable angles away from said predetermined path;

directing the transformed beam of optical images to a matched filter array for creating a resultant correlation light beam from the filter;

passing the created correlation light beam to the back focal plane of the array;

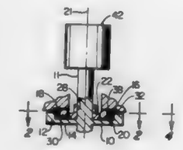
detecting the resultant correlation light beam at the back focal plane; and

displaying a diffracted light in the focal plane that indicates correlation between the transparent optical image and a corresponding reference image stored in said matched filter array.

H332
HIGH SPEED LOCK MECHANISM

Anthony P. Antonuzzi, Stoneham; William E. Hagel, Billerica; Donald M. Lawson, Lexington, all of Mass., and Richard S. Herman, Clifton, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

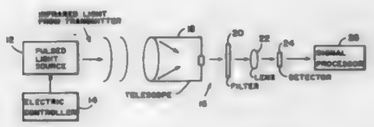
Filed Jan. 31, 1986, Ser. No. 859,100
Int. Cl.[4] F42C *15/06*
U.S. Cl. 310—78 **2 Claims**



1. Apparatus for unlocking a trigger mechanism comprising,

an electrical motor mounted on a shaft, said shaft extending from said motor and having a ring coaxially mounted to rotate with said shaft,
means for activating said motor by electrical impulses to rotate said shaft 30° in either direction,
said wheel being located on said shaft adjacent a frame, a ball housing and a plurality of balls being disposed between the frame and wheel, said frame and wheel being spaced apart less than the diameter of said balls,
grooves in said frame to receive said balls to prevent relative rotation between the housing and the frame,
indentations in the wheel to receive the balls and allow said balls to drop from said grooves,
a notch in the periphery of said wheel,
a latch mounted adjacent the periphery of said wheel,
said notch being configured to receive said latch upon the proper orientation of said wheel by said means for activating.

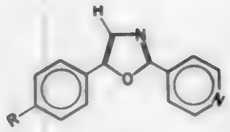
H333
NONIMAGING IDENTIFICATION STRUCTURE
Richard A. Curtis, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jul. 3, 1986, Ser. No. 881,369
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—608 **6 Claims**



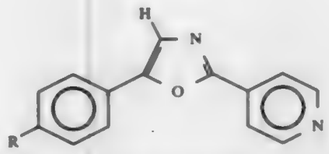
1. Apparatus for nonimaging identification of a vehicle comprising:
a. a pulsed light source transmitter carried by said vehicle for emitting infrared radiation at a level which does not exceed the vehicle's infrared signature;
b. a receiver remotely located from said source to receive said infrared radiation;
c. first filter means carried by said pulsed light source transmitter for passing said infrared radiation at a predetermined frequency;
d. second filter means carried by said receiver for matching said wavelength of said passed infrared radiation;
e. detector means carried by said receiver for detecting said filtered infrared radiation and providing an output signal; and
f. signal processing means carried by said receiver for receiving said output signal from said detector means and determining the identification of said detected filtered infrared radiation.

II334
OXAZOLE DYES
Ronald A. Henry, and Aaron N. Fletcher, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 20, 1986, Ser. No. 920,649
Int. Cl.⁴ H01S *3/20*
U.S. Cl. 372—53 **4 Claims**

1. As a composition of matter, the compound having a formula as follows:

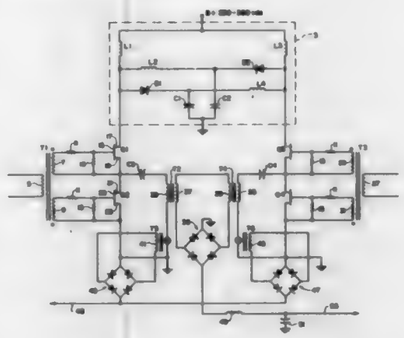


R = F and Cl



where R is selected from the group consisting of F and Cl.

H335
CONVERTER
Walter E. Millberger; Donald C. Lewns, both of Severna Park, and David E. Buigher, Ellicott City, all of Md., assignors to The United States of America as respresented by the Secretary of the Army, Washington, D.C.
Filed Mar. 27, 1987, Ser. No. 32,406
Int. Cl.⁴ H02N *3/335*
U.S. Cl. 363—16 **7 Claims**



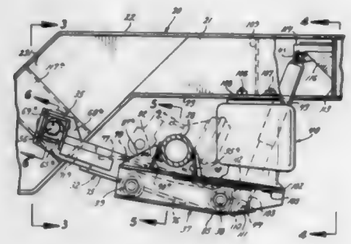
1. An electrical power converter comprising; two current fed square wave choppers the phase relationships of which may be varied over 180 degrees to achieve output voltage control and regulation, means to drive one of said choppers by means of an amplified square wave clock signal and means to drive the other of said choppers with an amplified and variable-phase version of the said clock signal, means to combine the outputs of said choppers by means of two series-connected windings of two different transformers, the primaries of which are driven by said choppers, said series-connected windings being connected to a full-wave bridge rectifier which provides the converter output.

REISSUES

SEPTEMBER 1, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

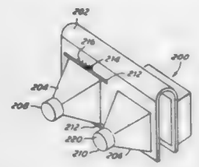
Re. 32,486
VEHICLE SUSPENSION WITH RIGID TORQUE BEAM
John E. Raidel, Jr., 2924 South Chantilly, Springfield, Mo. 65808
Original No. 4,427,213, dated Jan. 24, 1984, Ser. No. 341,445, Jan. 21, 1982. Application for reissue Jul. 8, 1987, Ser. No. 752,830
Int. Cl.⁴ B60K *23/00*
U.S. Cl. 280—711 **16 Claims**



1. In a vehicle suspension assembly for a vehicle having a frame: a torque beam *having first and second ends* adapted to be secured to the vehicle frame at a first point; a spring also adapted to be secured to the vehicle frame at a second point spaced from the first point; a first resilient bushing having an outer sleeve adapted to be firmly secured *directly* to the frame; an inner sleeve, an elastomeric sleeve between the outer and inner sleeve; a pivot extending through the inner sleeve, and initially rotatable therein; the torque beam having spaced arms at its *first* end, one extending across each end of the inner sleeve, means for non-rotatably connecting the said arms to the pivot, so as to restrain rocking movement of the arms relatively to the inner sleeve; the torque beam arms extending from the first point toward the second point, and [converting] *converging* to a closer relation *at the second end*; means connecting the two arms to form a box-like torque beam; a buffer beam; [a second resilient bushing] *means* connecting the *second* end of the torque beam [near the second point] to the buffer beam [and another third resilient bushing connecting the two beams between the first and second points]; the spring being attached to the buffer beam beyond the torque beam, and means to connect the buffer beam [between its resilient bushings] to an axle housing.

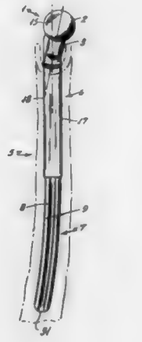
Re. 32,487
BINOCULAR PRESENTATION OF VISUAL INFORMATION
Patrick G. Kalaugher, Exmouth, England, assignor to University of Exeter, Devon, England
Original No. 4,521,074, dated Jun. 4, 1985, Ser. No. 457,515, Jan. 13, 1883. Application for reissue Jul. 16, 1986, Ser. No. 886,030
Claims priority, application United Kingdom, Jan. 22, 1982, 8201842
Int. Cl.⁴ G02B *27/02*
U.S. Cl. 350—145 **6 Claims**

1. A method for presenting first and second images derived from respective different sources to respective ones of an observer's eyes so that they can be substantially mentally fused to be perceived as a single mental image, wherein the method comprises: prerecording a first image *of at least a portion of a scene* to serve as a first image source; selecting *said scene as* a second, different image source for a second image so that said first and second images have substantial but not complete equivalence in visual content; *and* presenting said first image to the observer's first eye while simultaneously presenting to the observer's second eye said second image under conditions such



that it matches the first image sufficiently for said substantial mental fusion to occur[; and subsequently interrupting the presentation of one of said images to a respective eye, the other image being visible to the other eye during said interruption; said interruption being effected externally of the observer].

Re. 32,488
HIP PROSTHESIS
Ramon B. Gustilo, and Richard F. Kyle, both of Hennepin County Medical Center - 701 Park Ave. South, Minneapolis, Minn. 55415
Original No. 4,546,501, dated Oct. 15, 1985, Ser. No. 426,092, Sep. 28, 1982. Application for reissue Sep. 12, 1986, Ser. No. 907,594
Int. Cl.⁴ A61F *2/32*
U.S. Cl. 623—23 **14 Claims**



13. In a femoral insert for hip joint prosthesis having a spherical shaped head member, a neck member connected to the head member and terminating at a shaft member having a proximal portion connected to the neck member and extending approximately half the extent of the shaft member, and a distal portion extending therefrom, the improvement comprising:
the proximal portion having a longitudinal axis and a substantially straight aspect, an upper half which is broad in the medial-lateral direction and curved in the medial aspect and having a generally rectangular cross-section which is widest adjacent the neck member and gradually tapers to a generally square cross-section, and a lower half which has flat sides and a generally square cross-section of the upper half;
said neck member being anteverted with respect to the proximal portion at an angle of about 10° to 20° and is at an angle to

said longitudinal axis through said proximal portion of said shaft member of about 125° to about 140°;

at least one of the anterior and posterior sides of the upper half of said proximal portion including at least one porous bony ingrowth surface; and

said distal portion having the curved configuration of an intramedullary rod and curving in the opposite direction from the direction of said anteversion of said neck member, and said proximal portion extending straight in a plane parallel to said lateral aspect,

whereby firm fixation of the prosthesis is initially provided by the distal intramedullary rod portion while long term stabilization is achieved proximally through the bony ingrowth surface.

Re. 32,489

HERBICIDAL SUBSTITUTED 2-(1-(OXYAMINO)-ALKYLIDENE)-CYCLOHEXANE-1,3-DIONES

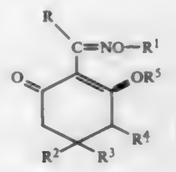
Tatao Luo, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Original No. 4,440,566, dated Apr. 3, 1984, Ser. No. 406,423, Aug. 9, 1982. Continuation-in-part of Ser. No. 405,228, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 210,206, Nov. 25, 1980, abandoned. Application for reissue Aug. 30, 1985, Ser. No. 771,086

Int. Cl.⁴ C07C *131/00;* A01N *31/06, 33/24*

U.S. Cl. 71—98 **47 Claims**

1. A compound of the formula



wherein

R is alkyl of 1 to 6 carbon atoms or phenyl;

R^1 is haloalkenyl of 2 to 6 carbon atoms and 1 to 3 halogen atoms, p-halobenzyl or p-trifluoromethylbenzyl;

R^2 and R^3 are independently hydrogen, alkyl of 1 to 3 carbon atoms, alkylthio of 1 to 6 carbon atoms, or alkylthioalkyl of 2 to 8 carbon atoms;

R^4 is hydrogen, or carbalkoxy of 2 to 4 carbon atoms;

R^5 is hydrogen, a cation, or



wherein R^6 is alkyl of 1 to 6 carbon atoms, phenyl or naphthyl:

34. The compound of claim 33 wherein R^1 is 3-transchloroallyl and R^5 is hydrogen.

Re. 32,490

METHOD OF MAKING A COMPOSITE LABEL WEB

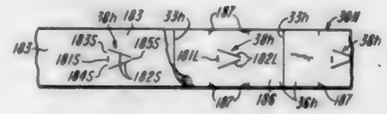
William A. Jenkins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Original No. 4,081,309, dated Mar. 28, 1978, Ser. No. 715,812, Aug. 19, 1976. Division of Ser. No. 607,317, Aug. 25, 1975, which is a continuation-in-part of Ser. No. 475,728, Jun. 3, 1974, Pat. No. 3,948,172, and Ser. No. 475,730, Jun. 3, 1974, Pat. No. 3,941,289, each is a division of Ser. No. 366,919, Jun. 4, 1973, abandoned, which is a division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,083, which is a continuation-in-part of Ser. No. 155,740, Jun. 23, 1971, abandoned. Application for reissue Oct. 29, 1979, Ser. No. 88,802

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.⁴ B32B *3/16, 31/18*

U.S. Cl. 156—250 **24 Claims**



14. Method of making a composite web for use in a label dispensing apparatus, comprising the steps of: providing a composite web comprising a web of supporting material and a web of label material releasably secured to the supporting material web by pressure-sensitive adhesive, making a series of butt cuts in the label material web at longitudinally spaced-apart locations to provide a series of pressure-sensitive labels on the supporting material web, and making a series of flap-forming cuts through the supporting material web and at least partially through the label material web between the marginal side edges of the composite web at longitudinally spaced-apart locations to provide *a series of* flap portions in the supporting material web, *all of the flap portions within the supporting material web projecting in the same direction,* the [supporting material] *composite* web being wound into a roll in a direction that *all of* the flap portions extend *only* in a trailing direction away from the outer free end of the [supporting material] *composite* web.

Re. 32,491

PROCESS FOR THE PREPARATION OF 7α-METHOXY-7β-(1,3-DIETHIETANE-2-CARBOXYAMIDO)CEPHALOSPORANIC ACID DERIVATIVES

Masaru Iwanami, Yokohama; Tetsuya Maeda, Uraws; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Noriaki Nagano, Ageo, and Atsuki Yamazaki, Ichikawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

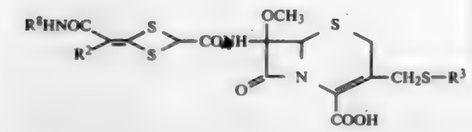
Original No. 4,404,373, dated Sep. 13, 1983, Ser. No. 208,298, Nov. 19, 1980. Division of Ser. No. 913,500, Jun. 7, 1978, Pat. No. 4,263,432. Application for reissue Apr. 25, 1985, Ser. No. 727,233

Claims priority, application Japan, Jun. 10, 1977, 52-68699; Jul. 28, 1977, 52-90772; Feb. 2, 1978, 53-10772

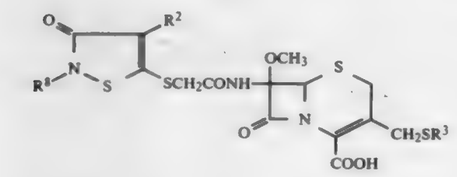
Int. Cl.⁴ C07D *501/57;* A61K *31/54*

U.S. Cl. 540—221 **7 Claims**

1. A process for the preparation of a 7α-methoxy-7β-(4-substituted methylene-1,3-[dithientane]*dithietane*-2-yl) carboxamido-3-heterocyclic thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula



wherein R^2 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, $R^4S(O)_n$ group wherein R^4 represents a lower alkyl gorup and n represents 0, 1 or 2, a lower alkanoyl group, a phenyl group, a naphthyl group, a benzoyl group, a naphthoyl group, *a carboxyl group, a derivative thereof selected from the group consisting of lower alkyl, phenyl lower alkyl and naphthyl lower alkyl esters of said carboxyl group and carbamoyl, carbazolyl and cyano groups,* a lower alkenyl group a sulfamoyl group, or a pyridyl group, or a thiadiazolyl group, and R^3 represents a lower alkyl-substituted tetrazolyl group or a lower alkyl-substituted thiadiazolyl group, and R^8 represents a hydrogen atom or an alkyl group [which may have substituents selected from N-monoalkyl carbamoyl, N-dialkyl carbamoyl, and alkoxy carbonyl amino], which comprises treating the 7α-methoxy-3-heterocyclic thiomethylcephalosporin derivatives represented by the formula



wherein R^2, R^3 and R^8 have the same significance as above, with a base.

Re. 32,492

SOLID-STATE COLOR TELEVISION CAMERA DEVICE

Yasuo Takemura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Original No. 4,460,919, dated Jul. 17, 1984, Ser. No. 380,145, May 20, 1982. Application for reissue Jun. 26, 1986, Ser. No. 878,631

Claims priority, application Japan, Jun. 10, 1981, 56-88248

Int. Cl.⁴ H04N *9/07*

U.S. Cl. 358—44 **14 Claims**

12. A solid-state color television camera device comprising:

a semiconductor substrate;

a photosensor array, formed on the substrate, having a plurality of photosensors arranged in horizontal and vertical rows, each photosensor generating a charge upon receipt of an image;

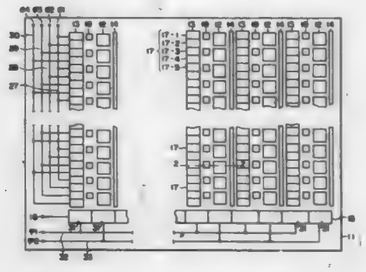
a vertical transfer means, positioned adjacent each vertical row of photosensors and responsive to vertical transfer signals, for receiving the charges generated by the adjacent photosensors and transferring the charges to a horizontal transfer means;

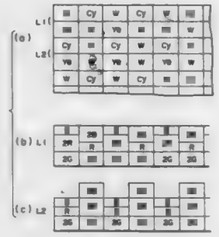
a charge mixing means, coupled to said vertical transfer means, for mixing the charges generated by the photosensors in two adjacent horizontal rows;

a horizontal transfer means, positioned adjacent one end of each vertical row of photosensors for receiving the charges transferred by the vertical transfer means, and transferring them as an output signal to an output terminal formed on the substrate;

a color filter array having a plurality of separate filter elements arranged in horizontal and vertical rows, each of said elements corresponding to a respective photosensor;

said color filter array, comprising a plurality of unit filter arrays, each unit consisting of 2×4 filter elements of yellow





(Ye), green (G), cyan (Cy) or white (W) colors and including at least one element of the yellow (Ye) and cyan (Cy) colors.

Re. 32,493

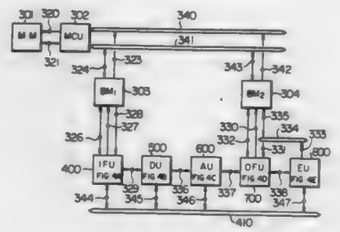
DATA PROCESSING UNIT WITH PIPELINED OPERANDS

Hideaki Matsumoto; Tadaaki Bandoh, and Hideo Maejima, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,454,578, dated Jun. 12, 1984, Ser. No. 265,168, May 19, 1981. Application for reissue Jun. 11, 1986, Ser. No. 873,174

Int. Cl.⁴ G06F *9/42, 9/34, 9/36*

U.S. Cl. 364—200 **23 Claims**



18. A data processing unit for executing variable length instructions in which operand specifiers for specifying addressing modes of operands are independent from operation codes for ascertaining operations, comprising:

first means for storing data including variable length instructions and certain of the operands to be executed by certain of the instructions;

second means for prefetching an instruction from said first means, for retaining the prefetched instruction, and for aligning a predetermined sequence of elements of the instruction including at least one operand specifier;

third means for decoding an operation code and each operand

specifier of an aligned instruction received from said second means, for calculating the effective address for the operand specified by each operand specifier in accordance with the decoded operation code, for fetching the operand from said first means in accordance with the calculated effective address for each operand specifier, and for retaining the fetched operands;

fourth means for controlling said third means so that said decoding and said address calculating are executed independently and at different times for each operand specifier, with one operand specifier being decoded while an effective address for an operand corresponding to another preceding operand specifier is being calculated; and

fifth means for executing the instruction in accordance with the decoded operation code and the retained operand.

PLANT PATENTS

GRANTED SEPTEMBER 1, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,998

HYBRID SHRUB ROSE PLANT CV. AROPICLU

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Somis, Calif.

Filed Sep. 9, 1985, Ser. No. 773,660
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. The new and distinct variety of hybrid shrub rose plant cv. Aropiclu and the parts thereof, substantially as shown and described herein, the plant being particularly characterized by its unusual open flower form, essentially as described and illustrated herein; its extremely abundant production of flowers in very large pyramidal clusters; its female sterility and well-above-average disease resistance; its semi-pendulous branching habit, yielding a large, well-filled and rounded bush with flowers and foliage extending to the ground; its very narrow, elongated foliage with highly serrated edges; and its nearly continuous production of flowers throughout the growing season.

5,999

ROSE PLANT NAMED SAVAPEG

Peggy L. Utz, New Albany, Ind., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Oct. 2, 1985, Ser. No. 783,115
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, which is a sport of the miniature rose "Starina" producing exhibition form flowers of varying pale rose tonality that hold color well through development and aging.

6,000

HYBRID TEA ROSE PLANT CV. AROLICAL

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Somis, Calif.

Filed Sep. 9, 1985, Ser. No. 773,661
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. The new and distinct variety of hybrid tea rose plant cv. Arolical and the parts thereof, substantially as shown and described herein, the plant being particularly characterized by its abundant production of large blooms of a pleasing, uniform medium-lavender coloration; its heavy, sweet citrus-blossom fragrance; its medium height and abundant, relatively large foliage; and its above-average vigor and bloom production, especially as compared to other cultivars of similar coloration.

6,001

GRAPEFRUIT HYBRID NAMED MELOGOLD

Robert K. Soost, and James W. Cameron, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 12, 1985, Ser. No. 797,286
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—45 **1 Claim**

1. The new and distinct variety of grapefruit hybrid plant herein described and illustrated and identified by the characteristics enumerated above.

6,002

IMPATIENS PLANT NAMED CIRRUS

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 10, 1985, Ser. No. 786,073
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens named Cirrus, as described and illustrated, and particularly characterized by the combined features of relatively early flowering, white flowers with five petals in which the upper petal has a green blotch showing through; vigorous and highly self-branching growth habit; green stems carrying relatively long and broad green leaves having uniform greenish yellow variegation; excellent flower keeping qualities, and ideal suitability for hanging baskets.

6,003

ASIATIC LILY PLANT NAMED 'TRIBUTE'

Edward A. McRae, Boring, Oreg., assignor to Melridge Inc., Gresham, Oreg.

Filed Sep. 3, 1985, Ser. No. 772,158
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive variety of Asiatic hybrid lily plant, substantially as herein shown and described, characterized in particular by the orange-red coloration of its large sized, virtually unspotted flowers, by its high tolerance of virus, its vigorous growth and rapid natural propagation, the excellence of its flower form, and its versatility both as a garden plant and as a cut flower producer from precooled bulbs forced out-of-season under glass.

6,004

IMPATIENS PLANT NAMED NOVA

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 10, 1985, Ser. No. 786,127
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens named Nova, as described and illustrated, and particularly characterized by the combined features of bright orange red flower color; relatively large flowers, two of which occur at each leaf axil; vigorous and superior self-branching habits; leaf variegation pattern and color, and relatively early flowering.

PATENTS

GRANTED SEP. 1, 1987

ERRATA

For CLASS	See PATENT NO.
060-228	4,689,845
437-044	4,689,869
437-040	4,689,871
437-228	4,689,872
437-002	4,689,873
437-002	4,689,874
437-211	4,689,875
187-101	4,690,243
254-327	4,690,376
439-013	4,690,470
439-063	4,690,471
439-067	4,690,472
439-001	4,690,473
439-120	4,690,474
439-502	4,690,475
439-502	4,690,476
439-595	4,690,477
439-271	4,690,478
439-097	4,690,479
439-364	4,690,480
439-585	4,690,481
439-578	4,690,482
439-517	4,690,483
439-736	4,690,484
437-208	4,690,714
437-022	4,690,717
435-161	4,690,903

PATENTS

GRANTED SEPTEMBER 1, 1987

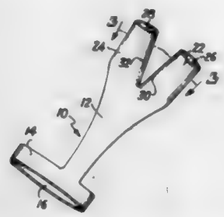
GENERAL AND MECHANICAL

4,689,823

PROTECTIVE DEVICE FOR HAIR STYLIST'S FINGERS

Janet C. Brewer, 506 Clay St., La Porte, Ind. 46350

Filed Jan. 2, 1987, Ser. No. 67
Int. Cl.[4] A41D 45/10
U.S. Cl. 2—21
11 Claims



1. A finger protector for hair stylist's fingers useful to protect the index finger and second finger of one hand from being pierced and cut by scissors which are used in the other hand during the cutting and styling of hair, comprising:

an open ended two finger body having a lower open end portion, a web portion between the two fingers and an upper open end portion which extends from said lower end portion to cover the first knuckles of the index and second fingers;

said unitary two-fingered body portion being thickened on the inside for the index finger and the second finger; and

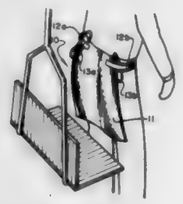
said web portion between the index finger and the second finger separating these fingers at an angle between about 25° to about 35° to facilitate pulling said body over the index and second fingers over the knuckles and into the web between the two fingers in the palm area while permitting the remaining fingers and the thumb to curl below the index finger and second finger and to be completely exposed when the hair stylist grasps the tips of the hair for cutting.

4,689,829

SEAT CONVERING DEVICE FOR SKIERS

Robert M. Kaplan, 5546 E. Sanna, Paradise Valley, Ariz. 85253

Filed Nov. 26, 1986, Ser. No. 935,018
Int. Cl.[4] A41D 27/12
U.S. Cl. 2—46
3 Claims



1. A seat covering device for skiers comprising:

an elongated flap having a width and length sufficient to cover the seat of a skier,

said flap being formed of a supple, lightweight, waterproof material for rolling up and unrolling along its length,

belt means secured to one end of said flap and extending laterally thereof for fastening around the waist of a skier, and

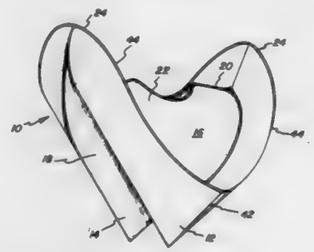
a pair of loops formed of elastic material mounted on said one end of said flap, one at each side thereof for surrounding the flap when it is rolled up along its length to said belt and releasing the rolled up flap when the loops are moved laterally of the ends of the rolled up flap to cause it to extend downward under the action of gravity over the seat of the skier.

4,689,830

HAIR CUTTING CAPE WITH CATCH FOR HAIR CLIPPINGS

Mary Williams, 148 East Hunter St., Glens Falls, N.Y. 12801

Filed Apr. 24, 1986, Ser. No. 855,391
Int. Cl.[4] A41B 13/10
U.S. Cl. 2—50
7 Claims



1. A haircutting cape comprising:

a piece of flexible material adapted to be disposed about the head and shoulders of the user, said cape having a shield portion consisting of a front panel and a rear panel to cover the user;

and a catch downward of the shield portion for receiving hair clippings, said catch comprising a front receptacle and a rear receptacle.

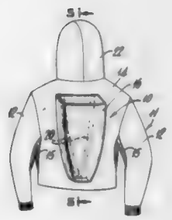
4,689,831

CONVERTIBLE GARMENT

Susan Greenberger, and Kate B. Horwich, both of Westport, Conn., assignors to Homebodies, Inc., Westport, Conn.

Filed Jan. 27, 1986, Ser. No. 879,452
Int. Cl.[4] A41B 1/00
U.S. Cl. 2—93 10 Claims





1. A convertible garment comprising a garment and a pocket on a side of the garment, the pocket being invertible such that the garment may be folded therein, thereby forming a carrying bag adapted to be worn on an individual's back.

4,689,832

PARTIALLY DETACKIFIED LEATHER AND GLOVE

Lewis W. Mulvaney, Ho-Ho-Kus, N.J., assignor to R. Neumann & Co., Hoboken, N.J.

Division of Ser. No. 671,761, Nov. 14, 1984, Pat. No. 4,598,429. This application Feb. 25, 1986, Ser. No. 832,751
Int. Cl.[4] B05D 1/18, 1/36, 3/02; A41D 19/02
U.S. Cl. 2—161 A 6 Claims

1. A tackified glove having an inner and outer surface and at least a portion of said inner surface detackified,

said glove being produced by a process which comprises the steps of:

a. immersing leather in an organic solvent solution containing a hydrocarbon tackifying resin and an isobutylene-butene copolymer in a ratio of hydrocarbon resin to copolymer of 10:1 to 1:10 to impregnate the leather on both sides with said solution,

b. evaporating the solvent from said impregnated leather sheet to thereby tackify both sides of said leather,

c. detackifying at least a portion of the inner side of said leather by applying thereto an organic solvent solution containing nitrocellulose and a silicone resin in a ratio of silicone resin to nitrocellulose of 1:30 to 1:10,

d. evaporating the solvent from the leather of step c. and

e. sewing the leather into a glove,

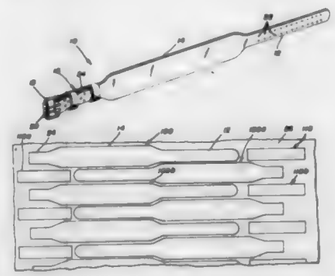
wherein the outer side is tackified and the inner side is detackified, but yet retains the feel of leather.

4,689,833

WEIGHT LIFTING BELT

Jerry Daniels, 4308 Ooltewah-Ringgold Rd., Ooltewah, Tenn. 37363

Filed Mar. 17, 1986, Ser. No. 840,132
Int. Cl.[4] A41F 9/00; A61F 5/24
U.S. Cl. 2—322 10 Claims



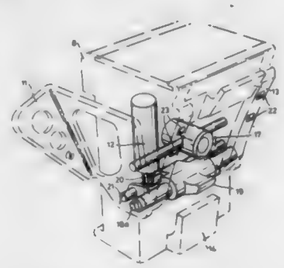
1. A weight lifting belt comprising a pair of strips of natural leather, one of said strips being longitudinally elongated and having a central portion intermediate first and second end portions, said central portion having a larger width relative to both end portions, said central portion and a first of said end portions being substantially elongated longitudinally relative to the second end portion, the other strip of said pair of strips comprising a short strip relative to said one strip and having substantially the same width as said second end portion, a fold formed in said other strip so that terminal ends thereof are substantially adjacent end other and a surface of said other strip forms superposed opposed surfaces, a buckle entrapped intermediate said opposed surfaces at said fold, and connecting means for fixedly securing said second end portion to said other strip remote from said buckle, said buckle and said first end portion having cooperating fastening means for adjustably attaching said buckle to said first end portion, one terminal end portion of said other strip being offset from the other terminal end portion relative to said fold, and said second end portion is in abutment and secured to one surface of said opposed surfaces, said one surface being adjacent the terminal end most remote from said fold.

4,689,834

NIGHT VISION GOGGLE ARRANGEMENT WITH AUTOMATIC RELEASE

Brian D. McCarthy, and Michael Edwards, both of MS Instruments Limited, Electron House, 33-49 Farwig Lane, Bromley, Kent BR1 3RE, England

Filed Mar. 7, 1986, Ser. No. 837,154
Int. Cl.[4] A42B 3/00; A61F 9/02
U.S. Cl. 2—422 7 Claims



1. A night vision goggle arrangement for a helmet, comprising

(a) an adjustable assembly connected with the goggles for adjusting the position of the goggles relative to a user;

(b) means for connecting said assembly with a mounting plate on the helmet;

(c) means for locking said assembly to the helmet mounting plate;

(d) means for releasing said assembly from the helmet mounting plate; and

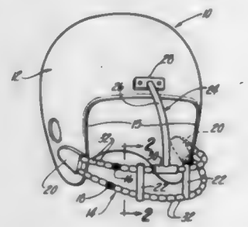
(e) stored energy means for disengaging and ejecting said assembly from the helmet mounting plate.

4,689,835

FACE GUARD DESIGN

Howard J. Draft, 1050 Helen Ln., Madison Heights, Mich. 48071, and Robert W. Chambers, 3540 Greentree Rd., Bloomfield Hills, Mich. 48013

Filed Nov. 2, 1981, Ser. No. 317,498
Int. Cl.[4] A42B 3/00
U.S. Cl. 2—424 10 Claims



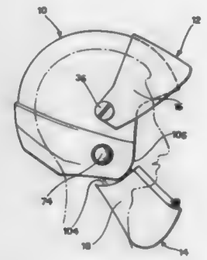
1. In an athletic helmet having a face opening and a face guard assembly located across the face opening, said face guard assembly comprising: at least one bar member extending generally across the face opening and a plurality of rollers rotatably supported on said bar member whereby manual gripping of the face guard assembly is inhibited, at least two of said rollers being located adjacent each other on said bar member with no intervening non-rotatable element in between.

4,689,836

HEADGEAR FOR MOTORCYCLING AND SIMILAR ACTIVITIES, WITH A MOVABLE VISOR AND CHIN GUARD

Alberto Vitaloni, Turin, Italy, assignor to Vitaloni Group S.p.A., Turin, Italy

Filed Jul. 14, 1986, Ser. No. 885,151
Claims priority, application Italy, Nov. 5, 1985, 54002/85[U]
Int. Cl.[4] A42B 1/08
U.S. Cl. 2—424 15 Claims



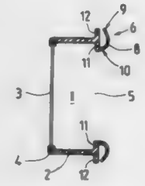
1. Headgear for motorcycling and like activities, comprising a protective helmet, a visor and a chin guard, both said visor and said chin-guard being substantially C-shaped in plan so as to have lateral arms which are fixed to the sides of the helmet by respective hinge means which allow the visor to be moved between a lowered position in front of the upper part of the face and a raised position on the forehead and the chin guard adapted to be moved by the hand of a wearer and independently of the chin between a raised position in front of the lower part of the face and a lowered position beneath the chin, the arms of the visor and of the chin guard being interconnected in correspondence with their respective hinge means by operating means such that the lowering of one of the visor and chin guard causes the concomitant raising of the other and vice versa and means for maintaining the visor and the chin guard in their respective raised and lowered positions.

4,689,837

EYE SHIELD WITH FACE ENGAGING SEAL

Robert Bollé, Oyonnax, France, assignor to Etablissements Bolle Georges, Robert et Maurice, Oyonnax, France

Filed May 21, 1985, Ser. No. 736,326
Claims priority, application France, May 21, 1985, 84 07851
Int. Cl.[4] A61F 9/02
U.S. Cl. 2—440 7 Claims



1. A mask to be placed flush against a wearer's face, said mask comprising:

a visor and a lateral frame which define an interior space,

said lateral frame extends between said visor and the wearer's face essentially perpendicular to the wearer's face to space away the wearer's face from said visor a distance substantially equal to a length of said lateral frame, said lateral frame including flexible bearing means by which said mask bears on the wearer's face, said flexible bearing means comprises two flexible rims respectively extending from said lateral frame in a symmetrical arrangement towards the interior space and away from the interior space, said two flexible rims extending in a direction transverse to said lateral frame,

a cushion mounted on one of said flexible rims, extending in a cantilever manner from said one flexible rim towards the other flexible rim, and being curved towards said other flexible rim,

so that when said visor is impacted, said cushion will in a first position deform to absorb the impact and under sufficient force will in a second position transmit pressure to at least one of said two flexible rims, which will also deform to absorb such pressure, thereby providing a two position deformation while spacing said lateral frame and said visor from the wearer's face to avoid impacting the wearer's face with said visor.

4,689,838

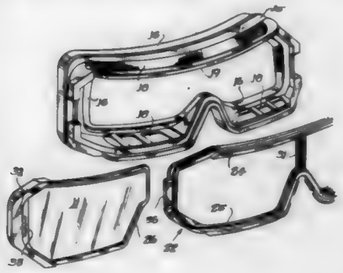
GOGGLES WITH INTERCHANGEABLE LENSES

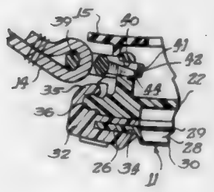
Gottfried Angermann, Neuhofen, and Berthold Hiebl, Traun, both of Austria, assignors to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed Feb. 20, 1986, Ser. No. 831,408
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3506079
Int. Cl.[4] A61F 9/02
U.S. Cl. 2—441 5 Claims

1. Goggles comprising flexible frame means deformable to conform to and seal about the wearer's face and eyes; strap

means secured to the goggles adjacent the temple for securing the goggles to the wearer's head; rigid frame means secured to the periphery of the flexible frame means and having a beaded edge, and a channel means adjacent the upper and lower edges of the flexible frame means, the channel means having an opening adjacent the temple area of the flexible frame means; removable lens means including a peripheral flange receivable





within the opening of the channel means so that the lens means are slidable within the channel means to locate the lens means with respect to the rigid frame means; and rigid gripping means secured to the temple portion of the lens means operable to close the opening of the channel means and including locking clip means which snaps over the beaded edge of the rigid frame means to removably secure the lens means within the channel means.

4,689,839

TAP WATER POWERED HYDROTHERAPY METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 796,987, Nov. 12, 1985, and Ser. No. 843,151, Mar. 24, 1986. This application Aug. 29, 1986, Ser. No. 902,179

Int. Cl.[4] A61H *33/02*

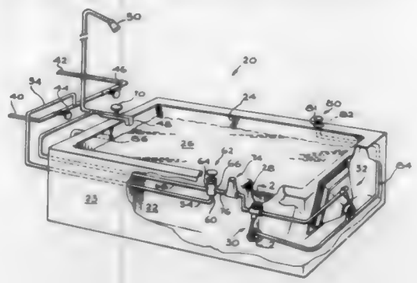
U.S. Cl. 4—542 **55 Claims**

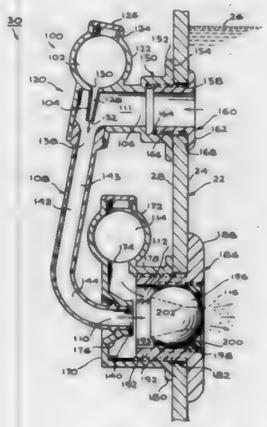
1. In combination with a tap water source means supplying a pressurized fresh water flow, hydrotherapy apparatus operable with an electrically driven pump for discharging a water stream for massaging a user's body, said apparatus comprising:

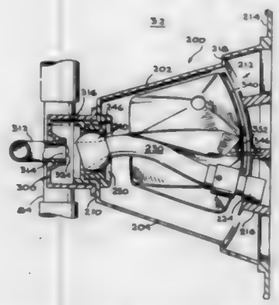
a tub having a peripheral wall for containing a water pool;

a discharge means for discharging a water stream into said pool;

means mounting said discharge means proximate to an area of said peripheral wall for movement along a path extending substantially perpendicular to said stream; and







means responsive to said pressurized fresh water flow for moving said discharge means along said path.

4,689,840

BUILT-IN SINK

Manfred Mück, Kürnbach; Walter Blanc, Oberderdingen, and Hans-Albert Müller, Schwabach, all of Fed. Rep. of Germany, assignors to Blanc GmbH & Company, Fed. Rep. of Germany

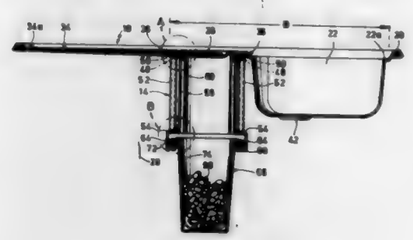
Continuation of Ser. No. 711,958, Mar. 14, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,694

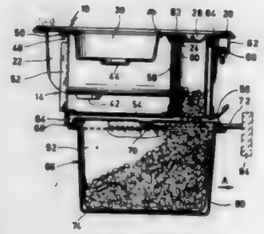
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410103; Jan. 17, 1985, 3501443

Int. Cl.[4] E03C *1/00*

U.S. Cl. 4—629 **32 Claims**

1. A built-in sink unit comprising a built-in sink with a shaped plate within which a sink basin and beside the same a waste disposal opening are provided, said unit having a drop shaft extending downwardly from the shaped plate and encompassing the waste disposal opening and holding means for carrying a waste container beneath said drop shaft, said waste container having an upper opening larger in cross-sectional area than the cross-sectional area of the drop shaft, said upper opening having a front and rear end relative to the position of the built-in sink said holding means comprising guide means mounting the waste container for horizontal sliding movement transversely to the longitudinal direction of the built-in sink





along a path of movement extending between a rear and a front end position, relative to the position of the built-in sink in which the waste container is located in front of the built-in sink, whereas in the rear end position of the waste container the drop shaft is located above an area of the upper opening of the waste container being spaced from the rear end of said upper opening.

4,689,841

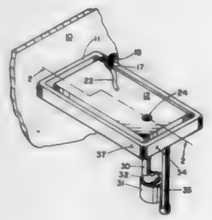
FOLDAWAY SINK

Gregory M. Owen, 2919 E. Elm Cir., Katy, Tex. 77449

Filed Oct. 2, 1986, Ser. No. 914,271

Int. Cl.[4] E03C *1/322*

U.S. Cl. 4—644 **10 Claims**



1. A foldaway sink comprised of an elongated sink member having a substantially flat central surface, said sink member having a generally rectangular configuration with four side surfaces,

means on one of said side surfaces for pivotally coupling said one side surface to a vertical base member,

means defining a drain opening in said central surface and including threaded coupling means disposed below said central surface for attaching a drain pipe,

a tubular drain pipe with means for releasably attaching to said threaded coupling means,

first attachment means on said drain pipe and on a side surface of said sink for attachment of said drain pipe to said side surface when said sink is pivoted to a non-use position,

means defining a blind opening on the bottom surface of said sink member for releasably receiving a support pipe,

a tubular support pipe receivable in said opening, said support pipe having a second attachment means thereon adapted to cooperate with a second attachment means on a side surface of said sink for attachment of said support pipe to said side surface when said sink is pivoted to said non-use position.

4,689,842

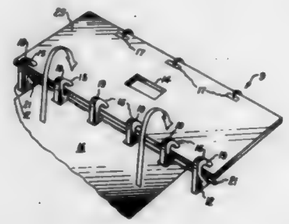
PATIENT MOTIVATION DEVICE

George C. Kuhn, 228 E. Commercial St., East Rochester, N.Y. 14445

Filed Nov. 26, 1986, Ser. No. 935,016

Int. Cl.[4] A61G *7/10, 7/02*

U.S. Cl. 5—61 **6 Claims**



1. A device for assisting attendants in moving bedridden patients for their excretory functions comprising:

(1) a substantially rigid rectangular platform for supporting a patient thereon, said platform including an opening therein so located that waste excreted by said patient falls into waste collector underneath said opening without touching said platform, and

(2) a plurality of substantially rigid vertical supports formed on the underside of said platform for supporting said platform at a predetermined distance above the surface on which said patient is reposed, each of said vertical supports including a resilient member thereon said resilient member extending from said vertical support outwardly and around one of the longer edges of said platform,

whereby said resilient member is initially compressed by contact with the patient as the patient is moved from a place of repose over to and on to said platform edge thereby tilting said platform and as said patient is fully moved on to said platform, said resilient member is released from compression to return to its original state thereby allowing said platform to return to its original position supported by said rigid vertical supports.

4,689,843

DECORATIVE COVER FOR A FLOATATION SLEEP SYSTEM

Philip J. Santo, 12 Mountin Rd., Rochester, N.Y. 14625

Filed Sep. 2, 1986, Ser. No. 902,776

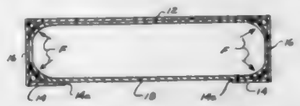
Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—452 **4 Claims**

1. For use with a floatation sleep system including a fluid-filled bladder, a decorative cover adapted to contain a fluid-filled bladder and functional to maintain a substantially rectilinear shape for such fluid-filled bladder, said cover comprising:

a first flexible, substantially rectangular, dimensionally stable sheet;

a second flexible, substantially rectangular, dimensionally stable sheet, said second sheet having an opening defined therein and adapted to have a floatation sleep system bladder inserted therethrough;
means for interconnecting the marginal perimeter edges of said first and second sheets; and
a first dimensionally stable tie member joining said first sheet to said interconnecting means and disposed interiorly of the interconnection of said first sheet and said interconnecting means, and a second dimensionally stable tie member joining said second sheet and said interconnecting



means and disposed interiorly of the interconnection of said second sheet and said interconnecting means, whereby said first and second tie members respectively form first and second chambers with said first and second sheets and said interconnecting means, said first and second chambers being adapted to contain a compressible medium, and wherein said first and second tie members respectively prevent said first and second sheets from moving away from said interconnecting. means due to forces exerted by a fluid-filled bladder contained therewithin.

4,689,844

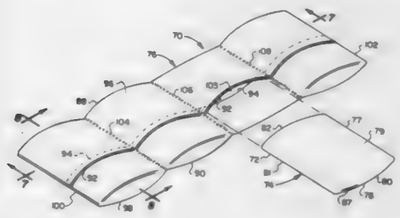
CONVERTIBLE BODY SUPPORTING PADS

Margaret A. Alivizatos, 3745 Purdue St., Dallas, Tex. 75225

Division of Ser. No. 683,067, Dec. 18, 1984, Pat. No. 4,606,087, which is a continuation-in-part of Ser. No. 650,800, Sep. 14, 1984, Pat. No. 4,607,403. This application Apr. 29, 1986, Ser. No. 857,731

Int. Cl.⁴ A47C *27/14*; A61G *7/04*

U.S. Cl. 5—455 **7 Claims**



1. A convertible support pad useful at least as a mattress or lounging support comprising:
a plurality of cushions comprising flexible drainable fabric top and bottom panels of generally rectangular configuration which are each closed to form an enclosed space, said space being at least partially filled with a flowable expanded foam bead fill material for conforming to a body or limb supported by said cushions and for distributing support forces therein, and
a segmented flexible drainable fabric cover forming a plurality of side by side pockets for receiving said cushions, respectively, said pockets being formed between laterally extending hinge lines formed in said segmented cover by securing opposed panels of said segmented cover to each other along said hinge lines, and means for inserting and removing cushions comprising marginal edges of the cover material that forms one of said opposed panels, said means extending along said one opposed panel, said marginal edges being secured together with the other opposed panel at the hinge lines, said marginal edges being separable for insertion and removal of respective cushions from their respective pockets.

4,689,845

IMPULSE PROPULSION UNIT

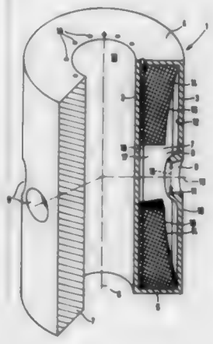
Lothar Stessen, Lauf, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 867,217

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521204

Int. Cl.⁴ F02K *1/00, 9/00*; C06D *5/00*

U.S. Cl. 60—228 **9 Claims**



1. An impulse unit for lateral acceleration of a projectile comprising:
a housing dispersed about a longitudinal axis having annular end walls and inner and outer cylindrical walls radially spaced from each other and extending between said end walls, thereby defining an annular, elongated space enclosed by said walls;
a plurality of nozzles disposed on an outer surface of said outer wall, each nozzle adapted to communicate with a propellant chamber disposed in said annular space;
a plurality of separating walls radially extending between said inner and outer cylindrical walls to separate adjacent propellant chambers from one another and thereby dividing said annular space between the outer and inner cylindrical walls into a plurality of axially elongated segments circumfertentially adjacent one another and separate from one another.

4,689,846

DOCK LEVELER APPARATUS

Danny Sherrod, Joshua, Tex., assignor to Bluff Welding Inc., Burleson, Tex.

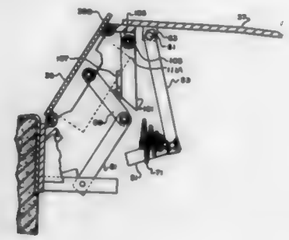
Filed Nov. 3, 1986, Ser. No. 926,634

Int. Cl.⁴ E01D *1/00*

U.S. Cl. 14—71.3 **7 Claims**

1. Apparatus for use with a dock leveler of the type having a base means adapted to be attached to a dock, a bridge plate having a first edge pivotally coupled to an edge of said base means for pivotal movement in rearward and forward directions between a forward extended position and a rearward position, stop means coupled to said base means to be engaged by said bridge plate when said bridge plate is in its forward extended position for preventing said bridge plate from pivoting in a forward direction beyond said forward extended position, a lip plate pivotally coupled to an edge portion of said bridge plate opposite said first edge for pivotal movement between an extended position generally forming an extension of said bridge plate and a folded position wherein said lip plate

forms an acute angle with said bridge plate, said apparatus comprising:
first and second linkage means having first ends respectively pivotally coupled together,
the other end of said first linkage means being adapted to be pivotally coupled to the underside of said bridge plate,
the other end of said second linkage means being adapted to be pivotally coupled to said base means for pivotal movement about a pivot axis that is to be fixed relative to said base means,
catch means having a first end adapted to be pivotally coupled to the under side of said lip plate and a free end adapted to hang downward from said lip plate,



said catch means having an engaging means adapted to engage structure of said first linkage means when said bridge plate is moved to its rearward position for holding the free end of said lip plate away from and forward of said bridge plate as said bridge plate is moved from its rearward position toward its forward extended position for allowing said lip plate to engage the bed or the like of a vehicle,
said engaging means of said catch means being adapted to be disengaged from said structure of said first linkage means when said bridge plate reaches a given position as it moves toward its forward extended position.

4,689,847

BALL UNIT

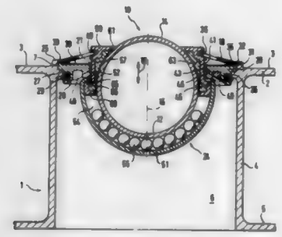
Thomas Huber, Iffeldorf, Fed. Rep. of Germany, assignor to Electro-Pneumatic-International GmbH, Hausham, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 836,943

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507945

Int. Cl.⁴ B60B *33/08*

U.S. Cl. 16—26 **14 Claims**



1. Ball transfer unit, in particular for conveying devices such as for example ball mats, and having a load ball which by a part of its surface can bear against a first body, in particular against a load object to be displaced by way of the conveying device; said ball unit comprising:
a bearing unit which bears the load ball to be freely rotatable and to a large extent so encloses it that a free part of the surface of the load ball projects out of the bearing unit through a circular passage opening to bear against the first body,
a holder which, for the fastening of the ball unit at a second body, in particular at the carrying frame of a conveying device, has a fastening portion which in the assembled state bears against the second body, wherein the bearing unit is so movable to and fro linearly relative to the holder between an advanced and a withdrawn end position that the free surface of the load ball in the advanced end position projects further beyond a surface of the second body than in the withdrawn end position, and
spring means including a spring which is stressed between the bearing unit and holder, is arranged concentrically with the passage opening of the bearing unit as seen in the direction of the linear movement of the bearing unit and which biases the bearing unit into the advanced end position, said spring (**18**) being constructed as a flatly bowed annular disk and being supported at the holder (**20**) in immediate proximity of said fastening portion (**31**), said disk being bowed to conform generally to a sphere or truncated cone.

4,689,848

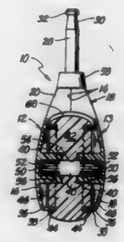
CASTER HAVING INTERFITTING HOUSING MEMBERS WITH INTEGRAL BEARINGS AND A SEPARATE AXLE

Bernard Kotzin, 510 Anderson St., Manhattan Beach, Calif. 90266

Filed Jun. 23, 1986, Ser. No. 877,533

Int. Cl.⁴ B60B *33/00*

U.S. Cl. 16—46 **5 Claims**



1. In a caster constructed so as to include a rigid yoke having a center portion and arms which extend generally parallel to one another from the center portion, a wheel located so that the arms of the yoke extend along its sides, cooperating wheel support means on the wheel and on the yoke for holding the wheel so that it can rotate about an axis extending between the arms and a caster support located on the center portion of the yoke for mounting the caster so that it can rotate about an axis which is offset relative to the axis of rotation of the wheel the improvement which comprises:
said yoke being formed of two separate housing members, each of said arms being integral with one of said members,
cooperating interfitting means on both of said members for positioning said housing members so that they cannot slide relative to one another, and
fastener means for securing said housing members against relative movement with respect to each other, said fastener means extending between and engaging both of said housing members, said arms include aligned cylindrical bosses on the adjacent surfaces of said arms, and said wheel is shaped so as to receive said bosses so that said bosses serve as an axle for said wheel, said bosses are hollow bosses having aligned openings formed therein and including a separate axle located within both of said bosses so as to extend between said arms.

4,689,849

CONTROL MECHANISM FOR A DOOR OF A MOTOR VEHICLE WITH A RECIPROCATING SAFETY VALVE

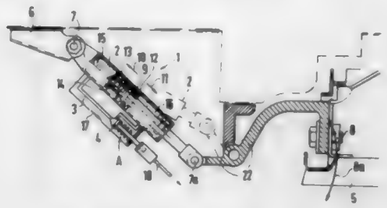
Georg Eger, Hochdorf/Vaihingen, and Rainer Srock, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 820,330, Jan. 21, 1986, abandoned. This application Apr. 10, 1986, Ser. No. 850,004

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501713; May 29, 1985, 3519203

Int. Cl.[4] E05F *5/02*

U.S. Cl. 16—82 8 Claims



1. A control mechanism for a motor vehicle door of the type which is swingably linked to a vehicle body door post and includes interior and exterior door handles, said control mechanism comprising:

a piston-cylinder unit arranged between the door post and the vehicle door for dampering door opening and closing movements, said piston-cylinder unit exhibiting passage opening means and communicating two working chambers of opposite effective pressure surfaces of the piston-cylinder unit and interior valve means controlling the passage opening means in response to relative movement of the vehicle door and door post,

and control circuit means connecting the two working chambers separately from the passage opening means, said control circuit means including blocking valve means controlled by the door handles in such a way that the door can be blocked in at least one intermediate position,

wherein said blocking valve means is reciprocable against a biasing force between a release position when said door handle is actuated and a closing position when said door handle is not actuated;

said blocking valve means including a substantially flat control surface;

said control circuit means including a widened portion with a diameter wider than a remaining portion of said control circuit means and substantially equal to the diameter of said control surface, said widened portion forming a pressure column means for reciprocating said blocking valve means to said release position when there is excessive pressure in said pressure column means.

4,689,850

PULLEY MOUNT FOR WINDOW BALANCE SYSTEM

Robert S. Flight, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,394

Int. Cl.[4] E05D *13/00*

U.S. Cl. 16—197 32 Claims

1. A pulley mount for a window balance system, said pulley mount comprising:

a. a support plate having a hole;

b. a shoulder rivet having a shaft fitting through said hole and a shoulder abutting against said support plate around said hole;

c. a pulley mounted on said shoulder between said support plate and a head for said rivet;

d. a bushing mounted on said rivet shaft; and



e. another pulley mounted on said bushing between said support plate and a riveted end of said rivet.

4,689,851

ELASTIC HINGE FOR EYEGLASSES

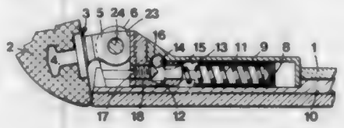
Karl Beyer, Meyrin, Switzerland, assignor to LN Industries SA, Geneva, Switzerland

Filed Mar. 17, 1986, Ser. No. 840,039

Claims priority, application Switzerland, May 1, 1985, 01842/85

Int. Cl.[4] G02C *5/22*

U.S. Cl. 16—228 5 Claims



1. Elastic hinge for eyeglasses comprising two parts (3 and 8) articulated to one another between open and folded positions, an elongated box (9) defining a housing (13) and adapted to be fixed to an eyeglass temple (1),

one (8) of said parts (3 and 8) slidably disposed in said housing (13),

a return spring (11) biasing said sliding part (8),

a closing part (12) extending partially into said housing (13) and holding said return spring (11) in said housing (13),

locking means (14) fixing said closing part (12) in relation to said box (9),

characterizied in that said closing part (12) includes a tapped hole (18) oriented longitudinally in relation to said sliding part (8), a screw (17) disposed in said tapped hole (18) and acting on said locking means (14), said screw (17) having a head accessible in the folded position of said temple (1).

4,689,852

FRICTION SUPPORTED STAYS FOR WINDOWS

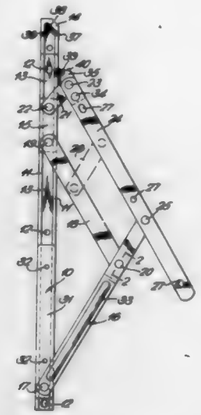
John E. Buckley, Tewkesbury, United Kingdom, assignor to Securistyle Limited, Nottingham, England

Continuation of Ser. No. 560,559, Dec. 12, 1983, abandoned. This application Nov. 20, 1985, Ser. No. 799,559

Claims priority, application United Kingdom, Dec. 24, 1982, 8236777

Int. Cl.[4] E05C *17/04*

U.S. Cl. 16—341 8 Claims



1. A friction supporting stay for being fitted to a window comprising:

a track;

a slider movable along said track;

a strut having first and second ends and pivotally connected at said first end to said track;

a brace having first and second ends and pivotally connected at said first end to said slider and pivotally connected at said second end to said strut between the first and second ends of said strut;

a link having first and second ends and pivotally connected at said first end to said slider;

a cap member disposed at the end of said track remote from the first end of said strut and having two internal cam surfaces perpendicular to the plane of said track and extending outward therefrom and meeting at an apex, the internal cam surfaces on said cap member being asymmetrically disposed with respect to the central longitudinal axis of the track, one cam surface being at a greater angle to the axis than the other; and

a bar having first and second ends and pivotally connected at said first end proximate the second end of said link and pivotally connected to the second end of said strut at a point between the first and second ends of said bar and adapted so that as said slider moves along said track said bar swings from a closed position overlying said track to an open position angled with respect to said track, said bar having a nose portion formed at the first end thereof which has two external surfaces meeting at an apex and correspondingly shaped to co-operate with the two internal cam surfaces of said cap member and which enters said cap member and engages the two internal cam surfaces thereof with a wedging action as said bar is moved into the closed position;

said two external surfaces of said nose portion and said two internal cam surfaces of said cap member being disposed such that the apex of the two external surfaces of said nose portion is offset relative to the longitudinal axis of said bar toward the side thereof more proximate said track, the offset ensuring that said nose position enters said cap member even if said track, said strut, said brace, said link or said metal bar are deflected due to loading thereof.

4,689,853

HINGE MEMBER FOR AN ALL-GLASS PLATE MEMBER INCLUDING A METAL FITTING

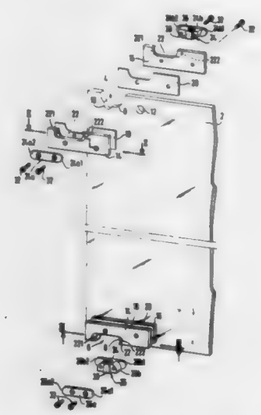
Mario Marinoni, Magenta, Italy, assignor to Casma di V. Marinoni & Figli, Magenta, Italy

Filed Apr. 11, 1986, Ser. No. 850,976

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3538964

Int. Cl.[4] E05D *5/02*

U.S. Cl. 16—382 12 Claims



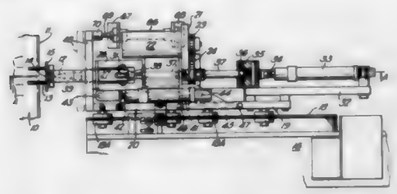
1. Metal fitting for glass doors, windows, transoms and display window panels, comprising an all-glass plate member having a pair of opposite face surfaces and at least one pair of edges extending between said face surfaces, an elongated recess formed in each said edge and extending between said face surfaces, a pair of clamping plates each arranged to be located on an opposite one of said face surfaces, first means for interconnecting said clamping plates and for pressing said clamping plates against said plate member, said first interconnecting means extending through said plate member, each said pair of clamping plates having an elongated recess therein arranged to align with the recess in said edge and with one another with said clamping plates covering the face surfaces of said plate member in which the edge recess is formed, a hinge member arranged to be fitted into said recess in said edge and into said recesses in said clamping plates, said hinge member comprising at least two hinge member parts each arranged to fit into a different one of said recesses in said clamping plates, a shoulder at each end of said elongated recesses in said clamping plates with said shoulders projecting into said recesses and forming a support surface, each of said hinge member parts having spaced end sections and each said end section arranged to seat against the support surface of one of said shoulders in the recess of the corresponding said clamping plate, one said hinge member part having a projecting region thereon projecting outwardly therefrom toward the other said hinge member part with said projecting region located between and spaced from said end sections thereon, and second means for interconnecting said hinge member parts, said second interconnecting means comprising bolts extending through and interconnecting said hinge member parts and being spaced from and located between said projecting region and said end sections, the tightening of the bolts causing said other hinge member part to bend slightly about the projecting region and thereby grip tightly at the shoulders to cause the hinge member parts to fit tightly in the recesses.

4,689,854

HEAT SEALING MACHINE

Barry R. Wakefield, Cambusbarron, Scotland, and Francis J. Pullen, Willingham, England, assignors to Devro, Inc., Somerville, N.J.

Filed Dec. 1, 1986, Ser. No. 936,687
Int. Cl.[4] A22C *13/00*
U.S. Cl. 17—1 R **11 Claims**



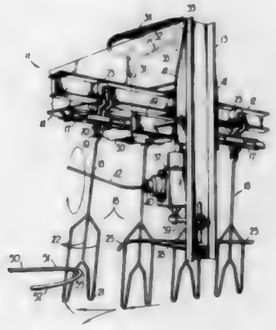
1. A machine for receiving and automatically sealing one end of a sausage casing using a heat sealing process, the machine comprising means for gripping and rotating one end of the sausage casing so as to twist the sausage casing, means for applying heat to the twisted portion of the sausage casing so as to heat seal the end of the sausage casing, and means to sever the heat sealed portion leaving a short protruding length of heat sealed casing.

4,689,855

POULTRY LINE DIVIDER

Woodal W. Dameron, Marietta, Ga., assignor to Cantrell Machine Co.

Filed Jan. 30, 1986, Ser. No. 824,122
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 **11 Claims**



1. An apparatus for separating poultry feed in a defined forward direction along a generally predetermined line, comprising:

conveyor means for sequentially conveying, at a selected operative speed in the forward direction along said predetermined line, poultry suspended from shackles;

rotary drive means, positioned with the axis of rotation thereof substantially parallel with said predetermined line, for rotating at a rotary speed having a selected relationship with said operative speed of said conveyor means, and synchronized with said shackles conveyed thereby;

a deflector bar mounted on said rotary drive means for rotation thereby, said bar including a base portion projecting substantially away from said rotation axis, and further including an extending portion attached to said base portion and projecting substantially along said rotation axis but radially displaced therefrom, said extending portion being adequately displaced from said axis to selectively project into said predetermined line upon rotation of said rotary drive means so as to engage shackles therein and thereby deflect such selected shackles from said line;

divider guide means, situated generally along said predetermined line downstream from said rotary drive means, for guiding into one of at least two discrete paths shackles conveyed by said conveyor means, depending on whether said shackles are conveyed substantially in said predetermined line or have been deflected therefrom; wherein

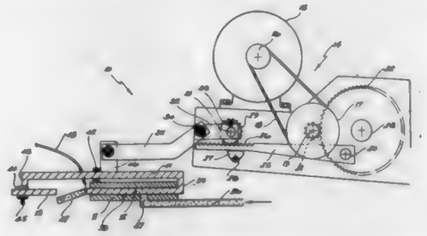
said rotary speed of said rotary drive means may be selected so as to controllably cause one out of a selected number of shackles to be periodicially deflected from said predetermined line by said deflector bar at a point in said line upstream from said divider guide means and continuing thereto, so that poultry is separated along said line at a desired ratio.

4,689,856

MATERIAL FORMING APPARATUS

Royce G. Gibson, Murwillumbah, Australia, assignor to Tendapak Holdings Pty. Limited, Brisbane, Australia

PCT No. PCT/AU85/00087, § 371 Date Feb. 19, 1986, § 102(e) Date Feb. 19, 1986, PCT Pub. No. WO85/04784, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 19, 1985, Ser. No. 821,740
Claims priority, application Australia, Apr. 19, 1984, PG4671
Int. Cl.[4] A22C *7/00*
U.S. Cl. 17—32 **6 Claims**



1. An apparatus for forming paste-like materials into discrete product units comprising an elongate, open ended tube of substantially constant internal cross-sectional shape, an inlet port through the wall of the tube intermediate its ends to allow the entry of paste-like material into the interior of the tube, a piston means including first and second piston members spaced apart in axial alignment and adapted to be moved together relative to the tube between a first position in which the space between them is effectively external of the tubes and a second position in which that space is completely within the tube and in communication with the inlet port therein, the apparatus further including means adapted to cause the piston members to undergo a short oscillation when at the first and/or second positions.

4,689,857

WEB WEIGHT CONTROL SYSTEM

Akiva Pinto, Gastonia, N.C., assignor to John D. Hollingsworth On Wheels, Inc., Greenville, S.C.

Filed Sep. 1, 1987, Ser. No. 886,711
Int. Cl.[4] D01H *5/38*
U.S. Cl. 19—105 **19 Claims**

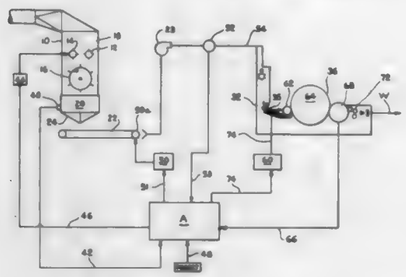
1. A method for controlling the weight of a web produced on a carding machine of the type wherein fiber is fed from a fiber supply means to a fiber weighing means which supplies a weighed amount of fiber into a fiber delivery means which delivers fiber to a fiber storage means, said fiber storage means feeding fiber in the form of a fiber batt to a card feed roll which feeds the fiber batt to the carding machine, said method comprising:

sensing the actual weight of fibers supplied to said fiber delivery means and generating an actual fiber weight signal corresponding to the actual weight of fibers;

sensing the quantity of fibers stored in said fiber storage means and generating a fiber quantity signal corresponding to the quantity of fiber in said storage means;

establishing a preset web weight signal corresponding to a desired weight for the web being produced by said carding machine;

controlling the operation of said card feed roll in response to a comparison of said actual fiber weight signal and said



preset web weight signal and adjusting the operation of said card feed roll to maintain the weight of said web at said preset web weight during production;

controlling the fiber delivery means in response to said fiber quantity signal to maintain a prescribed fiber quantity in said fiber storage means as the operation of said card feed roll is controlled and varied; and

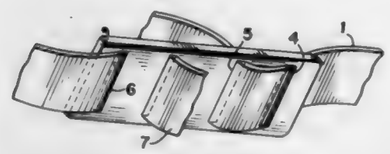
controlling the operation of said fiber supply means in response to said actual fiber weight signal to adjust the weight of fiber supplied to said fiber delivery means and maintain a prescribed fiber supply weight.

4,689,858

ADJUSTABLE RUBBER BAND

Michael T. Barber, 6427 Eppard St., Falls Church, Va. 22044

Filed Jun. 12, 1986, Ser. No. 873,728
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—17 B **1 Claim**



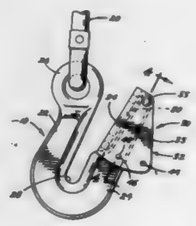
1. A fastening device consisting of a flat rectangular piece of polymer plastic which forms a clasp with two sets of two equally spaced slits at either end of the clasp, where rubber material exhibiting a high coefficient of friction, forms a band which is temporarily adjusted by entering one of the two sets of slits at one end, transversing the distance between this slit and the next closest slit of the set from the opposite side of the clasp to form a temporary adjustment of the length of the band because of material/material friction between the rubber band surface and the polymer/plastic surface, and whose adjustment remains constant because of this material/material friction and the fact that the width of the band between the slits upon stretching remains conserved showing little or no decrease in the total frictional force between the rubber and plastic surface, and where the other end of the band is permanently attached in a utilitarian sense to the clasp by entering the second set of slits at the opposite end of the clasp as was described for the temporarily adjusted end, or by some other permanent means, to form any designated circumference allowed by the total length of the band to retain an object or objects which are classified by using different colored polymer/plastic clasps, by the use of printed tag extensions on the side of the clasp or by employing an ink marker to write on the top of the clasp, wherein the free end of the band is adapted to pass over an end portion of said clasp through the adjacent slit end portion, then passes under the clasp and through the associated slit and above the clasp to provide a pull tab for adjusting the band; and the dimensions of the band and the associated slits being such that the friction forces generated during tightening of the band will be held constant irrelevant of whether the device is in use or not.

4,689,859

HOOK WITH SAFETY LATCH

Thomas A. Hauser, Rockford, Ill., assignor to The Caldwell Co., Inc., Rockford, Ill.

Filed Nov. 13, 1985, Ser. No. 797,454
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—233 **3 Claims**



1. A safety hook comprising a generally U-shaped piece of metal having first and second legs, said second leg having a solid free end portion and having a second remaining portion located adjacent said free end portion, each of said legs having inboard and outboard sides and having a pair of laterally facing sides, an eye on the free end portion of said first leg, and a latch for retaining an element between said legs, said latch comprising a single-piece latching member of generally U-shaped cross-section and defined by two laterally spaced wings and by a plate having a free end portion and an inboard side, said plate being formed integrally with and extending laterally between said wings, said latching member being located with said wings straddling said second leg and with said plate disposed adjacent the inboard side of said second leg, the free end portion of said second leg including an elongated relief area which lies outwardly of the inboard side of the remaining portion of said second leg, means extending between said wings and the free end portion of said second leg and mounting said latching member for swinging toward and away from said first leg between latched and unlatched positions, the free end portion of said plate engaging and being stopped by the inboard side of said first leg when said latching member is in said latched position and being received within and engaging the elongated relief area of the inboard side of said second leg when said latching member is in said unlatched position so as to cause the inboard side of said plate to lie outwardly of the inboard side of the remaining portion of said second leg, a laterally extending hole formed through said second leg, two balls located in the two end portions of said hole, a spring located within said hole between said balls and urging the balls toward the ends of said hole, first and second angularly spaced openings formed in each of said wings adjacent the free end portion thereof, each of said openings having a diameter less than the diameter of said balls, said first openings receiving said balls when said latching member is in said latched position and coacting with said balls to releasably hold said latching member in said latched position, and said second openings receiving the same balls when said latching member is in said unlatched position

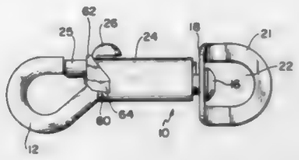
and coacting with said balls to hold said latching member releasably in said unlatched position.

4,689,860

HOOK

Bernard Suchowski, Marlboro, N.J., assignor to The Hartz Mountain Corporation, Harrison, N.J.

Filed May 23, 1986, Ser. No. 866,388
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—239 2 Claims



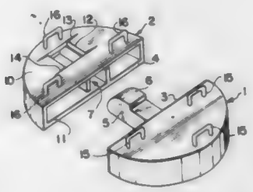
1. A snap hook comprising a hook portion having a hook with a free end and having an elongated stem, a body formed from a bent and folded metal sheet enclosing said stem, said body having sides and having opposed edges defining a slot at its top having an open end facing said hook end, a snap movable in said body into and out of engagement with the free end of said hook, said snap having a finger actuatable projection extending through said slot, spring means biasing said snap toward said hook end, and means connecting the edges of said slot at said slot open end and to prevent expansion of said slot which means comprises a U-shaped saddle having a body extending transversely of said slot at its open end and having legs overlying said sides of said body, said saddle being secured to said body.

4,689,861

ANCHORING DEVICES FOR JOINING OVERLAPPING CLOTHS FOR GARMENTS OR ARTICLES MANUFACTURED WITH THEM

Alberto Kopelowicz, 103 Heredia 1165, SanMartin, Buenos Aires 1650, Argentina

Filed May 30, 1986, Ser. No. 869,041
Claims priority, application Argentina, Jun. 18, 1985, 300739
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—662 7 Claims



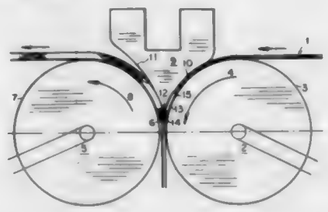
1. An anchoring device for joining articles comprising a male part and a female part, each having a plane face, wherein the male part further comprises a substantially square cross-section stem extending perpendicularly from the plane face, said stem having a widening in the shape of a hook, and wherein the female part further comprises a tube with an axis perpendicular to the plane face, having a cavity with a square cross-section and extending along said axis in a direction opposite the male part for a distance approximately equal to the length of said stem and adapted to receive said stem, said tube having a pair of parallel elastically deformable walls and a pair of parallel non-deformable walls, one of said non-deformable walls containing an anchoring window which is adapted to receive the widening of the stem and wherein said female part further comprises an exterior casing, said casing being attached to said plane face and said pair of non-deformable walls, and in which said anchoring window is formed by two pairs of opposite transverse edges in one of said non-deformable walls, one pair of said transverse edges being non-deformable and the other pair of edges being elastically deformable, said elastically deformable transverse edges being parallel to the axis of said tube and perpendicular to said place face.

4,689,862

METHOD AND APPARATUS FOR THE COMPRESSIVE TREATMENT OF FABRIC

Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568

Filed Apr. 25, 1986, Ser. No. 856,613
Int. Cl.[4] D06C *21/00*
U.S. Cl. 26—18.6 10 Claims



1. An apparatus for the compressive treatment of fibrous thread interlaced material having an initial thickness comprising:

(a) a first movable uninterrupted cylindrical surface;

(b) means for moving the first movable surface at a first speed;

(c) a second movable uninterrupted surface;

(d) a confining means spaced from the first and second movable surfaces, having a smooth arcuate apex and extending between the first and second surfaces to form a stuffing chamber therewith into which material is adapted to be moved by the first movable surface and from which material is adapted to be moved by said second movable surface around the apex;

(e) said confining means including a first concave confining surface of uniform smoothness connecting with said apex and spaced from and opposite the first movable cylindrical surface and having a first portion adjacent the apex which is spaced a greater distance from said first movable surface than a second portion located further from the apex to provide a precompacting zone; and

(f) means for moving the second movable surface in a direction opposite the first movable surface at a speed slower than said first speed to move said material therealong at a retarded speed less than the first speed to thereby precompact the material in said precompacting zone.

7. A method for the compressive treatment of a fibrous thread interlaced web material wherein said web is forced into a stuffing chamber formed by a space between a first movable uninterrupted cylindrical surface and a second movable uninterrupted surface and a smooth arcuate apex of a confining means extending in part between and spaced from the first and second surfaces with the confining means having a concave confining surface of uniform smoothness connecting with said apex opposite said first surface and spaced from said first surface by a first distance along a first portion of said concave confining surface and spaced a second distance greater than said first distance along a second portion of said concave confining surface comprising the steps of:

(a) moving the first surface at a first rate of speed to move the web between said first surface and the confining surface along said first portion toward said stuffing chamber;

(b) moving the web into the space between the second portion of said concave confining surface allowing the web to precompact therein without buckling;

(c) moving the web into the stuffing chamber; and

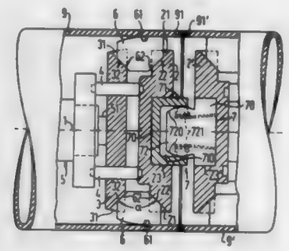
(d) moving said second surface at a second rate of speed slower than said first rate of speed in a direction opposite the movement of said first surface to move said material around said apex, out of said stuffing chamber and along and between said second surface and said confining means while retarding the speed of the web to cause said precompacting.

4,689,863

FIXTURE FOR MACHINING THE CUTTING LINE OF A PIPE

Robert Weber, Uttenreuth; Roland Bieselt, Weinheim; Siegfried Förner, Herzogenaurach, and Helmut Mechtold, Nürnberg, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,907
Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319319
Int. Cl.[4] B23Q *39/00*; B23K *37/04*
U.S. Cl. 29—33 T 10 Claims



1. Fixture for machining the cutting line of a pipe, comprising a centering device insertible into an end section of the pipe, said centering device including a clamping system having pressure pieces with prismatic pressure surfaces formed thereon, said pressure pieces being disposed about the longitudinal axis of said centering device, and a pressure motor for driving said pressure pieces in radial direction of the pipe, for maintaining an equal distance between each of said pressure surfaces and the longitudinal axis of said centering device and for holding said centering device in the pipe with said clamping system, a coupling device disposed at an end of said centering device along the longitudinal axis thereof, said coupling device including a coupling part having a cylindrical receptacle formed therein; an accessory device in the form of another centering device including a coupling post having a spherical surface formed thereon matching said cylindrical receptacle; and hydraulic means for detachably connecting said coupling post to said cylindrical receptacle by remote control.

4,689,864

METHOD OF MAKING VALVE SLEEVES

Nobuo Fukuma, Toyota; Hisayasu Hasegawa, Aichi; Kimimasa Murayama, Toyota; Kunio Hayashi, Nagoya, and Yoshihiro Tokudome, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

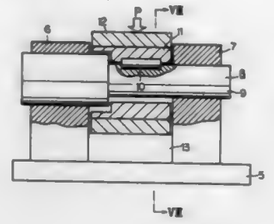
Continuation of Ser. No. 661,920, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 515,635, Jul. 20, 1983, abandoned. This application Mar. 28, 1986, Ser. No. 843,820
Claims priority, application Japan, Jul. 28, 1982, 57-131738
Int. Cl.[4] B21D *53/00*
U.S. Cl. 29—157.1 R 3 Claims

1. A method of machining a valve sleeve on a device having a base, a support member fixedly secured to the base, a shaft mounted on the support member, and a male die secured to the shaft, comprising:

(a) mounting an annular cylindrical workpiece on the male die;

(b) applying pressure to the workpiece in a direction toward the male die;

(c) forging the workpiece by applying pressure to it toward the male die, thereby forming a first groove on an interior surface of the workpiece;



(d) applying pressure to the workpiece in a direction away from the male die;

(e) rotating the workpiece a predetermined amount;

(f) repeating steps (c) through (e), thereby forming multiple grooves in the workpiece until a predetermined number of grooves have been formed in the workpiece ending with a final groove being formed adjacent to the first groove; and

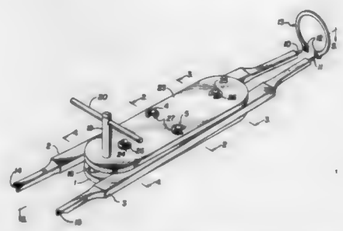
(g) machining at least one of the multiple grooves adjacent to the final groove a second time.

4,689,865

SNAP RING TOOL

Henry F. Chamblee, 906 Taylor St., Sulphur, La. 70663

Filed Oct. 14, 1986, Ser. No. 918,524
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—229 6 Claims



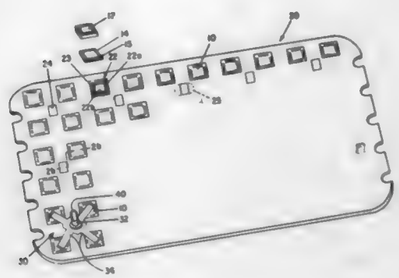
1. A tool for selectively installing or removing conventional apertured snap rings and split C-rings, comprising, a mounting plate, a pair of elongated, spaced, parallel arms, means pivotally connecting said arms to said mounting plate, an axially extending pin secured to one end of each of the arms adapted to be inserted into the apertures of a conventional snap ring, and a recess provided in the other end of each of said arms adapted to receive the split ends of a conventional C-ring, whereby, an external snap ring can be manipulated by manually squeezing the recessed ends of the arms in a direction toward each other to spread the pin ends of the arms, to thereby expand the external snap ring; a C-ring can be manipulated by manually squeezing the pin ends of the arms in a direction toward each other to spread the recessed ends of the arms, to thereby expand the C-ring.

4,689,866

METHODS FOR TRANSFERRING SPRING CLIPS

John S. Cartwright, Hopewell Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 683,065, Dec. 18, 1984, Pat. No. 4,582,245. This application Jan. 10, 1986, Ser. No. 817,652
Int. Cl.[4] B23K *31/02*
U.S. Cl. 29—426.6 2 Claims



1. A method of transferring an article, having an elongated central member with first and second ends and a plurality of resilient arms extending radially therefrom, comprising the steps of:
(a) positioning a first planar body, having the first end of the central member lockably engaged therewith, proximate a second planar body having an opening therein;
(b) imparting relative movement to the first and second planar bodies to position the second end of the central member in the opening:
(c) rotating the elongated central member to unlock the first end of said member from the first planar body while simultaneously lockably engaging the second end thereof to the second planar body; and
(d) imparting relative movement to the first and second planar bodies to withdraw the first end of the elongated central member from the first planar body.

4,689,867

CONCRETE REINFORCEMENT SPACER AND METHOD OF USE

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 423,557, Sep. 27, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 739,769
Int. Cl.[4] B23P *11/02*; E04C *5/16*
U.S. Cl. 29—453 3 Claims



1. A method for reinforcing concrete comprising:
positioning a plurality of spacers throughout a concrete form;
providing each spacer with a base platform, a pair of inverted, generally U-shaped spaced uprights and a pair of lateral cross supports extending between said uprights, each of said uprights comprising a metal rod bent into said generally U-shaped configuration so as to define a pair of spaced legs joined by an upper top member, said legs being secured at their bottoms to said platform, said uprights being inclined at an angle towards one another so that they are relatively close together at said top members and are spaced farther apart at the bottoms of said legs, said lateral cross supports being secured to and extending between opposed legs on adjacent uprights at a point spaced below said top members whereby in side elevation, the spacers have a generally "A" shaped configuration;
spacing said tops of said uprights sufficiently far apart to allow passage therebetween of a reinforcement rod therebetween and into a position between said spaced uprights, supported by said cross supports, but sufficiently close together so as to prevent easy or accidental withdrawal of said reinforcement rod from between said uprights;
supporting a first reinforcement mat on said spacers, said first mat comprising a plurality of generally parallel rods joined at generally right angles to a second plurality of generally parallel rods, by inserting one of said rods at each said spacer through said spacing at the tops of said uprights and into position resting on said cross supports;
supporting a second mat on said spacers, said second mat also comprising a plurality of generally parallel rods joined at generally right angles to a second plurality of generally parallel rods, by supporting one of said rods at each of said spacers on said tops of said uprights.

4,689,868

BEADLOCK WRENCH FLOAT FITTING

Brett A. Hughes, VanWert; David L. Gilbert, Paulding, and Eugene A. Ellerbrock, Columbus Grove, all of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Division of Ser. No. 613,274, May 24, 1984, Pat. No. 4,596,410. This application Apr. 28, 1986, Ser. No. 856,766
Int. Cl.[4] B21D *39/00, 53/00*; F16L *25/00*
U.S. Cl. 29—523 1 Claim

1. The method of attaching an annular wrench engaging member having wrench flats, lateral sides and recesses defined in the lateral sides having radially disposed surfaces to a deformable metal conduit comprising the steps of:
(a) axially locating the wrench engaging member upon the conduit,
(b) imposing an axial force upon the conduit to cause the conduit to outwardly deform adjacent and into contact with each lateral radially extending side of the wrench engaging member, and
(c) axially compressing the conduit deformed portions toward the wrench engaging member to deform conduit material into the member recesses to prevent rotation of the member upon the conduit.

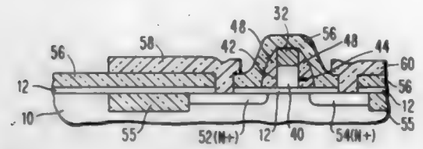
4,689,869

FABRICATION OF INSULATED GATE GALLIUM ARSENIDE FET WITH SELF-ALIGNED SOURCE/DRAIN AND SUBMICRON CHANNEL LENGTH

Chakrapani G. Jambotkar, Hopewell Junction, and Robert B. Renbeck, Staatsburg, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,874
Int. Cl.[4] H01L *21/00*
U.S. Cl. 437—44 30 Claims

1. Method for forming an insulated GaAs-gate FET having submicron channel length comprising:
(a) providing a GaAs substrate having layers of AlGaAs and doped GaAs thereon;
(b) forming a submicron dimensioned conductor contacting said doped GaAs layer;
(c) forming, by anisotropic etching, using said conductor as a mask, a GaAs gate of submicron width from said doped



GaAs layer, said conductor serving as self-aligned contact to said gate;
(d) establishing submicron-wide insulator sidewalls to the GaAs gate and its associated contact structure; and
(e) ion implanting to form source and drain in said substrate, said source and drain being self-aligned to said gate and the AlGaAs beneath the gate serving as the gate insulator.

4,689,870

METHOD OF MAKING HONEYCOMB FLOOR PANEL

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Division of Ser. No. 783,127, Oct. 2, 1985, Pat. No. 4,594,833, which is a division of Ser. No. 555,142, Nov. 25, 1983, Pat. No. 4,573,304. This application Mar. 24, 1986, Ser. No. 843,006
Int. Cl.[4] B21D *35/00, 39/00*; E04C *2/42*
U.S. Cl. 29—469.5 3 Claims



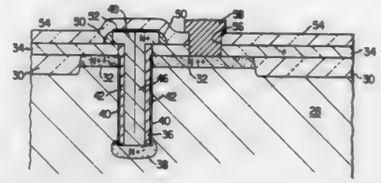
1. A method of forming honeycomb structures comprising forming lateral slits partially across thin metal elongated strips at intervals along the length thereof without removing substantial metal and bending a tab along at least one side of said slits out of the plane of said strips to provide an angulated tab spaced from the opposite edges of said slits, positioning said tabs so that the longitudinal spacing between the edges of said tabs and the opposite edges of said slits is at least substantially as small as the thickness of said strips, said tabs provding an angulated throat having a width substantially greater than the thickness of said strips, positioning said strips in two arrays of parallel strips angulated with respect to the strips of the other arrays in alignment with said angulated throats, assembling said arrays with said arrays angulated until said strips extend through associated slits in the strips of the other arrays, thereafter turning said arrays relative to each other until a position is reached in which opposite edges of said slits engage opposite sides of said strips extending therethrough, and locking said arrays in said position.

4,689,871

METHOD OF FORMING VERTICALLY INTEGRATED CURRENT SOURCE

Satwinder D. S. Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1985, Ser. No. 779,748
Int. Cl.[4] H01L *21/302, 21/441*
U.S. Cl. 437—40 11 Claims



1. A method for forming a semiconductor device, comprising:
providing a silicon substrate of a first conductivity type;
forming a first buried region of a second conductivity type in the silicon substrate;
forming a trench in the silicon substrate extending through the first buried region, the trench having sidewalls and a bottom, the bottom extending into the substrate and below the first buried region;
forming an insulating layer on the sidewalls of the trench;
forming a second buried region of the second conductivity type in the silicon substrate at the bottom of the trench;
forming a conductive layer over the bottom of the trench contacting said second buried region and over the insulating layer covering the sidewalls of the trench to form a gate region on the sidewalls which is conductively connected with the second buried region;
the area in the silicon substrate adjacent the trench and between the first and second buried regions comprising a channel region; and
forming a first interconnect to the conductive layer and forming a second interconnect to the first buried region, the first and second interconnects operable to be interfaced with external circuitry.

4,689,872

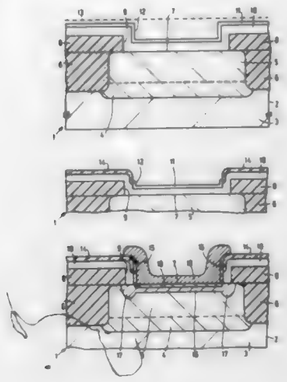
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Johannes A. Appels, and Henricus G. R. Maas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,930
Claims priority, application Netherlands, Sep. 18, 1984, 8402856
Int. Cl.[4] H01L *21/22, 21/265, 21/318*
U.S. Cl. 437—228 4 Claims

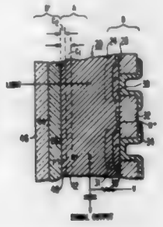
1. A method of manufacturing a semiconductor device comprising the steps of
forming an insulating layer on a surface of a semiconductor body, said insulating layer having an opening to said surface;
providing a substantially uniform layer of a first semiconductor material over said insulating layer and said surface in said opening;
covering said first semiconductor material with a substantially uniform layer of an oxidation preventing material;
selectively removing portions of said oxidation preventing layer, said portions being free of said opening;
oxidizing exposed portions of said first semiconductor material over a part of the thickness of said first semiconductor material;
removing remaining portions of said oxidation preventing layer in said opening;

anisotropically etching at least parts of said first semiconductor material in said opening, said first semiconductor material remaining along edges of said opening;
oxidizing said first semiconductor material remaining along said edges of said opening to form a mask; and



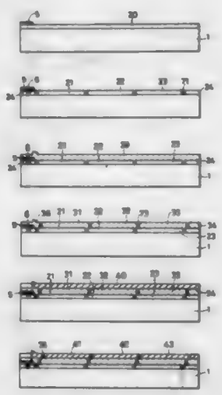
exposing said surface of said semiconductor body in said opening to semiconductor ions through said mask to form portions of a semiconductor device.

4,689,873
IMAGING DEVICE HAVING TWO ANTI-REFLECTION LAYERS ON A SURFACE OF SILICON WAFER
William M. Kramer, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.
Division of Ser. No. 489,303, Apr. 28, 1983, Pat. No. 4,594,605. This application Aug. 27, 1985, Ser. No. 769,742
Int. Cl.[4] H01L *27/14, 31/18*
U.S. Cl. 437—2 **2 Claims**



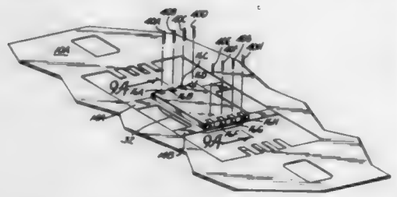
1. A method of making an imaging device having improved quantum efficiency in the range of 400 nanometers to 500 nanometers comprising the steps of:
preparing a silicon wafer of a first-type conductivity, said wafer having first and second major surfaces;
forming a plurality of regions of a second-type conductivity in the second major surface of said wafer;
implanting an element into said first major surface of said wafer so as to form a region of enhanced first-type conductivity for controlling blooming spaced from said first surface;
forming a shallow region of second-type conductivity extending into said wafer from said first surface a distance less than said region of enhanced first-type conductivity,
providing a first anti-reflection layer on said first surface of said wafer by depositing thereon at ambient temperature a material having a high index of refraction ranging from 2.3 to 2.4 thereon, said first anti-reflection layer having an optical thickness substantially equal to a quarter of the wavelength of light incident thereon;
providing a second anti-reflection layer on said first anti-reflection layer by depositing thereon at ambient temperature a material having a low index of refraction ranging from 1.32 to 1.35 thereon, said second anti-reflection layer having an optical thickness substantially equal to a quarter of the wavelength of light incident thereon; and
limiting the processing temperature of said device to about 125° C. to prevent an increase in the index of refraction of said second anti-reflection layer.

4,689,874
PROCESS FOR FABRICATING A THIN-FILM SOLAR BATTERY
Masaharu Nishiura, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan
Filed May 15, 1986, Ser. No. 863,426
Claims priority, application Japan, May 16, 1985, 60-104375
Int. Cl.[4] H01L *31/18, 27/14*
U.S. Cl. 437—2 **6 Claims**



1. A process for fabricating a thin-film solar battery having one or more unit cells each having a thin-film semiconductor active region formed over a transparent dielectric substrate and being in contact with a transparent electrode on the substrate side and with a metal electrode on the opposite side, said process comprising the steps of:
depositing a transparent conductive film over one surface of the substrate;
forming an opaque film over a portion of the combined substrate and deposited transparent conductive film remote from the area where the unit cells are to be formed;
scribing with a laser beam the deposited transparent conductive film down to the substrate to form from the transparent conductive film separate transparent electrodes for the respective unit cells inward from said opaque film;
removing selected portions of the opaque area with a laser beam to form light-transmitting markers;
depositing a semiconductor film over the separate transparent electrodes and the surface of the substrate surrounding the electrodes, but not in the area where the markers are formed;
placing the substrate into proper alignment with the aid of the markers;
scribing with a laser beam the deposited semiconductor film down to the transparent conductive film to form from the semiconductor film separate active regions for the respective unit cells;
depositing a metal film over the separate active regions and the surface of the transparent conductive film surrounding the separate active regions, but not in the area where the markers are formed;
placing the substrate into proper alignment with the aid of the markers; and
scribing with a laser beam the deposited metal film down to the semiconductor film to form from the metal film separate metal electrodes for the respective unit cells.

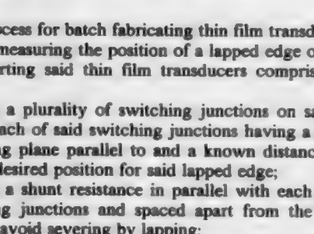
4,689,875
INTEGRATED CIRCUIT PACKAGING PROCESS
Russell V. Solstad, St. Paul, Minn., assignor to VTC Incorporated, Bloomington, Minn.
Filed Feb. 13, 1986, Ser. No. 828,876
Int. Cl.[4] H01L *23/04*
U.S. Cl. 437—211 **14 Claims**



1. A method for packaging semiconductor chips on a carrier tape to produce a carrier tape having packaged semiconductor chips supported thereon, the method comprising:
providing a carrier tape having a nonconductive substrate and a conductive layer, the tape having a plurality of chip bonding areas formed by an opening in the substrate with a chip support frame extending across the opening and a corresponding opening in the conductive layer with conductive leads extending from edges of the opening in the conductive layer to the frame to provide first free ends for bonding to a chip;
aligning semiconductor chips with the chip support frames so that contact pads on a first surface of the chips are positioned opposite respective first free ends of the leads;
bonding the contact pads of the semiconductor chips and the first free ends of the leads;
severing the leads from the conductive layer at predetermined distance from the frames to form second free ends;
bending the second free ends of the leads substantially perpendicularly to a plane of the carrier tape away from the semiconductor chips to form nests;
applying an adhesive to the first surface of the semiconductor chips;
positioning bases on the adhesive and within the nests; and
bending the second free ends of the leads over the bases.

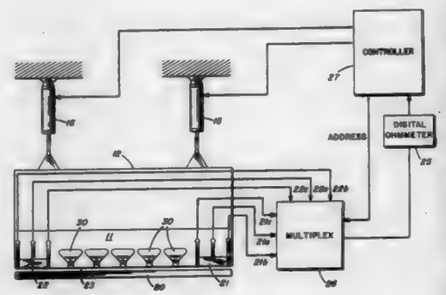
4,689,876
METHOD OF MAKING WAVEGUIDE ASSEMBLY
John D. Foglesonger, Los Angeles, and David M. Vranson, Canyon Country, both of Calif., assignors to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.
Division of Ser. No. 631,425, Jul. 16, 1984, Pat. No. 4,638,273. This application Aug. 4, 1986, Ser. No. 892,565
Int. Cl.[4] H01P *11/00*
U.S. Cl. 29—600 **8 Claims**

1. A method of making a subassembly for a waveguide joint, said method comprising the steps of:
providing a rectangular waveguide section having four sides forming four corners;
providing a flange separated into two pieces, said pieces having internal constructions for forced engagement with the exterior of said waveguide section;
placing an adhesive internally on said flange pieces;



inserting a mandrel into said waveguide section; and
pressing said flange pieces onto said waveguide section while curing said adhesive.

4,689,877
METHOD AND APPARATUS FOR CONTROLLING THE THROAT HEIGHT OF BATCH FABRICATED THIN FILM MAGNETIC TRANSDUCERS
Mark A. Church, Los Gatos, Calif., assignor to International Business Machines Corp., Armonk, N.Y.
Continuation-in-part of Ser. No. 760,189, Aug. 29, 1985, abandoned. This application Jul. 15, 1986, Ser. No. 885,894
Int. Cl.[4] G11B *5/127;* **B23Q** *17/00, 15/00*
U.S. Cl. 29—603 **10 Claims**



1. In a process for batch fabricating thin film transducers, a method for measuring the position of a lapped edge of a substrate supporting said thin film transducers comprising the steps of:
depositing a plurality of switching junctions on said substrate, each of said switching junctions having a distinct switching plane parallel to and a known distance away from a desired position for said lapped edge;
depositing a shunt resistance in parallel with each of said switching junctions and spaced apart from the lapped edge to avoid severing by lapping;
forming a circuit comprising each of said switching junctions connected in a series circuit;
lapping said substrate from an initial edge of said substrate toward said desired position for said lapped edge wherein each of said switching junctions changes from a closed state to an open state when said lapping plane is coincident with said switching junction switching plane whereby said shunt resistance in parallel with said switching junction which changes state is connected into said series circuit; and
detecting stepwise changes in said series circuit resistance during lapping of said substrate, each of said changes indicating a change of state of one of said switching junc-

tions thereby identifying the position of said lapped edge to be coincident with said switching plane of said switching junction which changes state.

9. In apparatus for batch fabricating thin film transducers, said apparatus comprising an electrical lapping guide for measuring the position of a lapped edge of a substrate supporting said thin film transducers, said apparatus comprising:

a plurality of switching junctions formed on said substrate, in known spaced relation to said thin film transducers, each of said switching junctions having a distinct switching plane parallel to and a known distance away from a desired position for said lapped edge;

a shunt resistance formed in parallel with each of said switching junctions and spaced apart from the lapped edge to avoid severing by lapping;

an electrical circuit comprising each of said switching junctions connected in a series circuit, said electrical circuit having a first and a second terminal; and

a resistor element having two terminals formed on said substrate adjacent to said plurality of switching junctions, said resistor element having a resistance which changes with lapping of said substrate,

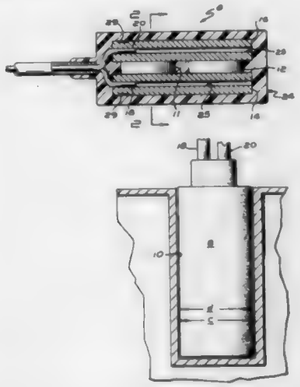
whereby, upon connection of means for measuring resistance across said first and second terminals, stepwise changes in said series circuit resistance can be detected during lapping of said substrate, each of said changes indicating a change of state of one of said switching junctions thereby identifying the position of said lapped edge to be coincident with said switching plane of said switching junction which changes state, and whereby, upon connection of means for measuring resistance across said two terminals, a lapping edge position versus resistance characteristic can be determined for said resistor element each time a switching junction changes state, whereby said resistor element is recalibrated each time a switching junction changes state.

4,689,878

PTC HEATER AND METHOD OF MANUFACTURE

William W. Beauregard, Agawam, and Peter J. Fessenden, East Longmeadow, both of Mass., assignors to Springfield Wire, Inc., Springfield, Mass.

Filed Aug. 3, 1981, Ser. No. 289,499
Int. Cl.⁴ H05B *3/00*
U.S. Cl. 29—611 **2 Claims**



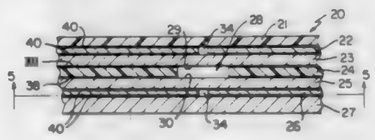
1. Method of manufacturing a heater element for use in a cylindrical metal casing of a crankcase heater comprising the steps of cutting an aluminum bar of semi-cylindrical cross-section, having a flat surface on one side thereof, into a plurality of discrete conductor members which are electrically and thermally conductive, the length of said conductor members being selected to provide a heater of predetermined wattage, forming a heater assembly by bonding the opposed flat surfaces of the conductor members to opposite sides of at least one positive temperature coefficient heater platelet using an electrically and thermally conductive adhesive and connecting lead wires to the ends of said conductor members, inserting said assembly into a mold having a cylindrical cavity and injecting silicone liquid containing a dispersion of ceramic particles into the mold cavity and curing the silicone to form an integral elastromeric sheath which encapsulates said assembly and is in surface contact with said members and the heater platelet, said sheath having an outer diameter, at room temperture, substantially less than the inner diameter of said metal casing and having a coefficient of expansion such that upon heating it will expand omnidirectionally to a diameter at least equal to that of said casing so that upon insertion of the silicone encapsulated heater assembly into the metal casing it will, when the heater is in operation, expand into overall elastic contact with the inner surface of said casing.

4,689,879

METHOD OF MAKING A MEMBRANE KEYBOARD

Daniel L. Fowler, Kentwood, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 690,982, Jan. 14, 1985, Pat. No. 4,596,905.
This application Mar. 11, 1986, Ser. No. 838,358
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.⁴ H01H *11/04*
U.S. Cl. 29—622 **20 Claims**



1. In a method of making a membrane keyboard construction comprising the steps of forming two circuit layer means, disposing and securing a spacer means between said circuit layer means, forming an opening means through said spacer means to permit said circuit layer means to be pressed together in said opening means and thereby provide a switching function, forming a face plate means, and disposing an adhesive layer means between said face plate means and one of said circuit layer means to secure said face plate means to said one circuit layer means, the improvement comprising the step of forming said adhesive layer means to have passage means therein so as to lead from an area thereof that is aligned in superimposed relation with said opening means to the exterior of said construction to vent said area thereof whereby said area is isolated from said opening means by said one circuit layer means and is vented by said passage means to tend to enhance tactile feel and avoid false switch closure of said opening means by tending to prevent entrapment of air bubbles in said area.

4,689,880

METHOD OF MANUFACTURING A POLYMER-CONSOLIDATED CADMIUM ELECTRODE FOR AN ALKALINE STORAGE CELL, AND AN ELECTRODE OBTAINED BY THE METHOD

Jean-Loup Brezillon, Parempuyre, and Jean-Michel Dauchier, Martignas sur Jalle, both of France, assignors to Saft, S.A., Romainville, France

Filed Jul. 28, 1986, Ser. No. 890,937
Int. Cl.⁴ H01M *4/26*
U.S. Cl. 29—623.5 **6 Claims**

1. A method of manufacturing a polymer-consolidated cadmium electrode for an alkaline storage cell, the method comprising the steps of:

mixing the following ingredients in water: a gelling agent; cadmium and cadmium oxide in powder form constituting the active material; and a copolymer of carboxylated styrene-butadiene at a concentration lying in the range 0.5% to 3% by weight of active material;

coating the resulting paste on a metal current collector;

drying the coated current collector; and

subjecting the resulting assembly to a temperature lying in the range 120° C. to 150° C. for a period of a few minutes in order to cause said polymer to cross-link.

4,689,881

HEAD AND MAGAZINE LOADER ASSEMBLY

James C. Fall, 9531 Melvin Ave., Northridge, Calif. 91342

Filed Jul. 8, 1986, Ser. No. 883,523
Int. Cl.⁴ B23Q *7/10*; B21F *7/00*, *15/04*
U.S. Cl. 29—813 **11 Claims**



1. In a head utilized in a driver apparatus for securing a wire hanger to a beam or the like by means of an eyelet screw to which the wire hanger is applied in a tightly wound looped arrangement, the head comprising a member formed of a rigid, solid material within an outer wall and having a top and including a cavity forming crossed passageways extending to the top, the first of such cavity passageways formed by vertically-oriented walls and a bottom for containing the eyelet screw,

the improvement comprising

tapering walls converging to the top and in opposing relationship to each other included in the second of such cavity passageways,

the tapering walls diverging away from the top to terminate at corresponding opposing portions of the outer wall of said member and at which terminations corresponding openings in said outer wall are formed communicating with the first of such cavity passageways and the atmosphere, the openings being above the plane of the first passageway's bottom so that a wire passes through one of such openings threading through the screw's eyelet and thence projected out of the other one of such openings.

4,689,882

HAND TOOL AND METHOD FOR REMOVING INSULATION FROM WIRE-WOUND IGNITION CABLE

Jerome L. Lorenz, Birmingham, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

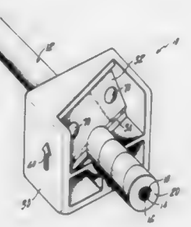
Filed Oct. 22, 1984, Ser. No. 663,537
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 30—90.1 **11 Claims**

1. A hand tool for removing insulation from a wire-wound ignition cable, the cable including an elongated core of circular cross section, a wire wound helically in a predetermined lead direction around the core and a tubular jacket of insulation disposed about the wire-wound core, the tool comprising:

a body having a passage therethrough, the diameter of the passage being only slightly greater than that of the ignition cable to ensure a close sliding fit of the cable within the passage;

a blade-supporting surface being formed integrally with said body adjacent to said passage; and

a blade having a cutting edge and being rigidly mounted on said blade supporting surface, said blade cutting edge extending across the passage at a lead angle thereto and at a depth for cutting at least most of the way through said cable insulation, the direction of said lead angle being



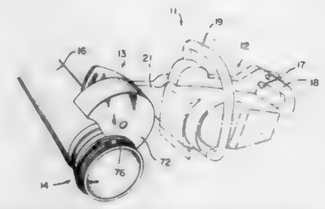
counter to that of said lead direction of said wire winding on said cable to thereby aid in maintaining the integrity of said wire winding in its wound condition on said core during relative rotation of said body and said cable in an insulation-cutting direction, said passage in said body affording feed of the cable in a cable-feed direction toward said blade, said lead angle of said blade cutting edge being greater than about 5° an said blade further being inclined forwardly in the cable-feed direction about an axis which parallels said blade edge, thereby to orient said cutting edge at a forwardly-inclined rake angle, said rake angle being measured in quadrature with said lead angle.

4,689,883

PIPE CUTTING DEVICE

Larry G. Dent, 3312 Westside Hwy., Castle Rock, Wash. 98611

Filed Nov. 4, 1985, Ser. No. 794,856
Int. Cl.⁴ B23D *21/06*
U.S. Cl. 30—94 **14 Claims**



1. An apparatus for cutting plastic pipe comprising;

means for engaging a pipe including rotatable cutting means for cutting said pipe to a predetermined depth,

drive means operatively associated with said pile engaging and cutting means for rotating said cutting means,

said rotatable cutting means including at least one cutting bit and mounting means therefor,

said mounting means forming a slot for receiving said cutting bit with said cutting bit being tapered such that, when mounted in said slot the bit increases in thickness toward the bottom of said slot,

deformable shim means positionable in said slot, and

locking means for deformably engaging said shim means and

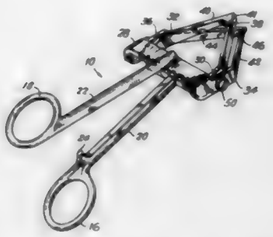
pressing said shim means into engagement with said bit when said bit is mounted in said slot, whereby said bit is retained in said slot during rotation of said rotatable cutting means.

4,689,884

V-SNIP SCISSORS

Randy Chavarria, Lexington Ave., New York, N.Y. 10016

Filed May 28, 1986, Ser. No. 867,765
Int. Cl.⁴ B26B *13/00*
U.S. Cl. 30—229 **7 Claims**



1. Scissors for cutting a V shape, and comprising first and second parts pivotably coupled for relative rotation about an axis by coupling means, said first part comprising:
(a) first means for receiving a digit;
(b) first cutting means having first and second cutting edges formed thereon; and
(c) first support means for rigidly connecting said first means for receiving a digit to said first cutting means, and
said second part comprising:
(a) second means for receiving a digit;
(b) second cutting means having first and second cutting edges formed thereon; and
(c) second support means for rigidly connecting said second means for receiving a digit to said second cutting means, said first and second support means being pivotably coupled, wherein said first and second cutting means are arranged such that said and second cutting edges of said first cutting means respectively engage said first and second cutting edges of said second cutting means during the relative rotation of said first and second parts in a closing direction, said first cutting edges performing a first cut and said second cutting edges performing a second cut, said first and second cuts defining a V shape, said first cutting edges and said second cutting edges being disposed whereby said first and second cuts are terminated at different times during said relative rotation of said first and second parts in a closing direction.

4,689,885

APPARATUS FOR CUTTING OUT A FACE IN A PUMPKIN

Thomas C. Albanese, 1 Summerset Dr., Smithtown, N.Y. 11787

Filed May 30, 1986, Ser. No. 868,575
Int. Cl.⁴ B26D *3/00*; **B26F** *1/46*
U.S. Cl. 30—316 **6 Claims**

1. An apparatus for cutting out a face in a pumpkin, which comprises:
(a) a hollow housing having an open end with a beveled edge and a slot within side thereof; said housing being generally trapezium with two curved sides in cross section so as to be used to form left and right eye cutouts in said pumpkin, said housing having a second open end with a second beveled edge opposite said first open end;
(b) a handle on other end of said housing opposite said open end so that a person can grip said handle and push said beveled edge of said housing through a side of said pumpkin to make said face by forming a pumpkin piece within said housing and allowing removal of said pumpkin piece by pushing said pumpkin piece out of said housing via said slot in said housing, said handle being removable from said housing a including a shank having external threads thereon; and



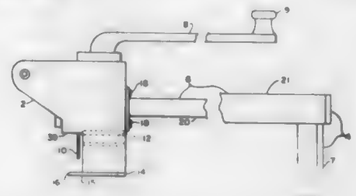
(c) a removable cap having a boss extending beyond surface of said cap, said boss having internal threads therein so that said shank of said handle can be removably threaded to said boss, said cap being generally trapezium with two curved sides in cross section so as to be removably attached to either of said ends of said housing to form said left and right eye cutouts in said pumpkin.

4,689,886

HAND HELD CAN OPENER

Richard J. Bernazzani, Roslindale, and Domenic J. Bumbaca, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1986, Ser. No. 846,688
Int. Cl.⁴ B23P *17/00*
U.S. Cl. 30—416 **4 Claims**



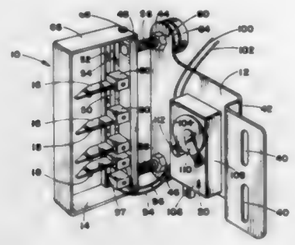
1. An improved can opener adapted to cut a can top by rotating the can having a vertical dimension and supported on a flat surface while holding the cutting blade in a fixed position through the can lid, said cutting blade being pivotally mounted to a housing and adapted to pierce and cut the can lid and having a feed wheel mounted to said housing and perpendicular to said cutting blade to rotate the can and having means to cause said cutting blade to pierce the top of the can and means to rotate said feed wheel to advance said can while in cutting engagement with said cutting blade to cut the top of said can adjacent its lip, and having guide means mounted to said housing to guide the upper edge of the can lip as the can is being rotated by said feed wheel, wherein the improvement comprises:
(a) a protruding lip mounted on said housing and spaced from said guide means to secure the can lip therebetween to prevent the cutting blade from slipping out of the can during rotation, and
(b) a handle mounted to said housing and extending perpendicular therefrom and adapted so that a portion thereof extends along the vertical dimension of the can and rests against said flat surface and is further adapted so that downward pressure of the user on the handle toward said flat surface holds the can opener in a stable position while the feed wheel is being rotated against said can.

4,689,887

ARCHERY SIGHT

Richard Colvin, 9 Alder La., Liverpool, N.Y. 13090

Filed Jun. 23, 1986, Ser. No. 877,649
Int. Cl.⁴ F41G *1/32*
U.S. Cl. 33—265 **19 Claims**



10. An illuminated bowsight for use with an archery bow, said bowsight comprising:
light emitting aiming means;
means for electrically connecting said aiming means to an electrical energy source;
means for mounting said aiming means on said bow relative to the line of sight of the archery; and,
a switch comprised of:
a base portion of nonconductive material having a generally planar surface,
electrical contact means mounted in said base portion flush with said planar surface, and
a switch member movable on said surface to electrically engage said contact means, said switch being operative to control the connection of said aiming means to said electrical power source in response to movement of the bow string on the bow, said switch having a first normal aiming means off condition and a second aiming means on condition, said switch being in said second aiming means on condition when said bow string is drawn to a predetermined position, and a third aiming means off condition, said switch assuming said third condition when said bow string is drawn past said predetermined position.

15. A sight for use with an archery bow or the like comprising:
a blade-like element;
means for mounting said blade-like element to said bow wherein said element is oriented edgewise relative to the line of sight of the archer;
a light emitting aiming point secured on the edge of said element;
conductive means in contact with said light emitting aiming point; and,
means for electrically connecting said conductive means to an electrical power source.

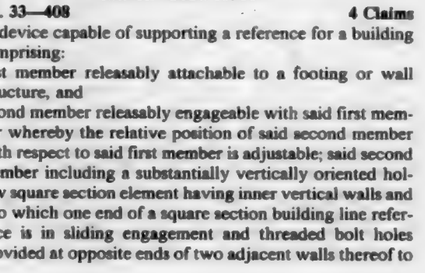
4,689,888

MEASURING DEVICE FOR USE WITH AUTOMOTIVE FRAME STRAIGHTENING EQUIPMENT

Roger B. Aldrich, and Gary R. White, both of Grand Island, Nebr., assignors to Chief Automotive Systems, Inc., Grand Island, Nebr.

Filed Oct. 22, 1986, Ser. No. 921,749
Int. Cl.⁴ G01B *5/25, 11/27*
U.S. Cl. 33—288 **13 Claims**

1. An improved measuring bar assembly for use with automotive frame straightening equipment, comprising, in combination:
a first elongated bar and a second elongated bar generally parallel to the first bar, each one of the bars having opposite side surfaces, each side surface having a uniform configuration along an active length of the bar in the longitudinal direction, the first one of said surfaces defining at least two separate planar surface guide tracks, the other surface defining at least one planar surface guide track; said bars arranged with said first surfaces in opposed, uniformly spaced relation with pairs of guide tracks on the separate bars parallel to one another and defining mirror images with respect to one another;
a bar support housing, said housing including first and second longitudinally, parallel channels for receipt of the first and second bars respectively; said housing also including at least two generally opposed cylindrical follower members along the sides of each channel, said follower members each in line contact with the planar guide tracks of



the bars and rotatable about the cylindrical axis thereof, said axis generally parallel to a planar guide track thereby defining a total of at least four follower members, at least two of said follower members being intermediate follower members positioned intermediate the channels, each such intermediate follower members mounted to simultaneously engage one pair of opposed, parallel guide tracks, and at least one remaining follower member being an outside follower member engaging the other surface of the first bar with the other remaining follower member also being an outside follower member engaging the other surface of the second bar, all of said follower members being supported for rotation on their cylindrical axes by the housing; and
said follower members and guide tracks frictionally engaged and defining means for movement of the bars in equal and opposite directions.

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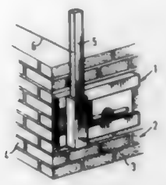
DEVICE FOR SUPPORTING A BUILDING LINE REFERENCE

Raymond A. Reeves, 9 Matravers Road, Great Malvern, Hereford & Worcester, England

Filed May 10, 1985, Ser. No. 733,235
Claims priority, application United Kingdom, May 19, 1984, 8412876
Int. Cl.⁴ G01C *15/10*
U.S. Cl. 33—408 **4 Claims**

1. A device capable of supporting a reference for a building line comprising:
a first member releasably attachable to a footing or wall structure, and
a second member releasably engageable with said first member whereby the relative position of said second member with respect to said first member is adjustable; said second member including a substantially vertically oriented hollow square section element having inner vertical walls and into which one end of a square section building line reference is in sliding engagement and threaded bolt holes provided at opposite ends of two adjacent walls thereof to

receive adjustable bolt means adapted to act on the end of the reference to vary the vertical orientation thereof and to lock the reference in said orientation, and said hollow element further including two protrusions projecting



inwardly of the two inner walls thereof opposite said adjacent sides, said protrusions extending substantially horizontally across said walls, and being positioned to face between said bolt holes in said adjacent walls.

4,689,890

DIGITAL DISPLAY MEASURING APPARATUS

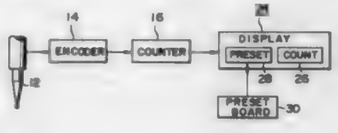
Shingo Nishina, Kanagawa, Japan, assignor to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 590,194, Mar. 15, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,651

Claims priority, application Japan, Mar. 18, 1983, 58-46511

Int. Cl.[4] G01B *7/02;* **G02F** *1/133*

U.S. Cl. 33—504 **3 Claims**



1. A digital display measuring apparatus comprising a movable contact on the body of said measuring apparatus and adapted to engage an object to be measured, an encoder for converting the displacement of said contact into an electrical output signal, a counting circuit for counting said electrical output signal from said encoder, and a digital display for digitally indicating the counted value from said counting circuit, said measuring apparatus being characterized in that said digital display includes a measurement indicator display unit for indicating the displacement of said contact, a preset indicator display unit for only indicating a reference preset value of figures higher than those indicated on said measurement indicator display unit simultaneously with the indication of the displacement of the contact on the measurement indicator display unit, and a presetting means for supplying said reference preset value only to said preset indicator display unit, said presetting means comprising a presetting means activation means and a memory means for storing a predetermined reference preset value of figures higher than those indicated on said measurement indicating display unit and for supplying said reference preset value only to said preset indicator display unit when said presetting means activation means is actuated.

4,689,891

LOCATOR AND FIXTURE ASSEMBLY

Thomas R. Clark, 15400 Kellogg Rd., Bowling Green, Ohio 43402

Filed Oct. 31, 1986, Ser. No. 925,240

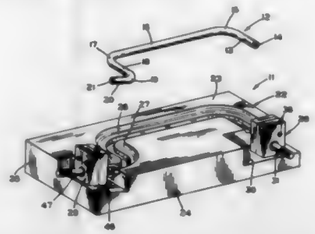
Int. Cl.[4] G01B *3/14, 5/20*

U.S. Cl. 33—529 **16 Claims**

1. A fixture assembly for inspecting a formed hollow tube for a predetermined configuration, comprising:

a base having a working surface with an envelope groove formed therein, said envelope groove having dimensions approximately equal to the maximum dimensions defining an error envelope for a formed hollow tube;

a locator block positioned at one end of said envelope groove and attached to said base;



a locator pin slidably mounted in said locator block and having one end adapted to engage a free end of a formed hollow tube positioned in said envelope groove; and

biasing means for urging said locator pin toward said one end of said envelope groove.

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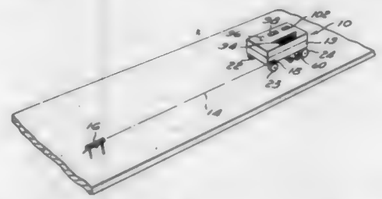
APPARATUS AND METHOD OF MEASURING SURFACE HEIGHTS

Thomas Kirven, Pomona, Calif., assignor to Kalman Floor Company, Evergreen, Colo.

Filed Jun. 17, 1985, Ser. No. 745,504

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—533 **15 Claims**



1. A method for using an inclinometer mounted on a vehicle to measure the height profile relative to gravitational level of a path upon a floor surface comprising the steps of:

determining a path along a floor surface;

mounting an inclinometer upon a vehicle which moves along the path;

calibrating the inclinometer, in order that an indicated level versus actual gravitational level of the inclinometer as mounted upon the vehicle may become known and corrected, by making oppositely directed runs of the vehicle along the path;

moving the vehicle along the path to make measurements with the inclinometer of the slope of the floor relative to gravitational level along the path;

sampling the slope measurements at predetermined intervals along the path; and

processing the sampled slope measurements to determine the floor height profile along the path at the predetermined points relative to a gravitational level.

4,689,893

APPARATUS AND METHOD FOR DRYING ELONGATED WEBS

Rudolph Behrens, Collegeville, Pa., assignor to BCD Dryers, Inc., Totowa, N.J.

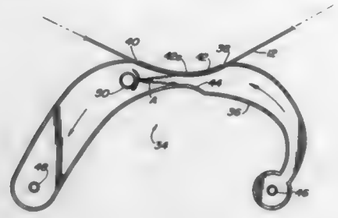
Filed Aug. 5, 1986, Ser. No. 893,225

Int. Cl.[4] F26B *13/02, 3/04*

U.S. Cl. 34—23 **18 Claims**

1. For use in association with apparatus for printing an

elongated web, web dryer apparatus comprising a hollow housing having a web inlet and a web outlet therein, guide means in said housing for conducting at least a portion of said web within said housing from said inlet to said outlet, means for admitting a gas stream to said housing and means permitting said gas stream to exit therefrom, airfoil means within said housing and disposed between said inlet and said outlet for



creating in said housing a region of reduced pressure in the vicinity of the web to induce evaporation from the web, said airfoil means comprising a passage having a wall defining an airfoil section, said portion of said web being in the flow of said gas stream as it passes over said airfoil section, and means in fluid communication with said housing for removing evaporated liquid from said housing.

4,689,894

CLOSED INTERMITTENT DRYING PROCESS

Sten O. Zellon, Heimdalsgatan 21, S-260 14 Glumslöv, Sweden

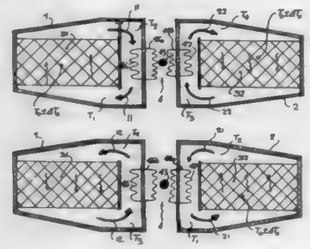
PCT No. PCT/SE85/00097, § 371 Date Oct. 23, 1985, § 102(e) Date Oct. 23, 1985, PCT Pub. No. WO85/04001, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 5, 1985, Ser. No. 800,620

Claims priority, application Sweden, Mar. 6, 1984, 8401221

Int. Cl.[4] F26B *3/02*

U.S. Cl. 34—13 **14 Claims**



11. A closed intermittent drying process for drying moist material within a substantially gastight chamber, characterized in that the material is intermittently dried by means of a first gas flow circulated in a closed path in which the first gas flow is cooled and dehumidified and conducted through the moist material such that the necessary vapor dissipation heat for drying is taken from the latent heat of the moist material, and latent heat is restored to the moist material alternately with said drying by means of a second gas flow circulated in a closed path in which the second gas flow is heated and conducted through the moist material in such a manner that the moist material is heated but substantially no water vapor is transported from the material.

4,689,895

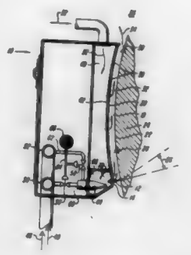
EVAPORATIVE-COOLING APPARATUS AND METHOD FOR THE CONTROL OF WEB OR WEB-PRODUCTION MACHINE COMPONENT SURFACE TEMPERATURES

Bruce F. Taylor, Auburn, Mass., and Kenneth G. Hagen, Cape Elizabeth, Me., assignors to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Feb. 28, 1986, Ser. No. 834,755

Int. Cl.[4] F26B *7/00*

U.S. Cl. 321—20 **18 Claims**



1. An apparatus for use in the non-contact cooling of a web or a machine component in contact with a web, said apparatus being positioned adjacent said web or component to be cooled, said apparatus comprising:

means for creating fog within said apparatus, said fog having a temperature lower than the temperature of said web or component to be cooled;

means for directing said created fog from said apparatus into a channel between said apparatus and the web or machine component, said directing means providing said fog to said channel so that said fog is applied to the surface of said web or machine component;

means for exhausting vapor from said channel, said vapor being created by the contact of said fog with said surface which causes evaporation of said fog, said exhausting means preventing the residual build-up of mositure on said web or machine component.

4,689,896

CLOTHES DRYER AND LAUNDRY SYSTEM

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

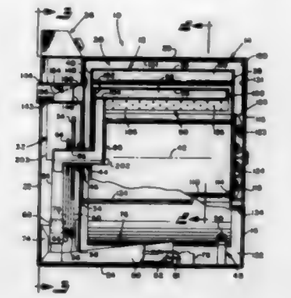
Filed Dec. 15, 1983, Ser. No. 561,882

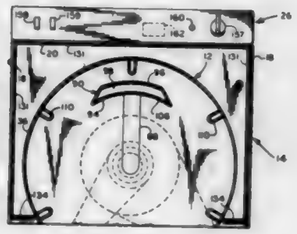
Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—82 **14 Claims**

1. A clothes dryer comprising a housing, a cylindrical drum in said housing for receiving wet clothing, means for tumbling the wet clothing in said drum, blower means for generating air flow through said drum, heater means for heating the air prior to passage through said drum, and diffuser means located in said drum for receiving the heated air and discharging it into

said drum against the wet clothing at a plurality of locations spaced along the axial length of said drum, said diffuser means





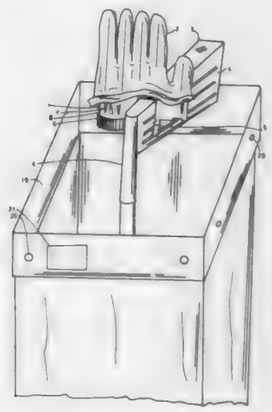
being located in the uppermost portion of said drum and having a plurality of downwardly directed air outlets.

4,689,897

COMPOSITE GLOVE DRYING DEVICE

Guy Marsalona, 11653 Hackberry St., Palm Beach Gardens, Fla. 33410

Filed Oct. 28, 1986, Ser. No. 923,900
Int. Cl.[4] F26B *9/10*
U.S. Cl. 34—103 **20 Claims**



1. A composite device for drying a wet glove and for containing liquid, solid and powdered materials, comprising:

a. an impermeable container having a shape generally conforming to the shape of a hand for holding a wet glove open to a drying atmosphere to enhance drying and to maintain the glove shape, said container having an opening to receive and dispense said materials;

b. resealable closure means formed at said opening to close said opening to retain said materials in said container; and

c. device attaching means connected to said container for removeably attaching said container to a support during the drying process.

4,689,898

RUNNING SHOE

Brian W. Fahey, 1620 Cornell Dr., SE., Albuquerque, N. Mex. 87106

Filed Sep. 11, 1985, Ser. No. 774,785
Int. Cl.[4] A43B *13/38, 7/22*
U.S. Cl. 36—43 **15 Claims**



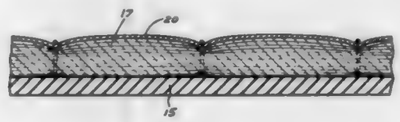
1. An inner sole for an article of footwear comprising a substantially planar, horizontal top surface adapted to support the bottom of a person's foot and having a raised bar extending above said top surface substantially across the width of said inner sole and arranged to contact a person's foot near the anterior surface of the calcaneus, said bar defining a substantially arcuate surface from the rear to the front of said bar so that said foot will roll over said bar during a running motion.

4,689,899

LAYERED INNER SOLE

Jon Larson, and Van Larson, both of 513 S. 6th St., Grand Forks, N. Dak. 58201

Filed Apr. 21, 1986, Ser. No. 853,934
Int. Cl.[4] A43B *13/40*
U.S. Cl. 36—44 **1 Claim**



1. For insertion into a shoe, an inner sole of layered construction, having in combination

a bottom cushion layer repellant to the penetration of moisture,

compression resistant insulating central layer of a relatively non-absorbent polyester micro-fibers, and

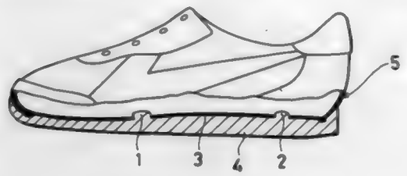
a top layer of a relatively thin non-woven highly porous absorbent non-wicking material which retains foot generated moisture until it is evaporated therefrom.

4,689,900

ANTISTATIC SHOE

Tokujiro Ishibashi, Tokyo, Japan, assigner to Nippon Rubber Co. Ltd., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,074
Claims priority, application Japan, Sep. 17, 1983, 50-143960[U]
Int. Cl.[4] A43B *13/00*
U.S. Cl. 36—103 **7 Claims**



1. An antistatic shoe comprising:

a sole;

an insole juxtapositioned relative to said sole, said insole including at least one aperture therein; and

at least one soft compression deformable antistatic projection corresponding to a medial plantar middle point disposed at a middle portion of a foot between the second toe bone and the third toe bone of the sole of a foot, said projection extending through said aperture in said insole;

said sole and said at least one soft antistatic projection being formed of an antistatic foam material so as to be integral therewith and said projection projects upwards to extend through said aperture and above the insole to be compressed and to engage a substantial portion of the medial plantar middle portion of a foot;

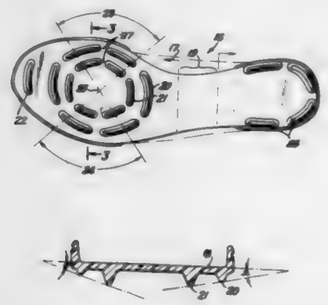
said at least one soft antistatic projection and the antistatic shoe sole are constructed of rubber that has an electric resistance value in a range of 1.0×10^5–1.0×10^8 ohm.

4,689,901

REDUCED TORSION RESISTANCE ATHLETIC SHOE SOLE

Frederick Ihlenburg, 1440 Chandler Rd., Lake Oswego, Oreg. 97034

Filed Oct. 19, 1984, Ser. No. 662,894
Int. Cl.[4] A43B *5/00*
U.S. Cl. 36—126 **11 Claims**



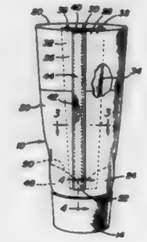
1. A shoe sole having a bottom face, instep, out step and toe portions, said toe portion including a plurality of vacuum limiting traction elements depending from the bottom face and arranged in a generally circular fashion about a point in a vertical axis at the balance point of the shoe sole, said depending elements including a first set more axially disposed, a second set more peripherally positioned adjacent the instep side of the toe portion and a third set more peripherally positioned adjacent the out step side of the toe portion, said first, second and third sets respectively depending first, second and third distances from said bottom face, wherein said first distance is greater than said third distance with the latter being greater than said second distance so that the bottoms of said first and second sets define an instep angle relative to said bottom face and the bottoms of said first and third sets define an out step angle relative to said bottom face with said instep angle being greater than said out step angle.

4,689,902

BREAKAWAY RIDING BOOT

Johnnie D. Lewis, Jr., Lubbock, Tex., assignor to Anthony E. Deprima, Phoenix, Ariz., a part interest

Continuation-in-part of Ser. No. 678,001, Dec. 3, 1984. This application Jul. 8, 1986, Ser. No. 883,162
Int. Cl.[4] A43B *5/00, 23/04, 11/00*
U.S. Cl. 36—131 **11 Claims**



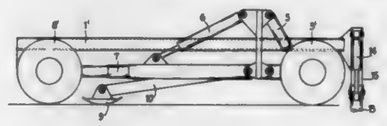
1. A riding boot comprising a sole, a heel, and an upper defining a foot-receiving portion and a lower leg-receiving portion, wherein the lower leg-receiving portion of the upper has a lengthwise opening extending down the back of the boot from the top of the boot to the heel of the boot, and fastening means for releasably holding opposing edges of the upper defining the opening together during normal usage of the boot, and for breaking open in response to forces created in the boot if the wearer of the boot falls from a horse and the wearer's foot is caught in a stirrup so as to provide quick release of the wearer's foot from the boot, wherein the boot includes a heel insert having an upper edge which diverges downwardly toward its center and defines a central tip located substantially at the base of the lengthwise opening above an insole of the boot so as to allow a degree of up-and-down movement of the user's heel during normal walking while providing quick release of the fastening means in the event the user's heel rises above the tip and exerts outward pressure on the fastening means.

4,689,903

EARTH DIGGING MACHINE FOR USE ON SOFT OR UNDULATING TERRAIN, PARTICULARLY FOR THE CLEARING OF PONDS, SWAMPS OR CANALS

Bibaut Gilbert, 22, rue de Compiègne, 60880 Le Meux, France

Filed Aug. 29, 1985, Ser. No. 770,588
Claims priority, application France, Sep. 3, 1984, 84 13585
Int. Cl.[4] E02F *5/02* .
U.S. Cl. 37—103 **11 Claims**



1. In a soft terrain earth digging machine vehicle, especially

useful for clearing and dredging ponds, swamps, canals and the like, and having a frame with four wheels attached to and supporting said frame on ground and defining a nominal wheelbase, and an automated shovel pivotally attached to said frame by a boom, the improvement comprising:

means, operatively associated with at least one pair of said wheels, for raising said one pair of said wheels from the ground;

a carriage attached for relative movement along a length of said frame, said carriage having a central stabilizer arm and means for engaging said arm with and disengaging said arm from the ground and said arm being sufficient with another pair of wheels, when said one pair of wheels are raised and said arm is engaged with the ground, to provide three point stable support of said vehicle on said ground; and

means, operatively associated with said carriage, boom and shovel, for actuating said carriage, boom and shovel are operable along with said wheel raising means so as to propel said vehicle, wherein said frame is supportable, alternately on said four wheels and on said three point support, and is shiftable relative to said carriage by engaging said shovel with said ground and moving said boom to propel said vehicle by moving said frame relative to said carriage, when supported by said three point support, on said other pair of wheels while said central stabilizer arm and carriage remain stationary relative to said ground.

4,689,904

RUB LINK ASSEMBLY FOR DRAGLINE BUCKET

Terry L. Briscoe, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Sep. 29, 1986, Ser. No. 912,270
Int. Cl.[4] F16G *15/04*; E02F *3/46*
U.S. Cl. 37—135 **12 Claims**



1. A rub link assembly for a dragline bucket adapted to be interconnected in a hoist chain for rolling movement against the bucket side comprising a relatively elongated member having a clevis at each end, each clevis being equipped with aligned openings adapted to receive bolt means for removably connecting said clevis to the hoist chain links, said member being further equipped with a cylindrical collar journaled thereon between said clevises and providing a rolling bearing against the bucket side.

4,689,905

COLLAPSIBLE LAUNDRY PRESS

Henri Vartan, 135 Seminary Dr., Apt. C, Mill Valley, Calif. 94941

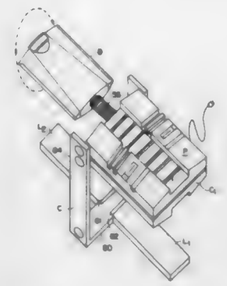
Filed Jul. 28, 1986, Ser. No. 891,436
Int. Cl.[4] D06F *71/02, 71/16*
U.S. Cl. 38—26 **11 Claims**

1. A laundry press comprising:

a cabinet having at least one side member and a upright member, said said member side foldable from a first position, closing said cabinet to a second position at substantial right angles to said cabinet to brace said cabinet in an erect position;

a buck movable from a first position interior of said cabinet upright member where it may be enclosed by a further member of said cabinet to a second position at substantial right angles to and supported from the top of said cabinet;

a pressing plate supported from said top of said cabinet upright member overlying said buck, said pressing plate



being movable towards and away from confrontation with said buck to press garments supported on said buck;

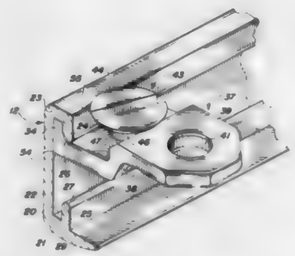
said buck and pressing plate mounted for reciprocation outwardly from said further member of said cabinet, said further member of said cabinet supported at 90° to said cabinet.

4,689,906

DISPLAY FRAME FOR MOUNTING VERTICAL SURFACE

Charles F. Sherman, Townsend, Mass., assignor to Esselte Pendaflex Corp., Garden City, N.Y.

Filed Aug. 21, 1985, Ser. No. 767,802
Int. Cl.[4] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152.1 **10 Claims**



1. Article display apparatus comprising:

a frame assembly comprising a plurality of joined elongated frame sections; each frame section comprising a longitudinally extending channel defined by a rear wall, a pair of side walls joined to said rear wall, and a pair of front wall lips each having one edge joined to a different one of said side walls and opposite edges spaced apart by a slot that opens into said channel; and

a pair of frame hangers each retained by a channel in a different one of said frame sections; each of said hangers comprising a latch arm portion extending into a portion of said channel defined by said rear wall, one of said side walls and one of said front wall lips, an inner end of said latch arm portion engaging said rear wall; a base portion having one end projecting out of said channel through said slot and joined to said latch arm portion, said one end engaging said opposite edge of said one front wall lip and said base portion defining a tapped hole; a lever portion extending from an end of said base portion opposite to said

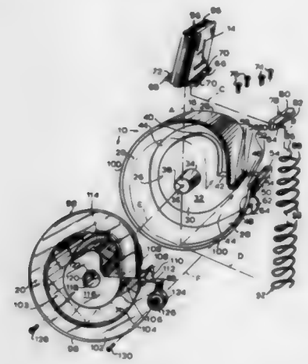
one end and defining an engagement surface; a fastener having a head and a threaded shank received by said tapped hole, said head comprising first and second diametrically opposed contact surfaces, said first contact surface engaging said engagement surface and said second contact surface engaging an outer surface of said one side wall; and retainer means adapted to retain one end of a frame supporting strand.

4,689,907

SMALL ARM MAGAZINE

Mack W. Gwinn, Jr., P.O. Box 61, Stetson Rd., Levant, Me. 04456

Filed May 14, 1986, Ser. No. 863,003
Int. Cl.[4] F41C *25/10*
U.S. Cl. 42—50 **17 Claims**



1. A small arm magazine for a small arm having a magazine well or the like comprising a generally drum shaped housing portion including cartridge guiding means located therein for guiding at least one column of cartridges in at least a partially curved manner, said cartridge guiding means having a substantially straight portion and having means for reducing friction with cartridges located in said cartridge guiding means, and projecting cartridge feeding means projecting outwardly from said generally drum shaped housing portion in a direction generally tangential to the outer portion of said generally drum shaped housing portion for fitting into and feeding cartridges into the magazine well of said small arm, said projecting cartridge feeding means having an outer upper end portion and a lower inner end portion with said lower inner end portion being located with respect to said generally drum shaped portion whereby a substantial portion of said generally drum qhaped housing portion is located at a level above the level of the lower inner end portion of said projecting cartridge feeding means when said small arm magazine is oriented for normal use.

4,689,908

HOLSTER AND HANDGRIP EXTENSION FOR MINIATURE HANDGUNS

Gary C. McClellan, 4011 Saddler La., Vale, Oreg. 97918

Filed Oct. 27, 1986, Ser. No. 923,189
Int. Cl.[4] F41C *23/00, 33/02*
U.S. Cl. 42—71.02 **10 Claims**

1. Holster and handgrip extension apparatus for miniature handguns of the type having a handgrip framework, to which handgrip side plates are removably attached, said framework defining an opening, said apparatus comprising:

pivot bolt support means engaging the handgrip framework of the handgun;

a pivot bolt laterally extending through said opening of said framework, said pivot bolt supported by said support means; and

a holster and handgrip extension member pivotally engaging



said pivot bolt, said member defining a handgrip extension when pivoted to an open operational mode and defining a holster covering the trigger and barrel of the handgun when pivoted to a closed non-operational mode.

4,689,909

MAGAZINE CHARGER

William J. Howard, P.O. Box 573, Wilson, N.C. 27893

Filed Jul. 16, 1986, Ser. No. 886,043
Int. Cl.[4] F42B *39/06*
U.S. Cl. 42—87 **11 Claims**



1. A magazine chargr for charging cartridges to a magazine; said magazine charger comprising;

A. a body comprising:

(1) an open end constituting means for receiving a magazine to be charged with cartridges; wherein the magazine has a magazine spring which biases cartridges toward two juxtaposed, cartridge-retaining lips carried by the magazine; and

(2) a closed end opposite the open end; and

(3) a saddle, the surface of which is lower than the cartridge-retaining lips of the magazine;

whereby insertion of a cartridge into the magazine causes the cartridge to slide along the saddle while remaining out of contact with the lips of the magazine; and

B. a plunger axially, slidably carried by the closed end of the body of the charger and adapted to move cartridges against the magazine spring; and

C. means for biasing the plunger away from the open end of the charger.

4,689,910

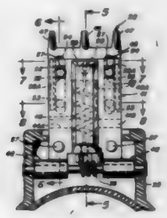
FRONT SIGHT FOR PROJECTILE LAUNCHERS

Paul V. Choate, Milton, and Robert W. Woodburn, Middleboro, both of Mass., assignors to N I Industries, Los Angeles, Calif.

Filed Mar. 6, 1986, Ser. No. 836,746
Int. Cl.[4] F41G *1/02*
U.S. Cl. 42—100 **6 Claims**

1. A thermally responsive front sight for a launcher of a

projectile the efficiency of the propellant of which varies with the temperature thereof, the launcher of a type having a port opening into a thermally insulated housing adjacent the muzzle and provided with a removable closure, said sight including a sighting member provided with a central sighting post, said sighting member thin and flat surfaced, a sight housing including means at one end for use in connecting said sight housing to the interior of said insulated housing below said port in a position to be erected therethrough and having a central lengthwise chamber the width of which is substantially less than the width of the sighting member, said sight housing having a transverse slideway opening through the other end thereof and intersecting a substantial portion of said chamber and shaped and dimensioned to receive and slidably confine



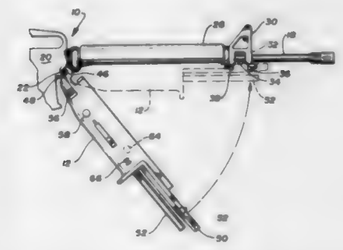
said sighting member, said sighting member within said slideway with a central portion exposed in said chamber and with the sighting post exposed above said housing, portions of the sighting member at each side of the chamber having lengthwise parallel slots, and a thermally responsive element within said chamber with one end anchored in the bottom thereof and the other end of the element attached to said exposed central portion, said element of the type expanding lengthwise as the temperature rises and contracting as the temperature falls, and means on each side of said chamber entrant of the appropriate one of the slots of the sighting member and dimensioned to enable said sighting member to be moved vertically by said element while holding said sighting member against lateral movement.

4,689,911

GRENADE LAUNCHER ATTACHMENT FOR INFANTRY WEAPON

Bernard C. White, Robbinsdale, Minn., assignor to Napco Industries, Inc., Hopkins, Minn.

Filed Jun. 4, 1984, Ser. No. 617,264
Int. Cl.[4] F41C *21/18;* **F41F** *1/06, 19/02*
U.S. Cl. 42—105 **4 Claims**



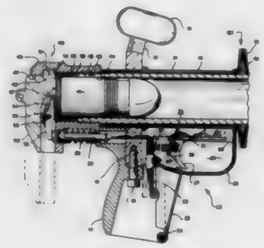
1. In combination with an infantry weapon having a bayonet lug mounted near the distal end of its barrel and projecting receiver bolts positioned at the forward portion of the rifle receiver on opposite sides thereof, a projectile launcher for firing individual projectile rounds comprising, in combination:
(a) a launcher body;
(b) a pair of hooklike projecting elements attached at one end of the launcher body for engagement of the projecting bolts on the rifle receiver to permit purely pivotal movement of the launcher body about the projecting bolts relative to the barrel of the infantry weapon and removal from the rifle without the use of tools when the launcher body is pivoted about the receiver bolts;
(c) a projecting tongue portion attached to the first end of the launcher and having locking means disposed thereon for engagement with the bayonet lug of the infantry weapon when the launcher body is pivoted about the receiver bolts into a position with the launcher body parallel to the barrel of the weapon;
(d) an opening in the projecting tongue portion positioned to receive the bayonet lug when the launcher body is pivoted into position parallel to the barrel; and
(e) pivotally movable engaging means including actuating arms and clamping jaws mounted on both sides of the opening constructed and arranged when actuated to open the jaws to allow insertion of the bayonet lug along an axis perpendicular to the longitudinal axis of the barrel into the opening and when not actuated to engage the step of the bayonet lug and resist pivotal movement of the launcher body away from parallel alignment with the barrel of the infantry weapon by interference with the widened step of the bayonet lug with the engaging means.

4,689,912

HAND-HELD HIGH-VELOCITY GRENADE LAUNCHER

Richard R. Gillum, Marblehead, Ohio, assignor to Weapon Technology System R & D Ltd., Westlake, Ohio

Filed Jun. 26, 1986, Ser. No. 878,673
Int. Cl.[4] F41C *15/08;* **F41F** *19/06*
U.S. Cl. 42—105 **6 Claims**



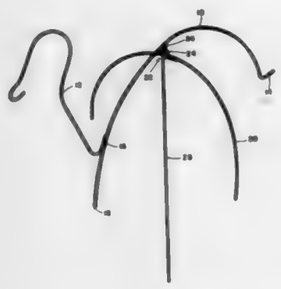
1. A hand-held, single-shot weapon for firing a high-velocity grenade round comprising:
a receiver;
stocks associated with said receiver for gripping said weapon for firing;
a barrel slidably received in said receiver and having an annular external shoulder spaced forwardly of said receiver;
annular recoil spring means surrounding a portion of said barrel and operatively located between said shoulder and the forward end of said receiver;
a breech connected to the rearward end of said barrel and defining with said barrel a firing chamber adapted to receive a grenade round to be fired;
a breech block received in said breech and manually slidable between an open position to permit end loading of a grenade round into said firing chamber and a closed position closing said firing chamber;
a firing lever pivotably mounted in said breech block about a transverse axis and having a first lever arm with a firing pin thereon axially aligned with said barrel and a second lever arm;
a striker slidably mounted in said receiver for movement in a direction parallel to the axis of said barrel and adapted to engage said second lever arm of said firing lever; and
striker spring means urging said striker toward said second lever arm;
a sear engagable with said striker and movable in one direction to move said striker against said striker spring means;
trigger means including a trigger spring having one end engaging said sear;
cocking means operable by the user when gripping the weapon for firing, to move said sear in one direction to a cocked position and to cause said sear to compress
said trigger spring; and
said trigger means being operable by the user to disengage said striker from said sear when said sear is in the cocked position whereby said striker means is moved into the cocked position only when the weapon is gripped for firing and when said striker means is released, said striker means impacts against said second lever arm to pivot said firing pin sharply to impact against and fire said grenade round.

4,689,913

COLLAPSIBLE DECOY

Ronnie V. Brice, R.R. 2, Box 487, Henryetta, Okla. 74437

Filed Jul. 9, 1986, Ser. No. 883,557
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **6 Claims**



1. A collapsible fowl decoy consisting of:
a generally U-shaped first wire frame living in a single plane;
a U-shaped second wire frame lying in a single plane;
a neck extension fixed to said second wire frame and lying in said single plane;
the only frame lies wholly in said single plane;
a pivot means for pivotally connecting an intermediate point on said first wire frame and an intermediate point on said second wire frame such that the wire frames can be rotated between an enhanced position and a collapsed flat position, there being no connection between said first wire frame and said second wire frame other than said pivot means;
a flexible covering over said first and second wire frame and said neck extension;
a ground anchor rod connected to said second frame.

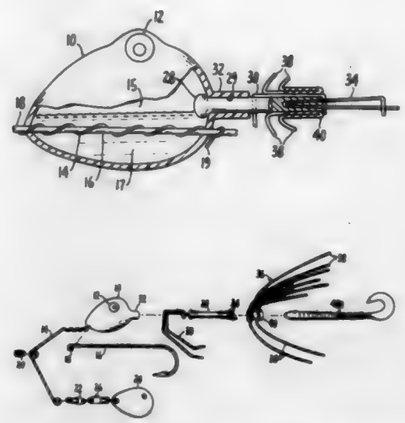
4,689,914

VARIABLE BUOYANCY FISHING LURE

Leland F. Quinlan, Rte. 1, Box 14A, Westwood, Calif. 96137

Filed Aug. 28, 1985, Ser. No. 770,661
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.22 **13 Claims**

8. A fishing lure comprising:
a hollow, resilient head member having a vent opening in communication with the interior of said head member;
adjustment means for adjusting the specific gravity of said lure by manually collapsing and releasing said head member, said adjustment means including a relatively rigid plug having a first end disposed within said vent opening; and



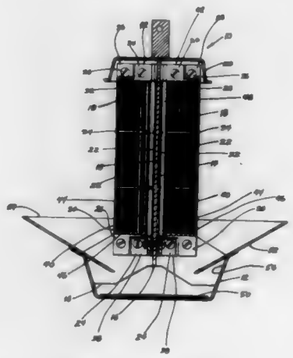
a hook having a hook shank which extends through said head member and a barb which is biased against a second end of said vent plug by said head member.

4,689,915

TRAP FOR HOUSEFLIES

Roger H. Grothaus, and Donald W. Hildebrandt, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 7, 1984, Ser. No. 607,371
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 **11 Claims**



1. A trap for trapping flies and flying insects of comparable size, comprising:
an upright array of substantially parallel, exposed conductors, said conductors being of insufficient width to allow an adult fly to easily alight on only one conductor, wherein adjacent pairs of said conductors are separated by air and closely spaced such that an alighting fly contacts an adjacent pair of conductors;
insect receiving-and-holding means below said array for receiving and holding insects;
flying insect-directing means disposed adjacent the lower end of said array and above said receiving-and-holding means for directing generally downwardly flying insects into contact with said receiving-and-holding means; and

pulsing-charge means for periodically generating opposing pulsating charges and delivering such charges to adjacent pairs of said conductors, said charges having about 25 to 40 volts peak and a frequency of about 60 to 600 Hz,

the pulsating-charge means being operatively connected to the conductors and adapted to cause the flies to be subjected to a less-than-lethal shock which, in turn, causes the flies to fly in a generally downward direction into the insect receiving-and-holding means via the flying insect-directing means.

4,689,916

DOOR GLASS ASSEMBLY FOR AUTOMOTIVE VEHICLES

Yoshiro Shimizu, Kanagawa, Japan, assignor to Isuzu Motors Ltd., Tokyo, Japan

Continuation of Ser. No. 561,369, Dec. 14, 1983, which is a continuation-in-part of Ser. No. 247,574, Mar. 26, 1981, abandoned. This application Nov. 29, 1985, Ser. No. 802,959

Claims priority, application Japan, Mar. 31, 1980, 55-42884; Mar. 31, 1980, 55-42885; Mar. 31, 1980, 55-42886; Apr. 28, 1980, 55-58646; Apr. 28, 1980, 55-58647

Int. Cl.⁴ E05F *11/38*

U.S. Cl. 49—374 **6 Claims**



1. A door glass assembly for an automobile door comprising:

a door body member;

top and side frame members defining an opening within said door body member;

a door glass for opening and closing said opening;

door glass elevating and lowering guide groove means fixed to said frame members for supporting and permitting movement of said door glass;

weather strip means for slidably guiding said door glass, said weather strip means being mounted in said door glass elevating and lowering groove means;

guide shoe means fixedly secured to at least one end portion of said door glass, said guide shoe means slidably engaging said guide groove means, said guide shoe means including at least one guide shoe member having at one end a guide portion substantially parallel to said door glass and slidably engaging said weather strip means, said guide portion being located at a predetermined offset portion with respect to a central plane of said door glass to fair said door glass with a door outer panel, a first extension on a passenger compartment side, a second extension on the outside and a connecting portion therebetween defining a U-shaped channel for clamping an end portion of said door glass, an adhesive applied to portions corresponding to said first extension and said connecting portion of said guide shoe member, said second extension being shorter and thinner than said first extension;

said guide shoe member is made of plastic by integrally molding; and

said end portion of said door glass is pressingly inserted into said clamping portion whereby said door glass is fixedly secured to said clamping portion, and the surface of said door glass and said door body member are made substantially flush.

4,689,917

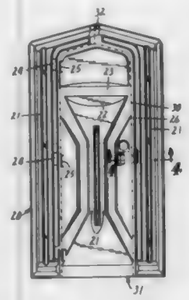
BUILDING WALL PANEL AND DOOR UNIT

Phillip R. Juaire, Brooklyn Center; Frederic M. Wagner, Rogers, and Leo F. Wildgen, Bloomington, all of Minn., assignors to Satellite Industries, Inc., Minneapolis, Minn.

Division of Ser. No. 566,582, Dec. 29, 1983, Pat. No. 4,574,025. This application Sep. 30, 1985, Ser. No. 782,294

Int. Cl.⁴ E06B *1/00*

U.S. Cl. 49—380 **7 Claims**



1. A generally rectangular, building-wall panel comprising:

an interior polymeric sheet and an exterior polymeric sheet bonded together at their peripheral edges and at selected areas within their peripheral edges to define a panel,

a central panel area defining a door which is bordered on at least three sides by a planar surface area wherein said sheets are bonded together, which central panel area may be cut from said panel in said planar area, said central panel area having patterned offset areas to reinforce said central panel area, and

an offset area extending from one edge of said central panel area to the adjacent edge of said panel wherein said molded sheets are bonded together and one side of said offset area is at a plane parallel to the other side, said one side being spaced substantially the thickness of said two sheets from said other side, which offset area may be cut at its midpoint to separate said panel whereby the one and said other side may be placed in overlapping relationship to form a frame smaller than said central panel area, said offset and overlap provides said frame in one plane from said surface area adjacent the central panel area.

4,689,918

APPARATUS FOR MANUFACTURING AND WORKING OF GEARS

Herbert Loos, Dorfen-Stadt, and Manfred Erhardt, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 576,672, Feb. 3, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,946

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304980; May 17, 1983, 3317915; Nov. 18, 1983, 3341671; Nov. 19, 1983, 3341877

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—105 GG **12 Claims**

1. An apparatus for the precision working of a tooth system of a rotatably supported gearlike workpiece by rolling the teeth of said gearlike workpiece with teeth on a rotatably supported gearlike tool, the axes of rotation of said workpiece and said tool being spaced along a common normal, comprising:

support means supporting said rotatably supported workpiece and tool for movement only toward and away from each other in a direction parallel to said common normal and so that said axes of rotation thereof are crossed;

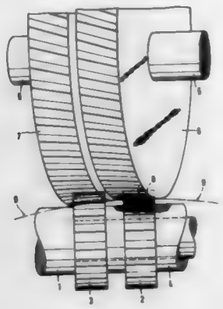
first guide gear means coaxially coupled to said workpiece and being rotatable therewith;

second guide gear means coaxially coupled to said tool and being rotatable therewith, said first and second guide gear means operatively engaging each other and having the same speed ratio therebetween as between said workpiece and said tool;

abrasive surface means on said teeth of said tool, said tool teeth being free of uniformly directed cutting edges, said tool further being formed hyperboloidally in the axial dimension thereof so that when said workpiece and said tool are engaged, at least one of said teeth of said tool is engaged by at least one of said teeth on said workpiece over the entire axial length of the tool tooth;

first means providing a first tooth contact between successive teeth on said tool and successive teeth on said workpiece on only one side of each of said successive teeth on said tool, a first backlash spacing being provided between each of said successive teeth on said workpiece and the opposite side of each of said successive teeth on said tool;

second means providing a second tooth contact, simultaneous with said first tooth contact, between successive teeth on said first guide gear means and successive teeth on said second guide gear means on only side of said of said successive teeth on said second guide gear means, a



second backlash spacing being provided between each of said successive teeth on said first guide gear means and the opposite side of each of sdid successive teeth on said second guide gear means, said first tooth contact being on a first circumferentially facing side of each said successive tooth of said workpiece and said tool, said second tooth contact being on a second circumferentially facing side of each said successive tooth of said first and second guide gear means, said first circumferentially facing side facing oppositely to a facing direction of said second circumferentially facing side so that the operatively engaged combination of said workpiece/tool and said first guide gear means/second guide gear means is entirely backlash free;

drive means for driving said workpiece/tool pair and said guide gear pair for continous rotation during an interval of time that work is being performed by said tool on said workpiece;

said first and second means including an adjusting means for effecting a change in the side on which tooth contact is provided from one circumferentially facing side to the opposite side and during said continuous rotational driving of said workpiece/tool pair and said guide gear pair so that said rotation of said workpiece/tool pair and said guide gear pair is continuous during a cycle of operation including a change in the side on which tooth contact is provided between said workpiece/tool pair and said guide gear pair.

4,689,919

METHOD FOR WELDING CUTTER SEGMENTS

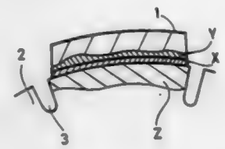
Takao Kawakita, Ikeda, and Ichiro Miyao, Fujieda, both of Japan, assignors to Osaka Diamond Industrial Co., Sakai, Japan

Filed Apr. 24, 1985, Ser. No. 726,517

Claims priority, application Japan, May 8, 1984, 59-92518; May 8, 1984, 59-67635[U]

Int. Cl.⁴ B24D *5/06*

U.S. Cl. 51—206 P **17 Claims**



1. In a method for fixing to a steel core body a segment containing grit selected from the group consisting of diamond, cubic boron nitride and mixtures thereof, the improvement comprising the steps of using as the material of said segment, a cobalt powder compact, containing said grit, which has been sintered to nearly 100% apparent density, and welding said segment to said steel core body by focusing an electron beam or a laser beam on the boundary between said steel core body and said segment.

4,689,920

SLITTING TOOL

Samuel C. Geise, Memphis, Tenn., assignor to Specialty Tool Co., Inc., Memphis, Tenn.

Filed Aug. 18, 1986, Ser. No. 897,724

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—241 S **7 Claims**

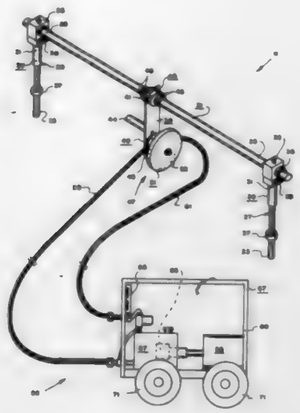
1. A tool for cutting a slit into at least one web portion of one end of a membrane wall, said tool comprising:

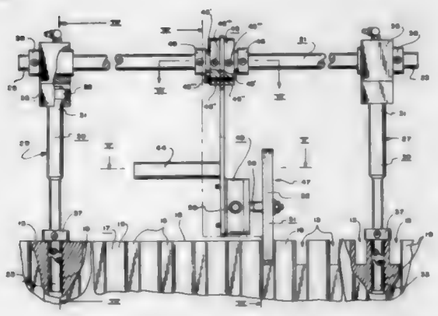
(a) a guide bar;

(b) securing means for securing said guide bar to said membrane wall at a location above said one end of said membrane wall;

(c) a swing arm having a first end attached to said guide bar and having a second end swingable between a first position and a second position; and

(d) cutting means attached to said second end of said swing arm for cutting a slit into said at least one web portion of





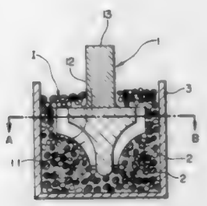
said membrane wall when said swing arm is moved between said first and second positions.

4,689,921

PROCESS OF CONTOURING THE EDGES OF A CERAMIC ROTOR

Shigenori Murate, and Yoshinori Hattori, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Nov. 12, 1985, Ser. No. 796,714
Claims priority, application Japan, Nov. 13, 1984, 59-239184
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—317 **11 Claims**



1. A method of shaping the edges of a sintered ceramic turbine rotor, said method comprising the steps of:

providing a plurality of grindstones having a diameter in the range of from about 1 to 10 mm;

placing said rotor in said grindstones; and

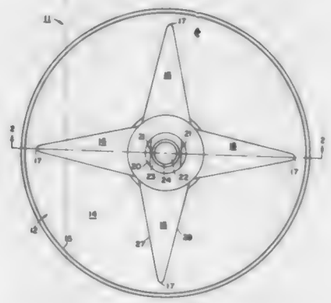
rotating said rotor within said grindstones such that the radius of the edges of said rotor is in the range of about 0.2 to 1 mm.

4,689,922

BUFFING PAD

Walter W. Blanchard, Jr., 411 Lake Shore Dr., Duxbury, Mass. 02331

Filed Feb. 18, 1986, Ser. No. 830,627
Int. Cl.[4] B44D *1/00*
U.S. Cl. 51—358 **12 Claims**



9. A light-weight, one-piece portable buffing pad for use with a hand-held power drive member having a threaded shaft comprising:

a generally disk-shaped, flexible, solid, plastic backing plate having a generally planar central portion and an integrally formed peripheral lip of a thicknessnless than the thickness of saidi planar central portion, said lip being of a predetermined curvature thereby forming a generally concave inner surface and a generally convex outer surface, said outer surface, including the outer surface of said peripheral lip, being roughened;

a tufted pad;

means for permanently glueing said tufted pad to said outer surface of said backing plate including said peripheral lip;

means for releasably connecting said backing plate directly to the threaded shaft of the power drive means, said connecting means being integrally connected to the center of said central portion of said inner surface and including a top portion for forming a stop with the power drive means; and

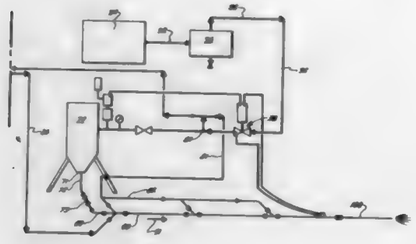
four control ribs symmetrically disposed at 90° intervals and integrally formed on said central portion of said inner surface of said backing plate and extending from said connecting means in a radial direction toward the peripheral lip of said backing plate, each of said control ribs decreasingly tapering in both width and thickness from said connecting means toward the peripheral lip of said backing plate, with said control ribs having their greatest thickness and width at the connecting means, and their least thickness and width at a point near said peripheral lip, with said taper being continuous from said connecting means to said point near said peripheral lip, said control ribs providing increased flexibility to said backing plate toward the peripheral lip of said backing plate and said inner surface of said backing plate having unobstructed pathways between said ribs for directing debris particles in a generally centrifugal direction when the buffing pad is driven by the power drive member.

4,689,923

SLURRY SANDBLASTING SYSTEM

James L. Goudeaux, 450 Vitrano La., Independence, La. 70443, and Eric J. Olivier, 1406 Hwy. 311, Schriever, La. 70395

Filed May 7, 1985, Ser. No. 731,670
Claims priority, application PCT Int'l Appl., Jul. 29, 1985, PCT/US85/01417
Int. Cl.[4] B24C *3/02*
U.S. Cl. 51—410 **1 Claim**



1. An apparatus for sandblasting while maintaining consistent pressure in the sandblasting line, the apparatus comprising:

a. a source of pressurized gas;

b. a source of water in a tank;

c. a source of abrasive material;

d. a principal flow line in communication with the source of sand and pressurized air for delivering the sand under pressure within the principal flow line;

e. means for injecting a chemical inhibitor into the water tank;

f. first means along said principal flow line for introducing the water containing inhibitor into the sand flowing in the principal flow line, said means further comprising a principal flow chamber for accommodating the sand flow in said principal flow line;

g. first and second injection ports located in the wall of said chamber for allowing water containing chemical inhibitor and air to flow into said principal flow chamber through said first and second ports respectively; and

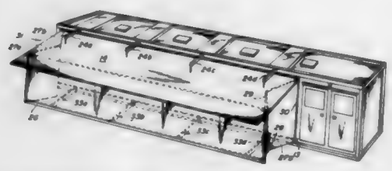
h. means situated at points along the length of said principal flow line for providing an air pressure boost within the line, said means including an angulated orifice for introducing said air into said principal flow line under pressure in the direction of said main flow in said flow line.

4,689,924

EXPANDABLE STRUCTURE AND SEQUENCE OF EXPANSION

Bruce A. Jurgensen, 3412 - 17th Ave., Forest Grove, Oreg. 97116

Filed May 30, 1985, Ser. No. 739,607
Int. Cl.[4] E04B *1/344;* **E04H** *1/12*
U.S. Cl. 52—67 **15 Claims**



1. An expandable structure, comprising:

a core structure having a roof section, sidewall sections, endwall sections and a floor section;

a plurality of structural members hinged to a frame of said core structure and vertically stacked adjacent a selected one of said sidewall sections, a substantial portion of said selected sidewall section being hinged to said frame of said core structure, said selected sidewall section being rotatable outwardly to form the roof of a contiguous expanded structure, said structural members being capable of deployment subsequent to said deployment of said selected sidewall, to form a window wall, end walls and the floor of said contiguous expanded structure;

power beam means housed within said roof section of said core structure to drive said selected sidewall/roof outwardly to form said roof of said contiguous expanded structure; and

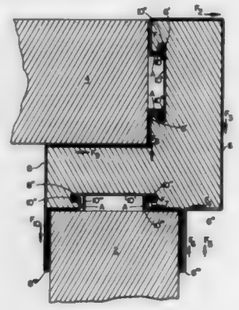
power beam means housed within said floor section of said core structure to deploy said window wall, end walls and said floor of said contiguous expanded section.

4,689,925

IN A BUILDING A CORNICE BETWEEN A WALL AND A CEILING BOTH MADE OF MODULAR PANELS

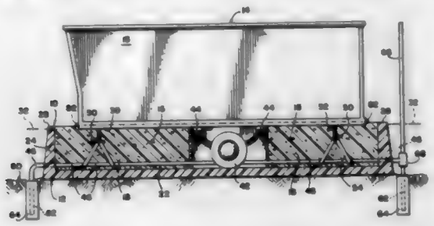
Luigi Granieri, Pautalia, Italy, assignor to GN/PI de Luigi Granieri e Figli, S.n.c., Perugia, Italy

Filed Sep. 23, 1986, Ser. No. 910,725
Claims priority, application Italy, Sep. 25, 1985, 36192/85[U]
Int. Cl.[4] E04B *7/00;* **E04D** *3/40*
U.S. Cl. 52—94 **3 Claims**



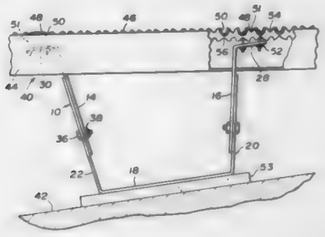
1. A protective peripheral cornice of a building wherein the walls and the top roof are both formed with modular panels of common dimensions a cornice that is an equal angle broad flanged beam is inserted between the top of the wall and the end section of said roof which cornice with its inner surface of its vertical flange covers the end of the ceiling and with its inner surface of its horizontal flange covers the terminal section of the ceiling; while the outer surface of its horizontal flange covers the top surface of the wall and projects from the latter for about ¼ of the wall thickness while the outer surface of the vertical flange is exposed to the atmosphere, said cornice being made of light material which is totally enveloped in a metal sheet except for two interruptions where the sheet is replaced by bridgelike means of insulating plastic material which extend for about ¼ the panel thickness; one of said interruptions being located across the horizontal median plane of the ceiling panel while the other is located across the vertical median plane of the wall panel.

4,689,926
FOUNDATION FOR BUILDING STRUCTURE AND METHOD OF CONSTRUCTING BUILDING STRUCTURE UTILIZING SAME
J. Kevin McDonald, 6452 Briarway Cove, Memphis, Tenn. 38115
Filed Feb. 5, 1986, Ser. No. 826,182
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—169.11 **44 Claims**



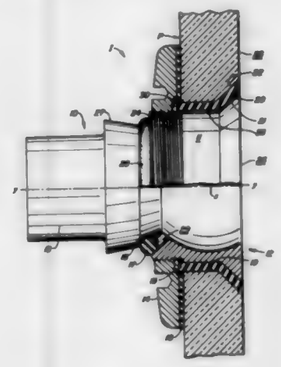
1. A foundation for a mobile building unit having wheels, the foundation comprising:
(a) a shell having side walls said shell being of such size and configuration as to underlie the building unit and provide a base on which the building unit is supported, said shell partially defining a space between itself and the building unit, and
(b) an insulating filling in said shell, said insulating filling being of such volume and shape as to fill said space between said shell and the building unit,
(c) said side walls of said shell being resiliently movable between a bent condition, allowing the wheels of the mobile building unit to pass over said side walls to move the mobile building unit into or out of place, and a relaxed condition in which said side walls have resumed their normal, upstanding position with respect to said bottom wall of said shell,
(d) whereby increased energy efficiency and stability are provided for the building unit.

4,689,927
WALKWAY FOR A SLOPING ROOFTOP
William J. Green, Lake Forest, and Ralph P. Semmerling, Arlington Heights, both of Ill., assignors to USG Industries, Inc., Chicago, Ill.
Filed Dec. 3, 1986, Ser. No. 937,324
Int. Cl.[4] E04D *13/12*; E04G *3/00*
U.S. Cl. 52—180 **4 Claims**



1. A rooftop walkway comprising a longitudinal, expanded metal plank disposed at an acute angle to the roof on which the walkway rests, and an adjustable, U-shaped support stand to which the plank is fastened transversely; the support stand comprising a base, a pair of divergent legs connected to the base, and an extension member connected to each leg; each leg having a plurality of holes arranged in at least two spaced apart columns, and each extension member having a web and an outwardly extending flange connected to the plank, the webs having a pair of slots spaced apart in correspondence with the columns, wherein the slots in the extension members are aligned with the holes in the legs so that the base of the support stand and the flanges of the extension members are in different planes.

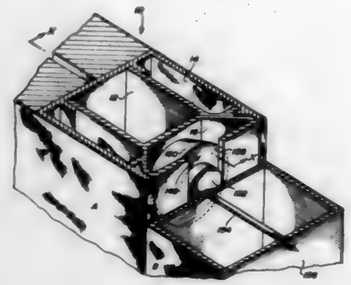
4,689,928
ARCHITECTURAL PLATE GLASS SUPPORT SYSTEM
Hugh J. Dutton, 31 Rue Des Thermopyles, Paris, and Martin Francis, 6 Avenue Thiers, Antibes, both of France
Filed Apr. 14, 1986, Ser. No. 851,196
Claims priority, application France, Apr. 15, 1985, 85 06179
Int. Cl.[4] E04B *1/40*
U.S. Cl. 52—235 **24 Claims**



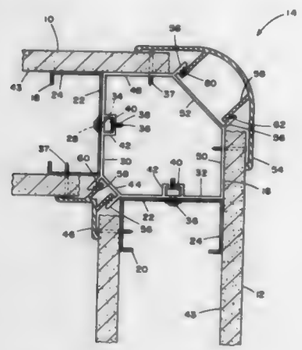
1. A mechanical joint for supporting a vertically oriented plate comprising:
a stem having first and second ends;
a head having reduced sized first end and enlarged sized second end;
articulated means for mounting the head to the second stem end for articulated movement relative to the stem;
said first end of said stem and said head sized to pass through a hole in the plate, said second head end sized to prevent said head from passing completely through the hole in the plate; and
means for securing the plate to said head.

4,689,929
FASTENER FOR A READILY DISENGAGEABLE INTERIOR PANEL
James D. Wright, 110 Pennsylvania Ave., Bangor, Pa. 18013
Filed Jul. 21, 1986, Ser. No. 888,054
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 **4 Claims**

1. A pair of snap fitted linear rigid strut members together defining a panel frame end comprising a male member, said male member including a linear shaft and a linear trapezoidal channel with the longer parallel side including a slit midpoint to receive the shaft of a button-type fastener, said channel's short parallel side forming said shaft's top side, said shaft having a total of three sides with an open bottom, said other two sides being formed by parallel arms projecting from said trapezoid short side corners and wherein, also, said nonparallel sides of said channel each include an outward projecting horizontal flange, and a female member, said female member defining part of said panel edge so that a fabric panel cover surrounding at least a portion of said female member is internally held by said male member to thereby cover at least a portion of said female member.

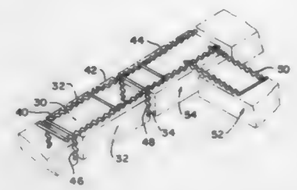


4,689,930
PARTITION STRUCTURE
Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.
Filed May 29, 1986, Ser. No. 868,247
Int. Cl.[4] E04B *1/348, 1/56*
U.S. Cl. 52—277 **4 Claims**



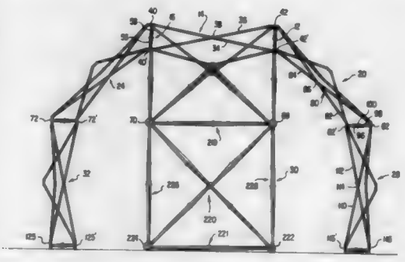
3. A partition wall comprising a plurality of sections adjoined together by a plurality of vertically spaced apart clips, each said clip being affixed to a vertical stud located at substantially the end of each of said plurality of sections of wall, said clips therein comprising a relatively short length of a hollow tubular preformed rigid section of substantially uniform cross section, said preformed rigid section including a plurality of stud-engaging flat sides, each said stud-engaging flat side having means for firm attachment to a stud of a partition wall section, said preformed rigid section further including at least two additional sides having means for firm attachment thereto of elongate clip-concealing trim strips, wherein said means for attachment to a stud in each stud-engaging flat side comprises a screw threadedly affixed to said clip with a screw-head located externally of said clip for engaging screw-head holding means of abutting studs, and wherein said means for attachment to a stud in each stud-engaging flat side further comprises a nut threadedly engaged by said screw and means for preventing rotation of said nut when said screw is rotated therein.

4,689,931
MASONRY CONSTRUCTION DEVICE
Philip R. Hodges, P.O. Box 1617, Petersburg, Va. 23805
Filed Mar. 3, 1986, Ser. No. 835,773
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—442 **11 Claims**



1. An interlocking spacer device adapted to be disposed between adjacent masonry elements for spacing the masonry elements a predetermined distance apart, the device being U-shaped and being formed by first and second elongated members which are corrugated over substantially their entire length and spaced apart in respective first and second parallel planes, and by a third straight member connected to the first and second members and extending substantially perpendicular to the first and second planes, the third member being formed of two telescoping sections so that the spacing between the first and second members may be varied, each member comprising a rod of circular cross-section and uniform diameter, and the first and second members each being formed to have in its respective plane a sawtooth shape which provides, on one side of the member, a plurality of first ridges and valleys alternating along the length of the member and, on an opposite side of the member, a plurality of second alternating ridges and valleys, the first and second ridges being spaced apart in the plane of the member by said predetermined distance and providing a plurality of bearing surfaces for engaging and spacing corresponding first and second adjacent masonry elements, and wherein the diameter of said members is less than a distance in said planes between the ridges and alternating valleys such that a member of another U-shaped device may cross one of the first and second members at an angle and be received within a valley between adjacent ridges to interlock the U-shaped devices together with the ridges of said U-shaped devices at substantially the same levels.

4,689,932
PORTABLE SHELTER ASSEMBLIES
Theodore R. Zeigler, 205 S. Columbus St., Alexandria, Va. 22314
Filed Nov. 6, 1985, Ser. No. 795,534
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—648 **41 Claims**



1. In a portable shelter framework formed of elongate struts

and which is capable of being expanded into arched three dimensional form and collapsed into bundled form, the combination of a plurality of series of end-interconnected modules each defining a separate arch portion of the framework, said arch portions extending in different directions relative to each other.

4,689,933

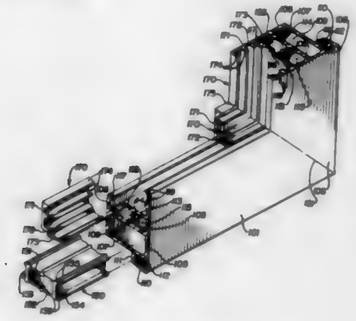
THERMALLY INSULATED WINDOW SASH CONSTRUCTION FOR A CASEMENT WINDOW

Alexander J. Biro, Export, Pa., assignor to Winchester Industries, Inc., Saltsburg, Pa.

Continuation-in-part of Ser. No. 632,910, July 20, 1984, Pat. No. 4,624,091. This application Aug. 29, 1986, Ser. No. 902,426

Int. Cl.⁴ E04C *2/38*

U.S. Cl. 52—656 **23 Claims**



1. A window sash member comprising:

first and second generally parallel sidewalls;

first and second spaced, generally parallel transverse walls connecting said first and second sidewalls, extending between and oriented generally perpendicular to said first and second sidewalls to define a first hollow chamber;

a third transverse wall, located without said first hollow chamber adjacent to and generally parallel to said first transverse wall, extending from said first sidewall and terminating short of said second sidewall;

a first interior wall extending from said third transverse wall to said first transverse wall and oriented generally parallel to said first sidewall to define a second hollow chamber;

a fourth transverse wall, located without said first hollow chamber adjacent to and generally parallel to said second transverse wall, extending from said first sidewall and terminating short of said second sidewall; and

a second interior wall extending from said fourth transverse wall to said second transverse wall and oriented generally parallel to said second sidewall to define a third hollow chamber.

4,689,934

APPARATUS FOR AND METHOD OF APPLYING WRAP TO ARTICLE CLUSTERS

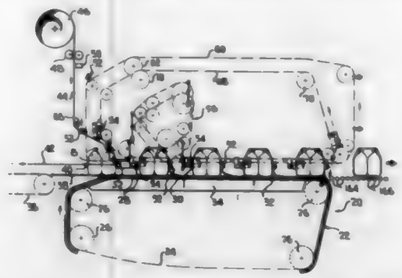
Robert H. Ganz, Saddle River, N.J., assignor to The Mead Packaging Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 709,724, Mar. 8, 1985, Pat. No. 4,633,647. This application Oct. 16, 1985, Ser. No. 788,034

Int. Cl.⁴ B65B *21/24, 49/10, 49/14*

U.S. Cl. 53—398 **26 Claims**

1. A wrapping machine comprising a web supply, an article transport conveyor having a platform defining run for moving articles in sequence at a preselected rate, web pulling means carried by said article transport conveyor at preselected regular spacing, plural article retarder means for movement in advance of articles being wrapped and in overlying relation to said platform defining means at a rate less than said preselected rate, means for separating said web supply into separate web portions and plural article clamp means for movement in overlying relation to said platform defining means behind articles



being wrapped and for cooperation with said article retarder means to fixedly clamp a separated web portion to each article being wrapped.

4,689,935

ANTISEPTIC GLOVE

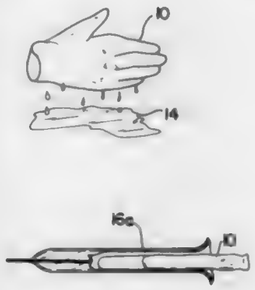
Audrey E. Harding, 1087 Cork Dr., Bethel Park, Pa. 15102

Filed Feb. 25, 1987, Ser. No. 118,775

The portion of the term of this patent subsequent to Nov. 1, 1993, has been disclaimed.

Int. Cl.⁴ B65D *81/22*

U.S. Cl. 53—431 **2 Claims**



1. A method for providing sterilized protective gloves including the following steps,

(a) immersing a saturable glove capable of fully enclosing a wearer's hand and adapted to cover separately each of a wearer's fingers and thumb in a solution having antiseptic qualities to saturate the said glove with said solution,

(b) removing said saturable glove from said solution,

(c) draining said glove of excess solution to provide a glove saturated with said antiseptic solution,

(d) inserting said saturated glove between two layers of material having leakproof qualities,

(e) sealing peripheral portions of said material to totally encapsulate said saturated antiseptic glove,

(f) shearing said peripheral portions of said material that encapsulates said glove to expose for use by the wearer of the glove, said glove being saturated when removed and worn thereby providing the wearer with a hygenic glove saturated with said antiseptic solution which fully encloses the hand and separately covers each of a wearer's fingers and thumb and which will not allow contamination of said wearer's hands during the performance of routine operations.

4,689,936

PROCESS FOR THE PACKAGING OF PRODUCTS, USING A HEAT TREATMENT, AND CLOSED CONTAINER WITH PACKED PRODUCTS, OBTAINED USING A HEAT TREATMENT

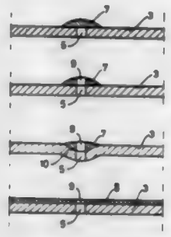
Gjalt M. Gaikema, Dedemsvaart, and Dirk Zyistra, Bathmen, both of Netherlands, assignors to Wavin B.V., Netherlands

Continuation of Ser. No. 698,440, Feb. 5, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 894,507

Claims priority, application Netherlands, Feb. 6, 1984, 8400366

Int. Cl.⁴ B65B *63/08, 55/14*

U.S. Cl. 53—440 **8 Claims**



1. A process of packaging heat-treated products, particularly foods, comprising the steps of:

filling a container with a specific quantity of product to be packed;

closing said container, said closed container having a wall which is not resistant to substantial overpressures and is provided with at least one pressure balancing vent opening, said vent opening being closed by a solidified drop of a heat meltable polymer adhering to the surface of the container;

subjecting said container with its contents to a heat treatment, the size of the vent opening and the melting point and viscosity of the heat meltable polymer having been selected in such a way that said polymer is melted during said heat treatement but does not substantially flow into the container during heat treatment and wherein gaseous products formed in the container during said heat treatment are able to escape through said vent hole and said meltable polymer, and;

cooling the container after said heat treatment thereby solidifying said melted polymer and hermetically sealing sid balancing vent opening by means of said heat-meltable polymer without substantially sucking the drop of heat meltable polymer into the interior of the container, wherein said polymer has a melting point lower than the temperature of the heat treatment.

4,689,937

ARTICLE BAGGING UNIT

Anthony T. Finan, Sr., 9640 Wissinoning St., Philadelphia, Pa. 19114; Richard K. Lowery, Sr., 1304 Sturbridge Dr., and Walter T. Leible, 915 Roberts Rd., both of Warminster, Pa. 18974

Filed Sep. 8, 1986, Ser. No. 904,896

Int. Cl.⁴ B65B *1/32*

U.S. Cl. 53—502 **15 Claims**

1. An article bagging unit comprising:

means for storing a strip of bags interconnected by perforated lines extending between the top edge of the back of each bag and the bottom of the next bag;

means for storing articles to be deposited in said bags;

a dispensing compartment within which said bags are filled with said articles;

means for delivering said articles to said dispensing compartment;

means for feeding said bags to said dispensing compartment and for positioning said bags to receive said articles from said article delivering means;

means for opening a bag positioned in said dispensing compartment to receive articles from said article delivering means and for closing and sealing a bag filled with said articles, said bag opening, closing and sealing means including:

(a) an air blower for blowing air into the top of a bag to separate the tops of the front and the back of said bag and partially open said bag,

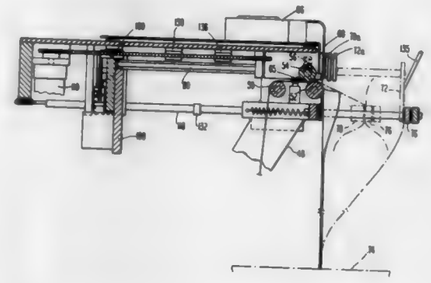
(b) a first pair of fingers movable downward into said bag and upward out from said bag and fixed relative to opposite directions transverse to said front and said back of said bag,

(c) a second pair of fingers movable downward into said bag and upward out from said bag and also movable in said transverse directions away from and toward said first pair of fingers,

(d) a pair of aligned heat-sealing members positioned to engage the outside surfaces of said tops of said front and said back of said bag and movable in said transverse directions toward and away from each other

(e) first drive means for moving said first pair of fingers and said second pair of fingers downward into said bag and upward out from said bag,

(f) second drive means for moving (1) said second pair of fingers in said transverse directions away from and toward said first pair of fingers and (2) said heat-sealing



members in said transverse directions toward and away from each other, and

(g) power supply means for energizing at least one of said heat-sealing members;

and control means for:

(a) actuating said bag feeding and positioning means to position a bag in said dispensing compartment to receive said articles from said article delivering means,

(b) actuating said air blower to separate the tops of the front and the back of said bag to partially open said bag,

(c) actuating said first drive means to move said first and said second pairs of fingers into said partially open bag,

(d) actuating said second drive means to move said second pair of fingers in a first of said transverse directions away from said first pair of fingers to spread said front and said back of said partially open bag to fully open said bag,

(e) actuating said article delivering means to fill said fully open bag with a prescribed amount of said articles,

(f) actuating said first drive means to move said first and said second pairs of fingers upward out from said filled bag,

(g) actuating said second drive means to move said heat-sealing members in said transverse directions toward each other to close said filled bag and clamp said tops of said front and said back of said filled bag between said heat-sealing members,

(h) applying power from said power supply means to said heat-sealing member to energize said heat-sealing member to seal said filled bag, and

(i) actuating said second drive means to move (1) said second pair of fingers in the second of said transverse directions toward said first pair of fingers and (2) said heat-sealing members in said transverse directions away from each other.

4,689,938

AUTOMATIC WRAPPING MACHINE COMPRISING A TENSIONING AND FASTENING DEVICE

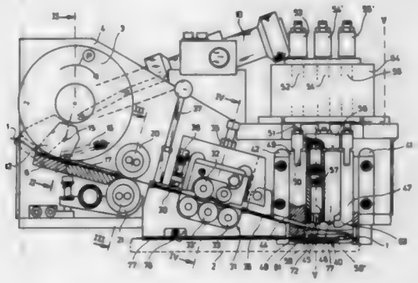
Dieter Zoppe, Balve, Fed. Rep. of Germany, assignor to PKM Verpackungssysteme GmbH & Co., Garbeck, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 839,174

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3504835; Mar. 13, 1985, 3508837

Int. Cl.[4] B65B *13/02*

U.S. Cl. 53—582 **8 Claims**



1. An automatic wrapping machine including guide means for guiding a wrapping band from a supply, a loop forming means for looping said wrapping band around an object to be wrapped and a tensioning and fastening device for the wrapping band, said tensioning and fastening device comprising:

a main frame member;

first driving means mounted to said main frame member for driving said wrapping band through the tensioning and fastening device;

tensioning means mounted to said main frame member for tensioning said wrapping band against the direction of driving;

first and second holding plungers slidably mounted to said frame member for holding first and second ends, respectively, of said wrapping band in an overlapping area of a wrapping loop formed by said loop forming means;

at least one electrode plunger slidably mounted to said frame member between said holding plungers for movement substantially perpendicular to said overlapping area;

second driving means for moving said holding plungers and said at least one electrode plunger toward and away from said overlapping area;

moveable plate means operatively coupled to and disposed below said at least one electrode plunger, said moveable plate means including an upper slide plate member and a lower slide plate member slidably coupled together and each including stops for limiting the sliding movement thereof relative to the other plate member;

a counter electrode element mounted to an end of said movable plate means; and

means for reciprocally moving said moveable plate means relative to said frame member in a plane parallel to said overlapping area of said wrapping loop.

4,689,939

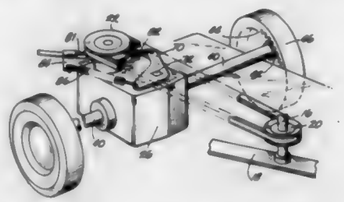
OPERATOR PRESENCE CONTROL FOR SELF-PROPELLED IMPLEMENTS

Carl E. Seyerle, Cordova, Tenn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 746,938, Jun. 20, 1985, abandoned, which is a continuation of Ser. No. 697,681, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 490,960, May 2, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 818,351

Int. Cl.[4] A01D *69/08, 34/67*

U.S. Cl. 56—11.1 **13 Claims**



1. A self-propelled lawn mower having a frame provided with a drive wheel and supporting an engine, a drive train for delivering power from the engine to the drive wheel and including clutch means comprising multiple drive and driven plates which are separated when the clutch means is disengaged, means biasing said plates to separated positions, and manual control means actuated by an operator for variably applying axial load to said plates against the action of said biasing means so as to variably engage said clutch means to effect rotation of said drive wheel at selective speeds within a speed range between zero and substantially above zero.

4,689,940

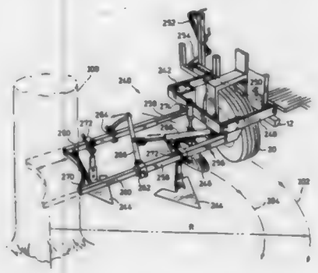
LAWN AND GARDEN MAINTENANCE APPARATUS

Jens B. Skovhoj, 128 Brahms Avenue, Willowdale, Ontario, Canada (M2H 1H8)

Division of Ser. No. 465,779, Feb. 11, 1983, Pat. No. 4,546,601. This application Jun. 11, 1985, Ser. No. 743,627

Int. Cl.[4] A01D *35/24;* **A01B** *73/00*

U.S. Cl. 56—228 **5 Claims**



1. An apparatus for use in lawn and garden maintenance comprising:

a chassis having a pair of axially aligned and independently operable drive wheels journally mounted thereon and having at least one idler wheel swivelly mounted thereon offset from the axis of the drive wheels; and

a cultivator comprising a frame mounted on the chassis and movable pivotably in a vertical plane containing the axis of the drive wheels, a plurality of hoes adjustably mounted on the frame, and means mounted on the chassis to raise and lower the frame pivotably into an inoperative and an operative position respectively.

4,689,941

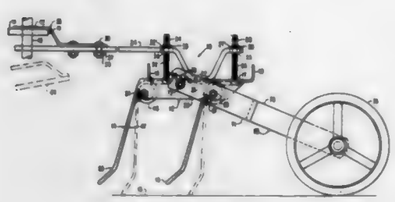
PULLED DETHATCHING UNIT

Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Continuation of Ser. No. 560,981, Dec. 13, 1983, abandoned. This application Aug. 30, 1985, Ser. No. 771,261

Int. Cl.[4] A01D *76/00*

U.S. Cl. 56—396 **21 Claims**



1. A pulled dethatching unit including:

frame means;

at least two wheels supported by said frame means adjacent the rear end of said frame means and on opposite sides of said frame means to continuously support said frame means, each of said wheels being independently rotatable;

means to separately adjust the position of each of said wheels relative to said frame means;

means supported by said frame means and extending forwardly therefrom for attachment to pulling means to enable pulling of said dethatching unit by the pulling means;

said frame means having at least one row of tines mounted thereon, each of said tines being mounted for movement independently of each of the other of said tines at all times, each of said tines extending downwardly from said frame means, all of said tines being forward of said wheels;

each of said tines having a lower portion extending forwardly of the vertical for engaging the material to be thatched during forward motion of said dethatching unit by said lower portion of each of said tines having its tip independently deflected downwardly and rearwardly as it comes in contact with grass so that said tip engages the material to be thatched to tear it loose from the soil and flip the material when said tip is released;

at least said lower portion of each of said tines being deflectable from its stationary longitudinal axis in any direction through 360°;

and said lower portion of each of said tines having its tip above the ground so that no weight is applied to any of said tines when said dethatching unit is at rest.

4,689,942

DEVICE AND METHOD FOR ASSEMBLING THREADS

Ferand Chateau, Pont-du-Chateau, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 1, 1986, Ser. No. 892,694

Claims priority, application France, Aug. 7, 1985, 85 12192

Int. Cl.[4] D01H *7/88, 7/90;* **D02G** *3/28*

U.S. Cl. 57—58.36 **14 Claims**

1. A device for assembling at least two threads which comprises:

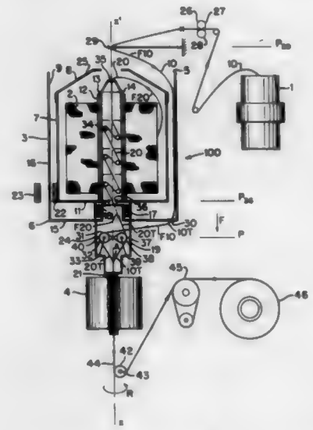
(a) a first group and a second group of bobbins, the first group being formed by at least one first bobbin on each of which is wound at least one first thread and the second group being formed by at least one second bobbin on each of which is wound at least one second thread;

(b) a wall and means for driving the wall in rotation around an axis;

(c) means for immobilizing the second bobbin during the rotation of the wall;

(d) first twisting means for twisting the first thread in the direction of rotation of the wall, the first twisting means being formed, at least in part, by a first upstream guide, a first downstream guide and the wall; the first twisting means permitting the first thread to come into contact with the inner face of the wall between said first guides and to turn jointly with the wall around the axis, turning around the second bobbin without making contact with the second bobbin;

(e) second twisting means for twisting the second thread in the direction of rotation of the wall, the second twisting means being formed, at least in part, by a second upstream guide and a second downstream guide; the direction in



which it is necessary to move along the axis of rotation in order to pass from a plane passing through the first upstream guide to a plane passing through the first downstream guide being the same as the direction in which it is necessary to move along said axis in order to pass from a plane passing through the second upstream guide to a plane passing through the second downstream guide, said planes being perpendicular to said axis;

(f) means other than the threads for driving the downstream guides in rotation around the axis of rotation of the wall in the same direction and at the same angular speed as the wall; and

(g) means for assembling the first thread with the second thread after the passage of these threads over the downstream guides by twisting these threads together in a direction opposite the direction of rotation of the wall.

4,689,943

PAY-OUT STAND FOR SUPPLY REELS

Guenter Einsle, Munich; Ernst Mayr, Starnberg; Ulrich Oestreich, Munich; Gernot Schöeber, and Wolfgang Schrey, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,251

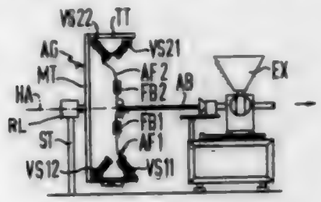
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503843

Int. Cl.[4] G02B *5/16;* **G01H** *13/04;* **D07B** *3/06*

U.S. Cl. 57—90 **2 Claims**

1. In a pay-out stand for supply reels for the manufacture of light waveguide bundles or cables, said pay-out stand having a structure, which is constructed for rotation and has means forming a back portion with a plurality of points lying in a circle concentric with a horizontal axis of rotation of the stand and a plurality of carrier parts with one carrier part for each

point on the circle, said carrier parts extending from said points of the circle and being substantially parallel to the horizontal axis, the improvement comprising each of said carrier parts having means for supporting two supply reels arranged in pairs for the light waveguide with a first supply reel of each pair being a feed reel capable of having its light waveguide being struck off overhead simultaneously with the waveguides of the feed reels of the other carrier parts and said waveguides being brought into a position required for forming the cable, a second reel of the pair being a backup reel, said pay-out stand forming a rotatable structure with its relevant feed and backup reels being also rotatable in an accessible position from the outside for an operator to splice the waveguide of the backup reel to the waveguide of the feed reel during the running operation of manufacture of the light waveguide bundles or cables without disturbing the pay-out of the waveguide from the feed reel,



said rotatable structure being in a non-displaceable position during the splicing of the waveguides, said means for supporting enabling each of the supply reels to be manually rotated to produce sufficient slack to enable splicing the waveguide of the backup reel to the waveguide of the feed reel and the then rotate the backup reel to place the splice under tension so that a separate support for the splice is not required, said means for supporting of each carrier part having a pair of retaining pins for receiving the pair of supply reels, said pair of pins extending obliquely relative to one another and being directed inwardly from the carrier part toward a common guide and braking device so that the longitudinal axis of each reel of the pair extends obliquely relative to each other and inwardly toward the common guide and braking device, and said carrier parts being constructed to enable accessibility from the outside of the pay-out stand.

4,689,944

FLAT YARN AND METHOD FOR PRODUCING THE SAME

Masahisa Toki; Seiji Satoh, both of Osaka; Yoshiaki Matsui; Kunio Morihata, both of Nagoya, and Toyoji Murata, Kiryu, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Division of Ser. No. 779,114, Sep. 23, 1985, Pat. No. 4,633,662. This application Aug. 26, 1986, Ser. No. 900,412

Claims priority, application Japan, Sep. 28, 1984, 59-203299

Int. Cl.[4] D02G *1/00, 1/14, 7/00*

U.S. Cl. 57—260 **4 Claims**



1. A flat yarn wherein fibers composing a yarn are bonded to each other substantially in a side-by-side manner to form a tape-like flat body and said flat body had a plurality of gear-crimped portions across a width thereof, wherein said gear-crimped portions are arranged randomly in the lengthwise direction of said yarn.

4,689,945

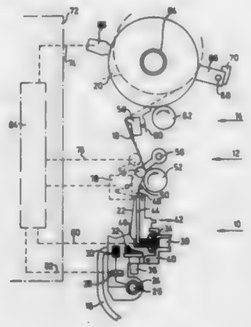
OPEN-END YARN PIECER

Andre Lattion, Seuzach; Jürg Blachofberger, Elsau; Walter Salvik, Horgen; Jakob Stapfer, Horgen, and Manfred Schreiber, Horgen, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,602

Int. Cl.[4] D01H *15/02*

U.S. Cl. 57—263 **23 Claims**



1. A method of automatically piecing a spinning station of a rotor spinning machine having a plurality of said stations, each station including a rotor spinning unit having a yarn withdrawal tube, a package forming means, a nip roll pair for withdrawing yarn from the withdrawal tube for delivery to the package forming means, feed means for feeding fiber to the spinning unit and drive means for driving the rotor spinning unit at a predetermined operating speed, package forming means, nip roll pair and feed means; said method comprising the steps of

separating the nip roll pair;

inserting a seed yarn during a preliminary stage to a position within an upstream end of the withdrawal tube;

forming a ring of fibers in the rotor spinning unit after said preliminary stage;

back-feeding the seed yarn during a final stage from said position to join with the ring of fibers to form a pieced yarn;

re-engaging the nip roll pair to commence withdrawing of the pieced yarn from the withdrawal tube; and

running the rotor spinning unit at said operating speed while effecting said final stage of back-feeding and the withdrawal of the pieced yarn.

13. A travelling piecer for a spinning machine having a plurality of spinning stations, each station including a rotor spinning unit having a yarn withdrawal tube, a package forming means, a nip roll pair for withdrawing yarn from the withdrawal tube for delivery to the package forming means, feed means for feeding fiber to the spinning unit, and drive means for driving the rotor spinning unit at a predetermined operating speed, package forming means, nip roll pair and feed means, said piecer comprising

means for selectively separating the nip rolls of a selected spinning station;

means for inserting a seed yarn between the separated nip rolls;

means for operating the feed means of a selected spinning station to form a ring of fibers in the spinning station;

a device for back-feeding the seed yarn to the spinning unit, said device being operable in a preliminary stage to permit suction within the spinning unit to draw the seed yarn along the withdrawal tube until the end of the seed yarn is at a predetermined position and operable in a final stage to permit movement of the end of the seed yarn from said predetermined position to join with the ring of fibers in the rotor, and

means for re-engaging the separated nip rolls to commence withdrawal of the pieced yarn from the withdrawal tube at the expiration of said final stage.

4,689,946

SPINNING DEVICE FOR PRODUCING A TWISTED THREAD

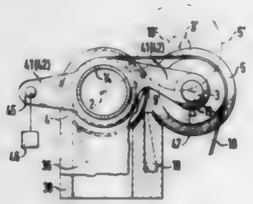
Heinz-Georg Wassenhoven, Möchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,046

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506254

Int. Cl.[4] D01H *7/885*

U.S. Cl. 57—301 **4 Claims**



1. Spinning device for producing a twisted thread of spinning fibers, the device having two friction elements rotatable in the same rotary direction and with mutually parallel rotational axes, and a position varying device for permitting the friction elements to be brought temporarily into another position relative to one another for cleaning purposes, comprising constructive means in the position varying device for assuring constant parallelism of the rotational axes, at least one of the two friction elements being rotatably mounted in swivel arms, said swivel arms being pivotable, in turn, about the rotational axis of the other friction element.

4,689,947

APPARATUS AND METHOD FOR REDUCING BROKEN FIBERS ON THE SURFACE OF A CARBON FIBER YARN BUNDLE

Steven J. Winckler, Troy, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

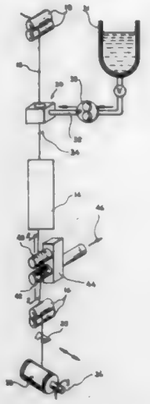
Filed Aug. 19, 1986, Ser. No. 898,903

Int. Cl.[4] D02J *3/12, 3/14, 7/00*; D01H *13/30*

U.S. Cl. 57—304 **5 Claims**

1. In an apparatus for removing broken fibers from a multifilament carbon yarn moving in a path that includes a suction nozzle coupled to a source of suction, said nozzle being located adjacent said path, the improvement comprising: said nozzle having a slot-shaped intake passage substantially perpendicular to said path and in communication with said source of suction, said slot-shaped intake passage being formed of a continuous wall and having leading and trailing edges, said trailing edge being a sharp edge vertically displaced from said leading edge to form an extended wall of said passage; and means for guiding said yarn close to said trailing edge.

4. A method for reducing broken fibers on a portion of the surface of a carbon fiber yarn having a coating thereon comprising: forwarding the carbon yarn in a path past a nozzle having a slot shaped intake passage with a leading edge and a sharp trailing edge vertically displaced from said leading edge, said path being substantially perpendicular to said nozzle; applying a sufficient suction to said nozzle to draw the ends of the broken fibers toward said nozzle; and impacting said broken fibers against said sharp trailing edge to cut said broken fibers from said yarn.



4,689,948

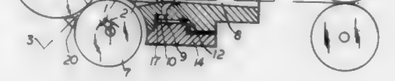
VORTEX AIR NOZZLE FOR YARN SPINNING FROM STAPLE FIBERS

Dinko A. Bahov, Gabrovo, and Hristo A. Bahov, Stara Zagora, both of Bulgaria, assignors to NPK "Textilno Maschinostroene" , Gabrovo, Bulgaria

Filed May 9, 1986, Ser. No. 861,496

Int. Cl.[4] D01H *5/28, 7/92*; D02G *1/04*

U.S. Cl. 57—328 **3 Claims**



1. A false-twist-producing air vortex spinning nozzle, comprising:

a pair of drafting rollers including an upper roller and a lower roller having respective axes lying in a common plane inclined to a linear spinning path extending along an axis and between which a roving of staple fibers is fed;

an inlet body formed with an elongated inlet chamber extending along said axis having an inlet end receiving said roving from said rollers, said lower roller projecting into said chamber from below, opposite sides of said chamber along said path being formed with generally flat grooves receiving said roving and in which free fiber ends are formed and guided, said inlet body being formed at an outlet end opposite said inlet end with a projecting tip;

an outlet body axially adjoining at one end thereof said inlet body and formed with an elongated outlet chamber axially aligned with said tip and receiving said roving therefrom, said outlet chamber opening into an outlet diverging toward an end of said outlet body opposite said end at which said outlet body adjoins said inlet body, said bodies defining between them an annular outwardly open space surrounding said tip and opening into said outlet chamber around said tip;

a sleeve at least partly receiving said bodies and defining an

annular compartment connectable with a compressed-air source; and

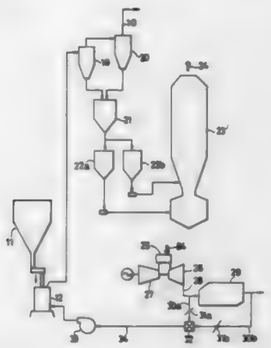
means including a step formed on said outlet body between said compartment and said space defining passages angularly spaced about said axis, communicating between said compartment and said space and opening tangentially into said space to generate an air vortex where said space opens into said chamber to impart a false twist to said roving.

4,689,949

COAL GASIFICATION COMPOSITE POWER GENERATOR

Masamichi Kashiwazaki; Kiichiro Ogawa, and Satoshi Uchida, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,389
Claims priority, application Japan, Jan. 30, 1985, 60-14340
Int. Cl.[4] C10J *3/48, 3/50, 3/86*; F02B *43/08*
U.S. Cl. 60—39.12 **4 Claims**



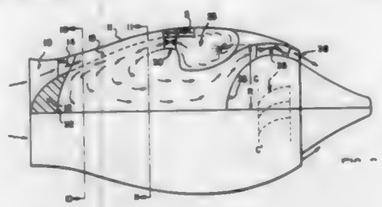
1. In a coal gasification composite power generator which comprises a coal pulverizer in which coal is finely pulverized, a means for transferring the finely pulverized coal with a drying gas, a coal feeding means for feeding the coal from the transfer means to a gasification furnace in which the coal is converted to a combustible gas, a gas turbine connected to the gasification furnace and driven by combustion of the combustible gas fed from the gasification furnace, and an exhaust gas boiler to which an exhaust gas from the gas turbine is passed to recover the heat of the exhaust gas, the improvement characterized by further comprising gas mixing means, means connecting said gas turbine to said exhaust gas boiler, first means for withdrawing part of the combustion exhaust gas from said gas turbine from said connecting means upstream from the exhaust gas boiler and introducing the withdrawn part of the combustion exhaust exhaust gas into said gas mixing means, outlet means for flowing combustion exhaust gases frm said exhaust gas boiler, second means for withdrawing combustion exhaust gases from said outlet means and introducing the withdrawn part into said gas mixing means, and a pipe connecting said gas mixing means to said pulverizer, so that the mixed gas is passed to the pulverizer for use as the drying gas.

4,689,950

HOT GAS FLOW GENERATOR WITH NO MOVING PARTS

John E. Minardi, and Hans P. von Ohain, both of Dayton, Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Jun. 17, 1985, Ser. No. 745,166
Int. Cl.[4] F02K *7/00*
U.S. Cl. 60—204 **6 Claims**



1. A method of producing a mass fluid flow from an engine housing without use of rotating parts,

comprising the steps of:

causing an inlet flow of air to swirl into a first circular path moving longitudinally of the housing,

adding heat energy to said inlet flow of air at the end of said first path to produce hot gases,

directing the hot gases into a second swirling circular path coaxially of and within the first path and having an open interface therewith whereby momentum is transferred from the hot gases in the second path into the inlet flow of air in the first path, and

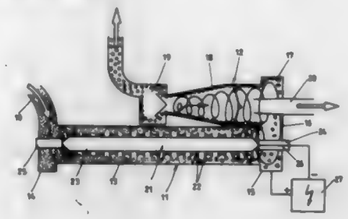
converting the swirling hot gases at the end of the second path into an essentially unidirectional gas flow exiting the housing.

4,689,951

DEVICE FOR REMOVING SOLID PARTICLES, PARTICULARLY SOOT, FROM EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

Wilhelm Polach, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 813,225
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1985, 3500375
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—275 **4 Claims**



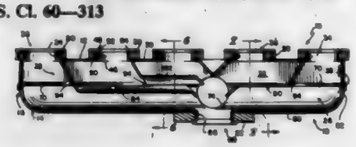
1. A device for removing solid particles, particularly soot from exhaust gas of an internal combustion engine, comprising an electric filter including a source of direct current high voltage, a tubular filter housing electrically connected to the positive pole of the voltage source, a central electrode in the form of a cylindrical shell arranged coaxially in the filter housing and being electrically connected to the negative pole of the voltage source, the cylindrical shell having a plurality of cut-out portions delimiting segments provided with electrical discharge points, said segments being bent radially outwardly toward the inner wall of said filter housing; and the wall thickness of the cylindrical shell being about 0.05 mm so that the entire central electrode is brought into vibrations during the running of the engine.

4,689,952

TUNED EXHAUST MANIFOLD

James C. Arthur, and Freddie A. Baldwin, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Jun. 13, 1986, Ser. No. 873,984
Int. Cl.[4] F02B *27/02*; F01N *7/10*
U.S. Cl. 60—313 **27 Claims**



1. An exhaust manifold for attachment to an engine having a plurality of exhaust ports, the exhaust manifold comprising

a housing formed to include an exhaust chamber, inlet means for admitting combustion product discharged from the engine exhaust ports into the exhaust chamber, and outlet means for exhausting combustion product from the exhaust chamber, the housing including an inner shell providing the inlet means and an outer shell attached to the inner shell at a perimetrically extending split line, the inner and outer shell cooperating to define the exhaust chamber therebetween, and

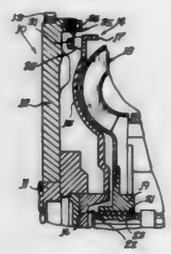
baffle means rigidly fixed in the exhaust chamber for partitioning the exhaust chamber to define separate passageways connecting each of the engine exhaust ports to the outlet means so that the flow of combustion product discharged from each engine exhaust port and admitted into the exhaust chamber is substantially isolated in its companion passageway as it is conducted through the housing to permit performance tuning of the exhaust manifold, the baffle means including at least one baffle rigidly attached to the housing at the split line.

4,689,953

VARIABLE RATE DRIVE STRAP

Ting M. Wang, Warren, Mich., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Aug. 14, 1986, Ser. No. 896,375
Int. Cl.[4] F16F *1/18*; F16D *3/52*
U.S. Cl. 60—330 **7 Claims**



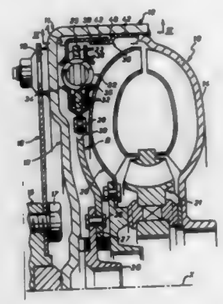
1. A drive strap assembly adapted for utilization between an engine flywheel and a torque converter housing, comprising an elongated relatively flexible drive strap secured at its opposite ends to the flywheel and the torque converter cover, and a pair of relatively stiff back-stops sandwiching one end of said drive strap, the back-stops having free ends being oppositely outwardly curved away from the drive strap.

4,689,954

TRANSMISSION SYSTEM, IN PARTICULAR FOR AUTOMOBILE VEHICLES, HYDRAULIC COUPLING UNIT COMPRISING SAME, MOVEMENT TAKE-UP DEVICE ADAPTED FOR USE IN SAME, AND METHOD OF MANUFACTURING SAID MOVEMENT TAKE-UP DEVICE

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Nov. 7, 1985, Ser. No. 795,886
Claims priority, application France, Nov. 9, 1984, 84 17126
Int. Cl.[4] F16D *33/00*
U.S. Cl. 60—338 **17 Claims**



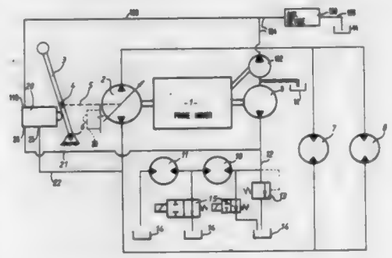
1. Transmission system comprising an annular input member adapted to be keyed at least circumferentially to a first shaft and having a generally cylindrical axial wall and a movement take-up device within said cylindrical wall having at least one mild steel lug protected against subsequent hardening treatment, said lug keying siad movement take-up device axially and circumferentially to said cylindrical wall, said movement take-up device adapted to be at least circumferentially keyed to a second shaft, said movement take-up device having an input part to which one end of said lug is welded, the other end of said lug being fixed to said cylindrical wall.

4,689,955

VIBRATION ROLLER HAVING A POWER LIMITING DEVICE

Heinz Lietzke, Neuss, Fed. Rep. of Germany, assignor to Case Vibromax GmbH & Co KG, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,619
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321443
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—420 **22 Claims**



1. A vibration roller apparatus comprising:

a prime mover;

a hydraulic pump driven by said prime mover;

a hydraulic travelling drive means for providing travelling

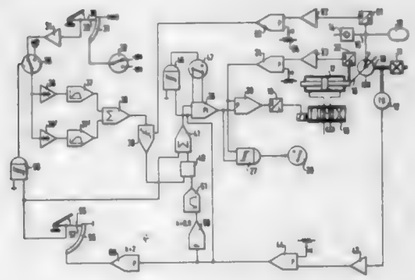
operation of said vibration roller, apparatus said travelling drive means being hydraulically connected to said pump;
at least one hydraulic vibration drive means for operating a vibration device of said vibration roller, apparatus said vibration drive means only being adapted to be hydraulically powered by said prime mover;
at least one travelling lever for controlling said travelling drive means, said lever being movable within a setting range; and
an automatic power limiting means for engaging said travelling lever and for limiting said setting range of said lever to thereby limit a total power output taken from said prime mover to a value no greater than a limiting power of said prime mover thus preventing an overloading of said prime mover.

4,689,956

DRIVE SYSTEM COMPRISING AN ADJUSTABLE HYDROSTATIC MACHINE

Theo Hein, Lohr-Sendelbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,198
Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517104
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—449 **12 Claims**



1. Drive system comprising an adjustable hydrostatic machine which is connected to a pressure line and operating as motor or pump takes fluid from the pressure line or supplies fluid to said pressure line, having a directional valve for actuating the adjusting member of the hydrostatic machine for setting a rotational speed, comprising a rotational speed controller to which the speed actual value is supplied by a tachogenerator coupled to the machine and an arbitrarily settable speed desired value is supplied and which generates a control signal for driving the directional valve, characterized in that the desired value input of the speed controller (26) is preceded by a selection stage (40) to which the speed desired value and a guide signal derived from the speed actual value and lying beneath the speed actual value are supplied and that the selection stage switches the particular greater signal through to the desired value input of the speed controller.

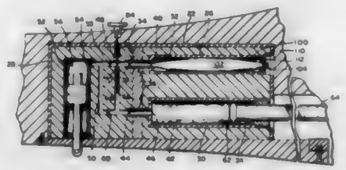
4,689,957

HYDRAULIC TOOL SYSTEM

William Gallentine, Hood River, Oreg., assignor to Galco, Inc., Bellevue, Wash.

Filed Sep. 23, 1985, Ser. No. 779,178
Int. Cl.⁴ F16D *31/02*; B25B *7/00*
U.S. Cl. 60—481 **27 Claims**

1. A modular hydraulic power unit for use in various tool bodies, comprising:
a removable, modular fluid reservoir having a fluid outlet and means for maintaining a volume of hydraulic fluid under pressure;
a fluid pump having a fluid containing cylinder with a fluid outlet at one end and fluid displacing piston mounted for reciprocal motion within the cylinder wherein depression of the piston towards the fluid outlet end displaces fluid from the cylinder;
a removable, modular valve body having a fluid input port, a fluid output port, an input conduit between the input port and the pump cylinder outlet on the fluid pump including means within the input conduit for permitting fluid flow from the fluid reservoir to the pump cylinder when the pump piston is retracted and for preventing fluid return to the reservoir through the input conduit when the pump piston is depressed, an output conduit between the pump cylinder outlet and the exit port including means



within the output conduit for allowing fluid displaced from the pump cylinder to exit the valve body through the output port and for preventing fluid return to the pump cylinder through the output conduit, and a bypass conduit between the exit port and the input port including selectively operable bypass means for returning fluid from the exit port to the fluid reservoir through the bypass conduit;
detachable couplings connecting the fluid reservoir outlet to the valve body input port allowing fluid flow therebetween; and
a frame having a valve body receptacle and a fluid reservoir receptacle including means for releasably securing the valve body and fluid reservoir within the receptacles.

4,689,958

BRAKE BOOSTER

Masao Arino, Higashimatsuyama, and Michio Kobayashi, Kawajima, both of Japan, assignors to Jidosha Kiki Co., Ltd., Shibuya, Japan

Filed Aug. 19, 1986, Ser. No. 898,177
Claims priority, application Japan, Sep. 30, 1985, 60-149499
Int. Cl.⁴ B60T *13/40*
U.S. Cl. 60—547.1 **7 Claims**



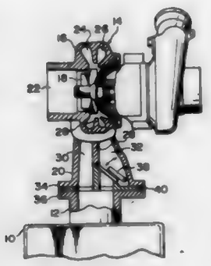
1. A brake booster including an enclosed shell which has its interior divided into a plurality of pressure chambers, a master cylinder fastened to the enclosed shell by mounting bolts which extends through the front end face of the shell, and strengthening plate disposed against the internal surface of the shell around each of the mounting bolts; characterized in that the strengthening plate is welded to the internal surface of the shell while the head of the mounting bolt is welded to the internal surface of the shell so as to maintain a hermetic seal therebetween, and a reinforcing member fixedly connected to the strengthening plate is disposed on top of the head of the mounting bolt and welded thereto.

4,689,959

VARIABLE-CAPACITY TURBOCHARGER

Atsushi Houkita, Katsuta, and Tomio Hokari, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,402
Claims priority, application Japan, Jul. 3, 1985, 144785/85
Int. Cl.⁴ F02B *37/12*
U.S. Cl. 60—602 **7 Claims**



1. A variable-capacity turbocharger comprising:
(a) a turbine casing having a turbine inlet portion, a turbine outlet portion and a scroll chamber;
(b) a turbine impeller located in said scroll chamber and having a multiplicity of blades;
(c) a partition wall extending to the vicinity of said turbine inlet portion to partition said scroll chamber into a first scroll chamber and a second scroll chamber and to define a first exhaust introducing passageway and a second exhaust introducing passageway for introducing exhaust gases separately into said first scroll chamber and second scroll chamber respectively;
(d) exhaust flow control valve means located at least in said second exhaust introducing passageway and opening in the direction of flow of the exhaust gases; and
(e) valve seat means formed separately from the turbine casing and located in the turbine inlet portion, said valve seat means cooperating with said exhaust flow control valve means to control the flowrate of exhaust gases flowing into said second exhaust introducing passageway.

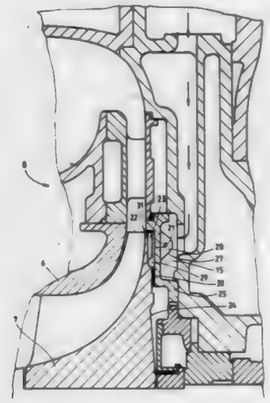
4,689,960

TURBO SUPERCHARGER FOR AN INTERNAL COMBUSTION ENGINE

Joachim Schröder; Hanns-Günter Bozung, both of Neusäss; Rudolf Bandel, Augsburg, and Hans Mendle, Friedberg, all of Fed. Rep. of Germany, assignors to M.A.N. - B&W Diesel GmbH, Augsburg, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,560
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504465
Int. Cl.⁴ F02B *33/44*
U.S. Cl. 60—607 **22 Claims**

1. The combination of an internal combustion engine (ICE) with
an exhaust gas turbosupercharger
wherein the exhaust gas turbosupercharger includes
a common shaft (2);
an exhaust gas turbine (4) secured to the common shaft and pneumatically coupled to receive exhaust gases from the internal combustion engine;
a compressor housing (20);
a compressor wheel (7) secured to the common shaft and operable in the compressor housing, and providing compressed charging air to the internal combustion engine,
the compressor wheel having compression vanes or blades (22);
means for introducing auxiliary compressed air to the compressor wheel having
a source (12, 13) of compressed air,
means defining a compressed air chamber (15),
a controllable connection (41) between the source of compressed air and the compressed air chamber (15), and
nozzle means (21) pneumatically connecting the compressed air chamber (15) and the compressor wheel housing, and directing compressed air along a nozzle axis from the nozzle means against the compressor wheel to provide



additional drive energy to the compressor wheel when the controllable connection is controlled to supply compressed air from the source (12, 13) to the chamber (15),
and comprising, in accordance with the invention,
a set of auxiliary drive vanes or blades (23) secured to the compressor wheel (7), the auxiliary drive vanes or blades of the set being uniformly distributed about the compressor wheel (7);
and wherein the axes of the nozzle means are positioned to direct the compressed air against the auxiliary drive blades or vanes (23) at an impingement angle providing at least approximately optimum energy transfer from the compressed air emitted through the nozzle means to the auxiliary drive vanes or blades.

4,689,961

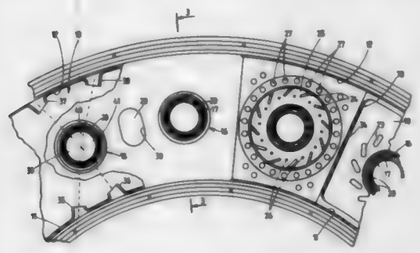
COMBUSTION EQUIPMENT

John F. Stratton, Accrington, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 704,281, Feb. 22, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,783
Claims priority, application United Kingdom, Feb. 29, 1984, 8405271
Int. Cl.⁴ F02C *1/00*; B05B *7/10*
U.S. Cl. 60—748 **6 Claims**

1. Combustion equipment comprising a flame tube having walls defining a combustion zone therein, flame tube wall means in which is defined an air inlet to be at one end of said flame tube; an outer flare segment mounted in said flame tube adjacent said inlet, said outer flare segment having a passage through said outer flare segment communicating with said air inlet and with said combustion zone; a fuel injector disposed in said passage and having a fuel outlet discharging into said combustion zone; an air swirler device disposed in said passage and surrounding said fuel injector, said air swirler device in-

cluding a plurality of spaced blades which are shaped and positioned to cause air flowing from said air inlet and passing through said passage and between said blades and into said combustion zone to move in a swirling motion about the flow direction axis, adjacent edges of adjacent blades defining gaps through which said air flows; an inner flare mounted on said air swirler device, said inner flare having a downstream portion which expands radially outwardly of said passage to direct a first amount of the flowing air against an inner surface of said outer flare segment and a second amount of the flowing air along a path spaced from the inner surface of said outer flare segment; a plurality of elongate slots defined in said outer flare segment to be located peripherally outside of said inner flare, said slots being positioned to form an annulus which is concentric with said passage and providing further communication



between said air inlet and said combustion zone, each said slot being locating adjacent to one of said gaps, each slot having a radially outer end and a radially inner end with a longitudinal axis extending between said ends, said slots being oriented so that said longitudinal axis is located along a secant of said annulus and is inclined so that the direction of extent of said slot longitudinal axis from said outer slot end to said inner slot end is opposite to the direction of said air swirling motion, means for providing air to said slots so that air passing through said slots flows in a direction different from said swirling direction and flows on a path which surrounds said swirling air to constrain and confine flow of fuel from said fuel injector and swirling air from said air swirler device and prevent such fuel and swirling air from moving radially outward beyond said annulus.

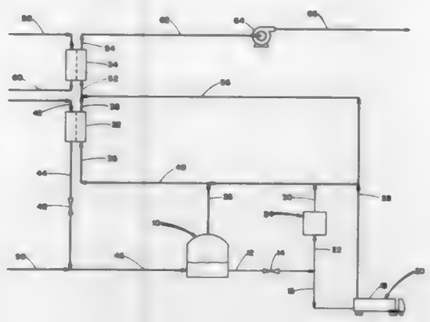
4,689,962

PROCESS AND APPARATUS FOR HANDLING A VAPORIZED GASEOUS STREAM OF A CRYOGENIC LIQUID

Antony Lofredo, Springfield, N.J., assignor to The Boc Group, Inc., Montvale, N.J.

Filed Jan. 17, 1986, Ser. No. 819,560
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 **8 Claims**

1. A process for gas treating comprising the steps of:
(a) recovering boil-off vapors generated in the storage and/or handling of a cryogenic liquid;
(b) passing said boil-off vapors in indirect heat transfer relationship with a compressed gaseous stream to be expanded to form said cryogenic liquid to thereby cool said compressed gaseous stream and thereby heat said boil-off vapors;
(c) expanding said thus cooled compressed gaseous stream of step (b) to form cryogenic liquid;
(d) compressing said thus heated boil-off vapors of step (b); and



(e) admixing said compressed boiled-off vapors of step (d) with said compressed gaseous stream of step (b) prior to step (c).

4,689,963

METHOD OF FREEZING FOODS

Tadaaki Sakai, 39-8 Yamadanishi 3-chome, Suita-shi, Osaka, Japan

Filed Jul. 2, 1986, Ser. No. 881,388
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **7 Claims**

1. A method of freezing food articles which comprises the step of cooling heat transfer means having an open end, and the step of bringing the food articles to be frozen in contact with one surface of the heat tranfer means through a layer of brine present therebetween and keeping the food articles in said contact relation, whereby the food articles may begin to be frozen only with their respective portions at which they are in contact with the brine.

4,689,964

ZERO GRAVITY (POSITION-INSENSITIVE) LOW-TEMPERATURE MULTI-COMPONENT REFRIGERATOR

Michael St. Pierre, Rohnert Park, Calif., assignor to Marin-Tek, Inc., San Rafael, Calif.

Filed Apr. 2, 1986, Ser. No. 847,232
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—114 **16 Claims**

1. A refrigeration system which comprises:
(a) a plurality of cascaded heat exchangers, each heat exchanger including a high pressure line and a suction region, said high pressure lines being connected in cascade by a connection region;
(b) a constriction in each said connection region between said heat exchangers; and
(c) a capillary tube having an opening disposed at and facing upstream of each said constriction and terminating in a suction region of a said heat exchanger.

9. A refrigeration method which comprises:
(a) providing a plurality of cascaded heat exchangers, each heat exchanger including a high pressure line and a suction region, said high pressure lines being connected in cascade by a connection region,
(b) providing a constriction in each said connection region between said heat exchangers;



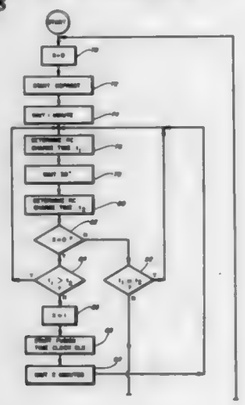
(c) providing a capillary tube having an opening disposed at and facing upstream of each said constriction and terminating in a suction region of a said heat exchanger; and
(d) applying a multi-component refrigerant to said constriction having a liquid phase and a gaseous phase in sufficient volume to substantially seal said gaseous refrigerant from said constriction with said liquid regrigerant.

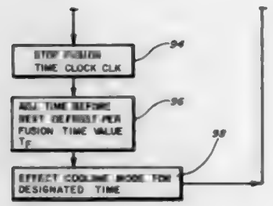
4,689,965

ADAPTIVE DEFROST CONTROL FOR A REFRIGERATOR

Donald E. Janke, Benton Township, Berrien County, and William J. Linstromberg, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 27, 1985, Ser. No. 814,216
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—155 **15 Claims**





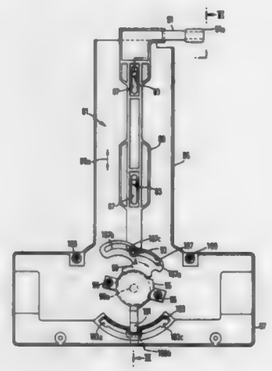
1. A control for a refrigeration device having cooling apparatus including an evaporator, defrosting apparatus for removing frost from the evaporator and means for energizing the defrosting apparatus at the end of a cooling cycle to initiate a defrost cycle, comprising:
detecting means for detecting the rate of change of evaporator temperature during a defrosting cycle;
determining means for determining the length of time the rate of change of evaporator temperature remains at substantially zero; and
establishing means for establishing the duration of a subsequent cooling cycle in dependence upon the determined length of time.

4,689,966

REFRIGERATION HAVING MODE-CHANGE CHAMBER CAPABLE OF OPERATION WITHIN FREEZING, CHILL AND REFRIGERATION TEMPERATURE RANGES

Hikaru Nonaka, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 29, 1985, Ser. No. 792,585
Claims priority, application Japan, Nov. 15, 1984, 59-241232
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—187 **3 Claims**



1. A refrigerator including a mode-change chamber capable of being operated within first and second temperature ranges and comprising:
cooling means for providing a source of cooling air;
first and second duct means for establishing communication between said mode-change chamber and said cooling means;
first and second damper means operatively coupled to said first and second duct means to selectively permit said cooled air to flow into said mode-change chamber from said cooling means; and
control means for selectively operating either said first damper means or said second damper means to thereby establish said first and second temperature ranges within said mode-change chamber and including:
(a) an operating rod mounted for reciprocal rectilinear movements between an operative position wherein one end of said rod engages said first damper means to cause said first damper means to open and an inoperative position wherein said rod permits said first damper means to close;
(b) a cam follower formed on another end of said rod;
(c) a handle member which is pivotally manually movable between at least first and second positions corresponding to said operative and inoperative positions of said rod; and
(d) cam means operatively coupled between said handle member and said cam follower and establishing a cam track having a first arcuate portion a second arcuate portion of a lesser radius than said first arcuate portion

and a transition portion connecting said first and second arcuate portions, said cam means for translating said pivotal movements of said handle member between said first and second positions into reciprocal movements of said rod between said operative and inoperative positions, respectively, wherein said cam means causes said cam follower to follow said first arcuate portion responsive to said handle member being moved into said first portion thereby displacing said rod into said operative position thereby opening said first damper means, and wherein said cam means causes said cam follower to follow said second arcuate portion responsive to said handle member being moved into said second position thereby displacing said rod into said inoperative position whereby said first damper means can be selectively manually opened and closed.

4,689,967

CONTROL AND METHOD FOR MODULATING THE CAPACITY OF A TEMPERATURE CONDITIONING SYSTEM

Doyoung Han, North Syracuse, N.Y., and Merle A. Renaud, Onalaska, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,426
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—201 18 Claims



1. In a system for temperature conditioning a fluid to a predetermined setpoint temperature, a system capacity control comprising

a. a temperature sensor responsive to the temperature of the conditioned fluid;

b. means for selecting a first variable used for determining the widths of a first deadband and a second relatively wider deadband, said deadbands being related to control of system capacity in response to deviation of the fluid temperature from the setpoint temperature;

c. means for selecting a second variable defining a gain setting for the control; and

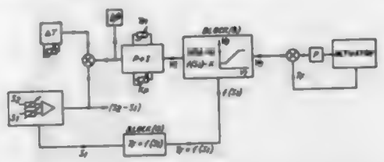
d. control means, connected to the temperature sensor, and the first and the second variable selecting means and responsive to the conditioned fluid temperature, the first variable, and the gain setting, said control means being operative to determine the width of the first and second deadbands as a function of the first variable, and to determine the deviation of the fluid temperature from the setpoint, and further operative to modulate the capacity of the system to maintain the temperature of the conditioned fluid near the setpoint as a function of the gain setting, using the first deadband if the absolute value of the deviation of the fluid temperature from the setpoint is increasing and using the wider second deadband if the absolute value of said deviation is decreasing.

4,689,968

ACTUATOR MEANS FOR THE CONTROL OF A REFRIGERATION SYSTEM EXPANSION VALVE

Robert M. McCulloch, Broager, and Ove Jorgensen, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 21, 1986, Ser. No. 842,539
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—225 5 Claims



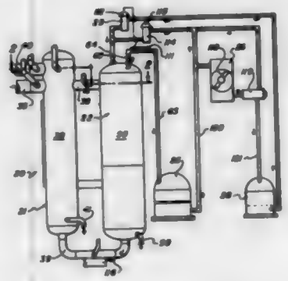
1. A regulating system for a refrigeration installation of the type having a compressor, condenser and an evaporator arranged in series and first and second electrical temperature sensors at the inlet and outlet ends of the evaporator, the first sensor being positioned to respond to the temperature of a liquid refrigerant expanded to suction pressure and the second sensor being positioned to respond to suction line sensible temperature, said regulating system, comprising, thermostatic valve means for controlling the flow of refrigerant to said evaporator having an actuator chamber filled with a refrigerant medium having liquid and vapor phases, an electrical heat supply element in said actuator chamber, an electrical feedback in said actuator chamber, control means connected to said sensors and said elements for generating a superheat error signal for controlling the temperature of said refrigerant medium, and means for utilizing said first sensor to determine a reference start value for said valve means corresponding to the opening pressure of said refrigerant medium in said actuator chamber.

4,689,969

REFRIGERATED GAS SEPARATION APPARATUS

Leon R. Van Steenburgh, Jr., Denver, Colo., assignor to Wilkerson Corporation, Englewood, Colo.

Filed May 6, 1986, Ser. No. 860,135
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—474 8 Claims



1. In a refrigerated dryer for compressed air, a refrigeration evaporator and moisture separation unit comprising, in combination, a vertical, cylindrical housing having in longitudinal alignment an air cooler section and a moisture separator section, means at one end of said housing defining an air inlet chamber, means at the other end of said housing defining a moisture sump, an outlet drain for draining said sump, a refrigeration evaporator heat exchanger in said air cooler section, said heat exchanger comprising a finned tube refrigeration system evaporator, said evaporator having adjacent inlet and outlet conduits for connection with a refrigeration system, a plurality of baffle plates inserted between said fins at spaced intervals alternating on opposite sides of said finned tube assembly for channeling air transversly across said finned tube evaporator, a generally hexagonal housing enclosing said evaporator and inserted baffles to provide an internal cooling chamber, said hexagonal housing having generally circular end panels for mounting said hexagonal housing within said outer cylindrical housing, said end panels having openings for the passage of compressed air therethrough, said hexagonal housing being formed in two sections, each having three angularly disposed wall panels and opposed longitudinal seam panels on the outer edges of the wall panels, a pair of longitudinal spacer strips for holding said baffles in spaced relation, a spacer strip and a pair of juxtaposed seam panels being secured together to form the side seams of the hexagonal housing when said wall panel sections are mounted together in evaporator enclosing arrangement, an air flow directing outlet nozzle on the outlet end panel of said hexagonal housing, said nozzle being eccentrically positioned to provide a generally tangential air outlet flow pattern from said evaporator cooling section into said moisture separator section, a downwardly opening conical baffle extending axially centrally within said moisture separator section and extending axially from said cooler section to a point adjacent said sump, the larger end of said baffle opening above said sump, an air outlet conduit extending from the lower end of said cylindrical housing upwardly into said conical baffle, said baffle and conduit being positioned to prevent the passage of liquid into said outlet conduit, a plurality of longitudinally extending scraper bars secured to the internal surface of said cylindrical housing within said moisture separator section, said scraper bars having a hooked edge extending radially inwardly of said cylindrical housing with the hook extending towards the direction of air flow for interrupting said air flow and creating turbulence to effect the removal from said air of moisture condensed therein and a sump cover plate in the lower end of said separator section including arcuate notches in the peripheral edge thereof for receiving corresponding inserted ends of said scraper bars for directing moisture into said sump, whereby incoming moisture-laden gas is cooled by said evaporator and condensed liquid is removed therefrom by said swirling movement and scraper bars to produce a cold, dry gas output through said outlet conduit.

4,689,970

CRYOGENIC APPARATUS

Hirotsugu Ohguma, Kawasaki; Mitsuo Harada, Yokohama; Hideaki Saura, Sagamihara, and Satoshi Yasuda, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

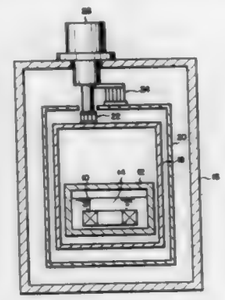
Filed Jun. 26, 1986, Ser. No. 878,576
Claims priority, application Japan, Jun. 29, 1985, 60-143766; May 12, 1986, 61-108142
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R 7 Claims

1. A cryogenic apparatus comprising a refrigerant vessel containing an object to be cooled and a refrigerant, a vacuum casing containing said refrigerant vessel, a radiation shield disposed between said refrigerant vessel and vacuum casing such as to enclose said refrigerant vessel for preventing the transfer of radiation heat to said refrigerant vessel, a refrigerator for cooling at least one of said radiation shield and said refrigerant vessel, and a thermal conductive coupling disposed between said refrigerator and at least one of said radiation shield and said refrigerant vessel, and turning on and off the transfer of heat between said refrigerator and at least one of said radiation shield and said refrigerant vessel, wherein said thermal conductive coupling includes:

a first member having high thermal conductivity and connected to said refrigerator; and

a second member having high thermal conductivity and connected to at least one of said radiation shield and said refrigerant vessel; wherein satisfactory heat transfer is obtained between said first and second members by supplying a heat conductive medium in the form of a fluid into a space defined between said first and second members; only slight heat transfer being caused by only heat radiation obtained between said first and second members by evacuating said space between said first and second members and wherein:

each one of said first and second members has a plurality of heat transfer members separated from each other;



the heat transfer members of said first member and the heat transfer members of said second member are alternately arranged with a small gap therebetween so as to face each other; and

said satisfactory heat transfer between said first and second members is obtained by heat conduction of said heat conductive medium, which is supplied into the small gaps between the heat transfer members of said first member and the heat transfer members of said second member.

4,689,971

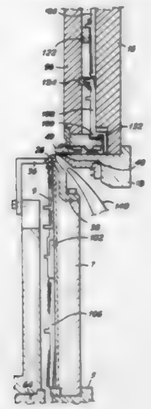
PROCESS AND CIRCULAR KNITTING MACHINE FOR MANUFACTURING PANTYHOSE ARTICLES AND THE LIKE

Paolo Conti; Gianni Conti, both of Florence; Franco Gariboldi, Condove, and Benito Manini, Florence, all of Italy, assignors to Paolo Conti and Meritex S.r.l., both of, Italy

Filed Jul. 24, 1985, Ser. No. 758,540
Claims priority, application Italy, Aug. 1, 1984, 9470 A/84
Int. Cl.[4] D04B *9/38, 9/42, 15/58, 1/24*
U.S. Cl. 66—25 28 Claims

1. A procedure for the formation of hosiery articles like stockings, pantyhose and panties, comprising, simultaneously forming a plurality of pairs of adjacent tubular leg-like articles on two non-rotating circular arched fronts of needles and by threads reciprocating transfer means, the tubular articles having rows of knitted threads that are alternatively formed by the two fronts through sets of needles whose number may vary, subsequently joining the adjacent tubular leg-like articles of each pair of each other, thereafter continuing the formation of rows of knitted thread to produce a tubular panties body por-

tion for a plurality of pantyhose articles that are simultaneously manufactured, and during a passage of the thread from one





front to the other, shorter stitches are formed for recovering a possible thread excess.

4,689,972

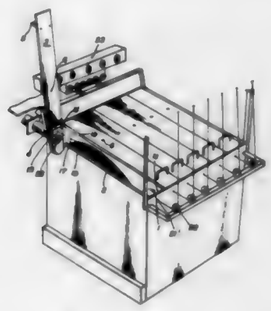
YARN DRYING AND DYE SETTING APPARATUS

Frankie B. Stanley, Dalton, Ga., assignor to J. W. Yarbrough, Chatsworth, Ga., a part interest

Filed Sep. 30, 1985, Ser. No. 781,529

Int. Cl.[4] D06F *3/04*

U.S. Cl. 68—20 **9 Claims**



1. Drying and dye setting apparatus for a strand of yarn comprising an enclosure having air entry and exhaust ports, a yarn entry port and a yarn discharge port, means for circulating heated air within said enclosure, a reel rotatably mounted in said enclosure on which said yarn is wound, said reel comprising a pair of rotatably spaced side wheels, said reel having an axis, a plurality of rods fixedly secured to and extending between said spaced side wheels, each of said rods having a yarn entry end adjacent one of said side wheels and a yarn exit end adjacent the other of said side wheels, and the radius between said axis and said yarn entry ends being greater than the radius between said axis and said yarn exit ends and each of said rods being angularly disposed relative to an imaginary plane containing and intersecting said axis and the connection between each rod and said one side wheel.

4,689,973

LAUNDRY MACHINE DRIVE

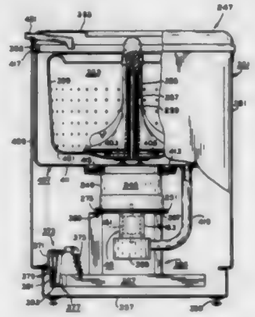
Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 487,921, Apr. 22, 1983, which is a division of Ser. No. 304,536, Sep. 22, 1981, Pat. No. 4,434,546, which is a division of Ser. No. 77,784, Sep. 21, 1979, Pat. No. 4,327,302.

This application Dec. 17, 1986, Ser. No. 942,896

Int. Cl.[4] D06F *23/04, 37/40*

U.S. Cl. 68—23.7 **7 Claims**



1. A drive for a laundry machine having a DC power source associated therewith and means for agitating water and fabrics to be laundered thereby to wash the fabrics and for thereafter spinning the fabrics to effect centrifugal displacement of water from the fabrics, the drive comprising:

an electronically commutated motor adapted to be energized from the DC power source for driving the agitating and spinning means, said electronically commutated motor comprising a stator, a multi-stage winding arrangement associated with the stator and having a plurality of winding stages adapted to be electronically commutated in a plurality of preselected sequences, and a rotatable assembly associated with said stator and arranged in selective magnetic coupling relation with said winding stages so as to be rotatably driven thereby, said rotatable assembly being rotatably driven in one direction in response to the electronic commutation of at least some of said winding stages in one of the preselected sequences and also being rotatably driven in the one direction and another direction opposite thereto in response to the electronic commutation of said winding stages in another of the preselected sequences; and

means for driving the agitating and spinning means from said rotatable assembly of said electronically commutated motor.

4,689,974

SKIN HOLDER IN AN APPARATUS FOR LETTING OUT SKINS

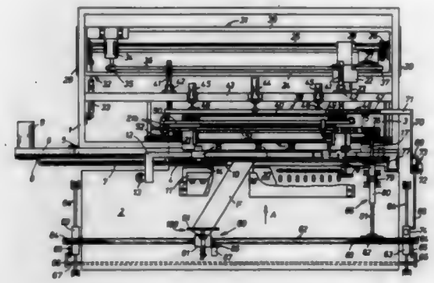
Herbert Dietrich, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 854,322

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, 3514466

Int. Cl.[4] C14B *15/00, 17/06*

U.S. Cl. 69—27 **8 Claims**



1. In a device for letting out a skin to be cut and sewn at seam areas extending in a longitudinal direction and at an angle to an edge of the skin, the device comprising a pair of clamping jaws for clamping the skin at each seam area, jaw drive means for moving the jaws laterally of the longitudinal direction to clamp the skin at each seam area, a parting sword movable between the jaws and extending in a longitudinal direction, sword drive means connected to said sword for moving said sword in a longitudinal direction to form a furrow and upwardly to push the skin at each seam area between said jaws, cutting means for cutting the seam area after it is clamped by said clamping jaws, a sewing machine for sewing the seam area, a seam gripper for gripping the seam after it is sewn by said sewing machine and moving the seam downwardly of said clamping jaw and laterally of said longitudinal direction by a seam spacing amount corresponding to a distance between adjacent seam areas on the skin, and gripper drive means for moving said seam gripper upwardly and downwardly and laterally of the longitudinal direction for repositioning the skin to bring an additional seam area thereof into alignment with said parting sword, the improvement comprising holding means for receiving an end of at least one skin spaced from the seam areas, guide means for guiding the holding means for movement in the longitudinal direction and laterally of the longitudinal direction, and switchable drive means connected to said holding means for moving said holding means along said guide means for following movements of the seam areas of the skin due to said sword and gripper drive means.

4,689,975

PADLOCK

Gerald F. Dunphy, Glen Waverley, and Donald J. Newman, Sommerville, both of Australia, assignors to Ogden Industries Pty. Ltd., Huntingdale, Australia

Filed Aug. 5, 1986, Ser. No. 902,597

Claims priority, application Australia, Aug. 15, 1985, PH 1959

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—56 **10 Claims**

1. A padlock comprising, a body, a U-shaped shackle having a portion which projects beyond an upper end surface of said body, said shackle being movable relative to said body between a locked condition and a released condition at which said shackle portion projects beyond said upper end surface by a minimum extent and a maximum extent respectively, said shackle having two parallel legs one of which is captured within said body against escape at all times and the other of which is located within and outside said body in locked and released conditions respectively, locking means within said body operable to engage said other leg to releasably hold said shackle against movement from the locked to the released condition, a shroud integral with said body and extending beyond said upper end surface by a distance greater than said minimum extent of said shackle portion, said shroud extending completely across a front side of said body, two spaced end



portions of said shroud extending towards a rear side of said body, each of said end portion at least partially overlapping a respective one of said shackle legs when said shackle is in said locked condition, said shroud forming a cavity in a rear side of said shroud between said end portions for substantially containing said shackle portion when the shackle is in said locked condition, said end portions forming an opening to allow said other shackle leg to move laterally relative to said shroud when the shackle is in said released condition so as to be thereby movable into and out of said cavity.

4,689,976

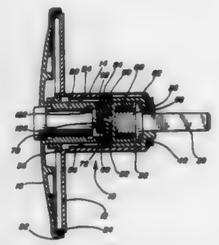
POP-UP HANDLE ASSEMBLY

Marvin L. Larsen, New Hampton, Iowa, assignor to Tri/Mark Corporation, New Hampton, Iowa

Filed Jun. 16, 1986, Ser. No. 874,402

Int. Cl.[4] E05B *13/00*

U.S. Cl. 70—208 **21 Claims**



1. A pop-up T-handle assembly comprising, a base with a generally planar mounting panel for attachment to a support and a tubular housing, a T-handle having a section with a peripheral lip which in a handle-closed position encloses the mounting panel and precludes rotation of the T-handle, spring means urging the T-handle section away from the base to an operative position remote from said mounting panel, a drive-bar rotatably mounted by the tubular housing, means within the tubular housing for drivingly connecting the T-handle with the drive-bar, a depressible key-plug carried by the T-handle and movable between locked and unlocked positions, means preventing depression of the key-plug when in locked position, means locking the T-handle in closed position against the action of the spring means, and means operable upon depression of the key-plug to release said locking means and permit pop-up of the T-handle under the urging of the spring means.

4,689,977

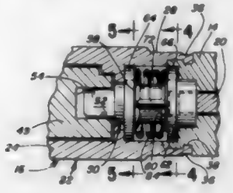
SWITCH LOCK WITH TWO MOMENTARY POSITIONS

Stanley C. Woinjak, Vernon Hills, and Timothy P. Leabo, Des Plaines, both of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Continuation-in-part of Ser. No. 646,790, Sep. 4, 1984, Pat. No. 4,633,689. This application Jul. 28, 1986, Ser. No. 889,738

Int. Cl.⁴ H01H *27/06*; E05B *17/04*

U.S. Cl. 70—379 R **17 Claims**



1. In a key operated switch including a lock having a barrel and rotatable plug with key actuated tumblers and a switch having a rotatable shaft, an improved switch actuator comprising:

an actuator member interconnecting the rotatable plug and the rotatable shaft;

first and second rotatable stop washers about the actuator member;

means for rotationally biasing the first and second stop washers in opposite directions;

a surface on the first stop washer which engages the actuator member upon rotation of the plug in one direction from a first position to a second position to rotate the first stop washer against the action of the biasing means;

a surface on the second stop washer which engages the actuator member upon rotation of the plug in the other direction from the first position to a third position to rotate the second stop washer against the action of the biasing means;

means for maintaining the first and second stop washers against the action of the biasing means in an orientation corresponding to the first position;

means associated with the first stop washer for allowing rotation of the actuator member in the other direction independently of the first stop washer to turn the switch from the first to the third position; and

means associated with the second stop washer for allowing rotation of the actuator member in the one direction independently of the second stop plate to turn the switch from the first to the second position.

4,689,978

SIDE BAR WAFER LOCK, AN IMPROVED SPRING RETAINER FOR SAID LOCK, AND A METHOD OF USING SAID SPRING RETAINER IN SAID LOCK

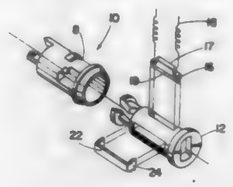
Robert L. Drummond, 163 Woodlawn NW., Perry Heights, Canton, Ohio 44709

Filed Oct. 27, 1986, Ser. No. 923,766

Int. Cl.⁴ E05B *17/00*

U.S. Cl. 70—431 **17 Claims**

1. In a side bar wafer lock consisting essentially of a housing; a metal plug adapted to fit into said housing and having at least one slot for receiving a spring retainer; a side bar, side bar springs, tumblers, and tumbler springs in a working relationship in said plug for controlling the movement of said side bar; and a spring retainer having at least one leg adapted to be inserted into said slot, for holding the tumbler springs in said plug, the improvement comprising a U-shaped spring retainer having barbed legs wherein barbs on said legs are formed by placing angled cuts in said legs and said barbs increase the width of said legs to a width wider than said slot when measured across said barbs, and wherein said barbs are upward angled and compress when said legs are inserted into said slot.



4,689,979

PRESSING METHOD AND PUNCH AND DIE PRESS FOR THE SAME

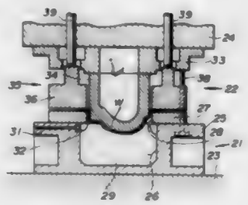
Nobuyuki Otsuka; Atsuo Kasuya; Yusho Nakayama; Masayuki Kumashiro; Tamio Furuya, and Shigeo Kaiho, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,018

Claims priority, application Japan, Dec. 21, 1983, 58-241644

Int. Cl.⁴ B21D *22/10*

U.S. Cl. 72—57 **14 Claims**



1. A method of pressing a blank, comprising the steps of:

(a) pressing the blank between a die assembly having a cavity containing a highly viscous substance with dilatant and thixotropic properties therein, and a punch;

(b) inserting said punch into said cavity to increase a pressure of the highly viscous substance in said cavity; and

(c) pressing said blank against a surface of said punch under said pressure of said highly viscous substance such that the pressure of said highly viscous substance does not reach a final pressing pressure until said punch closely approaches a final insertion depth on said cavity.

4,689,980

METHOD FOR SNAP RING FORMING AND GROOVING

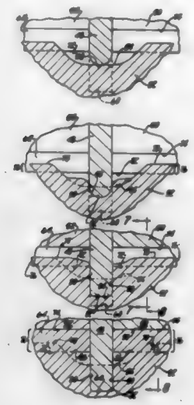
James T. Killop, Warren, and Gerald W. Holbrook, Saint Clair, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Division of Ser. No. 769,581, Aug. 25, 1985, Pat. No. 4,644,772. This application Sep. 15, 1986, Ser. No. 907,475

Int. Cl.⁴ B21D *17/04*

U.S. Cl. 72—88 **6 Claims**

1. A method for simultaneously forming splines and an annular groove in a metal workpiece having central portions and ends on each side thereof, said method including the steps of: forming a substantially U-shaped annular recess (**56**) along the central portion of the workpiece which has a flat base and spaced side walls which are spaced apart to a greater distance than the side walls of the groove (**82**) to be formed; deforming the recess (**56**) to initially form a groove (**82**) therein; progressively and simultaneously forming splines in the ends of the workpiece and forming the groove (**82**) in the recess of the workpiece and moving metal outwardly and upwardly from the recess as the groove (**82**) is formed to fill the remainder of the recess (**56**) and form the side walls of the groove (**82**).



4,689,981

DRAW-BENDING METHOD

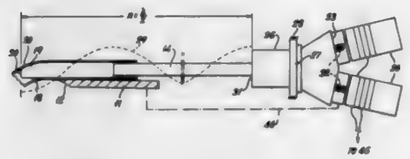
Ibrahim N. Ibrahim, Cairo, Egypt, and Dennis H. Sansome, Sutton Coldfield, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 628,603, Jul. 6, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,099

Claims priority, application United Kingdom, Jul. 8, 1983, 8318577

Int. Cl.⁴ B21D *9/05*

U.S. Cl. 72—150 **1 Claim**



1. A method of draw-bending an elongated workpiece of hollow section with apparatus including a bend former, support means to contact the outer surface of the workpiece, drawing means for gripping the workpiece and drawing the workpiece in a bend around the former and an elongated mandrel assembly having one end anchored to a fixed structure of the apparatus and presenting at an end opposite said one end a mandrel means for disposition within the workpiece close to said bend former, said mandrel means including a forward nose part presenting a surface which faces generally radially outward relative to a bend to be formed in the workpiece, said appartus further including first vibration transducers attached to said mandrel assembly, the steps comprising:

gripping a portion of the workpiece with the drawing means and imparting movement to said drawing means to effect bending of the workpiece over the bend former, while disposing the nose part of the mandrel within the workpiece in sliding and supporting contact with the inner surface of that part of the wall of the workpiece lying on the outside of the bend being formed;

supporting the outer surface of the workpiece to define a first axis of drawing movement for the workpiece upstream of the bend former with said drawing means being disposed downstream of the bend former, said drawing means moving by virtue of said movement to a position in which said workpiece gripped by said means defines a second axis of drawing movement extending at an angle to said first axis;

imposing on said workpiece a standing wave of resonant vibration with the first vibration transducers, the standing wave extending in a direction aligned with said first axis of drawing movement and out of alignment with said second axis and with the first vibration transducers and said workpiece being without direct attachment therebetween; and

continuing said movement of said drawing means without substantially changing the cross-section of said workpiece as bending of said workpiece is accomplished.

4,689,982

METHOD FOR MAKING A CAGE AND THE CAGE PRODUCED THEREBY

Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld; Peter Horling, Mainberg, and Robert Stolz, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,824

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440962

Int. Cl.⁴ B21D *53/12*

U.S. Cl. 72—334 **1 Claim**



1. A method for producing a cage, especially a roller cage of sheet material by punching out the roller element pockets of a predetermined shape having corner areas, consisting of the steps of localized stamping the sheet material in the direction of the sheet thickness in the corner areas only to provide a densified transition zone in said corner areas only and thereafter forming the pockets by a punching operation through the transition zone.

4,689,983

METHOD FOR PRODUCING WORM SHAFT FOR USE IN POWER STEERING APPARATUS

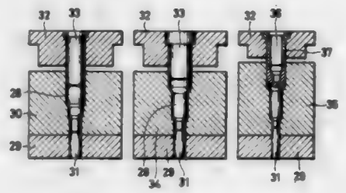
Naosuke Masuda, and Sohsuke Sunaga, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,171

Claims priority, application Japan, Jan. 14, 1983, 58-4787

Int. Cl.⁴ B21D *22/26, 22/28*

U.S. Cl. 72—356 **3 Claims**



1. In a method for producing a worm shaft for use in a power steering apparatus, said worm shaft having first and second end

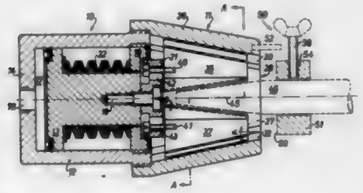
portions, said power steering apparatus comprising an input shaft, a rotation control valve including said worm shaft and a valve rotor fitted in a valve sleeve formed at said first end portion of said worm shaft, said method including the steps of forming said valve sleeve, forming fluid control passages on an inner peripheral portion of said valve sleeve, and forming a plurality of parallel ribs on an inner peripheral portion of said worm shaft toward said second end portion thereof, said ribs being physically separate from said fluid control passages, with a predetermined gap formed radially between said ribs for permitting a predetermined amount of relative rotation between said worm shaft and said input shaft, the improvement comprising the step of aligning said ribs and said fluid control passages by simultaneously forming said ribs and said fluid control passages by plastic working.

4,689,984

METHOD FOR PRODUCING MALE CONICAL THREADS

Urs Kellner, Hüttenackerstrasse 10, CH-8712 Stäfa, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,275
Claims priority, application Switzerland, Jan. 10, 1985, 103/85
Int. Cl.⁴ B21K *1/56*
U.S. Cl. 72—402 **8 Claims**



1. A method of forming an external conical thread having a generally tapered outer contour at an end portion of an elongated structure made of steel; said method comprising the steps of:

shaping said end portion into a cone corresponding to said outer contour and having a generally smooth outer surface; and

deforming said surface of said cone by cold-pressing so as to form said thread;

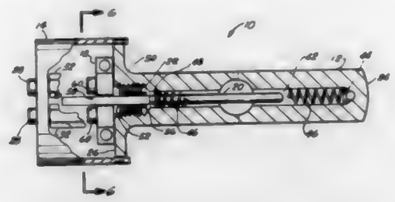
said cold-pressing being effected by applying onto said surface a composite die including a plurality of die segments arranged about an axis which in a first or open position are capable of receiving said cone and which move along said axis and radially to said axis to a second or closed position to substantially define an internal conical thread matching said external conical thread; and wherein a force is applied to move said die segments from said open position to said closed position onto said cone surface for deformation thereof; said force acting upon said die segments in a direction substantially parallel to a longitudinal axis of said cone; and wherein each of said segments is guided into said closed position to move in a direction toward said cone surface which direction intersects with said longitudinal axis at an acute angle or below about 20°.

4,689,985

CALIBRATION IMPACT HAMMER

Samuel W. Glass, III, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 5, 1986, Ser. No. 836,377
Int. Cl.⁴ G01L *1/00*
U.S. Cl. 73—1 R **14 Claims**



1. A calibration impact hammer, comprising:

(a) a head with first and second ends having a longitudinal bore extending from said second end toward said first end, said longitudinal bore being threaded at said second end;

(b) an inertia rod slidably received within said longitudinal bore and movable between a first normal retracted position and a second inserted position;

(c) means in said longitudinal bore for biasing said inertia rod toward said first normal position;

(d) optical switch means mounted on said second end of said head;

(e) means on said inertia rod for activating said optical switch means upon movement of said inertia rod between said first and second positions;

(f) means threadably engaged in said longitudinal bore for slidably receiving and adjusting the position of said inertia rod relative to said optical switch means; and

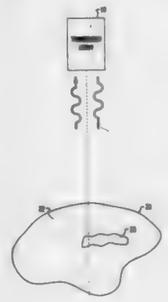
(g) display means connected to said optical switch means for receiving signals therefrom and calculating and displaying the impact energy of said hammer upon striking a surface.

4,689,986

VARIABLE FREQUENCY GAS-BUBBLE-MANIPULATING APPARATUS AND METHOD

Paul L. Carson, Ann Arbor, Mich., and Richard M. Detsch, Denver, Colo., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Mar. 13, 1985, Ser. No. 711,255
Int. Cl.⁴ G01N *29/02*
U.S. Cl. 73—19 **32 Claims**



1. A bubble detection method of the type which utilizes ultrasonic acoustical energy to detect a bubble-containing region within a specimen, the bubble detection method comprising the steps of:

emitting from an ultrasonic transducer the acoustical energy into the bubble-containing region within the specimen;

decreasing the frequency of the acoustical energy with respect to time whereby the size of a bubble in the bubble-containing region is increased; and

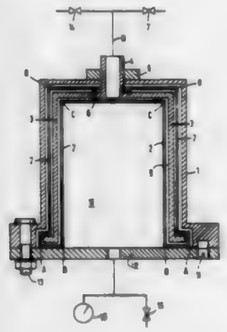
receiving a portion of said emitted acoustical energy reflected by said bubble of increased size within the bubble-containing region.

4,689,987

LEAKAGE DETECTION WITH FLEXIBLE BAG

Mathias L. C. Aarts, Bilthoven, Netherlands, assignor to Product Suppliers AG, Zug, Switzerland

Filed Jul. 16, 1986, Ser. No. 886,522
Claims priority, application Netherlands, Jul. 17, 1985, 8502061
Int. Cl.⁴ G01M *3/32*
U.S. Cl. 73—49.3 **5 Claims**



1. A bag for use in leak testing vacuum packages having a predetermined shape, comprising:

a rigid frame having (i) an open end, (ii) a shape generally comforming to the predetermined shape, and (iii) inside and outside surfaces;

a flexible inner layer extending along the inside surface of the frame, having a shape generally conforming thereto, and forming (i) an open end adjacent the open end of the rigid frame, and (ii) an interior in communication with said open end of the inner layer to receive a vacuum package;

a flexible outer layer extending along the outside surface of the frame and having a shape generally conforming thereto;

the inner and outer layers forming an internal space, and being connected to each other adjacent the open ends of the frame and the inner layer to close said internal space adjacent said open ends; and

inlet means in communication with said internal space to conduct gas into the internal space to urge the inner and outer layers away from the frame, and to conduct gas out from the internal space to collapse the inner and outer layers onto the frame.

4,689,988

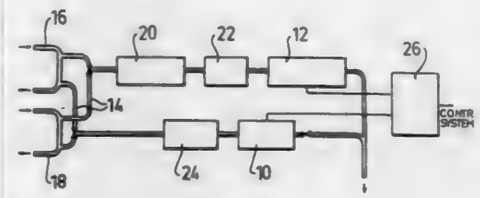
DEVICE FOR SEPARATELY MEASURING PARTICLES IN A SUSPENSION

Staffan Rydefalk, Vallentuna, and Jens Einarsson, Stockholm, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

PCT No.: PCT/SE85/00073, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985
PCT Pub. No. WO85/03774, PCT Pub. Date Aug. 29, 1985
PCT filed Feb. 13, 1985, Ser. No. 795,347
Claims priority, application Sweden, Feb. 14, 1984, 8400784
Int. Cl.⁴ G01N *15/07*
U.S. Cl. 73—61 R **9 Claims**

1. A device for measuring individually the content of each of at least two types of substances in a suspension wherein the density of each substance is approximately equal and known, said device comprising:

a density meter for measuring the density of the suspension and the density of the liquid in which the substances are suspended, in order to determine the difference in density; measuring means for measuring particle concentration and the ratio of the volume of the suspended substances and the liquid; and calculating means electrically connected to said density meter and measuring means to adjust the signal received from the density meter by use of the signal received from the measuring means according to the relationship:



$$S_F = k_a U_a + k_b U_2$$

$$S_M = k_c U_1 + k_d U_2$$

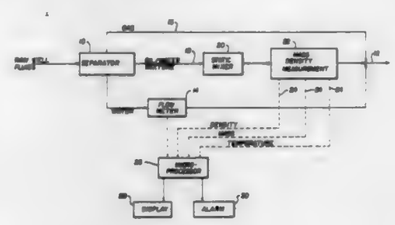
where S_F is the content of suspended substance of the first type substance, S_M is the content of suspended substances of the second type, U_1 is the signal received from the density meter by the calculating means, U_2 is the signal received from the measuring means by the calculating means for measurement of particle concentration and k_a, k_b, k_c and k_d are constants of proportionality.

4,689,989

METHOD AND APPARATUS FOR TESTING THE OUTFLOW FROM HYDROCARBON WELLS ON SITE

Kerby S. Aalseth, Vernal, Utah; John R. Bocek; Dennis R. Canfield, both of Casper, Wyo., and Ke-Tien Liu, Sugar Land, Tex., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 24, 1985, Ser. No. 747,706
Int. Cl.⁴ G01F *5/00*
U.S. Cl. 73—61.1 R **32 Claims**



29. A method of determining the amounts of a first and of a second component in a flowing mixture comprising said first and second components, said first and second components being liquids and having different densities, comprising the steps of:

(a) measuring the mass flow of said mixture;

(b) determining the density of said mixture;

(c) obtaining values for the densities of said first and second components;

(d) calculating the amounts of said first and second compo-

nents in said mixture based on said measured mixture mass flow rate, measured mixture density, and said first and second component obtained values for their said densities, said step of calculating amounts including the substeps of

(i) calculating the density of said first and second components at said measured temperature, utilizing said measured temperature and said values for the densities and the thermal coefficients of expansion of said first and second components,

(ii) calculating the percent of one of said first and second components in said mixture utilizing the measured mixture density and the previously calculated values for the densities of said first and second components,

(iii) calculating the volume flow rate of the mixture utilizing said measured value of mixture mass flow and mixture density, the substeps of calculating amounts of said first and of said second components utilizing the output of said last mentioned substeps of calculating the percent of one of said components in said mixture, and the substep of calculating the mixture volume flow rate, and then the substep of temperature correcting the outputs of said last-mentioned two substeps of calculating the first and second component flow rates;

(e) measuring the temperature of said mixture,

(f) obtaining values for the thermal coefficients of expansion of said first and of said second components,

(g) performing said calculating amounts step to include said measured mixture temperature and said thermal coefficients values to correct said calculated amounts for the difference in temperature between the measured temperature of said mixture and a predetermined reference temperature.

4,689,990

APPARATUS FOR THE ACQUISITION OF SPEED-OF-ROTATION AND/OR ANGLE OF ROTATION SIGNALS ON A DRIVE SHAFT

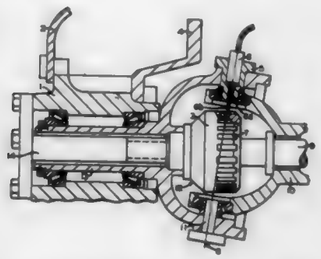
Siegfried Hofler, Hanover; Konrad Rode, Seelze, and Reinhard Schmidt, Lehrte, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,735

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521606

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—118.1 **14 Claims**



1. An apparatus to detect the rotation of a shaft, comprising two shafts, a universal joint which connects said two shafts so that said shafts rotate together, at least one of said shafts is mounted radially in a swivel housing, and is pivotable with said housing around a pivot axis generally passing through the midpoint of said joint, transmitter means for indicating rotational position of said joint located on the circumference of said joint, a sensor means for detecting movement of said transmitter means, and said sensor means being located on said pivot axis.

4,689,991

FLUID-GAUGING PROBES AND THEIR MANUFACTURE

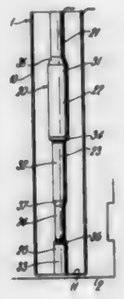
Keith A. Beckley, Cheltenham; Neil R. Jacob, and Geoffrey A. Trussler, both of Basingstoke, all of England, assignors to Smiths Industries Public Limited Company, London, England

Filed May 13, 1986, Ser. No. 862,871

Claims priority, application United Kingdom, May 22, 1985, 8512907

Int. Cl.⁴ G01F *23/26*; H01G *5/28*

U.S. Cl. 73—304 C **10 Claims**



1. A tubular inner electrode of the kind for a capacitive fluid-gauging probe, said electrode having at least three different diameters at different points along its length, the improvement wherein said inner electrode comprises at least two discrete tubular sections and a substantially cylindrical metal coupling piece coupling said tubular sections with one another, wherein at least one of said tubular sections consists of only two cylindrical regions, namely a first region of one diameter providing a first end of the tubular section and a second region integral with said first region providing an opposite end of the tubular section, said second region having a second diameter formed by mechanically reducing the diameter of the section from that of said first region, wherein one end of said coupling piece projects within one end of said one tubular section, and wherein the other end of said coupling piece projects within one end of the said other tubular section, the said one end of said one tubular section having a diameter different from that of the said one end of the said other tubular section.

4,689,992

ROTATION RATE SENSOR

John S. Strachan, Edinburgh, Scotland, assignor to Syrinx Innovations Limited, Edinburgh, Scotland

PCT No. PCT/GB85/00131, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04722, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 1, 1985, Ser. No. 809,889

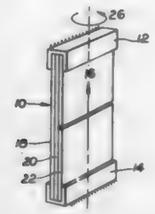
Claims priority, application United Kingdom, Apr. 4, 1984, 8408639

Int. Cl.⁴ G01P *9/04*; H01L *41/08*

U.S. Cl. 73—505 **5 Claims**

1. A device for measuring rotation, comprising a laminar assembly and means mounting said assembly so as to lie, in a rest condition, in a reference plane containing a central longitudinal axis; said assembly comprising a first piezoelectric member connected to an oscillator to produce oscillation of said assembly transvorco to said reference plane, and a second piezo electric member arranged to generate an electrical output when stressed in a direction oblique to said oscillation, said second piezoelectric member comprising two polarized polymeric piezoelectric films arranged in a common plane along

said axis each with a main uniaxial mode transverse to said axis, and connected together in series; whereby said electrical out-



put is a function of twisting of said assembly about said axis and between said films.

4,689,993

MEASURING AND MAPPING VIBRATIONS

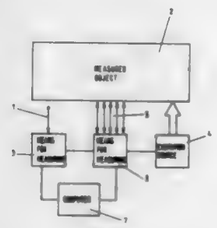
Gudmunn Slettemoen, Tonstadgrenda 252, N-7075 Tiller, Norway

Filed Jun. 18, 1986, Ser. No. 875,643

Claims priority, application Norway, Jun. 28, 1985, 852615

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—579 **21 Claims**



2. A device for measuring and mapping vibrations, comprising:

at least one local sensor;

a first means for measuring associated with said local sensor for making local registrations and frequency decompositions of the vibrations of an oscillating object to be examined;

an image forming unit;

a second means for measuring associated with said image forming unit to be used in combination with said local sensors and said first means for measuring to provide image-forming recording and local recording of the vibrations of an oscillating object, respectively;

an oscillating source of excitation which causes the object to be examined to oscillate harmonically; and

a means for calculation to collocate said local recordings and image-forming recordings.

4,689,994

DELIVERY SYSTEM FOR A REMOTE SENSOR

Alan Savinell, Penn Hills Twp., Allegheny County, and Jeffrey E. Hydeman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 9, 1984, Ser. No. 670,421

Int. Cl.⁴ G01N *29/00*

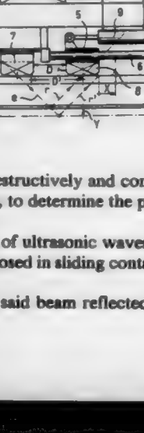
U.S. Cl. 73—634 **44 Claims**

1. A mechanical delivery system for remotely positioning a sensor in mating engagement with a predetermined portion of a component to be inspected, comprising:

elongated support means for positioning a sensor, said elongate support means having a first end adapted for manipulation from a remote location and a second end having a housing;

a sensor having a sensor portion adapted for mating engagement with the predetermined portion of the component to be inspected; and

mounting means for mounting said sensor to said support means at said second end of said support means, said



mounting means movable between a first position and a second position, said mounting means positioning said sensor portion within said housing when in said first position and positioning said sensor portion extending laterally of said housing when in said second position to thereby enable said sensor portion to be placed in mating engagement with the predetermined portion of the component as a result of manipulation of said first end.

4,689,995

METHOD AND APPARATUS FOR THE NON-DESTRUCTIVE TESTING OF RAILROAD TRACK RAILS

Jean Pierre Turbe, Nanteuil-les-Meaux, France, assignor to Societe Nationale des Chemins de Fer Francais, Paris, France

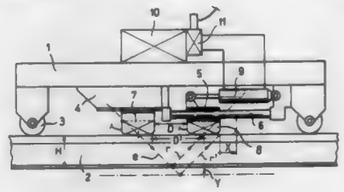
PCT No. PCT/FR85/00058, § 371 Date Nov. 19, 1985, § 102(e) Date Nov. 19, 1985, PCT Pub. No. WO85/04484, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 22, 1985, Ser. No. 807,881

Claims priority, application France, Mar. 23, 1984, 84 04523

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—636 **8 Claims**



1. A method for non-destructively and continuously testing railroad track rails, in situ, to determine the presence of faults, comprising the steps of:

(a) transmitting a beam of ultrasonic waves into a rail using a first transducer disposed in sliding contact with an upper surface of the rail,

(b) receiving signals of said beam reflected by a lower sur-

face of the rail using a second transducer disposed in sliding contact with the surface of the rail,

(c) comparing time displaced reflected signals to determine the magnitude and direction of any changes in the strength of the reflected signals, and

(d) displacing said second transducer in a direction parallel to the longitudinal direction of the rail in accordance with the comparison determinations to maximize the strength of the reflected signals and to thereby compensate for any variations in the height of the rail.

4,689,996

METHOD AND DEVICE FOR TESTING ELECTRICALLY CONDUCTING OBJECTS BY MEANS OF ULTRA-SONICS

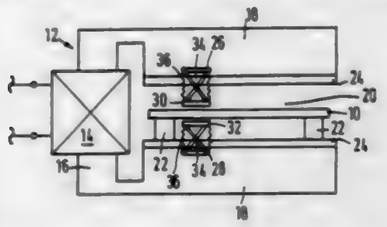
Gerhard Hüschelrath, Laufach, Fed. Rep. of Germany, assignor to Nukem GmbH, Hanau, Del.X

Filed Apr. 4, 1985, Ser. No. 719,957

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413787

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—643 **9 Claims**



1. An apparatus for performing non-destructive testing of an electroconductive plane object, said apparatus comprising:

a magnet being substantially U-shaped, with the poles of said magnet extending along opposite arms of the U-shape, the object to be tested being placed between the poles of the magnet

an electrodynamic transmitting probe being arranged between a first surface of the test object and one of the poles of said magnet;

a coordinated receiving probe being arranged between a second surface of the test piece and the other pole of said magnet;

said transmitting and receiving probes being moved synchronously oscillatorily over the test object along the poles at a constant preset distance to the respective first and second surfaces; and

a flaw detector and a wall thickness measuring instrument for generating an output signal proportional to the thickness of the wall connected to the receiving probe, the output signal being fed to an adjustment circuit by which a response threshold value of the flaw detector can be varied.

4,689,997

MOTION DETECTOR SUITABLE FOR DETECTING EARTHQUAKES AND THE LIKE

David E. Windisch, 904 Silverspur Rd., Rolling Hills Estates, Calif. 90274

Filed Dec. 24, 1985, Ser. No. 813,264

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—652 **11 Claims**

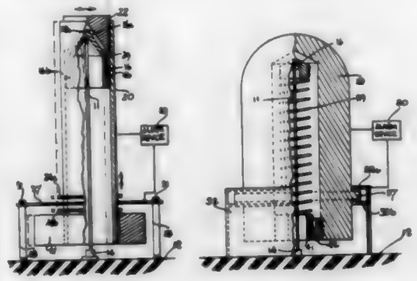
1. A motion detector device suitable for detecting vibrational tremors such as earthquakes comprising:

an inertial mass,

spring means comprising a spring barb oriented principally for motion along a horizontal axis and a coil spring oriented principally for motion along a vertical axis,

means for resiliently supporting said inertial mass on said spring means for resilient motion along both said horizontal and vertical axes comprising means for anchoring said spring barb at one end thereof and means for connecting said coil spring between the other end of said spring barb and said inertial mass,

said mass and spring means forming a resonant mechanical vibration circuit at a predetermined vibrational frequency corresponding to that of the vibrational tremor to be detected,



spaced apart oppositely positioned electrical switching contact means connected to said spring means and said inertial mass respectively, said contact means being brought into switching contact with each other when said vibrational circuit is excited at said predetermined vibrational frequency, and

alarm means connected to said switching means for providing an alarm signal when the contact means are brought into switching contact.

4,689,998

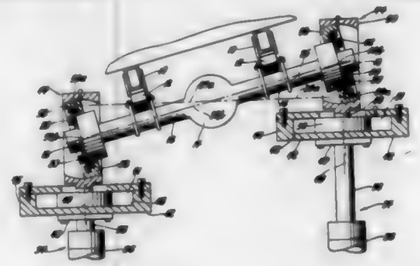
WHEELED VEHICLE TEST FIXTURE CONNECTOR

Gerald W. Jackson, 29526 Pearson, Selfridge, Mich. 48045, and David S. Rohweder, 4973 10 Mile Rd. Apt. #6, Warren, Mich. 48091

Filed Sep. 15, 1986, Ser. No. 907,424

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—669 **4 Claims**



1. In a shaker mechanism for wheeled vehicles, wherein each vehicle has a plural number of axles, each axle including a rotary hub and a plural number of threaded studs centered in a ring pattern around the axle axis; said shaker mechanism comprising a plural number of fixtures, one for each axle; and a powered actuator supportably connected to each fixture for imparting vertical oscillatory forces thereto:

the improvement wherein each fixture comprises an annular housing; an annular axle-support element located within each housing for universal rotary motion around a point on the axle axis; and an annular adapter plate removably attached to each axle-support element; each adapter plate having a number of circumferentially-spaced openings therethrough arranged in the same ring pattern as the aforementioned studs, whereby each said adapter plate can be fitted onto an axle hub with the studs extending through the adapter plate openings; and nuts threaded onto the studs to rigidly secure the adapter plate to the hub;

the adapter plates being sufficiently sized so that adapter plates having different numbers of stud openings therethrough can be removably attached to a given axle-support element, thereby achieving a significant commonality of fixture components while continuing to use existing fixtures with a range of different wheeled vehicles.

4,689,999

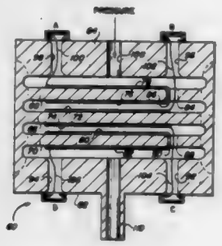
TEMPERATURE COMPENSATED PRESSURE TRANSDUCER

Zvi Shkedi, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 26, 1985, Ser. No. 759,626

Int. Cl.⁴ G01L *7/08, 9/12, 19/04*

U.S. Cl. 73—708 **31 Claims**



1. A pressure transducer comprising:

a housing portion;

a first diaphragm having a first electrode on one side thereof and a second electrode on the other side thereof, said first diaphragm being located adjacent to and spaced apart from said housing portion with said first electrode facing said housing portion and said second electrode facing away from said housing portion;

a second diaphragm having a third electrode on one side thereof and a fourth electrode on the other side thereof, said second diaphragm being located adjacent to and spaced apart from said first diaphragm with the side of said second diaphragm having said third electrode thereon facing the side of said first diaphragm having said second electrode thereon;

a third diaphragm having a fifth electrode on one side thereof and a sixth electrode on the other side thereof, said third diaphragm being located adjacent to and spaced apart from said second diaphragm with the side of said third diaphragm having said fifth electrode thereon facing the side of said second diaphragm having said fourth electrode thereon, wherein a first capacitance C_1 is present across said fourth and fifth electrodes and a second capacitance C_2 is present across said second and third electrodes, and one of said first, second, and third diaphragms is responsive to a pressure input to cause a change in at least one of said first and second capacitances C_1 and C_2 as the pressure input changes.

4,690,000

DIRECT-ACTING PRESSURE SENSOR

Siegfried H. A. Schmaus, 806 Powder Mill La., Penfield Downs, Philadelphia, Pa. 19151

Filed Jun. 19, 1986, Ser. No. 875,959

Int. Cl.⁴ G01L *7/04*

U.S. Cl. 73—741 **5 Claims**



1. A fluid pressure sensor comprising:

(A) inner and outer flat springs having similarly curved formations and maintained in concentric relation to define a pressure region therebetween;

(B) a fixed fluid input socket anchoring said springs at one end thereof, the free end of the springs being joined to form a tip whose travel is indicative of fluid pressure, said tip having a hollow rivet attached thereto;

(C) a flexible bladder occupying said region and having an internal chamber, the faces of said bladder engaging said springs, said internal chamber communicating with said fluid input socket whereby the fluid pressure applied to said chamber through said socket imposes a load on said springs producing deflection thereof whereby said tip is caused to travel, said bladder being fabricated of a sleeve formed of elastomeric material incorporating a helical reinforcing coil whose convolutions are spaced from each other and are joined by said elastomeric material whereby the bladder is free to flex when subjected to fluid pressure but is prevented by the coil from dilating, thereby maintaining a proportional relationship between the applied fluid pressure and the travel of the tip; and

(D) a pointer operatively coupled to the tip and swingable along a scale graduated in pressure values, said pointer being anchored on a rotatable post to which is secured one end of a wire-like lever which extends through said hollow rivet and is slidable therein whereby the travel of the tip is converted into a pressure indication.

4,690,001

OPTICAL DISPLACEMENT TRANSDUCER USABLE AS AN EXTENSOMETER

Dennis N. Harvey, Chaska, Minn., and Robert B. Bertolasi, Rockford, Ill., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Nov. 13, 1985, Ser. No. 797,435

Int. Cl.⁴ G01L *1/24*

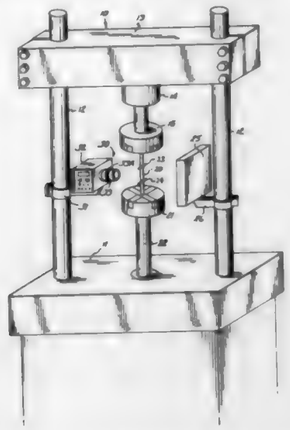
U.S. Cl. 73—800 **7 Claims**

3. An optical extensometer sensor assembly comprising a housing, a camera lens mounted on a wall of said housing, a circuit card mounted on the interior of said housing and including an array of individual light sensitive elements arranged in a linear relationship to represent the length of a specimen to be sensed and providing a voltage signal as a function of light striking such elements, said light sensitive elements being repeatably scanned at a desired clock rate;

an exterior light and dark display mounted on said housing comprising a plurality of light emitting elements which provide light in response to a voltage signal and arranged in linear array, and;

a separate plurality of adjacent ones of said light sensitive elements being coupled to each one of the light emitting elements at corresponding locations on the array and display to provide a light signal on the display when any

one of the light sensitive elements coupled to a light emitting element produces an output signal above a threshold



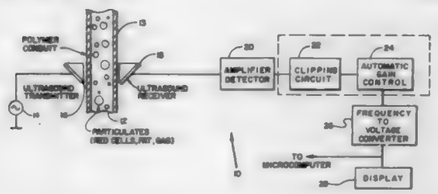
level to provide a visual display external of the housing of the conditions of the light sensitive elements.

4,690,002

DOPPLER SYSTEM FOR MEASUREMENT OF BLOOD FLOW DURING CARDIOPULMONARY BYPASS AND VENTRICULAR ASSIST

Lloyd C. Hubbard, Minnetonka, and Earl W. Clausen, Wayzata, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 14, 1986, Ser. No. 863,128
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.25 **6 Claims**



4. An ultrasonic flow measurement system for measuring velocity of blood flow through a conduit, the system comprising:

means for producing a Doppler signal having a frequency which varies as a function of the velocity of blood flow;

means for controlling amplification of the Doppler signal to compensate for variations in Doppler signal strength due to variations in red blood cell concentration in the blood; and

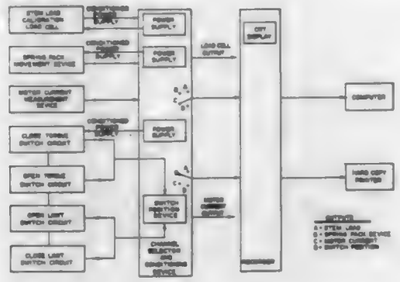
means for preventing inordinate reduction in amplification of the Doppler signal due to presence of particulates in the blood having higher ultrasonic reflectivity than red blood cells.

4,690,003

MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

John A. McNeeamey, Cobb, and Steven Nafziger, Gwinnett, both of Ga., assignors to Charbonneau & Godfrey Associates, Marietta, Ga.

Continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Jun. 6, 1985, Ser. No. 741,861
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Int. Cl.[4] G01M *19/00*; G01L *5/00*
U.S. Cl. 73—862.32 **32 Claims**



1. Method for determining and evaluating the general material and operational condition of a valve and/or an associated operator thereof said method comprising:

monitoring a drive system for said operator;

providing a dynamic valve operator spring pack movement-/time trace;

correlating valve stem load to spring pack movement to provide a valve stem load/time trace;

providing a motor current/time trace;

correlating the motor current/time trace with the valve stem load/time trace;

providing a torque and limit switch on-off/time trace;

correlating the switch on-off/time trace with the valve stem load/time trace and the motor current/time trace; and

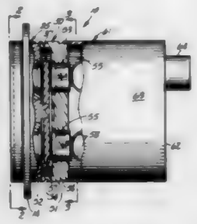
diagnosing the correlated traces to evaluate the condition of the valve and/or valve operator.

4,690,004

VARIABLE-RELUCTANCE TRANSDUCER

John R. Tavis, 3634 Highway 49, Mariposa, Calif. 95338

Filed Aug. 14, 1986, Ser. No. 896,748
Int. Cl.[4] G01L *1/14, 9/10*
U.S. Cl. 73—862.64 **4 Claims**



4. A variable-reluctance pressure transducer, comprising:

a housing;

a deflectable force-summing diaphragm mounted at one end of the housing to be movable with respect to the housing responsive to pressure applied to a front surface of the diaphragm;

two pairs of magnetic sensors, the pairs being spaced apart, and the sensors in each pair being spaced apart by a gap;

a post secured to the diaphragm and extending rearwardly with respect to the diaphragm front surface and generally between the two pairs of sensors;

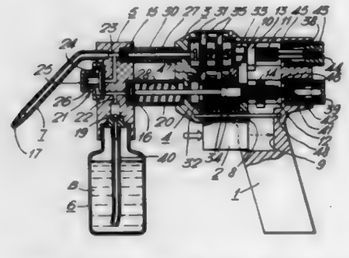
a beam secured to the post and projecting laterally from opposite sides of the post to extend into the gap between each pair of sensors, so movement of the beam responsive to pressure-caused movement of the diaphragm and post varies spacing of the beam from each sensor to change magnetic-circuit reluctance of each sensor and thereby to vary inductance of each sensor.

4,690,005

DILUTING DOSAGE DEVICE

Jukka Tervamäki, Helsinki, and Kari Järvimäki, Espoo, both of Finland, assignors to Labstystems Oy, Helsinki, Finland

Filed Nov. 1, 1985, Ser. No. 794,104
Claims priority, application Finland, Nov. 2, 1984, 844320
Int. Cl.[4] B01L *3/02*; G01N *1/14*
U.S. Cl. 73—864.12 **9 Claims**



1. Diluting dosage device for the dilution and dosage of liquids, which said device includes a handle (1), in which there is a dilution-liquid cylinder (20) open at one end, and in said cylinder a sealed first piston (16) provided with a first piston rod (12), said first piston being connected with a first spring (28), which presses the first piston towards the open end of the dilution-liquid cylinder; in which said handle there is further a sample cylinder (30) open at one end and therein correspondingly a second piston (15) provided with a second rod (11), the second piston being connected with a second spring (27), which presses the second piston towards the open end of the sample cylinder, in which said handle there is further an operating knob (2) engaging the said piston rods for pulling said pistons apart from the open ends of their cylinders; and a valve unit (5), in which there is a dilution-liquid duct (22) provided with a side branch, one end of the said dilution-liquid duct (22) communicating with the open end of said dilution-liquid cylinder and the other end of the said dilution-liquid duct (22) being provided with a suction valve (19), which valve is open when there is a negative pressure in said dilution-liquid duct, and closed when there is a positive pressure in said dilution-liquid duct, in which said valve unit there is further a sample duct (23) provided with a side branch, one end of the said sample duct (23) communicating with the open end of said sample cylinder and the other end of the said sample duct (23) being open, and in which said valve unit the side branch of said dilution-liquid duct and the side branch of said sample duct communicate with each other via a blocking valve (21), which blocking valve is closed when there is a negative pressure in said dilution-liquid duct, and open when there is a positive pressure in said dilution-liquid duct.

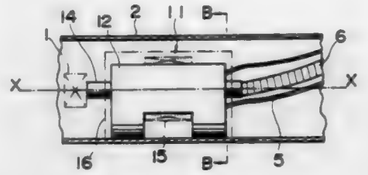
4,690,006

JIG FOR CARRYING OUT MOVEMENT AND ALIGNMENT WITHIN A PIPE

Toshimitsu Urata, Kawasaki, Japan, assignor to Kosaa Giken Co., Ltd., Kanagawa, Japan

Filed May 29, 1986, Ser. No. 867,966
Claims priority, application Japan, May 30, 1985, 60-117416
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—866.5 **11 Claims**

(A)



1. A jig for carrying out movement and alignment within a pipe comprising:

a magnet including a barrel portion having a smaller diameter than the diameter of the pipe and magnetic poles radially extending from the barrel portion to form a pair of ends formed in such a configuration that the ends constitute a part of the side of an annular column having a diameter slightly smaller than that of the pipe, the pole ends circumferentially extending within a lower portion of the pipe;

a cylindrical bore formed in said barrel portion, said cylindrical bore being aligned coaxially with an axis of said column; and

an instrument mounting shaft which is rotatably fitted through said cylindrical bore.

4,690,007

GYROSCOPE

John A. G. Moles, and Colbert M. McMahon, both of Belfast, Northern Ireland, assignors to Short Brothers PLC, Belfast, Northern Ireland

Filed Mar. 5, 1986, Ser. No. 836,533
Claims priority, application United Kingdom, Mar. 5, 1985, 8505674
Int. Cl.[4] G01C *19/12, 19/26*
U.S. Cl. 74—5.12 **12 Claims**



1. A gyroscope having a gas-turbine reaction rotor which comprises a pair of masses, one spaced from the other at each end of a shaft, and an inner gimbal which extends into the space between the two masses and there provides a rotational mount-

ing for the masses, and means for feeding to the rotor, through the space between the pair of rotor masses, gas to be discharged from the rotor to cause it to spin.

4,690,008

GEARSHIFT RANGE PRECONDITIONING SYSTEM

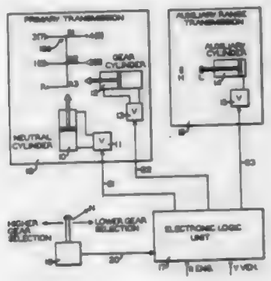
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,741

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429531

Int. Cl.⁴ F16H *5/42*

U.S. Cl. 74—336 R **15 Claims**



1. A gearshift range preconditioning system for a vehicle transmission having a plurality of neutral gear positions and a plurality of active gear positions comprising:

(a) gear-selecting means manually-operable for generating a gear-change signal indicating a request to change to one of the plurality of neutral and active gears;

(b) electronic control means coupled to said gear-selecting means for receiving such gear-change signal and for receiving vehicle-operating characteristics such as vehicle speed and engine RPMs, said electronic control means further including storage means for storing optimum values of such vehicle-operating characteristics associated with each of the plurality of neutral gear positions, said electronic control means further being effective for generating a neutral control signal representing an optimum neutral gear position as a function of a comparison of such received vehicle-operating characteristics and such optimum values of such vehicle-operating characteristics;

(c) gear-operating means connected to the vehicle transmission and coupled to said electronic control means for receiving such neutral control signal and effecting operation of the vehicle transmission into such optimum neutral gear position in response thereto; and

(d) said gear operating means including a neutral gear cylinder positionable to a plurality of positions proportionally corresponding in number to the plurality of neutral gear positions, and a first solenoid valve coupled to said electronic control means and connected to said neutral gear cylinder such that upon reception of such neutral control signal, said first solenoid valve operates to position said neutral gear cylinder into such optimum neutral gear position.

4,690,009

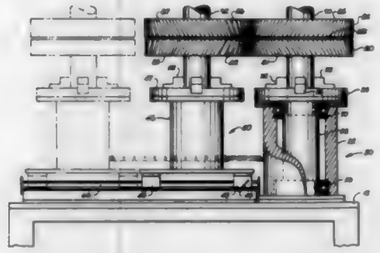
METHOD AND APPARATUS FOR PRODUCING PSEUDO - HERRINGBONE-TYPE GEARS AND GEAR PRODUCED THEREBY

Ajit K. Rakhit, Greer, S.C., assignor to Reliance Electric Company, Greenville, S.C.

Filed Nov. 29, 1985, Ser. No. 802,963

Int. Cl.⁴ F16H *55/18*

U.S. Cl. 74—409 **24 Claims**



1. Apparatus for production of a matched set of shaft-mounted pseudo herringbone gears from preformed helical gears, comprising:

(a) a base;

(b) first chuck means received on said base, said first chuck means defining a shaft receiving bore therein for receiving a first shaft having a first helical gear thereon;

(c) second chuck means received on said base, said second chuck means defining a shaft receiving bore therein extending substantially parallel to said bore in said first chuck means for receiving a second shaft having a second helical gear thereon, at least one of said first and second chuck means being adapted for relative movement with respect to said other of said chuck means while maintaining said shaft receiving bore of said first chuck means substantially parallel to said shaft receiving bore of said second chuck means; and

(d) locking means for locating and securing said first and second chuck means with a predetermined distance therebetween, whereby said first shaft may be received in said shaft receiving bore of said first chuck means and said second shaft may be received in said shaft receiving bore of said second chuck means with the first helical gear of said first shaft substantially meshing with the second helical gear of said second shaft, said first shaft and said second shaft being positioned such that a third helical gear may be provided said first shaft, and a fourth helical gear may be provided said second shaft for substantially meshing with said third helical gear, allowing said first and second helical gears to substantially mesh with one another and said third and fourth helical gears to substantially mesh with one another for producing a matched set of pseudo herringbone gears.

4,690,010

ROBOT ARM DRIVE APPARATUS OF INDUSTRIAL ROBOT

Kazuyuki Matsumoto, Ogaki; Mashstaka Hashimoto, and Michiyoshi Iwata, both of Fuwa, all of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 817,106, Jan. 8, 1986, abandoned. This application Jul. 29, 1986, Ser. No. 890,971

Claims priority, application Japan, Jan. 18, 1985, 60-7856; Mar. 18, 1985, 60-53866

Int. Cl.⁴ B66C *23/00*; F16H *1/28*; H02K *7/02*

U.S. Cl. 74—469 **11 Claims**

1. A robot arm drive apparatus of an industrial robot comprising:

an electric motor having a drive shaft;

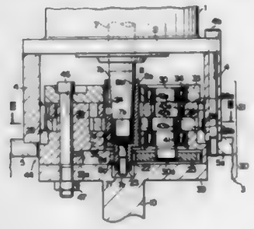
a first robot member having said electric motor mounted thereon;

a second robot member rotatably supported on said first robot member; and

reduction gear means for reducing rotation of said electric motor and then transmitting to said second robot member;

said reduction gear means comprising a primary reduction gear for reducing said rotation of said electric motor and a secondary, planetary reduction gear for further reducing rotation of output of said primary reduction gear;

said electric motor, when in normal operation, having the number of rotations which include the characteristic torsion frequency of a drive system comprising said electric



motor, said second robot member and said reduction gear means;

said primary reduction gear having a reduction ratio so that the maximum number of rotations of said electric motor is reduced less than said characteristic torsion frequency of the drive system;

said secondary reduction gear comprising an eccentric input shaft connected with said primary reduction gear, an external gear which is rotatable eccentrically in response to rotation of said input shaft, an internal gear held in mesh with and larger in number of teeth than said external gear by one, and carrier means held in engagement with said external gear.

4,690,011

SELECTOR MECHANISM FOR AN INFINITELY VARIABLE TRANSMISSION

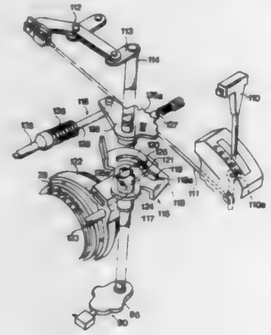
Yasuhito Sakai, Higashimurayama, and Kenichi Yamada, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,560

Claims priority, application Japan, Jan. 31, 1984, 59-15411

Int. Cl.⁴ B60K *20/12*; F16D *67/02*

U.S. Cl. 74—475 **7 Claims**



1. In a selector mechanism for an infinitely variable belt-drive transmission for a vehicle, the transmission having a selector device comprising a synchronizer for selection of forward and reverse gears, and a hydraulic circuit for changing the transmission ratio of the transmission, the improvement comprising:

a selector lever mounted shiftably along a line so as to perform a selection of ranges including said forward and reverse gears;

a rotatable shaft operatively connected to the selector lever so as to be rotated by the selector lever;

a cam plate secured to the rotatable shaft and having a cam groove including a first arcuate portion and a second arcuate portion which are different in radii, and an intermediate portion between the first and second arcuate portions, the second arcuate portion corresponding to a drive range, and respectively, a high engine speed drive range for downshifting the transmission ratio during driving in the drive range, and the first arcuate portion corresponding to a reverse range and respectively a parking range;

cam follower means following the cam groove for operating the synchronizer; and

a parking lock mechanism including a detent plate secured to the rotatable shaft and having a plurality of indentations, a spring-loaded ball engaging with one of the indentations for holding the rotatable shaft at a selected position, a first cam connected to the detent plate and a locking pawl on a housing of the transmission which are so arranged that when the parking range is selected, the first cam engages the pawl to engage the pawl with a rotatable member of the transmission so as to lock said member;

a second cam secured to the rotatable shaft; and

means actuated by the second cam when the cam plate is rotated into a position corresponding to said high engine speed drive range for causing the hydraulic circuit to provide a high transmission ratio.

4,690,012

ROBOT WRIST

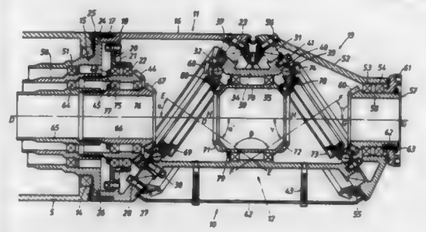
Håkan Dahlquist, and Herbert Kaufmann, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 645,686, Aug. 30, 1984, abandoned. This application May 7, 1986, Ser. No. 859,239

Claims priority, application Sweden, Sep. 1, 1983, 8304726

Int. Cl.⁴ G25J *17/02*

U.S. Cl. 74—479 **8 Claims**



1. A wrist mechanism which can be attached to the arm of a robot and which can support a working tool, said wrist mechanism comprising

a first tubular wrist part which defines a first central axis therethrough and which has a first end and a second end, said first end being mountable on said robot arm so as to be rotatable about said first central axis and said second end having an oblique orientation relative to said first central axis, said first central axis defining a first rotation axis of said wrist mechanism,

a second tubular wrist part which defines a second central axis therethrough and which has a first end and a second end, each of said first and second ends having an oblique orientation relative to said second central axis,

first journal means for mounting the first end of said second tubular wrist part to the second end of said first tubular wrist part and to enable said second tubular wrist part to rotate relative to said first tubular wrist part about a second rotation axis which intersects said first central axis,

a third tubular wrist part which defines a third central axis therethrough and which has a first end and a second end, said first end having an oblique orientation relative to said third central axis,

second journal means for mounting the first end of said third tubular wrist part to the second end of said second tubular wrist part and to enable said third tubular wrist part to rotate relative to said second tubular wrist part about a third rotation axis which intersects said third central axis,

bevel gear means interconnecting the second end of said first tubular wrist part with the first end of said third tubular wrist part so as to cause coordinated rotation therebetween,

a tool attachment means, and

a third journal means for mounting said tool attachment means on the second end of said third tubular wrist part and to enable said tool attachment means to rotate relative to said third journal means about a fourth rotation axis which intersects said third rotation axis,

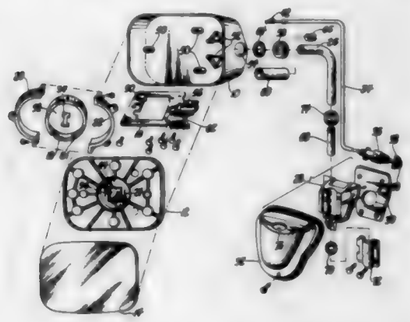
said first, second and third tubular wrist parts allowing a cable to be extended therethrough.

4,690,013

REMOTE CONTROL REAR VIEW MIRROR, CABLE OPERATED

Charles Bramer, Norton Shores, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.

Filed Feb. 13, 1986, Ser. No. 829,004
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 M **5 Claims**



1. A rear view mirror assembly comprising;

a housing shell having a mirror glass receptive opening provided therein, mounting pads formed within and on a back wall of said housing shell and a mounting plate adapted to be engaged on said pads,

a mirror glass receptive frame part received within the opening in said housing shell and having a spherical surfaced projection on a back side thereof,

a gimbal ring member adapted for gimbal mounting and having the projection on the back side of the mirror glass frame part received in snap-lock spherical engagement therewith,

a pair of retainer rings adapted to be clamped together and to have said gimbal ring member pinned to said rings for movement about a given axis,

said retainer rings and mounting plate being held and retained in said housing shell by the same fastener means,

said gimbal mounted ring member having an inner wall surface thereof formed to complement the spherical form of the back wall projection on said mirror glass frame part and formed to include relief slots to afford the snap-lock engagement aforesaid,

said back wall projection being also formed to include a rearwardly disposed arm having a gear tooth segment provided on an extended end thereof,

said gimbal mounted ring member having a back wall and an opening formed in said back wall receptive of said rearwardly disposed arm and the gear toothed segment therethrough,

means mounted on the back wall of the gimbal mounted ring member and for engagement with the gear toothed segment on said rearwardly disposed arm to effect relative movement therebetween,

remote control means associated with said last mentioned means to effect movement both thereof and of said gimbal ring member relative to said retainer rings, and

said remote control means including a bowden wire and said last mentioned means including a small pinion gear mounted on the end of said wire and between supporting arms formed on the back wall of said gimbal mounted ring member.

2. A rear view mirror assembly, comprising;

a housing shell having a mirror glass receptive opening provided thereon, mounting pads formed within and on a back wall of said housing shell and a mounting plate adapted to be engaged on said pads,

a mirror glass receptive frame part received within the opening in said housing shell and having a spherical surfaced projection on a back side thereof,

a gimbal ring member adapted for gimbal mounting and having the projection on the back side of the mirror glass frame part received in snap-lock spherical engagement therewith,

a pair of retainer rings adapted to be clamped together and to have said gimbal ring member pinned to said rings for movement about a given axis, and

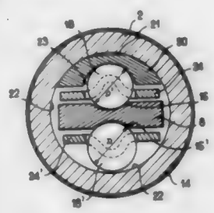
said gimbal mounted ring member having an inner wall surface thereof formed to complement the spherical form of the back wall projection on said mirror glass frame part and formed to include relief slots to afford the snap-lock engagement aforesaid.

4,690,014

FLEXIBLE-TUBE DEVICE FOR TRANSMITTING LONGITUDINAL FORCES

Raymond Richoux, ISPE 40600 Biscarrosse, France

Filed Dec. 5, 1985, Ser. No. 804,785
Claims priority, application France, Dec. 14, 1984, 84 19126
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 R **7 Claims**



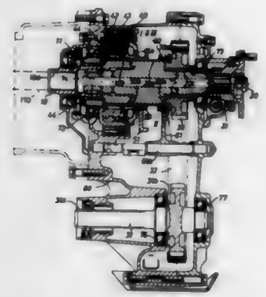
1. A flexible-tube device for transmitting longitudinal forces which comprises a flexible tubular sheath having a circular cross-section, a flat and flexible core strip placed within the sheath, a first row of balls rolling in a first ball-race cut in a first face of the core strip, a second row of balls rolling in a second ball-race cut in the second core-strip face opposite to the first; first and second cage strips for retaining the balls; a single metallic rail having a ball-race groove for the balls only of the first row of balls, said rail being applied against the internal surface of the tubular sheath; wherein the balls of the second row of balls roll directly on the internal surface of said tubular sheath and wherein said tubular sheath has a smooth internal surface which serves as a ball-race for said balls of said second row of balls; and the ends of said metallic rail being anchored in sleeve means.

4,690,015

POWER TRANSFER DEVICE FOR AUTOMOTIVE VEHICLES

Shuji Nagano; Shuichiro Ida; Toshio Yoshinaka, and Shozo Okuda, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 6, 1985, Ser. No. 805,748
Claims priority, application Japan, Dec. 7, 1984, 59-186353[U]
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—665 GE **4 Claims**



1. A power transfer device associated with a power transmission for an automotive vehicle, comprising:

an input shaft for connection to an output shaft of said power transmission;

a first output shaft arranged coaxially with said input shaft and rotatably coupled at the inner end thereof with said input shaft;

a second output shaft arranged in parallel with said input and first output shafts;

an output member rotatably mounted on said first output shaft and connectable with said first output shaft, said output member being operatively connected to said second output shaft;

a change-speed mechanism mounted on said input shaft and having an input element connected with said input shaft, a first output element for providing a high speed drive power train, and a second output element for providing a low speed drive power train;

first coupling means mounted on said first output shaft between said change-speed mechanism and said output member and shiftable between a first position where said first coupling means is retained to connect said first output shaft to the first output element of said change-speed mechanism and a second position where said first coupling means is retained to connect said first output shaft to the second output element of said change-speed mechanism;

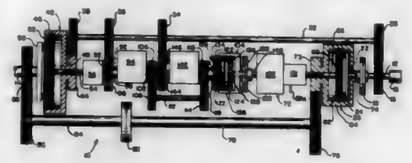
second coupling means mounted on said first output shaft between said first coupling means and said output member and shiftable between a first position where said second coupling means is retained to connect said output member to said first output shaft and a second position where said second coupling means is retained to disconnect said output member from said first output shaft; and a shift means for shifting said first and second coupling means between their respective first and second positions wherein said first coupling means is arranged to be shifted to and from the second position only when said second coupling means is retained in the first position, while said second coupling means is arranged to be shifted to and from the second position only when said first coupling means is retained in the first position.

4,690,016

MULTISTATE DIFFERENTIAL TRANSMISSION

Brian Whalen, 8 Hawk Dr., Selden, N.Y. 11784

Filed Jul. 5, 1985, Ser. No. 751,896
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—687 **10 Claims**



1. A multistate transmission having an input shaft and an output shaft comprising:

a. planetary gear train means having a ring gear, planetary gears with a planetary gear carrier, and a sun gear, said planetary gear train means connected to said output shaft:

b. first bypass means connecting said input shaft to said planetary gear train means;

c. differential transmission means for receiving its input from said input shaft and having means to adjust the torque and speed output infinitely variable over its range of operation for each state of said transmission;

d. power return means for receiving the output of said differential transmission means;

e. means including clutch operated speed reversing means for interconnecting said sun gear in said planetary gear train means with said power return means;

f. said power return means including a first gear to receive the output of said differential transmission means, a second gear connected through said interconnecting means to said sun gear, carrier gear means for interconnecting said first and second gears supported for rotation on a carrier shaft, and means for supporting said carrier shaft for radial rotation;

g. first multispeed transmission means connecting said means for supporting said carrier shaft to said first bypass means whereby the rotational speed of said carrier shaft is determined as a fraction of the speed of said input shaft, whereby an increase in the output speed of said differential transmission means will cause a change in the speed of said sun gear causing said output shaft to increase in speed;

h. means to shift the state of said multistate transmission when the maximum speed of the output shaft is reached for the existing state of said multistate transmission comprising means to unload said first multispeed transmission means and bypass said power return means during shifting of the latter from one speed to another; and

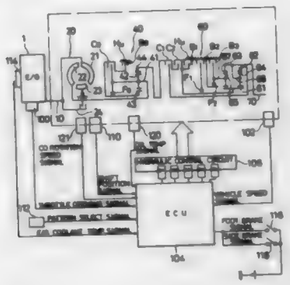
i. means to provide direct coupling between said input shaft and said output shaft through said planetary gear train means while said first multispeed transmission means is shifting from one speed to another.

4,690,017

SHIFT CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

Hiroji Taniguchi; Kunihiro Iwatsuki, and Yoshio Shindou, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 30, 1986, Ser. No. 880,029
Claims priority, application Japan, Jul. 1, 1985, 60-144340; Aug. 20, 1985, 60-182485
Int. Cl.⁴ B60K *41/10*
U.S. Cl. 74—866 **21 Claims**



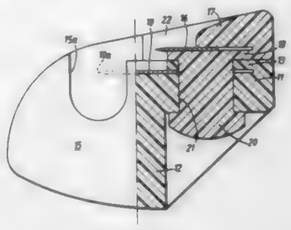
1. A shift control system of an automatic transmission, wherein said automatic transmission includes first and second transmission sections capable of automatically shifting gear stages independently to thereby achieve multi-stage shifts, said control system comprising:
means for starting a shift in said first transmission section;
means for starting a shift in said second transmission section at a time after the start of a shift in said first transmission section; and
means for ending the shifts in said first and second transmission sections in synchronism with each other.

4,690,018

RAZOR BLADE ASSEMBLY AND ITS METHOD OF MANUFACTURE

David S. Duncan, London, England, assignor to Wilkinson Sword Limited, High Wycombe, England

Filed Sep. 18, 1985, Ser. No. 777,158
Claims priority, application United Kingdom, Sep. 20, 1984, 8423839
Int. Cl.⁴ B21K *21/00*; B26B *21/00*
U.S. Cl. 76—101 R **4 Claims**



1. A method for the manufacture of a razor blade assembly which comprises forming cutting edges of first and second blades, molding a blade platform and guard bar on to said first blade, molding a top cap on to said second blade, locating the second blade above and parallel spaced from the first blade with the cutting edges of the blades parallel to one another and in mutually staggered relationship, and securing the blades rigidly with respect to one another, which method further comprises molding a blade spacer and rivets on the second blade, the spacer and top cap being formed on opposite sides of the second blade, inserting the rivets in holes provided in the first blade and blade platform and forming heads on the portions of the rivets projecting through said holes.

4,690,019

OPERATING WRENCH FOR TAMPERPROOF HYDRANTS

Joseph L. Daghe; Dennis W. Humes, both of Decatur; Mervin D. Stanley, Stonington, and Gary L. Bouc, Decatur, all of Ill., assignors to Mueller Co., Decatur, Ill.

Continuation-in-part of Ser. No. 736,831, May 22, 1985, Pat. No. 4,554,944. This application Nov. 15, 1985, Ser. No. 798,287
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.⁴ B25B *13/28*
U.S. Cl. 81—99 **6 Claims**



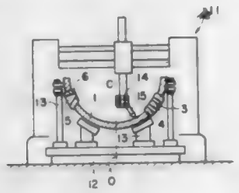
1. A tamperproof fire hydrant comprising:
barrel means having an open upper end portion;
valve means in a lower portion of said barrel means;
valve stem means extending from said valve means upwardly within said barrel means;
a top closure member secured to the upper end section of said barrel means, said top closure member having an aperture therethrough;
a rotatable operating nut operatively connected to said valve stem means for reciprocating the same, said rotatable operating nut having a polygonal end portion projecting out of the aperture of said top closure member;
a tubular hold-down nut carried by said top closure member for positioning said rotatable operating nut against axial movement;
a dome shaped cap covering the polygonal end portion of said operating nut, said cap having a lower edge spaced from said hold-down nut to provide a limited access space to the polygonal end portion of said operating nut;
means supporting said dome shaped cap on said polygonal end portion of said operating nut for relative free rotation with respect thereto; and
operating means for rotating said polygonal end portion of said operating nut in said limited access space between said dome shaped cap and said hold-down nut, said operating means including a handle assembly having a fixed flat jaw part extending from one end of the same, said fixed flat jaw part having a thickness no greater than said limited access space between said dome shape cap member and said hold-down nut and having a straight planar edge surface extending at an acute angle to a longitudinal axis of said handle assembly for engaging at least a substantial portion of one side of said polygonal end portion, said handle assembly further having a flat hook-shaped jaw part pivotally connected thereto adjacent said fixed flat jaw part and projecting axially of the same, said pivotal flat hook-shaped jaw part having cooperating edge surfaces facing generally toward said planar edge surface of said fixed flat jaw part for engaging at least a portion of three other sides of said polygonal end portion of said operating nut, said pivotal flat hook-shaped jaw part having a thickness no greater than said limited access space between said dome shaped cap member and said hold-down nut, and spring means carried by said handle jaw part to normally urge said cooperating surfaces of the said pivotal flat hook-shaped jaw part toward said straight planar surface of said fixed jaw part when rotating said operating nut, said pivotal jaw and said fixed jaw thereby squeezing said end portion tightly without restraint, said spring means permitting said pivotal flat hook-shaped jaw part to be pivoted away from said polygonal end portion when said operating means is being removed.

4,690,020

APPARATUS FOR WORKING PERIPHERAL WALL OF HEMISPHERICAL SHELL

Ryoichiro Sasano; Tsutomu Toyohara, and Toshimichi Takigawa, all of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 593,628, Mar. 26, 1984, Pat. No. 4,617,845. This application Jul. 2, 1986, Ser. No. 881,064
Claims priority, application Japan, Mar. 29, 1983, 58-51574
Int. Cl.⁴ B23B *3/28, 5/40*
U.S. Cl. 82—2 D **2 Claims**



1. A profile surfacing apparatus for working a peripheral wall of a hemispherical shell comprising a boring machine having a boring head (**31**) with a main spindle (**33**), and apparatus body (A) mounted on said boring head for receiving said main spindle, a rotary flange (**50**) rotatably supported on said apparatus body and connected to said main spindle for receiving a rotary drive force of said main spindle, said rotary flange having a rotation axis, a rotary arm (**60**) provided on an end of said rotary flange and having a slide guide portion (**60a**, **60b**) extending in a direction perpendicular to the rotation axis of said rotary flange, a template (**92**) fixed to said rotary arm and extending along said slide guide portion, a slide head (**78**) slidable along said slide guide portion of said rotary arm, a cutting tool holder (**84**) provided with a cutting tool (**85**) and mounted on said slide head for movement parallel to the rotation axis of said rotary flange in cutting and feeding directions, and a profiling unit engaged with said template and connected to said tool for moving said cutting tool in the cutting and feeding directions along said template which is mounted on said rotary arm for profiling the semispherical shell.

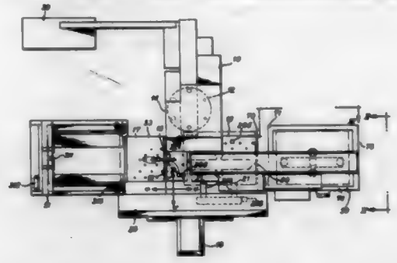
4,690,021

AUTOMATIC LOAD UNLOAD TURRET PUNCH

Stephen C. Clark, Clemson, S.C., assignor to Strippit/Di-Acro-Houdaille, Inc., Akron, N.Y.

Continuation of Ser. No. 52,241, Jun. 26, 1979, abandoned, which is a continuation of Ser. No. 815,821, Jul. 15, 1977, abandoned. This application Sep. 20, 1985, Ser. No. 777,872
Int. Cl.⁴ B21D *43/11, 43/22, 43/24*
U.S. Cl. 83—71 **18 Claims**

1. A machine tool device comprising, in combination: an automatic control device, a machine tool, a worktable adjacent the machine tool, a workpiece loading device adjacent the worktable having carriage means for moving a workpiece from a supply spaced from the worktable to a loading portion of the worktable and depositing it thereon, a workpiece grasping and moving device associated with the worktable for moving a workpiece on the worktable, means for gauging a workpiece deposited on the loading portion including sensing means sensing engagement of the deposited workpiece with devices having positions on the worktable which is known by the control device at the time of gauging, at least one of said devices being movable under control of said controller to a known position, said means for gauging including moving means causing relative movement between the workpiece and the sensing means to cause said engagement, actuation of the sensing means providing an input to the automatic control device indicating positioning of portions of the workpiece at



the known positions, the machine tool, loading device, workpiece grasping and moving device and moving means all being under the control of the control device.

4,690,022

STAMPING DEVICE HAVING IDENTICAL MOUNT BASES FOR ROTATABLY SUPPORTING A CUTTING TOOL AND AN ANVIL

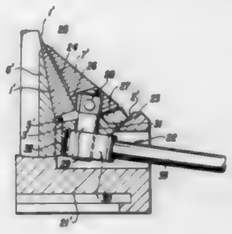
Takehiro Takahashi, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,965
Int. Cl.⁴ B26D *1/36*; B31B *1/24*
U.S. Cl. 83—308 **7 Claims**

1. A stamping device for cutting holes in paper sheet such as corrugated cardboard, comprising:
a pair of identically shaped mount bases, each of which is slidably mounted on a respective rotatable upper and lower shaft, each of said mount bases having the same dimensions and being of one-piece cylindrical construction and fixed to said respective shaft for rotation therewith, each of said mount bases having means thereon for adjusting the position of said mount bases along said respective shaft;
an anvil and a knife base both of which are interchangeably mounted on said mount bases;
said anvil slidably disposed on one of said mount bases, said anvil being freely rotatable with respect to said one mount base;
said knife base slidably disposed on the other of said mount bases, means fixing said knife base to said other mount base for rotation therewith, said knife base having a cutting tool disposed thereon; and
a pair of identically shaped retaining plates, each of said retaining plates being fixed to a respective one of said mount bases, one of said retaining plates engaging said anvil for positioning said freely rotatable anvil on said one of said mount bases, the other of said retaining plates engaging said knife base for positioning said knife base on said other mount base.

2. The stamping device of claim 1, wherein said means fixing said knife base to said other mount base comprises a key which is fitted in respective slots in said knife base and said other mount base.

faces in condition for cutting wherein a cutting operation with the blade is effected by a cutting region of the cutting blade, which mechanism comprises, a base, a blade support mounted on said base defining a generally planar blade abutment face extending across said support for directly abutting the front face of the blade in the vicinity of the cutting region of the cutting blade, a jaw including means defining two narrow blade-engaging surfaces extending transversely of and across the total transverse extent of the jaw and arranged relative to said blade support so that each of said narrow blade-engaging surfaces directly opposes said blade abutment face along the entire length of said blade-engaging surfaces, said jaw being movably mounted on said support for movement relative to said blade abutment face between one jaw position at which a blade which has been operatively positioned within said mechanism so that the front face therof operatively abuts said blade abutment face is stably secured between said jaw and said blade abutment face in the vicinity of the cutting region of the



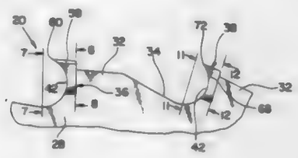
blade as said two narrow blade-engaging surfaces of the jaw and only said two narrow blade-engaging surfaces engage the back face of the blade and effectively press the blade against said blade abutment face and another jaw position at which said two narrow blade-engaging surfaces are in condition for releasing the blade from the mechanism, and means acting between said blade support and said jaw for releasably urging said jaw from said another jaw position to said one jaw position so that when a rigid, wedge-shaped blade is operatively positioned between said blade abutment face and said jaw and said jaw is said urged by said urging means from said another jaw position to said one jaw position, the blade is securely clamped in the vicinity of the cutting region of the cutting blade used for cutting and so that movement of said jaw from said one position to said another position permits the blade to be shifted relative to and across said support for operatively positioning an alternative cutting region of the cutting blade between said jaw and said abutment face thereby permitting substantially all of the blade to be used.

4,690,024

SAW BLADE AND TIP THEREFOR

Peter C. Chaconas, Glyndon, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 28, 1985, Ser. No. 706,523
Int. Cl.[4] B27B *33/08, 33/12*
U.S. Cl. 83—852 **45 Claims**



1. A tip for a saw blade having a gullet formed integrally with the blade, which comprises:

a one-piece tip body for assembly with the saw blade immediately adjacent the integrally formed gullet;

the tip body being composed of a hardened long-wearing material;

a front face formed on the tip body extending from a first-end edge of the front face to a second-end edge thereof;

a top face formed on the tip body;

a first side and a second side formed on the tip body on opposite sides of the front face and contiguous therewith;

the front face and the top face being contiguous along a common edge coincidental with the first-end edge of the front face and which extends from the first side of the tip body toward a second side of the tip body;

the front face being formed with a curved surface contiguous with the common edge and extending from the common edge over the entire front face to the second-end edge thereof which is positionable adjacent the gullet integrally formed with the saw blade; and

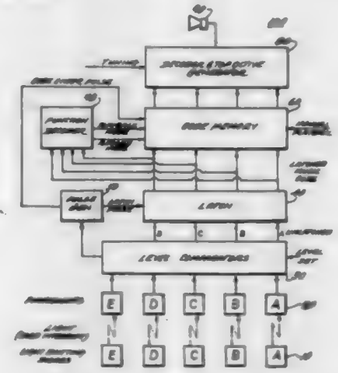
a cutting edge formed by the portion of the common edge which extends from a the first side of the tip body toward the second side of the tip body.

4,690,025

MUSICAL ENTERTAINMENT BOARD GAME

Robin H. Hines; Michael R. Glasscock, and D. Bruce Johnson, all of Tullahoma, Tenn., assignors to Quantime, Inc., Tullahoma, Tenn.

Filed Aug. 30, 1985, Ser. No. 771,024
Int. Cl.[4] G10H *3/06, 5/00*
U.S. Cl. 84—1.18 **4 Claims**



1. An apparatus for reproducing a portion of a melody so that individuals can attempt to identify the title of the melody after listening to said portion of said melody, said apparatus comprising:

melody encoding means comprising a card having a plurality of holes in a predetermined pattern, said predetermined pattern of holes representing the muscial notes of said portion of melody to be reproduced;

a set of light emitting diodes;

a set of photodiodes facing said set of light emitting diodes, wherein said card is inserted between said set of light emitting diodes and said set of photodiodes so that said predetermined pattern of holes determines a predetermined sequence in which said photodiodes will receive light from said light emitting diodes and photodiodes to thereby generate said signals;

comparator means for comparing signals output from a portion of said set of photodiodes to a predetermined input signal level to determine which ones of said portion of said set of photodiodes are at a high signal level and which ones of said portion of said set of photodiodes are at a low signal level;

latching means for latching said high and low signals received from said comparator means in response to an input latching signal generated in accordance with at least one photodiode, other than said portion of said set photodiodes, going to a high signal level; and

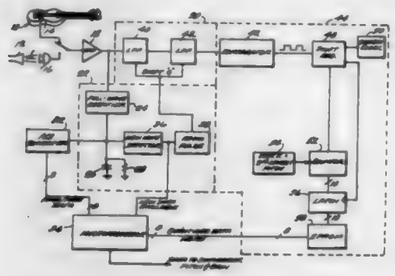
converter means for converting said signals determined by said predetermined sequence in which said photodiodes receive light from said light emitting diodes into said musical notes of said portion of said melody to be reproduced.

4,690,026

PITCH AND AMPLITUDE CALCULATOR AND CONVERTER WHICH PROVIDES AN OUTPUT SIGNAL WITH A NORMALIZED FREQUENCY

Bing McCoy, #8 Carderock Ct., Bethesda, Md. 20817, assignor to Bing McCoy, Bethesda, Md. and Donald DeLaski, Great Falls, Va.

Filed Aug. 22, 1985, Ser. No. 768,447
Int. Cl.[4] G10H *1/12, 3/02, 7/00*
U.S. Cl. 84—1.19 **25 Claims**



1. A system for determining a standard quantized fundamental frequency of a periodic signal from a musical instrument, comprising:

means for detecting said periodic signal and providing a detect signal indicative thereof;

threshold means for determining when said detect signal exceeds a predetermined threshold;

counter means for counting the number of times said threshold is exceeded in a determinable time period and providing a count indicative thereof;

memory means for storing a plurality of quantized fundamental frequencies at predetermined addressable locations, said quantized frequencies representing a standard frequency to which all frequencies within a predetermined range are normalized; and

means for addressing said memory means based on said count and reading the quantized fundamental frequency stored thereat.

4,690,027

APPARATUS FOR FINE TUNING STRINGS OF A STRINGED MUSICAL INSTRUMENT

Nobuyuki Ido, 910-1, Osugi, Seki-shi, Gifu-ken, Japan

Filed Mar. 26, 1986, Ser. No. 844,402
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—298 **3 Claims**

1. An apparatus for fine tuning a plurality of strings of a stringed musical instrument, comprising:

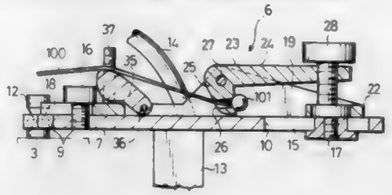
(a) a base plate adapted to be attached to a body of the stringed musical instrument;

(b) a plurality of saddle plates mounted on said base plate;

(c) a string anchoring member on each said saddle plate, each said anchoring member having an arm pivotable toward and away from said base plate and a hook extending from said arm and adapted to catch a terminal ball disposed on a rear end of a respective string, said hook being pivotable longitudinally of the respective string in response to pivotal movement of said arm;

(d) first adjusting means mounted on said arm of each said anchoring member for adjusting a distance between said arm and said base plate to change the position of said hook to fine tune the respective string;

(e) first and second side walls respectively disposed at first and second sides of each said anchoring member;



(f) a saddle mounted separately on each of said saddle plates in front of said anchoring member, said saddle having a base portion and having opposite first and second side portions with a groove formed therebetween for receiving a respective string; and

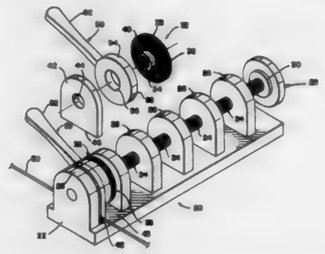
(g) a pin provided on each of said first and second side walls for supporting said base portion of said saddle for pivoting said saddle on said saddle plate toward and away from said base plate.

4,690,028

STRING CLAMPING DEVICE

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,670
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—314 N **15 Claims**



1. A clamping device for clamping the strings of a stringed musical instrument comprising:

a base, the base including a plurality of threaded shank elements, and a plurality of spaced stationary clamping plates forming an array extending across and spaced between the strings of the musical instrument when positioned on the musical instrument;

a plurality of threaded nuts, each threaded on a respective shank element; and

a plurality of actuation means, each interposed between a respective threaded nut and stationary clamping plate for selectively applying clamping pressure to a string positioned between a respective actuation means and stationary clamping plate by engaging and rotating with a respective threaded nut as clamping pressure is applied to the string.

4,690,029

METHOD OF SECURING A FLARE COMPOSITION SLEEVE IN A BLIND BOREHOLE AT THE TAIL PORTION OF A PROJECTILE BODY

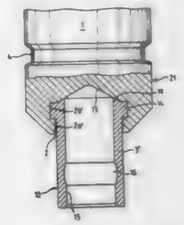
Harald Katzmann, Neuenhof; Werner Senn, Zurich, and David Ammann, Gossau, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Dec. 9, 1986, Ser. No. 939,860

Claims priority, application Switzerland, Dec. 16, 1985, 05353/85

Int. Cl.⁴ F42B *3/00*

U.S. Cl. 86—20.11 **4 Claims**



1. A method of securing a flare composition sleeve in a blind borehole at the tail portion of a projectile body, comprising the steps of:

forming at the tail portion of the projectile body a blind borehole having an annular groove located at a predetermined region of the blind borehole;

providing a bolt member from which there is to be formed said flare composition sleeve;

inserting said bolt member into said blind borehole until an end surface thereof abuts against a bottom portion of said blind borehole;

rotating said bolt member and said projectile body containing the blind borehole relative to one another while exerting pressure between the relatively rotating bolt member and the projectile body conforming the blind borehole to produce frictional heat;

generating during said relative rotation of the bolt member and the blind borehole due to frictional heat a rise in temperature at the region of said end surface of said bolt member;

continuing said relative rotation until said temperature rise is sufficient to cause a flow of material at the region of said end surface of said bolt member into said annular groove in order to form a flange member at said bolt member which is thus secured in said annular groove and the blind borehole by means of the flange member; and

then machining the bolt member secured in the blind borehole in order to form the flare composition sleeve.

4,690,030

MINE FIELD CLEARING APPARATUS

Simcha Bar-Nefy, Omer, and Michael Tiomkin, Beersheva, both of Israel, assignors to Israel Aircraft Industries Ltd., Ben Gurion Airport, Israel

Continuation-in-part of Ser. No. 554,639, Nov. 23, 1983, Pat. No. 4,590,844. This application Sep. 24, 1984, Ser. No. 653,835

Claims priority, application Israel, Sep. 25, 1983, 69802

The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.

Int. Cl.⁴ F41F *3/02*

U.S. Cl. 89—1.13 **15 Claims**

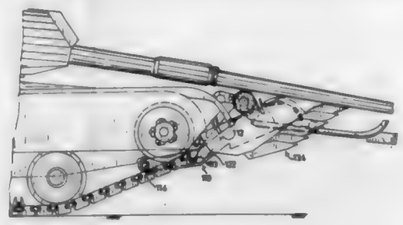
1. Mine clearing apparatus for attachment to a vehicle and comprising:

a frame mountable onto a vehicle for selectable positioning in a raised or lowered orientation;

means, mounted onto said frame, for raising and shunting aside mines to a location removed from the path of said vehicle;

means for selectably retaining said frame in a raised orientation; and

electrically operated means operable from inside the vehicle for automatically raising said frame and said raising and



shunting means from a lowered orientation to a raised orientation independently of vehicle motion, wherein said means for automatically raising comprises motor means as well as lifting means, the lifting means being affixed to said frame and being in driven engagement with said motor means.

4,690,031

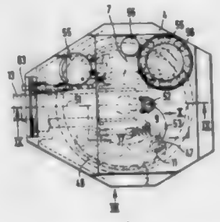
AUTOMATIC LOADER FOR AN ARMORED VEHICLE HAVING A ROTATABLE TURRET

Josef Metz, Neuss; Manfred Pehker, Duesseldorf, and Erich Zielinski, Haan, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 617,677, Jun. 5, 1984, Pat. No. 4,632,011. This application Apr. 28, 1986, Ser. No. 856,503

Int. Cl.⁴ F41F *9/10*

U.S. Cl. 89—36.13 **4 Claims**



1. In an armored vehicle, said vehicle having a rotatable turret which has an uppermost region visible from the outside, an improved automatic loader for transporting projectiles, said projectiles being vertically stored in said vehicle and being movable from an endless band automatically driven magazine which extends into said uppermost region to a position in the loading chamber of a large caliber weapon from which it is slid into the gun barrel of the weapon by means of rammer means, the improvement comprising

(a) said endless band automatically driven magazine being operatively mounted in said uppermost region in a trough portion of the armored vehicle which is disposed immediately below said uppermost region of the rotatable turret and on one side of the longitudinal axis of the gun barrel, encircled by a partition wall, said armored vehicle also including a personnel chamber which is separated from said uppermost region and trough of said armored vehicle and is located on the other side of the lognitudinal axis of the gun barrel;

(b) a plurality of projectiles being stored in said magazine in a first vertical position, feeding means being operatively

mounted in said armored vehicle for successively grasping projectiles stored in said magazine in said first position and transporting them by means of a pivotal movement into a second loading position in said loading chamber; said feeding means being pivotally mounted in said armored vehicle about a horizontal shaft and located between the longitudinal axis of the gun barrel and the magazine;

and first driving means operatively connected to said feeding means for pivoting them about said horizontal shaft;

(c) loading tray means operatively mounted in said armored vehicle, said feeding means operatively connected to said loading tray means ;

(d) said loading tray means being movable by said first driving means via said feed means by being swung upwardly toward the turret, and

(e) said loading tray means being movable from a first vertical upright position in which position projectiles are stored through a first arc in which said tray remains normal to a first plane to an intermedinte position and through a second arc in a second plane to a loading position, said first and second planes being normal to each other and said loading position being disposed in axial alignment with the gun barrel.

4,690,032

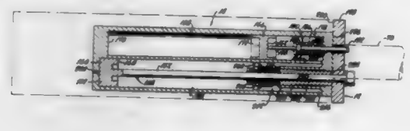
BREECH/RECEIVER ASSEMBLY FOR AUTOMATIC CANNONS

Eugene M. Stoner, Palm City, Fla., assignor to ARES, Inc., Port Clinton, Ohio

Continuation of Ser. No. 559,304, Dec. 8, 1983, Pat. No. 4,599,933. This application Mar. 11, 1986, Ser. No. 838,590

Int. Cl.⁴ F41F *19/14*

U.S. Cl. 89—43.01 **9 Claims**



1. A breech/receiver assembly for automatic cannon having a barrel comprising;

a receiver having trunion means for pivotally supporting the receiver in a a gun mount,

a breech having means defining a first aperture therein for receiving a chamber and a second aperture therein, communicating with said first aperture and adapted for receiving the barrel at an outside end thereof, said breech being slidably mounted within the receiver;

a chamber having means defining an opening therethrough sized for accepting ammunition, said chamber being mounted within the breech first aperture for rotational movement about a chamber axis from a first position in which the opening therein is aligned with the breech second aperture and barrel and a second position in which the opening therein is disposed at an angle with said breech second aperture and is aligned for simultaneously accepting ammunition from a point outside the breech and ejecting ammunition casings therefrom, said chamber axis being coaxial with said trunion means when the chamber aperture is aligned with the breech first aperture and the breech is in battery position; and,

combination recoil and counterrecoil buffer means disposed within said breech for buffering barrel recoil and counterrecoil forces as the breech slides within the receiver, said combination recoil and counterrecoil buffer means including two fixed pistons and means defining first and second longitudinal chambers in said breech for receiving said fixed pistons, one piston being disposed in each of said first and second longitudinal chambers, said longitudinal chambers being disposed on opposite sides of said breech first aperture and having axes generally parallel with one another and with the breech second aperture longitudinal axis, said fixed pistons being fixed to the receiver and moving in said longitudinal chambers in the breech when the breech moves relative to the receiver in recoil and counterrecoil.

4,690,033

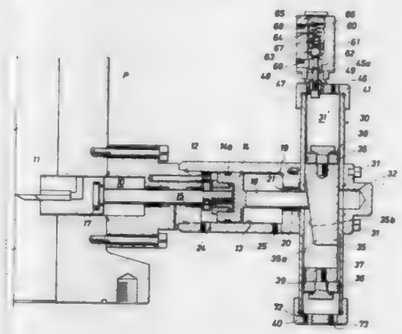
SELF ACTUATING LOCKING AND UNLOCKING ARRANGEMENT AND METHOD FOR RECIPROCATING PISTON TYPE ACTUATORS

Denzal W. Van Winkle, P.O. Box 79727, Houston, Tex. 77279

Filed Dec. 16, 1985, Ser. No. 807,735

Int. Cl.⁴ F15B *15/26*

U.S. Cl. 91—43 **4 Claims**



1. In a fluid actuator having a cylinder with a piston reciprocable therein between alternate positions by actuating fluid, the invention including:

a rod on the piston extending through one end of the cylinder for connection with a part to be moved, and a tail rod on the piston having an outer end extending through the opposite end of the cylinder;

a body;

a lock member in said body, said lock member having a wedge shaped portion reciprocable between a first position in which said lock member wedge shaped portion is disposed to one side of the tail rod, when said piston is moved to one of its alternate positions, and a second position in which said lock member wedge shaped portion is disposed across the outer end of the tail rod, as said piston is moved toward its other alternate position;

means for simultaneously communicating actuating fluid to the cylinder and to said lock member which maintains said lock member wedge shaped portion and the tail rod outer end in locking relation as the piston moves to and is in the other alternate position;

means including passage means and normally closed valve means therein for controlling communication of actuating fluid to the cylinder for moving the piston to the one alternate position;

means for communicating actuating fluid to said lock member for moving said lock member to the first position; and

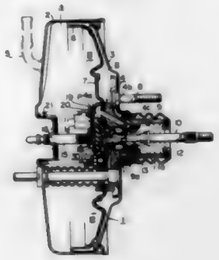
means operable by said lock member when it is moved to said first position to open said valve means and communicate actuating fluid to the cylinder to move the piston to the one alternate position.

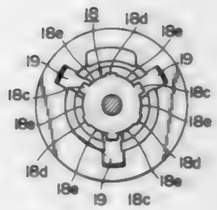
4,690,034

PNEUMATIC BOOSTER

Hiromi Ando, Tokyo; Mitsuhiro Endo, Kanagawa, and Yukou Ono, Tokyo, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Mar. 18, 1985, Ser. No. 713,030
Claims priority, application Japan, Mar. 19, 1984, 59-52844
Int. Cl.⁴ F15B *9/10*
U.S. Cl. 91—369 A **7 Claims**





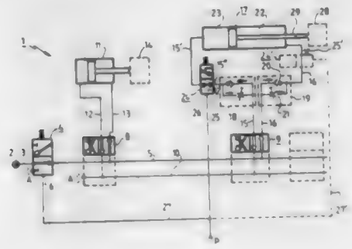
1. A pneumatic booster comprising:
a housing;
a diaphragm and a power piston coacting to divide the interior of said housing into a constant-pressure front chamber and a variable-pressure rear chamber;
a valve mechanism positioned in said power piston for controlling the pressure in said rear chamber;
an input shaft connected to said valve mechanism for actuating said valve mechanism;
an output shaft in said front chamber for transmitting an output force from said power piston, said output shaft having at least one abutting portion adjacent a rear end thereof, said abutting portion extending radially outward from said output shaft;
a reaction disc mounted on said power piston on a side of said power piston facing said front chamber, said reaction disc contacting with the rear end of said output shaft in transmitting the output force from said power piston to said output shaft;
a return spring in said front chamber for biasing said power piston towards said rear chamber;
a plurality of angularly spaced and radially extending reaction levers having radially inner ends thereof abutting with a rear surface of said abutting portion of said output shaft, lengthwise intermediate portions of said reaction levers engagaing with said power piston at fulcrum points on said power piston and radially outer ends of said reaction levers engaging with said return spring, said reaction levers being operable to transmit at least part of the output force from said power piston to said output shaft, said reaction levers transmitting at least part of a reaction force from said output shaft to said input shaft and sasid reaction levers balancing at least part of the reaction force applied to the output shaft with the force of said return spring to thereby prevent at least part of the reaction force from being transmitted to said reaction disc; and
means for rotating said output shaft to control the point of engagement between said reaction levers and the abutting portion of said output shaft to thereby vary the amount of force transmitted from said power piston to said output shaft.

4,690,035

EMERGENCY DRAINING DEVICE FOR STOPPING PNEUMATIC CYLINDERS

Daniel Bouteille, Ville d'Avray; Michel Nicolas, Neauphle le Chateau, and Daniel Guillin, Sannois, all of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 686,510, Dec. 26, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 912,700
Claims priority, application France, Jan. 17, 1984, 84 00652
Int. Cl.⁴ F01B *3/00*
U.S. Cl. 91—442 **3 Claims**



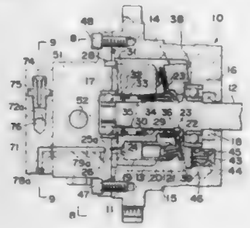
1. The combination of a pneumatic cylinder having at least one working chamber formed in a cylindrical body and control means for effecting supply and release of fluid under pressure selectively to and from said working chamber, said control means comprising:
pneumatic distributor means having a power inlet connected to a source of fluid pressure, an outlet and a control inlet connected to a control pneumatic conduit adapted to transmit a control signal of pressure;
an emergency drain device having a pressurized fluid supply inlet, a fluid outlet, means for connecting the said fluid outlet to said working chamber, a control chamber having control inlet means, an internal chamber permanently connected to the supply inlet and to the fluid outlet and having a by-pass channel portion in controllable communication with an exhaust connected to the atmosphere and a valve member movable in said control chamber, said valve member being actuated by said control signal of pressure and cooperating with said by-pass channel portion for controlling the said communication;
means connecting the outlet of the pneumatic distributor means to the pressurized fluid inlet of said emergency drain device, and
conduit means connecting said control inlet means of said emergency drain device to said pneumatic control conduit, said valve member being pushed by said control signal of pressure in a first position in which said communication is closed and being pushed in a second position by a transitory pressure which remains in said internal chamber when the control signal of pressure in the control pneumatic conduit is cancelled.

4,690,036

AXIAL PISTON PUMP OR MOTOR WITH MULTI POSITION SWASH PLATE

Masato Kosaka, Tokyo, and Tatsu Yamazaki, Yamato, both of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 689,652, Jan. 8, 1985, abandoned. This application Feb. 28, 1986, Ser. No. 838,421
Claims priority, application Japan, Aug. 16, 1984, 59-170728
Int. Cl.⁴ F01B *13/04*
U.S. Cl. 91—506 **6 Claims**





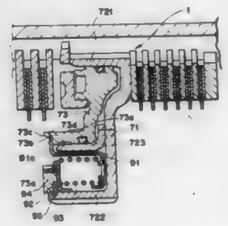
1. A hydraulic pump or motor comprising a casing having a cavity therein with an inside face, a rotary shaft pivotally mounted to said casing for rotation in said cavity, said shaft having a rotation axis and said inside face of said casing extending perpendicularly to said rotation axis, a cylinder block connected to said rotary shaft for rotation therewith in said cavity, said cylinder block having a plurality of cylinders, a plunger slidably inserted into each of said cylinders of said cylinder block, a pair of kidney shaped ports extending in said casing and communicating with said cavity, one of said kidney shaped ports forming a low pressure side port and the other of said kidney shaped ports forming a high pressure side port, said cylinder block being engaged with said pair of kidney shaped ports and said ports communicating respectively with said cylinders as said cylinder block rotates with rotation of said rotary shaft, a sliding shoe connected to each plunger, and a swash plate disposed in said cavity and having a smooth slant surface on which each shoe of each plunger is slidably engaged, for transmitting a resultant force at a working point on said swash plate, said swash plate having first and second abutting planes on a side opposite from said slant surface, said planes lying in mutually different angles and meeting each other at a border line, said swash plate being non-rotatably and pivotally mounted in said cavity and having two pivotal positions, one position with one of said planes in engagement with said inside face of said casing and the other position with the other of said planes engaged with said inside face with the other of said planes engaged with said inside face of said casing, sais swash plate having a pair of semicircular recesses lying on said border line and defined in said planes on opposite sides of said shaft, said casing having a pair of semicircular recesses in said inside face aligned respectively with said pair of semicircular recesses of said swash plate, a ball positioned in each of said pair of aligned recesses for pivoting of said swash plate between its positions, said border line engaged against said inside face of said casing to form a fulcrum for pivoting of said swash plate, a pair of drive cylinders with drive pistons therein, arranged in said casing on opposite sides of and at equal distances from a dividing plane containing said rotation axis for said rotary shaft and extending perpendicular to said border line, each ball in said aligned semicircular recesses lying on opposite sides of said dividing plane, said casing having passages therein for communicating each drive cylinder with one of said pair of kidney shaped ports which is located on the same side of said dividing plane as said drive cylinder, said drive cylinders being positioned eccentrically with respect to said rotation axis and said swash plate, and each drive piston being engaged against one of said abutting planes at pressure points with said working point being between said fulcrum and said pressure points and whereby low pressure is exerted on one of said drive cylinders and on cylinders of said cylinder block which are in communication with said low pressure side port and, high pressure is exerted on said drive cylinder and said cylinders of said cylinder block which are in communication with said high pressure side port to compensate forces exerted on opposite sides of said swash plate.

4,690,037

HYDRAULIC SERVO FOR FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

Koji Sumiya, Nishio; Kazuaki Watanabe, and Seitoku Kubo, both of Toyota, all of Japan, assignors to Aisin-Warner Limited and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jul. 29, 1985, Ser. No. 759,827
Claims priority, application Japan, Jul. 31, 1984, 59-161905
Int. Cl.⁴ F01B *31/00*
U.S. Cl. 92—130 R **5 Claims**



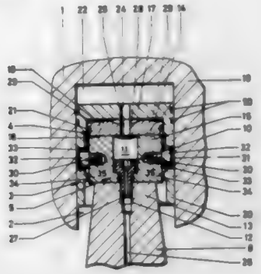
1. A hydraulic servo for a friction coupling element in an automatic transmission including a casing, comprising:
an annular drum fixed to the automatic transmission casing and having an outer cylinder, asn inner cylinder, a sidewall connecting said outer and inner cylinders, and an intermediate cylinder connected to the sidewall between the outer and inner cylinders to divide the interior of said drum into outer and inner annular spaces;
a piston slidably mounted within said outer annular space, between the outer and intermediate cylinders, said piston having a terminal axially extending guide sleeve portion; and
return biasing means including:
a connecting member having one end fixed to said piston and abutting said guide sleeve portion and the other end located in said inner annulasr space, between the inner cylinder and the intermediate cylinder;
a retainer fixed to the inner cylinder, at a position axially inward of said guide sleeve with respect to said sidewall when said piston is fully retracted, and;
return springs interposed within said inner annular space between said other end of said connecting member and said retainer.

4,690,038

HYDRAULICALLY ACTUATED PISTON MACHINE WITH BEARING FOR CONNECTING PISTON TO PISTON ROD

Jürgen Klie, and Rudolf Beyer, both of Sprockhövel, Fed. Rep. of Germany, assignors to G. Dusterloh, GmbH, Sprockhövel, Fed. Rep. of Germany

Filed Jan. 9, 1986, Ser. No. 817,358
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500451
Int. Cl.⁴ F01B *31/00*; F16J *1/14, 1/04*
U.S. Cl. 92—181 R **19 Claims**



1. A piston machine, particularly a hydraulically-actuated piston machine, comprising at least one cylinder having an axis; a piston axially slidable in said cylinder and having a piston bottom with an inner surface; a piston rod turnably connected with said piston and having a piston rod shaft; a turning member mounted on said piston rod and having a side which is opposite to said piston rod shaft and has a convex circular surface; a pressing member having a shell surface which is in sliding contact with said circular surface of said turning member, said pressing member having a side which is opposite to said turning member and is provided with a convex circular surface movably abutting against said inner surface of said piston bottom so that said pressing member is movable both relative to said turning member and to said piston bottom, said circular surface of said pressing member and one of said circular surface of said turning member and said shell surface of said pressing member having central axes with central axes projections along their common orthogonals forming an angle of approximately 90°.

4,690,039

AIR CONDITIONER FOR VEHICLE

Goro Uchida, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 761,664, Aug. 1, 1985, abandoned, which is a continuation of Ser. No. 557,924, Dec. 5, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,985
Claims priority, application Japan, Feb. 8, 1983, 58-17218
Int. Cl.⁴ B60H *1/24*
U.S. Cl. 98—2.08 **10 Claims**



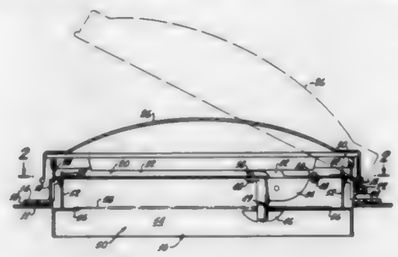
1. An air conditioner for a vehicle, comprising:
three chambers in series communication, a first chamber having an air inlet and a heat exchanger, a second chamber communicating with a downstream portion of said first chamber and having at least one mid-level directed ventilation diffuser, and a third chamber communicating with a downstream portion of said second chamber and having at least one downwardly directed heater diffuser and at least one upwardly directed defroster diffuser;
said first and third chambers being disposed adjacent to each other on opposite sides of a shared first common wall;
said second chamber being disposed adjacent to said first and third chambers such that said first common wall abuts a second common wall, a first portion of said second common wall being common to said first chamber and said second chamber and a remaining second portion of said second common wall being common to said third chamber and said second chamber, said first and second portions of said second common wall lying in a common plane;
said dowstream portion of said first chamber communicating with said second chamber through a first opening in said second common wall;
said first chamber including therein a passage for directing air through said heat exchanger and a bypass for bypassing said heat exchanger to direct air from said inlet to said first opening, an air mix damper being located upstream of said heat exchanger for selectively controlling the relative amounts of air flowing through said passage and bypass of said first chamber;
said downstream portion of said second chamber communicating with said third chamber through a second opening in said second common wall, a switching damper being located within said second opening for selectively controlling communication between said second and third chambers.

4,690,040

SNAP-IN SCREEN FRAME AND MOUNTING FOR SAME

Timothy J. Barnett, Anaheim, Calif., assignor to Elixir Industries, Gardena, Calif.

Filed May 27, 1986, Ser. No. 866,707
Int. Cl.⁴ B60H *1/26*
U.S. Cl. 98—2.14 **23 Claims**



1. A screen frame attaching apparatus for attaching a screen frame into a ventilation opening housing having a support bar extending between first and second opposing side walls of the ventilation opening housing corresponding to first and second opposing side walls of the screen frame, comprising:
a first and a second pawl arm each connected to a respective one of the screen frame first and second side walls, and extending above a rim defining the terminus of the respective side wall of the screen frame, each pawl arm having a first surface and an opposing second surface;
a pawl extending from the respective first surface outwardly beyond the plane of the first surface;
a first and second pawl receiving opening positioned at opposing ends of the support bar and shaped and positioned to receive a respective one of the pawls, and such that movement of the respective pawl into the respective pawl opening deflects the respective pawl arm resulting in the respective pawl snapping into a mated position when the respective pawl clears the respective pawl opening; and
cooperating means on the opposing second surface of the pawl arm for cooperating with the pawl opening for restraining lateral deflection of the pawl arm from its mated position, to thereby hold the pawl arm in its mated position.

4,690,041

PREVENTION, ARRESTING AND REMOVAL OF ACCUMULATION OF MOISTURE IN BUNKER STORAGES

Henry J. Banks, Pialligo, and John R. Wiseman, via Hall, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Mar. 19, 1986, Ser. No. 841,418
Claims priority, application Australia, Mar. 19, 1985, PG9792
Int. Cl.⁴ A01F *25/13*
U.S. Cl. 98—57 **5 Claims**



1. A method of preventing, arresting or reducing the accumulation of moisture in particulate durable foodstuff in a bunker storage having a moisture-impervious sheet over the stored foodstuff comprising the steps of:
(a) inserting at least one top-venting pipe substantially vertically into said foodstuff, through said sheet, for a distance such that the lower end of said top-venting pipe is below the region where the particulate foodstuff in the bunker consolidates and the upper end of said top venting pipe is above said sheet;
(b) removing any of said foodstuff that may be present in said or each inserted top-venting pipe;
(c) providing a rain shield on the upper end of said or each top-venting pipe;
(d) inserting at least one side-venting pipe into said foodstuff at the side of the bunker, through said sheet;
(e) removing any of said foodstuff that may be present in the or each side venting pipe; and
(f) closing the outer end of said or each side-venting pipe with a closure member which includes a perforated or mesh-covered region which permits air to pass therethrough.

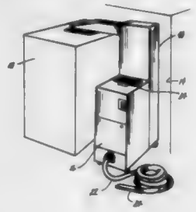
4,690,042

COMPUTER ENVIRONMENT FILTER APPARATUS HAVING WING WITH INTERNAL BAFFLES

Matthew H. Bertelsen, 3060 Baker Rd., Dexter, Mich. 48130, and Gary Klapperich, Dexter, Mich., assignors to Matthew H. Bertelsen, Dexter, Mich.

Filed May 27, 1986, Ser. No. 866,749
Int. Cl.⁴ F23J *11/00*
U.S. Cl. 98—115.1 **14 Claims**

1. Filter means for use in a computer room for removing paper dust, carbon black and the like from the air being discharged from a high speed paper handling machine, such as a laser printer, comprising:
a filter housing having an upper discharge opening for passing filtered air, and a lower inlet opening for receiving unfiltered air;
an electrically energized fan in the filter housing, the fan being operative to move air from the paper handling machine to the filter housing and toward said upper discharge opening;
filter pack means in the filter housing for removing material from air being passed therethrough, said filter pack means being mounted in the filter housing between the upper discharge opening and the lower inlet opening;
an elongated hollow wing, and an elongated upright duct having an upper end supporting the wing in a raised position above the filter housing and a lower end connected to the filter housing such that the wing and the filter housing are moveable together with respect to the paper handling machine, the upright duct being disposed such that air being discharged from the paper handling machine is passed through both the wing and the upright duct toward the filter housing, the wing having an inlet opening with a first cross sectional area, and a longitudinally spaced outlet opening having a second, lesser cross sectional area, the wing inlet opening being disposed to receive air from the paper handling machine along a path generally at right angles to the longitudinal axis of the wing, the wing outlet opening being disposed to pass air toward the upright duct and the filter housing;
an elongated, planar first baffle member mounted within the wing generally parallel to the longitudinal axis of the wing;
the first baffle member having a forward edge disposed to divide the inlet opening into a pair of sections including a first section having a first area and a second section having a second area, the second section being disposed between the first section and the outlet opening of the wing, the first baffle member being disposed to generally face the flow of air from the paper handling machine to change the direction of such air flow as it passes through the wing from the inlet opening to the outlet opening; and
a second baffle member disposed downstream of the first baffle member and facing the direction of air flow through the outlet opening of the wing to change the direction of such air flow from a direction generally parallel to the longitudinal axis of the wing toward a direction at an angle to said longitudinal axis and through the upright duct.



4,690,043

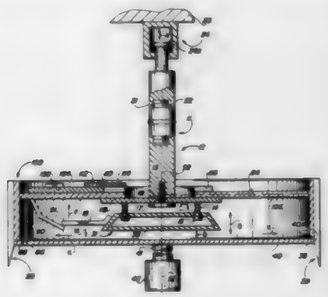
PIZZA DOUGH SPREADING APPARATUS

Victor C. Pacilio, P.O. Box 10516, Phoenix, Ariz. 85064

Filed Aug. 20, 1985, Ser. No. 767,727
Int. Cl.⁴ A21C *11/00*
U.S. Cl. 99—353 **5 Claims**

1. Apparatus for spreading a body of dough to form a generally circular soft pizza crust, comprising
(a) a support surface for receiving a body of dough;
(b) dough retaining means for controlling the centrifugal spreading of said body of dough on said support surface, including
(i) a frame member contacting said tray and circumscribing said body of dough,

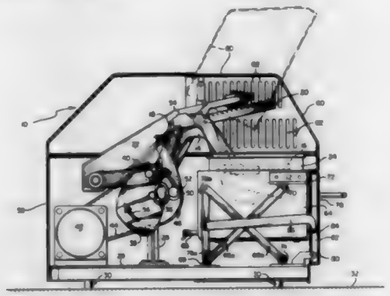
(ii) a support structure centered in and connected to said frame member,
(iii) a plurality of arm-linkage means connected to said support structure and extending outwardly from said support structure toward said frame, each of said arm-linkage means having an outer end adjustable inwardly toward and outwardly away from said support structure,
(iv) a plurality of guides, each attached to said outer end of one of said arm-linkage means,
(v) a plurality of flexible strips, each having one end affixed to one of said guides and extending to be slidably received in an another of said guides to define a variable diameter peripheral annular rim around said body of dough, said diameter of said peripheral annular rim being varied by adjusting said arm-linkage means and guides attached thereto inwardly and outwardly from said support structure,
(vi) a generally continuous circular flat planar surface



attached to said support structure above said support surface and
terminating at a peripheral edge, and
continuously contacting a central portion of said body of dough during centrifugal spreading said dough, said central portion of dough contacted by said flat planar surface, said peripheral edge of said planar surface circumscribing said central portion of said body of dough,
(vii) means for urging
said flat planar surface into continuous contact with said central portion of said body of dough, and
said flat planar surface toward said support surface and away from said support structure
during the centrifugal spreading of the body of dough; and
(c) motive power means for rotating said support surface to centrifugally spread said body of dough, said rotation of said support surface causing said dough retaining means to simultaneously rotate with said support surface.

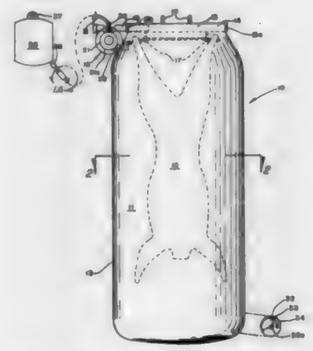
4,690,044
HAMBURGER COOKING APPARATUS
Charles E. Verkler, Peoria, Ill., assignor to International Food Equipment Inc., Peoria, Ill.
Filed Oct. 27, 1986, Ser. No. 923,200
Int. Cl.[4] A47J *37/04*
U.S. Cl. 99—419 **10 Claims**

1. A device for cooking food products such as hamburger patties comprising:
grill means of a heat conductive material for impaling and holding the food product;
a grill arm having first and second ends, the first end supporting the grill means;
support means for pivotally mounting the second end of the grill arm;
fork means interfittable with the grill means so as to underlie a food product impaled thereon, the fork means being movable with respect to the grill means to selectively remove a food product impaled thereon;
a fork arm having first and second ends, the first end supporting the fork means and the second end pivotally mounted with respect to the grill arm;
stationary former means disposed above the first ends of the grill arm and fork arm for engagement with the grill means and fork means;



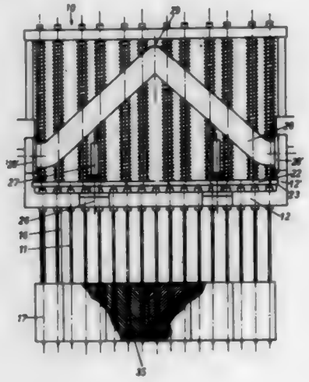
reservoir means for containing a heated cooking liquid disposed below the first ends of the grill arm and fork arm; and
oscillating means for moving the grill means and fork means between a first position adjacent the stationary former means and a second position in which the grill means and fork means are immersed in the heated cooking liquid held in the reservoir means, the grill means and the fork means being moved in unison when moving from their first position to their second position, but separately, with the fork means leading the grill means, when moving from their second position to their first position.

4,690,045
UTILITY GAME BAG SYSTEM
Robert J. T. Badger, 2510 Alden St., Salt Lake City, Utah 84106
Filed Jul. 11, 1985, Ser. No. 753,774
Int. Cl.[4] A23L *3/00*
U.S. Cl. 99—485 **11 Claims**



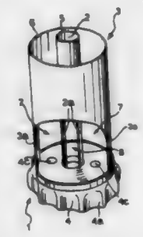
1. A game bag system comprising, a game bag having length, width and thickness dimensions sufficient to contain an animal carcass therein and including an opening and closure means therefore for providing access to said game bag interior; a hanger means for connection in supporting engagement to said game bag for supporting said game bag; blower means for arrangement with said game bag such that a discharge nozzle thereof is arranged to discharge into said game bag, said blower means to provide an airflow into said game bag that is pulled through an inlet thereof; a filter mat canister means for coupling to said blower means, over an inlet thereof, such that a filter mat means therein will be positioned to extend across said blower means inlet; and means for providing water to wet said filter mat wherethrough said blower pulls an airflow.

4,690,046
INJECTING MACHINE FOR MEAT PIECES
Narciso L. Corominas, Gerona, Spain, assignor to Metalquimia, S.A., Gerona, Spain
Filed Jan. 11, 1985, Ser. No. 690,596
Claims priority, application Spain, May 7, 1984, 532.269
Int. Cl.[4] A23L *3/34*; A23B *4/00*
U.S. Cl. 99—533 **5 Claims**



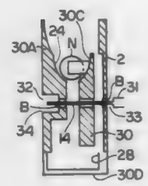
1. An improved apparatus for injecting pressurized fluid into conveyored meat pieces, comprising:
a relatively fixed base plate;
a movable head assembly;
a plurality of multi-orificed needles which are mounted in said movable head assembly;
a plurality of transverse pressing blocks disposed between the meat piece and said relatively fixed base plate of said movable head assembly;
a series of vertical cylindrical ducts disposed in parallel rows along a length of said pressing blocks so as to permit the passage of said needles therethrough, and which are arranged such that said parallel rows of ducts are mutually offset in a quincunx-like pattern of ultimate injection holes in the meat piece;
a dual diameter configuration for each of said vertical cylindrical ducts wherein an upper section of each said duct is somewhat larger than a respective diameter of a corresponding one of said needles, and a lower section of each one of said ducts is nearly equal to said diameter so that each said duct serves as a guide formed by said corresponding one of said needles and said upper section; said chamber tending always to be filled with fluid which has been fed to the needle by fluid pressure during injection, and under the influence of gravity before and after injection; and
a means for reducing flow and pressure of an injection fluid when each said upper fluid chamber of said ducts overflow an entire set of pressing blocks and fall onto a meat conveyor floor, whereby said fluid can be recycled to said head assembly without introduction of air or foam.

4,690,047
TOOL FOR PEELING AND CORING PINEAPPLES AND THE LIKE
Savino Balzano, Torino, Italy, assignor to Metallurgiche Balzano S.p.A., Verres, Italy
Filed Mar. 4, 1986, Ser. No. 836,067
Claims priority, application Italy, Mar. 5, 1985, 53094/85[U]
Int. Cl.[4] A47J *25/00*; B26B *3/00*
U.S. Cl. 99—542 **6 Claims**



1. Tool for cleaning for consumption fruit having a core and a skin which are to be thrown away, between which is a fleshy part to be eaten, comprising inner and outer substantially annular and coaxial blades each comprised of a single elongate tubular body, each of the elongate tubular bodies of the blades having a frontal cutting edge at one end thereof, the tool further including a handgrip connecting the ends of the elongate tubular bodies opposite the cutting edges, the handgrip enabling the blades to be pushed into the fruit and rotated so as to achieve separation of the core and the skin from the fleshy part through the action of the cutting edge of the inner blade and the cutting edge of the outer blade respectively, and in that the tubular bodies of the inner blade and the outer blade each have associated elongate parts that are connected by the handgrip which constitute, together with the edge associated therewith, regions of said single tubular bodies extending from the handgrip to the cutting edge of the associated blade, each single tubular body being defined by a wall that is substantially smooth.

4,690,048
NUTCRACKER
Bahram Namdari, P.O. Box 17366, Milwaukee, Wis. 53217
Filed Jun. 3, 1985, Ser. No. 740,568
Int. Cl.[4] A23N *5/00*
U.S. Cl. 99—575 **10 Claims**



1. A nutcracker comprising:
a pair of relatively movable members, said members include adjacent confronting surfaces which cooperate to define a nut-receiving chamber;
means for mounting said members for relative movement and for maintaining said members in predetermined spaced apart relationship;
restricting means on the adjacent confronting surfaces of said members which cooperate to diminish said nut-receiving chamber in size as said members are moved

relative to each other, said chamber diminishing in size from a first size sufficient to accommodate a whole nut to a second size whereby the nut is crushed; and

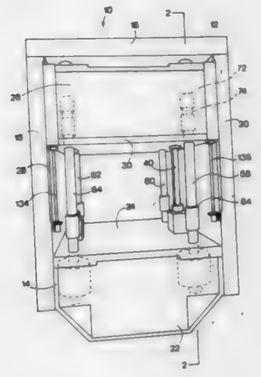
means on one of said members for preventing passage of the nut beyond a predetermined degree of rotation of said members.

4,690,049

HYDRAULIC PRESS WITH SIDE SLAB GUIDED UPPER PLATEN

Leon Malashenko, Toronto, Canada, assignor to John T. Hepburn, Limited, Mississauga, Canada

Filed Oct. 24, 1986, Ser. No. 922,542
Claims priority, application Canada, Nov. 12, 1985, 495086
Int. Cl.[4] B30B *7/02*
U.S. Cl. 100—214 **7 Claims**



1. A hydraulic press, comprising:

a support structure including a base structure which defines a lower platen;

an upper moveable platen;

guide means mounted on the support structure for guiding the upper platen vertically towards and away from the lower platen;

a multiplicity of compression-phase hydraulic cylinders each having a body member fixed to the base structure and a piston rod oriented for vertical movement relative to the body member;

a multiplicity of vertical posts, each of the posts being fixed to a different one of the compression-phase hydraulic cylinders for vertical movement with the piston rod associated with the compression-phase hydraulic cylinder, each post having an upper end portion formed with a recess;

the upper platen having a multiplicity of internal vertical passages, each of the internal passages being aligned with, and dimensioned for guided passage of, one of the multiplicity of posts;

releasable locking means attached to the upper platen for locking the upper platen to the vertical posts, the releasable locking means including a multiplicity of lock members and controllable lock member displacement means for displacing the lock members at least horizontally between locking positions in which the lock members engage the recesses in the posts and unlocking positions in which the lock members are disengaged from the posts; and,

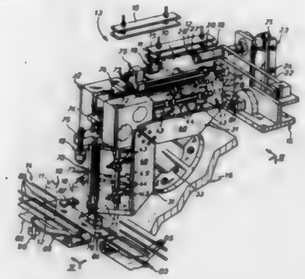
upper platen displacement means attached to the support structure for raising and lower the upper platen when the locking means are disengaged from the posts.

4,690,050

TRANSFER SYSTEM FOR ARTICLE PRINTING MACHINE

Eric Rouly, Pontault Combault; Jean-Louis Dubuit, Paris, and Gilles Marette, Coalommiers, all of France, assignors to Societe d'Exploitation des Machines Dubuit, Paris, France

Filed Nov. 12, 1985, Ser. No. 796,775
Claims priority, application France, Nov. 13, 1984, 84 17301
Int. Cl.[4] B41F *17/20*; B65G *47/52*
U.S. Cl. 101—35 **23 Claims**



1. Printing machine of the kind comprising a horizontal printing station co-operating with conveyor means disposed at a level below that of said printing station and at least one transfer arm which is equipped with holding means adapted to support an object to be printed and which, mounted to rotate about an axis inclined at 45, is able to occupy alternately two positions, one in vertical alignment with the conveyor means and the other in vertical alignment with the printing station, in combination with, on the one hand, a first transfer means adapted to pass an object to be printed from said conveyor means onto an exchange platform, in order for the object to be printed to be grasped by the transfer arm, and, on the other hand, a second transfer means adapted to pass from the exchange platform to the conveyor means an object already printed previously put down by the transfer arm, characterized in that there are two rotatable transfer arms having a common rotation axis and disposed at 90 relative to each other, one on each side of their common rotation axis and in a plane containing the latter, and which alternately occupy a vertical position on the exchange platform and a horizontal position at the printing station, and each of the transfer arms having holding means which comprises at least one transverse clamp having two transverse branches each of which is fitted at a free end with a jaw adapted to surround at least partially, in conjunction with the jaw of the other branch, an object to be printed.

4,690,051

METHOD OF IMAGE REGISTRATION IN A WEB FED, MULTIPLE PRINTING ROTARY PRESS

Toshiaki Kishine; Hideo Izawa, both of Yachiyo, and Masaru Ohba, Funabashi, all of Japan, assignors to Miyakoshi Printing Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1986, Ser. No. 828,737
Int. Cl.[4] B41F *5/06, 5/16, 13/14*
U.S. Cl. 101—211 **4 Claims**

1. A method of achieving image registration in a web fed rotary printing press of the type including a series of print stations, each having a circumferentially and laterally adjustable plate cylinder, for successively printing images on a continuous web of material traveling along a predetermined path, which method comprises:

(a) preparing printing plates for the respective print stations of the web feb rotary press, each prepared printing plate hearing in a preassigned different position thereon a registration mark having two nonparallel line segments generally extending transversely with respect to the web, the relative positions of the registration marks on the prepared printing plates being such that when the printing plates are mounted on the respective plate cylinders in proper registration, the images of the registration marks thereby reproduced on the web are arranged in a row in the longitudinal direction of the web at predetermined distances from one another:

(b) mounting the above prepared printing plates on the respective plate cylinders of the press;

(c) starting the printing of images, including those of the registration marks, from the printing plates on the web traveling along the predetermined path at a predetermined speed;

(d) optically sensing the printed images of the registration marks on the traveling web at a predetermined point intermediate the opposite extremities of the registration mark images in the transverse direction of the web, in order to ascertain the actual distances between the registration mark images and the actual distance between the two line segments of each registration mark image at the predetermined intermediate point thereof;

(e) converting the above ascertained actual distances into corresponding numbers of periodic reference pulses;

(f) comparing the numbers of reference pulses representing the actual distances between the registration mark images and between the two line segments of each registration mark image with prescribed numbers of such reference pulses representing the proper distances between the registration mark images and a proper spacing between the two line segments of each registration mark image, respectively;

(g) adjusting the angular position of any one or more of the plate cylinders in accordance with a difference or differences, if any, between the reference pulse numbers representative of the actual distances between the the registration mark images and the prescribed reference pulse numbers representative of the proper distances therebetween; and

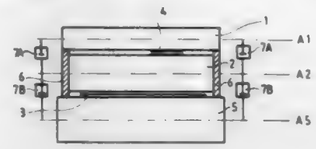
(h) adjusting the lateral position of any one or more of the plate cylinders in accordance with a difference or differences, if any, between the reference pulse number representative of the actual distance between the two line segments of each registration mark image and the prescribed reference pulse number representative of the proper distance therebetween.

4,690,052

MEANS FOR COMPENSATING FOR VARIATIONS IN THE MATRIX HEIGHT AND OPTIONALLY THE PAPER THICKNESS ON A ROTARY PRINTING MACHINE

Gustav Paulsen, Ovre Strandgt. 107, N-4000 Stavanger, Norway

Filed Jun. 28, 1985, Ser. No. 749,824
Claims priority, application Norway, Aug. 24, 1984, 843379
Int. Cl.[4] B41F *5/00*
U.S. Cl. 101—216 **6 Claims**



1. A means for compensating for variations in matrix height (thickness) and optionally variations in paper thickness on a rotary printing press, especially a rotogravure printing press which comprises cooperating pairs of rollers/cylinders including at least one inking roller (1) for transferring ink or the like to a matrix (4) detachably mounted on a matrix cylinder (2) that cooperates with the inking roller (1), the matrix (4) being adapted in turn to transfer the ink or the like to a moving web of paper (3) which passes over and is intended to be pressed against the matrix (4) by a counterpressure cylinder (5) which thus is adapted to cooperate with the matrix (2), means for supporting the rollers/cylinders, wherein the center-to-center distance between the axes of cooperating pairs of rollers/cylinders (A1-A2 and A2-A5) is adjustable for adapting to varying matrix and/or paper thicknesses, power driven means for causing a power driven relative movement between cooperating pairs of rollers/cylinders transversely to their longitudinal axes for adjusting said center-to-center distance, characterized in that the power driven means are flexible power driven means (7A, 7B), and that the supporting means for the cooperating pairs of rollers/cylinders (1-2 and 2-5) also comprise compensating means in the form of flexible spacer members (6; 6A, 6B; 9A, 9B) which upon a reduction of said center-to-center distance (A1, A2; A2-A5) are capable of being compressed with elastic deformation, such that the flexible spacer members (6; 6A, 6B; 9A, 9B) provide a counterforce against the flexible power driven means (7A, 7B), and that the reduced center-to-center distance between the cooperating pairs of rollers is defined by equilibrium between forces from the flexible means (7A, 7B) acting on respective pairs of rollers/cylinders and forces from the flexible spacer members and that the reduced center-to-center distance is flexible for adapting and accommodating variations in the matrix height and/or paper thickness.

4,690,053

ROLLER STAMP CONSTRUCTION

Gary D. Munyon, Concord, and Matthew J. Swiech, Antioch, both of Calif., assignors to G & B Rubber Stamp Co., Inc., Concord, Calif.

Filed Nov. 18, 1985, Ser. No. 799,257
Int. Cl.[4] B41F *5/00*
U.S. Cl. 101—328 **4 Claims**

1. A roller stamp for imprinting sheet material with indicia, said stamps having a handle, a support frame mounted from one end of said handle, and a pair of rollers rotatably mounted on parallel axes from the frame, one of said rollers being a die roller, said roller being formed of wood, the other roller being an inking roller, the improvement comprising: a die strip formed of flexible plastic material that encircles the die roller, the ends thereof being adjacent or abutting, said die strip having a central embossed printing surface and recessed surface areas on either side thereof; and a pair of staples that engage the adjacent ends of said die strip within said recessed areas, each staple comprising a pair of legs that project substantially

perpendicular to a connecting member, one leg of each staple being engaged with one end of said die strip and embedded in



said die roller, the other leg of each staple being engaged with the other end of said die strip and embedded in said die roller.

4,690,054

SHEET FEED DRUM FOR ROTARY PRESSES

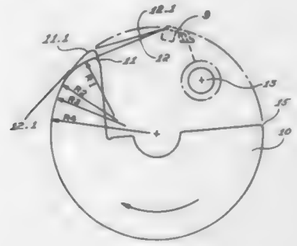
Bert Cappel, Muhlheim; Karl L. Knapp, Oberthausen, and Adolf Jung, Muhlheim, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,007

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507925

Int. Cl.[4] B41F *21/10, 29/02*

U.S. Cl. 101—409 **1 Claim**



1. A sheet feed drum for transferring freshly printed sheets in a rotary printing press wherein the drum outer contour is provided with an ink-repellent coating and two circumferentially spaced front and rear drum edges defining a duct therebetween which accommodates a sheet gripper system, said ink-repellent coating supporting a netting-like fabric relatively loosely thereon, said fabric preventing any smearing of a freshly printed underside of a sheet during sheet feed on the drum while the sheet is engaged by the gripper system, characterized in that starting at the front edge of the drum, the outer contour of the drum is constructed in the form of a smooth and continuously increasing spiral curve merging into a fixed drum radius whereby the netting-like fabric is contactable by the freshly printed underside of the sheet on the spiral surface first substantially flatly behind the front edge of the drum and then in any subsequent angle of rotation of the drum without the sheet tangent ever being bent or creased, which would cause smearing and distortion of the ink on the printed underside of the sheet.

4,690,055

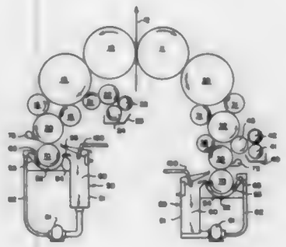
KEYLESS INKING SYSTEM FOR OFFSET LITHOGRAPHIC PRINTING PRESS

Thomas A. Fadner, La Grange; Edward R. Harenza, Chicago; Stanley H. Hycner, Bartlett, and Nelson M. Robinson, Naperville, all of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1986, Ser. No. 901,236

Int. Cl.[4] B41F *7/26, 7/32, 31/04, 31/06*

U.S. Cl. 101—451 **12 Claims**



1. In an offset lithographic printing press having blanket cylinder, plate cylinder with printing mounted thereon, form cylinders, and a system for supplying dampening water to the printing plate an improved inking system comprising:

A. ink pan means for holding and circulating an ink and water mixture including:

(i) a tray portion having a first longitudinally extending wall area defining the ink input side of said tray and having a second longitudinally exiting wall area defining the ink input side of said tray having a second longitudinally exiting wall area of lower height than first wall area which defines an outflow weir that determines the depth of the ink and water mixture in said tray portion;

(ii) a reservoir portion adjacent said tray portion to receive the ink and water mixture flowing from said tray portion over said outflow weir;

(iii) means for introducing ink and water into the input side of said tray portion along the entire length thereof;

(iv) pump means connected to said reservoir portion and to said ink and water mixture introducing means to circulate the mixture therebetween;

(v) means for introducing fresh replacement ink for that used by the printing process;

B. a pan roller mounted within said tray portion and having an outer compressible, oleophilic surface that is spaced from said first and second longitudinal wall areas a distance such that rotation of said pan roller causes flow of ink or an ink and water mixture toward said outflow weir;

C. a hard oleophilic and hydrophobic celled metering roller mounted above said pan roller and in positive interference therewith to receive ink and ink and water mixture from said pan roller and deliver it to inking form roller;

D. scraping blade mounted for contact with said celled metering roller at a location causing excess ink and water mixture to be returned to said tray portion in the area defining the ink and water mixture input side of said tray portion; and

E. an ink level measuring device operating on the ink pan contents to actuate the means for replenishing ink used up during operation.

4,690,056

ELECTRIC DETONATOR DEVICE

Uwe Brede, Furth, and Gerhard Kordel, Nuremberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,905

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403179

Int. Cl.[4] F42B *3/18;* **F42C** *19/12*

U.S. Cl. 102—202.2 **22 Claims**



1. An electric detonator device comprising an electrically insulating carrier member carrying an ignition bridge and first and second electrodes connected to the ignition bridge, at least one of the first and second electrodes being in the form of a layered conductor path configured to provide a high-frequency filter, whereby the connection of the ignition bridge to the at least one of the first and second electrodes formed as a layered conductor path configured to provide a high frequency filter is only by the layered conductor path thereof.

4,690,057

HIGH VELOCITY PROJECTILE

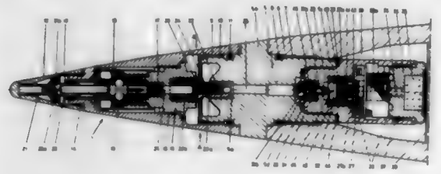
Gengt Carlsson, Örebro, Sweden, assignor to AB BOFORS, Bofors, Sweden

Filed May 19, 1986, Ser. No. 864,379

Claims priority, application Sweden, May 24, 1986, 8502575

Int. Cl.[4] F42C *9/14*

U.S. Cl. 102—266 **10 Claims**



1. A high velocity projectile for penetration of both soft and hard targets and exploding the payload after penetration comprising:

forward and rear portions of a projectile body;

a barrier member made of a high strength material separating said forward and said rear portions, said rear portion including a casing member;

a fuse detonatable on impact with a target and operating either by high sensitivity on impact against soft targets or by delayed action, which allows explosion of the main charge after penetration, said fuse including a delayed action charge, located in said rear portion of said projectile body behind said barrier member thereby being protected against detonation by shock waves produced in the forward portion, said charge being disposed in a hollow cylindrical portion which is resiliently mounted within said casing member by means of elastic annular ring members damping movements of said cylindrical portion in both axial and radial direction; and

an effectuating unit disposed between said barrier and said delayed action charge for providing a reliable ignition of said delayed action charge in the detonated state of said projectile.

4,690,058

SMOOTH WALL BLASTING IN ROCK

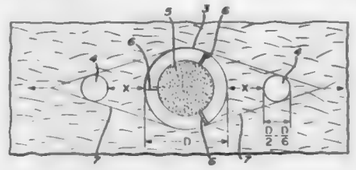
Bibhuti B. Mohanty, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Filed Feb. 27, 1987, Ser. No. 20,119

Claims priority, application Canada, Apr. 9, 1986, 506242

Int. Cl.[4] F42D *3/00*

U.S. Cl. 102—312 **6 Claims**



1. An improved method of smooth wall blasting with explosives in rock comprising the steps of:

(a) drilling a group of aligned, triad boreholes in a rock body, the said triad group comprising a larger central borehole for explosive charging and one, empty, smaller, close-spaced, parallel satellite borehole on each side of the said central borehole;

(b) drilling a series of said group of triad boreholes at intervals along a line of desired crack or fracture in said rock;

(c) charging the said larger central borehole in each of said triad groups with explosives; and

(d) detonating the said charged boreholes to produce a flat plane crack or fracture intersecting each of the said triad groups and in alignment therewith.

4,690,059

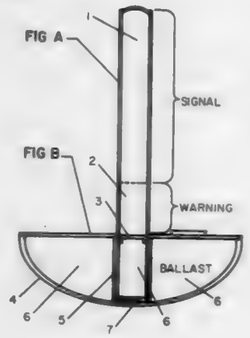
METHOD OF MAINTAINING AN UNINTERRUPTED WARNING SIGNAL

Edgar E. Fischer, 936 Johnston Dr., Watchung, N.J. 07060

Filed Feb. 24, 1986, Ser. No. 832,318

Int. Cl.[4] F42B *4/24, 4/20*

U.S. Cl. 102—336 **2 Claims**

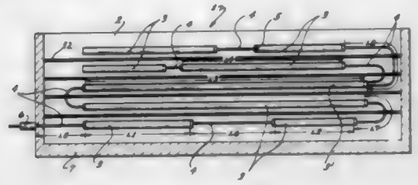


1. A method of maintaining an uninterrupted warning signal comprising:

(a) lighting a warning flare which changes color a predetermined time before burnout to alert a user that burnout is approaching; and

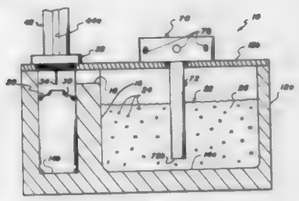
(b) providing another warning means when the flare changes color.

4,690,060
GENERATING GAS PRESSURE IN AN EXPANSION CHAMBER
Albert Dietrich, Markdorf, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany
Filed Jan. 28, 1985, Ser. No. 695,688
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403352
Int. Cl.[4] C06D *5/00*; F41F *1/00*; F42B *13/50*
U.S. Cl. 102—352 7 Claims



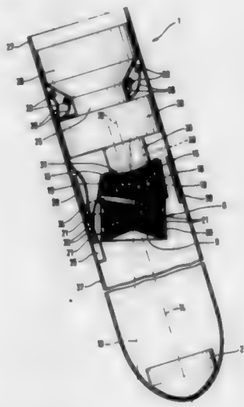
5. Device for the generation of gas pressure by means of explosive charges and including at least one expansion chamber comprising
- a plurality of propellant explosive charge hoses alternating with and being serially interconnected by a plurality of ignition charge hoses; and
- means for shielding at least some of said hoses from said hoses from others as far as pressure is concerned.

4,690,061
LAND MINE FOR USE IN A SIMULATED WAR GAME
Leon N. Armer, Jr., 22 Utica St., Brockport, N.Y. 14420; Joseph M. Antonio, 151 Rosecroft Dr.; Craig A. Roth, 241 Haviland Pk., both of Rochester, N.Y. 14616, and James R. VerWeire, 48 Ogden Ctr. Rd., Spencerport, N.Y. 14559
Filed Nov. 21, 1985, Ser. No. 800,203
Int. Cl.[4] F42B *23/22*
U.S. Cl. 102—401 4 Claims



1. A weapon, for use in a simulated war game, exhibiting the characteristics of a land mine, said weapon comprising:
- a housing, said housing defining first and second intercommunicating chambers, said first chamber being loadable with a slurry including a marking agent and a dispersing agent, and said second chamber being loadable with a slurry propellant;
- means for activating a propellant loaded in said second chamber to enable such propellant to drivingly force a slurry loaded in said first chamber from said first chamber;
- directing means, associated with said first chamber, for defining an exit flow path therefrom, said directing means including a receptacle, means for adjustably mounting said receptacle on the exterior of said housing adjacent to said first chamber, an opening defined in a wall of said housing between said first chamber and said receptacle enabling flow communication therebetween, and a plurality of openings defined in an exterior wall of said receptacle, whereby adjustment of said receptacle orients said openings in a desired direction; and
- a trigger mechanism operatively associated with said activating means for actuating said activating means.

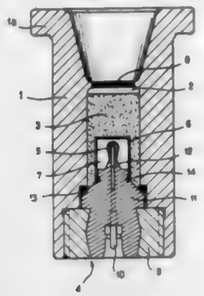
4,690,062
WARHEAD, ESPECIALLY FOR THE ATTACKING OF RADAR INSTALLATIONS
Horst G. Bugiel, Bonn, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Jun. 24, 1986, Ser. No. 877,795
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525147
Int. Cl.[4] F42B *11/22*
U.S. Cl. 102—476 11 Claims



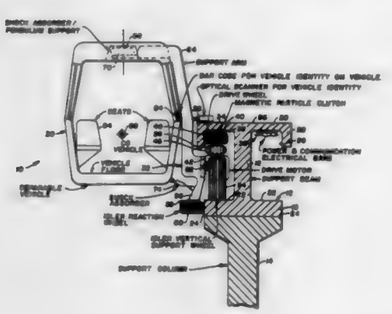
1. A steeply diving airborne body including a propulsion motor and a warhead for the attacking of quasistationary targets possessing armor reducing in strength along the vertical extension thereof, especially radar installations; the improvement comprising: said warhead including an explosive encompassed by a frusto-conical casing area constituted of a fragmentation casing; an oxidizer container in an effective region of said explosive arranged between a propellant tank and said explosive; and operational components of said propulsion motor being located at an opposite side of said propellant tank relative to said oxidizing container.

4,690,063
ULTRARAPID GAS GENERATOR WITH INCREASED SAFETY
Georges Granier, Viry Chatillon, and Yves Valliere, Le Beuzit, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France
Filed Aug. 28, 1985, Ser. No. 770,504
Claims priority, application France, Sep. 5, 1984, 84 13635
Int. Cl.[4] F42B *5/20, 9/18*
U.S. Cl. 102—530 15 Claims

1. An ultrarapid gas generator, utilizable in particular on a motor vehicle, which comprises a mechanically resistant body (1) forming a combustion chamber (2), a closure means (8) for the combustion chamber, a gas generating charge (3) within the combustion chamber, an initiation plug (4) which comprises an ignition bead (5) fired by means of a resistant filament and which is fixed on the body (1) and penetrates into the combustion chamber, wherein the initiation plug (4) has a hood (6) forming a leaktight initiation chamber (7) around said ignition bead (5), whereby said ignition bead is separated from the gas generating charge (3), the gas generating charge is composed of grains of powder based on nitrocellulose and of a pulverulent oxidoreduction powder containing at least one metal and said gas charge, is disposed entirely outside the hood.

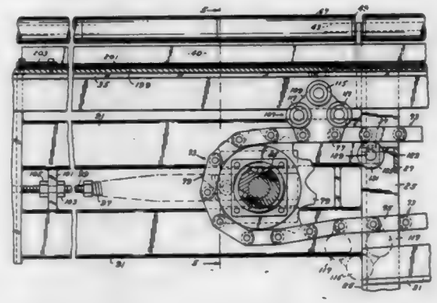


4,690,064
SIDE-MOUNTED MONORAIL TRANSPORTATION SYSTEM
William E. Owen, 481 S. Keeler Woods Dr., Marietta, Ga. 30064
Filed May 20, 1986, Ser. No. 865,022
Int. Cl.[4] E01B *25/08*; B61B *13/04*; B61C *13/04*
U.S. Cl. 104—119 17 Claims



1. A monorail transit system, comprising:
- a beam adapted to be supported on a ground-supported foundation, said beam having two opposite sides, at least one of which has respective truck means provided thereon;
- a transit car body;
- at least one transit car truck and a transit car guide means for each transit car body;
- each said transit car truck and each said transit car guide means comprising a frame having first wheel means mounted thereon for rotation and disposed in rolling engagement with said track means for providing vertical support, and second and third wheel means mounted thereon for rotation and disposed in rolling engagement with said track means for providing horizontal support;
- each said transit car truck and said transit car guide means further including an arm based on the respective said frame and arching upwardly and outwardly therefrom to an upper outer end at which a respective first securement means is provided;
- each said transit car truck and said transit car guide means for each car body being spaced from one another longitudinally of the respective said track means;
- each transit car body, above the center of gravity thereof having a plurality of second securement means provided thereon, said second securement means being spaced from one another longitudinally of the respective said transit car body;
- each said second securement means being secured to a respective said first securement means for dependingly supporting each respective transit car body from said beam via a respective said at least one transit car truck and a respective said transit car guide means;
- each said transit car truck further including motor means for powering one of said first and second wheel means for effecting transportation of each said transit car along the respective said track means of said beam.

4,690,065
AUTOMOBILE CONVEYOR
James A. Belanger, Northville; Robert Wentworth, Ann Arbor, and James M. Lapham, Northville, all of Mich., assignors to Belanger, Inc., Northville, Mich.
Continuation of Ser. No. 498,254, May 26, 1983, Pat. No. 4,576,098. This application Jan. 2, 1986, Ser. No. 815,618
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] B61B *10/00*
U.S. Cl. 104—172.3 12 Claims



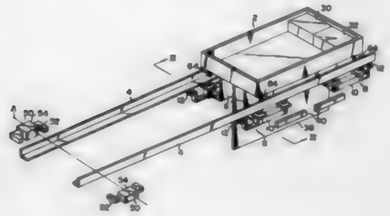
1. In an automobile conveyor having an elongated framework including a pair of spaced top plates for supporting the tire of an automobile movable thereover, an endless sprocket chain having upper and lower runs movably positioned within said framework below said top plates and extending around drive and driven sprockets within and adjacent opposite ends of said framework, and a plurality of roller dollies within said framework spaced along the length of, connected to and projecting outwardly of said sprocket chain;
- the improvement comprising said driven sprocket having bearing members on opposite sides thereof, said bearing members being rotatably mounted upon a transverse sprocket shaft, said sprocket shaft being mounted between opposed carriage blocks; each of said carriage blocks including a split collar having first and second sections for supporting said shaft; said first section being fixedly attached to said carriage block below said shaft opposite said top plates at an angle to the vertical such that said shaft is cradled against the pulling force of said drive sprocket; said second section being removably attached by attachment means to said first section about said shaft; said attachment means being accessible from said top plate to permit removal of said second section and then removal of said driven sprocket, bearing members and transverse sprocket shaft through said top plates.

4,690,066

ELECTROMAGNETICALLY FLOATED CARRIER SYSTEM WITH STOPPING UNIT

Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1985, Ser. No. 726,982
Claims priority, application Japan, Jun. 30, 1964, 59-135987
Int. Cl.[4] B61B *13/08*
U.S. Cl. 104—282 **19 Claims**



1. A system for transporting cargo to a predetermined position, comprising:
- a carrier for carrying cargo;
- at least one rail extending along the travelling path of said carrier, at least the lower portion of said rail being made of a ferromagnetic material;
- means including a plurality of magnet units each having at least one permanent magnet and at least one electromagnet, provided on said carrier and facing said rail, for generating electromagnetic force that floats said carrier with respect to said rail, a gap being provided between each magnet unit and said rail;
- gap sensor means provided on said carrier for sensing the gap between each magnet unit and said rail and generating an output signal representing this gap;
- means for energizing said electromagnets with an excitation current in accordance with the output signal of said gap sensor means to make the gap fall within a predetermined range;
- means provided on said carrier for supplying power to said gap sensor means and said energizing means; and
- a station, at which said carrier is to be stopped, and at least a stopping unit provided at said station such that it faces one of said magnet units when said carrier is stopped at said station, said carrier being stopped upon arrival at said station by electromagnetic forces of attraction acting between said stopping unit and magnet unit.

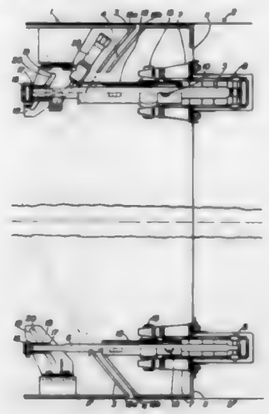
4,690,067

DEVICE FOR INTERCONNECTING A PORTAL PASSAGEWAY BETWEEN TWO RAIL VEHICLES

Wolfgang Küker, and Heinz Fladeklee, both of Salzgitter, Fed. Rep. of Germany, assignors to Linke-Hofmann-Busch, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,427
Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418679
Int. Cl.[4] B61D *17/20*; B60D *5/00*
U.S. Cl. 105—3 **9 Claims**

1. A device for interconnecting a portal passageway between two rail cars, comprising an engagement member connected to one end of one rail car, a portal mounted between the cars, said engagement member and portal having curved opposed parting surfaces with a common center of curvature and a selected gap width therebetween, a sleeve for guiding said parting surfaces pivotally said sleeve being mounted for pivotal movement to the one end of the one rail car and about a vertical axis spaced from said parting surfaces, a carrying arm axially movable in said sleeve, means for holding said sleeve against rotation to the one end of rhe one car, means on the one car for confining one end of said arm for arcuate movement in a horizontal plane, a cross piece mounted to the opposite end of said arm for pivotal movement about a vertical axis, a fixed frame connected to said portal and having a frame guide with a radius having the same center of curvature as said parting



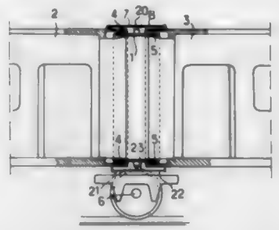
surfaces, said frame guide extending in a vertical plane and confining vertical movement of said cross piece, said frame guide and the arcuate movement to which said one end of said arm is confined having a shape for maintaining the selected gaps between said parting surface.

4,690,068

INTER-CARRIAGE PASSAGE FOR A RAILWAY TRAIN

Paul Delfourne, Villeneuve-La-Gareane, France, assignor to R.A.T.P. Regie Autonome des Transports Parisiens, Paris, France

Filed Oct. 1, 1985, Ser. No. 782,687
Claims priority, application France, Oct. 2, 1984, 84 15100
Int. Cl.[4] B61D *17/20*
U.S. Cl. 105—8.1 **2 Claims**



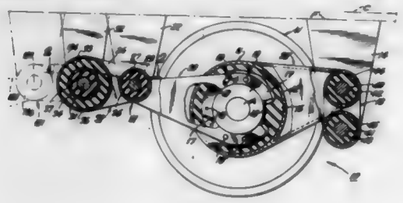
1. In a railway carriage set, an inter-carriage passage comprising an intermediate bodywork member of generally annular shape in overlapping relation with adjoining ends of two carriages of said carriage set, a single axle carrying said adjoining ends, and positioning means for positioning said intermediate member so that a transverse median plane thereof extends midway between said carriage ends and generally radially with respect to any curve on which said carriage set is disposed, said positioning means comprising cooperating guide means on said axle and on said intermediate body member for maintaining said transverse median plane in substantial alignment with said axle, and linkage means disposed at an upper part of said intermediate member and pivoted on a point in a longitudinal median plane of said intermediate member, said linkage means being connected between said adjoining carriage ends to accomodate expansion and contraction of an inter-carriage gap, a deformable pneumatic joint disposed between the overlap of said intermediate member with each said carriage end, said joint being hollow and generally toroidal in shape so as to provide a substantially continuous seal of said overlap, and splines on said pneumatic joint in meshing engagement with respective splines on each of said carriage and said intermediate body member in order to eliminate sliding movement of said joint relative to said carriage and said intermediate body member.

4,690,069

SUSPENSION FOR AXLE CONTROL WITH EMPTY CAR SPRING

Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Filed Apr. 25, 1986, Ser. No. 855,990
Int. Cl.[4] B61F *5/30*
U.S. Cl. 105—224.1 **10 Claims**



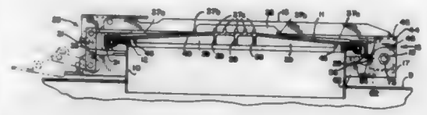
1. A suspension for the sprung mass of a vehicle such as a railway car and the like which includes at least one axle supporting a pair of wheels at respective ends, the ends being journaled in journal boxes; said suspension comprising torque arm means extending in the longitudinal direction of the car between a journal box and the sprung mass, first means mounting said torque arm means to the journal box for rotation about a center substantially at the vertical center of the axle, second means mounting said torque arm means to said sprung mass for supporting the sprung mass and for rotation about a center above the vertical center of the axle; torsion means in said torque arm means for resisting vertical deflection of the sprung mass, whereby as the sprung mass is deflected, said second mounting means travels through a relative arc and constitutes means for shifting the axle end longitudinally of the car, said torsion means comprises inner and outer hubs, an annular torsionally stressed elastomeric bushing bonded at its inner and outer circumferential surfaces to said inner and outer hubs, respectively, said torque arm means comprising a pair of oppositely, longitudinally extending torque arms, said first mounting means comprising said inner hub secured concentrically to the journal box, inner ends of said pair of torque arms being respectively integral at their inner ends with said hubs, said second mounting means comprising hinge means for mounting the outer end of one of said torque arms for rotation about a shaft centered above the vertical center of the axle, and further comprising shackle means for mounting the outer end of the other of said torque arms for longitudinal movement, empty car spring means, means hinging said empty car spring means to at least one of said torque arms, means mounting said empty car spring means above said second mounting means for supporting the sprung mass, said empty car spring means comprising second torsion means of less resistance than said first mentioned torsion means and stop means depending from the sprung mass for supporting the sprung mass on said second mounting means as the sprung mass becomes loaded and said empty car spring means is deflected downwardly.

4,690,070

HATCH COVER STRUCTURE

Roy W. Miller, Highland, Ind., assignor to Pullman Rail Leasing Inc., Chicago, Ill.

Filed Jan. 15, 1986, Ser. No. 819,198
Int. Cl.[4] B61D *39/00*; B65D *45/28*
U.S. Cl. 105—377 **30 Claims**



29. A hatch cover arrangement pivotally connected with the top of a railway car and comprising:
- a hold-down bar means having a first portion pivotally connected with the top of the railway car;
- the railway car having an opening therein generally adjacent the first portion of the hold-down bar means;
- a cover adapted to cover the opening;
- the hold-down bar means extending above the cover and having a second portion having securing means connecting with the car for securing the hold-down bar means against pivoting away from the opening;
- the cover having a forward end portion and a rearward end portion;
- the hold-down bar means having first and second retaining means thereon entrappingly engaging the forward and rearward end portions respectively whereby the hold-down bar means floatingly carries the cover between opened and closed positions of the cover and the hold-down bar means with the forward and rearward end portions of the cover entrained by the first and second retaining means; and
- one of the retaining means being selectively movable into entrapping engagement and out of entrapping engagement with the cover;
- the cover being free to be moved away from the other of the retaining means and out of entrapping engagement therewith and from the hold down bar means when said one of the retaining means is moved out of entrapping engagement with the cover whereby the cover may be readily removed from the hold-down bar means for replacement of the cover.

4,690,071

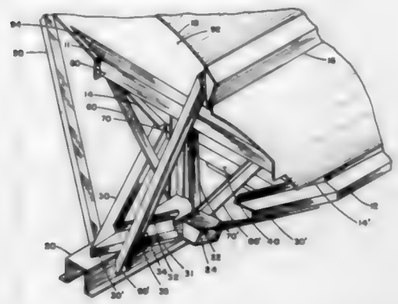
TRUSS END STRUCTURE FOR STUB SILL HOPPER CARS

Robert H. Billingsley, White Oak, Pa., and Steven L. Jantzen, St. Charles, Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Continuation of Ser. No. 558,143, Dec. 5, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 828,552
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—404 **6 Claims**

1. In an end structure for a railway car having a car body, a stub center sill located generally along the longitudinal centerline of the car and extending axially at each end of the car body, side sills extending longitudinally along either side of the car body carrying substantially all of the longitudinal train loads from one end of the car to the other, the improvement comprising: a generally horizontal side sill extension at each side of the car extending in an inclined fashion inwardly from the end of each of said side sills to said stub center sill, said side sill extensions comprising the only horizontal load path between said stub center sill and said side sills for carrying horizontal, longitudinal loads between said side sills and said stub center sill; a means extending transversely between the ends of said side sills for carrying transverse compression and tension loads between the ends of said side sills upon horizontal, longi-

tudinal tension and compression loads being applied to said stub center sill; and a truss structure extending upwardly be-



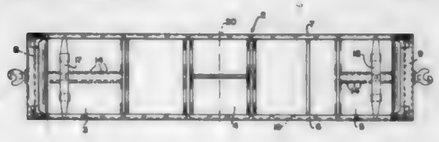
tween the stub center sill and car end for carrying vertical loads and overturning moments between said stub center sill and said car end.

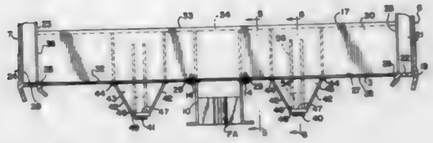
4,690,072

RAILWAY CAR BODY STRUCTURAL ARRANGEMENT

Herbert S. Wille; Phillip G. Przybylinski, both of Schererville, Ind., and Joe B. Raidt, Lansing, Ill., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 597,125
Int. Cl.[4] B61D *17/00, 7/00, 3/00*
U.S. Cl. 105—406.1 24 Claims





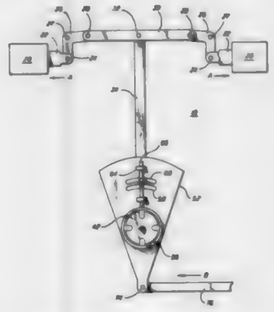
9. A railway car body having:
a center sill having an upper surface
said center sill being a stub center sill;
a bottom closure member having an upper surface and a lower surface, said lower surface of said bottom closure member engaging the upper surface of the center sill;
said upper surface defining a cargo engaging surface;
said bottom closure member having two sides laterally outwardly spaced from said center sill;
a pair of side sill members, each engaging and fixedly connected with a respective side of the bottom closure member and having a pair of opposing longitudinal ends;
said bottom closure member serving as a shear plate member for beaming draft and buff force loadings to the sides of the bottom closure member;
a pair of side wall members each connected with a respective side sill member and extending upwardly therefrom;
the side wall members, the side sill members, and the bottom closure member defining a cargo carrying space therebetween;
a pair of bolster post members each supported adjacent the bottom closure member and fixedly connected with a respective side sill member intermediate the longitudinal ends thereof and connected with a respective side wall member for receiving loads therefrom; and
a body bolster extending transversely with respect to said center sill and extending between said bolster post members;
said bolster being fixedly engaged with said upper surface of said bottom closure member and with said bolster post members;
the bolster comprising:
a pair of bolster side plate members continuously extending from one of said sides of said bottom closure member to the other of said sides of said member;
each of said bolster side plate members having a lower edge portion rigidly engaged with said upper surface of said bottom closure member and each of said bolster side plate members having an upper edge portion; and
a top plate member being rigidly affixed to said side plate members adjacent said upper edge portion of each of said side plate members and forming a beam with said plate members and said bottom closure member for transmitting loads inwardly from the bolster post members; and
each of said side plate members and said top plate member having end portions, said bolster post members being located outwardly of the end portions of the side and top plate members, said end portions abutting and rigidly affixed to the bolster post members to securely connect the bolster post members to the bolster for transferring loads therebetween.

4,690,073

LOCKING MECHANISM

James D. Shoop, Stark County, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Jul. 23, 1986, Ser. No. 888,919
Int. Cl.[4] E05G *1/04;* E05B *13/10*
U.S. Cl. 109—59 T 16 Claims



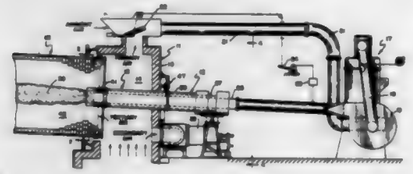
1. Apparatus for selectively engaging an external handle associated with a door to a movable bolt for securing said door in a jamb, according to a condition of locking means associated with said door, said locking means settable between locked and unlocked conditions and controlling movement of a pin, said pin having a first position corresponding to said locked condition and a second position corresponding to said unlocked condition, said apparatus comprising:
means for holding said pin on a path between said first position and said second position;
a housing;
first slot means in said housing extending in a first direction for accepting said pin, said first slot means enabling movement of said pin between said first and second positions;
second slot means in said housing for accepting said pin, said second slot means intersecting with said first slot means at an intersection and extending therefrom in a second direction;
mounting means mounting said housing for movement of said door, said mounting means enabling movement of said housing opposite said second direction and transverse to said first direction when the pin is in the second slot means;
a probe mounted for movement on said housing, said probe being movable between a first condition and a second condition;
probe connecting means for connecting the probe and the pin such that movement of said pin between said first and second positions moves said probe between said first and second conditions respectively;
a moving member, said member including probe engaging means for engaging said probe, said housing and said member movable together for said second condition of said probe;
handle connecting means for connecting said moving member and said handle; and
bolt connecting means for connecting said housing and said bolt, whereby said bolt is moved in response to movement of said housing.

4,690,074

COAL COMBUSTION SYSTEM

Charles L. Norton, 8669 White Oak Ave., Munster, Ind. 46321

Filed May 2, 1986, Ser. No. 859,138
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 6 Claims



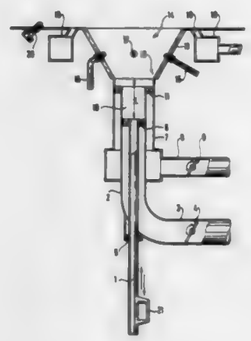
1. A coal combustiom system comprising:
a combustion chamber;
an elongated burner pipe assembly having an inlet end and an exit end, said exit end being adapted to emit finely divided ooal and combustion air into said combustion
said burner pipe being divided longitudinally into at least two conduits including a central conduit and a concentric first outer annular conduit,
the outlet end of said first annular conduit zone being equipped with spinner means for imparting turbulence to an airstream passing therethrough,
said spinner means comprising a plurality of vanes adjacent the exit end of said first annular conduit, and arranged at an oblique angle to the direction of airflow therein.
said varies being arranged in two sets, a first set within said first annular conduit and a second set downstream of the first set and beyond the exit end of said central conduit, the vanes of said second set being attached at their outer edges to said second annular conduit and projecting radially inwardly.
the vanes of said second set being fewer in number than the vanes of said first set and being arranged at an oblique angle which is larger than the oblique angle at which the vanes of said first set are arranged.
the inner edges of the vanes of said second set falling on a projected cylinder having a cross-sectional area larger than the cross-sectional area of said central conduit.
means for supplying finely divided coal suspended in a first stream of air to the inlet end of said central conduit;
means for supplying a second stream of air to the inlet end of said first annular conduit; and
means for heating said second stream of air.

4,690,075

IGNITION AND COMBUSTION SUPPORTING BURNER FOR PULVERIZED SOLID FOSSIL FUEL AND COMBUSTION CHAMBER COMPRISING SAME

Jean Vidal, Ville d'Avray; Francois Malaubier, Le Plessis Robinson, and Jean-Claude Mevel, Les Ulis, all of France, assignors to Stein Industrie, Velizy Villacoublay, France

Continuation of Ser. No. 766,375, abandoned. This application Aug. 4, 1986, Ser. No. 891,429
Claims priority, application France, Aug. 16, 1984, 84 12855
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 2 Claims



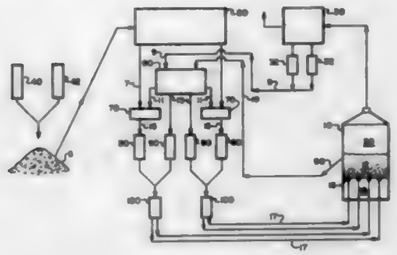
1. Ignition and combustion supporting burner for pulverized solid fossil fuel, comprising an axial conduit (1) for feeding pulverized solid fuel in a primary combustion supporting gas, a refractory tap-hole (12) coaxially of said axial conduit having an inlet and a shape which confines the initial part of the flame, a premix chamber (10) between the end of said axial conduit and the inlet of said tap-hole for preliminary mixing of said fuel and a part of a secondary combustion supporting gas, a first annular conduit (2) feeding a part of a secondary combustion supporting gas, rotation inducing vanes (6) around the end of said axial conduit and within said first annular conduit for creating turbulence in the flow of said secondary combustion supporting gas within said first annular conduit, a second annular conduit (7) concentric about said first annular conduit (2) feeding another part of said secondary combustion supporting gas, rotation inducing vanes (11) at the end of said first annular conduit and within said second annular conduit for creating turbulence in the flow of said another part of said secondary combustion supporting gas, means (4, 9), separate from said rotation inducing vanes (6, 11) for independently adjusting the respective flowrates of said secondary combustion supporting gas in said first and second annular conduits respectively, a conduit (19) for feeding a tertiary combustion supporting gas concentric with said tap-hole and at least partially surrounding it, adapted to be supplied with a sufficient flowrate of a tertiary combustion supporting gas and acting, in conjunction with flowrates of said primary and secondary combustion supporting gas, to produce total combustion of said pulverized solid fossil fuel, a flame detector device (20), an igniter (15) disposed in one of said refractory tap-hole and said axial conduit, and translation means (21) for shifting said axial conduit axially within said first annular conduit (2) whereby the length of said premix chamber may be adjusted.

4,690,076

METHOD FOR DRYING COAL WITH HOT RECYCLE MATERIAL

Lawrence J. Peletz, Jr., East Granby, and Glen D. Jukkola, Glastonbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 4, 1986, Ser. No. 848,065
Int. Cl.[4] F22B 1/00
U.S. Cl. 110—347 3 Claims



1. A method for feeding particulate fuel, particulate sulfur absorbant, and particulate recycle material to a fluidized bed furnace system having a combustion chamber housing a bed of said particulates wherein the particulate fuel is combusted to produce hot gases, a flue through which the gases are vented to the atmosphere, and a mechanical particulate collector disposed in the flue for removing particulates entrained in the gases prior to venting the gases to the atmosphere, said method comprising:

a. premixing at ambient temperature a supply of wet raw particulate fuel comprising crushed raw sulfur-bearing coal to be combusted with a supply of raw particulate sulfur absorbent comprising crushed raw limestones to form a flowable mixture thereof, the crushed raw sulfur-bearing coal and the crushed raw limestone being selectively premixed to provide a calcium to sulfur mole ratio ranging from about 50% to about 90% of the desired overall calcium to sulfur mole ratio;

b. blending the mixture of wet raw particulate fuel and raw particulate sulfur absorbent in a first mixing apparatus with a first portion of hot particulate recycle material withdrawn from the fluidized bed furnace system at a temperature ranging from about 400 F. to about 700 F. at a controlled rate so as to contact the wet raw particulate coal with the hot particulate recycle material at a ratio ranging from 0.1 to about 1.0 pounds of hot particulate material per pound of particulate fuel thereby substantially drying the wet raw particulate coal;

c. monitoring the temperature of the resultant mixture of dried raw crushed coal, raw crushed limestone, and cooled particulate recycle material leaving the first mixing apparatus;

d. selectively adjusting the controlled rate at which the first portion of the hot particulate material is blended with the mixture of wet raw crushed coal and raw crushed limestone so as to maintain the temperature of the resultant mixture within a preselected temperature range;

e. blending a second portion of the hot particulate recycle material withdrawn from the fluidized bed furnace system in a second mixing apparatus with the resultant mixture of dried raw crushed coal, raw crushed limestone, and cooled particulate recycle material after leaving the first mixing apparatus; and

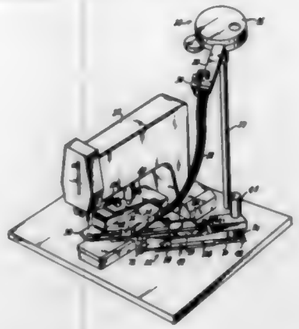
f. entraining the mixture of dried raw particulate coal, raw particulate sulfur absorbent and particulate recycle material withdrawn from the fluidized bed furnace system in a conveying gas for introduction into the conbustion chamber of the fluidized bed furnace system.

4,690,077

BUTTON DELIVERY SYSTEM FOR SEWING MACHINES

Morris Nirenberg, 480 Golf Ct., North Woodmere, N.Y. 11581

Filed Jun. 6, 1986, Ser. No. 872,085
Int. Cl.[4] D05B 3/22
U.S. Cl. 112—113 14 Claims



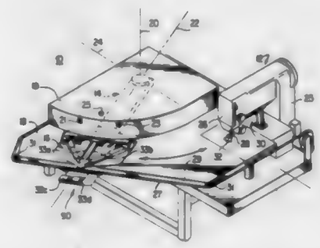
1. In a button feeding mechanism for feeding buttons to a clamp on a raised arch of a sewing machine wherein the button feeding mechanism comprises a frame, driving means mounted on said frame, a first rod mounted on said frame for reciprocal movement and having an initial position, coupling means for coupling said driving means to said first rod selectively to move said first rod from its initial position through a cycle of movement, orienting means mounted on said frame for orienting a button and coupled to said first rod, a second rod coupled to said first rod and mounted on said frame for reciprocal motion, and moving means coupled to said second rod for moving a button through the orienting means to the clamp of said sewing machine, the improvement comprises said coupling means comprising a clutch controlled by an electrical circuit energized by the simultaneous condition of the arch of said sewing machine being in its raised position subsequent to being in its lowered position and said first rod being in its initial position.

4,690,078

METHOD AND APPARATUS FOR FORMING AND STITCHING A SHIRT PLACKET

Joseph W. A. Off, Irving, and Vivian Ferguson, Dallas, both of Tex., assignors to Automated Machinery Systems, Richmond, Va.

Filed Sep. 19, 1986, Ser. No. 909,693
Int. Cl.[4] D05B 21/00; A41H 33/00
U.S. Cl. 112—121.12 12 Claims



1. An apparatus for folding and stitching a placket, comprising:

a base having a pivot axis and first and second longitudinal axes located in the plane of the base and intersecting the pivot axis, the second longitudinal axis offset from the first longitudinal axis by a predetermined angle;

a sewing machine mounted on the base and having means for clamping and stitching a placket;

a transfer arm assembly having a first end and a second end, the first end attached to the base at the pivot axis;

a placket forming assembly supported on the second end of the transfer arm assembly for receiving a workpiece to be formed into a placket while the transfer arm assembly is located along the first longitudinal axis;

means supported by the base for rotating the transfer arm assembly and the workpiece about the pivot axis following formation of the placket between the first longitudinal axis and the second longitudinal axis to locate the placket along the second longitudinal axis;

means responsive to the rotating means for actuating the clamping and stitching means of the sewing machine to stitch the placket;

a clamping assembly supported on the second end of the transfer arm assembly for clamping the workpiece prior to rotating the transfer arm assembly;

a control switch for actuating the clamping assembly to clamp the placket in the transfer arm assembly; and

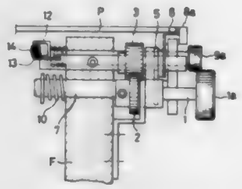
means responsive to the control switch for extending the placket forming assembly between a retracted position and an extended position along the first longitudinal axis to facilitate formation of the placket.

4,690,079

OVEREDGE WIDTH REGULATING DEVICE FOR OVEREDGING SEWING MACHINES

Shiro Satoma, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Dec. 23, 1986, Ser. No. 945,664
Claims priority, application Japan, Dec. 28, 1985, 60-298667
Int. Cl.[4] D05B 1/20
U.S. Cl. 112—162 2 Claims



1. In an overedging sewing machine capable of adjusting overedge width by moving an overedge-width latch and a lower knife, both adjacently located near the needle holes of said machine, in a direction crossing to the feeding direction of a workpiece, an overedge width regulating device comprising: a movable piece which moves along a plurality of shafts in a direction crossing the feeding direction of said workpiece; an overedge-width latch arranged on one of said plurality of shafts which is adapted to move in a direction crossing the feeding direction of said workpiece; a lower knife arranged on one of said plurality of shafts which moves simultaneously with said movable piece and in the same direction as said movable piece; a switching means located on one of said plurality of shafts for releasing and returning said overedge-width latch to its original position; and adjusting means located on one of said plurality of shafts for moving said movable piece back and forth by rotating a knob located on one of said plurality of shafts.

4,690,080

OVEREDGE SEWING MACHINE

Yoshio Mikuni, Osaka, and Osamu Koshinaka, Izumi, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Jul. 15, 1986, Ser. No. 885,698
Claims priority, application Japan, Jul. 15, 1985, 60-156826
Int. Cl.[4] D05B 1/20, 57/06
U.S. Cl. 112—162 16 Claims



1. An overedge sewing machine wherein with movements given from a main shaft which is driven for rotation, a needle is substantially vertically moved and an upper looper is substantially vertically moved in the direction which crosses the fabric feed direction and a lower looper is swung in the direction crossing the fabric feed direction, the cooperating action of said needle and said upper and lower loopers performing three thread overedge stitching, said overedge sewing machine being characterized in that it comprises:

means for selectively stopping the substantially vertical movement of said upper looper; and

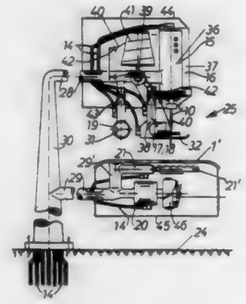
means for applying reciprocating movement in the fabric feed direction to said lower looper with the timing agreeing with the substantially vertical movement of said needle.

4,690,081

SEWING MACHINE

Wolfgang Castagna; Jochen Krankenhagen; Heinz Ortwein, and Klaus Weertz, all of Berlin, Fed. Rep. of Germany, assignors to awfi Arbeitswissenschaffliches Forschungsinstitut GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 522,840, Aug. 12, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,518
Int. Cl.[4] D05B 69/08
U.S. Cl. 112—276 2 Claims



1. A sewing device having a sewing head with thread tensioner, a presser foot, an underthread roller with a looper for guiding the underthread, transport means for the advancing of

the workpiece to be handled and a plurality of drives, characterized in that:

(a) each individual element has its separate drive (15 to 23) in the form of hydromotors or hydropistons;

(b) the separate drives (15 to 23) are connected via lines (14) with a hydraulic pulse generator (11) driven by an electric or hydraulic motor (12) and can be controlled synchronously by said generator;

(c) the hydraulic stream (13) which is continously fed to the pulse generator (11) is transformed into a plurality of hydraulic streams which are fed separately, via the lines (14), to the individual drives (15 to 23), pulsate and are infinitely adjustable in their frequency range; and

(d) the separate drives (15 to 23) of the individual elements are adapted to the forces of speeds to be transmitted by the latter.

4,690,082

DEVICE FOR REGULATING UPPER THREAD TENSION OF A SEWING MACHINE

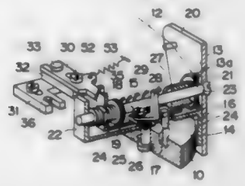
Yasukata Eguchi; Kazumasa Hara, both of Tokyo, and Michio Hisatake, Fujino, all of Japan, assignors to Janome Sewing Machine Co Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 796,392

Claims priority, application Japan, Nov. 9, 1984, 59-234900

Int. Cl.⁴ D05B *47/04*

U.S. Cl. 112—254 **7 Claims**



1. A device for regulating upper thread tension in a sewing machine having an upper thread tension device with two discs receiving an upper thread therebetween, a spring pressing the discs one against the other, a presser body positioned between said spring and said discs, and a manually operated dial for actuating said presser body, the regulating device comprising an indicator for indicating a thread tension of a proper value and operatively connected to said dial and movable thereby, and a regulating means for regulating a relation between a moving amount of said presser body and a moving amount of said indicator and adjusting a pressure of a thread tension to the movement of the thread tension indicator.

4,690,083

AUTOMATIC UPPER THREAD TENSION CONTROL FOR A SEWING MACHINE

Kazumasa Hara; Mikio Koike, both of Tokyo, and Akiyoshi Sasano, Musashino, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 797,418

Claims priority, application Japan, Nov. 9, 1984, 59-236088; Nov. 20, 1984, 59-243253

Int. Cl.⁴ D05B *47/04*

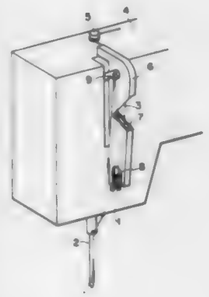
U.S. Cl. 112—254 **8 Claims**

1. An automatic thread tension adjusting device on a sewing machine that includes an upper drive shaft rotatable to vertically reciprocate a swingable needle to penetrate a fabric to be sewn and also to reciprocate a thread take-up lever to supply an upper thread from a supply means to the needle and tighten a stitch to be formed and includes a loop taker rotatable in association with the upper drive shaft to catch the upper thread for interlocking the upper thread with a lower thread to form the stitch, the upper thread being extended between an upper thread supply and the needle and through at least the thread takeup lever, said automatic thread tension adjusting device comprising:

(a) thread tension means (14) provided between said upper thread supply and said thread take-up lever, said thread tension means guiding said upper thread and normally giving a predetermined constant tension to said upper thread;

(b) cushion spring means (1) provided between said thread tension means and said thread take-up lever, said cushion spring means absorbing a surplus of thread between said thread tension means and said thread take-up lever, said surplus thread resulting from the difference between an upper thread amount required by said loop taker and an upper thread amount supplied by said thread take-up lever, said cushion spring means having an elastic force greater than the tension of said thread tension means (14) and movable in a predetermined range to absorb said surplus upper thread;

(c) first means (12) provided between said thread tension means and said cushion spring and being activable to hold said upper thread between said thread tension means and said cushion spring means;



(d) second means (13) provided between said cushion spring means and said thread take-up lever and being activable to hold said upper thread between said cushion spring means and said thread take-up lever;

(e) first sensor means (34), (35) operable in association with the rotation of said upper drive shaft for giving a first signal at a first angular position θ_2 of said upper drive shaft while said first thread holding means (12) is activable to hold said upper thread, said first signal activating said second thread holding means (13) to hold said upper thread; and

(f) second sensor means (30, 31) operable in association with the rotation of said upper drive shaft to give a second signal at a second angular position θ_3 of said upper drive shaft, said second signal inactivating said first thread holding means (12) to release said upper thread, said second sensor means producing a third signal at a third angular position θ_4 of said upper drive shaft, said third signal activating said first thread holding means (12) to hold said upper thread and simultaneously inactivating said second thread holding means (13) to release said upper thread, such that said surplus upper thread is supplied to said fabric to be sewn.

4,690,084

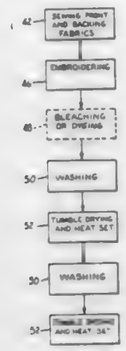
PRODUCTION OF PUFFED EMBROIDERED DESIGN FABRICS

David Krieger, Greenville, S.C., assignor to Krieger Corporation, Travelers Rest, S.C.

Filed Dec. 20, 1985, Ser. No. 811,780

Int. Cl.⁴ D05C *17/00*; D06C *23/04*

U.S. Cl. 112—266.1 **6 Claims**



1. A method of producing a stabilized puffed embroidered design fabric which may have included on its face any one of a wide variety of designs patterned by embroidery comprising;

providing a front fabric consisting of warp and weft yarns woven in a generally closed mesh;

providing a separate lightweight back fabric consisting of warp and weft yarns woven in a loosely woven open mesh having a substantially larger open mesh than the generally closed mesh of said front fabric, and selecting said back fabric to have warp and weft yarns of up about 20% higher shrinkage than the yarns of said front fabric;

uniting said front and back fabrics in a composite fabric by embroidering a prescribed preshrink embroidered pattern on said front fabric formed by a first shrinkable embroidery thread on the face of said front fabric interlocked with a second shrinkable thread on the backside of said back fabric;

subjecting said embroidered composite panel to hot water treatment in a manner and temperature that said back fabric shrinks relative to said front fabric causing excess in said front fabric within said emboidery stitches to puff up and form puffed design elements in said preshrunk embroidered pattern creating a puffed embroidered design on the face of said front fabric after shrinking; the shrinkage of said embroidery threads enhancing the puffing of the design and

drying said embroidered composite panel in a relaxed, untensioned state in a manner that said puffed design elements and puffed embroidered design are stabilized in said front fabric.

4,690,085

PROPULSION SYSTEM FOR A TORPEDO WITH THRUST COMPENSATION

Daniel R. Dobbs, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 9, 1986, Ser. No. 883,634

Int. Cl.⁴ F16C *35/06, 33/74*

U.S. Cl. 114—20.2 **10 Claims**

1. In a propulsion system, the combination of:

a frame;

a rotatable propeller on said frame;

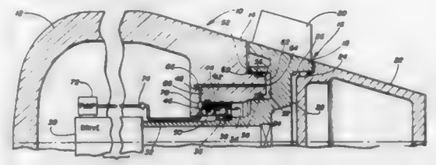
a drive on said frame and connected to said propeller;

a bearing jurnalling said propeller for rotation about an axis;

a first piston mounting said bearing on said frame for movement along said axis;

a first cylinder on said frame receiving said piston;

a second piston on said frame;



a second cylinder on said propeller opening oppositely of said first cylinder and receiving said second piston; and

means placing said cylinders in fluid communication with each other.

4,690,086

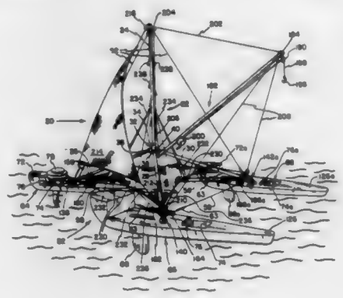
WATER SAILING CRAFT

Quentin M. McKenna, P.O. Box 512, Waimanalo, Hi. 96795

Filed Jan. 28, 1985, Ser. No. 695,696

Int. Cl.⁴ B63B *1/14*

U.S. Cl. 114—39 **8 Claims**



1. In a watercraft, the combination comprising:

a plurality of spaced-apart flotation members;

a plurality of elongate spar members having opposite proximal and distal ends, each of said elongate spar members corresponding to one of said flotation members;

a generally vertical spar member having opposite proximal and distal ends;

a juncture means for receiving the proximal ends of each of said elongate spar members and said vertical spar member; and

a plurality of spar attachment means each for connecting the distal end of one of said elongate spar members to its corresponding flotation member, each of said spar attachment means including

an elongate mounting bracket attached to the distal end of its corresponding elongate spar member, said mounting bracket having a connection portion defining an aperture therein, and

a mounting assembly attached to its corresponding flotation member, said mounting assembly having an upstanding fastener which extends through said aperture and a coupling member received about said upstanding fastener having a lower reduced diameter portion extending through said aperture between said fastener and said connection portion of said mounting bracket in spaced relation thereto so as to connect said corresponding spar member to its corresponding flotation member and permit said corresponding spar member to move omni-directionally relative thereto, said coupling member having an

upper enlarged diameter portion which overlies said connection portion of said mounting bracket and has a diameter greater than the diameter of said aperture so as to limit the omni-directional movement of said corresponding spar member relative to its corresponding flotation member.

4,690,087

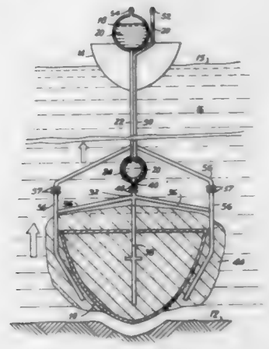
SYSTEM AND METHOD FOR RAISING SUNKEN VESSELS

Constantin Hadjis, Calle 84 No. 2A/14, Edificio El Cerro, Maracaibo(Zulia), Venezuela

Continuation of Ser. No. 842,504, Mar. 21, 1986, abandoned, which is a continuation of Ser. No. 778,631, Sep. 20, 1985, abandoned, which is a continuation of Ser. No. 625,279, Jun. 27, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 894,162

Int. Cl.⁴ B63C *7/06*

U.S. Cl. 114—50 **14 Claims**



1. A method for raising a sunken vessel lying at the bottom of a body of water, comprising the following steps:

positioning cryogenic means in relationship with said sunken vessel, said cryogenic means including a liquefied cryogenic fluid in the vicinity of the vessel for delivery of the fluid to the vessel, and

distributing said fluid the length of the vessel within cryogenic piping held in close proximity to the vessel, and

directing said fluid through cryogenic pipes of said piping which are shaped for delivering said fluid to the lower outside of the vessel that is close to the bottom's surface, with minimum penetration of said bottom surface, with

releasing for vaporization, said liquefied cryogenic fluid around said sunken vessel along its length in sufficient quantity so that a sufficient volume of water is formed into an ice mass integral with and encapsulating a sufficient portion of the length of said sunken vessel so that the vessel is raised to the surface of the water by the force of the buoyancy of the ice.

4,690,088

SAIL RIGGING WITH FAIRING

Fabio Perini, Via Fornace, 55100 San Michele di Moriano, Lucca, Italy

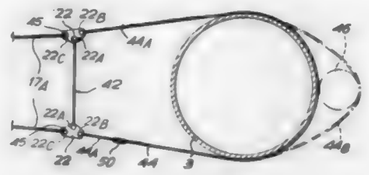
Filed Jul. 14, 1986, Ser. No. 885,559

Claims priority, application Italy, Jul. 23, 1985, 9460 A/85

Int. Cl.⁴ B63H *9/06, 9/08*

U.S. Cl. 114—102 **8 Claims**

1. A sail of improved aerodynamic efficiency for a sailboat having a mast and a boom, said sail including a spanker portion and a fairing portion interconnected by a stay, said fairing portion having trailing edges, the leading edge of the spanker portion being bifurcated and disposed in said stay so that each portion of said bifurcated edge is in alignment with a trailing edge of said fairing, said stay includes at least two seperate portions, each having channels therein, and wherein the leading edges of the bifurcated portion of the sail and the trailing



edges of the fairing all have footropes disposed and arranged to lie within a juxtaposed channel in the adjacent stay portion.

4,690,089

BOAT WITH A RAISABLE AND LOWERABLE KEEL

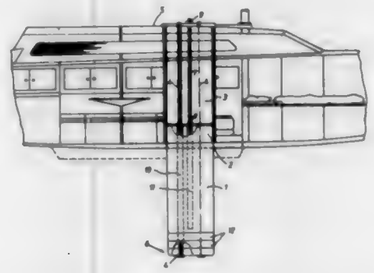
Fritz Marggraff, Schwanenstieg 1, 7750 Konstanz 16, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,077

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501892; Apr. 26, 1985, 3515090

Int. Cl.⁴ B63B *41/00*

U.S. Cl. 114—141 **4 Claims**



1. A boat having a movable lifting keel guided in a lifting keel box, said lifting keel having a top and a bottom and being provided with a plurality of channels extending from said top toward said bottom, compression springs positioned in said plurality of channels such that one end of said compression springs presses against a lower stop connected to said boat and the other end presses against an upper stop connected to said lifting keel, and a plurality of rods connected to said boat and passing through said compressing springs, said rods having on their lower ends a plate forming said lower stop.

4,690,090

CLEAT AND DEVICE THEREFOR

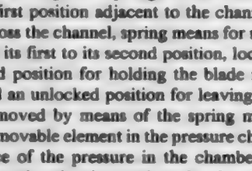
William E. Tuttle, 843 SE. St. Lucie Blvd., Stuart, Fla. 33494

Filed Oct. 28, 1986, Ser. No. 923,916

Int. Cl.⁴ B63B *21/04*

U.S. Cl. 114—218 **9 Claims**

6. A device for improving the line snagging properties of a conventional deck cleat, comprising a continuous length of wire, said wire being bent to comprise a first and a second oppositely extending, downwardly sloping open loops, said loops comprising an inner width substantially equal to an outer width of said cleath, the wire of said first loop comprising a portion extending upwardly, thereby, upon said device being clamped to said cleat, combining with a top surface of said cleat to form a wedge-shaped opening for snagging a line, and



said loops combining with tapered portions of said cleat to form wedge-shaped openings for snagging a line.

4,690,091

SECURING ARRANGEMENT SO EXECUTED AS TO BE TRIPPED ON ACTUATION

Sven-Erik Persbeck, Torslanda, Sweden, assignor to Mats Hermansson, Gothenburg, Sweden

Filed Mar. 18, 1986, Ser. No. 840,668

Claims priority, application Sweden, Mar. 18, 1985, 8501305

Int. Cl.⁴ B63B *9/00*

U.S. Cl. 114—221 A **2 Claims**

1. Securing device connected to a loadable link for attaching an item of equipment to a construction, the device being operable to open the link to release the equipment by being actuated by a change in pressure in the water surrounding the device, which device comprises a channel for the link, which link is in the form of a cable, guide means transverse to the channel, blade means having a sharp edge slidable in the guide means between a first position adjacent to the channel and a second position across the channel, spring means for moving the blade means from its first to its second position, locking means having a locked position for holding the blade means in its first position and an unlocked position for leaving the blade means free to be moved by means of the spring means, a pressure chamber, a movable element in the pressure chamber subject to the influence of the pressure in the chamber, second spring means for pressing the element into the chamber with a predetermined force, connecting means between the element and the locking means for holding the locking means in its locked position when the second spring means is biasing the element to be in an inner position in the chamber and for bringing the locking means to its unlocked position in order to release the blade means when the element is pressed outwards from the chamber from its inner position by means of a predetermined pressure level in the chamber, the second spring means being adjustable to allow the element to be moved from its inner position by the reaching of the predetermined pressure level in the chamber.

4,690,092

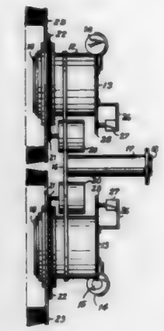
AQUATIC SCRUBBING DEVICE

Milton Rabuse, 249-32 57th Ave., Little Neck, N.Y. 11362

Filed Jun. 5, 1986, Ser. No. 871,452

Int. Cl.⁴ B63B *59/00*

U.S. Cl. 114—222 **4 Claims**



1. An aquatic scrubbing device for attachment to a ferromagnetic surface, comprising:

(1) a first electromagnet having a longitudinal axis;

(2) a second electromagnet having a longitudinal axis spaced from and parallel to the longitudinal axis of said first electromagnet;

(3) a first carriage interconnecting said electromagnets and supporting each said electromagnet for rotation about its longitudinal axis relative to said carriage;

(4) drive means for rotating each said electromagnet about its longitudinal axis;

(5) control means for selectively energizing said electromagnets and their associated drive means in repetitive sequence comprising:

(a) energization of both said electromagnets to cause said electromagnets to attach to said ferro-magnetic surface, and de-energization of said drive means of both said electromagnets

(b) subsequent de-energization of one of said electromagnets only and energization of the drive means of the other said electromagnet to cause said carriage to move arcuately about the longitudinal axis of said other electromagnet

(c) subsequent de-energization of said drive means of said other electromagnet and energization of both said electromagnets

(d) subsequent de-energization of the said other said electromagnet and energization of the drive means of said one electromagnet to cause said first carriage to move arcuately about the longitudinal axis of said one electromagnet; and,

(6) rotary scrubbing means and associated drive means carried by said device.

4,690,093

OIL-SPILL-COMBATTING WATER CRAFT

Lars Lundin, Porvoo, Finland, assignor to Oy Lars Lundin Patent AB, Helsinki, Finland

Filed Jun. 3, 1986, Ser. No. 870,211

Claims priority, application Finland, Jun. 4, 1985, 852238

Int. Cl.⁴ B63B *35/00*

U.S. Cl. 114—270 **4 Claims**

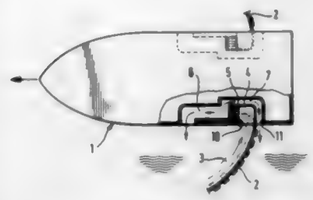
1. In an oil-spill-combatting water craft for recovering oil present on the surface of water, in which said water craft has at least one inlet for oil-contaminated water positioned in the side of the water craft hull, comprising:

a collecting boom partly submerged into the water and secured to said hull side immediately behind the inlet for

oil-contaminated water, said boom extending outwardly and forwardly with respect to the travel of the water craft so as to collect and guide oil-contaminated water into said inlet;

a flow conduit arranged inside the water craft and being directly connected to said inlet;

separating means arranged in said flow conduit to separate oil from the oil-contaminated water entering the water craft through said inlet; and



at least one outlet opening for the discharge of water from which oil has been separated, and

said outlet opening positioned in the hull immediately behind the collecting boom, said outlet opening discharging at least a portion of the water, from which oil has been separated, immediately at the rear side of the collecting boom.

4,690,094

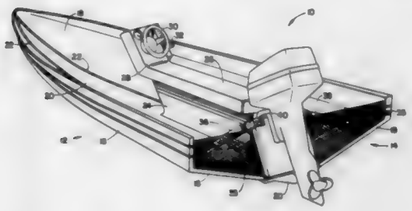
BOAT WITH CHANGEABLE CONFIGURATION HULL

James F. Taylor, 4217 Laurel Ridge Dr., Raleigh, N.C. 27612

Filed Mar. 31, 1986, Ser. No. 845,939

Int. Cl.[4] B63B *1/22*

U.S. Cl. 114—284 **18 Claims**



1. A boat with a variable configuration hull comprising: a hull structure having moveable hull section means moveable between a first position and a second position; drive means for moving said boat through the water; hull configuration control means operatively connected between said drive means and said hull section means for moving said moveable hull section means between said first and second positions; said boat further including mounting means, for supporting said drive means, pivotally secured to said hull structure and moveable between a first position and a second position; and wherein said control means includes connecting arm means secured at one end to said mounting means and at the other end to said moveable hull section means such that when said mounting means is moved from said first position to said second position said hull section means will also be moved from said first position to said second position.

4,690,095

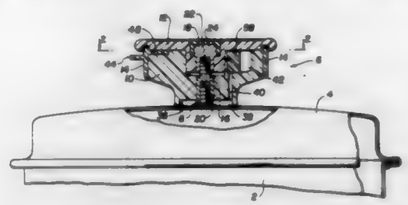
COOKING AND WHISTLING KNOB THEREFOR

Henry M. Walls, Pittsburgh, and George M. Sayers, Jr., Clearfield, both of Pa., assignors to TSCO Corporation, Hickory, Pa.

Continuation of Ser. No. 512,072, Jul. 8, 1983, abandoned. This application May 19, 1986, Ser. No. 865,949

Int. Cl.[4] A47J *27/212*; G08B *3/00*

U.S. Cl. 116—67 R **22 Claims**



1. A whistling knob for a cooking vessel,

said knob having a body with a surface for engaging a wall of a cooking vessel,

a whistle chamber in said knob, said whistle chamber having an axis,

passage means formed in said knob and extending from said surface and has a convergent portion with a planar bottom to said whistle chamber, said passage means being oriented to introduce steam into said whistle chamber at an angle from an inlet normal to said planar bottom and in direct communication with said passage, which causes an audible whistle and rotary movement of steam in the whistle chamber, said rotary movement being in a direction which is circumferential with respect to said axis,

said whistle chamber having outlet means for releasing steam to the atmosphere.

4,690,096

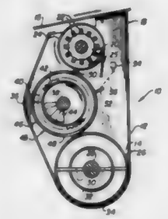
MAGNETIC BRUSH DEVELOPMENT APPARATUS HAVING A GATING AND METERING MECHANISM

Frank Hacknauer, Honeoye Falls; Salvatore C. DeFazio, Bergen, and Richard S. Fox, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,895

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **5 Claims**



1. In a magnetic brush development apparatus for applying developer material to a latent image on a photoconductor, the apparatus having a housing with a sump for holding a supply of developer material, a magnetic brush for applying developer material to the latent image, a rotatable transport roller between the sump and the magnetic brush, and a magnet in the roller for attracting developer material from the sump to the roller, the improvement comprising:

a gating and matering mechaniam for controlling the flow of developer material to the magnetic brush, the mechanism comprising a gating member positioned around at least part of the transport roller and having first and second spaced openings, and means for moving the gating member relative to the roller between

(1) a first position wherein (a) the first opening is located relative to the roller and the magnetic brush to permit flow of developer material from the roller through the first opening to the magnetic brush and (b) the second opening is located relative to the sump and the magnet to permit flow of developer material from the sump through the second opening to the roller, and

(2) a second position wherein the openings are offset from the sump and the magnetic brush to block the transport of developer material from the sump to the magnetic brush by the roller.

4,690,097

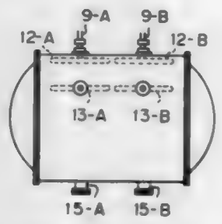
APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 583,270, Feb. 4, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 931,012

Int. Cl.[4] B01J *19/08*

U.S. Cl. 118—723 **1 Claim**



1. An apparatus for irradiating resinous work pieces with plasma which comprises:

a vacuum reaction chamber having an inner continuous side wall closed at both ends to provide a work receiving space with a cross sectional area having distance between diametrically opposed points on said wall of at least 1000 mm;

means for mounting work pieces within said chamber;

a plurality of plasma introducing ports extending through said side wall and spaced circumferentially about said wall in spaced increments;

a plurality of pipes individually extending longitudinally of said chamber in proximity to said side wall and adjacent to associated ones of said plurality of introducing ports;

a plurality of manifold means associated with and individually connected to each of said plurality of introducing ports, each manifold means having a number of conduits running from each of said plurality of introducing ports to each of said associated ones of said plurality of pipes;

each of said plurality of pipes having a plurality of nozzle openings extending along the entire length of each of said plurality of pipes, each of said nozzle openings being circumferentially spaced at angular staggered positions of up to 30° on either side of a reference plane defined by a pair of axes running through the center of each of said plurality of pipes and through an associated one of said plurality of introducing ports;

a plurality of plasma exhaust ports extending through said side wall, each of said plurality of exhaust ports being spaced circumferentially and diametrically opposed to individual ones of said plurality of introducing ports and thereby individually paired with said individual ones of plurality of introducing ports to pass plasma through said reaction chamber, said paired plurality of introducing and exhaust ports being positioned on substantially diametrically opposed points on said side wall; and

means for operating each pair of said paired plurality of introducing and exhaust ports intermittently and at differently timed intervals from said remaining pairs of said plurality of introducing and exhaust ports, thereby uniformly distributing plasma on the work pieces in said reaction chamber.

4,690,098

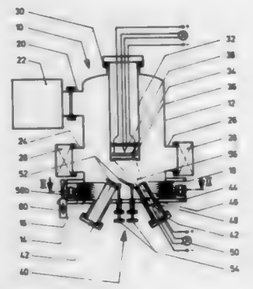
VACUUM VAPOR-DEPOSITION SYSTEM

Horst M. Mertens, Munich, and Leonhard Bögl, Buchbach, both of Fed. Rep. of Germany, assignors to ATOMIKA Technische Physik GmbH, Munich and Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, both of, Fed. Rep. of Germany

Filed Oct. 29, 1985, Ser. No. 792,700

Int. Cl.[4] C23C *14/26*

U.S. Cl. 118—727 **7 Claims**



1. A vacuum-vapor-deposition system comprising a vacuum-tight vapor-deposition chamber the wall whereof includes a fixed part and a movable part, a substrate-holder adapted to hold at least one substrate to be coated arranged at said fixed part, an evaporation apparatus arranged at said movable part and having at least one heatable vapor-deposition material source, vacuum-tight connecting apparatus adapted to connect said fixed part to said movable part and means to permit a swivel motion, around two nonparallel axes, of the movable part while the fixed part remains stataionary and means coupled to said fixed part and said movable part for producing said swivel motion throughout deposition.

4,690,099

PULSATION ARRANGEMENT

David J. Gregan, and Ronald H. Crowter, both of Hamilton, New Zealand, assignors to The National Dairy Association of N.Z., Auckland, New Zealand

Filed Nov. 27, 1985, Ser. No. 802,261

Claims priority, application New Zealand, Nov. 27, 1984, 210351

Int. Cl.[4] A01J *5/04*

U.S. Cl. 119—14.41 **7 Claims**

1. A milking machine pulsator arrangement for operating a plurality of milking claws comprising:

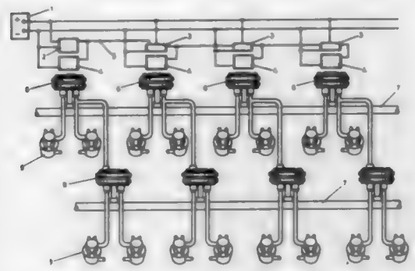
a plurality of pulsator units each of which comprises a valve means operatively connected to a separate milking claw means for controlling alternative application of atmospheric and vacuum pressure to operate each respective milking claw means and a separate electric coil means operatively associated with each respective valve means for individually operating said valve means;

a pulsator rate and ratio timing means operatively associated with a first one of said plurality of pulsator units for operating the coil means of said first one of said units;

time delay means operatively associated with each of the other of said pulsator units for individually operating the respective coil means of each of said other units;

an electric power source; and

electrical conduit means connecting said power source to each of said coil means and connecting said pulsator rate and ratio timing means between said power source and each of said time delay means;



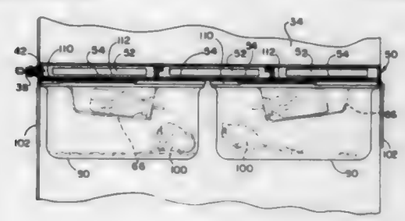
so that said pulsator rate and ratio timing means controls the operation of the coil of said first one of said units and provides an electric pulse after a predetermined time delay to said time delay means of each of said other units for operating the respective coils of said other units in succession after a respective predetermined time delay.

4,690,100

VENTILATED ANIMAL HOUSING AND SERVICE SYSTEM WITH CAGE FILTER COVERS

William R. Thomas, Coaynham, Pa., assignor to Thoren Caging Systems, Inc., Hazleton, Pa.

Filed Oct. 22, 1985, Ser. No. 790,106
Int. Cl.[4] A01K *1/03*
U.S. Cl. 119—15 **12 Claims**



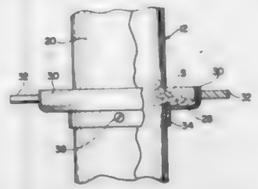
1. An animal housing and maintenance system, comprising:
at least one hollow shelf having at least one internal duct for carrying air, the at least one shelf being affixed to at least one of an air supply and an air exhaust, the at least one shelf having a plurality of spaced air openings on one side thereof, communicating with the at least one duct;
a plurality of hollow cages removably mounted on the at least one shelf, each cage being a solid box with one open wall, the open wall being disposed toward the at least one shelf when the cage is mounted on the shelf, the cage encompassing at least one of said spaced air openings;
means for removably holding the cages in position against the at least one shelf;
a filter panel disposed across each said open wall, the filter panel having a foraminous sheet for enabling air flow and a frame for engaging the cage around a periphery of the open wall, the frame being affixed to the foraminous sheet;
whereby occupants of the cages are pathologically isolated when the cages are held against the at least one shelf and also when the cages are removed form the at least one shelf.

4,690,101

BIRD FEEDER WITH ADJUSTABLE FEED TRAY

Peter Kilham, Mill Rd., Foster, R.I. 02825

Continuation-in-part of Ser. No. 735,220, May 17, 1985, abandoned. This application Jun. 27, 1986, Ser. No. 879,260
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52 R **19 Claims**



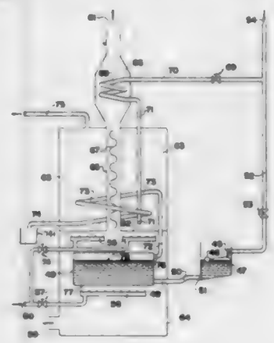
1. In a bird feeder including a vertically disposed hollow housing having a peripheral side wall, a removable top cover, a bottom wall, and at least one aperture in said side wall such that seed disposed in said housing at a height above said at least one aperture may normally pass freely as by gravity therethrough, the improvement comprising: a combination baffle, seed tray and perch device adapted for mounting on the outside of said side wall, said device including a vertically disposed peripheral collar of a configuration similar to said side wall and of a height at least essentially equal to the height of said at least one aperture and adapted to receive said housing therein with the inside of said collar and the outside of adjacent side wall portions in slidable face to face contact such that said collar may move across and accordingly cover said at least one aperture from a slight to an essentially complete obstruction thereof, mounting means for adjustably fixing the position of said collar vis-a-vis said housing whereby the flow of seed from said housing through the uncovered portion of said at least one aperture is determined, and said device further including a tray having an essentially flat inner rim portion outwardly extending from the periphery of said collar such that seed passing by gravity from said housing through said at least one aperture collects on said tray.

4,690,102

WATER HEATER AND DISTILLER APPARATUS

Glen Sandquist, Box 823, Watrous, Saskatchewan, Canada (S0K 4T0)

Division of Ser. No. 802,675, Nov. 29, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 5,551
Claims priority, application Canada, Dec. 6, 1984, 469526
Int. Cl.[4] F22B *5/00*; F24D *3/00*
U.S. Cl. 122—13 R **7 Claims**



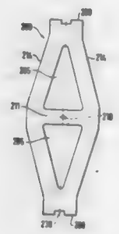
1. A water heater and distiller apparatus adapted for utilizing latent heat of water condensing in a distilling process for heating water, said water heater and distiller apparatus comprising:
a boiler chamber means for containing water to be boiled to steam, said boiler chamber means having an inlet for receiving water from a water supply and an outlet disposed for delivery of steam thereout said boiler chamber being closed except for said inlet and said outlet;
heating means for boiling water in said boiler chamber means;
a water heating tank means for containing water to be heated, said water heating tank means having an inlet for receiving water from a water supply and an outlet for passage of heated water thereout;
a condenser means disposed for being cooled by water in said water heating tank means, said condenser means having an inlet for receiving steam, an outlet for delivery of condensate thereout and means for collection of condensate from said outlet and arranged such that said condensate is removed for use separate from said boiler chamber means;
duct means communicating with said outlet of said boiler chamber means and said inlet of said condenser means for delivery of steam from said boiler chamber means to said condenser means;
a reservoir disposed laterally of said boiler chamber means, said reservoir being open to air pressure;
flow control means for controlling the flow of water from said reservoir for maintaining the level of water in said boiler chamber means below a predetermined maximum and above a predetermined minimum, said flow control means comprising a float valve controlled by a float, said float valve being adapted for closing upon said level of water moving to said predetermined maximum and adapted for opening upon moving of said water level to said predetermined minimum;
conduit means communicating between said boiler chamber means and said reservoir for communicating water from said reservoir to said boiler chamber means, at least a portion of the length of said conduit means being disposed entirely downwardly of said predetermined minimum so as to form a gas trap for impeding venting of steam from said boiler chamber means through said conduit; and
heating means separate from said condenser means for heating said water to be heated.

4,690,103

VISCOUS FAN COUPLING UNIT

Werner Göb, Kürnach, and Peter Anders, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG

Filed Apr. 4, 1986, Ser. No. 848,812
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513785
Int. Cl.[4] F01P *5/02*
U.S. Cl. 123—41.12 **7 Claims**



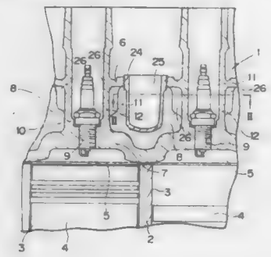
1. A fan coupling unit for controlling the operation of a fan providing a cooling stream for an internal combustion engine system, said coupling unit comprising two rotor units rotatable about a common axis and defining at least one gap between them, said gap being fillable with a viscous liquid, said fan coupling unit further comprising a control member (**110, 210, 310**) controlling the torque transmitting condition of said viscous liquid within said gap in response to temperature, said control member (**110, 210, 310**) being engageable with a bimetallic element (**109, 209, 309**) having the shape of an elongate bimetallic strip with a long axis (**130, 230, 330**) and a short axis perpendicular to said long axis, said bimetallic strip (**109, 209, 309**) having end portions (**108, 208, 308**) spaced along said long axis (**130, 230, 330**) and supported by respective support members (**20**), and an intermediate portion acting onto said control member (**110, 210, 310**),
said bimetallic strip (**109, 209, 309**) having a separation slot (**105, 205, 305**) extending substantially along said long axis (**130, 230, 330**) and defining at least two partial strips (**114, 214, 314**) of said elongate strip (**109, 209, 309**), said partial strips (**114, 214, 314**) being interconnected with each other by said end portions (**108, 208, 308**) and by at least one cross-piece (**111, 211, 311**) located in the area of said intermediate portion.

4,690,104

CYLINDER HEAD WITH INWARDLY PROJECTING CUP PLUG IN CASTING SAND EXTRACTION HOLE FOR SPEEDING UP COOLANT FLOW

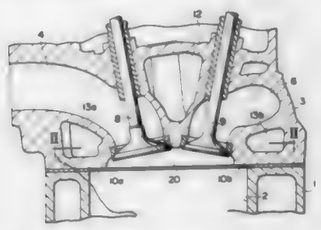
Masao Yasukawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 16, 1986, Ser. No. 864,086
Claims priority, application Japan, May 24, 1985, 60-111776
Int. Cl.[4] F01P *3/02*
U.S. Cl. 123—41.32 **7 Claims**



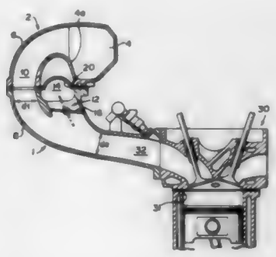
1. A cylinder head for an internal combustion engine having combustion chambers, the cylinder head comprising:
(a) an inner wall serving to define roofs of combustion chambers of the internal combustion engine;
(b) an outer wall spaced from the inner wall, the inner and outer walls defining a coolant plenum between said inner wall and said outer wall, with a coolant flow path being defined through said coolant plenum, and said outer wall having a casting sand extraction hole extending through said outer wall and opening to a region of said coolant plenum which has a cross-sectional area that is substantially larger than the cross-sectional area of said coolant flow path in a portion of the coolant plenum adjacent to said region; and
(c) a cup plug fitted into said casting sand extraction hole so as to block said hole, said cup plug projecting inwards into said coolant flow plenum so far as to reach nearly to said inner wall but to leave a coolant flow passage between the plug and the inner wall, thereby substantially reducing the cross-sectional area of said region of said coolant plenum.

4,690,105
CYLINDER HEAD WITH COOLANT PASSAGE FOLLOWING SQUISH AREA AND OF GENERALLY UNIFORM CROSS SECTIONAL AREA
Mutsumi Kanda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed May 16, 1986, Ser. No. 863,972
Claims priority, application Japan, May 30, 1985, 60-117561
Int. Cl.⁴ F01P *3/02*
U.S. Cl. 123—41.82 R **6 Claims**



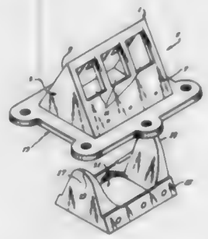
1. For an internal combustion engine of an automotive vehicle, comprising a cylinder block formed with a cylinder bore and a piston fitted in said bore and reciprocating therein:
a cylinder head for affixment to said cylinder block and for defining a combustion chamber in cooperation with said piston and said cylinder bore, formed with:
(a) a portion which extends from a portion lying over a peripheral portion of said cylinder bore toward a central portion of said combustion chamber and which in cooperation with a portion of said piston defines a squish area of said combustion chamber; and:
(b) a coolant passage formed through said cylinder head as convexly curved at a portion thereof adjacent to said squish area toward a central portion of said combustion chamber so as more extensively to overlie and directly to cool said squish area;
(c) said coolant passage being of substantially the same cross sectional area along its extent.

4,690,106
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE
Hideo Nakayama; Shuichi Nakatani; Fusatoshi Tanaka, and Hiroyuki Hanafusa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan
Filed Jun. 27, 1986, Ser. No. 879,639
Claims priority, application Japan, Jul. 1, 1985, 60-142578
Int. Cl.⁴ F02B *75/18*
U.S. Cl. 123—52 M **11 Claims**



1. An intake system for an internal combustion engine having a plurality of cylinders comprising an intake manifold and a surge tank member connected together to form a plurality of first discrete intake passages each of which leads to one of the cylinders and is bowed substantially in a vertical plane and a volume chamber disposed on upstream ends of the first discrete intake passages characterized in that the intake manifold is provided with a plurality of second discrete intake passages each of which branches off from one of the first discrete intake passages to extend from an the inner side of the same and is shorter than the first discrete intake passages, and with a communicating passage for interconnecting the second discrete intake passages, a passage switching means being provided to open and close the second discrete intake passages according to an operating condition of the engine and a part of a wall defining the communicating passage being formed by a plate member sandwiched between the intake manifold and an outer wall of the surge tank member.

4,690,107
FLOW ENHANCER FOR REED INLET VALVES
Don R. Emler, 1430 West 259th St., Harbor City, Calif. 90710, and Glenn M. Thomas, 11621 Kathy La., Garden Grove, Calif. 92643
Filed Jan. 11, 1986, Ser. No. 873,590
Int. Cl.⁴ F02B *75/02*
U.S. Cl. 123—65 V **8 Claims**

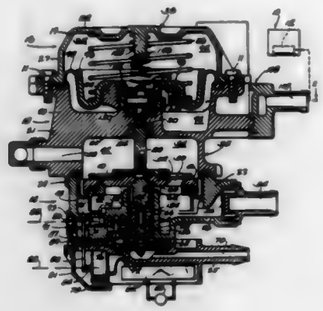


1. A flow enhancer insert for use in a roof prism shaped reed valve inlet frame of a two cycle internal combustion engine comprising:
an annular ring secured into an upstream portion of the reed valve inlet frame adjacent to a carburetor duct leading to the reed valve inlet frame, said ring being flush with an upstream opening face of the reed valve inlet frame and matching a downstream contour of the carburetor duct to an interior contour of the reed valve inlet frame; and two substantially triangular wedges each shaped so as to extend downstream from opposite sides of the annular ring and substantially to an interior apex of the reed valve inlet frame and each wedge to substantially cover an entire interior surface of each of two parallel triangular surfaces of the reed valve inlet frame with each wedge tapering outwards from the interior of the annular ring to cause substantially zero wedge thickness at an apex of each wedge and each wedge being attached at its base to the annular ring.

4,690,108
FUEL/OIL PUMP
Anthony F. Debevec, 38518 Waveland, Waukegan, Ill. 60087
Filed Jul. 31, 1985, Ser. No. 760,890
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—73 AD **35 Claims**

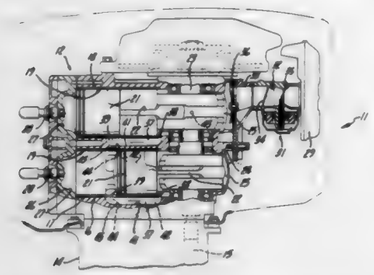
1. A pump comprising a housing, an oil pumping chamber in said housing, an oil outlet passageway in said housing communicating with said oil pumping chamber, an oil pumping piston reciprocally movable in said oil pumping chamber to produce oil flow into said oil outlet passageway in response to reciprocation of said oil pumping piston, a switch mounted on said housing and adapted to be operably connected to a device for actuation thereof, a second piston reciprocally movable in said housing relative to said oil outlet passageway between spaced

first and second positions, means biasing said second piston to said second position, and means for closing said switch in response to movement of said second piston to said first position, said means for closing said switch including a rocker arm having opposite first and second ends and being pivotally mounted in said housing for movement about a pivot point



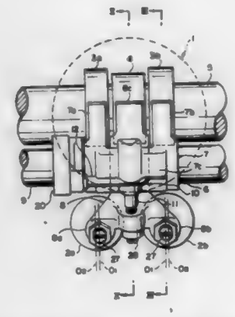
intermediate said opposite ends, said first end being engageable with said second piston for movement in one direction in response to movement of said second piston to said first position, and said second end being engageable with said switch for closing said switch in response to movement of said first end in said one direction.

4,690,109
TWO-STROKE ENGINE
Takio Ogasahara, Shizuoka, and Hiroaki Fujimoto, Hamamatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Sep. 18, 1985, Ser. No. 777,331
Claims priority, application Japan, Sep. 25, 1984, 59-199840
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—73 A **8 Claims**



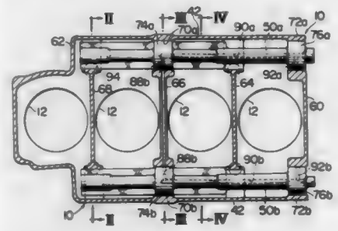
1. in a crankcase compression, two-cycle internal combustion engine having a cylinder and a crankcase, a piston reciprocating in said cylinder and a transfer passage extending between said crankcase and said cylinder for transferring a charge from said crankcase to said cylinder, said transfer passage having a horizontally extending portion defined by a lower horizontal wall upon which fuel condensation may collect, the improvement comprising separate conduit means for directing a high velocity flow along and intersecting said horizontal wall towards said cylinder for purging said horizontal wall of condensed fuel.

4,690,110
VARIABLE VALVE MECHANISM FOR INTERNAL COMBUSTION ENGINES
Hirofumi Nishimura, and Yasuyuki Morita, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Apr. 24, 1986, Ser. No. 855,436
Claims priority, application Japan, Apr. 26, 1985, 60-91564; Apr. 26, 1985, 60-91565; Apr. 26, 1985, 60-91567
Int. Cl.⁴ F01L *1/34*
U.S. Cl. 123—90.17 **12 Claims**



1. A valve mechanism for an internal combustion engine including cam means having two types of cams of different shapes which are rotated synchronously with engine rotation, rocker arm means adapted to be operated by selected one of said two types of cams for operating valve means, characterized by the fact that said cam means includes a central cam of a first type and a pair of side cams of a second type which are disposed at the opposite sides of and symmetrically with respect to the central cam.

4,690,111
BEARING ARRANGEMENTS FOR BALANCING SHAFTS OF INTERNAL COMBUSTION ENGINES
Kouji Kohno; Hiroichi Takubo, and Toshinobu Ito, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Oct. 28, 1985, Ser. No. 792,253
Claims priority, application Japan, Oct. 29, 1984, 59-163306[U]; Oct. 29, 1984, 59-163307[U]; Oct. 30, 1984, 59-164096[U]
Int. Cl.⁴ F16F *15/10, 15/26*
U.S. Cl. 123—192 B **11 Claims**



1. An internal combustion engine including cylinder block means having inner wall means defining at least one cylinder bore, outer wall means provided outside the inner wall means and defining cooling water jacket means with said inner wall means, deck means provided below and continuous with said outer wall means to provide at least partly an upper part of crankcase means, a piston disposed in said cylinder bore for

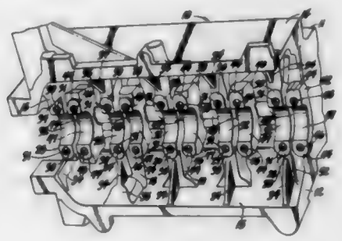
reciprocating movements, crankshaft means disposed in said crankcase means and connected with said piston means so that a reciprocating movement of the piston is converted into a rotation of the crankshaft means, balancing shaft means supported by said cylinder block means in parallel with said crankshaft means and having eccentric mass means, said balancing shaft means being rotated to counterbalance effects of reciprocating mass in said cylinder block means, said cooling water jacket means having a lower end located above the deck means, said inner wall means having downward extension means extending downwardly beyond said deck means, said downward extension means and said upper part of said crankcase means defining balancing shaft case means, said balancing shaft means being located in said balancing shaft case means, said balancing shaft means being supported by bearing means formed in said upper part of said crankcase means at least partly defined by said deck means, said eccentric mass means being located in said cylinder block means and housed at least partly in said balancing shaft case means.

4,690,112

CRANKCASE STRUCTURE

Philip D. Arnold, Pleasant Ridge, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1986, Ser. No. 831,423
Int. Cl.⁴ B21D *53/10*
U.S. Cl. 123—195 R **7 Claims**



1. An integral crankcase comprising
a pair of laterally spaced longitudinally extending side walls partially defining a crank chamber,
a plurality of transverse webs extending between the side walls at longitudinally spaced locations therealong, each of said webs having a journal receiving portion with a bearing recess located between the walls, said recesses being substantially longitudinally coaxial, and
separable bearing caps formed adjacent longitudinally to said journal receiving portions, said caps each having a bearing recess coaxial with the recesses of said journal receiving portions and with one another.

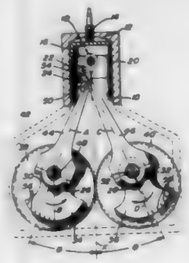
4,690,113

INTERNAL COMBUSTION ENGINE

Olivier Deland, 821 Normandie, No. 18, St. Jean, Quebec, Canada (J3A 1K6)

Filed Apr. 30, 1986, Ser. No. 857,499
Int. Cl.⁴ F02B *75/32*
U.S. Cl. 123—197 AC **12 Claims**

1. In an internal combustion engine including a cylinder defining a combustion chamber adapted to receive a combustible mixture for the combustion thereof, a piston slidably mounted in said cylinder for reciprocating movement between a first limit position whereat the combustion chamber defines its minimum volume and a second limit position whereat the combustion chamber defines its maximum volume, a pair of rotatably mounted parallel crankshafts arranged equidistantly relative to the longitudinal axis of said cylinder and each having a crank-arm rotatable about its respective crankshaft axis, and means coupling said crankshafts together for synchronising the rotation thereof with the crank-arm of one of said crankshafts having an angular advance over the crank-arm of the other crankshaft, the improvement comprising a single-arm lever pivotally connected at one end thereof to said piston for pivotal movement about a pivot axis extending normal to the longitudinal axis of said cylinder, and a pair of connecting rods interconnecting said lever and the respective crank-arms of said crankshafts with one of said connecting rods being pivotally connected to said lever at a free end thereof and the other connecting rod pivotally connected to said lever intermediate the ends thereof, said lever comprising two arm portions of different lengths with one of said arm portions extending radially from the pivot axis about which said lever pivots and the other arm portion extending from said one arm portion at an angle of about 150°, said one arm portion being longer than said other arm portion and defining an angle of about 13° relative to an imaginary line intersecting the pivotal connections at the ends of said lever, said other arm portion and said



imaginary line defining therebetween an angle of about 17°, said lever together with said connecting rods defining a position control means for enabling said lever to pivot and move past said longitudinal axis when said piston reaches said first limit position and to thereby maintain said piston substantially stationary at said first limit position for a period of time sufficient to permit the crank-arm of said one crankshaft to move past dead-center, whereby substantially maximum compression is achieved in said combustion chamber during a compression stroke of said piston when said piston is at said first limit position while the crank-arm of said one crankshaft is positioned past dead-center and the pivotal connections of said connecting rods to said lever are positioned on a side of said longitudinal axis whereat said one crankshaft is disposed such that upon combustion of said combustible mixture substantially maximum thrust is imparted to said piston and substantially maximum force is transmitted to the connecting rod connected to the crank-arm of said one crankshaft.

4,690,114

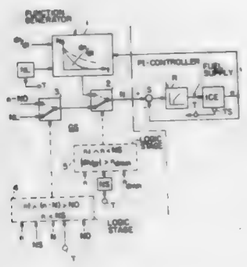
SPEED GOVERNING SYSTEM FOR A FUEL INJECTED INTERNAL COMBUSTION ENGINE, ESPECIALLY A DIESEL ENGINE

Guido Weischedel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 741,182, Jun. 4, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 940,225
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429672
Int. Cl.⁴ F02M *31/00*
U.S. Cl. 123—357 **13 Claims**

1. A method of controlling the operation of a fuel injected internal combustion engine (ICE), especially a diesel engine, upon commanding decrease of engine speed in a direction towards a predetermined idling speed (NL),
utilizing an idle speed controller (R) which has proportional-integrating characteristics,
said method comprising

establishing a predetermined speed threshold (NS) which is above the predetermined idling speed (NL);
supplying an input signal to the controller (R) representative of the actual instantaneous speed of the engine (n);
supplying an input signal to the controller (R) representative of a commanded instantaneous engine speed (N) of the engine;
determining when the actual speed (n) of the engine drops below said predetermined speed threshold (NS), and generating a control signal;
and controlling the commanded rate of change of speed of the engine upon sensing that the actual speed (n) of the engine has dropped below said predetermined speed threshold (NS) towards said predetermined and lesser idling speed (NL) of the engine in accordance with an exponential function (e),



wherein the exponential function determining the rate of change of speed is defined as follows:

$$N=NL+(NS-NL)e^{(-t/K)}$$

wherein

$$K=dn/dt\cdot KV+KO$$

and wherein dn/dt is time rate of change of actual engine speed and wherein
KV is a constant
KO is a constant
t represents time
NL represents the predetermined idle speed;
NS the predetermined speed threshold; and
dn/dt the actual rate of drop in engine speed.

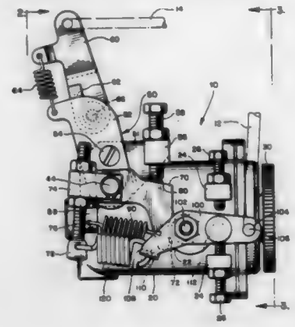
4,690,115

ENGINE GOVERNOR

James H. Conlogue, Westmont, and Henry Banker, Villa Park, both of Ill., assignors to Hoof Products Co., Chicago, Ill.

Filed Aug. 2, 1985, Ser. No. 761,969
Int. Cl.⁴ F02D *1/04*
U.S. Cl. 123—366 **8 Claims**

1. In an engine governor of the type comprising a housing; an input shaft, rotatably mounted to the housing; an output shaft, rotatably mounted to and extending into the housing; and means, included within the housing, for applying a torque to the output shaft in a fuel decreasing direction as a selected function of the rotational speed of the input shaft, the improvement comprising:
an output plate mounted to the output shaft outside of the housing to rotate with the output shaft;
a stop plate mounted to rotate freely about the output shaft;
a stop secured to the housing and positioned to abut the stop plate to limit movement of the stop plate in a fuel increasing direction, opposed to the fuel decreasing direction;
an additional stop secured to the output plate to cause the stop plate to rotate with the output plate in the fuel decreasing position and to allow the output plate to rotate independently of the stop plate in the fuel increasing direction;
a first spring coupled to the stop plate;
means for securing the first spring to the housing such that the first spring biases the stop plate against the stop in the fuel increasing direction;
a second spring coupled between the stop plate and the output plate to bias the output plate in the fuel increasing direction with respect to the stop plate;



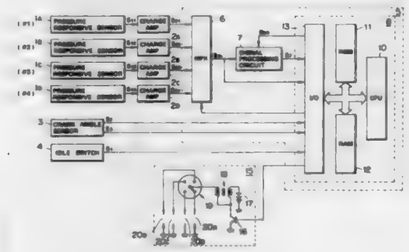
said second spring operative to move the output plate into an over fuel range of positions when the rotational speed of the input shaft is less than a selected value and the torque applying means applies a lesser torque to the shaft than that applied by the second spring; and
said stop operative to limit movement of the output plate to a range of positions characterized by a maximum continuous fuel position when the rotational speed of the input shaft is greater than the selected value and the torque applying means applies a greater torque to the shaft than that applied by the second spring.

4,690,116

SYSTEM FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE AND METHOD THEREFOR

Nobutaka Takahashi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Claims priority application Japan, Oct. 17, 1985, 60-229930
Filed Sep. 17, 1986, Ser. No. 908,309
Int. Cl.⁴ F02P *5/15, 11/00*
U.S. Cl. 123—425 **21 Claims**



1. A system for controlling a multi-cylinder internal combustion engine, comprising:
(a) first means associated with each cylinder of the engine for monitoring internal pressure variations therein;
(b) second means for determining whether said first means for any of the cylinders is malfunctioning on the basis of the pressures measured by said first means; and
(c) third means for controlling the ignition timing for each cylinder on the basis of the pressures measured by said first means and retarding the ignition timing for any one of

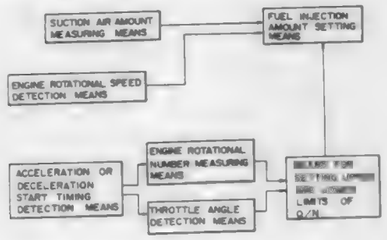
cylinders or any cylinders in which the associated first means is determined by said second means to be malfunctioning.

4,690,117

FUEL INJECTION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Toshiaki Isobe, Nagoya, and Hidehiro Oba, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 19, 1986, Ser. No. 897,940
Claims priority, application Japan, Sep. 3, 1985, 60-194377
Int. Cl.⁴ F02M *51/00*
U.S. Cl. 123—492 **6 Claims**



1. A fuel injection control device for internal combustion engine including suction air amount measuring means for measuring suction air amount Q, engine rotational speed detection means for detecting a number of rotations N of the engine per fixed time, and fuel injection amount setting means for setting a fundamental fuel injection amount according to a suction air amount signal generated by said suction air amount measuring means and an engine rotational speed signal generated by said engine rotational speed detection means; said fuel injection control device comprising:

transitional operation start timing detection means for detecting an acceleration start timing or a deceleration start timing of the engine;

engine rotational number measuring means for measuring a predetermined number of rotations of the engine from the acceleration start timing or the deceleration start timing;

throttle valve angle detection means for detecting that a throttle valve angle is out of a set range; and

means for setting an upper limit value and/or a lower limit value of Q/N calculated from said suction air amount signal and said engine rotational speed signal when said throttle valve angle detection means generates a signal showing that the throttle valve angle is out of said set range until said engine rotational number measuring means measures said predetermined number of rotations of the engine.

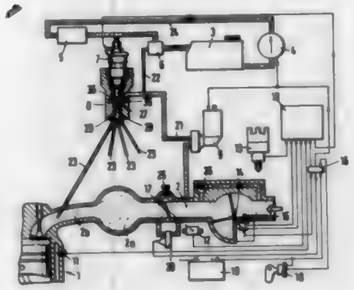
4,690,118

DEVICE FOR CONTINUOUS FUEL INJECTION

Peter Hofbauer, Wolfsburg, and Jürgen Sandhagen, Vordorf/Rethen, both of Fed. Rep. of Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

PCT No. PCT/EP85/00334, § 371 Date Mar. 12, 1986, § 102(e) Date Mar. 12, 1986, PCT Pub. No. WO86/00669, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 8, 1985, Ser. No. 847,905
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425856
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—533 **6 Claims**

1. Device for continuous injection of fuel into the intake lines of a multi-cylinder mixture-compressing internal combustion engine, with an air pump delivering a carrier air current branched off the intake line and with a fuel pump which delivers the fuel from a fuel tank to a metering device which apportions the fuel to the carrier air current as a function of the operating state of the internal combustion engine, the device comprising means for division of the carrier air current among carrier air injection lines separately associated with the individual cylinders of the internal combustion engine, the metering device being provided as an injection valve having a head part and a valve body which is adjustable relative to said head



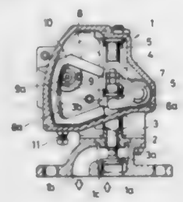
part so as to deliver the fuel through separate injection openings provided in said injection valve so as to be individually associated with and opening into the carrier air injection lines said head part of the injection valve being provided with an annular carrier air reservoir which surrounds the injection valve concentrically and is connected to the air pump, said carrier air injection lines being provided so as to individually branch off the carrier air reservoir at uniform intervals over the circumference of said reservoir.

4,690,119

EGR VALVE DEVICE OF INTERNAL COMBUSTION ENGINES OF AUTOMOBILES

Hiroshi Makino, and Akio Sasaki, both of Odawara, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Japan

Filed Aug. 6, 1986, Ser. No. 893,776
Claims priority, application Japan, Aug. 6, 1985, 60-119953
Int. Cl.⁴ F02M *25/06*
U.S. Cl. 123—571 **3 Claims**



1. An EGR valve device for internal combustion engines of automobiles, comprising:

a valve body;

a valve rod slidably borne on said valve body and having, at one end, a valve member capable of opening and closing an exhaust gas recirculation path and being urged to close the valve;

a sector-shaped member rotatably supported on said valve body and operatively coupled to said valve rod and having a gear portion; and

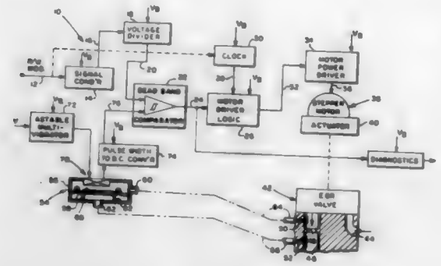
a driving motor secured to said valve body in such a way that its rotary member shaft intersects a plane containing said sector-shaped member at right angles, and having a pinion secured to said rotary member shaft and meshed with said gear portion of said sector-shaped member.

4,690,120

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Lawrence E. Egle, Itasca, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1986, Ser. No. 832,902
Int. Cl.⁴ F02M *25/06*
U.S. Cl. 123—571 **29 Claims**



1. A system for controlling exhaust gas recirculation (EGR) in an internal combustion engine:

(a) base means defining an exhaust gas inlet port, an exhaust gas outlet port and an EGR passage communicating said inlet port with said outlet port, said base means adapted for attachment to an exhaust passage and a combustion chamber inlet passage of an engine;

(b) flow valve means disposed in said passage and including a valve seat and poppet member operable upon movement with respect to said seat for controlling EGR flow between said inlet and said outlet;

(c) actuator means operable upon receipt of an electrical control signal to move said poppet, said actuator means including:

(i) a stepper motor,

(ii) an axial lead means operatively rotated by said stepper motor,

(iii) follower means guided for axial movement, and operably connected to move said poppet in response to rotation of said lead means;

(d) plate means disposed in said EGR passage between said seat and said outlet port and defining a flow measuring orifice;

(e) pressure tap means operative to sense the pressure in said passage on the upstream and downstream sides of said orifice;

(f) transducer means operative in response to the pressure in said pressure tap means to provide said electrical control signal for said stepper motor, said transducer means including,

(i) pressure responsive means operative to move in response to changes in the pressure differential across said orifice sensed by said pressure tap means,

(ii) a non-magnetic member disposed for movement with said pressure responsive means,

(iii) inductive means disposed spaced closely adjacent said pressure responsive means, said inductive means operative upon electrical energization to generate eddy currents in said non-magnetic member, said eddy currents operative to alter the inductance of said inductive means in accordance with movement of said non-magnetic member,

(iv) circuit means operative to detect said change in inductance and emit a change signal representative thereof, and,

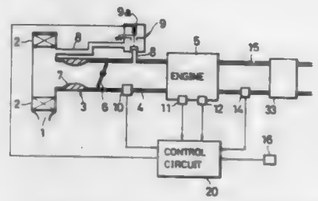
(v) driver circuit means responsive to said change signal and operative to provide a control signal for indexing said stepper motor by an amount corresponding to the change in position of said pressure responsive means.

4,690,121

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DUTY RATIO CONTROL OPERATION

Tomohiko Kawanabe; Masahiko Asakura; Takanori Shiina, all of Wako; Yukihiro Matsumoto, Fujimi, and Minoru Muroya, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,630
Claims priority, application Japan, Feb. 16, 1985, 60-028758; Sep. 30, 1985, 60-218505
Int. Cl.⁴ F02M *23/06, 23/08, 23/10*
U.S. Cl. 123—589 **6 Claims**



2. An air intake side secondary air supply system for an internal combustion engine having an air intake passage with a carburetor and an exhaust passage, comprising:

an air intake side secondary air supply passage communicating with the air intake passage on the downstream side of said carburetor;

an open/close valve disposed in said air intake side secondary air supply passage;

an oxygen concentration sensor disposed in the exhaust passage; and

detection and control means for detecting whether an air-fuel ratio of mixture to be supplied to the engine is leaner or richer with respect to a target air-fuel ratio through a level of an output signal of the oxygen concentration sensor and for periodically actuating said open/close valve, said detection and control means decreasing a valve open period of said open/close valve within each cyclic period by a first predetermined amount when a detected air-fuel ratio of mixture is leaner than the target air-fuel ratio and increasing the valve open period by a second predetermined amount when the detected air-fuel ratio of mixture is richer than the target air-fuel ratio, said second predetermined amount being different from said first predetermined amount.

4,690,122

IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hachirou Sasakura, Inuyama, and Masakuni Tsujimura, Aajo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 3, 1986, Ser. No. 870,144
Claims priority, application Japan, Jun. 4, 1985, 60-121253
Int. Cl.⁴ F02P *5/00*
U.S. Cl. 123—609 **4 Claims**

1. An ignition control system for internal combustion engines comprising:

a reference angle sensor for detecting the rotational speed of the internal combustion engine and generating a reference angle signal by discriminating a point near the top dead center;

an angle sensor for detecting the rotational speed of the internal combustion engine and generating an angle signal by discriminating the revolutions for each predetermined angle; and

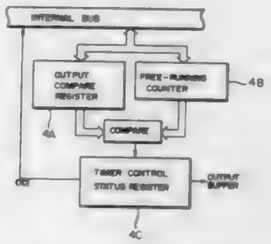
a microcomputer including an output compare register, a free-running counter and a timer control status register for computing the ignition timing and the ignition coil energi-

zation time thereby to control the energization of the ignition coil in response to said reference angle signal, said angle signal and data on the operating conditions representing at least the amount of intake air,

said microcomputer further including:

output compare interrupt means for starting or cutting off the energization of the ignition coil in accordance with the value set in the timer control status register at the time point when the value on the output compare register coincides with that on the free-running counter, while at the same time meeting the request for the output compare interrupt in the microcomputer;

first setting means for setting the sum of a value corresponding to a predetermined maximum energization time and the present time in said output compare register and setting a value for cutting off the energization in said timer control status register, when the energization of said ignition coil is started;



second setting means for setting again in said output compare register the sum of a value corresponding to the time representing the angle remaining before said ignition timing and the present time at the time when the angle signal immediately before the ignition timing computed on the basis of said operating conditions is input; and

third setting means for setting in said output compare register the sum of a value corresponding to the cut-off time computed on the basis of said operating conditions and the present time and setting a value for energization start in said timing control status register at the time point when the energization of the ignition coil is cut off.

4,690,123

CONTROL OF IGNITION TIMING UPON OCCURRENCE OF ABNORMALITY IN A REFERENCE CRANK ANGLE POSITION SENSING SYSTEM

Shigehiro Kimura, Nitta; Takashi Ono, Wakoh, and Nobuyuki Narisawa, Toshima, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,523

Claims priority, application Japan, May 27, 1985, 60-113757

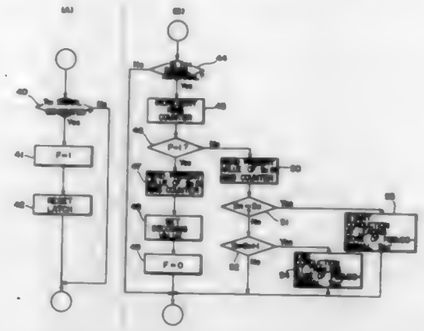
Int. Cl.⁴ F02P 9/00

U.S. Cl. 123—612 **2 Claims**

1. A method of controlling ignition timing of an internal combustion engine when an abnormality develops in a system for sensing a reference crank angle position of a crankshaft of the engine, in which the timing at which an ignition coil starts and stops conducting is controlled on the basis of a first pulse signal generated once per at least two revolutions of the crankshaft at a predetermined crank angle position associated with a particular cylinder of the engine, a second pulse signal indicative of a predetermined reference crank angle position of the crankshaft for each cylinder, and a third pulse signal indicative of predetermined angular positions of the crankshaft, the method comprising the steps of:

sensing an abnormality in the reference crank angle position sensing system for sensing said predetermined reference crank angle position;

generating a pseudo-signal pulse having a predetermined pulse width in place of said second pulse signal on the basis of said first and third pulse signals when said second pulse signal fails to be generated because of the abnormality in said reference crank angle position sensing system;



starting conduction of said ignition coil at a leading edge of said pseudo-signal pulse; and

stopping conduction of said ignition coil at a trailing edge of said pseudo-signal pulse.

4,690,124

SPARK CONTROL SYSTEM FOR AN ENGINE

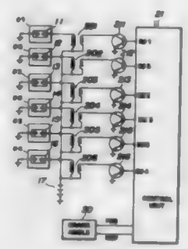
Kazuhiro Higashiyama, Ebina, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 8, 1986, Ser. No. 861,006

Claims priority, application Japan, Jun. 5, 1985, 60-120397

Int. Cl.⁴ F02P 23/00

U.S. Cl. 123—643 **3 Claims**



1. A spark control system for an engine having a crankshaft and cylinders, each of the cylinders being associated with an ignition coil and a power transistor for controlling the ignition coil, the system comprising:

(a) means (21) for generating reference signals at reference crank angles corresponding to the cylinders respectively, wherein the cylinders are separated into groups and the cylinders in a common group are different from each other by an interval or 360° in crank angle, wherein the reference signals corresponding to the cylinders in a common group are similar to each other and the reference signal corresponding to the cylinder in a group is different from the reference signal corresponding to the cylinder in other group, and wherein the reference signal corresponding to preset one of the cylinders is different from the reference signals corresponding to the other cylinders;

(b) means for, during engine start, causing sparks simultaneously in the cylinders in a common group in accordance with the reference signals corresponding to said cylinders in said gorup until the reference signal corresponding to the preset cylinder is generated; and

(c) means for, when and after the reference signal corresponding to the preset cylinder is generated, causing a spark in one of the cylinders sequentially in a predetermined orer starting from the preset cylinder.

4,690,125

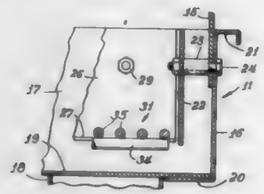
MESQUITE BURNING OUTDOOR COOKING DEVICE

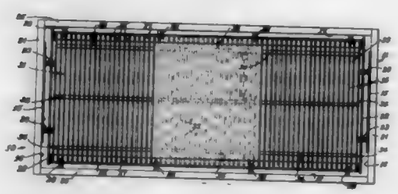
Frank W. Beiler, Aurora, Ill., assignor to Belson Manufacturing Co., Inc.

Filed Oct. 21, 1985, Ser. No. 789,741

Int. Cl.⁴ A47J 37/00; F24B 3/00

U.S. Cl. 126—25 A **13 Claims**





1. A high temperature outdoor cooking device suitable for use with hot burning materials such as mesquite charcoal, or equivalent, said cooking device comprising:

a firebox having interconnected side walls and a bottom wall;

a grill assembly means supportably arranged over the firebox for retaining items to be cooked;

liner sheet means forming a curtain-like barrier inwardly of the side walls and comprising at least four separate unconnected liner sections each liner section associated with means for disengagenbly attaching it to and spacing it inwardly of a firebox side wall and wherein each said liner section is individually removable from the cooking device facilitating selective replacement of any one thereof without disengaging any of the others, said liner sheet means including opposing liner sections thereof having opposing shelf support means;

grate means being supportable by said shelf support means within the firebox at a distance above the bottom wall of said firebox, said liner sheet means being arranged to laterally surround said grate means whereby to insulate said firebox side walls from material burning on said grate means, and wherein said grate means is freely removably from said support shelf means;

said cooking device being capable of combusting mesquite charcoal, or equivalent, as a heat source for extended use therewith whereby the liner sheet means protects the firebox side walls from heat degradation which might otherwise be caused by temperatures ranging up to about 1500° F.

4,690,126

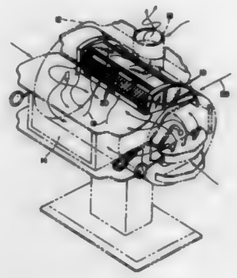
CATALYTIC COMBUSTION ASSEMBLY FOR WOOD-BURNING STOVE

David R. Jencks, Rogue River, and Mark R. Nelson, Medford, both of Oreg., assignors to Orley's Manufacturing Co., Inc., White City, Oreg.

Filed Jul. 14, 1986, Ser. No. 885,425

Int. Cl.⁴ F24C 1/14

U.S. Cl. 126—77 **5 Claims**



1. A catalytic combustor for a wood-burning stove, the stove including a flue outlet and a firebox having a ceiling and a primary air inlet for supplying primary air to the firebox, comprising:

an insertable housing having a pair of spaced-apart parallel walls having tops, the walls defining an airtight passageway for volatile gases from the firebox to the outlet, the tops of the walls shaped to engage and hermetically seal against the ceiling of the firebox surrounding the flue outlet, the housing further defining a pair of secondary air inlets and a connected U-shaped conduit having lateral portions running parallel to the housing walls and a transverse portion running between the housing walls across the entrance of the passageway to release secondary air into the passageway;

a catalytic combustor mounted within the housing across the passageway to intercept the volatile cases and burn them with the secondary air;

a bypass door pivotally mounted to a base of the housing for opening and closing a bypass opening in the base, the bypass opening allowing the volatile gases within the firebox to bypass the combustor in passing from the firebox to the flue outlet;

a mixing screen sealingly mounted within the housing across the defined passageway upstream of the catalytic combustor, the screen having a plurality of holes to promote mixing of the secondary air released from the transverse conduit and the volatile gases from the firebox; and

an inclined baffle mounted within the housing across the passageway downstream of the catalytic combustor for impeding the gas flow therethrough to increase the residency time of the gases within the catalytic combustor and thereby promote a cleaner burn, the baffle positioned below the flue outlet and including an upturned tip portion for guiding the gas flow into the outlet.

4,690,127

CATALYTIC COMBUSTION DEEP FAT FRYER

Gerald W. Sank, Pasadena, Md., assignor to Vulcan-Hart Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 734,844, May 16, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,019

Int. Cl.⁴ A47J 27/00

U.S. Cl. 126—391 **17 Claims**

1. A deep fat fryer, comprising

(a) an open-top vessel adapted to hold a quantity of cooking oil;

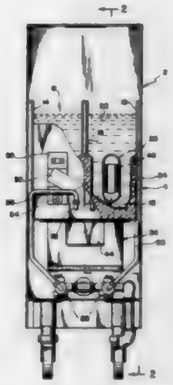
(b) heater means for heating the oil in said vessel, said heater means including

(1) hollow, elongated heat exchange means arranged within said vessel and adapted for immersion in the oil, said heat exchange means having a generally oval interior vertical cross-sectional configuration, a combustion end portion and a flue end portion;

(2) fiber matrix burner means mounted within said heat exchange means and closing the combustion end thereof, said burner means having a generally oval vertical cross sectional configuration, the longitudinal axis of said burner means corresponding with the longitudinal axis of said heat exchange means, whereby said burner is symmetrically arranged within said heat exchange means;

(3) ignition means mounted within said heat exchange means adjacent said burner means;

(4) a plurality of generally U-shaped fins connected with the opposite sides of said interior wall surface of said heat exchange means at the flue end thereof, each of said fins including a base portion connected with said



interior side wall surface and a pair of leg portions extending inwardly toward and spaced from the leg portions of a corresponding fin connected with the opposite side of said interior wall surface, whereby said fins are arranged in opposed pairs; and

(5) core buster means arranged between said opposed pairs of fins, said core buster means including

(i) a rear portion extending longitudinally of said heat exchange means in contiguous relation with the end edges of said fin leg portions, thereby to define a channel within each of said U-shaped fins; and

(ii) a front portion integral with said rear portion and extending toward said burner means for deflecting heat and exhaust from said burner means into said channels, whereby a greater quantity of heat is transferred to the outer wall surface of said heat exchange means owing to the U-shaped fins and to the reduction of cross-sectional area of said heat exchange means due to said core buster means; and

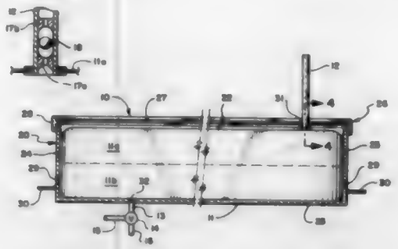
(c) means for supplying a combustion mixture of gas and air to the interior of said fiber matrix burner means, whereby upon operation of said burner means, heat from said heat exchange means is used to heat the oil to a given temperature.

4,690,128

INSULATED FLEXIBLE BLADDER SOLAR COLLECTOR

Carl B. Gibbons, 720 S. 1650 East, Clearfield, Utah 84015

Filed Sep. 8, 1986, Ser. No. 904,200
Int. Cl.[4] F24J *2/56*
U.S. Cl. 126—450 **12 Claims**



1. A solar collector for heating water comprising:

(a) a housing having a floor, connected to contiguous upwardly extending opposing sidewalls and endwalls and a removable transparent lid adapted to fit about said sidewalls and endwalls, said lid containing an aperture through which a valve stem can be inserted, said floor being covered with a dark radiation absorbing material, said floor further containing an aperture through which a water line can be inserted,

(b) a non-opaque soft flexible plastic bladder contained in said housing said bladder having an inlet line for filling the bladder with water and an outlet line in the lower portion thereof for removing water therefrom, said outlet line in said bladder extending through said aperture in the floor of said housing, said bladder also containing an upwardly extending valve stem in the upper portion thereof extending through said aperture in said transparent lid, said valve stem containing a valve which allows air in said bladder to escape, prevents air from entering the bladder and prevents water from overflowing the bladder when filled with water; and

(c) wherein at least one of said transparent lid or the upper portion of said bladder contains ultraviolet light absorbing properties to inhibit the transmission of ultraviolet solar rays therethrough.

4,690,129

TERMINAL UNIT FOR A BALANCED FLUE

Christopher Halstead, Accrington, England, assignor to Myson Heating Limited, London, England

Continuation of Ser. No. 760,770, Jul. 31, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,918
Claims priority, application United Kingdom, Aug. 2, 1984, 8419767; Mar. 11, 1985, 8506260
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—85 B **12 Claims**

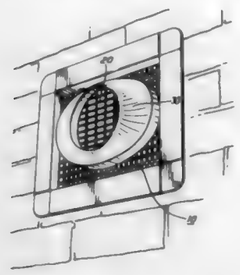
1. A terminal unit for a balanced flue, the unit comprising:

an air inlet duct having an inlet mouth;

an outlet duct having an outlet mouth, said outlet duct projecting beyond said inlet mouth by a distance of from 20 mm to 50 mm so that in use, combustion products are expelled from said outlet duct, in a substantially uninhibited manner, even when air currents pass across, or towards said unit; and

a plate which has a flared configuration surrounding said outlet duct and extending from said outlet mouth and towards said inlet mouth such that the perimeter of the

flared plate meets the planar portion of the inlet mouth to cover part of the inlet mouth, whereby combustion products expelled from said outlet duct are substantially prevented from entering said inlet duct.

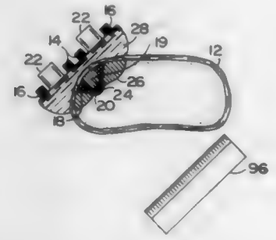


4,690,130

ELECTROMAGNETIC THERAPY CONTROL SYSTEM

Stuart G. Mirell, 10816 Cushdon Ave., Los Angeles, Calif. 90064

Filed Dec. 19, 1985, Ser. No. 811,159
Int. Cl.[4] A61B *17/52*
U.S. Cl. 128—1.3 **13 Claims**



1. A method for applying a therapeutic agent to a treatment zone in a patient, which treatment zone is not adjacent the skin of the patient, comprising:

applying a steady or low frequency magnetic field to the patient to include the treatment zone;

supplying microspheres for circulation through the patient to include said zone, said microspheres including a therapeutic agent, and also includes medically bodily compatible magnetic material having a Curie point at which the magnetic material becomes substantially non-magnetic slightly above the normal body temperature of the patient; and

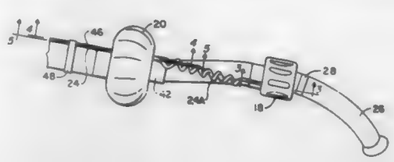
applying high frequency electromagnetic field energy to said patient where said magnetic field is applied to said patient, except to said treatment zone, to heat up said magnetic material to demagnetize it so the microspheres are not restrained by said magnetic field except in said treatment zone.

4,690,131

MEDICAL APPARATUS

James E. Lyddy, Jr., Arlington, Mass.; William Z. Penland, and Paul H. Sugarbaker, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 740,171, May 31, 1985, abandoned. This application May 12, 1986, Ser. No. 862,111
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **29 Claims**



1. A device capable of being used with an elongated flexible instrument of the type adapted to at least partially extend into the lumen of a tubular body part and having a front end for leading said instrument through said lumen and a rear end opposite said front end, said device comprising, in combination:

a front cuff adapted to be secured to said instrument in the proximity of said front end of said instrument and radially expandable so that said front cuff is capable of moving with said instrument through said lumen when said cuff is deflated, and contacting the interior walls of said body part when said front cuff is inflated;

an elongated flexible sheath capable of being coaxially mounted on and axially slidable with respect to said instrument between said front cuff and said rear end of said instrument so that said sheath is adapted to at least partially extend into said lumen with said instrument, said sheath comprising a forward end near and axially movable with respect to said front cuff and a back end near and axially movable with respect to said rear end of said instrument;

a rear cuff secured to said sheath in the proximity of said forward end of said sheath, said rear cuff being relatively movable with respect to said front cuff when said front cuff is secured to said instrument and said sheath is coaxially mounted on said instrument and radially expandable so that said rear cuff is capable of moving with said sheath through said lumen when said rear cuff is deflated, and contacting the interior walls of said body part when said rear cuff is inflated; and

means for selectively inflating and deflating each of said front and rear cuffs;

wherein said sheath and rear cuff when mounted on said instrument are movable relative to said instrument and said rear cuff is inflatable so that at least a portion of said body part and the corresponding lumen can be straightened with said sheath and rear cuff and so that said instrument can advance through said corresponding lumen.

4,690,132

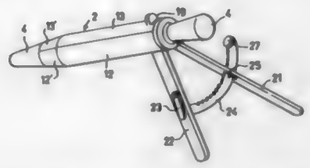
ENDOSCOPE PARTICULARLY USEFUL AS AN ANOSCOPE

Izhak Bayer, 58 Ahad Ha'am Street, Herzlia, and Amnon Adoram, 14 Kaplanski Street, Givatayim, both of Israel

Filed Apr. 7, 1986, Ser. No. 849,212
Claims priority, application Israel, Apr. 9, 1985, 74847
Int. Cl.[4] A61B *1/00, 17/02*
U.S. Cl. 128—4 **18 Claims**

1. An endoscope device particularly useful an an anoscope, characterized in that it includes a plurality of sections each of the configuration of a segment of a cylinder, said plurality of sections comprising a first section, a second section pivotable to said first section along one edge thereof, and a third section

attachable to said first and second sections along their opposite edges to define therewith a tubular endoscope insertable into a body cavity for examining same, said thrid section being de-



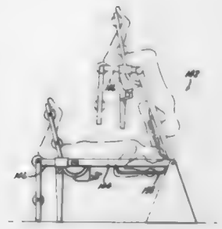
tachable from said first and second sections permitting said first and second sections to be pivoted to an open position wherein they define a retractor for retracting tissue in the body cavity to facilitate performing a clinical treatment therein.

4,690,133

INVERSION APPARATUS

Achilles N. George, 7688 S. Strawtown Pike, Jonesboro, Ind. 46938

Filed Sep. 12, 1985, Ser. No. 775,143
Int. Cl.[4] A61H *1/02*; A63B *21/00*
U.S. Cl. 128—25 R **16 Claims**



1. Inversion apparatus for enabling an individual to be supported from the legs in an inverted position, said apparatus comprising:

a supporting base;

a frame assembly including a platform having one end pivotably supported on said supporting base for movement between a generally horizontal position and a generally vertical position, said platform having an articulated portion pivotably connected to the other end thereof, said articulated portion being adapted to supportingly engage the front upper portion of said individual's legs when said individual is in a face down position on said platform;

a gear segment secured to said articulated portion;

drive means engageable with said gear segment for selectively pivoting said articulated portion and maintaining said articulated portion in a desired angular relationship to said platform;

a knee support means secured to said articulated portion of said platform and adapted to supportingly engage said individual's legs at the back of the knees;

elongated instep support means pivotably supportingly secured to said frame assembly in generally parallel spaced relationship to said knee support means and adapted to supportingly engage said individual's instep;

adjustment means for securing said instep support means in any one of a variety of circumferential positions with respect to said knee support means whereby said individual may be supported in an inverted position with the upper and lower leg portions positioned at any desired angulation therebetween; and

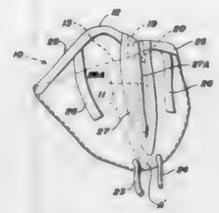
drive means for effecting movement of said platform, said drive means including means to maintain said platform at any desired degree of angulation between said generally horizontal position and said generally vertical position.

4,690,134

VENTRICULAR ASSIST DEVICE

Robert V. Snyders, 31 W. Brentmoor, Clayton, Mo. 63105

Filed Jul. 1, 1985, Ser. No. 750,477
Int. Cl.[4] A61H *9/00*, *31/00*
U.S. Cl. 128—64 **14 Claims**



1. A ventricular assist device to be inserted through the pericardial sac which receives and stabilizes the position of a human heart, the assist device being in aligned position relative to the anterior interventricular line of the anterior descending coronary artery which marks the right and left ventricular surfaces, said assist device comprising:

(a) a shell formed of flexible and substantially inelastic material which forms a visible surface of the device, said shell having an open end margin defined by anterior superior and posterior inferior extremities;

(b) an inner elastic membrane sealed to said shell in position to form an internal lining for presenting surfaces in contiguous fixed relation to the ventricular heart surfaces, said membrane having a line of sealed attachment to said shell for separating said membrane into adjacent but noncommunicating spaces for the right and left ventricular surfaces;

(c) a wedge opening through said shell presenting spaced margins substantially relatively movable, said membrane having margins sealed to said spaced margins to complete the separation of said spaces, such spaced margins of said wedge opening presenting suturable flaps; and

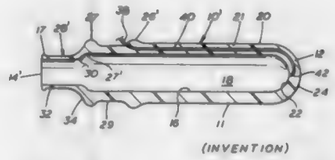
(d) means on said shell for suturing said shell directly to the normal heart enclosing pericardial sac, said suturing means being in a position in which said wedge opening is substantially aligned with the anterior decscending coronary artery for presenting said spaces to the right and left ventricular surfaces.

4,690,135

MALE IMPOTENCE PROSTHESIS

Frank J. Gerow, Houston, Tex., assignor to Synergist Limited, Houston, Tex.

Filed May 5, 1986, Ser. No. 859,459
Int. Cl.[4] A61F *5/41*
U.S. Cl. 128—79 **8 Claims**



1. An external device for accepting a male penis to its anatomic limit for overcoming impotence and permitting sexual intercourse, comprising:

a generally cylindrical hollow body member constructed of a flexible and elastic material for accommodating the penis and having distal closed end and a proximal open end, said body member having a first predetermined substantially constant inner circumferential measurement that is a function of the measured circumference of the erect penile shaft,

a sealing member integrally extending from said proximal open end of said body member and comprising

a flexible sleeve-like sealing portion having a second predetermined substantially constant inner circumferential measurement which is a function of the measured circumference of the stretched non-erect penile shaft, said second predetermined inner circumferential measurement being less than said first predetermined inner circumferential measurement, and

a flexible transition portion integrally interconnecting one end of said sleeve-like sealing portion and said open proximal end of said body member for positioning said sleeve-like sealing portion in concentric axial alignment with said body member,

said sleeve-like sealing portion having a wall thickness substantially less than the wall thickness of said body member and adapted to be rolled up over the open end of the thicker-walled body member to permit the distal end of the male penis to be inserted into said proximal open end of said hollow body member,

said second predetermined substantially constant inner circumferential measurement of said sealing member sleeve-like sealing portion selected for permitting said sealing portion to snugly contact the exterior surface of the non-erect penile shaft throughout the length of said sleeve-like sealing portion when returned to the unrolled extended position,

a length of flexible tubing at least a portion of which is disposed longitudinally in the wall of said body member, one end of said tubing communicating with the most distal end of the interior of the hollow body member, the other end of said tubing freely extending from said body member, and

means cooperating with said other end of said tubing for evacuating the air from the interior of said body member forward of the inserted penile end for exerting a negative pressure therein for permitting the male penis to expand to its anatomic limit in an erect condition into the interior of the hollow body member, said negative pressure exerted within said body member further acting on said thin-walled sleeve-like portion for collapsing said thin walls about the non-erect portion of the penile shaft in contact with said sealing portion for maintaining an air-tight seal therewith during movement of the penis with respect to said body member during intercourse but not engaging the non-erect penile shaft tightly enough to restrict venous blood flow therein.

4,690,136

ASSEMBLY OF INTRA-UTERINE CONTRACEPTIVE DEVICE AND INSERTOR

Willem A. A. A. van Os, Le Rouret, France, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 12, 1985, Ser. No. 807,980
Claims priority, application Netherlands, Dec. 21, 1984, 8403915
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—130 **5 Claims**

5. An attachment for use in an intra-uterine contraceptive device insertion assembly for carrying an intra-uterine contraceptive device into the uterine cavity, comprising an elongated member having a hollow section at least at one end thereof formed by a substantially cylindrical wall and wherein a portion of said cylindrical wall is removed to form an opening in the side thereof located at the hollow section near or immediately adjacent to the end of said member having the hollow section, the opening being of such a size and shape whereby the stem of a contraceptive device provided with a central stem that at one end merges into at least two flexible self-supporting arms can be introduced therein and removed therefrom, the edge of said opening being smooth and merging at or near the end of said member to form a bulbous end portion having a smooth end surface, whereby said insertor with the contraceptive device accommodated therein can easily be inserted into



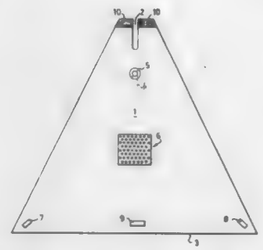
the uterine cavity through the cervix, and wherein said bulbous end portion acts as a ramp for the contraceptive device as it is removed from the insertor and deposited into the uterine cavity, said hollow section having an interior adjacent to said opening opposite the end surface being of such a shape to accommodate the stem of said contraceptive device coaxially therein and to accommodate, in addition, the arms of the contraceptive device when extended along the length of the stem.

4,690,137

SUBSTANTIALLY TRIANGULAR SURGICAL DRAPE

Martin Starzmann, Gothenburg, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

Filed Nov. 13, 1985, Ser. No. 797,832
Claims priority, application Sweden, Nov. 21, 1984, 84058650
Int. Cl.[4] A61B *19/08*
U.S. Cl. 128—132 D **3 Claims**



1. A surgical drape which is intended for surgical procedures on the urethra and which is adapted to be used in combination with a surgical sheet, which surgical sheet comprises a piece of material used to cover the torso and legs of a patient with the patient's legs raised and bent in a widely divergent attitude while the surgeon operates therebetween, characterized in that the surgical drape (1) has a substantially triangular shape; that an aperture (2) for the patient's penis is located in one corner of the drape; that a palpation stall (4) is located at a suitable distance from said one corner in a direction towards the side of the drape opposite said one corner; that said opposite side has a length in the order of 1.5 m and the remaining two sides of the triangle are of substantially the same length as the base; that fastening means (7,8,10) are provided in the

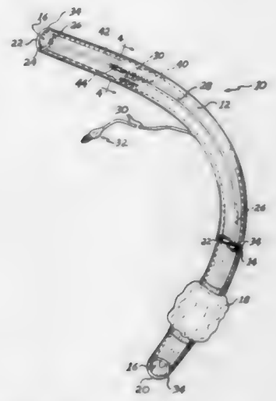
corners of the triangle, of which fastening means those (7,8) provided at the corners at the ends of said opposite side are adapted, subsequent to bringing the aperture (2) and the palpation stall (4) into their respective positions, to be secured to a said surgical sheet (11) in the vicinity of the lower extremities of the patient, so that the surgical drape (1) hangs from its three corners in the shape of a bowl.

4,690,138

MARKING SYSTEM FOR TUBE PLACEMENT

Eugene L. Heyden, Sr. 627 Bernard, #8, Spokane, Wash. 99204

Continuation-in-part of Ser. No. 667,098, Nov. 1, 1984, Pat. No. 4,649,915. This application Nov. 3, 1986, Ser. No. 926,083
Int. Cl.⁴ A61M *16/00*
U.S. Cl. 128—207.15 **21 Claims**



1. A marking system for indicating a correct placement depth of a tubular apparatus inserted within an anatomical pathway, said apparatus comprising an elongated tubular means including a wall with an inner wall surface and an outer wall surface, a forward portion and end for residing at a depth within said anatomical pathway, and a rearward portion and end for residing a distance outside said anatomical pathway, said marking system comprising:

guide means of longitudinal extent provided by the wall of said tubular means and adapted for positionally retaining an insert means, said guide means comprising a passage means recessively defined by said tubular means and an elongated wall separation in the wall of said tubular means leading from said outer wall surface to said passage means, said passage means and said wall separation in combination in the rearward portion of said tubular means and extending in combination a substantial distance toward said forward end;

insert means of longitudinal extend adapted for inclusion and slidable adjustment within said guide means, said insert means including a laterally projecting side member for extending within said wall separation, and also presenting a distinguishing means suitable for space-relating to a stationary reference means, said stationary reference means located apart from said apparatus and stationary with respect to a range of locations within said anatomical pathway;

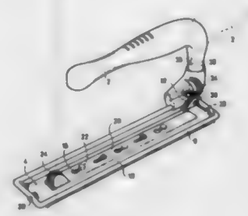
whereby, said insert means may be included to said guide means and adjusted within the same as said side member extends within said wall separation, said side member suitable for manipulating said insert means along said guide means and into a position so that said distinguishing means may be space-related to said stationary reference means when said tubular means is inserted within said anatomical pathway to a desired depth, so that a continuation of the spaced relation between said distinguishing means and said stationary reference means indicates a continuation of a correct depth of placement of said tubular means within said anatomical pathway, and a substantial departure of the spaced relation between distinguishing means and stationary reference means indicates a departure from a correct depth of placement of said tubular means within said anatomical pathway.

4,690,139

DERMATOME PARTICULARLY USEFUL FOR SKIN-GRAFTING PURPOSES

Llor Rosenberg, 13 Hardaf Street, Omer, Beer-Sheva, Israel

Continuation of Ser. No. 588,778, Mar. 12, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 869,830
Claims priority, application Israel, Mar. 22, 1983, 68193
Int. Cl.⁴ A61B *17/322*
U.S. Cl. 128—305.5 **17 Claims**



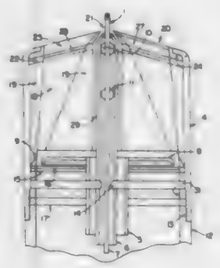
1. A dermatome, comprising: a handle; a blade-mounting head for mounting a cutting blade; a guard for controlling the cutting depth; and adjusting means for effecting an angular displacement between aid guard and the blade of the mounting head for varying the cutting depth; said guard being carried by said blade-mounting head so as to be movable therewith during the reciprocation of the blade-mounting head and extending the complete length of the cutting edge of the blade; said guard being rounded at its opposite ends enabling the full blade length to be used during the reciprocation of the head, blade and guard across the skin to be cut by the blade; said blade-mounting head being formed with projections at the ends protecting the corners of the cutting edge of the blade against catching the skin during use of the cutting blade.

4,690,140

ARTERIAL REGENERATOR

John Mecca, 110 Whittier Dr., San Remo, N.Y. 11754

Filed Apr. 1, 1986, Ser. No. 846,727
Int. Cl.⁴ A61B *17/32*
U.S. Cl. 128—305 **7 Claims**



5. A cutter head assembly mounted on the end of a catheter for use in the removal of deposits lining the interior wall of a blood vessel and the like, comprising:

(a) non-rotating cylinder means having an outer wall fitted to the inside wall of said vessel;

(b) endoscopic tube means for lighting and viewing the region of said deposits adjacent said cutter head assembly, said endoscopic tube means extending from said catheter through said cylinder means and out through the end of said cylinder means facing said deposits to be removed;

(c) means for effecting the controlled movement of said endoscopic tube means in forward and reverse directions so as to permit selective viewing of the deposits to be removed;

(d) cutting means enclosed within the outer wall of said cylinder means on the end of the latter facing said deposits for rotation around said endoscopic tube means for dislodging said deposits;

(e) means for circulating clear liquid around said endoscopic tube means for exposing the region forward of said cutting means for viewing prior to and during cutting action of said cutting means;

(f) means within said cylinder means for bypassing a first portion of said clear liquid for use in causing rotation of said cutting means;

(g) means within said cylinder means for utilizing a second portion of said liquid to effect the entrapment and removal of deposits being dislodged by said cutting means; and

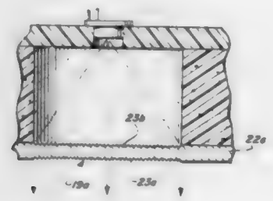
(h) said means for effecting movement of said endoscopic tube means including piston means actuated by a liquid for moving said endoscopic tube means.

4,690,141

FRESNEL LENS LIGHT APPLICATOR

John C. Castel, c/o Physio Technology, Inc., 1925 W. 6th St., Topeka, Kans. 66606, and Richard G. Kerwin, 1004 Elmhurst Rd., Prospect Hts., Ill. 60070

Filed Sep. 16, 1985, Ser. No. 776,354
Int. Cl.⁴ A61N *5/00;* **F21V** *5/04;* **G02B** *3/08*
U.S. Cl. 128—396 **19 Claims**



1. A therapeutic laser radiation applicator comprising:

means for providing laser radiation in an elliptical transverse distribution; and

means for converting the elliptical transverse distribution of the laser radiation into a circular distribution thereof comprising at least two axially spaced fresnel lenses, and means for mounting the fresnel lenses in preselected association with said laser radiation means for refracting a portion of a laser radiation to said circular distribution adapted to provide a therapeutic tissue irradiation pattern.

4,690,142

METHOD AND SYSTEM FOR UTILIZING ELECTRO-NEURO STIMULATION IN A BIO-FEEDBACK SYSTEM

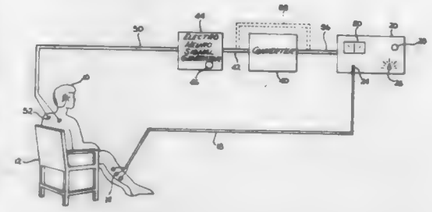
Sidney A. Ross, 6901 Katherine Ave., Van Nuys, Calif. 91405, and Lyn P. Taylor, 18300 Subido, Rowland Heights, Calif. 91748

Filed Dec. 10, 1980, Ser. No. 215,027
Int. Cl.⁴ A61N *1/08*
U.S. Cl. 128—419 R **39 Claims**

1. In a method for controlling the nervous system of a living organism, including the steps of (i) detecting at least one physiological signal from at least a first topological location on said organism; (ii) detecting at least one characteristic of interest in said physiological signal; and (iii) producing at least one output signal responsive to the detected characteristic of interest, the improvement comprising the steps of:

(a) generating at least one electro-neuro signal responsive to said at least one output signal;

(b) feeding back said electro-neuro signal to said organism by coupling the same to at least a second topological location on said organism, thereby producing a tactile sensation thereat; and



(c) causing said organism to concentrate mentally so as to vary said tactile sensation at said second topological location and training said organism to alter said characteristic of interest of said physiological signal by said concentration,

wherein at least one electrical characteristic of said electro-neuro signal is continually responsive to said at least one output signal, and said tactile sensation experienced by said organism continually varies as said electrical characteristic of said electro-neuro signal varies.

4,690,143

PACING LEAD WITH PIEZOELECTRIC POWER GENERATING MEANS

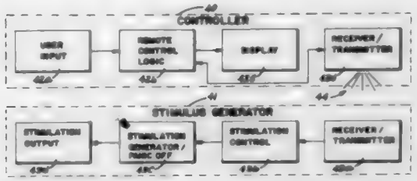
Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 632,457, Jul. 19, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,694
Int. Cl.⁴ A61N *1/00*
U.S. Cl. 128—419 P **7 Claims**



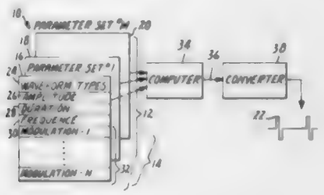
1. A pacing lead comprising a lead body having a distal end portion and a distal end, said lead body comprising a catheter having a given wall thickness and an interior lumen, a tip electrode mounted at the distal end of said lead body for providing electrical stimulus to a heart wall, a wire conductor in said catheter lumen extending the length of said catheter, being connected at one end to said tip electrode and being connectable at the other end to a pacer, piezoelectric electrical power generating means associated with said lead body distal end portion for generating electrical power in response to flexing movement of said pacing lead during contractions of the heart, within the heart and without any electrical power being supplied to said piezoelectric electrical power generating means, and electrical conducting means in said catheter coupled to said piezolectric electrical power generating means and adapted to be coupled to a pacer for providing electrical power to the pacer.

4,690,144
WIRELESS TRANSCUTANEOUS ELECTRICAL TISSUE STIMULATOR
Mark T. Rise, Minneapolis, and David J. Stanton, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Apr. 2, 1982, Ser. No. 364,660
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R **9 Claims**



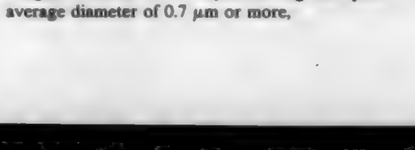
1. A transcutaneous electrical tissue stimulator, comprising:
a housing and means for positioning it in use between the body and the outer clothing;
one or more transcutaneous electrodes for attachment to the skin, said electrodes including wire leads;
stimulation generating circuit means for producing electrical stimulation and means for mounting it within said housing, said generating means electrically coupled to said electrodes through said leads;
said stimulation generating circuit means including means for receiving remotely generated programming signals and altering one or more modes or parameters of said electrical stimulation in response to said programming signals ; and
hand-sized remote control means including user actuated controls for generating and transmitting programming signals to be received by said receiving means to permit a user to control said stimulation generating circuit means from a position remote from the location of said housing.

4,690,145
OUTPUT LIMITED ELECTRICAL STIMULATOR FOR BIOLOGICAL TISSUE
Eric A. King-Smith, St. Louis Park; Walter J. ReMine, St. Paul, and Joel R. Dufresne, Vadnais Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 17, 1985, Ser. No. 745,084
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **3 Claims**



1. An electrical stimulator for biological tissus having output limits, comprising:
storage means for storing a plurality of sets of stimulus parameters designed to specify an electrical stimulus signal comprising a plurality of pulses each having a pulse amplitude and a pulse duration;
calculation means operatively coupled to said storage means for calculating the electrical charge which would be generated by each of said plurality of pulses contained in said electrical stimulus signal from said plurality of sets of stimulus parameters;
limit means having a stored predetermined standard for the maximum electrical charge to be delivered by each of said plurality of pulses, said limit means being operatively coupled to said calculation means for comparing said calculated electrical charge of said electrical stimulus pulse with a predetemined standard and adjusting at least one of said plurality of sets of stimulus parameters so that said electrical charge of said electrical stimulus signal would not exceed said predetermined standard;
generation means operatively coupled to said storage means, to said calculation means and to said limit means for taking at least one of said sets of stimulus parameteres as adjusted by said limit means and generating said electrical stimulus signal as designated by said and of said plurality of sets of stimulus parameters as adjusted.

4,690,146
NEUROMUSCULAR STIMULATING APPARATUS
Gad Alon, Rockville, Md., assignor to Chattanooga Corporation, Chattanooga, Tenn.
Filed Jun. 17, 1985, Ser. No. 745,577
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—422 **11 Claims**

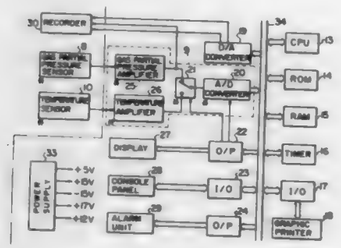


6. A portable electrical neuromuscular stimulating apparatus comprising
a plurality of separate and individually portable electrical stimulation units, with each unit including at least one pair of electrodes adapted to be placed on the body of the patient,
pulse oscillator means mounted in one of said units for generating a reference pulsed signal of predetermined waveform,
electrical line means for supplying the resulting reference pulsed signal to each of said units, and
electrical circuit means mounted in each of said units for adjustably modifying the supplied reference pulsed signal to produce a pulsed signal of modified waveform, and including means mounted in each of said units for amplifying the modified pulsed signal and applying the resulting amplified pulsed signal to the associated electrodes.

4,690,147
METHOD AND APPARATUS FOR MEASURING GAS PARTIAL PRESSURE IN LIVING BODY
Akihiko Ooe, Komaki; Tetsuo Imatida; Teruyoshi Uchida, both of Nagoya, and Hirotaka Kojima, Kasugai, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 486,413, Apr. 19, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,760
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—635 **9 Claims**

1. An apparatus for measuring a partial pressure of gas in a living body based on the principle of polarography comprising:
a gas partial pressure sensor including a biomedical electrode and a counter electrode for producing an output signal indicative of a polargraphic current, at least said biomedical electrode being placed in said living body wherein said biomedical electrode has a tip end surface covered with a membrane comprised of an outer dense, thin layer having fine pores of an average diameter of 20 Å to 0.7 μm and an inner porous layer, contigous to and integral with the outer layer, having fine pores of an average diameter of 0.7 μm or more,

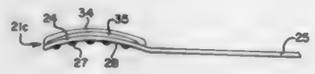
a temperature sensor adapted to be placed at a position suitable for producing an output signal indicative of a temperature of said living body,
an interface unit having an A/D converter which digitizes the output signals from said partial pressure sensor and said temperature sensor,
an operation unit connected to said interface unit to receive the digitized values of the output signals of said gas partial pressure sensor and said temperature sensor, said operation unit correcting the digitized output signal of said gas partial pressure sensor to an output signal value at a reference temperature on the basis of the temperature measured by said temperature sensor, in accordacne with the following equation:



$$I_t = I_{ST}(k)^{T-t}$$

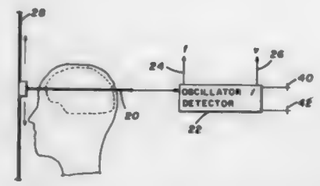
where I_t is the output value of the gas partial pressure sensor at t° C., I_{ST} is the output value of the gas partial pressure sensor at T° C., k is the temperature coefficient of the gas partial pressure sensor, and t is the temperature measured by the temperature sensor, and calculating a gas partial pressure on the basis of a working curve prepared in said operation unit in advance, said working curve representing a relationship between said gas partial pressure and said corrected digitized output signal of said gas partial pressure sensor.

4,690,148
SURFACE MAPPING ELECTRODE SETS
Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Continuation of Ser. No. 650,192, Sep. 13, 1984, abandoned. This application Jan. 16, 1987, Ser. No. 5,314
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—639 **15 Claims**



1. A surface mapping electrode set assembly comprising:
a plurality of insulated elongated wires positioned generally longitudinally adjacent to each other, said plurality of elongated wires being included in both a head portion and a handle portion of the electrode set assembly;
each said insulated wire having a distal end embedded within the head portion of the surface mapping electrode set;
administration means on said head portion for contacting an organ to be mapped, said administration means including an insulated administration surface having a plurality of slits therethrough; and
each said elongated wire having at least one non-intrusive electrode fixed relative to said administration surface, each said electrode being a generally arcuate section of the respective elongated wire, said generally arcuate wire electrode being located on said head portion of the surface mapping electrode set and being aligned generally parallel to the portion of said respective elongated wire adjacent said wire electrode, and each said generally arcuate wire electrode extending through one of said slits of the administration surface and projecting beyond the administration surface.

4,690,149
NON-INVASIVE ELECTROMAGNETIC TECHNIQUE FOR MONITORING PHYSIOLOGICAL CHANGES IN THE BRAIN
Harvey W. Ko, Columbia, Md., assignor to The Johns Hopkins University, Baltimore, Md.
Filed Oct. 28, 1985, Ser. No. 791,864
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 **7 Claims**



1. A method for locating edematous tissue within the white or grey matter of an animal or human brain, comprising:
noninvasively detecting the impedance due to brain tissue and other biological matter at a plurality of localized portions within the brain, wherein said detecting step for each of said plurality of localized portions comprises the steps of:
a. producing an oscillating magnetic field that is spatially concentrated in a localized portion of a brain using a coil means, whereby eddy currents induce a secondary magnetic emission which alters the mutual inductance of said coil means in accordance with the impedance of brain tissue and other biological matter in said portion, and
b. measuring a change in the mutual inductance of said coil means, wherein an increase in mutual inductance indicates an increase in impedance and a decrease in mutual inductance indicates a decrease in impedance; and,
comparing the impedance detected at each portion of the brain to determine the location of higher impedance regions within the white or grey matter of the brain that indicate the location of edematous tissue.

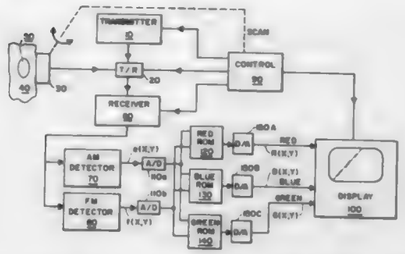
4,690,150
PRODUCING PSEUDOCOLOR IMAGES FOR DIAGNOSTIC ULTRASOUND IMAGING
William T. Mayo, Jr., Seal Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.
Filed Aug. 20, 1985, Ser. No. 767,457
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **8 Claims**

1. Ultrasound imaging apparatus comprising:
first means which direct a beam of ultrasound energy into a region of a body and which detect echoes of the energy which are reflected from structures within the body;
second means which process the detected echoes to produce a first signal, a(x,y), where x and y are spatial coordinates of the reflecting structures, which represents the instantaneous amplitude of the detected echoes;
third means which process the detected echoes to produce a second signal, f(x,y), which represents the deviation of the

instantaneous frequency of the echoes which originate from points x,y from a reference frequency, f_0;

fourth means which scan the beam with respect to the body and which produce an image wherein positions of pixels map corresponding spatial coordinates (x,y) in the body;

fifth means which receive the first signal and which modulate the intensity of each pixel in the image with corresponding values of the first signal; and



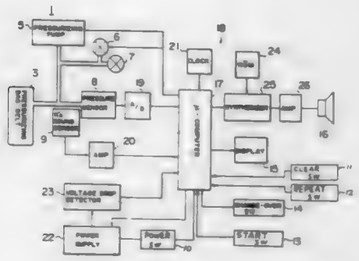
sixth means which receive the second signal and which modulate the color of each pixel in the image with the corresponding values of the second signal so that the hue of that pixel assumes a first color when the value of the second signal is positive and assumes a second complementary color when the value of the second signal is negative and which modulate the saturation of that pixel as a function of the corresponding absolute value of the second signal.

4,690,151

BLOOD PRESSURE MEASURING APPARATUS

Shunji Utsunomiya, Kyoto; Tsutomu Teramoto, Takatsuki, and Tadashi Huruta, Ohtsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 22, 1985, Ser. No. 800,963
Claims priority, application Japan, Nov. 22, 1984, 59-247340
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—682 **2 Claims**



1. In a blood pressure measuring apparatus for measuring maximum and minimum values of blood pressure, comprising a bag-like arm belt for compressing an arm of a person whose blood pressure is to be measured, a power source switch, pressurizing means for pressurizing interiorly said bag-like belt, pressure detecting means for detecting pressure within said bag-like belt, information detecting means for detecting blood information in the course of decreasing of the pressure within said bag-like belt, blood pressure determining means for determining maximum and minimum values of the blood pressure on the basis of output signals of said pressure detecting means and said information detecting means,

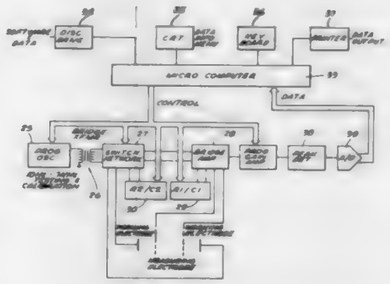
a combination comprising; pressure setting means for setting a pressure value to be established within said bag-like belt, pressure increasing means for increasing the pressure within said bag-like belt to said set pressure value, announcing means for announcing said set pressure value in the form of speech information upon closing of said power source switch, to thereby issue said set pressure value in the form of speech information, before the pressurizing operation is effected.

4,690,152

APPARATUS FOR EPITHELIAL TISSUE IMPEDANCE MEASUREMENTS

Robert D. Juncosa, Santa Ana, Calif., assignor to American Medisean, Inc., Los Angeles, Calif.

Filed Oct. 23, 1985, Ser. No. 790,491
Int. Cl.[4] H61B *5/05*
U.S. Cl. 128—734 **1 Claim**



1. Apparatus for use in effecting epithelial tissue impedance measurements within a test subject, comprising:

a first probe having first and second annular electrodes arranged in spaced relation by an intervening insulative member;

first and second lead wires having an end connected respectively to the first and second annular electrodes;

a second probe leaving third and fourth electrodes with lead wires connected thereto;

bridge circuit means interconnected with the lead wires of the first and second probe electrodes having a first stage configuration including a source of oscillatory voltage with two terminals, a lead wire interconnecting the first electrode with one terminal of the oscillatory voltage source, a selectively variable resistance-capacitance impedance means interconnected between the oscillatory voltage source other terminal and the second probe fourth electrode, the second and third electrodes connected as separate inputs to a first differential amplifier having an input impedance greater than that of the tissue impedance, a balancing amplifier having its input interconnected with the oscillatory voltage source other terminal and its output fed into a second differential amplifier, lead means interconnecting the first differential amplifier output with the second differential amplifier input, the second differential amplifier output connected to a digitizing means, said digitizing means forming a digital signal fed into a microcomputer to vary the resistance-capacitance impedance means to a value corresponding to the impedance of the epithelial tissue; and

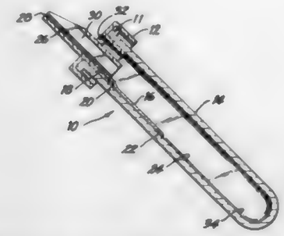
means responsive to microcomputer control for adjusting the resistance-capacitance impedance means to remove error impedances associated with cabling, internal equipment and circuit sources.

4,690,153

FLOW INDUCING MEANS FOR SMALL VOLUME CONTAINERS

Robert J. Lounda, Astoria, N.Y., and Hugh T. Conway, Verona, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 29, 1985, Ser. No. 803,050
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—763 **7 Claims**



1. A collector for use on a blood microcollection container which collector avoids capillary blood flow, comprising

(a) a collector body having a blood flow passage therethrough;

(b) the bottom surface of said blood flow passage being the blood flow surface of said blood flow passage;

(c) a blood source engaging front end surface on said body;

(d) a blood discharge rear end surface on said body;

(e) said body extending from said blood source engaging front end surface to said blood discharge rear end surface;

(f) means on said body for attaching said body to a microcollection container;

(g) vent means in said body for air displacement therethrough;

the improvement characterized by

(h) an elongated solid blood flow inducing member positioned along said blood flow surface of said blood flow passage;

(i) the forward end of said member positioned midway between said front end surface and said blood discharge rear end surface of said blood flow passage; and

(j) the rear end of said member extending beyond said blood discharge rear end surface.

4,690,154

VENTED SYRINGE

Timothy Woodford, and John Cherasso, both of 795 Northlake Blvd., North Palm Beach, Fla. 33408

Filed Jun. 3, 1985, Ser. No. 740,514
Int. Cl.[4] A61B *5/14*
U.S. Cl. 128—765 **13 Claims**

1. A syringe of a type used to obtain a specimen of blood for blood gas analysis comprising:

a hollow cylinder providing a specimen chamber adapted to having a hollow needle, of the type for insertion into an artery, affixed to one end thereof in fluid communication therewith, said cylinder having an inner surface;

a plunger slideably positioned within said inner surface of said cylinder, said plunger including a handle and a piston, and at least one radial rib around said piston in movable contact with said inner surface, said piston having an inner end adjacent said needle, an external end connected to said handle, and an unbroken peripheral piston surface;

a plurality of air passage and fluid restricter means through said plunger sized to allow air to flow and to restrict the flow of blood in a direction from said specimen chamber and to restrict the flow of blood through said air passage and fluid restricter means to said external end of said piston remote from said specimen chamber and out past said handle, said air passage and fluid restricter means formed between said inner end and said external end of said piston; and

valve and seat means in fluid communication with said air passage and fluid restricter means and positioned on said piston remote from said specimen chamber to prevent air from flowing through said air passage and fluid restricter means into said specimen chamber;



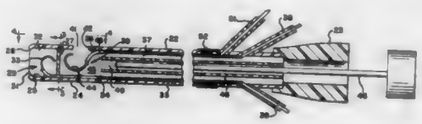
said air passage and fluid restricter means for allowing air to flow out of said chamber leaving blood by blocking blood flow out through said air passage and fluid restricter means each said air passage and fluid restricter means having a generally straight channel constructed and sized of substantially small cross section of a length to prevent blood, a liquid from flowing therethrough and allow air, a gas to flow therethrough.

4,690,155

MONOPHASIC ACTION POTENTIAL RECORDING LEAD

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 752,141, Jul. 3, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 945,242
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—786 **5 Claims**



1. A monophasic action potential contact electrode catheter, comprising:

an elongated tubular body having a longitudinal lumen therethrough, said elongated tubular body having a proximal portion and a distal end, said proximal portion including a plurality of terminal assemblies;

a compartmentalized tip portion extending from said distal end of the tubular body, said compartmentalized tip portion including a generally cylindrical wall member;

said compartmentalized tip portion includes a distal tip compartment having a circumferential surface and a proximal compartment having a circumferential surface, said distal tip compartment circumferential surface and said proximal compartment circumferential surface being substantially coextensive and defined by said generally cylindrical wall member, said distal tip compartment and said proximal compartment being electrically insulated from each other, said distal tip compartment having an opening at its distal end, and said proximal compartment having an opening in its said circumferential surface;

a tip electrode within said distal tip compartment and including an uninsulated length of a first electrically conductive wire in electrical communication with one of said terminal assemblies of the proximal portion of the tubular body, said tip electrode including a conductor-loaded material that is an injected and set resin or polymer plug that substantially fills said distal tip compartment and that is exposed through said distal end opening of the distal tip compartment, said uninsulated length of the first electrically conductive wire being encapsulated by and embedded within said tip electrode conductor-loaded material;

a lateral surface electrode within said proximal compartment and including an uninsulated length of a second electrically conductive wire in electrical communication with another of said terminal assemblies of the proximal portion of the tubular body, said lateral surface electrode including a conductor-loaded material that is an injected and set resin or polymer plug that substantially fills said proximal compartment and that is exposed through said circumferential surface opening of the proximal compartment, said uninsulated length of the second electrically conductive wire being encapsulated by and embedded within said lateral surface electrode conductor-loaded material;

each of said plugs is a thermoset and chlorodized resin or polymer that is filled with conductive particles substantially throughout the respective volumes of the plugs, said plug of the tip electrode defines a sealed interface of the tip electrode along said distal end opening, and said plug of the proximal electrode defines a sealed interface of the lateral surface electrode along said circumferential surface opening; and

a non-conductive separator member within said compartmentalized tip portion, said non-conductive separator member defining said distal tip compartment and said proximal compartment and electrically insulating said distal tip compartment from said proximal compartment, said non-conductive separator member being substantially disk-shaped and being transversely positioned within said generally cylindrical wall member.

4,690,156

APPLICATOR FOR LOCALIZED HYPERTHERMIA BY ELECTROMAGNETIC WAVES

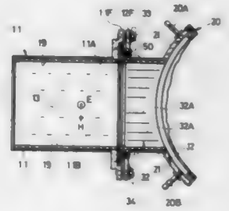
Makoto Kikuchi, 16-9, Inokashira 1-chome, Mitaka-shi, Tokyo; Shinsaku Mori, 31-6, Okusawa 1-chome, Setagaya-ku, Tokyo; Yoshio Nikawa, 26-14, Nerima 2-chome, Nerima-ku, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd.; Makoto Kikuchi; Shinsaku Mori and Yoshio Nikawa, all of Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,445

Claims priority, application Japan, Mar. 4, 1984, 59-40797; Mar. 4, 1984, 59-40798; Mar. 4, 1984, 59-40799; Apr. 28, 1984, 59-86921; Apr. 28, 1984, 59-86922

Int. Cl.[4] A61N *5/00*

U.S. Cl. 128—804 **16 Claims**



1. An applicator for applying a heating treatment to a body comprising:

a. a waveguide case for guiding electromagnetic waves towards said body;

b. an electromagnetic wave feed section formed at one end of said waveguide case for feeding said electromagnetic waves towards said body;

c. an opening formed at a second end of said waveguide case for delivering said electromagnetic waves to said body;

d. an electromagnetic lens section positioned in said waveguide case between said electromagnetic feed section and said opening for focusing said electromagnetic waves towards said body; and

e. a coolant liquid circulation system connected to said electromagnetic lens section for circulating coolant liquid into and out of said electromagnetic lens section.

4,690,157

SMOKING COMPOSITIONS CONTAINING A FLAVORANT-RELEASE ADDITIVE

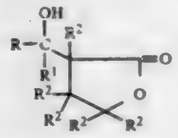
Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,695

Int. Cl.[4] A24B *3/12, 15/40*

U.S. Cl. 131—276 **12 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001–5 weight percent, based on the total weight of filler, of a flavorant-release additive corresponding to the formula:



where R is an aromatic substituent containing between about 4–10 carbon atoms; and R^1 and R^2 are substituents selected from hydrogen and aliphatic, aromatic and alicyclic radicals containing between about 1–10 carbon atoms.

4,690,158

WASHING APPARATUS

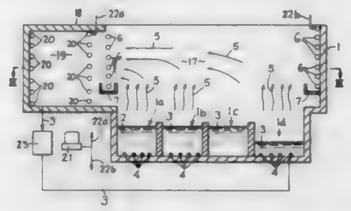
Yosuke Yamada, Funabashi, and Mitsuhiro Ooganei, Chiba, both of Japan, assignors to Daiwa Special Chemical Co., Ltd., Osaka, Japan

Filed Jan. 29, 1985, Ser. No. 696,122

Claims priority, application Japan, Feb. 16, 1984, 59-28305

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—107 **5 Claims**



1. A washing apparatus for washing and drying articles with a volatile organic washing liquid, which comprises:

an upright vessel having a bottom wall and an upright circumferential wall defining a working bath in the lower portion thereof, partition means dividing said working bath into a plurality of washing baths each adapted to contain a volatile liquid organic solvent, heating means in at least one of said washing baths for vaporizing said solvent, said vessel having an upper main chamber there-

within above said washing baths for receiving vapor of said solvent from said washing baths;

a first condenser coil facing said upper main chamber and defining the perimeter thereof, said first condenser coil being arranged so that the convolutions of said first condenser coil form a vertical array with interstices being provided between adjacent convolutions of said first condenser coil,

said vessel having wall means defining a suction chamber which extends horizontally outwardly from said upper main chamber at the same vertical height as said first condenser coil, said suction chamber being open along the horizontally inner side thereof whereby vapor of said solvent can flow through the interstices between adjacent convolutions of said first condenser coil and thence into said suction chamber;

a second condenser coil disposed in said suction chamber at the same vertical height as and horizontally outwardly offset from said first condenser coil, said second condenser coil being arranged so that the convolutions of said second condenser coil form a vertical array, corresponding portions of the convolutions of said second condenser coil being spaced horizontally outwardly from, in parallel with and being directly opposed to corresponding portions of the convolutions of said first condenser coil so that the vapor of said solvent that flows into said suction chamber flows in contact with said second condenser coil; and

cooling means connected for receiving coolant discharged from said first and second condenser coils, then cooling said coolant and then separately returning different portions of said coolant to said first and second condenser coils to maintain the temperature in said suction chamber lower than the temperature in said upper main chamber, whereby the solvent vapor evolved from said working bath is substantially completely condensed in said upper main chamber and said suction chamber.

4,690,159

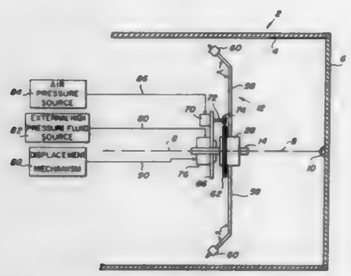
ROTARY CLEANING DEVICE

Thomas C. Vadakin, and Thomas A. Hoenigman, both of Marietta, Ohio, assignors to Vadakin, Inc., Marietta, Ohio

Filed Dec. 17, 1985, Ser. No. 809,718

Int. Cl.[4] B08B *9/02*

U.S. Cl. 134—167 C **11 Claims**



1. Apparatus for cleaning the inner surface of a cylindrical housing such as a cyclone furnace, a horizontally oriented tank, and the like, comprising

(a) a fixed support connected with the ends of the housing and extending along the axis thereof;

(b) a cylindrical shaft containing

(1) an axial through-bore adapted to receive said support, said shaft being axially displaceable relative to the fixed support;

(2) an elongated annular passage concentrically arranged relative to and isolated from said through-bore; and

(3) inlet and outlet opening means affording communication with said passage;

(c) an elongated generally cylindrical insert member arranged within said cylindrical shaft through-bore, said insert member containing a longitudinal through-bore adapted to receive said support, said insert member having end portions the outer diameter of which corresponds with the inner diameter of said shaft, said insert member further having an intermediate portion the outer diameter of which is less than the outer diameter of said end portions, said intermediate portion extending at least between said shaft inlet and outlet opening means, thereby to define said annular passage between the inner surface of said shaft and the outer surface of said insert member intermediate portion;

(d) cleaning means extending radially from said shaft and in communication with said passage via said outlet opening means, each of said cleaning means including a rigid lance and a nozzle connected with the end of said lance, said nozzle being arranged adjacent the surface to be cleaned;

(e) means for rotatably connecting said cleaning means with said shaft;

(f) drive means connected with said cleaning connecting means for rotating said connecting means about said shaft; and

(g) means connected with said inlet opening means for supplying a cleaning fluid to said cleaning means via said passage, whereby when said drive means are operated to rotate said cleaning means and when said shaft is axially displaced along said support, said nozzles traverse both orbital and linear paths to direct said cleaning fluid against the entire interior surface of all of the cylindrical housing.

4,690,160

HYDRAULICALLY OPERATED HIGH-PRESSURE PISTON PUMP

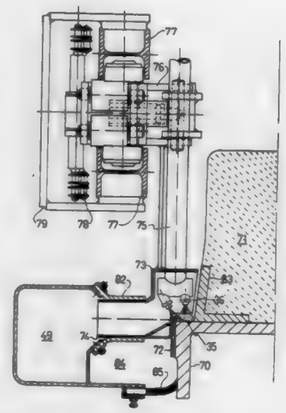
Norbert Walther, Recklinghausen; August Lucas, Datteln-Horneburg; Kurt Lorenz, Hattingen, and Engelbert Bruns, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,443

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402920; Oct. 27, 1984, 3439457; Oct. 27, 1984, 3439458

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—181 **7 Claims**



7. A coke oven door and cleaning apparatus combination for cleaning a sealing surface of the coke oven door, comprising, a coke oven door having an annular sealing surface, means defining a generally rectangular sealing surface trackway around said sealing surface of said coke oven door, a support structure

adjacent said sealing surface having a sliding support surface trackway adjacent said door, a sliding support movable over said support surface trackway, a nozzle lance carried on said support and having one end with a nozzle directed at said sealing surface and an opposite end having a cleaning liquid connection, a highpressure liquid nozzle including a cowl for exhausting a mist of liquid and dirt which is supported for movement along said trackway for moving the nozzle along said surface to be cleaned, a second sliding support arranged at spaced locations around said trackway from said first mentioned sliding support, each sliding support having a high pressure nozzle lance with a liquid nozzle discharge directed at said sealing surface, each device including a cowl for exhausting the mist of liquid and dirt and a flexible line connection to each cowl for connecting each cowl and its lance to a high-pressure liquid source, an exhaust duct having the shape of a frame which is displaceable toward said sealing surface to be cleaned, said exhaust duct having a sealing opening facing said sealing surface, each cowl having a projecting connection which protrudes into and is displaceable along the sealing opening of said exhaust duct in the longitudinal direction thereof, means sealing said projecting connection to said exhaust duct including elastic sealing elements, a further seal connected to said exhaust duct and engaged against said coke oven door for sealing said exhaust duct to said coke oven door, and a collecting tube connected below said coke oven door for collecting water and solid matter which is directed off said door by said cleaning apparatus.

4,690,161

METHOD AND DEVICE FOR MOUNTING THE POLE AND CLOTH OF A LIGHT SHELTER WITH CENTRAL POLE

Jean Dalo, Rue Beaurepaire, 91410-Roinville-sur-Dourdan, and Pierre Dalo, 153, rue de Fleury, 92140-Clamart, both of France

Filed Jun. 19, 1985, Ser. No. 746,270
Claims priority, application France, Jun. 21, 1984, 84 09766
Int. Cl.[4] E04H *15/00, 15/26*
U.S. Cl. 135—99 **7 Claims**



1. A method of mounting a tent, said tent comprising a vertical, central pole having its lower first end pivotably supported on a stationary base on the ground and supporting at its upper second end, the central top portion of a cloth forming a roof of said tent, the method comprising:

(a) mounting the lower first end of said pole on a stationary base on the ground, to pivot around a horizontal axis at approximately ground level;

(b) placing said pole flat on the ground;

(c) attaching one end of a single hoisting cable to said pole at a point between the ends thereof;

(d) extending said single hoisting cable in a vertical plane along said pole and at a right angle to said horizontal axis;

(e) at least temporarily supporting said single hoisting cable above said base, on a stationary support fixedly attached to said base;

(f) engaging the other end of said single hoisting cable to a cable pulling device;

(g) anchoring said cable pulling device to the ground;

(h) slipping a cloth over said pole to position said central, top portion of the cloth on said upper second end of said pole;

(i) pivoting said pole carrying the cloth around said horizontal axis until said pole has reached the vertical position; and

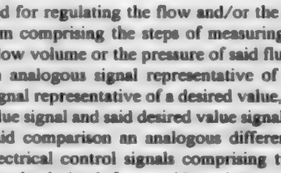
(j) controlling the ascent of said pole by said single cable and said cable pulling device.

4,690,162

METHOD AND APPARATUS FOR REGULATING FLUID FLOW

James E. Lyddy, 122 Claremont Ave., Arlington, Mass. 02174, and Randall W. Fincke, 23 Chisholm Rd., Winchester, Mass. 01890

Filed Sep. 30, 1985, Ser. No. 782,552
Int. Cl.[4] E03B *1/00*; F16K *55/14*
U.S. Cl. 137—1 **31 Claims**



1. A method for producing a time-stable orifice within a deformable tubing with a fluid flow through said orifice comprising thesteps of

placing the inner surfaces of at least a first portion of the tubing into contact with one another in a plane of contact, and

generating a compressive stress within the walls of the contacting tubing portions that causes a second portion of the tubing walls adjacent the first portion to curve away from said plane of contact to form said orifice, said compressive stress being of a value that the net stresses within the tubing wall that defines said orifice are generally in equilibrium after said curvature, wherin an increase in said compressive stress increases the flow rate of said fluid through said orifice and a decrease in said compressive stress decrease said flow rate.

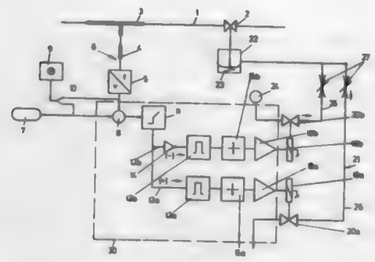
4,690,163

METHOD AND APPARATUS FOR REGULATING FLUID FLOW

Robert Steinemann, Thayngen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 854,663, Apr. 18, 1986, abandoned, which is a continuation of Ser. No. 653,694, Sep. 21, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 938,812
Claims priority, application Switzerland, Sep. 27, 1983, 5221/83
Int. Cl.[4] G05D *16/20*
U.S. Cl. 137—8 **10 Claims**

1. A method for regulating the flow and/or the pressure of a fluid medium comprising the steps of measuring the actual value of the flow volume or the pressure of said fluid medium, generating an analogous signal representative of said actual value and a signal representative of a desired value, comparing said actual value signal and said desired value signal and generating from said comparison an analogous differential signal, generating electrical control signals comprising two parallel analogous signals derived from said analogous differential signal, reversing one of said signals, applying said control signals as individual pulse signals having a frequency proportional to the value of said analogous differential signal, amplifying said control signals and applying said amplified control signals to control one of the pressure and rate of flow of said fluid medium.

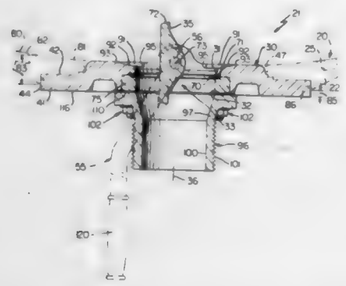


4,690,164

VALVE ASSEMBLY AND METHOD OF MAKING SAME

John F. Gardner, Loveland, and Gerald H. Morton, Cincinnati, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Nov. 8, 1984, Ser. No. 669,598
Int. Cl.[4] F16K *51/00*
U.S. Cl. 137—15 **13 Claims**



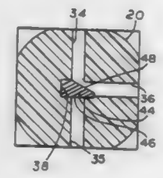
1. In a method of making a valve assembly for a fluid-containing tank which has a mounting saddle fixed to the bottom portion thereof, said method comprising the steps of, providing a housing structure having a fluid inlet and a fluid outlet defined therein, said inlet and said outlet being interconnected by a flow passage therebetween, providing means for mounting said housing structure against said saddle and substantially within the confines of said tank, supporting bottom operable means on said housing structure, said bottom operable means being movable between an open position thereof and a closed position thereof to shut off fluid flow through said flow passage, said inlet and said outlet being defined in said housing structure on a common rectilinear flow axis which is the central axis of said flow passage, said supporting step comprising supporting said bottom operable means so that it has its closed position at a location between said inlet and said outlet, said bottom operable means once moved to said open position enabling substantially free unobstructed flow of fluid through said valve assembly parallel to said axis and with minimum pressure drop to thereby enable a maximum rate of fluid transfer through said valve assembly, the improvement in said method wherein said step of providing said housing structure comprises providing said inlet of said housing structure which is adapted to provide complete drainage of fluid within said tank once said housing structure is mounted on said tank employing said mounting means, said tank having an inside surface with said saddle having an innermost surface which blends smoothly with a lowermost portion of said inside surface, said step of providing said housing structure comprises providing said housing structure having said inlet which is adapted to be disposed with respect to said innermost surface and lowermost portion to enable said complete drainage by gravity, said saddle having a maximum thickness, said step of providing said housing structure comprises providing said housing structure which has a thickness over the major portion thereof when viewed parallel to said flow axis which is substantially equal to said maximum thickness, and said step of providing said housing structure also comprises providing said housing structure with a comparatively small downwardly extending portion which extends beneath a bottom annular projection of said mounting saddle with said housing structure mounted in position against said saddle, said downwardly extending portion being sufficiently small to preclude the need for a protective skid for said valve assembly when using same as a lading valve of a railway tank car.

4,690,165

MIXING TEE CHECK VALVE AND METHOD

Lev J. Leytes, Palo Alto, and Harry A. Penhasi, Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 676,126, Nov. 29, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,867
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—112 **6 Claims**



1. A fluid mixing valve, comprising:

a housing defining a central valve chamber, for connecting at least a pair of inlet ports with an outlet port, said inlet ports converging into said valve chamber substantially perpendicular to said outlet port;

a valve core body having an exterior shape which conforms to the interior shape of said valve chamber and having passages aligned with said inlet and outlet ports and providing a conduit from said ports to a cavity in said valve core body which defines valve seats at the interior end of the passages within said cavity, said cavity adapted to receive valve seal means;

a deformable valve seal means compressibly held within and substantially filling said cavity in said valve core body and sealing against said valve seats at the interior ends of said inlet ports closing said inlet ports to said outlet port in said valve core body when fluidic pressure in each of said inlet ports is less than a predetermined pressure, said seal means deforming in response to increase in fluidic pressure in either of said inlet ports to permit fluid communication through said cavity from the pressurized inlet port to said outlet port while sealing the other inlet port during fluid flow, said seal means recovering to substantially fill said

cavity in said valve core body and seal against said valve seats at the interior ends of said inlet ports closing said inlet ports to said cavity and from each other when fluidic pressure is relieved in said inlet ports to a point below said predetermined pressure; and

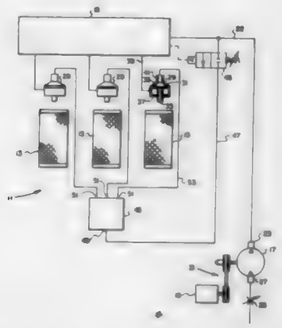
closure means for seating and enclosing said valve core body in the valve chamber in said housing.

4,690,166

PRESSURE DEPENDENT DUST CONTROL FILTER COMPRESSED AIR REVERSED FLUSHING CONTROL SYSTEM

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Filed Jul. 19, 1985, Ser. No. 757,010
Int. Cl.[4] B01D *46/04*
U.S. Cl. 137—119 **12 Claims**



1. A sequencing valve for sequentially opening a plurality of flushing valves of compressed fluid flushing system, which comprises:

a valve body having a cylindrical bore;

a piston slidingly mounted in said bore and dividing said bore into a first chamber and a second chamber;

an inlet to said first chamber;

an outlet for discharging air from said first chamber;

a plurality of inlets to said second chamber;

a normally closed valve in each of said inlets to said second chamber;

means for venting said second chamber;

operator means on said piston for opening one of said valves in said inlets to said second chamber;

means for biasing said piston toward said first chamber;

and means for rotating said piston in response to axial movement of said piston within said bore, whereby said operator means sequentially opens said valves in said inlets to said second chamber in response to fluid pressure received at said inlet to said first chamber.

4,690,167

FIREPLUG ANTI-THEFT APPARATUS

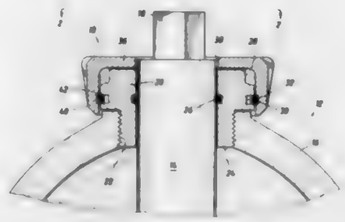
Claud Skipper, Willis, Tex., assignor to Productive Instrument & Machine Inc., Houston, Tex.

Filed Jul. 21, 1986, Ser. No. 887,736
Int. Cl.[4] F16B *33/00*
U.S. Cl. 137—382 **1 Claim**

1. In combination with a fire plug having an upstanding hollow housing with an axially threaded opening therein and a protruding valve operating shaft extending through the axially threaded opening in radial spaced relation therewith, wherein the shaft has a lug extending therefrom for engagement by an operating wrench;

an annular nut made of brass and having a cylindrical bore through which passes the valve operating shaft, the cylindrical bore having a seal therein for engaging the valve operating shaft, the annular nut including an externally threaded portion threadably engaged with the axially threaded opening in the hollow housing and substantially filling the space between the hollow housing and valve operating shaft, a radially projecting shoulder directly adjacent to the threaded portion of the annular nut, the shoulder having an outwardly facing groove which is rectangular in cross section; a polygonal portion disposed on the other side of the radially projecting shoulder from the threaded portion for engagement by wrench for removing the annular nut, the polygonal portion having a flat top surface;

a split, resilient locking ring which is rectangular in cross section disposed in the groove, the locking ring being biased outwardly and being made of a synthetic plastic material which yields under a force substantially less than that required to deform the annular brass nut so as to protect the annular brass nut from damage;



a protective cap having an annular top wall with a planar interior surface and a cylindrical skirt projecting downwardly therefrom with an interiorly facing groove of a rectangular cross-section therein, the protective cap being positioned over the annular brass nut for free rotation relative thereto with the interior surface of the annular top wall juxtaposed with the flat top surface of the annular nut, the skirt extending below the shoulder of the annular nut, and the locking ring disposed in the external groove of the annular nut and internal groove of the protective cap, the protective cap being made of a material less expansive than the nut and stronger than the locking ring and further having an inwardly bevelled portion on the lower edge of the cylindrical skirt and plurality of radially protecting lugs to facilitate removal of the protective cap by using a wheel puller, or the like, to deform the locking rings so as to release the protective cap without damaging either the annular brass nut or the protective cap when it is necessary to remove the brass annular nut for servicing the hydrant.

4,690,168

VALVE ACTUATOR POSITION INDICATING SYSTEM

Joe A. Kihm, Churchville, Pa., assignor to Harold Beck & Sons, Inc., Newtown, Pa.

Filed Oct. 16, 1964, Ser. No. 661,575
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—554 **8 Claims**

1. A valve actuator for controlling and sensing the rotational position of a valve member comprising:

an actuator motor for rotating an actuator shaft;

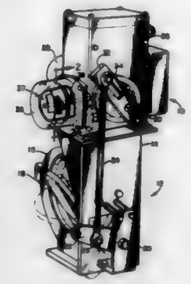
an actuator arm coupled to said actuator shaft, the rotation of said actuator shaft causing rotation of said actuator arm through an angle exceeding 90°;

a linkage connecting said actuator arm to said valve mechanism, the rotation of said actuator arm causing movement of said linkage and, in turn, rotation of said valve member; and

a positional indicator means or sensing the angular position of said actuator shaft, said positional indicator means including:

a positional indicator shaft coupled to said actuator shaft such that angular rotation of said actuator shaft causes a corresponding angular rotation of said positional indicator shaft;

a rotor/stator assembly including a rotor coupled to a said indicator shaft whereby said rotor includes a magnetically active sector located about a portion of the peripheral surface of said rotor, and a magnetically inactive sector located about another portion of the peripheral surface of said rotor; and



a stator comprising a first sensing pole piece partially surrounding said rotor, a second sensing pole piece partially surrounding said rotor, and a driving pole piece, said rotor being mounted for rotation with respect thereto, said rotor varying the inductive coupling in the stator; and

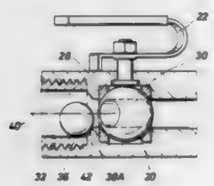
a positional indicator circuit responsive to said rotor/stator assembly for generating an analog output signal which varies in accordance with the angular position of said rotor with respect to said stator and, therefore, in accordance with the angular position of said actuator shaft.

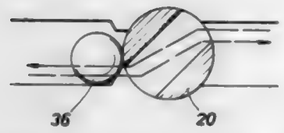
4,690,169

COMBINED SHUT OFF AND CHECK VALVE

Benjamin L. Jobe, Houston, Tex., assignor to Jogler, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 848,241, Apr. 4, 1986. This application Jun. 13, 1986, Ser. No. 873,943
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] F16K *15/18*
U.S. Cl. 137—614.16 **4 Claims**





1. A combined shut off and check valve, comprising

a valve housing for horizontal installation having a bore therethrough,

a ball closure having a flow hole therethrough, said ball closure being mounted for swivelly opening and closing said bore,

said housing including a chamber on the upstream side of said ball closure and having an upstream opening,

an appropriate seat at the downstream end of said chamber, and

a ball confined in said chamber, the center of said ball being below the central axis of said flow hole when said ball rests on the lower side of said chamber during normal operating pressure differential across said ball closure, an abnormally high operating upstream-to-downstream pressure causing said ball to seat in said seat at the downstream end of said chamber,

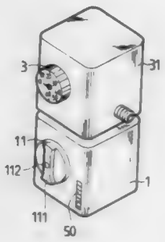
wherein said ball closure has a stable part-open swivel position such that reverse flow can proceed through said flow hole of said ball closure and around said ball, said flow hole being at an angle sufficient to prevent said ball from seating in the event of reverse flow interruption.

4,690,170

SAFETY GAS VALVE WITH TIMER

Tzong D. Tsai, No. 143, Hain Sheng Street, Feng Shan City, Kaohsiung, and Tsang J. Tsai, No. 233, Sec. 2, Ta Tung Road, Tainan, both of Taiwan

Filed Jul. 23, 1986, Ser. No. 888,339
Int. Cl.[4] F16K *24/01*
U.S. Cl. 137—624.11 **3 Claims**



1. A safety gas valve having a timer comprising:

a valve;

a timer mounted on said valve, said valve including;

a valve body provided with a slot, a tapered recess at the central portion thereof and a vertical through hole;

a rubber cup disposed within the recess of said valve body, said rubber cup having two holes in alignment with said vertical through hole;

a plug having a tapered end received in the recess of said valve body, said tapered end having a vertical through hole aligned with the vertical through hole of said valve body, each end of the through hole of said plug being provided with a ferrule;

a ball disposed into said through hole of said plug;

a push rod inserted into said plug for separating said ball from said ferrule;

a positioning spring located on said plug for biasing said plug into said valve body;

a knob threadedly engaged with said push rod;

a compressed spring in contact with said positioning spring for biasing said knob away from said valve body;

a packing disposed between said compressed spring and the positioning spring and rigidly mounted within said plug;

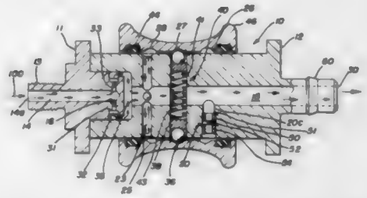
a pitot tube in communication with the vertical through hole of said valve body;

said timer including,

a set of timing gears;

a notched disc operatively connected with said set of timing gears and pivoted at center thereof;
an actuating arm pivoted at one end, said actuating arm having a protuberance constantly in contact with circumference of said notched disc;
a hitting rod operatively connected with said set of timing gears so as to hit a bell when set time of the timer is up;
a connector connecting said valve to said timer;
a spring-loaded lift rod fitted into said connector, said spring-loaded lift rod having a hole in communication with two gas exits so that only when the lift rod is pressed downwards by said actuating arm will the hole of the lift rod be in communication with the valve.

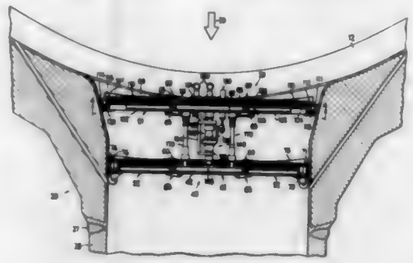
4,690,171
VALVE ASSEMBLY FOR A SPHYGMOMANOMETER
Charles F. Johnston, Rte. 1, Box 400, Fincastle, Va. 24090
Filed Jun. 5, 1986, Ser. No. 870,968
Int. Cl.[4] F16K *47/08*
U.S. Cl. 137—877 **10 Claims**



1. A valve assembly for a sphygmomanometer comprising:
(a) an inlet connectable to a fluid pressure source;
(b) an outlet connectable to a pressure cuff;
(c) inlet directional control means for preventing fluid flow from said pressure cuff to said inlet;
(d) metering means for metering the fluid flow from said pressure cuff at a fixed rate to control the deflation of said pressure cuff, said metering means having an orifice which provides a fixed flow throughout a metered deflation operation;
(e) quick vent means for rapidly deflating said pressure cuff; and
(f) a positively selectable valve selectively directing fluid flow from said inlet to said outlet through said inlet directional control means in a preset cuff inflation position, directing fluid flow from said outlet through said metering means in a preset metered deflation position during a metered deflation operation, or directing fluid flow from said outlet through said quick vent means in a preset quick vent position, said valve means including means for positively retaining said valve in a selected one of said cuff inflation position, said metered deflation position or said fast vent position.

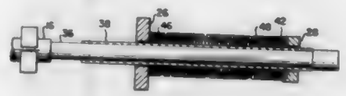
4,690,172
FOLDABLE DUAL-SEAL NOZZLE DAM
James W. Everett, New Stanton, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 17, 1985, Ser. No. 809,708
Int. Cl.[4] F16L *55/12*
U.S. Cl. 138—89 **10 Claims**

1. A nozzle dam for preventing fluid flow under pressure through a primary fluid nozzle in the plenum of a nuclear steam generating vessel, wherein the nozzle has an inner surface with a circularly cylindrical portion and a frustoconical portion, said nozzle dam comprising: first and second seal means each including a plurality of foldably interconnected sections, coupling means directly interconnecting one of said sections on said first seal means with a corresponding section on said second seal means independently of any other section, and support means only on said one section of one of said seal means disposed for supported engagement with the frustoconical portion of the inner surface of the nozzle for cooperation with said coupling means to support said first and second seal



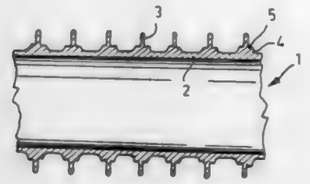
means in sealing conditions extending across and closing the nozzle, said seal means being responsive to pressurized fluid for urging said support means more firmly into supported engagement with the inner surface of the nozzle.

4,690,173
SHIRRED CASING ARTICLE
Algimantas P. Urbutis, Palos Heights, Ill., assignor to Viskase Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 436,057, Oct. 22, 1982, Pat. No. 4,578,842. This application Feb. 13, 1985, Ser. No. 701,309
Int. Cl.[4] A22C *11/00*
U.S. Cl. 138—118.1 **7 Claims**



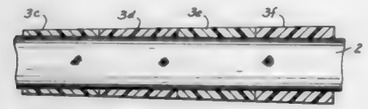
1. A casing article comprising:
(a) a tubular core having a bore which is a size that is at least equivalent to the inside diameter of a stuffing horn selected from a range of stuffing horns used for filling a certain size of cellulosic casing; and
(b) a compressed casing stick on said core, said stick containing at least 200 feet of a moisturized, substantially pinhole-free, length of said certain size of cellulosic casing, shirred and longitudinally compacted to such a degree that said compressed casing stick embraces and exerts inward forces on said tubular core, said core being sufficiently rigid to resist said forces so as to maintain a bore diameter no less than the equivalent inside diameter of a said stuffing horn;
(c) said compressed casing stick having in substantially any one inch segment of stick length over substantially the full length of said stick a pack ratio of casing length to segment length of at least 100; and
(d) said pack ratio being substantially uniform over the length of said stick such that the variation of pack ratio along the length of said stick in successive one inch segments thereof is represented by a straight line as calculated by the least squares method, whose slope has an absolute value of less than about 0.500.

4,690,174
PLASTIC PIPE
Jyri Järvenkylä , Tapiontie, Finland, assignor to Uponor N.V., St. Maarten, Netherlands Antilles
Filed Jul. 8, 1986, Ser. No. 883,543
Claims priority, application Finland, Jul. 30, 1985, 852947
Int. Cl.[4] F16L *9/04*
U.S. Cl. 138—121 **10 Claims**



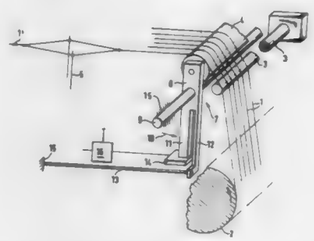
1. A plastic pipe comprising a tubular wall having an inner and an outer face, mutually spaced circumfential ribs having side walls protruding from said outer face and extending at substantially right angles with said wall and circumfential elevations protruding from said outer face of the wall and being integral with said pipe wall and said ribs, the elevations having an outer face joining both the side walls of the ribs, and the juncture between the side walls of said ribs and the outer face of said elevations being sharp.

4,690,175
FLEXIBLE TUBE FOR ENDOSCOPE
Teruo Ouchi, Saitama, and Hiromichi Shibuya, Tokyo, both of Japan, assignors to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan
Continuation-in-part of Ser. No. 512,376, Jul. 11, 1983, abandoned, which is a division of Ser. No. 441,998, Nov. 16, 1982, Pat. No. 4,495,134. This application Dec. 9, 1985, Ser. No. 806,379
Int. Cl.[4] A61B *1/06*
U.S. Cl. 138—131 **3 Claims**



1. A flexible tube for use in an endoscope, comprising:
a flexible basic tubular core structure including an inner metallic tubular spiral having a series of turns spaced from each other by gaps and an outer surface constituted by an outer meshwork tube formed of a fabric mesh consituted by mesh elements, said outer meshwork tube being situated tightly over said inner metallic tubular spiral; and
at least two thermoplastic synthetic resin tube sections, each having a uniform inner diameter and a wall thickness which is thicker at one end of said tube section than at the other end thereof, said tube sections bonded to the meshwork of said meshwork tube, said synthetic resin tube sections having an inner diameter prior to being located over said tubular core structure which is less than an outer diameter of said basic tubular core structure, said bonding being accomplished by,
(a) expanding the inner diameters of said synthetic resin tube sections and locating the same over said meshwork tube of said tubular core structure with adjacent tube sections abutting at respective ends having substantially the same outer diameter;
(b) allowing said tube sections to contract so that said tube sections exert a compressive force on said core structure;
(c) heating said synthetic resin tube sections to a temperature at least slightly higher than a softening point and below a melting point of the synthetic resin of said tube so that the resin softens and enters into the meshwork tube under the compressive force;
(d) heating only the regions of said abutting ends of said resin tube sections substantially to a melting point of the tube sections to fuse the respective abutting ends to each other;
(e) cooling said synthetic resin tube sections so that the resin hardens and is integrally bonded to the meshwork of said meshwork tube while retaining an inherent compressive pre-stress in the flexible tube so formed;
said flexible tube so formed having a construction wherein:
(a) said synthetic resin tube sections have at least one of (1) portions which curve at least partially into spaces between said mesh elements of said outer meshwork tube, and (2) regions wherein said mesh elements are embedded therein, so that said resin tube sections are tightly bonded to said meshwork tube;
(b) said resin of said synthetic resin tube sections is totally absent from said gaps between said turns of said metallic tubular spiral; and
(c) said synthetic resin tube sections have an inherent compressive stress acting inwardly on said tubular core structure.

4,690,176
BACK REST ARRANGEMENT ON A WEAVING MACHINE
Theo Thalmann, St. Gallen, Switzerland, and Gerhard Oesterle, Koblach, Austria, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland
Filed Feb. 10, 1986, Ser. No. 828,040
Claims priority, application Switzerland, Feb. 14, 1985, 668/85
Int. Cl.[4] D03C *49/06*
U.S. Cl. 139—110 **7 Claims**



1. A back rest arrangement for a weaving machine having a back rest supported in positionally variable manner, comprising;
a machine frame for said weaving machine;
a support yoke possessing a first arm and a second arm and supported on said machine frame;
means cooperating with said machine frame for pivotably supporting said support yoke for pivotal motion about a pivot axis;
said back rest being supported on at least one of said first and second arms of said support yoke;
one of said arms of said support yoke possessing a resilient shank having a free end;
means for retaining said free end of said resilient shank in a manner which is relatively rigid in relation to a pivoting motion of the support yoke caused by a varying warp force acting on said back rest;
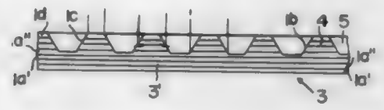
a sensor for generating an electrical signal proportional to a deflection of said resilient shank;
said sensor being operatively associated with said resilient shank;
said means for relatively rigidly retaining said free end of said resilient shank comprises a rod;
said rod has a free end; and
said free end of said rod being fixedly connected with said machine frame.

4,690,177

GRIPPER ROD FOR SHUTTLELESS LOOMS

Fritz Gehring, Lindau-Bodolz; Siegfried Roth, Salem-Mittelstenweiler, and Hans-Juergen Semrau, Kippenhausen, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 871,510
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527202
Int. Cl.⁴ D03D *47/00*
U.S. Cl. 139—449 **7 Claims**



1. A gripper rod for a shuttleless loom, comprising a toothed rack section for cooperation with a pinion for driving said gripper rod, said gripper rod comprising a plurality of fiber reinforced belts of synthetic material laminated and bonded to one another to form a stack of said fiber reinforced belts, said belts further comprising perforations with dimensions increasing from belt to belt in an outward direction, and lands with correspondingly decreasing dimensions from belt to belt in said outward direction, said belts being arranged relative to each other so that said perforations are arranged in alignment relative to a central perforation axis extending perpendicularly to planes defined by said perforations in said belts so that teeth are formed by said lands between adjacent perforations for meshing with said pinion.

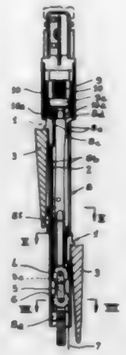
4,690,178

MOBILE HOOK FOR THE SHED FORMING DEVICE OF A WEAVING LOOM

Dario Bassi, Corbas, and Joseph Palau, Duingt, both of France, assignors to Etablissements Staubli Verdol, Chassieu, France

Filed Aug. 14, 1986, Ser. No. 896,272
Claims priority, application France, Aug. 23, 1985, 85 12817
Int. Cl.⁴ D03C *13/00, 3/00, 3/06*
U.S. Cl. 139—455 **4 Claims**

1. In a weaving loom a shed forming device comprising a plurality of systems each having two mobile hooks movable between lower and upper positions by a movable knife means and connected by a funicular element, each of said mobile hooks having a toe portion which is selectively retained in said upper position by an elastic retaining blade which is movable in response to an electro-magnet, each of said systems being disposed between two vertically separating partitions assembled together to form an assembly, each of said partitions having opposing face portions including longitudinal grooves formed therein, each of said mobile hooks having a heel which is slideably and guidingly received within said grooves and between said separating portions, said mobile hooks also having a web which extends vertically between said partitions and which includes said toe portion and which also includes an outwardly extending nose element by which said hooks are driven by said knife means, and said hooks including a push element adjacent said toe portion which is engagable with said elastic retaining blade to urge said elastic retaining blade against said electromagnet jst prior to said hooks being at said upper positions whereby if said electromagnet is activated, said



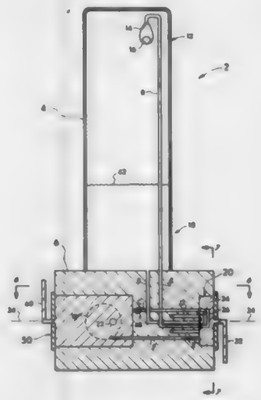
elastic retaining blades will retain said hooks in said upper position.

4,690,179

FLUID INDUCTOR AND METERING DEVICE AND METHOD OF USE

Joel J. Bleth, 928 9th East, and Williard R. Tormaschy, 819 8th Ave. West, both of Dickinson, N. Dak. 58601

Filed Nov. 19, 1986, Ser. No. 932,919
Int. Cl.⁴ B65B *3/00*; F16K *31/02*
U.S. Cl. 141—1 **38 Claims**



1. A method for selectively using a primary flow of fluid through a conduit to first fill a chamber with a liquid from a remote storage container and then to empty the liquid from said chamber into said primary flow, said chamber having upper and lower portions and said method including the steps of:
(a) establishing said primary flow of fluid through said conduit from a first location to a second location,
(b) creating an area of reduced flow pressure in said primary flow at an intermediate location along said conduit between said first and second locations, said reduced flow pressure being less than ambient air pressure,
(c) providing a first flow path between said area of reduced flow pressure and the upper portion of said chamber,
(d) providing a second flow path from said remote storage container of liquid to the lower portion of said chamber,

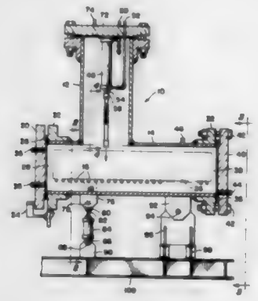
(e) providing a third flow path between said area of reduced flow pressure and the lower portion of said chamber,
(f) providing a fourth flow path from air at ambient air pressure to the upper portion of said chamber, and
(g) selectively (1) opening the first and second flow paths and closing the third and fourth flow paths to reduce the pressure in the chamber below ambient air pressure to draw liquid from said remote storage container through the second flow path into the chamber through the lower portion thereof and then (2) closing the first and second flow paths and opening the third and fourth flow paths to draw liquid from the chamber through the lower portion thereof into the primary flow through the third flow path as air at ambient air pressure fills the upper portion of the chamber through the fourth flow path.

4,690,180

CYLINDER RUPTURE VESSEL

Jeffrey W. Gold, Atlanta, Ga., assignor to Integrated Environmental Services, Atlanta, Ga.

Filed Nov. 8, 1984, Ser. No. 669,537
Int. Cl.⁴ B65B *31/00*; B67B *7/24*
U.S. Cl. 141—51 **21 Claims**



1. A waste cylinder rupture vessel, comprising:
an enclosed chamber with a longitudinal axis;
means for gaining access to the interior of said chamber;
bearing means located within said chamber adapted to support thereon a target container to be ruptured;
means for sealing said chamber;
means for communicating with the interior of said chamber to purge the air from said chamber;
means for communicating with the interior of said chamber to introduce an inert gas into said chamber; and
puncture means including moveable parts which are disposed entirely within said chamber for puncturing at least one wall of said target container, said puncture means being positioned along said longitudinal axis of the chamber at the mid section of the chamber, said puncture means being adapted to puncture the mid-section of said target container whereby the contents of said target container are released, said contents being contained within said enclosed chamber.

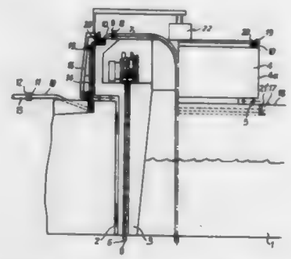
4,690,181

APPARATUS TO TRANSFER FLUID BETWEEN A FIXED STRUCTURE AND A ROTATABLE STRUCTURE BY USING AT LEAST ONE FLEXIBLE CONDUIT

Pierre Carrio, Paris, France, assignor to Coflexip, Paris, France

Filed Nov. 12, 1985, Ser. No. 796,786
Claims priority, application France, Nov. 12, 1984, 84 17207
Int. Cl.⁴ B63B *5/00*; E21B *43/01*
U.S. Cl. 141—388 **24 Claims**

1. Apparatus providing a swivelless connection of first and second fixed positions on respective first and second structures, which structures are relatively rotatable about a common axis, through a length of flexible conduit defined by first and second spaced portions thereof respectively connected to the first and second fixed positions and predetermined in accordance with the extent of relative rotation to be accomodated while continuously maintaining the connection, comprising:
first conduit storing means on the first support structure, extending about the axis of rotation in a generally arcuate configuration, for storing thereon, in corresponding arcuate configuration, substantially all of the predetermined length of flexible conduit;
second conduit storing means on the second support structure, extending about the axis of rotation in a generally arcuate configuration and relatively displaced from said first conduit storing means, for storing, in corresponding arcuate configuration, substantially all of the predetermined length of flexible conduit; and
guide means defining a guide path extending between said first and second conduit storing means, said guide means being rotatable about the axis of rotation during relative rotation of the first and second structures for engaging a portion of the predetermined length of flexible conduit intermediate the first and second spaced portions thereof and guiding same out of one and into the other of said conduit storing means.

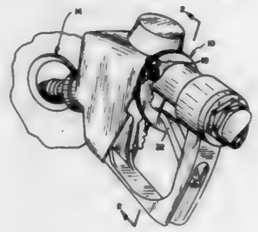


4,690,182

GASOLINE PUMP LEVER HOLDER

Raymond D. Knaus, 5565 Wilson Dr., Mentor, Ohio 44060

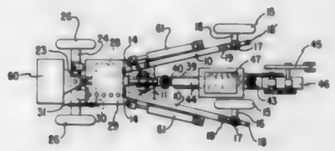
Filed Mar. 25, 1986, Ser. No. 843,497
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—392 **7 Claims**



1. An appliance in combination with a nozzle assembly such as is used to dispense gasoline or other fluids, wherein said nozzle assemply comprises an end portion from which the dispensed fluid emerges, a variable flow rate valve, an actuating lever that operates the valve, the position of which lever effects said variable flow rate, and a handle portion, and wherein said appliance comprises an open frame including a hook portion and an opposing and interconnected stepped portion having two or more steps, which hook portion releasibly and rotatably engages said handle portion of said nozzle

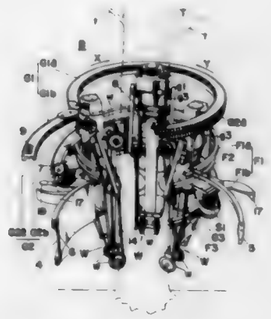
assembly by partially surrounding it in hook-like fashion, and said stepped portion having two or more steps, any one of which steps may be selected by the user by rotating the appliance about an axis that is substantially parallel with that of said handle portion of said nozzle assembly, thereby to releasibly engage the actuating lever on a selected step of said stepped portion for the purpose of positioning said lever and holding it unattended in a selected position to obtain a selected fluid dispensing rate from said nozzle assembly.

4,690,183
SELF-PROPELLED STUMP CUTTER
Donald M. Ellertson, 1109 Trinidad La., Garland, Tex. 75040
Filed Oct. 28, 1985, Ser. No. 791,734
Int. Cl.[4] A01G *23/06*
U.S. Cl. 144—2 N **16 Claims**



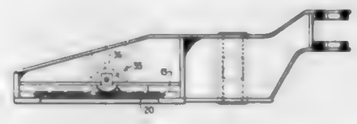
1. A self-propelled stump cutter comprising a frame, wheels on said frame adapted to carry the frame, motive means on said frame, drive means engaged between said motive means and at least one of said wheels whereby said wheel can be driven to propel said frame, steering means connected to at least one of said wheels whereby the stump cutter can be steered, cutting means movably mounted on said frame vertical and transverse movement relative to the frame, master motive means on said frame and drive means connected between said master motive means and said cutting means to cause said movement.

4,690,184
TREE PRUNING MACHINE
Tanitomi Fuminao, Houtaku, Japan, assignor to Kaisei Kogyo Corporation, Fukuoka, Japan
Filed Jan. 23, 1986, Ser. No. 821,642
Claims priority, application Japan, Apr. 27, 1985, 60-92119
Int. Cl.[4] B27L *1/00;* **A01G** *23/02*
U.S. Cl. 144—2 Z **2 Claims**



1. A tree pruning machine comprising:
a body;
a plurality of wheels connected to the body for elevating the body vertically on a tree;
a cutting unit connected to the body;
an engine;
means, connected to the engine and to the plurality of wheels, for driving the wheels with the engine;
means, connected to the engine and to the cutting unit, for driving the cutting unit with the engine;
wherein the cutting unit includes:
a first member connected to the cutting unit and extending generally vertically therefrom;
a drive wheel mounted on a lower portion of the first member, the drive wheel being connected to the cutting unit driving means;
a second member connected to the top of the first member, the second member extending in a forward direction and having an upward gradient for forming with the first member a recess therebetween; and
a saw chain engaging with the drive wheel and the second member.

4,690,185
RIM DRIVEN ROTARY CUTTER AND TREE FELLING HEAD INCORPORATING THE SAME
Douglas D. Hamilton; Robert M. Palfy, and Hans Viereck, all of Montreal, Canada, assignors to Logging Development Corporation, Montreal, Canada
Filed Jan. 21, 1986, Ser. No. 820,053
Int. Cl.[4] A01G *23/08;* **B27B** *5/14*
U.S. Cl. 144—34 R **40 Claims**

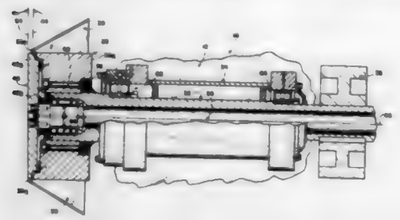


1. A rim driven saw for cutting trees comprising a planar circular saw blade having combined gear and cutting teeth around the outer periphery thereof and a power driven pinion mounted on a supporting frame, said pinion having gear teeth meshing with said combined gear and cutting teeth of the saw, said saw and pinion being disposed in substantially the same plane, one face of each of said combined gear and cutting teeth on the saw being an active profile of a standard gear tooth mating with teeth on the drive pinion and in the other face having a cutting edge thereon each of said combined gear and cutting teeth having a profile of a conventional gear tooth that includes, relative to the direction of saw rotation, a top land portion, a leading and trailing face portion and a leading and trailing flank portion wherein the leading face portion is modified by a cut out which extends from a proximate a juncture of the leading face and flank portions to a leading edge of a cutter located at intersection of the said cut out portion and said top land.

4,690,186
LOG FEED APPARATUS
Robert E. Chapman, Surrey, Canada, assignor to Optimil Machinery, Inc., Delta, Canada
Filed Mar. 5, 1986, Ser. No. 836,308
Int. Cl.[4] B02C *7/12;* **B27C** *1/08*
U.S. Cl. 144—176 **6 Claims**

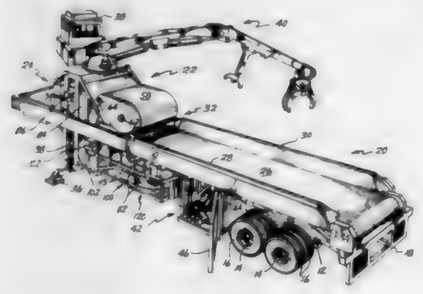
1. In a chipper having means defining therethrough a linear transport path for a workpiece, and a rotary chipper head disposed adjacent such path including knife means which, with rotation of the head, defines a cutting plane including a circularly bounded cutting expanse,
means mounting such head for rotation in a manner whereby the knife means' cutting plane is disposed at an angle relative to the transport path, and

nonrotating workpiece guide means having a planar guide surface located within the boundary of the cutting ex-



panse, with the plane (guide plane) of said guide surface substantially paralleling the transport path.

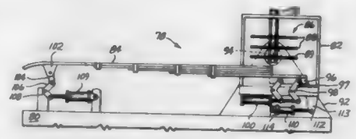
4,690,187
METHOD AND APPARATUS FOR FLAIL DEBARKING
Phillip A. Schmidt, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Continuation of Ser. No. 678,437, Dec. 5, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 935,595
Int. Cl.[4] B27L *3/00*
U.S. Cl. 144—340 **13 Claims**



1. An apparatus for simultaneously debarking a plurality of logs of the type having infeed means for longitudinally conveying a plurality of logs in a side-by-side relationship along a substantially horizontal feed plane into a debarking station with flailing means and outfeed means for conveying the debarked logs away from the debarking station, comprising:
means located above and forming a part of the infeed means to help maintain the unbarked logs in their side-by-side relationship,
enclosure means substantially surrounding the debarking station including an infeed and an outfeed opening for the traveling logs,
at least one top and one bottom rotatable flail member, each spaced vertically from the feed plane, comprising the flailing means whereby as the logs travel through the debarking station the rotating flail members impact the logs knocking substantially all the bark thereform,
means within the enclosure means for collecting and directing the removed bark toward a debris outlet within the enclosure means and located below the feed plan, and
size reducing means located substantially at the debris outlet whereby collected bark is passed therethrough to be reduced in size before being directed to an external location.

7. A process for simultaneously debarking a plurality of logs of the type including longitudinally feeding a plurality of logs in a side-by-side relationship along a substantially horizontal feed plane into an infeed opening of a substantially enclosed debarking station having flailing means therein and after debarking conveying the debarked logs out of an outfeed opening and away from the debarking station, comprising the steps of:
exerting a force on the logs ahead of the flailing means to help maintain the unbarked logs in their side-by-side relationship,
rotating at least one top and one bottom flail member so the individual flail members will impact substantially all surface area of all logs thereby knocking substantially all the bark therefrom, and
collecting the removed bark within the enclosure for the flailing means and directing it to an outlet in the enclosure below the feed plane where a size reducing means is operable to reduce the bark in size before being directed to a location external to the enclosure.

4,690,188
VARIABLE CURVE LINEBAR WITH SKEWABLE SAWS
Earl D. Hasenwinkle, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Oct. 27, 1986, Ser. No. 923,776
Int. Cl.[4] B27B *1/00, 25/02*
U.S. Cl. 144—378 **21 Claims**



1. In combination, a linebar and saw assembly for sawing cants or logs having varying amounts of sweep from piece to piece which comprises:
at least one saw;
an elongated flexible linebar means conformable between a straight line and a line approximating an arc of a circle,
said linebar means being positioned relative to the saw so that one end is essentially adjacent to that centerline of the saw lying in the plane of the saw and normal to a projection of the longest dimension of the linebar,
both ends of the linebar means always lying on the line defined by said linebar means when in straight line position,
a tangent to the end of the linebar means adjacent the saw always being essentially parallel to the plane defined by saw saw;
said saw being skewable essentially about the point of intersection of the end of the linebar means adjacent the saw with a line drawn normal to the plane of the saw from said centerline;
bending means for controlling the curvature of the linebar; and
skewing means for the saw,
whereby said linebar means can be configured into an arc which approximates the sweep curvature of a cant or log being sawn and said saw can be skewed to maintain parallelism with the line of tangency of the linebar adjacent said saw so that a cant can be guided into the saw along a path approximating its radius of curvature.

17. A method of sawing cants or logs having varying amounts of sweep from piece to piece which comprises:
providing at least one saw;
further providing an elongated flexible linebar means conformable between a straight line and a line approximating an arc of a circle;
said linebar means being positioned relative to the saw so that one end is essentially adjacent to that centerline of the saw lying in the plane of the saw and normal to a projection of the longest dimension of the linebar,
both ends of the linebar means always lying on the line defined by said linebar means when in straight line position,
a tangent to the end of the linebar means adjacent the saw

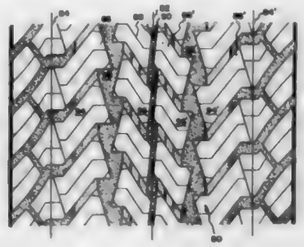
always being essentially parallel to he plane defined by said saw;
said saw being skewable essentially about the point of intersection of the end of the linebar means adjacent the saw with a line drawn normal to the plane of the saw from said centerline;
bending the linebar to conform its curvature to the sweep curvature of the cant or log; and
skewing the saw to maintain parallelism with the line of tangency of the linebar adjacent said saw so that the cant is guided into the saw along a path approximating its radius of curvature.

4,690,189

ALL-SEASON PNEUMATIC TIRE WITH CHAMFERED TREAD BLOCKS

John L. Bradisse, Munroe Falls, and Daniel J. Lindner, Canal Fulton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 29, 1986, Ser. No. 823,696
Int. Cl.[4] B60C *11/11*
U.S. Cl. 152—209 R **8 Claims**



1. An all-season radial-ply pneumatic tire for passenger and light-truck vehicles, the tire comprising:
(a) a radial carcass ply;
(b) a belt structure positioned radially outwardly of the carcass ply, the belt structure including at least one ply of cords, the belt structure having cords oriented at both positive and negative angles, in the magnitude range from 17° to 30°, with respect to the mid-circumferential plane of the tire; and
(c) a rubber tread positioned radially outwardly of the belt structure and having a surface adapted for use on paved road surfaces, the tread having grooves of width at the tread surface of at least 2 mm and the net-to-gross ratio of the tread being greater than 55%, such grooves defining blocks of rubber surrounded either fully by such grooves or by such grooves and the lateral edges of the tread road-contact surface, the rubber blocks being spaced apart circumferentially around the tread, intersecting walls of grooves that define the rubber blocks forming corners, circumferentially-spaced corners of the rubber blocks being chamfered toward the bottoms of the respective grooves that form such chamfered corners, thereby, to increase the stiffnesses of the rubber blocks.

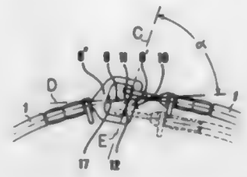
4,690,190

SECURING DEVICE FOR A VEHICLE TIRE CHAIN

Ferdinand Jeindl, Graz, Austria, assignor to Steirische Kettenfabriken Pengg-Walenta KG, Graz, Austria

Filed Jan. 22, 1985, Ser. No. 693,684
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401972
Int. Cl.[4] B60C *27/06*
U.S. Cl. 152—213 A **7 Claims**

1. In a tire chain adapted to be mounted on and readily removed from a vehicle tire including an inner support extending, in the mounted state of the chain, circumferentially along and in engagement with an inwardly oriented tire side; said inner support having a spring steel yoke including adjacent opposite free yoke ends and a hook lock having cooperating first and second components mounted on the opposite yoke ends, respectively and adapted to selectively assume an interengaged, closed state or a disengaged, open state; the improvement wherein said first component is a flat, quadrangular eyelet defining an eyelet plane being parallel to the eyelet flatness and being oriented such that in said mounted state the



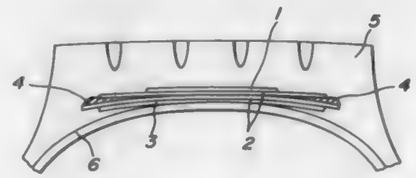
eyelet lies flat against the side wall of the tire and said plane being oriented perpendicularly to a rotary axis of the vehicle tire and further wherein said second component is a flat hook having a hook flatness and a length dimension generally oriented in a direction toward the yoke end on which said quadrangular eyelet is mounted; said flat hook defining a hook plane containing said length dimension; said hook plane being parallel to said hook flatness and being oriented perpendicularly to said eyelet plane.

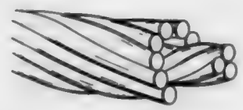
4,690,191

RADIAL TIRE WITH REINFORCING STEEL CORD

Kiyohito Kawasaki, Akigawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,459
Claims priority, application Japan, Dec. 21, 1984, 59-268540; Jun. 18, 1985, 60-90826[U]
Int. Cl.[4] B60C *9/18*
U.S. Cl. 152—527 **7 Claims**





1. A radial tire having a combined reinforcement consisting of a belt composed of at least three piled cord layers with steel cords buried in parallel in rubber in which the cords in each of the layers are set at a relatively small angle with respect to a tire equatorial plane and the cords in at least one pair of the adjacent cord layers are intersectingly arranged at an angle from 15° to 30° and a carcass having cords arranged substantially at right angles with respect to the tire equatorial plane, wherein the steel cords buried in the at least one pair of the cord-intersecting cord layers other than the outermost cord

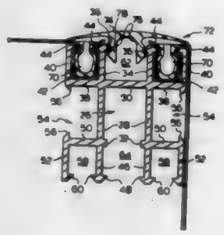
layer have Young's modulus of 6,000 to 16,000 kg/mm^2 and a flexural rigidity of 150 to 250 g, and the initial stage elongation (P.L.E.) of the rubberized cords taken out from the tire is not more than 0.2% and said cord being a tire reinforcing steel cord of a two layer twisted construction composed of a core consisting of from two to four steel filaments and a single sheath consisting of a plurality of the steel filaments surrounding the core wherein the steel filaments have a tensile strength of not lower than 260 kg/mm^2 and a filament diameter from 0.32 to 0.42 mm; the twisting direction of the core is reversed to that of the sheath; the twisting angle of the sheath, P2, is $72° \leqq P2 \leqq 80°$ and the core twisting angle P1 and the sheath twisting angle P2 meet the relation of $1.0 \leqq P1/P2 \leqq 1.1$.

4,690,192

REPLACEABLE AWNING

Johann Stilling, 1141 Royal York Road, Apt. A1001, Islington, Ontario, Canada

Filed Apr. 29, 1986, Ser. No. 857,158
Int. Cl.[4] A47H *13/00*
U.S. Cl. 160—57 **6 Claims**



1. An awning having a modular frame and comprising;
a plurality of frame pieces, defining pairs of parallel longitudinal fastening channels defining a spacing therebetween;
an interior longitudinal junction channel formed along each said frame piece, said junction channel being located in a plane lying between said parallel fastening channels and offset to one side of said fastening channels;
an access opening defined by said junction; channel for access thereto from the exterior of said frame piece;
connecting means in said junction channels of adjacent said frame pieces connecting adjacent said frame pieces together in abutting relation;
adjustable locking means operable through said access opening from the exterior of said frame pieces;
flexible plastic panel means adapted to be stretched over said composite frame and fastened in said fastening channels, and,
elongated flexible wedging strips shaped and adapted to be force fitted into said recesses together with portions of said flexible panel means thereby wedging said portions of said flexible panel means in said channels and securing the same.

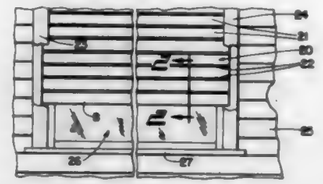
4,690,193

ROLLING SHUTTER CONSTRUCTION

Donald L. Morrison, Huntington Beach, and Stephen Bartok, Rancho Palos Verdes, both of Calif., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 7, 1985, Ser. No. 763,453
Int. Cl.[4] E06B *9/16*
U.S. Cl. 160—133 **23 Claims**

6. In a rolling shutter, a slat comprising a hollow slat body including at least one channel extending along the length thereof, and a pair of telescopically connected reinforcing members received in and extending substantially the length of



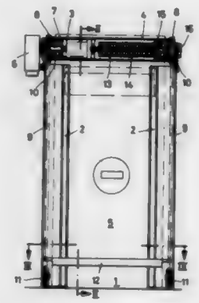
said channel, said reinforcing members being relatively movable telescopically for length adjustment.

4,690,194

DOOR WHICH CAN BE ROLLED UP

Kurt Seuster, Mühlenbach 9, 5990 Altena, Fed. Rep. of Germany

Continuation of Ser. No. 679,457, Dec. 7, 1984, abandoned. This application Jan. 8, 1987, Ser. No. 4,312
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345016
Int. Cl.[4] A47G *5/02*
U.S. Cl. 160—265 **3 Claims**



1. A roll-up door means, in combination comprising:
a hanging door having a mass weight with a free end which can be rolled up as well as unwound and including a winding tube having two ends, one of said ends having a first inside-arranged spring receiving means mounted on a winding shaft for winding up and unwinding said hanging door for opening and closing-off an opening the other of said ends having a second inside-arranged spring receiving means connecting a pretensioned spring means relative to a fixed shaft for balance of the mass weight of said hanging door, said second spring receiving means being rotatably mounted on said fixed shaft being disposed between said second spring receiving means and said fixed shaft is said pretensioned spring means, a tensioning mechanism, being disposed between the free end of said hanging door and said winding tube, said winding tube also including therewith traction members which are guided about guide pulleys; said traction members being fixed with one end on said free end of said door and with the other end on said tensioning mechanism which comprises:
tensioning pulleys which are freely rotatably mounted at both ends of said winding tube; and
pretensioned leg springs respectively disposed between each of said tensioning pulleys and said winding tube;
said ends of said winding tube being axially recessed at each end thereof; and said leg springs being disposed in said axial recesses of said winding tube so that no additional

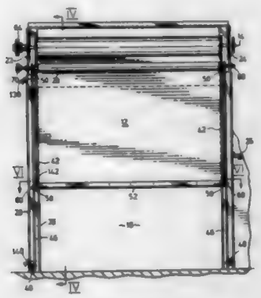
casing is required, said leg springs being subjected only to bending stresses particularly for long service life and no risk to safety.

4,690,195

APPARATUS FOR OPENING AND CLOSING INDUSTRIAL DOOR

Douglas B. Taylor, Barrie, Canada, assignor to Cooper Cliff Door Manufacturing (1980) Ltd., Barrie, Canada

Filed Jun. 23, 1986, Ser. No. 877,520
Claims priority, application Canada, Nov. 14, 1985, 495376
Int. Cl.⁴ E06B *9/204*
U.S. Cl. 160—310 **11 Claims**



1. An operator for a rolling door comprising a first shaft rotatable for actuating the door, drive sprocket means mounted for free rotation on one end of said first shaft, an idler roller, said idler roller in use engaging one surface of said door and extending horizontally across a top of an opening to be closed by said door, a second shaft for rotatably mounting said idler roller, second sprocket means mounted for free rotation on one end of said second shaft, a third sprocket for mounting on a drive shaft of power means for opening and closing said door, an endless chain extending about and engaging said drive sprocket means, second sprocket means and third sprocket, first dog means fixedly connected to said first shaft, said drive sprocket means including means for engaging said first dog means so that upon engagement said drive sprocket means can rotate said first shaft, second dog means fixedly connected to said second shaft, said second sprocket means including means for engaging said second dog means so that upon engagement said second sprocket means rotates said second shaft, endless chain loop means connectable to said door and provided for closing said door, and upper and lower sprocket means for guiding and moving said chain loop means, said lower sprocket means being adapted to be rotably mounted near the bottom of said opening and said upper sprocket means being mounted on said second shaft, wherein said door is opened by a driving connection extending from said third sprocket to said endless chain to said drive sprocket means and said door is closed by a driving connection extending from said third sprocket to said endless chain to said second sprocket means to said upper sprocket means and finally to said chain loop means.

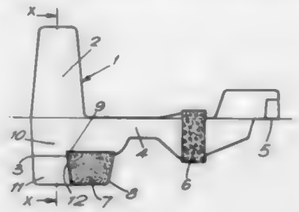
4,690,196

CASTING OF MOLTEN FERROUS METAL AND MOULDS FOR USE THEREIN

Pierre Vernay, Milly la Foret, France, assignor to Foseco International Limited, Birmingham, England

Filed Feb. 18, 1987, Ser. No. 16,005
Claims priority, application United Kingdom, Feb. 25, 1986, 8604569
Int. Cl.⁴ B22D *27/00*
U.S. Cl. 164—58.1 **14 Claims**

1. A process for casting molten ferrous metal in a mould comprising providing a mould having a mould cavity and a runner system comprising a sprue, a sprue well and a runner, and having located in the runner a ceramic filter having an open-cell foam structure, locating in a chamber in the runner system on that side of the filter which is further from the mould cavity a sealed plastics container containing particles of a treatment agent for the molten ferrous metal such that part of the container is in the sprue well, and pouring the molten ferrous metal into the mould so that the molten ferrous metal is



treated by the treatment agent before flowing through the filter and into the mould cavity.

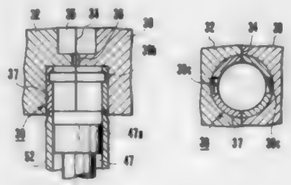
14. A mould for casting ferrous metal comprising a mould cavity and a runner system comprising a sprue, a sprue well and a runner, said mould having located in the runner a ceramic filter having an open-cell structure, and located in a chamber in the runner system on that side of the filter which is further from the mould cavity a sealed plastics container containing particles of a treatment agent for the molten ferrous metal such that part of the container is in the sprue well.

4,690,197

MOLTEN METAL POURING DEVICE

Sadayuki Dannoura, Ube, Japan, assignor to UBE Industries, Inc., Ube, Japan

Filed May 21, 1985, Ser. No. 736,654
Claims priority, application Japan, May 23, 1984, 59-102701; Dec. 19, 1984, 59-266232
Int. Cl.⁴ B22D *17/12*
U.S. Cl. 164—312 **10 Claims**



4. In a die casting apparatus of the type having a stationary cover die and a rejector die which is movabe in horizontal direction to be joined with and separated from said cover die, said cover and rejector dies, when joined with each other securely, defining a die cavity having a small hole at a bottom thereof, a molten metal being injected into said die cavity from said hole to form a product, a vertical neck portion having a reduced diameter and an upper end communicated with said hole of the die cavity, and an enlarged-diameter vertical bore having an upper end communicated with a lower end of said neck portion and a lower end opened at the bottom surface of said cover and rejector dies; a vertical sleeve for containing said molten metal, an upper end of said vertical sleeve being adapted to the opened lower end of said vertical bore; and a plunger capable of vertically reciprocating in a bore of said vertical sleeve and said vertical bore to force the molten metal into said die cavity through said neck portion;

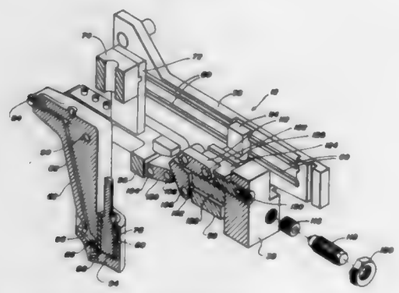
the improvement in said die casting apparatus comprising; a stationary sleeve which is split into halves along the parting surfaces of said cover and rejector dies and has an inner peripheral surface forming said vertical bore, an inner diameter of said stationary sleeve being substantially same as that of said vertical sleeve so that said plunger can pass upwardly through the bottom surface of said cover and rejector die without a reduction of a forcing pressure applied on said molten metal, a stepped portion being formed in the inner peripheral surface of said stationary sleeve.

4,690,198

INJECTOR FOR INJECTING MOLTEN MATERIAL INTO A DIE

Donald H. Hardey, and Franklin D. Austin, both of Rockford, Ill., assignors to Castech Enterprises, Inc., Rockford, Ill.

Filed Sep. 27, 1985, Ser. No. 780,810
Int. Cl.⁴ B22D *17/04*
U.S. Cl. 164—316 **9 Claims**



1. In an injector of the piston type for a die casting machine including a gooseneck with a cylinder well adjacent its lower end, said cylinder well connected at its outlet by a delivery tube to a nozzle adjacent the upper end of the gooseneck for injecting molten material into the gate of a die, an inlet communicating the cylinder well with molten material in which the lower end of the gooseneck is dipped and a plunger which is reciprocated in the cylinder well, the improvement wherein the gooseneck is mounted on a slide between a pair of side mounts joined at one end by a block forming a rigid support and a toggle linkage against which the slide is held under compressive force by the toggle linkage and wherein a means for compensating for thermal expansion which maintains a substantially constant compressive force on the nozzle in the gate of the die is provided between the toggle linkage and the block.

4,690,199

APPARATUS FOR THE ROTARY SUPPLY OF MOLTEN CAST-IRON TO AN INSTALLATION FOR THE VERTICAL CONTINUOUS CASTING OF A PIPE FROM SPHEROIDAL GRAPHITE CAST-IRON

Yves Gourmel, and Michel Pierrel, both of Pont-A-Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Dec. 9, 1985, Ser. No. 806,318
Claims priority, application France, Dec. 7, 1984, 84 18862
Int. Cl.⁴ B22D *11/00*
U.S. Cl. 164—421 **4 Claims**

1. An apparatus for the continuous vertical extraction casting of pipes from spheroidal graphite cast iron, comprising:

(a) a cylindrical reservoir crucible (**11**, **12**) for molten cast iron,

(b) cooling means (**13**) surrounding an outer circumference of the crucible,

(c) means for supplying molten cast iron to the crucible, and

(d) means for slowly rotating a mass of molten cast iron (F) in the crucible to ensure a constant wall thickness of pipes vertically extracted from the crucible over their entire peripheries, said rotating means comprising:

(1) a central relief (**34**) upstanding from a base (**12**) of the crucible and coaxial therewith,

(2) a blind cavity (**35**) defined within the relief,

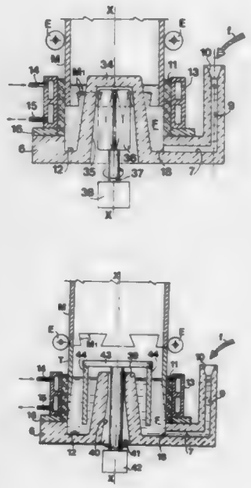
(3) a vertically oriented shaft (**37**) extending into the cavity from a lower end thereof,

(4) magnet means (**36**) mounted to the shaft and disposed within the cavity, said magnet means extending vertically over substantially the entire height of the mass of molten cast iron in the crucible, and

(5) means (**38**) for slowly rotating the shaft and magnet means mounted thereto.

3. An apparatus for the continuous vertical extraction casting of pipes from spheroidal graphite cast iron, comprising:

(a) a cylindrical reservoir crucible (**11**, **12**) for molten cast iron,



(b) cooling means (**13**) surrounding an outer circumference of the crucible,

(c) means for supplying molten cast iron to the crucible, and

(d) means for slowly rotating a mass of molten cast iron (F) in the crucible to ensure a constant wall thickness of pipes vertically extracted from the crucible over their entire peripheries, said rotating means comprising:

(1) a central relief (**39**) upstanding from a base (**12**) of the crucible and coaxial therewith, and extending upwardly to a height greater than the level of molten cast iron in the crucible,

(2) an axial bore (**40**) extending through the relief,

(3) a verticaly oriented shaft (**41**) extending through the bore,

(4) a horizontal member (**43**) extending radially outwardly from an upper end of the shaft, above a top of the relief,

(5) a plurality of graphite bars (**44**) extending vertically downwardly from opposite outer ends of the horizontal member into the molten cast iron to a depth proximate the crucible base, and

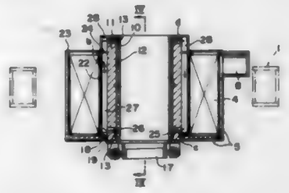
(6) means (**42**) for slowly rotating the shaft and graphite bars mounted thereto.

4,690,200

INDUCTION STIRRER/CONTINUOUS CASTING MOLD ASSEMBLY

Hiroshi Okamoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 30, 1985, Ser. No. 696,531
Claims priority, application Japan, Feb. 16, 1984, 59-21467[U]
Int. Cl.[4] B22D 27/02, 11/124, 11/04
U.S. Cl. 164—504 5 Claims



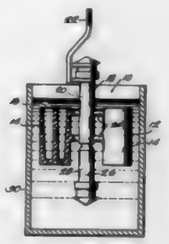
1. An induction stirrer/mold assembly for use on a continuous casting machine, comprising:
a vibrating table;
a coil assembly having an outer frame securely fastened to said vibrating table;
a plurality of induction stirring coils accommodated in said outer frame;
a continuous casting mold assembly detachably mounted on said outer frame of said coil assembly, wherein sides of said mold assembly comprise separable mold walls each having a copper facing plate and a reinforcing back-up plate wherein said copper facing plate is connected to said reinforcing back-up plate;
cast strip guide means located in a secondary cooling zone immediately beneath said mold assembly; and
mold aligning means for adjusting the position of said mold on said frame which comprise at least first and second reference blocks adjustably fixed at a lower end of said mold walls, said reference blocks being abuttingly engagable with an end face of a bottom wall of said outer frame of said coil assembly to hold said mold assembly in alignment with said cast strip guide means and a shim member attached to at least one of said reference blocks for adjusting the position of said mold assembly relative to said cast strip guide means.

4,690,201

LOST FOAM MOLD PATTERN AND ASSOCIATED METHOD

Russell J. VanReas, West Allis, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 21, 1985, Ser. No. 747,262
Int. Cl.[4] B22C 7/02, 9/04
U.S. Cl. 164—516 10 Claims



1. A foam mold pattern assembly comprising a pattern having opposite first and second ends and including a blind pocket open in one direction, first means connected to said pattern for facilitating suspension of said foam mold pattern assembly with said first end facing generally upwardly, second means for facilitating suspension of said foam mold pattern assembly with said second end facing generally upwardly, and means connecting said second means to one of said first means and said pattern for facilitating separation of said second means from said one of first means and said pattern.

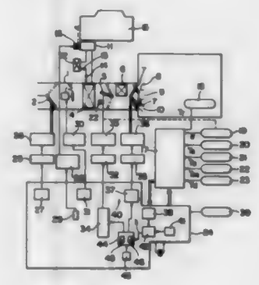
10. A method for preparing a foam mold pattern for casting in a lost foam casting process, said method comprising the steps of providing a foam mold pattern assembly including a pattern, a first projection connected to said pattern and extending therefrom in one direction, and a second projection connected to said pattern and extending therefrom in a direction generally opposite said one direction, providing a container of refractory coating, dipping said foam mold pattern assembly into said container of refractory coating with said first projection extending upwardly, drying said foam mold pattern assembly by suspending said foam mold pattern assembly by said second projection, and removing said second projection from said pattern.

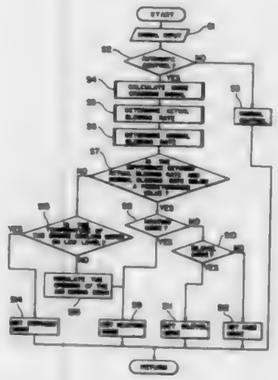
4,690,203

AUTOMOTIVE AIR-CONDITIONING SYSTEM ADAPTED TO OBVIATE THE INFLUENCE OF INSOLATION DURING BLOWER START-UP

Katsumi Iida, Saitama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 833,647
Claims priority, application Japan, Mar. 18, 1985, 60-053981
Int. Cl.[4] F25B 29/00
U.S. Cl. 165—25 2 Claims





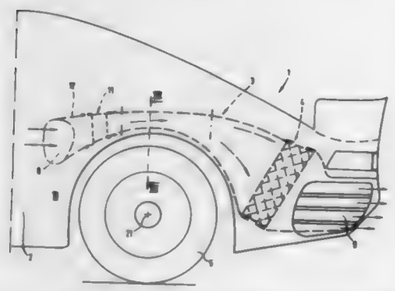
1. An automotive air-conditioning system comprising:
(a) a combined signal producing means which calculates combined signals T at least on the basis of room temperature, fresh air temperature, set temperature and intensity of insolation; a blower control means which controls a blower so that conditioned air is blown at a normal blowing rate corresponding to the combined signals T;
(b) an air mixing door control means which controls the opening of an air mixing door according to the combined signals T;
(c) a mode changing means which, according to a mode changing signal based on the opening of the air mixing door and on the temperature of an evaporator, establishes one of a defrosting mode where conditioned air is blown through a window defrosting opening, a face mode where conditioned air is blown through a center opening, a foot mode where conditioned air is blown through a foot opening, and a bilevel mode where conditioned air is blown through both the center opening and the foot opening;
(d) a blowing rate control means which increases the blowing rate of the blower gradually after the blower has been started;
(e) an arithmetic means which calculates the difference between the normal blowing rate corresponding to the combined signals T and the blowing rate during the initial stage of air-conditioning operation immediately after the start of the blower, and which provides a detection signal when the difference is reduced below a predetermined value;
(f) a sensor for detecting the temperature of the engine cooling water and for producing an output signal representative of the temperature of the cooling water; and
(g) a control means which operates from a time when the blower is actuated to a time when the detection signal is provided by the arithmetic means, and when operating controls the air mixing door control means and the mode changing means on the basis of the output signal of the sensor for detecting the temperature of the engine cooling water.

4,690,204

AIR INLET CHANNEL FOR A CHARGING AIR INTERCOOLER

Anton Reichel, Ditzingen; Bernard Lohmann, Loeningen; Eugen Kolb, Stuttgart; Manfred Hochkönig, Moeglingen; Hermann Burst, Ruteshelm, and Helmut Kretschmer, Waldaschaff, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,044
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 8427918
Int. Cl.[4] B60K 13/02
U.S. Cl. 165—44 15 Claims



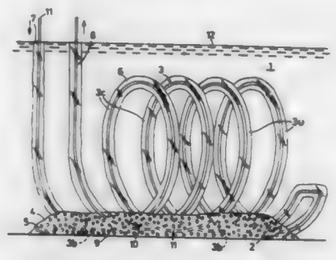
1. An air supply channel for a charging air intercooler of an exhaust gas turbocharger of an internal combustion engine arranged within the rear of a vehicle having a body means, in which the air channel is arranged within a fender area of the vehicle and comprises air inlet and discharge opening means, the air channel being formed as a separate tubular structural element which is retained in a wheel casing of the body means above the rear wheel, said channel being connected at its inlet side with an inlet connection means fixed at the body means by way of a connecting sleeve means and at its air discharge side with the charging air intercooler.

4,690,205

ARRANGEMENT FOR ENSURING THAT ICE WILL FORM SUBSTANTIALLY UNIFORMLY ON A TUBULAR HEAT EXCHANGER PLACED IN WATER

Hans Jelbring, Fridhem 1, S-179 00 Stenhamra, Sweden

PCT No. PCT/SE84/00275, § 371 Date Apr. 12, 1985, § 102(e) Date Apr. 12, 1985, PCT Pub. No. WO85/00878, PCT Pub. Date Feb. 28, 1985
PCT Filed Aug. 13, 1984, Ser. No. 723,962
Claims priority, application Sweden, Aug. 12, 1983, 8304381
Int. Cl.[4] F25C 1/12
U.S. Cl. 165—45 5 Claims



1. An arrangement for ensuring that ice will form substantially uniformly on the outer surface of a tubular heat exchanger which is submersed to the bottom of a body of water and which comprises at least one tubular member, within which there flows a liquid heat carrier whose inlet temperature is lower than the freezing point of the water in said body of water, wherein the tubular member is so arranged that parts thereof contact said bottom at a plurality of locations so chosen that the distance between two mutually adjacent locations is short in relation to the length of tube between two consecutive contact locations between the tubular member and said bottom, and wherein parts of the tubular member located between said locations lie freely placed in said body of water, at least the majority of said parts in contact with the bottom of said body of water being covered with a suitably coherent layer of lump ballast material, which, due to the relatively low input temperature of the heat carrier flowing through said tubular member is caused to freeze to form a block of ice and ballast material, said frozen block therewith forming a heat conductor for distributing cold from the inlet of the tubular member and the areas adjacent thereto to remaining regions of said tubular member, so that there is formed an ice-coating of substantially uniform thickness on those parts of the tubular member which lie freely placed in said body of water between said locations.

4,690,206

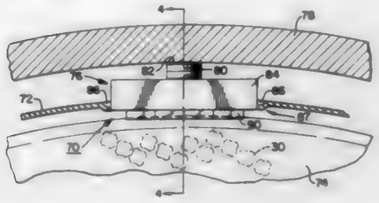
NUCLEAR STEAM GENERATOR WRAPPER BARREL/TUBE SUPPORT PLATE CONNECTION ASSEMBLY AND RADIAL TUNING METHOD FOR ASSEMBLING SAME

Jeffrey D. Bein, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 22, 1985, Ser. No. 757,719
Int. Cl.[4] F28F 7/00
U.S. Cl. 165—81 24 Claims

13. A steam generator wrapper barrel/tube support plate connection assembly, comprising:

(a) a generally cylindrical outer shell having a first diameter;
(b) a wrapper barrel having a second, relatively smaller diameter so as to fit within the outer shell with an annular space therebetween, and being made of a material having a first coefficient of thermal expansion;
(c) a plurality of vertically spaced tube support plates located within the wrapper barrel, each being made of a



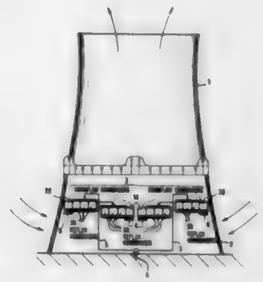
material having a second, relatively higher coefficient of thermal expansion; and
(d) adjustable jacking assembly means positioned between the wrapper barrel and the outer shell, for effecting a preload in the wrapper barrel such that a deformation is caused in the wrapper barrel at the adjustable jacking assembly means.

4,690,207

NATURAL-DRAFT COOLING TOWER WITH FORCED-DRAFT FLOW OVER REFLUX CONDENSERS

Burkhard Trage, and Richard Leitz, both of Ratingen, Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,472
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441514
Int. Cl.[4] F28B *1/06, 7/00*
U.S. Cl. 165—113 2 Claims



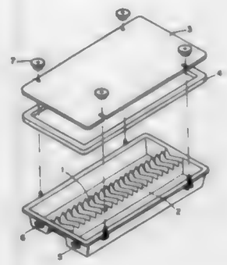
1. In a natural-draft cooling tower having a plurality of preferably roof-shaped heat exchange elements substantially standing rather than lying as arranged for direct heat exchange and for condensing the turbine exhaust steam from a power plant, wherein a portion of said heat exchange elements are connected to operate as condensers, and additionally another portion of said heat exchange elements are connected to operate as reflux condensers, with the latter being disposed downstream, when viewed in the direction of flow of said steam, of said heat exchange elements that are connected to operate as condensers;
the improvement wherein only each of said heat exchange elements that is connected to operate as a reflux condenser is provided with a respective fan installed internally therewith.

4,690,208

CONTAMINATED FLUID HEAT EXCHANGING

Brent D. Deck, 24 Shawmut Ter., Framingham, Mass. 01701

Filed Feb. 3, 1986, Ser. No. 825,535
Int. Cl.[4] F28F *13/12*
U.S. Cl. 165—119 15 Claims



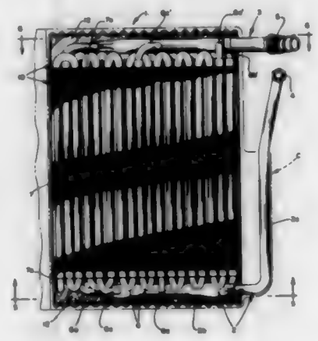
1. Mechanical filtering apparatus comprising,
means defining a fluid inlet,
fluid inlet means for receiving fluid,
fluid outlet means for expelling fluid,
a plurality of passage means intercoupling in parallel said fluid inlet means and said fluid outlet means for carrying fluid, string, lint and small substantially spherical solids from said fluid inlet means to said fluid outlet means while blocking the transfer of long thin objects,
each of said passage means being formed with an angular elbow which allows passage of fluid, string, lint and small substantially spherical solids therethrough but prevents the passage of said long thin objects.

4,690,209

AIR CONDITIONER EVAPORATOR SYSTEM

Cory I. Martin, 401 Second Ave., P.O. Box 26087, Dallas, Tex. 75226

Filed Mar. 18, 1985, Ser. No. 712,622
Int. Cl.[4] F28D *1/00*
U.S. Cl. 165—150 6 Claims



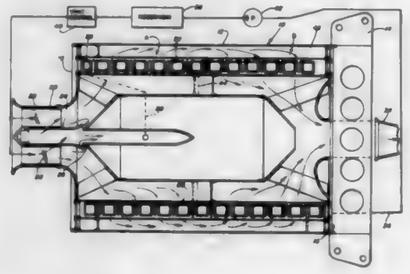
1. An evaporator package for air conditioners, comprising in combination:
a. a plurality of parallel air cooling fins substantially defining a heat transfer window,
b. a tube system having a plurality of tubes that are parallel within said window and wherein certain, but not all, of said parallel tubes above and below said window are connected at the ends of said package,
c. an intake manifold at one end of said package and connecting to selected ones only of said tubes at that end of said package,
d. an exhaust manifold at the opposite end of said package and connecting to selected ones only of said tubes at that end of said package,
e. said tubes, fins and manifolds comprise an evaporator unit, and wherein
f. said manifolds and all said tubes connecting thereto being insulated at and near the joinder of said tubes and manifolds by an expandable foam material that simultaneously adheres to all of said tubes above and below said window, said manifolds and said package.

4,690,210

FLUID JET IMPINGEMENT HEAT EXCHANGER FOR OPERATION IN ZERO GRAVITY CONDITIONS

Richard Niggemann, and John Readman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 1, 1985, Ser. No. 750,166
Int. Cl.[4] F28D *7/00*; F28F *9/22*
U.S. Cl. 165—139 6 Claims



1. A heat exchanger particularly suited for use in zero gravity conditions comprising
a spirally coiled tube;
a housing containing said tube;
an inlet to said housing centrally of said tube including swirl inducing means for imparting rotation to a fluid entering said housing;
an outlet from said housing opposite of said inlet;
a port centrally within said housing and just downstream of said swirl inducing means and in fluid communication with the interior of said tube through which lesser density components of an incoming fluid stream may pass to said tube interior; and
a baffle structure radially outwardly of said port and surrounding said tube for causing higher density components of an incoming fluid stream to impinge upon said tube before passing to said outlet.

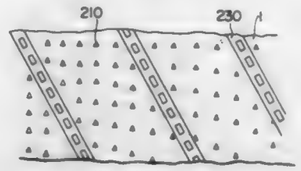
4,690,211

HEAT TRANSFER TUBE FOR SINGLE PHASE FLOW

Heikichi Kuwahara, Ibaraki; Kenji Takahashi, Abiko; Takehiko Yanagida, Tsuchiura; Wataru Nakayama, Kashiwa; Shigeo Sugimoto, Ibaraki, and Kiyoshi Oizumi, Tsuchiura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,798
Claims priority, application Japan, Jun. 20, 1984, 59-125224
Int. Cl.[4] F28F *1/00*
U.S. Cl. 165—177 6 Claims

1. A heat transfer tube for single-phase flow having at least one row of projections formed on the inner surface of said heat transfer tube along at least one spiral curve, said at least one row of projections having a plurality of projections formed discontinuously, portions of the inner surface of the heat transfer tube between adjacent rows presenting surfaces parallel to the tube axis, each of said projections has a cross-section constituted by smooth curves at any portion along a height thereof including the bottom thereof, a cross-sectional area of said projections progressively decreases toward the top thereof, said projections have a height of 0.45 to 0.6 mm and are arranged at a circumferential pitch of 3.5 to 5 mm and an axial pitch of 5 to 15 mm, said heat transfer tube has porous heat transfer surfaces formed on the outer surface of said heat transfer tube, said porous heat transfer surfaces having a plurality of tunnel-shaped parallel cavities in outer surface portions



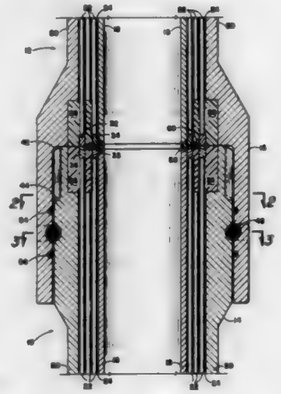
thereof, a plurality of openings formed in ceiling portions of said plurality of said tunnel-shaped cavities, a spiral groove is formed on an outer surface of the heat transfer tube and extends across said plurality of tunnel-shaped cavities, said spiral groove being formed when said projections are formed at the inner surface of the heat transfer tube, and wherein each of said plurality of tunnel shaped cavities opens in a direction of the spiral groove at an intersection of the spiral groove with the respective tunnel shaped cavities.

4,690,212

DRILLING PIPE FOR DOWNHOLE DRILL MOTOR

David E. Termohlen, 23 W. 4th St., Tulsa, Okla. 74103

Filed Feb. 25, 1982, Ser. No. 352,374
Int. Cl.[4] E21B *47/00, 17/042*
U.S. Cl. 166—65.1 9 Claims



1. A drilling pipe for maintaining electrical connection between the surface and a subsurface location comprising:
(a) a first fitting at one end of said pipe;
(b) a second fitting at the other end of said pipe adapted to connect with a fitting like that at the first end;
(c) a pipe sidewall interconnecting said end fittings and wherein said pipe sidewall substantially comprises a plurality of essentially parallel, tightly packed rods or wires cemented to each other wherein at least one of said rods or wires is electrically conductive and insulated from the rest of the pipe; and
(d) an alignment means for making electrical contact between corresponding insulated rods or wires when said

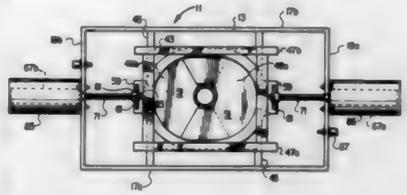
first fitting of one of said pipes is connected with said second fittinq of another of said pipes.

4,690,213

PNEUMATIC PIPE WIPER SYSTEM

James P. Stannard, Houston, Tex., and Charles W. Shockley, Lafayette, La., assignors to Pneumatic Pipewipers, Inc., Lafayette, La.

Filed Feb. 3, 1986, Ser. No. 825,338
Int. Cl.[4] E21B *33/08*
U.S. Cl. 166—84 **22 Claims**



19. A system for stripping fluid from the external surface of tubular articles being pulled from the wellhead of a well, said system being used in conjunction with a rig having a source for supplying fluid to said well, said system comprising:

a carriage mountable over said wellhead;

a pair of wiper pad assemblies slidingly mounted for inward and outward movement with respect to each other in said carriage;

actuator means for moving said wiper pad assemblies inward and outward with respect to each other in said carriage, said actuator means including an actuator having a cylinder and piston rod movable between a retracted position with respect to said cylinder and an extending position with respect to said cylinder;

pneumatic means for extending and retracting said piston rod;

means for sensing the pressure of said fluid supplied to said well;

and means for moving said wiper pads outward with respect to each other when said pressure of said fluid supplied to said well exceeds a preselected amount.

4,690,214

METHOD AND A DEVICE FOR CARRYING OUT MEASUREMENTS AND/OR OPERATIONS IN A WELL

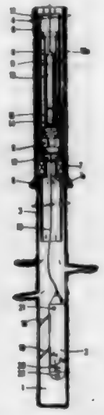
Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Français du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1984, Ser. No. 596,604
Claims priority, application France, Apr. 7, 1983, 83 05823
Int. Cl.[4] E21B *23/00, 47/00, 49/00*
U.S. Cl. 166—250 **14 Claims**

1. A device for carrying out measurements and/or operations in a well extending from a surface of the earth, said device comprising a tubing of a diameter of less than that of the well, at least one measuring or operating instrument, at least one sealing member surrounding a lower portion of said tubing, a support member located above said instrument and supported by said tubing,

a flexible connecting member comprising at least one electrical connection, said flexible connecting member connecting said support member to said instrument, and means for causing the support member to move in said tubing between a first position and a second position corresponding respectively to one position in which said instrument is protected within the tubing and another position in which the instrument is partially out of said tubing; said tubing extending from the surface to a position within said well above a working position of said instrument.

11. A method for carrying out measurements or operations in a well extending from a surface of the earth, wherein an assembly is introduced into said well, said assembly comprising a tubing defining an annular space with a wall of said well, at least one measuring or operating instrument, a support member, a flexible connecting member connecting said member to said to said instrument, means for anchoring said instrument in said well and remote control means for actuating said anchoring means, said method comprising the following steps:



(a) lowering said assembly into the well;

(b) positioning said instrument in the well while maintaining the flexible connecting member stretched;

(c) anchoring said instrument in said well by actuating the the remote control means which in turn actuates the anchoring means; and

(d) relaxing said flexible connecting member.

4,690,215

ENHANCED CRUDE OIL RECOVERY

George W. Roberts; James G. Hansel, both of Emmaus, and Goutam H. Shahani, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 16, 1986, Ser. No. 864,179
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 **4 Claims**

1. In a process for secondary recovery of an oil field wherein waterflooding proceeds fireflooding, the improvement comprising terminating said waterflooding and initiating said fireflooding prior to achieving an oil in place value (OIP) of at least 0.1 and carrying out said fireflooding with an oxygen enriched atmosphere.

4. In a process for secondary recovery of an oil field wherein waterflooding to an oil in place value (OIP) of less than 0.1 preceeds fireflooding, the improvement comprising carrying out said fireflooding with an oxygen enriched atmosphere wherein the oxygen content is at least 90 volume percent oxygen.

4,690,216

FORMATION FLUID SAMPLER

John J. Pritchard, Jr., Harvey, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Jul. 29, 1986, Ser. No. 890,433
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—264 **11 Claims**

1. An apparatus for taking a sample of formation fluid when lowered into a well casing, said apparatus comprising:

sampling means having means for dividing the hollow interior thereof into a plurality of chambers axially displaced and adapted to be positioned along the longitudinal axis of said casing, each of said chambers having at least one port through an outer wall thereof for allowing formation fluid to enter thereinto;

perforating means carried by said apparatus for perforating said casing wall;

first packing means operatively positioned below and adjacent said sampling means and being adapted to be sealingly set within said casing;

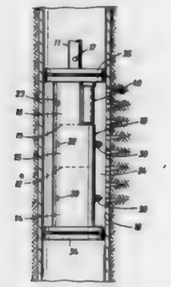
second packing means operatively positioned above and adjacent said sampling means and being adapted to be sealingly set to form a closed annular space between said sampling means and said casing and between said second packing means and said first packing means;

lowering means operatively connected to said sampling means for lowering said sampling means within said casing;

first valving means carried in the outer wall forming the lowermost chamber of said sampling means for normally closing each of said ports of said chambers;

second valving means carried by the means for dividing the hollow interior of said sampling means shared by said chamber above and adjacent said lowermost chamber and said lowermost chamber, said second valving means being in fluid communication with said lowermost chamber and sequentially actuatable with said first valving means caused by an increase in fluid pressure within said lowermost chamber; and

third valving means carried by the outer wall of said chamber above and adjacent said lowermost chamber, said



third valving means operatively engageable with said second valving means to open the port through the outer wall of the chamber above and adjacent said lowermost chamber to allow formation fluid to enter thereinto.

8. A method for taking a sample of formation fluid when lowered into a well casing, said method comprising:

lowering an apparatus having a sampling means including a plurality of chambers in fluid communication with each other and a perforating means operatively connected thereto into a well casing;

engaging first packing means operatively positioned below and adjacent said apparatus to be sealingly set within said casing;

engaging second packing means operatively positioned above and adjacent said apparatus to be sealingly set to form a closed annulus space between said sampling means and said casings and between said second and first packing means;

actuating said perforating means carried by said apparatus to perforate said casing wall;

opening first valving means carried by the outer wall of the lowermost chamber of said sampling means to allow formation fluid to enter thereinto;

then opening second valving means carried by means for dividing said sampling means into a chamber above and adjacent said lowermost chamber and said lowermost chamber caused by an increase in fluid pressure within said lowermost chamber; and

opening third valving means carried by the outer wall of said chamber above and adjacent said lowermost chamber, to allow formation fluid to enter thereinto.

4,690,217

PROCESS FOR WATER INJECTIVITY IMPROVEMENT TREATMENT OF WATER INJECTION WELLS

Davis L. Taggart, and Edward W. Heffern, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Aug. 15, 1986, Ser. No. 897,179
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **11 Claims**

1. A method for enhancing the injectivity into an injection well and thereby accelerating the recovery of oil by a waterflood process from an oil-bearing subterranean formation penetrated by at least one injection well and at least one production well wherein the near wellbore area of the formation penetrated by the injection well has a low formation permeability to water as compared to the formation's absolute permeability, said method compriaing:

injecting into the formation through an injection well, an aqueous fluid containing a first surface-active agent in an amount suitable to sweep the residual oil from the formation pore spaces in the near wellbore area and to thereby improve the water injectivity of said injection well, wherein the first surface-active agent has a general formula:

$$RO(C_3H_6O)_a(C_2H_4O)_bYX$$

where:

R is an alkyl group containing from about 3 to about 20 carbon atoms or an alkyl phenol, wherein the alkyl portion of the alkyl phenol contains from about 3 to about 20 carbon atoms or a mixture thereof;

a has an average value of from 0 to about 10;

b has an average value of from about 1 to about 10;

Y is a sulfate or sulfonate; and

X is a cation; and

thereafter injecting an aqueous fluid into the formation through the injection well.

4,690,218

METHOD FOR DEPTH CONTROL AND DETONATION OF TUBING CONVEYED GUN ASSEMBLY

Cyril R. Sumner, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 3, 1986, Ser. No. 848,008
Int. Cl.[4] E21B *43/116*
U.S. Cl. 166—297 **14 Claims**

1. A method of registering a tubing conveyed perforating assembly at a desired location in a well comprising the steps of:

(a) setting a packer in the well at some location above the approximate location of the desired formation;

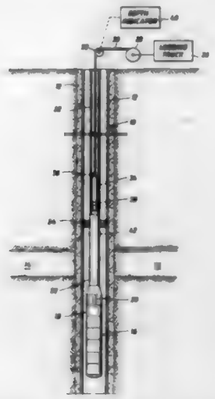
(b) lowering on a tubing string a tubing conveyed perforating assembly having a firing mechanism therewith, the lowering step extending the tubing string into the well until the tubing conveyed perforating assembly is below the approximate location of the desired formation;

(c) lowering a radioactive logging tool into the well on a logging cable;

(d) operating the logging tool along the well to locate the desired formation into which perforations are desired;

(e) raising or lowering the tubing conveyed perforating assembly on the tubing string to a position in the well registered with the formation wherein this step comprises: (1) initially installing a radioactive marker means in the tubing string prior to placing the tubing string in the well, (2) measuring the distance along the tubing string between the radioactive marker means and the tubing conveyed perforating assembly, (3) locating the radioactive marker means in the well through use of the radioactive logging tool, (4) then moving the tubing string in the well as a

function of the location of the radioactive marker means located in step (3), and (5) wherein the step of moving the tubing string is dependent on the measured distance between the radioactive marker means and the tubing conveyed perforating assembly and also on the location of the desired formation in the well determined in step (c);



(f) moving the logging cable to achieve an operative connection between the firing mechanism and the logging cable; and

(g) initiating operation of the firing mechanism through the logging cable to form perforations into the formation.

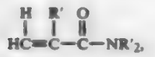
4,690,219

ACIDIZING USING N-VINYL LACTUM/UNSATURATED AMIDE COPOLYMERS

Lyle D. Burns, and G. Allan Stahl, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 586,504, Mar. 5, 1984, Pat. No. 4,578,201.
This application Dec. 5, 1985, Ser. No. 805,030
Int. Cl.[4] E21B *43/27*
U.S. Cl. 166—307 **29 Claims**

1. A process for acidizing a subterranean formation penetrated by at least one well comprising injecting into said formation, without a crosslinking agent, a water soluble thickened acid composition comprising: (1) water: (2) acid; and (3) a linear copolymer prepared from the monomers consisting of a N-vinyl lactam monomer and an alpha, beta-unsaturated amide monomer of the formula



where R' is methyl, ethyl or hydrogen, said copolymer being made in the absence of a crosslinking agent during polymerization of the monomers.

4,690,220

TUBULAR MEMBER ANCHORING ARRANGEMENT AND METHOD

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Filed May 1, 1985, Ser. No. 729,231
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—382 **18 Claims**

5. A method of anchoring a member with anchor means thereon to a well bore tubular member by manipulating a setting string connected with a mandrel having housing means threadedly supported thereon and the member sealably connected therewith, the housing means having means to restrain relative movement between it and the mandrel to enable the mandrel to be manipulated for disconnecting from the housing means for relative longitudinal movement between the mandrel and housing means whereupon slip means supported on the housing means may be moved outwardly from a retracted position by slip actuating means to releasably secure the housing means to the tubular member which thereafter enables the setting string to be manipulated to anchor the member to the tubular member, release the mandrel from the anchored member while maintaining them engaged in a sealing relationship comprising the steps of:

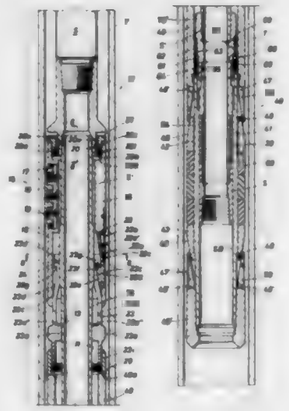
positioning the mandrel, housing means and member on the setting string;

lowering the setting string with the mandrel, housing means and member into the well bore;

rotating the setting string to threadedly disconnect the housing means from the mandrel;

maintaining the slip actuating means and slip means in contact while the slip means is in retracted position during lowering of the setting string in the well bore and while threadedly disconnecting the housing means from the mandrel;

manipulating the setting string to move the mandrel and slip actuating means to urge the slip means into engagement



with the tubular member to secure the housing means thereto;

manipulating the setting string to actuate the member anchor means and anchor the member to the tubular member; and

manipulating the setting string to release from the anchored member and remain in a sealing relationship therewith.

9. Apparatus to lower on a setting string and anchor in position in a well bore tubular member a member having tubular member engaging means to secure the member with the tubular member including:

a mandrel for securing with the setting string;

housing means;

means to releasably support said housing means on said mandrel, said mandrel being disconnectable from said housing means for securing said housing means with the tubular member by manipulating the setting string;

slip actuating means;

slip means;

surface means on said mandrel to maintain said slip means and slip actuating means in contact in retracted position as the apparatus is lowered in the well bore, said surface means and slip actuating means movable by said mandrel after said housing means is secured to the tubular member to urge said slip means outwardly from retracted position

to engage said slip means with the tubular member and secure said housing means thereto whereby said mandrel may then be manipulated to actuate the tubular member engaging means and anchor the member in the tubular member;

connecting means to release said mandrel from the anchored member; and

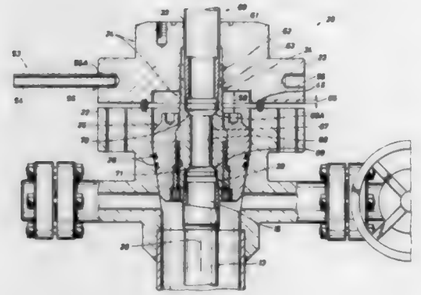
additional surface means on said mandrel positionable by the setting string to accommodate retraction of said slip actuating means and slip means to retracted position.

4,690,221

WELL TUBING HANGER METHOD AND APPARATUS FOR USE IN WELL CONTROL

Paul B. Ritter, Jr., Bakersfield, Calif., assignor to Shell California Production Inc., Houston, Tex.

Filed Jul. 3, 1986, Ser. No. 881,762
Int. Cl.[4] E21B *23/00, 33/04*; F16L *21/04*
U.S. Cl. 166—382 **23 Claims**



1. A well tubing hanger apparatus for use in well fluid control comprising;

a tubing head having a tubing head opening defined upwardly therethrough,

a moveable tubing hanger positioned within said tubing head opening, said moveable tubing hanger being moveable relative to said tubing head,

seal means located between said tubing head and said tubing hanger and being engageable in a fluid-tight manner therebetween, and

axial movement means operatively connected in a rotatable manner between said moveable tubing hanger and said tubing head to move, when rotated, said tubing hanger relative to said tubing head so as to engage said seal means in a fluid-tight manner between said tubing head and said moveable tubing hanger.

14. A method of well fluid control comprising the steps of: providing said well with;

a tubing head having a central longitudinal axis and a tubing head central opening defined upwardly therethrough,

a moveable tubing hanger centrally positioned within said tubing head central opening and having a tubing hanger central opening defined upwardly therethrough, said moveable tubing hanger being axially moveable relative to said tubing head along said central longitudinal axis,

seal means located between said tubing head and said tubing hanger and being engageable in a fluid-tight manner therebetween when said moveable tubing hanger is moved relative to said tubing head, and

axial movement means operatively connected in a rotatable manner between said moveable tubing hanger and said tubing head, being capable when rotated of axially moving said moveable tubing hanger relative to said tubing head along said central longitudinal axis,

rotating said axial movement means,

moving said moveable tubing hanger relative to said tubing head, and

engaging said seal means between said tubing head and said moveable tubing hanger in a fluid-tight manner, thereby preventing fluid flow between said tubing head and said tubing hanger.

4,690,222

HORSE SHOE

Kenneth A. Cameron, 8702 Meadow Rd., Downey, Calif. 90242

Filed Dec. 27, 1985, Ser. No. 813,946
Int. Cl.[4] A01L *5/00*
U.S. Cl. 168—4 **8 Claims**



1. A horse shoe comprising:

(a) a resilient curved body having

(1) an upper surface adapted to receive a horse's hoof;

(2) resilient tab means projecting upwardly and adapted to clampingly engage an outer surface of a horse's hoof and to position said horse shoe on said hoof;

(3) said upper surface of said horse shoe and the engaging surface of said tab means adapted to receive a bonding means, with at least said upper surface being provided with a plurality of openings for receiving said bonding means;

(b) a curved member embedded in said horse shoe comprising a material having a high strength to weight ratio, said openings being aligned with said curved member and passing through said upper surface terminating at an upper surface of said curved member; and,

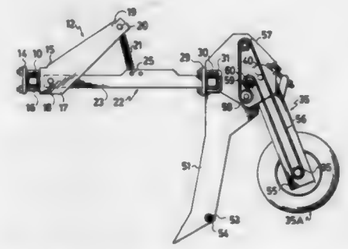
(c) a lower surface provided with a plurality of downwardly depending projections, said lower surface further including a downwardly depending gripper portion having a portion of said curved member embedded therein.

4,690,223

ROD WEEDER ATTACHMENT FOR AN AGRICULTURAL IMPLEMENT

Duane C. Hauksen, Box 202, Mortlach Saskatchewan, Canada (R=S0H 3E0)

Filed Jun. 11, 1986, Ser. No. 872,920
Int. Cl.[4] A01B *39/19*
U.S. Cl. 172—44 **20 Claims**



1. A tillage attachment device for mounting on an agricultural implement of the type comprising a tool bar, ground wheels for supporting the tool bar for movement across the ground and means for causing the tool bar to move in a direction transverse to its length, the device comprising clamp means for attachment of the device to the tool bar, rigid pivot

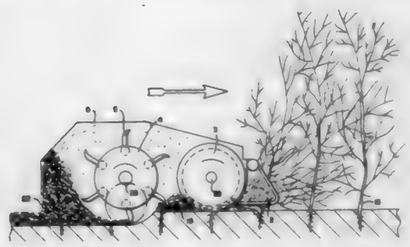
arm means mounted on said clamp means so as to extend rearwardly therefrom and so as to be pivotal about a horizontal axis at right angles to said arm means, spring biasing means connected between said clamp means and said pivot arm means for biasing said arm means downwardly around said axis, a ground engaging wheel mounted on said arm means remote from said clamp means for running on the ground rearwardly of and following said tool bar, said ground wheel being of a type such that its engagement with the ground controls the height of said arm means from the ground, strut means rigidly mounted upon and extending transversely to said arm means, two vertical ground engaging rigid shank means each rigidly mounted on said strut means at horizontally spaced locations and extending downwardly therefrom for engagement with the ground, a rod extending between said shank means at respective lower ends thereof, bearing means mounting said rod on each of said shank means for rotation relative thereto about a longitudinal axis of said rod and drive means for communicating drive from said ground wheel to said rod for rotating said rod.

4,690,224

AGRICULTURAL IMPLEMENT FOR DISPOSAL OF CROP RESIDUE

Mark Shwez, 3/13 Zahal Street, Haifa, Israel (35052)

Filed Dec. 23, 1985, Ser. No. 812,507
Int. Cl.[4] A01B *33/00*
U.S. Cl. 172—45 **2 Claims**



1. An agricultural implement for clearing a field of residue of plants growing in parallel rows and adapted to simultaneously clear at least two rows of plant stalks, comprising

a frame provided with means for its attachment to an agricultural traction vehicle adapted to move said implement across a field along said rows of plant stalks, said frame having a front end and a rear end,

at least two rollers rotatably fastened in the front portion of said frame on horizontal axle means positioned at right angles to the direction of travel of said implement,

at least two laterally spaced rotating shredders positioned in the rear portion of said frame, one shredder behind each of said rollers, each shredder comprising a pair of laterally spaced discs having a plurality of cutter bars pivotally attached to its circumference, said discs being positioned at a height above ground level so as to permit at least a portion of each cutter bar to penetrate into the upper layer of the soil,

drive means for forcefully rotating said shredder discs and said cutter bars,

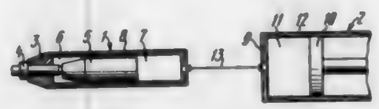
the implement being characterized by the improvement wherein each said cutter bar has a central portion positioned laterally between said discs and extends radially outwardly to a cutting edge beyond the circumference of said discs and has two side portions extending laterally beyond the sides of the discs spaced radially inwardly from the cutting edges, permitting said central portion to penetrate into the soil, and said side portions to rotate close to and above the ground level.

4,690,225

PERCUSSIVE TOOL

Konstantin K. Tupitsyn; Sergei K. Tupitsyn; Alexandr D. Kostylev; Veniamin V. Kamensky, and Sergei A. Chufistov, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Continuation of Ser. No. 413,891, Sep. 1, 1982, abandoned. This application Sep. 20, 1985, Ser. No. 777,880
Claims priority, application U.S.S.R., May 14, 1979, 2765328
Int. Cl.[4] B25D *9/02*
U.S. Cl. 173—116 **8 Claims**



1. A percussive tool comprising a percussion mechanism having:

a hollow housing the interior of which is isolated from the outside, said housing having a working end;

a piston hammer arranged in the interior of said housing for reciprocation therein and separating the interior of said housing into two closed chambers of variable volume, said chambers including a first chamber and a second chamber, said first chamber communicating only with said second chamber, and said second chamber communicating with said first chamber and with a source of pressurized gaseous fluid;

a restrictor passage continuously freely intercommunicating said first and second chambers of said housing during the entire operation of the percussive tool; and

a pressure pulser having:

a housing;

a source of gaseous fluid;

a fluid displacer arranged inside said housing of said pressure pulser and defining with the walls of said housing a working chamber;

communicating means for communicating said working chamber with said source of gaseous fluid, said communicating means including an opening provided in the side surface of the housing of the pressure pulser to communicate said working chamber with the source of gaseous fluid and also to be closed by the side surface of the fluid displacer depending on the position of the fluid displacer relative to the housing of the pressure pulser;

means for constantly communicating said working chamber with said second chamber of said percussion mechanism while said first chamber of said percussion mechanism remains closed except for the continuous free intercommunication between said first chamber and said second chamber provided by said restrictor passage; and

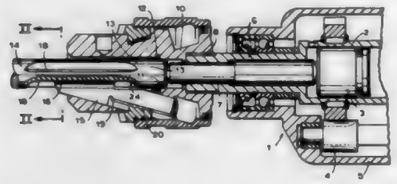
driving means for driving said fluid displacer inside said housing of said pressure pulser for periodically varying the volume of said working chamber to transmit to said second chamber of said percussion mechanism a pulsed pressure under action of which reciprocations of said piston hammer are effected to deliver impacts to said working end of said hollow housing.

4,690,226

HAMMER DRILL

Albrecht Schnizler; Manfred Schulz, both of Nürtingen, and Klaus Bartmann, Neuffen-Kappishäusern, all of, Fed. Rep. of Germany, assignors to Metabowerke GmbH & Co., Nürtingen, Fed. Rep. of Germany

Continuation of Ser. No. 645,846, Aug. 29, 1984, abandoned. This application May 12, 1986, Ser. No. 864,738
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3331866; European Pat. Off., Jul. 7, 1984, 84107973.4
Int. Cl.[4] B25D *17/08*
U.S. Cl. 173—128 **6 Claims**



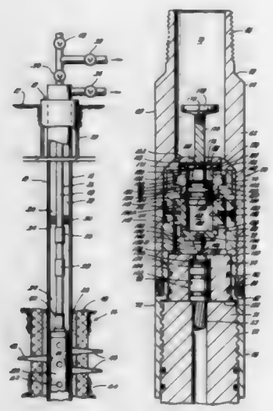
1. A tool for a hammer drill comprising a tool shaft having a profiled cross-section; and an adapter sleeve axially displaceable on said tool shaft and having an inner cross-section corresponding to said profiled cross-section of said tool shaft and also having a cylindrical outer surface, said outer cylindrical surface being fixedly clampable by clamping surfaces of clamping jaws, said profiled cross-section of said tool shaft having at least guiding grooves, said adapter sleeve having inwardly extending guiding surfaces cooperating with said guiding grooves, said tool shaft having two abutments, said adapter sleeve being arranged to be displaceable between said two abutments of said tool shaft.

4,690,227

GUN FIRING HEAD

Flint R. George, Katy, and Martin R. Smith, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 481,069, Mar. 31, 1983, abandoned. This application May 28, 1985, Ser. No. 738,617
Int. Cl.[4] E21B *43/116*
U.S. Cl. 175—4.56 **28 Claims**



1. A well perforating gun firing head comprising:

an expansible chamber having a movable wall carrying a firing pin;

first valve means for admitting pressure fluid to the chamber;

second valve means for equalizing pressure on opposite sides of the movable wall;

said first and second valve means being interconnected whereby when the first valve means is closed the second valve means is open and vice versa;

primary frangible means holding the movable wall against movement;

ancillary frangible means holding the first valve means in closed position; and

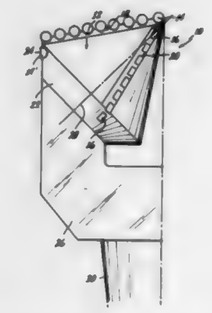
release means for causing the sequential release of initially the ancillary frangible means and ultimately the primary frangible means.

4,690,228

CHANGEOVER BIT FOR EXTENDED LIFE, VARIED FORMATIONS AND STEADY WEAR

Dieter Voelz, Burgwedel, Fed. Rep. of Germany, and Roland Illerhaus, Salt Lake City, Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Mar. 14, 1986, Ser. No. 839,415
Int. Cl.[4] E21B *10/20, 10/62, 44/00*
U.S. Cl. 175—24 **21 Claims**



1. A drag bit in combination with a drill string arranged and configured to drill when rotated in a single predetermined direction comprising:

a bit body;

at least one carrier rotatably coupled to said bit body;

a plurality of cutting elements disposed on said carrier; and

means for selectively rotating said carrier to selectively dispose said cutting elements into an operative configuration without rotating said drill string in any direction other than said predetermined direction,

whereby cutting properties of said drag bit are selectively altered.

15. An improvement is a roller cone bit in combination with a drill string for cutting a rock formation said drill string arranged and configured to drill when rotated in a single predetermined direction, said roller cone bit comprising a plurality of roller cones, said improvement comprising:

a plurality of sets of drag cutters disposed on each one of said plurality of roller cones; and

means for selectively preventing rotation of each roller cone to present selected ones of said sets of drag cutters to said rock formation for cutting without rotating said drill string in a direction opposite to said predetermined direction,

whereby cutting performance of said roller cone bit as a drag bit is selectively alterable.

20. In a drill string adapted to drill in a single direction or rotation, a method for selectively presenting ones of a plurality of sets of drag cutters for cutting into a rock formation, said drag cutters disposed on roller cones of a roller cone bit, said roller cones being generally free to rotate with rotation of said roller cone bit, said method comprising the steps of:

rotating said roller cone bit; and

selectively preventing rotation of each roller cone of said bit to dispose selected sets of said plurality of drag cutters to said rock formation for cutting, without rotating said drill string in the direction opposite to said single direction.

4,690,229

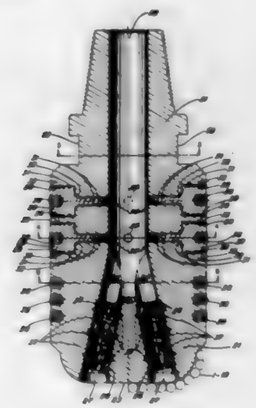
RADIALLY STABILIZED DRILL BIT

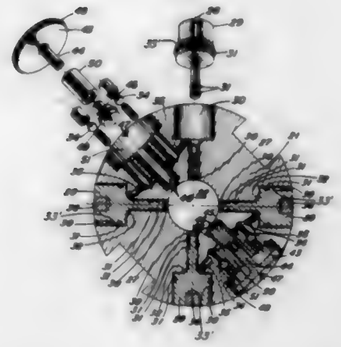
Richard C. Ramey, 3609 Godfrey Ct., Midland, Tex. 79707

Filed Jan. 22, 1986, Ser. No. 820,742

Int. Cl.[4] E21B *10/60, 17/10*

U.S. Cl. 175—325 **18 Claims**





1. A stabilized drill bit comprising: a generally cylindrical main body having means at an upper end thereof for attachment to a driving means; a drilling face at the lower end of said main body; drilling cutters secured to said face; a throat formed through said main body for passage of drilling fluid to said face; flow restricting means positioned in the fluid path of the bit with said flow restricting means arranged to provide a fluid pressure drop therethrough; radially active stabilizing means for radially stabilizing said main body; means responsive to fluid pressure in said bit for applying outward force on said radially active stabilizing means and thereby moving said radially active stabilizing means into any one of a range of different extended positions; and blocking means for selectively preventing inward radial movement of said radially active stabilizing means from any of said extended positions upon application of radial force upon said main body opposed to said radially active stabilizing means sufficient to displace said fluid pressure in said bit.

4,690,230

MULTI-RANGE LOAD CELL WEIGHING INSTRUMENT

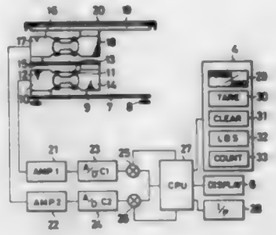
Mitsuo Uchimura, and Tsutomu Masuyama, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,044

Claims priority, application Japan, Apr. 25, 1985, 60-89263

Int. Cl.[4] G01G *3/08, 3/14*

U.S. Cl. 177—229 **6 Claims**



1. A multi-range load cell weighing instrument comprising:

means for supporting an article to be weighed;

a low range load cell having a high accuracy weighing range and including means for outputting a first signal in response to a weight on said supporting means;

a high range load cell having a high load weighing range which is higher than said high accuracy weighing range, said high range load cell including means for outputting a second signal in response to a weight on said supporting means;

means for receiving said first and second signals and for outputting a weight signal as a function of one of said first and second signals, wherein said means for receiving includes means for outputting said weight signal as a function of said first signal for any said weight within said weighing range of said low range load cell, whereby high accuracy weighing is achieved;

means for counting a number of repetitions of receiving said first and second signals by said means for receiving; and

means for outputting a counting signal as a function of said received repetition signals, whereby said instrument may be used as a counting instrument.

4,690,231

TRACKLAYING UNDERCARRIAGE FOR BULLDOZER, CRAWLER LOADERS OR OTHER TRACKLAYING VEHICLES

Peter Rimi, Mieming, Austria, assignor to Liebherr-Werk Telfs GES. m.b.H., Telfs, Austria

Filed Feb. 26, 1986, Ser. No. 832,999

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506774; Feb. 3, 1986, 3603261

Int. Cl.[4] B62D *55/00*

U.S. Cl. 180—6.48 **5 Claims**

1. A tracklaying undercarriage for bulldozers, crawler loaders or other tracklaying vehicles, comprising:

(a) an elongated centrally positioned main frame;

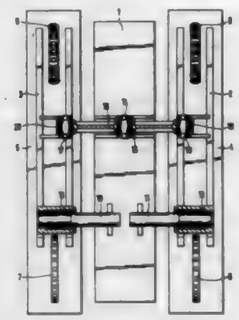
(b) two tracklaying frames disposed on opposite sides of the main frame and both having a pair of spaced ends, said tracklaying frames each supported at one end on one of a pair of aligned supporting axles which extend transversely of and are fixed to the main frame and extend from the main frame to the respective tracklaying frame, said tracklaying frames supported at the other end on a rocker bridge that lies forward of the supporting axles, extends transversely of and is pivotally mounted at its center to the main frame on a pivot extending in the longitudinal direction of the main frame;

(c) driving and reversing chain sprockets mounted at mutually opposite ends of the tracklaying frames;

(d) track chains that pass around respective pairs of said driving and reversing chain sprockets;

(e) driviing means for driving the driving chain sprockets;

(f) two juxtaposed spherical bearings for carrying each tracklaying frame on its respective supporting axle, said bearings having outer races non-rotatably connected to



the tracklaying frames and inner races non-rotatably connected to the supporting axles, said outer and inner races interconnected by elastic material disposed therebetween; and

(g) said tracklaying frames being carried on the rocker bridge on elastic bearing means having outer races non-rotatably connected to the tracklaying frames and inner races non-rotatably connected to the rocker bridge, said outer and inner races interconnected by elastic material disposed therebetween.

4,690,232

HOLD DOWN APPARATUS FOR THE TIPPABLE STRUCTURE OF A VEHICLE

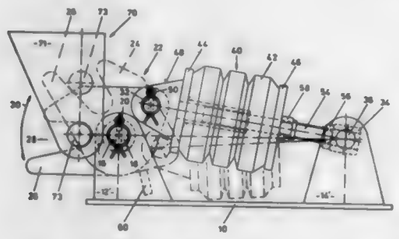
Gerd Schulz, Hamburg, Fed. Rep. of Germany, assignor to Gerd Schulz Fahrzeug- und Container-Technik, Hamburg, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,883

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444804

Int. Cl.[4] B62D *33/06*

U.S. Cl. 180—89.14 **11 Claims**



1. A hold down apparatus for a vehicle of the type having a vehicle body and a tippable structure pivotally mounted on said vehicle body, said tippable structure having a locking bolt thereon, and said hold down apparatus being adapted to cooperate with said locking bolt to hold said tippable structure in a desired position on said vehicle body, the improvement in said hold down apparatus comprising

a clamping catch mountable on said vehicle body, said clamping catch being pivotable about a transverse axis, said clamping catch having a fork-like member formed by a pair of spaced prongs lying on one side of said transverse axis, and

a spring device having an adjustable spring force, said spring device being pivotally connected to said clamping catch on the other side of said transverse axis, said spring device having a compression spring which is pivotally connectable to said vehicle body at that end of said spring device remote from said clamping catch, said clamping catch being pivotable about said transverse axis between a release position in which said fork-like member is positioned to face said tippable structure for receiving said locking bolt therein and a hold down position in which said locking bolt is captured within said fork-like member by prongs for preventing movement of said locking bolt, said spring device comprising

a hollow rubber compression spring captured between two mounting plates, said mounting plates having adjustable relative spacing therebetween,

a projection fixed to one side of one of said mounting plates, said projection being pivotally attached to said clamping catch,

a tubular projection fixed to the other side of said one of said mounting plates, said tubular projection extending within said hollow rubber spring,

a central hole defined in the other of said mounting plates,

a partially threaded rod that extends through said central hole, one end of said bolt being telescopically received within said tubular projection and the other end of said bolt being pivotally attachable to said vehicle body, and

a nut threaded on said rod, said nut bearing against an outer surface of said other mounting plate for forming an adjustable stop for said other plate, and

an over center connector that connects said spring device and said clamping catch such that said clamping catch has an over-centre action when said clamping catch is moved between said release and hold down positions.

4,690,233

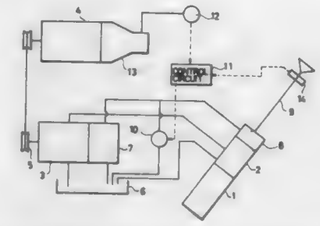
STEERING POWER CONTROL SYSTEM IN ELECTRONICALLY CONTROLLED STEERING SYSTEM

Toshihiko Daido, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 9, 1985, Ser. No. 806,349

Int. Cl.[4] B62D *5/09*

U.S. Cl. 180—142 **4 Claims**



1. A power steering control device for use in an electronically controlled power steering system of a vehicle wherein the degree of opening of an orifice in a liquid pressure circuit is controlled by an actuator to adjust the steering force, the device comprising:

actuator driving means for driving the actuator to selectively open or close the orifice;

memory means for storing a plurality of orifice control data, each of said orifice control data corresponding to the effect on the level of steering force of a different combination of values of a set of external factors that affect the

level of steering force, said factors including the steering angle of the vehicle and the vehicle speed;

means for detecting the actual values of each of said external factors, said detecting means including a vehicle speed sensor and a steering angle sensor correcting means for sampling for a predetermined period of time the steering angle of the vehicle, for computing the average value of said sampled steering angle, and for outputting the absolute value of the difference between the steering angle and the computed average thereof; and

means responsive to said detected actual values including the vehicle speed and said absolute value for accessing from said memory means orifice control data corresponding to the combination of said detected actual values and supplying said accessed orifice control data to said actuator driving means to drive the actuator and correspondingly open or close the orifice to adjust the steering force in accordance with said detected actual values.

4,690,234

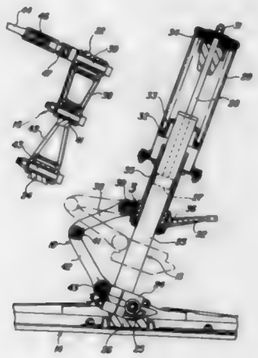
STABILIZING MEANS FOR SNOWMOBILE

Kazuyoshi Takada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 11, 1986, Ser. No. 850,985

Int. Cl.⁴ B62B *13/08, 17/04*

U.S. Cl. 180—182 **9 Claims**



1. In a suspension system for a snowmobile or the like comprising a pair of skis, suspension means for suspending each of said skis for suspension movement relative to said snowmobile, each suspension system comprising a pair of links, the links of each of said pair of links being pivotally connected to each other about a first pivot axis, means for pivotally connecting one of said links of each pair of links to said snowmobile for pivotal movement about a second pivot axis, and means for pivotally connecting the other of said links of each pair of links to the respective ski for pivotal movement about a third pivot axis, the improvement comprising a torsion bar extending between said suspension systems, fixing means fixing one end of said torsion bar for rotation, with one of said links of one of said pair of links about one pivot axis of said pivot axes of said one pair of links upon suspension movement of the respective ski, and fixing means fixing the other end of said torsion bar for rotation with one of said links of the other of said pair of links about the corresponding pivot axis of the other ski for rotation of said other end about said other pivot axis upon suspension movement of said other ski, said fixing means causing said torsion bar end to be rotated through substantially the same angle as said one link is pivoted.

4,690,235

THREE-WHEELED MOTOR VEHICLE

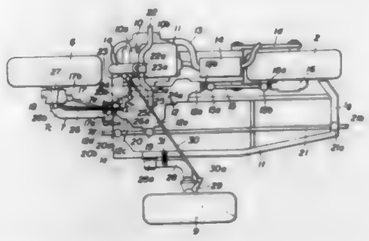
Shinichi Miyakoshi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,628

Claims priority, application Japan, Nov. 6, 1984, 59-233840; Nov. 8, 1984, 59-235907

Int. Cl.⁴ B62D *61/06*

U.S. Cl. 180—210 **16 Claims**



1. A motor vehicle comprising:

a steering handle;

a rider's seat disposed behind said steering handle;

a front wheel disposed in front of said steering handle and steerable by the steering handle;

a rear wheel disposed behind said rider's seat and substantially aligned with said front wheel along an axis;

an engine for driving at least said from and rear wheels;

a side runner disposed between said front and rear wheels as seen in side elevation and spaced transversely from said axis;

a steering mechanism for steering said side runner in coaction with said front wheel; and

a structural body supporting said front and rear wheels of said side runner and defining a space located between said axis and said side runner and opening in the longitudinal direction of the motor vehicle.

4,690,236

MOTORCYCLE LUBRICATION SYSTEM

Takashi Shinozaki, and Satoshi Ishikawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,281

Claims priority, application Japan, Sep. 29, 1982, 57-170218; Sep. 29, 1982, 57-17019

Int. Cl.⁴ F16N *7/14;* **B62D** *21/00*

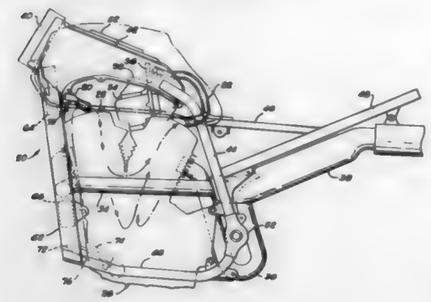
U.S. Cl. 180—219 **1 Claim**

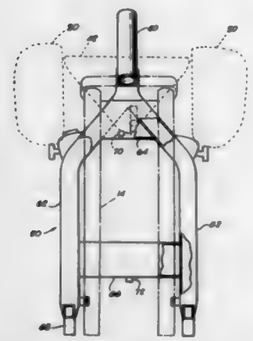
1. A frame for a motorcycle having a front fork suspension and an internal combustion engine with a lubricant supply system, comprising

an oversized down tube assembly sealed to form a fluid tight cavity to provide engine lubricant storage and engine lubricant cooling and including two parallel, mutually spaced down tubes of rectangular cross section spaced apart laterally from the centerplane of the motorcycle wider than the front fork suspension, said down tubes being located to receive air flow during movement of the motorcycle to cool said lubricant passing through said down tube assembly, cross members connecting said parallel down tubes and forming part of said cavity;

a breather port in said down tube assembly and in communication with the lubricant supply system;

an inlet passage means to said cavity from the lubricant supply system of said engine; and





an outlet passage means from said cavity to the lubricant supply system of said engine.

4,690,237

REAR STRUCTURE FOR MOTORCYCLES

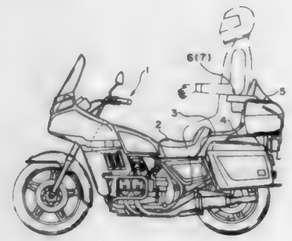
Katsunori Funabashi; Tai Nakashima; Toshiyuki Yamada, and Kazuo Morishima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 608,830, May 10, 1984, abandoned. This application May 9, 1986, Ser. No. 862,186

Claims priority, application Japan, May 12, 1983, 58-83294; May 12, 1983, 58-83295

Int. Cl.⁴ B62J *7/04*

U.S. Cl. 180—219 **9 Claims**



1. A rear structure for a motorcycle having dual seat structure comprising; a driver's seat and a rider's seat, said rear structure further comprising;

a rear trunk means for receiving therein articles, armrest means for bearing rider's elbows in a natural posture, said rear trunk means including a backrest means for bearing at lest a part of the rider's back, and said armrest means not integral with said rear trunk means; said armrest means including a pair of armrests, said armrests being each detachably coupled to said trunk means.

4,690,238

FOUR-WHEEL DRIVE ARRANGEMENT FOR MOTOR VEHICLES

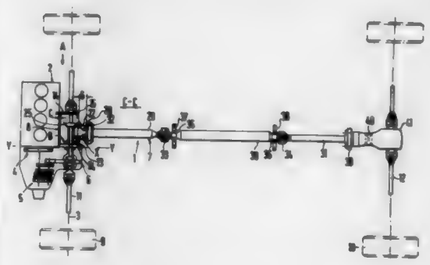
Rolf von Sivers, Rutesheim; Kim Havemann, Weissach, and Bernhard Ilsemann, Stadtweg, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,009

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 35606727

Int. Cl.⁴ B60K *5/04, 17/348*

U.S. Cl. 180—248 **18 Claims**



1. A four-wheel drive arrangement for a motor vehicle, having a transversely mounted internal-combustion engine, comprising:

transmission means for receiving power from the engine and for driving a first set of vehicle wheels; and

angular drive means for receiving power from said transmission means and for driving a second set of vehicle wheels;

wherein said transmission means and said angular drive means are fastened together at an output end and an input end of the respective transmission and angular drive means; and

support means for rigidly supporting a housing of said angular drive means, relative to said internal-combustion engine, at a point distal from said input end of said angular drive means;

wherein said angular drive means includes angular drive gear assembly means and a cardan shaft arrangement connected to an output shaft of the angular drive gear assembly means by a resonance decoupling device; and

wherein said angular drive means includes angular drive gear assembly means having an output shaft supported by bearing means disposed in a supporting neck of the angular drive means housing, said neck extending a distance along a longitudinal axis of the vehicle, said distance being not substantially longer than necessary to provide adequate support for the bearing means, and a connecting element on the output shaft which extends a slight distance beyond an end of the bearing supporting neck.

4,690,239

CONTROL SYSTEM FOR INTERMEDIATE DIFFERENTIAL IN FOUR-WHEEL DRIVE VEHICLE

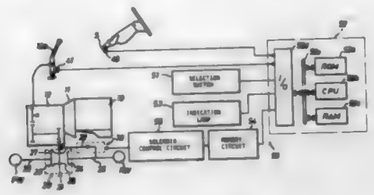
Tokuyuki Takahashi; Koujiro Kuramochi, and Syoichi Sayou, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 22, 1986, Ser. No. 899,012

Claims priority, application Japan, Aug. 23, 1985, 60-129093[U]

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—249 **5 Claims**



1. A control system for an intermediate differential in drive connection to a power transmission in a four-wheel drive vehicle for transmitting a drive power from a prime mover of the vehicle to front and rear wheel drive axles therethrough, said intermediate differential being provided with a lock mechanism which is operated under control of an actuator to selectively maintain said intermediate differential in a locked condition or an unlocked condition, wherein the control system comprises:

first detecting means arranged to detect a steering angle of a dirigible road wheel for producing a first detection signal therefrom when the steering angle of said road wheel exceeds a predetermined value;

second detecting means arranged to detect disconnection of the drive power transmitted to said intermediate differential from said prime mover for producing a second detection signal therefrom when transmission of the drive power is disconnected; and

means responsive to the first and second detection signals from said detecting means for controlling said actuator in such a manner that said lock mechanism is operated to release the locked condition of said intermediate differential when the steering angle of said road wheel exceeds the predetermined value in a condition where the transmission of the drive power is disconnected.

4,690,240

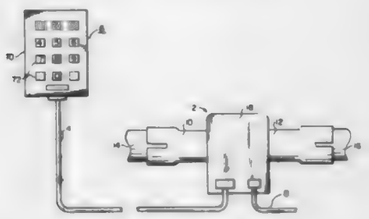
ANTI-THEFT EXHAUST SYSTEM FOR VEHICLES

Rudolph P. Russo, 35 Market St., Poughkeepsie, N.Y. 12601

Filed Apr. 1, 1985, Ser. No. 718,468

Int. Cl.⁴ B60R *25/00*

U.S. Cl. 180—287 **6 Claims**



1. An automotive anti-theft device comprising valve means disposed in the engine exhaust conduit intermediate the exhaust manifold and downstream noise suppression means and displaceable between a first position permitting exhaust gas flow therepast and a second position effectively precluding the flow of exhaust therepast to prevent engine operation;

electrically operable valve actuating means for displacing said valve means intermediate said first and second positions;

housing means enclosing said valve means and valve actuating means for impeding physical access thereto,

means for remotely generating a multiplicity of different sequences of discrete electrical signals;

means selectively responsive to a single predetermined sequence of said discrete electrical signals to energize said valve actuating means.

4,690,241

CONSTRUCTION FOR MOUNTING SERVICE HOLE BLANK CAP OF A CONSOLE BOX

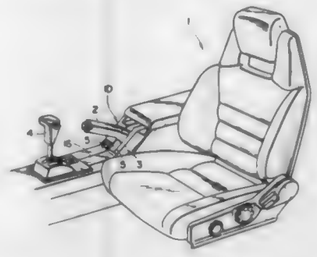
Kazuhiko Miyadera, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 13, 1986, Ser. No. 828,618

Claims priority, application Japan, Feb. 14, 1985, 60-019360[U]

Int. Cl.⁴ B62D *25/20*

U.S. Cl. 180—315 **17 Claims**



1. A construction for mounting a service hole blank cap in a service hole of a console box for a motor vehicle having longitudinal and transverse axes, a longitudinal slit being formed in said console box through which a hand brake lever penetrates, a portion of said slit defining said service hole, the construction comprising a rim defining a periphery of said service hole; an undersurface of a peripheral edge of said blank cap abutting against a top surface of said rim of said service hole; at least one engaging piece formed on an undersurface of said blank cap engaging an undersurface of the rim of the service hole to thereby releasably mount said blank cap on said rim in said service hole; at least one fixing hole being formed in the top surface of the rim on each longitudinal side of said service hole; and said blank cap being formed on the undersurface thereof with at least one fixing piece on each longitudinal side thereof, each having a shape and location adapted for reception within a corresponding one of said fixing holes to prevent longitudinal and transverse movement of the blank cap in the service hole.

4,690,242

SOUND ACTUATED SWITCH

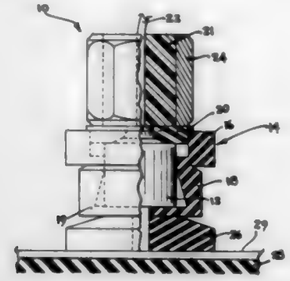
David S. Mark, 194 Sagamore, San Francisco, Calif. 94112

Filed Nov. 19, 1986, Ser. No. 932,730

Int. Cl.⁴ H01H *35/24*

U.S. Cl. 191—0.5 **7 Claims**

1. A sound actuated detector comprising a microphone, a cylinder having a flexible membrane perpendicular to its axis, the cylinder being adapted to fit tightly around the microphone with the sensing surface of the microphone fitting tightly against the flexible membrane, means for affixing the cylinder to a surface at which sound is to be detected, and a weight connected to the cylinder having a mass such as to distort the flexible membrane of the cylinder in response to frequencies in a selected range.



4,690,243

ELEVATOR CONTROL APPARATUS

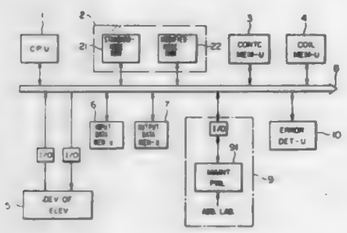
Youichi Ichioka, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 881,212

Claims priority, application Japan, Jul. 8, 1985, 60-149738

Int. Cl.⁴ B66B *1/18*

U.S. Cl. 187—101 **8 Claims**



1. A control apparatus for an elevator comprising control calculation means receiving state and control signals from a plurality of operating devices of the elevator to determine operating steps necessary for an elevator service in accordance with a selected mode of operation among standard and special sequences, ladder memory means for storing said standard and special sequences, contact memory means for storing data representing relay contact states, and coil memory means for storing data representing operating states of respective relay coils on the basis of the data of relay contact states and said state and control signals, said ladder memory means including a read only memory for storing said standard sequences and a random access memory for storing said special sequences.

4,690,244

LOUDSPEAKER ENCLOSURES

Laurence G. Dickie, Brighton, England, assignor to B & W Loudspeakers Limited, Brighton, England

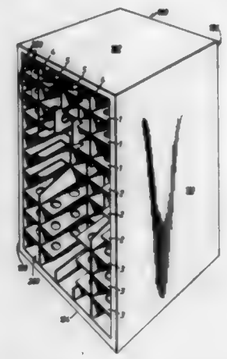
Filed Feb. 6, 1986, Ser. No. 826,910

Claims priority, application United Kingdom, Feb. 9, 1985, 8503389

Int. Cl.⁴ H05K *5/00*

U.S. Cl. 181—146 **25 Claims**

1. A loudspeaker enclosure comprising a rectangular box-like housing consisting of top and bottom walls, front and back walls, left and right side walls, each of the walls being formed by a wooden panel, a hollow stiffening structure located within the housing and extending from the top wall to the bottom wall, from the front wall to the back wall, and from the left side wall to the right side wall, the hollow stiffening structure comprising a first set of spaced-apart stiffening panels arranged with their planes substantially parallel to each other and substantially parallel to the walls of a pair of opposed housing walls, and a second set of spaced-apart stiffening panels arranged with their planes substantially parallel to each other and substantially parallel to the walls of a different pair of opposed housing walls, the stiffening panels of the first set being secured to the stiffening panels of the second set and intersecting them substantially orthogonally so that the stiffening panels, together with the housing walls, define a multiplicity of rectangular parallepipedal cells, holes being provided in the stiffening panels to provide communication between adjacent cells.



4,690,245

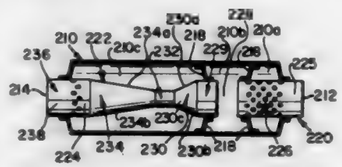
FLATTENED VENTURI, METHOD AND APPARATUS FOR MAKING

Edward E. Gregorich, and Timothy R. Maher, both of Longview, Tex., assignors to Stemco, Inc., Longview, Tex.

Continuation of Ser. No. 476,280, Mar. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 366,967, Apr. 9, 1982, abandoned. This application Nov. 14, 1986, Ser. No. 931,903

Int. Cl.⁴ F01N *1/08*

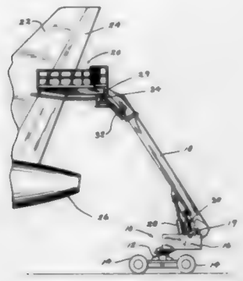
U.S. Cl. 181—272 **16 Claims**



4. A muffler defining a portion of a path for exhaust gases from an internal combustion engine comprising a housing and a venturi at least partially within the housing defining a path for exhaust gases passing through the housing, the venturi having a centerline, an inlet section at one end to admit exhaust gases, an outlet section at an opposing end to release exhaust gases, a throat section intermediate the inlet section and the outlet section having a transverse cross-sectional area normal to the centerline less than the transverse cross-sectional area normal to the centerline in either the inlet section or the outlet section, a reduction chamber section connecting said inlet section and said throat section and diminishing in transverse cross-sectional area normal to the centerline between the inlet section and the throat section, and an expansion chamber section connecting said throat section and said outlet section

and increasing in transverse cross-sectional area normal to the centerline between the throat section and the outlet section, the improvement wherein the venturi is formed from a single length of tubing having a uniform transverse circumferential wall length in planes normal to the centerline at each point along the centerline.

4,690,246
ARTICULATED WORK PLATFORM WITH SCISSORS MOTION
John T. Hornagold, Delafield, and Paul Pezewski, Milwaukee, both of Wis., assignors to Simon Aerials, Inc., Milwaukee, Wis.
Filed Jul. 11, 1985, Ser. No. 754,024
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 **22 Claims**



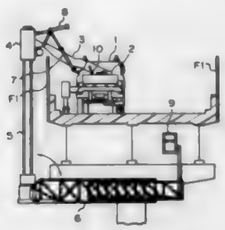
1. A work platform suitable for mounting on a base, comprising:

a pair of side platform sections each having one end adjacent said base and its other end extending from said base, said side platform sections being movable toward and away from each other between a first position in which said side platform sections are adjacent one another and a second position in which said side platform sections diverge in a direction away from said one ends;

pivotal mounting means for pivotally mounting said one ends of said side platform sections to said base; and

a fixed platform section mounted adjacent said one ends of said side platform sections and above said pivotal mounting means.

4,690,247
INSPECTION CAR FOR BRIDGE CONSTRUCTION OF A HIGH LEVEL ROAD
Katunori Yoshida, Kumagaya, Japan, assignor to Nippon Light Metal Co., Ltd., Tokyo, Japan
Filed Mar. 11, 1985, Ser. No. 710,235
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—63 **6 Claims**



1. An inspection car for inspecting bridge construction of a high level road comprising a rotatable pedestal rotatably mounted on a chassis about a vertical axis, a vertically swingable and extensible boom with its proximal end pivotally mounted on said rotatable pedestal, a reciprocal boom longitudinally slidably and reciprocally fitted in a saddle pivotally mounted on the distal end of said swingable boom, and an inspection passageway with its proximal end pivotally mounted on one end of said reciprocal boom so as to be swung in the vertical longitudinal center plane of said passageway as well as to be rotated about the longitudinal axis of said reciprocal boom, a pair of stretching hydraulic cylinder means arranged along either side of said swingable boom with one of the ends thereof being pivotally supported on a distal boom member of said swingable boom, and folding hydraulic cylinder means having one of the ends pivotally connected to said saddle, the other of the ends of said stretching hydraulic cylinder means or piston rods therof being pivotally connected to said folding hydraulic cylinder means, the portion at which said stretching hydraulic cylinder means or said piston rods thereof are pivotally connected to said folding hydraulic cylinder means being relatively swingably connected through connecting links to the portion at which said hydraulic cylinder means being pivotally connected between the forward ends of the respective piston rods or the stretching hydraulic cylinder means, a control device comprising a detecting station for detecting and ascertaining at least the rotational angle of said swingable boom about the rotational axis of said rotatable pedestal, the vertical swinging angle of said swingable boom, the angle formed between the longitudinal axis of said reciprocal boom and said swingable boom, and the rotational angle of said passageway about said reciprocal boom, and a discriminating station adapted to receive the detected signals from said detecting station so as to judge the permission/inhibition of movements of the respective components of the inspection car on the basis of a predetermined correlationship between the movements of the respective components for effecting such movements upon permission.

4,690,248
PORTABLE HOIST
Walter H. Killeen, 210 S. Lopez St., New Orleans, La. 70119
Continuation of Ser. No. 631,852, Jul. 18, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,691
Int. Cl.[4] E04G *1/08*
U.S. Cl. 182—118 **6 Claims**



1. A portable apparatus for lifting, transporting and distributing a load, comprising:

a. a horizontal frame support having parallel side rails connected by transverse supporting members;

b. a first ladder shaped leg, having a pair of side rails connected by transverse supports and extending transversely away from said side rails of said horizontal support, thereby forming a base on said first leg being wider than said horizontal frame support, said first leg being, pivotally connected to a first end of said horizontal frame support and moveable between a first folded inoperative position and a second unfolded operative position, said first leg extending downwardly from said horizontal frame support when in said second operative position, said first leg including first and second telescopically mating members, whereby the length of said first leg is selectively adjustable;

c. a second ladder shaped leg, having a pair of spaced parallel side members connected by transverse supports, and pivotally connected to the other end of said horizontal frame support and moveable between a first folded inoperative position and a second unfolded operative position, said second leg extending downwardly from and substantially perpendicular to said horizontal frame member when in said second operative position;

d. means operatively connected to said first leg and said horizontal support for lifting and lowering a load, including a first pulley fixedly mounted on said horizontal frame member and a second pulley mounted on said horizontal frame member and moveable longitudinally therealong;

e. means connected to said first leg for transporting said apparatus and said load;

f. means for communication of said second leg with the ground, forming a support for lifting a load, said communication means comprising a generally ladder shaped bracket engageable with a ladder-like structure and said second leg, and being selectively adjustable in length whereby said load is distributed over both said first and second leg members and the ground when said first leg rests on a surface when is elevated with respect to the ground; and

g. means for locking said first and second legs in said second unfolded operative position, further comprising:

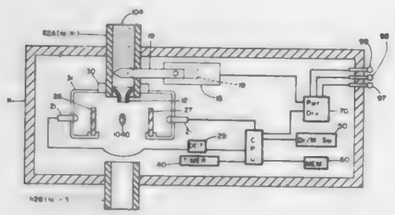
a. a pair of spring loaded latches extending through said side rails of said horizontal support;

b. said first leg having apertures for receiving said latches;

c. a pair of spring loaded latches extending through said side members of said second leg; and

d. a pair of flanges connected to said side rails of said horizontal support having apertures therethrough for receiving said latches said portable apparatus in said first folded inoperative position is transportable on the back of a user.

4,690,249
PRECISELY RECURRENTLY CONTROLLABLE DROPWISE LIQUID-FEEDERS
Theodore D. Olson, Jr., R.R. #4, Atkinson, Nebr. 68713
Filed May 20, 1986, Ser. No. 865,003
Int. Cl.[4] F16N *29/04*
U.S. Cl. 184—6.4 **8 Claims**



1. Precisely recurrently controllable dropwise oiler for machinery having an optimal-requirement expressed in optimal-drops/minute of oil to be gravitationally fed into said machinery through an oil intake-line, said controlled dropwise oiler comprising:

(A) a reservoir for oil and an outlet-line therefor and both being disposed at an elevation loftier than for said machinery intake-line, said outlet-line having a lower outlet-length portion including an outlet-end communicating with a drop-former located above and in gravitational alignment with said machinery intake-line, there being a finite vertical-gap between said drop-former and said intake-line, and said outlet-length above said drop-former being provided with a reciprocatable plunger-valve;

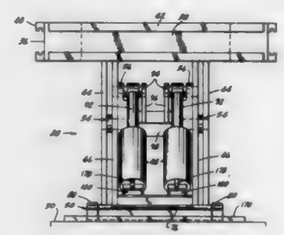
(B) a timer of the type arbitrarily settable to register recurring time-periods expressed as seconds/drop for said optimal-requirement;

(C) a solenoid actuatably connected to said reciprocatable plunger-valve;

(D) solenoid control means for selectively varying at least the duration that said plunger-valve permits oil to flow along said outlet-length and to said drop-former during each recurring time-period, whereby an actual-drops/minute oil flow in the form of oil falling dropwise from said drop-former is achieveable for each time-period; and

(E) detection means for electronically detecting the presence of each said falling oil droplet.

4,690,250
VEHICLE BENCH LIFT
Hans R. Bergstrom, Kungsor, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.
Continuation of Ser. No. 722,739, Sep. 5, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 5,234
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—18 **11 Claims**



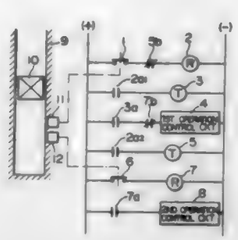
1. A lift for raising and lowering a bench frame with a pair of laterally spaced apart and longitudinally extending rails comprising: a base, a first pair of arms laterally spaced apart and adjacent one end each pivotally connected to one of said base and frame and adjacent the other end each slidably connected to the other for said base and frame, a second pair of arms laterally spaced apart and adjacent one end each pivotally connected to said other of said base and frame and adjacent the other end each slidably connected to said one of said base and frame, one of said pivotal connections being fixed relative to said base and the other of said pivotal connections being fixed relative to said frame, said slide connections being movable along paths generally parallel to each other and the longitudinal axes of said rails, a first pivot pivotally connecting one of the arms of said first pair with one of the arms of said second pair adjacent their midpoints, a second pivot pivotally connecting the other of the arms of said first pair with the other of the arms of said second pair adjacent their midpoints, said first and second pivots being separate from, spaced apart from, independent of, unconnected to and coaxial with each other, a pair of fluid actuated cylinders each having a piston rod and a case and being received between said arms, one of the piston rod and case of each cylinder being pivotally connected with one of the arms of one pair of said arms and the other of the piston rod and case of each cylinder being pivotally carried by said base, at least one of the pivotal connections of each cylinder being offset from a straight line intersecting the axis of said first and second pivots at the midpoints of the arms and the axis of each pivotal connection of the other pair of arms with one of the base and frame, and all of said arms and cylinders being constructed and arranged such that they are received between and within the vertical height of the rails of the bench frame when the lift and bench frame are fully lowered.

4,690,251

EMERGENCY CONTROL SYSTEM FOR ELEVATORS

Yoshimitsu Onoda, Toride, and Hiroshi Goko, Tokyo, both of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering and Service Co., Ltd., both of Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,096
Claims priority, application Japan, Apr. 10, 1985, 60-74303
Int. Cl.[4] G01P *15/00*
U.S. Cl. 187—107 **5 Claims**



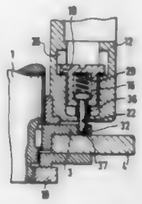
1. An emergency control system for an elevator comprising:
signal producing means for producing a signal in response to vibration of a structure in which the elevator is installed when the vibration of the structure is at a level in magnitude larger than a predetermined level;
first means responsive to said signal for effecting a predetermined mode of emergency operation on the elevator for a predetermined first time interval; and
second means for disabling said signal producing means for a predetermined second time interval upon initiation of the operation of said first means, said predetermined second time interval being longer than said first predetermined time interval.

4,690,252

ROTATION-PREVENTING LOCKING DEVICE FOR A PORTABLE TOOL

Joachim Kottke, Remseck, and Gerhard Zerrer, Korb, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,377
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447154
Int. Cl.[4] B62C *7/02;* **F16D** *69/00;* **B23B** *29/24;* **F16M** *21/44*
U.S. Cl. 188—69 **15 Claims**



1. A rotation-preventing locking device for releasably locking a rotatably journalled output drive member of a hand-held portable tool such as a brushcutter or the like, the portable tool having a structure which is stationary relative to the rotatably journalled output drive member, the locking device comprising:
a blocking piece mounted on said structure so as to be movable between a blocking position whereat said blocking piece engages said output drive member for blocking the latter against rotation and a clear position whereat said blocking piece is disengaged from said member so as to permit the latter to rotate freely;
said blocking piece being a blocking pin defining a longitudinal axis and having respective end faces on corresponding longitudinal ends thereof, said blocking pin being mounted on said structure so as to be displaceable between said positions along said axis;
blocking bore means formed in said member for receiving said blocking pin in said blocking position thereof;
releasable latching means disposed on said structure for latching and holding said blocking pin in said blocking position, said latching means including:
a housing on said structure;
an actuating member movably mounted in said housing between an unlatched position and a latched position for actuating said blocking pin between said clear position and said blocking position; and,
resilient means interposed between said blocking pin and said actuating member for resiliently biasing said pin toward said blocking position;
said actuating member being a cylinder-like member having a top wall at one end thereof and being movably mounted in said housing vis-a-vis said blocking pin so as to telescopically receive the latter therein, said resilient means being interposed between said top wall and one of said end faces of said blocking pin; and,
guide means for guiding said actuating member in said housing between said unlatched and latched positions; and,
engaging means formed on said housing and on said actuating member for engaging said actuating member to hold the same in said latched position.

13. A rotation-preventing locking device for releasably locking a rotatably journalled output drive member of a hand-held portable tool such as a brushcutter or the like, the portable tool having a structure which is stationary relative to the rotatably journalled output drive member, the locking device comprising:
a housing on said structure;
a blocking piece movably mounted in said housing so as to be movable between a blocking position whereat said blocking piece engages said output drive member for blocking the latter against rotation and a clear position whereat said blocking piece is disengaged from said member so as to permit the latter to rotate freely;
releasable latching means disposed on said housing for latching and holding said blocking pin in said blocking position, said latching means including:
an actuating member movably mounted in said housing between an unlatched position and a latched position for actuating said blocking piece between said clear position and said blocking position;
resilient biasing means for resiliently biasing said actuating member into said unlatched position; and,
guide means for guiding said actuating member in said housing between said unlatched position and said latched position; and,
engagement means formed in said housing for engaging and holding said actuating member in said latched position against the force of said resilient biasing means.

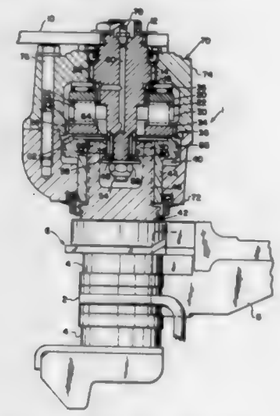
4,690,253

BRAKE ACTUATOR

James L. Weber, West Bloomfield, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 769,526
Int. Cl.[4] F16D *55/08*
U.S. Cl. 188—72.7 **5 Claims**

1. Roller cam actuator apparatus for a disc brake caliper assembly comprising a housing, a shaft in said housing mounted for rotation to said disc brake caliper assembly, a lever means connected to said shaft, means for connecting the lever means to the shaft for rotating the shaft upon rotating movement of the lever means, said connecting means including radially directed spline means connected to the shaft, said shaft having a relatively large portion near said lever means where it is mounted for rotation, roller bearing means for said shaft surrounding said large portion, rotor means in said housing having inward facing spline means for connecting the rotor means to the shaft, stator means in said housing aligned in parallel to the rotor means, means connecting the stator means to the housing to prevent relative rotation of the stator means in respect to said caliper assembly, said caliper assembly having a large central cavity, said shaft having spline means mounted thereon axially adjacent the relatively large portion of said shaft adjacent the roller bearing means rotatably mounting said rotor means thereto, said shaft being reduced in the next axial inward position adjacent the spline means, a roller mounting means being mounted on the reduced portion of said shaft, the stator means and rotor means having opposed axial faces spaced apart at a predetermined distance, the opposed faces having complementary cam grooves therein, roller means mounted between the faces and positioned in the complementary cam grooves whereby as the rotor is turned by the



shaft, the cam grooves turn the roller means and move the roller means with respect to the faces, whereby the roller means moving in the cam grooves causes the faces to separate and urge the stator and rotor axially apart, bearing means on said shaft means adjacent the rotor and said roller means further comprising annular cage means having a central opening for mounting on the bearing means and further having plural rollers, retaining means for holding said plural rollers in radial alignment and for contacting the cam grooves in the opposite faces of the rotor and stator, thrust bearing means connected between the rotor means and the caliper assembly for preventing relative axial movement of the rotor and the caliper assembly said means connecting the stator means to the housing including sliding means connected between the stator means and the caliper assembly for permitting relative sliding of the stator means with respect to the caliper assembly, and pressure means in contact with the surface of the stator means for urging a piston in a brake applying direction.

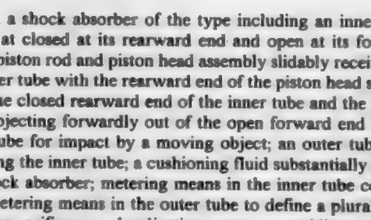
4,690,254

PAD SPRING FOR A DISC BRAKE WITH A SLIDING CALIPER, AND DISC BRAKE EQUIPPED WITH SUCH A SPRING

Marc Couvez, Aubervilliers, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 755,955, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 525,202, Aug. 22, 1983, abandoned. This application Jun. 16, 1986, Ser. No. 874,880
Claims priority, application France, Sep. 30, 1982, 82 16450
Int. Cl.[4] F16D *65/02*
U.S. Cl. 188—73.36 **4 Claims**

1. A disc brake of the type incorporating a caliper housing a brake motor, said caliper slidingly supported on a fixed support via at least two axial slide surfaces on the caliper and on the fixed support, two friction pads anchored and able to slide in an opening of the fixed support for selective friction engagement with a disc rotating around an axis, each pad having an upper edge with a substantially central radially outwardly extending protuberance, the caliper having an intermediate portion in the form of an arch straddling the disc and the pads and having, directly above the friction pads, a central opening of reduced circumferential width, relative to the circumferential extent of said arch, limited by facing lateral sides, one of said lateral sides being formed with radially opposed recesses defining therebetween in said arch a lateral web portion of reduced radial thickness, and a pad spring made out of a spring leaf and comprising a cantilevered portion bearing against said protuberance of each pad projecting, in a mounting position in



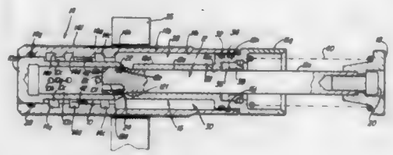
the brake, radially at least partially into said opening, and a lateral mounting portion with integrally formed mounting wings forming a U-shaped channel so that the wings are elastically grippingly mounted on said lateral web portion, the mounting wings having radially spaced-apart planar surfaces which engage corresponding radially spaced-apart surfaces of the lateral web portion, the spring being attached to the caliper at only the lateral web portion of the caliper, one of said wings reversely formed to extend in an opposite direction relative to the U-shaped channel and extend into said cantilevered portion which projects transversely across said opening and forms, adjacent a free end, a line of contact with tops of said protuberances and which is continuous and parallel to said axis of said disc.

4,690,255

COMPACT SHOCK ABSORBER

Robert J. Heideman, Westland, Mich., assignor to Enertrols, Inc., Westland, Mich.

Filed Mar. 10, 1986, Ser. No. 838,267
Int. Cl.[4] F16F *9/44*
U.S. Cl. 188—287 **13 Claims**



1. In a shock absorber of the type including an inner tube closed at closed at its rearward end and open at its forward end; a piston rod and piston head assembly slidably received in the inner tube with the rearward end of the piston head spaced from the closed rearward end of the inner tube and the piston rod projecting forwardly out of the open forward end of the inner tube for impact by a moving object; an outer tube surrounding the inner tube; a cushioning fluid substantially filling the shock absorber; metering means in the inner tube coating with metering means in the outer tube to define a plurality of metering orifices; and adjusting means providing relative movement between the inner and outer tubes and operative in response to such relative movement to selectively vary the

respective relative positions of the metering means in the inner tube relative to the coacting respective metering means in the outer tube to thereby vary the size of the metering orifices and thereby selectively vary the impact resistance generated by the movement of the cushioning fluid through the metering orifices in response to impacting movement of the piston assembly toward the closed rearward end of the inner tube; the improvement wherein:

(A) an annular accumulator chamber is provided in said shock absorber radially outwardly of said piston assembly at a longitudinal location forwardly of said metering orifices; and

(B) means are provided for routing cushioning fluid from said metering orifices axially forwardly between said inner and outer tubes to said annular accumulator chamber.

4,690,256

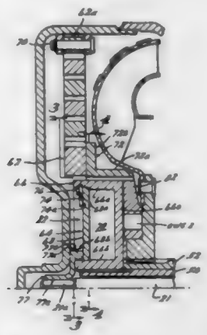
TORSION DAMPING ASSEMBLY

Warren G. Bopp, Farmington Hills, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 734,440, May 16, 1985, abandoned. This application Aug. 30, 1985, Ser. No. 771,373

Int. Cl.⁴ F16D *3/14, 33/00, 47/02*

U.S. Cl. 192—21 **22 Claims**



1. An assembly disposed for driving connection between rotatably mounted input and output driven of a driveline; the assembly including resilient means for transmitting driveline torque between the drives and an expandable chamber mechanism for to and fro hydraulic damping of driveline torsionals; the mechanism including first and second relatively moveable members, the first member and the resilient means disposed for serial driving connection between the drives, and the second member disposed for direct driving connection to one of the drives and in parallel driving connection with the resilient means; the members defining at least two chambers varying inversely in volume in response to flexing of the resilient means and containing an incompressible fluid for damping driveline torsionals in responsee to the volumes varying; characterized by:

the driveline including a housing assembly having a compartment containing said incompressible fluid under pressure during driveline operation; the mechanism being disposed in said compartment; and means providing restricted communication of the fluid in said variable volume chambers with the pressurized fluid in said compartment, whereby said variable volume chambers are continuously charged with said pressurized fluid during driveline operation.

4,690,257

SPEED RESPONSIVE CENTRIFUGAL CLUTCH WITH A SERIAL CIRCUMFERENTIAL ARRANGEMENT OF SHOE ASSEMBLIES AND DAMPERS

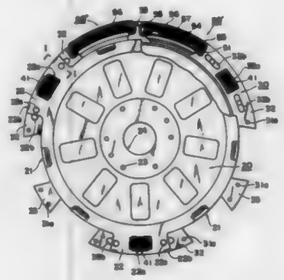
Akimitsu Suzuki; Toshio Awaji, and Kozaburo Igari, all of Fujisawa, Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,035

Claims priority, application Japan, Jul. 20, 1984, 59-149617

Int. Cl.⁴ F16B *43/18*

U.S. Cl. 192—3.31 **12 Claims**



1. A speed responsive centrifugal clutch assembly, comprising:

a generally disk-shaped clutch plate fixedly mounted on a first rotary member;

a reaction ring support to be rotatable relative to said clutch plate at one side thereof;

a plurality of shoe assemblies supported by said reaction ring on an outeer periphery of said reaction ring so as to be movable radially outward until said shoe assemblies come into contact with a second rotary member as the centrifugal force acting thereon increases;

a plurality of damper members operatively associated with said clutch plate and said reaction ring thereby transmitting a rotational force between said clutch plate and said reaction ring; and

wherein said plurality of shoe assemblies and said plurality of samper members are spacedly disposed one after another substantially along the same circumference of said reaction ring, in series and independently from one another.

4,690,258

HYDRAULIC POWER TRANSMISSION DEVICE WITH CENTRIFUGALLY ACTUATED CLUTCH OVERRIDE

Masao Terasoka, Sano, and Yukio Yuhashi, Kitasaitama, both of Japan, assignors to Tochigifujisangyo Kabushikigaisha, Tochigi, Japan

Filed May 23, 1986, Ser. No. 867,336

Claims priority, application Japan, May 27, 1985, 60-112138; Apr. 10, 1986, 61-81127

Int. Cl.⁴ F16D *37/00, 19/00*

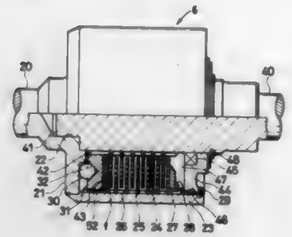
U.S. Cl. 192—58 C **5 Claims**

1. A hydraulic power transmission device with a centrifugally actuated clutch override, comprising:

first and second coaxially arranged independently rotatable shaft assemblies, said shaft assemblies being provided respectively with first and second wall members defining a chamber adapted to contain a viscous fluid;

first and second mutually spaced discs alternately arranged in said chamber, said first and second discs being respectively connected to and rotatable with said first and second shaft assemblies, with the viscous resistance of the fluid in said chamber providing a rotational driving connection between said first and second discs and their respective shaft assemblies; and

clutch means arranged between said shaft assemblies, said clutch means including at least one clutch member carried on said first shaft assembly at a location surrounded by a circumferential surface on said second shaft assembly, said clutch member being movable radially outwardly into



engagement with said circumferential surface in response to centrifugal forces developed during rotation of said first shaft assembly above a selected angular velocity, thereby establishing a rotational driving connection between said first and second shaft assemblies which overrides the rotational driving connection derived from the viscous resistance of the fluid in said chamber.

4,690,259

CLUTCH COVER ASSEMBLY

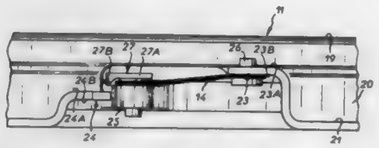
Jacky Naudin, Asnieres, France, assignor to Valeo, Paris, France

Filed May 13, 1985, Ser. No. 733,190

Claims priority, application France, May 18, 1984, 84 07742

Int. Cl.⁴ F16D *13/69*

U.S. Cl. 192—70.28 **11 Claims**



1. A clutch cover assembly adapted to rotate about an axis of rotation, comprising a hollow cover including an annular endwall and a skirt having openings each circumferentially bordered by a retaining lug and a fixing lug, associated ones of said retaining and fixing lugs being axially and circumferentially offset relative to one another, a pressure plate having radially projecting tabs passing through said openings in said skirt, resilient clamping means urging said pressure plate in an axial direction away from said endwall of said cover, axially flexible circumferential straps attached at their ends by fixing members respectively to said fixing lugs on said cover and to said projecting tabs on said pressure plate and coupling said pressure plate for rotation with said cover walls permitting relative axial movement, circumferentially extending axial retaining members for limiting displacement of said pressure plate away from said endwall of said cover to a predetermined distance, and said axial retaining members each being an integral part of said fixing means fixing said straps to said tabs of said pressure plate and adapted to abut axially against said retaining lugs of said cover to limit displacement of said pressure plate.

4,690,260

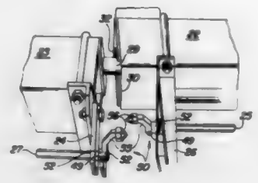
RADIAL ENGAGEMENT DRIVE COUPLER

Donald K. Landphair, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 592,696, Mar. 23, 1984, abandoned. This application May 15, 1986, Ser. No. 863,637

Int. Cl.⁴ A01B *73/06;* **F16D** *3/16*

U.S. Cl. 192—71 **11 Claims**



1. In a drive coupling mechanism adapted for use in conjunction with a folding implement frame having a first beam carrying a drive shaft, a second beam carrying a driven shaft, said first and second beams being movable between a folded position and an unfolded operational position, the improvement comprising:

means for axially aligning said drive shaft and said driven shaft in closely spaced end-to-end relationship when said frame is in said operational position;

a pair of drive couplers, one coupler being attached to said drive shaft and the other coupler being attached to said driven shaft, each of said couplers including:

a contact head having a pair of drive faces and a pair of inner guide faces interconnected between the inner edges of said drive faces;

said pair of couplers being disposed such that their respective drive faces contact each other in an engaged driving mode when said frame is in said operational position.

4,690,261

SHIP PROPULSION TRANSMISSION WITH AT LEAST ONE ENGAGEABLE FRICTION CLUTCH

Rudolf Peter; Ernst Jahnel, and Hans-Peter Kunz, all of Augsburg, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk AG, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 831,563

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505987

Int. Cl.⁴ F16D *25/11*

U.S. Cl. 192—87.13 **5 Claims**

1. A ship propulsion transmission system comprising:

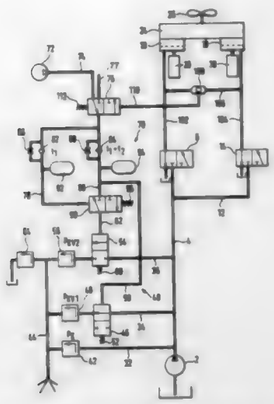
at least one engageable friction clutch in a drive line between a ship engine and a ship propeller, comprising:

means for delivering a pressurized fluid from a pressure source through a pressure medium line to the friction clutch to actuate it,

setting means for setting the operating pressure of said delivered pressurized fluid during the starting up of the power transmission, and

said setting means including means for setting the fluid pressure at a plurality of different operating stages, in sequence, at least the first two of which stages are maintained for a predetermined time, wherein during the first stage pressure is maintained at a peak level, during the

second stage pressure is maintained at an intermediate level and during the final stage pressure is maintained at a



final level which is higher than that during any said intermediate stage.

4,690,262

CLUTCH CONTROL CABLE WITH AUTO-ADJUSTER

Edgar Hoyle, 193 The Street, Boughton, Faversham, Kent, ME13 9BH, United Kingdom

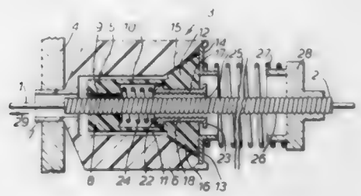
PCT No. PCT/GB85/00005, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/03113, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 4, 1965, Ser. No. 774,600

Claims priority, application United Kingdom, Jan. 5, 1984, 8400134

Int. Cl.⁴ F16D *11/00*

U.S. Cl. 192—111 A **15 Claims**



1. An engine clutch control cable which comprises a flexible movement-transmitting core (1,33,50,58,71) within a flexible guiding conduit (2,35,49,57,78) and which is associated with a self-adjustment device comprising a clamp (3) via which the conduit can be connected to an abutment (4,30,38,60,77) for sustaining reaction load on the conduit (2,35,49,57,78), which clamp automatically closes and opens in dependence on axial advance and retraction movements respectively of a component (5,41,62,73) of the clamp (3) during a movement cycle of the cable core (1,33,50,58,71) when the cable is in use, characterised in there is a slip coupling (9,51–52,74) between said clamp component (5,41,62,73) and the conduit (2,35,49,57,78) of the cable, by which coupling, when the cable is in use, axial advancing motion of a part of said conduit which occurs responsive to application of load to the cable at the start of the clutch-disengaging stroke of the core (1,33,50,58,71) is transmitted from conduit part to said clamp component (5,41,62,73) thereby advancing such component, and such transmited motion results in closure of the clamp (3); and in that there is (i) means (27,45,66,79) for biasing said conduit part towards retraction from the clamp, and (ii) means (17–18,24; 47–48; 70) which allows the position along said conduit (2,35,49,57,78) at which it is engaged by said slip coupling (9,51–52,74) when the control is in its rest position to alter from cycle to cycle under end-of-cycle load on the cable resulting from clutch wear.

4,690,263

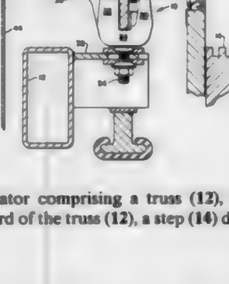
COIN REFUND SIGNAL GENERATOR

Shinji Yokomori, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Japan

Continuation of Ser. No. 549,724, Nov. 8, 1983, abandoned. This application Jul. 21, 1986, Ser. No. 885,732

Int. Cl.⁴ G07D *5/08*

U.S. Cl. 194—317 **13 Claims**



1. A coin refund signal generator for use with a vending machine having a coin deposit opening, a coin processing path connected to the coin deposit opening, and a coin return requesting means, the refund signal generator comprising:

coin sorting sensing means in said coin processing path for generating a sensing signal having a first value or a second value, said sensing signal being generated with said second value in response to the deposit of a coin in the coin deposit opening and also in response to the operation of the coin return requesting means; and

detection circuit means for generating a coin refund signal in response to said sensing signal having said second value for longer than a predetermined time period.

4,690,264

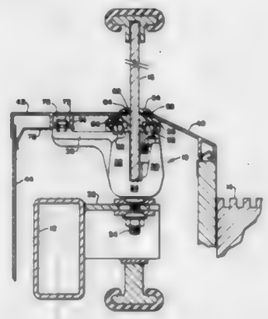
MULTIFUNCTION GLASSHOLDER FOR ESCALATOR BALUSTRADE

Willy Adrian, Oberurkirchen, and Gerald Wente, Pohle, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 31, 1986, Ser. No. 846,396

Int. Cl.⁴ B66B *9/14*

U.S. Cl. 198—335 **3 Claims**



1. An escalator comprising a truss (12), a balustrade (16) disposed inward of the truss (12), a step (14) disposed inward of the balustrade (16), a glassholder (10) attaching the balustrade (16) to the truss (12), an inward decking profile (40) extending inwardly and downwardly from the balustrade (16) towards the step (14), an outward decking profile (42) extending outwardly from the balustrade from a point opposite the outward edge of the inward decking profile (40), and an exterior cladding profile (44) extending downwardly from the outward edge of the outward decking profile (42), characterized in that:

the glassholder (10) has a base portion (24), an upwardly-extending inward leg (20) and an upwardly-extending outward leg (22), thereby forming a U-shaped longitudinal channel (18) for receiving the base portion of balustrade;

the glassholder (10) has clamping means (26) disposed in the inward leg (20) for securing the balustrade (16) in the glassholder (10);

the truss (12) has a bracket (32) extending inwardly therefrom to a position below the base portion (24) of the glassholder;

the glassholder (10) is attached by its base portion (24) to the bracket (32);

a first piece (54) abutting one side of the balustrade (16) and containing a slot to receive the edge of the inner decking profile (40);

the glassholder (10) has a spring clip (52) disposed in the upward surface of the inward leg (20) that extends into a slot 56 in the first piece (54);

a second piece (64) abutting one side of the balustrade (16) and containing a slot for receiving the edge of the outer decking profile (42);

the glassholder (10) has a spring clip (62) disposed in the upward surface of the outward leg (22) that extends into a slot in said second piece.

4,690,265

PACKET HANDLING APPARATUS

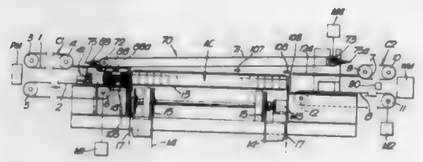
David Gayfer; Stanley V. Starkey, and John G. Wareham, all of London, England, assignors to Molins PLC, London, Great Britain

Filed Aug. 10, 1984, Ser. No. 639,358

Claims priority, application United Kingdom, Aug. 11, 1983, 8321675

Int. Cl.⁴ B65G *47/57*

U.S. Cl. 198—347 **27 Claims**



1. Packet handling apparatus comprising an accumulator having a plurality of compartments for receiving and storing batches of packets, means defining a delivery path on which packets are moved towards said accumulator, reversible drive means for moving successive compartments into a transfer position in alignment with said delivery path, means defining a receiving path on which packets are moved away from the accumulator, first and second conveying means each being arranged for conveying packets along at least part of the delivery path and through a compartment at the transfer position, said second conveying means including at least one pusher movable through a compartment at the transfer position, and control means for operating a selected one of said first and said second conveying means according to the operating condition of the accumulator, so that either said first or said second conveying means conveys packets along said part of the delivery path and through a compartment at said transfer position said control means including first detector means comprising spaced sensors for detecting a complete batch of packets upstream of said transfer position and second detector means downstream of said first detector means for detecting when said complete batch has moved to said transfer position.

4,690,266

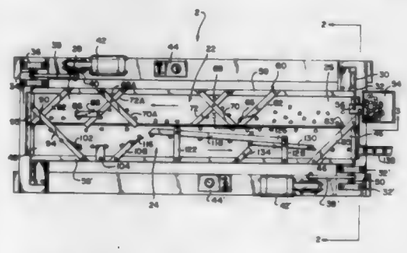
BELT CONVEYOR HAVING ARTICLE SORTING AND ORIENTING FEATURES

Stanley W. T. Croman, Dillsburg; Janet M. Jordan, Camp Hill, and Edward J. Paukovits, Jr., Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1981, Ser. No. 314,602

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—388 **10 Claims**



1. A belt conveyor for conveying articles from a loading zone along a conveyor path, the conveyor being of the type having first and second conveyor belts in side-by-side adjacent relationship, the belts each having a first end and a second end, the first ends being adjacent to each other and the second ends being adjacent to each other, the first belt being movable in a direction extending away from its first end, the second belt being movable in a direction extending towards its first end, the loading zone being at the first end of the first belt, the loading zone being at a level below the level of the first end of the second belt, the articles having first and second stable attitudes on the first belt when delivered to the loading zone, the conveyor being characterized in that:

a sorting guide extends transversely across the first belt towards the second belt at a location spaced from the loading zone, the sorting guide having a gate therein which permits articles in the first stable attitude to pass the sorting guide and which prevents articles in the second stable attitude from passing the sorting guide, the sorting guide having guiding surfaces which guide articles in the second stable attitude laterally on the first belt towards and onto, the second belt,

a transfer guide is provided at the second end of the first belt having transfer guide surfaces which guide articles laterally of the first belt and onto the second belt whereby transferred articles in the first stable attitude are carried from the second end of the second belt to the first end of the second belt, a discharge station is provided at the first end of the second belt for discharging articles in the first stable attitude, the second belt having a series of article guides in spaced relationship to the surface thereof for guiding the articles to the discharge station, and

a return guide is provided on the second belt at the first end thereof having guiding surfaces which guide any articles in the second stable attitude, which passed the sorting guide, laterally of the second belt and towards the loading zone whereby the articles fall onto the loading zone on the first belt and at least some of the articles will have the first stable attitude when they arrive in the loading zone.

4,690,267

CHARGING-AND-CONVEYING MEANS

Vladimir T. Gradoboev, ulitsa Kropotkina, 120/1, kv. 86; Alexandr E. Sitnikov, ulitsa Leskova, 250, kv. 39; Alexandr M. Klimenov, ulitsa Nevelskogo, 5, kv. 45, and Leonid I. Melnikov, ulitsa Dm. Donskogo, 19, kv. 19, all of Novosibirsk, U.S.S.R.

PCT No. PCT/SU85/00011, § 371 Date Oct. 28, 1985, § 102(e) Date Oct. 28, 1985, PCT Pub. No. WO85/04155, PCT Pub. Date Sep. 26, 1985

PCT Filed Feb. 13, 1985, Ser. No. 796,020

Claims priority, application U.S.S.R., Mar. 13, 1984, 3709443

Int. Cl.[4] B65G *47/14*

U.S. Cl. 198—396 **4 Claims**



1. A charging-and-conveying means comprising

a hopper for piece articles placed in bulk therein, and

a system of synchronously operating screws providing for by-the-piece removal of the articles from the bulk pile and their subsequent conveyance along members restricting the degree of their movement,

said system including a first pair of screws positioned relative to each other with their turns mutually overlapping to effect the removal of the articles from the pile, said first pair of screws rotating towards each other, one of said members being positioned in an overlap zone of said first pair of screws and orienting the articles being conveyed by said first pair of screws, a second pair of screws effecting the continued conveyance of the articles from said first pair of screws and said second pair of screws having an area for accumulation of the articles, and guides arranged along said said second pair of screws.

4,690,268

SHEET CONVEY APPARATUS

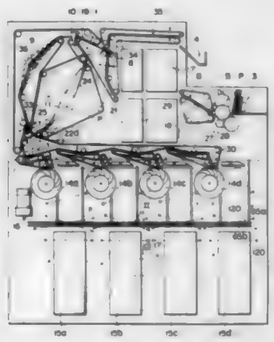
Akito Ueshin, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 555,542, Nov. 28, 1983, abandoned. This application May 16, 1986, Ser. No. 867,421

Claims priority, application Japan, Nov. 30, 1982, 57-209693

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—399 **10 Claims**



1. A sheet convey apparatus for conveying a mixture of obverse-and reverse-presented sheets, set at an inlet port, to collecting means, said sheets having a lengthwise direction, said apparatus comprising:

take-in means for taking in the sheets set at said inlet port, one at a time, and conveying said sheets in a direction perpendicular to said lengthwise direction;

sorting means for sorting the sheets taken in by said take-in means into a first group of obverse-presented sheets and a second group of reverse-presented sheets;

first conveying means for conveying the obverse-presented sheets which were sorted into the first group by said sorting means to a trailing end of said first conveying means and for conveying said sheets in said direction perpendicular to said lengthwise direction;

second conveying means for reversing the reverse-presented sheets which were sorted into the second group by said sorting means and conveying the obverse-presented sheets thus reversed to a trailing end of said second conveying means, said trailing ends of said first and second conveying means being arranged so as to merge, and for conveying said sheets in said direction perpendicular to said lengthwise direction, said second conveying means including:

a twisted convey path having an inlet port region and an outlet port region, said twisted convey path being arranged so as to clamp the sheets fed from said inlet port region and convey them to said outlet port region, while turning the sheets 180°, said twisted convey path being defined by the mutually opposing surfaces of a belt, one end of which is twisted by 720° with respect to the other end thereof and is coupled to the other end to form an endless belt, said endless belt being looped in a substantially 8-shaped manner so that portions of said endless belt are brought into surface contact at an intersection and are twisted in the same direction by 180°, about an axis perpendicular to a longitudinal direction of said endless belt, while being driven, said endless belt having a width narrower than a length of the sheet along the longitudinal direction; and

twisted guide means disposed at both sides of said twisted convey path and therealong, for supporting the two ends of the sheet being twisted and conveyed, said twisted guide means including first and second guide members which extend along both edges of said twisted endless belt, the first guide member having inlet and outlet portions, the inlet portion being in contact with one surface of one end portion of the sheet and the outlet portion being in contact with the other surface of one end portion of the sheet, the second guide member having inlet and outlet portions, the inlet portion being in contact with the other surface of the other end portion of the sheet and the outlet portion being in contact with one surface of the other end portion of the sheet, so that the sheet is turned by the twisted convey path and the twisted guide means; and

third conveying means for conveying merged obverse-presented sheets to said collecting means and for conveying said said sheets in a direction perpendicular to said lengthwise direction.

4,690,269

APPARATUS FOR TRANSFERRING SHAPED ARTICLES

Kenji Takao, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Jan. 31, 1986, Ser. No. 824,885

Claims priority, application Japan, Feb. 1, 1985, 60-16598

Int. Cl.[4] A21C *9/08*; B65G *23/00*

U.S. Cl. 198—460 **1 Claim**

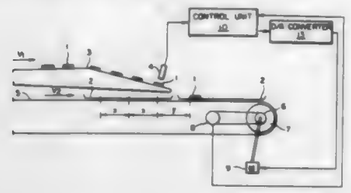
1. An apparatus for transferring shaped articles comprising:

a first conveyor for conveying shaped articles at a constant speed;

a detecting unit disposed at a predetemined position above the first conveyor so as to detect the shaped articles being conveyed on the first conveyor;

a second conveyor for conveying at a variable speed trays spaced apart a predetermined distance from each other, the second conveyor being disposed beneath and opposite to the delivery end of the first conveyor;

a rotary encoder coupled to the second conveyor; and



a control means which receives information from the detecting unit, information from the rotary encoder, and information concerning the positions of the shaped articles to be placed on the trays, the control means controlling the speed of the second conveyor on the basis of the above three kinds of information, whereby the shaped articles are automatically transferred onto the trays in a relation spaced apart a predetermined distance from each other.

4,690,270

RAIL-TUBE HOLDER FOR WALKING-BEAM CONVEYOR

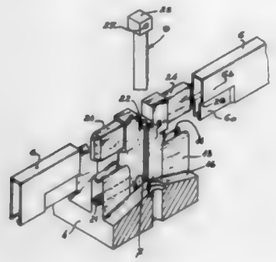
Robert Braymand, Villefranche Sur Saone, France, assignor to Societe Nouvelle Baele Gangloff, Vennissieux, France

Filed Jul. 7, 1986, Ser. No. 882,276

Claims priority, application France, Jul. 5, 1985, 85 10765

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—774 **13 Claims**



1. In a walking-beam conveyor having a plurality of beams each formed of a longitudinal row of longitudinally extending and aligned tubes connected together at holders, the improvement wherein each holder comprises:

a stationary base formed with an upwardly open hole and provided above the hole with a projection extending longitudinally in one direction and fitting complementarily with one of the ends of one of the tubes;

a holder element having an upright shaft engageable snugly in the hole and formed with a projection extending longitudinally in a direction opposite to the base projection and normally fitting complementarily with one of the ends of another of the tubes;

a locking member engageable longitudinally between the hole and the holder element and pressing the holder element longitudinally in the opposite direction against a face of the hole; and

vertically overlapping formations on the element and on the face of the hole preventing upward movement of the element in the hole when the element is pressed against the face by the locking member.

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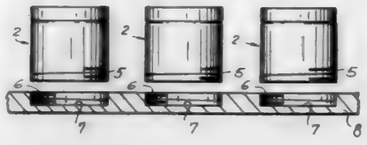
TRAVEL CASE WITH SCREW-IN CONTAINERS

Deborah K. Zak, 130A S. State St., Apt. C, Newtown, Pa. 18940

Filed Sep. 20, 1982, Ser. No. 419,965

Int. Cl.[4] B05C *17/00*; B65D *21/00*

U.S. Cl. 200—1.7 **5 Claims**



1. An enclosed travel case comprising a substantially rigid bottom wall, at least one covered round container which fits within said case and has screw threads on its lower extremity, and a mating threaded element integral with said bottom wall on the inside of said case, whereby said container may be screwed to the threaded element in the bottom wall of said case.

4,690,272

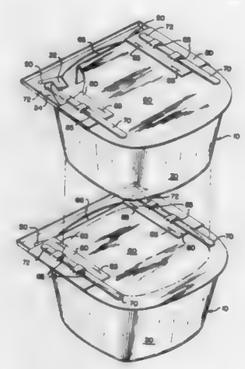
CONTAINER DISPLAY

William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.

Continuation-in-part of Ser. No. 714,975, Mar. 22, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 884,476

Int. Cl.[4] B65D *51/00*

U.S. Cl. 206—45.28 **13 Claims**



1. A container for shipping, storing and displaying goods comprising:

(a) a bottom including a base portion upwardly depending wall portion forming a dish-like structure having an open top, the wall portion having at least one slot sized and positioned to receive and support a strut, and a rim on the upper portion of the wall portion.

(b) a lightweight cover made from a material selected from the group comprising lightweight cardboard, card stock and paper which is at least 90 pound weight, divided into a first portion and a second portion by a fold line across the cover, the first portion sized to cover the open top and to extend over at least part of the rim, and the second portion sized for attachment to the wall portion of the

base, the second portion of which is attached to the wall portion of the base in a manner allowing the cover to be folded along the fold line to a closed position closing the container with the cover resting on at least part of the rim, and raised to an open portion in which the first portion of the cover and the second portion of the cover are in the same plane;

(c) at least one rigid support strut having one end sized to be received by the slot, said strut movably attached to the cover in a manner so that the strut is

(i) substantially perpendicular to the fold line,

(ii) able to be moved into engagement with the slot and the first portion of the cover when the cover is in an open position

(iii) and sized and positioned to be within the first portion of the cover and have opposite ends overlap the rim when the cover is closed and to provide support to the first portion of the cover.

4,690,273

TWIN MATCHBOOK

Leon E. Smith, 740 Ranch Dr., Toledo, Ohio 43607

Filed Feb. 26, 1986, Ser. No. 833,186

Int. Cl.⁴ A24F *27/00*

U.S. Cl. 206—105 **7 Claims**



1. A twin matchbook including a pair of axially aligned match bundles each incorporating a plurality of side-by-side elongated match members including chemically treated scratch ignitable head ends and base ends, the base ends of the match members of each bundle being removably jointed to a corresponding binder strip and each bundle including side-by-side parallel rows of match members with said binder strip extending transversely of the rows, said bundles being arranged in spaced relation with the head ends of the bundles axially opposing each other and the base ends of bundles facing in opposite directions, first and second substantially straight elongated panel means extending lengthwise between said bundles and interconnecting pairs of corresponding opposite ends of said binder strips, said panel means extending along and overlying opposite sides of said bundles with said bundles sandwiched between said panel means, the head ends of the match members of said bundles being spaced apart sufficiently to enable said binder strips and bundles to be displaced toward each other sufficient to allow the longitudinal mid-portions of said panel means to be appreciably bowed apart for the reception of a user's finger between said bowed apart panel mid-portions while the match heads of the bundles are still spaced apart.

4,690,274

CONTAINER FOR ELECTRONIC COMPONENTS

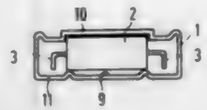
Hsueh C. Lee, Kaohsiung, Taiwan, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,356

Claims priority, application Netherlands, May 15, 1985, 8501400

Int. Cl.⁴ B65D *85/30*

U.S. Cl. 206—328 **10 Claims**



1. A container for generally flat, rectangular electronic components, said container comprising:

a tubular housing having a cross-section with an inside height and an inside width, the width exceeding the height, said tubular housing having top and bottom walls defining the height and side walls defining the width, said tubular housing having an end, said top wall having a recess therein spaced from the end of the tubular housing, said tubular housing being made of a synthetic elastic material; and

a closure member arranged in the end of the tubular housing, said closure member being in the form of a key having a handle and a shaft, the shaft extending from the handle into the tubular housing, the shaft having a thickened portion spaced from the handle a distance equal to the spacing of the recess from the end of the tubular housing, said thickened portion having a cross-section with a height and width, the height of the thickened portion of the shaft being larger than the inside height of the tubular housing, the width of the thickened portion of the shaft being substantially equal to the inside height of the tubular housing, said shaft being rotatable in the tubular housing, said thickened portion of the shaft being engageable in the recess in the top wall of the tubular housing, said handle being substantially aligned with the tubular housing when the thickened portion of the shaft engages the recess.

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CARRIER MEMBER FOR INTEGRATED MODULES

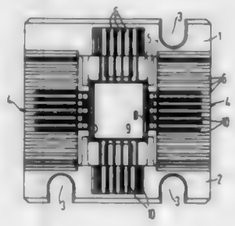
Otmar Fritz, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,793

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 8527387[U]

Int. Cl.⁴ B65D *73/02*

U.S. Cl. 206—331 **2 Claims**



1. A carrier member for integrated circuit modules, comprising:

two parallel flanges each having at least one outwardly open groove for accepting a retaining pin;

two connecting webs extending between said two parallel flanges to form a rectangular frame around a central recess;

a plurality of parallel extending guide channels for accepting lead wires extending laterally from the integrated circuit module and provided in each of said flanges and said connecting webs, at least twice as many of said guide channels in said connecting webs as in said flanges;

retaining webs arranged in said central recess; and

retaining catch tabs arranged in said central recess;

whereby circuit modules having lead wires extending only from two opposite sides occupy all guide channels of said connecting webs, and circuit modules having lead wires extending in identical numbers from all four sides are insertable into said central recess.

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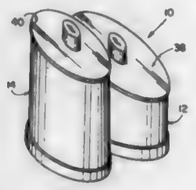
CONTAINERS FOR COSMETIC SUNDRIES

Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069

Filed Sep. 5, 1986, Ser. No. 904,030

Int. Cl.⁴ B65D *83/02, 21/02*

U.S. Cl. 206—36 X **7 Claims**



1. A container for cosmetic sundries having two integrally connected sections, each adapted to hold a particular class of sundry articles, each section comprising a vertically oriented sleeve having an open top and a removable lid, one of said sleeves having a relatively fixed bottom wall and the other one of said sleeves having a bottom tray movable within said other sleeve and an articulating connection between said bottom tray and the associated lid to present the articles held in said other sleeve above the top thereof, said articulating connection comprising a flat bar having a trunion at each end and said tray and lid have clevis means for pivotaly receiving said trunion, said tray and lid being relatively movable with respect to said bar and to each other.

4,690,277

PREPACKAGED FUSED SYNTHETIC BRUSHES

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Forest Dale, Vt.

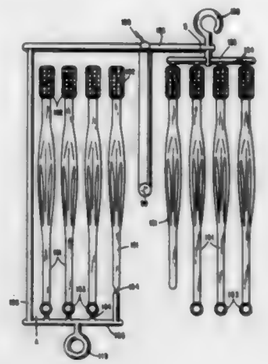
Continuation-in-part of Ser. No. 709,667, Mar. 8, 1985, Pat. No. 4,619,485. This application Jul. 14, 1986, Ser. No. 884,941

Int. Cl.⁴ A46B *9/04, 15/00;* **A46D** *3/04;* **B65D** *69/00*

U.S. Cl. 206—362.1 **11 Claims**

1. An improved brush package comprising:

a plurality of brushes, each brush consisting of a plastic brush back and a plurality of synthetic cut-to-length filament tufts fused thereonto; an integral plastic runner forming a frame, and severable gates interconnecting each of said brush backs at an end thereof to said runner whereby said brush backs, runner and gates may be simultaneously molded for subsequent tufting; and an integral



hook means mounted on said runner for displaying said package.

4,690,278

CASSETTE TAPE HOLDER

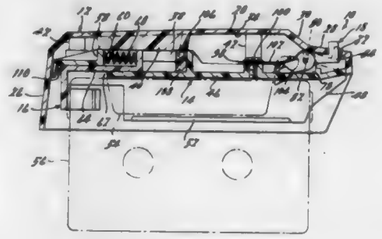
Yuki Uchiyama, Tokyo, Japan, assignor to Sakai & Co., Ltd., Japan

Continuation of Ser. No. 735,325, May 17, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,889

Claims priority, application Japan, May 18, 1984, 59-072947[U]; May 18, 1984, 59-020119

Int. Cl.⁴ A47B *81/06*

U.S. Cl. 206—387 **11 Claims**



1. A cassette tape holder comprising:

a housing;

a frame secured within said housing, said frame including means defining a plurality of elongated channels in side by side relationship, each of said channels being sized to receive a cassette tape, said defining means including means engageable with said cassette to support same;

grasping means associated with each of said channels and movably supported on said frame, each of said grasping means including opposed arm members positioned within said channel and operative to frictionally grasp opposite lateral edges of said cassette; and

releasable latching means associated with each of said channels and supported on said frame, said releasable latching means including a portion projecting into said channel and engageable with said cassette to lock said cassette within said channel;

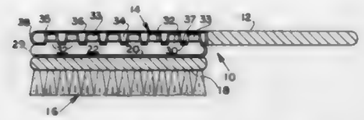
said grasping means being operative to inhibit ejection of said cassette from said channel upon release of said latching means.

4,690,279

BIRTH CONTROL PILL DISPENSER IN THE FORM OF A HAIR BRUSH

Charles Hochberg, 508 Jeffords St., Clearwater, Fla. 33516

Filed Mar. 13, 1986, Ser. No. 839,202
Int. Cl.⁴ B65D *83/04*
U.S. Cl. 206—531 **6 Claims**



1. A birth control pill dispenser, compriaing:
a hair brush member having a solid base within which is mounted a plurality of bristle members;
a pill-discharging chamber surmounting said base;
said pill-discharging chamber having an open end for allowing pills disposed therein to exit therefrom;
said pill-discharging chamber having a top wall with a plurality of pill-sized openings formed therein;
a pill storage chamber surmounting said pill-discharging chamber;
said top wall of said pill-discharging chamber forming the bottom wall of said pill storage chamber;
a supply of birth control pills positioned in said pill storage chamber;
a frangible barrier means positioned in overlying relation to said bottom wall of said pill storage chamber;
said barrier means including a plurality of deformable pill-containing compartments, each of said compartments being positioned in registration with an associated pill-sized opening formed in said pill storage chamber bottom wall;
a pill positioned in each of said compartments;
and masking means operable to close said pill storage chamber so that when said pill storage chamber is closed, said pill dispenser has the appearance of a hair brush;
whereby a pill is dispensed from said dispenser by opening said masking means, pushing a preselected pill through its associated opening formed in said pill storage chamber bottom wall by deforming its compartment and breaking said frangible barrier means so that said pill falls through said opening into said pill-discharging chamber, and tilting said dispenser so that said pill slides out of said pill-discharging chamber through its open end.

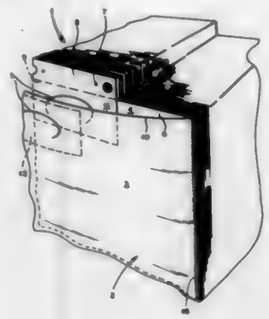
4,690,280

DETACHABLE PLASTIC BAG PAD AND PROCESS FOR MAKING SAME

Armin Meyer, Cologne, Fed. Rep. of Germany, assignor to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,872
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424748
Int. Cl.⁴ B65D *1/34, 6/04*
U.S. Cl. 206—554 **12 Claims**

1. In a stack of interlocked detachable bags, each of said bags being formed from a thermoplastic foil strip and comprising two walls, a front wall and a back wall, at least one handle-shaped incision positioned on one of said walls adjacent on upper filling opening, wherein said bags are attached together with the aid of at leat one interlock means engaging an interlock piece and by means of a row of perforations are detachable from said interlocked stack by tearing off, the improvement wherein on one of said walls which form an upper filling opening edge a reinforcing piece of plastic foil with said interlock piece connected thereto is attached adjacent said handle-shaped incisions, said reinforcing piece is attached so that said interlock piece protrudes above said upper filling opening edge, said interlock piece having said row of said perforations, said bags being detachable from said stack by tearing along



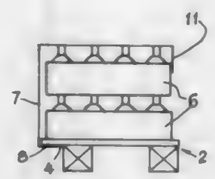
said row of said perforations, and said interlock means is formed in said interlock piece of said bags.

4,690,281

ASSEMBLY FOR STORING, TRANSPORTING AND DISTRIBUTING OBJECTS OF THE BOTTLE, FLASK OR SIMILAR TYPES AND PROCESS FOR MANUFACTURING SAME

Maurice Berthet, Coudoux, France, assignor to Compagnie Gervais Danone, Levallois-Perret, France

Continuation of Ser. No. 799,386, Nov. 18, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 6,301
Claims priority, application France, Nov. 16, 1984, 84 17503
Int. Cl.⁴ B65D *19/00*
U.S. Cl. 206—597 **6 Claims**



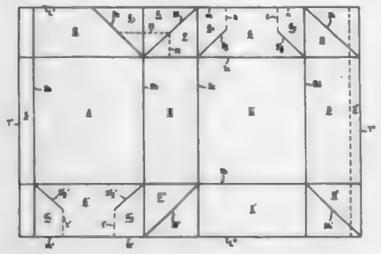
1. A packing and transport device for bottles, flasks, and jars as articles to be held thereon, comprising a first primary transport pallet with primary platform and two rows of primary support feet, at least two secondary pallets, said secondary pallets being placed side-by-side to define a junction interface between said articles on each said secondary pallet, each said secondary pallet comprising a secondary platform for receiving said articles, and each pallet having first and second rows of secondary support feet resting on the primary platform, said first row of secondary support feet being placed under the secondary platform and spaced inwardly from a first edge of said secondary platform opposite said junction interface to define along said first edge a free edge zone on said secondary platform, and a heat shrinkable material film cover enveloping the whole of said articles for holding said articles in position on the secondary pallets, said cover being fixed to said secondary pallets on the free edge zones of their respective secondary platforms, said heat shrinkable film further comprising, for holding said articles in position on each of said secondary pallets, individual folded holding zones disposed substantially along the function interface which, when said cover is slit along the length of said junction interface and said secondary pallets separated, form tongues which hold said articles on each said respective secondary pallet.

4,690,282

BLANK FOR PARALLELEPIPED DISPENSING CARTON

Mario Ghini, Cassino, Italy, assignor to IN.GR.ED. Industrie Grafiche Editoriali S.p.A., Latina, Italy

Continuation-in-part of Ser. No. 535,955, Sep. 26, 1983, abandoned. This application Dec. 3, 1985, Ser. No. 804,035
Claims priority, application Italy, Sep. 28, 1982, 49177 A/82
Int. Cl.⁴ B65D *5/74*
U.S. Cl. 206—626 **3 Claims**



1. A rectangular semifinished sheet for manufacturing parallelepiped boxes for solid and fluid substances, having an upper and a lower longitudinal folding line and first, second, third and fourth transverse folding lines which, respectively, subdivide the sheet into a marginal transverse sealing zone, first, second, third and fourth side wall areas and first, second, third and fourth top and bottom wall areas, wherein:
said second top wall area has a quadrate shape and a diagonal folding line starting from the intersection point of said upper longitudinal folding line with said second transverse folding line between said first and second top wall areas and ending at the intersection point of the upper sheet edge with said third transverse folding line between said second and third top wall areas;
said first top wall area has a rectangular shape and an oblique folding line forming a right angle with said diagonal folding line; a first line of weakness extending from said oblique folding line to said diagonal folding line at an intermediate position between said upper sheet edge and said upper longitudinal folding line and parallel thereto and a second line of weakness extending from the intersection point of said first line of weakness with said diagonal folding line to said upper longitudinal folding line perpendicularly thereto;
said third top wall area having a first oblique partial folding line extending parallel to said diagonal folding line from the intersection point of said upper longitudinal folding line with said third transverse folding line, a second oblique folding line symmetrical to said first oblique folding line and first and second cut lines starting parallel to one another from the upper edge of the sheet and ending at the intersection point with said first and second oblique folding lines, respectively;
said first bottom wall area having folding and cut lines identical to those of said third top wall area, said second and fourth bottom wall areas having diagonal folding lines identical to those of said second and fourth top wall areas, no folding lines being provided on said third bottom wall area.

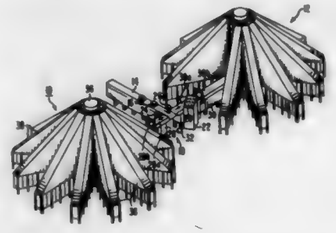
4,690,283

PARCEL SORTING APPARATUS

Ross M. Carrell, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 26, 1985, Ser. No. 813,571
Int. Cl.⁴ B07C *5/36;* **B65G** *43/08*
U.S. Cl. 209—549 **18 Claims**

10. A system for sorting and distributing articles, said articles having destination information thereon, said system comprising:
means for conveying said articles to a work station;
a plurality of distribution stations; and
means at said work station responsive to said destination information for selectively conveying said articles to said distribution stations, wherein each of said distribution stations comprises:
an array of inclined chute sets, each chute set comprising
a plurality of inclined chutes, open at their upper and lower ends, said chutes arranged so that the aggregate of their upper ends forms a generally cylindrical surface having a substantially vertical central axis and their lower ends are disposed outwardly of said cylindrical surface forming radially spaced rows of axially directed openings;
a plurality of receptacles, each one positioned adjacent the lower end of a respective one of said chutes, such that an article exiting the lower end of one of said chutes will drop into one of said receptacles;
a rotatable mast having a longitudinal central axis aligned



substantially with the central axis of said cylindrical surface;
a carrier on said mast;
carrier motion means for producing pivotal motion of said carrier between a first position and a second position, said first position being such that said carrier retains an article therein, said second position of said carrier causing an article carried therein to spill radially outward of said central axis of said mast into the upper end of one of said chutes;
loading means for loading said articles into said carrier when said carrier is in said first position;
mast motion means for producing rotary motion of said mast about its central axis;
elevating means for elevating and lowering said carrier on said mast; and
control means for controlling said carrier motion means, said mast motion means and said elevating means, so that an article which has been loaded into said carrier by said loading means may be conveyed to a predetermined one of said plurality of receptacles.

4,690,284

METHOD OF AND APPARATUS FOR INSPECTING OBJECTS USING MULTIPLE POSITION DETECTORS

B. Shawn Buckley; Roy H. Reichwein; Edward M. Buckley, all of San Jose, and James A. Pinyan, Sunnyvale, all of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Oct. 4, 1985, Ser. No. 784,009
Int. Cl.⁴ B07C *5/344*
U.S. Cl. 209—590 **17 Claims**

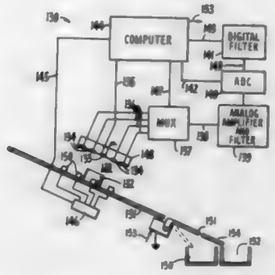
1. Apparatus for parts sorting, that comprises:
parts transport means to transport a part into an interaction region;
means for transmitting continuous wave energy of a single frequency into said interaction region where the wave energy interacts with said part;
detector means comprising a multiplicity of spaced-apart detectors for detecting the location of said part at a multi-

plicity of locations within said interaction region and adapted to provide a feedback signal indicative of each said location;

sensor means comprising a multiplicity of spaced-apart sensors disposed to receive said wave energy at a multiplicity of places after interaction with the part and to provide electrical signals representative of at least one of amplitude and phase information of the received wave energy for each sensor of said sensor means for each location on the basis of said feedback signal;

means for analyzing said at least one of amplitude and phase information from the multiplicity of sensors into at least one of a geometric and an electromagnetic characteristic of said part for each said location; and

means for sorting said part in response to said characteristic.

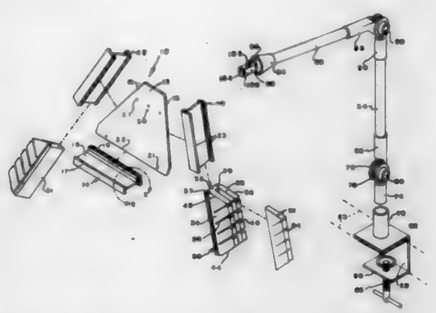


4,690,285

DISPENSING RECEPTACLE FOR DRAFTING EQUIPMENT

Earlyn W. Stone, 1109 Ridgecrest Cir., Costa Mesa, Calif. 92627

Filed Nov. 22, 1985, Ser. No. 800,828
Int. Cl.[4] A47G *19/08*
U.S. Cl. 211—41 17 Claims



1. A storage member to removeably receive flat, stiff items such as drafting tools and the like which comprises:

(a) a U-shaped frame having a base with opposite side-walls coextensive its side edges to form a single central, coextensive and longitudinal channel, and a plurality of cross slots extending laterally across said frame completely through each of said frame sidewalls to thereby guide or support said items during insertion or retraction from storage member; and

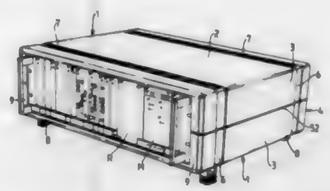
(b) an elastomeric retainer member received in said longitudinal channel of said U-shaped frame, substantially filling said channel between said sidewalls, with a like plurality of cross slits extending laterally across said member and aligned with said plurality of cross slots.

4,690,286

ENCLOSURE FOR HOUSING CIRCUIT BOARDS

David Horne, Winchester, and Laurence Parker, West Wellow, both of England, assignors to BICC Public Limited Company, London, England

Filed Sep. 16, 1986, Ser. No. 907,972
Claims priority, application United Kingdom, Sep. 19, 1985, 8523161
Int. Cl.[4] H05K *5/00*
U.S. Cl. 211—41 17 Claims



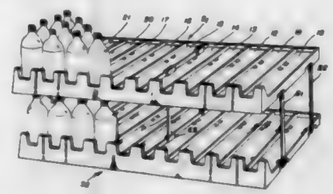
1. An enclosure for housing sub-racks carrying circuit boards and modules carrying other electrical components, which enclosure comprises two separately formed substantially identical bodies, each of which constitutes an end wall and a part of each of a pair of oppositely disposed side walls and which are detachably secured together to form an enclosure having two oppositely disposed open faces, wherein, adjacent one of said two oppositely disposed open faces of the enclosure, the enclosure includes means on which sub-racks and modules can be detachably mounted in the enclosure in either of two positions, in one of which two positions front faces of the sub-racks and modules are substantially flush with said open face of the enclosure and in the other of which two positions said faces of the sub-racks and modules are set back from said open face of the enclosure.

4,690,287

GRAVITY FEED DISPLAY DEVICE

Jane S. Fershko, Marietta, Ga., and Robert W. Lackey, Hickory, N.C., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 557,851, Dec. 5, 1983, Pat. No. 4,593,823. This application Apr. 21, 1986, Ser. No. 853,938
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 2 Claims



1. A gravity feed shelf unit comprising a main chute structure including a pair of side walls and arranged to be inclined so as to feed articles in the direction of inclination thereof, a supplementary chute structure disposed alongside said main chute structure and including a slide plate and an outer side wall integral with said slide plate and spaced from one side wall of said main chute structure, one wall of said pair of side walls constituting an inner side wall of said supplementary chute structure, a front bumper, and a rear wall and similarly inclined so as to feed articles in the direction of inclination thereof, frangible means including a first frangible tab interconnecting said bumper and said one side wall of said main chute structure and a second frangible tab interconnecting said rear wall of said supplementary chute structure and said one side wall of said main chute structure, and a weakened severance

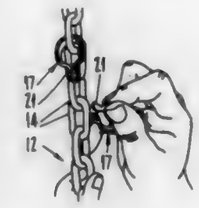
line interconnecting lower portions of said main and said supplemental chute structures and arranged to attach said supplementary chute structure to said main chute structure.

4,690,288

ARTICLE STORAGE AND DISPLAY DEVICE

Francoise E. L. Mitchell, South Melbourne, Australia, assignor to Tidy Chain Pty. Ltd., Prahran, Australia

Filed Feb. 18, 1986, Ser. No. 829,916
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—113 4 Claims



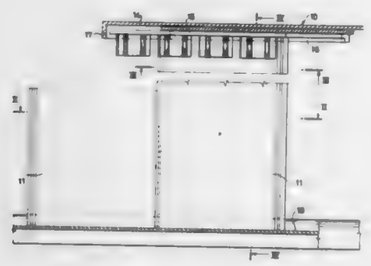
1. A storage or display device for maintaining a plurality of articles in a desired relationship comprising, in combination, a plurality of links of synthetic plastic material interconnected to form a chain having one or more strands, suspending means for suspending the chain from a support so that the chain hangs freely, substantially vertically, and a plurality of fastener means to be connected through a plurality of spaced links of the chain to be carried thereby, said fastener means having releasable gripping means to grip articles for support by the suspended chain.

4,690,289

SECTIONAL MODULAR ELEMENT DISPLAY UNIT

Franco Leolli, Magliaso Ticino, Switzerland, assignor to Modecor Italiana S.p.A., Varese, Italy

Filed Mar. 26, 1986, Ser. No. 844,130
Claims priority, application Italy, Apr. 12, 1985, 21429/85[U]
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—186 3 Claims



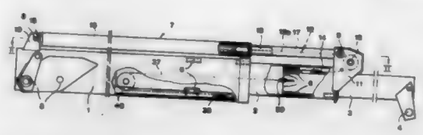
1. A display unit with variously combinable modular elements, comprising in combination: a plurality of vertically positioned plastic elongated sections of different lengths removably interlinked along their longitudinal edges by complementary jointing means to form a self-supporting structure, intermediate connection means removably mounted on upper ends of said sections and support surfaces removably mounted on said intermediate connection means, said elongated sections consisting of slightly curved section laths having complementary jointing means on either longitudinal edge, said jointing means being composed of an H-shaped portion and a slit hollow portion.

4,690,290

DEVICE OF THE KIND COMPRISING AT LEAST THREE MOVABLY CO-ORDINATED PARTS

Paul Gustafsson, Gavle, Sweden, assignor to AB Tico, Gavle, Sweden

PCT No. PCT/SE85/00243, § 371 Date Mar. 7, 1986, § 102(e) Date Mar. 7, 1986, PCT Pub. No. WO86/00607, PCT Pub. Date Jan. 30, 1986
PCT Filed Jun. 10, 1985, Ser. No. 845,261
Claims priority, application Sweden, Jul. 9, 1984, 8403618
Int. Cl.[4] B66C *23/06*
U.S. Cl. 212—267 20 Claims



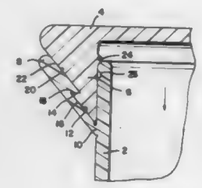
1. A device for providing relative movement between at least three movably co-ordinated parts (1, 2, 3), comprising: first, second and third co-ordinated parts, power means (7) at least partly arranged externally of the parts, said power means (7) being variable in length and acting between a point (8) on a first (1) and a point (9) on a second (2) of the parts, and at least one partly flexible traction element (12) extending between a point (14) on the third part (3) and a point (15) fixed in relation to the first part (1) and being arranged to cause relative movement between the third part (3) and said first and second parts (1, 2) by transmitting forces between the first and the third parts when relative movement between the first and second parts (1, 2) is effected by the power means, said traction element (12) having a portion (12*a*) located externally of the parts when the parts are extended relative to each other, characterized in that said portion (12*a*) of the traction element (12) located externally of the parts (1, 2, 3) is received in a longitudinal internal passage (13) in the power means (7), which thereby acts as a casing which is variable in length for said portion (12*a*) of the traction element (12).

4,690,291

BARBED LID CLOSURE

Alan H. Grant, 3208 Woodhollow Dr., Chevy Chase, Md. 20015

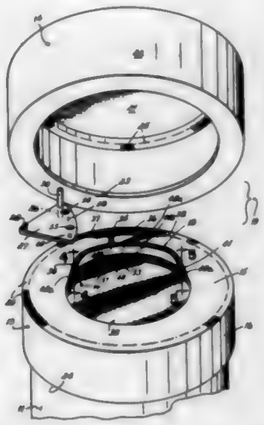
Filed Apr. 1, 1986, Ser. No. 846,802
Int. Cl.[4] B65D *41/16*
U.S. Cl. 215—32 11 Claims



1. A closure for a container comprising neck means for allowing passage of material therethrough, removable cap means for sealing said neck means, and removable retaining means for holding said cap means to said neck means, said cap means comprising an annulus having a first surface and a second surface contiguous and transverse to said first surface to form a ledge, said removable retaining means comprising a third surface extending generally parallel to said first surface and a fourth surface extending generally parallel to said second surface, said removable retaining means being connected to said neck means by frangible means, wherein said second and fourth surfaces engage to hold said cap means to said neck means and said first and third surfaces engage when said cap

means is moved with respect to said neck means in a first direction transverse to said first and third surfaces to break said frangible means.

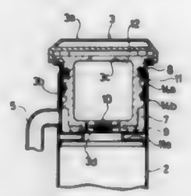
4,690,292
SAFETY CLOSURE
John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio
Filed Jun. 20, 1986, Ser. No. 876,930
Int. Cl.⁴ B65D *55/00*
U.S. Cl. 215—201 **17 Claims**



1. A safety closure for a threaded container adapted to store a potentially harmful substance, said closure comprising an inner cap having internal threads for engagement with the threads of said container, an outer cap substantially enclosing said inner cap and being rotatably supported thereby, a driving lug, means carried by said outer cap for supporting said driving lug for radial movement relative to said outer cap, groove means on said inner cap receiving said driving lug said groove means comprising an inner circular section, a first radial section, an intermediate arcuate section, said first radial section extending between said inner circular section and said intermediate arcuate section, a second radial section, an outer arcuate section having first and second abutments, said second radial section extending between said intermediate section and said outer arcuate section, said outer cap being effective to rotate said inner cap in one direction when said drive lug engages said first abutment and in the opposite direction when the drive lug engages the second abutment.

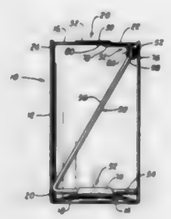
4,690,293
FILLER CAP STRUCTURE FOR A FUEL TANK
Kouji Uraishi, Susono, and Takaaki Itoh, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Apr. 28, 1986, Ser. No. 856,358
Claims priority, application Japan, Jul. 17, 1985, 60-156126; Jul. 17, 1985, 60-156127
Int. Cl.⁴ B65B *31/00*; **B65D** *41/04*
U.S. Cl. 220—86 R **6 Claims**

1. A filler cap structure for a fuel tank, comprising:
a filler cap having a plug member with upper and lower end and adapted to be fitted into a filler tube of a fuel tank;
an annular seal member provided on the inner peripheral surface of the filler tube at a location inward of the bottom end of the filler cap, the annular seat member including a seal seat adapted to be placed in intimate abutting engagement with the bottom end of the filler cap;
an annular space defined by the annular seal member, the inner peripheral surface of the filler tube, and the bottom portion of the filler cap;
a communication tube connected at its one end with the filler tube and at its other end with a canister for communicating the annular space with the canister for absorption of the fuel vapor introduced into the latter from the fuel tank;
a first annular seal member mounted on said upper end of said plug member disposed between an upper inner peripheral surface of the filler tube and the filler cap at a location outward of the annular space for sealing the fuel vapor from the ambient atmosphere; and



a second annular seal member mounted on said bottom end of said plug member and adapted to be placed, upon complete closure of the filler cap against the filler tube, in sealing engagement with the annular seal seat on the inner peripheral surface of the filler tube for sealing of the fuel vapor in the fuel tank, the first annular seal member engaging an upper portion of said annular seal member second seal member being disengaged from the annular seal seat so as to place the fuel tank in communication with the canister when the filler cap is partially loosened.

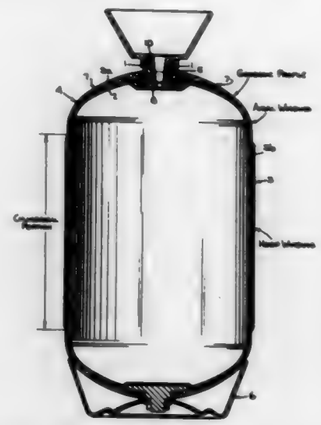
4,690,294
BEVERAGE CONTAINER
Robert D. Jones, 201 S. Creekdale Dr., #908, Norman, Okla. 73069
Filed Sep. 3, 1985, Ser. No. 771,620
Int. Cl.⁴ A47G *19/22*
U.S. Cl. 220—90.2 **2 Claims**



1. An improved container for beverages comprising:
a cylindrical body member having a first end and a second end;
a substantially laterally disposed first disk sealingly connected to one of the first and second ends of the cylindrical body;
a substantially laterally disposed second disk sealingly connected to the other of the first and second ends of the cylindrical body member, the second disk having a pour opening formed therein;
closure strip means supported by the second disk for sealingly closing the pour opening, the closure strip means manually separable from at least a portion of the disk so as to permit access to contents within the container via the pour opening, said closure strip means comprising:
a closure strip and a pull ring supported by the closure strip, the closure strip being defined by a scored line for retaining the closure strip to the second disk with a force greater than the force generated by pressure of the beverage contained in the container, the closure strip further characterized as having an underside facing the contents of the container when retained by the scored line, the pull-ring being pivotally connected to the second disk such that upon application of an upwardly directed force on the pull-ring one end portion of the pull-ring engages the closure strip and directs at least a portion of the closure strip in a downwardly direction so as to separate same along the scored line and cause the closure strip to be moved inwardly into the container so as to substantially unrestrict the pour opening;
a flexible tubular member disposed within the container so as to be flexible through the pour opening when the closure strip means is separated from the second disk, the flexible tubular member having a first end portion, a second end portion, and an extendible length greater than the length of the cylindrical body; and
stabilizing and aligning means for stabilizing the flexible tubular member within the container and for aligning the flexible tubular member with the pour opening such that upon removal of the closure strip means one end portion of the flexible tubular member is extendible through the pour opening, said stabilizing and aligning means comprising:
a pair of spatially disposed channel forming members supported by the first disk so as to be disposed within the container, the spatially disposed channel forming members defining a channel therebetween adapted to receive and stabilize the first end portion of the flexible tubular member in a position substantially adjacent the first disk;
a support member supported by the second disk and the adjacent end of the cylindrical body of the container so as to be substantially aligned with the pour opening, the support member supportingly engaging the second end portion of the flexible tubular member; and
a retainer member supported by the closure strip via the underside thereof, the support member and the retainer member cooperating to maintain the second end portion of the flexible tubular member in a biased position substantially adjacent the second disk such that upon disengaging the closure strip from at least a portion of the second disk the second end portion of the flexible tubular member is directed to the pour opening and extendible through the pour opening a sufficient distance to permit disengagement of the first end portion of the flexible tubular member from the channel formed by the spatially disposed channel forming members.

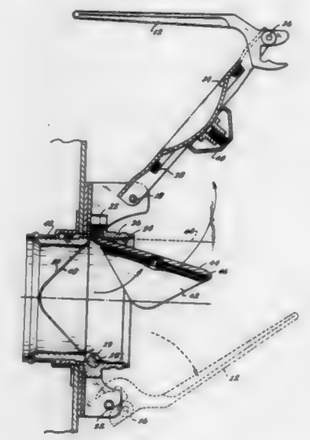
4,690,295
PRESSURE CONTAINER WITH THERMOPLASTIC FUSIBLE PLUG
Anthony J. Wills, Clevedon, England, assignor to The British Petroleum Company P.L.C., London, England
PCT No. PCT/GB84/00383, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/02243, PCT Pub. Date May 23, 1985
PCT Filed Nov. 8, 1984, Ser. No. 744,819
Claims priority, application United Kingdom, Nov. 9, 1983, 8329905
Int. Cl.⁴ B65D *25/00*; **F25J** *00/00*
U.S. Cl. 220—207 **17 Claims**

1. A container for the storage and transportation of pressurised fluids and having a discharge opening, said container comprising:
a thermoplastic inner liner which opens into said discharge opening and which is stable and impervious to the fluid to be contained therein up to a predetermined temperature but is fluid-pervious above said temperature, a portion of said inner liner forming a fusible plug which is fluid-pervious above said temperature and which is exposed to the atmosphere when said discharge opening is closed and said container is subjected to at least said temperature and



an outer layer of an insulating fire resistant material encasing the inner liner but without covering said fusible plug so that above said temperature said fluid can pass through said plug to the atmosphere without passing through said outer layer.

4,690,296
OPEN FLOW VALVE ASSEMBLY
Gregory K. Elliott, Tustin, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.
Continuation of Ser. No. 805,588, Dec. 9, 1985, abandoned, which is a continuation of Ser. No. 633,659, Jul. 23, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 919,596
Int. Cl.⁴ B65D *43/16*
U.S. Cl. 220—259 **9 Claims**



1. A valve assembly for sealing an aircraft lavatory drain port and adapted for full opening with no obstruction of flow, comprising:
a cylindrical conduit having an end on which a valve seat is formed;
a valve member made from a hollow cylindrical member

having an inner diameter which is the same as the inner diameter of said conduit, said inner valve member being formed from said hollow cylindrical member as a longitudinal portion thereof by cutting said hollow cylindrical member along two intersecting orthogonal planes whose bisector is a plane radial to said hollow cylindrical member;

said valve seat being formed on said conduit along two intersecting orthogonal planes entering said conduit at the circumference thereof and whose bisector is a plane that includes the longitudinal axis of said conduit, the apex of said valve member created by the intersection of its orthogonal planes being cut to a curvature and said valve seat being formed with a mating curvature whereby said inner valve member may be disposed with its longitudinal axis perpendicular to the longitudinal axis of said conduit for engaging said valve seat and thereby closing off said conduit;

an elongated support bar extending longitudinally of said inner valve member along its outer wall and secured thereto, one end of said support bar having a transversely extending hinge pin therein, said hinge pin being disposed radially external to the interior wall surface of one side of said conduit;

a tubular extension secured to the end of said conduit and forming an extension thereof, the inner diameter of said tubular extension being greater than the inner diameter of said conduit, said hinge pin being rotatably supported from said tubular extension such that said valve member may pivot through an angle of ninety degrees between its closed position, and a fully open position in which its interior wall surface is an extension of the interior wall surface of said conduit;

said tubular extension having external seating grooves adapted to receive a quick connect coupler; and

locking means carried by said tubular extension cooperating with the other end of said support bar for locking said valve member in its closed position.

4,690,297

OPENING MEANS FOR OBLONG CANS

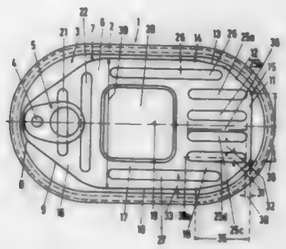
Peter Höft, Braunschweig; Wolfgang Peter, Cuxhaven; Johann Bergsteiner, Bremerhaven; Günter Berschick, Geversdorf; Wolfgang Drobe, Bremerhaven; Fritz Engelke, Cuxhaven; Heinz Hacke, Cuxhaven; Walter Hebbinghaus, Cuxhaven, and Siegfried Kuhnert, Cuxhaven, all of Fed. Rep. of Germany, assignors to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 914,114

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535226

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—273 **8 Claims**



1. A tin lid, in particular, of aluminum sheet, for out-of-round cans, in particular, cans of oblong shape in Hansa-format, comprising a tear-open portion which takes up almost the greatest part of the lid image section defined by the lid core wall, is enclosed by a self-contained recessed line having a starting portion in the area of one lid end and extending closely adjacent to the longitudinal sides and parallel to the lid edge, and, in the area near the starting portion, has secured thereto a lever-type pull-open ring so as to be in flat contact with the tear-open portion, the end of the pull-open ring extending in the longitudinal lid direction, and which is defined by a recessed line portion at the end of the lid remote from the starting portion, said recessed line portion extending in chordal-type fashon with respect to the arc-shaped extension of the core wall and having a length which equals almost half the greatest width of the tear-open portion spaced apart from the lid core wall—measured alaong the longitudinal lid center line at a distance between approximately 2 mm and 15 mm, and in the case of which lid, the tear-open portion is stiffened in various manners by means of a plurality of beads or the like which are oriented approximately transversely to the longitudinal center line in the starting area and, approximately parallel to the longitudinal center line, in the other areas, characterized in that over the entire width (**38**) of the chordal-type recessed line portion (**11**) the beads (**25**) extending substantially parallel to the longitudinal center line (**19**) are spaced from the chordal-type recessed line portion (**11**) at equal distances (**30**) of between approximately 1 mm and approximately 7 mm and the width (**31**) of the beads approximately equals the width of the undeformed area (**32**) intermediate adjacent beads (**25***a*–**25***d*).

4,690,298

REMOTELY-HANDLED REPLACEABLE COMPONENT

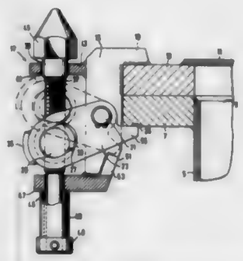
Erwin Schepers, Haltern, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 845,173

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512467

Int. Cl.[4] B65D *45/16*

U.S. Cl. 220—325 **5 Claims**



1. A remotely handled-replaceable component adapted for being removably mounted on a stationary component, the replaceable component being especially for use in a large-area processing cell for reprocessing irradiated nuclear fuel, the replaceable component comprising:

a body defining the replaceable component;

at least two locking devices mounted laterally on said body, each of said locking devices including:

a carrier mounted on said replaceable component;

locking lever means pivotally mounted on said carrier for moving between a first position whereat said locking lever means is disengaged from said stationary component and a second position whereat said locking lever means is engaged with said stationary component for locking said replaceable component thereto;

entrainment means for entraining said locking lever means; and,

actuator means mounted on said carrier for displacing said entrainment means to pivotally drive said locking lever means between said positions.

4,690,299

BULK CARBONATED BEVERAGE CONTAINER

David C. Cannon, Darlington, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 17, 1986, Ser. No. 875,047

Int. Cl.[4] B65D *5/40*

U.S. Cl. 220—402 **1 Claim**



1. In a container for pressurized liquids a tubular composite body of sufficient structural integrity to independently accommodate pressurized liquids therein with minimal radial expansion, a similarly configured independent self-sustaining tubular metal wall surrounding said body, said tubular wall having an inside diameter greater than the outside diameter of said composite body and defining a continuous annular space therebetween sufficient for the accommodation of pressure-induced radial expansion of the composite body equally thereabout and independently of said tubular wall, the relationship between the defined annular space and the anticipated pressure-induced expansion of the composite body being such as to accommodate the expansion, up to intimate engagement with said tubular wall, without imposing a wall distorting pressure on said tubular wall, said composite body and said tubular wall having opposed ends with the ends of the composite body and the ends of the tubular wall being generally coextensive, and a pair of container end caps overlying the opposed ends of the composite body and peripherally joining the opposed ends of the tubular wall for an axial retention of said end caps, said end caps extending into the opposed ends of the composite body and being exposed to internal pressure within said container with the joining to the tubular wall and the tensile strength of the tubular wall being sufficient to resist said pressure.

4,690,300

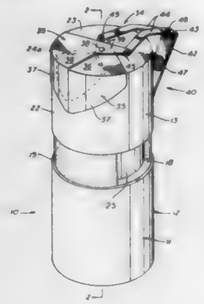
INSULATED COOLER FOR BEVERAGE CONTAINERS

David E. Woods, 2647 Kodiak Ct., Houston, Tex. 77067

Filed Dec. 31, 1986, Ser. No. 947,990

Int. Cl.[4] B65D *25/34*

U.S. Cl. 220—412 **13 Claims**



1. An insulated enclosure for containers comprising in combination;

a lower cup-shaped cylindrical member adapted to receive a container containing a consumable product,

a lining in said lower cup-shaped cylindrical members extending beyond the open top thereof and of sufficient length to receive and completely enclose the length of a container of a consumable product

an upper cup-shaped cylindrical member of a size fitting around the extending portion of said lining and having a top wall with a lining closing against the top end of said first named lining to form a complete enclosure around a container when said cylindrical members are fitted together,

said upper cup-shaped cylindrical member having a top opening located over a top opening in a consumable product container when positioner therein,

closure means mounted on said upper member in position to open and close said opening therein and operable by the user of said enclosure to selectively expose said container opening, and

said upper member opening being of a size and shape when open to expose a portion of the top and side surfaces adjacent said opening of said container sufficient to allow the user to directly consume the contents therefrom.

4,690,301

APPARATUS FOR INDIVIDUALLY DEPOSITING ARTICLES

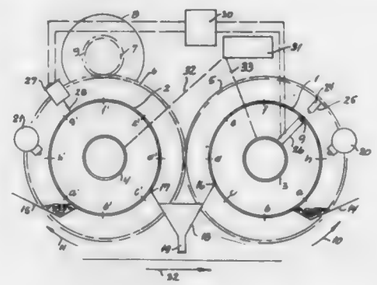
Leif Högberg, Solkilntvej, Denmark, assignor to Jydsk Teknologisk Institut, Arhus, Denmark

Filed Feb. 6, 1986, Ser. No. 826,774

Claims priority, application Denmark, Feb. 22, 1985, 830/85

Int. Cl.[4] A01C *7/04*

U.S. Cl. 221—2 **3 Claims**



2. An apparatus for individually depositing seeds according to a predetermined pattern comprising:

rotatably mounted, side-by-side, first and supplementary hollow cylinders having intermeshed gears for effecting rotation of said cylinders in mutually opposite directions;

drive means engaging one of said gears for the rotation of said cylinders;

each of said cylinders having longitudinally extending rows of apertures of equal number in each of said rows, said rows in said cylinders, respectively, being equally spaced apart circumferentially and said rows of one of said cylinders corresponding to said rows of the other of said cylinders;

troughs respectively associated with said cylinders for supplying seeds to said apertures in said cylinders during the rotation;

sets of blowing nozzles respectively directed toward one of said rows of said cylinders for blowing all but one seed from said apertures of said rows, in succession during the rotation, said sets being respectively spaced from said troughs at locations in the directions of the rotation;

means for detecting the presence and absence of a seed in

any of said apertures of said rows in said first cylinder, said detecting means being spaced from said first cylinder set of nozzles at a location in the direction of the rotation;

stripping means including strippers for normally carrying out a removal of each of the seeds from said apertures in each of said rows, in succession, in said supplementary cylinder upon the rotation thereof, said stripping means being spaced from said supplementary cylinder set of nozzles at a location in the direction of the rotation, said stripping means and said detecting means being in registry relative to said cylinders;

means coupling said detecting means with said stripping means for lifting said strippers relative to said supplementary cylinder to cese the removal of seeds from said apertures in response to any absence of seeds from said apertures of said first cylinder as detected by said detecting means; and

an upright collecting box associated with both said cylinders and having a row of depositing pipe stubs corresponding to the number of said apertures in each said row, said box having a pair of scraping edges at the top thereof respectively contacting said cylinders for releasing the seeds from said apertures during the rotation;

whereby seeds are deposited in said collecting box from said apertures of said first cylinder during the rotation thereof, and only in the event of any absence of seeds from any of said apertures of said first cylinder, seeds are deposited in said box from said apertures of said supplementary cylinder, during the rotation thereof, corresponding to the empty apertures of said first cylinder.

4,690,302

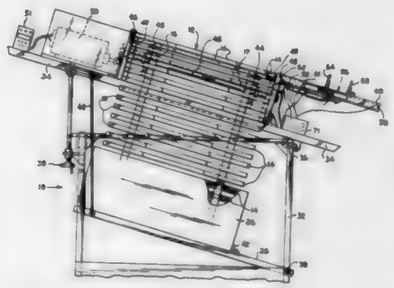
PACKAGE AND APPARATUS FOR DISPENSING ELECTRICAL CONNECTORS

Raymond S. Zebley, York Haven, Pa.; James H. Nichols, Jr., Hockessin, and Bernard M. Closek, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 705,181, Feb. 25, 1985, abandoned. This application Nov. 22, 1985, Ser. No. 799,525

Int. Cl.[4] B65H *5/28*

U.S. Cl. 221—11 **13 Claims**



1. An apparatus for dispensing articles from elongated tubes secured to and arranged in spaced parallelism across a flexible tape, each tube having a closure at each end for holding articles therein, said apparatus comprising

a stand provided with upper and lower support members for the ends of the tubes,

a slide extending downwardly from the lower support member to a perch,

a stepping device for advancing successive tubes along said support members to the location of said slide, and

means on the lower support member for opening the closure at the lower end of each tube in its approach to the slide, said means having an opening device extending through said lower support member at the location of the tube to be opened.

4,690,303

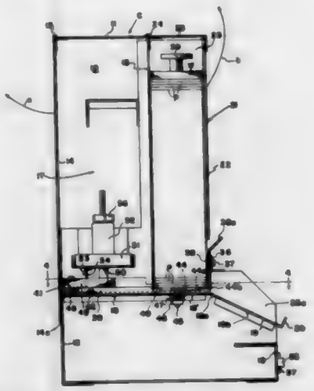
COUPON PACKET DISPENSING SYSTEM

Reed T. Draper; Kenneth J. Pol, and Dennis R. Martin, all of Saginaw, Mich., assignors to Draper Technologies, Inc., Saginaw, Mich.

Filed Sep. 23, 1985, Ser. No. 779,158

Int. Cl.[4] B65G *59/06*

U.S. Cl. 221—131 **13 Claims**



1. In a coupon packet dispenser or the like; housing means defining a vertically disposed compartment receiving a stack of substantially vertically aligned, vertically juxtaposed packets; said compartment having generally vertical front and rear walls; a forwardly and return movable regid floor plate underlying said compartment and having a flat surfaced, recessed portion extending rearwardly from its front end and defining a generally vertically disposed dispensing shoulder adjacent the rear of said compartment and said rear wall when the plate is in rearward position, the recessed portion underlying the compartment so that the lowermost packet is received in said recessed portion, and opening to the front of said plate so the packet can be separated from the recessed portion when the plate is moved forwardly and thence returned; the plate having a flat surfaced rear portion for receiving the next lowermost packet and supporting the stack when the plate is moved forwardly and the shoulder removes the lowermost packet from the bottom of the stack; the said recessed portion of the plate having front to rear extending groove means thereon and the said rear wall of the compartment supporting downwardly projecting tab means which are received in said grooves to prevent famming of a lowermost packet between the said rear wall and plate when the plate is returned rearwardly; and means attached to the housing means extending downwardly to restrain the next lowermost packet from moving forwardly when the plate is moved forwardly to push the lowermost packet forwardly.

4,690,304

OBTURATING DEVICE FOR TUBES, FLASKS AND OTHER CONTAINERS, THE OPENING AND CLOSING OF WHICH ARE CONTROLLED THROUGH ROTATION

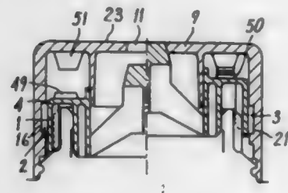
Simone Morel, 15 rue du Faubourg de Paris, 51210 Montmirail, France

Filed Dec. 5, 1985, Ser. No. 805,285

Claims priority, application France, Dec. 7, 1984, 84 18787; Mar. 6, 1985, 85 03292

Int. Cl.[4] B67D *5/22;* **B65D** *47/30;* **G01F** *11/32;* **B67B** *7/48*

U.S. Cl. 222—44 **21 Claims**



1. An obturating device for a tube, flask and like container having a neck with an inner edge and an outlet passage, wherein the obturating device comprises

a valve-cap and a casing; said valve-cap having a plate provided with an upper part;

a secondary component protruding at said upper part;

a set of maintaining blades protruding in middle of the outlet passage of the container in order to maintain in place said secondary component;

a fitting skirt for said neck, with said fitting skirt downwardly extending said plate of said valve-cap and comprising an outer periphery;

said valve-cap further having an inner cylindrical tightness skirt and a second tightness skirt, with said second tightness skirt being slightly tapered downwardly and applied against said inner edge of said neck;

said casing comprising a substantially plane upper plate having a central hole and an outer fitting skirt comprising an inner periphery;

said outer periphery of the fitting skirt of said valve-cap and said inner periphery of the outer fitting skirt of said casing having a complementary notch-ramp structure for an alternate reciprocating engagement and disengagement of said secondary component of said valve-cap into and from said hole of said substantially plane upper plate of said casing;

said casing having an inner part provided with a tightness skirt, said tightness skirt being slightly tapered downwardly and applied against said inner cylindrical tightness skirt of said valve-cap;

said upper part of the valve-cap being further provided with first fin means cooperating with second fin means mounted in the casing to prevent any rotation of the casing during transportation of the container, whereby opening and closing of the device are respectively made by a positive rotation of the casing in one and another direction with a suitable tightness in rotation being provided by said tightness skirts.

4,690,305

SOLID BLOCK CHEMICAL DISPENSER FOR CLEANING SYSTEMS

James L. Copeland, Burnsville, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Filed Nov. 6, 1985, Ser. No. 796,017

Int. Cl.[4] B67D *5/00;* **B01D** *11/02*

U.S. Cl. 222—52 **6 Claims**

1. A means for dispensing a concentrated aqueous wash chemical solution from a solid block of a wash chemical to a utilization point, which comprises:

(a) a housing for the solid block of wash chemical, comprising:

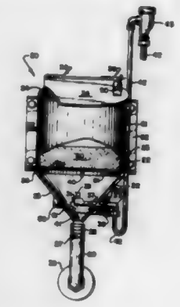
(i) an upper storage portion which can retain more than one solid block of wash chemical and which allows a downwardly facing surface of the lowermost solid block of wash chemical to remain in substantially continuous contact with a flat, horizontal screen support means; the upper storage portion defining a storage cavity and having an upwardly disposed access port with a cross-sectional area at least as large as the cross-sectional area of the storage cavity for allowing access to the storage cavity;

(ii) a door operatively engaged to the housing and positioned across the upwardly disposed access port, the door being movable with respect to the access port to open and close access to the storage cavity; and

(iii) a funnel shaped collector portion integral with and extending continuously downward from the storage portion and terminating at a lower outlet port from the housing;

(b) mounting means for mounting the housing onto a vertical support;

(c) the flat horizontal screen support means in contact with the housing for retainably supporting more than one solid block of wash chemical thereabove;



(d) spraying means mounted in the collector portion of the housing and below the screen supporting means for directing a uniform spray at substantially the entire downwardly facing surface of the lowermost solid block of wash chemical such that the concentrated aqueous wash chemical solution is formed by dissolution of substantially only the downwardly facing surface of the lowermost solid block of wash chemical;

(e) a wash chemical solution conduit connecting the outlet port with the utilization point for directing the concentrated wash chemical solution from the collector portion of the container to the utilization point;

(f) a water supply line connecting the spraying means with a pressurized source of water;

(g) spray control means cooperatively connected to the water supply line for selectively controlling the flow of water through the supply line and onto the spray means, the spray control means being operative in response to receipt of a control signal to open the water supply line to water flow therethrough, causing the spray means to direct a spray of water against substantially the entire downwardly facing surface of the solid block of wash chemical retainably supported immediately above the support screen, dissolving that wash chemical contacted with water which then passes in solution through the support screen to the underlying collector portion of the container, through the outlet port, to the conduit and onto the utilization point.

4,690,306

DISPENSING DEVICE FOR STORING AND APPLYING AT LEAST ONE LIQUID OR PASTY SUBSTANCE

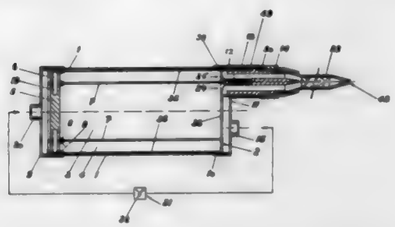
Theodor Stäbeli, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 1, 1986, Ser. No. 891,826

Claims priority, application Switzerland, Aug. 12, 1985, 3456/85; Jan. 17, 1986, 193/86

Int. Cl.⁴ B67D *5/42*

U.S. Cl. 222—80 **26 Claims**



1. A dispensing device for storing and applying at least one liquid or pasty substance, which device comprises

a housing;

a dispensing nozzle attached thereto;

at least one cartridge adapted for being lodged in the interior of said housing and having cartridge wall means adapted for enclosing contents of at least one substance therein, and a discharge outlet; said cartridge being longitudinally displaceable between a rearward and a forward end position in said housing;

a piston assembly comprising at least one piston for expelling a quantity of the aforesaid substance from said cartridge;

mounting means for said at least one cartridge in said housing;

at least one valve means for controlling dispensing of contents of said cartridge therefrom; said valve means being associated with said cartridge and said housing in a manner such that said valve means are closed in said rearward end position, and said valve means are open in said forward end position of said cartridge;

means for displacing said cartridge and said piston assembly in a forward direction; and

restoring means for returning said cartridge from a forward position to said rearward end position thereof.

4,690,307

DISPENSING SYSTEM WITH SLIDABLE MODULES

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Continuation-in-part of Ser. No. 427,504, Sep. 29, 1982, Pat. No. 4,513,885, which is a continuation of Ser. No. 35,817, May 4, 1979, abandoned. This application Feb. 13, 1984, Ser. No. 579,391

Int. Cl.⁴ F04B *43/12*

U.S. Cl. 222—95 **8 Claims**

1. A dispenser system for a plurality of flowable products, said system comprising:

a housing having an upper body having side walls, a top wall and a bottom wall defining a hollow compartment with an open front face,

a plurality of dispenser modules for sliding rearwardly through the open front face of the module,

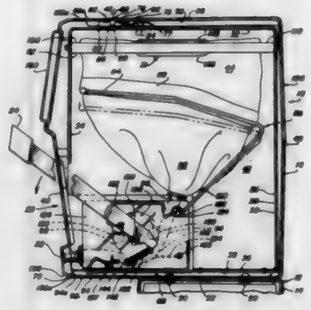
each of the modules having an internal flexible bag of flowable product and peristaltic pump therein for discharging flowable product at a lower front end of the module,

an open side on each of said modules providing access for installation and replacement of a flexible bag within the module,

operating means on the front of each module to operate the peristaltic pump to dispense a portion of the flowable product,

guide surfaces on the modules and housing to guide each of the modules for rearward sliding movement into positions parallel with each other within the housing,

latching means extending between each of the modules and the housing to latch each module in position in the housing, and



a front section having a front wall on each module, said front section having a top wall and a pair of sidewalls extending rearwardly from the front wall and joined thereto, the outer wide walls on said modules being aligned with the side walls on the housing and top walls on said modules being aligned with the top wall on the housing.

4,690,308

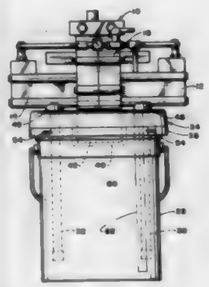
PAIL MOUNT PUMP WITH INTEGRAL COVER

James E. Cavanaugh, Sunland; Larry Erwin, North Hollywood, and Robert D. Hetherington, Sunland, all of Calif., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Jan. 9, 1986, Ser. No. 817,527

Int. Cl.⁴ B67D *5/52*

U.S. Cl. 222—156 **8 Claims**



1. A portable pail mounted pumping system comprising;

a pail cover having a skirt constructed to fit around the peripheral rim of a pail;

flange means beneath said skirt forming an annulus constructed to snugly fit the rim of said pail to stabilize a pumping system mounted on said pail cover;

pump mounting means on said pail cover, said pump mounting means including a recess in said cover constructed to extend below the rim of said pail;

pump means comprised of a pair of alternating reciprocal pumps driven by an air motor mounted on said pail cover pump mounting means, a portion of the housing of said pump means fitting into said recess in said pail cover so that when said pump means and pail cover are mounted on a pail a low profile and center of gravity is provided to prevent the pail from tipping;

fastening means for fastening said pail cover with said pump on the rim of a pail, said fastening means being constructed to allow said pump and pail cover to be easily removed and re-mounted on another pail whereby said pail mounted pump system is easily removed and transported from one pail to another.

4,690,309

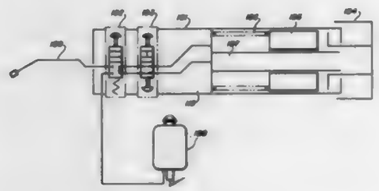
PORTABLE, SELF-POWERED, ADJUSTABLE HERBICIDE DISPENSING SYSTEM

Michael A. Wehr, Hancock, and Robert L. Sajdak, Chassell, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 676,147, Nov. 29, 1984, Pat. No. 4,653,830. This application Jul. 3, 1986, Ser. No. 881,995

Int. Cl.⁴ G01F *11/06*

U.S. Cl. 222—249 **2 Claims**



1. A liquid dispensing device comprising:

a. a body;

b. a chamber within said body;

c. a piston slidably mounted within said chamber to form a front cavity to the front of the piston and a rear cavity to the rear of said piston so that said piston moves in a rearward and a forward direction;

d. a means for biasing said piston in the rearward direction;

e. a nozzle;

f. a combined fluid pressure means and supply of liquid;

g. a first valve and second valve each having an open and a closed position;

h. a first conduit connecting said front cavity to said second valve;

i. a second conduit connecting said rear cavity to said second valve;

j. a third conduit connecting said nozzle to said first valve;

k. a fourth conduit connecting said combined fluid pressure means and supply of liquid to said first valve;

l. a fifth and sixth conduit, each connecting said first valve to said second valve and;

wherein with said first valve in the open position said third conduit is connected to said fifth conduit and said fourth conduit is connected to said sixth conduit, and with said first valve in the closed position said fifth conduit is connected to said sixth conduit; and wherein with said second valve in the open position said first conduit is connected to said fifth conduit and said second conduit is connected to said sixth conduit, and with said second valve in the closed position said fifth conduit is connected to said sixth conduit.

4,690,310

SLEEVE PUMP

Robert Rasmussen, Minneapolis, Minn., assignor to Progressive Assembly Machine Co., Inc., Plymouth, Minn.

Filed Dec. 11, 1985, Ser. No. 807,502

Int. Cl.⁴ B65B *3/30*

U.S. Cl. 222—309 **12 Claims**

1. An apparatus for dispensing fluid, comprising:

an outer sleeve presenting an outer sleeve casing and having structure defining an outer sleeve inlet port through said outer sleeve adapted for coupling to a source of said fluid;

an inner sleeve, presenting an inner sleeve casing, shiftably carried within said outer sleeve casing and including structure defining an internal fluid chamber, an inner sleeve inlet port through said inner sleeve in fluid communicating orientation with said fluid chamber, and a fluid chamber outlet port,

said inner sleeve and said outer sleeve shiftable relative to each other between a first position wherein said outer sleeve inlet port and said inner sleeve inlet port are aligned for fluid communication through said outer sleeve and said inner sleeve between said source of said fluid and said fluid chamber, and a second position wherein said outer sleeve inlet port and said inner sleeve inlet port are misaligned whereby fluid communication between said source of said fluid and said fluid chamber is blocked;



piston means received within said inner sleeve and shiftable along a first path of travel for drawing fluid into said fluid chamber through said inner sleeve inlet port and said outer sleeve inlet port when said inner sleeve and said outer sleeve are in said first position, and shiftable along an opposed path of travel for expelling said fluid from said chamber through said fluid chamber outlet port when said inner sleeve and said outer sleeve are in said second position;

first actuating means operably coupled to said inner sleeve and said outer sleeve for shifting said inner and outer sleeves between said first and second positions; and

second actuating means operably coupled to said piston means for shifting said piston along said paths of travel independently of the position of said inner sleeve relative to said outer sleeve.

4,690,311

BOTTLE WITH FINGER PIECES

Abraham Y. Schultz, 1233 Guelbreth La., Creve Coeur, Mo. 63141

Continuation of Ser. No. 369,368, Apr. 19, 1982, abandoned. This application Apr. 25, 1986, Ser. No. 858,889

Int. Cl.⁴ G01F *11/02*

U.S. Cl. 222—324 **3 Claims**

1. A bottle of a size to be grasped in one hand having finger pieces thereon including: a shoulder on the upper end of the bottle from the center of which projects a neck, the neck extending upwardly at a sharp angle to the shoulder so that the bottom of the neck merges with the shoulder in a line of demarcation around the neck, two free-standing finger pieces of similar shape integrally found with and individually and separately projecting upwardly from opposite sides of the shoulder and transversely to the shoulder of the bottle, the base portions of the finger pieces being integrally formed with the shoulder and extending upwardly from the shoulder at points outside and spaced away from the neck so that the entire lengths of the upwardly projecting portions of the finger pieces are spaced outwardly and away from the neck to provide a space between each upwardly extending portion and the neck, the finger pieces projecting upwardly and transversely to be engageable

by the fingers of a user, and terminating outwardly in outer ends so that the transverse distance from the base of each finger piece to the end of each finger piece lies substantially within the lateral limits of the bottle, the outer ends of the finger pieces being disconnected from and spaced above and



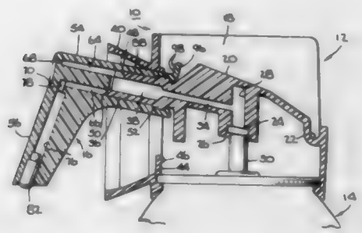
free from the shoulder of the bottle to enable a pair of digits of a hand to move from each side of the bottle so that each said digit can engage the upwardly extending portion of each finger piece and engage the undersides of the transverse portions of the finger pieces, to allow a third digit of the same hand to rest atop a cap to press downwardly thereagainst.

4,690,312

DUAL FUNCTION CAP.

James R. Crapser, and Scott W. Demarest, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 15, 1986, Ser. No. 863,659
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—402.17 **4 Claims**



1. An overcap assembly, comprising an actuator unit and a nozzle device, said actuator unit having means defining an outlet passage and having an acutator adapted for opening a valve of a container having contents under pressure to release the contents into said outlet passage, said nozzle device having a first outlet adapted to produce a spray of a material passing therethrough and a second outlet adapted to produce a for of a material passing therethrough, the axis of said second outlet being substantially transverse with respect to the axis of said first outlet, said nozzle device being connected to said actuator unit to selectively permit one or the other of said outlets to be in communication with said outlet passage of said actuator unit,

wherein said nozzle device is movable, while connected to said actuator unit, between first and second positions relative to said actuator unit, said first and said second outlets respectively being in communication with said outlet passage when said nozzle device is in said first and said second positions, respectively,

wherein said nozzle device and said actuator unit each have a respective cooperating locking member means for locking said actuator in a position to maintain open the valve of the container with which said assembly is being used, said locking member means being shaped and positioned so as to engage each other and lock upon operation of said actuator when said nozzle device is in said second relative position, and said locking member means being shaped and positioned so as to remain disengaged from each other when said nozzle device is in said first relative position,

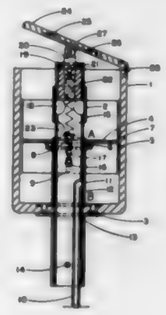
whereby actuation of the valve by said actuator will selectively produce a spray or a fog of the contents of the container.

4,690,313

BOTTLE MOUNTED ADJUSTABLE LIQUOR DISPENSING DEVICE

George J. Luine, and John L. Luine, both of 2641 N. Vermont, Los Angeles, Calif. 90027

Continuation-in-part of Ser. No. 836,736, Mar. 6, 1986, abandoned. This application Dec. 29, 1986, Ser. No. 947,436
Int. Cl.[4] G01F *11/26, 11/28*
U.S. Cl. 222—454 **9 Claims**



1. A bottle mounted liquor dispensing device which comprises: a moveable outer cylindrical housing having a longitudinal axis and a base; a slideable shutoff sleeve with a flange at one end, said shutoff sleeve affixed by its flanged end to an inner face of said base, said axis of said housing coaxial with a longitudinal axis of said sleeve and said base having an opening centrally located; a stationary filling member with an attached insertion flange member at the lower end thereof, said filling member extending upwardly through said centrally formed opening in said base, and through said shutoff sleeve to a releasing member at the upper end of said outer housing; and outer diameter of said filling member slideably and sealably compatible with an inner diameter of said shutoff sleeve as a slip-fit; said filling member having two opposing filling openings one-hundred-and-eighty degrees apart at an upper end thereof, said shutoff sleeve forming two opposing filling openings which align with said filling openings in said filling member to form a liquid passage from the bottle through the filling member and shutoff sleeve when said device is in a rest position; a rearward movement of said housing and shutoff sleeve mis-aligns said filling openings in said filling member and shutoff sleeve to close said liquid passage; an air passage member affixed to an inner wall of said filling member and extending downwardly towards said bottle with an opening at the upper end of said air passage member affixed to a formed opening in said filling member at a juncture of said filling member with said base within said outer housing, said shutoff sleeve having an elongated opening at its flanged end extending upwardly along said filling member, said elongated opening coinciding with said formed opening in said air passage member, and said elongated opening having a length pre-determined by the length of movement of said shutoff sleeve from alignment to mis-alignment of said filling openings allowing an uninterrupted flow of air from within said outer housing into said air

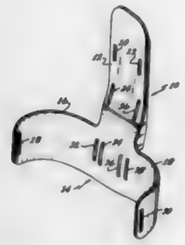
passage member; said releasing member attached at its center to an upper hinge member, and a lower hinge member anchored in a filling cap member which closes a terminal end of said filling member, and a hinge pin member connecting said upper and lower hinge members; said releasing member additionally attached at an outer edge to the outer diameter of said housing at an uppermost edge of said housing by a releasing hinge member, said releasing member being bias towards the upper end of said housing by a bias spring within said filling member; an upper end of said spring attached to said lower hinge member, and a lower end of said spring attached to a spring retaining pin affixed to a well at the lower end of said shutoff sleeve in a direction perpendicular to the longitudinal axis of said shutoff sleeve, said pin further extending through two opposing formed elongated openings one-hundred-and-eighty degrees apart in the wall of said filling member, said elongations being parallel to the axis of said filling member and said retaining pin sliding within said elongations as said shutoff sleeve is moved from a closed to an open dispensing position, the length of said formed elongations being determined by the length of movement of said shutoff sleeve relative to said filling member between aligned and mis-aligned positions of said filling openings, the width of said formed elongated openings being determined by the thickness of said retaining pin allowing for a smooth passage of said pin throughout its travel, said spring retaining pin further preventing rotation of the outer housing and shutoff sleeve around said filling member which remains stationary.

4,690,314

BUOYANCY COMPENSATOR INSERTABLE BACKPACK

Mark Faulconer, 1555 Mesa Verde East, Costa Mesa, Calif. 40100, and Scott E. Greatrake, 101 La Hacienda, Fountain Valley, Calif. 40202

Filed Aug. 26, 1985, Ser. No. 769,125
Int. Cl.[4] A45F *3/08*
U.S. Cl. 224—211 **22 Claims**



1. The combination of a buoyancy compensator formed as a buoyancy compensator vest and a backpack wherein said buoyancy compensator vest has an inflator means for inflating it and maintaining it at a desired buoyancy compensation level and wherein said backpack comprises:

a T shaped inverted member formed as a unified resilient structure having an upright portion and two lateral portions extending therefrom wherein said lateral portions of said inverted T are proximate a user's lower torso area and are sufficiently flexible to flexibly curve in part around a user's waist, and said upright portion extends upwardly along a user's back:

means for connecting said backpack to said buoyancy compensator; and,

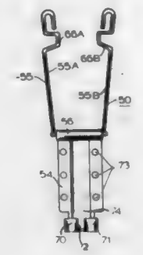
means for connecting said backpack to a tank of breathing gas.

4,690,315

UNIVERSAL CLIP

John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390

Division of Ser. No. 655,036, Sep. 26, 1984, Pat. No. 4,627,558. This application Apr. 25, 1986, Ser. No. 856,794
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—252 **10 Claims**



1. A clip for supporting an object from the belt of a wearer comprising an elongated substantially planar body including an upstanding end portion defining an integral transverse hinge opening and said substantially planar body further defines one end of a belt loop opening:

said elongated substantially planar body further defining at least one integral catch spaced from said upstanding portion and integral hinge;

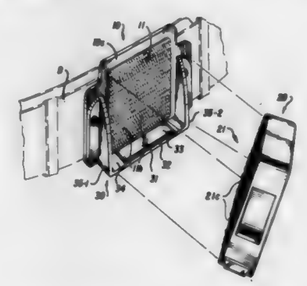
said catch means including a resilient member engaging said hinge opening and said integral catch of said substantially planar body to selectively open and close to define a belt receiving elongated opening between said clip body and said resilient means.

4,690,316

QUICK RELEASE RETENTION OF WORK PIECES

Dennis P. Peterson, P.O. Box 15809, Arlington, Va. 22215

Filed Apr. 8, 1986, Ser. No. 849,270
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—253 **10 Claims**



1. A quick release retainer for a work piece, which comprises:

a receptor for the work piece;

means for attaching the receptor to a user;

means for attaching the work piece to the receptor by contact;

means for guarding against accidental separation of said work piece from said receptor, comprising

a guard which partially encloses said work piece when positioned on said receptor completely protecting a base portion of said work piece and partially protecting the adjoining sides thereof;

said guard including side guards extending parabolically and partially on the adjoining sides of said work piece

sloping gradually to the base thereof to the point of connection of said guard on said receptor; and

said guard containing a raised portion in the base thereof to enhance the ability of the user to grasp the device; and

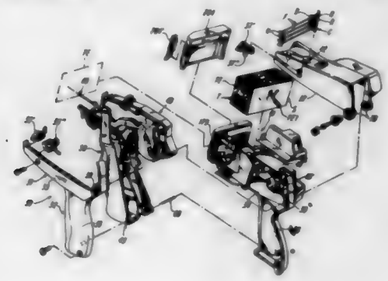
thereby to facilitate the removal of said work piece from said receptor when the work piece is to be placed in use and simultaneously guard against inadvertent and accidental removal of said work piece from said receptor.

4,690,317

HAND-HELD TAG ATTACHER

Paul H. Hamisch, Jr., Franklin; James A. Makley; Robert M. Pabodie, both of Dayton, and Larry D. Strausburg, Waynesville, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 6, 1985, Ser. No. 773,480
Int. Cl.⁴ B65C *7/00*; A43D *69/00*
U.S. Cl. 227—67 **20 Claims**



1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the attacher comprising: an attacher body having a hopper adapted to receive a stack of tags and having a manually engageable handle, a needle having an elongate needle bore and an elongate side opening communicating with the needle bore, means for engaging an endmost tag in the stack, wherein the engaging means includes a non-impaling frictional member engageable with a facial area of the tag and a tag-impaling feed pin, driver means for moving the feed pin and the frictional member from ineffective positions out of feeding engagement with the endmost tag to an effective position in feeding engagement with the tag, for holding the feed pin and the frictional member in contact with the tag to advance the tag to an attaching position in alignment with the needle, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while it filament section extends through the side opening, and means including a manually operable actuator disposed at the handle for moving the driver means, the push rod and the bar section advancing means.

4,690,318

SOLDER DISPENSER

John D. Hite, 206 Brewster Ave., Silverspring, Md. 20901

Filed Sep. 30, 1986, Ser. No. 913,298
Int. Cl.⁴ B23K *20/26*
U.S. Cl. 228—57 **20 Claims**

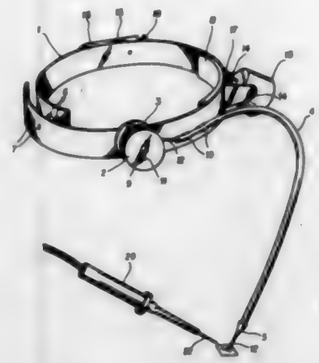
1. A head worn solder dispensing device comprising:

a head worn housing;

a supply of solder mounted onto said housing;

a means for dispensing said solder;

a guide means attached to said housing having an inlet for receiving said solder and directing said solder along a predetermined path extending through an outlet to a location where said solder may be applied to a work piece while being heated.

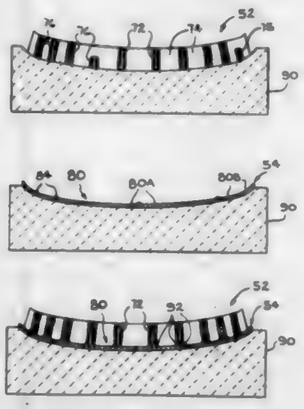


4,690,319

METHOD OF MAKING COMPLEXLY CURVED MOLD

Quintin R. Smith, 317 E. Fourth St., and Kellen R. Smith, 760 Brokate Rd., both of Port Clinton, Ohio 43452

Division of Ser. No. 811,544, Dec. 20, 1985, Pat. No. 4,632,691. This application Sep. 15, 1986, Ser. No. 907,330
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—182 **18 Claims**



1. A method of fabricating a mold for forming plastic material into a desired shape, comprising the steps of,

providing a pattern having such desired shape, providing a plurality of strips of metal, arranging said plurality of strips into a lattice-work grid and conforming an edge of each of said strips to an individual lineal portion of said pattern,

securing said plurality of strips to one another at intersections of said strips,

providing a plurality of plates of metal,

arranging said plates to form a mold face and conforming each of said plates to an individual area of said pattern,

securing said plates to one another and,

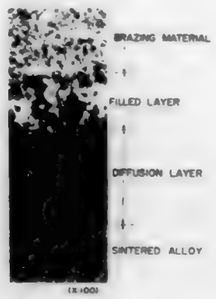
securing said plates to said lattice-work grid.

4,690,320

METHOD OF BONDING POROUS METALLIC MEMBERS AND PRODUCT MADE BY THE METHOD

Tsuyoshi Morishita; Sigemi Osaki, and Noriyuki Sakai, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 703,406, Feb. 20, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 9,094
Claims priority, application Japan, Feb. 24, 1984, 59-33748
Int. Cl.⁴ B23K *20/16, 20/22*
U.S. Cl. 228—194 **7 Claims**



1. A method of bonding a metallic member to an iron-based material having a porous structure, said method comprising the steps of:

preparing a metallic material by combining 30 to 70 wt % of Fe-Cr type alloy powders with 70 to 30 % of Fe-C-P-Mo type eutectic alloy powders which are finer than 150 mesh, said Fe-Cr type alloy containing 10 to 15 weight % Cr, and less than 1.5 weight % of at least one of C, P, Si, S, Mn and Ni, and the balance Fe, and said Fe-C-P-Mo eutectic alloy containing 3.5 to 4.5 weight % C, 1.8 to 2.8 weight % P, 8 to 12 weight % Mo, less than 4 wt % of at least one of Cr, Si, Mn and Ni, and the balance Fe,;

mixing 90 to 99% of said metallic material with 10 to 1% of an organic binder comprising an acrylic resin to form a brazing material;

placing said brazing material between said metallic member and said iron-based material;

preheating said brazing material at 150° to 380° C. for at least 5 minutes to cause said organic binder to become adhesive so that said metallic member and said iron-based material remain securely intact during subsequent bonding steps;

heating said brazing material, said metallic member and said iron-based material to a temperature above the melting point of said brazing material so that the elements of the eutectic powders of said brazing material diffuse into the surfaces of the pores of said iron-based material; and

preventing further diffusion of said brazing material into said pores by cooling said brazing material, said metallic member, and said iron-based material.

4,690,321

FOLDABLE QUICK PACK FOR FOODSTUFFS AND THE LIKE

Lolita Spaeth, Wendeberg 43, 3180 Wolfsburg, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,804
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533068
Int. Cl.⁴ B65D *5/02*
U.S. Cl. 229—40 **4 Claims**

1. A box-like quick pack, formed from a folded blank, for goods sensitive to pressure, particularly foodstuffs, comprising:

(a) a baseplate having front, side and back fold edges and having sufficient inherent stiffness to support the goods;

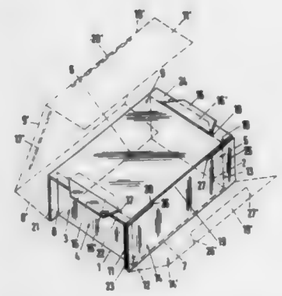
(b) two side walls directed substantially vertically upwards starting from two opposite side edges of the baseplate;

(c) a rear wall which starts from the rear edge of the baseplate and is directed upwards and which merges into a lid and front wall;

(d) side portions of said rear wall and lid overlapping the edges of the two side walls and projecting beyond the periphery of the baseplate;

(e) said side walls having fold-over flaps adapted to pass through slits formed in said lid;

(f) said lid being extended at its front edge by a downwardly directed first front wall;



(g) a second front wall directed upwards and lying against the first front wall, said second front wall being foldably attached to the front edge of said baseplate;

(h) said first front wall extending between said second front wall and the front edges of said two side walls;

(i) a push-in tongue foldably attached to the top edge of said second front wall; and

(j) a slit formed in said first front wall near the front edge of said lid and into which said tongue extends when the pack is assembled, and wherein

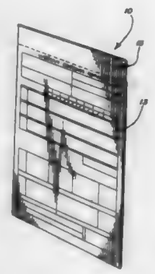
(k) said fold-over flaps are sufficiently long that they can be folded over said lid to lie approximately parallel to it.

4,690,322

RESEALABLE ENVELOPE

Joseph E. Burns, 754 Chandler Rd., Gurnee, Ill. 60031

Filed Oct. 31, 1986, Ser. No. 926,359
Int. Cl.⁴ B65D *27/06, 27/16*
U.S. Cl. 229—80 **5 Claims**



1. A resealable envelope comprising: a first paper panel including a wall portion and a flap portion; a second paper panel disposed in face-to-face relation with the wall portion of said first panel; a first plastic strip fixedly secured to said flap portion of said first panel; a second plastic strip fixedly secured

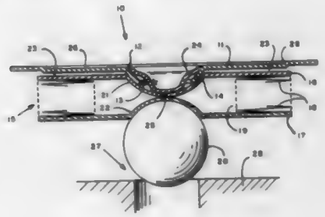
to said second panel; said first panel being foldable to place said flap portion in overlapping relation with said second panel and said first strip in registration with said second strip; a tape having a pressure sensitive contact adhesive on one face thereof, said adhesive being in contact with one of said strips and releasably securing said tape to said one strip, said adhesive remaining on said one strip upon removal of said tape and effecting sealing of said envelope by contacting the other strip when said strips are brought into registration and pressed against each other.

4,690,323

SWIVEL BELLOWS ASSEMBLY

David L. Morgan, Stratford, Conn., assignor to Seymour-Sheridan, Inc., Stratford, Conn.

Filed Aug. 28, 1986, Ser. No. 901,330
Int. Cl.⁴ G05D *23/12*
U.S. Cl. 236—99 F **6 Claims**



1. A thermostatic swivel bellows assembly designed for attachment within a housing to perform a function in response to predetermined temperatures therewithin, said assembly comprising a bellows mounting plate having an opening surrounded by a portion of said plate which is downwardly and inwardly deformed to provide a tapered skirt, a thermostatic bellows unit having an upper end surface and a lower end surface, said upper end surface being adjacent said mounting plate and being provided with a central contoured well portion which receives the tapered skirt of the mounting plate, a flexible, contoured retainer cup which confines the skirt of the mounting plate in frictional engagement between itself and the well of said upper end surface and which extends through said opening and is permanently attached within said well portion to said upper end surface to permit swivel movement between said mounting plate and said bellows unit, said lower end surface being provided with a central work member for altering an opposed element when said bellows unit is expanded, said swivel movement permitting the bellows unit to align the work member with the opposed element during use.

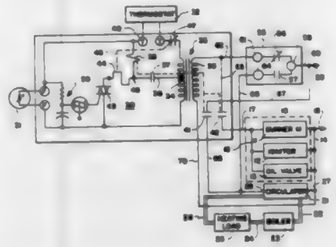
4,690,324

OIL BURNER CONTROL FOR HYDRONIC SYSTEM

Donald J. Kasprzyk, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1986, Ser. No. 879,733
Int. Cl.⁴ F24D *3/00*
U.S. Cl. 237—8 R **5 Claims**

1. A control for an oil burner heated boiler connected to a hydronic system having a circulator, including: oil burner control means having a step-down transformer and connection means for powering said oil burner control means and adapted to be controlled by a thermostat; said burner control means further including relay means having a plurality of normally open relay contacts with said contacts being operated to a closed state in response to the operation of said thermostat; a first of said relay contacts latching said relay means into an operated state upon operation of said thermostat; boiler water temperature limit control means having a high temperature limit switch that open circuits upon the water in said boiler reaching an upper temperature limit; said limit control means including a further switch means that closes when said high temperature limit switch opens; said high temperature limit switch including connection means connecting said oil burner control means, said oil burner, and a second normally open relay contact of said relay means in a first circuit means which is adapted to be connected to a line voltage source to energize



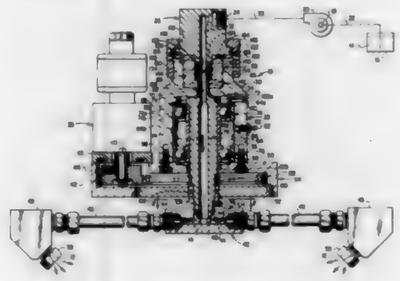
said oil burner and said oil burner control means when said water in said boiler is below said upper temperature limit; and circulator energizing means including a second circuit means adapted to connect said circulator to said line voltage source through said further switch means when said further switch means closes to cause said circulator to operate when said high temperature limit switch is open circuited.

4,690,325

HIGH PRESSURE FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Butterworth Jetting Systems, Inc., Houston, Tex.

Filed Sep. 17, 1986, Ser. No. 908,280
Int. Cl.⁴ B05B *3/02*
U.S. Cl. 239—124 **25 Claims**



1. High pressure fluid delivery apparatus comprising:
(a) wall means defining a housing having intercommunicating first and second chambers;
(b) a hollow, open-ended fluid delivery shaft extending through said first chamber, said shaft having an inlet end portion projecting into said second chamber, and an outlet end portion;
(c) bearing means, positioned within said first chamber, for supporting said shaft for rotation relative to said housing, said bearing means defining with the interior surface of said first chamber a subchamber interposed between said bearing means and said second chamber;
(d) means for rotating said shaft relative to said housing;
(e) means, carried by said outlet end portion of said shaft for rotation therewith, for converting high pressure fluid discharged from said outlet end portion of said shaft to a high pressure spray;
(f) an inlet member having an inlet opening for receiving high pressure fluid from a source thereof, a discharge portion facing and spaced from said inlet end portion of said shaft and adapted to discharge high pressure fluid into and through said shaft, and an internal flow passage extending from said inlet opening outwardly through said discharge portion;
(g) seal means, removably positioned in said second chamber, for sealingly and rotatably interconnecting facing portions of said inlet end portion of said shaft and said discharge portion of said inlet member;
(h) means, removably connected to said housing, for captively associating said inlet member and said seal means with said housing; and
(i) means for directly venting said subchamber to limit fluid pressure within said housing caused by leakage of high pressure fluid past said seal means into said housing.

4,690,326

SPRAYING EQUIPMENT

David C. Gill, Bristol, United Kingdom, assignor to Nomix Manufacturing Co. Limited, Bristol, United Kingdom

Filed Mar. 18, 1985, Ser. No. 713,185
Claims priority, application United Kingdom, Mar. 19, 1984, 8407068
Int. Cl.⁴ B05B *3/10;* **A62C** *31/02;* **F16K** *5/10;* **B25G** *3/02*
U.S. Cl. 239—223 **5 Claims**



1. A spraying head comprising a body and a rotary distribution element supported by the body, the body comprising:
a first body component having a projection which extends coaxially with the distribution element;
a second body component having an aperture in which the projection is situated, the second body component being connected rotatably to the first body component;
an annular gap defined between the projection and the periphery of the aperture;
an annular cavity defined between the first and second body components, the cavity communicating with the gap;
inlet means, opening into the cavity, for material to be sprayed;
a first opening provided in the second body component;
a plurality of second openings provided in the first body component, the first opening being movable selectively into alignment with the second openings by rotation of the second body component relatively to the first body component;
a plurality of metering orifices of different crosssectional area from each other, each metering orifice providing communication between a respective one of the second openings and the cavity; and
an inlet fitting which is removably insertable into the first opening and an aligned one of the second openings, thereby to retain the body components against rotation relative to each other.

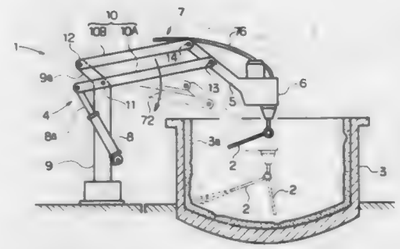
4,690,327

HOT GUNNING ROBOT FOR FURNACE LINING

Kiyoshi Takai, Nishinomiya, and Akinori Kaseya, Ashiya, both of Japan, assignors to Godo Steel, Ltd., Osaka, Japan

Filed Jan. 31, 1986, Ser. No. 824,835
Int. Cl.⁴ B05B *3/02*
U.S. Cl. 239—226 **9 Claims**

1. A hot gunning robot for applying a lining material to interior surfaces of a furnace to obtain a furnace lining, comprising:
support base means;
a shifting arm operatively connected to the support base means and a nozzle carrier attached to the shifting arm;
parallelogram-link means connecting the support base means to the shifting arm for moving said shifting arm in a constant orientation between a first position wherein said nozzle carrier and shifting arm are located substantially entirely outside said furnace and a second position wherein said nozzle carrier is inside the furnace, said parallelogram-link means being substantially entirely located outside the furnace in either the first or second position of the nozzle carrier;
a substantially vertical feed pipe rotatably mounted in said nozzle carrier;



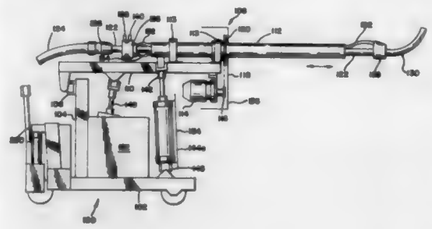
a gunning nozzle and means for connecting the nozzle to the pipe for supplying lining material to the nozzle through the pipe, said connecting means including
a cylindrical nozzle supporter with an inlet port communicating with the lower end of said feed pipe;
said gunning nozzle having nozzle base means fitted on said cylindrical nozzle supporter for allowing the gunning nozzle to tilt in relation to the vertical feed pipe and thereby supply lining material to substantially entirely all interior surfaces of the furnace, wherein said cylindrical nozzle supporter has a wide angle outlet port defined by side wall means divergently flared in the downstream direction of feed and a guide vane connected to the nozzle supporter and located within the nozzle supporter between said outlet port and said inlet port.

4,690,328

SPRAYING MACHINE

Franz Roehl, Frankfurt am Main, Fed. Rep. of Germany, assignor to Bentonspritz Nasegubeb GmbH Co., Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,655
Int. Cl.⁴ B05B *3/00*
U.S. Cl. 239—227 **14 Claims**



1. A spraying device including a stationary frame having a base, an arm universally pivoted at one end on said base and having a free end with an application nozzle on said free end, at least a pair of ground-engaging wheels on one end of said base, extensible support means on an opposite end of said base, and a three-wheel power driven truck including a drive wheel

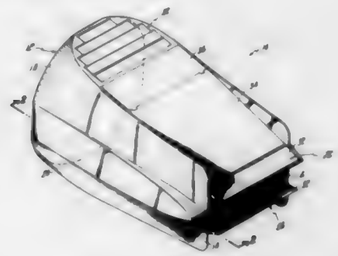
and a pair of retractable jack wheels, said truck having a movable fork, said one end of said base having slot means receiving a free end of said fork, said free end of said fork abutting a surface of said slot means to support said fork with said fork being in engagement with and supporting said base by said opposite end so that said extensible support means and retractable jack wheels can be retracted and said stationary frame and truck become one unit supported by said ground-engaging wheels and said drive wheel and said power driven truck can be used to position said application nozzle with respect to a working surface.

4,690,329

EXHAUST NOZZLE COUPLED WITH REVERSER EXHAUST DOOR

William M. Madden, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1984, Ser. No. 667,707
Int. Cl.[4] B63H *11/10*
U.S. Cl. 239—265.19 **4 Claims**



1. An exhaust nozzle assembly for an aircraft engine, said engine having a centerline and comprising:

exhaust duct means including means defining reverse flow outlet means, said exhaust duct means having spaced apart stationary sidewall means; and

an upper and lower flap assembly each including a nozzle flap having a forward edge and rearward edge, said nozzle flaps each extending between and pivotally secured to said sidewall means, said flaps being spaced apart and rotatable about respective parallel axes and forming between them a gas flow path having an exit area defined by said flap rearward edges and said sidewall means, said nozzle flaps being rotatable through a range of forward thrust positions and a range of reverse thrust positions including a full reverse thrust position wherein said rearward edges meet at said engine centerline and said exit area is reduced to zero, each flap assembly including:

(A) blocker door means extending between and pivotally connected to said sidewall means and rotatable about said axis of said nozzle flap of its respective flap assembly from a closed position which blocks said outlet means to an open position which unblocks said outlet means, said respective nozzle flap including seal means along its forward edge in sealing contact with said blocker door means in all positions of said respective nozzle flap to prevent exhaust gases from escaping between said blocker door means and said respective nozzle flap; and

(B) actuation means connected to said blocker door means and respective nozzle flap and adapted to

(1) rotate said nozzle flap through its range of forward thrust positions and its range of reverse thrust positions;

(2) maintain said blocker door means stationary and in its closed position as said respective nozzle flap moves through its range of forward thrust positions; and

(3) rotate said blocker door means from its closed position to its open position about said respective nozzle flap axis as said nozzle flap is rotated through its range of reverse thrust positions, said respective nozzle flap adapted to direct the engine exhaust through said outlet means when said blocker door means is in its open position

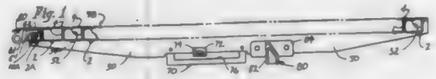
wherein said actuation means includes a cam track connected to said respective flap means for rotation therewith, said actuation means also including a cam follower and linkage means connected to said cam follower, said linkage means having a first end pivotally connected to one of said sidewall means and a second end operably connected to said blocker door means, said cam follower being disposed within said cam track, said cam track being adapted to maintain said linkage means substantially stationary as said flap means rotates through its range of forward thrust positions and adapted to move said second end of said linkage means to rotate said blocker door means to its open position as said flap means rotates through its range of reverse thrust positions.

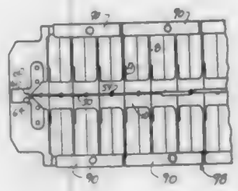
4,690,330

LOUVERED SEAL FLAP EDGE STIFFENER

Ronald L. Robinson, Palm Beach Gardens, and Fred L. Honeycutt, Jr., Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1985, Ser. No. 804,021
Int. Cl.[4] F02K *1/06*
U.S. Cl. 239—265.39 **6 Claims**





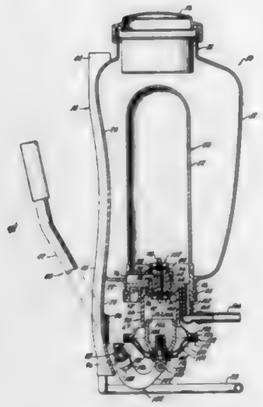
1. An exhaust nozzle flap having an inner hot flow directing side and an outer side; said nozzle flap having a forward end, a rearward end, and two side edges; said nozzle flap including a longitudinal series of louver elements between the forward end and rearward end; said series of louver elements each having a forward U-section; said U-section having an integrally connected forward leg, bottom portion, rearward leg, and open end; a plate member extending rearwardly from the rearward leg at the open end of each forward U-section, said forward leg of each U-section being located against the rearward leg of each forward adjacent U-section and fixed thereto; each plate member extending rearwardly over the open end of the rearward adjacent U-section, said plate members forming the inner hot flow directing side of the nozzle flap; beam means extending longitudinally along said U-sections and fixed thereto; said plate members each having side ends, said side ends forming side edges of the nozzle flap; stiffener means covering the length of the side edges of the nozzle flap; means fixing said stiffener means to the side edges of the nozzle flap.

4,690,331

SPRAYER AND DIAPHRAGM PUMP THEREFOR

Pedro W. Luchsinger, Kilometer 445 of the Panamericana Road, Lagos de Moreno 047400, Jalisco, Mexico

Continuation of Ser. No. 616,012, May 31, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 848,786
Claims priority, application Mexico, Jun. 6, 1983, 197539
Int. Cl.[4] B05B *9/043*
U.S. Cl. 239—333 **6 Claims**



1. A manually operated sprayer for dispensing liquid insecticides, herbicides or pesticides comprising

a liquid container having a first sealable opening for receiving liquid to be dispensed from the container, and having a second opening,

a pressure vessel mounted within said container and sealed to said second opening, said pressure vessel having an internally threaded pump-receiving fitting communicating with the interior thereof and with said container, said pressure vessel having a discharge fitting providing communication between the interior thereof and ambient atmostphere,

a pump housing having a generally cylindrical section and having a connecting section coaxial with said generally cylindrical section and detachably secured and sealed to said pump-receiving fitting of said pressure vessel, a downwardly and outwardly flared chamber section integral with said cylindrical section at an end remote from said connecting section and having an outwardly extending peripheral flange,

a cover section having an outwardly extending peripheral cover flange,

a peripheral groove formed in one of said flanges,

a stiff but resilient generally bell shaped diaphragm having a peripheral edge thereof secured to and between said flanges and having a normal inverted orientation for forming a liquid receiving pumping chamber within said pump housing between said diaphragm and said connecting section,

said diaphragm having a flat central portion lying in a plane displaced from the plane of said diaphragm peripheral edge and connected to said diaphragm peripheral edge by an integral dome shaped intermediate portion, whereby the central portion moves between extreme positions that are spaced from one another by a distance that is a major fraction of the diaphragm radius, and whereby the intermediate portion flexes and reverses its curvature during pumping action, and whereby the stiff but resilient diaphragm provides an over-the-center snap type action that tends to return the diaphragm to hold it in its normally inverted orientation,

said diaphragm having a peripheral bead received in said peripheral groove,

a continuous peripheral clamping ring extending around and over both said flanges and clamping said flanges and the interposed diaphragm edge therebetween to thereby securely hold said flanges and interposed diaphragm in interconnected and sealed relation, said clamping ring, flanges and diaphragm peripheral edge being free of fastening apertures,

a rigid circular diaphragm cap on said diaphragm adjacent said cover section,

an actuating lever pivotally mounted to said container and having an end pivoted directly to said diaphragm cap whereby at least portions of the diaphragm are driven in an arcuate path during said pumping and suction strokes, thereby tending to distort the diaphragm and tending to cause it to bend asymmetrically,

said cylindrical housing section including a cylindrical guide section,

a hollow guide piston having a closed end and having a diameter slightly less than the diameter of said cylindrical guide section, said hollow guide piston extending from said diaphragm into sliding and guiding engagement with the interior of said cylindrical guide section, said hollow guide piston having at least an end portion thereof positioned within said guide section during all positions assumed by the diaphragm during said pumping and suction strokes,

fastener means having an end contained within said hollow piston and extending through said closed end and through said diaphragm for holding said hollow piston and said diaphragm cap rigidly clamped together with said central diaphragm portion interposed therebetween, whereby only said dome shaped intermediate diaphragm section bends during said pumping and suction strokes, and

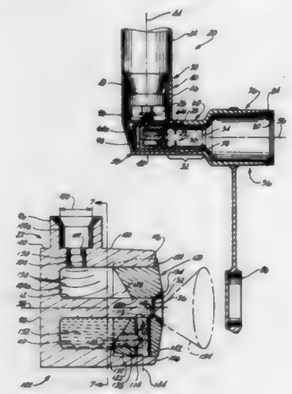
valve means in said connecting section and one end of said guide section for controlling flow to and from said pumping chamber.

4,690,332

SINGLE INLET PREPACKAGED INHALER

Nathaniel Hughes, 1934 Sonora Rd., Palm Springs, Calif. 92662

Continuation-in-part of Ser. No. 555,703, Nov. 28, 1983, Pat. No. 4,635,857. This application Sep. 18, 1984, Ser. No. 652,754
Int. Cl.[4] A61M *11/06*
U.S. Cl. 239—338 **1 Claim**



1. An inhaler for administering a medicine containing aerosol, comprising

an inlet having a first axis for accepting a discharge tube of a container containing a propellant and a medicant;

a transducer body having a second central axis along a

length of the body and coupled to the inlet wherein the second central axis is normal to a plane containing the first axis and wherein the transducer body comprises an outlet;

a central cylindrical bar coaxial with the second central axis, extending substantially the length of the body and having a free end with a groove formed longitudinally in an outer surface of the bar;

a lens mounted on the free end of the bar to form a substantially airtight fit between the lens and the outer surface of the bar and at least partly within the body;

a first expansion chamber defined by first chamber walls adjacent the body downstream from and adjacent the outlet;

a second expansion chamber defined by second chamber walls downstream from and adjacent the first expansion chamber; and

a screen mounted to an end of the second expansion chamber.

4,690,333

MEDIA MIXING NOZZLE ASSEMBLY

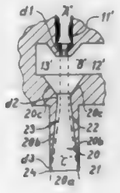
Lars-Erik Johansson, Växjö , Sweden, assignor to Fläkt AB, Nacka, Sweden

Filed Apr. 2, 1985, Ser. No. 719,236

Claims priority, application Sweden, Dec. 4, 1984, 8406144

Int. Cl.⁴ B05B *7/04*

U.S. Cl. 239—434.5 **10 Claims**



1. A media mixing nozzle assembly arranged in a contact reactor, said nozzle assembly being arranged partly to enable a first medium to be mixed with a second medium, and partly to cause the resultant mixed medium to be mixed with and to be used to cleanse a contaminated medium fed to the contact reactor, said mixed medium containing an absorption substance, which reacts with the impurities contained in the contaminated medium, whereby said first medium and said second medium are passed, under an overpressure, to a chamber in the nozzle assembly for mixture therein, wherein said chamber is connected to a channel intended for the mixture and having a cross-section which diverges away from said chamber by a degree such that the pressure adjacent the mouth of the channel coincides substantially with the surrounding pressure of the contaminated medium at said channel mouth wherein the channel cross-section diverges from the chamber and has a form which, with respect to prevailing pressure and as a result of irreversible effects, causes a reduction in both speed and pressure while the mixture passes the channel.

4,690,334

AUTOMATICALLY ADJUSTABLE SHOWER HEAD TO MAINTAIN CONSTANT PRESSURE SPRAY

Martin W. Dalton, Solihull, United Kingdom, assignor to Triton Aquatherm Limited, Warks, England

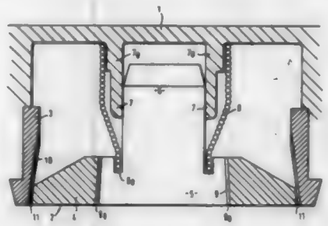
Filed Feb. 25, 1985, Ser. No. 705,081

Claims priority, application United Kingdom, Feb. 25, 1984, 8404976

Int. Cl.⁴ B05B *1/18, 1/30*

U.S. Cl. 239—452 **12 Claims**

1. A water spraying device comprising: a spray head and means for supplying water under pressure to a chamber located within said head, said head including a face element comprising a plurality of annular concentric spray rings, each ring having an inner and an outer peripheral wall extending axially of said face element, the outer peripheral wall of one ring lying adjacent the inner peripheral wall of a second ring, a plurality of spray ring apertures communicating with said chamber being formed by axially directed serrations cut in the peripheral wall of at least one of said adjacent rings to define a



spray pattern of water emitted from said apertures, wherein the pressure of water emitted from said apertures is controlled by means for automatically varying the size of the apertures in response to changes in water pressure whereby the pressure of water emitted from said apertures is maintained substantially constant at variable water input pressures.

4,690,335

METHODS AND APPARATUS FOR TWO-STAGE CRUSHING

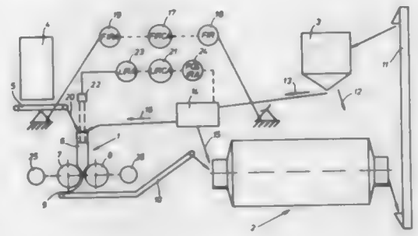
Tyark Allers, Sendenhorst, and Gotthardt Blaszczyk, Beckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,946

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520069

Int. Cl.⁴ B02C *25/00*

U.S. Cl. 241—24 **4 Claims**



1. In a two-stage method of crushing brittle material wherein fresh material is delivered via a filling chute to a first roll mill having a pair of spaced apart rotary rolls, agglomerates from the roll mill are passed to a second mill, the discharge of said second mill is sifted to separate finished material and grit, and grit is returned to at least one of said mills for further crushing, the improvement comprising rotating the rolls of said roll mill at a substantially constant speed, adjusting the quantity of fresh material delivered to said filling chute in generally inverse relationship to the total quantity of returned grit to keep the sum of the quantities of fresh material and grit being processed constant during fluctuations in grindability of said fresh material, delivering to said first roll mill a quantity of said returned grit sufficient to maintain a substantially constant level of grit and fresh material in said filling chute irrespective of fluctuations in the adjusted quantity of fresh material supplied, and delivering the remaining quantity of said returned grit directly to said second mill.

4,690,336

APPARATUS AND METHOD FOR DRIVING RAW SAUSAGE MEAT PROCESSING CUTTER

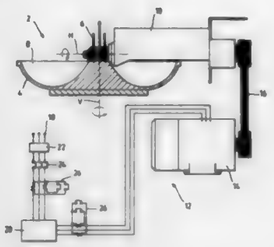
Tsuyoshi Higashimoto, Ikoma, Japan, assignor to Higashimoto Kikai Co., Ltd., Japan

Filed Oct. 21, 1985, Ser. No. 789,394

Claims priority, application Japan, Oct. 31, 1984, 59-231097

Int. Cl.⁴ B02C *25/00*

U.S. Cl. 241—30 **5 Claims**



1. An energy-efficient, raw sausage meat processing apparatus, comprising:

(a) a bowl for containing raw sausage meat lumps to be processed;

(b) means for mixing and comminuting the meat lumps, including a rotary cutter rotatably driven in the bowl;

(c) a frequency-controlled, variable speed, AC drive motor having a plurality of poles and energized by an electrical power source, said motor having an output shaft on which the cutter is mounted for rotation at low speeds for mixing and coarsely cutting the meat lumps, and at high speeds for mixing and finely cutting the meat lumps; and

(d) control means for controlling the motor speed as a function of frequency and the number of poles for the motor, including a frequency converter operatively connected between the power source and the motor, and means for adjusting the frequency of the converter for changing the motor speed to a desired energy-efficient magnitude appropriate for processing the meat lumps without spoiling their inherent flavor.

4,690,337

ROLL CUTTING MACHINE FOR COMMINUTION OF BULKY REFUSE

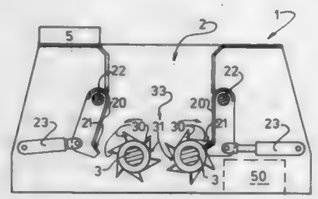
Jakob Stiefel, Lindenhof 4, 8604 Volketswil, Switzerland

Filed Dec. 16, 1985, Ser. No. 809,326

Claims priority, application Switzerland, Jul. 17, 1985, 3105/85

Int. Cl.⁴ B02C *13/00*

U.S. Cl. 241—36 **10 Claims**



1. A roll cutting machine for comminution of bulky refuse, comprising:

a charging hopper;

two rolls arranged substantially axially parallel to each other;

rotary drive means for rotatably driving said two rolls in opposite directions of rotation;

said two rolls forming a common roll gap therebetween;

each one of said two rolls being provided with a predetermined number of axially spaced annular zones;

each one of said predetermined number of annular zones being provided with a related roll tooth;

each roll tooth of each annular zone of each roll being radially spaced from the related roll tooth at the annular zone of the other roll of said two rolls so that the roll teeth at said two rolls fail to overlappingly interleave with one another at the region of the common roll nip;

said charging hopper possessing two hopper wall sections each of which is arranged adjacent a related one of said two rolls;

said rotary drive means rotatably driving said two rolls in said opposite directions of rotation such that each one of said two rolls is rotatably driven in a direction away from the top side of said common roll gap towards a related one of said two hopper wall sections which is arranged adjacent each said related roll;

each one of said two hopper wall sections containing a lower region and being provided in said lower region with a predetermined number of hopper teeth and tooth spacings therebetween;

said predetermined number of hopper teeth being displaceable between an operative position and an inoperative position;

each roll tooth of each one of said two rolls, when said two rolls are rotatably driven by said rotary drive means, cuttingly passing through a related one of said tooth spacings between related ones of said hopper teeth of a related one of said two hopper wall sections and in said operative position of said predetermined number of hopper teeth;

means for displacing a preselected number of said predetermined number of hopper teeth of each one of said two hopper wall sections into said inoperative position in response to the action of a predetermined force effective between said preselected number of hopper teeth and related ones of said roll teeth;

said displacing means serving to displace said hopper teeth away from said related one of said two rolls into said inoperative position;

said preselected number of said hopper teeth of each of said two hopper wall sections being pivotably displaceable in response to the action of said predetermined force and between said operative position and said inoperative position by pivoting said preselected number of said hopper teeth about a predetermined pivot axis which extends axially parallel to said related one of said two rolls in order to prevent blockage of the charging hopper by the bulky refuse.

4,690,338

SOLID FUEL PULVERIZER FOR PULVERIZED FUEL BURNING SYSTEM

William H. Sayler, Salt Lake City, and Justin C. White, Magna, both of Utah, assignors to T.A.S., Inc., Magna, Utah

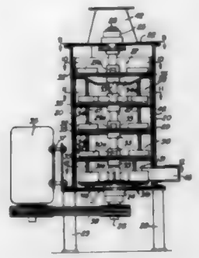
Division of Ser. No. 588,900, Mar. 12, 1984, Pat. No. 4,531,461, which is a continuation of Ser. No. 378,347, May 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,267, Dec. 15, 1980, abandoned. This application Mar. 8, 1985, Ser. No. 709,911

Int. Cl.⁴ B02C *13/288*

U.S. Cl. 241—56 **9 Claims**

1. A solid fuel pulverizer, comprising a vertical shaft rotatably mounted in a vertically positioned substantially cylindrical housing having a top wall, cylindrical side wall, and bottom wall; a series of horizontal impellers fixed to said shaft in mutually spaced arrangement and terminating short of but relatively close to said housing to define therewith relatively narrow peripheral flow space therearound, said impellers being provided with air-motivating, solid particle impact members

thereon, and the inside face of the cylindrical side wall of said housing being provided with mutually spaced, substantially vertical, impact bars positioned within said flow space; a series of annular, substantially flat and horizontal partitions fixed to the housing, the individual partitions thereof extending peripherally inwardly thereof between mutually adjacent impellers, each of said individual partitions being spaced closely below



and underlying a corresponding impeller to direct flow toward the axis of said shaft in opposition to centrifugal force exerted by the impellers; air inlet means in said top wall of the housing for introducing primary air to provide a carrier stream of air; solid fuel inlet means also in said top wall of the housing for introducing solid fuel to be pulverized; discharge conduit means adjacent to the lower end of the housing; and means for rotating the impeller shaft.

4,690,339
HAMMER MILL

Richard Schultz, Morschwil SG, CH-9402 Morschwil, Switzerland

PCT No. PCT/CH85/00183, § 371 Date Aug. 29, 1985, § 102(e) Date Aug. 29, 1985, PCT Pub. No. WO86/03990, PCT Pub. Date Jul. 17, 1986
PCT Filed Dec. 30, 1985, Ser. No. 912,249
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1985, 3500032; Switzerland, Dec. 23, 1985, 05521/85
Int. Cl.⁴ B02C *13/286*
U.S. Cl. 241—73 **7 Claims**

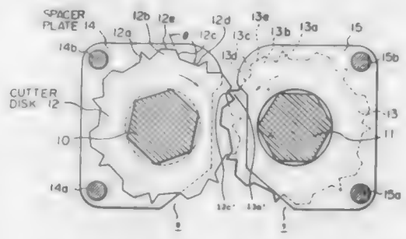


1. A hammer mill having a grinding chamber, a rotor with hammers or beaters, and means for feeding coarse material and discharging a product of reduced size, said grinding chamber being arranged substantially horizontally, said rotor being supported on a vertical axis, said means for feeding coarse material and discharging a product comprising a plurality of supply ducts with corresponding inlets for feeding said coarse material for size reduction and a plurality of discharge ducts with corresponding outlets for discharging said product of reduced size from said grinding chamber, said supply ducts and discharge ducts being arranged on the periphery of said grinding chamber in such manner that each supply duct with its inlet is associated with a corresponding discharge duct with an adjacent outlet, said outlets each being positioned between two inlets on the periphery of said grinding chamber, whereby said grinding chamber is subdivided peripherally into a corresponding number of mill segments each of which is defined by an inlet and a corresponding outlet.

4,690,340
WASTE MATERIAL SHREDDER

Takefumi Hatanaka, No. 1-4-13, Midori-cho, Koganei-shi, Tokyo, Japan

Continuation of Ser. No. 689,272, Jan. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 465,969, Feb. 14, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 880,638
Claims priority, application Japan, Feb. 12, 1982, 57-17236; Jul. 19, 1982, 57-125582
Int. Cl.⁴ B02C *13/20*
U.S. Cl. 241—236 **8 Claims**

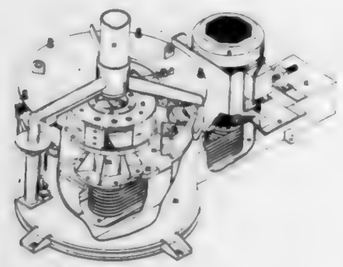


1. A waste material shredding apparatus for converting sheets of waste material into small chips, comprising:
a supporting frame;
first and second counter-rotating cutter rollers;
mounting means for mounting said first and second cutter rollers in said supporting frame for rotation about respective axes thereof;
first and second sets of spacer plates fixedly mounted on said supporting frame;
said first and second cutter rollers comprising first and second roller shafts, respectively, disposed mutually parallel to each other, and first and second sets of cutter disks pointed coaxially along said first and second shafts, respectively, with adjacent ones of said first set of cutter disks being mutually separated by one of said first set of spacer plates, and adjacent ones of said second sets of cutter disks being mutually separated by one of said second set of spacer plates, first fixing means fixing said first set of cutter disks to said first shaft, second fixing means fixing said second set of cutter disks to said second shaft, said mounting means mounting said first and second cutter rollers on said supporting frame to provide a mutual interacting relationship between said first and second sets of cutter disks in which the relative position between said first and second sets of cutter disks is repeatedly the same for each revolution of said first and second sets of cutter disks, each of said cutter disks having an outer peripheral surface which is concentric with a corresponding one of said axes of rotation;
a plurality of pairs of protrusions on each cutter disk, with each pair being formed at regular spacings around said outer peripheral surface, each of said pairs comprising a cutter tooth and a chip clearance protrusion leading the cutter tooth of that pair with respect to the direction of rotation of said each cutter disk, each of said cutter teeth and each of said chip clearance protrusions protruding radially outward from said peripheral surface, each of said cutter teeth having a tip portion formed with a sharp cutting edge which is disposed substantially parallel to said axes of rotation, each of said chip clearance protrusions having a blunt surface as viewed along the direction of rotation, each of said chip clearance protrusions having a leading face leading said chip clearance protrusion with respect to the direction of rotation thereof, said cutting edge defining the outermost radial boundary of each cutter tooth, and said blunt surface defining the outermost radial boundary of each chip clearance protrusion, the radial distance between said outermost radial boundary of each cutter tooth and the axis of rotation of its respective cutter disk being substantially equal to the radial distance between said outermost radial boundary of each chip clearance protrusion and the axis of rotation of its respective cutter disk,
said first and second fixing means and said mounting means providing said mutual interacting reationship so that each one of said cutter teeth on a first cutter disk on one roller shaft is repeatedly at a position in which the tip portion of said one cutter tooth overlaps a a pair of leading faces of a pair of chip clearance protrusions, respectively, formed on second and third cutter disks mounted on the other face of said roller shafts and disposed respectively on either side and closely adjacent to said first cutter disk, said overlapping relationship arising when said one cutter tooth on said first cutter disk and said pair of chip clearance protrusions on said second and third cutter disks are approaching one another, so that said pair of leading faces of said pair of chip clearance protrusions on either side of said one cutter tooth supports said waste material as said sharp cutting edge of said one cutter tooth penetrates said waste material to effect a cross-cut with minimal resistance and thereby produce a cross-cut waste chip;
the chip clearance protrusion on said first cutter disk which forms said pair of protrusions with said one cutter tooth and which leads said one cutter tooth in the direction of rotation of said first cutter disk being constructed to engage said waste chip which has just been cross cut and to push said just cut waste chip radially outwardly away from said one cutter tooth and downwardly to thereby remove the waste chip from the cutter apparatus, the aforesaid being sequentially repeated for each pair of cutter teeth and chip clearance protrusions on each cutter disk such as to preclude chip build-up and thereby provide jam-free operation.

4,690,341
IMPACT CRUSHER ROTATING IMPELLER TABLE

Mason R. Hise, P.O. Box 732, Placitas, N. Mex. 87043, and Neil R. Hise, P.O. Box 722, Placitas, N. Mex. 87048

Filed Feb. 3, 1986, Ser. No. 825,396
Int. Cl.⁴ B02C *23/00*
U.S. Cl. 241—275 **22 Claims**

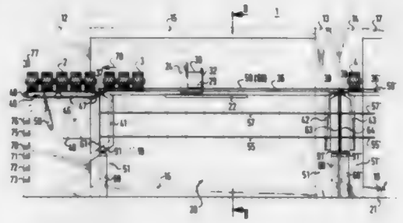


1. In a vertical axis secondary impact crusher, a rotating impeller table assembly comprising:
a rotatable housing having upper and lower annular end plates and a vertical axis of rotation, said housing having cylindrical walls containing side discharge ports;
a pair of vertical substantially parallel planar aggregate deflecting wall elements disposed between and essentially perpendicular to said flat annular end plates, said wall elements opposing one another equidistantly across said axis of rotation; upper and lower aggregate deflecting means removably mounted on said upper and lower flat annular plates, respectively, within said rotatable housing, said deflecting means comprising separate flat and ramped portions; and means removably attached to said cylindrical walls for directing aggregate from said housing through said side discharge ports onto impact surfaces located outside said housing.

4,690,342
TEXTILE MACHINE FOR PRODUCING CROSS-WOUND BOBBINS

Manfred Langen, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,816
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511735
Int. Cl.⁴ B65H *67/06*
U.S. Cl. 242—35.5 A **6 Claims**

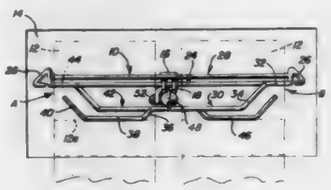


1. Textile machine for producing cross-wound bobbins, comprising a bobbin conveyor belt disposed along the length of the textile machine for receiving and transporting finish wound bobbins away from the textile machine, means for switching said bobbin conveyor belt on and off, a controllable bobbin depositing device, means for transferring the bobbin between said bobbin conveyor belt and said bobbin depositing device, and means for raising said bobbin depositing device for temporarily storing a row of bobbins from said conveyor belt on said bobbin depositing device with said transferring means at a distance above said bobbin conveyor belt greater than the height of the bobbins and for lowering said bobbin depositing device for returning a row of bobbins from said bobbin depositing device to said conveyor belt with said transferring means.

4,690,343
PAPER ROLL HOLDER WITH TENSION ARM

Harold E. Goetz, 1004 First, Dodge City, Kans. 67801

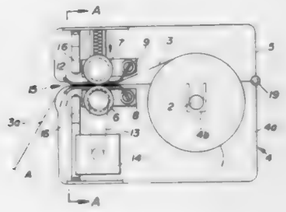
Filed Jan. 8, 1986, Ser. No. 817,118
Int. Cl.⁴ B65H *16/04*
U.S. Cl. 242—55.3 **14 Claims**



1. A paper roll holder of rod material formed to provide a support arm extending cantilever-wise from a support, and a tension arm extending from one end of the support arm in juxtaposed relation to the support arm, the tension arm being bent to define a roll engaging portion parallel to the support arm and shorter in length than the support arm for resilient

deformation of the tension arm toward the support arm and gripping of a paper roll pushed onto the holder from the opposite end of the support arm, said opposite end of the support arm being formed as a headed end and the tension arm has a free terminal end portion inclined from said roll-engaging portion toward said headed end.

4,690,344
ROLL HOLDER
Mamoru Yokota, Yaizu, Japan, assignor to Yazaki Industrial Chemical Co., Ltd., Shizuoka, Japan
Filed Mar. 3, 1986, Ser. No. 835,763
Claims priority, application Japan, Feb. 18, 1986, 61-21898[U]
Int. Cl.⁴ B65H *19/00, 20/02;* B26F *3/00*
U.S. Cl. 242—55.53 **1 Claim**



1. A roll holder for holding rotatably a roll of consecutive thin-film-like products which are separable along a break line provided between individual units of said products and for paying out a succeeding product up to a given position upon separating a product from said roll along the break line, said holder having a body and a lid openable and closeable with respect to the body via a hinge,

said body, on an inside thereof, comprising:

holding means for holding rotatably a winding core so as to hand said roll;

a first feed roll disposed in parallel with said roll and having a circumferential groove, one end of said first feed roll being supported in a bearing and another end of said first feed roll passing through a hold of a bulkhead and having a sprocket attached thereto, said sprocket being drivingly coupled via a chain to a motor;

a lower product guide arranged along said circumferential groove and attached to a mounting piece; and

a detector means, spaced a given distance from said first feed roll in a pay-out path along which said consective thin-film-like products move and stop, for detecting a succeeding product;

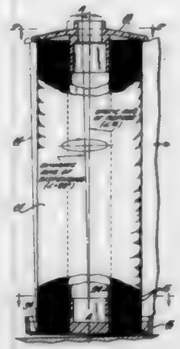
said lid, on an inside thereof, comprising:

a second feed roll held by slide bearings and accommodating springs and having a circumferential groove similarly to said first feed roll, said second feed roll pressing against said first feed roll when said lid is shut and locked by a lock mechanism; and

an upper product guide arranged at a position corresponding to said lower product guide and attached to a corresponding mounting piece; and

a control unit which, upon said detector means an absence of the succeeding product, causes said motor to rotate said first feed roll and thereby pay out the succeeding product a first distance and, upon said detector means detecting a presence of the succeeding product, causes said motor to rotate said first feed roll a certain amount in order to pay out said succeeding product a second distance.

4,690,345
PORTABLE DISPENSER FOR ROLLED PAPER PRODUCTS
John Corey, 27 W. End Ave., Haddonfield, N.J. 08033
Filed Mar. 31, 1986, Ser. No. 846,201
Int. Cl.⁴ B65H *19/00;* B65D *85/66*
U.S. Cl. 242—55.53 **5 Claims**

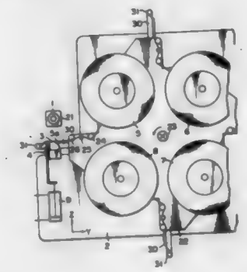


1. A portable dispenser for a roll of paper having a hollow inner core and two opposing axial ends, comprising:

a disc-like rotatable base member having an inwardly planar inner face and an upstanding retention means for firmly, non-rotatably engaging one axial end of the hollow inner core of a roll of paper, said base member having an outer face with a centrally located downward projection forming a pivot, said pivot providing means for supporting the base during rotation and an annular depending rib spaced radially outwardly of the pivot;

a cap member having an inwardly dished conical inner face and a downwardly extending rentention means for firmly, non-rotatably engaging the hollow inner core at the opposite axial end of the roll of paper, said cap member having an outer face with an upstanding projection providing means both for grasping the dispenser and for applying downward pressure on the cap member and dispenser assembly during paper sheet dispensing.

4,690,346
TAPE WINDING MACHINE
Kyoji Takeda, and Akira Kitai, both of Tokyo, Japan, assignors to Tanaka Seiki Co., Ltd., Tokyo, Japan
Filed Jan. 22, 1986, Ser. No. 821,540
Claims priority, application Japan, Jan. 25, 1985, 60-8787[U]
Int. Cl.⁴ B65B *11/04*
U.S. Cl. 242—56 R **2 Claims**



1. A tape winding machine for winding an adhesive cover tape around a wound coil mounted on a rotable spindle, said

spindle having an axis extending in a first direction, comprising:

a base movable in second and third orthogonal directions, said second and third directions being perpendicular to said first direction;

a tape table rotatably supported on said base, said tape table supporting a plurality of rolls of said adhesive cover tape and being rotatable about an axis extending in said first direction;

tape mechanism means for withdrawing said cover tape from one said plurality of rolls of tape, said means including

a plurality of arms extending from said tape table, one of said arms being associated with each of said rolls of cover tape;

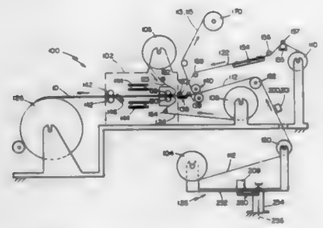
an axle secured to the end of each of said arms, each of said axles being rotatable about an axis extending in said first direction; and

at least one roller rotatable about an axis extending in said first direction interposed between said axle and its associated roll of cover tape, the end of a cover tape being withdrawable from a selected roll of tape and stuck to the axle associated with said selected roll of tape;

a pad supported by said base for movement in said second direction, said pad having a surface contacting said tape between said axle and said roller, the end of said tape being attached to the outer winding of said wound coil by movement of said pad in said second direction; and

a cutter supported by said base adjacent to said pad for movements in said second and third directions, said cutter being moved in said third direction to a predetermined position after the end of said tape has been attached to said wound coil and in said second direction to cut said tape.

4,690,347
SYSTEM FOR TRANSVERSELY ALIGNING A SUBSTRATE
Frederick G. J. Grise, Osterville, Mass., assignor to Flexwatt Corporation, Canton, Mass.
Continuation of Ser. No. 478,080, Mar. 23, 1983, abandoned.
This application Nov. 7, 1985, Ser. No. 796,012
Int. Cl.⁴ B65H *23/032*
U.S. Cl. 242—57.1 **8 Claims**



1. A system for transversely aligning a substrate moving from a supply roll along a generally longitudinal path, said system comprising:

a first guide roll the axis of which is perpendicular to said path and generally parallel to the desired path of said substrate;

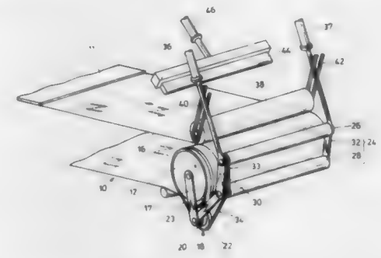
a movable guide roll intermediate said supply roll and said first guide roll, said movable guide roll being mounted such that its axis is rotatable relative to the axis of said first guide roll in a plane parallel to the axis of said first guide roll about an axis of rotation perpendicular to the axis of said first guide roll,

a sensor intermediate said movable guide roll and said first guide roll for sensing the transverse position of substrate moving from said movable guide roll towards said first guide roll and producing a signal when the sensed transverse position of said substrate is other than a desired transverse position; and

a drive operatively connected to said mounted guide roll for rotating said movable guide roll axis about said axis of rotation in response to a said signal to shift said substrate towards said desired transverse position,

said supply roll and said movable guide roll being mounted on a support with the axes thereof parallel to and spaced from each other, and said support being rotatable about said axis of rotation.

4,690,348
APPARATUS FOR WINDING A SHEET-FORMED ARTICLE
Kenji Watanabe; Hiroshi Kato, both of Aichi, and Katsunori Onishi, Shinsakae, all of Japan, assignors to Inoue Mtp Kabushiki Kaisha, Nakamura, Japan
Filed Sep. 26, 1985, Ser. No. 780,592
Claims priority, application Japan, Nov. 21, 1984, 59-177133[U]
Int. Cl.⁴ B65H *18/08*
U.S. Cl. 242—66 **20 Claims**



1. An apparatus for winding a sheet-formed article, comprising:

conveyor means for transporting said sheet-formed article in an advancing-winding direction;

a takeup member, disposed adjacent to said conveyor means for forming a nip through which said sheet-formed article is to be conveyed, upon which said sheet-formed article is to be wound;

means movably disposed between a first position upon one side of said nip and at which said means is disengaged from said sheet-formed article, and a second position upon the opposite side of said nip and at which said means is engaged with said sheet-formed article for causing a free end portion of said sheet-formed article to become wrapped about said takeup member;

transmission driving means, mounted upon said conveyor means for movement with respect to said conveyor means along with said movably disposed means when said movably disposed means is moved between said first and second positions and drivingly interconnecting said movably disposed means and said conveyor means, for driving said movably disposed means, in response to the transportation drive movement of said conveyor means, in said advancing-winding direction whereby said movably disposed means can drivingly advance said free end portion of said sheet-formed article while said conveyor means can drivingly advance a remaining portion of said sheet-formed article; and

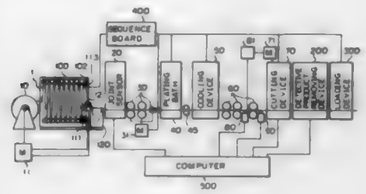
pressing means for tucking said free end portion of said sheet-formed article between said takeup member and said remaining portion of said sheet-formed article.

4,690,349

DEVICE FOR SUPPLYING A LONG LENGTH OF MATERIAL

Yoshimitsu Yamaguchi, Kariya; Tadahiko Shibata, Aichi; Masanori Suzuki, and Takezi Toda, both of Kariya, all of Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Jul. 3, 1985, Ser. No. 751,730
Claims priority, application Japan, Jul. 6, 1984, 59-138969
Int. Cl.[4] B65H *16/00, 23/185*
U.S. Cl. 242—75.5 11 Claims



1. A device for supplying a long length of a material such as a metal strip, a wire, a thread and the like, comprising:

material supply means adapted for holding and supplying the material;

means adapted for feeding the material from said device, said feeding means including:

feed rollers adapted for passing said material into into said feeding means; and

a casing having an inlet side adjacent said feed rollers, and an outlet side, said outlet side having an opening therein adapted for passing said material therethrough to cause said material to be held in said casing in a sagging state between said inlet and outlet sides;

an accumulator disposed between said material supply means and said feeding means, said accumulator including a substantially horizontal fixed bridge, first rollers rotatably mounted on said fixed bridge each first roller rotating about a substantially horizontal axis, a substantially horizontal movable bridge disposed below said fixed bridge, and second rollers rotatably mounted on said movable bridge each second roller rotating about a substantially horizontal axis, said first and second rollers being positioned with respect to each other to cause the material supplied by said material supply means to pass alternately over said first and second rollers aand then fed to said feeding means, said movable bridge moving vertically through a first horizontal position, a second horizontal position which is located above said first position, and a third horizontal position located above said second horizontal position; and

means for controlling said material supply means and said feeding means, said controlling means including first, second, and third limit switches provided at said first, second and third positions, respectively, and a projection engagable with said first, second, and third limit switches and connected to said movable bridge, said first second and third limit switches outputting signals when said projection engages said first, second and third limit switches, respectively;

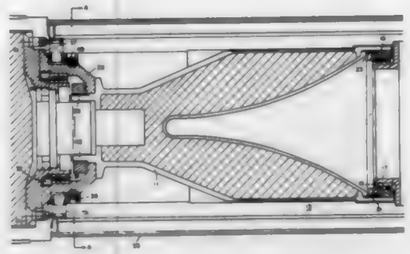
said controlling means controlling said material supply means to suspend supply of said material after said movable bridge reaches one of said first position and said third position and controlling said material supply means to supply said material after said movable bridge moves to said second position.

4,690,350

DESPINNING MECHANISM

Vincent A. Grosso, Hopkinton; Raymond J. Estlick, Winchester, and William A. Zarr, Concord, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 19, 1985, Ser. No. 811,039
Int. Cl.[4] F42B *15/02*
U.S. Cl. 244—3.1 2 Claims



1. In a spinning projectile carrying a shaped charge warhead, an arrangement for despinning such warhead during the terminal phase of flight of such projectile, such arrangement comprising:

(a) first means disposed between the spinning projectile and the shaped charge warhead for mounting such warhead within such projectile, the first means comprising:

(i) a pair of journal bearings disposed between the spinning projectile and the shaped charge warhead;

(ii) locking means disposed between the spinning projectile and the shaped charge warhead for inhibiting relative rotational movement between such projectile and warhead;

(b) second means for effectively increasing the moment of inertia of the shaped charge warhead whereby the speed of rotation of such warhead is reduced substantially to zero radians per unit time; and

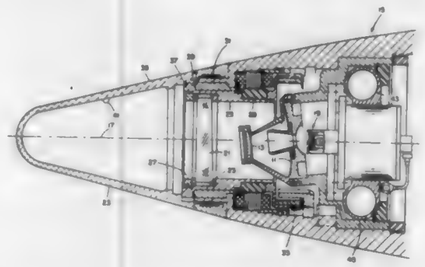
(c) means, operative during the terminal phase of flight, for removing the locking means then to allow relative movement between the spinning projectile and the shaped charge warhead.

4,690,351

INFRARED SEEKER

Richard A. Beckerleg, Boxford, Mass.; Mark R. Fernald, Amherst, N.H.; Richard R. LaTorre, Bedford, and Vincent A. Grosso, Hopkinton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 11, 1986, Ser. No. 828,413
Int. Cl.[4] F41G *7/26*
U.S. Cl. 244—3.16 2 Claims



1. For use in a spinning projectile, an infrared seeker comprising:

(a) an optical wedge fabricated from germanium and prestressed, such wedge serving as the entrance of a Cassegranian telescope having a small field of view;

(b) means for rotatably mounting the optical wedge about the longitudinal axis of such telescope to provide the gimbal function for the Cassegranian telescope; and

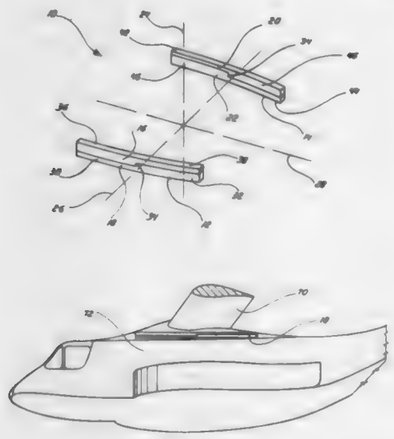
(c) means for producing a signal indicative of the orientation of the optical wedge with respect to the longitudinal axis which, when combined with an on-board spin timing measurement and I.R. detector output properly signal processed, will supply, in inertial coordinates, the time rate of change of the target's angular position without regard to the projectile's angular or positional motion to guide to intercept with the target.

4,690,352

AIRCRAFT ROTATING WING SEAL

Stephen F. Abdenour, Akron, and Stephen M. Polstra, Parma, both of Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Jul. 28, 1986, Ser. No. 890,057
Int. Cl.[4] B64C *3/56*
U.S. Cl. 249—49 13 Claims



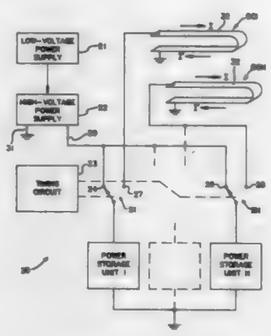
1. In an aircraft having a turntable mounted wing configured for rotation in a particular direction about a rotational axis from an inflight position wherein a longitudinal axis of the wing is substantially perpendicular to a longitudinal axis of a fuselage of the aircraft, to a stowage position wherein the longitudinal axis of the wing substantially parallels the longitudinal axis of the fuselage, and wherein a gap exists between the wing and fuselage while the wing is in the inflight position, the gap requiring sealing, a seal therefor comprising: (a) a seal element positioned to fill and seal the gap, the seal element including a pair of sections; (b) one of the sections being affixed to the fuselage, the remaining section being affixed to the wing; (c) the fuselage attached section including a forward portion and a rearward portion with respect to a direction of rotation of the wing from the inflight to the stowage position, each portion having a length, width, and thickness and the portions being separated by an inflection point; (d) the fuselage attached section forward portion having a thickness generally parallel to the rotational axis reduced by at least 1% from a corresponding thickness of the fuselage attached section rearward portion; and (e) the other section having corresponding forward and rearward portions configured to mate to the fuselage attached section portions to protluce a seal having a desired thickness in a direction generally parallel to the rotation axis.

4,690,353

ELECTRO-EXPULSIVE SEPARATION SYSTEM

Leonard A. Haslim, Hayward, and Robert D. Lee, San Mateo, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 31, 1985, Ser. No. 739,792
Int. Cl.[4] B64D *15/00*
U.S. Cl. 244—134 D 27 Claims



1. Apparatus comprising first and second opposed, flexible, ribbon-shaped, electrically conductive members, a resilient insulating member being of generally sheet-like configuration having first and second opposed surfaces, said first and second conductive members being embedded in spaced apart relationship and electrically isolated from each other in said resilient insulating member with said first and second conductive members being adjacent said first and second surfaces of said insulating member, respectively, said electrically conductive members being electrically interconnected so that any electrical current flowing in said first conductive member also flows in said second conductive member in a direction opposite to the flow in said first conductive member, said resilient insulating member having at least one void positioned between said first and second conductive members so as to facilitate separation between said first and second conductive members when electric current is routed through said conductive members and said conductive members repel each other, said void having a height less than the distance between said conductive members so that a portion of said insulating member is between said opposed conductive members.

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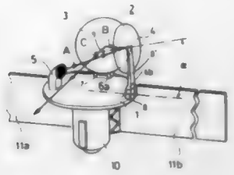
GEOSTATIONARY COMMUNICATIONS SATELLITE

Eberhard Frisch, Unterhaching, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,147
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516811
Int. Cl.[4] B64G *1/10*
U.S. Cl. 244—158 R 8 Claims

1. A sun-oriented geostationary communications satellite, comprising an operational module including unfoldable solar cell arrays directable toward the sun and payload carrier means directable toward the earth, said payload carrier means having a platform (1) defining a first reference plane, antenna means, means for foldably mounting said antenna means on said platform so that said antenna means are tiltable between a folded position and an operating position, said antenna means including a main reflector (3) and a subreflector (4), both said reflectors having approximately the same size, primary radiator means (5) operatively mounted on said platform (1), said primary radiator means, said main reflector, and said subreflector being oriented relatve to each other in said operating posi-

tion so that respective beams define a second plane oriented at an angle (α) relative to said first reference plane, said angle (α) being sufficiently small for permitting folding said main reflector and said subreflector into a compact package, said mounting means comprising only one folding axis for said main reflector and only one folding axis for said subreflector for folding both said reflectors into a position substantially in parallel to said reference plane and substantially in parallel to each other, whereby in the folded condition one of said reflectors is located between said platform and the respective other reflector.



4,690,355

SOLAR ENERGY COLLECTOR

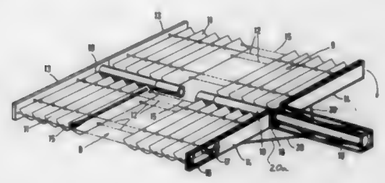
Ernst Hornung, Stuhr, and Dietrich Rex, Brunswick, both of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik Gmbh, Bremen, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 918,285

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536290

Int. Cl.[4] H02N *6/00*; B64G *1/44*

U.S. Cl. 244—173 **9 Claims**



1. Solar energy collector, including a plurality of parallely arranged strip-like curved mirrors, each having on its respective concavely curved front side a reflective surface and having solar cells on the surface of its respective convexly curved rear side, upon which solar cells of another of said mirrors concentrates solar radiation, the improvement comprising:

a telescopic mast;

frame means including two transverse bars connected to said mast, said mirrors being arranged between said bars;

a plurality of cables for suspending said mirrors in said parallel arrangement between said bars, for pivoting them equally so as to change their orientation vis-a-vis a source of radiation;

operating means connected to said cables for obtaining controlling adjustment; and

two control cables connected to said mirrors for purposes of their retraction as the mast is retracted.

9. The improvement as in claim 1, and including two said arrangements of transverse bars and mirrors extending from opposite sides of a space vehicle.

4,690,356

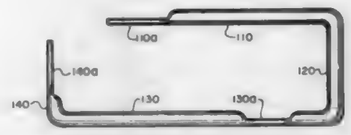
WIRE FORMED CABLE BRACKETS

James V. Koppensteiner, Chicago, and Charles K. Kubik, Brookfield, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed Dec. 30, 1985, Ser. No. 814,702

Int. Cl.[4] F16L *3/22*

U.S. Cl. 248—68.1 **1 Claim**



1. A bracket for use in an environment including cables and a supporting structure,

said bracket comprising a flexible material formed into an enclosure through which cables are inserted, whereby said flexible bracket causes said cables to be grouped together;

said bracket formed from wire, at least partially enclosing a pluraity of cables, and including an upper horizontal member, including at least a first area of swaged construction, said flattened area including a first hole for mounting said bracket to a supporting structure;

a left vertical member;

a lower horizontal member, including a second flattened area of swaged construction; and

a left vertical member, including a third flattened area of swaged construction, said third flattened area including a hole for mounting said bracket to a supporting structure.

4,690,357

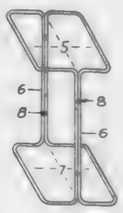
BAG STAND CONTAINER

James N. Webster, R.R. #3, Dundas, Ontario, Canada (L9H 5E3)

Filed Jun. 11, 1985, Ser. No. 743,413

Int. Cl.[4] B65B *67/04*

U.S. Cl. 248—99 **8 Claims**



1. A two legged bag stand capable of supporting an open top plastic or cloth bag; said stand comprising two closed U-shaped sections, each U-shaped section consisting of a series of eight straight sections, the ends of which are connected to each other by eight bends of approximately 90°, and means mechanically attaching said U-shaped sections back to back to make a bag stand frame having a top frame portion defining a top generally rectangular opening over which the top of an open bag may be attached, a similarly shaped bottom frame portion resting on the floor, and two vertically support members extending between said top and bottom frame portions.

4,690,358

HEIGHT-ADJUSTABLE FITTING FOR FURNITURE

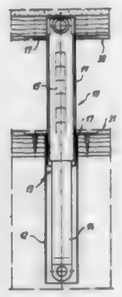
Franz Horenkamp, Bielefeld, Fed. Rep. of Germany, assignor to Ferdinand Lasch GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,135

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 8507806[U]

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—297.3 **3 Claims**



1. An adjustment fitting for a height-adjustable furniture furniture, comprising in combination

a guiding sleeve;

an elongated carrier post partially received in said guiding sleeve for shifting therein and defining a longitudinal axis;

a furniture part connected to one of said guiding sleeve and said elongated carrier,

said guiding sleeve and said carrier post having non-circular cross-sectional configurations;

means for arresting said carrier post in a multitude of shifted positions relative to said guiding sleeve, said arresting means being free of any lever means or pawl means and arranged within one of said guiding sleeve said and carrier post,

said arresting means including an outwardly projecting pocket in said guiding sleeve, said pocket having a downwardly tapering wedge-like configuration, and

a clamping roller made of synthetic material and extending transversely to the longitudinal axis of said carrier post, received in said pocket, and normally exerting a wedging effect,

whereby an independent descent of the furniture part under its own weight is prevented by said wedging effect, but said wedging effect may be overcome by exerting a certain predetermined force onto said furniture part, so that said furniture part may be brought into a rest position.

4,690,359

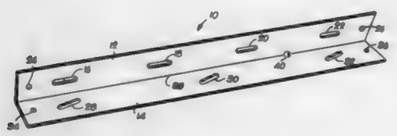
TAKE-UP BRACKET FOR FLOORING ADJUSTMENT

Randall L. Phillips, 8004 Belleview, Kansas City, Mo. 64114

Filed May 1, 1986, Ser. No. 858,383

Int. Cl.[4] A47F *5/00*

U.S. Cl. 248—300 **4 Claims**



1. An adjustment bracket adapted for operative connection to a supporting joist or rafter and an overlying supported section in order to move the supported section towards or away from the joist or rafter as desired, said bracket comprising:

an elongated, integral metallic body of generally L-shaped cross section and presenting a longitudinal axis, said body including

an elongated section-engaging leg and an elongated support-engaging leg, said section-engaging leg including structure defining a plurality of elongated first slots therein each being of substantially constant width throughout essentially the entire length thereof, said first slots each having a longitudinal axis, the longitudinal axes of said first slots being substantially parallel with the longitudinal axis of said bracket, said support-engaging leg also including structure defining a plurality of elongated second slots therein each being of substantially constant width throughout substantially the entire length thereof, said second slots each having a longitudinal axis, said second slot axes being substantially parallel with each other and oriented at an angle of from about 10 to 30 degrees relative to the longitudinal axis of said bracket,

said first and second slots being configured and arranged for receiving therethrough screws or other fasteners affixed to said joist or rafter and said section, and for permitting selective axial shifting of the bracket in either axial direction whereby to alternately draw the section closer to, or move the section away from, said joist or rafter; and

structure defining at least one fastener-receiving set hole through each of said legs and separate from said slots for securing said bracket in operative disposition in engagement with said section and support after said shifting of said bracket.

4,690,360

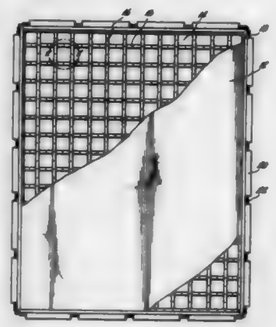
CARGO PALLET

Robert Looker, Carpenteria, Calif., assignor to Satco, Inc., El Segundo, Calif.

Filed Apr. 16, 1985, Ser. No. 723,881

Int. Cl.[4] A47B *91/00*

U.S. Cl. 248—346 **9 Claims**



1. A cargo pallet comprising:

a. a rectangularly shaped core comprising a grid of a plurality of stringers and struts, said stringers and struts creating a cross-hatch assembly in which said stringers are elongate members extending from one edge of said core to the other edge of said core, and said struts are cross members between said stringers, said stringers and said struts also having at least one cross-sectional portion thereof in substantially a C-shape such that a flat surface is presented on either side thereof;

b. a first aluminum sheet rigidly attached to said flat surface on said stringers and struts on one side of said core, said first aluminum sheet sized and shaped to substantially cover said core; and

c. A second aluminum sheet rigidly attached to the other said flat surface on said stringers and struts on the second side of said core, said second aluminum sheet sized and shaped to substantially cover the second side of said core.

4,690,361

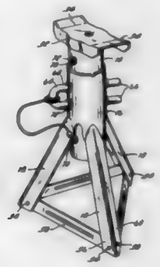
JACK STAND AND METHOD FOR MAKING A JACK STAND

Philip L. Lundman, 400 Wheeler Rd., Fredonia, Wis. 53021

Continuation-in-part of Ser. No. 682,610, Dec. 17, 1984, abandoned, which is a division of Ser. No. 455,013, Jan. 3, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 852,234

Int. Cl.[4] E04G *25/00*

U.S. Cl. 248—352 **1 Claim**



1. A jack stand of the type for use in supporting a vehicle, the jack stand comprising:

a base portion including,

a generally cylindrical upper body portion including a central cylindrical chamber and a central longitudinal axis, said cylindrical upper body portion being formed from a first portion of a flat steel plate bent around said longitudinal axis so as to form a cylinder, said flat steel plate including lateral edges welded together to form a vertical linear welded seam parallel to said central longitudinal axis of said cylindrical upper body portion, said cylindrical upper body portion including an aperture therein, said aperture being surrounded by a flange formed by extruding metal surrounding said aperture, and said flange extending outwardly with respect to said longitudinal axis,

a plurality of legs adapted to support said cylindrical upper body portion, each of said plurality of legs including an upper end and a lower end, said upper ends of said legs being integrally joined to said cylindrical upper body portion, said plurality of legs being formed from a second portion of said flat steel plate, and said plurality of legs each including a longitudinal axis, and said legs diverging with respect to said central longitudinal axis of said cylindrical upper body portion and in the direction away from said upper body portion, and said welded seam defining a line bisecting the angle defined by said longitudinal axis of a first one of said legs and said longitudinal axis of a second one of said legs, and each of said legs being bent about a bend line parallel to said longitudinal axis so as to include a first elongated planar leg portion and a second elongated planar leg portion joined at said bend line, said first elongated planar leg portion and said second elongated planar leg portion defining an angle therebetween of substantially 60°, and the lower end of the first elongated planar leg portion of a first one of said legs being coplanar with the lower end of a second elongated planar leg portion of a second one of said legs, and the second elongated planar leg portion of said first one of said legs including a portion coplanar with a portion of the first elongated planar leg portion of a third one of said legs and the first elongated planar leg portion of the second one of the legs including a portion coplanar with a portion of the second elongated planar leg portion of said third one of said legs, and said bend line formed between said first elongated planar leg portion and said second elongated planar leg portion of at least one of said legs extending into said cylindrical upper body portion, and

brace means for fixedly joining said lower ends of said legs together in spaced apart relation, said brace means including a one piece triangular brace member, said triangular brace member including a first corner engaging said lower end of one of said legs, said first corner including a first planar portion welded in face to face relation to said lower end of the first elongated planar leg portion of said first one of said legs and a second planar portion welded in face to face relation to said lower end of the second elongated planar leg portion of said one of said legs, a second corner engaging said lower end of a second one of said legs, said second corner including a first planar portion welded in face to face relation to said first planar portion of a second one of said legs and a second planar portion welded in face to face relation to said second planar portion of said second one of said legs, and a third corner engaging said lower end of a third one of said legs, said third corner including a first planar portion welded in face to face relation to said first planar portion of a third one of said legs and a second planar portion welded in face to face relation to said planar portion of said third one of said legs,

a vehicle supporting member including a cylindrical portion housed in said generally cylindrical upper body portion in telescoping relation and having an upper end adapted to support a vehicle, said cylindrical portion of said vehicle supporting member including an aperture therein, said aperture being surrounded by a flange, said flange extending inwardly with respect to said longitudinal axis and being formed by extruding metal surrounding said aperture inwardly with respect to said longitudinal axis,

pin means extending through said apertures in said cylindrical upper body portion and in said cylindrical portion of said vehicle supporting member.

4,690,362

ADJUSTABLE STAND FOR A VISUAL DISPLAY UNIT

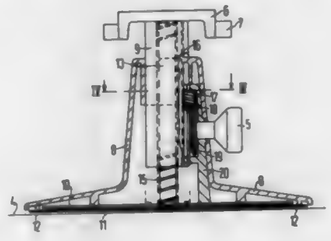
Olav Helgeland, Nittedal, Norway, assignor to Tangberg Data A/S, Oslo, Norway

Filed Jun. 5, 1985, Ser. No. 741,353

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423549

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—404 **10 Claims**



1. An adjustable height stand for a visual display unit comprising a base part disposed on a work surface, and a support part capable of being moved relative to said base part, said support part having a column and a bearing bracket connected to said column for securing and supporting said visual display unit, and adjustment means interconnected between said base part and said support part, comprising a helical drive gear connected to said base part and spaced from the side of said column and axially aligned with the displacement direction of the column, a second gear cooperating with said helical drive gear, said second gear comprising an externally directed female thread connected to said column and arranged parallel thereto, side by side with said drive gear, whereby said column is moved longitudinally in response to rotation of said drive gear, and a spring interposed between said base part and said support part within said column for compensating for the weight of said visual display unit.

4,690,363

CANVAS CARRIER

Thomas Koves, 431 S. Burnside Ave., #2C, Los Angeles, Calif. 90036

Filed Aug. 29, 1986, Ser. No. 901,743

Int. Cl.[4] A47B *97/04*

U.S. Cl. 248—449 **10 Claims**



1. In combination:

a central spine, said central spine having a substantially uniform exterior cross section;

a manually engageable handle on said central spine for manual grasp;

first and second cross members on said central spine, each of said first and second cross members being mounted on said central spine, each of said adjustable cross members having a collar thereon which embraces said spine, means on said collar for locking said collar at a selected position on said spine;

means on each of said first and second cross members for engagement on an artist's canvas panel so that said means on said cross member can grasp an artist's canvas panel to be carried by said manually graspable handle, each of said cross rails having first and second channels therein, said first channel having sufficient width to engage on the edge of a panel of first thickness and said second channel having a width suitable to engage on the edge of a panel of second thickness;

a tripod, said tripod having a head and having three legs pivotally mounted to said head, said tripod head having a transverse pivot axis, said tripod head being substantially upright disc with said axis substantially through the center of said disc, an arcuate slot through said disc around said axis, a control unit engaging said central spine and said tripod head, and a clamp engaging said control unit and extending through said arcuate slot to clamp said control unit at a selected angle with respect to said disc on said tripod head.

4,690,364

WHEELCHAIR RESTRAINING DEVICE

Bruce J. Constantin, 7575 E. Industrial, Baton Rouge, La. 70805

Filed Apr. 14, 1986, Ser. No. 851,972

Int. Cl.[4] A47B *97/00*

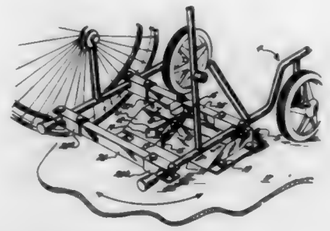
U.S. Cl. 248—503.1 **4 Claims**

1. An apparatus for restraining a wheelchair inside a moving vehicle comprising:

(a) attaching assembly comprising:

(i) a base member fixed to the underside of said wheelchair, said base member comprising a tubular member having end pieces extendable and attachable to the parallel runners attached to wheelchair frame members underneath the seat of said wheelchair, said end pieces comprising a tubular section concentric whith said tubular member and shaped to slide along and extend beyond said tubular member, and

(ii) a vertical member perpendicularly attached to said base member and extending downward; and



(b) a single locking assembly fixedly mounted to a predetermined position on the floor of said moving vehicle comprising a single locking means to receive and lock to said vertical member by means to allow rotation of said vertical member while locked by said single locking means, said locking means being attached to the inside of a housing fixedly mounted to said floor, said housing having a guide channel extending along and through its top surface to receive said vertical member and position it within the locking members of said locking means.

4,690,365

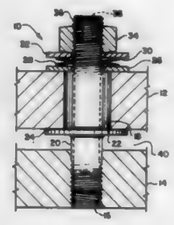
JACK STUD

John Miller, Huntington Station; Richard O. Barton, Levitown, and Oscar H. Schaefer, Massapequa Park, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 16, 1986, Ser. No. 863,896

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—650 **12 Claims**



1. A clamping device for setting a detail which has at least one oversized throughbore to a fixture base which has at least one threaded throughbore, said clamping device having six degrees of freedom, comprising:

(a) a longitudinally adjustable body portion having an upper portion and a lower portion and being fixed in space so as to form a firm point for longitudinal rotation so that bending of said body portion is eliminated during setting;

(b) an integral flange disposed on said body portion and separating said upper portion from said lower portion; and

(c) clamping means including two Belleville spring washers disposed intermediate two standard washers under a standard hexagonal nut, said clamping means being disposed on said upper portion of said body portion and providing single load line jacking and clamping to adjust and hold the detail in position with relation to the fixture base while

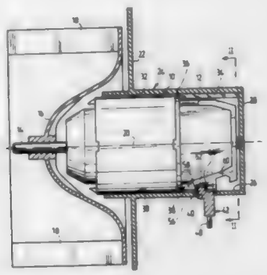
preventing lock-up of the clamping device and the detail as the detail traverses the six degrees of freedom, said clamping means and the oversized throughbore in the detail allow the detail to traverse the six degrees of freedom, said clamping means captivating the detail being set without constantly tightening or loosening said standard hexagonal nut as the detail is being adjusted into position both linearly and angularly, said clamping means turning with said body portion during adjustment and forming an integral unit so as to keep a continual clamping pressure on the detail throughout adjustment with said integral flange providing a jacking surface and a clamping surface.

4,690,366

SYSTEM FOR HOLDING AN ELECTRIC MOTOR IN A HOUSING

Didier Loup, Maurepas, France, assignor to Valeo, Paris, France

Filed Dec. 11, 1985, Ser. No. 807,607
Claims priority, application France, Dec. 20, 1984, 84 19578
Int. Cl.⁴ F16M *1/00*
U.S. Cl. 248—676 **11 Claims**



1. A system for retaining an electric motor in a housing against withdrawal therefrom, said system comprising said motor including a cage supporting the stator and guiding the motor shaft, said motor further including two tabs, the housing including a motor-receiving open end and centering and abutment means cooperating with said cage and slidably receiving and positioning the motor within the housing through said open end, said housing having a wall including an orifice defined therethrough, a connector passing through said orifice and being engaged on said two tabs for feeding electricity to the motor, which tabs are fixed on said cage within said housing; a notch defined in said cage aligned with said housing orifice, said connector including a lug received through said orifice and into said notch when said connector is passed through said orifice and engaged with said tabs, said lug comprising a member independently of said tabs retaining the motor within the housing when said connector is engaged.

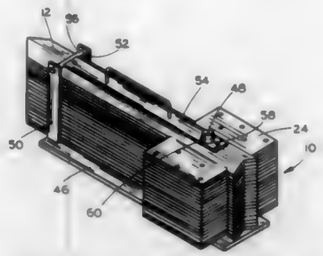
4,690,367

WOOD-FORM SPLICE STAKE AND CARRIER

Beryl D. Weathers, Box 72, Holmesville, Nebr. 68374

Filed Jan. 6, 1986, Ser. No. 816,322
Int. Cl.⁴ E01C *7/00*
U.S. Cl. 249—6 **8 Claims**

1. A wood-form splice stake, comprising,
an elongated stake member having front and back sides and upper and lower ends, said lower end being adapted to be driven into the ground,
a pair of generally flat flanges rigidly mounted on said stake member adjacent the upper end thereof,
said flanges extending laterally outwardly from said stake member in opposite directions,
said flanges having respective front surfaces lying in a common plane, said stake member being positioned in nonintersecting relation with respect to said common plane,
said stake member having a cross-sectional shape such that a plurality of stake members may be stacked front surface to back surface in nested relation, and



means for detachably securing said flanges to respective adjacent ends of aligned forms for supporting said forms in aligned relation.

4,690,368

APPARATUS FOR HOLLOW CONCRETE WALL CONSTRUCTION

Naftali Heiman, 105a Yehuda Halevi Street, Tel-Aviv, Israel

Filed Apr. 16, 1985, Ser. No. 723,833
Int. Cl.⁴ E04G *11/08*
U.S. Cl. 249—37 **9 Claims**



1. Apparatus for use in constructing hollow concrete walls including a pair of vertical mold plates; a spacer core to be introduced from the lower end of the core and spaced from the pair of vertical mold plates before casting wet concrete, and to be subsequently removed after initial setting of the concrete, said spacer core having a width of at least an order of magnitude greater than its thickness, only the lower end of said spacer core including a water permeable wall and a bottom chamber for accumulating water permeating said wall; and means for spacing the spacer core from the vertical mold plates when introduced therebetween.

4,690,369

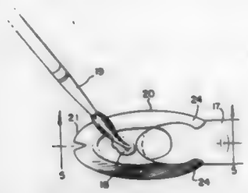
FORM FOR PREPARING ARTIFICIAL NAILS

James T. Giuliano, Ft. Lauderdale, Fla., assignor to Zotos International, Inc., Darien, Conn.

Division of Ser. No. 522,536, Aug. 12, 1983. This application Mar. 27, 1986, Ser. No. 844,530
Int. Cl.⁴ A45D *31/00*; B29C *41/38*
U.S. Cl. 249—55 **12 Claims**

1. A mold form for use in preparing artificial nails, comprising a flexible liquid-impermeable sheet material having a leading end, a trailing end and opposed lateral edges, said trailing end being generally arcuate for placement under a tip of a natural nail of a digit, said sheet material having means defining a well in the shape of a desired artificial nail, said well defining

means comprising a continuous upstanding wall extending from said trailing end towards said leading end intermediate said lateral edges and said leading end, said well being of the



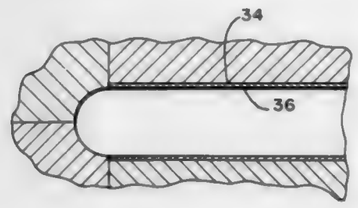
general configuration of the desired artificial nail tip and being adapted for receiving a liquid artificial nail coating composition.

4,690,370

RHODIUM COATED MOLD

James R. Skinner, Saratoga, Calif., assignor to M. U. Engineering & Manufacturing, Inc., Mountain View, Calif.

Filed Sep. 29, 1982, Ser. No. 427,717
Int. Cl.⁴ B29C *33/56*
U.S. Cl. 249—114 R **5 Claims**



1. In a mold (**24**) useful for preparing a molded plastic article (**10**), the mold (**24**) having a mold surface (**30**) having a surface portion (**32**) which is replicated onto the molded plastic article (**10**), an improvement comprising:
wherein said surface portion (**32**) has a surface roughness of no more than about 12.5×10^{-8} meters, RMS; and including
a surface coating (**34**) comprising rhodium covering said surface portion (**32**), said coating (**34**) being substantially void-free, substantially noncorroding when exposed to ambient atmospheric conditions, having a Rockwell C hardness above about 60 and having a surface roughness of no more than about 12.5×10^{-8} meters, RMS.

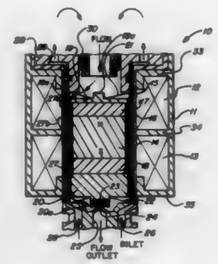
4,690,371

ELECTROMAGNETIC VALVE WITH PERMANENT MAGNET ARMATURE

Robert W. Bosley, Cerritos; Samson Kirshman, San Jose; Dan B. LeMay, Palos Verdes Estates, and Wayne G. Renken, San Jose, all of Calif., assignors to Innovus, San Jose, Calif.

Filed Oct. 22, 1985, Ser. No. 790,279
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 251—65 **13 Claims**

1. A modulating valve comprising:
a flow orifice having an orifice seat;
an armature assembly including a valve seal on an axial end of said armature assembly, said valve seal being axially oriented with respect to said orifice seat;
at least one annular solenoid coil;
said armature assembly including a cylindrical armature housing confined within an annulus formed by said at least one annular solenoid coil and moveable axially with respect to said at least one annular solenoid coil to any displaced selected position between a full open and close position of said valve seal and said orifice seat;
a permanent magnet fixedly mounted in said cylindrical armature housing axially within said annulus of said at least one annular solenoid coil;
further including a first magnetically inert cylindrical housing extending interiorly of said at least one annular solenoid coil;



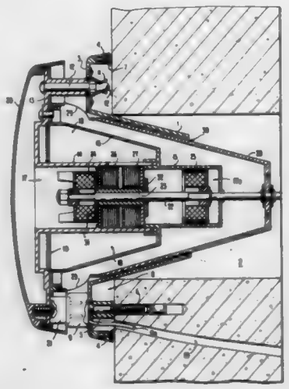
a second magnetically inert cylindrica housing annularly spaced interiorly of said first magnetically inert cylindrical housing forming a first flow passage therebetween;
said cylindrical armature housing having an outer peripheral surface annularly spaced from said second magnetically inert cylindrical housing forming a second flow passage therebetween; and
wherein said permanent magnet and said at least one annular solenoid coil are remote from said first and second flow passages.

4,690,372

AUTOMATIC REGULATING VALVE OF THE AIR FLOW SUCKED OUT OF A ROOM THROUGH A MECHANICAL VENTILATING INSTALLATION

Marius Thiebaud, 301, Route de Suisse, CH-1298 Celigny, Switzerland

Filed Jun. 13, 1986, Ser. No. 874,034
Claims priority, application Switzerland, Jul. 1, 1985, 02800/85
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 251—129.1 **7 Claims**



1. Automatic regulating valve of the air flow sucked out from a room through a mechanical ventilation installation comprising a channel to suck air the cross-section of which depends on the position of an obturating member subjected to

the action of an acuating device itself controlled by a control device, the actuating device of the obturation member comprising a shaft sliding axially in a portion of the body of the valve, one end of which is fast with the obturation member, two permanent magnets carried by said shaft and separated the one from the other by a distance defining the variation of the cross-section of the passage of the air channel; at least one coil fixed in said valve between said magents to create a magnetic field, said control device having means to feed this coil with a direct current alternatively in one and the other direction during a given time interval, the obturation member comprising a membrane having a bottom and a frustoconical rigid wall, the bottom being connected to said shaft, the periphery of the frustoconical portion being connected through a flexible membrane portion to the body of the valve.

4,690,373

MAGNETIC VALVE FOR FLUID CONTROL

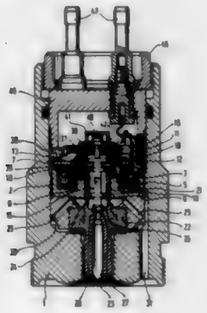
Ernst Linder, Mühlacker; Helmut Rembold; Max Straubel, both of Stuttgart, and Walter Teegen, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,723

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442750

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.02 **6 Claims**



1. A magnetic valve for fluid control comprising a valve housing, a magnetic coil mounted on a core of ferromagnetic material disposed in said housing and provided with an armature that actuates a valve closing element arranged to cooperate with a fixed valve seat, the armature being arranged to press the valve closing element against the valve seat counter to an opposing force of fluid flow during an excited state of said magnetic coil, said valve closing element being lifted in an opening direction from the valve seat by said opposing force of fluid flow during an unexcited state of said magnetic coil and limited in a lifted direction by a yieldable stop means spaced axially therefrom, the stop means being arranged to yield in the opening direction of the valve closing element, and the valve closing element is adapted to lift a variable distance off the valve seat thereby increasing a free flow cross section at the valve seat as a function of fluid pressure applied by said opposing force of fluid flow acting thereon.

4,690,374

MAGNETIC VALVE FOR FLUID CONTROL

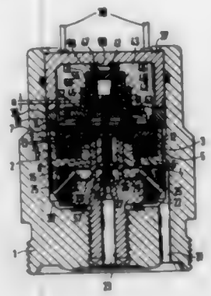
Wilhelm Polach, Möglingen, and Helmut Rembold, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 801,710

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500449

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.02 **9 Claims**



1. A magnetic valve for fluid control comprising, a housing (1), a ferromagnetic core (2) in said housing adapted to receive a magnetic coil (3), said magnetic coil surrounding a portion of said core, an armature (10) arranged to actuate a valve closing element (15) having a terminal portion (28) in a valve closing direction, a valve seat body (22), an inlet (23) in said valve seat body, a valve seat (27) on said valve seat body adapted to receive said valve closing element, first spring means (35) arranged to force said valve closing element in an opening direction, pressure equalizing means (43) adjacent one end of said valve closing element and second spring means (56) associated with said pressure equalizing means and a collar (41) on said valve closing element, whereby upon excitation of said magnetic coil to close said valve closing element, pressure from said inlet exerts an increasing pressure on to said pressure equalizing means which exerts a force on said second spring means which exerts a force upon said valve closing element to urge said valve closing member in an opening direction in a delayed manner prior to deenergization of said magnetic coil, and subsequent to deenergization of said magnetic coil, said first and second spring exerts a force on said closing element to cause said closing element to quickly rise.

4,690,375

SELF CLOSING SQUEEZE VALVE

Daniel J. Vorhis, P.O. Box 4183, Seattle, Wash. 98104

Filed Jul. 7, 1986, Ser. No. 882,837

Int. Cl.[4] F16K *31/00*; **B65D** *5/72*

U.S. Cl. 251—342 **4 Claims**



1. A self-closing squeeze valve comprising:
a body,
at least one resilient and deformable wafer,
said body being resilient and deformable and having:
a longitudinal axis,
an inlet port,
an internal cavity,
an outlet port,
said inlet port, said cavity and said outlet port being interconnected to form a passage through said body,
said passage having a first cross sectional area in a plane essentially transverse to said longitudinal axis of said body as formed and when at rest, and
a second cross sectional area in said plane with said body deformed
said second cross sectional area being larger than said first cross sectional area,
said at least one wafer being inserted in said cavity and having a third cross sectional area larger than said first cross sectional area and smaller than said second cross sectional area, whereby, with said at least one wafer inserted into said cavity, said body is deformed to adapt said first cross sectional area to essentially equal said third cross sectional area to close said passage, and, when
said body and wafer are further deformed, such as by finger pressure applied by an operator, said passage is deformed to said second cross sectional area such that said passageway opened.

4,690,376

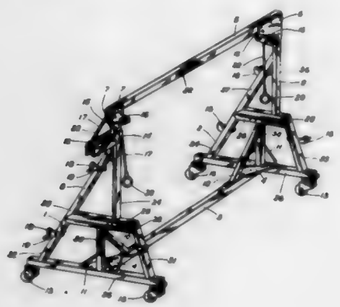
MAT TRANSPORT RACK

Neil Duncan, North Babylon, N.Y., assignor to Olympia Sports Products, Inc., Plainview, N.Y.

Filed Apr. 16, 1986, Ser. No. 852,417

Int. Cl.[4] B66D *3/12, 3/26*

U.S. Cl. 254—327 **1 Claim**



1. A transport rack for storing and transporting a three section wrestling mat comprising:
a first upright frame and a second upright frame connected in parallel by an upper hollow horizontal beam and a lower horizontal beam; the horizontal beams being substantially perpendicular to the frames and having a length greater than the length of a rolled mat section;
the frames having a long inclined member having storage locations for two rolled mat sections and a short inclined member having a storage location for one rolled mat section, the long inclined member being at least twice the length of the short inclined member, the frames being positioned and configured so that the long inclined members define a first inclined lifting plane and the short inclined members define a second inclined lifting plane;
the inclined members having a plurality of support means for engaging a cylindrical member extending from the rolled mat section, two support means positioned along the length of each of the long inclined members so as to define a first upper storage location for a rolled mat section and a second lower storage location for a rolled mat section along the first lifting plane, one support means positioned along the length of each of the short inclined members so as to define a third storage location along the second lifting plane at substantially the same level as the second storage location;
the first frame having a winch means mounted thereon, the winch means being connected to a short cable and a long cable, each cable terminating in a hook means for engaging the cylindrical members extending from the rolled mat sections;
the short cable being mounted on a first pulley means positioned adjacent to the first frame and thereafter extending downwardly between two guide pulleys attached to the first frame along the first frame;
the long cable being mounted on a second pulley means coupled to the first pulley means and thereafter extending through the upper horizontal beam and being mounted on a third pulley means positioned adjacent to the second frame and extending downwardly between two guide pulleys attached to the second frame along the second frame;
the winch means being operable to lift mat sections coupled to the cables along the first lifting plane to the first and second storage positions and along the second lifting plane to the third storage position.

4,690,377

HIGH-PRESSURE GAS FILLING VALVE FOR USE IN A PRESSURE RESISTANT CONTAINER

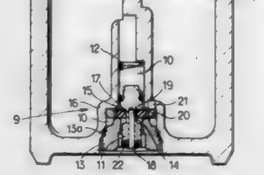
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Kanagawa, Japan

Filed Dec. 29, 1986, Ser. No. 947,444

Claims priority, application Japan, Mar. 18, 1986, 61-38341[U]

Int. Cl.[4] F16K *31/00*

U.S. Cl. 251—354 **1 Claim**



1. A gas filling valve for use in a pressure resistant container comprising:
a reentrant valve chamber opening to the atmosphere at one end thereof and communicating with the inside space of the pressure resistant container at the other end of said valve chamber;
a slidable valve body put in the valve chamber, said valve body having a neck or reduced diameter, a gas injection path opening to the atmosphere and extending short of the top of the valve body along the longitudinal central axis thereof, and valve outlet radially branching from the longitudinal gas injection path;
a spring means for pushing the slidable valve body towards the open end of the valve chamber;
a valve fitting fixed to the valve chamber, accommodating said slidable valve body in the center hole or the valve fitting;
an annular seat integrally connected to and inwardly projecting from the top perimeter of the valve chamber wall in opposing relation to the top end of the valve fitting, leaving a given space therebetween; and
a seal ring of an elastic material slidably fitted around the neck of the valve body, said seal ring being movable between the annular seat and the top end of the valve fitting in said given space, and being pushed against the top end of the valve fitting under the influence of said

spring means in the stand-by position, said valve body being normally in the stand-by position in which its valve outlet is closed by the inner peripheral surface of said seal ring, and the valve outlet being brought above said seal ring in the gas-filling position in which said slidable valve body is pushed upward against said spring means; characterized in that said gas filling valve further comprises:

a control ring sandwiched between the top end of said valve fitting and said annular seat, encircling said seal ring in said valve chamber; and

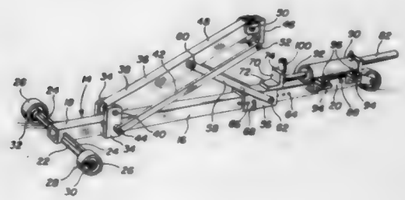
gas depletion path extending from the place at which the top surface of said control ring is in contact with said annular seat to the atmosphere through the space between said control ring and the inner wall of said valve chamber and the space between said control ring and the top end of said valve fitting.

4,690,378

VEHICLE JACK

Davis R. Jarman, Hortense, and Virgil H. Hinson, Brunswick, both of Ga., assignors to Automotive Collision Tools, Inc., Brunswick, Ga.

Filed Feb. 24, 1986, Ser. No. 832,060
Int. Cl.⁴ B60P *1/48*
U.S. Cl. 254—8 B **11 Claims**



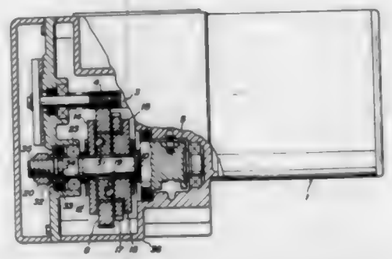
1. A vehicle jack including an elongated horizontal main beam member having first and second ends, first and second support wheel means journalled from said first and second ends for rolling support of said main beam member from a horizontal support surface with said beam member slightly spaced above said surface, a follower mounted on said main beam member for guided reciprocal movement longitudinally therealong generally centrally intermediate said ends, upper and lower, elongated and parallel lift arm means including corresponding first and second ends, means pivotally mounting said first ends from said first end of said beam member for angular displacement relative thereto about first horizontal upper and lower axes, respectively, extending transversely of said beam member and lift arm means, an upright support, means pivotally securing the second ends of said upper and lower lift arm means to upper and lower portions, respectively, of said upright support for relative angular displacement of said upright support and upper and lower arm means about second horizontal upper and lower axes, elongated thrust arm means including first and second ends pivotally secured to a longitudinal midportion of said upper lift arm means and said follower, respectively, for angular displacement relative thereto about axes paralleling said first and second upper and lower axes, anchor means carried by said follower and projecting upwardly therefrom to an elevation spaced above said beam member, and elongated, longitudinally extendable fluid motor means carried by and extending along said beam member second end on the side of said follower remote from said first end of said beam member and including a mounted base portion anchored relative to said beam member and an extendable portion engaged with said anchor means to force said anchor means and follower along said beam member toward said first end of said beam member responsive to longitudinal extension of said fluid motor, said beam member comprising a tubular member and said follower comprising a sleeve slidably mounted on said tube member, and a latch means including selectively registerable transverse bores in and spaced longitudinally of said tube and follower sleeve and a pin removably receivable through selectively registered bores.

4,690,379

ELECTRIC CHAIN BLOCK

Takayoshi Nakamura, Nakakoma, Japan, assignor to Kabushiki Kaisha Kito, Yamanashi, Japan

Filed Feb. 26, 1986, Ser. No. 832,788
Claims priority, application Japan, Feb. 27, 1985, 60-36500
Int. Cl.⁴ B66D *3/20, 5/22*
U.S. Cl. 254—347 **7 Claims**



1. An electric chain block including a driving shaft connected to a rotating shaft of an electric motor, and a driving gear provided on the driving shaft, and further including an intermediate driven gear in mesh with said driving gear, a torque limiter, and a mechanical brake assembly between the driving shaft and a load sheave, said mechanical brake assembly comprising: an intermediate shaft arranged in parallel with said driving shaft, urging means coupled to the intermediate shaft, a cam support provided radially inside said intermediate driven gear and fitted on said intermediate shaft, a retainer disc and a brake receiving disc axially slidably but non-rotatably mounted on said intermediate shaft respectively on one side and the other side of the cam support, said urging means being a spring, a ratchet wheel for braking interposed between the intermediate driven gear and the brake receiving disc and engaging a pawl for braking, brake releasing cam members accommodated in cam grooves formed in a side of said cam support, the depths of said cam grooves changing circumferentially of the intermediate shaft, and an adjusting nut threadedly engaging an extending end of said intermediate shaft for adjusting the urging force of said urging means.

4,690,380

SHEAVE ASSEMBLY WITH MULTIPLE PULLEYS USED TO MEASURE CABLE ANGLE

Shale J. Niskin, Miami Beach, and Gerald J. Williams, Dade County, both of Fla., assignors to General Oceanics, Inc., Miami, Fla.

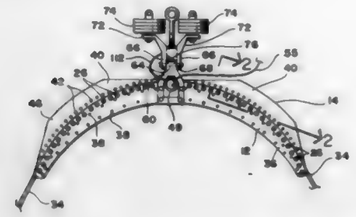
Filed Jan. 30, 1986, Ser. No. 824,243
Int. Cl.⁴ B66D *3/06*; G01L *5/08*
U.S. Cl. 254—394 **8 Claims**

1. In a counter-balanced sheave assembly for supporting a cable having a tension applied thereto and which extends downward from said sheave assembly so as to define a cable angle, said sheave assembly having a support frame; a plurality of sheaves rotatably mounted to said support frame along a downwardly facing, arcuate path the improvement comprising:

means for measuring downward force on said sheave assembly and for generating a force signal indicative of said downward force;

a plurality of sensors, each one disposed to detect rotation of one of said sheaves and for generating rotation signals indicative of said rotation for each said sheave for which rotation is sensed;

means for determining said angle of said cable from said



rotation signals and for generating an angle signal indicative of said angle; and

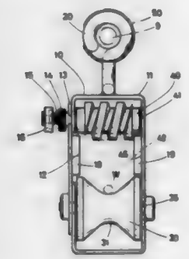
means for determining said tension applied to said cable from said force signal and said angle signal.

4,690,381

PULLEY BLOCK ASSEMBLY FOR AERIAL LINE

Masaki Aoai, Nagoya, Japan, assignor to Meitoh Denki Kohji Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1985, Ser. No. 752,692
Int. Cl.⁴ B66D *3/06*; H02G *1/02*
U.S. Cl. 254—394 **14 Claims**



1. A pulley-block unit for an aerial line comprising:

(a) a pulley frame;

(b) a pulley rotatably supported by said pulley frame; and

(c) an inverting guide roller rotatably supported by said pulley frame, opposed to and parallel to said pulley, having a helical groove on the periphery thereof; wherein said pulley frame guides an aerial line between said pulley and said inverting guide roller.

4,690,382

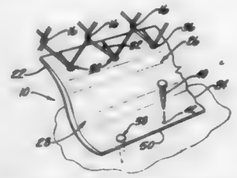
COVING ATTACHMENT

Edward A. Koperdak, Kalamazoo, Mich., assignor to Cope, Inc., Schoolcraft, Mich.

Filed Dec. 23, 1985, Ser. No. 812,503
Int. Cl.⁴ E04H *17/00*
U.S. Cl. 256—1 **11 Claims**

1. A one-piece coving strip (10) of the type utilized along fences, rails, or the like, for preventing vegetation growth at the base thereof, comprising:

an upper fence-engaging portion (22) and a lower ground-engaging portion (24), joined together by curved connections (26,28) and characterized by attachment means (36) for directly attaching said upper portion by interlocking said portion with a fence (16), rail, or the like, so as to cover an area of ground between the fence and said



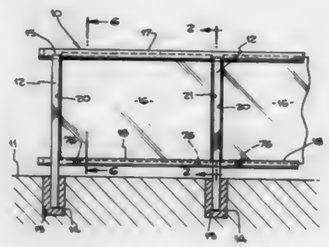
ground-engaging portion, preventing vegetation growth and the passage of objects thereunder.

4,690,383

PANEL RAIL SYSTEM

Roy W. Batcheller, West Covina, Calif., assignor to Craneveyor Corp., South El Monte, Calif.

Filed Apr. 4, 1986, Ser. No. 848,244
Int. Cl.⁴ E04H *17/16*
U.S. Cl. 256—24 **9 Claims**



1. A panel rail system comprising posts adapted to be set at locations in an appropriate surface structure, unitary panels having each an upper edge and a lower edge for substantially spanning the area between adjacent posts, an upper rail having a longitudinal slotted junction for reception of the upper edge of the panel, a lower rail having a longitudinal slotted junction for reception of the lower edge of the panel, said posts having an upper and lower retention means for supporting retention of the rails, the upper retention means having a rail-engaging means for reception of the upper rail, the lower retention means having a rail-engaging means for reception of the lower rail, and a connector adapted to interconnect said respective rail-engaging means and the corresponding rail, each post having a chamber throughout its length and said retention means comprising a sleeve with a sliding fit within the chamber.

4,690,384

CHAIN LINK FENCE SYSTEM

Thomas M. Palmer, Houston, Tex., assignor to Innovative Research and Development Co., Houston, Tex.

Filed Jul. 16, 1984, Ser. No. 631,062
Int. Cl.⁴ B21F *27/00*
U.S. Cl. 256—47 **2 Claims**

1. A chain link fence system comprising

a pair of end, corner, or gate posts anchored vertically in the earth in laterally spaced relation,

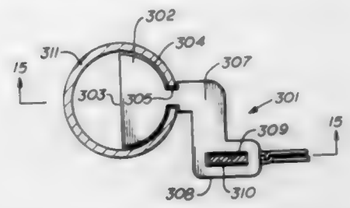
a cross bar extending between the upper ends of said posts and secured thereon, and

a chain link fence material extending between and secured at opposite ends to said posts, in which

each of said posts comprises a tubular metal post having a series of vertically aligned retaining bands spaced longitu-

dinally thereof with narrow openings extending between said bands in vertically oriented and vertically aligned linear relation,

a plurality of retainer members each comprising a flat plate having a retainer head portion having a flat edge and a semi-circular rear edge, a neck portion connected to said retainer head portion, a flat L-shaped supposting portion with a laterally extending portion extending from said neck portion and a longitudinally extending portion extending therefrom with a slot located therein, said retainer head portion being sized to fit through said post slot and said neck portion being sized to permit the same to be



turned 90° in said slot with said semi-circular rear edge fitting the inner wall of said post,

said retainer members being supported in said openings and extending outward therefrom and having their slots arranged in vertical orientation when installed on said posts,

one of said chain link fence being positioned adjacent to said retainer members, and

a retainer rod comprising an elongated rod of flat, rectangular cross section positioned in said slots and through the end loops of said chain link fence to secure the same in place, thereby securing said cross bar and chain link fence material to each of said posts.

4,690,385

METHOD FOR STORING AND MAINTAINING THE TEMPERATURE OF MOLTEN METAL

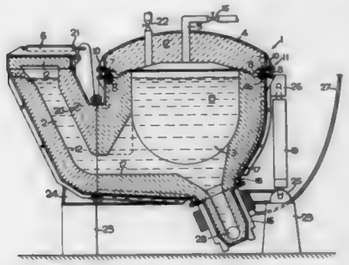
Günther Beele, Kerpen-Blatzheim, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 836,095, Mar. 4, 1986, Pat. No. 4,638,980. This application Oct. 6, 1986, Ser. No. 915,779

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507648

Int. Cl.⁴ C21C *7/02*

U.S. Cl. 266—44 **4 Claims**



1. A method of storing and maintaining the temperature of a nodular cast iron melt comprising:

providing a heatable furnace having an inner chamber adapted to receive a cast iron melt,

at least partially filling said inner chamber with a nodular castiron melt which has been treated with magnesium,

maintaining the temperature of said melt within a predetermined range of casting temperature values,

closing said furnace chamber with a sealed pressure-tight cover, and

filling the space in said inner chamber above said melt with an inert gas and pressurizing said gas to an extent sufficient to prevent disintegration of the magnesium in said melt.

4,690,386

METHOD OF IMPROVING THE SERVICE LIFE OF PERMEABLE REFRACTORY ELEMENTS IN BOTTOMS OF METALLURGICAL VESSELS

Guy Denier, Metz, France, and Romain Henrion, Luxembourg, Luxembourg, assignors to Institute de Recherches de la Siderurgie Francaise, Maizieres-Les-Metz, France

Filed Apr. 20, 1983, Ser. No. 486,844

Claims priority, application France, Apr. 22, 1982, 82 07118

Int. Cl.⁴ C21C *5/44*

U.S. Cl. 266—44 **6 Claims**

1. A method of improving the service life of permeable refractory elements provided in a bottom of a converter, the elements serving for controlled injection of a stirring fluid into a molten metal bath contained in the converter, the method comprising the steps of conserving in the converter a fluid slag formed during refining of a charge, after a liquid metal has been cast by tipping the converter, depositing and spreading the slag over the bottom by bringing the converter back to its upright position, wherein the slag has a sufficient fluidity to spread over the bottom, and leaving the slag to harden and set on the bottom while a sufficient pressure which insures a permanent flow of the stirring fluid approximately close to in the order of 30 m^3/h per refractory element is maintained in the permeable refractory elements.

4,690,387

METALLURGICAL PLANT FOR PRODUCING A MIXED GAS

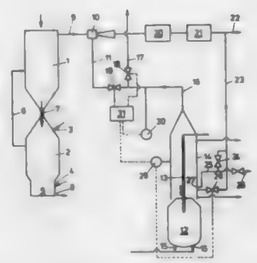
Walter Rockenschaub, and Werner Kepplinger, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria

Filed Nov. 5, 1985, Ser. No. 795,090

Claims priority, application Austria, Nov. 19, 1984, 3652/84

Int. Cl.⁴ C21B *7/22*; **C21C** *5/38*

U.S. Cl. 266—144 **2 Claims**



1. In a plant for producing steel from iron-oxide containing starting materials and including a plant for recovering pig iron comprised of a reduction shaft furnace and a melt-down gasifier, and at least one oxygen blowing converter for converting said pig iron into steel by utilizing process gases forming, the improvement comprising:

a top gas duct system provided for said reduction shaft furnace, said top gas constituting said process gas, at least one off-gas duct connected to and provided for said oxygen blowing converter;

an ejector connecting said top gas duct system with said off-gas duct, said converter off-gas being feedable into said top gas duct via said ejector to produce a mixed gas;

common dedusting and washing means connected to said ejector and provided for the mixed gas formed by said top gas and said converter off-gas; and

safety means for preventing the entry of oxygen into said mixed gas.

4,690,388

PNEUMATIC VEHICLE SUSPENSION WITH FAILSAFE INTERNAL STOP

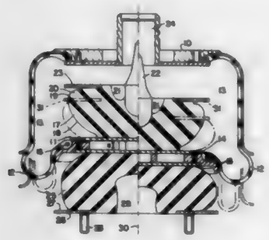
Reginald Harrison, Oadby, England, assignor to Dunlop Limited, United Kingdom

Continuation of Ser. No. 713,639, Mar. 19, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,882

Claims priority, application United Kingdom, Mar. 29, 1984, 8408167

Int. Cl.⁴ B60G *11/62*; **F16F** *3/08*

U.S. Cl. 267—35 **15 Claims**



1. A vehicle suspension comprising a pneumatic spring having a closed body with first and second rigid members interconnected by a toroidal shape flexible member of substantially gas-impermeable material and provided within the pneumatic spring an elastomeric spring having a first end connected to said first rigid member and a second end which is spaced from said second rigid member when the closed body of the pneumatic spring is pressurized to a normal working pressure, said second end being free to move transversely relative to said first end, the elastomeric spring being positioned within the closed body of the pneumatic spring such that in normal use of the vehicle suspension applied compression loading is withstood solely by the pneumatic spring and such that the applied compression loading acts on the elastomeric spring only in the event of a pressurization failure of the pneumatic spring, said elastomeric spring being of generally circular cross-sectional shape in a plane perpendicular to the normal direction of movement of the rigid members one towards the other and of pregressively increasing external diameter over at least a part of the length thereof from one end of the elastomeric spring to the other whereby in the event of pressurization failure of the pneumatic spring the elastomeric spring allows relative movement of the first and second rigid members both in said normal direction of movement of the rigid members one towards the other and in directions perpendicular thereto and whereby both the vertical compression stiffness and horizontal shear stiffness of the elastomeric spring progressively increase when, in use, the elastomeric spring is subject to an increasing compression loading.

4,690,389

HYDRAULICALLY DAMPED MOUNTING DEVICE

John P. West, Devizes, England, assignor to Avon Industrial Polymers Limited, Wiltshire, England

Filed Aug. 6, 1985, Ser. No. 763,123

Claims priority, application United Kingdom, Aug. 7, 1984, 8420035; Jan. 25, 1985, 8501863; May 28, 1985, 8513408

Int. Cl.⁴ F16M *5/00*; **F16F** *15/04, 7/10*; **B60G** *15/04*

U.S. Cl. 267—140.1 **9 Claims**

1. A hydraulically damped mounting device having first anchor and a second axial anchor, for damping vibrations in direction orthogonal to said second anchor comprising:

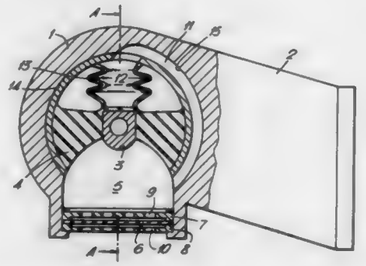
a hollow sleeve formed at said first anchor;

second anchor formed within said sleeve, said second anchor extending axially of said sleeve, said sleeve and said second anchor defining a space extending radially from said second anchor to said sleeve;

a resilient wall within said space connecting said sleeve and said second anchor and thereby subdividing said space into two pockets, said resilient wall being adapted to be compressed in a predetermined direction when a load is applied to the hydraulically damped mounting device;

a working chamber in one pocket of said space and enclosed between said sleeve and said resilient wall, said working chamber containing a liquid;

a bellows wall of corrugated material withing said space in the other of said pockets;



a compensation chamber within said space bounded, at least in part, by said bellows wall; and

an open passageway connecting said working chamber and said compensation chamber to allow fluid communication of said liquid between said working chamber and said compensation chamber;

said working chamber is physically separate from said bellows wall and having substantial different spring characteristics, thereby effectively separating the spring effect of the device from the damping effect thereof with the spring effect substantially determined by the resilient wall and the damping effect substantially determined by the flow characteristics of the passageway, and at least parts of said bellows wall remote from said second anchor point are physically separate from said resilient wall.

4,690,390

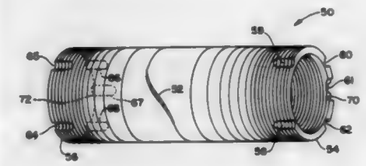
OVERRUNNING CLUTCH SPRING

Jules G. Kish, West Haven, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 660,332, Oct. 12, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,333

Int. Cl.⁴ F16F *1/06*; **F16D** *13/04*; **B23P** *13/00*

U.S. Cl. 267—155 **4 Claims**



1. A method of manufacturing an overrunning clutch spring having a center crossover point from tube stock, comprising:

rotating the tube stock;

axially feeding a cutter along the rotating tube stock at an exponential rate until a position before the center crossover point; and

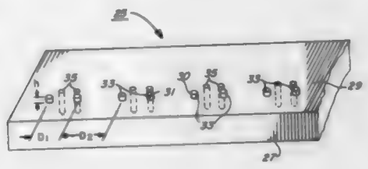
continuing to axially feed the cutter along the rotating tube stock from the position before the center crossover point to the center crossover point at greater than the exponential rate.

4,690,391

METHOD AND APPARATUS FOR FABRICATING FULL WIDTH SCANNING ARRAYS

James C. Stoffel, Rochester, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 31, 1983, Ser. No. 462,593
Int. Cl.[4] B25B *11/00, 11/02*
U.S. Cl. 269—21 **3 Claims**



1. A tool for positioning a preset number of smaller scanning arrays in exact end to end abutting relation to provide a composite scanning array of predetermined length, comprising:

(a) a base having at least one substantially flat surface; and

(b) a plurality of discrete array aligning formations on said base flat surface arranged in a predetermined array alignment pattern, said array alignment formations being adapted for interlocking cooperation with plural array aligning formations on each of said small arrays on assembly of said preset number of said small arrays with said base whereby to accurately locate and align said small arrays in abutting lengthwise relation with one another to provide said composite scanning array of predetermined length.

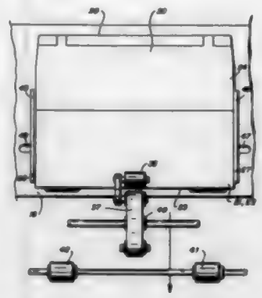
4,690,392

ENVELOPE CONFIGURATION FOR USE IN A HIGH SPEED COPIER WITH ENVELOPE PRINTING CAPABILITY

Robert A. Coons, Jr., Holcomb, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 653,408, Sep. 24, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 780,866
Int. Cl.[4] B65H *5/00*; G03B *15/00*
U.S. Cl. 271—2 **2 Claims**

1. The combination of an envelope and a copying machine, said copying machine comprising a paper supply feeder, a stack supporting platform, a sheet transport system, a sheet separating device adapted to contact a stack of envelopes to be fed placed on the platform, to separate the envelopes seriatim, and to direct the same to the starting position for the sheet transport system, said envelope comprising front and back panels folded to form and define a bottom edge of the envelope, said bottom edges of the stack of envelopes being arranged to be the leading edges of the stack of envelopes being directed by said sheet separating device to said transport system, said panels having side edges generally perpendicular to said bottom edge and being joined together by side welding with adhesive material applied to the surfaces adjacent and inwardly, respectively, and a closure flap formed as an extension of one of the panels and being defined by side edges which extend between lines projecting from and coincident with the side edges of said one panel, respectively, and for a distance which when added to the length of said side edges of said panels when the envelope is in a flat orientation is equal to or



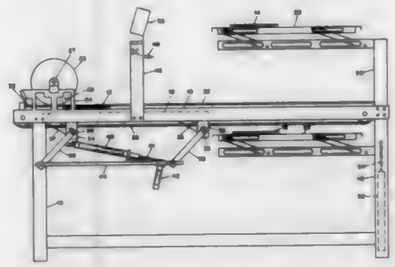
greater than the distance between said sheet separating device and said starting position of said sheet transport system.

4,690,393

APPARATUS FOR SEPARATING STACKS OF CLOTH

Elbert Engle, Ashville, Ala., assignor to Chesebrough-Pond's, Inc., Conn.

Continuation-in-part of Ser. No. 492,721, May 11, 1983, Pat. No. 4,555,102. This application Oct. 10, 1985, Ser. No. 786,337
Int. Cl.[4] B65H *3/22*
U.S. Cl. 271—4 **10 Claims**



3. A method for detecting the presence of a fold in a ply which is being transported by passing the ply between a pair of localized magnetic field regions spaced apart essentially the full width of the ply in the absence of a fold so that opposite edges of the fold-free ply will pass through the separate field regions and detecting the magnetic field in the two regions as the ply passes.

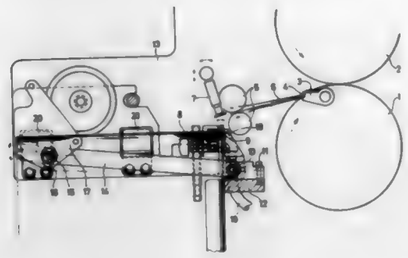
4,690,394

STACK STOP ASSEMBLY ON A SHEET FEEDER OF A PRINTING PRESS

Bernhard Maul, Heidelberg; Günter Zobl, Leimen, and Hans-Jürgen Kusch, Neckargemünd, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,096
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 8406329[U]
Int. Cl.[4] B65H *5/10*
U.S. Cl. 271—11 **4 Claims**

1. Stack stop assembly on a sheet feeder of a printing press having an impression cylinder, with grippers disposed thereon formed with respective sheet stops, and having a row of suckers and a pair of conveyor rollers disposed between the sheet feeder and the impression cylinder, an uppermost sheet of a stack of sheets being liftable at a leading edge thereof by the row of suckers over and beyond stack stops of the stack stop assembly and being feedable to the pair of conveyor rollers for advancing the uppermost sheet to the sheet stops formed on the impression-cylinder grippers, the stack stop assembly comprising swivel bearings supporting the stack stops, respectively, at both sides thereof, each of the stack stops having a journal pin to which a pivot arm is secured, said stack stops being pivotable on said journal pins, during press operation so as to vary the direction of transport of the uppermost sheet, and being fixed against reciprocal motion with respect to the stack stop assembly.

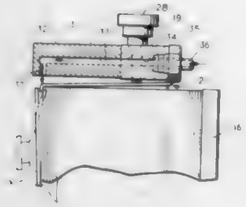


4,690,395

LABEL MAGAZINE

Casimir W. Nowicki, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 20, 1986, Ser. No. 841,650
Int. Cl.[4] B65H *3/14*
U.S. Cl. 271—98 **6 Claims**



2. A label magazine comprising

a ring,

a tray for supporting a stack of labels, said labels have corners, said tray comprising spaced longitudinally extending L-shaped rails fixed to said ring and adapted to an edge and engaging the corners of a stack of labels and forming the sole support for the labels,

said ring having the general configuration of a label,

means at one end of said tray for yieldingly urging the labels toward the other end of the tray and,

a plurality of circumferentially spaced spring members mounted on the ring at the other end of the tray about the labels,

each member including an axially extending portion and a radially inwardly extending portion extending from one end of said axially extending portion and engaging the outermost label of the stack,

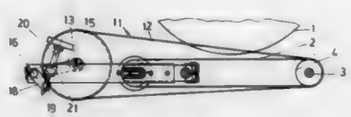
means for mounting the other end of said axially extending portion of each member.

4,690,396

DELIVERY DEVICE

Rudolf Herb, Bobenheim, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,801
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515328
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—311 **15 Claims**



1. In a delivery device for sheet-like products having at least one conveyor belt defining a conveying plane disposed below a fan wheel which delivers the sheet-like products to the conveyor belt in an overlapping arrangement, the improvement comprising:

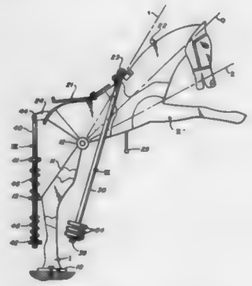
at least one bridge aligned in the direction of delivery, said bridge being raised relative to the conveying plane of the conveyor belt and sloped downwardly in the direction of delivery so that its leading edge extends into the conveying plane of the conveyor belt, said bridge being arranged relative to said conveyor belt and said fan wheel such that sheet-like products delivered to said conveyor belt from said fan wheel have a buckled like configuration while in contact with said bridge.

4,690,397

MECHANICAL HORSE FOR CHILDREN'S PLAY

Kamel Ben Y. Abed, Yarka Village 24967, Israel

Filed Dec. 24, 1985, Ser. No. 812,952
Claims priority, application Israel, Mar. 7, 1985, 74531
Int. Cl.[4] A63G *17/00*
U.S. Cl. 272—53.2 **8 Claims**



1. A children's toy in the form of a rocking horse or other animal, comprising:

a stationary part defining the hind leg or legs of said animal, positioned on the ground;

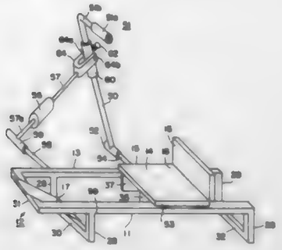
a rockable part defining the rump, the head and the forelegs of said animal, attached in its rear portion to the top portion of said stationary part by means of a pivot and adapted to swing about said pivot in a vertical plane by a predetermined angle;

a weighted pendulum attached to said rockable part by a pivot permitting its swinging motion in a plane parallel to the plane of said rockable part; and

a guide bar pivotally attached to the tail end of said rump and slidingly movable in guide means on said stationary part, said guide bar being provided with adjustable stops

adapted to limit the rocking motion of said rockable part by a predetermined angle.

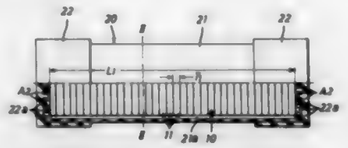
4,690,398
MULTIPURPOSE ROWING APPARATUS
Robert S. Smith, 1263 Emory St., San José , Calif. 95126
Filed Feb. 10, 1986, Ser. No. 828,317
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 5 Claims



1. An exercise machine of the rowing type having a track, a seat that rolls on the track and a footrest at the end of said track, which further comprises;
a right fulcrum bar having a first end hingeably attached to a right side of said seat and a second end;
a left fulcrum bar having a first end hingeably attached to a left side of said seat and a second end;
a right resistance means having a first end with attachment means for hingeable attachment to said track near said footrest and a second end;
a left resistance means having a first end with hingeable attachment means for attachment to said track near said footrest and a second end;
means for hingeably attaching said second end of said right resistance means to said right fulcrum bar at a location on said right fulcrum bar whose distance from said first end of said right fulcrum bar may be adjusted;
means for hingeably attaching said second end of said left resistance means to said left fulcrum bar at a location on said left fulcrum bar whose distance from said first end of said left fulcrum bar may be adjusted;
so that a user may sit on said seat with his feet on said footrest and grasp each said fulcrum bar near said second end and exercise by straightening his knees and hips and pulling with his arms whereby the ratio of force exerted by the arms and back to the force exerted by the knees to overcome resistance presented by the resistance means depends on said locations of said means for attaching said second ends of said resistance means to said fulcrum bars respectively and further whereby the resistance means force varies with movement of said seat which is coupled thereto by said fulcrum bars.

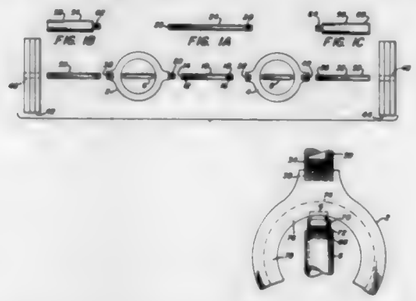
4,690,399
FLEXIBLE DUMBBELL
Sadao Hayashi, Nagoya, Japan, assignor to Asahi Gomu Kako Kabushiki Kaisha, Aichi, Japan
Filed Mar. 16, 1984, Ser. No. 590,305
Claims priority, application Japan, Mar. 16, 1983, 58-38220[U]; Nov. 2, 1983, 58-206636; Jan. 21, 1984, 59-9154
Int. Cl.[4] A63B *21/11*
U.S. Cl. 272—122 5 Claims

1. A flexible dumbbell comprising:
a cylindrical body of elastic material such as rubber formed in predetermined length and diameter suitable for use in various kinds of physical exercises;
a flexible core element of predetermined weight suitable for a user's physique contained within said cylindrical body and cooperable with said cylindrical body to provide radial resiliency of said dumbbell; and
closure means for closing the opposite ends of said cylindrical body and for retaining said core element in place by engagement therewith;



wherein said closure means comprises a pair of end caps secured to the opposite ends of said cylindrical body, each of said end caps being made of hard synthetic resin and formed at its inner wall with a plurality of annular ribs which are concentrically arranged to provide air gaps at each end of said core element.

4,690,400
SUPINATING BARBELLS WITH MEANS TO SET THE FORCE FOR ROTATORY MOTION
Charles L. Metz, R.D. #9 - Box 683A, Greensburg, Pa. 15601
Filed Dec. 9, 1985, Ser. No. 806,600
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 13 Claims

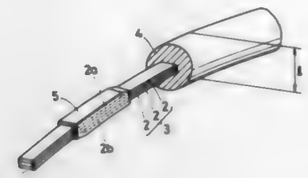


1. Exercise means including an elongated handle means to be grasped by the user, said handle means being located within circular housing means for rotatory motion with respect thereto, a shoe member carried by each of opposite ends of said elongated handle means for rotary motion in said housing means, means operatively associated with the shoe members for varying the degree of resistance to rotatory motion of said handle means with respect to the circular housing means within which it is located and elongated bar means operatively associated with said housing means for bearing weights.

4,690,401
CIRCULAR SPORTING ARTICLE
Shoji Cho, Osaka, Japan, assignor to Life Environment Research Laboratories, Osaka, Japan
Filed Sep. 30, 1985, Ser. No. 781,481
Claims priority, application Japan, Sep. 29, 1984, 59-147599
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 11 Claims

1. A circular sporting article comprising (a) a core material in a ring shape made of concentric adjacent windings of a long and narrow strip of spring steel having two ends, (b) a flexible covering material to cover said circular core material, (c) at least one fitting fixing the two ends of the strip of spring steel with respect to one another, and (d) at least one fitting slidably

holding the concentric windings of the strip of spring steel to allow the windings to slide circumferentially with respect to



one another, said article having an overall diameter approximately corresponding to the shoulder length of a user and a sectional diameter which can be easily grasped by a user.

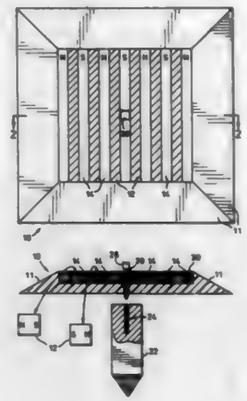
4,690,402
TENSILE EXERCISE DEVICE
Jack A. Basting, 1945 E. Ivy St., St. Paul, Minn. 55119
Filed Dec. 2, 1986, Ser. No. 937,197
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 9 Claims



1. A tensile exercising device for performing tension exercises, comprising:
(a) a central, longitudinal, nonelastic strap member;
(b) a pair of elastic bands, each band having an inner and outer end, and each band being connected at its inner end to opposite longitudinal ends of said elongated strap member;
(c) a pair of rubber grip members connected to said outer ends of said elastic bands; and
(d) adjusting means for adjusting the length of said elastic bands to vary with the size of the person using said device and with the exercise to be performed; and
(e) two substantially flat strips of padded sheath which encase said strap member and said adjusting means and which have ends that include means to attach each strip of said padded sheath to each other so that the ends fold back from said strap member inorder to access said adjusting means.

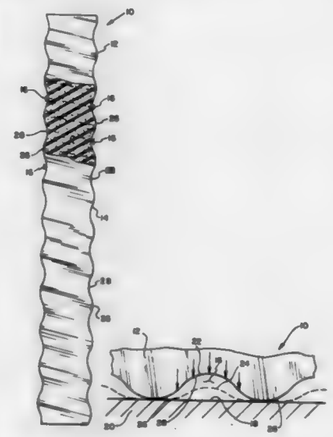
4,690,403
BASES FOR THE GAME OF BASEBALL
Dennis Meggs, 285 Bluevale St., Unit #4, Waterloo, Ontario N2J 4L8, Canada
Filed Dec. 26, 1985, Ser. No. 813,573
Claims priority, application United Kingdom, Dec. 31, 1984, 8432786
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—25 10 Claims

1. A baseball base, comprising:
an anchor member having an upper portion with a top surface, and a lower portion adapted to be received in the ground to secure the anchor member in place,
the upper portion having magnetic means defining at the top surface at least four parallel, spaced, elongate bands which constitute alternating north and south magnetic poles,
and an upper member having a top portion of a size and shape corresponding to that of the usual baseball base, and a ferromagnetic plate secured to the underside of said top



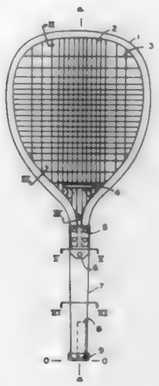
portion, the plate being adapted to be retained in place on said alternating north and south magnetic poles.

4,690,404
TAGGING STICK
Jerry L. Yoder, 4076 County Rd. 27, Auburn, Ind. 46706
Filed Dec. 23, 1985, Ser. No. 812,173
Int. Cl.[4] A63B *59/00*
U.S. Cl. 273—67 R 17 Claims



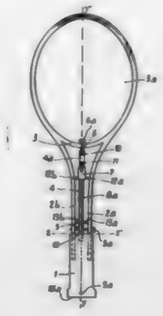
1. A tagging stick, comprising:
(a) an elongated body composed of resiliently flexible cellular foam material being stiff enough to allow grasping and swinging by a human hand;
(b) a plurality of indentations formed in the exterior surface of said body to form a plurality of air pocket means for making loud sounds upon impact of said body against an object, said indentation being substantially larger than the cells of said foam material.

4,690,405
TENNIS RACKET
Jack L. Frolow, 448 Dewey St., Long Branch, N.J. 07740
Filed Oct. 19, 1983, Ser. No. 543,431
Int. Cl.[4] A63B *49/04*
U.S. Cl. 273—73 C **46 Claims**



1. A complete tennis racket held by the hand of a player to impact a ball comprising at least a frame including a head portion supporting a string netting in a plane and a handle portion having a grip portion suitably adapted for the hand to grip, the end of the grip portion being located at the handle portion end of the racket, said racket having a longitudinal axis running from the center of the head portion end of the racket to the center of the grip portion end of the racket; said racket having a weight and stiffness distribution providing for a frequency of vibration f_1, in cycles per second when tested in accordance with test 13 of FIG. 15 herein before defined; said racket having a weight distribution providing for a center of percussion located at a distance Cp in inches from the end of the grip portion when tested in accordance with test 4 of FIG. 15 herein before defined, said center of percussion taken about a pivot located at the end of the grip portion, said pivot having an axis perpendicular to the longitudinal axis of said frame and parallel to the plane of said string netting; said racket characterized in that said handle portion has a system comprising a weight means and a means for the attachment of said weight means to the handle portion of the racket for reducing the shock and vibration received by the player's hand during the impact of the racket with the ball and the vibration subsequent to said impact; said system having a center of gravity being located at all times at a distance F from the end of the grip portion, said distance F being less than 0.26 of the overall length of said racket along said longitudinal axis; said weight means being firmly attached to said handle portion to provide that responsive to a single impulsive force to said weight means there is no significant movement between said weight means and said handle portion; and said racket excluding said system has said distance Cp greater than 18.75 inches; and said racket excluding said system has said frequency of vibration f_1 greater than 140 cycles per second; said racket having a weight distribution providing for a moment of inertia I_a in ounce-inches squared about said longitudinal axis and the magnitude of Ia is greater than 75 ounce-inches squared, and the said magnitude of Ia being attained without a weight means being attached to the said head portion of the racket.

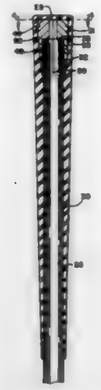
4,690,406
VARIABLE BALANCE RACKET
Jean Hufenus, 15A Av. Crebillon 78, 600 Maisons Laffitte, France
Filed Dec. 12, 1985, Ser. No. 808,170
Int. Cl.[4] A63B *49/04*
U.S. Cl. 273—73 J **7 Claims**



1. A variable balance tennis racket comprising, an annular head adapted to receive strings, an elongated handle connected to and extending from a base portion of said head, a grip on said handle adjacent an end of the handle remote from the head, a weight element, means mounting said weight element for movement between a first position speced from the base portion of the head in a direction toward the grip, and a second position adjacent the base portion of the head, elastic means for returning said weight element from said second position to said first position, retaining means for retaining said weight element in said second position, against the return action of said elastic means, upon movement of the weight element to the second position, and means for releasing said weight element from said retaining means in response to centrifugal force of a swing of the racket so that the weight element is returned to said first position by said elastic means after a forceful swing of the racket.

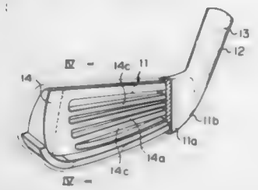
4,690,407
WEIGHTED GOLF GRIP
Robert J. Reisner, Chicago, Ill., assignor to Para-Tech Industries, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 774,566, Sep. 10, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,039
Int. Cl.[4] A63B *53/14*
U.S. Cl. 273—81 A **6 Claims**

1. A golf club comprising: a shaft, a club head on one side of said shaft and a grip portion on the distal end of said club opposite said club head;
said shaft having a certain distribution of weight;
said grip portion including a weight assembly on said distal end of said shaft;
said weight assembly comprising at least two longitudinal portions located about said distal golf shaft end in spaced relationship, each longitudinal upper portion having a portion positioned entirely behind said shaft, the combined mass of said longitudinal portions being disposed equally about said shaft end,
said longitudinal portions being spaced from one another, thereby creating a gap, said gap being filled with resilient material to permit limited expansion during assembly;
said upper portions each having a flange depending therefrom, said flanges surrounding said shaft at said distal end;
said weight assembly being encompassed by a resilient grip material, and adhesively secured to said shaft, thereby maintaining the relative immobility of said weight assembly and preventing movement of said weight relative to said shaft;



whereby said weight displaces the weight distribution on said shaft to a point closer said distal end.

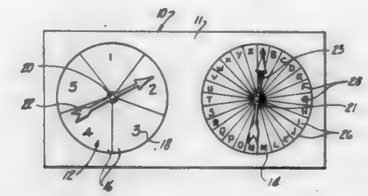
4,690,408
CLUB-HEAD
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Mar. 10, 1986, Ser. No. 837,981
Claims priority, application Japan, Mar. 14, 1985, 60-49378
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—169 **5 Claims**



1. A club-head for a golf club made of metal comprising an outer shell made of a first metal and a core body embedded in said outer shell made of a second metal, said first metal having a different specific weight from said second metal, and the weight of said core body being concentrated in an area defining the periphery of the hitting portion of the club-head.

4,690,409
METHOD OF PLAYING A LETTER SELECTING AND ARRANGING GAME
Antonino Scalia, 5639 Raven Ct., Birmingham, Mich. 48010
Continuation of Ser. No. 632,534, Jul. 29, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 858,821
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—299 **1 Claim**

1. A method for playing a game comprising:
(a) spinning a first pointer pivotally secured to a first dial having a sectored face with an integer in each sector to randomly select one integer from a set of a plurality of integers;
(b) spinning a second pointer pivotally secured to a second dial having a sectored face with an alphabetic letter indicia in each sector to randomly individually select a plurality of letters of the alphabet when said integer is greater than 1, wherein the number of said plurality of individual letters corresponds to the value of said integer and wherein the probability of selecting any letter remains constant throughout the play of the game;
(c) selecting letter indicia members, each member selected having indicia designating a letter corresponding to the letters selected in step (b); and
(d) arranging said at least two letter indicia members to form an identifiable abbreviation, initial or acronym;





(e) recording a predetermined positive score value for each indicia member used in the abbreviation, initial or acronym;
(f) recording a negative score value whenever the selected integer from said first step equals a predetermined value;
(g) maintaining a recorded total score for each player until the total score for any player exceeds a predetermined amount.

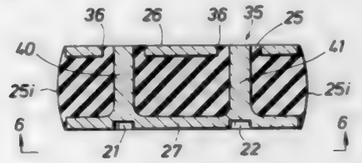
4,690,410
WORD FORMING TILE GAME
Andrew S. Berton, Potts Point, Australia, assignor to Incomm Direct Pty. Ltd., State of Victoria, Australia
Division of Ser. No. 706,628, Feb. 28, 1985, abandoned. This application Jul. 29, 1986, Ser. No. 890,288
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—299 **3 Claims**



1. A word game comprising the steps of:
providing a plurality of tiles to a group of players, each said tile having a letter formed on one face thereof;
dividing said plurality of tiles between said players so that each player has a predetermined number of tiles, not to exceed an equal distribution of the tiles among the players, said tiles being so provided in a face down mode whereby a player does not know the letter of any tile until such tile is exposed during play;
sequentially exposing one tile in the possession of each of the players;
arranging a word having at least three letters from the group of letters sequentially exposed by the players;
continuing the sequentially exposing and arranging of words from the group of letters sequentially exposed by the players and by cannibalizing letters from words previously arranged by any player for forming new words;
continuing the sequential exposing, arranging of words and cannibalizing of letters from words previously arranged by any player for forming new words until the supply of

tiles is exhausted and arranged to form words, or no further words are capable of being formed;
adding up a score for each player, determined from the tiles utilized in the arranging of particular words formed by each player; and
comparing the scores of each player to determine the highest score.

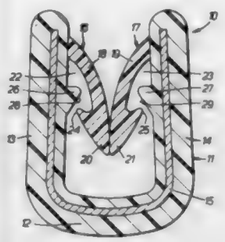
4,690,411
BONDED MECHANICALLY INNER CONNECTED SEAL ARRANGEMENT FOR A BLOWOUT PREVENTER
Denzal W. Van Winkle, P.O. Box 79727, Houston, Tex. 77279
Filed Dec. 23, 1985, Ser. No. 810,310
Int. Cl.⁴ E21B *33/06*; F16J *15/16*
U.S. Cl. 277—166 **6 Claims**



1. A replaceable seal arrangement for a groove extending diametrically across the front of a blowout preventer ram body comprising:
an elastomer body having upper and lower surfaces for fitting in the groove;
plate members embedded in the upper and lower surfaces of said elastomer body;
receptacle means in one of said plate members which includes said elastomer body therein;
projection means forming part of and extending from said other plate member, through said elastomer body and into the elastomer in said receptacle means for interlocking said plate members together without securing said projection means to said one plate member to accommodate relative movement of said interlocked plate members upon expansion and contraction of said seal means, said receptacle means and elastomer body therein being significantly larger than the portion of the projection means received therein about the entire periphery of said portion to accommodate said relative movement; and
releasable means for releasably securing said seal arrangement in the groove of the ram body.

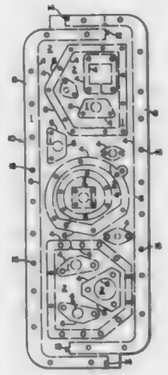
4,690,412
STRIP STRUCTURE INTENDED FOR CLAMPING ON A FLANGE
Trevor R. Tuckley, 7 The Furrows, St. Ives, Cambridgeshire, and Harold W. E. Pike, "Elm Lee", School Lane, Conington, Nr. Elsworth, Cambridgeshire, both of United Kingdom
Filed Mar. 8, 1985, Ser. No. 709,569
Int. Cl.⁴ F16J *15/12*; E06B *7/23*
U.S. Cl. 277—184 **11 Claims**

1. A strip structure intended for clamping engagement on a flange or like member, the strip structure having a channel defined by a base and two opposed side walls, each side wall being provided with an elongate limb having a free end region directed inwardly and towards the base such that the limbs abut at their free end regions;
wherein each limb has a pair of substantially straight faces in the region of the free end, one of said faces the corresponding face of the other said limb and the other of said faces generally facing the associated side wall;
wherein each side wall also is provided with an inward projection nearer the base of the channel than the root of the associated limb; and
wherein each limb is provided on that face which generally faces the associated side wall with a recess in which the projection may be accommodated;
the arrangement being such that, in use, when the strip structure is being clamped on a flange or like member, the flange causes the limbs to be moved apart, with the projections being accommodated in the corresponding recess, whereby the clamping may be effected without undue force, but, when an attempt is made to remove the strip



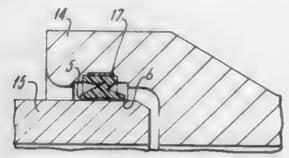
structure from the flange, the free end regions of the limbs grip the flange and the limbs are restrained from undue movement towards the open end of the channel by the interaction of the projections and the limbs in the region of the recesses of the latter, the configuration of the limbs and the effect of said interaction being such that considerably more force is required to remove the strip structure from the flange than is required to clamp the strip structure on the flange.

4,690,413
GASKETS
Ernest Adkins, Hildenborough, England, assignor to Klinger AG, Zug, Switzerland
Filed Sep. 3, 1985, Ser. No. 772,153
Claims priority, application United Kingdom, Sep. 3, 1984, 8422193
Int. Cl.⁴ B65D *73/00*; F16J *15/00*
U.S. Cl. 277—199 **6 Claims**



1. A kit of gaskets comprising at least one web of dry joint grade gasket material, which web comprises (1) a plurality of gasket parts and (2) a plurality of parts serving as packaging material, the respective parts (1) and (2) being defined by cuts which extend completely through the web and along respective peripheries of the gasket parts but which cuts terminate so as to retain interconnecting regions securing the gasket parts in position in the web, whereby the gasket parts are capable of being pushed out of the web and thereby separated therefrom, at least two of the gasket parts defining respective gasket segments, each segment being profiled at each end thereof to provide interengaging members for enabling assembly of the gasket segments, after being pushed out from the web into a gasket, and each segment, when retained in the web, being disposed so that respective end portions of respective gasket segments are in generally overlapping relationship so as to define a region of the web generally surrounded by the gasket segments, the remaining gasket parts being present within the said region of the web and at least some of the remaining gasket parts nesting essentially within one another.

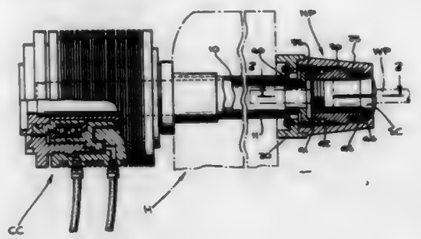
4,690,414
MEANS FOR SEALING THE GAP BETWEEN TWO AXIALLY DISPLACEABLE SEALING SURFACES
Per Haaland, Oslo, Norway, assignor to Mehren Rubber A/S, Kolbotn, Norway
PCT No. PCT/NO84/00025, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00210, PCT Pub. Date Jan. 17, 1985
Continuation of Ser. No. 711,565, Feb. 8, 1985, abandoned. This PCT application Jun. 19, 1984, Ser. No. 838,884
Claims priority, application Norway, Jun. 20, 1983, 832235
Int. Cl.⁴ F16J *15/32*
U.S. Cl. 277—207 A **4 Claims**



1. Gasket for sealing the gap between two approximately parallel first and second sealing surfaces which during assembly are displaced axially relative to each other, such that the gasket follows the first sealing surface and is compressed between said first sealing surface and the second sealing surface, said gasket being of the type in which the gasket body is made of a soft elastic material, the gasket body comprising an annular sliding part and an annular attachment part, one part being within the other part, the attachment part and the sliding part being connected through a connection part having a thickness less than the attachment part and the sliding part such that the sliding part can pivot relative to the attachment part, the axis of the connection part extending diagonally from a point of attack on one edge of the sliding part to a supporting surface on an opposite edge of the attachment part such that, in cross-section, the gasket body has a Z-type general configuration, the sliding part being inclined relative to attachment part such that the edge of the sliding part with the point of attack is nearer the attachment part than the remainder of the sliding part, the gasket being oriented relative to the sealing surfaces such that the point of attack of the sliding part is nearer to the second sealing surface prior to assembly than is the opposite edge of the attachment part.

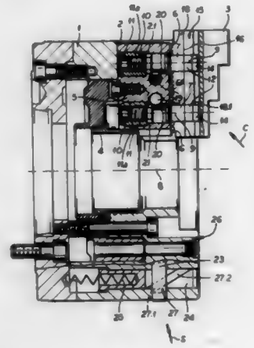
4,690,415
HYDRAULIC NOSEPIECE ASSEMBLY FOR A COLLET CLOSER, AND METHOD
Warren B. Holdridge, 15224 S. Figueroa, Gardena, Calif. 90248
Filed Aug. 15, 1986, Ser. No. 896,968
Int. Cl.⁴ B23B *31/20*
U.S. Cl. 279—4 **2 Claims**

1. In a machine tool having a rotating hollow spindle and a drawbar disposed within the spindle and rotatable therewith, and a spring collet supported from the spindle and which has a conical nose part for selectively capturing and holding a work piece, the method of closing the collet comprising the steps of:
selecting a sleeve having in its forward end a flared opening which is adapted to selectively engage the conical nose part of the collet;
placing the sleeve about the collet;
supporting the sleeve from the spindle for axially slidable movement relative thereto;



axially reciprocably moving the draw bar; and
in response to each axial movement of the draw bar, axially moving the sleeve in the opposite direction so as to either open or close the collet;
whereby the work piece is maintained in a fixed axial position relative to the spindle.

4,690,416
POWER CHUCK
Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany
Filed Mar. 20, 1986, Ser. No. 841,558
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510457
Int. Cl.⁴ B23B *31/02*
U.S. Cl. 279—110 **11 Claims**



1. A power chuck comprising:
a chuck base provided with a chuck drive;
a plurality of clamping jaws, each clamping jaw including
a base jaw guided in said chuck base, and formed with at leats one connecting opening with internal screw threads,
a respective mounting jaw releasably secured in interfacing relationship at a respective end face of a repesective one of said base jaws and formed with at least one lock retainer, and
at least one shaft disposed in said opening for respectively connecting each base jaw with its mounting jaw;
said shaft extending substantially parallel to a central longitudinal axis of the power chuck;
said shaft being rotatable between a lock position in which a

respective mounting jaw is positively secured to its base jaw, and into an unlocked position in which the respective mounting jaw can be released from its base jaw for displacement in an adjustment direction;

said shaft having a first end, an intermediate section, and a second end, said first end being formed with external screw threads engageable with the internal screw threads of said connecting opening in a respective base jaw;

said intermediate section being formed with a plurality of gear teeth disposed circumferentially as a pinion, said intermediate section extending into a respective base jaw;

a lock head being formed at said second end of each shaft and having at least one lock shoulder which extends therefrm, said lock head being adapted to axially enter into the associated lock retainer in a respective mounting jaw when said shaft is in the unlocked position, whereby upon rotation of said shaft into the locked position said lock head can engage with its lock shoulder against a dovetail of an elongated T-shaped formation of said lock retainer, thereby positively securing said base jaw and said mounting jaw together;

a control bolt for said shaft, said control bolt having a central longitudinal axis extending transversely with respect to the central longitudinal axis of said shaft and being shiftable transversely thereto, said control bolt having a plurality of rack-forming teeth meshing with said pinion;

guided control pieces for shifting a respective control bolt in the chuck base, with at least one control piece being provided on either side of the respective base jaw, said control pieces being axially algined with respect to the control bolt and being adapted for the longitudinal displacement thereof;

push rods disposed in said chuck and adapted to be actuated from the exterior thereof against the force of respective reset springs for the control pieces, said push rods being axially guided in said chuck; and

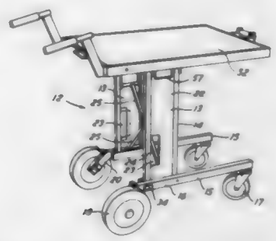
a wedge-type transmissions for operatively connecting a respective push rod and control piece.

4,690,417

FOLDABLE TROLLEY

David R. Betts, Dartford, and Michael G. Edmonds, Bexley, both of United Kingdom, assignors to Kentinental Engineering Limited, Kent, England

Filed Jan. 28, 1986, Ser. No. 823,223
Int. Cl.[4] B62B *3/00*
U.S. Cl. 280—42 **10 Claims**



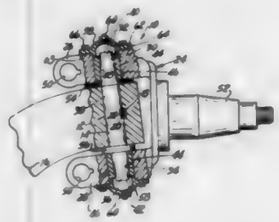
1. A trolley comprising a trolley base and a trolley top arranged to be releasably supported on the trolley base, the trolley base having two sides each of which has an upright portion and a support portion and wheel means on which the trolley base can be pushed over the ground in an erected working condition in which the upright and support portions are at an angle to one another and the sides are spaced apart and which trolley base is movable by a double folding action between the erected condition and a folded condition in which the sides are juxtaposed and the angle between the upright and support portions is reduced so that they lie substantially adjacent one another, and including locking means arranged to lock the upright and support portions in their relative erected condition and release means coupled to the locking means and arranged to release the locking means on movement of the sides to the juxtaposed condition and means arranged to cause the locking means to automatically re-engage when the upright and support portions are moved to their relative erected condition with the sides spaced from one another.

4,690,418

STEERING KNUCKLE AND KINGPIN ASSEMBLY

Joseph E. Smith, Birmingham, Mich., assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.

Filed May 7, 1985, Ser. No. 731,556
Int. Cl.[4] B60G *3/02*
U.S. Cl. 280—96.1 **21 Claims**



1. A steering knuckle and kingpin assembly comprising a kingpin, means for fixedly mounting said kingpin on a support member, said kingpin having an upper end portion and a lower end portion, a wheel spindle knuckle pivotally mounted relative to said kingpin, said wheel spindle knuckle having an integral upper yoke having a bore disposed around said kingpin upper end portion and an integral lower yoke having a bore disposed around said kingpin lower end portion, a pair of bushings disposed in each of said bores in said yokes, at least one of said bushings having a peripheral surface fitted in said bore and an internal surface forming a bearing surface in engagement with one of said kingpin end portions, and means for compensating for an increase in clearance between said bearing surfaces due to wear by displacing said bushing longitudinally in a direction that causes said bushing internal surface to be urged toward engagement with said kingpin end portion,

wherein at least one of said kingpin end portions has a frusto-conical peripheral surface and corresponding bushing has a cylindrical peripheral surface fitted in a cylindrical bore in a yoke and a frusto-conical internal surface forming said bearing surface with said kingpin end portion.

4,690,419

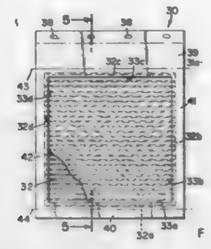
REFLECTORIZED SPLASH GUARD

Dale E. Hoshal, Minneapolis, Minn., assignor to Lums Guard, Inc., West Minneapolis, Minn.

Continuation-in-part of Ser. No. 485,662, Apr. 18, 1983, abandoned. This application Aug. 16, 1985, Ser. No. 766,824
Int. Cl.[4] B62D *25/16*
U.S. Cl. 280—154.5 R **2 Claims**

1. A splash guard for an over the road vehicle, said splash guard of the type adapted to receive a reflectorized insert, said splash guard comprising:

(a) a base member having a top end and a bottom end and having an inner cavity, said inner cavity having an opening sized smaller than said inner cavity and larger than the insert, the inner cavity being aligned with a series of parallel ribs, each rib having a concave tip, the insert being insertable in the said inner cavity and retained in said inner cavity by means of a suction effect, the insert being retained within the inner cavity by means of the concave tip of each rib serving as a suction cup which grips the insert; and



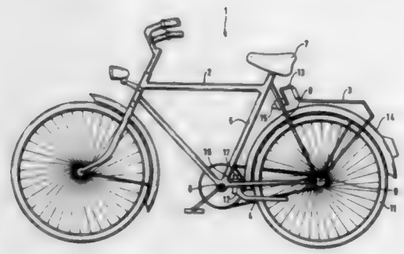
(b) means for operatively connecting said base member to the vehicle.

4,690,420

VIBRATION-RESISTANT, SELF-CENTERING ACCESSORY ATTACHMENT FOR A CYCLE

Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to ESGE-Marby GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,196
Int. Cl.[4] B62H *1/02*; B62J *7/04*
U.S. Cl. 280—289 A **17 Claims**



1. In combination with a cycle (1) having spaced, essentially parallel or slightly diverging support struts (8, 12; 12*a*, 12*b*),

a vibration-resistant, self-centering attachment element (13, 16) for attachment of an accessory, particularly of a luggage carrier (3) or a kickstand (4) to the cycle,

wherein the accessory (3, 4) includes counter holding means forming a bearing surface (3*a*, 4*a*; 46) for engagement with the support struts,

said attachment element (13, 16) having a cross piece formed with a central portion (18) and two lateral flange portions (19, 21) spanning the space between the spaced support struts, an aperture (24) formed in the central portion of the cross piece having an aperture axis extending perpendicularly to a theoretical plane connecting said flange portions and a clamping screw (17) passing through the aperture and into the counter holding means,

and wherein, in accordance with the invention,

the element is formed with facing end surfaces (26, 27) located in essentially parallel planes,which essentially parallel planes are parallel with respect to the axis of the aperture (24),

the flange portions (15, 21) form similar wedge elements with upper and lower surfaces diverging from outer end portions (33, 34) of the wedge elements towards the central portion (18), which define, in cross section in a plane parallel to the axis of the aperture and transverse to the struts, triangles which have bases (22, 23) adjacent the central portion (18);

the flange portions (19, 21) are elastically deformable in a direction parallel to the axis of the aperture (24);

the similar wedge elements of the flange portions are formed with hollow spaces (35, 36) which, in cross section, correspond essentially to the cross section of the respective flange portion, and extend from one facing end surface (26) of the respective flange portion to the other facing end surface (27) thereof; and

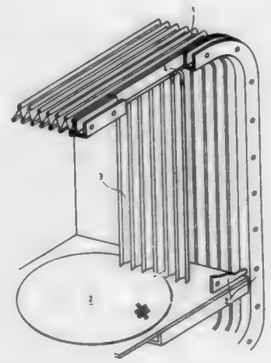
wherein the central portion (18) is formed with an essentially rectangular prismatic hollow space (25) extending from one facing end surface (26) to another facing end surface (27) of the attachment element.

4,690,421

CROSSOVER SHELTER BETWEEN SECTIONS OF ARTICULATED ROAD AND RAIL VEHICLES

Helmbrecht Schmidt, Vellmar; Robert Koch, Bad Sooden-Allendorf, and Richard Seyer, Baunatal, all of Fed. Rep. of Germany, assignors to Hubner Gummi-und Kunststoff GmbH, Kassel-Betteshausen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,489
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439807
Int. Cl.[4] B60D *5/00*; B61D *17/22*
U.S. Cl. 280—403 **2 Claims**



1. For use between two articulated vehicle sections having a crossover platform between them, each of the vehicle sections having an end facing the opposite end of the other vehicle section, a crossover shelter comprising:

a bellows in the form of a tube completely surrounding the crossover platform and a passageway region between the opposed ends of the vehicle sections, the bellows unit being accordion-folded and defining a roof portion and two opposite side walls of the passageway region, the side walls being spaced outwardly from the sides of the crossover platform so that a gap is present between each side wall and the crossover platform,

a curtain spaced inwardly from each bellows side wall and spaced inwardly from the gap between its respective side wall and the crossover platform, each curtain being accordion-folded in a manner corresponding to the accordion folds of the bellows, and each curtain extending from the roof portion of the bellows to about the level of the upper surface of the crossover platform,

a plurality of angle brackets for suspending each curtain from the roof portion of the bellows, one leg of each angle bracket being fixed to the roof portion of the bellows and the other leg of each angle bracket being fixed to the curtain, and

a frame secured to each of the opposed ends of the two vehicle sections, one end of the bellows and the corresponding ends of the two curtains being fastened to each

of the frames, whereby the crossover shelter is secured between the opposed vehicle ends.

4,690,422

JOINT FOR A TRANSVERSELY SEPARATED VEHICLE

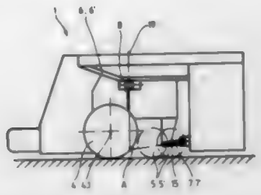
Max Bräandli, and Hansueli Feldmann, both of Safnern, Switzerland, assignors to JD-Technologie AG, Zug, Switzerland

Filed Oct. 21, 1985, Ser. No. 789,627

Claims priority, application Switzerland, Oct. 26, 1984, 05134/84

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—460 R **17 Claims**



11. A joint pivotably interconnecting two vehicle members each having a vertical axis across a transverse line dividing the wheel base of a vehicle in order to permit relative angular deflections of the vertical axes of said two vehicle members due to vehicle travel on uneven ground, each one of said two vehicle members having a transverse axis and a central longitudinal axis, said joint comprising:

first support elements provided on two sides of said two vehicle members;

said first support elements comprising means for supporting said two vehicle members against forces which are directed substantially parallel to said transverse axes and to said vertical axes of said two vehicle members;

second support elements provided on said two sides of said two vehicle members;

said second support elements comprising means for supporting said two vehicle members against traction and bracking forces acting upon said two vehicle members;

said first and second support elements cooperating with each other and having predetermined interdependent positions each of which positions has a predetermined deflection angle between said two vehicle members and a predetermined transverse virtual pivot axis; and

said first and second support elements including means for permitting relative angular deflections of the vertical axes of said two vehicle members and corresponding parallel displacements of said predetermined transverse virtual pivot axis.

4,690,423

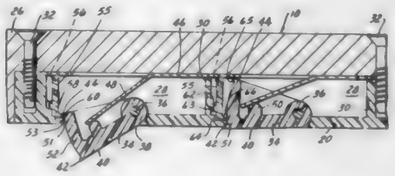
SKI BRAKING DEVICE

Walter J. DeVigili, 4215 Brown Rd., Emmett, Mich. 48022

Filed Mar. 31, 1986, Ser. No. 846,611

Int. Cl.[4] A63C *7/10*

U.S. Cl. 280—605 **3 Claims**



1. A braking device for reducing or retarding rearward movement of a ski, such as when climbing a hill, comprising an elongated frame adapted to be mounted lengthwise in a recess in the bottom of a ski with its bottom surface flush with the bottom surface of the ski, a plurality of cleats spaced apart lengthwise of said frame and projecting through openings in the bottom surface of said frame, means pivoting the front ends of said cleats to said frame for vertical movement of said cleats about horizontal axes extending at right angles to the longitudinal center line of the ski between a lower operative position projecting below the bottom of said frame and an upper retracted position, spring means urging said cleats to their operative positions, said cleats having teeth on the rear ends adapted to dig into snow when climbing a hill and said cleats are in their operative positions, means for preventing movement of said cleats beyond their operative and retracted positions, said openings closely receiving the sides and ends of said cleats to restrict the entrance of snow into said frame through said openings, the rear ends of said cleats being curved on a radius centered on their axes of vertical movement so as to remain in close contact with the rear walls of said openings throughout their vertical movement, the rear wall of each opening having a ledge providing a snow stripper which is in continuous contact with the curved rear end of the associated cleat through the full range of its movement to wipe away snow and keep it from packing into and clogging the cleat chamber, the rear wall of each opening having a pocket beneath the snow stripper in which snow is allowed to collect when the cleat is pivoted to its retracted position without being forced past said snow stripper, and a cleat wiper for each cleat, said cleat wiper being located in a cleat chamber at the rear of the cleat and pivoted at the top, the foot of said cleat wiper having an edge which contacts the curved rear end of the cleat just above said snow stripper to wipe away any snow that may have accumulated thereon.

4,690,424

HEEL HOLDER, IN PARTICULAR FOR A RENTAL SKI

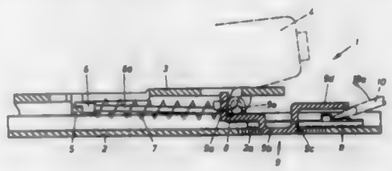
Englebert Spitaler, Wr. Neudorf, and Hubert Wuerthner, Hainburn both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jan. 29, 1986, Ser. No. 823,552

Claims priority, application Austria, Feb. 1, 1985, 279/85

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—633 **8 Claims**



1. In a heel holder, in particular for a rental ski, which with its underside is guided on a guide rail adapted to be fastened to a ski, said guide rail having at least one toothed segment, said heel holder including a locking member which has at least one toothed segment which can be locked with respect to said guide rail and is biassed by at least one spring, said locking member being pivotal about a transverse axis on said heel holder and projects toward a tail end of said ski beyond said heel holder, the improvement comprising wherein directly below a tail end of said locking member there is arranged a guard plate for covering primarily the section of said toothed segment that lies opposite said tail end area of said locking member so that a tool inserted between said tail end of locking member and said guard plate will be unable to contact said toothed segment on said guide rail and effect damage thereto.

4,690,425

SHOCK ABSORBER MOUNT ASSEMBLY FOR MOTOR VEHICLE SUSPENSION

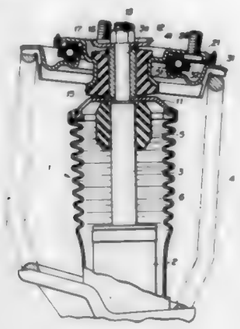
Kanji Kubo, Kanagawa, Japan, assignor to Honda giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,122

Claims priority, application Japan, Jun. 11, 1985, 60-87724[U]

Int. Cl.[4] B60F *11/16*

U.S. Cl. 280—668 **8 Claims**



1. A mount assembly for mounting a shock absorber/coil assembly in a motor vehicle suspension, the shock absorber/-coil assembly including a fluid cylinder, a piston rod movable into and out of the cylinder, a vibration isolator mounted on an end of the piston rod, and a coil spring disposed around the fluid cylinder and the piston rod, said mount assembly comprising:

a retainer adapted to be mounted on said vibration isolator and having an attachment portion adapted for attachment to a motor vehicle frame;

a spring seat adapted to engage an end of said coil spring; and

a thrust bearing interposed between said attachment portion of said retainer and said spring seat and adapted to extend around said vibration isolator, said thrust bearing including a pair of first and second races and a plurality of balls rotatably disposed between said first and second races, said first race engaging said retainer and said second race engaging said spring seat.

4,690,426

TRAILING ARM JOINT STRUCTURE

Kanji Kubo, Tokyo; Nobuyoshi Asanuma, Saitama; Kazuo Saito, Tokyo, and Yasuhiko Yamamoto, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1985, Ser. No. 773,438

Claims priority, application Japan, Sep. 6, 1984, 59-135519[U]; Sep. 6, 1984, 59-135520[U]

Int. Cl.[4] B60G *3/00*

U.S. Cl. 280—690 **5 Claims**

1. A trailing arm joint structure comprising:

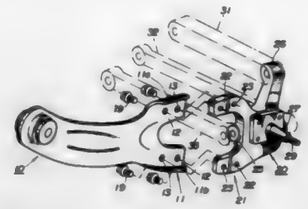
a knuckle for supporting a wheel;

a substantially plate-like trailing arm lying in a vertical plane and having a front end adapted to be pivotally coupled to a vehicle frame and a rear end rigidly coupled to said knuckle;

said knuckle having a front bifurcated portion composed of first upper and lower joint fingers extending forwardly and spaced vertically from each other, said knuckle having a link joint positioned between said first upper and lower joint fingers;

said rear end of the trailing arm having a rear bifurcated portion composed of second upper and lower joint fingers extending rearwardly and spaced vertically from each other, said front and rear bifurcated portions being held against each other with said first and second upper and lower joint fingers being fastened together; and

said trailing arm includes more-rigid portions which are



longitudinally and horizontally separated by a less-rigid portion so that said trailing arm has an increased buckling strength at said more rigid portions, but is transversely flexible at said less rigid portion.

4,690,427

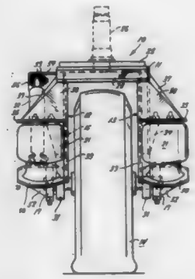
FORK MOUNT MONO-WHEEL SUSPENSION

John E. Raidel, Sr., Rte. 1, Box 400-N, Springfield, Mo. 65804

Filed Nov. 23, 1983, Ser. No. 554,579

Int. Cl.[4] B60G *3/00*

U.S. Cl. 280—694 **6 Claims**



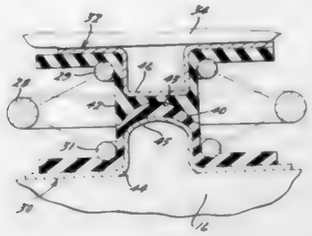
1. In a wheel mount particularly adapted to a single wheel mounted on an axle; the combination of a fork mount having a transverse block at its upper end, means on the top of the block to mount the wheel mount for turning movement on an axis, and two depending side members secured to the block, one for the left side and one for the right side of the wheel; each side member comprising a plate forming a pedestal extending fore and aft with respect to the wheel with its forward edge being rearward of the front part of the wheel, left and right rocker beams extending fore and aft with respect to and on opposite sides of the wheel; connecting means including left and right pivot shafts for rockably connecting the left and right rocker beams, respectively, to the lower parts of the left and right pedestal plates, the forward edges of the pedestal plates being substantially coterminous with the forward ends of the rocker beams and having reinforcing flanges thereon; each rocker beam having means to the rear of the pivot shaft to connect the same to the wheel axle and also having a rear end extending rearward of the wheel axle; each pedestal plate having a spring attachment means spaced above said rear end of the rocker beam to form an upward and backward space, and a spring means mounted between the rear ends of each left and right rocker beam and the respective spring attachment means on each left and right pedestal plates.

4,690,428

DOUBLE ISOLATED JOUNCE BUMPER SYSTEM

Jerry H. Fluegge, Manitou Beach, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1984, Ser. No. 671,645
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—697 **5 Claims**



1. A motor vehicle suspension comprising a chassis, a wheel carrier, a roadwheel and tire assembly and one or more control arms pivotally attaching said wheel carrier to said chassis, characterized in that the suspension includes a jounce bumper system comprising:

(A) a first member comprising:
  (i) a base attached to said chassis; and
  (ii) a shaped projection depending from said base;

(B) a second member engageable with said first member during full suspension jounce, comprising:
  (i) a base attached to a suspension component subject to vertical displacement during suspension jounce; and
  (ii) a projection attached to and extending upwardly from said base and shaped so as to permit complementary interlocking engagement with said projection depending from said first member;

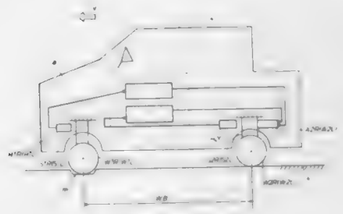
(C) said projections each comprising a rigid armature, a portion of which also forms said base, and a covering of elastomeric material fitted over at least part of said armature.

4,690,429

REAR SUSPENSION CONTROLLER

Ken Asami, Nagoya; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Shuuichi Buma, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 13, 1986, Ser. No. 818,140
Claims priority, application Japan, Jan. 16, 1985, 60-7248
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 **8 Claims**



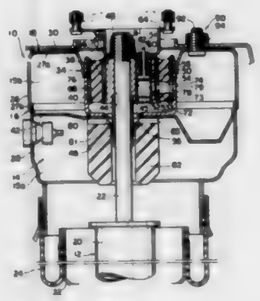
1. A rear suspension controller for a vehicle having a suspension between a vehicle body and a rear wheel comprising:
a front vehicle height detecting means for measuring a distance between the vehicle body and a front wheel and for generating a front data signal;
a first judgment means for comparing the front data signal with a first preset range and for generating a first judgment signal if the first data signal is out of the first preset range;
a rear vehicle height detecting means for measuring distance between the vehicle body and a rear wheel and for generating a rear data signal;
a second judgment means for comparing the rear data signal with a second preset range and for generating a second judgement signal if the rear data signal is out of the second preset range; and
a rear suspension characteristic alteration means for altering a rear suspension characteristic on receiving the first judgment signal and for returning the suspension characteristic to an unaltered state after receiving the second judgment signal.

4,690,430

AIR SUSPENSION

Shuuichi Buma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1986, Ser. No. 829,313
Claims priority, application Japan, Feb. 14, 1985, 60-18333[U]
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—708 **5 Claims**



1. An air suspension assembly provided with an air chamber for an air spring positioned below a car body surrounding a shock absorber, comprising:
a piston rod;
a housing for forming said air chamber having a support including a connecting member connected with said piston rod and a resilient bushing disposed outside the connecting member;
a spacer disposed radially outwardly of said support between said housing and the car body; and
means for securing said housing to the car body and for transmitting a majority of a force from the air spring directly to the car body.

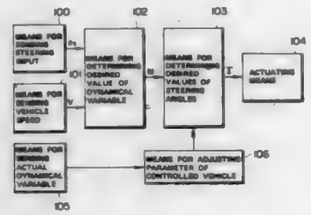
4,690,431

SYSTEM FOR CONTROLLING CORNERING CHARACTERISTICS OF WHEELED VEHICLE

Ken Ito, and Naohiko Inoue, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,621
Claims priority, application Japan, Sep. 10, 1984, 59-188154
Int. Cl.[4] B62D *6/02*
U.S. Cl. 280—771 **18 Claims**

1. A steering control system for a controlled vehicle having a pair of first wheels and a pair of second wheels, comprising:
steering input sensing means for sensing a steering input quantity representing a driver's steering command of said controlled vehicle and determining a sensed value of said steering input quantity,
vehicle speed sensing means for sensing a vehicle speed of said controlled vehicle and determining a sensed value of said vehicle speed,
target behavior determining means connected with said steering input and vehicle speed sensing means for determining a desired value of at least one dynamic variable corresponding to said sensed values of said steering input quantity and said vehicle speed by solving for said dynamic variable a group of equations of vehicle motion characteristic of a desired vehicle by setting vehicle parameters appearing in said equations of vehicle motion equal to desired values representing said desired vehicle,
steering angle determining means connected with said target determining means for determining a desired value of a first wheel steering angle of said first wheels required to achieve said desired value of said dynamic variable, by solving for said steering angle a group of equations of



vehicle motion characteristic of said controlled vehicle using said desired value of said dynamic variable and actual values of vehicle parameters representative of said controlled vehicle,
actuating means for steering said first wheels so that an actual first wheel steering angle is maintained equal to said desired value of said first wheel steering angle,
actual vehicle behavior sensing means for sensing an actual value of said dynamic variable of said controlled vehicle, and
parameter adjusting means connected with said steering angle determining means for adjusting said actual value of at least one of said vehicle parameters used by said steering angle determining means in accordance with said actual value of said dynamic variable sensed by said actual behavior sensing means.

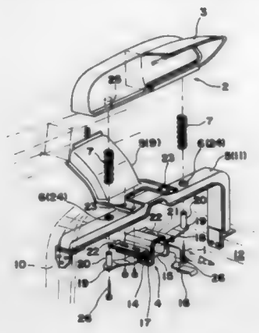
4,690,432

AUTOMOBILE INSTRUMENT CLUSTER TILTABLE WITH A STEERING COLUMN

Toshinori Sakamoto, Higashihiroshima; Isao Hirashima, and Seiichi Tsuji, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 23, 1985, Ser. No. 790,515
Claims priority, application Japan, Oct. 24, 1984, 59-223167; Oct. 24, 1984, 59-160800[U]; Nov. 5, 1984, 59-168107[U]
Int. Cl.[4] B62D *1/18*
U.S. Cl. 280—775 **6 Claims**

1. A support of an automobile gauge cluster on a steering column, having a steering shaft rotatably extending therein, for permitting a steering wheel to tilt up and down, which support comprises:
vertically extending connecting strut members provided for connecting said gauge cluster with said steering column;
a generally elongated bracket rigidly connected at one end to a portion of an automobile body structure located forwardly of a driver's seat in said automobile body structure and extending rearwardly of the vehicle therefrom;
a steering support bracket for supporting the steering column, said steering support bracket being connected with another end of the elongated bracket so as to extend in a widthwise direction of the automobile body structure; and,
guide hole means provided in the steering support bracket for receiving said vertically extending connecting strut members therein to permit the gauge cluster to undergo a tilting motion in response to the tilting of the steering wheel.

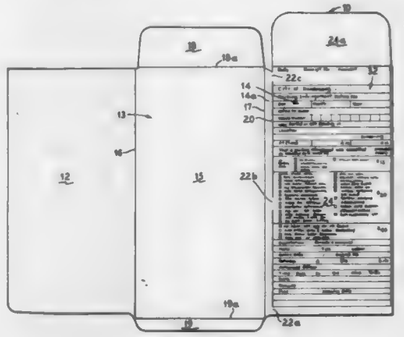


4,690,433

STATIONERY SET

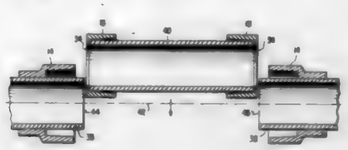
David F. Showers, Malvern; Raymond A. James, Bulleen, both of Australia, assignors to Glenwood Systems U.S.A., Ltd., Australia

Filed May 29, 1985, Ser. No. 738,755
Claims priority, application Australia, May 30, 1984, PG5270
Int. Cl.[4] B42B *15/00*; B41L *1/20, 1/24*; B65D *27/00*
U.S. Cl. 283—1 B **9 Claims**



1. A mailable business single sheet form requiring only single entries producing a retained record page and a notice page foldable into an envelope sealed by the addressor which comprises a first page having printed indicia and cooperating blank spaces to be filled in by the person giving the notice, an underlying second page having indicia and blank spaces registering with the first page, means reproducing entries in the blank spaces of the first page of the blank spaces of the second page, a third page hinged to one of said first and second pages having an address printed thereon, gummed flaps on at least one of the hinged together pages to close the pages into an envelope with the address and entries exposed on opposite faces of the envelope, a projecting tab on a page receiving the entries to provide the record page, and means for separating the envelope forming pages from the record page.

4,690,434
PIPE COUPLING
Victor P. Schmidt, 12304 N. Ledges, Roscoe, Ill. 61073
Filed Jan. 23, 1981, Ser. No. 227,938
Int. Cl.⁴ F16L *21/02*
U.S. Cl. 285—31 **7 Claims**



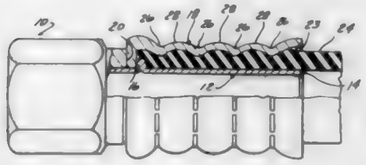
1. A coupling for joining the open ends of first and second pipe sections, said coupling comprising:

(a) a first coupling member having an elongated portion with an outer surface of a predetermined length and an inner diameter larger than the outer diameter of said first pipe section, a flange element extending radially inward and terminating at a circular recess, said flange element having an inner surface for limiting sliding of said first coupling element on the end of said first pipe, said flange element having an outer surface which extends in a plane from said outer surface of said first coupling member to said circular recess,

(b) a second coupling member having a first portion with an inner diameter larger than the outer diameter of said second pipe, a second portion having a recess of a predetermined length and of a diameter larger than the outer diameter of said first coupling member for sliding thereover and a surface extending radially from said inner diameter of said first elongated portion to the inner diameter of said second elongated portion for engaging said outer surface of said flange element to limit sliding movement of said second coupling member on said first coupling member, and

(c) means for securing said first and second coupling members together and to said first and second pipe sections respectively, said length of said outer surface of said first coupling member and said length of said inner recess of said second portion of said second coupling member being substantially the same to provide a visual indication when said first coupling member is fully inserted into said seconed coupling member.

4,690,435
HOSE COUPLING
Thomas J. Manning, 20135 Brookwood, Dearborn Heights, Mich. 48127; Jack L. Ritzert, 831 Burr Rd., Wauseon, Ohio 43567; Joseph D. Blouin, 1400 Rolling Ridge, Sturgis, Mich. 49091, and Josephine A. Mowinski, 24553 Bashian, Novi, Mich. 48050
Filed Mar. 7, 1986, Ser. No. 837,187
Int. Cl.⁴ F16L *33/20*
U.S. Cl. 285—256 **2 Claims**



1. In a hose coupling of the type wherein an end section of a hose is inserted coaxially between an inner sleeve and an outer sleeve and the outer sleeve in subsequentially radially crimped at axially spaced locations to circumferentially clamp the hose end section against the inner sleeve;

the improvement wherein said hose coupling comprises a fitting including an elongate hollow tubular inner sleeve fixedly projecting from one end of said fitting to a distal end, said distal end of said inner sleeve having an annular outwardly convex curved surface, means defining a radially outwardly projecting annular flange on an inner sleeve adjacent said one end of said fitting, said inner sleeve having a smooth continuous cylindrical outer surface extending from said flange to said distal end, an elongate hollow tubular outer sleeve of uniform wall thickness coaxially mounted upon said inner sleeve, a radially inwardly projecting annular lip at one end of said outer sleeve radially overlapping and seated against the side of said flange adjacent said one end of said fitting, said outer sleeve extending from said flange to an outer end substantially aligned with said distal end of said inner sleeve, a hose having an end section coaxially received between said inner and outer sleeves with the end of said end section engaged with said flange and said lip, means defining at least four annular reduced diameter circumferentially crimped sections at uniformly spaced locations between the opposite ends of said outer sleeve, said crimped sections having an internal diameter less than the normal outer diameter of said hose to circumferentially clamp said hose against said smooth cylindrical outer surface of said inner sleeve at least four axially spaced locations, said crimped sections being separated from each other by outwardly bulged intermediate sections having a maximum internal diameter greater than that of the normal outer diameter of said hose, the outer end of said outer sleeve terminating at an outwardly flared end section having an annular chamfered inner edge radially spaced from the hose, the outer diameter D of such outer sleeve adjacent said annular lip is greater than the maximum diameter of said outwardly bulged inner portions and the maximum diameter of said flared end section is approximately equal to D.

4,690,436
PIPE COUPLING
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany
Filed May 28, 1985, Ser. No. 738,469
Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3419999
Int. Cl.⁴ F16L *19/00*
U.S. Cl. 285—321 **10 Claims**

1. A pipe coupling adapted for use as a repeatedly disconnectable and reconnectable union between two pipe ends or a pipe end and a wall port of a hydraulic system which is capable of sustaining elevated hydraulic pressures, the pipe coupling comprising in combination:

a first coupling member in the form of a pipe end portion having a cylindrical outer diameter and an inner axial extremity with an inner end face;

a second coupling member in the form of a body with an axially outwardly open bore into which the first coupling member is insertable, inner extremity first, the second coupling member having a female thread in the outer axial end portion of said bore;

a clamping member in the form of a sleeve having a bore which rotatably supports the clamping member on the outer diameter of the first coupling member, the clamping member having a male thread which can be screwed into the female thread of the second coupling member to create an axial inward movement of the clamping member;

an annular groove in the pipe end portion and a split snap ring arranged in the annular groove in such a way that it protrudes from the groove by approximately one-half of its radial height;

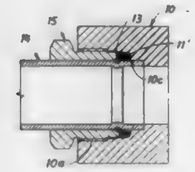
an axial recess in the bore of the clamping member, on the inner axial side thereof, the axial recess having a diameter accomodating the engaged snap ring, the clamping member having an axially inwardly facing shoulder cooperating with the protruding portion of the snap ring to transmit an axial inward movement of the clamping member to the first coupling member;

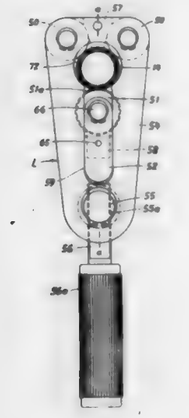
an annular gasket which is confined and compressed within an annular gasket chamber formed between said first and second coupling members and the clamping member; and

a pressure ring arranged between the inner extremity of the clamping member and the annular gasket; and wherein

the bore of the second coupling member includes a first cylindrical bore portion on the axially inner side of said female thread, said first bore portion surrounding the outer diameter of the pipe end portion with an annular gap, so as to define concentrically spaced outer and inner walls of said gasket chamber;

the bore of the second coupling member further includes a





second, smaller cylindrical bore portion adjoining said first bore portion on its axially inner side, the second bore portion cooperating with the cylindrical outer diameter of the pipe end portion to define a first displacement interface of minimal radial clearance;

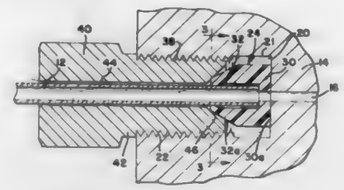
the bore of the second coupling member further includes an annular face between said first and second bore portions defining the inner axial side of the gasket chamber;

the pressure ring has an axially inwardly facing pressure face defining the outer axial side of the gasket chamber;

the inner diameter of the pressure ring forms an interface of minimal radial clearance with the outer diameter of the pipe end portion, and the outer diameter of the pressure ring cooperates with the first bore portion of the second coupling member to form a second displacement interface of minimal radial clearance; and

the resultant axially shortenable gasket chamber encloses the annular gasket on all sides in such a way that, even under elevated compression forces exerted on the gasket by the gasket chamber walls and by high-pressure fluid contained inside the pipe coupling, extrusion of the gasket material between the constituent surfaces of the gasket chamber is precluded.

4,690,437
LOW PRESSURE FITTING
James M. Anderson, Jr., Arlington Heights, Ill., assignor to Alltech Associates, Inc., Deerfield, Ill.
Filed Feb. 27, 1986, Ser. No. 834,003
Int. Cl.⁴ F16L *17/02*
U.S. Cl. 285—356 **6 Claims**

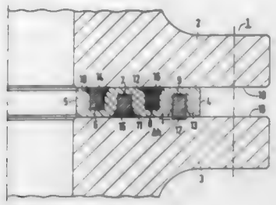


1. A fitting for connecting in pressure-tight fluid sealing relationship a tubing end to a fluid conducting member having a pressurizable fluid port terminating in a counterbore having an end wall surrounding said port, a cylindrical side wall and a threaded portion extending outwardly from said side wall; said fitting comprising a ferrule of resisilent deformable material having a forward portion, the outer diameter of which is substantially greater than the outer diameter of the tubing and substantially less than the diameter of the fluid conducting member counterbore and which has an end surface on said forward portion configured to mate with and sealingly engage the end wall surrounding the port, and a rearward portion which is rearwardly tapered, said ferrule having a throughbore with its diameter at least through said rearward portion being sufficient to receive and surround the tubing end; a fastener having a threaded portion for threadedly engaging the threaded portion of said fluid conducting member counterbore and having a throughbore for receiving the tubing, the throughbore being outwardly tapered at the forward end of said fastener to present conical walls for axially engaging said ferrule rearward portion, the taper angle of the conical throughbore walls at the forward end of said fastener being substantially greater than the taper angle of the rearward portion of said ferrule; whereby when the threaded portion of said fastener is tightened on the threaded portion of the fluid conducting member, the conical forward walls of said fastener will engage and force the tapered rearward portion of the ferrule laterally inwardly into sealing engagement around the surrounded tubing end only at approximately the point the tubing enters the ferrule rearward portion and the forward portion of the ferrule will be forced axially forwardly into sealing engagement with the counterbore end wall surrounding the port of said fluid conducting member and in such a sealing engagement said ferrule will be out of contact with the side wall of the counterbore.

4,690,438
FLANGE CONNECTION
Thaddaeus-Anton Kanczarek, Spardorf, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany
Filed Dec. 17, 1985, Ser. No. 810,317
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445975; Dec. 2, 1985, 3542593
Int. Cl.⁴ F16L *23/00*
U.S. Cl. 285—363 **10 Claims**

1. A flange connection with a disc-shaped base body of incompressible material disposed between mutually facing

planar sealing surfaces of flanges which are to be assembled and connected to one another, the base body being formed with a central bore having a diameter matching an inner diameter of the flanges and formed with at least one annular slot, comprising a compressible sealing insert formed of expanded graphite and received in the annular slot, said sealing insert, after the flanges are assembled, being enclosed on all sides by



defining surfaces of the annular slot and by means of the sealing surfaces of the flanges in which said sealing insert, before assembly and connection of the flanges, is higher than the depth of the annular slot by an amount Δh, so that when said sealing insert is compressed, with the flange engaging the base body and taking into account the spring-back resilient properties of said sealing insert, said sealing insert has a compression of more than 100 N per mm².

4,690,439

MECHANISM FOR OPENING AND CLOSING A DOOR OF A HOME ELECTRIC EQUIPMENT, PARTICULARLY A ELECTRONIC RANGE

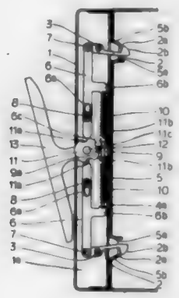
Jong D. Park, Changwon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 23, 1986, Ser. No. 866,368

Claims priority, application Rep. of Korea, May 24, 1985, 6162/1985[U]

Int. Cl.⁴ E05C *3/34*

U.S. Cl. 292—27 **1 Claim**



1. A mechanism for opening and closing a door of a home electric equipment, particularly an electronic range, comprising:

a pair of locking levers each pivotablely mounted, at the middle portion thereof, on the inner side wall of the door and provided, at one end thereof, with a locking portion having an engaging step and an inclined surface;

a locking plate fixedly mounted on a front wall of a body of said electronic range and provided with a pair of openings each adapted to receive the corresponding locking portion of said locking lever and a pair of engaging extensions each adapted to engage with said engaging step of the locking lever so as to maintain the door at a locked position thereof when the door is closed;

a pair of actuating levers each pivoted, at one end thereof, on the other end of said locking lever by means of a pin and provided, at the middle portion thereof, with a slot receiving a pin fixed on the inner side wall of the door and guiding the movement of said actuating lever, and provided with a lateral extension at a position between said slot and the pin connecting said locking lever and said actuating lever;

a pair of springs arranged between respective lateral extension of said actuating levers and adapted to urge said actuating levers in a direction that each locking lever is maintained at a locking position thereof;

a spring connector connecting said springs and having a protrusion;

a circular cam pivoted on a pin fixed to the inner side wall of the door and adapted to effect the movement of said actuating levers by the pivoting movement thereof, said cam having, at upper and lower portions thereof, a pair of cam surfaces each contacting with said other end of the actuating lever, respectively, and at the inner side thereof, an arc-shaped groove receiving said protrusion of the spring connector and respective steps formed at both ends of said groove, said steps adapted to limit the pivoting movement of the cam to a certain range by cooperating with said protrusion of the spring connector; and

a T-shaped handle disposed outwardly from the outer wall of the door and integrally connected with said cam, so that said cam pivots together with said handle when the handle turns in either direction of clockwise or counterclockwise, as an operator pulls the handle.

4,690,440

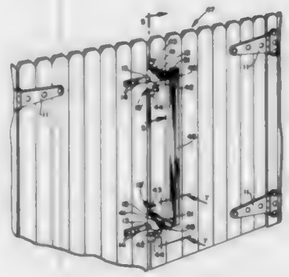
STRENGTHENED LATCH AND STRIKER BAR STRUCTURE FOR FENCE GATES

Gerald H. Rogers, Rte. 1, Athens, Tex. 75751

Filed Dec. 30, 1985, Ser. No. 814,312

Int. Cl.⁴ E05C *3/14*

U.S. Cl. 292—54 **16 Claims**



1. A gate latch and striker bar structure comprising: latch striker bar means with a striker bar extension mountable on a pivotally mounted gate panel pivotal into open and closed states; a gate latch with a latch mounting back plate mountable on a fence gate member and having a striker bar receiving opening with a rear end that absorbs striker bar closing impact directly with closing of said gate panel; a pivotal latch member pivotally mounted on said latch mounting back plate for pivotal movement up and down; pivotal mounting means pivotally mounting said pivotal latch member on said latch mounting back plate; pivotal latch member pivot position limiting means mounted on said latch mounting back plate; cam surface means on said pivotal latch member engageable by said latch striker bar to lift said pivotal latch member as said gate panel is being moved to the closed state after which the pivotal latch member drops down to a latched state with the gate panel in the closed state; a downward facing opening enclosing said striker bar extension in the latched state in said pivotal latch member having a rear edge recessed back from the rear end of said striker bar receiving opening to prevent contact of said rear edge with said latch striker bar as said gate panel is being pivoted to the closed state insuring that the back plate absorbs striker bar closing impact directly rather than such impact being imposed on the pivotal latch member and on said pivotal mounting means; and wherein said pivotal mounting means is a pivot screw extended through a pivot opening in said pivotal latch member, and threaded into a threaded opening in said latch mounting back plate; and wherein said pivotal latch member pivot position limiting means includes, a limit screw threaded into a threaded opening in said latch mounting back plate; and a slot in said pivot latch member with opposite slot ends coming into engagement with said limit screw to limit pivotal movement of said pivot latch member about said pivot screw.

4,690,441

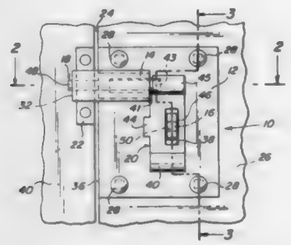
SHROUDED SLIDE LOCK ASSEMBLY

Anthony Fazzolari, and Nicholas Fazzolari, both of Brooklyn, N.Y., assignors to Myron Siegel, Brooklyn, N.Y.

Filed Sep. 25, 1985, Ser. No. 779,482

Int. Cl.⁴ E05C *5/02*

U.S. Cl. 292—57 **4 Claims**



1. A shrouded slide bolt lock assembly which comprises:

(a) a plate to be secured near the edge of a door;

(b) an exposed shroud guide directly secured to and projecting from said plate with an end portion having an aperture projecting over an edge of said plate;

(c) a staple secured to said plate;

(d) a slide bolt mounted in said shroud guide having endwise and rotatory movement therein;

(e) a hasp secured at right angle to one end of said slide bolt;

(f) a bracket secured to a wall frame so that when the door is closed the end portion of said exposed shroud guide will cover said bracket allowing said slide bolt to manually enter said bracket and aperture in the end portion of said shroud while said hasp will coact with said staple, and

(g) a bushing rotatively mounted on said slide bolt between said exposed shroud guide and said hasp to prevent tampering and cutting of said bushing and said slide bolt therein.

4,690,442

LOCATION MEANS FOR FREIGHT CONTAINER DOOR LOCKING ASSEMBLIES

Kenneth Reynard, Thirsk, United Kingdom, assignor to George Blair Public Limited Company, England

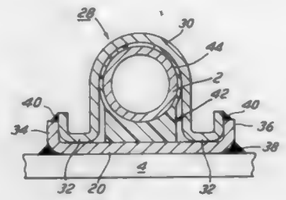
Filed Dec. 2, 1985, Ser. No. 803,572

Claims priority, application United Kingdom, Dec. 3, 1984, 8430474

Int. Cl.⁴ E05C *9/08*

U.S. Cl. 292—218 **3 Claims**

1. Location means for a freight container door locking assembly having a locking bar of circular cross-section, the location means comprising a backing member including a substantially plate-like portion having a rear surface adapted to be secured against the surface of the door of the container, the locking member further including a front surface shaped to receive therein part of the cirular section of the locking bar of the assembly and a pair of opposed, upstanding sidewalls having upper ends thereto, and a saddle bracket having a body portion of substantially U-shape in transverse section and a pair of opposed reflex edge regions of generally U-shape in transverse section, the edge regions of the saddle bracket being



located laterally within the upstanding sidewalls of the backing member to engage the front surface of the backing member such that the body portion of the saddle bracket, together with the shaped front surface of the backing member, define a substantially cylindrical guide channel for the locking bar, the free edges of the bracket lying closely adjacent the upper ends of the associated sidewalls of the backing member and being welded thereto at locations remote from the door.

4,690,443

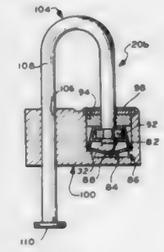
LOCKING DEVICE WITH SPLIT COLLAR

Terrence N. Brammall, Angola, Ind., assignor to Trans-Guard Industries, Inc., Angola, Ind.

Continuation of Ser. No. 500,323, Jun. 2, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 727,601

Int. Cl.⁴ B65D *33/34*

U.S. Cl. 292—307 R **11 Claims**



1. A locking device comprising:

an elongate member having on one end a neck portion of a first diameter supporting a head of a second diameter greater than said first diameter to define a shoulder therebetween; and

a lock body securable to said elongate member, said lock body including

a body member having an annular recess therein,

a retainer fixed to said body member to overlie said recess and having a hole therethrough at least as large as said second diameter,

first and second locking jaws within said recess and movable between a first position providing an opening of said first diameter and a second position providing an opening of said second diameter,

said locking jaws defining bottom surfaces substantially perpendicular to said elongate member when secured to said lock body,

means for supporting said locking jaws above the bottom of said recess, and

means for biasing said locking jaws toward said first position, whereby said locking jaws bottom surfaces abut against the elongate member shoulder when the elongate member and lock body are secured together.

4,690,444

SECURITY SEAL WITH RUPTURABLE WALL

Frank H. Arthur, Chelsfield Village, United Kingdom, assignor to Envopak Group Limited, Kent, England

Filed Feb. 26, 1986, Ser. No. 833,020

Claims priority, application United Kingdom, Mar. 11, 1985, 8506229

Int. Cl.⁴ E05B *39/02*

U.S. Cl. 292—324 **9 Claims**



1. A security seal of the type having internal means for non-detachable locking therein comprising a flexible strip, a locking box attached to a first end of the strip, and a free, second end of ths strip being insertable through an entry slot in the locking box for non-detachable locking therein, characterised in that an indicating member is arranged inside the box adjacent a rupturable wall thereof so that, when locking of the free end of the strip is effected, the indicating member is caused to rupture the wall and thereby provide visible evidence of locking.

4,690,445

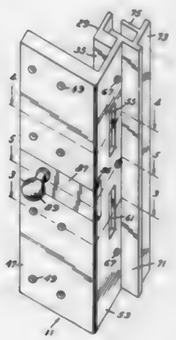
SECURITY STRIKER PLATE

Richard A. Hartley, 25834 Continental Cir., Taylor, Mich. 48180

Filed May 27, 1986, Ser. No. 866,748

Int. Cl.⁴ E05B *15/02, 17/00;* **E05C** *1/04, 19/06*

U.S. Cl. 292—341 **11 Claims**



1. A security striker plate for a locking means upon a door hinged within a door jamb, including an upright rail, a peripheral door stop and interior framing studs;

comprising an elongated mount plate inset within a portion of the upright rail and bearing against its inner surface; said mount plate being located in a plane which is parallel to the plane of the door when closed;

a first series of longitudinally spaced elongated first screws arranged in a pair of laterally spaced rows extending through said mount plate and into the framing studs for anchoring the mount plate thereto;

an elongated right angular apertured strike plate intergral with and extending from said mount plate bearing against a right angular surface of the upright rail and facing the door when closed;

a second series of longitudinally spaced elongated second screws arranged at right angles to said first screws extending through said strike plate and threaded into said studs;

an enlongated right angular door stop lip integral with and extending outwardly from one side of said strike plate in registry with and reinforcing the door stop;

an elongated anchor plate integral with and projecting from said door stop lip at right angles thereto, registering with an outer portion of the door jamb;

a third series of longitudinally spaced tamper proof third screws extending through said anchor plate and threaded into said studs, and extending parallel to said second screws;

a first elongated fin integral with and in registry with said door stop lip and extending rearwardly of said strike plate to prevent tampering with said second screws; and

a second elongated fin integral with, extending along and projecting rearwardly of said anchor plate outwardly of and protecting said third screws from tampering;

said mount plate, door stop lip and second elongated fin being parallel to one another, said strike plate and said anchor being parallel, and said first elongated fin being parallel to said mount plate and to said second elongated fin.

4,690,446

BUMPER STRIP FOR AUTOMOBILES

Monty Warren, Mississauga, Canada, assignor to Dorfender Products Inc., Mississauga, Canada

Filed May 30, 1986, Ser. No. 869,019

Int. Cl.⁴ B60R *19/14, 19/42*

U.S. Cl. 293—128 **5 Claims**



1. A foldable add-on side protection device for automobiles and the like, comprising:

an elongate strip of impact-absorbing resilient material,

backing material in strip form surface-attached to the resilient material.

the strip of resilient material being separated into a plurality of sections of various lengths while the strip of backing material is continuous across each location where the resilient material is separated, thereby to allow the device to be wound upon itself in a compact spiral, the sections into which the strip of resilient material is separated comprising in sequence, beginning from one end;

(a) a first section having a first length,

(b) a second section having a length substantially the same as said first length,

(c) a third section having a length substantially the same as a width of the side protection device taken perpendicular to the surface between the resilient and the backing strip, and

(d) a fourth section having a length substantially the same as the first length,

means on the resilient material and on the backing material for detachably connecting to each other adjacent portions of the device when in the wound up condition,

and magnetic means attached to the protection device, whereby the first, second and fourth sections, when wound, are parallel, and the third section is perpendicular thereto, in abutment to an end of the first section.

4,690,447

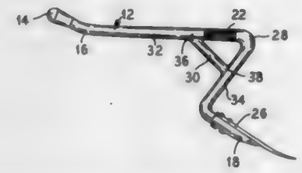
RAISED GRIP SHOVEL

Michael Adams, 3954 Dundee Rd., Northbrook, Ill. 60062

Continuation of Ser. No. 748,503, Jun. 25, 1985, abandoned. This application Dec. 10, 1986, Ser. No. 941,534

Int. Cl.⁴ B25G *1/10*

U.S. Cl. 294—57 **1 Claim**



1. A shovel comprising a substantially Z shaped handle bar and a scoop blade having a leading edge and a back edge, said scoop blade attached to said handle bar adjscent said back edge at a connection area, said handle bar having a proximal portion, an intermediate portion and a distal portion, said distal portion attached to said scoop blade, a hand grip at a proximal end of said proximal portion, said proximal portion extending from said hand grip to an angled junction to said intermediate portion, said intermediate portion being angled with respect to said proximal portion such that when said proximal portion is substantially horizontal said intermediate portion extends backwardly under said proximal portion, said intermediate portion terminating in said distal portion, said distal portion located under said proximal portion and projecting forwardly of a junction with the intermediate portion, a hand grip area associated with sid proximal portion adjacent the junction between said proximal portion and said intermediate portion, the angle of the junction of the intermediate portion to the proximal portion being great enough whereby a hand may grip said proximal portion at the hand grip area adjacent to the junction to the intermediate portion with clearance for the hand between an under surface of the proximal portion and an upper surface of the intermediate portion underlying the proximal portion, said scoop blade projecting from said intermediate portion at an angle such that when said proximal portion is horizontal, said blade projects from said intermediate portion forwardly of the intermediate portion and downwardly from the horizontal, said hand grip area substantially overlying the connection area between the distal portion and the blade.

4,690,448

CONSOLE BOX FOR AUTOMOBILE

Naoki Fujisawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1986, Ser. No. 885,156

Claims priority, application Japan, Jul. 16, 1985, 60-108605

Int. Cl.⁴ B60R *7/04*

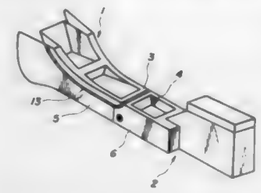
U.S. Cl. 296—37.8 **6 Claims**

1. A console box for an automobile, split longitudinally into front and rear blocks, said console box comprising:

upwardly and downwardly projecting strips engaged with each other at the ends of opposed upper walls of the front and rear blocks;

an extension projecting toward one of said blocks from a side wall of the other of said blocks;

a cutout portion in said one block corresponding to the extension at the side wall of said other block; and



a platelike seat projecting from the side wall of said one block, said seat contacting the inner surface of the side wall of said other block when said blocks are coupled together.

4,690,449

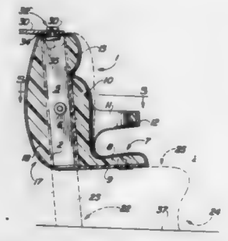
ROTATING CHILD'S SEAT

Tommy E. Holman, 8974 Marlow St., Shreveport, La. 71118

Filed Jan. 23, 1986, Ser. No. 821,856

Int. Cl.⁴ B60N *1/12*

U.S. Cl. 296—65 R **17 Claims**



1. A rotating child's seat for vehicles having a storage area and at least one bench seat with a cooperating backrest, said rotating child's seat comprising seat means adapted to support a child, an opening provided in the bench seat for receiving said seat means and pivot means carried by the bench seat, said pivot means engaging said seat means near the center of said seat means in transverse relationship, and an access panel having one end carried by said vehicle and the opposite end of said access panel engaging said seat means and latch means carried by said access panel for securing said opposite end of said access panel to said seat means, whereby said seat mens is selectively rotated on said pivot means throug an arc of substantially 180° into a first functional orientation over the bench seat in the vehicle and into a second stored configuration in the storage area of the vehicle responsive to manipulation of said latch means to release said opposite end of said access panel from said seat means and open said access panel.

4,690,450

VISOR SYSTEM

Edward T. Boerema, Zeeland; Michael J. Suman, and Dennis J. Fleming, both of Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Nov. 2, 1984, Ser. No. 667,765

Int. Cl.⁴ B60J *3/02*

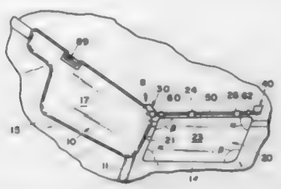
U.S. Cl. 296—97 K **4 Claims**

1. A pair of mounting brackets for mounting opposite ends of first and second visors to a vehicle, said brackets comprising:

a first body having integrally formed therein a semi-cylindrical, longitudinally extending socket for releasably holding a clip of a first visor, said first body adapted to be mounted to a vehicle such that the axis of said socket extends generally in parallel relationship to the longitudinal axis of the

first visor, said first body further integrally including an aperture formed therein on an axis which is generally parallel to and in offset relationship with said socket for receiving an end fitting of a second visor for supporting an end of the second visor;

a second body integrally including a generally circular aperture extending through said second body along a first axis thereof for receiving an end of a pivot elbow rod of a first



visor for permitting the first visor to pivot about the first axis of said second body, said second body further including a second aperture extending into said second body on a second axis generally orthogonal to and offset from said first axis for receiving an end fitting of a second visor for permitting the second visor to pivot about the second axis; and

means for mounting said brackets in spaced relationship to a vehicle for supporting the visors therebetween.

4,690,451

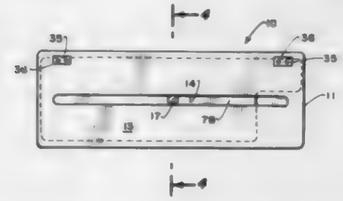
CONVERTIBLE SUN VISOR

Thaddeus Killar, P.O. Box 1922, Carmel, Calif. 93921

Filed Sep. 15, 1986, Ser. No. 906,926

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97 G **13 Claims**



1. A convertible sun visor for an automobile adapted to be used as original equipment, when employed with an auxiliary mount means, and also adapted to be used an accessory sun visor by mounting thereof upon a preexistent sun visor, which comprises:

A. a generally rectangular housing having a rear wall, and a spaced therefrom front wall, said front wall having a longitudinal slot therein, and a pair of spaced connecting side walls, each of which has an vertically elongated cutout portion therein;

said housing being adapted to receive one of, auxiliary mount means for mounting said device on a preexistent sun visor or means for mounting as an original equipment sun visor;

B. a frame disposed within said housing, said frame having a rear wall, spaced top and bottom walls and a front wall, having a longitudinal slot therein, said frame being open at each end, and;

C. an elongated laterally adjustable light diminishing slider slidably mounted for longitudinal adjustment, both leftwardly and rightwardly, in said frame and sized to extend when extended through the side walls of said housing, said slider being adaptable to not impact upon the rear view mirror of a plurality of vehicles when in the rightwardly position;

D. a knob connected to said slider, said knob extending forwardly through the longitudinal slots in said housing and said frame.

4,690,452

SLIDING ROOF FOR VEHICLES

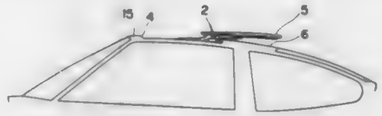
Toshiaki Niwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 510,336, Jul. 1, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 827,874

Claims priority, application Japan, Jul. 2, 1982, 57-115271

Int. Cl.[4] B60J *7/047, 7/057*

U.S. Cl. 296—216 **23 Claims**



1. An apparatus for tilting up a sliding roof panel (2) about a rear edge of a frame (22) defining an opening (4) in a vehicle roof (6, 15) and for moving said sliding roof panel (2) rearwardly, said apparatus comprising:

guide means (23, 31, 53, 31, 71) arranged on both sides of said opening (4); and

stay means, including front stays, (12, 52, 74) and rear stays (41, 41, 76), provided on said sliding roof panel (2);

said sliding roof panel (2) is supported at a front end thereof by said front stays (12, 52, 74) provided on both sides thereof and at a rear end thereof by said rear stays (41, 41, 76) provided on both sides thereof;

at least said rear stays (41, 41, 76) being supported by portions of said guide means (31, 31, 71), front ends of said portions (31, 31, 71) being hinged to said frame (22) and rear ends of said portions (31, 31, 71) being liftable;

said rear stays (41, 41, 76) being elevated when the rear ends of said portions (31, 31, 71) are lifted; and

each of said rear stays (41, 41, 76) having a rearwardly extending section which, when said sliding roof panel (2) has been completely moved rearwardly, is located over a section (6) of said vehicle roof (6, 15) adjacent a rear edge of said opening (4).

4,690,453

SLIDING ROOF FOR VEHICLES

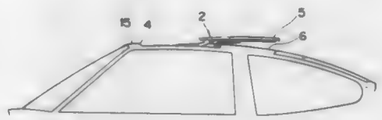
Toshiaki Niwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 510,336, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 890,975, Jul. 30, 1986. This application Feb. 10, 1986, Ser. No. 827,876

Claims priority, application Japan, Jul. 2, 1982, 57-115271

Int. Cl.[4] B60J *7/047, 7/057*

U.S. Cl. 296—216 **20 Claims**



1. An apparatus for tilting up a sliding roof panel (2) about a rear edge of a frame (22) defining an opening (4) in a vehicle roof (6, 15) and for moving said sliding roof panel (2) rearwardly, said apparatus comprising:

guide means (23, 31, 53, 31, 71, 91) disposed on both sides of said opening (4); and

stay means, including front stays (12, 52, 74, 74) and rear stays (41, 41, 76, 93), provided on said sliding roof panel (2);

said sliding roof panel (2) being supported at a front end thereof by said front stays (12, 52, 74, 74) provided on both sides thereof, and at a rear end thereof by said rear stays (41, 41, 76, 93) provided on both sides thereof; and

at least said rear stays (41, 41, 76, 93) are operatively connected to portions of said guide means (31, 31, 71, 91), and said portions (31, 31, 71, 91) being hinged at front ends thereof to said frame (22) and liftable at rear ends thereof by means of a rocker-type lever (37) which can be tilted by a tilting mechanism (36) arranged below a region (6) of said vehicle roof (6, 15) adjacent a rear edge of said opening (4).

4,690,454

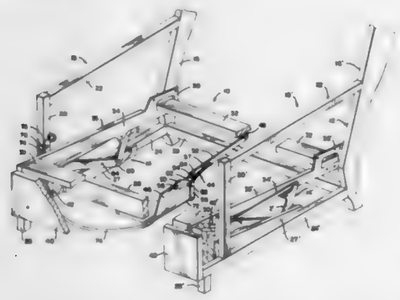
RECLINER UNIT WITH NOVEL LOCKING AND ACTUATING MECHANISM

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262

Filed Jun. 27, 1985, Ser. No. 749,409

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—89 **18 Claims**



1. A recliner, comprising,

a stationary frame having a back frame portion, a left side frame portion, and a right side frame portion,

a seat frame which is located between said side frame portions,

a leg rest which is located at a forward portion of the recliner,

a left recliner mechanism connecting the left side of said seat frame to the left side frame portion,

a right recliner mechanism connecting the right side of said frame to the right side frame portion,

each of said recliner mechanisms including a seat linkage means and a leg rest linkage means, said seat linkage means being operable to support said seat frame for movement relative to said stationary frame between a rear position and a forward position which has a greater pitch from the horizontal than said rear position, said seat linkage means including seat support links which are inclined rearwardly when the seat frame is in its rear position, said seat support links being inclined forwardly when the seat frame is in its forward position,

said leg rest linkage means being operable to support the leg rest for movement between a retracted position where it is generally vertical and an extended position where it is generally horizontal and extends in a forward direction,

a locking mechanism for holding the seat frame in its rear position at which said seat support links are inclined rearwardly, said locking mechanism being spaced from and located between the recliner mechanisms and having its opposite ends connected to the seat frame and to the stationary frame, said locking mechanism including pivotally interconnected links, one of which is a toggle member movable to an over center position where it prevents the links of the locking mechanism from pivoting relative to each other when the locking mechanism is subjected to longitudinal compressive forces, and unlocking means for moving the toggle member from its over center position so that the links of the locking mechanism are able to pivot relative to each other to enable the seat support links to move to positions where they are inclined forwardly and to enable the seat frame to move to its forward position, said unlocking means including a flexible tension member which, when pulled by a user of the recliner, causes the toggle member to move from its over center position.

4,690,455

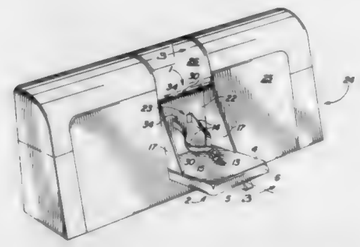
INFANT SEAT FOR AUTOMOBILES

Randal N. Bailey, 6011 Fox Chase Cir., Shreveport, La. 71106, and Purvis J. Crews, 4025 Marion Pl., Shreveport, La. 71109

Filed May 8, 1986, Ser. No. 860,896

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—238 **15 Claims**



1. An infant seat for automobiles comprising frame means disposed in the backrest of an automobile seat; a support hingedly carried by said frame means, wherein said support is selectively retractable in the backrest in a first orientation and deployed from the backrest in a second orientation; restraint means extending from a first point of attachment in said support to second points of attachment in said frame means; a first flexible side flap extending between one side of said support and the backrest of the automobile seat and a second flexible side flap extending between the opposite side of said support and the backrest of the automobile seat, said first flexible side flap and said second flexible side flap foldable in the backrest with said support when said support is retracted in said first orientation; ;and a first back support flap provided in recessed relationship inside the backrest of the automobile seat for supporting the back of the infant.

4,690,456

AIR BAG ASSEMBLY

Yoshinori Chiba, Yokosuka; Keiichi Ishida, Toyota, and Fumio Sugiura, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha; Toyota Jidosha Kabushiki Kaisha, both of Aichi and Kanto Jidosha Kogyo Kabushiki Kaisha, Kanagawa, all of, Japan

Filed Jun. 26, 1985, Ser. No. 748,860

Claims priority, application Japan, Jun. 27, 1984, 59-95369[U]

Int. Cl.[4] A47C *7/46;* **B60N** *1/06*

U.S. Cl. 297—284 **8 Claims**

1. A lumbar supporting air bag built into a seat back, comprising:

a main body consisting essentially of a resilient sheet of synethetic resin sealed together at side edges thereof;

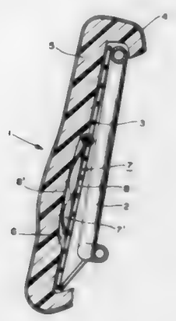
port means provided in said main body for introducing air into said main body and for withdrawing air from said main body;

a plurality of partitions formed in said sheet, said partitions being aligned substantially colinearly and extending transversely along said main body, said partitions being separated from one another and defining mutually communi-

cating upper and lower horizontal chambers in said air bag;

each of said partitions having longitudinally extending elongated holes at the center thereof, wherein opposing edge of said elongate holes separate from each other when air is introdued under pressure into the bag, in such manner that said elongate holes cause said upper and lower chambers to be outwardly expanded;

first and second plates sandwiching said air bag, said first plate having a plurality of apertures aligned with said lower chamber, said first and second plates each having a pair of mounting lugs for mounting said plates on said seat



back member, said mounting lugs of each pair being equally spaced along a peripheral portion of said first and second plates on a side of said upper chamber opposite from said lower chamber, said pairs of mounting lugs beig aligned with each other when said plates are mounted on said seat back member;

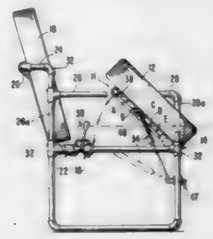
a resin sheet on the side of said first plate opposite said air bag, said sheet contacting said lower chamber of said air bag through said aperatures in said first plate, wherein the contacting surfaces between the sheet and said lower chamber of said air bag are joined for supporting the air bag on said plates.

4,690,457

CHAIR WITH LIFT ASSISTANCE MECHANISM

Richard P. Poucy, Palm Beach Gardens, and Mathew Chrzanowski, West Palm Beach, both of Fla., assignors to Steridyne Corporation, Riviera Beach, Fla.

Filed Jul. 1, 1986, Ser. No. 880,928
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—337 **6 Claims**



1. A lift chair comprising:

a seat;

a frame supporting said seat and to which a front portion of said seat is pivotably attached, said frame having a central vertical frame member below said front portion of said seat;

a resilient compression cylinder having a first and second ends; and

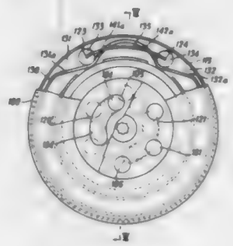
means for selectably pivotably connecting said ends of said cylinder in a plurality of positions on said seat and said central vertical frame member of the chair frame, respectively, whereby the lifting force applied to said seat and the pivotal movement of said seat provided thereby are controlled.

4,690,458

RAPID LOCKING DEVICE FOR AN ARTICULATED SEAT

Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin & Cie, Flers, France

Filed Jun. 10, 1985, Ser. No. 743,071
Claims priority, application France, Jun. 15, 1984, 84 09418; May 22, 1985, 85 07699
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—379 **4 Claims**



1. A rapid locking device for an articulated seat, comprising an outer casing (**115**) rigidly connected to a frame of the seat back (**116**) at an inner portion and having an outer peripheral portion, an outer dish (**100**) connected at an outer peripheral portion to said outer peripheral portion of said outer casing (**115**) to provide a space therebetween, a shaped casing (**130**) placed in said outer casing (**115**) and delimiting therewith a housing containing an inertia locking member, said inertia locking member comprising two rollers (**133,134**) each having a serrated outer surface and connected by a maintaining member (**135**), said shaped casing (**130**) shaped so that when said inertia locking member is subjected to an inertial force with respect to said housing, a respected one of said rollers rolls between respective surfaces of said outer casing (**115**) and said shaped casing (**130**) to prevent one from freely rotating with respect to the other, the device further comprising an articulation setting fitting (**103**) rigidly connected to a frame of the seat and the shaped casing (**130**) said shaped casing being able to rotate by means of the articulation setting fitting (**103**), said articulation setting fitting (**103**) having at least one protrusion (**104**) extending therefrom, and the outer casing (**115**) further having at least one elongate opening (**120**) cooperating with said at least one protrusion (**104**) to permit forward displacement of the seat back with respect to the seat.

4,690,459

WORKING CHAIR

Johan Ullman, Ånestadsgatan 3, S-582 58 Linköping, Sweden

Filed Oct. 17, 1985, Ser. No. 788,640
Claims priority, application Sweden, Oct. 19, 1984, 8405225
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—458 **4 Claims**

1. A chair comprising:

a stand having two uprights and a lower bow connected thereto for resting against a foundation, a foot rest provided on said uprights, said foot rest having outwardly extending pins and being positioned slightly above the

height which is necessary to allow a person's feet rest against the pins without pressure against the foundation;

a seat carried by said stand having an upwardly facing sitting surface provided with a resilient material giving a distribution of surface pressure, a textured surface covering provided on said sitting surface, said seat having on its upwardly facing sitting surface a rear portion and a front portion;

said rear portion being a substantially horizontal main surface having an effective length of substantially 10–15 cm;



said front portion being a second main surface which slopes forwards and downwards at an angle of substantially 16°–30° and preferably 18° with relation to the surface of the rear portion, said front portion having a length from the edge of the rear portion at a connection between said two portions to an outer edge of the front portion of substantially 23–30 cm, and being suitably adapted so that support is provided for ⅓ of the length of a person's thigh; and

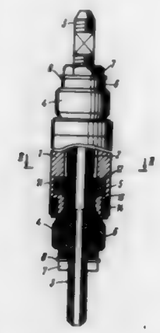
a support for a person's back carried by said stand.

4,690,460

POWER UNIT

Jury A. Lebedev, Gorno-Altaisk, U.S.S.R., assignor to Gorno-Altaisky Gosudarstvenny Pedagogichesky Institut, Gorno-Altaisk, U.S.S.R.

Filed Oct. 25, 1985, Ser. No. 791,455
Int. Cl.[4] E21C *37/06*
U.S. Cl. 299—21 **4 Claims**



1. A power unit, comprising:

a longitudinally split housing defining a parting line;

an inner wall of said housing;

a tubular elastic vessel coaxially accommodated in said housing;

an inner space of said tubular elastic vessel;

an outer wall of said tubular elastic vessel;

two expanding inserts, each of said inserts being disposed proximate to said parting line of said housing and being trapezoidal in section, the larger base of which bears against said outer wall of said elastic vessel, while the sides bear against said inner wall of said housing;

two pipe unions intended for delivery of a working medium into said space of said tubular elastic vessel;

two holders with two flanges in each of which is installed one of said two pipe unions which is configurated and mounted for longitudinal movement;

two ends of said tubular elastic vessel each of which is disposed between one of said two pipe unions and one of said two holders;

two annular recesses made on said inner wall of said housing;

a flange of each of said two holders arranged in one of said two annular recesses;

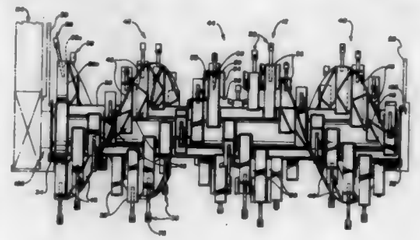
two elastic elements, each of which surrounds said outer wall of said tubular elastic vessel and arranged in one of said two annular recesses.

4,690,461

CUTTING HEAD FOR STRIP MINING APPARATUS

Richard H. Rink, Huron, S. Dak., assignor to Huron Manufacturing Corporation, Huron, S. Dak.

Division of Ser. No. 514,957, Jul. 18, 1983, Pat. No. 4,536,037 and a continuation of Ser. No. 651,422, Sep. 17, 1984.
This application Mar. 31, 1986, Ser. No. 845,952
Int. Cl.[4] E02F *5/00*; E21C *47/00*
U.S. Cl. 299—39 **4 Claims**



1. A mining apparatus cutting head for loosening a contiguous mineral deposit into a disturbed composite, comprising:

a rotatable elongated axle member having first and second terminal ends and a longitudinal axis extending therebetween, said axle member presenting a generally cylindrical axle outer surface;

a first set of cutting arms extending radially outwardly from said axle outer surface, said first set of cutting arms being longitudinally and circumferentially spaced apart from each other to mutually define a first helix of given direction;

a second set of cutting arms extending radially outwardly from said axle, said second set of cutting arms being longitudinally and circumferentially spaced apart from each other to mutually define a second helix of opposite handed direction relative to said first helix;

a plurality of flighting elements, each element having a flighting surface and radially inwardly facing and radially outwardly facing, opposed margins, each of said flighting elements interconnecting respective ones of adjacent cutting arms in said first and second sets of cutting arms to present opposite handed flighting helices, the radially inwardly facing margin of each respective flighting element being radially spaced apart from said axle outer surface to present radially extending gaps between said flighting helices and said axle outer surface;

a third set of cutting arms interposed between said first and second sets of cutting arms, said third set cutting arms extending radially outwardly from said axle outer surface and being longitudinally and circumferentially spaced apart from each other such that adjacent ones of said third set of cutting arms define third set longitudinal gaps therebetween;

impelling elements operably coupled to and extending outwardly from said third set of arms, each of said impelling elements presenting a generally radially oriented impelling surface, the impelling elements of adjacent ones of said third set cutting arms being circumferentially spaced and longitudinally overlapping across said longitudinal gaps whereby said impelling elements mutually enscribe a continuous cylindrical surface upon rotation of said axle member for impelling said composite tangentially outwardly from said cutting head by said surfaces when said member is rotated;

a fourth set of cutting arms extending radially outwardly from said axle outer surface, said fourth set of cutting arms being longitudinally and circumferentially spaced apart from each other to define a third helix parallel to said first helix;

a fifth set of cutting arms extending radially outwardly from said axle outer surface, said fifth set of cutting arms being longitudinally and circumferentially spaced apart from each other to define a fourth helix parallel to said second helix;

each of said cutting arms of said first, second, fourth and fifth sets of cutting arms defining a generally uniform cutting arm width taken along said longitudinal axis, adjacent ones of said arms within said first, second, fourth and fifth sets of cutting arms being longitudinally spaced apart by no more than the distance of said cutting arm width to present longitudinal cutting arm gaps, said first and fourth sets of said cutting arms oriented such that a respective one of said fourth set cutting arms is circumferentially spaced apart, yet longitudinally overlapping relative to each respective longitudinal cutting arm gap presented by said first set of cutting arms; and

said second and fifth sets of cutting arms oriented such that a respective one of said fifth set cutting arms is circumferentially spaced apart, yet longitudinally overlapping relative to each respective longitudinal cutting arm gap presented by said second set of cutting arms.

4,690,462

CENTRAL LOCKING ARRANGEMENT

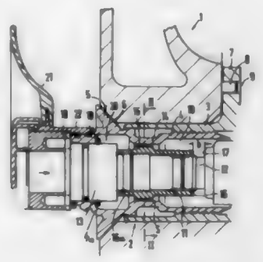
Manfred Bantle, Vaihingen, and Reinhard Lechner, Pforzheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 819,342

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501240

Int. Cl.⁴ B60B *27/00*

U.S. Cl. 301—9 CN **15 Claims**



1. A central locking arrangement for wheels of motor vehicles, comprising:

a centrally arranged threaded bush means operable to be connected with a joint shaft, said threaded bush means retainingly receiving a wheel under interposition of a wheel hub means,

an anti-rotation protecting sleeve means having an inner and outer end, arranged inside of the threaded bush means, said protecting sleeve means being engageable at its inner end with the joint shaft and retained in the bush means in a form-locking manner, said sleeve means being axially slideable within the bush means and axially movable with respect to the joint shaft while maintaining a form-locking arrangement with the bush means, and

a safety lock means adapted to be inserted and locked in the bush means, said sleeve means being form-lockingly connected at its outer end with the safety lock means.

4,690,463

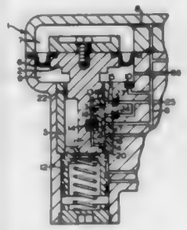
FREIGHT BRAKE CONTROL VALVE HAVING AN EMERGENCY PISTON SLIDE VALVE ARRANGED TO PROVIDE AN ACCELERATED BRAKE APPLICATION FUNCTION

James E. Hart, Trafford, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Apr. 18, 1986, Ser. No. 853,519

Int. Cl.⁴ B60T *15/30*

U.S. Cl. 303—37 **17 Claims**



1. For use on each car of a railway train having a brake pipe interconnected to the brake pipe of an adjoining car, a control valve device operable in response to selective service and emergency rates of reduction of the pressure carried in said brake pipe for effecting either a service or an emergency brake application, said control valve device comprising:

(a) a housing having a cavity therein;

(b) an emergency piston in said cavity forming therewith first and second pressure chambers on opposite sides of said emergency piston, said first and second chambers being subject to said brake pipe fluid under pressure;

(c) a first choke via which said second chamber is communicated with said brake pipe;

(d) slide valve means carried by said emergency piston for effecting a reduction of the fluid pressure in said second chamber when said emergency piston is actuated in one direction in response to a pressure differential thereacross due to said selective reduction of the fluid pressure carried in said brake pipe, said reduction of said second chamber fluid pressure counteracting the selective reduction of said brake pipe fluid pressure effective in said first chamber, to such extent as to prevent said emergency piston from being actuated in said one direction sufficiently to establish an emergency brake application, so long as said selective reduction of fluid pressure carried in said brake pipe is at a service rate; and

(e) said slide valve means in response to said actuation of said emergency piston in said one direction being effective for establishing a further reduction of said brake pipe fluid pressure in addition to said selective reduction of said brake pipe fluid pressure.

4,690,464

HYDRAULIC BRAKING PRESSURE CONTROL APPARATUS

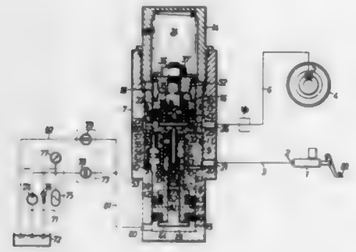
Shohei Matsuda, Utsunomiya, and Yoshihiro Iwakawa, Haga, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Nov. 25, 1985, Ser. No. 802,120

Claims priority, application Japan, Jan. 24, 1985, 60-11699

Int. Cl.⁴ B60T *8/14*

U.S. Cl. 303—115 **4 Claims**



1. A hydraulic braking pressure control apparatus for vehicles, comprising:

a casing;

a first cylinder portion and a second cylinder portion disposed on the same axis inside the casing;

a partition interposed between the first cylinder portion and the second cylinder portion;

a first piston slidably fitted in said first cylinder portion defining an input hydraulic chamber, communicating with an output port of a master cylinder, on one side of said partition and a control chamber on the opposite side to said partition;

a second piston slidably fitted in said second cylinder portion defining on one side thereof nearest to said partition an output hydraulic chamber communicating with wheel brake and adapted to generate a hydraulic braking pressure corresponding to a hydraulic pressure in said input hydraulic chamber and a spring chamber on an opposite side thereof farthest from said partition;

said output hydraulic chamber being adapted to increase its volume in accordane with a control liquid pressure supplied from anti-lock control means to said control chamber when a wheel is about to be locked;

said first and second pistons being mounted to both ends of a piston rod penetrating through said partition and hydraulically sealed therewith and movably therethrough;

a valve mechanism provided in said partition and operable to be closed in response to the movement of said second piston away from said partition, thereby cutting off the communication between said input and output hydraulic chamber; and

a spring housed in said spring chamber for biasing said second piston toward said partition;

the sectional area of said first piston being smaller than that of said second piston so that the occurrence of a proportional pressure reduction action in said valve mechanism is avoided.

4,690,465

ANTISKID HYDRAULIC PRESSURE MODULATOR FOR VEHICLE HYDRAULIC BRAKING SYSTEM

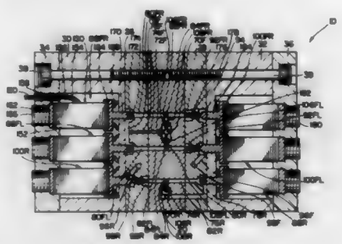
Kenji Takeda, Nukata; Mitsuo Inagaki; Hideaki Sasaya, both of Okazaki, and Kazuma Matsui, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed May 21, 1986, Ser. No. 865,443

Claims priority, application Japan, May 22, 1985, 60-108333

Int. Cl.⁴ B60T *8/00 8/36, 13/68, 15/02*

U.S. Cl. 303—119 **14 Claims**



1. An antiskid hydraulic pressure modulator for adjusting hydraulic pressure applied from a master cylinder to a wheel cylinder of a vehicular hydraulic braking system, which comprises:

(a) a body having a main hydraulic passage for transmitting the hydraulic pressure from the master cylinder to the wheel cylinder and a pressure relief passage for relieving the hydraulic pressure in the wheel cylinder;

(b) a normally open first shutoff valve in said body for providing and interrupting fluid flow through said main passage;

(c) a first piezoelectric actuator received in said body for operating said first shutoff valve in response to variations in voltage applied thereto, said first piezoelectric actuator having and elongated piezoelectric element;

(d) a normally closed second shutoff valve in said body for providing and interrupting fluid flow through said relief passage; and

(e) a second piezoelectric actuator received in said body for operating said second shutoff valve in response to variations in voltage applied thereto, said second piezoelectric actuator having an elongated piezoelectric element.

4,690,466

SEWING MACHINE CABINET AND LIFT

Mamdouh M. Bakr, Little Rock, and Bobby J. Maloney, Trumann, both of Ark., assignors to Delta Wood Products, Inc., Trumann, Ark.

Filed May 30, 1986, Ser. No. 868,565

Int. Cl.⁴ A47B *81/00*

U.S. Cl. 312—29 **17 Claims**

1. A sewing machine cabinet and lift combination comprising:

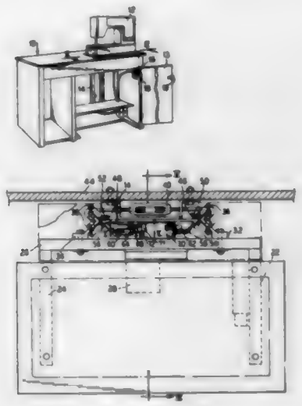
a cabinet having a rear wall and a top wall, said top wall having an opening to permit movement of a sewing machine therethrough;

a platform having a top wall which is sized to pass through said cabinet top wall opening for receiving the sewing machine, and a rear wall attached to said top wall;

a vertical track secured to said rear wall of said cabinet, on the interior side thereof, said track having two pairs of vertical wall flanges, each pair comprising walls formed perpendicularly to each other;

a linear gear toothed rack secured to said track; roller means secured to said rear wall of said platform to rollingly engage said track, said roller means comprising pairs of

perpendicularly arranged rollers engagable with said track wall flanges;
an adjustment means on at least one pair of said roller means to ensure that engagement is maintained between said rollers and said wall flanges;
a reversible electric motor mounted on said platform;
a gear tooth pinion driven by said motor and engagable with said rack to move said platform vertically upon operation of said motor;
a switch operable through a circuit means to supply power



to said motor to move said platform along said track between a lower stored position and a normal operative position;
a switch operable through said circuit means to supply power to said motor to move said platform along said track between said normal operative position and an elevated position;
said circuit means including additional switches engagable by an actuator on said platform to interrupt power to said motor when said platform is at said lower, normal and elevated positions.

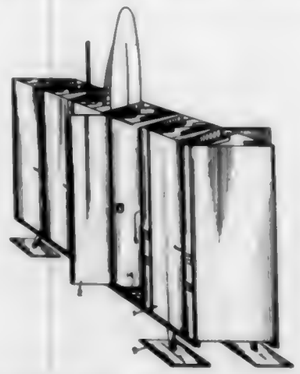
4,690,467

SECURITY ENCLOSURE HAVING ONE OR MORE COMPARTMENTS FOR HOUSING AND PROTECTING A WINDSURFER AGAINST THEFT

Louis Imbert, 3, rue Alphonse Daudet, Trebes, France (11800)

Filed Dec. 7, 1982, Ser. No. 447,621
Claims priority, application France, Dec. 9, 1981, 81 23334
Int. Cl.⁴ A47B *81/00, 53/00*
U.S. Cl. 312—198 **16 Claims**

1. A security housing for storing elongated objects, such as a windsurfer which includes a wishbone, said housing comprising at least one compartment comprising:
(a) a door;
(b) means for locking said door;
(c) a top face having a first opening therein;
(d) two vertical walls which lie in intersecting planes, wherein said compartment is adapted to receive said wishbone having a length greater than the vertical height of said compartment, wherein the length of said opening as measured along the longitudinal axis of said opening is less than the largest width of said wishbone as measured along said longitudinal axis of said opening when said wishbone is properly positioned in said compartment so that a portion of said wishbone extends through said first opening;
(e) means for preventing said wishbone from being removed from said compartment, said wishbone removal prevention means including said opening;
(f) a coin-activated apparatus for locking and unlocking said locking means;
(g) a lower frame for supporting said compartment, including a plurality of hollow beams; and
(h) a plurality of hollow posts, mounted on said frame such



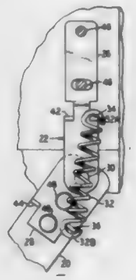
that each of said vertical walls is mounted between and supported by said hollow posts, wherein at least one post includes an opening in the front therein for receiving said coin-activated apparatus, wherein said post having said opening includes means for passing pieces of change away from said coin-activated apparatus.

4,690,468

REVERSIBLE HINGE WITH OVER-CENTER SPRING FOR REFRIGERATORS

Robert G. Lau, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 26, 1986, Ser. No. 833,036
Int. Cl.⁴ A47B *47/00*
U.S. Cl. 312—291 **6 Claims**



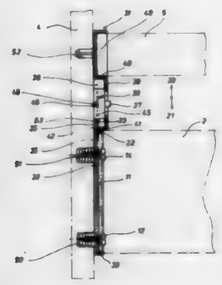
1. In a refrigerator having a single external door mounted on a cabinet and an inner freezer compartment door at an opening of a freezer compartment, an improved hinge comprising:
a stationary leaf for mounting to the refrigerator cabinet at a first side of said opening to said freezer compartment and alternately at a second side of said opening, said stationary leaf including first and second tabs extending therefrom in spaced apart disposition from one another;
a movable leaf for mounting to said freezer compartment door including third and fourth tabs extending therefrom in spaced apart disposition from one another, said movable leaf being mounted adjacent a first edge of said compartment door when said stationary leaf is at said first side of said opening and said movable leaf being mounted adjacent a second edge of said compartment door when said stationary leaf is at said second side of said opening;
a hinge pin pivotably connecting said stationary leaf to said movable leaf;
said movable leaf being pivotable to a first center position having said first tab and said third tab in-line with said hinge pin, said movable leaf being pivotable to a second center position different than said first center position, said second center position having said second tab and said fourth tab in-line with said hinge pin; and
an energy storing spring having a first end connected to one of said first and second tabs and a second opposite end connected to one of said third and fourth tabs, said spring biasing said movable leaf in a first pivotal direction with respect to said stationary leaf and when a predetermined movement of said movable leaf occurs past a respective one of said first and second center positions biasing said movable leaf in a second pivotal direction with respect to said secondary leaf;
whereby said first position corresponds to a closed position of said freezer compartment door and said second position corresponds to an open position of said freezer compartment door.

4,690,469

PANEL ADJUSTMENT DEVICE FOR THE FRONT PANEL OF DRAWERS OR THE LIKE

Alfred Gruss, Konsumstrasse 20, A-6973 Hoechst/VLBG., Austria

Filed Jun. 27, 1985, Ser. No. 749,569
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423732
Int. Cl.⁴ A47B *88/00*
U.S. Cl. 312—330 R **13 Claims**



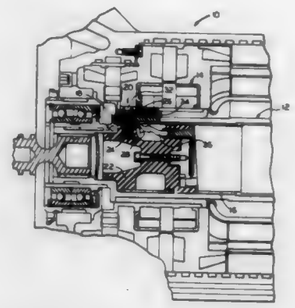
1. In a panel adjustment arrangement for a front panel of a drawer, said drawer having frame pieces, front screw flanges, drawer guides and side walls, and wherein said front panel is connected to each frame piece by one of said screw flanges, adjustment of position between said front panel and frame piece being effected by a displaceable adjustment element; the improvement wherein the adjustment element includes a wedge shaped tongue having a first tongue surface positioned to press against a surface fixed to said front panel and a surface of said tongue positioned to lie against a surface of the respective screw flange, said tongue between said screw flange and said front panel producing an adjustment gap therebetween, and a mounting in which said adjustment element is movably constrained, said mounting having a U-shaped cross-section including a base and two sides, at least said adjustment gap between said front panel and said screw flange being covered by at least one said side, said sides of said U-shaped cross-section laterally guiding movement of said adjustment element.

4,690,470

ROTATING SHAFT ELECTRICAL CONNECTION

Howard L. Hayden, Rockford; Vallabh V. Vaghani, Belvidere, and John Readman, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 12, 1986, Ser. No. 862,318
Int. Cl.⁴ H01R *39/02*
U.S. Cl. 439—13 **6 Claims**



1. In an electrical apparatus having a hollow rotating shaft, said electrical apparatus having an electrical component disposed externally of said rotating shaft and adapted to rotate therewith and said electrical apparatus having an electrical component disposed internally of said rotating shaft and adapted to rotate therewith, said externally disposed electrical component adapted to be electrically interconnected through an opening in said rotating shaft to said internally disposed electrical component, the improvement comprising:
means for electrically interconnecting said electrical components through said rotating shaft opening, said interconnecting means including an insulator fixed within said hollow rotating shaft in proximity to said rotating shaft opening and an insert disposed within said insulator in alignment with said rotating shaft opening, terminal means of low resistance and high conductivity associated with each of said electrical components in spaced relation thereto and having an opening adapted to receive a fastener on opposite sides of said rotating shaft opening, conductive sleeve means of low resistance and high conductivity extending through said rotating shaft opening and spaced from said rotating shaft so as to be in electrically isolated relation thereto, and a fastener extending through said rotating shaft opening and operatively associated with said insert for electrically interconnecting said electrical components through said terminal means and said conductive sleeve means.

4,690,471

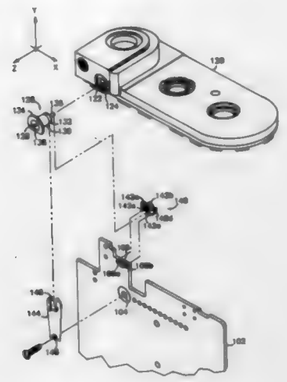
RF INTERCONNECT WITH TRIAXIAL SELF-ALIGNMENT

Eduardo J. Marabotto, Miami, and Mark S. Bresin, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 19, 1986, Ser. No. 864,239
Int. Cl.⁴ H01R *9/09*
U.S. Cl. 439—63 **6 Claims**

1. A triaxial self-aligning interconnect for connecting a circuit substrate to a connector, said interconnect comprising in combination:
a wire conductor formed into five segments: two flexible attaching segments formed at the ends of said wire for attaching said wire conductor to said substrate, two substantially parallel pin contact segments adjoining said flexible attaching segments, and a joining segment mutually connecting said pin contact segments; and

a substantially straight pin attachable to said connector, said pin being clamped between and substantially perpendicular to said pin contact segments of said wire conductor, thereby forming an electrical connection between said pin and said wire conductor;



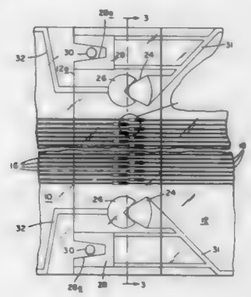
whereby, substantial misalignment of said substrate and said connector is permitted in any direction without breaking said electrical connection.

4,690,472

HIGH DENSITY FLEX CONNECTOR SYSTEM

Richard A. Elco, Mechanicsburg, Pa., and Hugh R. Vandegriff, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1986, Ser. No. 911,679
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **4 Claims**



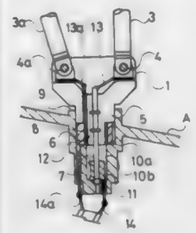
1. In a system for connecting a photodefined array of connector pads on a printed wiring board with a matching array of photodefined connector contact fingers and squeezing the connector into contact with the printed wiring board that includes a squeeze clamp for the connector and the printed wiring board, means for aligning said connector fingers as the connector fingers are guided into an overlapping position with said pads within said clamp comprising: a photodefined first guide located at each side of the array of connector pads; and a photodefined second guide located at each side of the array of fingers, said first and second guides intermeshing as said connector fingers are guided into said overlapping position to precisely align said fingers with said pads.

4,690,473

ROTARY COUPLING FOR ROTATIVELY CONNECTING A FEEDER LINE TO A ROD ANTENNA

Bong-Kwan Chung, Keumsan-kun, Rep. of Korea, assignor to Sam Sung Electronics Co., Ltd., Suwon Kyungki-do, Rep. of Korea

Filed Aug. 22, 1986, Ser. No. 899,410
Claims priority, application Rep. of Korea, Aug. 22, 1985, 85-10727[U]
Int. Cl.[4] H01R *39/00*
U.S. Cl. 439—1 **4 Claims**



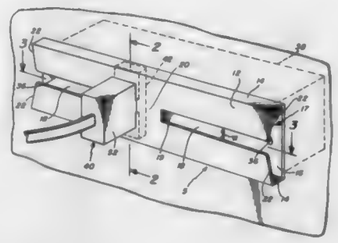
1. A rotary coupling for rotatively connecting an antenna feeder line of a television set to a rod antenna, a wall of the set having a receptacle open at one end, comprising a rotatable antenna body having a plug received in said receptacle for rotation about its central axis, antenna rods pivotally connectable to said body, a pivot terminal fixed to said body and seated within said receptacle, a sleeve coupled to said body for rotation together therewith, a sleeve bearing in rotary engagement with said sleeve, said bearing being fixed against rotation within said receptacle, a pivot terminal holder in rotary engagement with said terminal and being fixed against rotation within said receptacle, a pair of wires of the feeder line being respectively connectable to said bearing and said holder, and said rods being respectively connectable to said terminal and said sleeve, whereby said body is capable of rotation about said central axis relative to said holder and said bearing for preventing any twisting of the feeder line during such rotation.

4,690,474

ELECTRIC OUTLET AND PLUG

Nancy M. Smart, Rte. 2, Box 238, Contoocook, N.H. 03229, and Ricky B. Smart, P.O. Box 238, Concord, N.H. 03301

Filed Apr. 3, 1986, Ser. No. 847,942
Int. Cl.[4] H01R *19/16*
U.S. Cl. 439—120 **19 Claims**



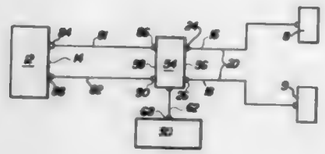
1. An electric wall outlet and plug, comprising:
a wall outlet having a top surface, sidewalls, and a bottom surface which define an interior passage, the top surface of said wall outlet having a lateral slot extending from the center to a longitudinal end of said top surface, a first electrical conductor secured to the bottom surface of said wall outlet, means for securing said first conductor to said wall outlet, means for connecting said first conductor to a live electrical wire, and means for attaching said wall outlet to a wall; and
a plug having a base shaped and sized so as to slidably fit in said passage, a second electrical conductor secured to the bottom of said base, said second conductor contacting said first conductor, and a neck which extends upwardly from said base, said neck having a width less than the width of said slot, wherein said second conductor contacts said first conductor when said plug is slid in said passage from said longitudinal end of the wall outlet and plug being shaped so that said plug can only be inserted into said outlet in a direction parallel to the longitudinal axis of the outlet and not in a direction normal to said longitudinal axis.

4,690,475

COMPUTER HARNESS ADAPTIVE TESTER

Robert C. McElroy, 1061-B Jefferson Dr., Homestead, Fla. 33034

Filed Sep. 2, 1986, Ser. No. 902,691
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—502 **4 Claims**



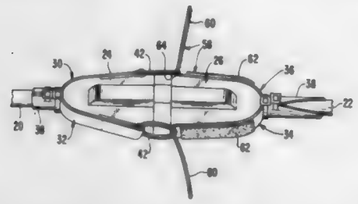
1. A computer harness adaptive tester to be electrically interconnected between (a) the end of an electrical harness, which normally connects to a module on a vehicle, and (b) the electronic control module, said adaptive tester comprising:
(A) a coupler means, (B) a jumper means, (C) a remote pin-out box, and (D) a secondary harness interconnecting said coupler means and said remote pin-out box;
said jumper means including means interconnecting the coupler means and said control module, and
said secondary harness being of a length greater than two feet,
whereby testing of wires in the vehicle circuits may be conducted at a remote location without removal of the electronic control module from the vehicle and while the tester is temporarily and electrically interconnected between the harness end and its normal connection to the module.

4,690,476

ELECTRICAL CONNECTOR SECURING SYSTEM

Jali Morgenrath, Pfeiffer Ridge, Big Sur, Calif. 93920

Filed Oct. 30, 1986, Ser. No. 924,986
Int. Cl.[4] H01R *13/631*
U.S. Cl. 439—502 **18 Claims**



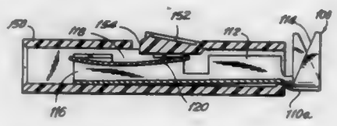
1. A system for coupling electrical cables, comprising:
first and second electrical connectors with matable electrical contacts mounted on the cables to be coupled;
a pair of first flexible straps secured at first ends thereof to said first connector and extending in a direction of a free end of said first connector, each of said first straps having a relatively rigid ring secured at an opposite second end thereof; and
a pair of second flexible straps secured at first ends thereof to said second connector and extending in a direction of a free end of said second connector, each of said second straps having mating first and second fastener parts separated by a hinge section adjacent an opposite second end thereof;
whereby said first and second connectors can be secured passing each said second strap through one of said rings such that said rings lie adjacent said hinge sections, folding said second straps at said hinge sections, and then attaching said fastener parts of each of said second straps.

4,690,477

ELECTRICAL CONNECTOR APPARATUS

Ray C. Doutrich, Lebanon, and George T. DeShong, East Berlin, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 729,162, Apr. 30, 1985, Pat. No. 4,616,415. This application Apr. 25, 1986, Ser. No. 856,003
Int. Cl.[4] H01R *33/76*
U.S. Cl. 439—595 **5 Claims**



1. A partially pre-assembled electrical connector comprising:
a housing having a plurality of longitudinal, laterally adjacent, substantially parallel apertures, each aperture extending all the way through the housing between front and rear surfaces of the housing;
a plurality of flexible latches disposed on one side of said housing in corresponding one-to-one relationship with said apertures, each latch having a nose portion which extends into its associated aperture;
a longitudinal metal terminal partially inserted into each aperture at the rear surface of said housing in a direction substantially parallel to the longitudinal axis of the associated aperture, each terminal having a front disconnect portion with a downwardly bowed spring member and an uncrimped rear wire portion, the disconnect portion being disposed in the aperture and at least a portion of the wire crimp portion being outside the housing to the rear of the rear surface, the nose portion of each latch being in biased contact with the bowed spring member of the disconnect portion of the associated terminal to a degree sufficient to retain said terminal position against inadvertent withdrawal but not sufficient to permanently latch said terminal in the housing.

4,690,478

SEALED ELECTRICAL CONNECTOR ASSEMBLY

Thomas F. Rahrig, Antwerp, Ohio, and Thomas E. Hall, Fort Wayne, Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

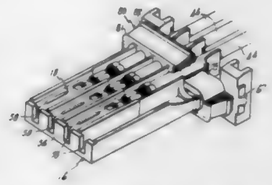
Filed Apr. 10, 1986, Ser. No. 850,460
Int. Cl.[4] H01R *4/00*
U.S. Cl. 439—271 **10 Claims**

1. In a connector assembly comprising at least one terminal having a conductor wire joined thereto and extending therefrom, a terminal holder, the terminal being mounted in the

terminal holder, a connector housing having an interior cavity and an opening therein communicating with said cavity, the terminal being operatively disposed within the connector housing cavity and the conductor wire extending through the housing opening, and sealing means for preventing moisture from intruding to the connector housing cavity via said connector opening, the improvement wherein:

the terminal holder includes a support surface for at least supporting a longitudinal portion of the conductor wire; and

the sealing means comprises first and second resilient sealing members, the first sealing member being interposed between the terminal holder support surface and said portion



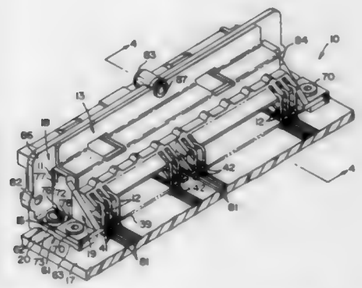
of the conductor wire, in engagement with said conductor wire and said second sealing members being annular and encircling both said terminal holder and said portion of the conductor wire in at least partial longitudinal coincidence with said first sealing member and in engagement with said conductor wire, said first and second sealing member being cummulatively so contoured and sufficiently resilient as to sealingly engage said portion of the conductor wire around substantially its entire perimeter, and the outer periphery of said second sealing member being in continuous sealing engagement with an interior surface of the connector housing at the opening therein, thereby to seal the opening.

4,690,479

FILTERED ELECTRICAL HEADER ASSEMBLY

Robert D. Hollyday, Elizabethtown, and Patrick F. Yeager, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 10, 1985, Ser. No. 786,392
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—97 **22 Claims**



1. A filtered electrical connector comprising:

a housing means having at least one cavity therein, said housing means including a front housing portion and a rear housing portion, one of said housing portions including a pair of flange portions, each having an aperture extending therethough;

a conductive grounding plate supported between said front and rear housing portions, said grounding plate having a plurality of apertures therein for receiving a plurality of tubular filter elements in conductive contact with said grounding plate, said grounding plate further including a pair of integral grounding flanges, said grounding flanges each having an aperture extending therethrough, said apertures being aligned with corresponding apertures in said housing flange portions;

a plurality of electrical terminal members, each extending through a respective tubular filter element in conductive contact with its respective tubular filter element, said members being supported with said housing means and said tubular filter elements being mechanically and electrically secured in said filter receiving apertures of said grounding plate; and

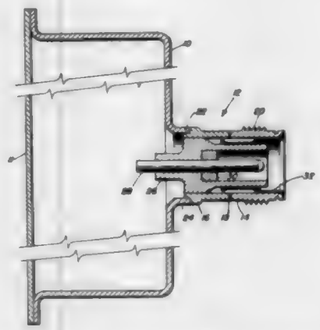
conductive means comprising a first fastening means extending through each of said aligned apertures in said grounding plate flanges and said housing portion flanges for connecting said grounding plate to said housing portion and a second fastening means extending through said first fastening means for providing means for mounting said connector to a circuit board, and a grounding path from said grounding plate through said conductive means to said circuit board.

4,690,480

TUBULAR BI-METAL CONNECTOR

Wayne R. Snow, Jacksonville, Fla.; Gaston R. Isliker, Sidney, N.Y., and Colin A. Johnson, deceased, late of Jacksonville, Fla. (by Barbara F. Johnson, executor), assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 26, 1985, Ser. No. 780,536
Int. Cl.[4] H01R *13/504*
U.S. Cl. 439—364 **6 Claims**



1. An electrical connector adapted to be secured to a housing by welding, comprising,

an outer shell;

electrical contact means supported within and insulated from said shell;

said shell being fabricated as a unitary structure from a composite laminate of first and second layers of distinctly different materials which have been explosively bonded together;

said first layer being of a material having a higher shear strength than the material of said second layer,

the material of said second layer being of a type suitable for welding to the material of the housing,

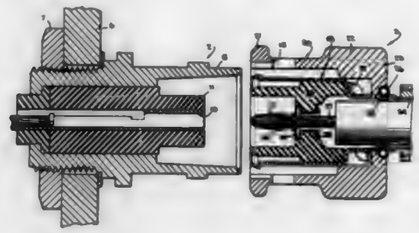
whereby one end of said shell is formed of the material composing said first of said layers of laminate and the opposite end of said shell is formed of the material composing said second of said layers of laminate.

4,690,481

COAXIAL COUPLING

Walter J. Randolph, R.D. 3, Hill Rd., Crawford County, Saegertown, Pa. 16433

Continuation of Ser. No. 377,617, May 13, 1982, abandoned. This application Dec. 26, 1985, Ser. No. 813,530
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—585 **1 Claim**



1. In an improved plug for a coaxial connector wherein an electrical connection is made between a pin in the plug and a contact in a connector socket the improvement comprising:

a hollow forwardly opening plug shell;

a hollow forwardly opening insulator disposed and gripped within said plug shell;

a pin within the hollow of said insulator and having a hollow interior and being firmly attached to said insulator at a rear wall of said insulator hollow opening which is intermediately disposed longitudinally between ends of said insulator, said pin hollow interior opening rearwardly from said insulator rear wall for receiving a conductor and said pin hollow interior extending to the forward end of said pin within the hollow insulator;

a crimped portion on said pin forwardly of the attachment of said pin to the rear wall of said insulator and being disposed in the forwardly opening portion of said insulator;

whereby the crimped portion electrically and mechanically attaches a conductor to said pin.

4,690,482

HIGH FREQUENCY, HERMETIC, COAXIAL CONNECTOR FOR FLEXIBLE CABLE

Roger R. Chamberland, Oakdale, and Andrew J. Stanland, Niantic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 7, 1986, Ser. No. 881,366
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—578 **2 Claims**



1. A coaxial connector for shieldably joining together one end each of a first and second flexible coaxial cable, each said cable having identical impedance and a diameter no greater than 0.375 of an inch, comprising:

plug means, fixedly attached to said first coaxial cable, for providing a male ended cable termination having an impedance corresponding to said first coaxial cable, said plug means further comprising a first hollow, cylindrical body having a cable end and a connector end and first and second coaxial internal bores of different diameter, such that said first bore of smaller diameter extends a preselected depth into said first body from said cable end, a first internal body shoulder being formed where said first and second bores meet, a first cylindrical metal pin, concentrically positioned within said first body, said first pin having a length substantially greater than the diameter thereof and an undercut of preselected length formed thereupon at a preselected location along the length thereof thereby forming first and second pin shoulders, and further having first and second tapered ends, said first tapered end aligning with said first body connector end and said first pin shoulder aligning with said first body shoulder, for providing an electrically conducting path therethrough, a first fused glass cylindrical insert, having a preselected thickness, a cable end surface, a connector end surface and a dielectric constant, said first insert being heat fused to said second bore, said first body shoulder and said first pin undercut, for providing axial open-face pressure strength and hermetically sealing said plug means, a first cylindrical plastic insulator, press fit on said connector end of said pin and contacting the periphery of said first bore and the connector end surface of said first insert, a first metal sleeve, slideably engaing said second tapered end of said first metal pin and soldered to the central conductor of said coaxial connector, for providing electrical conduction therebetween, a second cylindrical plastic insulator, positioned within said first body over said first sleeve and contacting said second bore, contacting the cable end surface of said first insert and contacting the cable dielectric, for providing an impedance matching that of said cable, and a first tapered metal adapter, inserted within and fixedly attached to said second bore and being soldered to the outer metal braid of said coaxial cable, for providing support for said braid and electrical conductivity; and

receptacle means, fixedly attached to said second coaxial cable, for providing a female ended cable termination having an impedance corresponding to said second coaxial cable;

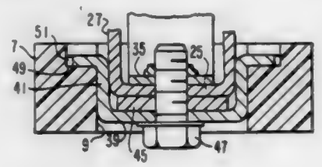
said male and female ends being slideably engagable with one another such that when coupled together a coaxial, first cable-to-second cable joint is formed having a continuous impedance corresponding to that of said first and second coaxial cables.

4,690,483

TERMINAL BASE ASSEMBLY FOR METER SOCKETS

George M. Carris, Monroe, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1986, Ser. No. 913,878
Int. Cl.[4] H01R *9/18, 13/426*
U.S. Cl. 439—517 **8 Claims**



7. A terminal assembly for a meter socket, comprising:

a jaw terminal for receiving a mating blade terminal for an electric meter;

an electrical conductor for conducting current to the jaw terminal;

a mounting clip for releasably and frictionally attaching the assembly to an insulating base of a meter socket, the clip having a flat base with an offset perpendicular side wall extending along opposite edges of said flat base and with a lateral flange extending from each side wall parallel to

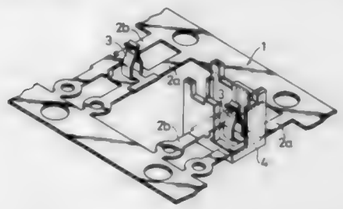
said flat base and the clip being receivable by a hole in said insulating base with the side walls and flanges adapted to be in snug engagement with the surfaces forming the hole and a top surface portion of said insulating base, respectively, and said perpendicular side walls being in frictional engagement with perpendicular side walls of said jaw terminal.

4,690,484

WAFER AND METHOD FOR MANUFACTURING SWITCH WAFER

Hiroki Oba, Furukawa; Seiichi Aoki, Miyagi; Akira Niinuma, Furukawa, and Seiichiro Sato, Tajiri, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 26, 1985, Ser. No. 813,649
Claims priority, application Japan, Dec. 25, 1984, 59-275084
Int. Cl.⁴ H01R *13/516*
U.S. Cl. 439—736 **3 Claims**



1. A method of manufacturing a switch body, having a clip contact held therein which is connected to a terminal member, comprising the steps of:

forming from an integral piece of plate material a hoop segment connected to a terminal member connected to a T-shaped clip portion;

bending the T-shaped clip portion back 180 degrees over the terminal member and then bending the T-ends of the clip portion uprightly substantially 90 degrees toward each other so as to form a clip contact extending upright with respect to said terminal member; then

insert-molding a box body made of insulating material such that the terminal member is molded at the bottom of the box body with the clip contact held upright in an enclosure defined in the box body.

4,690,485

FLAT BED OPTICAL SCANNING BEAM DEFLECTION SYSTEM

Michael Plaot, Eschborn, Fed. Rep. of Germany, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1985, Ser. No. 778,585
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434841
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—6.5 **15 Claims**



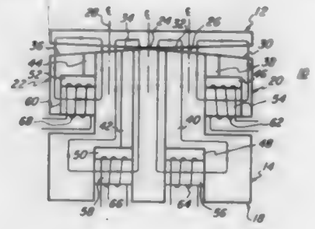
1. In an optical laser beam deflection system of the type including rotating active reflective faces for generating a light scan, in combination with an imaging system for imaging, the improvement comprising optical means (2–8) provided in the light path before the imaging system (18) for enlarging the entrance angle (C) of the imaging system, and wherein not more than two rotating reflective bodies (4,5) are provided which are arranged in a pentaprism structure, each with one active reflective face, to thereby obviate effects of tilting relative to inclinations of the axis of rotation (20) during rotation thereof, and said bodies being positioned in the light path before said optical means.

4,690,486

FOUR POSITION INTERLACING APPARATUS

Walter F. Roll, Blue Ridge, and Michael Campbell, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1985, Ser. No. 728,127
Int. Cl.⁴ G02B *26/10*
U.S. Cl. 350—6.6 **7 Claims**



5. A multiple position interlacer comprising:

(a) an interlace mirror including magnetic material;

(b) a support body of magnetic material for supporting the interlace mirror, said support body including a surface having a plurality of surface segments sloping downwardly from a central ridge formed by adjacent surface edges, each surface segment having a sloping, flat surface forming a facet of a preselected interlace angle, a plurality of non-magnetic bars for dividing the support body into a plurality of magnetic cords beneath the facets and a plurality of coils mounted within the plurality of magnetic cores; and

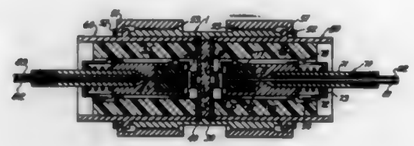
(c) an electrical control circuit means operatively connected to the plurality of coils for selectively energizing the coils to move the interlace mirror through preselected angles whereby a plurality of interlaced lines is formed of the energy impinging on the interlace mirror, wherein the control circuit means includes a signal generating means for sequentially producing first signals of a first polarity for selectively energizing the coils of the body support for selectively magnetizing the cores thereof and second signals of an opposite polarity, a second signal being produced at the end of each first signal for expediting the demagnetization of the corresponding core, wherein the signal generating means includes a clock means, logic circuitry operatively connected to the clock means for producing a plurality of control signals, and a switching means operatively connected to the logic control means for sequentially introducing current flowing in a first direction for energizing the coils a preselected time and then sequentially introducing current flowing in a second direction in the coils for deenergizing the coils a preselected time prior to turn off whereby the coils first energize the cores in a first direction followed by energization in a second direction prior to cutoff for expediting demagnetization of the coils.

4,690,487

HERMETICALLY SEALED FIBER OPTIC CONNECTOR

Charles S. Hale, Sidney; Andrew Matzkin-Bridger, Oneonta, and Ronald W. Morse, Sidney, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1983, Ser. No. 550,833
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.21 **4 Claims**



1. A hermetically sealed fiber optic connector for optically coupling separate optical fibers, said connector comprising:

a main housing having a central passage;

an optically transparent window located in the central passage, said window having first and second surfaces extending across said central passage;

a hermetic seal between said window and said housing;

a first member having a bore therein, said first member located adjacent to the first surface of said window;

a second member having a bore therein, said second member located adjacent to the second surface of said window, the bore of said second member axially aligned with the bore in said first member;

a first lens;

a second housing;

means for mounting said first lens in said second housing and said second housing to said main housing so that said first lens is axially aligned with the bore of said first member, said means for mounting said first lens axially aligned with the bore of said first member comprising a first insert attached to the window on the side of the first lens and having a bore therethrough of a size sufficient to receive and align the first lens axially with the bore of the first member, and said means further including means for receiving a first optical fiber in axial alignment with said first lens, and said means for receiving said first optical fiber in axial alignment with said first lens being a fiber end receiving slot in said first lens;

a second lens;

a third housing separably connected to the other side of said first housing;

means for mounting said second lens in said third housing and said third housing to said main housing so that said second lens is axially aligned with the bore of said second member, said means for mounting said second lens axially with the bore of the second member comprising a second insert attached to the window on the side of the second lens and having a bore therethrough of a size sufficient to receive and align the second lens axially with the bore of the second member, and said means further including means for receiving a second optical fiber in axial alignment with said second lens, and said means for receiving said second optical fiber in axial alignment with said second lens being a fiber end receiving slot in said second lens;

said second and third housings each including means for selectively coupling and uncoupling said second and third housings from said main housing; and

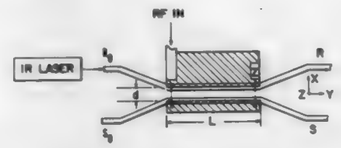
biasing means for biasing said first lens and second lens into tight abutment with said window.

4,690,488

COMPENSATION FOR OPTICAL DAMAGE OF DIRECTIONAL-COUPLER SWITCHES

Caroline M. Gee, Woodland Hills, and Gary D. Thurmond, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 3, 1984, Ser. No. 606,507
Int. Cl.⁴ G02B *6/10*
U.S. Cl. 350—96.12 **21 Claims**



1. An improved waveguide assembly, of a ferroelectric crystal material having a plurality of input and output ports transmitting electromagnetic energy, for use in an optical directional coupler switch, comprising ferroelectric crystal waveguides having stabilized indices of refraction resulting from the process steps of:

(a) applying electromagnetic energy in a wavelength range above the visible spectrum at a power level, at least approximately twice the normal operating level of the coupler switch, for a predetermined time period sufficient to saturate the change in the indices of refraction, to one waveguide input port, and

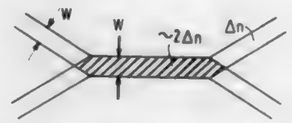
(b) applying electromagnetic energy in a wavelength range above the visible spectrum at a power level, at least approximately twice the normal operating level of the coupler switch, for a predetermined time period sufficient to saturate the change in the indices of refraction, to another waveguide input port whereby the optical switching characteristics are stabilized for subsequent electromagnetic energy transmission at a normal power operating level.

4,690,489

INTEGRATED OPTICAL WAVELENGTH MULTIPLEXER AND DEMULTIPLEXER DEVICE FOR MONOMODE TRANSMISSION SYSTEMS AND ITS USE

Antonius A. Neyer, Iserlohn, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,523
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406207
Int. Cl.⁴ G02B *6/10*
U.S. Cl. 350—96.14 **17 Claims**



1. A wavelength multiplexer and demultiplexer device for combining radiation of wavelength λ_0 with radiation of wavelength λ_1, and for separating radiation of combined wavelengths λ_0 and λ_1 into radiation of wavelength λ_0 and separate radiation of wavelength λ_1, said device comprising:

a two-mode strip waveguide having first and second opposite ends and having a length L from the first end to the second end;

a first monomode strip waveguide optically coupled to the first end of the two-mode strip waveguide; and

second and third monomode strip waveguides optically coupled to the second end of the two-mode strip waveguide;

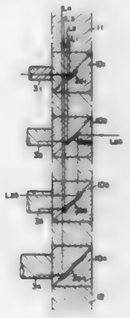
characterized in that the difference $\Delta\lambda$ between λ_0 and λ_1 is approximately equal to $n\pi/\gamma L$, where γ is the differential mode dispersion of the two-mode waveguide in the vicinity of λ_0, and where n is an odd integer.

4,690,490

LIGHT DIVERTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,983
Claims priority, application Japan, Sep. 27, 1983, 58-178718; Nov. 16, 1983, 58-215809
Int. Cl.⁴ G02B *6/28*
U.S. Cl. 350—96.15 **14 Claims**



1. A light diverting device comprising a first cylindrical optical conductor means having a longitudinal axis, said first conductor means having a first light-emission end surface which is inclined relative to said longitudinal axis, a second cylindrical optical conductor means having a longitudinal axis axially aligned with the longitudinal axis of the first conductor means, said second conductor means having a second light-receiving end surface which is inclined relative to the longitudinal axis of said second conductor means, said first inclined surface engaging said second inclined surface, said second conductor means having a receiving-passage opening up onto said second inclined surface, third optical conductor means disposed in said receiving-passage, said third optical conductor means having an opening means which defines a hole in said second inclined surface, a fourth optical conductor means having a longitudinal axis which is disposed transversely to the longitudinal axis of said first conductor means, said fourth conductor means having a light-receiving edge which conforms to and engages the outer cylindrical surface of said first conductor means at a position opposite to said hole such that light energy transmitted through the first conductor means is partially diverted by a first portion of said first inclined surface opposite to said hole into said fourth conductor means, the remaining light energy transmitted through the first conductor means being transmitted through said second conductor means, said third optical conductor means providing for changing the size of said hole to thereby change the amount of light energy diverted into said fourth optical conductor means.

4,690,491

BUILDING DATA TRANSMISSION SYSTEM

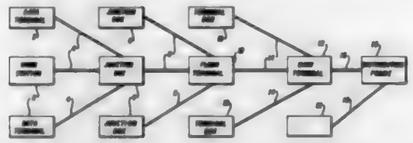
David E. Stein, St. Louis, Mo., and Donald R. Hammer, Waterloo, Ill., assignors to Southwestern Bell Telephone, St. Louis, Mo.

Filed Oct. 4, 1985, Ser. No. 784,565
Int. Cl.⁴ G02B *6/28*
U.S. Cl. 350—96.16 **19 Claims**

1. A fiber optic communications network for internal building data transmission having at least three data work station terminals which can communicate with each other but are not serially connected comprising:

(a) at least three junction boxes each of which is connected to at least one work station terminal through no more than two fibers;

(b) at least two floor distribution terminals to which at least two of said junction boxes are connected by fiber optic cable to different floor distribution terminals; and



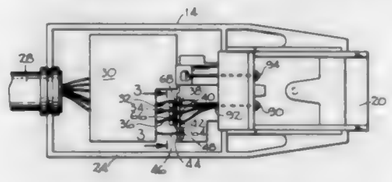
(c) nonadhesive connector and jumper cable means for changing the pattern of the network at said distribution terminals.

4,690,492

OPTICAL COUPLING

Robert W. Beard, Placerville, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.

Filed Sep. 4, 1984, Ser. No. 646,794
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **10 Claims**



1. An optical coupling comprising

a substrate having a flat surface and a hole extending through the substrate to the flat surface,

an optical fiber extending through the substrate hole and fixed therein with an end face of the optical fiber located at a fixed position relative to the flat surface,

a deformable bracket made of electrically conductive material having a first portion mounted to the substrate and having a free end portion extending from the first portion and spaced from the substrate, said free end portion having a flat surface located generally parallel to the end face of the optical fiber, and

a light emitting diode mounted on the flat surface of the bracket adjacent the optical fiber end face,

said bracket being formed of a soft malleable metallic ribbon whereby the bracket can be deformed by force generally in the plane of the optical fiber end face so that the light emitting diode can be positioned to provide the maximum light energy to the optical fiber.

4,690,493

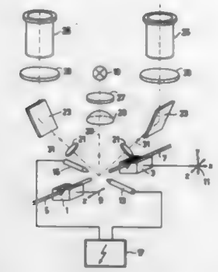
METHOD AND DEVICE FOR POSITIONING LIGHT-CONDUCTING FIBRES

Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,283
Claims priority, application Netherlands, May 12, 1982, 8201941
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **4 Claims**

1. A method of visually positioning te end of a light conducting fiber, said fiber having a core and a cladding surrounding the core, said method comprising the steps of:

transversely irradiating a porting of the fiber with ultraviolet light, said ultraviolet light having a wavelength such that it causes the core of the fiber to emit visible light; and



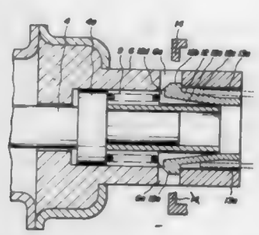
positioning the end of the fiber by observing the visible light emitted by the core.

4,690,494

FERRULE HOLDING DEVICE FOR OPTICAL FIBER CONNECTOR

Takao Hirose, and Norio Kumekawa, both of Shimotsuga, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,245
Claims priority, application Japan, May 7, 1984, 59-65497[U]
Int. Cl.⁴ G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **8 Claims**



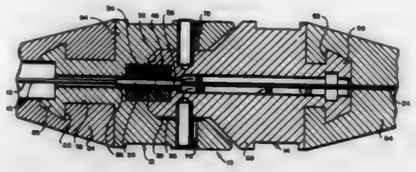
1. A ferrule holding device for an optical fiber connector, said connector including two connector bodies, a sleeve extending in said two connector bodies, and two ferrules respectively accomodating optical fibers therein to be aligned with each other when the ferrules are inserted in said sleeve in end-to-end relationship, said ferrules being urged by spring means so as to bring ends of said optical fibers into close contact with each other, said ferrule holding device comprising a spring urged sleeve consisting of a cylindrical body having an outer diameter somewhat smaller than an inner diameter of each said connector body, said cylindrical body being provided at plural locations with resilient curved pieces having hooks with the same thickness as the wall of said cylindrical body and having outer chamfered surfaces, said hooks being outwardly extending but depressible inwardly of an outer periphery of said cylindrical body, said resilient curved pieces being integral parts of said cylindrical body being formed such that said curved pieces are thinner than the wall of said cylindrical body with the bottom inside diameter of said parts on the same radius as the inside diameter of said cylindrical body, and said hooks being curved outwardly, and each said connector body being formed with anchoring apertures into which said hooks of said resilient curved pieces extend so as to hold said spring urged sleeve in said connector to support said spring means urging said ferrule.

4,690,495

OPTICAL FIBER MAGNETIC CONNECTOR

Gabriel M. Giannini, 51555 Madison St., Indio, Calif. 92120

Filed Nov. 14, 1984, Ser. No. 671,325
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **4 Claims**



1. A connector for optically coupling one end of a first fiber optic light guide to one end of a second fiber optic light guide which comprises:

a first generally tubular member having a first end opening shaped and dimensioned to engage the end of said first fiber optic light guide about a first axis common to said first tubular member and said first fiber optic light guide;

a first generally U-shaped magnet inserted into said first opening of said first tubular member and defining at least two magnetic poles of opposite polarities symmetrically disposed about a first plane containing said first axis;

a first cylindrical lens coaxially mounted into said first tubular member, said lens having an inner face in contact with the end of said first fiber optic light guide and an exposed outer face near an opposite second end opening of said first tubular member;

a second generally tubular member having a first end opening shaped and dimensioned to engage the end of said second fiber optic light guide about a second axis common to said second tubular member and said second fiber optic light guide;

a second generally U-shaped magnet inserted into said first opening of said second tubular member and defining at least two magnetic poles of opposite polarities symmetrically disposed about a second plane containing said second axis;

a second cylindrical lens coaxially mounted into said second tubular member, said lens having an inner face in contact with the end of said second fiber optic light guide and an exposed outer face near an opposite second end opening of said second tubular member;

the edge of the second end opening of said first tubular member defining at least one pair of helicoidal ramps, the ramps in said pair being symmetrically and diametrically opposite in relation to said first axis, said ramps together extending over the entire periphery of said second end opening of said first tubular member and the ends of said pair of ramps which are closest to the end of said first fiber optic generally falling on a first line orthogonal to said first axis;

the second end opening of said second tubular member being shaped and dimensioned to define at least one pair of contact points symmetrically and diametrically positioned in relation to said second axis, said contact points being commensurately positioned to ride on said ramps when the second end openings of said tubular members are brought together until said contact points reach the ends of said ramps, said points being on a second line oriented so that the angle defined by the first line and said first plane is equal to the angle defined by said second line and said second plane. and the poles of the first magnet are lined with the opposite poles of the second magnet when said contact points reach said ends; and

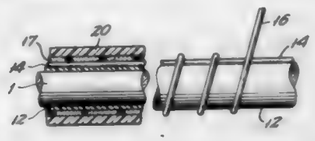
said second tubular lens is coaxially positioned within said second tubular member so that its outer face contacts the outer face of the first tubular lens when said points reach the ends of said ramps.

4,690,496

OPTICAL FIBER JOINT WITH REINFORCING FILAMENT AND METHOD OF MAKING SUCH JOINT

Bruno Bortolin, Cinisello Balsamo, and Sergio Borgonovo, Lomazzo, both of Italy, assignors to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Jan. 23, 1985, Ser. No. 693,772
Claims priority, application Italy, Jan. 27, 1984, 19341 A/84
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 11 Claims



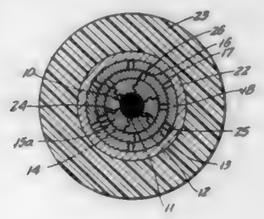
1. A joint between two optical fiber cables, each cable comprising an optical fiber surrounded by a plurality of coverings, said joint comprising:
the end of the optical fiber of one said cable mechanically connected to the end of the optical fiber of the other said cable;
ends of said protective coverings axially spaced from each other and axially spaced from the connected ends of the optical fibers;
a protective layer of moisture impervious material around the connected ends of the fibers and extending axially on each side of said ends;
a plurality of non-metallic filaments on said protective layer and secured thereto by an adhesive, at least one of said filaments extending axially of the fibers and another of said filaments being wound around said fibers; and
a layer of elastomeric material surrounding said filaments.

4,690,497

UNDERWATER OPTICAL FIBER CABLE WITH SEGMENTED PROTECTIVE TUBE

Elio Occhini, and Giuseppe Bianchi, both of Milan, Italy, assignors to Societa Cavi Pirelli, S.p.A., Milan, Italy

Filed May 24, 1985, Ser. No. 738,059
Claims priority, application Italy, May 29, 1984, 21158 A/84
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 14 Claims



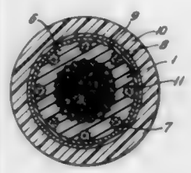
1. An underwater, optical fiber cable comprising an optical fiber core including one or more optical fibers, a pressure resisting tube surrounding said core, said tube being formed by a plurality of elongate wires of copper or aluminum and their alloys, each elongate wire having, in transverse section, substantially the shape of a sector of an annulus, a layer of helicoidally wound, elongate steel elements surrounding said tube and a tubular, water-tight conductive sheath surrounding said layer of said elements, wherein the improvement comprises providing said elements in the form of side-by-side elongate elements each of which has a quadrangular, transverse cross-section with the radial lengths of the radially extending sides thereof smaller than the peripheral lengths of the peripherally extending sides thereof.

4,690,498

PRESSURE RESISTANT SUBMARINE OPTICAL FIBER CABLE

Paolo G. Prisaroggia, Milan, Italy, assignor to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Apr. 15, 1985, Ser. No. 723,039
Claims priority, application Italy, Apr. 19, 1984, 20621 A/84
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 14 Claims



1. A submarine, telecommunication cable comprising:
a core comprising an axially disposed and extending armor formed by a strand of wires and a layer of plastic material around and adhering to said strand, said plastic layer having a plurality of spaced-apart, helical grooves therein extending longitudinally of said core and opening radially outwardly and said strand of wires having, by itself, a tensile strength sufficient to withstand the tensile stresses to which the cable is subjected during laying and recovery thereof;
a substantially incompressible fluid disposed in and filling-up otherwise empty spaced within said layer of plastic material including any spaces between said wires;
at least one optical fiber loosely received in each of said grooves;
a substantially incompressible fluid disposed in and filling-up any othwise empty spaces in said grooves; and
a water-tight metal sheath around said core, said sheath, by itself, having a resistance to compression which is insufficient to withstand the compression forces to which the cable is subjected during use;
said cable being without armor externally of said layer of plastic material which, by itself, can withstand the mechanical stresses to which the cable is subjected in use;
whereby said cable is able to withstand hydrostatic pressures to which it is subjected when submerged without any armor outwardly of the optical fiber or fibers which by itself can withstand such pressures.

4,690,499

OPTICAL FIBRE ELEMENT HOUSED IN A TUBE RESILIENTLY SET IN A FORM SUCH THAT ITS LONGITUDINAL AXIS FOLLOWS A PATH GREATER THAN THE RECTILINEAR DISTANCE BETWEEN POINTS TO BE CONNECTED

John E. Taylor, Maidenhead, and Ian W. Keene, London, both of England, assignors to BICC Public Limited Company, London, England

Filed Mar. 13, 1985, Ser. No. 711,247
Claims priority, application United Kingdom, Mar. 14, 1984, 8406535
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 21 Claims

7. An optical fibre element comprising a flexible tube having a bore in which at least one optical fibre is loosely housed, wherein the tube is resiliently set in such a form that the central longitudinal axis of the tube follows a path of smoothly curved undulations whose axes of curvature lie parallel to one another and substantially normal to the longitudinal axis of the tube, the arrangement being such that, when the undulating flexible tube is subjected to a longitudinally applied tensile force, the tube will tend to straighten in a lengthwise direction against



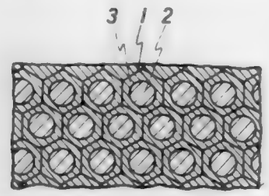
the action of the undulating resilient set thereby to reduce the tensile force applied to the or each optical fibre and, when the tensile force is removed, the tube will return under the action of its undulating resilient set towards its original form.

4,690,500

OPTICAL MULTIPLE FIBER

Hiroyuki Hayami, Itami, and Atsushi Utsumi, Kawanishi, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

PCT No. PCT/JP83/00057, § 371 Date Nov. 1, 1983, § 102(e) Date Nov. 1, 1983, PCT Pub. No. WO83/03144, PCT Pub. Date Sep. 15, 1983
PCT Filed Feb. 26, 1983, Ser. No. 556,234
Claims priority, application Japan, Mar. 1, 1982, 57-32559
Int. Cl.[4] G02B 6/06
U.S. Cl. 350—96.25 16 Claims



1. An optical multiple fiber comprising a plurality of optical fibers which are fused together with each other, each optical fiber comprising a core made from pure silica glass and which has a substantially circular cross-section and a cladding layer disposed directly on the core and made of a dopant-containing silica glass having a lower refractive index than the pure silica glass of the core, said cladding layer having a thickness which satisfies the following equation (I):

$$2D_1 \geqq T_1 \geqq 1.0\ \mu m \quad (I)$$

wherein T_1 is the thickness of the cladding layer in μm and D_1 is the diameter of the core in μm and $T_1 \leqq D_1$; the difference in refractive index between the core and the cladding layer being from 0.008 to 0.016 and the diameter of the optical multiple fiber being 5 mm or less.

4,690,501

ULTRAVIOLET CURABLE OPTICAL GLASS FIBER COATINGS FROM ACRYLATE TERMINATED, END-BRANCHED POLYURETHANE POLYUREA OLIGOMERS

John M. Zimmerman, Schaumburg; Gerry K. Nores, Hoffman Estates, and Timothy E. Bishop, Algonquin, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 8, 1985, Ser. No. 752,582
Int. Cl.[4] C08F 2/50, 126/02, 26/02; G02B 6/22
U.S. Cl. 350—96.29 24 Claims

1. An ultraviolet curing liquid coating composition which, when cured with ultraviolet light in the presence of a photoinitiator, either provides a single coating for optical glass fiber having adequate strength at room or expected elevated temperature, and a low tensile modulus which remains low to resist microbending difficulties down to around −40° C., or which can be used to overcoat softer buffer coatings which remain soft to resist microbending difficulties down to around −60° C., said coating composition consisting essentially of a linear polyacrylate-terminated polyurethane polyurea oligomer containing a linear polyurethane core terminated at both ends by urea formation with a polyhydroxy-functional amine containing a single isocyanate-reactive amino hydrogen atom, the plurality of hydroxy-terminated branches provided by said amine being capped with an acrylate-functional compound, and said polyacrylate-terminated oligomer being in admixture with an ultraviolet curable liquid acrylate or polyacrylate to provide the liquidity needed for application and to adjust the hardness or softness of the cured coating for the selected single coat or topcoat utility.

6. A coating composition as recited in claim 1 adapted for single coat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer, whose homopolymer has a glass transition temperature less than 0° C.

21. An optical glass fiber single coated with an ultraviolet-cured coating of the composition of claim 6.

4,690,502

ULTRAVIOLET CURABLE OPTICAL GLASS FIBER COATINGS FROM ACRYLATE TERMINATED, END-BRANCHED POLYURETHANE POLYUREA OLIGOMERS

John M. Zimmerman, Schaumburg, and Timothy E. Bishop, Algonquin, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 8, 1985, Ser. No. 752,583
Int. Cl.[4] C08F 2/50, 26/02, 126/02; G02B 6/22
U.S. Cl. 350—96.29 27 Claims

1. A ultraviolet curing liquid coating composition which, when cured with ultraviolet light in the presence of a photoinitiator, either provides a single coating for optical glass fiber having adequate strength at room or expected elevated temperature, and a low tensile modulus which remains low to resist microbending difficulties down to around −40° C., or which can be used to overcoat softer buffer coatings which remain soft to resist microbending difficulties down to around −60° C., said coating composition consisting essentially of a linear polyacrylate-terminated polyurethane polyurea oligomer comprising a linear polyurethane terminated with an essentially monohydric adduct of low molecular weight diprimary amine with from about 1 to about 2.5 moles of monoepoxide per mole of diamine and reacted with acrylate-functional monoisocyanate to leave about 1 hydroxy group per molecule, and an ultraviolet curable liquid acrylate or polyacrylate to provide the liquidity needed for application and to adjust the hardness or softness of the cured coating for the selected single coat or topcoat utility.

4. A coating composition as recited in claim 1 adapted for topcoat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer whose homopolymer has a glass transition temperature above about 55° C. in the absence of acrylic acid.

6. A coating composition as recited in claim 1 adapted for single coat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer whose homopolymer has a glass transition temperature less than 0° C.

24. An optical glass fiber single coated with an ultraviolet-cured coating of the composition of claim 6.

4,690,503

GLASS OPTICAL FIBER HAVING A PRIMARY AND A SECONDARY COATING

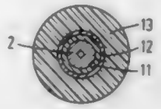
Petrus J. Janssen, and Peter C. Janssens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,634

Claims priority, application Netherlands, Sep. 22, 1983, 8303252

Int. Cl.⁴ G02B *6/16, 6/22*

U.S. Cl. 350—96.30 **3 Claims**



1. A coated optical fiber comprising:

a glass optical fiber;

a primary coating on the fiber, said primary coating comprising a UV cured acrylate; and

a secondary coating surrounding and in intimate contact with the primary coating, said secondary coating comprising a thermoplastic resin;

characterized in that:

the primary coating has a thickness of 50 to 70 microns;

the primary coating consists of an inner primary layer and an outer primary layer of UV cured acrylate, said inner primary layer being in contact with the fiber;

the ratio of the thickness of the inner primary layer to the thickness of the outer primary layer is from 0.5 to 2;

the inner primary layer has a modulus of elasticity less than or equal to 5 Newtons per square millimeter at 25° C.; and

the outer primary layer has a modulus of elasticity from 25 to 1500 Newtons per square millimeter at 25° C.

4,690,504

QUARTZ GLASS-MADE OPTICAL FIBERS AND A METHOD FOR THE PREPARATION THEREOF

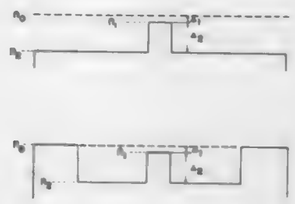
Kiyoshi Yokokawa, and Kazuo Koya, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 31, 1985, Ser. No. 739,874

Claims priority, application Japan, Jun. 4, 1984, 59-114317

Int. Cl.⁴ G02B *6/00*

U.S. Cl. 350—96.34 **5 Claims**



1. An optical fiber of fused quartz glass having a core-and-cladding structure composed of a core portion and a cladding portion on and around the core portion, of which each of the core portion and cladding portion contains fluorine as a dopant to decrease the refractive index of the fused quartz glass, the concentration of the fluorine being higher in the cladding portion than in the core portion, and wherein the core portion has a refractive index lower by 0.01% to 0.1 than that of an undoped fused quartz glass.

4,690,505

LENS MOUNTING

Toshimi Iizuka, Kanagawa, and Shigeru Kamata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha

Filed May 31, 1985, Ser. No. 740,203

Claims priority, application Japan, Jun. 14, 1984, 59-088803

Int. Cl.⁴ G02B *7/02*

U.S. Cl. 350—252 **7 Claims**



2. A lens mounting comprising:

(a) a body tube;

(b) a holding sleeve holding a lens,

said holding sleeve having a plurality of protruded portions projected to a parallel direction with an optical axis and positioned in a circle with its center at the optical axis;

(c) a movable sleeve arranged in the inner diameter of said body tube,

said movable sleeve having a perpendicular surface perpendicular parallel direction with the optical axis, and a plurabity of camming surfaces being formed in said perpendicular surface; and

(d) a retainer member, said retainer member fixedly securing said holding sleeve to said movable sleeve after said holding sleeve was fitted in the inner diameter of said movable sleeve and the tilt of said lens has been adjusted by the abutting engagement of said camming surfaces on said protruded portions.

4,690,506

METHOD OF PRODUCING VARIED LINE-SPACE DIFFRACTION GRATINGS

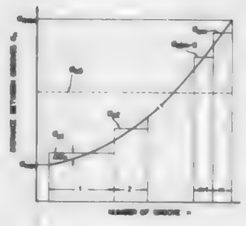
Toshiaki Kita, Nishitama, and Tatsuo Harada, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,363

Claims priority, application Japan, Oct. 3, 1984, 59-206278

Int. Cl.⁴ G02B *5/18*; B43L *13/24*

U.S. Cl. 350—320 **4 Claims**



1. In a method of producing diffraction gratings by feeding either one of a blank or a groove-ruling tool by an amount consisting of the amount of constant transference and the amount of variable transference that is added thereto, or subtracted therefrom, while reciprocally moving the other one of said blank or said groove-ruling tool, in order to rule grooves of irregular intervals on said blank, a method of producing varied line-space diffraction gratings wherein the region of ruling is divided into a plurality of small regions so that the difference between a maximum value and a minimum value of distance between grooves becomes smaller than a predetermined value, and the amount of constant transference is set to be nearly equal to an average distance between grooves in each of said small regions.

4,690,507

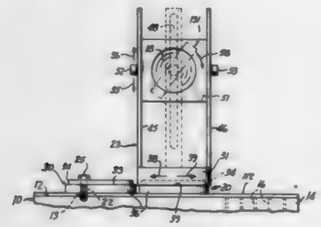
MOUNTING SYSTEMS FOR OBJECTS AND OPTICAL COMPONENTS

Micha Zimmermann, Haifa, Israel, assignor to Newport Corporation, Fountain Valley, Calif.

Filed Sep. 9, 1985, Ser. No. 774,029

Int. Cl.⁴ G02B *27/02, 7/02*

U.S. Cl. 350—321 **33 Claims**



1. In a method of fixing a base for mounting an object on a surface having a two-dimensional pattern of mutually spaced mounting holes for fasteners, the improvement comprising in combination the steps of:

providing said base with two complementary base parts rotatable relative to each other;

providing one of said base parts with an at least partially eccentric aperture for receiving any one of said fasteners at any one of said mounting holes;

placing said base on said surface;

extending one of said fasteners through said aperture at one of said mounting holes;

shifting said base relative to said one of said fasteners at any one of a multitude of positions about said one mounting hole; and

attaching said base to said surface with said one of said fasteners;

said object being mounted on the other of said base parts, and said base parts being rotated relative to each other as needed for orienting said object above said surface.

4,690,508

LIQUID CRYSTAL CLOSED-LOOP CONTROLLED MIRROR SYSTEMS

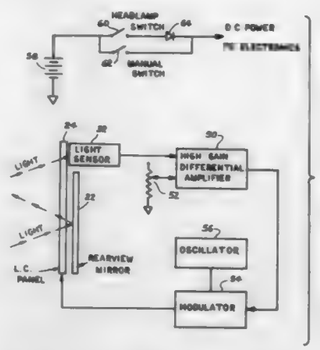
Keith D. Jacob, Ann Arbor, Mich., assignor to C-D Marketing, Ltd., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 449,949, Dec. 15, 1982, abandoned. This application May 17, 1985, Ser. No. 735,419

Int. Cl.⁴ G02B *17/00*; G02F *1/13*

U.S. Cl. 350—331 R **39 Claims**

38. A variable brightness rearview mirror system comprising a reflecting surface for reflecting to an observer a field of view and an electrically controlled optical transmission plate disposed in the optical path between the observer and the field of view, said optical transmission plate being operable to any of a number of different states of light transmission between a state of maximum light transmission and a state of maximum opaqueness, and control means for controlling the brightness of the reflected field of view seen by the observer comprising means for closed-loop regulating the state of light transmission of said optical transmission plate to compensate for changes in incident brightness over a range of different intensities of incident brightness detected by a sensor means, said control means comprising a high gain differential amplifier circuit receiving a differential input signal derived from differential



between a signal correlated with the degree of incident brightness of the field of view and a desired reference signal level, said desired reference signal level serving to establish an operating point of nominal incident brightness on the mirror assembly over a range of nominal incident brightnesses about which said sensor means is effective to exercise control of the optical transmission plate over said number of possible states between maximum light transmission and maximum opaqueness.

4,690,509

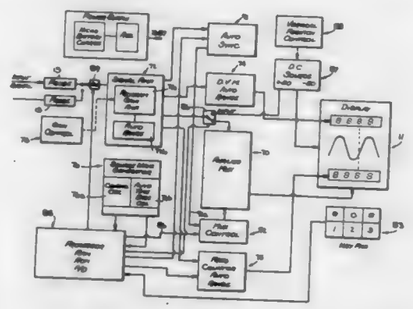
WAVEFORMS ON A LIQUID CRYSTAL DISPLAY

William Bohmer, Flanders, N.J., assignor to Control Interface Company Limited, Randolph, N.J.

Filed Oct. 2, 1984, Ser. No. 656,972

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—333 **57 Claims**



1. Apparatus for providing a visual display of an electrical input signal, comprising:

a viewing screen of predetermined thickness having two oppositely disposed parallel faces and formed of a material having optical properties which in any predetermined portion of the screen are variable in response to the application of a predetermined electrical potential across the thickness of the screen in the predetermined portion, the variable optical properties enabling the transmission of light to be controlled with respect to the predetermined portion,

a plurality of first conductive elements disposed spaced apart with respect to one another, the plurality of first conductive elements being positioned adjacent and substantially parallel to one face of the screen,

means for applying a voltage gradient across said plurality of first conductive elements to produce a different predetermined voltage on each of the plurality of the first conductive elements and wherein the relationship of each predetermined voltage with respect to another is predetermined,

a plurality of second conductive elements disposed spaced apart with respect to one another, the plurality of second conductive elements being positioned adjacent and substantially parallel to the other face of the screen and extending at an angle to the plurality of first conductive elements, means for sampling said electrical input signal at predetermined sample times and for producing respective input voltages, each of which being a predetermined function thereof and independent of any other input voltage, and

means responsive to said sampling means for sequentially coupling to each of the plurality of second conductive elements said respective input voltages, whereupon each input voltage which is coupled to a respective one of the plurality of second conductive elements coacts with the different predetermined voltage of each of the plurality of first conductive elements across the thickness of the screen to form a plurality of different control voltages impressed across the screen, each of said control voltages enabling the optical properties of the predetermined portion of the screen across which the control voltage is applied to control the transmission of light with respect to the predetermined portion when said control voltage corresponds to a predetermined electrical potential.

4,690,510

STRUCTURE AND METHOD OF CONNECTING TERMINALS OF MATRIX DISPLAY UNITS

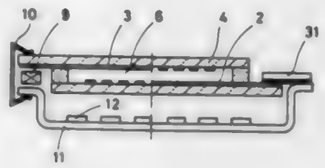
Toshiaki Takamatsu, Tenri; Hiroshi Kawagaki, Jyoyo; Shigehiro Minezaki, Ikoma; Kanihiko Yamamoto, Nara; Hiroshi Nakatani, Tenri, and Hisao Kawaguchi, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 512,633, Jul. 11, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,522

Claims priority, application Japan, Jul. 13, 1982, 57-122402; Jul. 28, 1982, 57-132810

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—334 **6 Claims**



4. A matrix display unit comprising:

first and second support means in a mutually opposing planar relationship for forming a liquid crystal display panel;

first electrode means disposed on either of said first or second support means;

driver means for driving said liquid crystal display panel;

driver support means for supporting said driver means;

second electrode means mounted on said driver support means, said second electrode means being in a mutually perpendicular relationship to said first electrode means; and

connector means for connecting said first and second electrode means, said connector means bridging together either end of said first and second support means without the necessity for a through-hole;

said first and second electrode means being aligned such that said connector means bridges together either end of said first and second support means without having to be folded over itself.

4,690,511

LIQUID CRYSTAL COLOR DISPLAY PANEL WITH MOSAIC COLOR FILTER

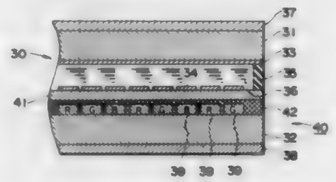
Haruo Watanabe, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 592,587, Mar. 23, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 854,684

Claims priority, application Japan, Mar. 31, 1983, 58-55623

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **2 Claims**



1. A liquid crystal color display panel comprising:

a first polarizer;

a first transparent plate having said first polarizer on its outer surface;

a color filter having a mosaic array of red, green and blue filter elements provided on an inner surface of said first transparent plate;

a glass plate bonded on said color filter by a bonding agent, said glass plate being less than 200 μm in thickness and thin as compared with said first plate;

a plurality of transparent electrodes provided on an inner surface of said glass plate each in exact registration with each of the filter elements of said color filter;

a twisted nematic liquid crytal surrounded by a gasket and accommodated on the inner surfaces of said plurality of transparent electrodes and said glass plate, said twisted nematic liquid crystal exhibiting a property of rotating the polarization plane of transmitted light in response to one of the presence and the absence of an electric field across said liquid crystal layer;

at least one common electrode layer provided in contact with an inner surface of said liquid crystal layer;

a second transparent plate having said common electrode layer on its inner surface, said inner surface opposing said inner surface of said glass plate; and

a second polarizer provided on an outer surface of said transparent plate.

4,690,512

COMPOSITE LENS ASSEMBLY

Robert P. Forsyth, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 28, 1985, Ser. No. 695,238

Int. Cl.[4] B29D *11/00*; **G02B** *3/00*; **B32B** *7/00*

U.S. Cl. 350—417 **23 Claims**

1. A lens assembly comprising:

a first lens element having an optical surface of a predetermined configuration;

a second lens element formed of an organic polymer and having an optical surface facing the optical surface of the first lens element and being of a configuration substantially complementary thereto;

a substantially uniform layer of room temperature vulcanizable silicone adhesive in contact with the optical surface of the first lens element; and

a primer coating comprising an aliphatic polyurethane on



the optical surface of the second lens element and in contact with the layer of adhesive for providing a physically stable, optically neutral bond between the first and second lens elements.

4,690,513

WIDE ANGLE HIGH RANGE ZOOM LENS

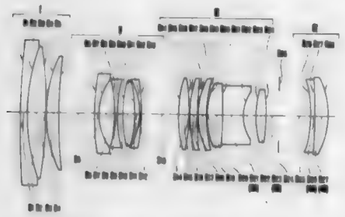
Sadatoshi Takahashi, Tokyo, and Tsunefumi Tanaka, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,907

Claims priority, application Japan, Jul. 31, 1984, 59-161049; Dec. 13, 1984, 59-263636

Int. Cl.[4] G02B *7/10, 9/64, 15/14*

U.S. Cl. 350—427 **10 Claims**



1. A zoom lens system comprising, from front to rear, a first lens unit of positive refractive power, a second lens unit of negative refractive power, a third lens unit of positive refractive power and a fourth lens unit, wherein when zooming from a wide angle end to a telephoto end, said first lens unit and said third lens unit are axially movable forward in unison, and said second lens unit is axially movable non-linearly relative to the movement of said first lens unit and said third lens unit, said zoom lens system satisfying the following conditions:

$$0.4\ fT < f1 < 0.65\ fT$$

$$0.4\ fW < |f2| < 0.25\ fT$$

$$0.12\ fT < f3 < 0.35\ fT$$

$$-0.18 < fW/f4$$

$$fT/f4 < 0.1$$

$$0.8 < |\beta 2T| < 1.0$$

where fi is the focal length of the i-th lens unit counting from the front, fW and fT are the shortest and longest focal lengths of the entire zoom lens system, respectively, and β 2T is the lateral magnification of said second lens unit when said zoom lens system is at the telephoto end.

4,690,514

LENS MOVING DEVICE

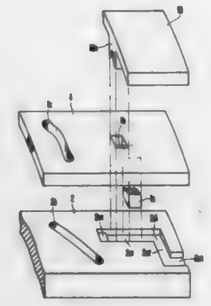
Shigeru Kamata, Tokyo, and Toshimi Iizuka, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,110

Claims priority, application Japan, Oct. 23, 1984, 59-221194

Int. Cl.[4] G02B *7/10*

U.S. Cl. 350—429 **6 Claims**



1. A lens moving device comprising:

(a) an optical lens contributing to a zooming function and a lens holder holding said lens;

(b) a body tube, said body tube being provided with a penetration hole and a first engaging portion on an inner surface thereof;

(c) operating means;

(d) a movable sleeve fitted in said body tube and arranged, upon actuation of said operating means, to move, said movable sleeve having a guide groove or slot engaging with said first engaging portion of said body tube; and

(e) an engagement member, said engagement member being positioned outside of said body tube and having a second engaging portion fitted in both said penetration hole of said body tube and said guide groove or slot of said movable sleeve.

4,690,515

COMPACT PROJECTION LENS

Yasuo Nakajima, Ibaraki; Yoshiharu Yamamoto, Toyonaka; Yoshito Miyatake; Yoshitomi Nagaoka, both of Neyagawa, and Shusuke Ono, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 802,341

Claims priority, application Japan, Dec. 20, 1984, 59-269783; Feb. 6, 1985, 60-21251; Mar. 30, 1985, 60-65044

Int. Cl.[4] G02B *9/12, 9/34, 13/18*

U.S. Cl. 350—432 **16 Claims**

1. A projection lens disposed between a cathode ray tube (CRT) and a screen for projecting an enlargement of an image on the cathode ray tube (CRT) onto the screen, said projection lens comprising:

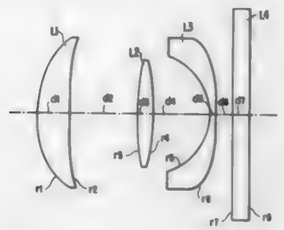
first, second and third lenses disposed successively in a direction extending from the screen to the CRT,

said first lens having a positive optical power and two optical surfaces spaced from one another in said direction and through which said image passes to the screen, at least one of said two surfaces being aspherical, and the one of said two surfaces that faces the screen being convex,

said second lens having a positive optical power, and bi-convex surfaces spaced from one another in said direction and through which said image passes before passing through said first lens,

said third lens having a negative optical power and an aspheric concave surface facing said second lens through which said image passes before passing through said second lens, and

the projection lens satisfying the following condition



$$0.55 < f_1/f_2 < 1.2$$

in which f_1 is the focal length of said first lens and f_2 is the focal length of said second lens.

4,690,516

PHOTOGRAPHING LENS BARREL PROVIDED WITH A CATADIOPTRIC OPTICAL SYSTEM

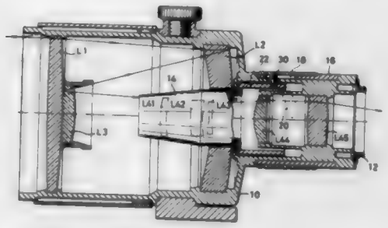
Hideo Kanno, Chiba, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 658,990

Claims priority, application Japan, Oct. 20, 1983, 58-195224

Int. Cl.[4] G02B *17/08, 7/04*

U.S. Cl. 350—444 **11 Claims**



1. Optical apparatus comprising:

optical means including a first dioptric system, a first catoptric system having an opening formed at a middle portion thereof including an optical axis and an annular reflective surface disposed to reflect a beam of light coming from an object and transmitted through said first dioptric system, a second catoptric system located on the optical axis in the vicinity of said first dioptric system and disposed to reflect the beam from said first catoptric system toward said opening, and a second dioptric system having a moving lens group to be moved in the direction of the optical axis in an area near said opening and disposed to transmit the beam from said second catoptric system;

a stationary cylindrical member holding said first dioptric system and said first catoptric system;

a movable cylindrical member provided in said stationary cylindrical member and holding said moving lens group, said movable cylindrical member having a diameter smaller than a diameter of said opening of said first catoptric system and being movable in the direction of the optical axis passing through said opening of said first catoptric system;

a moving member provided to be moved in the direction of the optical axis;

transmission means for moving said movable cylindrical member in response to said moving member, said transmission means including movement expanding means for moving said movable cylindrical member over an expanded distance relative to the moved distance of said moving member; and

operating means for moving said moving member.

4,690,517

RETROFOCUS TYPE WIDE ANGLE LENS

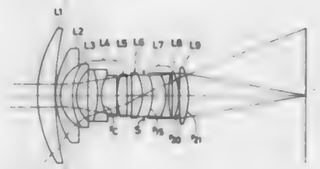
Daijiro Fujie, Sagamihara, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,523

Claims priority, application Japan, Oct. 9, 1984, 59-212243

Int. Cl.[4] G02B *9/64, 13/04*

U.S. Cl. 350—458 **13 Claims**



1. A retrofocus type wide angle lens having, in succession from the object side, a first component which is a positive meniscus lens having its convex surface facing the object side, a second component which is a negative meniscus lens having its convex surface facing the object side, a third component which is a negative meniscus lens having its convex surface facing the object side, a fourth component having a cemented surface of negative refractive power convex toward the object surface and having a negative refractive power as a whole, a fifth component which is a biconvex positive lens having a surface of sharper curvature on the object side, a sixth component which is a positive meniscus lens having its convex surface facing the image side, a stop, a seventh component which is a biconcave cemented negative lens comprising a positive meniscus lens having its convex surface facing the image side and a biconcave negative lens cemented thereto, an eighth component which is a positive meniscus lens having its convex surface facing the image side, and a ninth component which is a biconvex positive lens, said retrofocus type wide angle lens satisfying the following conditions:

$-0.9f < f_{14} < -0.6f$

$0.35f < D_4 < 0.53f$

$-1.3f < r15 < -0.9f$

$-0.9 < (r_{21}+r_{20})/(r_{21}-r_{20}) < -0.2$

$23 < \nu_2 < 40$

where f is the combined focal length of the entire system, f_{14} is the combined focal length of said first to fourth components, D_4 is the combined center thickness of said fourth component, r15 is the radius of curvature of the object side lens surface of said seventh component, r20 and r21 are the radii of curvature of the object side and image side lens surfaces, respectively, of said ninth component, and ν_2 is the Abbe number of said second component.

4,690,518

WIDE ANGLE COPYING LENS SYSTEM

Taira Kouchiwa, Kamakura, and Kiichiro Nishina, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

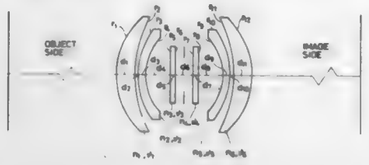
Filed Mar. 12, 1986, Ser. No. 839,044

Claims priority, application Japan, Mar. 15, 1985, 60-50616

Int. Cl.[4] G02B *9/62*

U.S. Cl. 350—464 **5 Claims**

1. A wide angle copying lens system comprising a completely symmetrical arrangement of six units in the form of six lenses which consists of, in order from the object field side, a first lens in the form of a positive meniscus with the convex surface directed toward the object field, a second lens in the form of a negative meniscus with the convex surface directed toward the object field, a third lens in the form of a positive meniscus with the concave surface directed toward the object field, a diaphragm, a fourth lens in the form of a positive meniscus with the concave surface directed toward the image field



in and of the same configuration as that of the third lens with the diaphragm placed therebetween, a fifth lens in the form of a negative meniscus with the convex surface directed toward the image field and of the same configuration as that of the second lens, and, a sixth lens in the form of a positive meniscus with the convex surface directed toward the image field and of the same configuration as that of the first lens,

the lens system satisfying the following conditions:

$$2.4 < f_{1,2}/f_1 < 2.8$$

$$0.065 < \frac{d_1 + d_2 + d_3}{f} < 0.075$$

$$11 < f_3/f < 17$$
$$1.62 < n_1 < 1.7$$
$$55 < \nu_1 < 63$$
$$1.7 < n_2 < 1.75$$
$$\nu_2 < 30$$

where

f: combined focal length of the entire system

f_i: focal length of the ith lens

$f_{1,2}$: combined focal length of a first and second lenses

d_i: axial spacing between the ith surface and the $(i=1)^{th}$ surface

n_i: refractive index of the ith lens

ν_i: Abbe's number of the ith lens.

4,690,519

ZOOM MICROSCOPE HAVING A CRANK AND LINKAGE MECHANISM

James A. Clark, Honeoye Falls, and Henry J. Emmel, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 17, 1985, Ser. No. 735,412

Int. Cl.[4] G02B *7/10, 21/22*

U.S. Cl. 350—515 **19 Claims**

1. A variable power optical instrument comprising:

(a) support means;

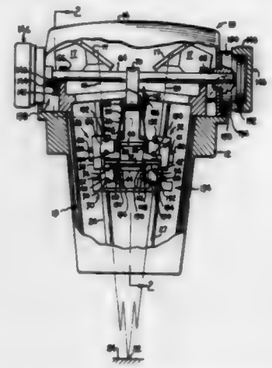
(b) first and second support rods secured to said support means;

(c) first and second lens carriers for supporting a pair of lenses and positioning said lenses along the optical axis of said instrument, each of said carriers including means for guiding said carriers along said first support rod and an arm secured to and extending therefrom for engaging said second rod;

(d) means for biasing each of said carriers into engagement with both said first and said second support rods to prevent rotation of said carriers relative to said first rod;

(e) means secured to said support means, for moving said first and second lens carriers along said optical axis ;and

(f) support means, slidably secured to said second rod, for supporting said biasing means, said biasing means being secured between said support means for supporting said biasing means and each of said carriers to bias each of said carriers into said first rod and said arms into engagement with said second rod.



4,690,520

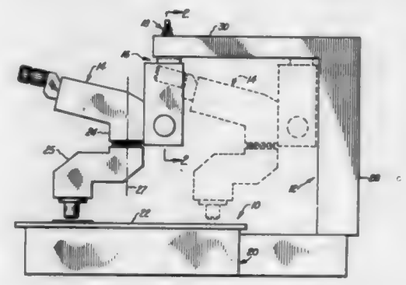
APPARATUS FOR USE IN TRANSPORTING A PHOTOGRAMMETRIC MICROSCOPE FROM A FIRST POSITION TO A SECOND POSITION

Alfred L. Shawcross, Lima; Donn E. Stevens, and Robert E. Jones, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 5, 1986, Ser. No. 859,511

Int. Cl.[4] G02B *21/22;* F16M *11/04*

U.S. Cl. 350—517 **12 Claims**



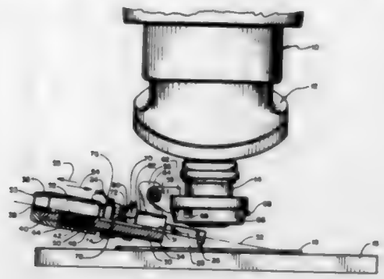
1. Apparatus for permitting movement of a microscope suspended by a horizontal support arm of an optical instrument from a first fixed position over an object to be viewed to a second position, comprising:

guide means affixed to the horizontal support arm and extending substantially horizontally above the object;

slide means having a microscope mounted thereto, said slide means being slidably mounted to said guide means; and

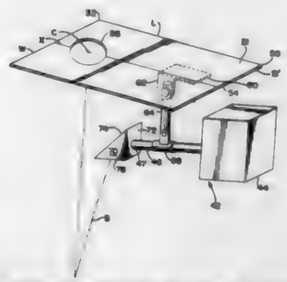
clamping means affixed to the horizontal support arm for locking said slide means to the horizontal support arm in a preselected first position along said guide means and for unlocking said slide means from the horizontal support arm to enable said slide means to be moved along said guide means to a second position, said clamping means including a first member for pivotal engagement with a surface formed on the horizontal support arm and a second member pivotally connected thereto, said second member being releasably received within a longitudinal slot formed within said guide means.

4,690,521
MICROSCOPE SLIDE MARKING DEVICE AND METHOD
Geno Saccomanno, 778 26½ Rd., Grand Junction, Colo. 81501
Filed Jan. 24, 1986, Ser. No. 821,953
Int. Cl.[4] G02B 7/02, 15/02; B23B 49/02; G01B 5/14
U.S. Cl. 350—520 31 Claims



26. A device for making reference marks on a microscope slide comprising:
means for mounting said device to a microscope having an optical centerline or axis;
a marking nib adapted to selectively place a reference mark on said slide;
a plunger means for activating said nib and selectively reference marking said slide;
positioning means apart from said mounting means adapted to allow said selective placement of the reference mark at a selectively variable position relative to said optical centerline during normal use.

4,690,522
MICROSCOPE ILLUMINATOR SUPPORT
Robert C. Welsh, Ste. 608, 168 SE. 1st St., Miami, Fla. 33131
Filed Jul. 1, 1985, Ser. No. 750,279
Int. Cl.[4] G02B 21/08
U.S. Cl. 350—528 10 Claims



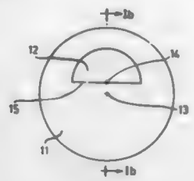
1. An illuminator support for use with a microscope holder having an opening therethrough of a dimension sufficient to receive a lens for a microscope, a line of vision being defined by said lens and a subject to be viewed with said microscope, said illuminator support comprising:
a plate having a first portion and a second portion, said first portion being clamped between said microscope and said microscope holder and having an aperture therethrough of dimensions corresponding to the dimensions of said opening, said lens being inserted through said aperture;
said second portion extending from said first portion; and
bracket means secured to said second portion of said plate for supporting an illuminator means for projecting a beam of light, said bracket means including an arm, said arm having one end pivotably attached to said plate and an opposite end with a clamp for supporting said illuminator means, said illuminator means having an outlet end for projecting a beam of light therethrough, said bracket means locating said outlet end of said illuminator means such that an angle between said beam of light and said line of vision is in the range of 5°–8°.

4,690,523
MONOLITHIC REINFORCED EYEGLASS FRAME AND FRICTION WELDING METHOD FOR MANUFACTURING SAME
Joseph Loiacono, Ft. Salonga, N.Y., assignor to Kenco Optics, Inc., Boca Raton, Fla.
Filed Jul. 3, 1985, Ser. No. 752,213
Int. Cl.[4] G02C 5/02
U.S. Cl. 351—129 18 Claims



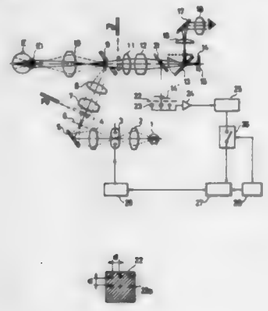
1. A method for manufacturing a monolithic eyeglass frame member fabricated from thermoplastic resin and having a reinforcement member fully embedded therein which comprises:
(a) superimposing a first thermoplastic resin sheet upon a second thermoplastic sheet with a reinforcement element disposed therebetween, the adjacent surfaces of said sheets being in substantial contact with each other;
(b) applying a pressure force to the outer surfaces of said first and second thermoplastic sheets in a direction which is transverse to the lengths thereof to force said sheets toward one another with said reinforcements element disposed therebetween;
(c) applying a motion to one of said thermoplastic sheets relative to the other while said sheets are under pressure thereby creating frictional heat sufficient to melt the thermoplastic resin at the interface of the two sheets such that upon cooling of the sheets to below the melt temperature of the molten thermoplastic resin, there is provided a monolithic, one piece frame front member ready for rough-machining;
(d) rough-machining the one piece frame front member to provide semi-finished frame front member; and,
(e) finishing the semi-finished frame front member to provide a finished monolithic eyeglass frame front member.

4,690,524
MULTIFOCAL SPECTACLE LENS HAVING A LARGE NEAR-VISION PART
Erwin J. Daniels, Aalen, and Siegfried Korn, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
Filed Feb. 11, 1985, Ser. No. 700,392
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 8404836[U]
Int. Cl.[4] G02C 7/06
U.S. Cl. 351—168 11 Claims



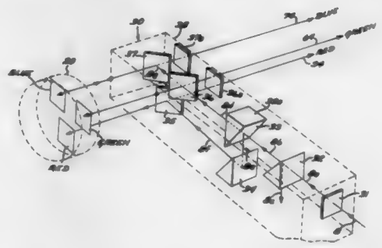
1. A multifocal spectacle lens having a large near-vision part, the spectacle lens comprising:
a base lens dimensioned for the near-vision range, said base lens having an outer surface facing objects to be viewed and having a recess formed in said outer surface;
a supplementary lens seated in said recess so as to be in juxtaposition with said base lens to form a composite lens defining a predetermined region of said spectacle lens for a distance-vision range thereof; and,
said base lens having an index of refraction greater than the index of refraction of said supplementary lens thereby causing said composite lens to have a refractive power less than the remainder of said base lens outside of said predetermined region.

4,690,525
EYE FUNDUS CAMERA
Kazunobu Kobayashi, Yokohama; Kyoji Sekiguchi, Tokyo; Isao Matsumura, Yokosuka, and Haruhisa Madate, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1984, Ser. No. 682,231
Claims priority, application Japan, Dec. 27, 1983, 58-245965
Int. Cl.[4] A61B 3/14; G03B 7/00
U.S. Cl. 351—206 6 Claims



1. An eye fundus camera having:
an illuminating system for illuminating an eye to be examined;
a photographing system for photographing the fundus of the eye to be examined;
light receiving portions comprising multiple spots for receiving the reflected light from the eye fundus illuminated by said illuminating system, said light receiving portions being disposed in a plane substantially optically conjugate with the fundus of the eye to be examined, the spacing between each two adjacent spots being greater than a length corresponding to a diameter of the optic disk of the eye fundus; and
a control unit for processing the outputs of said light receiving portions to restrict influence of the optic disk, and automatically controlling the quantity of photographing light.

4,690,526
PRISM ASSEMBLY FOR A SINGLE LIGHT VALVE FULL-COLOR PROJECTOR
Arno G. Ledebuhr, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Sep. 12, 1985, Ser. No. 775,890
Int. Cl.[4] G02F 1/13
U.S. Cl. 353—31 7 Claims

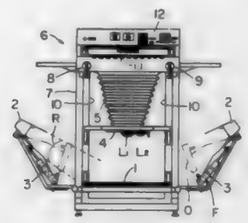


1. In a color, single light valve projector system wherein three input images corresponding to three primary color components of a color image to be projected are applied to three separate regions of a photoresponsive layer of the single light valve, each region having "on" and "off" states corresponding to image information in the primary color, the improvement comprising:
prepolarizing means for polarizing a white illumination light beam to a first polarization state; and
an optical assembly including a first set of optical elements for color separating the polarized white illumination light beam into three primary color beams each having the first polarization state and a second set of optical elements for polarization of each of the three primary color beams to a second polarization state and directing the three primary color beams having the second polarization state to individual ones of the regions of the photoresponsive layer, where the respective three primary color beams are each reflected from the "on" state portion of the regions of the photoresponsive layer as image bearing color components having the first polarization state corresponding to the input image information, the image bearing component being passed through said second set of optical elements as three primary color beams.

4,690,527
DEVICE FOR REPRODUCTION AND TRACING
Masakazu Ohtorii, Hikoneshi, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Jun. 18, 1985, Ser. No. 745,918
Claims priority, application Japan, Nov. 13, 1984, 59-171969
Int. Cl.[4] G03B 21/06
U.S. Cl. 353—65 8 Claims

1. In a device for reproduction and tracing of an original comprising
(a) a table upon which the original is placed;
(b) a screen apart from said table;
(c) at least one lens disposed between said table and said

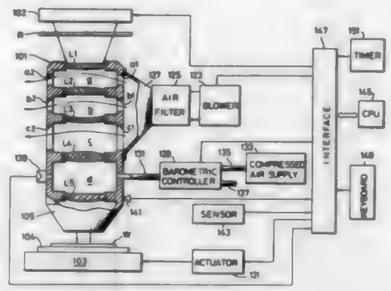
screen such that an image of an original placed upon the table can be formed on the screen at a desired scale;
(d) a frame supporting said table, screen and lens;
(e) at least one arm affixed to said frame at one end, and being free at the other end;
(f) at least one illumination system for reproduction supported by said arm and positioned so as to illuminate the original placed upon the table; and
(g) at least one illumination system for tracing supported by said arm and disposed between said illumination system for reproduction and said table, said illumination system for tracing being movable between an extended position wherein the illumination system for tracing extends into a space between the original placed on the table and said illumination system for reproduction, and a retracted position wherein the illumination system for tracing is



outside said space between the original and said illumination system for reproduction, the improvement comprising forming said illumination system for tracing from a lamp means having a luminous front surface and an absorptive back surface, a supporting member, and a positioning means, wherein a first end of said supporting member is pivotally connected to the free end of said arm, and wherein said lamp means is pivotally connected to a second end of said supporting member such that in the retracted position said lamp means is rotatable such that the front surface faces the arm whereby illumination from the illumination system for reproduction can strike only the back surface, and such that in the extended position the front surface is oriented so as to illuminate the original on the table and is fixed in that orientation by the positioning means.

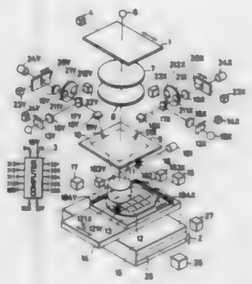
4,690,528
PROJECTION EXPOSURE APPARATUS
Akikazu Tanimoto, Yokohama, and Kazunori Imamura, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan
Filed Oct. 1, 1984, Ser. No. 656,746
Claims priority, application Japan, Oct. 5, 1983, 58-186266; Oct. 7, 1983, 58-187866; Oct. 7, 1983, 58-187867
Int. Cl.[4] G03B *3/10*
U.S. Cl. 353—101 **17 Claims**

1. Apparatus for projecting a pattern on a first plane onto a second plane, comprising:
a projection lens system disposed between said first and second planes and including a plurality of lens elements arranged in a spaced relation and defining a plurality of spaces;
means for isolating at least one of said spaces from the atmosphere;
means for supplying a gas flow to at least another one of said spaces different from said isolated space for cooling the lens elements facing said another one space, said supply means having inlet means and outlet means at opposite sides of an optical path of said projection lens system, respectively, and passing said gas flow across said optical path from said inlet means to said outlet means; and
means for changing the refractive index of said isolated space, said changing means including means for measuring the temperature of said projection lens system, means for measuring the pressure of the atmosphere and means for



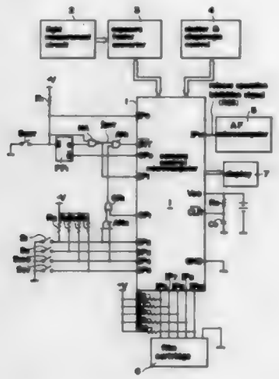
controlling said refractive index in response to the measured temperature of said projection lens system and the measured pressure of the atmosphere.

4,690,529
OPTICAL EXPOSER
Shuji Sugiyama; Shuji Syohda, both of Katsuta, and Shinji Kuniyoshi, Suginami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
PCT No. PCT/JP84/00467, § 371 Date Aug. 5, 1985, § 102(e) Date Aug. 5, 1985, PCT Pub. No. WO85/01834, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 3, 1984, Ser. No. 741,800
Claims priority, application Japan, Oct. 7, 1983, 58-187025
Int. Cl.[4] G03B *27/52*
U.S. Cl. 353—122 **16 Claims**



1. An optical projection exposure system comprising:
means for generating light;
a mask having a predetermined pattern and at least one alignment mark;
means for directing said light to said mask;
a projection lens for projecting an image of said predetermined pattern onto a work piece, said work piece including at least one alignment mark; and
means for detecting a first superposed image of a first light wavelength composed of a first focused image of said at least one alignment mark of said work piece through said projection lens and said at least one alignment mark of said mask, and for detecting a second superposed image of a second wavelength composed of a second focused image of said at least one alignment mark of said work piece through said projection lens and said at least one alignment mark of said mask.

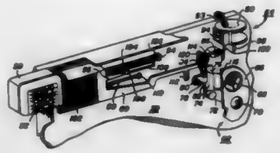
4,690,530
CAMERA WITH RELEASE CONTROL AND AUTOMATIC FILM SENSITIVITY SETTING
Akihiko Fujino, Sakai; Masabu Inoue, Kobe; Masaaki Nakai, Kawachinagano, and Minoru Sekida, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 26, 1985, Ser. No. 801,912
Claims priority, application Japan, Nov. 26, 1984, 59-178792[U]; Dec. 10, 1984, 59-187985[U]; Dec. 10, 1985, 59-187986[U]
Int. Cl.[4] G03B *1/60, 7/24, 17/38*
U.S. Cl. 354—21 **11 Claims**



1. A camera which is adapted to be transferred to a normal photographing condition through winding-up of a film contained in a film cartridge by a predetermined length, said camera comprising:
switch means changed over from a first state to a second state upon transfer of said camera to said normal photographing condition;
determining means for determining whether or not said camera is in said normal photographing condition in response to said winding-up;
signal generating means for generating a release inhibition signal under a condition of said camera in which it is undesirable to start an exposure operation; and
release control means for inhibiting said camera from being released to start an exposure operation in response to said release inhibition signal when said determining means indicates that said camera is in the normal photographing condition while allowing said camera to be released independently of the generation of said release inhibition signal when said determining means indicates that said camera is not in said normal photographing condition.

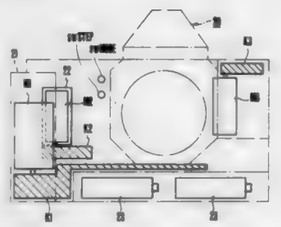
4,690,531
LOW COST TELEPHOTO AND NORMAL LENS CAMERA WITH AN EXTENDABLE FLASH
David E. Hansen, Fairport; Richard R. Kelbe, Fishers, and Dana W. Wolcott, Honeoye, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 24, 1985, Ser. No. 748,535
Int. Cl.[4] G03B *15/03, 13/02*
U.S. Cl. 354—149.11 **3 Claims**

1. In a camera including means for providing a source of flash illumination having means adjustable for varying the illumination projected toward a photographic subject, a viewfinder adjustable to provide relatively wide-angle and relatively narrow-angle views of a scene, and lens apparatus movable for focusing said camera according to the distance between said camera and a subject to be photographed, the improvment comprising:
control means for controlling jointly said lens apparatus, said flash source, and said viewfinder, said control means having:
(1) a first condition in which
(i) said lens apparatus is focused at a relatively short distance,
(ii) said flash source is positioned at a first distance from the lens apparatus, and
(iii) said viewfinder is adjusted to provide a relatively wide-angle view of a photographic scene including a photographic subject situated at such relatively short distance,



(2) a second condition in which
(i) said lens apparatus is focused at a relatively remote distance,
(ii) said flash source is positioned at a second distance from the lens apparatus greater than said first distance, and
(iii) said viewfinder is adjusted to provide a relatively narrow-angle view of a photographic scene including a subject situated at the remote distance, and
(3) a third condition in which said lens apparatus, said viewfinder and said flash source are covered.

4,690,532
MOTORIZED DRIVE DEVICE FOR CAMERA
Masaharu Kawamura, Kawasaki; Yoshihito Harada, Yokohama; Ryuichi Kobayashi, Kawasaki; Masayuki Suzuki, Yokohama; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 25, 1986, Ser. No. 911,992
Int. Cl.[4] G03B *1/18, 17/18, 17/42*
U.S. Cl. 354—173.11 **27 Claims**



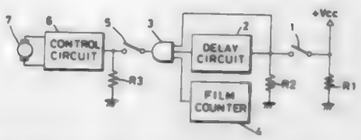
1. A motorized drive device for a camera comprising:
(a) a motor as a rotation drive source;
(b) a transmission system to be driven by said motor, said transmission system having at least two speed reduction ratios set therein;
(c) a camera mechanism to be driven by the output of said transmission system;
(d) control means for changing over said transmission system between the two speed reduction ratios; and
(e) display means for changing the display state in response to changeover of the speed reduction ratio of said transmission system by said control means.

4,690,533

FILM FEEDING APPARATUS FOR CAMERA

Hiroshi Wakabayashi, Yokohama, and Kazuyuki Kazami, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 797,970
Claims priority, application Japan, Dec. 4, 1984, 59-256281
Int. Cl.⁴ G03B *1/18*
U.S. Cl. 354—173.11 **12 Claims**



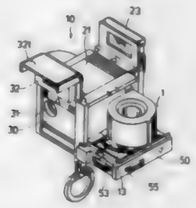
1. A film feeding apparatus for a camera to feed a film from a cartridge, comprising:
- rear cover detection moans for detecting closing of a rear cover of a camera so as to generate a close signal;
- a delay circuit which starts counting upon reception of the close signal and generates a delay signal after a predetermined time elapses from reception of the close signal; and
- feed means, including a motor, for energizing the motor upon reception of the delay signal so as to successively feed a film from the cartridge.

4,690,534

SUPERMINIATURE CAMERA

Cheng Chen-Liang, Hsintien, Taiwan, assignor to Chen Liang Co., Ltd., Hsintien, Taiwan

Filed Oct. 1, 1986, Ser. No. 914,017
Int. Cl.⁴ G03B *1/10, 13/06, 17/04*
U.S. Cl. 354—187 **4 Claims**



1. A superminiature camera for use with a 110 film cassette, said film cassette including a roll-out cylinder, a spool mounted in said roll-out cylinder, a first gear provided on an end portion of said spool extending externally of said roll-out cylinder, a roll-in cylinder, and a middle hollow section connecting said two cylinders and having an exposing portion, said superminiature camera having an extensible camera body, said extensible camera body comprising:
- a front wall with a lens thereon;
- a first side wall;
- a rotary second side wall, opposing said first side wall, pivoted to said lower wall at a lower side of said rotary side wall and rotatable to a horizontal position when it is to used, a second gear on an inner surface of said rotary second side wall capable of engaging with said first gear of said film cassette, and a rotary knob integrated with said second gear;
- a releasable fastening device for fastening said rotary second side wall to said upper wall when said superminiature camera is in an idle condition;
- a rear wall, including an upper slide portion and a lower slide portin thereon, said slide portions projecting from said rear wall toward said front wall;
- an upper wall including a first guide device thereon for guiding the sliding movement of said upper slide portion of said rear wall with respect ot said upper wall so as to permit the horizontal movement of said rear wall;
- a lower wall including a second guide device thereon for guiding the sliding movement of said lower slide portion of said rear wall with respect to said lower wall so as to permit the horizontal movement of said rea wall;
- a viewfinder, including an eyepiece mounted on a front side of said camera body, and an objective piece opposing said eyepiece on a rear side of said camera body; and
- a locating device for locating said two slide portions of said rear wall at a front, intermediate and rear positions of said two guide devices, said rear wall being nearest to said two side walls when said slide portions are located at said front position, the width of the space between said rear wall and said side walls being larger slightly than the thickness of said middle hollow section of said film cassette when said slide portions are located at said intermediate position, the space between said rear wall and said side walls being higher and wider than said cylinders of said film cassette;

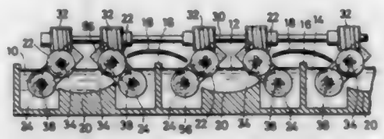
whereby, said film cassette can be inserted into the space formed when said slide portions are in the rear position, can be snapped into usable condition when said slide portions are in the intermediate position, wherein said second is disposed in such a manner that, when said slide portions are in the intermediate position, said second gear will mesh with said first gear of said film spool so as to drive said first gear.

4,690,535

AUTOMATIC FILM PROCESSOR ARRANGEMENT

Takao Kubota, and Yasuo Ujii, both of Saitama, Japan, assignors to Sun Seiki Co., Ltd., Japan

Filed Jun. 27, 1986, Ser. No. 881,977
Claims priority, application Japan, Jul. 3, 1985, 60-101533
Int. Cl.⁴ G03B *3/08*
U.S. Cl. 354—322 **4 Claims**



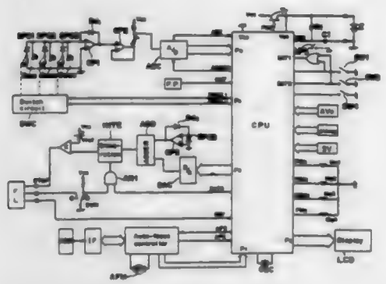
1. An automatic film processor arrangement including a plurality of processing tanks, each being charged with a processing liquid and plural pairs of rollers received therein to continuously pass a photosensitive film through the processing liquid, wherein:
- each of said rollers includes a shaft projecting from its both ends, which is provided with a lock groove in the circumferential direction,
- a sleeve-like bearing is provided to rotatably support said shaft, said bearing being formed on the inner face with a projection to be locked in said lock groove, including a split groove which extends axially from the mouth thereof which is open on the roller side, and being formed on the outer face with flat portions, and
- a lock plate is provided to supprt said bearing, said lock plate including an elogated slot having a width equal to the distance between said flat portions of said bearing, and serving to receive the flat portions of said bearings for a pair of rollers, thereby supporting said pair of rollers while they come into contact with each other along the full length thereof.

4,690,536

EXPOSURE CONTROL DEVICE FOR A CAMERA IN FLASH PHOTOGRAPHY

Masaaki Nakai, Kawachinagano; Shuji Izumi; Akihiko Fujino, both of Sakai; Nobuyuki Taniguchi, Nishinomiya; Toshio Yamaki, Osaka, and Hiromu Mukai, Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,160
Claims priority, application Japan, Sep. 9, 1985, 60-200277; Sep. 9, 1985, 60-200278; Sep. 9, 1985, 60-200279; Sep. 9, 1985, 60-200280; Sep. 10, 1985, 60-201126
Int. Cl.⁴ G03B *7/097, 15/05*
U.S. Cl. 354—402 **6 Claims**



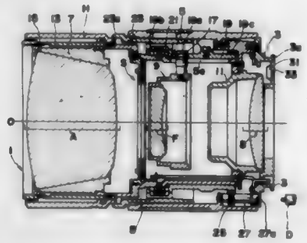
1. An exposure control device for a camera in flash photography comprising;
- first means for measuring light from a central area of an object field;
- second means for measuring light from another area surrounding the central area;
- means responsive to said first and second measuring means for detecting a rear light condition;
- means for controlling exposure in response to said second measuring means to cause an over-exposure by a given value when said detecting means detects the back light condition;
- means for directing a flash light emission; and
- means for integrating light reflected from the object field upon the flash light emission to stop the flash light emission when the integrated light reaches a predetermined level.

4,690,537

LENS BARREL

Makoto Ando, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Sep. 23, 1985, Ser. No. 779,185
Claims priority, application Japan, Sep. 25, 1984, 59-199858
Int. Cl.⁴ G03B *3/10*
U.S. Cl. 354—402 **7 Claims**



1. A lens barrel detachably attached to a camera including focus detaching means detecting an amount of an aberration of positions between a predetermined focal plane and an image surface, signal means generating a focus detecting signal corresponding to said aberration amount and driving means moving in response to said signal, said lens barrel comprising:
- storage means for storing a fixed coefficient for tranforming said aberration amount to a focus detecting signal corresponding to said amount;
- information means for generating said fixed coefficent to said signal means of said camera;
- an optical lens system including a stationary front element and a movable element movably supported along its optical axis for focusing;
- a rotating member rotated by said driving means; and
- a cam means for moving said movable element along its optical axis in response to the rotation of said rotating member,

wherein said cam means is formed such that the degree of rotation ($\Delta\theta$) of said rotating member and the amount of movement (ΔL) of said image surface have a following relation:

$$\Delta\theta = C \cdot \Delta L$$

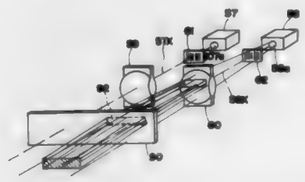
(wherein C is a constant).

4,690,538

FOCUS DETECTION SYSTEM AND LIGHTING DEVICE THEREFOR

Tohru Matsui, Sakai, and Takeshi Egawa, Senaan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 807,642, Dec. 11, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 940,190
Claims priority, application Japan, Dec. 11, 1984, 59-261194; Jan. 17, 1985, 60-7178; Jan. 19, 1985, 60-7686; Jan. 21, 1985, 60-9716
Int. Cl.⁴ G03B *3/00, 15/03;* **G01J** *1/20*
U.S. Cl. 354—403 **62 Claims**



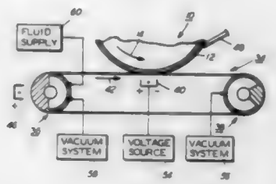
1. A focus detection system for detecting focus condition of an objective lens of a camera with respect to an object within a focus detection area which spreads at a solid angle centering at the optical axis of said objective lens, comprising:
- a first light projecting optical system for projecting a first flux of light which illuminates a first distance zone within said focus detection area; and
- a second light projecting optical system for projecting a second flux of light which illuminates a second distance zone within said focus detection area, said second distance zone being set wider than said first distance zone so as to cover the whole of said first distance zone at a farther distance side thereof and so as to extend beyond said first distance zone at a closer distance side thereof.

4,690,539

TRANSFER APPARATUS

Charles A. Radulski, Macedon, and Henry R. Till, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1986, Ser. No. 867,129
Int. Cl.[4] G03G *15/01, 15/14*
U.S. Cl. 355—3 TR **26 Claims**



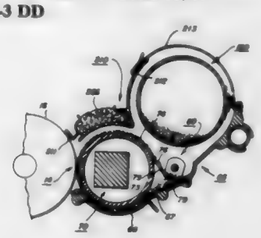
1. An apparatus for transferring a plurality of liquid images having at least a liquid carrier with toner particles dispersed therein from a member to a copy sheet, including:
an intermediate member positioned closely adjacent to the member;
means for attracting one of the liquid images from the member to said intermediate member;
means for removing a substantial portion of the liquid carrier on said intermediate member and securing the toner particles on said intermediate member in image configuration; and intermediate member in image configuration; and
means for transferring toner particles from said intermediate member to the copy sheet in image configuration.

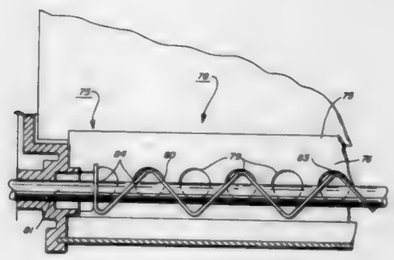
4,690,540

DEVELOPER SYSTEM FOR REPRODUCTION AND PRINTING MACHINES

Eugene J. Manno, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1986, Ser. No. 818,930
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD **7 Claims**





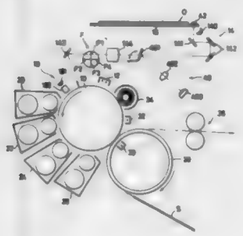
1. In a reproduction machine having a movable recording member on which latent electrostatic images are created, developing means for developing the images, and transfer means for transferring the developed images to a copy substrate material, the developing means including a developer housing having a sump for a developer mixture including toner for developing the images on the recording member and a rotatable magnetic brush roll with magnet means for forming a developer brush from developer in said sump on the surface of the magnetic brush roll, so that rotation of the magentic brush roll brings the developer brush into developing relation with the recording member, the combination of:
(a) a developer stripper plate having a developer stripping edge, the surface of said stripper plate adjoining said stripping edge providing a support surface for developer removed from said magnetic brush roll;
(b) means supporting said stripper plate in said developer housing above said sump with said stripper plate stripping edge in operative juxtaposition with said magnetic brush roll to strip developer from said magnetic brush roll as the developing brush formed on said magnetic brush roll moves out of developing relation with said recording member, said stripper plate being inclined so that the removed developer on said stripper plate surface moves downwardly along said stripper plate surface and away from said magnetic brush roll;
(c) at least oe row of developer return holes communicating said stripper plate surface with said sump, said developer return holes being spaced from said stripping edge to enable the removed developer on said stripper plate surface to pass into said sump;
(d) chevron means for mixing the removed developer on said stripper plate to enhance the returned developer mixture; uniformity
(e) means supporting said chevron means in said developer housing in predetermined spaced relation to said stripper plate surface opposite to or upstream of said row of developer return holes; and
(f) drive means for rotating said chevron means to mix the removed developer on said stripper plate surface as the removed developer is returning to said sump whereby to maintain a substantially uniform developer mix in said sump.

4,690,541

COLOR ELECTROPHOTOGRAPHIC COPYING PROCESS

Yoshihiro Sakai, Tokyo; Ituso Ikeda; Katsuo Sakai, both of Kanagawa; Tsukasa Adachi, Tokyo; Satoshi Shinguryo, Saitama, and Hideya Furuta, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,069
Claims priority, application Japan, Aug. 30, 1984, 59-181459; Sep. 17, 1984, 59-194258; Sep. 17, 1984, 59-194259; Sep. 21, 1984, 59-198368; Sep. 28, 1984, 59-203806
Int. Cl.[4] G03G *13/01, 15/01*
U.S. Cl. 355—4 **16 Claims**



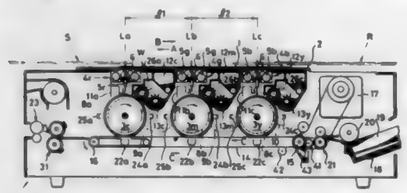
1. A color electrophotographic copying process utilizing the Carlson process, comprising the steps of:
reading a colored original with a solid-state image pickup device wherein said image pickup device includes a plurality of photographic elements which are covered with respectively red, green and blue filters which are cyclically arranged;
color-separating said colored original;
determining an amount of masking for a color-separated latent image to be masked, based on image information read in said reading step; and
partially erasing the color-separated latent image to be masked in an area-modulating manner with an eraser comprising a light-emitting dot array at an erase ratio depending on the determined amount of masking wherein said light-emitting dot array includes an array of light-emitting elements extending transversely from a photosensitive body wherein said light-emitting elements are turned on and off simultaneously to form a light-spot image wherein said light-spot image is formed by said area-modulating manner of partially erasing with said light-emitting elements being turned on and off without modulation of the light intensities of said elements.

4,690,542

COLOR COPYING APPARATUS

Hideya Furuta, Yokohama; Yutaka Koizumi, Kawasaki; Mitsuru Mamizuka, and Yoshihiro Sakai, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 812,947
Claims priority, application Japan, Dec. 29, 1984, 59-276677; Dec. 29, 1984, 59-276678; Dec. 29, 1984, 59-276681; Dec. 30, 1984, 59-281073; Dec. 30, 1984, 59-281075
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 **7 Claims**







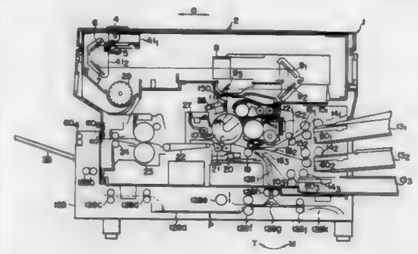
1. A color copying apparatus comprising:
a mounting table adapted to mount an original to be copied thereon and capable of moving for exposing said original to a light;
a plurality of photosensitive members being arranged along a moving path of said mounting table;
exposing units provided correspondingly to each of said photosensitive members, and each having an image exposing portion for receiving a light image of said original exposed to each of said photosensitive members;
whereby latent images are formed by said exposing units, on said respective photosensitive members and, after said latent images are developed, resultant visible images are transferred overlappingly onto a transfer paper;
a first pulley connected, through a first clutch, with one of said photosensitive members in order to rotate;
a wire whose one end is connected with said mounting table and another end is connected with said pulley, and upon rotation of said pulley, allowing said mounting table to move for exposing said original to a light;
and wherein said image exposing portions are arranged along a moving path of said mounting table with an interval corresponding to an integer multiple of a peripheral length of said pulley.

4,690,543

IMAGE FORMING APPARATUS WITH A PLURALITY OF COLORS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 21, 1986, Ser. No. 865,339
Claims priority, application Japan, May 28, 1985, 60-114826
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—4 **2 Claims**



1. An image forming apparatus with a plurality of colors, said apparatus comprising:
an original table for placing thereon an original which possesses at least a first color and a second color;
original scanning means for optically scanning an original placed on said original table, said means having an optical system to feed the image reflecting light coming from the original into a given light path;
color component detection means for transmitting electric signals corresponding to said first and second colors in response to the image reflecting light, said means being movably provided on said light path on which said image reflecting light coming from said optical system of said original scanning means passes;
original color identifying means for identifying different color areas from the electric signals for said first and second colors transmitted from said color component detection means and for storing the color and positional data for the first and second colors in different color areas;
image forming means for forming an image of given colors of the original on an image forming medium by using said image reflecting light coming from said optical system of said original scanning means and by selectively driving a first and a second developing units which correspond to said first and second colors respectively;
image erasing means for selectively erasing an image to be formed by said image forming means;
image forming medium return means for selectively returning said image forming medium to said image forming means after formation of an image by said image forming means;
first control means for producing a first control signal to drive said original scanning means and said color component detection means for a given number of times prior to actual formation of an image;
second control means for reading out, at the time of the first

image forming operation, said first color data that have been stored in said original color identifying means to send them to said first developing unit of said image forming means as drive signals and said second positional data which correspond to said second color data to send them to said image erasing means as erasure data and for producing a second control signal to said image forming medium return means as an instruction for a return operation; and

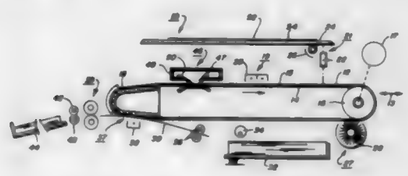
third control means for reading out, at the time of the second image forming operation, said second color data that have been stored in said original color identifying means to send them to said second developing unit of said image forming means and said first positional data which correspond to said first color data to send them to said image erasing means as erasure signals.

4,690,544

BLADE CLEANING APPARATUS FOR FLEXIBLE BELT

Richard L. Forbes, II, Pittsford, and Bruce E. Thorp, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1985, Ser. No. 813,183
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **9 Claims**



1. In an electrostatographic reproducing apparatus comprising an endless flexible belt having an imaging surface thereon supported for movement between two support members defining a substantially horizontal top run therebetween, a blade cleaning station for removing residual toner particles from the imaging surface comprising a rigid stationary cleaning platen under the top run of said belt between said support members for supporting said belt thereon and a cleaning blade mounted in opposed relationship to said cleaning platen on the imaging surface of said belt for removing residual toner therefrom,

said cleaning blade being positioned in interference with said imaging surface on said belt supported by said cleaning platen such that its beam deflection provides the force required to clean the imaging surface and toner cleaned from said imaging surface lubricates the nip between the cleaning blade and the imaging surface.

4,690,545

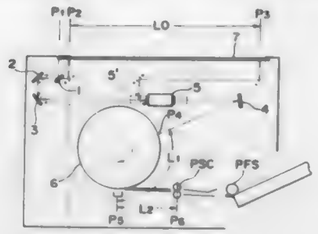
COPYING APPARATUS

Sigeharu Maehara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jul. 3, 1986, Ser. No. 881,657
Claims priority, application Japan, Jul. 5, 1985, 60-148782
Int. Cl.[4] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **3 Claims**

1. In a copying apparatus including an original scanning means adapted to be reciprocated such that relative positions of a leading edge of a copy paper sheet and a front end of an image to be copied are controlled in accordance with a time interval between a point of time of start of scanning of said original scanning means and a point of time of start of transport of the copy paper sheet, the improvement comprising:

means for reciprocating, in a mode for starting scanning of said original scanning means after start of transport of the copy paper sheet, said original scanning means through a short distance at a low speed prior to start of copying of



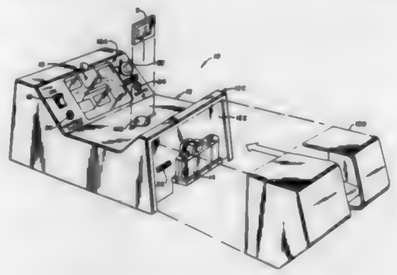
the image onto the copy paper sheet so as to determine a start position of scanning of said original scanning means.

4,690,546

APPARATUS FOR PRODUCING INTERNEGATIVES

Roman Kuzyk, Trenton, N.J.; Richard H. Bender, Gaithersburg, Md., and Lew Edwards, Orlando, Fla., assignors to ECB Technologies, Inc., Washington, D.C.

Filed Sep. 4, 1986, Ser. No. 903,478
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—69 **25 Claims**



1. An apparatus for producing an internegative, comprising:

means for positioning a transparency from which an internegative is to be made;

camera means having a selectively controllable shutter for exposing film therein with an image of a transparency positioned by said first-mentioned means;

first illumination means selectively controllable to project light for a selected time duration through the transparency and into said camera means to expose film in said camera means with an image of the transparency;

second illumination means selectively controllable to project light for a selected time duration into said camera means to expose film therein; and

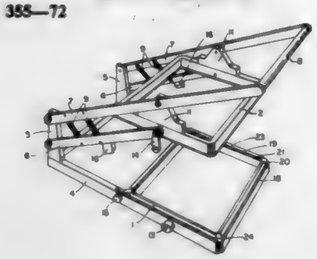
stored-program controlled means coupled to said camera means and said first and second illumination means for selectively opening said shutter and controlling said first illumination means to project light therefrom through said transparency and into said camera means for a selected time duration and for selectively controlling said second illumination means to project light therefrom for a selected time duration into said camera means to effect a contrast correction of the exposed film.

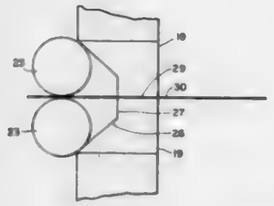
4,690,547

EXPOSING FRAME

Brian E. Shawcross, Cheadle Hulme, England, assignor to CIBA-GEIGY AG, Basel, Switzerland

Filed Sep. 17, 1986, Ser. No. 908,138
Claims priority, application United Kingdom, Sep. 20, 1985, 8523300
Int. Cl.[4] G03B *27/58*
U.S. Cl. 355—72 **5 Claims**





1. A device for holding photosensive material during light exposure which comprises two planar frames of equal size, each of which has two parallel walls and rounded corners, one frame at least being open between its four walls, each frame carrying around its peripheral walls a band of resilient material of rounded cross-section which when the device is in the non-use state is so mounted that part of the band is held above walls of the frame, the sides of each frame being bevelled outwards, together with means to hold in position the two frames separated from each other with the bands of resilient material facing each other, means to force the two frames together so that the bands contact each other substantially over their entire length and force each other down the walls of each frame and means to hold securely the two frames in this position.

4,690,548

METHOD AND APPARATUS FOR THE CONTROL OF A REPRODUCTION CAMERA

Niels E. Holm, Soroe, Denmark, assignor to Danagraf A/S, Soroe, Denmark

Filed Aug. 20, 1985, Ser. No. 767,776
Claims priority, application Denmark, Aug. 31, 1984, 4169/84
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **4 Claims**

1. A method for the control of a reproduction camera, having work surface for receiving a picture comprising the steps of:

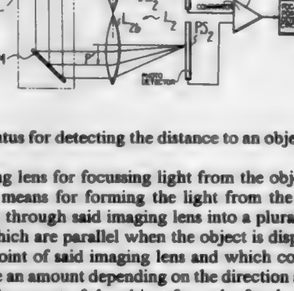
(a) placing the picture on the work surface;

(b) scanning of the entire work surface including the picture in the object plane on the work surface;

(c) reading the scanning image optically on a point-by-point basis to determine the intensity of each point by use of a matrix of a large number of punctiformed photometers, converting the photometers into digital values and thereby creating a matrix of numerical measurements;

(d) analyzing said matrix of numerical measurements to locate the photometers corresponding to the lightest and darkest points, Dmin and Dmax;

(e) setting the exposure of the camera based on Dmin and Dmax;



(f) measuring the reflected light from the work surface after the picture is located thereon, calculating the position and dimensions of the picture by use of the image in the matrix; and

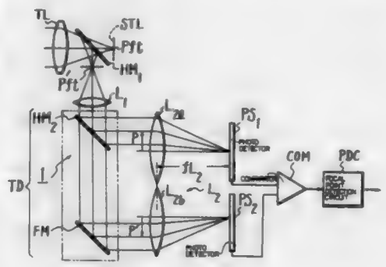
(g) calculating the pictures degree of density and setting the camera according to the measuring under (f).

4,690,549

APPARATUS FOR DETECTING DISTANCE TO AN OBJECT

Yasuo Nakada, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 436,614, Oct. 25, 1982, abandoned.
This application Feb. 3, 1986, Ser. No. 824,946
Claims priority, application Japan, Oct. 26, 1981, 56-171204; Oct. 27, 1981, 56-171755
Int. Cl.[4] G01C *3/08*; G03B *13/20*
U.S. Cl. 356—4 **19 Claims**



1. Apparatus for detecting the distance to an object comprising:

an imaging lens for focussing light from the object;

first lens means for forming the light from the object and passing through said imaging lens into a plurality of light rays which are parallel when the object is disposed at the focal point of said imaging lens and which converge and diverge an amount depending on the direction and amount of displacement of the object from the focal point of said imaging lens;

separating means for separating said light rays from said first lens means into at least two bundles of light;

second lens means for forming each said bundle of light into a separate image at a respective location depending on the amount of convergence and divergence of said light rays;

light sensing means for sensing said locations of said images; and

detecting means for detecting said locations of said images

on said light sensing means and for generating an output varying with the displacement of said images from the locations thereof when the object is at the focal point of said imaging lens.

4,690,550

LASER RANGE FINDER

Christoph Kühne, Giengen/Brenz, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,852
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 8518594
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 **5 Claims**



1. A laser range finder for use with a common telescope and comprising:
- a laser light source for generating and transmitting a transmitted light beam through said common telescope to a target whereat said light beam is reflected into said common telescope in the form of a receiving light beam;
- a Keplerian telescope mounted between said common telescope and said laser light source;
- wobble mirror means for wobbling between a first position for deflecting said transmitted light beam and a second position for deflecting said receiving light beam, said wobble mirror means being mounted between said common telescope and said Keplerian telescope for coacting with said Keplerian telescope to separate said transmitted light beam from said receiving light beam;
- said Keplerian telescope defining a real image plane and a laser focus whereat said transmitted light beam is focussed;
- a receiving apparatus for receiving said receiving light beams;
- said Keplerian telescope including a fixed deflecting mirror for directing said receiving light beam to said receiving apparatus when said wobble mirror means is in said second position; and,
- said fixed deflecting mirror being disposed in said image plans at a location next to said laser focus so as to not shade the latter.

4,690,551

LASER RADAR UTILIZING PULSE-TONE WAVEFORM

Brian E. Edwards, Sterling, and David G. Biron, Westford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 19, 1985, Ser. No. 725,243
Int. Cl.[4] G03G *15/00*
U.S. Cl. 356—5 **6 Claims**

1. Laser radar comprising:
(1) A CW laser;
(2) A pulsed laser;
(3) Means for deriving a local oscillator beam from the CW laser;
(4) Acousto-optic angular multiplexer means for passing the output of the pulse laser when the multiplexer is in the off state and for passing and frequency shifting the output of the CW laser when the multiplexer is in the on state to generate a pulse-tone waveform;
(5) Optical means for launching the pulse-tone waveform toward a target and for receiving a return waveform;



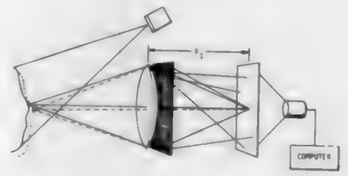
(6) A detector; and
(7) Means for simultaneously directing the return waveform and the local oscillator beam onto the detector to generate a beat signal including both target range and velocity information.

4,690,552

OPTICAL METHOD AND APPARATUS FOR STRAIN ANALYSIS

Ralph M. Grant; Richard E. Haskell; Anthony Paskus, all of Rochester; Stanley R. Windeler, Bloomfield Hills, and Forrest S. Wright, Rochester, all of Mich., assignors to Industrial Holographics, Inc., Auburn Heights, Mich.

Filed Aug. 19, 1985, Ser. No. 766,927
Int. Cl.[4] G01B *9/02, 11/16*
U.S. Cl. 356—35.5 **7 Claims**



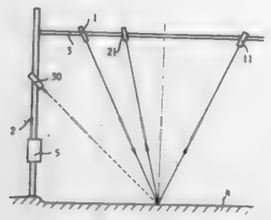
1. In an apparatus for detecting strains in an object resulting from the application of deformation forces, including means for illuminating the object with coherent light, a focussing/shearing optical element operative to receive the coherent light reflected by the object and to generate a plurality of interferring focussed images of the object each shifted laterally with respect to the others, means for recording a first interferogram resulting from the interference of the plurality of focussed images, means for imposing a deforming force to the object, and means for recording a second interferogram resulting from the interference of the plurality of focussed images of the object which result after imposing the deforming force, the improvement wherein the focussing/shearing optical element comprises a focussing optical element and a phase diffraction grating having lines arranged in a plurality of directions including a first plurality of lines extending radially from a common point and a second plurality of lines oriented in radial directions from the common point whose distance from the common point exceed a predetermined distance supported relative to the focussing optical element so that the coherent light reflected by the object passes through both the focussing optical element and the diffraction grating, whereby the interferograms can be analyzed to detect strain in any of the plurality of directions perpendicular to the diffraction grating lines.

4,690,553

ROAD SURFACE CONDITION DETECTION SYSTEM

Hiroshi Fukamizu, Takatsuki; Masaji Nakano, Otokuni; Kunio Iba, Kobe; Taro Yamasaki, Shikama, and Kenji Sano, Kakogawa, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 12, 1980, Ser. No. 158,901
Claims priority, application Japan, Jun. 29, 1979, 54-83112
Int. Cl.[4] G01N *21/47, 21/55;* **G08B** *19/02*
U.S. Cl. 356—51 **11 Claims**



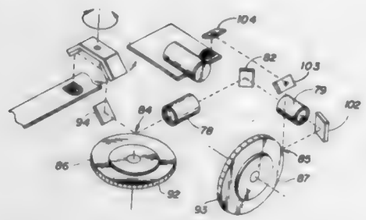
1. Road surface condition detection system comprising:
light projecting means for projecting light including infrared light to a road surface to sense the condition thereof;
said infrared light having a wavelength or wavelengths at which the reflectance of snow is smaller than that of asid road surface in a dry condition,
light receiving means for receiving light reflected from said road surface and for generating output signals representing the luminous energy of said reflected light;
comparison means for comparing said output signals with predetermined reference signals levels corresponding to classified road surface conditions so as to generate comparison output signals representing results of comparison; and
judging means for judging said road surface to be one of said classified road surface conditions in accordance with said comparison output signals.

4,690,554

FINGERPRINT IDENTIFICATION DEVICE

Ronald W. Froelich, 2405 N. Cameron Ave., Covina, Calif. 91724

Filed Dec. 1, 1986, Ser. No. 936,169
Int. Cl.[4] G06K *9/20, 9/74;* **G02B** *26/10*
U.S. Cl. 356—71 **10 Claims**



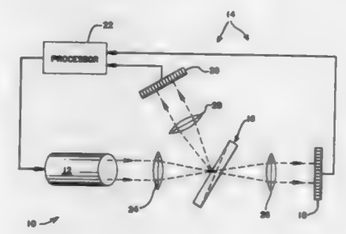
1. A fingerprint identification device for rapid automatic comparison of a latent fingerprint with a known fingerprint, comprising:
a light source illuminating said latent print;
optical projection means interposed between said fingerprints projecting the image of said latent fingerprint in an optical path and superimposing said image on said known fingerprint, said optical projection means including:
a pair of independent coaxial image forming lenses symmetrically disposed with respect to a common intermediate image plane, each of said lenses having an aperture stop location associated therewith,
optical deflection means positioned at each of said aperture stop locations causing said image to traverse said known fingerprint in a repeating pattern, and
optical rotation means effectively rotating said image in said optical path;
sensing means positioned adjacent said known fingerprint, said sensing means being responsive to the radiance produced by the interaction of said image with said known fingerprint and emitting an electrical signal representative of said radiance;
signal processing means connected with said sensing means comparing said signal with a preestablished correlation signal threshold; and
indicator means responsive to said signal processing means and actuated thereby when said signal exceeds said threshold to indicate the matching of said fingerprints.

4,690,555

SOLID-STATE WAVEFRONT SLOPE DETERMINATION

Brent L. Ellerbroek, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1985, Ser. No. 793,941
Int. Cl.[4] G01J *1/00*
U.S. Cl. 356—121 **11 Claims**



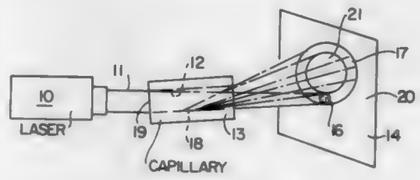
1. A wavefront slope sensor comprising:
means for obtaining a laser beam sample;
means for splitting the sample into two components according to a spatially varying transmittance function which is continuous and monotonic;
means for measuring the intensity distributions of said components; and
a processor for calculating the wavefront slope from said intensity distributions.

4,690,556

CAPILLARY BORE STRAIGHTNESS INSPECTION

Ray A. Walker, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jul. 30, 1985, Ser. No. 760,381
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—152 **27 Claims**



1. A method for checking straightness of an elongated gener-

ally cylindrical bore having a substantially smooth surface, comprising,

directing a substantially collimated light beam having a longitudinal axis through the bore,

skewing the bore slightly by a preselected angle with respect to the beam, so that a wall of the bore reflects some of the beam light, forming generally an off-axis ring of reflected light as well as an on-axis spot of non-reflected light beyond the end of the bore, and

determining scatter of reflected light in directions other than toward of reflected light, indicating non-straightness of the reflecting bore wall.

4,690,557

ARRANGEMENT FOR MEASURING WHEEL ALIGNMENT AND STEERING GEOMETRY IN AN AUTOMOBILE

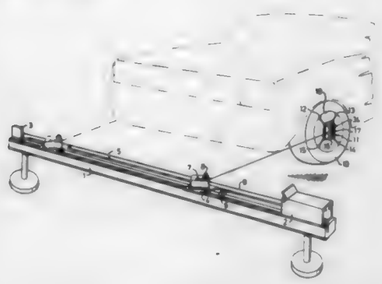
Klas R. Wiklund, Täby, Sweden, assignor to Nicator AB, Sweden

Filed Jun. 7, 1985, Ser. No. 742,703

Claims priority, application Sweden, Jun. 28, 1984, 8403456

Int. Cl.[4] G01B *11/275*

U.S. Cl. 356—155 **15 Claims**



1. An arrangement for measuring wheel alignment and steering geometry in an automobile of the type having a longitudinal axis and opposing first and second front wheels, wherein each wheel is mounted on a rim, including:

a subtantially horizontal bar placeable in front of the vehicle and essentially at right angles to its longitudinal axis,

at least one light emitting means placed on and displaceable along said bar, for emitting a narrow ray of light at a predetermined angle to said bar,

a measuring unit attachable to the rim,

said measuring unit having means for forming an optical path, means in said optical path for receiving and focusing said light ray at a focal plane, at least three angle sensor means in each measuring unit for detecting angular deviations in three diverging directions, all three directions lying in different planes from each other, each angle sensor means having means for delivering an output signal,

at least one of said angle sensor means comprising a widely dimensioned light detecting means placed in said focal plane for detecting said light ray focused at a point in said plane,

means for detecting the location of said point of said focused ray on said light detecting means and

calculating means, means for providing the output signal of said angle sensor means to said calculating means, said calculating means including means for calculating wheel alignment values in response to said output signals from said angle sensors obtained at different rotational positions of the wheel.

4,690,558

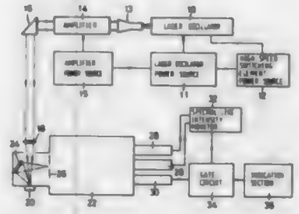
METHOD OF LASER EMISSION SPECTROSCOPICAL ANALYSIS AND APPARATUS THEREFOR

Kouzou Tanoyama, Chiba; Yoshiharu Ohashi, Setagaya; Yasuko Furunushi, and Motoyuki Konishi, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Dec. 18, 1984, Ser. No. 682,835

Int. Cl.[4] G01N *21/63*

U.S. Cl. 356—318 **6 Claims**



1. A method of laser emission spectroscopial analysis, wherein the light emitted from the surface of a sample when a pulsed laser beam irradiates the surface of the sample is spectroscopically analyzed, characterized in that said method includes the steps of:

(1) fixing the emission mode of the laser beam to a guass distribution type TEM_{00} mode; and

(2) measuring the spectral line intensity of a sample element only when the intensity ratio between a pair of preset spectral lines in the light emitted from the sample is within a preset range.

4,690,559

OPTICAL SYSTEM FOR SPECTRAL ANALYSIS DEVICES

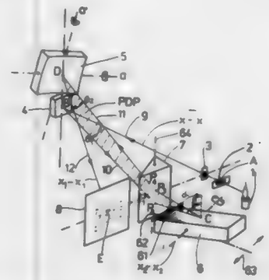
Stefan Florek; Helmut Becker-Ross, both of Berlin; Hans-Jürgen Dobschal, Jena, and Joachim Mohr, both of Jena, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Jan. 14, 1985, Ser. No. 744,861

Claims priority, application German Democratic Rep., Jul. 2, 1984, 2647890; Aug. 20, 1984, 2664168

Int. Cl.[4] G01J *3/18*

U.S. Cl. 356—328 **16 Claims**



1. An optical system for spectral analysis devices comprising

a dispersion member having a surface provided with a dispersing structure and a dispersion plane at right angles to said surface and to a principal direction of said dispersing structure, a concave collimating reflector having a first vertex and a first radius of curvature R,

a concave camera reflector having a second vertex and a second radius of curvature R,

said collimating reflector and said camera reflector being adjacently arranged remote and at the same distance from said dispersion member,

said first and said second vertex being located in said dispersion plane,

said first radius of curvature R and said second radius of curvature R being equal,

an excitation light source for emitting a light beam along a first optical axis,

said light source being arranged in the vicinity of said dispersion member on one side of said dispersion plane,

said first optical axis connecting said light source and said first vertex,

said collimating reflector being for producing a reflected beam from said light beam and directing the same to said dispersion member,

said reflected beam and said light beam including a first angle θ and defining a first reflection plane,

an aperture being arranged about said first optical axis adjacent said light source,

said aperture comprising a horizontal slit and a vertical slit,

said horizontal slit having a first distance r_2 to said collimating reflector,

said vertical slit having a second distance r_1 to said collimating reflector,

a focal plane on the side of said dispersion plane opposite said first side in the vicinity of said dispersion member,

said focal plane having a center,

said center and said aperture being substantially equidistantly positioned to said dispersion plane,

a second optical axis connecting said center of said focal plane and said second vertex,

said dispersion member being for producing a dispersed beam from said reflected beam and directing the dispersed beam to said camera reflector,

said second optical axis and said dispersed beam including a second angle θ and defining a second reflection plane,

said first and said second angle θ being equal,

said first and said second reflection plane being substantially at right angles to said dispersion plane,

said reflected beam, when impinging upon said dispersion member, producing a point of impingement,

said reflected beam and a perpendicular line erected on said surface of said dispersion member at said point of impingement including an angle α,

said dispersed beam and said perpendicular line including an angle β.

4,690,560

OPTICALLY BASED MEASUREMENT OF FLUID PARAMETERS

Clive K. Coogan, Canterbury, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU84/00122, § 371 Date Feb. 28, 1985, § 102(e) Date Feb. 28, 1985, PCT Pub. No. WO85/00426, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 29, 1984, Ser. No. 717,264

Claims priority, application Australia, Jun. 30, 1983, PG0051/83

Int. Cl.[4] G01N *21/49*

U.S. Cl. 356—338 **8 Claims**

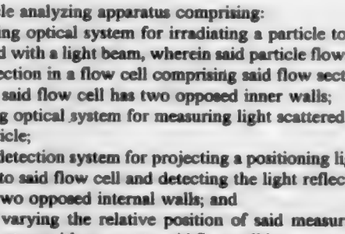
1. Optical measurement apparatus comprising:

an elongate tubular sample cell (12) adapted to receive fluid for testing;

a light source (16) arranged to direct an incident light beam into the cell; and

hollow light integration means (14', 26') about said cell to detect at least a pre-determined portion of light emitted by the cell transversely of the direction of said incident light beam, said cell being transparent to such emitted light;

wherein the light source and the cell are arranged so that said incident light beam is not collimated but, as it traverses said cell, is confined to the cell by total internal reflection, unless otherwise scattered by particles in the cell;



and wherein said tubular sample cell is coiled within said light integration means so as to substantially increase the path length of the incident light beam within the light integration means.

4,690,561

PARTICLE ANALYZING APPARATUS

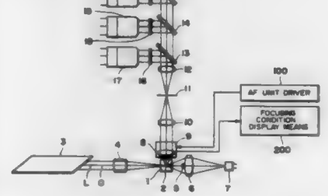
Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1986, Ser. No. 818,263

Claims priority, application Japan, Jan. 18, 1985, 60-007038; Jan. 18, 1985, 60-007039; Jan. 18, 1985, 60-007040; Jan. 19, 1985, 60-008101

Int. Cl.[4] G01N *21/00;* **G01B** *11/00*

U.S. Cl. 356—339 **20 Claims**



1. A particle analyzing apparatus comprising:

an irradiating optical system for irradiating a particle to be examined with a light beam, wherein said particle flows in a flow section in a flow cell comprising said flow section wherein said flow cell has two opposed inner walls;

a measuring optical system for measuring light scattered by said particle;

an optical detection system for projecting a positioning light beam onto said flow cell and detecting the light reflected by said two opposed internal walls; and

means for varying the relative position of said measuring optical system with respect to said flow cell in response to the output of said optical detection system.

4,690,562

GAS ANALYSIS APPARATUS AND METHOD

William L. Davies, Stanton St. John; Clive E. W. Hahn, Radley; Roy K. Jackson, Oxford; Thomas A. McGraghan, Fringeford; Eileen Palayiwa, Marston, and Basil R. Sugg, Oxford, all of England, assignors to Penlon Limited, England

Filed Jun. 19, 1985, Ser. No. 746,338

Claims priority, application United Kingdom, Jun. 20, 1984, 8415670

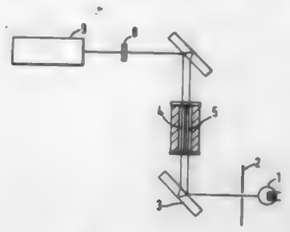
Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—361 **20 Claims**

20. In a gas analyser for analysing the constitution of gases which comprises means for produing an interference pattern,

displacements of said pattern being indicative of changes of the constitution of a gas being analysed, the improvement therein comprising:

an array of photosensitive elements arranged to receive said interference pattern, and means for providing digital indications representative of the intensity of the interference pattern falling on each respective element;



means for providing a stored pattern representing a relatively large portion of said interference pattern, such stored pattern being stored with a resolution which is finer than the resolution of the interference pattern; and

processing means for determing the best fit of said digital indications from said photosensitive elements with said stored pattern whereby to determine the relative position of at least one principal peak of said interference pattern received by said array of photosensitive elements.

4,690,563

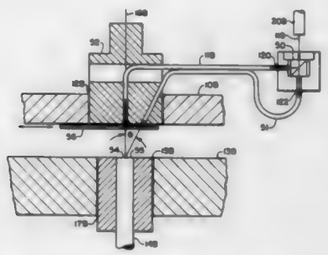
HOLE CENTRATION GAGE

Richard O. Barton, Levittown; Michael T. Bergin, Bayside, and John M. Miller, Huntington Station, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,506

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 **26 Claims**



1. An apparatus for determining the position of a first hole with respect to a second hole along the x, y, and z axes thereof, said apparatus having means at said first hole for providing electromagnetic radiation, and having radiation conducting means comprising:

first means for transmitting the radiation from the radiation providing means along a path that is collinear with a central axis of said first hole,

second means for transmitting said radiation from said radiation providing means along a path that is oriented at a predetermined angle with respect to said central axis of said first hole,

means for alternately blocking selectively said radiation transmitted from said first and second transmitting means,

position sensitive means responsive to said radiation for receiving said radiation transmitted from said radiation transmitting means, said radiation received from said first transmitting means by said receiving means illuminating a first point of a plurality of points to provide a first offset measurement corresponding to the relative position of said first hole with respect to said second hole along the x and the y axes,

said radiation received from said second transmitting means by said receiving means illuminating a second point of said plurality of points to provide a secodn offset measurement corresponding to the relative position of said first hole with respect to said second hole along the z axis.

4,690,564

DEVICE FOR MEASURING INK DENSITY ON PRINTED SURFACES

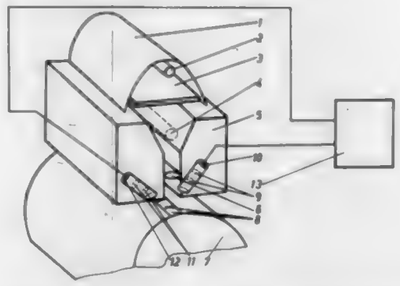
Bernd Morgenstern, Lützschena; Helmut Weigend, and Peter Reinhardt, both of Leipzig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Nov. 5, 1984, Ser. No. 668,074

Claims priority, application German Democratic Rep., Nov. 14, 1983, 256651

Int. Cl.[4] B41F *33/00*; G01N *21/47*

U.S. Cl. 356—445 **3 Claims**



1. A device for measuring ink density on a measured surface of a printed material in a running printing machine, comprising an elliptic reflector having two focal points, one of said focal points being completely enclosed in said reflector, an actual light source arranged in said one focal point so as to generate an image light source in the other forcal point which is equivalent to the actual light source, means for directing a narrow light beam from said image light source at right angles to the measured surface, light sensors provided above the measured surface to detect remitted light, and evaluating means for converting the signals from the sensors into ink density values.

4,690,565

OPTICAL APPARATUS FOR THE DETECTION OF SCATTERED LIGHT

Kinya Kato, and Hiroyuki Tsuchiya, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,163

Claims priority, application Japan, Mar. 19, 1984, 59-53347

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—446 **9 Claims**

1. Apparatus for the detection of scattered light from a test object, said apparatus comprising:

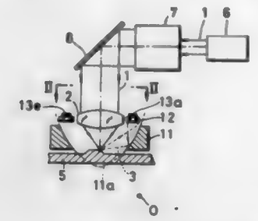
light source means for supplying a beam of light having a predetermined wavelength;

objective lens means having an objective lens and a lens tube mounting the objective lens therein, said objective lens focusing the light beam from the light source means on the test object;

annular light converging means disposed around an end of the objective lens means near the test object for receiving scattered light from the object and for converting the scattered light into a beam of collimated light rays substantially parallel with an optical axis of the objective lens;

an annular filter member disposed around said end of the objective lens means for filtering the collimated light rays from said annular light converging means, said annular filter member being constructed to transmit the collimated light rays of said predetermined wavelength while filtering off light rays of other wavelengths;

photo sensor means mounted on the annular filter member at



an exit side thereof for receiving the collimated light rays transmitted by the annular filter member and for generating electric signals corresponding to the intensity of the received light rays; and

a holder ring member mounted on said lens tube and supporting said annular light converging means and said annular filter member around the periphery of the lens tube.

4,690,566

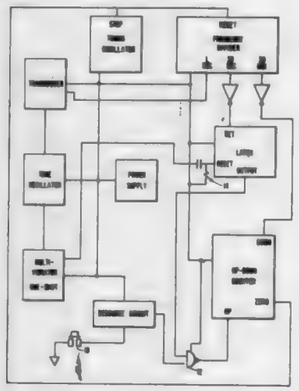
PROGRAMMABLE TIMING DEVICE

Anthony L. Robertson, Anaheim Hills, Calif., assignor to Elite Concepts, Inc., Laguna Niguel, Calif.

Filed Dec. 8, 1986, Ser. No. 939,406

Int. Cl.[4] G04B *23/12*

U.S. Cl. 368—108 **4 Claims**



1. In an improved programable timing device, having a programming circuit, a timing circuit, a signal circuit, and a source of electrical power connected to the electrically functioning elements of said circuits:

(a) said programming circuit including an up-down counter having an input terminal and a zero detector terminal, a programming switch connected to the input terminal of the counter and adapted to program and counter up by introducing pulses thereto, and a NAND gate in said connection between said switch and counter;

(b) said timing circuit including a timing oscillator and a frequency divider, the output of said timing oscillator being connected to the input of said frequency divider, said frequency divider having a plurality of outputs, each output being a different multiple of the frequency of the timing oscillator, one of said frequency divider outputs being connected to said up-down counter and adapted to down count said counter;

(c) said signal circuit having an input connected to said zero detector terminal of said counter and adapted to be activated when said counter counts down to zero from pulses received from said one of said frequency divider outputs;

(d) the improvement comprising a lockout circuit adapted to disable said programming circuit after a selected interval of time, said lockout circuit including a latch having an input and an output, the input to said latch being connected to a second output of said frequency divider representing said selected interval of time, and the output of said latch being connected to said NAND gate in said programming circuit.

4,690,567

ELECTRICAL CONNECTION ARRANGEMENT BETWEEN THE BRACELET AND THE CASE OF AN ELECTRONIC APPLIANCE TO BE WORN ON THE WRIST

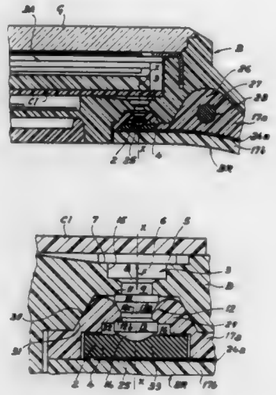
Jean-Philippe Rebeaud, Cressier, Switzerland, assignor to ETS SA Fabriques d'Ebauches, Granges, Switzerland

Filed Nov. 29, 1985, Ser. No. 802,915

Claims priority, application Switzerland, Dec. 10, 1984, 05847/84

Int. Cl.[4] G04B *1/00, 37/00*

U.S. Cl. 368—203 **9 Claims**



1. An electrical connection arrangement between portions of a circuit located respectively in the case and the bracelet of an electronic appliance to be worn on the wrist, said connection arrangement comprising:

at least one electrical path means inserted between portions of a circuit located respectively in a case and a bracelet of an electronic appliance to be worn on the wrist, said path means comprising a set of mating contacts which are separable but maintained applied to one another by a latching effect, said set of contacts exhibiting at least partially a rotation symmetry defining an axis;

means associated with said set of mating contacts for generating an elastic force directed along said axis of said set of mating contacts so as to achieve said latching effect; and

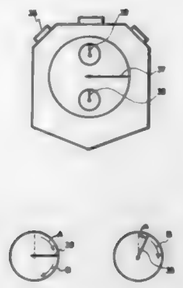
complementary abutment surfaces provided respectively on the bracelet and the case, said complementary abutment surfaces surrounding said mating contacts and being applied against one another also by said latching effect in such a manner as to seal said mating contacts off from the exterior.

4,690,568

BATTERY LIFETIME INDICATOR FOR A STOPWATCH

Hiroshi Odagiri, and Isamu Nishida, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,765
Claims priority, application Japan, Oct. 5, 1984, 59-209359
Int. Cl.[4] G04B *1/00*
U.S. Cl. 368—204 **18 Claims**



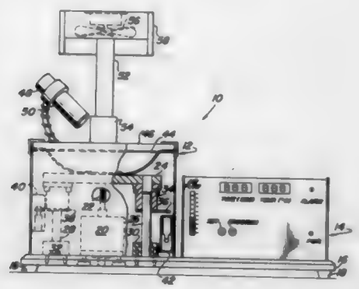
1. In a stopwatch energized by a battery and having a hand rotationally driven in a step-by-step manner by driving pulses, a battery lifetime indicator for indicating the lifetime of the battery comprising: battery lifetime detection circuit means for detecting the output voltage of the battery and generating a detection signal according to the amount of the output voltage; control means having at least one switch manually operative when the stopwatch is not being used to indicate elapsed time for generating an instruction signal to initiate the battery lifetime indicator; and battery lifetime display circuit means initiated by the instruction signal and responsive to the detection signal for generating a predetermined number of driving pulses effective to drive the hand to a predetermined rotational angular position from a rest position.

4,690,569

THERMAL PROFILE SYSTEM

Randall C. Veitch, Allentown, Pa., assignor to Qualtronics Corporation, Palm, Pa.

Filed May 22, 1986, Ser. No. 865,761
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—11 **14 Claims**



1. Apparatus for the implementation of a characterized thermal profile of a temperature/time dependent process upon a preselected material or materials comprising:

a substantially rectangular thermally transparent platform capable of supporting the material or materials to be thermally treated having a preselected locus or target area for the placement of said material or materials;

a source of heat energy;

a means for moving said source of heat energy either closer to or farther away from the material or materials to be thermally treated;

a means for creating a controlled air flow through said platform to provide more gradual temperature increases and decreases to the material or materials to be thermally treated;

a temperature measuring means for detecting increases or decreases in the surface temperature of the material or materials to be thermally treated placed in the target area;

a means for storing a predetermined heating and cooling pattern for the material or materials to be thermally treated; and,

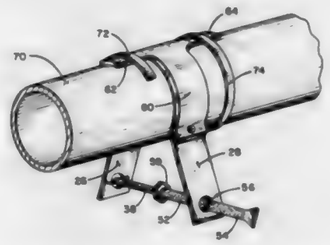
a means for controlling the thermal treatment of the material or materials to be thermally treated in accordance with the predetermined heating and cooling pattern.

4,690,570

C-SHAPED FAILURE DETECTOR FOR STEAM TRAPS

Donald W. Wall, 6850 Washington St. N.E., Minneapolis, Minn. 55432

Filed May 19, 1986, Ser. No. 864,312
Int. Cl.[4] G01K *05/70*
U.S. Cl. 374—188 **17 Claims**



1. Apparatus for indicating a change in temperature at the surface of a monitored structure including:

a thermally sensitive element generally conforming to the surface of a structure and having a normal configuration when at a predetermined temperature, and a means for mounting the element against said surface;

a first arm means integrally extended from one end of said thermally sensitive element, and a second arm means integrally extended from the other end of said thermally sensitive element and positioned for movement relative to the first arm means responsive to thermally induced flexure of said element;

an indexing member mounted to said first arm means for movement with said first arm means and positioned at a select location relative to said second arm means, corresponding to the normal configuration of said element, and movable along with said first arm means, and relative to said second arm means, away from the select location responsive to the thermally induced flexure of said element away from said normal configuration; and

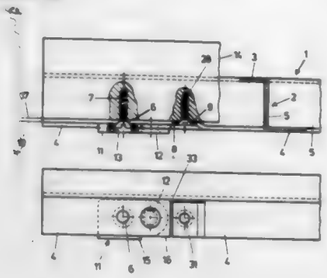
an indexing means on said indexing member and cooperating with said second arm means to indicate a deviation of said indexing member relative to said second arm means from said select location, thereby to indicate a difference in element temperature from said predetermined temperature.

4,690,571

PULLOUT GUIDE ASSEMBLY FOR MOUNTING SLIDING FURNITURE PARTS

Manfred Fulterer, Lustenau, Austria, assignor to Fulterer Gesellschaft m.b.H.

Filed May 22, 1986, Ser. No. 866,327
Claims priority, application Austria, Jun. 17, 1985, 1787/85
Int. Cl.[4] F16C *29/12*; A47B *88/00*
U.S. Cl. 384—22 **6 Claims**



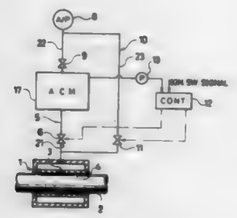
1. A pullout guide assembly for mounting a sliding furniture part such as a drawer or shelf on furniture comprising: a first rail section serving as a guide rail attached at a side wall of said furniture; at least one second rail section serving as a sliding rail attached to said sliding furniture part, said second rail section having one of an L- or Z-shaped cross-sectional configuration including a lower horizontal leg having said sliding furniture part attached thereto; means provided between said first and second sections to enable sliding movement therebetween; adjustment screw means interposed between said second rail section and said sliding furniture part operable to enable height adjustment of said furniture part with respect to said horizontal leg, said adjustment screw means including an adjustment screw threadedly engaged in said furniture part having a head portion retained in engagement with said horizontal leg to restrain axial mobility of said screw with regard to said horizontal leg while enabling relative rotation therebetween; and a flat upwardly bent bracket provided at said horizontal leg having a bore therethrough for receiving an attachment screw threadedly engaged in said furniture part, said bracket having a support face upon which said furniture part is supported.

4,690,572

STATIC PRESSURE GAS BEARING APPARATUS FOR TURBOCHARGER

Naoto Sasaki, Zushi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1986, Ser. No. 925,220
Claims priority, application Japan, Nov. 1, 1985, 60-168637[U]
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—120 **5 Claims**



1. A static pressure gas bearing apparatus equipped with a static pressure bearing that can support in floated state the rotating shaft of the turbocharger to be placed on an internal combustion engine, said apparatus comprising:

air pump means for pressurizing and supplying a gas;

an accumulator for storing the pressurized gas supplied from said air pump means;

pressurized gas supply passage means for connecting said accumulator to the static pressure gas bearing;

bypass passage means for connecting said air pump to the static pressure gas bearing by bypassing said accumulator; and

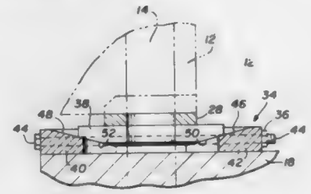
control means for controlling the opening and the closing of said bypass passage means in response to the internal pressure of said accumulator.

4,690,573

ADJUSTER FOR THRUST WASHER WEAR

Joseph L. Huffman, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 7, 1986, Ser. No. 928,214
Int. Cl.[4] F16C *25/02*
U.S. Cl. 384—251 **4 Claims**



1. A take up adjuster for a swivel mounted on a structure for swiveling about a pin comprising:

a. an adjusting body positioned about said pin between said swivel and said structure, said adjusting body comprising;

i. a first pair of wedge plates having sloping surfaces and positioned on diametrically opposed sides of said pin,

ii. a second wedge positioned about said pin and having sloping surfaces complimentary to and in sliding engagement with said sloping surface of said first pair of wedge plates,

b. means for containing said second wedge in sliding engagement with said first of pair wedge plates, and

c. means for moving said first pair of wedge plates toward each other so as to raise said second wedge and eliminate unnecessary space between said swivel and said structure as wear occurs from use.

4,690,574

BEARING AND METHOD FOR ROTATABLY SUPPORTING A WORN SHAFT

Bernard Green, South Euclid, Ohio, assignor to The Green Ball Bearing Company, Cleveland, Ohio

Filed Nov. 17, 1986, Ser. No. 931,614
Int. Cl.[4] F16C *25/06*
U.S. Cl. 384—569 **8 Claims**

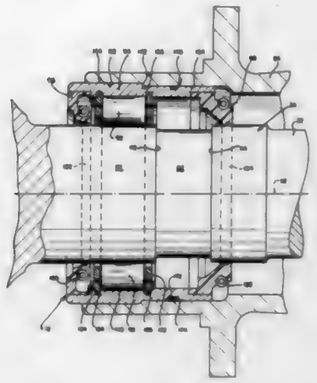
1. An apparatus for use in rotatably supporting a shaft having an annular worn portion and unworn portions disposed adjacent to axially opposite ends of the worn portion, said apparatus comprising:

bearing means for engaging the unworn portion of the shaft at a location adjacent to a first axial end of the worn portion of the shaft;

sleeve means for enclosing said bearing means and the worn portion of the shaft;

first seal means connected with a first end portion of said sleeve means for engaging an unworn portion of the shaft adjacent to said bearing means and at a location spaced from the worn portion of the shaft by an axial distance

which is at least as great as the axial extent of engagement of said bearing means with the unworn portion of the shaft; and



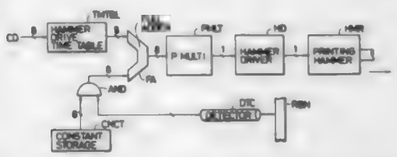
second seal means connected with a second end portion of said sleeve means for engaging an unworn portion of the shaft adjacent to a second axial end of the worn portion of the shaft.

4,690,575

DEVICE FOR CONTROLLING PRINTING PRESSURE ACCORDING TO THE KIND OF INK RIBBON BEING USED

Hiroyuki Ueda, Kawasaki, and Yoshihiro Kobata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 693,236, Jan. 22, 1985, abandoned, Continuation of Ser. No. 462,186, Jan. 31, 1983, abandoned. This application Oct. 10, 1986, Ser. No. 917,312
Claims priority, application Japan, Feb. 17, 1982, 57-25093
Int. Cl.[4] B41J *9/38*
U.S. Cl. 400—166 **5 Claims**



1. A printing device capable of printing with two types of ink ribbon, one of which is usable a plurality of times and the other of which is usable only once, said device comprising:

print pressure information generating means responsive to a code representing a character to be printed for generating print pressure information that varies depending on the character;

means for identifying the type of ink ribbon to be used for printing to determine whether the ink ribbon is usable a plurality of times or usable once;

means for performing an arithemtic operation on said print pressure information, in accordance with the identification of the type of ink ribbon to be used for printing, to produce an arithmetic operation result; and

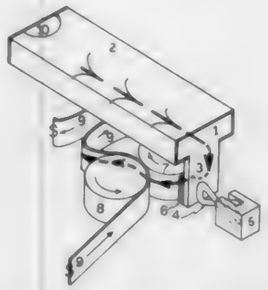
print pressure providing means for providing a print pressure for printing the character in accordance with the arithmetic operation result.

4,690,576

AUTOMATIC RIBBON RE-INKER

John S. Cory, 1436 View Pointe Ave., Escondido, Calif. 92027

Filed Jan. 13, 1986, Ser. No. 818,474
Int. Cl.[4] B41J *31/14, 32/00*
U.S. Cl. 400—200 **6 Claims**



1. An automatic ribbon re-inker improvement to a pre-existing inked-ribbon transport means for impact printers, comprising

an inked ribbon,

a ribbon transport means using pinch rollers, with at least one of said rollers constructed to essentially block diffusive ink flow,

a pinch roller driver means, and

a support means for its elements;

the improvement comprising

an ink reservoir to store and dispense ink, constructed from an ink absorptive material, with a volume greater than eight times (a) the average initial ink usage rate preferred for the printer, times (b) the operational lifetime of the unmodified ribbon transport mechanism, divided by (c) the saturation concentration of the reservoir material, and,

with a cross sectional area greater than the (a) reservoir length times (b) the average initial ink usage rate preferred for the printer divided by (c) the saturation concentration of the reservoir material divided by (d) the diffusivity of the reservoir material,

a feeder tab to conduct ink by diffusion, extending from one end of the said reservoir to the ribbon drive surface of said diffusion blocking pinch roller of the inked-ribbon transport mechanism,

a pressing force device forcing the said feeder tab against the inked-ribbon drive surface of the said ink diffusion blocking pinch roller,

a restrainer device supporting one end of said pressing force device, to conduct both pressing and sideways forces from said pressing force device to the said support means for the elements of the said inked-ribbon transport mechanism.

4,690,577

PRINTING MEDIUM DETECTING MECHANISM OF PRINTER

Hiroshi Kikuchi; Shyoichi Watanabe, and Yukio Ohta, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,696
Claims priority, application Japan, Oct. 25, 1984, 59-222990
Int. Cl.[4] B41J *29/46*
U.S. Cl. 400—708 **10 Claims**

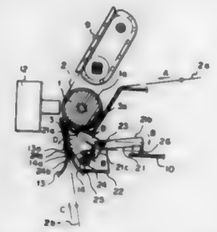
1. A printing device, comprising:

a platen having a bottom side, a print head facing side spaced from said bottom side, for facing a print head, and a detecting groove at its circumferential periphery outside a printing region of said platen;

first printing medium guiding means for guiding a printing medium along a first path extending along the bottom side of said platen to a position between said print head facing side and the print head, said first printing medium guiding means including a paper chuted beneath said bottom side defining a portion of said first path between said paper chute and said bottom side;

second printing medium guiding means for guiding a printing medium along a second path extending from beneath said printing device to said position between said print head facing side and the print head without passing along said portion of said first path, said second printing medium guiding means including a pair of paper guides defining therebetween a portion of said second path below said position between said print head facing side and the print head and spaced from said first path;

a first printing medium detecting lever having an end pivotable through a first slit in said paper chute between a first position in said detecting groove in said platen along said



portion of said first path in response to the absence of a printing medium in said portion of said first path, and a second position spaced from said detecting groove in response to presence of the printing medium in said portion of said first path, said first lever being biased toward said first position;

a second printing medium detecting lever having an end pivotable through a second slit in said pair of paper guides between a third position in said portion of said second path in response to the absence of a printing medium in said portion of said second path, and a fourth position outward of said third position in response to the presence of the printing medium along said portion of said second path, said second lever being biased toward said third position, said first and second levers having means for pivoting said end of said first lever from said first postion to said second position when said second lever is pivoted from said third position to said fourth position; and

sensor means for sensing when said end of said first lever is in said second position, thereby to sense when a printing medium is in one of said first and second paths.

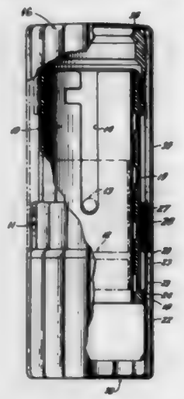
4,690,578

COSMETIC CONTAINER CONSTRUCTION

Eric J. Idec, Madison, and Thomas F. Holloway, Southbury, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Filed Sep. 8, 1986, Ser. No. 904,646
Int. Cl.[4] A45D *40/06, 40/00*
U.S. Cl. 401—78 **5 Claims**

1. In a swivel lipstick or the like container having an open end for the dispensing of cosmetic substance, wherein a central carrier member of the container has a cam follower engaged to propulsion cams of inner and outer tubular members which are relatively rotatable to develop propel/repel displacement of the carrier member with respect to the open end of the container, and wherein a closure cap is removably applicable over the open end and in longitudinal overlap of the propulsion-cam region of the container with friction engagement to one of said tubular members, the improvement wherein the inner tubular member is of metal and is characterized by a radially outward shoulder formation between an elongate upper propulsion-cam portion of lesser diameter and a circumferentially continuous cylindrical base portion of greater diameter, wherein the outer tubular member includes a sleeve of molded plastic with an elongate cam-characterized bore in running clearance with the upper portion of said inner tubular member, and wherein the outer tubular member integrally includes a circumferentially continuous radially outward flange in axial engagement with said shoulder formation and of diameter less than said greater diameter, a circumferentially continuous tubular metal adapter



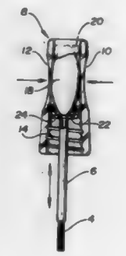
member with a lower cylindrical portion having an outer diameter equal to said greater diameter, said adapter member including at its lower end a radially inward flange in axially abutting relation with the upper surface of said outer tubular member, and a base cup member having a bore of greater axial extent than the base of said inner tubular member and in permanent metal-to-metal force-fitted assembly to both said greater-diameter cylindrical surfaces, namely to the base of said inner tubular member and to at least the lower end of said adapter member, said force-fitted assembly being characterized by axial engagement of said adapter flange and of said shoulder to the respective upper and lower surfaces of said plastic sleeve flange.

4,690,579

BRUSH EXTENSION DEVICE

Drew E. Tuckman, 25-15 Fair Lawn Ave., Fair Lawn, N.J. 07410

Filed Sep. 3, 1985, Ser. No. 772,012
Int. Cl.[4] A45D *34/00*; A46B *11/00*
U.S. Cl. 401—127 **11 Claims**



1. In a cap having a shaft and liquid pick-up means attached thereto, the improvement which comprises means for extending the length of said liquid pick-up means by moving the shaft

relative to said cap, said improvement including sealed gas filled flexible means mounted within said cap and coupled to said shaft, said flexible means on compression thereof, causing said shaft to move relative to said cap.

4,690,580

RING BINDER MECHANISM WITH MATING RINGS

Karl-Heinz Kissel, Espelkamp, Fed. Rep. of Germany, assignor to Robert Krause GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,530
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1984, 3433124
Int. Cl.[4] B42F *13/20, 13/22, 13/30*
U.S. Cl. 402—39 **4 Claims**



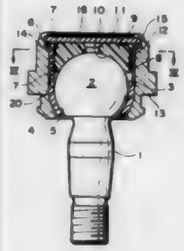
1. In a ring binder mechanism of the type in which two ring sections are resiliently supported in pairs to form rings, the combination comprising pairs of ring sections having a non-round cross section, each ring section of a pair having free end portions, each of said free end portions having a terminating end face, one of said free end portions of a pair comprising a first and a second external frusto-conical portion and a cylindrical portion disposed between said first and second frusto-conical portions, said first external frusto-conical portion having its larger diameter end joined to the respective non-round ring section and its small diameter end jointed to one longitudinal end of said cylindrical portion, said smaller diameter end of said first external frusto-conical portion being equal to the diameter of said cylindrical portion and being coincident with one longitudinal end of said cylindrical portion, said second external frusto-conical portion having its smaller diameter end coincident with the terminating end face of said one free end portion and the larger diameter end equal to the diameter of said cylinder portion and coincident with the other longitudinal end of said cylindrical portion, the other of said free end portions of a pair having a cylindrical bore and an internal frusto-conical portion opening up onto said terminating end face of said other free end portion, said internal frusto-conical portion having its smaller diameter and equal to the diameter of said cylindrical bore and coincident with one longitudinal end of said cylindrical bore, said cylindrical bore having a diameter greater than the diameter of said cylindrical portion, said first external frusto-conical portion and said internal frusto-conical portion each having a cone angle of about forty-five degrees, said cylindrical portion being insertable into said cylindrical bore to a depth at which said first external frusto-conical portion mates with said internal frustoconical portion to thereby provide a frusto-conical seating surface, said second external frusto-conical portion and said internal frustoconical portion facilitating insertion of said one free end portion into said other free end portion, said frusto-conical seating surface preventing initial transverse displacement between said one and said other free end portions and the engaging of said cylindrical portions with said cylindrical bore preventing further transverse displacement between said one and said other free end portions.

4,690,581

BALL JOINT

Yonetsugu Umemoto; Hiroshi Shirasawa, both of Toyota; Mueyu Ogo, Nishio; Kazumasa Kinoshita, Nishio, and Tetsuo Kondo, Nishio, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Odai Tekko Kabushiki Kaisha, both of Aichi, Japan

Filed May 10, 1985, Ser. No. 732,623
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—133 **3 Claims**



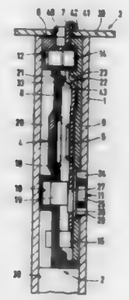
1. A ball joint comprising;
a socket having an inner surface;
a ball mounted in the socket;
a stud extending from the ball;
a synthetic resin ball seat positioned in the socket for supporting the ball for rotation about its center;
said socket having an opening at the side opposite to the stud;
a cap for urging the ball seat against the ball and closing the opening of the socket at the side opposite to the stud;
the ball seat including a first, substantially hard ball seat member having an inner spherical surface and covering a portion of the ball adjacent to the stud and having a cylindrical wall extending axially along the inner surface of the socket to the proximity of the socket opening, said cylindrical wall having an inner surface, and a second, substantially soft ball seat member having an inner spherical surface and an outer surface retained within the cylindrical wall and covering a portion of the ball at the side opposite to the stud, said second ball seat member being compressed by said cap thereby causing radial expansion of said second ball seat member;
the first ball seat member having at the inner surface of the cylindrical wall a plurality of linear projections extending axially and terminating in ends substantially defining a cylinder having a diameter, and having an axial length longer than that of the second ball seat member, said linear projections penetrating the outer surface of the second ball seat member, said second ball seat member having in an uncompressed state a first outer diameter approximately equal to or slightly smaller than the diameter of the cylinder defined by the ends of the linear projections, and a second outer diameter larger than the diameter of said cylinder but smaller than the inner surface of the cylindrical wall of the first ball seat member when said second ball seat member is compressed axially by the cap, whereby said linear projections penetrate into the outer surface of said second ball seat member.

4,690,582

CONNECTING ELEMENT FOR STRUCTURAL FRAMEWORK

Helmut Maier, Schoenbüch, Switzerland; Bruno Neumann, Eupen, Belgium, and Ludwig R. Schaafhausen, Frankfurt am Main, Fed. Rep. of Germany, assignors to Exfbelco GmbH, Basel, Switzerland

Filed Oct. 15, 1985, Ser. No. 787,425
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437805
Int. Cl.[4] B25G *3/00*; F16B *9/00*
U.S. Cl. 403—252 **28 Claims**



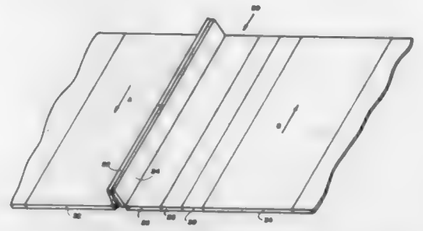
1. A connecting element for detachably joining an elongate first sectional bar to an elongate second sectional bar, the first sectional bar having a longitudinal recess extending inwardly from one end face thereof and a transversely extending bore communicating with said recess substantially at an inner end thereof, the second sectional bar being provided with a longitudinally extending slot and at least one undercut longitudinal flange along one side of said slot, said connecting element comprising:
an elongate housing insertable into the recess at the one end face of the first sectional bar, said housing including two housing portions;
an elongate mounting element slidably disposed in said housing, said mounting element having an aperture at one end, a hook at an opposite end and a bent segment between said aperture and said hook, said hook protruding from said housing and being engageable with a rearwardly facing surface of the flange of the second sectional bar;
actuating means in said housing and engageable with said mounting element for shifting same in a longitudinal direction in said housing and for moving said hook in a transverse direction during a portion of a longitudinal stroke of said mounting element, said actuating means including a manipulable eccentric pin transversely and rotatably mounted in said housing and traversing said aperture and at least a portion of said bore, said actuating means further including an incline in said housing engageable by said bent segment of said mounting element during a longitudinal stroke thereof caused by rotation of said eccentric pin; and
means for inducing said mounting element to execute solely longitudinal motion during a terminal portion of an inwardly directed locking stroke bringing said hook into engagement with said rearwardly facing surface of said flange, said means for inducing including a compression spring in said housing, said spring engaging said mounting element on a side thereof opposite said incline and said hook.

4,690,583

FLAT FOLDING ALTERNATING BARRIER

Harry A. Faulconer, 10405 Sierra Vista, La Mesa, Calif. 92041

Filed Apr. 8, 1986, Ser. No. 849,539
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **31 Claims**



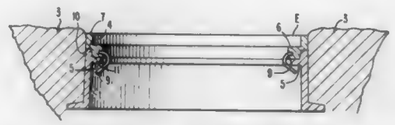
1. A barrier for dividing a roadway having a plurality of traffic lanes, comprising:
a plurality of slab-like roadway segments having adjacent sides thereof hingedly joined together; and
means for elevating at least two adjacent slab-like segments to form a dividing barrier for separating said traffic lanes in the general form of an inverted "V".

4,690,584

APPARATUS FOR SECURING ADJUSTABLE SUPPORT STRUCTURES FOR MANHOLE COVERS, GRATES AND THE LIKE

Francis LeBaron, East Bridgewater, Mass., assignor to E. L. LeBaron Foundry Co., Brockton, Mass.

Filed Apr. 17, 1985, Ser. No. 724,082
Int. Cl.[4] E02D *29/14*
U.S. Cl. 404—26 **4 Claims**



1. Apparatus for providing adjustable leveling of manhole covers, grates, and the like within ground and similar structures, having, in combination, an annular base ring provided with an internal ring seat and adapted to be secured within the ground or similar structure; an annular extension ring for supporting a cover, grate and the like at its upper edge and provided with a depending lower edge for engaging the said ring seat within the base ring; and the extension ring being provided with deformable bar means disposed inwardly of the extension ring near its said lower edge, said bar means extending lengthwise thereof substantially radially inwardly from an inner peripheral surface of the extension ring and being disposed such that said bar means may be bent over the ring seat of the said base ring securely to clinch the extension ring to the base ring.

4,690,585

EROSION CONTROL FOUNDATION MAT AND METHOD

Dick L. Holmberg, P.O. Box 100, Whitehall, Mich. 49461

Filed Jan. 17, 1985, Ser. No. 692,211
Int. Cl.[4] E02B *3/04, 3/12*
U.S. Cl. 405—19 **50 Claims**

1. A method of restoring coastal shoreline of a water body having a surface, a bottom with granular material on said

bottom, and having erosion zones in which currents exceed an erosion velocity, comprising:

providing a generally flat water permeable geotextile sheet having peripheral edges;

forming peripheral pockets extending around said peripheral edges of said sheet and forming a plurality of spaced openings along said pockets such that said sheet is provided with a substantially flat central region intermediate said peripheral pockets;

positioning said sheet at said shoreline so as to extend into said water body such that at least a portion of said sheet is positioned along said bottom where currents exceed said erosion velocity sufficient to entrain granular material on said bottom;



filling said peripheral pockets with ballast material such that said peripheral pockets assume a downwardly oriented substantially vertical position in the granular material along said bottom;

providing a flexible stabilizer chamber separable from said sheet;

placing said stabilizer chamber on said substantially flat central region of said sheet with said peripheral pockets spaced from said stabilizer chamber and extending around said stabilizer chamber; and

filling said stabilizer chamber with ballast material such that said stabilizer chamber extends upwardly in a low profile from said sheet into said currents, but at least a portion of said stabilizer chamber is disposed beneath said surface sufficient to permit water currents to pass over said stabilizer chamber.

4,690,586

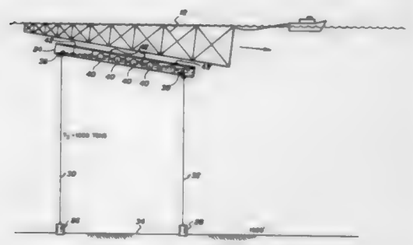
METHOD AND APPARATUS FOR POSITIONING AN OFFSHORE PLATFORM JACKET

Yalcin Oksuzler, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1985, Ser. No. 814,958

Int. Cl.⁴ E02D *25/00*

U.S. Cl. 405—209 **2 Claims**



1. A method of positioning an offshore platform jacket comprising the steps of:

loading and securing the platform jacket onto a tension leg barge;

towing said tension leg barge to a predetermined offshore location;

laying anchors on the floor of the ocean at said predetermined offshore location;

attaching lines between said anchors and said tension leg barge to position and maintain said barge above said predetermined offshore location;

partially submerging said tension leg barge by shortening said lines between said anchors and said tension leg barge;

completing the submerging of said tension leg barge by flooding said barge with seawater; and

releasing said platform jacket from said tension leg barge and towing said jacket off said barge while said barge is submerged.

4,690,587

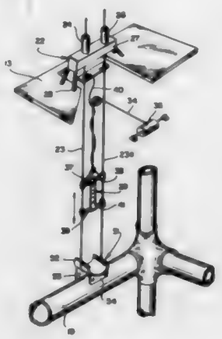
CORROSION DETECTION FOR MARINE STRUCTURE

Karl H. Petter, Metairie, and Gregory K. Robbins, Mandeville, both of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 21, 1985, Ser. No. 789,545

Int. Cl.⁴ C23F *13/00*

U.S. Cl. 405—211 **9 Claims**



1. In a corrosion monitoring system for an offshore structure having a deck, an underwater deck supporting jacket formed of members which are subject to corrosion, said system including guide cable means (**23**–**23***a*) which extend longitudinally of the jacket,

a carriage (**29**) detachably engaging said guide cable means and adapted to be slidably positioned along the latter,

signal generating corrosion sensing cell means (**32**) carried on said carriage (**29**) for communication with signal receiving means on said deck,

control means (**34**) engaging said carriage (**29**) for operably regulating the longitudinal position thereof along said guide cable means (**23**–**23***a*),

said carriage (**29**) fabricated of a material capable of enclosing the corrosion sensing cell means (**32**) without interfering with the generation of signals by said cell means which reflect the corrosive condition of said jacket members, and comprising

an elongated body (**31**),

a plurality of lateral arms (**37** and **38**) extending outwardly from said elongated body (**31**) and including a contact shoe (**42**) at the remote end of said respective arms to removably engage said guide cable means (**23**, **23***a*), and

said shoe (**42**) having a wall including a slotted opening (**46**) formed therein, said opening being of sufficient width to register said guide cable means (**23**) therethrough.

4,690,588

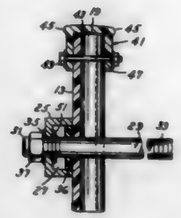
SEAWALL

Lawrence E. Berger, Sterling Heights, Mich., assignor to C-Lock Retention Systems, Inc., Utica, Mich.

Continuation of Ser. No. 607,313, May 4, 1984. This application Jun. 5, 1986, Ser. No. 873,443

Int. Cl.⁴ E02D *29/02*

U.S. Cl. 405—262 **29 Claims**



1. In a seawall along a body of water, extending along and retainingly and protectively bearing against a bounding shore with the seawall at its top extending above the ground level and at its bottom, retainingly projected down into the ground below the water bottom, the seawall comprising a series of laterally aligned enlongated corrugated bulkhead strips;

each bulkhead strip having along one side an undercut groove edge and along its other side, a similarly shaped tongue edge;

with the groove edges and tongue edges of adjacent bulkhead strips snugly interlocked;

the strips being made from a plastic material such that each strip may be lifted and assembled manually relative to an adjacent strip and driven into the ground into lateral alignment and longitudinal interlock with an adjacent strip;

a plurality of laterally spaced upright anchor strips inclined upwardly and away from said assembled bulkhead strips and embedded into the ground;

a series of flexible whalers spanning laterally across the face of said bulkhead strips adjacent said body of water, each of said whalers abutting an adjacent whaler in longitudinal alignment; and

a plurality of laterally spaced tie means protruding through said whalers interconnecting said bulkhead strips and said anchor strips, said whalers transferring and distributing the forces applied to said seawall along the surface of said bulkhead strips.

4,690,589

METHOD FOR FORMING A WATER-IMPERMEABLE LAYER IN A SOIL

Yutaka Owa, Chiba, Japan, assignor to Lion Corporation, Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,188

Claims priority, application Japan, Apr. 30, 1985, 60-92528

Int. Cl.⁴ E02D *3/12*

U.S. Cl. 405—263 **2 Claims**

1. In a method for forming a water-impermeable layer in a soil containing 10 meq or less of cations per 100 g of the dry soil by sprinkling an aqueous solution of a water-soluble polymer, which is convertible into a water-insoluble form by reacting with the ions in a soil, over a land so that the aqueous solution infiltrates the soil and the polymer is insolubilized by reacting with the ions in the soil, an improvement which comprises controlling the value of pH of the aqueous solution, in which the concentration of soluble salts does not exceed 0.2% by weight, in the range from 4 to 12 by adding an acid or alkali so that the water-impermeable layer is formed at a controlled depth in the range from 12 to 150 cm from the ground surface.

4,690,590

METHOD AND APPARATUS FOR POSITIONING DIAPHRAGMS IN VERTICAL SLOTTED WALLS WHICH ARE SUPPORTED BY A SUSPENSION

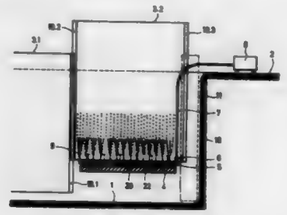
Manfred Nussbaumer, Leonberg; Eberhard Gliser, Aichwald, and Eberhard Beitinger, Stuttgart, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,420

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430792

Int. Cl.⁴ E02D *5/20*

U.S. Cl. 405—267 **22 Claims**



1. An apparatus for positioning diaphragms in vertical slotted walls which are supported by a support suspension having a thixotropic structure, with respective diaphragm sections being lowered substantially centrally into the support suspension of the sealing wall mass; said apparatus comprises:

at least one air distributing device disposed at the bottom edge of said diaphragm section during the positioning process;

a supply line which connects said air distributing device to a source of compressed air to produce an upwardly directed flow of air bubbles for locally limited dissolution of the thixotropic structure of said support suspension and for reduction of specific weight of said support suspension having air bubble flow therethrough as well as for reduction of buoyancy lift force; and

a ballast weight connected to the bottom edge of said diaphragm section, with said air distributing device being connected to said ballast weight.

4,690,591

METHOD AND APPARATUS FOR TRANSPORTING AN ARTICLE IN VACUUM

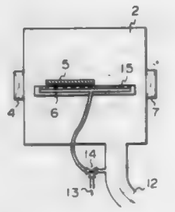
Masayasu Nagashima, Yokohama, and Nobuo Iijima, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,728

Claims priority, application Japan, May 28, 1982, 57-91629

Int. Cl.⁴ B65G *51/03*

U.S. Cl. 406—88 **5 Claims**



1. A method for transporting an article disposed on an upper surface of a stage, housed in an enclosed chamber, having a

plurality of inclined nozzles, said method comprising the steps of:

(a) reducing pressure of the enclosed chamber below atmospheric pressure;

(b) injecting a gas through the plurality of inclined nozzles formed in the stage housed in the enclosed chamber, while the pressure is maintained below atmospheric pressure, so that the article is transported in the direction of inclination of said inclined nozzles; and

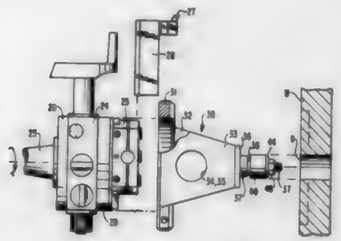
(c) treating the article by a chemical reaction with the gas used in said injecting step (b).

4,690,592

STABILIZING ATTACHMENT FOR BORING HEAD

Elbert P. Odor, Tampa, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1983, Ser. No. 534,238
Int. Cl.⁴ B23B *3/26*
U.S. Cl. 408—1 R **15 Claims**



1. A stabilizing attachment for a boring head for machining an annular groove about an opening in a wall, the boring head having in axial alignment a driven shaft, a body stationary with respect to the wall and a rotatable head plate for supporting a tool holder and an orbiting bit, said attachment comprising:

(a) means for releasably engaging the rotatable head plate of the boring head,

(b) support means extending forwardly from said engaging means, said support means comprising at least two support arm means extending transversely from said engaging means and a transverse plate attached to the forward end of said support arm means, said arm means and plate providing a chamber for receiving said head plate, and said support arm means having an opening transversely thereof for passage therethrough of the tool holder carried by said rotatable head plate,

(c) a shaft carried by said support means axially thereof, and

(d) bearing means carried by said shaft having relatively rotatable parts, the relatively rotatable parts comprising an inner race and an outer race, the inner race being fixedly attached to said shaft and the outer race being adapted to engage the opening.

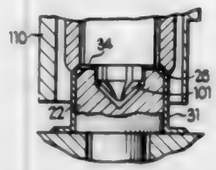
4,690,593

TOOL FOR CUTTING LOCKING CUPS FROM GUIDE TUBE MOUNTING SCREWS IN A NUCLEAR REACTOR

John D. Nee, Level Green, and Joseph J. Hahn, Whitehall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1986, Ser. No. 822,182
Int. Cl.⁴ B23B *41/00, 47/18*
U.S. Cl. 408—80 **20 Claims**

1. Apparatus for freeing a socket-head screw from a locking cup therefor in a reactor cavity, wherein the locking cup includes a fixed cylindrical side wall encircling the side surface of the screw head and an annular end wall overlying the outer end surface of the screw head, said apparatus comprising: frame means, cylindrical cutter means having a longitudinal axis and having a frustoconical cutting surface with an inner diameter less than the inner diameter of the locking cup side wall and with an outer diameter greater than the outer diameter of the locking cup side wall, and drive means carried by said frame means and coupled to said cutter means for effecting



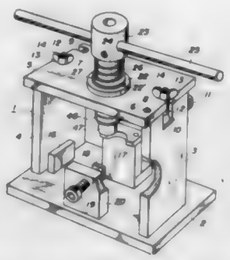
rotation thereof about said axis, said rotating cutter means being operable for severing the locking cup end wall from the locking cup side wall at the junction therebetween when said cutter means is moved against the locking cup substantially coaxially therewith.

4,690,594

DEBURRING APPARATUS

Minoru Kato, Kawasaki, Japan, assignor to Myotoku Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,603
Claims priority, application Japan, Jun. 16, 1984, 59-89745[U]
Int. Cl.⁴ B23B *27/02*
U.S. Cl. 408—159 **1 Claim**



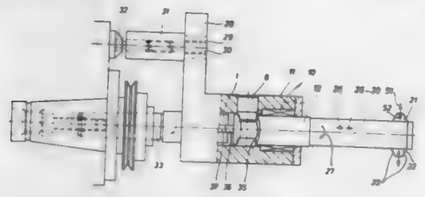
1. A deburring apparatus for removing burrs which are formed at the intersecting inner edges of at least two intersecting bores of a workpiece, comprising: a frame having means for holding said workpiece; a cutter spindle borne rotatably in said frame in axial alignment with one of said bores; a cutter hinged to a leading end portion of said cutter spindle and biased to swing outwardly of the peripheral side thereof for cutting off the burrs at said intersecting inner edges of said intersecting bores of said workpiece held by said holding means of said frame when said cutter spindle is inserted into said one of said bores and is rotated; a guide sleeve fitted slidably on said cutter spindle for sheathing said cutter while said cutter spindle is being inserted into or retracted out of said one of said bores, and for exposing the edge of said cutter to the outside when in the deburring operation; and cam means for directing said cutter along a curve defined by said intersecting inner edges of said bores of said workpiece, said cam means comprising a member fixed on said frame and having a cam face profiling said curve defined by said inner edges, and a follower fixed on said cutter spindle and urged to come into contact with said cam face during said deburring operation.

4,690,595

DE-BURRING TOOL FOR THE DE-BURRING OF THE EDGES OF HOLES IN CURVED OR OBLIQUE SURFACES OF A WORK PIECE

Heinrich Heule, Kristallstrasse 6, CH-9434 Au/TG, Switzerland

Filed Feb. 11, 1986, Ser. No. 828,634
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505084
Int. Cl.⁴ B23C *9/00*; B23B *51/16*
U.S. Cl. 409—143 **1 Claim**



1. A de-burring tool for the de-burring of hole edges (47–50), particularly those formed in curved or oblique work piece surfaces, and including a rotationally-driven tool holder (20) in which one or more cutters (21) (22) are arranged, and in which motion is controlled in an axial direction, characterized in that the tool holder (20) is axially and displaceably mounted in a fixed base body (11), in that the axial displacement of the tool holder (20) is achieved by a cam means (35) which follows the curvature of the edges (47–50) to be de-burred, said cam means being formed by an annular cam slot (38) which is cut into a cam body (13) which is connected to the tool holder (20), in that said cam means are engaged by follower means, the follower means including at least two trunnions (8) (17) which are adjustably connected to the base body (11) and mount rotatable bearing means on pins extended radially into the cam slot (38), achieving a form-locking fit of the trunnion (17) to the cam means (35), and in that on the centrally-mounted head of one of the trunnions (17) the pin (42) is arranged eccentrically to the trunnion's middle longitudinal axis, and the bearing means (9) are arranged on the pin (42), whereby rotary adjustment of said one of the trunnions (17) is effective to eliminate backlash between the cam means and the bearing means.

4,690,596

DEVICE FOR MAKING INSIDE GROOVES IN HOLLOW PARTS

Guy Mortier, Bounetable, and Jean-Claude Chartrain, St-Aubin des Coudrais, both of France, assignors to Sourieu & Cie., Boulogne, France

Filed Jun. 12, 1986, Ser. No. 873,382
Claims priority, application France, Jun. 18, 1985, 85 09203
Int. Cl.⁴ B23C *5/26*
U.S. Cl. 409—143 **7 Claims**

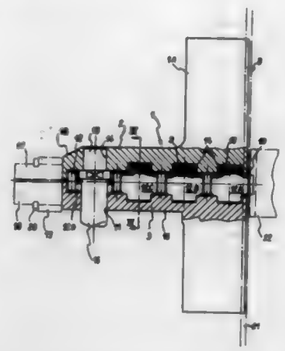
1. A device for making inside grooves in a hollow part, said device comprising:

an elongate body having a first end and a second end;

said body having an interior hollow extending from said first end to a side opening close to said second end;

said interior hollow containing a succession of intermeshing gearwheels including a first gearwheel mounted at said first end for engagement with a driving toothed wheel having a thickness larger than said first gearwheel, and a last gearwheel having fixing means facing said side opening and suitable for fixing a milling bit, said first end of said body being provided with mounting means for slidingly mounting said body on a slideway; and

said mounting means and said slideway extending parallel to teeth of said driving wheel and said first gearwheel whereby said device can be moved in said slideway without discharging said first gearwheel from said driving wheel.

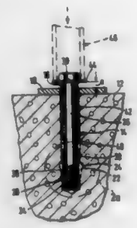


4,690,597

POSITIVE ARRANGEMENT FOR FASTENING A DOWEL

Heinrich Liebig, Wormser Strasse 23, D-6102 Pfungstadt, Fed. Rep. of Germany

PCT No. PCT/EP84/00017, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984, PCT Pub. No. WO84/03917, PCT Pub. Date Oct. 11, 1984
PCT Filed Jan. 20, 1984, Ser. No. 638,970
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312141
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—32 **4 Claims**



1. A fastening arrangement for fastening a workpiece, comprising: a dowel, and a sub-surface; said sub-surface having a cylindrical bore with a mouth at the sub-surface, an end face inside the bore at a distance from the mouth, and an undercut surface between the mouth and the end face and extending radially outwardly from the cylindrical bore; said dowel comprising: an elongated fastening bolt having a first end and a second and spaced from said first end; a bolt head or nut on said second end of said fastening bolt; a distance sleeve arranged around said fastening bolt and having a first end adjacent said bolt head or nut, and a second end remote therefrom; a tubular sleeve having: a circumferential wall with a wedge-shaped peripheral groove, a first end wall, a plurality of slots extending at substantially uniform angular spacing in said circumferential wall from said first end wall to said peripheral groove, thus dividing the tubular sleeve into a plurality of segmental sections, said segmental sections constituting locking elements, the tubular sleeve below said groove forming a head part approximately of the same diameter as the bore, said head part threadedly engaging said first end of said bolt and having a second end wall supported on said end face, the locking elements having ends projecting towards the distance

sleeve and being pivotable from a first, radially inward position within the diameter of the bore to a second, locking position in which said locking elements project at least partly radially outwardly beyond the bore for lockingly engaging the undercut surface; a component tapering conically towards and engaging between said ends of said locking elements, and a deformable sleeve arranged around said bolt between said distance sleeve and said component; the resistance of the deformable sleeve to axial deformation being greater than the force required for pivoting the locking elements from the first to the second position; the length of the dowel measured from the second end wall of the tubular sleeve to the first end of the distance sleeve, when the locking elements are in the first, radially inward position, being substantially equal to: the depth of the bore between the mouth and the end face of the bore, plus the thickness of the workpiece to be fastened, plus a length required for pivoting the locking elements from the first position to the second position; whereby first, upon subjecting the distance sleeve to a blow the dowel supported by the second end wall of the head part on the end face of the bore will be compressed such that the locking elements are pivoted from the first position to the second position; and whereby secondly, upon screwing the bolt head or nut further into the head part the deformable sleeve is deformed for fastening the workpiece to the sub-surface.

4,690,598

EXPANSION DOWEL

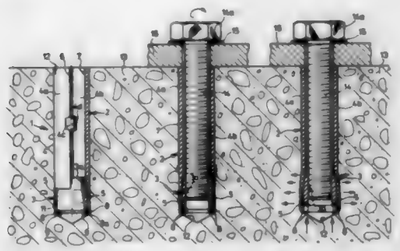
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Jul. 8, 1985, Ser. No. 752,918

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425239

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—40 **9 Claims**



1. An expansion dowel comprising an axially extending generally cylindrically shaped expansion sleeve having a leading end and a trailing end spaced apart in the axial direction of said expansion sleeve with the leading end being inserted first into a prepared borehole for the expansion dowel and a generally circularly shaped expansion body extending in the axial direction of said expansion sleeve and positioned within the leading end of said expansion sleeve and arranged to be pulled in the axial direction of and through said sleeve from the leading end toward the trailing end for radially expanding at least the leading end of said sleeve into contact with the borehole, said sleeve comprising an axially extending generally circularly shaped sleeve section extending from the trailing end toward and terminating short of said leading end of said sleeve, said sleeve section having a first end spaced from the leading end of said sleeve and a second end at the trailing end of said sleeve, said sleeve having at least one slit therein open at the first end of said sleeve section and extending from the first end toward the second end of said sleeve section, said expansion body having an axially extending inner surface and an axially extending outer surface with at least one recess in the outer surface thereof and extending generally in the axial direction of said sleeve, said sleeve including at least one web extending and elongated in the axial direction of said sleeve and extending from the first end of said sleeve section and forming the leading end of said sleeve, said sleeve section having a circumferential dimension and said web having a dimension in the circumferential direction of said generally circularly shaped sleeve section significantly smaller than the circumferential dimension of said sleeve section and said recess having a circumferential dimension substantially the same as the circumferential dimension of said web, said web being fitted into said recess in said expansion body, a bridge member located at the end of said web forming the leading end of said sleeve and interconnecting said web and said expansion body, and said bridge member being breakable or separable transversely of the axial direction of said sleeve when said sleeve is expanded for separating said expansion body from said expansion sleeve.

4,690,599

SELF-PIERCING NUT

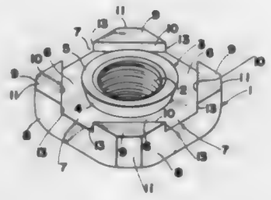
Katsumi Shinjo, Osaka, Japan, assignor to Yugen Kaisha Shinjoseisakusho, Osaka, Japan

Continuation of Ser. No. 646,468, Sep. 4, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,095

Claims priority, application Japan, Dec. 24, 1981, 56-212367

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—180 **4 Claims**



1. A self-piercing nut adapted to be fixed to a metal panel, the self-piercing nut comprising a substantially rectangular body portion, a centrally disposed threaded fastener accommodating hole extending through said body portion, a pilot means provided around said threaded fastener accommodating hole for punching a nut accommodating hole in the metal panel, said pilot means includes a circumferential side wall converging toward an upper surface of said body portion, and a punching face defining a periphery of the threaded fastener accommodating hole, an individual seat face means provided only at each corner of said body portion for supporting the metal panel, said seat face means including an upper surface having a substantially flat profile and a substantially vertically extending wall portion facing the circumferential wall portion of the pilot means and spaced therefrom, said wall portion of said seat face means extending perpendicular to a diagonal axis of the body portion, each of said wall portions of said seat face means intersects with sides of the body portions such that the said seat face means are provided with shoulder portions at respective intersections, and single recess means defined between adjacent seat face means for receiving extruded portions of the metal panel between the shoulder portions thereby preventing relative rotation between the self-piercing nut and the metal panel and ensuring a firm fastening of the self-piercing nut to the metal panel.

4,690,600

THREADED CONNECTION HAVING MULTI-PART THREADED BOLT

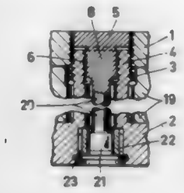
Fredy Lauer, Rickenbach-Attikon, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 22, 1986, Ser. No. 866,212

Claims priority, application Switzerland, May 30, 1985, 02286/85

Int. Cl.[4] F16B *39/28, 39/22*

U.S. Cl. 411—263 **6 Claims**



1. A threaded connection comprising
a tapped component; and
a bolt having a pair of externally threaded parts for threading into said tapped component, a screwthread threadably connecting said parts for relative rotation therebetween, one of said parts having a longitudinally disposed threaded bore and the other of said parts including a threaded extension threaded into said bore and having a torsion bar connected at one end to said one part at one end of said bore to permit relative movement between said parts whereby during threading of said bolt into said tapped component said parts move together to permit continuous threading and in response to unthreading of said bolt from said tapped component said parts move relative to each other to prevent removal of said bolt from said tapped component.

4,690,601

STORAGE ASSEMBLY AND METHOD OF USING SAME

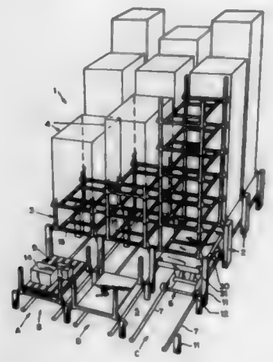
Siegried Delius, and Doris Delius, both of Rothensvägen 10, S-595 00 Mjölby, Sweden

Continuation of Ser. No. 97,752, Nov. 27, 1979, abandoned. This application Jan. 14, 1983, Ser. No. 458,073

Claims priority, application Sweden, Dec. 4, 1978, 7812441

Int. Cl.[4] B65G *57/30*

U.S. Cl. 414—96 **8 Claims**



5. A method of stacking load carriers in a storage assembly, said method comprising the steps of:
(a) providing a plurality of vertically stackable load carriers, pile bed means including vertically disposed uprights having support members fixedly attached to each upright for supporting said load carriers, and at least one carriage operative to move below a load carrier supported by the pile bed means,
(b) providing each of the load carriers with a plurality of vertically disposed posts interconnected by frame means with each post including upper guide members at its upper end and lower guide members at its bottom end for cooperative engagement with the upper guide members of another load carrier for vertically stacking the load carriers on top of each other,
(c) providing rest means attached on each load carrier to engage the support members for supporting the bottommost load carrier at an upwardly spaced distance to allow the disposition of the carriage carrying a load carrier underneath the bottommost load carrier support by the pile bed means,
(d) engaging the guide means of the carriage with the lower guide members of a load carrier to be loaded on the bottommost position of a selected pile of load carriers,
(e) moving the carriage with the engaged load carrier horizontally to a first position below the selected pile,
(f) moving the guide means of the carriage vertically upwardly so that the upper guide members of the load carrier positioned on the carriage cooperatively engage the lower guide members of the bottommost load carrier of the selected pile in order to raise the whole pile of load carriers thereabove,
(g) stopping the vertical movement of the guide means of the carriage at an intermediate position and moving the load carriers from the support members of the pile bed means so that the pile of load carriers is vertically movable without interference of the support members,
(h) moving the guide means of the carriage vertically upwardly further until the rest means of the load carrier positioned on the carriage have passed the support members of the pile bed means,
(i) moving the load carrier back to a position where the rest means of the load carriers are vertically aligned with the support members of the pile bed means, and
(j) moving the guide means of the carriage vertically downwardly until the rest means of the bottommost load carrier of the pile cooperatively engage the support members of the pile bed means for supporting the pile of load carriers, and releasing the carriage from the load carrier now loaded.

4,690,602

AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

John Castaldi, Brooklyn, and Fred Greenzang, Huntington, both of N.Y., assignors to Applied Retrieval Technology, Inc., Hempstead, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,552

Int. Cl.[4] B65G *1/02*

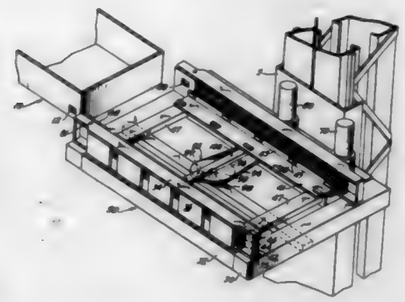
U.S. Cl. 414—282 **9 Claims**

1. A storage and retrieval system comprising:
(a) a plurality of storage bins arranged in spaced fashion in a first two-dimensional array, each bin having a first pair of engageable means on each side wall near a first end of the bin and a second pair of engageable means on each side wall near the opposite end of the bin;
(b) means for extracting any selected bin from the array by engaging that pair of engageable means on the selected bin located nearest the front of the array, the extracting means including a frame and parallel arms spaced apart by a distance greater than the bin width, the arms being capable of joint movement with respect to the frame in a direction perpendicular to the plane of the array to a limit position where the arms extend part way along the sides of a selected bin, each arm having associated therewith bin engaging means capable of movement along the arm and having retractable means for engaging the engageable

means on any selected bin and thereby withdrawing that bin from the array and onto the frame;

(c) movable platform means for carrying the extracting means; and

(d) control means for causing the platform means to move horizontally and vertically to a position with respect to the array where the extracting means is adjacent the selected bin; for then directing the arms to move toward and



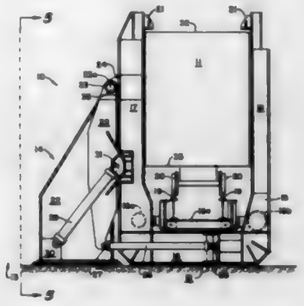
around the bin sufficiently to bring the retractable bin engaging means into alignment with the engageable means on the selected bin; for then causing the retractable bin engaging means to engage the bin; for then directing the extracting means to extract the selected bin from the array; and for then directing the platform means to move horizontally and vertically to another desired location with the selected bin.

4,690,603

CAR DUMPING APPARATUS

Joseph R. Graner, Pittsburgh, Pa., assignor to Heyl & Patterson, Inc., Pittsburgh, Pa.

Filed Jul. 2, 1985, Ser. No. 751,232
Int. Cl.⁴ B65G *67/00*
U.S. Cl. 414—372 **6 Claims**



1. Apparatus for dumping an open top railroad car comprising:

a railroad car damping site including: a parking area for said railroad car; a dumping area spaced from said parking area; and support means between said dumping area and said parking area; said support means defining a generally horizontal axis generally parallel to the lengthwise axis of said railroad car in said parking area; means for advancing a said railroad car into the said parking area;

frame means rigidly engageable with said railroad car, said fram means being connected to said support means for rotation movement about said horizontal axis;

an intermediate support member connected to said support means for rotation movement about said horizontal axis;

a first hydraulic piston motor pivotally connected at one end to said support means and pivotally connected at the other end to the said intermediate support member at the central portion thereof between the said first and second ends of said intermediate support member, whereby extension of said first hydraulic piston motor causes a rotation movement of the combination of said frame means and said railroad car and said intermediate member about said horizontal axis;

a second hydraulic piston motor pivotally connected at a first end to the bottom of said intermediate support member and pivotally connected at a second end to said frame means whereby extension of said second hydraulic piston motor causes rotation movement of the combination of said frame means and said open top railroad car about said horizontal axis;

wherein the said horizontal axis defines a vertical plane and wherein the combination of said frame and said railroad car in its loaded condition has a centroid which passes through the said vertical plane prior to completion of rotation movement of the said combination; and

wherein the said combination of said frame and said railroad car in an unloaded condition has its centroid positioned nearer to the base of said frame on the parking area side of the said vertical plane when the combination of said frame and said railroad car is in the maximum rotation position;

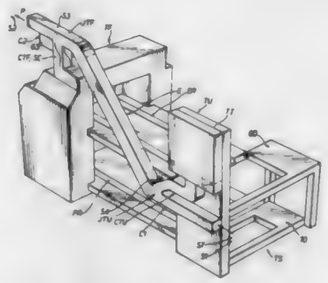
whereby the extendion of said first and said second hydraulic piston motors positions the said frame in a dumping position to a final position where the said railroad car is positioned above said support means with its open top facing said dumping area.

4,690,604

CONVEYING APPARATUS FOR ROD-LIKE ARTICLES

Simon G. Calverley, Heaton Chapel; David C. M. Carter, Milton Keynes; Peter A. Clarke, London; John G. Dowding, Milton Keynes; David M. Hawkins, Milton Keynes, and Robert J. C. S. Mitchell, Milton Keynes, all of United Kingdom, assignors to Molins PLC, London, United Kingdom

Filed Jul. 6, 1984, Ser. No. 628,304
Claims priority, application United Kingdom, Jul. 6, 1983, 8318304
Int. Cl.⁴ A24C *5/35*
U.S. Cl. 414—403 **33 Claims**



33. Apparatus for conveying rod-like articles of the tobacco industry, comprising an articles delivery device, an article receiving device, conveyor means for conveying articles away from the delivery device and for conveying articles towards the receiving device, said conveyor means being arranged to convey articles in multi-layer stack formation, a container loading means, a container unloading means, a first subsidiary conveyor linking the container loading means with said conveyor means at a first junction, a second subsidiary conveyor

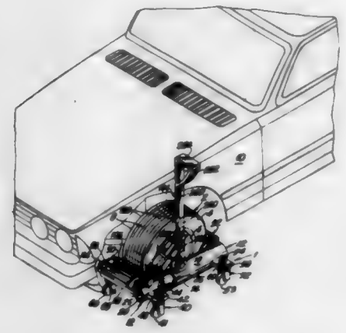
linking the container unloading means with said conveyor means at a second junction, and a container handling system including means for conveying a container between said loading means and said unloading means, wherein said first junction is upstream of said second junction relative to the direction of movement of articles on said conveyor means, and said unloading means is upstream of said loading means relative to said direction.

4,690,605

APPARATUS FOR JACKING AND DOLLYING AN AFFIXED VEHICLE WHEEL ASSEMBLY

Albert V. Coccaro, 9 Capricorn La., Bedford Hills, N.Y. 10507

Filed Aug. 30, 1985, Ser. No. 771,243
Int. Cl.⁴ B60B *29/00*
U.S. Cl. 414—429 **12 Claims**



1. Apparatus that jacks and, thereafter, dollies a vehicle wheel assembly while the assembly is affixed to the vehicle, the assembly including a pneumatic tire, a wheel and an axle, the apparatus comprising:

structural means for constituting an apparatus framework, the framework including a body section having a first member and a second member, the first and second body section members being movable relative to one another, the framework also including a first arm member connected to the first body member, and a second arm member connected to the body section second member;

transport means for rendering the apparatus movable;

engaging means which are adjustable for interacting with the wheel assembly, the engaging means including a first element connected to the framework first arm member, and a second element connected to the framework second arm member, wherein at least one of the engaging means elements includes a roller assembly having means for adjusting the effective roller assembly radius; and

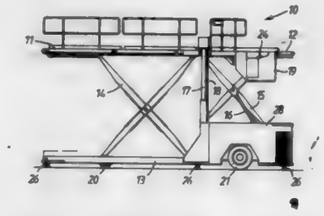
actuator means which is connected to the framework and which cooperates with the engaging means such that when the actuator means is activated, the engaging means elements are forced into contact with the pneumatic tire causing the tire to ride over the roller assembly of the engaging means and lift the wheel assembly while forming the framework into a carriage for receiving the wheel assembly, and which actuator means also cooperates with the engaging means to provide a mechanical advantage, for lifting the wheel assembly onto the carriage which may be varied by adjusting the effective roller assembly radius of the engaging means relative to the wheel assembly.

4,690,606

MOBILE LOADERS

Christopher P. Ross, West Drayton, England, assignor to Ipeco Europe Limited, Essex, England

PCT No. PCT/GB85/00121, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/04387, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 28, 1985, Ser. No. 798,688
Claims priority, application United Kingdom, Mar. 30, 1984, 8408346
Int. Cl.⁴ H02J *7/00*; B60P *1/44*
U.S. Cl. 414—495 **6 Claims**



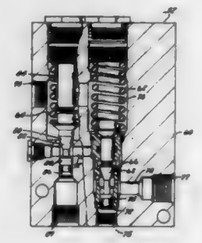
2. Apparatus for raising and/or lowering of loads, said apparatus comprising a chassis having a variable height platform, said platform being connected to said chassis by means for maintaining said platform in a substantially level attitude irrespective of said platform height, mechanical lifting means for varying the height of the platform with respect to said chassis, electric motor drive means connected by transmission means to said mechanical lifting means for raising said platform, electrical energy storage means for powering said electric motor drive means, control means whereby the electric motor drive means may be switched to function as electrical generator means to provide retardation of said platform when being lowered, and means to direct electrical energy generated during lowering of said platform into said electrical energy storage means.

4,690,607

REFUSE COLLECTION TRUCK AND APPARATUS FOR CONTROLLING COMPACTION OF REFUSE

Gary Johnson, Fort Payne, Ala., assignor to The Heil Co., Milwaukee, Wis.

Filed Oct. 4, 1985, Ser. No. 784,846
Int. Cl.⁴ B65F *3/28*
U.S. Cl. 414—517 **12 Claims**



1. Apparatus for use in a refuse collection container having a forward end and an open rearward end, a refuse packing plate supported adjacent said rearward end of the container for forcing refuse material into the container, a first hydraulic cylinder for causing movement of the refuse packing plate between a retracted position and a refuse compacting position, an ejector panel housed in the container and being movable between a forward end of the container and the open rearward

end of the container, and a second hydraulic cylinder connected to the ejector panel, the second hydraulic cylinder being extendable to cause movement of the ejector panel toward the open end and being retractable, the apparatus comprising:

a hydraulic fluid operably connected to the first hydraulic cylinder and to the second hydraulic cylinder,

a control valve for controlling the supply of hydraulic fluid to the second hydraulic cylinder,

means for selectively releasing hydraulic fluid from the second hydraulic cylinder to permit movement of the ejector panel toward the forward end of the container only when both the hydraulic pressure at the hydraulic fluid pump exceeds a first selected hydraulic pressure and when the hydraulic pressure in the first hydraulic cylinder exceeds a second selected hydraulic fluid pressure.

4,690,608

TRAILER FOR TRANSPORTING LARGE CONTAINERS

Robert Rasmussen, Berlin, N.J., assignor to Accurate Industries, Inc., Williamstown, N.J.

Division of Ser. No. 468,319, Feb. 22, 1983, Pat. No. 4,599,040. This application Dec. 9, 1985, Ser. No. 806,907

Int. Cl.[4] B60P *1/48*

U.S. Cl. 414—529 **1 Claim**



1. A trailer for transporting simultaneously two nested pluralities of containers over a road surface comprising

a pair of laterally spaced main rails extending the entire length of the trailer, the main rails each terminating upwardly in a planar top surface;

each main rail comprising an inner facing surface and an outer facing surface;

a plurality of cross members connected between the main rails and spacing the main rails apart;

a plurality of outer rollers rotatively carried at the outer facing surfaces of the main rails near the said top surfaces to rotatively support the containers to permit the containers to longitudinally move along the main rails;

a plurality of inner rollers rotatively carried at the inner facing surfaces of the main rails near the said top surfaces to alternatively rotatively support others of the containers to permit the others of the containers to longitudinally move along the main rails;

the trailer not being equipped with any type of container lifting mechanism;

axles secured to the main rails to rotatively support left and right rear wheels; and

an unloading ramp positioned rearwardly of the axles and rearwardly extending integrally from the main rails, the unloading ramp downwardly declining from the said planar top surfaces, the unloading ramp declining at an angle of approximately fifteen degrees from the planar top surfaces, the unloading ramp terminating at least about fifteen inches above the said road surface and not more than about twenty-one inches above the road surface, whereby the containers are unloaded by backing and quickly stopping the trailer.

4,690,609

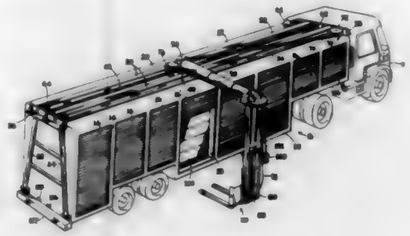
TRUCK LOADING APPARATUS

James M. Brown, 1637 Deer Valley Rd., Crown Point, Ind. 46307

Continuation of Ser. No. 727,528, Apr. 25, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,314

Int. Cl.[4] B60P *1/64, 1/00*

U.S. Cl. 414—543 **11 Claims**



1. In combination with a truck of the type that as an elongated body enclosing cargo-carrying space which is covered by a permanent roof, and along whose oppositely directed sides are openings to allow loading or unloading of cargo into and out of the cargo space from the sides of the body and which body also has a transverse end, cargo-unloading apparatus comprising:

track means mounted longitudinally along said roof;

a carriage mounted to said track means;

an arm having an extendable portion mounted on said carriage and carried by that carriage so as to be moved along said roof, said arm and carriage being so constructed and mounted so as to allow the positioning of said extendable portion outward of any one of a range of positions along one of the other of said opposite directed sides and for the arm to revolve about a generally vertical axis so as to move said extendable end about one transverse end of the truck body;

projecting means which may releasably engage cargo for lifting and carrying the cargo;

powered and controlled depending means connected to said extendable portion of said arm and mounting said projecting engaging means;

said powered and controlled means and said arm being controllable so as to move said projecting members deep into the cargo space under the roof at any number of different locations along the side of the body, through an opening therein, for lifting cargo therefrom and carrying it out and depositing it adjacent to the truck; and

whereas said extendable portion and said depending means may be swung from one oppositely directed side of said body to the other oppositely directed side about a transverse end of said body, without the need to remove or raise said depending means, so it may serve to unload or load from either side.

4,690,610

LIFT MAST TRANSPORT ARRANGEMENT

James R. Fotheringham, Willowick, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Apr. 24, 1986, Ser. No. 855,866

Int. Cl.[4] B66F *17/00*

U.S. Cl. 414—631 **20 Claims**

1. A material handling vehicle, comprising:

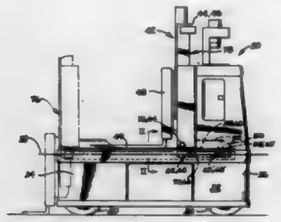
a frame having first and second spaced apart end portions, and a longitudinal vehicle axis extending between said first and second end portions;

a first guide rail connected to said frame, said first guide rail being substantially parallel to said longitudinal vehicle axis;

a second guide rail connected to said frame at a location spaced from said first guide rail, said second guide rail being substantially parallel to the first guide rail;

a lift mast assembly having a pair of spaced apart upright guide members, and a carriage assembly connected to and elevationally movable along said upright guide members;

transport means for connecting said lift mast assembly to said first and second guide rails and guiding movement of said lift mast assembly along said first and second guide rails in directions substantially parallel to said longitudinal vehicle axis;



power means for moving said transport means along said first and second guide rails between a first position at which said lift mast assembly is adjacent the frame first end portion, and a second position at which the lift mast assembly is spaced from the first position and between the first and second end portions; and

coupling means for connecting said power means to said transport means and providing a preselected amount of free movement of the transport means relative to said power means in directions transverse to the first and second guide rails.

4,690,611

AUTOMATIC TRANSFER APPARATUS FOR ELEVATORS

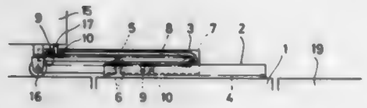
Uichi Nobuhara, Kishiwada, Japan, assignor to Kabushiki Kaisha Kumalift Gijutsu Kenkyusho, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,734

Claims priority, application Japan, Dec. 3, 1984, 59-184551[U]

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—661 **3 Claims**



1. An automatic transfer apparatus for loading and unloading a push car into and out of an elevator, comprising:

a guide means fixedly mounted on the floor of the elevator;

a carriage mounted in said guide means so as to be movable in a direction on and off the elevator while being guided by said guide means;

a first conveyor means in said guide means and connected to said carriage for reciprocally moving said carriage along said guide means;

a first drive means connected to said first conveyor means;

a second conveyor means on said carriage and having an endless travelling member for conveying a push car into and out of the elevator;

a second drive means connected to said second conveyor means for driving said second conveyor means; and

a plurality of pairs of pins secured to said endless travelling member, the pins in each pair being spaced in the direction of movement of said endless travelling member and each pin being pivotable only from a first position in which the pin projects transversely of the direction of travel of said endless travelling member to a second position in which the pin is out of said projected position and being pivotable back to said first position, the pivotal movement of the pins in each pair which is in the direction from the first to the second position being pivotal movement toward the other pin of the pair,

whereby when the carriage member is in a position where it has been moved off the elevator by said first conveyor means, and said endless travelling member is driven to move the endless travelling member toward the elevator, the forward pin in each pair will be pivoted so as to pass a projection on the push car to be loaded and the rear pin in each pair will engage the projection to move the push car onto the elevator, and the rear pin in each pair will similarly engage the projection on the push car to move the car off the elevator when the endless travelling member is driven after the carriage has been moved off the elevator preparatory to unloading the push car from the elevator.

4,690,612

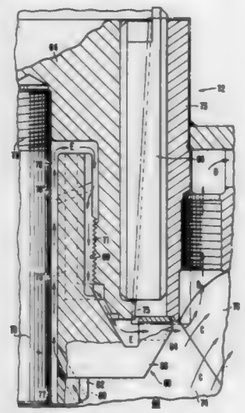
NUCLEAR REACTOR COOLANT PUMP IMPELLER/SHAFT ASSEMBLY

Leonard S. Jenkins, Plum Borough, Pa., assignor to Westinghouse Electric Corp, Pittsburgh, Pa.

Filed Aug. 1, 1985, Ser. No. 761,447

Int. Cl.[4] F01D *11/00*; **G21C** *15/00*

U.S. Cl. 415—112 **8 Claims**



1. A pump, comprising:

(a) a casing having an inlet and an outlet in fluid communication for circulating fluid coolant through the pump;

(b) a shaft positioned in the casing;

(c) an impeller nut connected to the shaft;

(d) a lockbolt fixedly connecting the impeller nut relative to the shaft;

(e) passageway means with first and second ends for directing fluid from the lockbolt to the shaft;

(f) first conduit means formed in the impeller nut in fluid communication with the first end of the passageway means and the inlet of the casing; and

(g) second conduit means formed in the impeller nut in fluid communication with the second end of the passageway means and the outlet of the casing,

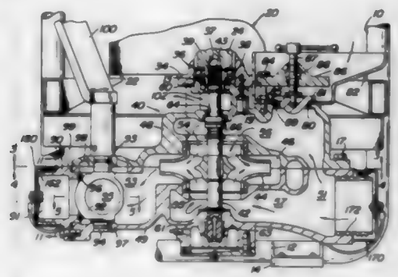
wherein a portion of the fluid coolant circulating through the inlet of the casing is pumped through the first conduit means, through the passageway means, out the second conduit means and into the outlet of the casing.

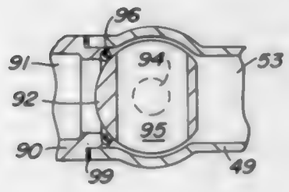
4,690,613

PORTABLE ENGINE-PUMP ASSEMBLY

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Continuation of Ser. No. 707,736, Mar. 4, 1985, Pat. No. 4,643,652. This application Jul. 18, 1986, Ser. No. 886,988
Int. Cl.[4] F04D 29/40
U.S. Cl. 415—148 6 Claims





1. In a centrifugal pump having a pump shaft and an impeller mounted for rotation on said pump shaft within a volute chamber, said pump having a pump body split into two separable pieces defining said volute chamber and providing a pump inlet passage and a pump discharge passage, said pump body including a first body portion and a second body portion, the improvement comprising a ball valve for controlling flow through said discharge passage, the said first body portion forming one piece of said two piece pump body and being constructed to define a discharge passage having a housing for receiving and supporting said ball valve therein, and said second body portion forming the other piece of said two piece pump body and being constructed to provide a cover portion closing said ball valve housing, said first and second body portions being secured together at mating faces extending around said impeller.

4,690,614

TORQUE METER

Reginald G. Keetley, Daphne, Ala., and Keith Allen, Hollingworth Via Hyde, England, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 4, 1985, Ser. No. 794,651
Int. Cl.[4] B64C 11/38
U.S. Cl. 416—43 10 Claims

1. In an aircraft engine including a torque-experiencing rotating lay shaft, a propeller, and means connecting said propeller to said shaft for driving said propeller, a lay shaft torque meter comprising:

a forward lay shaft end;

a housing;

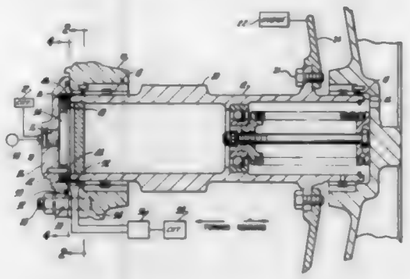
means for rotatably mounting said lay shaft in said housing;

means for applying a force to said lay shaft, said force being proportional to the torque experienced by said lay shaft, for axially moving said lay shaft in said housing between a forward lay shaft position and a rearward lay shaft position;

a body secured to said housing adjacent said forward end of said lay shaft and defining a chamber open to said forward end of said lay shaft;

a piston slidably mounted in said body abuttable against said forward end of said lay shaft;

means for pressurizing said chamber;



means for applying a force to said piston, said force being proportional to the pressure in said chamber, for urging said piston against said forward end of said lay shaft;

means for venting the pressure from said chamber when said lay shaft moves from said forward lay shaft position and towards said rearward lay shaft position; and

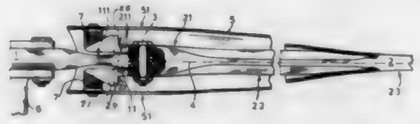
means for measuring the pressure in said chamber.

4,690,615

ROTOR, ESPECIALLY FOR ROTARY WING AIRCRAFT

Gerald Kuntze-Fechner, Bad Wiessee; Otmar Friedberger, Neubiberg, and Michael Hahn, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 903,024
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534968
Int. Cl.[4] B64C 27/33
U.S. Cl. 416—134 A 10 Claims



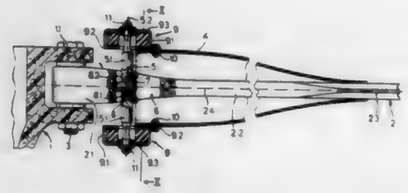
1. A rotor structure, especially for rotary wing aircraft, comprising rotor blade means having a blade pitch axis and defining a rotation plane in which said rotor blade means rotate,a rotor hub having a rotational axis, said rotation plane extending substantially perpendicularly to said rotational axis, torsionally rigid rotor hub arm means projecting radially outwardly from said rotor hub, first means for connecting said rotor blade means to said rotor hub arm means, said rotor blade means comprising a blade root, a blade wing section, and a torsionally yielding blade neck arranged between said blade root and said blade wing section, said blade neck having a given first bending flexibility relative to blade flapping bending movements, torsionally rigid blade angle control sleeve means having a radially outer end and a radially inner end and extending without contact substantially coaxially along said blade neck, second means for movably connecting said radially inner end of said blade angle control sleeve to said blade root, and third means for rigidly connecting said radially outer end of said blade control sleeve to said blade wing section, said rotor hub arm means comprising a flattened section (1.1.1) having a second bending flexibility which is larger than said given first bending flexibility so that said blade flattened section is softer relative to blade flapping than said neck, said flattened section (1.1.1) comprising a cross-sectional profile which is flat in a direction substantially perpendicularly to said rotation plane, said first means for connecting said rotor blade means to said rotor hub arm means comprising fork means forming part of said blade root and further means for connecting said fork means to said rotor hub arm means, and wherein said second means for movably connecting said radially inner end of said blade angle control sleeve to said blade root are connected to said fork means.

4,690,616

ROTOR STRUCTURE, ESPECIALLY FOR ROTARY WING AIRCRAFT

Michael Hahn, Ottobrunn, and Gerald Kuntze-Fechner, Bad Wiessee, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 884,961
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526470
Int. Cl.[4] B64C 27/35
U.S. Cl. 416—134 A 5 Claims



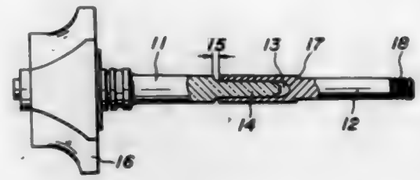
1. A rotor structure, especially for rotary wing aircraft, comprising a rotor hub and one or more rotor blades, each blade having a blade root, a blade neck, a blade wing section, and a blade pitch angle control sleeve, said blade neck being torsionally yielding for allowing a blade pitch angle adjustment movement, said blade neck being arranged between said blade root and said blade wing section, means connecting each rotor blade root to said rotor hub, said control sleeve being torsionally stiff for transmitting blade pitch angle adjustment forces to said wing section, said control sleeve extending essentially coaxially along but without contacting said blade neck to one end where said control sleeve is rigidly connected to said blade wing section, two-armed support strut means for securing an opposite end of said control sleeve to said blade root in a longitudinally slidable and rotatable manner relative to said blade root, said support strut means comprising bearing means for connecting said support strut means to said blade root in an articulated and slidable manner, said bearing means of said strut means being located in a hole in said blade root, said rotor structure further comprising damping means arranged above and below of said blade root outside said blade control sleeve, said damping means comprising at least an outer and an inner stiff cover layer and at least one damping elastomeric layer arranged between said inner and outer cover layers, said layers being arranged parallel to a lead-lag plane of said rotor blades, said damping means simultaneously forming a connection between said blade control sleeve and a respective strut arm of said two-armed support strut means, said strut arms,formed as threaded bolts, projecting from said damping means, and a nut for each threaded bolt strut for compressing the respective elastomeric layer.

4,690,617

METAL-CERAMIC COMPOSITE ARTICLE AND A METHOD OF PRODUCING THE SAME

Isao Oda, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 16, 1984, Ser. No. 641,339
Claims priority, application Japan, Aug. 31, 1983, 58-158070
Int. Cl.[4] F01D 5/28
U.S. Cl. 416—241 B 17 Claims



1. A metal-ceramic composite article, comprising:

a metallic member having a first thermal expansion and having a first end and a second end and a hole extending from said first end toward said second end, said hole having an inner peripheral surface; and

a ceramic member having a second thermal expansion and having a first portion and a second portion, said second portion being a projection extending from said first portion, said projection having an outer peripheral surface which is in press-fitted contact with said inner peripheral surface of said hole throughut substantially its entire length, such that a gap is formed between said first portion of said ceramic member and said first end of said metallic member, said gap being formed such that it is greater in size than the product of a difference in thermal expansion between said metallic member and said ceramic member, multiplied by the length of press-fitted contact between the outer peripheral surface of the projection and the inner peripheral surface of said hole, multiplied by a maximum operating temperature of the composite article.

4,690,618

BOOSTER TYPE HIGH-PRESSURE VESSEL

Makoto Akatsu, and Keiichi Hori, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,681
Claims priority, application Japan, Oct. 1, 1984, 59-204155
Int. Cl.[4] F04F 7/02
U.S. Cl. 417—226 4 Claims

1. A booster type high-pressure vessel apparatus for increasing the pressure of a liquid medium to pressure treat a work piece, said apparatus comprising:

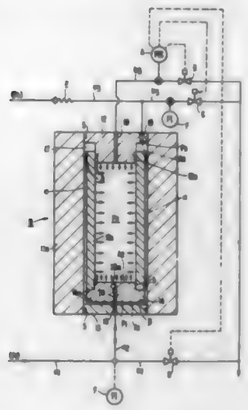
an outer cylinder having an upper lid at one end of said outer cylinder and a lower lid at the other end of said outer cylinder;

an inner cylinder slidably mounted within said outer cylinder, said inner cylinder having an outer diameter that is less than the inner diameter of said outer cylinder such that a clearance gap is defined between the outer cylindrical surface of said inner cylinder and the inner cylindrical surface of said outer cylinder;

a piston covering the end of said inner cylinder that is adjacent said lower lid, a pressure chamber in which the liquid medium is disposed being defined within said inner cylinder between said piston and said upper lid, and a booster chamber defined between said piston and said lower lid, said booster chamber open to and communicating with said clearance gap; and

a hydraulic circuit means for injecting pressurized fluid into said booster chamber and said clearance gap open thereto

for causing said inner cylinder to slide within said outer cylinder thereby pressurizing the liquid medium within the pressure chamber, said pressurized fluid in said clear-



ance gap creating a first pressure acting on said inner cylinder therearound that opposes the pressure acting on said inner cylinder therein created by the liquid medium when it is pressurized.

4,690,619

COMPRESSOR HAVING PULSATING REDUCING MECHANISM

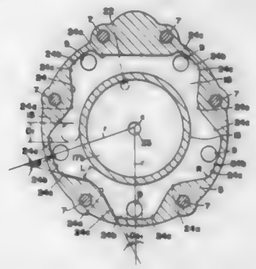
Takeo Iijima; Hiroshi Nomura; Susumu Saito, and Susumu Echizen, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,285

Claims priority, application Japan, Mar. 12, 1985, 60-48799[U]

Int. Cl.[4] F04B *1/18, 39/00*

U.S. Cl. 417—269 **4 Claims**



1. A compressor having a pulsating reducing means, said compressor comprising:

a cylinder block having a plurality of cylinder bores therein;

a plurality of pistons slidable in said cylinder bores;

means connected to said pistons for driving said pistons with a predetermined phase difference between the strokes of the respective pistons;

a valve plate on one end of said cylinder block and having a plurality of sets of at least one suction hole and at least one discharge hole, one set being positioned over the end of each of said cylinder bores;

a suction valve in each suction hole for opening and closing said suction hole;

a discharge valve in each discharge hole for opening and closing said discharge hole;

a hollow cylinder head on said one end of said cylinder block over said valve plate, said cylinder head having an end wall and a depending peripheral wall; and

a plurality of connecting bolts fixing the cylinder head and the valve plate to said cylinder block;

said cylinder head having a peripheral wall depending from an end wall and a bulkhead within said peripheral wall also depending from said end wall for partitioning the interior of said cylinder head into a high pressure chamber in the center of the interior and a low pressure chamber around the periphery of the interior, said end wall having a suction opening and a discharge opening therein, said high pressure chamber having said discharge holes opening thereinto and said discharge opening opening out therefrom, said low pressure chamber having said suction holes opening out therefrom and having said suction opening opening thereinto, and the inner surface of the peripheral wall of said cylinder head forming the outer wall of said low pressure chamber having a plurality of enlarged thickness sections around the respective connecting bolts, each of said sections having an inwardly convex surface portion, and said inner surface having a plurality of concave portions extending around the outer portions of the peripheries of said suction holes, and said inner surface having smoothly curved connecting portions connecting said convex portions and said concave portions, all points of which connecting portions are at an inwardly acute angle to a radius through the adjacent suction holes and the central axis of said cylinder block, whereby they do not form resistances to flows of gas passing through said low pressure chamber, said suction holes and said suction opening extending in the axial direction of said cylinder block and being in non-overlapping relation in said axial direction.

4,690,620

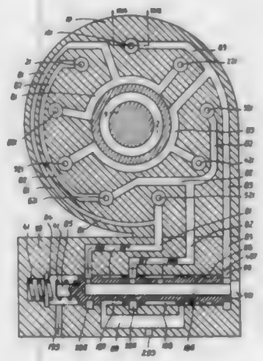
VARIABLE RADIAL PISTON PUMP

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 429,746, Sep. 30, 1982, abandoned, which is a division of Ser. No. 179,420, Aug. 19, 1980, Pat. No. 4,475,870. This application Mar. 20, 1985, Ser. No. 714,225

Int. Cl.[4] F04B *27/04*

U.S. Cl. 417—273 **5 Claims**



1. A hydraulic arrangement, comprising, in combination, a high pressure pump arranged in a housing and a valve body reciprocably arranged in a valve housing portion,

wherein said pump is provided with a plurality of working chamber groups with pluralities of individual pistons in individual working chambers of the respective working chamber group while every working chamber group combines the delivery passages of its individual working chambers to a respective common delivery passage of the respective working chamber group,

wherein said valve housing portion is provided with a plurality of inlets equal to the number of said common delivery passages with said inlets axially distanced from each other relative to the axis of said valve body while each individual common delivery passage of said common delivery passages is individually and separately communicated to a single inlet of said inlets of said valve housing portion,

wherein said valve housing portion is provided with a high pressure delivery exit port and unloading passage means communicated to a space of substantially low pressure while said valve body is subjected to pressure in fluid on one of its axial ends by the rate of pressure of fluid in said high pressure delivery exit port and on its other axial end to a thrusting compressible spring which thrusts with its spring force again said other axial end of said valve body;

wherein said valve housing portion and said valve body are provided with passages and recesses to communicate and discommunicate said individual delivery passages of said chamber groups and said inlets individually and in common at different rates of pressure of said rate of pressure in said high pressure delivery exit port to said high pressure delivery exit port with stepwise variation of the number of inlets and common delivery flows of said inlets and said common delivery passages in dependency of said rate of pressure in said exit port; and an improvement;

wherein said improvement provides in combination;

(a) piston shoes between pistons in said chambers and a cylindrical outer face of an eccentric cam in said pump;

(b) fluid pressure pockets with surrounding and sealing sealing lands around said pockets to provide hydrostatic bearings between said piston shoes and said outer face of said cam;

(c) annular recesses provided from the radial outside into said valve body;

(d) radially extending annular recesses provided radially into said valve housing portion,

(e) an axially entending passage through a portion of said valve body,

(f) radial bores to individually communicate said annular recesses of said valve body with said axially extending passage; and

(g) axially extended annular control recesses provided on said valve body to alternately remain distanced from said radially extending annular recesses and to communicate at least one of said radially extending annular recesses with said unloading passage means;

whereby

(a) said radially extending recesses surround that valve body radially to prevent radially directed the valve body laterally displacing and thrusting forces;

(b) said annular recesses of said valve body temporarily register with respective recesses of said radially extending recesses of said valve housing portion for said communication and discommunication of said individually combined flows of fluid of said individaul chambers of said chamber groups, and;

(c) said axially extending passage of said valve body prevents valve body dislocating radial forces,

whereby said annular recesses of said housing portion and of said valve body together with said axially extending passage secure the easy reciprocation of said valve body in said housing portion without radially laterally directed forces respective to the axis of said valve body,

while said fluid pressure pockets between said piston shoes and said cam secure the capability to deliver fluid under pressure which exceeds three thousand pounds per square inch;

whereby said pump and said valve body in said valve housing portion secure the delivery of rates of pressure which exceed three thousand pounds per square inch through said exit port at different rates of flow which exceed three thousand pounds per square inch when said valve body reciprocates in said valve housing portion and thereby communicates and discommunicates a respective number of said annular recesses of said valve body with a respective number of said radially extending annular recesses of said valve housing portion.

4,690,621

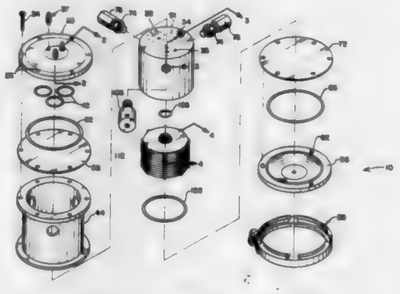
FILTER PUMP HEAD ASSEMBLY

Danny C. Swain, San Jose, Calif., assignor to Advanced Control Engineering, Santa Clara, Calif.

Filed Apr. 15, 1986, Ser. No. 852,221

Int. Cl.[4] F04B *43/02*

U.S. Cl. 417—313 **20 Claims**



1. A filter pump head assembly, comprising:

an exterior frame member including an upper cap, a central barrel portion, and a lower cap and further including means for fastening said portions together to form an enclosed volume;

liner means adapted to fit within said barrel portion, the liner means including a control block portion adapted to be situated at the end of said barrel portion near said upper cap, said control block portion having paired apertures formed therein to permit fluid flow therethrough, and a hollow cylindrical portion extending from said solid portion and abuting against the interior of said barrel portion throughout the remainder of its extent;

filter means adapted to fit within said hollow portion such that all fluid flowing completely through the assembly must pass through the filter means;

first membrane means for blocking and unblocking said apertures in said control block portion to permit fluid flow therethrough; and

second membrane means adapted to alter the effective volume of said hollow portion;

first pneumatic means for selectively deforming said first membrane means;

second pneumatic means for selectively deforming said second membrane means; and

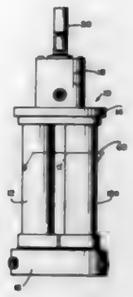
sealing means to restrain fluid to positions intermediate said first membrane means and said second membrane means.

4,690,622

LIQUID INTENSIFIER UNIT

Robert W. Decker, Stewartsville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 776,463, Sep. 16, 1985, Pat. No. 4,621,988. This application Aug. 7, 1986, Ser. No. 893,952
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] F04B *35/02*
U.S. Cl. 417—342 **3 Claims**



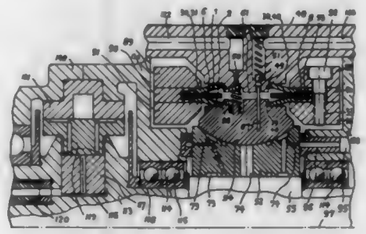
1. A liquid intensifier unit, comprising:
a plurality of elongate, liquid intensifiers; and
first means fixing said intensifiers together in juxtaposition; wherein
each of said intensifiers has a first, common opening at one end thereof for both admitting thereinto, and discharging therefrom, respectively, an operating, low-pressure fluid;
each of said intensifiers further has a second, common opening at the other, opposite end thereof for both admitting thereinto, and discharging therefrom, respectively, a subject liquid for pressure intensification of such liquid by such each intensifier;
each of said intensifiers also has a given, variable volume chamber formed therewithin for receiving therewithin, and expelling therefrom, an operating liquid; and further including
second means effecting a common, fluid communication of said given, variable-volume chambers only with each other, for conducting operating liquid, expelled from such a given, variable-volume chamber of one of said intensifiers, to said given, variable-volume chamber of another of said intensifiers; and
valving means, coupled to said intensifiers for admitting an operating, low-pressure fluid to, and for discharging the same, said, low-pressure fluid from, said first, common opening of each of said intensifiers, in turn, and repetitively; wherein
each of said intensifiers further has a low-pressure piston therewithin movable in first and second, opposite directions;
said valving means and said second means comprise means cooperative for moving one of said low-pressure pistons, in one of said intensifiers, in one of said first and second directions, at a given acceleration in response to a movement of another low-pressure piston, in another of said intensifiers, in the other of said first and second directions, at a differing acceleration;
said first means comprises a base plate;
said base plate has a given plurality of channels formed therein;
each of said channels has a pair of ports, formed in, and opening externally of, said plate, in communication therewith;
an aperture formed in said plate, and opening both externally and internally of said plate; and
ends of each of said channels are in fluid-flow communication with said aperture.

4,690,623

FLUID PUMPS, FLUID MOTORS AND DEVICES, WHICH INCLUDE A CONED RING

Karl Eickmann, 2420 Inshiki, Hayama-machi, Kanagawa-Ken, Japan

Division of Ser. No. 282,990, Jul. 14, 1981, Pat. No. 4,557,347, which is a continuation of Ser. No. 910,809, May 30, 1978, abandoned, and a continuation-in-part of Ser. No. 911,246, May 31, 1978, abandoned, and a continuation-in-part of Ser. No. 224,769, Jan. 13, 1981, abandoned. This application Dec. 9, 1985, Ser. No. 806,574
Int. Cl.[4] F04B *43/00*; F01B *19/00*
U.S. Cl. 417—472 **5 Claims**



1. A hydrostatic pump, comprising, in combination,
at least one working chamber for the reception and exhaustion of a fluid, inlet means and outlet means communicated to said chamber, at least one pair of coned rings adjacent to said chamber to border said chamber at least partially in two axially opposed directions with said coned rings symmetrically arranged about said chamber, at least one piston movable along its longitudinal axis to at least indirectly bear on one of said coned rings with said piston subjected to a drive means to move said piston along its longitudinal axis in periodic reciprocal movements to periodically increase and decrease the volume of said chamber by periodically expanding and compressing said coned rings and an improvement,
wherein said improvement comprises a combination,
wherein said combination includes the provision of an outer ring with planar axial end faces and said outer ring provided between the radial outer ends of said coned rings,
wherein said outer ring plate provides a distance between said coned rings and a seal ring bed radially inward of said outer ring and between said coned rings,
wherein a flexible seal ring is inserted into said seal ring seat,
wherein a planar inner ring of a thickness substantially equal to the thickess of said outer ring is inserted radially inward of said seal ring and between said coned rings, and,
wherein said outer ring extends radially outwardly beyond the outer diameters of said coned rings,

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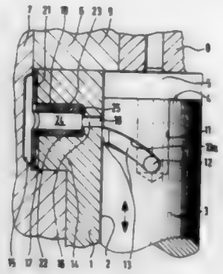
4,690,624

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Reinhard Schwartz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,454
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535800
Int. Cl.[4] F02M *59/26*
U.S. Cl. 417—499 **18 Claims**

1. A fuel injection pump for internal combustion engines having at least one pump cylinder, a fuel chamber, a diversion bore in said pump cylinder that extends to said fuel chamber, a pump piston that operates in said pump cylinder, said pump piston has a control edge cooperating with said diversion bore for an end of fuel supply, and a device in said diversion bore for preventing erosion, said diversion bore (**14**) is embodied as two segments, a stepped bore having a short, precisely disposed segment (**16**) of smaller diameter, and a longer segment (**17**) of larger diameter, said short segment (**16**) of smaller diameter



forms a precisely embodied inlet (**18**) which cooperates with said control edge of said pump piston (**3**), said longer segment (**17**) of larger diameter includes therein said device (**19**) for preventing erosion, said device is formed by a liner (**19**) of erosion-resistant material having an inner bore (**24**) which has a diameter at least as large as that of said shorter segment (**16**) of said diversion bore (**14**).

4,690,625

SCROLL-TYPE FLUID MACHINE WITH CONFIGURED WRAP EDGES AND GROOVES

Akira Murayama; Hiroshi Kuno; Naoshi Uchikawa; Takahiro Tamura; Takao Mizuno; Kazumi Aiba; Mitsuo Ikeda, and Kiyoshi Fukatsu, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,719
Claims priority, application Japan, Jan. 9, 1985, 60-848
Int. Cl.[4] F01C *1/04, 21/08*
U.S. Cl. 418—55 **3 Claims**



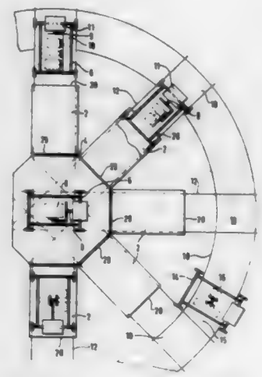
1. A scroll-type fluid machine comprising an orbiting scroll member and a stationary scroll member, each of said scroll members having an end plate and a spiral wrap protruding upright therefrom, said scroll members being assembled together with their wraps meshing with each other, said orbiting scroll member being movable to execute an orbiting motion so that closed spaces defined by the wraps and end plates of both scroll members are progressively moved towards the center thereof while decreasing their volumes in accordance with the orbiting movement of said orbiting scroll member, wherein steps are formed at respective corners of a groove bottom between adjacent turns of the wrap of each scroll member so that said groove bottom is formed in a different configuration from that defined between adjacent turns of the wrap of each scroll member, and edges of a projecting end of the wrap of each scroll member facing said steps are chamfered to avoid a collisions of said projecting wrap end with said steps.

4,690,626

ROTATIONAL MOLD SYSTEM WITH MULTIPLE STATIONS

Horst Krzepinski, Schulstrasse 23, 6837 St. Leon-Rot 1, Fed. Rep. of Germany

Filed Oct. 8, 1985, Ser. No. 785,548
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 8429732[U]
Int. Cl.[4] B29C *41/04*
U.S. Cl. 425—68 **14 Claims**



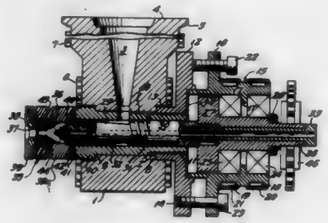
1. A rotational molding apparatus, comprising:
a mold filling station;
a heating chamber;
means for supporting at least one mold for forming workpieces; and
at least three cooling chambers arranged operatively adjacent and circularly around a center at which the heating chamber is disposed;
wherein said mold is movable between said mold filling station, said heating chamber and said cooling chambers.

4,690,627

ROTARY EXTRUSION HEAD MORE ESPECIALLY FOR MANUFACTURING CABLES WITH HELICAL GROOVES FOR OPTICAL FIBERS

Michel Sebille, Carrieres-Sur-Seine, France, assignor to Treficable Pirelli, Saint Maurice, France

Filed Nov. 21, 1985, Ser. No. 800,517
Claims priority, application France, Nov. 21, 1984, 84 17735
Int. Cl.[4] B29C *47/06*
U.S. Cl. 425—113 **6 Claims**



1. An extrusion head for applying a layer of a material to a core as it is advanced, said extrusion head comprising:
a head body having mandrel receiving bore extending therethrough and a duct extending transversely to said bore for supplying said material to said bore;
a mandrel rotatably and axially movably mounted in said bore, said mandrel having a downstream end and an up-

stream end and a screw threaded portion intermediate said upstream end and said downstream end and within said bore for advancing said material within said bore in the direction of said downstream end with rotation of said mandrel and said mandrel having an axial passageway therein for the passage of said core therethrough;

a die assembly secured to said mandrel at said downstream end thereof for rotation therewith, said assembly comprising a hollow cylindrical member carrying a die with an opening aligned with said passageway in said mandrel and said cylindrical member being restrained with respect to movement in the direction from said downstream end to said upstream end of said mandrel by said body;

adjusting means rotatably engaging said upstream end of said mandrel and acting between said upstream end of said mandrel and said body for adjusting the axial position of said mandrel within said bore; and

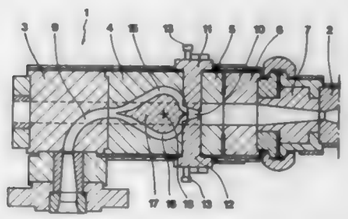
driving means at the upstream end of said mandrel and engaging the upstream end of said mandrel for rotating said mandrel.

4,690,628

ADJUSTABLE FEED BLOCK FOR COEXTRUSION DIE

Claude Dehennau, Waterloo, and Paul Dubois, Ghislenghien, both of Belgium, assignors to Solvay & Cie. (Societe Anonyme), Brussels, Belgium

Filed Oct. 8, 1985, Ser. No. 785,591
Claims priority, application France, Oct. 18, 1984, 84 16100
Int. Cl.[4] B29C *47/06*
U.S. Cl. 425—133.5 **6 Claims**



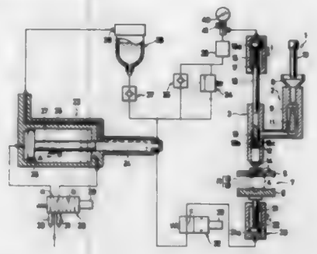
1. Adjustable feed block for a coextrusion die, comprising a main central channel having an axis for conveying a main stream of molten thermoplastic in a downstream direction towards a coextrusion die and at least one secondary channel, having a portion which is substantially parallel to the central channel, for conveying a second stream of molten thermoplastic in the downstream direction to form a local coating layer on the main stream, each secondary channel having a downstream end which is inclined relative to the central channel and which is connected to a portion of the periphery of the said central channel, wherein a connection between the central channel and each secondary channel is laterally delimited by ends of two adjustable slides which can be moved in a direction at right angles to a plane containing the axis of the central channel, and wherein each secondary channel is subdivided into two curved branches which join together again before the respective second stream of molten thermoplastic reaches the connection to the central channel.

4,690,629

INJECTION MOLDING MACHINE FOR SMALL-SIZED ARTICLES

Yoichi Horikawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,275
Claims priority, application Japan, Jun. 19, 1985, 60-131643
Int. Cl.[4] B29C *45/02, 45/70*
U.S. Cl. 425—156 **6 Claims**



1. An injection molding machine for small-sized articles of thermoplastic synthetic resin, comprising:

(a) a support;

(b) a mold supported on said support, said mold including a pair of first and second mold members jointly defining a mold cavity therebetween, said first mold member being fixed to said support, and said second mold member being movable toward and away from said first mold member;

(c) an injection unit having an injection cylinder through which molding material is to be injected through said first mold member into said mold cavity;

(d) a hydraulically pressurizable injection head cylinder supported on said support and operable on said injection cylinder for injecting the molding material into said mold cavity;

(e) a hydraulically pressurizable clamping cylinder supported on said support and operable on said second mold member for opening and closing said mold; and

(f) a booster operatively connected to both said injection head cylinder and said clamping cylinder for converting pneumatic pressure into high hydraulic pressure to actuate said injection head cylinder and said clamping cylinder in timed relation to each other.

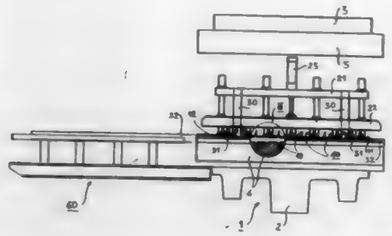
4,690,630

DEVICE FOR STRIPPING FROM A MOLD A COMPOSITE ELECTRICAL INSULATOR

Patrick Gissinger, Mariol, and Yves Poutignat, Puy Guillaume, both of France, assignors to Ceraver, Paris, France

Filed Apr. 24, 1986, Ser. No. 855,260
Claims priority, application France, Mar. 25, 1986, 86 04279
Int. Cl.[4] B29C *33/44;* **B25J** *15/10*
U.S. Cl. 425—236 **5 Claims**

1. In a press molding apparatus having top and bottom mold members defining mold cavities suitable for molding a composite electrical insulator having a core member and a finned casing of elastomer sheds, the improvement comprising a stripping device having a frame movable in translation relative to said press on guideways parallel to the axis of the insulator core, said frame comprising a carrying beam supporting a cylinder actuator and a beam parallel to the carrying beam and movable in vertical translation by means of said cylinder, the movable beam being equipped with a plurality of gripping modules for acting upon a few of the said sheds, each module having a first bearing part for part of one side of a shed and a second part having a recess, and an inflatable packing within



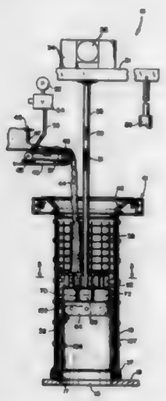
said second part for application against the corresponding part of the other side of the shed fin.

4,690,631

PACKERHEAD WITH ELASTIC ROLLERS

Michael L. Haddy, Harlinger, Tex., assignor to Hydrotile Machinery Company, Nashua, Iowa

Filed Mar. 6, 1986, Ser. No. 837,097
Int. Cl.[4] B28B *21/24*
U.S. Cl. 425—262 **26 Claims**



1. A machine for making concrete pipe in an upright mold comprising: a frame, a mold having a mold chamber for accommodating concrete to be formed into a concrete pipe, a packerhead movable in said mold chamber for forming a concrete pipe within said mold, cross head means movably mounted on said frame, means connected to said cross head means to selectively raise and lower the cross head means, means connecting the cross head means to said packerhead whereby said packerhead moves with said cross head means, drive means mounted on the cross head means for rotating said packerhead during upright movement thereof; means for supplying concrete to the mold chamber during the rotation and upright movements of the packerhead whereby the packerhead forms the concrete pipe in the mold, said packerhead comprising a generally circular plate, said means connecting the cross head means to said packerhead including means secured to the center of the plate connected to the drive means, a plurality of rollers rotatably mounted on the plate for rotation about separate generally upright axes for packing concrete in a cylindrical shape within the mold, each of said rollers having an upright roller shaft secured to the plate and projected upwardly therefrom, means mounting the shaft on the plate including an eccentric bushing attached to the shaft, said plate having a hole accommodating said bushing, said bushing being rotatable to adjust the radial position of the roller relative to the plate to vary the packing pressure of the roller on the concrete, and means for holding the bushing in an adjusted position, a generally cylindrical body surrounding said roller shaft, said body having a top end and a generally cylindrical outer surface, bearing means rotatably mounting the body on the roller shaft, a cap mounted directly on the top end of said body closing the upper end thereof, at least one upright fin secured to said cap, a continuous annular sleeve of elastic rubber material surrounding the body and mounted on the cylindrical outer surface thereof, said sleeve having a length about the same as the length of the body and a uniform thickness throughout the length thereof and a continuous cylindrical outer surface, means securing the sleeve to said body to prevent rotation of the sleeve relative to the body, said cylindrical outer surface of the sleeve being engageable with concrete in the mold chamber to insure rotation of the roller and packing of the concrete in the mold, cylindrical side wall secured to the plate and projected downwardly therefrom; and cylindrical trowel means secured to said side wall, said trowel means includes a cylindrical trowel of elastic material having an outer surface for troweling the inside surface of the pipe during movement of the packerhead relative to the mold.

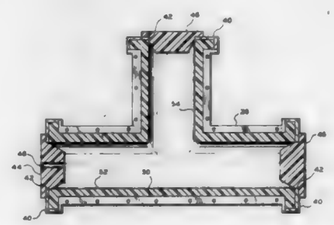
21. A packerhead for a concrete product making machine comprising: a generally circular plate, a plurality of rollers rotatable about separate generally upright axes for packing concrete in a generally cylindrical shape within a mold, each of said rollers having an upright roller shaft secured to the plate and projected upwardly therefrom, adjustable means mounting the shaft on the plate operable to adjust the radial position of the roller relative to the plate to vary the packing pressure of the roller on the concrete, a body surrounding said roller shaft, said body having a generally cylindrical outer surface, means rotatably mounting the body on the roller shaft, elastic sleeve means surrounding the body and mounted on the cylindrical outer surface thereof, said elastic sleeve means having a length about the same as the length of the body and uniform thickness throughout the length thereof and a continuous outer surface, means securing the sleeve means to the body to prevent rotation of the sleeve means relative to the body, said cylindrical outer surface of the sleeve means being engageable with concrete in the mold to insure rotation of the roller and the packing of the concrete in the mold.

4,690,632

METHOD AND APPARATUS FOR MOLDING HOLLOW ARTICLES

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 521,761, Aug. 9, 1983, Pat. No. 4,666,650.
This application Jun. 10, 1985, Ser. No. 743,131
Int. Cl.[4] B29C *39/26, 41/06*
U.S. Cl. 425—429 **6 Claims**



1. Apparatus for producing a hollow article, comprising:

a mold assembly having a cavity therein generally corresponding to the exterior shape of the article to be produced and having at least one portion defining a generally tubular sidewall of said article, said mold assembly having

an aperture therein communicating with the interior thereof at the extremity of said portion defining the generally tubular sidewall of said article;

plug means for closing said aperture said plug means defining vent means therein in the form of a vent hole extending through said plug means and terminating in a generally flat face of said plug means toward said cavity, in said mold assembly and usable for opening said aperture;

means for securing said plug means in position closing the aperture in said mold assembly;

means secured to said mold assembly for revolving said mold assembly about at least two nonparallel axes of rotation, said means being adapted to simultaneously revolve said mold assembly about each of said axes of rotation continuously in one direction through an angle of rotation greater than 360°; and

means for heating said mold assembly and the contents of the cavity therein including means for circulating hot gas through said cavity in said mold assembly.

4,690,633

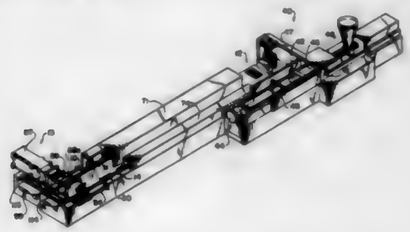
APPARATUS FOR PREPARING HOLLOW PLASTIC ARTICLES

Robert D. Schad, Toronto; Herbert Rees, Orangeville; Gary Hughes, Nobleton, and John R. Murchie, Aurora, all of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation-in-part of Ser. No. 648,793, Sep. 7, 1984, Pat. No. 4,522,581. This application May 14, 1985, Ser. No. 733,969

Int. Cl.⁴ B29C *49/02, 49/06*

U.S. Cl. 425—526 **13 Claims**



1. An apparatus for preparing hollow plastic articles said apparatus comprising: a receiving station for receiving a first number of plastic parisons; an injection molding machine in spaced relationship to said receiving station for injection molding said first number of plastic parisons in an injection molding cycle for transfer to said receiving station and means for transferring said first number to said receiving station; a finishing station for forming said plastic parisons into said hollow plastic articles; a first conveyor means moving from said receiving station to said finishing station; a second conveyor means returning from said finishing station to said receiving station; a multiplicity of pallets successively entrainable by said first and second conveyor means in a single row, each of said pallets being provided with holding means for holding a second number of parisons less than said first number, wherein said pallets are operative to transfer said plastic parisons from said receiving station to said finishing station; means to transfer said pallets from said finishing station to said second conveyor means; means to transfer said pallets from said second conveyor means one at a time to said receiving station until said holding means at said receiving station corresponds to said first number; means for transferring said pallets with said parisons thereon one at a time from said receiving station to first conveyor means; and means for transferring said pallets with said parisons thereon one at a time from said first conveyor means to said finishing station to form hollow plastic articles.

13. An apparatus for preparing hollow plastic articles said apparatus comprising: a receiving station for receiving a first number of plastic parisons; an injection molding machine in spaced relationship to said receiving station for injection molding said first number of plastic parisons in an injection molding cycle for transfer to said receiving station and means for transferring said first number to said receiving station; a finishing station for forming said plastic parisons into said hollow plastic articles; a first conveyor means moving from said receiving station to said finishing station; a second conveyor means returning from said finishing station to said receiving station; a multiplicity of pallets successively entrainable by said conveyor means in a single row, each of said pallets being provided with holding means for holding a second number of parisons less than said first number; means to transfer said pallets from said finishing station to said second conveyor means; means to transfer said pallets from said second conveyor means one at a time to said receiving station until said holding means at said receiving station corresponds to said first number; means for transferring said pallets with said parisons thereon one at a time from said first conveyor means to said finishing station to form hollow plastic articles, including a post-cooling means between the injection molding machine and receiving station for post-cooling the parisons, carrying means for transporting said parisons from said injection molding machine to said receiving station provided with heat transfer means to post-cool the parisons from the injection molding machine, wherein said carrier means comprises an open ended tube having a taper corresponding to the taper of the parison but somewhat smaller than the parison so that said heat transfer means is operative to shrink the parison upon cooling with the parison sliding inside the tube to fit snuggly therein.

4,690,634

METHOD OF MEASURING DRY SUBSTANCE IN FLUE GASES

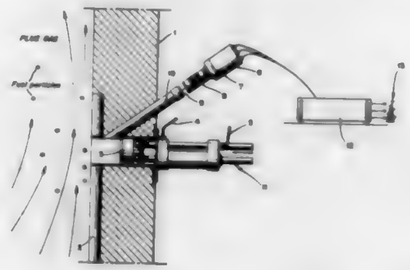
Torbjörn Heragren, Älvsjö, and Jon Lofthus, Sollentuna, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockhold, Sweden

Filed May 22, 1986, Ser. No. 865,848

Claims priority, application Sweden, May 31, 1985, 8502697

Int. Cl.⁴ F23C *5/00*; F23M *3/02*

U.S. Cl. 431—8 **20 Claims**



1. A method of measuring dry substance in the flue gas in liquor recovery units in mills for the manufacture of papermaking pulp and thereby render it possible to predict coats on heat surfaces, control of the size of fuel drops, control of the distribution of the fuel drops in the incinerator and/or control of the intensity of cleaning the heat surfaces of the boiler from soot, wherein radiation emitted from the combustion of fuel particles in the hearth of the liquor recovery unit above the fuel supply level is detected optically in the combustion chamber, the number of pulses of the signal received from the detection is determined and used as a measure of the number of fuel particles, and the signal is used for an indication and/or control of the operation of the unit.

4,690,635

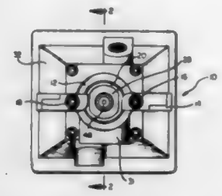
HIGH TEMPERATURE BURNER ASSEMBLY

William Coppin, Muncie, Ind., assignor to Maxon Corporation, Muncie, Ind.

Filed Jul. 21, 1986, Ser. No. 887,441

Int. Cl.⁴ F23C *7/00*

U.S. Cl. 431—187 **11 Claims**



1. In a high temperature burner assembly having a nozzle body for containing and conveying oxygen, a gas conduit disposed within the nozzle body and having means for directing a gaseous fuel therethrough to be expelled from the conduit and to mix with the oxygen for burning in a sustainable flame, and for use in association with a refractory burner block for substantially containing such flame, the improvement comprising:

a gas conduit tip connected to the gas conduit and including a substantially flat exteriorly disposed tip face, said tip face having a substantially frusto-conical shaped prominence disposed on and protruding from said tip face;

said gas conduit tip having a central gas channel centrally disposed therethrough and terminating at the proximal end of said frusto-conical shaped prominence to form substantially a knife edge shaped rim for briefly delaying combustion and to provide no substantial available surface for carbon accumulation thereon; and

primary oxygen expelling orifice means opening concentrically about the base of said frusto-conical shaped prominence for directing oxygen outwardly therefrom to mix with the gaseous fuel for initial combustion.

4,690,636

FLAT TYPE GAS BURNER, MORE PARTICULARLY FOR HOUSEHOLD APPLIANCES, ADAPTED FOR USING DIFFERENT GASES

Jean B. Lemonnier de Gouville, and Bernard Dane, both of Veigne, France, assignors to Sourdillon-Airindex, France

Filed Jan. 10, 1986, Ser. No. 817,727

Claims priority, application France, Jan. 30, 1985, 85 01311

Int. Cl.⁴ F23D *14/62*

U.S. Cl. 431—354 **7 Claims**

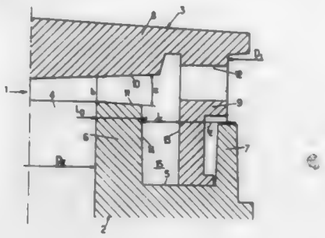
1. A flat type burner, more particularly for household appliances, comprising a burner body (**2**) with an axial, vertical and cylindrical gas mixture delivery passage (**4**) housing a gas injector (**25**) and a cap (**8**) covering the burner body (**2**) and resting thereon through an annular ring (**9**) having circumferentially spaced flame orifices (**12**), the annular surface (**11**) of the burner body bordering the opening of the gas mixture delivery passage (**4**) and the opposite surface (**10**) of the cap (**8**) defining an annular convergent-divergent system extending approximately transversely to the axis of the gas delivery passage, the burner body (**2**) and the annular ring (**9**) further defining between their opposite faces an annular decompression chamber (**15**) situated between said convergent-divergent system and the flame orifices (**12**), characterized in that:

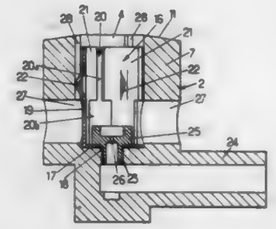
(a) the diameter (D_E) of the gas mixture delivery passage is determined by:

$$D_E = D_c K_3$$

where K_3 is a coefficient substantially between 1.10 and 1.34, (respectively for burner powers greater than 0.6 kW) determined for each value of D_c by the chart shown in FIG. 4, and D_c is the frustro-conical diameter equivalent to the Venturi diameter of the said annular convergent-divergent system, determined by

$$D_c = D_f K_4$$





with D_f=diameter (in mm) of the injector for butane gas and K_4=coefficient substantially between about 12.5 and 22 determined for each value of D_f from the charge of FIG. 3,

(b) an angle (α) formed by the opposite truncated cone shaped surfaces (**10, 11**) defining the annular convergent-divergent system is between about 3° and 8°,

(c) a length (L_D) of the divergent system is determined by:

$$L_D = \frac{D_1 - D_E}{2} - (l_E + l_c)$$

where

D_1=outer diameter of the ring

l_E=thickness of the ring

l_c=thickness of the expansion chamber

(d) and mechanical means (**16**) within the gas delivery passage for setting, for each type of gas usable in the burner, the venturi diameter equivalent (D_c) of the annular convergent-divergent system.

4,690,637

SIDE-MOUNTED FLASHLAMPS

Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Danvers, Mass.

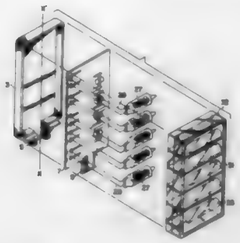
Continuation-in-part of Ser. No. 708,928, Mar. 6, 1985, abandoned. This application Feb. 19, 1986, Ser. No. 831,227

Int. Cl.⁴ G03B *15/02*

U.S. Cl. 431—359 **9 Claims**

1. In a miniaturized multilamp photoflash array having a base member formed to receive a circuit board having a longitudinal axis, a tab member and a printed circuit thereon, the improvement wherein said printed circuit is on a single surface of said circuit board and includes an electrically conductive

circuit extending from said tab member along one edge of said circuit board and parallel to said longitudinal axis, a plurality of spaced contact pads extending along an opposite edge of said circuit board and parallel to said longitudinal axis, a hot circuit extending from said tab member, a plurality of normally-open (N/O) switches connecting said hot circuit to a following flashlamp upon activation of a flashlamp, a plurality of



normally-closed (N/C) switches for connecting said common circuit to said hot circuit, a plurality of flashlamps each aligned normal to said longitudinal axis of said circuit board with a pair of leads connected to a pair of contact pads and extending over said opposite edge of said circuit board, and a light transparent cover member enclosing said flashlamps and printed circuit board and affixed to said base member.

4,690,638

WATER COOLED SCRAP PREHEATING BUCKET

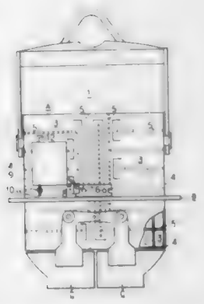
Fumio Nakagawa, Onoda; Kazuyoshi Nakamura; Hitoshi Shibao, both of Ube; Hiroshi Yoshimura, Onoda; Koichi Taki, Onoda; Makoto Inoue, Onoda; Eiji Hayashi, Onoda; Fusao Dejima, Onoda, and Yuritoshi Kohara, Onoda, all of Japan, assignors to Yamaguchikyoei Industry Co. Ltd., Japan

Filed Aug. 1, 1986, Ser. No. 892,012

Claims priority, application Japan, Aug. 6, 1985, 60-173672; Aug. 6, 1985, 60-173673; Aug. 6, 1985, 60-121402[U]; Aug. 6, 1985, 60-121403[U]; Nov. 27, 1985, 60-268044; Jan. 17, 1986, 61-5706[U]

Int. Cl.⁴ F27D *15/02*

U.S. Cl. 432—81 **12 Claims**



1. A bucket cooled by circulating water for use in preheating scrap to be charged into an electric furnace, which comprises;

a bucket-shaped container which contains scrap to be preheated and through which an exhaust gas from an electric furnace is passed to preheat the scrap contained therein;

a cooling water passageway which surrounds the periphery of said container; and

water supply and exhaust ports which are connected to said cooling water passageway, cooling water being supplied to and exhausted from the bucket during preheating of the scrap contained therein.

4,690,639

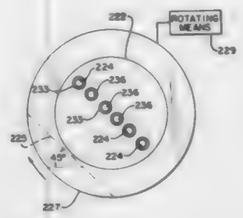
CONSTANT PRESSURE VARIABLE ORIFICE BURNER NOZZLE ASSEMBLY

James T. Voorheis, Essex Fells, N.J., assignor to Voorheis Industries, Inc., Fairfield, N.J.

Continuation of Ser. No. 733,557, May 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 585,087, Mar. 1, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,435

Int. Cl.⁴ F27B *7/34*

U.S. Cl. 432—105 **13 Claims**



1. A rotary kiln comprising:

a rotary tube for containing material to be burned, said rotary tube having a longitudinal axis, and said material tending to form a chordal incline at a substantially constant angle relative to a fixed reference frame as said tube containing said material is rotated in a given direction;

means for rotating said tube about its longitudinal axis; and

a burner gun at a first end of said tube, said burner gun including:

(a) conduit means having an inlet, an outlet at said first end of said tube and a longitudinal axis;

(b) gas inlet means for supplying a gas to said inlet of said conduit means;

(c) gas outlet means for emitting said gas supplied to said conduit means, said gas outlet means including a plurality of orifices arranged in at least one linear row at said outlet of said conduit means, each orifice having a longitudinal axis substantially parallel to the longitudinal axis of said conduit means, each linear row being arranged substantially parallel to said incline;

(d) a plurality of orifice plug means, each axially adjustable with respect to a respective one of said orifices; and

(e) control means for simultaneously adjusting said plurality of orifice plug means with respect to said plurality of orifices to vary the openings of said plurality of orifices so as to provide a constant gas velocity at the outlet of said conduit means.

4,690,640

ORAL VESTIBULE PLATE FOR PROPHYLACTIC PURPOSES AND EARLY ORTHODONTIC TREATMENT

Rolf Hinz, Kornerstrasse 6, D-4690 Herne 1, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 798,901

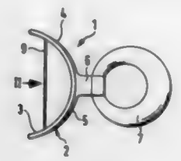
Int. Cl.⁴ A61C *7/00*

U.S. Cl. 433—6 **8 Claims**

1. An appliance for prophylaxis and early orthodonic treatment of children, said appliance comprising:

a curved, rigid shield of plastic material suitable for being inserted into the vestibule of the mouth of the wearer, said shield having a smooth concave inner surface, said shield having a post affixed to the middle portion of the outer surface and extendable through the lips of the wearer for receiving an appliance holding means on the exposed end; and

a wire crosspiece disposed across said shield along a line forming a secant of the curvature of said shield, said crosspiece having a pair of straight end portions disposed generally on a central plane of said shield that is oriented horizontally when said appliance is worn by an upright wearer, each of said end portions having an end mounted in said inner surface of said shield, said end portions extending inwardly from said inner surface along said secant line, said crosspiece having a central portion intermediate said end portions and lying on said secant line, said central



portion having a generally sinusoidal configuration including at least one central generally U-shaped bend extending in one direction with a generally U-shaped bend on either side thereof extending in an opposite direction, said central portion lying in a single plane containing said secant line and normal to said central plane with said U-shaped bends extending in opposite directions in said single plane, said crosspiece serving to hold back the tip of the tongue by means of said central portion when said appliance is worn.

4,690,641

CONTRA-ANGLE OR TURBINE HEAD OF A DENTAL HANDPIECE

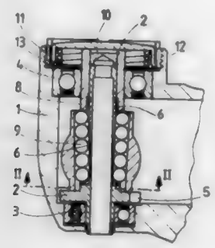
Jean-Jacques Luiset, Geneva, Switzerland, and Michel Seigneurin, Douvaine, France, assignors to Micro-Mega S.A., Besancon, France

Filed Feb. 3, 1986, Ser. No. 825,233

Claims priority, application France, Feb. 4, 1985, 85 02145

Int. Cl.⁴ A61C *1/14*

U.S. Cl. 433—129 **16 Claims**



1. A head of a dental hand piece comprising a head case, a chuck for receiving a smooth shank of a dental tool rotatably mounted in said case, means for driving said chuck in rotation about an axis, said chuck comprising a sleeve adapted to receive a smooth shank of a dental tool and provided with at least one elongate, axially extending clamping claw movable radially between an inner position for clamping said dental tool shank and an outer position for releasing said dental tool shank, an actuating member movable axially relative to said sleeve, said actuating member and clamping claw having in opposed surfaces elongate longitudinal grooves which face one another to form an elongate ramp way for rolling elements, an plurality of rolling elements disposed in a row in said ramp way, said ramp way extending in a generally axial direction but inclined at a small angle to said axis of rotation in such manner that axial movement of said actuating member relative to said sleeve acts through said ramp way and rolling elements to produce radial movement of said clamping claw, means for resiliently urging said clamping claw inwardly toward said clamping position and releasing means for manually moving said actuating member axially relative to said sleeve in a direction to move said clamping claw radially outwardly to said outer releasing position.

4,690,642

DENTAL POLISHING STRIP

Ikuo Kyotani, Kitamoto, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,756

Claims priority, application Japan, Nov. 9, 1984, 59-235046

Int. Cl.⁴ A61C *3/06*

U.S. Cl. 433—142 **12 Claims**



1. A dental polishing strip comprising:

(a) a substrate formed of a shape-memory alloy selected so that, after deformation by contact with the teeth during use, said substrate returns to its original shape upon being heated to a temperature at least slightly higher than the temperature of human mouths and

(b) a polishing surface on said substrate for polishing the proximal surfaces of teeth or fillings in the proximal cavity.

4,690,643

DENTAL FASTENING DEVICE AND METHOD OF USE

Carl H. Rousseau, 1510 Barry St., Clearwater, Fla. 33516

Filed Mar. 10, 1986, Ser. No. 838,245

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—213 **12 Claims**



1. A dental fastening device for fastening a wax substructure of a subsequently fabricated dental bridge adjacent to a first and second dental die of a cast during the fabrication and shaping of the substructure, the substructure having a pontic portion disposed between a first and a second abutment portion, the fastening device inhibiting relative movement between the pontic and abutment portions during hardening and shrinkage of the substructure, said fastening device comprising in combination:

a first elongate tie down member having a first and a second end, said first member fastening the first abutment portion of the wax substructure against movement relative to the first die, said first end of said first tie down member being anchored to the lingual face of the cast adjacent to the first die, said second end of said first tie down member being anchored to the buccal face of the cast adjacent to the first

die, said first tie down member extending from the lingual face of the cast adjacent to the first die over the occlusal surface of the first abutment portion and around to the buccal face of the cast adjacent to the first die; and

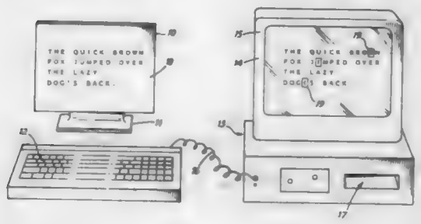
a second elongate tie down member having a first and a second end, said second member fastening the second abutment portion of the wax substructure against movement relative to the second die, said first end of said second tie down member being anchored to the lingual face of the cast adjacent to the second die, said second end of said second tie down member being anchored to the buccal face of the cast adjacent to the second die, said second tie down member extending from the lingual face of the cast adjacent to the second die over the occlusal surface of the second abutment portion and around to the buccal face of the cast adjacent to the second die such that during the hardening and inherent shrinkage of the wax substructure, said first and second die down members cooperate together for inhibiting relative movement between the pontic portion and the adjacent abutment portions of the wax substructure so that the subsequently fabricated dental bridge will be an accurate fit.

4,690,644

TEACHING APPARATUS, PARTICULARLY FOR TEACHING SHORTHAND

Robert G. Flanders, and Marguerita E. Flanders, both of Dico Education International, 247 Court Road, London, England (SE9 4TQ)

Filed Dec. 23, 1985, Ser. No. 812,138
Int. Cl.[4] G09B *11/00*
U.S. Cl. 434—158 **1 Claim**



1. An apparatus for use in teaching, comprising: a series set of printed sheets carrying information for use in teaching shorthand each set including a lesson page, a page printed with text, a page printed with a shorthand version of said text, and at least a partially blank sheet wherein each set is progressively more difficult;

a keyboard having its keys marked with symbols which include those related to the said shorthand teaching sheets;

a computer; and

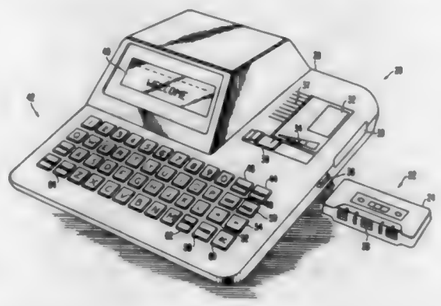
program means in said computer, to program the computer in relation to said information to check the accuracy of a student's transcription of at least part of the information by indicating the performance of the student.

4,690,645

INTERACTIVE EDUCATIONAL DEVICE

Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,410
Int. Cl.[4] G09B *7/06*
U.S. Cl. 434—309 **12 Claims**



1. An educational device adapted to receive a tape cassette having voice signals and data signals stored thereon, comprising:

driving means for driving the tape cassette;

reading means for reading the voice signals and data signals stored on the tape cassette, and for generating a voice playback signal and a data playback signal for each of the stored voice signals and data signals, respectively, the voice playback signal including a question and the data playback signal including data representing the correct answer to the corresponding question;

means for generating an audio signal, including the question, based on the voice playback signal;

user input means, actuated by a user, for inputting answer data in response to each of the questions, said user input means including means for inputting first, second or third mode signals indicating one of first, second and third modes of operation, the first mode being a mode in which the tape cassette has both voice signals and data signals stored thereon, the second mode being a mode in which the tape cassette includes only voice signals, so that the user can input the second mode signal when said educational device is to continously play the tape cassette incuding only voice signals, and the third mode corresponding to an internal game stored in said educational device;

display means including means for displaying the answer data as it is input by the user through said user input means, and means for generating first or second display signals to indicate whether the input answer data is correct or incorrect; and

control means for receiving the data playback signal, for controlling said driving means to drive the tape cassette in dependence upon the data playback signal, so that the tape cassette is temporarily halted to allow the user to input the answer data in response to the question included in the audio signal, for comparing the input answer data with the correct answer data included in the data playback signal, for generating a first control signal if the input answer data is correct and for generating a second control signal if the input answer data is incorrect, said display means generating one of the first and second display signals in dependence upon whether said control means generates the first control signal or the second control signal, said control means including:

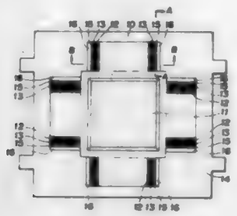
means for storing data corresponding to the internal game, said control means generating internal game display control signals or internal game audio control signals in accordance with the data corresponding to the internal game, said display means generating a display in response to the internal game display control signals, said means for generating an audio signal generating audio signals in response to the internal game audio control signals, said control means judging the input answer data input by the user via said user input means in response to the display generated by said display means or the audio signal generated by said means for generating an audio signal, and said control means causing said display means to generate a score based on the answer data input by the user.

4,690,646

IC PACKAGE CONNECTOR WITH CONTACTS OF HIGH DENSITY

Suegi Sibata, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,047
Claims priority, application Japan, May 29, 1985, 60-80729[U]
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—71 **1 Claim**



1. An IC package connector having closely spaced contacts, comprising:

a connector body;

an IC package accommodation section formed in the center of said connector body, said body having a wall extending around said accommodation section;

at least one pair of rows opposed to each other on opposite sides of said IC package accommodation section, each of said rows comprising a plurality of parallel partition walls at the same pitch and having a small thickness, a plurality of contact implanting slits defined between adjacent partition walls and having a small width, two separator walls having a thickness substantially the same as the thickness of said partition walls and disposed outside of the end partition walls at opposite ends of said rows and spaced from said end partition walls a distance substantially the same as the width of the contact implanting slits, and two buffer spaces having a width substantially larger than the width of one of said slits and each having one side wall constituted by the outside surface of the corresponding separator wall and the other side wall constituted by an inner surface of said wall of said connector body, at least part of said buffer spaces extending completely through the thickness of said wall of said connector body; and

a plurality of contacts in the contact implanting slits.

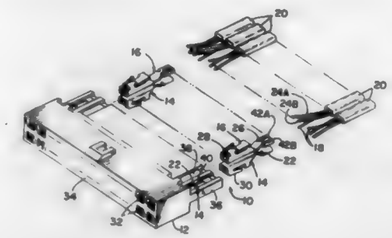
4,690,647

ELECTRICAL CONTACT FOR RECEIVING TWO CONDUCTORS

Wilbur A. Hamsher, Jr., New Cumberland, and William B. Long, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 3, 1986, Ser. No. 882,048
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—92 **3 Claims**

1. In a ground terminal for terminating an associated pair of small diameter ground conductor wires of tri-lead electrical cable means without substantially distorting the wires, for a multi-terminal electrical connector for a plurality of signal and associated ground conductor wires to be applied to electrical cable means for use in transmitting electrical signals with high reliability and uniformity, where the ground terminal includes a forward contact section and a terminating section axially rearwardly therefrom, the improvement comprising said terminating section including a spaced pair of discrete conductor-receiving slots coextending forwardly substantially in parallel from a rearward end thereof, the spacing of centers of said slots being about equal to the spacing of said associated ground conductor wires in said tri-lead electrical cable means, whereby said wires are terminable to said ground terminal substantially axially forwardly of the portions thereof within the cable means insulation, and each said slot having a width at at least one axial location selected to be just less than a respective said conductor wire and defined by inside surface portions of opposing side walls to hold a said conductor wire in interference fit therein at said at least one axial location to be terminated by laser welding, whereby each said ground conductor wire is weldable to said ground terminal by a discrete laser weld joint needing to be only slightly wider than a corresponding said slot thereby requiring less energy to perform the laser welding and reducing the risk of damaging each said wire.

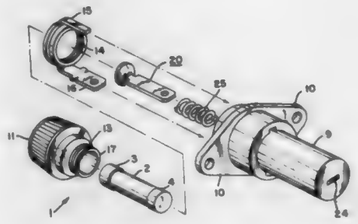


4,690,648

CARTRIDGE FUSE HOLDER

Angelo Urani, Ellisville, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 5, 1985, Ser. No. 720,503
Int. Cl.[4] H01R *13/08, 13/68*
U.S. Cl. 439—622 **10 Claims**



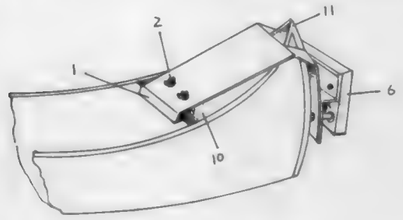
1. In a cartridge fuse holder for an electrical circuit including a body having an elongated bore open at one end and closed at its other end sized to receive a cartridge fuse having an electrical terminal at each of its ends, a removable mounting cap releasably secured to the body over the open end of the bore adpated to retain the fuse within the bore, and a stationary electrical contact adapted to engage the fuse terminal proximate the open end of the bore to connect said terminal to the electrical circuit, the improvement comprising a movable electrical contact adapted to connect the other fuse terminal proximate the other end of the bore to the electrical circuit, including:

a generally T-shaped contact formed from an integral sheet metal blank of electrically conductive material having a contact head portion reciprocably mounted within the elongated bore adapted to abut said other fuse terminal and a relatively flat shaft portion bent perpendicularly from said head portion, said shaft being located at the approximate center of said T-shaped contact;

a second bore of substantially the same cross-section as said

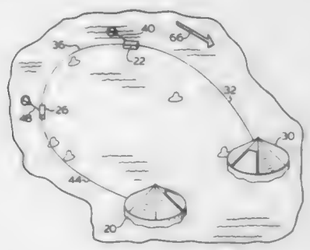
flat shaft portion extending through the closed end of the body having said shaft portion extending therethrough;
spring means within the elongated bore interposed between the closed end of the body and the said head portion adapted to urge the head portion against said other terminal; and
stop means on said shaft portion outwardly of the body retaining said movable contact within the elongated bore.

4,690,649
CENTER STERN OUTBOARD MOTOR MOUNT FOR DOUBLE-END CANOES
Richard E. Zeimet, 25 Wenchang St., Nantou, Taiwan (540)
Filed Apr. 15, 1985, Ser. No. 723,260
Int. Cl.[4] B63H *21/30*
U.S. Cl. 440—6 **10 Claims**



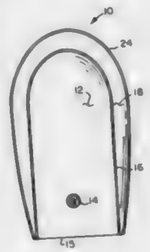
1. A center stern mounting for supporting a motor on a canoe having its sides converging and forming the canoe hull and terminating to form a pointed stern rear edge, the mounting comprising, a mounting member in the form of a single elongated rigid plate extending longitudinally of the canoe from a position forward of the pointed stern rear edge to a position rearward of the pointed stern rear edge, the member including an opening to allow the pointed stern rear edge to protrude therethrough, the member including a downward first bend directly forward of the opening, including a second downward bend directly rearward of the opening, the mounting member including a rearmost upwardly extending section, a motor mounting block being attached to the rearmost upwardly extending section, a third bend in the mounting member at a forwardmost section of the member to engage the canoe deck or otherwise to engage a canoe deck plate, and fastening means to retain the mounting member on the canoe.

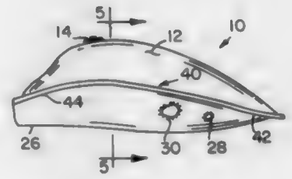
4,690,650
SEA RESCUE KIT FOR DEPLOYMENT FROM A HELICOPTER
Larry Bell, 702 Old Sackville Road, Lower Sackville, Nova Scotia, Canada (B4C 2K3)
Filed Jun. 20, 1986, Ser. No. 876,590
Claims priority, application Canada, Mar. 11, 1986, 503,820
Int. Cl.[4] B63C *9/04*
U.S. Cl. 441—40 **4 Claims**



1. A sea rescue kit deployable from a helicopter comprising a first self-inflating life raft, a second self-inflating life raft, a line connecting the first and second life rafts, and means associated with the line to retard the line in the water relative to the life rafts to cause the life rafts and line to assume a substantially horse-shoe-shaped configuration around a predetermined position in the sea after deployment from a helicopter upwind of the predetermined position.

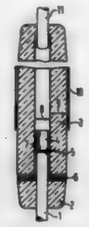
4,690,651
INFLATABLE AQUATIC DEVICE
Sam Samson, 150 Bennett Ave., New York, N.Y. 10040, and Mark J. Gruenspecht, 81-16 Chevy Chase St., Jamaica, N.Y. 11432
Filed Jan. 27, 1986, Ser. No. 823,085
Int. Cl.[4] A63B *31/02*
U.S. Cl. 441—56 **6 Claims**





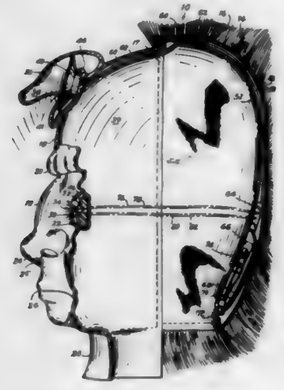
1. An inflatable aquatic device for use by a swimmer, comprising:
an inflatable chamber formed of flexible material;
a valve formed in said inflatable chamber to effect inflation and deflation thereof;
a flexible sheet element having a front and a rear and being attached to said inflatable chamber substantially around its periphery and including a non-attached peripheral portion at said rear adapted to receive a hand of the swimmer when said inflatable chamber is deflated, said flexible sheet element including a plurality of apertures formed through flat surfaces of said sheet material, through which fingers and thumb of the hand can protrude after being received therein; and
a rigid, U-shaped, flange element having a continuously variable width being wider at a location corresponding to said front of said sheet element and becoming less wide at locations corresponding to said rear of said sheet element, and being attached to said inflatable chamber along the peripheral portion thereof coextensively with said flexible sheet element, the arms of said U-shaped flange being arranged at the rear thereof said flange element being adapted to be substantially flat when said inflatable chamber is uninflated and being curved downwardly relative to said flexible sheet element at said front and said rear when said inflatable chamber is inflated.

4,690,652
METHOD OF MAKING A WALL STABILIZED INFRARED FLASH TUBE
Ingo Dilnisch, Wiesbaden, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany
PCT No. PCT/DE83/00138, § 371 Date Mar. 4, 1985, § 102(e) Date Mar. 4, 1985, PCT Pub. No. WO85/00927, PCT Pub. Date Feb. 28, 1985
PCT Filed Aug. 12, 1983, Ser. No. 713,405
Int. Cl.[4] H01J *9/32, 9/36, 61/36, 61/06*
U.S. Cl. 445—28 **1 Claim**



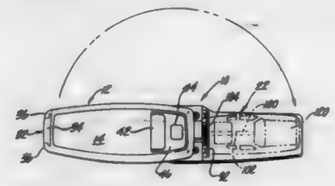
1. A method for manufacturing a wall-stabilized infrared flash tube comprising the steps of: holding a cylindrical electrode member having a cylinder length of at least 1.2 mm which is coated and/or saturated with an activator at its electron generating surface, securing said electrode member to a lead by beam welding by generating a weld having a cross-section less than the cross-section of the lead, inserting the electrode member on said lead into a flash chamber of a glass bulb, and fusing said lead vacuum-tight to the glass bulb.

4,690,653
NOISE MAKING MASK
Mel Goldberg, c/o Topstone Industries, Inc., 2 Augusta Dr., Danbury, Conn. 06810
Filed Oct. 3, 1985, Ser. No. 784,360
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—27 **5 Claims**



1. A noise-generating mask comprising:
(a) a face covering disguise section having a substantially realistically sized human head form fitting disguise area and a rear portion attached to said face covering forming a hollow structure with an inside surface;
(b) a surface abnormality integrally molded into said disguise area;
(c) a speaker mounted within said surface abnormality;
(d) electronic means for driving said speaker to generate a noise;
(e) power means for powering said electronic means and said speaker;
(f) wiring connecting said speaker, said electronic means and said power means;
(g) a pair of fake eyes provided to said disguise section; and
(h) said fake eyes being provided with light emitting diodes which are also electrically connected to said power means.

4,690,654
TOY VEHICLE CARRYING CASE AND LAUNCHER
George E. DeLaney, Hanover Park, Ill., assignor to Craft House Corporation, Toledo, Ohio
Filed Nov. 18, 1985, Ser. No. 798,924
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—28 **24 Claims**

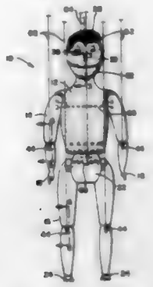


1. A toy vehicle carrying closure and launcher comprising, in combination:
an elongate housing having a top and bottom wall;
a retractable belt clip mounted on said housing for carrying said closure on the user's belt and retracting flush with said housing bottom wall when the launcher is placed on a surface for launching;
a vehicle carrier mounted to said housing for movement from a
first position in which the carrier is confined within said housing to function therewith as a carrying closure to a
second position presenting an open end for launching said vehicle;
ready means on said top wall for actuating movement of said carrier from said first to said second launching position;
a launching device operatively connected to said carrier; and
firing means on said top wall for causing said launching device to propel said vehicle.

4,690,655
TALKING MARIONETTE WITH THEATRE
Samuel G. Bailey, 815 S. 18th St., Apt. 200, Arlington, Va. 22202
Filed Jul. 1, 1986, Ser. No. 880,994
Int. Cl.[4] A63J *19/00*
U.S. Cl. 446—84 **11 Claims**

1. An amusement device comprising:
a marionette body suspended by a plurality of control lines, said control lines being attached at their lower ends to said body and one or more limbs, said control lines having upper ends disposed for use by an operator, said body being capable of suspension exclusive of any control line attached to a head of said body;
said head attached to said body at an upper torso, said head having a lower attached portion and an upper movable portion;
a head actuation line attached at a lower end to said upper movable portion, and having an upper end disposed for use by an operator;
pivot means connecting said upper movable portion to said lower attached portion, allowing said upper movable

portion to pivot about said lower attached portion when said head actuation line is raised and lowered; and



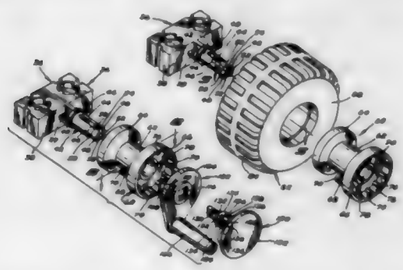
sound producing means disposed in said head, said sound producing means being in communication with an audio input signal source.

4,690,656

WHEEL AND WINCH ASSEMBLIES UTILIZING IDENTICAL HUBS AND AXLES IN A TOY CONSTRUCTION SET

Walter Friedman, Newbury, and David J. Stricker, Salem, both of Mass., assignors to Kenner Parker Toys, Inc., Beverly, Mass.

Filed Jun. 27, 1985, Ser. No. 749,258
Int. Cl.[4] A63H *17/00, 33/30, 17/26*
U.S. Cl. 446—95 **16 Claims**



1. In a toy construction set, a block, an axle projecting from one side of said block, said axle including a pair of legs formed by a slot therebetween, a spool-shaped hub journaled for rotation on said axle, means releasably engaging said legs to maintain said hub on said axle, and shiftable locking means having a tab movable into said slot to prevent rotation of said hub and movable out of said slot to permit rotation of said hub.

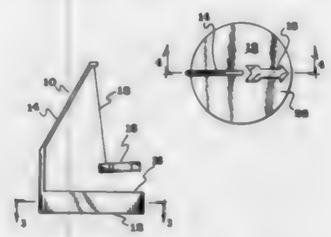
4,690,657

MAGNETICALLY ACTUATED AMUSEMENT DEVICE

Lawrence E. Lodrick, Sr., 2436 Harrison Ave., North, Rochester, Mich. 48063

Filed Jun. 3, 1985, Ser. No. 740,328
Int. Cl.[4] A63H *33/26;* **A63B** *71/00;* **A63F** *1/18*
U.S. Cl. 446—134 **9 Claims**

1. A magnetically cantilevered pendulously supported amusement device comprising:
- a base;
- an enclosed chamber disposed within the base;
- a first magnet having north and south poles on the opposite faces thereof contained within the enclosed chamber;
- a second magnet having north and south poles on the opposite ends thereof, pendulously supported above the base at one end thereof;
- wherein the polarity of the other, free end of the second magnet is the same as and repulses the polarity of the upper face of the first magnet and the strength of the repulsion between the first and second magnets is sufficient to at least balance the force of gravity acting to pull the free end of the second magnet down, thereby causing the free end to be cantilevered up and disposed at least as high as the supported end;
- wherein the first magnet is capable of free lateral movement



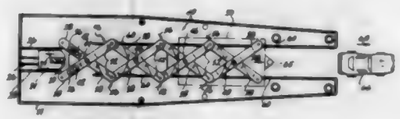
within the enclosed chamber and is displaced therein in response to movement of the base, said displacement causing a change in position of the free end of the second magnet;
- wherein the enclosed chamber contains means for permitting movably and randomly positioning of the first magnet; and
- wherein the positioning means comprises at least one ring larger than the first magnet but smaller than the chamber such that the at least one ring can move freely and randomly within the chamber and the first magnet can move freely within the at least one ring.

4,690,658

TOY CAR LAUNCHER WITH EXPANDABLE SCISSORS MEMBERS

Peter Crosson, Torrance; Terry Sanchez, Lakewood; Kevin Gray, San Pedro, and Samuel M. Goldstein, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 1, 1986, Ser. No. 880,775
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—429 **6 Claims**



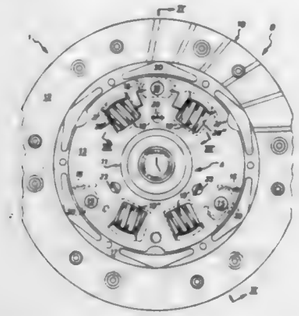
1. A toy vehicle launcher, comprising:
- a hollow body portion;
- a plurality of scissors members operably coupled together to form an expandable parallelogram linkage, said scissors members slidably mounted inside said body portion;
- a launching plate supported by said scissors members;
- a sliding plate operably engaged to said scissors members and slidably mounted inside said body portion; and
- hand grip means connected to said body portion for moving said sliding plate in order to activate said expandable parallelogram linkage.

4,690,659

TORSIONAL DAMPER DEVICE

Aldo Marchisio, Moncalieri Turin, and Carlo Beccaris, Santena Turin, both of Italy, assignors to Valeo, Paris, France

Filed Apr. 24, 1985, Ser. No. 726,889
Claims priority, application France, Apr. 27, 1984, 84 06717
Int. Cl.[4] F16D *3/14, 13/64*
U.S. Cl. 464—68 **5 Claims**



1. Torsional damper device comprising a first coaxial part in the form of a hub flange formed with circumferential slots, a second coaxial part in the form of two guide rings disposed one on each side of said hub flange and spacers passing through said slots and fastening said guide rings together, means for permitting relative angular movement between said first and second coaxial parts within predetermined limits of relative angular movement defined by abutment of said spacers with lateral edges of said slots, circumferentially acting elastic means disposed between said first and second coaxial parts along at least one circumference of the device urging them into an idle angular configuration and at least one elastic cushion member carried by one of said coaxial parts and operatively disposed circumferentially between one of said spacers and at least one of the lateral edges of the associated slot but off set from the zone of abutment of said one spacer with said at least one lateral edge to cushion elastically the abutment of said spacer against said edge, said at least one elastic cushion member being on said hub flange, there being a respective elastic cushion member associated with each slot in said hub flange, said elastic cushion member being an arch-shaped wire disposed in a plane parallel to the plane of said hub flange with each of its sides lying along a lateral edge of said slot.

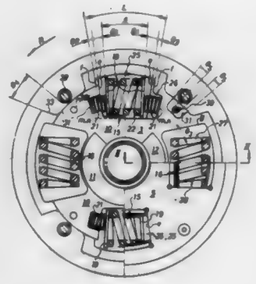
4,690,660

DAMPER DISC

Yasuyuki Hashimoto, Katano, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jul. 22, 1985, Ser. No. 757,504
Claims priority, application Japan, Jul. 31, 1984, 59-162338
Int. Cl.[4] F16D *3/14, 47/02*
U.S. Cl. 464—68 **3 Claims**

1. A damper disc comprising:
- an annular flange having an inner peripheral portion and being connected at the inner peripheral portion to a torque output part;
- a pair of annular side plates each having an outer peripheral portion, the side plates being connected at the outer peripheral portions thereof to a torque input part and arranged relatively twistably to said flange;
- a pair of annular sub-plates arranged relatively twistably to said flange, and frictionally connected to the corresponding annular side plates during a soft torsion operation;
- a first spring mechanism for the soft torsion operation disposed in first openings in the side plates, first openings in the sub-plates, and first openings in the flange for connecting the side plates to the flange;
- said first spring mechanism for the soft torsion operation including:
- a pair of first springs,
- a second spring disposed circumferentially between said first springs in series, and
- a pair of engagement parts, each disposed at a corresponding end of said second spring and operable to engage with edges of said first openings;
- said first opening in one of the flange and each side plate being designed to support both ends of the first spring mechanism for the soft torsion operation and to form a circumferential first space with respect to said engagement part in a neutral position,
- the other of said first openings in the flange and each side plate being designed to support both ends of the first spring mechanism for the soft torsion operation and to form a circumferential second space longer than said first space with respect to the engagement parts in the neutral position; and



- a second spring mechanism for a hard torsion operation disposed in second openings in the side plates and second openings in the flange for connecting the side plates to the flange;
- wherein said second spring of said first spring mechanism for the soft torsion operation consists of a compressible coil spring of large diameter, said each first spring consists of a compressible coil spring of a diameter smaller than that of said second spring, said openings in the combination of the side plate and the sub-plate, and the openings in the flange for the first spring mechanism for the soft torsion operation have configurations nearly similar to that of the first spring mechanism for the soft torsion operation, and said each opening in the sub-plate and in the flange has a pair of side edges having circumferentially long length therebetween for supporting the ends of the first spring and a pair of side edges having a circumferentially short length therebetween and operable to support said engagement parts.

4,690,661

TORSIONAL STRESS DISTRIBUTION FLEXIBLE COUPLING

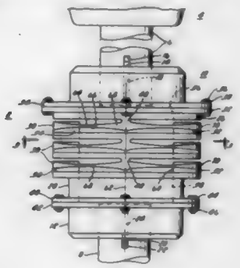
Walter A. Fredericks, and Edward W. McCullough, both of Warren, Pa., assignors to Rexnord Inc., Brookfield, Wis.

Filed Aug. 26, 1985, Ser. No. 769,237
Int. Cl.[4] F16D *3/52*
U.S. Cl. 464—78 **16 Claims**

11. A flexible coupling connected between a rotary power source and a device driven by the power source and which may be out of alignment with the power source, the flexible coupling including two spaced apart transfer members for transmitting the rotary power comprising:
- at least one flex element positioned between and spaced from

the transfer members, the flex element having an axis extending toward the transfer members, an axial thickness in the direction of the axis, and opposite sides facing in the axial direction;

a first plurality of spaced apart spacer links connected directly to one of the sides of the flex element and also connected to one of the transfer members, and a second plurality of spacer links connected directly to the other of the sides of the flex element and also connected to the other of the transfer members, the flex element being



stressed due to transfer to it by the spacer links of rotary power force from a transfer member and force due to misalignment of the rotary power source and the driven device;

the flex element varying in axial thickness peripherally about its axis to substantially equalize the stress concentrations in the flex element resulting from the stresses transferred to it by the spacer links; and

the flex element is symmetrical with respect to a plane bisecting said axial thickness and is symmetrical in peripheral directions on opposite sides of each spacer link.

4,690,662

SPEED CONTROL DEVICE

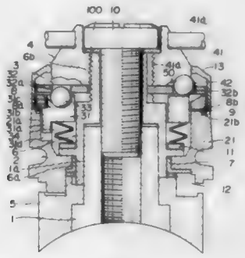
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 22, 1986, Ser. No. 888,161

Claims priority, application Japan, Jul. 29, 1985, 60-168295; Feb. 28, 1986, 61-44974

Int. Cl.⁴ F16H *11/08*

U.S. Cl. 474—69 **7 Claims**



1. A speed control device for operating a derailleur which includes a return spring, said speed control device comprising:

a fixing member;

a lever body rotatably supported relative to said fixing member, said lever body for operating said derailleur;

a positioning mechanism including a positioning member rotatable with said lever body about said fixing member, said positioning member for setting speed change stages of said derailleur;

a switching mechanism including an operating member, said operating member for selectively switching said positioning mechanism between an operating mode and a non-operating mode;

a friction mechanism for applying to said lever body a rotational resistance overcoming said return spring of said derailleur in response to said operating member being operated to switch said positioning mechanism to said operating mode, said friction mechanism for releasing said rotational resistance in response to said operating member being operated to switch said positioning mechanism to said non-operating mode;

said lever body comprising a first delay member and said positioning mechanism comprising a second delay member, said first delay member and said second delay member being angularly spaced apart to provide a gap therebetween, said first delay member and said second delay member cooperating to cause said positioning mechanism to idle in a predetermined rotation range of said lever body and to rotate with said lever body after a predetermined rotational delay corresponding to said gap; and

a delay negating means, responsive to said operating member switching said positioning mechanism to said non-operating mode, for negating said predetermined rotational delay and for causing said positioning member to rotate in concert with said lever body without any rotational delay.

4,690,663

REAR DERAILLEUR FOR A BICYCLE

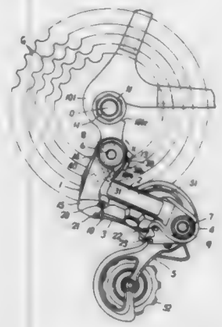
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,610

Claims priority, application Japan, Jun. 17, 1985, 60-91403[U]

Int. Cl.⁴ F16H *11/08*

U.S. Cl. 474—80 **5 Claims**



1. A rear derailleur for a bicycle, said derailleur being adapted to be mounted on a fixing member which is fixed to a frame of the bicycle and which has an abutting projection, said derailleur comprising:

a derailleur body including (i) a base member having a first stopper and (ii) a movable member;

a chain guide having a guide sprocket and a tension sprocket;

a first horizontal shaft to be fixed to said fixing member, for pivotably mounting said derailleur body on said fixing member;

a second horizontal shaft through which said chain guide is pivotably mounted on said movable member;

a stopper plate having a positioning nose adapted to be positioned opposite to said abutting projection and a second stopper to abut against said first stopper;

a first spring interposed between said base member and said stopper plate; and

a second spring interposed between said movable member and said chain guide;

said stopper plate including an adjusting means for changing the position of said positioning nose with respect to said abutting projection to thereby adjust a twist angle of said first spring.

4,690,664

TOOTHED BELT

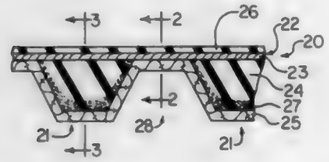
Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 508,209, Jun. 27, 1983, Pat. No. 4,533,420, and Ser. No. 378,978, May 17, 1982, Pat. No. 4,415,397, which is a division of Ser. No. 217,261, Dec. 16, 1980, Pat. No. 4,343,666, which is a continuation of Ser. No. 110,032, Jan. 7, 1980, abandoned, which is a division of Ser. No. 957,280, Nov. 2, 1978, Pat. No. 4,235,119. This application Apr. 22, 1985, Ser. No. 725,966

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.⁴ F16G *1/28*

U.S. Cl. 474—205 **10 Claims**



1. In a belt construction having opposed sides and comprising a tensile means intermediate said opposed sides, said tensile means having opposed sides, a plurality of teeth defining one of said opposed sides of said belt construction and being mainly formed of a first polymeric material that has reinforcing fibers therein, each tooth having opposed sides that are disposed in spaced relation to adjacent sides of adjacent teeth, and a backing member defining the other of said opposed sides of said belt construction, said backing member being mainly formed from a second polymeric material that is initially separate from said material of said teeth and is substantially free of fibers therein, said material of said backing member having a surface that joins with a surface of each tooth whereby said joining surfaces define an interface line therebetween, the improvement wherein said interface line for each tooth extends from a point that is intermediate said opposed sides of said tensile means and is spaced inwardly from one of said opposed sides of the respective tooth into the medial portion of said respective tooth and then back to a point that is intermediate said opposed sides of said tensile means and is spaced inwardly from the other of said opposed sides of said respective tooth whereby part of said material of said backing member defines part of the medial portion of each tooth.

4,690,665

CHAIN BELT CONSTRUCTION, LOAD BLOCK THEREFOR AND METHODS FOR MAKING THE SAME

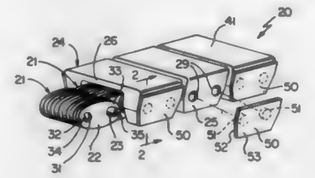
Larry R. Oliver, Springfield; James D. Hill, Jr., Marionville; Charles M. Lewis, Springfield; Gerald C. Hollaway, Jr., Springfield, and Jack Nelson, Springfield, all of Mo., assignors to Dayco Products, Inc., Dayton, Ohio

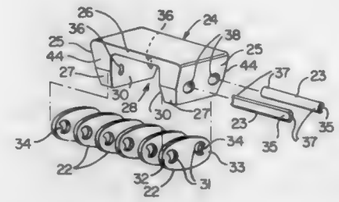
Filed Nov. 5, 1985, Ser. No. 795,070

Int. Cl.⁴ F16G *5/18*

U.S. Cl. 474—245 **18 Claims**

1. In a chain belt construction comprising a plurality of interleaved sets of links, each set of links having transversely disposed pivot pin means joining its links to the links of the sets of links adjacent thereto, and a plurality of load block means respectively interconnected to certain of said sets of links to be carried thereby, the improvement wherein each said load block means has means defining tubular opening means therein that telescopically receive said pivot pin means of its respective set of links therein to interconnect that load block means to its





respective set of links, each said means that defines its respective opening means having a portion thereof that interlocks with its respective pivot pin means to prevent rotational movement therebetween.

4,690,666

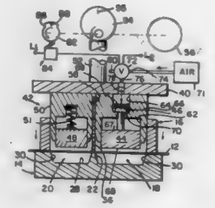
TRAY-FORMING APPARATUS

Garold W. Alexander, Noblesville; Lonnie E. Hyder, Huntington, both of Ind., and Robert V. Wright, Strongsville, Ohio, assignors to Peerless Machine & Tool Corporation, Marion, Ind. and Champion International Corporation, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,961

Int. Cl.⁴ B29C *51/20, 55/02*

U.S. Cl. 493—152 **23 Claims**



1. A die set for forming a multi-compartmented tray from sheet material, the die set comprising

a female die assembly formed to include at least two mold cavities and a drawing surface bounding said mold cavities and providing common drawing regions between adjacent mold cavities,

first compartment-former means for pressing sheet material into a selected mold cavity to form a compartment therein, the first compartment-former means including a first die for pre-forming the compartment, a second die for finish-forming the compartment, projection means for moving the first die relative to the second die in a direction toward the selected mold cavity from an initial position to a pre-forming position leading the second die into

the selected mold cavity during pre-forming of the compartment therein, and control means for disabling the projection means at a predetermined position of the first die in the selected mold cavity to permit relative movement between the leading first die and the trailing second die during finish-forming of the compartment in the selected mold cavity,

second compartment former means for pressing sheet material into the remaining mold cavities to form compartments therein, and

draw ring means for holding sheet material against said drawing surface during movement of the first and second compartment-former means into their respective mold cavities.

4,690,667

METHOD FOR PRODUCING A PACKAGING CONTAINER HAVING A PRESSURE RELIEF VALVE

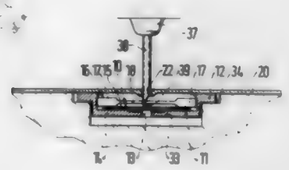
Klaus Domke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,505

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526602

Int. Cl.⁴ B31B *1/14, 1/90*

U.S. Cl. 493—213 **7 Claims**



1. A method for securing and forming a pressure release valve onto a packaging bag by use of a bag making apparatus which comprises:

forming a pressure release valve including a carrier having an inner bottom surface and a peripheral flange and including a central opening in the inner bottom surface;

said forming step including positioning a membrane on said inner bottom surface of the carrier and over the central opening and securing the membrane in the carrier at oppositely disposed surface areas,

positioning the pressure release valve in a recess of a support with the peripheral flange of the release valve supporting the carrier within said recess with the membrane above said inner bottom surface,

positioning a substantially gas impermeable packaging material to which the relief valve is to be secured over the carrier supported in the recess of the support,

securing the peripheral flange of the carrier to the packaging material, and

forming an opening through which gas can flow in the packaging material which coincides with the confines of the peripheral flange of said release valve and injecting a quantity of sealant through the formed opening onto said membrane which seals between said membrane and said carrier.

4,690,668

METHOD AND APPARATUS FOR MAKING A BUTT SEAM HAVING A COVER STRIP ON A TUBE OF MULTI-LAYER PACKAGING MATERIAL

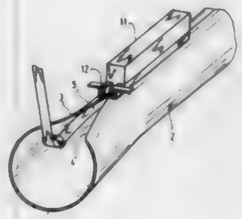
Manfred Rebmann, Weinstadt, and Helmut Weigold, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

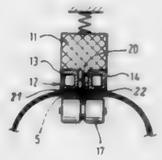
Filed Jun. 18, 1986, Ser. No. 875,898

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536172

Int. Cl.⁴ B31C *1/06*

U.S. Cl. 493—297 **3 Claims**





1. A method for making a butt seam on a multi-layered sheet of packaging material **1** having an inlay of metal and at least one outer layer of a thermoplastic which comprises forming said multi-layered sheet of packaging material into a tubular shape with substantially abutting longitudinal edges **3** and **4**, positioning and guiding said formed tubular shape of material with its edges **3** and **4** juxtaposed a pair of fixed induction coils placed so that the edges **3** and **4** are adjacent to each other, extending a separating blade downward between said fixed pair of induction coils and between said edges **3** and **4**, placing a thermoplastic cover strip **5** beneath said edges **3** and **4** pressing said cover strip onto an inner surface of said tubular shaped sheet of packaging material and welding said cover strip to said edges **3** and **4** by use of said pair of fixed induction coils placed juxtaposed said edges **3** and **4** of said formed tubular shaped packaging material as said tubular shaped sheet of packaging material and said cover strip travel continuously past said pair of fixed induction coils and are pressed together.

4,690,669

REFRIGERATED CENTRIFUGE HAVING A REMOVABLE BOWL

John F. Williams, New Canaan, and Emery L. Wagner, Norwalk, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1985, Ser. No. 802,303

Int. Cl.⁴ B04B *15/02*

U.S. Cl. 494—14 **5 Claims**

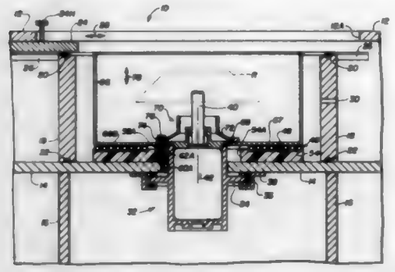
1. A centrifuge comprising:

a casing;

a drive member mounted within the casing, the drive member having a shaft mounted for rotational movement about an axis of rotation;

a refrigeration coil formed in a substantially planar array mounted within a casing;

a bowl mounted within the casing in thermal contact with the coil, the bowl being removable from the casing in a direction substantially parallel to the axis of rotation;



a thermally conductive material disposed between the bowl and the refrigeration coil; and

a formed plate of thermally insulated material corresponding in shape to the coil for supporting the coil within the casing.

4,690,670

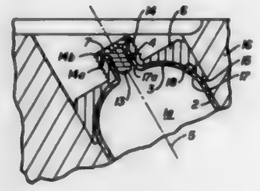
CENTRIFUGE TUBE HAVING REUSABLE SEAL

Steven T. Nielsen, 1126 W. Knickerbocker Dr., Sunnyvale, Calif. 94087

Filed Jan. 10, 1986, Ser. No. 818,524

Int. Cl.⁴ B04B *5/02*

U.S. Cl. 494—16 **17 Claims**



1. A centrifuge tube and seal comprising:

a tube having a body portion for holding contents to be centrifuged and a partially enclosed upper end, said upper end terminating in a filler stem,

said stem having a central aperture and an exterior end annular sealing surface;

a support crown fitting over said filler stem for supporting at least a portion of said stem below said sealing surface; and

a screw plug screw inserted into said central aperture of said stem, said screw plug having a screw head undersurface compressing said stem annular sealing surface when said screw plug is sufficiently torqued into said central aperture.

4,690,671

LUBRICATED TAMPON INSERTER

Mary T. Coleman, 23 Mertensia La., Henrietta, N.Y. 14467, and Hedy E. Tasbas, 29 Northfield Gate, Pittsford, N.Y. 14534

Filed Oct. 15, 1985, Ser. No. 787,470

Int. Cl.⁴ A61F *13/20*

U.S. Cl. 604—12 **14 Claims**

1. A device for placing an absorbent tampon into a body cavity comprising:

a. an applicator body comprising a tubular-like body within which said tampon is placed, said tubular-like body containing a plurality of conduits extending longitudinally along the inner side of said tubular-like body whereby fluid for medicating and or lubricating said tampon can be conducted down the side of said tubular-like body to and on to the other end of said tampon;

b. fluid reservoir means moveably and removeably attached to one end of said applicator body; and



c. movement means, moveably secured within said applicator body and at the end opposite said fluid reservoir, sized and shaped to fit within said applicator body, wherein said movement means can move the tampon out of the applicator body when the device is used,

whereby when said device is placed within said body cavity said treated tampon can be moved into said body cavity.

4,690,672

APPARATUS FOR REMOVING SOLID STRUCTURES FROM BODY PASSAGES

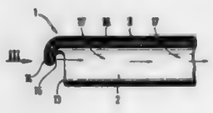
Elmar M. Veltrup, Hermann-Schumacher-Str. 16a, 4150 Krefeld 1, Fed. Rep. of Germany

Continuation of Ser. No. 768,025, Aug. 21, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,872

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 8426270[U]

Int. Cl.⁴ A61M *3/00*

U.S. Cl. 604—43 **1 Claim**



1. An apparatus for the removal of a solid structure from a passage in a body of a patient, said apparatus comprising:

a flexible dual duct catheter having distal and proximal ends adapted to be inserted into said passage and formed with

a flexible suction duct means having an outer portion opening at an open mouth at the distal end of said catheter placed in fluid communication with the passage in the patient's body and of substantially uniform flow cross-section between the proximal and distal ends of said suction duct means,

a flexible positive pressure duct means extending substantially along said outer portion of said suction duct means and terminating and extending distally of said mouth of said suction duct means and having a nozzle with an opening means to direct fluid in a direction opposite to the direction of flow in said positive pressure duct means into

said open mouth at the distal end of said suction duct means, the positive pressure duct means being of substantially smaller flow cross section than the suction duct means, and

a flexible wall extending along, unitary with and separating said suction duct means and pressure duct means laterally from each other, the wall adjacent said open mouth having a row of orifices extending longitudinally in the wall rearwardly from said open mouth providing fluid communication between said suction duct means and said pressure duct means;

means including a suction pump connected to said suction duct means at the porximal duct means end thereof remote from the suction-duct means mouth for aspirating material into and back through the suction duct means in an inward particle-flow direction; and

means including a high-pressure pump connected to said pressure duct means remote from the nozzle thereof for pressurizing the pressure duct means and thereby simultaneously directing a stream of water from the nozzle back into the mouth of the suction duct means to break up a solid structure at the mouth and for directing respective streams of said fluid from the orifices back into said suction duct means in the particle flow direction.

4,690,673

DUAL MODE I.V. INFUSION DEVICE WITH DISTAL SENSOR

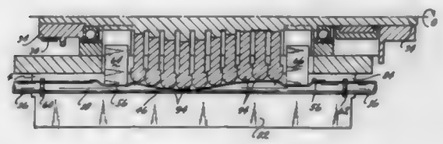
Ted C. Bloomquist, San Diego, Calif., assignor to IMED Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 801,987, Nov. 26, 1985, Pat. No. 4,617,014. This application Mar. 26, 1986, Ser. No. 844,414

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.⁴ A61M *31/00*

U.S. Cl. 604—67 **20 Claims**



1. A device for pumping fluids from a fluid source through a tube having a compressible pumping section, which device comprises:

a case;

means for holding a portion of said compressible pumping section on said case;

peristaltic means mounted on said case and operatively engaged with said tube to sequentially squeeze said pumping section and produce at least one moving zone of occlusion along said pumping section for infusing fluids to the patient;

a gauge fixedly mounted on said case and operatively coupled with said pumping section, at a predetermined location thereon, for sensing fluid pressure in said pumping section at said location at a first time when said I.V. tube downstream from said location is patent and at a second time when said I.V. tube upstream from said location is patent;

a first stationary finger disposed upstream from and adjacent to said gauge;

a second stationary finger disposed downstream from and adjacent to said gauge;

means to determine a pressure differential between said first time and said second time; and

means to alarm and cease operation of said device when said pressure differential attains a predetermined value.

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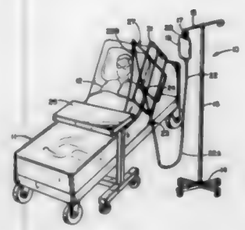
INTRAVENOUS TUBE ASSEMBLY

Herbert F. Dalglish, 284 Cherokee Ave., St. Paul, Minn. 55107

Filed May 12, 1986, Ser. No. 861,979

Int. Cl.⁴ A61M *27/00*

U.S. Cl. 604—93 **20 Claims**



1. An intravenous tube assembly for providing fluid intravenously to a patient, comprising:

a stand having an elongate vertical column supported on a pedestal base at a lower end thereof and having a hanger member at the upper end thereof;

an intravenous fluid container comprised as a flexible pouch suspended from the hanger member of the stand for containing a supply of intravenous fluid;

intravenous fluid tubing, having a first end operatively connected to the fluid container, and a second end connectable to a patient for intravenous receipt of fluid by the patient;

a mast assembly having an elongate, resiliently deflectable mast, a base, said mast having a fixed end secured to the base and a movable tip deflectable with respect to the base, and a tube holder located on the movable tip of the mast, said tube holder having means releasably retaining an intermediate tubular segment of the fluid tubing between the first and second ends;

said base of the mast assembly having means for securing the mast assembly on a structure proximate the patient with the mast holding the intermediate tube segment out of the way of the patient and positioned for deflection toward the patient upon movement by the patient away from the mast beyond a predetermined distance;

said tubing section between the tube holder on the mast and the second end being a measured length to extend from the top of the undeflected mast to the normal relaxed position of the patient with some residual tubing to accommodate limited normal patient movement before deflection of the mast upon additional movement in a direction away from the mast.

4,690,675

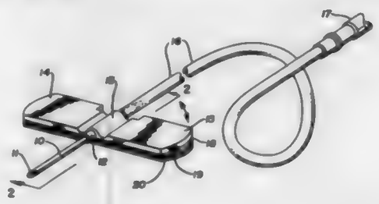
INTRAVENOUS NEEDLE ASSEMBLY

William Katz, 550 Parmalee Ave., Youngstown, Ohio 44510

Continuation-in-part of Ser. No. 672,926, Nov. 19, 1984, Pat. No. 4,627,842. This application Jun. 11, 1986, Ser. No. 872,867

Int. Cl.⁴ A61M *5/32*

U.S. Cl. 604—177 **3 Claims**



1. An improvement in an intravenous needle assembly having an elongated flexible body member with upper and lower surfaces with a central section and oppositely extending wing sections with respect thereto, and a hollow needle having a beveled end positioned through said central section transversely of said elongated flexible body member on a transverse horizontal plane; the improvement comprising means for tilting said elongated flexible body member and the hollow needle from said transverse horizontal plane to an angular transverse plane with respect to said transverse horizontal plane when said assembly is applied to a patient's skin, said means comprising at least one longitudinally extending transversely tapered resilient pad positioned on said elongated flexible body member in oppositely disposed relation to said central section and said hollow needle so that when said hollow needle of said assembly is positioned through a patient's skin and into a vein of said patient, said tapered flexible body member engages the patient'skin and tilts said central section and said hollow needle relative to said patient's skin and vein and spaces the beveled end of said hollow needle in unencumbered relation to the walls of said vein.

4,690,676

METHOD OF OPENING A MEDICINE PACKAGE

Thomas S. Moulding, Jr., 1954 Glencoe St., Denver, Colo. 80220, and Donald G. Ellis, Geneva Park, Boulder, Colo. 80302

Division of Ser. No. 532,038, Sep. 14, 1983, Pat. No. 4,604,847. This application Jun. 10, 1986, Ser. No. 872,482

Int. Cl.⁴ G09F *30/00*

U.S. Cl. 604—189 **25 Claims**



1. A method of dispensing medicine to a person comprising the steps of:

(a) providing a package of medicine provided with a code indicating information concerning the characteristics of the medicine;

(b) providing a machine having means for identifying the medical needs of the person and for determining whether the dispensing of the medicine to the person will help satisfy the medical needs of the person, means for reading the code and transmitting the information indicated by the code to said identifying and determining means, means for rendering the code unreadable only when said identifying and determining means determines that the medicine in the package will help satisfy the medical needs of the person, and means for opening the package only when said identifying and determining means determines that the medicine in the package will help satisfy the medical needs of the person;

(c) reading the code by the reading and transmitting means;

(d) rendering the code unreadable by the rendering means;

(e) opening the package by the opening means; and

(f) delivering the medicine to the person.

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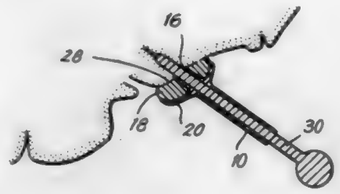
URINE COLLECTION SYSTEM FOR FEMALES

Robert A. Erb, Valley Forge, Pa., assignor to Daltex Medical Sciences, Inc., West Orange, N.J.

Filed Sep. 25, 1985, Ser. No. 780,056

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—329 **25 Claims**



1. An enclosed, self-contained female urine collection system which can be worn for extended periods of time and which avoids the necessity for catheterization, whereby transurethral transport of micro-organisms are avoided, or minimized, said system comprised of in combination:

(a) a flexible conduit for conducting urine from the urethral ostium to a urine collection and storage zone, said conduit having an internal diameter essentially the same as the urethra, and said conduit having disposed therein a movable, urethral positioning member whereby said conduit can be axially aligned with said urethral ostium,

(b) a support member affixed to and circumferentially encompassing one end of said conduit and having disposed thereon a pliable, adhesive sealing medium whereby the lumen of said conduit can be sealably positioned in alignment with the ostium of said urethra using said urethral positioning member and whereby said conduit does not penetrate said urethra, but is maintained in a leak-free relationship therewith so that urine can flow from said urethral ostium through said conduit to said collection and storage zone, and

(c) said urine collection and storage zone located at a point on said conduit distant from said urethral ostium.

4,690,678

DEVICE AND METHOD FOR FACILITATING ANIMAL ARTIFICIAL INSEMINATION

Margaret M. Douglas-Hamilton, Beverly, Mass., assignor to 501 Hamilton/Thorn Research Associates, Wenham, Mass.

Continuation-in-part of Ser. No. 588,681, Mar. 12, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 747,912

Int. Cl.⁴ A61F *5/00*

U.S. Cl. 604—349 **5 Claims**



1. A one-piece disposable artificial vagina liner and collection receptacle comprising:

a continuous flexible sheet defining

a generally tubular main portion having a first and a second end portion,

said first end portion defining an intromission opening,

said second end portion defining a closed, integral collection chamber, and

a filter means located within said liner intermediate said

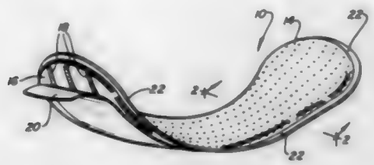
main portion and said collection chamber and secured to said sheet,
said first end portion and said second end portion, and the area disposed therebetween being constructed of the same material and having the same degree of flexiblity.

4,690,679

COEXTRUDED APERTURED FILM SANITARY NAPKIN COVER

William B. Mattingly, III, Somerset; Alex W. Cabe, Jr., Lebanon; Richard B. Chapas, E. Windsor, and Arthur J. Sampson, Jr., Belle Mead, all of N.J., assignors to Johnson & Johnson, New Branswick, N.J.

Filed Mar. 14, 1986, Ser. No. 840,290
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—383 22 Claims



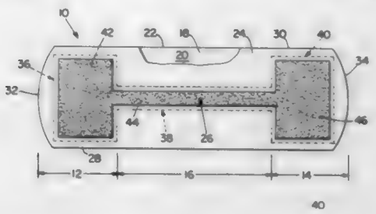
1. An absorbent product, including a body of absorbent material covered by a cover of polymeric materials, said cover comprising:
a first layer of polymeric material which exhibits a first melting point temperature;
a second layer of polymeric material, bonded to said first layer, said second layer exhibiting a second melting point temperature which is less than said first melting point temperature; and
a plurality of apertures, penetrating through both said first layer and said second layer for the transmission of fluids through said cover,
wherein said first layer maintains the integrity of said apertured cover when said cover is heated to a temperature below said first melting point temperature for thermal bonding of said cover.

4,690,680

ADHESIVE ATTACHMENT MEANS FOR ABSORBENT ARTICLES

Maureen L. Higgins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1986, Ser. No. 879,677
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—386 20 Claims



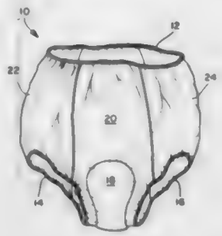
1. An absorbent article designed to be worn in the crotch region of a garment, the absorbent article having a central region, a first end region and a second end region, the absorbent article comprising:
an absorbent core;
a backsheet associated with said absorbent core; and
adhesive attachment means disposed on said backsheet for securing the absorbent article to a garment, said adhesive attachment means consisting of an adhesive pattern having the shape of a block I having
a base adhesive portion located in said first end region of the absorbent article,
a stem adhesive portion centrally located in said central region of the absorbent article, and
a head adhesive portion located in said second end region of the absorbent article.

4,690,681

DISPOSABLE LEAKPROOF CATAMENIAL DEVICE

Susan M. Hauaschild, Neenah; Stephen S. Hats, Menasha, and Shirlee A. Wismer, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 23, 1986, Ser. No. 821,631
Int. Cl.[4] A61F 13/16
U.S. Cl. 604—396 17 Claims



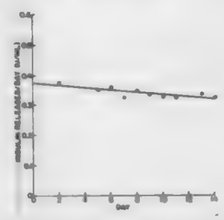
1. A disposable undergarment for absorption of human exudate comprising a panty-like garment having an elastic waist, elasticized legs, an absorbent integral with said undergarment extending from at least about the top of the pubic region through the crotch and upward to at least about the point between the upper portion of the crack between the gluteus maximus wherein said garment is provided with an impervious portion extending from a point above the pubic region in the front of the garment and extending through the crotch region and upward in the back to a point above the upper end of the crack between the gluteus maximus of the wearer, wherein there is a greater amount of absorbent in the back of the garment than in the front, wherein the elastic of said elasticized legs is separated from said absorbent by flexible nonabsorbent flaps between the absorbent and said elastic of said elasticized legs and wherein stretchy side fabrics cause said garment to conform to the body of the wearer.

4,690,682

SUSTAINED RELEASE

Franklin Lim, Richmond, Va., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Continuation of Ser. No. 485,471, Apr. 15, 1983, abandoned.
This application Jan. 14, 1986, Ser. No. 819,979
Int. Cl.[4] A61K 9/22
U.S. Cl. 604—891 17 Claims



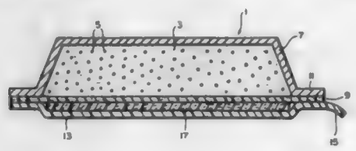
1. An injectable dispensing system for releasing a substance at a substantially constant rate in an environment immediately adjacent said dispensing system that depletes said substance, said system comprising:
a microcapsule having a membrane comprising a matrix of polycationic polymer salt bonded to a polyanionic polymer which defines an intracapsular volume, said membrane having a multiplicity of pores of dimensions sufficient to limit the rate at which the molecules of said substance pass therethrough from said intracapsular volume; and
disposed within said volume, for purposes of maintaining a given extracapsular concentration in said environment, a concentration of aid substance at least two orders of magnitude greater than said given extracapsular concentration which results in an osmotic pressure sufficient to sustain said limited rate when said capsule is placed in said environment.

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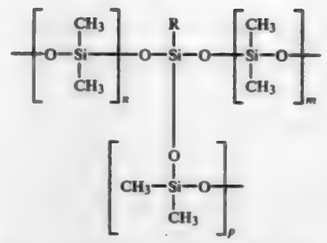
TRANSDERMAL VARAPAMIL DELIVERY DEVICE

Yie W. Chien, North Brunswick, and Kakuji Tojo, Highland Park, both of N.J., assignors to Rutgers, the State University of New Jersey, New Brunswick, N.J.

Filed Jul. 2, 1985, Ser. No. 751,126
Int. Cl.[4] A61K 9/00
U.S. Cl. 604—896 29 Claims



1. A transdermal drug delivery device comprising:
a permeable polymer matrix comprising a silicone elastomer corresponding to the formula:



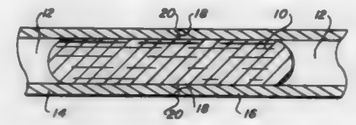
wherein R represents an alkoxy, alkyl, alkenyl or aryl group containing 1 to 7 carbon atoms and wherein n, m and p are each 100 to 5,000; said permeable polymer matrix having an effective cardiovascular affecting amount of 5-[-(3,4-dimethoxyphenyl) methylamino]-2-(3,4-dimethoxyphenly)-2-isopropylvaleronitrile and an effective release promoting amount of a first transport enhancing agent dispersed therein, and
a bioacceptable adhesive layer covering one face of said polymer matrix, said adhesive having an effective drug transport promoting amount of a second transport enhancing agent dispersed therein;
wherein said second agent is different from said first agent.

4,690,684

MELTABLE STENT FOR ANASTOMOSIS

Francis T. McGreevy, Aurora, and Karl W. Hahn, Englewood, both of Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jul. 12, 1985, Ser. No. 754,472
Int. Cl.[4] A61F 2/04; A61B 17/04
U.S. Cl. 623—12 17 Claims



1. A stent for insertion into the interior of the ends of a tubular vessel in a living being to align the ends of the vessel and support the vessel during anastomosis, comprising an integral solid of a biological fluid material adapted to melt into a fluid which is biologically compatible and naturally integrable with that fluid which normally flows through the vessel, said stent having a predetermined temperature substantially less than the temperature of the vessel upon insertion into the vessel.

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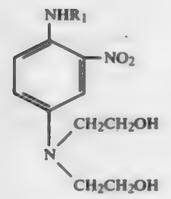
DYEING COMPOSITION FOR KERATINOUS FIBRES CONTAINING AT LEAST ONE CO-SOLUBILIZED N-SUBSTITUTED 2-NITRO-PARA-PHENYLENEDIAMINE

Jean-Francois Grollier, Paris; Jean Cotteret, Franconville; Alex Junino, Aulnay, and Alain Genet, Neuilly Plaisance, all of France, assignors to L'Oreal, Paris, France

Filed Sep. 26, 1985, Ser. No. 780,606
Claims priority, application Luxembourg, Sep. 27, 1984, 85557
Int. Cl.[4] A61K *7/13*
U.S. Cl. 8—405 **16 Claims**

1. A hair dye composition for living human hair comprising a solution in water, as a cosmetically acceptable vehicle, of (1) a paraphenylene diamine selected from the group consisting of

(a) a 2-nitroparaphenylene diamine of the formula



(I)

wherein

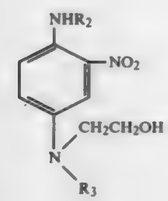
R_1 represents alkyl having 1–3 carbon atoms or β-hydroxyalkyl and

(b) an inorganic or organic salt of the 2-nitro paraphenylene diamine defined in (a),

said paraphenylene diamine being present in an amount ranging from 0.05 to 10 percent by weight, expressed as free based, based on the total weight of said composition, and

(2) a co-solubilizing amount of a compound selected from the group consisting of

(c) a compound having the formula



wherein

R_2 represents hydroxyalkyl wherein the alkyl moiety has 2–3 carbon atoms; and

R_3 represents ω-hydroxyalkyl wherein the alkyl moiety has 2–3 carbon atoms, with the proviso that when R_3=CH_2CH_2OH, R_2 does not represent β-hydroxyethyl, and

(d) an inorganic or organic salt of the compound defined in (c),

said compound of (2) being present in an amount ranging from 0.1 to 10 percent by weight, expressed as free base, based on the total weight of said composition.

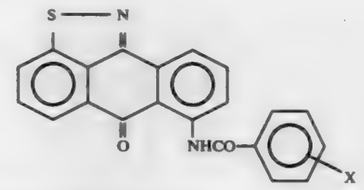
4,690,686

LIGHT-FAST YELLOW DISPERSE DYE COMPOSITION FOR POLYESTER

Toshio Nakamatsu, Ibaraki; Yoshikazu Matsuo, Sakai; Masao Nishikuri, Hirakata, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

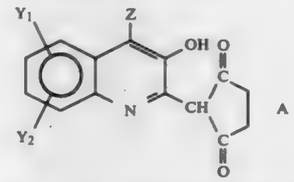
Filed Jul. 7, 1986, Ser. No. 882,714
Claims priority, application Japan, Jul. 9, 1985, 60-151035
Int. Cl.[4] C09B *1/00, 29/00*
U.S. Cl. 8—638 **5 Claims**

1. A water-insoluble disperse dye composition comprising a combination of a dye represented by the following formula (I),



(I)

wherein X is hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, in an amount of 95 to 20% by weight, and a dye represented by the following formula (II),



(II)

wherein Z, Y_1 and Y_2 are independently hydrogen or halogen, and the ring A is a benzene or naphthalene ring unsubstituted or substituted with a carboxylic acid ester group, in an amount of 5 to 80% by weight.

4,690,687

FUEL PRODUCTS COMPRISING A LEAD SCAVENGER

Thomas E. Johnston, Mentor, and Casper J. Dorer, Jr., Lyndhurst, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 766,615, Aug. 16, 1985. This application May 14, 1986, Ser. No. 863,623
Int. Cl.[4] C10L *1/30*
U.S. Cl. 44—67 **75 Claims**

1. An unleaded fuel composition for an internal combustion engine comprising a major portion of a liquid hydrocarbon fuel and a minor amount of:

(a) a hydrocarbon soluble alkali metal or alkaline earth metal containing composition; and

(b) a lead scavenger.

4,690,688

FOAM CONTROL

Graham Adams, Brussels, Belgium, and Martin A. Jones, S. Glamorgan, Wales, assignors to Dow Corning, Ltd., Barry, Wales

Filed Feb. 24, 1986, Ser. No. 831,954
Claims priority, application United Kingdom, Mar. 29, 1985, 8508254; Jan. 30, 1986, 8602234
Int. Cl.[4] C10L *1/28*
U.S. Cl. 44—76 **8 Claims**

1. A method for controlling foaming of a liquid hydrocarbon

fuel comprising the inclusion in the hydrcarbon fuel of an antifoam agent consisting essentially of a siloxane copolymer having the average general formula

$$Me_3SiO(Me_2SiO)_x(MeR'SiO)_ySiMe_3$$

wherein Me represents a methyl radical, R' represents the group $Q(OCH_2CH_2)_nOZ$ in which Q represents an alkylene group having from 2 to 8 carbon atoms, n is 5 to 25 and Z represents hydrogen or a group OCR" in which R" denotes a monovalent hydrocarbon group, and wherein the ratio of x:y is in the range of 1:1 to 9:1.

5. A hydrocarbon fuel treated by a method according to claim 1.

4,690,689

GAS TRACER COMPOSITION AND METHOD

Norman D. Malcosky, and Gregory Kozlar, both of Columbus, Ohio, assignors to Columbia Gas System Service Corp., Columbus, Ohio

Division of Ser. No. 471,278, Mar. 2, 1983, Pat. No. 4,551,154. This application Oct. 24, 1985, Ser. No. 790,814

Int. Cl.⁴ B65G *5/00*; G01N *33/22*

U.S. Cl. 48—174 **7 Claims**

1. A process for determining whether any of a plurality of porous underground gaseous methane storage sites is in fluid communication with a gas producing well, and if there is fluid communication, determining which site is in said fluid communication comprising injecting a different gaseous tracer mixture into each of a plurality of said sites at some location in each said site in an amount such that the presence of the tracer mixture will be detectable in the gaseous methane stored therein,

each said mixture having the properties of (1) not occurring in natural supplies of methane, (2) diffusing through any underground methane storage site in a manner very similar in rate to methane, and (3) being substantially insoluble in petroleum distillates,

after a period of time sufficient for each of said tracer mixtures to diffuse through the underground site from its injection location to the well, withdrawing a sample gaseous product from said well,

testing said sample gaseous product for the presence of each of said tracer mixtures.

4,690,690

STEAM REFORMING HYDROCARBONS

Sydney P. Andrew, Hartlepool; Ralph J. Doy, Saltburn-by-the-Sea, and Antony P. J. Limbach, Stockton-on-Tees, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Feb. 24, 1986, Ser. No. 832,425

Claims priority, application United Kingdom, Mar. 5, 1985, 8505684; Aug. 21, 1985, 8520890; Aug. 21, 1985, 8520891; Aug. 25, 1985, 8518824

Int. Cl.⁴ C01B *3/38*

U.S. Cl. 48—214 A **12 Claims**

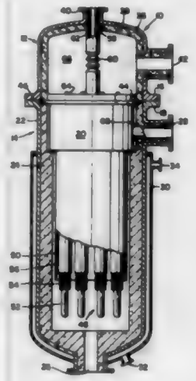
1. A process for producing a product gas stream containing hydrogen, carbon oxides, and methane by incomplete catalytic reaction of a hydrocarbon feedstock with steam and/or carbon dioxide comprising:

passing a reactants stream containing a hydrocarbon feedstock steam and/or carbon dioxide over a catalyst disposed in an elongated zone having an inlet end and an outlet end, said elongated zone being defined by an outer wall and a wall of a tube, disposed within the outer wall and extending from the outlet end of the elongated zone to the inlet end thereof;

externally heating said elongated zone with a heating medium;

withdrawing a product gas stream containing hydrogen, carbon oxides and methane through said tube countercurrently to the flow of said reactants stream over the catalyst; and

cooling the product gas stream by at most 100° C. by heat



exchange with the reactants stream across the wall of said tube as the product gas stream passes through said tube thereby improving heat transfer between the heating medium and reactants stream.

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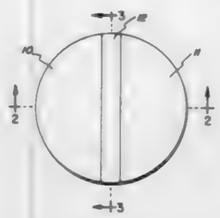
POLYCRYSTALLINE DIAMOND AND CBN CUTTING TOOLS

Ranga Komanduri, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,414

Int. Cl.⁴ B24D *3/00*

U.S. Cl. 51—293 **26 Claims**



1. A process for producing a composite of a partitioned polycrystalline diamond layer adhered to a substrate structure wherein said layer is partitioned into at least two discrete areas by a substantially straight partitioning part of said substrate structure, which comprises forming a supporting structure comprised of a substrate with at least one substantially straight partition on its surface, said partition dividing said support surface forming therewith at least two discrete support areas, said supporting structure being comprised of polycrystalline metal carbide containing a metallic cementing agent, substantially filling said support areas with crystals of diamond, heating the resulting assembly under an applied pressure to a temperature above the melting point of said metallic cementing agent but below a temperature which has any significant deleterious effect on said assembly for a period of time sufficient to form said composite and recovering said composite.

4,690,692

SYNTHETIC RESIN BINDERS AND THEIR USE FOR THE MANUFACTURE OF ABRASIVES

Wolfgang Hesse, Breckenheim; Richard Settelmeyer, Schlangenbad-Georgenborn, and Eckart Teschner, Hünstetten-Limbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 141,000, Apr. 17, 1980, abandoned, which is a continuation of Ser. No. 936,833, Aug. 25, 1978, Pat. No. 4,251,408. This application Jun. 22, 1984, Ser. No. 623,616

Int. Cl.⁴ B24D *3/02*

U.S. Cl. 51—293 **14 Claims**

1. A process for producing a flexible abrasive article comprising in sequence the steps of:

A. applying on a flexible substrate a first layer of a binder comprising a resinous component;

B. distributing abrasive particles in the first layer to form a particle embedded layer;

C. drying the first layer;

D. applying a second layer of a binder comprising a resinous component to the particle embedded layer to form a composite structure;

E. drying the second layer;

F. heating the composite structure to cure the first layer and the second layer;

wherein the resinous component of the binders used in steps A and D consists essentially of Component I and Component II;

wherein Component I is the reaction product of a monohydric phenol and formaldehyde in the molar ratio of 1:1.1 to 1:2.2; and

wherein Component II is a co-condensate of (a) a monohydric phenol, (b) a polyhydric phenol and (c) formaldehyde; wherein the molar ratio of a:c is from 1:1.1 to 1:1.9; wherein the molar ratio of a:b is from 1:0.1 to 1:2.0; wherein the molar ratio of (a+b):c is from 1:0.6 to 1:1.5; and

wherein the weight ratio of I:II is at least 70:30 and at most 95:5; with the proviso that in the resinous component the total amount of the polyhydric phenol is equal to or less than it is in a resinous component derived from Component I and Component II in a mixing ratio of 70:30 by weight; and wherein Component II has a molar ratio of 1.5 moles of polyhydric phenol to one mole of monohydric phenol.

4,690,693

HIGH PURITY SILICON NITRIDE POLISHING COMPOUND

Robert J. Dobbs, Monroeton, Pa., and Shuford M. Alexander, Jr., Dallas, Tex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 5, 1985, Ser. No. 804,724

Int. Cl.⁴ C04B *35/64*

U.S. Cl. 51—307 **4 Claims**

1. A polishing compound of relatively high purity silicon nitride, said silicon nitride comprising particles having essentially equiaxial crystals, the particle size being from about 0.03 microns to about 5 microns.

4,690,694

METHOD OF AUTOMATICALLY CONTROLLING AN ELECTROSTATIC PRECIPITATOR

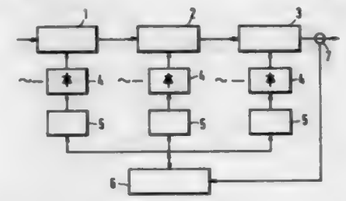
Franz Alig, Johannesberg; Heinrich Bücker, Gründau; Franz Neulinger, Erzhausen, and Helmut Schummer, Heusenstamm, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,882

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526009

Int. Cl.⁴ B03C *3/68*

U.S. Cl. 55—4 **12 Claims**



1. A method of optimizing the supply of energy to an electrostatic precipitator and avoiding a reverse corona discharge in such precipitator, comprising the steps of: energizing the precipitator in cycles, each of which comprising a pulsing time, in which at least one charging pulse is applied, and a non-pulsing time having a duration of a plurality of pulses, and iteratively changing parameters of the charging pulses in successive cycles to maximize the time in which the voltage across the precipitator decays from a peak value to a predetermined residual voltage.

4,690,695

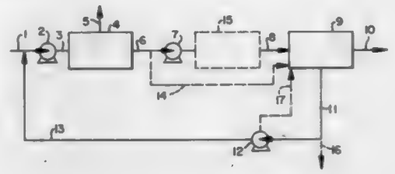
ENHANCED GAS SEPARATION PROCESS

Kishore J. Doshi, Mahopac, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 10, 1986, Ser. No. 850,045

Int. Cl.⁴ B01D *53/04, 53/22*

U.S. Cl. 55—16 **30 Claims**



1. A process for the enhanced separation of gases comprising:

(a) contacting a feed gas stream at an elevated pressure with a permeable membrane capable of selectively permeating a first component thereof, thereby obtaining a first component enriched, second component depleted permeate portion of said feed stream at a reduced pressure, and a second component enriched, first component depleted non-permeate portion of said feed stream essentially at said elevated pressure;

(b) withdrawing said non-permeate gas from the permeable membrane;

(c) passing said permeate gas to a feed end of an adsorbent bed in a pressure swing adsorption system capable of selectively adsorbing additional amounts of said second component therefrom at an upper adsorption pressure, with unadsorbed, purified first component gas being withdrawn as a high purity gas from a product end of the bed;

(d) countercurrently depressurizing the bed to a lower desorption pressure and/or purging said bed to desorb and release a first and second component-containing regeneration stream from the feed end of the bed; and

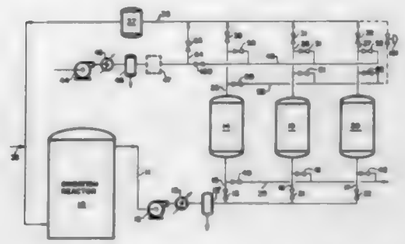
(e) recycling at least a first portion of said regeneration stream for combination with additional quantities of the feed gas stream, whereby the separation of the first component is achieved at a high purity and desirable recovery levels, with said second component being available at a desirably high pressure level.

4,690,696

OXIDATION OF CARBONACEOUS MATERIAL

Shivaji Sircar, Wescosville, and William R. Koch, Wilson, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 18, 1985, Ser. No. 789,002
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 **7 Claims**



1. In the oxidation of biological or other organic substances with an oxygen-rich gas stream containing 25 to 80 volume percent O_2, wherein there is evolved a gaseous effluent containing one or more oxides of carbon and unreacted oxygen, and wherein said effluent is freed of oxides of carbon by selective adsorption and the resulting CO_2-freed gas residue is recycled for use in said oxidation, the method which comprises the steps of:

(a) discharging the CO_2-containing gaseous effluent from the oxidation reaction and compressing the same to a pressure in the range of 30 to 100 psig;

(b) passing the thus-compressed gas during a fixed time period into and through a bed of adsorbent selective in retention of carbon oxides, while withdrawing from said bed an oxygen-containing gas stream substantially free of carbon oxides;

(c) following the aforesaid adsorption step (b) depressuring the adsorbent bed by withdrawal of gas therefrom in a direction counter to that of the adsorption step, until the pressure in said bed drops to about ambient atmospheric level;

(d) while at about ambient atmospheric pressure, purging the bed by passing air therethrough in a direction counter to that of the adsorption step, to remove sorbed oxides of carbon therefrom;

(e) and thereafter repressuring the purged bed to adsorption pressure by introduction therein of part of the oxygen-containing gas withdrawn during step (b);

wherein said steps (b) through (e) are carried out in a sequentially operated plurality of adsorbent beds wherein:

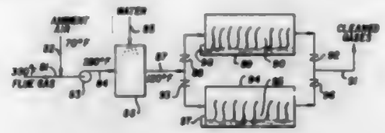
during the fixed time period that one bed is undergoing step (b), a second bed which has theretofore completed step (b) is subjected during the initial part of that time period to depressuring by gas withdrawal and during the remainder of that fixed time period said second bed is being purged, while during that same fixed time period, a third previously purged bed is being repressured to adsorption pressure level.

4,690,697

LONG RESIDENCE POLLUTION CONTROL SYSTEM

Arthur G. Schwartz, 1119 Smyrna Ct., Sunnyvale, Calif. 94087; Richard M. Gurries, 19314 Vineyard La., Saratoga, Calif. 95070, and Jay K. Johnson, P.O. Box 137, La Honda, Calif. 97020

Filed Feb. 20, 1986, Ser. No. 831,295
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—84 **12 Claims**



1. A process utilizing growing plants to remove noxious components from gaseous streams comprising the steps of:

providing a plurality of enclosures, each of which includes growing plants for removing noxious components from said influent gas stream prior to discharge;

providing inlet and outlet means associated with each enclosure for introducing said gaseous stream being purified and for discharging said purified gaseous stream to the atmosphere;

providing damper means for periodically swiching from one of said enclosures to another of said enclosures;

introducing said influent gas stream into a first enclosure through said damper means;

contacting said influent gas stream with said growing plants for a sufficient time to remove the noxious components in said gas stream and concomitantly permitting the plants to grow to a size where it can be harvested;

discharging said purified gas stream to the atmosphere;

switching said influent gas stream to a next enclosure, harvesting said grown plants from said first enclosure, and replacing said removed grown plants with smaller ones; and

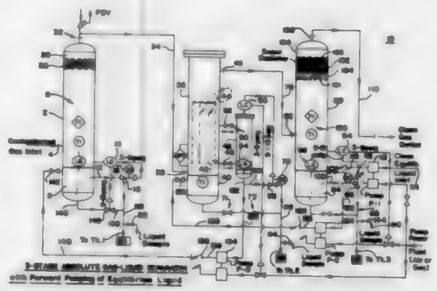
repeating the cycle.

4,690,698

ABSOLUTE SEPARATOH

Laurance S. Reid, 601 Broad La., Norman, Okla. 73069

Filed Jun. 25, 1986, Ser. No. 878,370
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—89 **16 Claims**



1. A method of continuously removing entrained liquid toxic contaminants from a gas stream comprising:

directing said liquid contaminated gas stream sequentially through a plurality of increasingly efficient gas-liquid separator vessels, each of said separator vessels containing a level of contaminant compatible solvent therein;

coalescing the liquid contaminant from said gas stream in said separator vessels into collectable droplets such that said droplets form part of said solvent in said separator vessels;

maintaining said solvent in each separator vessel in a greater than equilibrium amount disposed in direct contact with said gas stream in each of said gas-liquid separator vessels such that said coalesced liquid contaminant easily becomes part of said solvent; and

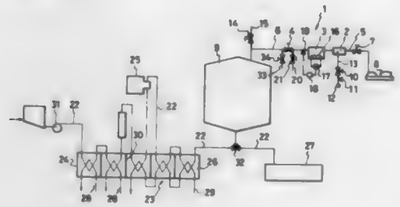
replenishing said solvent in said separator vessels to maintain a sufficiently high concentration of solvent in contact with said gas stream in each separator vessel to enable essentially complete absorption of said toxic contaminants in said solvent.

4,690,699

APPARATUS FOR PRODUCING STERILE AIR

Ko Sugisawa, Nara; Kazuya Sekiguchi, Ikoma; Masao Taguchi, Osaka; Masayuki Nakatani, Higashiosaka, and Hitoshi Iwata, Tsuzuki, all of Japan, assignors to House Food Industrial Co., Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,393
Claims priority, application Japan, Jun. 27, 1984, 59-132200
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—267 **3 Claims**



1. An apparatus for producing sterile air, comprising:

a compressor;

an air supply pipe connecting a sterilizing filter for filtering microbes to said compressor and disposed downstream therefrom;

a connecting pipe connecting said sterilizing filter to an air heater disposed downstream from said sterilizing filter; a sterile air supply pipe connecting said air heater to a downstream aseptic tank, said sterile air supply pipe further having a shut-off valve;

and

an air or condensate discharging pipe having a discharge valve at least on the upstream side of said shut-off valve, said shutt-off valve being closed to discharge sterile air from said air heater through the discharge valve at an initial stage of the production of the sterile air.

4,690,700

BACKFLUSHED AIR FILTERS WITH QUICK OPENING MULTIPLE DISCHARGE VALVE

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation-in-part of Ser. No. 549,963, Nov. 7, 1983, Pat. No. 4,544,389. This application Oct. 4, 1985, Ser. No. 784,872
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—302 **34 Claims**

1. A quick opening multiple jet discharge valve, which comprises:

a valve body including a main body having an inlet and a plurality of outlet nozzles arranged in a predetermined pattern so as to form overlapping jets of gas which expand to form a flow stream, each of said outlet nozzles having a valve seat interior of said valve body and an outlet exposed to ambient pressure exterior of said valve body, and a pilot pressure dome connected to said main body.

a valve member sealing positioned within said valve body between said pilot pressure dome and said outlet nozzle valve seats to divide said valve body into a primary chamber for receiving pressurized gas from said inlet and containing said outlet nozzle valve seats, and a pilot chamber, said valve member being movable between a closed position in engagement with said outlet nozzle valve seats and an open position;

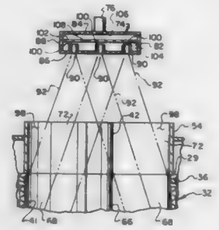
means for introducing pressurized gas into said pilot chamber to balance the pressure in said pilot chamber to equal the pressure in said primary chamber, thereby to urge said valve member into sealing engagement with said outlet nozzle valve seats to hold said valve member in said closed position.

and means for venting said pilot chamber to permit pressure in said primary chamber to move said valve member to said open position out of sealing engagement with said outlet nozzle valve seats, thereby to produce a quick exhaust of gas from said nozzles to produce a plurality of overlapping expanding jets of gas.

16. A porous media barrier type air filter unit, said filter unit including:

a housing forming a filter chamber including means for conducting dust laden air into said chamber;

a porous media barrier filter element in said filter chamber,



said filter element defining at least in part a clean air chamber for receiving air which has flowed through said filter element;

means for supporting said filter element in said filter chamber;

means forming a flow tube opening into said clean air chamber for conducting clean air from said clean air chamber and away from said filter element;

reverse flow air jet valve means disposed downstream of said filter element with respect to the direction of flow of clean air through said filter element, said valve means being in communication with a source of pressure air discharging in a predetermined pattern of multiple overlapping expanding frusto-conical jets forming a shaped jet of pressure air for contact with substantially the entire periphery of the walls of said flow tube, said valve means being arranged in such a way as to generate a jet having a cross sectional shape conforming to the cross sectional shape of said flow tube and for inducting a relatively large volume of substantially ambient pressure air into said flow tube in a direction opposite to the direction of flow of clean air out of said clean air chamber to backflush said filter element with a quantity of combined induced and jetted pressure air.

4,690,701

REUSABLE GREASE FILTER

Steven E. Hedrick, and Alan H. Gates, both of 771 S. Sherman, Denver, Colo. 80209

Filed Apr. 16, 1986, Ser. No. 852,559
Int. Cl.[4] B01D *45/16*
U.S. Cl. 55—436 **4 Claims**

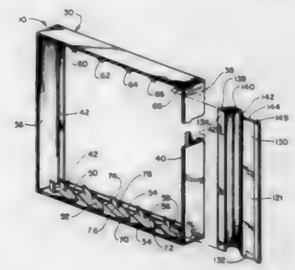
1. A reusable grease filter for installation in an exhaust system for restaurant cooking equipment and the like comprising:

frame means having a front portion, a back portion, a top portion, a bottom portion and lateral side portions adapted to be fixedly mounted in an exhaust system opening of similar shape to said frame means for supporting bracket means therein;

louver means positionable within said frame means having a plurality of discontinuous overlapping louver surfaces extending generally transversely of an exhaust system airflow direction and providing a plurality of tortuous air passages extending from a front portion of said louver means to a rear portion of said louver means, whereby passage of flame through said grease filter is substantially blocked by said transversely extending overlapping louver surface, and whereby grease and other airborne particles are removed from exhaust air passing through said tortuous passages through contact with said louver surfaces;

bracket means fixedly mounted on said frame means for stably holding said louver means in a predetermined position in said frame means and for enabling rapid removal and reinstallation of said louver means in said frame means for facilitating cleaning of said louver means;

wherein said louver means comprise a plurality of generally planar louver surfaces extending continuously from said top of said frame means to said bottom of said frame means and defining said tortuous air passages, whereby grease and other airborne liquids collecting on said louver means is provided an unobstructed downwardly directed flow



path by said planar surfaces to said bottom of said frame means, whereby said liquids are readily collectable in grease trough devices associated with said bottom of said frame means;

wherein said louver means comprises a plurality of individual louvers, each louver being integrally formed from a single metal plate and comprising a plurality of generally planar surfaces defining said planar louver surfaces and positioned in nonenclosing relationship with one another, whereby substantially all of said surfaces of a louver which is removed from said frame means are exposed, whereby said louvers are readily cleanable and reusable;

wherein said bracket means comprise a plurality of individual brackets mounted on said frame means top and bottom portions, said brackets each comprising an elongated inwardly projecting plate portion, said elongated plate portions of said brackets being arranged in parallel spaced apart relationship on said frame means, said brackets on said top portion of said frame means being positioned in mirror image relationship with said brackets on said bottom portion of said frame means;

wherein each said louvers comprises a plurality of vertically extending fold lines defining said plurality of planar surfaces, said louvers being relatively resiliently deflectable at said fold lines and having a shape adapted to fit in snug engagement between opposite portions of two laterally adjacent bracket plate portions whereby movement of said louver in a direction perpendicular to said bracket plate portions is restricted;

said louver means further comprising a hook shaped end portion adapted to receive a terminal end portion of said plate portion of an associated bracket therein for restricting the movement of said louver in a first direction generally parallel said bracket plate portion;

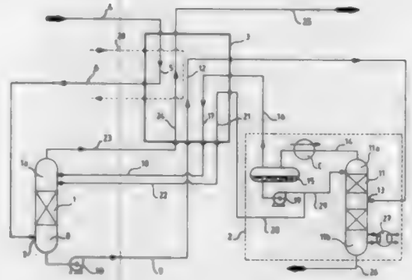
each said bracket comprising a nub surface protruding outwardly from said plate portion adapted to engage a terminal edge surface of an associated louver in snap-fit relationship, which edge surface is positioned at an end of said louver opposite said hook shaped end portion, for preventing movement of said louver in a second direction parallel to said bracket plate portion subsequent to snap-fit engagement of said louver with said nub surface.

4,690,702

METHOD AND APPARATUS FOR CRYOGENIC FRACTIONATION OF A GASEOUS FEED

Henri Paradowski, Cergy-Pontoise; Joëlle H. Castel, Le Pont Marly, and Hervé B. Parfait, Paris, all of France, assignors to Compagnie Francaise d'Etudes et de Construction "Technip", Paris, France

Filed Sep. 25, 1985, Ser. No. 779,811
Claims priority, application France, Sep. 28, 1984, 84 14996
Int. Cl.[4] F23J *3/06*
U.S. Cl. 62—23 **16 Claims**



1. A method of cryogenic fractionation of a gaseous feed into a residual gas containing the most volatile compounds of the feed and into a liquid product containing the heaviest compounds of the feed, compriaing the steps of:

injecting said feed in a partially condensed state into the bottom portion of a contact purifying-refrigerating column, which column produces in its head portion at least some of said residual gas, and in its bottom portion, a liquid;

withdrawing said liquid from said contact purifying-refrigerating column and injecting said liquid into a fractionating column to obtain in the bottom portion thereof a liquid product containing the heaviest compounds of the feed, and in the head portion thereof, a distillate;

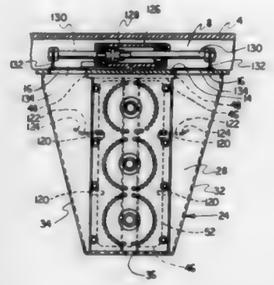
withdrawing said distillate from said fractionation column, and partially condensing and injecting said distillate as head supply into the said purifying-refrigerating column and recovering from the bottom of the fractionating column a liquid containing the heavy compounds contained in the vaporized fraction of a gaseous feed.

4,690,703

MOLD COOLING ARRANGEMENT FOR USE IN A GLASSWARE FORMING MACHINE

Constantine W. Kulig, Windsor, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 18, 1986, Ser. No. 853,538
Int. Cl.[4] C03B *9/38*
U.S. Cl. 65—265 **3 Claims**



1. A glassware forming machine comprising

mold cavity means including bottom means and opposing side means,

said bottom and side means having vertically extending cooling passages therein,

air plenum means defined by one long end wall, an opposed short end wall, a pair of inwardly inclined side walls forming with said end walls a keystone configuration, and top and bottom walls,

means for mounting said mold cavity means on the top wall of said air plenum means with said cooling passages communicating with the interior of said plenum means and with said mold cavity means centered on a line bisecting said end walls,

horizontally spaced opening means in said long end wall,

second air plenum means communicating with said first air plenum means through said horizontally spaced opening means so that air under pressure can be fed from said second air plenum means into said first air plenum means towards said short end wall, said inclined side walls being located outwardly from said mold cavity means so that the air will be directed centrally inwardly towards said mold cavity means.

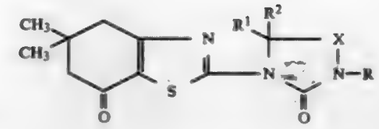
4,690,704

DERIVATIVES OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Hideo Arabori; Satoru Kumazawa; Susumu Shimizue; Takeo Watanave; Yohichi Kondo; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa, all of Iwaki, Japan, and Tsuneaki Chida, Greenbelt, Md., assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

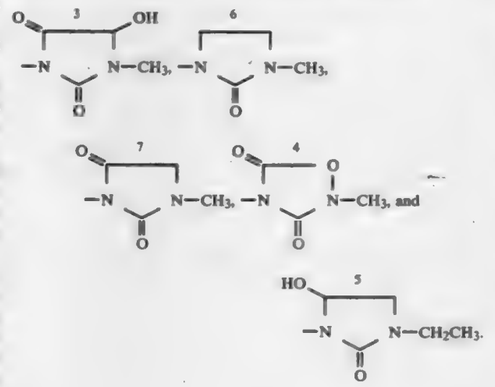
Continuation-in-part of Ser. No. 597,451, Apr. 6, 1984, Pat. No. 4,624,697. This application Jan. 17, 1986, Ser. No. 820,278
Claims priority, application Japan, Apr. 8, 1983, 58-61924
Int. Cl.[4] C07D *417/04*; A01N *47/38*
U.S. Cl. 71—90 **2 Claims**

1. A derivative of tetrahydrobenzothiazole represented by the formula (I):



(I)

wherein R represents a methyl group or ethyl group; R^1 represents a hydrogen atom, a hydroxyl group, methoxy group or =O together with R^2; R^2 represents a hydrogen atom or =O together with R^1 and X represents a methylene group, hydroxymethylene group, carbonyl group —O—, with the proviso that (1) X is not a methylene group when R^1 represents a methoxy group, (2) X is not a carbonyl group when R^1 represents =O together with R^2, (3) R is not an ethyl group when R^1 represents =O together with R^2 and X represents a hydroxymethylene group and (4) R is not a methyl group when R^1 represents a hydroxyl group and X represents a methylene group or a hydroxymethylene group, when R^1 represents a methoxy group and X represents a hydroxymethylene group, or when R^1 represents a hydrogen atom and X represents a carbonyl group; wherein the imidazolidinone moiety of said derivative is one selected from the group consisting of



4,690,705

HERBICIDAL SULFONAMIDES

Joel R. Christensen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,891, Nov. 30, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 788,711
Int. Cl.[4] C07D *403/14, 417/14*; A01N *47/36*
U.S. Cl. 71—90 **30 Claims**

1. A compound of the formula



I

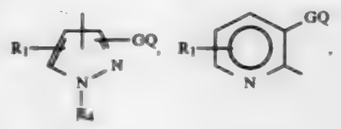
wherein

W is O or S;

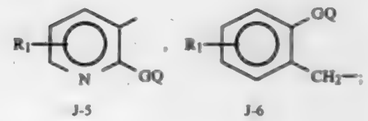
J is



J-1 J-2

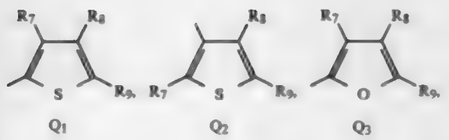


J-3 J-4

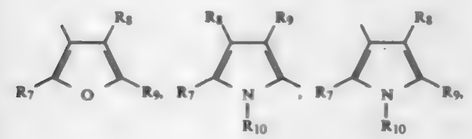


J-5 J-6

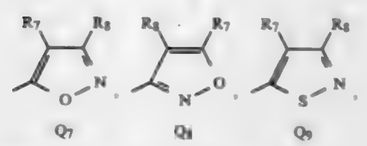
Q is



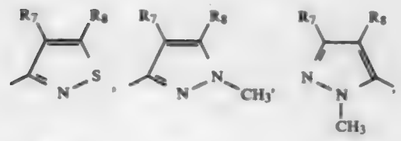
Q1 Q2 Q3



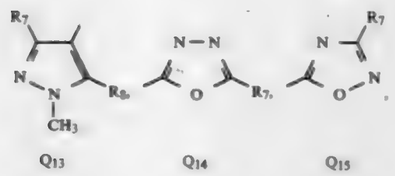
Q4 Q5 Q6



Q7 Q8 Q9

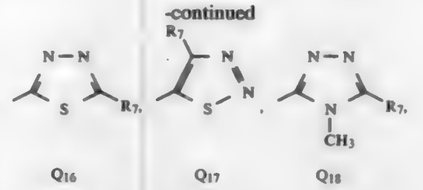


Q10 Q11 Q12

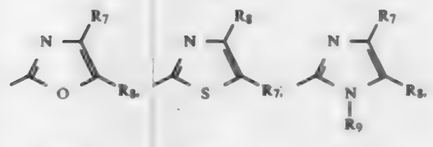


Q13 Q14 Q15

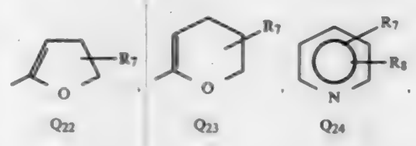
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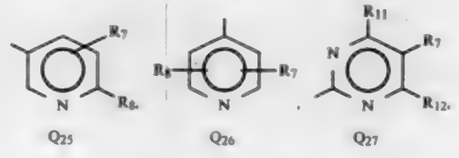
Q16 Q17 Q18



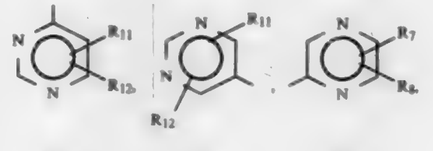
Q19 Q20 Q21



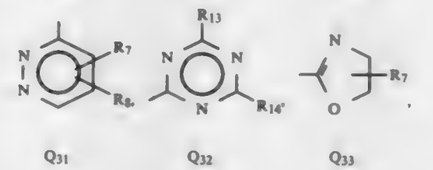
Q22 Q23 Q24



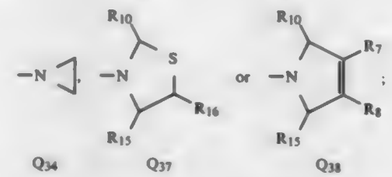
Q25 Q26 Q27



Q28 Q29 Q30



Q31 Q32 Q33



Q34 Q37 Q38

G is a C_1–C_3 alkyl radical in which one of the carbons must be substituted with R_2 and/or R_3, and the remaining carbon atoms may optionally be substituted with 1 or 2 substituents selected from CH_3, F and Cl;

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CO_2R^{III}, CH_2OCH_3, CH_2SCH_3, CH_2CN, NH_2, $NHCH_3$ or $N(CH_3)_2$;

R_2 is OH, OCH_3 or OC_2H_5;

R_3 is OCH_3 or OC_2H_5; or

R_2 and R_3 can be taken together to form a carbonyl group, or the 5- or 6-membered ring ketal or thioketal thereof;

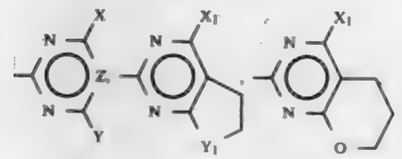
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

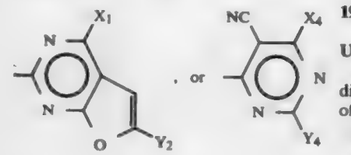
R^I and R^{II} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

A is



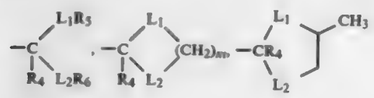
A-1 A-2 A-3



A-4 A-7

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, $C(O)R_4$,



or $N(OCH_3)CH_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_5 and R_6 are independently C_1–C_2 alkyl;

R_4 is H or CH_3;

Z is CH;

Y_1 is O or CH_2;

X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H;

Y_2 is H or CH_3;

X_4 is CH_3, OCH_3, OC_2H_5, CH_2OCH_3 or Cl; and

Y_4 is CH_3, OCH_3 or OC_2H_5;

R_7, R_8 and R_9 are independently H, CH_3, Cl or Br;

R_{10}, R_{15} and R_{16} are independently H or CH_3;

R_{11} and R_{12} are independently H, CH_3 or OCH_3; and

R_{13} and R_{14} are independently CH_3 or OCH_3;

and their agriculturally suitable salts; provided that

(a) when X is Cl, F, Br or I, then Y is OCH_3, OCH_2CH_3, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(b) when J is J-2 or J-3, then GQ and the sulfonylurea bridge must be on adjacent carbon atoms;

(c) when Q is bonded to G through nitrogen, then the adjacent carbon atom of G cannot be substituted with OH, F or Cl;

(d) when the total number of carbon atoms of X and Y is greater than four, then the total number of carbon atoms of R_1 and GQ must be less than or equal to ten;

(e) when W is S, the A is A-1, R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$; and

(f) when R_3 is OCH_3 or OC_2H_5, then R_2 is other than OH.

4,690,706

HERBICIDE

Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 257,867, Apr. 27, 1981, abandoned, which is a continuation of Ser. No. 98,860, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 732,899, Oct. 15, 1976, abandoned, which is a continuation of Ser. No. 453,305, Mar. 21, 1974, abandoned. This application Nov. 16, 1981, Ser. No. 321,727

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1973, 2319364

Int. Cl.[4] A01N *43/88*

U.S. Cl. 71—91 **6 Claims**

1. A herbicide composition comprising a carrier having dispersed therein a herbicidally effective amount of a mixture of herbicides consisting essentially of

(a) 3-isopropyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxide or a salt thereof, and

(b) γ-(2,4-dichlorophenoxy)-butyric acid or a salt or ester thereof in a weight ratio of a to b in the range of 10:1 to 1:10.

4,690,707

SULFONYLUREAS

Werner Föry, Basel; Karl Gass, Magden, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

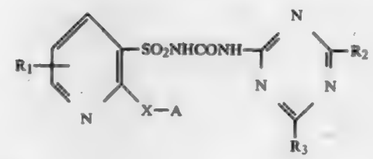
Division of Ser. No. 527,599, Aug. 29, 1983, Pat. No. 4,579,583. This application Oct. 4, 1985, Ser. No. 784,446

Claims priority, application Switzerland, Sep. 8, 1982, 5337/82; Apr. 28, 1983, 2283/83

Int. Cl.[4] C07D *251/18, 401/12;* A01N *43/66, 43/70*

U.S. Cl. 71—93 **21 Claims**

1. An N-pyridylsulfonyl-N'-triazinylurea of the formula



wherein

A is C_3–C_6alkynyl, C_1–C_6alkyl which is substituted by halogen or C_1–C_4alkoxy, C_2–C_4alkenyl which is unsubstituted or substituted by halogen or C_1–C_4alkoxy, or phenyl which is unsubstituted or substituted by halogen, cyano, nitro, C_1–C_4alkyl, C_1–C_4haloalkyl or —X—C_1–C_4alkyl,

R_1 is hydrogen, halogen or C_1–C_4alkyl,

R_2 is C_1–C_3alkyl which is unsubstituted or substituted by 1 to 3 halogen atoms, or is C_1–C_3alkoxy,

R_3 is hydrogen, halogen, an amino group —NR_4R_5, or C_1–C_3 alkyl which is unsubstituted or substituted by 1 to 3 halogen atoms, or is C_1–C_4alkoxy which is unsubstituted or substituted by methoxy, ethoxy or 1 to 3 halogen atoms,

R_4 is hydrogen or methyl,

R_5 is hydrogen, C_1–C_2alkyl or methoxy,

R_6 and R_7 are each independently hydrogen or C_3–C_6alkenyl, and

X is oxygen,

or a salt of such a compound.

15. A herbicidal and plant growth regulating composition which contains an effective amount of an N-pyridylsulfonyl-N'-triazinylurea according to claim 1, together with an inert carrier and/or other inert adjuvants.

4,690,708

HERBICIDES DERIVED FROM ARYLOXYBENZENECARBOXYLIC ACID IMIDES

Alain Chene, and Guy Borrod, both of Lyons, France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

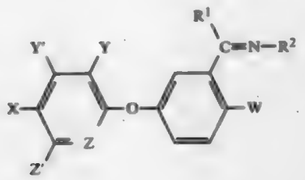
Filed Jul. 11, 1984, Ser. No. 629,895

Claims priority, application France, Jul. 12, 1983, 83 11858

Int. Cl.⁴ A01N *43/40*

U.S. Cl. 71—94 **38 Claims**

1. A compound of the formula:



wherein:

Z is selected from the group consisting of nitrogen and $-C(X')=$;

W, Y, Y', X, Z' and X' are each independently selected from the group consisting of hydrogen, halogen, NO_2, CN, C_1–C_4 polyhalogenoalkyl, C_1–C_4 alkyl and C_1–C_4 alkoxy;

R^1 is selected from the group consisting of halogen, X^2R^3 and NR^4R^5;

R^2 is selected from the group consisting of hydrogen, halogen, allyl, propargyl, CN, NR^4R^5, $C(X^2)R^7$, $C(X^2)X^3R^8$, $C(X^2)NR^4R^5$, SO_2F, SO_2OR^8, $SO_2NR^4R^5$, $P(X^2)R^9R^{10}$ and C_1–C_4 alkyl substituted by one or more of each of halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, NO_2, CN, phenyl, phenyl substituted by one or more halogen atoms, and a carboxyl group or one of its derivatives of the salt, ester or amide type;

R^3 is selected from the group consisting of C_1–C_4 alkyl, substituted C_1–C_4 alkyl, allyl and propargyl;

R^4 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, allyl, propargyl, C_1–C_4 alkylcarbonyl and C_1–C_4 alkylsulphonyl;

R^5 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, allyl, propargyl, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylsulphonyl, a cation and OR^6, wherein R^6 is selected from the group consisting of hydrogen, a cation, C_1–C_4 alkyl and substituted C_1–C_4 alkyl;

X^2 and X^3 are each independently selected from the group consisting of oxygen and sulphur;

R^7 is selected from the group consisting of hydrogen, C_1–C_{12} alkyl, substituted C_1–C_{12} alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, C_2–C_4 alkenyl and C_2–C_4 alkynyl;

R^8 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl and a cation;

R^9 and R^{10} are each independently selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, hydroxyl, OM, wherein M is a cation, halogen, X^2R^3 and NR^4R^5, wherein R^3, R^4, R^5 and X^2 are as previously defined above, provided that

(a) R^2 is not $COOCH_3$ when R^1 is OCH_3, W is NO_2, Y' and Z' are H, X is CF_3, Y is Cl and Z is —CH=, and provided futher that

(b) R^2 is not H when X is NO_2.

4,690,709

UREA DERIVATIVES, AND THEIR USE AS HERBICIDES

Ichiki Takemoto, Takarazuka; Seizo Sumida, Nishinomiya; Ryo Yoshida, Kawanishi, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 952,775, Oct. 19, 1978, Pat. No. 4,309,212. This application Nov. 3, 1980, Ser. No. 203,485

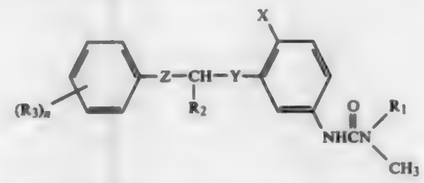
Claims priority, application Japan, Oct. 26, 1977, 52-129089; Feb. 28, 1978, 53-23027; Mar. 1, 1978, 53-23891

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.⁴ C07C *127/19, 119/00*; A01N *47/30*

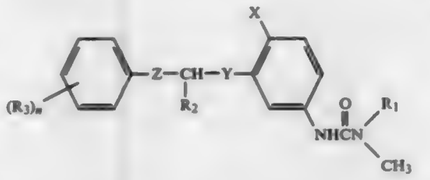
U.S. Cl. 71—120 **17 Claims**

1. A compound of the formula:



wherein R_1 is a hydrogen atom, a methyl group or a methoxy group, R_2 is a hydrogen atom or a lower alkyl group, R_3, which may be the same or different, is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group or a trifluoromethyl group, n is an integer of 0 to 5, X is a hydrogen atom or a halogen atom, Y is an oxygen atom or a sulfur atom and Z is a straight or branched C_1–C_8 alkylene group or a C_1–C_8 alkylene group which has at least one atom of oxygen and/or sulfur at the end of and/or inside the carbon chain.

17. A method for the selective control of broadleaf weeds in the presence of crops, said method comprising: applying, as an active ingredient, to said weeds or to soil containing seeds of said weeds a herbicidally effective amount of a compound of the formula:



(I)

wherein Y is oxygen; R_3, which may be the same or different, is a halogen atom, a C_1–C_3 alkyl group, a C_1–C_4 alkoxy group, a methylthio group or a trifluoromethyl group; n is an integer of 0 to 3; Z is a C_1–C_4 alkylene group; R_1 is a methoxy group; R_2 is hydrogen and X is hydrogen.

4,690,710

PROCESS FOR PRODUCING COBALT METAL POWDER

Richard A. Scheithauer; Clarence D. Vanderpool; Michael J. Miller, and Richard G. W. Gingerich, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 31, 1985, Ser. No. 793,079

Int. Cl.⁴ C22C *1/04*

U.S. Cl. 75—0.5 AA **7 Claims**

1. A process for producing pure cobalt metal powder, said process comprising:

(a) contacting a cobaltous salt with a sufficient amount of an alkaline earth halide in an aqueous solution at a sufficient temperature for a sufficient time to form a solution which is essentially cobaltous halide and a solid which consists essentially of a salt of said alkaline earth and the anion of said cobaltous salt;

(b) removing the cobaltous halide solution from the solid;

(c) complexing the cobaltous ions in the cobalt halide solution with ammonia in the presence of a catalyst to form a cobaltic hexammine ion;

(d) treating the resulting cobaltic hexammine ion containing solution with an acid in the presence of halide ions to form a cobaltic hexammine halide precipitate;

(e) removing said precipitate from the resulting mother liquor and impurities;

(f) dissolving said precipitate in an aqueous solution to form a relatively pure solution thereof;

(g) treating said relatively pure solution with a sufficient amount of a metallic hydroxide to form a cobalt containing precipitate; and

(h) reducing said cobalt containing precipitate to form cobalt metal.

4,690,711

SINTERED COMPACT AND PROCESS FOR PRODUCING SAME

Brian C. Coad, San Francisco, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 680,105, Dec. 10, 1984, abandoned. This application May 21, 1986, Ser. No. 865,303

Int. Cl.⁴ C22C *19/05, 38/18, 38/32, 38/54*

U.S. Cl. 75—244 **3 Claims**

1. A compact having an iron group alloy additive selected from a nickel boron-silicon alloy having nickel as the major element and an iron-silicon-chromium-nickel alloy having iron as the major element as a continuous phase and iron as a discontinuous phase wherein said additive has a melting point of at least about 50° C. lower than that of the discontinuous phase.

4,690,712

POLYAMIDE-MODIFIED METAL RESINATES AND THEIR USE IN PUBLICATION GRAVURE PRINTING INKS

Edward G. Janusz, Wallington, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,530

Int. Cl.⁴ C09D *11/08*

U.S. Cl. 106—30 **6 Claims**

1. A printing ink comprising a polyamide-modified metal resinate, a pigment, and a solvent.

3. A process for the preparation of a polyamide-modified metal resinate which comprises reacting a metal resinate in solution with a polyamide in solution at a temperature within the range of about 25° to 100° C.

4,690,713

ANTIFOAM COMPOSITION

Nobuyuki Terao; Masaaki Yamaya, and Fumio Okada, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,218

Claims priority, application Japan, Jan. 27, 1984, 59-13178

Int. Cl.⁴ C09K *3/00*; B01D *17/00*

U.S. Cl. 106—287.16 **6 Claims**

1. An antifoam composition which comprises:

(a) 100 parts by weight of a hydrophobic base fluid selected from the class consisting of hydrocarbon oils and organopolysiloxane fluid having a viscosity in the range from 20 to 1,000,000 centistokes at 25° C.;

(b) from 0.1 to 40 parts by weight of an organosilicon compound represented by the general formula $R^1_aY_bSi$, in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 20 carbon atoms, Y is a monovalent group selected from the class consisting of alkoxy groups, acyloxy groups and alkenyloxy groups having 1 to 6 carbon atoms and a hydroxy group and the suffixes a and b are each a positive integer of 1, 2 or 3 with the proviso that a+b=4;

(c) from 1 to 40 parts by weight of a finely divided silica powder; and

(d) up to 5 parts by weight of a catalyst.

4,690,714

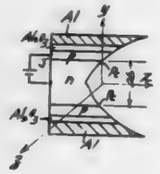
METHOD OF MAKING ACTIVE SOLID STATE DEVICES

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 7,584, Jan. 29, 1979, Pat. No. 4,371,406, which is a continuation of Ser. No. 764,433, Jan. 31, 1977, Pat. No. 4,136,435, which is a continuation of Ser. No. 405,138, Oct. 10, 1973, abandoned, and Ser. No. 580,414, May 23, 1975, abandoned, said Ser. No. 405,138, and Ser. No. 580,414, each is a continuation-in-part of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, Ser. No. 386,102, Aug. 6, 1973, and Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned, said Ser. No. 802,018, is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109. This application Jan. 31, 1983, Ser. No. 462,374

Int. Cl.⁴ H01L *21/208*

U.S. Cl. 437—208 **25 Claims**





1. A method of making an integral, polycrystalline, active, solid-state device comprising the steps of:

non-eutectically forming a structure comprising a multiplicity of semiconductor material bodies separated from each

other by other material, wherein each body comprises substantially single crystal material and there is physical, but not crystallographic, continuity between the single crystal bodies and the other material, said forming step further comprising forming electronic rectifying barriers within a fraction of a micron from a specified location at or adjacent at least a portion of the interface between each single crystal body and the adjacent other material, including selecting the characteristics of the semiconductor material and the other material to produce preselected electrical characteristics of said electronic rectifying barriers; and

providing electrical contacts to said structure for operation thereof as an active device.

4,690,715

MODIFICATION OF THE PROPERTIES OF METALS

David L. Allara, Florham Park, and Ralph G. Nuzzo, Summit, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1982, Ser. No. 389,775

Int. Cl.[4] C23C *22/08*; B03D *3/10*

U.S. Cl. 148—6.15 R **22 Claims**

1. A process for fabricating a metal layer on a substrate comprising the steps of

(1) treating said substrate with a modifier, said modifier comprising a compound having (a) an organic functional group which interacts with the surface of said substrate to form a chemical bond and (b) a reactive moiety, and

(2) forming a layer of said metal on said treated substrate wherein said reactive moiety reacts with the species of said metal used in said formation.

4,690,716

PROCESS FOR FORMING SEAMLESS TUBING OF ZIRCONIUM OR TITANIUM ALLOYS FROM WELDED PRECURSORS

George P. Sabol, Murrysville Boro, and Robert F. Barry, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1985, Ser. No. 701,326

Int. Cl.[4] C21D *8/10*

U.S. Cl. 148—11.5 F **15 Claims**

1. A process for forming seamless tubing of a material selected from zirconium, zirconium alloys, titanium, and titanium alloys, from welded precursor tubing of said material, having a heterogeneous structure resulting from the welding thereof, comprising:

heating succesive axial segments of the welded tubing, completely through the wall thereof, including the weld, to uniformly transform the heterogeneous, as welded, material into the beta phase;

quenching said beta phase tubing segments, said heating and quenching effected sufficiently rapid enough to produce a fine sized beta grain structure completely throughout the precursor tubing, including the weld, and to prevent growth of beta grains within the material larger than 200 micrometers in diameter; and

subsequently substantially uniformly deforming said quenched precursor tubing by cold reduction steps to produce a seamless tubing of final size and shape.

4,690,717

METHOD OF MAKING SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 525,459, Aug. 22, 1983, Pat. No. 4,591,892. This application Nov. 22, 1985, Ser. No. 800,694

Claims priority, application Japan, Aug. 24, 1982, 57-146561; Oct. 18, 1982, 57-182546

Int. Cl.[4] H01L *21/205*

U.S. Cl. 437—2 **6 Claims**

1. A method of making a semiconductor device, said method comprising:

forming a non-single-crystal semiconductor laminate member on a substrate or a conductive layer, said laminate member including at least one I-type non-single-crystal semiconductor layer and having formed therein at least one PI, NI, PIN, or NIP junction, said I-type layer being formed using a silane gas obtained by passing a raw silane gas of high purity through a passage containing a molecular sieve having a mesh diameter of 2.7 to 4.65 A or zeolite having a pore diameter of the same size;

wherein the I-type non-single-crystal semiconductor layer of the non-single-crystal semiconductor laminate member contains oxygen only in such a low concentration as 5×10^{18} atoms/cm^3 or less.

4,690,718

APPARATUS FOR AND METHOD OF MAKING THE CABLE CORE OF A TELECOMMUNICATION CABLE WATER-TIGHT IN THE LONGITUDINAL DIRECTION

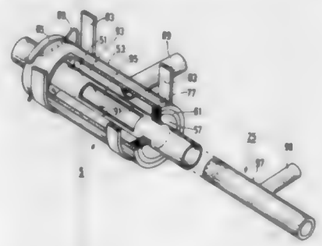
Johannis A. B. Laugs, Gouda; Gerrit Van Den Berg, Vlaardingen; Peter A. Van Daalen, Bleiswijk, and Edward D. Reinders, Boskoop, all of Netherlands, assignors to N.K.F. Groep B.V., Rijswijk, Netherlands

Filed Nov. 18, 1985, Ser. No. 799,212

Claims priority, application Netherlands, Nov. 19, 1984, 8403514

Int. Cl.[4] H01B *13/14*

U.S. Cl. 156—48 **10 Claims**



1. A method of making the cable core of a telecommunication cable water-tight in the longitudinal direction, in which the cable core consisting of stranded single wires is passed through a filling head, a filling material mainly consisting of hydrocarbons is supplied under pressure and in an excess quantity to the filling head at a temperature above the pour point of the material, is spread over the circumference of the cable core and is introduced into the cable core and the excess filling material not absorbed by the cable core is drained away, characterized in that the filling material is divided into a number of separate jets distributed over the circumference of the cable core so that a substantially complete conversion of the static pressure into dynamic pressure is obtained and the filling material is injected at a high speed, solely in purely radial directions and without generation of an axial speed component, through the outer layer of the cable core at least into the heart of the cable core in a manner such that a reconversion of the dynamic pressure into static pressure is effected in the cable core.

6. An apparatus for carrying out the method claimed in claim 1, comprising a container for filling material, a filling head, a pump for the supply of filling material from said container to the filling head and heating means for heating the filling material, the filling head comprising an annular pressure chamber and a central passage coaxial with said pressure chamber through which said cable core is transported, the pressure chamber being connected to the pump and being in communication with the passage chamber through a series of orifices in a separation wall, characterized in that the passage chamber extends without any restriction from one end to the other end of the filling head, is provided with two ends both of which are open and is in free communication with the immediate surroundings.

4,690,719

EGG TIMER-SHAPED ABSORBENT PAD FOR A PAIR OF NAPPY-PANTS, AND PROCESS FOR THE CONTINUOUS MANUFACTURE OF SUCH PADS

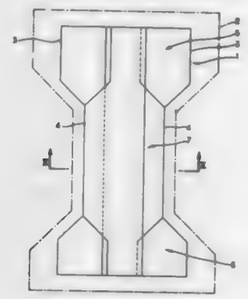
Gérard Lucas, Bousbecque; Jacques Dussaud, La Madeleine, and André Leroy, Bousbecque, all of France, assignors to Boussac Saint Freres B. S. F., Lille, France

Filed Aug. 26, 1986, Ser. No. 900,642

Claims priority, application France, Aug. 27, 1985, 85 12808

Int. Cl.[4] B32B *1/00*

U.S. Cl. 156—201 **8 Claims**



1. Process for the continuous manufacture of egg timer-shaped absorbent pads, having a rectangular general shape with two opposite lateral indentations, for a pair of nappy-pants, comprising, in the direction of its length, two end zones and a between-the-legs intermediate zone of width smaller than and thickness greater than those of the end zones, characterized in that in a strip of absorbent material (10) of width greater than the maximum width of the pads to be manufactured, at intervals corresponding to the length of the pads to be manufactured, two opposite incisions (11) symmetrical in relation to the longitudinal median line (12) of the strip and comprising, in the direction of the length of the strip, two diverging parts (13), followed by two converging parts (15) are successively made, in that the two lateral parts (17) of the strip (10), included between each incision (11) and the longitudinal lines (16) connecting between them the successive incisions on the one hand, and the corresponding longitudinal edge (19) of the strip (10) on the other, are folded over each other around the said longitudinal lines and over the median part (18) of the strip situated between the said lines (16), and in that the strip thus folded is cut in the transverse direction at intervals corresponding to the length of the absorbent pads to be manufactured, at the place where the distance separating the opposite incisions (11) is maximal.

4,690,720

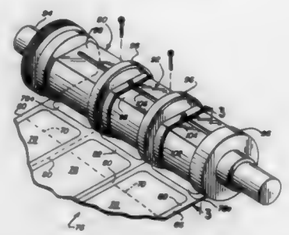
METHOD OF MANUFACTURING MULTILAYER LABELS AND APPARATUS THEREFOR

Jory B. Mack, Chicago, Ill., assignor to Pamco Label Co., Rosemont, Ill.

Filed Jan. 16, 1986, Ser. No. 819,516

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—248 **31 Claims**



1. A method of manufacturing multilayer labels, which comprises:

providing first and second continuous webs, said first web having an adhesive surface; adhering leaflet members by automated means to said adhesive surface of the first web to place a plurality of said leaflet members on said first web in spaced relation to each other; bringing the adhesive surface of said first web into adhering contact with a face of said second web, with the leaflet members positioned between said adhering webs; forming a line of tearing weakness in said first web adjacent each leaflet member to permit opening of said first web for access for the leaflet member, said second web having an adhesive surface covered with a removable backing web facing away from said first web; and die cutting said first and second webs to provide a plurality of separate, leaflet-carrying, multilayer labels without cutting said backing web, whereby the labels produced are removably carried on said backing web.

4,690,721

APPARATUS AND PROCESS FOR THE PRODUCTION OF MULTILAYER LAMINATED PLATES

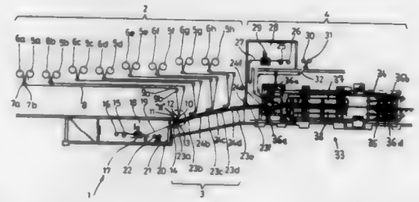
Konrad Schermutzki, Remseck, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jun. 25, 1984, Ser. No. 624,925

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324302

Int. Cl.[4] C09J *5/02*

U.S. Cl. 156—307.5 **20 Claims**



13. A process for producing multi-level laminated plates, such as electronic circuit boards, from webs of pregnable fibrous material, said process comprising the steps of:

providing a plurality of webs of pregnable fibrous material, advancing said webs,

applying a binder substance to a web first surface as said webs are being advanced,

stacking said webs one upon the other,

conducting said webs in the stacked condition through a temperature control zone in which said web travel along a table means and in which the temperature of said binder substance in controlled,

reversing the direction of web travel in advance of said table means and following the application of said binder substance so that said web first surface is oriented in facing relationship to said table means as said web first surface reaches said table means, whereby said binder substance is pressed into said webs in a direction away from said table means along with air disposed in said webs, and

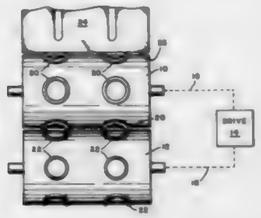
maintaining a web second surface, located opposite said web first surface, exposed to ambient surroundings for a distance following the arrival of said webs at said table means, to permit air to be expelled from said webs.

4,690,722

ULTRASONIC APPARATUS FOR JOINING AND SEVERING SHEET MATERIAL

Gary N. Flood, Washington Depot, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Oct. 24, 1986, Ser. No. 923,030
Int. Cl.[4] B29C *65/08*; B32B *31/18*
U.S. Cl. 156—510 **6 Claims**



1. An apparatus for joining two or more juxtaposed layers of sheet material, at least one of said layers containing thermoplastic material, in accordance with a desired pattern, comprising:

a first rotatably mounted drum having a pattern of raised welding surfaces along its surface, said pattern corresponding to the desired pattern;

a second rotatably mounted drum having along its surface a pattern of raised cutting surfaces corresponding at least in part to said pattern of welding surfaces, said second drum mounted in facing relationship with said first drum for providing therebetween a nip for feeding sheet material therethrough responsive to the rotation of said drums whereby sequentially portions of said cutting surfaces are disposed in confronting relationship with respective portions of said welding surfaces;

a resonator capable of providing vibrations in the ultrasonic frequency range at an output surface thereof mounted for causing said output surface and first drum to form a nip through which the layers of juxtaposed sheet material are fed responsive to the rotation of said first drum,

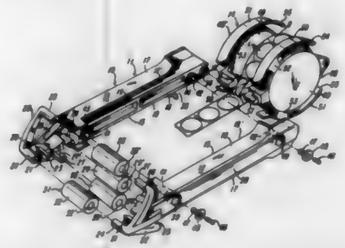
whereby when said resonator is rendered resonant and urged toward said pattern of welding surfaces and the sheet material is fed through the nip between said output surface and said first drum the juxtaposed layers are welded to one another in accordance with the pattern of welding surfaces and when the material is fed through the nip between said first drum and second drum the welded layers are severed in accordance with the pattern of cutting surfaces of said second drum.

4,690,723

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 408,310, Aug. 16, 1982, Pat. No. 4,619,727.
This application Jun. 6, 1986, Ser. No. 871,659
Int. Cl.[4] B44B *5/00*; B32B *31/00*
U.S. Cl. 156—541 **23 Claims**



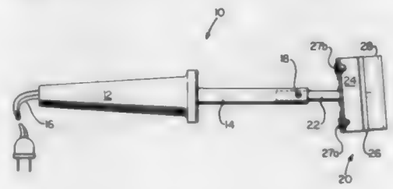
1. A hand-held labeler for applying labels releasably adhered to a carrier web, comprising: a labeler body, means for successively delaminating labels from a carrier web, means adjacent the delaminating means for applying labels, means including a feed roll adapted to contact a surface to be labeled for advancing the carrier web, means defining a feed path for the carrier web to the delaminating means and from the delaminating means to the carrier web advancing means, the labeler body having a pair of adjacent identical one-piece molded plastics body sections, and wherein each one-piece body portion includes a portion of the means defining a feed path.

4,690,724

ELECTRICALLY HEATED DECAL STRIPPING TOOL

William F. Outlaw, P.O. Box 1255, Rocky Mount, N.C. 27801

Filed Apr. 24, 1986, Ser. No. 855,811
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—584 **1 Claim**



1. A heat conductive decal stripper attachment for a portable soldering iron of the type having a handle and a barrel and comprising:

an elongate base adapted to be removably secured to said barrel so that the longitudinal axis thereof will be substantially coaxial with that of said barrel; and

an elongate head portion affixed thereto so that the longitudinal axis of said head portion is substantially perpendicular to that of said base, said head portion comprising biased clamping means for replaceably engaging and supporting a single edge razor blade with the blade thereof positioned at the outermost operative end of said soldering iron.

4,690,725

PURIFICATION OF CD AND TE BY ZONE REFINING

Roelof P. Bult, Fruitvale; Alan B. I. Bolleng, Trail, and Robert F. Redden, Fruitvale, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 22, 1985, Ser. No. 800,932
Int. Cl.[4] C01B *19/02*; C30B *13/02, 13/08*
U.S. Cl. 156—617 R **5 Claims**

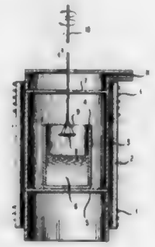
1. A method for the purification of a metal chosen from the group consisting of cadmium and tellurium which comprises adding to an ingot of the metal an amount of a gettering substance chosen from the group consisting of tellurium, cadmium and cadmium telluride, subjecting the metal with added gettering substance to multiple-pass zone refining, said amount of tellurium or the amount of tellurium in cadmium telluride added in the zone refining of cadmium being less than the amount of tellurium in the cadmium rich eutectic composition between cadmium and tellurium, and said amount of cadmium or the amount of cadmium in cadmium-telluride added in the zone refining of tellurium being less than the amount of cadmium in the tellurium-rich eutectic composition between cadmium and tellurium, and cropping said ingot after multiple zone refining to recover a product of reduced impurity content.

4,690,726

LIQUID PHASE EPITAXIAL GROWTH OF BISMUTH-CONTAINING GARNET FILMS

Lars C. Luther, Basking Ridge, N.J., and Virendra V. Singh Rana, Allentown, Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 615,836, May 31, 1984, Pat. No. 4,544,438. This application Sep. 11, 1985, Ser. No. 774,665
The portion of the term of this patent subsequent to Sep. 30, 2002, has been disclaimed.
Int. Cl.[4] C30B *19/04*
U.S. Cl. 156—624 **2 Claims**



1. Method for making a magnetic device comprising a layer of garnet material which contains bismuth and which is epitaxially deposited on a surface of a supporting substrate, said method comprising

heating a preferred melt consisting essentially of a garnet material which contains bismuth and a flux material at a temperature corresponding to supercooling of said garnet material, said flux material comprising lead oxide and bismuth oxide and chromium trioxide, the lead oxide being comprised in said flux material in an amount corresponding to an amount of PbO in the range of from 50 to 98 molecular percent, the bismuth oxide being comprised in said flux material in an amount corresponding to an amount of Bi_2O_3 in the range of from 1 to 30 molecular percent, said chromium trioxide being comprised in said flux material in an amount corresponding to CrO_3 in the range of 1 to 20 molecular percent,

bringing at least a surface of a substrate in contact with said melt, and

removing said substrate from contact with said melt upon deposition of a layer of said garnet material on said surface,

the degree of supercooling being chosen in combination with amount of said chromium trioxide so as to substantially achieve a desired level of magnetic anisotropy in said layer.

4,690,727

GLAZE POLISHING POLYCRYSTALLINE ALUMINA MATERIAL

Curtis E. Scott, Eastlake, and Charles I. McVey, Twinsburg, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 666,858, Oct. 31, 1984, Pat. No. 4,633,137.
This application Aug. 12, 1986, Ser. No. 895,965
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—635 **7 Claims**



1. A method of increasing the optical transmission of an optically transparent body of sintered polycrystalline alumina which comprises:

(a) depositing a solid glaze coating on at least one major surface of said alumina body which dissolves the surface alumina in physical contact therewith when subsequently melted at elevated temperatures, said solid glaze coating comprising an alkali metal borate other than lithium borate having an alkali metal oxide to boron oxide weight ratio in the range from about 1:2 up to about 1:4,

(b) heating said coated alumina body to elevated temperatures of at least about 800° C. for a sufficient time period to liquify the glaze coating and dissolve the surface alumina grains, and

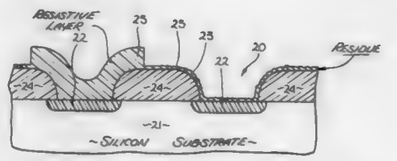
(c) removing the coating residue from the surface of said alumina body.

4,690,728

PATTERN DELINEATION OF VERTICAL LOAD RESISTOR

Chi-Hwa Tsang; Galen Kawamoto, both of Beaverton, and Leopoldo D. Yau, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

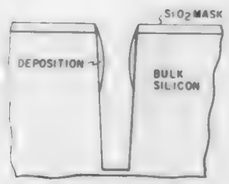
Filed Oct. 23, 1986, Ser. No. 922,289
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C23F *1/02*; C03C *15/00*
U.S. Cl. 156—643 **30 Claims**



1. A process for patterning a resistive layer of a semiconductor device, comprising the steps of:

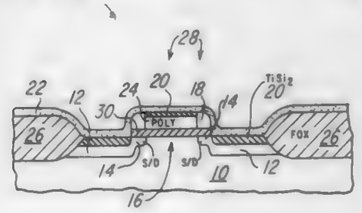
depositing an electrically resistive layer;
etching in dry plasma to remove an unmasked portion of said resistive layer;
etching in a wet bath to remove remnants of said unmasked portion;
whereby a vertical resistor is formed on said semiconductor device.

4,690,729
TAPERED TRENCH PROCESS
Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation-in-part of Ser. No. 730,701, May 3, 1985. This application Mar. 19, 1986, Ser. No. 841,391
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **28 Claims**



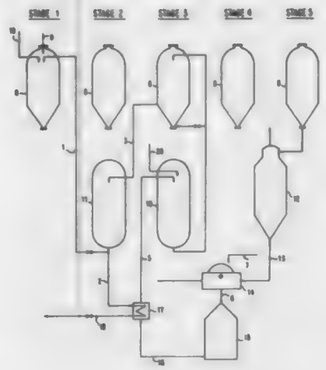
1. A process for etching trenches in silicon, comprising the steps of:
(a) providing a patterned mask over a silicon substrate;
(b) plasma etching exposed portions of said silicon substrate under etch conditions such that the material of said mask is forward sputtered to induce deposition on sidewalls of said trench during etching.

4,690,730
OXIDE-CAPPED TITANIUM SILICIDE FORMATION
Thomas E. Tang, Dallas; Che-Chia Wei, Plano; Roger A. Haken, Richardson; Thomas C. Holloway, and David A. Bell, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation-in-part of Ser. No. 837,468, Mar. 7, 1986, which is a continuation-in-part of Ser. No. 729,318, May 1, 1985. This application Jun. 20, 1986, Ser. No. 876,947
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*
U.S. Cl. 156—643 **55 Claims**



1. A method for fabricating integrated circuit devices, comprising the steps of:
(a) providing a substrate
having thereon a partially fabricated integrated circuit structure
including exposed portions consisting essentially of silicon;
(b) depositing overall a metal layer consisting predominantly of titanium;
(c) providing a dielectric layer directly overlying at least predetermined portions of said metal layer, said dielectric layer consisting predominantly of oxides; and
(d) applying heat until portions of said metal layer react with portions of said exposed silicon to form titanium silicides;
whereby said dielectric layer suppresses silicon outdiffusion through portions of said metal layer under said dielectric layer.

4,690,731
METHOD OF MAKING SULPHATE PULP
Nils J. C. Hartler, Lidingö; Karl-Erik Lekander, Alingsås; Lars T. Sjödin, Solna, and Per J. Mjöberg, Ekerö, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden
Continuation of Ser. No. 482,879, Apr. 7, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,707
Claims priority, application Sweden, Apr. 28, 1982, 8202665
Int. Cl.[4] D21C *3/26, 11/00*
U.S. Cl. 162—45 **1 Claim**

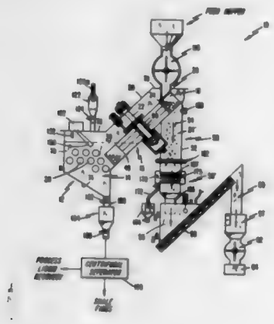


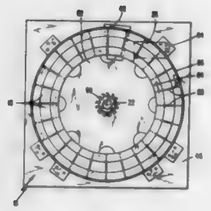
1. A method of making sulfate pulp with a high degree of delignification from lignocellulose material in a batch digester, said method comprising the steps of cooking said lignocellulose material in said batch digester at a digester temperature in a first cooking phase utilizing a cooking liquor containing white liquor and black liquor to provide a free liquor having a first lignin content; displacing substantially all of said free liquor after said first cooking phase with a displacement liquor having a lower lignin content than said first lignin content and having substantially the same temperature as said digester temperature; thereafter cooking said lignocellulose material in the presence of said displacement liquor in a second cooking phase to provide a free liquor having a second lignin content from said lignocellulose material, separating the pulp from said free liquor having said second lignin content by washing and filtering to provide a filtrate, adding white liquor to said filtrate to form a composition of liquor, and utilizing said composition of liquor as said displacement liquor, said method including only two cooking phases as aforesaid, said displacing step being carried out when the lignocellulose material has been cooked to a yield of between about 50% and 54% in said first cooking phase.

4,690,732
APPARATUS FOR SHALE OIL RETORTING
Wayne H. Everman, Vanceburg, and Joseph H. Gilbert, Quincy, both of Ky., assignors to Combs Enterprises, Inc., Alexandria, Va.
Continuation of Ser. No. 689,997, Jan. 9, 1985, abandoned, which is a division of Ser. No. 645,258, Aug. 29, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,729
Int. Cl.[4] C10B *1/10*
U.S. Cl. 202—100 **16 Claims**

1. A shale oil retorting system for retorting oil shale, comprising:

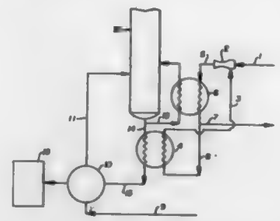
(a) a retort for containing a liquid bath;
(b) chute means for continuously feeding suitably sized particles of oil shale into said retort;
(c) container means including annular compartments respectively positionable below said chute means for receiving and containing said particles within the retort; and
(d) means connected to the container means for rotating said container means and continuously advancing said compartments without interrupting travel thereof from (1) a feed location below said chute means for loading said compartments with particles, to (2) an immersion location downstream of said feed location wherein said particles in said compartments are placed into intimate contact with said liquid bath to evolve product vapor from said particles and to (3) a discharge location downstream from the immersion location wherein spent shale particles are unloaded from the compartments and discharged from the





retort, wherein said retort includes body members joined to establish a retort housing, a lower portion of said housing containing said liquid bath, and inclined mounting means within an upper portion of said housing for supporting said container means within the housing for rotation along an inclined travel path between upper positions corresponding to said feed and discharge locations and a lower position corresponding to said immersion location, wherein said inclined mounting means includes a base plate forming an angle of greater than 90° with a horizontal reference plane, and wherein said container means includes a pair of generally cylindrical walls concentrically mounted for rotation on the base plate and connected to each other with dividers to define said annular compartments, said cylindrical walls being connected to a drive shaft rotatably mounted to said base plate, said drive shaft extending along an inclined axis about which said container means rotates.

4,690,733
PROCESS FOR THE SEPARATION OF HYDROCARBONS FROM A MIXED FEEDSTOCK
Paulino Forte, Yonkers, and Jose A. Videira, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Nov. 4, 1985, Ser. No. 794,845
Int. Cl.[4] B01D *3/38, 11/00*
U.S. Cl. 203—21 **2 Claims**



1. In a combination solvent extraction-steam distillation process for the recovery of aromatic hydrocarbons, the improvement comprising
(a) introducing high pressure steam into a steam ejector;
(b) passing the steam from step (a) to a first heat exchanger where it exchanges heat with lean solvent coming from the bottom of a distillation column, which lean solvent has a temperature which is cooler than the steam temperature, and is condensed;
(c) returning the lean solvent from step (b) to the bottom of the distillation column;
(d) passing part of the condensate from step (b) to a second heat exchanger where it exchanges heat with the lean solvent coming from the bottom of the distillation column which lean solvent has a temperature which is warmer than the condensate temperature, cooling the lean solvent and vaporizing the condensate; and
(e) passing the vapor from step (d) to the steam ejector in step (a).

4,690,734
SEPARATION OF N-AMYL ACETATE FROM N-AMYL ALCOHOL BY EXTRACTIVE DISTILLATION
Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., Bozeman, Mont. 59715
Filed Nov. 25, 1985, Ser. No. 801,214
Int. Cl.[4] B01D *3/40;* **C07C** *67/48*
U.S. Cl. 203—56 **30 Claims**

1. A method for recovering n-amyl acetate from a mixture of n-amyl acetate, n-amyl alcohol and water which comprises distilling a mixture of n-amyl acetate, n-amyl alcohol and water in a rectification column in the presence of about one part of extractive agent per part of n-amyl acetate - n-amyl alcohol - water mixture, recovering n-amyl acetate and water as overhead product and obtaining the n-amyl alcohol and the extractive agent from the stillpot, the extractive agent comprises at least a glycol.

4,690,735
ELECTROLYTIC BATH COMPOSITIONS AND METHOD FOR ELECTRODEPOSITION OF AMORPHOUS CHROMIUM
Herbert A. Laitinen, Gainesville, Fla., and Shigeo Hoshino, Kawasaki, Japan, assignors to University of Florida, Gainesville, Fla.
Filed Feb. 4, 1986, Ser. No. 825,977
Int. Cl.[4] C25D *3/04*
U.S. Cl. 204—37.1 **13 Claims**

1. A composition of matter for electrodepositing an amor-

phous, bright chromium material having a hardness value above about 950 Hv comprising an aqueous solution containing:

(a) from about 20 to about 200 g/l of chromium trioxide (CrO_3),

(b) an amount of a source of formic acid, formaldehyde, glyoxal or formamide, sufficient to provide from about 2 to about 30 g/l of (1) a member selected from the group consisting of formic acid, calculated on 85% formic acid, (2) formaldehyde, calculated on 35% formaldehyde, (3) glyoxal, calculated on 40% glyoxal or (4) formamide, calculated on 98% formamide, and mixtures thereof, and

(c) an amount of a source of sulfuric acid sufficient to provide a weight ratio of chromium trioxide to sulfuric acid in said solution in the range of from about 2:1 to about 40:1.

4,690,736

CHROMIC ACID ANODIZING OF ALUMINIUM PRIOR TO ADHESIVE BONDING

Peter Albericci, Woodford, England, assignor to British Aerospace Public Limited Company, London, England

Filed Mar. 26, 1986, Ser. No. 844,151

Claims priority, application United Kingdom, Mar. 26, 1985, 8507761

Int. Cl.⁴ C25D *5/00*

U.S. Cl. 204—38.3 **6 Claims**

1. A method of preparing an adhesively bonded aluminium or aluminium alloy structure comprising:

forming an environmentally stable adhesive receptive oxide layer on the surfaces of the articles to be adhesively bonded by anodising said articles in a bath containing an aqueous solution of chromic acid, the bath voltage being from at least 5 volts to about 30 volts, the concentration of chromic acid in solution lying in the range of 3% to 5% w/w, said solution being maintained at a temperature between at least 55° C. to about 62° C.; rinsing said articles to remove said solution,

applying an adhesive to said surfaces to be adhesively bonded and

bonding said articles together to form said adhesively bonded structure.

4,690,737

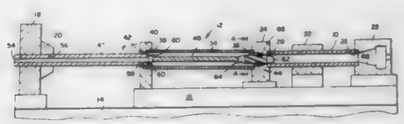
ELECTROCHEMICAL RIFLING OF GUN BARRELS

Alexander Vishnitsky, Henrietta, N.Y., assignor to Cation Corporation, Rochester, N.Y.

Filed Jun. 10, 1986, Ser. No. 872,704

Int. Cl.⁴ B23H *3/10, 7/30, 7/36*

U.S. Cl. 204—129.7 **24 Claims**



24. A method for electrochemically rifling barrels comprising the steps of:

mounting an anode barrel and an elongate cam member extending therethrough in fixed coaxial relationship, said cam member having a spiral cam groove on its outer periphery;

slidably mounting an elongate hollow cathode rod rifling assembly on said cam member, said rifling assembly having a plurality of captive annular metallic segments interposed between the barrel and rod rifling assembly and defining a space therebetween, each segment having a plurality of circumferentially spaced, radially outwardly extending insulating strips and a radially inwardly extending depending follower lug insertable in said cam groove;

forcing an electrolyte fluid into the space between the inner surface of the barrel and the segments of said rifling assembly;

subjecting said anode barrel and said segments of said cathode rod rifling assembly to a power supply for generating current flow therebetween; and

pushing or pulling said rifling assembly relative to the barrel for moving said segments from one end of the barrel to the other for electrochemically rifling the barrel corresponding to the twist of the cam groove on said cam member.

4,690,738

METHOD OF ELECTROCHEMICALLY SURFACE TREATING CARBON FIBERS, FIBERS TREATED BY THE METHOD, AND COMPOSITE MATERIALS INCLUDING SUCH FIBERS

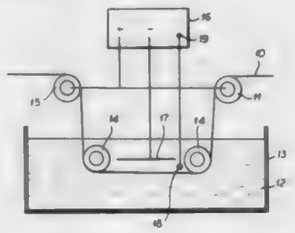
Georges Desarmot, Paris, and Manuel Sanchez, Villiers Le Bel, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed May 10, 1985, Ser. No. 733,227

Claims priority, application France, May 18, 1984, 84 07814

Int. Cl.⁴ C25F *1/00*

U.S. Cl. 204—130 **9 Claims**



1. A method of treating the surface of carbon fibers to render them adherent to a synthetic resin comprising putting the fibers into contact with an aqueous solution of a basic electrolyte selected from the group comprising amine compounds and amide compounds having a dissociation degree of less than about 10^{-3}, and polarizing the fibers in said electrolyte positively relative to a cathode at a potential not exceeding 1.7 volts relative to a saturated calomel reference electrode in said electrolytes.

4,690,739

ELECTROLYTIC PROCESS FOR PRODUCING EXTREMELY LOW CHLORIDE ANION EXCHANGE RESINS

Babu R. Nott, 4144 Powderhorn Crescent, Mississauga, Ontario, Canada (L5L 3B9)

Continuation of Ser. No. 776,784, Sep. 17, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,160

Int. Cl.⁴ B01D *13/02*

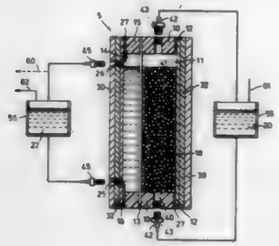
U.S. Cl. 204—131 **9 Claims**

1. An electrolytic method for producing a strong base anion. exchange resin having an extremely low chloride concentration, comprising:

placing a resin having an undesirably high chloride concentration in a cathode cell of an electrolytic cell having an anode and a cathode, and having anode and cathode cells which are separated by an anion selective permeable membrane;

flowing an aqueous hydroxide catholyte through the resin containing cathode cell and flowing an anolyte through the anode cell while applying a direct current across the cathode and anode thereby causing xigration of chloride ions from the resin through the xembrane and into the anode cell; and

removing chloride or chlorine gas from the anode cell thereby reducing the concentration of chloride bound to the resin, and continuing the method for a sufficient time



to reduce the chloride concentration of the resin to 20 to 300 μg chloride per gram of resin.

4,690,740

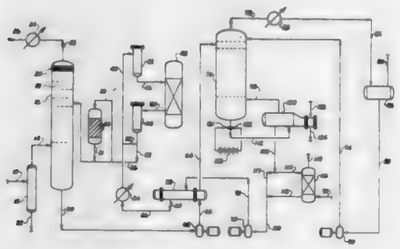
METHOD FOR MAINTAINING EFFECTIVE CORROSION INHIBITION IN GAS SCRUBBING PLANT

David C. Criagle, Angleton; Roscoe L. Pearce, Lake Jackson, and Michael S. DuPart, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1986, Ser. No. 837,230

Int. Cl.⁴ C23F *13/00*; B01D *53/34*

U.S. Cl. 204—147 **2 Claims**



1. In a process for the recovery of carbon dioxide from feed gases containing the same and oxygen in the presence or absence of sulfur compounds, by contacting the gas with a circulating alkanolamine solution which contains cooper in a plus 2 state as a corrosion inhibitor and threating said solution rich in CO_2 with heat to release the CO_2 thereby producing a lean solution and returning the so treated lean solution to the contacting step, the improvement which comprises

maintaining an amount of copper in the plus two state in said circulating solution effective to inhibit corrosion, inhibit plating out of said copper and/or reduce degradation of the solvent, by impressing a volume across two electrode in contact with the circulating solution to convert nonplus 2 state copper in said solution to the plus 2 valence state.

4,690,741

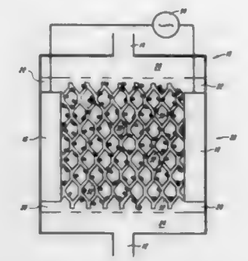
ELECTROLYTIC REACTOR AND METHOD FOR TREATING FLUIDS

Myles A. Walsh, III, Falmouth, and R. Scott Morris, Fairhaven, both of Mass., assignors to Cape Cod Research, Inc., Buzzards Bay, Mass.

Continuation of Ser. No. 660,123, Oct. 12, 1984, abandoned. This application Dec. 31, 1985, Ser. No. 815,665

Int. Cl.⁴ C02F *1/46*

U.S. Cl. 204—149 **13 Claims**



1. A process for treating a solution containing organic compounds comprising:

(a) filling an electrochemical reactor with the solution to be treated, said electrochemical reactor comprising:

at least one pair of opposed main electrodes,

a plurality of auxiliary electrodes coated onto a plurality of tightly packed electrically insulating support structures for holding said auxiliary electrodes between said main electrodes;

electrocatalytic materials selected from a first group consisting of N_4 metal chelates comprising at least one phthalocyanine, porphyrin, or tetraazaannulene group and a metal center selected from the group consisting of iron, cobalt, osmium, and rthenium, a second group consisting of chemisorbed oxygen complexes comprising at least one carboxylic, quinonic, lactonic, or phenolic group, and mixtures thereof of said first and second groups, the electrocatalytic materials being disposed on the surface of said auxiliary electrodes; and

(b) applying an alternating current across said main electrodes;

(c) removing a treated solution depleted in organic compounds.

4,690,742

METHOD AND APPARATUS FOR LASER ISOTOPE SEPARATION

C. D. Cantrell III, and G. L. Peterson, both of Richardson, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 15, 1983, Ser. No. 533,528

Int. Cl.⁴ B01D *59/34*

U.S. Cl. 204—157.2 **31 Claims**

1. A method of separating a selected isotope from a sample material comprising the steps of:

first, irradiating the sample with laser means for producing an adiabatic population inversion of said selected isotope at an excited state,

the pulse shape of the first irradiation having a particular rise time greater than t_m, where t_m equals:

$$t_M = \max_{E_o \leqq E_{max}} \left\{ \max_{e} \frac{|\langle \lambda_e(E_o) | \Delta | \lambda_e(E_o) \rangle|}{[w_{oe}(E_o)]^2} \right\}$$

where

$|\lambda_q(E_o)>$

is the dressed state that evolves continuously from the ground state of the atom or molecule as the amplitude of the irradiation field is increased adiabatically from zero to E_o,

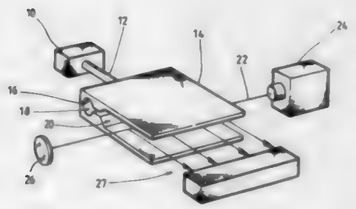
$|\lambda_r(E_o)>$

is the dressed state that evolves continuously from an excited state,

$\hbar w_{qr}(E_o)$

is the difference of energy between

$|\lambda_q(E_o)>$



and

$|\lambda_r(E_o)>$

at the irradiating field amplitude E_o,

Δ

is a diagonal matrix, the diagonal elements of which in the basis of atomic or moleculr energy eigenstates in zero radiation field are

$\Delta_{mm} = N(m)w - E_m/h$

where

$$N(m) = \text{integer part}\left(\frac{E_m}{hw}\right)$$

w being the radiation frequenty and E_m being the energy of the atomic or molecular eigenstate in zero radiation field, and

E_{max}

is the radiation field amplitude at the instant when the pulse achieves its maximum intensity; and

second, irradiating the isotope while in said excited state with laser means to cause a transition of said selected isotope from said excited state.

4,690,743

METHOD FOR GAS SYNTHESIS

Don Ethington, Dimmitt; Ray J. Riley, Hart, and Richard W. Tock, Lubbock, all of Tex., assignors to AL-CHEM Fuels, Inc., Dimmitt, Tex.

Filed May 2, 1985, Ser. No. 729,567

Int. Cl.[4] C07C *3/24*

U.S. Cl. 204—168 **14 Claims**

1. A process involving

a. a fluid-tight tank,

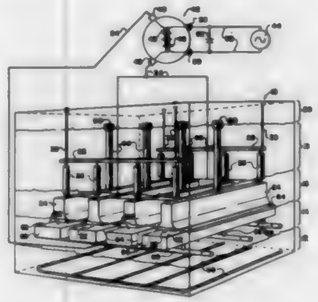
b. an insulative mixture that includes an electrically nonconductive liquid compound within the tank, and

e. an electrode disposed within the insulative mixture;

wherein a process for chemically reforming compounds within the tank comprises the steps of:

d. insulating the electrode from an electric conductor with the insulative mixture,

e. connecting alternating electrical current, having a voltage waveform and a current waveform, across the electrode and the conductor,



f. repetitively producing an arc between the electrode and the conductor with the alternating electrical current, until

g. establishing a stable plasma of partially ionized gases between the electrode and the conductor with the alternating electrical current,

h. placing a capacitor in electrical circuits connected to the electrode which modifies a phase difference between the voltage and current waveforms of the alternating electrical current connected across the electrode and conductor producing the plasma so that the power factor of the alternating electrical current approaches unity.

4,690,744

METHOD OF ION BEAM GENERATION AND AN APPARATUS BASED ON SUCH METHOD

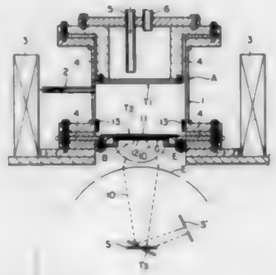
Masahiko Naoe, Tokyo, and Shozo Ishibashi, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,514

Claims priority, application Japan, Jul. 20, 1983, 58-133030; Jul. 20, 1983, 58-133031; Jul. 20, 1983, 58-133032; Jul. 20, 1983, 58-133033

Int. Cl.[4] H01J *37/08*

U.S. Cl. 204—192.11 **19 Claims**



1. An ion beam generating method comprising generating plasma in a space between a plurality of opposing targets wherein at least one of said targets has first small holes made therethrough, producing ionized particles by sputtering said targets, and leading said ionized particles outside said space in a predetermined direction through said first small holes by controlling the energy of said particles through the use of an electric field.

4,690,745

TARGETS FOR CATHODE SPUTTERING

Hans D. Klein, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 569,696, Jan. 10, 1984, Pat. No. 4,647,548. This application Nov. 25, 1986, Ser. No. 934,978

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1983, 3300525

Int. Cl.[4] C23C *14/00*

U.S. Cl. 204—192.29 **14 Claims**

1. In a process for coating a substrate by direct voltage sputtering thereon of a target, the improvement wherein the target is an oxide-ceramic composition comprising a hot-pressed indium oxide/tin oxide mixture of a density of at least 75% of the theoretical density and which has been diminished to such an extent in its oxygen content compared with the stoichiometric composition that it has an electric conductivity which corresponds to a specific resistance of 0.6 to 0.1 Ω-cm.

4,690,746

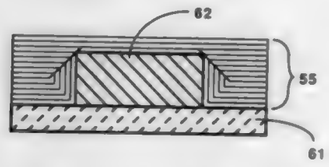
INTERLAYER DIELECTRIC PROCESS

Edward J. McInerney, Milpitas; E. Ronald Dornseif, Scotts Valley, and Norman E. Zetterquist, Santa Cruz, all of Calif., assignors to Genus, Inc., Mountain View, Calif.

Filed Feb. 24, 1986, Ser. No. 832,836

Int. Cl.[4] B05D *3/06*; C23C *14/00*

U.S. Cl. 204—192.32 **6 Claims**



1. A method of producing a film over a wafer that has a topologically non-planar surface of a material having an RF sputter etch rate which is higher in a direction parallel to the plane of the wafer than perpendicular to the plane of the wafer, comprising the steps of:

(1) depositing said material by plasma enhanced chemical vapor deposition while simultaneously sputter etching said material as it is deposited;

(2) after step 1, sputter etching said material; and

(3) repeating steps 1 and 2 as a pair N times, where N is an integer and N≧1.

4,690,747

SELECTIVE PLATING APPARATUS

Mark L. Smith, and Richard M. Wagner, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 23, 1986, Ser. No. 946,467

Int. Cl.[4] C25D *5/02, 17/00*

U.S. Cl. 204—206 **18 Claims**

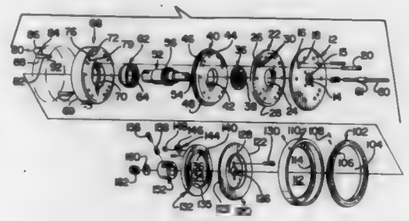
1. An apparatus for plating interior surfaces of electrical terminals that are spaced apart and attached to a carrier strip, that is utilized to strip feed the terminals, comprising:

a mandrel having first and second portions, said first portion being dielectric and mounted for rotation on a stationary conductive shaft as strip fed terminals are continuously fed to said first portion, wrapped against said first portion and exited therefrom, said first portion including a plurality of nozzles distributed about its axis of rotation, said second portion being conductive and mounted in a stationary position on said shaft;

a plurality of anode members mounted within said nozzles, said anode members being movable into and out of the interiors of the terminals that are against said first mandrel portion;

a conduit supplying plating solution under pressure through said nozzles and upon said anode members;

a source of electrical potential for supplying electrical current flow from said anode members, through said plating solution and into the interiors of said terminals, thus forming a plurality of plating cells about said first mandrel portion; and



means for providing an essentially uniform current to each of said plating cells, comprising a conductor member having one end electrically engaged and mechanically secured to a conductive portion of said anode member, a conductive member secured circumferentially around a forward portion of said dielectric first mandrel portion proximate said conductive second mandrel portion, said conductive member including a plurality of conductor member terminating apertures in which are disposed the other end of said conductor members, and means for electrically coupling said conductive second mandrel portion with said conductive member such that said conductive member may rotate while remaining in electrical engagement with said conductive second mandrel portion.

4,690,748

PLASTIC ELECTROCHEMICAL CELL TERMINAL UNIT

Richard N. Beaver, Angleton; Gregory J. Morris, Lake Jackson; John R. Pimlott, Sweeny, and Hiep D. Dang, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1985, Ser. No. 809,374

Int. Cl.[4] C25B *9/04, 11/03*; H01R *11/00*; H01M *4/02*

U.S. Cl. 204—279 **24 Claims**

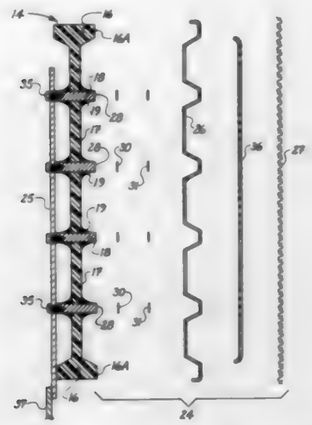
1. An article suitable for use as a terminal unit in monopolar or bipolar electrochemical cells comprising:

an organic, planar plastic member having a plurality of horizontally and vertically spaced-apart shoulders protruding outwardly from opposing generally coplanar surfaces of said planar plastic member;

at least one electrically conductive insert extending from an exterior face of a shoulder on a first surface of the planar plastic member, through the planar plastic member, to an exterior face of a shoulder on a second surface of the planar plastic member, wherein each of said shoulders annularly encircles and supports each of said inserts;

an electrically conductive, substantially completely hydraulically impermeable protective liner resistant to the corrosive effects of an electrolyte matingly contacted with the first surface of said planar plastic member and adapted to

minimize contact between an electrolyte and said planar plastic member; and



an electrical connection means electrically connected to at least a portion of the inserts at the second surface of the planar plastic member.

4,690,749

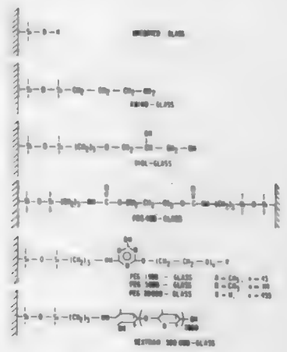
POLYMER-COATED SURFACES TO CONTROL SURFACE ZETA POTENTIAL

James M. Van Alstine, Montesano; J. Milton Harris, Huntsville; Steve Shafer, Huntsville; Robert S. Snyder, Huntsville, and Blair Herren, Arab, all of Ala., assignors to Universities Space Research Association, Washington, D.C.

Filed Dec. 16, 1985, Ser. No. 808,981

Int. Cl.⁴ B01D *13/02;* **C25D** *13/00*

U.S. Cl. 204—299 R **26 Claims**



1. A method for eliminating or controlling electroosmosis and other zeta potential related phenomena in electrophoresis comprising conducting electrophoresis employing an electrophoretic surface coated with a monolayer of covalently bound hydrophilic, neutral polymers, provided that said polymers are not polymerized onto said surface.

4,690,750

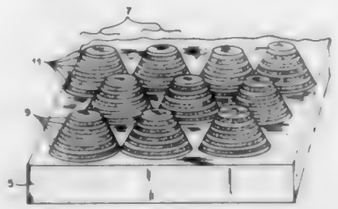
MICRO-POROUS SUPERLATTICE SEPARATIONS

Charles B. Roxlo, Bridgewater, and Harry W. Deckman, Clinton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 13, 1986, Ser. No. 874,027

Int. Cl.⁴ C07C *7/12*

U.S. Cl. 208—310 Z **10 Claims**



1. A process for absorbing a molecular species from a medium of a liquid or a gas comprising contacting said medium with a superlattice which includes multilayered material having layers which extend laterally with different dimensions so as to provide two dimensional slots between said layers within said multilayered material.

4,690,751

METHOD FOR SORTING OUT CERTAIN CONTAINERS, SUCH AS INDUSTRIAL CONTAINERS, BOTTLE CRATES ETC. FROM A STOCK OF CONTAINERS AND A DEVICE ON A CONTAINER FOR THE IDENTIFICATION OF A TO BE SORTED OUT CONTAINER

Hans Umiker, Zurich, Switzerland, assignor to Alexander Schoeller & Co. AG, Romont, Switzerland

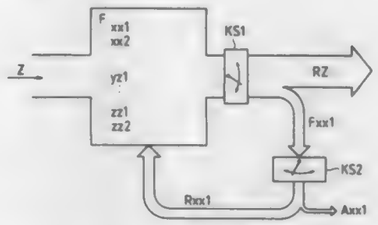
PCT No. PCT/CH84/00124, § 371 Date Apr. 3, 1985, § 102(e) Date Apr. 3, 1985, PCT Pub. No. WO85/00763, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 7, 1984, Ser. No. 723,963

Claims priority, application Switzerland, Aug. 8, 1983, 4303/83

Int. Cl.⁴ B07C *5/34*

U.S. Cl. 209—3.3 **7 Claims**



1. Method for sorting out containers, such as bottle crates and industrial containers, from a stock of containers by means of optical detection, which comprises: providing a stock of containers with specific markings from which it can be noted if they belong to a common issue, whereby after being mixed up during use the containers of a common issue are brought together; optically detecting said markings; separating containers from said stock based on the optical detection of containers belonging to a common issue; further checking the separated containers at a further processing stage for reuseable containers; and returning said reuseable containers to a more recent common issue, wherein the marking is changed before returning separated items to said more recent common issue.

4,690,752

SELECTIVE FLOCCULATION PROCESS FOR THE RECOVERY OF PHOSPHATE

Douglas R. Shaw, Arvada, Colo., assignor to Resource Technology Associates, Boulder, Colo.

Continuation of Ser. No. 524,889, Aug. 19, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,343

Int. Cl.⁴ B03D *3/06*

U.S. Cl. 209—5 **6 Claims**

1. A process for separating an upgraded phosphorus ore from an aqueous slurry containing said phosphorus ore comprising particles from about minus 20 to about minus 150 mesh, comprising:

(a) contacting the slurry at a pH of at least about 10 with a dispersing agent selected from the group consisting of sodium silicate, sodium hydroxide and polyacrylate in an amount sufficient to achieve dispersion in the slurry of substantially all the ore particles;

(b) contacting the dispersed mixture of step (a) with a flotation collector in an amount sufficient to coat and render hydrophobic substantially all the ore particles capable of being coated therewith;

(c) vigorously agitating the mixture of step (b) to achieve said coating;

(d) contacting the mixture of step (c) with a hydrophobic nonionic polyethylene oxide in an amount sufficient to cause the agglomeration of substantial portions of the fine particles of about minus 150 mesh;

(e) gently mixing the mixture of step (b) to provide dispersion of the polyethylene oxide of step (d) and form said agglomerates without significantly breaking up said agglomerates;

(f) subjecting the mixture of step (e) to froth flotation by the addition of gas bubbles thereto;

(g) separating the phosphorus-rich froth concentrate from the mixture of step (f).

4,690,753

COAL PROCESSING SETTLING MACHINE

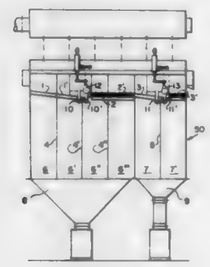
Alexander Lotz, Wetter, and Heinrich Stevermuer, Bochum, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,914

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431653

Int. Cl.⁴ B03B *11/00*

U.S. Cl. 209—496 **5 Claims**



1. A discharge device for the discharge of heavy matter from a fluid containing the heavy matter in a settling machine for the processing of coal and the like, comprising a vessel defining an interior having an upper portion with a plurality of settling bed wall portions, said vessel having an upper inflow opening for the inflow of fluid and for the passage of fluid in a flow direction along said settling bed wall portions, two discharge openings at the bottom of each settling bed wall portion, said two discharge openings for each settling bed wall portion being spaced apart in the flow direction, a valve member movable in each of said discharge openings for opening and closing each discharge opening for permitting the passage of heavy matter which has settled onto said settling bed wall portion to pass through said discharge opening, a control device connected to said valve members for moving said valve members to open and close said discharge openings for each settling bed wall portion, and a level-sensing element for each settling bed wall portion positioned above the downstream one of said discharge openings in said flow direction for each settling bed wall portion, for sensing the level of fluid in said upper portion of said vessel above said downstream one of said discharge openings for each settling bed wall portion, said level-sensing element being connected to said control device for each settling bed wall portion, for simultaneously moving said valve members to open both of said discharge openings for each settling bed wall portion.

4,690,754

FILTER DEVICE FOR A MINUTE VOLUME OF LIQUID

Kenji Koyama, and Shotaro Ohno, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,836

Claims priority, application Japan, Mar. 12, 1985, 60-47533

Int. Cl.⁴ B01D *13/01*

U.S. Cl. 210—94 **6 Claims**



1. A filter device for a minute volume of liquid in combination with means for applying pressure or centrifugal force, said filter device comprising a cylindrical member and a single hollow fiber filter having an open lower end and housed in said cylindrical member to form an annular space for containing a sample liquid around the filter, with the lower part of the hollow fiber filter liquid-tightly bonded to the inside wall of the lower part of the cylindrical member and with the upper end of the hollow fiber filter sealed, said hollow fiber filter being a microfilter having micro-scale pores observable only with an electron microscope or an ultrafiltration membrane.

4,690,755

ANAEROBIC CONTACTOR

Alexander A. Friedman, Fayetteville, N.Y., and Peter L. Podolak, Westminster, Md., assignors to Syracuse University, Syracuse, N.Y.

Continuation-in-part of Ser. No. 628,904, Jul. 9, 1984, Pat. No. 4,563,281. This application Oct. 24, 1985, Ser. No. 790,880

Int. Cl.⁴ C02F *3/28*

U.S. Cl. 210—96.1 **14 Claims**

1. Apparatus for treating wastewater containing anaerobically digestible nutrients and organic substrates that includes

a gas tight reactor housing for containing a quantity of wastewater, said housing having a shaft rotatably mounted therein,

means to turn the shaft at a desired rate,

a plurality of spaced apart contactors affixed to the shaft for

supporting a biofilm of anaerobic organisms, said contactors being partially immersed in the wastewater whereby the biofile is passed in series through the wastewater and a headspace over the wastewater,

wastewater flow circuit for passing wastewater through the reactor housing,

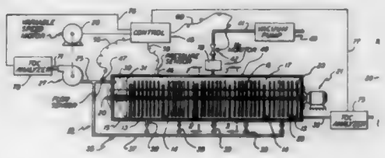
automatic detector means positioned in the wastewater flow circuit for determining the chemical oxygen demand loading on the reactor and providing an output signal and indicative of the loading, and

control means responsive to the output signal of the detector means for regulating the pressure in the headspace to maintain the reactor at a predetermined operating level.

10. Apparatus for treating wastewater containing anaerobically digestible nutrients and organic substrates that includes

a gas tight reactor housing containing a quantity of wastewater and having a shaft rotatably mounted in said housing,

means to drive the shaft at a predetermined rate,



a plurality of contactors spaced apart along said shaft for rotation therewith, each contractor supporting a biofilm of anaerobic organisms and is partially immersed in said wastewater so that the biofilm is passed sequentially through the wastewater and a headspace over the wastewater,

means for passing wastewater through said reactor housing at a desired rate,

a control valve operatively connected into the headspace over the wastewater for controlling the flow of head space gas out of the reactor,

a monitoring unit arranged to sense the concentration of hydrogen in the headspace gas and provide a data signal indicative thereof, and

control means operatively connected between the monitoring unit and the control valve for positioning said control valve in response to the concentration of hydrogen sensed in the headspace gas whereby the concentration of hydrogen in the reactor is held within desired limits.

4,690,756

APPARATUS FOR MICROAQUACULTURE AND POLLUTION CONTROL

Charles D. Van Ry, P.O. Box 4801, Annapolis, Md. 21403

Filed May 15, 1985, Ser. No. 734,090

Int. Cl.[4] B03D *1/24*; C02F *1/24*

U.S. Cl. 210—221.2 **7 Claims**

1. Apparatus for removing dissolved matter from a body of water in situ comprising:

a substantially hollow tube having a substantially open top and bottom, and a screen covering said open bottom;

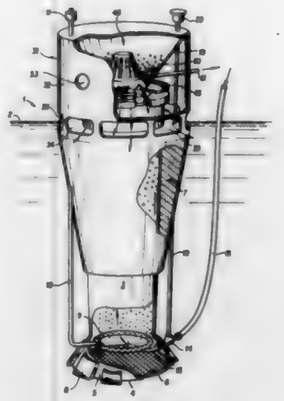
means for supporting said tube vertically in a body of water such that the top is disposed proximate the surface;

a source of compressed air;

air releasing means connected to the source of compressed air and disposed proximate the open bottom of the tube so that air released from the air releasing means will formula bubbles that rise within the tube and draw in water through the open bottom of the tube;

a baffle liftably supported on the top of the tube so that water, upwelling in the tube may lift the baffle and overflow the top of the tube, the baffle having an upper portion with at least one opening therein and being shaped to direct foam provided by the bubbles to the at least one opening;

reservoir means disposed around the baffle or receiving



foam passing through the at least one opening in the baffle; and

outlet means in communication with said reservoir means for removing said foam from said reservoir means.

4,690,757

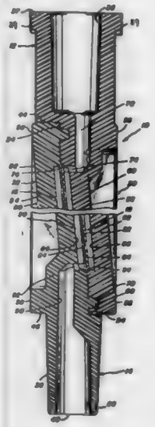
SMALL VOLUME LABORATORY FILTER

Gregory Mathus, Concord, Mass.; George Lyman, Cape Porpoise, Me., and Kevin Looney, Bedford, Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Mar. 21, 1986, Ser. No. 842,494

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—232 **16 Claims**



1. A small volume laboratory filter comprising

a thin rectangular body having opposed ends and connecting sides and opposite generally parallel faces,

means defining a shallow filter cavity extending over a major portion of the body's rectangular dimensions and having opposite side walls,

said cavity being inclined with one end lying closely adjacent one face of the rectangular body along one end thereof and the opposite end of the cavity lying closely adjacent the other face of the body along the opposite end thereof,

an inlet sleeve connected to one end of the body and an outlet sleeve coaxial therewith connected to the other end thereof,

separate inlet and outlet manifolds connecting each sleeve to the cavity adjacent the respective ends, the respective connections to the cavity being through the opposite side walls,

and a filter membrane bisecting the cavity and disposed parallel to the cavity side walls so that the manifold connections to the cavity from the inlet and outlet sleeves are disposed on opposite sides of the membrane.

4,690,758

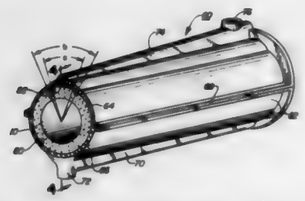
MASS TRANSFER DEVICE

Ronald J. Leonard, Harvard, and Kenneth M. Johnson, Lindenhurst, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 5, 1984, Ser. No. 668,629

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—247 **6 Claims**



1. A mass transfer device comprising:

(a) a generally cylindrical hollow fiber bundle;

(b) a substantially cylindrical hollow housing enclosing said hollow fiber bundle, said housing having opposed first and second ends defining a second fluid inlet port and a second fluid outlet port, and a continuous sidewall;

(c) a first fluid inlet manifold projecting from said continuous sidewall of said housing, said first fluid inlet manifold having a first fluid inlet port projecting therefrom and being in fluid communication therewith; and

(d) a first outlet manifold projecting from said continuous sidewall of said housing, said first fluid outlet manifold having a first fluid outlet port projecting therefrom and being in fluid communication therewith, said first fluid outlet manifold including an expansion volume running substantially the entire length of said sidewall of said housing, said expansion volume allowing hollow fibers adjacent to said first fluid outlet manifold to migrate into said expansion volume during operation of said mass transfer device, thereby substantially alleviating void fraction decreases adjacent to said first fluid outlet manifold.

4,690,759

CENTRIFUGAL AND IMPINGEMENT OIL SEPARATOR

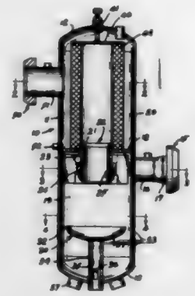
Zoltan A. Mandy, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Oct. 14, 1986, Ser. No. 918,062

Int. Cl.[4] B01D *19/00*

U.S. Cl. 210—304 **9 Claims**

1. An oil separator comprising: means for use with an oil separation and return system for the compressor means of a refrigeration system including a vessel for receiving the relatively high pressure vapor-oil discharged from a compressor, said vessel having a receiving chamber with a cylindrical wall and a tangential inlet for connection to the compressor discharge conduit, oil outlet means at the lower end of said vessel, a turbine wheel rotatably mounted in said receiving chamber and positioned in line with said tangential inlet for receiving the impact of refrigerant vapor thereon, said turbine wheel having vanes on its exterior portion and a central portion that is open for the passage of vapor, a flow reverter mounted in spaced relation beneath said turbine wheel, said flow reverter comprising plate means extending laterally of said vessel and spaced from the wall thereof for enabling oil to freely flow downwardly of said wall but vapor flow is deflected upwardly towards the central portion of said turbine wheel, said vessel having a vapor discharge chamber above said receiving chamber and sealed therefrom except for the central portion of said turbine wheel, said discharge chamber having a vapor outlet,



said flow reverter being positioned for causing substantially oil-free vapor to be deflected upwardly through the central portion of said turbine wheel for passage through said outlet directly to a filter means, and said turbine wheel being driven by the relatively high pressure refrigerant vapor-oil at a rapid rate, the oil in said vapor impinging thereon and being thrown outwardly into contact with the side walls of the vessel and draining downwardly to the oil outlet means sufficient that the oil is separated from the vapor and the vapor flows through the vessel to the vapor outlet.

4,690,760

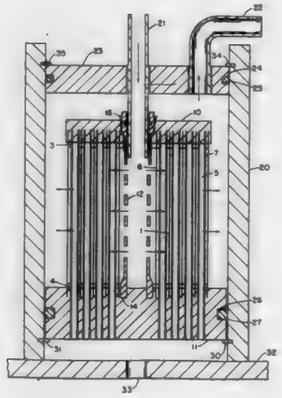
NOVEL CARTRIDGE WITH STRESS RELIEVING MEMBER

Michael A. Smoot, Oakmont; Herbert W. Barch, Natrona Heights, and Balbhadra Das, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 637,233, Aug. 28, 1984, abandoned. This application May 7, 1986, Ser. No. 860,394

Int. Cl.[4] B01D *13/01*

U.S. Cl. 210—321.5 **21 Claims**



1. A cartridge suitable for use in a fluid separation system

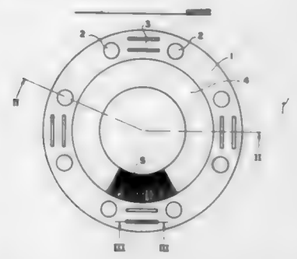
comprising a solid, top member having an opening therein, a fluid distributor tube having one end extending through said opening and extending along an axis of said cartridge, said distributor tube having a plurality of openings along its length and having another end embedded in a solid, bottom member sealing it therein, a mat of fluid permeable sheet having a plurality of glass fibers affixed thereto positioned around said distributor tube in successive wraps to provide alternate layers of fluid permeable sheets and glass fibers from the distributor tube to the outside of the cartridge, said glass fibers being oriented in parallel to the distributor tube and to each other and wherein the fibers are embedded in said top member below its upper surface and in said bottom member, said fibers being opened to the atmosphere at the lower surface of said bottom member, means positioned around said distributor tube in the said opening in said top member and surrounding said distributor tube in said opening to thereby provide a sliding surface on which the said top member may move downwardly on said tube in response to changes in the length of the said fibers caused by shrinkage thereof during operation.

4,690,761

ANNULAR FILTER DISC

Itzhak Orlaas, M.P. Hevel Korazim, Israel, assignor to Amida Sinun Vehashkaya, M.P. Hevel Korazim, Israel

Filed Feb. 10, 1986, Ser. No. 828,556
Claims priority, application Israel, May 7, 1985, 75110
Int. Cl.[4] B01D *29/46*
U.S. Cl. 210—330 **4 Claims**



1. A tubular filter stack comprising a stack of annular filter discs; a plurality of angularly spaced apart springy spacer projections formed integrally with a first surface of each disc so as to abut a second and opposite surface of a successive disc for enabling compression of said discs into close juxtaposition one with the other during a filtering cycle and for enabling expansion of said disc one from the other sufficient to enable flushing during a flushing mode; disc mounting means for mounting said discs in a stacked condition and releasable clamping means for clamping said discs together so as to compress said projections.

4,690,762

APPARATUS FOR REMOVING BUBBLES FROM A LIQUID

Yoshiro Katsura, Narashino, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,058, Jun. 7, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 854,679
Claims priority, application Japan, Jun. 10, 1983, 58-102726
Int. Cl.[4] B01D *19/02*
U.S. Cl. 210—436 **7 Claims**

1. An apparatus for removing bubbles from a liquid, comprising:

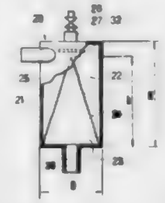
a generally cylindrical vessel having an axis and a cylindrical inner wall;

a substantially conically shaped filtration member disposed in said vessel coaxially therewith, said filtration member dividing the space in said vessel into a liquid inlet space and a liquid outlet space;

a liquid inlet port formed in a wall of said vessel in communication with said liquid inlet space for introducing a liquid into said liquid inelt space in the form of a vortex flow around the axis of said vessel;

a liquid outlet port formed in the wall of said vessel in communication with said liquid outlet space for adapting the treated liquid passed through said filtration member to be discharged therethrough; and

a gas outlet port formed in the wall of said vessel in communication with an uppermost region of said liquid inlet space for allowing the gas of the separated bubbles to be discharged therethrough;



said filtration member having an upper apex end and a bottom end, said upper apex end being positioned at substantially the same level as said liquid inlet port, the filtration area of said filtration member being reduced in the vicinity of its upper apex end and increasing in the axial direction toward said bottom end of asid filtration member in accordance with its conical configuration, and the radial separation between the periphery of said filtration member and said inner wall of said vessel increasing in the axial direction thereof from said bottom end toward sasid upper apex end by an amount sufficient to allow separation of bubbles from said vortex flow of said liquid in said liquid inlet space.

4,690,763

FILTER MEDIUM IN THE FORM OF A STABLE POROUS BODY

Wolfhart Rieger, Buch; Ludwig Gauckler, Schaffhausen; Albert Maurer, Thayngen, and Konrad Kampfer, Thayngen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 426,902, Sep. 29, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 766,053
Int. Cl.[4] B01D *39/20*
U.S. Cl. 210—496 **18 Claims**

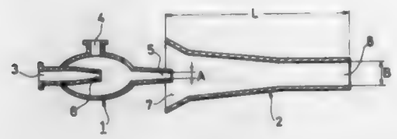
1. A filter plate constructed and arranged for filtering molten metal in the form of a stable porous body of hollow spherical ceramic granules of fire-resistant material which are bonded together, said granules having a mean diameter of from 0.5 mm to 8 mm and are thermally bonded together such that the surface area of the point contact between any two granules is from 0.1% to 1.5% the surface area of the granules, said filter plate being characterized by a width to thickness ratio of from 1:1 to 25:1, an apparent density of 16 to 25 percent the density of the ceramic material, a through flow porosity of 20 to 35 percent by volume and a permeability of 10 μPm to 30 μPm.

4,690,764

AERATOR AND AEROBIC BIOLOGICAL TREATMENT PROCESS USING SAME

Munehiro Okumura, Hoya; Takao Nomura, Matsudo; Tadashi Matsuda; Shojiro Kido, both of Yokohama; Shinichi Ishii, Hachiouji, and Hideki Hattori, Tokyo, all of Japan, assignors to Mitsubishi Rayon Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,730
Claims priority, application Japan, Oct. 11, 1985, 60-224802
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—629 **7 Claims**



1. An aerator comprising a jet stream generator for ejecting a gas and a liquid in a mixed state from a nozzle, and a tubular flow straightener for mixing the bubble-containing stream ejected from the nozzle with ambient water and discharging the resulting mixture from the discharge orifice thereof, characterized in that said jet stream generator has a liquid inlet, at least one gas inlet, an outer nozzle and at least one inner nozzle, said liquid inlet communicates with the internal space of said jet stream generator by way of said inner nozzle, said flow straightener has a tubular form whose internal diameter is reduced from the inlet toward the discharge orifice through at least a part of its length, and said outer nozzle is disposed so as to be substantially coaxial with said flow straightener and to have its tip located in the neighborhood of the inlet of said flow straightener.

7. A process for the aerobic biological treatment of waste water placed in a tank which comprises the steps of

(a), providing an aerator comprising a jet stream generator for ejecting a gas and a liquid in a mixed state from a nozzle, and a tubular flow straightener for mixing the bubble-containing stream ejected from the nozzle with ambient water and discharging the resulting mixture from the discharge orifice thereof, characterized in that said jet stream generator has a liquid inlet, at least one gas inlet, an outer nozzle and at least one inner nozzle, said liquid inlet communicates with the internal space of said jet stream generator by way of said inner nozzle, said flow straightener has a tubular form whose internal diameter is reduced from the inlet toward the discharge orifice through at least a part of its length, and said outer nozzle is disposed so as to be substantially coaxial with said flow straightener and to have its tip located in the neighborhood of the inlet of the flow straightener;

(b) installing said aerator within said tank in such a way that said aerator is located at a depth of at least 2 meters below the water surface and the discharge orifice of said flow straightener is located at a distance of not less than 3 meters from the opposite wall of said tank as measured in the direction of flow of the bubble-containing stream discharged from said discharge orifice;

(c) disposing two partitions within said tank in such a way that said partitions are substantially parallel to the bubble-containing stream discharged from said discharge orifice, said partitions define a section having a width of not greater than 5 meters, and said aerator is located substantially equidistant from said partitions; and

(d) supplying a gas and a liquid to said aerator so as to produce a bubble-containing stream having a flow velocity of not less than 1.5 meters per minute at said discharge orifice.

4,690,765

CHEMICALLY MODIFIED SEMIPERMEABLE MEMBRANES AND THEIR USE IN REVERSE OSMOSIS AND ULTRAFILTRATION

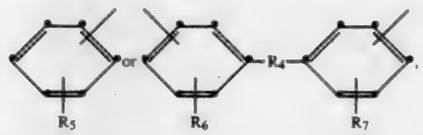
Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 411,066, Aug. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 355,509, Mar. 8, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,321
Claims priority, application Switzerland, Mar. 17, 1981, 1809/81
Int. Cl.[4] B01D *13/00, 13/04*
U.S. Cl. 210—654 **27 Claims**

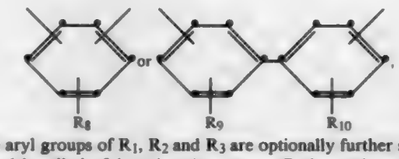
1. A semipermeable membrane of a modified polysulfone, which comprises repeating units of the formula

$$—M_1—R_1—M_2—R_2—SO_2—R_3— \quad (1)$$

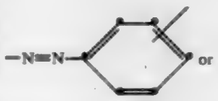
wherein M_1 and M_2 are independently a valence bond, —O— or —NH—, R_1 is a valence bond or a group of the formula

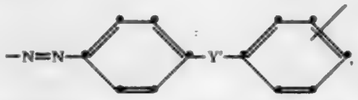


with the proviso that if R_1 is a valence bond, only one of M_1 and M_2 can be —O—, R_2 and R_3 are independently a group of the formula



the aryl groups of R_1, R_2 and R_3 are optionally further substituted by alkyl of 1 to 4 carbon atoms, R_4 is a valence bond —O—, alkylene of 1 to 4 carbon atoms optionally substituted or interrupted by cycloalkyl(ene) or aryl(ene) of at most 7 carbon atoms, or alkylidene of 2 to 4 carbon atoms, R_5 to R_{10} are independently hydrogen, or $—R_{11}NH_2$ or $—R'_{13}OH$ radicals, wherein R_{11} and R'_{13} each being





Y' being a valence bond, —O— or —NH—, these radicals being modified through a sequence of chemical reactions consisting essentially of steps (a) and (c), wherein:

step (a) is reacting said radicals with a monomeric compound containing at least two functional groups, to bond $—R_{11}NH—$ or $—R'_{13}O—OH$ said radicals to one of the functional groups of the monomeric compound,

step (b) is reacting a product of step (a) with a polyfunctional, linear or branched oligomer or polymer, to bond an available functional group of the monomeric compound to

one of the functional groups of the oligomer or polymer, and

step (c) is reacting a product of step (b) with at least one member selected from the group consisting of a non-ionic compound and an ionic compound containing at least one group capable of reaction with the product of step (b), to bond the non-ionic compound, ionic compound or both compounds to the product of step (b), a degree of substitution of substituents R_5 to R_{10}—different from hydrogen—being between 0.05 and 3.5 milliequivalents/g.

4,690,766

CHEMICALLY MODIFIED SEMIPERMEABLE POLYSULFONE MEMBRANES AND THEIR USE IN REVERSE OSMOSIS AND ULTRAFILTRATION

Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 355,509, Mar. 8, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 737,911

Claims priority, application Switzerland, Mar. 17, 1981, 1809/81

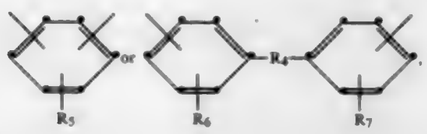
Int. Cl.⁴ B01D *13/00, 13/04*

U.S. Cl. 210—654 **26 Claims**

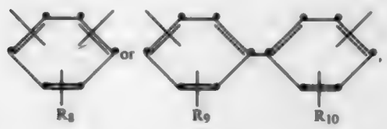
1. A semipermeable membrane of a modified polysulfone which comprises repeating units of the formula

$$—M_1—R_1—M_2—R_2—SO_2—R_3— \quad (I)$$

wherein M_1 and M_2 are independently a valence bond, —O— or —NH—, R_1 is a valence bond or a group of the formula



with the proviso that if R_1 is a valence bond, only one of M_1 and M_2 can be —O—, R_2 and R_3 are independently a group of the formula



the aryl groups of R_1, R_2 and R_3 are optionally further substituted by alkyl of 1 to 4 carbon atoms, R_4 is a valence bond, —O—, alkylene of 1 to 4 carbon atoms optionally substituted or interrupted by cycloalkyl(ene) of aryl(ene) of at most 7 carbon atoms, or alkylidene of 2 to 4 carbon atoms, R_5 to R_{10} are independently hydrogen, or $—R_{11}NH_2$,



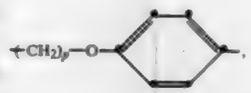
or $—R_{13}OH$ radicals, these radicals being modified through a sequence of chemical reactions consisting essentially of steps (a) to (c), wherein:

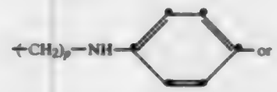
step (a) is reacting said radicals with a monomeric compound containing at least two functional groups, to bond the $—R_{11}NH—$,

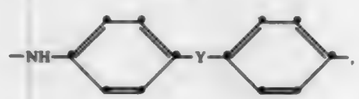
or $—R_{13}O—$ of said radicals to one of the functional groups of the monomeric compound,

step (b) is reacting a product of step (a) with a polyfunctional, linear or branched oligomer or polymer, to bond an available functional group of the monomeric compound to one of the functional groups of the oligomer or polymer and

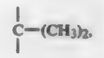
step (c) is reacting a product of step (b) with a non-ionic or ionic compound containing at least one group capable of reaction with the product of step (b), to bond the non-ionic or ionic compound to the product of step (b), $—R_{12}X$ or $—R_{13}CHO$ radicals, modified through a sequence of chemical reactions consisting essentially of steps (b) and (c), or $—R_{13}CN$ radicals, modified through a sequence of chemical reactions consisting essentially of reacting said $—R_{13}CN$ radicals with hydroxylamine to form an amidoxime group, followed by steps (a), (b) and (c), R_{11} is a valence bond, $—CH_2—$, $—(CH_2)_pNH(CH_2)_{2\text{-}6}$, $—(CH_2)_p—O—(CH_2)_{2\text{-}6}$,



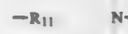




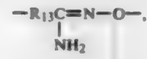
R'_{11} constitutes atoms necessary to form an imidazolone ring condensed with a polymer backbone consisting of the repeating units of the formula (1), R_{12} is $—C_nH_{2n}$, R_{13} is a valence bond or $—C_mH_{2m}$, Y is —O—, $—SO_2—$ or



X is halogen, m is an integer of 1 to 5 and n is an integer of 1 to 6, p is zero of 1, wherein said membrane contains at least one radical selected from the group consisting of $—R_{11}NH—$,



$—R_{12}—$, $—R_{13}O—$, $—R_{13}CH═$ and



a degree of substitution of substituents R_5 to R_{10}—different from hydrogen—being between 0.3 and 3.5 milliequivalents/g.

4,690,767

HYDROGEN SULFIDE STABILIZED OIL-SOLUBLE SULFURIZED ORGANIC COMPOSITIONS

Stephen A. DiBiase, Euclid, and James N. Vinci, Mayfield Heights, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 712,587, Mar. 15, 1985. This application Aug. 11, 1986, Ser. No. 879,243

Int. Cl.⁴ C10M *135/02, 141/06*

U.S. Cl. 252—47 **8 Claims**

1. A metal working fluid, comprising:

a major amount of an oil of lubrication viscosity;

an oil-soluble sulfurized organic compound present in an amount of about 0.1% to about 10% by weight based on the weight of the fluid;

an oil-soluble hindered organic amine structured so as to provide stearic hinderance, said hindered organic amine being selected from the group consisting of primary amines and secondary amines wherein the hindered amine is present in an amount of from about 0.25% to about 2% by weight based on the weight of the sulfurized organic compound.

4,690,768

PROCESS FOR THE PREPARATION OF FERRITE MAGNETIC PARTICULATE FOR MAGNETIC RECORDING

Kouzi Kamiyama, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 580,161, Feb. 14, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,476

Claims priority, application Japan, Feb. 16, 1983, 58-24255

Int. Cl.⁴ C04B *35/26*

U.S. Cl. 252—62.58 **6 Claims**

1. A process for the preparation of a magnetoplumbite type ferrite magnetic particulate for magnetic recording which comprises the steps of:

(1) melting a starting material mixture containing a basic component for hexagonal ferrite comprising Fe_2O_3 and RO, wherein R is at least one metal atom selected from the group consisting of barium, strontium and lead, a coercive force reducing component comprising MO and $M'O_2$, wherein M is at least one divalent metal atom selected from the group consisting of cobalt, nickel and zinc and M' is at least one tetravalent metal atom consisting of titanium, zirconium and hafnium, and a glass-forming component comprising B_2O_3 and SiO_2,

(2) rapidly cooling the resulting molten mixture to obtain an amorphous material,

(3) heat-treating said amorphous material to form ferrite crystals, and

(4) removing components other than the ferrite crystals from the material resulting from said heat-treatment;

characterized in that a step for pulverizing said amorphous material under application of shearing force and pressure to give particles passing through a sieve of 170 mesh is included in advance of the step (3) for heat-treating said amorphous material to form ferrite crystals.

4,690,769

HYDRATED CALCIUM BROMIDE REVERSIBLE PHASE CHANGE COMPOSITION

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1986, Ser. No. 894,592

Int. Cl.⁴ C09K *5/06*

U.S. Cl. 252—70 **15 Claims**

13. A method of storing thermal energy, comprising the steps of preparing a reversible liquid/solid phase change composition by admixing $CaBr_2$ and water to form a eutectic composition of $CaBr_2.6H_2O$ and $CaBr_2.4H_2O$ having more than 5.4 but less than 6.0 moles of water per mole of $CaBr_2$, introducing the composition into an encapsulating means for use as a heat storage device, and hermetically sealing the encapsulating means to prevent evaporation of water from the composition.

4,690,770

BLOCK-FORM DETERGENT FREE FROM ALKALI HYDROXIDES FOR USE IN DISHWASHING MACHINES AND A PROCESS FOR ITS PRODUCTION

Peter Jeschke, Neuss; Theodor Altenschoepfer, Duesseldorf; Jochen Jacobs, Wuppertal, and Klaus Schumann, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,913

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519354

Int. Cl.⁴ C11D *7/18*

U.S. Cl. 252—99 **20 Claims**

1. A storage stable detergent in the form of fused blocks made from a liquid melt free of alkali metal hydroxide for use in dishwashing machines containing from about 65 to about 85% by weight, based on the weight of the detergent, of a mixture of alkali metal silicates and pentaalkalitriphosphates, said silicates being present in an amount of between about 5 and about 60% by weight, and being selected from sodium metasilicate nonahydrate, sodium metasilicate hexahydrate, sodium metasilicate pentahydrate, sodium metasilicate anhydrous, and mixtures thereof, and homogeneously distributed throughout said detergent from about 0.2 to about 4% by weight of a chlorine donor.

4,690,771

PHOSPHATE FREE NONAQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMPOSITION AND METHOD OF USE

Trazollah Ouhadi, Liège, and Louis Dehan, Seraing, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,164

Int. Cl.⁴ C11D *1/74, 3/12, 3/43, 3/39*

U.S. Cl. 252—102 **20 Claims**

16. A phosphate detergent builder free nonaqueous liquid heavy duty laundry detergent composition which comprises

Nonionic surfactant in an amount of about	30–40%
Polycarboxylic Acid Terminated nonionic surfactant in an amount of about	4–10%
Sodium salt of nitrilotriacetic acid (NTA) builder in an amount of about	5–15%
Sodium salt of crystalline aluminosilicate zeolite in an amount of about	15–20%

4,690,772

STERILANT COMPOSITIONS

Elaine N. Tell, Fort Lee, N.J., and Preston L. Veltman, Severna Park, Md., assignors to National Medical Care, Rockleigh, N.J.

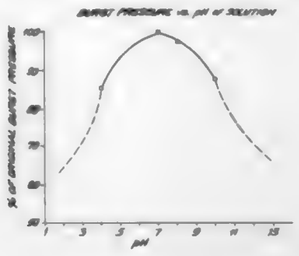
Filed Jun. 3, 1985, Ser. No. 740,643

Int. Cl.⁴ C11D *3/48*

U.S. Cl. 252—106 **2 Claims**

1. A dry, granular, solid, water soluble, biocompatible, sterilant cleansing composition suitable for cleansing hemodialysis apparatus for reuse comprising by weight, 56.8 grams of so-

dium chlorite, 11.6 grams of citric acid and 151.4 grams of sodium bicarbonate, said composition being isotonic and having a pH of approximately 7.3 when dissolved in five gallons of water.



4,690,773

MICROBIAL ENZYMATIC CONTACT LENS CLEANER AND METHODS OF USE

Lai Ogunbiyi, Fairport, and Francis X. Smith, Walworth, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 690,372, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 545,315, Oct. 24, 1983, abandoned. This application May 7, 1986, Ser. No. 861,741

Int. Cl.⁴ B08B *3/08*

U.S. Cl. 252—174.12 **8 Claims**

1. A method of cleaning an extended wear contact lens, which comprises contacting the lens for less than 2 hours with an effective amount of an activator-free, non-malodorous enzyme-containing solution comprising an aqueous solution containing a protease prepared by dissolution in aqueous solution of a contact lens cleaning tablet comprising from about 0.01 mg. to about 500 mg. of a protease derived from a Bacillus, Streptomyces, or Aspergillus microorganism.

4,690,774

NOVEL TRANSLUCENT WATER IN OIL EMULSIONS

Mohan Vishnupad, Monroe, and Jose E. Ramirez, Trumbull, both of Conn., assignors to Chesebrough Pond's Inc., Greenwich, Conn.

Filed Sep. 11, 1985, Ser. No. 774,727

Int. Cl.⁴ B01J *13/00*

U.S. Cl. 252—309 **10 Claims**

1. A translucent water-in-oil emulsion having the same general appearance and feel as petroleum jelly comprising an aqueous phase, said aqueous phase comprising water in an amount from 8% to 20% by weight of the total composition and a humectant in an amount from about 15% to 30% by weight of the total compositon, an oil phase in an amount of about 50% to 77% by weight, said oil phase comprising petroleum jelly in an amount from about 40% to 70% by weight of the total composition and a water-in-oil emulsifying agent in an amount needed to form the water-in-oil emulsion, said aqueous phase having a refractive index in essentially the same range as the oil phase to produce the translucent water-in-oil emulsion.

4,690,775

EMULSION-BASED GEL AND PROCESS FOR PREPARING SAME

Hans Schott, and Alan E. Royce, both of Philadelphia, Pa., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 537,980, Sep. 30, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 726,923

Int. Cl.⁴ B01J *13/00*

U.S. Cl. 252—312 **32 Claims**

1. A method for preparing a transparent gel which comprises centrifuging an emulsion comprising a substantially oleophilic, hydrophobic liquid component constituting the dispersed phase in a substantially aqueous medium containing an emulsifying amount of emulsifying agent which is soluble therein at its level of concentration but which is substantially insoluble in the oleophilic, hydrophobic component, the emulsion being devoid of gelling agent, to separate the emulsion into a transparent gel phase containing substantially all of the oleophobic component of the emulsion and a clear aqueous phase, said oleophilic, hydrophobic liquid component being a liquid organic material having at most low or slight solubility in water and/or other polar solvent and said organic material being an edible fat, edible oil, liquid paraffin, aliphatic hydrocarbon or derivative thereof, aromatic hydrocarbon or derivative thereof, essential oil, or mixtures thereof and said emulsifying agent being a nonionic surface active agent having an HLB number of from about 8 to about 18 or an ionic surface active agent.

4,690,776

METHOD OF MANUFACTURE OF A TOOTHPASTE COMPOSITION

Irwin E. Smigel, 635 Madison Ave., New York, N.Y. 10022

Division of Ser. No. 706,001, Feb. 27, 1985, Pat. No. 4,603,045. This application Jan. 8, 1986, Ser. No. 817,043

Int. Cl.⁴ A61K *7/18;* **B01J** *13/00*

U.S. Cl. 252—315.3 **7 Claims**

1. A method of preparing a toothpaste composition comprising adding calcium phosphate in an amount of 0.5 to 5% by weight of the composition and sodium perborate in an amount of 0.5 to 5% by weight of the composition to hot water to form a first mixture and agitating the first mixture, adding to said first mixture sorbitol in an amount of 1 to 50% by weight of the composition, cornstarch in an amount of 0.5 to 10% by weight of the composition and aluminum hydroxide in an amount of 0.01 to 1% by weight of the composition to form a second mixture and agitating the second mixture, adding to said second mixture dicalcium phosphate in an amount of 1 to 50% by weight of the composition and sodium monofluoride phosphate in an amount of 0.7 to 0.8% by weight of the composition to form a third mixture and agitating the third mixture, adding to the third mixture sodium bicarbonate, in an amount of 1 to 50% by weight of the composition, gradually adding increments of a flavoring material in an amount of 0.05 to 2% to control any foaming and to facilitate release of gases to form a fourth mixture, and adding to the fourth mixture sodium lauryl sulfoacetate in an amount of 0.1 to 5% and gum in an amount of 0.5 to 5% and agitating the fourth mixture until a homogeneous paste composition is obtained.

4,690,777

PRODUCTION OF SYNTHESIS GAS

Louis J. Valenyi, Lyndhurst; Frederick A. Pesa, Aurora, and Christos Paparizos, Willowick, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 336,533, Jan. 4, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 548,104

Int. Cl.⁴ C01B *3/38, 3/40*

U.S. Cl. 252—373 **12 Claims**

1. A process for reforming light hydrocarbons selected from the group consisting of olefins having from 2 to about 4 carbon atoms and paraffins having from 1 to about 4 carbon atoms, to a product gas mixture containing at least carbon monoxide and hydrogen comprising contacting the light hydrocarbons with carbon dioxide in the presence of a catalytic amount of a catalyst comprising a porous catalyst support having a surface area greater than 1 to less than about 350 m^2/gm and a pore volume of about 0.4 to about 3 cc/gm and at least one Group VIII metal or mixture thereof on a pore surface of the support in the absence of steam.

4,690,778

ELECTROMAGNETIC SHIELDING MATERIAL

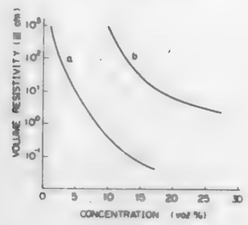
Yoshikazu Narumiya; Yasuo Hashimoto, both of Chiba; Hiroshi Yui, and Yoshiteru Kageyama, both of Mie, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 20, 1985, Ser. No. 735,955

Claims priority, application Japan, May 24, 1984, 59-103669

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—506 **7 Claims**



1. An electromagnetic shielding material for forming a sheet having electromagnetic absorbing property, the said material comprising a composition in which MN-ZN ferrite powders and conductive carbon black powders are dispersed in a matrix of organic high molecular weight compounds, the content of the MN-ZN ferrite powders being in the range between 30 and 70 vol percent, the content of the carbon black powders being in the range between 1 and 12 vol percent, the composition having a volume resistivity in the range between 100 and 1/10 ohm/cm, and the carbon black powders having the specific surface of more than 900 m^2/g.

4,690,779

HARD SURFACE CLEANING COMPOSITION

Harold R. Baker, Pleasanton; Eugene S. Thrower, Oakland, and David C. Simpson, Indio, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 505,038, Jun. 16, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 815,664

Int. Cl.⁴ C11D *1/75, 3/37*

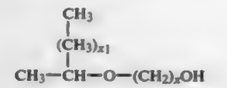
U.S. Cl. 252—546 **2 Claims**

1. A substantially non-streaking, aqueous hard surface cleaning compositin comprising:

(a) approximately 0.05% to 25.0% by weight of a C_{10-14} amine oxide or a betaine surfactant;

(b) approximately 0.05% to 25.0% by weight of a polyethylene glycol of molecular weight less than 5,000;

(c) approximately 0.05% to 25.0% by weight of a solvent having the general structure



wherein x_1 is 0 to 6, and x is 1 to 6;

(d) approximately 0.05% to 25.0% by weight of sodium salts of ethyelen diamine tetraacetic acid; and

(e) the remainder as water.

4,690,780

INSULATING MATERIAL AND USE THEREOF IN INSULATORS

Leonard V. Chabala, Maywood; John Haarsma, Barrington; Raymond P. O'Leary, Evanston; Christopher D. Roman, Glenview, and Thomas J. Tobin, Northbrook, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Division of Ser. No. 721,615, Apr. 10, 1985, Pat. No. 4,622,250. This application Jul. 1, 1986, Ser. No. 880,867

Int. Cl.⁴ H01B *3/20*

U.S. Cl. 252—572 **18 Claims**

1. An insulating material consisting of 10% to 80% by volume of an insulating fluid and 20% to 90% by volume of solid insulative bodies, the relative volumes and densities of said insulating fluid and said solid bodies, and the shape of said solid bodies being determined to provide a relatively free-flowing mixture, the densities of said insulating fluid and said solid insulative bodies being generally equal, the apparent viscosity of the insulating material to an object moving therein being less than 20 times the viscosity of said insulating fluid.

4,690,781

METHOD OF FILLING A METAL VESSEL WITH A GLASS MELT CONTAINING HIGHLY RADIOACTIVE FISSION PRODUCTS

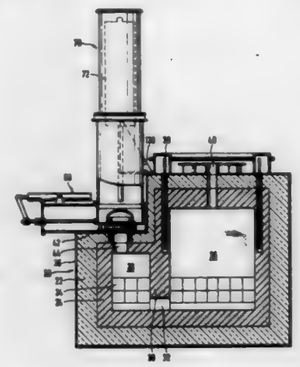
Wilfried Heimerl, Mol, and Eckhart Ewest, Balen, both of Belgium, assignors to Deutsche Gesellschaft für Widerseufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 627,473, Jul. 3, 1984. This application Jul. 1, 1986, Ser. No. 881,008

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324696

Int. Cl.⁴ G21F *9/16, 9/34;* **C03B** *7/18*

U.S. Cl. 252—633 **3 Claims**



1. Method of filling a metal vessel with a radioactive glass melt from a glass-melt furnace disposed in a cell of a nuclear facility and having a closable suction port that communicates with a chamber of the furnace containing the radioactive glass melt, the vessel being provided with a suction tube mounted on the base wall thereof so as to communicate with the interior of the vessel and being sealed with a solid fused mass, the method comprising the steps of:

placing the metal vessel with the sealed suction tube extending therefrom into a holding device surrounding the vessel, the metal vessel being evacuated so that a partial vacuum is present therein;

positioning the holding device over the closable suction port of the glass-melt furnace so as to align the suction tube with respect thereto and so as to cause the holding device to hermetically seal off the suction port with respect to the atmosphere in the cell;

opening the suction port thereby causing said chamber to communicate with the interior of said holding device;
lowering the metal vessel until the suction tube dips into the glass melt in said chamber thereby causing said solid fused mass to melt whereby the glass melt flows upwardly into the metal vessel;
freezing the glass melt in the suction tube thereby again sealing the same with a solid fused mass;
moving the metal vessel upwardly until the suction tube is withdrawn from said furnace;
closing the suction port and positioning a sealing cover for the vessel directly beneath the metal vessel so that the inner surface of said cover faces upwardly; and,
again lowering the metal vessel to cause the suction tube to come into contact engagement with said inner surface thereby pushing the suction tube into the vessel as the same is lowered further and finally seating said cover in said vessel.

4,690,782

PROCESS FOR DECONTAMINATING MATERIALS CONTAMINATED BY RADIOACTIVITY

Godfried Lemmens, Leopoldslei 50, 2130 Brasschaat, Belgium

Filed Apr. 3, 1986, Ser. No. 847,776
Claims priority, application Belgium, Jan. 30, 1986, 2/60917
Int. Cl.⁴ G21F *9/00*; C23G *1/02*
U.S. Cl. 252—626 **14 Claims**

1. A process for decontaminating radioactively contaminated material comprising the steps of:
(a) successively bringing into contact for a predetermined length of time the surface of the contaminated material with a solution of sodium carbonate,
(b) bringing the surface of the contaminated material into contact with heated and diluted nitric acid, thereafter potassium permanganate is added thereto,
(c) bringing the surface of the contaminated material into contact for a predetermined length of time with a solution of oxalic acid (COOH—COOH.$2H_2O$), and
(d) finally rinsing and drying the material.

4,690,783

METHOD OF PREPARING ROSIN ESTER FROM POLYOL WITH PHOSPHOROUS ACID CATALYST

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Aug. 29, 1986, Ser. No. 902,464
Int. Cl.⁴ C08F *1/04*
U.S. Cl. 260—104 **12 Claims**

1. A method of preparing a polyol ester of rosin, which comprises esterifying a rosin with a polyol in the presence of a catalytically effective amount of phosphorous acid.

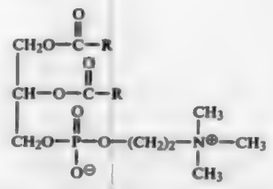
4,690,784

PROCESS FOR PREPARING PHOSPHATIDYLCHOLINE DERIVATIVES

Yukihiro Nanba, and Toshiyuki Sakakibara, both of Kobe, Japan, assignors to Nippon Fine Chemical Co., Ltd., Osaka, Japan

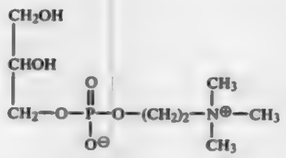
Filed May 28, 1985, Ser. No. 738,220
Claims priority, application Japan, May 30, 1984, 59-110450
Int. Cl.⁴ C07F *9/10*
U.S. Cl. 260—403 **15 Claims**

1. A process for preparing a phosphatidylcholine derivative represented by the formula



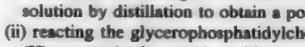
(I)

wherein R represents straight- or branched-chain and saturated or unsaturated hydrocarbon group, the process consisting essentially of the steps of:
(i) providing a suspension or solution of (a) glycerophosphatidylcholine represented by the formula



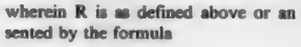
(II)

and (b) a carrier selected from the group consisting of a porous mineral material and an inorganic neutral salt in a solvent and removing the solvent from the suspension or solution by distillation to obtain a powder, and
(ii) reacting the glycerophosphatidylcholine of the formula (II) present in the powder with an acid anhydride represented by the formula:



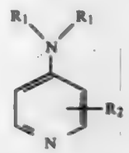
(III)

wherein R is as defined above or an acid halide represented by the formula



(IV)

wherein R is as defined above and X represents halogen atom, in a solvent and in the presence of a basic catalyst, to acylate the glycerophosphatidylcholine of the formula (II)
wherein the carrier is used in an amount of about 1 to about 100 parts by weight per part by weight of the gylcerophosphatidylcholine of the formula (II) and
wherein the basic catalyst is tri(C_1–C_4alkyl)amine or a pyridine derivative represented by the formula



(V)

wherein R_1 represents straight- or branched-chain alkyl group having 1 to 4 carbon atoms or two R_1 groups, when taken together with the nitrogen to which they are attached, form a pyrrolidino group, and R_2 represents an alkyl group having 1 to 4 carbon atoms or an hydrogen atom.

4,690,785

LOW WATER NEUTRALIZATION TO PRODUCE A HIGHLY ACTIVE ALKARYL SULFONATE

Marvin L. Mausner, Teaneck, N.J., and Siegfried Meinstein, Oaklawn, Ill., assignors to Witco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 747,546, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 258,202, Apr. 27, 1981, abandoned. This application Jul. 7, 1986, Ser. No. 882,290
Int. Cl.⁴ C07C *143/24*
U.S. Cl. 260—505 N **14 Claims**

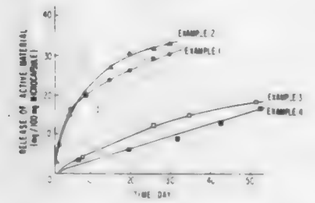
1. A low water concentration, essentially one-step process for the preparation of an alkaryl sulfonate in the form of a dry, free flowing powder, comprising: forming a reaction mixture consisting essentially of an alkaryl sulfonic acid and a salt-forming base, the concentration of the salt-forming base in the mixture being such that the total concentration of the water in the reaction mixture which may be present in the salt-forming base and/or formed during the neutralization reaction between the alkaryl sulfonic acid and the salt-forming base will be below about 15%, by weight; and utilizing substantially only the heat generated during the neutralization reaction to remove the said water present in the salt-forming base and/or formed during said neutralization reaction from the mixture to provide a dry, free-flowing powder having an alkaryl sulfonate concentration of about 90%, by weight.

4,690,786

PROCESS FOR PRODUCING A MICROCAPSULE CONTAINING A LIQUID ACTIVE MATERIAL

Yasuo Ninomiya; Chiaki Komamura, and Yoshikazu Musa, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 608,834, May 10, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,602
Claims priority, application Japan, Dec. 12, 1983, 58-234688
Int. Cl.⁴ A61K *9/52*; B01J *13/02*
U.S. Cl. 264—4.6 **16 Claims**



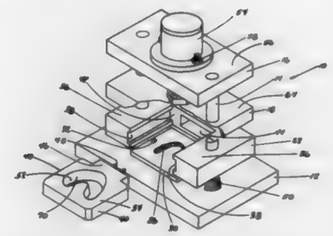
1. A process for producing a microcapsule containing a liquid active material, which can release the liquid material into an ambient atmosphere (30°±15° C.) at a controlled rate, comprising the steps of:
(1) dissolving in an organic solvent a polysulfone and an active material which has a limited solubility of about 0.01 to about 2 parts by weight in 100 parts by weight of said polysulfone and which is liquid at room temperature, the amount of said liquid active material added being more than the limited solubility and being about 2 to about 250 parts by weight per 100 parts by weight of the polysulfone and said organic solvent being capable of dissolving the respective components and being more volatile than said active material;
(2) atomizing the resulting solution through a nozzle into a gaseous atmosphere to form a mist of tiny liquid droplets; and
(3) removing the solvent from the droplets by evaporation so as to provide a microcapsule having the liquid active material confined by the wall of said microcapsule made of the polysulfone.

4,690,787

APPARATUS AND METHOD FOR MAKING POSITIONERS

Jeffery L. Fasnacht, 4956 Douglas Ave., Racine, Wis. 53402

Filed May 9, 1986, Ser. No. 861,441
Int. Cl.⁴ B29C *43/04, 43/52*
U.S. Cl. 264—16 **18 Claims**



1. In apparatus for forming tooth positioners of the type including a pair of aligned opposed toothwork model mounting means relatively movable toward each other and a holding member between the mounting means having a cavity to receive a positioner blank, the improvement comprising:
heating means embedded in the holding member; and
means to apply pressure on upper and lower surfaces of a blank in the cavity through the mounting means and the toothwork models thereon to shape the blank on the upper and lower surfaces,
whereby heat can be specifically applied to the blank.

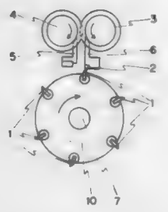
17. A method for forming tooth positioners comprising:
mounting a pair of upper and lower toothwork models on aligned opposed toothwork model mounting means;
loading a positioner blank into a blank-receiving cavity of a holding member;
placing the loaded holding member between the upper and lower toothwork models with the blank in alignment with the models;
heating the loaded holding member by applying heat internally to the holding member; and
applying pressure simultaneously to upper and lower surfaces of the blank through the toothwork models.

4,690,788

PROCESS FOR PREPARING WATER-SOLUBLE POLYMER GEL PARTICLES

Akira Yada; Shusaku Matsumoto, both of Kyoto; Yoshihiro Kawamori, Joyo; Takao Saito, Nagaokakyo; Tadashi Nishiyama, and Yoshitugu Adachi, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Nov. 5, 1985, Ser. No. 795,263
Claims priority, application Japan, Nov. 6, 1984, 59-233560; Nov. 6, 1984, 59-233561; Nov. 13, 1984, 59-239229
Int. Cl.⁴ B02C *4/08*; B29B *9/02*; B29C *33/06, 35/08*
U.S. Cl. 264—22 **19 Claims**



1. A process for preparing dry, spherical, polymer gel, powder particles from an aqueous polymer gel in a wet state ob-

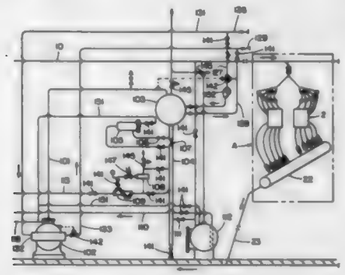
tained by subjecting an aqueous solution of a water-soluble vinyl monomer to polymerization which comprises feeding said polymer gel in a wet state into a roller cutter including a pair of cutter rollers wherein the rollers bite into said polymer gel with a plurality of annular projections or grooves at predetermined intervals on surfaces of the rollers, said rollers rotating in the opposite directions to each other to engage with each other, thereby cutting the polymer gel into strips; thereafter cutting said strips in a wet state into pieces by a combination of a fixed cutting blade with a rotary cutter, said fixed cutting blade extending in the axial direction of said roller cutter over at least the full length of said roller cutter and said rotary cutter including a rotatable cylindrical body provided on its periphery with at least one cutting blade extending in the axial direction; pulverizing the obtained pieces of polymer gel in a wet state into fine, round particles with a vertical type cutter comprising a casing, at least one vertically fixed cutting blade arranged in said casing in a vertical direction, at least one rotary cutting blade arranged rotatably and vertically in said casing and positioned to minimize the clearance between an edge of the rotary cutting blade and an edge of the fixed cutting blade, said vertical type cutter having a residence space wherein the polymer gel pieces to be pulverized are located, and the residence time of the polymer gel pieces in said residence space being at least 3 minutes; and drying said fine, round particles.

4,690,789

REFRIGERANT COOLED PLASTIC MOLDING, METHOD AND APPARATUS

Robert C. Ritchie, Braintree, Mass.; Henry J. McKone, Francestown, N.H., and Richard H. Stamm, Mt. Prospect, Ill., assignors to Dart Industries Inc., Northbrook, Ill. and Energy Systems Industries, Inc., Newton, Mass.

Filed Mar. 13, 1985, Ser. No. 711,546
Int. Cl.⁴ B29C *35/04, 45/72, 45/76*
U.S. Cl. 264—40.1 **26 Claims**



1. A method for molding hardenable material in a mold a molding machine subject to repeated and rapid variations in mold cooling requirements, the mold being of the type having one or more cooling fluid passageways formed therethrough, said method comprising the steps of:

providing a supply flow of liquid phase refrigerant to the site of the molding machine;

distributing the supply flow into feed flows through the cooling fluid passageways;

independently adjusting each of the feed flows to obtain a mixed phase flow consisting of a boiling liquid phase and vapor phase refrigerant mixture throughout each of the cooling fluid passageways; and

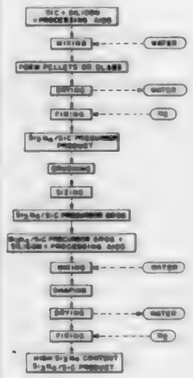
monitoring each feed flow exiting each passageway such that a majority of such flow by weight is in a liquid phase.

4,690,790

SILICON NITRIDE/SILICON CARBIDE COMPOSITION AND ARTICLES THEREOF

Carl H. Bates, South Amboy, N.J., assignor to Stemcor Corporation, Cleveland, Ohio

Filed Jul. 23, 1985, Ser. No. 758,184
Int. Cl.⁴ C04B *35/56, 35/58*
U.S. Cl. 264—63 **8 Claims**



1. A process for the preparation of an article of silicon nitride - bonded silicon carbide comprising:

a. forming an admixture of finely divided silicon metal, and SiC grain, shaping said admixture into discrete pellets, drying said pellets, firing said dried pellets in a nitrogenous non-oxidative atmosphere at a temperature and for a period sufficient to convert substantially all of said silicon metal to Si_3N_4, thereby resulting in formation of Si_3N_4-bonded SiC precursor material pellets having a Si_3N_4 content of at least 50 weight percent;

b. crushing said precursor material pellets;

c. mixing from 30 to 75 weight percent of said crushed precursor material with from 16 to 60 weight percent finely divided silicon metal to form a green composition;

d. shaping said green composition and drying said shaped green composition; and

e. firing said dried green composition in a nitrogenous non-oxidative atmosphere at a temperature and for a period sufficient to convert substantially all of said silicon metal to Si_3N_4.

4,690,791

PROCESS FOR FORMING CERAMIC PARTS

Charles G. Edmiston, San Ramon, Calif., assignor to GTE Products Corporation, Stamford, Conn.

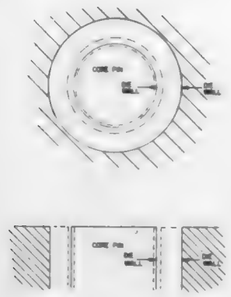
Filed Oct. 2, 1985, Ser. No. 782,822
Int. Cl.⁴ B29C *59/00*
U.S. Cl. 264—122 **5 Claims**

1. A process comprising:

(a) filling a die cavity of sufficient dimensions to produce parts having an aspect ratio of greater than 4:1 with a powder having widely varying realtive sizes of generally spherical shapes.

(b) providing an acoustical energy of a frequency of from about 2 to about 200 kilohertz to at least a portion of said

cavity to thereby cause an induced motion to said powder during the filling of said die cavity and



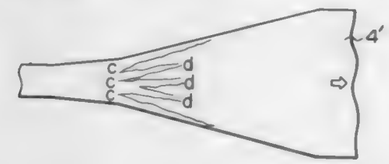
(c) compressing said powder under pressure to form a compressed part having said aspect ratio.

4,690,792

BIAXIALLY DRAWN LAMINATED FILMS PREPARED BY SEQUENTIAL STRETCHING

Hitoshi Matsuda, Tsuchiura; Tsuguo Okumura, Ibaraki, and Kazuharu Abe, Tsuchiura, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,571
Claims priority, application Japan, May 10, 1985, 60-99334
Int. Cl.⁴ B29C *55/14, 55/26*
U.S. Cl. 264—235.8 **8 Claims**



1. A process for the preparation of biaxially drawn laminated films, which comprises:

a first step of forming a substantially amorphous unoriented laminated film comprising a saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98% and a polyamide, and drawing the film in the longitudinal direction at a deformation rate of at least 10,000%/min and a draw ratio of 2.7 to 3.5 at a temperature adjusted to 45° to 65° C. by using a roll type longitudinal drawing machine;

a second step of transferring the film drawn in the longitudinal direction at the first step to the transverse drawing-initiating point of a tenter type transverse drawing machine, expanding the width of the film at an angle of not larger than 6° with respect to the central line of the width of the film at least until the mechanically set ratio of the tenter clip distance to the original distance becomes at least 1.4 while maintaining the temperature of the tenter clips at a level lower than the temperature of the film and drawing the film in the traverse direction at an average deformation rate of 2,000 to 10,000%/min and a draw ratio of 3 to 5 under temperature conditions such that, from the transverse drawing-initiating point, the temperature of the film is elevated stepwise so that the temperature of the film is in the range of 70° to 100° C. at the point of termination of the transverse drawing; and

a third step of heat-treating the film drawn in the transverse direction at the second step at a temperature ranging from 110° C. to the temperature lower by 10° C. than the melting point of the starting polyamide.

7. A process for preparation of biaxially drawn laminated films according to claim 1, wherein the substantially amorphous unoriented laminated film formed at the first step comprises an intermediate layer of the saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98% and layers of the polyamide laminated on both the surfaces of the intermediate layer, respectively.

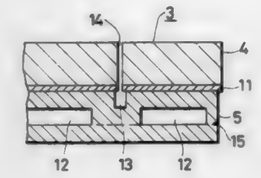
8. A process for the preparation of biaxially drawn laminated films according to claim 1, wherein the substantially amorphous unoriented laminated film formed at the first step comprises an intermediate layer of the polyamide and layers of the saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98%, which are laminated on both the surfaces of the intermediate layer, respectively.

4,690,793

NUCLEAR FUSION REACTOR

Hitachi, Ltd., Tokyo, Japan; Hisanori Okamura, Toukai; Kunio Miyazaki, Hitachi; Hirosi Akiyama, Hitachi; Shinichi Itoh, Hitachi; Tomio Yasuda, Hitachi; Kousuke Nakamura, Hitachi; Yukio Okoshi, Mito; Mutuo Kamoshita, Katsuta, and Akio Chiba, Hitachi, all of Japan

Filed Feb. 17, 1984, Ser. No. 581,076
Claims priority, application Japan, Feb. 18, 1983, 58-24633
Int. Cl.⁴ G21B *1/00;* **B32B** *15/04, 15/20*
U.S. Cl. 376—136 **17 Claims**



1. A nuclear fusion reactor which comprises a vacuum vessel for enclosing plasma particles; coils distributed around the vacuum vessel for generating a magnetic field; and a reactor wall that is exposed to the plasma particles within said vacuum vessel; the reactor wall having a piled structure in which many separate heat-resisting ceramic tiles are bonded to a metal-base body operatively associated with cooling means, gaps being formed between neighboring ceramic tiles and said metal-base body having grooves formed at portions corresponding to at least some of the gaps; said ceramic tiles being formed of compounds of elements having atomic numbers less than 14 and being bonded by a brazing material forming a junction layer between the tiles and the metal-base body.

4,690,794

SYSTEM FOR CONTROLLING DRIVING WATER FOR CONTROL ROD DRIVING MECHANISM OF NUCLEAR REACTOR

Katsuhige Onodera, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,570
Claims priority, application Japan, Feb. 17, 1983, 58-26053
Int. Cl.⁴ G21C *7/16*
U.S. Cl. 376—230 **27 Claims**

1. In a boiling water reactor having a plurality of control rods in the reactor and adapted to be driven independently by corresponding control rod driving mechanisms having a hydraulic piston adapted to be actuated by pressurized water supplied thereto through a hydraulic unit annexed to each

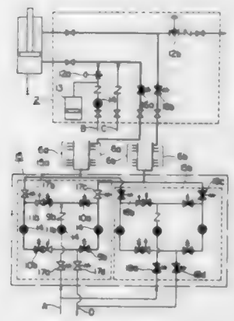
control rod driving mechanism to drive the associated control rod into and out of the reactor core, a system for controlling the driving water for the control rod driving mechanism characterized in that a control rod driving water control unit, which controls the direction of movement of said hydraulic pistons, is used commonly for one or a plurality of independently selectable control rod driving mechanisms, said control rod driving water control unit including:

first conduit means for providing passage for water between said control rod driving water control unit and said hydraulic unit;

second conduit means for providing passage for the water between said control rod driving water control unit and said hydraulic unit;

system means for supplying the water, including first valve means for coupling said supplying system means to a selected one of said first and second conduit means; and

system means for draining the water, including second valve means operable in conjuction with said first valve means



for coupling said draining system means to the other one of said first and second conduit means; and

that said hydraulic unit annexed to each control rod driving mechanism is provided with control rod selector valves which are adapted to be selectively actuated in conjuction with operation of said control rod driving water control unit to connect both inlet and outlet of each of said control rod driving mechanisms selectively to said control rod driving water control unit via not more than two conduits extending between each control rod driving mechanism and said first and second conduit means; said two conduits including:

third conduit means connectable by said selector valves to the discharge side of said first valve means, for supplying the water for driving the hydraulic piston in a first direction;

fourth conduit means connectable by said selector valves to the suction side of said second valve means, for supplying the water for driving the hydraulic piston in a second direction.

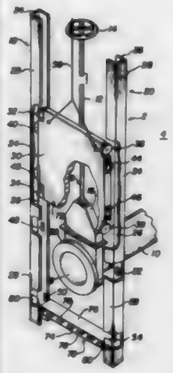
4,690,795

EMERGENCY TRANSFER TUBE CLOSURE AND PROCESS FOR SEALING TRANSFER TUBE UNDER EMERGENCY CONDITIONS

Roy T. Hardin, Jr., Unity Township, Westmoreland County, and James R. Marshall, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1985, Ser. No. 785,293
Int. Cl.[4] G21C *19/19*
U.S. Cl. 376—264 **12 Claims**

1. In a nuclear fuel reactor well that includes a transfer tube projecting outwardly from wall thereof, said transfer tube having a first closure assembly, and said transfer tube having a circumferential flange extending outwardly laterally therefrom, an emergency transfer tube closure therefor comprising; a pair of elongated, vertically-extending U-shaped guides, one U-shaped guide disposed laterally on each side of said transfer tube, each of said U-shaped guides comprising a base and laterally-extending flanges thereon, said U-shaped guides having their open ends facing each other, a closure plate, having a surface facing said circumferential flange greater in area than the area circumscribed by the outer circumference of said circumferential flange, vertically disposed between said U-shaped guides, said closure plate normally being disposed in a vertical plane just slightly in front of the vertical plane of said circumferential flange, two pairs of rollers, one pair of which is rotatably mounted on each side of said closure plate adjacent



said U-shaped guides, riding on the inner portion of each of said flanges of each of said U-shaped guides, each of said U-shaped guides being provided with a pair of spatially disposed openings on a flange thereof adjacent said wall of said nuclear fuel reactor well, each of said pairs of openings being disposed on each of said U-shaped guides a distance equal to the distance between the center lines of the corresponding pair of rollers riding within said U-shaped guides, each of said openings being sufficiently large to receive a corresponding roller of said pairs of rollers in said U-shaped guides, said openings being shaped on said flanges of said U-shaped guides so that when said pairs of rollers are disposed therein, the face of said closure plate will be in sealing engagement with said circumferential flange of said transfer tube.

4,690,796

PROCESS FOR PRODUCING ALUMINUM-TITANIUM DIBORIDE COMPOSITES

Mukteah Paliwal, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 13, 1986, Ser. No. 839,313
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—12 **8 Claims**



1. A process for producing composite powder particles consisting essentially of a matrix phase and a reinforcement phase, said process comprising:

(a) entraining agglomerated particles in a carrier gas, said agglomerated particles consisting essentially particles of titanium diboride and particles of a metal selected from the group consisting of aluminum and aluminum based alloys;

(b) feeding said agglomerated particles through a high temperature zone having a temperature sufficient to allow said metal particles to melt, coalesce together, and encapsulate said titanium diboride particles; and

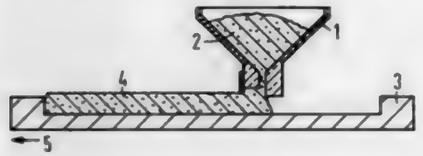
(c) resolidifying said metal to form said composite powder particles wherein said matrix phase consists essentially of said metal and said reinforcement phase consists essentially of said titanium diboride particles.

4,690,797

METHOD FOR THE MANUFACTURE OF LARGE AREA SILICON CRYSTAL BODIES FOR SOLAR CELLS

Achim Eyer, Freiburg/Breisgau; Armin Raeuber, Gundelfingen, and Norbert Schillinger, Ihringen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,165
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536743
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—23 **10 Claims**



1. A method for the manufacture of large area silicon crystal bodies suitable for the manufacture of solar cells which comprises:

(a) compressing finely divided silicon powder particles into a layer of larger thickness than said particles, the compressing taking place in a form composed of silicon or a silicon compound,

(b) sintering the compressed layer into a self-supporting silicon foil at a first elevated temperature,

(c) irradiating the sintered silicon foil with a single-sided energy irradiation in a radiation zone to melt the foil up to at least one-half its thickness at a second elevated temperature,

(d) recrystallizing the melted portion of said foil,

(e) melting the remaining previously unmelted layer portion at a third elevated temperature, and

(f) recrystallizing the newly melted layer portion, the conditions being such that the recrystallized grains produced after treatment at said second elevated temperature continue to grow over the entire layer thickness of the silicon body.

4,690,798

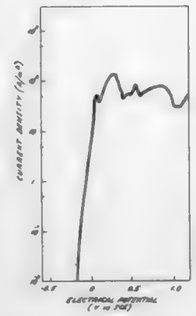
ULTRASOFT STAINLESS STEEL

Tetsu Narutani, and Shigeharu Suzuki, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Feb. 18, 1986, Ser. No. 830,696
Claims priority, application Japan, Feb. 19, 1985, 60-31020; Apr. 12, 1985, 60-77876
Int. Cl.[4] C22C *38/20*
U.S. Cl. 420—61 **16 Claims**

1. An ultrasoft ferritic stainless steel having excellent stamping formability and corrosion resistance in use, which consists essentially of:

about 0.002 to 0.03% by weight of carbon, about 0.01 to 0.30% by weight of silicon, about 0.01 to 1.5% by weight of manganese, about 0.003 to 0.04% by weight of phosphorus, about 0.001 to 0.15% by weight of sulfur, about 0.02 to 1.0% by weight of nickel, about 0.005 to 0.50% by weight of copper, about 0.01 to 0.6% by weight of molybdenum, about 11.5% to 20% by weight of chromium,



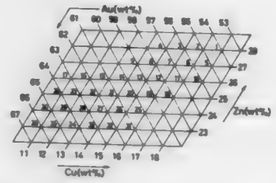
about 0.005 to 0.03% by weight of nitrogen, about 0.005% to 0.20% by weight of aluminum, and the balance consisting of iron and conventional impurities, said ultrasoft steel having a Vickers hardness equal to about 140 or less.

4,690,799

SUPERELASTIC DENTAL AU-CU-ZN ALLOYS

Takaichi Yoshida, Musashino, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,949
Claims priority, application Japan, Apr. 2, 1985, 60-68531
Int. Cl.[4] C22C *5/02*
U.S. Cl. 420—507 **3 Claims**



1. A superelastic dental Au-Cu-Zn alloy having enhanced corrosion resistance selected from the group of alloys whose compositions are defined by the zone encompassed by the region of points 2-9-16-24-30-35-34-19-11-2 of FIG. 2.

4,690,800

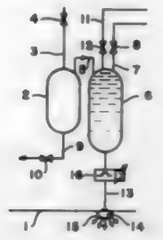
PROCESS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION DUE TO THE DECOMPOSITION OF HIGH-PRESSURE INDUSTRIAL PROCESS GASES

Alain Nardi, Boibec, and Jean-Nöel Simier, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages-CdF chimie, Paris, France

Division of Ser. No. 143,636, Apr. 25, 1980, Pat. No. 4,622,059.
This application Aug. 27, 1986, Ser. No. 901,049
Claims priority, application France, Apr. 25, 1979, 79 10444
Int. Cl.[4] G05B *9/00*
U.S. Cl. 422—40 **11 Claims**

1. A process for reducing the danger of ignition and explo-

sion due to the decomposition of ethylene gases in a high-pressure vessel, comprising cooling the decomposition gases with a



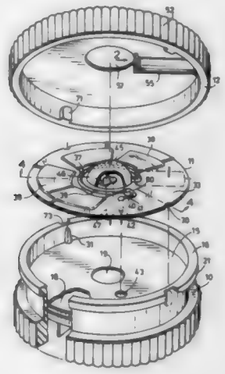
delay not exceeding 25 milliseconds from the time the gases begin to flow out of the vessel into an evacuation circuit.

4,690,801

DEVICE FOR PERFORMING ENZYME IMMUNOASSAYS

Hugh B. Anderson, Toronto, Canada, assignor to Allelix Inc., Mississauga, Canada

Filed Jun. 3, 1986, Ser. No. 870,320
Int. Cl.[4] G01N *33/52, 37/00, 21/05*
U.S. Cl. 422—68 **18 Claims**



1. A device for performing chemical and immunochemical assays, comprising:

a disk having a thin flexible membrane applied to one side thereof, the membrane coacting with the disk to form a circumferentially disposed conduit having entrance and exit ends and also a plurality of circumferentially disposed reagent reservoirs, the reservoirs being isolated from one another or from the conduit by frangible seals, the frangible seals being arranged to define the desired flow of reagents through the conduit;

at least one assay tube having entrance and exit ends, the entrance end being attached to the exit end of the conduit, the assay tube having an assay reagent bonded to the inner wall thereof;

test sample injection means for flowing test sample through the assay tube; and

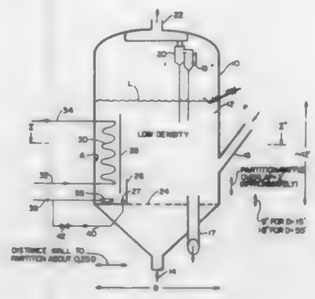
means for forcing the contents of each reservoir through the conduit and the assay tube in the desired order by causing the rupture of each frangible seal sequentially, said means preventing back flow of reagent in the conduit.

4,690,802

APPARATUS FOR CONTROLLING THE TEMPERATURE IN CATALYST REGENERATION

Ronald J. Jenkinson, Madison, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 31, 1985, Ser. No. 815,211
Int. Cl.[4] B01J *8/26*
U.S. Cl. 422—141 **3 Claims**



1. In a regenerator having an inner wall adapted to contain a bed of fluidized catalyst which comprises catalyst inlet means, catalyst outlet means, gas inlet means, gas outlet means, catalyst support means, a tubular cooling coil adapted to contain H_2O, the improvement which comprises: a first zone formed by a partition disposed in said regenerator substantially parallel to a section of the inner wall of the regenerator and at a spaced distance (a) above said catalyst support means, and (b) from said inner regenerator wall, said tubular coil being vertically disposed in the space between said partition and the inner wall of said regenerator, a baffle connected to said catalyst support means and projecting vertically upwardly, said baffle being at a spaced distance from said partition, said catalyst support means being imperforated from below said baffle to under said first zone formed by said partition and said inner wall of said regenerator wherein said coil is vertically disposed, and said catalyst support means having orifices below a second zone formed by said baffle and said inner wall of the regenerator on a side of said baffle opposite said first zone, means for introducing a first fluidizing gas into said first zone, means for introducing a second fluidizing gas into the space between said baffle and said partition, and control means disposed in said means for introducing said second fluidizing gas between said baffle and said partition to control the introduction of said fluidizing gas into said space in said regenerator.

4,690,803

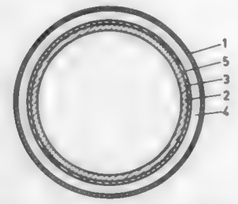
OZONE GENERATOR

Michael Hirth, Unterentfelden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 14, 1986, Ser. No. 851,160
Claims priority, application Switzerland, May 21, 1985, 2154/85
Int. Cl.[4] B01J *19/08, 19/12*
U.S. Cl. 422—186.18 **6 Claims**

1. In an ozone generator with a first and a second metallic electrode and a layer of a dielectric material of titanium dioxide ceramic or of plastic filled with a dielectric power on that surface of the second electrode which faces the first electrode,

and a discharge gap between the first electrode and the dielectric layer, the improvement comprising that the surface facing



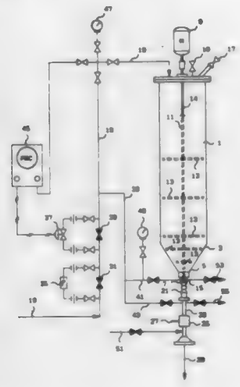
the discharge gap of the dielectric layer is coated with a protective glass or ceramic layer based on silica (SiO_2).

4,690,804

CATALYST FEED SYSTEM

Raymond G. Rohlfing, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 514,387, Jul. 15, 1983, Pat. No. 4,563,665, which is a continuation of Ser. No. 282,312, Jul. 10, 1981, abandoned. This application Sep. 18, 1985, Ser. No. 777,145
Int. Cl.[4] B01J *8/08*
U.S. Cl. 422—219 **4 Claims**



1. An apparatus for charging polymer-coated catalyst compositions to a reactor comprising:

(a) a catalyst mixing tank comprising:

(i) a vertically aligned, elongated vessel having a bottom portion with an axially aligned port at the vessel bottom portion with an axially aligned, cylindrical outlet conduit attached to said port, and

(ii) a agitator shaft axially aligned within said vessel, said shaft terminating in a spiral configuration, said spiral configuration extending through the port in the vessel bottom portion and at least a portion of said outlet conduit and terminating within said outlet conduit, said spiral configuration sized to move freely within said outlet conduit thereby providing agitation of material therein, and

(b) a ball-check feed valve attached to a conduit extending from said outlet conduit of said mixing tank, said ball-check feed valve having a symmetrical clearance between ball and cylinder in a range of about 0.040 inch to about 0.100 inch.

4,690,805

PROCESS FOR REMOVAL OF MERCAPTANS FROM GAS STREAMS

Kishan Bhatia, Katy, and John G. Garcia, Jr., Houston, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 11, 1986, Ser. No. 838,379
Int. Cl.[4] C01B *17/16, 31/20*
U.S. Cl. 423—224 **13 Claims**

1. A process for removing mercaptins from a gaseous mixture comprising treating said gaseous mixture with an inorganic, water soluble nitrite and an effective amount of a water soluble polysulfide.

4,690,806

REMOVAL OF SULFUR FROM PROCESS STREAMS

James J. Schorfheide, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 1, 1986, Ser. No. 858,036
Int. Cl.[4] C01B *17/10, 31/20, 17/00;* **B01J** *8/00*
U.S. Cl. 423—230 **18 Claims**

1. In a process for the removal of sulfur compounds from a process stream in which a metal alumina spinel sorbent is used, which sorbent is characterized by the formula:

$$MAl_2O_4$$

wherein M is a divalent cation selected from the group consisting of chromium, iron, cobalt, nickel, copper, cadmium, mercury, magnesium, and zinc, the improvement which comprises: significantly increasing the absorbent capacity of the alumina spinel for said sulfur compounds by:

(a) providing that M is one or more of the above mentioned divalent cations; and

(b) substituting at least 5 mole %, but not as much as 100 mole %, of the aluminum with one or more trivalent cations selected from the group consisting of chronium, molybdenum, tungsten, manganese, iron, cobalt, and nickel.

4,690,807

PROCESS FOR THE SIMULTANEOUS ABSORPTION OF SULFUR OXIDES AND PRODUCTION OF AMMONIUM SULFATE

Abdus Saleem, Leola, Pa., assignor to General Electric Environmental Services, Inc., Lebanon, Pa.

Continuation-in-part of Ser. No. 765,774, Aug. 15, 1985, abandoned. This application Feb. 20, 1986, Ser. No. 831,381
Int. Cl.[4] C01B *17/00;* **C01C** *1/24*
U.S. Cl. 423—242 **26 Claims**

1. A multi-step process for treating a gas containing a sulfur oxide in a single vessel comprising:

(a) passing the gas containing sulfur oxide through a spray of aqueous ammonium sulfate in the vessel to form an aqueous ammonium sulfate having sulfur oxide absorbed therein and a scrubbed gas;

(b) collecting in a reservoir in the vessel the aqueous ammonium sulfate having sulfur oxide gas absorbed therein;

(c) introducing aqueous ammonia into the aqueous ammonium sulfate having sulfur oxide gas absorbed therein;

(d) introducing an oxygen-containing gas into the aqueous ammonium sulfate having sulfur dioxide absorbed therein in the reservoir whereby ammonium sulfate product is formed in the reservoir by the reaction of the absorbed sulfur oxide gas with the ammonia in the aqueous ammonia and the oxygen in the oxygen-containing gas;

(e) forming the spray of aqueous ammonium sulfate through which the gas containing sulfur oxide is passed, from aqueous ammonium sulfate liquor removed from the reservoir;

(f) withdrawing scrubbed gas; and

(g) withdrawing ammonium sulfate product.

4,690,808

CRYSTALLINE GALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Naomi A. Woodard, Peekskill, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 20, 1985, Ser. No. 811,282
Int. Cl.[4] C01B *25/00*; B01J *27/14*
U.S. Cl. 423—305 26 Claims

1. Crystalline gallophosphate compositions having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is

$$mR:Ga_2O_3:1.0\pm0.2P_2O_5;$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from 0.02 to 0.3 and represents the moles of "R"; said framework structure being microporous in which the pores have nominal diameters within the range of about 3 to about 10 Angstroms.

2. Crystalline gallophosphate compositions having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is

$$Ga_2O_3:1.0\pm0.2P_2O_5;$$

said framework structure being microporous in which the pores have nominal diameters within the range of about 3 to about 10 Angstroms; and said framework structure retains at least 50 percent of its crystallinity upon calcination at a temperature of at least 300° C. for at least one hour.

3. Process for preparing a microporous crystalline gallophosphate according to claim 1 or 2 which comprises forming a reaction mixture having a composition expressed in terms of mole ratios of oxides of

$$Ga_2O_3:1.0\pm0.5P_2O_5:7\text{–}100H_2O$$

and containing from about 0.2 to 10.0 moles of an organic templating agent per mole of Ga_2O_3, and heating said reaction mixture at a temperature of at least 100° C. until crystals of said gallophosphate are produced.

4,690,809

PROCESS FOR THE PREPARATION OF ASBESTIFORM CRYSTALLINE CALCIUM SODIUM METAPHOSPHATE FIBERS

Vaidy R. Nathan; John T. Wang, and James E. Downes, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 812,042, Dec. 23, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 924,674
Int. Cl.[4] C01B *25/30*
U.S. Cl. 423—306 20 Claims

1. A process for the preparation of asbestiform crystalline calcium sodium metaphosphate fibers, which process comprises:

(a) heating substantially crystalline calcium sodium metaphosphate, or at least one compound convertible by heat thereto, having a composition on a dry basis equivalent to a $CaO/Na_2O/P_2O_5$ mol percent ratio of about 29.0–34.0/16.0–18.0/50.0–53.0 and a degree of crystallinity from about 60% to about 75% as determined from density and differential thermal analysis measurements in a melting zone at a temperature and for a time sufficient to form a homogeneous melt;

(b) cooling the homogeneous melt in a cooling zone to a temperature and at a rate sufficient to form a supercooled melt;

(c) introducing into the supercooled melt at least one seed crystal of asbestiform crystalline calcium sodium metaphosphate;

(d) maintaining the seeded supercooled melt under isothermal conditions at the seeding temperature for a time sufficient to form crystalline blocks of asbestiform calcium sodium metaphosphate; and

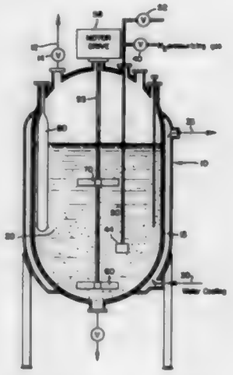
(e) fiberizing the crystalline blocks of asbestiform calcium sodium metaphosphate into fibers.

4,690,810

DISPOSAL PROCESS FOR CONTAMINATED CHLOROSILANES

William C. Breneman, Vancouver, Wash., and David M. Reeser, Tigard, Oreg., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1986, Ser. No. 844,362
Int. Cl.[4] C01B *33/12, 7/00*; C01F *55/26, 11/20*
U.S. Cl. 423—335 3 Claims



1. A method for the conversion of a stream of contaminated chlorosilanes to a stable, substantially inert and filterable solids mass, said stream of chlorosilanes being predominantly trichlorosilane and silicon tetrachloride and being contaminated by about 0.1 to about 5 percent by weight of impurities selected from the chlorides of aluminum, iron, titanium, and up to 20% by weight of finely divided metals having a particle size of less than 40 microns selected from silicon, iron and aluminum, said method comprising

(i) providing a bath of water-based lime particle slurry having a CaO to H_2O ratio, by weight, of about 0.05 to 0.20 and a pH of at least 9

(ii) introducing into the lime particle slurry bath at a location substantially below its surface, a said stream of contaminated chlorosilanes to cause reaction of the chlorosilanes and contaminants with CaO to result in (a) replacement of the solid particles of CaO in the bath with solid reaction product particles of SiO_2 in which oxides of other contaminants are entrapped and (b) an aqueous phase containing dissolved $CaCl_2$

(iii) monitoring the pH of the aqueous phase and recovering said solid reaction products particles from the bath when the pH is in the range of 7–8.

4,690,811

PROCESS FOR PREPARING SILICON CARBIDE WHISKERS

Tohru Kida, Chigasaki, and Motohiro Yamamoto, Fujisawa, both of Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 798,787
Claims priority, application Japan, Nov. 21, 1984, 59-244554
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 6 Claims

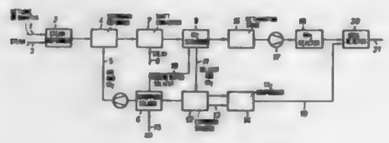
1. A process for preparing silicon carbide whiskers, comprising blending a silicon source material with carbon black, as a carbonaceous material, having (a) a nitrogen adsorption specific surface area of 150 to 500 m^2/g, (b) a dibutyl phthalate absorption of 120 to 200 ml/100 g, and a tint strength (%) smaller than or equal to a value calculated according to the following formula: 0.3496×(nitrogen adsorption specific surface area)−0.2143×(dibutyl phthalate absorption)+101.87; and heating the resulting mixture in a non-oxidizing atmosphere at 1,300° to 1,800° C.

4,690,812

INTEGRATED PRODUCTION OF AMMONIA AND UREA

Gerhard Ranke, Poecking, and Ulrich Schrader, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,563
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401779
Int. Cl.[4] C01C *1/04*
U.S. Cl. 423—359 5 Claims



1. In a process for the combined production of ammonia and urea, comprising the steps of reacting gas containing hydrocarbons with steam in a steam reformer, reacting residual hydrocarbon in a downstream secondary reformer with air, reacting resultant CO in a shift converter to form CO_2 and H_2, scrubbing resultant ammonia synthesis gas consisting essentially of hydrogen, nitrogen and carbon dioxide with a physical solvent to remove CO_2, regenerating resultant CO_2-loaded physical solvent to recover a CO_2 stream, passing said CO_2 stream to urea synthesis, and recycling resultant regenerated solvent to the scrubbing step, the improvement wherein said regenerating of said physical solvent comprises: (a) effecting at least one pressure reduction step on the CO_2-loaded physical solvent to liberate a gaseous stream containing a major portion of the CO_2 for urea synthesis and to obtain a physical solvent having residual CO_2, and (b) stripping the latter residual CO_2-containing physical solvent with air as the stripping gas; recovering a mixture of the air together with said residual CO_2 from the stripping step and feeding said mixture into the secondary reformer.

4,690,813

MOLYBDENUM OXIDE WHISKERS AND A METHOD OF PRODUCING THE SAME

Yoshimi Kamijyo, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

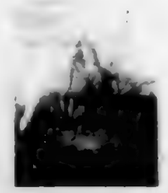
Filed Sep. 13, 1985, Ser. No. 775,659
Claims priority, application Japan, Sep. 14, 1984, 59-193751; Oct. 19, 1984, 59-220073; Oct. 19, 1984, 59-220074
Int. Cl.[4] C01G *39/02*
U.S. Cl. 423—606 3 Claims

1. A method of producing whiskers of molybdenum oxide MoO_3 comprising:

firing metallic molybdenum in an open-ended vessel at a temperature of at least 400° C. in a flow of gas through the vessel containing oxygen;

recovering the resulting whiskers of molybdenum oxide from the gas exiting the end of the vessel;

heating molybdenum oxide remaining in the vessel to a temperature of 950° C. to 1100° C. in a hydrogen atmosphere to reduce it into metallic molybdenum; and



reusing the metallic molybdenum obtained by said reduction as a starting material.

4,690,814

PROCESS FOR THE PRODUCTION OF HYDROGEN

Louis J. Velenyi, Lyndhurst, and Andrew S. Krupa, Twinsburg, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 692,157, Jun. 17, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 849,925
Int. Cl.[4] C01B *31/18*
U.S. Cl. 423—648 R 17 Claims

1. A process for the production of hydrogen which process comprises reacting steam with carbon in the presence of a catalyst system comprising a supported Group VIIIA metal and, as modifier for the suppression of methane, an effective amount of one or more of phosphomolybdic acid, phosphotungstic acid and/or a salt of either.

4,690,815

METHOD FOR TESTING SKIN FOR PRESENCE OF MOISTURIZER

George E. Deckner, Westfield, N.J., assignor to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,632
Int. Cl.[4] C12Q *1/58*; G01N *33/62, 33/68, 33/48*
U.S. Cl. 424—9 11 Claims

1. A method for determining the presence of moisturizing substances on skin, which comprises providing a moisturizing composition which includes an active material capable of binding with water to form a complex, applying the moisturizing composition to desired areas of the skin to form a film or coating which includes such complex and which inhibits moisture loss from the skin, and subsequently testing skin previously treated with such moisturizing composition for the presence of the active material remaining on the previously treated skin, the presence of which active material is directly correlated to the amount of moisturizer composition remaining on the skin.

4,690,816

TYPE SOFT CAPSULE

Takehisa Hata, Mukou; Nobuto Kanagawa, Kyogo; Takashi Morishita, and Toshiyuki Suzuki, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd. and Morishita Jintan Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 534,109, Sep. 20, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 798,360
Claims priority, application Japan, Sep. 20, 1982, 57-164706
Int. Cl.[4] A61K *9/48*
U.S. Cl. 424—456 2 Claims

1. A soft capsule which is prepared by wrapping an oily substance which is a member selected from the group consisting of tricaprylic acid glyceride and sesame oil, with a gelatin film containing sodium picosulfate.

4,690,817

QUATERNARY NITROGEN CONTAINING POLYVINYL ALCOHOL POLYMERS FOR USE IN SKIN CONDITIONING, COSMETIC AND PHARMACEUTICAL FORMULATIONS

Ronald I. Davis; Charalambos J. Phalangas, and George R. Titus, all of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 540,041, Oct. 7, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,239

Int. Cl.[4] A61K *7/06, 7/08, 7/021, 7/44*

U.S. Cl. 424—70 5 Claims

1. In an improved aqueous hair and skin conditioning composition comprising an oil phase, a water phase, and 0.05% to about 8% of an emulsifier wherein the improvement comprising reducing moisture loss with an aqueous solution containing 0.1 to 30% by weight of a quaternary nitrogen modified polyvinylalcohol polymer having a molecular weight ranging from at least 2,000 up to about 200,000 and which comprises a polyvinyl alcohol having oxygen-linked pendant groups of the formula —R—$NR_1R_2R_3A$— wherein R is selected from the group consisting of alkylene, hydroxy substituted alkylene and an acylene radical of formula weight ranging from 14 to about 3000, R_1, R_2 and R_3 are selected from the group consisting of alkyl and arylalkyl having 1–20 carbon atoms, A^-, is an anion, said polymers having a total nitrogen ranging from 0.01–7% by weight.

4,690,818

SHAMPOO AND BATH AND SHOWER GEL

Eugene Puchalski, Jr., Jersey City; Emil F. Schneider, Long Branch; Judith A. Cohee, Atlantic Highlands, and El-Sayed El-Menshawy, Holmdel, all of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,169

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 15 Claims

1. A shampoo or bath and shower gel composition having excellent conditioning and moisturizing properties and substantivity comprising a combination of from about 0.05 to about 2% by weight of (A) cocodimonium hydrolyzed keratin, and from about 0.001 to about 5% by weight of (B) a mixture of monosaccharides and disaccharides in natural combination with amino acids which includes hexylene glycol, glucose, fructose, sucrose, urea, dextrin, alanine, glutinic acid, aspartic acid and hexyl nicotinate in a wt. ratio of (A) to (B) within the range of from about 0.001:1 to about 5:1, and from about 10 to about 60% by weight water, from 0 to about 5% by weight thickener, from 5% to about 60% by weight cleanser or detergent, from 0.001 to about 0.5% by weight acid to adjust pH to appropriate levels, from 0.001 to about 0.5% by weight chelating agent, from 0.01 to about 5% by weight of conditioner, preservative, from 0.001 to about 1% by weight viscosity adjuster or feel enhancer, from about 0.01 to about 5% by weight of hydrolyzed animal protein, and from 0.001 to about 5% by weight humectant or emollient.

4,690,819

METHOD FOR STABILIZING RUBELLA HA ANTIGEN

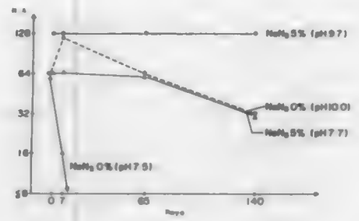
Akihiko Sato; Akira Noto; Fumiaki Morita, all of Osaka, and Kunihiro Nakajima, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,316

Claims priority, application Japan, Dec. 14, 1984, 59-264863

Int. Cl.[4] A61K *39/00*

U.S. Cl. 424—88 8 Claims



1. A method for stabilizing inactivated rubella HA antigen which comprises adjusting an inactivated rubella HA antigen suspension at pH 9.6 or higher.

4,690,820

HIGH-CALORIC, HIGH-FAT DIETARY FORMULA

Vlado Simko, Staten Island, N.Y., assignor to The State University of New York, Albany, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,299

Int. Cl.[4] A61K *33/42, 33/30, 33/06, 31/00*

U.S. Cl. 424—128 10 Claims

1. A high caloric, high fat dietary composition having 2.5/3.6 Kcals/ml. and deriving 45–75% of its calories from fat which comprises:

120–325 grams/liter fat;

56–69 grams/liter protein; and

168–207 grams/liter carbohydrate.

4,690,821

TOWEL FOR SKIN MOISTURIZING AND DRYING

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Fort Lee, N.J.

Continuation of Ser. No. 579,033, Feb. 10, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,508

Int. Cl.[4] A61K *6/00*

U.S. Cl. 424—401 11 Claims

1. A cosmetic applicator comprising a porous fibrous or cellular substrate sheet coated with a water-free composition consisting essentially of emollient oils, said oils including:

(a) about 35–60% of hydrophillic emollient oils including:

(i) about 25–35% of a polyoxyethylene, (C_{15}–C_{22}) fatty acid glycerate wherein the polyoxyethylene moiety comprises about 5–10 ethylenoxy moieties;

(ii) about 5–10% of a C_6–C_{12} acid diester of propylene glycol; and

(iii) about 1–5% of a C_{12}–C_{18} fatty acid, C_{12}–C_{18} fatty alcohol ester-alkoxylate of a polyethylene glycol comprising about 2–5 ethylenoxy units; and

(b) about 40–60% of a mixture of hydrophobic emollient oils including:

(i) about 15–25% of a benzyl alcohol ester of a C_{10}–C_{20} fatty acid;

(ii) about 10–25% of a C_{12}–C_{15} alkyl benzoate;

(iii) about 7–20% of a C_2–C_5 alkanol ester of dimer acid, trimer acid or mixtures thereof, wherein the interstices between the fibers or the cells of the substrate sheet are substantially free of the composition so that when the applicator is pressed against wet skin under conditions of pressure, the water is absorbed and an emollient film is deposited on said skin, wherein all percentages are by weight of the composition.

4,690,822

NOVEL DRUG CARRIER AND PHARMACEUTICAL PREPARATION COMPRISING THE SAME

Toshinobu Uemura, Kishiwada; Toshiaki Okhuma, Osaka; Kiyohide Shinooka, Nishinomiya; Hiroshi Ishikuro, Ikeda, and Yoshio Ueda, Koube, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 839,077

Claims priority, application United Kingdom, Mar. 26, 1985, 8507779

Int. Cl.[4] A61K *9/66, 9/52, 9/48*

U.S. Cl. 424—455 6 Claims

1. A pharmaceutical oral capsule preparation filled with a substantially anhydrous mixture which is in solid or semi-solid form comprising:

(a) a drug or a drug treated by a conventional manner, each of which is in solid form, and

(b) a drug carrier which is a semi-solid mixture comprising an aqueous polymer selected from the group consisting of polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, hydroxypropylmethylcellulose, methylceullose, ethylcellulose, hydroxyethylcellulose, hydroxypropylcellulose, sodium carboxymethylcellulose, dextran, gelatin, pectin, sodium poly(acrylic acid), carboxypolymethylene, poly-L-lysin, pullulan, sodium alginate, chitosan, acacia, gum tragacanth, xanthan gum, guar gum and karaya gum, and liquid oil selected from the group consisting of arachis oil, cottonseed oil, sesame oil, medium chain monoglyceride, medium chain diglyceride, medium chain triglyceride, liquid paraffin, squalene, squalane, oleic acid, linoleic acid, ethylene glycol, propylene glycol and glycerin, the ratio of aqueous polymer to liquid oil by weight being 2:1 to 1:40.

4,690,823

IBUPROFEN-CONTAINING SOFT GELATIN CAPSULES AND PROCESS FOR PREPARING SAME

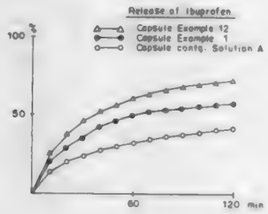
Manfred Lohner, and Klaus Posselt, both of Bonn, Fed. Rep. of Germany, assignors to Dolorgiet Beteiligungs-GmbH, St. Augustin, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,727

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437599

Int. Cl.[4] A61K *31/19, 9/48*

U.S. Cl. 424—456 18 Claims



1. An ibuprofen-containing soft gelatin capsule containing a solution of from 15 to 30 parts by weight of ibuprofen in from 70 to 85 parts by weight of a polyoxyethylene-polyoxypropylene polymer having a molecular weight of 1400 to 2000.

4,690,824

SOLID PHARMACEUTICAL FORMULATIONS FOR SLOW, ZERO ORDER RELEASE VIA CONTROLLED SURFACE EROSION: EXPANDED RANGE

David R. Powell, and Vithal K. Patel, both of Baudette, Minn., assignors to Redi-Rowell, Inc., Atlanta, Ga.

Division of Ser. No. 511,605, Jul. 7, 1983, Pat. No. 4,539,198. This application May 22, 1985, Ser. No. 736,737

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—468 24 Claims

1. A solid, orally administrable pharmaceutical tablet composition from which the active ingredient has a slow, zero-order release rate attained without layers, beads or enteric materials and without relatively insoluble polymers, waxes or gums when administered orally, said tablet being compressed to a hardness of about 5–20 kg, and being either shaped as a sphere, or else having a ratio of tablet thickness to tablet diameter effective to permit tablet erosion and penetration control sufficient for controlled surface erosion thereof, comprising an essentially homogeneous, granulated mixture of:

(a) an effective amount in the range of about 10–90 wt. % of a pharmacologically active compound having a water solubility (20° C.) of less than 1/560 to 1/1000 (w/w);

(b) about 1–40 wt. % of a surface controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility (20° C.) of about 1/1–1/40 (w/w);

(c) about 2–20 wt. % of an erosion controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility of about 1/1–1/10 (w/w);

(d) an amount in the range of about 0.05–1.0 wt. %, of a surface activator which is a disintegrating agent for pharmaceutical compositions at which amount the compound is ineffective as a disintegrating agent;

(e) about 0.1–2.0 wt. % of a surfactant which is pharmaceutically acceptable in oral compositions, and,

as necessary for tablet manufacturing purposes;

(f) about 1–20 wt. % of a binder which is pharmaceutically acceptable in oral compositions; or

(g) about 0.5–5.0 wt. % of a die wall lubricant which is pharmaceutically acceptable in oral compositions;

the pharmacologically active ingredient thus having a slow, zero-order release rate when administered orally, and the pharmacologically active compound not being a lithium compound, and not being penny shaped or pancake shaped wherein the ratio of thickness to diameter is too small for erosion and penetration control.

4,690,825

METHOD FOR DELIVERING AN ACTIVE INGREDIENT BY CONTROLLED TIME RELEASE UTILIZING A NOVEL DELIVERY VEHICLE WHICH CAN BE PREPARED BY A PROCESS UTILIZING THE ACTIVE INGREDIENT AS A POROGEN

Richard Won, Palo Alto, Calif., assignor to Advanced Polymer Systems, Inc., Redwood City, Calif.

Filed Oct. 4, 1985, Ser. No. 784,382

Int. Cl.[4] C08J *9/28*

U.S. Cl. 424—501 80 Claims

1. A composition of matter useful as a time-release delivery vehicle for delivering an active ingredient by controlled time

release, comprising a porous polymeric bead having a network of pores with the active ingredient held within the network of



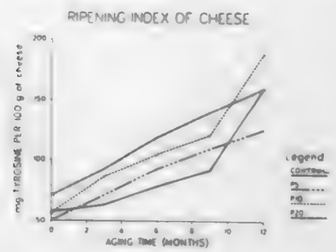
pores, said network of pores being substantially non-collapsible upon removal of the active ingredient.

4,690,826

BACTERIAL ENZYME USED AS CHEESE RIPENING AID

Norman F. Haard, Outer Cove, and Thakor R. Patel, St. Johns, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 15, 1986, Ser. No. 863,443
Int. Cl.⁴ A23C *19/02*
U.S. Cl. 426—36 **15 Claims**



1. In a process for preparing Cheddar cheese which comprises treating a milk starting material with a coagulant to cause the milk starting material to form into solid curds and liquid whey, separating the solid curds from the liquid whey and treating said curds to form a Cheddar cheese product, and ripening said cheese product by allowing the product to age at a controlled temperature, the improvement which comprises adding a protease derived from bacteria of the species *Pseudomonas fluorescens* to said milk starting material in an amount of at least about 5 mg/L as a ripening aid prior to the formation of said solid curds.

4,690,827

FRUIT JUICE CONTAINING DIET BEVERAGE

Philip L. Kupper, Cincinnati, Ohio; Katherine L. Moore, Brussels, Belgium, and Robert L. Swaine, Jr., Springdale, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 31, 1985, Ser. No. 760,885
Int. Cl.⁴ A23L *2/02, 1/236*
U.S. Cl. 426—548 **7 Claims**

1. A process for preparing an artificially sweetened orange juice containing beverage with reduced artificial sweetener unpleasant aftertaste, said process comprising the steps of

forming an admixture comprising from about 5% to about 100% orange juice, from 0 to about 95% water, a sweetening amount of an artificial sweetener, and an amount of fruit pulp to provide in the orange juice containing beverage, upon particle size reduction of the pulp, a percentage background pulp volume at least twenty percent higher than that of said original orange juice,

reducing the fruit pulp to a particle size such that the particles pass through a 20 mesh sieve whereby said pulp reduces unpleasant aftertaste caused by said artificial sweetener.

4,690,828

COAGULATED FOOD MADE FROM BROWN ALGAE

Nagako Kitahara, 17-19 Yamanotechnocho, Shimonoseki-shi, Yamaguchi, 751, Japan

PCT No. PCT/JP85/00186, § 371 Date Dec. 11, 1985, § 102(e) Date Dec. 11, 1985
PCT Filed Apr. 11, 1985, Ser. No. 815,707
Claims priority, application Japan, Apr. 11, 1984, 59-73796
Int. Cl.⁴ A23L *1/04*
U.S. Cl. 426—575 **3 Claims**

1. A coagulated food product made from brown algae comprising:

at least two different kinds of brown algae, the food product is prepared by dissolving a first kind of brown alga in a chelating agent to form a viscous liquid which is interspersed with fibrous, solid portions of the brown algae which are undissolved,

mixing the viscous liquid and interspersed fibrous, solid portions of undissolved brown algae with finely divided particles of a second brown algae,

coagulating the mixture by immersion into a chemical which will cause coagulation,

and leaching the coagulated mixture with water.

4,690,829

METHOD OF PREVENTING RETROGRADATION OF FOODSTUFFS

Takayuki Usui, Kanazawa, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00314, § 371 Date Feb. 4, 1985, § 102(e) Date Feb. 4, 1985, PCT Pub. No. WO85/00004, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 15, 1984, Ser. No. 704,315
Claims priority, application Japan, Jun. 16, 1983, 58-108242
Int. Cl.⁴ A21D *2/08*
U.S. Cl. 426—661 **1 Claim**

1. A method of preventing the retrogradation of foodstuffs containing starchy material, wherein waxy barley starch or waxy barley flour having an amount of waxy barley starch within the range of 2 to 50 wt.% of the starchy material, is used as part of said starchy material, and, wherein at least one polysaccharide selected from the group consisting of an oligosaccharide, dextrin, carrageenin, pectin, locust bean gum, guar gum, tamarind tum and xanthane gum is added thereto, wherein the amount of the polysaccharide to be added is within the range of 0.5 to 15 wt.% of the starchy material.

4,690,830

ACTIVATION BY DEHYDROGENATION OR DEHALOGENATION OF DEPOSITION FEEDSTOCK AND DOPANT MATERIALS USEFUL IN THE FABRICATION OF HYDROGENATED AMORPHOUS SILICON ALLOYS FOR PHOTOVOLTAIC DEVICES AND OTHER SEMICONDUCTOR DEVICES

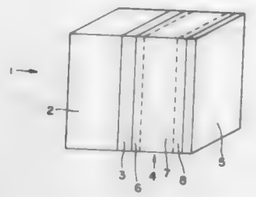
Charles R. Dickson, Trenton, N.J., and David E. Carlson, Yardley, Pa., assignors to Solarex Corporation, Rockville, Md.

Filed Feb. 18, 1986, Ser. No. 830,072
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **64 Claims**

1. A process for preparing hydrogenated amorphous silicon alloy by deposition of hydrogenated amorphous silicon alloy

film onto a substrate in a deposition chamber comprising the steps of (a) introducing into the deposition chamber during deposition a deposition gas mixture which includes one or more compounds having the formula:

$$(MX_3)_n M' X_{4-n}$$



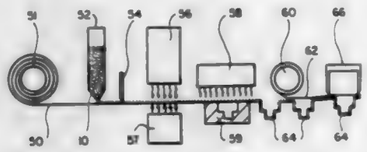
wherein M and M' are different Group 4A atoms selected from the group of silicon, germanium, tin and lead, at least one of M and M' is silicon, X is hydrogen, halogen or mixtures thereof, and n is an integer between 1 and 4, inclusive; and (b) activating said deposition gas mixture by dehydrogenation or dehalogenation.

4,690,831

PROTECTIVE ARTICLE

William D. Uken, Fremont; Robert S. Dubrow, Redwood City; Carlb Nelson, Palo Alto, and Catherine A. Dittmer, Mountain View, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Division of Ser. No. 730,699, May 2, 1985, Pat. No. 4,643,924, which is a continuation-in-part of Ser. No. 715,789, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,435, Jun. 23, 1983, abandoned. This application Jun. 18, 1986, Ser. No. 875,802
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—44 **18 Claims**



1. A method of making an article for protecting a substrate, comprising:

transporting a backing material past a gel dispenser;

dispensing a gel from the gel dispenser onto the backing; and deforming the backing and the gel into a predetermined shape such that at least a major portion of an inner surface of the backing has gel thereon, the shape being similar to an external surface shape of at least part of a substrate to be protected.

4,690,832

PROCESS FOR PROVIDING HYDROLYSIS RESISTANT PHOSPHORS

Ramon L. Yale, Ulster, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 729,374, May 1, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 939,654
Int. Cl.⁴ C09K *11/475*
U.S. Cl. 427—65 **11 Claims**

1. A process for making a rare earth oxysulfide phosphor resistant to hydrolysis, said process comprising:

(a) forming a slurry of said phosphor in water;

(b) adding to said slurry a sufficient amount of a source of silicon dioxide and a water soluble salt selected from the group consisting of alkaline earth metal salts, and transition group IIB metal salts, with agitation for a sufficient time to form a silicate coating on said phosphor, the cation of said water soluble salt becoming the cation of said silicate coating, the amount of said silicate coating being sufficient to impart hydrolysis resistance to said phosphor;

(c) separating the resulting silicate coated phosphor powder from the resulting liquor;

(d) heating said silicate coated phosphor powder at from about 100° C. to about 150° C. for a sufficient time in ambient atmosphere to remove essentially all of the water therefrom; and

(e) heating the resulting dried silicate coated phosphor powder at from about 400° C. to about 800° C. for a sufficient time in ambient atmosphere to produce the final hydrolysis resistant phosphor, said heating of the dried silicate coated phosphor powder effecting a phosphor exhibiting a greater hydrolysis resistance than said dried silicate coated phosphor powder absent this heating.

4,690,833

PROVIDING CIRCUIT LINES ON A SUBSTRATE

William A. Donson; James V. Ellerson, both of Endicott; Richard B. Hammer, Apalachin; William Lafer, Chenango Bridge, and Keith A. Snyder, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1986, Ser. No. 845,316
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 427—96 **17 Claims**

1. A process for providing circuit lines on a substrate wherein said substrate has non-planar areas which comprise:

applying a layer of photoresist material in a liquid form to said substrate;

selectively screen printing on non-planar areas of the substrate a screen printable coating wherein said screen printable coating has sufficient viscosity so as to resist pull back and thinning at the corners of the contoured surface to thereby prevent undercutting or voids;

photoprocessing said layer of photoresist material; and

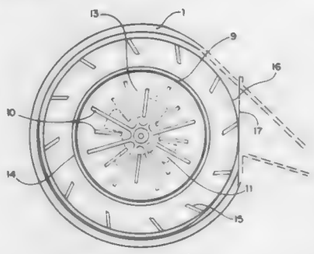
providing predetermined electrically conductive pattern on said substrate.

4,690,834

PROCESS FOR COATING SOLID PARTICLES

Curt H. Appelgren, Benjaminssons väg, Pl 1461, S-434 00 Kungsbacka, and Nemo Ivarsson, Skönviksvägen 253, S-122 42 Enskede, both of Sweden

Filed Jul. 30, 1986, Ser. No. 890,735
Int. Cl.⁴ B05D *7/00*; B29C *67/00*; C09C *1/56*; A01N *25/00*
U.S. Cl. 427—189 **13 Claims**



1. A process for coating solid particles with a coating material which is highly viscous or solid at room temperature comprising:

(a) introducing the coating material in the form of a melt via a conduit to a hollow space in a rotating mixing disc;

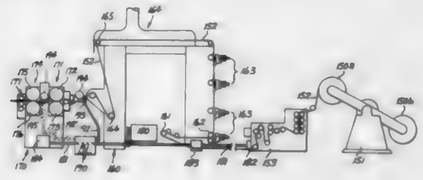
(b) introducing the solid particles via a separate conduit to at least one separate space in said rotating mixing disc; and
(c) rotating the mixing disc to sweep the solid particles and the melt to the periphery of the mixing disc, the melt being forced from the hollow space through a slot in the mixing disc in a direction toward the upper surface of the disc so that the melt becomes a finely dispersed mist which contacts and forms a coating on the solid particles.

4,690,835

REINFORCED CONTAINER

Donald D. Halabisky, Tacoma, and Dwight A. Dudley, II, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 616,464, Jun. 1, 1984, Pat. No. 4,586,643. This application Feb. 3, 1986, Ser. No. 825,125
Int. Cl.⁴ B05D *3/12, 5/00*
U.S. Cl. 427—210 **6 Claims**



1. The process of reinforcing a polyethylene coated blank comprising
applying a reinforcing stripe to a polyethylene coated web along a longitudinal score line to be scored,
said reinforcing stripe comprising essentially
a major portion of polyethylene,
a small amount of vinyl acetate and
a polypropylene/polyisobutylene copolymer,
scoring said web along said line, and
cutting said blank from said web.

4,690,836

PROCESS FOR THE PRODUCTION OF VOID-FREE PREPREG SHEETS

Thomas C. Clarke, Morgan Hill, Calif.; Neng H. Lu, Endwell, N.Y.; Yaffa Tomkiewicz, Scarsdale, N.Y., and Ho M. Tong, Yorktown Heights, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 23, 1985, Ser. No. 790,566
Int. Cl.⁴ B05D *1/18, 3/02;* **B32B** *5/02;* **D04H** *3/08*
U.S. Cl. 427—299 **7 Claims**

1. A method for reducing the void content in a prepreg sheet which is prepared by impregnating a reinforcing cloth with a solvent solution of a thermosetting resin, the method comprising first immersing the cloth in a liquid medium having a viscosity less than the solution of thermosetting resin, then immersing the prewetted cloth in a resin solvent solution to impregnate the cloth with said resin solvent solution and then heating the cloth to remove the solvent and cure the resin.

4,690,837

PROCESS OF COATING A HEATED SURFACE

Andrew Doroszkowski, Marlow, and Maurice W. Skinner, Maidenhead, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 689,968, Jan. 9, 1985, abandoned. This application Dec. 18, 1986, Ser. No. 943,879
Claims priority, application United Kingdom, Jan. 27, 1984, 8402191
Int. Cl.⁴ B05D *3/02*
U.S. Cl. 427—314 **9 Claims**

1. A process of coating a surface of an article which is capable of being heated by contacting the heated surface of the article with a coating composition comprising an aqueous dispersion of an organic film-forming material which is sterically stabilised and which has a critical coalescence temperature which is lower than the temperature to which the surface of the article is heated so that the film-forming material is destabilised.

4,690,838

PROCESS FOR ENHANCING THE RESISTANCE OF A RESIST IMAGE TO REACTIVE ION ETCHING AND TO THERMAL FLOW

Hiroyuki Hiraoka, Saratoga; Jeffrey W. Labadie, Campbell; James H. Lee, San Jose; Scott A. MacDonald, San Jose, and Carlton G. Willson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1986, Ser. No. 899,589
Int. Cl.⁴ G03C *5/00;* **B05D** *3/04*
U.S. Cl. 427—343 **9 Claims**

1. A process for increasing the reactive ion etching and thermal flow resistance of a resist image, said process being characterized by contacting said resist image with a alkyl metal compound of magnesium or aluminum, the resist comprising a polymer which has a group which reacts with the alkyl metal compound to undergo metallization or salt formation.

4,690,839

METHOD FOR MANUFACTURING THICK ASPHALT SHEET

Takashi Iwasaki; Yasuo Tomita, and Tsunekazu Hayashi, all of Tokyo, Japan, assignors to Mitsuboshi Sangyo Co. Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,192
Claims priority, application Japan, Jan. 26, 1984, 59-12946; Apr. 6, 1984, 59-69667
Int. Cl.⁴ B05D *1/28, 3/12;* **B05C** *3/02, 3/12*
U.S. Cl. 427—366 **8 Claims**



2. A method for manufacturing a thick asphalt sheet comprising preparing a thick sheet material made of non-woven fabric of synthetic material, passing said sheet material through a series of three or four stages of pairs of heated pressing rolls from the upper side to the lower side of each pair of rolls and feeding and storing molten petroleum asphalt into concavities formed on the upper sides of the respective pairs of rolls, excluding the lowest stage of pair of rolls, whereby the molten petroleum asphalt is pressed into the sheet material when said material passes through said pairs of rolls.

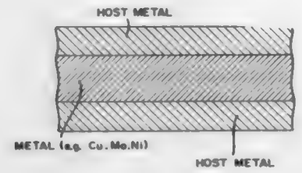
4,690,840

PROCESS FOR PREPARING ALLOYED NEGATIVE ELECTRODES

Michel Gauthier, and Denis Fauteux, both of Quebec, Canada, assignors to Hydro-Quebec, Quebec, Canada and Societe Nationale Elf Aquitaine, Paris, France

Filed Apr. 4, 1985, Ser. No. 719,978
Claims priority, application Canada, Apr. 11, 1984, 451782
Int. Cl.⁴ H01M *4/12, 4/40;* **B05D** *1/18*
U.S. Cl. 427—436 **73 Claims**

1. Method for the preparation of metallic alloys containing an alkali or alkali-earth metal as well as a host metal, which comprises preparing an active organic solution of said alkali or alkali-earth metal in metallic form, as well as a source of said alkali or alkali-earth metal which are brought together, separately preparing a metallic structure containing said host metal and keeping said metallic structure separate from said source of alkali or alkali-earth metal, contacting together the metallic



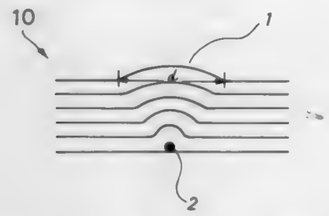
structure with the organic solution the latter being kept in contact with the source of metal until formation of a superficial alloy of said host metal and of the alkali or the alkali earth metal with the metallic structure, and the alloy has an activity which is determined by that of the organic solution, said organic solution then serving as transfer agent of the alkali or alkali-earth metal towards the host metallic structure.

4,690,841

PYROLYTIC BORON NITRIDE ARTICLE

Hiroaki Tanji, Tokyo; Masaharu Suzuki, Machida; Kenji Nomura, Machida; Shojiro Watanabe, Machida, and Takashi Kawasaki, Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 831,247
Claims priority, application Japan, Feb. 28, 1985, 60-39532
Int. Cl.⁴ B65D *1/00*
U.S. Cl. 428—35 **6 Claims**



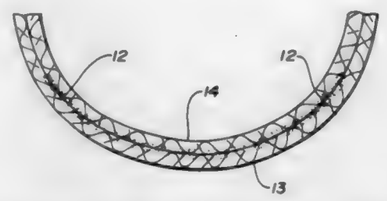
1. A pyrolytic boron nitride article of uniform structure having a thickness of from 0.3 mm to 10 mm, comprising pyrolytic boron nitride deposited through a vapor phase by chemical vapor deposition using boron halide and ammonia as starting materials, said article having an overall surface and having nodules and/or traces thereof on the overall surface, the number of nodules and/or traces thereof each having a diameter of not less than 100 μm being:
(a) 0.5 or less/cm^2 in average all through the overall surface of the article; and
(b) 2 or less in any portion of a unit square centimeter on the overall surface of the article.

4,690,842

REINFORCED CASTING MATERIAL

Gene W. Kammerer, East Brunswick; Hee K. Yoon, North Brunswick, and Robert Li-Jiun Sun, Stanhope, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 784,297, Oct. 7, 1985, Pat. No. 4,643,909. This application Jan. 20, 1987, Ser. No. 5,492
Int. Cl.⁴ A61L *15/00;* **A61F** *13/00*
U.S. Cl. 428—35 **13 Claims**



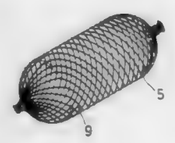
8. A moisture impervious container having a volume of from 2 to 16 ounces and a sealable opening at one end filled with a liquid composition comprising an aromatic polyisocyanate and a polyol in an equivalent ratio of from 2.1 to 15.1, a catalyst in an amount of from 0.1 to 10% based on the weight of the composition, an antifoam agent in an amount of from 0.7 to 7.5% based on the weight of the composition, a thickening agent in an amount of from 2 to 5% by weight of the composition, from 0.5% to 2% by weight mineral oil and a 0.5% to 3% by weight of a water soluble polymer selected from the group consisting of polyvinylpyrrolidone having a molecular weight of from 100,000 to 1,000,000 and a polymer having repeating units of the structure $(O—CH_2CH_2)_n$ where n is an integer such that the molecular weight of the water soluble polymer is from 50,000 to 4,000,000, said composition having a viscosity of between 100,000 and 1,000,000, and said composition capable of foaming in a ratio of from 4 to 1 to 16 to 1.

4,690,843

CASINGS FOR HAM AND SAUSAGE

Hiromichi Inagaki, 1-143, Aza Maedaomote, Inuyama-shi, Aichi-ken, Japan

Filed Feb. 19, 1986, Ser. No. 831,149
Int. Cl.⁴ F16L *11/00;* **B32B** *3/12*
U.S. Cl. 428—36 **13 Claims**



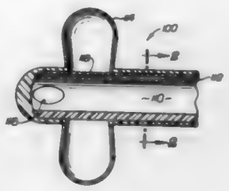
1. A casing for use in enclosing ham and sausage, comprising a heat shrinkable base film having an inner surface and an outer surface, a surface film having an inner surface adhered to said outer surface of said base film, a pattern of heat foamable ink forming an inner pattern between said outer surface of said base film and said inner surface of said surface films, said inner pattern being provided on one of said inner surfaces of said surface film and said outer surface of said base film whereby heating of said casing causes shrinkage of said shrinkable base film and expansion of said heat foamable ink to form a textured pattern on said outer surfaces corresponding to said pattern of foamable ink.

4,690,844

METHOD FOR PARTING RUBBER AND PRODUCTS FORMED THEREBY, AND A METHOD OF MAKING A HLOOD VESSEL

Abdul S. Saudagar, 12 Eastshore, Irvine, Calif. 92714

Filed Oct. 26, 1984, Ser. No. 665,295
Int. Cl.[4] F16L *11/04;* A01N *1/02;* B05D *3/02*
U.S. Cl. 428—36 11 Claims



1. A method of making a medical device comprising:
providing a rubber substrate;
coating a portion of the substrare with parting agent selected from the group consisting of polyvinyl pyrrolidone, a water soluble grade of polyvinyl alcohol, methylcellulose, starch derivatives, and dextran;
applying rubber in solution over the parting agent coating; and
drying the rubber solution and coating at a temperature sufficient to cause the coating to become brittle.

4,690,845

METHOD AND APPARATUS FOR LAMINATING FLEXIBLE PRINTED CIRCUITS

Thomas M. Kloss, Jr., Newtown, Pa., assignor to Gila River Products, Inc., Chandler, Ariz.

Continuation of Ser. No. 582,303, Feb. 22, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 793,452
Int. Cl.[4] A61F *13/02;* B32B *7/02, 27/00;* C09J *7/02*
U.S. Cl. 428—40 15 Claims



1. A stratiform press sheet for use in laminating three dimensional flexible printed circuits on a flat bed press, said press sheet having its component layers bonded together to form a unified sheet containing:
(a) a median layer comprising a polymeric thermoplastic film having a glass transition point lower than the laminating temperature peak, a melting point higher than the laminating temperature peak, and a thickness at the laminating temperature peak at least as great as the differences between the peaks and valleys in the cross-section of the three-dimensional flexible printed circuit for uniform transmission of pressure in said laminating process;
(b) a polymeric release layer having a thickness of from 0.1 to 4 mils and having an outer surface for releasable disposition against a printed circuit which is being laminated;
(c) an outer polymeric stabilizing layer having a melting point higher than the laminating temperature peak and being formed as an integral part of said unified press sheet in order to prevent lateral movement of said thermoplastic film when in a plastic state in said laminating process; and
(d) adhesive means to bond the component layers in a single, stratiform press sheet,
said press sheet being further characterized by substantial freedom from creases, entrapped gases, and contaminants between said layers.

4,690,846

RECORDING DISK SUBSTRATE MEMBERS AND PROCESS FOR PRODUCING SAME

Toshiaki Wada, Takatsuki; Yoshiaki Katsuyama, Muro, and Junichi Nakaoka, Amagasaki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Jul. 26, 1985, Ser. No. 759,366
Claims priority, application Japan, Aug. 15, 1984, 59-169409
Int. Cl.[4] H01F *10/02;* B05D *1/38;* B32B *7/02*
U.S. Cl. 428—64 8 Claims

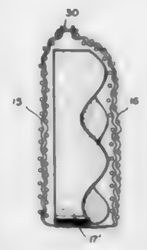
1. A substrate member for recording disk characterized in that a glass coating film is provided on an alumina base ceramic material having micropores of no larger than 5 microns and a relative theoretical density of no less than 96%, said glass coating film having a surface roughness of no more than 80 angstroms, being substantially pore-free and strain-free on the surface, and having a thickness of 0.3 to 200 microns and a relative difference of no more than 10^{-6}/deg in the coefficient of thermal expansion with respect to said alumina base ceramic material.

4,690,847

COLD WEATHER GARMENT STRUCTURE

B. Dean Lassiter, and Vincent F. Ambrosiani, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 26, 1986, Ser. No. 879,053
Int. Cl.[4] B32B *3/26, 5/18*
U.S. Cl. 428—71 20 Claims



11. A cold-weather garment consisting of: an interior lining fabric; an outer fabric; a layer of open cell foam at least ¼ inch thick between the interior lining fabric and the outer fabric; and the lining, foam layer, and outer fabric connected together by connecting means to form a garment; and wherein:
said layer of foam sheet comprises a non-flat foam sheet, said non-flat foam sheet having increased flexibility and reduced material and weight, and having added surface area for moisture transfer during sweating of the wearer, compared to a flat foam sheet.

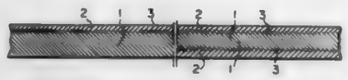
12. A garment as recited in claim 11 wherein said non-flat foam sheet comprises a sheet having a first, flat face, and a second, convoluted face.

4,690,848

WEATHER-RESISTANT LIGNOCELLULOSE OR OTHER ORGANIC OR INORGANIC MATERIAL BOARDS AND PROCESS FOR THEIR PRODUCTION

Reinhard F. Hering, via Alberedo 34, CH 6645 Brione Sopra Minisio, Switzerland

Continuation-in-part of Ser. No. 434,834, Oct. 14, 1982, Pat. No. 4,562,103, which is a continuation-in-part of Ser. No. 74,669, Oct. 23, 1979, abandoned. This application Oct. 7, 1985, Ser. No. 785,198
Int. Cl.[4] B32B *1/04*
U.S. Cl. 428—74 17 Claims



1. A weather-resistant impregnated board possessed of surface elasticity and pliancy by means of a permanently elastic covering layer comprising: an impregnatable porous base material selected from the group consisting of (a) an organic lignocellulose or other organic fibrous or particle material; (b) an inorganic mineral fibrous or particle material; and (c) a mixture of an organic lignocellulose or other organic fibrous or particle material and an inorganic mineral fibrous or particle material; and a vulcanized outer covering layer constituted by a vulcanized weather-resistant, resilient synthetic elastomeric material which has been vulcanized thereon in situ at a temperature of at least 175° C.; said vulcanized outer covering layer being both adhered securely to one outer surface of said base material, and when in unvulcanized form, penetrated and impregnated below and into the same outer surface of said base material to be within the porous structure of said base material for only a predetermined limited region in the vicinity of said outer surface of said base material, and being vulcanized therein in situ at a temperature of at least 175° C.

4,690,849

CONTACT MATERIAL FOR TREATING SEWAGE OF BRAIDED PILE MATERIAL

Ken Fukuda, and Hisaaki Ueba, both of Mibu, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Kureha Gosen Kabushiki Kaisha, Shimotsuga, both of, Japan

Filed Jun. 18, 1986, Ser. No. 875,681
Claims priority, application Japan, Jun. 21, 1985, 60-135405
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—91 8 Claims

1. A contact material for treating sewage, comprising a braid which is made of synthetic fibers and has loop piles, said synthetic fibers forming said loop piles being from 40 to 90% by weight of said synthetic fibers of the whole braid.

4,690,850

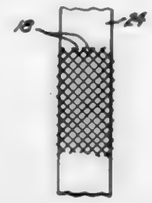
FIBER REINFORCED BRAIDED SKI CORE AND METHOD AND APPARATUS FOR MAKING SAME

Louis J. Fezio, Vashon Island, Wash., assignor to K-2 Corporation, Vashon Island, Wash.

Filed Jun. 6, 1986, Ser. No. 871,443
Int. Cl.[4] B32B *5/12, 17/02;* A63C *5/00*
U.S. Cl. 428—105 50 Claims

1. A wrapped ski core comprising:
a longitudinal core, and,
a plurality of continuous strands of a first set of fibers helically surrounding said core said fibers braided snugly thereon, conforming to the surface of said core; said braided strands of the first set of fibers being biased at an angle with respect to the longitudinal dimension of said core.

14. The wrapped core of claim 1, wherein the angle of said strands of the first set of fibers with said longitudinal ski core



is changed along the length of said ski to vary the torsional and longitudinal stiffness of said ski along its length.

4,690,851

FABRIC BASED ON GLASS AND CARBON FIBERS AND ARTICLES COMPRISING SUCH A FABRIC

Hervé Auduc, Jonage, and Jean Aucagne, La Tour du Pin, both of France, assignors to Brochier S.A., Decines Charpieu, France

Filed Oct. 6, 1986, Ser. No. 915,792
Claims priority, application France, Oct. 16, 1985, 85 15328
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 10 Claims

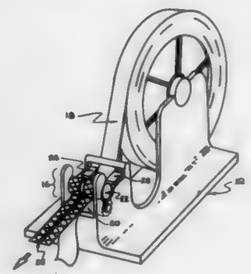
1. A fiber-based fabric having a high fire resistance, a low weight per unit area and a good mechanical strength, comprising a mixture of:
(a) about 50–90% by weight of textured glass fibers,
(b) about 10–50% by weight of carbon fibers.

4,690,852

FOIL FOR STAINED GLASS ASSEMBLY

A. Katherine Hull, Grosse Pointe, Mich., assignor to Paul Gach, St. Clair Shores, Mich.

Filed Jun. 11, 1985, Ser. No. 743,392
Int. Cl.[4] B32B *3/00;* B44C *5/08*
U.S. Cl. 428—156 3 Claims



1. A metallic foil ribbon for use in fabrication of panels and articles from stained glass, said ribbon comprising:
a solder supportive foil ribbon having an essentially uniform width, a coated surface and an uncoated surface, said coated surface having thereon a pressure-sensitive adhesive and said uncoated surface being provided with embossment essentially along its entire length so as to reference the center line of said ribbon along its length, said embossment being visible from the adhesive coated surface.

4,690,853

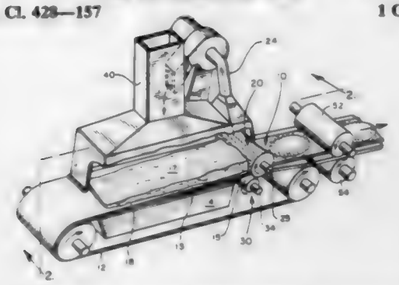
ABSORBENT STRUCTURE CONTAINING A CONTOURED BATT

Philip G. Hammond, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 711,789, Mar. 14, 1985, Pat. No. 4,626,184. This application May 19, 1986, Ser. No. 864,352

Int. Cl.[4] B32B *3/02, 7/00*

U.S. Cl. 428—157 **1 Claim**



1. An absorbent structure for a disposable absorbent garment comprising:

a liquid impermeable backing sheet;

a liquid permeable facing sheet; and

an airlaid batt having uniform density disposed between the backing and facing sheets, said batt having an integrally formed, longitudinally and transversely contoured, scarfed surface wherein said batt is thicker in the central portions than in the marginal side and end portions, respectively, thereof.

4,690,854

ELECTRICALLY CONDUCTING MATERIAL AND METHOD OF PREPARING SAME

Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji; Kiyofumi Takahashi, Yahata, and Noboru Kato, Joyo, all of Japan, assignors to Nihon Sanmo Dyeing Co., Ltd., Japan

Filed Sep. 18, 1985, Ser. No. 777,270

Int. Cl.[4] B05D *3/10, 5/12;* **B32B** *15/08;* **C08J** *7/00*

U.S. Cl. 428—195 **15 Claims**

1. An electrically conducting material comprising a water-insoluble, solid polymeric substrate containing at least 0.01 weight %, when calculated as sulfur or nitrogen atom, of a group selected from mercapto, thiocarbonyl, quaternary ammonium salt, amino and isocyanato, and copper sulfide bound to said polymeric substrate.

7. A process for the preparation of an electrically conducting material, comprising treating a water-insoluble, solid polymeric substrate containing at least 0.01 weight %, when calculated as sulfur or nitrogen atom, of a group selected from mercapto, thiocarbonyl, quaternary ammonium salt, amino and isocyanato with a source of monovalent copper ions and a sulfur-containing compound to form copper sulfide bound to said polymeric substrate.

4,690,855

SUBSTRATE FOR PRINT CIRCUIT BOARD, A PRINT CIRCUIT BOARD, AND METHOD OF MANUFACTURING THE SAME

Yukio Inokuti; Shigeko Ikeda; Toshihiko Funahashi, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 664,587, Oct. 25, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 906,599

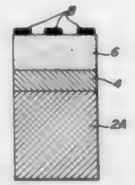
Claims priority, application Japan, Dec. 28, 1983, 58-251746

Int. Cl.[4] B32B *15/04, 15/16;* **B05D** *3/07, 1/12*

U.S. Cl. 428—209 **16 Claims**

1. A substrate for print circuit board comprising a steel sheet which contains 1.0–8.0% of Si, and a forsterite film layer on at least one surface of the steel sheet, and an insulating film layer disposed on the forsterite film layer, said insulating film layer being in the form of a baked solution of a phosphate and colloidal silica, the forsterite film layer being in the form of the reaction product of MgO in an annealing separator applied onto the steel sheet and SiO_2 in the silicon steel sheet.

7. A print circuit board comprising a steel sheet which contains 1.0–8.0% of Si, and a forsterite film layer formed on at least one surface of the steel sheet, and an insulating film layer



disposed on the forsterite film layer, said insulating film layer being in the form of a baked solution of a phosphate and a colloidal silica, and a conductive pattern bonded on the surface of said insulating film layer, the forsterite film layer being in the form of the reaction product of MgO in an annealing separator applied onto the steel sheet, and SiO_2 in the silicon steel sheet.

4,690,856

METAL POLYAMIDE ADHESIVE LAMINATES

Bunsaku Ito; Kimio Fukuda, and Rikio Hara, all of Hirakata, Japan, assignors to Ube Industries, Inc., Yamaguchi, Japan

Filed Dec. 26, 1985, Ser. No. 813,596

Claims priority, application Japan, Dec. 27, 1984, 59-273973

Int. Cl.[4] B32B *7/02, 15/08*

U.S. Cl. 428—215 **5 Claims**

1. A laminate comprising a metal material laminated on at least one surface of an adhesive layer, said adhesive layer being composed of a polyamide adhesive composition comprising 100 parts by weight of a polymer component and 0.1 to 5 parts by weight of an aminosilane compound, said polymer component comprising 50 to 99.5% by weight of a polyamide and 0.5 to 50% by weight of a modified polyolefin formed by grafting a polyolefin with an unsaturated compound having a polar group in the molecule and/or a polymer other than polyamides, having a polar group or an aromatic group and a tensile modulus not higher than 2,000 kg/cm^2.

2. A laminate according to claim 1, which has a structure composed of a metal layer/a polymer core layer/a metal layer and having a thickness of 0.3 to 1.5 nun; said polymer core layer having a thickness of 0.01 to 10 mm and being composed of either a single layer of the polyamide adhesive composition or a three layer structure of the polyamide adhesive composition layer/a resin layer/the polyamide adhesive composition layer, each polyamide adhesive layer in said three layer structure having a thickness of 5 to 100 μm.

4,690,857

MAGNETIC RECORDING MEDIUM

Ryuji Shirahata, and Yasuo Tamai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1985, Ser. No. 765,485

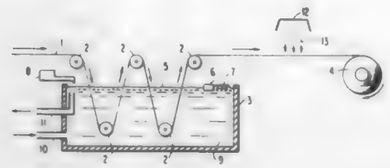
Claims priority, application Japan, Aug. 14, 1984, 59-169858; Aug. 14, 1984, 59-169861

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—216 **13 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon, in sequence, a thin ferromagnetic metal film, and at least one monomolecular layer comprising a saturated fatty acid salt of at least one metal selected from the group consisting of Cd, Co, Mn and Pb, or a polymer of a fatty acid or a derivative thereof, wherein the monomolecular layer comprising a saturated fatty acid salt of the at least

one metal is prepared by a Langmuir Blodgett method and wherein the monomolecular layer comprising a polymer of a



fatty acid or a derivative thereof is a Langmuir Blodgett polymerized layer.

4,690,858

THERMAL TRANSFER SHEET

Hiroyaki Oka; Shinichi Akasaka; Shuichi Ohara; Shintaroo Hattori; Yasuki Mori, all of Hitachi; Toshikazu Narahara, Ibaraki, and Hiroshi Matsumoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nitto Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Feb. 13, 1986, Ser. No. 828,974

Claims priority, application Japan, Feb. 15, 1985, 60-26311; Mar. 15, 1985, 60-50336

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—216 **16 Claims**

1. A thermal transfer recording sheet comprising a substrate and an ink layer formed thereon containing one or more sublimable dyes and a binder, said binder being a high-molecular-weight polyamide obtained from dimer acids and having a softening point of 100° C. or higher.

4,690,859

FIRE BARRIER FABRICS

Rick A. Porter, North Augusta, S.C., and Hans R. Hoernle, Augusta, Ga., assignors to United Merchants & Manufacturers Inc., New York, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,307

Int. Cl.[4] B32B *3/00, 17/10*

U.S. Cl. 428—251 **28 Claims**

1. A breathable fire barrier fabric comprising a woven fiber glass fabric on which is coated an encapsulating coating that minimizes or eliminates fiber to fiber self-abrasion and effectively adheres to the glass fabric even when subjected to heat and flames; said fire barrier fabric having a porosity value at an acceptable level such that the fire barrier fabric inhibits the spread of fire.

4,690,860

FIBRE REINFORCED COMPOSITE PLASTICS MATERIAL

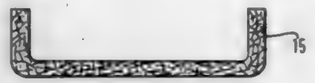
Bronislaw Radvan, Flackwell Heath, and Andrew Till, Marlow, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 884,306, Jul. 15, 1986, abandoned, which is a continuation of Ser. No. 688,806, Jan. 4, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,630

Claims priority, application United Kingdom, Jan. 6, 1984, 8400294

Int. Cl.[4] B32B *5/14, 5/22, 27/04;* **B27N** *3/10*

U.S. Cl. 428—290 **13 Claims**



1. A fibre reinforced plastics structure, comprising:

a porous matrix comprising 40% to 60% by weight of thermoplastic material and 20% to 60% by weight of single reinforcing fibres having a high modulus of elasticity, and being between about 7 and 50 millimeters long, the matrix having pores and a surface; and

a cured thermoset plastics material investing at least the pores at the surface of said matrix.

4,690,861

MAGNETO OPTICAL RECORDING MEDIUM

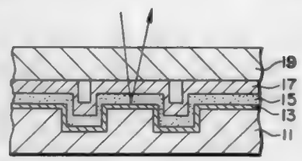
Hitoshi Nakamura; Yujiro Kaneko; Yasuo Sawada, all of Numazu; Hajime Machida, Tokyo; Fumiya Omi, and Atsuyuki Watada, both of Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,373

Claims priority, application Japan, Mar. 11, 1985, 60-46647

Int. Cl.[4] G11B *9/00*

U.S. Cl. 428—623 **37 Claims**



1. A magneto-optical recording medium comprising a substrate and a reflective layer, a dielectric undercoat layer and a hexagonal magnetoplumbite metal oxide magnetic layer laminated thereon in order, wherein the crystal misfit between said reflective layer and said dielectric undercoat layer formed thereon is within ±30% of the atomic surface distance of the reflective layer, and wherein the crystal misfit between said dielectric undercoat layer and said hexagonal magnetoplumbite metal oxide magnetic layer is within ±30% of the atomic surface distance of the dielectric undercoat layer.

4,690,862

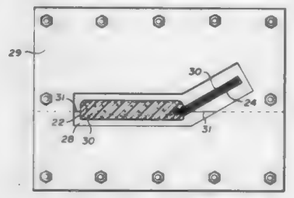
INTEGRAL COMPOSITE PROFILE OF CELLULAR AND NON-CELLULAR RESINS AND A DUAL EXTRUSION METHOD FOR ITS MANUFACTURE

Daniel J. Hoffmann, Milwaukee, Wis., assignor to Gossen Corporation, Milwaukee, Wis.

Filed Dec. 28, 1984, Ser. No. 687,058

Int. Cl.[4] B37B *5/18, 5/14;* **B29C** *67/22, 47/02*

U.S. Cl. 428—318.6 **7 Claims**



1. An integral composite profile of a cellular thermoplastic resin and a non-cellular thermoplastic resin in which a first profile has a tongue and a second profile has a pair of fingers which encapsulate and are fused to the tongue of the first profile.

4,690,863

MAGNETIC RECORDING MEDIA AND PROCESS FOR PRODUCING SAME

Takahito Miyoshi, Odawara; Masaaki Fujiyama, Minamiashigara; Akihiro Matsufuji, and Nobuyuki Yamamoto, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,567

Claims priority, application Japan, Jun. 21, 1984, 59-126349

Int. Cl.⁴ G11B *5/714*

U.S. Cl. 428—328 **10 Claims**

1. A magnetic recording medium comprising a nonmagnetic supporting substrate and a ferromagnetic alloy powder-containing magnetic layer applied onto the surface thereof with a binder, characterized in that said ferromagnetic alloy powder to be used has a specific surface area (S_{BET}) of no less than 45 m^2/g and an absorbed water content of no higher than 1.2% by weight.

4,690,864

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Teruhisa Miyata, Kyoto; Kenichi Inoue, Muko; Akira Miyake, Kyoto, and Kohji Norimatsu, Fukuchiyama, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 15, 1986, Ser. No. 919,021

Claims priority, application Japan, Oct. 15, 1985, 60-230374

Int. Cl.⁴ G11B *5/71*

U.S. Cl. 428—336 **9 Claims**

1. A magnetic recording disc which comprises a non-magnetic support and a magnetic layer provided on at least one surface of said support, said magnetic layer comprising magnetic powder, a resinous binder, (a) an ester of an unsaturated fatty acid of 8 to 18 carbon atoms with a monovalent or polyvalent, saturated or unsaturated alcohol of not more than 18 carbon atoms optionally substituted with at least one alkoxy group having not more than 8 carbon atoms and (b) a fatty acid ester of the formula:

$$R_1-\overset{\overset{O}{\|}}{C}-O+CH_2CH_2O\frac{}{n}R_2$$

wherein R_1 is a saturated or unsaturated aliphatic hydrocarbon group having 8 to 18 carbon atoms, R_2 is an alkyl group having not more than 18 carbon atoms and n is an integer of 1 or more, the combined amount of the unsaturated fatty acid ester (a) and the fatty acid ester (b) being not less than 5 parts by weight to 100 parts by weight of the magnetic powder.

4,690,865

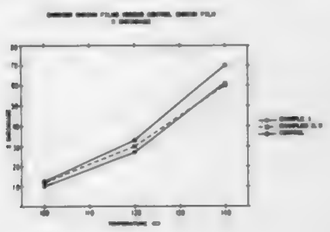
HEAT-SHRINKABLE POLYMERIC BARRIER FILM

Dan S. C. Fong, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 839,921, Mar. 17, 1986, abandoned. This application Apr. 28, 1986, Ser. No. 859,204

Int. Cl.⁴ B32B *27/08, 27/30;* **B05D** *3/12;* **B65B** *51/10*

U.S. Cl. 428—341 **8 Claims**



1. A heat-shrinkable barrier film consisting essentially of an oriented, shrinkable polyolefin film coated on at least one side with a vinylidene chloride copolymer which film is capable of shrinking at least 10% in either the machine or transverse directions, or both.

4,690,866

POLYESTER FIBER

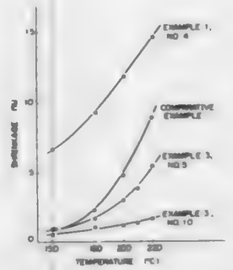
Shiro Kunakawa, and Kazuyuki Yamamoto, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 3, 1985, Ser. No. 751,796

Claims priority, application Japan, Jul. 9, 1984, 59-140655; Aug. 2, 1984, 59-161623; Nov. 29, 1984, 59-250552

Int. Cl.⁴ D02G *3/00*

U.S. Cl. 428—364 **8 Claims**



1. A polyester fiber composed of a polyester comprising ehtylene terephthalate units as the main recurring units and having an intrinsic viscosity of at least 0.90, wherein the amorphous orientation degree is in the range of from 0.30 to 0.55, wherein the peak temperature of the mean dispersion appearing in the temperature dispersion of the dynamic loss elasticity modulus is lower than 125° C., and the crystal melting point is at least 270° C.

4,690,867

MATERIAL FOR LOW MELTING POINT METAL CASTING EQUIPMENT

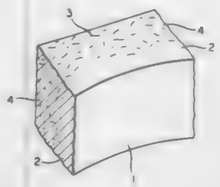
Tsutomu Yamamoto; Michio Nishiyama; Mitsuo Yamamoto, and Masakazu Ozaki, all of Yokohama, Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,222

Claims priority, application Japan, Apr. 5, 1985, 60-71039; Feb. 12, 1986, 61-26854

Int. Cl.⁴ B32B *13/02*

U.S. Cl. 428—367 **6 Claims**



1. A material for low melting point metal casting equipment comprising a calcium silicate molded body reinforced with fibers, characterized in that the matrix of said molded body substantially comprises xonotlite, that a surface of said molded body coming in contact with any molten metal to be cast and the zone near the surface substantially contain no reinforcing fibers or less reinforcing fibers than that of other zones, thereby providing that the fracture toughness of said surface or zone is lower than that of said other zones.

4,690,868

PROCESS FOR SURFACE TREATING CLAY MINERALS AND RESULTANT PRODUCTS

Camilla A. Rice, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 699,014, Feb. 8, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,083

Int. Cl.⁴ B32B *5/16;* **C23C** *16/00*

U.S. Cl. 428—409 **12 Claims**

1. A 2-dimensional layered lattice silicate having the general formula $E_zM_xSi_yO_n(OH)_m$, where M is Al, Mg, or Fe; x=2 to 6; y=2 to 8, n=2 to 20; m=0 to 8; and E_z is one or more exchangeable ions; the surface of which has been modified by surface bound NH_2 groups.

4,690,869

TRANSPARENT COATING MATERIAL

Akira Ohmori, and Kazuo Ishiwari, both of Ibaraki, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

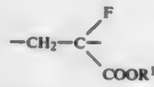
Division of Ser. No. 708,446, Mar. 5, 1985, abandoned. This application Jan. 23, 1986, Ser. No. 821,519

Claims priority, application Japan, Mar. 9, 1984, 59-46183

Int. Cl.⁴ C08F *20/24*

U.S. Cl. 428—421 **5 Claims**

1. In a method of coating an article with a transparent coating material having outstanding resistance to weather and water, said article being selected from the group consisting of furniture, a machine, a building and a fixed structure, the improvement wherein said coating material comprises a polymer which contains at least 50 wt. % of a structural unit represented by the formula


(a)

wherein R^1 is fluroalkyl having 2 to 10 carbon atoms, the light transmittance of said coating material being more than 80% when a sheet of 2 mm in thickness is tested with the use of a light having a wavelength of 600 mm.

4,690,870

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Nobuo Tsuji; Hiroshi Hashimoto, and Yoshito Mukaida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1984, Ser. No. 654,290

Claims priority, application Japan, Sep. 26, 1983, 58-177827

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.⁴ G11B *5/702*

U.S. Cl. 428—425.9 **28 Claims**

1. A magnetic recording medium comprising a non-magnetic support having thereon an electron beam radiation-cured magnetic recording layer, said magnetic layer comprising ferromagnetic particles and a binder comprising

(1) a resin selected from the group consisting of a vinyl resin containing a carboxylic group in an amount of about 5×10^{-5} to 2×10^{-3} equivalent per gram and a nitrocellulose resin;

(2) an urethane resin having at least one terminal acrylate group in the main chain or in a side chain of the molecule; and

(3) a compound having at least one acryloyl group which is obtained by modifying the isocyanate group of a polyisocyanate having at least two isocyanate groups per molecule, wherein the ratio of said vinyl resin to said urethane resin is from about 20:80 to 90:10, and said compound containing at least one acryloyl group is present in an amount of from about 20 to 400 parts by weight per 100 parts of the total amount of said vinyl resin and said urethane resin.

10. A method for producing a magnetic recording medium comprising the steps of

(A) coating a magnetic recording layer on a non-magnetic support, said layer comprising ferromagnetic particles and a binder comprising

(1) a resin selected from the group consisting of a vinyl resin containing a carboxylic group in an amount of about 5×10^{-5} to 2×10^{-3} equivalent per gram and nitrocellulose resin;

(2) a urethane resin having at least one terminal acrylate group in the main chain or in a side chain of the molecule; and

(3) a compound having at least one acryloyl group which is obtained by modifying the isocyanate group of polyisocyanate having at least one isocyanate group per molecule; and

(B) curing said magnetic layer by electron beam irradiation using an accelerating voltage of from about 100 to 1000 kV and an absorption dose of from about 1 to 20 megarads, wherein the ratio of said vinyl resin to said urethane resin is from about 20:80 to 90:10, and said compound containing at least one acryloyl group is present in an amount of from about 20 to 400 parts by weight per 100 parts of the total amount of said vinyl resin and said urethane resin.

4,690,871

PROTECTIVE OVERCOAT OF TITANIUM NITRIDE FILMS

Roy G. Gordon, c/o Thompson Birch, Gauthier & Samuels 225 Franklin St., Boston, Mass. 02110

Filed Mar. 10, 1986, Ser. No. 837,774

Int. Cl.⁴ C03C *17/00*

U.S. Cl. 428—432 **16 Claims**



1. A solar screening transparent sheet product characterized by oxidation resistance even during annealing, tempering, bending or other processes at temperatures above about 800° F., said product having:

(a) an exterior film of tin oxide forming means to mechanically and chemically protect a film of titanium nitride;

(b) said film of titanium nitride under said tin oxide and forming the principal barrier to near infrared radiation of such product; and

(c) a substrate of transparent glass under said film of titanium nitride.

11. A process for making a transparent sheet product comprising a layer of titanium nitride as a means to reduce near infrared radiation from penetrating the coated glass, said process comprising the steps of:

(a) coating said glass with an effective thickness of titanium nitride forming means to reduce passage of said near infrared radiation; and

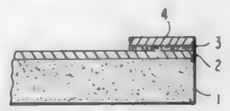
(b) thereupon overcoating said titanium nitride with a coating from 300 to 800 angstroms of tin oxide.

4,690,872

CERAMIC HEATER

Norio Kato; Shunkichi Nozaki; Yukihiro Kimura, and Rokuro Kambe, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 661,880, Oct. 17, 1984, abandoned, which is a continuation of Ser. No. 510,138, Jul. 1, 1983, abandoned. This application Jun. 16, 1986, Ser. No. 876,643
Claims priority, application Japan, Jul. 7, 1982, 57-116809
Int. Cl.[4] B32G *9/04*; H05G *3/10*
U.S. Cl. 428—446 **8 Claims**



1. A ceramic heater comprising an alumina or silicon nitride ceramic substrate of high mechanical strength and an electrode through which current is applied attached thereto, wherein said ceramic substrate has formed thereon, by deposition, an electrically conductive layer consisting essentially of a silicide of an element selected from groups IVb, Vb and VIb of the Periodic Table.

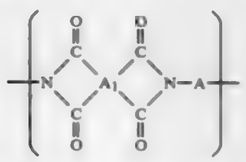
4,690,873

GAS SEPARATING MATERIAL

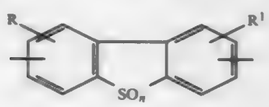
Hiroshi Makino, and Masayuki Nakatani, both of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 22, 1985, Ser. No. 800,981
Claims priority, application Japan, Nov. 30, 1984, 59-251613
Int. Cl.[4] B32B *27/00, 27/02*; B01D *53/22*
U.S. Cl. 428—473.5 **8 Claims**

1. A gas separating material having a gas separating layer comprising at least one aromatic imide polymer which contains at least 20 molar % of at least one type of recurring unit of the formula (I):



wherein A_1 represents a tetravalent aromatic radical and A represents a divalent aromatic radical of the formula (II):



in which R and R^1 respectively represent independently from each other a member selected from the group consisting of a hydrogen atom and organic and organic radicals, and n represents zero or an integer of 1 to 2.

4,690,874

MOLDED CONSTRUCTION ELEMENT

Claude Sauer, Aix-en-Provence; Raymond Burger, Sainte-Marie-Au; Gabriel Reguigne, Blois, and Mark Kern, Paris, all of France, assignors to Tourisme Hotellerie Ltd., Chypre, Switzerland

Filed Oct. 30, 1985, Ser. No. 793,114
Claims priority, application France, Apr. 25, 1984, 84 006507; May 4, 1984, 84 07004; May 4, 1984, 84 07005
Int. Cl.[4] B32B *21/04*; B24D *3/02*
U.S. Cl. 428—537.1 **2 Claims**



1. A process of forming an external and internal structural building component comprising:
selecting a supply of Phragmites Communis reeds, placing said supply of siad reeds inside a rotating drum to roll said reeds over one another for stripping the leaves from said reeds to obtain a plurality of reed stems, and scoring the epidermis of said reed stems within said drum by rotating said reed stems in contact with siliceous particles of the leaves that are stripped from said reeds;
forming a first layer having opposite sides of said plurality of reed stems that have a second epidermis;
providing an intermediate layer of said building component having opposite sides including a sheet of fluid-tight material;
providing a third layer of said building component from a supply of reed particles, said reed particles being processed from 20 to 50 percent Phragmites Communis reed stems and 50 to 80 percent of reed stems of another variety of reeds having a softer epidermis than the epidermis of said Phragmites Communis reeds; and
bonding said first layer of reed stems to one of said sides of said intermediate layer and to one another such that one of said sides of said first layer is exposed with said reed stems facing outwardly and the other of said sides of said first layer is adjacent said intermediate layer with a glud consisting of an isocyanate base, and bonding said reed particles of said third layer together and to the other of said sides of said intermediate layer with a glue consisting of an isocyanate base.

2. A structural component product made according to the process of claim 1.

4,690,875

HIGH VACUUM CAST INGOTS

Charles d'A. Hunt, deceased, late of Petaluma, Calif. (by Barbara A. Hunt, executrix), assignor to Degussa Electronics Inc., Materials Division, Morgan Hill, Calif.

Continuation-in-part of Ser. No. 747,332, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 570,176, Jan. 12, 1984, Pat. No. 4,558,729. This application Jul. 2, 1986, Ser. No. 881,218
Int. Cl.[4] B22D *25/06*
U.S. Cl. 428—577 **15 Claims**

1. A vacuum cast high strength iron, nickel or cobalt based alloy ingot wherein the average as cast diameter of the grains when viewed on a surface cut perpendicular to the longitudinal axis of the ingot is between about 50 μm and about 500 μm, and

wherein the average as cast diameter of the grains when viewed on a surface cut parallel to the longitudinal axis of the ingot is at least equal to the said perpendicular diameter,
said ingot being further characterized by a subgranular structure of substantially equiaxed cells having an average as cast diameter of between about 20 μm and about 80 μm,



said ingot having a density greater than 99.5% of theoretical density of the alloy in the as-cast condition, and having less than five ppm total oxygen content and less than one ppm oxygen as insoluble oxide.

4,690,876

ARTICLE COMPRISING A DUCTILE BRAZING ALLOY FOIL CONTAINING REACTIVE METALS AND PRECIOUS METALS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 672,058, Nov. 16, 1984, Pat. No. 4,606,978, which is a continuation of Ser. No. 422,625, Sep. 24, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,216
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] C22C *30/02, 5/00*
U.S. Cl. 428—606 **6 Claims**

1. An article consisting essentially of a ductile brazing alloy foil said alloy having a liquidus temperature of from 890° C. to 1400° C. a composition consisting essentially of from about 0.25% to about 5% by weight of a reactive metal selected from the group consisting of vanadium, zirconium and mixtures thereof, from about 25% to about 85% by weight of gold and from about 3% to about 40% by weight of nickel and from about 5% to about 65% by weight of copper.

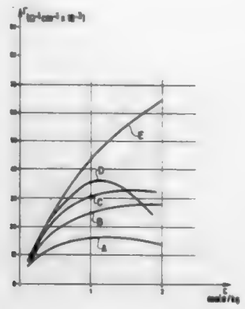
4,690,877

ELECTROCHEMICAL CELL HAVING A NON-AQUEOUS ELECTROLYTE

Jean-Paul Gabano, Poitiers; Michel Broussely, Liguge; Jean-Pierre Pereira-Ramos, Creteil; Richard Messina, Boussy Saint Antoine, and Jacques Perichon, Savigny sur Orge, all of France, assignors to Saft, S.A., Romainville, France

Filed Jan. 21, 1986, Ser. No. 821,157
Claims priority, application France, Jan. 30, 1985, 8501309
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 **3 Claims**

1. An electrochemical cell having a negative active material, a positive active material, and a non-aqueous electrolyte, the cell being capable of operation in a temperature range between 100° C. and 200° C., wherein the negative active material is selected from the group consisting of alkali metals, alkaline earths, magnesium, and aluminum, the positive active material is selected from the group consisting of CuO, $Cu_4O(PO_4)_2$, CF_x, MnO_2, V_2O_5, MoS_3, TiS_2, V_2S_5, V_6O_{13}, MoS_2, and $NiPS_3$, and wherein said nonaqueous electrolyte consists of at least one solvent selected from the group consisting of dimethylsulfone alone and mixtures of dimethylsulfone with other aromatic or aliphatic linear sulfones.

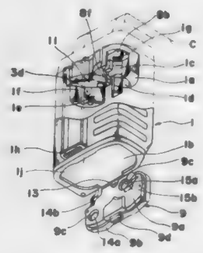


4,690,878

BATTERY POWER DETECTOR FOR SENSING PRESENCE OF BATTERIES

Ikushi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabukishi Kaisha, Japan

Filed Aug. 15, 1986, Ser. No. 897,101
Claims priority, application Japan, Aug. 23, 1985, 60-129357[U]; Feb. 12, 1986, 61-29400
Int. Cl.[4] H01M *2/10*
U.S. Cl. 429—1 **3 Claims**



1. A power supply for use in an electronic apparatus comprising:
a battery housing for accommodating a set of cylindrically-shaped batteries in parallel-spaced relationship with each other,
a battery door connected to the battery housing by a hinge to expose an opening of the housing and to close the opening to axially depress the batteries, and some of said batteries being located in the battery housing at one position relatively close to the hinge and the remainder of the batteries being located at another position relatively remote from the hinge;
a first contact means mounted on a bottom of the battery housing to be in contact with terminals of the batteries,
a second contact means mounted on the battery door to be in contact with terminals of the batteries and to connect the batteries in series in association with the first contact means,
a detector mounted on the bottom of the battery housing to operate when at least one battery located at the position remote from the hinge is depressed due to the battery door closing operation and the batteries are connected to each other in series, and
a switch mounted on the bottom of the battery housing to

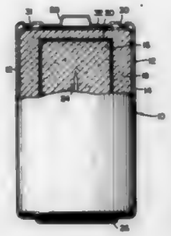
operate due to the operation of the detector for signalling said apparatus that the batteries have been connected to each other in series.

4,690,879

CELL CIRCUIT INTERRUPTER

Harry R. Hahndorff, Bay Village, and John P. Myers, Cleveland, both of Ohio, assignors to Eveready Battery Company, St. Louis, Mo.

Filed Dec. 5, 1986, Ser. No. 938,303
Int. Cl.[4] H01M 2/00
U.S. Cl. 429—61 **13 Claims**



1. A galvanic cell comprising a metal container closed at one end and including in said container a positive electrode, a negative electrode and an electrolyte with said container being in electrical contact with one of said electrodes; a cover mounted over said metal container, said cover being secured to said metal container with at least a portion of said cover being electrically insulated from said container and in electrical contact with the other electrode; a conductive member, said conductive member being secured to a portion of the bottom of said container with an electrically insulating securing means so that at least a portion of the interial area of the conductive member is electrically insulated from said container while at least a portion of the peripheral area of said conductive member is in electrical contact with the bottom of said container; and wherein electrically conductive securing means secures the peripheral area of the conductive member to, and in electrical contact with, the bottom of said container so that when the center of the bottom of said container bulges a predetermined amount, said electrically conductive securing means will break to separate the peripheral area of said conductive member from the bottom of said container thereby breaking the electrical contact between the bottom of said container and said conductive member.

4,690,880

PATTERN FORMING METHOD

Hideyuki Suzuki, Machida; Katsunori Terada, Sagamihara; Yuichi Masaki, Kawasaki, and Kenji Morimoto, Ise, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 755,463, Jul. 16, 1985, abandoned. This application May 5, 1986, Ser. No. 860,698
Claims priority, application Japan, Jul. 20, 1984, 59-149660; Jul. 23, 1984, 59-151382
Int. Cl.[4] G03C 5/00; G03F 9/00
U.S. Cl. 430—313 **13 Claims**

1. A method of forming a pattern on a surface of a workpiece, comprising the steps of coating the workpiece surface with photoresist, imagewise exposing, developing and etching the coated workpiece surface, said further particularly method including the steps of coating the workpiece surface with photoresist, first imagewise exposing part of the photoresist coated surface, developing the just exposed part, then imagewise exposing the unexposed portion of the coated photoresist,



developing the just exposed photoresist portion and etching the workpiece.

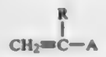
4,690,881

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Kayoko Nagai, and Kazuo Tsubuko, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,075
Claims priority, application Japan, May 13, 1985, 60-100882
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—114 **8 Claims**

1. A liquid developer for electrophotography having a solid content of not less than 10% by weight and a diffusion speed (as defined in the specification) of not lower than 1 mm/min., which comprises a toner containing a coloring agent covered with a coating polymer an aliphatic hydrocarbon dispersing medium dispersing said toner therein, wherein said coloring agent comprises pigment particles coated with at least one material selected from the group consisting of humic acid, humates and humic acid derivatives, said coated pigment particles being dispersed in a resinous composition containing an ethylene-vinylacetate copolymer, and said coating polymer is a copolymer of Monomer I of the following general formula,



wherein R represents hydrogen or methyl group and A represents $-COOC_nH_{2n+1}$ or $-OCOC_nH_{2n+1}$, n being an integer of 6 to 20, and Monomer II having an allyl group.

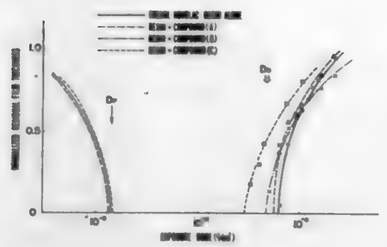
4,690,882

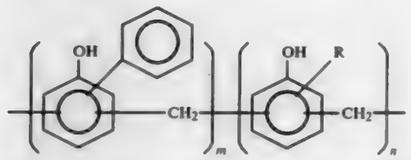
POSITIVE ACTING RESIST MATERIAL COMPRISED OF NOVOLOC RESIN DERIVED FROM PHENYLPHENOL

Katsumi Tanigaki, and Yasuo Iida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,038
Claims priority, application Japan, Sep. 28, 1984, 59-203234
Int. Cl.[4] G03C 1/52, 1/495
U.S. Cl. 430—192 **8 Claims**

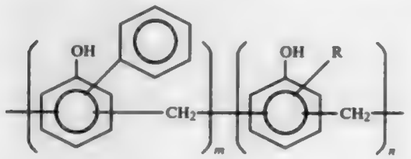
1. A positive acting resist material comprising a mixture of a novolac resin represented by the following general formula:





wherein R represents H or CH_3 and m and n are positive integers, respectively, and, a photosensitive agent which is a quinonediazide compound.

3. A positive acting resist material comprising a mixture of a novolac resin represented by the following general formula:



wherein R represents H or CH_3, and m and n are positive integers, respectively, and, a photosensitive agent which is poly(2-methylpentene-1-sulfone).

4,690,883

IMAGE FORMING PROCESS

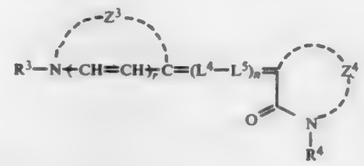
Seiiti Kubodera, and Masaki Okazaki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan and Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1985, Ser. No. 808,719
Claims priority, application Japan, Dec. 14, 1984, 59-264079
Int. Cl.[4] G03C 5/54, 1/14, 1/19, 1/10
U.S. Cl. 430—203 **11 Claims**

1. A process for forming an image, comprising
imagewise exposing a photosensitive material comprising on a support a photosensitive silver halide, a sensitizing dye having general formula (I) and/or (II) as defined below, and a compound which forms or releases a mobile dye in proportion or counterproportion to the reduction of the photosensitive silver halide into silver by heating, and
transferring the resulting mobile dye to a dye-fixing element in the presence of a hydrophilic solvent as a dye transfer assistant, said hydrophilic solvent consisting essentially of water,
wherein formula (I) is:



wherein
Z^1 and Z^2 individually represent a group of non-metallic atoms necessary to form a 5- or 6-membered heterocyclic ring, Z^1 and Z^2 may be the same or different,
R^1 and R^2 individually represent a substituted or unsubstituted alkyl group, R^1 and R^2 may be the same or different,
L^1, L^2 and L^3 individually represent a substituted or unsubstituted methine group,
p and q are individually equal to 0 or 1,
m is equal to 0, 1, 2, or 3,
$X_1\ominus$ represents an anion,
k is equal to 0 or 1,
with the proviso that the number of organic acid groups contained in the molecular except $X_1\ominus$ is up to 1,
and formula (II) is:



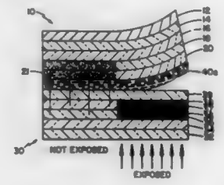
wherein
Z^3 has the same meaning as Z^1 and Z^2,
R^3 has the same meaning as R^1 and R^2 except an alkyl group having an acid group,
L^4 and L^5 have the same meaning as L^1, L^2, and L^3,
Z^4 represents a group of non-metallic atoms necessary to form a 5- or 6-membered heterocyclic ring,
R^4 represents a hydrogen atom, or a substituted or unsubstituted alkyl, aryl or heterocyclic group,
r has the same meaning as p and q, and
n has the same meaning as m, wherein the imagewise exposed photosensitive material is heated to develop the imagewise exposed photosensitive material.

4,690,884

PHOTOGRAPHIC ELEMENT AND METHOD FOR FORMING TRANSPARENCIES

Frank E. DeBruyn, Jr., Abington, and Lucretia J. Weed, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 11, 1986, Ser. No. 828,385
Int. Cl.[4] G03C 5/54, 5/26, 5/36, 5/38
U.S. Cl. 430—206 **24 Claims**



1. A scavenger-spreading element for use with a photosensitive element adapted to remove unwanted by-products produced during processing of said photosensitive element with a processing composition containing a polymeric thickening

agent, which comprises a support carrying a layer of a hydrophilic polymer, a cross-linking agent for said polymeric thickening agent, a barrier layer adapted to provide a temporary delay in the diffusion of said cross-linking agent pH reducing means, and a layer adapted to exhibit subtantial adhesion to cross-linked polymeric thickening agent.

2. The element of claim 1 which includes silver precipitating nuclei.

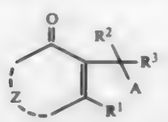
4,690,885

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara, and Akihiko Ikegawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 787,957
Claims priority, application Japan, Oct. 16, 1984, 59-216926
Int. Cl.⁴ G03C *1/40, 1/06, 1/34, 1/42*
U.S. Cl. 430—212 **32 Claims**

1. A silver halide photographic material which comprises a support having coated thereon a light-sensitive silver halide emulsion layer, wherein the photographic material contains at least one blocked photographic agent represented by the following general formula (I):



(I)

wherein A represents a photographic agent moiety which is bonded to a blocking moiety through a hetero atom, or a precursor thereof; R^1 represents a member selected from the group consisting of a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an oxycarbonyl group, a carbamoyl group, an acyl group, a sulfonyl group, a sulfinyl group and a sulfamoyl group, and R^2 and R^3 each represents a hydrogen atom, or a substituent group; and Z represents atoms necessary to form a cyclopentenone ring, a cyclohexenone ring, a cycloheptenone ring, a benzocycloheptenone ring, a 4-pyridone ring, a 4-quinolone ring, a 2-pyrone ring, a 4-pyrone ring, a 1-thio-2-pyrone ring, a 1-thio-4-pyrone ring, a coumarin ring, a chromone ring or a uracil ring, provided that said uracil ring has an alkyl group on the N atom adjacent to the carbon atom to which R^1 is attached and provided that none of said rings contains an >NH group at the position adjacent to the carbon atom to which R^1 is attached.

19. A silver halide photographic material as in claim 1, wherein the blocked photographic agent is present in a silver halide emulsion layer, a coupler layer, a subbing layer, a protective layer, an interlayer, a filter layer, an antihalation layer, an image receiving layer, a cover sheet layer, or an auxiliary layer.

4,690,886

METHOD FOR MAKING NEGATIVE WORKING O-QUINONE DIAZIDE CONTAINING DRY PLANOGRAPHIC PRINTING PLATE UTILIZING MULTIPLY LIGHT EXPOSURE, DEVELOPMENT AND BASIC TREATMENT

Yasuhisa Naritomi, Haibara; Hiroshi Takahashi, Fujieda, and Keisuke Shiba, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 13, 1985, Ser. No. 701,289
Claims priority, application Japan, Feb. 14, 1984, 59-25489
Int. Cl.⁴ G03F *7/08*
U.S. Cl. 430—303 **9 Claims**

1. A method for making a dry planographic printing plate, the steps comprising:

first, exposing a dry negative working presensitized plate comprising a base substrate having provided thereon, in order, a photosensitive layer containing an orthoquinonediazide compound and a silicone rubber layer to light through a negative transparency,

developing the exposed printing plate by a developer consisting essentially of a mixture of (i) an alcohol selected from the group consisting of ethyl, isopropyl and n-propyl alcohol, a glycol selected from the group consisting of mono-methyl, mono-ethyl, mono-propyl or mono-n-butyl ether of ethylene glycol, or mono-methyl, mono-ethyl or mono-n-butyl ether of diethylenegylcol, and benzyl alcohol, and (ii) a petroleum solvent selected from the group consisting of hexane, heptane and isoparaffin, so that the photosensitive layer and the overlying silicone rubber layer in the exposed area are removed,

exposing the whole surface of the developed printing plate to light where the exposure value is not less than 5% of the exposure value at the time of the exposure to light through the negative transparency, and

treating the twice exposed printing plate with a liquid or gaseous basic compound.

4,690,887

METHOD FOR FORMING MICRO-PATTERNS BY DEVELOPMENT

Mitsutoshi Fukuda, Tokuyama; Makoto Fukutomi, Shinnanyo; Osamu Kogure, and Kazunori Miyoshi, both of Tokai, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Shinnanyo and Toyo Soda Manufacturing Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 489,344, Apr. 28, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 800,100
Claims priority, application Japan, Apr. 28, 1982, 57-70482
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—331 **1 Claim**

1. A developer for developing patterns of a radiation sensitive negative resist prepared from a polymer of an aromatic vinyl compound comprising a mixture of a good solvent and a poor solvent, wherein the mixture of good and poor solvents is a mixture of isoamyl acetate and ethleneglycol ethylether in the ratios of about 50/50 and 45/55, respectively.

4,690,888

SILVER HALIDE COLOR PHOTO-SENSITIVE MATERIAL

Mitsuto Fujiwhara; Takao Nimura; Yasumasa Numata, and Yasuko Matsubara, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,340
Claims priority, application Japan, Sep. 14, 1984, 59-195152
Int. Cl.⁴ G03C *1/40, 7/32*
U.S. Cl. 430—549 **10 Claims**

1. In a photo-sensitive silver halide color photographic material having both (1) ballasted couplers combined with photo-sensitive silver halide emulsions and (2) colored compounds capable of reacting with the oxidized developing agent; said photo-sensitive silver halide color photographic material characterized in that (a) said colored compounds are compounds capable of diffusing at least 1μm in said photographic material during developing treatments thereof, (b) said colored compounds have their main absorption in the main absorption wavelength region of a dye produced by the reaction of said ballasted coupler with the oxidized color developing agent; (c) said colored compounds are contained either in the silver halide emulsion layers containing said ballasted couplers which produce said colored compounds, or in the silver halide emulsion layers having spectral sensitivity similar to said emulsion layers containing said ballasted couplers which produce said colored compounds, or in a photo-insensitive layer adjacent to said silver halide emulsion layers containing said ballasted couplers which produce said colored compounds; (d) said colored compounds are made colorless or diffused out from the photographic material by reaction with the oxidized color developing agent; and (e) said colored compounds are capable of remaining in the photographic material even after the developing treatments in an amount of at least 30% by weight of the amount added.

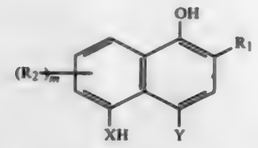
4,690,889

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING NOVEL CYAN DYE FORMING COUPLER

Naoki Saito; Kozo Aoki, and Yukio Yokota, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1985, Ser. No. 732,771
Claims priority, application Japan, May 10, 1984, 59-93605; Dec. 14, 1984, 59-264277; Dec. 19, 1984, 59-268135
Int. Cl.⁴ G03C *1/40, 1/08, 7/32*
U.S. Cl. 430—552 **20 Claims**

1. A silver halide color photographic light-sensitive material containing a cyan dye forming coupler represented by formula (I):



(I)

wherein R_1 represents $-CONR_3R_4$, $-NHCOR_3$, $-NHCOOR_5$, $-NHSO_2R_5$, $-NHCONR_3R_4$ or $-NHSO_2NR_3R_4$, wherein R_3 and R_4 each represent a hydrogen atom or a straight or branched chain or cyclic substituted or unsubstituted alkyl, alkenyl, or alkynyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted monocyclic or condensed heterocyclic ring, and R_5 represents a straight or branched chain or cyclic substituted or unsubstituted alkyl, alkenyl, or alkynyl group, a substituted or unsubstituted aryl group including a condensed ring, or a substituted or unsubstituted monocyclic or condensed heterocyclic ring; R_2 represents a group capable of substituting for a hydrogen atom on the naphthol ring; m represents 0 or an integer of from 1 to 3; X represents an oxygen atom, a sulfur atom, or



wherein R_6 represents a hydrogen atom or a monovalent organic group; and Y represents a hydrogen atom or a group capable of being released in a coupling reaction with an oxidation product of an aromatic primary amine developing agent; when m is 2 or 3, the plural R_2 groups can be the same or different, or together form a ring; or R_2 and X, X and Y, or R_3 and R_4 together form a ring; or formula (I) represents a dimer or a higher polymer by bonding at R_1, R_2, X or Y, wherein the hydrogen atom of OH, SH or R_6N as —XH undergoes intramolecular hydrogen bond formation after the coupling reaction with the oxidation product of the aromatic primary amine developing agent and thus stabilizes the cyan dye images to heat and light.

4,690,890

PROCESS FOR SIMULTANEOUSLY DETECTING MULTIPLE ANTIGENS USING DUAL SANDWICH IMMUNOMETRIC ASSAY

Rueyming Loor, Hercules; Thabiso M'Timkulu, El Sobrante, and Susanne K. DeWitt, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Apr. 4, 1984, Ser. No. 596,676
Int. Cl.⁴ G01N *33/53, 33/545;* **C12Q** *1/42;* **C12N** *15/00*
U.S. Cl. 435—7 **17 Claims**

1. An immunometric assay for detecting the presence of prostatic acid phosphatase and prostate antigen in a sample which comprises contacting the sample with (a) a labeled monoclonal antibody from hybridoma cell line ATCC No. HB 8523, which is directed against prostatic acid phosphatase, (b) a labeled monoclonal antibody from hybridoma cell line ATCC No. HB 8525, which is directed against prostate antigen, (c) an immobilized monoclonal antibody from hybridoma cell line ATCC No. HB 8526 or HB 8523, directed against prostatic acid phosphatase, and (d) an immobilized monoclonal antibody from hybridoma cell line ATCC No. HB 8527, directed against prostate antigen, wherein each immobilized antibody is immobilized on a common support.

4,690,891

METHOD AND THE MICROORGANISM AND ENZYME USED THEREIN FOR DEGRADING THE XANTHAN MOLECULE

Ching-Tsang Hou, Edison, and Nancy P. Barnabe, Annandale, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 11, 1985, Ser. No. 774,971
Int. Cl.⁴ C12P *39/00;* **C12N** *9/42, 1/20;* **C12R** *1/07*
U.S. Cl. 435—42 **6 Claims**

1. A method for degrading xanthan molecule comprising contacting said xanthan molecule with a mixed culture bearing the ARS Culture Collection Accession No. NRRL B-15992, wherein the contacting is conducted under aerobic conditions suitable for the growth of said first soil bacterium and for the elaboration of xanthan-degrading enzymes by said first soil bacterium, wherein said xanthan-degrading enzymes include a xanthan depolymerase which breaks the endo β-1,4-glucosidic linkage of said xanthan molecule.

4,690,892

PROCESS FOR THE RECYCLE OF PHASE-FORMING LIQUIDS OF MULTI-PHASE AQUEOUS SYSTEMS

Kavusery P. Ananthapadmanabhan, Spring Valley, N.Y., and Errol D. Goddard, Haworth, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 728,242, Apr. 29, 1985, abandoned. This application Feb. 12, 1986, Ser. No. 828,656
Int. Cl.⁴ C12N *9/00, 9/28, 9/20, 9/42;* **C07K** *3/12, 3/28*
U.S. Cl. 435—183 **19 Claims**

1. A method for recycling the phase-forming liquids of an aqueous system having at least two aqueous phases and which contains biological material in at least one phase thereof, comprising:

a. introducing into at least one of said liquid phases containing biological material a water-insoluble, particulate, inert inorganic binder under conditions suitable for the formation of a biological material/binder composition;

b. recovering the biological material/binder composition from said liquid phase, and

c. recycling at least a portion of the liquid phase from which biological material has been recovered to the two phase system.

4,690,893

HYBRIDOMA CELL LINES PRODUCING MONOCLONAL ANTIBODIES WHICH SPECIFICALLY BIND TO MOUSE INTERLEUKIN-2

Tim R. Mosmann, Atherton, Calif., assignor to DNAX Research Institute of Molecular and Cellular Biology, Inc., Palo Alto, Calif.

Filed May 3, 1985, Ser. No. 730,308
Int. Cl.⁴ C12N *5/00;* **C07K** *15/04*
U.S. Cl. 435—240.27 **2 Claims**

2. A monoclonal antibody produced by a hybridoma having the identifying characteristics of the cell line deposited under American Type Culture Collection accession number HB8794.

4,690,894

TREATMENT OF MICROORGANISMS WITH ALKALINE SOLUTION TO ENHANCE METAL UPTAKE PROPERTIES

James A. Brierley; Corale L. Brierley, both of Socorro, N. Mex.; Raymond F. Decker, Houghton, Mich., and George M. Goyak, Harmony, Pa., assignors to Advanced Mineral Technologies, Inc., Golden, Colo.

Filed Sep. 20, 1985, Ser. No. 777,061
Int. Cl.⁴ C12N *1/38, 1/14, 1/06;* **C02F** *3/00*
U.S. Cl. 435—244 **20 Claims**

1. A process for enhancing the metal uptake properties of *Bacillus subtilis* from aqueous solutions containing metal cations, which comprises,

treating cells of said *Bacillus subtilis* characterized by cell walls with an amount of a caustic solution maintained at an elevated temperature above ambient and ranging up to boiling at a pH in excess of 9 sufficient to form a causticized biomass reaction product consisting essentially of material derived from the cell walls thereof having enhanced metal uptake properties,

and thereafter recovering, washing to remove excess caustic and drying said treated biomass to form a relatively solid, stable product thereof,

said causticized biomass reaction product in the particulate state being characterized by alkalinity when dispersed in water and also being characterized by substantially enhanced metal uptake as compared to the metal uptake of *Bacillus subtilis* in the untreated state.

4,690,895

USE OF RLDM TM 1-6 AND OTHER LIGNINOLYTIC ENZYMES IN THE BLEACHING OF KRAFT PULP

Roberta L. Farrell, Danvers, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 755,243, Jul. 15, 1985, abandoned. This application Mar. 28, 1986, Ser. No. 845,654
Int. Cl.⁴ D21C *3/00, 3/20;* **C12R** *1/645*
U.S. Cl. 435—278 **19 Claims**

1. A process for bleaching kraft pulp which comprises treating said kraft pulp with extracellular growth medium from a fermentation of phanerochaete chrysosporium consisting essentially of rLDM TM 1 through 6, and other ligninolytic enzymes.

4,690,896

DEVICE FOR THE DETERMINATION OF MICRO-ORGANISMS

Gerhard Brüsewitz, Bergisch-Gladbach, and Reinhard Sieck, Cologne, both of Fed. Rep. of Germany, assignors to Madaus & Co., Cologne, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,533
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411072; Sep. 22, 1984, 3434851
Int. Cl.⁴ C12M *1/30*
U.S. Cl. 435—296 **2 Claims**

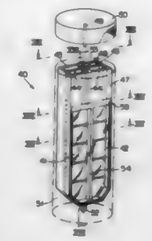
1. A device for the determination of micro-organisms, comprising:

a vessel closable with a cover;

a cover for closing said vessel;

a nutrient medium carrier housed in said vessel and comprising a longitudinal carrier body which has a plurality of troughs for the reception of nutrient substrate substances;

removable cover means on said troughs;



one or more closable filler connections, formed on said carrier body, communicating with at least one trough, and all said troughs continuing up to said filler connections of said carrier body, said filler connections being partially formed by a common encompassing wall which follows the cross-sectional shape of said carrier body.

4,690,897

METHOD FOR TRANSFORMATION OF ANAEROBIC MICROORGANISMS

Charles H. Squires, Boulder; Donald L. Heefner, Arvada; Ronald J. Evans, Boulder; Beatrice J. Kopp, Boulder, and Michael J. Yarus, Boulder, all of Colo., assignors to Synergen Associates, Inc., Boulder, Colo.

Filed Sep. 26, 1983, Ser. No. 535,933
Int. Cl.⁴ C12N *15/00, 1/00;* **C12P** *21/00;* **C12R** *1/145*
U.S. Cl. 435—320 **8 Claims**

1. The plasmid vector pCP1.

4,690,898

DNA CODING FOR A SIGNAL PEPTIDE AND DNA CONTAINING THE SAME

Kunio Yamane, 614-201, Takezono 3-chome, Sakura-mura, Niihari-gun, Ibaragi-ken; Kazutaka Ohmura, Chiba; Hisato Yamazaki, Hyogo, and Teruaki Shiroza, Chiba, all of Japan, assignors to Kunio Yamane, Ibaragi; The Calpis Food Industry Co., Ltd., Tokyo; Daicel Chemical Industries, Ltd., Osaka and Oji Corn Starch Co., Ltd., Tokyo, all of, Japan

Filed Feb. 25, 1985, Ser. No. 704,885
Claims priority, application Japan, Mar. 9, 1984, 59-043826
Int. Cl.⁴ C12N *1/00, 15/00;* **C07H** *17/00*
U.S. Cl. 435—320 **6 Claims**

1. Essentially pure DNA consisting essentially of a sequence of DNA bases coding for the signal amino acid sequence:

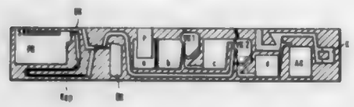
Met	Phe	Ala	Lys	Arg	Phe	Lys
Thr	Ser	Leu	Leu	Pro	Leu	Phe
Ala	Gly	Phe	Leu	Leu	Leu	Phe
Tyr	Leu	Val	Leu	Ala	Gly	Pro
Ala	Ala	Ala.				

4,690,899

PROCESS AND DEVICE FOR CARRYING OUT ANALYTICAL DETERMINATIONS

Sigmar Klose, Berg; Manfred Pasch, Tutzing; Helmut Schlumberger, Polling; Wolfgang Kleemann, Tutzing, and Friedhelm Vieth, Hausshofen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,368
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3425008
Int. Cl.⁴ G01N *21/07, 21/11*
U.S. Cl. 436—45 **8 Claims**



1. In a process for carrying out an analytical determination by mixing and incubating a sample liquid with at least one dry reagent soluble therein to form a reaction mixture liquid and measuring a parameter in the reaction mixture liquid, the improvement comprising:

transporting a sample liquid along a first transport path to a dry reagent positioned in said first transport path and which is soluble in said sample liquid for at least partially dissolving of the latter in the sample liquid to form a reaction mixture liquid;

then further transporting the reaction mixture liquid along the first transport path under the influence of a force-change cycle in which centrifugal force and a further force alternately predominate to determine the direction of the further transporting along the first transport path; and

transporting at least one further liquid along a second path, an initial part of which is separate from and a downstream part of which is common with the first transport path, by the force-change cycle simultaneously with the further transporting of the reaction mixture liquid in such a manner that at least the reaction mixture liquid and one of said further liquids pass through the common part of the transport path chronologically separated.

continuously moving the cuvette and contained liquid past a radiation flux source and a photometric detector measuring unit by engaging a mating member provided at one end of the cuvette with an engagement member in an automatic analyzer capable of moving the cuvette continuously in a longitudinal direction, wherein the reaction vessels are each in continuous movement relative to the photometric detector; and

passing the radiation flow continuously through side walls of each reaction vessel and the liquid contained therein and continuously photometrically measuring the contained liquid and also measuring the distance between adjacent reaction vessels, and determining a mean value of the radiation response from signals generated by the photometric measuring unit, so that the mean value of the radiation response is measured over substantially the entire length of each reaction vessel of the cuvette.



4. A row of reaction vessels for continuous photometric measurement of liquids, each reaction vessel in the row being contiguous with an adjacent vessel and separated by a common wall so as to form a unitary cuvette, wherein opposite sides of each reaction vessel are flat for receiving a continuous radiation flow from a radiation source, and the bottom of each reaction vessel of the cuvette comprises a lens, said lens having a convex shaped radius on its lower side for directing luminescent radiation from a liquid in the vessel; and at least one end of the cuvette being provided with a mating member adapted for being engaged with an engagement member for use in moving the cuvette continuously past a radiation source by means of the engagement member.

4,690,900

PROCEDURE FOR PHOTOMETRIC MEASUREMENT OF LIQUIDS IN REACTION VESSELS, AND REACTION VESSEL

Käyhkö Kimmo, and Kari H. Helenius, both of Espoo, Finland, assignors to Kone Oy, Helsinki, Finland

Filed Jan. 28, 1983, Ser. No. 462,046
Claims priority, application France, Feb. 5, 1982, 820372
Int. Cl.⁴ G01N *21/03*
U.S. Cl. 436—47 **8 Claims**

1. A procedure for photometric measurement of liquids contained in reaction vessels in an automatic analyzer by utilizing a radiation flow along a path substantially perpendicular to a row of the reaction vessels, comprising:

filling each reaction vessel in a row of vessels with liquid to be photometrically measured, each vessel being contiguous with an adjacent vessel and separated by a common wall so as to form a unitary cuvette;

4,690,901

SILVER METHENAMINE STAINING METHOD

Beverly L. Giammara, and Jacob S. Hanker, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill and Microelectronics Center of North Carolina, Research Triangle Park, both of, N.C.

Filed Jan. 26, 1984, Ser. No. 574,108
Int. Cl.⁴ G01N *21/75, 33/52*
U.S. Cl. 436—86 **9 Claims**

1. A procedure for staining a biological specimen comprising the steps of

(a) contacting a biological specimen with a solution containing periodic acid or hydrochloric acid;

(b) contacting the specimen of step (a) with a solution containing thiocarbohydrazide or thiosemicarbazide; and

(c) contacting the specimen of the step (b) with a solution of silver methenamine resulting in a stained specimen wherein silver methenamine is synthesized by mixing aqueous solutions containing silver nitrate and methenamine, filtering a resulting silver methenamine precipitate solid and air drying said solid.

4,690,902

METHOD, REAGENT AND KIT FOR THE DETERMINATION OF NITRATE IONS

Roland Bitsch, Pfungstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

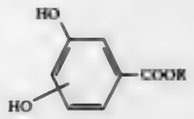
Filed Feb. 15, 1985, Ser. No. 702,154

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405912

Int. Cl.⁴ G01N *31/22*

U.S. Cl. 436—110 **15 Claims**

1. A method for the colorimetric determination of nitrate ions comprising admixing a sample with concentrated sulfuric acid and a color-generating compound having the formula



wherein R is H, one equivalent of a cation compatible with nitrate ion determination, or C_{1-6} alkyl, said color-generating compound being present in an amount effective to produce a quantitative coloration obtaining a resultant admixture and correlating the color of the resultant admixture with a calibrated reference standard.

4,690,903

PROCESS FOR PREPARING ORGANIC FUELS AND CHEMICALS FROM BIOMASS

Nai Y. Chen, Titusville, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 720,669, Apr. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 546,331, Oct. 28, 1983, Pat. No. 4,515,892, which is a continuation of Ser. No. 230,461, Feb. 2, 1981, Pat. No. 4,420,561. This application Jun. 2, 1986, Ser. No. 870,660

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.⁴ C12P *7/06*

U.S. Cl. 435—161 **15 Claims**

1. An integrated process for converting fermentable sugar in aqueous solution to gasoline boiling range products which comprises:

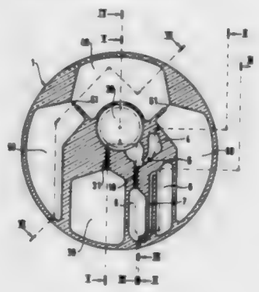
(a) converting fermentable sugar present in an aqueous solution thereof under the action of an ethanol producing microorganism to provide a dilute aqueous solution of ethanol with the ethanol being present in the solution at a concentration which does not exceed a predetermined maximum level, said predetermined maximum level of ethanol being selected to be that which is below the level of ethanol causing fermentation to substantially cease;

(b) selectively sorbing in a sorption zone, ethanol present in the solution, within a crystalline aluminosilicate zeolite characterized by a silica to alumina ratio greater than 12 and a constraint index within the range of 1 to 12, to yield an ethanol-containing zeolite,

(c) exposing the resulting ethanol-containing zeolite to ethanol conversion conditions including temperatures ranging from about 316 to 538° C., pressures ranging from about 10.13 to 1013 kPa and a liquid hourly space velocity ranging from about 0.1 to 10.

4,690,904

Patent Not Issued For This Number



4,690,905

METHOD FOR REMOVAL OF HUMAN ANTIBODIES TO NATIVE DNA FROM SERUM

Betty A. Diamond, New York, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, a division of Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 552,290, Nov. 16, 1983, which is a continuation-in-part of Ser. No. 446,718, Dec. 3, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,588

Int. Cl.⁴ G01N *33/564, 33/577*

U.S. Cl. 436—508 **9 Claims**

3. A method for removing human anti-native DNA antibody from a liquid sample comprising coupling monoclonal, anti-idiotypic antibodies capable of binding to a shared idiotype on human anti-native DNA antibody to a medium, said idiotype shared between genetically nonidentical individuals, contacting a liquid sample to said medium to permit binding of human anti-native DNA antibody in said sample to said anti-idiotypic antibodies and separating said sample from said medium to remove the human anti-native DNA antibodies therefrom.

9. A method as in claim 3 in which said monoclonal, anti-idiotypic antibodies are secreted by the hybridoma deposited at the American Type Culture Collection and catalogued as ATCC #HB 8376.

4,690,906

NEPHELOMETRIC DETERMINATION OF HB_s ANTIGEN WITH ANTIBODY-CONTAINING MICROPARTICLES

Jean Dubeille, Saint-Max; Bernard Pau, and Pierre Gros, both of Montpellier, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 522,533, Aug. 12, 1983, abandoned. This application Jan. 30, 1985, Ser. No. 696,474

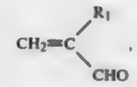
Claims priority, application France, Aug. 16, 1982, 82 14170

Int. Cl.⁴ G01N *33/546, 33/547, 33/576*

U.S. Cl. 436—512 **13 Claims**

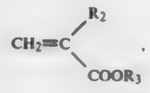
1. A method for nephelometrically determining HB_s antigen by contacting HB_s antigen with antibody containing polyfunctional hydrophilic spherical microparticles of uniform size having an average diameter of between about 10 nanometers and about 10 micrometers, said microparticles comprise copolymers obtained by copolymerizing:

(a) from 5 to 90% by weight of the total monomers of an acrylic aldehyde having a formula



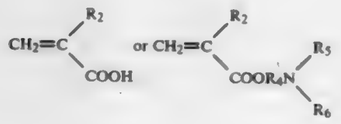
in which R_1 is an alkyl radical having from 1 to 4 carbon atoms,

(b) from 5 to 90% by weight of total monomers of an acrylic acid derivative having a formula



in which R_2 is hydrogen or an alkyl group having from 1 to 4 carbon atoms and R_3 is a lower hydroxyalkyl radical,

(c) and less than 15% by weight of total monomers of at least one acrylic acid derivative having a formula:



wherein R_2 is hydrogen or lower alkyl and R_4, R_5 and R_6, which may be the same or different, represent a C_{1-4} alkyl group; and from 0.1 to 10% by weight of total monomers of an unconjugated diene crosslinking agent; said microparticles having coupled thereto an antibody selected from the group consisting of polyclonal antibodies isolated from specific immune sera obtained from animals after immunization with purified HB_s antigen and monoclonal antibodies produced from hybrid cells resulting from the fusion of plasmocytes of animals immunized against HB_s antigen, and from myeloma cells to obtain an antigen-antibody reaction which is nephelometrically measured.

4,690,907

CAPILLARY TUBE IMMUNOASSAY

Mitsuga Hibino; Taira Kanada, and Miyoshi Hirata, all of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,628

Claims priority, application Japan, Dec. 19, 1983, 58-239549; May 8, 1984, 59-91379

Int. Cl.⁴ G01N *33/558, 33/557, 33/543, 33/551*

U.S. Cl. 436—514 **5 Claims**



1. An immunoassay for detecting the presence of a target substance in a sample by immunoreaction, which comprises:

(1) providing a capillary tube, wherein said capillary tube contains therein at least (a) a first solid matrix containing a labelled first antibody or antigen capable of binding to said target substance, and (b) a second solid matrix having immobilized thereon a second antibody or antigen capable of binding said target substance,

(2) contacting the end of said capillary tube closest to said first solid matrix with a liquid sample suspected of containing said targe substance to be measured, and allowing said sample material to migrate in said capillary tube by capillary action, thereby subjecting any target substance present in said liquid sample to immunoreaction with said first antibody or antigen in said first solid matrix to form an immunocomplex, followed by further migration of said immunocomplex and unreacted labelled first antibody or antigen into said second solid matrix, wherein any labelled immunocomplex is bound to said immobilized second antibody or antigen, and

(c) detecting the immobilized labelled immunocomplex bound to said second matrix material.

4,690,908

MEASURING REAGENT KIT FOR DETERMINING AN ANTIGEN, ANTIBODY OR ANTIGEN-ANTIBODY COMPLEX

Ei Mochida, Tokyo; Hiroyuki Shinkai, Kawagoe; Takashi Kudo, Tokyo, and Toshiyuki Sugawara, Urawa, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,162, Mar. 5, 1982, abandoned, which is a division of Ser. No. 152,390, May 22, 1980, Pat. No. 4,332,788. This application Aug. 20, 1984, Ser. No. 642,734

Claims priority, application Japan, Jun. 5, 1979, 54-70371

Int. Cl.⁴ G01N *33/546, 33/547, 33/551, 33/554*

U.S. Cl. 436—518 **7 Claims**

1. A measuring reagent kit for an immuno-chemical agglutination reaction measurement of a quantity or concentration of a substance to be measured selected from the group consisting of an antigen, an antibody, and an antigen-antibody complex in a sample, said kit comprising:

a mercantile container, said mercantile container containing at least first, second and third individual containers;

(a) at least one said first individual container containing a reagent consisting essentially of a suspension of sensitized

carrier particles for causing agglutination by reaction with the substance to be measured, said particles being formed by binding at least one substance selected from the group consisting of antigens, antibodies, and antigen-antibody complexes to a carrier composed of insoluble finely divided particles,

(b) at least one said second individual container containing a reagent consisting essentially of a buffer solution for diluting or dissolving the sample and for maintaining a reaction mixture of said sample and said suspension at a suitable pH and ionic strength for said agglutination reaction, and

(c) at least one said third individual container containing a reagent consisting essentially of a fixing compound in a concentration sufficient for fixing agglutinates formed from the reaction between the substance to be measured and the sensitized carrier particles, wherein said kit is used for measuring the quantity or concentration of the substance to be measured in the sample by

(i) mixing an amount effective for said measurement of said sensitized carrier particles with said sample dissolved or suitably diluted with a pH stabilizing amount of said buffer solution,

(ii) adding the fixing compound in an amount effective to fix the agglutinates formed in step (i), and

(iii) measuring the absorbancy or turbidity of the reaction mixture from the above step (ii) to determine the quantity or concentration of the substance to be measured in the sample.

4,690,909

SILICON CARBIDE-GRAPHITE COMPOSITE MATERIAL AND PROCESS FOR PRODUCING SAME

Akiyasu Okuno, and Masakazu Watanabe, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 558,725, Dec. 6, 1983, abandoned. This application May 6, 1986, Ser. No. 860,316

Claims priority, application Japan, Dec. 6, 1982, 57-212793

Int. Cl.⁴ C04B *35/56*

U.S. Cl. 501—90 **10 Claims**



1. A process for producing a silicon carbide-graphite composite material, comprising:

adding a sintering aid to silicon carbide of an average grain size less than 1 μm, said sintering aid comprising 0.1 to 3.0 wt% of a compound selected from the group consisting of boron and a boron compound which includes a corresponding amount of boron; and 0.1 to 6.0 wt% of an organic carbonaceous compound which includes a corresponding amount of carbon each based on the weight of silicon carbide;

further adding carbon black as a silicon carbide grain growth inhibitor to silicon carbide in an amount of 1 to 20 vol% based on the volume of the silicon carbide;

blending the compositions into an intimate mixture;

molding the intimate mixture to obtain a molded body; and

sintering the molded body at about atmospheric pressure.

4,690,910

SINTERED PRODUCT OF ZIRCONIA AND METHOD OF PRODUCING THE SAME

Koji Tsukuma, and Takaaki Tsukidate, both of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 586,959, Mar. 7, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 804,956

Claims priority, application Japan, Mar. 7, 1983, 58-35900

Int. Cl.⁴ C04B *35/48, 35/50*

U.S. Cl. 501—103 **2 Claims**

1. A sintered product of zirconia consisting essentially of CeO_2 and ZrO_2, said product having a crystal phase consisting essentially of a tetragonal crystal phase, wherein the mole ratio of CeO_2 is 12–14 mole % and the grain size of the sintered product is at most 2 μm.

2. A sintered product of zirconia consisting essentially of CeO_2, ZrO_2 and Y_2O_3, said product having a crystal phase consisting essentially of a tetragonal phase, wherein the mole ratio of CeO_2 is 8–10 mole %, the mole ratio of Y_2O_3 is 1–2 mole %, and the grain size of the sintered product is 2 μm.

4,690,911

ZIRCONIA CERAMICS AND PROCESS FOR PRODUCING THE SAME

Takao Nakada, Hitachi, Japan, assignor to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,566

Claims priority, application Japan, Oct. 20, 1983, 58-196705; Nov. 16, 1983, 58-215836

Int. Cl.⁴ C04B *35/48, 35/49*

U.S. Cl. 501—105 **17 Claims**

1. A ceramic comprising a sintered body containing zirconium oxide, cerium oxide and aluminum oxide in the form of tetragonal crystals with 20% by weight or less of monoclinic and/or cubic crystals, the proportions of zirconium oxide and cerium oxide being 74 to 84% by weight of zirconium oxide and 26 to 16% by weight of cerium oxide, and the proportions of zirconium oxide-cerium oxide and aluminum ozide being 99.9 to 80% by weight of zirconium oxide-cerium oxide and 0.1 to 20% by weight of aluminum oxide.

4,690,912

RHODIUM-CONTAINING CARBONYLATION CATALYSTS WITH HALOGEN-CONTAINING PROMOTER

Frank E. Paulik, St. Louis; Arnold Hershman, Frontenac; Walter R. Knox, Town & Country, all of Mo., and James F. Roth, Allentown, Pa., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 248,777, Mar. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 824,577, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 391,103, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,332, Jun. 15, 1972, Pat. No. 3,813,428, Ser. No. 128,519, Mar. 26, 1971, Pat. No. 3,769,326, and Ser. No. 2,413, Mar. 12, 1970, Pat. No. 3,769,329, which is a continuation-in-part of Ser. No. 701,637, Jan. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,581, Apr. 5, 1967, abandoned, said Ser. No. 263,332, is a continuation of Ser. No. 752,794, Aug. 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,581, , said Ser. No. 128,519, is a continuation of Ser. No. 2,377, Jan. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 628,581,. This application Oct. 14, 1983, Ser. No. 541,845

The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.

Int. Cl.⁴ B01J *31/20, 31/24, 31/18, 27/08*

U.S. Cl. 502—161 **13 Claims**

1. A catalyst system for the production of carbonylation products by the reaction of a carbonylatable reactant and carbon monoxide which consists essentially of:

(a) a rhodium-containing catalytically active component, the component comprising an adduct of a rhodium-containing component source material and carbon monoxide, and

(b) a separately added iodine-containing promoter component, the promoter component being selected from the group consisting of iodine and iodide compounds,

wherein the separately added iodine atoms of (b) are in excess of the rhodium atoms in the catalyst.

2. The catalyst system of claim 1 wherein the rhodium-containing component source material is a rhodium coordination compound.

13. A catalyst system according to claim 1 wherein the rhodium-containing component source material is a rhodium trihalide and the separately added iodine-containing promoter component is methyl iodide.

4,690,913

SILVER CATALYST FOR PRODUCTION OF ETHYLENE OXIDE FROM ETHYLENE AND PROCESS FOR PRODUCING THE CATALYST

Naohiro Nojiri, Tsuchiura, and Yukio Sakai, Ami, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,831

Claims priority, application Japan, Aug. 21, 1984, 59-173884; Sep. 14, 1984, 59-191732; Oct. 25, 1984, 59-224877

Int. Cl.⁴ B01J *23/02, 23/04, 23/50*

U.S. Cl. 502—340 **8 Claims**

1. A catalyst for the production of ethylene oxide from ethylene, said catalyst comprising a porous carrier composed of a molded article of a refractory material and having thereon (i) silver grains and (ii) as a cationic component, at least one alkali metal element selected from the group consisting of lithium, sodium, potassium, rubidium and cesium, wherein

(A) silver is distributed on the outside surface of the carrier and on the inner surfaces of the pores of the carrier,

(B) silver grains distributed on the inner surfaces of the pores of the carrier have an average diameter of 0.05 to 0.2 micron,

(C) the loading (S) of silver on the outside surface layer of the catalyst and the loading (I) of silver on the innermost layer of the catalyst satisfy the following formula (1):

$$I \geqq 0.7S \quad (1)$$

in which the said outside surface layer of the catalyst denotes a portion having a weight of about 5% by weight on average, in the range of about 4–6%, shaven as uniformly as possible from the ouside surface of one catalyst particle toward its inner layer when the weight of one catalyst particle is taken as 100%, and said innermost layer of the catalyst particle denotes an inner layer of the catalyst particle which is left after about 60% on the average, in the range of about 50 to 70%, has been shaven off from the outside surface of the catalyst particle toward its inner layer as uniformly as possible, and

(D) the loading (Sc) of the alkali metal element as the cationic component on the outside surface layer of the catalyst and the loading (Ic) of the alkali metal element as the cationic component on the innermost layer of the catalyst satisfy the following formula (2-1) or (2-2):

$$Ic \geqq 0.4Sc \quad (2\text{-}1)$$

in the case where the alkali metal is sodium or lithium

$$Ic \geqq 0.6Sc \quad (2\text{-}2)$$

in the case where the alkali metal is potassium, rubidium or cesium, in which said outside surface layer of the catalyst and said innermost layer of the catalyst are as defined above.

4,690,914

PROCESS FOR THE PREPARATION OF AN ABSORBING AND ADSORBING AGENT; AND THE PRODUCT PRODUCED THEREFROM

Francois Callut, Marcinelle-Bruyeres, and Daniel Demeuldre, Hyon-Mons, both of Belgium, assignors to Marginvest S.A. Holding, Luxembourg

Continuation-in-part of Ser. No. 742,201, Jun. 7, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,742

Claims priority, application Belgium, Jun. 7, 1984, 213086

Int. Cl.⁴ B01J *20/00*

U.S. Cl. 502—400 **24 Claims**

1. A process for the preparation of a noncarcinogenic, chemically inactive and mechanically strong material for use as an absorbing and adsorbing agent including the steps of:

treating a combustible material having a low fuel content of equal to or less than about 50% carbon and selected from the group comprising coal schists, bituminous schists or clays mixed with a fuel such as coal, coal slurry, wood, or organic residues from domestic or other refuse, by pyrolysis at a first temperature between about 350° to about 900° C. for at least two hours under a slightly reduced pressure in a reducing atmosphere wherein gaseous by-products are produced during said pyrolysis treatment;

subsequently sintering said combustible material at a second temperature, said second temperature being higher than said first temperature to produce an absorbing and adsorbing product, said product having no more than trace amounts of carbon therein;

recovering at least a portion of said gaseous by-products; and

using said recovered by-products to provide continued energy to effect said pyrolysis treatment or to provide energy for at least another different activity.

4,690,915

ADOPTIVE IMMUNOTHERAPY AS A TREATMENT MODALITY IN HUMANS

Steven A. Rosenberg, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,657

Int. Cl.⁴ A61K *37/02'45/05*

U.S. Cl. 514—2 **11 Claims**

1. A method of treating cancer in humans comprising systemically administering to a human suffering from cancer other than sarcomas, an effective amount of interleukin-2 and interleukin-2-activated autologous human lymphocytes to cause regression of said cancer.

4,690,916

NONA AND DECAPEPTIDE ANALOGS OF LHRH USEFUL AS LHRH ANTAGONISTS

John J. Nestor, Jr., San Jose, and Brian Vickery, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 13, 1984, Ser. No. 671,153

Int. Cl.⁴ A61K *37/43;* **C07K** *7/20*

U.S. Cl. 514—15 **13 Claims**

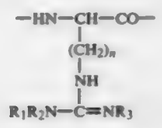
1. A compound of the formula

$$\underset{1\ 2\ 3\ 4\ 5\ 6\ 7\ \ 8\ \ 9\ 10}{A—B—C—D—E—F—G—Arg—Pro—H} \quad (I)$$

or a pharmaceutically acceptable salt thereof, wherein:

A is an amino acyl residue selected from the group consisting of N-Ac-D,L-$\Delta^{3,4}$-prolyl, N-Ac-D,L-prolyl, N-Ac-L-alkylprolyl, N-Ac-D,L-phenylalanyl, N-Ac-D,L-p-Cl-phenylalanyl, N-Ac-D,L-seryl, N-Ac-D,L-threonyl, N-Ac-D,L-alanyl, N-Ac-3-(1-naphthyl)-D,L-alanyl, N-Ac-3-(2-naphthyl)-D,L-alanyl, N-Ac-3-(2,4,6-trimethyl-

phenyl)-D,L-alanyl, and N-Ac-3-(4-trifluoromethylphenyl)-D,L-alanyl;
B is an amino acyl residue selected from the group consisting of D-phenylalanyl, D-p-Cl-phenylalanyl, D-p-Br-phenylalanyl, D-p-F-phenylalanyl, D-p-nitrophenylalanyl, 3-(3,4,5-trimethoxyphenyl)-D-alanyl, 2,2-diphenylglycine, D-α-methyl-p-Cl-phenylalanyl and 3-(2,4,6-trimethylphenyl)-D-alanyl;
C is an amino acyl residue selected from the group consisting of D-tryptophanyl, D-phenylalanyl, D-pentamethylphenylalanyl, 3-(3-pyridyl)-D-alanyl, 3-(1-naphthyl)-D-alanyl, and 3-(2-naphthyl)-D-alanyl;
D is an amino acyl residue selected from the group consisting of L-seryl, and D-alanyl;
E is an amino acyl residue selected from the group consisting of L-phenylalanyl and L-tyrosyl;
F is an amino acyl residue selected from the group consisting of the radicals represented by the following structural formula:

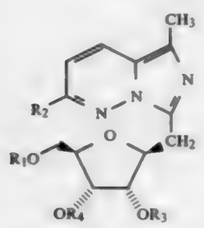


(II)

wherein
n is 1 to 5;
R_1 is lower alkyl substituted with one to three halo atoms;
R_2 is hydrogen;
R_3 is R_1, methyl, ethyl or $—CH_2CH_2OH$;
G is an amino acyl residue selected from the group consisting of L-leucyl, L-norleucyl, L-tryptophanyl, L-Nal(2) and L-norvalyl; and
H is D-alaninamide, D-leucinamide, glycinamide or $—NHR_5$ wherein R_5 is lower alkyl or $NHCONH_2$.

4,690,917
IMIDAZOPYRIDAYINE DERIVATIVES HAVING ANTIVIRAL ACTIVITY
David J. Knight, Chalfont St Peter; David L. C. Scopes, Furneux Pelham; Richard Storer, Pinner, and Stuart Holman, Northolt, all of England, assignors to Glaxo Group Limited, London, England
Filed Nov. 22, 1985, Ser. No. 800,667
Claims priority, application United Kingdom, Nov. 23, 1984, 8429694
Int. Cl.[4] A61K *31/70*; **C07H** *3/02*
U.S. Cl. 514—23 **15 Claims**

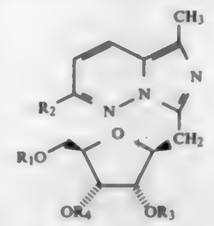
1. Compounds of the formula:



(I)

wherein
R_1, R_3 and R_4 are each independently selected from the group consisting of hydrogen atoms and protecting groups;
R_2 is selected from the group consisting of halogen atoms and groups of formula $—NR_aR_b$ (where R_a and R_b, which may be the same or different, are each selected from hydrogen atoms and alkyl groups; or R_a and R_b may be linked to form, together with the nitrogen atom to which they are attached, a saturated heterocyclic ring which may comprise a further heteroatom selected from the group consisting of nitrogen and oxygen); and their physiological equivalents as well as salts thereof with acids.

10. A method for the therapy or prophylaxis of RNA viral infections in a human or animal subject which comprises administering a therapeutic or prophylactic effective amount of one or more compounds selected from the group consisting of compounds of the formula:



(I)

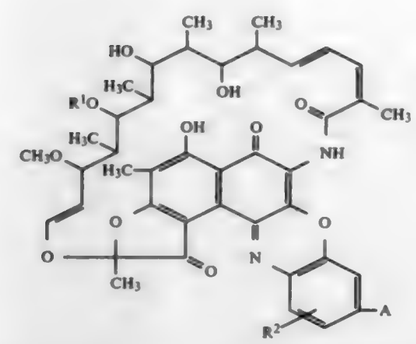
wherein
R_1, R_3 and R_4 are each independently selected from the group consisting of hydrogen atoms and protecting groups;
R_2 is selected from the group consisting of halogen atoms and groups of formula $—NR_aR_b$ (where R_a and R_b, which may be the same or different, are each selected from hydrogen atoms and alkyl groups; or R_a and R_b may be linked to form, together with the nitrogen atom to which they are attached, a saturated heterocyclic ring which may comprise a further heteroatom selected from the group consisting of nitrogen and oxygen);
physiological equivalents thereof, and physiologically acceptable salts thereof with acids.

4,690,918
USE OF TRICHOSTATIN COMPOUNDS FOR TREATING TUMOR CELLS
Teruhiko Beppu, 1-5-21, Horinouchi, Suginami-ku, Tokyo; Yasushi Iwamoto, Okegawa, and Minoru Yoshida, Tokyo, all of Japan, assignors to Teruhiko Beppu, Tokyo, Japan
Filed Jan. 24, 1986, Ser. No. 821,973
Claims priority, application Japan, Jan. 30, 1985, 60-16085
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—23 **4 Claims**

1. A method for inducing the differentiation of tumor cells, which comprises administering an effective amount of trichostatin A, trichostatin C, or a mixture of trichostatin A and trichostatin C to a recipient.

4,690,919
BENZOXAZINORIFAMYCIN DERIVATIVE, PROCESS FOR PREPARING THE SAME AND ANTIBACTERIAL AGENT CONTAINING THE SAME
Takehiko Yamane, Akashi; Takuji Hashizume, Takasago; Katsuji Yamashita, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Feb. 5, 1986, Ser. No. 826,398
Claims priority, application Japan, Feb. 5, 1985, 60-20384
Int. Cl.[4] C07D *498/18*; **A61K** *31/535*
U.S. Cl. 514—183 **30 Claims**

1. A rifamycin compound having the formula (I):



(I)

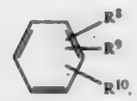
wherein R^1 is hydrogen atom or acetyl group; R^2 is hydrogen atom or hydroxyl group; A is a group represented by the formula:



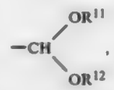
wherein R^3 is an alkyl group with 1 to 5 carbon atoms or an alkoxyalkyl group with 2 to 6 carbon atoms and R^4 is an alkyl group with 1 to 5 carbon atoms, a group represented by the formula: $—(CH_2)_aX^1$, wherein a is 1 to 4 and X^1 is ethynyl group, cyano group, a group having the formula:



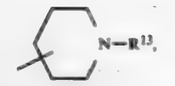
wherein R^5 and R^6 are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 3 carbon atoms, a group represented by the formula: OR^7, wherein R^7 is hydrogen atom or an alkyl group with 1 to 4 carbon atoms, a group represented by the formula:



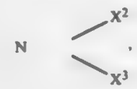
wherein R^8, R^9 and R^{10} are the same or different from each other and are hydrogen atom or an alkoxy group with 1 to 3 carbon atoms, or a group represented by the formula:



wherein R^{11} and R^{12} are the same or different from each other and are an alkyl group with 1 to 3 carbon atoms; a cycloalkyl group with 3 to 8 carbon atoms, a group represented by the formula:



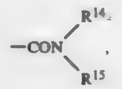
wherein R^{13} is hydrogen atom or an alkyl group with 1 to 3 carbon atoms, or a group represented by the formula: $—CH_2(CHOH)_4CH_2OH$; a group represented by the formula:



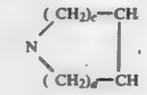
wherein

N

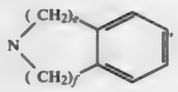
is a 3 to 10 membered cyclic amino group with 2 to 9 carbon atoms, X^2 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms and X^3 is hydrogen atom, an alkyl group with 1 to 3 carbon atoms, hydroxyl group, a group represented by the formula:



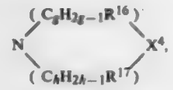
wherein R^{14} and R^{15} are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 4 carbon atoms, a hydroxyalkyl group with 1 to 3 carbon atoms or cyclic or noncyclic amino group with 2 to 6 carbon atoms, or X^2 and X^3 when taken together represent =O group or the group having the formula: $—O(CH_2)_bO—$, wherein b is 2 to 4, a group represented by the formula:



wherein c and d are the same or different from each other and are 1 to 4, a group represented by the formula:



wherein e and f are the same or different from each other and are 1 to 4, or a group represented by the formula:

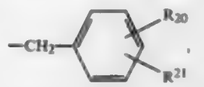


wherein g and h are the same or different from each other and are 1 to 4, R^{16} and R^{17} are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 3 carbon atoms and X^4 is oxygen atom, sulfur atom or a group

represented by the formula: NR^{18}, wherein R^{18} is hydrogen atom, an alkyl group with 1 to 3 carbon atoms, a phenyl group represented by the formula:



wherein R^{19} is hydrogen atom or trifluorometyl group, or a group represented by the formula:



wherein R^{20} and R^{21} are hydrogen atoms or when taken together represent the group having the formula: $—OCH_2O—$, or a pharmaceutically acceptable salt of the rifamycin compound of formula (I) formed with a base or an acid.

4,690,920

DERIVATIVE OF CEPHALOSPORANIC ACID AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Akihiko Kanao; Shigeaki Muto, both of Tokyo; Koichi Niimura, Sayama; Takao Ando; Takayoshi Fujii, both of Tokyo; Masahiko Fujii, Komae; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

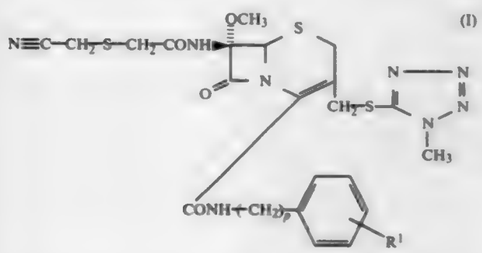
Filed Dec. 20, 1983, Ser. No. 563,515

Claims priority, application Japan, Dec. 29, 1982, 57-234550

Int. Cl.[4] C07D *501/57*; A61K *31/545*

U.S. Cl. 514—201 **21 Claims**

1. A substituted cephalosporin represented by the formula (I):



(I)

wherein p is 0, 1 or 2 and R^1 represents a hydrogen atom, a hydroxyl group, a carbamoyl group, an alkyl group having 1 to 4 carbon atoms, $—(CONH)_m(CH_2)_n—COOH$ wherein m is 0 or 1 and n is 0, 1 or 2, carboxylic ester or carboxylic salt thereof.

4,690,921

CEPHALOSPORIN COMPOUNDS AND SALTS THEREOF

Tadao Shibanuma; Noriaki Nagano, both of Saitama; Ryuichiro Hara, Tokyo; Kohji Nakano, Saitama; Akio Koda; Atsuki Yamazaki, both of Tokyo, and Yukiyasu Murakami, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

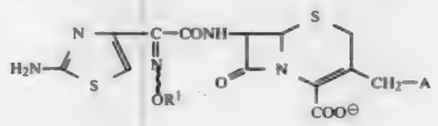
Filed Sep. 28, 1984, Ser. No. 656,162

Claims priority, application Japan, Oct. 11, 1983, 58-189555; Nov. 18, 1983, 58-217170; Dec. 26, 1983, 58-248929; Feb. 15, 1984, 59-26793; Feb. 28, 1984, 59-37019; Mar. 7, 1984, 59-41992

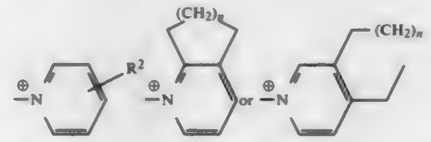
Int. Cl.[4] C07D *501/34*; A61K *31/545*

U.S. Cl. 514—205 **9 Claims**

1. A cephalosporin compound of the following formula, or a pharmaceutically acceptable nontoxic salt thereof:



wherein the wavy line means syn-form and anti-form bonds, R^1 represents an aminothiaxolylmethyl group, and A represents



in the above formulas, n represents an integer of 1 to 2, R^2 represents a hydrogen atom, a sulfo group, $—(CH_2)_mCOOH$, $—(CH_2)_mOH$, $—(CH_2)mNHR^3$, or $—CONHR^4$; in these formulas, m represents O or an or an integer of 1 to 3, R^3 represents a hydrogen atom or a formyl, acetyl, propionyl or oxalo group, and R^4 represents a carboxy lower alkyl group or a hydroxyl group.

4,690,922

2-(HETEROCYCLOALKYLTHIO)PENEMS

Ashit K. Ganguly, Upper Montclair; Viyyoor M. Girijavallabhan, Parsippany; Patrick A. Pinto, Mine Hill, and Richard W. Versace, Ringwood, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 564,586, Dec. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 475,281, Mar. 14, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 626,820

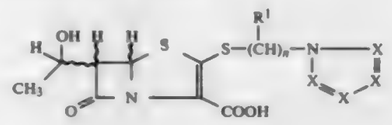
Claims priority, application Denmark, Feb. 29, 1984, 1417/84; European Pat. Off., Mar. 7, 1984, 84102429.2

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] C07D *499/00*; A61K *31/425*

U.S. Cl. 514—210 **34 Claims**

1. Compounds of the formula



wherein each x is



or =N—, with the proviso that at least one X is



R is hydrogen, lower alkyl, amino lower alkyl, mono- and di-lower alkyl amino lower alkyl, carboxy lower alkyl, sulfoalkyl, hydroxyalkyl, cyano, hydroxy, amino, mono- and di-lower alkyl amino, alkyl sulfonate, sulfamyl, halogeno, hydroxyliminoloweralkyl, lower alkoxyiminoloweralkyl, carboxy, carbamoyl, mono- or di-lower alkyl carbamoyl, nitro, carbamoyloxy, ureido lower alkyl, or carbamoylhydrazolower alkyl;

R^1 is hydrogen, lower alkyl, carboxy, carbamoyl, cyano, hydroxy, amino, lower alkylthio, fluoro, lower alkoxy, or lower alkanoyloxy, provided that when R^1 is attached to a carbon atom adjacent to S or N, R^1 is not hydroxy, amino, or fluoro; or R^1 is lower alkyl substituted by hydroxy, cyano, halogen, lower alkoxy, carbamoyloxy, $—SR^2$, imidazolyl, substituted imidazolyl wherein the substitutents are as defined by R, amino, amino substituted by lower alkyl, lower alkyl carbonyl, carbamoyl, mono-alkyl substituted carbamoyl or ureido, carboxy, carbamoyl, mono-alkyl substituted carbamoyl, lower alkylcarbonyl, lower alkoxycarbonyl, hydroxy lower alkyl carbonyl, sulfo, sulfamyl, lower alkyl thio, lower alkylsulfonyl, lower alkoxysulfonyl, or hydroxy lower alkylsulfonyl;

R^2 is a substituted or unsubstituted heterocyclyl radical selected from the group consisting of benzothiazolyl, oxazinyl, pyridyl, purinyl, imidazolyl, pyrrolyl, thiazolyl, thiadiazolyl, benzimidazolyl, triazinyl, thiazinyl, furyl, thienyl, triazolyl, tetrazolyl and pyrimidyl, wherein there can be one or more substitutents which can be the same or different and (a) are on a ring carbon or heteroatom, and are independently selected from the group consisting of lower alkyl, $—NR^3R^4$, and lower alkylene-NR^3R^4, wherein R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl, or (b) are on a ring carbon atom only and are selected from the group consisting of =O, hydroxy, lower alkoxy, $—COOR^5$ or halogen, wherein R^5 is hydrogen;

n is 1 to 4; and

the pharmaceutically acceptable salts and pharmaceutically acceptable esters thereof, in racemic or opticaly active form.

4,690,923

2-(PERHYDRO-1,4-DIAZINO)-PYRIMIDO(5,4-D)-PYRIMIDINES, PHARMACEUTICAL COMPOSITIONS AND USE

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

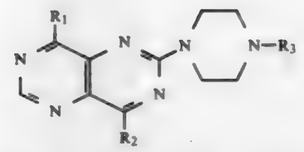
Continuation of Ser. No. 575,322, Jan. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 350,429, Feb. 27, 1982, abandoned, which is a continuation of Ser. No. 161,010, Jun. 19, 1980, abandoned. This application Mar. 15, 1985, Ser. No. 712,341

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926804; Apr. 11, 1980, 3013930

Int. Cl.[4] A61K *31/54*; C07D *417/14, 487/04*

U.S. Cl. 514—222 **8 Claims**

1. A compound of the formula



wherein

R_1 is 2-phenylethyl-mercapto; 3-phenylpropyl-mercapto; 1-(methyl-phenyl)-ethyl-mercapto; (unsubstituted or mono-substituted phenyl)-mercapto, where the substituent is fluorine, chlorine, bromine, methyl, hydroxyl or methoxy; (unsubstituted or mono-substituted benzyl)-mercapto, where the substituent is attached to the phenyl moiety and is fluorine, chlorine, methyl, methoxy or trifluoro-methyl; dichlorobenzyl-mercapto; or dimethoxybenzylmercapto;

R_2 is thiomorpholino-1-oxide or thiomorpholino-1,1-dioxide; and

R_3 is hydrogen or formyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. An antithrombotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,690,924

1,7-NAPHTHYRIDINE DERIVATIVES AND MEDICINAL PREPARATIONS CONTAINING SAME

Susumu Sato, Chiba; Haruyoshi Honda, Tomisato; Teruo Koumoto, Chiba; Kazuo Isomae, Narashino; Tadayuki Kuraishi, Chiba, and Tatsuhiko Katori, Tonemachi, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

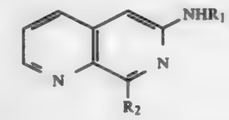
Division of Ser. No. 850,820, Apr. 11, 1986, Pat. No. 4,659,710. This application Dec. 9, 1986, Ser. No. 939,808

Claims priority, application Japan, Apr. 17, 1985, 60-81967

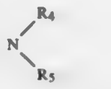
Int. Cl.[4] A61K *31/44, 31/535*; C07D *471/04*

U.S. Cl. 514—237 **2 Claims**

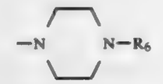
1. A 1,7-naphthyridine derivative represented by the formula (I):



wherein R_1 means a hydrogen atom or denotes a piperidino or morpholino group, an



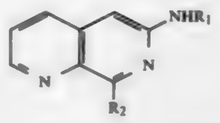
group, in which R_4 is a hydrogen atom or an alkyl or hydroxyethyl group and R_5 is an alkyl, amino, hydroxyethyl, hydroxypropyl, dihydroxypropyl, dialkylaminoethyl, phenylethyl, alkoxyphenylethyl or pyridylmethyl group, or an



group, in which R_6 is an alkyl, phenyl or hydroxyethyl group

or a cinnamoyl group which may optionally be substituted by one or more alkyl, alkoxy and/or hydroxyl groups and/or halogen atoms; or an acid addition salt thereof.

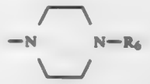
2. A pharmaceutical composition containing, as an effective ingredient, a 1,7-naphthyridine derivative represented by the following general formula (I):



wherein R_1 means a hydrogen atom or denotes a piperidino or morpholino group, an



group, in which R_4 is a hydrogen atom or an alkyl or hydroxyethyl group and R_5 is an alkyl, amino, hydroxyethyl, hydroxypropyl, dihydroxypropyl, dialkylaminoethyl, phenylethyl, alkoxyphenylethyl or pyridylmethyl group, or an



group in which R_6 is an alkyl, phenyl or hydroxyethyl group or a cinnamoyl group which may optionally be substituted by one or more alkyl, alkoxy and/or hydroxyl groups and/or halogen atoms; or an acid addition salt thereof in association with a pharmaceutically acceptable carrier.

4,690,925

(2-OXO-1,2,3,5-TETRAHYDROIMIDAZO-[2,1-B]QUINAZOLINYL) OXYALKYLAMIDES PROPERTIES HAVING PHOSPHODIOSTERASE INHIBITING

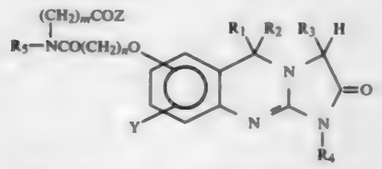
John H. Fried, Palo Alto, and Michael C. Venuti, San Francisco, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 580,409, Feb. 15, 1984, abandoned. This application May 15, 1985, Ser. No. 734,633

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—267 **21 Claims**

1. A compound according to the formula



(I)

, its optical isomers, or a pharmaceutically acceptable salt thereof wherein:

m and n are integers of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms, carbamoyl alkyl, carboxyalkyl, alkoxycarbonylalkyl or α-amino acid side chains;

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, benzyl, or hydroxy lower alkyl;

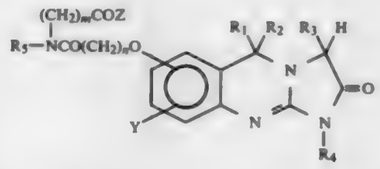
R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —$OCOR_6$, halo, —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COO(R_6)$ group wherein R_6 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy groups or an —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COOR_6$ group wherein R_6 is lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy; and

Z is —OR_7 or —NR_7R_8 wherein R_7 and R_8 are independently hydrogen or lower alkyl;

or a pharmaceutically acceptable salt thereof.

18. A method for inhibiting 3',5'-cyclic AMP phosphodiesterase which method comprises administering a cyclic AMP phosphodiesterase inhibiting amount of a compound of the formula



(I)

, its optical isomers, or a pharmaceutically acceptable salt thereof wherein:

m and n are integers of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms, carbamoyl alkyl, carboxyalkyl, alkoxycarbonylalkyl or α-amino acid side chains;

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, benzyl, or hydroxy lower alkyl;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —$OCOR_6$, halo, L—NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COO(R_6)$ group wherein R_6 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy group or an —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COOR_6$ group wherein R_6 is lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy; and

Z is —OR_7 or —NR_7R_8 wherein R_7 and R_8 are independently hydrogen or lower alkyl.

4,690,926

BOXAZOMYCIN A AND B, NEW ANTIBIOTICS CONTAINING BENZOXAZOLE NUCLEUS

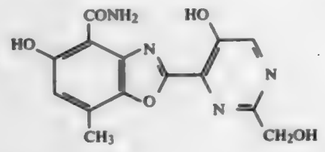
Kyoichiro Saitoh, Zushi; Masataka Konishi, Kawasaki, and Koji Tomita, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,498

Int. Cl.[4] A61K *31/42;* **C07D** *263/58*

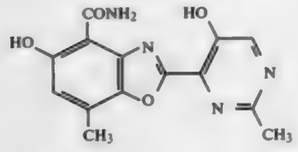
U.S. Cl. 514—269 **12 Claims**

1. The antibiotic compound boxazomycin A which has the structure:



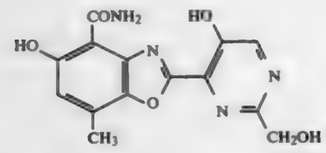
or a nontoxic salt thereof.

3. The antibiotic compound boxazomycin B which has the structure:



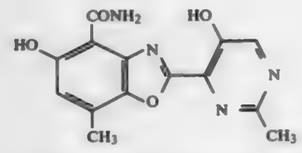
or a nontoxic acid addition salt thereof.

5. A method for therapeutically treating a host animal affected by a microbial infection which comprises administering to said host animal an antimicrobially effective amount of boxazomycin A of the formula



or a nontoxic salt thereof, or a pharmaceutical composition thereof.

7. A method for therapeutically treating a host animal affected by a microbial infection which comprises administering to said host animal an antimicrobially effective amount of boxazomycin B of the formula



or a nontoxic acid addition salt thereof, or a pharmaceutical composition thereof.

4,690,927

PHARMACEUTICAL COMPOSITIONS WITH ANALGESIC PROPERTIES AND THE PREPARATION AND USE THEREOF

Harald Voss, Bad Homburg, and Herbert Rothweiler, Rheinfelden-Eichsel, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,293

Claims priority, application Switzerland, Feb. 8, 1985, 570/85-4

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **15 Claims**

1. A pharmaceutical composition having analgesic properties comprising a pharmaceutically acceptable salt of diclophenac and a pharmaceutically acceptable salt of codeine in a weight ratio of about 1:1 to about 3:1.

4,690,928

SUBSTITUTED HEXAHYDRO ARYLQUINOLIZINES AS α_2 BLOCKERS

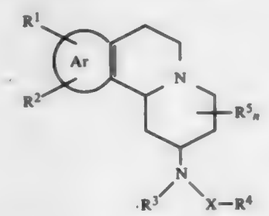
Joel R. Huff, Lederach; Joseph P. Vacca, Telford, and John J. Baldwin, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 755,863, Jul. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,678, Dec. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 576,233, Feb. 2, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,511

Int. Cl.[4] A61K *31/445;* **C07D** *491/147, 495/14*

U.S. Cl. 514—285 **51 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein

Ar represents an aromatic heterocycle selected from R^1, R^2-benzo[b]furo-, R^1, R^2-benzo[b]thieno-, thieno- and furo-;

R^1 and R^2 are independently:

(1) hydrogen,

(2) halo,

(3) hydroxy,

(4) C_{1-3} alkoxy, or

(5) C_{1-6} alkyl;

R^3 is

(1) hydrogen,

(2)

wherein R is hydrogen or C_{1-3} alkyl,

(3) C_{1-6} alkyl, either unsubstituted or substituted with one or more of;

(a) hydroxy,

(b) carboxy,

(c) C_{1-3} alkoxycarbonyl,

(d) halo,

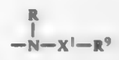
(e) C_{1-3} alkoxy,

(f) —$CONR^6R^7$, wherein R^6 and R^7 are the same or different and are hydrogen or C_{1-5} alkyl, or joined together directly to form a pyrrolidino or piperidino

ring or through a heteroatom to form a morpholino, piperazino or N-C_{1-3} alkylpiperazino heterocycle, or

(g) $-NR^6R^7$;

(h)



wherein X^1 is



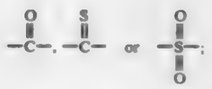
and R^9 is

(i) C_{1-3} alkoxy,

(ii) C_{1-3} alkyl, or

(iii) NR^6R^7;

X is



and

R^4 is

(1) $-OR^8$, wherein R^8 is hydrogen or C_{1-6} alkyl, either unsubstituted or substituted with one or more of;

(a) OR, or

(b) —NRCOR;

(2) $-N(R^8)_2$,

(3) $-CO^2R^8$,

(4) $-CONR^6R^7$,

(5) C_{1-6} alkyl, either unsubstituted or substituted with

(a) OR8

(b) halo,

(c) CO_2 R^8

(d) $CONR^6R^7$,

(6) C_{2-5} alkenyl,

(7) C_{2-5} alkynyl,

(8) C_{3-6} cycloalkyl,

(9) 5 or 6-membered heterocycle selected from imidazo, thiazolo, oxazolo, furamyl piperidino, piperzino, pyridino and pyrazino, or phenyl or napthyl, either unsubstituted or substituted with one or more of;

(a) halo, or

(b) OR, or

(c) C_{1-3} alkyl;

R^5 is independently

(1) C_{1-6} alkyl, either unsubstituted or substituted with one or more of

(a) $-OR^8$,

(b) $-NR^8COR^8$, or

(c) $-CO_2R^8$,

(2) $-CO_2R^8$, or

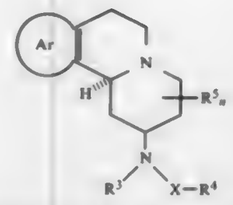
(3) $-CONR^6R^7$;

n is 0, 1, 2 or 3; and

R^3 and R^4 taken together form a 2-oxazolidinon-1-yl or succinimidoyl group or;

R^3 and R^5 or R^4 and R^5, if R^5 is in the 1- or 3-position and both are alkyl, can be joined together to form a 5- or 6-membered ring.

19. A method of antagonizing α_2-adrenoceptors which comprises administering to a patient in need of such treatment an effective α_2-adrenoceptor antagonist amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein Ar, R^3, X, R^4, and R^5 are as defined in claim 1.

4,690,929

ERGOLINES EXHIBITING PROTACTIN SECRETION INHIBITION ACTIVITY

Luigi Bernardi, Milan; Laura Chiodini, Busto Arsizio; Sergio Mantegani, Milan; Daniela Ruggieri, Milan; Aldemio Temperilli, Milan, and Patricia Salvati, Milan, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

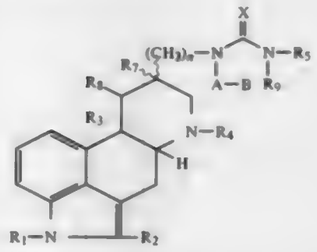
Filed Apr. 26, 1984, Ser. No. 604,041

Claims priority, application United Kingdom, Apr. 28, 1983, 8311679; May 27, 1983, 8314816

Int. Cl.⁴ A61K *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **7 Claims**

1. A compound of formula I:



I

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents a hydrogen or halogen atom or a methyl, cyano, C_1–C_4 alkylthio or phenylthio group; R_7 and R_8 represent hydrogen atoms and R_3 represents a hydrogen atom or a methoxy group, or R_7 represents a hydrogen atom and R_3 and R_8 taken together represent a bond, or R_3 represents a hydrogen atom or a methoxy group and R_7 and R_8 taken together represent a bond; R_4 represents a alkyl, alkenyl, alkynyl, cycloalkyl group having from 1 to 4 carbon atoms; R_5 represents a hydrogen atom or a alkyl, alkenyl, alkynyl, cycloalkyl group having from 1 to 4 carbon atoms or a phenyl group; X represents an oxygen or sulphur atom or an imino group, R_9 represents a hydrogen atom and B represents a cyano, a C_2–C_5 alkoxycarbonyl or carbamoyl group, or R_9 and B taken together represent a



group wherein W represents an oxygen atom or an imino group; A represents a group of the formula CHR_6, CH_2—CHR_6 or CH=CR_6 group wherein R_6 represents a hydrogen atom or a C_1–C_4 alkyl group; and n is 0, 1 or 2; or a pharmaceutically acceptable salt thereof.

7. A method for lowering blood pressure in a human which method comprises administering to a subject in need of such treatment a therapeutically effective amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof or a pharmaceutical composition containing a therapeutically effective amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof.

4,690,930

PYRAZOLO[4,3-C]QUINOLINE-3-ONE AND IMIDAZO[4,3-C]CINNOLIN-3-ONE DERIVATIVES AND THEIR USE AS PSYCHOTROPIC AGENTS

Susumu Takada, Hyogo; Takashi Sasatani, Nara; Hirohisa Shindo, Osaka; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd, Osaka, Japan

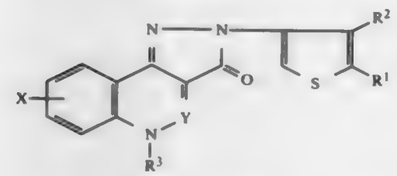
Filed Nov. 5, 1985, Ser. No. 795,168

Claims priority, application Japan, Nov. 5, 1984, 59-233511

Int. Cl.⁴ A61K *31/415;* **C07D** *471/04, 237/28*

U.S. Cl. 514—293 **13 Claims**

1. A compound of the formula:

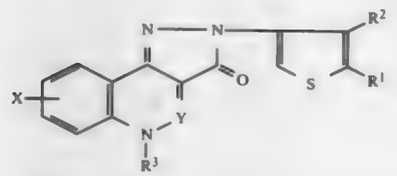


(I)

wherein R^1 and R^2 each is hydrogen, C_1—C_5 alkyl, halogen, nitro or trifluoromethyl, or R^1 and R^2 taken together may form C_3–C_4 alkylene; R^3 is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkanoyl or C_1–C_5 alkylsulfonyl; X is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, halogen or hydroxy; and Y is methine or nitrogen or a salt thereof.

12. A method for treating psychotropic disorders which comprises administering to a patient an effective amount of a pharmaceutical composition comprising:

a psychotropically effective amount of a compound of the formula:



(I)

wherein R^1 and R^2 each is hydrogen, C_1–C_5 alkyl, halogen, nitro or trifluoromethyl, or R^1 and R^2 taken together may form C_3–C_4 alkylene; R^3 is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkanoyl or C_1–C_5 alkylsulfonyl; X is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, halogen or hydroxy; and Y is methine or nitrogen; or a pharmaceutically acceptable salt thereof admixture with

a pharmaceutically acceptable diluent.

4,690,931

THERAPEUTICALLY USEFUL 1-PHENYL-2-PIPERIDINOALKANOL DERIVATIVES

Alexander Wick, Paris; Jonathan Frost, Wissous; Bernard Gaudilliere, Nanterre; Jean Bertin, Clamart; Regis Dupont, Villebon sur Yvette, and Jean Rousseau, Bourg la Reine, all of France, assignors to Synthelabo, Paris, France

Continuation of Ser. No. 540,648, Oct. 11, 1983, abandoned. This application Sep. 9, 1985, Ser. No. 773,926

Claims priority, application France, Oct. 13, 1982, 82 17187

Int. Cl.⁴ C07D *211/18;* **A61K** *31/445*

U.S. Cl. 514—317 **3 Claims**

1. The compound 2-[4-(4-fluorobenzyl)-piperidino]-1-(4-chlorophenyl)-ethanol or a pharmaceutically acceptable acid addition salt thereof.

2. A method for treating a subject suffering from anoxia, comprising administering to said subject an amount of a compound according to claim 1 effective for the treatment of anoxia.

4,690,932

COUMARINS WITH IMIDAZOLYL GROUP OR PYRIDYLOXY GROUP HAVING PLATELETES AGGREGATION INHIBITING ACTIVITY

Tadao Kojima, Saitama; Shunji Kageyama; Minoru Okada, both of Tokyo; Isao Ohata, and Noboru Sato, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

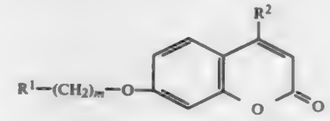
Continuation of Ser. No. 626,283, Jun. 29, 1984, abandoned. This application May 30, 1986, Ser. No. 871,155

Claims priority, application Japan, Jul. 5, 1983, 58-122222

Int. Cl.⁴ C07D *405/12;* **A61K** *31/44*

U.S. Cl. 514—337 **18 Claims**

1. A coumarin compound of the formula



wherein R^1 represents an imidazolyl group or a pyridyloxy group which may be substituted by lower alkyl group(s) of from 1 to 5 carbon atoms; R^2 represents a hydrogen atom or a lower alkyl group; and m represents an integer of 1 to 6; or a pharmacologically acceptable salt thereof.

4,690,933

PYRIDYLVINYL-1H TETRAZOLE HAVING ANTIHISTAMINE ACTIVITY

Geoffrey G. Coker, Bromley, England, and John W. A. Findlay, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 27, 1984, Ser. No. 635,433

Int. Cl.⁴ C07D *401/02;* **A61K** *31/44*

U.S. Cl. 514—343 **3 Claims**

1. 5-(E-6-[3-Pyrrolidino-1-(4-tolyl)prop-1E-enyl]-2-pyridyl-vinyl)-1H-tetrazole.

4,690,934

N-PHENYLSULFONYLISONICOTINAMIDE DERIVATIVES AND THEIR USE AS FUNGICIDES OR BACTERICIDES

Hiroshi Yoshida, Tokyo; Kenji Konishi; Kengo Koike, both of Ageo; Taizo Nakagawa, Omiya; Shizuo Shimano, and Seiji Mochizuki, both of Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

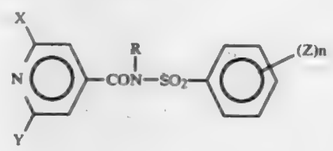
Filed Sep. 9, 1986, Ser. No. 905,133

Claims priority, application Japan, Sep. 25, 1985, 60-210097; Mar. 28, 1986, 61-68734

Int. Cl.⁴ A61K *31/44;* **C07D** *213/81*

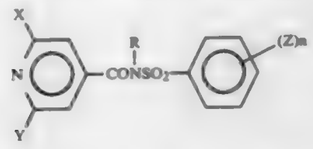
U.S. Cl. 514—354 **17 Claims**

1. A compound of the formula:



wherein
X is halogen, lower alkoxy or methylthio,
Y is hydrogen or chloro,
R is hydrogen, lower alkyl or allyl,
Z is hydrogen, lower alkyl, halogen, nitro, methoxy, methylthio, methylsulfonyl, —CF_3, phenyl, phenoxy or lower alkoxycarbonyl, and
n is an integer of 1 to 3.

6. A fungicidal or bactericidal composition which comprises as the active ingredient, a fungicidally or bactericidally effective amount of the compound of the formula:



(I)

wherein
X is a halogen, lower alkoxy, lower alkylthio, nitro or methyl,
Y is hydrogen or chloro,
R is hydrogen, lower alkyl or allyl,
Z is hydrogen, halogen, nitro, methoxy, methylthio, methylsulfonyl, —CF_3, phenyl, phenoxy or lower alkoxycarbonyl, and
n is integer of 1–3.

4,690,935

INHIBITION OF TUMOR GROWTH AND METASTASIS WITH CALCIUM CHANNEL BLOCKER COMPOUNDS

John D. Taylor, Detroit, and Kenneth V. Honn, Grosse Pointe Woods, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Mar. 31, 1983, Ser. No. 480,704
Int. Cl.[4] A61K *31/44, 31/55, 31/495, 31/275, 31/125*
U.S. Cl. 514—356 **7 Claims**

1. A method for reducing interaction between blood platelets and malignant tumors present in the blood and resulting attachment of the tumors with the platelets in blood vessels in a mammal which comprises:

administering to a mammal in need thereof an effective amount of a calcium channel blocker compound selected from the group consisting of phenylalkyamines, benzothiapenes, diphenylalkylamines and 1,4-dihydropyridines which is substituted in the 4-position which reduces the interaction between the platelets and the tumors and resulting attachment of the tumors with the platelets in the blood vessels without treating the tumors to thereby interfere with the metastatic cascade in the mammal and wherein in vitro the calcium channel blocker compounds prevent aggregation of tumor cells and platelets.

4,690,936

ANTI-HYPERTENSIVE AGENTS

James W. Ryan; Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

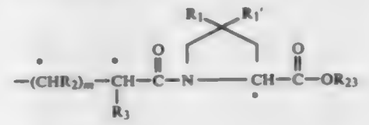
Continuation-in-part of Ser. No. 127,472, Mar. 5, 1980. This application May 2, 1980, Ser. No. 145,772
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **54 Claims**

1. A new compound having the general formula R—A—S—Z wherein,

R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-arginyl, L-lysyl or pyro-L-glutamyl;

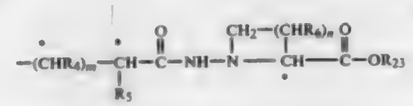
A is a divalent moiety derived from phenylglycine, β-benzyl aspartic acid, γ-benzyl glutamic acid, S-benzyl cysteine, O-benzyl aspartic acid, O-benzyl tyrosine, O-benzyl threonine, β-phenyl serine, thyronine, β-2-thienylserine, β-2-thienylalanine, α-methyl histidine, α-methyl tyrosine, α-methyl phenylalanine, α-methyl tryptophan, substituted tyrosine wherein the substituent is halo, nitro, methoxy or hydroxy, or subtituted phenylaline wherein the subatituent is selected from nitro, amino and methoxy or substituted tryptophan wherein the substituent is selected from methyl and methoxy, the α-amino group of which moiety is in amide linkage with R when R is acyl, and forms a primary amino group with R when R is H, and the carboxyl group of which moiety is in thioester linkage with S;

S is a sulfur atom joined in thioester linkage to A; and Z is selected from the following:



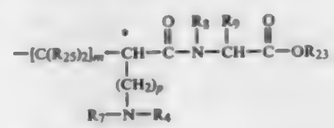
II.

wherein,
(i) R_1 and R_1' are each hydrogen or halogen, and R_2 and R_3 are each hydrogen, lower alkyl or trifluoromethyl provided that only one of R_2 and R_3 may be trifluoromethyl and further provided that at least one of R_1, R_1', R_2 and R_3 must be halogen or trifluoromethyl
(ii) R_{23} is hydrogen or lower alkyl and
(iii) m is 0 or 1;



III.

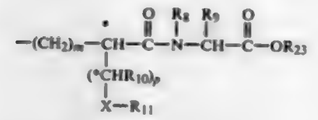
wherein
(i) R_4 and R_5 are each hydrogen, lower alkyl or phenyl-lower alkylene
(ii) N is 1, 2 or 3
(iii) R_6 is hydrogen or hydroxy or when n is 2, R_6 may also be halogen and
(iv) m and R_{23} are as stated in II. above;



IV.

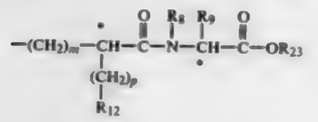
wherein
(i) R_7 is hydrogen, lower alkanoyl or amino (imino)methyl;
(ii) p is 0 or an integer of from 1 to 4;
(iii) R_{25} is hydrogen but when m is 1, p is 0, R_4 is hydrogen and R_7 is selected from hydrogen, lower alkyl and hydroxy lower alkylene; and R_9 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxy-phenyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene, but R_8 and R_9 may together constitute a $(CH_2)_v$ bridge wherein v is 3 or 4, thus forming a 5 or 6-membered ring with the N and C to which R_8 and R_9 are respectively attached and in such instance when v is 3 one hydrogen of $(CH_2)_v$ may be replaced by OH or halogen and when v is 4, one such hydrogen may be replaced by OH;
(v) m and R_{23} are each as defined in II. above; and

(vi) R_4 is as defined in III. above, provided further, however, that m and p may not both be 0;



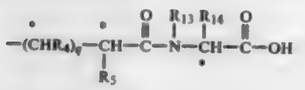
V.

wherein
(i) R_{10} is hydrogen or lower alkyl;
(ii) R_{11} is hydrogen, lower alkyl or lower alkanoyl
(iii) X is O or S;
(iv) m and R_{23} are as stated in II. above, and
(v) R_8, R_9 and p are as stated in IV. above;



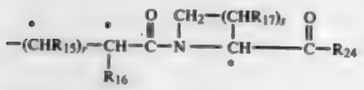
VI.

wherein
(i) R_{12} is selected from carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl and cyano;
(ii) m and R_{23} are as stated in II. above; and
(iii) R_8, R_9 and p are as stated in IV. above.



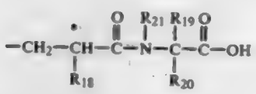
VII.

wherein
(i) R_{13} is hydrogen, lower alkyl or phenyl-lower alkylene;
(ii) R_{14} is selected from hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene;
(iii) R_4 and R_5 are each as stated in III. above; and
(iv) q is 0, 1 or 2;



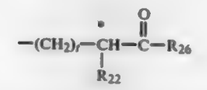
VIII.

wherein
(i) R_{15} and R_{16} are each hydrogen, lower alkyl, phenyl or phenyl-lower alkylene;
(ii) r is 0, 1 or 2;
(iii) s is 1, 2 or 3;
(iv) R_{17} is hydrogen, hydroxy or lower alkyl and when s is 2, R_{17} may also be halogen;
(v) R_{24} is hydroxy, amino or lower alkoxy;



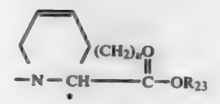
IX.

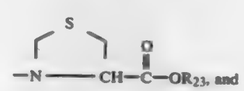
wherein
(i) R_{18} is hydrogen or lower alkyl;
(ii) R_{19} and R_{20} are each lower alkyl and may together constitute a $(CH_2)_w$ bridge wherein w is 4, to form a ring of 5-carbons with the carbon to which they are each attached;
(iii) R_{21} is hydrogen or lower alkyl and may constitute with R_{19} a $(CH_2)_x$ bridge wherein x is 3, to form a five-membered ring with the N and C to which they are respectively attached;

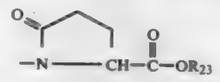


X.

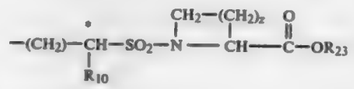
wherein
(i) R_{22} is hydrogen or lower alkyl;
(ii) t is 0 or 1; and
(iii) R_{26} is selected from







wherein u is 0 or 1 and R_{23} is as defined for formula II., above;



XI.

wherein
(i) z is 2 or 3;
(ii) R_{10} is as stated in V. above; and
(iii) R_{23} is as stated in II. above.

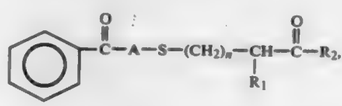
4,690,937

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Aug. 14, 1979, Ser. No. 64,897
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



wherein A is L-tryptophyl, L-tyrosyl, or L-histidyl, whose amino group is in amide linkage with the adjacent



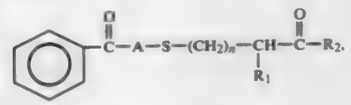
R_1 is hydrogen or methyl;
R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the adjacent



and
n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,938
ANTI-HYPERTENSIVE AGENTS
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.
Filed Aug. 14, 1979, Ser. No. 64,898
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **15 Claims**

1. A new compound having the formula



A is glycyl, L-isoleucyl, L-leucyl, or L-valyl whose amino group is in amide linkage with the adjacent



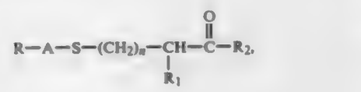
R_1 is hydrogen or methyl:
R_2 is a resdue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the adjacent



and,
n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,939
ANTI-HYPERTENSIVE AGENTS
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.
Filed Aug. 14, 1979, Ser. No. 64,900
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] H61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



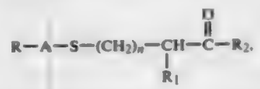
wherein
R is formyl, acetyl, propanoyl, butanoyl, phenylacetyl or phenylpropanoyl;
A is L-phenylalanyl, glycyl, L-alanyl, L-tryptophyl, L-tyrosyl, L-isoleucyl, L-leucyl, L-histidyl or L-valyl whose α-amino group is in amide linkage with R;
R_1 is hydrogen or methyl;
R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the



and,
n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,940
ANTI-HYPERTENSIVE AGENTS
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.
Filed Aug. 14, 1979, Ser. No. 64,902
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



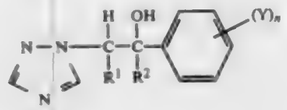
wherein R is cyclopentylcarbonyl-L-lysyl or pyro-glutamy-L-lysyl;
A is L-phenylalanyl, glycyl, L-alanyl, L-tryptophyl, L-tyrosyl, L-isoleucyl, L-leucyl, L-histidyl or L-valyl whose amino group is in amide linkage with R:
R_1 is hydrogen or methyl
R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydro-proline, L-3-hydroxyproline, L-4-hydroxyproline or L-4-carboxylic acid whose imino group is in imide linkage with the



and,
n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,941
CERTAIN TRIAZOLE COMPOUNDS AND THEIR USE AS FUNGICIDES
Paul A. Worthington, and Margaret C. Shephard, both of Maidenhead, England, assignors to Imperial Chemical Industries PLC, London, England
Filed Nov. 29, 1976, Ser. No. 745,780
Claims priority, application United Kingdom, Dec. 3, 1975, 49656/75; Nov. 16, 1976, 47666/76
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] C07D *249/08;* **A01N** *43/64*
U.S. Cl. 514—383 **5 Claims**

1. A compound of the formula

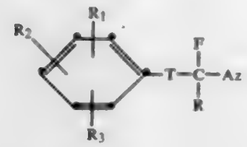


wherein R^1 is butyl or benzyl; R^2 is hydrogen; Y is hydrogen, halogen, nitro, C_{1-4} alkyl, C_{1-4} alkoxy or unsubstituted amino, and n is 0, 1 or 2; or a fungicidal acid salt of said compound.

4. A fungicidal composition consisting essentially of, as active ingredient, a fungicidally effective amount of a compound, salt or complex as claimed in claim 1, and a inert carrier for the active ingredient.

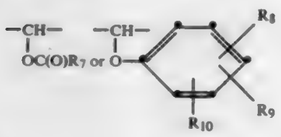
4,690,942
1-ARYL-2-FLUORO-2-AZOLYL ALKANONES, ALKANOLS, ESTERS, AND ETHERS, COMPOSITION CONTAINING THEM, AND USE OF THEM TO CONTROL PHYTOPATHOGENIC MICROORGANISMS
Willy Frick, Pfeffingen; Alfred Meyer, and Robert Nyfeler, both of Basel, all of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.
Filed Dec. 14, 1984, Ser. No. 681,989
Claims priority, application Switzerland, Dec. 20, 1983, 6757/83; Jun. 5, 1984, 2731/84
Int. Cl.[4] A01N *43/50, 43/653;* **C07D** *233/60, 249/08*
U.S. Cl. 514—383 **20 Claims**

1. A compound of formula I

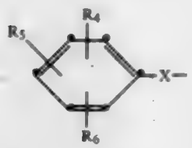


(I)

wherein
Az is 1H-1,2,4-triazol-1-yl, 4H-1,2,4-triazol-4-yl or 1H-imidazol-1-yl;
T is —CH(OH)— or one of the groups



wherein
R_7 is C_1–C_6alkyl which is unsubstituted or substituted by C_1–C_3alkoxy, halogen or cyano, or is C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_6cycloalkyl, 2-furyl, 2-tetrahydrofuryl, or is phenyl or benzyl, each unsubstituted or substituted by halogen, nitro, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3haloalkyl or C_1–C_3haloalkoxy;
R_8, R_9 and R_{10} are each independently hydrogen, nitro, halogen, cyano, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, —COO(C_1–C_3alkyl), NH_2 or $NHCOCH_3$;
R is hydrogen or C_1–C_6alkyl;
R_1 and R_2 are each independently hydrogen, halogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_1–C_6haloalkoxy, nitro or cyano; and
R_3 is hydrogen, halogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_1–C_6haloalkoxy, nitro, cyano or the group

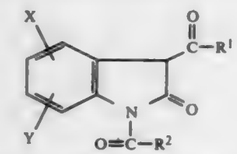


wherein
X is O, S, SO or SO_2;
R_4, R_5 and R_6 are each independently hydrogen, halogen, cyano, nitro, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl or C_1–C_6haloalkoxy; or an acid addition salt or metal complex thereof.

14. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by such microorganisms, which method comprises applying to said plants or to the locus thereof a microbicidally effective amount of a compound according to claim 1.

4,690,943
ANALGESIC AND ANTIINFLAMMATORY 1,3-DIACYL-2-OXINDOLE COMPOUNDS
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.
Continuation-in-part of Ser. No. 652,372, Sep. 19, 1984, abandoned. This application Jun. 20, 1985, Ser. No. 747,194
Int. Cl.[4] A61K *31/40;* **C07D** *209/34*
U.S. Cl. 514—418 **18 Claims**

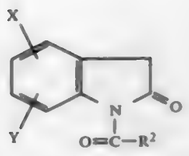
1. A 1,3-diacyl-2-oxindole compound of the formula:



and the pharmaceutically-acceptable base salts thereof; wherein
X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;
R^1 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, cycloalkenyl having 4 to 7 carbons, phenyl, substituted phenyl, phenylalkyl having 1 to 3 carbons in said alkyl, (substituted phenyl)alkyl having 1 to 3 carbons in said alkyl, phenoxyalkyl having 1 to 3 carbons in said alkyl, (substituted phenoxy)alkyl having 1 to 3 carbons in said alkyl, (thiophenoxy)alkyl having 1 to 3 carbons in said alkyl and naphthyl;
wherein the substituent on said substituted phenyl, said (substituted phenyl)alkyl and said (substituted phenoxy)alkyl is selected from the group consisting of fluoro, bromo, chloro, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl;
and R^2 is alkyl having from 1 to 5 carbons.

7. An analgesic or antiinflammatory pharmaceutical composition, which comprises a pharmaceutically-acceptable carrier and an effective analgesic or antiinflammatory amount of a 1,3-diacyl-2- oxindole compound according to claim 1, and wherein the weight ratio of the pharmaceutically-acceptable carrier to the 1,3-diacyl-2-oxindole compound is in the range from 1:4 to 4:1.

8. A compound of the formula



wherein X is selected from the group consisting of hydrogen, 5-fluoro, 5-chloro and 5-trifluoromethyl; Y is selected from the group consisting of hydrogen 6-fluoro, 6-chloro and 6-trifluoromethyl;

and R^2 is alkyl having 1 to 5 carbons;

provided that X and Y are not both hydrogen.

4,690,944

HOMOCYSTEINE THIOLACTONE DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Paolo Chiesi, and Vittorino Servadio, both of Parma, Italy, assignors to Chiesi Farmaceutici S.p.A., Parma, Italy

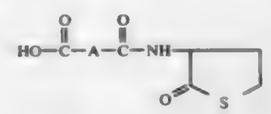
Filed Feb. 19, 1986, Ser. No. 831,159

Claims priority, application Italy, Feb. 22, 1985, 19621 A/85

Int. Cl.[4] A61K *31/38*; C07D *409/00, 333/36*

U.S. Cl. 514—445 6 Claims

1. A compound of formula I



(I)

wherein —COACO— is the radical from 1,2-, 1,3-, 1,4-cyclohexane dicarboxylic acid, 1,2-, 1,3-cyclopentane dicarboxylic acid or A is 4-cyclohexene-1,2-yl or 1-cyclohexene-1,2-yl; 1-2, 1-3 or 1-4 phenylene; 2-3, 2-4 or 2-5 pyridyl, -bicyclo-[2,2,1]-hepta-5-ene-1,2-diyl; -bicyclo-[2,2,2]-octa-5-ene-1,2-diyl; -7-oxabicyclo-[2,2,1]-hepta-5-ene-1,2-diyl.

4,690,945

PROCESS FOR THE PREPARATION OF 5'-SUBSTITUTED 2-(3'-THIENYL)PROPIONIC ACIDS

Sebastian J. Arechaga; Jose O. O. Granell; Carmen S. Linan; Alfonso P. Vallejo, and Jose A. P. Gabarro, all of Barcelona, Spain, assignors to Laboratorios Madaus Cerafarm, S.A., Barcelona, Spain

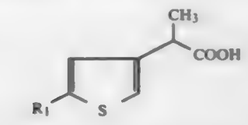
Continuation of Ser. No. 697,431, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 505,061, Jun. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 405,655, Aug. 5, 1982, abandoned. This application Jan. 14, 1986, Ser. No. 818,798

Claims priority, application Spain, Aug. 11, 1981, 504690

Int. Cl.[4] A61K *31/38*; C07D *333/22, 333/24*

U.S. Cl. 514—448 5 Claims

1. 5'-substituted 2(3'-thienyl)propionic acids of the formula



(I)

wherein R_1 is benzyl or alkanoyl, said alkanoyl group having 1 to 6 carbon atoms.

4,690,946

FUNGICIDAL N-PHENYLCARBAMATES

Junya Takahashi; Toshiro Kato, both of Hyogo, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 367,404, Apr. 12, 1982, Pat. No. 4,482,546. This application Oct. 14, 1983, Ser. No. 542,208

Claims priority, application Japan, Apr. 16, 1981, 56-58303; Nov. 6, 1981, 56-178509; May 4, 1982, 57-75768

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.[4] A01N *47/10*; C07C *125/065*

U.S. Cl. 514—485 19 Claims

1. A N-phenylcarbamate compound selected from the group consisting of:

Isopropyl N-(3-methoxy-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-methoxy-4-ethoxy-5-n-propylphenyl)-carbamate;

Isopropyl N-(3-ethyl-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-vinyl-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-bromo-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-[3-chloro-4-(2-chloroethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-[3-chloro-4-(2-bromoethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-(3-bromo-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-methyl-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-methyl-4-ethoxy-5-propionylphenyl)-carbamate;

Isopropyl N-(3-fluoro-4,5-diethoxyphenyl)carbamate;

Isopropyl N-[3-chloro-4-(2,2,2-trifluoroethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-(3-methoxy-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-allyloxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-propargyloxy-5-methoxymethylphenyl)-carbamate; and

Isopropyl N-[3-chloro-4-(2-fluoroethoxy)-5-methoxymethylphenyl]-carbamate.

19. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of a compound of claim 1.

4,690,947

SYNERGISTIC COMPOSITION FOR THE CONTROL OF ARTHROPODS

Walter M. Zeck, and Donald E. Simonet, both of Vero Beach, Fla., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 632,137, Jul. 18, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 801,454

Int. Cl.[4] A01N *37/34, 37/52, 57/00, 55/04*

U.S. Cl. 514—521 13 Claims

1. A synergistic arthropodicidal composition comprising an arthropodicidally effective amount of (A) cyano-(4-fluoro-3-phenoxyphenyl)-methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate plus (C) N[1]-(4-chloro-O-tolyl)-N,N-dimethyl-formamidine, in weight ratio of A:C of about 1:0.2–125.

4,690,948

HALOGENATED RESORCYLIC ACID LACTONE DERIVATIVES

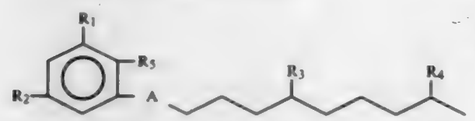
Jing-Jong Lu, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 1, 1986, Ser. No. 936,715

Int. Cl.[4] C07C *65/01*

U.S. Cl. 514—544 20 Claims

1. A compound having the formula



wherein A is CH_2—CH_2 or CH=CH; R_1 and R_2, which may be the same or different, are H, OH, OCH_3, OBz, OTHP, or OZ, where Z is an alkyl group having from 2–6 carbon atoms; R_3 is a halogen or OH; R_4 is a halogen; and R_5 is H, CO_2H, or CO_2Z, where Z is CH_3, CH_2OCH_3, CH_2SCH_3, or THP.

4,690,949

THERAPEUTIC DRUG FOR DEMENTIA

Mitsuo Yoshida; Yoshikuni Mizuno, both of Tochigi; Natsue Shimizu, Chiba; Mieko Otsuka; Masakatsu Dobutsu, both of Tochigi; Yuusuke Furukawa, and Yutaka Joshita, both of Tochigi, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Apr. 29, 1986, Ser. No. 857,239

Claims priority, application Japan, Oct. 31, 1985, 60-245726

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—561 11 Claims

1. A method of treating dementia comprising administering to a patient suffering from dementia an effective amount of DL- or L-threo-3,4-dihydroxyphenylserine or a pharmaceutically acceptable salt thereof.

4,690,950

1-[N-(α-AMINO-α-METHYLACETYL)AMINOPHENYL]-2-AMINOPROPANONE DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alford, France

Filed Aug. 16, 1985, Ser. No. 766,636

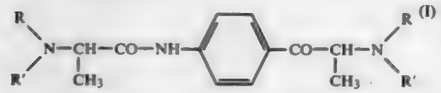
Claims priority, application France, Aug. 20, 1984, 84 12964

Int. Cl.[4] C07C *103/50*; A61K *31/165*

U.S. Cl. 514—626 4 Claims

1. A 1-[N-(α-amino-α-methylacetyl)aminophenyl]-2-aminopropanone derivative selected from the group consisting of:

(i) 1-[N-(α-alkylamino-α-methylacetyl)aminophenyl]-2-alkylaminopropanones of the general formula:



(I)

in which R represents $CH(CH_3)_2$ or $C(CH_3)_3$ and R' represents hydrogen; and

(ii) addition salts thereof.

3. A therapeutic composition comprising, in association with a physiologically acceptable excipient, a pharmaceutically effective quantity of a derivative of the formula I according to claim 1, or a non-toxic addition salt thereof.

4,690,951

GROWTH PROMOTION

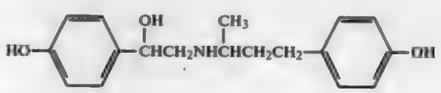
David B. Anderson, Greenfield; Klaus K. Schmiegel, Indianapolis, and Edward L. Veenhuizen, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 628,002, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 462,587, Jan. 31, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 811,059

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—653 9 Claims

1. A method for promoting the growth of a ruminant comprising administering to the ruminant a growth promoting amount of a compound of the formula



or an acid addition salt thereof.

4,690,952

PHARMACEUTICAL COMPOSITIONS FOR NASAL ADMINISTRATION COMPRISING CALCITONIN AND AN ABSORPTION-PROMOTING SUBSTANCE

Seiya Kagatani; Shunji Hasumi; Takashi Sonobe, and Masayoshi Aruga, all of Shizuoka, Japan, assignors to Yamanouchi Pharmaceutical Co., Inc., Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,983

Claims priority, application Japan, Nov. 26, 1984, 59-248898

Int. Cl.[4] A61K *37/26, 37/60*

U.S. Cl. 514—808 12 Claims

1. An intranasal pharmaceutical composition of calcitonin comprising (a) a pharmaceutically effective amount of calcitonin and (b) at least one absorption enhancer selected from the group consisting of benzyl alcohol, ethanol, thiamine or a salt thereof, capric acid or a salt thereof, polyethylene glycol 400, pyridoxal or a salt thereof, malic acid or a salt thereof and pyrophosphoric acid or a salt thereof which are contained in a liquid dilution or a carrier suitable for applying to nasal mucous membrane.

4,690,953

METHOD OF FROTHING AQUEOUS IONIC POLYURETHANE DISPERSIONS AND PRODUCTS PRODUCED THEREFROM

Robert B. Orr, Wilmington, and Leon Chicosky, Jr., Newark, both of Del., assignors to Seton Company, Newark, N.J.

Filed Mar. 11, 1986, Ser. No. 838,575

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—65 31 Claims

1. A frothable composition comprising an aqueous ionic polyurethane dispersion and a stearate salt.

4,690,954

HALOGENATED PHOSPHORATE ETHERS WITH FLAME-RETARDANT POLYURETHANES

David J. Wampfler; Donna J. Fielding, both of Midland, and Chester E. Pawloski, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1986, Ser. No. 856,524

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—107 17 Claims

1. A method for improving a production characteristic of flame-retardant polyurethanes comprising incorporation of a haloether phosphorate flame-retardant compound into a polyurethane under conditions sufficient to improve said characteristic, the haloether phosphorate being in an amount effective to reduce combustibility of the polyurethane.

4,690,955

POLYETHER SILICONE COPOLYMERS WITH MIXED HYDROXY ALKOXY CAPPING FOR STABILIZING HIGH SOLID CONTENT, MOLDED, FLEXIBLE URETHANE FOAM

John A. Kilgour, Putnam Valley, N.Y., and Michael W. Jorgenson, Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1986, Ser. No. 880,295
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—112 24 Claims

1. A polyurethane foam surfactant which comprises:
a single polydialkylsiloxane-polyoxyalkylene copolymer wherein the polydialkylsiloxane contains no more than ten silicon atoms and the backbone is substituted with an average of at least 0.5 polyoxyalkylene substituents wherein
(a) 5 to 95 percent by weight of the pendants on the copolymer have the formula

$$-R(R')_a(R'')_bX$$

wherein R is an alkylene group of 1 to 4 carbons linked to the silicon atom, R' is an oxyalkylene group of 1 to 4 carbons, R'' is a second oxyalkylene group of 1 to 4 carbons which is different from R', a plus b is 1 to 15, and X is OR^3 or

$$OCR^3$$
$$\|$$
$$O$$

where R^3 is a monovalent alkyl group of 1 to 4 carbons; and
(b) 95 to 5 percent by weight of the pendants on the copolymer have the formula

$$-R(R')_c(R'')_dOH$$

wherein R is an alkylene organic group of 1 to 4 carbons linked to the silicon atoms, R' is an oxyalkylene group of 1 to 4 carbons, R'' is a second oxyalkylene group of 1 to 4 carbons which is different from R', and c plus d is 1 to 10.

4,690,956

PROCESS FOR THE PREPARATION OF GRAFT POLYMER DISPERSIONS AND FLAME-RETARDANT POLYURETHANE FOAMS

Gerhard G. Ramlow, Quebec, Canada; Duane A. Heyman, Monroe, and Oscar M. Grace, Troy, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 426,311, Sep. 29, 1982, Pat. No. 4,550,194, which is a continuation-in-part of Ser. No. 364,336, Apr. 1, 1982, Pat. No. 4,454,255. This application Oct. 28, 1985, Ser. No. 791,873
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.[4] C08K *5/06, 5/10;* C08L *29/02, 51/08*
U.S. Cl. 521—137 20 Claims

1. A stable low viscosity graft polymer dispersion formed by polymerizing in the presence of a reaction moderator and a free radical initiator (a) an ethylenically unsaturated monomer or mixture of monomers provided that in the mixture of monomers the concentration of acrylonitrile or methacrylonitrile is 50 weight percent to 100 weight percent of the weight of monomers, in (b) from about 25 to about 75 weight percent based on the total weight of the dispersion, a polyol mixture comprising (1) a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000, (2) a macromer containing induced fumarate unsaturation consisting essentially of a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000 , wherein the polyol mixture contains from 0.001 to 0.09 mole of induced unsaturation per mole of polyol mixture.

4,690,957

ULTRA-VIOLET RAY CURING TYPE RESIN COMPOSITION

Hirofumi Fujioka, and Masami Inoue, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,165
Int. Cl.[4] C08G *59/62;* C08L *63/00*
U.S. Cl. 522—31 2 Claims

1. An ultra-violet ray curing type resin composition, which consists essentially of:
(A) at least one kind of cationically polymerizable compound containing, as the principal constituent thereof, an epoxy resin having two or more oxirane rings is one molecule thereof;
(B) 0.5 to 20% by weight, with respect to said cationically polymerizable compound, of phenoxy resin having a molecular weight in a range of from 10,000 to 60,000;
(C) 0.5 to 20% by weight, with respect to said cationically polymerizable compound, of polyhydric aliphatic alcohol other than (B) containing two or more hydroxyl groups in its molecule; and
(D) an effective amount of from 0.5 to 10% by weight, with respect to said cationically polymerizable compound, of a photo-initiator capable of isolating a Lewis acid catalyst which is able to initiate polymerization of said cationically polymerizable compound by irradiation of the ultra-violet rays.

4,690,958

ROAD MARKING COMPOSITIONS

Olivier H. V. Lacoste, Brussels, Belgium; Alain De Regel, Paris, France; Hidenori Fujiwara, and Raymond C. C. Yap, both of Yokohama, Japan, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 21, 1986, Ser. No. 832,106
Claims priority, application United Kingdom, Feb. 22, 1985, 85-04683; Aug. 28, 1985, 85-21391
Int. Cl.[4] C09D *3/00, 3/733*
U.S. Cl. 523—172 14 Claims

1. A road marking composition comprising 10 to 30 wt. % of a resin and 90 to 70 wt. % aggregate and, based on the weight of resin 0.1 to 5 wt. % of a substantially saturated dicarboxylic acid, anhydride or ester, substituted with at least one hydrogen-and carbon containing group of at least 30 carbon atoms, wherein said resin comprises a petroleum resin, a rosin derivative, a polyterpene, or derivatives thereof.

4,690,959

POLYETHYLENE COMPOSITE COMPRISING A COUPLING AGENT COMPOSITION COMPRISING FUMARIC ACID AND AN AMINOSILANE

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 9, 1986, Ser. No. 861,384
Int. Cl.[4] C08K *9/06, 3/40, 5/54*
U.S. Cl. 523—213 8 Claims

1. A method for making composite materials of polyethylene comprising the steps of;
(I) intermixing filler, polyethylene, and a coupling agent composition comprised of
(A) a diamine functional silane of the general formula

$$(RO)_3SiR'NH(CH_2)_2NHR''$$

where R denotes an alkyl radical with 1 to 6 carbon atoms or an alkoxyalkyl radical with 2 to 8 carbon atoms, R' denotes an alkylene radical with 1 to 4 carbon atoms, R'' denotes a hydrogen atom, an alkyl radical with 1 to 6 carbons, or an alkenylarylalkyl radical with 8 to 10 carbon atoms
(B) fumaric acid; and
(C) a nonreactive solvent where the mole ratio of the fumaric acid (B) to the diamine functional silane (A) is between 1.0 and 1.4.

4,690,960

VIBRATION DAMPING MATERIAL

Fumio Yamauchi, Tokyo; Tsutomu Tohara, Kanagawa; Shigeo Nakano, and Shigeo Emoto, both of Tokyo, all of Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 467,042, Feb. 16, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,354
Claims priority, application Japan, Jan. 14, 1981, 56-4266; Mar. 26, 1981, 56-44590; Apr. 10, 1981, 56-54043; Apr. 28, 1981, 56-64737; Jan. 22, 1982, 57-7168; Feb. 16, 1982, 57-23222; Mar. 4, 1982, 57-30556[U]
Int. Cl.[4] B23P *11/00;* F16M *11/00;* C08K *3/22*
U.S. Cl. 523—442 12 Claims

1. A system for isolating vibrations, comprising a functional apparatus to be operated where vibration is damped, and a bed on which said functional apparatus is mounted, said bed made by usage of a composition essentially consisting of 40 to 90 weight percent of iron oxide particles of 0.1 to 100 μm in size and 60 to 10 weight percent of resin, in which said bed includes honeycomb core made of metal.

4,690,961

SEALANT COMPOSITION

R. Clay Cole, Duncan, and Bobby K. Bowles, Comanche, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 8, 1986, Ser. No. 916,576
Int. Cl.[4] C08K *3/26, 3/08*
U.S. Cl. 523—440 12 Claims

1. A sealant composition comprising a hardenable liquid resin which can be caused to set into a hard mass, comprisng the condensation product of epichlorohydrin and bisphenol-A having a weight per expoxide of about 175 to about 195 diluted with butylglycidyl ether, a powdered inert filler dispersed in said resin, and a dispersing and thixotropy imparting agent comprised of precipitated calcium carbonate present in said composition in an amount in the range of about 10% to about 50% by weight of said composition.

4,690,962

COMPOSITION, COATED ARTICLE AND METHOD OF COATING

Roger J. Clark, Underhill, Vt.; James Economy, San Jose, Calif.; Mary A. Flandera, Endicott, N.Y.; John R. Susko, and Robin A. Wheater, both of Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 628,980, Jul. 12, 1984, Pat. No. 4,592,944, which is a continuation of Ser. No. 381,485, May 24, 1982, abandoned. This application Apr. 7, 1986, Ser. No. 835,083
Int. Cl.[4] C08K *5/34, 5/00;* C08L *49/00*
U.S. Cl. 524—94 19 Claims

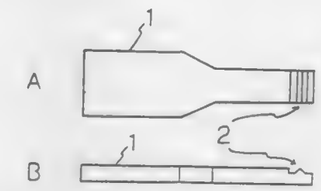
1. A composition capable of forming a continuous film comprising a soluble polymerizable oligomer wherein said oligomer is obtained from 1,3,5-triethynylbenzene, has a molecular weight of about 400 to about 2000, at least 60% of the acetylenic groups thereof are diacetylenic groups, each molecule of the oligomer contains at least two acetylenic groups, and the oligomer contains up to 20% by weight ethynyl content; and a plasticizer selected from the group of diphenyldiacetylene, diphenylbutadiene, diphenylether, phenyltriethynyl silane, 4,4'diethynyldiphenylether, and mixtures thereof; or a toughening agent selected from the group of cyclized poly(arylacetylene) polymer, aromatic diphenylether, acrylonitrile polymer, polyimides, polyquinoxalines, polyesters, or polysilicones, and mixtures thereof; or both.

4,690,963

TARTRATE-BASED LIGHT STABILIZERS FOR PLASTICS

Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 786,797, Oct. 11, 1985, abandoned. This application Sep. 2, 1986, Ser. No. 902,781
Int. Cl.[4] C07D *401/12, 401/14;* C08K *5/34*
U.S. Cl. 524—98 12 Claims



1. A compound of the formula I
wherein n has a value of 1 to 15,
when n is 1, p and q can be 1 or 0, when n is greater than 1, p is 1, while q may be 1 or 0;
R' is selected from hydrogen and an alkyl group of 1 to 5 carbon atoms;
R^2 is selected from hydrogen, oxyl, hydroxyl, a methylene-linked alkyl group from 1 to 18 carbon atoms, an alkanoyl group having 2 to 18 carbon atoms, an alkenyl group of 3 to 4 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, an aralkyl group of 7 to 15 carbon atoms, a group $-CH_2CH(OR^5-)-R^6$, and a group of the formula

$$-(CH_2)_m-\overset{O}{\overset{\|}{C}}-Z$$

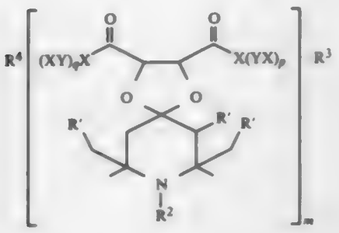
where Z is a group selected from $-OR^7$ and $-N(R^8(R^9)$ and m is either 1 or 0 and when m is 0, Z is a group $-C(O)-OR^{10}$ and $-A-C(O)-R^{11}$;
R^3 and R^4, same or different are selected from an alkyl group of 1 to 18 carbom atoms such as R^2, hydrogen and a group of formula II;
R^5 is selected from hydrogen, a methylene-linked alkyl group from 1 to 18 carbon atoms, an alkanoyl group having 2 to 18 carbon atoms, an alkenyl group of 3 to 4 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, an aralkyl group of 7 to 15 carbon atoms;
R^6 is selected from hydrogen, an alkyl group of 1 to 16 carbon atoms such as those of R^2, and phenyl;
R^7 is selected from an alkyl group of 1 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms alkyl, benzyl, phenyl, and a group of formula III wherein R' and R^2 are as described above;
R^8 and R^9, same or different, are selected from hydrogen, an alkyl group having 1 to 8 carbon atoms, alkyl group having 5 to 12 carbon atoms such as those of R^7, aryl groups having 6 to 10 carbon atoms and aralyl groups having 7 to 15 carbon atoms and R^8 and R^9 together with the nitrogen atom to which they are attached can form a 5 to 7-membered ring selected from the group consisting of pyrrolidine, piperidine and homopiperidine;
R^{10} is selected from an unsubstituted alkyl group of 1 to 18 carbon atoms, phenyl and benzyl;
A is selected from an alkylene group of 1 to 12 carbon atoms, phenylene and a group —NH—R^{12}—NH— where R^{12} is

selected from an alkylene group of 2 to 18 carbon atoms, either straight chained or branched a cycloalkylene group having 5 to 18 carbon atoms, an arylene group having 6 to 18 carbon atoms, and an aralkylene group having 7 to 18 carbon atoms and R^{11} is a group of the formula III;

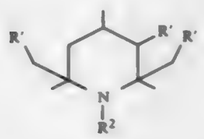
X is either —O— or —NR^{13} where R^{13} is selected from hydrogen or an alkyl group of 1 to 8 carbon atoms;

Y is a divalent alkylene group having 2–20 carbon atoms, wherein the alkylene may be interrupted by —O—, —S— or —NR^{13}—, a cycloalkylene group of 6–12 carbon atoms, dialkanylcycloalkane, a phenylene group and an aralkylene group having 8 to 15 carbon atoms whereinsaid formulas are:

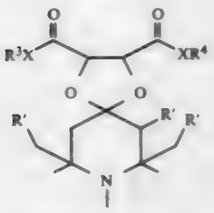
I



II



III



9. A synthetic polymer composition stabilized against light induced deterioration comprising an organic polymer normally subjected to deterioration by light, and from 0.01–5% by weight of a compound of the general formula of claim 1.

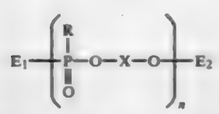
4,690,964

THERMOPLASTIC POLYURETHANE COMPOSITIONS HAVING IMPROVED FLAME RESISTANCE

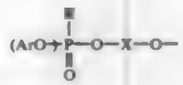
Manfred Schmidt, Krefeld, Fed. Rep. of Germany, and Robert P. Yeater, Moundsville, W. Va., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1983, Ser. No. 461,063
Int. Cl.⁴ C08K *5/53;* **C08F** *283/00*
U.S. Cl. 524—125 **6 Claims**

1. A homogeneous thermoplastic molding composition comprising (i) a thermoplastic polyurethane and (ii) an oligomeric polyalkylphosphonate characterized in that it contains structural units conforming to



wherein R denotes any of C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_6–C_{30} cycloalkyl or cycloalkenyl, C_7–C_{30} arylalkyl or C_8–C_{30} arylalkenyl, E_1 denotes



and E_2 denotes



where Ar denotes phenyl or cresyl and n is between 5 and 22 and X is the residue of a diphenol of the type

HO—X—OH

wherein X has 6 to 30 carbon atoms, said composition being further characterized in that said (i) is related by weight to said (ii) in a ratio of between 90:10 and 60:40.

4,690,965

RUBBER COMPOSITIONS HAVING IMPROVED REINFORCING PROPERTIES AND LOW HEAT BUILD-UP

Yasushi Hirata, Sayama; Hitoshi Kondo, Higashimurayama; Goro Yokoyama, Tokyo, and Masaki Ohara, Wako, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,985
Claims priority, application Japan, May 2, 1985, 60-93569
Int. Cl.⁴ C08K *5/32*
U.S. Cl. 524—236 **2 Claims**

1. A rubber composition having improved reinforcing properties, comprising 20–150 parts by weight of carbon black having an iodine adsorption value (IA) of not less than 60 mg/g and dibutyl phthalate oil absorption (DBP) of not less than 75 ml/100 g and 0.1–3 parts by weight of at least one nitrosoaniline compound selected from the group consisting of p-nitroso-N-methylaniline, p-nitroso-N-ethylaniline and p-nitroso-N-propylaniline, based on 100 parts by weight of natural rubber and/or synthetic diene rubber.

4,690,966

HEAT ACTIVATED SILICON-BASED ADHESIVE

Anthony V. Rende, Jr., Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 26, 1987, Ser. No. 19,179
Int. Cl.⁴ C08K *5/54*
U.S. Cl. 524—264 **8 Claims**

1. An adhesive composition comprising

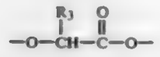
(i) about 2.5 to 70% by weight of an olefin organosilane

(ii) about 0.25 to 32% by weight water; and

(iii) about 0.25 to 20% by weight on a dry basis of aluminum zirconium metallo-organic complex of chelated aluminum moiety, an organofunctional ligand and a zirconium oxyhalide, the organofunctional ligand being complexed with and chemically bound to the chelated aluminum moiety and the zirconium;

said aluminum moiety having the formula:

$Al_2(OR_1O)_aA_bB_c$ wherein A or B is hydroxy or halogen and a, b and c are numerical values such that $2a+b+c=6$, and (OR_1O) is an alpha, beta or alpha, gamma glycol group in which R_1 is an alkyl group having 1 to 6 carbon atoms or an alpha-hydroxy carboxylic acid residue having the formula:



wherein R_3 is H or an alkyl group having 1 to 4 carbon atoms;

said organofunctional ligand is an aminofunctional carboxylic acid having 2 to 18 carbon atoms or a mercaptofunctional carboxylic acid having 2 to 18 carbon atoms; and

said zirconium oxyhalide moiety has the formula:

ZrA_dB_e

wherein A and B are as above defined and d and e are numerical values such that $d+e=4$; the molar ratio of chelated aluminum moiety to zirconium oxyhalide moiety being from 1.5 to 10, and the molar ratio of organofunctional ligand to total metal being from about 0.05 to 2.

4,690,967

HEAT-CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Robert LaGarde, Feyzin, and Noel Bouverot, Saint Symphorien d'Ozon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 21, 1984, Ser. No. 685,148
Claims priority, application France, Dec. 21, 1983, 83 20448
Int. Cl.⁴ C08K *5/54, 3/36*
U.S. Cl. 524—266 **14 Claims**

1. A heat-curable organopolysiloxane composition of matter, comprising (A) a major amount of a diorganopolysiloxane gum having a viscosity greater than 1,000,000 mPa.s at 25° C.; (B) a reinforcing amount of a reinforcing filler therefor; (D) a catalytic amount of an organic peroxide; and at least three of the following four constituents (E), (F), (G) and (H): (E) a minor amount of an organohydrogenopolysiloxane; (F) a minor amount of an organofluorinated polymer; (G) a minor amount of an organosiloxane compound containing at least one acroyloxyalkyl or methacroyloxyalkyl group covalently bonded to a silicon atom thereof; and (H) a minor amount of a boron compound.

4,690,968

FLUOROOLEFIN COPOLYMER, PROCESS FOR PRODUCTION THEREOF AND COMPOSITION CONTAINING SAID COPOLYMER

Tomonaga Mitani, Izumi, and Ichiro Mihata, Izumiohtsu, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 795,115, Nov. 5, 1985, Pat. No. 4,640,966. This application Oct. 22, 1986, Ser. No. 921,682
Claims priority, application Japan, Nov. 7, 1984, 59-234327; Dec. 18, 1984, 59-266831
Int. Cl.⁴ C08K *5/10;* **C08L** *27/12;* **C08F** *8/00*
U.S. Cl. 524—315 **14 Claims**

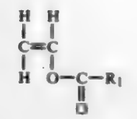
1. A coating composition comprising a fluoroolefin copolymer having an inherent viscosity of 0.05 to 2.0 dl/g and composed of

(I) 10 to 70 mole% of monomeric units derived from a fluoroolefin represented by the general formula



wherein X is H, Cl, F, CF_3, OCF_3 or OC_3F_7,

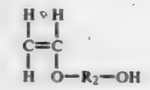
(II) 5 to 60 mole% of monomeric units derived from a vinyl carboxylate represented by the general formula



wherein R_1 represents an aliphatic, aromatic or alicyclic hydrocarbon group having 1 to 17 carbon atoms,

(III) 5 to 70 mole% of monomeric units derived from a vinyl ether having an alkyl group with 1 to 8 carbon atoms, and

(IV) 0 to 30 mole% of monomeric units derived from a hydroxyl-containing vinyl ether represented by the general formula



wherein R_2 represents an alkylene group having 1 to 6 carbon atoms;

and an organic solvent.

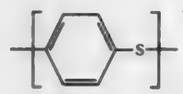
4,690,969

POLYPHENYLENE SULFIDE RESIN COMPOSITIONS AND THEIR MOLDINGS

Yoshio Takezawa, and Tatsuo Akatsu, both of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,751
Claims priority, application Japan, May 23, 1985, 60-111219
Int. Cl.⁴ C08K *3/16*
U.S. Cl. 524—413 **7 Claims**

1. A polyphenylene sulfide resin composition comprising at least 90 mol % polyphenylene sulfide having a unit represented by the formula:



(I)

as main component and halogenized copper, the copper content of which is 0.03–3% by weight based on the weight of the polyphenylene sulfide.

4,690,970

THERMOPLASTIC COMPOSITIONS BASED ON POLYPHENYLENE ETHERS, IMPACT-RESISTANT STYRENE POLYMERS, AND PULVERULENT, FILLER-CONTAINING RUBBER; AND METHOD FOR MANUFACTURING SUCH COMPOSITIONS

Roland Feinauer, and Hans Jadamus, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 18, 1985, Ser. No. 746,040
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424219
Int. Cl.⁴ C08K *3/36, 3/04*
U.S. Cl. 524—504 **19 Claims**

1. A thermoplastic molding composition comprising a polyphenylene ether, an impact-resistant styrene polymer and a pulverulent, filler-containing styrene-butadiene rubber, wherein the pulverulent, filler-containing rubber is prepared by (a) combining the rubber component in dissolved form with an aqueous suspension of a filler, wherein the suspension comprises a water-soluble aluminum salt and water glass, and has a pH of from 3.0 to 3.7, and (b) precipitating a pulverulent, filler

containing rubber by adding mineral acid to the aqueous suspension mixture to maintain the pH at from 3.0 to 3.7.

4,690,971

WATER ABSORBING POLYMERS

Peter Flesher; John Clarke, and David Marshall, all of West Yorkshire, England, assignors to Allied Colloids Limited, Great Britain

Filed Mar. 3, 1986, Ser. No. 835,602

Claims priority, application United Kingdom, Mar. 5, 1985, 8505632; Dec. 13, 1985, 8530784

Int. Cl.[4] C08L *33/26*

U.S. Cl. 524—555 **16 Claims**

1. A process in which a wet particulate mass which is not crumbly at a predetermined temperature is mixed with water absorbent polymer particles that absorb free water from the mass and the resultant mixture is crumbled at the said temperature characterized in that the mixture is free of polymeric binder, the polymer particles have a dry size of 50 micrometers to 3 millimeters and a gel capacity of at least 25, the polymer particles are substantially non-sticky when swollen with water, and the polymer is a non-film forming, wholly synthetic, polymer of (a) 5 to 100 mole percent acrylic acid (as free acid or water soluble salt), (b) 0 to 95 mole percent acrylamide, (c) 0 to 50 mole percent other monoethylenically unsaturated monomers selected from non-ionic and anionic monomers and (d) 10 to 10,000 ppm (by weight total monomers) cross-linking agent.

4,690,972

METHOD OF PRODUCING POLY(ARYLENE SULFIDE) COMPOSITIONS AND ARTICLES MADE THEREFROM

Timothy W. Johnson; William H. Beever; James E. O'Connor, and Jennings P. Blackwell, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1986, Ser. No. 848,436

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—609 **43 Claims**

1. A method comprising the steps of:

(a) blending a first poly(arylene sulfide)-containing composition together with an additive which is effective to achieve a crystalline morphology modification of said poly(arylene sulfide), said first poly(arylene sulfide)-containing composition and said additive forming a mixture;

(b) heating said mixture to melt the poly(arylene sulfide) present in the poly(arylene sulfide)-containing composition;

(c) further heating said mixture to at least 15° C. above the temperature employed in step (b); and

(d) cooling said mixture at a rate of less than about 50° C. per minute thus forming a second poly(arylene sulfide)-containing composition.

4,690,973

PRODUCTION PROCESS OF AN ANTITHROMBOGENIC AND ANTIADHESIVE MATERIAL FOR MEDICAL USE

Yasuharu Noishiki, Tottori; Kazuhiko Kodaira, Mitaka; Masayasu Furuse, Sagamihara; Teruo Miyata, Tokyo; Takeaki Miyamoto, Nagaokakyo, and Hiraku Ito, Kyoto, all of Japan, assignors to Koken Company Limited, Tokyo, Japan

Filed Jul. 15, 1986, Ser. No. 885,782

Claims priority, application Japan, Jul. 29, 1985, 60-165990

Int. Cl.[4] C08H *1/06;* **C08L** *89/04, 89/06*

U.S. Cl. 525—54.1 **4 Claims**

1. A production process of an antithrombogenic and antiadhesive material for medical use, characterized by subjecting glycidyltrialkylammonium halide to the reaction with a material comprising only collagen or collagen and other components in order to introduce a cationic functional group in collagen molecules of said material and then subjecting heparin to the ionic combination with said cationic functional group introduced.

4,690,974

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi, and Yutaro Fukuda, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 864,868

Claims priority, application Japan, May 21, 1985, 60-109102; May 22, 1985, 60-110989

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—64 **8 Claims**

1. A method for producing rubber modified thermoplastic resin which comprises (a) removing an aqueous phase from a two-phase mixture comprising a graft rubber polymer latex (1) obtained by graft polymerization of a vinyl monomer on a rubber latex, a thermoplastic resin (2), which is soluble in an organic agent, an organic agent in an amount of 0.1 to 6 times the weight of all the pblymers (3) which is capable of dissolving said thermoplastic resing (2) and has a solubility in water of 5% by weight or less at 25° C., wherein the said organic agent comprises petroleum ether, benzene, toluene, xylene, ethylbenzene, p-cymene, tetralin, methylene chloride, chloroform, carbon tetrachloride, trichlene, cholrlbenzene, epichlorlhydrin, methyl-n-propyl ketone, acetophenone, n-propyl acetate, n-butyl acetate 1-nitropropane, styrene, methyl methacrylate, or α-methyl styrene, and a coagulant in an amount of 10% by weight or less of said graft rubber polymer which can coagulate said latex and then (b) removing the said organic agent and the remaining water from the remaining organic phase by a thermal means.

4,690,975

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi, and Yutaro Fukuda, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,204

Claims priority, application Japan, May 28, 1985, 60-114871; May 30, 1985, 60-117056

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—64 **7 Claims**

1. A method for producing a rubber modified thermoplastic resin which comprises removing an aqueous phase from a two-phase mixture comprising a graft rubber polymer latex (1) obtained by graft polymerization of vinyl monomer on a rubber latex, a thermoplastic resin (2) which is soluble in an organic agent, and the organic agent in an amount of 0.2 to 6 times the weight of all the polymers (3) which is capable of dissolving said thermoplastic resin (2) and has a solubility in water of 5 to 50% by weight at 25° C., wherein the said organic agent comprises methyl ethyl ketone, methyl acetate, ethyl acetate, diethyl cellosolve, ethyl cellosolve acetate, furfural, trioxan, methyl formate, ethyl formate, propylene oxide, 2-pentanol, 2-butanol, isobutanol, n-butanol, acrylonitrile, or a mixed agent comprising a first agent and a second agent, wherein the first agent comprises acetone, methanol, ethanol, n-propanol, iso-propanol, formic acid, acetic acid, propionic acid, dioxane, tetrahydrofuran, N,N-dimethylformamide, N,N-dimethylacetamide, N,N-dimethylsulfoxide, ethyl cellosolve, or phenol, and wherein the second agent comprises toluene, xylene, benzene, chloroform, methylene chloride, dimethyl ether, isopropyl ether, tetrachloroethane, ethylbenzene, styrene, or methyl methacrylate; and then removing said organic agent and remaining water from the remaining organic phase by a thermal means.

4,690,976

BLENDS OF OLEFINIC AND MONOVINYLIDENE AROMATIC POLYMERS

Jerry L. Hahnfeld, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 519,438, Aug. 1, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,505

Int. Cl.[4] C08L *51/04, 51/06, 23/06, 23/10*

U.S. Cl. 525—70 **22 Claims**

1. A polymer blend composition comprising:

(a) at least about 20 weight percent olefin polymer, said weight percent being based on the weight of components (a), (b) and (c);

(b) at least about 5 weight percent monovinylidene aromatic polymer based on the weight of components (a), (b) and (c); and

(c) a compatibilizing amount of a monovinylidene aromatic polymer-grafted α-olefin copolymer provided that the α-olefin copolymer of component (c) is different from and nonmiscible with the olefin polymer of component (a) and comprises a polymer of an α-olefin monomer having from 2 to 4 carbon atoms and at least one additional different polymerizable alpha-olefin monomer having from 3 to 16 carbon atoms.

4,690,977

VINYL CHLORIDE POLYMER COMPOSITION

Hideki Hosoi, Kobe; Toshihiko Hasegawa, Hyogo, and Taizo Aoyama, Himeji, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 721,001, Apr. 8, 1985, Pat. No. 4,645,795. This application Aug. 20, 1986, Ser. No. 897,968

Claims priority, application Japan, Apr. 12, 1984, 59-74630

Int. Cl.[4] C08L *51/04, 57/08*

U.S. Cl. 525—83 **5 Claims**

1. A vinyl chloride polymer composition comprising:

(A) 3 to 50 parts by weight of a grafted copolymer, and

(B) 97 to 50 parts by weight of a vinyl chloride polymer, the total amount of said copolymer (A) and said polymer (B) being 100 parts by weight;

said grafted copolymer (A) comprising:

(1) 50 to 80 parts by weight of a rubber copolymer, and

(2) 50 to 20 parts by weight of a grafting monomer graft-polymerized onto said component (1), the total amount of said component (1) and said component (2) being 100 parts by weight;

said rubber copolymer component (1) comprising:

(a) 60 to 90% by weight of a core rubber copolymer comprising 99 to 85% by weight of an alkyl acrylate having an alkyl group of 2 to 8 carbon atoms, 1 to 15% by weight of a conjugated diolefin and 0 to 5% by weight of a polyfunctional cross-linking agent, and

(b) 40 to 10% by weight of a surface rubber copolymer comprising 98 to 70% by weight of an alkyl acrylate having an alkyl group of 2 to 8 carbon atoms, 2 to 30% by weight of a conjugated diolefin and 0 to 5% by weight of a polyfunctional cross-linking agent and being obtained by polymerizing said component (a) to give said core rubber copolymer and then polymerizing said surface rubber copolymer component (b) in the presence of said core rubber copolymer (a), and the ratio of said conjugated diolefin to said alkyl acrylate in said surface rubber copolymer (b) being larger than the ratio of said conjugated diolefin to said alkyl acrylate in said core rubber copolymer (a);

and said grafting monomer component (2) comprising:

(i) 30 to 95% by weight of methyl methacrylate, and

(ii) 70 to 5% by weight of at least one monomer selected from the group consisting of an unsaturated nitrile, an aromatic vinyl compound, an alkyl acrylate having an alkyl group of 1 to 8 carbon atoms and an alkyl methacrylate having an alkyl group of 2 to 4 carbon atoms, and being graft-polymerized onto said rubber copolymer (1) by conducting a graft-polymerization in two stages.

4,690,978

THERMOPLASTIC COMPOSITIONS BASED ON POLYPHENYLENE ETHERS AND STYRENE-BUTADIENE POLYMERS PRODUCED BY EMULSION POLYMERIZATION

Hans Jadamus, Marl; Wilfried Ribbing, Dorsten, and Roland Feinauer, Marl, all of Fed. Rep. of Germany, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 792,283

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442274

Int. Cl.[4] C08F *36/06;* **C08L** *9/06, 71/04*

U.S. Cl. 525—152 **12 Claims**

1. A thermoplastic composition, comprising:

(A) a polyphenylene ether in an amount of from 15 to 95 parts by weight;

(C) a styrene butadiene rubber, obtained by emulsion polymerization, in an amount of from 3 to 15 parts by weight; and

(D) a styrene-butadiene copolymer prepared by emulsion polymerization, wherein the said styrene is incorporated in the copolymer in an amount of >80 wt. %, the said styrene-butadiene copolymer being present in an amount of from 3 to 15 parts by weight.

4,690,979

TERMINALLY FUNCTIONALIZED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,230

Int. Cl.[4] C08F *8/42, 8/34*

U.S. Cl. 525—153 **14 Claims**

1. The functionalized polymer prepared from the reaction of an electrophilic reagent and anionically active poly(alloocimene) comprised of a mixture of greater than 50 weight percent 2,3- and 6,7-poly(alloocimene) and less than 50 weight percent 4,7-poly(alloocimene) residues in the polymer chain thereof.

4,690,980

ACRYLIC MODIFIED POLYMERS

Debra L. Singer, Pittsburgh; William J. Birkmeyer, Oakmont; Rostyslaw Dowbenko, Gibsonia, and Charles M. Kania, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 755,995, Jul. 17, 1985, abandoned. This application May 20, 1986, Ser. No. 864,579

Int. Cl.[4] C08F *265/02*

U.S. Cl. 525—286 **19 Claims**

1. A liquid, ungelled composition of matter which comprises a graft copolymer prepared by the free radical initiated vinyl addition polymerization in an organic medium of a vinyl monomer component which contains at least 0.5 weight percent of an epoxy group containing vinyl monomer in the presence of an acid group containing polymer having an acid value greater than 10 mg KOH/g, at least one means of graft formation being the condensation reaction between the acid groups of the acid group containing polymer and the epoxy groups of the vinyl monomer component.

4,690,981

IONOMERS HAVING IMPROVED LOW TEMPERATURE PROPERTIES

Robert J. Statz, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 477,512, Mar. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 453,951, Dec. 28, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,485

Int. Cl.[4] C08F *22/00*

U.S. Cl. 525—329.6 **5 Claims**

1. Ionic copolymer of ethylene, unsaturated carboxylic acid and at least one softening comonomer said ionic copolymer having improved low temperature properties, wherein the unsaturated carboxylic acid is selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid, and half esters of maleic, fumaric and itaconic acids, and the softening comonomer is selected from the group consisting of n-propyl acrylate, n-butyl acrylate, 2-ethylhexyl acrylate, and 2-methoxyethyl acrylate said copolymer containing from about 10 to about 87% by weight of ethylene, from about 3 to about 30% by weight of unsaturated acid and from about 10 to about 60% by weight of said softening comonomer, said copolymer having from about 3 to about 90% of the carboxylic acid groups ionized by neutralization with metal ion selected from the group consisting of sodium, potassium, zinc, calcium, magnesium, lithium, aluminum, nickel and chromium, said copolymer being characterized by a low level of chain branching of up to about 5.5 chain branches/1000 backbone methylene units, said copolymer being further characterized by having a flex durablity which is improved by a factor of at least about 500% when compared with a polymer of the same composition as said ionic copolymer, but having about 8.0 short chain branches per 1000 backbone methylene units.

4,690,982

EPOXIDIZED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,232

Int. Cl.[4] C08F *8/08*

U.S. Cl. 525—331.9 **3 Claims**

1. Epoxidized 2,3- and 6,7-poly(alloocimene).

4,690,983

HYDROGENATED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,231

Int. Cl.[4] C08F *8/04*

U.S. Cl. 525—331.9 **5 Claims**

1. Hydrogenated 2,3- and 6,7-poly(alloocimene).

4,690,984

METAL COMPLEXES OF POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, and Mark S. Pavlin, Lawrenceville, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 25, 1986, Ser. No. 934,729

Int. Cl.[4] C08F *8/42*

U.S. Cl. 525—332.3 **6 Claims**

1. A metal complex of 2,3- and 6,7-poly(alloocimene) and a metallic compound.

4,690,985

STAR/COMB-BRANCHED POLYAMINE

Donald A. Tomalia, and Mark J. Hall, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 683,299, Dec. 18, 1984, Pat. No. 4,599,400. This application Mar. 7, 1986, Ser. No. 837,126

Int. Cl.[4] C08G *69/00, 73/02*

U.S. Cl. 525—419 **4 Claims**

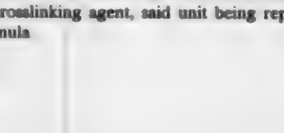
2. A star/comb-branched polyamine represented by the formula

$$Z[NH{-}C(R^2)_2(CH_2)_x C(R^2)_2)_m]_nR$$

wherein Z is the residue of a core compound, each R^2 is independently hydrogen or hydrocarbyl, R is a chain-terminating group, m is a whole number from 2 to 1000, x is 0 or 1 and n is a whole number from 3 to 100.

3. The polyamine of claim 2 wherein Z is an n-valent hydrocarbon radical, each R^2 is hydrogen, x is 0 and n is a whole number in the range from 3 to 20.

4. The polyamine of claim 3 wherein Z is



wherein n is from 3 to 6 and R is hydrogen or alkyl.

4,690,986

IMPACT-RESISTANT THERMOPLASTIC POLYORGANOSILOXANE-BASED GRAFT COPOLYMER AND PROCESS FOR PRODUCING SAME

Isao Sasaki, Hiroshima; Akira Yanagase; Yasunori Kawachi, both of Otake; Tetsuya Mayuzumi, Kawagoe; Toshio Oba, Annaka, and Fumio Okada, Takasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Shin-Etsu, Chemical Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 726,462, Apr. 24, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,463

Claims priority, application Japan, May 30, 1984, 59-108492

Int. Cl.[4] C08F *283/12*

U.S. Cl. 525—479 **18 Claims**

1. An impact-resistant, thermoplastic polyorganosiloxane-based graft copolymer produced by the emulsion graft polymerization of at least one vinyl monomer on an emulsion-polymerized polyorganosiloxane which consists of

90 to 99.8 mole % of an organosiloxane unit represented by the formula

$$R'_2SiO_{2/2} \quad (I)$$

wherein R' is the same or different and denotes methyl, ethyl, propyl, or phenyl,

0.1 to 10 mole % of a unit derived from a graft-linking agent, said unit being represented by the formula

$$CH_2{=}C(CH_3){-}COO{+}CH_2{\rightarrow}_p SiR_n^2O_{(3-n)/2} \quad (II)$$

wherein; R^2 denotes methyl, ethyl, propyl, or phenyl; n denotes a number of 0, 1, and 2; and p denotes a number of 1 to 6, and

0.1 to 10 mole % of a unit derived from a tetrafunctional silane crosslinking agent, said unit being represented by the formula

$$SiO_{4/2} \quad (III),$$

said polyorganosiloxane showing a degree of swelling of 5 to 15 in toluene, and

said graft copolymer containing said polyorganosiloxane in an amount of 10 to 70% by weight.

4,690,987

ACTIVATION ENERGY-CURABLE RESIN COMPOSITION

Shigeru Sakakibara, Ichihara; Shunji Arimoto, Narashino; Hidenobu Ishikawa, Ichihara, and Osamu Maruyama, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,254

Claims priority, application Japan, May 28, 1984, 59-106530

Int. Cl.[4] C08G *8/22, 8/30;* C08L *63/04*

U.S. Cl. 525—502 **13 Claims**

1. An activation energy-curable resin composition comprising as an essential ingredient a resin obtained by reacting (a) the reaction product of a novolac epoxy compound and an unsaturated monocarboxylic acid with (b) the reaction product of a diisocyanate and a polyacrylate or polymechacrylate ester of a polyol wherein the final structure has one hydroxyl group for each molecule.

4,690,988

POLYMER-MODIFIED VINYLIZED EPOXY RESINS

Dwight K. Hoffman, Midland, Mich.; Michael G. Stevens, Worthington, Ohio, and Virginia B. Messick, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1985, Ser. No. 693,411

Int. Cl.[4] C08G *8/30;* C08L *63/10*

U.S. Cl. 525—502 **18 Claims**

1. A dispersion which comprises an uncured vinylized epoxy resin prepared from an uncured epoxy resin as a continuous phase having dispersed therein (i) an insoluble polymer and (ii) a dispersion stabilizer which is the polymerizate of at least one vinyl monomer and a vinylized epoxy resin adduct derived from the reaction product of an unsaturated carboxylic acid and a polyepoxide, said insoluble polymer having been polymerized in situ in the uncured epoxy resin and in the presence of the dispersion stabilizer, and the uncured epoxy resin subsequently vinylized by reacting the uncured epoxy resin with an ethylenically unsaturated acid; the insoluble polymer dispersed phase further characterized in that it forms an insoluble polymer dispersion in the uncured epoxy and remains a stable dispersion in the vinylized epoxy resin at a temperature above 60° C.

4,690,989

METHOD FOR THE SINGLE-STEP PRODUCTION OF VINYL POLYMERS

Miloslav Kolinsky; Václava Jisová, and Josef Babka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

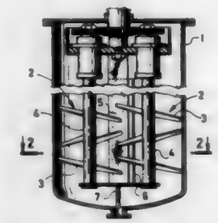
Filed Nov. 8, 1985, Ser. No. 796,558

Claims priority, application Czechoslovakia, Nov. 10, 1984, 8572-84

Int. Cl.[4] C08F *2/02, 14/06*

U.S. Cl. 526—88 **3 Claims**

1. A method for the single-step production of vinyl polymers by a non-radical heterogeneous polymerization in bulk under the effect of organometallic catalysts, which comprises: adding a vinyl monomer to a vertical, cylindrical reactor which is provided with at least two planetary stirrers placed outside of the reactor axis each of said planetary stirrers having at least one planar centrally symmetrical two-blade paddle, and means for wiping the sidewalls of said reactor; subsequently introducing into said reactor a solution of an organometallic catalyst under intense stirring in sequential partial doses of size 10^{-5} to 10^{-3} mole to achieve a total catalyst amount of 5×10^{-4} to 5×10^{-2} mole of catalyst per mole of the monomer; allowing the monomer to undergo non-radical heterogeneous polymerization under the influence of the organometallic catalyst; intensely stirring the contents of the reactor; cutting and disintegrating any formed compact mass with the planetary stirrers



while concurrently wiping the sidewalls of the reactor with said wiping means until the polymer acquires a powdery form; and discharging the powdery product.

4,690,990

POLYMERIZATION PROCESS USING A CATALYST COMPRISING A PHOSPHATE AND WITH A BIS-(CYCLOPENTADIENYL)CHROMIUM(II) COMPOUND

Max P. McDaniel, and James N. Short, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 363,681, Mar. 30, 1982, Pat. No. 4,424,139. This application Sep. 24, 1982, Ser. No. 423,499

Int. Cl.[4] C08F *4/44, 4/02*

U.S. Cl. 526—138 **24 Claims**

1. A polymerization process comprising:

contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with a catalyst system comprising:

(a) a catalyst comprising a bis-(cyclopentadienyl)chromium(II) compound and a phosphate-containing support;

(b) an organometal cocatalyst; and

recovering a polymer.

4,690,991

PROCEDURE FOR MAKING COPOLYMERS OF ETHYLENE AND LONG-CHAINED ALPHA OLEFINS

Jukka Seppälä , Helsinki, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI84/00045, § 371 Date Feb. 4, 1985, § 102(e) Date Feb. 4, 1985, PCT Pub. No. WO85/00172, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 21, 1984, Ser. No. 711,575

Claims priority, application Finland, Jun. 22, 1983, 83/2287

Int. Cl.[4] C08F *2/14, 210/6*

U.S. Cl. 526—158 **12 Claims**

1. Method of forming a terpolymer having a density of at least about 0.900 kg/dm$_3$ of an at least 11 carbon atom olefin, ethylene and 1-butylene, which comprises

polymerizing ethylene with said long-chain α-olefin of at least 11 carbon atoms, by suspension polymerization in the presence of a catalyst composed of Al-activated titanium chloride and triethyl aluminum to form a terpolymer thereof,

said polymerization being effected at a temperature of up to 120° C. in a fluid in which the resulting terpolymer is insoluble, in the presence of about 0.01–2.0 mol/dm$_3$ of 1-butylene,

whereby the reactivity of the long-chain α-olefin is increased, and the quantity of long-chain α-olefin in the resulting terpolymer is regulated to between about 0.01 and 15% by weight.

4,690,992

POLYMERIZATION OF DIFUNCTIONAL RING COMPOUNDS

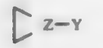
Robert H. Grubbs; Laura R. Gilliom, both of Pasadena, Calif., and Alain Stove, Paris, France, assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 594,355, Mar. 28, 1984, Pat. No. 4,607,112. This application Apr. 24, 1986, Ser. No. 855,370

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—160 **12 Claims**

1. A method of polymerizing comprising reacting a monomer of the formula:



where Z is a hydrocarbon or heterocarbon linkage containing 2 to 6 carbon atoms within a strained ring and Y contains a group polymerizable by a Lewis acid or by a transition metal catalyst but not polymerizable by the present catalyst, with a source of:

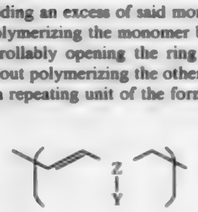
Cp_2TiCH_2

to form a titanacyclobutane complex catalyst of the formula:



adding an excess of said monomer to the complex; and

polymerizing the monomer by selectively and controllably opening the ring containing the strained olefin without polymerizing the other group to form a polymer having a repeating unit of the formula:



4,690,993

P-(2-HYDROXY HEXAFLUOROISOPROPYL) STYRENE [HFIS] MONOMER FOR OPHTHALMIC APPLICATIONS

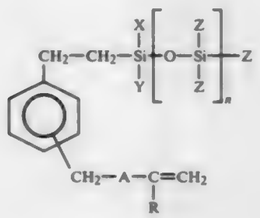
Joseph J. Faicetta, and Joonsup Park, both of Arlington, Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

Continuation-in-part of Ser. No. 801,259, Nov. 25, 1985. This application Dec. 31, 1985, Ser. No. 815,439

Int. Cl.[4] C08F *212/20, 230/08*

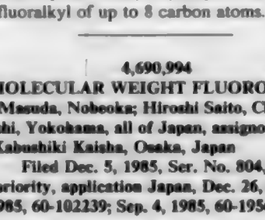
U.S. Cl. 526—242 **7 Claims**

1. A copolymer for preparation of optical lenses which comprises a siloxane main monomer polymerizable to make a colorless, eye-inert polymer, said siloxane monomer having the formula:



where

(1) "A" is selected from the group consisting of:

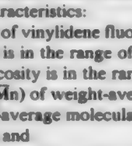


where m is a number and is from 2–4;

(2) R is hydrogen or methyl;

(3) X and Y are selected from the group consisting of C_1 to C_5 alkyl groups, phenyl groups and W groups;

(4) W is a group of the structure



(5) Z is selected from the group consisting of C_1 to C_5 alkyl groups and phenyl groups; and

(6) n is an integer from zero to five; and from about 10% by weight to about 60% by weight of a hydroxyperfluoroalkylstyrene of the formula:

wherein X and Y are selected from the group consisting of monovalent perfluoralkyl, hydroperfluoroalkyl, and chloroperfluoralkyl of up to 8 carbon atoms.

4,690,994

HIGH MOLECULAR WEIGHT FLUOROELASTOMER

Yoshinori Masuda, Nobeoka; Hiroshi Saito, Chiba, and Hiroshi Kobayashi, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1985, Ser. No. 804,772

Claims priority, application Japan, Dec. 26, 1984, 59-273338; May 14, 1985, 60-102239; Sep. 4, 1985, 60-195617; Sep. 9, 1985, 60-199015

Int. Cl.[4] C08F *14/22*

U.S. Cl. 526—254 **14 Claims**

1. A fluoroelastomer containing 65 to 100 wt % of vinylidene fluoride units and hexafluoropropylene units and 35 to 0 wt % of tetrafluoroethylene units wherein the fluoroelastomer has the following characteristics:

(a) the weight ratio of vinylidene fluoride units to hexafluoropropylene units is in the range of 80:20 to 50:50;

(b) the intrinsic viscosity is in the range of 250 to 500 ml/g;

(c) the ratio ($\overline{M}w/\overline{M}n$) of weight-average molecular weight ($\overline{M}w$) to number-average molecular weight ($\overline{M}n$) is in the range of 2 to 12; and

(d) said fluoroelastomer has a bimodal molecular weight distribution, and the ratio (h_2/h_1) of the peak-height (h_2) of higher molecular weight to the peak-height (h_1) of lower molecular weight shown by a chart of gel permeation chromatography is in the range of 0.8 to 4.0.

4,690,995

COPOLYMERS CONTAINING HIGH CONCENTRATIONS OF PHENOL ANTIOXIDANT UNITS

William H. Keskey, Midland, and Mark R. Johnson, Breckenridge, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,997

Int. Cl.[4] C08F *220/40, 220/38, 220/36, 220/28, 220/58, 220/68, 220/70*

U.S. Cl. 526—286 **31 Claims**

1. The process of producing an oxidation resistant composition of matter comprising a polymer derived from emulsion polymerizing at a pH lower than about 5.0 a monomer system comprising (a) 20 to 50 parts by weight per hundred parts by weight of total monomer of at least one hindered phenol antioxidant monomer having an addition polymerizable double bond of the formula:

Ph-A1-D

wherein Ph is a hindered phenol group having at least one branched or cyclic lower alkyl substituent of at least 3 carbon atoms ortho to the hydroxyl group; A1 is $-(CH_2)_k-$, —S—, —O—, $-CH_2O-$, $-CH_2S-$, where k is 1 or 2; and D is an acyclic substituent of the formula:

$$-(CR'_2)_m-A2-(CR'_2)_n-A3-(CR'_2)_p-A4-(CR'_2)_q-A5-E$$

wherein each A2, A3, A4 and A5 is independently selected from the group consisting of a thioether, ether, carboxylic acid ester, thioester, carboxylic acid amide, urethane-type linkage and nothing; m, n, p, and q are independently integers of zero to 4, but where A1 is —O— or —S—, m is not zero; each R' is independently H or a (substituted) alkyl group; and E is a group having addition polymerizable unsaturation, and (b) at least 15 to 60 parts by weight of at least one 3 to 8 carbon α,β-ethylenically unsaturated carboxylic acid monomer.

4,690,996

INVERSE EMULSIONS

Yen-Jer Shih, Somerset; John (Ji-Hsiung) Tsai, Belle Meade; Wen B. Chino, and Dilip K. Ray-Chaudhuri, both of Bridgewater, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 28, 1985, Ser. No. 770,332

Int. Cl.[4] C08L *51/02*

U.S. Cl. 527—312 **20 Claims**

1. A water soluble or water swellable graft copolymer dispersed in an inverse water-in-oil emulsion comprising:

(a) 20–80% by weight of the emulsion of an aqueous discontinuous phase comprising 30–70% by weight water and 70–30% by weight of a polysaccharide copolymer having a polysaccharide content of 5 to 50%; and

(b) 80 to 20% by weight of a continuous phase comprising 70 to 99% inert hydrophobic liquid; and 1 to 30% by weight of an oil soluble surfactant.

4,690,997

FLAME RETARDANT WIRE COATING COMPOSITIONS

James A. Cella, Clifton Park; Marsha M. Grade, and Thomas L. Evans, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

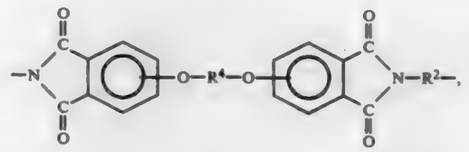
Continuation-in-part of Ser. No. 574,118, Jan. 26, 1984, abandoned. This application Jul. 31, 1985, Ser. No. 760,792

Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—26 **10 Claims**

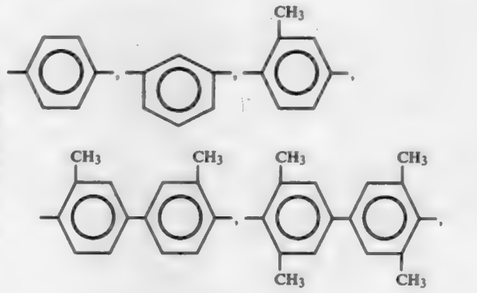
1. Extrudable, flame retardant, polydiorganosiloxane polyimide comprising by weight,

(A) from about 40 to 90% of chemically combined aryletherimide units having the formula,

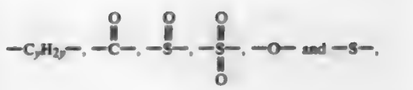


and

(B) from about 10 to 60% of chemically combined polydiorganosiloxane consisting essentially of from about 11 to about 20 diorganosiloxy units, where the organo radicals attached to silicon are selected from monovalent $C_{(1-14)}$ hydrocarbon radicals and substituted monovalent $C_{(1-14)}$ hydrocarbon radicals, R^2 is selected from the class consisting of the same or different $C_{(1-14)}$ divalent hydrocarbon radicals, or substituted $C_{(1-14)}$ divalent hydrocarbon radicals, and R^4 is a divalent aryl radical selected from the class consisting of



X^1 is a member selected from the class consisting of



and p is 0 or 1, and y is an integer equal to 1 to 5 inclusive.

4,690,998

SPECIAL EPOXY RESINS

Bernd Wahle, Kaarst; Dieter Freitag, Krefeld; Walter Uerdingen; Heinrich Heine, both of Leverkusen, and Manfred Blazejak, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

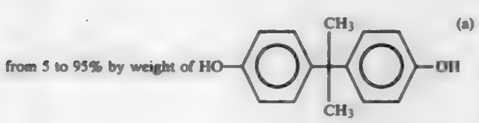
Filed Feb. 14, 1986, Ser. No. 829,205

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506519

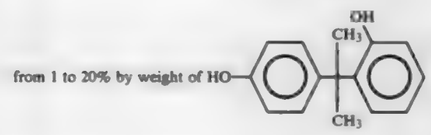
Int. Cl.⁴ C08G *59/00, 65/08, 65/14*

U.S. Cl. 528—96 **1 Claim**

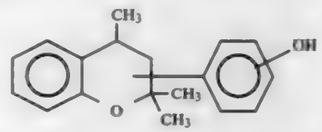
1. An epoxy resin which is the reaction product of epichlorohydrin and a phenolic mixture wherein the phenolic mixture is:



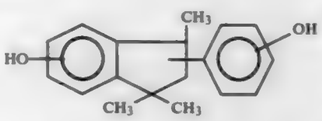
from 5 to 95% by weight of (a)



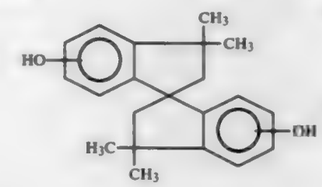
from 1 to 20% by weight of (b)



from 5 to 30% by weight of (c)



from 5 to 25% by weight of (d)

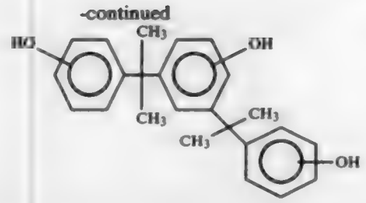


from 0.5 to 5% by weight of (e)



from 0.5 to 10% by weight of (f)

-continued



and

from 0 to 10% by weight of phenol. (g)

4,690,999

LOW THERMAL EXPANSION RESIN MATERIAL AND COMPOSITE SHAPED ARTICLE

Shun-ichi Numata; Koji Fujisaki; Noriyuki Kinjo; Junichi Imaizumi, all of Hitachi, and Yoshikatsu Mikami, Shimodate, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,736

Claims priority, application Japan, Aug. 1, 1983, 58-139436; Aug. 19, 1983, 58-152351

Int. Cl.⁴ G08G *18/06;* **C08G** *73/10*

U.S. Cl. 528—188 **12 Claims**

1. A low thermal expansion resin material comprising a polyimide having as a chemical structural unit at least one aromatic ring which can rotate around its molecular axis but which has no flexibility in another direction and which is bonded at para positions, said polyimide having a molecular chain oriented so as to have a substantially linear structure on a plane by stretching a film of the polyimide or a precursor thereof uniaxially or biaxially with stretcher and exhibiting a linear thermal expansion coefficient of $3\times[10^5]10^{-5}$ to $4\times10^{-7}k^{-1}$.

4,691,000

OXYMETHYLENE COPOLYMERS AND PROCESS FOR THEIR PREPARATION

André Collart, Rixensart, and Fredy Declerck, Grimbergen, both of Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

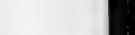
Filed Apr. 11, 1986, Ser. No. 850,550

Claims priority, application France, Apr. 15, 1985, 85 05756

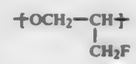
Int. Cl.⁴ C08G *10/02, 79/02*

U.S. Cl. 528—244 **20 Claims**

1. Copolymers containing oxymethylene repeating units having the formula



and 2-fluoromethoxyethylene repeating units having the formula



4,691,001

PROCESS FOR MAKING SOLID UREA-FORMALDEHYDE RESINS

David Taylor, Halesowen, England, assignor to BIP Chemicals, Ltd., Manchester, England

Continuation-in-part of Ser. No. 704,405, Feb. 22, 1985, Pat. No. 4,564,667. This application Oct. 31, 1985, Ser. No. 793,318

Claims priority, application United Kingdom, Feb. 23, 1984, 8404758; Aug. 1, 1985, 8519392

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.⁴ C08G *12/34*

U.S. Cl. 528—256 **17 Claims**

1. A process for the manufacture of a solid urea-formaldehyde resin which comprises the steps of

(a) reacting a solution of formaldehyde in water with urea under acid conditions at a molar ratio of formaldehyde to urea which is greater than 2.5 to 1 the reaction conditions being 15 to 100 minutes at 100° C. at pH6 or their equivalent, and adjusting the pH to be neutral to mildly alkaline;

(b) concentrating the solution so made its water content to less that 50 percent by weight

(c) adding further urea to adjust the molar ratio of formaldehyde to urea to between 2.0 to 1 and 1.1 to 1, and

(d) evaporating water from the solution under conditions whereby rapid evaporation of water takes place without substantial increase in the degree of condensation of the resin and without substantial precipitation of the solid resin to reduce the water content to such a level that on cooling the liquid resin product a friable solid is obtained.

4,691,002

UNSATURATED HOMO- AND/OR COPOLYMERIZABLE POLYESTERS

Günther Hegemann, and Karin Miedeck, both of Hamburg, Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Münster-Hiltrup, Fed. Rep. of Germany

Continuation of Ser. No. 519,489, Aug. 1, 1983, abandoned. This application Jan. 30, 1986, Ser. No. 823,980

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3229639

Int. Cl.⁴ C08G *63/52, 63/54, 63/68, 63/76*

U.S. Cl. 528—289 **10 Claims**

1. An unsaturated homo- and/or copolymerizable polyester prepared by the simultaneous reaction of:

(a) a diol selected from the group consisting of glycol, propane diol, butane diol, hexane diol, neopentyl glycol, trimethyl hexane diol, cyclohexane dimethanol, tricyclodecane diol, 1,1-bishydroxymethylcyclohexene-3, and tricyclodecane monoglycerin ether;

(b) a dicarboxylic acid selected from the group consisting of maleic acid, fumaric acid, itaconic acid, mesaconic acid, aconitic acid, esters thereof, anhydrides thereof and acid chlorides thereof;

(c) an end-position hydroxylated polybutadiene having an average molecular weight of about 2400 to 3000, an average hydroxy functionality of about 2.2 to 2.4, and a microstructure of about 60 percent 1,4-trans, about 20 percent 1,4-cis and about 20 percent vinyl, the amount of said hydroxylated polybutadiene being from 1 to 10 mol percent relative to the total amount of diol and hydroxylated polybutadiene present in the polyester.

5. An unsaturated homo- and/or copolymerizable polyester according to claim 1, wherein the components are further defined as:

(a) trimellitic acid anhydride;

(b) neopentyl glycol;

(c) said end-position hydroxylated polybutadiene having an average molecular weight of about 2800 and a hydroxyfunctionality of about 2.2 to 2.4;

(d) maleic acid anhydride; and

(e) the reaction product of tetrahydrophthalic acid anhydride and monoethanolamine.

4,691,003

UNIFORM POLYMERIC FILAMENTS

Benjamin C. Sze, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1986, Ser. No. 857,278

Int. Cl.⁴ C08G *63/02*

U.S. Cl. 528—308.1 **1 Claim**

1. A continuous filament polyester yarn spun at a spinning speed of at least 8 Km/min having a DSC endotherm temperature in the range of from about 264 to about 273 degrees centigrade and having a tenacity at break greater than that expressed by the relationship $t=79.89-0.278T$ wherein T is the DSC endotherm temperature in degrees centigrade and t is the tenacity at break in grams per denier.

4,691,004

COPOLYMERIZATION OF LACTAM WITH DIENE POLYMER HAVING AMINO OR IMINO END GROUPS

Masao Nishiyama, and Yasuo Hirano, both of Hirakata, Japan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 22, 1985, Ser. No. 789,991

Claims priority, application Japan, Oct. 30, 1984, 59-226941

Int. Cl.⁴ C08G *69/14, 69/18*

U.S. Cl. 528—323 **9 Claims**

1. A process for producing a lactam copolymer, which comprises copolymerizing an omega-lactam and a diene polymer having an amino or imino group at molecular ends by the action of an alkaline catalyst and a polyfunctional co-catalyst, the proportions of the components satisfying the following equations (I) and (II)

$$a/c>\frac{1}{2} \quad \text{(I)}$$

$$b/c>1 \quad \text{(II)}$$

wherein a, b and c represent the equivalent weights of the alkaline catalyst, the polyfunctional co-catalyst and the diene polymer, respectively, per equivalent of omega-lactam.

4,691,005

THIOPHENE DERIVATIVE POLYMER, POLYMER COMPOSITION, AND METHODS FOR MANUFACTURE THEREOF

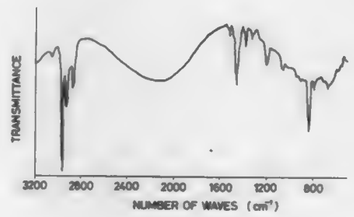
Masaaki Sato; Susumu Tanaka, both of Ibaraki; Kyoji Kaeriyama, Tsuchiura, and Yoshio Suda, Hachioji, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,494

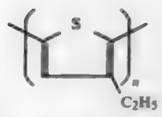
Claims priority, application Japan, Mar. 9, 1985, 60-46816; Mar. 9, 1985, 60-46818

Int. Cl.⁴ C08G *75/00*

U.S. Cl. 528—380 **1 Claim**



1. A poly-[2,5-(ethylthienylene)] having a trtansmitting light of orange color represented by the formula:



wherein n denotes a number of at least 110 and not more than 250.

4,691,006

ANTIGENIC MODIFICATION OF POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to Ohio State University, Columbus, Ohio

Continuation-in-part of Ser. No. 472,190, Mar. 4, 1983, Pat. No. 4,526,716, and a continuation-in-part of Ser. No. 00,777, May 18, 1983, said Ser. No. , is a continuation-in-part of Ser. No. 323,690, Nov. 20, 1981, Pat. No. 4,384,995, which is a continuation-in-part of Ser. No. 112,628, Jan. 16, 1981, Pat. No. 4,302,386, which is a division of Ser. No. 936,876, Aug. 25, 1978, Pat. No. 4,201,770, which is a continuation-in-part of Ser. No. 622,031, Oct. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,955, Apr. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 406,821, Oct. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 357,892, May 7, 1973, abandoned. This application Nov. 2, 1984, Ser. No. 667,863

Int. Cl.[4] C07K *7/10*

U.S. Cl. 530—324 **7 Claims**

1. A peptide having an amino acid sequence corresponding to the C-terminal sequence of the beta subunit of human chorionic gonadotropin, said peptide comprising from 20 to 45 amino acid residues.

4,691,007

PROLINE DERIVATIVES

Anand S. Dutta, Stockport, England; Ross L. Stein, Wilmington, Del.; Diane A. Trainor, Glen Mills, Pa., and Richard A. Wildonger, Newark, Del., assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, United Kingdom

Division of Ser. No. 603,408, Apr. 24, 1984, Pat. No. 4,596,789. This application Dec. 6, 1985, Ser. No. 806,265

Claims priority, application United Kingdom, Apr. 27, 1983, 8311423; May 27, 1983, 8314708

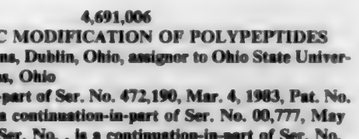
Int. Cl.[4] C07C *103/52*; A61K *37/02*; C07D *207/00*

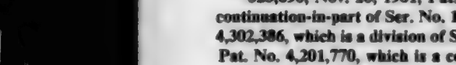
U.S. Cl. 530—331 **3 Claims**

1. A compound of the following formula (I-A), (II-A) or (III-A):



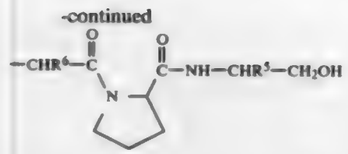
(I-A)

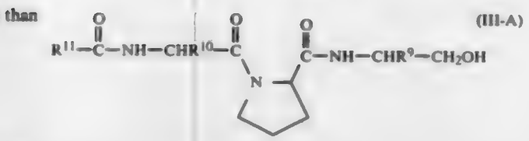




(II-A)

-continued





(III-A)

wherein

R^1, R^5 and R^9 are lower alkyl groups containing from 3 to about 6 carbon atoms;

R^2, R^3, R^6, R^7 and R^{10} are alkyl groups of about 1 to 10 carbon atoms which may optionally be substituted by a monocyclic aryl group or by an amide, urea or carbamate group via the nitrogen thereof; and

R^4 and R^{11} are lower alkyl, substituted lower alkyl, lower alkoxy or substituted lower alkoxy groups wherein the alkyl or alkoxy contains about 1 to 6 carbon atoms, or monocyclic or bicyclic aryl groups; and

R^8 is hydroxy, a lower alkoxy group containing about 1 to 6 carbon atoms, or an aralkoxy group containing about 7 to 12 carbon atoms;

and wherein $—CHR^2—$, $—CHR^3—$, $—CHR^6—$, $—CHR^7—$, $—CHR^{10}—$ and the proline group are of the L-configuration.

4,691,008

PROCESS FOR THE LOW-RACEMIZATION PREPARATION OF PEPTIDE INTERMEDIATES OF THE SYNTHESIS OF GONADORELIN AND GONADORELIN ANALOGS, AND NEW INTERMEDIATES FOR THIS PROCESS

Rainer Uhmann, Kriftel, and Kurt Radscheit, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 25, 1985, Ser. No. 715,418

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 341124

Int. Cl.[4] C07K *1/02, 5/08, 7/06*

U.S. Cl. 530—339 **10 Claims**

1. A process for the preparation of peptides of the Formula I

$$U—A^1—A^2—A^3—A^4—A^5—X \quad (I)$$

wherein

U denotes a urethane protective group,

A^1 denotes Trp or D-Trp,

A^2 denotes Ser, Ala or Thr,

A^3 denotes Tyr or Phe,

A^4 denotes Gly, the residue of a D-amino acid or the residue of a D-amino acid derivative,

A^5 denotes Leu, N-methyl-Leu, N-ethyl-Leu, Ser(Bu^t), Cys(Bu^t), Asp(OBu^t), Glu(OBu^t), Orn(Boc) or Lys(Boc) and

X denotes OBu^t or A^6—Pro—Y,

where

A^6 represents Arg, Orn, Lys or homoarginine, and

Y represents Gly—NH_2, NH—NH—CO—NH_2, (C_1–C_3)-alkylamino, cyclopropylamino, (C_1–C_3)-alkylamino which is substituted with hydroxyl or fluorine, or cycloalkylamino which is substituted with hydroxyl or fluorine, which process comprises reacting a tripeptide of the formula II

$$U—A^1—A^2—A^3—OH \quad (II)$$

having a free carboxyl group, in which U, A^1, A^2 and A^3 have the above-mentioned meaning, with a peptide of the formula III

$$H—A^4—A^5—X \quad (III)$$

having a free amino group and a protected carboxyl group, in which A^4, A^5 and X have the above-mentioned meaning, or its derivative having a free amino group and a protected carboxyl group in the presence of a condensing agent.

4,691,009

HYBRID PROTEINS PRODUCED BY AN ULTRAHIGH PROKARYOTIC EXPRESSION SYSTEM

John L. Palmer, and Algis Anilionis, both of Arlington, Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Dec. 26, 1984, Ser. No. 686,342

Int. Cl.[4] C07K *15/00*

U.S. Cl. 530—350 **3 Claims**

1. A hybrid protein having the following amino acid sequence:

Met Leu Arg Pro Val Glu Thr Pro Thr Arg Glu Ile Lys Lys Leu Asp Gly Leu Trp Ala Phe Ser Leu Asp Arg Glu Asn Cys Gly Ile Asp Gln Arg Trp Trp Glu Ser Ala Leu Gln Glu Ser Arg Ala Ile Ala Val Pro Gly Ser Phe Asn Asp Gln Phe Ala Asp Ala Asp Ile Arg Asn Tyr Als Gly Asn Val Trp Tyr Gln Arg Glu Val Phe Ile Pro Lys Gly Trp Ala Gly Gln Arg Ile Val Leu Arg Phe Asp Ala Val Thr His Tyr Gly Lys Val Trp Val Asn Asn Gln Glu Val Met Glu His Gln Gly Gly Tyr Thr Pro Phe Glu Ala Asp Val Thr Pro Tyr Val Ile Ala Gly Lys Ser Val Arg Ile Thr Val Cys Val Asn Asn Glu Leu Asn Trp Gln Thr Ile Pro Pro Gly Met Val Ile Thr Asp Glu Asn Gly Lys Lys Lys Gln Ser Tyr Phe His Asp Phe Phe Asn Ser Met Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala Ala Asn Ala Ala Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Lys Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu ILe Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Asn Leu Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Gly Val Ile Asp Asp Lys Leu Ser Asn Met Arg Ile Leu Glu Asp Glu Arg Ala Ser.

4,691,010

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO A HUMAN EARLY THYMOCYTE ANTIGEN, ANTIBODY, AND METHODS

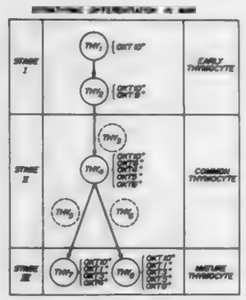
Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 432,458, Oct. 4, 1982, Pat. No. 4,624,925, which is a division of Ser. No. 100,071, Dec. 4, 1979, Pat. No. 4,364,934. This application Aug. 9, 1984, Ser. No. 639,162

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.[4] A61K *39/395, 35/16*; C12N *5/00*; C12P *21/00*

U.S. Cl. 530—387 **1 Claim**



1. A monoclonal antibody having the identifying characteristics of the product of hybridoma ATCC 8021.

4,691,011

WATER-DISPERSIBLE HYDROPHILIC MILK PROTEIN PRODUCT

Kaoru Inagami, Tokyo, and Noboru Kikuchi, Kawasaki, both of Japan, assignors to The Calpis Food Industry Co., Ltd., Japan

Filed Dec. 16, 1985, Ser. No. 809,569

Claims priority, application Japan, Dec. 24, 1984, 59-270709

Int. Cl.[4] A23C *9/12*

U.S. Cl. 530—832 **17 Claims**

1. A milk protein product having water-dispersible and hydrophilic properties and containing substantially no serum, said milk protein product being obtained by a process comprising the steps of:

(a) coagulating milk under a flowing condition and at a pH ranging from 5.10 to 6.10 and temperatures ranging from 38 to 86 degrees C., wherein the temperature y and the pH x vary together,

from $x=5.10$ to $x=(y+247)/52.3$ as y varies from 38 to 62 degrees C.,

from $x=(y+244)/60$ to $x=(y+247)/52.3$ as y varies from 62 to 72.03 degrees C., and

from $x=(y+244)/60$ to $x=6.10$ as y varies from 72.03 to 86 degrees C.,

to thus obtain a coagulum; and

(b) separating said coagulum.

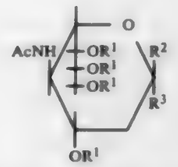
4,691,012

SIALIC ACID DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Haruo Ogura, Matsudo; Kimio Furuhata, Tokyo; Toshiaki Osawa, Tokyo; Satoshi Toyoshima, Tokyo; Yoshiyasu Shitori, Musashino; Masayoshi Ito, Kunitachi, and Shoji Yoshimura, Iruma, all of Japan, assignors to MECT Corporation, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,638
Claims priority, application Japan, Mar. 9, 1984, 59-44906
Int. Cl.[4] C07H *17/00*
U.S. Cl. 536—23 **16 Claims**

1. An N-acetylneuraminic acid represented by the general formula:



wherein the R^1 groups are, independently, hydrogen or acetyl; R^2 is selected from the group consisting of uridine, 5-fluoro-uridine, 2', 3'-isopropylidene-uridine and 5-fluoro-2',3-isopropylidene-uridine; and R^3 is carboxyl or methoxycarbonyl.

4,691,013

PROCESS FOR PRODUCTION OF MODIFIED HYDROXYETHYL CELLULOSE

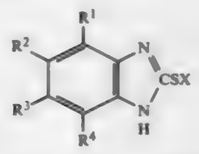
Yukihiko Sekimoto, Chiba; Makoto Yanagita, Tokyo, and Shoichi Kanda, Yokosuka, all of Japan, assignors to Lion Corporation and Nitto Chemical Industry Co., Ltd, both of Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,954
Claims priority, application Japan, Sep. 3, 1985, 60-193141
Int. Cl.[4] C08B *11/20*
U.S. Cl. 536—96 **6 Claims**

1. A process for producing a modified hydroxyethyl cellulose comprising the steps of:

allowing hydroxyethyl cellulose to be swollen in a solvent; and

mixing the hydroxyethyl cellulose swollen in the solvent with a 2-mercapto benzimidazole compound having the formula (I):



(I)

wherein R^1, R^2, R^3, and R^4 independently represent hydrogen, methyl, or ethyl, and X is hydrogen, an alkali metal, an alkaline earth metal, or ammonium.

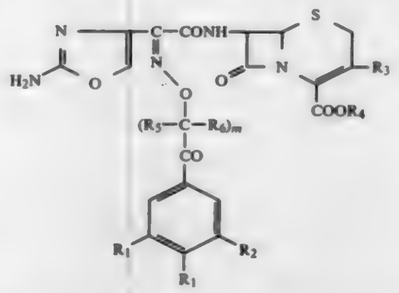
4,691,014

CEPHALOSPORIN COMPOUNDS

Takanobu Naito, Funabashi; Masaaki Yokoyama, Tokyo; Kazuya Sasaki, Higashikurume; Makoto Yamamoto, Tokyo, and Kouji Amemiya, Kodaira, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,567
Claims priority, application Japan, Oct. 19, 1984, 59-218660
Int. Cl.[4] C07D *501/22*; A61K *31/545*
U.S. Cl. 540—227 **10 Claims**

1. A cephalosporin compound having the formula:



(I)

wherein R_1 is a hydroxy group, a lower alkanoyloxy group or a lower alkoxycarbonyl group, R_2 is a hydrogen atom, a hydroxy group, a lower alkanoyloxy group or a lower alkoxycarbonyloxy group, R_3 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkenyl group, a lower alkoxy group, or $—CH_2R_7$ wherein R_7 is a hydrogen atom, an azido group, a lower alkanoyloxy group, a carbamoyloxy group, a pyridinium group, a 4-sulfoethyl pyridinium group, or a thiazolylthio, thiadiazolylthio, triazolylthio, oxazolylthio, tetrazolylthio, pyridinylthio, pyrimidinylthio or triazinylthio group which is unsubstituted or substituted by a lower alkyl, carboxyalkyl or dimethylaminoethyl group, R_4 is a hydrogen atom or a carboxy-protecting group, each of R_5 and R_6 is a hydrogen atom or a lower alkyl group, or R_5 and R_6 form a cycloalkylidene group together with the carbon atom to which they are attached, and m is 0 or 1, or a pharmaceutically acceptable salt thereof.

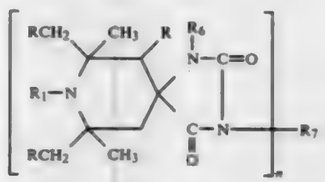
4,691,015

HYDROXYLAMINES DERIVED FROM HINDERED AMINES

Rudolf A. Behrens, New Fairfield, Conn., and Raymond Seltzer, New City, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

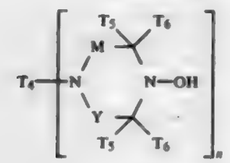
Continuation-in-part of Ser. No. 633,549, Jul. 23, 1984, Pat. No. 4,590,231, which is a continuation-in-part of Ser. No. 540,732, Oct. 11, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,651
Int. Cl.[4] C07D *413/04, 401/14, 401/02, 295/00, 211/94*
U.S. Cl. 544—198 **9 Claims**

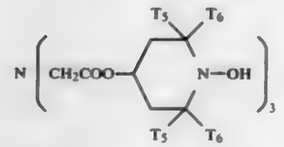
1. A compound of formula D, G, I-K or M



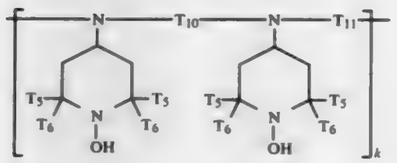
(D)

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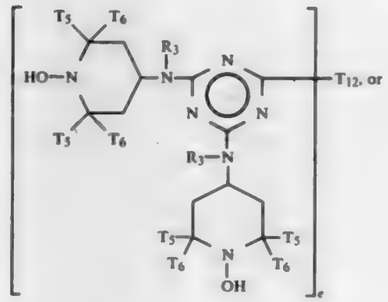


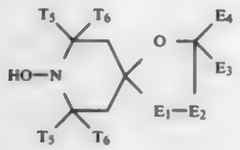


(I)



(J)





(M)

wherein

R is hydrogen or methyl

n is 1 or 2,

R_1 is hydroxyl,

R_6 is hydrogen, C_1–C_{12} alkyl, allyl, benzyl, glycidyl or C_2–C_6 alkoxyalkyl;

when n is 1

R_7 is hydrogen, C_1–C_{12} alkyl, C_3–C_5 alkenyl, C_7–C_9 aralkyl, C_5–C_7 cycloalkyl, C_2–C_4 hydroxyalkyl, C_2–C_6 alkoxyalkyl, C_6–C_{10} aryl, glycidyl, a group of the formula $—(CH_2)_m—COO—Q$ or of the formula $—(CH_2)_m—O—CO—Q$ wherein m is 1 or 2, and Q is C_1–C_4 alkyl or phenyl; or when n is 2,

R_7 is C_2–C_{12} alkylene, C_6–C_{12} arylene, a group $—CH_2CH(OH)—CH_2—O—X—O—CH_2—CH(OH)—CH_2—$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene, or a group $—CH_2CH(OZ^1)CH_2—(OCH_2)CH_2)_2—$ wherein Z^1 is hydrogen, C_1–C_{18} alkyl, allyl, benzyl, C_2–C_{12} alkanoyl or benzoyl;

when n is 1,

T_4 is hydrogen, C_1–C_{18} alkyl, C_5–C_7 cycloalkyl, C_2–C_8 alkenyl unsubstituted or substituted by a cyano, carbonyl or carbamide group, or it is glycidyl, a group of the formula $—CH_2CH(OH)—Z$ or of the formula $—CONH—Z$ and Z is hydrogen, methyl or phenyl; or

(G)

when n is 2,

T_4 is C_2–C_{12} alkylene, C_6–C_{12} arylene, xylylene, a $—CH_2CH(OH)—CH_2$ group, or a group $—CH_2—CH(OH)—CH_2—O—X—O—CH_2—CH(OH)—CH_2—$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene; or, provided that R_3 is not alkanoyl, alkenoyl or benzoyl, R_4 can also be divalent acyl radical of an aliphatic, cycloaliphatic or aromatic dicarboxylic acid or dicarbamic acid, or can be the group —CO—; or R_3 and R_4 together when p is 1 can be the cyclic acyl radical of an aliphatic or aromatic 1,2- or 1,3-dicarboxylic acid;

(I)

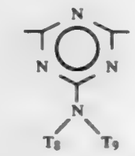
T_5 is methyl,

T_6 is methyl or ethyl, or T_5 and T_6 together are tetramethylene or pentamethylene;

M and Y are independently methylene or carbonyl, but are not both carbonyl;

(J)

T_{10} and T_{11} are independently alkylene of 2 to 12 carbon atoms, or T_{11} is

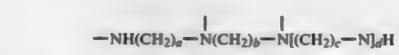


(K)

T_8 and T_9 are independently hydrogen, alkyl of 1 to 18 carbon atoms, or T_8 and T_9 together are alkylene of 4 to 6 carbon atoms, or 3-oxapentamethylene,

k is 2 to 100,

T_{12} is



where a, b and c are independently 2 or 3, and d is 0 or 1; and e is 3 or 4;

E_1 and E_2, being different, each are oxo or imino,

E_3 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl, said phenyl or said naphthyl substituted by chloride or by alkyl of 1 to 4 carbon atoms, or phenylalkyl of 7 to 12 carbon atoms, or said phenylalkyl substituted by alkyl of 1 to 4 carbon atoms, and

E_4 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl or phenylalkyl of 7 to 12 carbon atoms, or

E_3 and E_4 together are polymethylene of 4 to 17 carbon atoms, or said polymethylene substituted by up to four alkyl groups of 1 to 4 carbon atoms.

4,691,016

INTERMEDIATES FOR THE PREPARATION OF 8,9-DIHALOBENZO[IJ]QUINOLIZINE CARBOXYLIC ACIDS

Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 671,606, Nov. 15, 1985, Pat. No. 4,556,713, which is a division of Ser. No. 318,927, Nov. 6, 1981, Pat. No. 4,524,148. This application Aug. 22, 1985, Ser. No. 768,127
Int. Cl.[4] C07D *471/04*
U.S. Cl. 546—95 **1 Claim**

1. The compound 8-amino-6,7-dihydro-9-fluoro-5-methyl-1-oxo-1H,5H-benzo[ij]quinolizine-2-carboxylic acid.

4,691,017

2-HYDROXY-AND 2-HALO-ETHYLTHIOPYRIDINE INTERMEDIATES FOR PREPARING ANTIULCER COMPOUNDS

Elemer Ezer; Kalman Harsanyi; Hajnalka Vikar née Pethó ; Judit Matuz; Laszló Szporny; Eszter Cholnoky; Orsika Kuthi; Ferenc Trischler; Bela Hegedus; Márta Kapolnás née Pap, and Anna Kállay née Sohonyai, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

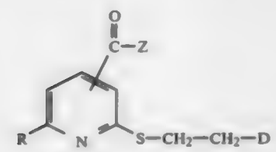
Continuation-in-part of Ser. No. 783,842, Oct. 3, 1985, Pat. No. 4,624,959, and Ser. No. 783,875, Oct. 3, 1985. This application Sep. 26, 1986, Ser. No. 912,999

Claims priority, application Hungary, Oct. 5, 1984, 3777/84; Oct. 5, 1984, 3775/84

Int. Cl.⁴ C07D *213/70*

U.S. Cl. 546—298 **4 Claims**

1. A compound of the Formula (I)



(I)

wherein

R is hydrogen or C_1 to C_4 alkyl;

Z is phenyl optionally substituted by one or more halogen atoms and/or alkyl groups having 1 to 4 carbon atoms; and

D is hydroxy, mesyloxy, p-tosyloxy, or halogen; or a pharmaceutically acceptable acid addition salt thereof.

4,691,018

PYRIDINE DERIVATIVES AND THEIR USE AS ANTI-ALLERGIC AGENTS

Takashi Mori; Nobuhiro Ohi; Yoshiyuki Ohsugi, and Yasuhiro Yamashita, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

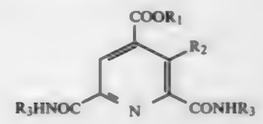
Filed May 6, 1986, Ser. No. 860,211

Claims priority, application Japan, May 23, 1985, 60-110642

Int. Cl.⁴ C07D *213/60*

U.S. Cl. 546—309 **6 Claims**

1. A compound of the formula



wherein R_1 is a hydrogen atom or a lower alkyl group which may be substituted with hydroxy, lower alkoxy or di-lower alkylamino; R_2 is a hydrogen atom, an amino group or a lower alkylamino group; and R_3 is a lower alkyl group, and a non-toxic salt thereof.

4,691,019

ANORECTIC AGENT; 4-(3-TRIFLUOROMETHYLPHENYL)-1-(2-CYANOETHYL)-1,2,3,6-TETRAHYDROPYRIDINE

Dino Nisato, Pavia; Emilio Crisafulli, Milan; Alberto Bianchetti, Milan, and Paolo Carminati, Milan, all of Italy, assignors to Sanofi, Paris, France

Division of Ser. No. 630,969, Jul., 1984, Pat. No. 4,602,024, which is a division of Ser. No. 354,522, Mar. 3, 1982, Pat. No. 4,472,408. This application Dec. 20, 1985, Ser. No. 811,490

Claims priority, application France, Mar. 11, 1981, 81 04890

Int. Cl.⁴ C07D *211/68*

U.S. Cl. 546—330 **1 Claim**

1. 4-(3-trifluoromethylphenyl)-1-(2-cyanoethyl)-1,2,3,6-tetrahydropyridine or a pharmaceutically acceptable acid addition salt thereof.

4,691,020

PREPARATION OF OPTICALLY ACTIVE CARBOXYLIC ACIDS

Christoph Ruechardt, Stegen b. Freiburg; Joachim Jachme, and Ulrich Salz, both of Freiburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

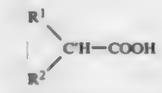
Continuation of Ser. No. 363,503, Mar. 30, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 632,700

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116474

Int. Cl.⁴ C07D *213/55, 401/06*; C07C *59/84, 59/86*

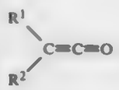
U.S. Cl. 546—341 **3 Claims**

1. A process for the preparation of an optically active carboxylic acid of the formula I



I

wherein R^1 is an unsubstituted or substituted alkyl radicals of 1 to 20 carbon atoms, unsubstituted or substituted alkenyl or alkynyl radicals having 2–20 carbon atoms, an unsubstituted or substituted cycloalkyl or cycloalkenyl radicals having 5 or 6 ring members, an unsubstituted or substituted benzyl, phenyl, naphthyl or pyridyl radical wherein substituted represents a member selected from the group consisting of C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, halogen, formyl, C_1–C_4-alkoxy, C_1–C_4-Carbalkoxy, C_1–C_4-acyl, C_1–C_4-acyloxy or amino which is linked to the asymmetric C' atom via a carbon atom and R^2 is one of the radicals R^1 (but not the same radical) or halogen which is bonded to the asymmetric C' atom via an oxygen atom, which process comprises reacting a ketene II



II

with an optically active alcohol in a homogeneous liquid phase in the presence of from 0.1 to 10 moles of a tertiary amine III per mole of ketene II and then converting the resulting ester into the acid I.

4,691,021

AMINOALKYL HYDANTOINS AND GLYCIDYL DERIVATIVES THEREOF

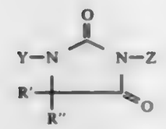
Pen C. Wang, Midland, Mich.; Van I. W. Stuart, Missouri City, Tex.; Ronald L. Yates, and Steven P. Crain, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 773,960

Int. Cl.⁴ C07D *405/14, 233/76*

U.S. Cl. 548—309 **19 Claims**

1. A compound of one of the following formulas:

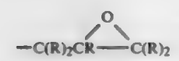


(A)

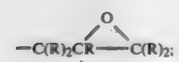
wherein R' and R'' are independently H, lower alkyl or phenyl, and wherein Z is a moiety of the formula:

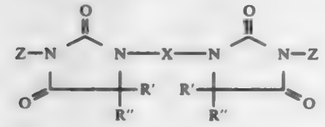
$$-C(R)_2C(R)_2N(Q)_2$$

wherein each Q independently is R or a moiety of the formula:



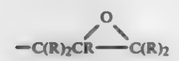
wherein each R independently is H or an aliphatic or inertly-substituted aliphatic moiety of up to about 25 carbon atoms, wherein inertness is defined as inertness with respect to reactive sites of the reagents under reaction conditions; and wherein Y is H when Q is R, but Y and Q are the same when Q is





(B)

wherein X is a divalent hydrocarbyl moiety which contains zero, one or more hetero atoms, and wherein each X is selected independently, provided that when X does not contain a hetero atom then Z contains the



group.

4,691,022

PROCESS FOR THE PREPARATION OF MONOCYCLIC, BICYCLIC AND TRICYCLIC AMINOACIDS

Rainer Henning, Hattersheim am Main, and Hansjörg Urbach, Kronberg/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

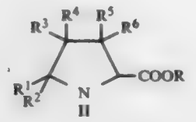
Filed Jun. 21, 1984, Ser. No. 623,200

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322530

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 548—408 **7 Claims**

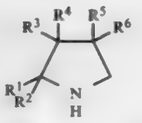
1. A process for the preparation of a compound of the formula



I

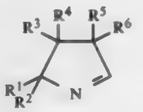
in which

R represents hydrogen, (C_1–C_6)-alkyl or (C_7–C_9)-aralkyl, and R^1 and R^3, together with the two carbon atoms bearing them, form a 4- to 8-membered saturated monocyclic or bicyclic carbocyclic ring system selected from cyclobutane, cyclopentane, cyclohexane, cycloheptane, cyclooctane, bicyclo[2.2.1]heptane or bicyclo[2.2.1]octane and the remaining radicals R^2, R^4, R^5 and R^6 are hydrogen, which process comprises converting a pyrrolidine derivative of the formula II



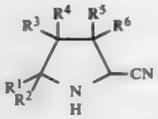
II

in which R^1 to R^6 have the same meaning as in formula I, with an ammonium, alkali metal or alkaline earth metal peroxodisulfate in the presence of a silver salt, into a Δ^1-pyrroline derivative of the formula III



III

in which R^1 to R^6 have the same meaning as in formula I, reacting the latter with hydrogen cyanide or a metal cyanide to form a compound of the formula IV



IV

in which R^1 to R^6 have the same meaning as in formula I, and reacting the latter with a compound of the formula ROH, in which R has the meaning defined above, with the formation of a compound of the formula I.

4,691,023

AMINO DISULFIDES

Dolatrai M. Vyas, Fayetteville, N.Y.; Yulin Chiang, Morristown, N.J., and Terrence W. Doyle, Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 581,291, Feb. 24, 1984, which is a continuation-in-part of Ser. No. 484,016, Apr. 11, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,602

Int. Cl.[4] C07D *487/14*; H61K *31/40*

U.S. Cl. 548—422 1 Claim

1. The compound having the chemical name 7-[2-(4-nitrophenyldithio)ethylamino]-9a-methoxymitosane.

4,691,024

NEW MITOMYCIN DERIVATIVES, PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Kunikatsu Shirahata, Komae; Motomichi Kono; Yutaka Saito, both of Machida; Masaji Kasai, Fujisawa; Makoto Morimoto, Shizuoka, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

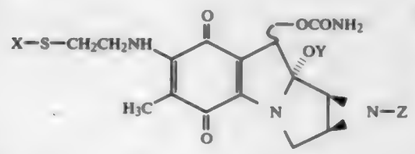
Filed Oct. 3, 1986, Ser. No. 915,949

Claims priority, application Japan, Jun. 1, 1984, 59-112428

Int. Cl.[4] C07D *487/14*

U.S. Cl. 548—422 5 Claims

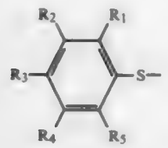
1. Mitomycin derivatives of general formula (I)



(I)

wherein Y and Z; which may be the same or different, each represents a hydrogen atom or a methyl group;

~ represents α or β bonding and x represents a group of formula (II)



(II)

wherein R_1 to R_5 are each selected from hydrogen, halogen, hydroxyl, nitro, amino, lower alkyl, lower alkoxy, lower alkylamino or lower alkanoylamino, and salts thereof.

4,691,025

BISMALEIMIDES AND PREPREG RESINS THEREFROM

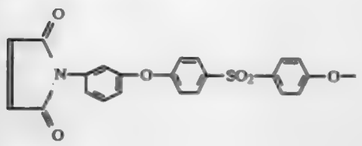
Linda A. Domeier, and Hugh C. Gardner, both of Somerville, N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1983, Ser. No. 564,400

Int. Cl.[4] C08G *20/32*

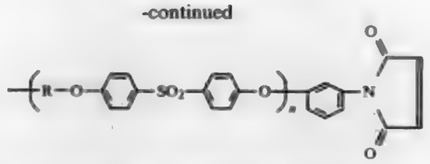
U.S. Cl. 548—521 9 Claims

1. A bismaleimide of the formula:



II

-continued



wherein n is 0 to 4 and R is the residuum of a dihydric phenol.

4,691,026

SELF- AND HYDROXYL REACTIVE FORMALDEHYDE-FREE CYCLIC HEMIAMIDAL AND HEMIAMIDE KETAL CROSSLINKING MONOMERS

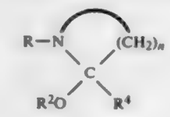
Robert K. Pinschmidt, Jr., Allentown; Dale D. Dixon, Kutztown, and William F. Burgoyne, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 30, 1985, Ser. No. 760,442

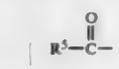
Int. Cl.[4] C07D *207/12, 251/18, 251/46, 251/70*

U.S. Cl. 548—531 21 Claims

1. A compound represented by the following formula:

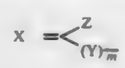


wherein R is an olefinically unsaturated organic radical represented by one of the following formulas



(a)

where R^5 is a C_2–C_{23} organic radical of the formula



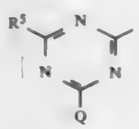
where

X is hydrogen, C_1–C_{10} alkyl, phenyl, —C(O)NH_2, or —CO_2R^8 where R^8 is hydrogen or a C_1–C_9 alkyl group,

Y is —O—, —CH_2O—, —NR^6—, —CH_2NR^6—, —(CO)—O—$(CH_2)_a$—NR^6—, where R^6 is hydrogen or a C_1–C_4 alkyl radical and a is 1 to 4, —O(CO)—, —N(CO)—, a branched or unbranched C_1 to C_8 alkylene group, or —C_6H_4—,

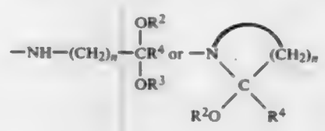
Z is hydrogen, C_1–C_4 alkyl, —C(O)NH_2, —CO_2R^7 where R^7 is hydrogen or a C_1–C_3 alkyl group,

m is 0 or 1;

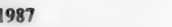


(b)

where R^5 is as defined above, Q is hydrogen, hydroxy, C_1–C_4 alkoxy or alkylamino,



-continued



(c)

where

R^2 is hydrogen or a C_1–C_4 alkyl group,

R^4 is hydrogen or a C_1–C_4 alkyl group, and

n is 3.

4,691,027

1,3-BENZOXATHIOLE DERIVATIVES

Takao Yoshioka; Eiichi Kitazawa; Mitsuo Yamazaki, and Yoshio Iizuka, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

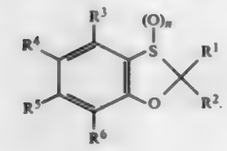
Filed Mar. 26, 1985, Ser. No. 716,171

Claims priority, application Japan, Mar. 28, 1984, 59-60198

Int. Cl.[4] C07D *327/04, 497/00*; A61K *31/39*

U.S. Cl. 549—32 29 Claims

1. A compound of formula (I):



(I)

in which:

R^1 represents a hydrogen atom, a C_1–C_{10} alkyl group, a substituted C_1–C_{10} alkyl group, a C_2–C_6 alkenyl group, a C_6–C_{10} carbocyclic aryl group, a substituted C_6–C_{10} carbocyclic aryl group or an alkoxycarbonyl group wherein the alkoxy parts has from 1 to 6 carbon atoms, said substituents on said alkyl and aryl groups being selected from the group consisting of:

halogen atoms, hydroxy groups, C_1–C_7 aliphatic acyloxy groups, C_6–C_{10} carbocyclic aryl carboxylic acyloxy groups, α-alkoxyalkoxy groups where both alkoxy parts have from 1 to 6 carbon atoms, a tetrahydro-2-furanyloxy- or tetrahydro-pyranyloxy group, trialkylsilyloxy groups where each alkyl part has from 1 to 6 carbon atoms, aralkyloxy groups where the aryl part is C_6–C_{10} carbocyclic aryl and the alkyl part is C_1–C_6 alkyl, C_1–C_6 alkoxy groups, C_1–C_6 aminoalkoxy groups, alkylaminoalkoxy groups where the alkyl and alkoxy parts both have from 1 to 6 carbon atoms, dialkylaminoalkoxy groups where the alkyl and alkoxy parts all have from 1 to 6 carbon atoms, carboxy groups, alkoxycarbonyl groups where the alkoxy part has from 1 to 6 carbon atoms, carbamoyl groups, alkylcarbamoyl groups where the alkyl part has from 1 to 6 carbon atoms, dialkylcarbamoyl groups where both alkyl parts have from 1 to 6 carbon atoms and, as substituents on aryl groups only, C_1–C_6 alkyl groups;

R^2 represents a hydrogen atom, a C_1–C_6 alkyl group or a C_3 or C_4 alkyl group;

R^3 represents a hydrogen atom or a C_1–C_6 alkyl group;

R^4 represents a hydroxy group, a C_1–C_{21} aliphatic acyloxy group or a C_6–C_{10} carbocyclic aryl carboxylic acyloxy group;

R^5 represents a C_1–C_{12} alkyl group, a C_1–C_6 alkoxy group, a hydroxy group, a C_1–C_7 aliphatic acyloxy group or a C_6–C_{10} carbocyclic aryl carboxylic acyloxy group;

R^6 represents a hydrogen atom, a C_1–C_6 alkyl group or a C_1–C_6 alkoxy group; and

n is 0, 1, or 2;

and pharmaceutically acceptable salts thereof.

4,691,028

TETRA-SUBSTITUTED FULVALENE DERIVATIVES

Hiroo Inokuchi, Okazaki; Genji Saito, Chigasaki; Kazuhiko Seki, and Takehiko Mori, both of Okazaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 855,105

Claims priority, application Japan, Apr. 26, 1985, 50-90604

Int. Cl.[4] C07D *317/32, 327/04, 339/06, 343/00*

U.S. Cl. 549—36 3 Claims

1. A fulvalene derivative represented by formula (I) below:



where A^1–A^8 are independently selected from an S atom, a Te atom, and an Se atom; and R^1–R^4 are an alkyl or alkene having 4 to 22 carbon atoms.

4,691,029

PROCESS FOR PRODUCING 3-THIENYLMALONIC ACID

Patrick C. Harris, Leatherhead, and John A. Wilcox, Capel, both of England, assignors to Beecham Group p.l.c., England

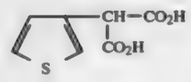
Continuation of Ser. No. 434,245, Oct. 14, 1982, abandoned, which is a continuation of Ser. No. 297,704, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 156,188, Jun. 3, 1980, abandoned. This application Aug. 16, 1984, Ser. No. 641,330

Claims priority, application United Kingdom, Jun. 19, 1979, 7921385

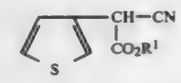
Int. Cl.[4] C07D *333/24*

U.S. Cl. 549—79 5 Claims

1. A hydrolytic process for the preparation in one step of 3-thienylmalonic acid from 3-thienyl cyanoacetate in enhanced yield and purity, said 3-thienylmalonic acid having the formula:



which comprises hydrolysing a compound of the formula:



wherein R^1 is alkyl or aryl, with at least a molar excess over the amount theoretically required for hydrolysis of sodium or potassium hydroxide in an aqueous solvent.

4,691,030

PROCESS FOR PREPARATION OF ALKENYLSUCCINIC ANHYDRIDES

Kiyoharu Fujino, Yokkaichi, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,885

Claims priority, application Japan, Dec. 19, 1984, 59-267889

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—255 4 Claims

1. A process for the preparation of alkenylsuccinic anhydrides, which comprises subjecting an olefin having 2 to 90 carbon atoms and maleic anhydride to addition reaction under heating in the presence of 0.001 to 5% by weight, based on the weight of the olefin, of at least one synthetic solid acid/base

catalyst selected from the group consisting of silica/titania, silica/alumina, silica/alumina/titania, silica/alumina/iron oxide, alumina/iron oxide, silica/alumina/magnesia, and silica/-titania/iron oxide,

the amount of the maleic anhydride being 0.5 to 1.2 moles per mole of the olefin.

4,691,031

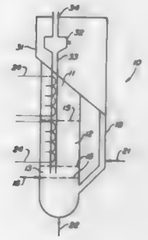
PROCESS FOR PREVENTING BACKMIXING IN A FLUIDIZED BED VESSEL

George D. Sucio, 417 Prospect St., Ridgewood, N.J. 07450, and John E. Paustian, 38 Adams Dr., Whippany, N.J. 07981

Filed Jun. 20, 1984, Ser. No. 622,767

Int. Cl.[4] B01J *8/18*

U.S. Cl. 549—258 8 Claims



1. A process for reacting a fluid phase in contact with solid catalyst particles in a fluidized bed contact zone, comprising:

reacting the fluid phase in contact with solid catalyst particles in a fluidized bed vessel including at least two fluidized bed compartments defined by partition means including a free flow area whereby said at least two fluidized bed compartments are in fluid flow communication with each other; maintaining the solid catalyst particles as a fluidized bed in each of the at least two compartments; passing the fluid phase through each of the compartments at a linear velocity of 2 to 50 times greater than the minimum fluidization velocity for the solid catalyst particles; passing the fluid phase through the free area of the partition means at a linear velocity of from 0.8 to 2.0 times greater than the entrainment velocity of the solid catalyst particles to thereby pass both the fluid phase and solid catalyst particles co-currently between the at least two fluidized bed compartments in substantially plug flow; separating solid catalyst particles from the fluid phase after passage through the at least two compartments; and recycling the separated solid catalyst particles for passage through the at least two compartments.

4,691,032

PROCESS FOR THE PREPARATION OF CHOLESTEROL DERIVATIVES AND NOVEL INTERMEDIATES THEREFOR

Andor Fürst, Basel; Ludwig Labler, Allschwil, and Werner Meier, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

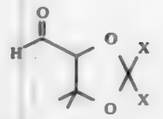
Division of Ser. No. 584,200, Feb. 27, 1984, Pat. No. 4,568,491, which is a continuation of Ser. No. 364,383, Apr. 1, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,928

Claims priority, application Switzerland, Apr. 29, 1981, 2784/81

Int. Cl.[4] C07D *317/26*

U.S. Cl. 549—450 3 Claims

1. An aldehyde of the formula



III

wherein X is hydrogen or methyl.

4,691,033

PROCESS FOR PREPARING 3-PHENOXYBENZALDEHYDES

James E. Hardwicke, III, Columbia, S.C., assignor to Hardwicke Chemical Company, Elgin, S.C.

Filed Dec. 20, 1985, Ser. No. 811,403

Int. Cl.[4] C07D *317/34*

U.S. Cl. 549—453 12 Claims

1. In a process for preparing a 3-phenoxybenzaldehyde acetal by reacting a 3-bromobenzaldehyde acetal with an alkali metal phenolate in the presence of a copper catalyst, the improvement which comprises conducting the reaction at a temperature of about 130°–165° C. in the presence of a phenol as the sole solvent.

4,691,034

PURIFICATION OF PROPYLENE OXIDE BY TREATMENT WITH CALCIUM HYDROXIDE IN GLYCEROL OR SUGAR WATER

John R. Sanderson; William A. Smith; Edward T. Marquis, all of Austin, and Kenneth P. Keating, Georgetown, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,842

Int. Cl.[4] C07D *301/32*

U.S. Cl. 549—542 18 Claims

1. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with aqueous calcium hydroxide in an amount at least stoichiometrically equivalent to the methyl formate and a solubilizing amount of a solubilizing compound selected from the group consisting of sucrose, fructose, maltose, glycerol and mixtures thereof,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the calcium hydroxide and

separating and recovering propylene oxide substantially free of methyl formate.

11. A method for purifying crude propylene oxide contaminated with methyl formate and aldehydes which comprises:

contacting crude propylene oxide with aqueous calcium hydroxide in an amount at least stoichiometrically equivalent to the methyl formate and a solubilizing amount of glycerol and an aldehyde scavenger selected from the group consisting of the sodium and potassium salts of bisulfite in an amount at least stoichiometrically equivalent to the aldehydes,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the calcium hydroxide and

separating and recovering propylene oxide substantially free of methyl formate and aldehydes.

4,691,035

PURIFICATION OF PROPYLENE OXIDE BY TREATMENT WITH A SELECTED BASE AND INERT SALT

John R. Sanderson; Edward T. Marquis; William A. Smith, all of Austin, and Kenneth P. Keating, Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,846

Int. Cl.[4] C07D *301/32*

U.S. Cl. 549—542 21 Claims

1. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with a base selected from the group consisting of NaOH, KOH, LiOH, Na_3PO_4, NaHCO, $NaHCO_3$, Na_2CO_3 and K_2CO_3 in an amount at least stoichiometrically equivalent to the methyl formate and glycerol in water,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the weak base and

separating and recovering propylene oxide substantially free of methyl formate.

10. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with a base selected from the group consisting of NaOH, KOH, LiOH, Na_3PO_4, Na_2CO_3 and K_2CO_3 in an amount at least stoichiometrically equivalent to the methyl formate; and a propylene oxide dehydrating amount of an inert salt selected from the group consisting of NaCl, NaBr, HCOONa, KCl, KBr, HCOOK, NaCHO, KCHO, Na_2SO_4 and K_2SO_4 in water,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the weak base and

separating and recovering propylene oxide substantially free of methyl formate.

4,691,036

ORGANIC NICKEL COMPOUNDS, THE PRODUCTION THEREOF AND THE USE THEREOF AS POLYMERIZATION CATALYSTS

Karl-Heinz A. O. Starzewski, Bad Vilbel; Josef Witte, Cologne, and Herbert Bartl, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,330

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506835

Int. Cl.[4] C07F *15/04*

U.S. Cl. 556—16 9 Claims

1. Nickel compounds produced by reacting a nickel(O) compound or a nickel compound which can be converted in situ into a nickel(O) compound with an adduct or a mixture of maleic acid anhydride and a tertiary phosphine.

4,691,037

RUTHENIUM-PHOSPHINE COMPLEX

Sadao Yoshikawa; Masahiko Saburi; Takao Ikariya; Youichi Ishii, all of Tokyo, and Susumu Akutagawa, Kanagawa, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 709,869, Mar. 8, 1985, abandoned. This application Jan. 6, 1986, Ser. No. 816,689

Claims priority, application Japan, Sep. 4, 1984, 59-183875

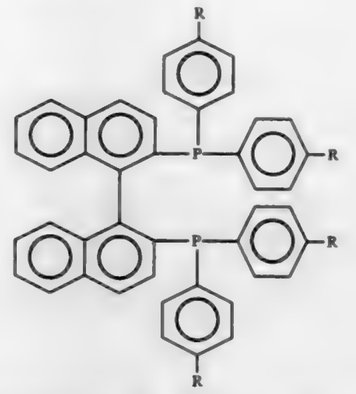
Int. Cl.[4] C07F *15/00*

U.S. Cl. 556—18 1 Claim

1. A ruthenium-phosphine complex represented by the formula (I)

$$Ru_xH_yCl_z(R\text{—}BINAP)_2(S)_p \quad (I)$$

wherein R—BINAP represents tertiary phosphine represented by the formula (II)



(II)

R which is the same represents hydrogen, methyl or t-butyl, S represents a tertiary amine selected from the group consisting of triethylamine, tri-n-butylamine, tri-n-octylamine, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, pyridine, dimethyl aniline and tetramethyl ethylenediamine, y represents 0 or 1, and when y is 0, x represents 2, z represents 4 and p represents 1, and when y is 1, x represents 1, z represents 1 and p represents 0.

4,691,038

NOVEL ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

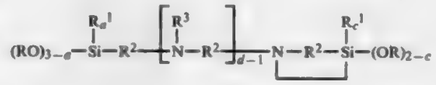
Eric R. Pohl, Tarrytown, and Enrico J. Pepe, Amawalk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 748,357, Jun. 24, 1985. This application Oct. 16, 1986, Ser. No. 919,653

Int. Cl.[4] C07F *7/10, 7/18*

U.S. Cl. 556—407 8 Claims

1. A poly(alkoxysilylalkyl)amine of the formula



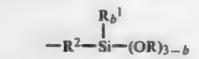
wherein

R is C_1–C_4 alkyl;

R^1 is hydrogen, C_1–C_6 alkyl or C_6–C_{12} aryl;

R^2 is C_3–C_8 alkylene, C_6–C_{12} arylene or C_7–C_{14} alkarylene,

R^3 is hydrogen, C_1–C_6 alkyl, C_6–C_{12} aryl or



wherein

R, R^1 and R^2 are as defined above;

a and b are 0, 1 or 2

c is 0 or 1, and

d is 1, 2 or 3.

4,691,039

ETHOXYLATED SILOXANE SURFACTANTS AND HYDROPHILIC SILICONES PREPARED THEREWITH

Steven M. Aasen, Lakeland, and Thomas T. Bryan, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1985, Ser. No. 798,738

Int. Cl.⁴ C07F 7/18

U.S. Cl. 556—446 **3 Claims**

1. An ethoxylated siloxane surfactant having the formula:

$$(R'O)_3Si(OC_2H_3R'')_m(OC_3H_6)_nOT$$

wherein each R′ group is independently a monovalent hydrocarbyl radical with the proviso that at least a majority of said R′ groups are sterically hindered alkyl radicals having at least three carbon atoms, each R″ group is independently hydrogen or a lower hydroxyalkyl radical, m is at least one, n is greater than or equal to zero, and T is hydrogen, a monovalent alkyl or alkenyl radical, or a group of the formula —Si(OR′)₃.

4,691,040

DERIVATIVES OF 10,11-DIHYDRO-5H-DIBENZO[A,D]CYCLOHEPTENE-5-ETHANOL

Werner Aschwanden, Ettingen; Quirico Branca, Basel; Emilio Kybarz, Reinach, and Rudolf Pfister, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

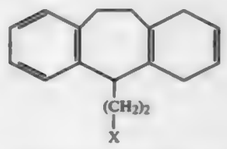
Division of Ser. No. 330,733, Dec. 14, 1981, Pat. No. 4,513,002. This application Feb. 5, 1985, Ser. No. 698,493

Claims priority, application Switzerland, Jan. 16, 1981, 273/81

Int. Cl.⁴ C07C 21/24, 143/02, 143/40, 143/26

U.S. Cl. 558—44 **2 Claims**

1. A compound of the formula



III

wherein X is selected from the group consisting of chlorine, bromine, iodine, methanesulfonyloxy, p-toluenesulfonyloxy, p-bromobenzenesulfonyloxy, and benzenesulfonyloxy.

4,691,041

PROCESS FOR PRODUCTION OF ETHYLENE GLYCOL AND DIMETHYL CARBONATE

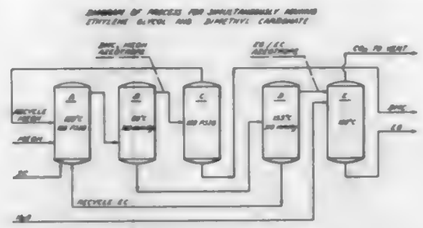
Roger G. Duranleau, Georgetown; Edward C. Y. Nieh, and John F. Knifton, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 3, 1986, Ser. No. 815,954

Int. Cl.⁴ C07C 68/00, 29/128, 31/20

U.S. Cl. 558—277 **11 Claims**

1. A process for producing ethylene glycol and dimethyl carbonate by reacting ethylene carbonate and methanol in the presence of a heterogeneous catalyst selected from the group consisting of ion exchange resins with quaternary ammonium functional groups, ion exchange resins with sulfonic, acid functional groups, ion exchange resins with carboxylic acid functional groups, alkali and alkaline earth silicates impregnated into silica, and ammonium exchanged zeolites, at a temperature of 0° to 150° C. until the desired products are formed.



4,691,042

PREPARATION OF MONOALKYLATED DIHYDROXYBENZENES AND NOVEL COMPOUNDS PREPARED THEREBY

Abel Mendoza, and Eric W. Otterbacher, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 614,503, May 29, 1984, which is a continuation-in-part of Ser. No. 507,448, Jun. 24, 1983. This application Oct. 9, 1985, Ser. No. 785,821

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—61 **1 Claim**

1. 2-Ethoxyethyl 2-(4-(1-methylethenyl)phenoxy)propanoate.

4,691,043

BENZOIC ACID DERIVATIVES PROCESS FOR PREPARATION AND APPLICATION AS DRUGS, DISINFECTANTS OR PRESERVATIVES

Henri Demarne; Robert Filhol, and Madeleine Mosse, all of Montpellier, France, assignors to Sanofi, Paris, France

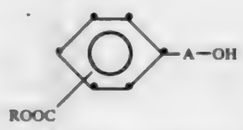
Continuation of Ser. No. 640,108, Aug. 13, 1984, abandoned. This application Jan. 7, 1986, Ser. No. 816,978

Claims priority, application France, Aug. 18, 1983, 83 13445

Int. Cl.⁴ C07C 69/76

U.S. Cl. 560—064 **10 Claims**

1. A compound of the formula



wherein A represents a straight or branched alkyl chain with 5 to 10 carbon atoms, and R represents hydrogen, or an aklyl or hydroxyalkyl group with 2 to 6 carbon atoms, and salts thereof when R represents hydrogen.

4,691,044

ANTIOXIDANTS FOR ORGANIC MATERIALS

Samuel Evans, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

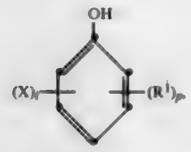
Filed Aug. 28, 1985, Ser. No. 770,049

Claims priority, application Switzerland, Sep. 3, 1984, 4203/84

Int. Cl.⁴ C07C 69/76

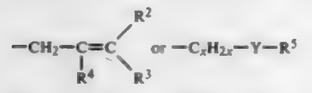
U.S. Cl. 560—75 **11 Claims**

1. A mixture of substances obtainable by reacting elementary sulfur with compounds of the formula I

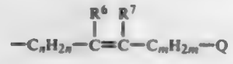


(I)

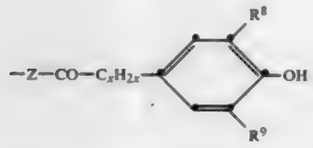
in which R^1 is C_1–C_{12}–alkyl, C_5–C_7–cycloalkyl, phenyl,-naphthyl, 2-naphthyl, C_7–C_9–aralkyl or C_7–C_9–alkaryl, t is 1, 2 or 3, p is O, 1 or 2 and X is one of the groups



in which R^2, R^3 and R^4 independently of one another are hydrogen or methyl, xi O 1, 2 or 3, Y is —CO—O—or —CO—NH—and R^5 is a radical



in which n and m independently of one another are integral values from O to 14, R^6 and R^7 are hydrogen or C_1–C_8–alkyl, and Q is hydrogen, methyl or a radical



in which Z is —O—or —NH—and R^8 and R^9 independently of one another are as defined for R^1 or are hydrogen

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4,691,045

HYDROXYL GROUP-CONTAINING (METH)ACRYLATE OLIGOMER, PREPOLYMER THEREFROM, AND METHOD FOR USE THEREOF

Shuzo Fukuchi, and Shigeru Yamaguchi, both of Himeji, Japan, assignors to Nippon Shokubai Kagaku Co., Ltd., Japan

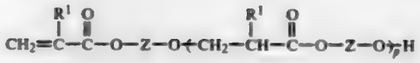
Filed Dec. 5, 1985, Ser. No. 805,342

Claims priority, application Japan, Dec. 6, 1984, 59-256558; Feb. 26, 1985, 60-35350; Jul. 8, 1985, 60-148374; Oct. 2, 1985, 60-218037; Oct. 29, 1985, 60-240661

Int. Cl.⁴ C08F 20/26

U.S. Cl. 560—185 **22 Claims**

1. A hydroxyl group-containing (meth)acrylate oligomer represented by the general formula I:



(I)

wherein two R^1's independently stand for hydrogen atom or methyl group, two Z's independently stand for a divalent hydrocarbon group of 2 to 20 carbon atoms, and p stands for an integer of the value of 1 to 100.

4,691,046

BUTANEDIOIC ACID MONO [(2-DIMETHYLAMINO] ETHYL ESTER)SUCCINATE

Miron O. Lozinsky, Kiev; Jury G. Bobkov, Moscow; Alla F. Shinanjuk, Kiev; Jury I. Gevaza, Kiev; Leonid N. Markovsky, Kiev; Galina A. Kuznetsova, Moscow; Valentin A. Markin, Moscow; Natsiya N. Kleimenova, Moscow; Antonina I. Tentsova, Moscow; Alexandr N. Motalov, Moscow; Sergei B. Seredinin, Moscow; Vladimir F. Katkov; Vasily M. Vinogradov, both of Leningrad, and Vladimir I. Kulinsky, Krasnoyarsk, all of U.S.S.R., assignors to Institut Organicheskoi Khimii Ordena Lenina I Ordena Druzhby Narodov Akademii Nauk Ukrainskoi SSR, Kiev and Institut Farmakologii Akademii Meditsinskikh Nauk SSSR, Moscow, both of, U.S.S.R.

Filed Jan. 2, 1987, Ser. No. 207

Claims priority, application U.S.S.R., Jan. 8, 1986, 4007025

Int. Cl.⁴ C07C 69/34

U.S. Cl. 560—196 **1 Claim**

1. Butanedioic acid mono[(2-dimethylamino)ethyl ester]succinate of the formula:



4,691,047

PREPARATION OF CARBOXYLIC DI-ESTERS OR ACIDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1986, Ser. No. 844,429

Claims priority, application United Kingdom, Apr. 15, 1985, 8509641

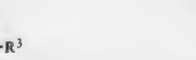
Int. Cl.⁴ C07C 67/38, 51/14

U.S. Cl. 560—204 **14 Claims**

1. A process for the production of carboxylic di-esters, dicarboxylic acids or mixtures thereof, which process comprises reacting at a temperature in the range of from 50° C. to 200° C. an olefinically unsaturated compound having two conjugated carbon-carbon double bonds with carbon monoxide and with an alcohol or water in the presence of an aprotic solvent and a dissolved catalytic system prepared by combining:

(a) a divalent palladium compound,

(b) an organic phosphine of the formula



(I)

in which R^1, R^2 and R^3 each individually represent an aryl group, optionally substituted with one or more electron-with-drawing substituents, at least 5 gram atom of trivalent phosphorus per gram atom of divalent palladium being present in the catalytic system, and

(c) at least one mol of hydrogen chloride per atom of trivalent phosphorus present in the catalytic system.

4,691,048

PROCESS FOR REDUCING CARBONYLATION OF ALDEHYDES, USES AS HEMIACETALESTERS, CATALYZED BY COBALT CARBONYL COMPLEXES

Francois Hugues, Nanterre; Dominique Commereuc, Meudon, and Yves Chauvin, Le Pecq, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

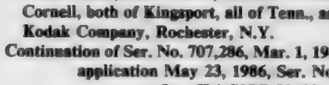
Filed May 10, 1985, Ser. No. 732,487

Claims priority, application France, May 11, 1984, 84 07280

Int. Cl.⁴ C07C *67/24*

U.S. Cl. 560—240 **9 Claims**

1. A process for the reducing carbonylation of hemiacetalesters comprising reacting a hemiacetalester with a gas containing hydrogen and carbon monoxide at a temperature is from 70° to 250° C. in the presence of a cobalt carbonyl complex, wherein the hemiacetalester has the formula:



and R_1, R_2 and R_3 each independently are hydrogen, $C_{1\text{-}12}$-alkyl, $C_{6\text{-}14}$-aryl, $C_{7\text{-}14}$-aralkyl, or $C_{3\text{-}12}$-cycloalkyl.

4,691,049

PROCESS FOR PREPARING A SPECIFIC DIASTEREOMER OF A MONOAMINO DICARBOXYLIC ACID ESTER

Ronald J. Doll, Maplewood; Bernard R. Neustadt, West Orange; Elizabeth M. Smith; Charles V. Magatti, both of Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 651,378, Sep. 17, 1984, Pat. No. 4,584,285, which is a continuation-in-part of Ser. No. 500,494, Jun. 2, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,383

Int. Cl.⁴ C07C *103/52*

U.S. Cl. 562—553 **3 Claims**

1. A process for the preparation of a single diastereomer of an monoamino dicarboxylic acid which comprises reacting an α-aminoacid ester with a lower alkyl or benzyl ester of a specific diastereomer of 2(trifluoromethanesulfonyloxy) propionic acid at room temperature in an inert solvent in the presence of a base to obtain the corresponding lower alkyl or benzyl ester of the resulting monoamino dicarboxylic acid as a specific diastereomer.

4,691,050

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC DICARBOXYLIC ACIDS

Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 707,286, Mar. 1, 1985, abandoned. This application May 23, 1986, Ser. No. 868,178

Int. Cl.⁴ C07C *51/10*

U.S. Cl. 562—406 **8 Claims**

1. A process for the preparation of aromatic dicarboxylic acids which comprises reacting an aromatic diiodide having about 5 to about 20 atoms in the ring or rings thereof, with carbon monoxide in the presence of a soluble homogeneous rhodium catablyst in a reaction medium selected from acetic acid, butyric acid and propionic acid.

4,691,051

ADAMANTYL PHENYL β-ALANINES

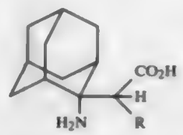
Vassil S. Georgiev, Rochester, and George B. Mallen, Avon, both of N.Y., assignors to Penwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 691,104, Jan. 4, 1985, abandoned. This application Jun. 4, 1986, Ser. No. 870,553

Int. Cl.⁴ C07C *101/08*

U.S. Cl. 562—443 **3 Claims**

1. Adamantyl phenyl β-alanines having the structure:



where R is phenyl or phenyl substituted with oxyalkyls having from 1 to 8 cabon atoms.

4,691,052

PROCESS FOR THE PREPARATION OF PYRETHROID ACIDS

William T. Brady, Sanger; Scott J. Norton, Argyle, and Jinrea Ko, Denton, all of Tex., assignors to S.C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 560,449, Dec. 12, 1983, abandoned. This application May 30, 1986, Ser. No. 871,153

Int. Cl.⁴ C07C *51/00*

U.S. Cl. 562—506 **3 Claims**

2. Process for preparing vinyl-substituted cyclopropanecarboxylic acids comprising:

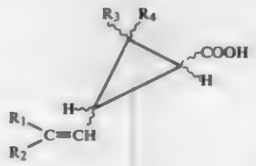
(a) forming a dihalo-vinylcyclobutanone addition product from the reaction of a dihaloketene and a conjugated diene of the Formula A in the presence of phosphoryl chloride, wherein the conjugated diene has the structure

$R_1R_2C{=}CHCH{=}CR_3R_4$ TM Formula A

wherein R_1 R_2 are each hydrogen, lower alkyl, lower carboxy, lower akoxyalkyl or, together, are cycloalkyl and R_3 and R_4 are each lower alkyl or, together are spiro $—(CH_2)_n$, where n=2–6;

(b) reacting said dihalo-vinylcyclobutanone addition product with up to one equivalent of dehalogenating reducing agent to reduce said addition product to its corresponding monohalo-vinylcyclobutanone, wherein the dehalogenating reducing agent is zinc dust and acetic acid; and

(c) reacting said monohalo-vinylcyclobutanone product with a base for inducing ring contraction to form a corresponding vinyl-substituted cyclopropanecarboxylic acid product of a structural Formula B:



Formula B

wherein, R_1 R_2 R_3 and R_4 are as before.

4,691,053

PROCESS FOR PRODUCING ORGANIC COMPOUNDS BY UTILIZING OXYGENIC COMPLEXES

Mutsuo Yamada; Yasuyuki Nishimura; Yoshijiro Arikawa; Takanori Kuwahara; Taiji Kamiguchi, and Hirotoshi Tanimoto, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 617,187

Claims priority, application Japan, Jun. 3, 1983, 58-99022; Feb. 29, 1984, 59-38137

Int. Cl.⁴ C07C *45/38, 51/235, 51/255, 45/39, 45/34;* C07D *307/89, 307/34;* B01J *31/18*

U.S. Cl. 562—531 **9 Claims**

1. A process for oxiding aldehydes to produce organic acids comprising contacting said aldehyde with an oxidizing agent consisting essentially of:

a transition metal complex ($M_mX_nL_l$) capable of coordinating with oxygen, consisting of a transition metal compound (M_mX_n) and an organic phosphorus compound L as a ligand, wherein M is a transition metal belonging to at least one group selected from the group consisting of Group I, Groups IV–VII and the iron group in Group VIII of the Periodic Table; X represents an anion; ligand L represents an organic phosphorous compound; m and n represent the number of atoms of said transition metal M and said anion X respectively; and l represents the number of molecules of said ligand, wherein m, n, and l are in the range of 1 to 4; and,

oxygen coordinated with the transition metal complex.

4,691,054

METHOD FOR SEPARATING A BASIC AMINO ACID

Takafumi Toda, Kawasaki; Yoshihiro Koga, and Tsutomu Matsuishi, both of Saga, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 9, 1986, Ser. No. 905,126

Claims priority, application Japan, Sep. 13, 1985, 60-202702

Int. Cl.⁴ C07C *99/12*

U.S. Cl. 562—554 **8 Claims**

1. A method for separating a basic amino acid from a liquor containing the safe, which comprises:

(a) contacting the basic amino acid containing liquor with a strongly acidic cation exchange resin at a pH at which the basic amino acid exists in the form of a divalent cation, thereby adsorbing at least a part of the basic amino acid in the form of the divalent cation;

(b) contacting said ion exchange resin with a liquor containing said basic amino acid and a neutral amino acid or an acidic amino acid or both at a pH at which the basic amino acid exists in the form of a monovalent cation;

(c) passing an eluant through said ion exchange resin, thereby eluting the basic amino acid from the ion exchange resin; and

(d) separating and recovering the basic amino acid from the eluate.

4,691,055

CONCENTRATION OF ORGANIC CHEMICALS FROM DILUTE AQUEOUS SOLUTIONS

Branko Urbas, Darien, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 7, 1981, Ser. No. 327,849

Int. Cl.⁴ C07C *59/08*

U.S. Cl. 562—589 **19 Claims**

1. A process for concentrating a dilute aqueous solution of an organic compound which is readily adsorbed from solution by activated carbon and which can be desorbed by vapors of a volatile solvent by adsorbing the organic compound on an adsorbent carbon, eluting the organic compound from the carbon with a volatile solvent that distills at a temperature below the boiling point of the organic compound, and separating the volatile solvent from the mixture of solvent and eluted organic compound, wherein the improvement comprises

applying vapors of the volatile solvent to a bed of the carbon, said bed being maintained at a temperature at or slightly below the condensation temperature of the solvent, at a rate of less than about one-half bed volume per hour until the volatile solvent is detected in the eluate,

continuing to apply said vapors until about one-half bed volume of eluate containing a concentrated aqueous solution of the organic compound in the volatile solvent is collected, and

evaporating the volatile solvent from said one-half bed volume of eluate to obtain an aqeous solution of the organic compound containing at least about 30% of the organic compound by weight.

4,691,056

3-HALOGENOACETONESULFONAMIDES AND A PROCESS FOR THEIR PREPARATION

Dieter Günther, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 904,049

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531788

Int. Cl.⁴ C07C *143/74*

U.S. Cl. 564—96 **3 Claims**

1. A compound of the formula

in which X can be fluorine, chlorine, bromine or iodine.

4,691,057

PROCESS FOR MAKING ALKALI METAL ARYLOXIDES

Allan A. Eisenbraun, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 19, 1984, Ser. No. 652,099

Int. Cl.⁴ C07C *103/38;* C07F *9/00*

U.S. Cl. 564—223 **11 Claims**

1. A process for making an alkali metal aryloxide, said process comprising reacting an alkali metal with an aromatic hydroxy compound in the presence of a promoter amount of a lower alcohol.

4,691,058

PROCESS FOR PRODUCING 1-HYDROXY KETONES

Werner Stegmann, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

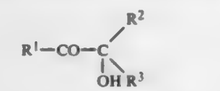
Continuation of Ser. No. 488,936, Apr. 27, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,792

Claims priority, application Switzerland, May 7, 1982, 2842/82

Int. Cl.⁴ C07C *45/64*

U.S. Cl. 568—316 **11 Claims**

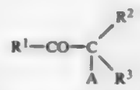
1. A process for producing a compound of the formula I



(I)

in which R^1 is phenyl or said phenyl substituted by straight-chain or branched-chain C_1-C_4-alkyl groups, R^2 and R^3 are identical or different, and are each a straight-chain or branched chain C_1–C_5-alkyl group, or a C_5–C_8-cycloalkyl or said cycloalkyl substituted by 1 to 3 straight-chain or branched chain C_1–C_5-alkyl groups, or together with the C atom to which they are bound they form a C_5–C_8-cycloalkyl or said cycloal-

kyl substituted by 1 to 3 straight-chain or branched-chain C_1–C_6-alkyl groups, which process comprises reacting a compound of formula II



(II)

in which R^1, R^2 and R^3 are as defined above, and A is chlorine or bromine, with a compound releasing hydroxide ions, in the presence of water or in the presence of water and an inert organic solvent, by the phase-transfer catalysis method, whereby the compound of the formula II is present in solution or in the melted form.

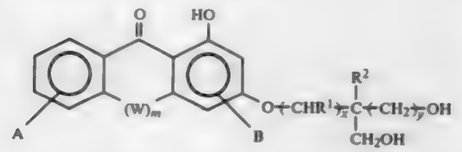
4,691,059

COPOLYMERIZABLE UV STABILIZERS

Sumita B. Mitra, and Smarajit Mitra, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1985, Ser. No. 771,307
Int. Cl.⁴ C07C *49/786*
U.S. Cl. 568—333 **3 Claims**

1. A monomer having the formula



wherein

R^1 and R^2 are the same or different and each is selected from the group consisting of hydrogen, and alkyl, alkoxyalkyl, aryl, aryloxyalkyl, aralkyl, and alkaryl groups, which can be substituted by a non proton-donating group selected from the group consisting of halogen, nitro, cyano, aldehyde group, acyl group having 1 to 10 carbon atoms, and an aroyl group having 6 to 10 carbon atoms, or R^1 and R^2 together can form an aliphatic cyclic structure of 5 to 7 atoms which can include carbon and zero to two non-connected oxygen atoms, wherein R^1 and R^2 together total from zero to forty carbon atoms;

x is an integer from 0 to 20,

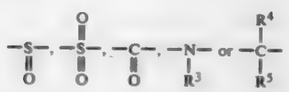
y is 0 or 1, provided that both x and y are not zero;

m is 0 or 1;

A and B are the same or different and represent one to eight monovalent substituents on the aromatic rings selected from the class consisting of (1) hydrogen, halide, nitro, tertiary amino, amido, and cyano, and (2) alkyl, alkenyl, aryl, araikyl, alkaryl, alkoxy, aryloxy, aralkyloxy, alkaryloxy, aryloxyalkyl, and thioalkyl, these groups having 1 to 20 carbon atoms and up to 6 non-connected oxygen and sulfur atoms and can be substituted by halogen, nitro, tertiary amino, cyano, and amido groups; or A and B can be linked to said aromatic rings by divalent keto, sulfoxide, and sulfone groups, with the proviso that when

m=—O—, W is not present, and then a benzophenone structure is present, and when

m=1, then W is a single bond or a divalent group group —O—, —S—,



in which R^3 is alkyl, alkoxyalkyl, aryl, aryloxyalkyl, aralkoxyaryl, aralkyl, or alkaryl group, which can be substituted by a non proton-donating group selected from the group consisting of halogen, nitro, cyano, aldehyde group, acyl group having 1 to 10 carbon atoms, and an aroyl group having 6 to 10 carbon atoms; and

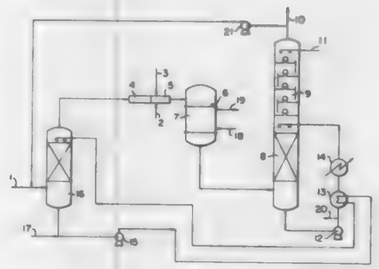
R^4 and R^5 independently are the same as R^1 and R^2 which are defined above.

4,691,060

PROCESS FOR RECOVERING WASTE HEAT FROM FORMALDEHYDE PRODUCT GAS

Shigeo Kimura, Nagoya, and Kouichi Kurata, Mie, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 825,767, Feb. 3, 1986, abandoned, which is a continuation of Ser. No. 669,174, Nov. 7, 1984. This application Nov. 25, 1986, Ser. No. 931,990
Int. Cl.⁴ C07C *47/052*
U.S. Cl. 568—420 **3 Claims**



1. A process for producing formaldehyde which comprises reacting a feed gas mixture comprising methanol, steam and air in the presence of a silver catalyst; heat exchanging a resulting hot formaldehyde containing product gas with pressurized water in a waste heat boiler, thereby generating steam; flowing the product gas to a formaldehyde absorption column and absorbing formaldehyde into an aqueous solution at the bottom of the absorption column; heat exchanging the aqueous formaldehyde-containing solution with water, thereby obtaining hot water; and introducing the hot water and feed air into a feed gas humidifier, the heated water being introduced into the top of the gas humidifier to thereby contact the hot water with the feed air by a gas liquid countercurrent and vaporizing the hot water into the feed air.

4,691,061

OXIDATION OF ACETOVANTILLONE TO VANILLIN

Bill S. K. Fung, Renton, and Bjorn F. Hrutfiord, Seattle, both of Wash., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 10, 1986, Ser. No. 905,618
Int. Cl.⁴ C07C *45/32*
U.S. Cl. 568—432 **15 Claims**

1. A process for the production of vanillin comprising contacting (a) p-hydroxy aromatic 1-carbonyl compounds comprising substantially acetovanillone, (b) oxygen and (c) alkaline material.

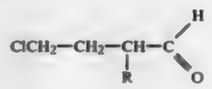
4,691,062

PROCESS FOR THE PRODUCTION OF 4-CHLORO-BUTANALS

Juan Andrade, Kleinostheim; Gunter Prescher, Hanau, and Klaus Kohler, Hainburg, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 921,474
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537815
Int. Cl.⁴ C07C *45/42*
U.S. Cl. 568—495 **6 Claims**

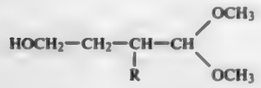
1. A process for the production of a 4-chloro-butanal of the formula



(I)

wherein R is hydrogen or a 1 to 4 carbon atom alkyl comprising

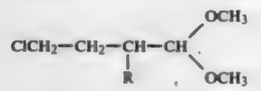
(a) reacting a 1,1-dimethoxy-4-hydroxybutane of the formula



(II)

at a temperature between −20° and +80° C. with a 1.0 to 10 fold molar amount of carbon tetrachloride in the presence of a 0.1 to 20 fold molar amount of triphenylphosphine and

(b) hydrolyzing in acid medium the 1,1-dimethoxy-4-chlorobutane formed of the formula



(III)

4,691,063

ISOMERIZATION OF CRESOLS

Dusan J. Engel, Des Plaines, Ill., and Jean-Pierre Gilson, Columbia, Md., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 16, 1986, Ser. No. 874,780
Int. Cl.⁴ C07C *37/48, 39/06*
U.S. Cl. 568—783 **8 Claims**

1. A process for the isomerization of a cresol selected from the group consisting of o-cresol and m-cresol which comprises contacting said cresol in the vapor phase with an acidic phosphorous-containing crystalline zeolite catalyst at isomerization conditions and recovering the resultant isomers.

4,691,064

METHOD FOR PRODUCING CYCLOALKANOLS

Tamio Shirafuji, and Itaru Kawata, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,512
Claims priority, application Japan, Nov. 22, 1985, 60-262853
Int. Cl.⁴ C07C *35/06, 35/08, 35/20*
U.S. Cl. 568—835 **9 Claims**

1. A method for producing cycloalkanols which comprises carrying out the catalytic hydration of a cycloalkene having from 5 to 8 carbon atoms with water using as a catalyst an aromatic sulfonic acid having at least one hydroxyl or ether group at a temperature in the range from about 30° C. to about 200° C., and separating the resulting cycloalkanol from the reaction solution by extraction.

4,691,065

CHLOROTRIFLUOROETHYLENE TELOMERIZATION PROCESS

Bobby F. Daniels, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,111
Int. Cl.⁴ C07C *17/26*
U.S. Cl. 570—139 **11 Claims**

1. A process for preparing a distribution of telomers of chlorotrifluoroethylene of general formula $CCl_3(CF_2CFCl)_nCl$, where n is from about 1 to about 20, consisting essentially of reacting chlorotrifluoroethylene with carbon tetrachloride in the presence of a catalytic amount of $CuCl_2$ and iron, said reaction being conducted in a solvent at a temperature of from about 90° C. to about 150° C.

4,691,066

PROCESS OF PREPARING METACHLOROBENZOTRIFLUORIDE

Fumio Inoue, Sakado; Yutaka Katsuhara, Kawagoe, and Koshi Okazaki, Saitama, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Continuation of Ser. No. 503,169, Jun. 10, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 709,370
Claims priority, application Japan, Jun. 18, 1982, 57-104004
Int. Cl.⁴ C07C *17/12*
U.S. Cl. 570—144 **3 Claims**

1. A process of preparing m-chlorobenzotrifluoride by reacting benzotrifluoride and chlorine in the presence of a catalyst with a selectivity sufficient to produce a ratio of m-chlorobenzotrifluoride to p-chlorobenzotrifluoride product of at least about 14, wherein said catalyst comprises a combination of at least one metal chloride selected from the group consisting of iron trichloride, gallium trichloride, antimony pentachloride, niobium pentachloride and tantalum pentachloride, and iodine, said at least one metal chloride and said iodine being present in amounts of at least 0.007 mole and at least 0.002 mole, respectively, per mole of benzotrifluoride, and wherein the reaction is maintained at a temperature of from about 0° to about 40° C., and the mole ratio of chlorine to benzotrifluoride does not exceed about 1.0.

4,691,067

CATALYTIC PROCESS FOR COUPLING TELOMERS OF CHLOROTRIFLUOROETHYLENE

Johny S. Ng, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,884
Int. Cl.⁴ C07C *17/26*
U.S. Cl. 570—153 **12 Claims**

1. A process for coupling two low molecular weight chlorotrifluoroethylene telomers, each telomer having the general formula $CCl_3(CF_2CFCl)_nCl$, where n is one or two, to form a perchlorofluoroolefin of higher molecular weight, said process consisting essentially of reacting said telomers with hydrogen in the presence of an effective amount of a catalyst selected from the group consisting of platinum, palladium, rhodium, ruthenium, Raney nickel, Raney cobalt, and mixtures thereof.

4,691,068

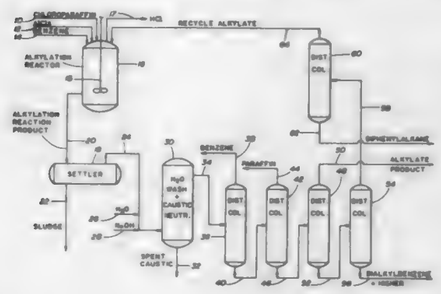
PROCESS FOR PRODUCTION OF ALKYL AROMATICS

Kyle W. Resh, Baltimore, Md., assignor to Vista Chemical Company, Houston, Tex.

Filed Aug. 1, 1986, Ser. No. 893,047
Int. Cl.⁴ C07C *1/00*
U.S. Cl. 585—323 **8 Claims**

1. In a process for the production of a mono alkyl aromatic wherein a mono nuclear aromatic compound and an alkylating

agent are subjected to an alkylation reaction to produce a reaction product comprising unreacted mono nuclear aromatic compound, alkanes, mono alkyl aromatic, dialkyl aromatic and by-products, said reaction product being treated to remove unreacted mono nuclear aromatic compound and paraffins, and produce a crude product stream containing mono alkyl aromatic, dialkyl aromatic and color forming by-products, and wherein the majority of said mono alkyl aromatic is separated



from said crude product stream to produce a higher boiling fraction containing a minor amount of mono alkyl aromatic, dialkyl aromatic and said color forming by-products, the improvement comprising separating said higher boiling fraction into a recycle stream containing mono alkyl aromatic and at least some of said color forming by-product and a co-product stream substantially free of said mono alkyl aromatic, and introducing said recycle stream into said alkylation reaction.

4,691,069

HYDROGENTATION OF UNSATURATED ALIPHATIC HYDROCARBONS

Michel O. Albers, and Eric Singleton, both of Pretoria, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Feb. 19, 1986, Ser. No. 831,006

Claims priority, application South Africa, Feb. 26, 1985, 85/1445

Int. Cl.[4] C07C *5/03*

U.S. Cl. 585—259 **26 Claims**

1. A process for the hydrogenation of an unsaturated aliphatic hydrocarbon which comprises bringing an unsaturated aliphatic hydrocarbon to be hydrogenated into contact with hydrogen in the presence of a catalyst which comprises cations selected from the group consisting in five-coordinate and six-coordinate complex cations of ruthenium (II) having the general formula (I):

$$(RuXL_n)^+ \quad (I)$$

in which

Ru is a ruthenium moiety;

X is a radical coordinated with the Ru;

L is a donor ligand; and

n is an integer not greater than 5.

4,691,070

CATALYST, ITS METHOD OF PREPARATION AND PROCESS FOR ITS USE IN THE HYDROGENATION OF DIOLEFINS

Teiji Nakamura; Eiichiro Nishikawa, both of Saitama, and Takeo Koyama, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 750,367, Jun. 28, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 932,644

Claims priority, application Japan, Jun. 28, 1984, 59-131930

Int. Cl.[4] C07C *5/05*

U.S. Cl. 585—273 **6 Claims**

1. A method for the hydrogenation of a cyclic diolefin selected for the group consisting of cyclopentadiene, cyclohexadiene and 1,3-cyclooctadiene to a corresponding cyclic monoolefin comprising the step of hydrogenating said diolefin in a hydrogen atmosphere at 50° C. to 200° C. and in the presence of a supported catalyst consisting essentially of from 0.01 to 10% by weight of palladium and from 0.01 to 5% by weight of at least one co-catalyst component selected from the group consisting of ruthenium, rhodium, cobalt, and rhenium said % by weight based on the total weight of the catalyst and support, said support being a non-acidic inorganic compound having a surface area of not more than 100 m^2/g, the weight ratio of said co-catalyst metal to the palladium metal being from 0.14 to 5.0.

4,691,071

DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Jeffery C. Bricker, Buffalo Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 11, 1986, Ser. No. 940,665

Int. Cl.[4] C07C *1/00*

U.S. Cl. 585—319 **19 Claims**

1. In a process for the dehydrogenation of a dehydrogenatable hydrocarbon with separate and intermediate selective oxidation of hydrogen which comprises the steps of:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first-reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first-reaction dehydrogenation zone effluent stream comprising a mixture of unconverted hydrocarbons, dehydrogenated hydrocarbons, hydrogen and steam;

(b) removing said first-reaction dehydrogenation zone effluent from said first-reaction dehydrogenation zone;

(c) passing said effluent of step (b) to a second-reaction oxidation zone, which is separate and discrete from said first-reaction dehydrogenation zone;

(d) contacting said first-reaction dehydrogenation zone effluent in said second-reaction oxidation zone with an oxygen-containing gas to selectively oxidize said hydrogen within said first-reaction zone effluent to the substantial exclusion of oxidation of unconverted and dehydrogenated hydrocarbons in the presence of an oxidation catalyst consisting essentially of a Group VIII noble metal, a Group IVA metal and a Group IA or IIA metal composited on a metal oxide support at oxidation conditions wherein the exothermic selective oxidation of said hydrogen provides additional heat and thereby raises the temperature of said unconverted and dehydrogenated hydrocarbons;

(e) withdrawing said unconverted and dehydrogenated hydrocarbons from said second-reaction oxidation zone having an increased temperature with respect to the temperature of said first-reaction dehydrogenation zone effluent;

(f) passing said removed second-reaction oxidation zone product stream of step (e) to a third-reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metalpromoted iron compound at dehydrogenation conditions to produce dehydrogenated hydrocarbons; and,

(g) withdrawing and recovering said dehydrogenated hydrocarbons, the improvement which comprises utilizing as said support a cerium-containing alumina.

4,691,072

POLYMERIZATION OF ISOBUTYLENE

Hans Schick, Mannheim; Erich Kolk, Bad Durkheim; Karl-Heinz Fauth, Wattenheim, and Heinrich Mohr, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 887,938

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527551

Int. Cl.[4] C07C *2/08*

U.S. Cl. 585—525 **2 Claims**

1. A process for increasing the conversion of isobutylene in the preparation of polyisobutylene by polymerization of isobutylene in a polymerization zone in which the temperature is maintained at from 0° to −130° C., in the presence of from 0.01 to 1.0% by weight of a boron trifluoride catalyst which contains less than 0.3% by volume of foreign components, from 0.001 to 1.0% by weight of a molecular weight regulator and from 30 to 90% by weight of a low-boiling solvent which is inert under the reaction conditions, the percentages by weight in each case being based on the isobutylene employed, and, from 10 to 5000 ppm by weight of a polymerization accelerator, the solvent vaporized during the polymerization being removed continuously, liquefied and recycled in the liquid state to the polymerization zone, wherein the content of but-1-ene in the monomeric isobutylene is kept constant at from 1.9 to 2.1% by weight, base on the isobutylene and the but-1-ene contains less than 50 ppm by weight of cis-but-2-ene and trans-but-2-ene together.

4,691,073

PRODUCTION OF TERTIARY OLEFINS

Robert C. Michaelson, Kinnelon, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jul. 14, 1986, Ser. No. 885,529

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—639 **12 Claims**

1. A process for the preparation of tertiary olefins starting from the corresponding tertiary ethers, consisting in contacting said tertiary ether at a temperature of from 100° C. to 250° C. with a catalyst prepared by reacting a clay with HF and/or HCl followed by calcining, to form said tertiary olefin.

4,691,074

MONOCHLOROBIPHENYL:CUPROUS ALUMINUM TETRACHLORIDE

David G. Walker, 904 Fleetwood Dr., Baytown, Tex. 77520

Division of Ser. No. 591,128, Mar. 12, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 767,321

Int. Cl.[4] C07C *7/148, 7/10, 7/156*

U.S. Cl. 585—849 **4 Claims**

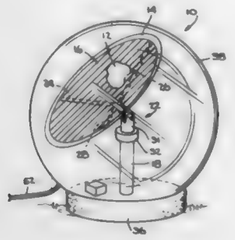
1. A process for separating a complexible ligand, selected from the group consisting of C_2 to C_5 olefins, C_2 to C_5 acetylenes, carbon monoxide and hydrogen sulfide, from a feedstream containing the ligand which consists essentially of contacting the feedstream with a liquid solution of cuprous aluminum tetrachloride ($CuAlCl_4$) in $C_{12}H_9Cl$ (an isomer or mixture of isomers of monochlorobiphenyl); said contacting being conducted under conditions to form a complex of the ligand and the solution from the feedstream while the complexed ligand is regenerated from the solvent by passing the ligand-rich solvent successively through the atmospheric reboiler (1 to 1.6 atma) pressure and one or more vacuum reboilers (0.1 to 0.9 atma pressure), whereas the gaseous streams from the reboilers are combined and cooled to yield the separated pure liquid.

4,691,075

ENERGY CONVERSION SYSTEM

Lawrence M. Murphy, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 16, 1985, Ser. No. 776,731
Int. Cl.[4] H02N *6/00*; H01L *25/02*
U.S. Cl. 136—246 **8 Claims**



1. Light-weight and self-contained solar energy conversion apparatus for converting solar radiation to electrical energy, comprising:

an array of photovoltaic cells mounted on a thin film substrate membrane and connected together to provide an electric power source, said thin film being stretched and mounted on a circular rim;

support means connected to said rim for supporting said array of photovoltaic cells in a position adapted to be exposed to solar radiation, said support means being adjustable about two orthogonal axes and having strength design parameters sufficient to support the array, substrate membrane, and rim safely in a still atmosphere without regard to ambient outside wind and hail loads; and

a substantially spherical dome positioned over and enclosing a chamber around said array of photovoltaic cells and support means, said dome being comprised of a specularly translucent, flexible, thin film material anchored around said support means and inflated to a pressure in the chamber in the range of about 0.02 to 0.10 pounds per square inch more than the pressure outside the chamber, the thin film material of said dome also being tear-resistant and sufficiently strong to withstand normal wind and hail storm forces and having sufficient resilience to yield without puncturing to hail stones, yet to recover to its spherical surface shape under the urging of the inflation pressure in the chamber.

4,691,076

SOLAR ARRAY WITH ALUMINUM FOIL MATRIX

Jules D. Levine, Dallas; Millard J. Jensen, Balch Springs, and Ronald E. Haney, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

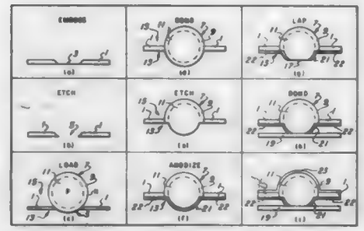
Continuation of Ser. No. 820,904, Jan. 16, 1986, abandoned, which is a continuation of Ser. No. 647,942, Sep. 4, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 937,473
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—250 **12 Claims**

1. A solar array which comprises:

(a) a first aluminum foil layer having a plurality of spaced apertures therein,

(b) a plurality of discrete semiconductor members, each in a corresponding one of said apertures and having a P-type and an N-type region, the N-type region being ohmically bonded to said first aluminum foil, said bond characterized as formed by pressing said member into said corresponding aperture at a temperature in the range of from 500° to 577° C., and

(c) a contact member insulated from said first foil and coupled to the P-type region.

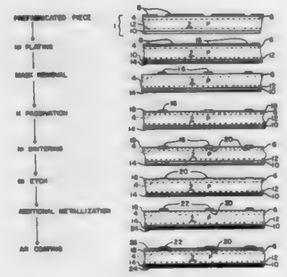


4,691,077

ANTIREFLECTION COATINGS FOR SILICON SOLAR CELLS

James A. Gregory, Sudbury; Jack I. Hanoka, and Zinovy Y. Vayman, both of Brookline, all of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed May 13, 1985, Ser. No. 733,712
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—256 **14 Claims**



1. In a silicon solar cell having a grid electrode on one side thereof, the improvement comprising a surface layer of modified silicon having a refractive index of about 3.4 to 3.6 at 633 nm and about 3.6 to 3.8 at 442 nm, said surface layer being formed at said one side thereof by hydrogen ion-beam implantation in the presence of between about 2% and about 10% methane, by volume, relative to the hydrogen.

4,691,078

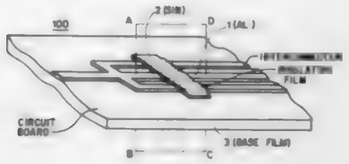
ALUMINUM CIRCUIT TO BE DISCONNECTED AND METHOD OF CUTTING THE SAME

Tadashi Nishioka; Hiroshi Koyama, both of Itami, and Yoji Mashiko, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 823,091
Claims priority, application Japan, Mar. 5, 1985, 60-45077
Int. Cl.[4] H05K *1/00*; B23K *26/00*
U.S. Cl. 174—68.5 **2 Claims**

1. A circuit having aluminum interconnections to be disconnected wherein said aluminum interconnections having a por-

tion to be cut are formed on an underlying insulating film base, said circuit to be disconnected comprising:



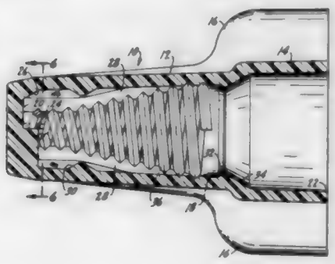
a hydrogen-containng plasma silicon nitride film formed to cover at least said portion of said aluminum interconnections to be cut.

4,691,079

SCREW-ON WIRE CONNECTOR

William E. Biaha, Elgin, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation-in-part of Ser. No. 760,275, Jul. 29, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 935,619
Int. Cl.[4] H01R *4/22*
U.S. Cl. 174—87 **11 Claims**



1. In an electrical connector for joining the ends of electrical wires, a cap of insulating material having a central bore open at one end and enclosed at the other end by an integral end wall, a wire coil in the bore tapered such that its maximum diameter is at the end of the coil nearest the open end of the bore, with the coil engaging the cap only at that point, and a first radial undercut on the inside of the cap, closer to the end wall than to the open end and projecting into the bore, the wire coil diameter at the undercut being less than the inside diameter of the undercut such that the coil does not engage the undercut until electrical wires are inserted into the cap to expand the coil against the undercut.

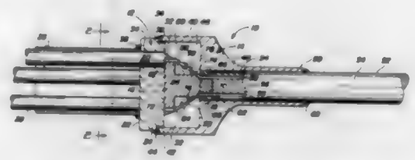
4. In an electrical connector for joining the ends of electrical wires, a cap of insulating material having a central bore open at one end and enclosed at the other end by an integral end wall, a tapered wire coil in the bore, a radial undercut on the inside of the cap, closer to the end wall than to the open end and projecting into the bore and a plurality of axial splines on the inside of the cap, extending from the end wall toward the open end of the cap, past the undercut, the splines having an outer, conical portion generally conforming to the taper of the wire coil, and an inner straight portion leading to the end wall.

4,691,080

HERMETICALLY SEALED CONNECTOR DEVICE

Charles W. Reinhart, Glendale, and Robert H. Mauldin, Flintridge, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 21, 1985, Ser. No. 789,602
Int. Cl.[4] H01R *4/02*
U.S. Cl. 174—88 R **10 Claims**



1. An improved, hermetically sealed, multiple conduit-to-single conduit connector device, said device comprising, in combination:

a. a male plug comprising a housing having a plurality of spaced, electrical conduit-receiving passageways extending longitudinally therethrough from the rear end to the front end thereof;

b. a female receptacle comprising a housing having an annular rim defining a central space within which the front end of said male plug is received and secured thereto, said female housing including a central longitudinal passageway extending therethrough, communicating with said central space and adapted to receive a single electrical conduit carrying a plurality of wires; and,

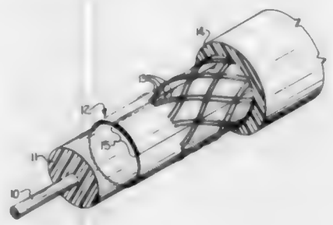
c. a dielectric wire spreader disposed between said plug front end and said longitudinal passageway in said central space, said spreader including a rear male plug-abutting portion and a front wire guide portion connected thereto and having a sloped outer surface defining spaced wire-receiving grooves adapted to guide wires from multiple electrical conduits in said male plug passageways into contact with wires from an electrical conduit in said female receptacle passageway within said central space.

4,691,081

ELECTRICAL CABLE WITH IMPROVED METALLIC SHIELDING TAPE

Chakra V. Gupta, and Brian D. Garrett, both of Conover, N.C., assignors to Comm/Scope Company, Catawba, N.C.

Filed Apr. 16, 1986, Ser. No. 852,776
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—105 R **30 Claims**



1. A cable comprising at least one metallic inner conductor, a dielectric material surrounding the at least one inner conductor, and a metallic shielding tape surrounding the dielectric material and the at least one inner conductor, said shielding tape comprising a metal foil layer and a heat sealable polymer supporting layer fusibly bonded directly to said foil layer and serving to structurally reinforce the foil layer and prevent unwanted disruptions in the foil which would adversely affect the signal propagating properties of the cable, said polymer supporting layer comprising a polymer blend of a non-heat sealable polyolefin strength component and an elastomeric heat sealable adhesive component.

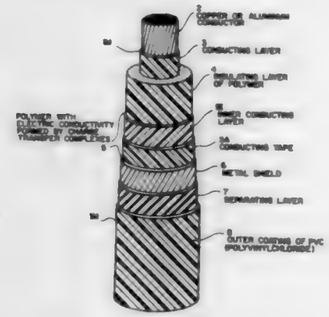
12. A metallic shielding tape useful for the preparation of shielded cable, said shielding tape comprising a metal foil layer and a heat sealable polymer supporting layer fusibly bonded directly to said foil layer and serving to structurally reinforce the foil layer and prevent unwanted disruptions in the foil which would adversely affect the signal propagating properties of the cable, said polymer supporting layer comprising a polymer blend of a non-heat sealable polyolefin strength component and an elastomer heat sealable adhesive component.

4,691,082

PLASTIC CABLE

Josef Flatz, Waldmichelbach; Gert Weddigen, Heidelberg; Hans-Joachim Böhme, Ketzsch; Fritz Grieser, Weinheim; Robert Huber, Ketach, and Hans Nienburg, Mainz, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,070
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509168
Int. Cl.[4] H01B *9/02*
U.S. Cl. 174—106 SC **19 Claims**



1. Plastic cable comprising at least one electric conductor surrounded by a cable covering comprising an insulating layer and a plurality of electrically conducting layers of a polymeric material which include an inner conducting layer and an outer conducting layer, with at least the outer conducting layer made of a synthetic polymer of triaromatic methane units, said synthetic polymer formed by polycondensation of an aromatic aldehyde and an aromatic ring compound which has at least one functional group which increases the electric density in the aromatic ring compound and thereby promotes the electrophilic action; by polycondensation of bisphenol-A and 4-dimethylaminobenzaldehyde; by polycondensation of bisphenol-A and para-anisaldehyde; and by a catalytic reaction in which methanes substituted by double-or triple aromatics are brought to reaction, said polymer having at least the properties,

(1) meltable-transformation from a solid into a liquid by means of heat, and

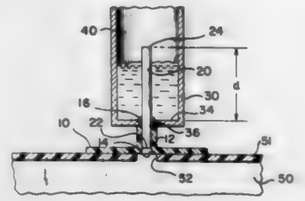
(2) soluble-capable of mixing with a liquid to dissolve to form a solution, the electric conductivity of the layers of polymer with triaromatic methane units is adjusted to at least 10^{-5} ohm^{-1} cm^{-1} by a content of charge transfer complexes, and the outer conducting layer is composed of an extruded layer of the conductive meltable polymer with triaromatic units and of a wrapping disposed thereon of carbon-black-containing paper or woven tape.

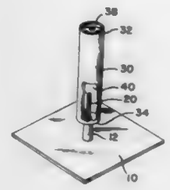
4,691,083

VENTING APPARATUS FOR ELECTRICAL CABLE

Zoltan B. Dienes, Annandale, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 4, 1985, Ser. No. 783,988
Int. Cl.[4] H02G *15/00*
U.S. Cl. 174—135 **7 Claims**





1. An apparatus for preventing rainwater from entering an air vent opening in an electrical cable jacket, said apparatus comprising;

a support pad for disposition over an opening in an electrical cable jacket;

venting means on said pad alignable with said opening;

an elongate hollow tube supported in communication with said venting means and extending from said support pad;

an elongate housing supported by said venting means and enclosing said hollow tube, said housing and said hollow tube extending partially coextensively and forming a holding chamber therebetween for holding a given volume of rainwater; and

outlet means on said housing for permitting air passage therethrough.

4,691,084

COMBINED ENERGISER AND REEL FOR ELECTRIC FENCES

Anthony C. Standing, 6 Buckland Pl., Cambridge, New Zealand

Continuation of Ser. No. 639,355, Aug. 9, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 905,680
Int. Cl.[4] A01K *3/00*; H05C *1/00*
U.S. Cl. 191—12.2 R **6 Claims**

1. An electric fencing device of the type including a hub for the storage of fence wire, support means in which the hub is rotatably supported, an electric fence energizer and a power source located within said hub for supplying electric current to said fence wire, and a grounding member for connecting the energizer to ground, the improvement comprising:

said hub being formed from an electrical insulating material;

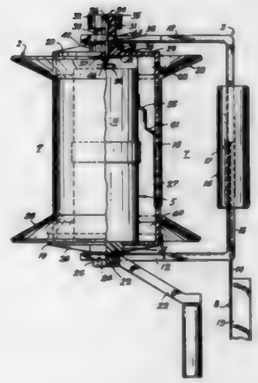
said support means being formed from an electrically conductive material and having spaced arms between which said hub is journalled for rotation, one axial end of said hub being rotatably supported in one of said arms; and,

a contact member carried by and in electrical continuity with the other of said arms, said contact member extending axially through the opposite axial end of said hub and supporting said opposite end for rotation relative to the other said arm;

said contact member extending axially into direct contact

with a grounding contact of said energizer and providing a pivotal contact between said electrically conductive





support means and said grounding member of said energizer.

4,691,085

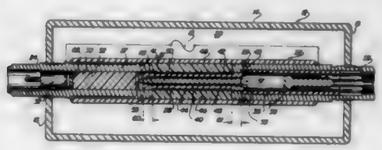
HIGH VOLTAGE INTERRUPTING SWITCH WITH IMPROVED CONTACT CONNECTION ARRANGEMENT AND METHOD

Roy T. Swanson, N. Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Dec. 19, 1985, Ser. No. 810,792

Int. Cl.⁴ H01H *33/06*

U.S. Cl. 200—151 **25 Claims**



1. An improved arrangement for electrically interconnecting the separable, electrical contacts of a device in which portions of a first contact and a second contact are engaged, the device being operated in response to movement of a drive element to rapidly separate the contacts via movement of one or both contacts, wherein the improvement comprises:

a member; and

means provided on the second contact and cooperating with said member for providing a contact-engagement force between the first and second contacts resulting from the insertion of at least a portion of said member or the second contact in the other and for providing the release of the contact-engagement force between the first and second contacts by relative movement between said member and the second contact in response to the movement of the drive element during device operation and in response to contact of said member by the drive element.

4,691,086

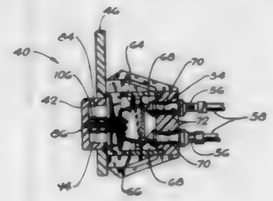
PUSHBUTTON ELECTRICAL SWITCH HAVING A FLAIRING CONTACTOR LOOSELY ROTATABLE ON A SPRING-BIASED EYELET

John W. Habecker, Zion, and Charles E. Black, III, Mount Prospect, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Apr. 3, 1986, Ser. No. 847,498

Int. Cl.⁴ H01H *1/18, 1/32, 13/14*

U.S. Cl. 200—159 R **4 Claims**



1. A pushbutton electrical switch, comprising

a casing having front and rear components with means for securing said components togther,

said front component including a hollow casing sleeve with a front end having a guide opening therein extending out of said casing and away from said rear component,

a pushbutton slidably received in said guide opening for sliding movement therein toward and away from said rear component,

said pushbutton having a front portion for manual movement of said pushbutton toward said rear component,

said pushbutton including a rear portion having an electrically conductive contactor mounted thereon,

said rear portion of said pushbutton including an axial generally cylindrical pin structure projecting in said casing toward said rear component for supporting said contactor,

said contactor being generally cup-shaped with a front end wall and a hollow annular side wall projecting from said end wall toward said rear component,

said annular side wall having an interior annular surface flaring away from said end wall,

said end wall of said contactor having an axial substantially circular aperture therein,

an eyelet loosely and rotatably received in said aperture,

said eyelet having a tubular substantially cylindrical shank portion loosely and rotatably received in said aperture,

said eyelet having a front end flange projecting generally radially outwardly from said shank portion in front of said end wall for loosely rotatable engagement therewith,

said eyelet having a rear end flange projecting generally radially outwardly from said shank portion to the rear of said end wall for loose rotatable engagement therewith,

said shank portion of said eyelet having a substantially circular and tubular opening therein loosely received around said pin structure with a loosely slidable and rotatable fit therebetween,

said pin structure having means forming a rear retaining element projecting generally radially outwardly thereon for abutting engagement by said rear end flange of said eyelet,

a compression coil spring received around said pin structure in front of said eyelet and compressed between said rear portion of said pushbutton and said front end flange of said eyelet for biasing said eyelet toward and against said rear retaining element,

said rear retaining element being free and clear of said contactor,

said coil spring being free and clear of said contactor whereby said contactor has free unimpeded rotatability relative to said eyelet,

said rear component of said casing comprising a terminal head including an electrically insulating member having a front portion facing toward said contactor but spaced therefrom,

said terminal head having a plurality of electrically conductive contact points mounted on said front portion of said electrically insulating member and projecting therefrom toward said interior annular surface of said contactor,

said terminal head having exterior electrically conductive terminals connected to said contact points,

and a second compression coil spring disposed in said casing and spaced away from said contactor for biasing said pushbutton away from said terminal head,

said pushbutton being manually movable toward said terminal head against the biasing action of said second coil spring to bring said interior annular surface of said contactor into wiping engagement with said contact points for connecting them together electrically,

said contactor being self-aligning with said contact points due to the free unimpeded rotatability of said contactor relative to said eyelet and also due to the loose slidability and rotatability of said eyelet relative to said pin structure,

the free unimpeded rotatability of said contactor relative to said eyelet tending to cause distribution and equalization of wear on said contactor due to repeated engagement between said contactor and said contact points.

4,691,087

PREVENTING TWIST OF A MICROWAVE TEMPERATURE PROBE LINE

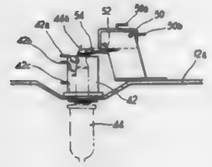
Hee J. Lee, Masan, Rep. of Korea, assignor to Gold Start Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 3, 1986, Ser. No. 925,961

Claims priority, application Rep. of Korea, Nov. 29, 1985, 15825/1985

Int. Cl.⁴ H05B *6/68, 6/80*

U.S. Cl. 219—10.55 B **1 Claim**



1. Means for preventing twist of a connecting line for a temperature probe in a microwave range comprising,

a disk provided with a protrusion at its peripheral surface and rotatably mounted on a rotating axis of a synchronous motor,

an activating lever pivotally fixed on supporting plates formed on a fixing plate by an axial pin and having a stopping pin at its one end adapted to contact said protrusion of said disk and at the other end a steel piece,

an electromagnet to attracting said steel piece of said activating lever on its operation,

a torsion spring with its body portion being inserted onto said axial pin to urge said activating lever toward a stopping member formed on said fixing plate, and

a micro switch to activate said electromagnet by means of an actuating protrusion contacted and pushed by an actuating means which is thrusted according to a connecting rod being inserted into a jack.

4,691,088

MICROWAVE OVEN WITH POWER TRANSFER AUTOMATICALLY RESPONSIVE TO DIELECTRIC LOAD OF FOOD

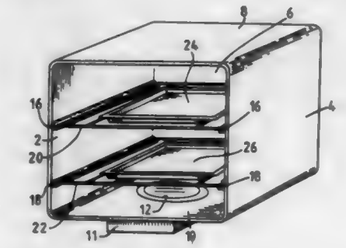
Kenneth I. Eke, South Croydon, England, assignor to Microwave Ovens Limited, Surrey, England

Continuation of Ser. No. 765,211, Aug. 13, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 910,328

Claims priority, application United Kingdom, Aug. 14, 1984, 8420608; Jan. 3, 1985, 8500095; Feb. 23, 1985, 8504724; May 29, 1985, 8513536

Int. Cl.⁴ H05B *6/74*

U.S. Cl. 219—10.55 F **12 Claims**



1. A microwave oven comprising: a cavity; a magnetron coupled to said cavity for producing microwave power in said cavity; said cavity being defined by cavity walls, means for launching said microwave power into said cavity, means for distributing said microwave power directly into said cavity; said cavity, said distributing means and said launching means being constructed and arranged so that said cavity is a multimode cavity with a large number of electric field resonances; and a metal tray supported in said cavity a predetermined distance above said launching means with the peripheral edges of said tray spaced further predetermined distances from said cavity walls so that the oven when devoid of food is ineffective in terms of effectiveness of power transfer from said magnetron to said cavity including said tray, and the effectiveness of power coupled and transferred to the loaded oven from said magnetron increases as a function of the dielectric load of food items placed on said tray in said cavity whereby the effectiveness of said power transfer is automatically accommodated to said food load in response thereto.

4,691,089

TRAVELLING WIRE EDM APPARATUS WITH MONITORING OF THE NUMBER OF ELECTRICAL DISCHARGES OCCURRING IN A SECTOR OF THE ACTIVE PORTION OF THE ELECTRODE WIRE

Francois Balleys, Petit-Lancy, Switzerland, assignor to Charmilles Technologies S.A., Geneva, Switzerland

Filed Oct. 16, 1985, Ser. No. 787,985

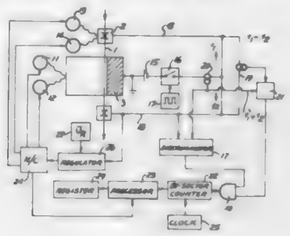
Claims priority, application Switzerland, Oct. 16, 1984, 4952/84

Int. Cl.⁴ B23H *7/04, 1/02*

U.S. Cl. 219—69 W **5 Claims**

4. An apparatus for controlling the shape of a surface of an electrically conductive workpiece cut by machining electrical discharges by means of an electrode wire stretched and displaced longitudinally between a pair of electrode wire guides,

the electrode wire having an active portion disposed in a machining zone formed between the electrode wire and the surface cut in the workpiece, said apparatus comprising means for arbitrarily deviding the active portion of the electrode wire into a plurality of sectors, means for detecting a sector among the plurality of sectors along the active portion of the electrode wire where an electrical discharge occurs, means for detecting machining electrical discharges, counting means associated with each of said sectors and with said machining electrical



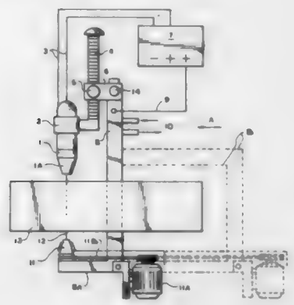
discharge detecting means for counting said machining electrical discharges in each of said sectors during a predetermined time period, means for saving the count of said electrical discharges for each sector for each predetermined time period, and processor means associated with said counting means for providing a signal representing the difference between the the count by said counting means and a corresponding reference value for controlling the electrical discharge machining process.

4,691,090

METHOD AND DEVICE FOR PLASMA CUTTING OF NON-METALLIC MATERIALS

Dimo T. Garlanov; Dimieter A. Dimitrov; Marin H. Beleov; Vladimir P. Hlbearov; Ivan V. Vangelov, all of Sofia; Nikolay Y. Nikov, Varna, and Ivan S. Savov, Sofia, all of Bulgaria, assignors to NPK za Kontrolno Zavarachni Raboti, Sofia, Bulgaria

Filed Dec. 9, 1980, Ser. No. 214,796
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PC **4 Claims**



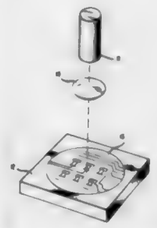
1. A method for cutting non-metallic material by means of a plasma are adapted to be formed between a plasma torch and a non-melting electrode-anode, comprising the steps of forcibly elongating the plasma arc by increasing the distance between said plasma torch and said non-melting electrode-anode to a predetermined extent so as to permit the passage of said non-metallic material therebetween to thereby place said non-metallic material under the direct action of said plasma arc; and thereafter cutting said non-metallic material by means of said plasma arc; rotating said non-melting electrode-anode prior and/or during cutting said non-metallic material to increase the life-span of said non-melting electrode-anode.

4,691,091

DIRECT WRITING OF CONDUCTIVE PATTERNS

Alan M. Lyons, Summit, N.J.; Frederick T. Mendenhall, Jr., Carmel, Ind.; Murray Robbins, Berkeley Heights, N.J.; Nathaniel R. Quick, Randolph, N.J., and Cletus W. Wilkins, Jr., Westfield, N.J., assignors to AT&T Technologies, Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Dec. 31, 1985, Ser. No. 814,986
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LM **10 Claims**



1. A method for making a conductive pattern on a substrate of which at least a surface portion consists essentially of a polymeric material,

said method comprising a step of directing a laser beam onto said surface portion and causing relative motion between said beam and said substrate so as to delineate said pattern on said surface portion,

said motion being controlled so as to cause thermal decomposition of selected portions of said material,

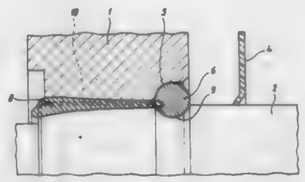
whereby said selected portions are transformed into an electrically conductive carbon material such that rsistance of conductive paths in said pattern is less than 16 ohms/cm.

4,691,092

METHOD FOR WELDING TWO PARTS TOGETHER EMPLOYING A CONCENTRATED ENERGY BEAM AND PROTECTIVE MEMBER

Martin B. Verburgh, Amersfoort, Netherlands, and Dieter Pfeifle, Filderstadt, Fed. Rep. of Germany, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Nov. 27, 1985, Ser. No. 803,201
Claims priority, application Netherlands, Dec. 7, 1984, 8403735
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD **5 Claims**



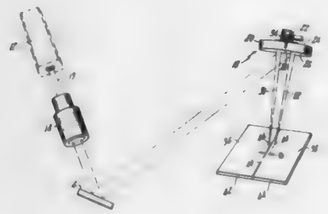
1. In the method for welding together first and second parts separated by a gap of extended depth, said gap being open at both ends in the direction of the gap's depth, wherein a concentrated beam of energy in the direction of the gap's depth causing melting of the parts is directed into the gap between the first and second parts, the improvement comprising permanently attaching to at least one said part a protective member at the end of the gap away from the end thereof where the beam first strikes the parts for preventing passage of the beam of energy beyond the gap, the load bearing capability of the formed weld between said parts being unaffected by the presence of said protective member.

4,691,093

TWIN SPOT LASER WELDING

Conrad M. Banas, Bolton, and Brian M. Doyle, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1986, Ser. No. 854,633
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **6 Claims**



1. Multiple spot laser welding apparatus responsive to an external signal for laser welding of workpieces each having a surface, and each abutting at a weld seam, comprising:

a one-piece mirror receiving a laser beam at a single reflective surface thereof and including a plurality of mirror sections having respective portions of said single reflective surface for reflecting a plurality of focused sub-beams, and at least one bendable hinge portion integral with and pivotably interconnecting said mirror sections; and

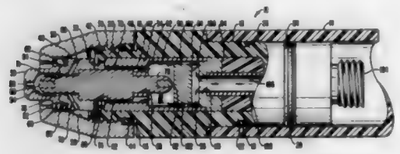
deformation means adapted to receive said mirror sections and pivoting the same about said hinge portion for adjustably positioning said sub-beam plurality on workpiece surfaces at the weld seam forming respective spots thereon.

4,691,094

PLASMA-ARC TORCH WITH SLIDING GAS VALVE INTERLOCK

Bruce O. Hatch, Lebanon, and Richard A. Spaulding, Hanover, both of N.H., assignors to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed May 20, 1986, Ser. No. 865,256
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PR **10 Claims**



1. A plasma-arc torch comprising:

a torch housing,

an inlet and an outlet in said housing,

passage means in said housing for conducting fluid from said inlet to said outlet,

an electrode in said housing adapted to be in an operational position adjacent said outlet for generating an arc,

a closure comprising retaining means removably connected to said housing for retaining said electrode in said housing,

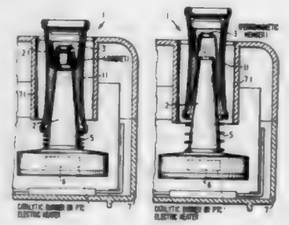
valve means in said housing operable to interrupt fluid flow from said inlet to said outlet when said retaining means is disconnected and removed from said housing, wherein said passage means includes a means defining a valve chamber therein and wherein said valve means comprises a valve element which is slidably movable within said valve chamber without the influence of any spring biasing means but only under the influence of fluid directed from said inlet to said outlet to selectively close or open fluid communication from said inlet to said outlet by way of said chamber.

4,691,095

HAIR ROLLER HEATING DEVICE WITH THERMOMAGNETIC ROLLER TEMPERATURE CONTROL

Karlheinz Barowski, Hattersheim, and Conrad Berghammer, Kronberg/Ts, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 768,033
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434072
Int. Cl.[4] A45D *2/12, 4/12;* **H05B** *1/02, 3/00*
U.S. Cl. 219—222 **13 Claims**



1. A hair styling device composed of a hair roller and heatable spindle structure for heating said hair roller,

said hair roller comprising a jacket containing a heat storing material and structure forming a heat exchange surface for supplying heat to the heat storing material and defining a conical inner chamber open at its larger end,

said heatable spindle structure adapted to be inserted into mating heat exchange engagement with said inner chamber of said roller and having structure defining a conical outer surface matching the surface of the conical inner chamber of said hair roller, biasing means associated with one of said roller and spindle structure for lifting said hair roller out of heating engagement with said heatable spindle structure,

and holding means for stressing said biasing means when said hair roller is placed on said heatable spindle and preventing said hair roller from being lifted out of engagement with said heatable spindle structure by the action of said stressed biasing means, said holding means comprising a body of ferromagnetic material disposed on said hair roller and a magnet, said body of ferromagnetic material being moved into the holding range of said magnet in response to said hair roller being placed on said heatable spindle structure to hold said biasing means in its stressed condition, the Curie temperature of said body of ferromagnetic material corresponding to the set temperature of said hair roller so as to release said biasing means at said temperature, and means for heating said heatable spindle structure.

4,691,096

ELECTRICALLY HEATED DEEP FAT FRYER

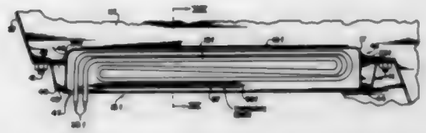
Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Division of Ser. No. 640,564, Aug. 14, 1984, Pat. No. 4,574,183. This application Dec. 11, 1985, Ser. No. 807,827

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3329793

Int. Cl.⁴ F27D *11/02;* **H05B** *3/68*

U.S. Cl. 219—441 **27 Claims**



1. An electric heating device for heating a substance, comprising:

a wall to be heated, the wall at least partially defining an area for the substance, the substance being disposed against a first surface of the wall for heating;

tubular heating means including a metallic tube with electrical insulation and heating resistors therein, the tubular heating means being soldered to a second surface of said wall;

a temperature control means having an elongated temperature sensor, said temperature sensor being mounted at said wall on said second surface in direct thermally-conductive contact with said second surface over substantially an entire length of said temperature sensor and closely adjacent to, substantially parallel to, and thermally responsive to at least one of said tubular heating means; and,

a heat conducting element thermally conductively connecting said temperature sensor to said second surface of said wall, said heat conducting element enclosing said temperature sensor over at least a part of its circumference, and over substantially its entire length.

4,691,097

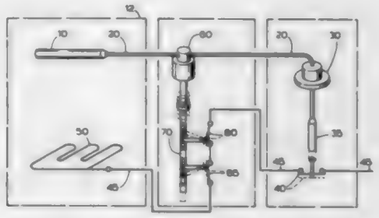
FAIL SAFE SAFETY CONTROL DEVICE

John J. Theiss, St. Louis, Mo., and Paul T. Durst, Louisville, Ky., assignors to Temp. Systems, Inc., St. Louis, Mo.

Filed Jun. 23, 1986, Ser. No. 877,260

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—513 **17 Claims**



1. In a temperature control system consisting of a nonelastic container adapted to be subject to temperature changes, a capillary tube connected to said container and extending to a first pressure responsive device, a thermally expansible and contractable material filling said container, said tube, and said first pressure responsive device, and a linkage connecting said first pressure responsive device to a first control device whereby changes in the first pressure responsive device, resulting from expansion or contraction of the expansible/contractable material caused by changes in the temperature of the area surrounding said nonelastic container, open or close the first control device so as to regulate when a primary heating device is supplying heat, the improvement wherein a second pressure responsive mechanism is interconnected with the material-filled capillary tubing in such a fashion that changes in the second pressure responsive device, resulting from expansion or contraction of the expansible/contractable material caused by the temperature of the area surrounding said nonelastic container having reached a preselected upper safety limit value, will activate a second control device so as to prevent the primary heating device from supplying heat; which second pressure responsive device will also activate a third control device to prevent the primary heating device from supplying heat when the expansible/contractable material does not completely fill the bulb, capillary tube, first pressure responsive device, and second pressure responsive device.

4,691,098

FOCUS CONTROL DEVICE

Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,560

Claims priority, application Japan, Oct. 29, 1984, 59-227441

Int. Cl.⁴ G01J *1/20, 1/24;* **G11B** *7/00, 20/22*

U.S. Cl. 250—201 **8 Claims**





1. A focus control device comprising:

a light source;

a movable recording medium on which incident light from said light source is focused and reflected therefrom;

an objective lens, positioned in the optical path of said incident light between said light source and said recording medium, for focusing incident light from said light source on said recording medium;

a beam splitter, positioned in the optical paths of said incident light from said light source and said reflected light from said recording medium, for separating said reflected light from said incident light and reflecting said separated light along an optical path;

a light receiving element for receiving said light reflected from said beam splitter;

optical means, positioned in said optical path of said reflected light from said beam splitter for selectively absorbing and transmitting said reflected light from said beam splitter;

said optical means comprising absorbing parts having a selected thickness and adapted to absorb a part of said reflected light from said beam splitter, and transmitting parts adapted to transmit a part of said reflected light from said beam splitter, said absorbing parts forming a predetermined angle with respect to the optical axis of said optical path of said reflected light from said beam splitter such that upon movement of said recording medium relative to said objective lens, varying amounts of reflected light from said beam splitter, indicative of the relative positions of said objective lens and said recording medium, impinge on said light receiving element.

4,691,099

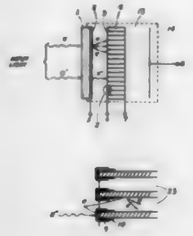
SECONDARY CATHODE MICROCHANNEL PLATE TUBE

C. B. Johnson, Fort Wayne, Ind., assignor to ITT Electro Optical Products, Roanoke, Va.

Filed Aug. 29, 1985, Ser. No. 770,446

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **9 Claims**



1. A radiant energy microchannel plate tube comprising:

a tube envelope;

a tube input window mounted in said envelope;

a first photocathode mounted on said input window;

a microchannel plate array mounted within said tube envelope and spaced from said tube input window with its input facing said input window; and

a second photocathode mounted on said microchannel plate input and spaced from said tube input window.

4,691,100

SHEET ORIENTER USING FLAP DETECTION

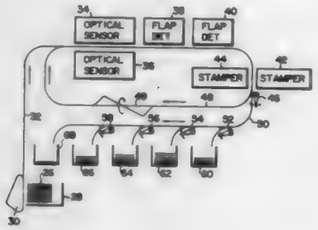
Shuji Kizu; Tsuyoshi Ishida, both of Yokohama, and Yasuo Nagase, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1984, Ser. No. 629,964

Claims priority, application Japan, Jul. 13, 1983, 58-127282

Int. Cl.⁴ G01N *9/04;* **G06M** *7/00*

U.S. Cl. 250—223 R **8 Claims**



1. An apparatus for detecting the direction of a paper sheet having a first surface with a flap and a second surface comprising:

means for transporting said paper sheet;

means for radiating a parallel light beam on one surface of said paper sheet being transported from an oblique direction with respect to the surface of the paper sheet, said parallel light beam crossing the direction of the outline of said flap;

means for receiving said light beam reflected from said one surface of said paper sheet to detect a shadow which is caused by said flap being obliquely radiated from said parallel light beam;

means for determining whether said second surface is facing said receiving means when said receiving means does not detect said shadow or said first surface is facing said receiving means when said receiving means does detect a shadow; and

means for reversing said first and second surfaces of said paper sheet when said judging means judges that said second surface is facing said receiving means, said reversing means carrying said paper sheet back to said transporting means after said reversing.

4,691,101

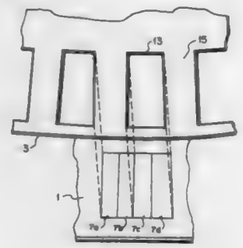
OPTICAL POSITIONAL ENCODER COMPRISING IMMEDIATELY ADJACENT DETECTORS

Mark G. Leonard, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 19, 1985, Ser. No. 747,084

Int. Cl.⁴ G01D *5/38*

U.S. Cl. 250—231 SE **47 Claims**



20. An optical encoder for indicating the rotational movement of a shaft, comprising:

an emitter means for emitting a light beam along a light path;

a light modulation means concentrically attached to the shaft and placed in the light path for modulating the light beam in response to the rotation of the shaft; and

a detector means, positioned in the light path, for receiving the modulated light beam with individual light detectors located immediately adjacent to one another and for generating index signals that reach their extreme amplitude at least once during each revolution of the shaft.

4,691,102

BOREHOLE COMPENSATION METHOD AND APPARATUS USING VARIATIONS IN RELATIVE BOREHOLE COMPONENTS

Ward E. Schultz, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 17, 1985, Ser. No. 745,723

Int. Cl.⁴ G01V *5/00*

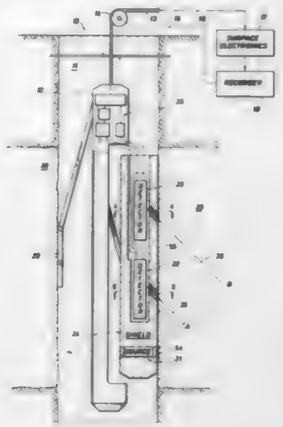
U.S. Cl. 250—256 **7 Claims**

1. For use in logging downhole earth formations penetrated by a borehole, a method for compensating measured gamma radiation for borehole effects on the photoelectric component thereof, comprising:

(a) measuring, with a first detector within the borehole, relatively low energy gamma radiation in the photoelectric effect energy range entering the borehole along a first predetermined path, and generating a first signal representative of the gamma radiation so measured,

(b) measuring, with a second detector within the borehole, relatively low energy gamma radiation in the photoelectric effect energy range entering the borehole along a second predetermined path different from the first path, and generating a second signal representative of the gamma radiation so measured,

(c) selecting said predetermined first and second paths such that differences in relative formation components of said first and second signals are minimized, and relative borehole components thereof are varied, and



(d) determining, as a function of said representative signals, the borehole effects thereon.

4,691,103

MICROSCOPE FOR NON-DIFFERENTIATED PHASE IMAGE FORMATION

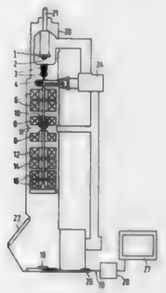
Jan B. Le Poole, Tucson, Ariz., and Nicolaas H. Dekkers, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1985, Ser. No. 757,998

Claims priority, application Netherlands, Jul. 25, 1984, 8402340

Int. Cl.[4] H01J *37/28*

U.S. Cl. 250—311 **15 Claims**



1. A microscope comprising a radiation source, a lens system, a beam scanning system, a radiation detector divided into a plurality of separately readable elements, a detector read-out system, and a monitor system receiving signals from said detector read-out system;

wherein the improvement comprises said beam scanning system including means for forming a scanning pattern provided in a continuous pattern of connected line segments, said radiation detector detecting separate signals for each line segment of said scanning pattern to be recorded.

4,691,104

ONE-DIMENSIONAL PYROELECTRIC SENSOR ARRAY

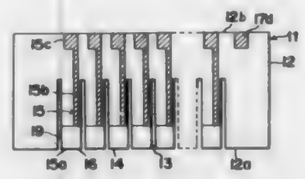
Michihiro Murata; Katsuhiko Tanaka, and Hiroyuki Seto, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 12, 1985, Ser. No. 743,950

Claims priority, application Japan, Jun. 14, 1984, 59-123423

Int. Cl.[4] G01J *5/10*

U.S. Cl. 250—338 **16 Claims**



1. A one-dimensional pyroelectric sensor array which comprises:

a base plate made of a pyroelectric material;

a plurality of strip elements made of pyroelectric material and having a free end and another end, said strip elements each having a heat-sensitive region at said free end thereof, and each being supported only at the other end to the base plate to form an integrated structure with the base plate, each of said strip elements being separated from each adjacent strip element at portions thereof away from said base plate; and

at least one pair of detecting electrodes formed on the heat-sensitive region of the free end of each strip element.

4,691,105

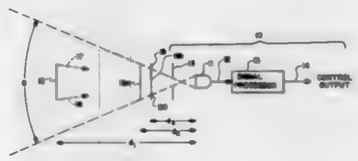
THERMAL ENERGY PROXIMITY DETECTOR

Norman P. Huffnagle, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 3, 1985, Ser. No. 740,798

Int. Cl.[4] G01J *1/28*

U.S. Cl. 250—338 **2 Claims**



1. A detector of thermal energy giving an output which is determined by the rate of change of the energy received by said detector, and which is independent of the absolute value of that energy comprising:

means establishing a field of view for said detector such that as the distance between said detector and a source of thermal energy decreases, the source occupies an increasingly large portion of the field, and the energization of said detector increases until the source fills the entire field of view, whereupon the energization of said detector has no further effective rate of change, so that the output of the detector becomes zero;

and output means connected to the detector for giving a signal when the detector output becomes zero.

4,691,106

APPARATUS FOR DETERMINING REFLECTIVITY OF AN OBJECT SUCH AS A MIRROR

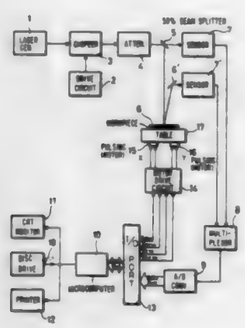
Choi J. Hyun; Lee J. Chul, both of Seoul, and Choi W. Bum, Kyungki-Do, all of Rep. of Korea, assignors to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea

Filed Sep. 13, 1985, Ser. No. 775,749

Claims priority, application Rep. of Korea, Nov. 20, 1984, 84-7249

Int. Cl.[4] G01N *21/55*

U.S. Cl. 250—349 **1 Claim**



1. An apparatus for detecting defects in a laser mirror to be inspected, comprising:

an infrared laser beam generator;

a chopper receiving the output beam from said generator and modulating it to have a selected frequency;

an attenuator receiving the modulated output beam from said chopper and attentuating it to a selected intensity level;

a beam splitter adapted to split the output beam from said attenuator, a portion thereof being irradiated on and reflected from the laser mirror to be inspected;

a pair of infrared ray-sensors, one of which receives said portion of the output beam reflected from the laser mirror and the other of which receives directly the remaining portion of the output beam from said beam splitter, such remaining portion thereof constituting a reference beam, such sensors producing analog output signals respectively corresponding to the intensities of the reflected and reference beams;

a multiplexer receiving both analog output signals from said sensors and combining them into a multiplexed signal alternately representing each of such output signal;

An A/D converter receiving the multiplexed analog output signal from said multiplexer and converting it into a digital signal;

X- and Y-axes pulsing motors for moving an X-Y table supporting the laser mirror to be inspected thereon;

a circuit for driving said X- and Y-axes pulsing motors;

an I/O port receiving the digital signal from said A/D converter and supplying it to a micro-computer; and

said micro-computer receiving the digital signal from said I/O port and deriving therefrom a comparison of the relative intensities of said reference beam and said reflected beam, said micro-computer further actuating said driving circuit for said pulsing motors so as to cause said X-Y table to move so that the laser mirror thereon is continuously scanned by the portion of the laser output beam irradiated thereon.

4,691,107

INFRA RED PHOTO DETECTOR SYSTEMS

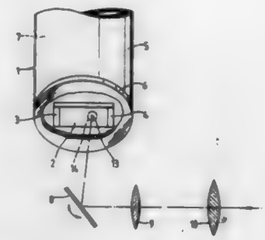
Charles T. Elliott, and Anthony M. White, both of Malvern, England, assignors to The Secretary of State for Defence, London, England

Division of Ser. No. 485,888, Apr. 18, 1983, Pat. No. 4,572,953. This application Oct. 4, 1985, Ser. No. 784,469

Claims priority, application United Kingdom, Apr. 19, 1982, 8211291

Int. Cl.[4] H01L *31/00*

U.S. Cl. 250—370 **15 Claims**



1. A method of detecting the position of an infrared light source in a scene, the method including the steps of:

imaging the scene on to a photosensitive surface region of an infrared sensitive photoconductive element, the element having bias electrodes arranged to define at least one bias current path substantially parallel to the said photosensitive surface region;

applying a DC electrical bias signal to the bias electrodes to generate an output signal from the photoconductive element;

controlling the element output signal by reversing the bias polarity;

detecting the controlled element output signal; and

extracting the light source image position from a difference/sum ratio of element resistance for the two bias polarities.

4,691,108

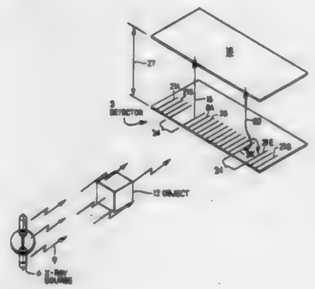
IONIZATION DETECTOR

Douglas S. Steele, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 565,672, Dec. 27, 1983. This application Feb. 27, 1986, Ser. No. 834,262

Int. Cl.[4] H01J *47/18*

U.S. Cl. 250—385 **6 Claims**



1. An ionization detector, comprising:

a substrate;

a plurality of data detectors positioned on the substrate so as

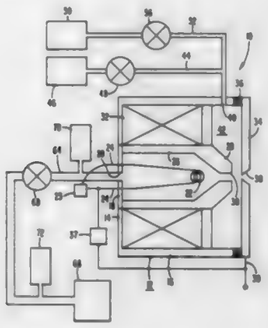
to respond to x-radiation attenuated by passing through an object;
a plurality of reference detectors positioned on the substrate so as to respond to x-radiation which does not pass through the object; and
a conductor located between the data detectors and the reference detectors which is coupled with a means for preventing electron accumulation on the conductor;
whereby the perpendicularity of electric field lines on nearby detectors is enhanced and arcing between the space and the nearby detectors is reduced.

4,691,109

APPARATUS AND METHOD FOR PRODUCING IONS

Charles W. Magee, West Windsor Township, Mercer County, and Lori R. Hewitt, Lawrence Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1986, Ser. No. 823,258
Int. Cl.⁴ H01J *27/00*
U.S. Cl. 250—426 **8 Claims**



1. In an ion beam source which includes within a housing a filament cathode, a means for providing a magnetic filed within said housing, an anode spaced from the cathode and having an opening therethrough, and means for admitting pure helium gas to be ionized into the housing between the anode and the cathode, a means for creating an arc discharge the improvement comprising
an outlet opening through the housing on the side of the cathode away from the anode, means for causing a flow of the helium gas over the cathode and out of the housing through said opening and means for providing a flow of a starting gas over the cathode.

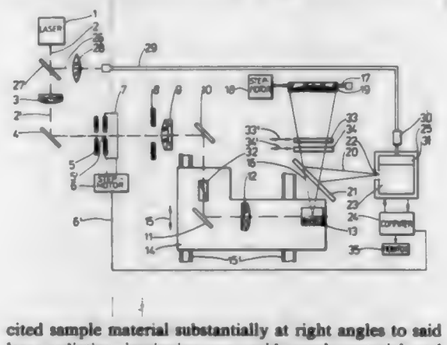
4,691,110

LASER SPECTRAL FLUOROMETER

Wolfgang Nebe; Jutta Reichel; Klaus Biehler, all of Jena; Hartmut Lucht, Altglienicke, and Heinz Drommert, Berlin, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 25, 1985, Ser. No. 716,002
Claims priority, application German Democratic Rep., May 2, 1984, WPG01J/2625764
Int. Cl.⁴ F21V *9/16*; G01N *21/64*
U.S. Cl. 250—458.1 **7 Claims**

1. A laser spectral fluorometer for analyzing a sample material, comprising
a laser radiation source for emitting a pulsed laser radiation over a given spectral range,
a first optical member,
at least a first slit,
a second optical member having an object side focus,
said first optical member producing a narrow diameter portion of said laser radiation in said first slit,
said first slit being variable within two end positions, the one end position being fully open, the other end position being closed,
said first slit being arranged in said object side focus of said second optical member,
means for varying said first slit,
said second optical member imaging said laser radiation at infinity,
at least a first deviating member, a third optical member, and a sample material to be analyzed,
a displaceable base,
said first deviating member, said third optical member, and said sample material being commonly mounted on said base subsequently in said laser radiation,
said first deviating member directing said laser radiation from said second optical member to said third optical member,
said first deviating member folding said laser radiation by 90°,
said third optical member focusing said laser radiation into said sample material for exciting the latter,
a luminescence radiation thereby being emitted by the excited sample material substantially at right angles to said laser radiation, impinging upon said sample material, and substantially in parallel to at least a portion of said laser radiation before said first deviating member,
an emission monochromator, in turn, comprising a concave reflective grating rotatably seated about a substantially horizontal axis,
said concave reflective grating having an image side focus, and being arranged in opposition to said sample material in said luminescence radiation,
said concave reflective grating dispersing said luminescence radiation into a dispersed wavelengths radiation,
a reflector,
an evaluation unit having an entry slit,
said reflector directing said dispersed wavelengths radiation into said entry slit,
said image side focus being located in said entry slit,
means for displacing said base in a plane defined by said laser radiation and said luminescence radiation, substantially along the latter,
said means for displacing said base adjusting said image side focus in said entry slit.



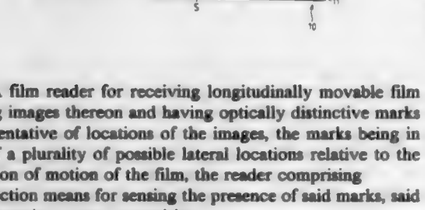
4,691,111

MULTIPLE GAP OPTICALLY ACTIVATED SWITCH

Lawrence J. Bovino, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 596,966, Apr. 5, 1984, Pat. No. 4,633,286. This application Sep. 3, 1986, Ser. No. 903,808
Int. Cl.⁴ G02B *27/00*
U.S. Cl. 250—551 **2 Claims**

1. A high voltage pulse forming network comprising:
a pair of similar optically activated switches;
each switch comprising a bulk semiconductor wafer, a pair of spaced electrical contacts arranged in a line on one of the broad surfaces of said wafer, and a bridging electrode located on the opposite broad surface of said wafer overlapping and bridging the pair of spaced contacts;
a source of high voltage connected to an electrical contact of a first optically activated switch;
an output terminal connected to the other contact of said first switch;
the other optically activated switch having an electrical contact connected to the bridging electrode of said first switch, with the other contact of the same connected to ground;



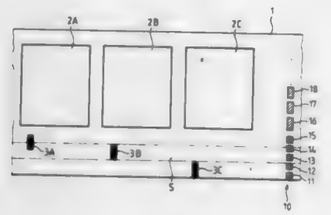
first light source means for illuminating and activating said first switch;
second light source means for illuminating and activating the other switch; and
control means for sequentially enabling said first and second light source means, said second light source means being enabled a predetermined short time after the first light source means is enabled to thereby disable the first optically activated switch.

4,691,112

APPARATUS FOR THE DETECTION OF OPTICAL MARKS ON A FILM SUPPORT MOVED RELATIVE TO THE APPARATUS

Peter Wydler, Zürich, Switzerland, assignor to Alos AG, Zürich, Switzerland

Filed Jul. 1, 1985, Ser. No. 750,133
Claims priority, application Switzerland, Jul. 20, 1984, 3548/84
Int. Cl.⁴ G06K *7/14*
U.S. Cl. 250—570 **2 Claims**



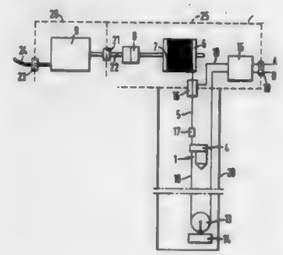
1. A film reader for receiving longitudinally movable film having images thereon and having optically distinctive marks representative of locations of the images, the marks being in any of a plurality of possible lateral locations relative to the direction of motion of the film, the reader comprising
detection means for sensing the presence of said marks, said detection means comprising
an elongated substantially continuous array of a plurality of photoresponsive devices, said array having a total length at least as great as the lateral dimension of said film,
each of said photoresponsive devices having an active light-receiving surface and all of said active surfaces of said devices facing in substantially the same direction in said array; and
means for supporting said array in a fixed position so that said active surfaces are exposed to and directed to receive light from said film and so that the long dimension of said array extends substantially perpendicular to the desired direction of motion of said film, whereby said photoresponsive devices in said array are responsive to changes in the optical characteristics of said film including changes resulting from the presence of said marks to produce electrical signals representative of said changes without regard to uncontrolled lateral relocation of said film or said marks thereon.

4,691,113

LEVEL INDICATOR FOR A LIQUID IN A CONTAINER

Philippe Corvazier, Montigny les Cormailles, and Jacques Dousteyssier, Rueil-Malmaison, both of France, assignors to The British Petroleum Company p.l.c., London, England

Filed Oct. 11, 1985, Ser. No. 786,643
Claims priority, application France, Oct. 26, 1984, 84 16449
Int. Cl.⁴ G01N *21/85*; G01F *23/00*
U.S. Cl. 250—577 **6 Claims**



1. Liquid level indicator comprising (a) totally internally reflecting optical sensor having a light emitter and receiver arranged so that when the optical sensor is in contact with the liquid the total internal reflections of the light from the light emitter to the receiver are reduced, (b) means for moving the optical sensor upwardly or downwardly relative to theliquid level so as to allow the optical sensor to be brought into contact with the liquid, (c) the optical sensor having means for indicating the maximum liquid level, (d) means for signaling the position of the optical sensor with respect to the liquid level and the maximum liquid level comprising a unit providing distinct signals for three logic states corresponding to the sensor in contact with the liquid and not at maximum liquid level, the sensor not in contact with the liquid and not at maximum liquid level, and the sensor at maximum liquid level whether in contact with the liquid or not, and (e) said means for signaling the position of the optical sensor being adapted to actuate said means of moving the optical sensor so as to cause the sensor to sense the liquid level.

4,691,114

ORIGINAL READER WITH VARIABLE MAGNIFICATION AND TIME DELAY

Shizuo Hasegawa, and Kimiyoshi Hayashi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,920
Claims priority, application Japan, Feb. 29, 1984, 59-38332; Feb. 29, 1984, 59-38333
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **17 Claims**

1. An original reader comprising:
a plurality of line sensors each consisting of a plurality of photosensor elements, said line sensors being arranged

such that lines read at a given instant by adjacent ones of said line sensors mutually differ;

means for moving said plurality of line sensors and an original relative to each other in a direction perpendicular to a scanning direction of said plurality of line sensors at a speed corresponding to a variable reading magnification of the original; and



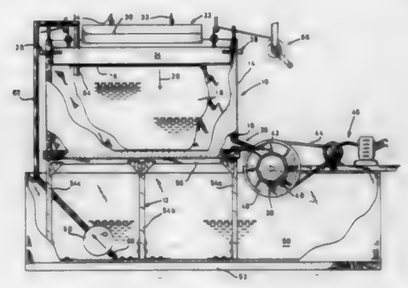
means for delaying by a delay time an output from one of said line sensors which scans a line of the original prior to scanning of that line by a second one of said line sensors, said delay time being varied in accordance with the reading magnification of the original.

4,691,115

SYSTEM FOR ROTATING A DRIVE MECHANISM FOR POWER GENERATION

Jerry W. Robinson, P.O. Box 1244, Weaverville, N.C. 28787

Filed Jan. 31, 1986, Ser. No. 824,713
Int. Cl.⁴ F01D *15/10*
U.S. Cl. 290—1 R **13 Claims**



1. A system for rotating a drive mechanism which can be connected to an electrical generator or the like, said system comprising:

a reservoir means for containing a volume of liquid such as water;

weight means for applying a downward pressure to said liquid in said reservoir means;

weight moving means for moving said weight means proximate an upper portion of said reservoir means whereby said weight means applies a downward pressure to an upper surface of said liquid in said reservoir means;

spout means for discharging liquid exiting said reservoir means, said spout means serving to direct and concentrate discharged water into a stream such that said stream of water can be directed against such drive mechanism for imparting rotational forces thereon;

catch basin means for receiving water discharged through said spout means from said reservoir means, said catch basin means being positioned below said spout means; and

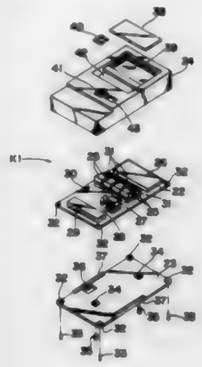
means for moving said water from said catch basin means into said reservoir means.

4,691,116

SWITCH CONTROL DEVICE FOR MOTOR VEHICLE

Yasuhiro Kiyono, Nagaokakyo, and Yutaka Takeyama, Toyonaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 5, 1985, Ser. No. 762,471
Claims priority, application Japan, Aug. 7, 1984, 59-165323
Int. Cl.⁴ H01H *3/14*
U.S. Cl. 307—10 R **13 Claims**



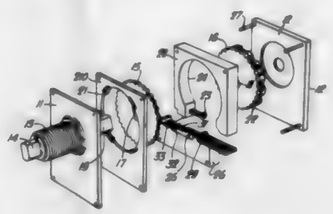
1. A switch control device for a motor vehicle comprising a plurality of switches for actuating a plurality of apparatuses of said vehicle, at least one of said plurality of switches comprising a stop mode switch and a moving mode switch, said device further comprising a means for enabling the stop mode switch or the moving mode switch of said at least one of said plurality of switches, depending on whether or not the vehicle is in motion.

4,691,117

SWITCH DEVICE

John C. Greenwood, Harlow; Robert J. Hodges, Cheshunt, and Robert Sheppard, Sawbridgeworth, all of Great Britain, assignors to International Standard Electric Company, New York, N.Y.

Continuation of Ser. No. 605,174, Apr. 30, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 837,562
Claims priority, application United Kingdom, May 10, 1983, 8312776
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 307—119 **10 Claims**



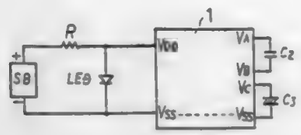
1. A contactless electrical switch, including: a switch element comprising a piezo-resistive body flexibly moving between first and second configurations corresponding to oppositely stressed conditions; said body having an unstressed condition between said oppositely stressed conditions; a rotatable code disc means forcing said body into said configurations; said disc means having an undulated periphery; and means for resiliently urging said body away from its unstressed condition.

4,691,118

SOLAR POWER CIRCUIT

Toshio Nishimura, Jyoyo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 24, 1985, Ser. No. 779,442
Claims priority, application Japan, Sep. 25, 1984, 59-200785
Int. Cl.⁴ H02J *9/00*
U.S. Cl. 307—66 **11 Claims**



11. A power supply circuit for supplying power to a load, comprising:

a primary power supply developing a supply voltage during a normal mode;

backup booster charge storage means for storing charge to be supplied to the load during a primary power supply failure mode when said supply voltage is not developed by said primary power supply;

secondary supply means storing charge received from said supply voltage developed from said primary power supply for supply to said backup booster charge storage means during said normal mode, said secondary supply means further receiving charge from said backup booster charge storage means for supply to said load during said primary power supply failure mode; and

control means, operative during said normal mode, for repetitively connecting said second supply means to said primary power supply during a first period and for connecting said secondary supply means in series with said backup booster charge storage means across said primary power supply during a second period to transfer a charge to said backup booster charge storage means at twice said supply voltage;

said control means being operative during said primary power supply failure mode for repetitively connecting said secondary supply means and backup booster charge storage means in series across said load during a first period to apply a difference voltage to said load and charge said secondary supply means with voltage and for connecting only said secondary supply means across said load in a second period to supply the energy stored therein to said load.

4,691,119

PERMANENT MAGNET ALTERNATOR POWER GENERATION SYSTEM

Jack L. McCabria, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

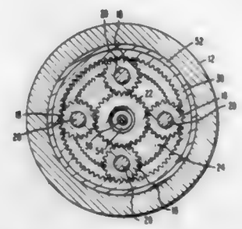
Filed Jun. 20, 1985, Ser. No. 746,819
Int. Cl.⁴ H02K *7/10*
U.S. Cl. 307—84 **15 Claims**

1. An electrical generating system comprising:

a plurality of permanent magnet alternators, wherein each of said alternators includes a rotor and a stator mounted such that rotation of each of said rotors induces a voltage in a stator winding in an associated one of said stators, and wherein the stator windings of each of said alternators are electrically connected in series;

means for rotating the rotors of each of said alternators at the same speed; and

means for changing the phase angle of the voltage induced in each of said stator windings such that the magnitude of the total voltage across the series connection of said stator windings remains substantially constant as the magnitude



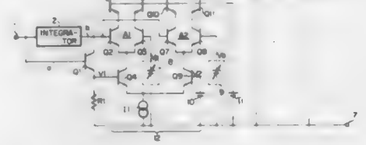
of the voltage induced in each of said stator windings changes.

4,691,120

PULSE DELAY CIRCUIT DEVICE

Hiroshi Kondo, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,022
Claims priority, application Japan, Oct. 29, 1985, 60-241847
Int. Cl.⁴ H03K *5/04, 5/22, 5/153, 5/01*
U.S. Cl. 307—265 **4 Claims**



1. A pulse delay circuit, comprising:

a double-balanced type differential amplifier means including a first differential amplifier comprising a first differential transistor pair having two input terminals and arranged to provide a first and a second output and a first current source transistor, and a second differential amplifier comprising a second differential transistor pair having two input terminals and arranged to provide a first and a second output and a second current source transistor;

an integrator for integrating an input pulse, said integrator being connected to one of the two input terminals of each of said first and second differential transistor pairs;

a first and a second reference voltage source connected to the other input terminals of said first and second differential transistor pairs, respectively;

a first output stage arranged to combine the first outputs of said first and second differential transistor pairs, and a second output stage arranged to combine the second outputs of said first and second differential transistor pairs; and

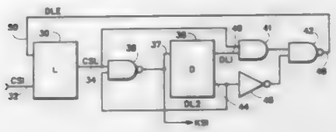
means for causing said first and second current source transistors to be turned on in synchronism with said input pulse so as to render said first and second differential amplifiers operative alternately, so that an output pulse having predetermined delay time and pulse width is derived from each of said first and second output stages of said double-balanced type differential amplifer means.

4,691,121

DIGITAL FREE-RUNNING CLOCK SYNCHRONIZER

John G. Theus, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 29, 1985, Ser. No. 803,262
Int. Cl.[4] H03K 5/13, 19/00
U.S. Cl. 307—269 6 Claims



1. An oscillator circuit, comprising:
a coincidence logic element comprising a NAND gate having a first input receiving a control signal, a second input, and an output, the control signal having first and second logic states;
a delay element having an input terminal connected to the output of said coincidence logic element, and a first output terminal connected to the second input of said coincidence logic element, said delay element passing a signal on the input terminal to the first output terminal after a delay T2, the control signal in the first logic state enabling said coincidence logic element to regenerate on the output thereof a complement of the signal on the second input, thereby generating on the output of said coincidence logic element a square wave output signal of said oscillator circuit having a period 2(T2+D) where D is a gate delay of the NAND gate, the control signal in the second logic state disabling said coincidence logic element;
a latch circuit receiving an asynchronous timing signal from an external source and having an enabling input, said latch circuit, when enabled, regenerating the asynchronous timing signal as the control signal; and
a logic element having an output connected to the enabling input of said latch circuit, said delay element having a second ouput terminal passing the signal on the input terminal after a delay T1 where T1<T2, said logic element receiving the signals at said first and second output terminals of said delay element and generating an enabling output signal, the enabling output signal being disabled during a period of positive to negative transition of the square wave output signal.

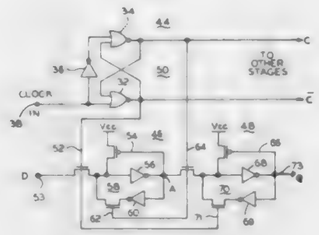
4,691,122

CMOS D-TYPE FLIP-FLOP CIRCUITS

Paul G. Schnitzlein, and Wen-Tsung F. Tang, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1985, Ser. No. 717,350
Int. Cl.[4] H03K 3/26, 17/16, 19/096, 3/284
U.S. Cl. 307—279 8 Claims

1. A CMOS D-type flip-flop circuit for avoiding the possibility of feedthrough comprising:
a non-overlapping clock generator section having a true clock output and a complement clock output;
a master section formed of a first transfer gate, a first regenerative transistor and a first inverter gate;
said first transfer gate being formed of a first N-channel MOS transistor with common electrodes and a gate electrode, and said first regenerative transistor being formed of a first P-channel MOS transistor with common electrodes and a gate electrode;
said first N-channel transistor having one of its common electrodes connected to a D input terminal, its other common electrode connected to the input of said first inverter gate and its gate electrode connected to the complement clock output;
said first P-channel transistor having one of its common electrodes connected to a supply potential, its other common electrode connected to the input of said first inverter gate, and its gate electrode connected to the output of said first inverter gate;
said first inverter gate being formed of a P-channel MOS transistor and an N-channel MOS transistor whose gate electrodes are connected together to define the input thereof and whose drain electrodes are connected together to define the output thereof;
a slave section formed of a second transfer gate, a second regenerative transistor and a second inverter gate;
said second transfer gate being formed of a second N-channel MOS transistor with common electrodes and a gate electrode, and said second regenerative transistor being formed of a second P-channel MOS transistor with common electrodes and a gate electrode;
said second N-channel transistor having one of its common electrodes connected to the output of said first inverter gate, its other common electrode connected to the input of said second inverter gate and its gate electrode connected to the true clock output;
said second P-channel transistor having one of its common electrodes connected to the supply potential, its other



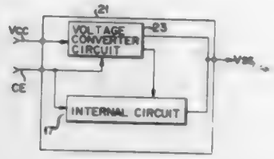
common electrode connected to the input of said second inverter gate and its gate electrode connected to the output of said second inverter gate and to an output terminal;
said second inverter gate being formed of a P-channel MOS transistor and an N-channel MOS transistor whose gate electrodes are connected together to define the input thereof and whose drain electrodes are connected together to define the output thereof;
a first regeneration circuit formed of a third inverter gate and a third N-channel MOS transistor with common electrodes and a gate electrode;
said third N-channel transistor having one of its common electrodes connected to the output of said third inverter gate, its other common electrode connected to the input of said first inverter gate and its gate electrode connected to the true clock output, the input of said third inverter gate being connected to the output of said first inverter gate;
a second regeneration circuit formed of a fourth inverter gate and a fourth N-channel MOS transistor with common electrodes and a gate electrode; and
said fourth N-channel transistor having one of its common electrodes connected to the output of said fourth inverter gate, its other common electrode connected to the input of said second inverter gate and its gate electrode connected to the complementary clock output, the input of said fourth inverter gate being connected to the output of said second inverter gate.

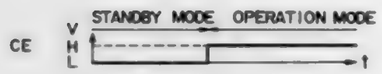
4,691,123

SEMICONDUCTOR INTEGRATED CIRCUIT WITH AN INTERNAL VOLTAGE CONVERTER CIRCUIT

Kazuhiko Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 14, 1986, Ser. No. 818,670
Claims priority, application Japan, Jan. 14, 1985, 60-4369
Int. Cl.[4] G05F 3/16
U.S. Cl. 307—296 R 10 Claims





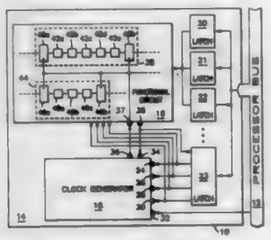
8. Semiconductor integrated circuit apparatus comprising:
internal circuit means for operating from a plurality of power source voltages and for switching between an operation mode during which the level of said plurality of power source voltages differ in value by a first amount and a standby mode during which the level of said plurality of power source voltages differ in value by a second amount greater than said first amount; and
voltage switching means for receiving a control signal indicative of said operation mode and said standby mode, and for supplying said power source voltages to said internal circuit means.

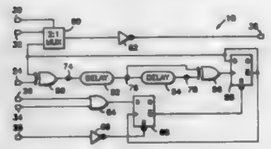
4,691,124

SELF-COMPENSATING, MAXIMUM SPEED INTEGRATED CIRCUIT

Robert C. Ledzius, Chandler, and Steven P. Allen, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1986, Ser. No. 863,915
Int. Cl.[4] H03K 5/14, 5/135, 3/72
U.S. Cl. 307—303 12 Claims





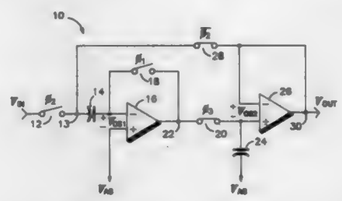
1. A self-compensated integrated circuit comprising:
a functional circuit for performing a dedicated task, said functional circuit being constructed on a substrate, having a clock input node and having a slowest signal path, said functional circuit slowest signal path having a propagation delay associated therewith which is slower than propagation delays for all other signal paths of said functional circuit; and
a clock generator constructed on the substrate and having a clock output node that couples to said functional circuit clock input node, said clock generator operating to generate a clock signal which exhibits a frequency influenced by a propagation delay characteristic of a delay element portion of said clock generator, said delay element portion being constructed from active components and causing a signal propagating through the delay element to exhibit a delay of a predetermined duration relative to the propagation delay of said functional circuit slowest signal path.

4,691,125

ONE HUNDRED PERCENT DUTY CYCLE SAMPLE-AND-HOLD CIRCUIT

Mathew A. Rybicki, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1986, Ser. No. 915,837
Int. Cl.[4] G11C 27/02
U.S. Cl. 307—353 9 Claims



1. A sample-and-hold circuit comprising:
first charge storage means for receiving and storing an input voltage;
a first differential amplifier having a first input coupled to the first charge storage means, a second input coupled to a reference voltage terminal, and an output;
first switching means having a first terminal coupled to the first input of the first differential amplifier means, and a second terminal coupled to the output of the first differential amplifier means, for selectively connecting the first input and output of the first differential amplifier;
second charge storage means having a first electrode coupled to the reference voltage terminal, and a second electrode for selectively receiving and storing the output of the first differential amplifier;
second switching means having a first terminal coupled to the output of the first differential amplifier, and a second terminal coupled to the second electrode of the second charge storage means;
a second differential amplifier having a first input coupled to the second electrode of the second charge storage means, and a second input connected to an output thereof for continuously providing a sampled output voltage; and
third switching means having a first terminal coupled to the first charge storage means, and a second terminal coupled to the second input of the second differential amplifier, for coupling the first charge storage means to the second differential amplifier.

4,691,126

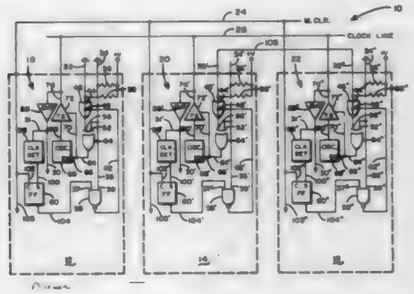
REDUNDANT SYNCHRONOUS CLOCK SYSTEM

Katherine A. Spiett, and James A. Howe, both of Burnsville, Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 29, 1985, Ser. No. 770,461

Int. Cl.[4] H03K *1/00, 17/02*

U.S. Cl. 307—441 **10 Claims**



1. A redundant clock system for an electronic digital logic system that has a common clock bus and is implemented with a plurality of digital clock circuits located on separate modules of said digital logic system comprising at least first and second modules, first and second alternately activatable clock generating means located on said first and second modules, coupled to supply a train of clock pulses to said clock bus from the activated one of said first and second clock generating means, wherein said first clock generating means is initially activated and said second clock generating means is initially deactivated, timing means located on said second module coupled to monitor the clock pulse pulses supplied on said clock bus by said first clock generating means to control a time-out period upon the occurrence of each clock pulse on said clock bus supplied by said first clock generating means and to supply a time-out signal when the interval after a monitored clock pulse exceeds a predetermined time interval and control means coupled to said timing means and constructed to maintain said first clock generator means in an activated state and said second clock generator means in a deactivated state until such time that said timing means has transmitted a time-out signal and to then switch said second clock generator means to an activated state and said first clock generating means to a deactivated state.

4,691,127

ADAPTIVE ELECTRONIC BUFFER SYSTEM HAVING CONSISTENT OPERATING CHARACTERISTICS

Cornelis M. Hutzer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,189

Claims priority, application Netherlands, Dec. 5, 1984, 8403693

Int. Cl.[4] H03K *1/02, 17/30*

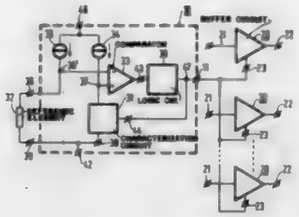
U.S. Cl. 307—475 **8 Claims**

1. An adaptive electronic output buffer system, which comprises:

a set circuit having a set output, said set circuit in operation generating a binary set signal at said output;

a buffer circuit having a signal input, a signal output and a set input which is connected to the set output of the set circuit, said buffer circuit comprising at least two sub-buffers which are connected in parallel between the signal input and the signal output, one of said sub-buffers being a switchable sub-buffer having an activation input connected to the set input and which is selectively set in operation to one of the states of maximum and minimum conductance by said binary set signal at said set output, the set signal at said set output in operation counteracting the effects of manufacturing process variations and operating conditions on the output conductance of the buffer circuit;

a characterization circuit in said set circuit having N inputs, first and second measurement connections, and first and second reference connections, the inputs of the characterization circuit being connected to the set output;



a measurement conductance provided between said first and second measurement connections for providing a measure of the output conductance of said buffer circuit; and

a reference element having a constant conductance connected to said first and second reference connections, said reference element comprising a resistor.

4,691,128

CIRCUIT FOR COUPLING A SIGNAL PROCESSING DEVICE TO A TRANSMISSION LINE

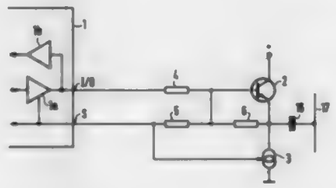
Waldemar Frühauf, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,916

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420268

Int. Cl.[4] H03K *17/56, 5/08;* **H03H** *7/38*

U.S. Cl. 307—557 **11 Claims**



1. A coupling circuit for coupling a signal processing device to an I/O device, such as a transmission line subject to substantial impedance fluctuations, the signal processing device having an I/O terminal for receiving and producing both input and output signals, respectively, and a control output for producing a control output signal having two states indicative of the direction of transmission, said coupling circuit comprising:

(a) a first transistor having a base, an emitter, and a collector wherein the latter-two form an emitter-collector circuit;

(b) a controlled current source and a supply source connected in series with the emitter-collector circuit of said first transistor, said first transistor and said current source connected together at a junction coupled to the I/O device;

(c) a first resistor coupling the I/O terminal of the signal processing device to the base of said first transistor;

(d) a second resistor coupling the control output of the signal processing device to the base of said first transistor;

(e) a third resistor coupling the I/O terminal of the signal processing device to the I/O device via the first resistor and

(f) said first transistor and said controlled current source being responsive to the states of the control output signal, said first transistor and said controlled current source both conducting responsive to a first state of said control output signal to provide a first impedance value for an output signal transmitted from the I/O terminal to the I/O device, said first transistor and said controlled current source both non-conducting responsive to a second state of said control output signal to provide a second impedance value for an input signal transmitted from the I/O device to the I/O terminal, and the second impedance value being greater than the first impedance value to increase responsiveness of the signal processing device during reception while the lower first impedance value increases the output signal drive to the I/O device during transmission.

4,691,129

DRIVE CIRCUIT FOR A POWER MOSFET WITH SOURCE-SIDE LOAD

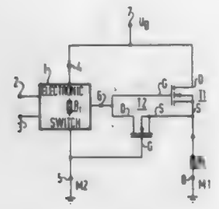
Josef Einzinger, Unterschleissheim; Christine Fellinger, Unterhaching; Ludwig Leipold, Munich; Jenoë Tihanyi, Munich, and Roland Weber, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,578

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609236

Int. Cl.[4] H03K *17/687, 3/01;* **H02H** *7/00;* **G05F** *1/40*

U.S. Cl. 307—581 **2 Claims**



1. In a drive circuit for a power MOSFET having a load connected between the source electrode of said power MOSFET and ground potential and with an electronic switch connected between ground potential and the gate electrode of said power MOSFET, the improvement comprising:

the source-drain path of a depletion mode MOSFET being connected between the source and gate electrodes of said power MOSFET; and

the gate electrode of said depletion mode MOSFET being connected to a terminal of said electronic switch for connection to ground potential.

4,691,130

PROCESS FOR THE GENERATION PLASMA AND AN MHD GENERATOR

Franz Gillissen, Ahornstrasse 8, Kerpen-Turnich, Fed. Rep. of Germany

PCT No. PCT/EP85/00271, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00180, PCT Pub. Date Jan. 3, 1986

PCT Filed Jul. 5, 1985, Ser. No. 834,324

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421129; May 29, 1985, 3519162

Int. Cl.[4] H02N *4/02*

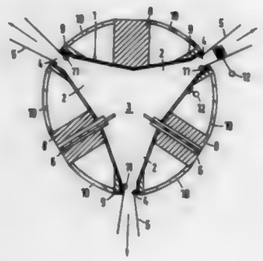
U.S. Cl. 310—11 **20 Claims**

1. A method for generating a plasma by heating a flowing gas comprising the steps of:

providing a cavity which encloses a plurality of flow channels that terminate in a common space, the cavity including gas exit orifices;

establishing magnetic fields having flux lines within each channel, said flow lines being oriented generally parallelly to the axes of the channels;

discharging a gas within each channel to produce a helical flow pattern around the flux lines as the gas moves toward the common space where the helical flows meet each other and form a zone of turbulence;



heating the turbulent gas zone until sufficient electrical energy is generated to effect a self-organized heating up and boost heating of the gas;

whereby Hall currents are established in the heated turbulent gas, the Hall currents producing axially parallel magnetic fields which compress and further heat up the gas to a plasma by the pinch effect; and

exhausting the plasma from the flow cavity, through the gas exit orifices.

4,691,131

STATOR LAMINATE IMPREGNATION IN A LIQUID-COOLED MOTOR

Jiro Nakano, Hino, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

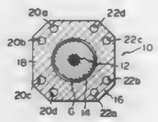
PCT No. PCT/JP85/00633, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/03068, PCT Pub. Date May 22, 1986

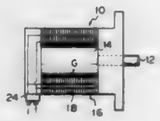
PCT Filed Nov. 13, 1985, Ser. No. 882,981

Claims priority, application Japan, Nov. 14, 1984, 59-238588

Int. Cl.[4] H02K *9/193*

U.S. Cl. 310—54 **3 Claims**





1. A liquid-cooled motor comprising:

a cylindrical rotor;

a hollow tubular stator surrounding said rotor with a gap therebetween, said stator having an unjacketed laminated core composed of a plurality of laminations each having a plurality of holes formed therein so aligned as to form a plurality of cooling liquid passages extending axially with respect to said stator and distributed symmetrically with

respect to an axis of said laminated core as viewed in cross section perpendicular to said axis, said cooling liquid passages being connected at a surface of said stator to external cooling liquid passages provided outside said hollow tubular stator; and

wherein said laminated core is impregnated with a resin to fill gaps between adjacent laminations and coat inner surfaces of said cooling liquid passages so that cooling liquid will flow through said cooling liquid passages without leakage therefrom.

4,691,132

SYNCHRONOUS MOTOR WITH TWO-POLE PERMANENT-MAGNET SOFT-MAGNETIC-CORE ROTOR

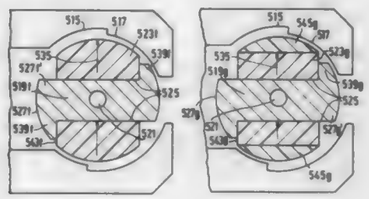
Leo Bertram, Stolberg, Fed. Rep. of Germany, and Hugo Schemmann, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1986, Ser. No. 866,033

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518697; May 24, 1985, 3518696

Int. Cl.⁴ H02K *1/22, 21/08*

U.S. Cl. 310—156 **13 Claims**



1. A single-phase synchronous motor comprising a two-pole permanent-magnet rotor between two electromagnetically excited stator poles, the rotor comprising a soft-magnetic block-shaped central part which is diametrally-symmetrical relative to the rotor axis and which has a longer dimension and a shorter dimension transverse to the rotor axis, permanent magnets having magnet poles being arranged on opposite sides of the longer lateral surfaces thus formed, which permanent magnets have directions of magnetization perpendicular to the longer lateral surfaces and have a lower magnetic permeability than the central part, the air gaps between the permanent magnets and the stator being larger than the air gaps between the soft-magnetic central part and the stator.

4,691,133

IRON-FREE ROTARY DISK ELECTRICAL MACHINE

Peter P. Mongeau, Needham, Mass., assignor to Electromagnetic Launch Research, Inc., Cambridge, Mass.

Filed Jul. 8, 1986, Ser. No. 883,344

Int. Cl.⁴ H02K *31/02, 1/22, 16/00*

U.S. Cl. 310—178 **33 Claims**

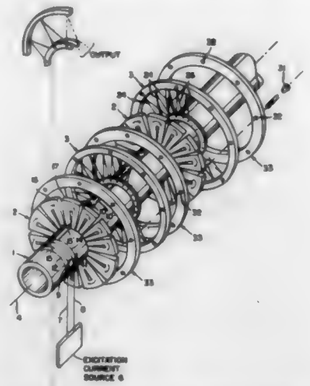
1. A rotary electircal machine comprising:

a drive shaft having a longitudinal axis of rotation;

one or more rotor elements mounted upon said drive shaft substantially perpendicular to the longitudinal axis thereof, said rotor elements comprising non-magnetic disks of high electrical conductivity, each said disk having radial slots therein forming a plurality of current carrying lobes connected in series and defining a meandering current path around said disk;

means for producing excitation current along said meandering path within said disks in a transverse plane with respect to the longitudinal axis of said drive shaft; and

a plurality of stator elements, adjacent said rotor elements, said stator elements comprising first and second sets of substantially radially extending elongated electrical conductors oriented in first and second planes respectively,



transverse with respect to the longitudinal axis of rotation of said drive shaft.

4,691,134

ELECTRIC MACHINE WITH IMPROVED COIL CONNECTION

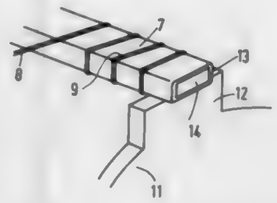
Arend Dijkstra; Bernardus Haijkens, and Mient Veenstra, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,918

Claims priority, application Netherlands, May 3, 1985, 8501258

Int. Cl.⁴ H02K *13/00*

U.S. Cl. 310—234 **3 Claims**



1. Electric machine comprising at least one coil of wire wound about an insulating member and at least two discrete connection elements fixed between said insulating member and collector means of said machine, each connection element comprising a metal core provided with a layer of soft solder, each end of said wire of each coil being embedded in the solder of a respective connection element, each element being soldered to said collector means.

4,691,135

ROTARY DRIVING DEVICE USED FOR ROTARY ACTUATOR

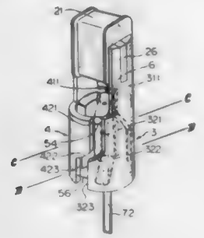
Ichita Sogabe, Gifu; Syuuji Murata, Nagoya, and Yuji Yokoya, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 19, 1985, Ser. No. 799,656

Claims priority, application Japan, Nov. 20, 1984, 59-246429

Int. Cl.⁴ H02K *33/00*

U.S. Cl. 310—254 **8 Claims**



1. A rotary driving device comprising:

a case defining an outer shape of the rotary driving device:

a pair of arcuate stator magnetic poles fixed inside said case and having end faces opposing through gaps;

a rotor of magnetic material rotatably supported inside said stator magnetic pole pair and having two arcuate pole surfaces disposed closely adjacent said stator poles and between two rotor planar surfaces parallel with the axis of rotation;

a rotary shaft for rotatably supporting said rotor; and

an excitation coil for generating a magnetic force between said stator magnetic pole pair and said rotor pole surfaces,

the circumferential positions of said gaps being so changed along the axial direction that a substantially constant rotational magnetic force is maintained between said stator poles and said rotor pole surfaces during rotation of said rotor,

the width of said gaps being smaller than the distance between the two planar surfaces of said rotor.

4,691,136

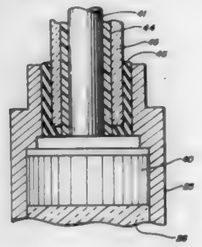
INSULATOR ASSEMBLY FOR ELECTRODE OF PIEZOELECTRIC IGNITION DEVICE

Frank T. Schmidt, Mulvane, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 29, 1986, Ser. No. 946,879

Int. Cl.⁴ H01L *41/08;* **F23Q** *3/01*

U.S. Cl. 310—339 **9 Claims**



1. In a piezoelectric ignition device having a piezoelectric crystal, a housing surrounding the crystal, and an electrode attached to the crystal and extending outwardly from the housing, an insulator assembly comprising a plastic sleeve surrounding the electrode, a tubular dielectric insulator surrounding the plastic sleeve, and a flexible sealing material between the crystal and the insulator.

4,691,137

ELECTRODE PLATE FOR GENERATING PLASMA

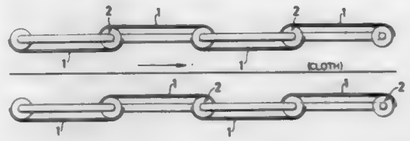
Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Oct. 4, 1985, Ser. No. 784,804

Claims priority, application Japan, Oct. 5, 1984, 59-150961; Oct. 5, 1984, 59-150962

Int. Cl.⁴ H01J *7/24;* **B23K** *9/00;* **B08B** *3/12*

U.S. Cl. 313—30 **3 Claims**



1. In an apparatus for treating cloth, said apparatus having at least two spaced electrode plates for use in generating a low temperature plasma, said electrode plates having a long dimension in which the cloth to be treated passes between said spaced electrode plates, said electrode plates including a plurality of electrode plate members having the same shaped configuration and arranged serially in the long dimension of said electrode plates, a plurality of cooling water passages extending transversely of the long dimension of said electrode plates, and for supporting and interconnecting each pair of serially adjacent said electrode plate members, each water passage having an outside surface with a first portion of said outside surface being closer relative to the path of travel of the cloth between two said electrode plates and a second portion of said outside surface being more remote relative to the path of travel of the cloth, and serially adjacent said electrode plate members being inverted relative to one another so that first ones of said electrode plate members extend between the first portions of the outside surfaces of said cooling water passages and second said electrode plate members extending between the second portions of the outside surfaces of said cooling water passages with said first and second electrode plate members being disposed in spaced parallel relation between said cooling water passages, and cooling water communicating pipes interconnecting said cooling water passages laterally outwardly from said electrode plate members.

4,691,138

COLOR PICTURE TUBE HAVING SHADOW MASK WITH VARIED APERTURE COLUMN SPACING

Walter D. Masterton, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 711,721, Mar. 14, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,321

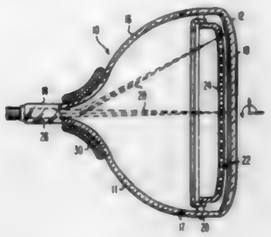
Int. Cl.⁴ H01J *29/07*

U.S. Cl. 313—403 **3 Claims**

1. In a color picture tube including a shadow mask mounted adjacent to a cathodoluminescent line screen, said shadow mask including a plurality of slit-shaped apertures therein located in columns, said shadow mask having a substantially somewhat rectangular periphery with two opposing long sides and two opposing short sides, a major axis of said mask being an axis passing through the center of the mask and centrally extending through the short sides, and a minor axis of said mask being an axis passing through the center of the mask and centrally extending through the long sides, and said aperture columns generally extending in the direction of the minor axis and being spaced from each other in the direction of the major axis, the improvement comprising

the aperture column-to-column spacing near the minor axis of said mask being less at the long sides of said mask than near the major axis of said mask,

the aperture column-to-column spacing being greater near the corners of said mask than near the major axis, and



the aperture column-to-column spacing along cross-sections parallel to the major axis but off the major axis varying approximately as the equation, $A=a+bx^2+cx^4$, where: A is the column-to-column spacing, a, b and c are different functions of the square of the distance from the major axis, and x is distance from the minor axis.

4,691,139

DISPLAY TUBE HAVING FERROMAGNETIC FIELD SHAPERS TO PREVENT BEAM DEFOCUSSING

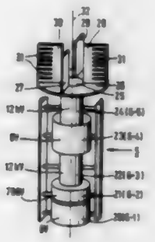
Jan Gerritsen, and Otto Meesies, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,948

Claims priority, application Netherlands, May 7, 1984, 8401444

Int. Cl.⁴ H01J *29/50, 29/70*

U.S. Cl. 313—413 **2 Claims**



1. In a display tube comprising an evacuated envelope having a display window, a conical portion and a neck, an electron gun in such neck for generating an electron beam within the envelope which is focussed to form a spot on a display screen on the display window, and a system of deflection coils mounted on said envelope producing pin-cushion-shaped deflection fields for deflecting such spot over the display screen in mutually perpendicular line and field directions; the improvement characterized in that the edge fields of the deflection fields at the electron gun end of the system of deflection coils are made barrel-shaped by means of field shapers, such field shapers comprising two mutually perpendicular pairs of thin, flat plates of ferromagnetic sheet material arranged coaxially around the electron beam and respectively laterally extending away from the electron beam substantially in the line and field deflection directions, both of such pairs of plates being supported on a planar centering member so that the gun ends thereof are at substantially the same distance from said electron gun; whereby such plates minimize defocusing of the electron beam caused by the pin-cushion-shaped deflection fields.

4,691,140

FLUORESCENT LAMP

Yuichi Sakakibara, Yokohama; Yukio Takahashi, Utsunomiya, and Hideharu Shima, Kanuma, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 671,091, Nov. 13, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,888

Claims priority, application Japan, Nov. 17, 1983, 58-215028

Int. Cl.⁴ H01J *61/44, 61/46*

U.S. Cl. 313—486 **7 Claims**



1. A fluorescent lamp comprising:

a glass bulb having an inner surface, and

a phosphor coating layer contacting said inner surface; said phosphor coating layer comprising lead-activated barium silicate particles and a protective layer comprising alumina particles coating said phosphor particles, the quantity of said alumina particles being at least 0.05% by weight and less than 3% by weight based on the weight of said lead-activated barium silicate particles, and the average diameter of said alumina particles being 0.01 to 0.1 μm.

4,691,141

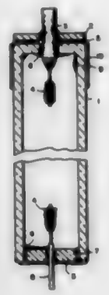
DOSING COMPOSITION FOR HIGH PRESSURE SODIUM LAMPS

Carl F. Buhrer, and Alfred E. Feuersanger, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 11, 1985, Ser. No. 786,737

Int. Cl.⁴ H01J *61/20*

U.S. Cl. 313—565 **15 Claims**



1. A dosing composition for high pressure sodium vapor lamps comprising an admixture of an intermetallic compound of sodium having a melting point in excess of about 600° C. and an intermetallic compound of mercury having a dissociation point of greater than about 600° C., which admixture will react and release sufficient mercury and sodium for the operation of said lamps via the thermal decomposition of the admixture.

4,691,142

ELECTRIC LAMP AND GLASS COMPOSITION

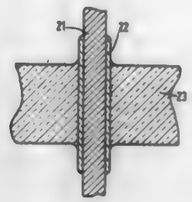
Petrus J. M. Dohmen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,240

Claims priority, application Netherlands, Sep. 19, 1984, 8402866

Int. Cl.⁴ C03C *3/093, 3/066;* H01J *17/18, 61/36*

U.S. Cl. 313—623 **3 Claims**



1. An electric lamp comprising a glass envelope and tungsten-current supply wires, which wires are led through the wall of the lamp envelope in a vacuum-tight manner and which have a coating of an intermediate glass over at least that part of their lengths which extends through the wall of the lamp envelope, which coating is fused with the glass of the lamp envelope, which intermediate glass contains SiO_2, B_2O_3, and Al_2O_3 and which, apart from small amounts of impurities, is free from sodium oxide, potassium oxide and lead oxide, characterized in that at least that part of the lamp envelope through which the current supply wires extend inward is made of borosilicate glass and the intermediate glass consists essentially of the following components in the following specified quantities in % by weight:

SiO_2	35–41	MgO	4–10
B_2O_3	12–18	CaO	2–6
Al_2O_3	12–18	BaO + SrO	2–5
ZnO	10–22	Sb_2O_3	0–0.5

4,691,143

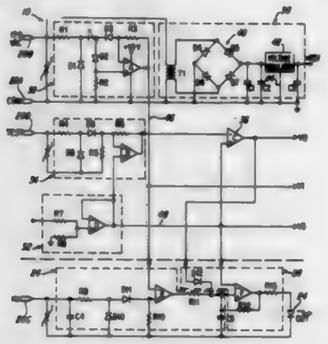
CIRCUIT STATUS INDICATING DEVICE WITH IMPROVED SWITCH ON/OFF DETECTION CAPABILITY

Philip E. Lange, Dayton, Ohio, assignor to Aero-Metric General, Inc., Dayton, Ohio

Filed Sep. 5, 1986, Ser. No. 904,387

Int. Cl.⁴ H01J *1/60*

U.S. Cl. 315—133 **18 Claims**



1. An improved circuit status indicating device for use in monitoring a circuit to indicate the on/off status of the circuit wherein said circuit conducts an alternating current (AC) operating signal when switched to "on" status and an AC non-operating signal when switched to "off" status, said AC non-operating signal being reduced to a fraction of, and is made out-of-phase with, said AC operating signal by conditioning effects of input circuitry intended to receive said signal, said circuit status indicating device comprising:

indicating means operated from an "off" to "on" condition by a direct current (DC) signal and from the "on" to "off" condition by the absence of a DC signal;

means for receiving and conditioning an AC input signal, said AC input signal corresponding to one of said AC operating and non-operating signals being conducted in the circuit being monitored;

means for generating a modified AC reference signal;

means for comparing said AC input signal with said modified AC reference signal and producing an AC comparison output signal, said AC comparison output signal being, after brief delay of some input cycle periods or fraction thereof, an AC output signal when said AC input signal corresponds to said AC operating signal or an AC output signal when said AC input signal corresponds to said AC non-operating signal;

means for generating a DC reference signal to act as a threshold or switching point for said AC comparison output signal;

means for comparing said AC comparison output signal with said DC reference signal and producing a DC output signal when said AC comparison output signal, after brief delay of some input cycle periods or fraction thereof, exceeds the predetermined level of said DC reference signal, said AC comparison output signal when corresponding to said first AC output signal being above said level of said DC reference signal or when corresponding to said second AC output signal being below said level of said DC reference signal; and

means for receiving said DC output signal and operating said indicating means from said "off" to "on" condition, and from said "on" to "off" condition in absence of receipt of said DC output signal.

4,691,144

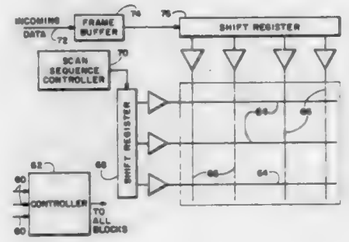
STAGGERED REFRESH PULSE GENERATOR FOR A TFEL PANEL

Christopher N. King, Portland; Brian J. Dolinar, Lake Oswego; William A. Barrow, Beaverton; Robert T. Flegal, Beaverton; Paul E. Gulick, Beaverton, and Laurin G. Blacken, Wilsonville, all of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Filed Jan. 22, 1986, Ser. No. 821,464

Int. Cl.⁴ G09G *3/30*

U.S. Cl. 315—169.3 **15 Claims**



1. In a TFEL panel having a first plurality of scanning electrodes and a second plurality of data electrodes, said first and second pluralities of electrodes being orthogonally dis-

posed with respect to each other and forming a matrix of pixels, the combination comprising:

(a) means for selectively energizing each of said scanning electrodes one at a time until all such electrodes have been energized so as to complete a frame of data;

(b) means for selectively energizing certain ones of said data electrodes simultaneously with the energization of each of said scanning electrodes so as to illuminate selected pixels within said matrix; and

(c) refresh pulse generator means for generating a refresh pulse once per frame of data during a time interval when no scanning electrode is energized, wherein said refresh pulse occurs at a different time during each sequential frame of data with respect to the energization of each of said scanning electrodes.

4,691,145

DRIVE CIRCUIT FOR FLUORESCENT DISPLAY TUBE

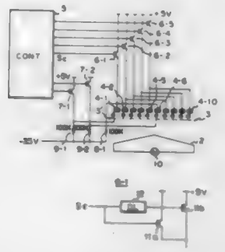
Taizo Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 624,548, Jun. 26, 1984, abandoned. This application Dec. 16, 1986, Ser. No. 942,048

Claims priority, application Japan, Jun. 29, 1983, 58-115879

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.3 **12 Claims**



1. A driver circuit for a fluorescent display tube, said driver circuit comprising:

a plurality of first drivers, each for selectively controlling a potential of a corresponding segment of said fluorescent display tube; and

a plurality of second drivers, each for selectively controlling a potential of a corresponding grid of said fluorescent display tube to effect a display operation, each of said first drivers having a plurality of transistor elements and a delay circuit, said plurality of transistor elements being connected in parallel, a control signal for driving said transistor elements being suppled to one of said transistor elements via said delay circuit, the drive timings of said plurality of transistor elements differing from each other, thereby decreasing the transition speed of the output signals of said first drivers.

4,691,146

METHOD FOR FORMING SPECIAL COLOR EFFECTS FROM A FLUORESCENT LAMP WHICH IS SUPPLIED WITH ELECTRICAL POWER AND A DEVICE FOR CARRYING OUT THE METHOD

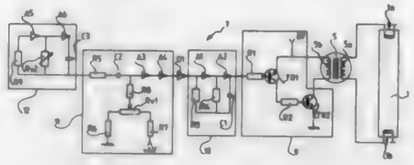
Jacques Roux, 6 passage des Abbesses, 75013 Paris, France

Filed Mar. 10, 1986, Ser. No. 837,746

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—287 **18 Claims**

1. A method for forming special color effects from a lighting lamp preferentially a fluorescent lamp which is supplied with a.c. electrical current, wherein said method consists in periodically supplying said lamp with the electrical current which is pulsed to flash the lamp to be visible to an observer during an emitting time T1 of the electrical current which is selected so that the cyclic ratio T1/T, where T is the pulsating period, is comprised between 0 and 1, and whose corresponding frequency 1/T is comprised between 1 and 500 Hz; and moving



the lamp in accordance with a relative moving speed V in space such as $0<V\leq 50$ m/s or $0<V\leq 50$ rps.

4,691,147

CIRCUIT ARRANGEMENT FOR CORRECTING HORIZONTAL PINCUSHION DISTORTION USING A VOLTAGE PROPORTIONAL TO VERTICAL SYNC PERIOD

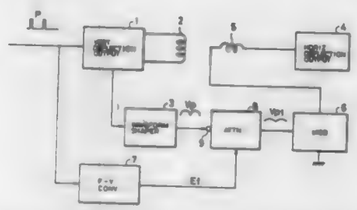
Shigeru Kashiwagi, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jun. 5, 1986, Ser. No. 872,384

Claims priority, application Japan, Jun. 6, 1985, 60-123215

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **4 Claims**



1. A circuit arrangement for correcting horizontal pincushion distortion arranged to modulate a horizontal deflection current by a parabolic wave signal of vertical deflection period which parabolic wave signal of obtained by waveform shaping a vertical deflection current flowing through a vertical deflection coil of a deflection yoke of a cathode-ray-tube, said circuit arrangement comprising:

(a) first means responsive to vertical synchronous signal for generating a d.c. voltage proportional to the vertical deflection period;

(b) second means responsive to said d.c. voltage from said first means for controlling the amplitude of said parabolic wave signal in substantial proportion to said d.c. voltage such that the amplitude of an output parabolic wave signal outputted from said second means is substantially constant irrespective of the variation in vertical deflection frequency; and

(c) third means for amplitude-modulating horizontal deflection current by an output parabolic wave signal from said second means.

4,691,148

CONTROL CIRCUIT FOR ELECTRIC VEHICLES

Robin P. Nicholls, 250 Dorking Pl., Santa Barbara, Calif. 93105, and Rolland J. Savoie, 434 Venado Dr., Santa Barbara, Calif. 93110

Continuation-in-part of Ser. No. 229,624, Jan. 29, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 653,851

Int. Cl.[4] B60K *41/12*

U.S. Cl. 318—12 **12 Claims**

1. A control system for a vehicle controlled by an operator-movable accelerator movable through a range of distance from

a rest position to a full power position, said vehicle being driven by a rotary electric motor through a variable transmission variable from a high gear ratio to a low gear ratio, said vehicle having a plurality of batteries, comprising:

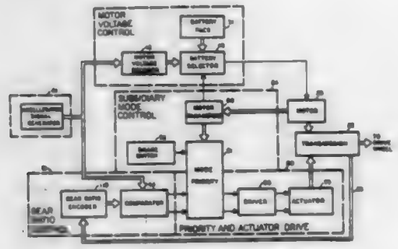
(a) accelerator means for generating digital signals of progressive numbers dependent upon the position of the accelerator in its range;

(b) transmission means for generating digital signals of progressive numbers dependent upon the gear ratio of the transmission;

(c) a transmission actuator for changing the transmission to a higher or lower gear ratio;

(d) a comparator connected to the actuator and to the accelerator means and the transmission means to compare the signals from the accelerator means and the transmission means to operate the transmission actuator to a higher gear ratio when the accelerator number exceeds the transmission number and to operate the transmission actuator to a lower gear ratio when the transmission number exceeds the accelerator number,

(e) and switching means responsive to positions of said accelerator for successively connecting said batteries in series to the motor to obtain a higher voltage as the accelerator is moved toward a greater power position, said transmission numbers being more than the accelerator numbers until at least some of said batteries are connected in series to the motor.



8. A control system for a vehicle controlled by an operator-movable accelerator movable through a range of distance from a rest position to a full-power position and controlled further by an operator-movable brake, said vehicle being driven by a rotary electric motor, said motor also being capable of generating electricity when mechanically driven, said motor being connected to a variable transmission variable from a high gear ratio to a low gear ratio, said vehicle having a source of current, comprising:

(a) a normally open battery switch closed by manually advancing the accelerator to connect the current source to the motor when the accelerator is advanced past its rest position, and which opens when the accelerator is released;

(b) brake switch operated by the brake to operate the battery switch to connect the current source to the motor when the brake is operated;

(c) and a generator voltage sensor interposed between the brake switch and the battery switch to prevent closing of the battery switch except when the generator voltage exceeds the voltage of the current source and to render the brake switch inoperable when the generated voltage of the motor is less than the voltage of the current source;

(d) means for varying the gear ratio of the transmission;

(e) and a regenerative current sensor connected to the means for varying the gear ratio, to thereby vary the motor rpm to obtain a selected range of regenerative current.

4,691,149

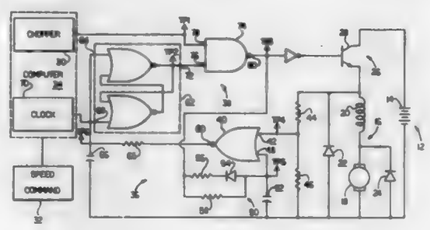
APPARATUS AND METHOD FOR PROTECTING A MOTOR CONTROL CIRCUIT

Kenneth A. Baumgartner, Peoria, Ill., and William Pickering, University Heights, Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Oct. 11, 1985, Ser. No. 786,580

Int. Cl.[4] G05B *5/00*; H02H *7/09*

U.S. Cl. 31*V* -331 **3 Claims**



1. Apparatus for sensing a short circuit condition of a motor control circuit, comprising:

a battery having first and second battery poles;

a transistor having an emitter terminal, a base terminal, and a collector terminal connected to one of said battery first and second poles;

a motor having a first motor terminal connected to the other of said battery first and second poles, and a second motor terminal connected to said transistor emitter terminal;

chopper means for controllably producing motor control signals;

clock means for periodically producing a reset signal;

a first logic gate having a second input terminal, an output terminal, and a first input terminal connected to said transistor emitter terminal;

a latch having an output terminal, a first input terminal connected to said first logic gate output terminal, and a second input terminal connected to said clock means; and

a second logic gate having a first input terminal connected to said latch output terminal, a second input terminal connected to said chopper means, and an output terminal connected to said transistor base terminal and said first logic gate second input terminal.

4,691,150

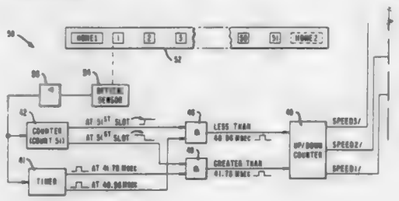
MOTOR SPEED CONTROLLER

Tai-Kuang Jen, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 20, 1986, Ser. No. 876,575

Int. Cl.[4] G05B *5/00*

U.S. Cl. 318—331 **6 Claims**



1. A controller for controlling the speed of a DC motor to which a variable torque is applied comprising:

a DC motor having first and second inputs for receiving power;

a short term controller having;

(i) a power transistor and a diode serially connecting a source of power to said first input of the DC motor, a load current sensing resistor connecting said second input of the DC motor to a power ground,

(ii) an operational amplifier having one input connected to said first input of the DC motor and a second input connected to said second input of the DC motor for providing an output signal which compensates for a drop in motor current, said one input adapted for receipt of a reference signal; and

a long term controller for generating the reference signal for said short term controller as a function of the deviation of the speed of the DC motor from a reference speed having;

(i) means for converting the speed of the DC motor to a series of pulses the spacing of which corresponds to the motor's speed,

(ii) counting means for receiving the series of pulses and for counting a fixed number of pulses and for providing a signal upon said counter having counted the fixed number of pulses,

(iii) timer means commencing its timing upon the occurrence of a first pulse in the series of pulses for providing a first signal corresponding to a time which exceeds the reference speed of the DC motor and a second signal corresponding to the time which is less than the reference speed of the DC motor,

(iv) a logic means connected to receive the provided signal from said counter and said first and second signals from said timer means for providing a less than signal if the counter provided signal occurs at a time which is less than the reference speed of the DC motor and a greater than signal if the counter provided signal occurs at a time which is greater than the reference speed of the DC motor,

(v) up/down counter means responsive to the occurrence of the less than signal and the greater than signal for providing a three-bit output signal which is a function of the occurrences of said greater than or less than signal, and

(vi) summing means for providing said reference signal as a function of the three-bit output signal.

4,691,151

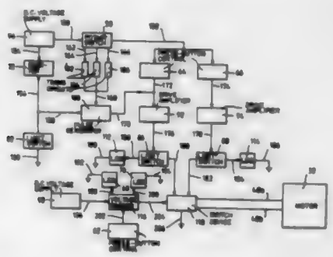
MICROTOME FEED-MOTOR CONTROL

Werner Behme, Bannstra, and Manfred Berleth, Schulstrasse, both of Fed. Rep. of Germany, assignors to Cambridge Instruments GmbH, Nusseloch Bei Heidelberger, Fed. Rep. of Germany

Division of Ser. No. 696,363, Jan. 30, 1985, which is a continuation-in-part of Ser. No. 691,348, Jan. 4, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 855,659

Int. Cl.[4] G05B *19/24*

U.S. Cl. 318—571 **4 Claims**



1. A microtome feed-motor control comprising

voltage means to generate a first voltage signal and a second voltage signal, said second voltage signal being a multiple of said first voltage signal,

timing means for generating first and second pulses of each of said first and second voltage signals,

said first pulse being of less duration than said second pulse,

first switch means for selecting one of said first and second voltages,

second switch means for connecting said voltage means to said timing means, and

a feed motor responsive to said voltage signals,

whereby the feed motor may be driven at a first or second speed and for a chosen duration.

4,691,152

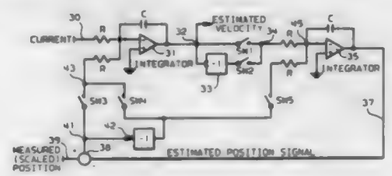
DATA DISK DRIVE VELOCITY ESTIMATOR

Travis E. Ell, and Jeff Stephenson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1986, Ser. No. 830,618

Int. Cl.[4] G11B *21/08*

U.S. Cl. 318—616 **7 Claims**



1. In a data disk drive servo positioning system having a DC motor driving an actuator between concentric data track locations, a velocity estimator comprising

motor current sensing means for deriving a first signal proportional to motor current;

measured position sensing means for deriving a position error signal (PES) representative of actuator position relative to said concentric track;

first integrating means for integrating said first signal to generate an estimated velocity;

second integrating means for integrating said estimated velocity to generate an estimated position;

comparison means for comparing said PES and said estimated position and generating an error signal representative of the diference therebetween; and

feedback means for providing a closed loop to feedback said error signal to correct said estimated velocity;

said feedback means comprising circuit means for supplying said comparison means error signal to the input of both said first integrator means and said second integrator means.

4,691,153

METHOD OF CONTROLLING POSITIONING OF ROTOR OF STEPPING MOTOR

Makoto Nishimura, Yokohama, Japan, assignor to Tokiko, Ltd., Kawasaki, Japan

Filed Feb. 7, 1986, Ser. No. 827,169

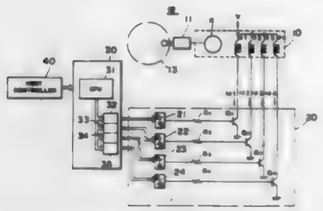
Claims priority, application Japan, Feb. 9, 1985, 60-24131

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **4 Claims**

1. A method of controlling the positioning of a rotor of a stepping motor having phase windings comprising the steps of:

(1) energizing the windings within the last step in a movement of the rotor to a desired rest position thereof so as to produce a first magnetic vector, a position indicated by said first magnetic vector being displaced from said desired rest position of the rotor in the direction of said movement thereof by a predetermined amount so that the rotor is caused to overshoot said desired rest position of the rotor by such an amount that a positioning error of the rotor due to a hysteresis characteristic thereof in the direction of said movement is compensated; and



(2) subsequently energizing the windings so as to produce a second magnetic vector, a position indicated by said second magnetic vector coinciding with said desired rest position of the rotor.

4,691,154

STEPPING MOTOR CONTROL SYSTEM

Masahiko Sato, Funabashi; Kazutoshi Kato, Narashino; Akira Ishibashi, Tokyo, and Tsurumasa Matsushita, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,756

Claims priority, application Japan, Apr. 16, 1985, 60-79165; Apr. 22, 1985, 60-84484

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **3 Claims**

1. In a positioning mechanism using a stepping motor having a rotor as a drive source, a stepping motor control system comprising:

means for determining that the phase excitation state of said stepping motor has reached a phase excitation state preceding the phase excitation state at a target stop position by a predetermined number of steps; and

control means for transferring the excitation state from one phase excitation state to another phase excitation state by successively decreasing one phase excitation current and successively increasing another phase excitation current, said control means being activated upon arrival of the rotor of said stepping motor at a phase state preceding the phase excitation state at the target stop position by a predetermined number of steps.

4,691,155

AUTOMATIC LOAD SEEKING CONTROL FOR A MOTOR

Noel R. Taylor, 2512 Bonham, and Paul A. Taylor, 1548 Tanglewood, both of Odessa, Tex. 79761

Division of Ser. No. 545,758, Oct. 26, 1983, Pat. No. 4,508,497, which is a continuation of Ser. No. 156,740, Jun. 5, 1980, Pat. No. 4,446,415, which is a continuation of Ser. No. 027,798, Apr. 6, 1979, Pat. No. 4,200,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Oct. 15, 1984, Ser. No. 661,229

Int. Cl.[4] H02P *1/32, 7/48, 5/28*

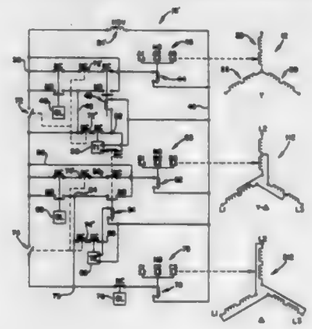
U.S. Cl. 318—771 **19 Claims**

1. A motor control unit for automatically controlling the torque output of a high slip motor for powering a cyclic load which varies from below to above the motor rated current load, said motor including motor starter means connected to motor stator windings and means for altering the electrical configuration of said stator windings, said motor control comprising:

sensor means for detecting the magnitude of the current flow through said motor stator windings during a multiplicity of cyclic loads;

first circuit means for connecting said motor stator windings in a first electrical configuration;

first overload means responsive to said sensor means for automatically altering the electrical configuration of said motor stator windings from said first electrical configuration to a second electrical configuration to increase motor torque output when said current flow exceeds a first preselected value;



first timing means for sensing the time period said motor stator windings are connected in said second electrical configuration; and

first switching means for automatically altering said motor stator windings from said second electrical configuration to another electrical configuration to reduce motor torque output in response to said first timing means reaching a preselected value in excess of a multiplicity of cyclic loads.

4,691,156

VARIABLE FREQUENCY POWER UNIT CONTROLLING SYSTEM

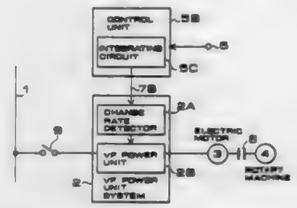
Nobuharu Takata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,850

Claims priority, application Japan, Apr. 2, 1984, 59-65419; Apr. 2, 1984, 59-65420; Apr. 2, 1984, 59-65421

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—798 **9 Claims**



1. A variable frquency power system with fault prevention for controlling the rotary speed of a rotary machine driven by an A.C. electric motor by regulating the frquency of an A.C. electric current supplied to the electric motor, comprising:

a control unit for generating a D.C. electric control signal designating the rotary speed of the rotary machine;

said control unit including an integrating circuit for integrating the control signal to prevent any rate of change of the

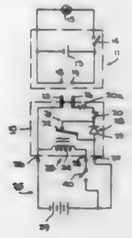
control signal from having a value outside a predetermined range;
a signal line connected to the output of the integrating circuit for transmitting the control signal;
variable frequency power means for receiving the control signal from the signal line and for generating the A.C. electric current with a frequency which varies in accordance with the magnitude of he control signal;
said variable frequency power means including a change rate detector for detecting the rate of change in the received control signal and for generating a fault signal when the detected rate of change has a value outside the predetermined range; and
means responsive to the fault signal of the change rate detector for restricting any change of the frequency of the variable frequency electric current supplied to the electric motor to prevent any fault in the rotary speed of the rotary machine from being caused by a disruption of transmission of the control signal over the signal line from the control unit to the variable frequency power means.

4,691,157

BATTERY CHARGING APPARATUS

Julian A. McDermott, 1639 Stephen St., New York, N.Y. 11227

Filed Nov. 19, 1984, Ser. No. 672,624
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—2 **11 Claims**



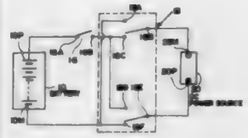
1. In combination
a portable module having a light mounted thereon, at least one rechargeable battery therein for operating said light, and a pair of contacts connected to said battery;
an electrical system of an automotive vehicle having a second battery and an operation switch connected to said second battery, said switch having a normally open position;
an apparatus for charging said rechargable battery from said second battery, said apparatus having a charging circuit with a diode between said second battery and one of said contacts for said rechargeable battery, means for short circuiting said diode to permit a current flow around said diode, said means including a second switch having a normally closed position to complete a short circuit about said diode and an open position to interrupt said short circuit, and actuating means for actuating said second switch connected with said operation switch to move said seocnd switch to said open position in response to closing of said operation switch.

4,691,158

METHOD OF OPERATING A SECONDARY BATTERY TO RECONDITION THE BATTERY

Takafumi Hashimoto; Yoshihide Kamanaka, and Tadashi Ashikaga, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,213
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—14 **8 Claims**



1. In a method of operating a secondary battery to recondition said battery, in which said battery includes at least one unit cell using zinc as an active material for a negative electrode in an electrolyte and adapted to be charged add discharged repeatedly, the inprovement comprising the steps of:
(a) discharging said secondary battery until a voltage of said battery has been reduced to a predetermined positive value;
(b) electrically and switchably connecting a positive electrode of said battery to a negative output terminal of a direct current supply means and connecting a negative electrode of said battery to a positive output terminal of said direct current supply means; and
(c) flowing a reversed charging current from said negative electrode to said positive electrode in the electrolyte of said battery from said direct current supply means until said battery voltage has been further reduced below a zero value and has reached a predetermined negative value, to cause the zinc on the negative electrode to be completely dissolved into the electrolyte.

4,691,159

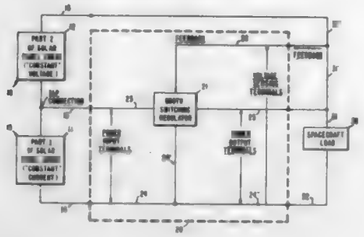
PARTIAL SHUNT SWITCHING LIMITER FOR A SPACECRAFT SOLAR-PANEL OR LIKE POWER-SOURCE ARRAY

Allan F. Ahrens, Acton, and Robert M. Martinelli, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 30, 1985, Ser. No. 771,396
Int. Cl.[4] G05F *5/00*
U.S. Cl. 323—222 **12 Claims**

1. A regulating system for electric power sources adaptable for use with an array of solar panels, each solar panel having a generally constant current, variable voltage operating region, each solar panel also having a generally constant voltage, variable current operating region whose output is applied to a load; said system comprising:
a tap connection to such array, dividing such array into first and second portions in series;
said first portion of such solar-panel array operates with all of its solar panels substantially in their generally constant-current operating region; and

said second portion operates with at least some of its solar panels substantially in their generally constant-voltage operating region;
a boost switching regulator having power-input, power-output, and sensing terminals connected so that:



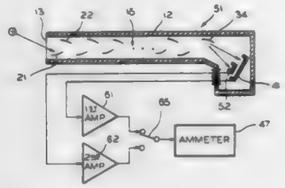
the power-input terminals are across only the first portion of such array, to receive power from only said first portion,
the power-output terminals are across such load, and
the sensing terminals receive a signal which is a measure of the voltage across or current into such load.

4,691,160

APPARATUS COMPRISING A DOUBLE-COLLECTOR ELECTRON MULTIPLIER FOR COUNTING THE NUMBER OF CHARGED PARTICLES

Yoichi Ino, Tokyo, Japan, assignor to Anelva Corporation, Japan

Filed Nov. 8, 1984, Ser. No. 669,603
Claims priority, application Japan, Nov. 11, 1983, 58-211069
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—71.3 **7 Claims**



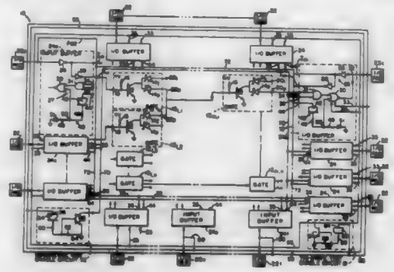
1. A number counting apparatus comprising:
a multiplier vessel having an inlet for enabling an entrance of particles, said vessel defining a hollow space in communication with said inlet;
a dynode member having an entrance end adjacent said inlet in said space and an exit end remote from said inlet in said spece, said dynode member producing secondary electrons through said exit end in response to a receipt of said charged particles through said inlet and to said entrance end;
a first collector having a first electron receiving surface which is adjacent said exit end of the dynode member in said space, said collector having a first area, said first collector collecting the secondary electrons on said first electron receiving surface to produce a first electric current determined by said first area;
a second collector having a second electron receiving surface which is close to said first electron receiving surface in said space, said second collector having a second area which is smaller than said first area, said second collector collecting a portion of the secondary electrons on said second electron receiving surface to produce a second electric current which is determined by said second area;
first amplifying means responsive to said first electric current for producing a first amplified current;
second amplifying means responsive to said second electric current for producing a second amplified signal;
selecting means coupled to said first and said second amplifying means for selecting either one of said first and said second amplified signals as a selected signal; and
indicating means responsive to said selected signal for indicating the number of said charged particles.

4,691,161

CONFIGURABLE LOGIC GATE ARRAY

Rajni Kant, Milpitas, and Kun-Nau Chen, San Jose, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 13, 1985, Ser. No. 744,349
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—73 R **4 Claims**



1. An integrated circuit comprising:
(a) an array of logic gates, selected logic gates of the array of logic gates being interconnected to provide predetermined logic functions on a plurality of input logic signals to the gate array and produce said predetermined logic functions as output signals at a selected one or ones of a plurality of array output terminals;
(b) a plurality of buffer circuits, each one of said plurality of buffer circuits being coupled to a corresponding one of a pluraity of signal pads, a selected one or ones of said plurality of buffer circuits being further coupled between the selected one or ones of the plurality of array output terminals and the corresponding one or ones of the plurality of signal pads; and
(c) means for electrically decoupling the selected one or ones of the plurality of buffer circuits from the corresponding one or ones of the plurality of signal pads in response to a common control signal applied to a signal pad corresponding to an unselected one of the plurality of buffer circuits, said electrical decoupling means comprising means for electrically coupling said signal pad corresponding to an unselected one of the plurality of buffer circuits to said electrical decoupling means.

4,691,162

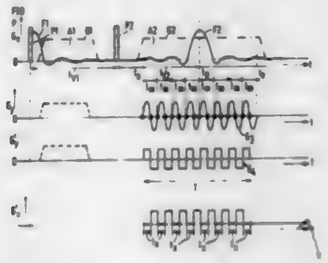
METHOD AND DEVICE FOR NMR SPECTROSCOPY

Cornelis M. J. Van Uijen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 447,841, Dec. 8, 1982, Pat. No. 4,527,124. This application Apr. 23, 1985, Ser. No. 726,213
Claims priority, application Netherlands, Sep. 10, 1982, 8203519
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **23 Claims**

1. A method for determining a nuclear magnetization distribution in a part of a body which is situated in a stationary, homogeneous magnetic field which is generated in a first direction, said method comprising the steps of: (a) generating a high-frequency electromagnetic pulse in order to cause a precessional motion of the magnetization of nuclei in the body

around a first field direction so as to generate a resonance signal (b) applying at least one gradient magnetic field during a preparation period (c) applying a further gradient field during a measuring period, said measuring period being divided into a number of sampling intervals of substantially equal duration, (d) periodically extracting n sample signals from the resonance signal during said sampling intervals, and (e) repeating a measurement cycle, comprised of the steps (a), (b), (c) and (d), n' times, wherein an integral of the intensity of at least one gradient field over the preparation period has a different value during successive measurement cycles in order to obtain a group of sample signals wherefrom, after Fourier transforma-



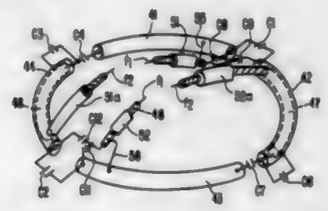
tion thereof, an image of the distribution of the induced nuclear magnetization is determined, characterized in that during said measuring period an additional gradient magnetic field is generated having a gradient direction corresponding to the gradient direction of said gradient magnetic field generated during said preparation period, said additional gradient magnetic field being periodic in time and having a period equal to said sampling interval, wherein the effect exerted on the nuclear magnetization by said additonal gradient magnetic field integrated over a sampling interval is zero, and wherein at least one additional sampling operation is performed after the beginning and before the end of each sampling interval.

4,691,163

DUAL FREQUENCY SURFACE PROBES

Judd Bloss, and Hanan Keren, both of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Mar. 19, 1985, Ser. No. 713,689
Int. Cl.[4] G01R 33/08
U.S. Cl. 324—318 14 Claims



1. A radio frequency (RF) surface probe for use in magnetic resonance (MR) systems with transmitter means for transmitting RF pulses which cause samples under test to emit RF signals and with receiver means for receiving said RF signals, the transmitter means and the receiver means having a characteristic impedance, said signals providing data for imaging and/or spectrograph purposes, said probe resonating at least at a first frequency and a second frequency, said probe comprising:

(a) a plurality of inductance means for transmitting said RF pulses to said samples and for receiving said RF signals from said samples;

(b) reactance means for connecting together said plurality of inductance means to form a balanced probe circuit having virtual short circuit planes that minimize electrostatic coupling between the probe and a given sample and thereby minimize loading of the probe by the given sample and enabling the probe to be used with different samples and/or spacing between the given sample and the probe without the necessity of retuning to maintain resonance at the first frequency and at the at least second frequency;

(c) first connecting means for connecting said balanced probe circuit to said transmitter means and said receiver means and to cause said plurality of inductance means and said reactance means to match said characteristic impedance and to resonate at said first frequency; and

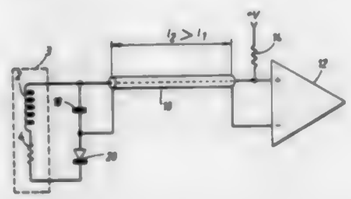
(d) second connecting means for connecting said balanced probe circuit to said transmitter means and said receiver means and to cause said plurality of inductance means and reactance means to match said characteristic impedance and to resonate at said second frequency.

4,691,164

NUCLEAR MAGNETIC RESONANCE TRANSMITTER AND RECEIVER SYSTEM

Motoji Haragashira, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1986, Ser. No. 901,737
Claims priority, application Japan, Aug. 30, 1985, 60-191779
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—322 8 Claims



1. A tuning circuit for a nuclear magnetic resonance transmitter and receiver system for sensing and coupling an NMR signal to a preamplifier comprising:

a pick-up coil,

a first capacitive element (18) connected in parallel with said pick-up coil, the capacitance of which is associated with a shielded connection means for transferring the NMR signal detected at said pick-up coil to said preamplifier, and

a second capacitive element (20) connected to said coil for forming a resonant circuit in combination with said pick-up coil,

wherein the respective values of said capacitive elements are such that the following condition applies

$$1/C1 + 1/Ct = \text{constant}$$

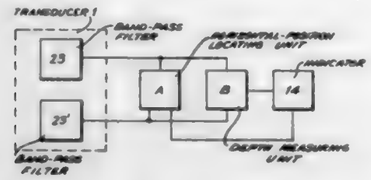
where Ct is the total capacitance of the first capacitive element and the stray capacitance of the connection means and C1 is the capacitance of said second capacitive element.

4,691,165

METHOD AND APPARATUS INCLUDING SPACED ANTENNAS FOR DETERMINING THE TRACE AND DEPTH OF UNDERGROUND METALLIC CONDUCTORS

Laszlo Szadlmajer, Zolyomi UT. 29, H-1112 Budapest, Hungary

PCT No. PCT/HU83/00037, § 371 Date Mar. 9, 1984, § 102(e) Date Mar. 9, 1984, PCT Pub. No. WO84/00423, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 7, 1983, Ser. No. 596,464
Int. Cl.[4] G01V 3/11; G01B 7/14
U.S. Cl. 324—326 15 Claims



7. Apparatus for determining the horizontal position and depth of an underground metallic conductor in which there exists an alternating current of a basic frequency which generates a corresponding electromagnetic field having vertical and horizontal components, comprising:

(a) a measuring receiver comprising a transducer, which transducer comprises a first ferrite antenna and a second ferrite antenna, at least one of which is rotatable in a vertical plane, for converting the magnetic field strength into voltage signals;

(b) a horizontal position locating unit electrically connected to the transducer for sensing the voltage signals corresponding to the magnetic field and for pointing out a corridor of a predetermined half-width depending on the depth of the conductor; and

(c) a depth measuring unit, comprising analog circuits, electrically connected to the transducer for sensing the voltage signals corresponding to the magnetic field and for determining the depth of the conductor;

wherein the transducer comprises:

first and second band-pass filters, each comprising inductive elements and capacitive elements in electrical parallel, and further comprising active and passive filter elements, wherein the first ferrite antenna is an inductive element of the first filter and the second ferrite antenna is an inductive element of the second filter and the capacitive elements of the filters comprise capacitors selected such that the resonant frequency of both filters is the Nth harmonic of the basic frequency when a separate generator is not used to generate the alternating current in the conductor, and the resonant frequency of both filters is the Mth harmonic of the basic frequency when a separate generator is used to generate the alternating current in the conductor, wherein (i) N is equal to (CP±1) or (2±C1), (ii) M is CP or 2C, (iii) C is a properly selected integer greater than 1, (iv) P is 1, 2, 3, or 6, and (v) the product CP is an even number.

4,691,166

ELECTROMAGNETIC INSTRUMENTS FOR IMAGING STRUCTURE IN GEOLOGIC FORMATIONS

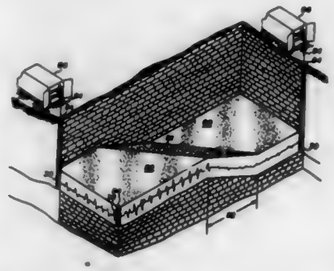
Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Division of Ser. No. 731,741, May 6, 1985, Pat. No. 4,577,153, which is a continuation-in-part of Ser. No. 483,264, Apr. 8, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,625
Int. Cl.[4] G01V 3/12, 3/30
U.S. Cl. 324—334 12 Claims

1. Apparatus for the detection and analysis of anomalies within geological formations comprising:

a down hole transmitter set comprising a tuned-loop antenna for orienting vertically within a geological formation, said antenna electrically coupled to a transmitter and mechanically coupled to a drive means whereby said antenna may be rotated about a vertical axis, said transmitter being adapted to transmit continuous wave, narrow band FM signals in a frequency range of approximately 300 KHz to approximately 800 KHz, a modem coupled to said transmitter and to a cable means to connect the transmitter set to surface control equipment, said surface control equipment including means for controlling antenna headings, the transmitter set further including an elongated probe enclosure means enclosing said transmitter, antenna, drive means and modem;

a down hole receiving set comprising a tuned-loop antenna for orienting vertically within said formation, said antenna being electrically coupled to a continuous wave medium frequency receiver capable of receiving signals transmit-



ted by the transmitter set and mechanically coupled to a drive means to rotate said antenna about a vertical axis, said receiver further including measuring and recording means for measuring and recording a plurality of data, comprising signal characteristics of said received signal, a modem coupled to said receiver and to a cable means to connect the receiver set to surface analysis and control equipment, said surface analysis and control equipment including means for controlling antenna headings, the receiver set further including an elongated probe enclosure means enclosing said receiver, antenna, drive means and modem; and

a computer aided processing means for receiving, processing and interpreting said recorded data, said recorded data being stored on a magnetic storage medium by said surface analysis and control equipment for later analysis by the computer aided processing means.

4,691,167

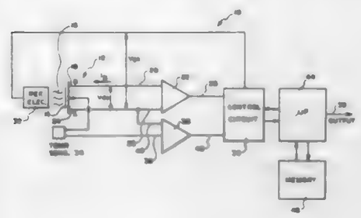
APPARATUS FOR DETERMINING THE ACTIVITY OF AN ION (PION) IN A LIQUID

Hendrik H. v.d. Vlekkert, Groningen, Netherlands, and Nicolaas F. de Rooy, Bole, Switzerland, assignors to Sentron v.o.f., Roden, Netherlands

Filed Aug. 17, 1984, Ser. No. 642,126
Claims priority, application Netherlands, Aug. 24, 1984, 8302964
Int. Cl.[4] G01N 27/26
U.S. Cl. 324—438 4 Claims

1. An apparatus for determining the activity of an ion (pIon) in a liquid, said apparatus comprising a measuring circuit including a field effect transistor sensitive to the ion (ISFET), a reference electrode adjacent said ISFET, a temperature sensor adjacent said ISFET, amplifying means coupled to said ISFET and to said temperature sensor, a control circuit coupled to said reference electrode and the output of said amplifying means and a computing circuit and memory coupled to said control circuit and having an output providing a temperature compensated signal indicative of ion activity, said apparatus

being operable to maintain two of three parameters which control the operation of the ISFET, namely V_{gs} (gate-source potential), V_{ds} (drain-source potential) and I_D (drain-source current) at a constant value so that the third parameter can be used for determining the ion activity or pIon, while taking into account the temperature dependent pIon sensitivity of the



apparatus and compensating for the normally induced temperature dependent variations of the drain-source current, I_D, by controlling V_{gs} to hold I_D fixed, while holding the drain-source potential V_{ds} fixed, whereby the pIon value is calculated from the following formula stored in the memory of the apparatus:

$$pIon = pIon_{cal.} + \frac{\Delta V_{gs} + T.C.\ \Delta T}{S + (dS/dT)\ \Delta T}$$

wherein:

$pIon_{cal.} = pIon_{calibration}$ = pIon value of the liquid at a given temperature T_C;

T.C. = the variation of V_{gs} with the temperature at $pIon_{cal.}$,

S = the pIon sensitivity at the temperature T_C,

(dS/dT) = the variation of the pIon sensitivity with the temperature, and

ΔT = the difference between the actual temperature and the given temperature T_C.

4,691,168

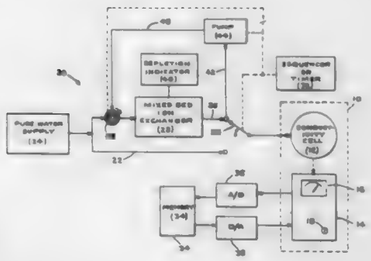
HIGH PURITY WATER CALIBRATING DEVICE

Gregory Dzula, North Caldwell, N.J., assignor to Beckman Industrial Corporation, Cedar Grove, N.J.

Filed Oct. 24, 1985, Ser. No. 791,126

Int. Cl.⁴ G01N *27/02*

U.S. Cl. 324—439 **6 Claims**



1. Apparatus for calibrating a conductivity instrument having a conductivity cell and a conductivity measuring instrument operatively associated with said conductivity cell, said apparatus comprising:

a. conduit means for supplying pure water to be measured by said conductivity instrument;

b. first flow line means for supplying said pure water from said conduit means to said conductivity cell;

c. second flow line means for supplying said pure water from said conduit means to said conductivity cell;

d. ion exchange means in said second flow line means for de-ionizing said pure water flowing through said second flow line means; and

e. valve means for selectively supplying said pure water to said conductivity cell, from one of:

i. said first flow line means to provide a conductivity measurement of said pure water; and

ii. said second flow line means to calibrate said conductivity cell, and

f. recirculation means connected to said second flow line means for recirculating at least a portion of the pure water flowing through said second flow line means and the ion exchange means to maintain the same at its highest purity at all times.

4,691,169

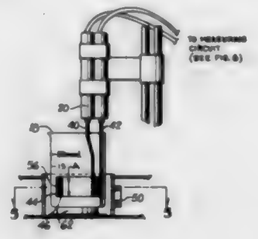
ELECTRODE ASSEMBLY ESPECIALLY ADAPTED TO UTILIZING A MAGNETIC FIELD FOR MEASURING ELECTRIC CONDUCTIVITY OF TREATED NON-POLAR LIQUIDS

Robert A. Baum, 1932 Altura Dr., Corona Del Mar, Calif. 92625

Division of Ser. No. 20,719, Mar. 15, 1979, Pat. No. 4,313,086. This application Jul. 8, 1981, Ser. No. 281,441

Int. Cl.⁴ G01N *27/42*; G01R *27/02*

U.S. Cl. 324—448 **2 Claims**



1. An electrode assembly for measuring electrical conductivity of non-polar liquids; the assembly comprising:

a beaker for receiving said non-polar liquids;

a pair of concentric cylinders radially spaced from one another to form a circumferential gap therebetween, said cylinders being positioned within said beaker to permit said non-polar liquids to flow within said gap;

a pair of electrically isolated connecting rods for connecting said cylinders, respectively, to separate terminals of an electrical circuit and for structurally supporting said cylinders in spaced relation; and

means for imparting a magnetic field in said circumferential gap; said magnetic field imparting means comprising a plurality of magnets spaced equidistantly around the perimeter of said cylinders.

4,691,170

FREQUENCY MULTIPLIER CIRCUIT

Mack W. Riley, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1986, Ser. No. 837,997

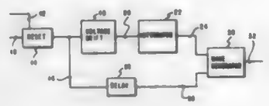
Int. Cl.⁴ H03K *3/78, 5/156*

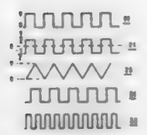
U.S. Cl. 328—20 **16 Claims**

1. A frequency multiplier circuit comprising:

means for receiving an input signal of a first frequency having a signal amplitude symmetrical about a first reference;

means for phase shifting said input signal including means for altering the input signal amplitude to be symmetrical about a second reference, said altering means connected to a means for integrating said altered signal and restoring the input signal amplitude to be symmetrical about the first reference; means for time delaying said input signal; and





threshold means for logically combining said delayed input input signal and said phase shifted signal for producing an output signal of a second frequency, said second frequency being a multiple of said first frequency.

4,691,171

INTEGRATED RC FILTER WITH RESISTOR TRIMMING

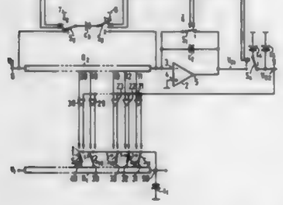
Arthur H. M. Van Roermund, and Petrus M. C. Coppelmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,126

Claims priority, application Netherlands, May 1, 1984, 8401370

Int. Cl.⁴ H03K *5/00*; H03B *1/00*; H04B *1/10*

U.S. Cl. 328—167 **14 Claims**



1. A filter arrangement comprising, at least a first resistor and a first capacitor, said arrangement having a time constant determined by the product of the resistance of the resistor and the capacitance of the capacitor, and a trimming circuit for adjusting the time constant of the filter arrangement, characterized in that the trimming circuit comprises: means for generating clock signals, a reference resistor, a second capacitor switchable by at least a first switch cyclically controlled by the clock means, a source of reference voltage coupled to the reference resistor and via said first switch to the second capacitor so that

a first reference voltage is established across the reference resistor and a second reference voltage, which is proportional to the first reference voltage, is established across the second capacitor,

first means coupled to the second capacitor via a second switch cyclically controlled by the clock means for generating a control voltage determined by the difference between the resistance of the reference resistor and the equivalent resistance of the second capacitor, and

second means responsive to said control voltage for short-circuiting a part of the firt resistor, said part, expressed as a percentage of the resistance of said first resistor, being substantially equal to the difference between the resistance of the reference resistor and the equivalent resistance of the second capacitor, expressed as a percentage of the resistance of said reference resistor.

4,691,172

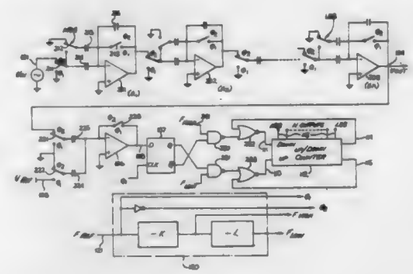
MOS SWITCHED CAPACITOR AUTOMATIC GAIN CONTROL CIRCUIT

Kiyoshi Fukahori, and Thomas Glad, both of Grass Valley, Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Sep. 10, 1985, Ser. No. 774,544

Int. Cl.⁴ H03G *3/20*

U.S. Cl. 330—129 **17 Claims**



1. An apparatus for adjusting the amplitude of an electrical signal to a predetermined level comprising:

an input means for receiving an input analog signal;

an output signal means;

an amplifier network, including a plurality of cascaded sequentially coupled amplifier stages, said input signal means coupled to a first stage of said amplifier network, and a last stage coupled to said output means;

a plurality of capacitors coupled to each said operational amplifier stage for determining the gain of each said operational amplifier stage;

first switching means for selectively coupling said capacitors to said amplifier network for selectively establishing the gain of said network;

a reference voltage source;

a reference frequency means, including a plurality of clocking signals;

a comparator comprising a single operational amplifier coupled to a voltage level of said output signal means and to a voltage level of said reference voltage source, for providing a comparator output signal representative of the comparison of said output signal from said output signal and said reference voltage;

digital conversion means, including a flip-flop and logic circuit means, said digital conversion means converting said comparator output signal from said comparator to a digital signal at a frequency rate determined by said reference frequency source;

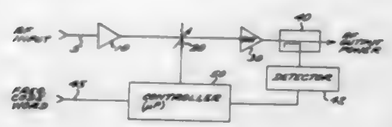
and a counter, coupled to receive said digital signal from said digital conversion means for selectively providing control signals to said first switching means at a frequency determined by said reference frequency source.

4,691,173

RF INPUT DRIVE SATURATION CONTROL LOOP

Larry R. Mollett, Fullerton, Calif., and Robert W. Geczalk, Acton, Mass., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 740,092, May 31, 1985, abandoned.
This application Dec. 22, 1986, Ser. No. 945,250
Int. Cl.[4] H03F 7/00
U.S. Cl. 330—144 17 Claims



8. A system for optimizing the RF input drive to a traveling wave tube (TWT) amplifier over an exciter frequency bandwidth, comprising:

programmable means for varying the input drive to the TWT amplifier in response to a drive signal;

means for providing a frequency signal indicative of the exciter frequency; and

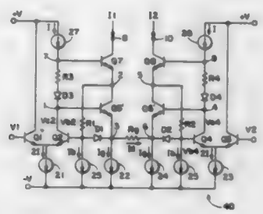
controller means responsive to said frequency signal and adapted to provide said drive signal to said programmable means so as to adjust the input drive level of said TWT amplifier to a predetermined optimum level in dependence on the frequency of the exciter signal, whereby the input drive level to the TWT amplifier is set to the optimum level for each exciter frequency of interest.

4,691,174

FAST RECOVERY AMPLIFIER

Theodore G. Nelson, Beaverton, and Calvin D. Diller, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 19, 1986, Ser. No. 909,437
Int. Cl.[4] H03F 3/45
U.S. Cl. 330—260 15 Claims



1. An amplifier comprising:

first, second, and third nodes;

first and second current sources;

first means for conducting current between said second and third nodes and between said first and third nodes according to a first potential difference between said first and third nodes;

first and second transistors each having an emitter terminal, a base terminal and a collector terminal, the collector terminal of said second transistor being coupled to said first node, the emitter terminals of said first and second transistors being coupled to said first current source, and the base terminal of said second transistor being coupled to said second current source;

resistor means having a first end connected to the base terminal of said second transistor and having a second end;

second means for coupling said third node and the base terminal of said second transistor when a second potential difference between the base terminal of said second transistor and said third node is of a first polarity and for decoupling said third node and the base terminal of said second transistor when said second potential difference is of a second polarity; and

third means for maintaining a constant potential between the first node and the second end of said resistor means

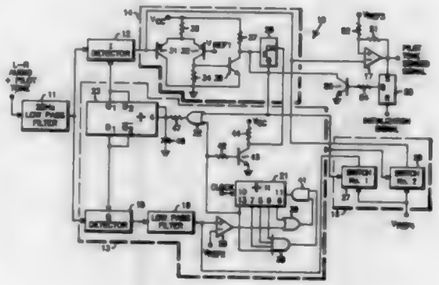
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4,691,175

ADAPTIVE PHASE LOCKED LOOP HAVING A VARIABLE LOCKING RATE

Lawrence M. Eckland, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1985, Ser. No. 797,735
Int. Cl.[4] H03L 07/06
U.S. Cl. 331—1 A 16 Claims



1. In a phase locked loop having:

(i) signal input means for receiving an input signal; and

(ii) first phase comparison means for comparing at least some component of said input signal with a second signal having an average phase and for providing an output signal related to the degree to which said input signal and said second signal are in phase with one another;

an improvement comprising:

(A) second phase comparison means for comparing at least some component of said input signals with a reference signal and for providing a second phase comparison means output signal related to the degree to which said input signal and said reference signal are in phase with one another;

(B) polarity detection means for providing a polarity indication signal dependent upon the polarity of said second phase comparison means output signal; and

(C) signal means for receiving said polarity indication signal and for providing said second signal, said signal means having means to selectively vary the average phase of said second signal at a first rate and at a second rate, such that said signal means will provide:

(i) said second signal having said phase that varies at said first rate when said polarity indication signal reflects a phase detector output having a first polarity; and

(ii) said second signal having said phase that varies at said second rate when said polarity indication signal reflects a phase detector output having a second polarity.

4,691,176

ADAPTIVE CARRIER TRACKING CIRCUIT

Chia Y. Hsiung, Phoenixville, and Daniel P. Ross, Philadelphia, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Mar. 17, 1986, Ser. No. 840,220
Int. Cl.[4] H03L 7/10
U.S. Cl. 331—2 16 Claims

10. An adaptive carrier tracking circuit comprising:

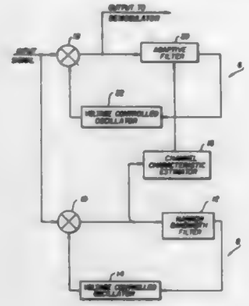
an adaptive filter having an adjustable bandwidth and responsive to a first error signal;

a voltage controlled oscillator for providing a first reference signal coupled to the output of said adaptive filter;

first error means for providing the first error signal as a function of the difference in phase or frequency between an externally derived input signal and the first reference signal;

means for generating a second reference signal in response to a second error signal;

second error means for providing the second error signal as



a function of the difference in phase or frequency between the externally derived input signal and said second reference signal; and

means for estimating the rate of fluctuations of said input signal as a function of variations of said second error signal, said estimating means providing an output signal being adapted to adjust the bandwidth of said adaptive filter;

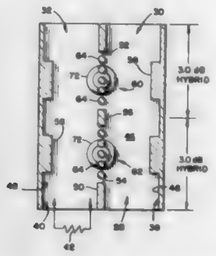
whereby the tracking and noise performance of said circuit is optimized.

4,691,177

WAVEGUIDE SWITCH WITH VARIABLE SHORT WALL COUPLING

Mon N. Wong, Torrance, and Ann L. Peebles, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 2, 1985, Ser. No. 782,809
Int. Cl.[4] H01P 5/12, 5/18
U.S. Cl. 333—113 9 Claims



1. A switch for radiant energy comprising:

a first waveguide, and a second waveguide sharing a common wall with said first waveguide;

an input terminal, a first output terminal, and a second output terminal; said input terminal and said first output terminal being located at opposite ends of said first waveguide; said second output terminal being located in said second waveguide;

a first window and a second window disposed in said common wall and connecting said first waveguide with said second waveguide; each of said windows having a length, as measured along said first waveguide in a direction of energy propagation, equal to approximately one free-space wavelength of the radiant energy, said windows being spaced apart in said direction by a distance greater than approximately one-tenth of the guide wavelength of the radiant energy; and

gate means including a first gate located at said first window for limiting a flow of radiant energy through said first window, and a second gate located at said second window for limiting a flow of radiant energy through said second window; said gate means further comprising

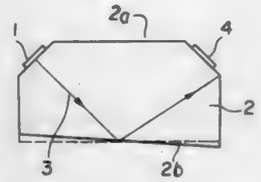
means for displacing said first and said second gates, across their respective windows for opening and closing the respective windows to couple and to decouple said first and said second waveguides, said gate means providing for a maximum amount of power from said first output terminal and essentially no power from said second output terminal upon a closure of both said first and said second gates, said gate means providing a coupling of approximately equal quantities of radiant energy to said first and said second output terminals upon a closure of one of said gates, and said gate means providing for a maximum amount of power from said second output terminal and essentially no power from said first output terminal upon an opening of both of said first and said second gates.

4,691,178

ULTRASONIC DELAY LINE

Takeshi Okado; Haruto Hashimoto, and Michihiko Uemura, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 854,930
Claims priority, application Japan, Apr. 23, 1985, 60-85457
Int. Cl.[4] H03H 9/36
U.S. Cl. 333—143 10 Claims



1. An ultrasonic delay line comprising:

an input transducer for producing sound waves depending on an input voltage;

a delay medium having at least one reflecting surface for transmitting said sound waves produced by said input transducer from said input transducer via said reflecting surface to a predetermined location; and

an output transducer disposed adjacent said predetermined location for receiving a portion of said sound waves transmitted in said delay medium to produce an output voltage;

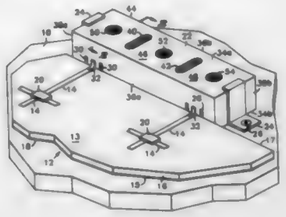
wherein said delay medium has a shape such that sound waves, including a main signal component and third or higher harmonic components, transmittted from said input transducer and through said delay medium via said reflecting surface are misdirected by a predetermined amount in relation to said output transducer such that a substantial portion of the main signal component is input into said output transducer and substantial portion of sound waves having the third or higher harmonic components with respect to said main signal do not reach said output transducer due to said main signal component having a rate of diffusion greater than that of said third or higher harmonic components.

4,691,179

FILLED RESONANT CAVITY FILTERING APPARATUS

Stephen C. Blum, Scottsdale, and John Derise, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1986, Ser. No. 937,954
Int. Cl.[4] H01P *1/207, 7/00, 5/08*
U.S. Cl. 333—202 **23 Claims**



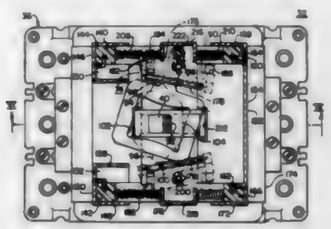
1. A filtering apparatus for electrical energy, said apparatus comprising:
- an electrically conducting base having a substantially planar surface;
- a substantially planar substrate having a ground plane on one side thereof, a conducting trace on an opposing side thereof, and an end substantially perpendicular to both the ground plane and the trace, said substrate being mounted to said base so that said substrate ground plane resides substantially parallel and in contact with the surface of said base;
- a solid core mounted on said base proximate the end of said substrate;
- a metallic plating clad to said core and having a slot therein extending through said metallic plating to said core, the slot being located proximate the trace of said substrate; and
- means for connecting the trace of said substrate to said metallic plating proximate the slot.

4,691,180

CIRCUIT BREAKER WITH ELECTRICAL DISCONNECT MEANS

Kurt A. Grunert, Beaver, and Joseph F. Changle, Carnegie, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1986, Ser. No. 875,914
Int. Cl.[4] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—6 **13 Claims**



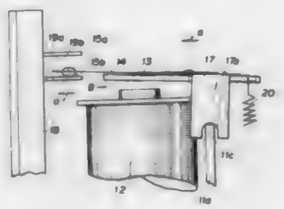
1. An electrical circuit breaker comprising:
- a pair of separable electrical contacts;
- operating means for moving the contacts between OPEN and CLOSED positions;
- a bracket engaging the operating means for movement between said positions;
- solenoid actuated means for moving the bracket between ON and OFF positions corresponding to the CLOSED and OPEN positions of the contacts, the solenoid actuated means including an electromagnet and an armature separately movable against the bracket for alternately moving the operating means into one of the ON and OFF positions upon successive actuations of the solenoid actuated means;
- a bistable mechanical latch having first and second positions for alternately placing the bracket in the ON or OFF position upon successive actuations of the electromagnet;
- a manual operator for moving the bracket between the ON and OFF positions;
- the bracket being immovable by the electromagnet from the OPEN contact position when the manual operator is in the OFF position;
- the bracket being movable by the electromagnet between ON and OFF positions when the manual operator is in the ON position; and
- the latch including stop means movable into and out of the path of movement of the bracket for preventing movement of the solenoid actuated means when the manual operator is in the OFF position.

4,691,181

HINGE TYPE RELAY

Kazuji Katsutani, Yokohama, and Shigeru Inaba, Zama, both of Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,431
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—128 **22 Claims**



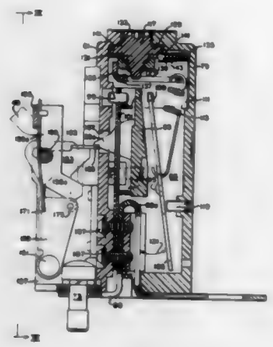
19. A hinge type relay comprising:
- an armature,
- a contact plate connected to said armature and having an outer plate end,
- a lower contact point at the lower surface of said outer plate end,
- yoke having a yoke portion presenting an upwardly-disposed surface,
- a supporting member having a channel forming a downwardly-disposed surface resting on said upwardly-disposed surface,
- said supporting member supporting said contact plate,
- an electromagnetic means positioned generally beneath said armature for magnetically attracting said armature towards it,
- a first fixed contact point positioned so that said lower contact point contacts it in a generally downward direction when said electromagnetic means is energized,
- a biasing means for biasing said lower contact point away from said first fixed contact point, and
- said supporting member rocking on said upwardly-disposed surface when said electromagnetic means attracts said armature towards it and causing said lower contact point, after initially contacting said first fixed contact point, to slide on said first fixed contact point.

4,691,182

CIRCUIT BREAKER WITH ADJUSTABLE MAGNETIC TRIP UNIT

Stephen A. Mrenna, Brighton Township, Beaver County, and Michael J. Whipple, New Sewickley, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1986, Ser. No. 858,137
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—176 **7 Claims**



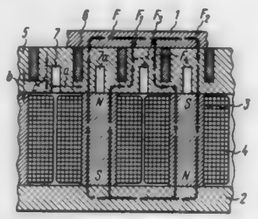
1. A circuit breaker structure for responding to abnormal current conditions in an electrical distribution system, comprising:
- a circuit breaker mechamism having separable contacts and having a releasable member movable to an unlatched position from a latched position to effect opening of the contacts;
- a latch lever movable between latched and unlatched positions of the releasable member and being biased in the latched position;
- a trip bar movable to unlatch the latch lever and being biased in the latched position;
- a trip unit comprising a stationary magnetic structure for each conductor of the distribution system and including a coil and core assembly and an armature;
- lever means associated with the stationary magnetic structure for moving the trip bar to the unlatched position;
- the lever means comprising the armature and movable in response to abnormal currents in at least one of the conductors;
- the armature being positioned at a constant distance from said assembly;
- tension means for varying tension on the lever means and comprising adjustable spring means operatively connected to the lever means so that the force required to attract the armature to the assembly is adjustable without varying the distance between the armature and the coil and core assembly;
- the tension means also comprising a manually operable cam and a cam follower;
- the cam follower being operatively connected to the spring means for increasing and decreasing tension on the spring means in response to rotation of the cam; and
- indexing means adjacent to and contacting the cam for positively indicating the position of the cam and comprising a retractable member and spaced member-receiving indentations, one of which is disposed in the housing and the member being biased into the indentations, whereby an adjustable magnetic trip is effected by changing the spring force on the armature.

4,691,183

DEVICE FOR MAGNETICALLY HOLDING WORKPIECES

Arkady Y. Vernikov; Iosif I. Gamarnik; Mikhail P. Rashkovich; Boris A. Trostanovsky, and Alexandr S. Khinkus, all of Odessa, U.S.S.R., assignors to Odesskoe Spetsialnoe Konstruktorskoe Bjuro Spetsialnykh Stankov, Odessa, U.S.S.R.

PCT No. PCT/SU85/00012, § 371 Date Oct. 7, 1986, § 102(e) Date Oct. 7, 1986, PCT Pub. No. WO86/04850, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 13, 1985, Ser. No. 933,747
Int. Cl.[4] H01F *7/20*
U.S. Cl. 335—289 **1 Claim**



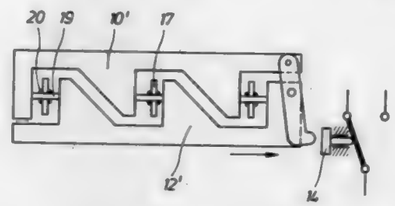
1. A device for magnetically holding workpieces to be machined on machine-tools, comprising a magnetic field source (3, 4) and, disposed thereon, a plate (5) whose side supporting workpieces (1) has recesses (6) for defining poles, characterized in that the plate 5, on its side facing the magnetic field source (3, 4), has auxiliary grooves (7) shifted with respect to the recesses (6) in such a manner that the distance (b) from the bottom of the recess (6) to the side of the plate (5) facing the magnetic field source (3, 4), the distance (a) between the recess (6) and auxiliary groove (7), and the overlap (c) between the recess (6) and auxiliary groove (7) are substantially equal to one another.

4,691,184

BIMETAL RELEASER

Hans-Jürgen Wulff, Hohenwestedt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP85/00492, § 371 Date May 27, 1986, § 102(e) Date May 27, 1986, PCT Pub. No. WO85/02197, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 20, 1985, Ser. No. 866,754
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435228
Int. Cl.[4] H01H *61/00, 71/16*
U.S. Cl. 337—49 **11 Claims**



1. A method for calibrating a bimetal releaser for a switch, the releaser including a release bridge pivotable about an axis, a differential bridge movable relative to the release bridge, a plurality of bimetal strips each having a free release end movable in a given direction as a function of the temperature of said bimetal strip, and a plurality of calibration elements each

mounted at the free release end of a respective bimetal strip and interposed between the release bridge and the differential bridge, the differential bridge being movable into a switch release position when at least one of the bimetal strips is brought to a given temperature, said method comprising:

mounting each calibrating element at the free release end of a respective bimetal strip so as to be movable relative to its respective bimetal strip;

bringing each calibrating element into contact with the release bridge and the differential bridge;

moving the release bridge, the differential bridge and the calibrating elements about the release bridge axis to bring the differential bridge to the switch release position;

while maintaining the differential bridge in the switch release position, bringing the free release end of each bimetal strip to the position corresponding to the given temperature; and

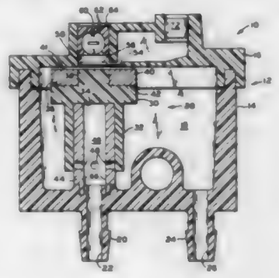
fixing each calibrating element to its associated bimetal strip while said strip and said differential bridge are in respective positions corresponding to the given temperature and the release position, respectively, and said calibrating element is in contact with said differential bridge.

4,691,185

SOLID STATE MAGNETIC MICROSWITCH

Robert J. Loubier, and William F. Bleeke, both of Fort Wayne, Ind., assignors to Xolox Corporation, Fort Wayne, Ind.

Filed Dec. 14, 1964, Ser. No. 681,562
Int. Cl.[4] H05B 43/00; H01H 9/00
U.S. Cl. 336—32 H 5 Claims



1. A switching device which comprises an actuating magnet having a first surface that is the north pole and a second surface opposed to said first surface that is the south pole, an opening extending between said first and second surfaces to provide a magnetic field having a first polarity at a first distance from one of said surfaces and a second polarity at a second distance from said one of said surfaces;

a sensor which changes state when subjected to fields of said first and second polarities;

means for disposing said sensor proximate to said one surface; and

means for selectively changing the relative position of said sensor between said first and said second distances.

4,691,186

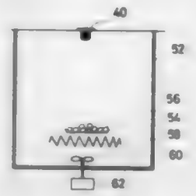
AGING TREATMENT FOR SEMICONDUCTOR GAS SENSOR

Yasuo Shin, Nara, and Takeshi Tanabe, Higashiosaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1981, Ser. No. 255,489
Claims priority, application Japan, Apr. 25, 1980, 55-56030
Int. Cl.[4] H01L 7/00
U.S. Cl. 338—34 5 Claims

1. A method for stabilizing the operation of a gas sensor prior to its being installed in a cooking apparatus for detecting the cooking condition performed therein which comprises

aging a SnO_2 semiconductor gas sensor by disposing said SnO_2 semiconductor gas sensor in an aging chamber having a gas ambience including a gas which is developed in an apparatus in which said SnO_2 semiconductor gas sensor is desired to be installed, said gas sensor being disposed in



said gas ambience for a sufficient time and at a gas ambience temperature which is effective in achieving said stability of operation; and

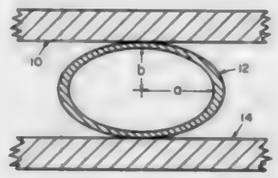
installing said aged SnO_2 semiconductor gas sensor in a cooking apparatus.

4,691,187

VARIABLE LINEAR RESISTOR

George Mon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 6, 1984, Ser. No. 647,591
Int. Cl.[4] H01C 10/10
U.S. Cl. 338—114 2 Claims



1. A variable linear resistor comprising:

a. a first plate having a recessed area cut into one face;

b. a second plate parallel to and facing the face of said first plate with the recessed area;

c. a length of elastic tubing disposed in said recessed area;

d. means for adjusting the distance between said first and second plates; and

e. means for allowing fluid to flow through said elastic tubing.

4,691,188

CIRCUIT BOARD

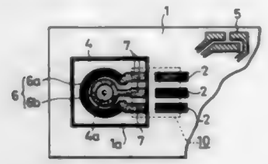
Masamichi Watanabe, and Yasushi Watanabe, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 838,286
Claims priority, application Japan, Mar. 8, 1985, 60-33009[U]
Int. Cl.[4] H01C 1/012
U.S. Cl. 338—307 3 Claims

1. A circuit board comprising:

a first insulating film having a hole defined therethrough and a first circuit pattern formed on one surface thereof including a plurality of first connecting terminals formed adjacent to one edge of said defined hole;

a second insulating film having a second circuit pattern formed on one surface thereof including a plurality of second connecting terminals formed adjacent to one edge of said second insulating film, said second insulating film being retained in said hole of said first insulating film such that said one edges of the respective films are adjacent each other and said first and second connecting terminals are substantially coplanar with each other; and



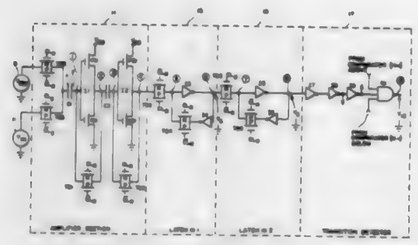
a heat-seal film having an electrically conductive portion on one side thereof which is placed over said first and second connecting terminals for selectively connecting said terminals of said first and second circuit patterns electrically with each other.

4,691,189

COMPARATOR WITH CASCADED LATCHES

Andrew G. F. Dingwall, Bridgewater Township, Somerset County, and Victor Zazzu, Montvale Borough, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 23, 1986, Ser. No. 866,317
Int. Cl.[4] H03M 1/34
U.S. Cl. 340—347 AD 1 Claim



1. A comparator comprising:

an amplifying stage having an input and an output;

first means for selectively applying a reference signal to said input of said amplifying stage;

second means for selectively applying an input signal to be sampled to said amplifying stage and for comparing said input signal with said reference signal and for producing a signal at the output of said amplifying stage indicative of the difference between said input signal and said reference signal;

first and second latchable circuits, each one of said first and second circuits having an input and an output, each one of said first and second circuits being operable in either a first mode in which the circuit functions to receive data applied to its input or in a second mode as a regenerative latch;

means for coupling the input of said first circuit to the output of said amplifying stage and means for coupling the output of said first circuit to the input of said second circuit;

means coupled to said first and second circuits for operating said first circuit in said first mode and said second circuit in said second mode during one time interval and for operating said first circuit in said second mode and said second circuit in said first mode during a subsequent time interval; and

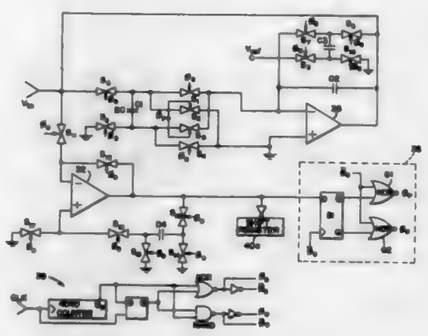
a decoding means coupled to the output of said second circuit.

4,691,190

ANALOG-DIGITAL CONVERTER

Jeffrey I. Robinson, New Fairfield, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Division of Ser. No. 822,396, Jan. 27, 1986, Pat. No. 4,667,180.
This application Jan. 28, 1987, Ser. No. 7,715
Int. Cl.[4] H03M 1/44
U.S. Cl. 340—347 AD 6 Claims



1. An apparatus for the analog to digital conversion of signal, comprising:

(a) a plurality of stages for performing the conversion algorithm $V_{out}=2|V_{in}|-V_{ref}$, wherein V_{in} is the voltage at the input of a particular stage, V_{out} is the voltage at the output of that stage and becomes the V_{in} to the following stage, and V_{ref} is a chosen reference voltage, each stage comprising

(i) a comparator means for comparing V_{in} with a second reference voltage for obtaining a bit of information,

(ii) a first input sampling capacitor,

(iii) a second feedback capacitor, wherein the capacitance of said first input sampling capacitor is twice that of said feedback capacitor,

(iv) a third switch capacitor,

(v) a switching network for permitting the charging and discharging of said input sampling capacitor, said feedback capacitor, and said switch capacitor according to predetermined clocking,

(vi) an operational amplifier having said input sampling capacitor bridging its inverting and noninverting inputs via said switching network, and said feedback capacitor feeding back from the operational amplifier output to its inverting input, wherein

said switching network is arranged to switch the connections of the plates of said input sampling capacitor to said operational amplifier inputs as a function of said clocking and said obtained bit of information from said comparator of said stage to effectuate rectification of V_{in}, and wherein said switching network is arranged to switch the connection of said switch capacitor as a function of said clocking from being connected to the output of said operational amplifier to being between the source of said chosen voltage reference and said inverting input of said operational amplifier, and

(b) a plurality of shift registers, each shift register corresponding to a particular stage and having a storage capacity of m bits of information, where m is chosen from ϕ to n−1 and is the number of said particular stage with n−1 representing the most significant bit and ϕ representing the least significant bit, wherein n is the number of bits output by said analog to digital converter, wherein the output of said shift registers provides an output word in Gray code.

4,691,191

DEVICE FOR SIGNAL PROCESSING AND TARGET PLATE FOR SUCH A DEVICE

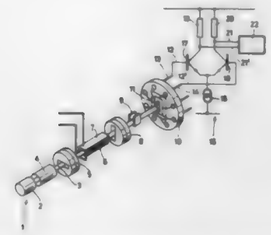
Arthur M. E. Hoeberechts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 478,973, Mar. 25, 1983, abandoned. This application Jul. 10, 1986, Ser. No. 883,852

Claims priority, application Netherlands, Apr. 20, 1982, 8201630

Int. Cl.⁴ H03K *13/00*

U.S. Cl. 340—347 P **20 Claims**



1. A device for converting an analog input signal into corresponding digital signals comprising

source means for generating a flat electron beam,

deflection means for deflecting said electron beam depending on an analog input signal,

target means for receiving the deflected electron beam, said target means comprising

a semiconductor body having a main surface,

a first set of radiation-sensitive semiconductor elements at said main surface, said first set of semiconductor elements being covered with a first portion of a pattern, said pattern being of a material substantially opaque to radiation, and

a second set of radiation-sensitive semiconductor elements at said main surface, said second set of semiconductor elements being substantially completely covered with a second portion of said pattern, said second portion being substantially complementary to said first portion of said pattern,

wherein said radiation-sensitive semiconductor elements produce a number of digital signals, said digital signals representing a number of discrete states of said analog input signal.

4,691,192

METHOD AND APPARATUS FOR MEASURING ANGULAR DISPLACEMENT

Alan J. Baker, 10329 33rd Ave., SE., Everett, Wash. 98204

Division of Ser. No. 479,043, Mar. 25, 1983, Pat. No. 4,630,033. This application Aug. 27, 1986, Ser. No. 901,094

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 P **8 Claims**

1. A method of measuring angular displacement comprising the step of:

rotating a multi-pole rotor about an axis;

producing a periodic signal from the passage of poles on the rotor past a sensor journalled about the axis for orbital movement along the periphery of the rotor;

generating an index mark once each revolution of the rotor as a selected pole passes a selected location on the periphery;

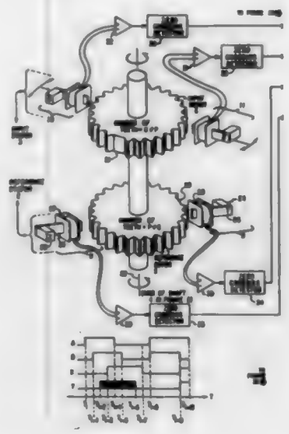
positioning the sensor to a reference orbital position;

measuring for an integral number of revolutions beginning upon and relative to a first index mark the times at which each pole passes the sensor at the reference orbital position;

averaging the times obtained by the measuring step at the reference orbital position to obtain a reference average time of occurrence of a pole passing the sensor;

positioning the sensor to an input orbital position;

measuring for an integral number of revolutions beginning upon and relative to a second index mark the times at which each pole passes the sensor at the input orbital position;



averaging the times obtained by the measuring step at the input orbital position to obtain an input average time of occurrence of a pole passing the sensor; and

expressing the difference between the reference average time of occurrence and the input average time of occurrence as a fraction of the time required for one revolution.

4,691,193

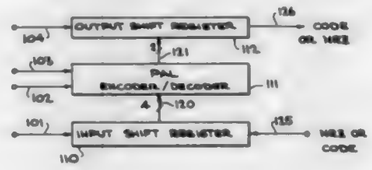
METHODS AND APPARATUS FOR ENCODING AND DECODING DATA TO AND FROM A (2,7) FORMAT

Arthur H. Khu, San Mateo, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 7, 1986, Ser. No. 827,843

Int. Cl.⁴ H03M *7/00*

U.S. Cl. 340—347 DD **32 Claims**



1. Apparatus for implementing a state dependent fixed length, fixed rate (2,7) coding scheme, used for converting, at said fixed rate, each of the data bits of a serial input data stream to a state dependent, fixed length (pair) of code bits, where successive pairs of said code bits are output serially as part of an output code stream which corresponds to said input data stream in coded form, comprising:

(a) means for receiving at least three successive bits of data from said data stream wherein a first one of said bits is a data bit to be encoded, immediately followed by two of said bits which constitute a first lookahead bit and a second lookahead bit;

(b) means, coupled to said means for receiving for synchronously outputting in parallel the set of bits comprised of said bit to be encoded and said first and second lookahead bits;

(c) means, responsive to the output of said means for receiving, constructed from a variable length (2,7) code dictionary and having a preselected initial state, for effectively converting a variable length fixed rate (2,7) coding scheme to a state dependent fixed length fixed rate (2,7) coding scheme, used for developing said fixed length output code stream; and

(d) means, coupled to said means for converting, for receiving said output code stream.

4,691,194

ELECTRIC ALARM SIREN WITH ARC-LIKE RUNNER LEGS

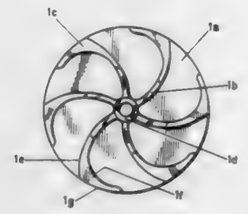
Janez Kavcic, Zelezniki, Yugoslavia, assignor to Iskra-Sozd elektrokovinske industrije n.sol.o, Ljubljana, Yugoslavia

Filed Aug. 14, 1984, Ser. No. 640,574

Claims priority, application Yugoslavia, Oct. 11, 1983, 2052/83

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 340—405 **1 Claim**



1. A lower power electric alarm siren comprising: a central cylindrically shaped member divided by a partition wall into a first portion with slots along the circumference of said first portion and a second portion with fixing accessories for a motor; a runner rotatably mounted within said first portion of said central member, said runner having low ribs and high blades; a front part extending axially outboard from said first portion and having a funnel-shaped nozzle that is open at an axial front end of the siren and that forms a round bore terminating proximate said runner; an electromotor coupled to said runner and to said second portion; and a cover for said electromotor, wherein said runner includes a circular plate having a flat axially inboard back, a convexity at the radially inward portion of the axially outboard front thereof, a bore through the center of said plate for a shaft of said electromotor, said convexity radially extending as a continuity into said low ribs and into said higher blades; and ribs and blades being arc-shaped and continuously curved along the radial extent thereof such that the radially outer portions of said blades tangentially approach the circumference of said runner, said radially outer portions of said blades being formed into air cutters each having a circumferential span, the outer arc of each said blade being shorter than the inner arc thereof, the outer arc being approximately as long as said air cutter, and the blades defining radially outermost circumferential spaces between said air cutters, said spaces being as long as the circumferential span of said air cutters.

4,691,195

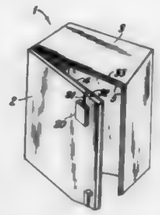
SELF-CONTAINED REFRIGERATOR OPEN DOOR INDICATOR

Jesse L. Sigelman, 69 East 71 St., New York, N.Y. 10021, and Saul Mlodownik, West Hempstead, N.Y., assignors to Jesse L. Sigelman, New York, N.Y.

Filed Feb. 26, 1985, Ser. No. 705,582

Int. Cl.⁴ G08B *13/08*

U.S. Cl. 340—545 **14 Claims**



1. A device for indicating that a refrigerator door is open, the device comprising:

a housing;

means for mounting the housing on a refrigerator in the vicinity of its door during use;

transducer means mountable at a refrigerator door gasket for changing an electrical parameter in response to the movement of the refrigerator door from its closed position to an open position, wherein the transducer means comprises capacitive sensor means including two electrically conductive coplanar plates having an insulating base and a dielectric layer thereover and adhesive means on the base for connecting the base to a gasket on the refrigerator;

circuit means disposed in the housing for sensing the change in the electrical parameter of the transducer means to produce an alarm after a preselected time delay.

4,691,196

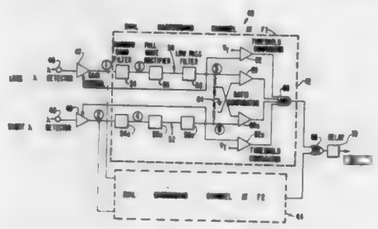
DUAL SPECTRUM FREQUENCY RESPONDING FIRE SENSOR

Mark T. Kern, Goleta, and Kenneth A. Shamordola, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Mar. 23, 1984, Ser. No. 592,611

Int. Cl.⁴ G08B *17/12*

U.S. Cl. 340—578 **23 Claims**



4. A dual channel fire sensor circuit comprising:

a first detector adapted to generate an electrical signal in response to long wavelength radiation;

a second detector adapted to generate an electrical signal in response to short wavelength radiation;

a plurality of dual narrowband channels connected in parallel to said first and second detectors for processing said electrical signals, each of said plurality of dual narrowband channels comprising first and second signal process-

ing paths including a narrowband filter at each of the inputs thereof of like passband characteristics, a threshold circuit coupled in series with the output of said narrowband filter and logic means for providing an output signal in response to corresponding electrical signals at the outputs of the threshold circuits of both of said first and second signal processing paths; the narrowband filters in any one of said plurality of dual narrowband channels being different and non-overlapping in passband characteristics from the narrowband filters in the other of said dual narrowband channels;

a pair of pre-amplifiers coupled to the outputs of the corresponding radiation detectors, each pre-amplifier having a large gain variability, and automatic gain control circuitry coupled to said amplifiers for controlling the gain thereof in response to the level of signals developed in the signal paths of one of said channels; and

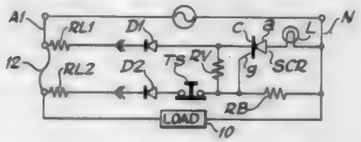
output gating means responsive to said output signals for providing a signal indicative of the detection of radiation.

4,691,197

BLOWN FUSE INDICATOR

Michael A. Damiano, Germantown, and Richard F. Schmerda, Oak Creek, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 24, 1985, Ser. No. 748,106
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—638 **27 Claims**



1. A blown fuse indicator comprising, in combination:

a power supply source;

an indicator;

a solid state switching device having a pair of switching terminals and a control terminal, said switching terminals being connected in circuit with said indicator across said source;

a control circuit for said solid state switching device comprising:

a voltage divider connected across said source, said voltage divider having two parts with a junction there between connected to said control terminal, one of said parts comprising two parallel branches; and

a fuse connected in one of said branches effective when it opens to interrupt said one branch for raising the voltage at said junction to render said solid state switching device conductive to energize said indicator to indicate the open state of said fuse.

4,691,198

CONTROL SYSTEM FOR DIVERTING/EQUALIZING ELECTRICAL POTENTIALS BETWEEN TWO OBJECTS

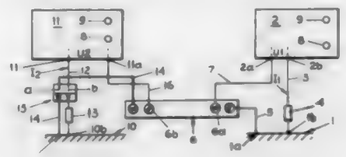
Alf Mortensen, "Bloksberg", Solhola, N-5300 Kleppestø, Norway

PCT No. PCT/NO84/00059, § 371 Date Jul. 24, 1985, § 102(e) Date Jul. 24, 1985, PCT Pub. No. WO85/02601, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 14, 1984, Ser. No. 762,150
Claims priority, application Norway, Dec. 16, 1983, 834639
Int. Cl.[4] G08B *21/00*; H02H *11/00*; B67D *5/32*; H05F *3/00*
U.S. Cl. 340—649 **14 Claims**

7. A control system for diverting and equalizing electrical potentials between two objects such as a body of a storage tank and a body of a delivery tank of transporting means during loading flammable or explosive fluids comprising

an electrical equalizer connection connecting the said transporting means via a terminal of the delivery tank of transporting means to the storage tank via a storage tank terminal, at least one said delivery tank and storage terminal is a part of a control circuit,

said control circuit comprising a low voltage source, a resistor, indicator means for registering a current flow, said indicator means controlling and blocking connection and disconnection of a fluid pump by means of signals, said storage tank and said delivery tank terminals are connected to the control circuit via independent control terminals including a storage tank and delivery tank control terminal of the body of the storage tank and the body of the delivery tank, and a control terminal of the equalizer connection.

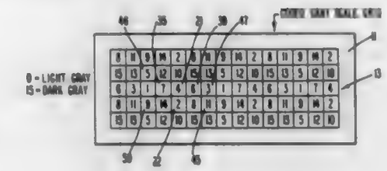


4,691,199

CURSOR POSITION CONTROLLER

Stanley Shell, Weban, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 5, 1985, Ser. No. 730,305
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **5 Claims**



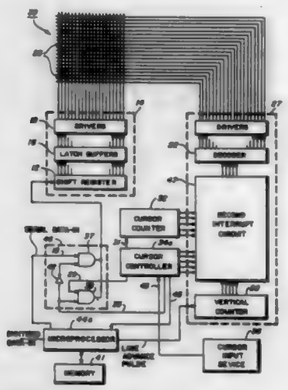
1. A system to be used with an electron beam display device, which display device has means to position a cursor, by coordinate control signals, and with said system designed to enable said cursor to be selectively and randomly moved to random display positions on said display device, comprising in combination: transducer means having light source means and light sensitive means for generating analog signals each of whose amplitude is commensurate with the amount of light reflected from a surface to said light sensitive means at the time of analog signal generation; surface means having a plurality of discrete area means each of which lies in abutting relationship with N other discrete area means and each of which is formed to partially absorb and partially reflect light transmitted thereto from said light source means; each of said discrete area means being formed to absorb a different amount of light each of the discrete area means which lies in abutment therewith and each of said N other discrete means being formed to absorb a different amount of light then every other discrete area means of said N other discrete area means; each of said discrete area means being formed to reflect a different amount of light than each of the discrete area means which lies in abutment therewith and each of said N other discrete area means being formed to reflect a different amount of light than every other discrete area means of said N other discrete area means; said light sensitive means being capable of generating an analog signal for each discrete area means, which has an amplitude which is different from the amplitude value of any analog signal generated in response to light reflected from abutting ones of said discrete area means; data processing circuitry means coupled to said transducer means to receive said analog signals, said data processing circuitry means including means responsive to particular combinations of amplitude values of said analog signals to determine the direction said transducer means is moved from a first discrete area means to a second discrete, abutting area means and to generate coordinate control signals indicative thereof; and control signal means connected between said data processing circuitry means and said electron beam display device to conduct said coordinate control signals to said means to position said cursor whereby said cursor is moved in accordance with the movement of said transducer means.

4,691,200

MATRIX DISPLAY WITH A FAST CURSOR

Joseph F. Stephany, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1984, Ser. No. 656,191
Int. Cl.[4] G09F *9/35*; G06F *3/147*
U.S. Cl. 340—784 **7 Claims**



1. In a matrix-addressed display device of the type having at least two mutually perpendicular, spaced arrays of electrodes which form a matrix of crossed electrodes, the electrode arrays sandwiching a display medium responsive to electrical fields generated between the crossed electrodes when they are addressed with a voltage, an independently positionable displayed cursor, and means for refresh cycling information displayed on the display device at a frequency faster than the relaxation time or information fading time of the display medium when the electric fields are removed, a means for repositioning the cursor faster than the refresh cycling time for the entire matrix comprising

a first interrupt circuit through which serialized streams of digitized data in the form of voltage pulses are transmitted to the display device matrix through a horizontal circuitry, the horizontal circuitry enabling concurrent addressing of the electrodes in one array with said digitized data voltage pulses, the first interrupt circuit being adapted to interrupt the serialized data streams in response to receipt of a first interrupt signal;

a second interrupt circuit in a vertical circuitry from which line-advance voltage pulses are sequentially transmitted to the electrodes of the other array in the display device matrix in timed relationship with the concurrently addressed electrodes of the other matrix array to create displayed information in said display device medium, the second interrupt circuit being adapted to interrupt the line-advance pulses in response to receipt of a second interrupt signal;

a cursor input device for generating cursor positional information;

a cursor controller for generating the first and second interrupt signals in response to changed cursor positional information and for converting the changed positional information into serialized streams of digitized positional information the cursor controller transmitting the serialized streams of positional information to the first interrupt circuit and concurrently activating a cursor counter that transmits cursor line-advance voltage pulses to the second interrupt circuit in timed relationship with the positional information serial streams; and

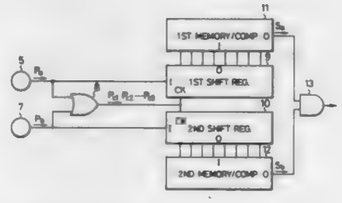
said first and second interrupt circuits being further adapted to transmit the serialized streams of positional information and cursor line-advance pulses respectively to the display device matrix while said first and second interrupt circuits are in an interrupted state, whereupon, at the conclusion of this transmission to the display device the cursor controller ceases to generate the first ahd second interrupt signals, removing the first and second interrupt circuits from said interrupted state.

4,691,201

ENCODED SIGNAL DEVICE WITH SELF-CONTAINED CLOCK GENERATION

Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 679,555, Dec. 7, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,582
Claims priority, application Japan, Dec. 7, 1983, 58-189469[U]; Dec. 22, 1983, 58-197469[U]
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.31 **14 Claims**



1. An encoded signal generating device comprising:

an operation member containing first and second rows of coded indicators containing n timing positions, said coded indicators being capable of assuming one of two mutually exclusive states and each of said rows of coded indicators being capable of representing 2^n possible values;

pulse generating means, cooperating with said coded indicators in said operation member, for generating first and second data trains of pulses from relative movement of said operation member and said pulse generating means, said first and second data trains corresponding to sid coded indicators in said first and second rows, respectively;

means for combining said first and second pulse data trains to produce a synchronizing signal comprising a plurality of pulses each approximately synchronized with a pulse of at least one of said first pulse data train and said second pulse data train; and

means for storing said first and second pulse pulse data trains under the control of said synchronizing signal.

4,691,202

IDENTIFICATION SYSTEMS

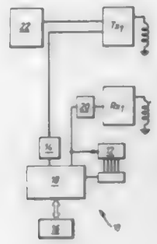
Phillip R. M. Dense, 70 Systems Limited, Unit 7, The Alpha Centre, Upton Road, Poole, Dorset, and Christopher D. Hook, 21 Chantry Close, Windsor, Berkshire, both of England

Filed Apr. 3, 1985, Ser. No. 719,551

Claims priority, application United Kingdom, Apr. 3, 1984, 8408538

Int. Cl.⁴ H04Q *7/00*; G07D *7/00*; G06K *5/00*

U.S. Cl. 340—825.54 **10 Claims**



1. An identification system comprising an interrogator and a plurality of transponders;

the interrogator having transmission means for transmitting an interrogation signal;

each transponder having receiver means for receiving the interrogation signal and having means operative in response to reception of the interrogation signal to transmit a reply signal comprising a first coded identification signal;

the interrogator having means for receiving said reply signal, checking and retransmitting said reply signal; and

wherein the system comprising the interrogator and transponders includes means for resolving contention between reply signals from different transponders which are received by the interrogator overlapping in time, such contention resolving means including the means within the interrogator for retransmitting said reply signal, and including comparison means within each transponder for comparing a retransmitted reply signal received by the transponder with its respective coded identification signal.

4,691,203

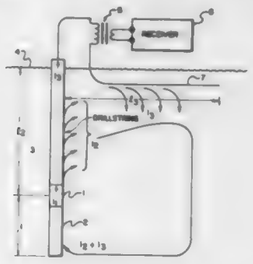
DOWNHOLE TELEMETRY APPARATUS AND METHOD

Llewellyn A. Rubin, 3295 S. Allegheny Ct., Westlake Village, Calif. 91359, and William H. Harrison, 7280 Hyannis Dr., Canoga Park, Calif. 91306

Filed Jul. 1, 1983, Ser. No. 510,298

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 340—856 **35 Claims**



1. A downhole drillstring signal transmitting system, comprising:

(a) first and second electrically conductive sleeves adapted to form a section of a drillstring,

(b) means holding said sleeves in axial alignment with their adjacent ends separated from each other by a predetermined insulative gap,

(c) an insulating means separating the sleeve ends across the gap,

(d) an amplifier for amplifying a first frequency electrical signal containing downhole information to be transmitted to the surface, the first signal having a frequency which is suitable for effective propagation through the earth from the downhole location to the surface, the amplifier comprising:

(i) input means for receiving the first signal,

(ii) a first circuit which is responsive to the first signal for generating a second signal having the downhole information content of the first signal, the frequency of the second signal being at least an order of magnitude greater than the frequency of the first signal, greater than the frequency range for effective propagation through the earth from the downhole location,

(iii) means for amplifying the power of the second signal,

(iv) an impedance matching means connected to receive the second signal and to provide impedance matching for the amplifier, and

(v) a second circuit which is responsive to the impedance matched and amplified second signal for generating a third signal having the downhole information content of the second signal and a frequency which is suitable for effective propagation through the earth from the downhole location, and

(e) means for applying the third signal across the sleeves for transmission to the surface.

4,691,204

RADAR APPARATUS

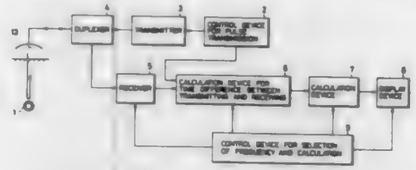
Kazuo Hiramoto, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,862

Claims priority, application Japan, Dec. 29, 1983, 58-247689

Int. Cl.⁴ G01S *7/28*

U.S. Cl. 342—22 **5 Claims**



1. In a radar apparatus for detecting a distance from an emitter of the radar apparatus to an underground object to be detected comprising a control device which outputs a timing pulse for controlling the timing of transmitting a detecting pulse used for detecting a buried object in the ground, a transmitter which transmits said detecting pulse from said control device to said buried object through an antenna, a receiver for receiving an echo signal reflected back from said buried object, and a display device for displaying said echo signal received from said receiver, the improvement comprising a calculation device for calculating time differences between said timing pulse from said control device and the time of receipt of signals of two or more different frequencies from said receiver to produce time difference signals, a calculation device for calculating said distance by solution of simultaneous equations based on the equation

$$\sqrt{2d} = \frac{1}{\sqrt{\epsilon\mu\left(\sqrt{1+\left(\frac{\sigma}{\omega_i\epsilon}\right)^2}+1\right)}}\,t_i$$

where

d=distance from said radar apparatus to said underground object to be detected

ϵ=electric permittivity of the medium of the ground

μ=magnetic permeability of the medium of the ground

σ=electric conductivity of the medium of the ground

ω_i=angular frequencies of electromagnetic waves received by said receiver (5)

t_i=delay time from transmition of pulse from said radar apparatus to reception thereof reflected from said underground object

i=1, 2 and 3 corresponding to said different frequencies

relating to the speed of propagation of an electromagnetic wave for said different frequencies and said time differences, and a control device which controls said calculation device to start the calculation of said distance.

4,691,205

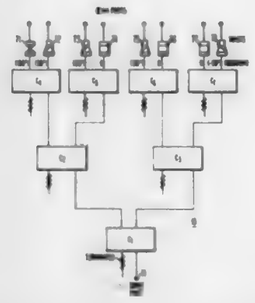
BEAM FORMING NETWORK FOR CIRCULARLY POLARIZED SHAPED BEAM ANTENNA SYSTEM

Charles E. Profera, Jr., Camden, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 6, 1985, Ser. No. 741,873

Int. Cl.⁴ H01Q *21/06*, *21/24*

U.S. Cl. 342—365 **10 Claims**



1. A feed network for a circularly polarized shaped beam antenna array having a plurality of antenna elements comprising:

a network of quadrature type couplers coupled to each other in a manner to couple RF signals between a single terminal at one network end and a plurality of terminals at the opposite end such that an RF input signal at said single terminal is power divided according to a desired distribution at said plurality of terminals;

said couplers interconnected without any intervening phase shifters, whereby an input RF signal at said single terminal produces unequal phase shift signals at said plurality of terminals; and

means including twisted waveguides coupled to each of said plurality of terminals for equalizing the phase of said signals from said plurality of terminals.

4,691,206

MICROSTRIP AND CAVITY-BACKED APERTURE ANTENNA

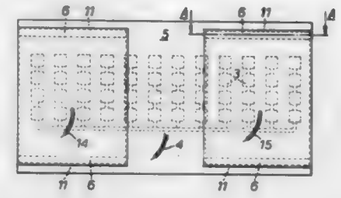
Hugh Shapter, Funtington, and Colin Wood, Havant, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Apr. 5, 1985, Ser. No. 720,405

Claims priority, application United Kingdom, Apr. 11, 1984, 8409339

Int. Cl.⁴ H01Q *1/38*, *13/18*

U.S. Cl. 343—700 MS **8 Claims**



1. A microwave antenna comprising a dielectric substrate, carrying on one side thereof a microstrip antenna defined by a plurality of microstrip patches, said antenna being suitable for operation within a first frequency band and carrying on the other side thereof a conductive ground plane, a first microwave feed coupled between the microstrip antenna and the ground plane for conducting microwave signals in the first band, at least one radiation aperture formed in the ground plane for operation within a second frequency band and arranged to communicate with an otherwise closed resonant microwave cavity defined between the ground plane and a conductive enclosure arranged to extend therefrom, and a second microwave feed coupled to conductor means carried on the substrate on a side thereof remote from the ground plane, the conductor means being arranged to extend into the enclosure to feed microwave signals in the second band from the second microwave feed to the resonant microwave cavity.

4,691,207

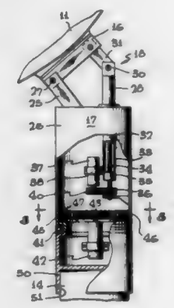
ANTENNA POSITIONING APPARATUS

Anthony A. Timineri, Van Nuys, Calif., assignor to Nissho Iwai American Corporation, Los Angeles, Calif.

Filed Sep. 4, 1984, Ser. No. 646,787

Int. Cl.⁴ H01Q *3/08*, *1/12*

U.S. Cl. 343—766 **1 Claim**



1. In a satellite antenna positioning system, the combination which comprises:

an antenna;

an upright post;

movable support means interconnecting said antenna with

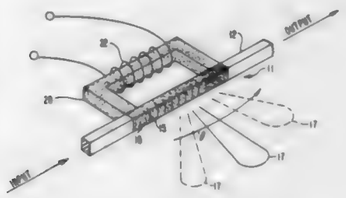
said upright post for movably supporting said antenna thereon;
said movable support means including a rotary housing carried on said upright post and being coaxially disposed therewith, and a linkage coupling said antenna to said rotary housing;
a first drive motor means including a gear drive train operably connecting said upright post to said rotary housing for driving said housing about a vertical post axis to position said antenna in azimuth;
a second drive motor means having a reciprocating rod interconnecting said rotary housing with said linkage for positioning said antenna in elevation;
a stationary housing fixed to said upright post;
a bearing means disposed between said stationary housing and said rotary housing for movably mounting said rotary housing on said stationary housing;
said stationary housing having an annular collar at the stationary housing end opposite to its end carrying said bearing means, which annular collar defines a mounting recess for insertably receiving said upright post;
said first drive motor means including a planetary gear mechanism carried in said rotary housing and having a ring gear and driving gears in mesh therewith and a drive motor fixed to said stationary housing and coupled to said driving gears in operative relationship for moving said rotary housing; and
a computer control means operably coupled to said first and second drive motor means for selectively positioning said antenna in azimuth via said first drive motor means and in elevation via said second drive motor means.

4,691,208

FERRITE WAVEGUIDE SCANNING ANTENNA

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 640,183
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—785 **9 Claims**



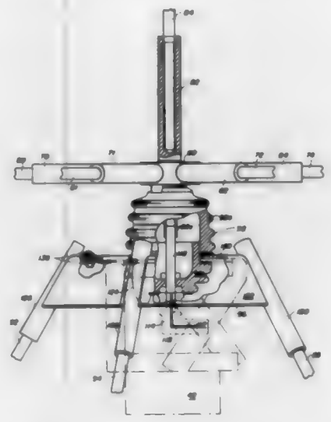
1. Phase-scan antenna apparatus comprising:
a rod-shaped length of dielectric waveguide having a major axis extending the length thereof, said waveguide having two non-ferrite dielectric rod-shaped sections fabricated of relatively high dielectric constant material forming the ends of said rod-shaped length of waveguide; and
a rod-shaped section of ferrite dielectric disposed between and joining said two non ferrite dielectric sections, said ferrite dielectric section being fabricated of a material having a dielectric constant which closely matches the dielectric constant of said non-ferrite dielectric sections and being equipped with means for permitting electromagnetic wave radiation to be emitted from or received by said ferrite section in a direction generally perpendicular to said major axis of said waveguide.

4,691,209

WIDEBAND ANTENNA

Joseph E. Kershaw, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1985, Ser. No. 766,462
Int. Cl.[4] H01Q *9/28, 21/00*
U.S. Cl. 343—846 **10 Claims**



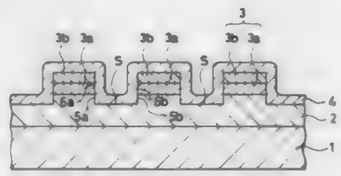
1. An antenna comprising:
a coaxial transmission line having an inner conductor and an outer conductor;
a conical antenna element having an apex, said apex being connected to said coaxial connector outer conductor;
a disc-shaped antenna element positioned adjacent said apex and electrically connected to said inner conductor; and
a vertical radiating antenna element electrically connected to said inner conductor and positioned othogonally to said disc-shaped antenna element; and
an antenna base comprised of an insulator, said conical antenna element, said disc-shaped antenna element and said vertical radiating element being mechanically connected to said antenna base.

4,691,210

THERMAL HEAD FOR HEAT-SENSITIVE RECORDING

Yasuo Nishiguchi; Tsuyoshi Yasutomi, both of Kokubu, and Ryoichi Shiraishi, Hayato, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Dec. 24, 1985, Ser. No. 812,970
Claims priority, application Japan, Dec. 25, 1984, 59-201055[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



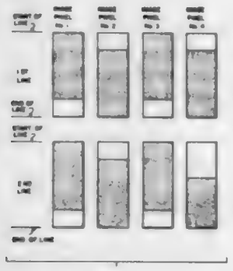
1. A thermal head comprising a substrate layer, a glaze layer formed on one surface of the substrate layer and a plurality of heat-generating elements formed on the surface of the glaze layer, each heat-generating element comprising a heat-generating resistor and a pair of electrodes connected in series to the heat-generating resistor, wherein the glaze layer is provided with grooves between every two adjacent heat-generating elements, the grooves extending into the glaze layer to a depth of 0.3 to 30 μm.

4,691,211

THERMAL PRINTER

Scott A. Brownstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,411
Int. Cl.[4] G01D *15/10*; H04N *1/21*; B41J *3/20*
U.S. Cl. 346—76 PH **1 Claim**



1. Thermal printing apparatus which transfers sublimable dye to form a dye image in a receiver composed of a plurality of lines of dye image pixels, each dye image pixel having N different possible dye density levels with the area of the dye portion of an image pixel being proportional to image pixel density, comprising:
(a) a thermal print head for printing a line of image pixels and including a plurality of groups of heating elements, the heating elements of each group being simultaneously addressable in parallel during at least N time slots which comprise an address cycle;
(b) a carrier including at least one heat transferable sublimable dye and being positionable in relation to the heating elements such that the amount of dye transferred for each image pixel is proportional to the energy provided by an energized heating element;
(c) a receiver disposed in relation to the carrier sheet and the print head for receiving transferred dye to form dye image pixels;
(d) means for moving the carrier and receiver relative to the print head; and
(e) control means for energizing adjacent heating elements during different sequences of time slots of an address cycle to cause adjacent image pixels to be formed in which their dye portions are staggered to form a check-board pattern.

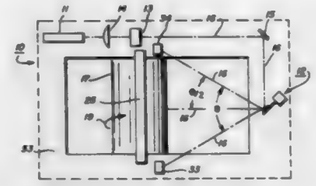
4,691,212

PIEZOELECTRIC OPTICAL BEAM DEFLECTOR

Edward J. Solcz, New York; Gerald A. Domoto, Briarcliff Manor, and Barry M. Wolf, Yorktown Heights, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 14, 1985, Ser. No. 798,091
Int. Cl.[4] G01D *9/42, 15/14*; H04N *1/21*
U.S. Cl. 346—108 **9 Claims**

1. A piezoelectric laser scanner for use as an optical beam deflector in an electrophotographic printer having a moving photoconductive member, comprising:
a piezoelectric bimorph crystal being mounted on a support member in a cantilevered fashion with one end of the bimorph crystal being free to oscillate along an arc;
a flexural beam having one end thereof in abutting contact with the free end of the bimorph crystal;
means for attaching the flexural beam to the bimorph crystal, so that their abutting ends are fixed together;
a mirror being bonded to the flexural beam at predetermined distance from the bimorph crystal free end;
means for fixedly mounting the support member to the printer;
means for applying an AC voltage of predetermined frequency to the bimorph crystal to drive said bimorph crystal causing the flexural beam to oscillate at resonance



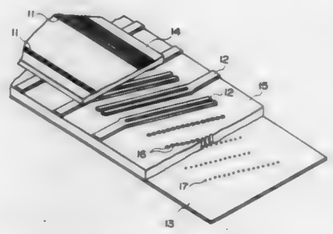
with a node formed substantially at the center of the mirror, so that the mirror rotates about the node without translation; and
means for direction a laser beam of modulated light to the center of the rotating mirror for deflection thereby across the photoconductive member of said printer, the modulated light containing digital information therein for forming electrostatic latent images on the photoconductive member.

4,691,213

ION GENERATING DEVICE AND METHOD OF MANUFACTURING SAME

Yutaka Inaba, Kawasaki, and Yujiro Ando, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 711,180, Mar. 13, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 941,553
Claims priority, application Japan, Mar. 19, 1984, 59-51034
Int. Cl.[4] G01D *15/06*; H01J *7/24*; C23F *1/02*
U.S. Cl. 346—159 **13 Claims**



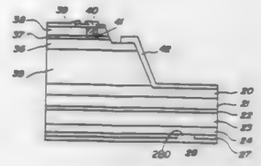
1. An ion generating device, comprising:
a plurality of first electrodes extending in a first direction;
a plurality of second electrodes extending in a second direction which is different from said first direction, to constitute a matrix;
a third electrode so disposed that said second electrodes lie between said first electrodes and the third electrode, said third electrode having apertures corresponding to said matrix;
a first dielectric member disposed between said first electrodes and said second electrodes; and
a second dielectric member disposed between said second electrodes and said third electrode, said second dielectric member having a plurality of apertures corresponding to the matrix, which apertures each have a cross-sectional area generally increasing toward said third electrode.

4,691,214

OPTICAL SEMICONDUCTOR APPARATUS

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 23, 1985, Ser. No. 757,975
Claims priority, application Japan, Jul. 31, 1984, 59-163212
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **2 Claims**



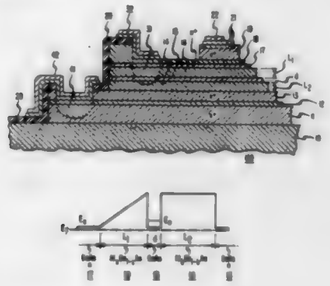
1. An optoelectronic integrated circuit apparatus comprising:
- a planar conductive substrate having a first facet at a first planar surface thereof and a second facet at a second planar surface thereof on the opposite side of said planar substrate from said first planar surface;
- an electrical circuit device comprising at least one transistor formed on said substrate at said first facet, said electrical circuit device being isolated from said conductive substrate by a semi-insulating layer formed on said first facet between said substrate and said electrical circuit device;
- an optical semiconductor device comprising at least one of a semiconductor laser oscillator area and a photo-emitting diode formed on said second facet; and
- a wiring layer providing an electrical connection between said electrical circuit device and said optical semiconductor device formed on an exterior surface of said semi-insulating layer.

4,691,215

HOT ELECTRON UNIPOLAR TRANSISTOR WITH TWO-DIMENSIONAL DEGENERATE ELECTRON GAS BASE WITH CONTINUOUSLY GRADED COMPOSITION COMPOUND EMITTER

Sergey Luryi, Millington, N.J., assignor to American Telephone and Telegraph Company and AT&T Bell Laboratories, both of Murray Hill, N.J.

Filed Jan. 9, 1985, Ser. No. 689,845
Int. Cl.⁴ H01L *29/80*
U.S. Cl. 357—22 **9 Claims**



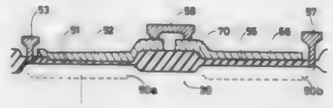
1. A unipolar transistor comprising:
- (a) a semiconductor base layer having first and second opposing surfaces;
- (b) a semiconductor emitter barrier layer contiguous with the first surface of the layer;
- (c) a semiconductor collector barrier layer contiguous with the second surface of the base layer;
- (d) a separate electrical contact to each of the emitter barrier layer, the base layer, and the collector barrier layer,
- means for forming a degenerate two-dimensional gas of mobile charge carriers in said base layer,
- the semiconductor emitter barrier layer being composed of a compound containing an element having a concentration that is continuously graded in a first direction perpendicular to the first surface of the base layer so that the bandgap of the emitter barrier layer is graded in that the bandgap increases in the first direction going toward the first surface of the base layer, whereby during operation, when a forward bias voltage is applied to the emitter barrier layer contact and a negative bias is applied to the collector barrier layer contact, said degenerate two-dimensional gas of mobile charge carriers exists in the base layer extending to the electrical contact thereto, and a flow of electrical current perpendicular to the first surface of the base layer between the emitter barrier layer contact and the collector barrier layer contact through the base layer is controllable by voltages applied to the electrical contacts.

4,691,216

SEMICONDUCTOR MEMORY DEVICE

Yasushi Terada, and Takeshi Nakayama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,881
Claims priority, application Japan, Jan. 18, 1985, 60-7721
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.6 **12 Claims**



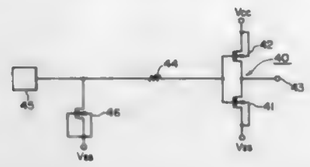
1. A semiconductor device with a programming high-voltage pulse generator in an electrically erasable and programmable read-only semiconductor memory device comprising data storage means including a plurality of memory transistors, each of said memory transistors comprising a semiconductor substrate, a floating gate for storing electric charges and a tunnel oxide film formed between said semiconductor substrate and said floating gate to serve as a path for electric charges, means for programming said data storage means using a programming high-voltage pulse signal, said programming high-voltage pulse generator comprising means for controlling the pulse height of the programming high-voltage pulse, and signal amplifying means for producing said programming high-voltage pulse in response to said controlling means, said pulse height controlling means comprising:
- means for generating a reference signal of a predetermined potential,
- voltage dividing means including a first capacitance formed of an oxide film having a thickness corresponding to the thickness of said tunnel oxide film and a second capacitance having a predetermined capacitance value, said first capacitance and said second capacitance being connected in series, one end of said first capacitance not connected to said second capacitance receiving the reference signal from said reference signal generating means and an output signal being provided from a junction of said first and second capacitance, and
- correcting means responsive to the output signal received from said voltage dividing means for providing an output voltage to said signal amplifying means.

4,691,217

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Tatsuaki Ueno, Tachikawa, and Hajime Inoue, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,035
Claims priority, application Japan, Jul. 25, 1984, 59-152996
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.13 **25 Claims**



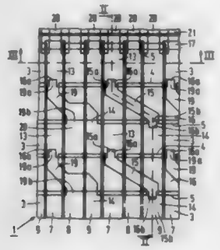
1. A semiconductor integrated circuit device comprising:
- an input terminal which serves to receive an input signal from external of the device and apply the signal to the remainder of the device;
- a circuit which is composed of first MISFETs connected to said input terminal, a gate electrode of at least one of said first MISFETs being connected to said input terminal; and
- a protective circuit which is connected between said input terminal and said circuit and which includes a resistor and a second MISFET, the second MISFET having two semiconductor regions constituting source and drain regions of the second MISFET, and having a gate electrode, said drain region of said second MISFET being directly connected to said input terminal at a position closer thereto than the position at which the input terminal is connected to said resistor, the gate electrode and the source region of the second MISFET being connected to a fixed potential.

4,691,218

CHARGE TRANSFER DEVICE

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 607,903, May 7, 1984, abandoned. This application Jan. 23, 1987, Ser. No. 8,112
Claims priority, application Netherlands, May 13, 1983, 8301715
Int. Cl.⁴ H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 **11 Claims**



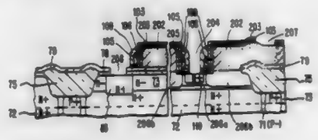
1. A charge transfer device comprising a semiconductor layer and a charge transfer channel associated with the semiconductor layer and having first and second longitudinal sides, a barrier layer on said charge transfer channel, and an electrode system comprising electrodes which are separated by said barrier layer from the charge transfer channel and which extend transversely across the charge transfer channel from one longitudinal side to the other, at least one of said electrodes being a first electrode which is associated with a first storage site present in the charge transfer channel, a second storage site located outside the charge transfer channel which belongs to the semiconductor layer and has an associated second electrode separated by the barrier layer from said second storage site, the first and second storage sites each having a substantially rectangular periphery having a length and a width, which periphery is defined at least in part by the relevant associated first or second electrode, the semiconductor layer comprising a connection channel which extends from the first to the second storage site, a transfer electrode which is separated by the barrier layer from the connection channel, said connection channel being controlled by said transfer electrode, said connection channel joining the first storage site on the first longitudinal side of the charge transfer channel, the transfer electrode being strip-shaped and being arranged substantially parallel to the first longitudinal side beside the charge transfer channel, charge carriers being transferred in operation through the connection channel between the first and second storage sites from one storage site to the other, the connection channel having at an end adjoining the one storage site a width which is smaller than both the length and the width of the one storage site, and the transfer electrode being separated from the first or second electrode associated with the one storage site, characterized in that the strip-shaped transfer electrode has a strip-shaped main part and a projection located at the area of the connection channel, which projection juts out from the strip-shaped main part and extends from said main part at least substantially as far as the periphery of the one storage site.

4,691,219

SELF-ALIGNED POLYSILICON BASE CONTACT STRUCTURE

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 454,919, Dec. 30, 1982, which is a continuation-in-part of Ser. No. 167,184, Jul. 8, 1980, Pat. No. 4,400,865. This application Mar. 24, 1986, Ser. No. 843,938
Int. Cl.⁴ H01L *29/72*
U.S. Cl. 357—34 **1 Claim**



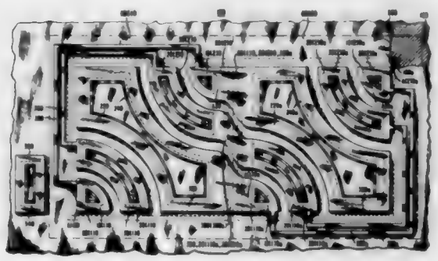
1. In an integrated circuit transistor having base and emitter regions formed in a semiconductor substrate and a junction therebetween, a polysilicon base contact and dielectric isolation structure for the base-emitter junction at a surface of said substrate, comprising:
- a polysilicon base contact on the surface of said substrate overlying a portion of the base region, said base contact having substantially vertical sidewalls near the base-emitter junction and said emitter being self-aligned to said base contact; and
- a dielectric isolation region extending upward from the surface of said substrate adjacent said polysilicon base contact, and extending over the base-emitter junction, comprising:
  - a silicon nitride layer overlying said base-emitter junction and completely covering the vertical sidewalls of said polysilicon base contact,
  - a polysilicon layer overlying said silicon nitride layer and extending upward from the horizontal surface thereof overlying said base-emitter junction, and
  - a silicon dioxide layer formed on the surface of said polysilicon layer.

4,691,220

RADIAL HIGH VOLTAGE BIDIRECTIONAL SWITCH STRUCTURE WITH CONCAVO-CONCAVE SHAPED SEMICONDUCTOR REGIONS

Hans W. Becke, Morristown, and Robert K. Smith, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 540,159, Oct. 7, 1983, abandoned. This application Dec. 3, 1985, Ser. No. 804,235
Int. Cl.[4] H01L *29/747*
U.S. Cl. 357—39 13 Claims



1. A semiconductor device structure located in a semiconductor body having a first major surface comprising:

(a) a first high conductivity localized region of the body intersecting the first major surface at a first localized area thereof having a perimeter characterized essentially by a concavo-concave portion;

(b) second and third high conductivity localized regions of the body intersecting the first major surface at second and third localized areas, respectively, the second and third areas each having a separate perimeter characterized essentially by convaco-convex portion, the convex portion of the perimeter of the second area being spaced apart from one of the concave portions of the perimeter of the first area essentially by a first fixed distance, the convex portion of the perimeter of the third area being spaced apart from the other of the concave portions of the perimeter of the first area essentially by the first fixed distance; and

(c) fourth and fifth high conductivity localized regions of the body intersecting the first major surface at fourth and fifth localized areas, respectively, the fourth and fifth areas each having a separate perimeter characterized essentially by convex portion, the convex portion of the perimeter of the fourth area being spaced apart from the concave portion of the second area essentially by a second fixed distance, and the convex portion of the perimeter of the fifth area being spaced apart from the concave portion of the third area essentially by the second fixed distance, the sum of the lengths of the convex portions of the perimeters of the fourth and fifth areas being less than the sum of the lengths of the two concave portions of the perimeter of the first area,

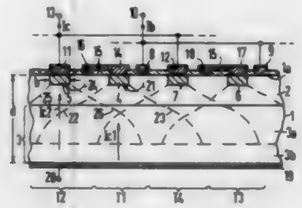
the first, second, and third regions all being essentially of one conductivity type, and the fourth and fifth regions both being essentially of conductivity type opposite to the one type and being coupled together by an electrical conductor.

4,691,221

MONOLITHICALLY INTEGRATED BIPOLAR DARLINGTON CIRCUIT

Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,458
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435571
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—46 10 Claims



1. A monolithically integrated bipolar Darlington circuit comprising, a driver transistor and an output transistor, formed in a semiconductor body (1) which contains a base layer (2) of a first conductivity type, a collector layer (3) of a second conductivity type below said base layer (2) a driver transistor emitter and an output transistor emitter, of said second conductivity type formed in said base layer (2) and separated a specified distance in a first direction, said emitter of said driver transistor conductively connected to a sub-region of said base layer lying between said driver and output transistors, and whereby said base layer, said emitter of said output transistor and said collector layer are, respectively, provided with a base terminal (10), an emitter terminal (13) and a collector terminal (20), said emitter of said output transistor is composed of a plurality of emitter regions (5, 7) which are provided with emitter contacts (12, 11) connected to said emitter terminal (13); said emitter of said driver transistor is composed of a plurality of emitter regions (4, 6) which are alternately arranged with said emitter regions (5, 7) of said output transistor such that each emitter region (5) of said output transistor lies next to at least one emitter region (4) of said driver transistor, whereby each emitter region of said driver transistor is provided with a conductive coating (14) which contacts said base layer (2) between it and one of said emitter regions (5) of said output transistor which is adjacent to said emitter region of said driver transistor; said base terminal (10) connected to a plurality of base contacts (8, 9) which are mounted on said base layer (2), respectively, adjacent to said emitter regions (4, 6) of said driver transistor; and a thickness (d) of said semiconductor body (1) is greater than one half of said specified distance between adjacent emitter regions (5, 7) of said output transistor between which at least one emitter region (4) of said driver transistor is located.

4,691,222

METHOD TO REDUCE THE HEIGHT OF THE BIRD'S HEAD IN OXIDE ISOLATED PROCESSES

Eugene R. Cox, Puyallup, Wash., assignor to Harris Corporation, Melbourne, Fla.

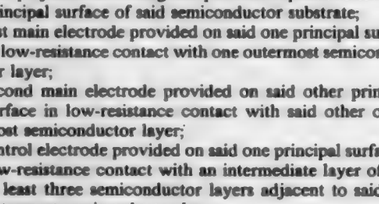
Division of Ser. No. 588,727, Mar. 12, 1984, Pat. No. 4,612,701.
This application May 1, 1986, Ser. No. 857,995
Int. Cl.[4] H01L *27/04, 29/34, 29/06*
U.S. Cl. 357—50 2 Claims

1. A semiconductor structure comprising:

a substrate of semiconductor material;

a plurality of oxide inserts extending into said substrate and having a central portion and a head portion extending above said central portion about the periphery of said central portion, said head portion having a planar top surface;

an oxide layer on said substrate and the top of said central portion is substantially coplaner with the top of said oxide layer; and



an oxide inhibiting layer on said oxide layer and said planar surface of said head portion is substantially coplanar with the top surface of said oxide inhibiting layer.

4,691,223

SEMICONDUCTOR DEVICE HAVING HIGH BREAKDOWN VOLTAGE

Susumu Murakami, Katsuta; Teruyuki Kagami, Hitachiota; Tsutomu Yatsuo, and Masaki Takahashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,464
Claims priority, application Japan, Nov. 9, 1984, 59-234989
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 27 Claims

1. A semiconductor device having a high breakdown voltage, comprising:

a semiconductor substrate having between opposite principal surfaces thereof at least three semiconductor layers which are adjacent to each other with alternately different conductivity types to form pn junctions therebetween, one of the outermost layers of said at least three semiconductor layers being on the side of one of said opposite principal surfaces of said semiconductor substrate, the other outermost semiconductor layer being on the side of the other principal surface, at least predetermined ones of said pn junctions having end portions exposed to said one principal surface of said semiconductor substrate;

a first main electrode provided on said one principal surface in low-resistance contact with one outermost semiconductor layer;

a second main electrode provided on said other principal surface in low-resistance contact with said other outermost semiconductor layer;

a control electrode provided on said one principal surface in low-resistance contact with an intermediate layer of said at least three semiconductor layers adjacent to said one outermost semiconductor layer;

an additional electrode provided on said one principal surface in low-resistance contact therewith, said additional electrode having a potential substantially equal to said other outermost semiconductor layer which is in low-resistance contact with said second main electrode;

a surface-passivation insulating film provided on said one principal surface to cover the exposed end portions of said predetermined ones of said pn junctions for passivation thereof; and

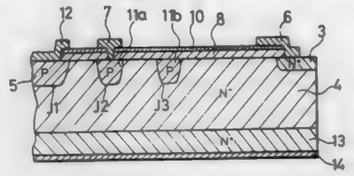
a resistive material sheet provided on said surface-passivation insulating film, wherein said resistive material sheet contacts with said first main electrode which is kept in low-resistance contact with said one outermost semiconductor layer, and further wherein said resistive material sheet contacts said additional electrode which has a potential equal to said other outermost semiconductor layer.

4,691,224

PLANAR SEMICONDUCTOR DEVICE WITH DUAL CONDUCTIVITY INSULATING LAYERS OVER GUARD RINGS

Ikunori Takada, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,140, Oct. 18, 1983, abandoned.
This application Apr. 22, 1986, Ser. No. 856,434
Claims priority, application Japan, Oct. 25, 1982, 57-188555
Int. Cl.[4] H01L *29/40*
U.S. Cl. 357—53 10 Claims



1. A planar semiconductor device comprising:

a main p-n junction formed in a substrate of a first electrically conductive type;

channel stop of said first electrically conductive type formed in said substrate;

guard means disposed in a first region, which is disposed between said main p-n junction and said channel stop, and being at least partially covered with an insulation layer, said insulating layer extending over substantially the entirety of said first region, said guard means minimizing an electric potential difference that may exist between a side of said insulating layer confronting said substrate and a side of said insulating layer opposite to said side confronting said substrate throughout said first region;

said guard means including,

a guard ring consisting essentially of a guard ring region composed of a second electrically conductive type extending to the surface of said substrate so as to be in contact with said insulating layer,

said insulating layer having an opening above a portion of said guard ring, and

an electrode electrically connected to said guard ring through said opening and at least partially covering said insulating layer, said electrode being otherwise electrically isolated, said electrode being provided such that it does not extend outside the said guard ring region in a direction away from said main p-n junction

and wherein said insulating layer comprises two or more layers wherein the upper layer is more electrically conductive than the lower layer which has a surface disposed on said substrate.

4,691,225

SEMICONDUCTOR DEVICE AND A METHOD OF PRODUCING THE SAME

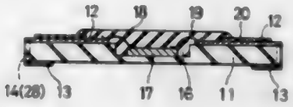
Gen Murakami, Machida, and Takeshi Gappa, Ohme, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,060

Claims priority, application Japan, Feb. 5, 1982, 57-16230; Feb. 5, 1982, 57-16231

Int. Cl.⁴ H01L 39/02

U.S. Cl. 357—80 **33 Claims**



1. A semiconductor device comprising:

a base having a front surface, rear surface and side surface, said side surface extending between the front surface and the rear surface, said side surface being nonplanar and having portions which are indented into the base, said front surface being formed in the shape of a square, and said base being made of a material selected from the group consisting of glass epoxy, glass phenol, tirazine, paper phenol, polyimide sand polyester;

a semiconductor element fastened on said front surface;

a plurality of inner leads formed on said front surface so as to surround said semiconductor element;

a plurality of outer leads formed on said rear surface;

a plurality of connective portions connecting said plurality of inner leads respectively to said plurality of outer leads, said plurality of connective portions being formed on the indented portions of said side surface of said base;

a plurality of electrical connection parts connecting between said semiconductor element and said plurality of inner leads; and

a resin sealing, at least, said semiconductor element and said plurality of electrical connection parts.

4,691,226

COLOR-TELEVISION RECEIVER WITH AT LEAST ONE INTEGRATED CIRCUIT FOR PROCESSING THE DIGITIZED COMPOSITE COLOR SIGNAL

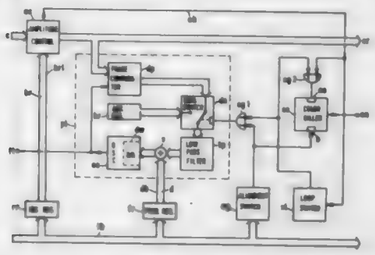
Laurin C. Freyberger, Endingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,345

Claims priority, application European Pat. Off., Nov. 2, 1984, 8 411 3205.3

Int. Cl.⁴ H04N 9/70

U.S. Cl. 358—26 **3 Claims**



1. A color television receiver having circuits for processing a composite color signal digitized under control of a clock signal, comprising:

first means for receiving a digital chrominance signal from color-television signals and including a burst signal having a burst amplitude and a chrominance subcarrier frequency;

a phase-locked loop including a frequency and phase controllable chrominance subcarrier oscillator;

said phase locked loop being locked in a phase-locked mode to the chrominance subcarrier frequency contained in the burst signal during reception of color-television signals, said oscillator oscillating at an integral multiple of said chrominance subcarrier frequency in the phase-locked mode, said oscillator generating said clock signal;

a color killer which generates a color kill signal which is used to inhibit color reproduction;

second means for opening or unlocking said phase locked loop from said phase-locked mode including first switch means connected in said phase-locked loop, an alignment switch having an output coupled to said first switch means and to a color inhibit input of said color killer, a loop switch having an input coupled to a burst amplitude control circuit and an output coupled to said first switch means and to a color enable input of said color killer;

third means for digitally adjusting the frequency of said oscillator coupled to said phase locked loop;

said first means including said burst amplitude control circuit providing a gain for regulating the burst amplitude to a burst reference value and for providing a control signal when said gain exceeds a predetermined gain;

said second means being responsive to said control signal to open said phase locked loop, causing said oscillator to oscillate at a predetermined alignment frequency, and cause said color killer to inhibit color reproduction by generating said color kill signal;

said burst amplitude control circuit being responsive to the burst signal having a predetermined amplitude relative to said burst reference value to cause said second means to close said phase locked loop enabling said phase-locked mode, causing said oscillator to switch back to the phase locked mode, and causing said color killer to enable color reproduction by terminating said color kill signal.

4,691,227

COLOR IMAGING APPARATUS HAVING A 1:2 FREQUENCY RATIO BETWEEN VIDEO AND REFERENCE SIGNALS FOR HIGH S/N COLOR DEMODULATION

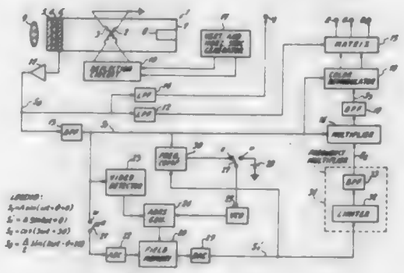
Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura, and Takashi Kuriyama, both of Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Oct. 3, 1985, Ser. No. 783,538

Claims priority, application Japan, Oct. 6, 1984, 59-210255; Dec. 3, 1984, 59-255280

Int. Cl.⁴ H04N 9/07

U.S. Cl. 358—47 **15 Claims**



1. Color image pickup apparatus wherein a color image is focused on a photoelectrical conversion target of a color image pickup tube through a color stripe filter and converted to an electrostatic image which is scanned in raster form by an electron beam under the control of a deflection system in response to horizontal and vertical sync pulses to generate a color-multiplexed video signal from said photoelectrical conversion target, said color stripe filter comprising a plurality of recurrent groups of different color stripes successively arranged at periodic intervals so that said video signal has a frequency inversely proportional to the intervals at which said recurrent groups are arranged, said video signal varying in phase in accordance with relative values of primary color components contained in the color image passing through the strips of each group and varying in amplitude in accordance with intensity of said primary color components, comprising:

a field memory;

reading and writing means for writing into the field memory, during a write-in mode, a reference signal having a duration of at least one field derived from said target when the target is uniformly illuminated by light of a predetermined color passing through said color stripe filter and repeatedly reading the field memory during a read-out mode to generate a constant-amplitude reference video signal having said reference phase;

frequency converting means for converting the frequency of said reference video signal so that said color-multiplexed video signal from said target and the frequency-converted reference video signal have a frequency ratio of 2:1 and an opposite phase relationship therebetween, and

demodulating means for demodulating said colormultiplexed video signal and said frequency-converted reference video signal and deriving a pair of color component signals.

4,691,228

IMAGE READER

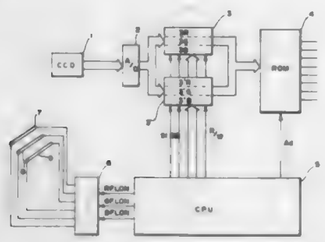
Fumikazu Nagano, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1985, Ser. No. 746,762

Claims priority, application Japan, Jun. 22, 1984, 59-129688; Aug. 22, 1984, 59-175352

Int. Cl.⁴ H04N 1/46

U.S. Cl. 358—75 **9 Claims**



1. A color image reader capable of reading a document in one scan of the document in one of three reading modes including a black and white mode, a color mode and a dropped color mode, comprising:

three fluorescent lamps for illuminating a document to be read with incident light, each lamp developing light having its own peak in a red, a green and a blue light zone respectively;

an optical system for obtaining a real image of the document therethrough from a reflection of the incident light by the document during a scan;

a single image sensor being arranged at the position where the real image is focused and producing a sensor signal,

mode selecting means for choosing one of said three reading modes; and

control means for driving the fluorescent lamps with a lighting signal in such a manner that the three fluorescent lamps are turned on and off sequentially and successively during one scan when the color mode is chosen and, the three fluorescent lamps are turned on at the same time during one scan when the black and white mode is chosen, and only two of the fluorescent lamps are lit, at the same time during one scan when the dropped color mode is chosen.

4,691,229

APPARATUS FOR CHECKING COLOR PICTURES ON A COLOR MONITOR

Armin Colditz, Kiel, and Siegfried Klopoch, Probsteierhagen, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

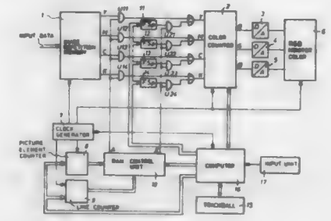
PCT No. PCT/DE84/00185, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01408, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 8, 1984, Ser. No. 734,265

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332791

Int. Cl.⁴ H04N 1/46; G03F 3/10

U.S. Cl. 358—76 **4 Claims**



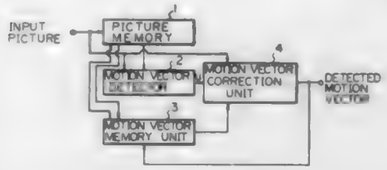
1. Apparatus for displaying a color picture on a color monitor, comprising, an image repetition memory (1) for generating a stationary image on a monitor (6) and containing the printing ink signals Y, M, C, K of the picture to be represented; a color converter (2) which is connected between the image repetition memory (1) and the monitor (6) in order to convert the four printing ink signals Y, M, C, K into three color signals R, G, B for the drive of the monitor (6); a clock generator (7) for generating read signals for the image repetition memory (1) and signals for the synchronization of the image repetition memory, color converter and monitor; color memories (11–14) into which freely selectable ink colors can be input as reference colors, whereby the color memories (11–14) and the outputs of the image repetition memory (1) are connected via gate circuits (U_{11}–U_{24}) to the input of the color converter (2); a coordinate acquisition device (15) for selecting coordinates on the monitor (6); a picture element counter (8) connected to the clock generator (7) by means of which the image signals within the individual lines are counted; a line counter (9) which is connected to the clock generator (7) and by means of which the lines of every individual image are counted; and comprising a control unit (10) which is connected to a computer (16) by means of which the control unit is loaded to the gate circuits (U_{11}–U_{24}), to the picture element counter (8), to the line counter (9) as well as, via the computer (16), to said coordinate acquisition (15) device for selecting coordinates on a monitor, to the color converter (2) and to an input unit (17), whereby the control unit (10) generates control signals for the gate circuit (U_{11}–U_{24}) from the respective coordinates of the device for coordinate acquisition and the two counters (8, 9), these control signals defined, by switching from the image repetition memory (1) to the color memories (11–14) or, respectively, vice versa, that the reference color input into the color memories (11–14) is switched to the color converter (2) by the gate circuit (U_{11}–U_{24}) instead of the output signals of the image repetition memory (1) in a region around the coordinate respectively called in by said coordinate acquisition device.

4,691,230

MOTION VECTOR DETECTION SYSTEM OF A MOVING OBJECT ON A SCREEN

Masahide Kaneko; Yoshinori Hatori, and Tsutomu Miyasato, all of Kanagawa, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 833,311
Claims priority, application Japan, Mar. 4, 1985, 60-41186
Int. Cl.⁴ H04N *7/18, 7/12*
U.S. Cl. 358—105 **5 Claims**



1. A motion vector detection system for detecting motion of a moving object on a screen comprising:

a picture memory means (1) connected to a picture input for receiving and storing at least a frame of an input picture signal;

a motion vector detector means (2) including a first input (100) connected to said picture input for receiving a current frame block of the input picture signal and a second input (105) connected to said picture memory means for receiving a stored preceding frame block of the picture signal, said inputs being in the form of signals representing blocks of m×n pixels, m and n being integers, said motion vector detector means including means for calculating block differences from said block input signals, and comparator means for outputting a first output of a minimum value of block differences and a second output of the block location that gives said minimum value;

a motion vector memory unit (3) connected to said picture memory means (1) and said motion vector detector means (2) to receive and store calculated motion vector outputs for at most one frame duration; and

a motion vector correction unit (4) connected to said picture input, said motion vector detector means (2) and said motion vector memory unit (3) for comparing inputs therefrom and correcting the motion vector of the current input block obtained from said motion vector detector means and providing an an output a corrected detected motion vector;

said comparison being made by calculating block differences of adjacent blocks using previous detected motion vectors stored in said motion vector memory unit (3) and the motion vector output of said motion vector detector means (2), and said corrected detected motion vector being selected from among a previous detected motion vector and the motion vector obtained by said motion vector detector means (2) according to predetermined conditions.

4,691,231

BOTTLE INSPECTION SYSTEM

Tyce Fitzmorris; Eric Espenhahn, both of Lake Park, and Jamie Pereira, North Palm Beach, all of Fla., assignors to Vistech Corporation, Lake Park, Fla.

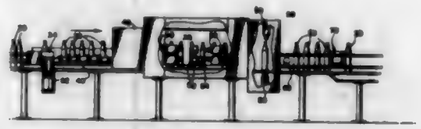
Filed Oct. 1, 1985, Ser. No. 782,432
Int. Cl.⁴ H04N *7/18;* **G01N** *9/04, 21/16;* **B07C** *5/00*
U.S. Cl. 358—106 **20 Claims**

1. An inspection system for hollow transparent and translucent bodies, comprising:

means for delivering the bodies to an inspection zone;

diffuse illumination means disposed on at least one side of the inspection zone;

a plurality of video cameras, each of the cameras being on an opposite side of the inspection zone from the diffuse illumination means, and oriented toward and focused on the inspection zone, the cameras being operable to provide a signal representing shades of light and dark of a matrix of pixels in a video field for each of the cameras, the cameras viewing the illumination means through two walls of the bodies, the fields for successive cameras representing sidewall elevation views angularly spaced around the bodies; and,



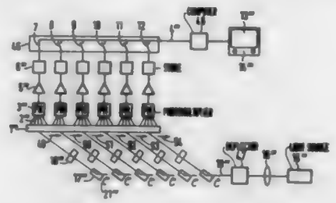
at least one digital processor having means for storing a digital representation of said shades of light and dark, the processor being adapted to count occurrences in at least three predetermined ranges of said shades in predetermined areas on the bodies and to determine the number of occurrences of shades in each of said ranges, and the processor being operable to select bodies meeting acceptable criteria based upon said number of occurrences and based upon a correlation of numbers of occurrences for the predetermined areas.

4,691,232

X-RAY IMAGE CONVERTER

Gottfried Lange, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,433
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236155
Int. Cl.⁴ H04N *5/32;* **G03G** *5/16*
U.S. Cl. 358—111 **4 Claims**



1. An x-ray image converter for generating an image from an x-ray phosphorescent screen, comprising:

a screen having a stimulable phosphor layer wherein an x-ray image is stored by exposure to x-ray radiation;

a plurality of scanning means for synchronously scanning a corresponding plurality of predetermined partial areas of said screen with lightwave radiation after exposure to x-ray radiation to produce visible image information from each of said partial areas;

a plurality of detector means, each detector means optically coupled to a respective one of said partial areas of said screen for receiving the image information from said screen and for converting said information into a video signal sequence;

storage means for storing therein information related to said video signal sequence; and

a display device for accessing said information stored in said storage device and processing said information to generate a visible picture,

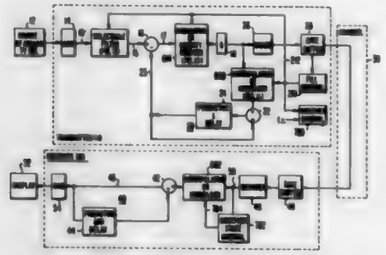
so that due to said plurality of detector means, said visible picture may be generated in high resolution.

4,691,233

RATE BUFFER CONTROL OF DIFFERENCE SIGNAL DECIMATION AND INTERPOLATION FOR ADAPTIVE DIFFERENTIAL PULSE CODE MODULATOR

Alfonso A. Acampora, Staten Island, N.Y., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1986, Ser. No. 913,692
Int. Cl.⁴ H04N *7/137, 7/12*
U.S. Cl. 358—136 **22 Claims**



1. A method for differential pulse code modulation of sampled frame sequential signals, comprising the steps of:

subtracting delayed predicted signals from the frame sequential signals to produce difference signals;

controllably decimating said difference signals to produce decimated difference signals;

interpolating said decimated difference signals to produce an interpolated sample for each decimated sample to form a stream of restored data rate difference signals including at least some interpolated signals;

adding said delayed predicted signals to said restored data rate difference signals to produce current predicted signals; and

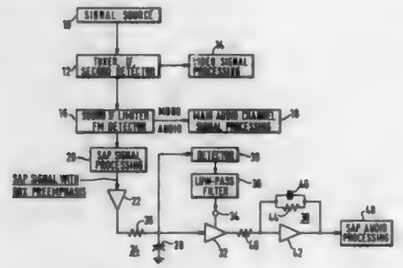
at least delaying said current predicted signals to produce said delayed predicted signals.

4,691,234

NOISE REDUCTION CIRCUIT FOR TELEVISION MULTI-CHANNEL SOUND

David L. Albean, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 761,216
Int. Cl.⁴ H04N *7/04*
U.S. Cl. 358—144 **5 Claims**



1. In a television receiver for receiving a selected channel wherein are provided a first audio program signal and a second audio program (SAP) signal containing a high frequency portion and a low frequency portion, said SAP signal being subjected to variable preemphasis for modifying the magnitude of said high frequency portion of said SAP signal without substantially affecting the magnitude of said low frequency portion of said SAP signal such that said high frequency portion is subject to large magnitude compression when the magnitude of said high frequency portion is large and said high frequency portion is subject to small magnitude compression when the magnitude of said high frequency portion is small, said receiver including a detector arrangement for providing first and second outputs corresponding respectively to said first and second audio program signal and including audio signal processing means coupled to said second output for processing said SAP signal which comprises:

first deemphasis network means having an input coupled to said second output for providing an intermediate audio signal representative of said SAP signal and exhibiting a first predetermined amount of deemphasis;

detector means coupled to receive said intermediate audio signal from said first deemphasis network for providing an output representative of the magnitude of said intermediate audio signal substantially throughout its entire frequency range;

controllable gain amplifier means having a gain control input coupled to said detector means and having a signal input coupled to said first deemphasis network; and

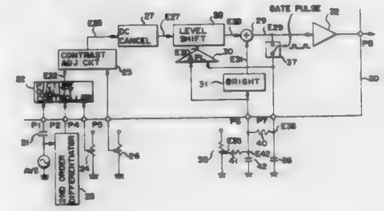
filter means for imparting a second predetermined amount of de-emphasis to the output of said amplifier.

4,691,235

DC RESTORATION CIRCUIT

Isamu Okui, Kumagaya, and Tetsurou Onda, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1985, Ser. No. 807,581
Claims priority, application Japan, Dec. 12, 1984, 59-262203
Int. Cl.⁴ H04N *5/18*
U.S. Cl. 358—172 **12 Claims**



1. A DC restoration circuit comprising:

gate circuit means, response to a first signal having a pedestal level specific potential portion and responsive to a gate signal, for detecting the specific potential portion of said first signal when said gate signal is applied thereto, and providing a second signal corresponding to the detected specific potential portion;

potential clamp means, coupled to said gate circuit means, for clamping the potential of said second signal to provide a clamped potential;

potential source means for providing a level adjusting potential;

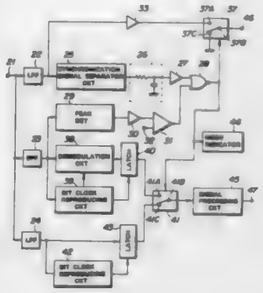
detector means, coupled to said potential clamp means and to said potential source means, for detecting a potential difference between said clamped potential and said level adjusting potential, and providing a third signal corresponding to said potential difference;

circuit means, coupled to said detector means and responsive to a first input signal corresponding to said first signal, for mixing said third signal with said input signal, and providing an output signal which contains a signal component corresponding to said specific potential portion, a DC level of this signal component being a function of said level adjusting potential; and

signal application means, coupled to said circuit means and to said potential source means, for applying to said circuit means a fourth signal corresponding to said level adjusting

potential, so that said output signal also has a component corresponding to said fourth signal.

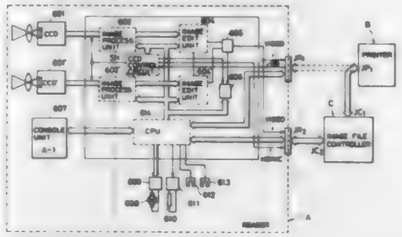
4,691,236
RECEIVER DEVICE IN A SATELLITE COMMUNICATION SYSTEM
Masayoshi Kanno, Tokyo; Yasuhiro Hideshima, Saitama; Shinobu Tsurumaru, and Ikuo Kanayama, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 30, 1985, Ser. No. 771,229
Claims priority, application Japan, Aug. 31, 1984, 59-182411; Aug. 31, 1984, 59-182414
Int. Cl.⁴ H04N *5/262, 5/44*
U.S. Cl. 358—181 **7 Claims**



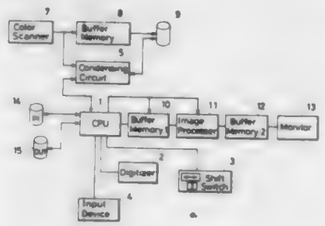
1. A receiver device in a satellite communication system for transmitting information through an artificial satellite in either of two transmission modes, in a first of which a video signal including synchronization signals and a subcarrier signal which is modulated by an audio and/or data signal are transmitted in the form of an FM modulated signal, and in a second of which an FM modulated audio and/or data signal is transmitted alone, the receiver device comprising:
- demodulation means for demodulating transmitted FM modulated signals;
- first means for deriving said audio and/or said data signal transmitted in said first mode;
- second means for deriving said audio and/or said data signal transmitted in said second mode;
- switching means, associated with said first and second means, for selectively deriving one of the output of said first and second means; and
- detector means for detecting said first mode, said detector means producing a detector signal for operating said switching means to derive the output from said first means when said first data transmission mode from said satellite is detected.

4,691,237
IMAGE DATA PROCESSING APPARATUS ADAPTABLE TO OUTPUT DEVICES OF DIFFERENT TYPES
Haruo Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 11, 1984, Ser. No. 629,898
Claims priority, application Japan, Jul. 18, 1983, 58-129443
Int. Cl.⁴ H04N *1/00, 1/36, 1/40, 1/04*
U.S. Cl. 358—256 **24 Claims**

1. An image data processing apparatus comprising:
- means for generating image data in syncronism with synchronization signals;
- means for outputting internal synchronization signals;
- means for transmitting the image data generated by said generating means to an external apparatus; and
- means for selecting either the internal synchronization signals from said outputting means or external synchronization signals from the external apparatus in accordance with the external apparatus to which the image data is to be transmitted, and for supplying the selected synchronization signals to said generating means.



4,691,238
METHOD AND APPARATUS OF STORING IMAGE DATA INTO A MEMORY IN A LAYOUT SCANNER SYSTEM
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Jul. 29, 1983, Ser. No. 517,963
Claims priority, application Japan, Oct. 21, 1982, 57-185067; Nov. 17, 1982, 57-202299
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—280 **13 Claims**



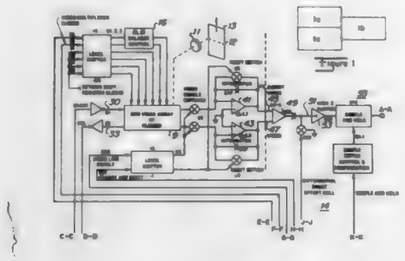
1. A method of storing image data into a memory in a layout scanner system operable for storing image data from plural original pictures and then for performing layout work on a monitor with images corresponding to the image data comprising the steps of:
- (a) storing into a memory image data obtained by directly scanning the original pictures;
- (b) condensing the image data by a predetermined ratio to obtain condensed image data;
- (c) storing the condensed image data into a condensed image memory for displaying on the monitor, and

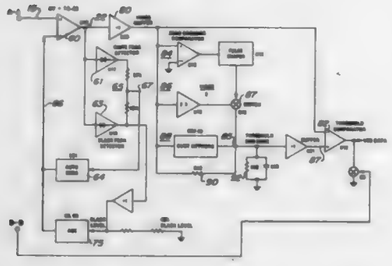
selecting the condensing ratio as a higher one of m/N or n/N provided that the number of pixels of an original pictures is m×n and the number of pixels of a monitor screen is N×N.

4,691,239
DYNAMIC VIDEO SYSTEM AND METHOD
Martin N. Nelson, 50 Willowview Ct., Danville, Calif. 94526, and J. Kirkwood H. Rough, 264 South 14th St., San Jose, Calif. 95112
Filed Dec. 23, 1982, Ser. No. 452,494
Int. Cl.⁴ H04N *1/040*
U.S. Cl. 358—282 **18 Claims**

1. Method of processing video signals representative of contrasting marks detected on a background document comprising the steps of:

detecting the extreme limits of amplitude of a plural number of video signals,
adjusting the extreme limits of amplitude of the video signals to amplitudes that are greater than and less than a first selected intermediate auto-zero reference level, and
dynamically detecting with a second dynamic reference level the adjusted video signals of amplitude greater in one

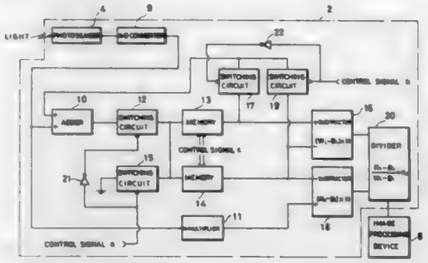




direction than said first selected intermediate auto-zero reference level but less than said video signals as representing detected contrasting marks, and dynamically detecting the adjusted video signals of amplitude greater in the opposite direction than said first selected intermedite auto-zero reference level but less than said video signals as representing detected background of the document.

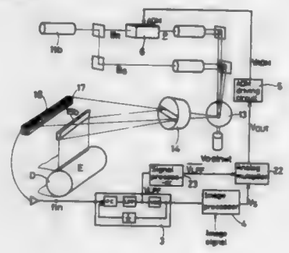
4,691,240
IMAGE INPUT DEVICE AND A METHOD OF CORRECTING INPUT SIGNALS OF THE SAME
Yasuo Kurusu, Kyoto, and Yoshiaki Morizumi, Shiga, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Mar. 20, 1986, Ser. No. 841,467
Claims priority, application Japan, Mar. 30, 1985, 60-67866
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—282 **12 Claims**

1. An image input device for correcting picture signals received in a time-series manner from an original to input said signals in an image processing device, said image input device comprising:
- memory means;
- a reference plane evenly finished in density;
- a photosensor formed by an array of a plurality of photoelectric conversion elements;
- a lens system for selectively converging the image of either said original or said reference plane on said photoelectric conversion elements of said photosensor;
- switching means for selectively switching the object of image formation of said lens system to either said original or said reference plane;
- reference data fetch means for performing main scanning of said reference plane at least once by said photosensor in a defocusing manner while switching the object of image formation of said lens system to said reference plane by said switching means to obtain reference data for correction;
- means for storing said reference data for correction in said memory means; and



- correction means for reading said picture signals from said original by said photosensor in a time-series manner while switching the object of image formation of said lens system by said switching means thereby to correct said picture signals through said reference data for correction stored in said memory means.

4,691,241
METHOD AND SYSTEM FOR COMPENSATING FOR A SHADING PHENOMENON
Kunio Tomohisa, Kyoto; Kiyoshi Maeda, Osaka, and Masamichi Cho, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan
Filed Nov. 15, 1984, Ser. No. 671,984
Claims priority, application Japan, Dec. 6, 1983, 58-231084; Dec. 6, 1983, 58-231083
Int. Cl.⁴ H04N *1/10*
U.S. Cl. 358—293 **12 Claims**



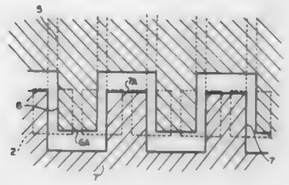
1. A method for campensating for a shading phenomenon comprising the steps of:
- (a) obtaining a shading compensation signal by processing an output signal of a low-pass filter employed in a phase lock loop circuit for outputting signals in synchronism with a scanning speed of an input scanning beam polarized by a beam polarizing means; and
- (b) multiplying the shading compensation signal obtained in the step (a) by an image signal obtained by scanning an original with an input scanning beam polarized by the beam polarizing means.

4,691,242

CONTACT TYPE IMAGE SENSOR HAVING MULTIPLE COMMON ELECTRODES TO PROVIDE INCREASED PIXEL DENSITY

Toshiaki Kato, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 16, 1986, Ser. No. 864,035
Claims priority, application Japan, May 16, 1985, 60-104374
Int. Cl.⁴ H01L *27/14, 31/08*
U.S. Cl. 358—294 **5 Claims**



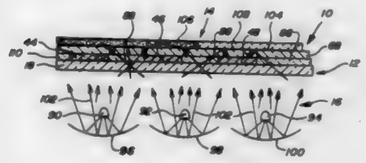
1. An image sensor comprising a layer of a photoelectric material having a pair of opposed major surfaces, a first set comprising a plurality of discrete electrodes spaced apart in a row on one of the pair of major surfaces of said layer, and a second set comprising at least two separate common electrodes on the other of said pair of major surfaces of the layer, each of said common electrodes having portions opposite a different limited portion of each of the discrete electrodes, one of the two sets of electrodes being transparent to pass incident radiation to the layer.

4,691,243

CONTACT-TYPE DOCUMENT SCANNER INCLUDING PROTECTIVE COATING

Vincent D. Cannella, Birmingham; Zvi Yaniv, Farmington Hills, and Robert R. Johnson, Franklin, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 607,153, May 4, 1984, Pat. No. 4,660,095. This application Sep. 29, 1986, Ser. No. 912,476
Int. Cl.⁴ H04N *1/024*
U.S. Cl. 358—294 **26 Claims**



1. Apparatus capable of providing electrical signals representative of an image on an image-bearing member, said apparatus including a photosensitive array of deposited semiconductor light sensitive elements, each of said elements being non-light transmissive, non-apertured, continuous and adapted to receive light from a corresponding small area portion of said image-bearing member and generate a detectable signal representative of the intensity of received light; the improvement comprising, in combination:

said array including at least one column of light sensitive elements operatively disposed so as to cover at least a portion of at least one dimension of said image-bearing member; and

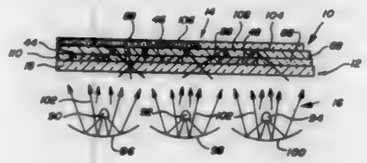
spacing means for closely positioning said light sensitive elements in juxtaposed relation relative to said image-bearing member so as to proximity focus light onto said light sensitive elements from corresponding small area portions of said member, said spacing means including a transparent cover layer overlying said light sensitive elements; said cover layer formed of a material selected from the group consisting essentially of a silicon-carbon alloy, a silicon-nitride alloy, a silicon-oxygen alloy or microcrystalline carbon.

4,691,244

CONTACT-TYPE DOCUMENT SCANNER INCLUDING STATIC SHIELD

Vincent D. Cannella, Birmingham; Zvi Yaniv, Farmington Hills, and Robert R. Johnson, Franklin, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 607,153, May 4, 1984, Pat. No. 4,660,095. This application Sep. 29, 1986, Ser. No. 912,477
Int. Cl.⁴ H04N *1/024*
U.S. Cl. 358—294 **27 Claims**



1. Apparatus capable of providing electrical signals representative of an image on an image-bearing member, said apparatus including a photosensitive array of deposited semiconductor light sensitive elements, each of said elements being non-light transmissive, non-apertured, continuous and adapted to receive light from a corresponding small area portion of said image-bearing member and generate a detectable signal representative of the intensity of received light; the improvement comprising, in combination:

said array including at least one column of light sensitive elements operatively disposed so as to cover at least a portion of at least one dimension of said image-bearing member;

spacing means for closely positioning said light sensitive elements in juxtaposed relation relative to said image-bearing member so as to proximity focus light onto said light sensitive elements from corresponding small area portions of said member; and static shielding means operatively disposed between said spacing means and said light sensitive elements for preventing the build-up of a large static charge from damaging said elements.

4,691,245

METHOD AND APPARATUS FOR COMBINING TWO COLOR VIDEO SIGNALS

William K. Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,270
Int. Cl.⁴ H04N *9/80, 11/06, 5/782*
U.S. Cl. 358—310 **12 Claims**

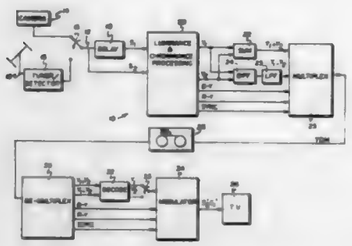
1. A method of color video signal processing comprising:

simultaneously providing first and second video signals which are adjacent in a frame, each of which has unmodulated luminance and chrominance components and has a predetermined time period;

producing a sum luminance signal which is a function of the sum of said luminance components of said first and second signals;

producing a difference luminance signal which is a function of the difference of said luminance components of said first and second signals, the bandwidth of said sum signal being equal to the full bandwidth of said luminance components and being greater than the bandwidth of said difference signal;

producing a chrominance signal which is a function of the chrominance components of said first and second signals; and



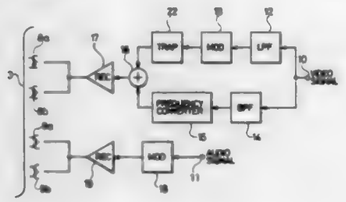
selectively compressing said sum and difference luminance and said produced chrominance signal and arranging said compressed signals in a time sequential manner to form a time division multiplex (TDM) signal having a single predetermined time period.

4,691,246

APPARATUS FOR MULTIPLEX RECORDING AND REPRODUCTION OF AUDIO AND VIDEO SIGNALS

Kuniaki Miura, Naka; Yoshinori Okada, Katsuta; Isao Fukushima, Katsuta, and Susumu Otsuka, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1984, Ser. No. 677,243
Claims priority, application Japan, Dec. 2, 1983, 58-226878
Int. Cl.⁴ H04N *5/782*
U.S. Cl. 358—310 **4 Claims**



1. A recording apparatus suitable for a magnetic recording-/reproduction apparatus for recording and audio signal and a video signal as superimposed signals on the same recording track, said recording apparatus comprising:

means for recording the audio signal in the form of a frequency-modulated signal on a recording tape by means of a first recording head; and

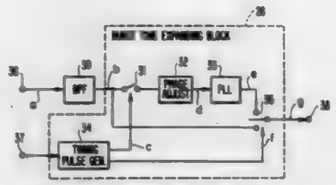
means for recording video signal information by means of a second recording head on the recording track formed by said first recording head, said video signal information consisting of a frequency-modulated luminance signal and a carrier color signal frequency-converted to a frequency band lower than the frequency band of said frequency-modulated luminance signal, including means for causing the frequency characteristics of the recording current of said frequency-modulated luminance signal to be substantially constant between the carrier frequency corresponding to the sync leading edge portion and the carrier frequency corresponding to the white peak in said frequency-modulated luminance signal.

4,691,247

VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

Masahiro Honjo, Neyagawa, and Akio Hashima, Tsuzuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 9, 1984, Ser. No. 669,939
Claims priority, application Japan, Nov. 11, 1983, 58-212736; Nov. 14, 1983, 58-214328; Mar. 28, 1984, 59-61458
Int. Cl.⁴ H04N *9/79*
U.S. Cl. 358—319 **16 Claims**



1. In a video signal recording/reproducing apparatus comprising means for separating an input video signal into a luminance signal and a chrominance signal including a color burst signal, a recording luminance signal processing means for frequency-modulating said luminance signal to obtain a frequency-modulating luminance signal, a recording chrominance signal processing means for converting a frequency band of said chrominance signal to a low frequency band to obtain a low-frequency converted chrominance signal including a low-frequency converted color burst signal, a means for mixing said frequency-converted luminance signal and said low-frequency converted chrominance signal to obtain a recordable video signal, a means for recording said recordable video signal on a recording medium and reproducing said recordable video signal from said recording medium to obtain a reproduced recordable video signal, a means for separating said reproduced recordable video signal into a reproduced frequency-modulated luminance signal and a reproduced low-frequency converted chrominance signal including a reproduced low-frequency converted color burst signal, a reproduced luminance signal processing means for frequency-demodulating said reproduced frequency-modulated luminance signal to obtain a reproduced luminance signal, a reproduced chrominance signal processing means for converting said low frequency band of said reproduced low-frequency converted chrominance signal to said frequency band of said chrominance signal to obtain a reproduced chrominance signal including a reproduced color burst signal, and a means for mixing said reproduced luminance signal and said reproduced chrominance signal to obtain a reproduced video signal,

the improvement comprising a color burst expanding means provided in said recording chrominance signal processing means for expanding an original duration of said color burst signal or said low-frequency converted color burst signal to a specific expanded duration.

4,691,248

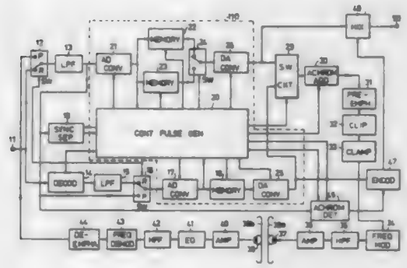
SYNCHRONIZED SIGNAL SEPARATING CIRCUIT FOR A RECORDING AND REPRODUCING APPARATUS

Naomichi Nishimoto, Tachikawa, Japan, assignor to Victor Company of Japan, Japan

Division of Ser. No. 628,500, Jul. 6, 1984, Pat. No. 4,616,270. This application May 21, 1986, Ser. No. 865,464
Claims priority, application Japan, Jul. 14, 1983, 58-128222; Jul. 14, 1983, 58-128223
Int. Cl.⁴ H04N *5/08, 5/93*
U.S. Cl. 358—320 **3 Claims**

1. A synchronizing signal separating circuit for a color video signal recording and reproducing apparatus which records a time-division-multiplexed signal on a recording medium, said

time-division-multiplexed signal having a time base compressed luminance signal and one of two kinds of time base compressed color difference signals time-division-multiplexed within one horizontal scanning period and having the two kinds of time base compressed color difference signals time-division-multiplexed in line-aequence with the time base compressed luminance signal, said time base compressed luminance signal and said time base compressed color difference signal being subjected to a time base compression responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit, said recording and reproducing apparatus reproducing said time-division-multiplexed signal from the recording medium, said reproduced time-division-multiplexed signal being subject to a time base expansion responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit so as to obtain a reproduced luminance signal and a reproduced line-sequential color difference signal which are returned to an original time base, said time-division-multiplexed signal having an achromatic level signal time-division-multiplexed between said time base compressed luminance signal and one of said time base compressed color difference signals, said achromatic level signal having a level which is approximately in a center of a level range from a pedestal level to a white peak level of said time base compressed luminance signal, having a transmission



period which alternately changes for every one horizontal scanning period and havng a period of two horizontal scanning periods, said synchronizing signal separating circuit comprising:

an input terminal for receiving a composite color video signal to be recorded at the time of a recording, and for receiving said time-division-multiplexed signal at the time of a reproduction;

a horizontal synchronizing signal separating circuit for generating a signal by slicing a horizontal synchronizing signal within said time-division-multiplexed signal received through said input terminal at approximately one-half a peak value of the horizontal synchronizing signal;

pulse generating means for delaying the output signal of said horizontal synchronizing signal separating circuit and for generating a first pulse which exists at a such time position that a leading edge of said achromatic level signal exists within the width of said first pulse; and

detecting means supplied with said first pulse from said pulse generating means and the output signal of said horizontal synchronizing signal separating circuit for generating a second pulse in phase with a leading edge of said achromatic level signal, said second pulse being produced at the time of the reproduction as a separated horizontal synchronizing signal.

4,691,249

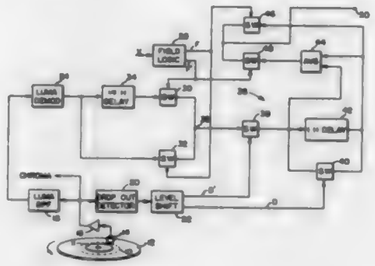
DROPOUT COMPENSATOR AND LUMINANCE AVERAGER WITH "SHARED" DELAY

John J. Acello, E. Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,733

Int. Cl.⁴ H04N *5/76*

U.S. Cl. 358—336 **5 Claims**



1. A video circuit that compensates for signal dropouts in a video signal representative of a video field and generates an interpolated video signal from adjacent lines of the video field, said circuit comprising:

a one-line delay element having input and output terminals;

an input switch through which the video signal is provided to the input terminal of said delay element;

means for opening said input switch and recirculating the delayed video field signal to said input terminal of said delay element when a signal dropout occurs;

means for generating an interpolated line signal from the video field signals at said input and output terminals of said delay element; and

means for generating a video frame signal from the delayed video field signal at the output of said delay element and the interpolated signal from said interpolating means.

4,691,250

MAGNETIC VIDEO REPRODUCER WITH REVERSELY RECORDED CUE TRACK

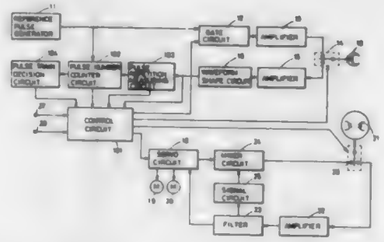
Katsuhiro Ookawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,981

Claims priority, application Japan, Nov. 26, 1983, 58-222681

Int. Cl.⁴ H04N *5/782;* **G11B** *27/08, 27/32*

U.S. Cl. 360—14.1 **13 Claims**



1. A magnetic video reproducer comprising:

a video head for recording video signals on video tracks of a magnetic tape as well as picking up recorded video signals;

video signal recording means for recording video signals and a plurality of pilot signals on said magnetic tape through said video head in a recording mode;

a cue head for recording a cue signal on a cue track provided on said magnetic tape separately from said video tracks as well as for picking up the recorded cue signal;

first tape travel control means for controlling travelling of said magnetic tape based on said pilot signals picked up from said magnetic tape by said video head in a reproducing mode;

second tape travel control means for controlling travelling of said magnetic tape by stopping recording of said video signals and said pilot signals so as to transfer said magnetic tape in a reversed direction from the position of stoppage of said magnetic tape in a stop mode including a pause mode;

cue signal recording control means for recording said cue signal in the form of a pulse train comprising a predetermined number of pulses on said cue track of said magnetic tape by said cue head in response to reverse travelling of said magnetic tape controlled by said second tape travel control means; and

program search control means for transferring said magnetic tape in the forward direction upon releasing of said stop mode, making said cue head pick up said pulse train recorded on said cue track in response to a determination of matching of said pilot signals, and re-starting a recording operation when the number of said reproduced pulses is correlated with the number of said pulses recorded on said cue track during said reverse transfer of said magnetic tape.

4,691,251

MAGNETIC RECORDING AND REPRODUCING APPARATUS IN WHICH RECORDING IS RESTARTED RESPONSIVE TO RECORDED CUE SIGNALS

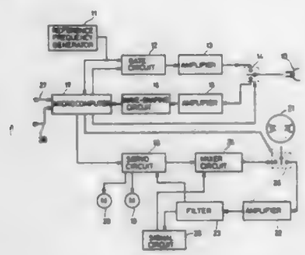
Katsuhiro Ookawa; Toshifumi Fujii, and Yoshihiro Nishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,421

Claims priority, application Japan, Nov. 4, 1983, 58-207748

Int. Cl.⁴ G11B *27/32, 27/08;* **H04N** *5/782*

U.S. Cl. 360—14.1 **10 Claims**



1. A magnetic recording and reproducing apparatus capable of recording and reproducing a video signal in and from a recording medium (7), said apparatus employing

a rotating head system (21) in which a video head is mounted on the circumference of a rotating drum, and

a helical scanning system (21, FIG. 1) in which said recording medium is adapted to travel slantingly with respect to the direction of rotation of said video head, whereby a plurality of recorded video signal tracks are formed on said recording medium arranged in the direction of travel side by side and slantingly with respect to the direction of travel,

said magnetic recording and reproducing apparatus comprising:

operation mode selecting means (17) for selecting operations of said magnetic recording and reproducing apparatus, said operations including a recording operation of said video signal, a reproducing operation of said video signal, a temporary stop of said recording operation of said video signal, and a cancellation of said temporary stop,

recording medium driving means (19, 20) responsive to a drive control signal for driving said recording medium for forward directional movement thereof, for reverse directional movement thereof, or for stoppage thereof,

forward directional movement driving signal providing means (17, 18) responsive to selection of said recording operation or said reproducing operation of said video signal for providing, as said drive control signal, a forward directional movement driving signal to said recording medium driving means for forward directional movement of said recording medium,

temporary stop signal providing means (17, 18) responsive to selection of said temporary stop of said recording operation for providing, as said drive control signal, a temporary stop signal to said recording medium driving means for bringing said recording medium in forward directional movement of said recording medium to a stop,

reverse directional movement driving signal providing means (17, 18) responsive to said stop of said recording medium for providing, as said drive control signal, a reverse directional movement driving signal to said recording medium driving means for driving said recording medium for reverse directional movement thereof by a predetermined amount,

recording operation disabling means (17, 26) associated with said reverse directional movement driving signal providing means for disabling said recording operation of said video signal for a period of said reverse directional movement of said recording medium,

a cue head (10) provided associated with said recording medium for recording and reproducing a cue signal in and from a cue track formed on said recording medium separate from said video signal tracks,

cue signal providing means (11, 12, 13) associated with said reverse directional movement driving signal providing means for providing a cue signal to said cue head during said reverse directional movement of said recording medium,

forward directional movement restarting signal providing means (17) responsive to said cancellation of said temporary stop for providing, as said drive control signal, a forward directional movement restarting signal to said recording medium driving means for regaining said forward directional movement of said recording medium,

cue signal recording/reproducing control means (17, 14) responsive to said temporary stop of said recording operation for performing a recording operation of said cue signal by said cue head at said cue track for a period of said reverse directional movement of said recording medium and responsive to said cancellation of said temporary stop for performing a reproducing operation of said cue signal by said cue head from said cue track for a certain period of said restarted forward directional movement of said recording medium, and

video signal recording restart control means (17, 26) responsive to reproduction of said cue signal during a period of said restarted forward directional movement of said recording medium for restarting said recording operation of said video signal.

4,691,252

ROTARY MAGNETIC RECORDING-REPRODUCING APPARATUS

Kazuo Okada, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 782,002

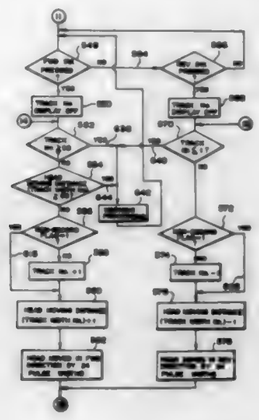
Claims priority, application Japan, Oct. 20, 1984, 59-206706

Int. Cl.⁴ G11B *21/02, 21/08*

U.S. Cl. 360—75 **6 Claims**

1. A rotary magnetic recording-reproducing apparatus comprising: a magnetic head for reading signals from a plurality of

tracks each of said tracks formed into a locus in which relative positions of a leading end and a tail end of a recording coincide with each other on a rotary magnetic recording medium; head moving means for transferring said magnetic head onto a selected one of the tracks; and control means for controlling said



head moving means so that the magnetic head is located on the selected track; and

address setting means wherein absolute addresses and relative addresses are simultaneously used to make the addressing from the first track to the final track.

4,691,253

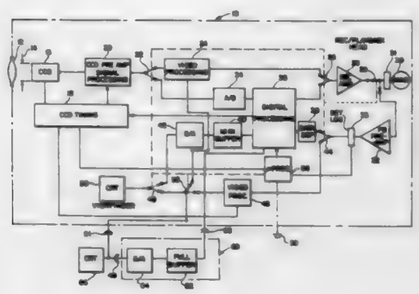
ELECTRONIC IMAGING CAMERA FOR RECORDING EITHER MOVING OR STILL IMAGES

Bruce R. Silver, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1985, Ser. No. 733,046

Int. Cl.[4] H04N *5/78, 5/76*; H04J *5/782*

U.S. Cl. 360—33.1 **9 Claims**



1. An electronic camera apparatus comprising:

photoresponsive means for continuously sensing image defining scene light and providing a continuous electronic information signal in response to the sensed scene light corresponding to the images defined by the scene light;

means for storing electronic signals;

means responsive to said continuous electronic information signal for processing said continuous electronic information signal and thereafter directing said processed continuous electronic information signal to said storage means for storage therein;

an electronic viewfinder;

means for providing from said processed continuous electronic information signal, a first electronic signal to said electronic viewfinder for displaying images on said electronic viewfinder thereby enabling the camera user to frame and compose the scene to be recorded as a continuous moving picture;

means for selectively interrupting said photoresponsive means from continuously sensing said image defining scene light so as to provide a still electronic information signal corresponding to the still image defined by said scene light and displayed on said electronic viewfinder to the camera user at the instant immediately prior to said selective interruption;

means responsive to said still electronic information signal for processing said still electronic information signal and thereafter directing said processed still electronic information signal to said storage means for storage therein; and

selectively responsive means for providing: from said processed and stored continuous electronic information signals a second electronic signal to said electronic viewfinder for displaying continuous images on said electronic viewfinder corresponding to the moving images previously stored or from said processed and stored still electronic information signal a third electronic signal to said electronic viewfinder for displaying a still image on said electronic viewfinder corresponding to the still image defined by said scene light at the instant immediately prior to said selected interruption.

4,691,254

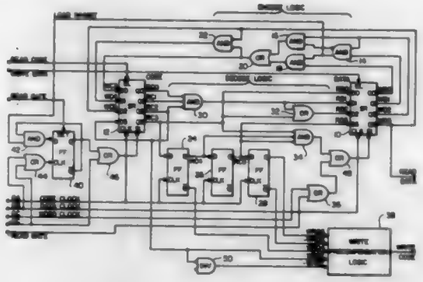
DATA PROCESSING SYSTEM INCLUDING ENCODER, DECODER AND WRITE PRECOMPENSATOR, USING RUN LENGTH LIMITED CODE

Robert L. Cloke, Santa Clara, Calif., assignor to Prism Corporation, San Jose, Calif.

Filed Jun. 24, 1985, Ser. No. 748,157

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—45 **10 Claims**



1. A circuit for processing data signals comprising:

a data shift register for receiving write data bits during a write mode;

a logic network for encoding said data bits in a run length limited code;

a code shift register coupled to said encoding logic network for loading and shifting coded write data bits;

a write precompensation logic circuit coupled to the output of said code shift register for selectively advancing and delaying said coded data bits; and

a source of timing signals for synchronizing said code shift register and said data shift register so that only valid data bits are passed to said write precompensation logic circuit.

4,691,255

POWER SAVING CIRCUIT ARRANGEMENT FOR DATA TRANSFER APPARATUS WITH A DISKLIKE RECORD MEDIUM

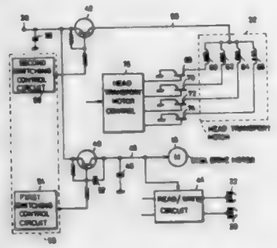
Yoshiaki Sakai, Higashikurume, and Hiroshi Tsuyuguchi, Tokyo, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,084

Claims priority, application Japan, Feb. 8, 1984, 59-21301

Int. Cl.[4] G11B *19/02*

U.S. Cl. 360—69 **5 Claims**



1. A data transfer apparatus for use with a diaklike record medium such as a flexible magnetic disk having data storage tracks, comprising:

(a) a disk drive motor for imparting rotation to the record medium;

(b) a transducer head for data transfer with the record medium;

(c) a head transport motor for transporting the transducer head in a predetermined direction relative to the record medium so as to enable the transducer head to access the data storage tracks on the record medium;

(d) direct current power supply means;

(e) a first switching transistor connected between the power supply means and the disk drive motor for the on off control of power delivery from the former to the latter;

(f) a second switching transistor connected between the power supply means and the head transport motor for the on off control of power delivery from the former to the latter;

(g) a first switching control circuit for controlling the switching operation of the first switching transistor;

(h) a second switching control circuit for controlling the switching operation of the second switching transistor;

(i) a voltage regulating capacitor connected between ground and a line connecting the first switching transistor to the disk drive motor, the voltage regulating capacitor having a capacitance greater than the capacitance between ground and a line connecting the second switching transistor to the head transport motor; and

(j) a conduction retarder connected to the first switching transistor for causing a gradual conduction therethrough in response to an output from the first switching control circuit.

4,691,256

INFORMATION REPRODUCING APPARATUS

Susumu Kozuki, Tokyo; Hiroyuki Takimoto, Kanagawa; Hiroo Edakubo, Tokyo, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 563,663, Dec. 20, 1983, Pat. No. 4,594,618.

This application Apr. 28, 1986, Ser. No. 856,708

Claims priority, application Japan, Dec. 24, 1982, 57-230445; Feb. 2, 1983, 58-15581

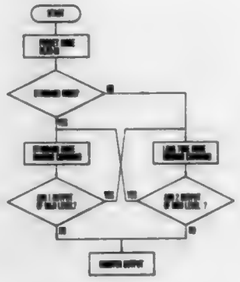
Int. Cl.[4] G11B *15/52*

U.S. Cl. 360—73 **11 Claims**

1. A reproducing apparatus for reproducing information signals from recording tracks formed on a tape-shaped recording medium, comprising:

(a) transporting means for selectively transporting said tape-shaped recording medium at one of at least two different running speeds for the purpose of reproducing said information signals;

(b) reproducing means for reproducing said information signals recorded on said recording tracks of said tape-shaped recording medium as it is transported by said transporting means, said reproducing means having at least one rotating head;



(c) first information forming means for forming a first information indicating a distance and a direction of the position of said rotating head relative to said recording tracks by using output signals of said rotating head;

(d) second information forming means for forming a second information indicating a varying period of said first information; and

(e) discriminating means for discriminating whether or not the running speed of said transporting means is coincident with the recording speed of said information signals based on the varying period indicated by said second information.

4,691,257

DUST PROTECTION APPARATUS FOR A MAGNETIC DISC DRIVE

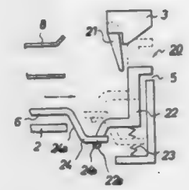
Katsuhiko Taguchi, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Japan

Filed Aug. 19, 1985, Ser. No. 767,081

Claims priority, application Japan, Aug. 28, 1984, 59-130022[U]

Int. Cl.[4] G11B *5/012, 5/016*

U.S. Cl. 360—97 **20 Claims**



1. In a disc drive, a system for preventing the introduction of dust into the interior of said disc drive, comprising:

a disc drive body;

means defining an inlet aperture within a sidewall of said disc drive body through which a disc may be inserted and ejected;

a first cover for covering and uncovering said inlet aperture means of said disc drive body;

means movably mounting said first cover upon said disc drive body between a first position at which said first cover covers said inlet aperture means in the absence of said disc being disposed within said disc drive body, and a second position at which said first cover uncovers said inlet aperture means of said disc drive body when said disc is fully inserted within said disc drive body;

a second cover for covering and uncovering said inlet aperture means of said disc drive body; and

means movably mounting said second cover upon said disc drive body between a first position at which said second cover uncovers said inlet aperture means of said disc drive body in the absence of said disc being disposed within said disc body and when said first cover covers said inlet aperture means of said disc drive body, and a second position at which said second cover covers said inlet aperture means of said disc drive body when said disc is fully inserted within said disc drive body and when said first cover uncovers said inlet aperture means of said disc drive body.

4,691,258

TEMPERATURE COMPENSATING MECHANISM FOR POSITIONING OF A MAGNETIC HEAD OF A MAGNETIC DISK DRIVE

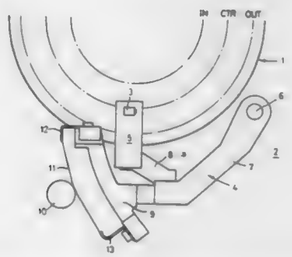
Masashi Kobayashi; Keishi Takahashi, both of Fujisawa, and Kimiya Yoneyama, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1985, Ser. No. 709,942

Claims priority, application Japan, Mar. 30, 1984, 59-61307

Int. Cl.⁴ G11B *5/02, 5/012, 5/54, 21/02*

U.S. Cl. 360—97 **3 Claims**



1. A temperature compensating mechanism for positioning a magnetic head of a magnetic disk drive that comprises a movable member supporting said magnetic head, a pulley for driving said movable member, a connecting structure including a band connecting said pulley and two spaced points on said movable member and a pair of springs positioned respectively between each end of said band and each of said two spaced points on said movable member exerting a tensile force on said band, wherein said temperature compensating mechanism is characterized in that the spring coefficient of one half of said connecting structure for connecting the pulley with either one of said two points on the movable member and including one of said pair of springs and the spring coefficient of the other half of the connecting structure including the other of said pair of springs for connecting the pulley with the other of said two spaced points on the movable member are chosen by choosing the respective spring coefficients of said pair of springs so that displacement between the magnetic head and a record track on a magnetic disk caused by temperature change is compensated by the force generated by the connecting structure resulting from the change in length between the two points on the movable member and the connecting structure caused by said temperature change.

4,691,259

MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

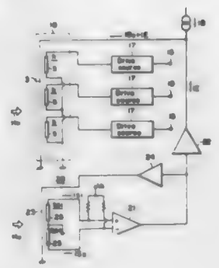
Shigeyoshi Imakoshi; Munekatsu Fukuyama; Hideo Suyama, and Yutaka Souda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,937

Claims priority, application Japan, Aug. 27, 1984, 59-177847; Oct. 5, 1984, 59-209303

Int. Cl.⁴ G11B *5/127, 5/02*

U.S. Cl. 360—113 **17 Claims**



1. A magnetoresistance effect type magnetic head apparatus, comprising:

a magnetic head element including a sensing element having a magnetoresistance effect and a bias conductor means for applying a bias magnetic field to said sensing element for reproducing a recording signal on a magnetic recording medium adjacent the magnetic head element;

detecting means for detecting an external magnetic field which effects said magnetic head element;

bias means for introducing a current through said bias conductor means; and

means connecting an output of the detecting means to said bias means so as to control the current in said bias conductor means and thus control the bias magnetic field.

4,691,260

TUNNEL ERASE MAGNETIC HEAD ASSEMBLY

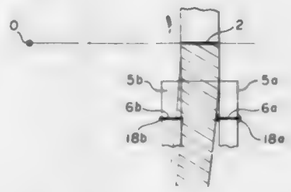
Shuroku Hosaka, Kamakura, and Masaaki Shiga, Fujisawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,318

Claims priority, application Japan, Sep. 16, 1983, 58-170838

Int. Cl.⁴ G11B *5/265, 5/024*

U.S. Cl. 360—121 **6 Claims**



1. A magnetic head assembly for use with a magnetic disk having curved data tracks, comprising a recording-reproducing head, having a recording-reproducing gap arranged along a radius of said disk and selectively aligned with one of said data tracks and having two sides perpendicular to said radius, and two erasing heads arranged along said two sides of said recording-reproducing head on opposite sides of said one of said data tracks, each erasing head having an erasing gap, said erasing gaps having a width parallel to the radius of said record at said recording-reproducing gap, a length extending across said erasing gap perpendicular to said width, and a depth perpendicular to said disk, each erasing gap producing a magnetic field to erase part of said data track, the improvement comprising:

means for making the magnetic field strength of the erasing gap of one of said erasing heads different from the magnetic field strength of the erasing gap of the other of said erasing heads, so that a wider erase path is provided on the radially outward side of the data track, to compensate for the larger off-set distance from the erase head to the data track on the radially outward side due to the curvature of said data path, thus causing a complete erasure on each side.

4,691,261

CHANNEL CHANGING MECHANISM IN A TAPE PLAYER

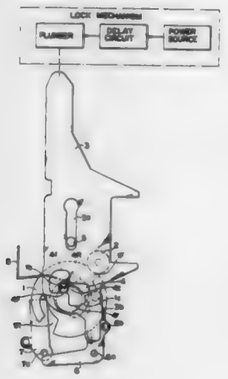
Isao Hasegawa; Kikuo Yoshikawa; Satoshi Takagi, all of Tokyo, and Akira Takahashi, Nagoya, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,509

Claims priority, application Japan, Dec. 2, 1983, 58-227029; Dec. 13, 1983, 58-233637

Int. Cl.⁴ G11B *15/02, 15/24*

U.S. Cl. 360—137 **2 Claims**



1. A channel changing mechanism in a tape player comprising:

a pinch roller change plate for alternatively bringing a pair of pinch rollers to and away from a pair of capstan shafts;

a power plate operatively linked to said pinch roller change plate to take its forward-mode, reverse-mode and neutral positions;

means for locking said power plate at said forward-mode or reverse-mode position when the source power is supplied to the tape player;

a gear mounted on said power plate and driven by a motor of the tape player;

a power gear mounted on said power plate and having two chipped portions along the geared circumference thereof so as to be intermittently engaged and rotated by said gear;

first engagement means formed in said power plate to engage said power plate with said power gear for establishing reciprocation of said power plate;

resilient means biasing said power gear in its rotatable direction;

a lock link for locking said power gear at an angular position whereat one of said chipped portions is opposed to said motor-driven gear;

said frist engagement means having a release portion to decouple said power plate from said power gear when the power supply is cut off, said power plate having formed a pushing portion for pushing said lock link in a direction to unlock said power gear when said power plate takes its neutral position; and

said lock means being configured to delay its action to lock said power plate by a time corresponding to about a half revolution of said power gear after a power-in to the tape player.

4,691,262

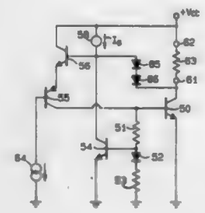
CIRCUIT FOR PROTECTING A POWER TRANSISTOR AGAINST A SHORT-CIRCUITED LOAD

Edward Chalfin, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 3, 1985, Ser. No. 719,618

Int. Cl.⁴ H02H *9/02*

U.S. Cl. 361—56 **2 Claims**



1. A circuit comprising:

(a) a bipolar output transistor of one polarity type;

(b) a terminal connected to the collector of said output transistor to which an electrical load may be attached;

(c) a first protective bipolar transistor of said one polarity type;

(d) a DC-bias current source connected to the base of said first transistor for biasing-on said first transistor;

(e) a voltage divider comprised of a diode and one and another resistors connected in series, said voltage divider being connected directly across the base-emitter junction of said output transistor, said diode being connected in the polarity such that a forward current in said diode tends to forward bias said output transistor; and

(f) a second protective transistor of said one polarity type having a base-emitter junction connected across the portion of said voltage divider which is composed of said diode and said another resistor in the direction whereby a forward current through said diode would tend to forward bias said base-emitter junction of said second transistor, and having a collector connected to the base of said first protective transistor; and

(g) a third protective transistor of the opposite polarity type having an emitter connected to the emitter of said first protective transistor and a collector connected to said base of said output transistor so that a signal to be amplified by said output transistor may be applied to the base of said third transistor.

4,691,263

LOW LEAKAGE, SOLID STATE A-C POWER CONTACT

Thomas J. Kenny, and James F. Sutherland, both of Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,710

Int. Cl.⁴ H02H *3/08*

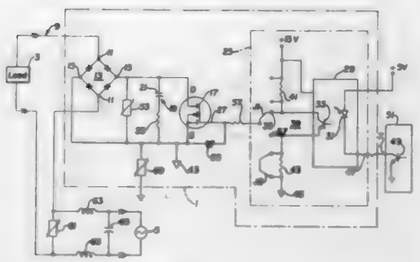
U.S. Cl. 361—58 **6 Claims**

1. A low off current solid state power contact used in switching an a-c power source supplying an a-c load in an a-c

circuit in response to a digital logic signal referenced to earth ground, said power contact comprising:

a rectifier bridge circuit having a pair of a-c terminals connected in series with the a-c source and the load, and a pair of d-c terminals,

a MOSFET having its source and drain terminals connected at the d-c terminals of said rectifier bridge circuit with the digital logic signal connected to its gate electrode, and



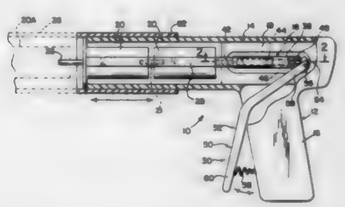
a series, resistor capacitor filter circuit connected in parallel with said MOSFET directly across the d-c terminals of said rectifier bridge circuit, said capacitor and resistor values being selected such that, with the MOSFET turned off, the current in the a-c circuit is less than that required to maintain energization of the load.

4,691,264

STATIC AMPLIFICATION STUN GUN

Brian E. Schaffhauser, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Sep. 23, 1985, Ser. No. 778,983
Int. Cl.⁴ F41B *15/04*
U.S. Cl. 361—232 **5 Claims**



1. A static amplification stun gun comprising in combination:

(a) a non-conductive pistol shaped housing having a hollow barrel and an insulated hand grip;

(b) a piezoelectric crystal unit positional within said barrel;

(c) at least one capacitor postioned within said barrel and operatively connected to said piezoelectric crystal unit;

(d) a probe positioned on an end of said barrel and operatively connected to said capacitor and said piezoelectric crystal unit; and

(e) a trigger means in said hand grip for activating said piezoelectric crystal unit producing a static charge which is then stored in said at least one capacitor until a grounded target, such as an unruly person, can receive said static charge through the air from said probe, wherein said piezoelectric crystal unit comprises:

(f) an insulated cylinder;

(g) a piezoelectric crystal fixed within said container;

(h) two contact members operatively connected to said piezoelectric crystal; and

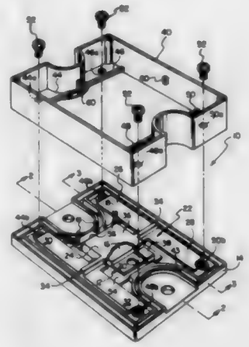
(i) a piston having an arm, said piston slidable within said cylinder to make contact and compress said piezoelectric crystal with said arm extending outwardly from an end of said cylinder.

4,691,265

SEMICONDUCTOR MOUNTING ASSEMBLY

John G. Calver, Rochester; Phillip W. Pearce, Pavilion, and Erich Zielinski, Bergen, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 10, 1986, Ser. No. 905,903
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—386 **22 Claims**



1. An assembly for mounting a heat-generating semiconductor to an associated heat sink wherein the semiconductor includes a body portion of predetermined thickness, said assembly comprising:

a heat-dissipating base element having plan dimensions which are larger than the plan dimensions of said semiconductor,

a retainer member formed of a dielectric material and having means for locating and retaining said semiconductor, said retainer member including a plurality of arms connected to said locating and retaining means,

the relative thicknesses of said semiconductor locating and retaining means and said semiconductor and the positioning of said arms with respect thereto being such that the ends of said arms are deflected when said retainer member is connected to said base element to force said semiconductor and said base element into intimate heat transmitting contact, and

means for connecting said base element and said arms of said retainer member.

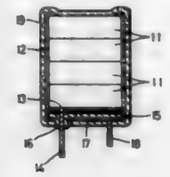
4,691,266

ELECTRIC DOUBLELAYER CAPACITOR

Arakawa Yoshio, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 24, 1986, Ser. No. 842,841
Claims priority, application Japan, Mar. 26, 1985, 60-44640[U]
Int. Cl.⁴ H01G *9/00*
U.S. Cl. 361—433 **3 Claims**

1. An electric doublelayer capacitor comprising a cell, a plus terminal plate with a plus terminal rod fixed beneath the cell, an insulating plate, a minus terminal plate with a minus terminal rod fixed beneath the insulating plate, an insulating tube surrounding the cell and a casing covering the top, side and bottom periphery of all said components, characterized in that a shrinkable electroconductive resin film is used as said casing.

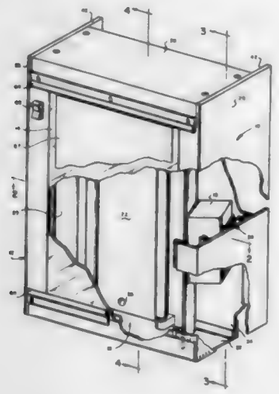


4,691,267

FILM ILLUMINATOR

Daniel J. Giesberg, 2347 Malcolm Ave., Los Angeles, Calif. 90064

Filed Jan. 28, 1985, Ser. No. 695,944
Int. Cl.⁴ F21V *21/00, 23/02*
U.S. Cl. 362—218 **14 Claims**



1. Apparatus for illuminating film, comprising, in combination:

(a) housing means, including means providing an illuminatable viewing area, the housing means including peripheral heat conductive walls;

(b) lamp means disposed within the housing means for providing illumination to the viewing area;

(c) internal light reflector means for directing light from the lamp area toward the viewing area of the housing means;

(d) ballast means disposed within the housing means and mounted on the reflector means, the ballast means being mounted on the reflector means facing away from the lamp means and operatively connected to the lamp means for controlling voltage applied to the lamp means; and

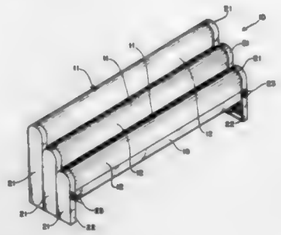
(e) heat sink means comprising an extended heat conductive element within the housing means in thermal contact with both the ballast means and a peripheral wall of the housing means for dissipating heat from the ballast means via the housing means including the peripheral walls, the heat sink means contacting the ballast means in spaced relation to the reflector means.

4,691,268

CAST RESIN LIGHT-EMITTING DISPLAY DEVICE

Walter L. Benson, 17237 7th St. E., Sonoma, Calif. 95476

Filed Oct. 21, 1985, Ser. No. 789,505
Int. Cl.⁴ F21S *3/00*
U.S. Cl. 362—223 **17 Claims**



1. A light-emitting display device capable of emitting a deep colorful glow in darkness, comprising:

a thick-walled elongated body of cast light-transmissive plastic resin having an elongated longitudinal tubular chase within the body,

a pigment in the resin,

a neon light tube within the internal tubular chase, as a source of light of the display device,

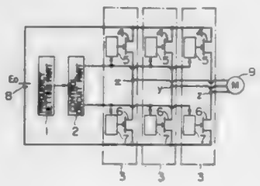
end closure means on the ends of the elongated body, and means for illuminating the neon light tube.

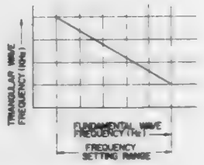
4,691,269

PWM INVERTER APPARATUS

Shigeki Yamane, Fujisawa; Keijiro Mori, Kanagawa, and Kyooya Sakamoto, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Seiko Co., Ltd., both of Osaka, Japan

PCT No. PCT/JP84/00558, § 371 Date Jun. 26, 1985, § 102(e) Date Jun. 26, 1985, PCT Pub. No. WO85/02505, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 22, 1984, Ser. No. 756,987
Claims priority, application Japan, Nov. 28, 1983, 58-223664; Nov. 28, 1983, 58-223665
Int. Cl.⁴ H02M *1/12, 7/48*
U.S. Cl. 363—41 **11 Claims**





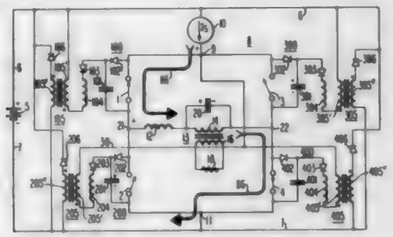
1. A PWM inverter apparatus comprising a frequency setting circuit providing a signal to set a frequency; a control circuit generating a PWM signal in response to the signal from

said frequency setting circuit, the PWM signal from said control circuit having a carrier frequency which is varied by the signal from said frequency setting circuit, said control circuit including a fundamental wave oscillating circuit generating a fundamental wave having a frequency which increases in response to an incremental change in the signal from said frequency setting circuit, a triangular wave oscillating circuit having a frequency which decreases in response to the incremental change in the signal from said frequency setting circuit, and a comparing circuit comparing the outputs of said fundamental wave oscillating circuit and said triangular wave oscillating circuit; a phase drive circuit receiving the PWM signal from said control circuit to supply power to a motor; and a DC power source connected to said phase drive circuit.

4,691,270
CURRENT FED INVERTER BRIDGE WITH LOSSLESS SNUBBERS

Duard L. Pruitt, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 22, 1986, Ser. No. 887,918
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 **10 Claims**



1. An inverter adapted to be operated from a source of direct voltage, comprising:

a source of direct current adapted to be coupled to first and second terminals of a source of direct voltage for being energized thereby, for producing a substantially constant current between first and second terminals of said source of direct current;

a first series combination of first and second controllable switches including a first intermediate terminal therebetween, said first series combination being coupled across said first and second terminals of said source of direct current;

a second series combination of third and fourth controllable switches including a second intermediate terminal therebetween, said second series combination being coupled in parallel with said first series combination;

a load coupled to said first and second intermediate terminals for receiving alternating current from said first, second, third and fourth switches in response to operation of said switches;

control means coupled to said first, second, third and fourth switches for, in recurrent sequence of four sequential intervals, controlling said first, second, third and fourth switches for (a) maintaining said first and fourth switches conductive and said second and third switches nonconductive during first intervals of said recurrent sequence, (b) maintaining said first, second, third and fourth switches conductive during second intervals of said recurrent sequence, (c) maintaining said first and fourth switches nonconductive and said second and third switches conductive during third intervals of said recurrent sequence, and (d) maintaining said first, second, third and fourth switches conductive during fourth intervals of said recurrent sequence;

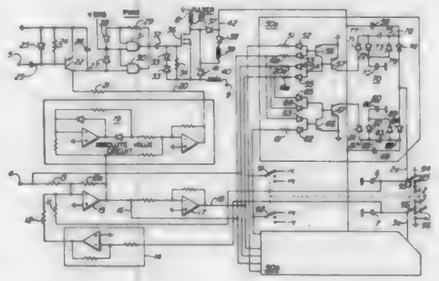
first, second, third and fourth snubbers coupled to said first, second, third and fourth switches, respectively, each of said first, second, third and fourth snubbers including the serial combination of a diode and capacitance means, said capacitance means being coupled for being charged in a first polarity by current bypassing the associated switch during its turn-off, whereby the snubber capacitor becomes charged in said first polarity and must be discharged in preparation for receiving current during the next turn-off cycle;

first, second third and fourth energy recovery means coupled to said capacitance means of said first, second, third and fourth snubbers, respectively; said first, second, third and fourth energy recovery means including first, second, third and fourth transformer means, each of said transformer means including a primary and a secondary winding, said secondary windings of each of said transformer means being coupled in series with rectifying means across said first and second terminals of said source of direct voltage, said primary windings of said first, second, third and fourth transformer means each being coupled in series with further rectifying means to form first, second, third and fourth primary circuits, one end of each of said first, second, third and fourth primary circuits being coupled to the junction of said diode and said capacitance means of said first, second, third and fourth snubbers, respectively, the other end of said first and third primary circuits being coupled to said first terminal of said source of direct voltage, the other end of said second and fourth primary circuits being coupled to said first terminal of said source of direct current, for transforming current pulses from said capacitance means of said snubbers to said source of direct voltage for recovering energy while discharging said capacitance means of said snubbers in preparation for receiving current during the next turn-off cycle.

4,691,271
VOLTAGE MULTIPLIER AND VOLTAGE MULTIPLIERS IN AN AMPLIFIER WITH DOUBLE RAIL OUTPUT

Stanley D. Rosenbaum, and Calvin Plett, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 28, 1986, Ser. No. 878,729
Claims priority, application Canada, Oct. 28, 1985, 493909
Int. Cl.[4] H02M *3/02*
U.S. Cl. 363—60 **4 Claims**



1. A voltage multiplier for receiving electrical energy at an input terminal and providing direct current at an output terminal, comprising:

a plurality of n unidirectional current conductive elements being connected in series between ground and the output terminal and being poled in one and the same direction and defining n−1 interconnecting junctions and an nth junction with the output terminal wherein n is an even number of at least four;

a capacitor element being connected between an alternating current ground and each even numbered ones of said junctions;

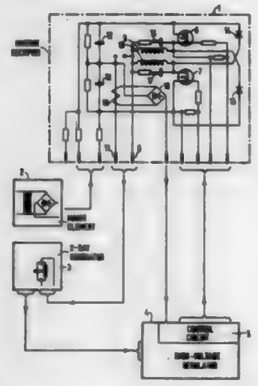
a capacitor element being connected between each pair of consecutively odd-numbered ones of said junctions; and

an input capacitor element being connected between the input terminal and the n−1 junction.

4,691,272
INVERSE RECTIFIER

Georg Geus, Wiesbaden, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,257
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502492
Int. Cl.[4] H02M *7/515;* **H05G** *1/20*
U.S. Cl. 363—98 **2 Claims**



1. An inverse rectifier for use with a high voltage transformer of an x-ray generator comprising:

two switching transistors connected to a common load output;

a constant voltage source having a positive pole and a negative pole, said constant voltage source being connected to said load output through said two switching transistors for alternately connecting said positive and negative poles of said constant voltage source to said load output;

two air-core coils respectively connected between said load output and said switching transistors at respective junctions; and

two diodes cross-connected between said junctions and said constant voltage source, said diodes being respectively polarized so as to block the voltage from said constant voltage source.

4,691,273
SERIES RESONANT CONVERTER WITH PARALLEL RESONANT CIRCUIT

Yutaka Kuwata, Kodaira, Japan, and Louis R. Nerone, Cleveland, Ohio, assignors to Nippon Telegraph & Telephone Corp., Tokyo, Japan and Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 11, 1986, Ser. No. 940,442
Int. Cl.[4] H02M *7/538*
U.S. Cl. 363—132 **10 Claims**

1. A controllable converter device for providing electrical current to a load comprising in combination:

(a) a power source;

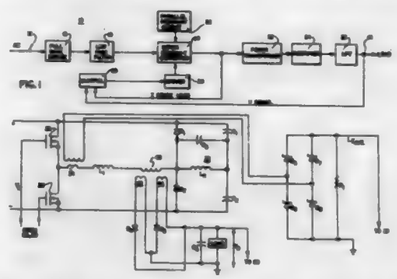
(b) first and second connected switch means;

(c) first and second connected clamp diode means;

(d) a primary winding of a transformer, said winding being interposed between said connected switch means and said connected clamp diode means;

(e) first and second connected capacitor means, said first and second connected switch means, said first and second connected diode clamp means and said first and second connected capacitor means each being connected across said power source;

(f) control means for actuating said first and second connected switch means on and off at an operating frequency



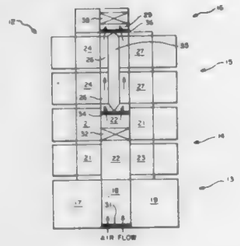
dependent upon said load such that when said switch means are alternately turned on sinusoidal current pulses alternately flow from said source in opposing directions in said primary winding; and

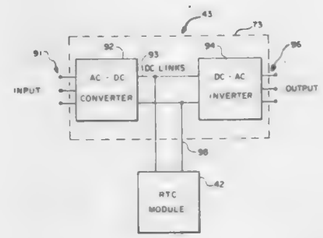
(g) parallel resonant circuit means having a predetermined resonant frequency, said circuit means interposed between said first and second connected diode clamp means and said first and second connected capacitor means to thereby limit said operating frequency to be no lower than said parallel resonant frequency.

4,691,274
MODULAR ELECTRONIC POWER SUPPLY

Anthony F. Matouk, Los Altos; David C. Hoffman, Los Gatos, and Donald M. Barrus, San Jose, all of Calif., assignors to Modular Power Corporation, Cupertino, Calif.

Filed Apr. 29, 1986, Ser. No. 857,110
Int. Cl.[4] H05K *7/20*
U.S. Cl. 363—141 **14 Claims**





1. In an electronic power supply, a framework having front and rear sides and top and bottom sides and having a vertically

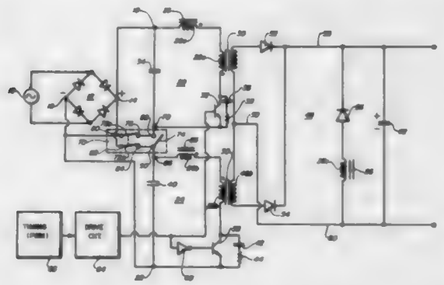
disposed space extending upwardly from the bottom of the framework through the top of the framework, a plurality of vertically spaced power modules disposed in the framework on opposite sides of the vertically disposed space and having vertically disposed heat sinks extending into the vertically disposed space, said heat sinks including a plurality with vertically disposed spaced apart fins extending into said vertically disposed space and means carried by the framework for forcing air in a vertical direction through the vertically disposed space, said vertically disposed space being free of impediments between the vertically disposed heat sinks so that the air can travel uninterrupted through the spaced apart fins in said vertically displaced space.

4,691,275

CURRENT FED INVERTER

Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,377
Int. Cl.[4] H02M *7/04*
U.S. Cl. 363—143 **18 Claims**



1. A current fed inverter circuit for accommodating two different input voltages from an input source of direct current or rectified alternating current, which comprises:

a first circuit having an inductor and a transformer primary winding; a second circuit having said inductor and said transformer primary winding;

an output circuit including a transformer secondary winding magnetically coupled to said transformer primary winding;

means for alternately modifying current flow in the first circuit and the second circuit; and

operator selector means for connecting said first and second circuits in a first configuration to form a current fed half bridge circuit to accommodate the higher of the two input voltages and in a second, different configuration, to form a current fed push-pull circuit to accommodate the lower of the two input voltages.

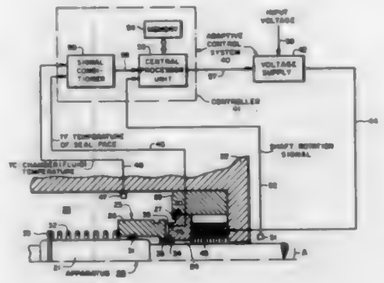
4,691,276

ADAPTIVE CONTROL SYSTEM FOR MECHANICAL SEAL ASSEMBLY

Alan L. Miller, Chicago, Ill., and James L. Kozlowski, Whiting, Ind., assignors to Borg-Warner Industrial Products, Inc., Long Beach, Calif.

Filed Oct. 21, 1985, Ser. No. 789,890
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.[4] G06F *15/46*; F16J *15/34*
U.S. Cl. 364—148 **24 Claims**

1. An adaptive control system for a mechanical seal assembly of the type including first and second seal faces, one of the seal faces being movable toward and away from the other seal face to regulate a gap, and thus adjust a film thickness, between the respective seal faces, actuator means for regulating the displacement of the movable seal face to adjust the film thickness, and sensor means connected to provide a first signal which varies as a function of a given parameter of the seal assembly, said control system being coupled to the sensor means and to the actuator means, for regulating the actuator means as a function of the received first signal, characterized in



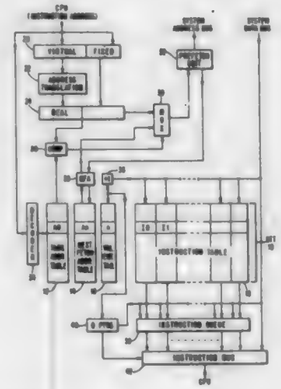
that the control system is operable, in response to identifying the presence of a given phenomenon in the mechanical seal assembly, to identify a reference position of the movable seal face, and thereafter to displace the movable seal face away from the other seal face to establish optimum seal performance.

4,691,277

SMALL INSTRUCTION CACHE USING BRANCH TARGET TABLE TO EFFECT INSTRUCTION PREFETCH

Eric P. Kronstadt, Westchester County, N.Y.; Tushar R. Ghoewala, Los Angeles, and Sharad P. Gandhi, Santa Clara, both of Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,275
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **5 Claims**



1. An instruction memory architecture for a microprocessor comprising:

a branch target table including a target address table, a next fetch address table, a valid entries table and an instruction table;

instruction address register means for storing a target address generated by said microprocessor;

decoder means responsive to said instruction address register means for addressing all entries of an addressed line of said branch target table whenever a branch is taken;

comparator means connected to the outputs of said instruction register means and said target address table for providing an output indicative of a match between the target address and the accessed target address table entry on said addressed line; and

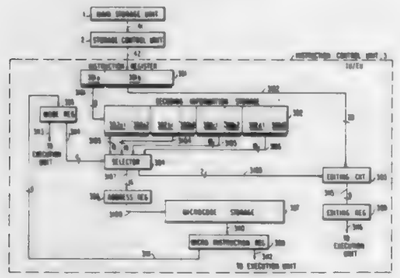
instruction prefetch means connected to said instruction address register means and said next fetch address table and responsive to the output of said comparator means for fetching the instruction in the accessed next fetch address table if said target address table entry matches the target address, otherwise for fetching the target and subsequent instructions from main memory, said next fetch address table entry for the line being updated so that it always contains the address of the instruction which follows the last valid instruction in the line and said valid entries table being updated so that it always counts the number of valid instructions in the addressed branch target table line.

4,691,278

DATA PROCESSOR EXECUTING MICROPROGRAMS ACCORDING TO A PLURALITY OF SYSTEM ARCHITECTURES

Jun Iwata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,440
Claims priority, application Japan, Apr. 23, 1984, 59-81585; May 25, 1984, 59-106120
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 **4 Claims**



1. In a data processor having an execution unit controlled by microprograms, one of said microprograms being read from control storage means and applied to said execution unit for execution thereby in response to a corresponding instruction read from a storage unit, the improvement comprising:

information storage means for storing a plurality of words correlating said instructions to respective microprograms, at least some of said words containing a plurality of instruction codes indicative of respective equivalent functions in a plurality of different system architectures, said words being stored at locations in said information storage means addressed by operation codes of said instructions;

mode information storage means for storing system administrative information for designating one of said system architectures;

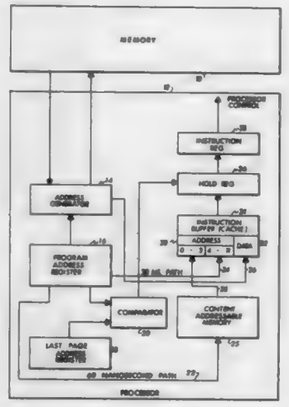
selector means for selecting and supplying to said control storage means one of said instruction codes from each word read from said information storage means in response to the system administration information from said mode information storage means.

4,691,279

INSTRUCTION BUFFER FOR A DIGITAL DATA FROCESSING SYSTEM

Michael Danilenko, West St. Paul; John T. Rusterholz, Roseville, and Archie E. Lahti, Fridley, all of Minn., assignors to Unisys Corporation, New York, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,708
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **11 Claims**



1. In a data processing system, a instruction buffer comprising:

(a) a program address register means for temporarily storing and providing as an output, a multiple bit address, which address includes, a page address portion and a word address portion;

(b) a content addressable memory connected to said program address register means to receive therefrom and store therein a plurality of page addresses;

(c) an instruction storage buffer means commonly coupled to said program address register means and said content addressable memory to receive a page address from said content addressable memory and a word address from the word address portion of said program address register means;

(d) a previous page address register means coupled to the input of said program address register means to receive and store the address of the previous page sent to the program address register means;

(e) a page address comparator means connected to the output of said program address register means and the output of the previous page address register means to receive and compare the address of the previous page address with the address of the present page address;

(f) a validity indicating and storing means connected to said address comparator means for indicating validity and temporarily storing said indication when said page address comparator means denotes correspondence between the previous page and the present page addresses; and

(g) a single instruction storage means connected to said instruction storage buffer for receiving and temporarily storing an output instruction from said instruction storage buffer means for providing a single output instruction, which is valid only when said validity indicating and storage means indicates page address correspondence by said address comparator means, and is invalid when said validity indicating and storage means indicates a lack of page address correspondence by said address comparator means.

4,691,280

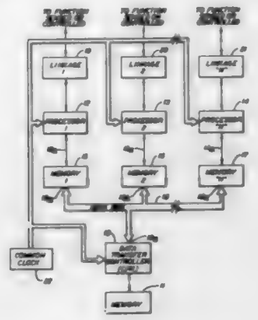
HIGH PERFORMANCE MULTI-PROCESSOR SYSTEM

William S. Bennett, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 393,204, Jun. 28, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 812,556

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **7 Claims**



1. A hign performance multi-processor system having increased data processing power and having an intercommunication system with increased flexibility, comprising:

a plurality of independently operable processor systems;

each of said of said plurality of processor systems includes a data processor means and a private, dual-port memory means;

means in each of said plurality of processor systems connecting its respective data processor means with a first port of its private, dual-port memory means;

data transfer controller means having a separate memory means;

common bus means connecting a second port of each private dual-port memory means to said data transfer controller means and to said separate memory means; and

clock means connected to each one of said plurality of processor systems, including said data transfer controller means for providing timing signals thereto;

said data transfer controller means direct data transfer on a fixed time schedule, which is synchronized with the execution of programs in said plural data processor means by said clock means, said data transfer is transferred synchronously from any one of said private, dual-port memory means to said separate memory and from said separate memory means to another one of said private, dual-port memory means, all data transfer being controlled by said data transfer controller means, so that operation of said plurality of data processor means is independent of such data transfer.

4,691,281

DATA PROCESSING SYSTEM SIMULTANEOUSLY CARRYING OUT ADDRESS TRANSLATION OF A PLURALITY OF LOGICAL ADDRESSES

Toshiyuki Furui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,869

Claims priority, application Japan, Apr. 13, 1983, 58-64776; Jul. 22, 1983, 58-132925; Nov. 28, 1983, 58-223731; Nov. 28, 1983, 58-223732

Int. Cl.[4] G06F *12/10*

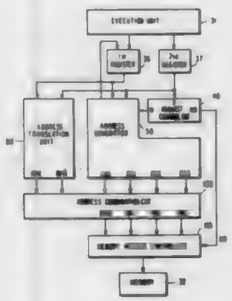
U.S. Cl. 364—200 **5 Claims**

1. A data processing system for use in accessing in each cycle a memory which has a plurality of real addresses located in a real address space and which stores a plurality of sequence of data elements, the data elements of each sequence being stored in the real addresses equidistantly spaced apart from one another in said real address space by a real distance which is representative of an address distance between two adjacent ones of the real addresses for each sequence and which is predetermined for each sequence, said data processing system comprising:

logical address specifying means (**36**) for identifying a preselected one of logical addresses of a logical address space in each cycle that corresponds to a preselected one of the data elements of each sequence;

a distance specifying means (**37**) for identifying the logical distance that corresponds to the real distance between data elements of each sequence in each cycle;

deciding means (**40**) coupled to said distance specifying means and responsive to said logical distance for determining an element number which is the number of data elements to be simultaneouly read out for each sequence;



address calculating means (**50, 80, 100, 135**) coupled to said deciding means, said distance specifying means and said logical address specifying means, and responsive to said preselected logical address, said logical distance, and said element number for calculating the specific addresses of a number of data elements which together equal in number said element number and are spaced apart from one another by the real distance which corresponds to said logical distance and which include a preselected real address for storing said preselected one of the data elements as a leading data element; and

means coupled to said address calculating means and responsive to said specific addresses for accessing said memory to produce those of the data elements of each sequence in each cycle including said preselected one of the data elements which in the aggregate equal in number said element number.

4,691,282

16-BIT MICROPROCESSOR SYSTEM

Tsuneo Kinoshita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1984, Ser. No. 643,386

Claims priority, application Japan, Aug. 31, 1983, 58-159285

Int. Cl.[4] G06F *9/30*

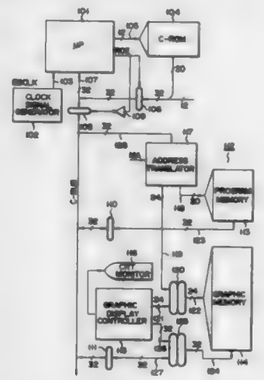
U.S. Cl. 364—200 **3 Claims**

1. A 16-bit microprocessor system comprising:

a memory having a basic address space for storing data and instructions and an expanded address space for storing data, said basic address space including a portion of a logical address space which consists of a plurality of paired segments assigned in units of a task, said portion being assigned to said basic address space in units of a page, each of said paired segments including a first segment for storing said data of said basic address space, and a second segment for storing said instructions of said basic address space, a least significant bit of a first segment number which is assigned to the first segment indicating a first logic value, a least significant bit of a second segment number which is assigned to the second segment indicating a second logic value, said second segment number being different by one from said first segment number;

a 16-bit microprocessor including memory access data output means for producing memory access data for accessing said memory, said memory access data comprising a status field in which memory control data including first and second specific bits is set, an (n−16)-bit segment field, where n is an integer greater than 16, and a 16-bit address field having first and second fields, said first specific bit indicating an access to one of said basic address space and said expanded address space, said second specific bit designating an operand fetch when equal to said first logic value, and an instruction fetch when equal to said second logic value,

said memory access data output means producing, during an operand fetch executed during execution of a first instruction having an n-bit first logical address, memory access data wherein: (a) said first specific bit of the status field is set to a logic value indicating an access to the expanded address space, (b) said second specific bit of the status field is set to said first logic value, (c) upper (n−16) bits of a first effective address corresponding to the first logical address are set in said segment field, and (d) remaining 16 bits of the first effective address are set in the address field,



said memory access data output means producing, during an operand fetch executed during execution of a second instruction having a 16-bit second logical address, memory access data wherein: (a) said first specific bit of the status field is set at a logic value indicating an access to the basic address space, (b) said second specific bit of the status field is set at said first logic value, (c) a segment number is set in said segment field, (d) a page number in a 16-bit second effective address comprising a page number and displacement within the page is set in the first field of said address field, and the displacement in the second effective address is set in the second field of said address field,

said memory access data output means producing, during an instruction fetch, memory access data wherein: (a) the first specific bit of the status field is set at a logic value indicating an access to the basic address space, (b) the second specific bit of the status field is set at the second logic value, (c) a segment number is set in the segment field, (d) a page number in a 16-bit third effective address comrpising a page number and displacement within the page is set in the first field of the address field, and (e) the displacement in the third effective address is set in the second field of the address field;

register means for holding memory access data output from the memory access data output means of said microprocessor;

a segment/page table, which is retrieved in accordance with data obtained by changing the segment field of the memory access data held by said register means, said changing effected by replacing the least significant bit of said segment field with the second specific bit of said memory access data, and by changing the first field of the address field of said memory access data, said segment/page table being accessed to generate page data; and

selecting means for selecting one of said basic address space and said expanded address space in accordance with said first specific bit of said memory access data held by said register means, said basic address space being accessed in response to first address data obtained by linking the page data from said segment/page table and said second field of the address field of the memory access data, and said expanded address space being accessed in response to second address data obtained by linking the segment field and address field of said memory access data.

4,691,283

AUTOMATIC REGISTRATION IN AN ELECTRONIC CASH REGISTER

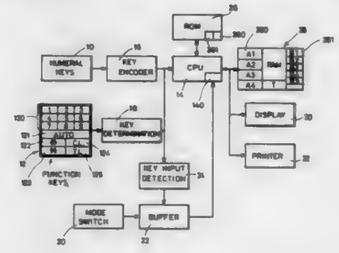
Kumehiko Matsuda, Jyoyo, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 563,526, Dec. 20, 1983, abandoned. This application May 28, 1986, Ser. No. 869,835

Claims priority, application Japan, Dec. 27, 1982, 57-231086

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—405 **2 Claims**



1. An electronic cash register for performing registration operations for sales transactions of a plurality of commodities comprising:

keyboard means for entering data identifying particular commodities of a given sales transaction into said register, including,

a plurality of department keys each identifying an individual commodity to be sold,

a plurality of numerical keys each identifying a predetermined group of said individual commodities, and

an automatic registration key for selecting an automatic registration mode of said register;

memory means for storing commodity identity and pricing information, including,

individual memory areas for storing identity and pricing information for each individual commodity to be sold, and

group memory areas for storing information identifying a predetermined group of said individual memory areas; and

means for registering and computing the amount of said given sales transaction in response to either the input of individual commodity data by said department keys, or the input of group commodity data by said numerical keys in conjunction with the activation of said automatic registration key, by retrieving pricing information directly

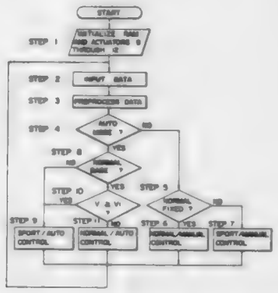
from said individual memory areas, or retrieving pricing information from individual memory areas identified by said group memory areas, respectively.

4,691,284

CONTROL SYSTEM FOR THREE WAY VARIABLE SHOCK ABSORBER DEVICE FOR SUSPENSION WITH HIGHEST SHOCK ABSORBER EFFECTIVENESS NOT SELECTED IN MANUAL MODE

Toshio Izumi; Ryozo Saito; Yoichi Kato, and Hiroshi Miyata, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1984, Ser. No. 681,586
Claims priority, application Japan, Aug. 18, 1984, 59-172146
Int. Cl.[4] B60G *17/00*
U.S. Cl. 364—424 **10 Claims**



1. For a variable damping effectiveness type shock absorber, comprising an actuator, for a suspension of a vehicle, said shock absorber by selective actuation of said actuator to respectively a first condition, a second condition, and a third condition, wherein said first condition

provides a minimum amount of damping effect, said second condition provides a medium amount of damping effect, and said third condition provides a maximum amount of damping effect: a suspension control system, comprising:

a means for detecting one or more parameters relating to the operational condition of the vehicle and for outputting information signals representative thereof;

a manually controlled selecting means for permitting an operator to manually select between a first manual operational mode, a second manual operational mode, a first auto operational mode and a second auto operational mode; and

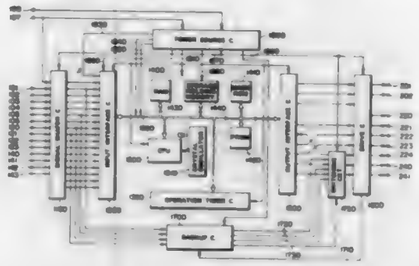
a control means for: when said manually controlled selecting means is selecting said first manual operational mode, actuating said actuator to its said first condition; when said manually controlled selecting means is selecting said second manual operational mode, actuating said actuator to its said second condition; when said manually controlled selecting means is selecting said first auto operational mode, actuating said actuator to one of a set of its said conditions including its said first condition and its said third condition, according to said information signals representing the operational condition of the vehicle outputted by said detecting means; and when said manually controlled selecting means is selecting said second auto operational mode, actuating said actuator to either its said second condition or its said third condition, according to said information signals representing the operational condition of the vehicle outputted by said detecting means.

4,691,285

METHOD AND APPARATUS FOR ALLEVIATING TRANSMISSION SHIFT SHOCKS

Hitoshi Takeda, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1984, Ser. No. 683,354
Claims priority, application Japan, Dec. 21, 1983, 58-239684
Int. Cl.[4] B60K *41/08*; G06F *15/20*
U.S. Cl. 364—424.1 **10 Claims**



6. An apparatus for alleviating shocks occurring when a transmission shifts from one reduction ratio to another reduction ratio, the transmission having an output shaft and being driven by an engine, said apparatus comprising:

means for detecting a shift command occurring in the transmission from the one reduction ratio to the other reduction ratio and generating a shift command signal;

means for estimating responsive to said shift command signal an engine revolution speed variation during actual shifting operation in the transmission which is caused by the occurrence of said shift command and generating an estimated engine revolution speed variation signal indicative of the engine revolution speed variation estimated; and

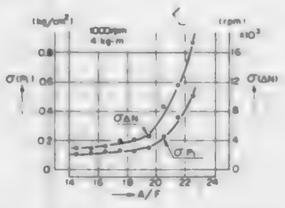
means for controlling the engine such that the output torque of the engine is subjected to a temporary change that is variable in response to said estimated engine revolution speed variation signal so as to alleviate shocks occurring during the shifting operation.

4,691,286

METHOD AND APPARATUS FOR DETECTING COMBUSTION VARIATIONS IN INTERNAL COMBUSTION ENGINE

Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi; Toshikazu Ina, Nagoya; Takashi Shigematsu, Susono; Setsuo Tokoro, Susono, and Tokio Kohama, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio; Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, all of, Japan

Filed Jun. 26, 1985, Ser. No. 749,087
Claims priority, application Japan, Jun. 27, 1984, 59-133504
Int. Cl.[4] F02B *3/02*; G06F *15/20*
U.S. Cl. 364—431.04 **8 Claims**



1. A method for detecting combustion variations in an internal combustion engine, comprising the steps of:

detecting at least two engine rotational speeds at predetermined timings for every firing stroke in one cylinder of said engine;

calculating the square of each of the detected engine rotational speeds;

calculating an engine speed variation between two of the squared engine rotational speeds for every firing stroke in one cylinder of said engine; and

performing a process upon the sequence of the calculated engine speed variations, thereby determining an engine combustion state by the processed result.

5. An apparatus for detecting combustion variations in an internal combustion engine, comprising:

means for detecting at least two engine rotational speeds at predetermined timings for every firing stroke in one cylinder of said engine;

means for calculating the square of each of the detected engine rotational speeds;

means for calculating an engine speed variation between two of the squared engine rotational speeds for every firing stroke in one cylinder of said engine; and

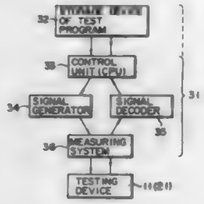
means for performing a process upon the sequence of the calculated engine speed variations, thereby determining an engine combustion state by the processed result.

4,691,287

IC DEVICE AND A SYSTEM FOR TESTING THE SAME

Soichi Suzuki, Yokohama; Mitsuo Aihara, Kamakura, and Mitsuo Fujii, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1984, Ser. No. 664,764
Claims priority, application Japan, Oct. 31, 1983, 58-202658
Int. Cl.[4] G06F *11/04*; G01R *31/28*
U.S. Cl. 364—490 **9 Claims**



6. A system for testing an IC device comprising:

a testing IC device including a main circuit to be tested, a type-distinguishing data output circuit for outputting IC device type-distinguishing data associated with the type of said main circuit, and a plurality of terminal means selectively coupled to said main circuit and said type-distinguishing data output circuit with a given positional relationship;

IC device type-distinguishing means for producing a signal to read said IC device type-distinguishing data from said type-distinguishing data output circuit of said testing IC device via said plurality of terminal means, and for receiving said IC device type-distinguishing data and determining to which type of IC device as IC device type-distinguishing data belongs;

test program-reading means for receiving the determination results from said IC device-type distinguishing means and for selecting a test program corresponding to the determination results from a plurality of prestored test programs; and

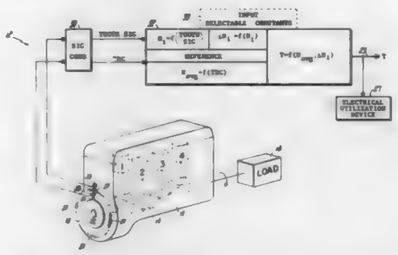
testing means for executing a predetermined test on said testing IC device according to said test program selected by said test program-reading means.

4,691,288

TORQUE SENSOR FOR INTERNAL-COMBUSTION ENGINE

Ira W. Kay, Tolland, and Ronald P. C. Lehrach, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1985, Ser. No. 713,153
Int. Cl.[4] G01M *15/00*; G06F *15/32*; G01L *3/00*
U.S. Cl. 364—511 **17 Claims**



1. Apparatus for providing a measure of the torgue of an internal-combustion engine having a rotating crankshaft for connection to a load, the crankshaft undergoing acceleration/deceleration sub-cycles associated with respective firing intervals within an engine cycle, comprising:

means for providing electrical signals indicating occurrence of particular angular positions of the crankshaft in an engine cycle;

electronic signal processing means responsive to said signals indicative of a crankshaft angle for providing signals, N_i, indicative of instantaneous sub-cyclic engine speed at each of a plurality of predetermined crankshaft angles in an engine cycle, said plurality of predetermined crankshaft angles including a respective pair of angles for each said firing interval, the respective two crankshaft angles of each said pair being spaced from one another by an angle corresponding with substantially one-half of a firing interval,

for providing in response to said sub-cyclic engine speed signals, N_i, further signals, ΔN_i, representative of the average of the difference between instantaneous engine speeds of the two crank angles of each respective said pair of crankshaft angles within an engine cycle,

for providing signals, N_{avg}, indicative of average engine speed, and

for generating a torque signal, T, as a function of said average engine speed signal, N_{avg}, and said average instantaneous engine speed difference signal, ΔN_i, and

electrical utilization means having said torque signal, T, operatively connected as an input thereto.

4,691,289

STATE MACHINE STANDARD CELL THAT SUPPORTS BOTH A MOORE AND A MEALY IMPLEMENTATION

Robert C. Thaden, Houston, and Mark W. Watts, Hockley, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 23, 1984, Ser. No. 633,367
Int. Cl.[4] G06F *13/00, 3/14*
U.S. Cl. 364—518 **6 Claims**

1. In a video system controller adapted to transfer data between a microprocessor and a display memory in a bit-mapped video display system, said video system controller comprising addressing means for storing a display memory address from said microprocessor and for presenting said display memory address to said display memory, display controller means for synchronizing a video display with said display memory, arbiter logic for choosing whether said microprocessor or said video display shall have access to said display

memory via said video display controller, and memory cycle generator means for generating the memory cycle information required for reading or writing said display memory, the improvement comprising:

a first sequential logic block in said memory cycle generator means comprising:

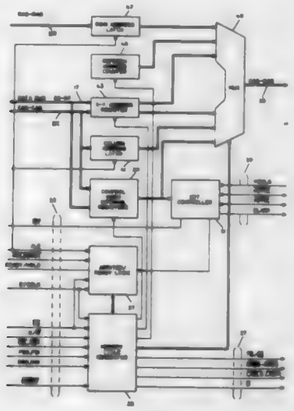
a data input for receiving digital data;

a data output for presenting digital data;

a clock input for receiving clock pulses; and

a plurality of logic cells connected to said data input and said data output, said plurality of logic cells responsive to a clock pulse received by said clock input to cause said output to present data dependent solely upon the data received by said data input during prior clock pulses; and

a second sequential logic block in said memory cycle generator means comprising:



a data input for receiving digital data;

a data output for presenting digital data;

a clock input for receiving clock pulses; and

a plurality of logic cells connected to said data input and said data output, said plurality of logic cells responsive to a clock pulse received by said clock input to cause said output to present data dependent upon the data received by said data input during prior clock pulses;

wherein said logic cells in said first and said second sequential logic blocks comprise substantially the same circuit components which are interconnected dependent upon the desired responsive behavior of said logic cells;

and wherein said memory cycle information is comprised of the outputs of said first and said second sequential logic blocks.

4,691,290

CREEP-COMPENSATED WEIGHING APPARATUS

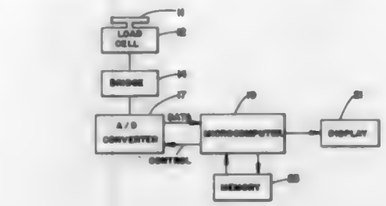
Neil C. Griffen, Westerville, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

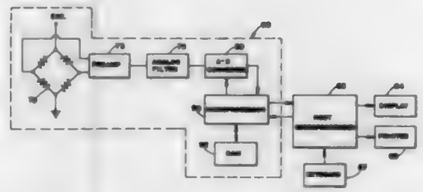
Filed Aug. 6, 1984, Ser. No. 638,272

Int. Cl.[4] G01G *23/14, 19/413*

U.S. Cl. 364—567 **28 Claims**

1. Weighing apparatus compensated for creep comprising a weighing mechanism, means for storing the creep state of said weighing mechanism, means for obtaining a representation of the weight on the weighing mechanism, means for predicting the creep increment resulting from said stored creep state and said weight, means for combining said creep increment with said stored creep state to determine a current creep state, means for combining said current creep state with said weight representation to provide a corrected weight representation,





and means for storing said current creep state in place of said stored creep state.

4,691,291

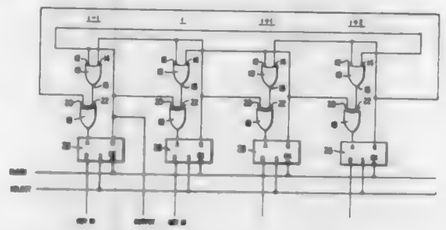
RANDOM SEQUENCE GENERATORS

Stephen Wolfram, Cambridge, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Filed Sep. 23, 1985, Ser. No. 779,121

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—717 **11 Claims**



1. A random sequence generator, comprising

a plurality of successive stages arranged in a closed loop wherein each of said stages includes

a logic circuit having n inputs and an output, said logic circuit having 2^n addresses for generating a 0 or 1 at its output in accordance with the signal applied to its n inputs;

an input-output circuit having a first input connected to the output of said logic circuit, a second input and an output; and

connection means connecting one of the inputs of said logic circuit to the output of the input-output circuit of the same stage, another input of said logic circuit to the output of the input-output circuit of a preceding stage and still another input of said logic circuit to the output of the input-output circuit of a succeeding stage, an output signal having a plurality of sequential random values being generated at the output of each of said input-output circuits in response to an initial key signal applied to the second inputs of said input-output means.

4,691,292

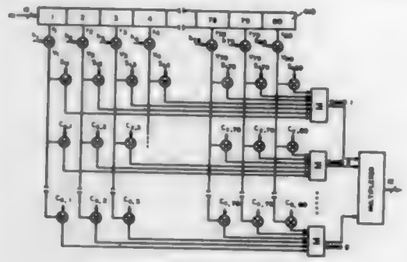
SYSTEM FOR DIGITAL MULTIBAND FILTERING

Joseph H. Rothweiler, Bloomfield, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 13, 1983, Ser. No. 484,526

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **6 Claims**



1. In a signal processing system including a signal transmitting system in which a signal processed for transmission is separated by a transmit digital filter means into several subbands, the improvement comprising:

means in said transmit digital filter means for generating said subbands including sine and cosine functions, the sine functions for generating every other one of said subbands and the cosine functions for generating the remaining ones of said subbands; and

wherein said sine and cosine functions are phased to preserve all components of the transmitted signal.

4,691,293

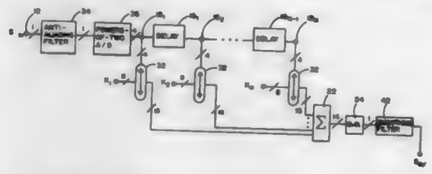
HIGH FREQUENCY, WIDE RANGE FIR FILTER

Leo W. Conboy, Huntington Beach, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 28, 1984, Ser. No. 687,088

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **5 Claims**



1. A digital FIR filter, comprising:

(a) a source of time-spaced analog samples of a signal to be filtered;

(b) encoding means for converting said samples into a digital code representative of signal levels differing from each other by powers of two;

(c) first storage means for storing a predetermined sequence of said digitally encoded signal samples;

(d) second storage means for storing a plurality of predetermined coefficients;

(e) shifting means for multiplying each sample of said sequence by one of said coefficients through shifting the digits of said coefficient by a number of positions determined by said digital code; and

(f) accumulator means for producing a digital value representative of the sum of said multiplications.

4,691,294

CLOCK/DATA SYNCHRONIZATION INTERFACE APPARATUS AND METHOD

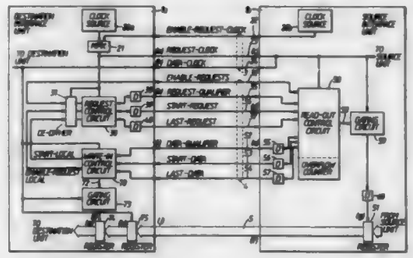
Richard J. Humpleman, Stoke-on-Trent, England, assignor to International Computers Limited, London, England

Filed Sep. 17, 1985, Ser. No. 776,823

Claims priority, application United Kingdom, Sep. 21, 1984, 8423968

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 **6 Claims**



2. A data transfer system for transmitting data from a source unit to a destination unit and comprising:

first interface apparatus for the source unit,

second interface apparatus for the destination unit, and

a plurality of signal paths interconnecting the said first interface apparatus and second interface apparatus which plurality of signal paths comprises

a first clock signal path,

a second clock signal path,

a data request signal path,

a path for a signal indicating data transmission, and

a data signal path,

the second interface apparatus for the destination unit comprising

means providing a reference clock signal,

means coupled to the last-mentioned means for transmitting onto the first clock signal path a clock signal derived from the reference clock signal,

means operating under timing control derived from the reference clock signal for outputting a data request signal onto the data request signal path,

means coupled to the path for the signal indicating data transmission and operating under timing control derived from the clock signal received from the second clock signal path for detecting the signal indicating data transmission and arranged in response thereto to output a control signal, and

means coupled to the data signal path and responsive to the said control signal to register data received on the said data signal path under timing control derived from the signal received from the second clock signal path, and

the first interface apparatus for the source unit comprising,

means coupled to the first clock signal path receiving the clock signal transmitting over that path,

means coupled to the last-mentioned means for transmitting over the second clock signal path a clock signal derived from the clock signal received from the first clock signal path,

means coupled to the data request signal path and operating under timing control derived from the clock signal received from the first clock signal path for detecting a data request and outputting a control signal or signals in response thereto,

means responsive to a said control signal from the detecting means for outputting signals indicating data transmission over the path therefor under timing control

derived from the clock signal received from the first clock path, and

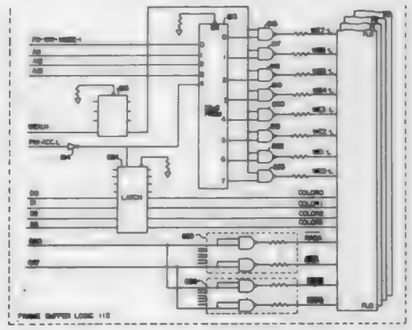
means responsive to a said control signal from the detecting means for outputting a data signal over the data signal path under timing control derived from the clock signal received from the first clock signal path.

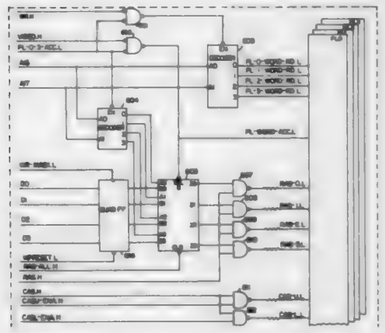
4,691,295

SYSTEM FOR STORING AND RETREIVING DISPLAY INFORMATION IN A PLURALITY OF MEMORY PLANES

Douglas A. Erwin, and Robert L. Skinner, both of Austin, Tex., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 28, 1983, Ser. No. 470,698
Int. Cl.⁴ G06F *12/00, 3/153;* G09G *1/02*
U.S. Cl. 364—900 **3 Claims**





1. Memory control apparatus for controlling memory access in a display terminal, said display terminal having

a processor;

memory means for storing at least the display image, said memory means containing a plurality of memories, each memory having a plurality of addressable storage locations, said memories being functionally divided into a plurality of planes such that one data bit of each pixel is located in each plane, each of said planes containing a plurality of memories;

bus means for providing at least addresses and data from said memory means;

means for generating timing signals and means for supplying said timing signals to at least said processor, said memory means and said memory control apparatus, said memory control apparatus comprising:

means connected to said bus means and responsive to address selection signals from said processor and said timing signal generating means, for generating row and column addresses for said memories, said row and column address generating means including

means for generating a first pair of addresses if the data from the memory is to be displayed, means for generating a second pair of addresses if a plurality of the planes are to be accessed and the access is for other than display and means for generating a third pair of address if only a single plane is to be accessed and the access is for other than display;

means, responsive to signals from said processor and said timing signal generating means, for generating a plurality of first row address strobe signal and first column address strobe signals, each said first row address strobe signal and each said first column address strobe signal being supplied only to the memories in one of said planes; and

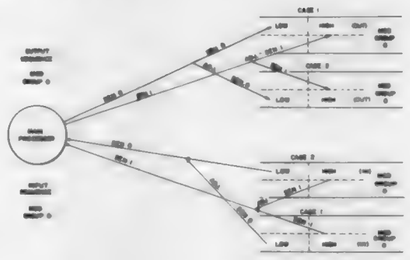
means responsive to signals from said processor and said timing signal generating means, for generating a plurality of second row address strobe signals and second column address signals, each said second row address strobe signal and each said second column address strobe signal being supplied to a portion of the memories in each of said planes.

4,691,296

METHOD AND APPARATUS FOR EXCHANGING MULTIPLE DATA BYTES WITH AN I/O MODULE IN A SINGLE SCAN.

Odo J. Struger, Chagrin Falls, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Nov. 16, 1984, Ser. No. 672,457
Int. Cl.⁴ G05B *11/01*
U.S. Cl. 364—900 **11 Claims**



1. A method of communicating bytes of data over a single-byte data bus in a programmable controller between a processor and two I/O modules, one of which is an output module, and one of which is an input module, wherein the processor transmits a first write signal and a first enable signal to the output module, wherein the processor transmits a second write signal and a second enable signal to the input module, wherein said first write signal is transmitted to both the input module and the output module, and wherein said second write signal is transmitted to both the input module and the output module, the method comprising:

the output module receiving and responding to said first write signal and said first enable signal from the processor to receive a first byte of data from the processor;

extending the transmission of said second enable signal from the input module to the output module; and

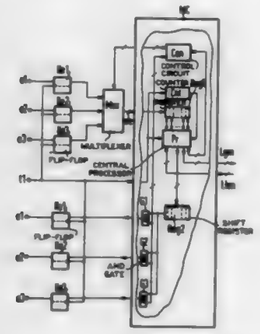
the output module receiving and responding to said second write signal and said second enable signal from the processor to receive a second byte of data from the processor.

4,691,297

CIRCUIT ARRANGEMENT FOR RECEIVING AND/OR TRANSMITTING SERIALLY APPEARING BINARY SIGNALS IN OR FROM A PROCESSING DEVICE CONTAINING A MICROCOMPUTER OR A MICROPROCESSOR

Pieter Wolff, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 4, 1985, Ser. No. 740,977
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420786
Int. Cl.⁴ G11C *7/00, 19/00*
U.S. Cl. 364—900 **3 Claims**



1. In a circuit arrangement for receiving binary signals serially appearing on a plurality of signal receiving lines, processing the binary signals in the form of parallel signals respectively encompassing a prescribed plurality of bits, and for the transmission of serially appearing binary signals via individual signal output lines after a previously ensuing processing of parallel signals respectively comprising the prescribed plurality of bits in and from a processing device containing a microprocessor means which is connected at its input and its output to the signal receiving and, respectively, signal output lines via signal receiving and signal output devices, respectively, the improvement wherein:

the signal receiving devices and the signal output devices each comprise a clock-controlled flip-flop connected to a respective receiving line and a respective output line for receiving serially appearing signal bits to be input and output, respectively;

a selection circuit having an input connected to each of said signal receiving devices and a single output connected to a single input of the microprocessor means such that the selection circuit selects the receiving device to be connected to the single input of the microprocessor means to process all of the received signal bits;

the microprocessor means comprises an input memory which receives the signal bits serially and output the same as parallel signal bits for processing, a microprocessor which processes the parallel signal bits, and an output memory connected to said microprocessor for receiving the processed bits and converting the same into serial form;

common clock means is connected to said signal receiving devices, said signal output devices and said microprocessor means for synchronizing the outputs of said signal receiving devices, said signal output devices and said microprocessor means; and

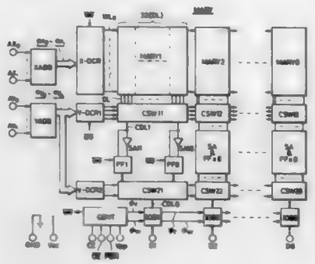
output selection means connected between said output memory and said signal output devices which selectively provides the processed and serial signal data bits thereto to said signal output devices in serial form.

4,691,298

SEMICONDUCTOR MEMORY

Minoru Fukuda, Tateno; Hideaki Takahashi, Koganei, both of Japan; June Sagiura, Troy, N.Y.; Fumio Tsuchiya, Kodaira, and Toshimasa Kihara, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,576
Claims priority, application Japan, Sep. 26, 1984, 59-199576
Int. Cl.⁴ G11C *8/00*
U.S. Cl. 365—189 **12 Claims**



1. In a semiconductor memory, the improvement for writing information comprising:

a memory array having data lines, including a plurality of nonvolatile semiconductor memory cells which can be erased and electrically written into;

external terminal means for receiving serially applied input signals to be written into the memory array;

a converter means having an input coupled to said external terminal means and having a plurality of outputs, said converter means responding to said serially applied input signals for converting said signals into a plurality of parallel produced output signals;

a select signal means for providing first select signals; and

a selector means controlled by said select signal means and having inputs corresponding in number and coupled to the respective outputs of said converter means, and having outputs greater than the number of the converter means outputs and represented by said data lines of the memory array, for providing said plurality of the parallel produced output signals to said data lines.

4,691,299

METHOD AND APPARATUS FOR REUSING NON-ERASABLE MEMORY MEDIA

Ronald L. Rivest, Arlington, Mass., and Adi Shamir, Rehovot, Israel, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

PCT No. PCT/US82/00564, § 371 Date Dec. 29, 1983, § 102(e) Date Dec. 29, 1983
PCT Filed Apr. 30, 1982, Ser. No. 565,210
Int. Cl.⁴ G11C *13/00*
U.S. Cl. 365—189 **16 Claims**

1. Apparatus for writing a plurality of times in a non-erasable memory comprising

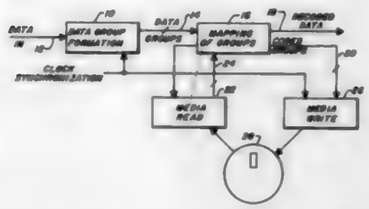
means for receiving incoming digital data and for forming sequential groups from said received data,

means for reading successive groups of digital data from successive groups of positions in the non-erasable memory,

means responsive to each said formed sequential group and to a respective read successive group from memory for generating successive new coded groups of digital data, and

means for sequentially writing into said memory each said

group of data at a said group of positions corresponding to said respective read group of data,



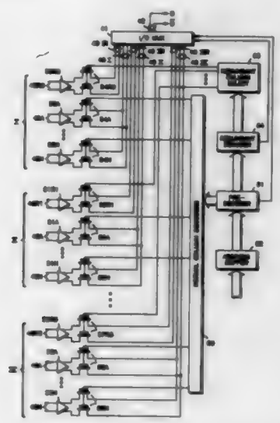
whereby said coded groups of data can be later read and uniquely decoded to generate said formed sequential groups.

4,691,300

REDUNDANT COLUMN SUBSTITUTION ARCHITECTURE WITH IMPROVED COLUMN ACCESS TIME

Perry H. Pelley, III, and Alan Lewandowski, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1985, Ser. No. 811,856
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—200 **4 Claims**



1. In a memory device having a predetermined number of normal columns of storage elements and a predetermined number of redundant columns of storage elements, a redundant column substitution apparatus comprising:

a multiplexer having inputs coupled to said normal and redundant columns of storage elements and outputs coupled to data pins of said memory device, said multiplexer being responsive to a control input to select one of said normal columns and said redundant columns;

first switch means interposed between said normal columns of storage elements and said multiplexer for selectively connecting at least one of said normal columns to said multiplexer;

second switch means interposed between said redundant columns of storage elements and said multiplexer for selectively connecting at least one of said redundant columns to said multiplexer;

normal column decoder means for receiving an address and for operating said first switch means

redundant decoder means for receiving an address, determining whether said address corresponds to a defective normal column of storage elements and providing at least one output signal in response to an address corresponding to such a defective normal column; and

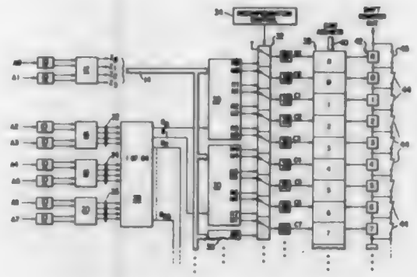
redundant column select means responsive to said at least one output signal received from said redundant decoder means and for operating said second switch means.

4,691,301

SEMICONDUCTOR MEMORY WITH REDUNDANT COLUMN CIRCUITRY

Daniel F. Anderson, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 693,417, Jan. 22, 1985, Pat. No. 4,598,388. This application Jun. 20, 1986, Ser. No. 876,619
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—200 **9 Claims**



1. A fault-tolerant memory device, comprising:

an array of addressable read/write memory cells, said memory cells arranged in rows and columns, said columns having addresses ranging from a first limit to a second limit;

row decode means, responsive to a row address signal, for selecting a row of memory elements in said array;

column decode means, responsive to a column address signal, for selecting a column of memory elements in said array, said column decode means having an output corresponding to each column in said array, said column decode means providing a decode signal at the output corresponding to said column address signal;

output means for presenting the contents of the memory cell at the intersection of said selected row and selected column;

a redundant column of memory cells;

redundant column enable means having a first position and a second position, said redundant column enable means in its first position for disabling said redundant column, and in its second position for enabling said redundant column responsive to the output of said column decode means corresponding to said first limit;

column enable means, for each column in said array, said column enable means having a first position and a second position, said column enable means in its first position for enabling its associated column responsive to the corresponding output of said column decode means, and in its second position for enabling its associated column responsive to the output of said column decode means corresponding to the column having the column address adjacent thereto in the direction toward said second limit;

disable means for disabling a column, said column having a fault therein; and

redundancy control means, for causing the column enable means for each column having a column address between said first limit and the address corresponding to said disabled column to be placed in its second position and for causing said redundant column enable means to be placed in its second position;

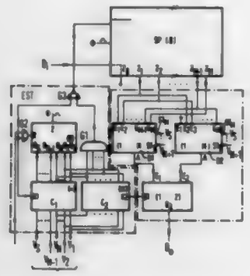
wherein said column enable means for each column having a column address between the address corresponding to said disabled column and said second limit said array is in its first position.

4,691,302

CIRCUIT ARRANGEMENT COMPRISING A MATRIX-SHAPED MEMORY ARRANGEMENT FOR VARIABLY ADJUSTABLE DELAY OF DIGITAL SIGNALS

Hans J. Mattausch, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 890,115
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531598
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—240 **8 Claims**



1. A circuit arrangement comprising:

a matrix-shaped memory for variably adjustable delay of data signals, said memory including a plurality of memory cells arranged in columns and rows,

each of said memory cells comprising a pair of inverters each including an input and an output with the input of each inverter connected to the output of the other inverter and defining a pair of junctions, and a pair of switching transistors each including a control electrode and a controlled-conduction path connected to a respective junction,

a write word line and a read word line per row of said matrix-shaped memory, and

a write bit line and a read bit line per column of said matrix-shaped memory;

said write word line and said read word line of each respective row connected to respective control electrodes of said switching transistors of all memory cells of that row;

said write bit line and said read bit line of each of said columns connected to the controlled-conduction paths of respective transistors opposite respective junctions of each memory cell of that column;

an input data clocked row selector comprising a pluralilty of serially connected stages, said row selector being continuously steppable and arbitrarily resettable at any time, said row selector comprising two signal outputs per stage which are offset in phase relative to one another and respectively connected to and for selecting the write word line and a read word line of a respective row of memory cells, each of said stages of said row selector including a reset input connected to a common reset input for receiving a row selector reset signal, the first stage of this series further including a set input connected to said common reset input for receiving a row selector input signal to set the row selector to the respective row of memory cells;

a plurality of disconnectible storage amplifiers, each of said amplifiers including an input connected to the read bit line of the respective column and an output connected to the write bit line of the adjacent column and further serving as a delayed data output;

a data input for receiving data signals to be delayed connected to the write bit line of a first column and also serving as an undelayed data output;

a column selector for selecting columns of said matrix-shaped memory, said column selector comprising a plurality of data inputs connected to the undelayed data outputs, a delay setting input for receiving a portion of a delay time setting word defining a selection of a column, a control signal input for receiving a control signal, and switching means operable in response to said control signal to select the column corresponding to the time delay defined by said portion of the delay time setting word; and

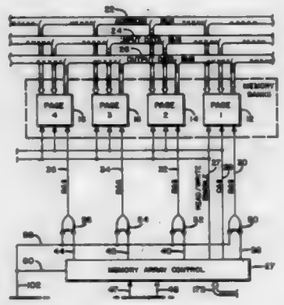
a data clock control means including an input for receiving the complete delay time setting word, an input for receiving an external reset signal, a control signal output connected to said control signal input of said column selector, a reset output connected to said common reset input of said row selector, and means responsive to said external reset signal and to said delay time setting word to reset said control means and said row selector.

4,691,303

REFRESH SYSTEM FOR MULTI-BANK SEMICONDUCTOR MEMORY

Reed R. Churchward, Apple Valley, and Thomas L. Krocheski, Burnsville, both of Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Oct. 31, 1985, Ser. No. 793,519
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—222 **4 Claims**



1. A refresh system for a dynamic memory comprising at least one memory bank having memory cells arranged in rows and columns that are all to be refreshed during a memory refresh rate period comprising,

refresh timing means that repeatedly supplies a row refresh request at a row timing rate, which when multiplied by all of the rows of said memory to be refreshed equals a time period which is approximately equal to said memory refresh rate period,

busy detect means which signals when said memory is currently busy due to said memory accessed for reading or writing,

refresh supply means for supplying said row refresh request to groups of rows of said memory in a sequential cyclic manner to refresh said rows, wherein each group of rows comprises at least one row of said memory,

refresh lock-out means responsive to said busy detect means which prevents said row refresh request from being supplied by said refresh supply means during a lock-out per-

iod that lasts for an integral number of row timing rate periods, up to a predetermined maximum number of periods, while said memory remains busy, and

refresh burst timing means which supplies a burst of row refresh requests during a subsequent memory not busy burst interval to refresh a number or groups of said row up to said maximum number of consecutive row timing rate periods, which were locked-out from refresh by said refresh lock-out means during the time frame that proceeded said burst interval.

4,691,304

SEMICONDUCTOR DEVICE HAVING AN ARRANGEMENT FOR PREVENTING OPERATIONAL ERRORS

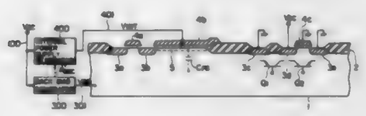
Ryoichi Hori, Tokyo, and Kiyoo Itoh, Higashikurume, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,092

Claims priority, application Japan, May 30, 1984, 59-108365

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—226 **18 Claims**



1. A semiconductor device formed on a semiconductor chip comprising:

a plurality of circuits formed on the semiconductor chip;

a voltage transformation means formed on the chip including means for transforming an external power supply voltage supplied from an external power supply into a predetermined internal power supply voltage;

means for coupling said predetermined internal power supply voltage generated by said voltage transformation means to predetermined ones of said circuits; and

means for delaying a starting time for an increase of said internal power supply voltage at a moment when said external power supply is switched on to start later than the starting time of an increase of said external power supply voltage, and/or for increasing a time necessary for said internal power supply voltage to rise to a predetermined internal voltage operational value to be longer than a time necessary for said external power supply voltage to rise to a predetermined external voltage operational value.

4,691,305

AUTOMATIC ATTENUATOR FOR SONOBUOYS

John H. Kuck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Air force, Washington, D.C.

Filed Sep. 5, 1985, Ser. No. 772,814

Int. Cl.⁴ H04B *11/00*

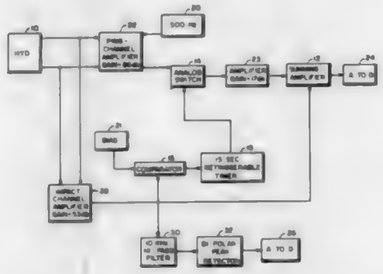
U.S. Cl. 367—3 **10 Claims**

1. In combination with a sonobuoy containing a hydrophone which detects first and second acoustic signals, said first acoustic signal having a relatively low amplitude when compared to said second acoustic signal, said sonobuoy having a radio frequency transmitter which transmits information by modulating a carrier with a first and second data stream, an automatic attenuator receiving all signals detected by said hydrophone and outputting said first acoustic signal in the form of said first data stream to said radio frequency transmitter while waiting for said second acoustic signal, said automatic attenuator conducting said second acoustic signal in the form of said first and second data streams to said radio frequency transmitter after said second acoustic signal is detected and verified while ceasing to output said first acoustic signal over said first data stream, said automatic attenuator comprising:

first and second signal channels each receiving acoustic signals from said hydrophone, said first signal channel isolating said first acoustic signal and producing an output signal by applying a high gain and narrow passband to acoustic signals received from said hydrophone;

said second signal channel isolating said second acoustic signal and producing said second data stream by applying a medium gain and peak detection to acoustic signals received from said hydrophone;

a means for summing the output signal of said first signal channel when available, with said second acoustic signal



from said second signal channel, said summing means thereby producing said first data stream; and

a means for switching said first signal channel off, said switching means being electrically connected to said summing means and said first and second signal channels, said switching means receiving and comparing all acoustic signals received by said second signal channel to a bias signal, said bias signal being a signal having a level relative to expected amplitudes in comparison with said second acoustic signal, said switching means switching off said first signal channel when said second acoustic signal is detected and verified so that the first data stream produced by the summing means does not contain said first acoustic signal.

4,691,306

METHOD FOR THE PROCESSING OF RECORDINGS OF SIGNALS RESULTING FROM A SEISMIC EXPLORATION OF A MEDIUM

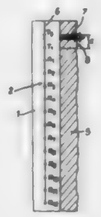
Georges Arens, Croissy S/Seine, and Philippe Staron, Mennecy, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoi, France

Filed Jul. 12, 1985, Ser. No. 754,436

Claims priority, application France, Jul. 18, 1984, 84 11341

Int. Cl.⁴ G01V *1/00*; G06F *7/48*

U.S. Cl. 367—40 **15 Claims**



1. Method for the processing of recordings of signals resulting from a transmission and a reception of acoustic waves propagating into a medium, comprising the steps of:

grouping the recordings in pairs such that in each pair the two recordings correspond to two acoustic paths including at least one non-common part defining a measuring space and at least one common part;

cross correlating the two recordings of each pair in order to obtain an elementary cross correlation function defining the time taken by the waves of the said pair to travel through the measuring space;

grouping the elementary cross correlation functions in at least one family in which the measuring spaces are included in a same predetermined reference space;

transforming the time variable of the elementary cross correlation functions in order to bring the dimension of their measuring space to the dimension of the reference space;

adding all the transformed cross correlation functions in order to form a sum cross correlation function of which the abecissas of the useful lobes represent the propagation time of the waves over the reference space.

4,691,307

AGC CIRCUIT FOR TELEVIEWER

Frederick H. K. Rambow, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 459,443, Jan. 20, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,770

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 367—69 **18 Claims**

1. A system for acoustically mapping the wall of a borehole, comprising:

(a) a borehole televiewer including an acoustical transducer moveable within the borehole for transmitting successive acoustic signals toward successive portions of the borehole wall,

(b) circuit means in said borehole televiewer coupled to said transducer to cause said transducer to produce a sequence of acoustic pulses,

(c) amplifier means coupled to said transducer to produce a signal whose amplitude is related to the amplitude of the acoustic signal that is reflected from the borehole wall and received by said transducer, and

(d) amplitude gain control means coupled to said amplifier means to automatically control the amplitude of the output signal of said amplifier means at least in part as a known function of said received acoustic signal amplitudes, said function including rise and decay characteristics selected for compensating for geometrically induced cyclical variations in the received acoustic signal amplitude to avoid obscuring borehole wall anomalies while simultaneously protecting said amplifier from saturating, and thereby providing accurate representations of substantially the entire wall of the borehole portion being mapped.

4,691,308

APPARATUS FOR REPRODUCING INFORMATION FROM MAGNETOOPTICAL RECORDING MEDIUM

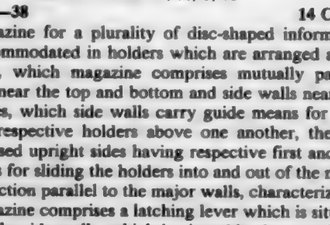
Akihiro Takagi, Kawasaki, and Kiyoshi Kimoto, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,186

Claims priority, application Japan, Apr. 19, 1984, 59-79280; Jun. 21, 1984, 59-128118

Int. Cl.⁴ G11B *11/10*

U.S. Cl. 369—13 **13 Claims**



9. An apparatus for irradiating a magnetooptical recording medium with a linearly polarized light beam and detecting the light from said medium, comprising:

(a) optical means for dividing the light from said medium into two light components having different planes of polarization, said optical means dividing the light from said medium in such a manner that the average intensity of one of said two light components is stronger than that of the other;

(b) first converting means for converting said one of said two light components into a first electrical signal with a determined amplification factor;

(c) second converting means for converting said other of said two light components into a second electrical signal, said second converting means comprising an avalanche photodiode; and

(d) control means for controlling said second converting means in such a manner that the amplification factor thereof becomes higher than said determined ampification factor, said control means including means for applying a voltage to said avalanche photodiode.

4,691,309

MAGAZINE FOR DISCS IN HOLDERS, AND COMBINATION OF A DISC-PLAYER WITH SUCH A MAGAZINE

Yukio Suzuki, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1985, Ser. No. 753,199

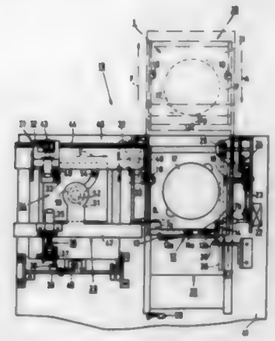
Claims priority, application Japan, Jul. 11, 1984, 59-103688[U]; Jul. 14, 1984, 59-105825[U]; Jul. 20, 1984, 59-108998[U]

Int. Cl.⁴ G11B *17/00, 5/48*

U.S. Cl. 369—38 **14 Claims**

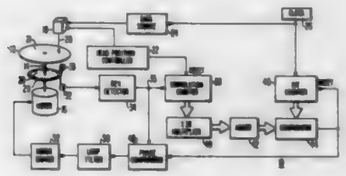
1. A magazine for a plurality of disc-shaped information carriers accommodated in holders which are arranged above one another, which magazine comprises mutually parallel major walls near the top and bottom and side walls near two opposite sides, which side walls carry guide means for positioning the respective holders above one another, the two further opposed upright sides having respective first and second openings for sliding the holders into and out of the magazine in a direction parallel to the major walls, characterized in that the magazine comprises a latching lever which is situated near one of the side walls, which is pivotable about a pivotal axis which extends substantially perpendicularly to the major walls and which comprises two arms, which are situated on the opposite sides of the pivotal axis, which arms carry respective first and second latching elements near respective first and second openings, which latching lever is urged into a first position by spring means in which position the latching ele-

ments latches the holders in the magazine, which arms can each be actuated externally of the magazine to pivot the latching lever against the force of the spring means from the first position to a second or a third position, in which second and third position the holders can be slid through the first and the



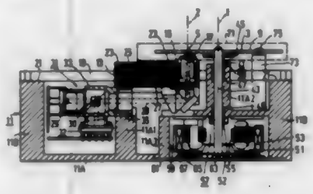
second opening respectively, whilst in the second position and in the third position of the latching lever the second and the first latching element near the second and the first opening, respectively, are situated in a stop position in which they block the relevant opening for the passage of the holders.

4,691,310
COMPACT DISK READ ONLY MEMORY RECORDING SYSTEM WITH SPEED CONTROL
Charles M. Wine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Aug. 9, 1985, Ser. No. 763,969
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—50 **12 Claims**



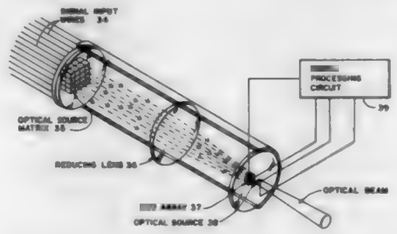
1. A computer data recording system for recording information comprising bits of data in a spiral track on a recording surface of a rotating disk by a recording head moving radially with respect to the axis of rotation of said disk, said system comprising:
- means for determining the radial position of said recording head;
- means for determining the optimal number of bits of data to be contained in the convolution of said spiral track at the determined radial position;
- means for counting the number of data bits provided from said recording head to said recording surface at said convolution; and
- means for controlling the speed at which said disk rotates in response to a comparison of the optimal number of data bits and the number of data bits provided from said recording head for said convolution.

4,691,311
DISC READING APPARATUS WITH DISC SHOOT JOURNALED IN FRAME
Gerardus L. M. Jansen, Colorado Springs, Colo.; Hearicus J. Smulders, and Pieter D. Schuitmaker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 8, 1985, Ser. No. 752,885
Claims priority, application Netherlands, Jul. 10, 1984, 8402176
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—100 **6 Claims**



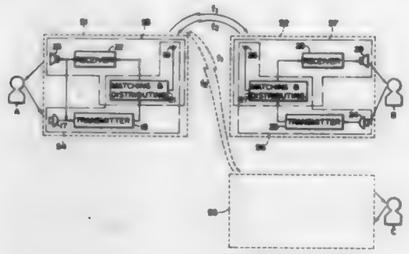
1. An apparatus for reading or writing information on an information surface of a rotating disc, said apparatus comprising
- a one piece frame,
- an electric motor having a motor shaft which is rotatable about an axis of rotation and which carries a turntable for the disc, said shaft being journalled in bearing means received directly in said frame,
- a lens system driving device which is movable parallel to the information surface, said driving device being supported by guide means secured directly to said frame,
- a lens system supported by said driving device for movement relative to said driving device in a direction substantially perpendicular to said information surface, said lens system having an optical axis parallel to the axis of rotation of said motor shaft.

4,691,312
DATA TRANSMISSION SYSTEM
Weldon R. H. Vlasak, Van Nuys, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.
Filed Aug. 10, 1984, Ser. No. 639,635
Int. Cl.[4] H04J *3/00*; H04B *9/00*
U.S. Cl. 370—4 **4 Claims**



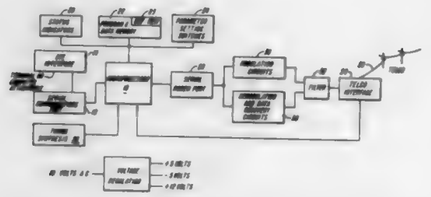
3. A data transmission system comprising: a wire cable; an optical source matrix to produce outputs corresponding to the outputs of said cable; a charge coupled device array; a reducing lens to focus the outputs of said optical source matrix onto said charge coupled device array; a signal processing circuit to scan said charge coupled device array; an optical source to be actuated by said charge coupled device array; an optical fiber having an input end positioned to receive the light output of said optical source; and demultiplex means at the ouput of said optical fiber to demultiplex light emanating therefrom.

4,691,313
WIRELESS TALKING APPARATUS
Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1985, Ser. No. 688,565
Claims priority, application Japan, Nov. 9, 1984, 59-236033
Int. Cl.[4] H04B *1/50*
U.S. Cl. 370—30 **10 Claims**



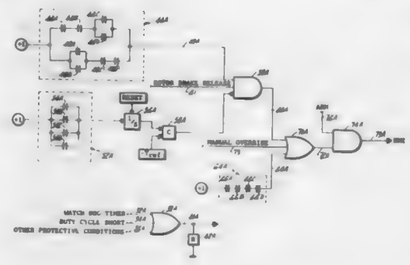
1. A wireless talking apparatus for simultaneous talking comprising:
- a main communication device including a microphone for producing a first voice signal, a transmitter for modulating a carrier wave of a frequency f_1 by the first voice signal and for transmitting a modulated carrier wave of the frequency f_1, a receiver for receiving a modulated carrier wave of a frequency f_2 and for demodulating the modulated carrier wave of the frequency f_2 to produce a second voice signal, and means connected between the transmitter and the receiver for applying the seond voice signal from the receiver to the transmitter to enable the transmitter to modulate the carrier wave of the frequency f_1 not only by the first voice signal but also by the second voice signal; and
- a subsidiary communication device including a transmitter for transmitting a modulated carrier wave of the frequency f_2 to the main communication device, and a receiver for receiving the modulated carrier wave of the frequency f_1 modulated by the first voice signal and the second voice signal from the main communication device.

4,691,314
METHOD AND APPARATUS FOR TRANSMITTING DATA IN ADJUSTABLE-SIZED PACKETS
Lewis A. Bergins, Millis; Anthony P. Amundson, Holliston, and Jerry Falk, Medway, all of Mass., assignors to Microcom, Inc., Norwood, Mass.
Filed Oct. 30, 1985, Ser. No. 792,757
Int. Cl.[4] H04J *3/24, 3/16*
U.S. Cl. 370—94 **20 Claims**



1. A method of transmitting data in packets in a data telecommunications system, said system including an initiating unit of data terminal equipment and a receiving unit of data terminal equipment, a first modem connected between the initiating unit and communication lines and a second modem connected between said receiving unit and said communication lines, said method comprising the steps of:
- transmitting a stream of data characters from said initiating unit to said first modem for transmission over communication lines to said second modem;
- dividing said data stream received by said first modem into packets of data with each packet including additional, identifying data;
- transmitting one data packet or one group of data packets at a time from said first modem to said second modem over communication lines;
- checking data in said transmitted data packets for errors, and when an error is detected retransmitting said data packet;
- incrementing a counter representing a number of retransmissions of data packets or groups of data packets for each data packet or group of data packets that is retransmitted;
- incrementing a counter representing a number of transmissions of data packets or groups of data packets for each data packet or group of data packets that is transmitted;
- determining an optimum packet size based on a ratio of retransmissions to transmissions.

4,691,315
BACKUP CONTROL SYSTEM (BUCS)
Richard D. Murphy, Trumbull, and William C. Fischer, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 22, 1985, Ser. No. 715,132
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 **4 Claims**



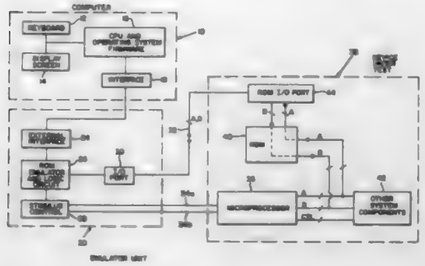
1. In a computer system (10) having at least two identical processors (12) and controlling a device (24), a method of providing control over the device comprising:
- installing identical primary software in a portion (18) of memory (16) associated with each processor (12), said primary software directing the operation of the processors to control the device during normal operation;
- installing backup software, dissimilar from the primary software, in an isolated portion (20) of memory (16) associated with at least one of the processors (12), said backup software capable of directing the operation of the processor(s) to control the device in the event of a sensed fault in the primary software affecting all processors;
- sensing the fault in the primary software affecting all processors;
- disabling the primary software and activating the backup software in response to sensing the fault in the primary software so as to maintain control over the device with the backup software associated with the at least one processor.

4,691,316

ROM EMULATOR FOR DIAGNOSTIC TESTER

Charles R. Phillips, Portland, Oreg., assignor to Support Technologies, Inc., Tigard, Oreg.

Filed Feb. 14, 1985, Ser. No. 701,770
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—20 **10 Claims**



1. Apparatus for testing an electronic system, said including a microprocessor and at least one ROM connected together by at least address and data busses, respectively, comprising:

(a) a programmable ROM emulator connected to said electronic system through a ROM input-output port for bi-directionally communicating with said microprocessor in place of said ROM;

(b) computer means connected to said ROM emulator for inserting test programs into said ROM emulator to be executed by said microprocessor; and

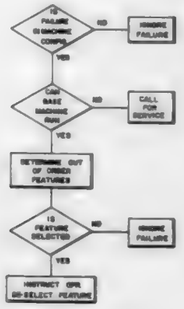
(c) logic circuit means in said ROM emulator connected to a bus from said ROM input-output port in communication with said microprocessor for reading the results of the said test programs in the form of test data signals.

4,691,317

FEATURE DESELECT CONTROL

Dennis E. Miazga, Fairport, and James J. Petery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,144
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 371—20 **6 Claims**



1. In a xerographic printing machine having a photoreceptor and a plurality of operating components cooperating with one another to produce images on support material, the operating components cooperating in various configurations to produce the images, and including a control panel providing an operator with the means to select the various machine features, various combinations of the features providing different machine configurations, some of the features being essential to producing images on the support material, other of the features only being essential in selected configurations to produce images on the support material, and a control having a fault location segment to identify machine malfunctions, the method of defeaturing the machine to continue operation upon the detection of a fault by the control comprising the steps of:

recognizing the existence of a machine malfunction in the control,

isolating the malfunction to a particular machine feature in a particular machine configuration,

determining that the malfunction is not essential to the production of images on copy sheets in all machine configurations,

determining that the machine feature associated with the identified malfunction has been selected by the operator at the control panel, and

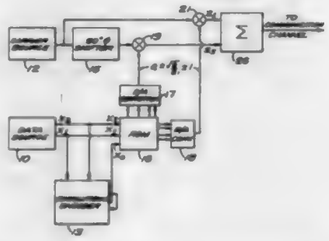
providing a message on a display at the control panel to deselect the machine feature associated with the identified malfunction.

4,691,318

DATA TRANSMISSION SYSTEM WITH ERROR CORRECTING DATA ENCODING

Alan W. Estenman, Bohemia, N.Y., assignor to Radyne Corporation, Bohemia, N.Y.

Continuation of Ser. No. 472,234, Mar. 4, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 878,392
Int. Cl.⁴ G06F *11/12*
U.S. Cl. 371—43 **1 Claim**



1. In combination in multiphase data communications apparatus for transmitting digital information, transmitter means for supplying at least one digital information data stream x_1, convolutional encoding means having an output bit stream x_0 for performing a continuous, non-block error correcting encoding on said data stream x_i and on its own output x_0 given by

$$x_0 = x_i G_i + x_0 G_0$$

where G_i and G_0 are independent Boolean expressions relating values over plural digit intervals of x_i and x_0 respectively to x_0, and signalling means coincidentally modulated by the x_0 output of said convolutional encoding means and by the digital information x_i supplied by said source thereof for disseminating plural carriers of different phases said carriers attaining one of more than four states, and receiving means connected to said signalling means for receiving the digital information from the output of said signalling means, said receiver means including decoder means, including delay means, each connected to the output of said signalling means for providing a first output signal if the expression

$$0 = x_i G_i + x_0(1 \pm G_0)$$

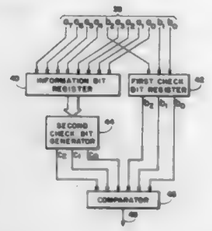
is satisfied and a different signal if such expression is not satisfied, and syndrome error detecting and correcting means enabled responsive to the output of said decoding means for selectively inverting the output of said received information depending upon the error state reported thereto by said decoding means.

4,691,319

METHOD AND SYSTEM FOR DETECTING A PREDETERMINED NUMBER OF UNIDIRECTIONAL ERRORS

Bella Bose, 4002 NW. Witham Hill Dr., No. 108, Corvallis, Oreg. 97330, and Der J. Lin, Corvallis, Oreg., assignors to Bella Bose, Corvallis, Oreg.

Filed Jun. 18, 1985, Ser. No. 746,109
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—54 **8 Claims**



1. In a data transmission system having a data source for producing an n-bit information code, a data sink for accepting a data word, and a data transmission channel for transmitting a data word from said data source to said data sink, a system for detecting at least t unidirectional errors in the transmission of said information code over said data transmission channel, comprising:

(a) first code generation means, associated with said data source, for producing, for a given information code in a predetermined set of n-bit information codes produced by said data source, a first m-bit check code according to the criteria that for all possible pairs of (n+m)-bit data words formed by said predetermined set of n-bit information codes and corresponding m-bit check codes, either the pair of words is unordered or the Hamming distance between the data words of the pair is greater than or equal to t+1, and there is at least one pair of said data words which is unordered and whose Hamming distance is less than t+1;

(b) transmission means for transmitting over said transmission channel a data word comprising an information code and its corresponding first check code;

(c) second code generation means, associated with said data sink, for producing, for a given information code accepted by said data sink, a second m-bit check code according to said criteria; and

(d) comparator means, associated with said data sink, for comparing, for a given data word accepted by said data sink, said first check code and said second check code and producing an indication of any disparity therebetween.

4,691,320

SEMICONDUCTOR STRUCTURE AND DEVICES

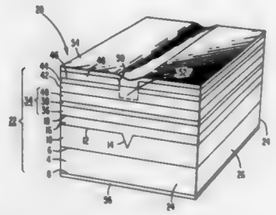
Nancy A. Dinkel, Spotswood; Bernard Goldstein, Princeton, and Michael Ettenberg, Freehold, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 11, 1985, Ser. No. 710,274
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **15 Claims**

1. A semiconductor structure comprising a substrate having first and second opposed major surfaces;

a buffer layer having a thickness greater than about 4 micrometers thick overlying the first major surface and having a surface with a channel therein, said channel having a depth less than the buffer layer thickness; and

a first clad layer overlying the buffer layer and the channel and having a substantially planar surface;



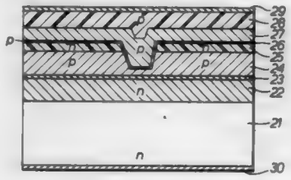
said substrate and said buffer layer being of one conductivity type with the resistivity of the buffer layer being substantially the same or less than the resistivity of the substrate.

4,691,321

SEMICONDUCTOR LASER DEVICE HAVING CURRENT CONFINING AND BUILT-IN WAVEGUIDE STRUCTURE

Nawoto Motegi, Kanagawa; Yukio Watanabe; Naohiro Shimada, both of Yokohama, and Masaki Okajima, Kunitachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 26, 1984, Ser. No. 686,478
Claims priority, application Japan, Dec. 26, 1983, 58-246148
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—46 **21 Claims**



1. A semiconductor laser device having a resonant cavity, said device comprising:

a substrate;

a first clad layer of a first conductive type formed on one surface of said substrate;

an active layer formed on said first clad layer;

a second clad layer of a second conductive type formed on said active layer and having a groove portion;

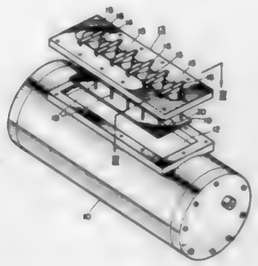
a first current confining layer of said first conductive type covering said second clad layer and having a strip shape opening corresponding to said groove portion;

a first coating layer of said second conductive type covering said current confining layer and said opening having a refractive index larger than the refractive index of said second clad layer;

a second coating layer of said second conductive type covering said first coating layer and having a refractive index smaller than the refractive index on said first coating layer; and

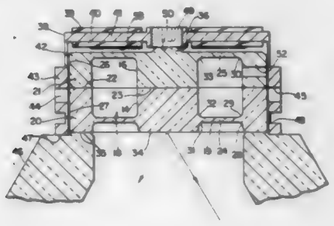
a pair of electrodes attached to said second coating layer and said substrate respectively.

4,691,322
GAS LASER DEVICE
Yasuhiro Nozue, Yokohama; Koichi Kajiyama, and Kazuaki Sajiki, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Jan. 22, 1986, Ser. No. 820,802
Claims priority, application Japan, Jan. 22, 1985, 60-9629
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—82 **8 Claims**



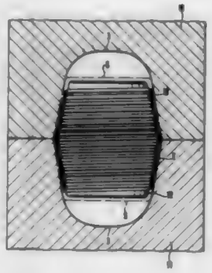
1. In a gas laser device of the type having an upper discharge electrode and a lower discharge electrode which is disposed to confront with said upper discharge electrode beneath a cover member for sealing a laser chamber and a plurality of capacitors arranged along the longitudinal direction of said discharge electrodes, wherein electric discharge is created between said discharge electrodes by a charged voltage of said plurality of capacitors so as to excite laser gas between said discharge electrodes, the improvement wherein a recess is formed on the upper surface of said cover member for accommodating said plurality of capacitors.

4,691,323
PATH LENGTH CONTROLLER FOR RING LASER GYROSCOPE
Bo H. G. Ljung, Wayne, and Walter J. Krupick, Succasunna, both of N.J., assignors to The Singer Company, Stamford, Conn.
Filed Jun. 11, 1984, Ser. No. 619,227
Int. Cl.⁴ H01S *3/08, 3/083;* G01B *9/02*
U.S. Cl. 372—107 **1 Claim**



1. A ring laser gyro path length controller comprising:
an actuator fixture having a mounting surface connected to a gyro block;
a mirror assembly having a projection formed thereon, the assembly located within the fixture and independently connected to the block for permitting independent assembly and disassembly of the assembly from the fixture;
a mirror means formed in the assembly for reflecting laser beams along predefined paths in the block;
actuator means mounted to the fixture for selectively deflecting a portion of the fixture; wherein
displacement of the deflecting fixture portion causes translated deflection of the mirror means, and wherein
the mirror assembly comprises:
a first disc having first and second transverse surfaces, the first surface being substantially planar and the second surface having an annular recess formed therein so as to define the mirror means at the center of the surface, a remaining portion of the first surface being coplanar with the mirror means and forming a connection joint for connection with the block; and
a second disc having first and second transverse surfaces, the first surface being substantially planar and attached to the first surface of the first disc to form a unitary structure, and wherein
the first and second discs have annular recesses formed in their first surfaces, the recesses being complementary thereby forming an enclosed annular space within the assembly which radially bounds a central hub of the assembly and defines transverse diaphragm sections in spaced coaxial relation for permitting deflection of the mirror means.

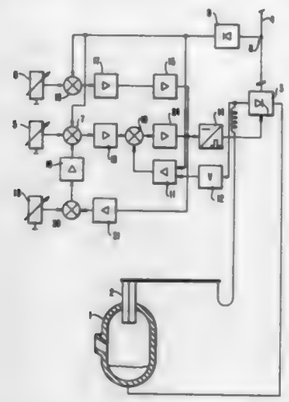
4,691,324
ELECTRODE CONNECTION
Günter Kraus, Ehekirchen, Fed. Rep. of Germany, assignor to Sigri GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany
Filed Feb. 26, 1986, Ser. No. 833,846
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506908
Int. Cl.⁴ H05B *7/14*
U.S. Cl. 373—91 **9 Claims**



1. Electrode connection between sections of carbon or graphite electrodes in whose faces are sunk, for the accomodation of double-conical threaded nipples with flat faces, threaded sockets of truncated-cone shape, a cone envelope enveloping the socket thread, and rotation-symmetrical recesses emanating from the socket base, wherein
(a) principle sections of the rotation-symmetrical recesses are defined by curves of the second or higher order,
(b) transition between the envelope of the socket thread and the defining curve is a continuously differentiable curve, and
(c) the defining curve forms right angles with a normal erected at the base of the envelope and with an axis of symmetry of the principle section.

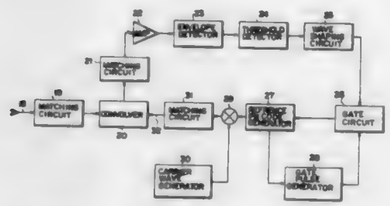
4,691,325
CONTROL APPARATUS FOR A DIRECT CURRENT ARC FURNACE
Claude Boisdon, Avon, France, assignor to Jeumont-Schneider Corporation, Puteaux cedex, France
Filed Feb. 20, 1986, Ser. No. 831,658
Claims priority, application France, Feb. 21, 1985, 85 02482
Int. Cl.⁴ H05B *7/148*
U.S. Cl. 373—108 **10 Claims**

1. Control apparatus for an arc furnace having at least one electrode powered with direct current from an alternating electric power source through a controlled-rectifier converter, comprising fast-response control loop means coupled to a control input means of said converter for adjusting the operation of said converter in response to the reactive energy drawn



from said power source for stabilizing against rapid fluctuation in the reactive energy drawn from said power source, and a limiting circuit coupled to the control input means of said converter for limiting the current flow said converter passes to said electrode to a predetermined maximum intensity.

4,691,326
SPREAD-SPECTRUM COMMUNICATION SYSTEM
Masahiro Tsuchiya, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan
Filed Apr. 11, 1985, Ser. No. 722,720
Claims priority, application Japan, Apr. 17, 1984, 59-77789
Int. Cl.⁴ H04L *27/30*
U.S. Cl. 375—1 **1 Claim**



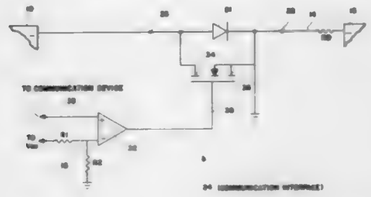
1. A receiver in a spread-spectrum communication system adapted to receive a signal which is modulated by a binary code modulated by a binary code or data, including a surface acoustic wave filter for detecting a correlation between the received signal and a signal modulated by a time-reversed reference binary code of said binary code, said receiver comprising:
first means for producing a correlation spike pulse from a correlation waveform signal with a relatively large amplitude when said binary code in said received signal supplied from said surface acoustic wave filter coincides with or has a small displacement from said reference binary code;
second means for selectively extracting a desired correlation spike pulse from said correlation spike pulses from said first means and producing a reset pulse therefrom; and
a code generator for producing said reference binary code and initialized by said reset pulse, wherein said first means include:
an amplifier for amplifying said correlation waveform signal;
an envelope detector for extracting a signal having an envelope waveform in an output signal from said amplifier;
a threshold detector for comparing the amplitude of said envelope waveform signal with a predetermined threshold and generating a pulse responsive to the result of the comparison;
and wherein said second means include:
a wave shaping circuit for shaping said pulse from said threshold detector into a pulse with a predetermined width;
said reference binary code being synchronized by a synchronizing pulse;
a gate pulse generator for generating a gate pulse from said pulse synchronizing said reference binary code; and
a gate circuit responsive to said gate pulse to selectively extract said pulse supplied from said wave shaping circuit.

4,691,327
CLOCK REGENERATOR
Bruno Wenger, Au, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany
Filed May 6, 1986, Ser. No. 860,273
Claims priority, application Switzerland, Jun. 10, 1985, 02440/85
Int. Cl.⁴ H04L *25/60*
U.S. Cl. 375—4 **3 Claims**

1. A clock regenerator comprising:
a programmable divisor circuit which is connected to the output of an oscillator and having as an output a regenerated signal;
a comparator circuit having a received input eye signal for transforming said input eye signal into input pulses;
a phase detector for comparing the regenerated signal with the input pulses by means of an oscillator signal from said oscillator and which provides a lead signal and a lag signal, said phase detector being configured as a phase locked loop having an oscillator frequency of approximately N times higher than the regenerated frequency; and
a loop filter controlled by the lead and lag signals, wherein:
the loop filter comprises a first logic circuit which delivers an information signal, a reset signal and control signals;
a second logic circuit which receives the lead and lag signals and the information signal to indicate the sign and, the direction of the counting status and which provides a counter clock signal and a count direction signal for a counter having a reset input for receiving the signal, and wherein said first logic circuit has an input connected to the output of the counter, and wherein the regenerated signal has at least one delayed signal delayed by L/N periods where L is a low integer, to derive from the delayed signal a pulse window having at least three zones; and output signals of the phase detector represent which zone includes the edge of the input signal; and
first logic circuit for controlling the programmable divisor such that, when the edges of the input pulses fall in the most central zone of the three zones, the counter counts

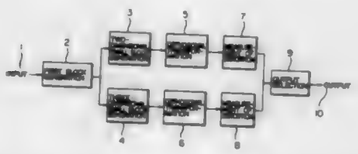
toward zero and no correction of the output signal is initiated, and wherein the status of said counter is stored in said first logic circuit.

4,691,328
ON-LINE SERIAL COMMUNICATION INTERFACE FROM A COMPUTER TO A CURRENT LOOP
Edward L. Sterling, Jr., Cleveland, and William L. Thompson, Montville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Aug. 12, 1985, Ser. No. 764,915
Int. Cl.[4] H04L *5/00*
U.S. Cl. 375—36 **6 Claims**



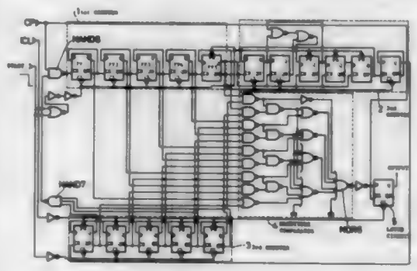
1. An on-line serial communication interface for a digital circuit for generating voltage pulses, to a current loop having lines for connecting a transmitter to a power supply to drain current from the power supply according to a process variable sensed by the transmitter, comprising:
- a diode connected in series in one of the lines of the current loop for establishing a voltage drop on the diode;
- an FET having a source and drain connected in parallel with the diode, said FET having a gate for receiving a voltage to render said FET conductive between its source and drain to short out said diode from applying its voltage drop to the one line; and
- a differential amplifier having an output connected to said FET gate, and two inputs, one of said inputs of said amplifier connected to the digital circuit for receiving the generated voltage pulses and the other input of said amplifier being connected to a selected voltage whereby said amplifier output receives voltage pulses synchronized with the generated voltage pulses from said digital circuit to render said FET conductive and non-conductive in synchronism with the voltage pulses.

4,691,329
BLOCK ENCODER
Tatsuro Juri, Hirakata; Akira Iketani, Higashiosaka; Chojuro Yamamitsu, and Akifumi Ide, both of Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 1, 1986, Ser. No. 880,992
Claims priority, application Japan, Jul. 2, 1985, 60-143914; Jul. 19, 1985, 60-160598
Int. Cl.[4] H04N *1/40, 7/12*
U.S. Cl. 375—122 **9 Claims**



1. A block encoder apparatus, comprising: first block generating means for constituting large-size blocks each composed of N sample points by dividing sample points of an image exhibiting continuity in three dimensional directions inclusive of a time-axis direction in a three-dimensional space; K varieties of second block generating means for dividing each of said large size blocks obtained by said first block generating means into small size blocks; block encoding means for generating K sets of block code words by block-encoding each of said K sets of small-size blocks obtained through said second block generating means; selecting means for selecting one set of the block code words from said K sets of the block code words obtained through said block encoding means; and transmitting means for transmitting said set of the block code words selected by said selecting means to receiver means and informing said receiver means of that one of said second block generating means which generated the transmitted set of the block code words.

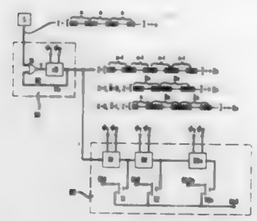
4,691,330
DUTY CONTROL CIRCUIT FOR GRADUALLY REDUCING THE DUTY TIME
Shinichiro Takahashi, and Isao Isshiki, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Mar. 26, 1986, Ser. No. 844,478
Claims priority, application Japan, Mar. 29, 1985, 60-44890[U]
Int. Cl.[4] H03K *21/00*
U.S. Cl. 377—39 **1 Claim**



1. A duty control circuit for controlling a duty factor, comprising:
- a first n-pulse counter for counting a series of pulses;
- a second m-pulse counter connected to said first counter so as to count one each time said first counter counts a predetermined number n;
- a third n-pulse counter connected to said second counter so as to count one each time said second counter counts another predetermined number m; and
- a magnitude comparator which comprises the count of said first counter with the count of said third counter and gives an output signal corresponding to ON when the count of said first counter is larger than, or equal to, the count of said third counter, and gives an output signal corresponding to OFF when the count of said first counter is smaller than the count of said third counter.

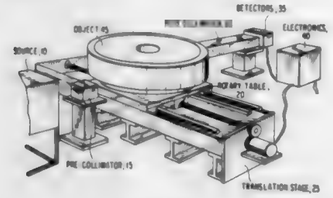
4,691,331
SELF-CORRECTING FREQUENCY DIVIDERS
Robert J. Bayruns, Middlesex, and Harry T. Weston, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 665,986, Oct. 29, 1984. This application Nov. 25, 1986, Ser. No. 935,170
Int. Cl.[4] H03K *21/00, 23/40*
U.S. Cl. 377—47 **24 Claims**

1. In combination:
- (a) a source of an n-bit counting stream of period equal to nT, where n is an integer greater than unity;
- (b) a two-input NOR gate having one of its two input terminals connected for receiving the n-bit counting stream from the source;
- (c) a delay device having n serially connected stages each arranged for delaying bit flow therethrough by an amount of time equal to T, said delay device having its input



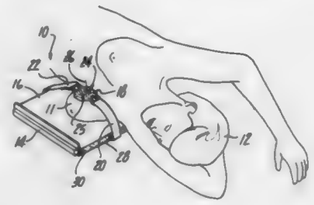
terminal connected for receiving the output of the NOR gate and its output terminal directly connected to the other input terminal of the NOR gate, whereby the output terminal of the delay device develops a 2n-bit counting stream.

4,691,332
HIGH ENERGY COMPUTED TOMOGRAPHY
Paul Burstein, Arlington; Allen Krieger, Lexington; Martin Annis, Cambridge, and Richard C. Chase, Tewksbury, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 474,937, Mar. 14, 1983, abandoned. This application Mar. 14, 1984, Ser. No. 589,443
Int. Cl.[4] G01N *3/02*
U.S. Cl. 378—7 **12 Claims**



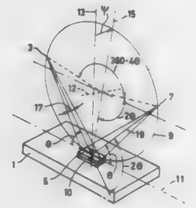
1. A system for a high energy CT imaging of targets of substantial size and density comprising:
- a source of penetrating radiant energy of energy in excess of one million electron volts,
- a plurality of radiant energy detectors spaced from said source,
- means for supporting a target of size and density substantially greater than a human body between said source and said detectors for relative movement in a direction transverse to an axis connecting said source and said detectors and for relative rotation about a second axis perpendicular to a plane including said source and said detectors, wherein the improvement comprises:
- collimating means for restricting an acceptance angle of said detectors to substantially less than 1 degree.

4,691,333
BREAST COMPRESSION AND NEEDLE LOCALIZATION APPARATUS
Joseph M. Gabriele, 846 Carole La., Fenton, Mich. 48430; George J. Sam, Sr., 22306 Grove Pt., St. Clair Shores, Mich. 48081; John N. Wolfe, 4707 E. St. Antoine, Detroit, Mich. 48210, and Navinchandra J. Parekh, 3159 Middlebury La., Birmingham, Mich. 48010
Filed Dec. 27, 1985, Ser. No. 817,568
Int. Cl.[4] A61B *6/04, 10/00;* **G03B** *42/02;* **H05G** *1/28*
U.S. Cl. 378—37 **20 Claims**



1. A breast compression device for use in mammographic radiological investigations comprising:
- a sleeve made of a material having a generally low level of x-ray attenuation and having an opening adapted to receive a mammographic film cartridge;
- a breast compression plate made of a material having a generally low level of x-ray attenuation and having a plurality of perforations disposed in a matrix;
- first and second flexible straps extending between and interconnecting said plate and said sleeve, said straps each being secured on one end to spaced locations on said breast compression plate and each of said straps being secured at spaced anchoring locations to said sleeve; and
- adjustment means included on at least one of said straps for adjusting the length of said straps extending between said plate and said sleeve and biasing said plate towards said sleeve to compress at least one breast between said plate and said sleeve.

4,691,334
X-RAY EXAMINATION APPARATUS
Ulrich M. E. A. Wolfstieg, Bad Herrenalb, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 11, 1984, Ser. No. 659,799
Claims priority, application European Pat. Off., Oct. 12, 1983, 83201456
Int. Cl.[4] G01N *23/207*
U.S. Cl. 378—71 **15 Claims**



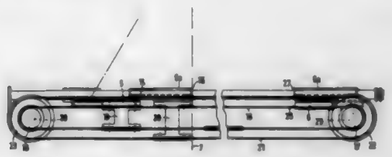
1. An X-ray examination apparatus comprising an X-ray source, an object receiving X-rays from said source, and an X-ray detector receiving X-rays from said object, the improvement comprising means for arranging said X-ray source, an irradiated area of said object, and a slit of said X-ray detector on a Seemann-Bohlin focusing circle, a mechanical shaft ex-

tending along a θ axis perpendicular to a focusing plane at the center of said Seemann-Bohlin focusing circle, said X-ray detector and a primary beam from said X-ray source being continually aimed at said irradiated area, and means for tilting said Seemann-Bohlin focusing circle transversely to said focusing plane about an axis through the center of said irradiated area to provide ψ inclination.

4,691,335
PRIMARY RADIATION DIAPHRAGM FOR X-RAY DIAGNOSTICS DEVICES

Gerhard Telorack, Aurachtal, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,245
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 8436281[U]
Int. Cl.[4] G21K 1/04
U.S. Cl. 378—152 **2 Claims**



1. A primary diaphragm for limiting x-radiation having a central ray emanating from an x-ray focus in an x-ray diagnostic installation, said primary diaphragm comprising:
- first and second pairs of diaphragm plates, the plates in each pair being in a common plane and said pairs being in spaced parallel planes perpendicular to said central ray;
- a first pair of wheels of a first diameter carried on separate spaced axles;
- a second pair of wheels of a second diameter also respectively carried on said spaced axles, said first diameter being smaller than said second diameter;
- a first belt entrained around said wheels of said first diameter and having upper and lower portions which move in opposite directions upon rotation of said axles respectively connected to said plates in said first pair of diaphragm plates in a plane farther from said x-ray focus for moving said plates in said first pair toward and away from each other; and
- a second belt entrained around said wheels of said second diameter and having upper and lower portions which move in opposite directions upon rotation of said axles respectively connected to said plates in said second pair of diaphragm plates in the plane closer to said x-ray focus for moving the plates in said second pair toward and away from each other, said first and second diameters being selected such that said second pair of plates in said plane closer to said focus are moved at a faster rate upon rotation of said axles than the plates in said first pair in the plane farther from said focus and the plates in the spaced planes overlapping at every plate position.

4,691,336
TELEPHONE TEST SET HAVING AN AUXILIARY AMPLIFIER AND SPEAKER FOR PERMITTING LISTENING TO LINE SIGNALS

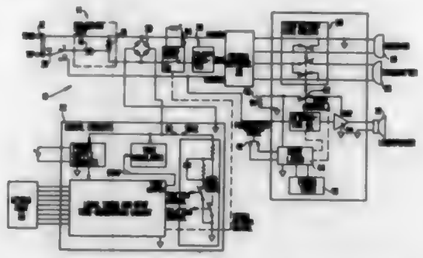
Thomas W. Durston, Camarillo, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 10, 1986, Ser. No. 917,480
Int. Cl.[4] H04M 3/22
U.S. Cl. 379—21 **10 Claims**

1. A telephone test set comprising:

means for coupling the test set to tip and ring lines of a telephone lines;

means for transmitting signals on the telephone line and means for receiving signals on the telephone line; the means for transmitting and the means for receiving being selectively coupled to the means for coupling;



selectively energizable amplifier means for amplifying signals appearing on the telephone line;

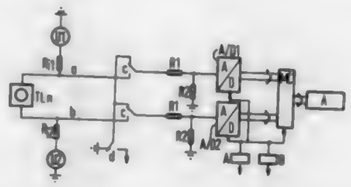
speaker means coupled to the amplifier means for reproducing signals appearing on the telephone line; and

control means for disabling the means for transmitting and the means for receiving when the amplifier means is energized to prevent acoustic feedback to the amplifier means.

4,691,337
METHOD AND APPARATUS FOR DETERMINING THE VALUE OF ANALOG VOLTAGES OCCURRING ON TELEPHONE SUBSCRIBER LINES OF A DIGITAL TELEPHONE EXCHANGE

Gabriele Held-Elbert, Lochhofen; Wolfgang Kaiser, Munich, and Werner Schmutzler, Fuerstenfeldbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,653
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515613
Int. Cl.[4] H04B 3/46
U.S. Cl. 379—24 **5 Claims**

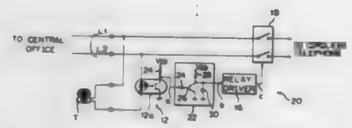


1. A method for determining the values of analog voltages occurring on subscriber lines of a preferably digital telephone exchange, particularly for the purpose of locating faults, characterized by the steps of scanning separately first and second analog voltage values prevalent at a point of a subscriber line circuit for ground potential at periodic intervals with reference to the two wires of a subscriber line and performing for each voltage value respectively an analog-digital conversion; storing the respective first and second digital values, as well as a digital value corresponding to the difference between the scanning values in storage locations of a pair of correspondingly allocated storage locations; that during an interval equivalent to the longest a.c. voltage period which reasonably can be expected, comparing the digital values obtained from a subsequent scanning respectively with the first and second corresponding stored digital values, whereupon, depending on whether said values are larger than one or smaller than the other stored digital value, replacing one or the other of said digital values, so that, each time, the maximum value and minimum value of the voltages, which are valid for said interval, are maintained; and determining respectively the d.c. voltage value, the a.c. voltage, and the external voltage value, between the wires (a,b) of the subscriber line or between each of said wires and the circuit point conducting the ground potential from said maximum and minimum values.

4,691,338
LINE SWITCHING CIRCUIT FOR CORDLESS TELEPHONE

Masayuki Makino, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 18, 1986, Ser. No. 908,573
Claims priority, application Japan, Sep. 30, 1985, 60-218387
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—61 **6 Claims**



1. In a communications system having a telephone which is connected to a central office by a subscriber's telephone line and a cordless telephone which comprises a mobile unit and a base unit, said base unit being connected to said telephone, said telephone having priority over said cordless telephone with regard to use of said subscriber's telephone line, a line switching circuit for controlling connection between said cordless telephone and said subscriber's telephone line, comprising:

detector means for outputting a first and a second voltages when said telephone is on-hook and off-hook, respectively;

signal transferring means for transferring an output signal of said detector means by delaying said output signal a predetermined period of time if said output signal is derived from a first change from said first voltage to said second voltage and not delaying said output signal if said output signal is derived from a second charge from said second voltage to said first voltage;

opening and closing means for controlling connection between said subscriber's line and said base unit; and

control means for controlling said opening and closing means such that said opening and closing means opens and closes in response to said first change which is delayed by said predetermined period of time and said second change which is not delayed, respectively, which are outputted by said signal transferring means.

4,691,339
ADDRESS CODE ARRANGEMENTS

Michael J. Redman, Bishops Stortford; Ming K. Wong, Harlow, and Peter R. Sugden, Brighouse, all of England, assignors to STC plc, Loudon, England

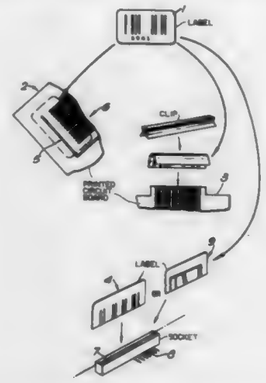
Filed Aug. 9, 1985, Ser. No. 764,114
Claims priority, application United Kingdom, Sep. 4, 1984, 8422288
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—62 **1 Claim**

1. An addressing arrangement for use in the handset and/or in the base station of a cordless telephone set, which arrangement includes:

(a) a circuit board having a contact field formed by a single strip-like conductive track to which a power supply is connected when the arrangement is in use and a set of conductive tracks on the board each of which terminates adjacent to the single strip-like track, the tracks of said set extending substantially orthogonally to the single strip-like track;

(b) label means of insulative material for carrying a set of generally parallel conductive strips, the pattern of said strips on the label means corresponding to an identification address for the handset or base station; and

(c) means to secure the said label means to the circuit board of the handset or base station such that the conductive strips on the label connect the single strip-like track on the



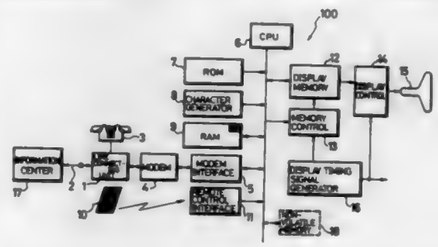
board to a selection of the conductive tracks on the board, which selection corresponds to the identification address of the handset or base station;

wherein when the handset or base station with the addressing arrangement is in use the single strip-like track is energized so that the said selection of the tracks on the circuit board which corresponds to the address is energized, and wherein the establishment of a connection is only effected if the address of the handset and the base station correspond.

4,691,340
IMAGE INFORMATION ACCESSING USER TERMINAL

Satoru Maeda, and Akihiko Tao, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,822
Claims priority, application Japan, Nov. 28, 1984, 59-251273; Apr. 20, 1985, 60-85237
Int. Cl.[4] H04M 11/08
U.S. Cl. 379—96 **8 Claims**



1. A user terminal for displaying one of a plurality of images transmitted in the form of respective image data and image number data from an information center over a communications network in response to commands therefor entered at said user terminal, said user terminal comprising:

network terminal means adapted to be connected to said

communications network for receiving said image data and image number data therefrom and for supplying said commands thereto;

display control means including image memory means for storing received image data and for generating a video signal in response to said stored image data, said image memory means initially storing the image number data corresponding to the current image data;

display means for displaying an image corresponding to said video signal;

image number memory means for storing the image number data corresponding only to the current image data stored in said image memory means;

said display control means including means for detecting the image number data initially stored in said image memory means and means for automatically storing the detected image number data in said image number memory means; and

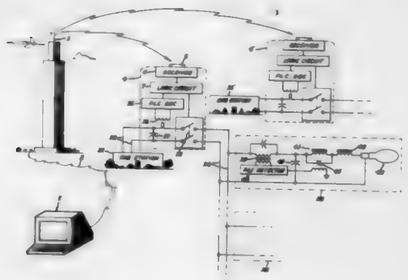
manually actuable input keying means including unitary autorequest key means actuable for entering an image selection command by single actuation thereof by which image selection is effected, said user terminal being responsive to said image selection to display an image whose image number data is stored in said image number memory means.

4,691,341

METHOD OF TRANSFERRING DIGITAL INFORMATION AND STREET LIGHTING CONTROL SYSTEM

David W. Knoble, E. Flat Rock, and Joseph W. Sanders, Flat Rock, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,834
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—97 **11 Claims**



11. A system for remote control of street lights over an area comprising:

a programmable computer generating wavelike control signals at fundamental frequencies in the telephone vice range, said signals having half periods corresponding in time-duration to the pulses or bits of binary digits in logic circuits,

means for transmitting said signals by ordinary audio channels of communication, including a telephone line and a shared paging transmitter used primarily for paging and voice messages,

local receivers in said area receiving said signals and including means for squaring-off the received signals,

local microcomputers receiving said square-off signals, each microcomputer being programmed to respond to said signals only when they are legitimate and addressed to it, and

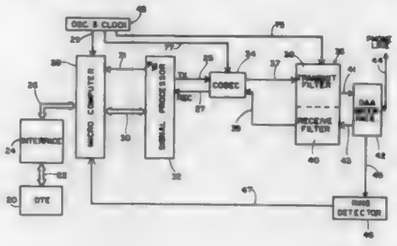
local means controlled by the local microcomputer for turning street lights off and on, and for dimming them.

4,691,342

MULTI-SPEED, FULL DUPLEX MODEM

Mark A. Waldron, Elkhart, Ind., and Tommy Y. Leung, Cassopolis, Mich., assignors to CTS Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 530,690, Sep. 9, 1983, Pat. No. 4,620,294. This application Apr. 21, 1986, Ser. No. 854,136
Int. Cl.[4] H04M *11/06*; **G06F** *3/00*
U.S. Cl. 379—98 **20 Claims**



1. A telephone network between an originate modem and an answer modem, at least one of said modems comprising a multi-speed full duplex modem apparatus for transmitting and receiving analog signals through said telephone network; said multi-speed, full duplex modem comprising:

(a) a data terminal means for transmitting and receiving digital data;

(b) a microcomputer means in communication with the data terminal means;

(c) a bi-directional bus in communication with the microcomputer means;

(d) a signal processor means in communication with the microcomputer means over the bi-directional bus;

(e) a timing means responsive to the digital data, for bi-directional communication of digital data over the bi-directional bus;

(f) a converting means in communication with the signal processor means for converting digital data from the signal processor to the analog signal for transmission over the telephone network, and for converting the received analog signal from the telephone network to the digital data; and

(g) a selecting means in communication with the microcomputer means for selecting a bit rate mode using the digital data from the data terminal means; said selecting means further providing a means responsive to the bit rate of the originate modem, to selectively communicate one of at two or more data rates selected from 0–300 b.p.s. by frequency shift keying, approximately 600 b.p.s. by differential phase shift keying, approximately 1200 b.p.s. by quarternary differential phase shift keying, and approximately 2400 b.p.s. by quadrature amplitude modulation; the selecting means further providing a means for selecting digital data samples at intervals determined by the bit rate mode, to synthesize the digital data modulated for transmission through the converting means to the analog signal for transmission over the telephone network for communication between the originate modem and the answer modem.

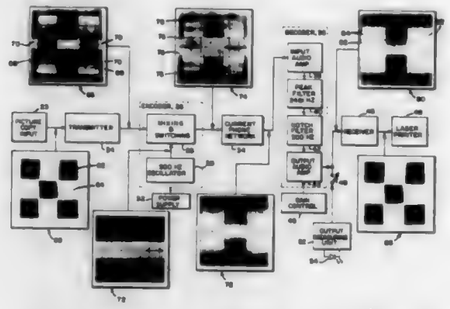
4,691,343

NOISE ELIMINATION SYSTEM FOR PICTURES AND THE LIKE

David M. Tenenbaum, 75 Palmer St. Apt. 214, Quincy, Mass. 02169

Filed May 27, 1986, Ser. No. 867,488
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—100 **20 Claims**

1. A system for eliminating degradation in quality of a picture or negative sent from a first location via signals transmitted over a dialed-up telephone line in a telephone network to a second location at which a receiver and picture reproducing means are located, in which means coupled to said dialed-up line are provided at said first location for translating the picture or negative to be sent into audio frequency signals of a predetermined operating frequency, and in which a receiver is coupled to said dialed-up telephone line at said second location for receiving the audio frequency signals representing the transmitted picture or negative and for coupling the received signals to said picture reproducing means at said second location comprising:



means at said first location for superimposing a carrier signal on the transmitted audio signals, said carrier signal being of a frequency different from the operating frequency of the audio frequency signals coupled to said phone line but within the audio bandwidth of said telephone network; and,

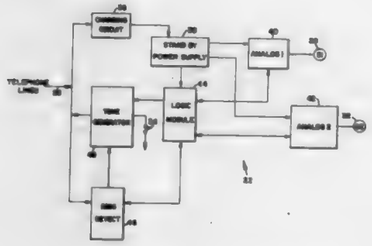
means at said second location for removing said carrier signal to provide a carrier-removed signal for use by said picture reproducing means.

4,691,344

LOW-POWERED REMOTE SENSOR AND TELEPHONE LINE TRANSMITTER

Richard W. Brown, Mound, and Duane R. Ardolf, Maple Grove, both of Minn., assignors to Aquatrol Corporation, Arden Hills, Minn.

Filed Jan. 21, 1986, Ser. No. 821,429
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—106 **6 Claims**



1. A data transmitter unit for transmitting data over conventional telephone lines from a remote location to a central location, the data transmitter unit deriving its operational power supply from the telephone lines to which it is interconnected, thereby doing away with the requirement for a separate power supply, the data transmitter unit comprising:

(a) ring detector means interconnected to the telephone line for detecting a ring signal sent over the telephone line to the remote location from the central location and actuating the unit in response thereto;

(b) pulse rate frequency transmitter means interconnected to the telephone line for transmitting on the telephone line from the remote location to the central location pulses of a tone where the tone comnprises signals of one or more predetermined frequencies, the rate of the pulses and the one or more frequencies representing different types of data; and

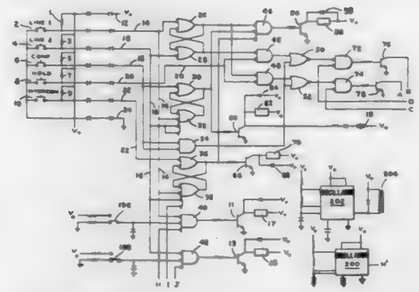
(c) charging circuit means interconnected to the telephone lines for providing power at the end of a transmission cycle to a stand-by power supply means for powering the data transmitter unit during a subsequent transmission cycle, the stand-by power supply means including capacitor means charged to a predetermined voltage.

4,691,345

MULTIFUNCTION TWO LINE TELEPHONE SYSTEM

Richard J. McAlevey, Miami; Malcolm D. Muir, Coral Springs, and Johan S. van der Laan, Miami, all of Fla., assignors to Rice Multiphones, Inc., North Miami, Fla.

Filed May 12, 1986, Ser. No. 861,928
Int. Cl.[4] H04M *9/02*
U.S. Cl. 379—158 **9 Claims**



1. A multi-function two line telephone comprising: means for receiving a first and a second telephone line each line including tip and ring lines; a line circuit for each of said telephone lines, each of said line circuits including first and second comparators connected to said telephone line for comparing the signals on said line with predetermined reference signals, and opto-isolator means connected to said comparators for isolating said line circuits; transformer means for inductively coupling said telephone lines; opto-isolated triac means connected between said telephone lines and said transformer means for connecting said lines in a conference connection; pushbutton switch means connected to said triac means for switching same to implement said conference connection; second pushbutton switch means connected to said triac means for implementing a hold function; further pushbutton switch means connected to said telephone lines; relay means connected between said further pushbutton switch means and said telephone lines; said further pushbutton means actuating said relay means to implement an intercom function.

4,691,346

PBX INTEGRITY ARRANGEMENT FOR MAINTAINING THE FUNCTIONAL INTEGRITY OF PBX COMMUNICATION DEVICES AND ASSOCIATED FACILITIES

Vincent D. Vanacore, Boulder, Colo., assignor to American Telephone and Telegraph Company and AT&T Information System Inc., both of Holmdel, N.J.

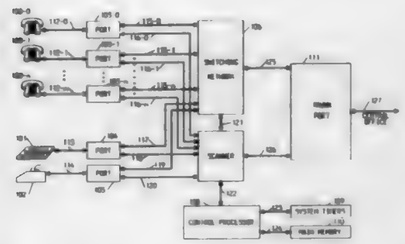
Filed Mar. 6, 1986, Ser. No. 836,912
Int. Cl.[4] H04M *1/66*
U.S. Cl. 379—198 **21 Claims**

1. In a PBX having a plurality of communication devices and trunk facilities where each of said communication devices and

said trunk facilities are connected to a corresponding port circuit of said PBX and which PBX operates under control of a processor, a method for checking the integrity of each of said communication devices and said trunk facilities wherein said method comprises the steps of:

storing a finite list of communication device invalid states each of which represents a lack of integrity of said communication devices;

polling on a periodic basis all of said communication devices to detect a current state of each of said communication devices;



comparing for each of said communication devices said detected current state with said list of communication device invalid states to determine if a match exists between said current state and one of said communication device invalid states; and

providing in response to the existence of a match at one of said communication devices, an action indicative of the occurrence of a communication device invalid state at said one communication device.

4,691,347

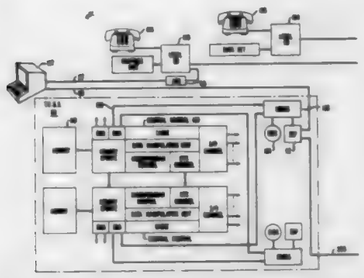
METHOD AND APPARATUS FOR CONTROLLING A CONFERENCE

Keith R. Stanley, Winfield, and David F. Winchell, Glen Ellyn, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 15, 1985, Ser. No. 702,378

Int. Cl.⁴ H04M *3/56*

U.S. Cl. 379—203 **17 Claims**



1. For use in a communication system having a plurality of stations, a conference bridge and means for interconnecting said stations to said bridge for conferencing, a method of controlling stations connected to the bridge comprising the steps of

summoning an operator position in response to a request from said bridge,

transmitting to said operator position a data message containing the directory number of and the status of all stations originally connected to the bridge.

identifying at said operator position one of said stations independently of the directory numbers transmitted thereto, and

transmitting a message to said bridge from said operator position to control the one identified station.

4,691,348

TWO WAY TELEPHONE COMMUNICATION SYSTEM

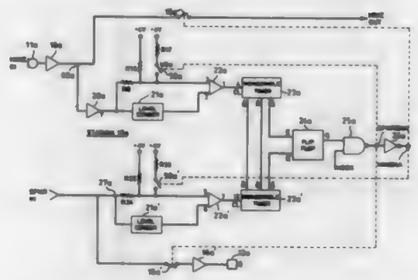
Russell E. Brauthen, Calgary, Canada, assignor to Novatel Communications Ltd., Calgary, Canada

Filed May 6, 1985, Ser. No. 730,590

Claims priority, application Canada, Oct. 30, 1984, 466643

Int. Cl.⁴ H04M *9/08*

U.S. Cl. 379—389 **8 Claims**



8. A two way telephone communication system comprising a station having a first signal path for signals to be transmitted to another station, a second signal path for signals received from another station, switching means for selectively enabling one of said signal paths and disabling the other of said signal paths, and automatic direction decision means for controlling said switching means to either maintain the one of said signal paths that is enabled in an enabled state or to change the state thereof to disabled, said automatic direction means including control means for switching said switching means, a first signal detection path connected between said first signal path and said control means and including therein means for deriving and supplying to said control means signals indicating the presence of a signal in said first signal path, a second signal detection path connected between said second signal path and said control means and including therein means for deriving and supplying to said control means signals indicating the presence of a signal in said second signal path, the control means responding to the signal detection path which first indicates the presence of a signal in said signal paths to cause the switching means to enable the signal path to which said signal detection path which first indicates the presence of a signal in said signal paths is connected, signal delay means in one of said signal detection paths for delaying the supplying to said control means of a signal indicating the presence of a signal in the signal path to which said one signal detection path is connected, and means for selectively enabling said delay means in response to enablement of, and continued presence of a signal in, the signal path to which the other of said signal detection paths is connected.

4,691,349

DUPLEX MICROPHONE COMMUNICATION SYSTEM

Kenneth R. Reichel, Hudson, and Steve Hebrock, Akron, both of Ohio, assignors to Audio-Technica U.S., Inc., Stow, Ohio

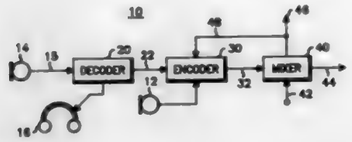
Filed Mar. 11, 1986, Ser. No. 838,587

Int. Cl.⁴ H04B *3/20*

U.S. Cl. 379—391 **13 Claims**

1. A full duplex communications system for providing simultaneous bi-directional signal transmission between first and second ends of a two center conductor shielded communications channel, comprising:

encoder means for balanced coupling of a talkback signal to both center conductors of the communications channel at the first end thereof utilizing the communications channel shield as ground reference, thereby transmitting a common-mode signal to the second end of the communications channel;



decoder means, coupled to the second end of the communications channel, for decoding the common-mode signal to recover the talkback signal and for simultaneously coupling a differential microphone signal across the two center conductors of the communications channel for transmission to the first end thereof.

4,691,350

SECURITY DEVICE FOR STORED SENSITIVE DATA

Theodoor A. Kleijne, Dreumel, and Jan B. Goossens, De Bilt, both of Netherlands, assignors to NCR Corporation, Dayton, Ohio

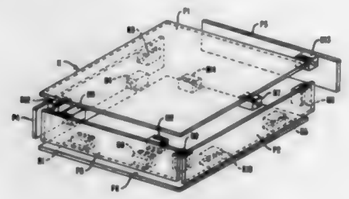
Filed Jun. 23, 1986, Ser. No. 877,049

Claims priority, application United Kingdom, Oct. 30, 1985, 8526089

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.⁴ H04L *9/00*

U.S. Cl. 380—3 **9 Claims**



1. A security device for protecting stored sensitive data comprising:

a closed housing containing memory means adapted to store sensitive data including conductive path means and conductive sheet means;

said conductive path means including a plurality of interconnected first and second conductive path segments;

said conductive sheet means including a plurality of interconnected conductive sheets;

each of said first conductive path segments, an associated second conductive path segment and an associated conductive sheet being arranged in superposed relationship and being separated by insulating material;

and tamper detection circuitry connected to said conductive path means and said conductive sheet means including a reset signal generating means arranged to provide a reset signal to erase the contents of said memory means in the event of interruption of said conductive path means or electrical interconnection between said conductive path means and said conductive sheet means brought about by an attempt to penetrate said housing.

4,691,351

TELEVISION SIGNAL RECEIVING APPARATUS

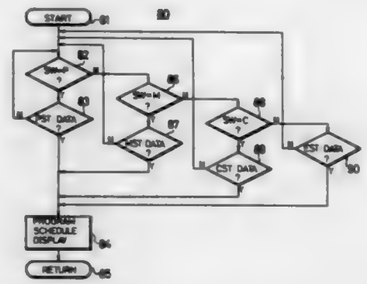
Toshihide Hayashi, Tokyo; Ikuo Kanayama, Kanagawa, and Masayoshi Kanno, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 803,017

Claims priority, application Japan, Nov. 29, 1984, 59-252142; Dec. 3, 1984, 59-235495

Int. Cl.⁴ H04N *7/167*

U.S. Cl. 380—10 **7 Claims**



1. A television signal receiving apparatus having a program schedule display function, comprising:

tuner means;

television signal processing means connected to said tuner means;

digital signal processing means and associated switch means connected to said tuner means for generating a local program schedule display signal based on program schedule data obtained through said tuner means; and

said switch means being switchable between at least two time zones, and said digital signal processing means providing said local program schedule display signal with times based on a time zone selected with said switch means.

4,691,352

ARRANGEMENT FOR DECIPHERING AND DECODING TELEVISION PICTURES ENCODED IN ACCORDANCE WITH THE MAC STANDARD AND SCRAMBLED AT TRANSMISSION BY SUBMITTING THE VIDEO SIGNALS TO CYCLIC PERMUTATIONS

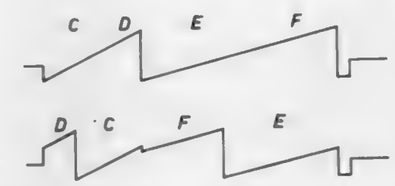
Jean-Pierre Arragon, Roissy-En-Brie, and Jean-Pierre Michel, Yerres, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1985, Ser. No. 711,545

Claims priority, application France, Mar. 16, 1984, 84 04099

Int. Cl.⁴ H04N *7/167*

U.S. Cl. 380—14 **9 Claims**



1. A digital circuit for decoding television picture signals comprising separate components of the MAC type which are scrambled with cyclic permutations, said scrambled signal

being descrambled from addresses X_1 of points of cut produced by a pseudo-random address generator comprising:

two two-way circuits receiving from an analog to digital converter said scrambled signal in serial digital form for processing the luminance component and four two-way circuits for processing the chrominance component, each comprising:

a circuit for converting the serial digital signal information in two rearranged bytes, whereby a writing speed for memories which are to receive said serial digital signal is accommodated such that the access rate of the memory columns are equal to the sampling frequency F_s of the analog to digital converter divided by the length of two digital words 2L, said bytes comprising even and odd bytes suitable for writing in separate low and high portions of a respective memory;

two sets of memories which are alternately read and written with said serial digital signal data, each memory having nL cells equal to the length of the useful signal on which said cyclic permutations are effected, comprising:

first and second luminance memories Y_1 and Y_2 receiving during the luminance interval the digital luminance signals from said converter circuit, and four chrominance memories C_1, C_2, C_3 and C_4 for receiving during the chrominance interval digital chrominance signals from said converter circuit, each of said memories having a high portion and a low portion and an associated read amplifier, a read/write circuit for writing and reading data to and from said memories, including a permutating circuit connecting a high portion to a low portion address circuit, whereby alternately received even and odd bytes are written into high and low portions of each memory; and

a parallel to series conversion register for serially rearranging data read from a memory; and,

a circuit for decoding the address of the points of cut of the MAC type signal from information supplied by a pseudo-random sequence generator which supplies column addresses of the memories Y_1, Y_2, C_1, C_2, C_3 and C_4 and which directs during a write phase of said memories data bytes to said memories.

4,691,353

SCRAMBLING SYSTEMS FOR CATV

James O. Farmer, Doraville, Ga., assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Feb. 25, 1985, Ser. No. 704,817

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—15 **13 Claims**



1. In a system in which the sync pulses of a color TV signal are changed in level for the purpose of scrambling the color TV signal, the improvement which comprises means for separating the components of the TV signal which contain color information from the components of the TV signal which contain the sync information, means for processing at least one of said components to remove coherence between the sync components and the color components, and means for recombining said separated components after processing in said processing means to provide a composite signal to which the sync pulses cannot be restored using the color components of said TV signal alone.

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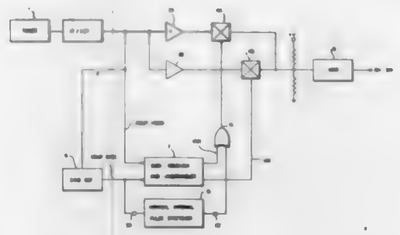
VERTICAL INTERVAL DATA BLANKER

Craig R. Palminteri, Mount Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 518,230, Jul. 28, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 850,208

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—15 **7 Claims**



1. In an addressable cable television signal decoder of the type including means for recovering data carried on one or more horizontal lines occurring during the vertical blanking interval of a conventional television signal that includes a serrated vertical sync pulse and pre and post equalizing pulses, and including data receiver and unscrambler means for recovering said data, developing a VNX signal for blanking said data from said television signal and for generating a control signal by integration of said serrated vertical sync pulse to control generation of said VN signal, and a transmission gate controlled by said VNX signal; the improvement comprising:

means for generating an additional stretched pulse signal by integration of said serrated vertical sync pulse;

gate means coupled to said transmission gate; and

means for applying said stretched pulse signal and said VNX signal to said gate means to delay blanking of said data by said VNX signal until after occurrence of said post equalizing pulses.

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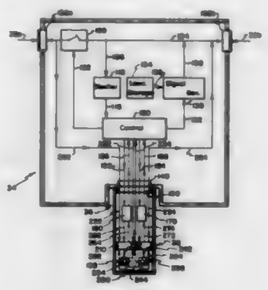
INTERACTIVE SECURITY CONTROL SYSTEM FOR COMPUTER COMMUNICATIONS AND THE LIKE

Peter Wirstrom, Pepper Pike, and William H. Cork, Brecksville, both of Ohio, assignors to Pirmasafe, Inc., Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 670,326

Int. Cl.[4] H04L *9/00*

U.S. Cl. 380—23 **38 Claims**



1. Apparatus for vertifying the authorization of a user of at least one communications station that is connected for accessing another communications station through a communications link, the apparatus comprising:

(a) encryption means for being carried by an "authorized user," namely a person who is authorized to use at least one communications station to access another communications station through a communications link that connected the at least one station to the another station, the encryption means including a first encryption that has a value which has been assigned to the authorized user as an indicator of the authorized user's authority to access the another station and a second variable portion representing the time of the last successful access of the another station;

(b) security means interposed in series between portions of the communications link for monitoring signals that are transmitted along the communications link, the security means defining port means for receiving the encryption means and for cooperating with the encryption means to detect a predetermined authentication query signal sequence of monitored signals that is transmitted along the communications link from the host computer and, in response to such detection, effecting transmission of an autheniticating signal sequence along the communications link, to the host computer with the value of the authenticating signal sequence being determined at least in part by the value of the first encryption and of a further encryption resident in said security means and representative of the identity of a predetermined terminal associated therewith so that the value of the authenticating signal sequence constitutes an indicator of the user's and terminal's authority to access the another station;

(c) authorization check means connected to the communications link for entering into a communications dialog with the security means as by transmitting the predetermined authentication query signal sequence along the communications link so that the authentication query signal sequence, when detected by the security means, will cause the security means to transmit the authenticating signal sequence along the communications link to indicate to the authorization check means whether the authorized user's encryption means is received by the port means for cooperating with the security means to cause the authenticating signal sequence to constitute an indication of the user's authority and the particular connected terminal's authority to access the another station; and,

(d) the encryption means including control means for interactively cooperating with the security means in the conduct of said dialog whereby, in the absence of the encryption means being received by the port means, said dialog cannot be properly conducted.

4,691,356

AM/FM SYNCHRONIZING CIRCUIT

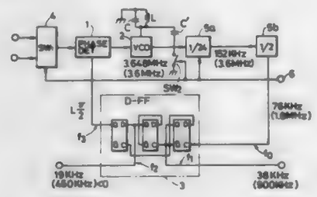
Toshihito Ichikawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,720

Claims priority, application Japan, Jul. 18, 1985, 60-110414[U]

Int. Cl.[4] H04N *5/00*

U.S. Cl. 381—4 **5 Claims**



1. An AM/FM synchronizing circuit, comprising:

switching means for alternatively selecting an AM intermediate frequency signal and an FM composite signal; and

phase locking means for producing a signal synchronized with an intermediate frequency carrier of said AM intermediate frequency signal when said AM signal is selected and a signal synchronized with a pilot signal of said FM composite signal when said FM signal is selected, said phase locking means having an input coupled to an output of said switching means:

said phase locking means comprising:

phase comparing means for receiving an output of said switching means as a reference signal;

voltage-controlled oscillating means controlled by an output of said phase detector;

frequency dividing means for dividing a frequency of an output of said voltage-controlled oscillating means; and

means for controlling a division factor of said frequency dividing means.

4,691,357

STEREOPHONIC RECEIVING CIRCUIT PROVIDING IMPROVED SWITCHING CHARACTERISTICS BETWEEN STEREOPHONIC AND MONAURAL MODES

Nobuo Kanda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,461

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—10 **4 Claims**



1. In a stereophonic receiving circuit in which a control voltage of a magnitude determined in accordance with the strength of a received signal is applied to control operations of an IF signal processing section including an electronic volume control circuit, a high-cut control circuit, and a stereophonic demodulator circuit, the improvement wherein said control voltage is generated by a circuit comprising: means for producing an S-meter voltage in response to an IF signal in said receiver; means for amplifying said S-meter signal only when said S-meter signal is above a predetermined level; and means for applying a greater one of said S-meter signal and an output of said amplifying means for controlling said operations of said electronic volume control circuit, said high-cut control circuit, and said stereophonic demodulator circuit.

4,691,358

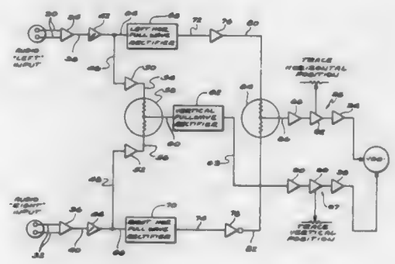
STEREO IMAGE DISPLAY DEVICE

John R. Bradford, c/o B&B Systems, 28111 N. Ave. Stanford, Valencia, Calif. 91355

Filed Apr. 14, 1986, Ser. No. 851,855

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—12 **6 Claims**



1. A device for providing a display on a cathode ray tube indicative of the stereo image and aural perspective of a first

stereophonic signal and a second stereophonic signal from different channels of a multichannel stereophonic system, comprising:

first means for processing said first and said second stereophonic signals to produce a rectified sum output, said processing means including a summing network and a rectifier;

second means for processing said first and said second stereophonic signals to produce a rectified difference output, said means including a plurality of rectifiers, an inverting amplifier and a summing network;

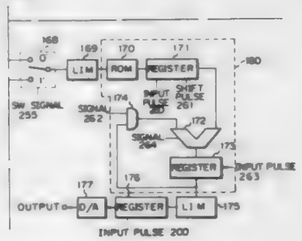
oscilloscope display means having a cathode ray tube with a display screen and having first deflection control circuits connected to said first processing means for receiving said rectified sum output and having second deflection control circuits connected to said second processing means for receiving said rectified difference output.

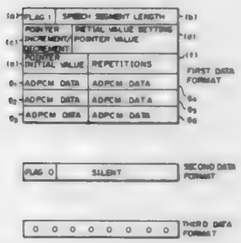
4,691,359

SPEECH SYNTHESIZER WITH REPEATED SYMMETRIC SEGMENT

Makoto Morito, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,205
Claims priority, application Japan, Dec. 8, 1982, 57-213971
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 381—51 **3 Claims**





1. A speech synthesizer for reproducing speech comprising at least a speech element having repeated symmetrical waveforms by using at least a data set which includes ADPCM data corresponding to the first half of the symmetrical waveform, repetition times R for repeating similar waveforms, a pointer increment/decrement value P_D for determining amplitude of the waveforms in each repetition cycle, an initial value setting pointer value P_L and a pointer initial value P_I comprising:

(a) a first memory (170) storing a predetermined plurality of quantization step sizes,

(b) means (158–160) which provide initially zero and accumulated value of pointer increment/decrement value P_D in each repetition cycle,

(c) means (157, 161, 168) for providing read address to said first memory (170), which provides initial symmetrical data in each repetition cycle, said means providing as read address an initial set pointer value P_L for output of initial data of the first symmetrical waveform, and said means providing as read address a sum of initial value set pointer P_L and accumulated value of pointer increment/decrement value P_D for output of initial data of the succeeding symmetrical waveforms,

(d) a second memory (163) for providing pointer moving value D_n according to ADPCM data L_n which is given as an address data in first half cycle, and said second memory providing pointer moving value D_n by using said ADPCM data L_n in opposition sequence in latter half cycle,

(e) pointer value output means (164–168) for providing address data of said first memory (170) for providing data X_n for succeeding data after said initial data of symmetrical waveform in each repetition cycle, said means providing for the first waveform,

(e-1) a pointer initial value P_I at initial time for providing symmetrical waveform,

(e-2) an accumulated sum of output D_n of second memory (163) during reproduction of former half of symmetrical waveform,

(e-3) a value which is obtained by subtracting sequentially output D_n of said second memory (163) from the last value of said accumulated sum during reproduction of the latter half of symmetrical waveform, and said means further providing for succeeding waveforms,

(e-4) a sum of pointer initial value P_I and accumulated pointer increment/decrement value which is output of means (158–160) at initial stage,

(e-5) an accumulated sum of output D_n of second memory (163) during the former half of the symmetrical waveform, and

(e-6) the value of which is obtained by subtracting sequentially the output D_n of said second memory (163) from the last value of said accumulated sum in the latter half of the symmetrical waveform,

(f) ADPCM reproducing means (170–174) for providing synthesized digital speech by

(f-1) providing the content of said first memory (170) in address designated by said means (157, 161, 168) as initial data in each repetition of the symmetrical waveform,

(f-2) providing the accumulated sum of said initial data and differential reproduced value q_n which is obtained by the calculation using output X_n of said first memory (170) in an address designated by pointer output means (164–168) and ADPCM data L_n, and

(g) a digital-to-analog converter (177) for converting synthesized digital speech issued from said ADPCM reproducing means (170–174) to an analog form to provide an output speech signal.

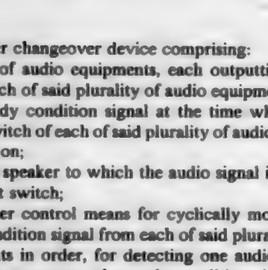
4,691,360

VOICE SIMULATOR

John W. Bloomfield, III, 19 Oyster Landing, Hilton Head Island, S.C. 29938

Filed Nov. 26, 1985, Ser. No. 802,585
Int. Cl.⁴ A61F *1/20*
U.S. Cl. 381—70 **7 Claims**

1. A voice simulating device having a dc source of voltage, means connected to said source for generating a signal characteristic of the acoustical wave form produced by a human larynx, transducer means for reproducing said signal as an audible tone, amplifier means connecting said signal generating means to the transducer means for amplification of the signal reproduced by the transducer means and conduit means for transmitting the audible tone from the transducer means into a human oral cavity wherein the tone is adapted to be transposed into intelligible speech, the improvement comprising a housing enclosing the voltage source, the signal generating means, the transducer means and the amplifier means and means pivotally mounting the conduit means in the housing for displacement thereof between extended and retracted positions, said housing having a face portion from which the conduit means projects



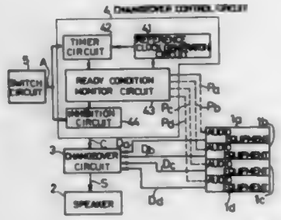
in the extended position and a groove formed within the face portion within which the conduit means is seated in the retracted position thereof.

4,691,361

SPEAKER CHANGEOVER DEVICE

Yasuhisa Yoshino, Okazaki, and Masahiko Osada, Hekinan, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 9, 1985, Ser. No. 785,852
Claims priority, application Japan, Oct. 9, 1984, 59-212237
Int. Cl.⁴ H04B *3/00*
U.S. Cl. 381—81 **7 Claims**



1. A speaker changeover device comprising:

a plurality of audio equipments, each outputting an audio signal, each of said plurality of audio equipments generating a ready condition signal at the time when a power source switch of each of said plurality of audio equipments is turned on;

at least one speaker to which the audio signal is inputted;

a cycle start switch;

a changeover control means for cyclically monitoring the ready condition signal from each of said plurality of audio equipments in order, for detecting one audio equipment which first generates the ready condition signal in each monitor cycle and for generating a changeover signal, said changeover control means stopping the monitor cycle at the time when the changeover signal is outputted, and restarting the monitor cycle at the time when said cycle start switch is turned on; and

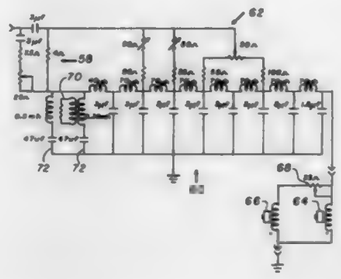
a changeover means for connecting said one audio equipment which first generates the ready condition, signal, to one of said at least one speaker in accordance with the changeover signal.

4,691,362

DIHEDRAL LOUDSPEAKERS WITH VARIABLE DISPERSION CIRCUITS

Steven J. Eberbach, 950 Fountain, Ann Arbor, Mich. 48103

Continuation of Ser. No. 457,035, Jan. 10, 1983, Pat. No. 4,578,809. This application Mar. 24, 1986, Ser. No. 843,152
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.⁴ H03G *5/00*
U.S. Cl. 381—99 **4 Claims**



1. A loudspeaker comprising an inward set of drivers and an outward set of drivers, both sets generally forward facing, each set including a high frequency driver and a lower frequency driver, one set located at a dihedral angle relative to the other set to direct sound energy away from each other and the sets being substantially the horizontal interaural distance apart, wherein the inward set of drivers is intended to generally face a listening area and the outward set of drivers is intended to generally face away from the listening area, and

a first circuit connected to the pair of high frequency drivers, selectable means to adjust the level of acoustic output of the outward facing high frequency driver lower than the inward facing high frequency driver while maintaining the summed acoustic output on the plane bisecting the dihedral angle substantially constant, and

a second circuit connected to the pair of lower frequency drivers, selectable means to adjust the level of acoustic output of the outward facing lower frequency driver lower than the inward facing lower frequency driver while maintaining the summed acoustic output on the plane bisecting the dihedral angle substantially constant, and

said selectable means for adjusting the relative acoustic output between the pair of high frequency drivers and the selectable means for adjusting the relative acoustic output between the pair of lower frequency drivers maintaining substantially constant the perceived tonal balance radiated by the loudspeakers regardless of the relative acoustic output of the outward facing drivers relative to the inward facing drivers.

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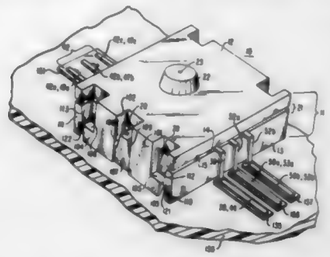
TRANSDUCER DEVICE

Satya P. Khanna, Indianapolis, Ind., assignor to American Telephone & Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.

Filed Dec. 11, 1985, Ser. No. 807,636
Int. Cl.⁴ H04R *19/01*
U.S. Cl. 381—205 **17 Claims**

1. A transducer device comprising: a silicon microtransmitter chip, a housing for said chip comprising top and bottom transversely-displaced insulative closures having their front ends in registration at an interface between them in a transversely central region of said housing, and having respective acoustic cavities extending rearwardly thereinto from their

front ends, said closures at their front ends having respective end surfaces facing towards each other and extending around the respective acoustic cavities formed in said closures and separated from each other by a discontinuity between them providing said interface between said closures, said top closure having a sound port formed in the top thereof to communicate with the cavity therein, chip-mounting means mounting said chip in said region in longitudinally and laterally centralized



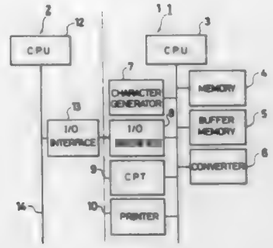
relation in said housing so that said chip is between said cavities, and closure coupling means comprising parts integral with, respectively, said top closure and bottom closure and snap-fittable together to lock said closures together in predetermined fixed relation and to cause said end surfaces to be in flush pressure engagement with each other at said interface when said closures are locked together by said closure coupling means.

4,691,364

BIT PATTERN CONVERSION APPARATUS

Takahiko Fukuzawa, and Kiyoshi Kitahara, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,220
Claims priority, application Japan, Feb. 15, 1984, 59-24949
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **5 Claims**



1. A bit pattern conversion apparatus for use witha central porocessing unit, comprising:

data latch means including n groups of memory sections, each group of said memory sections having m data input terminals, a data write terminals for receiving a data write signal, and m memory elements each arranged to permit to independently write data information thereinto and independently read out same therefrom, for storing therein data supplied to said m input terminals in response to the data write signal, said data latch means constituting an m-row by n-column matrix memory circuit;

first data readout means including m groups of gate sections which constitute row-column conversion means, each group of gate sections having n logical product circuits having first and second input terminals, the first input terminals of said n logical product circuits of one section of said m groups of gate sections being connected respectively to n memory elements of one row of said data latch means, the second input terminals of said n logical product circuits being connected in common to form a data readout terminal for a corresponding one group of gate sections and for receiving a data readout signal, the data readout signals for the m groups of gate sections being supplied independently of each other;

second data readout means including plural groups of gate sections which constitute at least one of a non-conversion means, an expansion conversion means and an 8-bit to 6-bit conversion means, each group of gate sections having m logical product circuits having first and second input terminals, the first input terminals of said m logical product circuits of one of said plural groups of gate sections being connected to predetermined memory elements of a predetermined number of groups of sections of said data latch means, the second input terminals of the m logical product circuits of one of said plural groups of gate circuit being connected in common to form a data readout terminal for a coresponding one group of gate sections for receiving a data readout signal, the data readout signals for said plural groups of gate sections being supplied independently of each other;

a logical sum circuit including m logical sum gates each operable to logically sum up outputs supplied from corresponding ones of the gate elements of said first and second data readout means;

a MSB/LSB conversion circuit including m select gate means each having a first and second input terminals and select terminals, the first input terminals of the m select gates being connected to the m logical sum gates of said logical sum circuit in a first order, the second input terminals of the m selected gates being connected to the m logical sum gates of said logical sum circuit (ORM) in a second, reverse order, each of the m select gate means being adapted to be connected to said logical sum circuit, so that either one of the first and second input terminals is selected in accordance with the presence or absence of a select signal supplied to the select terminals; and

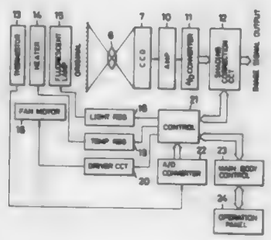
decoder means operable in accordance with a command from said central processing unit for sending the data write signals to the data write terminals of said data latch means, and for sending the data readout signals to the data readout terminals of said first and second data readout means, and for supplying the select signal to the select terminals of said MSB/LSB conversion circuit.

4,691,365

IMAGE READING APPARATUS

Nao Nagashima, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,239
Claims priority, application Japan, Jun. 1, 1983, 58-97168
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—54 **38 Claims**



1. An image reading apparatus comprising:

a light source;

reading means for photoelectrically reading an image in accordance with an optical image of a member illuminated with light from said light source;

a standard surface as a standard for reading of the image by said reading means;

control means for controlling the amount of light emitted by said light source in accordance with a read signal obtained by reading the standard surface by means of said reading means; and

correcting means for correcting an image read signal from said reading means in accordance with the read signal obtained by reading the standard surface by means of said reading means,

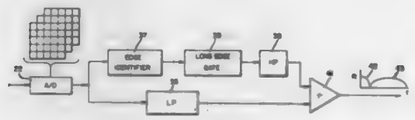
wherein said correcting means corrects the image read signal beginning after the amount of light emitted by said light source becomes a predetermined value under control of said control means.

4,691,366

IMAGE ENHANCEMENT

Paul Fenster, Petach Tikva, and Yair Shimoni, Jerusalem, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Nov. 7, 1984, Ser. No. 668,946
Claims priority, application Israel, Nov. 13, 1983, 70213
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—54 **16 Claims**



1. A method using filtering for image enhancement in digital fluorography, said method comprising the steps of:

(a) acquiring an image that comprises data of interest, data not of interest, and noise; said data of interest being amplitudes of edges having a finite linear dimension of at least two pixels, said noise having amplitudes with an average at a certain frequency that is substantially equal to an average amplitude of said edges, the average amplitude of the noise at frequencies higher than said certain frequency being higher than the average amplitude of said edges, and the average amplitude of the noise at frequencies lower than said certain frequency being lower than the average amplitude of said edges, said edges being enhanced at said higher frequencies;

(b) determining system parameters that effect filter optimizing procedures;

(c) using the system parameters to provide filter means that have different frequency responses to said data of interest than to said data not of interest or said noise; and

(d) filtering with said filter means to increase said certain frequency and thereby optimally enhance the data of interest and attenuate the data not of interest and the noise relative to the data of interest.

4,691,367

METHOD AND APPARATUS FOR OMNIDIRECTIONAL READING OF DATA BASES

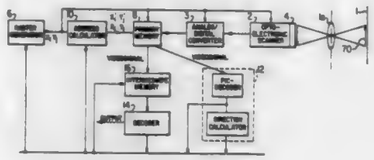
Klaus Wevelsiep, Fuchstanzstrasse 11, 6239 Kriftel, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,544
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—61 **14 Claims**

1. A process for the identification of objects which appear at an image window in random positions and orientations and for random times and which have a data field containing contrasting indicia in at least one data track and at least one predetermined contrasting line pattern (PIC-pattern) which indicates the position and orientation of the data track(s) and contains several lines of predetermined spacing and/or line width, which data track is opto-electronically scanned at the image window in at least one row and column organized point raster (X_i, Y_j i=1 . . . n, j=1 . . . m) and at each raster point (X_i, Y_j) video raster point signals V_{ij} are produced corresponding to the light/dark values of the scanned image points, whereupon the video raster point signals are assembled in a predetermined sequence to form a videosignal, and the position and orientation of the data track(s) relative to the image window is determined upon the appearance of a PIC contrasting sequence in the videosignal corresponding to the PIC pattern(s), whereupon the information contained in the videosignal is then decoded and the indicia in the data track(s) determined; and wherein:

(a) during each scanning of the point raster (X_i, Y_j) the video raster point signals V_{ij} corresponding to the original image are stored in a memory matrix made up of rows and columns;

(b) a search raster arranged in rows and columns (X_i, Y_j) is employed to scan and read the memory positions of the memory matrix once or several times and to produce a videosignal during each scan wherein the rows of the



search raster and of the memory matrix upon each scan of the search raster cross each other at a predetermined search angle α_k, k=1, 2, 3 . . . ;

(c) the output videosignal is examined for the presence/absence of the PIC—contrasting sequence;

(d) upon recognition of the PIC—contrasting sequence the angle β between the actual search direction (angle α_k) and the data track, as well as the position of the data field within the memory image is determined from the corresponding address coordinates of the search raster, and the direction of the data track(s) (reading angle $\rho=\beta+\alpha_k(\pm 90°)$) with the memory matrix is calculated;

(e) then the memory image is read and decoded with reading raster (X'_i, Y'_j) arranged in rows and columns in the direction of, or at right angles to, the data track, and

(f) the address coordinates of the search raster (x_i, y_j) are produced from a coordinate rotation of the address coordinates of the memory positions (X_i, Y_j) followed by an interpolation, by which the actual memory positions addresses of the memory image nearest to rotated address coordinates are selected.

4,691,368

FLEXIBLE BLOCK PACKAGING

Claude Roessiger, Wolfeboro, N.H., assignor to Ocor Products Corporation, Mirror Lake, N.H.

Filed Jun. 20, 1985, Ser. No. 746,978
Int. Cl.[4] B65D *33/16, 30/18*
U.S. Cl. 383—10 **4 Claims**

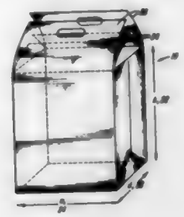
1. A flexible package for containing rectangular or square sided objects in a closely conforming relationship comprising:

a double layer of flexible material formed in a "U" shape with one layer forming an inner wall and the other layer forming an outer wall,

wherein the bottom of the "U" is tucked up between the two sides of the "U" to a distance equal to one half the desired depth of the finished package and the edges of the sides of the "U" are secured together, including the edges of the tucked up portion, to form a package open at its top end only, said edge sealed tucked in portion, when expanded

to surround the objects held in the package, forming a generally flat, rectilinear bottom portion,

integral upper portions of said inner wall extending beyond the upper ends of the combined height of the objects to be contained to form sealing flaps that can be folded across



the top portion of the finished package to enclose the top end of the package in said closely conforming relationship when it is fully loaded with the objects, and integral upper portions of said outer wall extending beyond the upper ends of said combined objects to form handles.

4,691,369

BAG WITH HANDLE AND METHOD OF MAKING THE SAME

Robert E. Costa, Middletown, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 14, 1986, Ser. No. 896,233
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—17 **6 Claims**





1. An elongated handle for a bag, said handle being formed from a braided or woven fabric material and said handle having a soft, limp and flexible central hand gripping portion and stiffened end portions for securement to the bag, wherein said stiffened end portions are formed by sleeves encircling said handle at said end portions thereof.

4,691,370

RECLOSABLE BULK MATERIAL BAG WITH SLIDE FASTENER

Norman W. MacFee, Stanley, N.C., assignor to Talon, Inc., Meadville, Pa.

Filed Apr. 4, 1986, Ser. No. 848,227
Int. Cl.[4] B65D *33/26*
U.S. Cl. 383—61 **10 Claims**

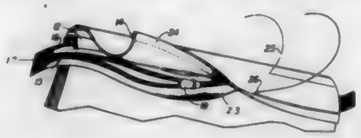
1. A reclosable bag comprising

a bag body having first and second opposing wall portions and a mouth,

an extension on the first wall portion of the bag body projecting somewhat beyond said mouth,

a closure flap on the first wall portion projecting a greater distance beyond said mouth and projecting beyond said extension,

a separable fastener having a first part secured to said extension and including a second part, the separable fastener,



said extension and closure flap being foldable as a unit across said mouth and into overlapping relationship with the exterior of the second wall portion of the bag body, and

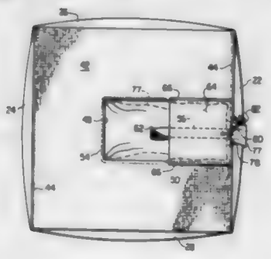
means attaching the second part of the separable fastener and said closure flap to the exterior of the second wall of the bag body, whereby said flap entirely covers and protects the separable fastener until the flap is released in the initial opening of the bag.

4,691,371

RECEPTACLE HAVING IMPROVED DISCHARGE SPOUT

Norwin C. Derby, Dallas, Tex., assignor to Super Sack Manufacturing Corporation, Dallas, Tex.

Filed Dec. 26, 1985, Ser. No. 813,407
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—62 **10 Claims**



1. A receptacle comprising:

an enclosure having a bottom wall for supporting materials contained by the receptacle;

a flexible discharge spout extending from an opening in the bottom wall of the enclosure;

a pocket mounted on the enclosure for securing the discharge spout across the opening in the bottom wall to prevent the contents of the receptacle from discharging through the opening the pocket having an aperature; and

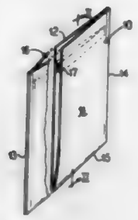
fastening means for securing the discharge spout within the pocket, the fastening means being secured to the discharge spout and extending through the aperture in the pocket.

4,691,372

MANUFACTURE OF MULTI-LAYERED RECLOSABLE BAG MAKING MATERIAL AND BAGS MADE THEREFROM

Donald L. Van Erden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 5, 1986, Ser. No. 893,368
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—63 **5 Claims**



1. A method of producing a multi-layered reclosable bag making material assembly comprising the steps of sequentially:

continuously coating over essentially the entire area of a moving continuous substrate layer, a continuous fluent layer of resin, and thereby directly laminating the resulting said resin layer to said substrate; and

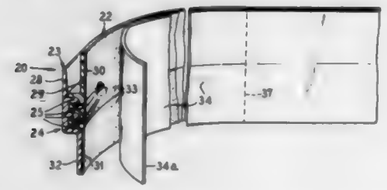
immediately thereafter, while said so-coated resin layer is still in an adhesive state on said substrate, continuously applying to said resin layer, a reclosable fastener strip means, and thereby solely by means of said still adhesive state resin layer directly bonding said fastener means to said resin layer.

4,691,373

ZIPPER CLOSURE WITH UNITARY ADHESIVE COVER SHEET

Steven Ausnit, New York, N.Y., assignor to Minigrip, Incorporated, Orangeburg, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,765
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—63 **11 Claims**



1. Zipper closure for selective attachment along elongated openings in preexisting containers, comprising:

a zipper strip assembly having a pair of contiguous strip members carrying complementary manually interlockable and releasable zipper means which are interlocked so that the assembly can be handled as a unit, said strip members having respective attachment surfaces;

pressure sensitive adhesive on each of said attachment surfaces;

peelable cover sheet means bridging both strip members and engaged on said adhesive in a protecting relationship and adapted to be peelably stripped therefrom to expose said adhesive, so that one of said attachment surfaces can be applied and attached by means of the adhesive thereon to a first lip on a container along an elongated opening therein and the other of said attachment surfaces can be applied and attached by means of the adhesive thereon to a second lip along the opening, for adhesion of the attachment surfaces to the lips and thus providing a reclosable closure for the container at said elongated opening;

said peelable cover sheet means being a single unitary structure with one portion engaged on the adhesive on one of the attachment surfaces and another portion engaged on the adhesive on the other of said attachment surfaces so as to bridge between the strip members so that the strip members do not become separated and are retained together as a unit for handling without inadvertent separation of the strip members; and

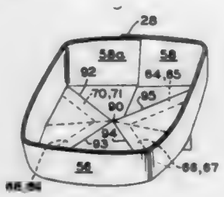
said adhesive having bonding strength and peel strength, with respect to the substrate of the container to which applied, greater than the manipulation strength normally applied for interlocking or releasing the zipper means after effecting attachment of the attachment surfaces to said lips by means of said adhesive.

4,691,374

COOKING BAG WITH DIAGONAL GUSSET SEALS

James D. Watkins, Prior Lake, and David W. Andreas, Minneapolis, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.

Continuation of Ser. No. 522,268, Aug. 11, 1983, abandoned.
This application Feb. 19, 1985, Ser. No. 721,458
Int. Cl.[4] B65D *30/16*
U.S. Cl. 383—104 **10 Claims**



1. A square end gusseted bag construction comprising a pair of opposing front and back rectangular face panels of the same length having parallel top and bottom edges and parallel side edges at right angles thereto,

left and right connecting gussets extending between the front and back panels of the bag, each having a pair of left and right gusset panels respectively adjacent each other and connected together by a gusset fold,

the gussets extending toward the center of the bag when the bag is in a flat condition and the gusset folds being close enough together when the bag is flat to separate the bag into a pair of connected tubes,

top and bottom seals extending across the bag from one side edge thereof to the other adjacent to the top and bottom edges of the bag,

permanent diagonal seals at the bottom of the bag to form a strong permanent seal,

the permanent diagonal seals comprising seals between the gussets and the face panels including a first pair of diagonal seals on the left side of the bag beginning at the center of the bag and being inclined laterally between each gusset panel and a portion of an adjacent face panel in contact therewith,

a second pair of diagonal seals beginning at the center of the bag and being inclined toward the right between each of the right gusset panels and an adjacent face panel,

a temporary seal dividing the bag into a plurality of interconnected communicating compartments comprising at least one transversely extending product locating seal defined by a transversely extending band of heating sealing adhesive to temporarily seal one face panel to adjacent gussets to initially hold the gussets in a tucked-in condition

adapted to hold a product in place on one side of said bag between said gussets,

said temporary seal being provided in the bag between at least one face panel and an adjacent portion of a gusset panel to seal at least one of the tubes transversely at a point located intermediate to the ends of the bag to separate at least one of the tubes into at least two separate connected compartments that communicate with one another between the gusset folds including a first compartment adapted to enclose said product and a second compartment,

said one face panel and said temporary seal being adapted to weaken when the bag and a product contained therein is heated to permit the gussets to pop out and thereby allow expansion of the bag and said product, said expansion enabling the product to shift from said one side of the bag to fill the entire bag, and

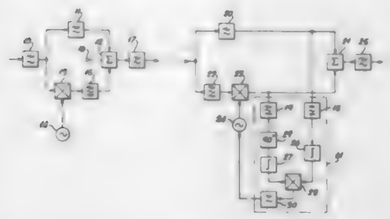
said permanent diagonal seals remaining intact after expansion of the bag to provide a sealed bag bottom free from confining corner folds within which if present portions of the product could otherwise become trapped.

4,691,375

DATA TRANSMISSION USING A TRANSPARENT TONE-IN BAND SYSTEM

Joseph P. McGeehan, Wiltshire, and Andrew Bateman, Avon, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 6, 1984, Ser. No. 617,733
Int. Cl.⁴ H04B 1/76
U.S. Cl. 455—71 **27 Claims**



10. A receiver for a communication system which employs a transmitter comprising frequency selection and translation means for dividing a band of interest in the frequency spectrum into upper and lower portions with at least one signal present at a significant level in both portions and for carrying out frequency translation, the output signal of the frequency selection and translation means having one said portion which is translated in frequency to provide a frequency notch between the lower and upper portions, the receiver comprising:

a receiver processor for restoring the original frequency spectrum,

means for deriving a correcting signal dependent upon any difference in frequency and phase in the said one signal in those parts of the restored spectrum derived from the lower and upper portions respectively, and

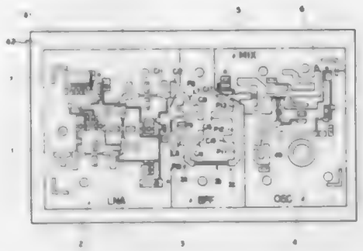
error-reduction means coupled to the said receiver processor for reducing any said frequency and phase difference in the output of the said receiver processor in accordance with the correcting signal.

4,691,376

FREQUENCY CONVERTER

Hiroshi Watanabe, Gyoda; Takashi Johzuka, Sakado, and Masanobu Suzuki, Nagareyama, all of Japan, assignors to New Japan Radio Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,863
Claims priority, application Japan, Dec. 8, 1984, 59-259733
Int. Cl.⁴ H04B 1/26
U.S. Cl. 455—131 **4 Claims**



1. A frequency converter for use in a 4 GHz band comprising:

a printed circuit board provided in a shield case having at a first end an input terminal and at a second end an output terminal;

a printed circuit formed longitudinally on said board comprising, connected in sequence, a low noise amplifier connected to said input terminal, a band pass filter, and a mixer having connected thereto a local oscillator, said mixer being connected to said output terminal;

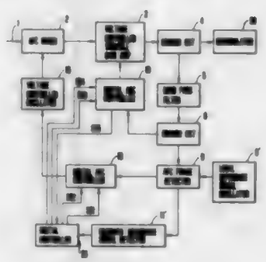
said band pass filter being formed of three portions on said printed circuit board substantially centrally thereon, comprising a first LC band pass portion formed transversely on said board, a second interdigitated band pass portion formed longitudinally on said board, and a third band rejection portion formed transversely on said board, said first, second and third portions being connected to each other in series in the direction of signal flow to form said band pass filter in a U-shape.

4,691,377

AUTOMATIC FREQUENCY AND GAIN CONTROL CIRCUIT

Masashi Yoshihara, and Kazuo Yano, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 17, 1985, Ser. No. 776,848
Claims priority, application Japan, Sep. 19, 1984, 59-196351
Int. Cl.⁴ H04B 1/16
U.S. Cl. 455—256 **3 Claims**



1. An automatic frequency and gain control circuit comprising:

an AFC mixer supplied with a received signal containing a received reference signal and controlled by an output signal of a voltage controlled oscillator;

a voltage controlled variable gain amplifer for amplifying an output signal of said AFC mixer under the control of a gain control signal to send said amplified output signal thereof to a demodulator;

a bandpass filter for passing only said received reference signal among an output of said voltage controlled variable gain amplifier;

a branching means for branching the output of said bandpass filter into two portions;

a digital AGC control means being supplied with one portion of an output of said branching means for supplying said gain control signal to said voltage controlled variable gain amplifier such that an output level of said variable gain amplifier would be constant;

an AFC phase detector for detecting the phase difference between the phases of the other portion of the output of said branching means and a reference signal generated by a local reference signal oscillator;

a digital AFC control means supplied with an output of said AFC phase detector for controlling an oscillator frequency of said voltage controlled oscillator such that an output frequency of said AFC mixer would be constant; and

a received reference signal detector supplied with an output of said AFC phase detector for producing an output representing a presence of said received reference signal, and a digital controller supplied with an output of said received reference signal detector for supplying sampling clock signal to said digital AFC control means and to said digital AGC control means when there is said received reference signals;

said digital AGC control means including means for setting the gain control voltage supplied to said voltage controlled variable gain amplifier to a predetermined value when said received reference signal is not received, means for switching its own input from an output of said setting means to an output of said bandpass filter when said received reference signal starts to be received, and means for sampling an output of said bandpass filter by said sampling clock signal so long as said received reference signal is being received;

said digital AFC control means including means for setting an oscillation frequency of said voltage controlled oscillator to any desired value when said received reference signal is not received, means for switching its own input from an output of said oscillation frequency setting means to an output of said AFC phase detector when said received reference signal starts to be received, and means for sampling the output of said AFC phase detector by said sampling clock signal so long as said received reference signal is being received;

both of said digital AGC control means and said digital AFC control means respectively including means responsive to an interruption said sampling clock signal for holding the gain control voltage and the frequency control voltage at values sampled by a last pulse before a stopping of the sampling clock signal when said received reference signal is interrupted; and

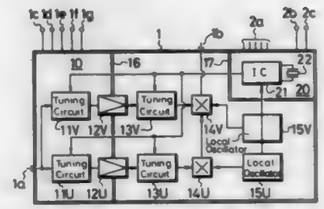
either one or both of said digital AGC control means and said digital AFC control means including means for detecting the interruption of said received reference signal to send to said digital controller a signal that stops sending of said sampling clock signal.

4,691,378

TUNER FOR TELEVISION RECEIVER

Kenichiro Kumamoto, Tokyo; Akira Sato, Kanagawa; Koichi Ohya, Tokyo, and Koichi Matsuda, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,739
Claims priority, application Japan, Dec. 24, 1984, 59-272660
Int. Cl.⁴ H04B 1/10, 1/08
U.S. Cl. 455—301 **4 Claims**



1. A tuner for a television receiver comprising:

a substantially rectangular common shielding case having opposed elongated side walls connected by opposed end walls;

electronic tuning means within said case for selectively receiving one of a plurality of frequencies within a plurality of frequency bands and including a respective tuning circuit means and a respective local oscillator circuit for each said frequency band, each said tuning circuit means including varicap diode means;

phase locked loop channel selection means within said case for supplying a selected tuning voltage corresponding to the selected frequency to each of said tuning circuit means;

said channel selection means and said local oscillator circuits being located along a first line substantially parallel to and adjacent one of said end walls of said case with said channel selection means being at one end of said first line nearest to one of said side walls of said case;

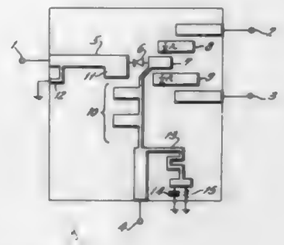
a plurality of external connection terminals for setting said tuning means and said channel selection means to a desired condition, said connection terminals being located on said one side wall along a second line substantially perpendicular to said first line;

shielding plate means within said case having a first portion extending substantially perpendicularly from said one side wall at a connection point thereon and a second portion angularly bent from said first portion and extending to said one end wall between said channel selection means and the closest one of said local oscillator circuits for defining an isolated compartment in said case in which said channel selection means is enclosed in separation from said tuning means;

a high frequency input terminal and an intermediate frequency output terminal located on respective walls of said case outside of said compartment; and

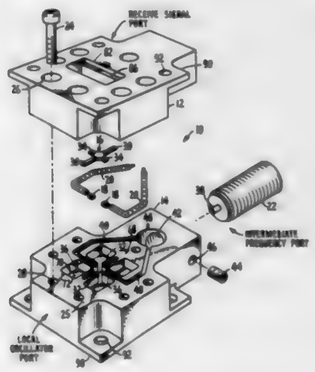
a channel selection terminal for receiving a channel selection control digital signal located on said one side wall of said case along said second line inside of said compartment.

4,691,379
MIXER CIRCUIT
Yasunichi Shizume, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Feb. 3, 1986, Ser. No. 825,235
Claims priority, application Japan, Feb. 1, 1985, 60-18298; May 20, 1985, 60-108643
Int. Cl.⁴ H04B *1/26*
U.S. Cl. 455—319 **12 Claims**



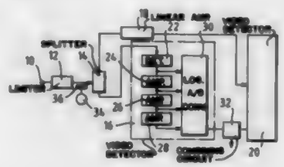
1. A mixer comprising:
first line means having a first end for receiving an input radio frequency signal;
first and second terminals for receiving first and second local oscillation signals having different frequencies;
a mixer diode having first and second terminals, one of said terminals of said mixer diode being coupled to a second end of said first line means;
second line means coupled to said second terminal of said mixer diode, said second line means having a length which is approximately ¼ of the wavelength of said input radio frequency signal;
first and second coupling means for coupling said second line means, to said first and second terminals, respectively; and
third line means coupled to the junction of said second line means and said mixer diode for delivering an intermediate frequency signal.

4,691,380
QUAD-RIDGE WAVEGUIDE MIXER
Wayne F. Westgate, Sunnyvale, Calif., assignor to Avantek, Inc., Santa Clara, Calif.
Filed May 5, 1986, Ser. No. 859,617
Int. Cl.⁴ H04B *1/26*
U.S. Cl. 455—328 **21 Claims**



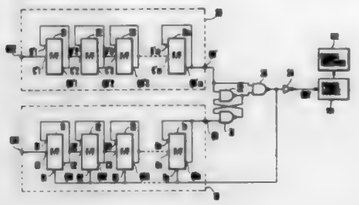
1. A mixer responsive to a receive signal and a local oscillator signal for generating an intermediate frequency signal equal to a product of the receive and local oscillator signals, said mixer comprising:
a quad-ridge waveguide having four ridges protruding inwardly from the walls thereof, wherein the receive signal is applied to one pair of opposed ridges and the local oscillator signal is applied to the other pair of opposed ridges;
two capacitors each coupled at one terminal thereof to a separate ridge of a first pair of opposed ridges;
a diode ring including four diodes interconnected as a ring with each diode coupled between two of four junctions of said ring and with each junction connecting the anode of one diode to the cathode of an adjacent diode, wherein a first pair of opposed junctions of said diode ring is coupled through said capacitors to said first pair of opposed ridges, and wherein a second pair of opposed junctions of said diode ring is coupled to a second pair of opposed ridges; and
summing means coupled to said first pair of opposed junctions of said diode ring for providing the intermediate frequency signal.

4,691,381
RECEIVER FOR AMPLITUDE MODULATED SIGNALS
David R. Bollard, Mayfield, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 12, 1985, Ser. No. 722,637
Claims priority, application United Kingdom, Apr. 30, 1984, 8411038
Int. Cl.⁴ H04B *1/16*
U.S. Cl. 455—334 **9 Claims**



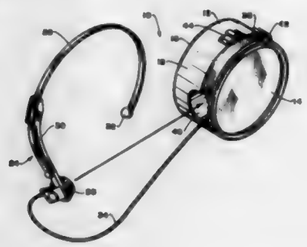
1. In a receiver for detecting an amplitude modulated signal received at the input thereof and producing a digital output having a digital value corresponding to the amplitude of the detected input signal on a logarithmic scale, a video detector comprising:
a detector stage coupled to the input of said receiver for detecting the received amplitude modulated input signal;
a cascaded chain of amplifiers connected to the output of the detector stage for receiving the detected input signal, said amplifiers respectively having gains which quantize the dynamic range of the amplitude of the detected signal in logarithmic steps;
a plurality of groups of comparators having first inputs and second groups, the first inputs of the comparators in respective groups being respectively connected to the output of the detector stage and to outputs of respective ones of said amplifiers;
and a plurality of logarithmically stepped resistive voltage divider chains respectively corresponding to respective ones of said groups of comparators and each having taps thereon respectively connected to the second inputs of respective comparators in the corresponding group, such taps supplying logarithmically quantized reference voltages to the comparators connected thereto, all of said voltage divider chains and the steps thereon being substantially the same.

4,691,382
BATTERY SAVING SIGNAL GENERATING CIRCUIT
Takeshi Nakajima, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Dec. 31, 1984, Ser. No. 687,645
Claims priority, application Japan, Jan. 9, 1984, 59-1605
Int. Cl.⁴ H04B *1/16*; H03K *3/01, 3/017*; G01R *29/02*
U.S. Cl. 455—343 **8 Claims**



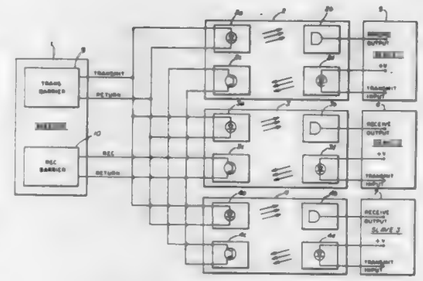
1. A battery saving signal generating circuit comprising means for producing time slot pulses for energizing a power source assembled in a paging receiver;
said time slot pulse generating means comprising:
first means for producing a first timing signal for determination of a time duration of each of said time slot pulses;
second means operable independent of said first means for producing a second timing signal for determination of an occurrence interval between said adjacent time slot pulses; and
third means responsive to said first and second timing signals for producing said time slot pulses;
whereby a driving power is supplied from said power source to said paging receiver when the time slot pulse is activated, and the driving power is not supplied to said paging receiver when the time slot pulse is inactivated.

4,691,383
COMPACT RADIO
Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304
Filed May 13, 1986, Ser. No. 862,790
Int. Cl.⁴ H04B *1/08*
U.S. Cl. 455—351 **10 Claims**



1. A compact radio comprising:
(a) a disk-like housing defined by two major, parallel surfaces separated by a cylindrical body, with an attachment means provided on at least one of said major surfaces for attaching said radio to the body of a listener;
(b) electronic means within said housing for detecting and amplifying a radio signal;
(c) an earphone assembly provided with means for conveying said amplified radio signal to an ear of said listener, said earphone assembly comprising a speaker adapted to be received in said ear, an adjustable head band for partially encircling the head of the listener, with means provided on one end thereof for supporting said speaker, and a wire for conveying said amplified signal to said speaker;
(d) means cooperatively associated in said cylindrical body for storing said wire;
(e) means cooperatively associated in said cylindrical body for storing at least a portion of said earphone assembly; and
(f) means in said cylindrical body for adjusting the volume of said amplified signal.

4,691,384
INTRINSICALLY SAFE MULTI-DROP COMMUNICATIONS LINK
Tommy L. Jobe, Noble, Okla., assignor to Technical Oil Tools Corporation, Norman, Okla.
Filed Oct. 2, 1985, Ser. No. 782,888
Int. Cl.⁴ H03H *5/12*
U.S. Cl. 455—602 **12 Claims**



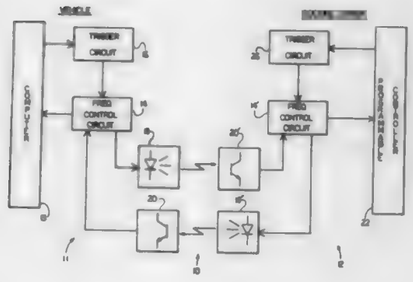
4. An intrinsically safe multi-drop communications link comprising a master having an output and an input means and a plurality of slaves, the slaves being in parallel; a transmit line extending from the master output means toward each slave; a receive line extending from each slave toward the master input means; a first shunt-diode safety barrier circuit in the master output means and a second shunt-diode safety barrier circuit in the master input means; and an opto-coupler interface at each slave communicating between each slave and the transmit and receive lines extending thereto, the opto-coupler interface comprising emitter-detector pairs spaced apart by an intrinsically safe distance whereby intrinsically unsafe fault conditions cannot occur.

4,691,385
OPTICAL COMMUNICATION APPARATUS FOR A VEHICLE
David J. Tupman, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio
Filed Sep. 5, 1985, Ser. No. 773,141
Int. Cl.⁴ H04B *9/00*
U.S. Cl. 455—607 **6 Claims**

1. Communication apparatus for controllably bidirectionally transferring information between a vehicle and a docking station, comprising:
first and second radiant energy emitting means for producing pulsed radiant energy in response to receiving respective pulse control signals, one of said first and second radiant energy emitting means being located on said vehicle and the other on said docking station;
first and second radiant energy detecting means for producing electrical signals responsive to received radiant energy, one of said first and second radiant energy detecting means being located on said vehicle and the other on said docking station;
first frequency control means for receiving said electrical signals from said one of said first and second radiant en-

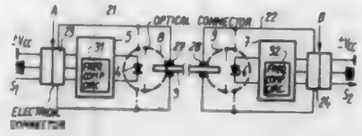
ergy detecting means located on said vehicle, producing pulse control signals having a nominal frequency which is variable within a predetermined frequency range, controllably delivering said produced pulse control signals at said nominal frequency to said one of said first and second radiant energy emitting means located on said vehicle in the absence of receiving said electrical signals, and automatically adaptively modifying the frequency of said respective produced pulse control signals in response to receiving said electrical signals;

second frequency control means for receiving said electrical signals from said one of said first and second radiant energy detecting means located on said docking station, producing pulse control signals having a nominal frequency which is variable within a predetermined frequency range, controllably delivering said produced pulse control signals at said nominal frequency to said one of said first and second radiant energy emitting means located on said docking station in the absence of receiving said electrical signals, and automatically adaptively modifying the frequency of said respective produced pulse control signals in response to receiving said electrical signals; and



wherein said vehicle includes first trigger means for controllably delivering a transmit trigger signal to said first frequency control means in response to predetermined status conditions of said vehicle, said docking station includes second trigger means for controllably delivering a transmit trigger signal to said second frequency control means in respose to predetermined status conditions of said docking station, and each of said first and second frequency control means include logic means for receiving said respective transmit trigger signal and blocking delivery of said respective pulse control signals to said respective one of said first and second radiant energy emitting means in response to the absence of said transmit trigger signal.

4,691,386
OPTICAL TRANSMISSION CHANNEL WITH ELECTRICAL CONNECTORS
Gregoire Eumurian, Argenteuil, and Albert Courty, Ville D'Avray, both of France, assignors to Thomson-CSF, Paris, France
Filed Nov. 28, 1984, Ser. No. 675,799
Claims priority, application France, Dec. 2, 1983, 83 19320
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—607 **10 Claims**



1. An optical transmission channel, comprising:

an optical cable having at least two optical fibers;

first and second modules connected to respective first and second ends of the optical cable, each of the modules having;

(a) a housing;

(b) means coupled to the housing for clamping a sheath of the optical cable in a fixed position to one end of the module;

(c) means for fixing photoemitting and photoreceiving diodes within the housing;

(d) first means for fixedly coupling an end of the first of the at least two optical fibers to the photoemitting diode, the photoemitting diode being connected to a first electronic circuit;

(e) second means for fixedly coupling the second of the at least two optical fibers to the photoreceiving diode, the photoreceiving diode being connected to a second electronic circuit;

(f) means for fixedly mounting the first and second electronic circuits within the housing; each of the first and second electronic circuits including a frequency compensating circuit for producing a phase lead to accentuate high frequencies attenuated by the optical cable and to permit operations in a widened frequency band, each of the frequency compensating circuits comprising in series a resistor, a capacitor and an impedance element of impedance determined with respect to a length of the cable, one of the frequency compensating circuits further having an adjustable capacitor connected in parallel with said capacitor for accurately setting the phase lead;

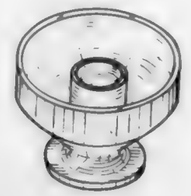
(g) means coupled to the fixing mounting means and electrically connected to the first and second electronic circuits for connecting the module to an external electrical linking means;

thereby providing for a transmission channel having a constant transfer function.

DESIGNS

SEPTEMBER 1, 1987

291,620
ICE CREAM CONE HOLDER
Emanuel Porchia, 423 West 5th, Eldorado, Ark. 71731
Filed Nov. 5, 1984, Ser. No. 668,209
Term of patent 14 years
U.S. Cl. D1—105



291,621
FOOT PROTECTOR
Pinky Herman, 4705 NW. 35th St., Lauderdale Lakes, Fla. 33319
Filed Sep. 1, 1987, Ser. No. 695,690
Term of patent 14 years
U.S. Cl. D2—271



291,622
DECORATIVE TOE COVER
Bonnie Gray, 400 Cranbury Rd., Apt. #4, E. Brunswick, N.J. 08816
Filed Aug. 13, 1984, Ser. No. 639,716
Term of patent 14 years
U.S. Cl. D2—330



291,623
INSULATED BELT CARRIER FOR BEVERAGE CANS
Craig A. Ericksen, 9940 Ammons Cir., Broomfield, Colo. 80020
Filed Mar. 27, 1985, Ser. No. 716,625
Term of patent 14 years
U.S. Cl. D2—630



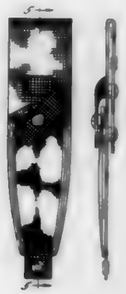
291,624
ATTACHE CASE OR SIMILAR ARTICLE
Walter Bialo, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Mar. 1, 1985, Ser. No. 707,134
Term of patent 14 years
U.S. Cl. D3—76



291,625
ATTACHE CASE OR SIMILAR ARTICLE
Walter Biale, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Apr. 12, 1985, Ser. No. 723,495
Term of patent 14 years
U.S. Cl. D3—76



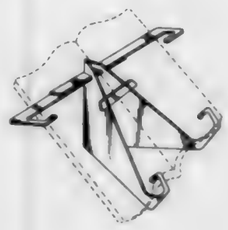
291,626
SHEATH
Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Inc., Portland, Oreg.
Filed Jan. 18, 1985, Ser. No. 692,531
Term of patent 14 years
U.S. Cl. D3—102



291,627
KNIFE POUCH
Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Inc., Portland, Oreg.
Filed Jan. 18, 1985, Ser. No. 692,534
Term of patent 14 years
U.S. Cl. D3—102



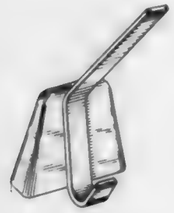
291,628
BOOK HOLDER
Lillian Poltere, 5733 Lord Cecil St., San Diego, Calif. 92122
Filed Feb. 11, 1985, Ser. No. 700,272
Term of patent 14 years
U.S. Cl. D6—310



291,629
BELT BUCKLE RACK
Walter R. Belden, 300 E. Prosser Rd., #25A, Cheyenne, Wyo. 82007
Filed Jan. 4, 1985, Ser. No. 688,971
Term of patent 14 years
U.S. Cl. D6—316



291,630
HOOK FIXTURE
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,083
Term of patent 14 years
U.S. Cl. D6—323



291,631
CHAIR
Peter de Boer, Pr.Margrietplantsoen 45, 1403 SV Bussum, Netherlands
Filed Dec. 19, 1984, Ser. No. 683,618
Claims priority, application Belgium, Jun. 22, 1984, 59102-01
Term of patent 14 years
U.S. Cl. D6—366

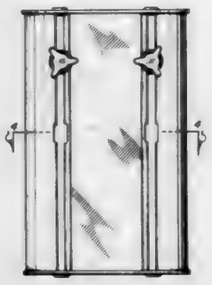


291,632
SEAT
Colman Zola, 58 Tamarack Way, Pleasantville, N.Y. 10570
Filed Sep. 28, 1984, Ser. No. 658,518
Term of patent 14 years
U.S. Cl. D6—379



291,633
CASSETTE STORAGE CASE
Richard Merzon, 49-16 Maspeth Ave., Maspeth, N.Y. 11378
Filed Apr. 19, 1985, Ser. No. 725,108
Term of patent 14 years
U.S. Cl. D6—446

291,634
FURNITURE SUPPORT STRUT
Raphael Ucros, Cerritos, Calif., assignor to Environmental Production Systems Company, Irvine, Calif.
Filed Mar. 14, 1985, Ser. No. 711,622
Term of patent 14 years
U.S. Cl. D6—491



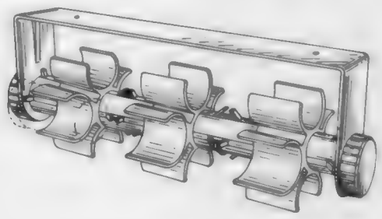
291,635
PORTABLE TRAY FOR ATTACHMENT TO A BEACH UMBRELLA
Benjamin Dickman, 1336 Knorr St., Philadelphia, Pa. 19111
Filed May 28, 1985, Ser. No. 737,784
Term of patent 14 years
U.S. Cl. D6—509



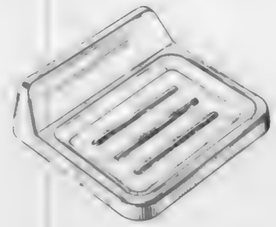
291,636
DRAWER SLIDE
Robert Rechberg, Orange, Calif., assignor to Actron Mfg., Inc., Anaheim, Calif.
Filed Apr. 25, 1985, Ser. No. 727,096
Term of patent 14 years
U.S. Cl. D6—510



291,637
SPICE RACK
Ralph R. Burin, Woodridge, Ill., assignor to Wilton Enterprises, Inc., Woodridge, Ill.
Filed Jun. 3, 1985, Ser. No. 740,863
Term of patent 14 years
U.S. Cl. D6—514



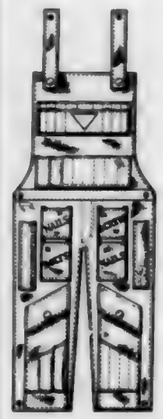
291,638
SOAP DISH
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,080
Term of patent 14 years
U.S. Cl. D6—540



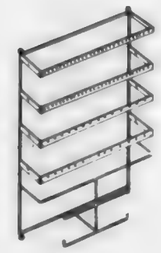
291,639
TOWEL BAR
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,081
Term of patent 14 years
U.S. Cl. D6—549



291,640
TOOL CADDY
Ralph M. Russo, 304 McNicoll Avenue, Willowdale, Ontario, Canada M2H 2C7
Filed Oct. 21, 1985, Ser. No. 789,974
Claims priority, application Canada, Sep. 23, 1985, 23-09-85-2
Term of patent 14 years
U.S. Cl. D6—563



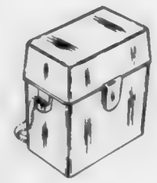
291,641
JEWELRY RACK
Mahin J. Farley, 8340 Greensboro Dr., McLean, Va. 22101
Filed Sep. 4, 1985, Ser. No. 772,438
Term of patent 14 years
U.S. Cl. D6—566

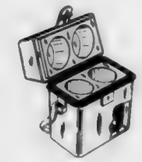


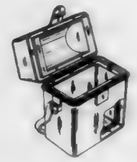
291,642
DOUBLE BASKET FRYER
Anthony F. Jerome, P.O. Box 428, Fairborn, Ohio 45324
Filed Jan. 9, 1986, Ser. No. 817,419
Term of patent 14 years
U.S. Cl. D7—43



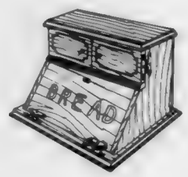
291,643
INSULATED CONTAINER
David L. Morris, Henderson, Ky., assignor to HTD, Inc., Henderson, Ky.
Filed Jun. 14, 1985, Ser. No. 744,626
Term of patent 14 years
U.S. Cl. D7—77



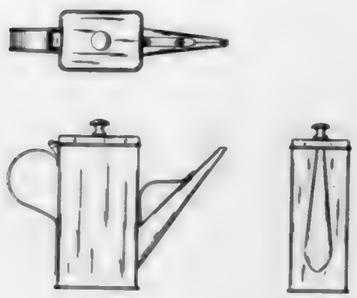




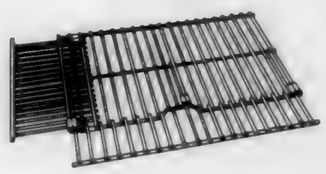
291,644
BREAD BOX
Gary A. Osborn, Rte. 6, Box 292A, Chatsworth, Ga. 30705
Filed Feb. 28, 1985, Ser. No. 706,665
Term of patent 14 years
U.S. Cl. D7—82



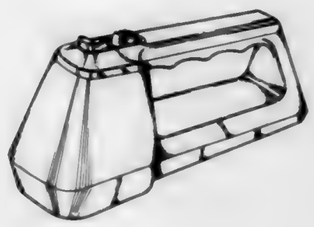
291,643
COOKING OIL CAN
Pasquale Bruno, Chicago, Ill., assignor to Amco Corporation, Chicago, Ill.
Filed Jul. 7, 1986, Ser. No. 882,693
Term of patent 14 years
U.S. Cl. D7—321



291,646
ADJUSTABLE COOKING GRID
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1985, Ser. No. 808,949
Term of patent 14 years
U.S. Cl. D7—332



291,647
HAND MIXER HOUSING
Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Mar. 21, 1985, Ser. No. 714,656
Term of patent 14 years
U.S. Cl. D7—379



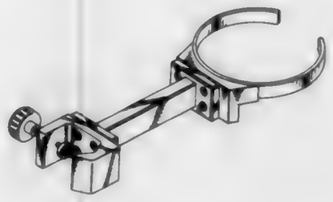
291,648
BARBECUE STAND
Donald M. Prieg, 117-11530 24 St., Edmonton, Alberts, Canada T5W4V3
Filed Jul. 23, 1984, Ser. No. 633,839
Term of patent 14 years
U.S. Cl. D7—403



291,649
VALVE SEAT DRIVER
David C. Rembold, Bloomington, Minn., assignor to Sunnen Products Company, St. Louis, Mo.
Filed Jun. 6, 1984, Ser. No. 617,673
Term of patent 14 years
U.S. Cl. D8—14



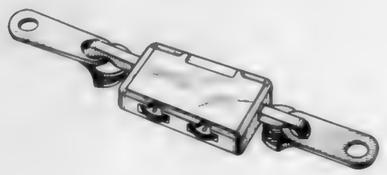
291,650
HOLDER RING FOR CARDIOTOMY RESERVOIR
Takashi Monzen, Tama, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,589
Term of patent 14 years
U.S. Cl. D8—72



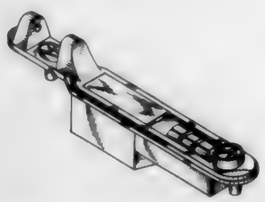
291,651
COUPON CLIPPER
William F. Sieg, 13-½ NE. Fifth St., Minneapolis, Minn. 55413, and Richard O. Barts, 7017 Mark Terrace Dr., Edina, Minn. 55435
Filed Jul. 11, 1984, Ser. No. 629,885
Term of patent 14 years
U.S. Cl. D8—98



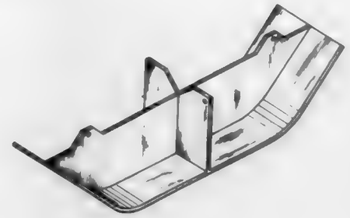
291,652
ZIPPER CLOSURE LOCK
Urs Gisiger, Gaensbruehlweg 4, 2545 Selzach, Switzerland
Filed Aug. 15, 1984, Ser. No. 641,039
Term of patent 14 years
U.S. Cl. D8—331



291,653
LUGGAGE LOCK
Walter Bialo, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Apr. 10, 1985, Ser. No. 721,710
Term of patent 14 years
U.S. Cl. D8—331



291,654
SLED FOR A REINFORCING CAGE OR THE LIKE
Thomas W. Foster, Jr., 3901 Shady Valley Dr., Arlington, Tex. 76013
Filed Jul. 15, 1985, Ser. No. 754,771
Term of patent 14 years
U.S. Cl. D8—349



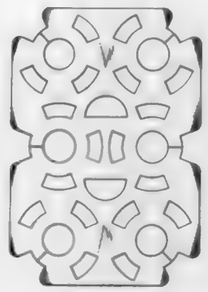
291,655
SHELF BRACKET
Kenneth F. Motta, 176 Mahogany Dr., Naples, Fla. 33963
Filed Feb. 19, 1985, Ser. No. 702,900
Term of patent 14 years
U.S. Cl. D8—381



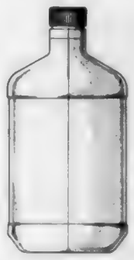
291,656
LOTION DISPENSING BOTTLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Continuation-in-part of Ser. No. 689,971, Jan. 9, 1985. This application May 28, 1985, Ser. No. 738,285
Term of patent 14 years
U.S. Cl. D9—300



291,657
INNER PACK BOTTLE CARRIER
Christopher Carr, and James J. Witt, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 4, 1985, Ser. No. 707,940
Term of patent 14 years
U.S. Cl. D9—344



291,658
OIL CONTAINER
John T. Klette, Fairfax, Va.; Harry O. Smith, Huntington Beach, Calif., and Eugene C. Bruns, House Springs, Mo., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 24, 1985, Ser. No. 726,571
Term of patent 14 years
U.S. Cl. D9—352



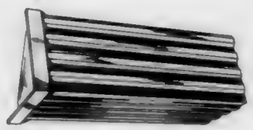
291,659
COMMUNION CONTAINER
Lee V. Powell, Memphis, Tenn., assignor to Johnese W. Powell, Memphis, Tenn., a part interest
Filed May 31, 1985, Ser. No. 739,890
Term of patent 14 years
U.S. Cl. D9—341



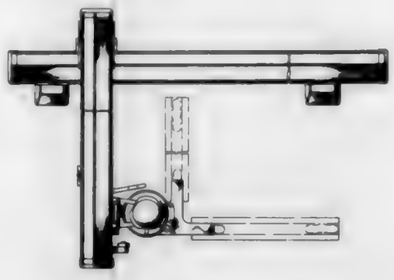
291,660
PERFUME BOTTLE
Oleg L. Cassini, 135 E. 19th St., New York, N.Y. 10003
Filed Sep. 12, 1984, Ser. No. 649,678
Term of patent 14 years
U.S. Cl. D9—384



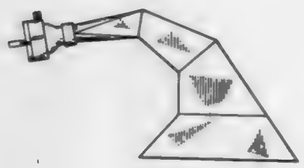
291,661
CORNER FITTING FOR A STACKABLE CONTAINER
Soren Stange, Engelbrektsgatan 57, Goteborg, Sweden
Filed Aug. 8, 1984, Ser. No. 638,872
Claims priority, application Sweden, Feb. 8, 1984, 84-0366; Feb. 8, 1984, 84-0387
Term of patent 14 years
U.S. Cl. D9—499



291,662
TRACK TYPE DRAFTING MACHINE
Zoltan Goncze, Palmdale; Andrew M. Ogden, and Stanley Y. Kong, both of Pasadena, all of Calif., assignors to Vemco Corporation, San Dimas, Calif.
Filed Feb. 15, 1985, Ser. No. 702,340
Term of patent 14 years
U.S. Cl. D10—63



291,663
ACOUSTIC HORN
James D. Parsons, 5384 W. Fremont Pl., Littleton, Colo. 80123, and James J. Schwab, Chico, Calif., assignors to James D. Parsons, Littleton, Colo.
Filed Feb. 19, 1985, Ser. No. 703,100
Term of patent 14 years
U.S. Cl. D10—120



291,664
RING
Pepi G. Kelman, Beverly Hills, Calif., assignor to Pepi Kelman, Inc., Los Angeles, Calif.
Filed Sep. 30, 1985, Ser. No. 781,347
Term of patent 14 years
U.S. Cl. D11—27



291,665
PENDANT
Varouj Tabakian, Mississauga, Canada, assignor to Jewellery by Varouj Inc., Toronto, Canada
Filed Sep. 17, 1985, Ser. No. 776,908
Claims priority, application Canada, Apr. 3, 1985, 03-04-85-7
Term of patent 14 years
U.S. Cl. D11—83





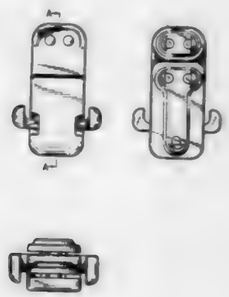
291,666
JEWELLERY PENDANT
Claude Gozlan, Toronto, Canada, assignor to Direct Jewellery Inc., Canada
Filed Feb. 11, 1985, Ser. No. 700,086
Claims priority, application Canada, Dec. 14, 1984, 14-12-84-7
Term of patent 14 years
U.S. Cl. D11—84



291,667
WATERING ATTACHMENT FOR FLOWER POTS OR THE LIKE
Jack M. A. Wouters, 89 Crescent Ave., St. Thomas, Ontario, Canada N5P 2K4
Filed Apr. 3, 1986, Ser. No. 847,829
Term of patent 14 years
U.S. Cl. D11—164



291,668
BUCKLE
Kazumi Kasai, 3105-1, Kamikoizumi, Namerikawa-shi, Toyama-ken, Japan
Filed Apr. 5, 1985, Ser. No. 720,343
Claims priority, application Japan, May 7, 1984, D59-18612
Term of patent 14 years
U.S. Cl. D11—216



291,669
SLIDER FOR SLIDE FASTENER
Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,278
Term of patent 14 years
U.S. Cl. D11—221



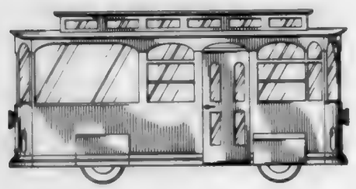
291,670
SLIDER FOR SLIDE FASTENER
Hideo Takabatake, Namerikawa, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,279
Claims priority, application Japan,
Term of patent 14 years
U.S. Cl. D11—221



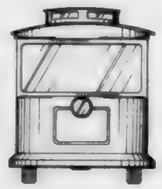
291,671
SLIDER FOR SLIDE FASTENER
Keiichi Keyaki, Kurobe, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,280
Term of patent 14 years
U.S. Cl. D11—221



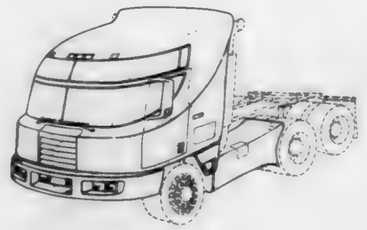
291,672
PASSENGER CARRYING VEHICLE
Richard B. McFadden, P.O. Box 3609, Deland, Fla. 32723
Filed Aug. 19, 1985, Ser. No. 767,101
Term of patent 14 years
U.S. Cl. D12—84



291,673
PASSENGER CARRYING VEHICLE
Richard B. McFadden, P.O. Box 3609, Deland, Fla. 32723
Filed Aug. 19, 1985, Ser. No. 767,117
Term of patent 14 years
U.S. Cl. D12—84



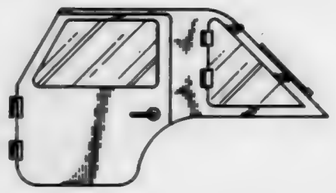
291,674
TRUCK CAB
Robert E. Smith, Orem, Utah, assignor to Pegasus Truck Cab Conversions, Inc., Orem, Utah
Filed May 21, 1985, Ser. No. 736,641
Term of patent 14 years
U.S. Cl. D12—96



291,675
TIRE
Ernst Mader, Munich, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany
Filed Sep. 28, 1984, Ser. No. 655,866
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, MR 13822
Term of patent 14 years
U.S. Cl. D12—136



291,676
REMOVABLE VEHICLE TOP
Charles E. Noble, P.O. Box 112, Minnie, Ky. 41651
Filed Feb. 21, 1985, Ser. No. 703,868
Term of patent 14 years
U.S. Cl. D12—156



291,677
STATION WAGON REAR BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,577
Term of patent 14 years
U.S. Cl. D12—169



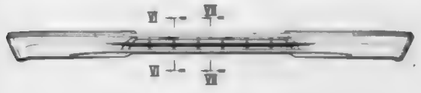
291,678
AUTOMOBILE FRONT BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 26, 1985, Ser. No. 759,620
Term of patent 14 years
U.S. Cl. D12—169



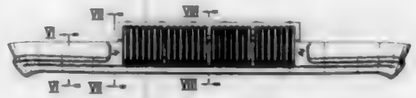
291,679
AUTOMOBILE REAR BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 26, 1985, Ser. No. 759,619
Term of patent 14 years
U.S. Cl. D12—169



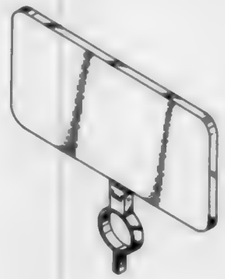
291,680
AUTOMOBILE VALANCE PANEL
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,578
Term of patent 14 years
U.S. Cl. D12—190



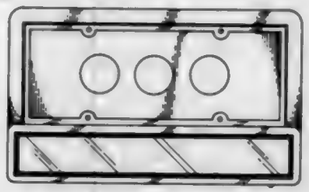
291,681
AUTOMOBILE VALANCE PANEL
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,617
Term of patent 14 years
U.S. Cl. D12—190



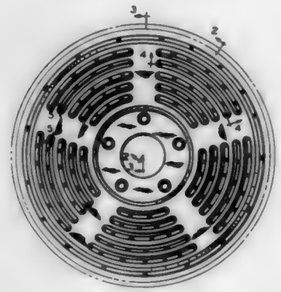
291,682
SUN DEFLECTOR FOR MOUNTING TO A VEHICLE INTERIOR REAR VIEW MIRROR
Stephen R. Stone, P.O. Box 818, 160 Tom Hickman, Malakoff, Tex. 75148
Filed Jan. 24, 1985, Ser. No. 694,271
Term of patent 14 years
U.S. Cl. D12—191



291,683
LICENSE PLATE FRAME
James C. Yates, 1091 NE. Sunrise La., Hillsboro, Oreg. 97123
Filed Apr. 22, 1985, Ser. No. 725,784
Term of patent 14 years
U.S. Cl. D12—193



291,684
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Aug. 12, 1985, Ser. No. 764,825
Term of patent 14 years
U.S. Cl. D12—209



291,685
BOAT
Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, and Gary L. Wilson, both of Bull Shoals, all of Ark., assignors to Wood Manufacturing Company, Inc., Flippin, Ark.
Filed Aug. 9, 1985, Ser. No. 763,964
Term of patent 14 years
U.S. Cl. D12—314



291,686
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 21, 1985, Ser. No. 789,654
Term of patent 14 years
U.S. Cl. D12—316



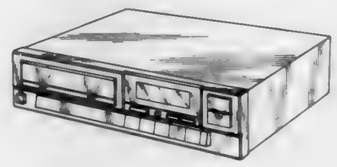
291,687
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 23, 1985, Ser. No. 790,365
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—316



291,688
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 23, 1985, Ser. No. 790,474
Term of patent 14 years
U.S. Cl. D12—316



291,689
AUDIO DISC PLAYER
Kazuhiko Nishiyama, Tokyo, and Takao Itoh, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 3, 1985, Ser. No. 688,508
Claims priority, application Japan, Jul. 17, 1984, 59-29520
Term of patent 14 years
U.S. Cl. D14—1



291,690
HEADPHONE
Joel B. Tabachnik, New York, N.Y., assignor to Talbot Toys Ltd., Kowloon, Hong Kong
Filed Mar. 4, 1985, Ser. No. 707,781
Term of patent 14 years
U.S. Cl. D14—36

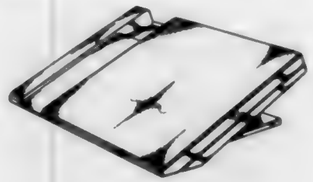


291,691
COMBINED HANDSET AND STAND TELEPHONE UNIT
Hansruedi Fellmann, Dietlikon, Switzerland, assignor to Autophon AG, Switzerland
Filed Apr. 24, 1985, Ser. No. 726,801
Term of patent 14 years
U.S. Cl. D14—58





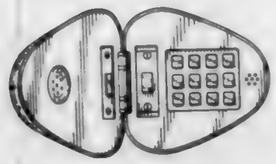
291,692
STAND FOR A TELEPHONE HANDSET
Clifford D. Read, Almonte, and Michael K. Eldershaw, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jun. 28, 1985, Ser. No. 750,086
Claims priority, application Canada, Jan. 23, 1985, 2301854
Term of patent 14 years
U.S. Cl. D14—60



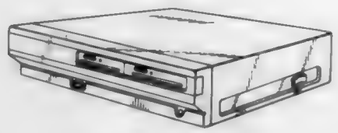


291,693
HANDSET TELEPHONE
Takei Yoshiharu, New Territories, Hong Kong, assignor to Tasca International Ltd, Kowloon, Hong Kong
Filed May 12, 1986, Ser. No. 862,574
Claims priority, application United Kingdom, Feb. 7, 1986, 1032115
Term of patent 14 years
U.S. Cl. D14—64

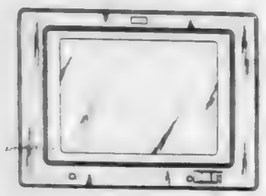




291,694
PERSONAL COMPUTER
Akira Aihara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 21, 1984, Ser. No. 684,795
Claims priority, application Japan, Jul. 6, 1984, 59-28028
Term of patent 14 years
U.S. Cl. D14—100

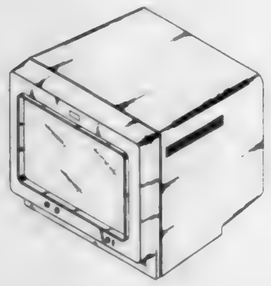


291,695
DISPLAY MONITOR
Michael H. Sharp, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 27, 1984, Ser. No. 676,024
Claims priority, application United Kingdom, May 30, 1984, 1019971
Term of patent 14 years
U.S. Cl. D14—113

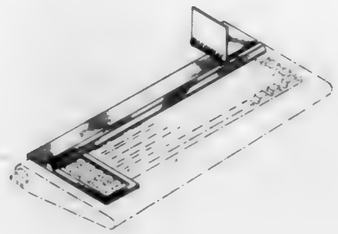


MONITOR
FRONT VIEW

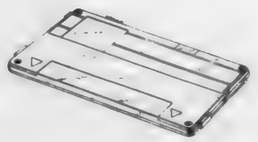
291,696
VISUAL DISPLAY MONITOR
David L. Schaum, Woodstock, N.Y.; Robert E. Steinbugler, and Jonathan J. Vitello, both of Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Mar. 1, 1985, Ser. No. 705,807
Term of patent 14 years
U.S. Cl. D14—113



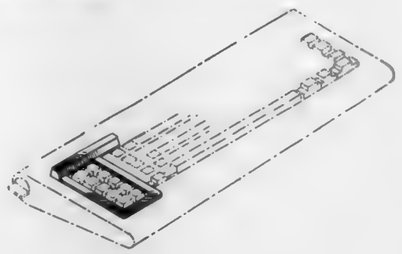
291,697
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed Dec. 14, 1984, Ser. No. 683,130
Term of patent 14 years
U.S. Cl. D14—114



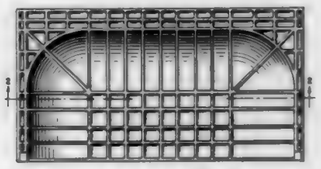
291,698
MEMORY CARD FOR WORD PROCESSOR
Junji Hirooka, Higashimurayama, and Osamu Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1985, Ser. No. 717,167
Claims priority, application Japan, Sep. 14, 1984, 59-38322
Term of patent 14 years
U.S. Cl. D14—114

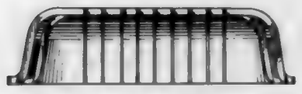


291,699
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed Jul. 9, 1985, Ser. No. 753,096
Term of patent 14 years
U.S. Cl. D14—114

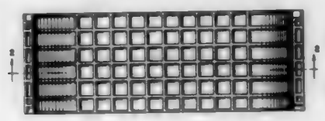


291,700
MOLD TO BE USED IN THE MANUFACTURE OF CONCRETE CEILINGS
Moshe Farhi, 4a Givat Downs St., Haifa, Israel
Continuation of Ser. No. 513,394, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 175,418, Aug. 5, 1980, abandoned. This application Jul. 7, 1986, Ser. No. 882,712
Claims priority, application Israel, Feb. 28, 1980, 8060
Term of patent 14 years
U.S. Cl. D15—136



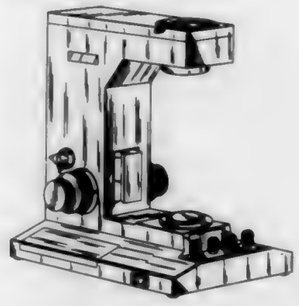


291,701
INNER SURFACE OF A MOLD TO BE USED IN THE MANUFACTURE OF CONCRETE CEILINGS
Moshe Farhi, 4a Givat Downs St., Haifa, Israel
Continuation of Ser. No. 513,395, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 175,417, Aug. 5, 1980, abandoned. This application Jul. 7, 1986, Ser. No. 882,713
Claims priority, application Israel, Feb. 28, 1980, 8067
Term of patent 14 years
U.S. Cl. D15—136



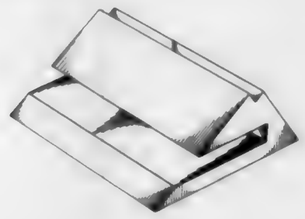


291,702
MICROSCOPE STAND WITH A BUILT-IN ILLUMINATOR
Robert M. Kabute, Honeoye Falls, N.Y., assignor to Warner-Lambert Technologies, Inc., Southbridge, Mass.
Filed Apr. 9, 1984, Ser. No. 598,108
Term of patent 14 years
U.S. Cl. D16—131

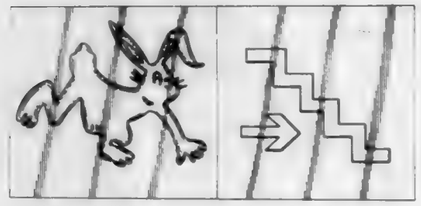


291,703
SEAL PRESS
Cameron Fink; Robert W. Schram, and Anthony Gentile, all of London, Canada, assignors to Sterling Marking Products Inc., London, Canada
Filed May 6, 1985, Ser. No. 730,909
Claims priority, application Canada, Jan. 21, 1985, 21-01-85-2
Term of patent 14 years
U.S. Cl. D18—15

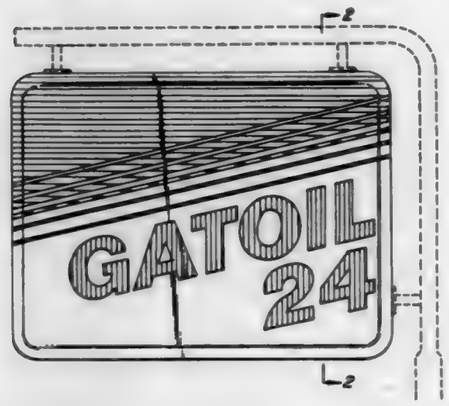
291,704
COMBINED MEMO PAD AND PEN HOLDER
Richard G. Zucker, New York, N.Y., assignor to Jonathan Bradley Pens, Inc., New York, N.Y.
Filed Oct. 29, 1984, Ser. No. 665,650
Term of patent 14 years
U.S. Cl. D19—78



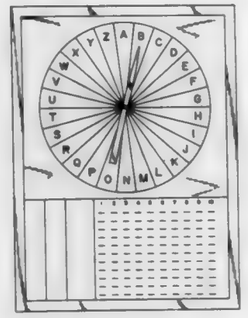
291,705
ESCAPE SYMBOL
Robert N. Hellmer, 538 New York Ave., Dunedin, Fla. 33528, and Robert J. Smallwood, 7250 Bandera Rd., San Antonio, Tex. 78238
Division of Ser. No. 549,390, Nov. 7, 1983, Pat. No. Des. 287,514. This application Feb. 11, 1986, Ser. No. 828,376
Term of patent 14 years
U.S. Cl. D20—30



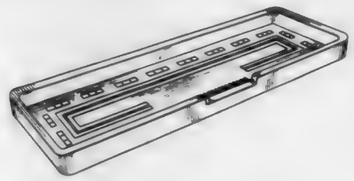
291,706
SIGN
Calame G. C. Georges, 32 av Frontenex, 1207 Genève, Switzerland; Jörg Zintzmeyer, and Peter G. C. Lux, both of Attenhoferstrasse 43, Zurich, Switzerland (CH-8032)
Filed Dec. 6, 1983, Ser. No. 558,649
Claims priority, application Switzerland, Jun. 6, 1983, 113107
Term of patent 14 years
U.S. Cl. D20—42



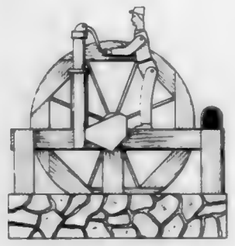
291,707
GAMEBOARD
Lois I. Martin, 1503 N. Windsor Dr., 103 Apartment, Arlington Hts., Ill. 60004
Filed Sep. 20, 1984, Ser. No. 652,138
Term of patent 14 years
U.S. Cl. D21—22



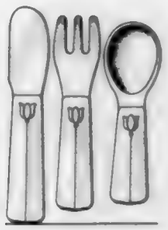
291,708
GAMING TABLE TOP
Robert F. Ollington, 129 Nelson Road, South Melbourne, Australia
Filed Jun. 25, 1984, Ser. No. 624,226
Claims priority, application Australia, Jan. 19, 1984, 6303/84
Term of patent 14 years
U.S. Cl. D21—37



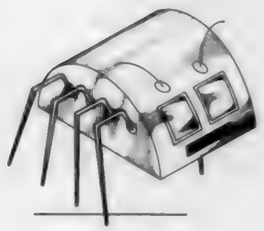
291,709
TOY WATER WHEEL
Troy B. Davis, Rte. 5, Box 295-A, Oxford, Miss. 38655
Filed Mar. 11, 1985, Ser. No. 710,074
Term of patent 14 years
U.S. Cl. D21—59



291,710
TOY TABLEWARE UTENSIL
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Jan. 16, 1985, Ser. No. 692,296
Term of patent 14 years
U.S. Cl. D21—121



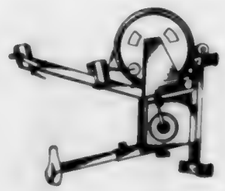
291,711
SPIDER MACHINE TOY
Robert Dixon, 3538 Kirby Rd., Memphis, Tenn. 38115
Filed Aug. 16, 1984, Ser. No. 641,469
Term of patent 14 years
U.S. Cl. D21—185



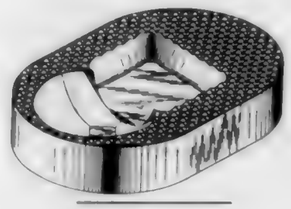
291,712
TRAMPOLINE
Mark Koivisto, 2230 Ridge Dr. #32, St. Louis Park, Minn. 55416
Filed Sep. 12, 1984, Ser. No. 649,735
Term of patent 14 years
U.S. Cl. D21—191



291,713
ERGOMETER
Heikki Kiiski, Turku 10, Finland, assignor to Tunturipyora OY, Truku, Finland
Filed Feb. 20, 1985, Ser. No. 703,408
Claims priority, application Finland, Sep. 4, 1984, 850/84
Term of patent 14 years
U.S. Cl. D21—195



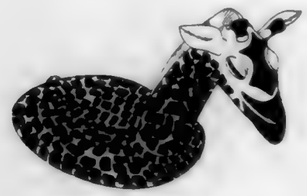
291,714
KICKING TEE
H. Jay Spiegel, Alexandria, Va., assignor to Premium Products, Inc., Alexandria, Va.
Filed Apr. 24, 1985, Ser. No. 726,795
Term of patent 14 years
U.S. Cl. D21—209



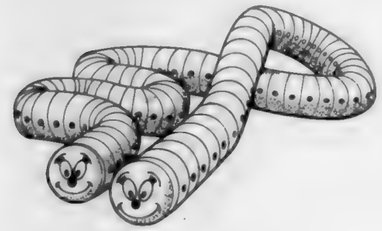
291,715
AIRFOIL FIN FOR SURFBOARDS
Denice C. Alpine, 7959 Woodlake, Canoga Park, Calif. 91304
Filed Oct. 29, 1985, Ser. No. 792,581
Term of patent 14 years
U.S. Cl. D21—236



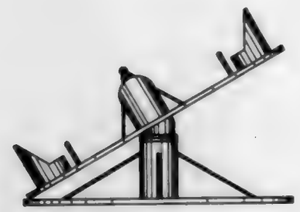
291,716
FLOAT
Henry S. Wolfe, 14480 62nd St. N., Clearwater, Fla. 33520
Filed Oct. 18, 1985, Ser. No. 789,156
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—237



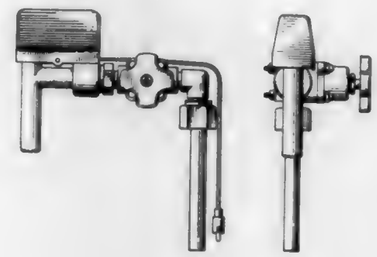
291,717
FAIRGROUND AMUSEMENT TUNNEL
Kevin C. Brooks, 500 Oxford Street, Bondi Junction N.S.W. 2022, Australia
Filed Feb. 27, 1985, Ser. No. 706,465
Term of patent 14 years
U.S. Cl. D21—242



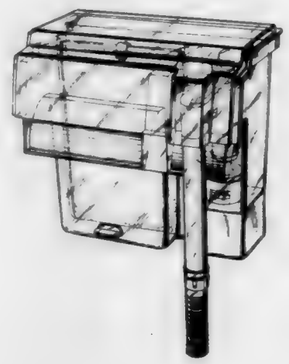
291,718
OCCUPANT PROPELLED AMUSEMENT DEVICE
Gerald A. Spencer, 1914 York, Independence, Mo. 64058
Filed Feb. 11, 1985, Ser. No. 700,668
Term of patent 14 years
U.S. Cl. D21—249



291,719
FAUCET FOR PROTECTING STERILE FLUID SYSTEMS
Narbik A. Karamian, Bethesda, Md., assignor to Raf-Tan Inc., Bethesda, Md.
Filed May 28, 1985, Ser. No. 737,879
Term of patent 14 years
U.S. Cl. D23—3



291,720
AQUARIUM FILTER PUMP
Allan H. Willinger, Englewood, N.J., and Monte Levin, New York, N.Y., assignors to Willinger Bros. Inc., Englewood, N.J.
Filed Mar. 11, 1985, Ser. No. 710,444
Term of patent 14 years
U.S. Cl. D23—4



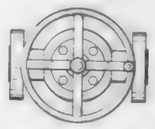
291,721
AQUARIUM FILTER CARTRIDGE
Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Englewood, N.J.
Filed Dec. 16, 1985, Ser. No. 809,272
Term of patent 14 years
U.S. Cl. D23—4



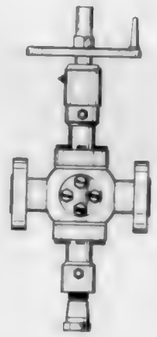
291,722
AQUARIUM FILTER CARTRIDGE FRAME
Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Inc., Englewood, N.J.
Filed Dec. 26, 1985, Ser. No. 813,531
Term of patent 14 years
U.S. Cl. D23—4



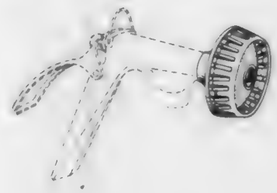
291,723
GATE VALVE
Willard E. Kemp, 14702 Broadgreen, Houston, Tex. 77079
Filed Jul. 5, 1983, Ser. No. 510,639
Term of patent 14 years
U.S. Cl. D23—19



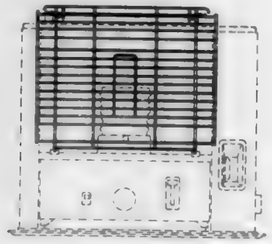
291,724
GATE VALVE
Willard E. Kemp, 14702 Broadgreen, Houston, Tex. 77079
Filed Jul. 5, 1983, Ser. No. 510,655
Term of patent 14 years
U.S. Cl. D23—19



291,725
MULTIPLE PATTERN SPRAY NOZZLE
Claus O. Huckenbeck, Tehachapi, and Glenn S. White, Canoga Park, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Nov. 27, 1984, Ser. No. 675,294
Term of patent 14 years
U.S. Cl. D23—35



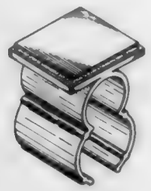
291,726
GRID-LIKE GUARD FOR THE FRONT OF A PORTABLE HEATER
Nobuyuki Kojima; Youichi Sekigawa, and Makoto Kobiyama, all of Niigata, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Niigata, Japan
Filed Mar. 7, 1984, Ser. No. 586,989
Claims priority, application Japan, Sep. 8, 1983, 58-38904; Sep. 8, 1983, 58-38905; Oct. 31, 1983, 58-169050[U]; Nov. 2, 1983, 58-170301[U]; Dec. 12, 1983, 58-53329; Dec. 12, 1983, 58-53330
Term of patent 14 years
U.S. Cl. D23—127



291,727
STOVE DOOR
John F. Desautels, Snohomish, Wash., assignor to Avalon Corporation International, Seattle, Wash.
Filed Aug. 5, 1985, Ser. No. 762,440
Term of patent 14 years
U.S. Cl. D23—128



291,728
SYRINGE CLIP
Garry Hoyt, Grapevine, Tex., assignor to Fisher Scientific Group Inc., San Diego, Calif.
Filed Mar. 6, 1985, Ser. No. 708,777
Term of patent 14 years
U.S. Cl. D24—27



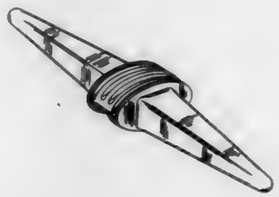
291,729
SPINAL HOOK DISTRACTOR OR THE LIKE
Kevin M. Greig, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed May 8, 1985, Ser. No. 731,801
Term of patent 14 years
U.S. Cl. D24—27



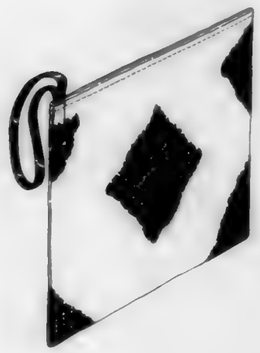
291,730
REAGENT CONTAINER OR SIMILAR ARTICLE
Norman G. Kells, and Thomas O. Tiffany, both of Spokane, Wash., assignors to Fisher Scientific Company, Pittsburgh, Pa.
Filed Feb. 27, 1985, Ser. No. 706,071
Term of patent 14 years
U.S. Cl. D24—29



291,731
PROSTHETIC JOINT IMPLANT FOR A FINGER OR TOE OR THE LIKE
Jerry L. Aikins, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed May 8, 1985, Ser. No. 732,027
Term of patent 14 years
U.S. Cl. D24—33



291,732
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,682
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34



291,733
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,762
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34

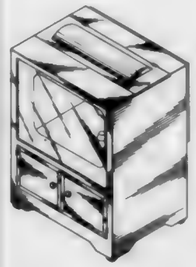


291,734
BODY MASSAGER
Desmond K. Shiu, Boston, Mass., assignor to Matrix International Industries, Inc, Boston, Mass.
Filed Feb. 27, 1985, Ser. No. 706,424
Term of patent 14 years
U.S. Cl. D24—36





291,735
AQUARIUM
Larry Billups, Lot 287, Air Base Mobile Home Park, Columbus, Miss. 39701
Filed Apr. 2, 1985, Ser. No. 719,137
Term of patent 14 years
U.S. Cl. D30—8



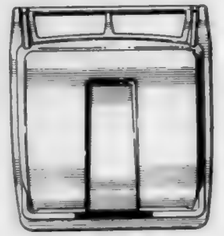
291,736
AQUARIUM AERATOR
Arno Richter, Osnabrück, Fed. Rep. of Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Sep. 25, 1984, Ser. No. 654,089
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 29 MR 727
Term of patent 14 years
U.S. Cl. D30—12

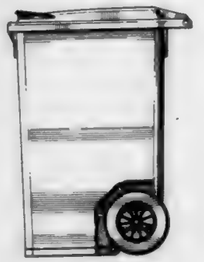


291,737
SINK DRAINBOARD
Walter C. McDaniel, Sr., Rte. 5, Box 92, Eufaula, Ala. 36027
Filed Sep. 26, 1985, Ser. No. 780,634
Term of patent 14 years
U.S. Cl. D32—56

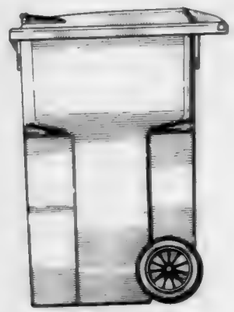


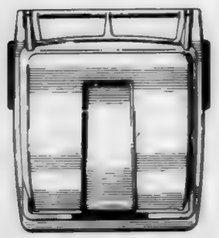
291,738
WASTE CONTAINER
Witold Orlowski, Helsingborg, Sweden, assignor to Perstorp AB, Perstorp, Sweden
Filed Mar. 26, 1985, Ser. No. 716,127
Claims priority, application Sweden, Sep. 27, 1984, 2583/84
Term of patent 14 years
U.S. Cl. D34—5





291,739
WASTE CONTAINER
Witold Orlowski, Helsingborg, Sweden, assignor to Perstorp AB, Perstorp, Sweden
Filed Mar. 26, 1985, Ser. No. 716,128
Claims priority, application Sweden, Sep. 27, 1984, 2584/84
Term of patent 14 years
U.S. Cl. D34—5





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. & M. Cousin & Cie: *See*—
Pipon, Yves; and Droulon, Georges, 4,690,458, Cl. 297-379.000.

Aarts, Mathias L. C., to Product Suppliers AG. Leakage detection with flexible bag. 4,689,987, Cl. 73-49.300.

Assen, Steven M.; and Bryan, Thomas T., to Minnesota Mining and Manufacturing Company. Ethoxylated siloxane surfactants and hydrophilic silicones prepared therewith. 4,691,039, Cl. 556-446.000

AB BOFORS: *See*—
Carlsson, Gengt, 4,690,057, Cl. 102-266.000.

AB Tico: *See*—
Gustafsson, Paul, 4,690,290, Cl. 212-267.000.

Abdenour, Stephen F.; and Polatas, Stephen M., to B.F. Goodrich Company, The. Aircraft rotating wing seal. 4,690,352, Cl. 249-49.000.

Abe, Kazuharu: *See*—
Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.

Abed, Kamel Ben Y. Mechanical horse for children's play. 4,690,397, Cl. 272-53.200.

Acampora, Alfonse A., to RCA Corporation. Rate buffer control of difference signal decimation and interpolation for adaptive differential pulse code modulator. 4,691,233, Cl. 358-136.000.

Accurate Industries, Inc.: *See*—
Rasmussen, Robert, 4,690,608, Cl. 414-529.000.

Acello, John J., to Eastman Kodak Company. Dropout compensator and luminance averager with "shared" delay. 4,691,249, Cl. 358-336.000.

ACF Industries, Incorporated: *See*—
Billingsley, Robert H.; and Jantzen, Steven L., 4,690,071, Cl. 105-404.000.

Adachi, Tsukasa: *See*—
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Adachi, Yoshitugu: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.

Adams, Graham; and Jones, Martin A., to Dow Corning, Ltd. Foam control. 4,690,688, Cl. 44-76.000.

Adams Mfg.: *See*—
Adams, William E., 4,690,272, Cl. 206-45.280.

Adams, Michael. Raised grip shovel. 4,690,447, Cl. 294-57.000.

Adams, William E., to Adams Mfg. Container display. 4,690,272, Cl. 206-45.280.

Adkins, Ernest, to Klinger AG. Gaskets. 4,690,413, Cl. 277-199.000.

Adoram, Amnon: *See*—
Bayer, Izhak; and Adoram, Amnon, 4,690,132, Cl. 128-4.000.

Adrian, Willy; and Wente, Gerald, to Otis Elevator Company. Multifunction glassholder for escalator balustrade. 4,690,264, Cl. 198-335.000.

Advanced Control Engineering: *See*—
Swain, Danny C., 4,690,621, Cl. 417-313.000.

Advanced Micro Devices, Inc.: *See*—
Khu, Arthur H., 4,691,193, Cl. 340-347.0DD.
Schnizlein, Paul G.; and Tang, Wen-Tsung F., 4,691,122, Cl. 307-279.000.

Advanced Mineral Technologies, Inc.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.

Advanced Polymer Systems, Inc.: *See*—
Won, Richard, 4,690,825, Cl. 424-501.000.

Aero-Metric General, Inc.: *See*—
Lange, Philip E., 4,691,143, Cl. 315-133.000.

Aeroquip Corporation: *See*—
Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.

Agency of Industrial Science & Technology: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Ahrens, Allan F.; and Martinelli, Robert M., to Hughes Aircraft Company. Partial shunt switching limiter for a spacecraft solar-panel or like power-source array. 4,691,159, Cl. 323-222.000.

Aiba, Kazumi: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Aihara, Mitsuo: *See*—
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-490.000.

Air Products and Chemicals, Inc.: *See*—
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., 4,691,026, Cl. 548-531.000.

Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., 4,690,215, Cl. 166-261.000.
Sircar, Shivaji; and Koch, William R., 4,690,696, Cl. 55-26.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Aisin-Warner Limited: *See*—
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.

Ajinomoto Co., Inc.: *See*—
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.
Tosa, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, 4,691,054, Cl. 562-554.000.

Akasaka, Shinichi: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Akatsu, Makoto; and Hori, Keiichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Booster type high-pressure vessel. 4,690,618, Cl. 417-226.000.

Akatsu, Tatsuo: *See*—
Takezawa, Yoshio; and Akatsu, Tatsuo, 4,690,969, Cl. 524-413.000.

Akiyama, Hirosi: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Aktiengesellschaft Adolph Saurer: *See*—
Thalmann, Theo; and Oesterle, Gerhard, 4,690,176, Cl. 139-110.000.

Akutagawa, Susumu: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Yosichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Akzo N.V.: *See*—
van Os, Willem A. A. A., 4,690,136, Cl. 128-130.000.

AL-CHEM Fuels, Inc.: *See*—
Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.

Albanese, Thomas C. Apparatus for cutting out a face in a pumpkin. 4,689,885, Cl. 30-316.000.

Albean, David L., to RCA Corporation. Noise reduction circuit for television multi-channel sound. 4,691,234, Cl. 358-144.000.

Albericci, Peter, to British Aerospace Public Limited Company. Chromic acid anodizing of aluminium prior to adhesive bonding. 4,690,736, Cl. 204-38.300.

Albers, Michel O.; and Singleton, Eric, to South African Inventions Development Corporation. Hydrogentation of unsaturated aliphatic hydrocarbons. 4,691,069, Cl. 585-259.000.

Albert Einstein College of Medicine of Yeshiva University, a division of Yeshiva University: *See*—
Diamond, Betty A., 4,690,905, Cl. 436-508.000.

Albert-Frankenthal AG: *See*—
Herb, Rudolf, 4,690,396, Cl. 271-311.000.

Alcon Laboratories, Inc.: *See*—
Falcetta, Joseph J.; and Park, Joonsup, 4,690,993, Cl. 526-242.000.

Aldrich, Roger B.; and White, Gary R., to Chief Automotive Systems, Inc. Measuring device for use with automotive frame straightening equipment. 4,689,888, Cl. 33-288.000.

Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., to Peerless Machine & Tool Corporation; and Champion International Corporation. Tray-forming apparatus. 4,690,666, Cl. 493-152.000.

Alexander Schoeller & Co. AG: *See*—
Umiker, Hans, 4,690,751, Cl. 209-3.300.

Alexander, Shuford M., Jr.: *See*—
Dobbs, Robert J.; and Alexander, Shuford M., Jr., 4,690,693, Cl. 51-307.000.

Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, to Metallgesellschaft Aktiengesellschaft. Method of automatically controlling an electrostatic precipitator. 4,690,694, Cl. 55-4.000.

Aligena AG: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.

Alivizatos, Margaret A. Convertible body supporting pads. 4,689,844, Cl. 5-455.000.

Allara, David L.; and Nuzzo, Ralph G., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Modification of the properties of metals. 4,690,715, Cl. 148-6.15R.

Allelix Inc.: *See*—
Anderson, Hugh B., 4,690,801, Cl. 422-68.000.

Allen-Bradley Company, Inc.: *See—*
Struger, Odo J., 4,691,296, Cl. 364-900.000.
Allen, Keith: *See—*
Keetley, Reginald G.; and Allen, Keith, 4,690,614, Cl. 416-43.000.
Allen, Steven P.: *See—*
Ledzius, Robert C.; and Allen, Steven P., 4,691,124, Cl. 307-303.000.
Allers, Tyark; and Blasczyk, Gotthardt, to Krupp Polysius AG. Methods and apparatus for two-stage crushing. 4,690,335, Cl. 241-24.000.
Allied Colloids Limited: *See—*
Flesher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.
Allied Corporation: *See—*
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.
Nishiyama, Masao; and Hirano, Yasuo, 4,691,004, Cl. 528-323.000.
Plaot, Michael, 4,690,485, Cl. 350-6.500.
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.
Alltech Associates, Inc.: *See—*
Anderson, James M., Jr., 4,690,437, Cl. 285-356.000.
Alon, Gad, to Chattanooga Corporation. Neuromuscular stimulating apparatus. 4,690,146, Cl. 128-422.000.
Alos AG: *See—*
Wydler, Peter, 4,691,112, Cl. 250-570.000.
Alps Electric Co., Ltd.: *See—*
Kamijyo, Yoshimi, 4,690,813, Cl. 423-606.000.
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.
Watanabe, Masamichi; and Watanabe, Yasushi, 4,691,188, Cl. 338-307.000.
Altenschoepfer, Theodor: *See—*
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.
Ambrosiani, Vincent F.: *See—*
Lassiter, B. Dean; and Ambrosiani, Vincent F., 4,690,847, Cl. 428-71.000.
Amemiya, Kouji: *See—*
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.
American Mediscan, Inc.: *See—*
Juncosa, Robert D., 4,690,152, Cl. 128-734.000.
American Science and Engineering, Inc.: *See—*
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.
American Standard Inc.: *See—*
Han, Doyoung; and Renaud, Merle A., 4,689,967, Cl. 62-201.000.
Hart, James E., 4,690,463, Cl. 303-37.000.
American Telephone and Telegraph Company: *See—*
Luryi, Sergey, 4,691,215, Cl. 357-22.000.
Vanacore, Vincent D., 4,691,346, Cl. 379-198.000.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Allara, David L.; and Nuzzo, Ralph G., 4,690,715, Cl. 148-6.15R.
Bayruns, Robert J.; and Weston, Harry T., 4,691,331, Cl. 377-47.000.
Becke, Hans W.; and Smith, Robert K., 4,691,220, Cl. 357-39.000.
Luther, Lars C.; and Singh Rana, Virendra V., 4,690,726, Cl. 156-624.000.
Stanley, Keith R.; and Winchell, David F., 4,691,347, Cl. 379-303.000.
American Telephone & Telegraph Company, AT&T Information Systems Inc.: *See—*
Khanna, Satya P., 4,691,363, Cl. 381-205.000.
American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See—*
Cartwright, John S., 4,689,866, Cl. 29-426.600.
Ammann, David: *See—*
Katzmann, Harald; Senn, Werner; and Ammann, David, 4,690,029, Cl. 86-20.110.
Amoco Corporation: *See—*
Domeier, Linda A.; and Gardner, Hugh C., 4,691,025, Cl. 548-521.000.
Taggart, Davis L.; and Heffern, Edward W., 4,690,217, Cl. 166-274.000.
AMP Incorporated: *See—*
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.
Hamaher, Wilbur A., Jr.; and Long, William B., 4,690,647, Cl. 439-92.000.
Hollyday, Robert D.; and Yeager, Patrick F., 4,690,479, Cl. 439-97.000.
Smith, Mark L.; and Wagner, Richard M., 4,690,747, Cl. 204-206.000.
Amundson, Anthony P.: *See—*
Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.
Ananthapadmanabhan, Kavasery P.; and Goodard, Errol D., to Union Carbide Corporation. Process for the recycle of phase-forming liquids of multi-phase aqueous systems. 4,690,892, Cl. 435-183.000.
Anders, Peter: *See—*
Gob, Werner; and Anders, Peter, 4,690,103, Cl. 123-41.120.
Anderson-Cook, Inc.: *See—*
Killop, James T.; and Holbrook, Gerald W., 4,689,980, Cl. 72-44.000.
Anderson, Daniel F., to Texas Instruments Incorporated. Semiconductor memory with redundant column circuitry. 4,691,301, Cl. 365-200.000.
Anderson, David B.; Schmiegel, Klaus K.; and Veenhuizen, Edward L., to Eli Lilly and Company. Growth promotion. 4,690,951, Cl. 514-653.000.
Anderson, Hugh B., to Allelix Inc. Device for performing enzyme immunoassays. 4,690,801, Cl. 422-68.000.
Anderson, James M., Jr., to Alltech Associates, Inc. Low pressure fitting. 4,690,437, Cl. 285-356.000.
Ando, Hiromi; Endo, Mitsuhiro; and Ono, Yukou, to Tokico Ltd. Pneumatic booster. 4,690,034, Cl. 91-369.00A.
Ando, Makoto, to Minolta Camera Kabushiki Kaisha. Lens Barrel. 4,690,537, Cl. 354-402.000.
Ando, Takao: *See—*
Kasuo, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikuni, Chikao, 4,690,920, Cl. 514-201.000.
Ando, Yujiro: *See—*
Inaba, Yutaka; and Ando, Yujiro, 4,691,213, Cl. 346-159.000.
Andrade, Juan; Preacher, Gunter; and Kohler, Klaus, to Degussa Aktiengesellschaft. Process for the production of 4-chloro-butanals. 4,691,062, Cl. 568-495.000.
Andreas, David W.: *See—*
Watkins, James D.; and Andreas, David W., 4,691,374, Cl. 383-104.000.
Andreas Stihl: *See—*
Kottke, Joachim; and Zerrer, Gerhard, 4,690,252, Cl. 188-69.000.
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., to Imperial Chemical Industries plc. Steam reforming hydrocarbons. 4,690,690, Cl. 48-214.00A.
Anelva Corporation: *See—*
Iso, Yoichi, 4,691,160, Cl. 324-71.300.
Angermann, Gottfried; and Hiebl, Berthold, to Optyl Eyewear Fashion International Corporation. Goggles with interchangeable lenses. 4,689,838, Cl. 2-441.000.
Aniliosis, Algis: *See—*
Palmer, John L.; and Aniliosis, Algis, 4,691,009, Cl. 530-350.000.
Annis, Martin: *See—*
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.
Antonio, Joseph M.: *See—*
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of tetrahydrobenzothiazole and herbicidal compositions containing the same as an active ingredient. 4,690,704, Cl. 71-90.000.
Aoki, Kozo: *See—*
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, 4,690,889, Cl. 430-551.000.
Aoki, Seiichi: *See—*
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.
Aoyama, Taizo: *See—*
Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, 4,690,977, Cl. 525-83.000.
Appelgren, Curt H.; and Ivarsson, Nemo. Process for coating solid particles. 4,690,834, Cl. 427-189.000.
Appels, Johannes A.; and Maas, Henricus G. R., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,689,872, Cl. 437-228.000.
Applied Retrieval Technology, Inc.: *See—*
Castaldi, John; and Greenzang, Fred, 4,690,602, Cl. 414-282.000.
Aquatrol Corporation: *See—*
Brown, Richard W.; and Ardolf, Duane R., 4,691,344, Cl. 379-106.000.
Arabori, Hideo: *See—*
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Ardolf, Duane R.: *See—*
Brown, Richard W.; and Ardolf, Duane R., 4,691,344, Cl. 379-106.000.
Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., to Laboratorios Madaus Ceraf-arm, S.A. Process for the preparation of 5'-substituted 2-(3'-thienyl)-propionic acids. 4,690,945, Cl. 514-448.000.
Arens, Georges; and Philippe, Staron, to Societe Nationale Elf Aquitaine (Production). Method for the processing of recordings of signals resulting from a seismic explorstion of a medium. 4,691,306, Cl. 367-40.000.
ARES, Inc.: *See—*
Stoner, Eugene M., 4,690,032, Cl. 89-43.010.
Arikawa, Yoshijiro: *See—*
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Arimoto, Shunji: *See—*
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.
Arino, Masao; and Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Brake booster. 4,689,958, Cl. 60-547.100.

Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R. Land mine for use in a simulated war game. 4,690,061, Cl. 102-401.000.
Arnold, Philip D., to General Motors Corporation. Crankcase structure. 4,690,112, Cl. 123-195.00R.
Arragon, Jean-Pierre; and Michel, Jean-Pierre, to U.S. Philips Corporation. Arrangement for deciphering and decoding television pictures encoded in accordance with the MAC standard and scrambled at transmission by submitting the video signals to cyclic permutations. 4,691,352, Cl. 380-14.000.
Arthur, Frank H., to Envopak Group Limited. Security seal with ruptarable wall. 4,690,444, Cl. 292-324.000.
Arthur, James C.; and Baldwin, Freddie A., to Arvin Industries, Inc. Tuned exhaust manifold. 4,689,952, Cl. 60-313.000.
Aruga, Masayoshi: *See—*
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.
Arvin Industries, Inc.: *See—*
Arthur, James C.; and Baldwin, Freddie A., 4,689,952, Cl. 60-313.000.
Asahi Glass Company Ltd.: *See—*
Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, 4,691,178, Cl. 333-143.000.
Asahi Gosmu Kako Kabushiki Kaisha: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, 4,690,994, Cl. 526-254.000.
Asai, Masaki, to Meitoh Denki Kohji Kabushiki Kaisha. Pulley block assembly for aerial line. 4,690,381, Cl. 254-394.000.
Asakura, Masahiko: *See—*
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yakihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.
Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Rear suspension controller. 4,690,429, Cl. 280-707.000.
Asanuma, Nobuyoshi: *See—*
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, to Hoffmann-La Roche Inc. Derivatives of 10,11-dihydro-5H-dibenzo[a,d]cycloheptene-5-ethanol. 4,691,040, Cl. 558-44.000.
ASEA Aktiebolag: *See—*
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Aslesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, to Chevron Research Company. Method and apparatus for testing the outflow from hydrocarbon wells on site. 4,689,989, Cl. 73-61.10R.
AT&T Bell Laboratories: *See—*
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Aucagne, Jean: *See—*
Auduc, Herve ; and Aucagne, Jean, 4,690,851, Cl. 428-116.000.
Audio-Technica U.S., Inc.: *See—*
Reichel, Kenneth R.; and Hebrock, Steve, 4,691,349, Cl. 379-391.000.
Auduc, Herve ; and Aucagne, Jean, to Brochier S.A. Fabric based on glass and carbon fibers and articles comprising such a fabric. 4,690,851, Cl. 428-116.000.
Aunit, Steven, to Minigrip, Incorporated. Zipper closure with unitary adhesive cover sheet. 4,691,373, Cl. 383-63.000.
Austin, Franklin D.: *See—*
Hardey, Donald H.; and Austin, Franklin D., 4,690,198, Cl. 164-316.000.
Automated Machinery Systems: *See—*
Off, Joseph W. A.; and Ferguson, Vivian, 4,690,078, Cl. 112-121.120.
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Avantek, Inc.: *See—*
Westgate, Wayne F., 4,691,380, Cl. 455-328.000.
Aviv, Gershon: *See—*
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.
Avon Industrial Polymers Limited: *See—*
West, John P., 4,690,389, Cl. 267-140.100.
Awaji, Toshio: *See—*
Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, 4,690,257, Cl. 192-3.310.
awfi Arbeitswissenschaftliches Forschungsinstitut GmbH: *See—*
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.
Azukizawa, Teruo: *See—*
Morishita, Mimpei; and Azukizawa, Teruo, 4,690,066, Cl. 104-282.000.
B.F. Goodrich Company, The: *See—*
Abdenour, Stephen F.; and Polstra, Stephen M., 4,690,352, Cl. 249-49.000.
B & W Loudspeakers Limited: *See—*
Dickie, Laurence G., 4,690,244, Cl. 181-146.000.
Babbitt, Richard W.: *See—*
Stera, Richard A.; and Babbitt, Richard W., 4,691,208, Cl. 343-785.000.
Babcock-Hitachi Kabushiki Kaisha: *See—*
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.
Babcock & Wilcox Company, The: *See—*
Glass, Samuel W., III, 4,689,985, Cl. 73-1.00R.
Sterling, Edward L., Jr.; and Thompson, William L., 4,691,328, Cl. 375-36.000.
Babka, Josef: *See—*
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, 4,690,989, Cl. 526-88.000.
Badger, Robert J. T. Utility game bag system. 4,690,045, Cl. 99-485.000.
Bahov, Dinko A.; and Bahov, Hristo A., to NPK "Textilno Maschinostroene" . Vortex air nozzle for yarn spinning from staple fibers. 4,689,948, Cl. 57-328.000.
Bahov, Hristo A.: *See—*
Bahov, Dinko A.; and Bahov, Hristo A., 4,689,948, Cl. 57-328.000.
Bailey, Randal N.; and Crews, Purvis J. Infant seat for automobiles. 4,690,455, Cl. 297-238.000.
Bailey, Samuel G. Talking marionette with theatre. 4,690,655, Cl. 446-84.000.
Baker, Alan J. Method and apparatus for measuring angular displacement. 4,691,192, Cl. 340-347.00P.
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., to Clorox Company, The. Hard surface cleaning composition. 4,690,779, Cl. 252-546.000.
Bakr, Mamdouh M.; and Maloney, Bobby J., to Delta Wood Products, Inc. Sewing machine cabinet and lift. 4,690,466, Cl. 312-29.000.
Balcke-Durr Aktiengesellschaft: *See—*
Trage, Burkhard; and Leitz, Richard, 4,690,207, Cl. 165-113.000.
Baldwin, Freddie A.: *See—*
Arthur, James C.; and Baldwin, Freddie A., 4,689,952, Cl. 60-311.000.
Baldwin, John J.: *See—*
Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.
Balleys, Francois, to Charmilles Technologies S.A. Travelling wire EDM apparatus with monitoring of the number of electrical discharges occurring in a sector of the active portion of the electrode wire. 4,691,089, Cl. 219-69.00W.
Balzano, Saviso, to Metallurgiche Balzano S.p.A. Tool for peeling and coring pineapples and the like. 4,690,047, Cl. 99-542.000.
Banas, Conrad M.; and Doyle, Brian M., to United Technologies Corporation. Twin spot laser welding. 4,691,093, Cl. 219-121.0LC.
Bandel, Rudolf: *See—*
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.
Banker, Henry: *See—*
Coalogue, James H.; and Banker, Henry, 4,690,115, Cl. 123-366.000.
Banks, Henry J.; and Wiseman, John R., to Commonwealth Scientific and Industrial Research Organization. Prevention, arresting and removal of accumulation of moisture in bunker storages. 4,690,041, Cl. 98-57.000.
Bantle, Manfred; and Lechner, Reinhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Central locking arrangement. 4,690,462, Cl. 301-9.0CN.
Bar-Nefy, Simcha; and Tiomkin, Michael, to Israel Aircraft Industries Ltd. Mine field clearing apparatus. 4,690,030, Cl. 89-1.130.
Barber, Michael T. Adjustable rubber band. 4,689,858, Cl. 24-17.00B.
Barch, Herbert W.: *See—*
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.
Barnabe, Nancy P.: *See—*
Hou, Ching-Tsang; and Barnabe, Nancy P., 4,690,891, Cl. 435-42.000.
Barnett, Timothy J., to Elixir Industries. Snap-in screen frame and mounting for same. 4,690,040, Cl. 98-2.140.
Barowski, Karlheinz; and Berghammer, Conrad, to Braun Aktiengesellschaft. Hair roller heating device with thermomagnetic roller temperature control. 4,691,095, Cl. 219-222.000.
Barrow, William A.: *See—*
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Barras, Donald M.: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.

Barry, Robert F.: *See*—
Sabol, George P.; and Barry, Robert F., 4,690,716, Cl. 148-11.50F.

Bartl, Herbert: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.

Bartmann, Klaus: *See*—
Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, 4,690,226, Cl. 173-128.000.

Bartok, Stephen: *See*—
Morrison, Donald L.; and Bartok, Stephen, 4,690,193, Cl. 160-133.000.

Barton, Richard O.; Bergin, Michael T.; and Miller, John M., to Grumman Aerospace Corporation. Hole centration gage. 4,690,563, Cl. 356-375.000.

Barton, Richard O.: *See*—
Miller, John; Barton, Richard O.; and Schaefer, Oscar H., 4,690,365, Cl. 248-650.000.

BASF Aktiengesellschaft: *See*—
Fischer, Adolf, deceased, 4,690,706, Cl. 71-91.000.
Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, 4,691,020, Cl. 546-341.000.
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.

BASF Corporation: *See*—
Ramlow, Gerhard G.; Heyman, Dunne A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.

BASF Farben & Fasern AG: *See*—
Hegemann, Gunther; and Miedeck, Karin, 4,691,002, Cl. 528-249.000.

Bassi, Dario; and Palau, Joseph, to Etablissements Staubli Verdol. Mobile hook for the shed forming device of a weaving loom. 4,690,178, Cl. 139-455.000.

Basting, Jack A. Tensile exercise device. 4,690,402, Cl. 272-137.000.

Batcheller, Roy W., to Craneveyor Corp. Panel rail system. 4,690,383, Cl. 256-24.000.

Bateman, Andrew: *See*—
McGeehan, Joseph P.; and Bateman, Andrew, 4,691,375, Cl. 455-71.000.

Bates, Carl H., to Stemcor Corporation. Silicon nitride/silicon carbide composition and articles thereof. 4,690,790, Cl. 264-63.000.

Baum, Robert A. Electrode assembly especially adapted to utilizing a magnetic field for measuring electric conductivity of treated non-polar liquids. 4,691,169, Cl. 324-448.000.

Baumgartner, Kenneth A.; and Pickering, William, to Caterpillar Industrial Inc. Apparatus and method for protecting a motor control circuit. 4,691,149, Cl. 318-331.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A.; and Emmel, Henry J., 4,690,519, Cl. 350-515.000.
Ogunbiyi, Lai; and Smith, Francis X., 4,690,773, Cl. 252-174.120.
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Baxter Travenol Laboratories, Inc.: *See*—
Leonard, Ronald J.; and Johnson, Kenneth M., 4,690,758, Cl. 210-247.000.

Bayer Aktiengesellschaft: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Bayer, Izhak; and Adoram, Amnon. Endoscope particularly useful as an anoscope. 4,690,132, Cl. 128-4.000.

Bayruns, Robert J.; and Weston, Harry T., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Self-correcting frequency dividers. 4,691,331, Cl. 377-47.000.

BBC Brown, Boveri & Company, Limited: *See*—
Hirth, Michael, 4,690,803, Cl. 422-186.180.

BCD Dryers, Inc.: *See*—
Behrens, Rudolph, 4,689,893, Cl. 34-23.000.

Beard, Robert W., to Oximetrix, Inc. Optical coupling. 4,690,492, Cl. 350-96.200.

Beauregard, William W.; and Fessenden, Peter J., to Springfield Wire, Inc. PTC heater and method of manufacture. 4,689,878, Cl. 29-611.000.

Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., to Dow Chemical Company, The. Plastic electrochemical cell terminal unit. 4,690,748, Cl. 204-279.000.

Beccaris, Carlo: *See*—
Marchisio, Aldo; and Beccaris, Carlo, 4,690,659, Cl. 464-68.000.

Becke, Hans W.; and Smith, Robert K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Radial high voltage bidirectional switch structure with concavo-concave shaped semiconductor regions. 4,691,220, Cl. 357-39.000.

Becker-Ross, Helmut: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.

Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., to Raytheon Company. Infrared seeker. 4,690,351, Cl. 244-3.160.

Beckley, Keith A.; Jacob, Neil R.; and Trusaler, Geoffrey A., to Smiths Industries Public Limited Company. Fluid-gauging probes and their manufacture. 4,689,991, Cl. 73-304.00C.

Beckman Industrial Corporation: *See*—
Dzula, Gregory, 4,691,168, Cl. 324-439.000.

Beckman Instruments, Inc.: *See*—
Leytes, Lev J.; and Penhasi, Harry A., 4,690,165, Cl. 137-112.000.

Becton, Dickinson and Company: *See*—
Losada, Robert J.; and Conway, Hugh T., 4,690,153, Cl. 128-763.000.

Beecham Group p.L.c.: *See*—
Harris, Patrick C.; and Wilcox, John A., 4,691,029, Cl. 549-79.000.

Beele, Gunther, to Kloeckner-Humboldt-Deutz AG. Method for storing and maintaining the temperature of molten metal. 4,690,385, Cl. 266-44.000.

Beever, William H.: *See*—
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.

Behme, Werner; and Berleth, Manfred, to Cambridge Instruments GmbH. Microtome feed-motor control. 4,691,151, Cl. 318-571.000.

Behrens, Rudolf A.; and Seltzer, Raymond, to Ciba-Geigy Corporation. Hydroxylamines derived from hindered amines. 4,691,015, Cl. 544-198.000.

Behrens, Rudolph, to BCD Dryers, Inc. Apparatus and method for drying elongated webs. 4,689,893, Cl. 34-23.000.

Bein, Jeffrey D., to Westinghouse Electric Corp. Nuclear steam generator wrapper barrel/tube support plate connection assembly and radial tuning method for assembling same. 4,690,206, Cl. 165-81.000.

Beitinger, Eberhard: *See*—
Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.

Belanger, Inc.: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.

Belanger, James A.; Wentworth, Robert; and Lapham, James M., to Belanger, Inc. Automobile conveyor. 4,690,065, Cl. 104-172.300.

Beleov, Marin H.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Belka, Heinrich, to ESGE-Marby GmbH & Co. KG. Vibration-resistant, self-centering accessory attachment for a cycle. 4,690,420, Cl. 280-289.00A.

Bell, David A.: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Bell, Larry. Sea rescue kit for deployment from a helicopter. 4,690,650, Cl. 441-40.000.

Beller, Frank W., to Belson Manufacturing Co., Inc. Mesquite burning outdoor cooking device. 4,690,125, Cl. 126-25.00A.

Belson Manufacturing Co., Inc.: *See*—
Beller, Frank W., 4,690,125, Cl. 126-25.00A.

Bender, Richard H.: *See*—
Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, 4,690,546, Cl. 355-69.000.

Bennett, William S., to Singer Company, The. High performance multi-processor system. 4,691,280, Cl. 364-200.000.

Benson, Walter L. Cast resin light-emitting display device. 4,691,268, Cl. 361-223.000.

Bentoaspritz Naacgubeb GmbH Co.: *See*—
Roehl, Franz, 4,690,328, Cl. 239-227.000.

Beppu, Teruhiko; Iwamoto, Yasuhi; and Yoshida, Minoru, to Beppu, Teruhiko. Use of trichostatin compounds for treating tumor cells. 4,690,918, Cl. 514-23.000.

Berg, Lloyd; and Yeh, An-I. Separation of n-amyl acetate from n-amyl alcohol by extractive distillation. 4,690,734, Cl. 203-56.000.

Berger, Lawrence E., to C-Lock Retention Systems, Inc. Seawall. 4,690,588, Cl. 405-262.000.

Berghammer, Conrad: *See*—
Barowski, Karlheinz; and Berghammer, Conrad, 4,691,095, Cl. 219-222.000.

Bergin, Michael T.: *See*—
Barton, Richard O.; Bergin, Michael T.; and Miller, John M., 4,690,563, Cl. 356-375.000.

Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, to Microcom, Inc. Method and apparatus for transmitting data in adjustable-sized packets. 4,691,314, Cl. 370-94.000.

Bergsteiner, Johann: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Bergstrom, Hans R., to Car-O-Liner Company. Vehicle beach lift. 4,690,250, Cl. 187-18.000.

Berleth, Manfred; and Weinhold, Helmut, to Cambridge Instruments Inc. Clamping mechanism for a cutter of a microtome. 4,690,023, Cl. 83-700.000.

Berleth, Manfred: *See*—
Behme, Werner; and Berleth, Manfred, 4,691,151, Cl. 318-571.000.

Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, to Farmitalia Carlo Erba. Ergolines exhibiting protactin secretion inhibition activity. 4,690,929, Cl. 514-288.000.

Bernazzani, Richard J.; and Bumbaca, Domenic J., to United States of America, Army. Hand held can opener. 4,689,886, Cl. 30-416.000.

Berschiek, Gunter: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Bertelsen, Matthew H.; and Klapperich, Gary, to Bertelsen, Matthew H. Computer environment filter apparatus having wing with internal baffles. 4,690,042, Cl. 98-115.100.

Berthet, Maurice, to Compagnie Gervais Danone. Assembly for storing, transporting and distributing objects of the bottle, flask or similar types and process for manufacturing same. 4,690,281, Cl. 206-597.000.

Bertin, Jean: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Bertolasi, Robert B.: *See*—
Harvey, Dennis N.; and Bertolasi, Robert B., 4,690,001, Cl. 73-850.000.

Berton, Andrew S., to Incomm Direct Pty. Ltd. Word forming tile game. 4,690,410, Cl. 273-299.000.

Bertram, Leo; and Schemmann, Hugo, to U.S. Philips Corporation. Synchronous motor with two-pole permanent-magnet soft-magnetic-core rotor. 4,691,132, Cl. 310-156.000.

Betts, David R.; and Edmonds, Michael G., to Kentinental Engineering Limited. Foldable trolley. 4,690,417, Cl. 280-42.000.

Beyer, Karl, to LN Industries SA. Elastic hinge for eyeglasses. 4,689,851, Cl. 16-228.000.

Beyer, Rudolf: *See*—
Klie, Jurgen; and Beyer, Rudolf, 4,690,038, Cl. 92-181.00R.

Bhatia, Kishan; and Garcia, John G., Jr., to NL Industries, Inc. Process for removal of mercaptans from gas streams. 4,690,805, Cl. 423-224.000.

Bianchetti, Alberto: *See*—
Ninato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.

Bianchi, Giuseppe: *See*—
Occhini, Elio; and Bianchi, Giuseppe, 4,690,497, Cl. 350-96.230.

Bianchi, John E. Universal clip. 4,690,315, Cl. 224-252.000.

BICC Public Limited Company: *See*—
Horne, David; and Parker, Laurence, 4,690,286, Cl. 211-41.000.
Taylor, John E.; and Keene, Ian W., 4,690,499, Cl. 350-96.230.

Biehler, Klaus: *See*—
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Bieselt, Roland: *See*—
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.

Billet, Rene , to Valeo. Transmission system, in particular for automobile vehicles, hydraulic coupling unit comprising same, movement take-up device adapted for use in same, and method of manufacturing said movement take-up device. 4,689,954, Cl. 60-338.000.

Billingsley, Robert H.; and Jantzen, Steven L., to ACF Industries, Incorporated. Truss end structure for stub sill hopper cars. 4,690,071, Cl. 105-404.000.

Binks Manufacturing Company: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.

BIP Chemicals, Ltd.: *See*—
Taylor, David, 4,691,001, Cl. 528-256.000.

Birkmeyer, William J.: *See*—
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.

Biro, Alexander J., to Winchester Industries, Inc. Thermally insulated window sash construction for a casement window. 4,689,933, Cl. 52-656.000.

Biron, David G.: *See*—
Edwards, Brian E.; and Biron, David G., 4,690,551, Cl. 356-5.000.

Bischofberger, Jurg: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.

Bishop, Timothy E.: *See*—
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.
Zimmerman, John M.; and Bishop, Timothy E., 4,690,502, Cl. 350-96.290.

Bitsch, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Method, reagent and kit for the determination of nitrate ions. 4,690,902, Cl. 436-110.000.

Black, Charles E., III: *See*—
Habecker, John W.; and Black, Charles E., III, 4,691,086, Cl. 200-159.00R.

Black & Decker Inc.: *See*—
Chaconas, Peter C., 4,690,024, Cl. 83-852.000.

Blacken, Laurin G.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Blackwell, Jennings P.: *See*—
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.

Blaha, William E., to Ideal Industries, Inc. Screw-on wire connector. 4,691,079, Cl. 174-87.000.

Blanc GmbH & Company: *See*—
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, 4,689,840, Cl. 4-629.000.

Blanc, Walter: *See*—
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, 4,689,840, Cl. 4-629.000.

Blanchard, Walter W., Jr. Buffing pad. 4,689,922, Cl. 51-358.000.

Blaszyk, Gotthardt: *See*—
Allers, Tyark; and Blaszyk, Gotthardt, 4,690,335, Cl. 241-24.000.

Blass, Judd; and Keren, Hanan, to Elscint Ltd. Dual frequency surface probes. 4,691,163, Cl. 324-318.000.

Blazejak, Manfred: *See*—
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Bleeke, William F.: *See*—
Loubier, Robert J.; and Bleeke, William F., 4,691,185, Cl. 338-32.00H.

Bleth, Joel J.; and Tornaschy, Williard R. Fluid inductor and metering device and method of use. 4,690,179, Cl. 141-1.000.

Bloomfield, John W., III. Voice simulator. 4,691,360, Cl. 381-70.000.

Bloomquist, Ted C., to IMED Corporation. Dual mode I.V. infusion device with distal sensor. 4,690,673, Cl. 604-67.000.

Blouin, Joseph D.: *See*—
Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.

Bluff Welding Inc.: *See*—
Sherrod, Danny, 4,689,846, Cl. 14-71.300.

Blum, Stephen C.; and Derise, John, to Motorola, Inc. Filled resonant cavity filtering apparatus. 4,691,179, Cl. 333-202.000.

Board of Regents, The University of Texas System: *See*—
Cantrell, C. D.; and Peterson, G. L., 4,690,742, Cl. 204-157.200.

Bobkov, Jury G.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Martin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Boc Group, Inc., The: *See*—
Lofredo, Antony, 4,689,962, Cl. 62-54.000.

Bocek, John R.: *See*—
Aalesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.

Bocker, Heinrich: *See*—
Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.

Boehringer Mannheim GmbH: *See*—
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.

Boerema, Edward T.; Suman, Michael J.; and Fleming, Dennis J., to Prince Corporation. Visor system. 4,690,450, Cl. 296-97.00K.

Bogl, Leonhard: *See*—
Mertens, Horst M.; and Bogl, Leonhard, 4,690,098, Cl. 118-727.000.

Bohme, Hans-Joachim: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Bohmer, William, to Control Interface Company Limited. Waveforms on a liquid crystal display. 4,690,509, Cl. 350-333.000.

Boisdon, Claude, to Jeumont-Schneider Corporation. Control apparatus for a direct current arc furnace. 4,691,325, Cl. 373-108.000.

Bollard, David R., to U.S. Philips Corporation. Receiver for amplitude modulated signals. 4,691,381, Cl. 455-334.000.

Bolle, Robert, to Etablissements Bolle Georges, Robert et Maurice. Eye shield with face engaging seal. 4,689,837, Cl. 2-440.000.

Bollong, Alan B. L: *See*—
Bult, Roelof P.; Bollong, Alan B. L; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.

Bopp, Warren G.; and Janson, David A., to Eaton Corporation. Torsion damping assembly. 4,690,256, Cl. 192-21.000.

Borg-Warner Automotive, Inc.: *See*—
Wang, Ting M., 4,689,953, Cl. 60-330.000.

Borg-Warner Industrial Products, Inc.: *See*—
Miller, Alan L.; and Kozlowski, James L., 4,691,276, Cl. 364-148.000.

Borgonovo, Sergio: *See*—
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Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , 4,690,719, Cl. 156-201.000.

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Bouverot, Noel: *See*—
LaGarde, Robert; and Bouverot, Noel, 4,690,967, Cl. 524-266.000.

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Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.
Braathen, Russell E., to Novatel Communications Ltd. Two way telephone communication system. 4,691,348, Cl. 379-389.000.
Braddick, Britt O., to Texas Iron Works, Inc. Tubular member anchoring arrangement and method. 4,690,220, Cl. 166-382.000.
Bradford, John R. Stereo image display device. 4,691,358, Cl. 381-12.000.
Bradisse, John L.; and Lindner, Daniel J., to Goodyear Tire & Rubber Company, The. All-season pneumatic tire with chamfered tread blocks. 4,690,189, Cl. 152-209.00R.
Brady, William T.; Norton, Scott J.; and Ko, Jinrea, to S.C. Johnson & Son, Inc. Process for the preparation of pyrethroid acids. 4,691,052, Cl. 562-506.000.
Bramer, Charles, to Lacks Industries, Inc. Remote control rear view mirror, cable operated. 4,690,013, Cl. 74-501.00M.
Brammall, Terrence N., to Trans-Guard Industries, Inc. Locking device with split collar. 4,690,443, Cl. 292-307.00R.
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Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.
Brandli, Max; and Feldmann, Hansueli, to JD-Technologie AG. Joint for a transversely separated vehicle. 4,690,422, Cl. 280-460.00R.
Branson Ultrasonics Corporation: *See—*
Flood, Gary N., 4,690,722, Cl. 156-510.000.
Braun Aktiengesellschaft: *See—*
Barowski, Karlheinz; and Berghammer, Conrad, 4,691,095, Cl. 219-222.000.
Braymand, Robert, to Societe Nouvelle Baele Gangloff. Rail-tube holder for walking-beam conveyor. 4,690,270, Cl. 198-774.000.
Brede, Uwe; and Kordel, Gerhard, to Dynamit Nobel Aktiengesellschaft. Electric detonator device. 4,690,056, Cl. 102-202.200.
Breneman, William C.; and Reeser, David M., to Union Carbide Corporation. Disposal process for contaminated chlorosilanes. 4,690,810, Cl. 423-335.000.
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Marsbotto, Eduardo J.; and Bresin, Mark S., 4,690,471, Cl. 439-83.000.
Brewer, Janet C. Protective device for hair stylist's fingers. 4,689,828, Cl. 2-21.000.
Brezillon, Jean-Loup; and Dauchier, Jean-Michel, to Saft, S.A. Method of manufacturing a polymer-consolidated cadmium electrode for an alkaline storage cell, and an electrode obtained by the method. 4,689,880, Cl. 29-623.500.
Brice, Ronnie V. Collapsible decoy. 4,689,913, Cl. 43-3.000.
Bricker, Jeffery C., to UOP Inc. Dehydrogenstion of dehydrogenatable hydrocarbons. 4,691,071, Cl. 585-319.000.
Bridgestone Corporation: *See—*
Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, 4,690,965, Cl. 524-236.000.
Kawasaki, Kiyohito, 4,690,191, Cl. 152-527.000.
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Doering, Charles W., 4,689,941, Cl. 56-396.000.
Briscoe, Terry L., to Esco Corporation. Rub link assembly for dragline bucket. 4,689,904, Cl. 37-135.000.
Bristol-Myers Company: *See—*
Saitoh, Kyoichiro; Konishi, Masataka; and Tomita, Koji, 4,690,926, Cl. 514-269.000.
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British Aerospace Public Limited Company: *See—*
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British Petroleum Company p.l.c., The: *See—*
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Wills, Anthony J., 4,690,295, Cl. 220-207.000.
Brochier S.A.: *See—*
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Gabaao, Jean-Paul; Brousely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.
Brower, Boyd G., to GTE Products Corporation. Side-mounted flashlamps. 4,690,637, Cl. 431-359.000.
Brown, Boveri & Cie AG: *See—*
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.05C.
Brown, James M. Truck loading apparatus. 4,690,609, Cl. 414-543.000.
Brown, Richard W.; and Ardolf, Duane R., to Aquatrol Corporation. Low-powered remote sensor and telephone line transmitter. 4,691,344, Cl. 379-106.000.
Brownstein, Scott A., to Eastman Kodak Company. Thermal printer. 4,691,211, Cl. 346-76.0PH.
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Brusewitz, Gerhard; and Sieck, Reinhard, to Madaus & Co. Device for the determination of micro-organisms. 4,690,896, Cl. 435-296.000.
Bryan, Thomas T.: *See—*
Aasen, Steven M.; and Bryan, Thomas T., 4,691,039, Cl. 556-446.000.
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., to Cochlea Corporation. Method of and apparatus for inspecting objects using multiple position detectors. 4,690,284, Cl. 209-590.000.
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Buckley, John E., to Securistyle Limited. Friction supported stays for windows. 4,689,852, Cl. 16-341.000.
Bugiel, Horst G., to Diehl GmbH & Co. Warhead, especially for the attacking of radar installations. 4,690,062, Cl. 102-476.000.
Buhrer, Carl F.; and Feuersanger, Alfred E., to GTE Laboratories Incorporated. Dosing composition for high pressure sodium lamps. 4,691,141, Cl. 313-565.000.
Bult, Roelof P.; Bollong, Alan B. I.; and Redden, Robert F., to Cominco Ltd. Purification of Cd and Te by zone refining. 4,690,725, Cl. 156-617.00R.
Bum, Choi W.: *See—*
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.
Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Air suspension. 4,690,430, Cl. 280-708.000.
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Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shusuichi, 4,690,429, Cl. 280-707.000.
Bumbaca, Domenic J.: *See—*
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Burgoyne, William F., Jr.: *See—*
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Burlington Industries, Inc.: *See—*
Lassiter, B. Dean; and Ambrosiani, Vincent F., 4,690,847, Cl. 428-71.000.
Burns, Joseph E. Resealable envelope. 4,690,322, Cl. 229-80.000.
Burns, Lyle D.; and Stahl, G. Allan, to Phillips Petroleum Company. Acidizing using n-vinyl lactum/unsaturated amide copolymers. 4,690,219, Cl. 166-307.000.
Burroughs Wellcome Co.: *See—*
Coker, Geoffrey G.; and Findlay, John W. A., 4,690,933, Cl. 514-343.000.
Burst, Hermann: *See—*
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., to American Science and Engineering, Inc. High energy computed tomography. 4,691,332, Cl. 378-7.000.
Butterworth Jetting Systems, Inc.: *See—*
Pacht, Amos, 4,690,325, Cl. 239-124.000.
C-D Marketing, Ltd.: *See—*
Jacob, Keith D., 4,690,508, Cl. 350-331.00R.
C-I-L Inc.: *See—*
Mohanty, Bibhuti B., 4,690,058, Cl. 102-312.000.
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C. R. Bard, Inc.: *See—*
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Cabe, Alex W., Jr.: *See—*
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Caldwell Co., Inc., The: *See—*
Hauser, Thomas A., 4,689,859, Cl. 24-233.000.
Caldwell Manufacturing Company: *See—*
Flight, Robert S., 4,689,850, Cl. 16-197.000.
California Institute of Technology: *See—*
Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.
Callut, Francois; and Demeuldre, Daniel, to Marginvest S.A. Holding. Process for the preparation of an absorbing and adsorbing agent; and the product produced therefrom. 4,690,914, Cl. 502-400.000.
Calpis Food Industry Co., Ltd., The: *See—*
Inagami, Kaoru; and Kikuchi, Noboru, 4,691,011, Cl. 530-832.000.
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, to Eastman Kodak Company. Semiconductor mounting assembly. 4,691,265, Cl. 361-388.000.
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., to Molins PLC. Conveying apparatus for rod-like articles. 4,690,604, Cl. 414-403.000.
Cambridge Instruments GmbH: *See—*
Behme, Werner; and Berleth, Manfred, 4,691,151, Cl. 318-571.000.
Cambridge Instruments Inc.: *See—*
Berleth, Manfred; and Weinhold, Helmut, 4,690,023, Cl. 33-700.000.

Cameron, Kenneth A. Horse shoe. 4,690,222, Cl. 168-4.000.
Campbell, Michael: *See—*
Roll, Walter F.; and Campbell, Michael, 4,690,486, Cl. 350-6.600.
Canadian Patents and Development Limited: *See—*
Haard, Norman F.; and Patel, Thakor R., 4,690,826, Cl. 426-36.000.
Canfield, Dennis R.: *See—*
Aalesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., to Energy Conversion Devices, Inc. Contact-type document scanner including protective coating. 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., to Energy Conversion Devices, Inc. Contact-type document scanner including static shield. 4,691,244, Cl. 358-294.000.
Cannon, David C., to Sonoco Products Company. Bulk carbonated beverage container. 4,690,299, Cl. 220-402.000.
Canon Kabushiki Kaisha: *See—*
Hasegawa, Shizuo; and Hayashi, Kimiyoshi, 4,691,114, Cl. 250-578.000.
Iizuka, Toshimi; and Kamata, Shigeru, 4,690,505, Cl. 350-252.000.
Inaba, Yutaka; and Ando, Yujiro, 4,691,213, Cl. 346-159.000.
Ito, Yuji, 4,690,561, Cl. 356-339.000.
Kamata, Shigeru; and Iizuka, Toshimi, 4,690,514, Cl. 350-429.000.
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.
Nagashima, Nao, 4,691,365, Cl. 382-54.000.
Shimizu, Haruo, 4,691,237, Cl. 358-256.000.
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.
Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,690,513, Cl. 350-427.000.
Ueda, Hiroyuki; and Kobata, Yoshihiro, 4,690,575, Cl. 400-166.000.
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Cantrell Machine Co.: *See—*
Dameron, Woodal W., 4,689,855, Cl. 17-11.000.
Cape Cod Research, Inc.: *See—*
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Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet feed drum for rotary presses. 4,690,054, Cl. 101-409.000.
Car-O-Liner Company: *See—*
Bergstrom, Hans R., 4,690,250, Cl. 187-18.000.
Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co.: *See—*
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Carl Still GmbH & Co. KG, Firma: *See—*
Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.
Carl-Zeiss-Stiftung: *See—*
Daniels, Erwin J.; and Korn, Siegfried, 4,690,524, Cl. 351-168.000.
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Carlsson, Gengt, to AB BOFORS. High velocity projectile. 4,690,057, Cl. 102-266.000.
Carminati, Paolo: *See—*
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Carrell, Ross M., to RCA Corporation. Parcel sorting apparatus. 4,690,283, Cl. 209-549.000.
Carrio, Pierre, to Coflexip. Apparatus to transfer fluid between a fixed structure and a rotatable structure by using at least one flexible conduit. 4,690,181, Cl. 141-388.000.
Carris, George M., to Westinghouse Electric Corp. Terminal base assembly for meter sockets. 4,690,483, Cl. 439-517.000.
Carrow, Guy E., to Phillips Petroleum Company. Method and apparatus for molding hollow articles. 4,690,632, Cl. 425-429.000.
Carson, Paul L.; and Detsch, Richard M., to University of Michigan, The. Variable frequency gas-bubble-manipulating apparatus and method. 4,689,986, Cl. 73-19.000.
Carter, David C. M.: *See—*
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Cartwright, John S., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Methods for transferring spring clips. 4,689,866, Cl. 29-426.600.
Case Vibromax GmbH & Co KG: *See—*
Lietzke, Heinz, 4,689,955, Cl. 60-420.000.
Casma di V. Marinoni & Figli: *See—*
Marinoni, Mario, 4,689,853, Cl. 16-382.000.
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, to awfi Arbeitswissenschaffliches Forschungsinstitut GmbH. Sewing machine. 4,690,081, Cl. 112-276.000.
Castaldi, John; and Greenzang, Fred, to Applied Retrieval Technology, Inc. Automatic storage and retrieval system. 4,690,602, Cl. 414-282.000.
Castech Enterprises, Inc.: *See—*
Hardey, Donald H.; and Austin, Franklin D., 4,690,198, Cl. 164-316.000.
Castel, Joelle H.: *See—*
Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., 4,690,702, Cl. 62-23.000.
Castel, John C.; and Kerwin, Richard G. Fresnel lens light applicator. 4,690,141, Cl. 128-396.000.
Catallo, Frank. Method and apparatus for the compressive treatment of fabric. 4,689,862, Cl. 26-18.600.
Caterpillar Industrial Inc.: *See—*
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Fotheringham, James R., 4,690,610, Cl. 414-631.000.
Tupman, David J., 4,691,385, Cl. 455-607.000.
Cation Corporation: *See—*
Vishnitsky, Alexander, 4,690,737, Cl. 204-129.700.
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., to Binks Manufacturing Company. Pail mount pump with integral cover. 4,690,308, Cl. 222-156.000.
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Central Glass Company, Limited: *See—*
Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, 4,691,066, Cl. 570-144.000.
Ceraver: *See—*
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Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., to S&C Electric Company. Insulating material and use thereof in insulators. 4,690,780, Cl. 252-572.000.
Chaconas, Peter C., to Black & Decker Inc. Saw blade and tip therefor. 4,690,024, Cl. 83-852.000.
Chalfin, Edward, to Sprague Electric Company. Circuit for protecting a power transistor against a short-circuited load. 4,691,262, Cl. 361-56.000.
Chamberland, Roger R.; and Stanland, Andrew J., to United States of America, Navy. High frequency, hermetic, coaxial connector for flexible cable. 4,690,482, Cl. 439-578.000.
Chambers, Robert W.: *See—*
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Chamblee, Henry F. Snap ring tool. 4,689,865, Cl. 29-229.000.
Champion International Corporation: *See—*
Alexander, Garold W.; Hyder, Loomie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.
Costa, Robert E., 4,691,369, Cl. 383-17.000.
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Chapas, Richard B.: *See—*
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Chapman, Robert E., to Optimil Machinery, Inc. Log feed apparatus. 4,690,186, Cl. 144-176.000.
Charbonneau & Godfrey Associates: *See—*
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Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.
Charmilles Technologies S.A.: *See—*
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Chartrain, Jean-Claude: *See—*
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Chase, Richard C.: *See—*
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Chateau, Fernand, to Compagnie Generale des Etablissements Michelin. Device and method for assembling threads. 4,689,942, Cl. 57-58.360.
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Chen-Liang, Cheng, to Chen Liang Co., Ltd. Superminiature camera. 4,690,534, Cl. 354-187.000.
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Chen, Nai Y.; and Miale, Joseph N., to Mobil Oil Corporation. Process for preparing organic fuels and chemicals from biomass. 4,690,903, Cl. 435-161.000.

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Cheraso, John: *See*—
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Chesebrough-Pond's, Inc.: *See*—
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Chevron Research Company: *See*—
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Chiso, Wen B.: *See*—
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Chicosky, Leon, Jr.: *See*—
Orr, Robert B.; and Chicosky, Leon, Jr., 4,690,953, Cl. 521-65.000.

Chida, Tsuneaki: *See*—
Aoki, Katsunichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Chief Automotive Systems, Inc.: *See*—
Aldrich, Roger B.; and White, Gary R., 4,689,888, Cl. 33-288.000.

Chien, Yie W.; and Tojo, Kakuji, to Rutgers, the State University of New Jersey. Transdermal verapamil delivery device. 4,690,683, Cl. 604-896.000.

Chiesi Farmaceutici S.p.A.: *See*—
Chiesi, Paolo; and Servadio, Vittorino, 4,690,944, Cl. 514-445.000.

Chiesi, Paolo; and Servadio, Vittorino, to Chiesi Farmaceutici S.p.A. Homocysteine thiolactone derivatives, process for the preparation thereof and pharmaceutical compositions therefrom. 4,690,944, Cl. 514-445.000.

Chiodini, Laura: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Cho, Masa..uchi: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.

Cho, Shoji, to Life Environment Research Laboratories. Circular sporting article. 4,690,401, Cl. 272-137.000.

Choate, Paul V.; and Woodburn, Robert W., to N I Industries. Front sight for projectile launchers. 4,689,910, Cl. 42-100.000.

Cholnoky, Eszter: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sobonyai, Anna, 4,691,017, Cl. 546-298.000.

Christensen, Joel R., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,690,705, Cl. 71-90.000.

Chrzanowski, Mathew: *See*—
Poncy, Richard P.; and Chrzanowski, Mathew, 4,690,457, Cl. 297-337.000.

Chufistov, Sergei A.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Mori, Takashi; Ohi, Nobuhiro; Obsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.

Chul, Lee J.: *See*—
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.

Chung, Alfred: *See*—
Ryan, James W.; and Chung, Alfred, 4,690,937, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,938, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,939, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,940, Cl. 514-362.000.

Chung, Bong-Kwan, to Sam Sung Electronics Co., Ltd. Rotary coupling for rotatively connecting a feeder line to a rod antenna. 4,690,473, Cl. 439-1.000.

Church, Mark A., to International Business Machines Corp. Method and apparatus for controlling the throat height of batch fabricated thin film magnetic transducers. 4,689,877, Cl. 29-603.000.

Churchward, Reed R.; and Krocheski, Thomas L., to Sperry Corporation. Refresh system for multi-bank semiconductor memory. 4,691,303, Cl. 365-222.000.

CIBA-GEIGY AG: *See*—
Shawcross, Brian E., 4,690,547, Cl. 355-72.000.

Ciba-Geigy Corporation: *See*—
Behrens, Rudolf A.; and Seltzer, Raymond, 4,691,015, Cl. 544-198.000.

Evans, Samuel, 4,691,044, Cl. 560-75.000.
Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.
Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.
Stabeli, Theodor, 4,690,306, Cl. 222-80.000.
Stegmann, Werner, 4,691,058, Cl. 568-316.000.
Vosi, Harald; and Rothweiler, Herbert, 4,690,927, Cl. 514-282.000.

Ciosek, Bernard M., Jr.: *See*—
Zebley, Raymond S.; Nichols, James H., Jr.; and Ciosek, Bernard M., Jr., 4,690,302, Cl. 221-11.000.

Citizen Watch Co., Ltd.: *See*—
Fukuzawa, Takahiko; and Kitahara, Kiyoshi, 4,691,364, Cl. 182-41.000.
Watanabe, Haruo, 4,690,511, Cl. 350-339.00F.

Clarion Co., Ltd.: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.
Tsuchiya, Masahiro, 4,691,326, Cl. 375-1.000.

Clark, James A.; and Emmel, Henry J., to Bausch & Lomb Incorporated. Zoom microscope having a crank and linkage mechanism. 4,690,519, Cl. 350-515.000.

Clark, Roger J.; Economy, James; Flanders, Mary A.; Suzko, John R.; and Wheater, Robin A., to International Business Machines Corporation. Composition, coated article and method of coating. 4,690,962, Cl. 524-94.000.

Clark, Stephen C., to Strippit/Di-Acro-Houdaille, Inc. Automatic load unload turret punch. 4,690,021, Cl. 83-71.000.

Clark, Thomas R. Locator and fixture assembly. 4,689,891, Cl. 33-529.000.

Clarke, John: *See*—
Flesher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.

Clarke, Peter A.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.

Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., to International Business Machines Corp. Process for the production of void-free prepreg sheets. 4,690,836, Cl. 427-299.000.

Classen, Earl W.: *See*—
Hubbard, Lloyd C.; and Classen, Earl W., 4,690,002, Cl. 73-861.250.

Cloke, Robert L., to Prism Corporation. Data processing system including encoder, decoder and write precompensator, using run length limited code. 4,691,254, Cl. 360-45.000.

Clorox Company, The: *See*—
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Coad, Brian C., to GTE Products Corporation. Sintered compact and process for producing same. 4,690,711, Cl. 75-244.000.

Coccaro, Albert V. Apparatus for jacking and dollying an affixed vehicle wheel assembly. 4,690,605, Cl. 414-429.000.

Cochlea Corporation: *See*—
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.

Coflexip: *See*—
Carrio, Pierre, 4,690,181, Cl. 141-388.000.

Cohee, Judith A.: *See*—
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.

Coker, Geoffrey G.; and Findlay, John W. A., to Burroughs Wellcome Co. Pyridylvinyl-1H tetrazole having antihistamine activity. 4,690,935, Cl. 514-343.000.

Colditz, Armin; and Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for checking color pictures on a color monitor. 4,691,229, Cl. 358-76.000.

Cole-Parmer Instrument Company: *See*—
Hogan, Lawrence R., 4,690,307, Cl. 222-95.000.

Cole, R. Clay; and Bowles, Bobby K., to Halliburton Company. Sealant composition. 4,690,961, Cl. 523-440.000.

Coleman Company, Inc., The: *See*—
Schmidt, Frank T., 4,691,136, Cl. 310-339.000.

Coleman, Mary T.; and Tasbas, Hedy E. Lubricated tampon inserter. 4,690,671, Cl. 604-12.000.

Colgate-Palmolive Company: *See*—
Ouhadi, Trazollah; and Dehan, Louis, 4,690,771, Cl. 252-102.000.

Collart, Andre ; and Declerck, Fredy, to Solvay & Cie. (Societe Anonyme). Oxymethylene copolymers and process for their preparation. 4,691,000, Cl. 528-244.000.

Columbia Gas System Service Corp.: *See*—
Malcosky, Norman D.; and Koziar, Gregory, 4,690,689, Cl. 48-174.000.

Colvin, Richard. Archery sight. 4,689,887, Cl. 33-265.000.

Combs Enterprises, Inc.: *See*—
Everman, Wayne H.; and Gilbert, Joseph H., 4,690,732, Cl. 202-100.000.

Combustion Engineering, Inc.: *See*—
Peletz, Lawrence J., Jr.; and Jukkola, Glen D., 4,690,076, Cl. 110-347.000.

Cominco Ltd.: *See*—
Bult, Roelof P.; Bollong, Alan B. L.; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.

Comm/Scope Company: *See*—
Gupta, Chakra V.; and Garrett, Brian D., 4,691,081, Cl. 174-105.00R.

Commereuc, Dominique: *See*—
Hagues, Francois; Commereuc, Dominique; and Chauvin, Yves, 4,691,048, Cl. 560-240.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Banks, Henry J.; and Wiesman, John R., 4,690,041, Cl. 98-57.000.
Coogan, Clive K., 4,690,560, Cl. 356-338.000.

Compagnie Francaise d'Etudes et de Construction "Technip" : *See*—
Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., 4,690,702, Cl. 62-23.000.

Compagnie Generale des Etablissements Michelin: *See*—
Chatens, Fernand, 4,689,942, Cl. 57-58.360.

Compagnie Gervais Danone: *See*—
Berthet, Maurice, 4,690,281, Cl. 206-597.000.

Conboy, Leo W., to Ford Aerospace & Communications Corporation. High frequency, wide range FIR filter. 4,691,293, Cl. 364-724.000.

Conlogue, James H.; and Benker, Henry, to Hoof Products Co. Engine governor. 4,690,115, Cl. 123-366.000.

Constantin, Bruce J. Wheelchair restraining device. 4,690,364, Cl. 248-503.100.

Conti, Gianni: *See*—
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Masini, Benito, 4,689,971, Cl. 66-25.000.
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Masini, Benito, to Conti, Paolo; and Meritex S.r.l. Process and circular knitting machine for manufacturing pantyhose articles and the like. 4,689,971, Cl. 66-25.000.

Control Interface Company Limited: *See*—
Bohmer, William, 4,690,509, Cl. 350-333.000.

Conway, Hugh T.: *See*—
Loeada, Robert J.; and Conway, Hugh T., 4,690,153, Cl. 128-763.000.

Coogan, Clive K., to Commonwealth Scientific and Industrial Research Organization. Optically based measurement of fluid parameters. 4,690,560, Cl. 356-338.000.

Coosa, Robert A., Jr., to Xerox Corporation. Envelope configuration for use in a high speed copier with envelope printing capability. 4,690,392, Cl. 271-2.000.

Cooper Cliff Door Manufacturing (1980) Ltd : *See*—
Taylor, Douglas B., 4,690,195, Cl. 160-310.000.

Cooper Industries, Inc.: *See*—
Urani, Angelo, 4,690,648, Cl. 439-622.000.

Cope, Inc.: *See*—
Koperdak, Edward A., 4,690,382, Cl. 256-1.000.

Copeland, James L., to Ecolab Inc. Solid block chemical dispenser for cleaning systems. 4,690,305, Cl. 222-52.000.

Coppelmans, Petrus M. C.: *See*—
Van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., 4,691,171, Cl. 328-167.000.

Coppin, William, to Maxon Corporation. High temperature burner assembly. 4,690,635, Cl. 431-187.000.

Cordis Corporation: *See*—
Hess, Stanley R., 4,690,148, Cl. 128-639.000.
Hess, Stanley R., 4,690,155, Cl. 128-786.000.
Schroeppel, Edward A., 4,690,143, Cl. 128-419.00P.

Cork, William H.: *See*—
Wirstrom, Peter; and Cork, William H., 4,691,355, Cl. 380-23.000.

Cornell, David D.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.

Corominas, Narciso L., to Metalquimia, S.A. Injecting machine for meat pieces. 4,690,046, Cl. 99-533.000.

Corvazier, Philippe; and Dousteyssier, Jacques, to British Petroleum Company p.l.c., The. Level indicator for a liquid in a container. 4,691,113, Cl. 250-577.000.

Cory, John S. Automatic ribbon re-inker. 4,690,576, Cl. 400-200.000.

Costa, Robert E., to Champion International Corporation. Bag with handle and method of making the same. 4,691,369, Cl. 383-17.000.

Costar Corporation: *See*—
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.

Cotey, John. Portable dispenser for rolled paper products. 4,690,345, Cl. 242-55.530.

Cotteret, Jean: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.

Courty, Albert: *See*—
Eumurian, Gregoire; and Courty, Albert, 4,691,386, Cl. 455-607.000.

Couvez, Marc, to Societe Anonyme D.B.A. Pad spring for a disc brake with a sliding caliper, and disc brake equipped with such a spring. 4,690,254, Cl. 188-73.360.

Cox, Eugene R., to Harris Corporation. Method to reduce the height of the bird's head in oxide isolated processes. 4,691,222, Cl. 357-50.000.

CPC International Inc.: *See*—
Urban, Branko, 4,691,055, Cl. 562-589.000.

Craft House Corporation: *See*—
DeLaney, George E., 4,690,654, Cl. 446-28.000.

Crain, Steven P.: *See*—
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Craneveyor Corp.: *See*—
Batcheller, Roy W., 4,690,383, Cl. 256-24.000.

Crapser, James R.; and Demarest, Scott W., to S. C. Johnson & Son, Inc. Dual function cap. 4,690,312, Cl. 222-402.170.

Creative Products Resource Associates, Ltd.: *See*—
Smith, James A.; and Murphy, Betty J., 4,690,821, Cl. 424-401.000.

Crews, Purvis J.: *See*—
Bailey, Randal N.; and Crews, Purvis J., 4,690,455, Cl. 297-238.000.

Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., to Dow Chemical Company, The. Method for maintaining effective corrosion inhibition in gas scrubbing plant. 4,690,740, Cl. 204-147.000.

Crisafulli, Emilio: *See*—
Nitsto, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.

Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., to AMP Incorporated. Belt conveyor having article sorting and orienting features. 4,690,266, Cl. 198-388.000.

Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., to Mattel, Inc. Toy car launcher with expandable scissors members. 4,690,658, Cl. 446-429.000.

Crowter, Ronald H.: *See*—
Gregan, David J.; and Crowter, Ronald H., 4,690,099, Cl. 119-14.410.

CTS Corporation: *See*—
Waldron, Mark A.; and Leung, Tommy Y., 4,691,342, Cl. 379-98.000.

Daewoo Heavy Industries Ltd.: *See*—
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.

Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., to Mueller Co. Operating wrench for tamperproof hydrants. 4,690,019, Cl. 81-99.000.

Dahlquist, Hakan; and Kaufmann, Herbert, to ASEA Aktiebolag. Robot wrist. 4,690,012, Cl. 74-479.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.

Daicel Chemical Industries, Ltd.: *See*—
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Daido, Toshihiko, to Koyo Seiko Co., Ltd. Steering power control system in electronically controlled steering system. 4,690,233, Cl. 180-142.000.

Daiichi Denshi Kogyo Kabushiki Kaisha: *See*—
Hirose, Takao; and Kumekawa, Norio, 4,690,494, Cl. 350-96.200.

Daiichi Pure Chemicals Co., Ltd.: *See*—
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.

Daikin Kogyo Co., Ltd.: *See*—
Ohmori, Akira; and Ishiwari, Kazuo, 4,690,869, Cl. 428-421.000.

Dainichi-Nippon Cables, Ltd.: *See*—
Hayami, Hiroyuki; and Utsumi, Atsushi, 4,690,500, Cl. 350-96.250.

Dainippon Ink and Chemicals, Inc.: *See*—
Mitani, Tomomasa; and Mihata, Ichiro, 4,690,968, Cl. 524-315.000.
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Kurusu, Yasuo; and Morizumi, Yoshiaki, 4,691,240, Cl. 358-282.000.
Ohtorii, Masakazu, 4,690,527, Cl. 353-65.000.
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.
Yamada, Mitsuhiko, 4,691,238, Cl. 358-280.000.

Daiwa Special Chemical Co., Ltd.: *See*—
Yamada, Yosuke; and Oogami, Mitsuhiro, 4,690,158, Cl. 134-107.000.

Dalglish, Herbert F. Intravenous tube assembly. 4,690,674, Cl. 604-93.000.

Dalo, Jean; and Dalo, Pierre. Method and device for mounting the pole and cloth of a light shelter with central pole. 4,690,161, Cl. 135-99.000.

Dalo, Pierre: *See*—
Dalo, Jean; and Dalo, Pierre, 4,690,161, Cl. 135-99.000.

Daltex Medical Sciences, Inc.: *See*—
Erb, Robert A., 4,690,677, Cl. 604-329.000.

Dalton, Martin W., to Triton Aquatherm Limited. Automatically adjustable shower head to maintain constant pressure spray. 4,690,334, Cl. 239-452.000.

Dameron, Woodal W., to Cantrell Machine Co. Poultry line divider. 4,689,855, Cl. 17-11.000.

Damiano, Michael A.; and Schmerda, Richard F., to Eaton Corporation. Blown fuse indicator. 4,691,197, Cl. 340-638.000.

Damon Biotech, Inc.: *See*—
Lim, Franklin, 4,690,682, Cl. 604-891.000.

Danagraf A/S: *See*—
Holm, Niels E., 4,690,548, Cl. 355-77.000.

Dane, Bernard: *See*—
Lemonnier de Gouville, Jean B.; and Dane, Bernard, 4,690,636, Cl. 431-354.000.

Danfoss A/S: *See*—
McCulloch, Robert M.; and Jorgensen, Ove, 4,689,968, Cl. 62-225.000.

Dang, Hiep D.: *See*—
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.

Daniels, Erwin J.; and Korn, Siegfried, to Carl-Zeiss-Stiftung. Multifocal spectacle lens having a large near-vision part. 4,690,524, Cl. 351-168.000.

Daniels, Jerry. Weight lifting belt. 4,689,833, Cl. 2-322.000.

Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., to Unisys Corporation. Instruction buffer for a digital data processing system. 4,691,279, Cl. 364-200.000.

Dannels, Bobby F., to Occidental Chemical Corporation. Chlorotrifluoroethylene telomerization process. 4,691,065, Cl. 570-139.000.

Dannoura, Sadayuki, to UBE Industries, Inc. Molten metal pouring device. 4,690,197, Cl. 164-312.000.

Dart Industries Inc.: *See—*
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

Das, Balbhadra: *See—*
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.

Data General Corporation: *See—*
Erwin, Douglas A.; and Skinner, Robert L., 4,691,295, Cl. 364-900.000.

Dauchier, Jean-Michel: *See—*
Brezillon, Jean-Loup; and Dauchier, Jean-Michel, 4,689,880, Cl. 29-471.500.

Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., to Pexlon Limited. Gas analysis apparatus and method. 4,690,562, Cl. 356-361.000.

Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., to ICI Americas Inc. Quaternary nitrogen containing polyvinyl alcohol polymers for use in skin conditioning, cosmetic and pharmaceutical formulations. 4,690,817, Cl. 424-70.000.

Dayco Products, Inc.: *See—*
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Wetzel, Robert E., 4,690,664, Cl. 474-205.000.

Debevec, Anthony F. Fuel/oil pump. 4,690,108, Cl. 123-73.0AD.

DeBruyn, Frank E., Jr.; and Weed, Lucretia J., to Polaroid Corporation. Photographic element and method for forming transparencies. 4,690,884, Cl. 430-206.000.

Deck, Brent D. Contaminated fluid heat exchanging. 4,690,208, Cl. 165-119.000.

Decker, Raymond F.: *See—*
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.

Decker, Robert W., to Ingersoll-Rand Company. Liquid intensifier unit. 4,690,622, Cl. 417-342.000.

Deckman, Harry W.: *See—*
Roxlo, Charles B.; and Deckman, Harry W., 4,690,750, Cl. 208-310.00Z.

Deckner, George E., to Charles of the Ritz Group Ltd. Method for testing skin for presence of moisturizer. 4,690,815, Cl. 424-9.000.

Declerck, Fredy: *See—*
Collart, Andre ; and Declerck, Fredy, 4,691,000, Cl. 528-244.000.

Deere & Company: *See—*
Landphair, Donald K., 4,690,260, Cl. 192-71.000.

DeFazio, Salvatore C.: *See—*
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.

Degussa Aktiengesellschaft: *See—*
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,691,062, Cl. 568-495.000.

Degussa Electronics Inc., Materials Division: *See—*
Hunt, Charles d'A., deceased, 4,690,875, Cl. 428-577.000.

Dehan, Louis: *See—*
Ouhadi, Trazollah; and Dehan, Louis, 4,690,771, Cl. 252-102.000.

Dehennau, Claude; and Dubois, Paul, to Solvay & Cie. (Societe Anonyme). Adjustable feed block for coextrusion die. 4,690,628, Cl. 425-133.500.

Dejima, Fusao: *See—*
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Dekkers, Nicolaas H.: *See—*
Le Poole, Jan B.; and Dekkers, Nicolaas H., 4,691,103, Cl. 250-311.000.

Deland, Olivier. Internal combustion engine. 4,690,113, Cl. 123-197.0AC.

DeLaney, George E., to Craft House Corporation. Toy vehicle carrying case and launcher. 4,690,654, Cl. 446-28.000.

DeLaski, Donald: *See—*
McCoy, Bing, 4,690,026, Cl. 84-1.190.

Delfourne, Paul, to R.A.T.P. Regie Autonome des Transports Parisiens. Inter-carriage passage for a railway train. 4,690,068, Cl. 105-4.100.

Delius, Doris: *See—*
Delius, Siegried; and Delius, Doris, 4,690,601, Cl. 414-96.000.

Delius, Siegried; and Delius, Doris. Storage assembly and method of using same. 4,690,601, Cl. 414-96.000.

Delta Wood Products, Inc.: *See—*
Bakr, Mamdouh M.; and Maloney, Bobby J., 4,690,466, Cl. 312-29.000.

Demarest, Scott W.: *See—*
Crapser, James R.; and Demarest, Scott W., 4,690,312, Cl. 222-402.170.

Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, to Sanofi. Benzoic acid derivatives process for preparation and application as drugs, disinfectants or preservatives. 4,691,043, Cl. 560-064.000.

DeMars, Robert A. Compact radio. 4,691,383, Cl. 455-351.000.

Demeuldre, Daniel: *See—*
Callut, Francois; and Demeuldre, Daniel, 4,690,914, Cl. 502-400.000.

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Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Dennis, Phillip R. M.; and Hook, Christopher D. Identification systems. 4,691,202, Cl. 340-825.540.

Dent, Larry G. Pipe cutting device. 4,689,883, Cl. 30-94.000.

Deprima, Anthony E.: *See—*
Lewis, Johnnie D., Jr., 4,689,902, Cl. 36-131.000.

Derby, Norwin C., to Super Sack Manufacturing Corporation. Receptacle having improved discharge spout. 4,691,371, Cl. 383-62.000.

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Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.

Deriso, John: *See—*
Blum, Stephen C.; and Deriso, John, 4,691,179, Cl. 333-202.000.

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v.d. Vlekkert, Hendrik H.; and de Rooy, Nicolaas F., 4,691,167, Cl. 324-438.000.

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DeShong, George T.: *See—*
Doutrich, Ray C.; and DeShong, George T., 4,690,477, Cl. 439-595.000.

DeSoto, Inc.: *See—*
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.
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Carson, Paul L.; and Detsch, Richard M., 4,689,986, Cl. 73-19.000.

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Heimerl, Wilfried; and Ewest, Eckhart, 4,690,781, Cl. 252-633.000.

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Schepers, Erwin, 4,690,298, Cl. 220-325.000.

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Freyberger, Laurin C., 4,691,226, Cl. 358-26.000.

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Wakefield, Barry R.; and Pullen, Francis J., 4,689,854, Cl. 17-1.00R.

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Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., 4,690,890, Cl. 435-7.000.

Diamond, Betty A., to Albert Einstein College of Medicine of Yeshiva University, a division of Yeshiva University. Method for removal of human antibodies to native DNA from serum. 4,690,905, Cl. 436-508.000.

DiBiase, Stephen A.; and Vinci, James N., to Lubrizol Corporation, The. Hydrogen sulfide stabilized oil-soluble sulfurized organic compositions. 4,690,767, Cl. 252-47.000.

Dickie, Laurence G., to B & W Loudspeakers Limited. Loudspeaker enclosures. 4,690,244, Cl. 181-146.000.

Dickson, Charles R.; and Carlson, David E., to Solarex Corporation. Activation by dehydrogenation or dehalogenation of deposition feedstock and dopant materials useful in the fabrication of hydrogenated amorphous silicon alloys for photovoltaic devices and other semiconductor devices. 4,690,830, Cl. 427-38.000.

Diebold, Incorporated: *See—*
Shoop, James D., 4,690,073, Cl. 109-59.00T.

Diehl GmbH & Co.: *See—*
Bugiel, Horst G., 4,690,062, Cl. 102-476.000.
Stensen, Lothar, 4,689,845, Cl. 60-228.000.

Dienes, Zoltan B., to Thomas & Betts Corporation. Venting apparatus for electrical cable. 4,691,083, Cl. 174-135.000.

Diesel Kiki Co., Ltd.: *See—*
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Diesel Kiki Kabushiki Kaisha: *See—*
Iida, Katsumi, 4,690,203, Cl. 165-25.000.

Dietrich, Albert, to Dornier GmbH. Generating gas pressure in an expansion chamber. 4,690,060, Cl. 102-352.000.

Dietrich, Herbert, to Pfaff Industriemaschinen GmbH. Skin holder in an apparatus for letting out skins. 4,689,974, Cl. 69-27.000.

Digital Equipment Corporation: *See—*
Shell, Stanley, 4,691,199, Cl. 340-710.000.

Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Miest, to U.S. Philips Corporation. Electric machine with improved coil connection. 4,691,134, Cl. 310-234.000.

Diller, Calvin D.: *See—*
Nelson, Theodore G.; and Diller, Calvin D., 4,691,174, Cl. 330-260.000.

Dimitrov, Dimieter A.: *See—*
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Dingwall, Andrew G. F.; and Zazzu, Victor, to RCA Corporation. Comparator with cascaded latches. 4,691,189, Cl. 340-347.0AD.

Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, to RCA Corporation. Semiconductor structure and devices. 4,691,320, Cl. 372-45.000.

Dittmer, Catherine A.: *See—*
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.

Dixon, Dale D.: *See—*
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., 4,691,026, Cl. 548-531.000.

DNAX Research Institute of Molecular and Cellular Biology, Inc.: *See—*
Moomaw, Tim R., 4,690,893, Cl. 435-240.270.

Dobbs, Daniel R., to Sundstrand Corporation. Propulsion system for a torpedo with thrust compensation. 4,690,085, Cl. 114-20.200.

Dobbs, Robert J.; and Alexander, Shuford M., Jr., to GTE Products Corporation. High purity silicon nitride polishing compound. 4,690,693, Cl. 51-307.000.

Dobschal, Hans-Jurgen: *See—*
Florek, Stefan; Becker-Roos, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,599, Cl. 356-328.000.

Dobutsu, Masakatsu: *See—*
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Dr. Ing. h.c.F. Porsche AG: *See—*
Eger, Georg; and Srock, Rainer, 4,689,849, Cl. 16-82.000.

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Bantle, Manfred; and Lechner, Reinhard, 4,690,462, Cl. 301-9.0CN.
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, 4,690,238, Cl. 180-248.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Colditz, Armin; and Klopsch, Siegfried, 4,691,229, Cl. 358-76.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Pulled dethatching unit. 4,689,941, Cl. 56-396.000.

Dohmen, Petrus J. M., to U.S. Philips Corporation. Electric lamp and glass composition. 4,691,142, Cl. 313-623.000.

Dolinar, Brian J.: *See—*
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., to Schering Corporation. Process for preparing a specific diastereomer of a monoamino dicarboxylic acid ester. 4,691,049, Cl. 562-553.000.

Dolorgiet Beteiligungs-GmbH: *See—*
Lohner, Manfred; and Posselt, Klaus, 4,690,823, Cl. 424-456.000.

Domeier, Linda A.; and Gardner, Hugh C., to Amoco Corporation. Bismaleimides and prepreg resins therefrom. 4,691,025, Cl. 548-521.000.

Domke, Klaus, to Robert Bosch GmbH. Method for producing a packaging container having a pressure relief valve. 4,690,667, Cl. 493-213.000.

Domoto, Gerald A.: *See—*
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.

Doan Incorporated: *See—*
Mieyal, David F., 4,689,870, Cl. 29-469.500.

Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., to International Business Machines Corporation. Providing circuit lines on a substrate. 4,690,833, Cl. 427-96.000.

Dorer, Casper J., Jr.: *See—*
Johnston, Thomas E.; and Dorer, Casper J., Jr., 4,690,687, Cl. 44-67.000.

Dorfender Products Inc.: *See—*
Warren, Monty, 4,690,446, Cl. 293-128.000.

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Dietrich, Albert, 4,690,060, Cl. 102-352.000.

Dornseif, E. Ronald: *See—*
McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.

Doroszkowski, Andrew; and Skinner, Maurice W., to Imperial Chemical Industries PLC. Process of coating a heated surface. 4,690,837, Cl. 427-314.000.

Doshi, Kishore J., to Union Carbide Corporation. Enhanced gas separation process. 4,690,695, Cl. 55-16.000.

Douglas-Hamilton, Margaret M., to 501 Hamilton/Thorn Research Associates. Device and method for facilitating animal artificial insemination. 4,690,678, Cl. 604-349.000.

Douglas, Monte A., to Texas Instruments Incorporated. Tapered trench process. 4,690,729, Cl. 156-643.000.

Dousteyssier, Jacques: *See—*
Corvazier, Philippe; and Dousteyssier, Jacques, 4,691,113, Cl. 250-577.000.

Doutrich, Ray C.; and DeShong, George T., to Du Pont de Nemours, E. I., and Company. Electrical connector apparatus. 4,690,477, Cl. 439-595.000.

Dow Chemical Company, The: *See—*
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., 4,690,740, Cl. 204-147.000.
Hahnfeld, Jerry L., 4,690,976, Cl. 525-70.000.
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., 4,690,988, Cl. 525-502.000.
Keskey, William H.; and Johnson, Mark R., 4,690,995, Cl. 526-286.000.
Lane, George A.; and Rossow, Harold E., 4,690,769, Cl. 252-70.000.
Mendoza, Abel; and Otterbacher, Eric W., 4,691,042, Cl. 560-61.000.
Tomalia, Donald A.; and Hall, Mark J., 4,690,985, Cl. 525-419.000.
Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Dow Corning Corporation: *See—*
Plueddemann, Edwin P., 4,690,959, Cl. 523-213.000.

Dow Corning, Ltd.: *See—*
Adams, Graham; and Jones, Martin A., 4,690,688, Cl. 44-76.000.

Dowbenko, Rostyslaw: *See—*
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.

Dowding, John G.: *See—*
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.

Downes, James E.: *See—*
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.

Doy, Ralph J.: *See—*
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.

Doyle, Brian M.: *See—*
Banse, Conrad M.; and Doyle, Brian M., 4,691,093, Cl. 219-121.0LC.

Doyle, Terrence W.: *See—*
Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., 4,691,023, Cl. 548-422.000.

Draft, Howard J.; and Chambers, Robert W. Face guard design. 4,689,835, Cl. 2-424.000.

Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., to Draper Technologies, Inc. Coupon packet dispensing system. 4,690,303, Cl. 221-131.000.

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Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.

Drent, Eit, to Shell Oil Company. Preparation of carboxylic di-esters or acids. 4,691,047, Cl. 560-204.000.

Dresser Industries, Inc.: *See—*
Huffman, Joseph L., 4,690,573, Cl. 384-251.000.

Drobe, Wolfgang: *See—*
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Drommert, Heinz: *See—*
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Droulon, Georges: *See—*
Pipon, Yves; and Droulon, Georges, 4,690,458, Cl. 297-379.000.

Drummond, Robert L. Side bar wafer lock, an improved spring retainer for said lock, and a method of using said spring retainer in said lock. 4,689,978, Cl. 70-431.000.

Dubois, Paul: *See—*
Dehennau, Claude; and Dubois, Paul, 4,690,628, Cl. 425-133.500.

Dubrow, Robert S.: *See—*
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.

Dubuit, Jean-Louis: *See—*
Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, 4,690,050, Cl. 101-35.000.

Dudley, Dwight A., II: *See—*
Halabisky, Donald D.; and Dudley, Dwight A., II, 4,690,835, Cl. 427-210.000.

Dufresne, Joel R.: *See—*
King-Smith, Eric A.; ReMine, Walter J.; and Dufresne, Joel R., 4,690,145, Cl. 128-421.000.

Duheille, Jean; Pau, Bernard; and Gros, Pierre, to Sanofi. Nephelometric determination of HB_2 antigen with antibody-containing microparticles. 4,690,906, Cl. 436-512.000.

Duncan, David S., to Wilkinson Sword Limited. Razor blade assembly and its method of manufacture. 4,690,018, Cl. 76-101.00R.

Duncan, Neil, to Olympia Sports Products, Inc. Mat transport rack. 4,690,376, Cl. 254-327.000.

Dunisch, Ingo, to Heimann GmbH. Method of making a wall stabilized infrared flash tube. 4,690,652, Cl. 445-28.000.

Dunlop Limited: *See—*
Harrison, Reginald, 4,690,388, Cl. 267-35.000.

Dunphy, Gerald F.; and Newman, Donald J., to Ogden Industries Pty. Ltd. Padlock. 4,689,975, Cl. 70-56.000.

DuPart, Michael S.: *See—*
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., 4,690,740, Cl. 204-147.000.

Du Pont de Nemours, E. I., and Company: *See—*
Christensen, Joel R., 4,690,705, Cl. 71-90.000.
Doutrich, Ray C.; and DeShong, George T., 4,690,477, Cl. 439-595.000.

Elco, Richard A.; and Vandegriff, Hugh R., 4,690,472, Cl. 439-67.000.
Fong, Dan S., 4,690,865, Cl. 428-341.000.
Statz, Robert J., 4,690,981, Cl. 525-329.600.
Sze, Benjamin C., 4,691,003, Cl. 528-308.100.
Williams, John F.; and Wagner, Emery L., 4,690,669, Cl. 494-14.000.
Winckler, Steven J., 4,689,947, Cl. 57-304.000.
Zebley, Raymond S.; Nichols, James H., Jr.; and Clonek, Bernard M., Jr., 4,690,302, Cl. 221-11.000.

Dupont, Regis: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Duranleau, Roger G.; Nieh, Edward C. Y.; and Knifton, John F., to Texaco Inc. Process for production of ethylene glycol and dimethyl carbonate. 4,691,041, Cl. 558-277.000.

Durst, Paul T.: *See*—
Theiss, John J.; and Durst, Paul T., 4,691,097, Cl. 219-513.000.

Durston, Thomas W., to Harris Corporation. Telephone test set having an auxiliary amplifier and speaker for permitting listening to line signals. 4,691,336, Cl. 379-21.000.

Dussaud, Jacques: *See*—
Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , 4,690,719, Cl. 156-201.000.

Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., to ICI Americas Inc.; and Imperial Chemical Industries PLC. Proline derivatives. 4,691,007, Cl. 530-331.000.

Dutton, Hugh J.; and Francis, Martin. Architectural plate glass support system. 4,689,928, Cl. 52-235.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; and Kordel, Gerhard, 4,690,056, Cl. 102-202.200.

Dzula, Gregory, to Beckman Industrial Corporation. High purity water calibrating device. 4,691,168, Cl. 324-439.000.

E.C.C. America Inc.: *See*—
Rice, Camilla A., 4,690,868, Cl. 428-409.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Knauss, Hermann, 4,691,096, Cl. 219-441.000.

E. L. LeBaron Foundry Co.: *See*—
LeBaron, Francis, 4,690,584, Cl. 404-26.000.

Eastern Company, The: *See*—
Wolniak, Stanley C.; and Laabs, Timothy P., 4,689,977, Cl. 70-379.00R.

Eastman Christensen Company: *See*—
Voelz, Dieter; and Illerhaus, Roland, 4,690,228, Cl. 175-24.000.

Eastman Kodak Company: *See*—
Acello, John J., 4,691,249, Cl. 358-336.000.
Brownstein, Scott A., 4,691,211, Cl. 346-76.0PH.
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.
Hansen, David E.; Kelbe, Richard R.; and Wolcott, Dana W., 4,690,531, Cl. 354-149.110.
Hickok, William K., 4,691,245, Cl. 358-310.000.
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.

Eaton Corporation: *See*—
Bopp, Warren G.; and Janson, David A., 4,690,256, Cl. 192-21.000.
Damiano, Michael A.; and Schmerda, Richard F., 4,691,197, Cl. 340-438.000.
Egle, Lawrence E., 4,690,120, Cl. 123-571.000.

Eberbach, Steven J. Dihedral loudspeakers with variable dispersion circuits. 4,691,362, Cl. 381-99.000.

Eberhardt, H. Alfred, to Hale Fire Pump Company. Portable engine-pump assembly. 4,690,613, Cl. 415-148.000.

ECB Technologies, Inc.: *See*—
Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, 4,690,546, Cl. 355-69.000.

Echizen, Susumu: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Ecklund, Lawrence M., to Motorola, Inc. Adaptive phase locked loop having a variable locking rate. 4,691,175, Cl. 331-1.00A.

Ecolab Inc.: *See*—
Copeland, James L., 4,690,305, Cl. 222-52.000.

Economy, James: *See*—
Clark, Roger J.; Economy, James; Flanders, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Ed. Zublin Aktiengesellschaft: *See*—
Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.

Edakubo, Hiroo: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

Edmiston, Charles G., to GTE Products Corporation. Process for forming ceramic parts. 4,690,791, Cl. 264-122.000.

Edmonds, Michael G.: *See*—
Betts, David R.; and Edmonds, Michael G., 4,690,417, Cl. 280-42.000.

Edwards, Brian E.; and Biron, David G., to Massachusetts Institute of Technology. Laser radar utilizing pulse-tone waveform. 4,690,551, Cl. 356-5.000.

Edwards, Lew: *See*—
Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, 4,690,546, Cl. 355-69.000.

Edwards, Michael: *See*—
McCarthy, Brian D.; and Edwards, Michael, 4,689,834, Cl. 2-422.000.

Egawa, Takeshi: *See*—
Matsui, Tohru; and Egawa, Takeshi, 4,690,538, Cl. 354-403.000.

Eger, Georg; and Srock, Rainer, to Dr. Ing. h.c.F. Porsche AG. Control mechanism for a door of a motor vehicle with a reciprocating safety valve. 4,689,849, Cl. 16-82.000.

Egle, Lawrence E., to Eaton Corporation. Exhaust gas recirculation control system. 4,690,120, Cl. 123-571.000.

Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, to Janome Sewing Machine Co Ltd. Device for regulating upper thread tension of a sewing machine. 4,690,082, Cl. 112-254.000.

Eickmann, Karl. Variable radial piston pump. 4,690,620, Cl. 417-273.000.

Eickmann, Karl. Fluid pumps, fluid motors and devices, which include a coned ring. 4,690,623, Cl. 417-472.000.

Eigyo, Masami: *See*—
Takada, Susumu; Santani, Takashi; Shindo, Hirohisa; Matsuhita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Eilertson, Donald M. Self-propelled stump cutter. 4,690,183, Cl. 144-1.00M.

Einarsson, Jens: *See*—
Rydefalk, Staffan; and Einarsson, Jens, 4,689,988, Cl. 73-61.00R.

Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, to Siemens Aktiengesellschaft. Pay-out stand for supply reels. 4,689,943, Cl. 57-90.000.

Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, to Siemens Aktiengesellschaft. Drive circuit for a power MOSFET with source-side load. 4,691,129, Cl. 307-581.000.

Eisenbraun, Allan A., to Ethyl Corporation. Process for making alkali metal aryloxides. 4,691,057, Cl. 564-223.000.

Eke, Kenneth I., to Microwave Ovens Limited. Microwave oven with power transfer automatically responsive to dielectric load of food. 4,691,088, Cl. 219-10.55F.

Elco, Richard A.; and Vandegriff, Hugh R., to Du Pont de Nemours, E. I., and Company. High density flex connector system. 4,690,472, Cl. 439-67.000.

Electro-Pneumatic-International GmbH: *See*—
Huber, Thomas, 4,689,847, Cl. 16-26.000.

Electromagnetic Launch Research, Inc.: *See*—
Mongeau, Peter P., 4,691,133, Cl. 310-178.000.

Eli Lilly and Company: *See*—
Anderson, David B.; Schmiegel, Klaus K.; and Veenhuizen, Edward L., 4,690,951, Cl. 514-653.000.

Elite Concepts, Inc.: *See*—
Robertsen, Anthony L., 4,690,566, Cl. 368-108.000.

Elixir Industries: *See*—
Barnett, Timothy J., 4,690,040, Cl. 98-2.140.

Ell, Travis E.; and Stephenson, Jeff, to International Business Machines Corporation. Data disk drive velocity estimator. 4,691,152, Cl. 318-616.000.

Ellerbrock, Eugene A.: *See*—
Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.

Ellerbroek, Brent L., to Hughes Aircraft Company. Solid-state wavefront slope determination. 4,690,555, Cl. 356-121.000.

Ellerson, James V.: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.

Elliott, Charles T.; and White, Anthony M., to Secretary of State for Defence, The. Infra red photo detector systems. 4,691,107, Cl. 250-370.000.

Elliott, Gregory K., to Kaiser Aerospace & Electronics Corporation. Open flow valve assembly. 4,690,296, Cl. 220-259.000.

Ellis, Donald G.: *See*—
Moulding, Thomas S., Jr.; and Ellis, Donald G., 4,690,676, Cl. 604-189.000.

El-Menshawy, El-Sayed: *See*—
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.

Elscint Ltd.: *See*—
Blass, Judd; and Keren, Hanan, 4,691,163, Cl. 324-318.000.
Fenster, Paul; and Shimoni, Yair, 4,691,366, Cl. 382-54.000.

Emhart Industries, Inc.: *See*—
Kulig, Constantine W., 4,690,703, Cl. 65-265.000.

Emler, Don R.; and Thomas, Glenn M. Flow enhancer for reed inlet valves. 4,690,107, Cl. 123-65.00V.

Emmel, Henry J.: *See*—
Clark, James A.; and Emmel, Henry J., 4,690,519, Cl. 350-515.000.

Emoto, Shigeo: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, 4,690,960, Cl. 523-442.000.

Endo, Mitsuhiro: *See*—
Ando, Hiromi; Endo, Mitsuhiro; and Oso, Yukoo, 4,690,034, Cl. 91-369.00A.

Energy Conversion Devices, Inc.: *See*—
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,244, Cl. 358-294.000.

Energy Systems Industries, Inc.: *See*—
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

Enertrols, Inc.: *See*—
Heideman, Robert J., 4,690,255, Cl. 188-287.000.

Engel, Dusan J.; and Gilson, Jean-Pierre, to UOP Inc. Isomerization of cresols. 4,691,063, Cl. 568-783.000.

Engelke, Fritz: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Engle, Elbert, to Chesebrough-Pond's, Inc. Apparatus for separating stacks of cloth. 4,690,393, Cl. 271-4.000.

Entenman, Alan W., to Radyne Corporation. Data transmission system with error correcting data encoding. 4,691,318, Cl. 371-43.000.

Envopak Group Limited: *See*—
Arthur, Frank H., 4,690,444, Cl. 292-324.000.

Epoch Company, Ltd.: *See*—
Ukisu, Hiroshi, 4,690,645, Cl. 434-309.000.

Erb, Robert A., to Daltex Medical Sciences, Inc. Urine collection system for females. 4,690,677, Cl. 604-329.000.

Erhardt, Manfred: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,689,918, Cl. 51-105.0GG.

ERNO Raumfahrttechnik Gmbh: *See*—
Hornung, Ernst; and Rex, Dietrich, 4,690,355, Cl. 244-173.000.

Erwin, Douglas A.; and Skinner, Robert L., to Data General Corporation. System for storing and retreiving display information in a plurality of memory planes. 4,691,295, Cl. 364-900.000.

Erwin, Larry: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.

Esco Corporation: *See*—
Briscoe, Terry L., 4,689,904, Cl. 37-135.000.

ESGE-Marby GmbH & Co. KG: *See*—
Belka, Heinrich, 4,690,420, Cl. 280-289.00A.

Espenhahn, Eric: *See*—
Fitzmorris, Tyce; Espenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.

Esselte Pendaflex Corp.: *See*—
Sherman, Charles F., 4,689,906, Cl. 40-152.100.

Etablissements Staubli Verdol: *See*—
Bassi, Dario; and Palau, Joseph, 4,690,178, Cl. 139-455.000.

Estlick, Raymond J.: *See*—
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.

Etablissements Bolle Georges, Robert et Maurice: *See*—
Bolle, Robert, 4,689,837, Cl. 2-440.000.

Ethington, Don; Riley, Ray J.; and Tock, Richard W., to AL-CHEM Fuels, Inc. Method for gas synthesis. 4,690,743, Cl. 204-168.000.

Ethyl Corporation: *See*—
Eisenbraun, Allan A., 4,691,057, Cl. 564-223.000.

ETS SA Fabriques d'Ebauches: *See*—
Rebeaud, Jean-Philippe, 4,690,567, Cl. 368-203.000.

Ettenberg, Michael: *See*—
Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, 4,691,320, Cl. 372-45.000.

Ezmurian, Gregoire; and Courty, Albert, to Thomson-CSF. Optical transmission channel with electrical connectors. 4,691,386, Cl. 455-607.000.

Evans, Ronald J.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.

Evans, Samuel, to Ciba-Geigy Corporation. Antioxidants for organic materials. 4,691,044, Cl. 560-75.000.

Evans, Thomas L.: *See*—
Cella, James A.; Grade, Marsha M.; and Evans, Thomas L., 4,690,997, Cl. 528-26.000.

Eveready Battery Company: *See*—
Huhndorff, Harry R.; and Myers, John P., 4,690,879, Cl. 429-61.000.

Everett, James W., to Westinghouse Electric Corp. Foldable dual-seal nozzle dam. 4,690,172, Cl. 138-89.000.

Everman, Wayne H.; and Gilbert, Joseph H., to Combs Enterprises, Inc. Apparatus for shale oil retorting. 4,690,732, Cl. 202-100.000.

Ewest, Eckhart: *See*—
Heimerl, Wilfried; and Ewest, Eckhart, 4,690,781, Cl. 252-633.000.

Exibelco GmbH: *See*—
Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.

Exxon Chemical Patents Inc.: *See*—
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.
Michaelson, Robert C., 4,691,073, Cl. 585-639.000.

Exxon Research and Engineering Company: *See*—
Hou, Ching-Tsang; and Barnabe, Nancy P., 4,690,891, Cl. 435-42.000.
Jenkinson, Ronald J., 4,690,802, Cl. 422-141.000.
Roxlo, Charles B.; and Deckman, Harry W., 4,690,750, Cl. 208-310.00Z.
Schorfheide, James J., 4,690,806, Cl. 423-230.000.

Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, to Siemens Aktiengesellschaft. Method for the manufacture of large area silicon crystal bodies for solar cells. 4,690,797, Cl. 419-23.000.

Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, to Richter Gedeon Vegyeszeti Gyar Rt. 2-hydroxy- and 2-halo-ethylthiopyridine intermediates for preparing antiulcer compounds. 4,691,017, Cl. 546-298.000.

Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., to Rockwell International Corporation. Keyless inking system for offset lithographic printing press. 4,690,055, Cl. 101-481.000.

Fahey, Brian W. Running shoe. 4,689,898, Cl. 36-43.000.

Falcetta, Joseph J.; and Park, Joonsup, to Alcon Laboratories, Inc. p-(2-Hydroxy hexafluoroisopropyl) styrene [HFIS] monomer for ophthalmic applications. 4,690,993, Cl. 526-242.000.

Falk, Jerry: *See*—
Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.

Fall, James C. Head and magazine loader assembly. 4,689,881, Cl. 29-813.000.

Fanuc Ltd.: *See*—
Nakano, Jiro, 4,691,131, Cl. 310-54.000.

Farmer, James O., to Scientific Atlanta, Inc. Scrambling systems for CATV. 4,691,353, Cl. 380-15.000.

Farmitalia Carlo Erba: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemic; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Farrell, Roberta L., to Repligen Corporation. Use of rLDM TM 1-6 and other ligninolytic enzymes in the bleaching of kraft pulp. 4,690,895, Cl. 435-278.000.

Fasnacht, Jeffery L. Apparatus and method for making positioners. 4,690,787, Cl. 264-16.000.

Faulconer, Harry A. Flat folding alternating barrier. 4,690,583, Cl. 404-6.000.

Faulconer, Mark; and Greatrake, Scott E. Buoyancy compensator insertable backpack. 4,690,314, Cl. 224-211.000.

Fauteux, Denis: *See*—
Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.

Fauth, Karl-Heinz: *See*—
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.

Fazzolari, Anthony; and Fazzolari, Nicholas, to Siegel, Myron. Shrouded slide lock assembly. 4,690,441, Cl. 292-57.000.

Fazzolari, Nicholas: *See*—
Fazzolari, Anthony; and Fazzolari, Nicholas, 4,690,441, Cl. 292-57.000.

Feinauer, Roland; and Jadamus, Hans, to Chemische Werke Huels Aktiengesellschaft. Thermoplastic compositions based on polyphenylene ethers, impact-resistant styrene polymers, and pulverulent, filler-containing rubber; and method for manufacturing such compositions. 4,690,970, Cl. 524-504.000.

Feinauer, Roland: *See*—
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, 4,690,978, Cl. 525-152.000.

Feldmann, Hansueli: *See*—
Brandli, Max; and Feldmann, Hansueli, 4,690,422, Cl. 280-460.00R.

Fellinger, Christine: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Fenster, Paul; and Shimoni, Yair, to Elscint Ltd. Image enhancement. 4,691,366, Cl. 382-54.000.

Ferdinand Lusch GmbH & Co. KG: *See*—
Horenkamp, Franz, 4,690,358, Cl. 248-297.300.

Ferguson, Vivian: *See*—
Off, Joseph W. A.; and Ferguson, Vivian, 4,690,078, Cl. 112-121.120.

Fernald, Mark R.: *See*—
Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., 4,690,351, Cl. 244-3.160.

Fershko, Jane S.; and Lackey, Robert W., to Mead Corporation, The. Gravity feed display device. 4,690,287, Cl. 211-49.100.

Fessenden, Peter J.: *See*—
Beauregard, William W.; and Fessenden, Peter J., 4,689,878, Cl. 29-611.000.

Feuersanger, Alfred E.: *See*—
Buhrer, Carl F.; and Feuersanger, Alfred E., 4,691,141, Cl. 313-565.000.

Fezio, Louis J., to K-2 Corporation. Fiber reinforced braided ski core and method and apparatus for making same. 4,690,850, Cl. 428-105.000.

Fichtel & Sachs AG: *See*—
Gob, Werner; and Anders, Peter, 4,690,103, Cl. 123-41.120.

Fielding, Donna J.: *See*—
Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.

Filhol, Robert: *See*—
Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, 4,691,043, Cl. 560-064.000.

Finan, Anthony T., Sr.; Lowery, Richard K., Sr.; and Leible, Walter T. Article bagging unit. 4,689,937, Cl. 53-502.000.

Fincke, Randall W.: *See*—
Lyddy, James E.; and Fincke, Randall W., 4,690,162, Cl. 137-1.000.

Findeklee, Heinz: *See*—
Kuker, Wolfgang; and Findeklee, Heinz, 4,690,067, Cl. 105-3.000.

Findlay, John W. A.: *See*—
Coker, Geoffrey G.; and Findlay, John W. A., 4,690,933, Cl. 514-343.000.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, legal representative), to BASF Aktiengesellschaft. Herbicide. 4,690,706, Cl. 71-91.000.

Fischer, Caecilia Emma, legal representative: *See*—
Fischer, Adolf, deceased, 4,690,706, Cl. 71-91.000.

Fischer, Edgar E. Method of maintaining an uninterrupted warning signal. 4,690,059, Cl. 102-336.000.

Fischer, William C.: *See*—
Murphy, Richard D.; and Fischer, William C., 4,691,315, Cl. 371-9.000.

Fitzmorris, Tyce; Espenhahn, Eric; and Pereira, Jamie, to Vistech Corporation. Bottle inspection system. 4,691,231, Cl. 358-106.000.

Flakt AB: *See*—
Johansson, Lars-Erik, 4,690,333, Cl. 239-434.500.

Flandera, Mary A.: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Flanders, Marguerita E.: *See*—
Flanders, Robert G.; and Flanders, Marguerita E., 4,690,644, Cl. 434-158.000.

Flanders, Robert G.; and Flanders, Marguerita E. Teaching apparatus, particularly for teaching shorthand. 4,690,644, Cl. 434-158.000.

Flanigen, Edith M.: *See*—
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,690,808, Cl. 423-305.000.

Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, to Brown, Boveri & Cie AG. Plastic cable. 4,691,082, Cl. 174-106.0SC.

Flegal, Robert T.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Fleming, Dennis J.: *See*—
Boerema, Edward T.; Sumaa, Michael J.; and Fleming, Dennis J., 4,690,450, Cl. 296-97.00K.

Flesher, Peter; Clarke, John; and Marshall, David, to Allied Colloids Limited. Water absorbing polymers. 4,690,971, Cl. 524-555.000.

Flexwatt Corporation: *See*—
Grise, Frederick G. J., 4,690,347, Cl. 242-57.100.

Flight, Robert S., to Caldwell Manufacturing Company. Pulley mount for window balance system. 4,689,850, Cl. 16-197.000.

Flood, Gary N., to Branson Ultrasonics Corporation. Ultrasonic apparatus for joining and severing sheet material. 4,690,722, Cl. 156-510.000.

Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, to Jenoptik Jena GmbH. Optical system for spectral analysis devices. 4,690,559, Cl. 356-328.000.

Fluegge, Jerry H., to Ford Motor Company. Double isolated jounce bumper system. 4,690,428, Cl. 280-697.000.

Foglesonger, John D.; and Vranson, David M., to ITT Gilfillan, a division of ITT Corporation. Method of making waveguide assembly. 4,689,876, Cl. 29-600.000.

Fong, Dan S., to Du Pont de Nemoura, E. I., and Company. Heat-shrinkable polymeric barrier film. 4,690,865, Cl. 428-341.000.

Forbes, Richard L., II; and Thorp, Bruce E., to Xerox Corporation. Blade cleaning apparatus for flexible belt. 4,690,544, Cl. 355-15.000.

Ford Aerospace & Communications Corporation: *See*—
Conboy, Leo W., 4,691,293, Cl. 364-724.000.

Ford Motor Company: *See*—
Fluegge, Jerry H., 4,690,428, Cl. 280-697.000.

Forner, Siegfried: *See*—
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.

Forsyth, Robert P., to Polaroid Corporation. Composite lens assembly. 4,690,512, Cl. 350-417.000.

Forte, Paulino; and Videira, Jose A., to Union Carbide Corporation. Process for the separation of hydrocarbons from a mixed feedstock. 4,690,733, Cl. 203-21.000.

Fory, Werner; Gass, Karl; and Meyer, Willy, to Ciba-Geigy Corporation. Sulfonylureas. 4,690,707, Cl. 71-93.000.

Foseco International Limited: *See*—
Vernay, Pierre, 4,690,196, Cl. 164-58.100.

Fotheringham, James R., to Caterpillar Industrial Inc. Lift mast transport arrangement. 4,690,610, Cl. 414-631.000.

Fowler, Daniel L., to Robertshaw Controls Company. Method of making a membrane keyboard. 4,689,879, Cl. 29-622.000.

Fox, Richard S.: *See*—
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.

Francis, Martin: *See*—
Dutton, Hugh J.; and Francis, Martin, 4,689,928, Cl. 52-235.000.

Fredericks, Walter A.; and McCullough, Edward W., to Rexnord Inc. Torsional stress distribution flexible coupling. 4,690,661, Cl. 464-78.000.

Freitag, Dieter: *See*—
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Freyberger, Laurin C., to Deutsche ITT Industries GmbH. Color-television receiver with at least one integrated circuit for processing the digitized composite color signal. 4,691,226, Cl. 358-26.000.

Frick Company: *See*—
Mandy, Zoltan A., 4,690,759, Cl. 210-304.000.

Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, to CIBA-GEIGY Corporation. 1-aryl-2-fluoro-2-azolyl alkanones, alkanols, esters, and ethers, composition containing them, and use of them to control phytopathogenic microorganisms. 4,690,942, Cl. 514-383.000.

Fried, John H.; and Venuti, Michael C., to Syntex (U.S.A.) Inc. (2-Oxo-1,2,3,5-tetrahydroimidazo-[2,1-B]quinazolinyl) oxyalkylamides properties having phosphodiosterase inhibiting. 4,690,925, Cl. 514-267.000.

Friedberger, Otmar: *See*—
Kuntze-Fechner, Gerald; Friedberger, Otmar; and Hahn, Michael, 4,690,615, Cl. 416-134.00A.

Friedman, Alexander A.; and Podolak, Peter L., to Syracuse University. Anaerobic contactor. 4,690,755, Cl. 210-96.100.

Friedman, Walter; and Stricker, David J., to Kenner Parker Toys, Inc. Wheel and winch assemblies utilizing identical hubs and axles in a toy construction set. 4,690,656, Cl. 446-95.000.

Frisch, Eberhard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Geostationary communications satellite. 4,690,354, Cl. 244-158.00R.

Fritz, Otmar, to Siemens Aktiengesellschaft. Carrier member for integrated modules. 4,690,275, Cl. 206-331.000.

Froelich, Ronald W. Fingerprint identification device. 4,690,554, Cl. 356-71.000.

Frolow, Jack L. Tennis racket. 4,690,405, Cl. 273-73.00C.

Frost, Jonathan: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Fruhauf, Waldemar, to Siemens Aktiengesellschaft. Circuit for coupling a signal processing device to a transmission line. 4,691,128, Cl. 307-557.000.

Fuji Electric Co., Ltd.: *See*—
Kato, Toshiaki, 4,691,242, Cl. 358-294.000.
Nishiura, Masaharu, 4,689,874, Cl. 437-2.000.
Yokomori, Shinji, 4,690,263, Cl. 194-317.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakai, Yasuhito; and Yamada, Kenichi, 4,690,011, Cl. 74-475.000.

Fuji Photo Film Co., Ltd.: *See*—
Kamiyama, Kouzi, 4,690,768, Cl. 252-62.580.
Kubodera, Seiiti; and Okazaki, Masaki, 4,690,883, Cl. 430-203.000.
Kubodera, Seiiti; and Okazaki, Masaki, 4,690,883, Cl. 430-203.000.
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, 4,690,886, Cl. 430-303.000.
Okada, Kazuo; and Nakayama, Yoshiaki, 4,691,252, Cl. 360-75.000.
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, 4,690,889, Cl. 430-552.000.
Shirahata, Ryuji; and Tamai, Yasuo, 4,690,857, Cl. 428-216.000.
Yagihara, Morio; and Ikegawa, Akihiko, 4,690,885, Cl. 430-212.000.

Fujie, Daijiro, to Nippon Kogaku K. K. Retrofocus type wide angle lens. 4,690,517, Cl. 350-458.000.

Fujii, Masahiko: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Fujii, Mitsuo: *See*—
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-490.000.

Fujii, Takayoshi: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Fujii, Toshifumi: *See*—
Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, 4,691,251, Cl. 360-14.100.

Fujimoto, Hiroaki: *See*—
Ogasahara, Takio; and Fujimoto, Hiroaki, 4,690,109, Cl. 123-73.00A.

Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Camera with release control and automatic film sensitivity setting. 4,690,530, Cl. 354-21.000.

Fujino, Akihiko: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-501.000.

Fujino, Kiyoharu, to Mitsubishi Monsanto Chemical Company. Process for preparation of alkenylsuccinic anhydrides. 4,691,030, Cl. 549-255.000.

Fujioka, Hirofumi; and Inoue, Masami, to Mitsubishi Denki Kabushiki Kaisha. Ultra-violet ray curing type resin composition. 4,690,957, Cl. 522-31.000.

Fujisaki, Koji: *See*—
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.

Fujisawa, Naoki, to Toyota Jidosha Kabushiki Kaisha. Console box for automobile. 4,690,448, Cl. 296-37.800.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Iahikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.

Fujitsu Limited: *See*—
Nagashima, Masayasu; and Iijima, Nobuo, 4,690,591, Cl. 400-83.000.
Satoh, Taizo, 4,691,145, Cl. 315-169.300.

Fujiwara, Hidenori: *See*—
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.

Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, to Konishiroku Photo Industry Co., Ltd. Silver halide color photo-sensitive material. 4,690,888, Cl. 430-549.000.

Fujiyama, Masaaki: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.

Fukahori, Kiyoshi; and Glad, Thomas, to Silicon Systems, Inc. MOS Switched capacitor automatic gain control circuit. 4,691,172, Cl. 330-129.000.

Fukamizu, Hiroshi; Nakano, Masaji; Ibe, Kunio; Yamasaki, Taro; and Sano, Kenji, to Omron Tateisi Electronics Co. Road surface condition detection system. 4,690,553, Cl. 356-51.000.

Fukatsu, Kiyoshi: *See*—
Murayama, Akira; Kuso, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Fukuchi, Shuzo; and Yamaguchi, Shigeru, to Nippon Shokubai Kagaku Co., Ltd. Hydroxyl group-containing (meth)acrylate oligomer, prepolymer therefrom, and method for use thereof. 4,691,045, Cl. 560-181.000.

Fukuda, Ken; and Ueba, Hisaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Kureha Gosen Kabushiki Kaisha. Contact material for treating sewage of braided pile material. 4,690,849, Cl. 428-91.000.

Fukuda, Kimio: *See*—
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, 4,690,856, Cl. 428-215.000.

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Fukushima, Isao: *See*—
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.

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Fukuzawa, Takahiko; and Kitahara, Kiyoshi, to Citizen Watch Co., Ltd. Bit pattern conversion apparatus. 4,691,364, Cl. 382-41.000.

Fulterer Gesellschaft m.b.H.: *See*—
Fulterer, Manfred, 4,690,571, Cl. 384-22.000.

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Fuminao, Tanitomi, to Kaisei Kogyo Corporation. Tree pruning machine. 4,690,184, Cl. 144-2.00Z.

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Funahashi, Toshihiko: *See*—
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.

Fung, Bill S. K.; and Hrutfiord, Bjorn F., to Monsanto Company. Oxidation of acetovantillone to vanillin. 4,691,061, Cl. 568-432.000.

Furst, Andor; Labler, Ludwig; and Meier, Werner, to Hoffmann-La Roche Inc. Process for the preparation of cholesterol derivatives and novel intermediates therefor. 4,691,032, Cl. 549-450.000.

Furuhata, Kimio: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Furui, Toshiyuki, to NEC Corporation. Data processing system simultaneously carrying out address translation of a plurality of logical addresses. 4,691,281, Cl. 364-200.000.

Furukawa, Yuusuke: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Furunushi, Yasuko: *See*—
Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, 4,690,558, Cl. 356-318.000.

Furuse, Masayasu: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.

Furusho, Takao: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, to Ricoh Company, Ltd. Color copying apparatus. 4,690,542, Cl. 355-4.000.

Furuta, Hideya: *See*—
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Furuya, Tamio: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

G & B Rubber Stamp Co., Inc.: *See*—
Munyon, Gary D.; and Swiech, Matthew J., 4,690,053, Cl. 101-328.000.

G-C Dental Industrial Corp.: *See*—
Kyotani, Ikuo, 4,690,642, Cl. 433-142.000.
Yoshida, Takaichi, 4,690,799, Cl. 420-507.000.

G. Dusterloh, GmbH: *See*—
Klie, Jurgen; and Beyer, Rudolf, 4,690,038, Cl. 92-181.00R.

Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, to Saft, S.A. Electrochemical cell having a non-aqueous electrolyte. 4,690,877, Cl. 429-194.000.

Gabarro, Jose A. P.: *See*—
Arechaga, Sebastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.

Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J. Breast compression and needle localization apparatus. 4,691,333, Cl. 378-37.000.

Gach, Paul: *See*—
Hull, A. Katherine, 4,690,852, Cl. 428-156.000.

Gaikema, Gjalt M.; and Zylstra, Dirk, to Wavin B.V. Process for the packaging of products, using a heat treatment, and closed container with packed products, obtained using a heat treatment. 4,689,936, Cl. 53-440.000.

Galco, Inc.: *See*—
Gallentine, William, 4,689,957, Cl. 60-481.000.

Gallentine, William, to Galco, Inc. Hydraulic tool system. 4,689,957, Cl. 60-481.000.

Gamarnik, Iosif I.: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.

Gandhi, Sharad P.: *See*—
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., 4,691,277, Cl. 364-200.000.

Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., to Schering Corporation. 2-(heterocycloalkylthio)penems. 4,690,922, Cl. 514-210.000.

Ganz, Robert H., to Mead Packaging Corporation, The. Apparatus for and method of applying wrap to article clusters. 4,689,934, Cl. 53-398.000.

Gappa, Takeshi: *See*—
Murakami, Gen; and Gappa, Takeshi, 4,691,225, Cl. 357-80.000.

Garcia, John G., Jr.: *See*—
Bhatia, Kishan; and Garcia, John G., Jr., 4,690,805, Cl. 423-224.000.

Gardner, Hugh C.: *See*—
Domeier, Linda A.; and Gardner, Hugh C., 4,691,025, Cl. 548-521.000.

Gardner, John F.; and Morton, Gerald H., to Xomox Corporation. Valve assembly and method of making same. 4,690,164, Cl. 137-15.000.

Gariboldi, Franco: *See*—
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Masini, Benito, 4,689,971, Cl. 66-25.000.

Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., to NPK za Kontrolno Zavarachni Raboti. Method and device for plasma cutting of non-metallic materials. 4,691,090, Cl. 219-121.0PC.

Garrett, Brian D.: *See*—
Gupta, Chakra V.; and Garrett, Brian D., 4,691,081, Cl. 174-105.00R.

Garrett Corporation, The: *See*—
Shkedi, Zvi, 4,689,999, Cl. 73-708.000.

Gass, Karl: *See*—
Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.

Gates, Alan H.: *See*—
Hedrick, Steven E.; and Gates, Alan H., 4,690,701, Cl. 55-436.000.

Gauckler, Ludwig: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Gaudilliere, Bernard: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Gauthier, Michel; and Fauteux, Denis, to Hydro-Quebec; and Societe Nationale Elf Aquitaine. Process for preparing alloyed negative electrodes. 4,690,840, Cl. 427-436.000.

Gayfer, David; Starkey, Stanley V.; and Wareham, John G., to Molins PLC. Packet handling apparatus. 4,690,265, Cl. 198-347.000.

Gee, Caroline M.; and Thurmond, Gary D., to Hughes Aircraft Company. Compensation for optical damage of directional-coupler switches. 4,690,488, Cl. 350-96.120.

Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, to Lindauer Dornier Gesellschaft mbH. Gripper rod for shuttleless looms. 4,690,177, Cl. 139-449.000.

Geise, Samuel C., to Specialty Tool Co., Inc. Slitting tool. 4,689,920, Cl. 51-241.00S.

General DataComm, Inc.: *See*—
Robinson, Jeffrey L, 4,691,190, Cl. 340-347.0AD.
General Electric Company: *See*—
Cella, James A.; Grade, Marsha M.; and Evans, Thomas L., 4,690,997, Cl. 528-26.000.
Hershberger, Doran D., 4,689,973, Cl. 68-23.700.
Hsiung, Chia Y.; and Ross, Daniel P., 4,691,176, Cl. 331-2.000.
Knoble, David W.; and Sanders, Joseph W., 4,691,341, Cl. 379-97.000.
Komanduri, Ranga, 4,690,691, Cl. 51-293.000.
Scott, Curtis E.; and McVey, Charles L, 4,690,727, Cl. 156-635.000.
Steele, Douglas S., 4,691,108, Cl. 250-385.000.
General Electric Environmental Services, Inc.: *See*—
Saleem, Abdus, 4,690,807, Cl. 423-242.000.
General Motors Corporation: *See*—
Arnold, Philip D., 4,690,112, Cl. 123-195.00R.
General Oceanics, Inc.: *See*—
Niskin, Shale J.; and Williams, Gerald J., 4,690,380, Cl. 254-394.000.
Genet, Alain: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.
Genus, Inc.: *See*—
McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.
Georg Fischer Aktiengesellschaft: *See*—
Steinemann, Robert, 4,690,163, Cl. 137-8.000.
George, Achilles N. Inversion apparatus. 4,690,133, Cl. 128-25.00R.
George Blair Public Limited Company: *See*—
Reynard, Kenneth, 4,690,442, Cl. 292-218.000.
George, Flint R.; and Smith, Marlin R., to Halliburton Company. Gun firing head. 4,690,227, Cl. 175-4.560.
Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Adamantyl phenyl β-alanines. 4,691,051, Cl. 562-443.000.
Gerd Schulz Fahrzeug- und Container-Technik: *See*—
Schulz, Gerd, 4,690,232, Cl. 180-89.140.
Gerow, Frank J., to Synergist Limited. Male impotence prosthesis. 4,690,135, Cl. 128-79.000.
Gerritsen, Jan; and Menses, Otto, to U.S. Philips Corporation. Display tube having ferromagnetic field shapers to prevent beam defocussing. 4,691,139, Cl. 313-413.000.
Geus, Georg, to Heimann GmbH. Inverse rectifier. 4,691,272, Cl. 363-98.000.
Gevaza, Jury I.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Gheewala, Tushar R.: *See*—
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Ghini, Mario, to IN.GR.ED. Industrie Grafiche Editoriali S.p.A. Blank for parallelepiped dispensing carton. 4,690,282, Cl. 206-626.000.
Giammara, Beverly L.; and Hanker, Jacob S., to University of North Carolina at Chapel Hill, The; and Microelectronics Center of North Carolina. Silver methenamine staining method. 4,690,901, Cl. 436-86.000.
Giannini, Gabriel M. Optical fiber magnetic connector. 4,690,495, Cl. 350-96.210.
Gibbons, Carl B. Insulated flexible bladder solar collector. 4,690,128, Cl. 126-450.000.
Gibson, Royce G., to Tendapak Holdings Pty. Limited. Material forming apparatus. 4,689,856, Cl. 17-32.000.
Giesberg, Daniel J. Film illuminator. 4,691,267, Cl. 362-218.000.
Gila River Products, Inc.: *See*—
Kloss, Thomas M., Jr., 4,690,845, Cl. 428-40.000.
Gilbert, Bibaut. Earth digging machine for use on soft or undulating terrain, particularly for the clearing of ponds, swamps or canals. 4,689,903, Cl. 37-103.000.
Gilbert, David L.: *See*—
Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.
Gilbert, Joseph H.: *See*—
Everman, Wayne H.; and Gilbert, Joseph H., 4,690,732, Cl. 204-100.000.
Gill, David C., to Nomix Manufacturing Co. Limited. Spraying equipment. 4,690,326, Cl. 239-223.000.
Gilliom, Laura R.: *See*—
Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.
Gillissen, Franz. Process for the generation plasma and an MHD generator. 4,691,130, Cl. 310-11.000.
Gillum, Richard R., to Weapon Technology System R & D Ltd. Handheld high-velocity grenade launcher. 4,689,912, Cl. 42-105.000.
Gilson, Jean-Pierre: *See*—
Engel, Dusan J.; and Gilson, Jean-Pierre, 4,691,063, Cl. 568-785.000.
Gingerich, Richard G. W.: *See*—
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.
Girijavallabhan, Viyyoor M.: *See*—
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.
Gissinger, Patrick; and Pontignat, Yves, to Ceraver. Device for stripping from a mold a composite electrical insulator. 4,690,630, Cl. 425-236.000.
Giuliano, James T., to Zotos International, Inc. Form for preparing artificial nails. 4,690,369, Cl. 249-55.000.
Glad, Thomas: *See*—
Fukahori, Kiyoshi; and Glad, Thomas, 4,691,172, Cl. 330-129.000.
Glaser, Eberhard: *See*—
Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.
Glass, Samuel W., III, to Babcock & Wilcox Company, The. Calibration impact hammer. 4,689,985, Cl. 73-1.00R.
Glasscock, Michael R.: *See*—
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.
Glaxo Group Limited: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.
Glenwood Systems U.S.A., Ltd.: *See*—
Showers, David F., 4,690,433, Cl. 283-1.00B.
GN/PI de Luigi Granieri e Figli, S.n.c.: *See*—
Granieri, Luigi, 4,689,925, Cl. 52-94.000.
Gob, Werner; and Anders, Peter, to Fichtel & Sachs AG. Viscous fan coupling unit. 4,690,103, Cl. 123-41.120.
Goczalk, Robert W.: *See*—
Mollett, Larry R.; and Goczalk, Robert W., 4,691,173, Cl. 330-144.000.
Godo Steel, Ltd.: *See*—
Takai, Kiyoshi; and Kaseya, Akimori, 4,690,327, Cl. 239-226.000.
Goetz, Harold E. Paper roll holder with tension arm. 4,690,343, Cl. 242-55.300.
Goko, Hiroshi: *See*—
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.
Gold, Elijah H.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-133.000.
Gold, Jeffrey W., to Integrated Environmental Services. Cylinder rupture vessel. 4,690,180, Cl. 141-51.000.
Gold Star Co., Ltd.: *See*—
Park, Jong D., 4,690,439, Cl. 292-27.000.
Gold Start Co., Ltd.: *See*—
Lee, Hee J., 4,691,087, Cl. 219-10.55B.
Goldberg, Mel. Noise making mask. 4,690,653, Cl. 446-27.000.
Golden Valley Microwave Foods Inc.: *See*—
Watkins, James D.; and Andreas, David W., 4,691,374, Cl. 383-104.000.
Goldstein, Bernard: *See*—
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Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,691,010, Cl. 530-387.000.
Goldstein, Samuel M.: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.
Gomibuchi, Reizo: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.
Goodard, Errol D.: *See*—
Ananthapadmanabhan, Kavasery P.; and Goodard, Errol D., 4,690,892, Cl. 435-183.000.
Goodyear Tire & Rubber Company, The: *See*—
Bradisse, John L.; and Lindner, Daniel J., 4,690,189, Cl. 152-209.000R.
Goossens, Jan B.: *See*—
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Gordon, Roy G. Protective overcoat of titanium nitride films. 4,690,871, Cl. 428-432.000.
Gorno-Altaisky Gosudarstveany Pedagogichesky Institut: *See*—
Lebedev, Jury A., 4,690,460, Cl. 299-21.000.
Gossen Corporation: *See*—
Hoffmann, Daniel J., 4,690,862, Cl. 428-318.600.
Goth, George R., to International Business Machines Corporation. Self-aligned polysilicon base contact structure. 4,691,219, Cl. 357-34.000.
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Electrode plate for generating plasma. 4,691,137, Cl. 313-30.000.
Goudeaux, James L.; and Olivier, Eric J. Slurry sandblasting system. 4,689,923, Cl. 51-410.000.
Gourmel, Yves; and Pierrel, Michel, to Pont-a-Mousson S.A. Apparatus for the rotary supply of molten cast-iron to an installation for the vertical continuous casting of a pipe from spheroidal graphite cast-iron. 4,690,199, Cl. 164-421.000.
Goyak, George M.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.
Grace, Oscar M.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.
Grade, Marsha M.: *See*—
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Gradoboev, Vladimir T.; Sitnikov, Alexandr E.; Klimenov, Alexandr M.; and Melnikov, Leonid I. Charging-and-conveying means. 4,690,267, Cl. 198-396.000.
Granell, Jose O. O.: *See*—
Arechaga, Sebastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.
Graner, Joseph R., to Heyl & Patterson, Inc. Car dumping apparatus. 4,690,603, Cl. 414-372.000.
Granier, Georges; and Valliere, Yves, to Societe Nationale des Poudres et Explosifs. Ultrarapid gas generator with increased safety. 4,690,063, Cl. 102-530.000.
Granieri, Luigi, to GN/PI de Luigi Granieri e Figli, S.n.c. In a building a cornice between a wall and a ceiling both made of modular panels. 4,689,925, Cl. 52-94.000.
Grant, Alan H. Barbed lid closure. 4,690,291, Cl. 215-32.000.
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., to Industrial Holographics, Inc. Optical method and apparatus for strain analysis. 4,690,552, Cl. 356-35.500.
Grass, Alfred. Panel adjustment device for the front panel of drawers or the like. 4,690,469, Cl. 312-330.00R.
Gray, Kevin: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.
Greatrake, Scott E.: *See*—
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Green Ball Bearing Company, The: *See*—
Green, Bernard, 4,690,574, Cl. 384-569.000.
Green, Bernard, to Green Ball Bearing Company, The. Bearing and method for rotatably supporting a worn shaft. 4,690,574, Cl. 384-569.000.
Green, William J.; and Semmerling, Ralph P., to USG Industries, Inc. Walkway for a sloping rooftop. 4,689,927, Cl. 52-180.000.
Greenberger, Susan; and Horwich, Kate B., to Homebodies, Inc. Convertible garment. 4,689,831, Cl. 2-93.000.
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, to International Standard Electric Company. Switch device. 4,691,117, Cl. 307-119.000.
Greenzang, Fred: *See*—
Castaldi, John; and Greenzang, Fred, 4,690,602, Cl. 414-282.000.
Gregan, David J.; and Crowter, Ronald H., to National Dairy Association of N.Z., The. Pulsation arrangement. 4,690,099, Cl. 119-14.410.
Gregorich, Edward E.; and Maher, Timothy R., to Stemco, Inc. Flattened venturi, method and apparatus for making. 4,690,245, Cl. 181-272.000.
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., to Mobil Solar Energy Corporation. Antireflection coatings for silicon solar cells. 4,691,077, Cl. 136-256.000.
Grieser, Fritz: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.
Griffen, Neil C., to Reliance Electric Company. Creep-compensated weighing apparatus. 4,691,290, Cl. 364-567.000.
Grise, Frederick G. J., to Flexwatt Corporation. System for transversely aligning a substrate. 4,690,347, Cl. 242-57.100.
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, to L'Oreal. Dyeing composition for keratinous fibres containing at least one co-solubilized N-substituted 2-nitro-para-phenylenediamine. 4,690,685, Cl. 8-405.000.
Gros, Pierre: *See*—
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., to Raytheon Company. Despinning mechanism. 4,690,350, Cl. 244-3.100.
Grosso, Vincent A.: *See*—
Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., 4,690,351, Cl. 244-3.160.
Grothaus, Roger H.; and Hildebrandt, Donald W., to S. C. Johnson & Son, Inc. Trap for houseflies. 4,689,915, Cl. 43-112.000.
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Yale, Ramon L., 4,690,832, Cl. 427-65.000.
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George, Flint R.; and Smith, Martin R., 4,690,227, Cl. 175-4.560.
Schultz, Ward E.; and Smith, Harry D., Jr., 4,691,102, Cl. 250-256.000.
Sumner, Cyril R., 4,690,218, Cl. 166-297.000.
Halstead, Christopher, to Myson Heating Limited. Terminal unit for a balanced flue. 4,690,129, Cl. 126-85.00B.
Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, to Logging Development Corporation. Rim driven rotary cutter and tree felling head incorporating the same. 4,690,185, Cl. 144-34.00R.
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., to Monarch Marking Systems, Inc. Hand-held tag attacher. 4,690,317, Cl. 227-67.000.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,690,723, Cl. 156-541.000.
Hammer, Donald R.: *See*—
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Haney, Ronald E.: *See*—
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Giammara, Beverly L.; and Hanker, Jacob S., 4,690,901, Cl. 436-86.000.
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Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, to Janome Sewing Machine Co. Ltd. Automatic upper thread tension control for a sewing machine. 4,690,083, Cl. 112-254.000.
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Haragashira, Motoji, to Kabushiki Kaisha Toshiba. Nuclear magnetic resonance transmitter and receiver system. 4,691,164, Cl. 324-322.000.
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Hardin, Roy T., Jr.; and Marshall, James R., to Westinghouse Electric Corp. Emergency transfer tube closure and process for sealing transfer tube under emergency conditions. 4,690,795, Cl. 376-264.000.
Harding, Audrey E. Antiseptic glove. 4,689,935, Cl. 53-431.000.
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Kihm, Joe A., 4,690,168, Cl. 137-554.000.
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Cox, Eugene R., 4,691,222, Cl. 357-50.000.
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Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Harris, Patrick C.; and Wilcox, John A., to Beecham Group p.L.c. Process for producing 3-thienylmalonic acid. 4,691,029, Cl. 549-79.000.
Harrison, Reginald, to Dunlop Limited. Pneumatic vehicle suspension with failsafe internal stop. 4,690,388, Cl. 267-35.000.
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Hart, James E., to American Standard Inc. Freight brake control valve having an emergency piston slide valve arranged to provide an accelerated brake application function. 4,690,463, Cl. 303-37.000.
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., to Sunds Defibrator Aktiebolag. Method of making sulphate pulp. 4,690,731, Cl. 162-45.000.
Hartley, Richard A. Security striker plate. 4,690,445, Cl. 292-341.000.
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Suchowski, Bernard, 4,689,860, Cl. 24-239.000.
Harvey, Dennis N.; and Bertolasi, Robert B., to MTS Systems Corporation. Optical displacement transducer usable as an extensometer. 4,690,001, Cl. 73-800.000.
Hasegawa, Hisayasu: *See*—
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Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, to Clarion Co., Ltd. Channel changing mechanism in a tape player. 4,691,261, Cl. 360-137.000.
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Hashimoto, Mashataka: *See*—
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Hashimoto, Takafumi; Kamesaka, Yoshihide; and Ashikaga, Tadashi, to Kabushiki Kaisha Meidensha. Method of operating a secondary battery to recondition the battery. 4,691,158, Cl. 320-14.000.
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Hashizume, Takuji: *See*—
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.
Haskell, Richard E.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
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Hata, Stephen S.: *See*—
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., 4,690,681, Cl. 604-396.000.
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd.; and Morishita Jintan Co., Ltd. Type soft capsule. 4,690,816, Cl. 424-456.000.
Hatanaka, Takefumi. Waste material shredder. 4,690,340, Cl. 241-236.000.
Hatch, Bruce O.; and Spaulding, Richard A., to Thermal Dynamics Corporation. Plasma-arc torch with sliding gas valve interlock. 4,691,094, Cl. 219-121.0PR.
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Hattori, Hideki: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-639.000.
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Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

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Haukaas, Duane C. Rod weeder attachment for an agricultural implement. 4,690,223, Cl. 172-44.000.
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., to Kimberly-Clark Corporation. Disposable leakproof catamenial device. 4,690,681, Cl. 604-396.000.
Hauser, Thomas A., to Caldwell Co., Inc., The. Hook with safety latch. 4,689,859, Cl. 24-233.000.
Havemann, Kim: *See*—
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Hawkins, David M.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Optical semiconductor apparatus. 4,691,214, Cl. 357-17.000.
Hayami, Hiroyuki; and Utsumi, Atsuhi, to Dainichi-Nippon Cables, Ltd. Optical multiple fiber. 4,690,500, Cl. 350-96.250.
Hayashi, Eiji: *See*—
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Veazey, Richard L.; and Hayes, Kathryn S., 4,690,983, Cl. 525-331.900.
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Hedrick, Steven E.; and Gates, Alan H. Reusable grease filter. 4,690,701, Cl. 55-436.000.
Heefner, Donald L.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.
Heffern, Edward W.: *See*—
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Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.
Hegemann, Gunther; and Miedeck, Karin, to BASF Farben & Fasern AG. Unsaturated homo- and/or copolymerizable polyesters. 4,691,002, Cl. 528-289.000.
Hehl, Karl. Pipe coupling. 4,690,436, Cl. 285-321.000.
Heidelberger Druckmaschinen AG: *See*—
Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.
Heideman, Robert J., to Enertrols, Inc. Compact shock absorber. 4,690,255, Cl. 188-287.000.
Heil Co., The: *See*—
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Heiman, Naftali. Apparatus for hollow concrete wall construction. 4,690,368, Cl. 249-37.000.
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Dunisch, Ingo, 4,690,652, Cl. 445-28.000.
Geus, Georg, 4,691,272, Cl. 363-98.000.
Heimerl, Wilfried; and Ewest, Eckhart, to Deutsche Gesellschaft fur Wideraufarbeitung von Kernbrennstoffen mbH. Method of filling a metal vessel with a glass melt containing highly radioactive fission products. 4,690,781, Cl. 252-633.000.
Hein, Theo, to Mannesmann Rexroth GmbH. Drive system comprising an adjustable hydrostatic machine. 4,689,956, Cl. 60-449.000.
Heine, Heinrich: *See*—
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Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, to Siemens Aktiengesellschaft. Method and apparatus for determining the value of analog voltages occurring on telephone subscriber lines of a digital telephone exchange. 4,691,337, Cl. 379-24.000.
Helenius, Kari H.: *See*—
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Heigeland, Olav, to Tangberg Data A/S. Adjustable stand for a visual display unit. 4,690,362, Cl. 248-404.000.
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Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.
Henkin, Melvyn L.; and Laby, Jordan M. Tap water powered hydrotherapy method and apparatus. 4,689,839, Cl. 4-542.000.
Henning, John C., to Product Investment Incorporated. Safety closure. 4,690,292, Cl. 215-201.000.
Henning, Rainer; and Urbach, Hansjorg, to Hoechst Aktiengesellschaft. Process for the preparation of monocyclic, bicyclic and tricyclic aminoacids. 4,691,022, Cl. 548-408.000.
Henrion, Romain: *See*—
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Herb, Armin, to Hilti Aktiegesellschaft. Expansion dowel. 4,690,598, Cl. 411-40.000.
Herb, Rudolf, to Albert-Frankenthal AG. Delivery device. 4,690,396, Cl. 271-311.000.
Herberg, Helmut, to Siemens Aktiengesellschaft. Monolithically integrated bipolar Darlington circuit. 4,691,221, Cl. 357-46.000.
Hering, Reinhard F. Weather-resistant lignocelluloae or other organic or inorganic material boards and process for their production. 4,690,848, Cl. 428-74.000.
Hermansson, Mats: *See*—
Persbeck, Sven-Erik, 4,690,091, Cl. 114-221.00A.
Herngren, Torbjorn; and Lofthus, Jon, to Svenska Traforskningsinstitutet. Method of measuring dry substance in flue gases. 4,690,634, Cl. 431-8.000.
Herren, Blair: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Hershberger, Doran D., to General Electric Company. Laundry machine drive. 4,689,973, Cl. 68-23.700.
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Hess, Stanley R., to Cordis Corporation. Surface mapping electrode sets. 4,690,148, Cl. 128-639.000.
Hess, Stanley R., to Cordis Corporation. Monophasic action potential recording lead. 4,690,155, Cl. 128-786.000.
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, to Hoechst Aktiengesellschaft. Synthetic resin binders and their use for the manufacture of abrasives. 4,690,692, Cl. 51-293.000.
Hetherington, Robert D.: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.
Hetterich, Hermann: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.
Heule, Heinrich. De-burring tool for the de-burring of the edges of holes in curved or oblique surfaces of a work piece. 4,690,595, Cl. 409-143.000.
Hewitt, Lori R.: *See*—
Magee, Charles W.; and Hewitt, Lori R., 4,691,109, Cl. 250-426.000.
Hewlett-Packard Company: *See*—
Leonard, Mark G., 4,691,101, Cl. 250-231.0SE.
Heyden, Eugene L. Marking system for tube placement. 4,690,138, Cl. 128-207.150.
Heyl & Patterson, Inc.: *See*—
Graner, Joseph R., 4,690,603, Cl. 414-372.000.
Heyman, Duane A.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, to Daiichi Pure Chemicals Co., Ltd. Capillary tube immunoassay. 4,690,907, Cl. 436-514.000.
Hickok, William K., to Eastman Kodak Company. Method and apparatus for combining two color video signals. 4,691,245, Cl. 358-310.000.
Hideshima, Yasuhiro: *See*—
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.
Hiebl, Berthold: *See*—
Angermann, Gottfried; and Hiebl, Berthold, 4,689,838, Cl. 2-441.000.
Higashimoto Kikai Co., Ltd.: *See*—
Higashimoto, Tsuyoshi, 4,690,336, Cl. 241-30.000.
Higashimoto, Tsuyoshi, to Higashimoto Kikai Co., Ltd. Apparatus and method for driving raw sausage meat processing cutter. 4,690,336, Cl. 241-30.000.
Higashiyama, Kazuhiro, to Nissan Motor Company Limited. Spark control system for an engine. 4,690,124, Cl. 123-643.000.
Higgins, Maureen L., to Procter & Gamble Company, The. Adhesive attachment means for absorbent articles. 4,690,680, Cl. 604-386.000.
Hildebrandt, Donald W.: *See*—
Grothaus, Roger H.; and Hildebrandt, Donald W., 4,689,915, Cl. 43-112.000.
Hill, James D., Jr.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Hilti Aktiegesellschaft: *See*—
Herb, Armin, 4,690,598, Cl. 411-40.000.

Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, to Quantime, Inc. Musical entertainment board game. 4,690,025, Cl. 84-1.180.

Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,690,378, Cl. 254-8.00B.

Hinz, Relf. Oral vestibule plate for prophylactic purposes and early orthodontic treatment. 4,690,640, Cl. 433-6.000.

Hiramoto, Kazuo, to Hitachi, Ltd. Radar apparatus. 4,691,204, Cl. 342-22.000.

Hirano, Yasuo: *See*—
Nishiyama, Masao; and Hirano, Yasuo, 4,691,004, Cl. 528-323.000.

Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., to International Business Machines Corporation. Process for enhancing the resistance of a resist image to reactive ion etching and to thermal flow. 4,690,838, Cl. 427-343.000.

Hirashima, Isao: *See*—
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, 4,690,432, Cl. 280-775.000.

Hirata, Miyoshi: *See*—
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.

Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, to Bridgestone Corporation. Rubber compositions having improved reinforcing properties and low heat build-up. 4,690,965, Cl. 524-236.000.

Hirose, Takao; and Kumekawa, Norio, to Daiichi Denshi Kogyo Kabushiki Kaisha. Ferrule holding device for optical fiber connector. 4,690,494, Cl. 350-96.200.

Hirth, Michael, to BBC Brown, Boveri & Company, Limited. Ozone generator. 4,690,803, Cl. 422-186.180.

Hisatake, Michio: *See*—
Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, 4,690,082, Cl. 112-254.000.

Hise, Mason R.; and Hise, Neil R. Impact crusher rotating impeller table. 4,690,341, Cl. 241-275.000.

Hise, Neil R.: *See*—
Hise, Mason R.; and Hise, Neil R., 4,690,341, Cl. 241-275.000.

Hitachi Cable, Ltd.: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Hitachi Chemical Co., Ltd.: *See*—
Nakada, Takao, 4,690,911, Cl. 501-105.000.
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.

Hitachi Engineering and Service Co., Ltd.: *See*—
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.

Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio. Nuclear fusion reactor. 4,690,793, Cl. 376-136.000.

Hitachi, Ltd.: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, Jusuc; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.
Hiramoto, Kazuo, 4,691,204, Cl. 342-22.000.
Hori, Ryoichi; and Itoh, Kiyoo, 4,691,304, Cl. 365-226.000.
Houkita, Atsushi; and Hokari, Tomio, 4,689,959, Cl. 60-602.000.
Kita, Toshiaki; and Harada, Tatsuo, 4,690,506, Cl. 350-320.000.
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.
Murakami, Gen; and Gappa, Takeshi, 4,691,225, Cl. 357-80.000.
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.
Murayama, Akira; Kuso, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.
Onodera, Katsuhige, 4,690,794, Cl. 376-230.000.
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.
Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, 4,690,529, Cl. 353-122.000.
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.

Hitachi Maxell, Ltd.: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.

Hite, John D. Solder dispenser. 4,690,318, Cl. 228-57.000.

Hlbearov, Vladimir P.: *See*—
Garianov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangeiov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Hochberg, Charles. Birth control pill dispenser in the form of a hair brush. 4,690,279, Cl. 206-531.000.

Hochkonig, Manfred: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.

Hodges, Philip R. Masonry construction device. 4,689,931, Cl. 52-442.000.

Hodges, Robert J.: *See*—
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, 4,691,117, Cl. 307-119.000.

Hoeberechts, Arthur M. E., to U.S. Philips Corporation. Device for signal processing and target plate for such a device. 4,691,191, Cl. 340-347.00P.

Hoechst Aktiengesellschaft: *See*—
Gunther, Dieter, 4,691,056, Cl. 564-96.000.
Henning, Rainer; and Urbach, Hansjorg, 4,691,022, Cl. 548-408.000.
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, 4,690,692, Cl. 51-293.000.
Uhmann, Rainer; and Radscheit, Kurt, 4,691,008, Cl. 530-339.000.

Hoenigman, Thomas A.: *See*—
Vadakin, Thomas C.; and Hoenigman, Thomas A., 4,690,159, Cl. 134-167.00C.

Hoernle, Hans R.: *See*—
Porter, Rick A.; and Hoernle, Hans R., 4,690,859, Cl. 428-251.000.

Hofbauer, Peter; and Sandhagen, Jurgen, to Volkswagen Aktiengesellschaft. Device for continuous fuel injection. 4,690,118, Cl. 123-533.000.

Hoffman, David C.: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.

Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., to Dow Chemical Company, The. Polymer-modified vinylized epoxy resins. 4,690,988, Cl. 525-502.000.

Hoffmann, Daniel J., to Gossen Corporation. Integral composite profile of cellular and non-cellular resins and a dual extrusion method for its manufacture. 4,690,862, Cl. 428-318.600.

Hoffmann-La Roche Inc.: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.
Furst, Aador; Labler, Ludwig; and Meier, Werner, 4,691,032, Cl. 349-450.000.

Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, to WABCO Westinghouse Fahrzeugbremsen GmbH. Apparatus for the acquisition of speed-of-rotation and/or angle of rotation signals on a drive shaft. 4,689,990, Cl. 73-118.100.

Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, to Schmalbach-Lubeca AG. Opening means for oblong cans. 4,690,297, Cl. 220-273.000.

Hogan, Lawrence R., to Cole-Parmer Instrument Company. Dispensing system with slidable modules. 4,690,307, Cl. 222-95.000.

Hogberg, Leif, to Jydsk Teknologisk Institut. Apparatus for individually depositing articles. 4,690,301, Cl. 221-2.000.

Hokari, Tomio: *See*—
Houkita, Atsushi; and Hokari, Tomio, 4,689,959, Cl. 60-602.000.

Holbrook, Gerald W.: *See*—
Killop, James T.; and Holbrook, Gerald W., 4,689,980, Cl. 72-88.000.

Holdridge, Warren B. Hydraulic nosepiece assembly for a collet closer, and method. 4,690,415, Cl. 279-4.000.

Hollaway, Gerald C., Jr.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.

Holloway, Thomas C.: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Holloway, Thomas F.: *See*—
Idec, Eric J.; and Holloway, Thomas F., 4,690,578, Cl. 401-78.000.

Hollyday, Robert D.; and Yeager, Patrick F., to AMP Incorporated. Filtered electrical header assembly. 4,690,479, Cl. 439-97.000.

Holm, Niels E., to Danagraf A/S. Method and apparatus for the control of a reproduction camera. 4,690,548, Cl. 355-77.000.

Holman, Stuart: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.

Holman, Tommy E. Rotating child's seat. 4,690,449, Cl. 296-65.00R.

Holmberg, Dick L. Erosion control foundation mat and method. 4,690,585, Cl. 405-19.000.

Homebodies, Inc.: *See*—
Greenberger, Susan; and Horwich, Kate B., 4,689,831, Cl. 2-93.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Funabashi, Katsunori; Nakashima, Tei; Yamada, Toshiyuki; and Morishima, Kazuo, 4,690,237, Cl. 180-219.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-339.000.
Kimura, Shigehiro; Ono, Takashi; and Narisawa, Nobuyuki, 4,690,123, Cl. 123-612.000.
Kubo, Kanji, 4,690,425, Cl. 280-668.000.
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.
Matsuda, Shohei; and Iwakawa, Yoshihiro, 4,690,464, Cl. 303-115.000.
Miyakoshi, Shinichi, 4,690,235, Cl. 180-210.000.
Niwa, Toshiaki, 4,690,452, Cl. 296-216.000.
Niwa, Toshiaki, 4,690,453, Cl. 296-216.000.

Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.
Shinozaki, Takashi; and Ishikawa, Satoshi, 4,690,236, Cl. 180-219.000.

Honda, Haruyoshi: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.

Honeycutt, Fred L., Jr.: *See*—
Robinson, Ronald L.; and Honeycutt, Fred L., Jr., 4,690,330, Cl. 239-265.390.

Honeywell Inc.: *See*—
Huffnagle, Norman P., 4,691,105, Cl. 250-338.000.
Kasprzyk, Donald J., 4,690,324, Cl. 237-8.00R.

Honjo, Masahiro; and Hashima, Akio, to Matsushita Electric Industrial Co., Ltd. Video signal recording/reproducing apparatus. 4,691,247, Cl. 358-319.000.

Hoon, Kenneth V.: *See*—
Taylor, John D.; and Hoon, Kenneth V., 4,690,935, Cl. 514-356.000.

Hoof Products Co.: *See*—
Conlogue, James H.; and Banker, Henry, 4,690,115, Cl. 123-366.000.

Hook, Christopher D.: *See*—
Denne, Phillip R. M.; and Hook, Christopher D., 4,691,202, Cl. 340-825.540.

Horenkamp, Franz, to Ferdinand Lusch GmbH & Co. KG. Height-adjustable fitting for furniture. 4,690,358, Cl. 248-297.300.

Hori, Keiichi: *See*—
Akatsu, Makoto; and Hori, Keiichi, 4,690,618, Cl. 417-226.000.

Hori, Ryoichi; and Itoh, Kiyoo, to Hitachi, Ltd. Semiconductor device having an arrangement for preventing operational errors. 4,691,304, Cl. 365-226.000.

Horikawa, Yoichi, to Yoshida Kogyo K. K. Injection molding machine for small-sized articles. 4,690,629, Cl. 425-156.000.

Horling, Peter: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

Hornagold, John T.; and Pezewski, Paul, to Simen Aerials, Inc. Articulated work platform with scissors motion. 4,690,246, Cl. 182-2.000.

Horne, David; and Parker, Laurence, to BICC Public Limited Company. Enclosure for housing circuit boards. 4,690,286, Cl. 211-41.000.

Hornung, Ernst; and Rex, Dietrich, to ERNO Raumfahrttechnik Gmbh. Solar energy collector. 4,690,355, Cl. 244-173.000.

Horwich, Kate B.: *See*—
Greenberger, Susan; and Horwich, Kate B., 4,689,831, Cl. 2-93.000.

Hosaka, Shuroku; and Shiga, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Tunnel erase magnetic head assembly. 4,691,260, Cl. 360-121.000.

Hoshal, Dale E., to Luma Guard, Inc. Reflectorized splash guard. 4,690,419, Cl. 280-154.50R.

Hoshino, Shigeo: *See*—
Laitinen, Herbert A.; and Hoshino, Shigeo, 4,690,735, Cl. 204-37.100.

Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride polymer composition. 4,690,977, Cl. 525-83.000.

Hou, Ching-Tsang; and Barnabe, Nancy P., to Exxon Research and Engineering Company. Method and the microorganism and enzyme used therein for degrading the xanthan molecule. 4,690,891, Cl. 435-42.000.

Houkita, Atsushi; and Hokari, Tomio, to Hitachi, Ltd. Variable-capacity turbocharger. 4,689,959, Cl. 60-602.000.

House Food Industrial Co., Ltd.: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.

Howard, William J. Magazine charger. 4,689,909, Cl. 42-87.000.

Howe, James A.: *See*—
Splett, Katherine A.; and Howe, James A., 4,691,126, Cl. 307-441.000

Howeth, D. Franklin. Pressure dependent dust control filter compressed air reversed flushing control system. 4,690,166, Cl. 137-119.000.

Howeth, D. Franklin. Backflushed air filters with quick opening multiple discharge valve. 4,690,700, Cl. 55-302.000.

Hoyle, Edgar. Clutch control cable with auto-adjuster. 4,690,262, Cl. 192-111.00A.

Hrutfiord, Bjorn F.: *See*—
Fung, Bill S. K.; and Hrutfiord, Bjorn F., 4,691,061, Cl. 568.451.000

Hsiung, Chia Y.; and Ross, Daniel P., to General Electric Company. Adaptive carrier tracking circuit. 4,691,176, Cl. 331-2.000.

Hubbard, Lloyd C.; and Clausen, Earl W., to Minnesota Mining and Manufacturing Company. Doppler system for measurement of blood flow during cardiopulmonary bypass and ventricular assist. 4,690,002, Cl. 73-861.250.

Huber, Robert: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.05C

Huber, Thomas, to Electro-Pneumatic-International GmbH. Ball unit. 4,689,847, Cl. 16-26.000.

Hubner Gummi-und Kunststoff GmbH: *See*—
Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, 4,690,421, Cl. 280-403.000.

Hufenus, Jean. Variable balance racket. 4,690,406, Cl. 273-73.00J.

Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., to Merck & Co., Inc. Substituted hexahydro arylquinolizines as α_2 blockers. 4,690,928, Cl. 514-285.000.

Huffman, Joseph L., to Dresser Industries, Inc. Adjuster for thrust washer wear. 4,690,573, Cl. 384-251.000.

Huffnagle, Norman P., to Honeywell Inc. Thermal energy proximity detector. 4,691,105, Cl. 250-338.000.

Hughes Aircraft Company: *See*—
Ahrens, Allan F.; and Martinelli, Robert M., 4,691,159, Cl. 323-211.000.
Ellerbroek, Brent L., 4,690,555, Cl. 356-121.000.
Gee, Caroline M.; and Thurmond, Gary D., 4,690,488, Cl. 350-96.120.
Ledebuhr, Arno G., 4,690,526, Cl. 353-31.000.
Mollett, Larry R.; and Goczalk, Robert W., 4,691,173, Cl. 330-144.000.
Wong, Mon N.; and Peebles, Ann L., 4,691,177, Cl. 333-113.000.

Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., to Aeroquip Corporation. Beadlock wrench float fitting. 4,689,868, Cl. 29-523.000.

Hughes, Gary: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.

Hughes, Nathaniel. Single inlet prepackaged inhaler. 4,690,332, Cl. 239-338.000.

Hugues, Francois; Commereuc, Dominique; and Chauvin, Yves, to Institut Francais du Petrole. Process for reducing carbonylation of aldehydes, uses as hemiacetalesters, catalyzed by cobalt carbonyl complexes. 4,691,048, Cl. 560-240.000.

Huhndorff, Harry R.; and Myers, John P., to Eveready Battery Company. Cell circuit interrupter. 4,690,879, Cl. 429-61.000.

Huizer, Cornelis M., to U.S. Philips Corporation. Adaptive electronic buffer system having consistent operating characteristics. 4,691,127, Cl. 307-475.000.

Hull, A. Katherine, to Gach, Paul. Foil for stained glass assembly. 4,690,852, Cl. 428-156.000.

Huls Aktiengesellschaft: *See*—
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, 4,690,978, Cl. 525-152.000.

Humes, Dennis W.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.

Humpleman, Richard J., to International Computers Limited. Clock-/data synchronization interface apparatus and method. 4,691,294, Cl. 364.000.000.

Hunt, Barbara A., executrix: *See*—
Hunt, Charles d'A., deceased, 4,690,875, Cl. 428-577.000.

Hunt, Charles d'A., deceased (by Hunt, Barbara A., executrix), to Degussa Electronics Inc., Materials Division. High vacuum cast ingots. 4,690,875, Cl. 428-577.000.

Huron Manufacturing Corporation: *See*—
Rink, Richard H., 4,690,461, Cl. 299-39.000.

Huruta, Tadashi: *See*—
Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, 4,690,151, Cl. 128-682.000.

Huschelrath, Gerhard, to Nukem GmbH. Method and device for testing electrically conducting objects by means of ultra-sonics. 4,689,996, Cl. 73-643.000.

Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.

Hycner, Stanley H.: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.

Hydeman, Jeffrey E.: *See*—
Savinell, Alan; and Hydeman, Jeffrey E., 4,689,994, Cl. 73-634.000.

Hyder, Lonnie E.: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.

Hydro-Quebec: *See*—
Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.

Hydrotile Machinery Company: *See*—
Haddy, Michael L., 4,690,631, Cl. 425-262.000.

Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., to Daewoo Heavy Industries Ltd. Apparatus for determining reflectivity of an object such as a mirror. 4,691,106, Cl. 250-349.000.

Iba, Kunio: *See*—
Fukamiza, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.

Ibrahim, Ibrahim N.; and Sansome, Dennis H., to National Research Development Corporation. Draw-bending method. 4,689,981, Cl. 72-150.000.

Ichikawa, Toshihito, to Pioneer Electronic Corporation. AM/FM synchronizing circuit. 4,691,356, Cl. 381-4.000.

Ichimura, Hiroshi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.

Ichioka, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,690,243, Cl. 187-101.000.

ICI Americas Inc.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Nelson, Richard V.; and Stephen, John F., 4,690,963, Cl. 524-98.000.

Ida, Shuichiro: *See*—
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.
Ide, Akifumi: *See*—
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.
Ideal Industries, Inc.: *See*—
Blaha, William E., 4,691,079, Cl. 174-87.000.
Idec, Eric J.; and Holloway, Thomas F., to Risdon Corporation. Cosmetic container construction. 4,690,578, Cl. 401-78.000.
Ido, Nobuyuki. Apparatus for fine tuning strings of a stringed musical instrument. 4,690,027, Cl. 84-298.000.
Igari, Kozaburo: *See*—
Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, 4,690,257, Cl. 192-3.310.
Ihlenburg, Frederick. Reduced torsion resistance athletic shoe sole. 4,689,901, Cl. 36-126.000.
Iida, Katsumi, to Diesel Kiki Kabushiki Kaisha. Automotive air-conditioning system adapted to obviate the influence of insolation during blower start-up. 4,690,203, Cl. 165-25.000.
Iida, Yasuo: *See*—
Tanigaki, Katsumi; and Iida, Yasuo, 4,690,882, Cl. 430-192.000.
Iijima, Nobuo: *See*—
Nagashima, Masayasu; and Iijima, Nobuo, 4,690,591, Cl. 400-81.000.
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, to Diesel Kiki Co., Ltd. Compressor having pulsating reducing mechanism. 4,690,619, Cl. 417-269.000.
Iizuka, Toshimi; and Kamata, Shigeru, to Canon Kabushiki Kaisha. Lens mounting. 4,690,505, Cl. 350-252.000.
Iizuka, Toshimi: *See*—
Kamata, Shigeru; and Iizuka, Toshimi, 4,690,514, Cl. 350-429.000.
Iizuka, Yoshio: *See*—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.
Ikariya, Takao: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.
Ikeda, Ituso: *See*—
Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.
Ikeda, Mitsuo: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Ikeda, Shigeko: *See*—
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.
Ikegawa, Akihiko: *See*—
Yagihara, Morio; and Ikegawa, Akihiko, 4,690,885, Cl. 430-212.000.
Iketani, Akira: *See*—
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.
Illerhaus, Roland: *See*—
Voelz, Dieter; and Illerhaus, Roland, 4,690,228, Cl. 175-24.000.
Ilsemann, Bernhard: *See*—
von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, 4,690,238, Cl. 180-248.000.
Imada, Kunihiko: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.
Imaiida, Tetsuo: *See*—
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.
Imaizumi, Junichi: *See*—
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, to Sony Corporation. Magnetic transducer head utilizing magnetoresistance effect. 4,691,259, Cl. 360-113.000.
Imamura, Kazunori: *See*—
Tanimoto, Akikazu; and Imamura, Kazunori, 4,690,528, Cl. 353-101.000.
Imbert, Louis. Security enclosure having one or more compartments for housing and protecting a windsurfer against theft. 4,690,467, Cl. 312-198.000.
IMED Corporation: *See*—
Bloomquist, Ted C., 4,690,673, Cl. 604-67.000.
Imperial Chemical Industries plc: *See*—
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.
Doroszkowski, Andrew; and Skinner, Maurice W., 4,690,837, Cl. 427-314.000.
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Worthington, Paul A.; and Shephard, Margaret C., 4,690,941, Cl. 514-383.000.
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Ghini, Mario, 4,690,282, Cl. 206-626.000.
Ina, Toshikazu: *See*—
Obayashi, Hideki; Kawai, Hisai; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Inaba, Shigeru: *See*—
Katsutani, Kazuji; and Inaba, Shigeru, 4,691,181, Cl. 335-128.000.
Inaba, Yutaka; and Ando, Yujiro, to Canon Kabushiki Kaisha. Ion generating device and method of manufacturing same. 4,691,213, Cl. 346-159.000.
Inagaki, Hiromichi. Casings for ham and sausage. 4,690,843, Cl. 428-36.000.
Inagaki, Mitsuo: *See*—
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.
Inagami, Kaoru; and Kikuchi, Noboru, to Calpis Food Industry Co., Ltd., The. Water-dispersible hydrophilic milk protein product. 4,691,011, Cl. 530-832.000.
Incomm Direct Pty. Ltd.: *See*—
Berton, Andrew S., 4,690,410, Cl. 273-299.000.
Indak Manufacturing Corp.: *See*—
Habecker, John W.; and Black, Charles E., III, 4,691,086, Cl. 200-139.00R.
Industrial Holographics, Inc.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Ingersoll-Rand Company: *See*—
Decker, Robert W., 4,690,622, Cl. 417-342.000.
Innovative Research and Development Co.: *See*—
Palmer, Thomas M., 4,690,384, Cl. 256-47.000.
Innovus: *See*—
Bosley, Robert W.; Kirahman, Samson; LeMay, Dan B.; and Renken, Wayne G., 4,690,371, Cl. 251-65.000.
Ino, Yoichi, to Anelva Corporation. Apparatus comprising a double-collector electron multiplier for counting the number of charged particles. 4,691,160, Cl. 324-71.300.
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, to Ajinomoto Co., Inc. Tetra-substituted fulvalene derivatives. 4,691,028, Cl. 549-36.000.
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, to Kawasaki Steel Corporation. Substrate for print circuit board, a print circuit board, and method of manufacturing the same. 4,690,855, Cl. 428-209.000.
Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, to Central Glass Company, Limited. Process of preparing metachlorobenzotrifluoride. 4,691,066, Cl. 570-144.000.
Inoue, Hajime: *See*—
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.
Inoue, Kenichi: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
Inoue, Makoto: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Inoue, Manabu: *See*—
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, 4,690,530, Cl. 354-21.000.
Inoue, Masami: *See*—
Fujioka, Hirofumi; and Inoue, Masami, 4,690,957, Cl. 522-31.000.
Inoue Mtp Kabushiki Kaisha: *See*—
Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, 4,690,348, Cl. 242-66.000.
Inoue, Naohiko: *See*—
Ito, Ken; and Inoue, Naohiko, 4,690,431, Cl. 280-771.000.
Institut Francais du Petrole: *See*—
Hugues, Francois; Commereuc, Dominique; and Chauvin, Yves, 4,691,048, Cl. 560-240.000.
Wittrisch, Christian, 4,690,214, Cl. 166-250.000.
Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.
Institut Organicheskoi Khimii Ordena Lenina I Ordena Druzhby Narodov Akademii Nauk Ukrainskoi SSR: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Institute de Recherches de la Siderurgie Francaise: *See*—
Denier, Guy; and Henrion, Romain, 4,690,386, Cl. 266-44.000.
Institut Farmakologii Akademii Meditsinskikh Nauk SSSR: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Integrated Environmental Services: *See*—
Gold, Jeffrey W., 4,690,180, Cl. 141-51.000.
Intel Corporation: *See*—
Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.
International Business Machines Corp.: *See*—
Church, Mark A., 4,689,877, Cl. 29-603.000.
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.
Ell, Travis E.; and Stephenson, Jeff, 4,691,152, Cl. 318-616.000.
Goth, George R., 4,691,219, Cl. 357-34.000.
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.
Jambotkar, Chakrapani G.; and Renbeck, Robert B., 4,689,869, Cl. 437-44.000.
Kobayashi, Masashi; Takahashi, Keishi; and Yoneyama, Kimiya, 4,691,258, Cl. 360-97.000.
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., 4,691,277, Cl. 364-200.000.
Riley, Mack W., 4,691,170, Cl. 328-20.000.
International Computers Limited: *See*—
Humpleman, Richard J., 4,691,294, Cl. 364-900.000.
International Food Equipment Inc.: *See*—
Verkler, Charles E., 4,690,044, Cl. 99-419.000.
International Minerals & Chemical Corp.: *See*—
Lu, Jing-Jong, 4,690,948, Cl. 514-544.000.
International Standard Electric Company: *See*—
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, 4,691,117, Cl. 307-119.000.
Ipeco Europe Limited: *See*—
Ross, Christopher P., 4,690,606, Cl. 414-495.000.
Ishibashi, Akira: *See*—
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.
Ishibashi, Shozo: *See*—
Naoe, Masahiko; and Ishibashi, Shozo, 4,690,744, Cl. 204-192.110.
Ishibashi, Tokujiro, to Nippon Rubber Co. Ltd. Antistatic shoe. 4,689,900, Cl. 36-103.000.
Ishida, Keiichi: *See*—
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.
Ishida, Tsuyoshi: *See*—
Kizu, Shuji; Ishida, Tsuyoshi; and Nagase, Yasuo, 4,691,100, Cl. 250-223.00R.
Ishidoshiro, Hiroshi: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.
Ishii, Shinichi: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.
Ishii, Youichi: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.
Ishikawa, Hidenobu: *See*—
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.
Ishikawa, Satoshi: *See*—
Shinozaki, Takashi; and Ishikawa, Satoshi, 4,690,236, Cl. 180-219.000.
Ishikuro, Hiroshi: *See*—
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.
Ishiwari, Kazuo: *See*—
Ohmori, Akira; and Ishiwari, Kazuo, 4,690,869, Cl. 428-421.000.
Iskra-Sozd elektrokovinske industrije n.sol.o: *See*—
Kavcic, Janez, 4,691,194, Cl. 340-405.000.
Isliker, Gaston R.: *See*—
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.
Isobe, Toshiaki; and Oba, Hidehiro, to Toyota Jidosha Kabushiki Kaisha. Fuel injection control device for internal combustion engine. 4,690,117, Cl. 123-492.000.
Isomae, Kazuo: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.
Israel Aircraft Industries Ltd.: *See*—
Bar-Nefy, Simcha; and Tiomkin, Michael, 4,690,030, Cl. 89-1.130.
Isshiki, Isao: *See*—
Takahashi, Shinichiro; and Isshiki, Isao, 4,691,330, Cl. 377-39.000.
Isuzu Motors Ltd.: *See*—
Shimizu, Yoshiro, 4,689,916, Cl. 49-374.000.
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, to Ube Industries, Inc. Metal polyamide adhesive laminates. 4,690,856, Cl. 428-215.000.
Ito, Hiraku: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Ito, Ken; and Inoue, Naohiko, to Nissan Motor Co., Ltd. System for controlling cornering characteristics of wheeled vehicle. 4,690,431, Cl. 280-771.000.
Ito, Masayoshi: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.
Ito, Toshinobu: *See*—
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-197.000.
Ito, Yo: *See*—
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.
Ito, Yuji, to Canon Kabushiki Kaisha. Particle analyzing apparatus. 4,690,561, Cl. 356-339.000.
Itoh, Kiyoo: *See*—
Hori, Ryoichi; and Itoh, Kiyoo, 4,691,304, Cl. 365-226.000.
Itoh, Shinichi: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.
Itoh, Takaaki: *See*—
Uranishi, Kouji; and Itoh, Takaaki, 4,690,293, Cl. 220-86.00R.
ITT Electro Optical Products: *See*—
Johnson, C. B., 4,691,099, Cl. 250-213.0VT.
ITT Gilfillan, a division of ITT Corporation: *See*—
Foglesonger, John D.; and Vranson, David M., 4,689,876, Cl. 29-600.000.
Vlasak, Weldon R. H., 4,691,312, Cl. 370-4.000.
Ivarsson, Nemo: *See*—
Appelgren, Curt H.; and Ivarsson, Nemo, 4,690,834, Cl. 427-119.000.
Iwakawa, Yoshihiro: *See*—
Matsuda, Shohei; and Iwakawa, Yoshihiro, 4,690,464, Cl. 303-115.000.
Iwamoto, Yasushi: *See*—
Beppu, Teruhiko; Iwamoto, Yasushi; and Yoshida, Minoru, 4,690,918, Cl. 514-23.000.
Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, to Mitsubishi Sangyo Co. Ltd. Method for manufacturing thick asphalt sheet. 4,690,839, Cl. 427-366.000.
Iwata Electric Co., Ltd.: *See*—
Iwata, Keisuke, 4,691,313, Cl. 370-30.000.
Iwata, Hitoshi: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.
Iwata, Jun, to NEC Corporation. Data processor executing microprograms according to a plurality of system architectures. 4,691,278, Cl. 364-200.000.
Iwata, Keisuke, to Iwata Electric Co., Ltd. Wireless talking apparatus. 4,691,313, Cl. 370-30.000.
Iwata, Michiyoshi: *See*—
Matsumoto, Kazuyuki; Hashimoto, Mashataka; and Iwata, Michiyoshi, 4,690,010, Cl. 74-469.000.
Iwatsuki, Kunihiro: *See*—
Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, 4,690,017, Cl. 74-866.000.
Izawa, Hideo: *See*—
Kishine, Toshiaki; Izawa, Hideo; and Ohba, Masaru, 4,690,051, Cl. 101-211.000.
Izumi, Shuji: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Control system for three way variable shock absorber device for suspension with highest shock absorber effectiveness not selected in manual mode. 4,691,284, Cl. 364-424.000.
Jackson, Gerald W.; and Rohweder, David S. Wheeled vehicle test fixture connector. 4,689,998, Cl. 73-669.000.
Jackson, Roy K.: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.
Jacob, Keith D., to C-D Marketing, Ltd. Liquid crystal closed-loop controlled mirror systems. 4,690,508, Cl. 350-331.00R.
Jacob, Neil R.: *See*—
Beckley, Keith A.; Jacob, Neil R.; and Trussler, Geoffrey A., 4,689,991, Cl. 73-304.00C.
Jacobs, Jochen: *See*—
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, to Huls Aktiengesellschaft. Thermoplastic compositions based on polyphenylene ethers and styrene-butadiene polymers produced by emulsion polymerization. 4,690,978, Cl. 525-152.000.
Jadamus, Hans: *See*—
Feinauer, Roland; and Jadamus, Hans, 4,690,970, Cl. 524-504.000.
Jaehme, Joachim: *See*—
Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, 4,691,020, Cl. 546-341.000.
Jahnel, Ernst: *See*—
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.130.
Jambotkar, Chakrapani G.; and Renbeck, Robert B., to International Business Machines Corporation. Fabrication of insulated gate gallium arsenide FET with self-aligned source/drain and submicron channel length. 4,689,869, Cl. 437-44.000.
Janke, Donald E.; and Linstromberg, William J., to Whirlpool Corporation. Adaptive defrost control for a refrigerator. 4,689,965, Cl. 62-155.000.
Janome Sewing Machine Co Ltd.: *See*—
Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, 4,690,082, Cl. 112-254.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, 4,690,083, Cl. 112-254.000.

Janssen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., to U.S. Philips Corporation. Disc reading apparatus with disc shoot journaled in frame. 4,691,311, Cl. 369-100.000.

Janson, David A.: *See*—
Bopp, Warren G.; and Janson, David A., 4,690,256, Cl. 192-21.000.

Janssen, Petrus J.; and Janssens, Peter C., to U.S. Philips Corp. Glass optical fiber having a primary and a secondary coating. 4,690,503, Cl. 350-96.300.

Janssens, Peter C.: *See*—
Janssen, Petrus J.; and Janssens, Peter C., 4,690,503, Cl. 350-96.300.

Jantzen, Steven L.: *See*—
Billingsley, Robert H.; and Jantzen, Steven L., 4,690,071, Cl. 105-404.000.

Januzz, Edward G., to Sun Chemical Corporation. Polyamide-modified metal resinates and their use in publication gravure printing inks. 4,690,712, Cl. 106-30.000.

Jarman, Davis R.; and Hinson, Virgil H., to Automotive Collision Tools, Inc. Vehicle jack. 4,690,378, Cl. 254-8.00B.

Jarvenkyla , Jyri, to Uponor N.V. Plastic pipe. 4,690,174, Cl. 138-121.000.

Jarvimaki, Kari: *See*—
Tervamaki, Jukka; and Jarvimaki, Kari, 4,690,005, Cl. 73-864.120.

JD-Technologie AG: *See*—
Brandli, Max; and Feldmann, Hansueli, 4,690,422, Cl. 280-460.00R.

Jeindl, Ferdinand, to Steirische Kettenfabriken Pengg-Walenta KG. Securing device for a vehicle tire chain. 4,690,190, Cl. 152-213.00A.

Jelbring, Hans. Arrangement for ensuring that ice will form substantially uniformly on a tubular heat exchanger placed in water. 4,690,205, Cl. 165-45.000.

Jen, Tai-Kuang, to NCR Corporation. Motor speed controller. 4,691,150, Cl. 318-331.000.

Jencks, David R.; and Nelson, Mark R., to Orley's Manufacturing Co., Inc. Catalytic combustion assembly for wood-burning stove. 4,690,126, Cl. 126-77.000.

Jenkins, Leonard S., to Westinghouse Electric Corp. Nuclear reactor coolant pump impeller/shaft assembly. 4,690,612, Cl. 415-112.000.

Jenkinson, Ronald J., to Exxon Research and Engineering Company. Apparatus for controlling the temperature in catalyst regeneration. 4,690,802, Cl. 422-141.000.

Jenoptik Jena GmbH: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Jensen, Millard J.: *See*—
Levine, Jules D.; Jensen, Millard J.; and Haney, Ronald E., 4,691,076, Cl. 136-250.000.

Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Block-form detergent free from alkali hydroxides for use in dishwashing machines and a process for its production. 4,690,770, Cl. 252-99.000.

Jeumont-Schneider Corporation: *See*—
Boisdon, Claude, 4,691,325, Cl. 373-108.000.

Jidosha Kiki Co., Ltd.: *See*—
Arino, Maseo; and Kobayashi, Michio, 4,689,958, Cl. 60-547.100.
Masuda, Naosuke; and Sunaga, Sohsuke, 4,689,983, Cl. 72-356.000.

Jisova, Vaclava: *See*—
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, 4,690,989, Cl. 526-88.000.

Jobe, Benjamin L., to Jogler, Inc. Combined shut off and check valve. 4,690,169, Cl. 137-614.160.

Jobe, Tommy L., to Technical Oil Tools Corporation. Intrinsically safe multi-drop communications link. 4,691,384, Cl. 455-602.000.

Jogler, Inc.: *See*—
Jobe, Benjamin L., 4,690,169, Cl. 137-614.160.

Johansson, Lars-Erik, to Flakt AB. Media mixing nozzle assembly. 4,690,333, Cl. 239-434.500.

John D. Hollingsworth On Wheels, Inc.: *See*—
Pinto, Akiva, 4,689,857, Cl. 19-105.000.

John T. Hepburn, Limited: *See*—
Malashenko, Leon, 4,690,049, Cl. 100-214.000.

Johns Hopkins University, The: *See*—
Ko, Harvey W., 4,690,149, Cl. 128-653.000.

Johnson, Barbara F., executor: *See*—
Snow, Wayne R.; Ishiker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Johnson, C. B., to ITT Electro Optical Products. Secondary cathode microchannel plate tube. 4,691,099, Cl. 250-213.0VT.

Johnson, Colin A., deceased: *See*—
Snow, Wayne R.; Ishiker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Johnson, D. Bruce: *See*—
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.

Johnson, Gary, to Heil Co., The. Refuse collection truck and apparatus for controlling compaction of refuse. 4,690,607, Cl. 414-517.000.

Johnson, Jay K.: *See*—
Schwartz, Arthur G.; Gurries, Richard M.; and Johnson, Jay K., 4,690,697, Cl. 55-84.000.

Johnson & Johnson: *See*—
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.

Johnson & Johnson Products, Inc.: *See*—
Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.

Johnson, Kenneth M.: *See*—
Leonard, Ronald J.; and Johnson, Kenneth M., 4,690,758, Cl. 210-747.000.

Johnson, Mark R.: *See*—
Keskey, William H.; and Johnson, Mark R., 4,690,995, Cl. 526-286.000.

Johnson, Robert R.: *See*—
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,244, Cl. 358-294.000.

Johnson, Robert W., Jr., to Union Camp Corporation. Method of preparing rosin esters from polyol with phosphorous acid catalyst. 4,690,783, Cl. 260-104.000.

Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., to Phillips Petroleum Company. Method of producing poly(arylene sulfide) compositions and articles made therefrom. 4,690,972, Cl. 524-609.000.

Johnston, Charles F. Valve assembly for a sphygmomanometer. 4,690,171, Cl. 137-877.000.

Johnston, Thomas E.; and Dorer, Casper J., Jr., to Lubrizol Corporation, The. Fuel products comprising a lead scavenger. 4,690,687, Cl. 44-67.000.

Johzuka, Takashi: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.

Jones, Martin A.: *See*—
Adams, Graham; and Jones, Martin A., 4,690,688, Cl. 44-76.000.

Jones, Robert D. Beverage container. 4,690,294, Cl. 220-90.200.

Jones, Robert E.: *See*—
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Jordan, Janet M.: *See*—
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.

Jorgensen, Ove: *See*—
McCulloch, Robert M.; and Jorgensen, Ove, 4,689,968, Cl. 82-225.000.

Jorgenson, Michael W.: *See*—
Kilgour, John A.; and Jorgenson, Michael W., 4,690,955, Cl. 521-112.000.

Joshita, Yutaka: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsuo; Otsuka, Mieko; Doburtu, Masakatsu; Furukawa, Yusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., to Satellite Industries, Inc. Building wall panel and door unit. 4,689,917, Cl. 49-380.000.

Jukkola, Glen D.: *See*—
Peletz, Lawrence J., Jr.; and Jukkola, Glen D., 4,690,076, Cl. 110-347.000.

Juncosa, Robert D., to American Medicsan, Inc. Apparatus for epithelial tissue impedance measurements. 4,690,152, Cl. 128-734.000.

Jung, Adolf: *See*—
Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, 4,690,054, Cl. 101-409.000.

Junino, Alex: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.

Jurgensen, Bruce A. Expandable structure and sequence of expansion. 4,689,924, Cl. 52-67.000.

Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, to Matsushita Electric Industrial Co., Ltd. Block encoder. 4,691,329, Cl. 375-122.000.

Jydsk Teknologisk Institut: *See*—
Hogberg, Leif, 4,690,301, Cl. 221-2.000.

K-2 Corporation: *See*—
Fezzi, Louis J., 4,690,850, Cl. 428-105.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Hashimoto, Yasuyuki, 4,690,660, Cl. 464-68.000.

Kabushiki Kaisha Kito: *See*—
Nakamura, Takayoshi, 4,690,379, Cl. 254-347.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Okamoto, Hiroshi, 4,690,200, Cl. 164-504.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.

Kabushiki Kaisha Kumalift Gijutsu Kenkyusho: *See*—
Nobuhara, Uichi, 4,690,611, Cl. 414-661.000.

Kabushiki Kaisha Medos Kenkyusho: *See*—
Ouchi, Teruo; and Shibuya, Hiromichi, 4,690,175, Cl. 138-131.000.

Kabushiki Kaisha Meidensha: *See*—
Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, 4,691,158, Cl. 320-14.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kokubu, Sadao, 4,691,201, Cl. 340-825.310.

Kabushiki Kaisha Toshiba: *See*—
Haragashira, Motoji, 4,691,164, Cl. 324-322.000.
Hashimoto, Kazuhiko, 4,691,123, Cl. 307-296.00R.
Kinoshita, Tsuneo, 4,691,282, Cl. 364-200.000.
Kizu, Shuji; Ishida, Tsuyoshi; and Nagase, Yasuo, 4,691,100, Cl. 150-213.00R.
Morishita, Mimpei; and Azukizawa, Teruo, 4,690,066, Cl. 104-282.000.
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.

Nonaka, Hikaru, 4,689,966, Cl. 62-187.000.
Ohguma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.
Oku, Isamu; and Onda, Tetsurou, 4,691,235, Cl. 358-179.000.
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, 4,691,140, Cl. 313-486.000.
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-491.000.
Watanabe, Junji, 4,690,543, Cl. 355-4.000.

Kadin, Saul B., to Pfizer Inc. Analgesic and antiinflammatory 1,3-diacyl-2-oxindole compounds. 4,690,943, Cl. 514-418.000.

Kaeriyama, Kyoji: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Kagami, Teruyuki: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.

Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, to Yamanouchi Pharmaceutical Co., Inc. Pharmaceutical compositions for nasal administration comprising calcitonin and an absorption-promoting substance. 4,690,952, Cl. 514-808.000.

Kageyama, Shunji: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.

Kageyama, Yoshiteru: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.

Kaiho, Shigeo: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

Kaisei Kogyo Corporation: *See*—
Fuminao, Tanitomi, 4,690,184, Cl. 144-2.00Z.

Kaiser Aerospace & Electronics Corporation: *See*—
Elliott, Gregory K., 4,690,296, Cl. 220-259.000.

Kaiser, Wolfgang: *See*—
Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, 4,691,337, Cl. 379-24.000.

Kajiyama, Koichi: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.

Kaken Pharmaceutical Co., Ltd.: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

Kallay nee Sohonyai, Anna: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Kalman Floor Company: *See*—
Kirven, Thomas, 4,689,892, Cl. 33-533.000.

Kamanaka, Yoshihide: *See*—
Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, 4,691,158, Cl. 320-14.000.

Kamata, Shigeru; and Iizuka, Toshimi, to Canon Kabushiki Kaisha. Lens moving device. 4,690,514, Cl. 350-429.000.

Kamata, Shigeru: *See*—
Iizuka, Toshimi; and Kamata, Shigeru, 4,690,505, Cl. 350-252.000.

Kambe, Rokuro: *See*—
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, 4,690,872, Cl. 428-446.000.

Kamensky, Veniamin V.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

Kamiguchi, Taiji: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Molybdenum oxide whiskers and a method of producing the same. 4,690,813, Cl. 423-606.000.

Kamiyama, Kouzi, to Fuji Photo Film Co., Ltd. Process for the preparation of ferrite magnetic particulate for magnetic recording. 4,690,768, Cl. 252-62.580.

Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, to Johnson & Johnson Products, Inc. Reinforced casting material. 4,690,842, Cl. 428-35.000.

Kamoshita, Katsuzo: *See*—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,690,946, Cl. 514-485.000.
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Kamoshita, Mutuo: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Kampfer, Konrad: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Kanada, Taira: *See*—
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.

Kanagawa, Nobuto: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.

Kanayama, Ikuo: *See*—
Hayashi, Toshihide; Kanayama, Ikuo; and Kanno, Masayoshi, 4,691,351, Cl. 380-10.000.
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.

Kanczarek, Thaddaeus-Anton, to Kraftwerk Union Aktiengesellschaft. Flange connection. 4,690,438, Cl. 285-363.000.

Kanda, Mutsumi, to Toyota Jidosha Kabushiki Kaisha. Cylinder head with coolant passage following squish area and of generally uniform cross sectional area. 4,690,105, Cl. 123-41.82R.

Kanda, Nobuo, to Pioneer Electronic Corporation. Stereophonic receiving circuit providing improved switching characteristics between stereophonic and monaural modes. 4,691,357, Cl. 381-10.000.

Kanda, Shoichi: *See*—
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.

Kanda, Yohichi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, 4,690,977, Cl. 525-83.000.
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

Kaneko, Masahide; Hatori, Yoshinori; and Miyasato, Tsutomu, to Kokusai Denshin Denwa Co., Ltd. Motion vector detection system of a moving object on a screen. 4,691,230, Cl. 358-105.000.

Kaneko, Takaoki: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,690,097, Cl. 118-723.000.

Kaneko, Yujiro: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sewada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.

Kania, Charles M.: *See*—
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.

Kanno, Akihiko ; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of cephalosporanic acid and pharmaceutical composition comprising the same. 4,690,920, Cl. 514-201.000.

Kanno, Hideo, to Nippon Kogaku K. K. Photographing lens barrel provided with a catadioptric optical system. 4,690,516, Cl. 350-444.000.

Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, to Sony Corporation. Receiver device in a satellite communication system. 4,691,236, Cl. 358-181.000.

Kanno, Masayoshi: *See*—
Hayashi, Toshihide; Kanayama, Ikuo; and Kanno, Masayoshi, 4,691,351, Cl. 380-10.000.

Kant, Rajni; and Chen, Kun-Nau, to Raytheon Company. Configurable logic gate array. 4,691,161, Cl. 324-73.00R.

Kanto Jidosha Kogyo Kabushiki Kaisha: *See*—
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Kaplan, Robert M. Seat covering device for skiers. 4,689,829, Cl. 2-46.000.

Kapolnas nee Pap, Marta: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Karl Thomae GmbH: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.

Kasai, Masaji: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.

Kaseya, Akinori: *See*—
Takai, Kiyoshi; and Kaseya, Akinori, 4,690,327, Cl. 239-226.000.

Kashiwagi, Shigeru, to Victor Company of Japan, Ltd. Circuit arrangement for correcting horizontal pincushion distortion using a voltage proportional to vertical sync period. 4,691,147, Cl. 315-371.000.

Kashiwazaki, Masamichi; Ogawa, Kiichiro; and Uchida, Satoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Coal gasification composite power generator. 4,689,949, Cl. 60-39.120.

Kasprzyk, Donald J., to Honeywell Inc. Oil burner control for hydronic system. 4,690,324, Cl. 237-8.00R.

Kasuya, Atsuo: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

Katkov, Vladimir F.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir

F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Kato, Hiroshi: *See*—
Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, 4,690,348, Cl. 242-66.000.
Kato, Kazutoshi: *See*—
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.
Kato, Kinya; and Tsuchiya, Hiroyuki, to Nippon Kogaku K. K. Optical apparatus for the detection of scattered light. 4,690,565, Cl. 356-446.000.
Kato, Minoru, to Myotoku Ltd. Deburring apparatus. 4,690,594, Cl. 408-159.000.
Kato, Noboru: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Nobora, 4,690,854, Cl. 428-195.000.
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, to NGK Spark Plug Co., Ltd. Ceramic heater. 4,690,872, Cl. 428-446.000.
Kato, Toshiaki, to Fuji Electric Co., Ltd. Contact type image sensor having multiple common electrodes to provide increased pixel density. 4,691,242, Cl. 358-294.000.
Kato, Toshiro: *See*—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,690,946, Cl. 514-485.000.
Kato, Yoichi: *See*—
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
Katori, Tatsuhiko: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.
Katsuhara, Yutaka: *See*—
Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, 4,691,066, Cl. 570-144.000.
Katsura, Yoshiro, to Terumo Kabushiki Kaisha. Apparatus for removing bubbles from a liquid. 4,690,762, Cl. 210-436.000.
Katsutani, Kazuji; and Inaba, Shigeru, to Niles Parts Co., Ltd. Hinge type relay. 4,691,181, Cl. 335-128.000.
Katsuyama, Yoshiaki: *See*—
Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,690,846, Cl. 428-64.000.
Katz, William. Intravenous needle assembly. 4,690,675, Cl. 604-177.000.
Katzmann, Harald; Senn, Werner; and Ammann, David, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method of securing a flare composition sleeve in a blind borehole at the tail portion of a projectile body. 4,690,029, Cl. 86-20.110.
Kaufmann, Herbert: *See*—
Dahlquist, Håkan; and Kaufmann, Herbert, 4,690,012, Cl. 74-479.000.
Kavcic, Janez, to Iskra-Sozd elektrokovinske industrije n.sol.o. Electric alarm siren with arc-like runner legs. 4,691,194, Cl. 340-405.000.
Kawachi, Yasunori: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.
Kawaguchi, Hisao: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Misezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Kawai, Hisasi: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Kawakita, Takao; and Miyao, Ichiro, to Osaka Diamond Industrial Co. Method for welding cutter segments. 4,689,919, Cl. 51-206.00P.
Kawamori, Yoshihiro: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.
Kawamoto, Galen: *See*—
Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, to Canon Kabushiki Kaisha. Motorized drive device for camera. 4,690,532, Cl. 354-173.110.
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine with a duty ratio control operation. 4,690,121, Cl. 123-589.000.
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Friedman, Walter; and Stricker, David J., 4,690,636, Cl. 446-95.000.
Kenny, Thomas J.; and Sutherland, James F., to Westinghouse Electric Corp. Low leakage, solid state a-c power contact. 4,691,263, Cl. 361-58.000.
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Urata, Toshimitsu, 4,690,006, Cl. 73-866.500.
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Betts, David R.; and Edmonds, Michael G., 4,690,417, Cl. 280-42.000.
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Rockenschaub, Walter; and Kepplinger, Werner, 4,690,387, Cl. 266-144.000.
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Blass, Judd; and Keren, Hanan, 4,691,163, Cl. 324-318.000.
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Khoe, Giok D., to U.S. Philips Corp. Method and device for positioning light-conducting fibres. 4,690,493, Cl. 350-96.200.
Khu, Arthur H., to Advanced Micro Devices, Inc. Methods and apparatus for encoding and decoding data to and from a (2,7) format. 4,691,193, Cl. 340-347.0DD.
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Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.
Kihara, Toshimasa: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.
Kihm, Joe A., to Harold Beck & Sons, Inc. Valve actuator position indicating system. 4,690,168, Cl. 137-554.000.
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Inagami, Kaoru; and Kikuchi, Noboru, 4,691,011, Cl. 530-832.000.
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Killeen, Walter H. Portable hoist. 4,690,248, Cl. 182-118.000.
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Hammond, Philip G., 4,690,853, Cl. 428-157.000.
Hauschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., 4,690,681, Cl. 604-396.000.
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Takagi, Akihiro; and Kimoto, Kiyoshi, 4,691,308, Cl. 369-13.000.
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Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, 4,690,872, Cl. 428-446.000.
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Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Kinoshita, Kazumasa: *See*—
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.
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Kirven, Thomas, to Kalman Floor Company. Apparatus and method of measuring surface heights. 4,689,892, Cl. 33-533.000.
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Takeda, Kyoji; and Kitai, Akira, 4,690,346, Cl. 242-56.00R.
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Bertelsen, Matthew H.; and Klapperich, Gary, 4,690,042, Cl. 98-115.100.
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Klie, Jurgen; and Beyer, Rudolf, to G. Dusterloh, GmbH. Hydraulically actuated piston machine with bearing for connecting piston to piston rod. 4,690,038, Cl. 92-181.00R.
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Kloss, Thomas M., Jr., to Gila River Products, Inc. Method and apparatus for laminating flexible printed circuits. 4,690,845, Cl. 428-40.000.
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Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, 4,690,054, Cl. 101-409.000.
Knaus, Raymond D. Gasoline pump lever holder. 4,690,182, Cl. 141-392.000.
Knauss, Hermann, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electrically heated deep fat fryer. 4,691,096, Cl. 219-441.000.
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Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, to Glaxo Group Limited. Imidazopyridayine derivatives having antiviral activity. 4,690,917, Cl. 514-23.000.
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Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.
Ko, Harvey W., to Johns Hopkins University, The. Non-invasive electromagnetic technique for monitoring physiological changes in the brain. 4,690,149, Cl. 128-653.000.
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Brady, William T.; Norton, Scott J.; and Ko, Jinrea, 4,691,052, Cl. 562-506.000.
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Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, to Canon Kabushiki Kaisha. Eye fundus camera. 4,690,525, Cl. 351-206.000.
Kobayashi, Masashi, to Marumae Golf Co., Ltd. Club-head. 4,690,408, Cl. 273-169.000.
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Kobayashi, Ryuichi: *See*—
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Koch, Robert: *See*—
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Koda, Akio: *See*—
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Kogure, Osamu: *See*—
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Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, to Mazda Motor Corporation. Bearing arrangements for balancing shafts of internal combustion engines. 4,690,111, Cl. 123-192.00B.
Koike, Kengo: *See*—
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Koizumi, Yutaka: *See*—
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Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, to Yamanouchi Pharmaceutical Co., Ltd. Coumarins with imidazolyl group or pyridyloxy group having platoletes aggregation inhibiting activity. 4,690,932, Cl. 514-337.000.
Koken Company Limited: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
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Kokusai Denshin Denwa Co., Ltd.: *See*—
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Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, to Ceskoslovenska akademie ved. Method for the single-step production of vinyl polymers. 4,690,989, Cl. 526-88.000.
Kolk, Erich: *See*—
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Komanduri, Ranga, to General Electric Company. Polycrystalline diamond and CBN cutting tools. 4,690,691, Cl. 51-293.000.
Kondo, Hiroshi, to Toko, Inc. Pulse delay circuit device. 4,691,120, Cl. 307-265.000.
Kondo, Hitoshi: *See*—
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Naoe, Masahiko; and Ishibashi, Shozo, 4,690,744, Cl. 204-192.110.
Kono, Motomichi: *See*—
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Kopelowicz, Alberto. Anchoring devices for joining overlapping cloths for garments or articles manufactured with them. 4,689,861, Cl. 14-662.000.
Koperdak, Edward A., to Cope, Inc. Coving attachment. 4,690,382, Cl. 256-1.000.
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Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.
Koppensteiner, James V.; and Kubik, Charles K., to GTE Communication Systems Corporation. Wire formed cable brackets. 4,690,356, Cl. 248-68.100.
Kordel, Gerhard: *See*—
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Korn, Siegfried: *See*—
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Kosaka, Masato; and Yamazaki, Tatsu, to Kayaba Kogyo Kabushiki Kaisha. Axial piston pump or motor with multi position swash plate. 4,690,036, Cl. 91-506.000.
Koshinaka, Osamu: *See*—
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Kostylev, Alexandr D.: *See*—
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Kottke, Joachim; and Zerrer, Gerhard, to Andreas Stihl. Rotation-preventing locking device for a portable tool. 4,690,252, Cl. 188-69.000.
Kotzin, Bernard. Caster having interfitting housing members with integral bearings and a separate axle. 4,689,848, Cl. 16-46.000.
Kouchiwa, Taira; and Nishina, Kiichiro, to Ricoh Company, Ltd. Wide angle copying lens system. 4,690,518, Cl. 350-464.000.
Koumoto, Teruo: *See*—
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Koves, Thomas. Canvas carrier. 4,690,363, Cl. 248-449.000.
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Koyama, Hiroshi: *See*—
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Koyama, Kenji; and Ohno, Shotaro, to Toyo Soda Manufacturing Co., Ltd. Filter device for a minute volume of liquid. 4,690,754, Cl. 210-94.000.
Koyama, Takeo: *See*—
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Koyo Seiko Co., Ltd.: *See*—
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Koziar, Gregory: *See*—
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Kozlowski, James L.: *See*—
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Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information reproducing apparatus. 4,691,256, Cl. 360-73.000.
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Kanczarek, Thaddaeus-Anton, 4,690,438, Cl. 285-363.000.
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.
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Kraus, Gunter, to Sigri GmbH. Electrode connection. 4,691,324, Cl. 373-91.000.
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Churchward, Reed R.; and Krocheski, Thomas L., 4,691,303, Cl. 365-222.000.
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Ljung, Bo H. G.; and Krupick, Walter J., 4,691,323, Cl. 372-107.000.
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Kuhn, George C. Patient motivation device. 4,689,842, Cl. 5-61.000.
Kuhne, Christoph, to Carl-Zeiss-Stiftung. Laser range finder. 4,690,550, Cl. 356-5.000.
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Hahn, Michael; and Kuntze-Fechner, Gerald, 4,690,616, Cl. 416-134.00A.
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Peter, Rudolf; Jahael, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.130.
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Kuramochi, Koujiro: *See*—
Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, 4,690,239, Cl. 180-249.000.
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Fukuda, Ken; and Ueba, Hisaaki, 4,690,849, Cl. 428-91.000.
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Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.
Kuthi, Csaba: *See*—
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Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.
Kyocera Corporation: *See*—
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.
Kyotani, Ikuo, to G-C Dental Industrial Corp. Dental polishing strip. 4,690,642, Cl. 433-142.000.
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Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, 4,690,035, Cl. 91-442.000.
Laabs, Timothy P.: *See*—
Wolniak, Stanley C.; and Laabs, Timothy P., 4,689,977, Cl. 70-379.00R.
Labadie, Jeffrey W.: *See*—
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Labler, Ludwig: *See*—
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Lafon, Louis, 4,690,950, Cl. 514-626.000.
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Tervamaki, Jukka; and Jarvimaki, Kari, 4,690,005, Cl. 73-864.120.
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Henkin, Melvyn L.; and Laby, Jordan M., 4,689,839, Cl. 4-542.000.
Lackey, Robert W.: *See*—
Fershko, Jane S.; and Lackey, Robert W., 4,690,287, Cl. 211-49.100.
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Bramer, Charles, 4,690,013, Cl. 74-501.00M.
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., to Exxon Chemical Patents Inc. Road marking compositions. 4,690,958, Cl. 523-172.000.
Lafer, William: *See*—
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Lafon, Louis, to Laboratoire L. Lafon. 1-[N-(α-amino-α-methylacetyl-)aminophenyl)-2-aminopropanone derivatives. 4,690,950, Cl. 514-626.000.
LaGarde, Robert; and Bouverot, Noel, to Rhone-Poulenc Specialites Chimiques. Heat-curable organopolysiloxane compositions. 4,690,967, Cl. 524-266.000.
Lahti, Archie E.: *See*—
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Laitinen, Herbert A.; and Hoshino, Shigeo, to University of Florida. Electrolytic bath compositions and method for electrodeposition of amorphous chromium. 4,690,735, Cl. 204-37.100.
Landphair, Donald K., to Deere & Company. Radial engagement drive coupler. 4,690,260, Cl. 192-71.000.
Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Hydrated calcium bromide reversible phase change composition. 4,690,769, Cl. 252-70.000.
Lange, Gottfried, to Siemens Aktiengesellschaft. X-ray image converter. 4,691,232, Cl. 358-111.000.
Lange, Philip E., to Aero-Metric General, Inc. Circuit status indicating device with improved switch on/off detection capability. 4,691,143, Cl. 315-133.000.
Langen, Manfred, to W. Schlafhorst & Co. Textile machine for producing cross-wound bobbins. 4,690,342, Cl. 242-35.50A.
Lapham, James M.: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.
Larsen, Marvin L., to Tri/Mark Corporation. Pop-up handle assembly. 4,689,976, Cl. 70-208.000.
Larson, Jon; and Larson, Van. Layered inner sole. 4,689,899, Cl. 36-44.000.
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Lassiter, B. Dean; and Ambrosiani, Vincent F., to Burlington Industries, Inc. Cold weather garment structure. 4,690,847, Cl. 428-71.000.

LaTorre, Richard R.: *See*—
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Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, to Rieter Machine Works, Ltd. Open-end yarn piecer. 4,689,945, Cl. 57-263.000.

Lau, Robert G., to Whirlpool Corporation. Reversible hinge with over-center spring for refrigerators. 4,690,468, Cl. 312-291.000.

Lauer, Fredy, to Sulzer Brothers Limited. Threaded connection having multi-part threaded bolt. 4,690,600, Cl. 411-263.000.

Lauga, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., to N.K.F. Groep B.V. Apparatus for and method of making the cable core of a telecommunication cable water-tight in the longitudinal direction. 4,690,718, Cl. 156-48.000.

LeBaron, Francis, to E. L. LeBaron Foundry Co. Apparatus for securing adjustable support structures for manhole covers, grates and the like. 4,690,584, Cl. 404-26.000.

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Bantle, Manfred; and Lechner, Reinhard, 4,690,462, Cl. 301-9.0CN.

Ledebuhr, Arno G., to Hughes Aircraft Company. Prism assembly for a single light valve full-color projector. 4,690,526, Cl. 353-31.000.

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Lee, Hee J., to Gold Start Co., Ltd. Preventing twist of a microwave temperature probe line. 4,691,087, Cl. 219-10.55B.

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Kay, Ira W.; and Lehrach, Ronald P. C., 4,691,288, Cl. 364-511.000.

Leible, Walter T.: *See*—
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Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Leitz, Richard: *See*—
Trage, Burkhard; and Leitz, Richard, 4,690,207, Cl. 165-113.000.

Lekander, Karl-Erik: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

LeMay, Dan B.: *See*—
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Lemmens, Godfried. Process for decontaminating materials contaminated by radioactivity. 4,690,782, Cl. 252-626.000.

Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik: *See*—
Meyer, Armin, 4,690,280, Cl. 206-554.000.

Lemonnier de Gouville, Jean B.; and Dane, Bernard, to Sourdillon-Airindex. Flat type gas burner, more particularly for household appliances, adapted for using different gases. 4,690,636, Cl. 431-354.000.

Lentz, Carl M.; Overton, James R.; and Cornell, David D., to Eastman Kodak Company. Carbonylation process for the production of aromatic dicarboxylic acids. 4,691,050, Cl. 562-406.000.

Leolli, Franco, to Modecor Italiana S.p.A. Sectional modular element display unit. 4,690,289, Cl. 211-186.000.

Leonard, Mark G., to Hewlett-Packard Company. Optical positional encoder comprising immediately adjacent detectors. 4,691,101, Cl. 250-231.0SE.

Leonard, Ronald J.; and Johnson, Kenneth M., to Baxter Travenol Laboratories, Inc. Mass transfer device. 4,690,758, Cl. 210-247.000.

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Leroy, Andre : *See*—
Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , 4,690,719, Cl. 156-201.000.

Leung, Tommy Y.: *See*—
Waldron, Mark A.; and Leung, Tommy Y., 4,691,342, Cl. 379-98.000.

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Lewandowski, Alan: *See*—
Pelley, Perry H., III; and Lewandowski, Alan, 4,691,300, Cl. 365-200.000.

Lewis, Charles M.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Holloway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.

Lewis, John C., Jr., to Tucel Industries, Inc. Prepackaged fused synthetic brushes. 4,690,277, Cl. 206-362.100.

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Li, Chou H. Method of making active solid state devices. 4,690,714, Cl. 437-208.000.

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Cho, Shoji, 4,690,401, Cl. 272-137.000.

Lim, Franklin, to Damon Biotech, Inc. Sustained release. 4,690,682, Cl. 604-891.000.

Limbach, Antony P. J.: *See*—
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.

Lin, Der J.: *See*—
Bose, Bella; and Lin, Der J., 4,691,319, Cl. 371-54.000.

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Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-444.000.

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Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, 4,690,177, Cl. 139-449.000.

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Ranke, Gerhard; and Schrader, Ulrich, 4,690,812, Cl. 423-359.000.

Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, to Aligena AG. Chemically modified semipermeable membranes and their use in reverse osmosis and ultrafiltration. 4,690,765, Cl. 210-654.000.

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Bradisse, John L.; and Lindner, Daniel J., 4,690,189, Cl. 152-209.00R.

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Kuker, Wolfgang; and Findeklee, Heinz, 4,690,067, Cl. 105-3.000.

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Janke, Donald E.; and Linstromberg, William J., 4,689,965, Cl. 62-155.000.

Lion Corporation: *See*—
Owa, Yutaka, 4,690,589, Cl. 405-263.000.
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.

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Aalesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.

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Beyer, Karl, 4,689,851, Cl. 16-228.000.

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Lofredo, Antony, to Boc Group, Inc., The. Process and apparatus for handling a vaporized gaseous stream of a cryogenic liquid. 4,689,962, Cl. 62-54.000.

Lofthus, Jon: *See*—
Herngren, Torbjorn; and Lofthus, Jon, 4,690,634, Cl. 431-8.000.

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Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, 4,690,185, Cl. 144-34.00R.

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Lohner, Manfred; and Posselt, Klaus, to Dolorgiet Beteiligungs-GmbH. Ibuprofen-containing soft gelatin capsules and process for preparing same. 4,690,823, Cl. 424-456.000.

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Long, William B.: *See*—
Hamaker, Wilbur A., Jr.; and Long, William B., 4,690,647, Cl. 439-92.000.

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Looney, Kevin: *See*—
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.

Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., to Cetus Corporation. Process for simultaneously detecting multiple antigens using dual sandwich immunometric assay. 4,690,890, Cl. 435-7.000.

Loos, Herbert; and Erhardt, Manfred, to Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co. Apparatus for manufacturing and working of gears. 4,689,918, Cl. 51-105.0GG.

Lord Corporation: *See*—
Rende, Anthony V., Jr., 4,690,966, Cl. 524-264.000.

L'Oreal: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.

Lorenz, Jerome L., to United Technologies Automotive, Inc. Head tool and method for removing insulation from wire-wound ignition cable. 4,689,882, Cl. 30-90.100.

Lorenz, Kurt: *See*—
Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.

Losada, Robert J.; and Conway, Hugh T., to Becton, Dickinson and Company. Flow inducing means for small volume containers. 4,690,153, Cl. 128-763.000.

Lotz, Alexander; and Stevermuer, Heinrich, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Coal processing settling machine. 4,690,753, Cl. 209-496.000.

Loubier, Robert J.; and Bleeke, William F., to Xolox Corporation. Solid state magnetic microswitch. 4,691,185, Cl. 338-32.00H.

Loup, Didier, to Valeo. System for holding an electric motor in a housing. 4,690,366, Cl. 248-676.000.

Lowery, Richard K., Sr.: *See*—
Finan, Anthony T., Sr.; Lowery, Richard K., Sr.; and Leible, Walter T., 4,689,937, Cl. 53-502.000.

Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir P.; Vinogradov, Vasily M.; and Kulinsky, Vladimir L, to Institut Organicheskoi Khimii Ordena Lenina I Ordena Druzhby Narodov Akademii Nauk Ukrainskoi SSR; and Institut Farmakologii Akademii Meditsinskikh Nauk SSSR. Butanedioic acid mono [(2-dimethylamino] ethyl ester)-succinate. 4,691,046, Cl. 560-196.000.

Lu, Jing-Jong, to International Minerals & Chemical Corp. Halogenated resorcylic acid lactone derivatives. 4,690,948, Cl. 514-544.000.

Lu, Neng H.: *See*—
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

Lubrizol Corporation, The: *See*—
DiBiase, Stephen A.; and Vinci, James N., 4,690,767, Cl. 252-47.000.
Johnston, Thomas E.; and Dorer, Casper J., Jr., 4,690,687, Cl. 44-67.000.

Lucas, August: *See*—
Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.

Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , to Boussac Saint Freres B. S. F. Egg timer-shaped absorbent pad for a pair of nappy-pants, and process for the continuous manufacture of such pads. 4,690,719, Cl. 156-201.000.

Lucas Industries public limited company: *See*—
Stratton, John F., 4,689,961, Cl. 60-748.000.

Luchsinger, Pedro W. Sprayer and diaphragm pump therefor. 4,690,331, Cl. 239-333.000.

Lucht, Hartmut: *See*—
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Lue, Hsueh C., to U.S. Philips Corp. Container for electronic components. 4,690,274, Cl. 206-328.000.

Luine, George J.; and Luine, John L. Bottle mounted adjustable liquor dispensing device. 4,690,313, Cl. 222-454.000.

Luine, John L.: *See*—
Luine, George J.; and Luine, John L., 4,690,313, Cl. 222-454.000.

Luinet, Jean-Jacques; and Seigneurin, Michel, to Micro-Mega S.A. Contra-angle or turbine head of a dental handpiece. 4,690,641, Cl. 433-129.000.

Luma Guard, Inc.: *See*—
Hoshal, Dale E., 4,690,419, Cl. 280-154.50R.

Lundin, Lars, to Oy Lars Lundin Patent AB. Oil-spill-combatting water craft. 4,690,093, Cl. 114-270.000.

Lundman, Philip L. Jack stand and method for making a jack stand. 4,690,361, Cl. 248-352.000.

Luryi, Sergey, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Hot electron unipolar transistor with two-dimensional degenerate electron gas base with continuously graded composition compound emitter. 4,691,215, Cl. 357-22.000.

Luther, Lars C.; and Singh Rana, Virendra V., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Liquid phase epitaxial growth of bismuth-containing garnet films. 4,690,726, Cl. 156-624.000.

Lyddy, James E.; and Fincke, Randall W. Method and apparatus for regulating fluid flow. 4,690,162, Cl. 137-1.000.

Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., to United States of America, Health and Human Services. Medical apparatus. 4,690,131, Cl. 128-4.000.

Lyman, George: *See*—
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.

Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., to AT&T Technologies; and AT&T Bell Laboratories. Direct writing of conductive patterns. 4,691,091, Cl. 219-121.0LM.

M.A.N. - B&W Diesel GmbH: *See*—
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Lotz, Alexander; and Stevermuer, Heinrich, 4,690,753, Cl. 209-406.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, 4,690,054, Cl. 101-409.000.

M. U. Engineering & Manufacturing, Inc.: *See*—
Skinner, James R., 4,690,370, Cl. 249-114.00R.

Maas, Henricus G. R.: *See*—
Appels, Johannes A.; and Maas, Henricus G. R., 4,689,872, Cl. 437-228.000.

MacDonald, Scott A.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.

MacFee, Norman W., to Talon, Inc. Recloasable bulk material bag with slide fastener. 4,691,370, Cl. 383-61.000.

Machida, Hajime: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.

Mack, Jory B., to Pamco Label Co. Method of manufacturing multilayer labels and apparatus therefor. 4,690,720, Cl. 156-248.000.

Madate, Haruhisa: *See*—
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.

Madaus & Co.: *See*—
Brusewitz, Gerhard; and Sieck, Reinhard, 4,690,896, Cl. 435-296.000.

Maddox, William M., to United Technologies Corporation. Exhaust nozzle coupled with reverser exhaust door. 4,690,329, Cl. 239-265.190.

Maeda, Kiyoshi: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.

Maeda, Satoru; and Tao, Akihiko, to Sony Corporation. Image information accessing user terminal. 4,691,340, Cl. 379-96.000.

Maeda, Takanori, to Pioneer Electronic Corporation. Focus control device. 4,691,098, Cl. 250-201.000.

Machara, Sigeharu, to Sharp Kabushiki Kaisha. Copying apparatus. 4,690,545, Cl. 355-51.000.

Magatti, Charles V.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.

Magee, Charles W.; and Hewitt, Lori R., to RCA Corporation. Apparatus and method for producing ions. 4,691,109, Cl. 250-426.000.

Maher, Timothy R.: *See*—
Gregorich, Edward E.; and Maher, Timothy R., 4,690,245, Cl. 181-272.000.

Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., to Exibeloo GmbH. Connecting element for structural framework. 4,690,582, Cl. 403-252.000.

Makino, Hiroshi; and Sasaki, Akio, to Mikuni Kogyo Kabushiki Kaisha. EGR valve device of internal combustion engines of automobiles. 4,690,119, Cl. 123-571.000.

Makino, Hiroshi; and Nakatani, Masayuki, to Ube Industries, Ltd. Gas separating material. 4,690,873, Cl. 428-473.500.

Makino, Masayuki, to NEC Corporation. Line switching circuit for cordless telephone. 4,691,338, Cl. 379-61.000.

Makley, James A.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.

Malashenko, Leon, to John T. Hepburn, Limited. Hydraulic press with side slab guided upper platen. 4,690,049, Cl. 100-214.000.

Malaubier, Francois: *See*—
Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

Malcosky, Norman D.; and Koziar, Gregory, to Columbia Gas System Service Corp. Gas tracer composition and method. 4,690,689, Cl. 48-174.000.

Malhi, Satwinder D. S., to Texas Instruments Incorporated. Method of forming vertically integrated current source. 4,689,871, Cl. 437-40.000.

Maloney, Bobby J.: *See*—
Bakr, Mamdouh M.; and Maloney, Bobby J., 4,690,466, Cl. 312-29.000.

Mamizuka, Mitsuru: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.

Mandy, Zoltan A., to Frick Company. Centrifugal and impingement oil separator. 4,690,759, Cl. 210-304.000.

Manini, Benito: *See*—
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Manini, Benito, 4,689,971, Cl. 66-25.000.

Mannesmann Rexroth GmbH: *See*—
Hein, Theo, 4,689,956, Cl. 60-449.000.

Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A. Hose coupling. 4,690,435, Cl. 285-256.000.

Manno, Eugene J., to Xerox Corporation. Developer system for reproduction and printing machines. 4,690,540, Cl. 355-3.0DD.

Mantegani, Sergio: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Marabotto, Eduardo J.; and Bresin, Mark S., to Motorola, Inc. RF interconnect with triaxial self-alignment. 4,690,471, Cl. 439-63.000.

Marchisio, Aldo; and Beccaris, Carlo, to Valeo. Torsional damper device. 4,690,659, Cl. 464-68.000.

Marette, Gilles: *See*—
Rouby, Eric; Dubuit, Jean-Louis; and Marette, Gilles, 4,690,050, Cl. 101-35.000.

Marggraff, Fritz. Boat with a raisable and lowerable keel. 4,690,089, Cl. 114-141.000.

Marginvest S.A. Holding: *See*—
Callut, Francois; and Denseuldre, Daniel, 4,690,914, Cl. 502-400.000.

Marin-Tek, Inc.: *See*—
St. Pierre, Michael, 4,689,964, Cl. 62-114.000.

Marinoni, Mario, to Casma di V. Marinoni & Figli. Hinge member for an all-glass plate member including a metal fitting. 4,689,853, Cl. 16-182.000.

Mark, David S. Sound actuated switch. 4,690,242, Cl. 181-0.500.

Markin, Valentin A.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir L., 4,691,046, Cl. 560-196.000.

Markovsky, Leonid N.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir L., 4,691,046, Cl. 560-196.000.

Marquis, Edward T.: *See*—
Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.

Marsalona, Guy. Composite glove drying device. 4,689,897, Cl. 34-103.000.

Marshall, David: *See*—
Fleaher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.

Marshall, James R.: *See*—
Hardin, Roy T., Jr.; and Marshall, James R., 4,690,795, Cl. 376-264.000.

Martin, Cory I. Air conditioner evaporator system. 4,690,209, Cl. 165-150.000.

Martin, Dennis R.: *See*—
Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.

Martinelli, Robert M.: *See*—
Ahrens, Allan F.; and Martinelli, Robert M., 4,691,159, Cl. 323-221.000.

Maruman Golf Co., Ltd.: *See*—
Kobayashi, Masashi, 4,690,408, Cl. 273-169.000.

Maruyama, Osamu: *See*—
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.

Maruzen Sewing Machine Co., Ltd.: *See*—
Mikuni, Yoshio; and Koshinaka, Osamu, 4,690,080, Cl. 112-162.000.

Masaki, Yuichi: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.

Mashiko, Yoji: *See*—
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,691,078, Cl. 174-68.500.

Massachusetts Institute of Technology: *See*—
Edwards, Brian E.; and Biron, David G., 4,690,551, Cl. 356-5.000.
Rivest, Ronald L.; and Shamir, Adi, 4,691,299, Cl. 365-189.000.

Masterton, Walter D., to RCA Corporation. Color picture tube having shadow mask with varied aperture column spacing. 4,691,138, Cl. 313-403.000.

Masuda, Naosuke; and Sunaga, Sohsuke, to Jidosha Kiki Co., Ltd. Method for producing worm shaft for use in power steering apparatus. 4,689,983, Cl. 72-356.000.

Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. High molecular weight fluoroelastomer. 4,690,994, Cl. 526-254.000.

Masuyama, Tsutomu: *See*—
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,690,230, Cl. 177-229.000.

Mathus, Gregory; Lyman, George; and Looney, Kevin, to Costar Corporation. Small volume laboratory filter. 4,690,757, Cl. 210-233.000.

Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., to Modular Power Corporation. Modular electronic power supply. 4,691,274, Cl. 363-141.000.

Matsubara, Yasuko: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.

Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, to Mitsubishi Monsanto Chemical Company. Biaxially drawn laminated films prepared by sequential stretching. 4,690,792, Cl. 264-235.800.

Matsuda, Koichi: *See*—
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.

Matsuda, Kumehiko; and Komai, Kensaku, to Sharp Kabushiki Kaisha. Automatic registration in an electronic cash register. 4,691,283, Cl. 364-405.000.

Matsuda, Shohei; and Iwakawa, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic braking pressure control apparatus. 4,690,464, Cl. 303-115.000.

Matsuda, Tadashi: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Iahii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-679.000.

Matsufuji, Akihiro: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.

Matsui, Kazuma: *See*—
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.

Matsui, Tohru; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Focus detection system and lighting device therefor. 4,690,538, Cl. 354-403.000.

Matsui, Yoshiaki: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.

Matsuishi, Tsutomu: *See*—
Toss, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, 4,691,054, Cl. 562-554.000.

Matsumoto, Hiroshi: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Matsumoto, Kazuyuki; Hashimoto, Masahataka; and Iwata, Michiyoshi, to Teijin Seiki Company Limited. Robot arm drive apparatus of industrial robot. 4,690,010, Cl. 74-469.000.

Matsumoto, Shusaku: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.

Matsumoto, Yukihiro: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.

Matsumura, Isao: *See*—
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.

Matsuo, Yoshikazu: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.

Matsushita, Akira: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Masahiro; and Hashima, Akio, 4,691,247, Cl. 358-319.000.
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.

Matsushita Seiko Co., Ltd.: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.

Matsushita, Tsurumasa: *See*—
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.

Mattausch, Hans J., to Siemens Aktiengesellschaft. Circuit arrangement comprising a matrix-shaped memory arrangement for variably adjustable delay of digital signals. 4,691,302, Cl. 365-240.000.

Mattel, Inc.: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.

Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., to Johnson & Johnson. Coextruded apertured film sanitary napkin cover. 4,690,679, Cl. 604-383.000.

Matuz, Judit: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Matzkin-Bridger, Andrew: *See*—
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.

Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, to Heidelberger Druckmaschinen AG. Stack stop assembly on a sheet feeder of a printing press. 4,690,394, Cl. 271-11.000.

Mauldin, Robert H.: *See*—
Reinhart, Charles W.; and Mauldin, Robert H., 4,691,080, Cl. 174-88.000.

Maurer, Albert: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Mautner, Marvin L.; and Meinstein, Siegfried, to Witco Corporation. Low water neutralization to produce a highly active alkaryl sulfonate. 4,690,785, Cl. 260-505.00N.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Mertens, Horst M.; and Bogl, Leonhard, 4,690,098, Cl. 118-727.000.

Maxon Corporation: *See*—
Coppin, William, 4,690,635, Cl. 431-187.000.

Mayo, William T., Jr., to North American Philips Corporation. Producing pseudocolor images for diagnostic ultrasound imaging. 4,690,150, Cl. 128-660.000.

Mayr, Ernst: *See*—
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.

Mayuzumi, Tetsuya: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.

Mazda Motor Corporation: *See*—
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-192.00B.
Morishita, Tsuyoshi; Otaki, Sigemi; and Sakai, Noriyuki, 4,690,320, Cl. 228-194.000.
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.
Nishimura, Hirofumi; and Morita, Yasuyuki, 4,690,110, Cl. 123-90.170.
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, 4,690,432, Cl. 280-775.000.

McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., to Rice Multiphones, Inc. Multifunction two line telephone system. 4,691,345, Cl. 379-158.000.

McCabria, Jack L., to Westinghouse Electric Corp. Permanent magnet alternator power generation system. 4,691,119, Cl. 307-84.000.

McCarthy, Brian D.; and Edwards, Michael. Night vision goggle arrangement with automatic release. 4,689,834, Cl. 2-422.000.

McClellan, Gary C. Holster and handgrip extension for miniature handguns. 4,689,908, Cl. 42-71.020.

McCoy, Bing, to McCoy, Bing; and DeLaski, Donald. Pitch and amplitude calculator and converter which provides an output signal with a normalized frequency. 4,690,026, Cl. 84-1.190.

McCulloch, Robert M.; and Jorgensen, Ove, to Danfoss A/S. Actuator means for the control of a refrigeration system expansion valve. 4,689,968, Cl. 62-225.000.

McCullough, Edward W.: *See*—
Fredericks, Walter A.; and McCullough, Edward W., 4,690,661, Cl. 464-78.000.

McDaniel, Max P.; and Short, James N., to Phillips Petroleum Company. Polymerization process using a catalyst comprising a phosphate and with a bis-(cyclopentadienyl)chromium(II) compound. 4,690,990, Cl. 526-130.000.

McDermott, Julian A. Battery charging apparatus. 4,691,157, Cl. 320-2.000.

McDonald, J. Kevin. Foundation for building structure and method of constructing building structure utilizing same. 4,689,926, Cl. 52-169.110.

McElroy, Robert C. Computer harness adaptive tester. 4,690,475, Cl. 439-502.000.

McGeehan, Joseph P.; and Bateman, Andrew, to National Research Development Corporation. Data transmission using a transparent tone-in band system. 4,691,375, Cl. 455-71.000.

McGraghan, Thomas A.: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

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Moles, John A. G.; and McMahon, Colbert M., 4,690,007, Cl. 74-5.120.

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McVey, Charles L.: *See*—
Scott, Curtis E.; and McVey, Charles L., 4,690,727, Cl. 156-635.000.

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Fershko, Jane S.; and Lackey, Robert W., 4,690,287, Cl. 211-49.100.

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Ganz, Robert H., 4,689,934, Cl. 53-398.000.

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Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.

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Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

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Megga, Dennis. Bases for the game of baseball. 4,690,403, Cl. 273-25.000.

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Haaland, Per, 4,690,414, Cl. 277-207.00A.

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Mausner, Marvin L.; and Meinstein, Siegfried, 4,690,785, Cl. 260-505.00N.

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Asai, Masaki, 4,690,381, Cl. 254-394.000.

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Gerritsen, Jan; and Mensies, Otto, 4,691,139, Cl. 313-413.000.

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Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.

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Bitsch, Roland, 4,690,902, Cl. 436-110.000.
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Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Manini, Benito, 4,689,971, Cl. 66-25.000.

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Frisch, Eberhard, 4,690,354, Cl. 244-158.00R.
Hahn, Michael; and Kuntze-Fechner, Gerald, 4,690,616, Cl. 416-134.00A.
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Messick, Virginia B.: *See*—
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., 4,690,988, Cl. 525-502.000.

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Gabeno, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

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Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, 4,690,226, Cl. 173-128.000.

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Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.

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Balzano, Savino, 4,690,047, Cl. 99-542.000.

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Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

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Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.

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Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.

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Chen, Nai Y.; and Miale, Joseph N., 4,690,903, Cl. 435-161.000.

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Luiset, Jean-Jacques; and Seigneurin, Michel, 4,690,641, Cl. 433-129.000.

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Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.

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Giammara, Beverly L.; and Hanker, Jacob S., 4,690,901, Cl. 436-86.000.

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Eke, Kenneth I., 4,691,088, Cl. 219-10.55F.

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Hegemann, Gunther; and Miedeck, Karin, 4,691,002, Cl. 525-249.000.
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Mitani, Tomomasa; and Mihata, Ichiro, 4,690,968, Cl. 524-315.000.
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Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Makino, Hiroshi; and Sasaki, Akio, 4,690,119, Cl. 123-571.000.
Mikusi, Yoshio; and Koshinaka, Osamu, to Maruzen Sewing Machine Co., Ltd. Overedge sewing machine. 4,690,080, Cl. 112-162.000.
Miller, Alan L.; and Kozlowski, James L., to Borg-Warner Industrial Products, Inc. Adaptive control system for mechanical seal assembly. 4,691,276, Cl. 364-148.000.
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Barton, Richard O.; Bergin, Michael T.; and Miller, John M., 4,690,563, Cl. 356-375.000.
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Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.
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Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Minigrip, Incorporated: *See*—
Ausnit, Steven, 4,691,373, Cl. 383-63.000.
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Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.
Minnesota Mining and Manufacturing Company: *See*—
Aasen, Steven M.; and Bryan, Thomas T., 4,691,039, Cl. 556-446.000.
King-Smith, Eric A.; ReMine, Walter J.; and Dufresne, Joel R., 4,690,145, Cl. 128-421.000.
Mitra, Sumita B.; and Mitra, Smarajit, 4,691,059, Cl. 568-333.000.
Minnesota Mining and Manufacturing Company: *See*—
Hubbard, Lloyd C.; and Clausen, Earl W., 4,690,002, Cl. 73-861.250.
Minolta Camera Kabushiki Kaisha: *See*—
Nakamura, Ikuahi, 4,690,878, Cl. 429-1.000.
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Ando, Makoto, 4,690,537, Cl. 354-402.000.
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, 4,690,530, Cl. 354-21.000.
Matsui, Tohru; and Egawa, Takeshi, 4,690,538, Cl. 354-403.000.
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.
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Sigelman, Jesse L.; and Miodownik, Saul, 4,691,195, Cl. 340-545.000.
Mirell, Stuart G. Electromagnetic therapy control system. 4,690,130, Cl. 128-1.300.
Mitani, Tomomasa; and Mihata, Ichiro, to Dainippon Ink and Chemicals, Inc. Fluoroolefin copolymer, process for production thereof and composition containing said copolymer. 4,690,968, Cl. 524-315.000.
Mitchell, Francoise E. L., to Tidy Chain Pty. Ltd. Article storage and display device. 4,690,288, Cl. 211-113.000.
Mitchell, Robert J. C. S.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
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Mitra, Sumita B.; and Mitra, Smarajit, 4,691,059, Cl. 568-333.000.
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Fujioka, Hirofumi; and Inoue, Masami, 4,690,957, Cl. 522-31.000.
Hosaka, Shuroku; and Shiga, Masaaki, 4,691,260, Cl. 360-121.000.
Ichioka, Youichi, 4,690,243, Cl. 187-101.000.
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,691,078, Cl. 174-68.500.
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Takada, Ikunori, 4,691,224, Cl. 357-53.000.
Takata, Nobuharu, 4,691,156, Cl. 318-798.000.
Terada, Yasushi; and Nakayama, Takeshi, 4,691,216, Cl. 357-23.600.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Kimura, Shigeo; and Kurata, Kouichi, 4,691,060, Cl. 568-420.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Akatsu, Makoto; and Hori, Keiichi, 4,690,618, Cl. 417-226.000.
Kashiwazaki, Masamichi; Ogawa, Kiichiro; and Uchida, Satoshi, 4,689,949, Cl. 60-39.120.
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,690,020, Cl. 82-2.00D.
Takahashi, Takehiro, 4,690,022, Cl. 83-308.000.
Mitsubishi Monsanto Chemical Company: *See*—
Fujino, Kiyoharu, 4,691,030, Cl. 549-255.000.
Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Nojiri, Naohiro; and Sakai, Yukio, 4,690,913, Cl. 502-340.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Ooe, Akihiko; Imaida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,974, Cl. 525-64.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,975, Cl. 525-64.000.
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Mitsubishi Rayon Engineering Co., Ltd.: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 110-629.000.
Mitsuboshi Sangyo Co. Ltd.: *See*—
Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, 4,690,839, Cl. 427-366.000.
Mitsui & Co., Ltd.: *See*—
Usui, Takayuki, 4,690,829, Cl. 426-661.000.
Mitutoyo Mfg., Co., Ltd.: *See*—
Nishina, Shingo, 4,689,890, Cl. 33-504.000.
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, to Hitachi, Ltd. Apparatus for multiplex recording and reproduction of audio and video signals. 4,691,246, Cl. 358-310.000.
Miyadera, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Construction for mounting service hole blank cap of a console box. 4,690,241, Cl. 180-315.000.
Miyake, Akira: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
Miyakoshi Printing Machinery Co., Ltd.: *See*—
Kishine, Toshiaki; Izawa, Hideo; and Ohba, Masaru, 4,690,051, Cl. 101-211.000.
Miyakoshi, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha. Three-wheeled motor vehicle. 4,690,235, Cl. 180-210.000.
Miyamoto, Takeaki: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Miyao, Ichiro: *See*—
Kawakita, Takao; and Miyao, Ichiro, 4,689,919, Cl. 51-206.00P.
Miyasato, Tsutomu: *See*—
Kaneko, Masahide; Hatori, Yoshinori; and Miyasato, Tsutomu, 4,691,230, Cl. 358-105.000.
Miyata, Hiroshi: *See*—
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
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Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
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Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Miyatake, Yoshito: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Miyazaki, Kunio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroai; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.
Miyoshi, Kazunori: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording media and process for producing same. 4,690,863, Cl. 428-328.000.
Mizelle, Ned W. Recliner unit with novel locking and actuating mechanism. 4,690,454, Cl. 297-89.000.
Mizuhara, Howard, to GTE Products Corporation. Article comprising a ductile brazing alloy foil containing reactive metals and precious metals. 4,690,876, Cl. 428-606.000.
Mizuno, Takao: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Mizuno, Yoshikuni: *See*—
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Mjoberg, Per J.: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

Mobay Corporation: *See*—
Schmidt, Manfred; and Yeater, Robert P., 4,690,964, Cl. 524-125.000.
Zeck, Walter M.; and Simonet, Donald E., 4,690,947, Cl. 514-521.000.
Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Miale, Joseph N., 4,690,903, Cl. 435-161.000.
Oksuzler, Yalcin, 4,690,586, Cl. 405-209.000.
Mobil Solar Energy Corporation: *See*—
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,691,077, Cl. 136-256.000.
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, to Mochida Seiyaku Kabushiki Kaisha. Measuring reagent kit for determining an antigen, antibody or antigen-antibody complex. 4,690,908, Cl. 436-518.000.
Mochida Seiyaku Kabushiki Kaisha: *See*—
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.
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Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.
Modecor Italiana S.p.A.: *See*—
Leolli, Franco, 4,690,289, Cl. 211-186.000.
Modular Power Corporation: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.
Mohanty, Bibhuti B., to C-I-L Inc. Smooth wall blasting in rock. 4,690,058, Cl. 102-312.000.
Mohr, Heinrich: *See*—
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.
Mohr, Joachim: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.
Moles, John A. G.; and McMahon, Colbert M., to Short Brothers PLC. Gyroscope. 4,690,007, Cl. 74-5.120.
Molins PLC: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.
Mollett, Larry R.; and Goczalk, Robert W., to Hughes Aircraft Company. RF input drive saturation control loop. 4,691,173, Cl. 330-144.000.
Molnlycke AB: *See*—
Starzmann, Martin, 4,690,137, Cl. 128-132.00D.
Mos, George, to United States of America, Army. Variable linear resistor. 4,691,187, Cl. 338-114.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.
Hamisch, Paul H., Jr., 4,690,723, Cl. 156-541.000.
Mongeau, Peter P., to Electromagnetic Launch Research, Inc. Iron-free rotary disk electrical machine. 4,691,133, Cl. 310-178.000.
Monsanto Company: *See*—
Fung, Bill S. K.; and Hrutfiord, Bjorn F., 4,691,061, Cl. 568-432.000.
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.
Paulik, Frank E.; Herahman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.
Moore, Katherine L.: *See*—
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.
Morel, Simone. Obturating device for tubes, flasks and other containers, the opening and closing of which are controlled through rotation. 4,690,304, Cl. 222-44.000.
Morgan, David L., to Seymour-Sheridan, Inc. Swivel bellows assembly. 4,690,323, Cl. 236-99.00F.
Morgenrath, Jali. Electrical connector securing system. 4,690,476, Cl. 439-502.000.
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for measuring ink density on printed surfaces. 4,690,564, Cl. 356-445.000.
Mori, Kei. Light diverting device. 4,690,490, Cl. 350-96.150.
Mori, Keijiro: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.
Mori, Shinsaku: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.
Mori, Shisaku: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, to Chugai Seiyaku Kabushiki Kaisha. Pyridine derivatives and their use as anti-allergic agents. 4,691,018, Cl. 546-309.000.
Mori, Takehiko: *See*—
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.
Mori, Yasuki: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikaza; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.
Morihata, Kunio: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Morimoto, Kenji: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.
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Morishima, Kazuo: *See*—
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Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.
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Morishita, Takashi: *See*—
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Morita, Fumiaki: *See*—
Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.
Morita, Yasuyuki: *See*—
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Morito, Makoto, to OKI Electric Industry Co., Ltd. Speech synthesizer with repeated symmetric segment. 4,691,359, Cl. 381-51.000.
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Morris, Gregory J.: *See*—
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Morris, R. Scott: *See*—
Walsh, Myles A., III; and Morris, R. Scott, 4,690,741, Cl. 204-149.000.
Morrison, Donald L.; and Bartok, Stephen, to Standard Oil Company, The. Rolling shutter construction. 4,690,193, Cl. 160-133.000.
Morse, Ronald W.: *See*—
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.
Mortensen, Alf. Control system for diverting/equalizing electrical potentials between two objects. 4,691,198, Cl. 340-649.000.
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Morton, Gerald H.: *See*—
Gardner, John F.; and Morton, Gerald H., 4,690,164, Cl. 137-15.000.
Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. Current fed inverter. 4,691,275, Cl. 363-143.000.
Mosmann, Tim R., to DNAX Research Institute of Molecular and Cellular Biology, Inc. Hybridoma cell lines producing monoclonal antibodies which specifically bind to mouse interleukin-2. 4,690,893, Cl. 435-240.270.
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Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, 4,691,043, Cl. 560-064.000.
Motalov, Alexandr N.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shimanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Motegi, Nawoto; Watanabe, Yukio; Shimada, Nsohiro; and Okajima, Masaki, to Kabushiki Kaisha Toshiba. Semiconductor laser device having current confining and built-in waveguide structure. 4,691,321, Cl. 372-46.000.
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Blum, Stephen C.; and Deriso, John, 4,691,179, Cl. 333-202.000.
Ecklund, Lawrence M., 4,691,175, Cl. 331-1.00A.
Ledzius, Robert C.; and Allen, Steven P., 4,691,124, Cl. 307-303.000.
Marabotto, Eduardo J.; and Bresin, Mark S., 4,690,471, Cl. 439-63.000.
Pelley, Perry H., III; and Lewandowski, Alan, 4,691,300, Cl. 365-200.000.
Rybicki, Mathew A., 4,691,125, Cl. 307-353.000.
Moulding, Thomas S., Jr.; and Ellis, Donald G. Method of opening a medicine package. 4,690,676, Cl. 604-189.000.
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Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.
Mrenna, Stephen A.; and Whipple, Michael J., to Westinghouse Electric Corp. Circuit breaker with adjustable magnetic trip unit. 4,691,182, Cl. 335-176.000.
M'Timkulu, Thabiso: *See*—
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MTS Systems Corporation: *See*—
Harvey, Dennis N.; and Bertolasi, Robert B., 4,690,001, Cl. 73-800.000.
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, to Blanc GmbH & Company. Built-in sink. 4,689,840, Cl. 4-629.000.
Mueller Co.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.
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McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.
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Mukaida, Yoshito: *See*—
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Muller, Hans-Albert: *See*—
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Mulvaney, Lewis W., to R. Neumann & Co. Partially detackified leather and glove. 4,689,832, Cl. 2-161.00A.
Munyon, Gary D.; and Swiech, Matthew J., to G & B Rubber Stamp Co., Inc. Roller stamp construction. 4,690,053, Cl. 101-328.000.
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Murakami, Susumu; Kagami, Teruyuki; Yetsuo, Tsutomu; and Takahashi, Masaaki, to Hitachi, Ltd. Semiconductor device having high breakdown voltage. 4,691,223, Cl. 357-51.000.
Murakami, Yukiyasu: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
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Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, to Murata Manufacturing Co., Ltd. One-dimensional pyroelectric sensor array. 4,691,104, Cl. 250-338.000.
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Murata, Toyoji: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Murate, Shigenori; and Hattori, Yoshinori, to NGK Spark Plug Co., Ltd. Process of contouring the edges of a ceramic rotor. 4,689,921, Cl. 51-317.000.
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, to Hitachi, Ltd. Scroll-type fluid machine with configured wrap edges and grooves. 4,690,625, Cl. 418-55.000.
Murayama, Kimimasa: *See*—
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Muroya, Minoru: *See*—
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Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,690,821, Cl. 424-401.000.
Murphy, Lawrence M., to United States of America, Energy. Energy conversion system. 4,691,075, Cl. 136-246.000.
Murphy, Richard D.; and Fischer, William C., to United Technologies Corporation. Backup control system (BUCS). 4,691,315, Cl. 371-9.000.
Musa, Yoshikazu: *See*—
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Muto, Shigeaki: *See*—
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Myers, John P.: *See*—
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Kato, Minoru, 4,690,594, Cl. 408-159.000.
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Halstead, Christopher, 4,690,129, Cl. 126-85.00B.
N I Industries: *See*—
Choate, Paul V.; and Woodburn, Robert W., 4,689,910, Cl. 42-100.000.
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Nafziger, Steven: *See*—
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Nagai, Kayoko; and Tsubuko, Kazuo, to Ricoh Co., Ltd. Liquid developer for electrophotography. 4,690,881, Cl. 430-114.000.
Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Image reader. 4,691,228, Cl. 358-75.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Speed control device. 4,690,662, Cl. 474-69.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,690,663, Cl. 474-80.000.
Nagano, Noriaki: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for automotive vehicles. 4,690,015, Cl. 74-665.0GE.
Nagaoka, Yoshitomi: *See*—
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Nagase, Yasuo: *See*—
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Nagashima, Masayasu; and Iijima, Nobuo, to Fujitsu Limited. Method and apparatus for transporting an article in vacuum. 4,690,591, Cl. 406-88.000.
Nagashima, Nao, to Canon Kabushiki Kaisha. Image reading apparatus. 4,691,365, Cl. 382-54.000.
Naito, Takanobu; Yokoyama, Masaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, to Kaken Pharmaceutical Co., Ltd. Cephalosporin compounds. 4,691,014, Cl. 540-227.000.
Nakada, Takao, to Hitachi Chemical Co., Ltd. Zirconia ceramics and process for producing the same. 4,690,911, Cl. 501-105.000.
Nakada, Yasuo, to Sony Corporation. Apparatus for detecting distance to an object. 4,690,549, Cl. 356-4.000.
Nakagaki, Shintaro: *See*—
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Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fuso; and Kohara, Yuritoshi, to Yamaguchikyoei Industry Co. Ltd. Water cooled scrap preheating bucket. 4,690,638, Cl. 432-81.000.
Nakagawa, Taizo: *See*—
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Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, to Minolta Camera Kabushiki Kaisha. Exposure control device for a camera in flash photography. 4,690,536, Cl. 354-402.000.
Nakai, Masaaki: *See*—
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Nakajima, Takeshi, to NEC Corporation. Battery saving signal generating circuit. 4,691,382, Cl. 455-343.000.
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, to Matsushita Electric Industrial Co., Ltd. Compact projection lens. 4,690,515, Cl. 350-432.000.
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Light-fast yellow disperse dye composition for polyester. 4,690,686, Cl. 8-638.000.
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, to Ricoh Co., Ltd. Magneto optical recording medium. 4,690,861, Cl. 428-623.000.
Nakamura, Ikushi, to Minolta Camera Kabukishi Kaisha. Battery power detector for sensing presence of batteries. 4,690,878, Cl. 429-1.000.
Nakamura, Kazuyoshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fuso; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
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Nakamura, Takayoshi, to Kabushiki Kaisha Kito. Electric chain block. 4,690,379, Cl. 254-347.000.
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst, its method of preparation and process for its use in the hydrogenation of diolefins. 4,691,070, Cl. 585-271.000.
Nakano, Jiro, to Fanuc Ltd. Stator laminate impregnation in a liquid-cooled motor. 4,691,131, Cl. 310-54.000.

Nakano, Kohji: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
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Nakatani, Hiroshi: *See*—
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Nakatani, Masayuki: *See*—
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Sagisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.
Nakatani, Shuichi: *See*—
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Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, to Mazda Motor Corporation. Intake system for internal combustion engine. 4,690,106, Cl. 123-52.00M.
Nakayama, Takeshi: *See*—
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Namdari, Bahram. Nutcracker. 4,690,048, Cl. 99-575.000.
Nanbe, Yukihiro; and Sakakibara, Toshiyuki, to Nippon Fine Chemical Co., Ltd. Process for preparing phosphatidylcholine derivatives. 4,690,784, Cl. 260-403.000.
Naoe, Masahiko; and Ishibeshi, Shozo, to Konishiroku Photo Industry Co., Ltd. Method of ion beam generation and an apparatus based on such method. 4,690,744, Cl. 204-192.110.
Napco Industries, Inc.: *See*—
White, Bernard C., 4,689,911, Cl. 42-105.000.
Narahara, Toshikazu: *See*—
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Narang, Rajendra K. Clothes dryer and laundry system. 4,689,896, Cl. 34-82.000.
Nardi, Alain; and Simier, Jean-Noel, to Societe Chimique des Charbonnages-CdF chimie. Process for reducing the chances of ignition and explosion due to the decomposition of high-pressure industrial process gases. 4,690,800, Cl. 422-40.000.
Narisawa, Nobuyuki: *See*—
Kimura, Shigehiro; Ono, Takashi; and Narisawa, Nobuyuki, 4,690,123, Cl. 123-612.000.
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Method for making negative working O-quinone diazide containing dry planographic printing plate utilizing multiply light exposure, development and basic treatment. 4,690,886, Cl. 430-303.000.
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Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshitera, to TDK Corporation. Electromagnetic shielding material. 4,690,778, Cl. 252-506.000.
Narutani, Tetsu; and Suzuki, Shigeharu, to Kawasaki Steel Corporation. Ultrasoft stainless steel. 4,690,798, Cl. 420-61.000.
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., to Monsanto Company. Process for the preparation of asbestiform crystalline calcium sodium metaphosphate fibers. 4,690,809, Cl. 423-306.000.
National Dairy Association of N.Z., The: *See*—
Gregan, David J.; and Crowter, Ronald H., 4,690,099, Cl. 119-14.410.
National Gypsum Company: *See*—
Menchetti, Robert J., 4,689,930, Cl. 52-277.000.
National Medical Care: *See*—
Teil, Elaine N.; and Veltman, Preston L., 4,690,772, Cl. 252-106.000.
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Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.
Naudin, Jacky, to Valeo. Clutch cover assembly. 4,690,259, Cl. 192-70.280.
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Jen, Tai-Kuang, 4,691,150, Cl. 318-331.000.
Kleijne, Theodoor A.; and Goossens, Jan B., 4,691,350, Cl. 380-3.000.
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, to Jenoptik Jena GmbH. Laser spectral fluorometer. 4,691,110, Cl. 250-458.100.
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Furui, Toshiyuki, 4,691,281, Cl. 364-200.000.
Iwata, Jun, 4,691,278, Cl. 364-200.000.
Makino, Masayuki, 4,691,338, Cl. 379-61.000.
Nakajima, Takeshi, 4,691,382, Cl. 455-343.000.
Shizume, Yasumichi, 4,691,379, Cl. 455-319.000.
Tanigaki, Katsumi; and Iida, Yasuo, 4,690,882, Cl. 430-192.000.
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Nee, John D.; and Hahn, Joseph J., to Westinghouse Electric Corp. Tool for cutting locking cups from guide tube mounting screws in a nuclear reactor. 4,690,593, Cl. 408-80.000.
Nelson, Carib: *See*—
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Nelson, Jack: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Nelson, Mark R.: *See*—
Jencks, David R.; and Nelson, Mark R., 4,690,126, Cl. 126-77.000.
Nelson, Martin N.; and Rough, J. Kirkwood H. Dynamic video system and method. 4,691,239, Cl. 358-282.000.
Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Tartrate-based light stabilizers for plastics. 4,690,963, Cl. 524-98.000.
Nelson, Theodore G.; and Diller, Calvin D., to Tektronix, Inc. Fast recovery amplifier. 4,691,174, Cl. 330-260.000.
Nerone, Louis R.: *See*—
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Neste Oy: *See*—
Seppala , Jukka, 4,690,991, Cl. 526-158.000.
Nestor, John J., Jr.; and Vickery, Brian, to Syntex (U.S.A.) Inc. Nona and decapeptide analogs of LHRH useful as LHRH antagonists. 4,690,916, Cl. 514-15.000.
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Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.
Neumann, Bruno: *See*—
Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.
Neustadt, Bernard R.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.
New Japan Radio Co., Ltd.: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.
Newman, Donald J.: *See*—
Dunphy, Gerald F.; and Newman, Donald J., 4,689,975, Cl. 70-56.000.
Newport Corporation: *See*—
Zimmermann, Micha, 4,690,507, Cl. 350-321.000.
Neyer, Antonius A., to U.S. Philips Corp. Integrated optical wavelength multiplexer and demultiplexer device for monomode transmission systems and its use. 4,690,489, Cl. 350-96.140.
Ng, Johny S., to Occidental Chemical Corporation. Catalytic process for coupling telomers of chlorotrifluoroethylene. 4,691,067, Cl. 570-153.000.
NGK Insulators, Ltd.: *See*—
Oda, Isao; and Tsuno, Nobuo, 4,690,617, Cl. 416-241.00B.
NGK Spark Plug Co., Ltd.: *See*—
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kanbe, Rokuro, 4,690,872, Cl. 428-446.000.
Murate, Shigenori; and Hattori, Yoshinori, 4,689,921, Cl. 51-317.000.
Okuno, Akiyasu; and Watanabe, Masakazu, 4,690,909, Cl. 501-90.000.
Nicator AB: *See*—
Wiklund, Klas R., 4,690,557, Cl. 356-155.000.
Nichias Corporation: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.
Nicholls, Robin P.; and Savoie, Rolland J. Control circuit for electric vehicles. 4,691,148, Cl. 318-12.000.
Nichols, James H., Jr.: *See*—
Zebley, Raymond S.; Nichols, James H., Jr.; and Cioack, Bernard M., Jr., 4,690,302, Cl. 221-11.000.
Nickl, Josef: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.
Nicolas, Michel: *See*—
Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, 4,690,035, Cl. 91-442.000.

Nieh, Edward C. Y.: *See*—
Duranleau, Roger G.; Nieh, Edward C. Y.; and Knifton, John F., 4,691,041, Cl. 558-277.000.

Nielsen, Steven T. Centrifuge tube having reusable seal. 4,690,670, Cl. 494-16.000.

Nienburg, Hans: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.05C.

Niggemann, Richard; and Readman, John, to Sundstrand Corporation. Fluid jet impingement heat exchanger for operation in zero gravity conditions. 4,690,210, Cl. 165-159.000.

Nihon Senmo Dyeing Co., Ltd.: *See*—
Tomibe, Shinji; Gonnbuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.

Niimura, Koichi: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Niinuma, Akira: *See*—
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.

Nikawa, Yoshio: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.

Nikov, Nikolay Y.: *See*—
Garianov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Niles Parts Co., Ltd.: *See*—
Katsutani, Kazuji; and Inaba, Shigeru, 4,691,181, Cl. 335-128.000.

Nimura, Takao: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.

Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, to Nitto Electric Industrial Co., Ltd. Process for producing a microcapsule containing a liquid active material. 4,690,786, Cl. 264-4.600.

Nippon Electric Co., Ltd.: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Esnoto, Shigeo, 4,690,960, Cl. 523-442.000.

Nippon Fine Chemical Co., Ltd.: *See*—
Nanba, Yukihiro; and Sakakibara, Toshiyuki, 4,690,784, Cl. 260-403.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.

Nippon Kogaku K. K.: *See*—
Fujie, Daijiro, 4,690,517, Cl. 350-458.000.
Kanno, Hideo, 4,690,516, Cl. 350-444.000.
Kato, Kinya; and Tsuchiya, Hiroynki, 4,690,565, Cl. 356-446.000.
Takagi, Akihiro; and Kimoto, Kiyoshi, 4,691,308, Cl. 369-13.000.
Tanimoto, Akikazu; and Imamura, Kazunori, 4,690,528, Cl. 353-101.000.
Wakabayashi, Hiroshi; and Kazami, Kazuyuki, 4,690,533, Cl. 354-173.110.

Nippon Light Metal Co., Ltd.: *See*—
Yoshida, Katunori, 4,690,247, Cl. 182-63.000.

Nippon Rubber Co. Ltd.: *See*—
Ishibashi, Tokujiro, 4,689,900, Cl. 36-103.000.

Nippon Shokubai Kagaku Co., Ltd.: *See*—
Fukuchi, Shuzo; and Yamaguchi, Shigeru, 4,691,045, Cl. 560-185.000.

Nippon Soken, Inc.: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.
Yoshino, Yasuhisa; and Osada, Masahiko, 4,691,361, Cl. 381-81.000.

Nippon Telegraph and Telephone Corporation: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazusori, 4,690,887, Cl. 430-331.000.
Kuwata, Yutaka; and Nerone, Louis R., 4,691,273, Cl. 363-132.000.

Nippondenso Co., Ltd.: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Sasakura, Hachiroe; and Tsujimura, Masakuni, 4,690,122, Cl. 123-609.000.
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Nirenberg, Morris. Button delivery system for sewing machines. 4,690,077, Cl. 112-113.000.

Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, to Sanofi. Anorectic agent; 4-(3-trifluoromethylphenyl)-1-(2-cyanoethyl)-1,2,3,6-tetrahydropyridine. 4,691,019, Cl. 546-330.000.

Nishida, Isamu: *See*—
Odagiri, Hiroshi; and Nishida, Isamu, 4,690,568, Cl. 368-204.000.

Nishida, Yoshihiro: *See*—
Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, 4,691,251, Cl. 360-14.100.

Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, to Kyocera Corporation. Thermal head for heat-sensitive recording. 4,691,210, Cl. 346-76.0PH.

Nishikawa, Eiichiro: *See*—
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, 4,691,070, Cl. 585-273.000.

Nishikuri, Masao: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.

Nishimoto, Naomichi, to Victor Company of Japan. Synchronized signal separating circuit for a recording and reproducing apparatus. 4,691,248, Cl. 358-320.000.

Nishimura, Hirofumi; and Morita, Yasuyuki, to Mazda Motor Corporation. Variable valve mechanism for internal combustion engines. 4,690,110, Cl. 123-90.170.

Nishimura, Makoto, to Tokiko, Ltd. Method of controlling positioning of rotor of stepping motor. 4,691,153, Cl. 318-696.000.

Nishimura, Toshio, to Sharp Kabushiki Kaisha. Solar power circuit. 4,691,118, Cl. 307-66.000.

Nishimura, Yasuyuki: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Nishina, Kiichiro: *See*—
Kouchiwa, Taira; and Nishina, Kiichiro, 4,690,518, Cl. 350-464.000.

Nishina, Shingo, to Mitutoyo Mfg., Co., Ltd. Digital display measuring apparatus. 4,689,890, Cl. 33-504.000.

Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, to Mitsubishi Denki Kabushiki Kaisha. Aluminum circuit to be disconnected and method of cutting the same. 4,691,078, Cl. 174-68.500.

Nishiura, Masaharu, to Fuji Electric Company, Ltd. Process for fabricating a thin-film solar battery. 4,689,874, Cl. 437-2.000.

Nishiyama, Masao; and Hirano, Yasuo, to Allied Corporation. Copolymerization of lactam with diese polymer having amino or imino end groups. 4,691,004, Cl. 528-323.000.

Nishiyama, Michio: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.

Nishiyama, Tadashi: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitagu, 4,690,788, Cl. 264-22.000.

Niskin, Shale J.; and Williams, Gerald J., to General Oceanics, Inc. Sheave assembly with multiple pulleys used to measure cable angle. 4,690,380, Cl. 254-394.000.

Nissan Motor Company Limited: *See*—
Higashiyama, Kazuhiro, 4,690,124, Cl. 123-643.000.
Ito, Ken; and Inoue, Naohiko, 4,690,431, Cl. 280-771.000.
Sasaki, Masafumi, 4,690,572, Cl. 384-120.000.
Takahashi, Nobutaka, 4,690,116, Cl. 123-425.000.
Takeda, Hitoshi, 4,691,285, Cl. 364-424.100.

Nissho Iwai American Corporation: *See*—
Timineri, Anthony A., 4,691,207, Cl. 343-766.000.

Nitta, Tomio, to Tokai Corporation. High-pressure gas filling valve for use in a pressure resistant container. 4,690,377, Cl. 251-354.000.

Nitto Chemical Industry Co., Ltd: *See*—
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, 4,690,786, Cl. 264-4.600.
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Niwa, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Sliding roof for vehicles. 4,690,452, Cl. 296-216.000.

Niwa, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Sliding roof for vehicles. 4,690,453, Cl. 296-216.000.

NL Industries, Inc.: *See*—
Bhatia, Kishan; and Garcia, John G., Jr., 4,690,805, Cl. 423-224.000.

Nobuhara, Uichi, to Kabushiki Kaisha Kumalift Gijutsu Kenkyusho. Automatic transfer apparatus for elevators. 4,690,611, Cl. 414-661.000.

Noshiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Terso; Miyamoto, Takeaki; and Ito, Hiraku, to Koken Company Limited. Production process of an antithrombogenic and antiadhesive material for medical use. 4,690,973, Cl. 525-54.100.

Nojiri, Nachiro; and Sakai, Yukio, to Mitsubishi Petrochemical Co., Ltd. Silver catalyst for production of ethylene oxide from ethylene and process for producing the catalyst. 4,690,913, Cl. 502-340.000.

Nomix Manufacturing Co. Limited: *See*—
Gill, David C., 4,690,326, Cl. 239-223.000.

Nomura, Hiroshi: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Nomura, Kenji: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Nomura, Takao: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.

Nonaka, Hikaru, to Kabushiki Kaisha Toshiba. Refrigeration having mode-change chamber capable of operation within freezing, chill and refrigeration temperature ranges. 4,689,966, Cl. 62-187.000.

Noren, Gerry K.: *See*—
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.

Norimatsu, Kohji: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.

North American Philips Corporation: *See*—
Mayo, William T., Jr., 4,690,150, Cl. 128-660.000.

Northern Telecom Limited: *See*—
Rosenbaum, Stanley D.; and Plett, Calvin, 4,691,271, Cl. 363-60.000.

Norton, Charles L. Coal combustion system. 4,690,074, Cl. 110-264.000.

Norton, Scott J.: *See*—
Brady, William T.; Norton, Scott J.; and Ko, Jinrea, 4,691,052, Cl. 562-506.000.

Noto, Akira: *See*—
Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.

Nott, Babu R. Electrolytic process for producing extremely low chloride anion exchange resins. 4,690,739, Cl. 204-131.000.

Novatel Communications Ltd.: *See*—
Brasthen, Russell E., 4,691,348, Cl. 379-389.000.

Nowicki, Casimir W., to Owens-Illinois, Inc. Label magazine. 4,690,395, Cl. 271-98.000.

Nozaki, Shunkichi: *See*—
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, 4,690,872, Cl. 428-446.000.

Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, to Kabushiki Kaisha Komatsu Seisakusho. Gas laser device. 4,691,322, Cl. 372-82.000.

NPK "Textilno Maschinostroene" : *See*—
Babov, Dinko A.; and Babov, Hristo A., 4,689,948, Cl. 57-328.000.

NPK za Kontrolno Zavarachni Raboti: *See*—
Garianov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

NSK-Warner Kabushiki Kaisha: *See*—
Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, 4,690,257, Cl. 192-3.310.

Nukem GmbH: *See*—
Huschelrath, Gerhard, 4,689,996, Cl. 73-643.000.

Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, to Hitachi, Ltd.; and Hitachi Chemical Co., Ltd. Low thermal expansion resin material and composite shaped article. 4,690,999, Cl. 528-188.000.

Numata, Yasumasa: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.

Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, to Ed. Zublin Aktiengesellschaft. Method and apparatus for positioning diaphragms in vertical slotted walls which are supported by a suspension. 4,690,590, Cl. 405-267.000.

Nuzzo, Ralph G.: *See*—
Allara, David L.; and Nuzzo, Ralph G., 4,690,715, Cl. 148-6.15R.

Nyfeler, Robert: *See*—
Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.

Oba, Hidehiro: *See*—
Isobe, Toshiaki; and Oba, Hidehiro, 4,690,117, Cl. 123-492.000.

Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, to Alps Electric Co., Ltd. Wafer and method for manufacturing switch wafer. 4,690,484, Cl. 439-736.000.

Oba, Toshio: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.

Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, to Nippon Soken, Inc.; Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Method and apparatus for detecting combustion variations in internal combustion engine. 4,691,286, Cl. 364-431.040.

Occhini, Elio; and Bianchi, Giuseppe, to Societa Cavi Pirelli, S.p.A. Underwater optical fiber cable with segmented protective tube. 4,690,497, Cl. 350-96.230.

Occidental Chemical Corporation: *See*—
Dannels, Bobby F., 4,691,065, Cl. 570-139.000.
Ng, Johny S., 4,691,067, Cl. 570-153.000.

O'Connor, James E.: *See*—
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.

Ocor Products Corporation: *See*—
Roesiger, Claude, 4,691,368, Cl. 383-10.000.

Oda, Isao; and Tsuno, Nobuo, to NGK Insulators, Ltd. Metal.ceramic composite article and a method of producing the same. 4,690,617, Cl. 416-241.00B.

Odagiri, Hiroshi; and Nishida, Isamu, to Seiko Instruments & Electronics Ltd. Battery lifetime indicator for a stopwatch. 4,690,568, Cl. 368-204.000.

Odai Tekko Kabushiki Kaisha: *See*—
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazunasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.

Odesskoe Spetsialnoe Konstruktorskoe Bjuro Spetsialnykh Stankov: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.

Odor, Elbert P., to Westinghouse Electric Corp. Stabilizing attachment for boring head. 4,690,592, Cl. 408-1.00R.

Oesterle, Gerhard: *See*—
Thalmann, Theo; and Oesterle, Gerhard, 4,690,176, Cl. 139-110.000.

Oestreich, Ulrich: *See*—
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.

Off, Joseph W. A.; and Ferguson, Vivian, to Automated Machinery Systems. Method and apparatus for forming and stitching a shirt placket. 4,690,078, Cl. 112-121.120.

Office National d'Etudes et de Recherche Aerospatiales: *See*—
Desarmot, Georges; and Sanchez, Manuel, 4,690,738, Cl. 204-130.000.

Ogasahara, Takio; and Fujimoto, Hiroaki, to Sanshin Kogyo Kabushiki Kaisha. Two-stroke engine. 4,690,109, Cl. 123-73.00A.

Ogawa, Kiichiro: *See*—
Kashiwazaki, Masamichi; Ogawa, Kiichairo; and Uchida, Satoshi, 4,689,949, Cl. 60-39.120.

Ogden Industries Pty. Ltd.: *See*—
Dunphy, Gerald F.; and Newman, Donald J., 4,689,975, Cl. 70-56.000.

Ogo, Muneya: *See*—
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazunasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.

Ogunbiyi, Lai; and Smith, Francis X., to Bausch & Lomb Incorporated. Microbial enzymatic contact lens cleaner and methods of use. 4,690,773, Cl. 252-174.120.

Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, to MECT Corporation. Sialic acid derivative and process for preparing the same. 4,691,012, Cl. 536-23.000.

Ohara, Masaki: *See*—
Hirata, Yasuhi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, 4,690,965, Cl. 524-236.000.

Ohara, Shuichi: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Ohara, Tsunemasa: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Ohashi, Kaoru: *See*—
Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shunichi, 4,690,429, Cl. 280-707.000.

Ohashi, Yoshiharu: *See*—
Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, 4,690,558, Cl. 356-318.000.

Ohata, Isao: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.

Ohba, Masaru: *See*—
Kishine, Toshiaki; Izawa, Hideo; and Ohba, Masaru, 4,690,051, Cl. 101-211.000.

Ohgama, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, to Kabushiki Kaisha Toshiba. Cryogenic apparatus. 4,689,970, Cl. 62-514.00R.

Ohi, Nobuhiro: *See*—
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.

Ohio State University: *See*—
Stevens, Vernon C., 4,691,006, Cl. 530-324.000.

Ohmori, Akira; and Ishiwari, Kazuo, to Daikin Kogyo Co., Ltd. Transparent coating material. 4,690,869, Cl. 428-421.000.

Ohmura, Kazutaka: *See*—
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Ohno, Shotaro: *See*—
Koyama, Kenji; and Ohno, Shotaro, 4,690,754, Cl. 210-94.000.

Ohsugi, Yoshiyuki: *See*—
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.

Ohta, Yukio: *See*—
Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.

Ohtorii, Masakazu, to Dainippon Screen Mfg. Co., Ltd. Device for reproduction and tracing. 4,690,527, Cl. 353-65.000.

Ohya, Koichi: *See*—
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.

Oizumi, Kiyoshi: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Oji Corn Starch Co., Ltd.: *See*—
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, to Hitachi, Ltd.; and Nitto Electric Industrial Co., Ltd. Thermal transfer sheet. 4,690,858, Cl. 428-216.000.

Okada, Fumio: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.

Terao, Nobuyuki; Yamaya, Masaki; and Okada, Fumio, 4,690,713, Cl. 106-287.160.

Okada, Kazuo; and Nakayama, Yoshiaki, to Fuji Photo Film Co., Ltd. Rotary magnetic recording-reproducing apparatus. 4,691,252, Cl. 360-73.000.

Okada, Minoru: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.

Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, to Asahi Glass Company Ltd. Ultrasonic delay line. 4,691,178, Cl. 333-143.000.

Okada, Yoshinori: *See*—
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.

Okajima, Masaki: *See*—
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.

Okamoto, Hiroshi, to Kabushiki Kaisha Kobe Seiko Sho. Induction stirrer/continuous casting mold assembly. 4,690,200, Cl. 164-504.000.

Okamura, Hisanori: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutsu; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Okazaki, Koshi: *See*—
Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, 4,691,066, Cl. 570-144.000.

Okazaki, Masaki: *See*—
Kubodera, Seiiti; and Okazaki, Masaki, 4,690,883, Cl. 430-203.000.

Okhuma, Toshiaki: *See*—
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 434-455.000.

Oki Electric Industry Co., Ltd.: *See*—
Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.
Morito, Makoto, 4,691,359, Cl. 381-51.000.

Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,690,870, Cl. 428-425.900.

Okoshi, Yukio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutsu; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Oksuzler, Yalcin, to Mobil Oil Corporation. Method and apparatus for positioning an offshore platform jacket. 4,690,586, Cl. 405-209.000.

Okuda, Shozo: *See*—
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.

Oku, Isamu; and Onda, Tetsurou, to Kabushiki Kaisha Toshiba. DC restoration circuit. 4,691,235, Cl. 358-172.000.

Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, to Mitsubishi Rayon Engineering Co., Ltd. Aerator and aerobic biological treatment process using same. 4,690,764, Cl. 210-629.000.

Okumura, Tsuguo: *See*—
Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.

Okuno, Akiyasu; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. Silicon carbide-graphite composite material and process for producing same. 4,690,909, Cl. 501-90.000.

O'Leary, Raymond P.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Holloway, Gerald C., Jr.; and Nelson, Jack, to Dayco Products, Inc. Chain belt construction, load block therefor and methods for making the same. 4,690,665, Cl. 474-245.000.

Olivier, Eric J.: *See*—
Goudeaux, James L.; and Olivier, Eric J., 4,689,923, Cl. 51-410.000.

Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, to SKF GmbH. Method for making a cage and the cage produced thereby. 4,689,982, Cl. 72-334.000.

Olson, Theodore D., Jr. Precisely recurrently controllable dropwise liquid-feeders. 4,690,249, Cl. 184-6.400.

Olympia Sports Products, Inc.: *See*—
Duncan, Neil, 4,690,376, Cl. 254-327.000.

Omi, Fumiya: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-423.000.

Omron Tateisi Electronics Co.: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,691,116, Cl. 307-10.000R.
Utsumomiya, Shunji; Teramoto, Tsutomu; and Haruta, Tadashi, 4,690,151, Cl. 128-682.000.

Onda, Tetsurou: *See*—
Oku, Isamu; and Onda, Tetsurou, 4,691,235, Cl. 358-172.000.

Onishi, Katsunori: *See*—
Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, 4,690,348, Cl. 242-66.000.

Ono, Shusuke: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.

Ono, Takashi: *See*—
Kimura, Shigehiro; Ono, Takashi; and Narisawa, Nobuyuki, 4,690,123, Cl. 123-612.000.

Ono, Yukou: *See*—
Ando, Hiroshi; Endo, Mitsuhiro; and Ono, Yukou, 4,690,034, Cl. 91-369.00A.

Onoda, Yoshimitsu; and Goko, Hiroshi, to Hitachi, Ltd.; and Hitachi Engineering and Service Co., Ltd. Emergency control system for elevators. 4,690,251, Cl. 187-107.000.

Onodera, Katsushige, to Hitachi, Ltd. System for controlling driving water for control rod driving mechanism of nuclear reactor. 4,690,794, Cl. 376-230.000.

Onuma, Toshio: *See*—
Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Ikuma, Shunichi, 4,690,429, Cl. 280-707.000.

Ooe, Akihiko; Imaida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, to Mitsubishi Rayon Co., Ltd. Method and apparatus for measuring gas partial pressure in living body. 4,690,147, Cl. 128-631.000.

Oogami, Mitsuhiro: *See*—
Yamada, Yosuke; and Oogami, Mitsuhiro, 4,690,158, Cl. 134-107.000.

Ookawa, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Magnetic video reproducer with reversely recorded cue track. 4,691,250, Cl. 360-14.100.

Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus in which recording is restarted responsive to recorded cue signals. 4,691,251, Cl. 360-14.100.

Optimil Machinery, Inc.: *See*—
Chapman, Robert E., 4,690,186, Cl. 144-176.000.

Optyl Eyewear Fashion International Corporation: *See*—
Angermann, Gottfried; and Hiebl, Berthold, 4,689,838, Cl. 2-441.000.

Orlans, Itzhak, to Vehashkaya, Amida Sinun. Annular filter disc. 4,690,761, Cl. 210-330.000.

Orley's Manufacturing Co., Inc.: *See*—
Jencks, David R.; and Nelson, Mark R., 4,690,126, Cl. 126-77.000.

Orr, Robert B.; and Chicosky, Leon, Jr., to Seton Company. Method of frothing aqueous ionic polyurethane dispersions and products produced therefrom. 4,690,953, Cl. 521-65.000.

Ortho Pharmaceutical Corporation: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,691,010, Cl. 536-187.000.

Ortwein, Heinz: *See*—
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.

Osada, Masahiko: *See*—
Yoshino, Yasuhisa; and Osada, Masahiko, 4,691,361, Cl. 381-81.000.

Osaka Diamond Industrial Co.: *See*—
Kawakita, Takao; and Miyao, Ichiro, 4,689,919, Cl. 51-206.00P.

Osaki, Sigemi: *See*—
Morishita, Tsuyoshi; Osaki, Sigemi; and Sakai, Noriyuki, 4,690,320, Cl. 228-194.000.

Osawa, Toshiaki: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Otis Elevator Company: *See*—
Adrian, Willy; and Wente, Gerald, 4,690,264, Cl. 198-335.000.

Otsuka, Mieko: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Pressing method and punch and die press for the same. 4,689,979, Cl. 72-57.000.

Otsuka, Susumu: *See*—
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.

Otterbacher, Eric W.: *See*—
Mendoza, Abel; and Otterbacher, Eric W., 4,691,042, Cl. 560-61.000.

Ouchi, Teruo; and Shibuya, Hironichi, to Kabushiki Kaisha Medos Kenkyusho. Flexible tube for endoscope. 4,690,175, Cl. 138-131.000.

Ouhadi, Trasollah; and Dehan, Louis, to Colgate-Palmolive Company. Phosphate free nonaqueous liquid nonionic laundry detergent composition and method of use. 4,690,771, Cl. 252-102.000.

Outboard Marine Corporation: *See*—
Seyerle, Carl E., 4,689,939, Cl. 56-11.100.
VanRens, Russell J., 4,690,201, Cl. 164-516.000.

Outlaw, William F. Electrically heated decal stripping tool. 4,690,724, Cl. 156-584.000.

Overton, James R.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.

Owa, Yutaka, to Lion Corporation. Method for forming a water-impermeable layer in a soil. 4,690,589, Cl. 405-263.000.

Owen, Gregory M. Foldaway sink. 4,689,841, Cl. 4-644.000.

Owen, William E. Side-mounted monorail transportation system. 4,690,064, Cl. 104-119.000.

Owens-Illinois, Inc.: *See*—
Novicki, Casimir W., 4,690,395, Cl. 271-98.000.

Oximetrix, Inc.: *See*—
Beard, Robert W., 4,690,492, Cl. 350-96.200.

Oy Lars Lundin Patent AB: *See*—
Lundin, Lars, 4,690,093, Cl. 114-270.000.

Ozaki, Masakazu: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.

Pabodie, Robert M.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.

Pacht, Amos, to Butterworth Jetting Systems, Inc. High pressure fluid delivery system. 4,690,325, Cl. 239-124.000.

Pacilio, Victor C. Pizza dough spreading apparatus. 4,690,043, Cl. 99-353.000.

Palau, Joseph: *See*—
Bassi, Dario; and Palau, Joseph, 4,690,178, Cl. 139-455.000.

Palayiwa, Eileen: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

Palfy, Robert M.: *See*—
Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, 4,690,185, Cl. 144-34.00R.

Paliwal, Muktesh, to GTE Products Corporation. Process for producing aluminum-titanium diboride composites. 4,690,796, Cl. 419-12.000.

Palmer, John L.; and Anilionis, Algis, to Repligen Corporation. Hybrid proteins produced by an ultrahigh prokaryotic expression system. 4,691,009, Cl. 530-350.000.

Palmer, Thomas M., to Innovative Research and Development Co. Chain link fence system. 4,690,384, Cl. 256-47.000.

Palminteri, Craig R., to Zenith Electronics Corporation. Vertical interval data blanker. 4,691,354, Cl. 380-15.000.

Pamco Label Co.: *See*—
Mack, Jory B., 4,690,720, Cl. 156-248.000.

Paparizos, Christos: *See*—
Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.

Para-Tech Industries, Inc.: *See*—
Reimer, Robert J., 4,690,407, Cl. 273-81.00A.

Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., to Compagnie Francaise d'Etudes et de Construction "Technip" . Method and apparatus for cryogenic fractionation of a gaseous feed. 4,690,702, Cl. 62-23.000.

Parekh, Navinchandra J.: *See*—
Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J., 4,691,333, Cl. 378-37.000.

Parfait, Herve B.: *See*—
Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., 4,690,702, Cl. 62-23.000.

Park, Jong D., to Gold Star Co., Ltd. Mechanism for opening and closing a door of a home electric equipment, particularly a electronic range. 4,690,439, Cl. 292-27.000.

Park, Joonsup: *See*—
Falcetta, Joseph J.; and Park, Joonsup, 4,690,993, Cl. 526-242.000.

Parker, Laurence: *See*—
Horne, David; and Parker, Laurence, 4,690,286, Cl. 211-41.000.

Pasch, Manfred: *See*—
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.

Paskus, Anthony: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.

Patel, Thakor R.: *See*—
Heard, Norman F.; and Patel, Thakor R., 4,690,826, Cl. 426-36.000.

Patel, Vithal K.: *See*—
Powell, David R.; and Patel, Vithal K., 4,690,824, Cl. 424-468.000.

Pau, Bernard: *See*—
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.

Paukovits, Edward J., Jr.: *See*—
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.

Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., to Monsanto Company. Rhodium-containing carbonylation catalysts with halogen-containing promoter. 4,690,912, Cl. 502-161.000.

Paulsen, Gustav. Means for compensating for variations in the matrix height and optionally the paper thickness on a rotary printing machine. 4,690,052, Cl. 101-216.000.

Paustian, John E.: *See*—
Sucio, George D.; and Paustian, John E., 4,691,031, Cl. 549-258.000.

Pavlin, Mark S.: *See*—
Veazey, Richard L.; and Pavlin, Mark S., 4,690,984, Cl. 525-337.300.

Pawloski, Chester E.: *See*—
Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.

Pearce, Phillip W.: *See*—
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.

Pearce, Roscoe L.: *See*—
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., 4,690,740, Cl. 204-147.000.

Peebles, Ann L.: *See*—
Wong, Mon N.; and Peebles, Ann L., 4,691,177, Cl. 333-113.000.

Peerless Machine & Tool Corporation: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.

Pehker, Manfred: *See*—
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.

Peletz, Lawrence J., Jr.; and Jukkola, Glen D., to Combustion Engineering, Inc. Method for drying coal with hot recycle material. 4,690,076, Cl. 110-347.000.

Pelley, Perry H., III; and Lewandowski, Alan, to Motorola, Inc. Redundant column substitution architecture with improved column access time. 4,691,300, Cl. 365-200.000.

Penhasi, Harry A.: *See*—
Leytes, Lev J.; and Penhasi, Harry A., 4,690,165, Cl. 137-112.000.

Penland, William Z.: *See*—
Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., 4,690,131, Cl. 128-4.000.

Penlon Limited: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

Pennwalt Corporation: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,691,051, Cl. 562-441.000.

Pepe, Enrico J.: *See*—
Pohl, Eric R.; and Pepe, Enrico J., 4,691,038, Cl. 556-407.000.

Pereira, Jamie: *See*—
Fitzmorris, Tyce; Bapenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.

Pereira-Ramos, Jean-Pierre: *See*—
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

Perichon, Jacques: *See*—
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

Perini, Fabio. Sail rigging with fairing. 4,690,088, Cl. 114-102.000.

Perry, Mordechai: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.

Persbeck, Sven-Erik, to Hermansson, Mats. Securing arrangement so executed as to be tripped on actuation. 4,690,091, Cl. 114-221.00A.

Pesa, Frederick A.: *See*—
Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.

Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, to Zahnraderfabrik Renk AG. Ship propulsion transmission with at least one engageable friction clutch. 4,690,261, Cl. 192-87.130.

Peter, Wolfgang: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschick, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Peterson, Dennis P. Quick release retention of work pieces. 4,690,316, Cl. 224-253.000.

Peterson, G. L.: *See*—
Cantrell, C. D.; and Peterson, G. L., 4,690,742, Cl. 204-157.200.

Petery, James J.: *See*—
Miazga, Dennis E.; and Petery, James J., 4,691,317, Cl. 371-20.000.

Petter, Karl H.; and Robbins, Gregory K., to Texaco Inc. Corrosion detection for marine structure. 4,690,587, Cl. 405-211.000.

Pezewski, Paul: *See*—
Hornagold, John T.; and Pezewski, Paul, 4,690,246, Cl. 182-2.000.

Pfaff Industriemaschinen GmbH: *See*—
Dietrich, Herbert, 4,689,974, Cl. 69-27.000.

Pfeifle, Dieter: *See*—
Verburgh, Martin B.; and Pfeifle, Dieter, 4,691,092, Cl. 219-121.01LD.

Pfister, Rudolf: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.

Pfizer Inc.: *See*—
Kadin, Saul B., 4,690,943, Cl. 514-418.000.

Phalangas, Charalambos J.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.

Philip Morris Incorporated: *See*—
Podraza, Kenneth F., 4,690,157, Cl. 131-276.000.

Philippe, Staron: *See*—
Arens, Georges; and Philippe, Staron, 4,691,306, Cl. 367-40.000.

Phillips, Charles R., to Support Technologies, Inc. ROM emulator for diagnostic tester. 4,691,316, Cl. 371-20.000.

Phillips Petroleum Company: *See*—
Burns, Lyle D.; and Stahl, G. Allan, 4,690,219, Cl. 166-307.000.
Carrow, Guy E., 4,690,632, Cl. 425-429.000.
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.
McDaniel, Max P.; and Short, James N., 4,690,990, Cl. 526-138.000.
Rohlfing, Raymond G., 4,690,804, Cl. 422-219.000.

Phillips, Randall L. Take-up bracket for flooring adjustment. 4,690,359, Cl. 248-300.000.

Pickering, William: *See—*
Baumgartner, Kenneth A.; and Pickering, William, 4,691,149, Cl. 318-331.000.
Pierrel, Michel: *See—*
Gourmel, Yves; and Pierrel, Michel, 4,690,199, Cl. 164-421.000.
Pike, Harold W. E.: *See—*
Tuckley, Trevor R.; and Pike, Harold W. E., 4,690,412, Cl. 277-184.000.
Pimlott, John R.: *See—*
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., to Air Products and Chemicals, Inc. Self- and hydroxyl reactive formaldehyde-free cyclic hemiaminal and hemiamide ketal crosslinking monomers. 4,691,026, Cl. 548-531.000.
Pinto, Akiva, to John D. Hollingsworth On Wheels, Inc. WEB weight control system. 4,689,857, Cl. 19-105.000.
Pinto, Patrick A.: *See—*
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.
Pinyan, James A.: *See—*
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.
Pioneer Electronic Corporation: *See—*
Ichikawa, Toshihito, 4,691,356, Cl. 381-4.000.
Kanda, Nobuo, 4,691,357, Cl. 381-10.000.
Maeda, Takanori, 4,691,098, Cl. 250-201.000.
Pipon, Yves; and Droulon, Georges, to A. & M. Cousin & Cie. Rapid locking device for an articulated seat. 4,690,458, Cl. 297-379.000.
Pirmasafe, Inc.: *See—*
Wirstrom, Peter; and Cork, William H., 4,691,355, Cl. 380-23.000.
PKM Verpackungssysteme GmbH & Co.: *See—*
Zoppa, Dieter, 4,689,938, Cl. 53-582.000.
Planar Systems, Inc.: *See—*
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.
Plaet, Michael, to Allied Corporation. Flat bed optical scanning beam deflection system. 4,690,485, Cl. 350-6.500.
Plessey Overseas Limited: *See—*
Shapter, Hugh; and Wood, Colin, 4,691,206, Cl. 343-700.0MS.
Plett, Calvin: *See—*
Rosenbaum, Stanley D.; and Plett, Calvin, 4,691,271, Cl. 363-60.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Polyethylene composite comprising a coupling agent composition comprising fumaric acid and an aminosilane. 4,690,959, Cl. 523-213.000.
Pneumatic Pipewipers, Inc.: *See—*
Stannard, James P.; and Shockley, Charles W., 4,690,213, Cl. 166-84.000.
Podolak, Peter L.: *See—*
Friedman, Alexander A.; and Podolak, Peter L., 4,690,755, Cl. 210-96.100.
Podraza, Kenneth F., to Philip Morris Incorporated. Smoking compositions containing a flavorant-release additive. 4,690,157, Cl. 131-276.000.
Pohl, Eric R.; and Pepe, Enrico J., to Union Carbide Corporation. Novel room temperature vulcanizable polydiorganosiloxane compositions. 4,691,038, Cl. 556-407.000.
Pol, Kenneth J.: *See—*
Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.
Polach, Wilhelm, to Robert Bosch GmbH. Device for removing solid particles, particularly soot, from exhaust gas of an internal combustion engine. 4,689,951, Cl. 60-275.000.
Polach, Wilhelm; and Rembold, Helmut, to Robert Bosch GmbH. Magnetic valve for fluid control. 4,690,374, Cl. 251-129.020.
Polaroid Corporation: *See—*
DeBruyn, Frank E., Jr.; and Weed, Lucretia J., 4,690,884, Cl. 430-206.000.
Forsyth, Robert P., 4,690,512, Cl. 350-417.000.
Silver, Bruce R., 4,691,253, Cl. 360-33.100.
Polatas, Stephen M.: *See—*
Abdenour, Stephen F.; and Polatas, Stephen M., 4,690,352, Cl. 249-49.000.
Poncy, Richard P.; and Charzanowski, Mathew, to Steridyne Corporation. Chair with lift assistance mechanism. 4,690,457, Cl. 297-337.000.
Pont-a-Mousson S.A.: *See—*
Gourmel, Yves; and Pierrel, Michel, 4,690,199, Cl. 164-421.000.
Porter, Rick A.; and Hoernle, Hans R., to United Merchants & Manufacturers Inc. Fire barrier fabrics. 4,690,859, Cl. 428-251.000.
Posselt, Klaus: *See—*
Lohner, Manfred; and Posselt, Klaus, 4,690,823, Cl. 424-456.000.
Poutignat, Yves: *See—*
Gissinger, Patrick; and Poutignat, Yves, 4,690,630, Cl. 425-236.000.
Powell, David R.; and Patel, Vithal K., to Redi-Rowell, Inc. Solid pharmaceutical formulations for slow, zero order release via controlled surface erosion: expanded range. 4,690,824, Cl. 424-468.000.
PPG Industries, Inc.: *See—*
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.
Prescher, Gunter: *See—*
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,691,062, Cl. 568-495.000.
Prism Corporation: *See—*
Cloke, Robert L., 4,691,254, Cl. 360-45.000.
Priaroggia, Paolo G., to Societa Cavi Pirelli S.p.A. Pressure resistant submarine optical fiber cable. 4,690,498, Cl. 350-96.230.
Prince Corporation: *See—*
Boerema, Edward T.; Seman, Michael J.; and Fleming, Dennis J., 4,690,450, Cl. 296-97.00K.
Pritchard, John J., Jr., to Shell Offshore Inc. Formation fluid sampler. 4,690,216, Cl. 166-264.000.
Procter & Gamble Company, The: *See—*
Higgins, Maureen L., 4,690,680, Cl. 604-386.000.
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.
Product Investment Incorporated: *See—*
Henning, John C., 4,690,292, Cl. 215-201.000.
Product Suppliers AG: *See—*
Aarts, Mathias L. C., 4,689,987, Cl. 73-49.300.
Productive Instrument & Machine Inc.: *See—*
Skipper, Claud, 4,690,167, Cl. 137-382.000.
Profera, Charles E., Jr., to RCA Corporation. Beam forming network for circularly polarized shaped beam antenna system. 4,691,205, Cl. 342-365.000.
Progressive Assembly Machine Co., Inc.: *See—*
Rasmussen, Robert, 4,690,310, Cl. 222-309.000.
Pruitt, Duard L., to RCA Corporation. Current fed inverter bridge with lossless snubbers. 4,691,270, Cl. 363-56.000.
Przybylinski, Phillip G.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, to Charles of the Ritz Group Ltd. Shampoo and bath and shower gel. 4,690,818, Cl. 424-70.000.
Pullen, Francis J.: *See—*
Wakefield, Barry R.; and Pullen, Francis J., 4,689,854, Cl. 17-1.00R.
Pullman Rail Leasing Inc.: *See—*
Miller, Roy W., 4,690,070, Cl. 105-377.000.
Pullman Standard Inc.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Qualtronics Corporation: *See—*
Veitch, Randall C., 4,690,569, Cl. 374-11.000.
Quantime, Inc.: *See—*
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.
Quick, Nathaniel R.: *See—*
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.
Quinlan, Leland F. Variable buoyancy fishing lure. 4,689,914, Cl. 43-42.220.
R.A.T.P. Regie Autonome des Transports Parisiens: *See—*
Delfourne, Paul, 4,690,068, Cl. 105-8.100.
R. Neumann & Co.: *See—*
Mulvaney, Lewis W., 4,689,832, Cl. 2-161.00A.
Rabuse, Milton. Aquatic scrubbing device. 4,690,092, Cl. 114-222.000.
Radscheit, Kurt: *See—*
Uhmann, Rainer; and Radscheit, Kurt, 4,691,008, Cl. 530-339.000.
Radulski, Charles A.; and Till, Henry R., to Xerox Corporation. Transfer apparatus. 4,690,539, Cl. 355-3.0TR.
Radvan, Bronislaw; and Till, Andrew, to Wiggins Teape Group Limited, The. Fibre reinforced composite plastics material. 4,690,860, Cl. 428-290.000.
Radyne Corporation: *See—*
Entenman, Alan W., 4,691,318, Cl. 371-43.000.
Raeuber, Armin: *See—*
Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.
Rahrig, Thomas P.; and Hall, Thomas E., to United Technologies Automotive, Inc. Sealed electrical connector assembly. 4,690,478, Cl. 439-271.000.
Raidel, John E., Sr. Fork mount mono-wheel suspension. 4,690,427, Cl. 280-694.000.
Raidt, Joe B.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Rakhit, Ajit K., to Reliance Electric Company. Method and apparatus for producing pseudo - herringbone-type gears and gear produced thereby. 4,690,009, Cl. 74-409.000.
Rambow, Frederick H. K., to Shell Oil Company. AGC circuit for televiewer. 4,691,307, Cl. 367-69.000.
Ramirez, Jose E.: *See—*
Vishnupad, Mohan; and Ramirez, Jose E., 4,690,774, Cl. 252-309.000.
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., to BASF Corporation. Process for the preparation of graft polymer dispersions and flame-retardant polyurethane foams. 4,690,956, Cl. 521-137.000.
Randolph, Walter J. Coaxial coupling. 4,690,481, Cl. 439-585.000.
Raney, Richard C. Radially stabilized drill bit. 4,690,229, Cl. 175-325.000.
Ranke, Gerhard; and Schrader, Ulrich, to Linde Aktiengesellschaft. Integrated production of ammonia and urea. 4,690,812, Cl. 423-359.000.

Rashkovich, Mikhail P.: *See—*
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.
Rasmussen, Robert, to Progressive Assembly Machine Co., Inc. Sleeve pump. 4,690,310, Cl. 222-309.000.
Rasmussen, Robert, to Accurate Industries, Inc. Trailer for transporting large containers. 4,690,608, Cl. 414-529.000.
Ray-Chaudhuri, Dilip K.: *See—*
Shih, Yen-Jer; Tsai, John (Ji-Haiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.
Raychem Corp.: *See—*
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.
Raytheon Company: *See—*
Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., 4,690,351, Cl. 244-3.160.
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.
Kant, Rajni; and Chen, Kan-Nau, 4,691,161, Cl. 324-73.00R.
RCA Corporation: *See—*
Acampora, Alfonso A., 4,691,233, Cl. 358-136.000.
Albean, David L., 4,691,234, Cl. 358-144.000.
Carrell, Ross M., 4,690,283, Cl. 209-549.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,691,189, Cl. 340-347.0AD.
Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, 4,691,320, Cl. 372-45.000.
Kramer, William M., 4,689,873, Cl. 437-2.000.
Magee, Charles W.; and Hewitt, Lori R., 4,691,109, Cl. 250-426.000.
Masterton, Walter D., 4,691,138, Cl. 313-403.000.
Profera, Charles E., Jr., 4,691,205, Cl. 342-365.000.
Pruitt, Duard L., 4,691,270, Cl. 363-56.000.
Rothweiler, Joseph H., 4,691,292, Cl. 364-724.000.
Wine, Charles M., 4,691,310, Cl. 369-50.000.
Readman, John: *See—*
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, 4,690,470, Cl. 439-13.000.
Niggemann, Richard; and Readman, John, 4,690,210, Cl. 165-159.000.
Rebeaud, Jean-Philippe, to ETS SA Fabriques d'Ebauches. Electrical connection arrangement between the bracelet and the case of an electronic appliance to be worn on the wrist. 4,690,567, Cl. 368-203.000.
Rebmann, Manfred; and Weigold, Helmut, to Robert Boesch GmbH. Method and apparatus for making a butt seam having a cover strip on a tube of multi-layer packaging material. 4,690,668, Cl. 493-297.000.
Redden, Robert F.: *See—*
Bult, Roelof P.; Bollong, Alan B. I.; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.
Redi-Rowell, Inc.: *See—*
Powell, David R.; and Patel, Vithal K., 4,690,824, Cl. 424-468.000.
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., to STC plc. Address code arrangements. 4,691,339, Cl. 379-62.000.
Rees, Herbert: *See—*
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.
Reeser, David M.: *See—*
Breneman, William C.; and Reeser, David M., 4,690,810, Cl. 423-335.000.
Reeves, Raymond A. Device for supporting a building line reference. 4,689,889, Cl. 33-408.000.
Reguigne, Gabriel: *See—*
Sauer, Claude; Burger, Raymond; Reguigne, Gabriel; and Kern, Mark, 4,690,874, Cl. 428-337.100.
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Air inlet channel for a charging air intercooler. 4,690,204, Cl. 165-44.000.
Reichel, Jutta: *See—*
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.
Reichel, Kenneth R.; and Hebrock, Steve, to Audio-Technica U.S., Inc. Duplex microphone communication system. 4,691,349, Cl. 379-391.000.
Reichwein, Roy H.: *See—*
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.
Reid, Laurance S. Absolute separator. 4,690,698, Cl. 55-89.000.
Reinders, Edward D.: *See—*
Lauga, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.
Reinhardt, Peter: *See—*
Morgenstern, Berad; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.
Reinhart, Charles W.; and Mauldin, Robert H., to Whittaker Corporation. Hermetically sealed connector device. 4,691,080, Cl. 174-84.00R.
Reisner, Robert J., to Para-Tech Industries, Inc. Weighted golf grip. 4,690,407, Cl. 273-81.00A.
Reliance Comm/Tec Corporation: *See—*
Kuwata, Yutaka; and Nerone, Louis R., 4,691,273, Cl. 363-132.000.
Reliance Electric Company: *See—*
Griffen, Neil C., 4,691,290, Cl. 364-567.000.
Rakhit, Ajit K., 4,690,009, Cl. 74-409.000.
Rembold, Helmut: *See—*
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.
Polach, Wilhelm; and Rembold, Helmut, 4,690,374, Cl. 251-129.020.
ReMine, Walter J.: *See—*
King-Smith, Eric A.; ReMine, Walter J.; and Dufresne, Joel R., 4,690,145, Cl. 128-421.000.
Renaud, Merle A.: *See—*
Han, Doyoung; and Renaud, Merle A., 4,689,967, Cl. 62-201.000.
Renbeck, Robert B.: *See—*
Jambotkar, Chakrapani G.; and Renbeck, Robert B., 4,689,869, Cl. 437-44.000.
Rende, Anthony V., Jr., to Lord Corporation. Heat activated silicon-based adhesive. 4,690,966, Cl. 524-264.000.
Renken, Wayne G.: *See—*
Bosley, Robert W.; Kirshman, Samson; LeMay, Dan B.; and Renken, Wayne G., 4,690,371, Cl. 251-65.000.
Repligen Corporation: *See—*
Farrell, Roberta L., 4,690,895, Cl. 435-278.000.
Palmer, John L.; and Anilionis, Algis, 4,691,009, Cl. 530-350.000.
Research Corporation: *See—*
Schott, Hans; and Royce, Alan E., 4,690,775, Cl. 252-312.000.
Resh, Kyle W., to Vista Chemical Company. Process for production of alkyl aromatics. 4,691,068, Cl. 585-323.000.
Resource Technology Associates: *See—*
Shaw, Douglas R., 4,690,752, Cl. 209-5.000.
Rex, Dietrich: *See—*
Hornung, Ernst; and Rex, Dietrich, 4,690,355, Cl. 244-173.000.
Rexnord Inc.: *See—*
Fredericks, Walter A.; and McCullough, Edward W., 4,690,661, Cl. 464-78.000.
Reynard, Kenneth, to George Blair Public Limited Company. Location means for freight container door locking assemblies. 4,690,442, Cl. 292-218.000.
Rheinmetall GmbH: *See—*
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.
Rheon Automatic Machinery Co., Ltd.: *See—*
Takao, Kenji, 4,690,269, Cl. 198-460.000.
Rhone-Poulenc Agrochimie: *See—*
Chene, Alain; and Borrod, Guy, 4,690,708, Cl. 71-94.000.
Rhone-Poulenc Specialites Chimiques: *See—*
LaGarde, Robert; and Bouverot, Noel, 4,690,967, Cl. 524-266.000.
Ribbing, Wilfried: *See—*
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, 4,690,978, Cl. 525-152.000.
Rice, Camilla A., to E.C.C. America Inc. Process for surface treating clay minerals and resultant products. 4,690,868, Cl. 428-409.000.
Rice Multiphones, Inc.: *See—*
McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.
Richoux, Raymond. Flexible-tube device for transmitting longitudinal forces. 4,690,014, Cl. 74-501.00R.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.
Ricoh Company, Ltd.: *See—*
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.
Kouchiwa, Taira; and Nishina, Kiichiro, 4,690,518, Cl. 350-464.000.
Nagai, Kayoko; and Tsubuko, Kazuo, 4,690,881, Cl. 430-114.000.
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-621.000.
Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, to Swiss Aluminium Ltd. Filter medium in the form of a stable porous body. 4,690,763, Cl. 210-496.000.
Rieter Machine Works, Ltd.: *See—*
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.
Riker Laboratories, Inc.: *See—*
Stern, Richard M., 4,691,016, Cl. 546-95.000.
Riley, Mack W., to International Business Machines Corporation. Frequency multiplier circuit. 4,691,170, Cl. 328-20.000.
Riley, Ray J.: *See—*
Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.
Riml, Peter, to Liebherr-Werk Telfs GES. m.b.H. Tracklaying undercarriage for bulldozer, crawler loaders or other tracklaying vehicles. 4,690,231, Cl. 180-6.480.
Rink, Richard H., to Huron Manufacturing Corporation. Cutting head for strip mining apparatus. 4,690,461, Cl. 299-39.000.
Risdon Corporation: *See—*
Idec, Eric J.; and Holloway, Thomas F., 4,690,578, Cl. 401-78.000.
Rise, Mark T.; and Stanton, David J., to Medtronic, Inc. Wireless transcutaneous electrical tissue stimulator. 4,690,144, Cl. 128-419.00R.
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., to Dart Industries Inc.; and Energy Systems Industries, Inc. Refrigerant cooled plastic molding, method and apparatus. 4,690,789, Cl. 264-40.100.

Ritter, Paul B., Jr., to Shell California Production Inc. Well tubing hanger method and apparatus for use in well control. 4,690,221, Cl. 166-382.000.

Ritzert, Jack L.: *See*—
Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.

Rivest, Ronald L.; and Shamir, Adi, to Massachusetts Institute of Technology. Method and apparatus for reusing non-erasable memory media. 4,691,299, Cl. 365-189.000.

Robbins, Gregory K.: *See*—
Petter, Karl H.; and Robbins, Gregory K., 4,690,587, Cl. 405-211.000.

Robbins, Murray: *See*—
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.

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Domke, Klaus, 4,690,667, Cl. 493-213.000.
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.
Polach, Wilhelm, 4,689,951, Cl. 60-275.000.
Polach, Wilhelm; and Rembold, Helmut, 4,690,374, Cl. 251-129.020.
Rebmann, Manfred; and Weigold, Helmut, 4,690,668, Cl. 493.297.000.
Schwartz, Reinhard, 4,690,624, Cl. 417-499.000.
Weischedel, Guido, 4,690,114, Cl. 123-357.000.

Robert Krause GmbH & Co. KG: *See*—
Kissel, Karl-Heinz, 4,690,580, Cl. 402-39.000.

Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., to Air Products and Chemicals, Inc. Enhanced crude oil recovery. 4,690,215, Cl. 166-261.000.

Robertson, Anthony L., to Elite Concepts, Inc. Programmable timing device. 4,690,566, Cl. 368-108.000.

Robertshaw Controls Company: *See*—
Fowler, Daniel L., 4,689,879, Cl. 29-622.000.

Robinson, Jeffrey I., to General DataComm, Inc. Analog-digital converter. 4,691,190, Cl. 340-347.0AD.

Robinson, Jerry W. System for rotating a drive mechanism for power generation. 4,691,115, Cl. 290-1.00R.

Robinson, Nelson M.: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.

Robinson, Ronald L.; and Honeycutt, Fred L., Jr., to United Technologies Corporation. Louvered seal flap edge stiffener. 4,690,330, Cl. 239-265.390.

Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Karl Thomae GmbH. 2-(Perhydro-1,4-diazino)-pyrimido(5,4-D)-pyrimidines, pharmaceutical compositions and use. 4,690,923, Cl. 514-222.000.

Rockenschaub, Walter; and Kepplinger, Werner, to Voest-Alpine Aktiengesellschaft. Metallurgical plant for producing a mixed gas. 4,690,387, Cl. 266-144.000.

Rockwell International Corporation: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.
Weber, James L., 4,690,253, Cl. 188-72.700.

Rode, Konrad: *See*—
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.

Roehl, Franz, to Bentonspritz Nasegubeb GmbH Co. Spraying machine. 4,690,328, Cl. 239-227.000.

Roessiger, Claude, to Ocor Products Corporation. Flexible block packaging. 4,691,368, Cl. 383-10.000.

Rogers, Gerald H. Strengthened latch and striker bar structure for fence gates. 4,690,440, Cl. 292-54.000.

Rohlfing, Raymond G., to Phillips Petroleum Company. Catalyst feed system. 4,690,804, Cl. 422-219.000.

Rohm, Gunter H. Power chuck. 4,690,416, Cl. 279-110.000.

Rohweder, David S.: *See*—
Jackson, Gerald W.; and Rohweder, David S., 4,689,998, Cl. 73-669.000.

Roll, Walter F.; and Campbell, Michael, to Texas Instruments Incorporated. Four position interlacing apparatus. 4,690,486, Cl. 350-6.600.

Roman, Christopher D.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Rosenbaum, Stanley D.; and Plett, Calvin, to Northern Telecom Limited. Voltage multiplier and voltage multipliers in an amplifier with double rail output. 4,691,271, Cl. 363-60.000.

Rosenberg, Lior. Dermatome particularly useful for skin-grafting purposes. 4,690,139, Cl. 128-305.500.

Rosenberg, Steven A., to United States of America, Health and Human Services. Adoptive immunotherapy as a treatment modality in humans. 4,690,915, Cl. 514-2.000.

Rose, Christopher P., to Ipeco Europe Limited. Mobile loaders. 4,690,606, Cl. 414-495.000.

Ross, Daniel P.: *See*—
Hsiung, Chia Y.; and Ross, Daniel P., 4,691,176, Cl. 331-2.000.

Ross, Sidney A.; and Taylor, Lyn P. Method and system for utilizing electro-neuro stimulation in a bio-feedback system. 4,690,142, Cl. 128-419.00R.

Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,690,769, Cl. 252-70.000.

Roth, Craig A.: *See*—
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.

Roth, James F.: *See*—
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.

Roth, Siegfried: *See*—
Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, 4,690,177, Cl. 139-449.000.

Rothweiler, Herbert: *See*—
Voss, Harald; and Rothweiler, Herbert, 4,690,927, Cl. 514-282.000.

Rothweiler, Joseph H., to RCA Corporation. System for digital multiband filtering. 4,691,292, Cl. 364-724.000.

Rough, J. Kirkwood H.: *See*—
Nelson, Martin N.; and Rough, J. Kirkwood H., 4,691,239, Cl. 318-282.000.

Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, to Societe d'Exploitation des Machines Dubuit. Transfer system for article printing machine. 4,690,050, Cl. 101-35.000.

Rousseau, Carl H. Dental fastening device and method of use. 4,690,643, Cl. 433-213.000.

Rousseau, Jean: *See*—
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Russo, Rudolph P. Anti-theft exhaust system for vehicles. 4,690,240, Cl. 180-287.000.

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Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., 4,691,279, Cl. 364-200.000.

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Chien, Yie W.; and Tojo, Kakuji, 4,690,683, Cl. 604-896.000.

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Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.
Swanson, Roy T., 4,691,085, Cl. 200-151.000.

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Brady, William T.; Norton, Scott J.; and Ko, Jiurea, 4,691,052, Cl. 562-506.000.
Crapser, James R.; and Demarest, Scott W., 4,690,312, Cl. 222-402.170.
Grothaus, Roger H.; and Hildebrandt, Donald W., 4,689,915, Cl. 43-112.000.

Sabol, George P.; and Barry, Robert F., to Westinghouse Electric Corp. Process for forming seamless tubing of zirconium or titanium alloys from welded precursors. 4,690,716, Cl. 148-11.50F.

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Saccomanno, Geno. Microscope slide marking device and method. 4,690,521, Cl. 350-520.000.

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Brezillon, Jean-Loup; and Dauchier, Jean-Michel, 4,689,880, Cl. 29-623.500.
Gabano, Jean-Paul; Brousely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

St. Pierre, Michael, to Marin-Tek, Inc. Zero gravity (position-insensitive) low-temperature multi-component refrigerator. 4,689,964, Cl. 62-114.000.

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Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.

Saito, Hiroshi: *See*—
Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, 4,690,994, Cl. 526-254.000.

Saito, Kazuo: *See*—
Kubo, Kanji; Asazuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.

Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing novel cyan dye forming coupler. 4,690,889, Cl. 430-552.000.

Saito, Ryozo: *See*—
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.

Saito, Susumu: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Saito, Takao: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitaga, 4,690,788, Cl. 264-23.000.

Saito, Yutaka: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.

Saitoh, Kyoshiro; Konishi, Masataka; and Tomita, Koji, to Bristol-Myers Company. Boxazomycin A and B, new antibiotics containing benzoxazole nucleus. 4,690,926, Cl. 514-269.000.

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Wehr, Michael A.; and Sajdak, Robert L., 4,690,309, Cl. 222-249.000.

Sajiki, Kazuaki: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.

Sakai & Co., Ltd.: *See*—
Uchiyama, Yuki, 4,690,278, Cl. 206-387.000.

Sakai, Katsuo: *See*—
Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Sakai, Noriyuki: *See*—
Morishita, Tsuyoshi; Osaki, Sigemi; and Sakai, Noriyuki, 4,690,320, Cl. 228-194.000.

Sakai, Tadaaki. Method of freezing foods. 4,689,963, Cl. 62-64.000.

Sakai, Yasuhito; and Yamada, Kenichi, to Fuji Jukogyo Kabushiki Kaisha. Selector mechanism for an infinitely variable transmission. 4,690,011, Cl. 74-475.000.

Sakai, Yoshiaki; and Tsuyuguchi, Hiroshi, to Teac Corporation. Power saving circuit arrangement for data transfer apparatus with a disklike record medium. 4,691,255, Cl. 360-69.000.

Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, to Ricoh Company, Ltd. Color electrophotographic copying process. 4,690,541, Cl. 355-4.000.

Sakai, Yoshihiro: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.

Sakai, Yukio: *See*—
Nojiri, Naohiro; and Sakai, Yukio, 4,690,913, Cl. 502-340.000.

Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, to Dainippon Ink and Chemicals, Inc. Activation energy-curable resin composition. 4,690,987, Cl. 525-502.000.

Sakakibara, Toshiyuki: *See*—
Nanba, Yukihiro; and Sakakibara, Toshiyuki, 4,690,784, Cl. 260-403.000.

Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, to Kabushiki Kaisha Toshiba. Fluorescent lamp. 4,691,140, Cl. 313-486.000.

Sakamoto, Kyooya: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.

Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, to Mazda Motor Corporation. Automobile instrument cluster tiltable with a steering column. 4,690,432, Cl. 280-775.000.

Saleem, Abdus, to General Electric Environmental Services, Inc. Process for the simultaneous absorption of sulfur oxides and production of ammonium sulfate. 4,690,807, Cl. 423-242.000.

Salvati, Patricia: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Salvik, Walter: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.

Salz, Ulrich: *See*—
Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, 4,691,020, Cl. 546-341.000.

Sam, George J., Sr.: *See*—
Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J., 4,691,333, Cl. 378-37.000.

Sam Sung Electronics Co., Ltd.: *See*—
Chung, Bong-Kwan, 4,690,473, Cl. 439-1.000.

Sampson, Arthur J., Jr.: *See*—
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.

Samson, Sam; and Gruenspecht, Mark J. Inflatable aquatic device. 4,690,651, Cl. 441-56.000.

Sanchez, Manuel: *See*—
Desarmot, Georges; and Sanchez, Manuel, 4,690,738, Cl. 204-130.000.

Sanchez, Terry: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.

Sanders, Joseph W.: *See*—
Knobie, David W.; and Sanders, Joseph W., 4,691,341, Cl. 379-97.000.

Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., to Texaco, Inc. Purification of propylene oxide by treatment with calcium hydroxide in glycerol or sugar water. 4,691,034, Cl. 549-542.000.

Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., to Texaco Inc. Purification of propylene oxide by treatment with a selected base and inert salt. 4,691,035, Cl. 549-542.000.

Sandhagen, Jurgen: *See*—
Hofbauer, Peter; and Sandhagen, Jurgen, 4,690,118, Cl. 123-533.000.

Sando Iron Works Co., Ltd.: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.

Sando, Yoshikazu: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.

Sank, Gerald W., to Vulcan-Hart Corporation. Catalytic combustion deep fat fryer. 4,690,127, Cl. 126-391.000.

Sankyo Company, Limited: *See*—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.

Sano, Kenji: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.

Sanofi: *See*—
Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, 4,691,043, Cl. 560-064.000.
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Ogasahara, Takio; and Fujimoto, Hiroaki, 4,690,109, Cl. 123-73.00A.

Sansome, Dennis H.: *See*—
Ibrahim, Ibrahim N.; and Sansome, Dennis H., 4,689,981, Cl. 72-150.000.

Santa Barbara Research Center: *See*—
Kera, Mark T.; and Shamordola, Kenneth A., 4,691,196, Cl. 340-578.000.

Santo, Philip J. Decorative cover for a floatation sleep system. 4,689,843, Cl. 5-452.000.

Santrade Ltd.: *See*—
Schermutzki, Konrad, 4,690,721, Cl. 156-307.500.

Sasaki, Akio: *See*—
Makino, Hiroshi; and Sasaki, Akio, 4,690,119, Cl. 123-571.000.

Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, to Mitsubishi Rayon Co., Ltd.; and Shin-Etsu, Chemical Co., Ltd. Impact-resistant thermoplastic polyorganosiloxane-based graft copolymer and process for producing same. 4,690,986, Cl. 525-479.000.

Sasaki, Kazuya: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

Sasaki, Masafumi, to Nissan Motor Co., Ltd. Static pressure gas bearing apparatus for turbocharger. 4,690,572, Cl. 384-120.000.

Sasakura, Hachirou; and Tsujimura, Masakuni, to Nippondenso Co., Ltd. Ignition control system for internal combustion engines. 4,690,122, Cl. 123-609.000.

Sasano, Akiyoshi: *See*—
Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, 4,690,083, Cl. 112-254.000.

Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for working peripheral wall of hemispherical shell. 4,690,020, Cl. 82-2.00D.

Sasatani, Takashi: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Sasaya, Hideaki: *See*—
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.

Satake, Keigo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Satco, Inc.: *See*—
Looker, Robert, 4,690,360, Cl. 248-346.000.

Satellite Industries, Inc.: *See*—
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.

Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, to Shionogi & Co., Ltd. Method for stabilizing rubella HA antigen. 4,690,819, Cl. 424-88.000.

Sato, Akira: *See*—
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.

Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, to Agency of Industrial Science & Technology; and Ministry of

International Trade & Industry. Thiophene derivative polymer, polymer composition, and methods for manufacture thereof. 4,691,005, Cl. 528-380.000.
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, to Hitachi, Ltd. Stepping motor control system. 4,691,154, Cl. 318-696.000.
Sato, Noboru: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Obata, Isao; and Sato, Nobora, 4,690,932, Cl. 514-337.000.
Sato, Seiichiro: *See*—
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, to SS Pharmaceutical Co., Ltd. 1,7-Naphthyridine derivatives and medicinal preparations containing same. 4,690,924, Cl. 514-237.000.
Satoh, Seiji: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Satoh, Taizo, to Fujitsu Limited. Drive circuit for fluorescent display tube. 4,691,145, Cl. 315-169.300.
Satoma, Shiro, to Tokyo Juki Industrial Co., Ltd. Overedge width regulating device for overedging sewing machines. 4,690,079, Cl. 112-162.000.
Saudagar, Abdul S. Method for parting rubber and products formed thereby, and a method of making a blood vessel. 4,690,844, Cl. 428-36.000.
Sauer, Claude; Burger, Raymond; Reguigne, Gabriel; and Kern, Mark, to Tourisme Hotellerie Ltd. Molded construction element. 4,690,874, Cl. 428-537.100.
Saura, Hideaki: *See*—
Ohguma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.
Savinell, Alan; and Hydeman, Jeffrey E., to Westinghouse Electric Corp. Delivery system for a remote sensor. 4,689,994, Cl. 73-634.000.
Savoie, Rolland J.: *See*—
Nicholls, Robin P.; and Savoie, Rolland J., 4,691,148, Cl. 318-12.000.
Savov, Ivan S.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.
Sawada, Yasuo: *See*—
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Sayers, George M., Jr.: *See*—
Walls, Henry M.; and Sayers, George M., Jr., 4,690,095, Cl. 116-67.00R.
Sayler, William H.; and White, Justin C., to T.A.S., Inc. Solid fuel pulverizer for pulverized fuel burning system. 4,690,338, Cl. 241-56.000.
Sayou, Syoichi: *See*—
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Scalia, Antonino. Method of playing a letter selecting and arranging game. 4,690,409, Cl. 273-299.000.
Schaafhausen, Ludwig R.: *See*—
Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., to Husky Injection Molding Systems Ltd. Apparatus for preparing hollow plastic articles. 4,690,633, Cl. 425-526.000.
Schaefer, Oscar H.: *See*—
Miller, John; Barton, Richard O.; and Schaefer, Oscar H., 4,690,365, Cl. 248-650.000.
Schaffhauser, Brian E.; and Spector, George. Static amplification stun gun. 4,691,264, Cl. 361-232.000.
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., to GTE Products Corporation. Process for producing cobalt metal powder. 4,690,710, Cl. 75-0.5AA.
Schemmann, Hugo: *See*—
Bertram, Leo; and Schemmann, Hugo, 4,691,132, Cl. 310-156.000.
Schepers, Erwin, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Remotely-handled replaceable component. 4,690,298, Cl. 220-325.000.
Schering Corporation: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Verseee, Richard W., 4,690,922, Cl. 514-210.000.
Schermutzki, Konrad, to Santrade Ltd. Apparatus and process for the production of multilayer laminated plates. 4,690,721, Cl. 136-307.500.
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, to BASF Aktiengesellschaft. Polymerization of isobutylene. 4,691,072, Cl. 585-525.000.
Schillinger, Norbert: *See*—
Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.
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Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.
Schmaus, Siegfried H. A. Direct-acting pressure sensor. 4,690,000, Cl. 73-741.000.
Schmerda, Richard F.: *See*—
Damiano, Michael A.; and Schmerda, Richard F., 4,691,197, Cl. 340-638.000.
Schmidt, Frank T., to Coleman Company, Inc., The. Insulator assembly for electrode of piezoelectric ignition device. 4,691,136, Cl. 310-339.000.
Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, to Hubner Gummi-und Kunststoff GmbH. Crossover shelter between sections of articulated road and rail vehicles. 4,690,421, Cl. 280-403.000.
Schmidt, Manfred; and Yeater, Robert P., to Mobay Corporation. Thermoplastic polyurethane compositions having improved flame resistance. 4,690,964, Cl. 524-125.000.
Schmidt, Phillip A., to Weyerhaeuser Company. Method and apparatus for flail debarking. 4,690,187, Cl. 144-340.000.
Schmidt, Reinhard: *See*—
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.
Schmidt, Victor P. Pipe coupling. 4,690,434, Cl. 285-31.000.
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Schmutzler, Werner: *See*—
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Schneider, Emil F.: *See*—
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cobee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.
Schnizlein, Paul G.; and Tang, Wen-Tsung F., to Advanced Micro Devices, Inc. CMOS D-type flip-flop circuits. 4,691,122, Cl. 307-279.000.
Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, to Metabowerke GmbH & Co. Hammer drill. 4,690,226, Cl. 173-128.000.
Schoeber, Gernot: *See*—
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.
Schorfheide, James J., to Exxon Research and Engineering Company. Removal of sulfur from process streams. 4,690,806, Cl. 423-230.000.
Schott, Hans; and Royce, Alan E., to Research Corporation. Emulsion-based gel and process for preparing same. 4,690,775, Cl. 252-312.000.
Schrader, Ulrich: *See*—
Ranke, Gerhard; and Schrader, Ulrich, 4,690,812, Cl. 423-359.000.
Schreiber, Manfred: *See*—
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Schrey, Wolfgang: *See*—
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Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, to M.A.N. - B&W Diesel GmbH. Turbo supercharger for an internal combustion engine. 4,689,960, Cl. 60-607.000.
Schroeppel, Edward A., to Cordis Corporation. Pacing lead with piezoelectric power generating means. 4,690,143, Cl. 128-419.00P.
Schuitmaker, Pieter D.: *See*—
Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., 4,691,311, Cl. 369-100.000.
Schultz, Abraham Y. Bottle with finger pieces. 4,690,311, Cl. 222-324.000.
Schultz, Richard. Hammer mill. 4,690,339, Cl. 241-73.000.
Schultz, Ward E.; and Smith, Harry D., Jr., to Halliburton Company. Borehole compensation method and apparatus using variations in relative borehole components. 4,691,102, Cl. 250-256.000.
Schulz, Gerd, to Gerd Schulz Fahrzeug- und Container-Technik. Hold down apparatus for the tippable structure of a vehicle. 4,690,232, Cl. 180-89.140.
Schulz, Manfred: *See*—
Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, 4,690,226, Cl. 173-128.000.
Schumann, Klaus: *See*—
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.
Schummer, Helmut: *See*—
Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.
Schwartz, Arthur G.; Gurries, Richard M.; and Johnson, Jay K. Long residence pollution control system. 4,690,697, Cl. 55-84.000.
Schwartz, Reinhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,690,624, Cl. 417-499.000.
Scientific Atlanta, Inc.: *See*—
Farmer, James O., 4,691,353, Cl. 380-15.000.
Scopes, David I. C.: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.
Scott, Curtis E.; and McVey, Charles L., to General Electric Company. Glaze polishing polycrystalline alumina material. 4,690,727, Cl. 156-635.000.
Sebille, Michel, to Treficable Pirelli. Rotary extrusion head more especially for manufacturing cables with helical grooves for optical fibers. 4,690,627, Cl. 425-113.000.
Secretary of State for Defence, The: *See*—
Elliott, Charles T.; and White, Anthony M., 4,691,107, Cl. 250-370.000.

Securitytyle Limited: *See*—
Buckley, John E., 4,689,852, Cl. 16-341.000.
Seigneurin, Michel: *See*—
Luinet, Jean-Jacques; and Seigneurin, Michel, 4,690,641, Cl. 433-129.000.
Seiko Instruments & Electronics Ltd.: *See*—
Odagiri, Hiroshi; and Nishida, Isamu, 4,690,568, Cl. 368-204.000.
Seki, Kazuhito: *See*—
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.
Sekida, Minoru: *See*—
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, 4,690,530, Cl. 354-21.000.
Sekiguchi, Kazuya: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.
Sekiguchi, Kyoji: *See*—
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, to Lion Corporation; and Nitto Chemical Industry Co., Ltd. Process for production of modified hydroxyethyl cellulose. 4,691,013, Cl. 536-96.000.
Seltzer, Raymond: *See*—
Behrens, Rudolf A.; and Seltzer, Raymond, 4,691,015, Cl. 544-198.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,690,717, Cl. 437-2.000.
Semmerling, Ralph P.: *See*—
Green, William J.; and Semmerling, Ralph P., 4,689,927, Cl. 52-180.000.
Semrau, Hans-Juergen: *See*—
Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, 4,690,177, Cl. 139-449.000.
Senn, Werner: *See*—
Katzmann, Harald; Senn, Werner; and Ammann, David, 4,690,029, Cl. 86-20.110.
Sentron v.o.f.: *See*—
v.d. Vlekkert, Hendrik H.; and de Rooy, Nicolaas F., 4,691,167, Cl. 324-438.000.
Seppala , Jukka, to Neste Oy. Procedure for making copolymers of ethylene and long-chained alpha olefins. 4,690,991, Cl. 526-158.000.
Seredinin, Sergei B.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Martin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Servadio, Vittorino: *See*—
Chiesi, Paolo; and Servadio, Vittorino, 4,690,944, Cl. 514-445.000.
Seto, Hiroyuki: *See*—
Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, 4,691,104, Cl. 250-338.000.
Seton Company: *See*—
Orr, Robert B.; and Chicosky, Leon, Jr., 4,690,953, Cl. 521-65.000.
Settelmeyer, Richard: *See*—
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, 4,690,692, Cl. 51-293.000.
Seuster, Kurt. Door which can be rolled up. 4,690,194, Cl. 160-265.000.
Seyer, Richard: *See*—
Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, 4,690,421, Cl. 280-403.000.
Seyerle, Carl E., to Outboard Marine Corporation. Operator presence control for self-propelled implements. 4,689,939, Cl. 56-11.100.
Seymour-Sheridan, Inc.: *See*—
Morgan, David L., 4,690,323, Cl. 236-99.00F.
Shafer, Steve: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Shahani, Goutam H.: *See*—
Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., 4,690,215, Cl. 166-261.000.
Shamir, Adi: *See*—
Rivest, Ronald L.; and Shamir, Adi, 4,691,299, Cl. 365-189.000.
Shamordola, Kenneth A.: *See*—
Kern, Mark T.; and Shamordola, Kenneth A., 4,691,196, Cl. 340-178.000.
Shapter, Hugh; and Wood, Colin, to Plessey Overseas Limited. Microstrip and cavity-backed aperture antenna. 4,691,206, Cl. 343-700.0MS.
Sharp Kabushiki Kaisha: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,691,214, Cl. 357-17.000.
Machara, Sigeharu, 4,690,545, Cl. 355-51.000.
Matsuda, Kumehiko; and Komai, Kensaku, 4,691,283, Cl. 364-405.000.
Nagano, Fumikazu, 4,691,228, Cl. 358-75.000.
Nishimura, Toshio, 4,691,118, Cl. 307-66.000.
Shin, Yasuo; and Tanabe, Takeshi, 4,691,186, Cl. 338-34.000.
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Shaw, Douglas R., to Resource Technology Associates. Selective flocculation process for the recovery of phosphate. 4,690,752, Cl. 209-5.000.
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., to Bausch & Lomb Incorporated. Apparatus for use in transporting a photogrammetric microscope from a first position to a second position. 4,690,520, Cl. 350-517.000.
Shawcross, Brian E., to CIBA-GEIGY AG. Exposing frame. 4,690,547, Cl. 355-72.000.
Shell California Production Inc.: *See*—
Ritter, Paul B., Jr., 4,690,221, Cl. 166-382.000.
Shell Offshore Inc.: *See*—
Pritchard, John J., Jr., 4,690,216, Cl. 166-264.000.
Shell Oil Company: *See*—
Drent, Eit, 4,691,047, Cl. 560-204.000.
Rambow, Frederick H. K., 4,691,307, Cl. 367-69.000.
Shell, Stanley, to Digital Equipment Corporation. Cursor position controller. 4,691,199, Cl. 340-710.000.
Shephard, Margaret C.: *See*—
Worthington, Paul A.; and Shephard, Margaret C., 4,690,941, Cl. 514-383.000.
Sheppard, Robert: *See*—
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, 4,691,117, Cl. 307-119.000.
Sherman, Charles F., to Esselte Pendaflex Corp. Display frame for mounting vertical surface. 4,689,906, Cl. 40-152.100.
Sherrod, Danny, to Bluff Welding Inc. Dock leveler apparatus. 4,689,846, Cl. 14-71.300.
Shiba, Keisuke: *See*—
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, 4,690,886, Cl. 430-303.000.
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, to Yamanouchi Pharmaceutical Co., Ltd. Cephalosporin compounds and salts thereof. 4,690,921, Cl. 514-205.000.
Shibao, Hitoshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Shibata, Tadahiko: *See*—
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.
Shibuya, Hiromichi: *See*—
Ouchi, Teruo; and Shibuya, Hiromichi, 4,690,175, Cl. 138-131.000.
Shida, Takafumi: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Shiga, Masaaki: *See*—
Hosaka, Shuroku; and Shiga, Masaaki, 4,691,260, Cl. 360-121.000.
Shigematsu, Takashi: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Inverse emulsions. 4,690,996, Cl. 527-312.000.
Shiina, Takanori: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.
Shima, Hideharu: *See*—
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, 4,691,140, Cl. 313-486.000.
Shimada, Naohiro: *See*—
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,690,662, Cl. 474-69.000.
Nagano, Masashi, 4,690,663, Cl. 474-80.000.
Shimano, Shizuo: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.
Shimizu, Haruo, to Canon Kabushiki Kaisha. Image data processing apparatus adaptable to output devices of different types. 4,691,237, Cl. 358-256.000.
Shimizu, Natsue: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.
Shimizu, Yoshiro, to Isuzu Motors Ltd. Door glass assembly for automotive vehicles. 4,689,916, Cl. 49-374.000.
Shimizue, Susumu: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Shimoni, Yair: *See*—
Fenster, Paul; and Shimoni, Yair, 4,691,366, Cl. 382-54.000.
Shin-Etsu, Chemical Co., Ltd.: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.
Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, 4,690,713, Cl. 106-287.160.
Yokokawa, Kiyoshi; and Koya, Kazuo, 4,690,504, Cl. 350-96.340.
Shin, Yasuo; and Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Aging treatment for semiconductor gas sensor. 4,691,186, Cl. 338-34.000.

Shinasjuk, Alla F.: *See*—
Loznsky, Miron O.; Bobkov, Jury G.; Shinasjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Martin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 360-196.000.

Shindo, Hirohisa: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Shindou, Yoshio: *See*—
Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, 4,690,017, Cl. 74-866.000.

Shinguryo, Satoshi: *See*—
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Shinjo, Katsumi, to Yugen Kaisha Shinjoseisakusho. Self-piercing nut. 4,690,599, Cl. 411-180.000.

Shinkai, Hiroyuki: *See*—
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.

Shinkawa, Hiroyasu: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Shinooka, Kiyohide: *See*—
Uemura, Toshinobu; Okbuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.

Shinozaki, Takashi; and Ishikawa, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle lubrication system. 4,690,236, Cl. 180-219.000.

Shionogi & Co., Ltd.: *See*—
Seno, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.

Shionogi & Co., Ltd: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Shirafuji, Tamio; and Kawata, Itaru, to Sumitomo Chemical Company, Limited. Method for producing cycloalkanols. 4,691,064, Cl. 568-835.000.

Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, to Kyowa Hakko Kogyo Kabushiki Kaisha. New mitomycin derivatives, preparation thereof and pharmaceutical compositions containing them. 4,691,024, Cl. 548-422.000.

Shirahata, Ryuji; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,690,857, Cl. 428-216.000.

Shiraishi, Ryoichi: *See*—
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.

Shirasawa, Hiroshi: *See*—
Umemoto, Yoseisugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.

Shiroza, Teruaki: *See*—
Yamane, Kunio; Okmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Shitori, Yoshiyasu: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Shizume, Yasumichi, to NEC Corporation. Mixer circuit. 4,691,379, Cl. 455-319.000.

Shkedi, Zvi, to Garrett Corporation, The. Temperature compensated pressure transducer. 4,689,999, Cl. 73-708.000.

Shockley, Charles W.: *See*—
Stannard, James P.; and Shockley, Charles W., 4,690,213, Cl. 166-84.000.

Shoop, James D., to Diebold, Incorporated. Locking mechanism. 4,690,073, Cl. 109-59.00T.

Short Brothers PLC: *See*—
Moles, John A. G.; and McMahon, Colbert M., 4,690,007, Cl. 74-5.120.

Short, James N.: *See*—
McDaniel, Max P.; and Short, James N., 4,690,990, Cl. 526-138.000.

Showers, David F., to Glenwood Systems U.S.A., Ltd. Stationery set. 4,690,433, Cl. 283-1.00B.

Shwez, Mark. Agricultural implement for disposal of crop residue. 4,690,224, Cl. 172-45.000.

Sibata, Suegi, to Yamaichi Electric Mfg. Co., Ltd. IC package connector with contacts of high density. 4,690,646, Cl. 439-71.000.

Sieck, Reinhard: *See*—
Brasewitz, Gerhard; and Sieck, Reinhard, 4,690,896, Cl. 435-296.000.

Siegel, Myron: *See*—
Fazzolari, Anthony; and Fazzolari, Nicholas, 4,690,441, Cl. 292-57.000.

Siemens Aktiengesellschaft: *See*—
Einale, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.
Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.
Fritz, Otmar, 4,690,275, Cl. 206-331.000.
Fruhauf, Waldemar, 4,691,128, Cl. 307-557.000.
Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, 4,691,337, Cl. 379-24.000.
Herberg, Helmut, 4,691,221, Cl. 357-46.000.
Lange, Gottfried, 4,691,232, Cl. 358-111.000.
Mattausch, Hans J., 4,691,302, Cl. 365-240.000.
Teloraek, Gerhard, 4,691,335, Cl. 378-152.000.
Wenger, Bruno, 4,691,327, Cl. 375-4.000.
Wolff, Pieter, 4,691,297, Cl. 364-900.000.

Sigelman, Jesse L.; and Miodownik, Saul, to Sigelman, Jesse L. Self-contained refrigerator open door indicator. 4,691,195, Cl. 340-545.000.

Sigri GmbH: *See*—
Kraus, Gunter, 4,691,324, Cl. 373-91.000.

Silicon Systems, Inc.: *See*—
Fukahori, Kiyoshi; and Glad, Thomas, 4,691,172, Cl. 330-129.000.

Silver, Bruce R., to Polaroid Corporation. Electronic imaging camera for recording either moving or still images. 4,691,253, Cl. 360-33.100.

Simen Aerials, Inc.: *See*—
Hornagold, John T.; and Peszewski, Paul, 4,690,246, Cl. 182-2.000.

Simier, Jean-Noel: *See*—
Nardi, Alain; and Simier, Jean-Noel, 4,690,800, Cl. 422-40.000.

Simko, Vlado, to State University of New York, The. High-caloric, high-fat dietary formula. 4,690,820, Cl. 424-128.000.

Simonet, Donald E.: *See*—
Zeck, Walter M.; and Simonet, Donald E., 4,690,947, Cl. 514-521.000.

Simpson, David C.: *See*—
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Singer Company, The: *See*—
Bennett, William S., 4,691,280, Cl. 364-200.000.
Ljung, Bo H. G.; and Krupick, Walter J., 4,691,323, Cl. 372-107.000.

Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., to PPG Industries, Inc. Acrylic modified polymers. 4,690,980, Cl. 525-286.000.

Singh Rana, Virendra V.: *See*—
Luther, Lars C.; and Singh Rana, Virendra V., 4,690,726, Cl. 156-624.000.

Singleton, Eric: *See*—
Albers, Michel O.; and Singleton, Eric, 4,691,069, Cl. 585-259.000.

Siove, Alain: *See*—
Grubba, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.

Sircar, Shivaji; and Koch, William R., to Air Products and Chemicals, Inc. Oxidation of carbonaceous material. 4,690,696, Cl. 55-26.000.

Sitnikov, Alexandr E.: *See*—
Gradoboev, Vladimir T.; Sitnikov, Alexandr E.; Klimenov, Alexandr M.; and Melnikov, Leonid I., 4,690,267, Cl. 198-396.000.

Sjodin, Lars T.: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

SKF GmbH: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

SKF Industrial Trading and Development Company B.V.: *See*—
Verburgh, Martin B.; and Pfeifle, Dieter, 4,691,092, Cl. 219-121.01LD.

Skinner, James R., to M. U. Engineering & Manufacturing, Inc. Rhodium coated mold. 4,690,370, Cl. 249-114.00R.

Skinner, Maurice W.: *See*—
Doroszkowski, Andrew; and Skinner, Maurice W., 4,690,837, Cl. 427-314.000.

Skinner, Robert L.: *See*—
Erwin, Douglas A.; and Skinner, Robert L., 4,691,295, Cl. 364-900.000.

Skipper, Claud, to Productive Instrument & Machine Inc. Fireplug anti-theft apparatus. 4,690,167, Cl. 137-382.000.

Skovhoj, Jens B. Lawn and garden maintenance apparatus. 4,689,940, Cl. 56-228.000.

Slettemoen, Gudmund. Measuring and mapping vibrations. 4,689,993, Cl. 73-579.000.

Smart, Nancy M.; and Smart, Ricky B. Electric outlet and plug. 4,690,474, Cl. 439-120.000.

Smart, Ricky B.: *See*—
Smart, Nancy M.; and Smart, Ricky B., 4,690,474, Cl. 439-120.000.

Smigel, Irwin E. Method of manufacture of a toothpaste composition. 4,690,776, Cl. 252-315.300.

Smith, Elizabeth M.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.

Smith, Francis X.: *See*—
Ogunbiyi, Lai; and Smith, Francis X., 4,690,773, Cl. 252-174.120.

Smith, Harry D., Jr.: *See*—
Schultz, Ward E.; and Smith, Harry D., Jr., 4,691,102, Cl. 250-336.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Towel for skin moisturizing and drying. 4,690,821, Cl. 424-401.000.

Smith, Joseph E., to V. W. Kaiser Engineering, Inc. Steering knuckle and kingpin assembly. 4,690,418, Cl. 280-96.100.

Smith, Kellen R.: *See*—
Smith, Quintin R.; and Smith, Kellen R., 4,690,319, Cl. 228-182.000.

Smith, Leon E. Twin matchbook. 4,690,273, Cl. 206-105.000.

Smith, Mark L.; and Wagner, Richard M., to AMP Incorporated. Selective plating apparatus. 4,690,747, Cl. 204-206.000.

Smith, Marlin R.: *See*—
George, Flint R.; and Smith, Marlin R., 4,690,227, Cl. 175-4.560.

Smith, Quintin R.; and Smith, Kellen R. Method of making complexly curved mold. 4,690,319, Cl. 228-182.000.

Smith, Robert K.: *See*—
Becke, Hans W.; and Smith, Robert K., 4,691,220, Cl. 357-39.000.

Smith, Robert S. Multipurpose rowing apparatus. 4,690,398, Cl. 272-72.000.

Smith, William A.: *See*—
Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.

Smiths Industries Public Limited Company: *See*—
Beckley, Keith A.; Jacob, Neil R.; and Trussler, Geoffrey A., 4,689,991, Cl. 73-304.00C.

Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, to PPG Industries, Inc. Novel cartridge with stress relieving member. 4,690,760, Cl. 210-321.500.

Smulders, Henricus J.: *See*—
Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., 4,691,311, Cl. 369-100.000.

Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased (by Johnson, Barbara F., executor), to Allied Corporation. Tubular bi-metal connector. 4,690,480, Cl. 439-364.000.

Snyder, Keith A.: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.

Snyder, Robert S.: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.

Snyders, Robert V. Ventricular assist device. 4,690,134, Cl. 128-64.000.

Societa Cavi Pirelli S.p.A.: *See*—
Bortolin, Bruno; and Borgonovo, Sergio, 4,690,496, Cl. 350-96.210.
Occhini, Elio; and Bianchi, Giuseppe, 4,690,497, Cl. 350-96.230.
Priaroggia, Paolo G., 4,690,498, Cl. 350-96.230.

Societe Anonyme D.B.A.: *See*—
Couvez, Marc, 4,690,254, Cl. 188-73.360.

Societe Chimique des Charbonnages-CdF chimie: *See*—
Nardi, Alain; and Simier, Jean-Noel, 4,690,800, Cl. 422-40.000.

Societe d'Exploitation des Machines Dubuit: *See*—
Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, 4,690,050, Cl. 101-35.000.

Societe Nationale des Chemins de Fer Francais: *See*—
Turbe, Jean Pierre, 4,689,995, Cl. 73-636.000.

Societe Nationale des Poudres et Explosifs: *See*—
Granier, Georges; and Valliere, Yves, 4,690,063, Cl. 102-530.000.

Societe Nationale Elf Aquitaine: *See*—
Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Arena, Georges; and Philippe, Staron, 4,691,306, Cl. 367-40.000.

Societe Nouvelle Baele Gangloff: *See*—
Braymand, Robert, 4,690,270, Cl. 198-774.000.

Sogabe, Ichita; Murata, Syunji; and Yokoya, Yuji, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Rotary driving device used for rotary actuator. 4,691,135, Cl. 310-254.000.

Solarex Corporation: *See*—
Dickson, Charles R.; and Carlson, David E., 4,690,830, Cl. 427-74.000.

Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., to Xerox Corporation. Piezoelectric optical beam deflector. 4,691,212, Cl. 346-108.000.

Solstad, Russell V., to VTC Incorporated. Integrated circuit packaging process. 4,689,875, Cl. 437-211.000.

Solvay & Cie. (Societe Anonyme): *See*—
Collart, Andre ; and Declerck, Fredy, 4,691,000, Cl. 528-244.000.
Dehennau, Claude; and Dubois, Paul, 4,690,628, Cl. 425-133.500.

Sonobe, Takashi: *See*—
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.

Sonoco Products Company: *See*—
Cannon, David C., 4,690,299, Cl. 220-402.000.

Sony Corporation: *See*—
Hayashi, Toshihide; Kanayama, Ikuo; and Kanno, Masayoshi, 4,691,351, Cl. 380-10.000.
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.
Maeda, Satoru; and Tao, Akihiko, 4,691,340, Cl. 379-96.000.
Nakada, Yasuo, 4,690,549, Cl. 356-4.000.

Souda, Yutaka: *See*—
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.

Soardillon-Airindex: *See*—
Lemonnier de Gouville, Jean B.; and Dane, Bernard, 4,690,636, Cl. 431-354.000.

Souriau & Cie.: *See*—
Mortier, Guy; and Chartrain, Jean-Claude, 4,690,596, Cl. 409.143.000.

South African Inventions Development Corporation: *See*—
Albers, Michel O.; and Singleton, Eric, 4,691,069, Cl. 585-259.000.

Southwestern Bell Telephone: *See*—
Stein, David E.; and Hammer, Donald R., 4,690,491, Cl. 350-96.160.

Spaeth, Lolita. Foldable quick pack for foodstuffs and the like. 4,690,321, Cl. 229-40.000.

Spaulding, Richard A.: *See*—
Hatch, Bruce O.; and Spaulding, Richard A., 4,691,094, Cl. 219-121.0PR.

Specialty Tool Co., Inc.: *See*—
Geise, Samuel C., 4,689,920, Cl. 51-241.00S.

Spector, George: *See*—
Schaffhauser, Brian E.; and Spector, George, 4,691,264, Cl. 361-232.000.

Spectra-Physics, Inc.: *See*—
Walker, Ray A., 4,690,556, Cl. 356-152.000.

Sperry Corporation: *See*—
Churchward, Reed R.; and Krocheski, Thomas L., 4,691,303, Cl. 365-222.000.
Splett, Katherine A.; and Howe, James A., 4,691,126, Cl. 307-441.000.

Spitaler, Englebert; and Wuerthner, Hubert, to TMC Corporation. Heel holder, in particular for a rental ski. 4,690,424, Cl. 280-633.000.

Splett, Katherine A.; and Howe, James A., to Sperry Corporation. Redundant synchronous clock system. 4,691,126, Cl. 307-441.000.

Sprague Electric Company: *See*—
Chalfin, Edward, 4,691,262, Cl. 361-56.000.

Springfield Wire, Inc.: *See*—
Beauregard, William W.; and Fessenden, Peter J., 4,689,878, Cl. 29-611.000.

Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., to Synergen Associates, Inc. Method for transformation of anaerobic microorganisms. 4,690,897, Cl. 435-320.000.

Srock, Rainer: *See*—
Eger, Georg; and Srock, Rainer, 4,689,849, Cl. 16-82.000.

SS Pharmaceutical Co., Ltd.: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isonse, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.

Staheli, Theodor, to Ciba-Geigy Corporation. Dispensing device for storing and applying at least one liquid or pasty substance. 4,690,306, Cl. 222-80.000.

Stahl, G. Allan: *See*—
Burns, Lyle D.; and Stahl, G. Allan, 4,690,219, Cl. 166-307.000.

Stamm, Richard H.: *See*—
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

Standard Oil Company, The: *See*—
Morrison, Donald L.; and Bartok, Stephen, 4,690,193, Cl. 160-133.000.
Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.
Valenyi, Louis J.; and Krupa, Andrew S., 4,690,814, Cl. 423-644.00R.

Standing, Anthony C. Combined energiser and reel for electric fences. 4,691,084, Cl. 191-12.20R.

Stanland, Andrew J.: *See*—
Chamberland, Roger R.; and Stanland, Andrew J., 4,690,482, Cl. 439-578.000.

Stanley, Frankie B., to Yarbrough, J. W., a part interest. Yarn drying and dye setting apparatus. 4,689,972, Cl. 68-20.000.

Stanley, Keith R.; and Winchell, David F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for controlling a conference. 4,691,347, Cl. 379-203.000.

Stanley, Mervin D.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.

Stannard, James P.; and Shockley, Charles W., to Pneumatic Pipewipers, Inc. Pneumatic pipe wiper system. 4,690,213, Cl. 166-84.000.

Stanton, David J.: *See*—
Rise, Mark T.; and Stanton, David J., 4,690,144, Cl. 128-419.00R.

Stapfer, Jakob: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.

Starkey, Stanley V.: *See*—
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.

Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, to Bayer Aktiengesellschaft. Organic nickel compounds, the production thereof and the use thereof as polymerization catalysts. 4,691,036, Cl. 556-16.000.

Starzmann, Martin, to Molnlycke AB. Substantially triangular surgical drape. 4,690,137, Cl. 128-132.00D.

State University of New York, The: *See*—
Simko, Vlado, 4,690,820, Cl. 424-128.000.

Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Ionomers having improved low temperature properties. 4,690,981, Cl. 525-329.600.

STC plc: *See*—
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.

Steele, Douglas S., to General Electric Company. Ionization detector. 4,691,108, Cl. 250-385.000.

Stegmann, Werner, to Ciba-Geigy Corporation. Process for producing 1-hydroxy ketones. 4,691,058, Cl. 568-316.000.

Stein, David E.; and Hammer, Donald R., to Southwestern Bell Telephone. Building data transmission system. 4,690,491, Cl. 350-96.160.

Stein Industrie: *See*—
Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

Stein, Ross L.: *See*—
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.

Steinberger, Ned, to Steinberger Sound Corporation. String clamping device. 4,690,028, Cl. 84-314.00N.

Steinberger Sound Corporation: *See*—
Steinberger, Ned, 4,690,028, Cl. 84-314.00N.

Steinemann, Robert, to Georg Fischer Aktiengesellschaft. Method and apparatus for regulating fluid flow. 4,690,163, Cl. 137-8.000.

Steirische Kettenfabriken Pengg-Walenta KG: *See*—
Jeindl, Ferdinand, 4,690,190, Cl. 152-213.00A.

Stemco, Inc.: *See*—
Gregorich, Edward E.; and Maher, Timothy R., 4,690,245, Cl. 181-272.000.

Stemcor Corporation: *See*—
Bates, Carl H., 4,690,790, Cl. 264-63.000.

Stephany, Joseph P., to Xerox Corporation. Matrix display with a fast cursor. 4,691,200, Cl. 340-784.000.

Stephen, John F.: *See*—
Nelson, Richard V.; and Stephen, John F., 4,690,963, Cl. 524-98.000.

Stephenson, Jeff: *See*—
Ell, Travis E.; and Stephenson, Jeff, 4,691,152, Cl. 318-616.000.

Steridyne Corporation: *See*—
Poncy, Richard P.; and Chrzanowski, Mathew, 4,690,457, Cl. 297-337.000.

Sterling, Edward L., Jr.; and Thompson, William L., to Babcock & Wilcox Company, The. On-line serial communication interface from a computer to a current loop. 4,691,328, Cl. 375-36.000.

Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Ferrite waveguide scanning antenna. 4,691,208, Cl. 343-785.000.

Stern, Richard M., to Riker Laboratories, Inc. Intermediates for the preparation of 8,9-dihalobenzo[i]quinolizine carboxylic acids. 4,691,016, Cl. 546-95.000.

Stessen, Lothar, to DIEHL GmbH & Co. Impulse propulsion unit. 4,689,845, Cl. 60-228.000.

Stevens, Donn E.: *See*—
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Stevens, Michael G.: *See*—
Hoffman, Dwight K.; Stevens, Michael G.; and Mensick, Virginia B., 4,690,988, Cl. 525-502.000.

Stevens, Vernon C., to Ohio State University. Antigenic modification of polypeptides. 4,691,006, Cl. 530-324.000.

Stevermuer, Heinrich: *See*—
Lotz, Alexander; and Stevermuer, Heinrich, 4,690,753, Cl. 209-496.000.

Stiefel, Jakob. Roll cutting machine for comminution of bulky refuse. 4,690,337, Cl. 241-36.000.

Stilling, Johann. Replaceable awning. 4,690,192, Cl. 160-57.000.

Stoffel, James C.; and Tandon, Jagdish C., to Xerox Corporation. Method and apparatus for fabricating full width scanning arrays. 4,690,391, Cl. 269-21.000.

Stolar, Inc.: *See*—
Stolarczyk, Larry G., 4,691,166, Cl. 324-334.000.

Stolarczyk, Larry G., to Stolar, Inc. Electromagnetic instruments for imaging structure in geologic formations. 4,691,166, Cl. 324-334.000.

Stolz, Robert: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

Stone, Earlyn W. Dispensing receptacle for drafting equipment. 4,690,285, Cl. 211-41.000.

Stoner, Eugene M., to ARES, Inc. Breech/receiver assembly for automatic cannons. 4,690,032, Cl. 89-43.010.

Storer, Richard: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.

Strachan, John S., to Syrinx Innovations Limited. Rotation rate sensor. 4,689,992, Cl. 73-505.000.

Stratton, John F., to Lucas Industries public limited company. Combustion equipment. 4,689,961, Cl. 60-748.000.

Straubel, Max: *See*—
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.

Strausburg, Larry D.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.

Stricker, David J.: *See*—
Friedman, Walter; and Stricker, David J., 4,690,656, Cl. 446-95.000.

Strippit/Di-Acro-Houdaille, Inc.: *See*—
Clark, Stephen C., 4,690,021, Cl. 83-71.000.

Struger, Odo J., to Allen-Bradley Company, Inc. Method and apparatus for exchanging multiple data bytes with an I/O module in a single scan. 4,691,296, Cl. 364-900.000.

Stuart, Van I. W.: *See*—
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Suchowski, Bernard, to Hartz Mountain Corporation, The. Hook. 4,689,860, Cl. 24-239.000.

Sucia, George D.; and Paustian, John E. Process for preventing backmixing in a fluidized bed vessel. 4,691,031, Cl. 549-258.000.

Suda, Yoshio: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Sugarbaker, Paul H.: *See*—
Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., 4,690,131, Cl. 128-4.000.

Sugawara, Toshiyuki: *See*—
Mochida, Eiji; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.

Sugden, Peter R.: *See*—
Redman, Michael J.; Woeg, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.

Sugg, Basil R.: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, to Mitsubishi Rayon Co., Ltd. Method for producing rubber modified thermoplastic resins. 4,690,974, Cl. 525-64.000.

Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, to Mitsubishi Rayon Co., Ltd. Method for producing rubber modified thermoplastic resins. 4,690,975, Cl. 525-64.000.

Sugimoto, Shigeo: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, to House Food Industrial Co., Ltd. Apparatus for producing sterile air. 4,690,699, Cl. 55-267.000.

Sugiura, Fumio: *See*—
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Sugiura, June: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.

Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, to Hitachi, Ltd. Optical exposer. 4,690,529, Cl. 353-122.000.

Sulzer Brothers Limited: *See*—
Lauer, Fredy, 4,690,600, Cl. 411-263.000.

Suman, Michael J.: *See*—
Boerema, Edward T.; Suman, Michael J.; and Fleming, Dennis J., 4,690,450, Cl. 296-97.00K.

Sumida, Seizo: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Sumitomo Chemical Company, Limited: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.
Shirafuji, Tamio; and Kawata, Itaru, 4,691,064, Cl. 568-835.000.
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,690,946, Cl. 514-485.000.
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Sumitomo Electric Industries, Ltd.: *See*—
Takahashi, Shinichiro; and Ishiki, Isao, 4,691,330, Cl. 377-39.000.

Sumitomo Pharmaceuticals Company, Limited: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,690,846, Cl. 428-64.000.

Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Hydraulic servo for friction coupling element of automatic transmission. 4,690,037, Cl. 92-130.00R.

Sumner, Cyril R., to Halliburton Company. Method for depth control and detonation of tubing conveyed gun assembly. 4,690,218, Cl. 166-297.000.

Sun Chemical Corporation: *See*—
Janusz, Edward G., 4,690,712, Cl. 106-30.000.

Sun, Robert Li-Jiun: *See*—
Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.

Sun Seiki Co., Ltd.: *See*—
Kubota, Takao; and Ujii, Yasuo, 4,690,535, Cl. 354-322.000.

Sunaga, Sohsuke: *See*—
Masuda, Naosuke; and Sunaga, Sohsuke, 4,689,983, Cl. 72-356.000.

Sundquist, Glen. Water heater and distiller apparatus. 4,690,102, Cl. 122-13.00R.

Sunds Defibrator Aktiebolag: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

Sundstrand Corporation: *See*—
Dobbs, Daniel R., 4,690,085, Cl. 114-20.200.
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, 4,690,470, Cl. 439-13.000.
Niggemann, Richard; and Readman, John, 4,690,210, Cl. 165-159.000.

Super Sack Manufacturing Corporation: *See*—
Derby, Norwin C., 4,691,371, Cl. 383-62.000.

Superior Manufacturing & Instrument Corporation: *See*—
Moscovici, Poldi, 4,691,275, Cl. 363-143.000.

Support Technologies, Inc.: *See*—
Phillips, Charles R., 4,691,316, Cl. 371-20.000.

Suski, John R.: *See*—
Clark, Roger J.; Economy, James; Flanders, Mary A.; Suski, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Sussman, Howard. Containers for cosmetic sundries. 4,690,276, Cl. 206-36.00X.

Sutherland, James F.: *See*—
Kenny, Thomas J.; and Sutherland, James F., 4,691,263, Cl. 361-58.000.

Suyama, Hideo: *See*—
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.

Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,691,214, Cl. 357-17.000.

Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, to NSK-Warner Kabushiki Kaisha. Speed responsive centrifugal clutch with a serial circumferential arrangement of shoe assemblies and dampers. 4,690,257, Cl. 192-3.310.

Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, to Canon Kabushiki Kaisha. Pattern forming method. 4,690,880, Cl. 430-313.000.

Suzuki, Masaharu: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Suzuki, Masanobu: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.

Suzuki, Masanori: *See*—
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Suzuki, Masayuki: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Suzuki, Shigeharu: *See*—
Narutani, Tetsu; and Suzuki, Shigeharu, 4,690,798, Cl. 420-61.000.

Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, to Kabushiki Kaisha Toshiba. IC device and a system for testing the same. 4,691,287, Cl. 364-490.000.

Suzuki, Toshiyuki: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.

Suzuki, Yukio, to U.S. Philips Corporation. Magazine for discs in holders, and combination of a disc-player with such a magazine. 4,691,309, Cl. 369-38.000.

Svenska Traforskningsinstitutet: *See*—
Herngren, Torbjorn; and Lofthus, Jon, 4,690,634, Cl. 431-8.000.
Rydefalk, Staffan; and Einarsson, Jens, 4,689,988, Cl. 73-61.00R.

Swain, Danny C., to Advanced Control Engineering. Filter pump head assembly. 4,690,621, Cl. 417-313.000.

Swaine, Robert L., Jr.: *See*—
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.

Swanson, Roy T., to S&C Electric Company. High voltage interrupting switch with improved contact connection arrangement and method. 4,691,085, Cl. 200-151.000.

Swiech, Matthew J.: *See*—
Munyon, Gary D.; and Swiech, Matthew J., 4,690,053, Cl. 101-328.000.

Swiss Aluminium Ltd.: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Synergen Associates, Inc.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.

Synergist Limited: *See*—
Gerow, Frank J., 4,690,135, Cl. 128-79.000.

Syntex (U.S.A.) Inc.: *See*—
Fried, John H.; and Venuti, Michael C., 4,690,925, Cl. 514-267.000.
Nestor, John J., Jr.; and Vickery, Brian, 4,690,916, Cl. 514-15.000.

Synthelabo: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Syohda, Shuji: *See*—
Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, 4,690,529, Cl. 353-122.000.

Syracuse University: *See*—
Friedman, Alexander A.; and Podolak, Peter L., 4,690,755, Cl. 210-96.100.

Syrinx Innovations Limited: *See*—
Strachan, John S., 4,689,992, Cl. 73-505.000.

Sze, Benjamin C., to Du Pont de Nemours, E. I., and Company. Uniform polymeric filaments. 4,691,003, Cl. 528-308.100.

Szedlmajer, Laszlo. Method and apparatus including spaced antennas for determining the trace and depth of underground metallic conductors. 4,691,165, Cl. 324-326.000.

Szporny, Laszlo : *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

T.A.S., Inc.: *See*—
Sayler, William H.; and White, Justin C., 4,690,338, Cl. 241-56.000.

Taggart, Davis L.; and Heffern, Edward W., to Amoco Corporation. Process for water injectivity improvement treatment of water injection wells. 4,690,217, Cl. 166-274.000.

Taguchi, Katsuhiko, to Tokyo Juki Industrial Co., Ltd. Dust protection apparatus for a magnetic disc drive. 4,691,257, Cl. 360-97.000.

Taguchi, Masao: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.

Tajiri, Noriyuki: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,974, Cl. 525-64.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,975, Cl. 525-64.000.

Takada, Ikunori, to Mitsubishi Denki Kabushiki Kaisha. Planar semiconductor device with dual conductivity insulating layers over guard rings. 4,691,224, Cl. 357-53.000.

Takada, Kazuyoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Stabilizing means for snowmobile. 4,690,234, Cl. 180-182.000.

Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, to Shionogi & Co., Ltd. Pyrazolo[4,3-c]quinoline-3-one and imidazo[4,3-c]cinnolin-3-one derivatives and their use as psychotropic agents. 4,690,930, Cl. 514-293.000.

Takagi, Akihiro; and Kimoto, Kiyoshi, to Nippon Kogaku K. K. Apparatus for reproducing information from magnetooptical recording medium. 4,691,308, Cl. 369-13.000.

Takagi, Satoshi: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.

Takahashi, Akira: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.

Takahashi, Hideaki: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.

Takahashi, Hiroshi: *See*—
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, 4,690,886, Cl. 430-303.000.

Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Fungicidal N-phenylcarbamates. 4,690,946, Cl. 514-485.000.

Takahashi, Keishi: *See*—
Kobayashi, Masashi; Takahashi, Keishi; and Yoneyama, Kimiya, 4,691,258, Cl. 360-97.000.

Takahashi, Kenji: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Takahashi, Kiyofumi: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.

Takahashi, Masaaki: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.

Takahashi, Nobutaka, to Nissan Motor Company, Limited. System for controlling an internal combustion engine and method therefor. 4,690,116, Cl. 123-425.000.

Takahashi, Sadatoshi; and Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Wide angle high range zoom lens. 4,690,513, Cl. 350-427.000.

Takahashi, Shinichiro; and Ishiki, Isao, to Sumitomo Electric Industries, Ltd. Duty control circuit for gradually reducing the duty time. 4,691,330, Cl. 377-39.000.

Takahashi, Takehiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Stamping device having identical mount bases for rotatably supporting a cutting tool and an anvil. 4,690,022, Cl. 83-308.000.

Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, to Toyota Jidosha Kabushiki Kaisha. Control system for intermediate differential in four-wheel drive vehicle. 4,690,239, Cl. 180-249.000.

Takahashi, Yoshinobu: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,690,097, Cl. 118-723.000.

Takahashi, Yukio: *See*—
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, 4,691,140, Cl. 313-486.000.

Takai, Kiyoshi; and Kaseya, Akinori, to Godo Steel, Ltd. Hot gunning robot for furnace lining. 4,690,327, Cl. 239-226.000.

Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, to Sharp Kabushiki Kaisha. Structure and method of connecting terminals of matrix display units. 4,690,510, Cl. 350-334.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, to Victor Company of Japan, Ltd. Color imaging apparatus having a 1:2 frequency ratio between video and reference signals for high S/N color demodulation. 4,691,227, Cl. 358-47.000.

Takao, Kenji, to Rheon Automatic Machinery Co., Ltd. Apparatus for transferring shaped articles. 4,690,269, Cl. 198-460.000.

Takasago Perfumery Co., Ltd.: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Takata, Nobuharu, to Mitsubishi Denki Kabushiki Kaisha. Variable frequency power unit controlling system. 4,691,156, Cl. 318-798.000.

Takayama, Nobutoshi: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

Takeda, Hitoshi, to Nissan Motor Co., Ltd. Method and apparatus for alleviating transmission shift shocks. 4,691,285, Cl. 364-424.100.

Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Antiskid hydraulic pressure modulator for vehicle hydraulic braking system. 4,690,465, Cl. 303-119.000.

Takeda, Kyoji; and Kitai, Akira, to Tanaka Seiki Co., Ltd. Tape winding machine. 4,690,346, Cl. 242-56.00R.

Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Urea derivatives, and their use as herbicides. 4,690,709, Cl. 71-120.000.

Takeyama, Yutaka: *See*—
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,691,116, Cl. 307-10.00R.

Takezawa, Yoshio; and Akatsu, Tatsuo, to Toray Industries, Inc. Polyphenylene sulfide resin compositions and their moldings. 4,690,969, Cl. 524-413.000.

Taki, Koichi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Takigawa, Toshimichi: *See*—
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,690,020, Cl. 82-2.00D.

Takimoto, Hiroyuki: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

Takubo, Hiroichi: *See*—
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-192.00B.

Talon, Inc.: *See*—
MacFee, Norman W., 4,691,370, Cl. 383-61.000.

Tamai, Yasuo: *See*—
Shirahata, Ryuji; and Tamai, Yasuo, 4,690,857, Cl. 428-216.000.

Tamura, Takahiro: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Tanabe, Takeshi: *See*—
Shin, Yasuo; and Tanabe, Takeshi, 4,691,186, Cl. 338-34.000.

Tanaka, Fusatoshi: *See*—
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.

Tanaka, Itsuo: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.

Tanaka, Katsuhiko: *See*—
Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, 4,691,104, Cl. 250-338.000.

Tanaka Seiki Co., Ltd.: *See*—
Takeda, Kyoji; and Kitai, Akira, 4,690,346, Cl. 242-56.00R.

Tanaka, Susumu: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Tanaka, Tsunefumi: *See*—
Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,690,513, Cl. 350-427.000.

Tandon, Jagdish C.: *See*—
Stoffel, James C.; and Tandon, Jagdish C., 4,690,391, Cl. 269-21.000.

Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., to Texas Instruments Incorporated. Oxide-capped titanium silicide formation. 4,690,730, Cl. 156-643.000.

Tang, Wen-Tsung F.: *See*—
Schnizlein, Paul G.; and Tang, Wen-Tsung F., 4,691,122, Cl. 307-279.000.

Tangberg Data A/S: *See*—
Helgeland, Olav, 4,690,362, Cl. 248-404.000.

Tanigaki, Katsumi; and Iida, Yasuo, to NEC Corporation. Positive acting resist material comprised of novoloc resin derived from phenylphenol. 4,690,882, Cl. 430-192.000.

Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Shift control system of automatic transmission. 4,690,017, Cl. 74-866.000.

Taniguchi, Nobuyuki: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.

Tanimoto, Akikazu; and Imamura, Kazunori, to Nippon Kogaku K. K. Projection exposure apparatus. 4,690,528, Cl. 353-101.000.

Tanimoto, Hirotoshi: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Taniji, Hiroshi; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Pyrolytic boron nitride article. 4,690,841, Cl. 428-35.000.

Tao, Akihiko: *See*—
Maeda, Satoru; and Tao, Akihiko, 4,691,340, Cl. 379-96.000.

Tasbas, Hedy E.: *See*—
Coleman, Mary T.; and Tasbas, Hedy E., 4,690,671, Cl. 604-12.000.

Tavis, John R. Variable-reluctance transducer. 4,690,004, Cl. 73-862.640.

Taylor, Bruce F.; and Hagen, Kenneth G., to Thermo Electron-Web Systems, Inc. Evaporative-cooling apparatus and method for the control of web or web-production machine component surface temperatures. 4,689,895, Cl. 321-20.000.

Taylor, David, to BIP Chemicals, Ltd. Process for making solid urea-formaldehyde resins. 4,691,001, Cl. 528-256.000.

Taylor, Douglas B., to Cooper Cliff Door Manufacturing (1980) Ltd. Apparatus for opening and closing industrial door. 4,690,195, Cl. 160-310.000.

Taylor, James F. Boat with changeable configuration hull. 4,690,094, Cl. 114-284.000.

Taylor, John D.; and Houn, Kenneth V., to Wayne State University. Inhibition of tumor growth and metastasis with calcium channel blocker compounds. 4,690,935, Cl. 514-356.000.

Taylor, John E.; and Keene, Ian W., to BICC Public Limited Company. Optical fibre element housed in a tube resiliently set in a form such that its longitudinal axis follows a path greater than the rectilinear distance between points to be connected. 4,690,499, Cl. 350-96.230.

Taylor, Lyn P.: *See*—
Ross, Sidney A.; and Taylor, Lyn P., 4,690,142, Cl. 128-419.00R.

Taylor, Noel R.; and Taylor, Paul A. Automatic load seeking control for a motor. 4,691,155, Cl. 318-771.000.

Taylor, Paul A.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,691,155, Cl. 318-771.000.

TDK Corporation: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.

Teac Corporation: *See*—
Sakai, Yoshiaki; and Tsuyuguchi, Hiroshi, 4,691,255, Cl. 360-69.000.

Technical Oil Tools Corporation: *See*—
Jobe, Tommy L., 4,691,384, Cl. 455-602.000.

Teegen, Walter: *See*—
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.

Teijin Limited: *See*—
Kumakawa, Shiro; and Yamamoto, Kazuyuki, 4,690,866, Cl. 428-364.000.

Teijin Seiki Company Limited: *See*—
Matsumoto, Kazuyuki; Hashimoto, Masbataka; and Iwata, Michiyoshi, 4,690,010, Cl. 74-469.000.

Tektronix, Inc.: *See*—
Nelson, Theodore G.; and Diller, Calvin D., 4,691,174, Cl. 330-260.000.
Theus, John G., 4,691,121, Cl. 307-269.000.

Teledyne Industries, Inc.: *See*—
Keetley, Reginald G.; and Allen, Keith, 4,690,614, Cl. 416-43.000.

Tell, Elaine N.; and Veltman, Preston L., to National Medical Care. Sterilant compositions. 4,690,772, Cl. 252-106.000.

Telorack, Gerhard, to Siemens Aktiengesellschaft. Primary radiation diaphragm for X-ray diagnostics devices. 4,691,335, Cl. 378-152.000.

Temp. Systems, Inc.: *See*—
Theiss, John J.; and Durst, Paul T., 4,691,097, Cl. 219-513.000.

Temperilli, Aldemio: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Tendapak Holdings Pty. Limited: *See*—
Gibson, Royce G., 4,689,856, Cl. 17-32.000.

Tenenbaum, David M. Noise elimination system for pictures and the like. 4,691,343, Cl. 379-100.000.

Tentsova, Antonina I.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Terada, Katsunori: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.

Terada, Yasushi; and Nakayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. 4,691,216, Cl. 357-23.600.

Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, to Shin-Etsu Chemical Co., Ltd. Antifoam composition. 4,690,713, Cl. 106-287.160.

Terakawa, Takashige: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.

Teramoto, Tsutomu: *See*—
Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, 4,690,151, Cl. 128-682.000.

Teraoka, Masao; and Yuhashi, Yukio, to Tochigifujisangyo Kabushikigaisha. Hydraulic power transmission device with centrifugally actuated clutch override. 4,690,258, Cl. 192-58.00C.

Termohlen, David E. Drilling pipe for downhole drill motor. 4,690,212, Cl. 166-65.100.

Terumo Kabushiki Kaisha: *See*—
Katsura, Yoshiro, 4,690,762, Cl. 210-436.000.

Tervamaki, Jukka; and Jarvimaki, Kari, to Labsystems Oy. Diluting dosage device. 4,690,005, Cl. 73-864.120.

Teschner, Eckart: *See*—
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, 4,690,692, Cl. 51-293.000.

Texaco Inc.: *See*—
Duranleau, Roger G.; Nieh, Edward C. Y.; and Kaifton, John F., 4,691,041, Cl. 558-277.000.
Petter, Karl H.; and Robbins, Gregory K., 4,690,587, Cl. 405-211.000.

Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.

Texas Instruments Incorporated: *See*—
Anderson, Daniel F., 4,691,301, Cl. 365-200.000.
Douglas, Monte A., 4,690,729, Cl. 156-643.000.
Levine, Jules D.; Jensen, Millard J.; and Haney, Ronald E., 4,691,076, Cl. 136-250.000.
Malhi, Satwinder D. S., 4,689,871, Cl. 437-40.000.
Roll, Walter F.; and Campbell, Michael, 4,690,486, Cl. 350-6.600.
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.
Thaden, Robert C.; and Watts, Mark W., 4,691,289, Cl. 364-518.000.

Texas Iron Works, Inc.: *See*—
Braddick, Britt O., 4,690,220, Cl. 166-382.000.

Thaden, Robert C.; and Wajta, Mark W., to Texas Instruments Incorporated. State machine standard cell that supports both a Moore and a Mealy implementation. 4,691,289, Cl. 364-518.000.

Thalmann, Theo; and Oesterle, Gerhard, to Aktiengesellschaft Adolph Saurer. Back rest arrangement on a weaving machine. 4,690,176, Cl. 139-110.000.

Theiss, John J.; and Durst, Paul T., to Temp. Systems, Inc. Fail safe safety control device. 4,691,097, Cl. 219-513.000.

Thermal Dynamics Corporation: *See*—
Hatch, Bruce O.; and Spaulding, Richard A., 4,691,094, Cl. 219-121.09R.

Thermo Electron-Web Systems, Inc.: *See*—
Taylor, Bruce F.; and Hagen, Kenneth G., 4,689,895, Cl. 321-20.000.

Theus, John G., to Tektronix, Inc. Digital free-running clock synchronizer. 4,691,121, Cl. 307-269.000.

Thiebaud, Marius. Automatic regulating valve of the air flow sucked out of a room through a mechanical ventilating installation. 4,690,372, Cl. 251-129.100.

Thinking Machines Corporation: *See*—
Wolfram, Stephen, 4,691,291, Cl. 364-717.000.

Thomas & Betts Corporation: *See*—
Dienes, Zoltan B., 4,691,083, Cl. 174-135.000.

Thomas, Glenn M.: *See*—
Emler, Don R.; and Thomas, Glenn M., 4,690,107, Cl. 123-65.00V.

Thomas, William R., to Thoren Caging Systems, Inc. Ventilated animal housing and service system with cage filter covers. 4,690,100, Cl. 119-15.000.

Thompson, William L.: *See*—
Sterling, Edward L., Jr.; and Thompson, William L., 4,691,328, Cl. 375-36.000.

Thomson-CSF: *See*—
Esmurian, Gregoire; and Courty, Albert, 4,691,386, Cl. 455-607.000.

Thoren Caging Systems, Inc.: *See*—
Thomas, William R., 4,690,100, Cl. 119-15.000.

Thorp, Bruce E.: *See*—
Forbes, Richard L., II; and Thorp, Bruce E., 4,690,544, Cl. 355-15.000.

Thrower, Eugene S.: *See*—
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Thurmond, Gary D.: *See*—
Gee, Caroline M.; and Thurmond, Gary D., 4,690,488, Cl. 350-96.120.

Tidy Chain Pty. Ltd.: *See*—
Mitchell, Francoise E. L., 4,690,288, Cl. 211-113.000.

Tihanyi, Jenoe: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Till, Andrew: *See*—
Radvan, Bronislaw; and Till, Andrew, 4,690,860, Cl. 428-290.000.

Till, Henry R.: *See*—
Radulski, Charles A.; and Till, Henry R., 4,690,539, Cl. 355-3.0TR.

Timineri, Anthony A., to Nissho Iwai American Corporation. Antenna positioning apparatus. 4,691,207, Cl. 343-766.000.

Tiomkin, Michael: *See*—
Bar-Nefy, Simcha; and Tiomkin, Michael, 4,690,030, Cl. 89-1.130.

Titus, George R.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.

TMC Corporation: *See*—
Spitaler, Englebert; and Wuerthner, Hubert, 4,690,424, Cl. 280-631.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, 4,691,070, Cl. 585-273.000.

Tobin, Thomas J.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Tochigifujisangyo Kabushikigaisha: *See*—
Teraoka, Masao; and Yuhashi, Yukio, 4,690,258, Cl. 192-58.00C.

Tock, Richard W.: *See*—
Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.

Toda, Takezi: *See*—
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Tohara, Tsutomu: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Enoto, Shigeo, 4,690,960, Cl. 523-442.000.

Tojo, Kakuji: *See*—
Chien, Yie W.; and Tojo, Kakuji, 4,690,683, Cl. 604-896.000.

Tokai Carbon Co., Ltd.: *See*—
Kida, Tohru; and Yamamoto, Motohiro, 4,690,811, Cl. 423-345.000.

Tokai Corporation: *See*—
Nitta, Tomio, 4,690,377, Cl. 251-354.000.

Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, to Mitsubishi Rayon Company Ltd. Flat yarn and method for producing the same. 4,689,944, Cl. 57-260.000.

Tokico Ltd.: *See*—
Ando, Hiromi; Endo, Mitsuhiro; and Ono, Yukou, 4,690,034, Cl. 91-369.00A.

Tokiko, Ltd.: *See*—
Nishimura, Makoto, 4,691,153, Cl. 318-696.000.

Toko, Inc.: *See*—
Kondo, Hiroshi, 4,691,120, Cl. 307-265.000.

Tokoro, Setsuo: *See*—
Obayashi, Hideki; Kawai, Hitasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.

Tokudome, Yoshihiro: *See*—
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.

Tokyo Electric Co., Ltd.: *See*—
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,690,230, Cl. 177-229.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Satoma, Shiro, 4,690,079, Cl. 112-162.000.
Taguchi, Katsuhiko, 4,691,257, Cl. 360-97.000.

Tokyo Keiki Co., Ltd.: *See*—
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Takezawa, Yoshio; and Akatsu, Tatsuo, 4,690,969, Cl. 524-413.000.

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Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.
Koyama, Kenji; and Ohno, Shotaro, 4,690,754, Cl. 210-94.000.
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Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shuuichi, 4,690,429, Cl. 280-707.000.
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Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.
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Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.

Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,690,097, Cl. 118-723.000.
Isobe, Toshiaki; and Oba, Hidehiro, 4,690,117, Cl. 123-492.000.
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
Kanda, Mutsumi, 4,690,105, Cl. 123-41.82R.
Miyadera, Kazuhiko, 4,690,241, Cl. 180-315.000.
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.
Obayashi, Hideki; Kawai, Hisai; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-411.040.
Sogabe, Ichita; Murata, Syunji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.
Takahashi, Tokuyuki; Kuramochi, Konjiro; and Sayou, Syoichi, 4,690,239, Cl. 180-249.000.
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Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.
Uranishi, Kouji; and Itoh, Takaaki, 4,690,293, Cl. 220-86.00R.
Yasukawa, Masao, 4,690,104, Cl. 123-41.320.
Trage, Burkhard; and Leitz, Richard, to Balcke-Durr Aktiengesellschaft. Natural-draft cooling tower with forced-draft flow over reflux condensers. 4,690,207, Cl. 165-113.000.
Trainor, Diane A.: *See*—
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Trans-Guard Industries, Inc.: *See*—
Brammall, Terrence N., 4,690,443, Cl. 292-307.00R.
Treficable Pirelli: *See*—
Sebille, Michel, 4,690,627, Cl. 425-113.000.
Tri/Mark Corporation: *See*—
Larsen, Marvin L., 4,689,976, Cl. 70-208.000.
Trischler, Ferenc: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.
Triton Aquatherm Limited: *See*—
Dalton, Martin W., 4,690,334, Cl. 239-452.000.
Trostanovsky, Boris A.: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.
Trussler, Geoffrey A.: *See*—
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Tsai, John (Ji-Hsiung): *See*—
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiso, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.
Tsai, Tsang J.: *See*—
Tsai, Tzong D.; and Tsai, Tsang J., 4,690,170, Cl. 137-624.110.
Tsai, Tzong D.; and Tsai, Tsang J. Safety gas valve with timer. 4,690,170, Cl. 137-624.110.
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Walls, Henry M.; and Sayers, George M., Jr., 4,690,095, Cl. 116-67.00B.
Tsubuko, Kazuo: *See*—
Nagai, Kayoko; and Tsubuko, Kazuo, 4,690,881, Cl. 430-114.000.
Tsuchiya, Fumio: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.
Tsuchiya, Hiroyuki: *See*—
Kato, Kinya; and Tsuchiya, Hiroyuki, 4,690,565, Cl. 356-446.000.
Tsuchiya, Masahiro, to Clarion Co., Ltd. Spread-spectrum communication system. 4,691,326, Cl. 375-1.000.
Tsuji, Nobuo: *See*—
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.
Tsuji, Seiichi: *See*—
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Oda, Isao; and Tsuno, Nobuo, 4,690,617, Cl. 416-241.00B.
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Lewis, John C., Jr., 4,690,277, Cl. 206-362.100.
Tuckley, Trevor R.; and Pike, Harold W. E. Strip structure intended for clamping on a flange. 4,690,412, Cl. 277-184.000.
Tuckman, Drew E. Brush extension device. 4,690,579, Cl. 401-127.000.
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Percussive tool. 4,690,225, Cl. 173-116.000.
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Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.
Tupman, David J., to Caterpillar Industrial Inc. Optical communication apparatus for a vehicle. 4,691,385, Cl. 455-607.000.
Turbe, Jean Pierre, to Societe Nationale des Chemins de Fer Francais. Method and apparatus for the non-destructive testing of railroad track rails. 4,689,995, Cl. 73-636.000.
Tuttle, William E. Cleat and device therefor. 4,690,090, Cl. 114-218.000.
UBE Industries, Inc.: *See*—
Dannoura, Sadayuki, 4,690,197, Cl. 164-312.000.
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, 4,690,856, Cl. 428-215.000.
Ube Industries, Ltd.: *See*—
Makino, Hiroshi; and Nakatani, Masayuki, 4,690,873, Cl. 428-473.500.
Uchida, Goro, to Toyota Jidosha Kabushiki Kaisha. Air conditioner for vehicle. 4,690,039, Cl. 98-2.080.
Uchida, Satoshi: *See*—
Kashiwazaki, Masamichi; Ogawa, Kiichiro; and Uchida, Satoshi, 4,689,949, Cl. 60-39.120.
Uchida, Teruyoshi: *See*—
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.
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Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Uchimura, Mitsuo; and Masuyama, Tsutomu, to Tokyo Electric Co., Ltd. Multi-range load cell weighing instrument. 4,690,230, Cl. 177-229.000.
Uchiyama, Yuki, to Sakai & Co., Ltd. Cassette tape holder. 4,690,278, Cl. 206-387.000.
Ueba, Hisaaki: *See*—
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Ueda, Hiroyuki; and Kobata, Yoshihiro, to Canon Kabushiki Kaisha. Device for controlling printing pressure according to the kind of ink ribbon being used. 4,690,575, Cl. 400-166.000.
Ueda, Yoshio: *See*—
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Uemura, Michihiko: *See*—
Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, 4,691,178, Cl. 333-143.000.
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Ueshin, Akito, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet convey apparatus. 4,690,268, Cl. 198-399.000.
Uhmann, Rainer; and Radscheit, Kurt, to Hoechst Aktiengesellschaft. Process for the low-racemization preparation of peptide intermediates of the synthesis of gonadorelin and gonadorelin analogs, and new intermediates for this process. 4,691,008, Cl. 530-339.000.
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Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., to Raychem Corp. Protective article. 4,690,831, Cl. 427-44.000.
Ukisu, Hiroshi, to Epoch Company, Ltd. Interactive educational device. 4,690,645, Cl. 434-309.000.
Ullman, Johan. Improvements in working chair. 4,690,459, Cl. 297-453.000.
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, to Toyota Jidosha Kabushiki Kaisha; and Odai Tekko Kabushiki Kaisha. Ball joint. 4,690,581, Cl. 403-133.000.
Umiker, Hans, to Alexander Schoeller & Co. AG. Method for sorting out certain containers, such as industrial containers, bottle crates etc. from a stock of containers and a device on a container for the identification of a to be sorted out container. 4,690,751, Cl. 209-3.300.
Union Camp Corporation: *See*—
Johnson, Robert W., Jr., 4,690,783, Cl. 260-104.000.
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Veazey, Richard L.; and Hayes, Kathryn S., 4,690,982, Cl. 525-331.900.

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Veazey, Richard L.; and Pavlin, Mark S., 4,690,984, Cl. 525-332.300.
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Ananthapadmanabhan, Kavasery P.; and Goodard, Errol D., 4,690,892, Cl. 435-183.000.
Breneman, William C.; and Reeser, David M., 4,690,810, Cl. 423-335.000.
Doshi, Kishore J., 4,690,695, Cl. 55-16.000.
Forte, Paulino; and Vidueira, Jose A., 4,690,733, Cl. 203-21.000.
Kilgour, John A.; and Jorgenson, Michael W., 4,690,955, Cl. 521-112.000.
Pohl, Eric R.; and Pepe, Enrico J., 4,691,038, Cl. 556-407.000.
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Unisys Corporation: *See*—
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United Merchants & Manufacturers Inc.: *See*—
Porter, Rick A.; and Hoernle, Hans R., 4,690,859, Cl. 428-251.000.
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Agriculture: *See*—
Wehr, Michael A.; and Sajdak, Robert L., 4,690,309, Cl. 222-249.000.
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Army: *See*—
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Stern, Richard A.; and Babbitt, Richard W., 4,691,208, Cl. 343-785.000.
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Rosenberg, Steven A., 4,690,915, Cl. 514-2.000.
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Haslim, Leonard A.; and Lee, Robert D., 4,690,353, Cl. 244-134.00D.
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Kershaw, Joseph E., 4,691,209, Cl. 343-846.000.
U.S. Philips Corporation: *See*—
Appels, Johannes A.; and Maas, Henricus G. R., 4,689,872, Cl. 437-228.000.
Arragon, Jean-Pierre; and Michel, Jean-Pierre, 4,691,352, Cl. 380-14.000.
Bertram, Leo; and Schemmann, Hugo, 4,691,132, Cl. 310-156.000.
Bollard, David R., 4,691,381, Cl. 455-334.000.
Boudewijns, Arnoldus J. J., 4,691,218, Cl. 357-24.000.
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Dohmen, Petrus J. M., 4,691,142, Cl. 313-623.000.
Gerritsen, Jan; and Mensies, Otto, 4,691,139, Cl. 313-413.000.
Hoeberechts, Arthur M. E., 4,691,191, Cl. 340-347.00P.
Huizer, Cornelis M., 4,691,127, Cl. 307-475.000.
Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., 4,691,311, Cl. 369-100.000.
Janssen, Petrus J.; and Janssens, Peter C., 4,690,503, Cl. 350-96.300.
Khoe, Giok D., 4,690,493, Cl. 350-96.200.
Le Poole, Jan B.; and Dekkers, Nicolaas H., 4,691,103, Cl. 250-311.000.
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Neyer, Antonius A., 4,690,489, Cl. 350-96.140.
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United Technologies Automotive, Inc.: *See*—
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United Technologies Corporation: *See*—
Banas, Conrad M.; and Doyle, Brian M., 4,691,093, Cl. 219-121.0LC.
Kay, Ira W.; and Lehrach, Ronald P. C., 4,691,288, Cl. 364-511.000.
Kish, Jules G., 4,690,390, Cl. 267-155.000.
Madden, William M., 4,690,329, Cl. 239-265.190.
Murphy, Richard D.; and Fischer, William C., 4,691,315, Cl. 371-9.000.
Robinson, Ronald L.; and Honeycutt, Fred L., Jr., 4,690,330, Cl. 239-265.390.
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University of Florida: *See*—
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Ryan, James W., 4,690,936, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,937, Cl. 514-362.000.
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UOP Inc.: *See*—
Bricker, Jeffery C., 4,691,071, Cl. 585-319.000.
Engel, Dusan J.; and Gilson, Jean-Pierre, 4,691,063, Cl. 568-713.000.
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Urani, Angelo, to Cooper Industries, Inc. Cartridge fuse holder. 4,690,648, Cl. 439-622.000.
Uranishi, Kouji; and Itoh, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Filler cap structure for a fuel tank. 4,690,293, Cl. 220-86.00R.
Urata, Toshimitsu, to Kensa Giken Co., Ltd. Jig for carrying out movement and alignment within a pipe. 4,690,006, Cl. 73-866.500.
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Urbas, Branko, to CPC International Inc. Concentration of organic chemicals from dilute aqueous solutions. 4,691,055, Cl. 562-589.000.
Urbutis, Algimantas P., to Viskase Corporation. Shirred casing article. 4,690,173, Cl. 138-118.100.
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Green, William J.; and Semmerling, Ralph P., 4,689,927, Cl. 52-190.000.
Usui, Takayuki, to Mitsui & Co., Ltd. Method of preventing retrogradation of foodstuffs. 4,690,829, Cl. 426-661.000.
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Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, to Omron Tateisi Electronics Co. Blood pressure measuring apparatus. 4,690,151, Cl. 128-682.000.
v.d. Vlekkert, Hendrik H.; and de Rooy, Nicolaas F., to Sentron v.o.f. Apparatus for determining the activity of an ion (pIon) in a liquid. 4,691,167, Cl. 324-438.000.
V. W. Kaiser Engineering, Inc.: *See*—
Smith, Joseph E., 4,690,418, Cl. 280-96.100.
Vacca, Joseph P.: *See*—
Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.
Vadakin, Inc.: *See*—
Vadakin, Thomas C.; and Hoenigman, Thomas A., 4,690,159, Cl. 134-167.00C.
Vadakin, Thomas C.; and Hoenigman, Thomas A., to Vadakin, Inc. Rotary cleaning device. 4,690,159, Cl. 134-167.00C.
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Valliere, Yves: *See*—
Granier, Georges; and Valliere, Yves, 4,690,063, Cl. 102-530.000.
Vanacore, Vincent D., to American Telephone and Telegraph Company; and AT&T Information System Inc. PBX integrity arrangement for maintaining the functional integrity of PBX communication devices and associated facilities. 4,691,346, Cl. 379-198.000.
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, to Universities Space Research Association. Polymer-coated surfaces to control surface zeta potential. 4,690,749, Cl. 204-299.00R.
Van Daalen, Peter A.: *See*—
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.
Vandegriff, Hugh R.: *See*—
Elco, Richard A.; and Vandegriff, Hugh R., 4,690,472, Cl. 439-67.000.
Van Den Berg, Gerrit: *See*—
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.
van der Laan, Johan S.: *See*—
McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.
Vanderpool, Clarence D.: *See*—
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.

Van Erden, Donald L., to Minigrip, Inc. Manufacture of multi-layered reclosable bag making material and bags made therefrom. 4,691,372, Cl. 383-63.000.

Vangelov, Ivan V.: *See*—
Garianov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

van Os, Willem A. A., to Akzo N.V. Assembly of intra-uterine contraceptive device and insertor. 4,690,136, Cl. 128-130.000.

VanRens, Russell J., to Outboard Marine Corporation. Lost foam mold pattern and associated method. 4,690,201, Cl. 164-516.000.

Van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., to U.S. Philips Corporation. Integrated RC filter with resistor trimming. 4,691,171, Cl. 328-167.000.

Van Ry, Charles D. Apparatus for microaquaculture and pollution control. 4,690,756, Cl. 210-221.200.

Van Steenburgh, Leon R., Jr., to Wilkerson Corporation. Refrigerated gas separation apparatus. 4,689,969, Cl. 62-474.000.

Van Uijen, Cornelis M. J., to U.S. Philips Corporation. Method and device for NMR spectroscopy. 4,691,162, Cl. 324-309.000.

Van Winkle, Denzal W. Self actuating locking and unlocking arrangement and method for reciprocating piston type actuators. 4,690,033, Cl. 91-43.000.

Van Winkle, Denzal W. Bonded mechanically inner connected seal arrangement for a blowout preventer. 4,690,411, Cl. 277-166.000.

Vartan, Henri. Collapsible laundry press. 4,689,905, Cl. 38-26.000.

Vayman, Zinovy Y.: *See*—
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Veazey, Richard L., to Union Camp Corporation. Terminally functionalized poly(alloocimene). 4,690,979, Cl. 525-153.000.

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Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.

Veenhuizen, Edward L.: *See*—
Anderson, David B.; Schmiegel, Klaus K.; and Veenhuizen, Edward L., 4,690,951, Cl. 514-653.000.

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Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Mient, 4,691,134, Cl. 310-234.000.

Vehashkaya, Amida Sinun: *See*—
Oriana, Itzhak, 4,690,761, Cl. 210-330.000.

Veitch, Randall C., to Qualtronics Corporation. Thermal profile system. 4,690,569, Cl. 374-11.000.

Velenyi, Louis J.; and Krupa, Andrew S., to Standard Oil Company, The. Process for the production of hydrogen. 4,690,814, Cl. 423-648.00K.

Veltman, Preston L.: *See*—
Tell, Elaine N.; and Veltman, Preston L., 4,690,772, Cl. 252-106.000.

Veltrup, Elmar M. Apparatus for removing solid structures from body passages. 4,690,672, Cl. 604-43.000.

Venuti, Michael C.: *See*—
Fried, John H.; and Venuti, Michael C., 4,690,925, Cl. 514-267.000.

Verburgh, Martin B.; and Pfeifle, Dieter, to SKF Industrial Trading and Development Company B.V. Method for welding two parts together employing a concentrated energy beam and protective member. 4,691,092, Cl. 219-121.0LD.

Verkler, Charles E., to International Food Equipment Inc. Hamburger cooking apparatus. 4,690,044, Cl. 99-419.000.

Vernay, Pierre, to Fosseo International Limited. Casting of molten ferrous metal and moulds for use therein. 4,690,196, Cl. 164-58.100.

Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., to Odesskoe Spetsialnoe Konstruktorskoe Bjuro Spetsialnykh Stankov. Device for magnetically holding workpieces. 4,691,183, Cl. 335-289.000.

Versace, Richard W.: *See*—
Gangaly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.

VerWeire, James R.: *See*—
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.

Vickery, Brian: *See*—
Nestor, John J., Jr.; and Vickery, Brian, 4,690,916, Cl. 514-15.000.

Victor Company of Japan: *See*—
Nishimoto, Naomichi, 4,691,248, Cl. 358-320.000.

Victor Company of Japan, Ltd.: *See*—
Kashiwagi, Shigeru, 4,691,147, Cl. 315-371.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.

Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, to Stein Industrie. Ignition and combustion supporting burner for pulverized solid fossil fuel and combustion chamber comprising same. 4,690,075, Cl. 110-264.000.

Vidueira, Jose A.: *See*—
Forte, Paulino; and Vidueira, Jose A., 4,690,733, Cl. 203-21.000.

Viereck, Hans: *See*—
Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, 4,690,185, Cl. 144-34.00R.

Vieth, Friedhelm: *See*—
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.

Vikar nee Petho , Hajnalka: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sobonyai, Anna, 4,691,017, Cl. 546-298.000.

Vinci, James N.: *See*—
DiBiase, Stephen A.; and Vinci, James N., 4,690,767, Cl. 252-47.000.

Vinogradov, Vasily M.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shimanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimesova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir L, 4,691,046, Cl. 560-196.000.

Vishnitsky, Alexander, to Cation Corporation. Electrochemical rifling of gun barrels. 4,690,737, Cl. 204-129.700.

Vishnupad, Mohan; and Ramirez, Jose E., to Chesebrough Pond's Inc. Novel translucent water in oil emulsions. 4,690,774, Cl. 252-309.000.

Viskase Corporation: *See*—
Urbutis, Algimantas P., 4,690,173, Cl. 138-118.100.

Vista Chemical Company: *See*—
Resh, Kyle W., 4,691,068, Cl. 585-323.000.

Vistech Corporation: *See*—
Fitzmorris, Tyce; Eapenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.

Vitaloni, Alberto, to Vitaloni Group S.p.A. Headgear for motorcycling and similar activities, with a movable visor and chin guard. 4,689,836, Cl. 2-424.000.

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Vitaloni, Alberto, 4,689,836, Cl. 2-424.000.

Vlasak, Weldon R. H., to ITT Gilfillan, a division of ITT Corporation. Data transmission system. 4,691,312, Cl. 370-4.000.

Voelz, Dieter; and Illerhaus, Roland, to Eastman Christensen Company. Changeover bit for extended life, varied formations and steady wear. 4,690,228, Cl. 175-24.000.

Voest-Alpine Aktiengesellschaft: *See*—
Rockenschaub, Walter; and Kepplinger, Werner, 4,690,387, Cl. 266-144.000.

Volkswagen Aktiengesellschaft: *See*—
Hofbauer, Peter; and Sandhagen, Jurgen, 4,690,118, Cl. 123-533.000.

von Ohain, Hans P.: *See*—
Minardi, John E.; and von Ohain, Hans P., 4,689,950, Cl. 60-204.000.

von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Four-wheel drive arrangement for motor vehicles. 4,690,238, Cl. 180-248.000.

Voorheis Industries, Inc.: *See*—
Voorheis, James T., 4,690,639, Cl. 432-105.000.

Voorheis, James T., to Voorheis Industries, Inc. Constant pressure variable orifice burner nozzle assembly. 4,690,639, Cl. 432-105.000.

Vorhis, Daniel J. Self closing squeeze valve. 4,690,375, Cl. 251-342.000.

Voss, Harald; and Rothweiler, Herbert, to Ciba-Geigy Corporation. Pharmaceutical compositions with analgesic properties and the preparation and use thereof. 4,690,927, Cl. 514-282.000.

Vranson, David M.: *See*—
Foglesonger, John D.; and Vranson, David M., 4,689,876, Cl. 29-600.000.

VTC Incorporated: *See*—
Solstad, Russell V., 4,689,875, Cl. 437-211.000.

Vulcan-Hart Corporation: *See*—
Sank, Gerald W., 4,690,127, Cl. 126-391.000.

Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., to Bristol-Myers Company. Amino disulfides. 4,691,023, Cl. 548-422.000.

W. Schlafhorst & Co.: *See*—
Langen, Manfred, 4,690,342, Cl. 242-35.50A.
Wassenhoven, Heinz-Georg, 4,689,946, Cl. 57-301.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.
Klatt, Alfred, 4,690,008, Cl. 74-336.00R.

Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, to Sumitomo Special Metals Co., Ltd. Recording disk substrate members and process for producing same. 4,690,846, Cl. 428-64.000.

Wagner, Emery L.: *See*—
Williams, John F.; and Wagner, Emery L., 4,690,669, Cl. 494-14.000.

Wagner, Frederic M.: *See*—
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.

Wagner, Richard M.: *See*—
Smith, Mark L.; and Wagner, Richard M., 4,690,747, Cl. 204-206.000.

Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, to Bayer Aktiengesellschaft. Special epoxy resins. 4,690,998, Cl. 528-96.000.

Wakabayashi, Hiroshi; and Kazami, Kazuyuki, to Nippon Kogaku K. K. Film feeding apparatus for camera. 4,690,533, Cl. 354-173.110.

Wakefield, Barry R.; and Pullen, Francis J., to Devro, Inc. Heat sealing machine. 4,689,854, Cl. 17-1.00R.

Waldron, Mark A.; and Leung, Tommy Y., to CTS Corporation. Multispeed, full duplex modem. 4,691,342, Cl. 379-98.000.

Walker, David G. Monochlorobiphenyl:cuprous aluminum tetrachloride. 4,691,074, Cl. 585-849.000.

Walker, Ray A., to Spectra-Physics, Inc. Capillary bore straightness inspection. 4,690,556, Cl. 356-152.000.

Wall, Donald W. C-shaped failure detector for steam traps. 4,690,570, Cl. 374-188.000.

Walls, Henry M.; and Sayers, George M., Jr., to TSCO Corporation. Cooking and whistling knob therefor. 4,690,095, Cl. 116-67.00R.

Walsh, Myles A., III; and Morris, R. Scott, to Cape Cod Research, Inc. Electrolytic reactor and method for treating fluids. 4,690,741, Cl. 204-149.000.

Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, to Carl Still GmbH & Co. KG, Firma. Hydraulically operated high-pressure piston pump. 4,690,160, Cl. 134-181.000.

Wampfler, David J.; Fielding, Doana J.; and Pawloski, Chester E., to Dow Chemical Company, The. Halogenated phosphorate ethers with flame-retardant polyurethanes. 4,690,954, Cl. 521-107.000.

Wang, John T.: *See*—
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.

Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., to Dow Chemical Company, The. Aminoalkyl hydantoins and glycidyl derivatives thereof. 4,691,021, Cl. 548-309.000.

Wang, Ting M., to Borg-Warner Automotive, Inc. Variable rate drive strap. 4,689,953, Cl. 60-330.000.

Wareham, John G.: *See*—
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.

Warren, Monty, to Dorfender Products Inc. Bumper strip for automobiles. 4,690,446, Cl. 293-128.000.

Wassenhoven, Heinz-Georg, to W. Schlafhorst & Co. Spinning device for producing a twisted thread. 4,689,946, Cl. 57-301.000.

Watada, Atsuyuki: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.

Watanabe, Haruo, to Citizen Watch Co., Ltd. Liquid crystal color display panel with mosaic color filter. 4,690,511, Cl. 350-339.00F.

Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, to New Japan Radio Co., Ltd. Frequency converter. 4,691,376, Cl. 455-131.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus with a plurality of colors. 4,690,543, Cl. 355-4.000.

Watanabe, Kazuaki: *See*—
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.

Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, to Inoue Mtp Kabushiki Kaisha. Apparatus for winding a sheet-formed article. 4,690,348, Cl. 242-66.000.

Watanabe, Kiyoshi: *See*—
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

Watanabe, Masakazu: *See*—
Okuno, Akiyasu; and Watanabe, Masakazu, 4,690,909, Cl. 501-90.000.

Watanabe, Masamichi; and Watanabe, Yasushi, to Alps Electric Co., Ltd. Circuit board. 4,691,188, Cl. 338-307.000.

Watanabe, Shojiro: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Watanabe, Shyoichi: *See*—
Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.

Watanabe, Yasushi: *See*—
Watanabe, Masamichi; and Watanabe, Yasushi, 4,691,188, Cl. 338-307.000.

Watanabe, Yukio: *See*—
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.

Watanave, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Watkins, James D.; and Andreas, David W., to Golden Valley Microwave Foods Inc. Cooking bag with diagonal gusset seals. 4,691,374, Cl. 383-104.000.

Watts, Mark W.: *See*—
Thaden, Robert C.; and Watts, Mark W., 4,691,289, Cl. 364-718.000.

Wavin B.V.: *See*—
Gaikema, Gjalt M.; and Zylstra, Dirk, 4,689,936, Cl. 53-440.000.

Wayne State University: *See*—
Taylor, John D.; and Honn, Kenneth V., 4,690,935, Cl. 514-356.000.

Weapon Technology System R & D Ltd.: *See*—
Gillum, Richard R., 4,689,912, Cl. 42-105.000.

Weathers, Beryl D. Wood-form splice stake and carrier. 4,690,367, Cl. 249-6.000.

Weber, James L., to Rockwell International Corporation. Brake actuator. 4,690,253, Cl. 188-72.700.

Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, to Kraftwerk Union Aktiengesellschaft. Fixture for machining the cutting line of a pipe. 4,689,863, Cl. 29-33.00T.

Weber, Roland: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Webster, James N. Bag stand container. 4,690,357, Cl. 248-99.000.

Weddigen, Gert: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.05C.

Weed, Lucretia J.: *See*—
DeBruyn, Frank E., Jr.; and Weed, Lucretia J., 4,690,884, Cl. 430-206.000.

Weertz, Klaus: *See*—
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.

Wehr, Michael A.; and Sajdak, Robert L., to United States of America, Agriculture. Portable, self-powered, adjustable herbicide dispensing system. 4,690,309, Cl. 222-249.000.

Wei, Che-Chia: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Weigend, Helmut: *See*—
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.

Weigold, Helmut: *See*—
Rebmann, Manfred; and Weigold, Helmut, 4,690,668, Cl. 493-297.000.

Weinhold, Helmut: *See*—
Berleth, Manfred; and Weinhold, Helmut, 4,690,023, Cl. 83-700.000.

Weischedel, Guido, to Robert Bosch GmbH. Speed governing system for a fuel injected internal combustion engine, especially a diesel engine. 4,690,114, Cl. 123-357.000.

Weisenberger, Johannes M.: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haermann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.

Welsh, Robert C. Microscope illuminator support. 4,690,522, Cl. 350-528.000.

Wenger, Bruno, to Siemens Aktiengesellschaft. Clock regenerator. 4,691,327, Cl. 375-4.000.

Wente, Gerald: *See*—
Adrian, Willy; and Wente, Gerald, 4,690,264, Cl. 198-335.000.

Wentworth, Robert: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Katzmann, Harald; Senn, Werner; and Ammann, David, 4,690,029, Cl. 86-20.110.

West, John P., to Avon Industrial Polymers Limited. Hydraulically damped mounting device. 4,690,389, Cl. 267-140.100.

Westgate, Wayne F., to Avantek, Inc. Quad-ridge waveguide mixer. 4,691,380, Cl. 455-328.000.

Westinghouse Electric Corp: *See*—
Jenkins, Leonard S., 4,690,612, Cl. 415-112.000.

Westinghouse Electric Corp.: *See*—
Bein, Jeffrey D., 4,690,206, Cl. 165-81.000.
Carris, George M., 4,690,483, Cl. 439-517.000.
Everett, James W., 4,690,172, Cl. 138-89.000.
Grunert, Kurt A.; and Changle, Joseph F., 4,691,180, Cl. 335-6.000.
Hardin, Roy T., Jr.; and Marshall, James R., 4,690,795, Cl. 376-264.000.
Kenny, Thomas J.; and Sutherland, James F., 4,691,263, Cl. 361-58.000.
McCabria, Jack L., 4,691,119, Cl. 307-84.000.
Mrenna, Stephen A.; and Whipple, Michael J., 4,691,182, Cl. 335-176.000.
Nee, John D.; and Hahn, Joseph J., 4,690,593, Cl. 408-80.000.
Odor, Elbert P., 4,690,592, Cl. 408-1.00R.
Sabol, George P.; and Barry, Robert F., 4,690,716, Cl. 148-11.50F.
Savinell, Alan; and Hydeman, Jeffrey E., 4,689,994, Cl. 73-634.000.

Weston, Harry T.: *See*—
Bayruns, Robert J.; and Weston, Harry T., 4,691,331, Cl. 377-47.000.

Wetzel, Robert E., to Dayco Products, Inc. Toothed belt. 4,690,664, Cl. 474-205.000.

Wevelsiep, Klaus. Method and apparatus for omnidirectional reading of data bases. 4,691,367, Cl. 382-61.000.

Weyerhaeuser Company: *See*—
Halabisky, Donald D.; and Dudley, Dwight A., II, 4,690,835, Cl. 427-210.000.
Hasenwinkle, Earl D., 4,690,188, Cl. 144-378.000.
Schmidt, Phillip A., 4,690,187, Cl. 144-340.000.

Whalen, Brian. Multistate differential transmission. 4,690,016, Cl. 74-687.000.

Wheater, Robin A.: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Whipple, Michael J.: *See*—
Mrenna, Stephen A.; and Whipple, Michael J., 4,691,182, Cl. 335-176.000.

Whirlpool Corporation: *See*—
Janke, Donald E.; and Linstromberg, William J., 4,689,965, Cl. 62-155.000.
Lau, Robert G., 4,690,468, Cl. 312-291.000.

White, Anthony M.: *See*—
Elliott, Charles T.; and White, Anthony M., 4,691,107, Cl. 250-370.000.

White, Bernard C., to Napco Industries, Inc. Grenade launcher attachment for infantry weapon. 4,689,911, Cl. 42-105.000.

White, Gary R.: *See*—
Aldrich, Roger B.; and White, Gary R., 4,689,888, Cl. 33-288.000.
White, Justin C.: *See*—
Sayler, William H.; and White, Justin C., 4,690,338, Cl. 241-56.000.
Whittaker Corporation: *See*—
Reinhart, Charles W.; and Mauldin, Robert H., 4,691,080, Cl. 174-68.00R.
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, to Synthelabo. Therapeutically useful 1-phenyl-2-piperidinoalkanol derivatives. 4,690,931, Cl. 514-317.000.
Wiggins Teape Group Limited, The: *See*—
Radvan, Bronislaw; and Till, Andrew, 4,690,860, Cl. 428-290.000.
Wiklund, Klas R., to Nicator AB. Arrangement for measuring wheel alignment and steering geometry in an automobile. 4,690,557, Cl. 356-155.000.
Wilcox, John A.: *See*—
Harris, Patrick C.; and Wilcox, John A., 4,691,029, Cl. 549-79.000.
Wildgen, Leo F.: *See*—
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.
Wildonger, Richard A.: *See*—
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Wilkerson Corporation: *See*—
Van Steenburgh, Leon R., Jr., 4,689,969, Cl. 62-474.000.
Wilkins, Cletus W., Jr.: *See*—
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.
Wilkinson Sword Limited: *See*—
Duncan, David S., 4,690,018, Cl. 76-101.00R.
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., to Pullman Standard Inc. Railway car body structural arrangement. 4,690,072, Cl. 105-406.100.
Willetts, Elwood H. Suspension for axle coatrol with empty car spring. 4,690,069, Cl. 105-224.100.
Williams, Gerald J.: *See*—
Niskin, Shale J.; and Williams, Gerald J., 4,690,380, Cl. 254-394.000.
Williams, John F.; and Wagner, Emery L., to Du Pont de Nemours, E. I., and Company. Refrigerated centrifuge having a removable bowl. 4,690,669, Cl. 494-14.000.
Williams, Mary. Hair cutting cape with catch for hair clippings. 4,689,830, Cl. 2-50.000.
Wills, Anthony J., to British Petroleum Company P.L.C., The. Pressure container with thermoplastic fusible plug. 4,690,295, Cl. 220-207.000.
Willson, Carlton G.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., to Union Carbide Corporation. Crystalline gallophosphate compositions. 4,690,808, Cl. 423-305.000.
Winchell, David F.: *See*—
Stanley, Keith R.; and Winchell, David F., 4,691,347, Cl. 179-203.000.
Winchester Industries, Inc.: *See*—
Biro, Alexander J., 4,689,933, Cl. 52-656.000.
Winckler, Steven J., to Du Pont de Nemours, E. I., and Company. Apparatus and method for reducing broken fibers on the surface of a carbon fiber yarn bundle. 4,689,947, Cl. 57-304.000.
Windeler, Stanley R.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Windisch, David E. Motion detector suitable for detecting earthquakes and the like. 4,689,997, Cl. 73-652.000.
Wine, Charles M., to RCA Corporation. Compact disk read only memory recording system with speed control. 4,691,310, Cl. 369-50.000.
Winstrom, Peter; and Cork, William H., to Pirmasafe, Inc. Interactive security control system for computer communications and the like. 4,691,355, Cl. 380-23.000.
Wiseman, John R.: *See*—
Banks, Henry J.; and Wiseman, John R., 4,690,041, Cl. 98-57.000.
Wismer, Shirlee A.: *See*—
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., 4,690,681, Cl. 604-396.000.
Witco Corporation: *See*—
Mausner, Marvin L.; and Meinstein, Siegfried, 4,690,785, Cl. 260-303.00N.
Witte, Josef: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.
Wittrisch, Christian, to Institut Francais du Petrole. Method and a device for carrying out measurements and/or operations in a well. 4,690,214, Cl. 166-250.000.
Wolcott, Dana W.: *See*—
Hansen, David E.; Kelbe, Richard R.; and Wolcott, Dana W., 4,690,531, Cl. 354-149.110.
Wolf, Barry M.: *See*—
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.
Wolfe, John N.: *See*—
Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J., 4,691,333, Cl. 378-37.000.
Wolff, Pieter, to Siemens Aktiengesellschaft. Circuit arrangement for receiving and/or transmitting serially appearing binary signals in or from a processing device containing a microcomputer or a microprocessor. 4,691,297, Cl. 364-900.000.
Wolfram, Stephen, to Thinking Machines Corporation. Random sequence generators. 4,691,291, Cl. 364-717.000.
Wolfstieg, Ulrich M. E. A., to U.S. Philips Corporation. X-ray examination apparatus. 4,691,334, Cl. 378-71.000.
Wolniak, Stanley C.; and Laabs, Timothy P., to Eastern Company, The. Switch lock with two momentary positions. 4,689,977, Cl. 70-379.00R.
Won, Richard, to Advanced Polymer Systems, Inc. Method for delivering an active ingredient by controlled time release utilizing a novel delivery vehicle which can be prepared by a process utilizing the active ingredient as a porogen. 4,690,825, Cl. 424-501.000.
Wong, Ming K.: *See*—
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.
Wong, Mon N.; and Peebles, Ann L., to Hughes Aircraft Company. Waveguide switch with variable short wall coupling. 4,691,177, Cl. 333-113.000.
Wood, Colin: *See*—
Shapter, Hugh; and Wood, Colin, 4,691,206, Cl. 343-700.0MS.
Woodard, Naomi A.: *See*—
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,690,808, Cl. 423-305.000.
Woodburn, Robert W.: *See*—
Choate, Paul V.; and Woodburn, Robert W., 4,689,910, Cl. 42.100.000.
Woodford, Timothy; and Cheraso, John. Vented syringe. 4,690,154, Cl. 128-763.000.
Woods, David E. Insulated cooler for beverage containers. 4,690,300, Cl. 220-412.000.
Worthington, Paul A.; and Shephard, Margaret C., to Imperial Chemical Industries PLC. Certain triazole compounds and their use as fungicides. 4,690,941, Cl. 514-383.000.
Wright, Forrest S.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Wright, James D. Fastener for a readily disengageable interior panel. 4,689,929, Cl. 52-239.000.
Wright, Robert V.: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.
Wuerthner, Hubert: *See*—
Spitaler, Englebert; and Wuerthner, Hubert, 4,690,424, Cl. 280-631.000.
Wulff, Hans-Jurgen, to Licentia Patent-Verwaltungs-GmbH. Bimetal releaser. 4,691,184, Cl. 337-49.000.
Wydler, Peter, to Alos AG. Apparatus for the detection of optical marks on a film support moved relative to the apparatus. 4,691,112, Cl. 250-570.000.
Xerox Corporation: *See*—
Coons, Robert A., Jr., 4,690,392, Cl. 271-2.000.
Forbes, Richard L., II; and Thorp, Bruce E., 4,690,544, Cl. 355-15.000.
Manno, Eugene J., 4,690,540, Cl. 355-3.0DD.
Miazga, Dennis E.; and Petery, James J., 4,691,317, Cl. 371-20.000.
Radulski, Charles A.; and Till, Henry R., 4,690,539, Cl. 355-3.0TR.
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.
Stephany, Joseph F., 4,691,200, Cl. 340-784.000.
Stoffel, James C.; and Tandon, Jagdish C., 4,690,391, Cl. 269-21.000.
Xolox Corporation: *See*—
Loubier, Robert J.; and Bleeke, William F., 4,691,185, Cl. 338-37.00H.
Xomox Corporation: *See*—
Gardner, John F.; and Morton, Gerald H., 4,690,164, Cl. 137-15.000.
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for preparing water-soluble polymer gel particles. 4,690,788, Cl. 264-22.000.
Yagihara, Morio; and Ikegawa, Akihiko, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,690,885, Cl. 430-212.000.
Yale, Ramon L., to GTE Products Corporation. Process for providing hydrolysis resistant phosphors. 4,690,832, Cl. 427-65.000.
Yamada, Kenichi: *See*—
Sakai, Yasuhito; and Yamada, Kenichi, 4,690,011, Cl. 74-475.000.
Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus of storing image data into a memory in a layout scanner system. 4,691,238, Cl. 358-280.000.
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, to Babcock-Hitachi Kabushiki Kaisha. Process for producing organic compounds by utilizing oxygenic complexes. 4,691,053, Cl. 562-531.000.
Yamada, Toshiyuki: *See*—
Funabashi, Katsunori; Nakashima, Tai; Yamada, Toshiyuki; and Morishima, Kazuo, 4,690,237, Cl. 180-219.000.
Yamada, Yosuke; and Oogami, Mitsuhiro, to Daiwa Special Chemical Co., Ltd. Washing apparatus. 4,690,158, Cl. 134-107.000.
Yamaguchi, Shigeru: *See*—
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Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzaki, Masanori; and Toda, Takezi, to Nippondenso Co. Ltd. Device for supplying a long length of material. 4,690,349, Cl. 242-75.500.
Yamaguchikyoei Industry Co. Ltd.: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Takada, Kazuyoshi, 4,690,234, Cl. 180-182.000.
Yamaichi Electric Mfg. Co., Ltd.: *See*—
Sibata, Suegi, 4,690,646, Cl. 439-71.000.
Yamaki, Toshio: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.
Yamamitsu, Chojuro: *See*—
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Yamamoto, Kazuyuki: *See*—
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Yamamoto, Kunihiko: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Yamamoto, Makoto: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.
Yamamoto, Mitsuo: *See*—
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Yamamoto, Motohiro: *See*—
Kida, Tohru; and Yamamoto, Motohiro, 4,690,811, Cl. 423-345.000.
Yamamoto, Nobuyuki: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.
Yamamoto, Saburo: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,691,214, Cl. 357-17.000.
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, to Nichias Corporation. Material for low melting point metal casting equipment. 4,690,867, Cl. 428-367.000.
Yamamoto, Yasuhiko: *See*—
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.
Yamamoto, Yoshiharu: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, to Yamane, Kunio; Calpis Food Industry Co., Ltd., The; Daicel Chemical Industries, Ltd.; and Oji Corn Starch Co., Ltd. DNA coding for a signal peptide and DNA containing the same. 4,690,898, Cl. 435-320.000.
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Seiko Co., Ltd. PWM inverter apparatus. 4,691,269, Cl. 363-41.000.
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Benzoxazinorifamycin derivative, process for preparing the same and antibecterial agent containing the same. 4,690,919, Cl. 514-183.000.
Yamanouchi Pharmaceutical Co., Inc.: *See*—
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Yamasaki, Taro: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.
Yamashita, Katsuji: *See*—
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Yamashita, Yasuhiro: *See*—
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, to Nippon Electric Co., Ltd. Vibration damping material. 4,690,960, Cl. 523-442.000.
Yamaya, Masaaki: *See*—
Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, 4,690,713, Cl. 106-287.160.
Yamazaki, Atsuki: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Yamazaki, Hisato: *See*—
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.
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Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Yamazaki, Shumpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making semiconductor device. 4,690,717, Cl. 437-2.000.
Yamazaki, Tatsu: *See*—
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Yanagase, Akira: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.
Yanagida, Takehiko: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Okuzumi, Kiyoshi, 4,690,211, Cl. 165-177.000.
Yanagita, Makoto: *See*—
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Yaniv, Zvi: *See*—
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Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,244, Cl. 358-294.000.
Yano, Kazuo: *See*—
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Yap, Raymond C. C.: *See*—
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Yarbrough, J. W.: *See*—
Stanley, Frankie B., 4,689,972, Cl. 68-20.000.
Yarus, Michael J.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.
Yasuda, Satoshi: *See*—
Ohgoma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.
Yasuda, Tomio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.
Yasukawa, Masao, to Toyota Jidosha Kabushiki Kaisha. Cylinder head with inwardly projecting cup plug in casting sand extraction hole for speeding up coolant flow. 4,690,104, Cl. 123-41.320.
Yasutomi, Tsuyoshi: *See*—
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.
Yates, Ronald L.: *See*—
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.
Yatsuo, Tsutomu: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.
Yau, Leopoldo D.: *See*—
Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.
Yazaki Industrial Chemical Co., Ltd.: *See*—
Yokota, Mamoru, 4,690,344, Cl. 242-55.530.
Yeager, Patrick F.: *See*—
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Yeater, Robert P.: *See*—
Schmidt, Manfred; and Yeater, Robert P., 4,690,964, Cl. 524-125.000.
Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,690,734, Cl. 203-56.000.
Yoder, Jerry L. Tagging stick. 4,690,404, Cl. 273-67.00R.
Yokokawa, Kiyoshi; and Koya, Kazuo, to Shin-Etsu Chemical Co., Ltd. Quartz glass-made optical fibers and a method for the preparation thereof. 4,690,504, Cl. 350-96.340.
Yokomori, Shinji, to Fuji Electric Co., Ltd. Coin refund signal generator. 4,690,263, Cl. 194-317.000.
Yokota, Mamoru, to Yazaki Industrial Chemical Co., Ltd. Roll holder. 4,690,344, Cl. 242-55.530.
Yokota, Yukio: *See*—
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, 4,690,889, Cl. 430-552.000.
Yokoya, Yuji: *See*—
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Yokoyama, Goro: *See*—
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Yokoyama, Masaaki: *See*—
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Yoneyama, Kimiya: *See*—
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Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, to Nippon Kayaku Kabushiki Kaisha. N-phenylsulfonylisonicotinamide derivatives and their use as fungicides or bactericides. 4,690,934, Cl. 514-354.000.

Yoshida, Katunori, to Nippon Light Metal Co., Ltd. Inspection car for bridge construction of a high level road. 4,690,247, Cl. 182-63.000.
Yoshida Kogyo K. K.: *See*—
Horikawa, Yoichi, 4,690,629, Cl. 425-156.000.
Yoshida, Minoru: *See*—
Beppu, Teruhiko; Iwamoto, Yasushi; and Yoshida, Minoru, 4,690,918, Cl. 514-23.000.
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yusuke; and Joshita, Yutaka, to Sumitomo Pharmaceuticals Company, Limited. Therapeutic drug for dementia. 4,690,949, Cl. 514-561.000.
Yoshida, Ryo: *See*—
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Yoshida, Takaichi, to G-C Dental Industrial Corp. Superelastic dental Au-Cu-Zn alloys. 4,690,799, Cl. 420-507.000.
Yoshihara, Masashi; and Yano, Kazuo, to NEC Corporation. Automatic frequency and gain control circuit. 4,691,377, Cl. 455-256.000.
Yoshikawa, Kikuo: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Yosichi; and Akutagawa, Susumu, to Takasago Perfumery Co., Ltd. Ruthenium-phosphine complex. 4,691,037, Cl. 556-18.000.
Yoshikumi, Chikao: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.
Yoshimura, Hiroshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fuseo; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Yoshimura, Shoji: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.
Yoshinaka, Toshio: *See*—
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.
Yoshino, Yasuhisa; and Osada, Masahiko, to Nippon Soken, Inc. Speaker changeover device. 4,691,361, Cl. 381-81.000.
Yoshio, Arakawa, to Murata Manufacturing Co., Ltd. Electric doublelayer capacitor. 4,691,266, Cl. 361-433.000.
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, to Sankyo Company, Limited. 1,3-benzoxathiole derivatives. 4,691,027, Cl. 549-32.000.
Yugen Kaisha Shinjoseisakusho: *See*—
Shinjo, Katsumi, 4,690,599, Cl. 411-180.000.
Yuhashi, Yukio: *See*—
Teraoka, Masao; and Yuhashi, Yukio, 4,690,258, Cl. 192-58.00C.
Yui, Hiroshi: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.
Zahnraderfabrik Renk AG: *See*—
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.100.
Zak, Deborah K. Travel case with screw-in containers. 4,690,271, Cl. 220-1.700.
Zarr, William A.: *See*—
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.
Zazzu, Victor: *See*—
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,691,189, Cl. 340-147.0AD.
Zebley, Raymond S.; Nichols, James H., Jr.; and Ciosek, Bernard M., Jr., to Du Pont de Nemours, E. I., and Company. Package and apparatus for dispensing electrical connectors. 4,690,302, Cl. 221-11.000.
Zeck, Walter M.; and Simonet, Donald E., to Mobay Corporation. Synergistic composition for the control of arthropods. 4,690,947, Cl. 514-521.000.
Zeigler, Theodore R. Portable shelter assemblies. 4,689,932, Cl. 52-648.000.
Zeilon, Sten O. Closed intermittent drying process. 4,689,894, Cl. 34-13.000.
Zeimet, Richard E. Center stern outboard motor mount for double-end canoes. 4,690,649, Cl. 440-6.000.
Zenith Electronics Corporation: *See*—
Palmateri, Craig R., 4,691,354, Cl. 380-15.000.
Zerrer, Gerhard: *See*—
Kottke, Joachim; and Zerrer, Gerhard, 4,690,252, Cl. 188-69.000.
Zetterquist, Norman E.: *See*—
McInerney, Edward J.; Dorneich, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.
Zielinski, Erich: *See*—
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable optical glass fiber coatings from acrylate terminated, end-branched polyurethane polyurea oligomers. 4,690,501, Cl. 350-96.290.
Zimmerman, John M.; and Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable optical glass fiber coatings from acrylate terminated, end-branched polyurethane polyurea oligomers. 4,690,502, Cl. 350-96.290.
Zimmermann, Micha, to Newport Corporation. Mounting systems for objects and optical components. 4,690,507, Cl. 350-321.000.
Zobl, Gunter: *See*—
Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.
Zoppa, Dieter, to PKM Verpackungssysteme GmbH & Co. Automatic wrapping machine comprising a tensioning and fastening device. 4,689,938, Cl. 53-582.000.
Zotos International, Inc.: *See*—
Giuliano, James T., 4,690,369, Cl. 249-55.000.
Zylstra, Dirk: *See*—
Gaikema, Gjalt M.; and Zylstra, Dirk, 4,689,936, Cl. 53-440.000.
501 Hamilton/Thorn Research Associates: *See*—
Douglas-Hamilton, Margaret M., 4,690,678, Cl. 604-349.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chevron Research Company: *See*—
Luo, Tatao, Re. 32,489, Cl. 71-98.000.
Fujimoto, Masaharu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.
Guttilo, Ramon B.; and Kyle, Richard F. Hip prosthesis. Re. 32,488, Cl. 623-23.000.
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of 7α-methoxy-7β-(1,3-diethietane-2-carboxyamido)cephalosporanic acid derivatives. Re. 32,491, Cl. 540-221.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Method of making a composite label web. Re. 32,490, Cl. 156-250.000.
Kalaugher, Patrick G., to University of Exeter. Binocular presentation of visual information. Re. 32,487, Cl. 350-145.000.
Kyle, Richard F.: *See*—
Gustilo, Ramon B.; and Kyle, Richard F., Re. 32,488, Cl. 623-23.000.
Luo, Tatao, to Chevron Research Company. Herbicidal substituted 2-(1-(oxyamino)-alkylidene)-cyclohexane-1,3-diones. Re. 32,489, Cl. 71-98.000.
Maeda, Tetsuya: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.
Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., Re. 32,490, Cl. 156-250.000.
Nagano, Noriaki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.
Nagano, Yoshinobu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.
Raidel, John E., Jr. Vehicle suspension with rigid torque beam. Re. 32,486, Cl. 280-711.000.
University of Exeter: *See*—
Kalaugher, Patrick G., Re. 32,487, Cl. 350-145.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.
Yamazaki, Atsuki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Electro-Plasma, Inc.: *See*—
Muehlberger, Erich; and Kremith, Roland D., B1 4,328,257, Cl. 427-34.000.
Kremith, Roland D.: *See*—
Muehlberger, Erich; and Kremith, Roland D., B1 4,328,257, Cl. 427-34.000.
Muehlberger, Erich; and Kremith, Roland D., to Electro-Plasma, Inc. System and method for plasma coating. B1 4,328,257, 9-1-87, Cl. 427-34.000.

LIST OF DESIGN PATENTEES

Actron Mfg., Inc.: *See*—
Rechberg, Robert, 291,636, Cl. D6-510.000.
Aihara, Akira, to Canon Kabushiki Kaisha. Personal computer. 291,694, 9-1-87, Cl. D14-100.000.
Aikins, Jerry L., to Zimmer, Inc. Prosthetic joint implant for a finger or toe or the like. 291,731, 9-1-87, Cl. D24-33.000.
Alpine, Denice C. Airfoil fin for surfboards. 291,715, 9-1-87, Cl. D21-116.000.
Amco Corporation: *See*—
Bruno, Pasquale, 291,645, Cl. D7-321.000.
Autophon AG: *See*—
Fellmann, Hansruedi, 291,691, Cl. D14-58.000.
Avalon Corporation International: *See*—
Desautels, John F., 291,727, Cl. D23-128.000.
Bartz, Richard O.: *See*—
Sieg, William F.; and Bartz, Richard O., 291,651, Cl. D8-98.000.
Belden, Walter R. Belt buckle rack. 291,629, 9-1-87, Cl. D6-316.000.
Bialo, Walter, to Ventura Travelware, Inc. Attache case or similar article. 291,624, 9-1-87, Cl. D3-76.000.
Bialo, Walter, to Ventura Travelware, Inc. Attache case or similar article. 291,625, 9-1-87, Cl. D3-76.000.
Bialo, Walter, to Ventura Travelware, Inc. Luggage lock. 291,653, 9-1-87, Cl. D8-331.000.
Billups, Larry. Aquarium. 291,735, 9-1-87, Cl. D30-8.000.
Brooks, Kevin C. Fairground amusement tunnel. 291,717, 9-1-87, Cl. D21-242.000.
Bruno, Pasquale, to Amco Corporation. Cooking oil can. 291,645, 9-1-87, Cl. D7-321.000.
Bruns, Eugene C.: *See*—
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., 291,658, Cl. D9-352.000.
Burin, Ralph R., to Wilton Enterprises, Inc. Spice rack. 291,637, 9-1-87, Cl. D6-514.000.
Bussell, Vanda J. Lotion dispensing bottle. 291,656, 9-1-87, Cl. D9-300.000.
Canon Kabushiki Kaisha: *See*—
Aihara, Akira, 291,694, Cl. D14-100.000.
Hirooka, Junji; and Murakami, Osamu, 291,698, Cl. D14-114.000.
Carr, Christopher; and Witt, James J., Jr., to Procter & Gamble Company, The. Inner pack bottle carrier. 291,657, 9-1-87, Cl. D9-344.000.
Cassini, Oleg L. Perfume bottle. 291,660, 9-1-87, Cl. D9-384.000.
Chap, John P., to Selfix, Inc. Hook fixture. 291,630, 9-1-87, Cl. D6-323.000.
Chap, John P., to Selfix, Inc. Soap dish. 291,638, 9-1-87, Cl. D6-540.000.
Chap, John P., to Selfix, Inc. Towel bar. 291,639, 9-1-87, Cl. D6-549.000.
Collins, Walter W., to Gerber Legendary Blades, Inc. Sheath. 291,626, 9-1-87, Cl. D3-102.000.

Collins, Walter W., to Gerber Legendary Blades, Inc. Knife pouch. 291,627, 9-1-87, Cl. D3-102.000.
Davis, Troy B. Toy water wheel. 291,709, 9-1-87, Cl. D21-59.000.
de Boer, Peter. Chair. 291,631, 9-1-87, Cl. D6-366.000.
Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,732, 9-1-87, Cl. D24-34.000.
Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,733, 9-1-87, Cl. D24-34.000.
Desautels, John F., to Avalon Corporation International. Stove door. 291,727, 9-1-87, Cl. D23-128.000.
Dickman, Benjamin. Portable tray for attachment to a beach umbrella. 291,635, 9-1-87, Cl. D6-509.000.
Direct Jewellery Inc.: *See*—
Gozlan, Claude, 291,666, Cl. D11-84.000.
Dixon, Robert. Spider machine toy. 291,711, 9-1-87, Cl. D21-185.000.
Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,697, 9-1-87, Cl. D14-114.000.
Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,699, 9-1-87, Cl. D14-114.000.
Eldershaw, Michael K.: *See*—
Read, Clifford D.; and Eldershaw, Michael K., 291,692, Cl. D14-60.000.
Environmental Production Systems Company: *See*—
Ucros, Raphael, 291,634, Cl. D6-491.000.
Ericksen, Craig A. Insulated belt carrier for beverage cans. 291,623, 9-1-87, Cl. D2-630.000.
Everts, Ramon L., to Ford Motor Company. Station wagon rear bumper. 291,677, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile front bumper. 291,678, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile rear bumper. 291,679, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile valance panel. 291,680, 9-1-87, Cl. D12-190.000.
Everts, Ramon L., to Ford Motor Company. Automobile valance panel. 291,681, 9-1-87, Cl. D12-190.000.
Farhi, Moshe. Mold to be used in the manufacture of concrete ceilings. 291,700, 9-1-87, Cl. D15-136.000.
Farhi, Moshe. Inner surface of a mold to be used in the manufacture of concrete ceilings. 291,701, 9-1-87, Cl. D15-136.000.
Farley, Mahin J. Jewelry rack. 291,641, 9-1-87, Cl. D6-566.000.
Fellmann, Hansruedi, to Autophon AG. Combined handset and stand telephone unit. 291,691, 9-1-87, Cl. D14-58.000.
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, to Sterling Marking Products Inc. Seal press. 291,703, 9-1-87, Cl. D18-15.000.
Fisher Scientific Company: *See*—
Kelln, Norman G.; and Tiffany, Thomas O., 291,730, Cl. D24-29.000.
Fisher Scientific Group Inc.: *See*—
Hoyt, Garry, 291,728, Cl. D24-27.000.
Ford Motor Company: *See*—
Everts, Ramon L., 291,677, Cl. D12-169.000.
Everts, Ramon L., 291,678, Cl. D12-169.000.
Everts, Ramon L., 291,679, Cl. D12-169.000.
Everts, Ramon L., 291,680, Cl. D12-190.000.
Everts, Ramon L., 291,681, Cl. D12-190.000.
Foster, Thomas W., Jr. Sled for a reinforcing cage or the like. 291,654, 9-1-87, Cl. D8-349.000.
Gentile, Anthony: *See*—
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, 291,703, Cl. D18-15.000.
Georges, Calame G. C.; Zintzmeyer, Jorg; and Lux, Peter G. C. Sign. 291,706, 9-1-87, Cl. D20-42.000.
Gerber Legendary Blades, Inc.: *See*—
Collins, Walter W., 291,626, Cl. D3-102.000.
Collins, Walter W., 291,627, Cl. D3-102.000.
Gisiger, Urs. Zipper closure lock. 291,652, 9-1-87, Cl. D8-331.000.
Gonczе, Zoltan; Ogden, Andrew M.; and Kong, Stanley Y., to Vemco Corporation. Track type drafting machine. 291,662, 9-1-87, Cl. D10-63.000.
Gozlan, Claude, to Direct Jewellery Inc. Jewellery pendant. 291,666, 9-1-87, Cl. D11-84.000.
Gray, Bonnie. Decorative toe cover. 291,622, 9-1-87, Cl. D2-330.000.
Greig, Kevin M., to Zimmer, Inc. Spinal hook distractor or the like. 291,729, 9-1-87, Cl. D24-27.000.
Hellmer, Robert N.; and Smallwood, Robert J. Escape symbol. 291,705, 9-1-87, Cl. D20-30.000.
Herman, Pinky. Foot protector. 291,621, 9-1-87, Cl. D2-271.000.
Hirooka, Junji; and Murakami, Osamu, to Canon Kabushiki Kaisha. Memory card for word processor. 291,698, 9-1-87, Cl. D14-114.000.
Hitachi, Ltd.: *See*—
Nishiyama, Kazuhiko; and Itoh, Takao, 291,689, Cl. D14-1.000.
Hoover, Charles C.: *See*—
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 291,685, Cl. D12-314.000.
Hoyt, Garry, to Fisher Scientific Group Inc. Syringe clip. 291,728, 9-1-87, Cl. D24-27.000.
HTD, Inc.: *See*—
Morris, David L., 291,643, Cl. D7-77.000.
Huckenbeck, Claus O.; and White, Glenn S., to Rain Bird Consumer Products Mfg. Corp. Multiple pattern spray nozzle. 291,725, 9-1-87, Cl. D23-35.000.
International Business Machines Corp.: *See*—
Schaum, David L.; Steinbugler, Robert E.; and Vitello, Jonathan J., 291,696, Cl. D14-113.000.
Sharp, Michael H., 291,695, Cl. D14-113.000.
Itoh, Takao: *See*—
Nishiyama, Kazuhiko; and Itoh, Takao, 291,689, Cl. D14-1.000.
Jensen, Dale H.: *See*—
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 291,685, Cl. D12-314.000.
Jerome, Anthony F. Double basket fryer. 291,642, 9-1-87, Cl. D7-43.000.
Jewellery by Varouj Inc.: *See*—
Tabakian, Varouj, 291,665, Cl. D11-83.000.
Johnson & Johnson Products Inc.: *See*—
Denny, Thomas, 291,732, Cl. D24-34.000.
Denny, Thomas, 291,733, Cl. D24-34.000.
Jonathan Bradley Pens, Inc.: *See*—
Zucker, Richard G., 291,704, Cl. D19-78.000.
Kahute, Robert M., to Warner-Lambert Technologies, Inc. Microscope stand with a built-in illuminator. 291,702, 9-1-87, Cl. D16-131.000.
Karamian, Narbik A., to Raf-Tan Inc. Faucet for protecting sterile fluid systems. 291,719, 9-1-87, Cl. D23-3.000.
Kasai, Kazumi. Buckle. 291,668, 9-1-87, Cl. D11-216.000.
Kelln, Norman G.; and Tiffany, Thomas O., to Fisher Scientific Company. Reagent container or similar article. 291,730, 9-1-87, Cl. D24-79.000.
Kelman, Pepi G., to Pepi Kelman, Inc. Ring. 291,664, 9-1-87, Cl. D11-27.000.
Kelsey-Hayes Company: *See*—
Reid, Donald J., 291,684, Cl. D12-209.000.
Kemp, Willard E. Gate valve. 291,723, 9-1-87, Cl. D23-19.000.
Kemp, Willard E. Gate valve. 291,724, 9-1-87, Cl. D23-19.000.
Keyaki, Keiichi, to Yoshida Kogyo, K. K. Slider for slide fastener. 291,671, 9-1-87, Cl. D11-221.000.
Kiiski, Heikki, to Tunturipyora OY. Ergometer. 291,713, 9-1-87, Cl. D21-195.000.
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., to Mobil Oil Corporation. Oil container. 291,658, 9-1-87, Cl. D9-352.000.
Kobiyama, Makoto: *See*—
Kojima, Nobuyuki; Sekigawa, Youichi; and Kobiyama, Makoto, 291,726, Cl. D23-127.000.
Koivisto, Mark. Trampoline. 291,712, 9-1-87, Cl. D21-191.000.
Kojima, Nobuyuki; Sekigawa, Youichi; and Kobiyama, Makoto, to Toshiba Heating Appliances Co., Ltd. Grid-like guard for the front of a portable heater. 291,726, 9-1-87, Cl. D23-127.000.
Kong, Stanley Y.: *See*—
Gonczе, Zoltan; Ogden, Andrew M.; and Kong, Stanley Y., 291,662, Cl. D10-63.000.
Koziol, Walter, to Modern Home Products Corp. Adjustable cooking grid. 291,646, 9-1-87, Cl. D7-332.000.
Levin, Monte: *See*—
Willinger, Allan H.; and Levin, Monte, 291,720, Cl. D23-4.000.
Lux, Peter G. C.: *See*—
Georges, Calame G. C.; Zintzmeyer, Jorg; and Lux, Peter G. C., 291,706, Cl. D20-42.000.
Mader, Ernst, to Metzeler Kautschuk GmbH. Tire. 291,675, 9-1-87, Cl. D12-136.000.
Mariol, James F. Toy tableware utensil. 291,710, 9-1-87, Cl. D21-121.000.
Martin, Lois I. Gameboard. 291,707, 9-1-87, Cl. D21-22.000.
Matrix International Industries, Inc: *See*—
Shiu, Desmond K., 291,734, Cl. D24-36.000.
McDaniel, Walter C., Sr. Sink drainboard. 291,737, 9-1-87, Cl. D32-56.000.
McFadden, Richard B. Passenger carrying vehicle. 291,672, 9-1-87, Cl. D12-84.000.
McFadden, Richard B. Passenger carrying vehicle. 291,673, 9-1-87, Cl. D12-84.000.
Merzon, Richard. Cassette storage case. 291,633, 9-1-87, Cl. D6-446.000.
Metzeler Kautschuk GmbH: *See*—
Mader, Ernst, 291,675, Cl. D12-136.000.
Mobil Oil Corporation: *See*—
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., 291,658, Cl. D9-352.000.
Modern Home Products Corp.: *See*—
Koziol, Walter, 291,646, Cl. D7-332.000.
Monzen, Takashi, to Terumo Kabushiki Kaisha. Holder ring for cardiotomy reservoir. 291,650, 9-1-87, Cl. D8-72.000.
Morris, David L., to HTD, Inc. Insulated container. 291,643, 9-1-87, Cl. D7-77.000.
Motta, Kenneth F. Shelf bracket. 291,655, 9-1-87, Cl. D8-381.000.
Murakami, Osamu: *See*—
Hirooka, Junji; and Murakami, Osamu, 291,698, Cl. D14-114.000.
Nishiyama, Kazuhiko; and Itoh, Takao, to Hitachi, Ltd. Audio disc player. 291,689, 9-1-87, Cl. D14-1.000.
Noble, Charles E. Removable vehicle top. 291,676, 9-1-87, Cl. D12-156.000.
Northern Telecom Limited: *See*—
Read, Clifford D.; and Eldershaw, Michael K., 291,692, Cl. D14-60.000.
Oda, Kiyoshi, to Yoshida Kogyo K. K. Slider for slide fastener. 291,669, 9-1-87, Cl. D11-221.000.
Ogden, Andrew M.: *See*—
Gonczе, Zoltan; Ogden, Andrew M.; and Kong, Stanley Y., 291,662, Cl. D10-63.000.

Ollington, Robert F. Gaming table top. 291,708, 9-1-87, Cl. D21-37.000.
Orlowski, Witold, to Perstorp AB. Waste container. 291,738, 9-1-87, Cl. D34-5.000.
Orlowski, Witold, to Perstorp AB. Waste container. 291,739, 9-1-87, Cl. D34-5.000.
Osborn, Gary A. Bread box. 291,644, 9-1-87, Cl. D7-82.000.
Parsons, James D.; and Schwab, James J., to Parsons, James D. Acoustic horn. 291,663, 9-1-87, Cl. D10-120.000.
Pegasus Truck Cab Conversions, Inc.: *See*—
Smith, Robert E., 291,674, Cl. D12-96.000.
Pepi Kelman, Inc.: *See*—
Kelman, Pepi G., 291,664, Cl. D11-27.000.
Perstorp AB: *See*—
Orlowski, Witold, 291,738, Cl. D34-5.000.
Orlowski, Witold, 291,739, Cl. D34-5.000.
Poley, Kenneth P.: *See*—
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 291,685, Cl. D12-314.000.
Poltere, Lillian. Book holder. 291,628, 9-1-87, Cl. D6-310.000.
Porchia, Emanuel. Ice cream cone holder. 291,620, 9-1-87, Cl. D1-101.000.
Powell, Johnese W.: *See*—
Powell, Lee V., 291,659, Cl. D9-341.000.
Powell, Lee V., to Powell, Johnese W., a part interest. Communion container. 291,659, 9-1-87, Cl. D9-341.000.
Premium Products, Inc.: *See*—
Spiegel, H. Jay, 291,714, Cl. D21-209.000.
Pring, Donald M. Barbecue stand. 291,648, 9-1-87, Cl. D7-403.000.
Procter & Gamble Company, The: *See*—
Carr, Christopher; and Witt, James J., Jr., 291,657, Cl. D9-344.000.
Raf-Tan Inc.: *See*—
Karamian, Narbik A., 291,719, Cl. D23-3.000.
Rain Bird Consumer Products Mfg. Corp.: *See*—
Huckenbeck, Claus O.; and White, Glenn S., 291,725, Cl. D23-35.000.
Read, Clifford D.; and Eldershaw, Michael K., to Northern Telecom Limited. Stand for a telephone handset. 291,692, 9-1-87, Cl. D14-60.000.
Rechberg, Robert, to Actron Mfg., Inc. Drawer slide. 291,636, 9-1-87, Cl. D6-510.000.
Reid, Donald J., to Kelsey-Hayes Company. Vehicle wheel center. 291,684, 9-1-87, Cl. D12-209.000.
Rembold, David C., to Sunnen Products Company. Valve seat driver. 291,649, 9-1-87, Cl. D8-14.000.
Richter, Arno, to Warner-Lambert Company. Aquarium aerator. 291,736, 9-1-87, Cl. D30-12.000.
Russo, Ralph M. Tool caddy. 291,640, 9-1-87, Cl. D6-563.000.
Schaum, David L.; Steinbugler, Robert E.; and Vitello, Jonathan J., to International Business Machines Corp. Visual display monitor. 291,696, 9-1-87, Cl. D14-113.000.
Schram, Robert W.: *See*—
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, 291,703, Cl. D18-15.000.
Schwab, James J.: *See*—
Parsons, James D.; and Schwab, James J., 291,663, Cl. D10-120.000.
Sekigawa, Youichi: *See*—
Kojima, Nobuyuki; Sekigawa, Youichi; and Kobiyama, Makoto, 291,726, Cl. D23-127.000.
Selfix, Inc.: *See*—
Chap, John P., 291,630, Cl. D6-323.000.
Chap, John P., 291,638, Cl. D6-540.000.
Chap, John P., 291,639, Cl. D6-549.000.
Sharp, Michael H., to International Business Machines Corporation. Display monitor. 291,695, 9-1-87, Cl. D14-113.000.
Shiu, Desmond K., to Matrix International Industries, Inc. Body massager. 291,734, 9-1-87, Cl. D24-36.000.
Sieg, William F.; and Bartz, Richard O. Coupon clipper. 291,651, 9-1-87, Cl. D8-98.000.
Smallwood, Robert J.: *See*—
Hellmer, Robert N.; and Smallwood, Robert J., 291,705, Cl. D20-30.000.
Smith, Harry O.: *See*—
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., 291,658, Cl. D9-352.000.
Smith, Robert E., to Pegasus Truck Cab Conversions, Inc. Truck cab. 291,674, 9-1-87, Cl. D12-96.000.
Spencer, Gerald A. Occupant propelled amusement device. 291,718, 9-1-87, Cl. D21-249.000.
Spiegel, H. Jay, to Premium Products, Inc. Kicking tee. 291,714, 9-1-87, Cl. D21-209.000.
Stange, Soren. Corner fitting for a stackable container. 291,661, 9-1-87, Cl. D9-499.000.
Steinbugler, Robert E.: *See*—
Schaum, David L.; Steinbugler, Robert E.; and Vitello, Jonathan J., 291,696, Cl. D14-113.000.
Steinkamp, Norman A., to Sunbeam Corporation. Hand mixer housing. 291,647, 9-1-87, Cl. D7-379.000.
Sterling Marking Products Inc.: *See*—
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, 291,703, Cl. D18-15.000.
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Drewlow, Lyndon W., 6,004, Cl. 68.000.

Nor'East Miniature Roses, Inc.: *See*—
Utz, Peggy L., 5,999, Cl. 9.000.

Soost, Robert K.; and Cameron, James W., to University of California, The Regents of the. Grapefruit hybrid named Melogold. 6,001, 9-1-87, Cl. 45.000.

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Utz, Peggy L., to Nor'East Miniature Roses, Inc. Rose plant named Savapeg. 5,999, 9-1-87, Cl. 9.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., to United States of America, Army. High speed lock mechanism. H332, 9-1-87, Cl. 310-78.000.

Bahnck, Thomas, to United States of America, Navy. Aerodynamic housing. H329, 9-1-87, Cl. 367-3.000.

Balcer, Thomas O.: *See*—
Burich, Lawrence R.; and Balcer, Thomas O., H330, Cl. 324-500.000.

Brager, Howard R.; and Garner, Francis A., to United States of America, Energy. Mn-Fe base and Mn-Cr-Fe base austenitic alloys. H326, 9-1-87, Cl. 420-63.000.

Bulgher, David E.: *See*—
Millberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., H335, Cl. 363-16.000.

Burich, Lawrence R.; and Balcer, Thomas O., to United States of America, Navy. Personnel grounding system tester. H330, 9-1-87, Cl. 324-500.000.

Curtis, Richard A., to United States of America, Army. Nonimaging identification structure. H333, 9-1-87, Cl. 455-608.000.

DiSanzo, Carmine P.; and Peake, Clinton J., to FMC Corporation. Nematicidal alkenanilides. H327, 9-1-87, Cl. 564-207.000.

Duthie, Joseph G. M.: *See*—
Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., H331, Cl. 382-31.000.

Fletcher, Aaron N.: *See*—
Henry, Ronald A.; and Fletcher, Aaron N., H334, Cl. 372-53.000.

FMC Corporation: *See*—
DiSanzo, Carmine P.; and Peake, Clinton J., H327, Cl. 564-207.000.

Garner, Francis A.: *See*—
Brager, Howard R.; and Garner, Francis A., H326, Cl. 420-63.000.

Graham, Gregory S.; and White, Harold V., to United States of America, Army. Electromechanical lag angle detector. H323, 9-1-87, Cl. 242-158.00R.

Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., to United States of America, Army. Large memory acousto-optically addressed pattern recognition. H331, 9-1-87, Cl. 382-31.000.

Hagel, William E.: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.

Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Navy. Oxazole dyes. H334, 9-1-87, Cl. 372-53.000.

Herman, Richard S.: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.

Huckabee, Laura L.: *See*—
Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., H331, Cl. 382-31.000.

Johnson, Conrad E.: *See*—
Mallory, Glenn O., Jr.; and Johnson, Conrad E., H325, Cl. 106-1.230.

Kawatake, Satoru: *See*—
Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, H328, Cl. 544-90.000.

Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, to Shionogi & Co., Ltd. Purification of cephalosporins. H328, 9-1-87, Cl. 544-90.000.

Lawson, Donald M.: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.

Lewns, Donald C.: *See*—
Millberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., H335, Cl. 363-16.000.

Mallory, Glenn O., Jr.; and Johnson, Conrad E., to Richardson Chemical Company. Electroless deposition of transition metals. H325, 9-1-87, Cl. 106-1.230.

Milberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., to United States of America, Army. Converter. H335, 9-1-87, Cl. 363-16.000.

Peake, Clinton J.: *See*—
DiSanzo, Carmine P.; and Peake, Clinton J., H327, Cl. 564-207.000.

Richardson Chemical Company: *See*—
Mallory, Glenn O., Jr.; and Johnson, Conrad E., H325, Cl. 106-1.230.

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Shionogi & Co., Ltd.: *See*—
Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, H328, Cl. 544-90.000.

Tokuyama, Kanji: *See*—
Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, H328, Cl. 544-90.000.

United States of America
Army: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.
Curtis, Richard A., H333, Cl. 455-608.000.
Graham, Gregory S.; and White, Harold V., H323, Cl. 242-158.00R.
Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., H331, Cl. 382-31.000.
Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.
Henry, Ronald A.; and Fletcher, Aaron N., H334, Cl. 372-53.000.
Millberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., H335, Cl. 363-16.000.
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Energy: *See*—
Brager, Howard R.; and Garner, Francis A., H326, Cl. 420-63.000.

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Bahnck, Thomas, H329, Cl. 367-3.000.
Burich, Lawrence R.; and Balcer, Thomas O., H330, Cl. 324-500.000.
Henry, Ronald A.; and Fletcher, Aaron N., H334, Cl. 372-53.000.

White, Harold V.: *See*—
Graham, Gregory S.; and White, Harold V., H323, Cl. 242-158.00R.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 1, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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310 4,690,195

CLASS 162
45 4,690,731

CLASS 164
58.1 4,690,196
312 4,690,197
316 4,690,198
421 4,690,199
504 4,690,200
516 4,690,201

CLASS 165
25 4,690,203
44 4,690,204
45 4,690,205
81 4,690,206
113 4,690,207
119 4,690,208
150 4,690,209
159 4,690,210
177 4,690,211

CLASS 166
65.1 4,690,212
84 4,690,213
250 4,690,214
261 4,690,215
266 4,690,216
274 4,690,217
297 4,690,218
307 4,690,219
382 4,690,220
4,690,221

CLASS 168
4 4,690,222

CLASS 172
44 4,690,223
45 4,690,224

CLASS 173
116 4,690,225
128 4,690,226

CLASS 174
68.5 4,691,078
87 4,691,079
88 R 4,691,080
105 R 4,691,081
106 SC 4,691,082
135 4,691,083

CLASS 178
4.56 4,690,227
24 4,690,228
325 4,690,229

CLASS 177
229 4,690,230

CLASS 180
6.48 4,690,231
89.14 4,690,232
142 4,690,233
183 4,690,234
210 4,690,235
219 4,690,236
4,690,237
248 4,690,238
249 4,690,239
287 4,690,240
315 4,690,241

CLASS 181
0.5 4,690,242
146 4,690,244
272 4,690,245

CLASS 182
2 4,690,246
63 4,690,247
118 4,690,248

CLASS 184
6.4 4,690,249

CLASS 187
18 4,690,250
101 4,690,243
107 4,690,251

CLASS 188
69 4,690,252
72.7 4,690,253
73.36 4,690,254
287 4,690,255

CLASS 191
12.2 R 4,691,084

CLASS 192
3.31 4,690,257
21 4,690,256
58 C [illegible]
70.28 4,690,259
71 [illegible]
87.13 [illegible]
111 A [illegible]

CLASS 194
317 4,690,263

CLASS 198
335 4,690,264
347 4,690,265
388 4,690,266
396 4,690,267
399 4,690,268
460 4,690,269
774 4,690,270

CLASS 200
1.7 4,690,271
151 4,691,085
159 R 4,691,086

CLASS 202
180 4,690,732

CLASS 203
21 4,690,733
36 4,690,734

CLASS 204
37.1 4,690,735
38.3 4,690,736
129.7 4,690,737
130 4,690,738
131 [illegible]
147 4,690,740
149 4,690,741
157.2 4,690,742
168 4,690,743
192.11 4,690,744
192.29 4,690,745
192.32 4,690,746
206 4,690,747
279 4,690,748
291 R 4,690,749

CLASS 206
36 X 4,690,276
43.28 4,690,272
105 4,690,273
318 4,690,274
331 4,690,275
362.1 4,690,277
387 4,690,278
531 4,690,279
554 4,690,280
597 4,690,281
626 4,690,282

CLASS 208
310 Z 4,690,750

CLASS 209
3.3 4,690,751
5 4,690,752
496 4,690,753
549 4,690,283
590 4,690,284

CLASS 210
94 4,690,754
98.1 4,690,755
221.2 4,690,756
232 4,690,757
247 4,690,758
304 4,690,759
321.5 4,690,760
330 4,690,761
336 4,690,762
496 4,690,763
629 4,690,764
634 4,690,765
4,690,766

CLASS 211
41 4,690,285
[illegible] [illegible]
49.1 4,690,287
113 4,690,288
186 4,690,289

CLASS 212
267 4,690,290

CLASS 215
32 4,690,291
201 4,690,292

CLASS 219
10.55 B 4,691,087
10.55 F 4,691,088
[illegible] [illegible]
121 LC 4,691,093
121 LD 4,691,092
121 LM 4,691,091
121 PC 4,691,090
121 PR 4,691,094
222 4,691,095
441 4,691,096
513 4,691,097

CLASS 220
86 R 4,690,293
90.2 4,690,294
[illegible] [illegible]
259 4,690,296
273 4,690,297
325 [illegible]
402 4,690,299
412 4,690,300

CLASS 221
2 4,690,301
11 4,690,302
131 4,690,303

CLASS 222
44 [illegible]
52 4,690,305
80 4,690,306
84 4,690,307
156 [illegible]
249 4,690,309
309 4,690,310
324 4,690,311
402.17 4,690,312
454 4,690,313

CLASS 224
211 4,690,314
252 4,690,315
253 4,690,316

CLASS 227
67 4,690,317

CLASS 228
57 4,690,318
182 4,690,319
194 4,690,320

CLASS 229
40 4,690,321
80 4,690,322

CLASS 236
99 F 4,690,323

CLASS 237
8 R 4,690,324

CLASS 239
124 4,690,325
223 4,690,326
226 4,690,327
227 4,690,328
265.19 4,690,329
265.39 4,690,330
333 4,690,331
338 4,690,332
434.5 4,690,333
452 4,690,334

CLASS 241
24 4,690,335
30 4,690,336
36 4,690,337
56 4,690,338
73 4,690,339
236 4,690,340
275 4,690,341

CLASS 242
35.5 A 4,690,342
55.3 4,690,343
55.53 4,690,344
4,690,345
36 R 4,690,346
57.1 4,690,347
66 4,690,348
75.5 4,690,349

CLASS 244
3.1 4,690,350
3.16 4,690,351
134 D 4,690,353
158 R 4,690,354
173 4,690,355

CLASS 248
68.1 4,690,356
[illegible] 4,690,357
297.3 4,690,358
300 4,690,359
346 4,690,360
352 4,690,361
404 4,690,362
446 4,690,363
503.1 4,690,364
[illegible] 4,690,365
[illegible] 4,690,366

CLASS 249
6 4,690,367
37 [illegible]
49 4,690,352
95 4,690,369
114 R 4,690,370

CLASS 250
201 4,691,098
213 VT 4,691,099
223 R 4,691,100
231 SE 4,691,101
256 4,691,102
311 4,691,103
338 4,691,104
4,691,105
349 4,691,106
370 4,691,107
385 4,691,108
426 4,691,109
458.1 4,691,110
551 4,691,111
570 4,691,112
577 4,691,113
578 4,691,114

CLASS 251
65 4,690,371
129.02 4,690,373
4,690,374
129.1 4,690,372
342 4,690,375
354 4,690,377

CLASS 252
47 4,690,767
62.58 [illegible]
70 [illegible]
99 [illegible]
102 4,690,771
106 4,690,772
174.12 4,690,773
309 4,690,774
312 4,690,775
315.3 4,690,776
373 4,690,777
506 4,690,778
546 4,690,779
572 4,690,780
626 4,690,782
633 4,690,781

CLASS 254
8 B 4,690,378
327 4,690,376
347 4,690,379
394 4,690,380
4,690,381

CLASS 256
1 4,690,382
24 4,690,383
47 4,690,384

CLASS 260
104 4,690,783
403 4,690,784
505 N 4,690,785

CLASS 264
4.6 4,690,786
16 4,690,787
22 4,690,788
40.1 4,690,789
63 4,690,790
122 4,690,791
235.8 4,690,792

CLASS 266
44 4,690,385
4,690,386
144 4,690,387

CLASS 267
35 4,690,388
140.1 4,690,389
155 4,690,390

CLASS 269
21 4,690,391

CLASS 271
2 4,690,392
4 4,690,393
11 4,690,394
98 4,690,395
311 4,690,396

CLASS 272
53.2 4,690,397
72 4,690,398
122 4,690,399
123 4,690,400
137 4,690,401
4,690,402

CLASS 273
25 4,690,403
67 R 4,690,404
73 C 4,690,405
73 J 4,690,406
81 A 4,690,407
169 4,690,408
299 4,690,409
4,690,410

CLASS 277
166 4,690,411
184 4,690,412
199 4,690,413
207 A 4,690,414

CLASS 279
4 4,690,415
110 4,690,416

CLASS 280
42 4,690,417
96.1 4,690,418
154.5 R 4,690,419
285 A [illegible]
401 4,690,421
460 R 4,690,422
505 4,690,423
633 4,690,424
668 4,690,425
690 4,690,426
694 4,690,427
697 4,690,428
707 4,690,429
708 4,690,430
711 Re.32,486
771 4,690,431
775 4,690,432

CLASS 283
1 B 4,690,433

CLASS 285
31 4,690,434
256 4,690,435
321 4,690,436
356 4,690,437
363 4,690,438

CLASS 290
1 R 4,691,115

CLASS 292
27 4,690,439
54 4,690,440
57 4,690,441
218 4,690,442
307 R 4,690,443
324 4,690,444
341 4,690,445

CLASS 293
128 4,690,446

CLASS 294
57 4,690,447

CLASS 296
37.8 4,690,448
65 R 4,690,449
97 G 4,690,451
97 K 4,690,450
216 4,690,452
4,690,453

CLASS 297
89 4,690,454
238 4,690,455
284 4,690,456
337 4,690,457
379 4,690,458
458 4,690,459

CLASS 299
21 4,690,460
39 4,690,461

CLASS 301
9 CN 4,690,462

CLASS 303
37 4,690,463
115 4,690,464
119 4,690,465

CLASS 307
10 R 4,691,116
86 4,691,118
84 4,691,119
119 4,691,117
265 4,691,120
289 4,691,121
279 4,691,122
296 R 4,691,123
311 4,691,124
353 4,691,125
441 4,691,126
475 4,691,127
557 4,691,128
581 4,691,129

CLASS 310
11 4,691,130
34 4,691,131
156 4,691,132
178 4,691,133
234 4,691,134
254 4,691,135
339 4,691,136

CLASS 312
29 [illegible]
198 4,690,467
291 [illegible]
330 R 4,690,469

CLASS 313
30 4,691,137
403 4,691,138
413 4,691,139
486 4,691,140
565 4,691,141
623 4,691,142

CLASS 315
133 4,691,143
169.3 4,691,144
4,691,145
287 4,691,146
371 4,691,147

CLASS 318
12 4,691,148
331 4,691,149
4,691,150
571 4,691,151
616 4,691,152
696 4,691,153
4,691,154
771 4,691,155
798 4,691,156

CLASS 320
2 4,691,157
14 4,691,158

CLASS 321
20 4,689,895

CLASS 323
222 4,691,159

CLASS 324
71.3 4,691,160
73 R 4,691,161
309 4,691,162
318 4,691,163
[illegible] 4,691,164
326 4,691,165
334 4,691,166
438 4,691,167
439 4,691,168
448 4,691,169

CLASS 325
20 4,691,170
167 4,691,171

CLASS 330
129 4,691,172
144 4,691,173
260 4,691,174

CLASS 331
1 A 4,691,175
2 4,691,176

CLASS 323
113 4,691,177
143 4,691,178
202 4,691,179

CLASS 335
6 4,691,180
128 4,691,181
176 4,691,182
289 4,691,183

CLASS 337
49 4,691,184

CLASS 338
32 H 4,691,185
4,691,186
114 4,691,187
307 4,691,188

CLASS 340
347 AD 4,691,189
4,691,190
347 DD 4,691,193
347 P 4,691,191
4,691,192
405 4,691,194
548 4,691,195
578 4,691,196
638 4,691,197
640 4,691,198
710 4,691,199
784 4,691,200
825.31 4,691,201

825.54 [illegible]
856 4,691,203

CLASS 342
22 [illegible]
345 4,691,205

CLASS 343
700 MS 4,691,206
766 4,691,207
785 4,691,208
846 4,691,209

CLASS 346
76 PH 4,691,210
4,691,211
108 4,691,212
159 4,691,213

CLASS 350
6.5 4,690,485
6.6 4,690,486
96.12 [illegible]
96.14 4,690,489
96.15 [illegible]
96.16 4,690,491
96.20 [illegible]
[illegible]
[illegible]
96.21 4,690,497
4,690,495
[illegible]
96.23 [illegible]
[illegible]
4,690,499
96.25 4,690,500
96.29 4,690,501
4,690,502
96.30 [illegible]
96.34 4,690,504
145 Re.32,487
252 4,690,505
320 4,690,506
321 4,690,507
331 R [illegible]
333 4,690,509
334 4,690,510
339 F 4,690,511
417 4,690,512
427 4,690,513
429 4,690,514
432 4,690,515
444 4,690,516
458 4,690,517
464 4,690,518
515 4,690,519
517 4,690,520
520 4,690,521
528 4,690,522

CLASS 351
129 4,690,523
168 4,690,524
206 4,690,525

CLASS 353
31 4,690,526
65 4,690,527
101 4,690,528
122 4,690,529

CLASS 354
21 4,690,530
149.11 4,690,531
173.11 4,690,532
4,690,533
187 4,690,534
322 4,690,535
402 4,690,536
4,690,537
403 4,690,538

CLASS 355
3 DD 4,690,540
3 TR 4,690,539
R 4,690,541
4,690,542
4,690,543
15 4,690,544
51 4,690,545
69 4,690,546
72 4,690,547
77 4,690,548

CLASS 356
4 4,690,549
R 4,690,550
4,690,551
35.5 4,690,552
51 4,690,553
71 4,690,554
121 4,690,555
152 4,690,556
155 4,690,557
158 4,690,558
328 4,690,559
338 4,690,560
339 4,690,561
361 4,690,562
375 4,690,563
445 4,690,564
446 4,690,565

CLASS 357
17 4,691,214
22 4,691,215
23.13 4,691,217
23.6 4,691,216
24 4,691,218
34 4,691,219
39 4,691,220
46 4,691,221
80 4,691,222
51 4,691,223
53 4,691,224
80 4,691,225

CLASS 358
26 4,691,226
47 4,691,227
75 [illegible]
76 4,691,229
105 4,691,230
108 4,691,231
111 4,691,232
136 4,691,233
144 4,691,234
172 4,691,235
181 4,691,236
256 4,691,237
280 4,691,238
282 4,691,239
4,691,240
293 4,691,241
294 4,691,242
4,691,243
4,691,244
310 4,691,245
4,691,246
319 4,691,247
320 4,691,248
336 4,691,249

CLASS 360
14.1 4,691,250
4,691,251
33.1 4,691,253
45 4,691,254
89 4,691,255
73 4,691,256
75 4,691,252
97 4,691,257
4,691,258
113 4,691,259
121 4,691,260
137 4,691,261

CLASS 361
56 4,691,262
58 4,691,263
232 4,691,264
386 4,691,265
433 4,691,266

CLASS 362
218 4,691,267
223 4,691,268

CLASS 363
41 4,691,269
56 4,691,270
60 4,691,271
98 4,691,272
132 4,691,273
141 4,691,274
143 4,691,275

CLASS 364
148 4,691,276
200 4,691,277
4,691,278
4,691,279
4,691,280
4,691,281
4,691,282
405 4,691,283
424 4,691,284
424.1 4,691,285
431.04 4,691,286
490 4,691,287
511 4,691,288
518 4,691,289
567 4,691,290
717 4,691,291
724 4,691,292
4,691,293
900 4,691,294
4,691,295
4,691,296
4,691,297

CLASS 365
189 4,691,298
4,691,299
200 4,691,300
222 4,691,301
4,691,303
226 4,691,304
240 4,691,302

CLASS 367
3 4,691,305
40 4,691,306
69 4,691,307

CLASS 368
108 4,690,566
203 4,690,567
204 4,690,568

CLASS 369
13 4,691,308
38 4,691,309
80 4,691,310
100 4,691,311

CLASS 370
4 4,691,312
30 4,691,313
94 4,691,314

CLASS 371
9 4,691,315
20 4,691,316
4,691,317
43 4,691,318
54 4,691,319

CLASS 372
45 4,691,320
46 4,691,321
82 4,691,322
107 4,691,323

CLASS 373
91 4,691,324
108 4,691,325

CLASS 374
11 4,690,569
188 4,690,570

CLASS 375
1 4,691,326
4 4,691,327
36 4,691,328
122 4,691,329

CLASS 376
136 4,690,793
230 4,690,794
264 4,690,795

CLASS 377
39 4,691,330
47 4,691,331

CLASS 378
7 4,691,332
37 4,691,333
71 4,691,334
152 4,691,335

CLASS 379
21 4,691,336
24 4,691,337
61 4,691,338
82 4,691,339
86 4,691,340
97 4,691,341
98 4,691,342
100 4,691,343
106 4,691,344
158 4,691,345
198 4,691,346
203 4,691,347
289 4,691,348
391 4,691,349

CLASS 380
3 4,691,350
10 4,691,351
14 4,691,352
15 4,691,353
4,691,354
23 4,691,355

CLASS 381
4 4,691,356
10 4,691,357
12 4,691,358
51 4,691,359
70 4,691,360
81 4,691,361
99 4,691,362
205 4,691,363

CLASS 382
41 4,691,364
54 4,691,365
4,691,366
61 4,691,367

CLASS 383
10 4,691,368
17 4,691,369
61 4,691,370
62 4,691,371
63 4,691,372
4,691,373
104 4,691,374

CLASS 384
22 4,690,571
120 4,690,572
251 4,690,573
569 4,690,574

CLASS 400
166 4,690,575
200 4,690,576
708 4,690,577

CLASS 401
78 4,690,578
127 4,690,579

CLASS 402
39 4,690,580

CLASS 403
133 4,690,581
252 4,690,582

CLASS 404
6 4,690,583
26 4,690,584

CLASS 405
19 4,690,585
209 [illegible]
211 4,690,587
262 4,690,588
263 4,690,589
267 4,690,590

CLASS 406
88 4,690,591

CLASS 408
1 R 4,690,592
80 4,690,593
159 4,690,594

CLASS 409
143 4,690,595
4,690,596

CLASS 411
32 4,690,597
40 4,690,598
180 4,690,599
263 4,690,600

CLASS 414
96 4,690,601
282 4,690,602
372 4,690,603
403 4,690,604
429 4,690,605
495 4,690,606
517 4,690,607
529 4,690,608
543 4,690,609
631 4,690,610
661 4,690,611

CLASS 415
112 4,690,612
148 4,690,613

CLASS 416
43 4,690,614
134 A 4,690,615
4,690,616
241 B 4,690,617

CLASS 417
226 4,690,618
269 4,690,619
273 4,690,620
313 4,690,621
342 4,690,622
472 4,690,623
490 4,690,624

CLASS 418
55 4,690,625

CLASS 419
12 4,690,796
23 4,690,797

CLASS 420
51 4,690,798
507 4,690,799

CLASS 422
40 4,690,800
68 4,690,801
141 4,690,802
186.18 4,690,803
219 4,690,804

CLASS 423
224 4,690,805
230 4,690,806
242 4,690,807
305 4,690,808
306 4,690,809
335 4,690,810
345 4,690,811
359 4,690,812
606 4,690,813
648 R 4,690,814

CLASS 424
9 4,690,815
70 4,690,817
[illegible] [illegible]
88 4,690,819
128 4,690,820
401 4,690,821
425 4,690,822
456 4,690,816
4,690,823
468 [illegible]
501 4,690,825

CLASS 428
88 4,690,626
113 4,690,627
133.5 [illegible]
156 4,690,629
236 [illegible]
262 4,690,631
429 4,690,632
526 4,690,633

CLASS 436
36 4,690,826
548 4,690,827
575 4,690,828
661 4,690,829

CLASS 427
34 B1 4,328,257
38 [illegible]
44 4,690,831
65 4,690,832
96 4,690,833
189 4,690,834
210 4,690,835
299 4,690,836
314 4,690,837
343 4,690,838
366 4,690,839
436 4,690,840

CLASS 428
35 [illegible]
4,690,842
36 4,690,843
4,690,844
40 4,690,845
64 4,690,846
71 4,690,847
74 4,690,848
91 4,690,849
105 4,690,850
116 4,690,851
156 4,690,852
157 4,690,853
195 4,690,854
209 4,690,855
215 4,690,856
216 4,690,857
4,690,858
251 4,690,859
290 4,690,860
318.6 4,690,862
328 4,690,863
336 [illegible]
341 4,690,865
364 [illegible]
367 4,690,867
409 4,690,868
421 4,690,869
425.9 4,690,870
432 4,690,871
446 4,690,872
473.5 4,690,873
537.1 4,690,874
577 4,690,875
606 4,690,876
623 4,690,861

CLASS 429
1 4,690,878
61 4,690,879
194 4,690,877

CLASS 430
114 4,690,881
192 4,690,882
201 4,690,883
206 [illegible]
212 [illegible]
303 4,690,886
313 4,690,880
331 4,690,887
349 [illegible]
552 4,690,889

CLASS 431
8 4,690,634
187 4,690,635
354 [illegible]
359 4,690,637

CLASS 432
81 4,690,638
105 4,690,639

CLASS 433
6 4,690,640
129 4,690,641
142 4,690,642
213 4,690,643

CLASS 434
158 4,690,644
309 4,690,645

CLASS 435
7 [illegible]
42 4,690,891
161 4,690,903
183 4,690,892
240.27 4,690,893
244 [illegible]
278 4,690,895
296 4,690,896
320 4,690,897
[illegible]

CLASS 436
85 4,690,899
87 4,690,900
86 4,690,901
110 4,690,902
508 4,690,905
512 4,690,906
514 4,690,907
518 [illegible]

CLASS 437
2 4,689,873
4,689,874
4,690,717
40 4,689,871
44 4,689,869
208 4,690,714
211 4,689,875
228 4,689,872

CLASS 439
1 4,690,473
13 4,690,470
63 4,690,471
67 4,690,472
71 4,690,646
92 4,690,647
97 4,690,479
120 4,690,474
271 4,690,478
364 4,690,480
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517 4,690,483
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585 4,690,481
595 4,690,477
622 4,690,648
736 4,690,484

CLASS 440
R 4,690,649

CLASS 441
40 4,690,650
56 4,690,651

CLASS 443
28 4,690,652

CLASS 446
27 4,690,653
28 4,690,654
84 4,690,655
95 4,690,656
134 4,690,657
429 4,690,658

CLASS 455
71 4,691,375
131 4,691,376
256 4,691,377
301 4,691,378
319 4,691,379
328 4,691,380
334 4,691,381
343 4,691,382
351 4,691,383
602 4,691,384
607 4,691,385
4,691,386

CLASS 444		282	4,690,927	CLASS 524		CLASS 527		422	4,691,023	589	4,691,055
68	4,690,639	285	4,690,928	94	4,690,962	312	4,690,996		4,691,024	CLASS 564	
	4,690,660	288	4,690,929	98	4,690,963	CLASS 528		521	4,691,025	96	4,691,056
78	4,690,661	293	4,690,930	125	4,690,964	28	4,690,997	531	4,691,026	123	4,691,057
CLASS 474		317	4,690,931	236	4,690,965	96	4,690,998	CLASS 549		CLASS 568	
69	4,690,662	337	4,690,932	284	4,690,966	188	4,690,999	32	4,691,027	316	4,691,058
80	4,690,663	343	4,690,933	286	4,690,967	244	4,691,000	36	4,691,028	333	4,691,059
205	4,690,664	354	4,690,934	315	4,690,968	256	4,691,001	79	4,691,029	420	4,691,060
245	4,690,665	356	4,690,935	413	4,690,969	289	4,691,002	153	4,691,030	432	4,691,061
CLASS 493		362	4,690,936	504	4,690,970	308.1	4,691,003	158	4,691,031	495	4,691,062
152	4,690,666		4,690,937	533	4,690,971	323	4,691,004	450	4,691,032	783	4,691,063
215	4,690,667		4,690,938	609	4,690,972	380	4,691,005	453	4,691,033	835	4,691,064
297	4,690,668		4,690,940	CLASS 530		CLASS 530		542	4,691,034	CLASS 570	
		383	4,690,941						4,691,035	179	4,691,065
CLASS 494			4,690,942	54.1	4,690,973	324	4,691,006	CLASS 556		184	4,691,066
14	4,690,669	418	4,690,943	64	4,690,974	331	4,691,007	16	4,691,036	193	4,691,067
16	4,690,670	445	4,690,944		4,690,975	339	4,691,008	18	4,691,037	CLASS 585	
CLASS 501		448	4,690,945	70	4,690,976	350	4,691,009	407	4,691,038	259	4,691,069
90	4,690,909	485	4,690,946	83	4,690,977	387	4,691,010	446	4,691,039	271	4,691,070
103	4,690,910	521	4,690,947	152	4,690,978	832	4,691,011	CLASS 558		319	4,691,071
105	4,690,911	544	4,690,948	153	4,690,979	CLASS 536		44	4,691,040	323	4,691,068
CLASS 502		561	4,690,949	186	4,690,980	23	4,691,012	177	4,691,041	525	4,691,072
161	4,690,912	626	4,690,950	328.6	4,690,981	96	4,691,013	CLASS 560		639	4,691,073
340	4,690,913	653	4,690,951	331.9	4,690,982	CLASS 540		61	4,691,042	849	4,691,074
400	4,690,914	808	4,690,952		4,690,983	221	Re.32,491	75	4,691,044	CLASS 604	
CLASS 514		CLASS 521		332.3	4,690,984	227	4,691,014	064	4,691,043	12	4,690,671
2	4,690,915	65	4,690,953	419	4,690,985	CLASS 544		185	4,691,045	43	4,690,672
15	4,690,916	107	4,690,954	879	4,690,986	198	4,691,015	196	4,691,046	87	4,690,673
23	4,690,917	112	4,690,955	902	4,690,987	CLASS 546		204	4,691,047	93	4,690,674
	4,690,918	137	4,690,956		4,690,988	95	4,691,016	240	4,691,048	177	4,690,675
183	4,690,919	CLASS 522		CLASS 526		298	4,691,017	CLASS 562		189	4,690,676
201	4,690,920	31	4,690,957	88	4,690,989	309	4,691,018	406	4,691,050	219	4,690,677
205	4,690,921	CLASS 523		138	4,690,990	330	4,691,019	443	4,691,051	349	4,690,678
210	4,690,922			158	4,690,991	341	4,691,020	506	4,691,052	383	4,690,679
222	4,690,923	172	4,690,958	160	4,690,992	CLASS 548		531	4,691,053	386	4,690,680
237	4,690,924	213	4,690,959	242	4,690,993	109	4,691,021	553	4,691,049	396	4,690,681
267	4,690,925	440	4,690,961	254	4,690,994	408	4,691,022	554	4,691,054	891	4,690,682
289	4,690,926	442	4,690,960	286	4,690,995					896	4,690,683
										CLASS 623	
										12	4,690,684
										23	Re.32,488

CLASSIFICATION OF DESIGNS

D1—	105	291,620		563	291,640		384	291,660		190	291,680	D15—	136	291,700		4	291,720
D2—	271	291,621		566	291,641		499	291,661			291,681			291,701			291,721
	330	291,622	D7—	43	291,642	D10—	63	291,662		191	291,682	D16—	131	291,702			291,722
	630	291,623		77	291,643	D11—	120	291,663		193	291,683	D18—	15	291,703		19	291,723
D3—	76	291,624		82	291,644		27	291,664		209	291,684	D19—	78	291,704			291,724
		291,625		321	291,645		83	291,665		314	291,685	D20—	30	291,705		35	291,725
	102	291,626		332	291,646		84	291,666		316	291,686		43	291,706		127	291,726
		291,627		379	291,647		154	291,667			291,687	D21—	22	291,707		128	291,727
D6—	310	291,628		413	291,648		214	291,668			291,688		37	291,708	D24—	27	291,728
	316	291,629	D8—	14	291,649		221	291,669	D14—	1	291,689		59	291,709			291,729
	323	291,630		72	291,650			291,670		38	291,690		121	291,710		29	291,730
	366	291,631		98	291,651			291,671		58	291,691		185	291,711		33	291,731
	379	291,632		331	291,652	D12—	84	291,672		80	291,692		191	291,712		34	291,732
	445	291,633			291,653			291,673		84	291,693		195	291,713			291,733
	491	291,634		349	291,654		86	291,674		100	291,694		209	291,714		36	291,734
	509	291,635		381	291,655		186	291,675		113	291,695		336	291,715	D30—	8	291,735
	510	291,636	D9—	300	291,656		136	291,676			291,696		237	291,716		13	291,736
	514	291,637		341	291,659		189	291,677		114	291,697		242	291,717	D32—	56	291,737
	540	291,638		344	291,657			291,678			291,698		249	291,718	D34—	5	291,738
	549	291,639		352	291,658			291,679			291,699	D23—	3	291,719			291,739

CLASSIFICATION OF PLANTS

P.—	1	5,998									
	9	5,999	11	6,000	45	6,001	68	6,002	6,003		6,004

STATUTORY INVENTION REGISTRATIONS

106—	1.23	H325	310—	78	H331	363—	16	H333	372—	53	H334	420—	63	H326	544—	90	H328
242—	158 R	H323	324—	500	H330	367—	3	H329	382—	31	H331	455—	608	H333	564—	207	H327
244—	117 R	H324															

GEOGRAPHICAL INDEX
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,690,393	4,690,476		4,691,358		4,690,780		4,690,149			
	4,690,607	4,690,488		4,691,380		4,690,480		4,691,055		4,690,291	
	4,690,614	4,690,492		4,691,383		4,690,522		4,691,063		4,690,318	
	4,690,749	4,690,495		4,328,257		4,690,592		4,691,071		4,690,756	
04 :	4,689,829	4,690,526	08 :	4,689,960		4,690,643		4,691,079		4,690,915	
	4,690,043	4,690,554		4,690,521		4,690,735		4,691,085		4,691,088	
	4,690,845	4,690,555		4,690,676		4,690,936		4,691,086		4,691,187	
	4,691,103	4,690,566		4,690,684		4,690,937		4,691,149		4,691,305	
	4,691,124	4,690,576		4,690,701		4,690,938		4,691,175	25 :	4,689,878	
	4,691,179	4,690,583		4,690,752		4,690,939		4,691,276		4,689,886	
05 :	4,690,466	4,690,621		4,690,897		4,690,940		4,691,347		4,689,895	
06 :	Re.32,489	4,690,658		4,691,075		4,690,947		4,691,354		4,689,906	
	4,689,839	4,690,670		4,691,311		4,691,231		4,691,372		4,689,910	
	4,689,848	4,690,673		4,691,346		4,691,345	18 :	4,689,828		4,689,922	
	4,689,876	4,690,697	09 :	4,689,831	13 :	4,689,855		4,689,952		4,690,131	
	4,689,877	4,690,711		4,690,076		4,689,972		4,690,070		4,690,162	
	4,689,881	4,690,746		4,690,323		4,690,003		4,690,072		4,690,208	
	4,689,892	4,690,779		4,690,390		4,690,064		4,690,074		4,690,347	
	4,689,905	4,690,791		4,690,482		4,690,180		4,690,133		4,690,350	
	4,689,914	4,690,825		4,690,483		4,690,287		4,690,404		4,690,351	
	4,689,964	4,690,831		4,690,578		4,690,378		4,690,443		4,690,512	
	4,689,997	4,690,836		4,690,653		4,690,783		4,690,468		4,690,551	
	4,689,999	4,690,838		4,690,669		4,690,868		4,690,609		4,690,584	
	4,690,004	4,690,844		4,690,703		4,691,353		4,690,635		4,690,656	
	4,690,040	4,690,875		4,690,722	15 :	4,690,086		4,690,666		4,690,678	
	4,690,053	4,690,876		4,690,774	17 :	4,689,859		4,690,948		4,690,741	
	4,690,107	4,690,890		4,690,943		4,689,927		4,690,951		4,690,757	
	4,690,130	4,690,893		4,691,015		4,689,973		4,691,099		4,690,789	
	4,690,142	4,690,916		4,691,093		4,689,977		4,691,185		4,690,871	
	4,690,150	4,690,925		4,691,190		4,690,019		4,691,234		4,690,884	
	4,690,152	4,690,992		4,691,288		4,690,044		4,691,342		4,690,892	
	4,690,165	4,691,080		4,691,315		4,690,055		4,691,363		4,691,009	
	4,690,193	4,691,101	10 :	4,690,705		4,690,081	19 :	4,689,976		4,691,077	
	4,690,221	4,691,148		4,690,817		4,690,108		4,690,260		4,691,133	
	4,690,222	4,691,159		4,690,865		4,690,115	20 :	4,690,141		4,691,141	
	4,690,242	4,691,161		4,690,953		4,690,120		4,690,343		4,691,199	
	4,690,284	4,691,169		4,690,963		4,690,125		4,691,136		4,691,253	
	4,690,285	4,691,172		4,691,003		4,690,173	21 :	4,689,941		4,691,262	
	4,690,296	4,691,173	12 :	4,689,897		4,690,198		4,690,732		4,691,291	
	4,690,309	4,691,177		4,690,032		4,690,210	22 :	4,689,865		4,691,299	
	4,690,313	4,691,193		4,690,090		4,690,307		4,689,923		4,691,314	
	4,690,314	4,691,196		4,690,143		4,690,322		4,690,216		4,691,332	
	4,690,315	4,691,203		4,690,148		4,690,356		4,690,248		4,691,343	
	4,690,332	4,691,207		4,690,154		4,690,407		4,690,364	26 :	4,689,835	
	4,690,353	4,691,209		4,690,155		4,690,434		4,690,449		4,689,867	
	4,690,360	4,691,239		4,690,276		4,690,437		4,690,455		4,689,879	
	4,690,363	4,691,254		4,690,279		4,690,447		4,690,587		4,689,882	
	4,690,370	4,691,267		4,690,329		4,690,470		4,691,057		4,689,953	
	4,690,371	4,691,268		4,690,330		4,690,501	23 :	4,689,907		4,689,965	
	4,690,383	4,691,274		4,690,369		4,690,502	24 :	4,690,024		4,689,980	
	4,690,398	4,691,293		4,690,380		4,690,654		4,690,026		4,689,986	
	4,690,415	4,691,312		4,690,457		4,690,720		4,690,127		4,689,998	
	4,690,451	4,691,336		4,690,471		4,690,758		4,690,146		4,690,013	

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September 8, 1987 Volume 1082 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 4, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents | 4,468,815 through 4,470,154
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 21, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,388,733	06/268,653	6/21/83
4,388,739	06/234,806	6/21/83
4,388,741	06/219,827	6/21/83
4,388,742	06/299,266	6/21/83
4,388,747	06/291,283	6/21/83
4,388,762	06/290,024	6/21/83
4,388,763	06/234,875	6/21/83
4,388,764	06/328,013	6/21/83
4,388,766	06/293,495	6/21/83
4,388,770	06/307,004	6/21/83
4,388,772	06/224,318	6/21/83
4,388,774	06/227,750	6/21/83
4,388,776	06/260,692	6/21/83
4,388,799	06/360,539	6/21/83
4,388,805	06/226,915	6/21/83
4,388,808	06/349,494	6/21/83
4,388,812	06/252,937	6/21/83
4,388,824	06/238,095	6/21/83
4,388,831	06/236,086	6/21/83
4,388,837	06/393,102	6/21/83
4,388,854	06/238,313	6/21/83
4,388,861	06/265,749	6/21/83
4,388,863	06/323,941	6/21/83
4,388,873	06/259,279	6/21/83
4,388,876	06/251,397	6/21/83
4,388,878	06/312,631	6/21/83
4,388,879	06/263,686	6/21/83
4,388,881	06/271,788	6/21/83
4,388,886	06/331,692	6/21/83
4,388,889	06/248,389	6/21/83
4,388,899	06/244,896	6/21/83
4,388,904	06/253,008	6/21/83
4,388,910	06/276,000	6/21/83
4,388,917	06/225,643	6/21/83
4,388,918	06/270,904	6/21/83
4,388,936	06/360,599	6/21/83
4,388,937	06/298,776	6/21/83
4,388,939	06/272,535	6/21/83
4,388,943	06/261,242	6/21/83
4,388,954	06/264,023	6/21/83
4,388,961	06/227,409	6/21/83
4,388,966	06/329,938	6/21/83
4,388,970	06/236,144	6/21/83
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4,388,978	06/230,017	6/21/83
4,388,993	06/228,114	6/21/83
4,388,995	06/271,472	6/21/83
4,389,001	06/263,178	6/21/83
4,389,004	06/284,221	6/21/83
4,389,008	06/304,512	6/21/83
4,389,016	06/258,960	6/21/83
4,389,025	06/216,656	6/21/83
4,389,031	06/290,408	6/21/83
4,389,036	06/256,064	6/21/83
4,389,041	06/426,619	6/21/83
4,389,051	06/398,359	6/21/83
4,389,060	06/231,418	6/21/83
4,389,062	06/216,722	6/21/83
4,389,065	06/315,042	6/21/83
4,389,067	06/224,633	6/21/83
4,389,099	06/283,459	6/21/83
4,389,103	06/286,520	6/21/83
4,389,130	06/366,563	6/21/83
4,389,133	06/241,661	6/21/83
4,389,145	06/297,777	6/21/83
4,389,152	06/297,989	6/21/83
4,389,169	06/241,238	6/21/83
4,389,173	06/364,286	6/21/83
4,389,180	06/277,279	6/21/83
4,389,182	06/343,307	6/21/83
4,389,192	06/257,916	6/21/83
4,389,201	06/231,655	6/21/83
4,389,210	06/307,978	6/21/83
4,389,211	06/269,361	6/21/83
4,389,215	06/305,568	6/21/83
4,389,216	06/355,309	6/21/83
4,389,224	06/283,423	6/21/83
4,389,258	06/334,624	6/21/83
4,389,263	06/310,173	6/21/83
4,389,265	06/283,709	6/21/83
4,389,272	06/285,558	6/21/83
4,389,274	06/246,529	6/21/83
4,389,276	06/270,678	6/21/83
4,389,277	06/270,679	6/21/83
4,389,284	06/334,966	6/21/83
4,389,308	06/322,906	6/21/83
4,389,311	06/283,992	6/21/83

Patent Number	Serial Number	Issue Date
4,389,315	06/286,563	6/21/83
4,389,319	06/257,460	6/21/83
4,389,321	06/334,860	6/21/83
4,389,326	06/272,943	6/21/83
4,389,353	06/394,519	6/21/83
4,389,359	06/244,579	6/21/83
4,389,367	06/306,948	6/21/83
4,389,386	06/305,058	6/21/83
4,389,388	06/351,051	6/21/83
4,389,405	06/223,159	6/21/83
4,389,406	06/263,927	6/21/83
4,389,410	06/285,612	6/21/83
4,389,415	06/285,215	6/21/83
4,389,416	06/310,164	6/21/83
4,389,417	06/336,107	6/21/83
4,389,425	06/272,738	6/21/83
4,389,427	06/330,856	6/21/83
4,389,430	06/318,913	6/21/83
4,389,449	06/219,090	6/21/83
4,389,469	06/308,098	6/21/83
4,389,494	06/283,546	6/21/83
4,389,501	06/319,633	6/21/83
4,389,504	06/308,201	6/21/83
4,389,519	06/321,926	6/21/83
4,389,530	06/352,723	6/21/83
4,389,545	06/220,359	6/21/83
4,389,561	06/277,989	6/21/83
4,389,578	06/255,393	6/21/83
4,389,583	06/271,398	6/21/83
4,389,588	06/361,336	6/21/83
4,389,589	06/289,194	6/21/83
4,389,602	06/236,231	6/21/83
4,389,603	06/233,692	6/21/83
4,389,642	06/279,323	6/21/83
4,389,674	06/240,660	6/21/83
4,389,695	06/232,540	6/21/83
4,389,697	06/288,807	6/21/83
4,389,731	06/254,849	6/21/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,897,892, Re. S.N. 063,930, Filed June 19, 1987, Cl. 223/66, CUSTOM FORMED WIG BLOCK, James L. Waters, Owner of Record: *Inventor,* Attorney or Agent: Robert M. Schwartz, et al., Ex. Gp.: 247

4,033,280, Re. S.N. 075,849, Filed July 20, 1987, Cl. 114/255, LIVE WELL FOR HIGH SPEED OPEN FISHING BOAT, Forrest L. Wood, et al., Owner of Record: *Wood Manufacturing Co., Inc., Flippin, Ariz.,* Attorney or Agent: Edward J. Lynch, et al., Ex. Gp.: 315

4,074,737, Re. S.N. 049,803, Filed May 14, 1987, Cl. 144/117.R, WOOD PLANER CUTTERHEAD DESIGN FOR REDUCED NOISE LEVEL, John S. Stewart, Owner of Record: *Noise Control Service, Inc.,* Attorney or Agent: Floyd A. Gibson, et al., Ex. Gp.: 321

4,471,114, Re. S.N. 051,271, Filed Sept. 6, 1986, Cl. 536/127, SEPARATION OF MANNOSE BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES, John D. Sherman, et al., Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 123

4,480,079, Re. S.N. 924,807, Filed Oct. 30, 1986, Cl. 526/301, COMPOLYMERIZATION OF UNSATURATED URETHANE MONOMERS, Michael L. Orton, Owner of Record: *Imperial Chemical Industries, London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 155

4,486,829, Re. S.N. 938,034, Filed Dec. 4, 1986, Cl. 364/200, METHOD AND APPARATUS FOR DETECTING A FAULTY COMPUTER IN A MULTICOMPUTER SYSTEM, Kinji Mori, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 237

4,508,996, Re. S.N. 034,436, Filed Apr. 2, 1987, Cl. 315/224, HIGH FREQUENCY SUPPLY SYSTEM FOR GAS DISCHARGE LAMPS AND ELECTRONIC BALLAST THEREFOR, John C. Clegg, et al., Owner of Record: *Brigham Young University, Provo, Utah,* Attorney or Agent: H. Ross Workman, Ex. Gp.: 266

4,510,883, Re. S.N. 039,158, Filed Apr. 16, 1987, Cl. 118/305, APPARATUS FOR DISTRIBUTING POWDERED MATERIAL, Donald C. Estes, Owner of Record: *Speedco, Inc., Winchester, Ky.,* Attorney or Agent: James R. Higgins, Jr., Ex. Gp.: 152

4,513,072, Re. S.N. 045,017, Filed Sept. 24, 1986, Cl. 430/57, DUAL LAYER ELECTROPHOTOGRAPHIC RECORDING MATERIAL CONTAINING A LAYER OF SELENIUM ARSENIC AND HALOGEN, AND THEREABOVE A LAYER OF SELENIUM AND TELLURIUM, Hartmut Dulken, et al., Owner of Record: *Licentia Patent-Verwattungs-GmbH, Frankfurt, Germany,* Attorney or Agent: George H. Spencer, et al., Ex. Gp.: 156

4,518,017, Re. S.N. 052,054, Filed May 21, 1987, Cl. 138/96R, PROTECTIVE COVER ASSEMBLY, Erin D. Hennon, et al., Owner of Record: *Dana Corp., Toledo, Ohio,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 243

4,531,158, Re. S.N. 074,938, Filed July 17, 1987, Cl. 358/227, AUTOMATIC FOCUSING SYSTEM FOR VIDEO CAMERAS, Toshio Murakami, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, Ex. Gp.: 262

4,541,712, Re. S.N. 075,175, Filed July 20, 1987, Cl. 355/53, LASER PATTERN GENERATING SYSTEM, Theodore R. Whitney, Owner of Record: *American Semiconductor Equipment Technologies, Woodland Hills, Calif.,* Attorney or Agent: Alan H. MacPherson, et al., Ex. Gp.: 211

4,556,483, Re. S.N. 079,628, Filed July 30, 1987, Cl. 209/160, NEUTRAL HYDROCARBOXY CARBONYL THIOUREA SULFIDE COLLECTORS, Yun-Lung Fu, Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Frank M. Van Riet, Ex. Gp.: 312

4,564,885, Re. S.N. 077,636, Filed July 24, 1987, Cl. 361/436, RECTIFIER WITH SLUG CONSTRUCTION AND MOLD FOR FABRICATING SAME, T. Michael McCann, Owner of Record: *General Instrument Corp.,* Attorney or Agent: Harold James, et al., Ex. Gp.: 211

4,581,929, Re. S.N. 038,703, Filed Apr. 15, 1987, Cl. 73/204, AIR FLOW METER CIRCUIT WITH TEMPERATURE COMPENSATION CIRCUIT, Noboru Sugiuro, Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 268

4,599,118, Re. S.N. 053,269, Filed May 21, 1987, Cl. 148/1.5, METHOD OF MAKING MOSFET BY MULTIPLE IMPLANTATIONS FOLLOWED BY A DIFFUSION STEP, Yu-Pin Han, et al., Owner of Record: *Mostek Corp., Carollton, Tex.,* Attorney or Agent: Roland Plottel, et al., Ex. Gp.: 114

4,623,860, Re. S.N. 075,356, Filed July 20, 1987, Cl. 335/170, LATCHING SOLENOID MECHANISM, Keith F. Baker, et al., Owner of Record: *Synchro-Start Products, Inc., Skokie, Ill.,* Attorney or Agent: Thomas E. Dorn, et al., Ex. Gp.: 335

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Dockside Research, Inc., New York, N.Y., Reg. No. 895,821, for the mark "TIE GARD", Canc. No. 16,238.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Turbine Legal Operation, 1 River Rd., Schenectady, N.Y. 12345.

4,597,676. HYBRID BEARING.
4,615,734. SOLID PARTICLE EROSION RESISTANT COATING UTILIZING TITANIUM CARBIDE, PROCESS FOR APPLYING AND ARTICLE COATED THEREWITH.
4,622,116. PROCESS FOR ELECTRODEPOSITING MICA ON COIL OR BAR CONNECTIONS AND RESULTING PRODUCTS.
4.624.586. BEARING LUBRICATION DEVICE.
4,648,793. TURBINE WHEEL KEY AND KEYWAY VENTILATION.
4,659,954. CARBON BRUSHES IN SEALED SILICONE ENVIRONMENT WITH CONTROLLED VAPOR PRESSURE.
4,668,161. VENTILATION OF TURBINE COMPONENTS.

D. 241,743. COMBINED PENCIL SHARPENER AND CLIP, *Mark Lemieux,* 131 Wilding Ave., Sault Ste. Marie, Ontario, Canada P6A-4V2; (705) 949-1802.
3,878,539. PORTABLE ALARM DEVICE FOR HOME, OFFICE AND TRAVEL. ADJUSTABLE SLIDE-BRACKET HOOKS OVER DOOR TOPS IN SECONDS, *Chadyeane Gooding,* 3100-A Spring Hill Rd., Smyra, Ga. 30080.
3,996,987. CONVERTIBLE VALENCE, *Edith Rodriguez,* Box 2576, St. Thomas, U.S. Virgin Islands 00801.
4,649,676. SHELTER CONSTRUCTION, *C. Regina Davey,* c/o Frederick L. Bergert, Law Offices, Nies, Webner, Kurz & Bergert, Suite 700, 1911 Jefferson Davis Hwy., Arlington, Va. 22202.
4,673,868. METHOD OF TESTING ELECTRONIC AUTOMOTIVE PARTS, *Rolin Jones, Jr.,* c/o Reginald F. Roberts, Jr., 1422 Hearthstone Dr., P.O. Box 515, Baton Rouge, La. 70820.
4,686,878. NEW ORLEANS WIND CHIME, *Barbara A. Hebert,* 812 Cameron Ct., Kenner, La. 70065.
S.N. 723,260. CENTER STERN OUTBOARD MOTOR FOR DOUBLE-END CANDES, *Richard E. Zeimet,* Taichung, P.O. Box 149, 40099 Taiwan, Republic of China.
S.N. 947,370. WIND DRIVEN VENTILLATING DEVICE, *Emirto T. Cruz,* 12312 Cloudview Ave., NE., Albuquerque, N. Mex. 87123.

PUBLIC ADVISORY COMMITTEE FOR TRADEMARK AFFAIRS

Meeting Date

The meeting date is Sept. 16, 1987. The date given in the prior Official Gazette notice published Aug. 25, 1987, is in error.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 8, 1987

Bl. 4,351,172	4,611,015	4,643,481	4,656,512
Re. 31,935	4,612,524	4,644,439	4,656,609
Re. 32,349	4,613,402	4,644,696	4,656,786
Re. 32,390	4,615,360	4,645,566	4,658,304
Re. 32,404	4,616,662	4,645,631	4,658,755
D. 287,227	4,618,518	4,646,110	4,659,274
4,326,940	4,619,820	4,646,175	4,659,283
4,482,365	4,623,504	4,646,722	4,659,385
4,493,783	4,623,702	4,646,784	4,659,701
4,513,699	4,624,195	4,647,143	4,659,882
4,520,913	4,625,405	4,647,208	4,660,803
4,531,026	4,626,289	4,647,402	4,660,860
4,540,448	4,626,921	4,647,459	4,661,093
4,547,411	4,627,414	4,647,740	4,661,097
4,551,175	4,628,043	4,647,952	4,661,379
4,552,960	4,628,194	4,648,136	4,661,534
4,566,962	4,628,427	4,648,575	4,661,790
4,566,985	4,628,912	4,649,069	4,662,367
4,567,187	4,629,720	4,649,252	4,662,791
4,575,778	4,629,773	4,649,735	4,663,144
4,576,633	4,630,374	4,649,875	4,663,172
4,582,842	4,631,356	4,650,086	4,663,313
4,585,605	4,631,488	4,650,302	4,663,512
4,586,101	4,631,707	4,650,361	4,664,333
4,588,661	4,634,407	4,650,803	4,664,742
4,588,679	4,634,752	4,651,419	4,664,774
4,591,858	4,634,975	4,651,566	4,664,977
4,593,852	4,635,078	4,651,623	4,666,689
4,594,379	4,635,570	4,652,270	4,667,598
4,594,940	4,636,147	4,652,495	4,667,903
4,596,875	4,637,327	4,652,694	4,668,493
4,597,711	4,637,843	4,652,986	4,668,774
4,598,256	4,638,192	4,653,446	4,669,465
4,598,292	4,639,153	4,654,156	4,670,027
4,598,842	4,639,836	4,654,464	4,670,498
4,599,439	4,640,543	4,654,510	4,671,005
4,601,171	4,640,588	4,654,651	4,671,038
4,601,868	4,640,839	4,655,106	4,671,273
4,602,058	4,640,957	4,655,417	4,671,825
4,604,171	4,641,228	4,655,640	4,672,254
4,605,809	4,641,783	4,655,642	4,677,958
4,606,772	4,641,954	4,655,752	4,681,119
4,607,071	4,642,011	4,655,829	4,681,996
4,607,098	4,642,581	4,656,181	
4,608,391	4,642,771	4,656,299	

Disclaimers

4,118,241.—*Frank E. Bernett*, Yardley, Pa. MORTAR COMPOSITIONS AND METHOD OF MAKING SAME. Patent dated Oct. 3, 1978. Disclaimer filed June 30, 1987, by the assignee, *Tile Council of America.*

Hereby enters this disclaimer to claims 1, 3, 4, 5 and 6 of said patent.

4,409,481.—*Harry D. Smith, Jr.*; *Ward E. Schultz* and *Jerry L. Verbout*, all of Houston, Tex. METHOD FOR SIMULTANEOUS MEASUREMENT OF THERMAL NEUTRON DECAY COMPONENTS. Patent dated Oct. 11, 1983. Disclaimer filed June 10, 1987, by the assignee, *Halliburton Co.*

The term of this patent subsequent to June 14, 2000 has been disclaimed.

4,424,444.—*Harry D. Smith, Jr.* and *Dan M. Arnold*, Houston, Tex. METHOD FOR SIMULTANEOUS MEASUREMENT OF BOREHOLE AND FORMATION NEUTRON LIFETIMES. Patent dated Jan. 3, 1984. Disclaimer filed June 10, 1987, by the assignee, *Halliburton Co.*

The term of this patent subsequent to June 14, 2000 has been disclaimed.

4,536,263.—*Oronzio deNora*, Milan, Italy and *Placido M. Spaziante*, Lugano, Switzerland. PROCESS FOR GENERATING HALOGEN USING NOVEL ELECTROLYSIS CELL. Patent dated Aug. 20, 1985. Disclaimer filed May 8, 1987, by the assignee, *Oronzio deNora Technologies, Inc.*

The term of this patent subsequent to July 20, 1999 has been disclaimed.

4,561,958.—*Douglas V. Stewart*, Florence and *Alton T. Tabereaux*, Sheffield, both of Ala. ALUMINA REDUCTION CELL. Patent dated Dec. 31, 1985. Disclaimer filed June 12, 1987, by the assignee, *Reynolds Metals Co.*

Hereby enters this disclaimer to all claims of said patent.

4,562,243.—*Virgil Percec*, Shaker Heights, Ohio. CROSS-LINKABLE DIFUNCTIONALIZED POLYARYLENE POLYETHERS. Patent dated Dec. 31, 1985. Disclaimer filed June 15, 1987, by the assignee, *The B. F. Goodrich Co.*

Hereby enters this disclaimer to claim 1 of said patent.

4,572,428.—*Gordon S. Groff*, Lancaster; *Dean S. Herr*, Willow Street, both of Pa. IN DUCT ATOMIZING HUMIDIFICATION AND EVAPORATIVE COOLING SYSTEM. Patent dated Feb. 25, 1986. Disclaimer filed July 16, 1987, by the assignee, *Herrmidifier Co., Inc.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,587,793.—*Eric L. Brennan* and *Kenneth W. Schawel*, Mission Viejo, Calif. PHARMACEUTICAL INFUSION PRODUCTS AND THE PROCESS AND APPARATUS FOR THE MAKING THEREOF. Patent dated May 13, 1986. Disclaimer and dedication filed June 26, 1987, by the assignee, *Home Health Care of America, Inc.*

Hereby disclaims all claims and dedicates to the public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sacramento: California State Library	(916) 322-4572
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	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
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Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
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Nevada	Reno: University of Nevada Library	(702) 784-6579
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New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 1, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-10-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-26-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

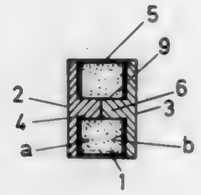
Patents	Numbers 3,522,401 to 3,526,003, inclusive
Plant Patents	Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 8, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,021,891 (754th)
MAGNETIC LOCK CLOSURE
Tamao Morita, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan
Reexamination Request No. 90/001,055, Jul. 22, 1986.
Reexamination Certificate for Patent No. 4,021,891, issued May 10, 1977, Ser. No. 462,174, Apr. 18, 1974.
Reexamination Certificate B1 4,021,891, issued Aug. 5, 1986.
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—303



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5** and **6** were previously cancelled.

Claims **1–3** are determined to be patentable as amended.

Claims **4**, **7** and **8**, dependent on an amended claim, are determined to be patentable.

1. A magnetic lock closure for use with handbags and similar containers comprising:

a magnetic attractor member comprised of:

a single permanent magnet means for supplying magnetic attraction having a first side and a second side of opposite polarities and a hole therethrough between said two sides [;], *and*

a first ferromagnetic plate-shaped body rigidly secured to said first side of said magnet means over said hole for centering the force of the magnetic attraction of said magnet means *through said hole, said magnetic attractor member having an outer lateral peripheral surface; and*

a second ferromagnetic plate-shaped body removably positioned against said second side of said magnet means for contacting and being attracted to said first ferromagnetic plate-shaped body through said hole, said second ferromagnetic plate-shaped body formed as:

a plate [means] adjacent said second side of said magnet means over said hole, and

a rod [means extending from said plate means] *the shape of said hole* rigidly [secured against substantial movement transverse to the plane of said plate means, said rod means adapted to extend into] *attached to said plate extending through* said hole and contacting said first ferromagnetic plate-shaped body, whereby said second ferromagnetic plate-shaped body is magnetically attracted and connected to said first ferromagnetic plate-shaped body *with the magnetic force centered* through said hole; and

a non-ferromagnetic *cover member comprised of a* cover having a central opening adapted to be substantially in register with said hole in said magnet means, said [non-ferromagnetic] cover superimposed at least over substantially the entire surface of said second side of said magnet means without substantially interfering with the magnetic attraction through said central opening *and with an outer peripheral edge spaced from said central opening*, and [to] *a continuous flange portion extending around and depending from the entire outer peripheral edge of said cover and extending toward a plane extending laterally outwardly from the junction of said first side of said magnet means and the outer lateral peripheral surface of said magnet means and said flange portion covering substantially the entire outer lateral peripheral surface of said magnetic attractor member extending from said plane toward said second side of said magnet, said cover member* substantially [protect] *protecting* the covered portion of said magnet means.

B1 4,315,963 (755th)
THERMOPLASTIC FILM WITH INTEGRAL RIBBED PATTERN AND BAG THEREFROM
Carl B. Havens, Newark, Ohio, assignor to The Dow Chemical Co., Midland, Mich.
Reexamination Request No. 90/000,805, Jun. 18, 1985.
Reexamination Certificate for Patent No. 4,315,963, issued Feb. 16, 1982, Ser. No. 170,217, Jul. 18, 1980.
Division of Ser. No. 75,477, Sep. 14, 1979, Pat. No. 4,265,853.
Int. Cl.[4] B65D *85/30*
U.S. Cl. 428—35



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **3** are determined to be patentable as amended.

Claims **2**, **4** and **5**, dependent on an amended claim, are determined to be patentable.

New claims **6–15** are added and determined to be patentable.

1. A thermoplastic film having *a film body with* an integral *mesh* ribbed pattern [thereon] *on one surface thereof*, said ribs *formed from the body of the film itself without a significant increase in film weight and* having a *rounded-peak rib shape with sloping sides but having a* rib sharpness sufficient to permit a large number of ribs per film width to be present in said pattern, the ribs having a thickness at least twice that of the film body between the ribs, the relatively thin film body between the ribs being oriented for toughness, said ribs preventing tear propagation should said film body become ruptured.

B1 4,515,759 (756th)

PROCESS OF REMOVING HYDROGEN SULFIDE FROM GAS MIXTURES

Edward E. Burnes, Arroyo Grande, Calif., and Kishan Bhatia, Katy, Tex., assignors to NL Industries, Inc., New York, N.Y.

Reexamination Request No. 90/001,066, Aug. 14, 1986.
Reexamination Certificate for Patent No. 4,515,759, issued May 7, 1985, Ser. No. 549,274, Nov. 3, 1983.

Int. Cl.[4] **B01D** *53/34*

U.S. Cl. 423—220

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **3**, **5** and **6** are cancelled.

Claims **1**, **7** and **8** are determined to be patentable as amended.

Claims **4** and **9**, dependent on an amended claim, are determined to be patentable.

1. A process for *selectively* removing hydrogen sulfide from a gas mixture comprising treating **[**said**]** *a* gas mixture *comprising natural gas, hydrogen sulfide and carbon dioxide* with an aqueous medium containing **[**an effective amount of a inorganic water soluble metal**]** *sodium* nitrite, *said aqueous medium being buffered to* **[**at**]** a pH of about 5.5 or greater.

REISSUES

SEPTEMBER 8, 1987

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,494

FRICTION SPINNING FRAME

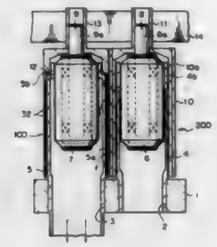
Meiji Anahara, Kariya, and Shigeru Muramatsu, Okazaki, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Original No. 4,606,185, dated Aug. 19, 1986, Ser. No. 769,593, Aug. 26, 1985. Application for reissue Dec. 3, 1986, Ser. No. 937,662

Claims priority, application Japan, Sep. 3, 1984, 59-184772; Sep. 3, 1984, 59-184773

Int. Cl.[4] **D01H** *1/135, 7/885*

U.S. Cl. 57—401 **5 Claims**



1. A friction spinning frame comprising a pair of twisting rollers disposed substantially in parallel and driven in the same direction to each other at a small gap therebetween to form a yarn forming zone of a valley shaped profile on upper surfaces of said twisting rollers along the gap, at least one of said twisting rollers being a perforated hollow roller comprising an outer shell having a plurality of perforations on the entire outer surface thereof and means for providing a suction force through said perforations on said yarn forming zone, whereby staple fibers are twisted to form a yarn while being sucked and held on said yarn forming zone, characterized in that:

a suction pipe, a part of which is accommodated in the interior of said outer shell and having a suction mouth extending close to an inside wall of said outer shell in the axial direction of said perforated roller is fixedly secured to a machine frame;

a bearing is fixedly accommodated in the interior of said suction pipe; and

a shaft is rotatably supported by said bearing at one end portion thereof and fixedly secured to said outer shell at the other end portion thereof.

Re. 32,495

CHIP RELIEF FOR ROCK BITS

J. Randall Coates, Tonkawa, Okla., assignor to Smith International, Inc., Newport Beach, Calif.

Original No. 4,513,829, dated Apr. 30, 1985, Ser. No. 569,060, Jan. 9, 1984. Continuation-in-part of Ser. No. 337,929, Jan. 8, 1982, abandoned. Application for reissue Feb. 24, 1986, Ser. No. 832,312

Int. Cl.[4] **E21B** *10/18*

U.S. Cl. 175—339 **5 Claims**

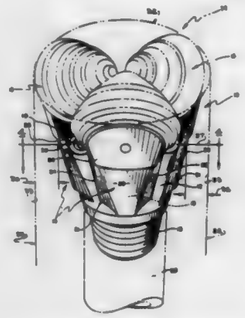
1. An air circulation, air lubricated, roller cone rock bit comprising:

a rock bit body having a first cutting end and a second threaded pin end *having a shoulder*, said body forming a chamber therein, said chamber communicates with said circulation air through an opening formed in said second pin end, said pin end being connected to a drill string,

at least a pair of legs extending from said bit body, each leg forming a shirttail portion and a bearing, each bearing serves to support a roller cutter cone at said first cutting end of said bit, cutting elements adjacent the largest diameter of each roller cone form a gage of a borehole in a formation,

at least one nozzle formed in said bit body in communication with said chamber, said nozzle directs air past each roller cone into said borehole to lift detritus material out of the bottom of the borehole, and

relief means formed by said legs, said relief means serves to pass said detritus material from the bottom of said borehole by the rock bit body and out of said borehole by



providing an annular space between an outer surface of said legs and walls formed by said borehole, said annular space, in a plane perpendicular to an axis of said bit, about adjacent an exit end of said at least one nozzle, is thirty-five percent or more of the *annular* area **[**formed by**]** *between the shoulder of the threaded pin end and the walls of* said borehole **[**through said plane**]**, said annular space progressively enlarges in perpendicular planes between said exit end of said at least one nozzle and a shoulder formed in said bit body, said shoulder forms a thread termination base end for said second threaded pin end of said rock bit.

Re. 32,496

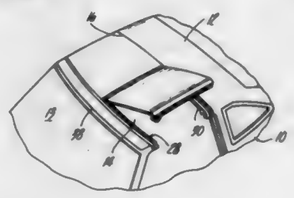
REMOVABLE ROOF PANELS FOR VEHICLES

Richard R. Chrysler, Brighton, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Original No. 4,120,529, dated Oct. 17, 1978, Ser. No. 755,665, Dec. 30, 1976. Continuation of Ser. No. 34,671, Apr. 30, 1979, abandoned. Application for reissue Jan. 19, 1981, Ser. No. 226,504

Int. Cl.[4] **B60J** *7/08*

U.S. Cl. 296—218 **6 Claims**



6. A roof assembly for a vehicle having a **[**windshield

header] *roof panel* and door and window openings at opposite sides of said vehicle, said vehicle forming a transverse opening in the vehicle roof *panel* defined by a forward edge portion and a rearward portion in said roof *panel* and extending from a window opening at one side of said vehicle to the window opening at the other side of said vehicle, a forward frame connected to said roof panel at said forward edge of said opening, a rearward frame connected to said roof panel rearwardly of said door openings and at said rearward edge of said opening, a center frame member disposed on the center line of said vehicle and fastened to said forward and rearward frame members, said center frame member and forward and rearward frame members forming a pair of oppositely extending spaces at opposite sides of said center member, a pair of panel members detachably connected to cover said pair of spaces, respectively, and a reinforcing plate having a generally H-shaped configuration and being congruous to said center member and to portions of said forward and rearward frame members extending to opposite sides of said center member.

Re. 32,497

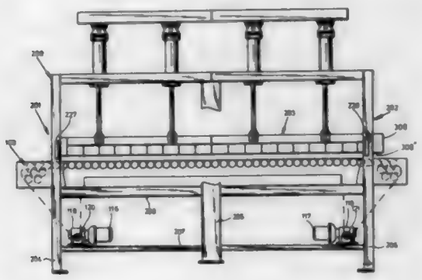
GLASS FURNACE WITH HEAT SENSING MEANS

Douglas M. Canfield, Suffern, N.Y., assignor to Casso Solar Corporation, Pomona, N.Y.

Original No. 4,601,743, dated Jul. 22, 1986, Ser. No. 729,680, May 2, 1985. Continuation-in-part of Ser. No. 531,906, Sep. 18, 1983, Pat. No. 4,528,016. Application for reissue Oct. 10, 1986, Ser. No. 917,990

Int. Cl.[4] C03B *27/00*

U.S. Cl. 65—162 **23 Claims**



1. A furnace for the heat treatment of glass including, annealing, heat-strengthening, tempering and bending of glass which comprises:

a housing defining an elongated furnace chamber having an inlet and an outlet;

a roller conveyor between said inlet and said outlet and including a row of stub rollers disposed along each side of said housing flanking a path between said inlet and said outlet, a drive conveyor belt extending over and under alternate stub rollers on one side of said conveyor, and fused silica support rollers spanning said conveyor with each support roller resting upon two stub rollers overshot by said belt;

means for driving said belt to oscillate glass articles carried by said support rollers back and forth in said housing;

an array of infrared heaters mounted in said housing above said conveyor; and

a computer for displaying parameters for the operation of said heaters in a pattern on a screen corresponding to said array.

Re. 32,498

METHOD OF MANUFACTURING FLUORESCENT SCREENS OF CATHODE RAY TUBES

Yoshifumi Tomita, and Hiromitsu Nakai, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,391,885, dated Jul. 5, 1983, Ser. No. 361,269, Mar. 24, 1982. Application for reissue Jul. 5, 1985, Ser. No. 752,359

Claims priority, application Japan, Mar. 27, 1981, 56-43919

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—28 **9 Claims**



1. A method of manufacturing a fluorescent screen of a cathode ray tube comprising the steps of:

forming a film of photosensitive [sticky] substance that exhibits stickiness when exposed to light on an inner surface of a face plate of said tube;

exposing said film to light to render portions thereof sticky;

applying a powdery substance onto said film to cause said powdery substance to adhere to said portions of the film rendered sticky;

removing excess powder to form a film pattern of said powdery substance;

causing the substance responsible for stickiness to ooze out onto said film pattern;

applying another powdery substance onto said film pattern; and

removing an excess of said another powdery substance, thus forming said fluorescent screen.

Re. 32,499

METHOD FOR QUANTITATIVE ANALYSIS FOR LIMONIN

Elmar W. Weller, Bochum, Fed. Rep. of Germany, and Richard L. Mansell, Tampa, Fla., assignors to University of South Florida, Tampa, Fla., a part interest

Original No. 4,305,923, dated Dec. 15, 1981, Ser. No. 147,732, May 8, 1980. Application for reissue Aug. 16, 1982, Ser. No. 408,497

Int. Cl.[4] G01N *33/53, 33/549*

U.S. Cl. 435—7 **12 Claims**

1. A method for [the] quantitative analysis of limonin *in a sample,* which *method* comprises reacting a known amount of limonin-specific antibodies[,] with [a mixture of a known volume of] *said* sample [containing an unknown amount of limonin] and *with* a known amount of a *readily-detectable, labeled* limonin derivative [labeled with an enzyme or with a radioactive isotope], determining the amount of labeled limonin-derivative which has reacted with said antibodies and [calculating] therefrom the [unknown] amount of limonin in said sample.

PLANT PATENTS

GRANTED SEPTEMBER 8, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,005

CHRYSANTHEMUM PLANT NAMED 'REYELLOW'

Martinus van der Jagt, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Association, N.V., Willemstad, Netherlands Antilles

Filed Apr. 12, 1984, Ser. No. 599,979

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinctive variety of Chrysanthemum as described and illustrated in the foregoing specification and accompanying drawings.

6,006

PLUM TREE, "HOWARD SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Nov. 27, 1985, Ser. No. 802,360

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree substantially as illustrated and described which is distinguished by producing fruit which matures late in the season, approximately Aug. 25 through 28 at Del Rey, Calif., and which bears a dark blue, almost black-colored fruit which is heart-shaped in appearance and has a firm texture which makes the fruit easy to handle and ship, and furthermore which has excellent cold storage characteristics.

6,007

PEACH TREE, SUMMER SUN

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Oct. 16, 1985, Ser. No. 788,132

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described, characterized by its bearing freestone fruit having a yellow flesh and by its general resemblance to the June Lady Peach Tree (unpatented), but from which it is distinguished by its bearing of fruit which mature for harvesting approximately 15 through 20 June, later than that of the June Lady Peach Tree, and having a flesh which is firm and crisp with a skin which is tenacious to flesh.

6,008

PEACH TREE, "SEPTEMBER SUN"

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Del Rey, Calif.

Filed Oct. 11, 1985, Ser. No. 786,829

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described which produces peaches that are full freestone, which have flesh which is crisp and bright Yellow in color, which peaches are ripe for harvesting from August 30 through the first week of September, and which peaches further have skin of medium thickness, which is tenacious to the flesh of the instant variety, and causes fruit of the subject variety to display exceptional handling and shipping characteristics.

6,009

GRAPEVINE, SUGRASIX

John H. Weinberger, 6111 E. Lyell, Fresno, Calif. 93727, and Timothy P. Sheehan, 8701 N. Highway 41, No. 25, Fresno, Calif. 93710

Filed Oct. 15, 1985, Ser. No. 787,459

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine to be known as Sugrasix and the parts thereof, substantially as illustrated and described, characterized principally by its production of grapes which mature in the same season of ripening as the Flame Seedless Grape (unpatented) which it most closely resembles, but from which it is distinguished by producing clusters of seedless grapes which are nearly Red black in color in contrast to the reddish color characteristic of the Flame Seedless Grapevine variety (unpatented).

PATENTS

GRANTED SEP. 8, 1987

ERRATA

For CLASS	See PATENT NO.
437-044	4,691,433
437-173	4,691,434
437-175	4,691,435
437-033	4,691,436
522-035	4,691,489
206-621	4,691,858
248-429	4,691,946
028-255	4,691,947
439-078	4,691,971
439-077	4,691,972
439-161	4,691,973
439-147	4,691,974
439-266	4,691,975
439-394	4,691,976
439-404	4,691,977
439-620	4,691,978
439-082	4,691,979
439-476	4,691,980
439-816	4,691,981
065-002	4,692,178
437-189	4,692,190
437-120	4,692,194
424-122	4,692,310
428-035	4,692,327
437-082	4,692,348
437-230	4,692,349
568-916	4,692,432
527-300	4,692,478
250-492	4,692,579
324-061	4,692,685
338-198	4,692,805

PATENTS

GRANTED SEPTEMBER 8, 1987

GENERAL AND MECHANICAL

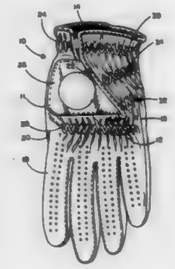
4,691,387
GLOVE APPARATUS
Lionel P. Lopez, Houston, Tex., assignor to Lion's Sports, Inc., Houston, Tex.
Filed Oct. 9, 1984, Ser. No. 658,610
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **32 Claims**



1. A glove apparatus for use with a baseball bat to provide the secure engagement of the hands with the bat comprising:
(a) one or two gloves for use with the hands,
(b) a palm truss member fixedly secured to the upper portion of the palm of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(c) a thumb truss member fixedly secured between the thumb and the palm of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(d) a finger truss member fixedly secured at the lower portion of one or more fingers of said glove but displaced from, and not associated with, the bending portions of the thumb and the palm,
(e) a pad fixedly secured to said glove for covering the lower, outer portion of the palm thereof, and
(f) a truss-receptive member fixedly secured to the bat for removeably engaging said truss members for providing a no-slip grip between said glove and the bat,
the glove apparatus for protecting the hand and for enhancing the sensitivity of the dexterity of the user.

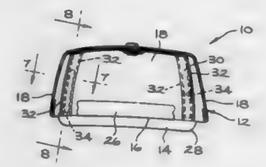
4,691,388
GOLF GLOVE
David D. Boone, Oceanside, Calif., assignor to Lynx Golf, Inc., City of Industry, Calif.
Filed Apr. 18, 1986, Ser. No. 853,691
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **4 Claims**

1. A sport glove of the type having a palm-side and a knuckle-side joined at a seam and defining a plurality of finger stalls, an access aperture adjacent a wrist-heel that is adapted to be substantially perpendicular to the wearer's arm and a fastenable opening extending from the access aperture toward the finger stalls for placing the glove on the hand and securing the glove thereon; the glove comprising:
first fastening means positioned on one side of said opening;
second fastening means positioned on another side of said opening opposite said first fastening means;
said opening and said first and second fastening means each extending diagonally along said knuckle-side whereby to provide easy access for placing the glove on the hand and removing the glove from the hand;
first elastic means extending between said opening and said seam in a direction substantially perpendicular to said opening, and second elastic means extending along the



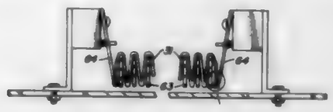
wrist-heel of said glove, at least one such first elastic means extending between said opening and said second elastic means and on each side of said seam whereby said first elastic means and said fastening means produce diagonally-directed tension forces through the palm area of said glove when said glove is worn on a wearer's hand.

4,691,389
CAP HAVING STIFFENERS
Eugene F. Meyer, Louisville, Ky., assignor to Town Talk, Inc., Louisville, Ky.
Filed Nov. 3, 1986, Ser. No. 926,507
Int. Cl.[4] A41B *1/02*
U.S. Cl. 2—195 **6 Claims**



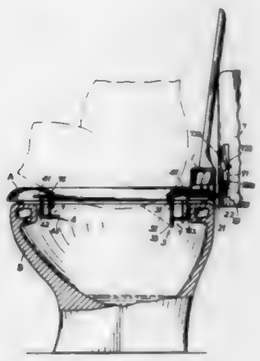
1. A cap comprising:
(a) a crown having a brim and including a plurality of crown segments located in side-by-side relationship, with side edges of the crown segments extending upwardly from the crown brim and each crown segment being fastened to its contiguous crown segment along a crown seam adjacent to their contiguous edges;
(b) a visor laterally centered on and attached to the front of the crown brim to extend outwardly therefrom, with the junctures of the peripheral edge of the visor and the crown brim being proximate to two of the crown seams;
(c) a strip of seam tape attached beneath the crown seams on the inside surface of the crown; and
(d) a stay of stiff material located under each of the two crown seams proximate to the junctures of the peripheral edge of the visor and crown brim and disposed between the strip of seam tape and the inside surface of the crown.

4,691,390
SANITARY HEADDRESS
Thomas J. McKeown, Pennsauken, N.J., assignor to Cellucap Manufacturing Company, Philadelphia, Pa.
Filed Dec. 23, 1985, Ser. No. 812,269
Int. Cl.[4] A41D 1/00
U.S. Cl. 2—200 7 Claims



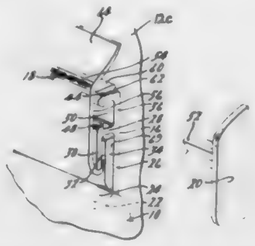
1. A disposable headdress comprising in combination,
(a) a crown portion formed from a web of fabric continuously reversely folded upon itself to form an elongated stacked plurality of pleats extending longitudinally from one end of said web to the other, which pleats are small in width compared to their length and to the length of the web forming said crown portion, the outermost pleats having longitudinally extending marginal edges folded inward and secured to the inner surface of the crown,
(b) stretched elastic cords extending longitudinally the full length of said web and secured substantially continuously thereto within the folded marginal edges of the longitudinally extending outermost pleats, each of said elastic cords in unstretched condition being shorter than the length of web to which it is secured and being stretchable to the full length of the web forming said crown portion, whereby when said elastic cords contract from their stretched to their unstretched condition the crown portion of the headdress is peripherally reduced in size, and
(c) securement means fixedly securing together all of said stacked plurality of pleats and said elastic cords closely adjacent to each end of said folded web which forms said crown portion.

4,691,391
TOILET HAVING WIRE-ADJUSTED WATER-SPRAY NOZZLES
Dai-Ming Kuo, P.O. Box 10160, Taipei, Taiwan
Filed Jun. 9, 1986, Ser. No. 872,146
Int. Cl.[4] E03D 9/08
U.S. Cl. 4—447 4 Claims



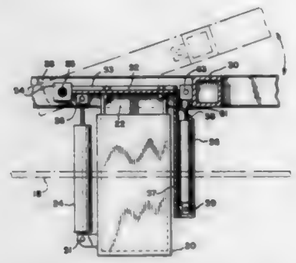
1. A toilet having a wire-adjusted water-spray nozzle comprising:
a warm water source;
two valves respectively controlling two branch water conduits directing water from said water source;
a rear-side nozzle adapted for spraying the human anus, and being fed by one said branch water conduit, a flexible portion formed on said conduit and a water-spray hole with a fixed spraying angle formed in said conduit, a front-side nozzle adapted for spraying the human genitals and being fed by the other branch water conduit, a flexible portion formed on said other conduit and a water-spray hole with a fixed spraying angle formed in said other conduit, a spraying-angle adjuster securing at least one of said nozzles on the toilet and including: a longitudinal casing, a toothed rack reciprocatively moving in said casing, a driving gear engaging and operating the teeth of said rack, said rack having, on the side opposite said teeth, a plurality of recesses, a positioning latch resiliently engaging any one recess of a plurality of recesses for temporarily braking the rack, a flexible hose extending between said rack and either said nozzle and having its one end fixed on a toilet water tank and having the outer end fixed on said toilet seat, an actuating wire reciprocatively jacketed in said hose and having its one end connected with said rack through a driving rod and having the other end connected through a follower rod to a lug of a terminal collar which is fixed to either said nozzle, whereby upon the rotation of said driving gear, said rack will be pushed or retracted to move said nozzle about said flexible portion to adjust the water-spray angle for thoroughly cleaning either human anus or genitals.

4,691,392
JOINT AND TRIM FOR BATHTUBS AND THE LIKE
Thomas H. Whitney, Attica, Mich., assignor to Trayco, Inc., Lapeer, Mich.
Continuation of Ser. No. 615,890, May 31, 1984, abandoned.
This application Feb. 10, 1986, Ser. No. 828,170
Int. Cl.[4] A47K 3/16
U.S. Cl. 4—595 3 Claims



1. A support joint for a tub and the like; said joint characterized by:
a support member having an engaging means for supportingly engaging a peripheral flange of a tub;
said support member having an upwardly extending flange that is constructed to be affixed against a wall;
said support member having connector means;
a trim molding member having interlocking means thereon to interconnect with said connector means;
said trim molding having a portion abutting against said wall and concealing said upwardly extending flange of said support member between said wall and said trim molding;
a support member having a lower horizontally extending ledge for seating a horizontal surface of a bathtub;
a vertical flange upwardly exending from said ledge;
a rib extending from said flange spaced above said ledge;
a downturned rim extending downwardly from a free edge of said rib and being spaced from said vertical flange;
said ledge, vertical flange, rib, and rim forming a channel for receiving an upwardly extending flange of said bathtub.

4,691,393
ANGULAR TILT CONTROL MECHANISM FOR A WHEELED STRETCHER
Jay L. Kuck, St. Marys, Ohio, assignor to Midmark Corporation, Versailles, Ohio
Filed Apr. 25, 1986, Ser. No. 855,976
Int. Cl.[4] A61G 7/00
U.S. Cl. 5—62 14 Claims



1. A bed-like stretcher for supporting a patient, comprising:
1 a frame for supporting a bed surface having a length and a width and defining a head end and a foot end;
a base;
a shaft connecting said frame to said base for pivotal movement of said frame along a horizontal line defined across said width of said frame;
fixing means for fixing said frame in any selected pivotal position within an available range relative to said base;
a release rod connected to said gas spring for selectively releasing said gas springs, thereby permitting pivotal movement of said frame;
a hand-operated actuator mounted to said frame capable of movement in first and second opposite directions to, respectively, first and second positions;
means for biasing said actuator into a normal position intermediate of said first and second positions;
a second rod connecting said actuator to said release rod whereby movement of said actuator in either of said first or second directions releases said gas spring to permit pivotal movement of said frame;
an upward-facing stop surface defined on said base;
a stop bar secured to said frame so as to be adjacent said stop surface when said frame is in a horizontal position;
a spring biasing said bar into contact with said stop surface when said frame is in said horizontal position to prevent downward pivotal movement of said foot end while having no effect on pivotal movement of said head end below horizontal;
a cable connecting said stop bar to said actuator, whereby movement of said actuator in a first direction causes said cable to slacken and movement of said actuator in a second direction causes said actuator to pull said cable to withdraw said bar from contact with said stop surface, thereby permitting pivotal movement of said foot end below horizontal.

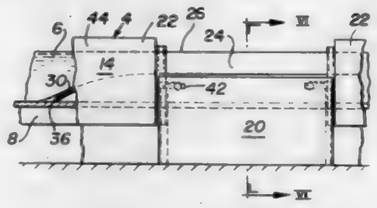
4,691,394
COLLAPSIBLE HAMMOCK
Chi Goo Woo, 2119 Potspring Rd., Lutherville, Md. 21093
Filed Dec. 18, 1986, Ser. No. 943,038
Int. Cl.[4] A45F 3/22, 3/24
U.S. Cl. 5—120 9 Claims

1. A collapsible hammock comprising:
main laterally disposed support members and cross support members, said main laterally disposed support members being connected to said cross support members to form a supporting base,
a pair of vertically disposed, auxiliary support members extending from each end of said supporting base, one end of each said auxiliary support member being connected to said supporting base by first hinge members, with the other ends thereof being connected together by second hinge members,



a tensile strength wire member passing through said lateral support members with said hinge members connected therewith, and
a bed member suspended between said vertically disposed auxiliary support members, said bed member being supported at each end by said tensile member attached thereto.

4,691,395
WATERBED FRAMES
John A. Corsetti, 833 SW. Bayshore Blvd., Port St. Lucie, Fla. 33452
Filed Dec. 12, 1986, Ser. No. 941,071
Int. Cl.[4] A47C 19/00, 21/08
U.S. Cl. 5—400 3 Claims



1. In a waterbed frame for supporting and confining a bladder-type mattress having a horizontal mattress support member, a head panel, a foot panel and a pair of side panels, the improvement that assists a person reclining in the bed to exit therefrom which comprises:
at least one of said side panels having a section thereof that can be lowered relative to the remainder of said panel to provide an exit area along the side of said frame within which there is no obstruction against egress above the upper level of said mattress and
an arcuate web having a longitudinal side contiguous with said section that slopes upwardly from said support member toward said section thereby to more strictly confine said mattress in the region thereof adjacent said section then over the remainder of said support member.

4,691,396
HOLSTER MOUNT
Gregory C. Hoffman, 716 Crestview Ct., San Marcos, Calif. 92069
Filed Dec. 15, 1986, Ser. No. 941,310
Int. Cl.[4] A47C 21/00; A47F 7/00; A47B 96/06
U.S. Cl. 5—503 3 Claims

1. A mount for supporting a handgun and holster adjacent the edge of the user's bed comprising, in combination:
a horizontal support plate having a proximal end adapted to

lie adjacent to the edge of the bed and a distal end adapted to lie inwardly therefrom, constructed and configured to extend from the edge of the bed inwardly toward the center of the bed between the mattress and spring of the bed;

a vertical barrier plate extending vertically from the proximal end of the horizontal support plate, constructed and



configured to lie against the outer vertical edge of the mattress;

a spacer portion extending outwardly from the upper edge of the vertical barrier plate; and

a holster mount portion extending upwardly at an angle of about 45 degrees from the outward edge of the spacer portion, constructed and adapted to receive thereupon a handgun holster.

4,691,397

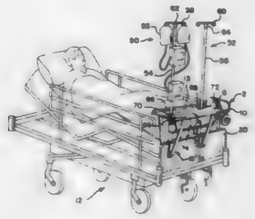
LIFE SUPPORT CARRYING APPARATUS

Ronald G. Netzer, 1037 55th St., Downers Grove, Ill. 60516

Filed Jun. 9, 1986, Ser. No. 871,878

Int. Cl.[4] A47B *23/02;* **A47C** *21/00*

U.S. Cl. 5—507 **7 Claims**



1. A life support carrying means that accommodates life support devices of a bedridden patient substantially within the lateral boundaries of a hospital bed, said hospital bed having a footboard, comprising:

a table-like surface means for supporting said life support devices;

I.V. holder bushing means;

transport means secured to said table-like surface means and including wheel means and axle means;

oxygen bottle support means lying substantially within the boundaries of said table-like surface means;

securing means for complementary mating engagement with the footboard of said hospital bed whereby the weight of the carrying means and the life support devices can be generally distributed along the major plane of said footboard;

I.V. holder means having distal end means for carrying intravenous feeding container means and lower end means for engagement with said I.V. holder bushing means when carrying said intravenous feeding containers; and

means cooperating with said I.V. holder means to form handle means which aid in movement by said transport means.

4,691,398

SHOE MAKING MACHINE

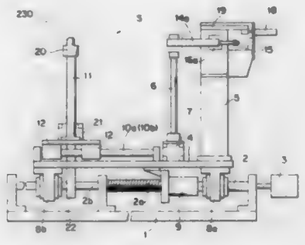
Kouji Kadogawa, Funabashi, and Tsunenori Watanabe, Asaka, both of Japan, assignors to Leader Company Limited, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,654

Claims priority, application Japan, Sep. 22, 1983, 58-174065; Sep. 22, 1983, 58-175238; Sep. 22, 1983, 58-175239; Sep. 22, 1983, 58-175240; Sep. 26, 1983, 58-177670

Int. Cl.[4] A43D *95/16, 95/08;* **C14B** *1/44*

U.S. Cl. 12—77 **5 Claims**



1. A shoe making machine, comprising:

a base;

a slide table movably mounted on said base;

a member fixedly mounted on said slide table for supporting the heel portion of a shoe body to be processed, said supporting member having means for clamping the heel portion of the shoe body;

guide shaft means fixedly mounted on said slide table and disposed in a direction parallel to the direction of movement of said slide table;

a toe portion carrying member having means for accommodating thereon the toe portion of a shoe body to be processed, said toe portion carrying member also having a guide member slidably engaged with said guide shaft means for movement of said toe portion carrying member with respect to said slide table, and thereby with respect to said heel portion supporting member, along said guide shaft means;

means for alternately locking said toe portion carrying member against movement with respect to said slide table or with respect to said base, whereby with said toe portion carrying member being locked against movement with respect to said base, said slide table may be moved on said base and with respect to said toe portion carrying member, thereby changing the distance between said heel portion supporting member and said toe portion carrying member for accommodating shoe bodies of different size, and with said toe portion carrying member being alternately locked against movement with respect to said slide table, said toe portion carrying member and said heel portion supporting member are fixed in relation to one another for supporting a shoe body while said slide table may be moved with respect to said base for processing of the shoe body;

a processing tool head table having a tool for processing the outer marginal portion of the under-surface of a shoe body and having a constant original position to return to slightly away from the toe portion of the shoe body when the shoe body has been set for processing; and,

means for simultaneously controlling the longitudinal movement of said slide table carrying a shoe body together with the transverse and vertical movement of said processing tool head table, so that shoe bodies of any size can be promptly processed in accordance with operation commands of a computer having memorized shoe size data.

4,691,399

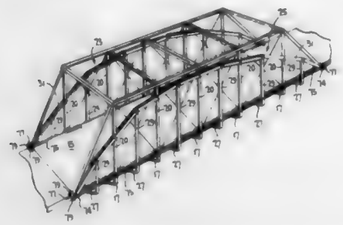
REHABILITATION OF STEEL TRUSS BRIDGES BY MEANS OF REINFORCING ARCHES

Jai B. Kim, Federal Building, Lewisburg, Pa. 17837, and John M. Yadlosky, 281 Thompsonville Rd., McMurray, Pa. 15317

Filed Nov. 21, 1985, Ser. No. 800,300

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—2 **19 Claims**



1. The rehabilitation method of increasing the useful life and load-carrying capacity of an existing steel truss bridge which itself is capable of carrying and has carried vehicle loads, the steel truss including top and bottom members, said method comprising the steps of superimposing a pair of relatively lightweight support arches and post-tensioning members for the respective arches on the existing truss in respective vertical planes on opposite transverse sides of the bridge such that the support arches are themselves laterally supported by the existing truss, the arches extending at least partly between the top and bottom members of the truss, and using the post-tensioning members for post-tensioning at least the support arches after superimposing same on the truss.

4,691,400

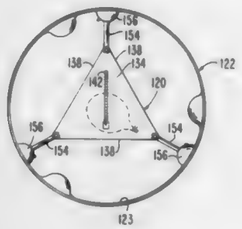
ARTICLE BUFFING APPARATUS AND METHOD

Howard M. Arneson, 6 Locksley La., San Rafael, Calif. 94901

Continuation-in-part of Ser. No. 502,433, Jun. 9, 1983, Pat. No. 4,566,144. This application Oct. 23, 1985, Ser. No. 790,300

Int. Cl.[4] A47L *23/00*

U.S. Cl. 15—3 **37 Claims**



1. Buffing apparatus comprising:

a container; a flexible bag of buffing material for placement into the container, said bag adapted for receiving an article to be buffed, said container adapted to be placed in a shiftable bin and moved about relative to a predetermined reference as the bin is shifted, there being a buffing element for placement in the bag, said element having a buffing material thereon frictionally engageable with the article in the bag, said container being of a size to permit the bag, the article and the element to move relative to container as the container is moved relative to said reference.

4,691,401

WASHING APPARATUS FOR A MOTOR VEHICLE

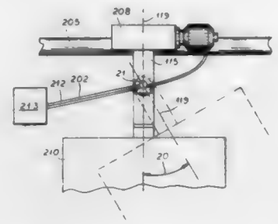
Roy Machin, Im Kälblesbiegel 16, 741 Reutlingen 3, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,273

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508945

Int. Cl.[4] B60S *3/06*

U.S. Cl. 15—53 A **13 Claims**



1. In a washing apparatus for an automotive vehicle comprising at least one washing brush with a substantially vertically oriented rotation axis, a brush mechanism for guiding and transporting said washing brush on a course over and around said vehicle to be washed, and a control mechanism for said washing apparatus, the improvement which comprises:

a sensing element connected to said control mechanism which responds to an incipient potentially detrimental catching of said washing brush during rotation thereof as it travels over said course; and

means connected to said element for reversing the rotation direction of said washing brush by acting on said control mechanism.

4,691,402

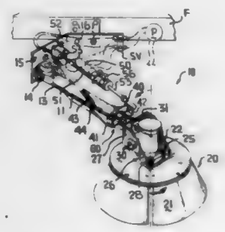
ADJUSTABLE SINGLE LOCK GUTTER BROOM MECHANISM

Kenneth R. Veselka, Rte. 1, Box 107V, Axtell, Tex. 76624

Filed Mar. 25, 1986, Ser. No. 843,633

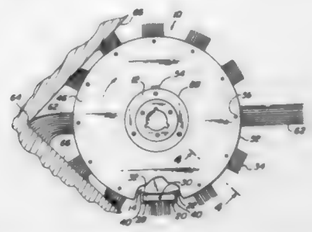
Int. Cl.[4] F01H *1/04*

U.S. Cl. 15—87 **38 Claims**



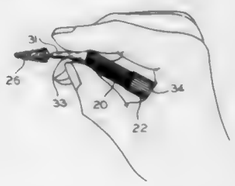
1. A gutter broom mechanism comprising an arm, a gutter broom, means for connecting said gutter broom to said arm for pivoting movement about two axes disposed generally normal to each other, means for locking said connecting means in any one of a plurality of different positions of said gutter broom relative to said arm, and said locking means including single locking means for simultaneously locking said connecting means to prevent pivoting movement about said two axes.

4,691,403
COMBINATION BASE BOARD/CORNER & FLOOR BRUSH HOLDER
Stephen Scharf, 54 Farmington La., Melville, N.Y. 11747
Continuation-in-part of Ser. No. 767,828, Aug. 21, 1985, abandoned. This application Apr. 3, 1986, Ser. No. 847,667
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—114 7 Claims



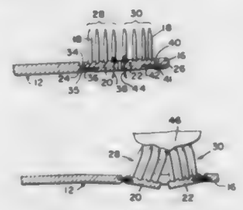
1. A combination base board/corner and floor brush holder for a floor polishing machine which comprises;
(a) a hub having a circular base flange wherein said hub is removably attachable to said floor polishing machine for rotating thereby;
(b) a circular pad for removable attachment to bottom of said circular base flange for use on a floor;
(c) means for removably attaching said circular pad to said bottom of said circular base flange in which said circular pad can be replaced when needed;
(d) a plurality of brushes for removable attachment around perimeter of said circular base flange for use on a base board of a wall;
(e) means for removably attaching said brushes to said perimeter of said circular base flange in which each said brush can be replaced when required; and
(f) means for polishing base boards to a corner apex between two walls which are at right angles to each other, which include at least a single brush with longer and softer bristles than said plurality of brushes where by said longer and softer bristles whip into the corner between said two walls and thereby polish said base board to said apex.

4,691,404
TOOTHBRUSH
Emanuel B. Tarrson; Dane Maric, both of Chicago, and Thomas P. Kelly, Palatine, all of Ill., assignors to John O. Butler Company, Chicago, Ill.
Continuation-in-part of Ser. No. 703,745, Feb. 21, 1985, abandoned. This application Apr. 21, 1986, Ser. No. 856,431
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167 R 21 Claims



13. A toothbrush having a handle made from a mixture of approximately 80% thermoplastic elastomer and 20% general purpose polypropylene, a twisted wire brush having a stem embedded in said handle and projecting from the handle in axial alignment therewith, the brush having dimensions which can be held within a loosely clasped fist, with one end of the brush held captured between a thumb and an index finger and the other end of the brush captured along the length of the index finger, the part held by the thumb and index finger being reduced in cross-section with respect to the remainder of the handle and having a flexibility and a resiliency such that by mahipulating the thumb and index finger, the angle at which the brush projects from the hand may be changed at will.

4,691,405
TOOTHBRUSH HAVING ADJUSTABLE BRISTLE-MOUNTED TABS
Joseph C. Reed, 114 5th St., Seal Beach, Calif. 90740
Filed Jul. 29, 1985, Ser. No. 759,896
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—201 11 Claims



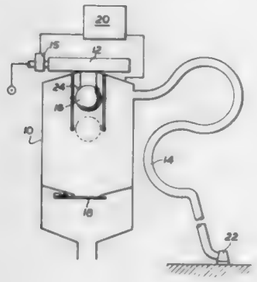
1. A toothbrush comprising the combination of a handle portion, a base portion at an end of the handle portion and having a central aperture therein, at least one tab portion disposed within the central aperture of and adjacent and moveable relative to the base portion, a metal plate embedded in the base portion so as to surround at least a substantial portion of the central aperture and extending into the tab portion, a first plurality of bristles mounted in the base portion and a second plurality bristles mounted in the tab portion.

4,691,406
DOCTORING APPARATUS
Ronald F. Goodnow, Leicester, and Robert A. Reid, Charlton City, both of Mass., assignors to Thermo Electron-Web Systems, Inc., Auburn, Mass.
Filed Sep. 2, 1986, Ser. No. 902,515
Int. Cl.[4] B08B *1/02*
U.S. Cl. 15—256.53 10 Claims



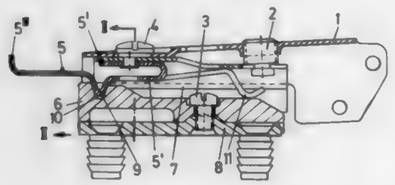
1. Apparatus for doctoring the surface of a rotating cylinder, comprising:
a doctor blade having a length greater than the axial length of the cylinder;
blade holding means for applying an intermediate portion of said doctor blade to the surface of the cylinder, said blade being longitudinally movable through said holding means and having continuing portions extending beyond the ends of said blade holding means;
clamping means for acting on at least one of the continuing portions of said blade, said clamping means being adjustable between a closed setting preventing relative movement between said blade and said clamping means, and an open setting permitting said relative movement; and
a drive for reciprocating one of said means in one direction when said clamping means is closed and in the opposite direction when said clamping means is open, thereby causing said blade to move incrementally in one direction across the surface of the cylinder.

4,691,407
LIQUID RECOVERY UNIT
Alex Sloan, 284 Gt Western Rd., Aberdeen, United Kingdom (AB1 6PJ), and Lyall Rennie, Danisia, 5 Lochburn Dr., Kintore; Aberdeenshire, United Kingdom (AB5 0UW)
PCT No. PCT/GB84/00402, § 371 Date Jul. 22, 1985, § 102(e) Date Jul. 22, 1985, PCT Pub. No. WO85/02356, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 23, 1984, Ser. No. 762,067
Claims priority, application United Kingdom, Nov. 23, 1983, 8331234
Int. Cl.[4] A47L *5/38*
U.S. Cl. 15—339 7 Claims



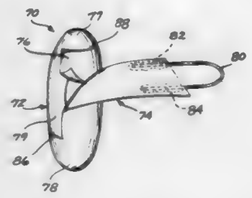
1. Apparatus for recovering liquids, comprising a vessel for containing liquid, a vacuum pump for creating a vacuum in said vessel, conduit means for sucking liquid into said vessel, a first valve means actuated by liquid in said vessel on reaching a predetermined level to cause a loss of vacuum in said vessel, means adapted to discharge liquid from the vessel when vacuum is lost, and pneumatic logic means responsive to said loss of vacuum to disable said vacuum pump for a predetermined time period.

4,691,408
FURNITURE HINGE HAVING A RESILIENT CATCH AND SPACER MECHANISM
Erich Röck, Höchst; Helmut Rupprechter, and Klaus Brüstle, both of Lauterach, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Filed Oct. 3, 1985, Ser. No. 783,639
Claims priority, application Austria, Oct. 19, 1984, 3339/84
Int. Cl.[4] E05D *7/06*
U.S. Cl. 16—241 5 Claims



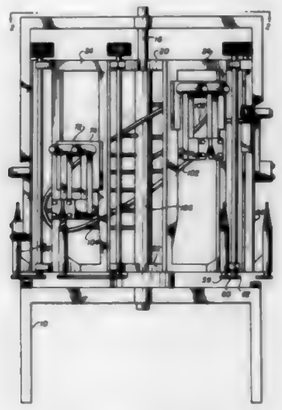
1. A furniture hinge comprising:
a mounting plate to be mounted on a wall of an article of furniture, said mounting plate having therein a surface recess;
a hinge arm having a U-shaped profile and to be connected to a door of the article of furniture;
an intermediate member for mounting said hinge arm on said mounting plate, said intermediate member being connected to said hinge arm by means of an adjustment screw for adjusting the spacing between said hinge arm and said mounting plate;
said mounting plate and said intermediate member having interengaging lateral recesses and projections extending in a longitudinal direction, such that said intermediate member and thus said hinge arm may be moved in said direction and mounted on said mounting arm;
said intermediate member including means for limiting the movement of and locking the position of said intermediate member and said hinge arm in said direction relative to said mounting plate, said locking means comprising a resilient member having a catch projection which snaps into said surface recess in said mounting plate upon movement of said intermediate member and said hinge arm in said direction, said resilient member being connected to said hinge arm by an adjustment member for adjusting the position of said hinge arm relative to said mounting plate and said resilient member in said direction; and
said resilient member including an integral handle forming means for enabling manual resilient deformation of said resilient member to release said catch projection from said recess, whereafter said intermediate member and said hinge arm can be withdrawn from said mounting plate.

4,691,409
HINGE MASK
Gary D. Torgerson, and Joyce E. Ferm, both of Seattle, Wash., assignors to Ferm & Torgerson Partnership, Seattle, Wash.
Continuation-in-part of Ser. No. 859,409, May 5, 1986, abandoned. This application Dec. 15, 1986, Ser. No. 941,790
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—250 15 Claims



1. A hinge mask for masking a hinge that includes a hinge barrel and a pair of hinge plates, the hinge mask comprising a body composed of an elastic sheet material and fastening means, the body comprising first and second body portions, the first body portion having first and second concave sections and an intermediate section extending between the concave sections with the concave sections opening towards the intermediate section and the intermediate section having a longitudinal opening extending between the concave sections, the second body portion comprising an elongated member having first and second ends, the first end of the second body portion being secured to the second concave section, the fastening means being connected to the second body portion near the second end thereof and including means for securing the second end to one end of the hinge.

4,691,410
GIZZARD HARVESTER
Dale M. Risser, Salisbury, Md., and Michael E. Lease, Delmar, Del., assignors to Perdue Incorporated, Salisbury, Md.
Filed Mar. 17, 1986, Ser. No. 839,950
Int. Cl.⁴ A22C *21/00*
U.S. Cl. 17—11 **12 Claims**



1. A device for removing foreign material and lining from a gizzard, comprising

means for holding the gizzard against rotation,

a spindle head having a tip facing the holding means,

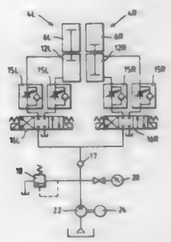
means for producing relative rotation between the spindle head and the gizzard holding means,

means for producing relative linear movement between the spindle head and the gizzard holding means so that said gizzard is forced to engage progressively larger diameters of said spindle head,

said spindle head having a surface adapted to engage the gizzard lining as said relative rotation occurs, thereby to separate the lining from the gizzard, and

means for washing foreign material from said gizzard.

4,691,411
METHOD AND APPARATUS FOR FEEDING MEAT
Tsuyoshi Higashimoto, Ikoma, Japan, assignor to Higashimoto Kikai Co., Ltd., Japan
Filed Dec. 16, 1985, Ser. No. 809,136
Int. Cl.⁴ A22C *11/08*
U.S. Cl. 17—49 **12 Claims**



1. A method of continuously feeding meat at constant pressure using a plurality of reciprocating pumps, comprising the steps of:

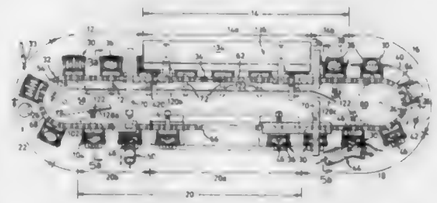
(a) providing at least two reciprocating pumps, each pump having a piston movable in a feed cylinder, each feed cylinder having meat inlet ports and outlet ports, said outlet ports being connected to a common discharge line,

(b) operating the pumps for sucking meat during respective suction strokes alternately through the inlet ports and into the feed cylinders, and for delivering meat during respective delivery strokes alternately through the outlet ports from the feed cylinders,

(c) pre-compressing the meat within the feed cylinder of one pump by slightly moving the piston of said one pump after the completion of the suction stroke of said one pump, and

(d) starting the delivery stroke of said one pump prior to the completion of the delivery stroke of another pump, and actually pumping the meat from the feed cylinder of said one pump so as to feed meat under pressure continuously into the discharge line and to maintain the pressure on the meat at a constant level within the discharge line.

4,691,412
BIVALVE MOLLUSK SHUCKER
Oswald Brown, Frenchman's Cove, Bay of Islands, Newfoundland, Canada A0L 1E0
Filed Jul. 8, 1985, Ser. No. 752,845
Int. Cl.⁴ A22C *29/04*
U.S. Cl. 17—74 **16 Claims**



1. A mollusk shucker for use in shucking bivalve mollusks which have two half-shell portions connected at a hinge end by an edible muscle, and each half-shell having a distal end remote from the hinge end, comprising:

(a) a conveyor mounted for longitudinal movement in an endless path extending through a loading station, a shell opening station, a first half-shell removal station, an eviscerating station, an edible muscle removal station and a second half-shell discharge station,

(b) a plurality of mollusk carriers mounted on said conveyor, said mollusk carriers have an inner side wall and a seat at one end of the inner side wall, said mollusk carriers being arranged to locate the seat at the lower end of the inner side wall and to position the inner side wall so that it extends in a direction parallel to the direction of longitudinal movement of the conveyor and is angularly inclined with respect to the vertical during movement of the conveyor through said loading and shell opening stations such that the inner side wall forms an inclined underlying support for supporting a second half-shell so that it opens laterally of the direction of longitudinal movement of the conveyor with its the hinge portion resting in said seat, each carrier having a central plane extending in the direction of movement of said conveyor along said endless path and being adapted to support a mollusk with its plane of shell separation aligned with said central plane,

(c) shell opening means in said shell opening station,

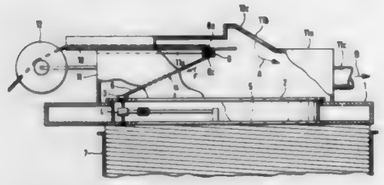
(d) first half-shell separation means in said first half-shell removal station for removing the first half-shell from its carrier,

(e) eviscerating means in said eviscerating station for removing the inedible viscera from the second half-shell without removing the edible muscle,

(f) edible muscle removal means in said edible muscle removal station adapted to remove the edible muscle from said second half-shell and,

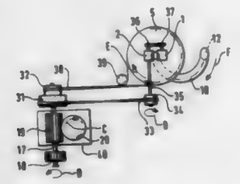
(g) release means in said second half-shell discharge station for discharging the second half-shell from its carrier.

4,691,413
SLIVER COILER
Jürgen Klüttermann, and Hermann Trützschler, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany
Filed May 12, 1986, Ser. No. 862,241
Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517058
Int. Cl.⁴ B65H *54/80*
U.S. Cl. 19—159 R **13 Claims**



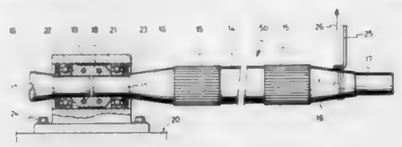
1. In a sliver coiler including a rotary head assembly having a radius and being arranged for rotation in a generally horizontal plane; a trumpet mounted eccentrically in said rotary head assembly; and a sliver supporting means situated at a vertical distance above said rotary head assembly and arranged for guiding the sliver to said trumpet orbiting during rotation of said rotary head assembly; the improvement comprising a hood enclosing a volume above the rotary head assembly; said hood having a ceiling wall provided with an air inlet opening; said sliver supporting means being stationarily affixed to and including a sliver inlet opening through which the sliver enters into said volume from an exterior or said hood; said air inlet opening and said sliver inlet opening being spaced from one another; further comprising suction means including an air outlet opening provided in said hood spaced from said sliver supporting means and from said inlet opening for removing air and dust immediately from said sliver supporting means in an upper part of said hood.

4,691,414
SLIVER COILER DRIVE
Jürgen Klüttermann, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany
Filed Jun. 26, 1986, Ser. No. 879,064
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1985, 3524601
Int. Cl.⁴ B65H *54/80*
U.S. Cl. 19—159 R **7 Claims**



1. In a sliver coiler including a coiler head supported for rotation about a generally vertical axis; a sliver depositing means carried by said coiler head eccentrically relative to said axis and arranged for receiving sliver from above and discharging sliver downwardly during rotation of the coiler head; a pair of cooperating pressure rollers supported for rotation stationarily upstream of the sliver depositing means as viewed in a running direction of the sliver passing between said pressure rollers; a rotatably held platform situation underneath said coiler head at a vertical distance therefrom for supporting a coiler can into which sliver running downwardly from said coiler head is deposited; and drive means including a rotatably supported power-driven shaft and first and second drive elements for said coiler head and said pressure rollers, respectively; said first and second drive elements being operatively connected with said power-driven shaft; the improvement wherein said first drive element is mounted on said power-driven shaft; the improvement further comprising a transmission element connecting said first drive element with said coiler head; a third drive element mounted on said power-driven shaft; a first additional shaft operatively connecting said third drive element with said rotary platform; a second additional shaft; said third drive element including a worm gear mounted on said power-driven shaft and a pinion mounted on said second additional shaft and meshing with said worm gear; a transmission ratio-changing gearing mounted on said first and second additional shafts and meshing with said pinion for drivingly connecting said pinion to said first additional shaft; first wheel means mounted on said first additional shaft at a distance from said transmission ratio-changing gearing; second wheel means coaxially and rigidly connected with said platform; and an endless belt trained about said first and second wheel means.

4,691,415
ROLLER OF DRAFT APPARATUS
Shoji Sakai, Nagaokakyo, and Koshi Noda, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Aug. 4, 1986, Ser. No. 893,007
Claims priority, application Japan, Aug. 12, 1985, 60-123837
Int. Cl.⁴ D01H *5/74*
U.S. Cl. 19—262 **2 Claims**



1. A draft apparatus for drafting a fiber bundle while holding the fiber bundle under pressure by plural pairs of rotating rollers which comprises:

(a) a plurality of draft rollers each having a support end and spaced, coaxial, cylindrical serrated draft sections separated by a cylindrical portion of slightly smaller uniform diameter in comparison to the diameter of the serrated sections, and tapered sections connecting the serrated sections and said support ends in a gradually reducing tapered angle, and

(b) a cutter element positionable adjacent the smaller end of said tapered sections movable in a direction transverse to the axis of rotation of said rollers to cut and release the loops of fibers moving from said draft sections and collecting on said tapered section.

4,691,416

HOOK DEVICE FOR ORNAMENTAL BUTTON ON SEAT COVER

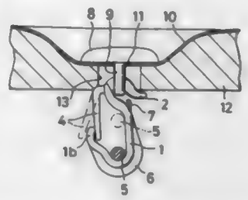
Hiromichi Nakayama, and Moritoshi Fukuda, both of Yokohama, Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Sep. 26, 1986, Ser. No. 912,773

Claims priority, application Japan, Sep. 30, 1985, 60-148023[U]

Int. Cl.⁴ A44B *1/18*

U.S. Cl. 24—90 B **2 Claims**



1. A an integral hook device of molded plastic material for hooking an ornamental button on a seat cover, comprising:

a C-shaped main hook to be hooked on a spring rod disposed on the inner side o a cushioning material under the seat cover, said C-shaped main hook being substantially wider than it is thick and having an inner surface that is laterally linear, said C-shaped main hook having an elongated reinforcing rib on the outside thererof and substantially on a central plane thereof, said C-shaped main hook having an end and a free extremity;

a C-shaped auxillarly hook extending integrally from said end of said main hook in the opposite direction to said main hook to be hooked on a lock piece of said ornamental button;

and a closing piece extending from said end of said main hook toward said free extremity end thereof for closing an opening of said main hook.

4,691,417

DEVICE FOR THE MANUFACTURE OF NON-WOVEN FABRICS WITH IMPRESSED OR EMBOSSED DESIGNS

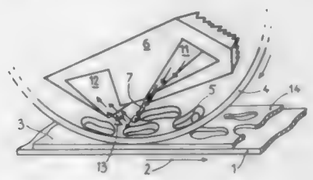
Andre Vuillaume, 63 Clos de Franquieres, Bivierd (Isere), France

Filed Nov. 18, 1983, Ser. No. 553,360

Claims priority, application France, Nov. 19, 1982, 82 19716

Int. Cl.⁴ D04H *18/00*

U.S. Cl. 28—105 **4 Claims**



1. A device for imprinting impressed or relief designs on a sheet of non-woven fibers, comprising:

perforated means for patterning said sheet of non-woven fibers;

supporting fabric means for supporting said sheet of non-woven fibers against said perforated patterning means;

hydraulic injector means for discharging a curtain of liquid at an oblique angle against said perforated patterning means; and

suction chamber means for collecting liquid splashed from said perforated patterning means at an oblique angle, said hydraulic injector means and said suction chamber means being located on the same side of said perforated patterning means.

4,691,418

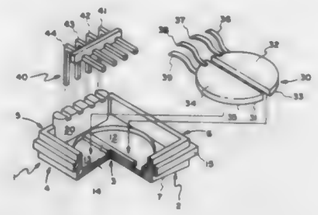
ULTRASONIC TRANSDUCER METHOD

Frank W. Ingle, and John P. Claude, both of Palo Alto, Calif., assignors to Medasonics Inc., Mountain View, Calif.

Filed Aug. 11, 1966, Ser. No. 895,273

Int. Cl.⁴ G11B *5/42*

U.S. Cl. 29—25.35 **13 Claims**



1. A method of making an ultrasonic transducer assembly comprising the steps of:

injection-molding a body member having an end wall and a plurality of side walls, said end wall having a pair of exterior planar surfaces, each of said exterior planar surfaces extending from a centerline of said end wall outwardly to a side edge of said end wall at a predetermined angle relative to each other, an interior surface, and a pair of recesses located in said interior surface which are separated from each other by a central rib which extends along said centerline of said end wall, each of said recesses having a planar surface which is parallel to one of said exterior planar surfaces of said end wall, said side walls having a radially extending exterior rib which is located between the top and bottom surfaces thereof and which extends about the periphery thereof, one of said end walls which is located at one end of said central rib including a multiple pin receiving post which is integrally formed therewith and which extends perpendicularly from said interior surface of said end wall, said post having a plurality of equally spaced, tapered, pin receiving holes;

providing a pair of piezoelectric ceramic planar members, each of said members having a pair of conductive electrodes covering and affixed to opposite surfaces thereof, respectively;

providing a plurality of metal ribbons;

attaching one of said ribbons to each of said electrodes, each of said ribbons having a length sufficient for it to be inserted well into a corresponding one of said plurality of tapered holes in said multiple pin receiving post;

attaching one of said pair of ceramic planar members to said planar surface in each of said recesses; and

inserting an electrically conductive pin and the free end of one of said ribbons in each of said tapered holes in such a manner as to form a good electrical connection between said pin and said ribbon inserted in said hole.

4,691,419

ROBOT END EFFECTOR FOR PROCESSING COMPONENT LEADS

Brian G. Keeler, Plainsboro, and George J. Whitley, Philadelphia, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 12, 1985, Ser. No. 797,132

Int. Cl.⁴ B23P *19/00*

U.S. Cl. 29—39 **15 Claims**

1. An apparatus for operation by a robot to process a component lead, extending from a substrate at a reference location and orientation, with a lead processing device having a first element and a second element at least one of which movably cooperates with the other to process said lead, said apparatus comprising:

a support adapted to be attached to said robot;

an annular member secured to the support for rotation about an axis, said member including a plurality of means annularly spaced about the axis, each for releasably securing a lead processing device thereto at a given annular position relative to said axis; and

means secured to the support and coupled to the member for selective displacement in opposite linear directions parallel to said axis for simultaneously operating a releasably secured lead processing device at any of said spaced means.

4,691,420

STONE PRESSURE ROLL FOR A WEB OF FIBERS

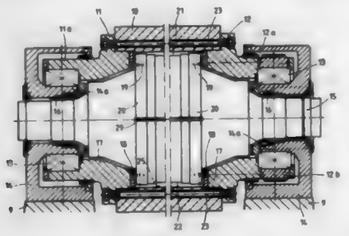
Christian Schiel, Heidenheim, and Herbert Kotitschke, Lenningen, both of Fed. Rep. of Germany, assignors to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,969

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528588

Int. Cl.⁴ B21B *13/02, 31/08*

U.S. Cl. 29—116 R **21 Claims**



1. A roll for exerting pressure on a web of fibers or the like comprising:

a rotatable hollow roll shell comprised of stone material, said hollow roll shell having an inner surface on the inside thereof and a roll shell outer surface on the exterior of said roll shell;

a stationary beam disposed in said hollow roll shell, said beam having two ends;

a beam support means disposed at each end of said stationary beam, said beam being sized such that an annular space is defined between said stationary beam and said inner surface;

sealing means supported on said beam and extending into contact with said inner surface of said roll shell and being shaped for defining a portion of said annular space, said inner surface of said roll shell presenting a smooth sealing surface for contacting said sealing means; and

means for pressurizing said portion of said annular space.

4,691,421

PRESS ROLL WITH ADJUSTABLE SAG

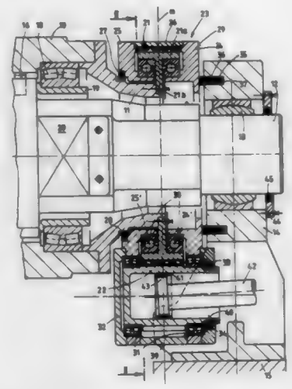
Christian Schiel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH' , Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,724

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623028

Int. Cl.⁴ B21B *13/02, 31/32*

U.S. Cl. 29—116 AD **20 Claims**



1. A press roll with adjustable sag comprising:

an elongated rotatable hollow roll shell, a relatively stationary yoke extending axially through said roll shell, and a hydraulic support device for transmitting a pressing force from the yoke to the roll shell in a press plane;

an outer gear rim secured to one end of the roll shell in a position concentric therewith, and a drive pinion having gear teeth in driving mesh with gear teeth on said outer gear rim;

a gear housing which surrounds the pinion and the outer gear rim, and support bearings within said housing rotatably mounting the housing on the roll shell;

a support disk interposed between the outer gear rim and the roll shell, and being positioned substantially centrally relative to the length of the teeth on the outer gear rim;

said support bearings being disposed radially within the outer gear rim and on both sides of the support disk.

4,691,422

METHOD AND APPARATUS FOR MAKING BALL AND SOCKET JOINTS INCORPORATING A SLIP LINER

Leopold Tilgner, Püttlingen; Jurgen Scholer, Losheim-Wahlen; Sieghart Sautter, Saarlous, and Jürgen Vogel, Künzeisau, all of Fed. Rep. of Germany, assignors to SKF Gleitlager GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 884,083

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524761

Int. Cl.⁴ B21D *53/10;* **B23P** *19/00*

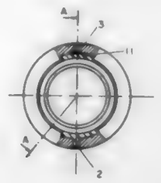
U.S. Cl. 29—149.5 B **4 Claims**

1. A method for making ball and socket joints with a slip liner of a friction reducing material consisting of the steps of:

inserting and centering a ring tool in the bore of the outer ring, filling the space between the outer ring and the ring tool with a friction reducing material;

separating the ends of the outer ring and simultaneously breaking the slip liner at a predetermined point, removing the ring tool, and inserting the inner ring of the ball and socket joint.

3. An apparatus for making ball and socket joints comprising inner and outer rings and a liner between the rings, the apparatus comprising a ring tool wherein the diameter of the ball is larger than that of the inner ring by an amount equal to the play in the bearing:



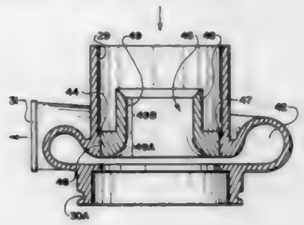
said ring tool being provided in the area of the separating line with a blade-like section extending over nearly the entire width of the outer ring, this section projecting beyond the lateral surface of the ring tool by an amount equal to the thickness of the slipliner.

4,691,423

METHOD FOR REMANUFACTURING A COMPRESSOR HOUSING

Dewey L. Willyard, Jr., Charlotte; David E. Cline, Concord, and David E. Wulfhorst, Denver, all of N.C., assignors to Cummins Atlantic, Inc., Charlotte, N.C.

Division of Ser. No. 736,664, May 22, 1985. This application Jan. 31, 1986, Ser. No. 824,736
Int. Cl.[4] B23P *15/00, 7/00*
U.S. Cl. 29—156.4 R **2 Claims**



1. A method of remanufacturing an air compressor housing having an integrally-formed inlet throat comprising a radially in wardly spaced annular collar portion nested within a radially outwardly spaced air inlet portion of the compressor housing, comprising the steps of:

(a) machining away the integrally-formed inlet throat from the interior sidewall of the air inlet portion of the compressor air compressor housing to leave a radially inwardly disposed annular seat on the walls of the housing defining the bore;

(b) forming a separate inlet throat insert comprising a radially inwardly spaced annular collar portion integrally connected with a case portion and adapted to be telescopically positioned within the bore of said compressor housing, said insert having seating means formed around the periphery of the base portion for mating cooperation with the seat on the interior sidewall of the housing; and

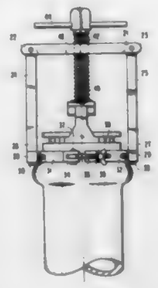
(c) telescopically positioning said inlet throat insert in the bore of the compressor housing with the annular collar portion nested with and spaced radially outwardly from, the air inlet portion of the compressor housing and securing the inlet throat insert to the compressor housing in mating cooperation with the seat on the interior sidewall of the housing.

4,691,424

PIPE CAP EXTRACTOR APPARATUS

E. Michael Schmidt, Carmel, and P. Michael Price, Greencastle, both of Ind., assignors to Harte Industries, Inc., Carmel, Ind.

Filed Jan. 16, 1986, Ser. No. 819,284
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—261 **11 Claims**



1. An extractor for removing an end cap mounted to a pipe wherein said pipe includes an outwardly extending ridge, comprising:

a frame having a threaded hole;

a screw with a first end and an opposite second end threadedly mounted in said hole and extendable lengthwise with said pipe;

a hook shaped end cap engager mounted to said first end of said screw hookingly engagable with said cap and including a pair of arms pivotally mounted thereto;

a pipe engager mounter to said frame and extendable against said pipe and including two depending legs pivotably mounted to said frame and a ring comprising plural ring segments mounted to said legs, said ring surrounding said pipe and being engagable with said ridge, said ring having mutually facing surfaces positionable around said pipe with said surfaces being a fixed distance apart; means connected to said ring segments for quickly attaching and detaching said ring segments to each other; and,

a handle mounted to said second end of s id screw for the turning of said screw to force said ring against said ridge and away from said second end of said screw and to force said cap engager and cap away from said pipe engager and pipe.

4,691,425

METHOD AND APPARATUS FOR REPLACING A FILTER IN A VESSEL

Jacques Lance, Mulhouse, and Georges Müller, Dijon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 16, 1983, Ser. No. 562,416
Claims priority, application France, Dec. 17, 1982, 82 21204
Int. Cl.[4] B23P *19/04;* **B01D** *46/04*
U.S. Cl. 29—402.08 **12 Claims**

1. A method for replacing a filter placed in a vessel to filter a fluid circulating in said vessel, said vessel comprising:

a hollow upstream part;

a hollow downstream part separated from said upstream part by a space, said filter being positioned in said space and having a first face and an opposed second face;

a hollow member movable between a closed position, in which it closes said space and surrounds said filter when fluid is circulating through all of said hollow members, and an open position allowing access to the filter from all sides thereof; and

means for sealingly fixing said hollow member to said upstream part and said downstream part to contain said circulating fluid within said hollow members, said method comprising the following steps:

(a) unfixing said hollow member from said upstream part and said downstream part,

(b) moving said hollow member from its closed position to its open position,

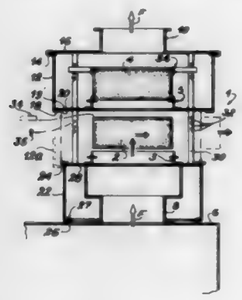
(c) removing said filter,

(d) putting a new filter in place in said vessel,

(e) moving said hollow member back from its open position to its closed position, and

(f) fixing said hollow member to said upstream part and said downstream part.

5. An apparatus for replacing a filter placed in a vessel to filter a fluid circulating in said vessel, said vessel comprising:



a hollow upstream part, and

a hollow downstream part separated from said upstream part by a space, said filter being positioned in said space, and having a first face and an opposed second face,

said apparatus comprising:

a hollow member movable between a closed position, in which it closes said space and surrounds said filter, when fluid is circulating through all of said hollow members and an open position allowing access to the filter from all sides thereof; and

means for sealingly fixing said hollow member to said upstream part and said downstream part to contain said circulating fluid within said hollow members.

4,691,426

REPAIR OF STRIP CONDUCTOR ON ELECTRICAL CIRCUIT BOARD

Joseph A. Roucek, Apalachin, and James R. Tessier, Owego, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,411
Int. Cl.[4] B23K *1/00*
U.S. Cl. 29—402.18 **10 Claims**

1. A method for correcting a defect in a plated electrical conductor on a circuit board comprising:

positioning a cutter near the conductor;

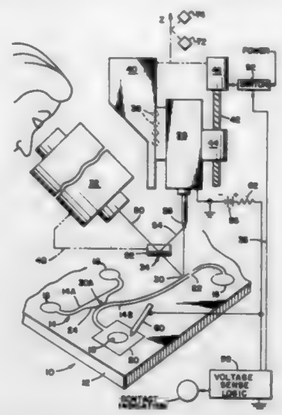
applying a voltage between the cutter and a portion of the conductor;

selecting a contact point on said conductor portion to be contacted by the cutter;

guiding the cutter towards said contact point under optical guidance;

noting a change in said voltage upon a contacting of said cutter with said conductor at said contact point;

advancing said cutter a predetermined distance beyond said contact point after the occurrence of said change in voltage to bring said cutter to said predetermined distance beyond said contact point; and correcting said defect, said



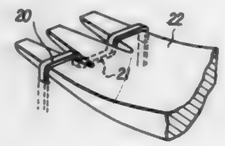
correcting including a translating of said cutter relative to said conductor along a surface parallel to said conductor.

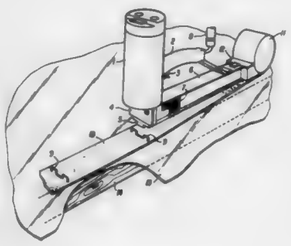
4,691,427

TAPE FASTENING SYSTEM

Delmar J. Hill, Medford, N.J., assignor to Vanguard-Hill, Inc., Wilmington, Del.

Filed Sep. 28, 1982, Ser. No. 425,241
Int. Cl.[4] B23P *19/00;* **B25C** *11/00*
U.S. Cl. 29—426.5 **10 Claims**





1. A method for fastening and detaching a protective cover sheet comprising:

(a) applying the cover sheet over goods to be protected,

(b) collecting a supply of preformed staples having a crown with a rectangular shaped depressed center section and corresponding raised end sections at each side of the crown,

(c) driving the staples through the cover sheet into goods to be protected with the center section forced against the cover sheet leaving the raised end sections extending upwardly from the cover sheet,

(d) inserting a three pronged tool under the driven staples, the tool comprising:
(i) a center prong of sufficient size and shape to be inserted over and abut the depressed center section of the staple, and
(ii) two side prongs of sufficient size and shape to be inserted under the two upraised end sections of the staple, and
(e) lifting on the tool to apply upward pressure from the two side prongs to the end sections to remove the staple.

4,691,428

SPANNER FOR TORSION SPRINGS AND METHOD FOR ITS USE

David A. Engstrom, R.D. 2, Sugar Grove, Pa. 16350

Continuation-in-part of Ser. No. 647,844, Sep. 6, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,454
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—426.6 **6 Claims**



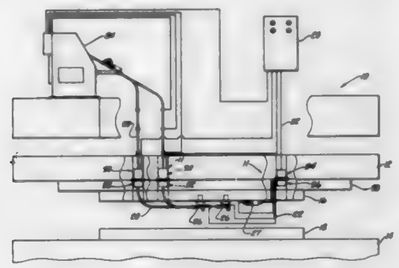
1. A method of removing a torsion spring from a winding cone to which the spring is torque locked comprising the steps of applying a torsional force to a terminal end of said spring on said cone, said torsional force acting counter to the torsion lock while simultaneously applying a lifting force which moves said terminal end of said spring radially outwardly away from said cone.

4,691,429

QUICK DISCONNECT COUPLER

Dale H. Goodsmith, Brighton, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Filed Apr. 8, 1986, Ser. No. 849,323
Int. Cl.⁴ B23P *11/00*
U.S. Cl. 29—432 **33 Claims**



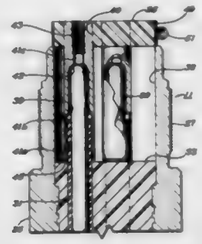
1. A quick disconnect normally interconnecting a source of self-attaching fasteners to at least one installation head, the installation head being mounted within one die shoe of a reciprocal press with a clinch die mounted in the other die shoe opposite the installation head, the press having relatively moveable plattens upon which the removable die shoes are mounted and, upon relative movement of the plattens, the installation head installs fasteners in a panel located between the installation head and the clinch die, the quick disconnect comprising:
a plurality of receptacle means mounted in one of the plattens, the receptacle means having a first fastener flow passage therethrough communicating with the source of self-attaching fasteners;
a plurality of plug means mounted in the one die shoe with at least one of the plug means being coaxially aligned with at least one of the receptacles, each plug means having a second fastener flow passage adapted to communicate between the first passage in the receptacle means and the installation head; and
a plurality of closure means each positioned in a respective first passage to close the first passage and prevent the advance of fasteners when a plug means is absent and to open the passage and permit the advance of fasteners when a plug means is present.

4,691,430

METHOD AND MEANS FOR SEALING ELECTRICAL CONDUCTOR RODS IN A TUBULAR HOUSING

Dale E. Wheeler, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 16, 1985, Ser. No. 809,355
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—451 **3 Claims**



1. A method of sealing at least one electrical conductor rod inside a tubular housing for connecting an electrical conductor through a pressure barrier structure, comprising in combination:
placing the rod in the housing and injecting epoxy around the central portions of the rod, leaving the opposite ends exposed, and allowing the epoxy to harden; then on each end of the housing,
inserting a hollow installation pin over the end of the rod;
providing an elastomeric circular grommet with a tight fitting hole for the conductor rod, and providing the grommet with an outer diameter that is greater than the inner diameter of the housing;
inserting the grommet over the pin, squeezing the grommet, and starting insertion of the grommet into the housing;
placing a mandrel on the grommet, the mandrel having a hole for receiving the pin;
moving the mandrel forwardly to drive the grommet into contact with the hardened epoxy; then
removing the installation pin and the mandrel, allowing the grommet to tightly seal around the rod and in the housing.

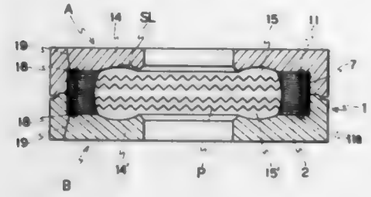
4,691,431

METHOD OF MAKING A METAL MOLD FOR TIRE VULCANIZATION

Naohiro Hayata, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 786,907, Oct. 15, 1985, abandoned. This application May 27, 1986, Ser. No. 867,592
Claims priority, application Japan, Oct. 31, 1984, 59-230590
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—526 R **6 Claims**

4. A method for making a metal mold for tire vulcanization comprising slicing a tire into a plurality of laminas parallel to an equator plane of the tire, preparing a plurality of metal or the like laminas each of which has an internal molding portion corresponding to sectional shape of an outer surface of a tire from the external configuration of said laminas of the tire



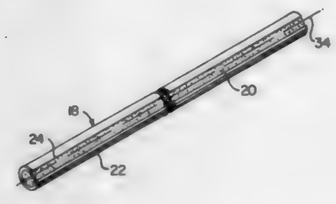
stacking up and fixing the obtained laminas in order to define an internal shape on said mold corresponding to the external tread of a tire to be vulcanized therein.

4,691,432

A METHOD OF MAKING A REINFORCED HARD POROUS INK ROLL ASSEMBLY

Doyle V. Haren, Clyde, N.C., and Lawrence V. Wiley, Putnam County, Tenn., assignors to Day International Corporation, Dayton, Ohio

Filed Oct. 9, 1985, Ser. No. 785,705
Int. Cl.⁴ B22D *11/01;* **B32B** *31/22;* **B41J** *27/12*
U.S. Cl. 29—527.2 **15 Claims**



1. A method of making an inking roll including a hard porous inking material encompassed by a hard ink resistant material over a substantial portion of an outside surface of said inking roll comprising
providing a cover member of said ink resistant material having a generally hollow interior,
filling said hollow interior with a polymeric material capable of yielding said hard porous material upon curing,
curing said polymeric material in said cover member to cure said polymeric material into said hard porous material and,
removing only a portion of said cover member to exteriorly expose only a portion of said hard porous material.

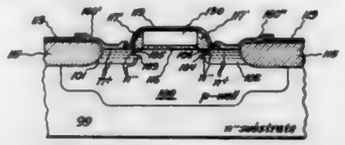
4,691,433

HYBRID EXTENDED DRAIN CONCEPT FOR REDUCED HOT ELECTRON EFFECT

Joseph M. Pimbley; Gennady Gildenblat; Ching-Yeu Wei, all of Schenectady, N.Y., and Joseph Shappir, Jerusalem, Israel, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 722,642, Apr. 12, 1985, Pat. No. 4,613,882. This application Apr. 30, 1986, Ser. No. 857,283
Int. Cl.⁴ H01L *21/425*
U.S. Cl. 437—44 **7 Claims**

1. A method for producing source or drain region structures in field effect transistor devices, said method comprising the steps of:
(a) implanting a light concentration of a first polarity dopant a fixed distance beneath the surface of a semiconductor body;
(b) implanting a second light dopant concentration of the same first polarity adjacent to the surface of said semiconductor body and spaced vertically apart from said region of dopant implanted a fixed distance beneath said semiconductor surface; and
(c) forming a source or drain region in said semiconductor body, said source or drain region including a heavy concentration of said first polarity dopant and extending



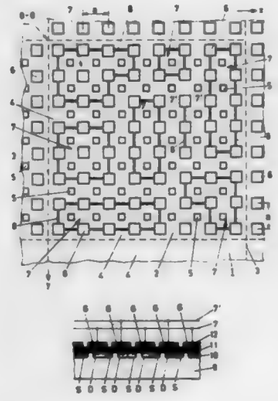
downwardly from the surface of said semiconductor body so as to include said lighter doped region and extending horizontally, said horizontal extension of said source or drain region being limited by implant screen means so as to define lighter doped protrusions extending from said heavily doped source or drain region, said light concentration being substantially smaller than said heavy concentration.

4,691,434

METHOD OF MAKING ELECTRICALLY CONDUCTIVE REGIONS IN MONOLITHIC SEMICONDUCTOR DEVICES AS APPLIED TO A SEMICONDUCTOR DEVICE

Richard Percival, Au/Zh, and Ernst Uhlmann, Stettfurt, both of Switzerland, assignors to Lasarray Holding AG, Thundorf, Switzerland

Filed Feb. 4, 1983, Ser. No. 463,817
Claims priority, application Switzerland, Feb. 19, 1982, 1036/82
Int. Cl.⁴ H01L *21/44*
U.S. Cl. 437—173 **10 Claims**



10. A method of patterning a conductive film on and, at least, partially connected to a semiconductor substrate for use in the fabrication of monolithic integrated semiconductor devices, comprising the steps of:
forming in said conductive film a plurality of at least in part regularly repeated openings;
during said step of forming said plurality of openings in said conductive film, forming said openings at predetermined locations;
subsequent to the formation of said plurality of openings in

said conductive film, removing parts of said conductive film along predetermined lines linking a preselected number of said openings in said conductive film in order to thereby obtain insular conductive areas of predetermined dimensions constituting the conductive parts of monolithic integrated semiconductor devices; and

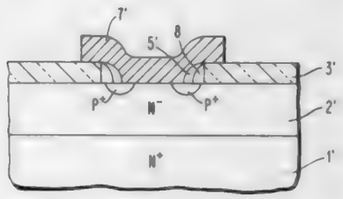
said step of forming said plurality of openings in said conductive film at said predetermined locations entailing the step of forming said openings at locations which correspond to the predetermined dimensions of said insular conductive areas.

4,691,435

METHOD FOR MAKING SCHOTTKY DIODE HAVING LIMITED AREA SELF-ALIGNED GUARD RING

Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia; Santosh P. Gaur, both of Wappingers Falls, all of N.Y., and John L. Mauer, IV, South Kent, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1981, Ser. No. 263,227
Int. Cl.⁴ H01L *21/385*
U.S. Cl. 437—175 **13 Claims**



1. The method for making a self-aligned guard ring Schottky barrier diode comprising

depositing a dielectric layer on a silicon substrate, anisotropically etching said dielectric layer to produce a substantially vertically walled hole therein,

depositing a doped silicon layer over said etched dielectric layer,

reactively ion etching said silicon layer anisotropically to expose said substrate through said hole in said etched dielectric layer,

heating said substrate and said doped silicon layer so as to diffuse the dopant from said silicon layer into said substrate, and

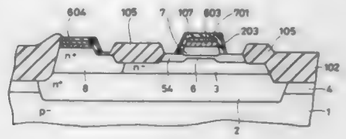
depositing Schottky diode metal onto said exposed substrate.

4,691,436

METHOD FOR FABRICATING A BIPOLAR SEMICONDUCTOR DEVICE BY UNDERCUTTING AND LOCAL OXIDATION

Tadashi Hirao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,934
Claims priority, application Japan, Aug. 14, 1985, 60-179732; Nov. 6, 1985, 60-249610
Int. Cl.⁴ H01L *21/302, 21/314*
U.S. Cl. 437—33 **10 Claims**



1. A method for fabricating a semiconductor device which has an emitter region (7), a collector region (3, 8), and a base region consisting of a base electrode lead-out region (54) and an active base region (6), said method comprising the steps of:

forming multilayer having a silicon film (600), a nitride film (202) and a first oxide film (104) stacked in the order mentioned at a predetermined region on a semiconductor substrate (1) of first conductivity type,

side-etching said first oxide film (104) alone so as to be receded inwardly from said silicon and nitride films (600, 202) of said multilayer,

effecting selective oxidation with said nitride film (202) used as a mask to form a second oxide film (105) on a predetermined region of said semiconductor substrate (1) for isolating said collector (8) and base (54) regions from each other,

selectively etching away said silicon and nitride films (600, 202) by using said side-etched first oxide film (104) as a mask,

forming a third oxide film (106) on the region which serves as said base electrode lead-out region (54) by effecting selective oxidation using said selectively etched nitride film (202) as a mask,

introducing impurity of said first conductivity type into said silicon film (602) by using said third oxide film (106) as a mask,

forming said emitter (7) and base (6) regions by introducing an impurity of second conductivity type with said second oxide film (105) used as a mask and then applying a heat treatment,

forming an insulation film (107, 203) on the side wall of said silicon film (603) by using anisotropic etching, and

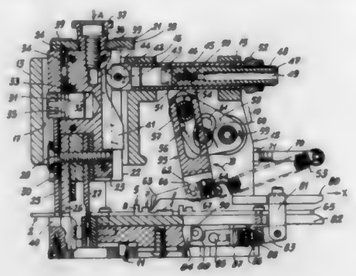
forming an emitter electrode interconnection (10) through a contact hole formed in a predetermined region of said silicon film (603) while forming a base electrode interconnection (9) on said base electrode lead-out region (54).

4,691,437

DEVICES FOR APPLYING TERMINALS AND SIMILAR METAL ELEMENTS TO CONDUCTORS, LENGTHS OF ELASTIC MATERIAL AND THE LIKE

Franco Vaglini, Gallarate, Italy, assignor to Siac Industria Accessori Cavaria S.p.A., Varese, Italy

Filed Jan. 27, 1986, Ser. No. 823,080
Claims priority, application Italy, Feb. 21, 1985, 19597 A/85
Int. Cl.⁴ B23P *19/02*
U.S. Cl. 29—753 **14 Claims**



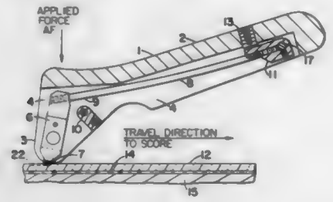
1. An improved device for applying terminals and similar metal elements to conductors, to lengths of elastic material and to other filiform bodies, starting from a strip composed of an interconnected succession of such elements, said device comprising a load-bearing structure, a controllable mobile head carrying tools for detaching an element from the strip and applying it to the end of the filiform body, strip feed means driven by the movement of the head by way of a cam and comprising a roller cooperating with said cam, and means for adjusting the feed and the point of commencement of the feed, characterized in that in the feed means a pawl, which is loaded by a spring, is mounted on a lever which has an adjustable fulcrum and is hinged to slider means carrying the roller, said adjustable fulcrum forming part of the feed adjustment means and a hinge of adjustable position forming part of the means for adjusting the feed commencement point.

4,691,438

CONSTANT FORCE MANUAL GLASS CUTTER

Thomas A. Insolio, 22 Elaine Dr., Bristol, Conn. 06010

Filed Feb. 11, 1985, Ser. No. 700,410
The portion of the term of this patent subsequent to Feb. 8, 2004, has been disclaimed.
Int. Cl.⁴ B26B *3/00*
U.S. Cl. 30—164.95 **13 Claims**



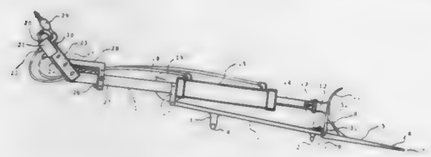
4. A hand held glass cutter for scoring flat glass and comprising, an elongated handle having one end provided with spaced furcations to define a downwardly open slot, a tool holder received in said slot and movable between first and second positions therein, an elongated leaf spring provided for movement in a recess defined by said handle, said spring having one end in engagement with said tool holder and an opposite end mounted to said handle, said tool holder being biased toward said first position by said leaf spring, said tool holder having a glass scoring tool in one end such that said tool projects beyond the ends of said handle furcations by approximately ¼ inch when said tool holder is in said first position, adjustable stop means defined in said handle and engageable with said spring to define said first position, said second tool holder position achieved by deflection of said leaf spring and corresponding movement of said tool holder inwardly of said slot such that said handle furcation ends of said handle contact the surface of the glass being scored to limit the manual scoring force on the glass in spite of excessive force exerted by the user's hand on the handle as a result of such contact between said handle furcation ends and the glass.

4,691,439

POWERED ROOF SHINGLE DETACHER AND STRIPPER APPARATUS

Gerardo J. Marra, P.O. Box 836, River Edge, N.J. 07410-0836

Filed Nov. 3, 1986, Ser. No. 929,072
Int. Cl.⁴ B26B *3/00*
U.S. Cl. 30—170 **9 Claims**



1. A powered roof shingle detacher and stripper apparatus, comprising;

(a) a frame;

(b) a rolling means under a front part of the frame to make the apparatus easy to move;

(c) a fulcrum means under a middle part of the frame to enable the apparatus to be rocked and to increase the mechanical advantage to detach the shingles and which also includes a rolling means;

(d) a shovel-like device comprising a blade located at the front part of the frame with a plurality of nail body engaging slots at the front end, wherein the blade is flat to turned up relative to a rear section;

(e) a pivot beneath the junction where the blade and the rear section meet to enable the blade to move down to properly position said blade for insertion under the shingles and to move up to raise and detach the shingles while engaging and pulling out nails;

(f) an arm attached to the rear section which accumulates the shingles after stripping and pushes them off a roof or stacks them in a pile;

(g) a handle joined to the rear section which attaches to an end mount of a cylinder shaft at one end of a gas cylinder by an unfixed pin assembly which allows the handle and the gas cylinder to move at varying angles to each other, said gas cylinder attached to a hinge fixed to the frame at the other end;

(h) a front grip and a guard attached to the middle of the frame which can be grasped with one hand to manipulate the apparatus in concert with a rear grip attached to the rear of the frame which can be grasped with the other hand;

(i) a control mechanism mounted on the rear grip which uses compressed gas as a power medium to activate the gas cylinder, wherein the control mechanism, the rear grip, the front grip, and the guard are extended to a plurality of locations at various angles relative to the frame to accommodate various pitches of the roof, different bodily positions of operation and also to change the amount of leverage exerted;

(j) a hose and fitting assembly which connects the control mechanism to the gas cylinder and which also connects the control mechanism to a compressed gas source to power the apparatus, wherein, when the control mechanism is in one setting, the cylinder shaft within the gas cylinder is pushed out by gas flow and acts on the handle to push the blade down, ready to be inserted under the shingles, and when the blade is moved under the shingles, the control mechanism is put in another setting and the cylinder shaft is brought back to its original closed position within the gas cylinder by the gas flow, thus raising the blade to exert leverage and to detach the shingles while the slots in the blade engage nail bodies and press upward against nail heads and pull out nails, and as the apparatus is rocked in a forward direction, the shingles with the nails attached are stripped by the blade and accumulated and pushed off the roof or stacked in a pile by the arm.

4,691,440

FORKED SHELL AND MEMBRANE STRIPPER FOR BOILED EGGS

Hideji Ushigome, No. 19-15, 3-chome, Kugayama, Suginami-ku, Tokyo, Japan

Continuation of Ser. No. 688,760, Jan. 4, 1985, abandoned. This application Jun. 23, 1986, Ser. No. 878,509
Int. Cl.⁴ A47J *43/28*
U.S. Cl. 30—322 **2 Claims**



1. A forked shell and membrane stripper for boiled eggs capable of simultaneously stripping the shell and membrane of the boiled eggs consisting of a stem portion and a forked portion comprising a central fork having a free end formed with a

head and two elongate side members straddling the central fork, the side members having front ends remote from the stem portion which are bridged by a cross-piece to constitute a guide face for guiding the central fork while sliding on the outer surface of the egg-shell so that the central fork may creep under the membrane of the boiled egg, said central fork and side members being curved longitudinally, the central fork extending from a junction with the stem portion at a level under the side members, passing through a plane containing the side members and protruding at its free end to a level above the side members, and the head of the central fork terminating short of the cross-piece, with a nipping gap formed between the head, the cross-piece and the side members for cutting open the shell and membrane simultaneously.

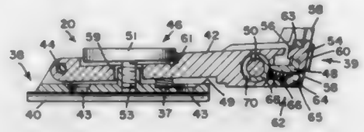
4,691,441
THREAD GAUGE
Charles A. Van Horssen, 9233 N. 12 Ave., Phoenix, Ariz. 85021
Filed Jan. 28, 1987, Ser. No. 8,278
Int. Cl.[4] G01B *3/48, 5/16*
U.S. Cl. 33—199 R **2 Claims**



1. A thread measuring tool comprising
(a) an elongate helical neck having a longitudinal axis and a first end and a second end;
(b) a threaded gauge attached to said first end of said neck;
(c) a drive member slidably mounted on said neck and having an inner helical surface slidably contacting said neck and shaped and dimensioned such that linear non-rotational displacement of said drive member along said neck in a direction of travel generally parallel said longitudinal axis generates forces on said helical neck causing said neck and threaded gauge to rotate.

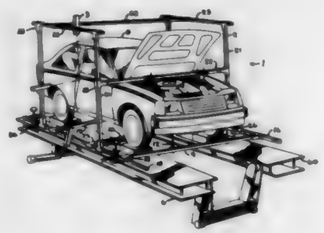
4,691,442
SIGHT SYSTEM FOR A FIREARM
Warren A. Center, Alton Bay, N.H., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.
Filed Apr. 2, 1986, Ser. No. 847,698
Int. Cl.[4] F41G *1/02, 1/10*
U.S. Cl. 33—253 **7 Claims**

3. Rear sight fixture for a gun barrel having a rearward end, a forward end, and outer surface and a central longitudinal axis which correlates with a sight axis which is located above said barrel and which is substantially parallel with said central longitudinal axis, said rear sight fixture comprising:
(a) a rear bracket which is adapted to lie along said outer surface at the rearward end of the gun barrel beneath said sight axis,
(b) fastening means for removably fastening the rear bracket to the barrel,
(c) a rear sight carrier which has a plurality of sight slots, each of said sight slots having a different width than the other slots within a plane which is tranverse to said sight axis, said rear sight carrier being mounted on said rear bracket for selective movement to a plurality of positions



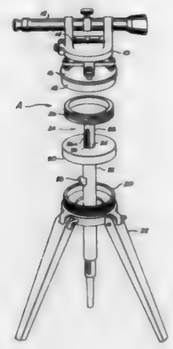
relative to said rear bracket so that for each position of said rear sight carrier, a different one of said sight slots intersects said sight axis and constitutes the rear sight of the gun,
(d) a biased detent which is mounted in the rear bracket for engaging one of the sight slots which is not in alignment with the sight axis for yieldingly locking the rear sight carrier in each of its positions.

4,691,443
DRIVE-IN, DRIVE-OUT VEHICLE ALIGNMENT SYSTEM
Harold F. Hamilton, Liberty, Mo., and Robert L. Donahue, McPherson, Kans., assignors to Hein-Werner Corporation, Waukesha, Wis.
Division of Ser. No. 844,030, Mar. 24, 1986, which is a continuation-in-part of Ser. No. 764,678, Aug. 12, 1985, Pat. No. 4,598,481. This application Sep. 22, 1986, Ser. No. 910,084
Int. Cl.[4] G01B *5/03, 11/03*
U.S. Cl. 33—288 **10 Claims**



1. A drive-in, drive-out alignment system comprising:
(a) first and second transverse bars and hanger means extending therefrom for connection to a first vehicle, said first transverse bar being connected to the vehicle forward of the vehicle front wheels, and said second transverse bar being connected to the vehicle aft of the vehicle front wheels;
(b) spaced, parallel longitudinal bars mounted normally to opposite ends of said transverse bars and extending parallel to the vehicle centerline;
(c) tee connectors joining said longitudinal bars to said first transverse bar;
(d) quick couple tee connectors joining said longitudinal bars to said second transverse bar for ready connection and disconnection; and
(e) support means extending from said longitudinal bars to a base surface and maintaining said longitudinal bars a set distance thereabove; whereby said second transverse bar is removable by said quick couple tee connectors and said longitudinal bars remain supported for ease of removing and replacing said vehicle with a second vehicle and quickly repositioning said second transverse bar to said second vehicle for alignment.

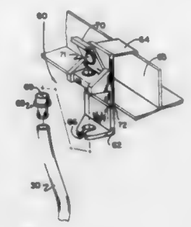
4,691,444
SURVEYOR'S LEVEL WITH CONSTANT INSTRUMENT HEIGHT AND METHOD
Grover Capps, Rte. 2, Box 388, Travelers Rest, S.C. 29690
Filed Apr. 1, 1986, Ser. No. 846,637
Int. Cl.[4] G01C *5/00*
U.S. Cl. 33—290 **18 Claims**



1. A method of constructing a surveyor's instrument mounted on a tripod for use in a surveying method wherein the instrument height determined by sighting through the surveyor's instrument to a prescribed benchmark may be reset at a constant height with respect to said benchmark with the tripod moved on a job site to different locations wherein the method comprises:
providing an elevatable base carried by said tripod on which said surveying instrument is mounted;
providing adjustment means for adjusting the vertical position of said elevatable base relative to said tripod in a manner that said elevatable base may be set to said instrument height upon repeated set-ups of said tripod whereby a constant instrument height can be used throughout the calculations of the surveyor at the job site;
providing a first adaptor member in the form of an adaptor collar which threadably mates with a base cap of said surveying instrument, and said adaptor collar having an integral elongated shaft; and
providing second adaptor member in the form of an adaptor base cap which threadably mates with a threaded collar of said tripod, and providing said adaptor base cap with an elongated sleeve which slideably receives said elongateg shaft of said adaptor collar.

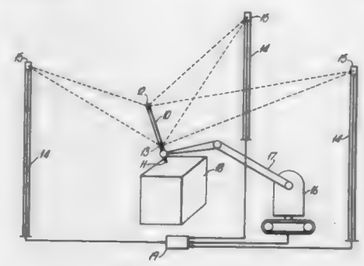
4,691,445
HORIZONTAL EVALUATION DATUM SCOPE
Loranza D. Fields, Jr., P.O. Box 1181, Chicago, Ill. 60126
Filed Oct. 29, 1985, Ser. No. 792,539
Int. Cl.[4] G01C *5/04*
U.S. Cl. 33—367 **7 Claims**

1. An apparatus for establishing a horizontal plane on an object structure at a predetermined level corresponding to the bottom of a workpiece, comprising:
a housing;
means associated with said housing defining a first liquid reservoir;
means defining a second liquid reservoir, each of said first and second reservoirs being vented to the atmosphere and having a translucent portion such that the level of a liquid in said reservoirs is viewable through said translucent portion from outside said reservoirs;
attachment means associated with said housing for securing said housing to said workpiece;
a reference marking on said housing in visual juxtaposition with said translucent portion of said first reservoir and correlated with said attachment means to correspond to the bottom of said workpiece;
a reference marking on said second reservoir-defining means in visual juxtaposition with said translucent portion of said second reservoir;
liquid-conducting means for placing said first and second reservoirs in closed communication with each other; and



means for introducing a quantity of liquid into said reservoirs and said liquid-conducting means sufficient to fill said liquid-conducting means and to fill said reservoirs to a level corresponding to their respective reference markings such that when the elevation of said second reservoir is adjusted relative to the object structure until the liquid level in said second reservoir corresponds to said reference mark associated therewith, said reference mark then corresponds on the object structure to said predetermined level corresponding to the bottom of said workpiece.

4,691,446
THREE-DIMENSIONAL POSITION MEASURING APPARATUS
Brian E. Pitches, and David A. Wright, both of Edinburgh, Scotland, assignors to Ferranti plc, Cheshire, England
Filed Sep. 2, 1986, Ser. No. 902,655
Claims priority, application United Kingdom, Sep. 5, 1985, 8522058
Int. Cl.[4] G01C *3/10*
U.S. Cl. 33—516 **6 Claims**



1. Three-dimensional position measuring apparatus for determining the position of a point movable throughout a measuring volume relative to a set of reference axes, which apparatus includes a probe member having a probe tip defining the position of the movable point and first and second reference points spaced apart from one another and having a fixed known spatial relationship with one another and with the probe tip, means for moving the probe member so that the

probe tip may be positioned at any desired point within the measuring volume, at least three distance meansuring equipments, each being located outside the measuring volume in a separate fixed known position relative to the set of reference axes and each operable to determine the distance between its known position and each reference point on the probe member, and calculating means responsive to the signals derived by each distance measuring equipment to determine the position of the probe tip relative to the set of reference axes.

4,691,447

COFFEE ROASTER

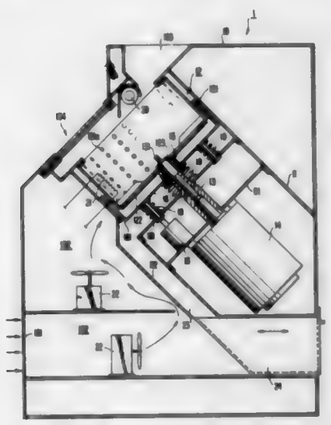
Masayuki Nakai, Isesaki; Kikuo Ishikawa, Ashikaga, and Shiro Okada, Isesaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jul. 31, 1985, Ser. No. 760,836

Claims priority, application Japan, Jul. 31, 1984, 59-117949[U]; Jul. 31, 1984, 59-117950[U]

Int. Cl.⁴ F26B *11/08*

U.S. Cl. 34—4 **8 Claims**



1. In a coffee roasting apparatus including a rotatable drum at an acute angle to the horizontal provided with a plurality of holes for promoting the roasting of coffee beans, a coffee bean supply duct arranged at an upper portion of the apparatus above said drum and a drive means operatively connected to said drum to cause the rotating motion of said drum, the improvement comprising:

said drum comprising an annular ring element having an upper opening and a bottom opening, and a bottom plate adjacent said bottom opening and axially slidably attached on said drive means for controlling the opening and closing of said bottom opening of said ring element to provide a discharge path for the roasted coffee beans;

a plurality of stirring blades formed on an inner surface of said ring element; and

an infrared heater placed adjacent to said upper opening of said ring element for roasting the coffee beans by the infrared radiation heat.

4,691,448

APPARATUS AND PROCESS FOR DRYING FINELY GRAINED SOLID PARTICLES

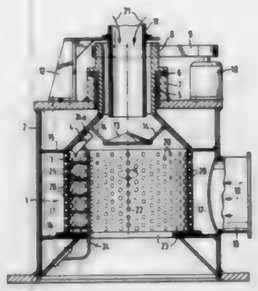
Franz Alstetter; Herbert Schiele, both of Karlsfeld; Peter Sedlmayer, Munich, and Günther Hultsch, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Krauss-Maffei, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,409

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430127

Int. Cl.⁴ F26B *5/08*

U.S. Cl. 34—8 **23 Claims**



1. A centrifugal drying apparatus for drying finely grained solid particles suspended in a fluid bed comprising:

a means for housing the drying apparatus;

means for screening solid particles wherein said means for screening exhibits a plurality of solid particle screening bores which allow passage of drying gas, said means for screening surrounds and defines a swirl chamber and is rotatingly mounted within said means for housing;

means for charging the drying apparatus connected to said means for screening;

means for introducing drying gas through said plurality of bores into the swirl chamber, wherein said solid particles and said drying gas form a fluid bed in said means for screening;

means for agitating mechanically said solid particles in the fluid bed.

4,691,449

METHOD AND APPARATUS FOR DRYING A MOIST FIBRE WEB

Per-Arne Wiberg, Gunnars Uäg 5, S-723 55 Västerås, Sweden

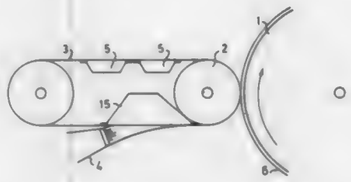
PCT No. PCT/SE85/00009, § 371 Date Aug. 16, 1985, § 102(e) Date Aug. 16, 1985, PCT Pub. No. WO85/03314, PCT Pub. Date Aug. 1, 1985

PCT Filed Jan. 11, 1985, Ser. No. 775,054

Claims priority, application Sweden, Jan. 19, 1984, 8400256-7

Int. Cl.⁴ F26B *5/16*

U.S. Cl. 34—9 **11 Claims**



1. In a method for drying a moist fiber web (6), in which the web downstream of a forming unit is taken up on a wire (9) and advanced to a press nip (13) via a couch roll (10), a pick-up felt (11) and a suction press roll (8), and the fiber web is transferred in the press nip (13) to the periphery of a drying cylinder (1); the improvement comprising carrying the web on the outer cylindrical surface of said cylinder to a drying press, and in the drying press pressing against the moist fiber web (6) a permeable press means at a temperature above 100° C. and including a press roll (2, 18) so that water is extracted from the fiber web and enters the permeable press means, extracting said water from the press means with the aid of suction boxes (5, 16, 19) within said press means, retaining the fiber web (6) from which water has been extracted on the drying cylinder (1) downstream of the press nip of said press means, and then removing the dried web from the drying cylinder.

4,691,450

METHOD AND APPARATUS FOR THE REMOVAL OF LIQUID FROM A RUNNING YARN

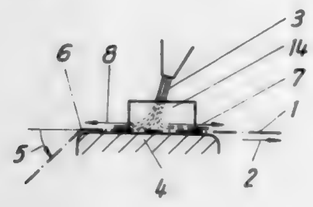
Dieter Glaser, Karl Marx Stadt, and Theobald Klemm, Dittersdorf, both of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Oct. 17, 1985, Ser. No. 788,275

Claims priority, application German Democratic Rep., Jan. 7, 1985, 272437

Int. Cl.⁴ F26B *3/04*

U.S. Cl. 34—23 **13 Claims**



1. Method for removing liquid from a running yarn exclusively by the squeezing action of a jet of gas, comprising passing a wet yarn in running contact with a surface bounded by means for forming the side walls of a channel of which said surface defines the bottom, and directing a jet of gas approximating the width of the channel downwardly into the channel so that it impinges on the yarn and is deflected off the bottom of the channel, the gas surrounding and squeezing the yarn in the channel thereby to squeeze liquid from the yarn.

4,691,451

HAIR DRYER

Roberto Giorgis, Via Casilina Vecchia, 27, 00182 Roma, Italy

Continuation of Ser. No. 663,747, Oct. 23, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 930,058

Claims priority, application Italy, Oct. 2, 1984, 48937 A/84

Int. Cl.⁴ F26B *19/00*

U.S. Cl. 34—68 **10 Claims**

1. A hair drying apparatus for drying hair on a person's head comprising:

an electric motor;

a plurality of hair drying lamps for drying the hair;

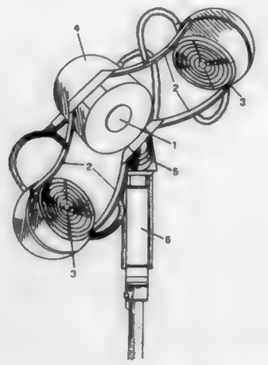
arms for supporting said lamps;

a mechanism for transmitting motion from said motor to said arms and said lamps, said mechanism including

a head assembly having a first support means, a grooved pulley journalled in said first support means, second support means, a slide means supported by said second support means and lying within said groove, said first support means being pivotal with respect to said second support means,

a neck assembly connected to said head assembly, said neck assembly including a rocker arm rigidly fixed to said second support means and a cam rigidly fixed to said first support means; and

base means for supporting the rocker arm for pivotal movement about an axis which is transverse to the rocker arm,



said base means having a surface rigidly fixed thereto for contacting said cam, said motor causing said grooved pulley to rotate whereby said mechanism moves said arms and said lamps around the head and hair to direct the lamps toward different areas of the hair on the head.

4,691,452

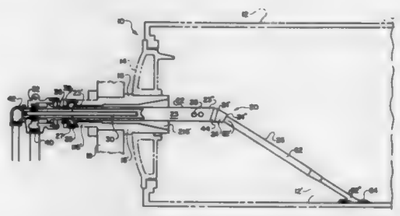
ARTICULABLE SIPHON TUBE ASSEMBLY FOR DRYER DRUM

George R. Ferguson, Clover, S.C., assignor to Duff Norton Company, Charlotte, N.C.

Filed Jul. 18, 1986, Ser. No. 887,688

Int. Cl.⁴ F26B *25/20*

U.S. Cl. 34—119 **17 Claims**



1. An articulable siphon tube assembly for use in a hollow rotary dryer drum having a tubular journal with an axial opening therethrough, said siphon tube assembly being particularly adapted for selective articulation for insertion into and removal from said drum through said axial opening of said journal and for siphoning disposition within said drum at a peripheral drying wall thereof, said siphon tube assembly comprising:

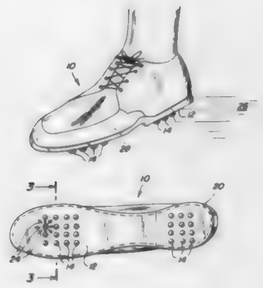
support tube means for operative positioning within said axial opening of said journal of said drum;

siphon tube means for operative positioning within said drum at said peripheral wall thereof; and

tubular elbow means disposed intermediate and connected with said support tube means and said siphon tube means in respective end-to-end communication, said elbow means being rotatably connected to one of said support tube means and said siphon tube means for rotation annularly with respect thereto about an axis angularly oriented with respect to both thereof and being fixed to the other thereof for selective rotation of said elbow means and said other tube means to orient said support tube means and

said siphon tube means either in general alignment with one another for permitting insertion and removal of said siphon tube assembly through said axial opening in said journal or at sufficient angular relation to one another for permitting mounting of said support tube means coaxially within said axial opening of said journal with said siphon tube means disposed at said peripheral drum wall for siphoning operation of said siphon tube assembly within said drum.

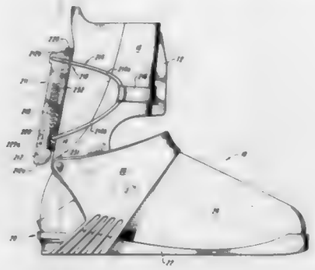
4,691,453
SPACE SKATING SHOE
Salustiano Tifre, 496 New Jersey Ave., Brooklyn, N.Y. 11207
Filed Sep. 8, 1986, Ser. No. 906,262
Int. Cl.[4] A43B *5/12, 5/16*
U.S. Cl. 36—8.3 **5 Claims**



1. A space skating shoe for recreation activities which comprises:
(a) a shoe portion for wearing upon the user's foot;
(b) a sole having a plurality of cavities recessed into the sole;
(c) means for attaching said sole to the bottom of said shoe portion; and
(d) a plurality of spherical balls rotatively mounted in said cavities with said cavities engulfing more than 180 degrees of said spherical balls thereby permitting said spherical balls to rotate freely in any direction, said spherical balls fitting loosely in said cavities but being prevented from being freely separated from said sole by the engulfing of said cavities, said spherical balls spacing said sole from a skating surface and permitting the user to propel himself in any desired direction, and wherein said sole is fabricated out of polytetrafluoroethylene material for permitting smooth rotation of the balls within the cavities and permitting forced removability of the spherical balls from the cavities for replacement of the spherical balls.

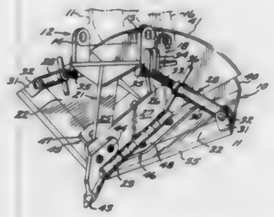
4,691,454
SKI BOOT CLOSURE SYSTEM
Marco T. Ottieri, Manchester, Mass., assignor to Ottieri Enterprises, Boston, Mass.
Continuation-in-part of Ser. No. 655,905, Sep. 28, 1984, Pat. No. 4,669,202, and a continuation-in-part of Ser. No. 664,991, Oct. 26, 1984, Pat. No. 4,565,017. This application Jan. 17, 1986, Ser. No. 820,405
Int. Cl.[4] A43B *5/04;* **A43C** *11/00*
U.S. Cl. 36—117 **12 Claims**

1. In a ski boot having a base element providing sole, toe and instep portions, a forward shin-cuff element mounted to said base element for supportingly engaging the shin of a wearer, a calf cuff element hingedly mounted to said base element for supportingly engaging the calf of a wearer, said cuff elements being movable between closed positions for providing said supporting engagements, and open positions for allowing a wearer to step into and out of the base element, and further having the improvement comprising a closure system for opening and closing said ski boot, said closure system comprising
(a) a cable system having height and length varying cable strands secured between one said cuff and a latch means mounted to the other said cuff,
(b) a means for slidably securing said cable strands to said one cuff,
(c) a latch means comprising a guide track and a lever, said guide track being mounted to the other said cuff, said lever being adapted for movement between open and closed positions, and
(d) said cable system having first, second, and third strand



portions, said forst portion extending on a first side of said boot from connection with said lever to said slideable securing with said one cuff and continuing to engagement with said guide track,
said third portion extending on the other opposite side of said boot from connection with said lever to said slideable securing with said one cuff and continuing to engagement with said guide track, and
said second portion interconnecting said first and third portions at the engagements thereof with said guide track and extending along said guide track for a length which changes with the position of said lever between said open and closed positions.

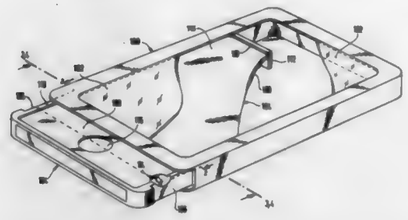
4,691,455
TRENCHING EQUIPMENT WITH HINGED SIDE PLATES
Russell L. Newman, 4591 Cathy Ave., Cypress, Calif. 90630
Filed Sep. 20, 1985, Ser. No. 778,030
Int. Cl.[4] E02F *5/02*
U.S. Cl. 37—103 **9 Claims**



1. An open top excavation bucket for forming trenches, comprising:
a. a support frame;
b. a pair of side plates hingedly connected along the lower edges thereof and supported from the support frame so that each of the side plates may be rotated about the axis of its hinge connection;
c. a back wall;

d. means connected to the side plates to adjust the orientation thereof about the axis of the hinge connection.

4,691,456
CONTAINER FOR STORING A STACK OF PICTURES
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
Filed Sep. 30, 1983, Ser. No. 537,861
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236643
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—10 R **14 Claims**



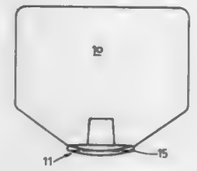
1. A container for displaying a single picture and storing a stack of pictures, said container comprising means defining first and second chambers and having separating means common to and separating said first and second chambers, said first chamber being for retaining a single picture and said second chamber being for storing a stack of pictures, said first chamber having a display window opposite said separating means, and said separating means being for holding a single picture in position for display and being shaped to retain the single picture in position at said window, said container further comprising first and second members movable relative to each other, each of said members defining at least one wall of each of said chambers, said container being closed against removal of pictures from either of said chambers when said first and second members are in a first relative position and said first and second chambers being accessible for picture removal when said first and second members are in a second relative position.

4,691,457
EMBLEM MOUNTING ASSEMBLY
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 625,667, Jun. 28, 1984, abandoned. This application Oct. 22, 1984, Ser. No. 663,718
Int. Cl.[4] G09F *3/08*
U.S. Cl. 40—20 A **16 Claims**



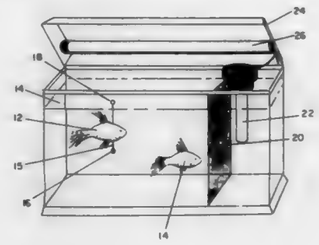
1. An emblem mounting assembly comprising an emblem having a front face and a rear face, a rod detachably secured to said emblem through said rear face of said emblem, locking means detachably secured to said rod for mounting said assembly to an object, said emblem including a nut receiving pocket, a nut trapped in said pocket and exposed through said rear face of said emblem, and said rod being threadably secured to said nut, said locking means including a hold down bar mounted on said rod, said emblem includes a shield and a hub unit secured together, and said pocket being formed in juxtaposed faces of said shield and said hub.

4,691,458
TAGS
Michael J. Scott, Fielding, New Zealand, assignor to Allflex International Limited, Palmerston North, New Zealand
Filed Oct. 2, 1984, Ser. No. 657,075
Claims priority, application New Zealand, Oct. 3, 1983, 205842
Int. Cl.[4] C09F *3/00*
U.S. Cl. 40—300 **6 Claims**



1. A tag for attachment to the ear of an animal, said tag comprising:
a female component having a base portion with an upper surface and lower surface;
a panel projecting upwardly from said upper surface;
an opening in said base portion;
said lower surface including an engagement surface which in use of the tag engages with the upper outer surface of an animal's ear, said engagement surface having a curved profile which, relative to the panel, is transverse to the plane of the panel and follows the contour of the upper outer surface of the animal's ear to which the tag is to be applied to resist swivelling movement of the tag about the axis of coupling of said female component.

4,691,459
ARTIFICIAL AQUARIUM
George Butler, 62 Dacia St., Dorchester, Mass. 02125
Filed Feb. 3, 1986, Ser. No. 825,148
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—406 **1 Claim**



1. A decorative artificial aquarium comprising:
a rectangular tank member having two opposite transparent first and second sides and two opposite transparent third and fourth sides shorter than said first and second sides;
water contained within said tank member;
at least one artificial fish freely floating at a predetermined level within said water;
a whirlpool pump positioned in said tank adjacent to one of its shorter sides, the water flow from said pump directed

to cause circular movement of water around the inside of said tank to carry said artificial fish around in a circular path in said tank member; and

a baffle positioned at one end of said tank extending between said first and second sides adjacent to said whirlpool pump to prevent said artificial fish from being drawn into the intake of said whirlpool pump said baffle extending across said tank member forming a wall separating said tank member into a first and second chamber, said first chamber containing said whirlpool pump causing said circular water circulation and said second chamber containing said artificial fish moved in a circular path at a predetermined level in said water by said circular water circulation and said baffle further having a plurality of apertures defined therein allowing water flow therethrough but preventing said fish from entering said first chamber to keep said fish away from said whirlpool pump.

4,691,460
DECORATIVE PLAQUE WITH REPLACEABLE DECORATIVE ELEMENT
Jerry Kohl, 800 Holladay Rd., Pasadena, Calif. 91106
Filed Sep. 9, 1985, Ser. No. 774,027
Int. Cl.[4] G09F *7/02*
U.S. Cl. 40—618 **16 Claims**



1. An elongated decorative plaque suitable for mounting on belts comprising:

(a) a frame comprising:

(i) an elongated cover plate having an elongated opening therethrough, the cover plate having a decorative front face and a back face; and

(ii) a backing place similar in shape to the cover plate and adapted for removable attachment to the cover plate, the backing plate having a front face and a back face;

(b) at least one replaceable decorative element sized and adapted for removable insertion between the cover plate and the backing plate such that at least an exposed portion of the decorative element shows through the opening of the cover plate, each decorative element being no wider than the length of the elongated opening, the decorative element having a front face and a back face;

(c) means for removably affixing the backing plate to the cover plate so that the decorative element is firmly held in place therebetween, the affixing means comprising

(i) screw nuts affixed to the back face of the cover plate; and

(ii) screws passing through the backing plate and threadingly engageable with the screw nuts, the screws each having a head too large to pass through the backing plate and therefore capable of holding the backing plate firmly against the cover plate;

the frame and the decorative element having interlocking engaging means for preventing the decorative element from moving along the length of the elongated opening.

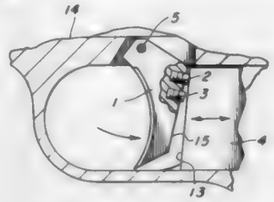
4,691,461
ADJUSTABLE GUN TRIGGER MECHANISM
Austin Behlert, R.D. #2, Box 63, Pipersville, Pa. 18947
Filed Oct. 14, 1986, Ser. No. 917,919
Int. Cl.[4] F41C *19/02*
U.S. Cl. 42—69.01 **6 Claims**

6. A trigger mechanism for a firearm, comprising:

a. a trigger housing,

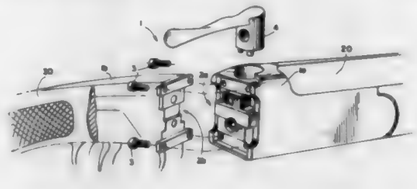
b. a trigger pivotably affixed to said trigger housing, the trigger having a back portion for engaging a firing mechanism,

c. an actuator being part of said firing mechanism and located in contacting relationship with the back portion of said trigger, and



d. a trigger extension affixed to said trigger and protruding from the back portion of said trigger, said extension being adjustable relative to said trigger to alter the point of contact between said trigger and said actuator.

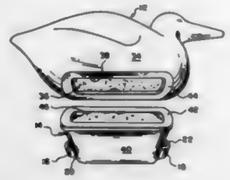
4,691,462
BREAK-OPEN ACTION FOR SPORTING RIFLES
Ennio Mattarelli, Zola Predosa, Italy, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany
Filed Mar. 26, 1986, Ser. No. 844,134
Claims priority, application Italy, Mar. 26, 1985, 4830/85[U]
Int. Cl.[4] F41C *7/00*
U.S. Cl. 42—75.04 **2 Claims**



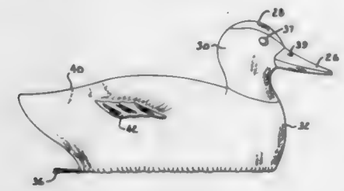
1. A break-open action for sporting rifles, the break open action comprising a forward part for connection with at least one rifle barrel, means for releasably locking the forward part with a rearward part including snug seat means and fastening means, the rearward part including lock means for connection with a rifle stock, and wherein said seat means enables an angular adjustment about an axis disposed in a plane of the snug seat means.

4,691,463
BUOYANT WATER FOWL DECOY AND METHOD FOR MAKING SAME
James A. DeKezel, 2300 79th Ave. W., Lot 97, Rock Island, Ill. 61201, and James R. Lerschen, 218 Elm St., Colona, Ill. 61241
Continuation of Ser. No. 397,551, Jul. 12, 1982, Pat. No. 4,450,642. This application Mar. 19, 1984, Ser. No. 591,120
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **10 Claims**

1. A water fowl decoy comprising: a hollow shell body portion which has the shape of a water fowl decoy, which has an interior chamber, and which is made of a hard, rigid plastic material; a buoyant foam plastic material within and substantially filling said interior chamber of said shell body portion; said hollow shell body portion being closed except for an opening in a bottom portion thereof for injection of said buoyant foam plastic material into said interior chamber through said opening; and a hollow, elongate, plastic keel shell portion which is mounted to said shell body as one piece, which depends from said bottom portion of said shell body portion, which has an interior chamber and which has an opening in an upper portion thereof and an opening in an exterior wall thereof, said shell body portion being in communication with said interior chamber in said keel shell portion through said openings in said shell body portion in said upper portion of said keel shell portion whereby said buoyant foam plastic material can be inserted through said opening in said exterior wall of said keel shell portion into said interior chamber in said shell body portion and allowed to set therein and, whereby weighting material may be subsequently inserted into said interior chamber of said keel shell portion through said opening in said external wall of said keel shell portion.



4,691,464
AVIAN DECOY COVERING
Thomas E. Rudolph, David City, Nebr., assignor to Eidos Corporation, David City, Nebr.
Filed Jul. 25, 1986, Ser. No. 889,216
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **16 Claims**



1. A removable covering for a bird decoy, said covering comprising:

a flexible fabric having a size to substantially cover said decoy and having a shape to substantially conform to the shape of said decoy, said fabric having an exterior surface;

markings on said exterior surface to simulate the surface features of a bird corresponding to the decoy; and

a reflective panel mounted on the exterior of the fabric at a location substantially coincident with the location of secondary feathers on at least one side of said bird.

4,691,465
GAFF FOR LANDING FISH
Patrick D. Dooley, 1519 Simeonoff, Kodiak, Ak. 99615
Filed Jun. 6, 1986, Ser. No. 871,475
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 **6 Claims**

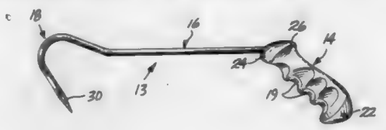
1. A gaff for landing fish comprising

an elongated shank of predetermined cross-sectional width,

said shank having a hook on one end thereof and a pistol grip handle on the other end thereof,

said hook having a first portion thereof which projects from the shank in one lateral direction thereof, and a second relatively outlying portion thereof which extends reentrantly about the one end of the shank from the first portion of the hook, in the opposing lateral direction of the shank,

said handle having a generally cylindrical body which is solid in outline, greater in cross-sectional width than the shank, and obtusely angled to the longitudinal axis of the shank in a plane substantially parallel to that longitudinal axial plane of the shank coinciding with the aforesaid lateral directions of the hook portions, so that when the user grips the handle in one hand, the body of the handle fills his hand and the user's forearm assumes a position substantially parallel to the longitudinal axis of the shank

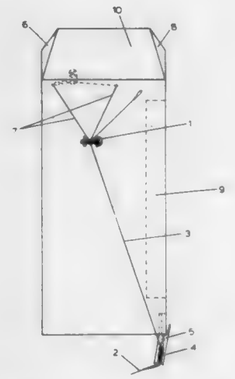


while his hand is similarly but oppositely angled to said handle in a typical pistol grip position,

there being elongated indentations in the body of the handle on the inside edge portion thereof which curve about the circumference of the same so as to conform to the curvature of the fingers of the user's one hand when they are passed about the handle in his pistol grip thereon, and

the body of the handle extending in the aforesaid opposing lateral direction of the shank, together with the relatively outlying portion of the hook, so that the user can cock and impale the fish without the hook at a point relatively in line with the length of his forearm.

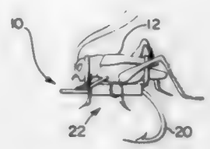
4,691,466
CURRENT KILLER, SWIFT WATER FLOATER
Timothy K. Lamb, Rte. 1, Box 294, Red House, W. Va. 25168
Filed Apr. 23, 1986, Ser. No. 854,923
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—43.13 **3 Claims**



1. A swift water fishing device for maneuvering a fishing line to a desired location, comprising, a lightweight rectangular elongated body of bouyant material having a front bow, a trailing end and two side surfaces, said bow having three angled planar surfaces forwardly sloping toward one of said side surfaces, a lower one of said planer surfaces causing hydrodynomic lift on said body when disposed substantially perpendicular to the water surface in an up stream direction; a three point hitch yoke system for angularly disposing said body substantially perpendicularly to the water surface, one point of

said three point hitch yoke system being a fixed anchor point on said trailing end of said body and having a tripable release for holding a hook end of the fishing line.

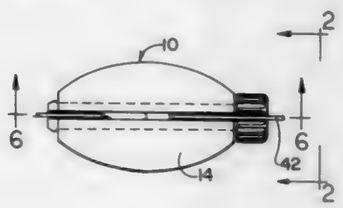
4,691,467
BAIT HOLDER AND METHOD FOR MAKING
Craig A. Brimmer, 2391-104th St. SE., Monroe, Wash. 98272
Filed Mar. 13, 1986, Ser. No. 840,408
Int. Cl.[4] A01K *83/06*
U.S. Cl. 43—44.4 **13 Claims**



1. A bait holder for fishing hooks of the type having a solid, elongated shank, comprising:
a continuous band of resilient material connected directly to the shank so as to form two resilient loops; and
a band retainer having a central portion tightly surrounding the band at the connection to prevent substantial axial movement of the band on the shank and having two axially extending wing portions loosely surrounding portions of the loops to hold the loops apart and to allow resilient axial movement of the loop portions and to prevent substantial radial movement of the loop portions.

8. A bait holder, comprising;
an elongated hollow tube;
a continuous band of resilient material connected directly to the hollow tube so as to form two resilient loops; and
a band retainer having a central portion tightly surrounding the band at the connection to prevent substantial axial movement of the band on the hollow tube and two axially extending wing portions loosely surrounding portions of the loops to hold the loops apart and to allow resilient axial movement of the loop portions and to prevent substantial radial movement of the loop portions.

4,691,468
FISHING WEIGHT ASSEMBLY
James L. Fernbach, 2660 Wenning Rd., Cincinnati, Ohio 45231
Continuation-in-part of Ser. No. 828,853, Feb. 12, 1986. This application Jun. 2, 1986, Ser. No. 869,338
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.9 **2 Claims**



1. A fishing weight assembly which comprises an elongated body having spaced end panels, there being an elongated bore in the body, ends of the bore being in the end panels, there being a radial slot in the body extending outwardly from the bore through an outer face of the body, a plug member, the plug member including a stem frictionally received in the bore of the body and heads for bearing on the end panels, there being an elongated bore in the plug member extending lengthwise of the stem and the heads thereof and a radial slot extending from the bore through an outer surface thereof, an end portion of the stem being bifurcated, one of the heads including two parts, each of the parts being integral with one of the bifurcations, the bifurcated end portion of the stem and the two parts of said one of the heads being compressible to permit said one of the heads to advance along the elongated bore of the body, the radial slot of the plug member being alignable with the radial slot of the body, the bores of the body and of the stem receiving a line, the line being held in the bores when the plug member is rotated from aligned position.

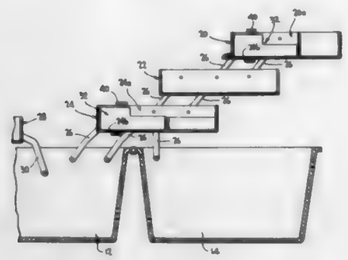
4,691,469
FISHING TACKLE MANAGEMENT SYSTEM AND METHOD
Lawrence C. Alsobrook, 907 Terrace Acres Dr., and Norman F. Browning, 623 Forestdale Dr., both of Auburn, Ala. 36830
Filed Apr. 24, 1986, Ser. No. 855,470
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—54.1 **35 Claims**



1. A fishing tackle management system for storing and carrying fishing tackle comprising:
a plurality of individual soft fishing tackle pack units;
each soft tackle pack unit having a customized design and construction for storing and carrying prescribed fishing tackle;
each customized soft pack unit including:
an outer fabric layer providing a cover having a finished flat configuration,
a plurality of rows of transparent pocket systems arranged vertically spaced on an interior of said cover with a number of said pocket systems included in each row horizontally spaced across said cover,
each pocket system comprising a plurality of overlying transparent pockets customized for storing prescribed tackle, said pockets lying over one another in a superposed manner when said cover is laid out in said flat configuration,
said pockets having openings for placement and removal of fishing tackle; and
each pocket system comprising a flap with closure means for closing the openings for each transparent overlying pocket in said pocket system and each overlying pocket closing the opening of each underlying pocket; and
unit fastening means for securing said soft pack unit in a compact folded or rolled configuration with said fishing tackle stored therein.

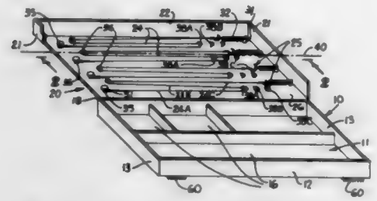
4,691,470
LIGHTED TACKLE BOX
Harper Landell, Downington, and Richard G. Woolworth, Lancaster, both of Pa., assignors to Woodstream Corporation, Lititz, Pa.
Filed May 12, 1986, Ser. No. 861,825
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—55 **14 Claims**

1. A portable lidded container having at least one internal tray having a base wall with an opening therein, a battery-operated lighting fitting having a light bulb, and means locating the fitting on the tray with the bulb light located in said opening so as to light a part of the container below the tray when the bulb is activated, the fitting having a plunger-type switch projecting upwardly therefrom for depression by a member of the container above the tray when the container is closed so as to deactivate the bulb, and for release by said member when the container is opened so as to activate the



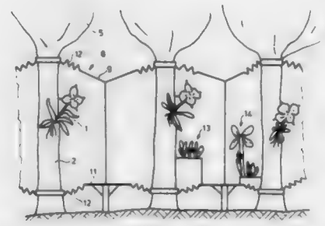
bulb, and said member of the container having switch actuating means for depressing and releasing the plunger switch as aforesaid, wherein the lighting fitting is a self-contained lighting fitting including a battery-receiving portion and circuitry for activating the light bulb, and locating means permits removal of the lighting fitting from the the tray for use of the lighting fitting separately as a flashlight, wherein the tray is compartmentalized, and the locating means comprises wall means defining a tray compartment, the lighting fitting being sized to fit in the compartment.

4,691,471
HOLDER FOR LEADERS
James E. Hansen, 16301 Valley Rd., Eden Prairie, Minn. 55344
Filed Dec. 30, 1986, Ser. No. 947,621
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.2 **18 Claims**



1. A kit for a holder of elongated lengths of line having opposite ends used in combination with a support panel that has a generally planar surface in at least one portion, said one portion having spaced opposite ends, the kit comprising:
a first retainer for mounting at a first of the opposite ends of a panel, and a second retainer for mounting at a second of the opposite ends of a panel, said retainers extending outwardly from such panel and having means for attaching opposite ends of an elongated length of line; and
a plurality of posts, including, a first post for mounting adjacent the second retainer and in position to substantially align with the first retainer, and being offset from the second retainer, and a second post for mounting adjacent the first retainer in position offset from the first retainer and the first post, whereby when the kit is assembled on a panel an elongated line can be attached with respect to one of the retainers, and then sequentially threaded around the first and second posts, the second end of such line being retained with respect to the second retainer.

4,691,472
PROCESS FOR REARING AND TRANSPORTING ARRANGEMENTS OF EPIPHYTIC PLANTS
György Makara, Budapest, Hungary, assignor to Innovator Mernok Kisszovetkezet, Budapest, Hungary
PCT No. PCT/HU84/00043, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/00953, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 24, 1984, Ser. No. 740,842
Claims priority, application Hungary, Aug. 25, 1983, 3004/83; Feb. 8, 1984, 3004/83
Int. Cl.[4] A01G *9/00*
U.S. Cl. 47—58 **4 Claims**



1. A combination of a floral arrangement and a hot house, wherein said floral arrangement comprises precultivated epiphytes including orchids, hybrids, and intergeneric derivatives settled on the bark of a host tree such that said hot house surrounds said epiphytes, wherein an area of said tree is not surrounded by said hot house, said hot house surrounding the trunk of the tree in gripping relation such that at least the lower end of the trunk is outside the hot house.

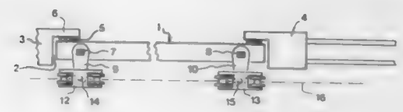
4,691,473
CIRCULAR PLANT MOBILE
Peter D. Ragen, 17055 W. Victor Rd., New Berlin, Wis. 53151
Continuation-in-part of Ser. No. 638,727, Aug. 6, 1984, abandoned. This application Mar. 4, 1985, Ser. No. 707,884
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—67 **16 Claims**



1. In a device for supporting hanging plant pots and the like consisting of a ring supporting a plant pot at the rim of the pot and a ring supporting hoop, the novelty comprising:
non-removable means pivoting the said ring from the said hoop including pivot holes in the ring, said hoop having two free ends each extending through a said pivot hole, cooperating locking means on said ring and said hoop comprising:
said free ends being shaped so that each said end engages

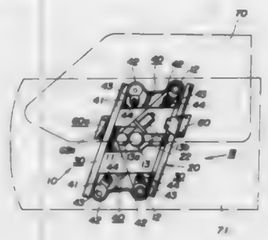
a complementary structure on said ring when said locking means is in its locked configuration;
complementary structures on said ring capable of engaging said free ends of said hoop to prevent relative rotation between said ring and said hoop, said free ends of said hoop being shaped so that each said free end may extend through a pivot hole in said ring,
said free ends being disengaged from said complementary structures on said ring when said locking means is in its unlocked configuration,
said locking means being able to secure said ring against pivotal motion with respect to said hoop except for storage,
said free ends each being positioned to substantially abut a pot placed in said ring, said free ends being movable radially inwardly of said ring to disengage said free ends from said complementary structures to unlock, whereby when said ring is filled with a pot, said free ends cannot be moved radially inwardly enough to release said locking means from its locked configuration.

4,691,474
SLIDING DOOR ASSEMBLY WITH MULLION LOCK
Stanley Rokicki, 112 Lake Promenade, Toronto, Ontario, Canada M8W 1A4
Filed Jun. 5, 1986, Ser. No. 870,953
Int. Cl.[4] E05D *15/10*
U.S. Cl. 49—220 **8 Claims**



1. In a sliding patio door assembly, comprising a door, a slide track, and a door frame which includes a recess; and
where the arrangement is such that, when the door is in a first position, outside the recess, the door is free to slide along the slide track, and when the door is in a second closed position the door is entered into the recess; and where, in order to close the door, the door is moved bodily into the recess in a direction that is lateral or sideways relative to the slide track; said sliding door assembly having:
a pair of crank arms mounted on the door adjacent the sides thereof in a manner that each crank arm can pivot through an arc about a respective axis which is fixed relative to the door, said crank arms extending substantially at right angles to the plane of said door when the door is in said second, closed position;
where the initial pivoting action of the crank arms is not effective to give to the door its said lateral movement;
a door handle, which is intermedially positioned along the height of the door and adjacent one said side edge, and which is pivotable relative to the door;
a first latch bar, which is operative with the door handle;
a latch slot, which is so located in the jamb of the door frame that the first latch bar can enter the latch slot when the door is fully closed in the recess;
and a transmission connection between the door handle and the crank arms, positioned within said door in visually non-obstructing relation with the face of said patio door comprising a pair of crankshafts mounted vertically within the door adjacent the respective vertical edges thereof, and drive means located adjacent at least one horizontal edge of said door within the confines of said door interconnecting said crankshafts for rotation thereof in unison, the initial rotation of said door handle providing said initial pivoting action of said crank arms, and serving to move said first latch bar clear of said latch slot while said door remains in said second position, prior to effective rotation of said crank arms whereby the action of continuing turning the door handle is effective to cause the crank arms to rotate through an angular displacement effective to move the door from out the recess to said first position.

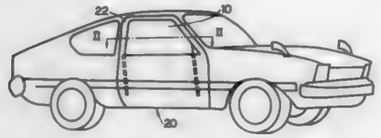
4,691,475
WINDOW REGULATOR
Junichi Maekawa, Yokohama, Japan, assignor to Ohi Seisakusho Co., Ltd., Yokohama, Japan
Filed Dec. 20, 1985, Ser. No. 811,858
Claims priority, application Japan, Dec. 20, 1984, 59-269307
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—352 **3 Claims**



1. A window regulator for raising and lowering a window pane of an automotive vehicle door, comprising:
a pair of guide rails;
a pair of connecting brackets contoured to have the same shape and symmetrically arranged to interconnect the end portions of said guid rails to form an integral framework, said connecting brackets having flanged peripheries extending in a direction tranverse to said guide rails;
a pair of reciprocating units which comprise roller units carrying thereon the window pane and movably mounted on said guide rails;
pair of guide members respectively mounted on said connecting brackets and a cable placed around said guide members and having opposite ends connected to one of said roller units; and
a drive unit mounted on said framework and operatively connected to said reciprocating units for driving said reciprocating units, wherein said connecting brackets each have two guide member mounting sections so that one of said connecting brackets mounts one of said guide members at one of said guide member mounting sections and the other of said connecting brackets mounts the other of said guide members at the other of said guide member mounting sections.

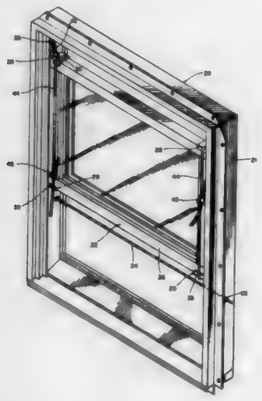
4,691,476
VEHICLE DOOR STRUCTURE
Hiroyuki Yao, Nagoya, and Yuji Okamoto, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Dec. 3, 1984, Ser. No. 677,297
Claims priority, application Japan, Dec. 19, 1983, 58-195292
Int. Cl.[4] B60J *1/17*
U.S. Cl. 49—374 **11 Claims**

1. A vehicle door structure, comprising:
a door frame mounted onto a vehicle such that it opens and closes;
a door window having a plurality of corner portions, top and bottom edges, interior and exterior surfaces, and two substantially vertical edges, at least one of said plurality of corner portions being cut-off, the door window being provided in said door frame such that said exterior surface of said door window is substantially flush with an exterior surface of said door frame; and
a slider fixed to one of said substantially vertical edges of said door window for guiding said door window along said door frame during an upward and downward displacement thereof, said slider including a substantially vertically extending base, a pair of substantially vertically extending extensions which project laterally from said base to define a gap therebetween, and a bridge extending from an upper end of said base for part of the distance between the substantially vertical edges of the door window and bridging upper ends of said pair of extensions, an upper surface of said bridge being substantially flush with



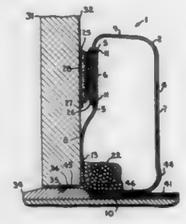
the upper end of said base and the top edge of said door window;
wherein said one substantially vertical edge of said door window is positioned within said gap between said pair of extensions, base and bridge, said bridge and said pair of extensions cooperate to surround said at least one cut-off portion of said plurality of corner portions of the door window, and a recess between said slider and said one substantially vertical edge of said door window within said gap is filled with an adhesive, whereby said adhesive is prevented by said bridge and said pair of extensions from contacting the upper surface of said bridge, the upper end of said base, and the top edge of said door window.

4,691,477
RIGIDIFYING SYSTEM FOR WINDOW ASSEMBLY DURING ITS SHIPMENT AND INSTALLATION
Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.
Filed Jul. 28, 1986, Ser. No. 889,762
Int. Cl.[4] E06B *3/32*
U.S. Cl. 49—380 **9 Claims**



1. A rigidifying system for a sliding sash window assembly comprising:
a tensioning element removably connected between vertical sides of a frame of the assembly to prevent outward bowing of said vertical sides,
holding means for one sliding sash of the window assembly including clip elements secured to the top corner regions of such sash,
means releasably anchoring said clip elements to said vertical sides of said frame,
said holding means further comprising tensioning straps encircling said one sliding sash vertically and engaging and holding said clip elements, and
additional clip elements on the bottom of said one sliding sash and being engaged and held by said tensioning straps.

4,691,478
INFILTRATION CONTROL DEVICE
John W. Lorg, 1235 A Woodchase La., Chesterfield, Mo. 63017
Filed Sep. 25, 1986, Ser. No. 911,513
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—499 **16 Claims**

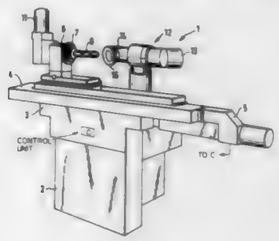


1. An infiltration control device for doors, operable windows and the like which comprises:
(a) an elongated tube, which includes:
(1) inner and outer sides;
(2) upper and lower edges;
(3) a fabric strip with opposite, overlapping side margins at said inner side;
(4) said strip being secured to itself at a lap seam adjacent to said side margins;
(5) opposite closed ends; and
(6) an enclosed pocket;
(b) insulation materials substantially filling said pocket; and
(c) longitudinally-extending fastener means secured to said tube over said seam thereof and adapted for mounting said device on a door, operable window or the like.

4,691,479
MACHINE AND PROCESS FOR CUTTING CHIPPING-GROOVES INTO ELONGATED PERIPHERAL MILLING CUTTERS WITH HEMISPHERICAL TIPS
Hans-Joachim Helle, Tübingen, Fed. Rep. of Germany, assignor to Montanwerke Walter GmbH, Tübingen, Fed. Rep. of Germany
Filed May 19, 1986, Ser. No. 865,043
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520521
Int. Cl.[4] B24B *3/02*
U.S. Cl. 51—165.71 **13 Claims**

1. Machine for cutting a cutting end and chipping-grooves, particularly into workpieces (18) forming elongated peripheral cutting tools such as milling cutters, die cutters, and the like, having a shank portion (9) and a cutting end which defines an essentially hemispherical end portion (29)
comprising
a cutting machine (1) having a machine bed (3);
a clamping device (6) for clamping the shank portion (9) of the workpiece, mounted on the machine bed;
a rotatably driven cutting device (12);

a rotatably driven disk-shaped cutting tool (15) on the cutting device;
a plurality of actuators (5,11,13) coupled, respectively, to the cutting tool (15) and the clamping device (6) for relative movement, adjustable in a coordinate system related to the workpiece (8),
wherein the coordinate system is defined by
an X-axis which contains the longitudinal axis of the workpiece (8),
a Y-axis which extends orthogonally to the X-axis, and
a Z-axis which extends at right angles to the X and Y-axes;
and a control unit (C) coupled to and controlling the movement of the actuators,
wherein, in accordance with the invention,
the control unit controls relative movement of the cutting tool (15) and of the clamping device (6) and hence the workpiece (8) by controlling the respective actuators (5, 11),
said cutting tool being moved by the respective actuator (13) in a direction parallel to a W-axis,
wherein said W-axis is determined by an axis which intersects an X-Y plane defined by the X-axis and the Y-axis at an angle (ϕ), which angle represents the pivoting angle of the cutting tool, and wherein the projection of the W-axis unto the X-Y plane extends parallel to the X-axis;

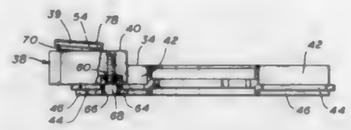


said control unit further controlling said relative movement of said actuators, continuously and without interruption, to move an intersection (31) of the axis of rotation of the cutting tool with the X-Y plane to describe, approximately, a part circle (23) having the concave sides thereof facing the hemispherical end portion (29) of the workpiece (8),
said part circle (23) beginning at a transition plane which intersects the X-Y plane at right angles, and defines a Y-Z plane, and positioned at the transition between the shank portion (9) and the essentially hemispherical end portion (29) of the workpiece; and
wherein said control unit further controls, simultaneously, movement, during passage of the cutting tool through said part circle (23), feed of the cutting tool parallel to the W-axis and towards the longitudinal axis of the workpiece (8), so that a finished cutting edge (21) on the workpiece (8) will smoothly continue between the transition plane (Y'-Z) and the end portion of said workpiece.
to provide a positive rake of the cutting edge in the direction of the longitudinal axis starting from the transitional plane towards the hemispherical portion (29) of the chipping groove cut by said cutting tool.

4,691,480
VALVE SEAT GRINDING APPARATUS
John R. Kelsey, 424 Wessex Rd., Valparaiso, Ind. 46386
Continuation-in-part of Ser. No. 650,841, Sep. 17, 1984, Pat. No. 4,610,112. This application Jan. 16, 1986, Ser. No. 819,281
Int. Cl.[4] B24B *15/02*
U.S. Cl. 51—241 A **10 Claims**

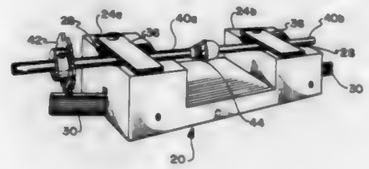
1. Valve seat grinding apparatus comprising:

(a) a rotatable drive wheel of disk shape having central means for connection to be driven by rotary drive means;
(b) a plurality of independently rotatable satellite wheels carried about said drive wheel with the respective radial planes of said satellite wheels being disposed at a selected included angle with respect to the axis of said drive wheel and disposed at a selected radial distance away from said axis of said drive wheel;



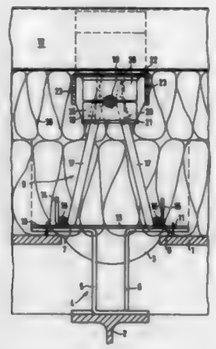
(c) a plurality of slide blocks intermediately connecting said drive wheel respectively with said satellite wheels;
(d) said selected included angle being selected within a range including ninety degrees (90°); and
(e) said drive wheel being made of shape, of material and of thickness to resist any deflection which would change said selected included angle by forces applied through said drive wheel to said satellite wheels within the operational range of forces employed with said apparatus;

4,691,481
DOPSTICK TRANSFER JIG DEVICE AND METHOD FOR USING SAME
Julius Souch, 1642 E. 33rd St., Lorain, Ohio 44055
Filed May 15, 1986, Ser. No. 863,365
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 51—277 **4 Claims**



1. A jig device for transferring a partially faceted gemstone from one dopstick to another dopstick so as to permit spatial relativity of the gemstone surfaces to the indexing head of the mechanical faceting device, and therefore to the facet cutting surface, to be maintained comprising:
two grooved blocks in association with each other;
means for clamping a dopstick in each of said grooves, and
two swivelable pawls, wherein said grooved blocks are attached to a base piece and separated from each other by a space large enough to accommodate the gemstones to be faceted; and wherein the groove in each of said blocks is in horizontal and vertical alignment with the groove in the other, and wherein further, said pawls are mounted in slots substantially directly below and parallel to said grooves, and are held by, and swivelable on pins located in said blocks, one end of each of said pawls being adapted to swivel upward toward an imaginary line extending in line with said grooves, and away from said jig device.

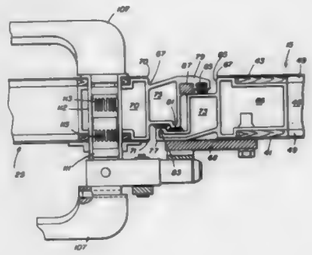
4,691,482
ROOF CONSTRUCTION
Horst D. Heinemann, Wolfsweg 10, D-5241 Gebhardshain, Fed. Rep. of Germany, and Alfred Jost, Wilnsdorf-Niederdilfen, Fed. Rep. of Germany, assignors to Horst D. Heinemann, Gebhardshain, Fed. Rep. of Germany
Filed Nov. 15, 1984, Ser. No. 671,658
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343984; Jun. 13, 1984, 3421871
Int. Cl.[4] E04D *12/00, 13/16;* **E04C** *1/78*
U.S. Cl. 52—3 **13 Claims**



1. In a roof construction for converting a ventilated roof into a thermally insulted, nonventilating roof without removing an existing roof sheathing which is carried by roof beams, the improvement comprising said existing sheathing having holes therethrough over the length of each roof beam at approximately equal intervals, wherein posts are secured on the roof beams, extend through the holes and project above the existing roof sheathing, wherein an intermediate carrier is secured on the posts, wherein said carrier supports a profile and extends above the posts which are arranged in a row, wherein the intermediate carrier includes insulating means for substantially preventing a flow of thermal energy between the posts and the profile through the intermediate carrier, wherein new roof sheathing is secured on the profile, wherein the carrier, the profile and the new sheathing are substantially completely supported by the posts, and wherein a space between the existing sheathing and the new sheathing is filled with an insulating layer.

4,691,483
SHELTER
Thomas L. Anderson, Nashua, N.H., assignor to Craig Systems Corporation, Amesbury, Mass.
Filed Dec. 31, 1984, Ser. No. 688,017
Int. Cl.[4] E04H *9/00;* **H05K** *9/00*
U.S. Cl. 52—79.1 **6 Claims**

1. A lightweight shelter for protecting electronic equipment from normal and abnormal environmental conditions including severe electromagnetic pulses, said shelter comprising:
wall panels and roof and floor panels each comprising inner and outer aluminum skin sheets with an insulating spacing material adhesively bonded therebetween;
along each line of intersection of a pair of side panels, an extruded aluminum tube of rectangular cross-section, the outer skins of the adjacent panels being extended substantially beyond the spacing material and being welded to each other and said tube thereby to form a substantially continuous conductive outer skin for said shelter;
in one side panel, a rectangular door opening frame comprising, along all four sides, an extrusion over which said inner and outr skins extend and to which said skins are welded;
hinged to said frame, a door comprising a door panel comprising inner and outer aluminum skins with an insulating spacer material adhesively bonded therebetween and a peripheral frame comprising, along all four sides, an extrusion over which the inner and outer skins of said door panel extend and to which said skins are welded, wherein said door opening extrusion and said door panel extrusion each include a box section which extend into a projecting lip portion, such that said door opening projecting lip portion is positioned relative to said door panel box section when said door is received into said frame, wherein said door opening projecting lip portion carries at least one peripherally mounted spring metal finger strip and said door panel box section carries at least one peripherally mounted spring metal finger strip which together provide at least two lines of conductive gasketing between said door opening frame and said door peripheral frame, when said door is received into said frame;

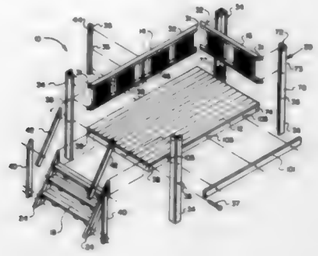


at least one weather gasket carried along the periphery of said door panel projecting lip portion which protects said at least one door opening projecting lip metal finger strip and said at least one door panel box section metal finger strip from ambient weather conditions when said door is received in said frame;
mounted at a plurality of spaced points around said door opening frame, a succession of locking ramps;
pivotally mounted at a plurality of spaced points around said door peripheral frame, a corresponding plurality of dogs adapted to engage said ramps; and
link means coupling said dogs to each other in sets for coordinated operation to engage said ramps and pull said door into intimate conductive engagement with said door opening frame, compressing said spring finger strips.

4,691,484
EXPANDABLE DECK SYSTEM
James W. Wilson, Rte. 2, Box 750, Big Sandy, Tenn. 38221
Filed Mar. 14, 1986, Ser. No. 839,600
Int. Cl.[4] E04F *11/10;* **E04B** *1/343*
U.S. Cl. 52—79.6 **17 Claims**

1. An improved deck system of the type in a wooden platform is constructed with side panels at least partially thereabout and steps providing access thereto, wherein the improvement comprises a portable deck structure including a fixedly assembled platform, fixedly assembled longitudinal side panel, fixedly assembled end panel, fixedly assembled step section and plurality of structural members adapted for securing said platform, steps, side and end panels one to the other and to a supporting surface, said longitudinal side panel further being constructed in the form of a structural truss and including a center attachment beam for coupling an intermediate section of said platform to said side panel, and said side panels being adapted for interchangeability on opposite sides and ends

of said platform, said step section being adapted for securement to either end of said platform, and said platform being adapted



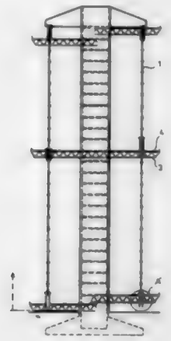
for attachment to a second platform positioned on end or side thereof facilitating bi-directional expansion of said deck.

4,691,485

APPARATUS AND PROCESS FOR THE CONSTRUCTION OF MONOLITHIC CEILINGS

István Nagy; Ferenc Nagy; István Pozsgai; László Karátson; Andor Gábori; Kálmán Tóth, and Jeno Zubretzky, all of Budapest, Hungary, assignors to Epitestudomanyi Intezet & Konnyuipari Szerelo es Epito Vallalat, Hungary

Filed May 29, 1986, Ser. No. 868,802
Claims priority, application Hungary, Nov. 30, 1982, 3838/82
Int. Cl.[4] E04B *1/35*
U.S. Cl. 52—125.1 **12 Claims**



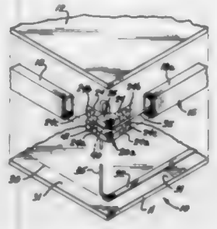
1. Apparatus for the construction of monolithic ceilings, particularly for monolithic ceilings of multi-level or pillar-framed buildings having suspended ceilings, said apparatus is provided with surface- and in given case working level- forming formwork shell surrounding the monolithic concrete formspace of the ceiling formwork bearer supporting the formwork shell, furthermore actuating mechanisms, e.g., lifting units for lifting and lowering the formwork bearer, the actuating mechanisms, e.g., lifting units are in force-transmitting connection directly or indirectly with a certain part, e.g., pillars of the temporary or permanent vertical load bearing structures of the building, load bearing elements, e.g., bear frame, connecting member, etc., are built in between the formwork bearer and the lifting units, characterized in that the lifting units /7/ are interconnected preferably with storey- high intermediate members /8/ forming forced trajectory for the formwork bearer /3/, furthermore the intermediate members /8/ are provided with releasable hinged bearers /9/ fixed to the vertical load bearing structure /1/ temporarily holding and temporarily releasing the intermediate members /8/ whereby to allow an inching movement of the lifting units /7/.

4,691,486

GLASS ASSEMBLY FOR REFRIGERATOR DOORS AND METHOD OF MANUFACTURE

Frank Niekrasz, 18009 Loomis Ave., Homewood, Ill. 60430, and Andrew Menke, 8600 W. 145th Pl., Orland Park, Ill. 60462

Filed Apr. 29, 1982, Ser. No. 372,993
Int. Cl.[4] E06B *7/12*; F16B *12/46*; A47F *3/04*; H05B *3/08*
U.S. Cl. 52—172 **9 Claims**



1. A glass assembly comprising a pair of similarly sized glass panes disposed in side-by-side relation, a spacer interposed between said panes for maintaining said panes in parallel relation with an airspace therebetween, said spacer including a plurality of hollow tubular members disposed adjacent the peripheral edges of said panes corner key elements connecting together ends of adjacent pairs of said tubular members, said corner key element each having a pair of perpendicularly disposed interconnected legs, said legs each being adapted for mounting into an end of a respective tubular spacer member, at least some of said corner key elements being formed with a first electrical lead wire passage means extending about the periphery of the corner key element communicating between the ends of two tubular members connected to said corner key element for permitting electrical lead wires to be trained about said corner key element from the end of one of the tubular members connected thereto and into the end of another tubular member connected thereto, and said some corner key elements being further formed with second electrical lead wire passage means communicating between said air space and said first passage means for permitting an electric lead wire within said air space to be directed through said second and first passage means of the corner key element and into either tubular member connected thereto, one of said panes having a conductive surface on a side thereof adjacent said airspace, a plurality of lead wires electrically coupled to said conductive surface, said lead wires coupled to said conductive surface being trained through the passage means of some of said corner key elements and longitudinally through some of said tubular members to an egress opening therein, said lead wires extending out of said egress opening to a location outside the periphery of said tubular members and glass panes, and means sealing the periphery of said assembly with said lead wires extending outwardly therefrom.

4,691,487

DRAIN TUBE FOR WINDOWS

Gerald Kessler, 302 McClurg Rd. at Southern Blvd., Box 389, Youngstown, Ohio 44501

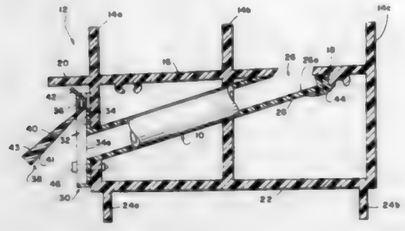
Filed Jul. 31, 1986, Ser. No. 891,346
Int. Cl.[4] E06B *7/14*
U.S. Cl. 52—209 **11 Claims**

1. A window assembly, comprising

an extruded frame serving as a window sill and having at least one vertically extending wall defining the exterior of said sill, and at least one generally horizontal wall for defining the upper surface of the sill for contact with a movable window;

a straight drain tube having an inlet end and an outlet end, said outlet end having a closure face integrally formed therewith;

a flap-like closure removably and pivotably secured to said closure face of said drain tube, said flap-like closure including a horizontal leg and a substantially longer vertical leg, said vertical leg having a tapered cross-section whereby said vertical leg becomes progressively thicker in cross-section as it approaches its end farthest from said horizontal leg, said vertical leg including a concave depression in its exterior face;



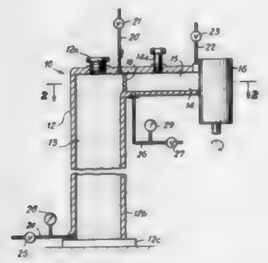
said drain tube being positionally mounted in said extruded frame at an angle from the horizontal with its inlet end being generally flush with a hole in said generally horizontal wall, said drain tube extending through an opening in said vertically extending wall and with said closure face being mounted to the exterior face of said vertically extending wall at a lower level than said inlet end.

4,691,488

METHOD FOR PRODUCING A CONCRETE-FILLED STEEL BODY FOR SUPPRESSING VIBRATIONS

Kauko Tomma, Helsinki, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Continuation-in-part of Ser. No. 291,928, Aug. 11, 1981, abandoned, which is a continuation of Ser. No. 33,219, Apr. 25, 1979, abandoned, which is a continuation of Ser. No. 648,744, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 514,320, Oct. 11, 1974, abandoned. This application Oct. 31, 1984, Ser. No. 666,967
Int. Cl.[4] E04C *3/10*; B65H *16/02, 18/00*; B28B *9/04*
U.S. Cl. 52—223 R **10 Claims**



8. A constructional element comprising a concrete-filled steel frame including a rotary unit for a machine having rotating paper web forwarding means, said element having good load carrying and vibration absorbing properties, comprising:

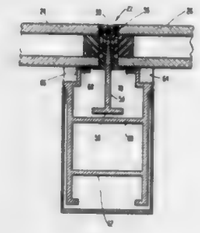
a combination of steel and concrete combined as load carrying materials, the main steel parts of said element forming a pressurizable hollow box-like steel casing, said casing being initially filled with a fluid concrete mass; supplying an internal pressure from an external source on said concrete mass during its hardening phase, said pressure being at least about 30% of but not exceeding the elastic limit of the casing, so as to positively expand said steel casing and provide therein an elastic expansion exceeding the sum of the shrinkage of said concrete mass during its hardening phase and any deformation occurring due to any normal load from said machine, said casing forming the main prestressing element of said constructional element, said casing being elastically expanded by the concrete for maintaining a firm contact between said casing and said concrete when substantial external loads are applied to said element, said concrete supporting said steel casing and damping vibrations induced in said steel casing.

4,691,489

JOINT SEAL ASSEMBLY

John R. Shea, Jr., 6404 Murray Hill Rd., Baltimore, Md. 21212

Filed Feb. 11, 1986, Ser. No. 828,333
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—235 **18 Claims**



1. An architectural panel assembly having a pair of adjacent panels with spaced opposing edge surfaces of substantially equal width, each panel having opposite first and second surfaces, comprising:

a flexible and compressible sealing means configured to seal the space between the opposing edge surfaces of the two adjacent panels when the panels are in place, said sealing means having a horizontal cross section with a crown and two spaced legs, said two spaced legs each having an end opposite said crown, said crown defining an end of said sealing member opposite said leg ends, said two spaced legs forming a slotted cavity therebetween having an elongated opening opposite said crown, said opening extending the vertical length of said sealing means, the ends of said two spaced legs being flanged outwardly away from said opening, each of said flanged portions having an inner flange surface facing the crown end for abutting the first surface of one of said adjacent panels, the sealing means having a dimension measured from each of said inner flange surfaces to said crown corresponding to the width of said adjacent panels to be sealed, for limiting the crown of the sealing member to a position flush with the second surface of each of the adjacent panels, no portion of said sealing means extending beyond the second surface of the adjacent panels;

a rigid member configured to fit in the cavity portion of said sealing means to maintain said sealing means in alignment with the opposing edge surface of said adjacent panels for positioning the crown flush with said second surface of each of the adjacent panels for the entire length of the rigid member, whereby said sealing means and said rigid member are configured for complete sealing installation from the first surface side of said adjacent panels.

4,691,490

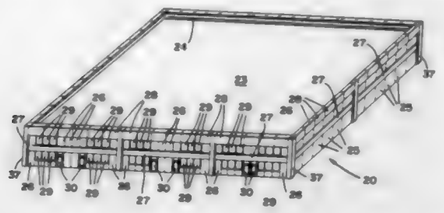
CEMENTITIOUS MODULAR PANEL AND PANEL ASSEMBLY FOR BUILDING WALLS AND METHOD OF CONSTRUCTION

James M. Leaver, 4145 Canyon Rd., Lafayette, Calif. 94549

Continuation of Ser. No. 419,746, Sep. 20, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 825,080

Int. Cl.[4] E04B 2/00

U.S. Cl. 52—293 17 Claims



1. An improved flanged cementitious and glass fiber reinforced building panel unit for assembly into a self-supporting unit by bolting through a flange of said panel comprising a generally rectangular panel structure with a thickness of at least ¾ inch consisting of glass fiber reinforced concrete containing from four (4) to six (6) percent glass fiber by weight, at least fifty (50) percent of cement by weight and aggregate said aggregate consisting of diatomaceous earth and Vermiculite, said panel structure having at least one integral flange along one of its edges, said flange having a thickness at least equal to the panel structure thickness, and said flange angularly disposed to the surface of said panel structure.

4,691,491

SUPPORT SYSTEMS

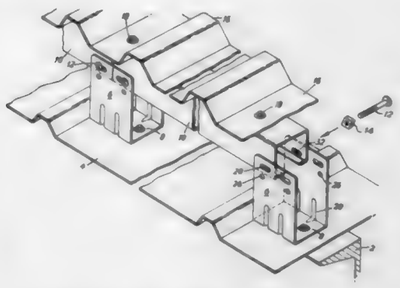
Raymond A. Lilley, Jordans, United Kingdom, assignor to Cladcolor Profiling Limited, Newport, United Kingdom

Filed Mar. 19, 1986, Ser. No. 841,285

Claims priority, application United Kingdom, Mar. 20, 1985, 8507191

Int. Cl.[4] E04B 5/52

U.S. Cl. 52—481 7 Claims



1. A support system comprising:

a pair of U-shaped brackets arranged to be mounted in alignment with each other, and each having rail locating means;

a spanning rail of inverted U-shaped cross-section each of said pair of brackets and said rail being nested one within the other with the rail resting on the locating means of each bracket; and

an inverted U-shaped clamp member for each bracket, each said clamp member being arranged to straddle said rail and to be secured to a corresponding bracket to provide a rigid composite structure of generally rectangular configuration and each said clamp member defining a profiled recess arranged to engage said locating means and by cam action effecting displacement of the clamp member with respect to the bracket to bring the clamp member into a predetermined position with respect to said bracket.

4,691,492

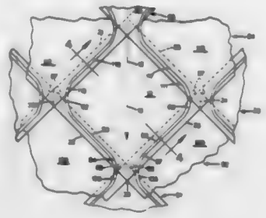
INTERLOCKING ROOF TILE

Patrick J. Kane, Vancouver, Canada, assignor to Creative Metal Designs Ltd., Vancouver, Canada

Filed Mar. 7, 1985, Ser. No. 709,208

Int. Cl.[4] E04D 1/00

U.S. Cl. 52—519 23 Claims



1. A tile adapted to cooperate with similar tiles to form a tiled surface, the tile being a relatively thin sheet and having:

(a) a periphery having first and second side edges intersecting at upper and lower corners and being disposed symmetrically about a central axis extending between the corners so that, when the tile is installed, the central axis coincides essentially with a line defining free water flow down the tile between upper and lower tile portions, the side edges being mirror images of each other about the central axis,

(b) first and second raised ribs extending symmetrically as mirror images of each other on each side of central axis, each rib having upper and lower rib portions which are substantially similar in cross-section to each other and are interconnected so as to extend smoothly and continuously between the upper and lower tile portions to increase stiffness of the tile, the upper and lower rib portions having rib axes which are also mirror images of each other about a lateral axis disposed normally to the central axis, the ribs intersecting the respective side edges generally adjacent to the upper and lower corners to provide first and second intermediate edge portions extending between the intersections of the first and second ribs with the first and second side edges respectively,

(c) a generally flat first side margin of the tile extending between the first intermediate edge portion and the first rib, and a generally flat second side margin of the tile extending between the second intermediate edge portion and the second rib,

(d) the upper rib portions being generally complementary to the lower rib portions so that the lower rib portions of an upper tile can fit over the upper rib portions of a lower tile.

4,691,493

THIN PLATE STRUCTURE

Anders Larsen, Hasley, Denmark, assignor to Nord-Plan Stalrooler A/S, Vipperod, Denmark

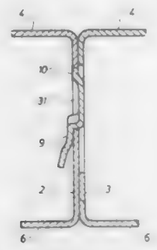
Filed Nov. 1, 1985, Ser. No. 794,191

Claims priority, application Denmark, Nov. 15, 1984, 5436/84

Int. Cl.[4] E04C 1/30, 2/42, 3/04

U.S. Cl. 52—588 13 Claims

1. A thin plate structure such as a deck structure for instance for a footbridge and comprising at least two abutting, substantially horizontally placed profiled girders, each girder comprising at least two substantially vertical, spaced, plate-shaped side members, the girders including a plurality of connecting means in the side members, characterized in that the connecting means are locking means comprising at least one downwardly pointing locking tongue integral with an associated one of the side members of each girder, said locking tongue extending outward in an offset manner along a bending area and downward therefrom, and furthermore co-operating with a locking tongue opening punched out opposite the locking tongue in an abutting side member of an adjacent girder, and in that the locking means comprises at least one upward locking gill cut out in one of the side members of each girder, said locking gill extending outward and upward in an offset manner along a generally horizontally extending bending area and furthermore co-operating with a locking gill opening punched



out opposite the locking gill in the abutting side member of the adjacent girder, and that the side members furthermore are so resilient that they allow an insertion of the locking tongue and the locking gill into the locking tongue opening and the locking gill opening, respectively, the locking gill having an upper edge surface defining an upwardly-facing rim surface, and the locking gill opening having an opposed, downwardly-facing surface which abuts said rim surface of said locking gill, the bending area of the locking tongue having a downward side and the locking tongue opening have an upward rim surface which abuts said downward side, the locking tongue having an inner side which has an uppermost area, the abutting side member having an inner side abutting said uppermost area, said tongue and gill being spaced vertically and separated by a planar area of the side member.

4,691,494

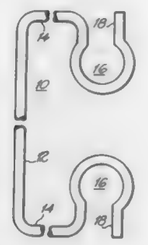
METAL FRAMING SYSTEM

Jacob M. Gwynne, 1853 Woodhaven Cir., Sarasota, Fla. 33562

Filed Jun. 28, 1985, Ser. No. 749,731

Int. Cl.[4] E04C 3/30

U.S. Cl. 52—729 29 Claims



1. A framing member continuously roll formed from a sheet of material of substantially constant thickness and having an inner and an outer surface comprising:

a generally planar web;

a pair of spaced apart, generally parallel and planar flanges each disposed from a different edge of said web and extending generally at right angles to the plane of said web, so as to form with said web a channel-shaped member with three sides of a generally rectangular cross-section with said outer surfaces, smooth and each lying in a plane;

each of said flanges having inwardly disposed along each distal edge, continuously roll formed curved side walls defining multi-purpose fastening recesses;

said side walls of said recesses having a curved configuration extending through more than 180 degrees;

said recesses terminating in a straight line segment recurved in relation to said curved configuration; and

said straight line segment of said recesses ends in the plane of said flange.

4,691,495

PRODUCT RETARD DEVICE FOR DROP-LOADING PACKAGING MACHINE

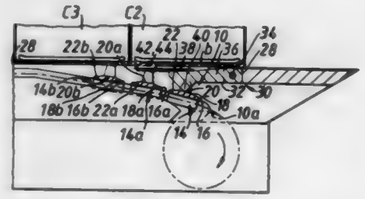
Rudolf Schuh, Schweich, Fed. Rep. of Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 18, 1986, Ser. No. 886,713

Claims priority, application United Kingdom, Jul. 20, 1985, 8518360

Int. Cl.[4] B65B 21/02, 5/06

U.S. Cl. 53—48 5 Claims



1. In a machine for conveying empty open-top article carriers along a feed platform to a loading station and drop-loading articles such as bottles or the like into the article carriers at said loading station, a device for intercepting the fall of the articles after they have entered the article carriers, said device comprising support means arranged at the loading station to temporarily displace the base panel of the article carriers upwardly and provide an elevated platform to which the dead load of the articles is transmitted when the articles are dropped into the article carriers, actuating means for causing said support means to be displaced upwardly and thereafter withdrawn whereby the dead load of said articles is transferred from said support means to the base panel of said article carriers, said support means comprising a pivotal arm disposed below the path of movement of said article carriers, and said feed platform being constructed so as to permit said pivotal arm to engage the base panel of said article carriers, characterized in that said actuating means includes an endless series of cam plates arranged to move below said pivotal arm and a cam follower associated with said pivotal arm so as to cooperate with said cam plates.

4,691,496

FILLER LINE MONITORING SYSTEM

F. Allan Anderson, San Francisco; Henry C. J. Chen, Fremont; Vito A. DiMucci, Saratoga, and Roger C. Wang, San Jose, all of Calif., assignors to Peco Controls Corporation, Milpitas, Calif.

Filed Jan. 31, 1983, Ser. No. 462,640

Int. Cl.[4] B65B 57/00

U.S. Cl. 53—53 20 Claims

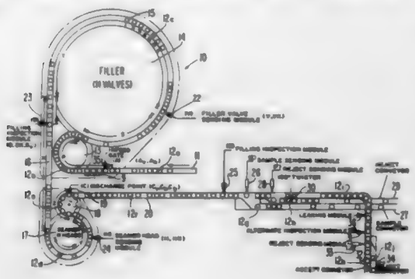
1. A monitoring and control system for a fluid container filler line having an empty container in-feed conveyor, a multi-valve rotary fill station, a multi-head seamer station to close and seal the then filled containers, a discharge conveyor and a fill height detector for under and overfill detection of liquid

within said containers, said monitoring and control system comprising:

(a) first sensor means located for indicating a first valve of a sequence of numbered fill valves in said fill station, a valve counter, and means for resetting said valve counter to 1 each time increment that said first valve passes said first sensor means;

(b) second sensor means located for counting each valve of the sequence to fill valves; a signal from said second sensor means for advancing said valve counter;

(c) controller means responsive to said first and second



sensor means and said valve counter for spacially tracking each of said containers through said system and for identifying a particular fill valve for each particular container;

(d) detector means responsive to said controller means and fault signals from said fill height detector for detecting an improperly filled faulty container and the particular numbered valve which filled said faulty container; and

(e) means responsive to detection of improperly filled faulty containers for preventing a container on said infeed conveyor from being positioned in said filter station at a numbered valve of said fill station which has been detected as being faulty.

4,691,497

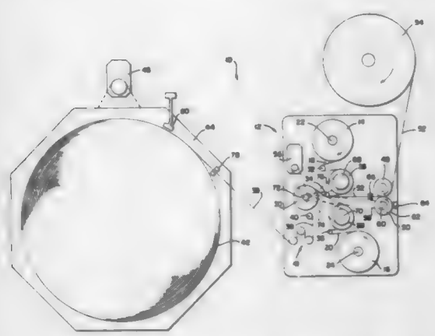
FILM LAMINATION STRETCH WRAPPING

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Mar. 28, 1986, Ser. No. 845,556

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—399 **36 Claims**



1. An apparatus for assembling and dispensing a multi-ply web and wrapping a load with the multi-ply web comprising:

a film web dispenser including first and second upstream roller means which are spaced from each other, each for receiving at least one of a plurality of webs provided by at least two rolls of web material, downstream roller means for receiving the plurality of webs from the upstream roller means and for dispensing the film web as a multi-ply film web, and means for prestretching at least one of the webs between the upstream and downstream roller means;

means for rotating the load relative to the film web dispenser to wrap the multi-ply web on the load;

means for maintaining tension on the multi-ply web between the dispenser and the load; and

means for inserting a core material between the plurality of webs upstream of the downstream roller means and downstream of the first and second upstream roller means.

4,691,498

PROCESS AND MACHINE FOR HOOPING A PACKAGE WITH A HOOPING BAND

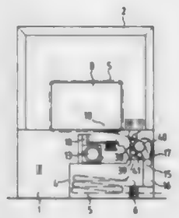
Nikolaus Stamm, Kilchberg, Switzerland, assignor to A. Konrad Feinmechanik AG., Mehrenschwand, Switzerland

Filed Mar. 3, 1986, Ser. No. 834,401

Claims priority, application Switzerland, Mar. 15, 1985, 1100/85

Int. Cl.[4] B65B *13/22*

U.S. Cl. 53—399 **8 Claims**



1. A process for hooping a package with a hooping band comprises: providing a first and second band supply means and a joining station, feeding a band from said first band supply means to said joining station such that said band envelopes a package to the hooped, sensing when said band arrives at said joining station, retracting said band by said first band supply means at a first speed and said second band supply means at a second speed upon sensing the arrival between said first and second band supply means of said band at said joining station so as to create a reserve band loop while loosely engaging said band around said package, sensing when said band is loosely engaged, further retracting said band by said first band supply means at a second speed lower than said first speed so as to use up said reserve band loop while tensioning said band around said package, sensing when said band is tensioned, joining said band in said joining station and separating the joined band from said joining station.

4,691,499

METHOD OF TENSIONING A WEB OF PACKAGING MATERIAL

Yoshiaki Umeda; Ryouhei Matsumoto; Hiroyasu Isomura, and Hisakuni Shimotaka, all of Aichi, Japan, assignors to Fuji Machinery Company, Ltd., Aichi, Japan

Filed Oct. 31, 1984, Ser. No. 666,676

Claims priority, application Japan, Apr. 16, 1984, 59-77010; Apr. 16, 1984, 59-77013

Int. Cl.[4] B65B *9/06, 41/12, 41/16*

U.S. Cl. 53—451 **20 Claims**

1. A method of tensioning a web of packaging material in a form-fill-seal packaging system, wherein the web of packaging material is pulled from a supply roll by means of web feeding rolls, and guided over means for forming the web or packaging material into tubing for enveloping articles to be packaged within the packaging material and for forwarding the formed enveloping tubing toward a sealing means for forming sealed

packages, between the web feeding rolls and the tube forming means, comprising the steps of:

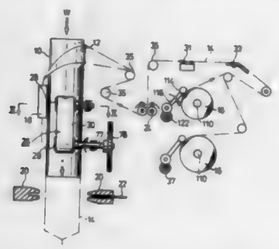
providing a single source of driving power for both said web feeding rolls and said tube forming means;

providing a first transmission means upon a shaft, between said single source of driving power and said web feeding rolls, and between said single source of driving power and said tube forming means, for driving said web feeding rolls and said tube forming means at a low rate of speed;

providing a second transmission means upon said shaft, between said single source of driving power and said web feeding rolls, and between said single source of driving power and said tube forming means, for driving said web feeding rolls and said tube forming means at a high rate of speed;

providing a one-way transmission means between both said first and second transmission means and said tube forming means;

actuating said first transmission means while deactuating said second transmission means so as to drive said web feeding rolls and said tube forming means at said low rate of speed so as to initially tension said web of material;



actuating said second transmission means while deactuating said first transmission means so as to drive said web feeding rolls and said tube forming means at said high rate of speed for conveying a predetermined amount of said web or packaging material at a high rate of production speed in preparation for formation of an enveloping package within which one of said article is to be enveloped;

actuating said first transmission means while deactuating said second transmission means so as to drive said web feeding rolls and said tube forming means at said low rate of speed in preparation for stopping of said web feeding rolls and said tube forming means whereupon sealing of said package can occur; and

deactuating said first transmission means while maintaining said second transmission means deactuated, and stopping said web feeding rolls and said transmission shaft, so as to stop driving power from being transmitted to said web feeding rolls and said tube forming means yet permitting said one-way transmission means to continue to rotate said tube forming means for a limited time after said stoppage of said web feeding rolls so as to retain said tension upon said web of packaging material within said stopped mode.

4,691,500

LID SEALING MACHINE

Ronald V. Danforth, West Springfield, Mass., and Medric H. Pleau, Vernon, Conn., assignors to Packaging Systems International, Inc., Ellington, Conn.

Filed Jul. 18, 1986, Ser. No. 888,111

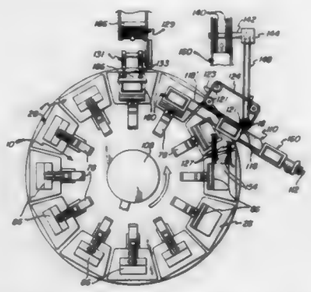
Int. Cl.[4] B65B *7/28, 51/14*

U.S. Cl. 53—478 **28 Claims**

1. In a machine for sealing lids to containers having a body with upstanding sidewall portions and a flange portion extending laterally outwardly about the upper periphery thereof, the combination comprising:

a carousel including a revolving horizontal table with means at each of a multiplicity of locations spaced circumferentially thereabout for seating such a container and for providing underlying support for its flange portion, said table also having at each of said seating locations a mechanism thereon for sealing a lid upon a container thereat, said sealing mechanism including a platen movable downwardly against said seating means for applying pressure in cooperation with said seating means and movable concurrently with said table as said table revolves along an arc aqual to at least one-fourth of the circle of rotation of said table; and

an infeed system for delivering such containers sequentially to each of said locations as said table revolves, said system defining a rectilinear feed channel extending along a path substantially tangential to the circle of rotation of said seating means, said infeed system including at least one



substantially horizontally disposed timing screw disposed at the base of said feed channel along a portion of the length thereof and dimensioned and configured to receive and engage the bottom portion of the body of such containers within the convolution of its thread portion for conveyance therealong from an intake end to an outlet end thereof to produce a predetermined spacing of the containers along said feed channel defined by said thread portion of said timing screw, a guide element having a surface portion disposed laterally adjacent and upwardly of said screw and extending generally parallel to the axis thereof for abutment by the containers conveyed thereby, and means adjacent said intake end of said timing screw for supporting the containers in a horizontal attitude and for sequentially presenting them to the upper portion of said screw.

4,691,501

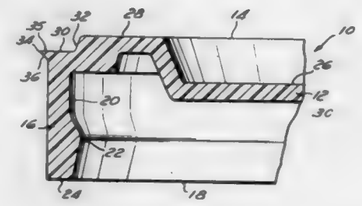
METHOD OF FEEDING AND APPLYING RIDGED CONTAINER CLOSURES

Robert F. King, La Habra Heights, Calif., assignor to King Plastics, Inc., La Habra Heights, Calif.

Filed Jun. 10, 1985, Ser. No. 742,996

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—485 **7 Claims**



4. A high-speed method of capping containers, comprising;

providing a stack of flexible lids having a greater outside diameter at their top than at their bottom, said lids having, a circular top surrounded by a depending skirt and a ridge on their upper, external corner protruding beyond the surface of said skirt;

placing said stack of lids edgewise on a rotating rod, with the bottom side of the lids facing the end of the rod which feeds into a chute which positions the lids onto the containers;

using the ridges to create pressure on the lids at the terminal end of the rod, said pressure maintaining the lids in position against a deadplate at the top of the chute so that the lids can be forced into the chute;

restraining the lids from dropping out the bottom of the chute unless the lid is on top of a container;

feeding a row of containers to be capped directly beneath the chute on a conveyor belt, the distance between the conveyor and the chute being such that the top of the container hooks onto the lid which is at the bottom of the chute, and pulls the lid out of the chute; and

passing the container and lid underneath a rotating roller which presses the lid into locking engagement with the top of the container.

4,691,502

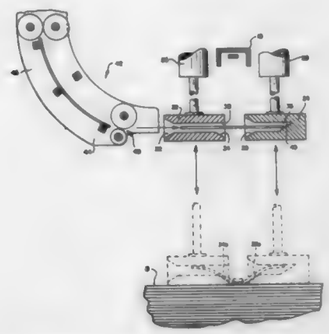
APPARATUS FOR PLACING A CARD ON A BUNDLE OF SHEET-LIKE ARTICLES

Frank H. Convey, Jr., Peru, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Aug. 15, 1986, Ser. No. 896,721

Int. Cl.[4] B65B *13/20, 61/20*

U.S. Cl. 53—529 **5 Claims**



1. An apparatus for placing a card on a bundle of sheet-like articles at a typing station where the bundle is tied, said apparatus comprising:

support means for supporting the card adjacent the bundle at the tying station, said support means comprising two spaced pressure blocks for compressing the bundle, said two pressure blocks being movable between an engaged position in which a surface on each block engages the top surface of the bundle for compressing the bundle and a retracted position, each of said two pressure blocks comprising a slot space from said engaging surface, extending parallel to the top surface of the bundle and aligned with the slot in the other of said two pressure blocks for receiving the card, said slots supporting the card adjacent the top surface of the bundle when the respective engaging surfaces of said two pressure blocks engage the top surface of the bundle;

feed means for feeding the card into said aligned slots;

means for placing a strap around the bundle and the card while said surface on each block engages the top surface of the bundle and the bundle is compressed by said pressure blocks and the card is supported adjacent the top surface of the bundle and effecting engagement of the card with the top surface of the bundle to secure the card to the top surface of the bundle upon trying of the strap; and

means for effecting relative movement of said support means and the bundle for stripping the card from said support means.

4,691,503

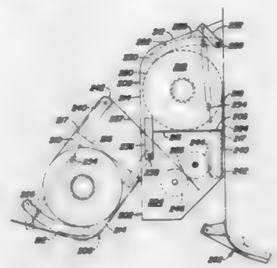
HOUSING FOR HOLDING A SUPPLY ROLL OF LARGE ROUND BALE WRAP MATERIAL

Josef Frerich, Dietrichingen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 8, 1986, Ser. No. 883,793

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—587 **8 Claims**



1. In a large round baler including support structure adjacent a bale-forming chamber, a bale wrapping mechanism mounted to the support structure and including a wrap material supply roll support adapted for supporting a supply roll from which wrap material is pulled during wrapping of a bale located in the chamber, the improvement comprising: said supply roll support being defined in part by a housing including opposite sidewalls joined by top and bottom walls so as to define an opening facing the bale-forming chamber, when the housing is in a normal dispensing position, and a further wall opposite the opening; a panel fixed to the support structure and normally closing said opening; and a housing support including pivot means coupled to the housing and defining a horizontal pivot axis below a portion of the housing bottom wall remote from the chamber and about which the housing is pivotable to a lowered, loading position wherein the opening faces away from said chamber for receiving a supply roll of wrap material for being supported by the bottom wall when the housing is in its dispensing position.

4,691,504

ROTARY MOWER FOR A TRACTOR

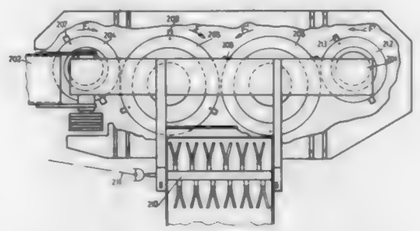
Josef Glunk, Gottmadingen, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Filed Jan. 14, 1986, Ser. No. 819,157

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501123

Int. Cl.[4] A01D *55/18*

U.S. Cl. 56—192 **5 Claims**



1. In a rotary mower laterally mountable on a tractor comprising a mowing drum mounting member connected to said tractor, a plurality of said mowing drums rotatably mounted on the underside of said mowing drum mounting member with the axes of rotation of said mowing drums substantially upright, at least one cutting tool mounted on a bottom of each of said mowing drums, wherein the cutting diameters for orbits of said cutting tools mounted on adjacent mowing drums overlap each other and said mowing drums are driven rotatably by said tractor, the improvement wherein at least three of said mowing drums are mounted on said mowing drum mounting member, said cutting diameters for said cutting tools mounted on at least two different ones of said mowing drums are different, and at least one of said mowing drums is rotated in a direction of rotation opposite to that of another two of said mowing drums, four of said mowing drums being munted on said mowing drum mounting member, two of said mowing drums being mounted on opposite ends of said mowing drum mounting member and having said cutting tools mounted thereon whose cutting diameters are smaller than said cutting diameters of the remaining mowing drums, the two mowing drums closest to said tractor rotating in the same direction of rotation, the other two of said mowing drum furthest from said tractor rotating in an opposite direction of rotation.

4,691,505

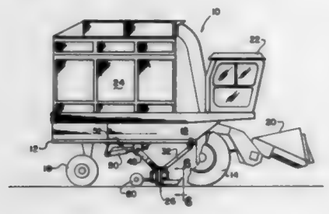
STALK SHREDDER FOR SELF-PROPELLED COTTON STRIPPER

Donald V. Browne, Colorado City, Tex., assignor to Browne Brothers, Inc., Colorado City, Tex.

Filed Jun. 4, 1986, Ser. No. 870,723

Int. Cl.[4] A01O *49/00*

U.S. Cl. 56—503 **3 Claims**



1. A machine for hrvesting four rows of cotton and shredding the stalks after harvest having

a. a frame,

b. two front ground engaging wheels on the frame,

c. two rear ground engaging wheels on the frame,

d. a power unit on the frame,

e. wheel drive means attached from the power unit to the front ground engging wheels for moving the machine in a forward direction,

f. a cotton harvesting element for each row forming means for harvesting cotton from cotton stalks on that row,

g. the four cotton harvesting elements on the frame forward of the front ground engaging wheels, and

h. storage means on said cotton harvesting machine for storing cotton harvested from the stalks;

Wherein the Improved Structure Comprises:

i. a horizontal traverse shredder bar between the front ground engaging wheels and the rear ground engaging wheels,

j. a pivot ear attached to each side of the frame,

k. a support arm pivoted to the pivot ear for supporting the shredder arm,

l. adjustable clamps clamping the support arm to the shredder bar,

m. a pitman pivoted to the clamp on the shredder bar,

n. a lift crank pivoted to

o. a frame bracket attached to the frame,

p. said lift crank pivoted to the pitman,

q. bell crank connected to the lift crank,

r. a hydraulic cyliner connecting the bell crank to the frame bracket so that operation of the hydraulic cylinder will act to raise and lower the shredder bar,

s. two gauge wheels,

t. a carriage clamp attached to the shredder bar near each end of the shredder bar,

u. a carriage vertically adjustable on the carriage clamp,

v. one of said gauge wheels attached to each carriage,

w. a shredder unit for shredding stalks for each row harvested,

x. a shredder bracket for each shredder unit clamped to the shredder bar,

y. said shredder unit attached to said shredder brackets,

z. a right angle gear drive on each of said shredder unit,

aa. a shredder blade attached to the right angle gear drive,

bb. a drive shaft journalled to the shredder bar parallel thereto,

cc. a drive belt at each shredder unit,

dd. said drive belt unterconnecting a sheave on the drive shaft with a sheave on the right angle gear drive, and

ee. a hydraulic motor connected to said drive shaft.

4,691,506

APPARATUS FOR DEFOLIATING SUGAR BEETS AND THE LIKE UTILIZING FLEXIBLE FLAILS WITH RIGID CUTTING MEMBERS AT THE FREE ENDS THEREOF

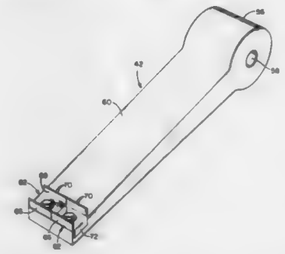
Schwitters, Wayne J., Clara City, Minn., assignor to WIC, Inc., Shelly, Minn.

Filed Jun. 17, 1985, Ser. No. 745,191

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] A01D *23/02*

U.S. Cl. 56—121.4 **20 Claims**



1. Apparatus for defoliating sugar beets and the like comprising a frame including front, rear and side members, at least one rotor journaled for rotation between said side members, a plurality of flexible polyurethane flails, means for pivotally connecting said flails to said rotor adjacent one end thereof, and rigid means mounted on each of said flails adjacent the other end thereof.

4,691,507

POLYURETHANE FLAIL FOR USE IN DEFOLIATING SUGAR BEETS AND THE LIKE

Wayne J. Schwitters, Clara City, Minn., assignor to WIC, Inc., Shelly, Minn.

Filed Oct. 15, 1985, Ser. No. 773,121

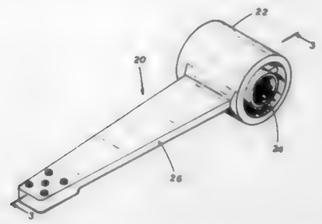
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] A01D *23/02*

U.S. Cl. 56—121.4 **21 Claims**

1. A flexible flail for use in defoliating sugar beets and the like comprising a relatively flexible polyurethane shank, a

polyurethane hub integral with one end of said shank for attachment to a rotor of defoliating apparatus, and a plurality of metal relatively rigid studs projecting from one side of said shank adjacent the other end thereof.



4,691,508

SPINNING OR TWISTING MACHINE WITH A DRIVE BELT PERFORMANCE MONITOR

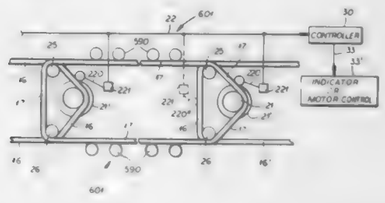
Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 834,627

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506822

Int. Cl.⁴ D01H *13/14*

U.S. Cl. 57—78 **8 Claims**



1. A textile machine for spinning or twisting yarn, comprising in combination:

a plurality of groups of operating units rotatable for spinning or twisting yarn spaced apart longitudinally along the length of the textile machine, each of said groups of operating units comprising at least one row of rotatable elements tangentially drivable to rotate the respective operating units;

a respective drive belt tangentially engaging each of the rotatable elements of a respective group and a resepctive pair of guide rollers around which said belt passes at each of two opposite ends of the respective row, whereby a plurality of said drive belts each driving only the elements of the respective group are arrayed longitudinally along said machine and between opposite ends of the machine, looping ends of adjacent belts overlapping, each of said belts passing around and engaging the pair of guide rollers about which an adjacent belt passes at each overlap between said belts;

at least one drive motor connected to at least one of said belts and forming a drive means for driving said belts and said machine;

a respective drive-belt-performance-monitoring means for each of said belts for sensing a deviation from normal operation of a drive belt monitored thereby tending to cause yarn breakage in the group of operating units of the row of elements tangentially driven by the monitored drive belt subject to said deviation; and

control means responsive to said monitoring means and coupled to said drive means for inactivating said drive means and shutting down said machine upon the detection of said deviation by the respective monitoring means of any of said belts.

4,691,509

OPEN-END FRICTION SPINNING MACHINE

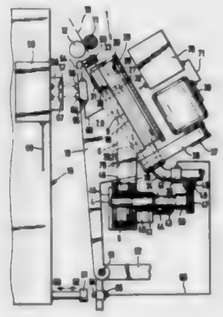
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Continuation of Ser. No. 692,972, Jan. 22, 1985, abandoned. This application Aug. 19, 1986, Ser. No. 898,848

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402367

Int. Cl.⁴ D01H *7/882, 13/26*

U.S. Cl. 57—264 **22 Claims**



1. An open-end friction spinning machine of the type having at least one spinning unit, each of said at least one units including:

two drivable, oppositely moving friction surface means defining a yarn formation zone for creating a friction effect, said friction effect resulting from coefficient of friction effects of the friction surface means and air flow effects at said friction surface means,

friction surface driving means for driving the friction surface means during spinning operations,

fiber feeding means for feeding separated fibers to the yarn formation zone,

yarn withdrawal means for withdrawing formed yarn from the yarn formation zone; and

suction means for applying suction forces to the yarn formation zone,

wherein each spinning unit is equipped with individually adjustable friction effect changing means for changing a parameter of the friction effect in the yarn formation zone,

wherein at least one measuring device means is provided for continuously directly examining the quality of the moving yarn at a spinning unit while spinning when the measuring device means is in operation at the respective spinning unit, and

wherein evaluating device means are provided for evaluating the signals of the measuring device and for triggering an automatic adjustment of the friction effect changing means while spinning when deviations exist from indicated desired values.

4,691,510

FUEL SUPPLY SYSTEMS

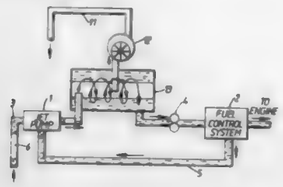
Peter J. Taylor, Fareham; Alan Clarke, Gosport, and John S. Thompson, Fareham, all of England, assignors to Plessey Overseas Ltd., Ilford, England

Filed Apr. 16, 1985, Ser. No. 723,872

Claims priority, application United Kingdom, Apr. 17, 1984, 8409999

Int. Cl.⁴ F02C *7/236*

U.S. Cl. 60—39.094 **1 Claim**



1. A fuel supply system for use in rotary wing aircraft, said system comprising:

vortex separator means including a chamber having a liquid fuel portion and an air and fuel vapor portion, said chamber having an inlet for passage of fuel mixture from a fuel supply tank of the rotary wing aircraft into the vortex separator means, and having an outlet for conveying a liquid fuel supply from the vortex separator means;

first pump means having an input port and an output port, the input port extending into the air and fuel vapor portion of the vortex separator means, the first pump means being operative for producing a relatively low pressure region within the air and fuel vapor portion of the vortex separator means for drawing air and fuel vapor therefrom;

discharge output means connected to the output port of the first pump means for conveying air and fuel vapor to the fuel supply tank, said first pump means being operative for producing a relatively high pressure within the discharge output means to provide a pressure differential between said input port and said output port so that air and fuel vapor from the fuel mixture can be discharged from the vortex separator means;

feed means coupled to the vortex separator means for inducing a fuel mixture to swirl within the vortex separator means so as to produce a relatively high pressure region therein so that air and vapor of the fuel mixture can migrate to a relatively low pressure region and liquid fuel of the fuel mixture can migrate to a relatively high pressure region, the outlet of said vortex separator means being situated in the relatively high pressure region so that liquid fuel at the outlet is at the relatively high pressure;

said feed means including a second pump means, fuel control means for controlling the fuel supply to an engine of the rotary wing aircraft, a jet pump, and a fuel line, said second pump means being connected between the outlet of the vortex separator means and the fuel control means and being operative for pumping liquid fuel at relatively high pressure from the vortex separator means to the fuel control means at a relatively higher pressure, the jet pump communicates with the inlet to the vortex separator means and a source of a fuel mixture for feeding the fuel mixture into the inlet of the vortex separator means, and the fuel line extends between the fuel control means and the jet pump for carrying excess fuel from the fuel control means to the jet pump, which excess fuel drives the jet pump by virtue of its relatively higher pressure so that the fuel mixture fed to the vortex separator means is induced to swirl therein.

4,691,511

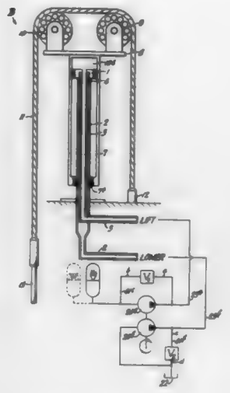
HYDRAULIC WELL PUMP

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 449,823, Dec. 14, 1982, Pat. No. 4,571,939. This application Oct. 23, 1985, Ser. No. 790,417

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—414 **10 Claims**



1. A system for operating a sucker rod string connected with a well pump comprising:

a double-acting fluid cylinder having opposing power ends;

means for connecting said cylinder with said sucker rod string for raising and lowering said string to operate said pump;

hydraulic pump means for supplying pressurized fluid alternately to the cylinder ends including a direction control movable between extend and retract conditions to extend and retract said cylinder;

drive means for shifting said direction control;

control means for operating said drive means responsive to the extend and retract movements of said cylinder; and

means for applying a fluid counterbalancing force into said cylinder for offsetting the combined weights of said sucker rod string, a production fluid column in a well bore above said pump, and movable surface equipment supported on said cylinder including an accumulator connected with said hydraulic pump means and said direction control for supercharging the intake of said pump during said extend movement of said cylinder and for applying an opposing hydraulic force to said cylinder during said retract movement.

4,691,512

ROTARY HYDROSTATIC MACHINES OR TRANSMISSIONS

Christian H. Thoma; George D. Mc. Arnold, and Arthur A. Blair, all of Channel Islands, Great Britain, assignors to UNIPAT AG, Glarus, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,018

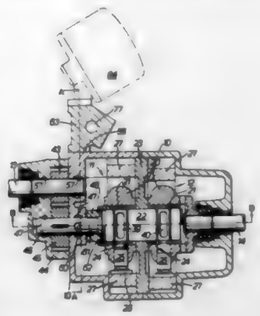
Claims priority, application United Kingdom, Nov. 3, 1983, 8329441; Dec. 9, 1983, 8332982

Int. Cl.⁴ F16D *31/02*

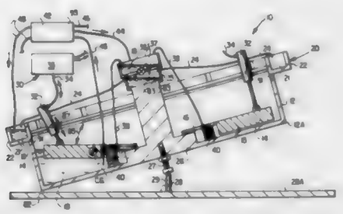
U.S. Cl. 60—456 **8 Claims**

1. A hydrostatic machine including a casing, a rotary member for rotation within the casing and formed with generally radial cylinders each accommodating a piston connected to a slipper which engages a surrounding cam track as the member rotates, and including an external shaft, and transmission means including reduction gearing for coupling the rotary member to said external shaft, said reduction gearing comprising a rela-

tively small diameter gear connected to said external shaft and a relatively large diameter gear connected to said rotary member, said reduction gear pair acting also as a fluid gear pump for supplying fluid under pressure.



4,691,513
ROTARY POWER TRANSDUCER SYSTEM
James Gillilan, 1807 W. College, Sherman, Tex. 75090
Filed Aug. 11, 1986, Ser. No. 895,157
Int. Cl.[4] F03B *13/14*
U.S. Cl. 60—495 **17 Claims**



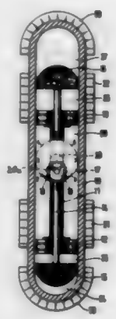
1. A rotary energy transducer system comprising:
- a flotation tank adapted for generally circular swivel action having fluid disposed therein;
- means for centrally supporting said flotation tank for swiveling therearound through a series of unbalanced positions;
- means for swiveling said tank around said central support and shifting said fluid disposed therein;
- a plurality of flotation means disposed within said tank adapted for floating upon said fluid disposed within said tank; and
- means coupled to said flotation means for actuation therewith in transducing energy from shifting fluid levels within said tank throughout the swiveling thereof.

4,691,514
WATER ENGINE
Iain M. Smith, Rochdale, England, assignor to Aur Hydropower Limited, London, England
Continuation-in-part of Ser. No. 583,546, Feb. 24, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 893,542
Claims priority, application United Kingdom, Feb. 25, 1983, 8305334
Int. Cl.[4] F03N *13/12*
U.S. Cl. 60—503 **8 Claims**

1. A water engine of the kind having at least two chambers, a float in each chamber, means mounting each float for vertical reciprocal movement in its respective chamber, means for supplying water from a head of water to each chamber to cause the float in each chamber to rise, means for exhausting water from each chamber to allow the float in each chamber to fall, and means for controlling the water supplying and exhausting means to provide inlet an outlet of water to and from each chamber in turn so that the floats in the chambers are caused to alternately rise and fall in turn one after another, and further comprising a rocking beam, means mounting the rocking beam for pivotal movement about a substantially horizontal axis, means connecting the at least two floats to the rocking beam, one to either side of the said axis, whereby the alternate rise and fall of the floats in their respective chambers causes the rocking beam to oscillate, means being provided for deriving power from the oscillatory movement of the rocking beam, said controlling means comprising a single valve member mounted for movement between one position directing water to one chamber while allowing water to exhaust from the other chamber, and another position directing water to the other chamber while allowing water to exhaust from the one chamber.



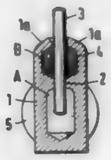
4,691,515
HOT GAS ENGINE OPERATING IN ACCORDANCE WITH THE STIRLING PRINCIPLE
Dietrich Ehrig, Grasberg, and Hans-Juergen Jacobs, Stuhr, both of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany
Filed Mar. 8, 1985, Ser. No. 709,509
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408480
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—526 **10 Claims**



1. Hot gas engine operating in accordance with a Stirling engine type principle comprising,
- a cylinder having spacially separated external means in heat conductive relationship with the interior of the cylinder and establishing separated hot and cold zones therein;
- a piston operating as displacement as well as regenerator piston moveable in said cylinder;
- a working piston likewise moveable in said cylinder and also relative to the regenerator piston wherein said displacement piston is mounted on a piston rod traversing said working piston, said working piston being mounted on a hollow piston rod being traversed by the piston rod mounted to said displacement piston; and

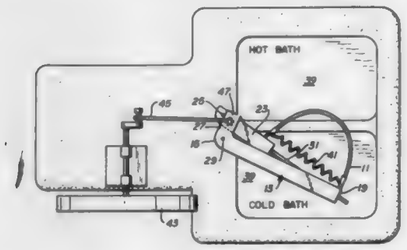
transmission gear means constructed to operate in a crank shaft manner by converting a rotary motion into linear motions for the two pistons and being accordingly coupled to both said pistons and having a common rotary input-output.

4,691,516
THERMALLY-ACTIVATED DEVICE FOR CREATING CONSIDERABLE POWER
Paolo Fornasari, Casale Monferrato, Italy, assignor to Eltek S.p.A., Alessandria, Italy
Filed Feb. 14, 1986, Ser. No. 830,257
Claims priority, application Italy, Feb. 22, 1985, 53024/85[U]
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 **11 Claims**



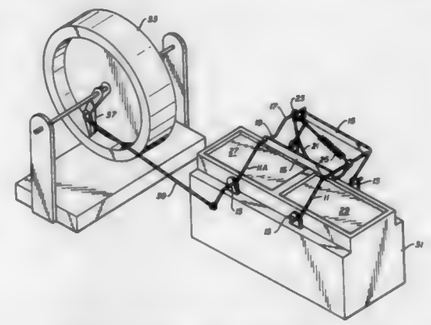
1. A thermally-activated device generating considerable power; said power being in the form of an axial thrust transmitted to a rod, said device comprising a metal casing divided into two chambers connected by a tubular passage; the first chamber containing wax or other material having high thermal dilative properties; and the second chamber containing a biconical mass with a vertical hole, coaxial to the tubular passage; said mass being made of a synthetic thermally-expandable material; a cylindrical metal rod passing vertically through said mass; one end of the rod being immersed in the contents of said first chamber consisting of wax or other thermally expandable material and the other end of the rod projects from the top of the casing at the end opposite to the blind end in order to create a power device that causes the axial movement of rod towards the outside of the casing when the device is thermally activated by means of any source of heat.

4,691,517
LATERALLY OSCILLATING NITINOL ENGINE
Ridgway Banks, 7411 Park Vista, El Cerrito, Calif. 94530
Filed Nov. 12, 1986, Ser. No. 929,507
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 **3 Claims**



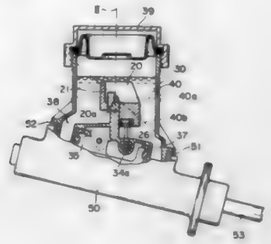
1. A laterally oscillating nitinol engine comprising
- a first L-shaped drive member journalled for pivoting horizontal oscillation about the juncture of the legs of the L-shaped member,
- a second drive member journalled for pivoting about a point proximate the outboard end of the shorter leg of the L-shaped member at a distance from the pivot journal of the L-shaped member,
- a bearing block secured to the end of longer leg of the L-shaped member and having a guide hole therethrough, said second member extending through said guide hole and arranged to reciprocate therein,
- a shape memory alloy power element disposed in flexure secured at its ends to said bearing block and to said second member intermediate the sliding connection with said bearing block and the pivotal connection of said second member,
- means for disposing different temperature baths below said element whereby as said drive members oscillate about their journals the element alternately dips into one bath and then the other, and
- means for absorbing a portion of the energy developed by the engine and moving the power element from the cold bath to the hot bath.

4,691,518
VERTICALLY OSCILLATING HEAT ENGINE
Ridgway Banks, 7411 Park Vista, El Cerrito, Calif. 94530
Filed Nov. 12, 1986, Ser. No. 929,508
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 **5 Claims**



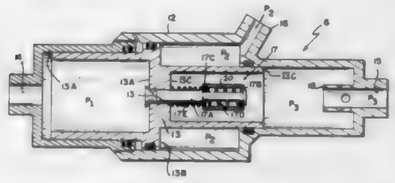
1. A vertically oscillating nitinol engine comprising
- at least a pair of vertically projecting drive posts journalled at a fixed distance from each other for at least partial rotational motion at their lower ends whereby said posts can be rocked back and forth or oscillated about their lower ends in parallel relation,
- at least one linkage bar interconnecting and journalled to said projecting drive posts equal distant along said posts from said journals, the connection length along said bar between said posts being equal to the distance between said journals whereby said posts and said linkage bar and the fixed distance between said journals at the lower ends of of said drive posts form a four bar linkage,
- at least one a shape memory alloy element disposed in flexure interconnecting the upper ends of said drive posts, one of said connections of said element with said drive posts being a further distance from the journal at the lower end of the drive post than the other connection of the element with the other drive post,
- means for disposing different temperature baths below said element whereby as said drive posts oscillate about their journals the element alternately dips into one bath and then the other,
- and means for absorbing a portion of the energy developed by the engine and utilizing it to swing the drive posts from the cold bath to the hot bath.

4,691,519
MASTER CYLINDER
Munesato Andoh, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Japan
Filed Sep. 25, 1985, Ser. No. 779,889
Claims priority, application Japan, Oct. 9, 1984, 59-152839[U]
Int. Cl.⁴ F15B *7/00*
U.S. Cl. 60—535 **2 Claims**



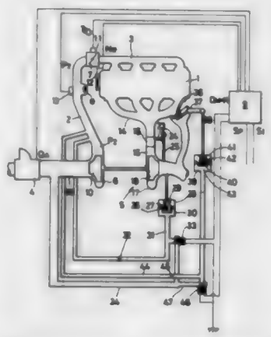
1. A cylinder construction for a tandem fluid pressure system, comprising a housing defining a liquid reservoir, a central upstanding partition centered within said reservoir, a float for floating on liquid in said liquid reservoir and having a vertical guideway into which said partition extends providing a guide for said float for guiding said float along its center of buoyancy for upward and downward movement along the center line of said liquid reservoir, a magnet carried by said float, and a magnetically operated switch carried by said housing in a position to be influenced by said magnet when said float is in a predetermined lower position due to the withdrawal of liquid from the reservoir, said float including an upper portion of substantially L-shaped cross section having a face engaging behind one side of said partition and having a front portion engaging on the opposite side of said partition, said magnet being held by the bottom of said float.

4,691,520
HYDRAULIC BRAKE SYSTEM
Lyle E. Osborne, 1506 Stanmore Ct., South Bend, Ind. 46614
Filed Jul. 21, 1983, Ser. No. 515,600
Int. Cl.⁴ F15B *15/18*
U.S. Cl. 60—593 **20 Claims**



1. Hydraulic brake pressure applying and releasing arrangement for a vehicle braking system subject to high system return pressure, comprising:
- a brake valve inlet port for communicating hydraulic fluid under pressure to and from a brake valve,
- a brake operating outlet port for communicating hydraulic fluid under pressure to and from, in pressure applying and pressure releasing stages, respectively, a brake of the type having brake return spring means,
- and hydraulic fluid control means intermediate the inlet port and the outlet port, said control means including means for amplifying the hydraulic pressure effect in the direction from the outlet port to the return pressure system, by continuously and automatically applying the pressure force of said return pressure with the pressure force of the hydraulic fluid from said brake in the pressure releasing stage, such that the brake return pressure exerted at the outlet port by the brake return springs can be substantially less than the system return pressure.

4,691,521
SUPERCHARGER PRESSURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH TURBOCHARGER
Yuji Hirabayashi, Zushi; Masato Noguchi, Yokohama, and Keiji Hatanaka, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan
Filed Apr. 24, 1985, Ser. No. 726,773
Claims priority, application Japan, Apr. 25, 1984, 59-81937; Apr. 25, 1984, 59-81938
Int. Cl.⁴ F02B *37/00*
U.S. Cl. 60—602 **26 Claims**

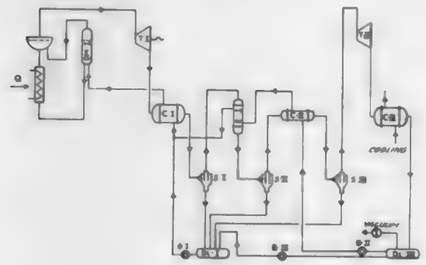


1. A supercharge pressure control system for an internal combustion engine with a turbocharger comprising:
- means for detecting the supercharge pressure of the engine;
- regulating means having at least one of a variable geometry means and an exhaust bypass means, for regulating the supercharge pressure of the engine; and
- control means for inputting the detected supercharge pressure from the detecting means and for selecting a specific control value based on an intake air flow of the engine in accordance with an accumulated value of a difference between the detected supercharge pressure and a target supercharge pressure, said accumulated value being calculated for each of the variable geometry means and the exhaust bypass means, said control means outputting a suitable control value, based on the specific control value, for controlling the supercharge pressure to each of the variable geometry means and the exhaust bypass means.

4,691,522
SOLAR POWER GENERATION
William G. Brown, II, 720 NW. 31st St., Corvallis, Oreg. 97330
Division of Ser. No. 486,087, Apr. 18, 1983, Pat. No. 4,549,604, which is a continuation-in-part of Ser. No. 122,357, Feb. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 816,501, Jul. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 788,207, Apr. 18, 1977, abandoned. This application Aug. 14, 1985, Ser. No. 765,823
Int. Cl.⁴ F03G *7/02*
U.S. Cl. 60—641.8 **21 Claims**

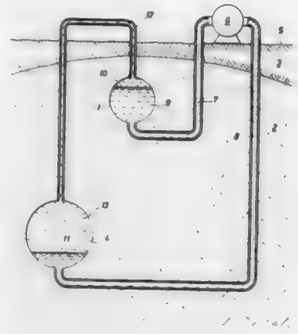
1. An absorption power generating process comprising:
- injecting low pressure steam at a subatmospheric pressure into an absorber chamber;
- injecting a rich desiccant into said absorber chamber;
- absorbing at least a portion of said low pressure steam into said rich desiccant to release heat from said desiccant and produce a weakened desiccant;
- removing at least a portion of said weakened desiccant from said absorber chamber;
- vaporizing at least a portion of the water from said weakened desiccant in an atmosphere of air to enrich said weakened desiccant;
- transferring said released heat from said absorber chamber to a stream of water to produce high pressure steam;
- expanding said high pressure steam through a turbine to produce power and low pressure steam.

4,691,523
THERMODYNAMIC PROCESS FOR A PRACTICAL APPROACH TO THE CARNOT CYCLE
Serafin M. Rosado, Marques de Lozoya 15, Madrid, Spain
Filed Jun. 13, 1984, Ser. No. 620,364
Claims priority, application Spain, Jun. 13, 1983, 523210
Int. Cl.⁴ F01K *25/06*
U.S. Cl. 60—649 **19 Claims**



1. A process for mechanical power generation comprising:
(a) selecting a working fluid mixture comprising a plurality of fluids having different boiling points wherein
(1) at a maximum working temperature and pressure, the mixture of vapors of such fluids is saturated with respect to the component having the highest boiling point, and
(2) the fluid having the lowest boiling point saturates at a minimum working temperature, for a minimum working pressure;
(b) performing one expansion in an expansion device of the mixture of fluid vapors initially saturated with respect to the component having the highest boiling point, from the maximum working pressure to the minimum working pressure;
(c) performing a stage of heat recovery, with heat exchange between (1) the mixture of fluids exhausted by said expansion device, which yields heat and undergoes condensation of at least some of its components, and (2) a fluid mixture coming from a final condenser and compressed to the maximum working pressure, which absorbs heat and undergoes vaporization of at least some of its components;
(d) performing total condensation in said condenser of the mixture that comes out of the hot side of the heat recovery stage, at the minimum working temperature; and
(e) contributing heat to the fluid mixture, once the latter has come out of the cold side of the heat recovery stage, until ali the remaining liquid fraction in the fluid mixture that corresponds to the component having the highest boiling point is vaporized.

4,691,524
ENERGY STORAGE AND RECOVERY
Hugo Holscher, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Aug. 1, 1986, Ser. No. 891,798
Claims priority, application Netherlands, Aug. 6, 1985, 8502194
Int. Cl.⁴ F01K *13/02*
U.S. Cl. 60—652 **34 Claims**

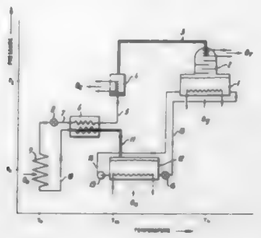


1. A system for the storage and recovery of energy comprising:
- a first storage space partly filled with a first fluid having a relatively high density;
- a second storage space partly filled with a second fluid having a relatively low density, which fluids are hardly or not at all miscible with each other;
- a connecting line filled with the second fluid and located between the top part of the first storage space and the top part of the second storage space; and
- a pump/turbine unit at approximately the same height as, or above, the first storage space, the pump/turbine unit being connected to the bottom part of the first storage space and to the bottom part of the second storage space in order, during normal operation, to be able to pump the first fluid from the second storage space to the first storage space or to be driven by the first fluid flowing from the first storage space to the second storage space.

4,691,525
METHOD OF OPERATING AN ABSORPTION HEAT PUMP OR REFRIGERATOR, AND AN ABSORPTION HEAT PUMP OR REFRIGERATOR
Pouwel J. Gelderloos, Ugchelen, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, Netherlands
Filed Apr. 7, 1986, Ser. No. 848,992
Claims priority, application Netherlands, Apr. 9, 1985, 8501019
Int. Cl.⁴ F25B *15/00*
U.S. Cl. 62—101 **10 Claims**

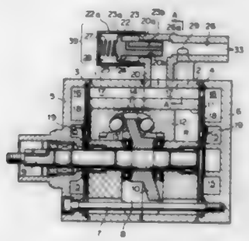
1. Method of operating an absorption heat pump or refrigerator, consisting at least of a refrigerant circuit and a refrigerant-containing soluton circuit, with a generator for evaporating refrigerant from the solution with the supply of relatively high-temperature heat, a condenser for condensing refrigerant and giving up heat at an intermediate temperature level, an evaporator for evaporating refrigerant with the absorption of heat from a relatively cold heat source, a heat exchanger for transferring heat from the liquid passing out of the condenser to the refrigerant vapour and liquid coming from the evaporator, an absorber for absorbing refrigerant vapour into the solution with the giving-up of heat at an intermediate temperature level, and means for circulating the solution or maintain-

ing the pressure, characterized in that the delivery of refrigerant is regulated in such a manner that the temperature differential Δt_w between the liquid entering the heat exchanger on the condenser side (t_1) and the liquid and vapour leaving the heat



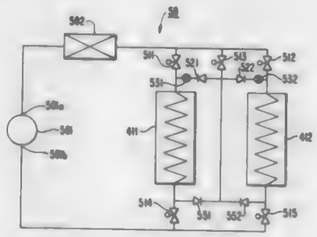
exchanger on the absorber side (t_4) substantially coincides with the temperature differential Δt_k between the liquid passing out of the heat exchanger on the evaporator side (t_2) and the liquid and vapour entering the heat exchanger on the evaporator side (t_3).

4,691,526
AIR CONDITIONING UNIT FOR VEHICLE
Hisao Kobayashi; Katsunori Kawai, and Hiroyuki Deguchi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan
Filed Apr. 28, 1986, Ser. No. 856,762
Claims priority, application Japan, May 8, 1985, 60-97541
Int. Cl.[4] F25B *31/00, 41/04*
U.S. Cl. 62—217 **6 Claims**



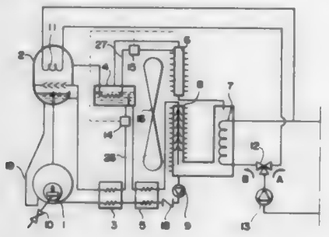
6. An air conditioning unit for a vehicle, comprising:
a reciprocatory piston type refrigerant compressor having a suction chamber for a refrigerant before compression, a discharge chamber for a refrigerant after compression, and a drive chamber formed to be independent of the suction and discharge chambers and accommodating therein a drive mechanism for reciprocating pistons in compressor cylinders, the drive mechanism being driven by a vehicle engine;
a first piping circuit for delivering said refrigerant after compression from said discharge chamber of said compressor toward an evaporator for conducting a thermal exchange of said refrigerant;
a second piping circuit for returning said refrigerant after thermal expansion from said evaporator toward said suction chamber of said compressor;
a condenser arranged in said first piping circuit for condensing said refrigerant after compression, delivered from said discharge chamber of said compressor;
an expansion valve arranged in said first piping circuit between said condenser and said evaporator for controlling a flow rate of said refrigerant after condensation;
a pressure control valve arranged in said second piping circuit between said evaporator and said suction chamber of said compressor for controlling an evaporating pressure within said evaporator in response to a cooling load applied to said air conditioning unit, wherein said pressure control valve is a pressure sensitive spool valve integrally attached to a suction flange mounted on said compressor to introduce said refrigerant after said thermal exchange into said suction chamber, said pressure sensitive spool valve comprising a cylindrical casing fixed to said suction flange and defining therein a first atmospheric pressure chamber, a spool valve movably mounted in said cylindrical casing to adjustably open and close a suction valve port of a suction passageway formed in said suction flange, a spring member arranged in said atmospheric pressure chamber of said cylindrical casing for constantly urging said spool valve toward a position closing said suction valve port, and an elastic bellows member elastically and sealingly arranged between said cylindrical casing and said spool valve for defining a suction pressure chamber separated from said atmospheric chamber, and said suction valve port of said suction passageway of said flange is a counterbore formed in said flange so as to be complementary to an end of said spool valve; and
a fluid bypass passageway means arranged in said second piping circuit for providing a constant fluid communication between said evaporator and said drive chamber of said compressor, thereby permitting said refrigerant after said thermal exchange to flow into said drive chamber even when said cooling load applied to said air conditioning unit is low.

4,691,527
CONTROL DEVICE FOR REFRIGERATED DISPLAY CASE
Hideo Ikeda, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Dec. 11, 1985, Ser. No. 807,844
Claims priority, application Japan, Dec. 11, 1984, 59-186708[U]; Dec. 11, 1984, 59-186709[U]
Int. Cl.[4] F25D *21/00*; F25B *47/00*
U.S. Cl. 62—234 **18 Claims**



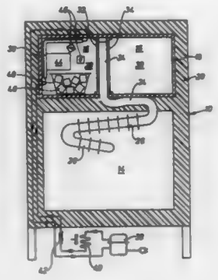
1. In a refrigerated display case comprising an external housing, an internal housing within the extension housing for storing merchandise, a front opening for access to the interior of said internal housing, passage means formed between said external and internal housing which includes inner and outer conduits interconnecting respective inlets and outlets extending across opposed edges of said front opening, circulating means for driving air around said passage means through said conduits in the form of inner and outer air curtains and a refrigeration unit to cool said display case, said refrigeration unit having a compressor, a condenser and first and second evaporators, the improvement comprising:
said first evaporator being disposed in said inner conduit;
said second evaporator being disposed in said outer conduit, the inlet side of said first evaporator being coupled to the inlet side of said second evaporator by a first passage line in which the outlet side of said first evaporator being coupled to the discharge side of said second evaporator by a second passage line in which third and fourth check valves are disposed in series, said first and second passage lines being connected to each other by a third passage line;
said condenser being coupled to the inlet side of said first and second evaporators and said first and third passage lines by a plurality of valve devices;
said compressor having its discharge side coupled to the inlet side of said condenser and its suction side connected to the outlet sides of said first and second evaporators through a plurality of valve devices; and
control means for controlling the operation of said refrigeration unit by operating said first and second evaporators in series and in parallel in accordance with a predetermined program.

4,691,528
AIR-COOLED ABSORPTION TYPE WATER COOLING/HEATING APPARATUS
Shinji Tonga, Hamamatsu, Japan, assignor to Yazaki Corporation, Japan
Filed Sep. 22, 1986, Ser. No. 909,718
Claims priority, application Japan, Aug. 15, 1985, 60-179954; Sep. 24, 1985, 60-210706
Int. Cl.[4] F25B *27/00*
U.S. Cl. 62—238.3 **16 Claims**



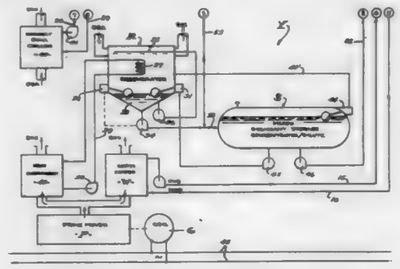
1. An air-cooled absorption type water cooling/heating apparatus comprising:
I. a cooling circulation system including:
(a) a high-temperature regenerator in which a thin solution which has absorbed a refrigerant is heated so that refrigerant vapor and thick solution are regenerated;
(b) a separator for separating said refrigerant vapor and said thick solution from each other;
(c) an air-cooled condenser for condensing said refrigerant vapor into liquid phase by air-cooling;
(d) an evaporator in which the condensed liquid refrigerant is evaporated by heat derived from a heat exchanger leading to a heat radiator, thereby cooling a heat transfer medium circulated through said heat exchanger;
(e) an absorber in which the refrigerant vapor generated in said evaporator in said thick solution introduced from said separator, said absorber being air-cooled so that the heat produced as a result of the absorption is carried away by the cooling air; and
(f) a pump for supplying the thin solution which is formed from said thin solution as a result of absorption of said refrigerant vapor into said high-temperature regenerator;
II. a heating circulation system including:
(g) a heat exchanger provided in said separator and leading to said heat radiator; and
III. means for closing a line between said separator and said condenser and a line between said separator and said absorber during operation of said apparatus in the heating mode.

4,691,529
ABSORPTION REFRIGERATOR FOR ICE-MAKING
Peter E. Blomberg, Stockholm, and Sven A. Gurt, Solna, both of Sweden, assignors to AB Electrolux, Stockholm, Sweden
Filed Oct. 8, 1986, Ser. No. 916,956
Claims priority, application Sweden, Oct. 23, 1985, 8504995
Int. Cl.[4] F25B *25/02*
U.S. Cl. 62—332 **3 Claims**



1. In a refrigerator having a compression-type refrigerating apparatus provided with an evaporator and an absorption-type refrigerating apparatus provided with an evaporator, a refrigerating chamber, the improvement comprising: two spaced freezer chambers, a heat conducting wall for each freezing chamber, the evaporator of said absorption refrigerating apparatus having the colder part in said space between said freezer chambers and in contact with said heat conducting walls, the warmer part of said evaporator being in said refrigerating chamber, said compression-type refrigerating apparatus having its evaporator operatively connected to one of said freezer chambers, and said absorption-type refrigerating apparatus being operated independent of the operation of said compression-type refrigerating apparatus.

4,691,530
COGENERATION AND CENTRAL REGENERATION MULTI-CONTACTOR AIR CONDITIONING SYSTEM
Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 92343
Filed Sep. 5, 1986, Ser. No. 903,690
Int. Cl.[4] F25D *23/00*
U.S. Cl. 62—238.1 **22 Claims**



1. A central regeneration multi-contactor air conditioning, including:
a support system comprised of a desiccant regenerator means continuously removing desiccant liquid from a storage means and simultaneously returning regenerated desiccant liquid thereto for maintaining a useable desiccant vapor pressure condition controlled by concentration and temperature thereof in said storage means,
and an air handling system comprised of a multiplicity of desiccant contactor means operated on demand and each

drawing the desiccant liquid of useable concentration and temperature from the storage means for dehumidification of air passed therethrough,

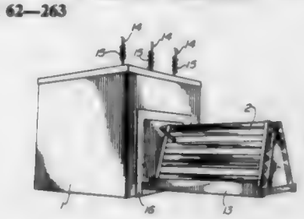
the storage means being comprised of a tank with a return of diluted desiccant liquid from the multiplicity of desiccant contactor means, a delivery of desiccant liquid from the tank to the regeneration means, a return of strengthened desiccant liquid from the regenerator means to the tank, and a supply of useable desiccant liquid from the tank to the contactor means.

4,691,531

CENTRAL AIR CONDITIONING SYSTEM

Kevin Clifton, P.O. Box 13175, Kanata, Ontario, Canada K2K 1X4, and Sean Delaney, Kanata, Canada, assignors to Kevin Clifton, Kanata, Canada

Filed Jul. 7, 1986, Ser. No. 882,293
Claims priority, application Canada, Mar. 26, 1986, 505252
Int. Cl.[4] T25D *23/12*
U.S. Cl. 62—263 **15 Claims**



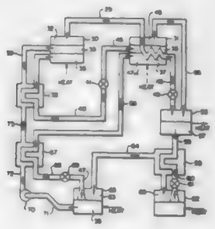
1. An air conditioning system for use in conjunction with a hot air plenum of a residential furnace, comprised of a central unit housing vibration causing components, an evaporator coil, vibration absorbing means for supporting said central unit adjacent said hot air plenum, means integral with and projecting from said central unit through an aperture in said hot air plenum for supporting said coil in said hot air plenum, and resilient means connected to said central unit for effecting a seal around said aperture between said hot air plenum and said central unit.

4,691,532

DUAL COOLING/HEATING SYSTEM ENERGY RECOVERY

Edward A. Reid, Westerville; F. Bert Cook, Columbus, and Edgar M. Purvis, Troy, all of Ohio, assignors to Columbia Gas System Service Corp, Wilmington, Del.

Division of Ser. No. 683,187, Nov. 13, 1984, Pat. No. 4,646,541. This application Dec. 22, 1986, Ser. No. 945,091
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—476 **11 Claims**



1. In an absorption refrigeration and/or heating system having components connected in series including at least one generator, a condenser, an evaporator, and an absorber, wherein a refrigerant is absorbed and desorbed or expelled in an absorbent solution, and the application of heat and externally supplied mechanical energy is combined and converted to pressure energy that is applied to or removed from a solution of refrigerant and absorbent, the improvement comprising:

(a) means to convert the pressure energy and/or phase change energy in the solution and/or refrigerant to mechanical energy, and

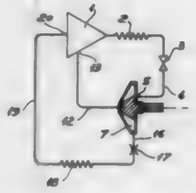
(b) means to replace or supplement the externally supplied mechanical energy in the system with the converted mechanical energy.

4,691,533

REFRIGERATION SYSTEM WITH A CENTRIFUGAL ECONOMIZER

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Filed Sep. 15, 1986, Ser. No. 907,080
Claims priority, application France, Sep. 27, 1985, 85 14337
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—512 **1 Claim**



1. A refrigeration or the like system comprising at least a compressor (1) having a discharge orifice connected to a condenser (2) communicating with an expansion valve (3) connected to a centrifugal economiser (7), the latter being connected via a gas conduit to an economiser orifice (13) of the compressor and via a liquid conduit to an evaporator (18) connected to an intake orifice of said compressor, the centrifugal economiser comprising a rotor (8) mounted for rotation in a stationary casing (6) provided with three orifices respectively connected to the expansion valve, to the economiser orifice and to the evaporator, and wherein the liquid conduit has means defining a fixed orifice, (17); the size of which is selected so that, for the highest pressure ratios sustained by the system during permanent operation, the flow of gas through the liquid conduit does not exceed substantially 20% of the flow of gas returning to the economiser orifice.

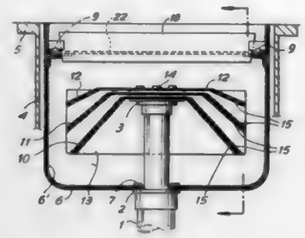
4,691,534

CRYOGENIC PUMP WITH REFRIGERATOR WITH THE GEOMETRY OF THE SHIELDS, SUITABLE FOR ACHIEVING A HIGH EFFICIENCY AND AN EXTENDED LIFE

Lapo Lombardini, and Gianluca Bardi, both of Florence, Italy, assignors to Officine Galileo S.p.A., Italy

Filed Mar. 24, 1986, Ser. No. 843,102
Claims priority, application Italy, Mar. 26, 1985, 9373 A/85
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **4 Claims**

1. A cryogenic pump having a cooling stage with a refrigeration temperature of from 70° to 80° K., at least one second stage connected to said first stage with a refrigeration temperature of from 12° to 15° K., a cylindrical shield having a closed end mounted on said first stage and extending above said second stage and having an opened end with an inlet grid extending across said opened end, said grid having spaced apart obliquely extending laterally spaced planar panels, said shield having condensation walls, said condensation walls and said planar panels comprising at least one metal strip and completely covered by absorbing material on both faces, said strips having externally reflecting surfaces, and a plurality of second stage planar panels connected to said second stage and being of a light metallic mass with at least one being disposed parallel to the axis of said second stage and at least one of said second



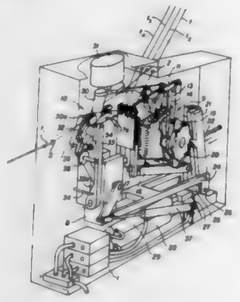
stage panels extending at an angle to the axis of said second stage, and second stage metal strips covering said second stage panels.

4,691,535

METHOD OF AND APPARATUS FOR JOINING A SELECTED YARN TO A YARN BEING KNITTED

Remi Cottenceau, Viry, France; Francois Fischer, Carouge, and Simon Arieh, Geneva, both of Switzerland, assignors to Mayer & Cie. GmbH & Co. und Sipra Patententwicklungs - und Beteiligungsgesellschaft mbH, both of Albstadt, Fed. Rep. of Germany

Continuation of Ser. No. 445,987, Dec. 1, 1982, abandoned. This application Nov. 19, 1985, Ser. No. 799,552
Claims priority, application Switzerland, Dec. 3, 1981, 7727/81
Int. Cl.[4] D04B *15/62*
U.S. Cl. 66—144 **4 Claims**



1. A method of joining a yarn selected for knitting to a yarn being knitted, the method comprising the steps of sequentially while the yarn being knitted moves continuously in a travel direction along a path

holding the end of the yarn selected for knitting adjacent the path of the yarn being knitted,

forming a closed loop of the selected yarn in the vicinity of the held end on a finger projecting in the direction of travel of the yarn being knitted,

deflecting the yarn being knitted adjacent and spaced from the held end so as to give the deflected yarn portion the form of an open loop,

passing this open loop through the closed loop on the finger,

gripping the yarn selected for knitting between the open loop and the held end and passing the gripped portion through this open loop,

thereafter generally simultaneously

tightening the closed loop by applying tension to the gripped portion of the yarn selected for knitting to form a knot by pulling the gripped portion in the direction of movement of the yarn being knitted and thereby pulling both loops off the finger, and

cutting the yarn being knitted upstream of the knot relative to the yarn travel direction, and

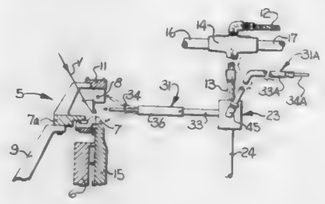
releasing the held end so that the knotted yarns move off in the travel direction.

4,691,536

DUST REMOVING DEVICE FOR CIRCULAR KNITTING MACHINE

Shozo Yorisue, Hyogo, and Seiji Morimoto, Aichi, both of Japan, assignors to Precision Fukuhara Works, Ltd., Japan

Filed Aug. 7, 1986, Ser. No. 894,656
Claims priority, application Japan, Aug. 30, 1985, 60-192800
Int. Cl.[4] D04B *35/32*
U.S. Cl. 66—168 **3 Claims**



1. A lint removing device for a circular knitting machine including an air jet nozzle having a free open end forming an orifice, means carried by said knitting machine and supporting said air jet nozzle for directing air against an area of said knitting machine adjacent said open end orifice of said air jet nozzle for blowing lint and dust from the portion of said knitting machine adjacent said air jet nozzle, means for supplying air under pressure to said air jet nozzle, means for causing said air jet nozzle to move with a fluttering motion to thereby increase the area of the knitting machine being engaged by the air being ejected from said air jet nozzle orifice, and fluttering motion adjustment means for limiting the swinging movement of said free open end of said air jet nozzle, said fluttering motion adjustment means comprising a flutter limiting member including an outer end portion completely surrounding and normally being spaced from said air jet nozzle, and means supporting said outer end portion of said flutter limiting member for longitudinal adjustment along said air jet nozzle for varying the location longitudinally of said nozzle at which said outer end portion is engaged by said nozzle to thereby vary the amount of swinging movement of said free open end of said air jet nozzle.

4,691,537

MOCK LINKING PROCESS AND APPARATUS FOR JOINING TWO PIECES OF KNITTED FABRIC, AND KNITTED EDGING TRIM FOR USE THEREWITH

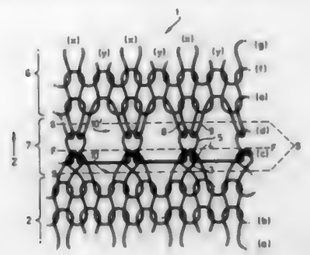
John C. Cullen; Paul M. Cullen, both of Main Street, and Owen Cullen, "The Brackens" , all of Monasterevin, Co. Kildare, Ireland

Filed Aug. 28, 1985, Ser. No. 770,265
Claims priority, application Ireland, Aug. 29, 1984, 2203/84
Int. Cl.[4] D04B *9/46;* **D05B** *7/00*
U.S. Cl. 66—172 R **6 Claims**

1. A knitted edging trim, for attachment to an unfinished edge of a knitted garment, which comprises

a ribbon of weft-knitted yarn, double knit, having two parallel longitudinal side edges defining a selvedge and a ravel edge, including a course of transfer stitching spaced from a side edge thereof and defining a fold line, such that when

the trim is folded over upon itself along the fold line, the folded edge of the trim then presents an adjacent seam line traversing outwardly protruding loops defining spaces therebetween, the folded trim being attached to an unfinished garment edge by machine stitching passing through the spaces defined by the seam line using matching yarn to produce a mock link finish substantially simulating a point-to-point link finish.



4,691,538

FULLY AUTOMATIC WASHING MACHINE

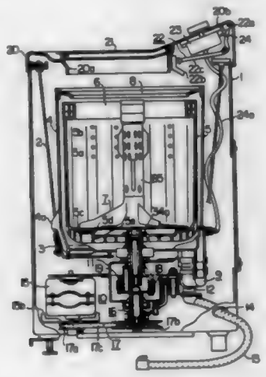
Tamotsu Shikamori, Juo; Hiroyuki Toshimitsu, Hitachi; Hiroshi Obuugi, Hitachi; Isao Hiyama, Hitachi, and Soichi Fukuzawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 575,785, Feb. 1, 1984, which is a continuation of Ser. No. 347,311, Feb. 9, 1982, abandoned. This application Feb. 28, 1986, Ser. No. 834,393

Claims priority, application Japan, Oct. 7, 1981, 56-158779

Int. Cl.[4] D06F *33/02, 39/02*

U.S. Cl. 68—12 R **6 Claims**



1. A fully automatic washing machine comprising:
an outer shell;
an outer cell supported in said outer shell in a vibration damping manner;
a washing/drying cell rotatably mounted in said outer cell;
a rotary blade unit rotatably provided on a central portion of an inner bottom surface of said outer cell;
a washing machine motor secured to the bottom of said outer cell and adapted to rotate in forward and backward directions in a washing step and a rinsing step and, in a drying step, at a high speed only in one direction;
a clutch mechanism adapted to transmit a torque of said washing machine motor to said rotary blade unit in said washing step and in said rinsing step and to said washing/drying cell in said drying step;
a speed reducing gear adapted to transmit the torque of said washing machine motor to said rotary blade unit at a reduced speed in the forward and backward directions;
a water supplying valve for supplying said washing/drying cell with water;
a draining valve for draining said outer cell; and
an automatic timer adapted to operate said washing machine motor, water supplying valve, and said draining valve in accordance with a predetermined program chart;
characterized in that said rotary blade unit is provided at a center of the upper surface thereof with a cylindrical member, and in that said cylindrical member is provided with a fabric conditioner supplying device capable of supplying a fabric conditioner into said washing/drying cell in the rinsing step taken immediately before said final drying step in a standard program including a plurality of intermediate drying steps and associated rinsing steps operated after said washing step, said standard program includes a first intermediate drying step, a first rinsing step, a second intermediate drying step, and a second rinsing step sequentially operated after a washing step, said fabric conditioner supplying device includes a first vessel for storing said fabric conditioner and a lid detachably secured to said first vessel, said lid including a second vessel for also storing said fabric conditioner, at least one first discharge port provided at an upper portion of said first vessel higher than a water level in the rinsing step, at least one second discharge port provided at an upper portion of said second vessel, and a sack portion provided around said at least one second discharge port, and wherein when said first and second vessels are rotated at a speed equal to the speed of rotation of said rotary blade unit in said first intermediate drying step of high speed, said fabric conditioner in said second vessel flows up along the inner surface of said second vessel and is discharged into said sack portion through said at least one second discharge port, and then, in the first rinsing step of low speed, said fabric conditioner received in the sack portion falls into said first vessel, and next, in the second intermediate drying step, flows from said first vessel along an inner surface thereof and is discharged through said discharge ports into said washing/drying cell.

4,691,539

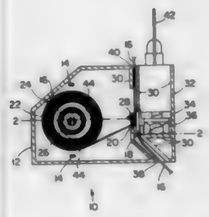
BAND SECURITY LOCK

Gary W. Gover, 630 N. 2nd St., Lakeview, Oreg. 97630

Filed Feb. 19, 1986, Ser. No. 830,729

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—18 **12 Claims**



1. A shackle-type security lock for skis, bicycles and the like comprising:
a thin, flat housing including edge surfaces,
a bi-directional reel rotatably mounted within said housing, said reel mounting a coil of thin, flexible metal shackle band and being spring-biased in a band-coiling direction,
said band having a free end including an anchor clip comprising a locking eye,
said housing including means defining a band exit slot and a band entrance slot in said edge surfaces and an internal guideway for guiding said locking eye through said entrance slot toward a predetermined locking position within said housing,
means defining a compression surface within said housing adjacent said locking position,
said band being trained about said compression surface enroute from said reel to said exit slot,
key-operated locking means within said housing operable with a key from without said housing, said locking means including a locking member movable by operation of said key between (a) an unlocked position retracted from said compression surface and locking position in which said band can be freely withdrawn from said housing through said exit slot and said locking eye can be freely withdrawn from said locking position through said entrance slot, and (b) a locked position in which said locking member extends through said locking position and toward said compression surface to extend through said locking eye when at said locking position and compress said band against said compression surface,
whereby said locking member in said locked position prevents both withdrawal of said locking eye from said housing through said entrance slot and said band from said housing through said exit slot.

4,691,540

LOCK FOR SLIDE FASTENER

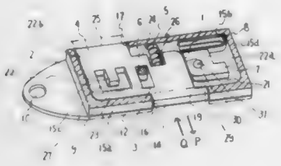
Mikio Murase, Osakafu, Japan, assignor to Osaka Trunk Material Co., Ltd., Osaka, Japan

Filed Sep. 16, 1986, Ser. No. 907,849

Claims priority, application Japan, Feb. 7, 1986, 61-17211[U]

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—68 **8 Claims**



1. A lock for a slide fastener for locking together a first and a second slider with the lock connecting the first slider to a projection on the second slider, the lock comprising
a single integral sliding plate having
an engaging portion on one side thereof,
and a tongue spaced from said engaging portion;
a guiding portion extending in a direction parallel to said tongue;
a case body for containing said sliding plate for reciprocal sliding movement of said sliding plate in the direction longitudinally of said guiding portion;
a corresponding guide member provided in said case body for slidably guiding said guiding portion;
a spring provided in said case body for elastically urging said sliding plate in the direction of extension of said tongue;
a locking member rotatably mounted to move between lock and unlock positions in said case body adjacent to said engaging portion;
said locking member mounted to engage said engaging portion of said sliding plate when said locking member is in the lock position to lock said sliding plate against said reciprocal sliding movement;
said locking member mounted to disengage said engaging portion of said sliding plate when said locking member is in the unlock position to enable said sliding plate to move in said reciprocal sliding movement;
a leaf spring for alternatively stably holding said locking member in each of said lock and unlock positions;
and a cover plate for said case body including
a connecting portion connecting said case body with the first slider,
and having a hole in said cover plate adapted to receive the projection of the second slider at a location corresponding to said tongue.

4,691,541

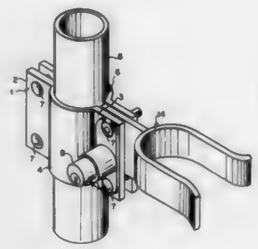
GATE LOCKING DEVICE

Donald E. McQuade, Sr., 1935 N. Railroad Ave., Staten Island, N.Y. 10306

Filed May 15, 1986, Ser. No. 864,643

Int. Cl.[4] E05C *3/14*

U.S. Cl. 70—77 **8 Claims**



1. A gate locking device in combination with a first pipe of a gate closure of a chain link fence, the fence is of the type having a support framework with an overlay of interwoven wire, the fence having an opening defined by a pipework frame with a gate mounted hingeably therein at one side for closing said opening, the frame including said first and a second pipe, said device comprising:
(a) a collar formed by a front piece and a back piece clamped to a first pipe opposite the hinged connection of said gate;
(b) a lock member fixed to a face of one of said front piece and said back piece, said lock member having a lock bar translatable in a line perpendicular to said face;
(c) an oar lock hingeably attached to said collar, movable between a first position where said gate is unlocked and a second position where said oarlock receives a second pipe, adjacent to said first pipe when said gate is in a closed position, within a forked shape portion of said oarlock to prevent relative movement of said first and second pipe in a direction perpendicular to the plane of said gate and thereby prevent opening said gate; and
(d) a plate portion of said oarlock defining a locking opening for receiving said lock bar when said oarlock is moved to the second position and said lock bar is moved to a locking position to thereby prevent hinged movement of said oarlock and lock the gate.

4,691,542

DOOR LOCKING SYSTEM

Quentin H. Young, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Continuation of Ser. No. 393,701, Jun. 30, 1987, Pat. No. 4,509,347. This application Apr. 9, 1985, Ser. No. 721,478

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] E05B *47/00, 65/06;* **E05C** *1/06, 1/12*

U.S. Cl. 70—129 **2 Claims**

1. An electrically operated door locking system for use in a door mounted in a door jamb comprising:
a modular carrier frame mounted in the door jamb;
bolt means mounted on said carrier frame for reciprocation between a retracted position wholly enclosed within said carrier frame and an extended position in which one end of said bolt means protrudes from said carrier frame;
a bolt actuator cam slide operable for movement between a

lock position and an unlock position for respectively positioning said bolt means in said extended position or said retracted position;

guide surfaces on said carrier frame for precluding horizontal movement of the bolt actuator cam slide;

solenoid means for selectively positioning said bolt actuator slide in its unlock or lock positions;



a control circuit for said solenoid means including circuit means for actuating said solenoid means to cause the bolt actuator slide to move to its lock position in response to movement of the door to closed position; and

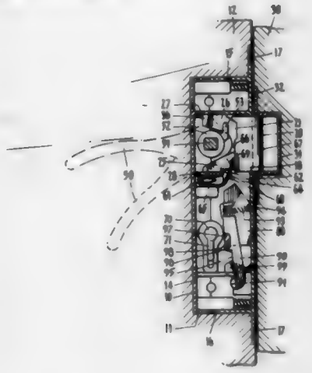
means for preventing actuation of said solenoid means for moving said bolt to its lock position in response to said door not being in a fully closed position.

4,691,543

DEADLOCK WITH KEY OPERATED LOCKING CYLINDER

John R. Watts, 87 Well St., Middle Brighton, Victoria 3186, Australia

Filed Mar. 25, 1986, Ser. No. 843,673
Int. Cl.⁴ E05B *55/00*
U.S. Cl. 70—143 **20 Claims**



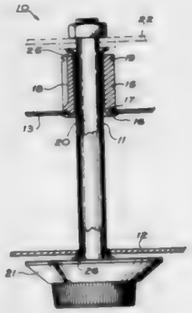
1. A deadlock comprising a lock casing, a locking bolt displaceable within said lock casing, the bolt having a locking tongue arranged, in use, to engage a striker plate, means to displace said locking bolt from a latched position where the tongue extends a short distance out of said lock casing to an unlatched position wherein the tongue is wholly within the casing, locking means comprising a lock slide to drive the tongue past the latched position to a locked position with the locking tongue extending a substantial distance out of the lock casing, and a key operated locking cylinder having an arm which engages the lock slide to displace the slide so that the slide presents an inclined surface to the locking bolt at the rear of the locking tongue to force the tongue outwardly of the casing to the locked position with a portion of the side extending behind the locking tongue, the locking tongue being similarly curved on both sides so that, in use, either side can slide past a striker plate in the latched position thereby enabling the lock to be used in both left and right hand locking doors.

4,691,544

SAFE DOOR BUSHING

Patrick J. Beattie, West Henrietta, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 780,975, Sep. 27, 1985, abandoned, which is a continuation of Ser. No. 520,436, Aug. 4, 1983, abandoned. This application Jul. 28, 1986, Ser. No. 890,862
Int. Cl.⁴ E05B *15/00*
U.S. Cl. 70—329 **15 Claims**



1. A safe door bushing system comprising:

a. a hollow stub mounted on an inner wall of said safe door by being fastened to a region of said inner wall around a hole in said inner wall to extend inward toward the interior of the safe from said inner wall where said stub supports combination lock components;

b. a thin walled tube separate from said hollow stub and extending from said hollow stub through said hole in said inner wall and to a hole in an outer wall of said safe door so that said tube spans an insulation-filled space between said inner and outer walls of said safe door where said tube is fixed in place by insulation filling said space; and

c. a lock spindle extending from outside said outer wall rotatably through said fixed tube spanning said insulation-filled space, through said inner wall and said stub and beyond an inner end of said stub to a drive wheel turned by said spindle to operate said lock components on said stub.

4,691,545

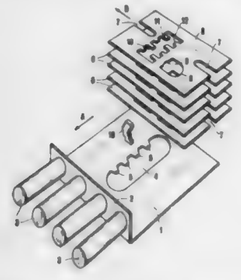
SAFETY LOCK WITH PLURAL TUMBLERS, HAVING A SHAPED CONSENT STUD

Amleto Pagano, Turin, Italy, assignor to SETEC s.r.l., Turin, Italy

Filed Mar. 20, 1984, Ser. No. 592,454
Int. Cl.⁴ E05B *21/00*
U.S. Cl. 70—352 **3 Claims**

1. In the combination of a lock and a key, said lock being intended to cooperate with a strike plate and to be operated by said key, said key having at least one web comprising a sequence of teeth, said lock comprising a casing, at least one plate mounted in said casing for movement in a longitudinal

direction therein under action of said key, at least one bolt mounted on said plate, said bolt extending along said longitudinal direction and being adapted to cooperate with a said strike plate, a consent stud mounted on said plate and extending perpendicularly to said longitudinal direction, and a set of superposed tumblers mounted in said casing for movement, under action of said key, in a transverse direction perpendicular to said longitudinal direction of movement of the plate, each said tumbler having an opening adapted to cooperate with one of said teeth of the key web, said openings being identical for all said tumblers, each said tumbler having a window extending in its said longitudinal direction and a number of pairs of opposed teeth extending along said transverse direction and protruding into said window, said pairs of opposed teeth defining a longitudinal passage in each said tumbler for passage of a corresponding portion of said consent stud in said longitudinal direction, said consent stud of the plate traversing the windows of all said superposed tumblers, in order



to allow longitudinal movement of said plate only when said lock is operated by said key, the improvement in which said consent stud is removably mounted on said plate and comprises an integral plurality of superposed portions offset relative to one another in said transverse direction, each said portion of said consent stud being able to pass through the said longitudinal passage of the corresponding tumbler, said key web and said consent stud being so dimensioned that engagement of said key web teeth with said tumbler openings adapted to cooperate with said key web teeth will move said set of superposed tumblers from an initial locked position to a final position wherein each said portion of said consent stud is centered in the corresponding longitudinal passage of each said tumbler, said plate being movable in said longitudinal direction only after said set of tumblers has been moved to said final position by said key, whereby the character of said lock may be changed simply by changing said consent stud, and changing said key in a corresponding manner.

4,691,546

ROLLING MILL CONTROL FOR TANDEM ROLLING

Roy Clegg, Rotherham, England, assignor to Davy McKee (Sheffield) Limited, Sheffield, England

Filed Nov. 8, 1983, Ser. No. 549,744
Claims priority, application United Kingdom, Nov. 11, 1982, 8232188
Int. Cl.⁴ B21B *37/12*
U.S. Cl. 72—9 **5 Claims**

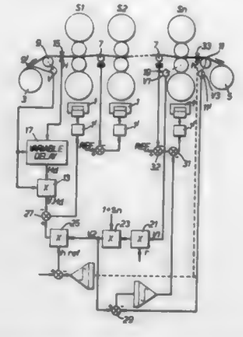
1. A method of operating a rolling mill to roll metal strip wherein said mill has a plurality of rolling mill stands arranged in tandem, and wherein further, the first and last stands of said mill are provided with hydraulic means for controlling the rolling load upon said stands, said method comprising the steps of:

obtaining a first signal representing the product of the velocity and gauge of said metal strip entering said first stand;

obtaining a second signal representing the product of the desired exit speed and the desired exit gauge of said metal strip leaving said last stand of said mill;

obtaining a third signal representing the actual exit speed of said metal strip leaving said last stand of said mill;

comparing said first and second signals and employing the difference, if any, between said first and second signals to adjust said hydraulic means upon said first stand in the sense so as to reduce said difference substantially to zero whereby the entry mass flow of said metal strip will equal the desired exit mass flow of said metal strip; and



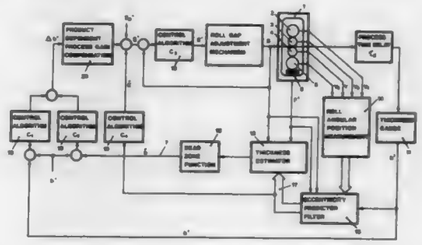
comparing said third signal with a fourth signal representing said desired exit speed of said metal strip leaving said last stand and employing the difference, if any, between said third and fourth signals to control the load upon said last stand in the sense so as to reduce said difference substantially to zero whereby said actual exit speed is maintained substantially equal to said desired exit speed and, in turn, the actual exit mass flow of said metal strip is substantially equal to said entry and desired exit mass flows of said metal strip.

4,691,547

ROLLING MILL STRIP THICKNESS CONTROLLER

Eam K. Teoh; Graham C. Goodwin, both of Newcastle, and William J. Edwards, Carey Bay, all of Australia, assignors to John Lysaght (Australia) Limited, Sydney, Australia

PCT No. PCT/AU84/00172, § 371 Date Apr. 11, 1985, § 102(e) Date Apr. 11, 1985, PCT Pub. No. WO85/00998, PCT Pub. Date Mar. 14, 1985
PCT Filed Sep. 7, 1984, Ser. No. 722,161
Claims priority, application Australia, Sep. 8, 1983, PG1318
Int. Cl.⁴ B21B *37/12*
U.S. Cl. 72—16 **18 Claims**



1. A method for automatically controlling the thickness of product emerging from a rolling stand comprising the steps of producing a first input signal indicative of total roll force, producing a second input signal indicative of rollgap position, producing a third input signal indicative of the angular position of a first mill roll, producing a fourth input signal indicative of product thickness at a predetermined downstream location relative to the rollgap, and deriving from said first, second,

third and fourth input signals a first output signal indicative of the total roll eccentricity affecting the true instantaneous roll-gap position as a function of the first mill roll angular position.

4,691,548

ROLLING MILL STAND FOR STRIP-SHAPED MATERIAL

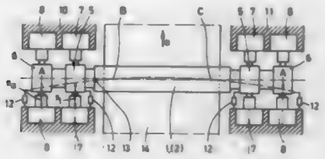
Gerhard Richter, Charlotteenstrasse 5, and Axel Barten, Siegener Strasse 227, both of D-5910 Kreuztal 5, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,070

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431691

Int. Cl.⁴ B21B *37/08, 31/32*

U.S. Cl. 72—21 **1 Claim**



1. In a device for regulating the planeness and the thickness of rolled strip in a multiple-roll strip mill stand with work rolls supported on each roll side in an inner mounting member and an outer mounting member, the mounting members being mounted for movement relative to each other horizontally; the improvement comprising means (12) for continuously detecting the horizontal position (s_i) of the inner mounting members (5) of the rolls (1, 2), means (12) for continuously detecting the horizontal position (s_a) of the outer mounting members (6) of the rolls (1, 2), and means (8) for moving one of said inner and outer mounting members (5, 6) of the rolls (1, 2) in a direction and by a distance sufficient to impart to the rolls a horizontal bending line indicated by said detecting means (12) to be needed to impart uniform planeness and a desired thickness to the rolled strip.

4,691,549

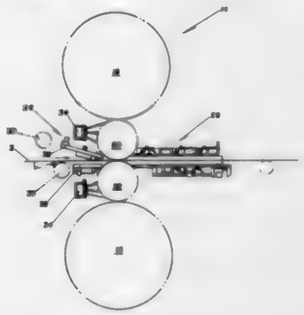
APPARATUS FOR REMOVING LIQUID FROM A STRIP IN A ROLLING MILL AND METHOD THEREOF

James R. Adair, Mt. Lebanon, Pa., assignor to United Engineering Rolling Mills, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 334,192, Dec. 24, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 669,142

Int. Cl.⁴ B21B *27/10, 45/02, 9/00*

U.S. Cl. 72—38 **27 Claims**



1. In a strip rolling mill stand having a strip entry and a strip delivery side thereof wherein a strip is reduced in a rolling area between work rolls defining a roll bite and a passline for the strip along which strip travels generally horizontally and a non-rolling area where a gap is created from the edges of said strip outwardly towards the ends of said work rolls, and wherein liquid lubricant applied to said rolls on said entry side tends to accumulate on the upper surface of said strip on the entry side, comprising:

strip guide means on said entry side for guiding said strip between said rolls,

said strip entry guiding means having air pressure means mounted therein which pressure means is located transversely along a portion of said upper surface overlapping the edges of said strip immediately adjacent said roll bite,

said air pressure means includes means associated with said strip constructed and arranged in a manner to prevent at least a substantial amount of said lubricant on said upper surface of said strip on said entry side from entering into said gap and finding its way to the delivery side of said mill stand.

4,691,550

METHOD AND APPARATUS FOR MAKING A PRESSURE HOSE SOCKET

Klaus Dietzel, Herdekamp 8, DE-4232 Xanten, Fed. Rep. of Germany

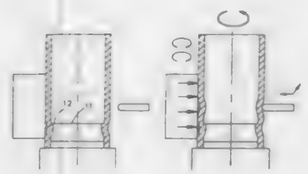
PCT No. PCT/EP85/00441, § 371 Date Mar. 28, 1986, § 102(e) Date Mar. 28, 1986, PCT Pub. No. WO86/01441, PCT Pub. Date Mar. 13, 1986

PCT Filed Sep. 3, 1985, Ser. No. 857,761

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432443

Int. Cl.⁴ B21D *15/06, 41/00;* **B21K** *1/16*

U.S. Cl. 72—68 **13 Claims**



1. A process for the production of a pressure hose socket having at least one crown with at least one tooth projecting inward and which points to one end of the socket, said process comprising the steps of pressing a socket from the outside into at least one continuous or interrupted corrugation projecting into the socket and forming at least one elevation of material, and stamping the at least one elevation of material from inside to form the tooth.

4,691,551

ROLLING METHOD AND ROLLING TOOLS

Minoru Haga; Shinobu Kaneko; Shoji Ikawa; Kimimasa Murayama; Yasuhide Nakamura, and Mitsuo Saito, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and OSG Mfg. Company, Hoi, both of, Japan

Filed Jul. 26, 1985, Ser. No. 759,445

Int. Cl.⁴ B21H *3/06*

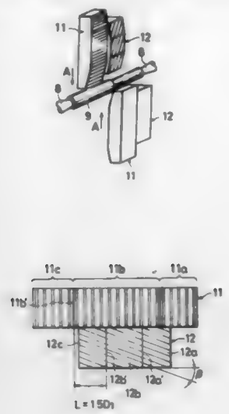
U.S. Cl. 72—88 **8 Claims**

1. A rolling method for simultaneously forming serrations and threads on a workpiece having a first rolling diameter portion on which serrations are to be formed, and a second rolling diameter portion on which threads are to be formed, comprising the steps of:

rolling the workpiece; and

during said step of rolling said workpiece first, beginning to form serrations on the first diameter portion of the workpiece, and

second, forming threads with a lead angle set as a function of a rolling diameter of the first rolling diameter portion of the workpiece, the forming of threads being started after the step of forming serrations has begun and being completed after said forming serrations step is more than half completed and before said forming serrations step is completed.



4,691,552

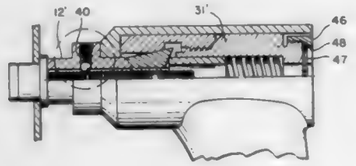
HEAD FOR BLIND RIVET INSTALLATION TOOLS

Richard B. Peterson, Rte. 1, Box 674, Vashon, Wash. 98070

Filed Jan. 13, 1986, Ser. No. 818,475

Int. Cl.⁴ B21J *15/32*

U.S. Cl. 72—391 **4 Claims**



1. The head of a blind rivet installation tool,

said rivet assemblies having shanks with expendable portions thereon,

said shanks with expandable portions having a first length,

said expendable portions having a second length,

said head having a first longitudinal axis and a third length and comprising:

a tip, said tip having a first bore extending therethrough insertion of said shanks, said first bore having a second longitudinal axis, said tip further comprising detent means for retaining said shanks in said first bore,

a casing having a first end, a second end, and a third longitudinal axis,

retention means having a second bore extending therethrough for exit of said expendable portions, said second bore having a fourth longitudinal axis,

said tip being attached to said first end of said casing,

said retention means being installed in said second end of said casing,

said first, second, third and fourth longitudinal axes being essentially coincident,

the sum of said first and second lengths being greater than said third length,

whereby insertion of a rivet assembly into said first bore will cause one of said expendable portions retained in said head to partially exit through said second bore.

4,691,553

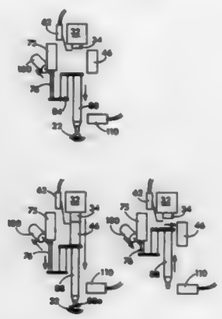
SAFETY POWER TOOL

Stephen C. Barber, 18900 Highland Ave., Deephaven, Minn. 55391

Filed Mar. 6, 1986, Ser. No. 836,837

Int. Cl.⁴ B21J *7/46*

U.S. Cl. 72—444 **8 Claims**



1. A safety power tool for exerting pressure on a work piece comprising,

a supporting framework having an anvil and a short stroke power ram mounted upon said framework,

a punch supported upon the tool and aligned slideably between the anvil and the short storke power ram, said ram being adapted when extended to move the punch toward the anvil through a relatively short distance, a spacer movable into an opening between the ram and the punch to contact the ram at one end and the punch at the other end when the ram is operated for transmitting the short stroke motion of the ram to the punch and a long stroke retraction actuator for withdrawing the punch from the anvil when the spacer is removed from between the ram and the punch to provide a relatively large cleared space between the punch and the anvil for accommodating and facilitating the introduction and removal of work pieces of various sizes without danger of injury to an operator, said retraction actuator elevating the punch into the space formerly occupied by the spacer when the spacer is in an inoperative position and a lock means mounted upon said apparatus in operative association with said punch, said lock means locking the punch in a fixed position after the punch has been elevated, a timer operatively connected to said lock for energizing the lock so as to halt the motion of the punch after the retraction actuator has raised the punch a predetermined period of time, thereby controlling the height to which the punch is raised when the motion is interrupted by the lock to control the clearance space between the anvil and the punch.

4,691,554

DIE TRANSFER SYSTEM

William P. Murphy, 1067 Kennesaw Ave., Birmingham, Mich. 48009

Filed Jun. 12, 1985, Ser. No. 744,028

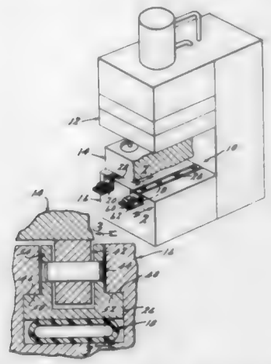
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.⁴ B30B *15/02;* **B21J** *13/08*

U.S. Cl. 72—448 **1 Claim**

1. The combination of a press having a bolster with a pair of

standard Joint Industrial Counsel T-slots therein and a die transfer system, said die transfer system comprising a pair of elongated, horizontally extending vertically movable rails of inverted T-shaped cross section disposed in said T-slots, respectively, each of said rails having laterally extending flanges at the lower extremity thereof for engagement with a pair of complementary laterally extending shoulders at the upper ends of said T-slots, respectively, a plurality of rollers supported by



each of said rails and movable vertically therewith, a pair of air bags extending longitudinally of each of said T-slots under said rails, respectively, and engageable with the bottoms thereof, inflation of said air bags effecting vertical movement of said rails and rollers in translation into engagement with the bottom of said die and elevation of said die relative to said bolster, the flanges on said rails being engageable with the shoulders on said T-slots to limit upward movement of said rails and distortion thereof.

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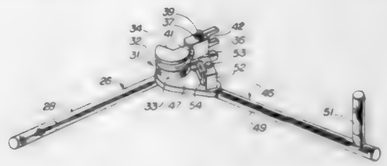
TUBE BENDING TOOL

Donald R. Vaughan, 880 N. East St., Woodland, Calif. 95695

Continuation of Ser. No. 671,882, Nov. 15, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 854,186

Int. Cl.[4] B21J *13/08*

U.S. Cl. 72—459 **11 Claims**



1. A tube bender for use with a tube having a given external radius comprising

a block having a peripheral edge face which is cylindrical about a first axis of rotation, said block being formed with an arcuate first semi-circular cross-section tube-receiving groove recessed into said edge face, said first axis being the center of said arcuate groove,

a retainer, support means mounting said retainer a fixed distance from said block, said retainer having an end formed with a straight second semi-circular cross-section tube-receiving groove, said first and second grooves generally facing toward each other,

a forming member having a shoe formed with a third semi-circular cross-section tube-receiving groove, means detachably mounting said forming member on said block for rotative movement about said first axis,

said first, second and third grooves lying in a common plane perpendicular to said first axis and also all having the same radius of curvature approximately equal to the external radius of the tube to be formed,

said retainer and said shoe each being positionable with said second and third grooves aligned along a common second axis lying in said common plane, the centers of curvature for said second and third grooves lying on said second axis,

said retainer and said shoe lying on opposite sides of a second plane passing through said first axis perpendicular to said second axis, said second plane intersecting said second groove.

4,691,556

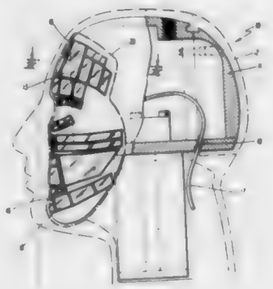
LOAD-SENSING FACEFORM FOR CRASH DUMMY INSTRUMENTATION

Hugo Mellander, Göteborg; Stefan Nilsson, Marstrand, both of Sweden; Charles Y. Warner; Milton G. Wille, both of Provo, Utah, and Magnus Koch, Göteborg, Sweden, assignors to AB Volvo, Göteborg, Sweden

Filed Jan. 31, 1986, Ser. No. 824,666

Int. Cl.[4] G01N *3/30*; **G01L** *25/00*

U.S. Cl. 73—12 **10 Claims**



1. A test dummy head for measuring the effects of impact force and pressure applied thereto, said head comprising a skull forming a face, a plurality of thin pressure-sensitive piezoelectric films attached to said face, said films providing eletrical signals representative of a time history of pressure applied to said face, said face containing individually machined surfaces sized to receive said films.

4,691,557

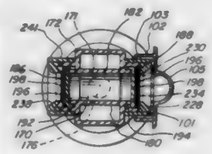
ACOUSTIC COUPLING ASSEMBLY WITH RETAINING CONNECTOR FOR NONINVASIVE SENSING OF SAMPLING CHAMBER FLUID

William J. Dunn, Libertyville, and Brian H. Silver, Hoffman Estates, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed May 6, 1985, Ser. No. 731,094

Int. Cl.[4] G01N *9/00*

U.S. Cl. 73—32 A **15 Claims**



1. In a fluid sampling chamber assembly for noninvasive sensing of the fluid having a chamber with a sensor wall arrangement for acoustic coupling therewith, apparatus for coupling a transducer of a transducer assembly with each sensor wall of said sensor wall arrangement, comprising:

means located adjacent the sensor wall for enhancing good acoustic coupling of the sensor wall with the transducer;

a relatively rigid connector member mounted to the chamber around the sensor wall, said connector member having an access opening means for coupling engagement therethrough of the transducer with the sensor wall; and

an annular portion of the access opening means being in retentive overlying relationship with said acoustic coupling enhancing means;

said acoustic coupling enhancing means including a fluid like coupling agent for eliminating air gaps;

said transducer assembly supporting said sampling chamber by each of said connector members when said transducer assembly is received within said access opening.

4,691,558

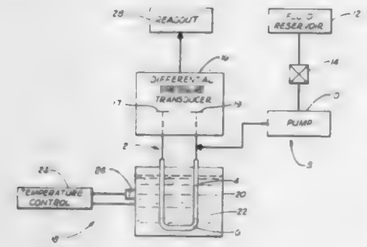
PRESSURE PULSE GELATION TEST APPARATUS AND METHOD

Edward F. Vinson, Duncan, and William H. Smith, Walters, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 19, 1986, Ser. No. 876,969

Int. Cl.[4] G01N *11/00*

U.S. Cl. 73—64.1 **25 Claims**



1. An apparatus for testing gelation of a sample comprising:

fluid circuit means, having a closeable internal volume, for receiving the sample within said internal volume;

pressurizing means, including means for creating pressure pulses within said internal volume on one side of the sample, connected into said fluid circuit means, for changing the pressure within said internal volume; and

pressure detecting means, connected into said fluid circuit means, for detecting a pressure differential across the sample in said internal volume in response to said pressurizing means when said internal volume is closed.

4,691,559

DEVICE FOR MEASURING THE PROPERTIES OF SOLID MATERIALS WHICH CAN BE DERIVED FROM THE BEHAVIOR OF A PENETRATING BODY

Helmut Fischer, Industriestrasse 21, 7032 Sindelfingen-Maichingen, Bundesrepublik, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,430

Int. Cl.[4] G01N *3/48*

U.S. Cl. 73—81 **45 Claims**

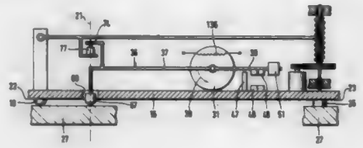
1. In an apparatus for nondestructive, absolute measurement of the properties of solid materials which is derived from the behavior of a body penetrating said materials, having a penetrating body, a guidance device for guiding said penetrating body in a direction of motion onto said materials, and an electrical evaluation circuit, the improvement comprising:

(a) an electromotive drive connected to said guidance device that urges said penetrating body with a specific, but variable force onto the surface of said materials,

(b) means for feeding a first voltage output representing said force to said electrical evaluation circuit,

(c) a floating distance-measuring device having first and second sections which allows measurements of the distance between said first and second sections in said direction of motion of said penetrating body and has a resolution that is significantly smaller than the depth of penetration of said penetrating body,

(d) said first section being rigidly connected to said penetrating body,



(e) a follower connected to said second section to guide said penetrating body, through said first section, bounce-free onto the surface of said material,

(f) means for finely moving said follower in said direction of motion of said penetrating body, said means switching off after said penetrating body has been set down onto said material and when said distance-measuring device measures a prespecified distance between said first and second sections, and

(g) means for feeding a second voltage output representing the depth of penetration from said distance measuring device to said electrical evaluation circuit.

4,691,560

METHOD AND APPARATUS FOR THE PERFORMANCE TESTING OF THE ENGINE OF A SHIP WHILE THE ENGINE IS INSTALLED IN THE HULL OF A SHIP

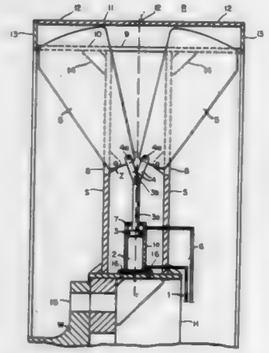
Wilhelm Otto, Seevetal, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,278

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444164

Int. Cl.[4] G01L *5/13*

U.S. Cl. 73—116 **20 Claims**



1. Apparatus for performance loading of an engine of a deepwater ship having a hull and a propeller shaft extending from said hull, said apparatus for testing the performance of said engine when said engine is installed in said hull of said ship

and when said propeller shaft is surrounded by water, said apparatus comprising:

a hub portion for being mounted on said propeller shaft of said ship at a position on said propeller shaft substantially where a propeller of said ship is mounted during operation of said ship on a body of water when said propeller is driven by said propeller shaft;

drag means for producing a drag when said hub is rotating and driven by said propeller shaft, said drag means being firmly attached to said hub, said hub driving said drag means through said water about said propeller shaft when rotated by said propeller shaft;

said drag means having at least one surface which interacts with water about said propeller shaft to produce said drag during operation, said drag means having a position of minimum drag, said drag means being extendable from said position of minimum drag to increase drag of said drag means; and

control means connected to and for adjusting said drag means to extend said drag means from said position of minimum drag and to withdraw said drag means to said position of minimum drag, thereby to increase and decrease drag respectively of said drag means during operation and to load said engine of said ship even when said ship is substantially stationary;

said at least one surface being disposed in operation to produce substantially, solely, a torque about said propeller shaft;

said at least one surface arranged for substantially reducing any thrust on said propeller shaft developed by said apparatus to a minimum;

said control means for adjusting said drag means to selectively increase and decrease torque on said propeller shaft and thereby to selectively vary the load on said engine during operation.

4,691,561

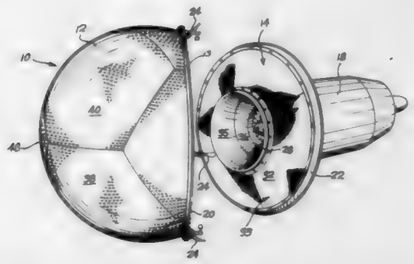
INFLOW CONTROL DEVICE FOR ENGINE TESTING

Ulrich W. Ganz, Kirkland, and Paul C. Topness, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 13, 1986, Ser. No. 873,818

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.1 **10 Claims**



1. An air inflow control device for simulating flight-like air inflow conditions into the intake of a jet engine or the like, comprising:

a hollow sphere truncated in a manner defining a circular opening into said sphere, with the sidewall of said sphere being pervious to airflow therethrough; and

a circular bellmouth closing said opening, said bellmouth including a recessed portion, a sound-absorbing material received in said recessed portion, and a layer of perforated material covering said sound-absorbing material, with said recessed portion, said sound-absorbing material and said perforated material together forming an inwardly projecting surface having a generally conical taper from near the bellmouth's outer radial edge to a central high-lite portion of said bellmouth, said high-lite portion providing an air inlet from inside said sphere to said jet engine, and wherein said high-lite portion is mated to said engine intake in a manner such that said high-lite portion inlet and said engine intake form a smooth and continuous intake from inside said sphere to said engine.

4,691,562

PROCESS FOR DETERMINING AGING CONDITION OF EXHAUST-GAS CATALYST

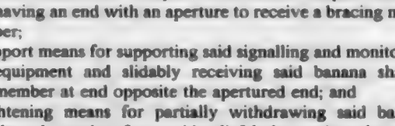
Joerg Abthoff, Pluederhausen; Hans D. Schuster, Schorndorf; Hans J. Langer, Remseck; Wolfgang Zahn, Stuttgart, and Günther Ebinger, Heiningen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1986, Ser. No. 890,540

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527175

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 **9 Claims**



4. A process for determining the condition of an exhaust-gas catalyst for an internal combustion engine which has a λ-probe for λ-controlled regulation of the fuel/air ratio, in which the fuel/air ratio is switched from rich to lean or from lean to rich when said ratio exceeds or falls below a pre-specified value, said process including the steps of delaying the switching of the fuel/air ratio, and measuring the relative amount of combustible components in the exhaust gas after the exhaust gas has passed the catalyst.

4,691,563

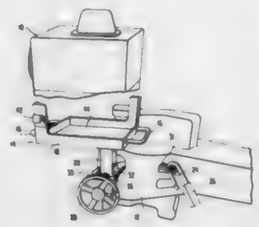
RAILROAD COUPLER MOUNT

Gregory C. Martin, Gaithersburg, Md., assignor to Pulse Electronics, Inc., Rockville, Md.

Filed Nov. 25, 1986, Ser. No. 934,922

Int. Cl.[4] G01L *5/00, 5/28*

U.S. Cl. 73—129 **9 Claims**



1. A railroad coupler mount for securing signalling and monitoring equipment to a knuckle of a railroad car coupler, comprising:

a banana shaped member which extends through a pair of relief holes on a common horizontal axis in said knuckle of said railroad car coupler, said banana shaped member having an end with an aperture to receive a bracing member;

support means for supporting said signalling and monitoring equipment and slidably receiving said banana shaped member at end opposite the apertured end; and

tightening means for partially withdrawing said banana shaped member from said relief holes against the resistance of said bracing member to force said support means against a side wall of said railroad car coupler.

4,691,564

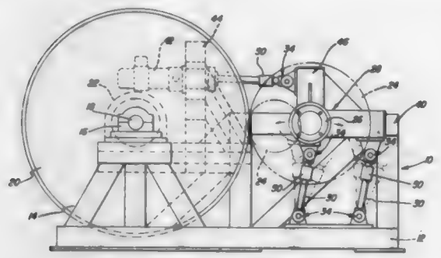
HIGH SPEED TIRE UNIFORMITY TESTING DEVICE

Gerald R. Potts, Flint, Mich., and John C. Ryder, Massillon, Ohio, assignors to G. R. Potts Associates, Inc., Flint, Mich.

Filed Jul. 1, 1986, Ser. No. 880,759

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 **4 Claims**



1. An apparatus for testing tires at high speed comprising:

a rotatable wheel mounted on an axle, means for supporting said wheel on a frame, and means operatively connected to said axle for driving said wheel;

a tire mounting means connected to a housing for rotatably mounting a test tire and a linear actuator connected to said housing by means of a universal joint for moving said housing and test tire toward and away from said wheel;

said housing connected to said frame by means of first and second tie rod members with said first tie rod member being connected between the frame and the underside of said housing and said second tie rod member being connected between the frame and a side of said housing wherein the angle formed between the axes of said first and second members being substantially 90 degrees; and

said tie rod members connected to said housing and said frame by means of universal joints whereby only tension and compression forces are applied to said members when said test tire is rotatably engaged against said wheel.

4,691,565

MOBILE MACHINE FOR MEASURING TRACK PARAMETERS

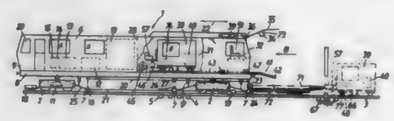
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 16, 1986, Ser. No. 863,884

Claims priority, application European Pat. Off., Aug. 22, 1985, 85890188.7

Int. Cl.[4] G01B *5/20*

U.S. Cl. 73—146 **12 Claims**



1. A mobile machine for measuring the position of a track and arranged for mobility on the track in an operating direction, which comprises

(a) a machine frame having a front end in the operating direction,

(b) track reference measuring systems on the machine frame for determining different track parameters including the vertical and lateral position of the track, the track reference measuring systems for determining the vertical and lateral track position including

(1) a laser beam receiver means on the machine frame front end, and

(c) a self-propelled satellite bogie preceding the machine frame front end in the operating direction for mobility on an uncorrected section of the track in said direction, the bogie being equipped with

(1) a drive for propelling the bogie in said direction and

(2) a laser beam emitter means emitting a laser beam extending in at least one plane and projecting the laser beam on the receiver means for continuously determining any deviations in an extended uncorrected track section from a desired one of said positions,

(d) the front end of the machine frame being arranged for receiving the satellite bogie and having a storage station whereinto, and wherefrom, the satellite bogie may be propelled, and

(e) the satellite bogie being constructed for being automatically propelled into, and from, the storage station and the front end of the machine frame.

4,691,566

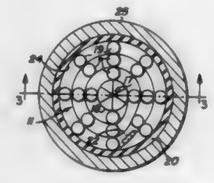
IMMERSED THERMAL FLUID FLOW SENSOR

Harry E. Aine, 30600 Page Mill Rd., Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 666,040, Dec. 7, 1984, abandoned. This application Aug. 15, 1985, Ser. No. 765,839

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **27 Claims**



1. In a method for sensing fluid flow in a fluid passageway for containing the flow to be measured, the steps of:

supporting a temperature dependent flexible sensing resistor on a flexible ribbon-shaped flow septum for immersion in said fluid passageway;

immersing and meandering by flexure both said ribbon-shaped septum and sensing resistor within said fluid flow passageway so as to partition a preponderance of the flow therein into a plurality of side-by-side flow portions, each with a length, L, at least three times larger than its characteristic minimum cross-sectional dimension, D and each partitioned flow portion being disposed in heat-exchanging relation with said meandered sensing resistor; and

deriving an electrical output signal from said meandered and flexed sensing resistor which is a function of the fluid flow for sensing the fluid flow.

4,691,567

APPARATUS FOR DETERMINATION OF THE STATIC UNBALANCE IN A BODY

Günther Himmler, Darmstadt, and Günter Knoll, Büttelborn, both of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Continuation of Ser. No. 643,696, Aug. 24, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 903,869

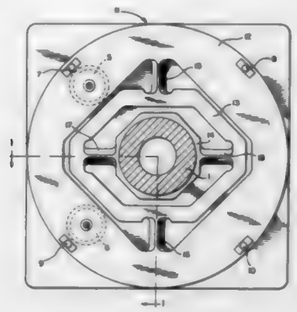
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1983, 3330974

Int. Cl.[4] G01M *1/12*

U.S. Cl. 73—483 **2 Claims**

1. Apparatus for determination of the static unbalance in a

body, said apparatus comprising: an adaptor plate for supporting the body to be balanced, a gimbal support for the adaptor plate and having two mutually perpendicular axes of rotation defining two degrees of freedom, said gimbal support counteracting the forces exerted by the unbalance, the axes of rotation of said gimbal support defined by axially rigid torsion members that can deflect torsionally about their own axes, said gimbal support provided as a single, undetachable unit including an outer body, a middle body, and an inner body wherein two twistable torsion members extend between and interconnect



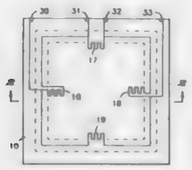
the outer and the middle bodies and another two twistable torsion members extend between and interconnect the middle and inner bodies, the axes of twist of said twistable torsion members lying in a single plane, said torsion members being rigid in both the vertical and the horizontal direction to transmit radial and axial forces exerted thereon, said torsion members having a substantially square cross section defined by four longitudinally extending sides that meet to define two pairs of opposed longitudinally extending edges, one pair of opposed, edges lying in a substantially vertical plane and another pair of opposed edges lying in a substantially horizontal plane.

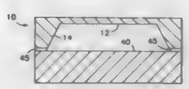
4,691,568

SEMI-CONDUCTOR ACCELEROMETER

Peter M. Rendek, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 9, 1985, Ser. No. 806,919
Int. Cl.[4] G01P *15/12*
U.S. Cl. 73—517 R **10 Claims**





1. An accelerometer comprising:

a substantially square diaphragm formed of monocrystaline silicon with opposed major surfaces and having four edges defined by a relatively thick frame member integrally affixed thereto;

a serpentine resistor diffused into one of the major surfaces of said diaphragm adjacent each edge and centered approximately on a bisector of the edge with two resistors being oriented parallel to the adjacent edges and two resistors being oriented perpendicular to the adjacent edges; said resistors being electrically connected into a Wheatstone bridge configuration;

a base member having a relatively flat surface, said frame member being positioned on the flat surface and fixedly attached thereto with said diaphragm being substantially parallel to the flat surface and spaced therefrom, said frame member fixedly anchoring each edge of said diaphragm to said base member to prevent relative movement thereof; and

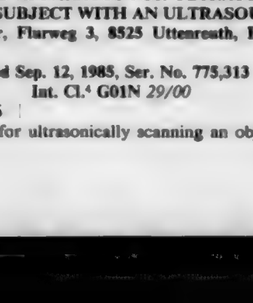
vent means formed in one of said frame member and said base member to prevent the occurrence of differential pressure on the opposed major surfaces of said diaphragm.

4,691,569

APPARATUS FOR OBSERVING SOUND FIELD OF ULTRASONIC WAVE

Takuso Sato, Tokyo, and Nobuyuki Ichida, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 647,389, Sep. 5, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 931,981
Claims priority, application Japan, Sep. 13, 1983, 58-168600
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—596 **7 Claims**



1. An apparatus for observing a sound field of an ultrasonic wave, comprising:

first means for determining a first parameter value of a medium at each point in a predetermined region using a first ultrasonic wave having a sound field of an arbitrary shape transmitted into the medium, the first parameter value being an equivalent second-order acoustic nonlinearity parameter which characterizes the nonlinear relationship between pressure and density in a medium;

second means for displaying the output of said first means as one of a two-dimensional and a three-dimensional picture of said predetermined region, thereby displaying the shape of the sound field of said first ultrasonic wave;

third means for determining a second parameter value of the medium at each point in said predetermined region using a second ultrasonic wave having a sound field uniform over said predetermined region of the ultrasonic wave field transmitted into the medium, the second parameter value being substantially the same as the first parameter value; and

fourth means for determining a ratio of the first and second parameter values of the medium at each point therein obtained from said first and third means, the output of said fourth means being supplied to said second means and displayed thereby.

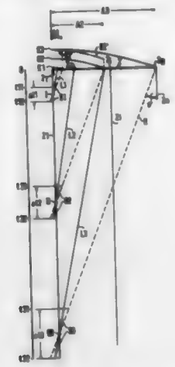
4,691,570

METHOD AND APPARATUS FOR ULTRASONICALLY SCANNING A SUBJECT WITH AN ULTRASOUND HEAD

Dietrich Hassler, Flurweg 3, 8525 Uttenreuth, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,313
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—626 **18 Claims**

1. A method for ultrasonically scanning an object at a selected number of different depth regions along a straight scan line in a direction of increasing depth using an ultrasound head having a plurality of ultrasonic transducer elements, wherein a predetermined number of said transducer elements is activated, thereby forming an ultrasound aperture during reception along said scan line, and wherein echo signals received from said object are successively processed, said method, during reception along said scan line, comprising the steps of:



enlarging the ultrasound aperture in steps, thereby moving the center of said aperture in a scan direction from a fixed starting point;

adjusting the directional characteristic of said aperture at each of said steps; and

selecting a different depth region at each of said steps,

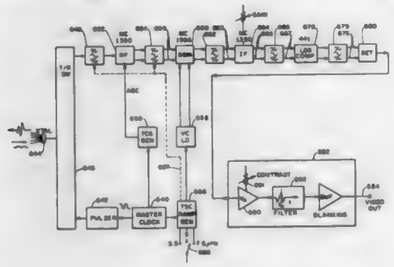
thereby generating a sawtooth scan curve approximating said straight scan line.

4,691,571

TISSUE SIGNATURE TRACKING TRANSCEIVER HAVING UPCONVERTED IF AMPLIFICATION

Terrance Matzuk, Verona, Pa., assignor to Dymax Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 707,584, Mar. 4, 1985, abandoned. This application Sep. 3, 1986, Ser. No. 902,140
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—632 **14 Claims**



1. For use with an ultrasound transducer, a selected bandwidth ultrasound transceiver comprising:

means for generating an ultrasound signal having a selected amplitude and frequency;

means for energizing said transducer for signal propagation of said ultrasound signal through a medium, wherein said transducer provides a reflected signal upon receipt of a reflection of said propagated signal; and

means for receiving said reflected signal, comprising:

superheterodyne receiver means for continuously selecting different frequency components from among the signal frequency components of said reflected signal according to the depth of the received reflected signal, providing an output signal by modulating the local oscillator frequency according to said selected different signal frequency components, wherein

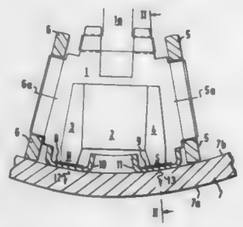
said detector means output signal describes the reflective characteristics within said medium, the amplitude variations and relative time intervals providing indication of medium reflectivity at corresponding medium depths.

4,691,572

TRANSDUCING DEVICE FOR CONTACTLESS ULTRASONIC INSPECTION OF PIPELINES OR TUBINGS

Wilhemus H. van den Berg; Marinus H. Homs, both of Amsterdam, Netherlands, and Bob P. J. van Oorschot, Aberdeen, United Kingdom, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 8, 1985, Ser. No. 763,845
Claims priority, application United Kingdom, Aug. 9, 1984, 8420244
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—643 **17 Claims**



1. A transducing device for contactless ultrasonic inspection of a conductive plate material, comprising:

means for electromagnetically generating focused transverse elastic waves within said plate material to be inspected effective to drive said elastic waves through the plate material causing reflections of the elastic waves from the rear side of the plate material; and

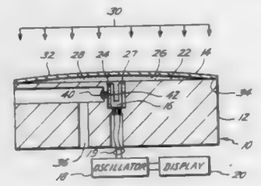
means for mounting and moving said means for generating along said material.

4,691,573

PRESSURE SENSOR

Gerald F. Varnum, Georgetown, Tex., and Christopher C. Duke, Lone Wolf, Okla., assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Jun. 16, 1986, Ser. No. 874,410
Int. Cl.[4] G01L *7/08, 11/00*
U.S. Cl. 73—702 **3 Claims**



1. A fluid filled pressure transducer for measuring the pressure of an external fluid comprising:

a sensor body having a substantially planar backup surface;

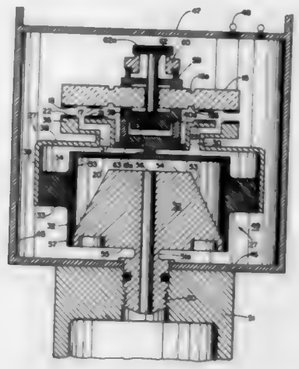
a flexible diaphragm having a radially outer portion in sealed relationship with the backup surface of the sensor body;
a variable volume fluid chamber defined by the backup surface and the diaphragm;
a sensor chamber formed in the sensor body and in fluid communication with the variable volume fluid chamber;
a pressurized, compressible working fluid contained in the fluid and sensor chambers;
means mounted in the sensor chamber for sensing variations in the density of the working fluid within the sensor chamber;
an enclosure cover attached to the sensor body and enclosing the flexible diaphragm;
an isolation diaphragm having a radially outer portion secured to said enclosure cover, said isolation diaphragm and enclosure cover forming a isolation chamber in fluid communication with said flexible diaphragm; and
a substantially incompressible isolation fluid contained in the isolation chamber whereby pressure exerted upon the isolation diaphragm is communicated by said isolation fluid to said flexible diaphragm.

4,691,574

CAPACITANCE TRANSDUCER

Leroy C. Delatorre, 11 Crestwood, Sugar Land, Tex. 77478

Filed Feb. 25, 1986, Ser. No. 832,736
Int. Cl.[4] G01L *7/08, 9/12, 19/04*
U.S. Cl. 73—708 **9 Claims**



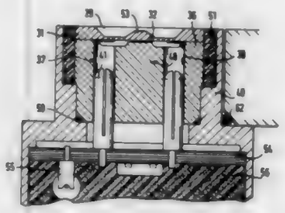
1. A capacitance type pressure transducer for converting fluid pressure into electrical signals representative of a magnitude of pressure, comprising:
housing means having a pressure measuring chamber with an input orifice for receiving a pressure input to be measured and with a flexible diaphragm for displacement with respect to a first axis as a function of pressure where said first axis is transverse with respect to said diaphragm;
first inner and outer support means in said housing means for respectively supporting first inner and first outer annular electrode plate means on said housing means and on said diaphragm where said plate means are in a first plane transverse to said first axis, said inner support means including a central cylindrical support member;
second support means in said housing means including an annular disc having upper and lower surfaces, and said disc having centrally located upper and lower bearing surfaces;
second inner and outer annular electrode plate means on said lower surface in a second plane transverse to said first axis and in a facing and spaced relationship to said first inner and first outer annular electrode plate means; and
interconnecting means for interconnecting said first inner support means and said second support means to one another including an annular temperature compensating ring means attached to said central cylindrical member, a lower support ring attached to said ring means and bearing on a lower bearing surface of said second support means, an upper annular support ring bearing on an upper bearing surface of said second support means, and rod member means extendable through openings in said upper annular support ring, said annular disc for interconnecting said upper annular support ring and said annular disc to said lower support ring.

4,691,575

TRANSDUCER INSERTS; METHODS OF MAKING THEM AND SENSORS FOR MEASURING MECHANICAL VARIABLES

Hans-Conrad Sonderegger, Neftenbach; Reto Calderara, Winterthur; Alfred Wenger, Winterthur, and Hans-Ulrich Baumgartner, Winterthur, all of Switzerland, assignors to Kristal Instrumente AG, Winterthur, Switzerland

Filed Dec. 30, 1985, Ser. No. 814,401
Claims priority, application European Pat. Off., Jan. 28, 1985, 85100819.5
Int. Cl.[4] G01L *7/08, 9/06, 9/12*
U.S. Cl. 73—756 **19 Claims**



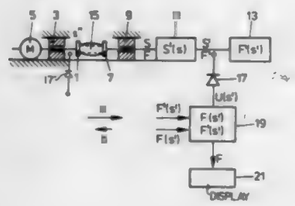
1. A transducer insert comprising:
a semi-conductor body having a measuring diaphragm with force responsive sensor means for generating measuring signals, said semi-conductor body also having connecting contacts;
a base body for holding the semi-conductor body, said base body being composed of an insulating material; and
electrical conductor means for carrying off said measuring signals, said conductor means comprises channels which extend through said base body and are provided with electrically conductive layers, said electrically conductive layers extend close to the connecting contacts to permit associated ones of said electrically conductive layers and said connecting contacts to be electrically connected to each other through an electrically conductive material, said electrically conductive material being applied adjacent to portions of the associated ones of said conductive layers and connecting contacts in an angle space therebetween.

4,691,576

METHOD OF TESTING THE MECHANICAL STRESS RESISTANCE OF A SAMPLE OF MATERIAL AND APPARATUS FOR CARRYING OUT THE METHOD

Kurt Schleuniger, Neunigkofen, and Peter Hermann, Brügg bei Biel, both of Switzerland, assignors to Straumak AG, Switzerland

PCT No. PCT/CH85/00036, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/04247, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 1, 1985, Ser. No. 801,685
Claims priority, application Switzerland, Mar. 21, 1984, 1416/84
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—821 **28 Claims**



1. A method of testing the mechanical resistance of a sample of material comprising the steps of:
(a) positioning said sample on a path of motion of two pressing jaws which are movable relative to each other, both towards and away from each other, when said jaws are apart from each other;
(b) moving at least one of said two jaws so as to bring said two jaws relatively closer to each other and thereby bring both of said two jaws into contact with said sample;
(c) automatically controlling the speed of said jaws relative to each other, from a high speed at the beginning of said moving, to a low speed just before both of said two jaws have made contact with said sample, to minimize the contact impact of said jaws and said sample and to simultaneously minimize the approach time of said jaws to said sample;
(d) pressing said two jaws together with said sample therebetween; and
(e) registering a pressing force and mechanical deformation of said sample.

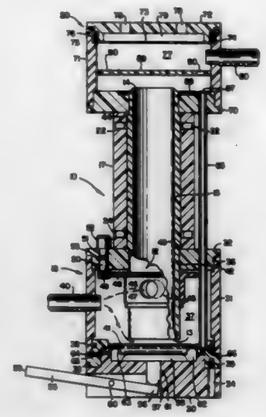
4,691,577

SOAP FILM GAS FLOWMETER

Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470; Jorge E. Bermudez, 55 Ave. B, Haledon, N.J. 07508, and William T. Fleming, 286 Green Village Rd., Green Village, N.J. 07935

Filed Mar. 10, 1986, Ser. No. 837,847
Int. Cl.[4] G01F *1/708, 25/00*
U.S. Cl. 73—861.05 **22 Claims**

1. A soap film gas flowmeter comprising: a flow tube having a hollow body with opposite open ends through which a soap film is propelled, a first closed chamber housing a soap solution; means for supporting said flow tube in a substantially vertical position with the open bottom end of the flow tube disposed in said first chamber above said soap solution; a second closed chamber into which the open top end of said flow tube extends; gas inlet means for introducing gas into said first chamber at a flow rate to be measured using the flowmeter; gas exit means for discharging the gas introduced into said first chamber through said second chamber; means for generating a single soap bubble from said soap solution substantially at the bottom end of said flow tube and a relatively large opening in said flowtube for providing an open passageway for inlet gas to



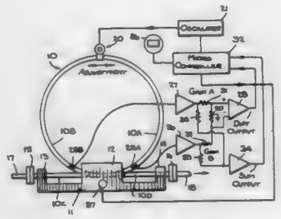
pass through said flowtube when said bottom open end of said flowtube is covered by said soap solution.

4,691,578

CORIOLIS-TYPE MASS FLOWMETER

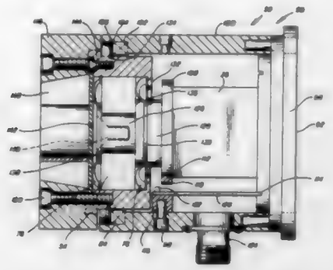
Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 21, 1986, Ser. No. 831,564
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 **8 Claims**



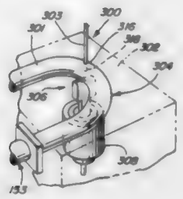
1. A mass flowmeter of the Coriolis type comprising:
A. a single turn flow loop formed by a pipe having a pair of arcuate legs, said loop being supported on a frame whereby the loop is free to vibrate at its natural resonance frequency;
B. a self-sufficient electromagnetic ballistic vibrator mounted on said loop at the vertex thereof, said vibrator having a mass therein that oscillates to cause the loop to vibrate at its resonance frequency;
C. means to feed a fluid to be metered through said vibrating loop to cause said loop to undergo tortional oscillation as a function of mass flow:
D. a pair of strain gauges mounted on the respective legs of said loop whereby in the absence of flow, the gauges yield equal signals and during flow they yield signals of different magnitude as a function of mass flow;
E. means to apply the signals from the gauges to a differential amplifier whose output is substantially proportional to the mass flow rate; and
F. means responsive to the differential amplifier output to provide a mass flow rate reading.

4,691,579
TENSION TRANSDUCER
Kenneth E. Ekola, 574 - 6th St., Dover, N.H. 03820
Filed Jan. 3, 1986, Ser. No. 870,113
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **11 Claims**



1. In a transducer of the cantilevered beam type wherein a force to be measured is applied perpendicularly to the end of the beam through a joint, the improved joint comprising:
(a) a self-aligning first roller bearing having an axially aligned center bore and a cylindrical outer surface;
(b) a cylindrical inner member carried by the end of the beam adapted to receive said center bore as a snug fit thereof;
(c) a cylindrical outer member having cylindrical inner and outer surfaces, said cylindrical inner surface being of a diameter to be a sliding fit about said cylindrical outer surface of said first roller bearing, said cylindrical inner surface also having parallel, spaced, inward-facing ridges thereon of a spacing greater than the width of the said first roller bearing, said cylindrical outer member further including means for receiving a force to be measured;
(d) bias means disposed between said inward-facing ridges and said first roller bearing for resiliently urging said first roller bearing towards a neutral position;
(e) a second roller bearing having an axially aligned center bore of a radius larger than the radius of said cylindrical outer surface of said cylindrical outer member by an amount equal to the maximum deflection to be allowed, said second roller bearing being disposed concentrically about said cylindrical outer member in alignment with said first roller bearing; and,
(f) means for non-movably supporting said second roller bearing with respect to the support of the cantilevered beam.

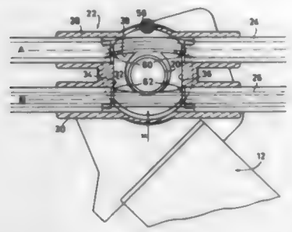
4,691,580
FLUID SAMPLING APPARATUS
Egil Fosslien, 1499 Shermer Rd., Northbrook, Ill. 60062, assignor to Egil Fosslien, Northbrook, Ill.
Filed Jan. 8, 1986, Ser. No. 817,077
Int. Cl.[4] G01N *1/14, 35/08*
U.S. Cl. 73—864.84 **20 Claims**



17. In combination in an apparatus for sequentially withdrawing a blood sample from a sample container which is part of a plurality of sample containers or withdrawing blood from individual containers in a manual mode, transporting the sample to an analyzer and then analyzing the sample in the analyzer:
a T-valve between the sample container and the analyzer, the T-valve comprising
a resilient conduit having an exterior wall, a longitudinal axis and an interior passage, the interior passage adapted to have blood flowing therethrough and being defined by an interior wall of the resilient conduit;
a rigid second conduit from the resilient conduit to the analyzer to transport blood samples from the resilient conduit to the analyzer, the second conduit having at least two orifices, a longitudinal axis substantially transverse to the longitudinal axis of the resilient conduit and an interior passage adapted to have blood flow therethrough, the second conduit extending through the exterior wall of the resilient conduit and having at least one orifice in the interior passage of the resilient conduit;
means for periodically deforming the interior wall of the resilient conduit into sealing engagement with the orifice of the second conduit in the interior passage of the resilient conduit to sequentially separate and transport blood samples from the resilient conduit to the analyzer, the deforming means being exterior to the resilient conduit and including a pinch member opposite the orifice in the interior passage of the resilient conduit and means for actuating the pinch member to abuttingly engage and deform said exterior wall to sealingly engage the interior wall against the orifice in the interior passage with the resilient tube retaining an interior passage of reduced cross-section for blood flow therein; and
a sliding analyzer valve between the T-valve and the analyzer, the analyzer valve comprising
a housing;
a longitudinal channel through the housing;
a sliding member extending through the channel in the housing for reciprocating movement therein, the sliding member having at least two channels which are generally normal to the longitudinal channel and which extend through the sliding member;
a valve seat which abuttingly engages the sliding member generally normal to the sliding member, the seat including at least one longitudinal channel which provides a generally straight fluid flow through the valve when it is aligned with one of the channels in the sliding member upon reciprocating movement thereof; and
a means for actuating the sliding member for reciprocating movement so as to put the analyzer in fluid communication with the T-valve or a sample container in the manual mode.

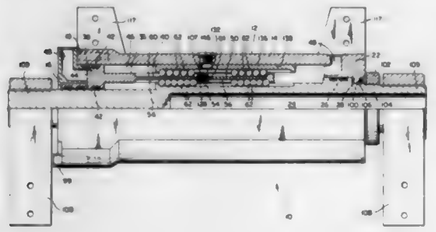
4,691,581
GEARMOTOR FOR THE ALTERNATE DRIVE OF TWO OPERATIONS
Jacques Bascou, Maule, France, assignor to Regie Nationale des Usines Renault, Paris, France
Filed Dec. 5, 1985, Ser. No. 804,768
Int. Cl.[4] F16H *19/04;* **E05F** *11/48*
U.S. Cl. 74—30 **6 Claims**

1. A gearmotor for the alternate drive of two operations, comprising:
a housing;
a drive pinion rotatably mounted in said housing;
first and second substantially parallel rack cables extending through said housing in a first direction perpendicular to an axis of rotation of said drive pinion and on respectively opposite sides of drive pinion;
sliding guide means for guiding said first and second rack cables, said sliding guide means being movable in said housing only in a second direction perpendicular to said axis of rotation and to said first direction by an amount sufficient for said drive pinion to alternately engage one of said first and second rack cables; and



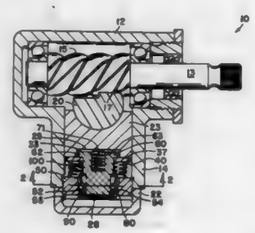
means for moving said sliding guide means comprising sliding guide means actuator means, and an actuating pin fixed to said sliding guide means, said pin extending outside of said housing and engaging said actuator means.

4,691,582
THIN PROFILE ROTARY ACTUATOR WITH BACKLASH ELIMINATION
Paul P. Weyer, 48811 284th SE., Enumclaw, Wash. 98022
Continuation-in-part of Ser. No. 575,228, Jan. 30, 1984, Pat. No. 4,590,816, and Ser. No. 692,293, Jan. 17, 1985, Pat. No. 4,683,767. This application Dec. 2, 1985, Ser. No. 803,954
Int. Cl.[4] F16H *55/18, 1/18*
U.S. Cl. 74—409 **47 Claims**



1. A fluid-powered actuator, comprising:
a body;
a rotatable member supported for rotation relative to said body and connectable to an external device;
a first member reciprocally mounted within said body;
a second member reciprocally mounted within said body generally coaxial with said first member, said first and second members being independently and adjustably rotatable and axially movable within at least a limited range relative to the other without directly producing axial or rotational movement of the other;
at least one piston reciprocally mounted within said body for application of fluid pressure to one or the other opposing sides thereof to produce axial movement of said piston, said piston operatively engaging at least one or the other of said first and second members to axially move said members in response to axial movement of said piston;
first torque-transmitting means for transmitting torque between said first member and said body;
second torque-transmitting means for transmitting torque between said first member and said rotatable member;
third torque-transmitting means for transmitting torque between said second member and said rotatable member;
fourth torque-transmitting means for transmitting torque between said second member and said body, at least said first and fourth torque-transmitting means or said second and third torque-transmitting means producing relative rotational movement between said body and said rotatable member in response to axial movement of said piston, and said first, second, third and fourth torque-transmitting means producing movement of said first and second members in unison and in the same axial direction with substantially equal axial travel in response to axial movement of said piston during fluid powered operation; and
a collar threadably connected to said first member and applying an adjustable and oppositely directed axial force on said first and second members to selectively axially move at least one of said first or second members relative to the other while allowing at least one of said first or second members to move axially and rotationally independent of the other in response thereto within said limited range by an amount sufficient to axially preload said first and second members with respect to said first, second, third and fourth torque-transmitting means with a desired force, said collar operatively engaging said first and second members to maintain said first and second members in fixed axial position relative to each other during fluid powered operation once so adjusted for preloading to substantially eliminate backlash in said first, second, third and fourth torque-transmittiag means as said piston moves from one axial direction to the other to produce relative rotational movement between said body and said rotatable member in response to selective application of fluid pressure to said piston.

4,691,583
SELF-ADJUSTING RACK SUPPORT
Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.
Filed Mar. 27, 1986, Ser. No. 845,208
Int. Cl.[4] B62D *3/12*
U.S. Cl. 74—422 **13 Claims**



1. In a rack and pinion assembly, comprising a housing receiving therein a pinion, a rack disposed within said housing and having teeth in meshing engagement with pinion teeth, a support yoke engaging and supporting said rack for engagement with said pinion, and resilient means disposed between said yoke and housing, characterized in that the resilient means includes self-adjustable locking means comprising a movable plug member coupled with said support yoke and having a self-adjusting locking mechanism disposed between said plug member and housing, a substantially flat sloped surface connected with one of said plug member and housing and engaged by said locking mechanism, and second resilient means biasing said locking mechanism into a locking position so that said locking mechanism prevents movement of said plug member away from said pinion.

4,691,584

ACTUATOR FOR REMOTE DEVICES OR THE LIKE

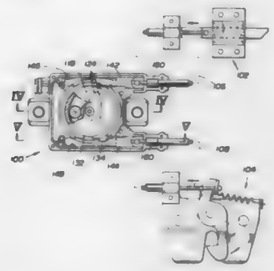
Tatsuyuki Takaishi, Yokohama; Fumio Kobayashi, Ayase; Keizaburo Usui, and Tsutomu Kagiyama, both of Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Feb. 14, 1986, Ser. No. 829,029

Claims priority, application Japan, Feb. 20, 1985, 60-30569; Apr. 19, 1985, 60-82222

Int. Cl.[4] G05G *9/00*; F16C *1/10*

U.S. Cl. 74—471 R **13 Claims**



1. An actuator for operating a remote device comprising:
a rotatable member;
a motor having a shaft, said motor being energizable to drive said shaft in first and second rotational directions;
a reduction gear operatively interposed between said motor and said rotatable member; and
a clutch;
said reduction gear comprising:
a first ring gear operatively connected with said clutch for being selectively rendered stationary with respect to a housing of said actuator;
a second ring gear connected with said rotatable member for rotation therewith;
a carrier;
pinion gears rotatably supported on said carrier, said pinion gears each having a first section which meshes with said first ring gear and a second portion which meshes with said second ring gear; and
a sun gear, said sun gear being in drive connection with the shaft of said motor.

4,691,585

GEAR SHIFT DEVICE

Achberger Gottfried, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

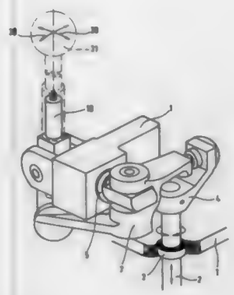
PCT No. PCT/EP85/00357, § 371 Date Apr. 2, 1986, § 102(e) Date Apr. 2, 1986, PCT Pub. No. WO86/01161, PCT Pub. Date Feb. 27, 1986

PCT Filed Jul. 19, 1985, Ser. No. 859,088

Int. Cl.[4] G05G *9/16, 9/02*

U.S. Cl. 74—473 R **7 Claims**

1. A gear control device for an automotive vehicle comprising:
a vertical gear-control shaft mounted for rotation about a first axis and axial displacement along said first axis to shift gears of the vehicle;
a shaft lever fixed to said gear-control shaft and having an end spaced therefrom;
a housing;
a connecting shaft rotatable in said housing about a second axis offset from and generally transverse to said first axis and at a short distance therefrom;
a bellcrank lever journaled by a fork-and-pin joint on one end of said connecting shaft for rotation about a third axis relative thereto, said third axis being generally perpendicular to said second axis, said bellcrank lever having two lever arms including a first lever arm extending transversely to said connecting shaft and parallel to said shaft lever and connected to said shaft lever and a second lever arm extending parallel to said connecting shaft;
a manual shift lever journaled by a fork-and-pin joint on an opposite end of said connecting shaft for rotation about a fourth axis relative thereto, said fourth axis being generally perpendicular to said second axis and orthogonal to said third axis;



a ball-and-socket joint connecting an end of a first of said arms with said end of said shaft lever, said ball-and-socket joint being slidable along one of said first arm and said shaft lever, said manual shift lever having a coupling arm; and
means forming a ball-and-slantguide joint between the second of said arms of said bellcrank lever and said coupling arm of said manual shift lever.

4,691,586

FINE-ADJUSTING DEVICE FOR ACCURATE POSITIONING AN ADJUSTING ELEMENT

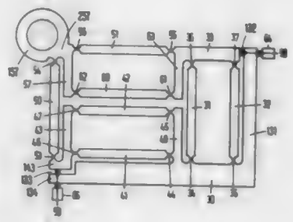
Harro M. van Leijenhorst, Zoetermeer, and Jan F. Suringh, Rotterdam, both of Netherlands, assignors to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telfonie), The Hague, Netherlands

Filed Mar. 4, 1986, Ser. No. 835,893

Claims priority, application Netherlands, Mar. 5, 1985, 8500615

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—479 **7 Claims**



1. A fine-adjusting device for positioning a work piece in two dimensions defined by a plane surface of a metal plate, which device is capable of having its principal structure formed from a metal plate having apertures cut out therein, at least part of which apertures are slots, and accordingly comprises a slotted and apertured metal plate, wherein:
a first four-hinged frame is formed of a first pair of parallel flat bars (**31, 32**) having the same length measured in a straight line between the extremities of a said bar, said bars both being reduced in width at both extremities by semicircular cutouts oppositely located on opposite bar sides forming flexure hinges (**34, 36; 35, 37**) connecting said first pair of flat bars to a second pair of flat bars (**30, 33**) which are of equal length measured between said flexure hinge connections, a first said bar (**30**) of said second pair being in fixed position and a second bar (**33**) of said second pair having at one end thereof a first rigid end extension (**63**) at right angles to the bar and extending towards said first bar (**30**) of said second pair, said first bar (**30**) of said second pair having a first right-angled rigid extension (**40**) extending towards but short of said right-angled extension (**63**) of said second bar of said second pair and also having a second right-angled extension (**131**) extending in the same direction as said first right-angled extension (**40**) thereof at a location such as to leave a first variable slot (**132**) between the end of said second extension (**131**) and the adjacent end of said second bar (**33**) of said second pair, which slot (**132**) extends parallel to said second right-angled extension (**131**) of said first bar (**30**) of said second pair to the vicinity of a hinge (**35**) connecting said first bar (**30**) of said second pair to a first bar (**32**) of said first pair, the latter bar (**30**) having also a straight end extension (**134**), an aperture being formed internally of said first four-hinged frame which aperture includes four of said semicircular cutouts located on facing sides of said bars of said first pair;
a second four-hinged frame is formed of first and second pairs of bars, said first pair of flat bars (**40, 43**) being straight, parallel and of equal length between hinges (**44, 45; 46, 47**) of said second frame connecting said first pair of bars to said second pair (**41, 42**) of bars in said second frame, a first bar (**40**) of said first pair of bars in said second frame being constituted by said first rigid extension of said first bar (**30**) of said second pair of said first frame for being rigidly connected to the latter bar, the bars of said second pair of bars (**41, 42**) in said second frame being constituted so as to maintain pairs (**44, 46; 45, 47**) of said hinges of said second frame always at equal distance separating the hinges of each hinge pair, each said hinge pair being composed of one hinge connecting to each of said bars of said first pair of said second frame, said hinges being formed by semicircular cutouts of both sides of end extensions of said bars of said second pair in said second frame, the second bar (**43**) of said first pair in said second frame having a right angled extension (**143**) extending away from the first bar of the same pair at the end of said second bar (**43**) of said first pair in said second frame which is nearer to said straight extension (**134**) of said first bar (**30**) of said second pair in said first frame, leaving an opening of a second variable slot (**133**) between said right-angled extension (**143**) of said second bar (**43**) of said first pair of said second frame and said straight end extension (**134**) of said first bar of said second pair in said first frame, said second variable slot (**133**) running along said straight end extension of said first bar of said second pair in said first frame to a semicircular cutout of a said flexure hinge (**44**) connecting said first bar (**40**) of said first pair in said second frame to a bar (**41**) of said second pair in said second frame;
a third four-hinged frame formed of a first pair of flat bars (**57, 63**) which are straight, parallel and of equal length between hinges (**55, 61; 56, 62**) of said third frame, of which pair of first said bar (**63**) is constituted by said right-angled end extension of said second bar (**33**) of said second pair in said first frame and the second bar (**57**) is equipped with a holder (**157**) rigidly attached thereto for holding an article to be positioned, said third frame having a second pair of flat bars (**51, 60**) constituted so as to maintain pairs (**55, 56; 61, 62**) of said hinges of said third frame always at equal distance separating the hinges of each pair, each said pair being composed of one hinge connecting to each said bars of said first pair of said third frame, said hinges being formed by semicircular cutouts on both sides of end extensions of said bars of said second pair of said third frame;
a coupling link flat bar (**50**) having a flexure hinges (**53, 54**) at its ends each having semicircular cutouts on both sides of the hinge portion of the bar, including a first hinge (**53**) connecting said link bar (**50**) to said right-angled end extension (**143**) of said second bar of said first pair in said second frame and a second hinge (**54**) connecting said link bar (**50**) to a right angled end extension (**257**) of said second bar of said first pair in said third frame, said link bar (**50**) being of a length equal to a length of the bar (**31, 32**) of said first pair in said first frame, and
means for independently varying the respective widths of said first and second variable-width slots, including first adjusting means mounted on said second right-angled extension (**131**) of said first bar of said second bar pair in said first frame and second adjusting means mounted on said straight extension (**134**) of said first bar of said second bar pair in said first frame, whereby said holder (**157**) may be positioned in two dimensions in a plane by actuation of said first and second adjusting means.

4,691,587

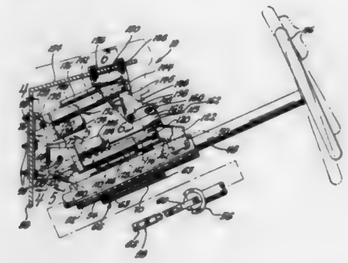
STEERING COLUMN WITH SELECTIVELY ADJUSTABLE AND PRESET PREFERRED POSITIONS

Robert M. Farrand, Saginaw; Thomas J. Milton, Essexville, and William R. McDow, Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1985, Ser. No. 811,733

Int. Cl.[4] B62D *1/18*

U.S. Cl. 74—493 **3 Claims**



1. An articulated tilt and telescoping steering column assembly for a vehicle comprising a steering shaft assembly having an elongated steering shaft extending within the vehicle and terminating in a pivot joint at the lower end thereof, hand wheel means affixed to the upper end of said steering shaft for turning the steering shaft for steering the steerable road wheels of the vehicle, said steering column assembly including a jacket mounting said steering shaft for rotation therein and for transmitting a linear telescoping force to said shaft, an intermediate shaft assembly having first and second shaft parts and having an upper end connected to said pivot joint and a lower end adapted to be operatively connected to the steerable road wheels of the vehicle, slip joint means operatively connecting said intermediate shaft parts and allowing said intermediate shaft parts to linearly slip relative to each other and to transmit torque therebetween, tilt bracket means for supporting said jacket and said steering shaft for axial sliding movement therein, a support, pivot means for mounting said tilt bracket means to said support for tilting movement of said bracket and steering column assembly, and first and second motorized actuator means operatively connected to said support and to said jacket for moving said steering shaft assembly to an infinite number of tilt and axially adjusted positions.

4,691,588

LEVER MECHANISM IN COMBINATION WITH A SEWING MACHINE DRIVING DEVICE

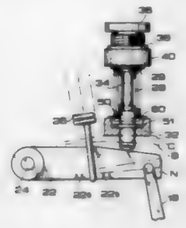
Hiroshi Kumatani, and Yutaka Yamaura, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 594,307, Mar. 28, 1984, abandoned. This application Mar. 7, 1986, Ser. No. 838,196

Claims priority, application Japan, Mar. 29, 1983, 58-45117[U]

Int. Cl.⁴ G05G *1/14, 1/04;* **F16F** *1/06*

U.S. Cl. 74—512 **7 Claims**



1. A lever mechanism in combination with a sewing machine device, comprising:
(a) a pivotable lever connected to a sewing machine pedal;
(b) first spring means for biasing said lever in a first direction;
(c) a rod disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;
(d) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force on said lever in a second direction opposite to said first direction;
(e) said rod having spaced first and second shoulders thereon;
(f) one end of said first spring engaging said first shoulder;
(g) one end of said second spring being positively spaced from said second shoulder when said lever is in its neutral position but being disposed to apply biasing force to said lever after a predetermined movement of said lever in said first direction; and
(h) means engaging the other ends of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever.

2. A lever mechanism in combination with a sewing machine device, comprising:
(a) a pivotable lever connected to a sewing machine pedal;
(b) first spring means for biasing said lever in a first direction;
(c) a first fixed member and a second fixed member spaced from said first fixed member;
(d) a rod extending between said fixed members and supported thereby, said rod being disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;
(e) said rod having spaced first and second shoulders thereon;
(f) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force in a second direction opposite to said first direction;
(g) one end of said first spring and one end of said second spring being disposed in engagement with said first fixed member, the other end of said first spring engaging said first shoulder, the other end of said second spring being positively spaced from said second shoulder when said lever is in its neutral position and being disposed for exerting a biasing force on said second shoulder when said lever has moved a predetermined distance in said first direction from the neutral position of said lever; and
(h) said first fixed member including means engaging said one end of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever.

7. A lever mechanism in a sewing machine device, comprising:
(a) a pivotable lever connected to a sewing machine pedal;
(b) first means for biasing said lever in a first direction;
(c) a first fixed member and a second fixed member spaced from said first fixed member;
(d) a rod extending between said fixed members and supported thereby, said rod being disposed on one side of said lever and movable by said lever when said lever is moved in said first direction from a neutral position;
(e) said rod having spaced first and second shoulders thereon;
(f) a first spring and a second spring having different diameters, said first and second springs being disposed concentrically about said rod, said first and second springs being arranged to exert a biasing force in a second direction opposite to said first direction;
(g) one end of said first spring and one end of said second spring being disposed in engagement with said first fixed member, the other end of said first spring engaging said first shoulder, the other end of said second spring being spaced from said second shoulder when said lever is in its neutral position and being disposed for exerting a biasing force on said second shoulder when said lever has moved a predetermined distance in said first direction from the neutral position of said lever;
(h) said first member including means engaging said one end of said first and second springs for simultaneously adjusting the biasing force exerted by said first and second springs without affecting the neutral position of said lever;
(i) said second fixed member having a recess therein on the side facing said first and second springs, and said second shoulder being received in said recess;
(j) a shoe slidably positioned on said rod above said recess;
(k) said other end of said second spring engaging said shoe; and
(l) said second shoulder engaging said shoe after said lever has moved a predetermined distance in said first direction from the neutral position of said lever, whereby further movement of said lever in said first direction is against the biasing force of both said first and second springs.

4,691,589

VISCOUS ROTARY DAMPER

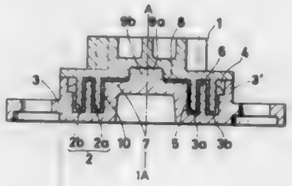
Masaru Arakawa, Chigasaki, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Feb. 3, 1986, Ser. No. 827,546

Claims priority, application Japan, Feb. 8, 1985, 60-15935[U]

Int. Cl.⁴ F16F *15/10*

U.S. Cl. 74—573 F **3 Claims**



1. A rotary damper comprising a driven gear having a rear surface, an axis of rotation and a cylindrical annular projection projecting from said rear surface coaxially with said gear axis, a case with a transverse bottom and having an axially extending cylindrical annular groove coaxial with said gear axis, the cylindrical annular projection being received in the cylindrical annular groove, there being a gap defined between the cylindrical annular projection and the cylindrical annular groove, grease filling said groove, an outer wall of the case defining the cylindrical annular groove having an inner periphery and a distal end opposite said bottom and being formed on said inner periphery and adjacent to said distal end with an axially extending annular depression having a greater outer diameter than the diameter of said inner periphery, said gear including a portion substantially covering said annular depression and the grease being partly forced out into the annular depression.

4,691,590

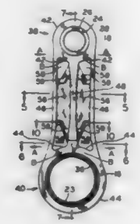
CONNECTING ROD DESIGN WITH VOIDS

Miles S. Geringer, Milwaukee, and Vernon R. Kaufman, Cedarburg, both of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 6, 1986, Ser. No. 816,208

Int. Cl.⁴ G05G *1/00*

U.S. Cl. 74—579 E **20 Claims**



15. A connecting rod for interconnecting reciprocating and rotating members in an internal combustion engine, said connecting rod comprising:
a unitary piston pin ring portion having a bore therein and including an outer peripheral surface;
a unitary crankshaft ring portion having a bore therein and including an outer peripheral surface;
a connecting member for interconnecting said ring portions and including three ribs which are coplanar with said ring portions and are substantially parallel to each other, one end of each said ribs being directly connected to the outer peripheral surface of said piston pin ring portion and the other end of each said ribs being directly connected to the outer peripheral surface of said crankshaft ring portion, the first of said three ribs being located between the other two ribs and being arranged substantially perpendicularly to the outer peripheral surfaces of said respective ring portions;
two webs extending between and respectively interconnecting said ribs; and
a plurality of voids located between said ribs, between said webs and the outer peripheral surfaces of said ring portions.

4,691,591

ROD SEAL DEVICE FOR STIRLING ENGINES

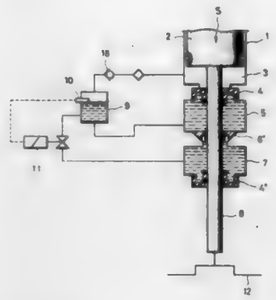
Daisaku Kobayashi; Tunesaku Itaba, both of Kashiwazaki, and Yutaka Momose, Anjyo, all of Japan, assignors to Kabushiki Kaisha Riken, Tokyo and Aisin Seiki Kabushiki Kaisha, Aichi, both of, Japan

Filed Feb. 12, 1986, Ser. No. 828,660

Claims priority, application Japan, Feb. 20, 1985, 60-23260[U]

Int. Cl.⁴ F16H *57/02;* **F16J** *15/00, 3/00*

U.S. Cl. 74—606 A **5 Claims**



1. A rod seal device for a Stirling engine comprising:
a piston rod connecting an operating piston of the Stirling engine with a driving means serving as a power takeoff;
a first scraper seal ring disposed next to one end of a compression chamber which is defined by one end of said piston and a cylinder of said engine;
a high pressure oil chamber disposed next to said first scraper seal and surrounding said piston rod;
an oil seal disposed next to said high pressure oil chamber and surrounding said piston rod;
a low pressure oil chamber disposed next to said oil seal and surrounding said piston rod;
means for scraping oil from said low pressure oil chamber to said high pressure oil chamber through said oil seal, said urging means including a second scraper seal disposed operatively next to said low pressure oil chamber and surrounding said piston rod, wherein said oil seal includes a tapered outer peripheral surface for contacting a holder, a larger diametrical end surface facing one end of said high pressure oil chamber, a smaller diametrical end surface facing one end of said low pressure oil chamber and an annular slit provided on said smaller diametrical end surface and open thereto; and
means for returning oil from said high pressure oil chamber to said low pressure oil chamber, said returning means comprising an oil reservoir, first means for communicating said high pressure oil chamber with said oil reservoir and second means for communicating said oil reservoir with said low pressure oil chamber, whereby oil may flow from said high pressure oil chamber to said low pressure oil chamber through said oil reservoir.

4,691,592

CONTINUOUSLY-VARIABLE RATIO TRANSMISSION

Forbes G. de Brie Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed Nov. 19, 1984, Ser. No. 672,897

Claims priority, application United Kingdom, Nov. 17, 1983, 8330682

Int. Cl.⁴ F16H *37/06, 15/50*

U.S. Cl. 74—691 **5 Claims**

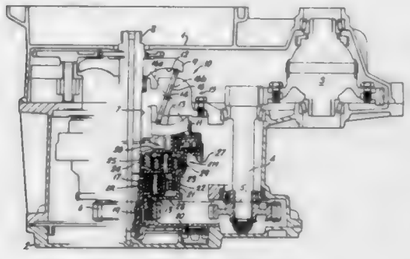
1. A continuously-variable ratio transmission capable for working in two regimes and having a casing and including:
a final output member;

first and second parts; said first part including a variator comprising a unit operable to vary the transmitted ratio in a stepless manner, having an input connectable to a prime mover and an output;

said second part including an input and an output and two epicyclic trains disposed between said second part input and output, each of said trains respectively comprising a sun member, a planet carrier and an annulus, said planet carrier of each of said respective epicyclic trains carrying a single planet gear in engagement both with said sun member of its respective train and with said annuluar of its said respective train;

said second part input being connected to both said input and said output of said first part and said second part output being connected to said first member;

said sun member of one of said trains being permanently connected to said second part input and said annulus of said one train being connected to said planet carrier of said other train;



a first clutch member;

said final output member being connected to said annulus of said other train and being connectable by means of said clutch member to said first part output and anchoring means being provided whereby said planet carrier of said one train is capable of being anchored to said casing;

whereby said transmission is capable of operating so that in said first regime said first clutch member is disengaged, with said planet carrier of said one train being anchored to said casing and the motion of said final output member reflects the geared motion of both said trains in response to both said first part's input and output transmitted to said final output member by way of said annulus of said other of said trains, whereas in said second regime said first clutch member is engaged so that said final output member is connected directly to said second part output, and said anchoring means are released so that said planet carrier of said one train imposes no restraint upon other components of said trains which are thereby free to idle.

4,691,593

LIMITED SLIP DIFFERENTIAL SYSTEM FOR A MOTOR VEHICLE WITH ALL-WHEEL DRIVE

Robert Mueller, Moensheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,381

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507490

Int. Cl.[4] F16H *1/42, 1/28*

U.S. Cl. 74—714 **16 Claims**

1. A limited slip differential system for the drive train of the front and rear axles of a motor vehicle with a continuous all-wheel drive, having an intermediate planetary transmission in the direct through drive and a corresponding braking device engageable with said intermediate planetary transmission in response to a rotational difference between the front and rear axles,

wherein a transmission ratio between said braking device and said planetary transmission is substantially higher than a transmission ratio for said direct through drive,

wherein said direct through drive comprises:

an inlet sun gear;

an outlet sun gear connected to an auxiliary axle to be driven, said outlet sun gear being adjacent, coaxial and having more teeth than said inlet sun gear;

a planet gear wheel of a planet carrier, wherein said planet



gear wheel is engageable with at least one of said sun gears and wherein rotational movement of said planet gear wheel is selectively braked by said braking device;

wherein the through drive ratio of said planetary transmission from said front axle to said rear axle is inverse to the ratio of gear drive means of the front axle to gear drive means of the rear axle, such that said planetary carrier is stationary when said rotational speed difference of the front and rear axles is zero.

4,691,594

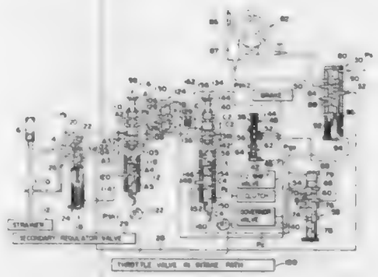
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Yutaka Taga, Aichi, and Kunio Morisawa, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1985, Ser. No. 689,305

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—869 **1 Claim**



1. A hydraulic control system for an automatic transmission, comprising:

a first throttle valve which produces a first throttle pressure having a first characteristic with respect to an output of an engine, wherein said first throttle valve comprises a first input port which receives a line pressure, a first output port for generating the first throttle pressure, a first spool for controlling a first flow area between the first input port and the first output port, a first spring for urging the first spool in a direction in which the first flow area decreases, and a first cam which rotates in relation to a movement of a member for controlling the output of the engine and urges the first spool in a direction in which the first flow area increases;

a second throttle valve which produces a second throttle pressure having a second characteristic with respect to the output of the engine, wherein said second throttle valve comprises a second input port for receiving the line pressure, a second output port for generating the second throttle pressure, a second spool for controlling a second flow area between the second input port and the second output

port, a second spring for urging the second spool in a direction in which the second flow area decreases, and a second cam which rotates in relation to the movement of the member for controlling the output of the engine and urges the second spool in a direction in which the second flow area increases;

a valve for regulating the line pressure during a first performance relative to the output of the engine via said first throttle pressure; and

a shift value for controlling a shift point of the automatic transmission during a second performance relative to the output of the engine via said second throttle pressure.

4,691,595

PLANETARY TRANSMISSION BASED ON FRICTION

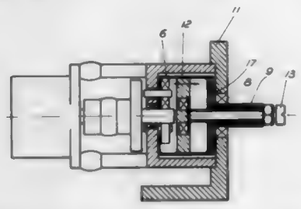
Ilmari Kiaanen, Espoo, and Sulo Ranne, Helsinki, both of Finland, assignors to Orion-yhtyma Oy, Helsinki, Finland

Filed Nov. 4, 1985, Ser. No. 794,580

Claims priority, application Finland, Nov. 16, 1984, 844519

Int. Cl.[4] F16H *13/06, 13/10*

U.S. Cl. 74—798 **2 Claims**



1. A friction based planetary transmission, which comprises a rotatable shaft, cylindrical rollers rotatably engaging the outer periphery of said rotatable shaft at at least two different positions, an outer peripheral member having an open tubular end portion surrounding said cylindrical rollers and engaging the rollers with its inner surface, said tubular portion being of thin elastic material and having an interference fit around the rollers in order to slightly deform during rotation thereof and thus to produce a pressure against the rollers, the outer peripheral member also including a central shaft portion connected to, or intergral with the tubular portion and extending away from the open end of the tubular portion, and a supporting disc positioned inside the tubular portion at an axially adjustable distance from the rollers towards the shaft portion of the peripheral member, said disc being closely fitted against the inner wall of the tubular portion in order to adjust the elasticity of the open end of the tubular member according to the axial position of the supporting disc.

4,691,596

AUTOMATIC TRANSMISSION WITH ANTI CREEP DEVICE

Masao Nishikawa, and Yoshimi Sakurai, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,358

Claims priority, application Japan, Sep. 20, 1983, 58-173610; Sep. 20, 1983, 58-173611

Int. Cl.[4] B60K *41/16*

U.S. Cl. 74—869 **4 Claims**

1. An automatic transmission, comprising:

(a) a fluid coupling;

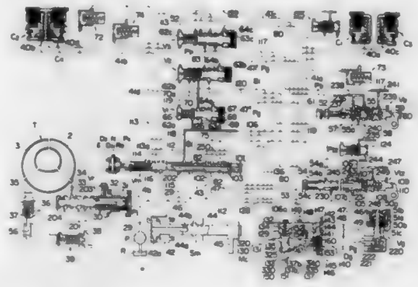
(b) a mechanical transmission mechanism coupled to said fluid coupling, comprising a plurality of power trains and a plurality of friction engagement mechanisms, various ones of said power trains being selectively engageable according to selective supply of actuating fluid pressure to selective ones of said friction engagement mechanisms to provide various speed stages including a lowest speed stage; and

(c) a transmission control system comprising:

(d) a means for producing a hydraulic pressure representative of engine output;

(e) an anti creep valve for varying the actuating hydraulic fluid pressure for a one of said friction engagement mechansms which is engaged for providing said lowest speed stage, according to said hydraulic pressure representative of engine output, from a small value when engine output is low upward as engine output increases;

(f) a means for inhibiting the action of said anti creep valve



operatie to cause said actuating hydraulic fluid pressure for said one of said friction engagement mechanisms to be at its high value when said mechanical transmission mechanism is providing one of its speed stages higher than said lowest speed stage;

(g) a shifting valve for switching between a pair of adjacent speed stages which produces a certain hydraulic fluid pressure when the higher one of said adjacent speed stages is engaged, said certain hydraulic fluid pressure being supplied to said inhibiting means; and

(h) wherein said inhibiting means comprises a means for inhibiting the action of said anti creep valve on receiving said certain hydraulic fluid pressure.

4,691,597

CONTROL SYSTEM FOR A FOUR-SPEED AUTOMATIC TRANSMISSION

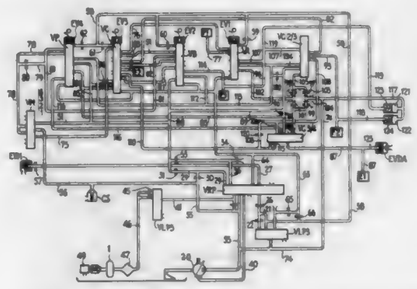
Francois Leorat, Versailles; Patrick Coutant, Rueil Malmaison, and Paul Aubert, Clamart, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 18, 1985, Ser. No. 777,444

Claims priority, application France, Sep. 18, 1984, 84 14262

Int. Cl.[4] B60K *41/18, 41/16*

U.S. Cl. 74—869 **37 Claims**



1. A control system for an automatic transmission having four forward speeds and a reverse speed, said automatic trans-

mission including a hydrokinetic torque converter having an integral torsion damper, said automatic transmission including a planetary gear train controlled by three clutches and two brakes, said clutches and brakes each being activated by hydraulic means, said control system comprising:

a hydraulic distributor including means for selectively distributing hydraulic fluid to said hydraulic means of said clutches and brakes;

four solenoid valves operatively connected to said means for selectively distributing for actuating said means for selectively distributing; and

control means sensitive to vehicle operation data for controlling said four solenoid valves, wherein said means for selectively distributing comprises:

means for distributing said hydraulic fluid at one of two flow rates for any line pressure by actuation of at least some of said four solenoid valves,

three sequence valves each being connectable to a source of hydraulic fluid and having a movable spool connected to a respective one of three of said solenoid valves for distributing said hydraulic fluid, and

a progressiveness valve connectable to said source of hydraulic fluid and having a movable spool connected to a fourth of said solenoid valves for distributing said hydraulic fluid,

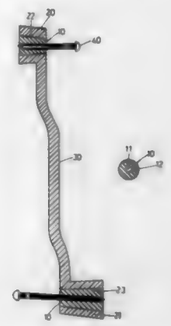
wherein said means for distributing at one of two rates comprises a feed duct for said hydraulic means for said clutches and brakes with a large passage section and including said progressiveness valve, in parallel with a feed duct for said hydraulic means for said clutches and brakes with a small passage section, whereby said hydraulic fluid can be supplied to said hydraulic means at a reduced flow rate by using said progressiveness valve to close said feed duct having said large passage section.

4,691,598

CLAMPING APPARATUS FOR HAMMERING A HARDENED NAIL

Min-Shin Lin, 116 Yuan txyy Street, Taichung city, Taiwan

Filed Mar. 26, 1986, Ser. No. 844,007
Int. Cl.[4] B25B *9/00*
U.S. Cl. 81—44 **3 Claims**



1. A clamping apparatus for assisting in the hammering of a hardened nail, comprising

a clamping means adapted to clamp a hardened nail, said clamping means comprising a truncated cone made of an elastic material and having an axial through center hole and a longitudinal through groove extending radially outwardly from said axial hole to an axial outer surface of said cone, said longitudinal through groove being for disengaging a clamped nail from said center hole and for achieving a flexibility for receiving hardened nails of different gauge within said axial hole;

a ring sleeve having an outer surface and a tapered inner surface for receiving therein said truncated cone clamping means; and

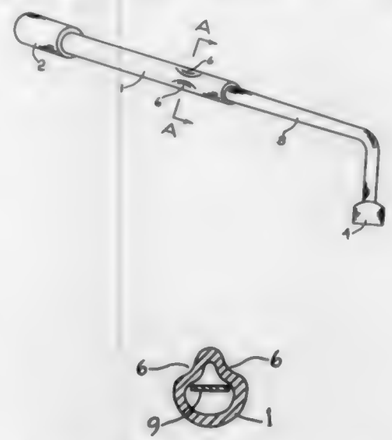
an elongated handle connected to the outer surface of said ring sleeve.

4,691,599

LUG WRENCH EXTENSION HANDLE

Jerald Schultz, 354 Longacre Ave., Woodmere, N.Y. 11598

Filed Jan. 3, 1986, Ser. No. 816,056
Int. Cl.[4] B25G *1/04*
U.S. Cl. 81—177.2 **1 Claim**



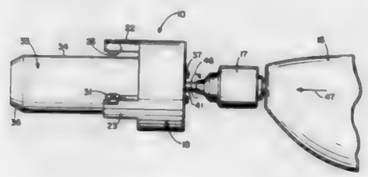
1. An automobile wheel lug nut wrench extension handle consisting of a length of straight round metal tube, having at a short distance from one end means for gripping a taper on one end of an automobile lug nut wrench, said gripping means forming a stop means for limiting the longitudinal insertion and rotation of said wrench relative to said handle, said gripping means comprising two adjacent indentations in said tube which forms in the bore of the tube bearing surfaces for securely engaging said taper of said lug nut wrench, said extension handle having on an end opposite the end on which the gripping means is disposed a hand grip for use in gripping and rotating said extension handle and lug wrench conjointly by an operator.

4,691,600

PIPE SHAVER

Larry M. Carlson, and Douglas J. Braun, both of 4903 S. Cedar Lake Rd., Minneapolis, Minn. 55416

Filed Nov. 20, 1985, Ser. No. 799,821
Int. Cl.[4] B23B *5/16*
U.S. Cl. 82—4 C **15 Claims**



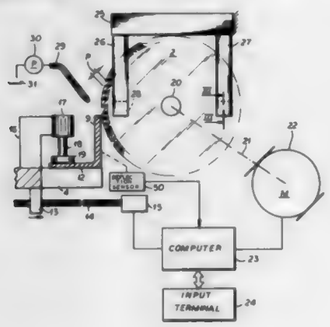
1. An apparatus for removing material from the outer surface of an end section of a tubular member having a cylindrical longitudinal passage in said end section comprising: a generally cup-shaped body having a longitudinally extended cylindrical side wall with a first end and a second end, a transverse base joined to the first end of the wall, a plurality of lugs joined to the second end of the wall, said side wall, base, and lugs comprising a one-piece cup shaped body, said lugs being circumferentially spaced from each other, each of said lugs being longitudinally away from said second end, each lug having a forward side with an outer end, a recess in the outer end of said forward side, a cutting tool located in each recess connected to each lug for removing material from the outer surface of the end section of the tubular member, each cutting tool comprising a cutting disc having a flat portion in engagement with the forward side of the lugs, a cone shaped outer surface, and an outer circular cutting edge at the large end of said cone shaped outer surface, each disc located in a radial plane extended through the axis of rotation of the apparatus, means securing the discs to the lugs to hold said flat portion thereof in engagement with the forward sides of the lugs and locate a portion of the cutting edge radially inwardly of said lugs, a mandrel having an inner end positioned in engagement with the base, means extended through said base to non-rotatably secure the mandrel to the base, said mandrel having a cylindrical outer surface spaced inwardly from said side wall providing an annular space and a forward end projected longitudinally away from the body, said cylindrical outer surface being of a size to fit into the cylindrical longitudinal passage of the tubular member to guide the apparatus into said end section of the tubular member, said base having an annular stop surface engageable with the tubular member to limit the length of the outer surface of the tubular member from which material is removed, means secured to the mandrel adapted to be connected to means for rotating the apparatus about the longitudinal axis of the mandrel whereby when the mandrel is moved into the passage of the tubular member and rotated with the means for rotating the apparatus whereby the cutting discs remove material from the outer surface of the end section of the tubular member providing a smooth uniform diameter cylindrical surface thereon, and the end section of the tubular member moves into said annular space until the end thereof abuts against the annular stop surface of the base.

4,691,601

METHOD OF SAWING A STEEL STRUCTURAL SHAPE HAVING AT LEAST ONE FLANGE

Rolf Peddinghaus, Deterbergerstr. 25, 5828 Ennepetal, Fed. Rep. of Germany

Filed Mar. 17, 1986, Ser. No. 840,438
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509522
Int. Cl.[4] B23D *45/02*
U.S. Cl. 83—56 **7 Claims**



1. A process for sawing a structural steel shape having at least one structural flange, in a saw apparatus with a rotary metal saw having a specified number of teeth, comprising the steps of:

(a) clamping said structural steel shape within range of said metal saw;

(b) rotating said metal saw at a specified number of r.p.m. to establish a speed of a cut by the number of r.p.m., the number of sawteeth, and the radius of said metal saw;

(c) relatively displacing the clamped shape and the saw to feed said metal saw toward a projected sawcut at a specified feed speed;

(d) determining a tooth succession time from the number of teeth and the number of r.p.m. of said metal saw;

(e) subjecting said structural flange to a forced elastic deflection by cutting engagement of said saw with said shape;

(f) determining an oscillation time of oscillation of said structural flange caused by the elastic deflection of said flange; and

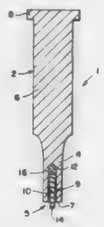
(g) controlling the r.p.m. of said saw and said feed speed such that the tooth succession time is small compared to the oscillation time, whereby said structural flange is held fast in a deflected position by said sawteeth following each other.

4,691,602

PUNCH AND EJECTOR ASSEMBLY

Edward Schlueter, 61 Norton Dr., East Northport, N.Y. 11731

Filed Sep. 14, 1981, Ser. No. 301,951
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—128 **7 Claims**



1. A piercing punch and ejector assembly comprising:

a piercing punch member having a point thickness section, said section provided with a longitudinal bore; and

an ejector member comprising a conical helical spring of rectangular cross section capable of being folded such that its length is reduceable to that of its width.

4,691,603

CUTTING APPARATUS FOR CUTTING SHEET MATERIAL

Aloys Winnemöller, Rheine, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,119
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503094
Int. Cl.[4] B26D *7/06*
U.S. Cl. 83—151 **6 Claims**

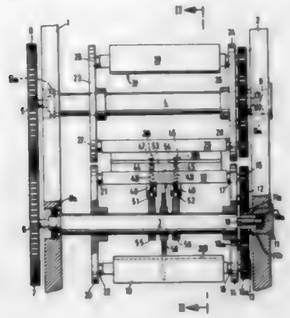
1. A cutting apparatus for cutting sheet materials, said apparatus comprising:

(a) cutter means for carrying a sheet material cutter member, said cutter means rotatable about a first axis and said cutter member rotatable about a second axis spaced from and parallel to said first axis;

(b) cutter backup means for carrying a backup member cooperable with said cutter member for effecting cutting of sheet material that is passed between said cutter member and said backup member to define a removable waste sheet portion, said cutter backup means rotatable about a third axis spaced from and parallel to said first axis, said backup member rotatable about a fourth axis spaced from and parallel to said third axis; and

(c) retractable needle means carried by one of said cutter means and said cutter backup means for piercing said removable waste sheet portion to effect removal thereof

from the sheet material after cutting, said needle means, including a needle and a needle holder therefor, supported for movement along the longitudinal axis of the needle and having a cam follower engageable with a rotatable



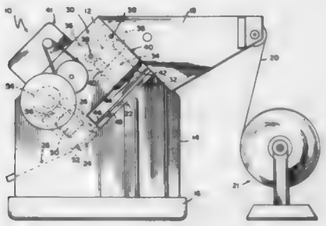
cam carried by said one of said cutter means and said cutter backup means to move said needle means into piercing engagement with the waste sheet portion and remove the waste sheet portion from the sheet material.

4,691,604

ANTI-JAMMING DIE

Kenneth Carmichael, Marion, Ind., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Filed Apr. 25, 1986, Ser. No. 855,739
Int. Cl.[4] B26D *7/06*
U.S. Cl. 83—164 **22 Claims**



1. A press die system for producing blanks from a sheet of material, the press die system comprising

a die shoe having an inclined blank delivery region,

partition means for dividing the inclined blank delivery region into a plurality of blank-receiving die lanes having entry regions and individual exit regions, the partition means separating at least one of the blank-receiving die lanes and an adjacent blank-receiving die lane including a first end in close proximity to the exit region of the at least one of the blank-receiving die lanes and a second end positioned in spaced relation to the entrance region of the at least one of the blank-receiving die lanes to provide an open region joining the at least one of the blank-receiving die lanes and the adjacent blank-receiving die lane away from the open region,

blanking means for piercing the sheet of material in a predetermined pattern to provide a plurality of blanks in alignment with the entry region of the blank-receiving lanes so that each blank falls under gravity into one of the blank-receiving die lanes, and

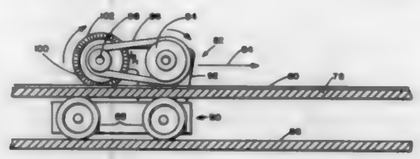
ramp means for guiding blanks generated by the blanking means as the blanks move under gravity through the at least one of the blank-receiving die lanes in a lateral direction away from the adjacent blank-receiving die lane to aid in preventing entanglement in said open region of blanks in said one of the blank-receiving die lanes with blanks in said adjacent blank-receiving die lane.

4,691,605

CUTTER ASSEMBLY WITH ROTATING KNIFE BLADE

Anatoly Vanetik, Fullerton, and Brian C. Preston, Anaheim, both of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jul. 22, 1985, Ser. No. 757,618
Int. Cl.[4] B26D *7/14*
U.S. Cl. 83—175 **3 Claims**



1. For cutting web material, a cutter assembly comprising:

A. frame;

B. a drag roller rotatably mounted on the frame for rotation about a drag-roller axis, the drag roller having a peripheral engagement surface adapted for engagement of web material so that the drag roller is caused to rotate when the frame and drag roller move with respect to the web material in a direction perpendicular to the drag-roller axis while the web material engages the engagement surface;

C. a circular cutter rotatably mounted on the frame for rotation about a cutter axis substantially parallel to the drag-roller axis, the cutter having a periperal endless blade and being disposed with respect to the drag roller for cutting engagement of web material by endless blade while the drag-roller engagement surface engages the web material; and

D. means connected to the drag roller for rotating the cutter, when the frame moves with respect to the web material in the direction in which the tension roller precedes the cutter, at such speed that the peripheral speed of the endless blade differs from the speed of the cutter assembly and the drag roller with respect to the web material so that the web material is effectively maintained in tension at the point at which the endless blade engages the web as relative movement occurs between the web and the cutter assembly.

4,691,606

WEB PERFORATING APPARATUS

Roy A. Johnson, Marietta, Ga., and Robert H. Ganz, Saddle River, N.J., assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 1, 1986, Ser. No. 891,646
Int. Cl.[4] B26D *7/14, 1/62;* **B26F** *1/20*
U.S. Cl. 83—175 **9 Claims**



1. Apparatus for perforating at spaced intervals a continuously moving flexible web said apparatus comprising means for moving and tensioning the web, a plurality of perforating knives mounted in peripherally spaced relation on a rotatable

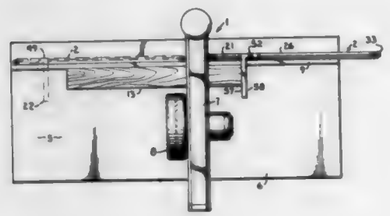
mandrel disposed adjacent the web and movable into perforating engagement therewith to impart perforations which are disposed in a transverse direction only to the direction of peripheral movement of the web, said perforating knives being disposed at an obtuse angle to the infeed end of the web and being movable at a peripheral velocity which is less than the linear velocity of the web during perforation thereof and being movable away from the web at a peripheral velocity somewhat greater than the linear velocity of the web following completion of a perforating operation, and means for controlling the velocity of rotation of said mandrel to provide variations in repeat lengths between perforations.

4,691,607

RADIAL ARM SAW POSITIONER

Floyd A. Webb, 611 E. Sheridan, Olathe, Kans. 66061

Filed Apr. 7, 1986, Ser. No. 849,168
Int. Cl.[4] B27B *5/20, 27/10*
U.S. Cl. 83—468 **4 Claims**



1. A positioner adapted for retrofitting to a power saw wherein a cutting blade is movable relative to a table top; the saw having a fence attached to the table top for positioning a workpiece; said positioner comprising:

(a) a support structure adapted to be removably attached to the table top behind the fence; said support structure comprising a unitary elongate member base strip having upstanding struts at either end thereof, a pair of fastener openings and a pair of elongated slots each communicating with a respective fastener opening;

(b) a slide bar non-rotatably mounted near opposite ends thereof to said support structure struts and adapted to be positioned along and spaced from the fence;

(c) a slide mounted on said slide bar and being axially positionable at an infinite number of positions therealong; said slide selectively being rotatably positionable relative to said slide bar;

(d) said slide including a workpiece stop member extending laterally from said slide and adapted to engage a workpiece on the saw;

(e) locking means to selectively lock said slide axially with respect to said slide bar;

(f) said stop including a bridge member allowing said stop to arc over the fence at any location along said slide bar such that said stop member is positionable against a work surface of the saw in front of the fence and is infinitely adjustable along the fence and such that said slide is rotatable away from the work surface to a location above said slide bar such that said positioner is free of interference with a workpiece on the work surface and further said bridge allows said slide to be adapted to work cooperatively with the fence of the saw so that the slide does not interfere with the fence during use and the fence does not have to be modified to use said positioner; and

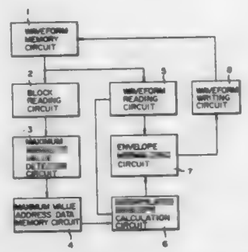
(g) fastening means for removably attaching said support structure to said table top such that said positioner may be retrofitted on said table top and may be selectively removed when not in use, said fastening means comprising a pair of screws with heads having diameters less than the widths of said fastener openings and greater than the width of said slots.

4,691,608

WAVEFORM NORMALIZER FOR ELECTRONIC MUSICAL INSTRUMENT

Hiroyuki Sasaki, and Kohtaro Hanzawa, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 910,207
Claims priority, application Japan, Sep. 30, 1985, 60-216744; Feb. 19, 1986, 61-32877
Int. Cl.[4] G10H *1/057, 7/00*
U.S. Cl. 84—1.01 **19 Claims**



1. A waveform normalizer for an electronic musical instrument, in which an input waveform signal is converted into a digital signal, stored in waveform memory means and converted into a sound signal having a designated frequency, comprising:

envelope extracting means for extracting an envelope signal from said input waveform signal;

normalization processing means for normalizing said input waveform signal according to an envelope signal extracted from said envelope extracting means to obtain a normalized waveform signal; and

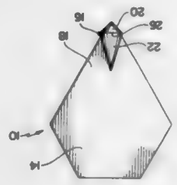
control means for causing said normalized waveform signal obtained from said normalization processing means to be supplied to and stored in said waveform memory means.

4,691,609

STYLUS PICK FOR STRINGED MUSICAL INSTRUMENTS

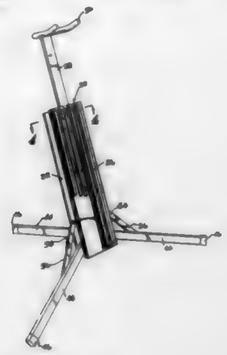
Richard A. Acocella, Boston, Mass., assignor to Robert G. Rice, Sharon, Mass., a part interest

Filed Dec. 9, 1986, Ser. No. 941,226
Int. Cl.[4] G10D *3/16*
U.S. Cl. 84—322 **10 Claims**



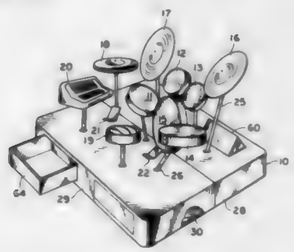
1. A pick for a stringed musical instrument comprising a pick body adapted to be grasped between a thumb and forefinger of a musician and a stylus on said body adjacent a peripheral edge thereof, said stylus including a tip portion of substantially pointed conical configuration which projects outwardly beyond said peripheral edge terminating substantially in a point.

4,691,610
GUITAR STAND WITH FOLD-AWAY, SUBSTANTIALLY CONCEALABLE LEGS
David S. Gilbert, Huntington Beach, Calif., assignor to William H. Howard, Newport Beach, Calif.
Filed Jun. 13, 1986, Ser. No. 873,800
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 19 Claims



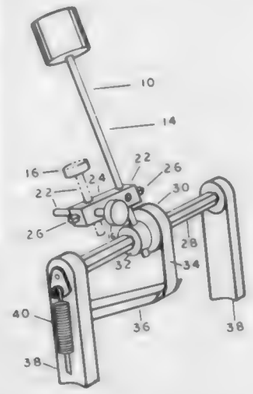
1. A guitar stand comprising:
a main body;
a yoke adapted for holding the neck of a guitar;
an elongated member mounted for sliding motion relative to the main body, the yoke being pivotably mounted to the elongated member;
a plurality of legs foldably mounted to the main body and thereby comprising means in their extended position for supporting the guitar stand;
first channel means incorporated in the main body for receiving and substantially concealing the legs when said legs are folded, and
second channel means incorporated in the main body for receiving and substantially concealing the elongated member when the elongated member is not extended relative to the main body.

4,691,611
ELECTRONIC PERCUSSION INSTRUMENT
Gordon H. May, 3261 Woodleigh La., Cameron Park, Calif. 95682
Filed Oct. 9, 1985, Ser. No. 785,764
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—421 1 Claim



1. A percussion instrument comprising:
a base forming internally a compartment;
a plurality of percussion heads which, when struck, will generate percussion sounds;
a head stand for each percussion head comprising;
an elongated standard for each percussion head;
a socket fixed to said base and each said percussion head for attachment of a standard to each head and the base to support the head above said base;
means to adjust and permanently set the length of said standard; and
means to adjust and permanently set the angle of each socket so as to adjust the angle of the standard relative to said base and the attached percussion head thereby to allow the percussion instrument to be assembled and adjusted once and to provide memory for allowing the instrument to be set up the same way each time it is disassembled.

4,691,612
ACCESSORY FOR A DRUM PEDAL ASSEMBLY
Peter L. Smith, 36 Tahattawan Rd., P.O. Box 443, Littleton, Mass. 01460
Continuation-in-part of Ser. No. 789,133, Oct. 18, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,801
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 R 13 Claims

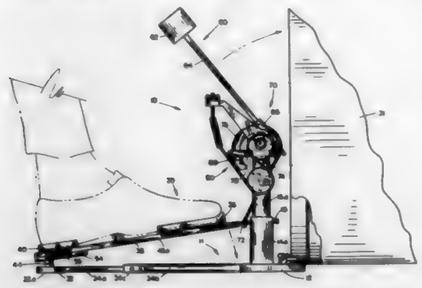


1. a drum pedal assembly having a drum beater element secured to a pedal actuated rotatory element, means to adjust the distribution of weight acting on the rotatory element comprising:
(A) a metal weight with straight parallel sides;
(B) a mount means to rotatively carry said metal weight;
(C) means to adjustably secure said metal weight to said mounted means; and
(D) means to secure said mount means to either said rotatory element of said beater element, whereby adjustment of said metal weight affects the balance point of the stroke of the beater element as well as the rotational forces influencing the character of the stroke of said beater element.

4,691,613
BASS DRUM PEDAL
Luke Jacobson, Box 115, Grenora, N. Dak. 58845
Filed Sep. 29, 1986, Ser. No. 912,415
Int. Cl.[4] G10D *13/00*
U.S. Cl. 84—422 R 11 Claims

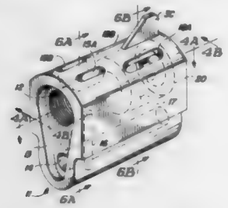
1. A bass drum pedal comprising;
a base frame;
a footplate pivotally connected at a heel end to said frame;
a pair of upstanding support members projecting from said frame supporting a generally horizontally disposed rotatable drive shaft therebetween;
a hammer assembly, including a hammer carried at the end of a shaft connected to said drive shaft;
a drive assembly connecting said footplate and drive shaft, for rotating the drive shaft to move said hammer into contact with a drum when said footplate is depressed, said drive assembly including:
(a) flexible means adjustably connecting said footplate to a first end of a torque arm adjustably connected to said drive shaft;

(b) said torque arm having a general spiral shape with a groove in its perimeter for carrying said flexible means;
(c) said torque arm adjustably connected to said drive shaft



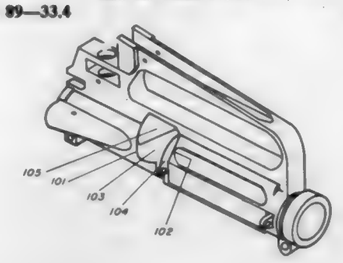
and adapted for selective adjustment within a plane perpendicular to said drive shaft; and
biasing means connected to said drive shaft, for resisting rotational movement of said drive shaft.

4,691,614
NONSYMMETRICAL COMPENSATOR FOR HANDGUN
Leon E. Leffel, 2473 1st St., and Rick G. Leffel, 2723 W. 1st St., both of Yuma, Ariz. 85364
Filed May 30, 1986, Ser. No. 868,951
Int. Cl.[4] F41F *17/12*
U.S. Cl. 89—14.3 7 Claims



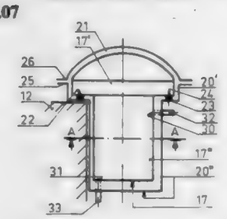
1. A compensating apparatus for resisting both muzzle climb and twist of a handgun in reaction to firing a bullet, the compensating apparatus comprising in combination:
(a) a threaded end of a barrel of the handgun, and first and second high pressure gas outlet ports disposed on either side of an imaginary vertical plane passing through the center of a bore through the barrel and through a gunsight of the handgun; and
(b) a compensator including a threaded bore receiving the threaded end of the barrel and also including an enlarged expansion chamber into which high pressure gas following a bullet being fired can expand, the compensator including third and fourth high pressure gas outlet ports aligned with the first and second high pressure gas outlet ports, respectively, the compensator also including first and second vertical low pressure gas outlet ports extending from upper surface portions of the compensator on either side of the imaginary vertical plane into the enlarged expansion chamber, the second vertical low pressure gas outlet port being substantially larger than the first vertical low pressure gas outlet port, the second vertical low pressure gas outlet port being located further from the imaginary vertical plane than the first vertical low pressure gas outlet port, whereby nonsymmetrically, non-radially discharged amounts of low pressure gas from the enlarged expansion chamber produce a countertorque resisting twist of the handgun due to counterforce applied by the accelerating bullet to rifling of the bore of the barrel, high pressure gas upwardly exhausted from the third and fourth high pressure gas outlet ports effectively resisting muzzle climb.

4,691,615
M-16 RIFLE, IMPROVED TO MORE SAFELY ACCOMODATE LEFT HANDED SHOOTERS
Loren F. Brunton, 363 - 34th Ave., East Moline, Ill. 61244
Continuation-in-part of Ser. No. 505,621, Jun. 20, 1983, Pat. No. Des. 285,236. This application Mar. 27, 1986, Ser. No. 845,672
Int. Cl.[4] F41C *27/00*
U.S. Cl. 89—33.4 4 Claims



1. A receiver for a firearm wherein spent cartridge cases are ejected in a trajectory of motion rearwardly at a side ejection port thereof, said port having a back stop rib means at its rear position, said receiver ejecting cases whose rearward motion is stopped when striking said back stop rib means and also cases whose rearward motion is not stopped despite striking, or by completely missing of, said back stop rib means and continue in a rearward trajectory towards the person of the shooter, said receiver comprising a boss thereon to change the rearward trajectory of those non-stopped cases so they can never strike the physical body of the shooter, on account of their changed trajectory.

4,691,616
ARRANGEMENT FOR FIRE CONTROL
Klas G. I. Larsson, Järfälla; Rolf C. Lindholm, Upplands Väsby, and Johan P. Ström, Järfälla, all of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 22, 1986, Ser. No. 821,565
Claims priority, application Sweden, Jan. 25, 1985, 8500360
Int. Cl.[4] F41G *1/04*
U.S. Cl. 89—41.07 4 Claims



1. A fire control system for a gun having a fire tube and an elevation system comprising set motors for setting the horizontal and vertical position of the fire tube, such fire control system comprising a tracking radar unit having a radar transmitter/receiver and an antenna, the tracking radar unit being mounted directly on the gun so that the axis of the antenna forms a given angle with the axis of the fire tube, and producing control signals in a closed servo loop connected to the set motors of the gun so that, after locking on a target, the movement of the axis of the radar unit causes the axis of the fire tube to track the target by controlling the set motors; characterized in that the radar unit is supported within an envelope which is rigidly mounted on the elevation system of the gun, the radar unit being fastened to the envelope by elastically resilient supporting elements at opposite surfaces of the envelope and the radar unit, said envelope being closed at the front by a radome which is dimensioned to withstand the forces arising upon firing of the gun in order to prevent deformation of the

antenna and ensure correct target tracking, said protection envelope having apertures therein for connection to a source of thermal fluid medium for controlling the temperature within such envelope.

4,691,617
MULTI-SECTION SWEEP CYCLE COMPACTION CYLINDER
Hans D. Purkott, Hot Springs, Ark., assignor to Arkansas Precision Hydraulics, Inc., Hot Springs, Ark.
Filed Feb. 14, 1986, Ser. No. 829,216
Int. Cl.[4] F15B *11/18;* F01B *7/20*
U.S. Cl. 91—167 R **7 Claims**



4. A multi-segment, triple action, telescoping hydraulic ram for selectively either fully or partially actuating a device such as a compression platen assembly operatively associated with the garbage receptive cargo area of a conventional garbage truck, said ram comprising:

a first, outermost, largest diameter, rigid elongated, cylinder comprising a terminal end cap having an external fitting adapted to be coupled to said platen within said cargo area;

a plurality of coaxially disposed, cooperating non sweep cycle cylinders telescopingly disposed internally of said first cylinder, and selectively extensible with respect thereto;

selectively extensible sweep cycle cylinder means comprising a first and a smaller second sweep cycle cylinder operationally disposed coaxially within the smallest one of said last mentioned plurality of non sweep cylinders and adapted to be extended or retracted relative to one another when said non sweep cycle cylinders are in a retracted position, a terminal end of the smallest sweep cycle cylinder terminating in pin eye fitting means for physically anchoring said sweep cycle cylinder means and thus said ram within said cargo area;

end block means secured within said ram and spaced apart from said end cap for internally defining primary pressure chamber means between itself and said endcap;

first fluid input port means for effectuating full extension of said ram by pressurizing said primary pressure chamber means and defined within piston center tube means defined within the smaller diameter sweep cylinder;

second fluid input port means separate from said first fluid input means for effectuating sweep cycle extension of said sweep cycle cylinder means;

third fluid input port means for retracting said ram from the fully extended position or for retracting said sweep cycle cylinders;

bridging tube means operationally extending between said end block means and said sweep cycle cylinder means for hydraulically coupling said plurality of said non sweep cycle cylinders with said sweep cycle cylinders, said bridging tube means comprising:

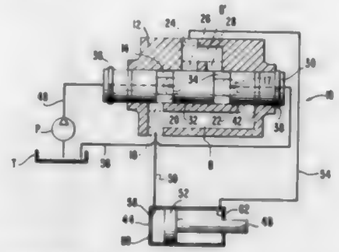
feed tube means extending coaxially from said end block means toward and coaxially receiving piston slider tube means associated with said sweep cycle cylinders;

said slider tube means extending coaxially between said feed tube means and piston center tube means communicating with said first fluid input port means;

said feed and slider tube means defining a separate sweep cycle actuation chamber between their outer peripheries and said sweep cycle cylinder means; and,

retract tube means disposed internally of the smallest sweep cycle cylinder for receiving said feed tube means during retraction of said sweep cycle cylinders; and, a sweep cycle retract volume being operationally defined between said retract tube means and said piston center tube means.

4,691,618
HYDRAULIC CONTROL VALVE
Denzil C. Poling, Rte. 6, Box 80, Hagerstown, Md. 21740
Filed May 5, 1986, Ser. No. 859,992
Int. Cl.[4] F15B *13/04*
U.S. Cl. 91—326 **26 Claims**



14. In combination:

(i) a hydraulic control valve comprising:

(a) a valve housing including a cylindrical valve bore, the valve housing further including a supply port in the valve housing in communication with the valve bore, a discharge port in the valve housing in communication with the valve bore, a first delivery port in the valve housing in communication with a first blind bore within the valve housing, the first blind bore having first and second openings into the valve bore, and a second delivery port in the valve housing in communication with a second blind bore within the valve housing, the second blind bore having first and second openings into the valve bore;

the hydraulic control valve further comprising:

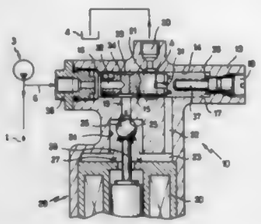
(b) a valve pin slidable within the valve bore, the valve pin including a first pin groove operable to establish communication between the supply port and either of the delivery ports to the exclusion of the other delivery port, which supply port communication is establishable through corresponding first valve bore openings communicating with respective delivery ports through respective blind bores, and a second pin groove operable to establish communication between the discharge port and either of the delivery ports to the exclusion of the other delivery port, which discharge port communication is establishable through corresponding second valve bore openings communicating with respective delivery ports through respective blind bores;

wherein supply port communication with one of the delivery ports is establishable simultaneously with discharge port communication with the other delivery port; and

(ii) a drive cylinder having ports at opposite ends thereof and housing a hydraulically operated reciprocating piston, one drive cylinder port being connected to the first delivery port of the valve, the other drive cylinder port being connected to the second delivery port of the valve.

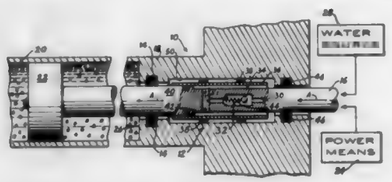
4,691,619
REGULATED DEVICE FOR CONTROLLING FLOW IN A HYDRAULIC INSTALLATION, PARTICULARLY FOR THE ASSISTED STEERING OF A VEHICLE
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Paris, France
Filed Mar. 11, 1986, Ser. No. 838,747
Claims priority, application France, Mar. 13, 1985, 85 03687
Int. Cl.[4] F16K *31/12;* B62D *5/06*
U.S. Cl. 91—459 **6 Claims**

1. A regulated device for controlling fluid in a hydraulic installation (1, 5), particularly for the assisted steering of a vehicle, comprising a source of pressure (3) through an outlet connected to a system for controlling (1) a hydraulic actuator (5), the device (10) being intended to be interposed in a branch hydraulic line (6) between the outlet of the source of pressure (3) and a reservoir (4) and incorporating a body (13) having a bore (14) in which a modulating slide (15) is slidingly mounted which forms a modulable restriction (s) between an inlet passage (32, 33, 19, 23, 22, 17), which is intended to be connected to the outlet of the source (3), and an outlet passage (20, 21),



which is intended to be connected to the reservoir (4), both passages opening into the bore, (14) position of the slide (15) being determined as a function of an electrical control signal (11) by an electromagnetic control member (29), characterized in that the inlet passage includes a first portion, (32, 33) which is formed in one end of the slide (15) and opens laterally (34) facing a first end (19) of a second passage portion (19, 24, 23, 22) which is formed in the body and the other end (22) of which opens into a closed end (17) of the bore (14), a valve (26) controlled by the electro-magnetic control member (29) being interposed in said second passage portion.

4,691,620
SELF-FLUSHING FLUID SEAL ASSEMBLY
David T. Kao, Lexington, Ky., assignor to Board of Trustees of the University of Kentucky, Lexington, Ky.
Filed Apr. 19, 1985, Ser. No. 725,225
Int. Cl.[4] F15B *21/04*
U.S. Cl. 92—80 **9 Claims**



1. A self-flushing fluid seal assembly to prevent particle intrusion into a seal around a drive shaft of a slurry pump during a return stroke of said pump when a portion of said drive shaft is retracted past said seal comprising:

a variable volume chamber concentrically disposed about the shaft;

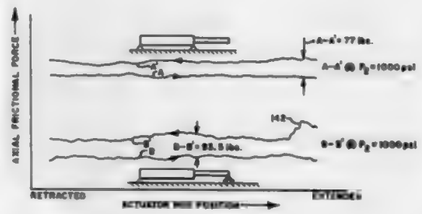
means for delivering flushing liquid to said variable volume chamber on a power stroke of said pump when a portion of said drive shaft is extended past said seal;

plunging means for varying the volume of said chamber, said plunging means including a pumping face directed away from said seal for increasing the volume of said chamber and for receipt of flushing liquid on said power stroke and decreasing the volume of said chamber for forcing liquid from said chamber on said return stroke;

the sealing of said seal being effective during the power stroke and the lack of sealing during the return stroke caused by the presence of flushing liquid;

passage means for redirecting liquid received from said variable volume chamber extending in the opposite direction into and through the seal around the shaft to provide a smooth, annular flushing stream that prevents particle intrusion into said seal during pumping, thereby reducing wear.

4,691,621
PISTON-AND-CYLINDER ARRANGEMENT WITH RADIALLY-YIELDABLE PISTON HEAD
Larry D. Hall, East Aurora, N.Y., assignor to Moog Inc., East Aurora, N.Y.
Filed Jun. 2, 1986, Ser. No. 869,591
Int. Cl.[4] F01B *31/00*
U.S. Cl. 92—184 **23 Claims**



1. In a piston-and-cylinder arrangement having an annular piston head member encircling a portion of an actuator rod member, said piston head member being mounted on said rod member portion for movement axially therewith and radially relative thereto, said piston head member having one end face adapted to be exposed to a first fluid pressure and having an opposite end face adapted to be exposed to a second fluid pressure, the improvement which comprises:

an annular recess provided in one of said members to face the other of said members, said one member having a first surface provided to one side of said recess, having a second surface provided within said recess, and having a third surface provided to the other side of said recess;

an annular lug provided on the other of said members and arranged in said recess, said other member having a first surface provided to one side of said lug and arranged to face said one member first surface, having a second surface provided on said lug and arranged to face said one member second surface, and having a third surface provided to the other side of said lug and arranged to face said one member third surface;

a first seal ring operatively arranged to seal the joint between said first surface;

a second seal ring operatively arranged to seal the joint between said second surfaces;

a third seal ring operatively arranged to seal the joint between said third surfaces;

a first passageway arranged to communicate said second fluid pressure with the annular space between said first and second seal rings;

a second passageway arranged to communicate said first fluid pressure with the annular space between said second and third seal rings;

said first, second and third surfaces being so configured and dimensioned that a fluid pressure acting on either end face of said piston head member will not urge said piston head member to move axially relative to said rod member;

whereby frictional forces opposing radial movement of said piston head member relative to said rod member, will be reduced.

4,691,622

LIGHT ALLOY PISTON

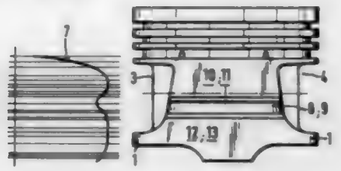
Wilfried Sander, Neckarsulm; Gunder Essig, and Erich Wacker, both of Heilbronn, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 785,319

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437111

Int. Cl.⁴ F16J *1/04*

U.S. Cl. 92—233 **10 Claims**



1. In a light alloy piston for internal combustion engines, having a cambered oval external shape and load-carrying skirt surfaces each of which is divided into two load-carrying partial skirt surfaces by peripherally extending depression, the improvement wherein: the depth of the depression (**8,9**) between the tapered portions of a curved generatrix (**7**) at the top and bottom ends of the skirt is approximately twice the peak-to-valley height of a machined profiled surface of the skirt (**1**), the axial extent of the depression (**8,9**) in an upward and downward direction is so selected that the depression will not protrude from the cylinder when the piston is at its lower dead center and in the cold engine the load-carrying partial skirt surfaces (**10, 11, 12, 13**) have between the upper limit of the depression and the lower limit of the tapered portion of the curved generatrix (**7**) at top end of the skirt an axially parallel portion at a height of 1.5 to 4.5 mm and the load-carrying partial skirt surfaces (**10, 11, 12, 13**) and the depression (**8,9**) are at least as wide as the wear pattern area.

4,691,623

VENTILATOR DEVICE FOR VEHICLE

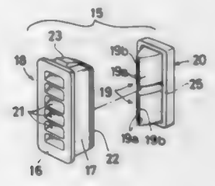
Akira Mizusawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Aug. 21, 1986, Ser. No. 898,960

Claims priority, application Japan, Aug. 27, 1985, 60-129520[U]

Int. Cl.⁴ B60H *1/24*

U.S. Cl. 98—2.18 **5 Claims**



1. A two-piece venilator device for use in connection with a vehicle comprising a ventilation frame including a shutter-like grille and a sidewall rearwardly extending from said grille and a one-piece molded frame-like valve member mounted in said side wall and including a check valve for exhausting air from the vehicle to the outside thereof through said grille, wherein:

said valve member has a bill-shaped check valve projecting toward said grille, and an end of the periphery of said valve member and an end of said side wall are provided with respective engagement means for snappingly engaging with each other.

4,691,624

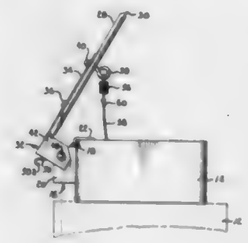
CHIMNEY FLUE COVER

Denny L. Moore, R.R. 2, Box 62C, Moberly, Mo. 65270

Filed Oct. 23, 1985, Ser. No. 790,405

Int. Cl.⁴ F23L *17/02*

U.S. Cl. 98—59 **2 Claims**



1. A chimney cap for opening and closing a fireplace chimney flue having a flue liner, comprising:

a mounting bracket having a body portion which includes a substantially flat plate member and a pair of spaced apart side plates integral with said plate member and extending therefrom generally parallel to one another, said mounting bracket also including a plate element oriented substantially parallel to said plate member and a bridge portion integral with and interconnecting said plate member and said plate element, said moutning bracket being applicable to the flue liner with said plate member adjacent an outside surface of the flue liner, said plate element adjacent an inside surface of the flue liner and said bridge portion spanning an upper edge of the flue liner;

means for clamping said bracket rigidly on the flue liner without permanently deforming same;

a cover having a size to cover the flue;

a hinge bracket connected with said cover and including a flat tongue portion overlying and secured to the cover and a pair of spaced apart hinge plates located adjacent said side plates of the body portion of said mounting bracket, said hinge plates terminating in back edges and said hinge bracket also including a rigid flange extending between said back edges of the hinge plates;

a substantially horizontal hinge pin connecting said hinge plates with said side plates in a manner to mount said cover for pivotal movement about the axis of the hinge pin between an open position wherein the flue is open and a closed position wherein the flue is covered by said cover;

a torsion spring soiled around said hinge pin and generally enclosed by said side plates at the ends, said plate member at the front, said flange at the back and said tongue at the top, said torsion spring being loaded in compression when the cover is closed and having opposite ends acting against said plate member and flange, respectively, to continously urge said cover toward the open position; and

cable means coupled with said cover and extending through the flue into the fireplace for opening and closing the cover.

4,691,625

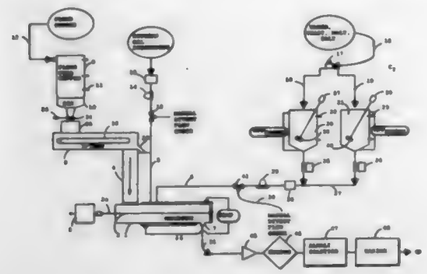
CONTINUOUS PRETZEL DOUGH MANUFACTURE

William A. Blain, Spring Valley, N.Y., and John Zabrodsky, III, Somerville, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 18, 1984, Ser. No. 621,741

Int. Cl.⁴ B01F *15/04*; A47J *37/12*; B67D *5/62*

U.S. Cl. 99—348 **10 Claims**



1. An apparatus for continuous production of pretzels comprising:

(a) at least one feed source for a variety of raw ingredients to make a dough;

(b) a continuous operating assemblage having a plurality of mixing units and a plurality of conveying units, said mixing units and said conveying units being in a ratio of about 3 to 1, respectively, said assemblage being adapted to receive and mix said raw ingredients into a uniform density dough, said dough being discharged at a steady rate from said assemblage;

(c) a means for extruding said discharged dough;

(d) a means for curing an exterior layer of said discharged dough;

(e) a means for treating said cured dough in an alkali metal hydroxide solution; and

(f) a means for baking said treated dough.

4,691,626

PORTABLE AND SIMPLE BARBECUE SPIT STRUCTURE

Tseng Shih-Cheng, No. 36 Ho-Fong Street, Shih-Lin District, Taipei, Taiwan

Filed Dec. 8, 1986, Ser. No. 939,627

Int. Cl.⁴ A47J *37/04*

U.S. Cl. 99—421 H **5 Claims**

1. A portable and simple barbecue spit structure comprising:

two supporting rods for driving into ground vertically, and the front tip thereof being sharp, while the top ends are formed into a fork respectively;

a spring being movably mounted on said supporting rod;

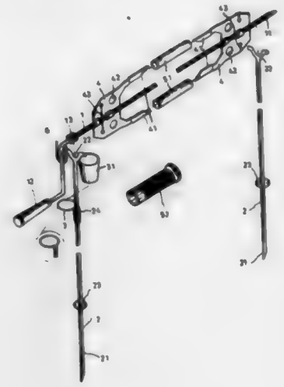
a cup rest;

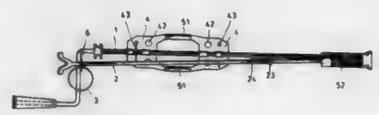
a rotary spit, the body portion thereof being formed into an elliptical shape, and having a hand crank, and in the vertical portion thereof a U-shaped member being welded so as to form into a left and a right hooks;

two forks, both of them being mounted around said rotary spit, and the front points thereof being used for thrusting into the food to be roasted and said forks being furnished with springs respectively.

two protective sleeves for protecting the points of said forks when not in use and a third sleeve for storing the spit and legs when disassembled and placed into a position parallel to each other;

and said barbecue spit structure being arranged for storage or transporting characterized in characterized that said two protective sleeves being mounted on the tips of said two forks respectively to form two handles for carrying convenience; and said two supporting rods being placed adjacent and parallel to said rotary spit, said two supporting rods being stored in said left and right hooks respectively, and said storing sleeve being placed over the ends of





said supporting rods and said rotary spit thereby bundling together said spit structure for carrying convenience and safety.

4,691,627

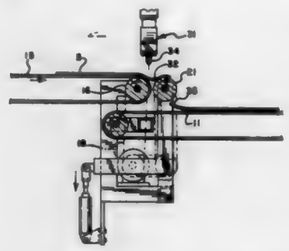
APPARATUS FOR MAKING FILLED FOOD ARTICLES

Gary F. Roberts, Colona, Ill., assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Jan. 16, 1986, Ser. No. 819,751

Int. Cl.⁴ A21C *9/00, 11/00*

U.S. Cl. 99—450.6 **4 Claims**



1. In apparatus for depositing a foodstuff filling on a dough sheet and forming the sheet so as to enclose the filling therein, comprising, dough sheet conveyor means, filling depositing means, and folding means; and wherein filler is deposited on the dough sheet in a crease formed therein and thereafter the dough sheet is folded around the filling; in combination;

a dough sheet feed section of said conveyor means having a discharge end roller rotatable about an axis extending transversely to the direction of movement of said conveyor means and means for rotating said discharge end roller continuously in one direction;

a crease-forming roller adjacent to said discharge end roller having its upper surface disposed at approximately the same elevation as the discharge end of said dough sheet feed section and rotatable about an axis substantially parallel to said axis of rotation of said discharge end roller, reversible drive mean for driving said crease-forming roller alternately in opposite directions, and first control means for controlling said reversible drive means to drive said crease-forming roller in the same rotative direction as said discharge end roller until a leading portion of each dough sheet delivered by said dough sheet section has been transferred therefrom onto said crease-forming roller and then to drive said crease-forming roller in the opposite rotative direction, whereby a portion of said dough sheet is drawn down between said rollers so as to form a transverse filling-receiving crease therein; and,

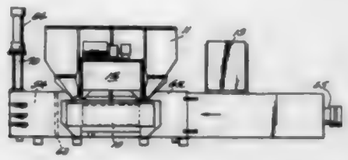
filling depositing means disposed above the opposing surfaces of said discharge end roller and said crease-forming roller, and second control means for said filling depositing means to deposit filling into each filling-receiving crease.

4,691,628

METHOD FOR DEWATERING A MASS OF WET FIBROUS MATERIAL

Edwin K. Simpson, Cordele, Ga., assignor to Harris Press and Shear, Inc., Cordele, Ga.

Division of Ser. No. 861,936, May 12, 1986. This application Oct. 24, 1986, Ser. No. 922,958
Int. Cl.⁴ B30B *9/06*
U.S. Cl. 100—37 **3 Claims**



1. A method for dewatering a mass of wet fibrous material, comprising the steps of:

containing a mass of wet fibrous material in a hopper;

selecting a given quantity of the mass of wet fibrous maerial by adjusting a first ram a predetermined distance beneath the hopper;

feeding the selected quantity of the mass of wet fibrous material into a compression chamber by guiding the first ram in a direction of movement toward the compression chamber via a pair of piston rods and cylinders arranged on opposite sides outside of the first ram;

feeding the selected quantity of wet fibrous material from the compression chamber into a press box by a second ram moving in a direction substantially perpendicular to the direction of the movement of the first ram;

lowering a door located at one end of the press box so that the wet fibrous material is pushed thereagainst by the second ram;

compressing the wet fibrous material in the press box by the second ram into a bale;

expressing water from the wet fibrous material being compressed in the press box by the second ram; and

channeling the water expressed from the fibrous material along a plurality of liners arranged on a front face of the second ram, on a rear face of the door, and on a top wall, a bottom wall, and two opposing side walls of the press box;

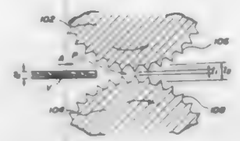
whereby the mass of wet fibrous material is efficiently dewatered from all six sides.

4,691,629

APPARATUS FOR DEHYDRATING CRUDE VENEER

Yoshinori Koba, Kajitacho Ohbushi, Japan, assignor to Meinan Machinery Works, Inc., Kajitacho Ohbushi, Japan

Filed Oct. 25, 1985, Ser. No. 791,359
Claims priority, application Japan, Oct. 30, 1984, 59-229691
Int. Cl.⁴ B30B *9/20*
U.S. Cl. 100—121 **20 Claims**



1. An apparatus for dehydrating a crude veneer, comprising:

a pair of parallel rolls positioned to face each other, the veneer being fed toward a predetermined position which is defined between said rolls and coplanar with axes of said rolls in such an orientation that fibers of the veneer extend generally in a longitudinal direction of the veneer with respect to an intended direction of veneer feed;

tooth means provided on a periphery of each of said rolls such that said tooth means on the rolls become aligned with each other at said predetermined position between the rolls, tips of said tooth means on the rolls being spaced from each other at said predetermined position by a distance which is substantially 20–60 percent of a thickness of the veneer;

the peripheries of the rolls except for said tooth means being spaced from each other at said predetermined position by a distance which is at least 90 percent of the thickness of the veneer; and

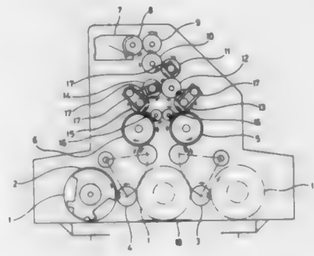
drive means for causing the rolls to rotate in opposite directions to each other.

4,691,630

INK-APPLYING MECHANISM OF A PRINTING MACHINE HAVING A RECIPROCATIVE PRINTING ROLL

Shinzo Asano, Yokohama, Japan, assignor to Asano Tekkosho Co., Ltd. and Fuk Co., Ltd., both of Tokyo, Japan

Filed Mar. 14, 1986, Ser. No. 839,903
Int. Cl.⁴ B41F *31/00*
U.S. Cl. 101—212 **3 Claims**



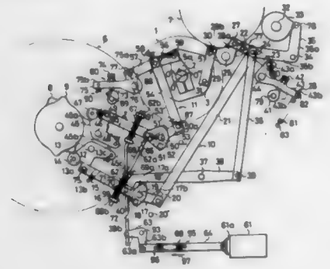
1. An ink-applying mechanism for a printing mechanism having a rotative printing roll reciprocative along an onward and a return way in which a first applying roll applies ink during the onward way of the printing roll to a printing face thereof, and a second applying roll applying ink to said printing face during the return way of the printing roll, said first and second applying rolls for this purpose being in contact with respective first and second ink rolls rotating in direction reverse to that of the first and second applying roll, said first and second ink rolls being supplied with ink from an ink-container through a single series of associated, sequentially contacting, kneading rolls, a first kneading roll in said series engaging an ink pad for feeding the ink from the ink container to said series of sequentially contacting kneading rolls, a last of said series of kneading rolls, distant from said first kneading roll, comprising a distributing roll which effectively rotates the first and second ink rolls in opposite directions relative to one another, and ink smoothing means comprising two rolls intermediate said first and second ink rolls and contacting said first and second ink rolls for smoothing ink supplied by said distributing roll to said first and second ink rolls.

4,691,631

CYLINDER SETTING MECHANISM FOR AN OFFSET PRINTING MACHINE

Koji Ishii, and Yukito Okuda, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Mar. 25, 1986, Ser. No. 844,031
Claims priority, application Japan, Mar. 26, 1985, 60-63130
Int. Cl.⁴ B41F *13/20, 13/28*
U.S. Cl. 101—218 **4 Claims**



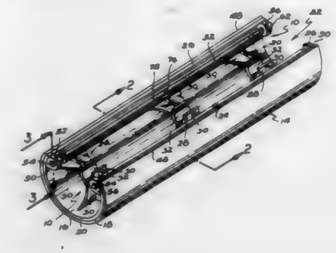
1. A cylinder setting mechanism for an offset printing machine, said offset printing machine comprising a frame, said frame including laterally spaced frame vertical walls, an impression cylinder mounted between said walls for rotation horizontally about a fixed axis on the frame, a plate cylinder mounted for rotation between said walls for rotation about a second fixed axis on the frame, parallel to the axis of rotation of the impression cylinder with the peripheries of the plate cylinder and the impression cylinder spaced from each other, and a rubber blanket cylinder interposed between the pressure cylinder and the plate cylinder, parallel thereto and between said frame vertical walls for peripheral contact with the plate cylinder and the impression cylinder, the improvement comprising, eccentric metal parts rotatably mounted on respective frame vertical walls for rotation about a first axis, an eccentric rubber blanket cylinder shaft extending between said frame vertical walls and mounted for rotation on said eccentric metal parts about an axis eccentric to the axis of rotation of said eccentric metal parts, and means for mounting said rubber blanket cylinder for rotation on said rubber blanket cylinder shaft about an axis which is eccentric to the axis of rotation of said eccentric rubber blanket cylinder shaft and means for selectively, sequentially rotating said eccentric metal parts and said eccentric rubber blanket cylinder shaft for sequentially setting said rubber blanket cylinder into engagement initially with said plate cylinder and subsequently with said impression cylinder in two steps.

4,691,632

METHOD AND APPARATUS FOR ATTACHING ANTI-SMEAR NET TO PRINTING PRESS TRANSFER CYLINDER

Howard W. DeMoore, 10954 Shady Trail, Dallas, Tex. 75220

Filed Jul. 8, 1986, Ser. No. 883,035
Int. Cl.⁴ B41F *21/00*
U.S. Cl. 101—426 **20 Claims**



1. A method for attaching an anti-smear fabric web having leading and trailing axial ends to the support surface of a skeleton wheel of the type used in supporting and conveying printed sheets in a printing press and having an opening along the axial width defining a leading edge and a trailing edge of the support surface, the steps of:

providing a reel assembly capable of limited axial movement within the opening adjacent the leading edge of the support surface;

attaching the leading axial end of the web to the reel assembly for limited axial movement therewith; and

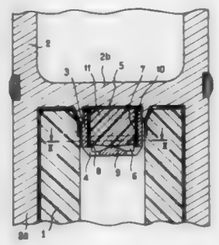
extending the trailing axial end of the web around the support surface and attaching the trailing axial end to the wheel within the opening.

4,691,633

IGNITER INTENDED FOR GAS-GENERATING CHARGES IN SHELLS

Jean-Philippe Godfrin, Plougastel-Daoulas; Bernard Landrevie, Saint-Medard en Jalles, and Gérard Escache, L'Hay-les-Roses, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jun. 6, 1986, Ser. No. 871,557
Claims priority, application France, Jun. 6, 1985, 85 08548
Int. Cl.⁴ F42B *13/267;* **F42C** *19/08*
U.S. Cl. 102—202 **12 Claims**



1. Igniter intended for gas-generating charges (1) with a central channel, contained in shells (2), comprising, on the one hand, a strong outer casing (3) whose bottom is equipped with divergent peripheral openings (4) and, on the other hand, an ignition charge (5) placed in this casing, characterized in that the inner surface of the casing comprises a means for axial positioning of the charge which provides a free space (6) between the downstream face of the charge and the bottom of the casing, the ignition charge (5) consisting of a pyrotechnic

block (11) integrally joined to a peripheral sleeve (7) resting on the said means of axial positioning.

4,691,634

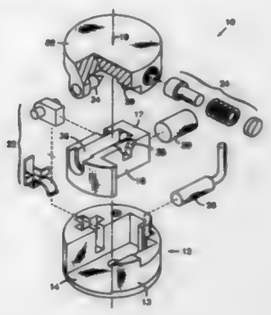
ELECTRO-EXPLOSIVE SAFETY AND ARMING DEVICE

John D. Titus, Phoenix, and Phillip E. Hall, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 19, 1986, Ser. No. 875,910

Int. Cl.[4] F42C *15/22, 15/40*

U.S. Cl. 102—245 **6 Claims**



1. A safety and arming mechanism for fuzes on spinning explosive projectiles and the like comprising:
   - a base member adapted to be affixed to the projectile;
   - a firing pin;
   - a detonator designed to be activated by contact with said firing pin;
   - one of said firing pin and said detonator being mounted on said base member;
   - a sliding member slideably mounted on said base member for movement towards one of said firing pin and said detonator from a first position in which said detonator is safe into a second position in which said detonator is armed;
   - means holding said sliding member in the out-of-line position;
   - the other of said detonator and said firing pin being mounted on said sliding member; and
   - actuator means for releasing said sliding member from the first position.

4,691,635

SAFETY FUSE FOR A SPINNING-TYPE PROJECTILE

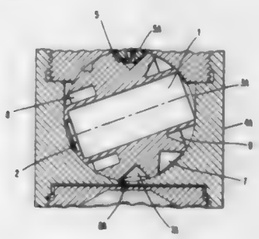
Walter Winterhalter, Tennenbronn, and Andreas Haissig, Denkingen, both of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Sep. 12, 1985, Ser. No. 775,400

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435402

Int. Cl.[4] F42C *15/26*

U.S. Cl. 102—251 **5 Claims**



1. In a safety mechanism for a fuse of a spinning-type projectile, said safety mechanism being of the type comprising a housing having a spherical cavity therein defined by a spherical surface, a spherical rotor rotatably disposed in said spherical cavity, said spherical rotor having a through-chamber therein carrying a detonator, said through-chamber defining a longitudinal axis and including first and second orifices at opposite longitudinal ends thereof, said first and second orifices disposed on a spherical periphery of said spherical rotor in substantially diametrically opposite relationship, said housing including a detonating passage leading to a detonable charge, said spherical rotor including a locking recess engaged by a releasable projection in said housing to lock said spherical rotor in a safety position wherein said first orifice is spaced from said detonating passage in the circumferential direction, said projection disposed diametrically opposite said detonating passage, a first cut-out formed in said spherical rotor periphery adjacent said first orifice to reduce the mass of said spherical rotor, the improvement wherein a second cut-out is provided in said spherical rotor periphery adjacent said second orifice to further reduce the mass of said spherical rotor, said first and second cut-outs being arranged and configured such that no portion thereof overlies said detonating passage when said spherical rotor is in said safety position, each of said first and second cut-outs being annular and extending coaxially relative to said longitudinal axis of said through-chamber, said locking recess disposed between said first an second cut-outs on one side of said spherical rotor, and a passage-covering portion of said spherical rotor periphery being disposed diametrically opposite said locking recess, said passage-covering portion being positioned between said first and second cut-outs and arranged to overlie said detonating passage in said safety position of said rotor, said spherical periphery of said spherical rotor including a first surface area positioned between said passage-covering portion and said first cut-out, and a second surface area positioned between said passage-covering portion and said second cut-out, said first and second surface areas making surface area contact with said spherical surface of said spherical cavity to block communication between said detonating passage and said first and second orifices when said spherical rotor is in said safety position.

4,691,636

EXPLODING MISSILE

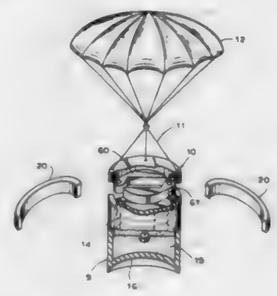
Wolfram Witt; Hendrik Lips, both of Düsseldorf; Herbert Scholles, Meerbusch, and Raimund Schweiger, Munich, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 624,042, Jun. 25, 1984, Pat. No. 4,622,900. This application Jul. 17, 1986, Ser. No. 887,176

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1983, 3322927

Int. Cl.[4] F42B *13/00, 1/02, 25/02*

U.S. Cl. 102—387 **5 Claims**



1. An exploding missile comprising:
   - a casing;
   - means attached to the casing for making it move in a predetermined direction relative to the casing after launch;
   - a charge in the casing having a projectile-forming front face;
   - an antenna on the casing behind the front face and charge and displaceable between a retracted position wholly behind the charge and an extended position projecting laterally therefrom and directed at least generally forwardly in the direction past the charge;
   - actuation means connected between the casing and the antenna for moving same from the retracted into the extended position after launch of the missile; and
   - control means including a receiver connected to the antenna and a detonator in the charge for detecting the distance to a target in front of the missile and exploding the charge when a predetermined distance is detected.

4,691,637

MODULAR GROUND MINE

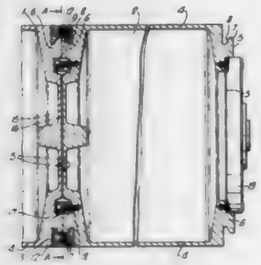
John W. Leigh, Sale, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Goverament of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 6, 1984, Ser. No. 662,987

Claims priority, application United Kingdom, Sep. 9, 1983, 8324179

Int. Cl.[4] F42B *22/06*

U.S. Cl. 102—406 **4 Claims**



1. A naval ground mine comprising at least two modules, each module including a cylindrical casing containing a mass of explosive, each casing being provided with a spigot on an end face thereof, and each spigot being provided with a radially outwardly directed lip,
   - the mine further comprising a ring having a radially outer surface which conforms substantially without discontinuity to the peripheral contour of the casing at least in the region of the said end face thereof, and a radially inner surface adapted to embrace and hold together the lips on the spigots of adjacent end faces of the two modules,
   - the ring being capable of being divided circumferentially into distinct segments to permit assembly of the mine, and being provided with fastening means whereby the ring segments can be firmly held together.

4,691,638

CASED TELESCOPED AMMUNITION

David A. Meyer, Plymouth; Brian B. Tasson, Anoka; Robert F. Vollmer, Bloomington, and J. Bruce Warren, Wayzata, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 30, 1985, Ser. No. 729,026

Int. Cl.[4] F42B *5/02*

U.S. Cl. 102—434 **4 Claims**

1. A cased telescoped ammunition for use with a gun having a barrel and chamber, said ammunition comprising:
   - a cylindrically shaped hollow body of resilient relatively thin material, said body having two axial ends and a butt joint extending longitudinally between said axial ends;
   - lip means integral with said body at each of said axial ends, each said lip means:
     - extending axially away from said body with an inward taper to an outboard edge surface having a diameter less than the diameter of said body, and
     - having a plurality of pairs outwardly extending nipples circumferentially disposed around the outer surface of each said lip means, each of said pairs of nipples comprising an inboard nipple and an outboard nipple; and
   - a pair of end caps respectively connected to said lip means of said axial ends of said hollow body, each of said end caps comprising:
     - a radially extending end portion,
     - a continuous rim portion integral with said end portion and extending axially to an inner edge surface,



   - axially extending notch means on the inner surface of said axially extending rim portion, said notch means being positioned beginning at a preselected point axially spaced from said inner edge surface and extending axially outboard a preselected distance equal to at least the axial extent of each of said pairs of nipples;
   - said end caps being connected to said body, as aforesaid, by said rim portion inner edge surface being positioned axially inboard from said inboard nipples and with all of said nipples being disposed in said axially extending notch means, and
   - said inboard nipples being characterized by being shearable by said rim portions of said end caps upon relative outboard axial movement of said end caps with respect to said body, and
   - said end caps being thereafter retained in assembled relationship with said body by said outboard nipples.

4,691,639

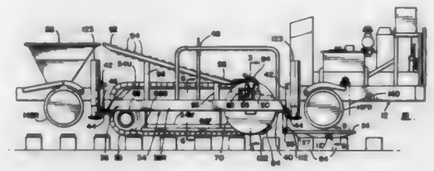
RAIL TIE PLATE PLACING VEHICLE AND METHOD

John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.

Filed Feb. 4, 1986, Ser. No. 826,008

Int. Cl.[4] E01B *29/32*

U.S. Cl. 104—16 **30 Claims**



1. A rail tie plate placing vehicle comprising:
   - (a) a main frame;
   - (b) a moving conveyor extending in a closed loop, said conveyor supported by said main frame and operable in a plate placing mode to place tie plates upon ties of a railroad track as the vehicle moves down the railroad track;
   - (c) a first gate for gating the conveyance of tie plates by said conveyor, said first gate disposable in a blocking state wherein it blocks the conveyance of a leading tie plate and disposable in an open state wherein it allows passage of a leading tie plate for conveyance by movement of said conveyor;
   - (d) holding means for holding tie plates against said con-

veyor and allowing the release of tie plates at a common predetermined release point on said closed loop for immediate disposal upon a tie; and

(e) a tie detector supported by said main frame for detection of ties at a detection point forward of said release point; and

wherein said tie detector causes said first gate to open for passage of a tie plate corresponding to the detection of a tie such that the tie plate which was allowed passage by said first gate arrives at said release point when said vehicle has moved said release point over the detected tie.

4,691,640

AUTOMOTIVE BODY, FLOOR CONVEYOR, HAVING PIVOTAL CARRIERS

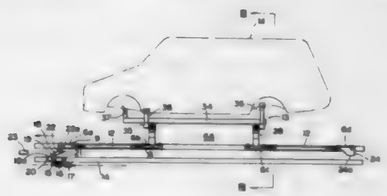
Masasumi Murai, Saitama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

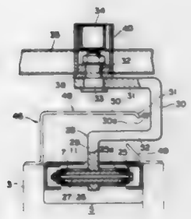
PCT No. PCT/JP84/00627, § 371 Date Oct. 7, 1985, § 102(e) Date Oct. 7, 1985, PCT Pub. No. WO86/04029, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 27, 1984, Ser. No. 789,306

Int. Cl.⁴ B61B *10/00*

U.S. Cl. 104—140 **9 Claims**





1. In a floor conveyor for conveying an automotive body on a track provided just under the working floor surface, including a stand for mounting the automotive body with its center of gravity directly overlying said track, support legs for supporting the stand at front and rear portions of the stand above the working floor surface, each leg having a carrier comprising traveling rollers with horizontal axes at its front and rear portions adapted to travel on said track, the improvement wherein:

the track comprises a pair of laterally-spaced channel members having their channels facing one another to receive the traveling rollers therein, the vertical height of said channels affording limited vertical displacement of said rollers in the respective channels when the automotive body sways from side to side, the spacing of said channels being greater than the sideward fluctuation of said center of gravity when said body sways;

said support legs being mounted at their lower ends on said carriers by axles positioned between said front and rear traveling rollers parallel to their rotational axes and having a length substantially the same as the spacing of said channels, said axles permitting said legs to pivot forwardly and rearwardly on said carriers but not laterally;

each carrier including vertical-axis guide rollers at the front and rear thereof;

said channel members having guide plates oppositely arranged on upper surfaces thereof providing therebetween a guide slot receiving the guide rollers and having a width smaller than the spacing of said channels and slightly greater than the diameter of said guide rollers so as to guide the carriers to maintain the traveling rollers within the channels of said channel members.

5. A painting booth with a floor conveyor for conveying an automotive body over a working floor surface,

a track provided just under the floor surface,

a stand for mounting the automotive body with its center of gravity directly overlying said track,

support legs at front and rear portions of the stand for supporting the stand above the working floor surface, each leg having a carrier comprising traveling rollers with horizontal axes at its front and rear portions adapted to travel on said track,

said track comprising a pair of laterally-spaced channel members having their channels facing one another to receive the traveling rollers therein, the vertical height of said channels affording limited vertical displacement of said rollers in the respective channels when the automotive body sways from side to side, the spacing of said channels being greater than the sideward fluctuation of said center of gravity when said body sways,

said support legs being mounted at their lower ends on said carriers by axles positioned between said front and rear traveling rollers parallel to their rotational axes and having a length substantially the same as the spacing of said channels, said axles permitting said legs to pivot forwardly and rearwardly on said carriers but not laterally,

each carrier including vertical-axis guide rollers at the front and rear thereof,

said channel members having guide plates oppositely arranged on upper surfaces thereof providing therebetween a guide slot receiving the guide rollers and having a width smaller than the spacing of said channels and slightly greater than the diameter of said guide rollers so as to guide the carriers to maintain the traveling rollers within the channels of said channel members.

4,691,641

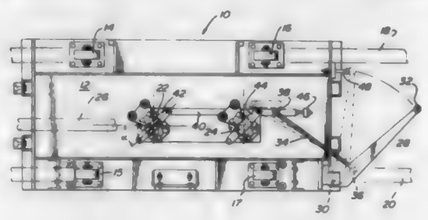
VEHICLE ACCUMULATION SYSTEM

Peter Rohrbach, Bath, and William Benzak, Bethlehem, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Feb. 21, 1986, Ser. No. 831,767

Int. Cl.⁴ B61B *13/12*

U.S. Cl. 104—166 **9 Claims**



8. A driverless vehicle of the type propelled along a track by contact between a drive wheel and a rotating drive shaft, the vehicle comprising:

a body;

support wheels adapted to ride on the track, said support wheels being mounted on and supporting the body;

a swing arm pivotably attached to one end of the body for pivoting about a fixed pivot axis on said body, said swing arm forming a bell crank and mounted for extension away from the body end;

means for rotatably supporting the drive wheel on said body for movement of said wheel about a vehicle axis;

means for connecting the swing arm and the drive wheel support means, said connecting means adapted to rotate the support means about its vertical axis in response to a corresponding pivoting motion of the swing arm;

means for biasing the swing arm to extend away from the body end;

means to limit the extension of the swing arm, said extension limiting means adapted to position the drive wheel in a vehicle maximum speed condition with respect to the drive shaft upon full extension of the swing arm;

means to limit the pivoting motion of the swing arm towards the body, said pivot limiting means adapted for selective adjustment such that the drive wheel may cause either decelaration of the vehicle with respect to its full extension position, accumulation of the vehicle along the track, or reverse movement of the vehicle with respect to the full extension position.

4,691,642

MULTICABLE CABLE-CAR OR GONDOLA LIFT

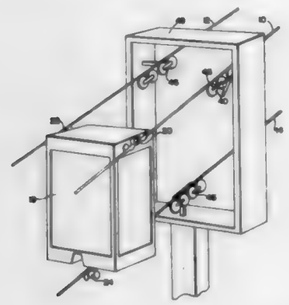
Denis Creissels, Allée de la Piscine, 38700 Corenc, France

Filed Oct. 30, 1985, Ser. No. 792,891

Claims priority, application France, Nov. 2, 1984, 84 16839

Int. Cl.⁴ B61B *7/04*

U.S. Cl. 104—173.1 **11 Claims**



1. Multicable passenger transport installation, notably a cable-car or gondola lift, having several aerial cables extending along parallel trajectories between two stations having loading and unloading platforms, comprising:

several vehicles or cars without hanger arms moving between the stations on the line defined by the cables,

at least two pivots borne by each vehicle and extending horizontally and transversely to the longitudinal direction of the cables,

two of said cables exending laterally along each vehicle being spaced apart transversely in relation to the direction of the cables and being spaced apart in height, the trajectories of said two cables being deduced one from the other by translation,

support parts pivotally mounted on said pivots for free movement in a vertical plane,

two grips, one borne by each of said support parts for coupling to the cables to move each vehicle on the line, the vehicles being stabilized in the rolling direction by the laterally spaced cables,

a device driving said two cables in synchronism to stabilize the rocking and the pitching of the vehicles driven in translation, to compensate for the absence of hanger arms.

4,691,643

ROPE COUPLING CARRIAGE HAVING CONCAVE TRACK BETWEEN GRIPS

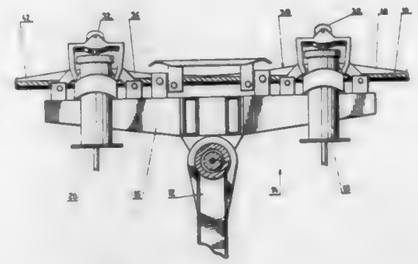
Max Brochand, Noyarey, France, assignor to Pomagalski, Fontaine, France

Filed Sep. 3, 1986, Ser. No. 903,238

Claims priority, application France, Sep. 9, 1985, 85 13450

Int. Cl.⁴ B61B *12/12*

U.S. Cl. 104—202 **6 Claims**



1. A carriage, coupling loads, notably cars, to an aerial rope of a transport installation having support and compression sheave batteries with successive sheaves separated by a first distance along a line formed by said rope, said carriage comprising two grips set apart by a second distance, each grip having a pair of jaws mounted astride and gripping the rope with a protruding part of limited thickness above an upper face of the rope for the grip to pass easily under the compression sheave batteries, and a running track extending said protruding part on both sides thereof on the rope, to facilitate entry and exit of the grip under a compression sheave, a part of the running track located between the two grips presenting at both ends a maximum thickness appreciably equal to the thickness of said protruding part so as to just reach the same level as the protruding part above the rope in the grip connection area and a general upward-facing concave shape with a minimum thickness in a middle portion between the two grips.

4,691,644

FRAME STRUCTURE ESPECIALLY FOR A CABINET, E.G. OF THE SHELVED TYPE

Georges Frydman, 70 avenue Auguste Galtier, 06230 Villefranche-sur-Mer, France

Continuation of Ser. No. 532,610, Sep. 15, 1983, abandoned. This application Nov. 4, 1985, Ser. No. 794,439

Claims priority, application France, Sep. 20, 1982, 82 15799

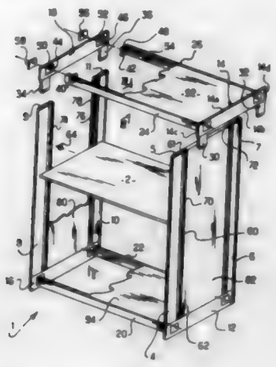
Int. Cl.⁴ A47B *47/00*

U.S. Cl. 108—111 **18 Claims**

1. A rigid frame structure especially for a cabinet or like piece of furniture, e.g. of the shelved type, comprising normally vertical uprights maintained laterally spaced from one another by single piece, normally horizontal, lateral yokes, and longitudinally-spaced, normally horizontal, longitudinal cross-members, said yokes comprising outwardly protruding tenons arranged substantially in the longitudinal plane of a respective yoke and substantially perpendicularly to the longitudinal edges of said respective yoke, said tenons adapted to be inserted or fitted into corresponding sockets provided at ends of said vertical uprights, said yokes having vertcal longitudinal faces which are each provided, in proximity to the lateral edges of said yokes, with assembling means for assembling said longitudinal cross-members on said vertical longitudinal faces of said yokes,

said assembling means comprising four cavities disposed on each yoke, two cavities being disposed on each vertical longitudinal face thereof, and each cavity being disposed on said vertical longiduinal face of said yoke substantially

opposite to a cavity disposed on said opposite vertical longitudinal face of said yoke,



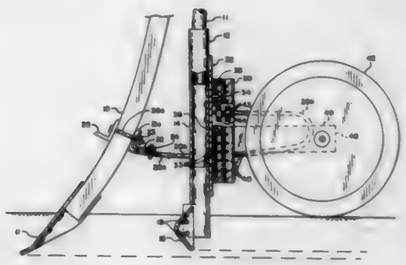
whereby said cavities provide end-to-end engagement of additional cross-members for a second frame structure or alternatively, are adapted to be fitted with an end cap for an anchoring engagement.

4,691,645

SEED PLANTER ATTACHMENT

Steven Anderson, Star Route, Arlington, Oreg. 97812

Filed Jul. 5, 1985, Ser. No. 752,036
Int. Cl.[4] A01C *5/08*
U.S. Cl. 111—86 **7 Claims**



1. A seed planter, for attachment to a vertically oriented plow shank, comprising:

(a) a plow shank;

(b) a hollow seed guide having a ground engaging boot;

(c) leaf spring rod means coupled to said plow shank for supporting said seed guide in rear trailing relation relative to said plow shank;

(d) a bracket means;

(e) wheel means, said wheel means and said leaf spring rod means connected to said bracket means at a predetermined vertical height relative to said plow shank, said bracket means vertically supporting said seed guide; and

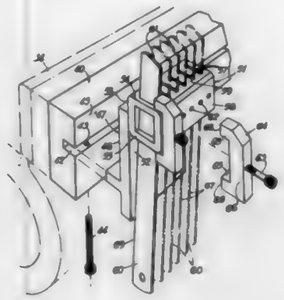
(f) said bracket means including means for selectively detachably coupling to said seed guide at predetermined vertical intervals along the length thereof for connecting said wheel means and said leaf spring rod means to said seed guide, whereby said boot may be regulated in vertical heighth independently of the connection of the wheel means and the leaf spring rod means.

4,691,646

KNIFE HOLDER FOR TUFTING MACHINE

Joseph L. Card, and Roy T. Card, both of Chattanooga, Tenn., assignors to Card-Monroe Corporation, Chattanooga, Tenn.

Filed Jun. 29, 1983, Ser. No. 508,853
Int. Cl.[4] D05C *15/24*
U.S. Cl. 112—80.6 **12 Claims**



1. A tufting machine of the type having needles for inserting yarns through a backing material and wherein a plurality of laterally spaced loopers catch and hold the loops of yarns as they are inserted through backing material by the needles, and a knife assembly supporting means is reciprocated for moving knives for cutting action with respect to the loops caught by the loopers; wherein the improvement comprises: a knife assembly between said knives and said knife assembly support means, said knife assembly including a laterally extending knife bar carried by said supporting means, said knife bar having a sidewise opening laterally extending recess in one side thereof, a plurality of side-by-side knife holder means disposed on said one side of said knife bar, each of said knife holder means having a bracket element and a laterally extending tongue fixed to and protruding sidewise from said bracket element into said recess, said tongue being sufficiently long that when it is received in said recess it prevents appropriable relative rotational movement of said knife holder means with respect to said knife bar, each of said knife holder means being movable into and out of its position adjacent to one side of said knife bar, and detent means for removably locking said tongue in place in said recess, said bracket element being disposed in a generally horizontal plane and having a plurality of equally spaced parallel slots, said slots being disposed at an acute angle to the horizontal plane of said bracket element and respectively receiving said knives therein for holding said knives with their cutting edges against and cooperating with said loopers.

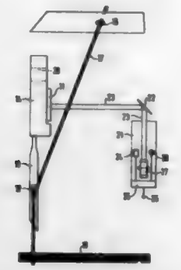
4,691,647

OPTICAL THREAD BREAKAGE MONITORING APPARATUS

Walter von Stein, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,377
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539536
Int. Cl.[4] D05C *15/08, 15/18*
U.S. Cl. 112—80.18 **10 Claims**

1. Optical thread breakage monitoring apparatus for tufting machines comprising a laser beam scanning device which generates a laser beam which executes a continually repeating rapid scanning movement perpendicular to the needles of the needle row and which, when it impinges onto a retroreflecting strip arranged behind the threads being worked by the needles,, as a result of a thread breakage or as a result of passing through the thread gaps, is reflected back on itself and is incident in the laser beam scanning device on a photoreceiver connected to an electronic processing circuit which, in the event of a change of the normally present periodic signal



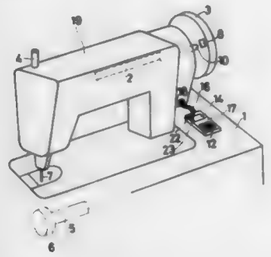
generates a fault signal, characterised in that the retroreflecting strip (**11**) is secured above the eyes (**12**) of the needles (**13**) to the front side of the needle beam (**14**).

4,691,648

DEVICE FOR DETECTING THE RESIDUAL AMOUNT OF BOBBIN THREAD IN A LOCK STITCH SEWING MACHINE

Tokuzo Hirose, Osaka, Japan, assignor to Hirose Manufacturing Company, Limited, Osaka, Japan

Continuation of Ser. No. 760,978, Jul. 31, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,592
Int. Cl.[4] D05B *19/00, 69/36*
U.S. Cl. 112—121.11 **1 Claim**



1. A device for detecting the residual amount of bobbin thread in a lock stitch sewing machine comprising:

a first means for detecting the number of rotations of an arm shaft of said sewing machine and for providing an output corresponding to the detected number of rotations, said first means comprising a light emitter disposed on a housing of said sewing machine and a light detector which is also disposed on said housing for detecting said light emitted from said light emitter after being reflected off of an optical reflector disposed on a side portion of a pulley affixed to said arm shaft;

a second means for detecting the residual amount of bobbin thread wound on a bobbin in a bobbin case based on said output of said first means and for comparing said detected residual amount of bobbin thread with a first predetermined value, said first predetermined value being predetermined in dependence upon the conditions of a thread and needle employed and of a workpiece, said second means causing said sewing machine to stop operating when said detected residual amount of bobbin thread reaches said first predetermined value;

said second means comprising an indication element consisting of at least one of a light emitting indication element and a sounding means which is activated when said second detected residual amount of bobbin thread reaches a second predetermined value which is larger than said first predetermined value at which said lock stitch sewing machine is caused to stop operating;

wherein said indication element remains activated until said detected residual amount of bobbin thread reaches said first predetermined value at which said lock stitch sewing machine is caused to stop operating;

wherein said second means further comprises a counter for counting said output of said first means and a key input means for manually inputting said first and second predetermined values and a processing means for controlling said sewing machine and said indication element and a display means for displaying a residual amount of bobbin thread;

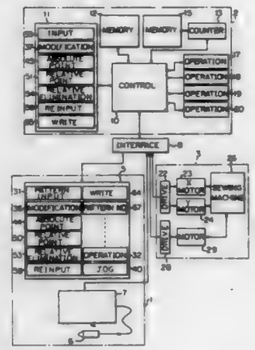
wherein said second means is disposed in a separate housing disposed apart from said first means and said first and second means are interconnected via a flexible electrical wires.

4,691,649

INPUT DEVICE FOR SEWING MACHINE

Kunio Takano, Tokyo; Masanori Nukushina; Yoichi Okiyama, both of Kanagawa, and Toshiyuki Miyamoto, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Jul. 24, 1985, Ser. No. 758,657
Claims priority, application Japan, Jul. 31, 1984, 59-160781
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **4 Claims**



1. An apparatus for use with a sewing machine for and modifying a sewing pattern to be sewn on a workpiece, said apparatus comprising:

sewing pattern inputting means for inputting coordinate values of a sewing pattern to be sewn on the workpiece;

modification type indication means for indicating absolute point modification of an inflection point in the inputted sewing pattern;

first means for inputting coordinate values of a modification point to replace the coordinate values of the inflection point to be modified;

second means for making visible a portion of the sewing pattern by an inflection point immediately before the inflection point to be modified; and

sewing pattern modification means for modifying relative coordinate values of each of the sewing points between the modification point and an inflection point immediately before the inflection point to be modified in accordance with coordinate values of the modification point and the inflection point immediately before the inflection point to be modified and for modifying the relative coordinate values of each of sewing points between the modification point and an inflection point immediately after the inflection point to be modified in accordance with coordinate

values of the modification point and the inflection point immediately after the inflection point to be modified.

4,691,650

LOCKSWITCH SEWING MACHINE HAVING A ROTARY HOOK

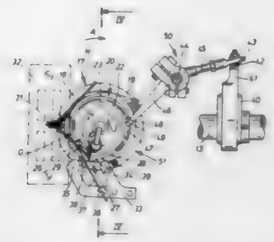
Albert Dusch, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,649

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446547

Int. Cl.⁴ D05B *57/08, 57/26*

U.S. Cl. 112—231 **2 Claims**



1. A rotary hook arrangement for a lockstitch sewing machine, comprising a stitch plate having a stitch hole therein, a hook housing rotatably mounted on the sewing machine below said stitch plate, a bobbin housing freely rotatably supported in said hook housing, a bobbin capsule carrier forming part of said bobbin housing, a projection formed on said bobbin housing extending outwardly of an outer periphery thereof and having first and second space abutment surfaces, a carrier mounted on the sewing machine and having two spaced apart first and second cams adjacent said projection, a spring rod on said carrier extending between said cams and engaged against said first abutment surface, said first abutment surface cooperating with said first cam to secure said bobbin housing against forward rotation with said hook housing and said second cam cooperating with said second abutment surface to secure against reverse rotation of said bobbin housing with said hook housing, said first and second cams being arranged substantially at 90° upstream of said stitch hole in the direction of forward rotation and thus substantially in the central region of a loop cast-off side of said bobbin housing and receiving said spring rod therebetween, said first cam providing reinforcement for said spring rod, said projection abutment surfaces formed by side faces of said projection extending tangential to the outer periphery of said bobbin housing and defining a shoulder of said bobbin housing.

4,691,651

TILTABLE SEWING HEAD AND UNDERARM FOR A SEWING MACHINE USED IN CONJUNCTION WITH A WORKPIECE SUPPORTING CARRIER PLATE

Hubert Jünemann, Bielefeld, Fed. Rep. of Germany, assignor to Kochs Adler AG, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,049

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518474

Int. Cl.⁴ D05B *75/00, 39/00*

U.S. Cl. 112—259 **12 Claims**

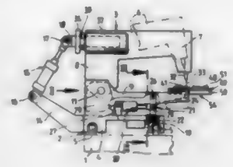
1. Sewing head for a sewing machine with a supporting device for said sewing head; and with a carrier for a workpiece to be stitched, said sewing head and said carrier being displaceable relative to each other, said sewing head comprising:

a standard;

an upper arm and an underarm arranged at said standard; a drivable arm shaft pivoted in said upper arm; a needle bar with a needle reciprocatingly drivable by said armshaft; a tubular stud formed at said underarm and into which said needle immerses;

said sewing head having an inoperative position and a working position for stitching;

said sewing head being horizontally displaceable during the movement thereof from said inoperative position to said working position;





an area of obstacle to said tubular stud reached during horizontal displacement of said sewing head

a device for downward tilting said underarm about an axle arranged in the area of said standard; and said device being for removing said tubular stud beyond said area of obstacle.

4,691,652

METHOD AND SEWING MACHINE FOR AUTOMATICALLY PROVIDING END OF STITCHING AT A GIVEN DISTANCE FROM THE EDGE OF A PIECE OF FABRIC

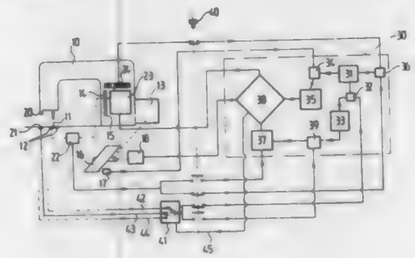
Charly Leclaire, Dourges, France, assignor to Prouvost S.A., Nord, France

Filed Jun. 3, 1986, Ser. No. 869,915

Claims priority, application France, Jun. 3, 1985, 85 08316; Mar. 28, 1986, 86 04534

Int. Cl.⁴ D05B *19/00, 27/22*

U.S. Cl. 112—262.1 **9 Claims**



1. A method for automatically carrying out, from a given signal, an end stitching portion of constant length (L) in one travel direction or in the opposite direction, on a sewing machine (**10**) having a device (**14**) for adjusting the length of the stitch, characterized in that it consists in storing, by recording a manual operation for forming at least said end portion (L), the number of pulses delivered, from the appearance of said signal until the end of the operation, by means of a coding device (**22**) delivering a pulse per fraction of the length of the stitch travelled by the fabric in one of the two opposite travel directions and, during reproduction, controlling from the

appearance of said signal the execution of the end part (L) of said stitching by means of a central control unit (**30**) which

compares the number of pulses recorded with the number of pulses read from said coding device (**22**) during reproduction,

orders for execution of a complete stitch as long as, at the beginning of the stitch, the difference between the number of pulses recorded and the number of pulses read is greater than the number of pulses corresponding to a complete stitch, and

controls the device for adjusting the length of a stitch and the execution of the last reduced stitch when said difference is less than said number of pulses of a whole stitch.

4,691,653

SEWING MACHINE CONTROL APPARATUS

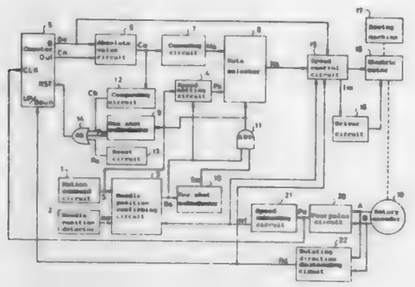
Shigeo Neki, Osaka; Kenichi Ohara, Hirakata; Nobuho Shibata, Katano, and Takashi Dohi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 4, 1986, Ser. No. 926,534

Claims priority, application Japan, Nov. 6, 1985, 60-248214

Int. Cl.⁴ D05B *69/24*

U.S. Cl. 112—275 **8 Claims**



1. Sewing machine control apparatus comprising:

an electric motor for driving a sewing machine,

a rotary encoder connected to said electric motor for generating pulse signals corresponding to revolution of said electric motor,

speed setting means for setting revolution speed of said electric motor,

speed control means for controlling said revolution speed of said electric motor in compliance with setting value of revolution speed set by said speed setting means,

rotating direction discriminating means for detecting rotating direction of said electric motor,

counting means for summing or deducting the number of pulse signals corresponding to output signals of said rotating direction discriminating means,

comparating means for comparing and for detecting coincidence of data of said counting means and a predetermined value thereby to reset said counting means,

converting means for converting said data of the counter to the setting value, and

switching means for selecting an output of said speed setting means in a rotating state of said electric motor and for selecting an output of said converting means in a state of stop of said electric motor.

4,691,654

LATERAL MOVEMENT FEED DOG FOR A SEWING MACHINE

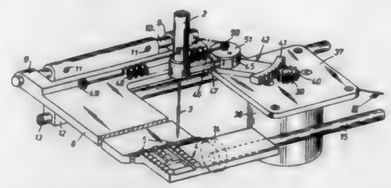
Willi Meier, Karlsruhe, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,277

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531630

Int. Cl.⁴ D05B *27/00*

U.S. Cl. 112—303 **5 Claims**



1. In a sewing machine which includes a reciprocating needle and a feed dog for moving material through a feed path taking it past the needle, the improvement comprising a lateral feed mechanism including a support carrying the feed dog, means mounting said support for lateral movement, said support having a drive surface, a link pivotally mounted adjacent said drive surface and having an eccentric portion in engagement with said slide surface, slide drive means connected to said link to pivot said link so as to rotate said eccentric portion to cause lateral shifting of said support.

4,691,655

MECHANISM FOR PRODUCING STITCHED PATTERNS IN A ZIGZAG SEWING MACHINE

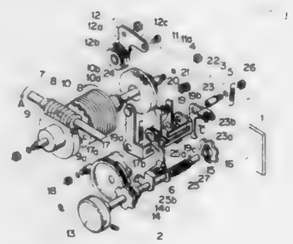
Yasuro Sano, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,817

Claims priority, application Japan, Jan. 14, 1985, 60-2344[U]; Jan. 21, 1985, 60-5459[U]

Int. Cl.⁴ D05B *3/02, 3/06*

U.S. Cl. 112—466 **5 Claims**



1. A zigzag sewing machine including a drive shaft rotated to vertically reciprocate, pattern cams, and a needle which is operatively connected to the pattern cams and is swingable laterally of a fabric feeding direction under the control of the pattern cams, the sewing machine further comprising a cam shaft; said pattern cams including a first group of pattern cams rotatably mounted on the cam shaft and operatively connected to said drive shaft to be rotated thereby at a first predetermined reduced speed, and a second group of pattern cams rotatably mounted on said cam shaft and operatively connected to said first group of the pattern cams to be rotated thereby at a second predetermined reduced speed; transmission means including a swingable member (**19**) positioned between said first and

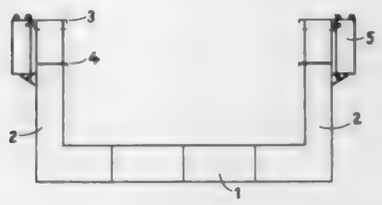
second group of said pattern cams and said swingable needle and operatively connected to said needle; cam follower means including a first cam follower (20), a guide shaft (5), and a second cam follower (21) swingably mounted on said guide shaft, which is arranged between said first and second group of the pattern cams and said swingable member (19), each of said first and second cam followers having one end for engaging a selected one of said first and second group of pattern cams and an opposite end for engaging said swingable member; pattern selecting means operated to move said first cam follower along said guide shaft substantially all through a range defined by said first and second group of pattern cams to thereby select one of said first and second groups of pattern cams, said pattern selecting means moving said second cam follower in association with said first cam follower within a range defined by said second group of pattern cams when said first cam follower is moved beyond a predetermined range defined by said first group of pattern cams, to thereby select two pattern cams, one of which is selected from said first group of pattern cams and the other of which is selected from said second group of pattern cams; and means for connecting said first cam follower to said second cam follower when said first cam follower is moved beyond said predetermined range defined by said first group of the pattern cams.

4,691,656

FLOATING DOCK CONSTRUCTION

Helmut Katernberg, Oberhausen, and Ingolf Köhler, Wesel-Blumenkamp, both of Fed. Rep. of Germany, assignors to M.A.N.Maschinenfabrik Augsburg-Nuraberg, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,898
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 8436853[U]
Int. Cl.⁴ B63C *1/02*
U.S. Cl. 114—45 **1 Claim**



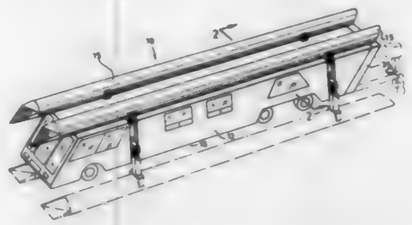
1. A floating dock, comprising a pontoon base, a side wall made up of individual closed portion extending upwardly from each side of said base, and a plurality of detachable buoyancy containers disposed on the outside of each side wall, said side walls including substantially rectangular tank portions temrminating in an upper deck at each top and a deck spaced below each upper deck defining a safety deck, said detachable buoyancy container each comprising a box secured to said side walls between said upper deck and said safety deck, upper and lower eyelets fixed to each side wall for each buoyancy container, an upper and lower eyelet fixed to each buoyancy container, said upper and lower eyelets of said container being aligned respectively with said upper and lower eyelets of one of said saide walls, and bolt elements extending through said aligned upper and lower eyelets for detachably connecting said buoyancy containers to said side walls and for permitting pivoting of said buoyancy containers on said side walls.

4,691,657

AMPHIBIOUS VEHICLE

Andrew J. Kovac, 4474 Shelby Crescent, Mississauga, Ontario, Canada L4W 3T3

Filed Jul. 16, 1986, Ser. No. 885,844
Int. Cl.⁴ B63B *1/00*
U.S. Cl. 114—61 **2 Claims**



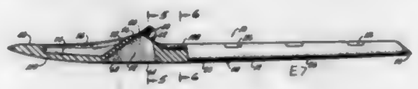
1. An amphibious vehicle having a front, a rear and two sides, comprising:
- a frame provided with wheels for transporting the vehicle on land;
- a body attached to the frame, the body having a watertight lower portion enabling the vehicle to float in a body of water;
- pontoons for the vehicle to provide flotation of the vehicle in a body of water, the vehicle having at least one pontoon positionable laterally along each side thereof; and
- at least two pivoting arms for moving each laterally extending pontoon from a stowed position atop the vehicle to an operating position alongside the vehicle, each said arm having one end attached to the pontoon and the other end provided with means for moving the arm approximately 180° about a pivot so that the pontoon may be moved into the desired position, the means for moving the arm comprising at least three hydraulic cylinders situated in the vehicle to control the movement of two arms disposed opposite one another, each arm being attached to one of the pontoons, the three hydraulic cylinders comprising a double cylinder having a piston rod extending from each end thereof, each said piston rod being pivotally attached adjacent said other end of each opposing arm, and each arm having a cylinder with a piston rod thereof being pivotally attached centrally of the arm portion between the pivot for the arm and said other end thereof with the other end of the cylinder being pivotally located to enable the cylinder to apply force to the arm substantially throughout its 180° range of movement, said double cylinder and said cylinders associated with the opposing set of arms being operable in concert to move both arms simultaneously and smoothly through their 180° ranges of movement.

4,691,658

AQUATIC SPORT DEVICE

Dane S. New, 4143 Devon Clr., Cypress, Calif. 90630, and Albert W. Dove, 367 Newport Glen Ct., Newport Beach, Calif. 92660

Filed Jun. 6, 1986, Ser. No. 871,480
Int. Cl.⁴ B63B *35/00*
U.S. Cl. 114—66 **4 Claims**



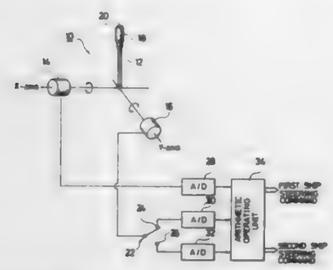
3. An aquatic sport device comprising:
a lighter than water paddle board having a bow, a stern and a sealable storage compartment therein sized for the storage of a wet suit, a sight compartment disposed aft of said storage compartment, and a deck portion disposed between said sight compartment and the paddle board stern and sized to accommodate a user in a prone position thereon;
means defining a topside portion of said paddle board and forming a top portion of said sight compartment for mounting a first transparent member at an elevated position above the paddle board deck portion and in an angular relationship therewith, said angular relationship enabling a user in a prone position on said paddle board deck portion to look forwardly into the sight compartment towards the bow of the paddle board;
a second transparent member, flush mounted in a hull of the paddle board and forming a bottom portion of said sight compartment, said second transparent member being larger than said first transparent member, said first and second transparent members being aligned with one another to enable a user, in a prone position on the paddle board deck portion, to look through the sight compartment and the paddle board in a downwardly and forwardly direction,
fairing means disposed on the buoyant board hull for guiding bubbles, foam and debris away from the second transparent member disposed in the hull when the buoyant board is floating in water and moved in a forward direction, said fairing means comprising a pair of vanes disposed in a V-like relationship with an intersection of the vanes being disposed proximate the bow of the buoyant board and said second transparent member between disposed said vanes.

4,691,659

APPARATUS FOR STEERING JOYSTICK OF SHIP

Kimiaki Ito; Tetsuo Ueno; Koichi Ueno, all of Yokohama, and Susumu Ishii, Tokyo, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Jun. 26, 1986, Ser. No. 879,041
Claims priority, application Japan, Jul. 6, 1985, 60-148483
Int. Cl.⁴ B63H *25/00*
U.S. Cl. 114—144 R **5 Claims**



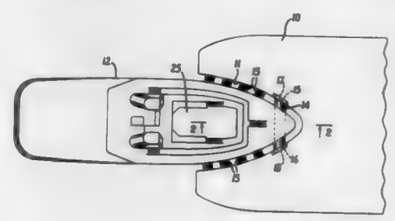
1. A joystick ship steering apparatus for use in steering of a ship equipped with a propelling equipment for generating a thrust in the back and forth directions, a rudder for changing the direction of the thrust of said propelling equipment, and a propelling equipment for generating a thrust in the lateral direction, said apparatus comprising:
- a joystick unit having a joystick lever which can be freely operated around three X, Y, and Z axes;
- first rotation angle detecting means for detecting an angle of rotation around the X axis by said joystick lever;
- second rotation angle detecting means for detecting an angle of rotation around the Y axis by the joystick lever;
- a push button switch provided at the edge of the joystick lever; and
- arithmetic operating means for calculating the operating direction and an amount of operation of the joystick lever from detection outputs of said first and second rotation angle detecting means when said push button switch is not operated, and for calculating the operating direction and the amount of operation of the joystick lever from the detection output of either one of said first and second rotation angle detecting means when said push button switch was operated.

4,691,660

TUG/BARGE APPARATUS

Edmund Torsay, New York, N.Y., assignor to Energy Transportation Group Inc., New York, N.Y.

Filed May 12, 1986, Ser. No. 862,037
Int. Cl.⁴ B63B *35/70*
U.S. Cl. 114—248 **3 Claims**



1. In combination a barge having formed in the stern thereof a notch shaped to accomodate the stern of a tug therein,
- a coupling member having positive buoyancy and mounted in slots formed in said notch so that it spans said notch and floats substantially at the barge water line so as to be able to rise and fall in relation to the barge, and
- a tug positioned within said notch in the barge and having means cooperable with said coupling member for coupling the tug to the barge,

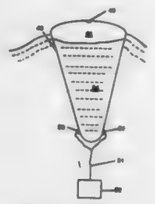
said coupling means comprising a socket in the bow of the tug conforming generally to the shape of said coupling member, said socket extending transversely of the tug and having a forwardly open, transversely extending slot therein to facilitate entry of said barge coupling member thereinto.

4,691,661

SELF-ADJUSTING BREAKWATER FOR ARTIFICIAL HARBORS

Salvatore Delana, #307-450 North Nanaimo Street, Vancouver, British Columbia, V5L 3G8, Canada

Continuation-in-part of Ser. No. 378,174, May 14, 1982, Pat. No. 4,487,151. This application Sep. 27, 1984, Ser. No. 654,900
Claims priority, application Canada, May 15, 1981, 377683
Int. Cl.⁴ E02B *3/06*
U.S. Cl. 114—267 **6 Claims**



1. For use in a artificial breakwater an extensible and flexible walled sealed bag of which a major part is to be submerged below the surface of the sea, at least one anchor fixed by a cable to the bottom of the bag, the bag being filled mostly with water and partly by air, whereby at least a part of the air filled

portion extends above the surface of the sea, the extensibility of the bag being such that in the presence of waves or troughs between waves its vertical dimension dynamically can increase or reduce thereby impeding transmission of wave energy at and below the surface therethrough, the bag being divided into a plurality of sealed compartments isolated from each other by impermeable extensible and flexible walls, and a plurality of anchors are fixed by separate cables to the bottom of the bag, whereby the bag, when deployed, takes the form of a wedge in cross section.

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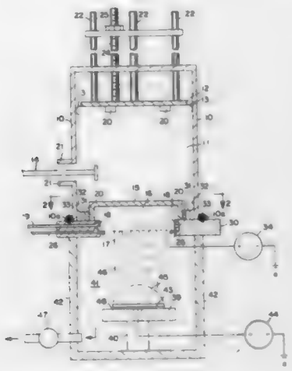
DUAL PLASMA MICROWAVE APPARATUS AND METHOD FOR TREATING A SURFACE

Thaddeus A. Roppel; Jes Asmussen, both of Okemos, and Donie K. Reinhard, East Lansing, all of Mich., assignors to Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 798,309, Nov. 15, 1985, Pat. No. 4,630,566, which is a division of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668, and a continuation-in-part of Ser. No. 849,052, Apr. 7, 1986, which is a continuation-in-part of Ser. No. 641,190, Aug. 16, 1984, Pat. No. 4,585,668. This application Jun. 12, 1986, Ser. No. 873,694

Int. Cl.[4] C23C *14/00;* **B05D** *3/06*

U.S. Cl. 118—50.1 **17 Claims**



1. An ion generating apparatus for treating a surface which comprises:

(a) a plasma source employing a radio frequency, including UHF or microwave, applicator which is metallic and in the shape of a hollow cavity and which is excited in one or more of its TE or TM modes of resonance and optionally including a static magnetic field surrounding the plasma source which aids in coupling electromagnetic energy to the plasma electrons at electron cyclotron resonance and aids in confining the charged species in the discharge chamber, wherein the plasma is maintained at a reduced pressure and wherein the ion source apparatus includes an electrically insulated chamber having a central longitudinal axis mounted in closely spaced relationship to an area of the applicator defining an opening from the chamber;

(b) a perforated means acting as a grid or screen adjacent the opening which allows ions, free radicals and electrons to be removed from the plasma;

(c) gas supply means for providing a gas which is ionized to form the plasma in the insulated chamber, wherein the radio frequency wave applied to the applicator creates and maintains the plasma in the shape of an elongate plasma disk perpendicular to and surrounding the central longitudinal axis in the chamber;

(d) metal plate means in the cavity mounted perpendicular to the axis;

(e) probe means connected to and extending inside the applicator for coupling electromagnetic energy to the applicator, wherein the plate means and the probe means in the applicator achieves the selected TE or TM mode of resonance of the radio frequency wave in the applicator;

(f) ion attracting means mounted in spaced relationship to the perforated means outside of the chamber for attachment to the surface to be treated for purposes of igniting a hybrid plasma and for attracting ions from the plasma to the surface by bias means providing a suitable voltage potential; and

(g) a platform means supporting the surface to be treated which is electrically insulated by an insulator means from the ion attracting means, wherein the ion attracting means and platform means are spaced from the plasma in the chamber such that the hybrid plasma is formed adjacent to the ion attracting means which is separate from the elongate plasma disk.

4,691,663

DEVELOPING DEVICE

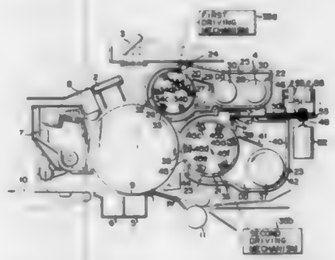
Natsuki Tachibana, Kamakura, and Isuey Ichihara, Chiba, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 758,679, Jul. 25, 1985, abandoned. This application Aug. 11, 1986, Ser. No. 894,747

Claims priority, application Japan, Jul. 31, 1984, 59-160516

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—658 **11 Claims**



1. A developing device, opposing an image carrier which is rotated along one direction, for developing a latent image formed on said image carrier, comprising:

a first developing member, rotatably arranged to oppose said image carrier, for holding a first developing agent thereon, said first developing member comprising a first developing roller having a predetermined diameter;

a second developing member, rotatably arranged to oppose said image carrier and located adjacent to said first developing member along said one direction, for holding a second developing agent thereon, said second developing member comprising a second developing roller having a diameter larger than the predetermined diameter of the first developing roller, said first developing member being located at an upstream side of said second developing member with respect to said one direction;

first driving means for causing said first developing member to rotate in said one direction to supply the first developing agent onto said image carrier;

second driving means for causing said second developing member to rotate in a direction opposite to said one direction to supply the second developing agent onto said image carrier; and

control means for selectively driving any one of said first and second driving means.

4,691,664

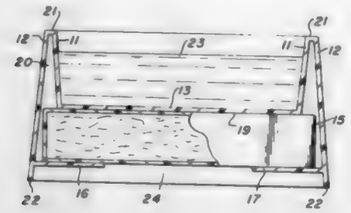
PET RECEPTACLE

William H. Crowell, North Wales, Pa., assignor to The Cool Water Corporation, Lansdale, Pa.

Filed Feb. 5, 1986, Ser. No. 826,316

Int. Cl.[4] A01K *7/00*

U.S. Cl. 119—61 **13 Claims**



1. A dish-type pet feeding receptacle equipped with means for cooling potable liquids and maintaining same at reduced temperatures over extended periods which comprises:

(1) a unitary container means consisting essentially of a cavity circumscribed by downwardly divergent inner walls and outer walls which are joined by a rim but otherwise spaced apart from a substantially liquid-free passageway of generally V-shaped cross section, said inner walls terminating in a flat base having a top-side and an underside and said outer walls extending downwardly beyond said inner walls and said base to form a peripheral support; and

(2) a replacable coolant cartridge resting upon said peripheral support and being in intimate contact with substantially the entire underside of said base.

4,691,665

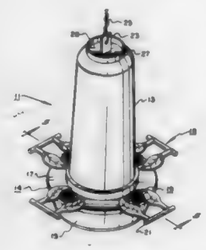
HUMMINGBIRD FEEDER

Boby R. Hefner, Coleman, Tex., assignor to Hefner Plastics, Inc., Troup, Tex.

Filed Oct. 8, 1985, Ser. No. 785,796

Int. Cl.[4] A01K *39/026*

U.S. Cl. 119—77 **18 Claims**



1. A bird feeder device comprising:

a reservoir having a top end and a lower end with an opening and a side wall between said top end and said lower end, said side wall near said lower end having exterior threads, said lower end opening being at least as large as other interior portions of said reservoir, including the interior portion at the top end,

a bowl assembly having an upper open end with interior threads adapted to matingly engage said threads on said side wall of said reservoir such that said bowl assembly may be removably coupled to said lower end of said reservoir,

said reservoir and said bowl assembly when coupled together being adapted to hold a liquid suitable for feeding birds,

said bowl assembly having an upper wall which extends outwardly from the side wall of said reservoir when said bowl assembly is coupled to the lower end of said reservoir,

said upper wall of said bowl assembly comprising a port for allowing a bird to feed on the liquid in said assembly by way of said port,

support means coupled to said top end of said reservoir to which a suspending means may be coupled for suspending said bird feeder device,

a wall means integral to the top end of said reservoir and surrounding said support means for holding a liquid substance suitable for preventing the passage of ants or the like from the suspending means to the bird feeder device outside of said wall means.

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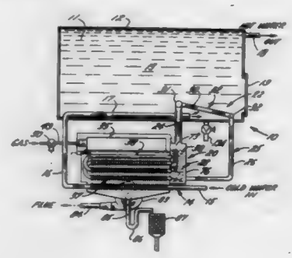
LIQUID HEATER WITH CLOSED LOOP HEAT TRANSFER SYSTEM

Richard M. Scherer, Niles, Mich., assignor to Stratus Corporation, South Bend, Ind.

Continuation-in-part of Ser. No. 605,239, Apr. 30, 1984, Pat. No. 4,660,542. This application Jun. 25, 1986, Ser. No. 878,294

Int. Cl.[4] F22B *1/02*

U.S. Cl. 122—33 **12 Claims**



1. A system for heating liquid and comprising a closed vessel defining a chamber for receiving liquid to be heated, heating element means disposed within said chamber, heat generating means located outside of said chamber, said heating element means forming part of a sealed closed loop circuit within which a working fluid is circulated for transferring heat from said heat generating means to said heating element means, said closed loop circuit including a heating and vaporization zone within which said working fluid is heated by said heat generating means and within which at least a portion of the heated working fluid is converted to vapor, said closed loop circuit further including a condensation zone within said heating element means and within which at least a portion of said vapor is condensed to cause heat to be transferred from said working fluid to said heating element means and to the liquid in said chamber, said heating element means comprising a series of laterally spaced and downwardly inclined tubes located in said chamber between the upper and lower ends of said chamber, a first manifold communicating with the upper ends of said tubes for delivering vapor from said heating and vaporization zone to said tubes, a second manifold communicating with the lower ends of said tubes for returning condensate from said tubes to said heating and vaporization zone, an inlet conduit for admitting a supply of low temperature liquid into the lower end portion of said chamber for upward flow past said heating element means, and an outlet conduit for discharging a supply of heated liquid out of the upper end of said chamber.

4,691,667

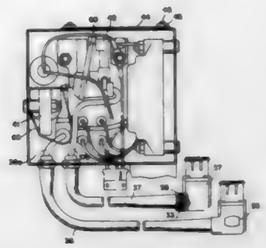
GASOLINE ENGINE EMI SUPPRESSION SYSTEM

H. Alfred Eberhardt, Paoli; Kalman Broitman, Dresher; Richard A. Evangelista, Downingtown; Richard E. Teske, Norristown, and Michael Salmone, King of Prussia, all of Pa., assignors to Hale Fire Pump Company, Conshohocken, Pa.

Filed Mar. 19, 1986, Ser. No. 841,277

Int. Cl.⁴ F02P *11/00*

U.S. Cl. 123—633 **6 Claims**



1. A spark ignition engine device adapted for use with an internal combustion engine driving an accessory such as a pump in an EMI radiation sensitive environment and mounted in a mounting structure, comprising:

an engine having a magneto flywheel supported thereon for generating an ignition current;

first wire means for transmitting ignition current from said magneto flywheel including a plurality of wires carrying said ignition current and radiated EMI from said magneto and a first conductive shield means covering said wires, said first wire means inherently acting as an EMI emitting antenna, said shield being grounded to said support for said magneto flywheel to divert EMI from said magneto and said wires to said ground, said first wire means further including a Lossy Sleeve Cover over said conductive shield means, to prevent radiation of said EMI carried by said wires and said shield;

a control box positioned on and grounded to said mounting structure;

connector means for introducing said first wire means into said control box, including means grounding said first conductive shield to said box to complete transfer of said EMI from said shield to said ground, said connector means connecting said plurality of wires to individual feed-through capacitor means for each wire to transfer said ignition current into said box and said EMI to ground, said ignition current inherently radiating EMI inside said box, said capacitor means being mounted inside and grounded to a wall of said box to disperse EMI transferred by said current flowing through said capacitor means and preventing flow of EMI outside of said box, back along said first wire means to magneto;

power pack means mounted in and grounded to said box to control said ignition current and inherently generating additional EMI inside said box;

second wire means including a plurality of wires connected to transmit ignition current from said individual capacitor means to said power pack means whereby said capacitors prevent re-radiation of said EMI generated by said power pack means back to the outside of said box;

ignition coil means mounted in and grounded to said box for generating high tension ignition current and inherently generating additional EMI;

third wire means including wires connected to transmit ignition current from said power pack means to the input of said ignition coil means, said wires inherently radiating additional EMI;

strap means mounted inside said box to hold said ignition coil means free from vibration to prevent sparking from connections and the resulting generation of EMI during operation of said coils;

resistance type high tension wire leads connected at one end to the output terminal of said ignition coil and passing through an exit means from said box potentially inherently transmitting EMI out of said box, said exit means including inside grounding means on the inside wall of said box to ground said exit means inside said box to said wall, said exit means also including outside grounding means on the outside wall of said box to ground said high tension wire outside said box to said wall, whereby both said inside and said outside grounding means cooperate to prevent radiation of EMI from said box, said high tension wire further including a braided conductive shield covering said wire outside said box and being mounted to said outside grounding means to prevent said high tension wire from radiating EMI; and

spark plug cap means for connecting said high tension wire to said spark plug cap of said engine, said cap means further including bonding means for preventing arcing generation of EMI and loss of spark due to separation of said lead and said spark plug cap, said bonding means maintaining ground contact between said shield and said cap to provide a ground path for any radiated EMI enclosed by said shield and cap.

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ENGINE COOLING SYSTEMS

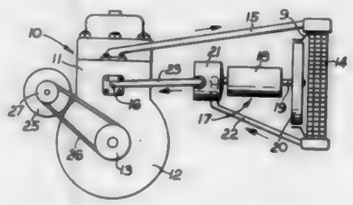
John G. W. West, Pershore, England, assignor to Lucas Electrical Electronics and Systems Limited, Birmingham, England

Filed Jul. 15, 1985, Ser. No. 754,729

Claims priority, application United Kingdom, Aug. 2, 1984, 8419784

Int. Cl.⁴ F01P *5/02, 5/10*

U.S. Cl. 123—41.12 **10 Claims**



1. A cooling system for a heat engine including a pump for forced circulation of coolant in a coolant flow circuit of the engine and a cooling fan for assisting in dispersal of heat from the coolant characterised by a common electric pump/fan motor driving the pump and fan in use, and by control means including sensor means responsive to temperature of the coolant in use for controlling operation of the motor automatically as a function of said temperature, wherein said motor is a variable speed, two-speed motor operating at a low speed when the coolant is below a first predetermined temperature and at a high speed when it is above that temperature, said motor further comprising a three brush motor.

4,691,669

ENGINE OVERHEAT PROTECTION SYSTEM

John H. Ottesan, 4005 Hecker Pass Hwy., Gilroy, Calif. 95020, and John R. Lufkin, 5534 Brookmead Dr., Whittier, Calif. 90601

Filed Mar. 17, 1986, Ser. No. 840,404

Int. Cl.⁴ F01P *11/16, 11/18*

U.S. Cl. 123—41.15 **7 Claims**

1. A coolant system protection system for internal combustion engines comprising;

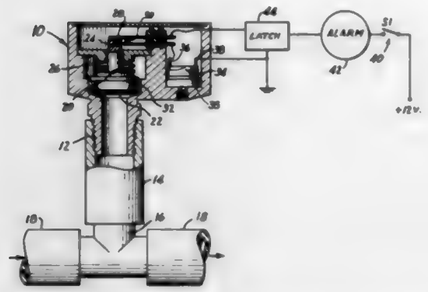
a housing;

a normally closed switch means in said housing;

coolant fluid pressure sensitive means constructed and arranged to operate said normally closed switch means so that said normally closed switch means remains closed at a lower pressure and opens at a higher pressure;

fluid connecting means connecting said coolant fluid pressure sensitive means to detect and respond to coolant fluid pressure;

temperature sensitive switch means mounted in said housing, said temperature sensitive switch means being normally



open at a lower temperature and closed at a higher temperature;

said normally closed switch means and said temperature sensitive switch means being connected in series;

alarm means connected in series with said normally closed switch means and temperature sensitive switch means; and

electrical power supply means connected to said alarm means;

whereby said alarm is activated when fluid pressure is low and temperature is high to indicate coolant loss and higher temperatures concurrently.

4,691,670

INSTALLATION FOR THE CONTROL OF THE CHARGING CYCLE IN INTERNAL COMBUSTION ENGINES

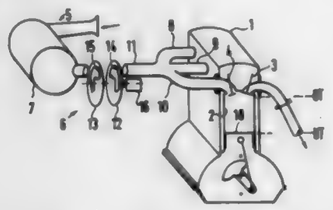
Heinz-Jurgen Bönisch, Groebenzell; Gerhard Brandl; Sybille Noor, both of Munich; Karl-Heinz Oehling, Karlsfeld; Walter Riedl, Munich; Mario Theissen, Munich; Ernst Wodiczka, Munich, and Alwin Macht, Mainleus, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 664,777, Oct. 25, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,871

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338870

Int. Cl.⁴ F02B *75/18*

U.S. Cl. 123—52 MF **26 Claims**



1. An installation for controlling the charge-exchange in internal combustion engines, comprising main control means for controlling the timing of a total inlet charge to the internal combustion engine and auxiliary control means coordinated to the main control means, whereby the auxiliary control periods are variable, said auxiliary control means being operatively connected on the engine suction side upstream of the main control means to also control the timing of the total inlet charge by overriding the timing called for by the main control means and opening in the end phase of the opening period of the main control means, and the opening beginning of the auxiliary control means, with increasing engine rotational speeds increasingly approaching the opening beginning of the main control means.

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CARBURETOR ICING PREVENTING DEVICE

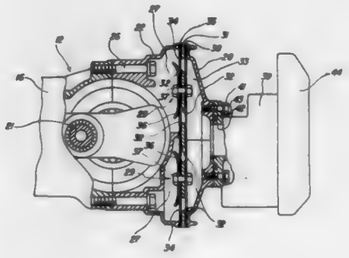
Seiichi Nishimura, Hamamatsu, Japan, assignor to Sanshin Kogy Kabushiki Kaisha, Japan

Filed Mar. 18, 1986, Ser. No. 840,780

Claims priority, application Japan, Mar. 22, 1985, 60-55949

Int. Cl.⁴ F02B *33/04*

U.S. Cl. 123—73 V **6 Claims**



1. An internal combustion engine having a body defining in part a variable volume chamber in which combustion occurs, an induction passage in said body for delivering a charge to said combustion chamber, an intake manifold affixed to said body and constructed from a highly conductive material and defining a passage communicating with said body induction passage, a highly heat conductive gasket sealingly engaged between said body and said intake manifold for promoting heat transfer therebetween, and a charge forming device affixed to said intake manifold for delivering a fuel/air charge to said passage.

4,691,672

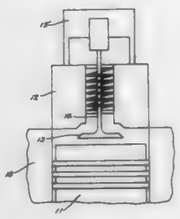
CYBERNETIC ENGINE

Horace L. Jones, 9613 Woodstream Dr., Richmond, Va. 23233

Filed Dec. 20, 1985, Ser. No. 811,916

Int. Cl.⁴ F01L *9/04*

U.S. Cl. 123—90.11 **6 Claims**



1. A timing mechanism adapted for use in conjunction with a four stroke internal combustion engine including a plurality of pistons disposed to reciprocate within cylinders and attached to a crankshaft in a timed sequence, each of said cylin-

ders including a fuel-air intake and an exhaust valve; said timing mechanism comprising:

a timing disc rotatably attached to said engine and operably attached to and rotated by said crankshaft, said timing disc including:

a number of sets of firing order openings formed therethrough, each of said sets of firing order openings being spaced radially outward from the axis of rotation of said timing disc; and

a number of sets of return openings formed through said timing disc 180° outward from a corresponding set of firing order openings;

a light source attached to said engine and disposed in closely spaced relationship to one side of said timing disc such that the light source emits light through said openings each time the openings are rotated into alignment with said light source;

a photosensor attached to said engine and disposed in closely spaced relationship to the other side of said timing disc opposite said light source such that light emitted through said openings strikes said photosensor; and

means for electrically coupling said photosensor to selectively operate said fuel-air intake and said exhaust valve of each of said cylinders in a timed sequence.

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CERAMIC AUXILIARY COMBUSTION CHAMBER

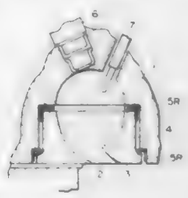
Takio Kojima, and Masato Taniguchi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 7, 1986, Ser. No. 848,975

Claims priority, application Japan, Apr. 8, 1985, 60-51134

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—271 **16 Claims**



1. An auxiliary combustion chamber for an internal combustion engine, the chamber being disposed to be mounted within an opening in a cylinder head, the opening having an internal surface, the chamber being defined by:

a ceramic nozzle body disposed in said opening, said nozzle body having an axis and an external surface dimensioned to fit in said opening while maintaining a space between said external surface and said internal surface; and

a one piece annular gasket integrally fit on said external surface to seal said space between said internal surface and said external surface, said gasket having a first portion extending parallel to said nozzle body axis and gripping said external surface of said nozzle body and a second portion extending perpendicular to said nozzle body axis.

4,691,674

MULTISTAGE FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

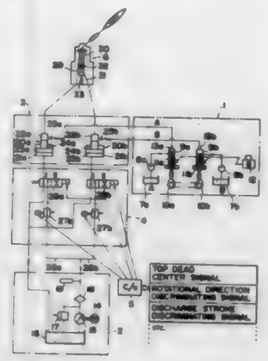
Shojiro Otsuka, and Hideaki Komada, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,918

Claims priority, application Japan, Oct. 13, 1984, 59-215021; Oct. 15, 1984, 59-215839

Int. Cl.⁴ F02M *43/00*

U.S. Cl. 123—299 **9 Claims**



1. A multistage fuel injection system for an internal combustion engine, said system comprising:

(a) flow control means for feeding a controlled quantity of main fuel and a controlled quantity of auxiliary fuel independently from one another;

(b) pressure generating means for generating a working pressure;

(c) intensifying means operatively connected to said flow control means for receiving the main and auxiliary fuels therefrom and operatively connected to said pressure generating means for intensifying the pressure of the main and auxiliary fuels received from said flow control means through the agency of said working pressure generated by said pressure generating means;

(d) selector means interposed between said pressure generating means and said intensifying means for selectively connecting and disconnecting said pressure generating means and said intensifying means;

(e) control means operatively connected to said selector means and responsive to operating conditions of the engine for controlling the operation of said selector means; and

(f) an injection nozzle connected to said intensifying means for injecting the main fuel and the auxiliary fuel respectively into the engine cylinder, said injection nozzle including a main injection passage through which the main fuel is injected to the engine cylinder, a needle valve for opening and closing said main injection passage, an auxiliary injection passage through which the auxiliary fuel is injected to the engine cylinder and which communicates with said main injection passage through said needle valve at a discharge end of the latter, and a check valve for preventing a reverse flow of the main fuel from said main injection passage to said auxiliary injection passage, and

said intensifying means including a first intensifier connected to said main injection passage and a second intensifier connected to said auxiliary injection passage, said flow control means including a first flow control pump connected to said first intensifier for feeding the main fuel thereto and a second flow control pump connected to said second intensifier for feeding the auxiliary fuel thereto,

said selector means including a first directional control valve connected to said first intensifier and said pressure generating means and controlled by said control means to selectively interconnect said first intensifier and said pressure generating means, and a second directional control valve connected to said second intensifier and said pressure generating means and controlled by said control means to selectively interconnect said second intensifier and said pressure generating means.

4,691,675

IDLING SPEED CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Masato Iwaki, Higashihiroshima, Japan, assignor to Mazda Motor Corp., Japan

Filed Jul. 7, 1986, Ser. No. 882,722

Claims priority, application Japan, Jul. 11, 1985, 60-153462

Int. Cl.⁴ F02D *41/16*

U.S. Cl. 123—339 **14 Claims**



1. An idling speed control system for an internal combustion engine comprising;

engine speed sensing means for detecting speed of the engine,

target idling speed determining means for setting a target idling speed,

intake air mass flow determining means for obtaining a difference between an actual idling speed of the engine detected by said engine speed sensing means and said target idling speed set by said target idling speed determining means and producing a control signal for determining intake air mass flow supplied to a combustion chamber of the engine on the strength of the difference obtained,

intake air mass flow adjusting means for adjusting intake air mass flow supplied actually to the combustion chamber of the engine in response to said control signal, and

extra intake air supplying means for causing said intake air mass flow adjusting means to start supplying the combustion chamber of the engine with extra intake air mass flow determined apart from the intake air mass flow determined in response to said control signal when the actual idling speed of the engine has gone down to be lower than a first predetermined speed and then to cause said intake air mass flow adjusting means to cease supplying the combustion chamber of the engine with the extra intake air mass flow when the actual idling speed of the engine has risen to attain a second predetermined speed higher than said first predetermined speed.

4,691,676

APPARATUS FOR THROTTLE VALVE CONTROL

Kazuhiro Kikuchi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 10, 1986, Ser. No. 837,845

Claims priority, application Japan, Mar. 12, 1985, 60-48792

Int. Cl.⁴ F02D *41/10, 41/12*

U.S. Cl. 123—399 **7 Claims**

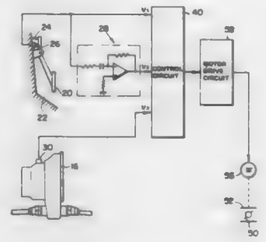
1. An apparatus for use with an internal combustion engine having an accelerator, a throttle valve situated within an induction passage, and a transmission, comprising:

a first signal source for generating an electrical signal indicative of the position of said accelerator;

a second signal source for generating an electrical signal indicative of the gear position of said transmission;

a control circuit operable to determine a demand value corresponding to a setting of the position of said throttle valve in response to said accelerator position indicative signal;

a throttle actuator connected to said control circuit for moving said throttle valve to said determined setting; and



said control circuit including means for determining an upper limit in accordance with the gear position of said transmission, means for setting said upper limit at a first predetermined value when said transmission is in a lower gear and at a second predetermined value smaller than said first predetermined value when said transmission is in a higher gear, and means for modifying said demand value to limit the speed of movement of said throttle valve below said upper limit.

4,691,677

THROTTLE VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

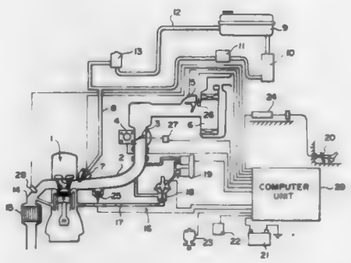
Makoto Hotate; Toshio Nishikawa; Kobuo Takeuchi; Itaru Okuno, and Tadataka Nakazumi, all of Hiroshima, Japan, assignors to Mazda Motor Corp., Japan

Filed Jan. 21, 1986, Ser. No. 820,613

Claims priority, application Japan, Jan. 24, 1985, 60-12007

Int. Cl.⁴ F02D *41/10, 41/12*

U.S. Cl. 123—399 **10 Claims**



1. A throttle valve control system for an internal combustion engine comprising an accelerator position sensor for detecting the position of the accelerator, a throttle valve opening determining means which receives the output of the accelerator position sensor and determines the opening of the throttle valve, and a throttle valve driving means which drives the throttle valve to the position corresponding to the opening determined by the throttle valve opening determining means, wherein the improvement comprises that the throttle valve opening determining means includes means for determining the opening of the throttle valve in response to the position of the

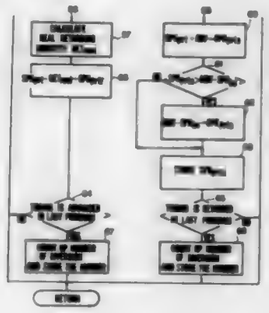
accelerator detected by the accelerator positon sensor such that the change in the opening of the throttle valve for a given change in the position of the accelerator is relatively small when the position of the accelerator is within a predetermined range and is relatively large when the position of the accelerator is both above and below the predetermined range.

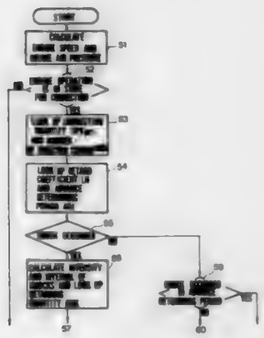
4,691,678

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Masaaki Nagai, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,107
Claims priority, application Japan, Dec. 28, 1984, 59-280553
Int. Cl.⁴ F02P *5/14*; F02D *41/22*
U.S. Cl. 123—425 **2 Claims**





1. A system for controlling the ignition timing of an internal combustion engine having a microprocessor and an ignition timing control device comprising:

sensing means for sensing operating conditions of the engine and for producing an engine operating condition signal;

a knock sensor for sensing engine knocking and for producing a knock signal;

first means responsive to the engine operating condition signal and knock signal for producing an ignition timing correcting signal representing an ignition timing correcting quantity at a time for deciding the ignition timing;

second means for counting up the number of inversions of correcting direction dependent on the ignition timing correction signal;

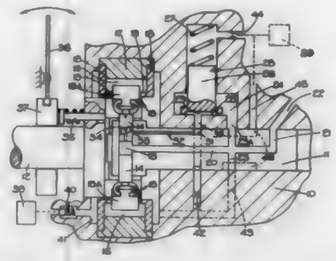
third means for reducing the ignition timing correcting quantity as the number increases.

4,691,679

FUEL INJECTION PUMPING APPARATUS

David F. Lakin, London, England, assignor to Lucas Limited public limited company, Birmingham, England

Filed Jul. 10, 1985, Ser. No. 753,548
Claims priority, application United Kingdom, Jul. 13, 1984, 8417860
Int. Cl.⁴ F02M *41/14*
U.S. Cl. 123—450 **5 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine comprising a body part, a rotary distributor member housed in the body part and arranged in use to be driven in time relationship with an associated engine, a pumping plunger housed within a bore in the distributor member, a cam ring for imparting inward movement to the plunger to displace fuel from the bore, a delivery passage in the distributor member for registration with an outlet port in the body part during successive inward pumping strokes of the pumping plunger, means for supplying fuel to the bore during a filling stroke of the plunger, a piston slidable within a cylinder, resilient means biasing the piston into contact with an end wall at one end of the cylinder, said one end of the cylinder being enlarged to define a chamber communicating with said bore during the pumping stroke of the plunger, a recess defined between said piston and said end wall when the piston is in contact with said end wall, a passage opening onto said end wall to communicate with said recess, and which is closed off from said chamber when the pistion is in contact with said end wall, a restrictor through which said passage communicates with a low pressure source, valve means formed by said plunger for connecting said passage intermediate said restrictor and said recess with said bore during the inward movement of the plunger, said plunger being adjustable whereby the instant during the inward movement of the plunger at which the passage is connected with the recess can be varied, the arrangement being such that when during inward movement of the pumping plunger, said passage is connected to the bore, the pressure in said recess will be increased to allow movement of the piston away from said end wall, the piston moving outwardly in the cylinder thereby reducing the pressure in the bore and terminating the flow of fuel through said outlet.

4,691,680

STARTING-ENRICHMENT CONTROL FOR A FUEL-INJECTED ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 22, 1986, Ser. No. 865,852
Int. Cl.⁴ F02D *41/06*
U.S. Cl. 123—491 **10 Claims**

1. In a multi-cylinder internal-combustion engine having a starter-operated fuel pump and an electronically controlled fuel-injection system wherein a pulse generator provides fuel-injection control pulses of time duration proportioned to desired throttle setting among other factors, the pulses each having a duration which is at all times a small fraction of the duration of a full cycle of operation of a given cylinder of the

engine, and wherein engine-cranking starter-operated means are operative upon starting the engine to temporarily enrich the fuel supplied to the engine by temporarily providing fuel-injection control pulses of greater time duration than that which applies for maximum throttle setting, the improvement in which the starter-operated means includes: (1) pressure-sensitive means which is responsive to pumped fuel pressure to delay generation of any greater-duration pulses until sensed achievement of a predetermined adequate level of fuel-injection pressure, whereby engine-priming is initiated only with adequate fuel pressure, (2) means limiting engine-priming to a

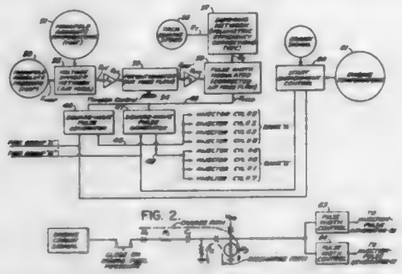


FIG. 2

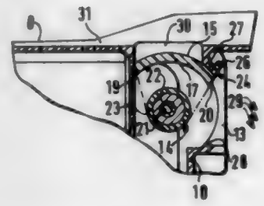
single priming pulse of relatively great duration for each cylinder for any given continuous period of engine cranking, (3) temperature-sensitive means which is responsive to engine temperature to determine the duration of said single priming pulse as an inverse function of sensed engine temperature, and (4) time-delay means responsive to an engine-priming operation of said pressure-sensitive means to determine a further delay period in which the generation of any greater-duration pulse is materially suppressed, whereby the danger of engine-flooding is avoided or substantially reduced for attempted starting within said further delay period.

4,691,681

ARRANGEMENT FOR CONTROLLING THE INTAKE AIR FOR THE CARBURETOR OF A HAND-HELD PORTABLE TOOL

Klaus Höppner, Marbach, and Bernhard Kiefel, Schorndorf-Schornbach, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 26, 1986, Ser. No. 878,622
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523949
Int. Cl.⁴ F02M *31/14*
U.S. Cl. 123—556 **27 Claims**



1. Arrangement for controlling the intake air for a carburetor of a hand-held portable tool such as a chain saw or the like which is suitable for both cold weather and hot weather operation, the portable tool also including a housing and an engine having a cylinder mounted in the housing, the arrangement comprising:

pass-through passage means for passing heated cooling air from the cylinder across a gap in the housing to adjacent the inlet of the carburetor air cleaner during cold weather operation;

a slide pivotally mounted in said housing and means for selectively moving the same about a pivot axis between a first position whereat said pass-through passage means is closed during hot-weather operation and a second position whereat said pass-through passage means is open so as to permit passage of said heated cooling air therethrough during said cold weather operation; and,

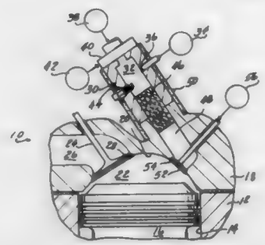
said slide being configured as a deflecting member for baffling said heated cooling air and then guiding the same in the direction toward said carburetor.

4,691,682

METHOD AND APPARATUS FOR MAXIMIZING INTERNAL COMBUSTION ENGINE WORK OUTPUT BY CONTROLLED HEAT RELEASE

Lyle O. Hopple, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 3, 1986, Ser. No. 825,281
Int. Cl.⁴ F02M *31/04*
U.S. Cl. 123—558 **11 Claims**



1. An improved expansible chamber heat engine of the type having cyclical compression and expansion of fluid introduced into a chamber during each engine cycle, said compression and expansion of said fluid caused by cyclical movement of a movable element defining in part said chamber, said movable element reaching a position during each engine cycle corresponding to minimum chamber volume to cause said compression of said fluid therein and means for causing an addition of heat to said fluid during each engine cycle while said fluid is compressed in said chamber, the improvement comprising means for initiating the addition of said heat at a point substantially later in said cycle after said movable element reaches said position of minimum chamber volume.

4,691,683

BOW STRING RELEASE

Paul L. Peck, Fond du Lac, Wis., assignor to Archery Designs, Inc., Fond du Lac, Wis.

Continuation-in-part of Ser. No. 716,627, Mar. 27, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 906,564
Int. Cl.⁴ F41C *19/00*
U.S. Cl. 124—35 A **10 Claims**

1. A bow string release comprising,

a body having a string receiving notch in one end of said body and a hole through the other end of said body,

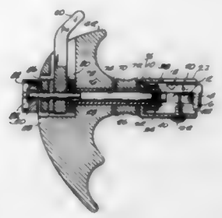
a sear pivoted in the body adjacent said notch and having string retaining means operative to retain a bow string in said notch when said sear is in its operative position,

a guide sleeve mounted in said hole and projecting from said body away from said notch, said sleeve having an enlarged head inside said body larger than said hole to couple said sleeve and said body for unlimited relative rotation and to prevent axial separation of said sleeve from said body,

a pull pin slidably mounted in said body and said sleeve for

movement between a first position and a retracted position, said pin engaging said sear in said first position to retain said sear in said operative position and releasing said sear upon movement to said retracted position,

spring means biasing said pin to said first position,



handle means rotatably mounted on and coupled to said sleeve to prevent axial separation of said handle means and said sleeve.

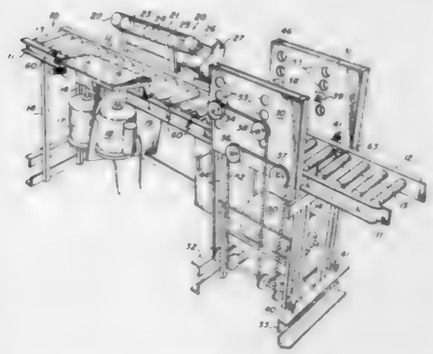
trigger means engaging said handle means and said pin and operative to pull said pin to said retracted position.

4,691,684

APPARATUS FOR MODIFYING BUILDING BLOCKS

Jorge L. Negron-Crespo, 809 Managua St., San Juan, P.R. 00921

Filed Jan. 13, 1986, Ser. No. 818,041
Int. Cl.[4] B28D *1/18*
U.S. Cl. 125—3 **8 Claims**



1. Apparatus for modifying building blocks which vary somewhat in size to provide spaced-apart depressions in the top and bottom surfaces thereof with the bottoms of the depression in the bottom surface being at a uniform distance from the top surface of the blocks comprising:

A. roller means for supporting the blocks as they are moved, the blocks being supported on one side thereof so that the top and bottom surfaces of the blocks are vertically positioned as said blocks are moved through the apparatus;

B. means to advance said blocks through the apparatus while on said rollers;

C. oppositely juxtaposed drill-carrying vertically disposed plates movable toward and away from one another at opposite sides of said roller support means, said drill-carrying vertical plates being pivotally supported and means are provided at the upper ends of said plates for moving said plates toward and away from one another;

D. a plurality of laterally spaced apart oppositely directed drills fixedly mounted on said plates for movement therewith, said drills carrying horizontal drill bits for drilling depressions in the top and bottom surfaces of said blocks;

E. stop means for stopping the advancing blocks when they are properly positioned with respect to said drills;

F. means for horizontally fixing the top of said block between said plates;

G. means for moving said plates toward one another so that said drill bits will drill depressions in the tops and bottoms of said blocks;

H. means for moving said plates apart after said depressions have been drilled; and

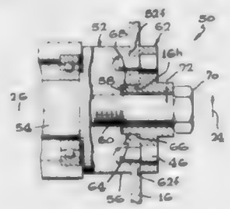
I. means to remove the drilled block from the apparatus after said plates have been moved apart.

4,691,685

SAWBLADE COLLAR ASSEMBLY

Edward J. Dempsey, 16482 Barnstable Cir., Huntington Beach, Calif. 92649

Continuation-in-part of Ser. No. 705,982, Feb. 27, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 881,637
Int. Cl.[4] B28D *1/04*; B23P *19/00*
U.S. Cl. 125—14 **2 Claims**



1. A concrete cutting saw which can move along a concrete surface while cutting a slot in the surface, comprising:

a driver which has means which supports it in movement along predetermined opposite forward and rearward drive directions along a surface and which weighs a plurality of hundreds of pounds so it cannot be easily moved sidewardly in a horizontal direction perpendicular to said drive direction, said driver having a motor device with an output shaft that can rotate about a shaft axis perpendicular to said drive direction and which has a largely flat face for abutting a face of a circular sawblade;

a circular diamond sawblade having a central hole, said blade having one face abutting said flat shaft face;

an outer blade plate which abuts a second face of said blade;

said shaft end has a fastener-receiving hole of smaller diameter than said blade hole lying on said axis, and has a recess which is shallower than said fastener-receiving hole and of no greater diameter than said blade hole and centered on said shaft axis;

said outer blade plates has a main plate portion with a largely flat face that abuts a face of the blade, and has a projecting collar with a blade-engaging portion of the same size as the blade hole and lying therewithin and a recess-engaging portion of the same diameter as said shaft recess and lying there, with a clearance between the collar and blade hole no more than about two-thousandths inch and a clearance between the collar and shaft recess no more than about two-thousandths inch to precisely center the shaft on the blade, said outer blade plate having a central hole; and

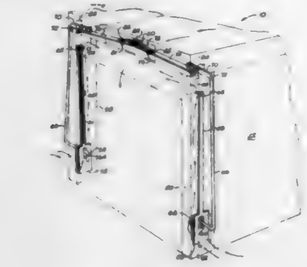
a fastener extending through said central hole in said outer blade plate and said fastener-receiving hole in said shaft to fasten said outer blade plate to said shaft, the clearance between the fastener and the central hole being greater than the clearance between the blade and the blade-engaging portion of the collar, whereby to enable precision blade mounting and to enable the driver to move parallel to said drive direction while a detached stuck blade remains stuck in place.

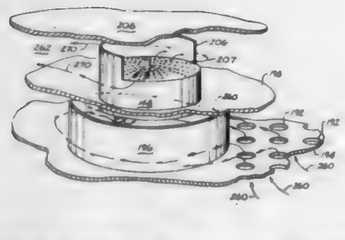
4,691,686

GASEOUS FLOW CONTROL FOR COMBUSTION DEVICES

Bernard V. Alvarez, Rt. 1, Box 249, Candler, N.C. 28715

Filed Oct. 7, 1985, Ser. No. 785,151
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—77 **26 Claims**





1. An apparatus for burning fuel to provide heat, comprising:

a housing defining a firebox within said housing for said burning;

at least one intake air pathway joining the exterior of said housing with said firebox;

at least one exhaust pathway joining said firebox with the exterior of said housing;

a controllable member associated with said intake pathway and controllably movable for alternately closing and opening such pathway; and

control means, operatively associated with said controllable member, for controlling the air flow within said intake pathway in response to a first temperature condition of said burning within said housing, and for closing said intake pathway in response to a second condition of excess of pressure within said housing.

22. A stove having a combustor, comprising:

a firebox for burning fuel to produce heat and combustion gasses;

an intake air pathway for providing primary air flow to said firebox and secondary air flow to said combustor; and

means associated with said combustor for providing a balanced flow of a mixture of said combustion gasses and said secondary air flow across the surface of said combustor; wherein

said stove further comprises an exhaust pathway connectable with a chimney associated therewith; and wherein

said means comprises:

a lower chamber, receiving in one portion thereof said secondary air flow from said intake pathway and a flow of combustion gasses form said firebox region, and

an upper chamber adjacent said lower chamber, and which connects with said exhaust pathway; and wherein

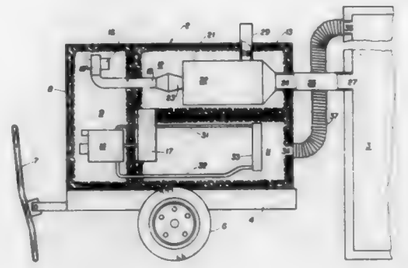
said combustor is lodged in an opening defined by a mutual wall of said lower and upper chambers such that said combustor partly resides in each of said chambers, and said combustor completely fills such opening so that combustion gases and secondary air flow throughout the entirety of said combustor from said lower chamber to said upper chamber.

4,691,687

PORTABLE AIR HEATING APPARATUS

Paul A. Mutchler, University City, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Sep. 2, 1986, Ser. No. 902,493
Int. Cl.[4] F24H *3/06*
U.S. Cl. 126—104 A **8 Claims**



1. Portable air heating apparatus for supplying and recirculating heated air to an equipment and personnel housing plenum chamber including a heated air inlet in the lower portion of the plenum chamber and a return air outlet in the upper portion of the plenum chamber comprising:

a portable housing partitioned into at least two chambers with at least one said chambers being sound-conditioned and having a power means disposed therein;

air heating means including a combustor and heat exchanger disposed in said housing outside said chamber containing said power means, said air heating means communicating with a hot air outlet in said housing through which heated air can be supplied through an adjustable duct to a heated air inlet in the lower portion of said plenum chamber to be heated;

blower means disposed in said housing, said blower means being connected to said power means to deliver air to said air heating means; and

radiator means disposed in said housing outside said chamber containing said power means, said radiator means being connected to said power means to circulate coolant fluid therethrough from and to said power means to control the temperature of said power means, said radiator means being adjacent to and directly communicating with a return air inlet in said housing which can be connected through an adjustable duct to a return air outlet in the upper portion of said plenum to heat return air therefrom before it is recirculated to said air heating means through said blower means.

4,691,688

SAFETY HEATER

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Continuation-in-part of Ser. No. 717,310, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 644,987, Aug. 28, 1984, abandoned, and Ser. No. 642,059, Aug. 20, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 919,086
Int. Cl.[4] A61F *7/08*
U.S. Cl. 126—208 **23 Claims**

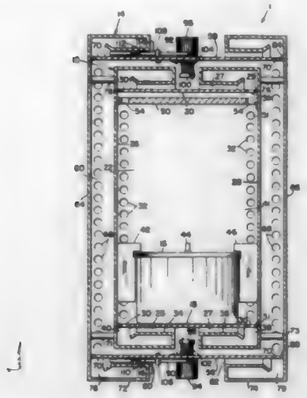
1. A portable safety heater comprising:

a container having at least one wall and two open ends;

a fuel source;

at least two end caps substantially enclosing the open ends of the container wherein the combination encloses the fuel

source, the end caps having entrapment means which operate in all positions of the heater for entrapping fuel



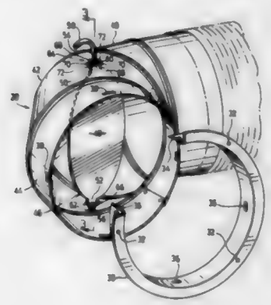
displaced from the fuel source wherein the combination includes air passages for allowing airflow past the entrapment means to support combustion of fuel therein.

4,691,689

ONE-PIECE ADJUSTABLE DAMPER

Charles G. Shepherd, Oakville, and Samuel Travale, Stoney Creek, both of Canada, assignors to B. D. Wait Co. Limited, Oakville, Canada

Filed Dec. 5, 1986, Ser. No. 938,479
Claims priority, application Canada, Dec. 6, 1985, 497016
Int. Cl.⁴ F23L *3/00*
U.S. Cl. 126—295 **2 Claims**



1. A adjustable damper for positioning in an air duct to adjustably restrict flow of air through the duct, the damper comprising:

a tubular duct section defining first and second diametrically opposed openings;

first and second sets of detents formed from the material of the duct and extending radially about the respective openings to define a plurality of damper settings, the first detent set being offset angularly relative to the second detent set; and

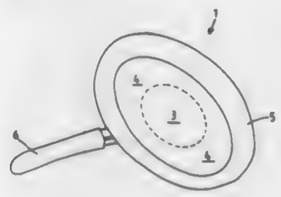
a valve element having a circular central portion proportioned to fit within the duct section, diametrically opposed first and second shoulders projecting from the periphery of the disc, aligned first and second stub axles formed from the material of the disc and dependent from the respective first and second shoulders, the shoulders being engageable with the respective first and second sets of detents such that in any one selected angular position of the valve element, the element is located by engagement of one of the shoulders in one of the detents of the detent sets, and means attached to one of the stub axles to permit manual operation to change the angular position of the element in the duct section to position one of the shoulders in another of the detents of the detent sets whereby the flow of air through the duct can be controlled in stages by moving the element angularly between fully closed and fully open positions.

4,691,690

FRYING DEVICE

Erling Jensen, Nordlyvej 26, DK-8550 Ryomgaard, Denmark

Filed Sep. 15, 1986, Ser. No. 907,721
Int. Cl.⁴ A47J *27/00*
U.S. Cl. 126—390 **2 Claims**



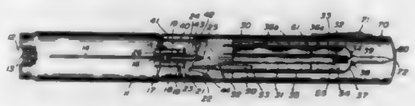
1. A frying device for use with an electrically heated hot circular heating plate, comprising a pan having a bottom, said bottom having a central planar circular massive hot heating plate contact area protruding from its underneath exterior and providing a high heat transfer central contact area, said bottom also having a wing-shaped bottom portion on each side of said contact area with a portion bordering a side of said hot plate contact area having a periphery of a length which is from 30 to 80% of its total periphery and providing a good heat transfer from said hot heating plate contact area, said bottom having a transition zone between said hot heating plate contact area and said wing-shaped bottom portion which has a thickness greater than the smaller thickness of said wing-shaped bottom portions, said hot heating plate contact area having a thickness which is from 20 to 50% greater than the smallest thickness of said wing-shaped bottom portion.

4,691,691

GAS POWERED SOLDERING IRON

Jean-Pierre Patenaude, 104 Guigues Street, Ottawa, Ontario, K1N 5H7, Canada

Filed Jul. 24, 1985, Ser. No. 758,605
Claims priority, application Canada, Jun. 26, 1985, 485355
Int. Cl.⁴ B23K *3/02*
U.S. Cl. 126—414 **11 Claims**



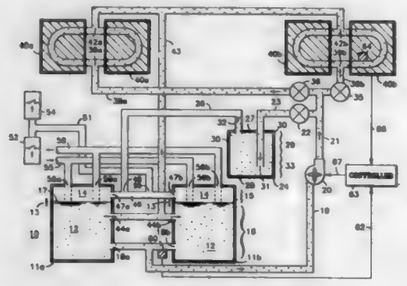
1. A gas powered, pencil-shaped, soldering iron suitable for positioning in a pocket of an article of clothing comprising a reservoir for liquid fuel, a housing attached to said reservoir including a control valve device adapted to regulate fuel flow from the reservoir, said control valve device having vaporizing means and a nozzle to conduct a regulated amount of pressurized fuel to an input side of a venturi adapted to vaporize and mix said fuel with air to produce a fuel-air mixture, a transfer tube secured to an output side of said venturi, a stainless steel combustor adapted to maintain combustion in the presence of said fuel-air mixture and secured at a combustor end of the transfer tube remote from said venturi, an "on-off" switch adapted to activate fuel flow through said nozzle of said control valve device whereby to initiate and terminate fuel flow from said reservoir to said venturi, a spark generating means simultaneously activated by switching on said switch to initiate an ignition spark in said combustor end, spark electrode means connected to both said transfer tube and an outside shield, respectively, to form a spark gap said spark generating means producing a high voltage which is transmitted by said transfer tube to said spark electrode, which is positioned adjacent said combustor, and a soldering element positioned forwardly of said combustor so as to be heated by said combustor when burning in the presence of said fuel-air mixture.

4,691,692

SOLAR ENERGY SYSTEM WITH DELAYED DRAIN-BACK

Leo B. Conner, Jr., 2444 N. 39th Pl., Phoenix, Ariz. 85018, and John M. Conner, 1458 N. Ashland, Mesa, Ariz. 85203

Filed Dec. 5, 1985, Ser. No. 804,828
Int. Cl.⁴ F24J *2/40*
U.S. Cl. 126—422 **17 Claims**



1. A solar energy system comprising:

a storage tank having upper and lower sections, said tank lower section being for holding a heat transferring liquid and said tank upper section being for holding a gas;

a solar collector located above said storage tank and having a collector feed and a collector return wherein a first one of the collector feed and return couples to the lower section of said storage tank;

a pump coupled to the lower section of said storage tank and to a second one of the collector feed and return, said pump exhibiting an active state in which the pump moves a portion of the liquid into said solar collector and exhibiting an inactive state; and

means for preventing a portion of the gas from substantially replacing the liquid in said collector until a predetermined amount of time passes after said pump initially exhibits the inactive state, said preventing means being located above said storage tank and said preventing means having a drainback feed coupled to said solar collector and a drainback return coupled to the upper section of said storage tank.

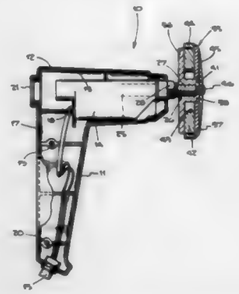
4,691,693

MASSAGE DEVICE

Ray S. Sato, Carson, Calif., assignor to Magnetic Massage Company, Los Angeles, Calif.

Filed Sep. 2, 1986, Ser. No. 902,462
Int. Cl.⁴ A61H *7/00*
U.S. Cl. 128—24.1 **13 Claims**

1. A massage device for the human body comprising a jacket having a handgrip and a chamber in said jaceket having an electric heater, said heater comprising a heat absorbent core and a shaft on said core having an exposed heat delivering end, an applicator assembly for engagement with the body of the user and a connection between the applicator and the shaft,



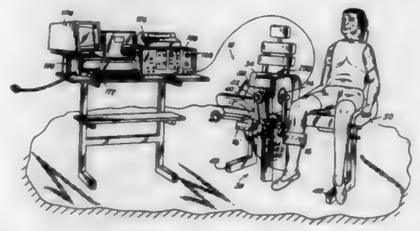
said applicator assembly comprising a permanent magnet, a heat transfer plate on a rear side of the applicator between said magnet and the connection, and a face plate on the forward side of the applicator, said face plate having a finish plate—constituting a body-engaging exterior surface.

4,691,694

MUSCLE EXERCISE AND REHABILITATION APPARATUS

Robert L. Boyd, Woodcliff Lake; Richard Krukowski, Chatham, both of N.J., and Daniel Y. Gezari, Chevy Chase, Md., assignors to Biodex Corporation, Shirley, N.Y.

Continuation-in-part of Ser. No. 676,493, Nov. 29, 1984, Pat. No. 4,628,910. This application Sep. 15, 1986, Ser. No. 907,392
The portion of the term of this patent subsequent to Feb. 16, 2003, has been disclaimed.
Int. Cl.⁴ A63B *23/00*
U.S. Cl. 128—25 R **56 Claims**



1. A muscle exercise and rehabilitation apparatus comprising:

movable fixture means against which a force can be applied;

servo motor means coupled tc the fixture means;

sensing means for sensing the force applied to the fixture means and for producing a load signal corresponding thereto;

speed detecting means for producing a velocity signal corresponding to the speed of the fixture means;

closed loop servo means for controlling said motor means in response to said load signal and said velocity signal to regulate the velocity of said fixture means;

limit means for preventing movement of said fixture means past at least one set limit;

storage means for storing a limit signal corresponding to each said limit; and

limit setting means for enabling said storage means to store

the respective limit upon movement of said fixture means to each said limit.

4,691,695

APPARATUS FOR MEDICAL TREATMENTS

Josef Birk, Lohmar; Friedhelm Baisch, Neunkirchen-Seelscheid, and Heinz J. Borger, Siegburg-Kaldauen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V., Cologne, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,534

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437461

Int. Cl.⁴ A61H *1/00, 33/06*

U.S. Cl. 128—38 **16 Claims**



1. In an apparatus for medical treatments, examinations or tests having a chamber configured to be connected to a vacuum source and including at one end thereof a passage aperture having a flexible sealing member, an improved chamber support structure adapted to be dismantled comprising:

a foldable bellow;

at least three substantially parallel peripheral members disposed to support the bellow, said peripheral members being capable of relative movement with respect to each other,

a longitudinal stiffening element secured to a first one of the peripheral members by a hinge, said hinge enabling rotation of said longitudinal stiffening element from a first position substantially parallel to said first peripheral member to a second position substantially perpendicular to said first peripheral member,

means for engaging said peripheral members to said stiffening element when said stiffening element is in said second position,

whereby said stiffening element in said second position restrains relative movement among said peripheral members.

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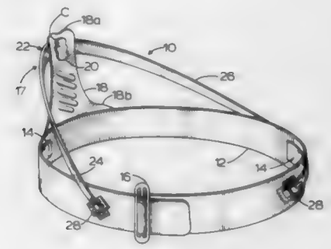
LUMBAR SPINAL BRACE

Henry F. Farfan de los Godos, Beebe, Canada, assignor to 102160 Canada Inc., Beebe, Canada

Filed Feb. 1, 1985, Ser. No. 697,400

Int. Cl.⁴ A61F *5/02*

U.S. Cl. 128—78 **31 Claims**



1. A lumbar spinal brace comprising:

a belt adaptable to be wrapped into a generally round shape having left and right hand halves and a central axis dividing said halves;

a first bracing means extending from the belt;

a contact point defined by the first bracing means, said contact point being disposed upwardly and laterally from the central axis, the first bracing means being resistant to rearward movement of the contact point; and,

said first bracing means comprising a support member extending from the belt and having an upper portion defining the contact point, and, a movement limiting means connected to the support member and the belt for resisting rearward movement of the contact point.

4,691,697

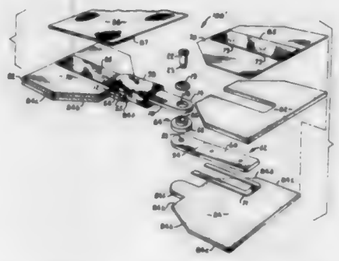
KNEE SUPPORT

Stephen C. Arensdorf; Lawrence T. Stromgren, both of Hays, Kans., and Noel Goudreau, Bourbonnais, Ill., assignors to Strom-Tec, Inc., Hays, Kans.

Filed Apr. 5, 1985, Ser. No. 720,169

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 L **3 Claims**



1. A knee support for attachment to a leg of the user to protect the knee, said support comprising:

a rigid impact bar having upper and lower ends;

an upper mounting bar adapted to lie adjacent said leg above the knee;

a lower mounting bar adapted to lie adjacent said leg below the knee;

means pivotally connecting said upper end of the impact bar to said upper mounting bar, and pivotally connecting said lower end of the impact bar to said lower mounting

upper pressure plate means on said upper mounting bar adapted to be secured to the user's leg above the knee;

lower pressure plate means on said lower mounting bar adapted to be secured to the user's leg below the knee, whereby said impact bar may be positioned in laterally spaced, spanning relationship to the knee;

shock-absorbing, anti-friction means between said upper and lower ends of the impact bar and the respective upper and lower mounting bars, comprising upper and lower bushing members interposed between said ends of the impact bar and the respective mounting bars at said pivotal connections;

a ridge on said upper bushing member projecting therefrom and engageable with a front edge of said impact bar and said upper mounting bar upon movement thereof to a position selected to prevent further movement and hyperextension of the knee; and

a ridge on said lower bushing member projecting therefrom and engageable with said front edge of the impact bar and said lower mounting bar upon movement thereof to a position selected to prevent further movement and hyperextension of the knee.

4,691,698

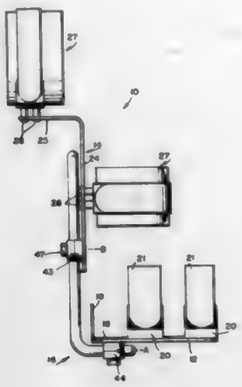
TIBIAL TORSION SPLINT WITH MULTIPLE DEGREES OF FREEDOM OF ADJUSTMENT

Ross L. Bremer, c/o 433 Margaret St., Jacksonville, Fla. 32204

Filed Apr. 16, 1986, Ser. No. 852,819

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 R **20 Claims**



1. A tibial torsion splint comprising:

a foot plate adapted to receive the foot of a user;

leg support means for supporting a user's leg adjacent both the upper and lower parts of the user's knee;

frame means interconnecting said plate and said leg support means;

first means for connecting said foot plate to said frame means for rotation of said foot plate about axes respectively generally perpendicular and parallel to said plate;

second means for adjusting the position of said leg support means with respect to said foot plate to accommodate users having tibias of different length; and

third means for adjusting the rotational position of said leg support means with respect to said frame means about an axis generally parallel to the plane of said foot plate and spaced from the first mentioned axis generally parallel to said plate, to accommodate users with knock-knees, or related conditions.

4,691,699

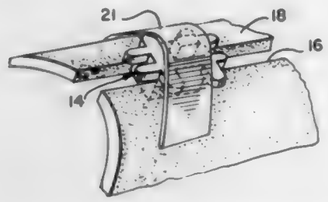
ORTHOPEDIC CAST SPACING AND SPREADING DEVICE

James W. Scott, P.O. Box 7630, Tifton, Ga. 31794, and John Hickox, 400 Northfield Rd., Valdosta, Ga. 31602

Filed Apr. 9, 1986, Ser. No. 849,715

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—91 A **8 Claims**



1. An orthopedic cast spacing and spreading device comprising:

a first orthogonal member having,

a generally planar first end face,

a second end face, and

mutually parallel side-wall surfaces extending between said end faces in a posture perpendicular to said first end face;

a second orthogonal member having,

a generally planar first end face,

a second end face, and

mutually parallel side wall surfaces extending between said end faces in a posture perpendicular to said first end face;

said second end face of said first orthogonal member being joined to said second end face of said second orthogonal member;

dimensions of said first orthogonal member transverse to a central longitudinal axis of said first orthogonal member being greater than dimensions of said second orthogonal member transverse to a central longitudinal axis of said second orthogonal member; and

at least one flange connected to said orthopedic cast spacing and spreading device at the junction of said first and second orthogonal members and laterally projecting outwardly from said first and second orthogonal members, wherein a orthopedic physician may selectively insert said first or said second orthogonal member into a longitudinal kerf cut into a patient's orthopedic cast to spread and maintain the kerf in a uniformly spaced posture with the lateral flange operably resting upon an outer surface of the cast.

4,691,700

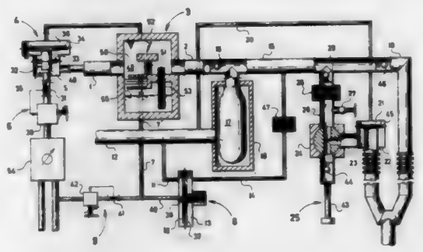
ANAESTHETICAL CIRCUIT WITH REVERSE INHALATION EQUIPPED WITH AN INJECTOR OF ESCAPED ANAESTHETICS

Ondrej Brychta; Jozef Tlucko; Viktor Magdolen; Miroslav Brostik, all of Trencin, and Dusan Klimacek, Stara Tura, all of Czechoslovakia, assignors to Konstructa Trencin, narodny podnik, Trencin, Czechoslovakia

Filed Jun. 2, 1986, Ser. No. 870,140

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—200.21 **7 Claims**



1. An anaesthetical circuit having conduit means for conducting inhalation and exhalation gasses of a patient comprising

a source of constant flow having a feeding pipe connected thereto,

an injector having an inlet and an outlet,

valve means having an inlet and an outlet,

said feeding pipe connected from said source of constant flow into said valve means inlet,

an inlet pipe connected from the valve means outlet to said injector inlet,

a differential pressure indicator having a pressurized chamber and a vacuum chamber defined on opposite sides of a membrane therein,

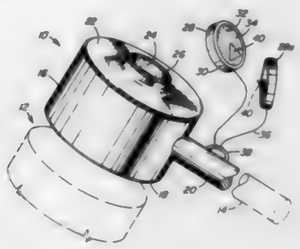
a pressure energy source,

a drive pipe,

said energy source being connected to said pressurized

chamber of said differential pressure indicator from said drive pipe,
an opposing pipe and a connection pipe,
said opposing pipe connected from said connection pipe into said vacuum chamber which is on the opposing side of the pressurized chamber of said differential pressure indicator, said differential pressure indicator having means for generating a signal indicative of a predetermined pressure differential between said drive pipe and said connection pipe,
said valve means being responsive to said signal for opening said valve means,
said connection pipe also connecting from the outlet of said injector to said conduit means,
a rubber bag connected to said connection pipe and arranged in a cylinder hermetically sealed therearound, said drive pipe also connected into the cylinder,
a check valve in said connection pipe upstream of said rubber bag and opposing pipe providing one way flow from said injector,
an expiration valve conected to said conduit means and having a control chamber and an outlet pipe
a pipe connected from the drive pipe into said control chamber,
a distribution valve, into which said outlet pipe is connected,
said distribution valve having two branches,
one branch of said distribution valve forming an exhaust system,
said exhaust system being provided with a check valve providing one-way flow from said distribution valve,
the second branch of said distribution valve forming a runback pipe connected to said connection pipe,
said runbeck pipe comprising an overpressure valve connected through a carbon dioxide absorber and then through a check valve to the connection pipe.

4,691,701
CARBON DIOXIDE DETECTOR
R. Tudor Williams, 3423 Utah Crescent N.W., Calgary, Alberta, Canada T2N 4A9
Filed Jul. 28, 1986, Ser. No. 889,763
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.14 **6 Claims**



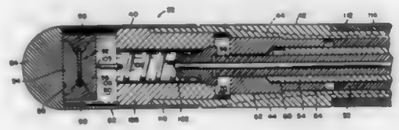
1. A carbon dioxide detector for use with an endotracheal tube or the like or an anaesthetic circuit comprising:
a housing having a first tubular member for connection to a endotracheal tube or the like;
a second tubular member for connection to said anaesthetic circuit, said first and second tubular members being in communication with the interior of said housing; and
means for indicating the presence of carbon dioxide in said detector comprising an aperture in said housing and in communication with said interior thereof and transparent disc means for sealingly engaging said aperture and thereby being in communication with said housing interior;
said disc means including a chemical substance which provides a colour change indication when exposed to carbon dioxide in said housing.

4,691,702
ASPIRATING DEVICE
Constantin B. Chantzis, Glen Rock, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Oct. 8, 1986, Ser. No. 916,358
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.16 **21 Claims**



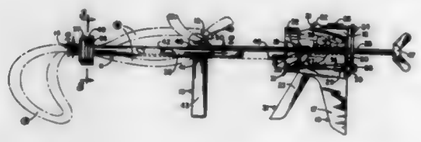
1. An operable aspirating device for use in conjunction with a patient ventilation apparatus for removing undesirable secretions comprising:
an elongate flexible catheter having a proximal portion including a proximal end, a distal portion including a distal end and a passageway therethrough, said catheter being adapted for insertion through said ventilating apparatus and into the trachea of a patient, said catheter having at least one aperture in said distal portion for allowing fluid communication between the exterior of said catheter and said passageway;
a patient housing including a proximal first end having a first opening, a distal second end having a second opening and a side wall therebetween defining a cavity in said patient housing, said catheter passing through said first opening and capable of passing through said second opening, said housing including means for connecting said housing to a patient ventilation apparatus so that said catheter may enter said patient ventilation apparatus through said second opening; and
a flexible sleeve surrounding a portion of said catheter having a far end connected at said distal portion of said catheter and a near end connected to said housing so that as said catheter is moved distally through said second opening said sleeve covers the portion of said catheter extending outwardly from said second opening between said second opening and said far end of said sleeve, said sleeve being capable of contacting the patient's trachea, said sleeve allowing rotational movement of said elongate catheter with respect to said housing, said sleeve being positioned so that when said catheter is moved proximally with respect to said housing said catheter moves through said first opening while leaving said sleeve within said housing.

4,691,703
THERMAL CAUTERY SYSTEM
David C. Auth, Redmond; Dale M. Lawrence, Lynnwood, and Tim R. Majoch, Kent, all of Wash., assignors to Board of Regents, University of Washington, Seattle, Wash.
Filed Apr. 25, 1986, Ser. No. 856,573
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **9 Claims**



1. A thermal cautery system comprising:
a thermal cautery probe having a heat-transfer portion adapted to be placed in contact with tissue to be cauterized;
a diode mounted in said probe in thermal contact with said heat-transfer portion so that heat is transferred from said diode to said heat-transfer portion by conduction, said diode having a predetermined breakdown voltage at a predetermined temperature;
a pair of electrical conductors; and
a power supply connected to said diode through said electrical conductors, said power supply applying an output voltage to said diode that is substantially equal to the predetermined breakdown voltage of said diode at said predetermined temperature so that the current through said diode is substantially reduced as the temperature of said diode approaches said predetermined temperature.

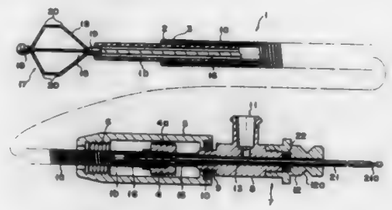
4,691,704
LIGATURE TOOL AND PROCESS FOR CASTRATING LARGE ANIMALS
Le Grand D. Wadsworth, Rte. 1, Box 168, St. Ignatius, Mont. 59865
Filed Oct. 3, 1986, Ser. No. 914,740
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—306 **6 Claims**



1. A tool for castrating animals having an external scrotal pouch by ligation, comprising, in combination:
a handle structure having an upper handle body with a perpendicularly depending handle element and associated trigger mechanism to move a tightening rod relative thereto;
an elongate body structure carried by a forward portion of the handle body and extending forwardly thereof with a forward plate structure in the forewardmost part of the body, said foreward plate structure defining a medial axially aligned grommet hole therein;
tightening structure including an elongate tightening rod with a forward portion having means of releasably fastening ligation material thereto, said tightening structure having a tightening rod communicating through the handle structure and rearwardly thereof;
means associated with the handle structure to move the tightening rod rearwardly upon operation of the handle trigger mechanism and of restraining forward motion except upon operation of a release arm; and
means carried by the body structure for crimping a grommet carried in the grommet hole defined in the forward plate structure.

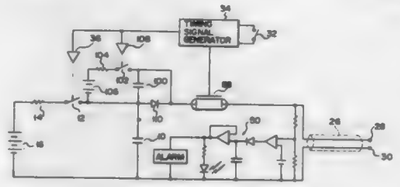
4,691,705
CALCULUS CRUSHING APPARATUS
Tsutomu Okada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jan. 24, 1986, Ser. No. 822,019
Claims priority, application Japan, Feb. 8, 1985, 60-22962
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 **8 Claims**

1. A calculus crushing apparatus for crushing a calculus produced in the body cavity, comprising:
a flexible sheath adapted to be inserted to be inserted in the body cavity, said sheath including a first sheath having a predetermined mechanical strength sufficient to impart a calculus-crushing force, and a second sheath which is weaker but more flexible than the first sheath, said first and second sheaths being coaxial and movable relative to each other between a first positon where the distal end of the first sheath extends at least to the distal end of the proximity of second sheath, and a second position where the second sheath projects beyond the distal end of the first sheath;
supporting means for supporting the first and second sheaths to be movable relative to each other;
an operating wire slidably inserted in the flexible sheath and adapted to be pushed and pulled from the proximal end side of the sheath;



a collapsible basket for seizing and crushing the calculus, said basket being formed of a plurality of resilient wires connected to the distal end portion of the operating wire, and adapted to be projected from and drawn into the distal end portion of the flexible sheath for expansion and contraction in accordance with the movement of the operating wire; and
retaining means for holding the first and second sheaths in the first position in crushing the caluculus seized by the basket.

4,691,706
CALCULUS DISINTEGRATING APPARATUS
Syuichi Takayama, Tokyo, Japan, assignor to Olympus Optical Co., Tokyo, Japan
Continuation of Ser. No. 723,050, Apr. 15, 1985, abandoned, which is a division of Ser. No. 449,699, Dec. 14, 1982, Pat. No. 4,535,771. This application Aug. 22, 1986, Ser. No. 899,787
Claims priority, application Japan, Dec. 22, 1981, 206107; Dec. 26, 1981, 214252; Jan. 19, 1982, 6576
Int. Cl.[4] A61B *17/22, 17/36*
U.S. Cl. 128—328 **2 Claims**



1. A calculus disintegrating apparatus, which comprises:
first and second electrodes provided separately from each other;
first discharge energy means including a first D.C. power source and a first capacitor arranged to be charged by said first D.C. power source; said first discharge energy means being connected to said first and second electrodes to apply a D.C. impulse voltage across said first and second electrodes when said first capacitor is discharged;
switching means having two ends, one end thereof being connected to said first electrode, said switching means being operable so as to be conductive between said two ends thereof;
means for selectively rendering said switching means conductive;

second discharge energy means including a diode, a second D.C. power source, and a second capacitor arranged to be charged by said second D.C. power source; a cathode of said diode and a first terminal of said second capacitor being connected to another end of said switching means; and a second terminal of said second capacitor and an anode of said diode being connected to said first capacitor;

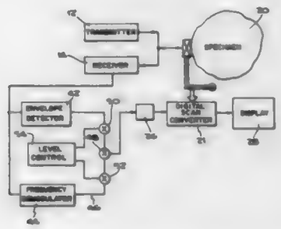
whereby said D.C. impulse voltage from said first capacitor and said D.C. impulse voltage from said second capacitor are superposedly applied across said first and second electrodes when said switching means is rendered conductive.

4,691,707

AM/FM HYBRID ULTRASONIC IMAGING

Pat V. Sankar, Santa Ana, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 1, 1986, Ser. No. 846,868
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **14 Claims**



1. A high resolution ultrasonic acoustic system for imaging reflected or scattered acoustic signals from a non-homogeneous media supporting acoustic pulse propogation comprising:

transmitter means for generating pulse signals;

transducer means coupled to said transmitter means for transmitting acoustic pressure signals into said media, and for receiving acoustic pressure signals reflected from said media in response to the transmitted acoustic pressure signal;

receiver means coupled to said transducer means for transforming the reflected acoustic pressure signals into electrical signals;

means for processing said electrical signals to form an imaging signal constituting the effective product of the detected amplitude modulation of said electrical signals multiplied by the frequency demodulation of said electrical signals; whereby the extreme excursions of the frequency demodulated signals are eliminated; and

display means, coupled to the output of said processing means and synchronized with said transducer means, for producing cross-sectional images of said media representative of both stationary and moving structures in said media.

4,691,708

OPTICAL PRESSURE SENSOR FOR MEASURING BLOOD PRESSURE

James Kane, Miami, Fla., assignor to Cordis Corporation, Dade, Fla.

Filed Mar. 10, 1986, Ser. No. 838,125
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 **7 Claims**

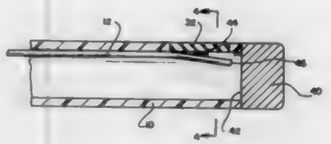
1. Apparatus for measuring blood pressure in a cardiovascular system and comprising:

an elongated tubular catheter having a lumen and having a proximal end and a distal end with the latter being adapted to be inserted into a passageway within a cardiovascular system;

an elongated optical fiber having a proximal end and a distal end and carried within the lumen of said catheter and extending throughout substantially the entire length thereof for receiving light at the proximal end of said catheter and transmitting it to the distal end thereof;

light reflecting means located at the distal end of said catheter and having a flat light reflecting surface fixed in position forwardly of the distal end of said optical fiber for receiving light from the distal end of said optical fiber and reflecting at least a portion of the light back to the optical fiber for receiving light from the distal end of said optical fiber and reflecting at least a portion of the light back to the optical fiber for transmission to the proximal end of said catheter;

means for modulating the intensity of light reflected back to the proximal end of said catheter as a function of pressure forces acting transversely of the distal end of the catheter



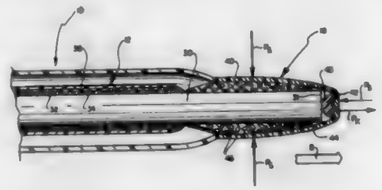
and including pressure transducer means carried by the catheter and located adjacent the distal end thereof, said catheter having an opening to one side thereof at a location adjacent the distal end thereof, membrane means covering said opening and being responsive to said pressure forces to deflect inwardly and outwardly of the catheter in dependence thereon, biasing means interposed between said membrane means and the distal end of said optical fiber for biasing the distal end of the optical fiber inwardly of said catheter so that the optical axis at the distal end of said fiber normally makes a greater than 90° angle with said flat light reflecting surface of said light reflecting means with said angle increasing with increased pressure forces and decreasing with reduced pressure forces to thereby modulate the intensity of light reflected from said reflecting means into the distal end of said optical fiber for transmission to the proximal end thereof.

4,691,709

APPARATUS FOR MEASURING VELOCITY OF BLOOD FLOW IN A BLOOD VESSEL

Donald M. Cohen, Encino, Calif., assignor to Cordis Corporation, Dade, Fla.

Continuation-in-part of Ser. No. 881,476, Jul. 1, 1986, which is a continuation of Ser. No. 671,913, Nov. 16, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 911,375
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 **14 Claims**



1. Apparatus for use in a device for measuring the velocity of blood flowing in a blood vessel in a body, comprising:

an elongated tubular catheter having a proximal end and a distal end with the latter adapted to be inserted into a blood vessel such that said blood flows parallel to said catheter;

an elongated optical fiber member carried within said catheter and having a proximal end and a distal end and extending throughout essentially the length of said catheter;

first pressure transducer means carried by said catheter adjacent the distal end thereof and responsive to static pressure acting transversely of said catheter for modulating the intensity of any light passing through said optical fiber inversely proportional to the magnitude of said transversely acting static pressure; and

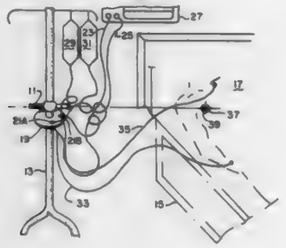
second pressure transducer means carried by said catheter at the distal end thereof and responsive to total pressure, including static pressure and kinetic pressure, acting parallel to said catheter, for modulating the intensity of any light passing through said optical fiber proportional to the magnitude of said total pressure, whereby the velocity of blood in said vessel can be determined as a function of the difference between said total pressure and said transversely acting static pressure.

4,691,710

MEDICAL APPARATUS AND SYSTEM

Judith F. Dickens, 3427 Pestalozzi, St. Louis, Mo. 63118, and John J. Loughlin, 8145 Whitburn, St. Louis County, Mo. 63105

Filed Feb. 18, 1986, Ser. No. 830,080
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—673 **9 Claims**



1. In a system for measuring internal pressures of a patient, said system including a pressure transducer fixedly mounted with respect to an IV pole or the like, and a catheter having a lumen forming a fluid path between the pressure transducer and a point in the patient at which the pressure is to be measured, the improvement comprising:

light source means for casting a light pattern upon a patient;

level means for indicating when the light source means is level;

a hollow body having at least one port fixedly receiving the light source means and an opening fixedly receiving the level means so that the body holds the light source means and the level means in fixed geometrical relationship with respect to each other;

a clamp secured to the body for fixedly securing the body to the IV pole or the like at a fixed elevation with respect to the pressure transducer;

said body being pivotable about an axis defined by the clamp for levelling the light source means once the body is fixedly secured to the IV pole.

4,691,711

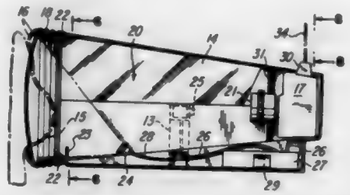
Patent Not Issued For This Number

4,691,712

DEVICE FOR DETECTING, MEASURING, AND RECORDING BODY THERMAL EMISSIVITY

George T. Brown, Jr., Dayton, Ohio, assignor to American Thermometer Co., Inc., Dayton, Ohio

Continuation of Ser. No. 515,503, Jul. 20, 1983, Pat. No. 4,524,779. This application Jun. 20, 1985, Ser. No. 747,017
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] G03B *29/00*
U.S. Cl. 125—736 **19 Claims**



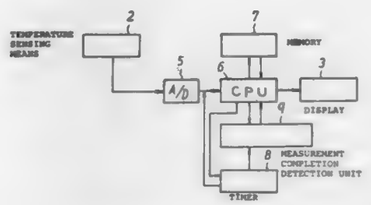
1. A device for detecting and recording the thermal emissivity of a human body, comprising a housing having opposite forward and rearward end portions, a flexible thermal responsive screen adapted to conform to the contour of the body and having a coating of liquid crystals effective to transform thermal differentials emanating from the body to visible color patterns, a resilient frame mounted on said forward end portion of said housing and supporting said flexible screen, said frame being conformable to the contour of the body in response to pressure of the body against said frame, camera means for recording the image of the patterns, means mounted on said rearward end portion of said housing for supporting said camera means, said housing cooperating with said screen and frame to define a chamber, and means for applying a fluid pressure against said flexible screen and cooperating with said resilient frame to conform said screen to the contour of the body.

4,691,713

ELECTRONIC CLINICAL THERMOMETER

Takashi Suzuki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1986, Ser. No. 830,081
Claims priority, application Japan, Feb. 21, 1985, 60-34131
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—736 **4 Claims**



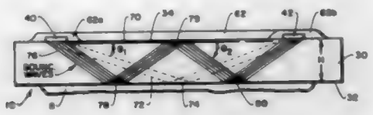
1. An electronic clinical thermometer comprising:

temperature sensing means for sensing actual temperature values;

prediction means responsive to said temperature sensing means for calculating a prediction temperature value based on the actual temperature values; and

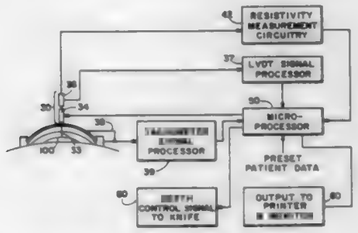
output control means for selectively outputting the actual temperature values or the prediction temperature value depending on the changes of the actual temperature values, said prediction temperature value taking less time for output than said actual temperature values.

4,691,714
RHEOLOGICAL TESTING APPARATUS AND METHOD
Jacob Y. Wong, Santa Barbara; Pierre Khuri-Yakub, Palo Alto; M. Ed Motamedi, Thousand Oaks, and Marcus Y. Wong, Pacific Palisades, all of Calif., assignors to Adamtek Corporation, Santa Barbara and Hibshman Corporation, San Luis Obispo, both of, Calif., a part interest
Continuation of Ser. No. 661,226, Oct. 15, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 850,077
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—738 **24 Claims**



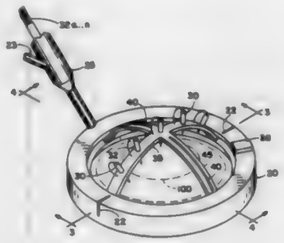
23. An instrument for rheological testing of cervical liquid comprising:
(a) a sensing transducer comprising an inert slab having a first face exposable to the liquid, wave generating means on a second face of the slab for generating a bulk wave toward the first face, receiving means on the slab in the path of the bulk wave after it reflects from the first face for receiving the reflected bulk wave from the first wave and generating a first output, first circuit means attached to the receiving means for measuring the amplitude of the first output and comparing the first output to a reference output whereby the difference between the first output and the reference output is a function of the viscosity of the liquid in contact with the first face; and
(b) support means for supporting the sensing transducer with the first face exposable to the cervical liquid, the support means being of a shape for insertion into a vagina for positioning the sensing transducer in contact with the cervical liquid.

4,691,715
AUTOMATIC CORNEAL SURGERY SYSTEM
Emanuel Tanne, 6517 Buena Vista Dr., Vancouver, Wash. 98661
Division of Ser. No. 814,223, Dec. 27, 1985, Pat. No. 4,665,914. This application May 27, 1986, Ser. No. 867,034
Int. Cl.[4] A61B *5/10*; **A61F** *17/32*
U.S. Cl. 128—774 **24 Claims**



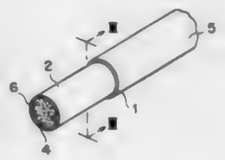
1. An automated corneal surgery system comprising:
(a) mapping means for measuring and mapping in two-dimensional coordinates the contour of the corneal surface by determining the positional location relative to a reference of a plurality of points distributed over the surface thereof, including means for generating data signals representative of the respective positions of said points;
(b) knife means with a movable blade for cutting into the corneal surface, including means for regulating the depth of penetration of said blade into the layers of the cornea; and
(c) microprocessor means, responsive to said data signals, for providing automated control of the cutting action of said knife means.

4,691,716
AUTOMATIC CORNEAL SURGERY SYSTEM
Emanuel Tanne, 6517 Buena Vista Dr., Vancouver, Wash. 98661
Division of Ser. No. 814,223, Dec. 27, 1985, Pat. No. 4,665,914. This application May 27, 1986, Ser. No. 867,039
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—774 **9 Claims**



1. An apparatus for mapping the contour of the corneal surface of the eye comprising:
(a) sensor probe means adapted to be juxtaposed above the corneal surface for determining the positional location relative to a reference of a plurality of points distributed over the surface of the cornea, said sensor probe being mounted on support means attachable proximate the eye, said support means including movable means for moving said sensor probe in two dimensions to differing measuring locations over said corneal surface;
(b) means for advancing said sensor probe means closer to said corneal surface;
(c) means for monitoring the electrical resistivity between said sensor probe means and said corneal surface as said probe means is advanced towards same, thereby to determine the point of contact therewith; and
(d) means for generating sets of data signals representative of both the respective positions of said points and the extent of advancement of said probe means at said point of contact.

4,691,717
CIGARETTES
Sakio Ikeda, Nagareyama, and Shozen Yonamine, Yokohama, both of Japan, assignors to Dynic Corporation, Kyoto and Mine Kinzoku Kogyo K.K., Kanagawa, both of, Japan
Filed Aug. 30, 1984, Ser. No. 645,923
Claims priority, application Japan, May 4, 1984, 59-64744
Int. Cl.[4] A24D *1/02, 1/10, 1/12*
U.S. Cl. 131—365 **56 Claims**



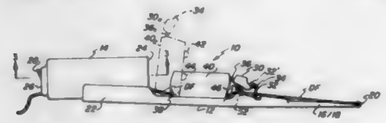
1. A cigarette comprising:
a rod shaped core made up of tobacco; and
a perforated sheath surrounding said core and extending along at least a portion of the axial length of said core, said perforated sheath having a helical rib on the outer surface thereof;
said perforated sheath being comprised of a material extending along said portion of said axial length of said core and which generates substantially less smoke when the cigarette is not sucked than when the cigarette is sucked.

4,691,718
TOOTHBRUSH
Shuji Sakuma, and Hirotaka Fujinawa, both of Tsukiji, Japan, assignors to Kabushiki Kaisha Sangi, Tokyo, Japan
Filed Mar. 31, 1986, Ser. No. 846,069
Claims priority, application Japan, Jun. 29, 1985, 60-141552
Int. Cl.[4] A61N *1/30*
U.S. Cl. 132—84 R **7 Claims**



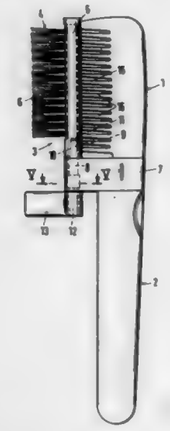
1. A toothbrush comprising a bristle portion having bristles implanted therein, and a handle portion contiguous to said bristle portion, said bristle portion consisting of an ion eluting-type ceramic, said handle or bristle portion having a battery accommodated therein, a first conductor accommodated therein and connected to one pole of said battery, and a second conductor connected to the pole of said battery and fixedly secured to the surface of said handle, said iirst conductor extending into the interior of said bristle portion and exposing outward via at least one hole on said bristle portion.

4,691,719
DENTAL FLOSS APPLICATOR
Angelo Ciccarelli, 32 N. Osprey Ave., Sarasota, Fla. 33577
Filed Mar. 28, 1986, Ser. No. 845,849
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—92 R **6 Claims**



1. A dental floss holder comprising:
an elongated main body having a top and bottom surface and a pair of extending spaced-apart opposing forks at one end and a refillable dental floss container disposed at the opposite end;
a floss lock bar pivotally connected at one end to a mid-portion of said top surface, the axis of said pivotal attachment generally transverse to said body;
each said fork having an eyelet at its distal end for receiving dental floss;
the lower surface of said floss lock bar having at least one protruding transversely disposed rib which is mateably receivable into a floss locking cavity in said body top surface when said floss lock bar is in a closed position;
said floss lock bar having a spring catch at its free end to releasably cooperate with a spring biased release pivotally mounted on said body top surface to hold said floss lock in a closed position;
the length of dental floss routable from a first aperture in a closed end of said dental floss container, between said rib and said cavity, along the length of one said fork and passing through each said fork eyelet such that the length of dental floss transversely spans and is held between said fork distal ends, then passing back along the length of the other said fork, between said rib and said cavity into a second aperture in said floss container closed end and exiting a third aperture in a removable cap of said floss container;
the outer surface of said removeable cap having a dental floss holder and cutter;
said rib and said cavity adapted to both tension and retain the so-routed dental floss when said floss lock bar is in the closed position.

4,691,720
APPLIANCE FOR PARTIALLY DYEING THE HAIR
Wolfgang Schmitz, Aachener Strasse 609, 5000 Köln 41, Fed. Rep. of Germany
Filed Aug. 22, 1985, Ser. No. 768,468
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513814
Int. Cl.[4] A45D *24/22*
U.S. Cl. 132—112 **20 Claims**



1. An appliance for partially dyeing the hair, including a comb part (1), a handle part connected thereto and a dye applicator device (3) connected therebetween, wherein
the dye applicator device (3) comprises a brush device (4; 4*a*; 4*b*) including an element (5) supporting bristles 6,
the element (5) is movable relative to the comb part (1) between a dye collecting position in which the bristles (6) point away from the comb part (1) and a dye dispensing position in which the bristles (6) are in contact with the comb teeth (15),
the bristles (6) of the brush device (4; 4*a*; 4*b*) being pointable substantially in one and the same direction, and
the element (5) supporting the bristles (6) is pivotable about an axis oriented substantially parallel to the comb part (1).

4,691,721
VOLUMETRIC GRAVITY FEED LIQUID DISPENSER
David L. Nystuen, Bloomington, Minn., assignor to Ecolab Inc., St. Paul, Minn.
Filed Dec. 7, 1984, Ser. No. 679,259
Int. Cl.[4] B08B *13/00*
U.S. Cl. 134—96 **1 Claim**

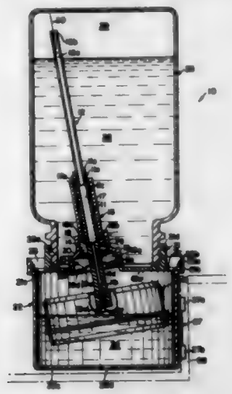
1. A liquid dispenser for dispensing a constant volumetric quantity of liquid, said dispenser comprising:
(a) a plunger having a longitudinal axis;
(b) first and second substantially elastic umbrella seals cooperatively connected to said plunger, said seals in a spaced relationship;
(c) a plunger housing enclosing at least a portion of said

plunger, said plunger housing adapted for relative movement with said plunger along said longitudinal axis, said plunger housing having an inner cavity having a first and a second opening, said inner cavity having a first and second sealing surface at said first and second openings, said seals positioned in said inner cavity, wherein a measuring chamber which holds a constant volume of liquid is defined between said seals, said first opening in fluid communication with the liquid to be dispensed, said first seal controlling fluid communication between said first opening and said measuring chamber and said second seal controlling fluid communication between said measuring chamber and said second opening;

(d) means for effecting relative movement along said longitudinal axis between said plunger and said plunger housing, said means comprising:

(i) a float cooperatively connected to said plunger; and

(ii) a housing having an inner cavity, wherein said plunger moves from a filling position to a dispensing position, wherein when in said filling position said second seal effects a liquid tight seal with said second sealing surface of said second opening and said first seal allows liquid to enter said measuring chamber through said first opening and when in said dispensing position said first seal effects a liquid tight seal with said second sealing surface of said first opening and said second seal



allows liquid to be dispensed by gravity from said second opening, said first seal always in a sealing relationship to said first opening when said second seal allows dispensing of liquid, whereby a constant volume of liquid is dispensed;

(e) said plunger housing comprises an upper portion having an inner bore sized larger than said plunger, wherein said upper portion acts as a guide for relative movement of said plunger and a seal is not effected between said plunger and said plunger housing;

(f) said first and second sealing surfaces at said first and second openings are conical;

(g) said seals having an opening proximate their center, said opening sized smaller that an outer dimension of said plunger where said seals are cooperatively connected, wherein a liquid tight seal is formed between said plunger and said seals;

(h) said plunger having annular grooves around which said seals are positioned, said grooves having a width that is substantially filled by said seals;

(i) said plunger having a bore with a first and second opening, said first opening cooperatively connected to a vent tube and said second opening in communication with atmospheric air;

(j) a stop cooperatively connected to said plunger to limit downward movement of said plunger;

(k) an adapter having an opening in which said plunger housing is cooperatively connected, said adapter having means for securing a container in which the liquid to be dispensed is contained; and

(l) said plunger housing is cooperatively connected to said adapter at an angle, wherein said plunger housing is at an angle with the horizontal when in use.

4,691,722

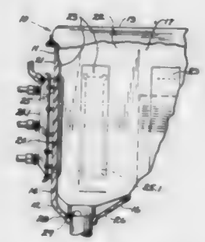
BOWL FOR LIQUID SPRAY PROCESSING MACHINE

James M. Silvernail, Maple Plain, and Clifford C. Miller, Bloomington, both of Minn., assignors to FSI Corporation, Chaska, Minn.

Filed Aug. 1, 1984, Ser. No. 636,724

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—155 **6 Claims**



1. A spray processing machine for confining and directing liquid sprays onto wafer substrates in the manufacture of electronic devices, comprising

a bowl having an open top, a peripheral side wall and base wall opposite the open top,

an openable cover cooperating with the bowl in defining a processing chamber,

rotor means in the bowl for mounting such wafer substrates and revolving the substrates,

means spraying liquid sprays into the bowl and onto the wafer substrates therein,

the base wall having an open drain port and having an upper drain surface being sloped peripherally downwardly in a spiraling configuration spray liquids toward the drain port, the flow of collected spray liquids toward the drain port, the peripheral direction of rotation of the rotor being the same as the peripheral direction of downward slope of the spiraling configuration, the base wall also having a step adjacent the drain port, the step defining a riser face, facing in a direction opposite to the rotation of the rotor, whereby the gaseous fluid turbulence induced in the processing chamber by revolving of the rotor assists and contributes to the flow of draining liquids downwardly along the spiraling configuration on the base wall until obstructed by the riser face of the step for rapid delivery into the drain port.

4,691,723

APPARATUS FOR CLEANING RADIOACTIVE TUBE BANKS

Christian Mierswa, Binzen, and Friedrich Schmutz, Weil am Rhein, both of Fed. Rep. of Germany, assignors to Ernst Schmutz GmbH, Weil am Rhein, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,258

Claims priority, application Fed. Rep. of Germany, May 21, 1984, 34188355

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—167 C **6 Claims**

1. Apparatus for cleaning radioactive contaminated banks of tubular members which have open ends located in a plane, said apparatus comprising:

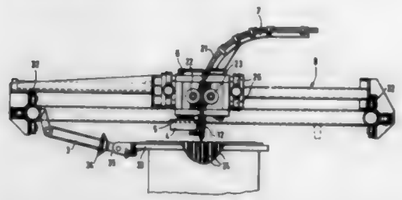
hose means for spraying a cleaning liquid,

feed means for feeding said hose means in a direction parallel to a longitudinal axis at said tubular members,

a cleaning carriage, said feed means being mounted on said cleaning carriage,

an intermediate carriage, said cleaning carriage being slidably mounted on said intermediate carriage,

first drive means for moving said cleaning carriage in a straight line on said intermediate carriage,



a main carriage, said intermediate carriage being slidably mounted on said main carriage,

second drive means for moving said intermediate carriage on said main carriage in a straight line normal to a direction of movement of said cleaning carriage,

a circular centering ring, said main carriage being rotatably mounted on said circular centering ring, and

third drive means for rotating said main carriage on said circular centering ring to thereby simultaneously rotate said cleaning carriage and said intermediate carriage.

4,691,724

ULTRASONIC DEVICE

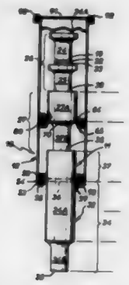
Raoul Garcia, Paris; Daniel Michaux, Noisy-le-Sec, and André Sales, Bures-sur-Yvette, all of France, assignors to SCP Biscornet, Paris, France

Filed Oct. 23, 1985, Ser. No. 790,614

Claims priority, application France, Oct. 23, 1984, 84 16169

Int. Cl.[4] B08B *9/00*; H01L *41/04*

U.S. Cl. 134—169 R **18 Claims**



1. Ultrasonic device comprising at least one ultrasonic transducer and a probe having an active part adapted to be immersed in a medium, said active part including an adapter part having a surface for matching the impedance of said probe to the medium, said adapter part surface having an end face and said active part extending longitudinally between said end face of said adapter part and a limiting part beyond said active part, said probe being adapted to carry longitudinal ultrasonic waves and radial ultrasonic waves generated by said ultrasonic transducer, said limiting part being located at a node of the longitudinal ultrasonic waves and said end face being located at a peak of the longitudinal ultrasonic waves, the longitudinal dimension of said active part being such that in operation at least one peak of the radial ultrasonic waves will be formed along said active part intermediate said limiting part and said end face.

4,691,725

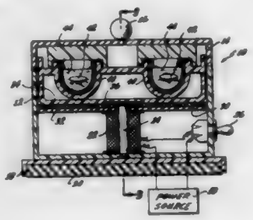
LENS CLEANER

Tulio T. Parisi, San Diego, Calif., assignor to Ultramed Corporation, San Diego, Calif.

Filed May 13, 1985, Ser. No. 732,926

Int. Cl.[4] B08B *3/12*

U.S. Cl. 134—184 **13 Claims**



1. In combination for cleaning a contact lens with a cleaning fluid,

a housing,

means disposed in the housing in displaceable relationship to the housing for holding the contact lens and the cleaning fluid,

means disposed in the housing for producing electrical pulsations,

means responsive to the electrical pulsations for vibrating the holding means relative to the housing to obtain a movememt of the contact lens relative to the holding means and the cleaning fluid and to obtain a cleaning of the contact lens by the cleaning fluid during such movement, and

resilient support means for the holding means, and

means responsive to the electrical pulsations for pressing the holding means against the resilient support means during the production of the electrical pulsations and for providing for the release of the pressure of the holding means against the resilient support means during the period of time between successive electrical pulsations.

4,691,726

METHOD AND APPARATUS FOR VALVE ASSEMBLY FOR A HOT WATER TANK

Robert L. Studer, 6116 NE. 87th St., Redmond, Wash. 98052, and William E. Schourup, 23234 NE. 54th, Redmond, Wash. 98053

Continuation-in-part of Ser. No. 528,721, Aug. 31, 1983, Pat. No. 4,508,130. This application Aug. 13, 1984, Ser. No. 640,687

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—15 **20 Claims**

1. A method of installing a valve in a water distribution network of an existing plumbing system where there is:

(a) a distribution pipe having an upstream end and a downstream outlet end, and also having an outside surface of a predetermined outside diameter, and an inside surface defining a passageway having a predetermined passageway diameter and passageway cross-sectional area;

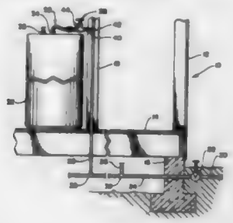
(b) an existing shutoff valve located upstream of the upstream end of the distribution pipe;

said method comprising:

(a) determining an installation location where the valve is to be installed in the plumbing system;

(b) operating said existing shutoff valve to stop flow of water to said installation location;

(c) providing said distribution pipe at said installation location with an open pipe end portion which is substantially undistorted and provides a substantially uninterrupted through passageway portion, without enclosing said installation location in a watertight containment and with said installation location being open to the surrounding environment;
(d) providing a valve assembly comprising:
(1) a valve comprising:
(i) a main body portion defining a central through passageway section having a cross-sectional area at least as great as that of the pipe passageway;
(ii) a valve closure member having a first position closing said central through passageway section and a second position where said central through passageway section is substantially unobstructed;
(iii) a first connecting portion defining a substantially unobstructed through passageway portion, and having an exterior threaded surface portion with threads arranged to receive a compression fitting;
(iv) a second connecting portion defining a substantially unobstructed through passageway portion, and having an exterior threaded surface portion with threads adapted to receive a conventional plumbing connecting member with interior threads;



(2) a compression nut having an annular integral structure, with an inner threaded surface to engage the threaded surface portion of said first connecting portion, and having a through opening to receive said pipe end portion;
(3) an annular compression seal member adapted to be positioned adjacent said pipe end portion in sealing engagement with said first connecting portion and said pipe end portion;
(e) inserting said valve at said installation location, with said compression nut and said seal member being placed adjacent said pipe end portion and with said first connecting portion being in connecting relationship with said pipe end portion and threading said nut onto said first connecting portion to bring said seal member in sealing relationship with the pipe end portion;
(f) interconnecting said valve to an end use component to which water is to be delivered, by threading a conventional interiorily threaded connecting member onto said second connecting portion, with said conventional interiorly threaded member being connected to said end use component;
(g) opening said existing shutoff valve.

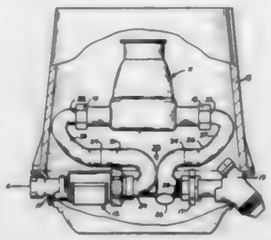
4,691,727

FLOW CONDITIONING DEVICE RESETTER ASSEMBLY

Larry D. Zorb, and L. Harvey Wicklund, both of Big Fork, Mont., assignors to A. Y. McDonald Manufacturing Co., Dubuque, Iowa

Filed Nov. 4, 1985, Ser. No. 794,283
Int. Cl.[4] F16L *55/07*; G01F *15/18*
U.S. Cl. 137—15 36 Claims

1. A resetting device for mounting a first flow conditioning device along a remote axis spaced from and substantially parallel to a main line axis defined by main line pipes, and for allowing a second flow conditioning device to be mounted between the resetting device and a main line pipe; comprising:
a first conduit having a first opening along a first axis, and a second opening along a reset axis;
a second conduit having a first opening along said first axis, and a second opening along said reset axis;
said first openings of the first and second conduits being spaced by a first axial spacing along the first axis; said second openings of the first and second conduits being spaced by a second axial spacing along the reset axis which is substantially greater than said first axial spacing; said first opening of the first conduit being spaced axially further from the second opening of the first conduit than an axial spacing between the first and second openings of the second conduit; said first openings being axially spaced between the axial positions of said second openings of the first and second conduits;



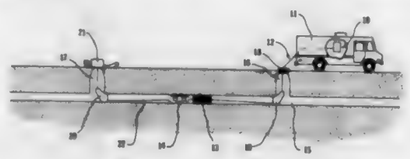
said first axis and said reset axis being substantially parallel and defining a first plane; said first and second conduits running laterally outward from said first plane along intermediate portions thereof with the conduits convoluting between the first and second openings thereof;
said first openings of the first and second conduits being outwardly facing in opposing directions, and said second openings of the first and second conduits being inwardly facing towards one another; and
in which a connection spacing between a first opening of the first or second conduits and a distal opening of the second flow conditioning device is approximately equal to said second axial spacing between the second openings, when the second flow conditioning device is connected to a first opening.

4,691,728

ELECTRONIC TEST AND SEAL APPARATUS AND METHOD

Allen D. Mathison, Richfield, Minn., assignor to Cherne Industries, Inc., Minneapolis, Minn.

Filed May 28, 1986, Ser. No. 868,129
Int. Cl.[4] F16K *43/00*; F16L *55/16, 55/18*
U.S. Cl. 137—15 20 Claims



16. A method for automatically testing and sealing a pipeline section of a predetermined diameter from a remote location comprising:
a. providing an inflatable packer device of a predetermined size, the packer device having inflatable end elements, an exterior sleeve member, a chemical dispensing mechanism and having hose assembly connecting means,

b. providing a compressed air source, a pressurized test fluid source, a sealing chemical source and a catalyst source,
c. providing a hose assembly having a packer sleeve air line, an end element air line, a catalyst and test fluid line and a chemical sealant line,
d. providing a first pump means in operative communication with the sealing chemical component source and the chemical sealant line, a second pump in operative communication with the catalyst source and the catalyst and test fluid line and a valve in operative communication with the test fluid source and the catalyst and test fluid line at a location beyond the second pump,
e. providing an electronically operated control panel in operative communication with the compressed air source, the sleeve air line, the end element air line, the valve and the first and second pumps, said control panel further having pneumatic pressure monitoring means in communication with the packer sleeve air line and having a first regulator means to preset the pneumatic test pressure for the packer sleeve and a second regulator means to preset the pneumatic seal pressure for the packer sleeve, said electronic control panel further having electronic circuitry to yield only electrical output signals including a first pressure differential sensor to monitor the pressure difference between the actual sleeve pressure and the preset test pressure and a second pressure differential sensor to monitor the difference between the actual sleeve pressure and the preset sleeve pressure,
f. setting the first and second pressure regulator means for the selected packer device and for the diameter of the pipeline section diameter, and
g. turning the electronic control panel to its operative position whereby the testing and sealing functions of the packer device are automatically controlled by the electrical output signals operative on the valve and the first and second pump means.

4,691,729

REVERSE-BUCKLING RUPTURE DISK WITH REPLACEABLE DISK AND BLADE

Miner E. Clift, P.O. Box 1327, Broken Arrow, Okla. 74012

Continuation of Ser. No. 617,893, Jun. 6, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,569
Int. Cl.[4] F16K *17/14*
U.S. Cl. 137—68.1 5 Claims



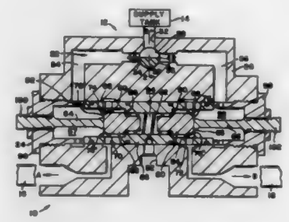
1. A rupture disk assembly comprising:
a. housing means defining a bore for conveying flow and comprising a pair of abutting annular sections;
b. a frangible concave-convex disk supported at its edge portions between the annular sections, closing the bore, the disk being designed to resist pressure on the convex side up to a predetermined pressure and then collapsing after the predetermined pressure is reached;
c. means for temporarily assembling the annular sections and disk together so that the disk can be removed after rupturing and replaced with another disk; and
d. an elongated U-shaped knife blade with two ends positioned within the bore on the concave side of the disk and spaced downstream therefrom, the blade comprising a flat blade body with an upstream leading edge and a downstream trailing edge that are spaced from the wall of the bore and a plurality of teeth lining the leading edge for perforating the disk when it collapses, the ends of the blade being connected to the inner surface of the housing means on one side of the lateral centerline of the bore and wherein the knife blade is removably connected to the housing means so that it can be replaced independently of the disk.

4,691,730

CONSTANT PERCENTAGE FLOW DIVIDER

Larry A. Portolese, Granger, and Thomas M. Leathers, South Bend, both of Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 19, 1986, Ser. No. 909,440
Int. Cl.[4] G05D *11/03*
U.S. Cl. 137—101 9 Claims



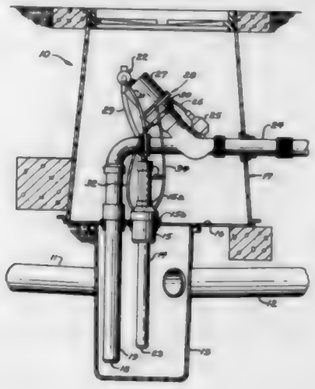
1. A flow control device for supplying at least first and second fluid distribution systems with a constant percentage of fluid flowing from a single source of fluid comprising:
a housing having a first bore and a second bore, said first bore being connected to said single source of fluid through an inlet orifice and to said second bore through first and second passages that extend from first and second outlet orifices, respectively, said second bore having first and second outlet ports connected to said first and second distribution systems;
a shaft located in said first bore having a semi-cylindrical section transversely located with respect to said first and second outlet orifices for establishing said percentage of fluid flow to each of said first and second outlet orifices;
means for moving said semi-cylindrical section of said shaft such that a change in the flow area through one of said first and second orifices causes a corresponding change in the other of said first and second orifices so that the total volume of flow through said inlet orifice remains constant;
indicia on said housing to provide a reference to inform the operator of the position of said semi-cylindrical section of said shaft with respect to said first and second outlet orifices;
a first piston located in said second bore and having a first area exposed to the fluid in said first passage;
a second piston located in said second bore and having a second area exposed to the fluid in said second passage;
adjusting means located in said second bore for aligning said first and second pistons with respect to said first and second outlet ports to assure that flow from said second bore simultaneously occurs through the first and second outlet ports; and
resilient means located between said first and second pistons

for urging said first and second pistons toward said adjusting means, said pressure of the fluid in said second bore being required to overcome said resilient means before any flow occurs through said first and second outlet ports, said first and second pistons responding to any differences in the fluid pressure between the first and second distribution systems by moving to correspondingly change the area of flow through said first and second outlet ports such that the volume of fluid flowing through the first and second outlet ports corresponds to the percentage established by said means in said first bore.

4,691,731
VACUUM SEWERAGE SYSTEM WITH IN PIT BREATHER

John M. Grooms, Rochester, and Mark A. Jones, Cloverdale, both of Ind., assignors to Burton Mechanical Contractors, Inc., Rochester, Ind.

Continuation-in-part of Ser. No. 539,198, Dec. 8, 1983, abandoned. This application Jun. 12, 1985, Ser. No. 743,751
Int. Cl.[4] E03F *1/00*
U.S. Cl. 137—205 **10 Claims**

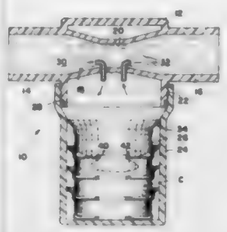


1. Apparatus for sewage flow control in a normally sub-atmospheric pressure sewerage transport system comprising:
- a sewage accumulation receptacle for sub-surface installation and for collecting sewage for discharge into the transport system,
- the receptacle being adapted for sub-surface connection to conduit means communicating with a remote pressure source to maintain the receptacle before and after discharge at a pressure level above the normal sub-atmospheric pressure of the transport system,
- a differential pressure operated flow control valve adapted to sequentially open and close in response to pre-selected pressure levels and to facilitate the discharge of sewage from the receptacle into the sewerage transport systems, and
- means between the valve and the receptacle for sub-surface installation and to provide continuous communication of at least two pressures developed in the receptacle with the differential pressure operated flow control valve for sequential operation thereof, one of the pressures including the pressure level above normal sub-atmospheric pressure maintained in the receptacle through its connection to the remote pressure source whereby the receptacle and the differential pressure operated control valve may be maintained entirely sub-surface without air vent or other conduits openly protruding above grade level.

4,691,732
POOL CHLORINATOR

Bruce R. Johnson, Sebastopol, and Ralph A. Falconer, Novato, both of Calif., assignors to Jandy Industries, Inc., Novato, Calif.

Filed Aug. 1, 1986, Ser. No. 892,037
Int. Cl.[4] B01D *11/02*
U.S. Cl. 137—268 **4 Claims**

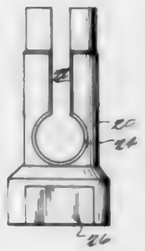


1. A chemical dispenser for a pool or spa comprising:
- a receptacle receiving a stack of dry, soluble chemical tablets;
- coupling means on said receptacle adapted for connection into a water circulation line;
- inlet and outlet ducts for introducing water from said coupling means into said receptacle at one end of said receptacle and for returning water from said one end to said coupling means; and
- sealing means comprising a plurality of annular seal members, each engaging around and between one of said chemical tablets in said stack thereof and the inner wall of said receptacle to prevent flow of water from said one end of the receptacle past that tablet closest thereto.

4,691,733
UNDERCOVER VALVE COVER ASSEMBLY AND VALVE SUPPORT

Frank R. Zinn, Culpeper, Va., assignor to Bingham & Taylor, Culpeper, Va.

Filed Jul. 3, 1986, Ser. No. 881,778
Int. Cl.[4] F16L *5/00*
U.S. Cl. 137—364 **5 Claims**

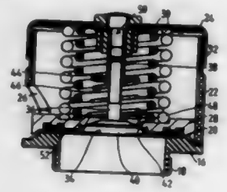


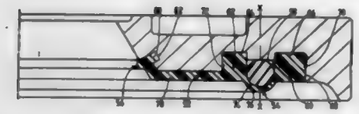
1. A valve cover assembly for covering a buried valve for a pipe section and permitting access thereto comprising:
- a hollow elongated valve cover means having a pair of opposed longitudinal slots therein extending upwardly from a lower end thereof;
- a valve support member adapted for slidingly receiving said valve cover means having opposed longitudinal slots extending downwardly from an upper end thereof, and a pair of outwardly extending portions beneath said opposed slots of said valve support member and extending from opposite sides of a lower portion of said valve support member, said outwardly extending portions having a width which is less than the width of said opposed longitudinal slots of said valve cover means;
- whereby a valve member having pipe extending outwardly from both sides thereof may be placed within said valve support member with said pipe being disposed within said opposed slots of said valve support member, and said valve cover means may be slid over said valve support member, said longitudinal slots of said valve cover means providing a passage through which the outwardly extending pipe passes, and tightly receiving said outwardly extending portions so as to secure the valve cover means firmly to said valve support member.

4,691,734
VALVE SEALS

Edward S. Fort, Clitheroe, England, assignor to Fort Vale Engineering Ltd., Nelson, England

Filed Mar. 28, 1986, Ser. No. 845,972
Claims priority, application United Kingdom, May 21, 1985, 8512829
Int. Cl.[4] F16K *17/196, 1/44*
U.S. Cl. 137—493.4 **11 Claims**



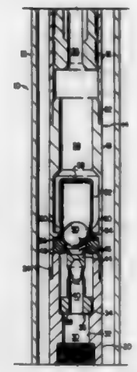


1. A pressure relief valve adapted in use to relieve excess pressure within a vessel, comprising a valve sea, a movable valve member resiliently biased towards the valve seat to maintain the pressure relief valve in a normally closed condition, and a valve seal carried by the movable valve member and disposed between the movable valve member and the valve seat, in which the valve seal comprises an annular valve seal member having on one side an annular pressure sealing face which in the normally closed position of the movable valve member sealingly cooperates with the valve seat and on its other side two concentric annular rims which define between them an annular groove opposite said annular pressure sealing face, said concentric annular rims being received in corresponding concentric annular recesses in the movable valve member, locating means formed integrally of the annular seal member and disposed radially inwardly of the annular pressure sealing face for locating the annular seal member on the movable valve member, and includes a resilient biasing member received in said annular groove and acting between the movable valve member and the annular seal member to maintain the annular pressure sealing face in sealing contact with the valve seat when the movable valve member is in said normally closing position.

4,691,735
PLUNGER VALVE APPARATUS FOR OIL WELL PUMP

James B. Horton, P.O. Box 1758, Kilgore, Tex. 75662

Continuation of Ser. No. 732,625, May 10, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,563
Int. Cl.[4] F16K *15/04*
U.S. Cl. 137—494 **10 Claims**

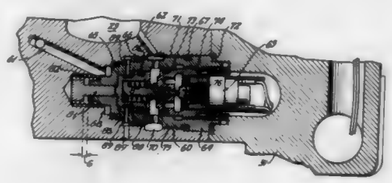


1. A valve comprising:
- a casing extending into a body of liquid;
- valve seat means fixedly mounted within said casing;
- a ball positioned within said casing above said valve seat means;
- a piston movably mounted within said casing below said valve seat means and adapted for reciprocation within said casing in response to fluid pressure and wherein said valve is closed by said ball engaging said valve seat means, and opened by a drop in fluid pressure above said piston causing said piston to rise, thereby lifting said ball away from said valve seat means; and
- a ball protection shield having a lower open end and an upper closed end fixedly mounted above said valve seat means and defining an enclosure in which said steel ball is contained, said shield having at least one aperture to permit fluid to flow through said shield, said aperture positioned entirely below the level to which said piston lifts the ball when said piston is in an elevated position.

4,691,736
VALVE FOR FIRE SUPPRESSION

Slawomir Kowalski, Oak Ridge, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

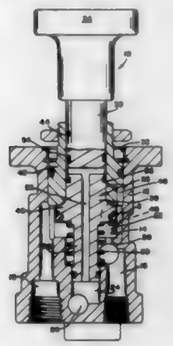
Filed Dec. 3, 1986, Ser. No. 937,542
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—557 **6 Claims**



1. In a fire-suppressing valve wherein a valve member is normally poised in valve-closed position to retain a high-pressure suppressant charge in an upstream chamber in readiness for rapid discharge via a downstream chamber upon quick-opening displacement of the valve member, the improvement in which said valve carries an electrical switch which exhibits a change of switching state in response to mechanical displace-

ment of an actuating element between an unactuated position and an actuated position, and fluid-pressure-responsive movable-piston means operatively associated with the actuating element of said switch, said piston means having a relatively small-area head end connected for exclusive response to upstream-chamber pressure and a relatively large-area tail end connected for exclusive response to downstream-chamber pressure, venting means interposed between said head and tail ends, first seal means isolating said venting means from said head end and therefore isolating said head end for exposure to upstream-chamber pressure, and second seal means isolating said venting means from said tail end and therefore isolating said tail end for exposure to downstream-chamber pressure.

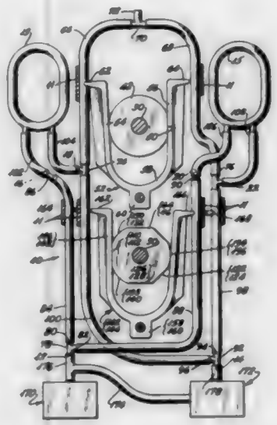
4,691,737
BRAKE CONTROL VALVE
Milan J. Sebo, Lorain, Ohio, assignor to Allied Corporation, Morristown, N.J.
Filed Dec. 10, 1984, Ser. No. 679,781
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—625.26 **14 Claims**



1. Control valve comprising a housing having an inlet port for communication with a fluid pressure source, an outlet port, and an exhaust port, said housing defining a bore communicating with said inlet, outlet and exhaust ports, a valve operating plunger slidably mounted in said bore and having larger and smaller diameter portions defining a shoulder therebetween, a valve seating surface on said housing, a circumferentially extending groove on said shoulder, a circumferentially extending cavity in said plunger communicating with said groove, a circumferentially extending seal including a main body portion received in said cavity and a circumferentially extending bead projecting from said body portion of the seal through said groove for sealing engagement with the valve seating surface when the shoulder on the plunger is urged thereagainst to thereby seal off the exhaust from the inlet and outlet ports, said plunger being movable to a position disposing the shoulder on the plunger away from the valve seating surface to thereby break the sealing engagement between the latter and said bead so that the exhaust port is thereby communicated with the outlet port.

4,691,738
CONTROL VALVE FOR USE WITH TOURNIQUET SYSTEM
William L. McCune, Denver, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Aug. 23, 1983, Ser. No. 525,600
Int. Cl.[4] F16K *7/06*
U.S. Cl. 137—627.5 **11 Claims**

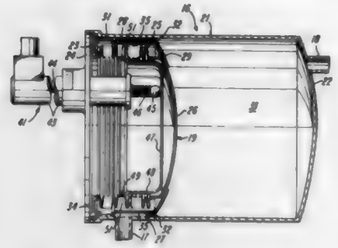
1. In a valve including a housing with:
(a) first and second inlets;
(b) first and second outlets;
(c) a first flexible conduit fluidly connecting said first inlet with said first outlet;
(d) a second flexible conduit fluidly connecting said second inlet with said second outlet;
(e) first and second valve means for controlling flow through the respective first and second conduits, said first and second valve means each including:
(i) rotatable cam means, and
(ii) pivoting means interposed between said cam means and the respective flexible conduit;
(iii) rotation of said cam means causing pivoting of said pivoting means to sequentially compress and release said flexible conduit, the improvement wherein, said pivoting means for said first and second valve means comprising a single U-shaped member mounted in surrounding relation to said cam means, a first leg of said



U-shaped member comprising said first valve means pivoting means, a second leg of said U-shaped member comprising said second valve means pivoting means and a further portion of said U-shaped member integrally connecting said first and second legs together and wherein said cam means are located between said first and second legs and each said leg includes a foot extending outwardly therefrom, each said foot engaging a respective flexible conduit and selectively compressing or releasing said respective flexible conduit, and wherein said cam means are located between said further portion and each said foot, and wherein said further portion is rigidly connected to said housing and said first and second legs pivot with respect to said further portion, and wherein said first and second legs and said further portion are integrally formed in one piece from a resilient material, said material inherently resisting said pivoting of said first and second legs.

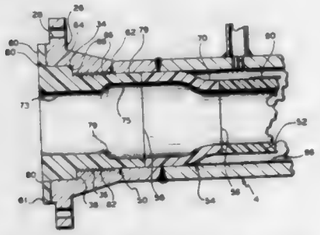
4,691,739
BOOTSTRAP RESERVOIR
Richmond A. Gooden, Kettering, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio
Filed Sep. 2, 1986, Ser. No. 902,687
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—31 **12 Claims**

1. A bootstrap accumulator-reservoir device for use in a closed system circulating liquid under pump pressure and having high pressure and low pressure system portions related respectively to pump output and intake sides, including a shell assembly providing a reservoir accommodating liquid expansion and contraction, means for communicating said reservoir with a low pressure system portion, a piston assembly in said shell assembly for applying pressure to liquid in said reservoir, a metallic bellows stretched between said piston assembly and a stationary part of said shell assembly defining an annular pressure applying chamber surrounding said bellows and on a side of said piston assembly oppositely of said reservoir, and



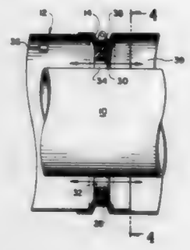
means for communicating said annular pressure chamber with a high pressure system portion, one end of said metallic bellows being joined to said stationary part of the shell assembly in a manner to anchor said other bellows end and to preclude communication of said high pressure annular chamber with ambient surroundings.

4,691,740
PIPELINE LINING
Harvey E. Svetlik, Dallas and Roy F. Wood, Carrollton, Tex., assignor to Phillips Petroleum Company, both of Bartlesville, Okla.
Continuation of Ser. No. 475,563, Mar. 15, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,483
Int. Cl.[4] F16L *55/18, 57/00, 58/00*
U.S. Cl. 138—109 **14 Claims**



1. A thermoplastic flange adapter for fusing to an end of a thermoplastic tube, said flange adapter having a first end and a second end and being characterized by an annular flange at the first end and a generally tubular portion attached normally to the annular flange, said tubular portion having an exterior surface defining a first generally cylindrical portion having a first end and a second end connected by its first end to the flange, a first outside diameter next to the flange and a second generally cylindrical portion having a first end and a second end connected by its first end to the second end of the first generally cylindrical portion, said second generally, cylindrical portion having a second outside diameter less than the first diameter, an annular shoulder separating the first diameter from the second diameter, wherein the tubular portion further defines a third generally cylindrical portion having a first end and a second end and a third outside diameter smaller than the second outside diameter connected by its first end via a flared or tapered shape to the second end of the second generally cylindrical portion with the second outside diameter being between the first generally cylindrical portion having the first outside diameter and the third generally cylindrical portion having the third outside diameter, the second end of the third generally cylindrical portion corresponding to the second end of the flange adapter to form a transition section for fusing the thermoplastic tube to the flange adapter.

4,691,741
SHROUD FOR AIRCRAFT DUCT
Steven N. Affa, Valencia; Ira R. Newman, Sun Valley, and Robert S. Allison, San Gabriel, all of Calif., assignors to General Connectors Corporation, Burbank, Calif.
Division of Ser. No. 500,073, Jun. 1, 1983, and a continuation of Ser. No. 412,515, Aug. 30, 1982, abandoned. This application Jul. 12, 1985, Ser. No. 754,283
Int. Cl.[4] F16L *9/18*
U.S. Cl. 138—113 **4 Claims**

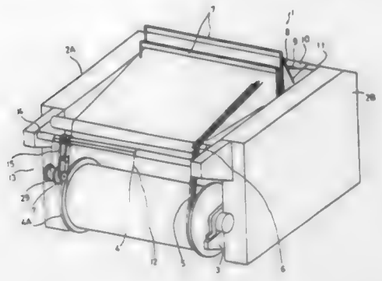


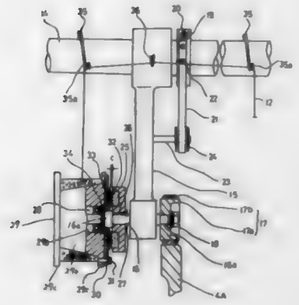
1. A shroud for a duct comprising a generally cylindrical resilient tube formed from an organic aramid fiber, said tube having an axially extending slot along its entire length whereby adjacent edges of the tube by the slot can be pulled apart so the tube can be inserted over a duct, at least one radially inwardly extending clamping band receiving groove situated transverse to the axis of said tube, said groove including a base which is radially inwardly spaced from the circumferential periphery of said cylindrical tube, said base adapted to receive a clamping band whereby the cylindrical shroud can be clamped to a duct mounted therein, a generally cylindrical spacer member formed from a selected elastomeric material mounted on the inner surface of said base member so the clamping band can clamp the shroud to said duct, said spacer member including a plurality of angularly spaced inwardly projecting abutments adapted to engage the peripheral surface of a duct defining thereby an insulating air gap between said shroud and the surface of said duct, the space between said angularly spaced inwardly projecting abutments defining channels through said spacer member for the passage of gases along the length of the air gap.

4,691,742
SURPLUS WARP YARN TREATING DEVICE OF LOOM
Masayuki Ushiro, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 31, 1985, Ser. No. 814,998
Claims priority, application Japan, Jan. 11, 1985, 60-1471[U]; May 17, 1985, 60-72150[U]
Int. Cl.[4] D03D *49/20*
U.S. Cl. 139—1 R **19 Claims**

1. A device for treating a surplus yarn drawn from a warp beam in a loom, said device comprising:
a first roller fixedly mounted on a rotatable shaft and in contact with and driven by a part of the warp beam;
a drive member in drivable connection with the rotatable shaft and spaced from said first roller;
a driven member drivable by said drive member;
transmission means for drivingly connecting said drive member with said driven member so that said drive and driven members are rotatable relative to each other even during transmission of a rotational force from said drive member to said driven member; and

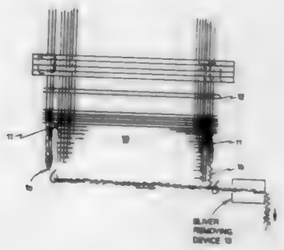
a take-up reel disposed separate from the warp beam and rotatable in timed relation to the warp beam by said driven





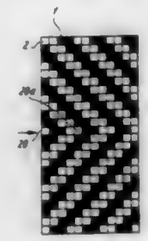
member, the surplus warp yarn drawn from the warp beam being wound up on said take-up reel.

4,691,743
METHOD AND DEVICE FOR REMOVAL OF WASTE SLIVERS IN A WEAVING LOOM
Jean Venet, Mulhouse, France, assignor to Societe Alsacienne de Construction de Material Textile, France
Filed Jul. 23, 1986, Ser. No. 888,225
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—291 C **5 Claims**



1. A method for removing the two waste slivers by cutting the two false selvedges on the two lateral edges of a sheet of fabric woven on a loom, comprising coiling said two waste slivers in the form of spiral turns around a coiler, biasing said spiral turns against said coiler by applying a braking pressure to said spiral turns, and discharging said spiral turns from said coiler, wherein said two waste slivers are coiled in the form of a single cord, said cord being subjected to a false twist for automatically balancing the tensions of said two waste slivers.

4,691,744
FILTER WIRE CLOTH
Eltel F. Haver; Heinz Lütke-Föller, and Reinhard Wössmann, all of Oelde, Fed. Rep. of Germany, assignors to Haver & Boecker, Oelde, Fed. Rep. of Germany
Continuation of Ser. No. 702,873, Feb. 19, 1985, abandoned. This application Apr. 4, 1986, Ser. No. 848,906
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429021
Int. Cl.[4] D03D *15/02*
U.S. Cl. 139—425 R **8 Claims**



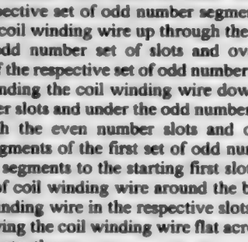
1. A wire mesh, formed as a filter mesh, of a twillplait weave, the wire mesh including individual interwoven single strand warp and weft wires being woven as a plurality of adjacent and consecutive pattern sections with each pattern section being woven as a twill pattern having diagonally running twill lines, the twill patterns in adjacent pattern sections having their twill lines running in different diagonal directions, and at least one intermediate wire woven between each pair of adjacent pattern sections so that a break region is formed between each pair of adjacent pattern sections each twill line of each pattern section of any adjacent pair of pattern sections defining included angles with their respective intermediate break region such that when said intermediate break region is considered as lying on a zero degree line the included angle defined by each twill line of one of said pair of pattern sections is an angle between zero degrees and negative ninety degrees and each twill line of the other of said pair of pattern sections is an angle between zero degrees and ninety degrees.

4,691,745
MULTI-NOZZLE WEFT INSERTION DEVICE FOR A FLUIDIC JET SHUTTLELESS-LOOM
Yujiro Takekawa, Ishikawa, and Fumio Matsuda, Kanazawa, both of Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan
Filed Dec. 4, 1985, Ser. No. 804,480
Claims priority, application Japan, Dec. 4, 1984, 59-257009
Int. Cl.[4] D03D *47/30*
U.S. Cl. 139—435 **17 Claims**

1. A multi-nozzle weft insertion device for a fluidic jet shuttleless-loom, comprising:

a group of indepedent nozzles, each nozzle corresponding to a weft to be inserted, each nozzle having a jet orifice and the jet orifice pointing toward a weft-path including a line of sight; and

a streamlined weft guide provided at the jet orifice of at least one of said nozzles and having a streamlined wall surface forming a boundary layer flow as a fluid stream passes adjacent thereto, where a weft blown from the at least one nozzle being moved along the boundary-layer flow formed on the streamlined wall surface of said weft guide, being blown gradually to the line of sight of the weft-path



and changing the direction of the fluid stream while maintaining a stable fluid stream.

4,691,746
FLAT WINDINGS, COIL FORMS, AND WINDING METHOD
Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820
Filed Sep. 30, 1985, Ser. No. 782,122
Int. Cl.[4] B21F *45/00*; H02K *3/04*
U.S. Cl. 140—92.1 **18 Claims**



1. A method for winding coil winding wire in a flat coil winding comprising:

providing a coil form bobbin in the configuration of a flat disk formed with a plurality of peripheral radial slots comprising at least one set of an odd number of slots spaced around the periphery of the flat disk dividing the bobbin into a respective set of an odd number of segments, said slots extending radially from the outside perimeter partially into the flat disk;

winding the coil winding wire down through the first slot of a first odd number set of slots and under the first segment of the respective set of odd number segments;

winding the coil winding wire up through the second slot of the first odd number set of slots and over the second segment of the respective set of odd number segments; and

generally winding the coil winding wire down through the odd number slots and under the odd number segments and up through the even number slots and over the even number segments of the first set of odd number slots and respective segments to the starting first slot completing a first turn of coil winding wire around the bobbin, seating the coil winding wire in the respective slots during winding and laying the coil winding wire flat across the respective segments; then

winding the coil winding wire up through the first slot of the first odd number set of slots and over the first segment of the respective set of odd number segments;

winding the coil winding wire down through the second slot of the first odd number set of slots and under the second segment of the respective set of odd number segments; and

generally winding the coil winding wire up through the odd number slots and over the odd number segments and down through the even number slots and under the even number segments of the first set of odd number slots and respective segments to the starting first slot completing a second turn around the bobbin, seating the coil winding wire in the slots in adjacent contact with the first turn of coil winding wire and laying the coil winding wire flat across the respective segments between said slots on alternately opposite sides of the segments of the bobbin from the first turn, said coil winding wire of the second turn passing through the slots in the opposite direction from the coil winding wire of the first turn;

continuing winding additional turns of coil winding wire around the bobbin, winding each odd number turn according to the method of winding the first turn and winding each even number turn according to the method of winding the second turn, seating and packing each turn of coil winding wire in the slots in adjacent contact with the preceding turn and laying the coil winding wire from the odd number turns next to each other side by side in flat array on the same alternating sides of the respective segments of the bobbin and laying the even nember turns next to each other side by side in flat array on alternately opposite sides of the respective segments of the bobbin from the odd number turns, completing a specified number of turns, said turns of coil winding wire crossing each other in the slots, one above the other, passing in opposite directions through the slots;

said odd number of slots being selected in number so that the turns of coil winding wire form well defined apexes at the slots of the set of odd number slots with well defined angles, said turns of coil winding wire forming conducting paths on either side of the apexes having components of radial direction in the direction of radii of the bobbin and flat coil winding for conducting radial components of current flow on either side of the apexes, said radial components of current flow defining axially directed magnetic fields at the apexes parallel to the center axis of the bobbin and flat coil winding for flux interaction of the flat coil winding with adjacent elements of a magnetic circuit;

thereby winding a multipole first phase of the flat coil winding in the form of a plurality of turns of coil winding wire in a flat array having a thickness no greater than approximately the thickness of two diameters of the coil winding wire plus the thickness of the flat disk coil form bobbin in between and in the configuration of a polygon with well defined apexes.

4,691,747
CONTROLLED DEFORMATION ALIGNMENT METHOD AND APPARATUS
Paul J. Sokolovsky, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Mar. 27, 1986, Ser. No. 844,922
Int. Cl.[4] B21F *1/02*
U.S. Cl. 140—147 **4 Claims**

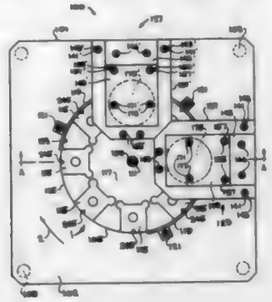
1. A method for straightening a plurality of electrical connector pins on a base of an integrated circuit mounting package, said method comprising the steps of:

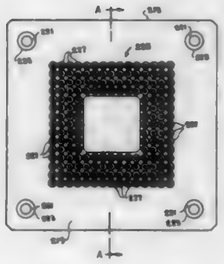
mating at a first straightening station said mounting package with a first deformation plate having first shaped apertures to deform said pins on a diagonal outward from the center of said first deformation plate into which said pins are inserted;

rotating said mounting package from the first straightening station to a second straightening station which is located orthogonally to said first straightening station; and

mating at said second straightening station said mounting package with a second deformation plate having second shaped apertures to deform said pins on a diagonal inward

to the center of said second deformation plate into which said pins are inserted, thereby aligning said pins to be





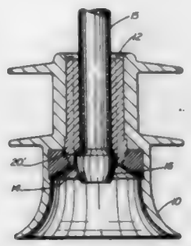
substantially perpendicular to the base of said mounting package.

4,691,748

IMPROVED FILLER TUBE TIP AND CENTERING BELL BUSHING

Alfred J. Gilmour, Waterloo, Canada, assignor to Auto-Flash Systems Ltd., Waterloo, Canada

Filed Jan. 16, 1986, Ser. No. 819,278
Int. Cl.⁴ B67C *3/26*
U.S. Cl. 141—165 **16 Claims**



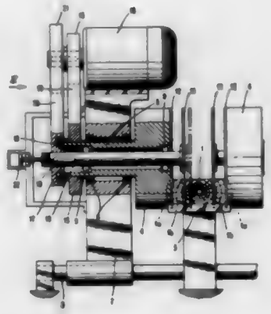
1. In a bottle filling machine having a centering bell with a bushing for slidable movement along a vertical axis on each of a plurality of filler tubes, wherein each filler tube has an enlarged tip portion with a top shoulder for engagement with the lower end of said bushing in said bell to limit downward movement of the bell, the improvement wherein said top shoulder has a downward and outward slope of about 20° to 45° with respect to said vertical axis and wherein a region of said bushing has a downward and outward slope of about 20° to 45° with respect to said vertical axis whereby the top shoulder of said tip portion and the region of said bushing smoothly contact to reduce bouncing of the bell and increase bushing life.

4,691,749

TREE-TRUNK SAWING AND CUTTING INSTALLATION

Alfred Reuter, Oberkirch, Fed. Rep. of Germany, assignor to Gebruder Linck Maschinenfabrik und Eisengiesserei "Gutterlinck" , Oberkirch, Fed. Rep. of Germany

PCT No. PCT/EP85/00186, § 371 Date Dec. 30, 1985, § 102(e) Date Dec. 30, 1985, PCT Pub. No. WO85/05062, PCT Pub. Date Nov. 21, 1985
PCT Filed Apr. 25, 1985, Ser. No. 822,418
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415931
Int. Cl.⁴ B27C *9/00*
U.S. Cl. 144—39 **4 Claims**



1. An apparatus for the cutting and sawing of logs, said apparatus comprising:

a hollow shaft mounted for rotation about its longitudinal axis,

a knife head carried by said hollow shaft and including a first circular saw blade for the production of wood chips from logs,

a saw shaft extending coaxially through said hollow shaft and rotatable about its longitudinal axis relative to said hollow shaft, and linearly displaceable along its longitudinal axis relative to said hollow shaft, means for linearly displacing said saw shaft along its longitudinal axis,

a second circular saw blade carried by said saw shaft so as to be axially spaced from said first circular saw blade for the production of sideboards from the logs, and

drive means for rotating said hollow shaft and for rotating said saw shaft at a faster speed than said hollow shaft so that said second circular saw blade rotates faster than said first circular saw blade.

4,691,750

BARKING MACHINE

Junichi Nakajima, Shizuoka, Japan, assignor to Fuji Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 25, 1986, Ser. No. 889,923
Claims priority, application Japan, Dec. 25, 1985, 60-296587
Int. Cl.⁴ B27C *9/00*
U.S. Cl. 144—208 B **8 Claims**

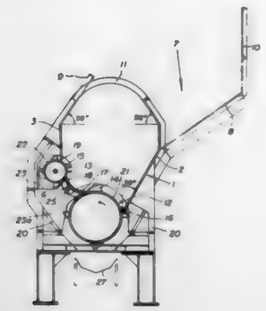
1. A barking machine for removing bark from logs, comprising

a container for receiving said logs to be debarked, having a lengthwise opening formed a lower portion and at a side portion thereof,

a transfer guide plate disposed in said opening,

a plurality of notches formed on both lengthwise sides of said opening,

a cylindrical lower rotor and a side rotor, each said rotor having a plurality of protruding barking blades which pass through said notches, said rotors being partially inserted from the outside of said container into said opening on opposite sides of said transfer guide plate,



said lower rotor being rotated so that its barking blades move said logs toward said transfer guide plate, and

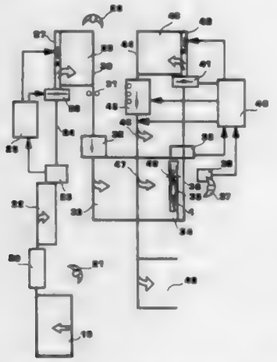
said side rotor being rotated so that said barking blades move upwardly.

4,691,751

METHOD FOR SAWING A TREE TRUNK AND FOR TREATING A UNIFORMLY THICK SLICE OF WOOD SAWED OFF THE TRUNK

Viljo S. Komulainen, Riihimäki, Finland, assignor to Aihiko Ky, Finland

Filed Dec. 20, 1985, Ser. No. 811,641
Claims priority, application Finland, Dec. 21, 1984, 845090; Jan. 8, 1985, 850089
Int. Cl.⁴ B27B *1/00*
U.S. Cl. 144—357 **10 Claims**



10. A method for treating a wood slice of a uniform thickness sawed off a tree trunk, the wood slice have a lengthwise and a cross-wise direction and having a region of varying biological quality grade, the method comprising the steps of:

(a) compiling data of product components having particular dimensions and qualities;

(b) recording the data about desired product components;

(c) observing quality attributes of regions of the wood slice;

(d) defining length-wise quality borders at locations of each wood slice, on the basis of the observed quality regions of the wood slice;

(e) recording data representing the locations of the defined quality borders;

(f) measuring the shape and size of each wood slice;

(g) recording data representing the shape and size of each wood slice measured;

(h) combining the data representing the shape and size of each wood slice with the data representing the location of the quality borders;

(i) computing the maximized value yield of the product components from said data of product components and said combined data representing shape and size of the wood slice and the location of the quality borders;

(j) fitting into each wood slice such product components as represent the maximized value yield;

(k) optimizing cross-cutting lines and sawing patterns on the basis of the product component's fit;

(l) cross-cutting and sawing the wood slice into the desired product components;

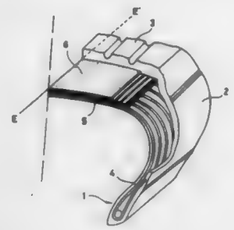
(m) and sorting the product components.

4,691,752

PNEUMATIC RADIAL TIRE

Kazuyuki Kabe, Hiratsuka, and Tuneo Morikawa, Hadano, both of Japan, assignors to Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,590
Claims priority, application Japan, Apr. 30, 1984, 59-86959
Int. Cl.⁴ B60C *9/22*
U.S. Cl. 152—527 **4 Claims**



1. A pneumatic radial tire which comprises:

(1) a pair of left and right bead portions,

(2) a pair of left and right side-wall portions, continuing from the respective bead portions,

(3) a tread portion positioned between the side-wall portions,

(4) a carcass layer provided between the left and right bead portions, a cord angle of which is substantially 90 degrees in relation to the circumferential direction of the tire,

(5) an auxiliary carcass layer, a cord angle of which is substantially 0 degrees in relation to the circumferential direction of the tire, being placed on the tread side of the carcass layer substantially to correspond to the tread portion, so that the carcass layer and the auxiliary carcass layer may be crossed substantially at a right angle to form a net structure, and

(6) a belt reinforcing layer constructed from rubber reinforced with short fibers having a length of not more than 50 mm to provide a tensile rigidity, at the circumferential direction of the tire, of not less than 10-kg/mm2, said belt reinforcing layer being placed on the auxiliary carcass layer substantially to correspond to the tread portion with all belt layers in addition to said auxiliary carcass layer having a cord angle which is substantially 0 degrees in relation to the circumferential direction of the tire.

4,691,753

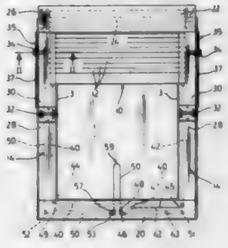
ROLL SHUTTER FOR HINGED-CASEMENT TYPE ROOF WINDOWS

Paul Baier, Reiersbacher Str. 108, D-7592 Renchen, Fed. Rep. of Germany

Continuation of Ser. No. 729,959, May 2, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,205

Int. Cl.⁴ E06B *9/10*

U.S. Cl. 160—32 **12 Claims**



1. A roll shutter for a hinged casement type roof window, comprising:

a shutter frame;

a winding shaft arranged in the frame which supports a wound portion of the roll shutter plating;

two guide rails connected to the shutter frame parallel to each other, each forming a guide groove for the ends of the shutter and are divided at equal distances by the shutter frame, whereby the upper sections of the guide rails connected to the roll shutter frame are connected with the lower sections by respective hinges, the pivot axes of which run parallel to the pivot axis of the hinged casement;

a cross rail connecting the lower sections with each other at their ends opposite the shutter frame;

a roll shutter activation device having a first and a second control cable, which are connected to the lower end of the roll shutter at equal distances from the center of the roll shutter and each of which runs in one of the two guide grooves in the guide rails and past diverting elements provided in the area of the cross rail and through a bore in the frame of the hinged casement and are connected with one end of an activation loop which can be grasped by the user, a third control cable being connected to the other end of the activation loop, said third control cable passing through a bore in the frame in the hinged casement, with the winding shaft, a spool onto which the end of this third control cable is wound, said spool being fixed to the winding shaft;

wherein in the area of the cross rail, first and second loop-forming rollers are provided in addition to the diverting elements, which rollers serve to form a buffer loop, the loop length of which is at least as large as the displacement path of the roller shutter between the entirely closed and entirely opened positions, and wherein the lengths of the first and second control cables attached to the lower end of the roll shutter are selected such that their connection point, at which they are attached to each other and are connected with the third control cable running to the spool, is located within the buffer loop when the roll shutter is completely open and completely closed and;

wherein said diverting elements are located within said guide rails at opposite sides of said frame, said first and second loop-forming rollers are located at opposite sides of said frame, and said connection point is free to move within said buffer loop to any point between one of the diverting elements and the loop-forming roller located on the same side of the frame, passing over the loop-forming roller located on the opposite side of the frame, as the roll shutter is completely opened and completely closed.

4,691,754

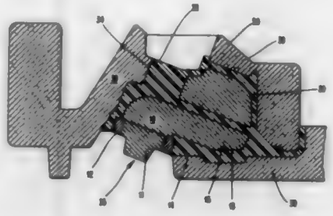
METHOD FOR FORMING CASTINGS HAVING INSERTS

David V. Trumbauer, Denver, Iowa; Larry L. Fosbinder, Moline, Ill., and Terry L. Erion, Janesville, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 31, 1985, Ser. No. 814,970

Int. Cl.⁴ B22C *7/02, 9/10*; B22D *19/00*

U.S. Cl. 164—9 **18 Claims**



1. A core assembly useful in casting metal castings, comprising: at least one insert; a unitary destructible thermoplastic form molded-in-place at least partially about said at least one insert and supporting said at least one insert; and an outer core.

7. A method of casting metal castings including an insert comprising the steps of:

forming a composite core assembly by:

positioning in a mold cavity, which includes at least one core, at least one insert;

molding in said mold cavity a destructible form of plastic material at least partially about said at least one insert and core to form said composite core assembly wherein said at least one insert is supported by said plastic material;

inserting said composite core assembly into a second mold cavity; and

introducing molten metal into said second mold cavity to destroy said plastic form and produce a casting having said at least one insert integral therewith and at least one passage.

4,691,755

DEGASSING APPARATUS FOR A METAL MOLD

Minoru Kuriyama, and Tadashi Yamamoto, both of Yamaguchi, Japan, assignors to Ube Industries, Japan

Filed Dec. 15, 1986, Ser. No. 942,091

Claims priority, application Japan, Dec. 24, 1985, 60-289421; Dec. 24, 1985, 60-289422

Int. Cl.⁴ B22D *17/20*

U.S. Cl. 164—305 **16 Claims**

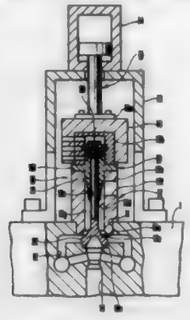
1. A degassing apparatus incorporated with a molding apparatus having a mold cavity, which comprises:

a spool having a bore formed therein, the spool further having formed therein a gas inlet opening adapted to be communicatively coupled to the mold cavity of the molding apparatus, and a gas outlet opening, the gas inlet and outlet openings being in selective communication and non-communication with each other;

means for selectively controlling the communication and non-communication between the gas inlet and gas outlet openings; and

a piston mounted in the bore and coupled to the communication controlling means, the piston being reciprocatingly slidable between a first position and a second position, the bore being further formed with first and second chamber situated on opposite axial sides of the piston;

the spool further including first, second and third fluid ports formed therein, the first and second ports being in communication with the first and second chambers respectively; the piston further having formed therein a first channel interconnecting the first and second chamber, and a second channel interconnecting the third port and the first chamber when the piston is in the first position, wherein the gas inlet and outlet openings are in non-communication, the third port and the first chamber being in non-communication when the piston is in the second position, wherein the gas inlet and outlet openings are in communication.



4,691,757

ARRANGEMENT PROVIDED AT A CONTINUOUS CASTING PLANT

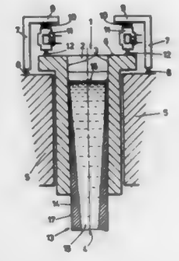
Wolfgang Polanschütz; Lezian Pochmarski, and Alfred Moser, all of Leoben, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 728,301, Apr. 29, 1985, abandoned. This application Aug. 28, 1986, Ser. No. 901,995

Claims priority, application Austria, May 10, 1984, 1537/84

Int. Cl.⁴ B22D *11/04*

U.S. Cl. 164—416 **10 Claims**



1. A continuous casting plant comprising a stationary supporting structure, a continous casting mold defining a mold cavity having a longitudinal axis supported on the structure, antivibration means fastened to the stationary supporting structure and an ultrasonic transducer having two ends, one end of the ultrasonic transducer being fastened to the antivibration means and the other end of the ultrasonic transducer being fastened to the continuous casting mold, thereby supporting said mold and being arranged to transmit ultrasound waves to the entire casting mold in the direction of the longitudinal axis of said mold cavity.

4,691,756

MOLDING MATERIAL AND MOLD

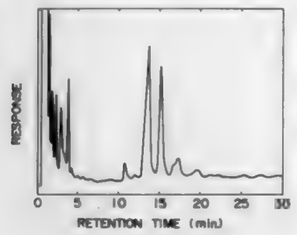
Takatoshi Suzuki; Yasuo Takada; Yuji Sakakibara; Masahiro Sugiura; Hiroaki Hayashi, and Osami Kamigaito, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Aug. 14, 1986, Ser. No. 896,199

Claims priority, application Japan, Aug. 22, 1985, 60-184550; Dec. 2, 1985, 60-271192

Int. Cl.⁴ B22C *1/18, 1/22*

U.S. Cl. 164—361 **14 Claims**



1. A shell mold comprising a cavity defined by a wall or walls into which molten metal is to be poured for producing a casting, wherein at least a part of said wall or walls is formed of thermosetting resin coated castings and and hydrous magnesium silicate clay mineral, and voids are formed among grains of said resin-coated casting sand and said clay mineral, with said resin-coated casting sand and said clay mineral being bonded together, thereby minimizing generation of smoke and irritating gases at the time of casting.

4,691,758

TWO-DRUM, TWO-LAYER CONTINUOUS MELD-CASTING METHOD

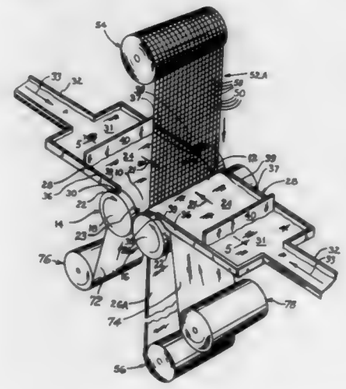
Forrest M. Palmer, 31 Towhee Rd., Hilton Head, S.C. 29928

Continuation-in-part of Ser. No. 540,834, Oct. 11, 1983, abandoned. This application May 2, 1986, Ser. No. 859,070

Claims priority, application Japan, Oct. 11, 1984, 59-213242

Int. Cl.⁴ B22D *11/00, 19/14*

U.S. Cl. 164—461 **17 Claims**



1. The method of meld-casting metallic strip from molten metal comprising the steps of:

providing two closely spaced drums with parallel horizontal axes defining a bite region between them,
revolving said drums in opposite directions at approximately the same surface speed with each drum moving downwardly in the bite region,
cooling said drums for maintaining the drum surfaces below the solidification temperatures of said molten metal,
flowing the molten metal in two shallow pools at controlled velocity in each pool toward the crest of the respective drum with the level of the top surface of the flowing metal being close to the horizontal level of the crest of the drum,
the metal flows in the respective shallow pools being in opposite directions flowing toward each other toward the crest of the respective drum,
causing each drum surface to travel at least 1.5 times the flow velocity in the respective pool immediately adjacent to the crest of the drum for forming thin solidifying layers of liquidous/solidous metal being carried from the crests of the respective drums down toward the bite region, and
melding together in the bite region said two solidifying layers forming a resulting meld-cast strip moving downwardly from the bite region below the bite region.

4,691,759

BINDER FOR DRY SAND MOLD AND METHOD OF ITS USAGE

Masaru Hayakawa, Tokyo; Takeshi Yoshida, Zushi, and Atsushi Kaiya, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,010

Claims priority, application Japan, Jul. 24, 1985, 60-163711; Aug. 9, 1985, 60-175246; Aug. 9, 1985, 60-175247

Int. Cl.[4] B22C *1/22*

U.S. Cl. 164—526 **4 Claims**

1. A method for manufacturing a sand mold for castings which comprises the steps of mixing foundry sand with an aqueous solution of a binder selected from the group consisting of a hydrolyzate of a butadiene/maleic anhydride copolymer, a neutralized or a partially neutralized substance of said hydrolyzate, a modified substance prepared by modifying said hydrolyzate with a basic organic compound, or a mixture thereof so that the amount of the binder in terms of a solid content is within the range of 0.1 to 5 parts by weight based on 100 parts by weight of said foundry sand, and molding, heating, drying and thereby curing the resultant mixture.

4,691,760

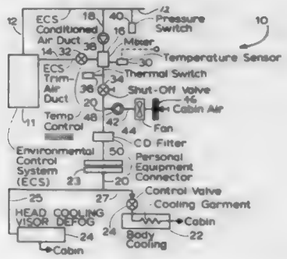
COOLING AND VISOR DEFOGGING SYSTEM FOR AN AIRCRAFT PILOT AND CREW

Alankar Gupta, and Adam J. P. Lloyd, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 9, 1985, Ser. No. 764,436

Int. Cl.[4] F25B *29/00*; **B60H** *1/00*; **B61D** *27/00*; **G05D** *23/00*

U.S. Cl. 165—26 **11 Claims**



1. In an aircraft having an environmental control system that produces both a flow of conditioned cold air in one duct and a flow of conditioned warm air in another duct, a thermal control system providing air conditioning to thermal control apparel worn by an aircraft pilot or crew, the system comprising:
a mixing chamber connected to both said cold and warm air ducts in a manner so as to receive flows of cold and warm air therefrom;
valve means, positioned in said warm air duct, for controlling the amount of warm air flow into said chamber, and wherein said flows of cold and warm air are mixed in said chamber to produce personal conditioning air;
a personal air conditioning conduit connecting said chamber and said flight apparel, for communicating said personal conditioning air from said chamber to said apparel;
means for controlling said valve means, including means for sensing the temperature of said personal conditioning air, wherein said control means operate said valve means to adjust the amount of warm air flowing into said mixing chamber in response to signals generated by said temperature sensing means, such signals indicating the temperature of said personal conditioning air, with such adjustment varying the mixing of cold and warm air in said chamber so that personal conditioning air is communicated to said flight apparel at a preselected comfortable temperature;
a thermal switch, positioned in said personal air conditioning conduit, said switch also sensing the temperature of said personal conditioning air;
shut-off valve means, positioned in said conduit downstream of said thermal switch, for blocking communication of said personal conditioning air from said mixing chamber to said apparel, said shut-off valve means being operated by said thermal switch to block said flow when said switch senses conditioning air temperature that is above a preselected maximum temperature;
means for sensing the pressure of said conditioned cold air; and
means for supplying aircraft cabin air to said flight apparel, said cabin air supply means being responsive to said pressure sensing means in a manner so that cabin air is supplied to said apparel when the pressure of said cold air drops below a certain preselected pressure value, said cabin air supply means being connected to said personal air conditioning conduit in a manner so that cabin air is delivered into said conduit at a position downstream of said shut-off valve means.

4,691,761

HEAT EXCHANGER

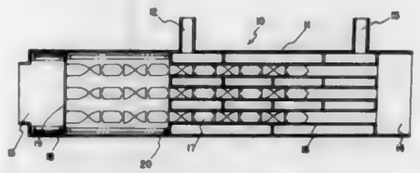
Masahiro Kito, Brighton, and Katsuhiro Mori, Hove, both of England, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 18, 1986, Ser. No. 853,694

Claims priority, application United Kingdom, Apr. 20, 1985, 8510138

Int. Cl.[4] G05D *23/00*

U.S. Cl. 165—32 **4 Claims**



1. A heat exchanger, comprising:
a casing having a first inlet port and first outlet port for a first fluid and a second inlet port and second outlet port for a second fluid;
a plurality of tubes fixedly connected to said casing;
movable turbulence generating means comprising turbulence promoters movably mounted within each of said tubes and between said inlet and outlet ports;
means for detecting a temperature within said second outlet port; and
means within said second outlet port for biasing said turbulence promoters towards said second inlet port in response to a detection of increased temperature in said second outlet port by said detecting means, whereby an area of said turbulence promoters in said tubes is increased and a turbulence effect on flow of said second fluid is changed.

4,691,762

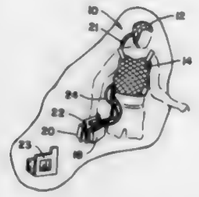
PERSONAL TEMPERATURE CONTROL SYSTEM

William Elkins, San Jose; Eugene W. Connell, Los Gatos, and Robert E. Short, Cupertino, all of Calif., assignors to Life Support Systems, Inc., Mountain View, Calif.

Continuation of Ser. No. 514,771, Apr. 1, 1983, abandoned. This application Mar. 14, 1986, Ser. No. 839,737

Int. Cl.[4] A61F *7/00*

U.S. Cl. 165—46 **12 Claims**



1. A temperature control system for the human body, adapted to be carried on the body of the user comprising:
a first heat exchanger in the form of a garment including a helmet and a separate body vest adapted to be worn by a user and connected together by a fluid conduit, each of the helmet and the body vest including a body of heat conducting material with an elongated fluid-tight passageway, adapted to conduct heat away from the head and torso of the user when worn thereon in heat-conducting relationship;
a second heat exchanger having means for receiving a source of cooling and including a body of heat conducting material with an elongated fluid-tight passageway, positioned to be in heat-conducting relationship with the source of cooling and being portable and having means for supporting it on the human body;
a first coolant conduit loop within which the first heat exchanger garment is positioned, including outlet conduit means from the heat exchanger garment and inlet conduit means to the heat exchanger garment and a bypass conduit extending between the outlet and inlet conduit means, the helmet being positioned upstream of the vest in the first heat exchange garment, whereby the coolant entering the garment from the inlet conduit means is first directed to the helmet and circulates through a series of channels throughout the helmet and is thereby warmed somewhat by heat exchange in the helmet before passing through the vest, so that the temperature differential between the coolant and the human body is less in the vest than in the helmet;
a pump in the first conduit loop, in one of said outlet conduit means and said inlet conduit means and between the heat exchanger garment and the bypass conduit, positioned to pump coolant liquid through the first heat exchanger garment from the inlet conduit means to the outlet conduit means;
a coolant liquid reservoir having an inlet and an outlet positioned in the first coolant conduit loop and containing coolant liquid;
a second coolant conduit loop within which the second heat exchanger is positioned, including said bypass conduit as part of the second conduit loop;
quick-disconnect means for joining the second heat exchanger into the second conduit loop whereby the second heat exchanger may be easily removed from the loop and replaced by another heat exchanger;
adjustable flow valve means connected in the bypass conduit, for adjusting the proportion of liquid coolant flowing from the outlet conduit means through (a) the second coolant conduit loop and (b) the bypass conduit, such valve being adjustable so that all, none or any proportion of the liquid coolant may be directed through the bypass conduit with the remainder, if any, being directed through the second coolant conduit loop, whereby the setting of the adjustable flow valve means regulates the extent to which coolant liquid warmed in the first heat exchanger garment is cooled in the second heat exchanger for return to the heat exchanger garment, and
portability means for securing the liquid reservoir, the pump, the bypass conduit and the adjustable flow valve means on the body of the user whereby the system is easily carried by the user for movement through hostile, high-temperature environments.

4,691,763

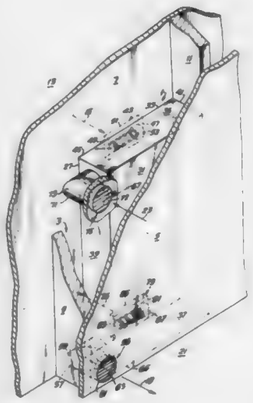
VENTILATOR INCLUDING A DOUBLE PASS COUNTERCURRENT HEAT EXCHANGER

Michael Kennedy, Yonkers, N.Y., assignor to Brother Albert Welsh Foundation, New York, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,791

Int. Cl.[4] F24H *3/02*

U.S. Cl. 165—54 **14 Claims**



1. A ventilator for replacing stale air with fresh air, and for exchanging heat between the stale air replaced and the fresh air, the ventilator comprising:
a fresh air inlet for receiving fresh air;
a fresh air outlet for exhausting fresh air;
a stale air inlet for receiving stale air;
a stale air outlet for exhausting stale air; and
a heat exchanger for exchanging heat between the stale air and fresh air;
wherein the fresh air inlet and outlet and the stale air inlet and outlet each include duct means for coupling the respective inlets and outlets to the heat exchanger such that

fresh air entering and exiting the exchanger is segregated from stale air entering and exiting the exchanger and wherein the exchanger includes conduit means connected to the duct means for establishing a continuous fresh air channel and a continuous stale air channel, the fresh air channel being pneumatically isolated from the stale air channel, and heat transfer means for exchanging heat between air in the fresh air channel and air in the stale air channel, the fresh air channel and the stale air channel being wound one upon the other and upon at least a portion or a ventilator inlet duct means associated with one channel and at least a portion of a ventilator outlet duct means associated with the other channel such that air in the fresh air channel flows in a direction countercurrent to the direction of air flowing in the stale air channel over a majority of the stale air channel length, and such that air in the fresh air channel passes in heat exchange relation to the stale air channel twice.

4,691,764

HEAT EXCHANGER UNIT WITH SUPPORT RING AND RADIAL BRACKETS

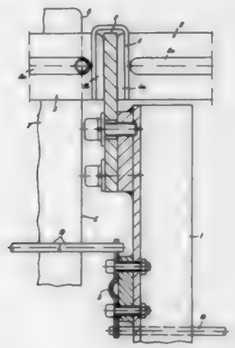
Felix Dürst, Zürich, Switzerland, assignor to Norbert Allenspach, Switzerland

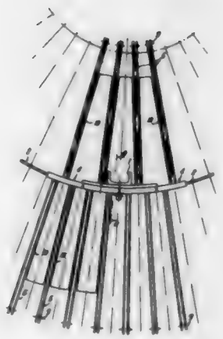
Filed Mar. 13, 1986, Ser. No. 839,357

Claims priority, application Switzerland, Mar. 15, 1985, 1167/85

Int. Cl.⁴ F28F *9/00*

U.S. Cl. 165—68 **5 Claims**





1. A heat exchanger, comprising a support, a plurality of stays mounted at spaced locations on said support, a horizontal bracket secured to each of said stays, a plurality of connected heat exchanger plates having at least one plate with an upper end suspended from said bracket, said plates having heat media carrying channels which are joined together, said brackets project out at intervals from one another from at least one side of said support and lying in a horizontal plane, said heat exchanger comprises a cylindrical tower structure, said support comprising a cylindrical steel ring having a radius, said brackets projecting radially outwardly and inwardly at regular intervals from one another, each of said brackets having a radial length and each of said heat exchanger plates having a radial edge extending along the bracket to which it is connected, the lengths being longer than the edges but shorter than the radius of said steel ring forming said support.

4,691,765

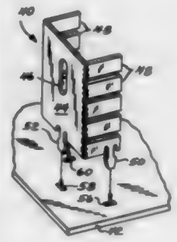
HEAT SINK

George Wozniczka, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 31, 1986, Ser. No. 846,664

Int. Cl.⁴ F28F *7/00*

U.S. Cl. 165—80.3 **9 Claims**



1. A heat sink positioned on a PC board for removing and dissipating heat in the PC board, said PC board having a plurality of spaced elongated apertures therein, said heat sink comprising:

a heat conducting body comprised of a plurality of generally planar members coupled along respective adjacent lateral edges thereof so as to form a unitary, multi-section structure having a generally continuous, flat edge portion thereon; and

a plurality of mounting tabs each attached to a respective planar member of said multi-section heat conducting body along the flat edge portion thereof and adapted for insertion within a respective PC board aperture, each of said mounting tabs having an elongated proximal portion and a distal end portion wider than the proximal portion of said mounting tab, wherein said distal end portion includes beveled cam means adapted for engaging an edge of the PC board aperture within which said mounting tab is inserted when said distal end portion is rotationally displaced about said elongated proximal portion resulting in the twisting thereof and for displacing said heat conducting body toward the PC board whereupon the PC board is positioned in intimate contact with the flat edge portion of said heat conducting body along the length thereof.

4,691,766

FINNED TUBE ARRANGEMENT FOR HEAT EXCHANGERS

Dieter Wurz, Riefstahlstrasse 6, 7500 - Karlsruhe, and Paul Paikert, Brunsbergweg 5a, 5810 Witten, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 630,244, Jul. 12, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,160

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1983, 3325876

Int. Cl.⁴ F28F *13/00, 13/12, 1/10*; F24B *1/06*

U.S. Cl. 165—135 **4 Claims**

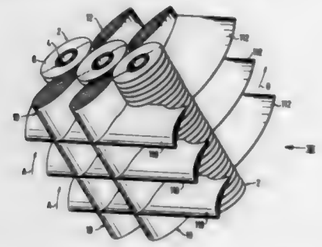
1. In a finned tube heat exchanger assembly including a plurality of parallel tubes each having a plurality of longitudinally-spaced, radially-extending annular fins mounted concentrically thereon, thereby to afford heat transfer between a first fluid medium flowing through the tubes and a second medium flowing externally thereof,

the improvement which comprises

(a) a plurality of first flow guide members arranged parallel to said finned tubes and in the inflow and outflow paths of said second fluid medium with respect to said finned tubes; and

(b) a plurality of second flow guide members arranged transversely of said finned tubes and said first flow guide members in the inflow and outflow paths of said second medium with respect to said finned tubes, said first and second flow guide members arranged in the inflow path defining generally a lattice for directing said second medium across said tubes in a direction normal to the axes thereof;

(c) said first flow guide members each having a symmetrical streamlined configuration relative to a center plane extending in the lengthwise direction thereof and each of said second flow guide members having an airfoil configuration including a first portion of maximum thickness and a second blade portion of minimum thickness arranged on opposite sides of said tubes, said first and second portions being curved to provide each of said second flow guide members with a generally S-shaped configuration, whereby when said second medium is directed toward said second flow guide member first portions, said second medium is directed by said first portions across said tubes in a direction normal to the axis thereof and by said portions to an outlet.



4,691,767

HEAT EXCHANGER

Hiroyoshi Tanaka, Kyoto; Masaaki Adachi, Nara; Yoshiyuki Tsuda, Suita; Shigeo Aoyama, Higashiosaka; Satoshi Tanno, and Kaoru Kato, both of Ohtsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Refrigeration Company, both of Osaka, Japan

Filed Sep. 4, 1985, Ser. No. 772,748

Claims priority, application Japan, Sep. 4, 1984, 59-185948; Jan. 25, 1985, 60-12993; Mar. 6, 1985, 60-44068

Int. Cl.⁴ F28D *1/04*

U.S. Cl. 165—151 **20 Claims**

1. A heat exchanger comprising:

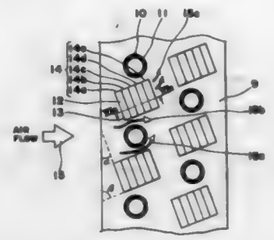
a plurality of flat plate fins arranged parallel to one another at predetermined intervals so as to allow an air stream to flow therebetween, each fin having a leading edge arranged perpendicularly to the air flow; and

a plurality of heat transfer tubes passing through the fins;

each of said fins being provided with a number of groups of successively adjacent first air vents arranged to cross the wake side of the air stream;

each of said first air vents being defined by a first slat having four sides in which two sides, facing the air stream, are opened and the other two sides are provided with leg portions for connecting said first slat with said fin, and

said leg portions in each group of first air vents being aligned with each other and being inclined at a same angle with respect to a line along said fin and normal to said leading edge of said fin such that all of the portion of the air stream passing through each group of first air vents is deflected from the direction of flow thereof upon entering said group normal to said leading edge.



4,691,768

LANCED FIN CONDENSER FOR CENTRAL AIR CONDITIONER

Charles B. Obosu, Nashville, Tenn., assignor to Heil-Quaker Corporation, Lavergne, Tenn.

Filed Dec. 27, 1985, Ser. No. 813,863

Int. Cl.⁴ F28D *1/04*

U.S. Cl. 165—151 **9 Claims**





1. In a finned-tube heat exchanger unit, wherein heat transfer takes place between a first fluid flowing through a plurality of spaced-apart finned tubes and a second fluid flowing outside the finned tubes, a fin comprising:

a thin sheet of a heat conductive material formed into first corrugations of predetermined pitch and height and also formed to have apertures therein spaced at intervals and having substantially cylindrical collars around such apertures of a shape and size to closely fit around said heat exchanger tubes for conductive heat exchange therewith, at least one edge of said sheet formed into second corrugations; and

said fin being shaped around said collar in the form of a shallow conical annular zone that is peripherally faired into said corrugated shape and is inclined with respect to

a plane normal to the axis of said cylindrical collar at an angle of approximately 6°.

4,691,769

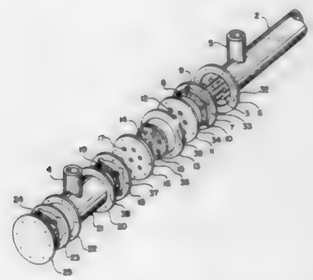
COMPRESSION SEALING OF TUBES WITHIN SHELL AND TUBE HEAT EXCHANGER

Katherine K. Flamm, Baltimore; J. Kyle Gilley, Columbia; David F. Geary, Severna Park, and Edward N. Schinner, Highland, all of Md., assignors to Baltimore Aircoil Company, Inc., Jessup, Md.

Continuation of Ser. No. 647,584, Sep. 5, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,477

Int. Cl.[4] F28F *9/02, 7/00*

U.S. Cl. 165—158 **13 Claims**



1. A shell and tube heat exchanger sealing means comprising a shell and an extension shell for sealing the tubes within the shell so that fluid flowing from the extension shell into the tubes within the shell is separated from the fluid flowing within the shell, which comprises a shell flange and an extension shell flange, two incompressible tube sheets and a tube sheet gasket with holes therethrough for the tubes, a relatively incompressible tube sheet gasket retainer in circumferential arrangement around the tube sheet gasket and two flange gaskets each with a circumferentially arranged flange gasket retainer adjacent to the shell and extension shell flanges, wherein said flange gaskets include protrusions along an outer circumference thereof and said flange gasket retainers include complementary indentations along an inner circumference thereof, wherein the tube sheet gasket and flange gaskets are thicker than the respective tube sheet gasket retainer and flange gasket retainers so as to compress and radially expand the flange gaskets an amount limited to the radial inner dimension of the flange gasket retainers and compress and radially expand the tube sheet gasket an amount limited to the width and radial inner dimension of the sheet gasket retainer so that said gaskets effectively seal the tubes from the inner shell of the shell and tube heat exchanger and to seal the shell and the extension shell from each other and from the atmosphere upon the application of a compressive force applied by tightening bolts extending through holes radially external to the shell in the shell flange and extension shell flange.

4,691,770

WELL CASING PACKER

Roderick D. McLeod, 5104 125th Street, Edmonton, Alberta, Canada T6H 3V5

Filed Dec. 27, 1985, Ser. No. 813,927

Claims priority, application Canada, Apr. 3, 1985, 478275

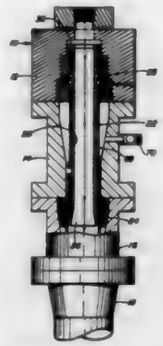
Int. Cl.[4] F21B *33/04*

U.S. Cl. 166—73 **3 Claims**

1. A short-coupled well casing packer comprises a body adapted for external mounting on a casing head, tubing spool or the like;

concentric inner and outer mandrels supported in said body, said outer mandrel being adapted to be restrained to the casing head and said inner mandrel being movable axially with respect to said outer mandrel;

high pressure seal means on the lower end of said outer mandrel for circumferentially sealing against the inner wall of the casing; means on the lower of end of said inner mandrel for engaging and expanding said seal means;



hydraulic pressure responsive means in said body and secured to said inner mandrel for linearly moving said inner mandrel with respect to said outer mandrel;

and means for locking said inner mandrel in position relative to said outer mandrel.

4,691,771

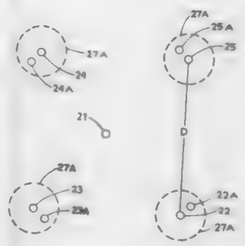
RECOVERY OF OIL BY IN-SITU COMBUSTION FOLLOWED BY IN-SITU HYDROGENATION

Charles H. Ware, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to WorldEnergy Systems, Inc., Fort Worth, Tex.

Continuation of Ser. No. 653,905, Sep. 25, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 908,885

Int. Cl.[4] E21B *43/243, 43/30*

U.S. Cl. 166—245 **6 Claims**



1. A method of recovering petroleum from an underground formation, comprising the steps of:

by way of a first well penetrating said formation, injecting at least oxygen into said formation and subjecting the petroleum in said formation surrounding said first well to in-situ combustion to heat said formation in a zone surrounding said well,

terminating the injection of oxygen into said formation,

injecting hydrogen into said heated formation zone by way of said first well,

by way of a second well, penetrating said formation and spaced from said first well, injecting into said formation, fluid to drive fluids including petroleum, in said formation between said second well and a third well, to said third well,

said third well being located near said first well such that said third well penetrates said heated formation zone,

said petroleum in said formation between said second well said third well being driven through said heated formation zone surrounding said third well and in the presence of hydrogen, hydrogenation of said petroleum occurs, and

by way of said third well, recovering petroleum driven to said third well.

4,691,772

PROCESS FOR OBTAINING PERMEABILITY LOGS USING RADIOACTIVE DRILLING MUD ADDITIVES

Ben W. Ebenhack, Fullerton, and Robert J. Floran, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 22, 1985, Ser. No. 725,398

Int. Cl.[4] E21B *47/04, 49/00;* **G01V** *5/00*

U.S. Cl. 166—254 **21 Claims**

1. A method for determining the permeability profile of a borehole penetrating a subterranean formation, said method comprising:

a. drilling a borehole into a subterranean formation using a drilling mud containing substantially evenly distributed particles bearing a gamma ray emitting nuclide so that a substantial portion of the particles accumulates along the face of the wellbore in a filter cake;

b. making a gamma spectroscopic log of the borehole bearing the substantially intact filter cake while the formation is being drilled; and

c. determining the permeability profile of the subterranean formation from the log of the borehole bearing the filter cake.

4,691,773

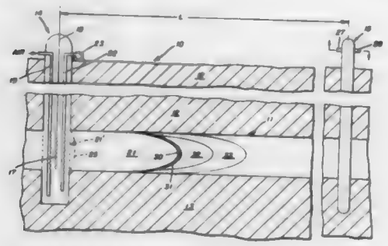
INSITU WET COMBUSTION PROCESS FOR RECOVERY OF HEAVY OILS

George D. Ward, Washington, and Charles E. Ward, West Redding, both of Conn., assignors to Ward Douglas & Co. Inc., Washington Depot, Conn.

Continuation-in-part of Ser. No. 657,723, Oct. 4, 1984, abandoned. This application Jul. 26, 1985, Ser. No. 759,359

Int. Cl.[4] E21B *43/24, 43/243*

U.S. Cl. 166—261 **15 Claims**



1. In the process for the recovery of petroliferous products from a subterranean formation containing said products by insitu wet combustion, the improvement comprising first, initiating the conventional wet combustion process in the usual manner by injecting an oxygen containing stream into said formation through an injection well, obtaining ignition of the petroliferous material in the formation by use of an igniter or other means, initiating the addition of liquid water to said oxygen containing stream being injected into said formation through said injection well, and collecting the gases produced and liquid products from one or more surrounding production wells, and then:

(a) introducing, after combustion has been initiated, in a first stage operation into said formation upstream of the flame front an initial amount of fluids containing oxygen in which the concentration of free uncombined molecular oxygen is controlled, by adjusting the amount of said liquid water stream added to said oxygen containing stream, to be sufficiently high that the flame is not quenched below its ignition temperature and a significant hot zone is established upstream of the flame front having a desired operating temperature range, and

(b) subsequently, in a second stage operation, introducing in said formation upstream of said flame front fluids containing free uncombined molecular oxygen in which the concentration of free uncombined molecular oxygen is reduced, by adjusting the amount of said liquid water stream added to said oxygen containing stream, to the point such that the total sensible heat carrying capacity of the fluids entering the flame zone exceeds the heat carrying capacity of a first portion of the formation entering the flame zone at the velocity of movement of said flame front, thereby producing a substantial increase in the temperature of a second portion of said formation downstream of said flame front and creating a downstream hot zone downstream of said flame front in which substantial amounts of petroliferous products are cracked.

2. In the process for the recovery of petroliferous products from a subterranean formation containing said products by insitu wet combustion, the improvement comprising first, initiating the conventional wet combustion process in the usual manner by injecting an oxygen containing stream into said formation through an injection well, obtaining ignition of the petroliferous material in the formation by use of an igniter or other means, initiating the addition of steam to said oxygen containing stream being injected into said formation through said injection well, and collecting the gases produced and liquid products from one or more surrounding production wells, and then:

(a) introducing, after combustion has been initiated, in a first stage operation into said formation upstream of the flame front an initial amount of fluids containing oxygen in which the concentration of free uncombined molecular oxygen is controlled, by adjusting the amount of said steam added to said oxygen containing stream, to be sufficiently high that the flame is not quenched below its ignition temperature and a significant hot zone is established upstream of the flame front having a desired operating temperature range, and

(b) subsequently, in a second stage operation, introducing in said formation upstream of said flame front fluids containing free uncombined molecular oxygen in which the concentration of free uncombined molecular oxygen is reduced, by adjusting the amount of said steam added to said oxygen containing stream, to the point such that the total sensible heat carrying capacity of the fluids entering the flame zone exceeds the heat carrying capacity of a first portion of the formation extering the flame zone at the velocity of movement of said flame front, thereby producing a substantial increase in the temperature of a second portion of said formation downstream of said flame front and creating a downstream hot zone downstream of said flame front in which substantial amounts of petroliferous products are cracked.

4,691,774

NOVEL FERROFLUIDS FOR USE IN CEMENTING WELLS

Erik B. Nelson, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Nov. 15, 1985, Ser. No. 798,527

Int. Cl.[4] E21B *33/16*

U.S. Cl. 166—291 **3 Claims**

1. A method of preparing a well for cementing comprising:

(a) injecting into the annulus separating a casing and the formation a stable ferrofluid comprising an aqueous spacer or wash containing finely divided magnetic particles, and

a binding agent or surfactant in an amount sufficient to render the composition stable in a magnetic field, and

(b) applying a magnetic field to cause a mechanical response of said ferrofluid in the annulus.

3. A method of cementing a well comprising the steps of:

(a) injecting a stable ferrofluid into the annulus separating a casing and a subterranean formation wherein said ferrofluid comprises an aqueous spacer or wash containing finely divided magnetic particles and a binding agent or surfactant in an amount sufficient to render the composition stable in a magnetic field, and,

(b) applying a magnetic field to cause a mechanical response of said stable ferrofluid in the annulus, and

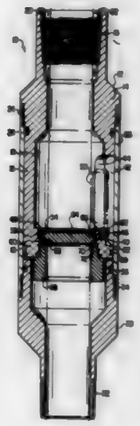
(c) displacing said stable ferrofluid with a stable cementitious ferrofluid comprising: (i) a hydraulic cement, (ii) finely divided magnetic particles, (iii) a binding agent or a surfactant, and (iv) a liquid medium, said binding agent or surfactant being present in an amount sufficient to render the composition stable in a magnetic field.

4,691,775

ISOLATION VALVE WITH FRANGIBLE FLAPPER ELEMENT

Lee M. Lustig, Garland, and Gary D. Ellis, Richardson, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 25, 1986, Ser. No. 843,910
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—317 **8 Claims**



1. An isolation valve comprising:

(a) a tubular member;

(b) a flapper mounted for pivotal movement within the tubular member between a closed and an open position;

(c) the flapper including a frangible member disposed for reopening when the flapper is in the sealing position.

4,691,776

RETRIEVABLE WELL SAFETY VALVE WITH EXPANDABLE EXTERNAL SEALS

Ronald E. Pringle, Houston, Tex., assignor to Cameo, Incorporated, Houston, Tex.

Filed May 29, 1986, Ser. No. 868,916
Int. Cl.[4] E21B *34/10*
U.S. Cl. 166—319 **7 Claims**

1. A retrievable subsurface well safety valve for controlling fluid flow through a well conduit having a polished bore comprising,

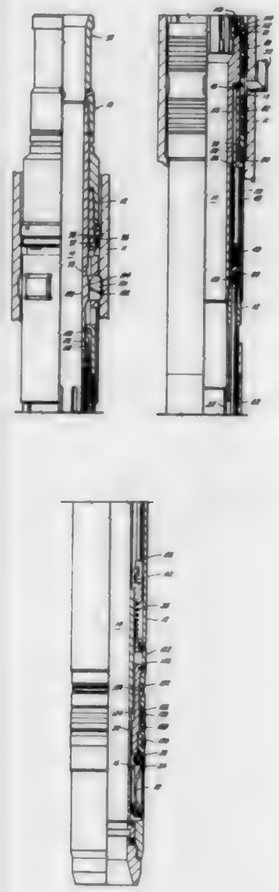
a tubular housing having a fluid control port and having a bore and having a valve closure member moving between open and closed positions for controlling the fluid flow through the bore,

a flow tube telescopically moving in the housing for controlling the movement of the valve closure member,

biasing means for moving the flow tube in a direction to close the valve,

piston and cylinder assembly means in the housing, said assembly engaging the flow tube and said assembly exposed to the fluid port for receiving control fluid for actuating the assembly and flow tube,

external means supported by the housing for sealing in the polished bore of the well conduit, said seal means including a first seal having a first and second end, the first end



abutting the housing for preventing movement of the first end, a longitudinally movable piston abutting the second end of the first seal, said first seal initially having an outer periphery of a size less than the size of the inner periphery of the polished bore and less than the maximum outside diameter of the housing, said seal means including a second seal connected to the piston for moving the piston against the first seal for expanding the first seal into engagement with the polished bore, said second seal sized to form an interference fit with the polished bore for actuating the piston upon the application of fluid pressure on the second seal,

means for holding the first seal means in an expanded position,

an additional external seal means on the exterior of the housing on each side of the fluid control port,

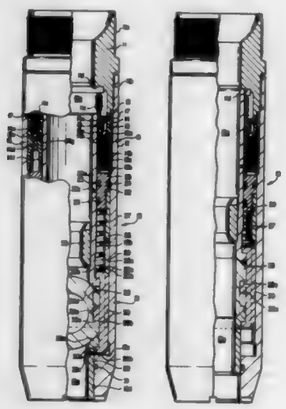
each additional seal means including a third seal having a first and second end, the first end of the third seal abutting the housing for preventing movement of the first end, a longitudinally movable piston abutting the second end of the third seal, said third seal initially having an outer periphery of a size less than the size of the inner periphery of the polished bore and less than the outside diameter of the housing, and including a fourth seal connected to the piston and exposed to the port for moving the piston against the third seal for expanding the third seal into engagement with the polished bore, said fourth deal sized to form an interference fit with the polished bore for actuating the piston upon application of fluid pressure to the port, and means for holding the third seal in an expanded position.

4,691,777

STANDING AND INJECTION VALVE

Jimmie R. Williamson, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 7, 1986, Ser. No. 849,125
Int. Cl.[4] E21B *37/00*
U.S. Cl. 166—319 **11 Claims**



1. A standing valve comprising:

(a) a housing having a longitudinal flow passage therethrough and at least one lateral port in the housing wall communicating between said flow passage and the valve exterior;

(b) annular valve means in said housing for controlling flow through said lateral port;

(c) first operator means for operating said annular valve means between open and closed positions;

(d) second operator means for moving said annular valve means to open position permitting two-way flow between the valve exterior and said housing flow passage through said lateral port; and

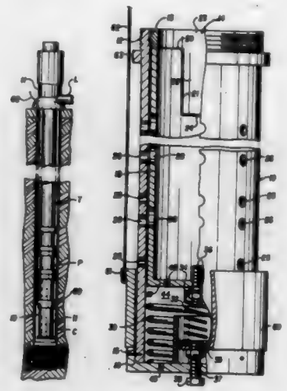
(e) control means for controlling pressure required to operate said second operator means.

4,691,778

DOWNHOLE WATER FLOW CONTROLLER FOR AQUIFER STORAGE RECOVERY WELLS

R. David G. Pyne, 540 NE. 5th Ave., Gainesville, Fla. 32601

Filed Feb. 9, 1987, Ser. No. 13,078
Int. Cl.[4] E21B *34/08*
U.S. Cl. 166—320 **21 Claims**



1. A downhole flow control device for continuous automatic control of water flowing into or out of wells, aquifers and the like through pipe columns including pump columns and injection pipes so as to prevent cascading during recharging comprising a first tubular member having upper and lower ends and side walls, said upper end of said first tubular member being mounted to the pipe column so as to be in fluid communication therewith, said lower end of said first tubular member being substantially closed, a second tubular member mounted concentrically within and proximate to said first tubular member and having an open upper end and side walls and a substantially closed lower end, a plurality of first and second openings through said side walls of said first tubular member, said first openings being spaced in vertical relationship to said second openings, a plurality of third openings through said second tubular member, said second tubular member being vertically movable with respect to said first tubular member so as to selectively align said third openings with either of said first and second openings, biasing means located between said lower ends of said first and second tubular members for normally urging said second tubular member vertically upward with respect to said first tubular member, said biasing means being yieldable upon the introduction of water into the pump column to permit said second tubular member to be vertically displaced relative to said first tubular member to thereby close said third openings with respect to said first or second openings and thereafter permitting said third openings to align with one of said first and second openings dependent upon the direction of fluid flow within the pipe column.

4,691,779

HYDROSTATIC REFERENCED SAFETY-CIRCULATING VALVE

Michael E. McMahan; Daniel A. Newman; Donald W. Winslow, all of Duncan, and Gary D. Zunkel, Chickasha, all of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 17, 1986, Ser. No. 820,289
Int. Cl.[4] E21B *34/08*
U.S. Cl. 166—321 **65 Claims**

1. An annulus pressure responsive downhole tool apparatus, comprising:

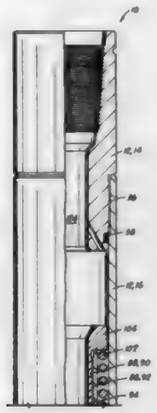
a housing;

an operation element means disposed in said housing and

movable from a first element position to a second element position relative to said housing;

a hydrostatic pressure referenced, pressure balanced with respective to hydrostatic pressure, annulus pressure responsive first piston means disposed in said housing, said first piston means being movable from a first to a second position thereof relative to said housing in response to an increase in well annulus pressure;

a lower than hydrostatic referenced annulus pressure responsive second piston means, disposed in said housing



and operatively associated with said operating element means, for permitting said operating element means to move from said first element position to said second element position in response to movement of said second piston means from a first position toward a second position thereof relative to said housing; and

a prevention means, operatively associated with said first and second piston means, for preventing said seconds piston means from moving to its said second position until said first piston means has moved at least part way toward its said second position.

4,691,780

SUBSEA WELLHEAD STRUCTURE

Edward M. Galle, Jr.; Kevin Gendron, and Paul C. Berner, Jr., all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

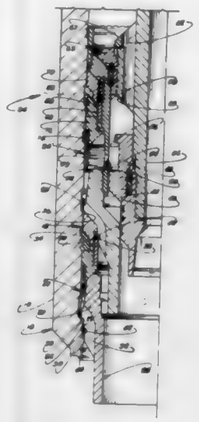
Filed Jun. 3, 1985, Ser. No. 740,523
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—348 **17 Claims**

1. A subsea wellhead structure comprising

a casing hanger having an exterior downwardly facing shoulder, a central bore, an upper internal threaded surface and an upper exterior surface tapered downwardly and outwardly,

a seal assembly including a metal seal sleeve having downwardly extending fingers, and an intermediate sealing portion including an internal annular bulbous metal sealing surface and an external cylindrical metal sealing surface,

means for latching said sealing assembly in set position,



a protector sleeve, and

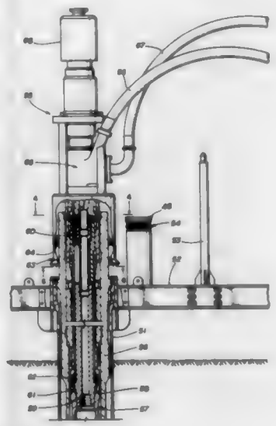
means releasably securing said protector sleeve to said seal assembly and said latching means.

4,691,781

WELL DRILLING AND COMPLETION APPARATUS

John C. Gano, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 28, 1986, Ser. No. 867,499
Int. Cl.[4] E21B *33/035*
U.S. Cl. 166—368 **7 Claims**



1. A wellhead comprising:

casing head means in said wellhead;

tubular hanger means supported in said casing head means;

cooperative seal means between said casing head means and said tubing hanger means, and hold-down means between said casing head means and said tubing hanger means;

said cooperative seal means and hold-down means permitting tilting of said tubing hanger means relative to said casing head means while maintaining said tubing hanger means in its supported position in said casing head means and said seal means in sealing relationship with said casing head means and said tubing hanger means; and

wellhead connector means releasably secured to said tubing hanger means.

4,691,782

METHODS FOR IMPACT AND VIBRATION DAMPING AND ARTICLES THEREFOR

Clifford R. Stine, Setauket, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 564,218, Dec. 22, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,190
Int. Cl.[4] A01L *7/02;* **A43B** *13/12, 13/40;* **F16M** *13/00*
U.S. Cl. 168—12 **18 Claims**

1. A method for dynamic force damping including the steps of

(a) affixing to one object a pad comprising a material having the damping, energy absorption, dimensional stability and liquid absorption characteristics of an elastoplastic blend including:

(1) 25–50 parts of a first polymer prepared from a monomer selected from the group consisting of olefin, substituted olefin, and unsaturated vinyl acetate monomers, and

(2) 25–80 parts of conjugated diene butyl rubbery material;

(b) subjecting the object to impact or vibrating force relative to a second object whereby significant energy is dissipated as heat in the pad.

18. In combination,

(a) a horseshoe,

(b) a pad comprising a blend of 30–70 parts polyolefin and 25–60 parts conjugated diene butyl rubbery material said pad being essentially moisture non absorbent, dimensionally stable and capable of dynamic shock damping by converting a measurable amount of shock impact energy into heat, and

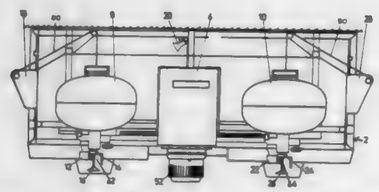
(c) means to permit affixing said horseshoe to a horse with said pad disposed therebetween.

4,691,783

AUTOMATIC MODULAR FIRE EXTINGUISHER SYSTEM FOR COMPUTER ROOMS

Geoffrey S. Stern, New York, N.Y. Israel; Zion Avni, Kfar Saba, Israel; Amos Gonen, Herzliya, Israel, and Amiram Peleg, Beit Yehoshua, Israel, assignors to Spectronix Ltd., Tel-Aviv, Israel

Filed Mar. 6, 1986, Ser. No. 836,682
Int. Cl.[4] A62C *35/02, 37/04*
U.S. Cl. 169—61 **13 Claims**



1. A module for use in a fire extinguishing system and comprising:

a housing, having a bottom panel;

detector means extending through a first hole in said bottom panel to just below the plane of said bottom panel, for detecting characteristics of a fire or an incipient fire;

control means adapted to be actuated by detection at said detector means;

fire extinguishing means adapted to be discharged by said control means, said fire extinguishing means comprising at least one container filled with extinguishing agent and terminated by a discharge valve, and a nozzle connected to said discharge valve, said nozzle comprising a deflector, extending through a second hole in said bottom panel distinct from said first hole and ending just below said bottom panel so that said bottom panel acts as a shield against turbulence; and;

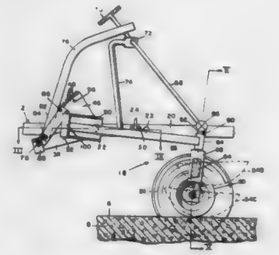
a winch assembly, comprising a pulley and pulley line, connected to the top of said at least one container for lowering said at least one container.

4,691,784

LAWN EDGER ATTACHMENT FOR TRACTORS

David L. Mullet, Sarasota, Fla., and Ivan W. Bontrager, Hesston, Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Sep. 2, 1986, Ser. No. 902,516
Int. Cl.[4] A01D *34/84*
U.S. Cl. 172—15 **12 Claims**



1. A lawn edger attachment for a tractor comprising:

a. a base member,

b. means for attaching said base member rigidly but removably to the frame of said tractor,

c. an elongated boom normally extending laterally outwardly from said tractor at an acute angle to the direction of travel of the tractor,

d. a universally pivotal connection joining the inner end of said boom to said base member,

e. a circular, generally planar cutting blade disposed beneath the extended end of said boom in a generally vertical plane, being mounted on said boom both for rotation about its own axis and for rotation about a generally vertical axis relative to said boom,

f. a manual operating lever connected to said boom and extending to a position accessible to the operator of the tractor, said lever being operable by forward and rearward movement thereof to pivot said boom on the horizontal axis of said universal pivotal connection, and by lateral movement thereof to pivot said boom on the vertical axis of said universal connection, said horizontal and vertical axes of said universal connection being offset relatively to each other in a direction longitudinal to said boom, whereby said boom may be pivoted about said horizontal axis to lift said boom and said blade with less manual force applied to said operating lever than would be required if said horizontal and vertical axes were both disposed at the same longitudinal point of said boom,

g. manually operable means for turning said blade on its vertical axis relative to said boom, and

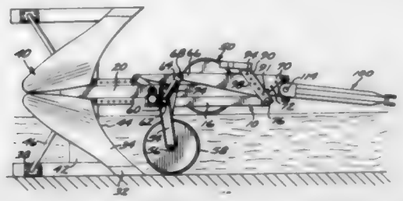
h. manually operable means for pivoting said boom on the horizontal axis of said universal connection to press said blade into penetrating relation to the ground.

4,691,785

REVERSIBLE PLOW AND CARRIAGE

Charles R. Post, Midway City, Calif., assignor to Post Brothers Construction Co., Orange, Calif.

Filed Mar. 18, 1985, Ser. No. 712,881
Int. Cl.[4] A01B *63/16, 3/30*
U.S. Cl. 172—212 **20 Claims**



1. In a carriage having at least one support wheel mounted on each of its left and right sides with wheel lift assembly means for a controlled, variable elevational position of each wheel, the improvement comprising:
(a) a carriage frame having at least one longitudinal member and front and rear cross members;
(b) said wheel lift assembly means comprising a main axle and a wheel lift shaft extending laterally across, and secured at spaced-apart positions to, said carriage frame;
(c) right and left wheel forks, each with a fork knuckle on one thereof, each said fork knuckle pivotally received over an opposite end of said main axle, and said right and left wheel forks each distally supporting a wheel axle on the other end thereof;
(d) right and left wheels comprising said at least one support wheel, one each rotatably received on its respective one of said wheel axles supported by said wheel forks;
(e) right and left fork arms, one each fixedly secured to and projecting from its respective wheel fork;
(f) right and left wheel lift levers pivotally mounted on said lift shaft at opposite ends thereof, and each having a first plurality of spaced-apart apertures;
(g) right and left lift links, one each distally and pivotally attached to its respective one of said fork arms and extending to its respective one of said lift levers and having a second, like plurality of apertures at equal spaced-apart intervals to said first plurality of apertures whereby respective pairs of apertures of said first and second pluralities of apertures are aligned in at least one position of said wheel lift assembly means;
(h) right and left removable pin means, one each inserted in a preselected, aligned pair of said apertures; and
(i) means to rotate said lift shaft whereby said lift assembly means displaces said right and left wheels a controlled vertical distance as determined by the insertion of its respective one of said pin means in a preselected aligned pair of said apertures.

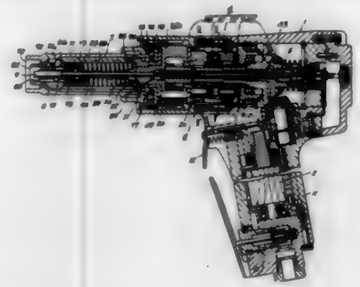
4,691,786

BOLT-NUT TIGHTENING DEVICE HAVING MEANS FOR PREVENTING ABNORMAL ROTATION

Manabiro Fujita, Sennan, and Yukio Uemura, Yokohama, both of Japan, assignors to Maeda Metal Industries Ltd., Osaka and Nissan Motor Co., Ltd., Kanagawa, both of, Japan

Continuation of Ser. No. 624,174, Jun. 25, 1984, abandoned.
This application Jun. 27, 1986, Ser. No. 879,520
Claims priority, application Japan, Jun. 30, 1983, 58-102303[U]
Int. Cl.[4] B23Q *5/00*
U.S. Cl. 173—12 **4 Claims**

1. A device for securing a fastener with a nut, said fastener having a head, a threaded shank and a sheer-off tip of polygonal cross section, said device comprising;
(a) a housing;
(b) a motor controlled by a switch means;
(c) an epicyclic gear train in said housing and including a tubular internal gear case, a sun gear driven by said motor and a planet gear support frame having planet gears in constant mesh with said sun gear and said tubular internal gear case;
(d) means between said tubular gear case and said housing for preventing the rotation of said tubular internal gear case in the nut loosening one direction;
(e) an outer nut engaging socket connected to and driven by



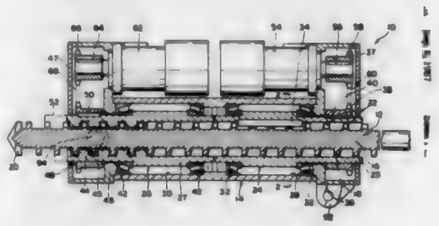
said tubular gear case in a direction for tightening said nut on said threaded shank; and
(f) an inner tip engaging socket connected to the planet gear support frame and driven in a direction opposite to the direction of said outer nut engaging socket;
wherein said means between said tubular gear case and said housing for preventing the rotation of said tubular internal gear case in said nut loosening one direction prevents abnormal rotation of the tubular internal gear case integrally together with and in the same direction as the inner socket.

4,691,787

EARTH AUGER

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 830,842
Int. Cl.[4] B23Q *5/33*
U.S. Cl. 173—145 **6 Claims**



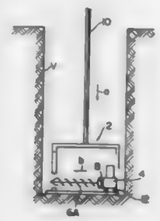
1. An earth auger comprising:
a drilling screw for cutting into and excavating earth, having a shaft portion, a blade portion formed spirally around said shaft portion, a bit portion secured to one end of said shaft portion and having substantially the same diameter as said blade portion, and notches arranged axially linearly on said blade portion;
a case for the screw;
a first rotary member supported rotatably about said shaft portion in the case to surround partially said screw and having a key engaging said notches of said screw;
a second rotary member disposed coaxially with said first rotary member and supported rotatably about said shaft portion in said case and having a thread groove meshing with said blade of said screw; and
drive mechanisms for rotating said first rotary member to rotate said screw and said second rotary member to move said screw along the longitudinal axis of the shaft portion.

4,691,788

LATERAL HOLE BORING METHOD AND APPARATUS

Shoji Yoshida, Funabashi; Yasuhiko Haru; Etsuji Kosaka, both of Yokohama; Toshimichi Ikeda, Ibaraki; Mikio Aoyama, Matsudo, and Takeo Iida, Tokyo, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd. and Tokyo Gas Co., Ltd., both of Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,735
Claims priority, application Japan, Jul. 4, 1984, 59-137094; Jul. 4, 1984, 59-137095; Jul. 4, 1984, 59-137096; Jul. 4, 1984, 59-137097; Jul. 4, 1984, 59-100010[U]
Int. Cl.[4] E21B *7/00*
U.S. Cl. 175—62 **17 Claims**



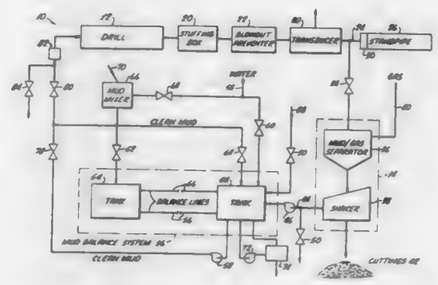
1. A method of boring a lateral hole underground the method comprising the steps of:
(a) preparing a vertical hole of a desired depth extending from a surface of the ground into the earth;
(b) preparing a lateral hole boring apparatus, a leading sugar of a length smaller than a diameter of the vertical hole, and a plurality of coupling augers each of a length smaller than the diameter of the vertical hole;
(c) attaching the leading auger to the lateral hole boring apparatus outside said vertical hole;
(d) lowering the lateral hole boring apparatus equipped with the leading auger into the vertical hole and stopping the apparatus in a desired position in the vertical hole;
(e) manipulating said lateral hole boring apparatus from the ground level to drive and advance said leading auger to bore a lateral hole;
(f) stopping the driving and advancing of the leading auger when the lateral hole has reached a predetermined length commensurate with the length of the leading auger;
(g) manipulating the lateral hole boring aparatus from the ground level to detach the leading auger from lateral hole boring apparatus;
(h) lifting the lateral hole boring apparatus above the vertical hole while leaving the leading auger in the lateral hole;
(i) attaching one of the coupling augers to the lateral hole boring apparatus outside the vertical hole;
(j) lowering the lateral hole boring apparatus equipped with the coupling auger into the vertical hole again until it reaches the predetermined position;
(k) manipulating the lateral hole boring apparatus from the ground level to connect to the coupling auger to the leading auger left behind in the lateral hole;
(l) repeating the steps (e) to (k) until the lateral hole has reached a predetermined final length.
(m) manipulating the the lateral hole boring apparatus from the ground level, after the lateral hole of the predetermined final length has been formed, to rearwardly move the leading auger and all coupling augers disposed in the lateral hole a distance corresponding to a length of one coupling auger;
(n) manipulating the lateral hole boring apparatus from the ground level to detach the extremity trailing auger of the rearwardly moved augers from the rest of the augers;
(o) lifting the lateral hole boring apparatus equipped with the extremity trailing auger above the vertical hole while leaving the rest of the augers in the lateral hole;
(p) detaching the extremity trailing auger from the lateral hole boring apparatus outside the vertical hole;
(q) again lowering the lateral hole boring apparatus into the vertical hole until the hole boring apparatus reaches the predetermined position;
(r) manipulating the lateral hole boring apparatus from the ground level to make the lateral hole boring apparatus grasp the next trailing auger remaining in the lateral hole;
(s) and repeating the steps (m)–(r) until all the augers including the leading auger have been withdrawn from the lateral hole and returned to the ground level.

4,691,789

PROCESS FOR ESTABLISHING A CLEAR HORIZONTAL BOREHOLE IN A SUBTERRANEAN FORMATION

Walter L. Richards, Huntington Beach, Calif.; Roger L. Henderson, Bluefield, W. Va.; George N. Aul, Richlands, Va., and Barry W. Pauley, West Blocton, Ala., assignors to Methane Drainage Ventures, Placentia, Calif.

Filed Jun. 9, 1986, Ser. No. 871,903
Int. Cl.[4] E21B *7/20*; E21D *10/00*
U.S. Cl. 175—62 **16 Claims**



1. A process for establishing a clear, generally horizontal borehole path in a subterranean formation having sloughing or caving characteristics, said process comprising the steps of:
drilling a generally horizontal borehole into a subterranean formation having sloughing or caving characteristics using a drill bit and drill pipe;
lubricating the drill bit and drill pipe with a mud capable of forming a cake on the borehole walls;
withdrawing the drill bit and drill pipe and thereafter replacing the drill bit with a casing shoe, said cake maintaining borehole wall integrity while the drill pipe is removed from the borehole;
inserting the casing shoe and drill pipe into the borehole;
simultaneously inserting a liner into the generally horizontal borehole inside of the drill pipe; and,
removing the drill pipe and casing shoe while holding the liner within the borehole, said casing shoe passing on the outside of said liner as it is removed, said liner providing a clean path through the borehole.

4,691,790

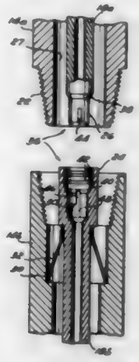
METHOD AND APPARATUS FOR REMOVING THE INNER CONDUIT FROM A DUAL PASSAGE DRILL STRING

James M. Reichman, Issaquah; Michael C. McDonald, Sumner, both of Wash., and T. B. O'Brien, Midland, Tex., assignors to Flowdril Corporation, Kent, Wash.

Continuation-in-part of Ser. No. 661,368, Oct. 16, 1984, Pat. No. 4,624,327. This application Mar. 5, 1985, Ser. No. 708,245

Int. Cl.[4] E21B *7/18, 17/18;* F16L *17/00*

U.S. Cl. 175—67 19 Claims



1. A method for removing the inner conduit from a dual conduit drill string used in drilling holes for geothermal, oil, and gas wells, and the like, to permit use of emergency or salvage procedures, comprising:

a. providing a standard drill pipe section;

b. modifying said standard drill pipe section to form an interior support;

c. engaging an inner conduit section with said interior support;

d. joining the modified drill pipe sections at joints to form a drill pipe string;

e. joining a plurality of said inner conduit sections at lockable joints to form an inner conduit string;

f. locking said lockable inner conduit joints; and

g. exerting an upward force on said inner conduit to remove the entire inner conduit string from said drill pipe string.

4,691,791

KNURLED DRILL STEM

Pierre R. Fillet, Paris, France, assignor to Vallourec, Paris, France

Filed Aug. 16, 1984, Ser. No. 641,562

Claims priority, application France, Aug. 17, 1983, 83 13379

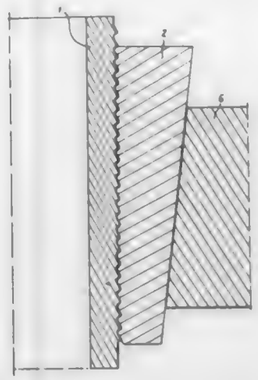
Int. Cl.[4] E21B *17/00, 19/10;* F16B *2/12*

U.S. Cl. 175—320 8 Claims

1. A device for holding a drill stem for use in sinking shafts in the ground comprising:

a drill stem body having on its periphery a surface of revolution with a generatrix comprising a succession of contiguous concave rounded profiles with a substantially toric shape, an upper end of said concave rounded profiles being extended with a substantially flat conical surface and an under end of said concave rounded profiles being extended with a substantially conical surface; and

a self gripping slip means adapted to hold said drill stem, said slip means having a surface of revolution with a generatrix comprising a succession of contiguous convex rounded profiles having a shape complementary to the shape of



said contiguous concave rounded profiles on the periphery of said drill stem body.

4,691,792

METHOD AND APPARATUS FOR MEASURING NET WEIGHT OF LOAD LOADED ON VEHICLE

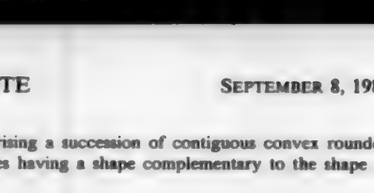
Fumio Shintani, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 757,979

Claims priority, application Japan, Jul. 27, 1984, 59-155200

Int. Cl.[4] G01G *19/10, 5/04;* G06F *15/20*

U.S. Cl. 177—1 5 Claims





1. A method for measuring the net weight of the load on a vehicle, which comprises the steps of detecting the axial force applied to each of suspension cylinders mounted between the vehicle body and axles on which wheels are journaled, and then compensating the detected axial force in accordance with respective mounting angles of links of linkage mechanisms mounted in the periphery of the axle, respectively, and the inclination angle of the vehicle body.

4,691,793

APPARATUS FOR DETECTING AMOUNT OF LIQUID NITROGEN

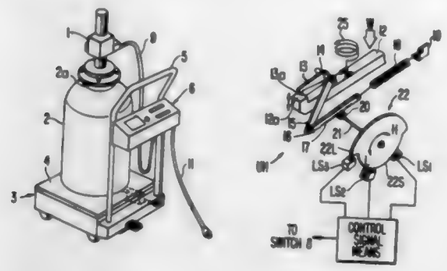
Koichi Kumakura, and Yoshinori Hosokawa, both of Minami, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 13, 1985, Ser. No. 809,111

Claims priority, application Japan, Dec. 13, 1984, 59-189233

Int. Cl.[4] G01G *19/52, 3/14, 19/00*

U.S. Cl. 177—50 2 Claims



1. An apparatus for detecting an amount of liquid nitrogen and shutting off power to a semiconductor radio detector when the amount of nitrogen is low, comprising:

a table for supporting a Dewar vessel in which liquid nitrogen used for cooling a semiconductor radio detector is contained;

a motion conversion mechanism engaged with said table for converting the movement of the table in the up and down direction in response to changes in the weight of the liquid nitrogen in the vessel and amplifying the movement, said motion conversion mechanism including a disk rotated by the amplified motion of said table;

a plurality of sensors adjacent said disk for detecting the rotational position of said disk which is representative of the weight of the liquid nitrogen in the vessel;

a signal controlled switch connected in the power supply for the semiconductor radio detector; and

control signal means connected between said sensors and said switch for supplying a control signal to turn said switch off when said sensors sense that the weight of liquid nitrogen in said vessel is below a predetermined amount.

4,691,794

WEIGHT SCALES AND STRAIN GAUGE ASSEMBLIES USEABLE THEREIN

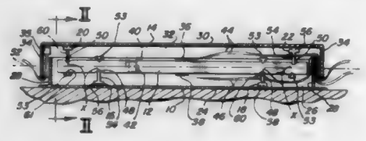
Larry D. Larsen, Elgin, Ill.; Richard C. S. Yung; Wing K. Leung, both of Hong Kong, Hong Kong, and Joseph E. Hogel, Algonquin, Ill., assignors to Fyrnetics, Inc., Elgin, Ill.

PCT No. PCT/US83/01617, § 371 Date Sep. 4, 1984, § 102(e) Date Sep. 4, 1984, PCT Pub. No. WO85/01796, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 19, 1983, Ser. No. 689,377

Int. Cl.[4] G01G *3/14, 21/24*

U.S. Cl. 177—211 62 Claims



1. In a weight scale having a housing and a display responsive to a strain gauge signal for visually indicating weight measured by the scale, an improved strain gauge assembly, comprising:

a flexible member with a strain gauge attached thereto to provide an electrical signal in response to the flexing of the flexible member;

a foot member in underlying relationship with the flexible member;

a load receiving member in overlying relationship with the flexible member;

a pair of support members connected with the foot member for supporting the flexible member at a pair of spaced locations associated therewith; and

a pair of load transmitting members connected with the load receiving member for transmitting a load therefrom to the flexible member at two locations spaced from one another and from the pair of locations associated with the foot member, at least one of said support members and load transmitting members having one end pivotally connected to the flexible member to pivot at a fixed location thereof and another end connected to the associated one of the foot member and load receiving member for relative lateral movement with respect thereto.

4,691,795

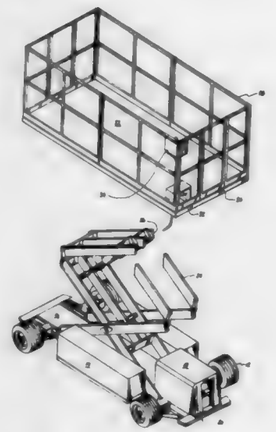
VEHICLE FLUIDIC DRIVE CIRCUIT

Donald T. Wehmeyer, Woodinville, Wash., and Ronald W. Barnhart, Elmhurst, Ill., assignors to Economy Engineering, Inc., Bensenville, Ill.

Continuation-in-part of Ser. No. 279,934, Jul. 2, 1981, abandoned, and Ser. No. 467,908, Feb. 18, 1983, abandoned. This application Jun. 18, 1985, Ser. No. 746,786

Int. Cl.[4] B62D *11/04;* F16D *65/24*

U.S. Cl. 180—6.48 3 Claims



1. In a fluid powered vehicle, a fluid power system for controlling driving torque to a drive wheel of the vehicle comprising:

a fluid pressure driven motor mounted in driving engagement with the driving wheel of said vehicle;

a restricting orifice mounted proximate said fluid pressure driven motor within the fluidic circuit directing power thereto, for providing constant but limited flow of fluid to said pressure driven motor;

a control valve mounted within said fluidic circuit proximate said fluid pressure driven motor in said fluidic circuit and providing, with respect to said restricting orifice, a parallel path to said fluid pressure driven motor for said fluid pressure; and

a pressure sensing line connected between said control valve and the inlet to said fluid pressure driven motor and ar-

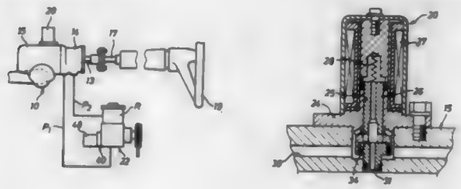
ranged to maintain said control valve open while the pressure at the inlet to said fluid pressure driven motor remains above a predetermined pressure and to close said control valve when the pressure at the inlet to said fluid pressure driven motor falls below a predetermined pressure.

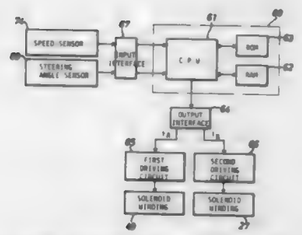
4,691,796

CONTROL APPARATUS FOR POWER-ASSISTED STEERING SYSTEM

Shigeo Tanooka; Yutaka Mori; Akihiro Oono, all of Kariya, and Akira Hasegawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 6, 1985, Ser. No. 773,233
Claims priority, application Japan, Sep. 10, 1984, 59-190423
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—142 **3 Claims**





1. A control apparatus for a power-assisted steering system in a vehicle including a rotatable steering shaft, a source of hydraulic pressure, a hydraulic power cylinder having a reciprocating power piston mounted therein and opposite fluid chambers, driven members operatively connected to said power piston, and a servo valve associated with said power cylinder to interconnect said hydraulic pressure source and said power cylinder, said servo valve being responsive to rotary motion of said steering shaft for selectively directing the flow of fluid under pressure from said hydraulic pressure source to one of said opposite fluid chambers of said power cylinder and permitting fluid from the other of said opposite fluid chambers to flow into a fluid reservoir thus effecting reciprocating movement of said power piston, said control apparatus comprising:

a first sensor for detecting rotary motion of said steering shaft and for producing a first output signal indicative of a rotary angle of said steering shaft and a second output signal indicative of a rotational speed of said steering shaft;

a second sensor for detecting a speed of the vehicle and for producing a third output signal indicative of the vehicle speed;

a first electrically operated control valve arranged to control a quantity of fluid under pressure discharged from said hydraulic pressure source;

a second electrically operated control valve of the normally closed type disposed within a bypass passage between the opposite fluid chambers of said power cylinder, whereby when said second control valve is in an energized condition fluid can flow therethrough thereby providing bypass flow; and

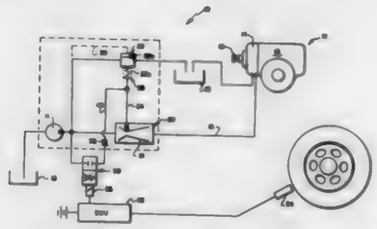
an electric control apparatus arranged to energize said first control valve in response only to said second and third output signals from said first and second sensors whereby the quantity of said fluid under pressure supplied into said power cylinder from said hydraulic pressure source is decreased in accordance with an increase of the vehicle speed and increased in accordance with an increase of the rotational speed of said steering shaft and being arranged to energize said second control valve in response to the first and second output signals from said first sensor whereby the degree of opening of said second control valve is increased in accordance with an increase of the rotary angle of said steering shaft thereby decreasing power assist, and decreased in accordance with an increase of the rotational speed of said steering shaft thereby increasing power assist.

4,691,797

FLUID FLOW CONTROL APPARATUS FOR A POWER STEERING SYSTEM

Laurence L. Miller, W. Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 10, 1986, Ser. No. 883,931
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **8 Claims**



1. An apparatus for controlling fluid flow from a hydraulic pump to a hydraulic power steering mechanism, said apparatus comprising:

orifice means, through which fluid from the pump flows to the steering mechanism, for generating a hydraulic control signal proportional to the fluid flow rate through said orifice means;

flow control valve means for bypassing fluid flow away from the steering mechanism in response to said hydraulic control signal; and

control means for modifying said hydraulic control signal including a pilot fluid circuit between the pump and said orifice means and a solenoid operated valve means in said pilot fluid circuit and operable in response to a secondary control signal.

4,691,798

SYSTEM FOR AUTOMATICALLY PREVENTING TURNOVER OF TWO WHEELED VEHICLES

Thomas S. Engelbach, 1037 Monterey Blvd., Hermosa Beach, Calif. 90254

Filed Oct. 10, 1985, Ser. No. 786,078
Int. Cl.[4] B62D *61/12*
U.S. Cl. 180—209 **22 Claims**

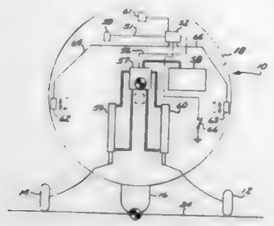
1. A system for stabilizing a two wheeled vehicle against lateral overturning, said vehicle having a front wheel and a rear wheel normally disposed in the same vertical plane, said stabilizing system comprising:

a pair of outrigger wheels pivoting on the vehicle frame for vertical movement relative thereto and disposed respectively at opposite sides of said rear wheel in laterally outwardly spaced relation therefrom;

means for sensing the roll rate of said vehicle and generating a first electrical signal in response thereto;

mean responsive to said electrical signal for generating a second electrical signal if the rate of roll is greater than the limit achievable while said front and rear wheels retain lateral traction; and

means responsive to said second electrical signal for moving at least one of said outrigger wheels downwardly into engagement with the roadway surface whereby the vehicle is enabled to return to a stable position.

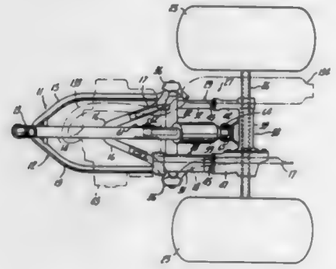


4,691,799

DRIVE ARRANGEMENT FOR THREE WHEELED VEHICLES

Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 475,838, Mar. 16, 1983, Pat. No. 4,540,061.
This application Jun. 12, 1985, Ser. No. 744,024
Claims priority, application Japan, Mar. 29, 1982, 57-50387; Nov. 19, 1982, 57-203188
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.
Int. Cl.[4] B62D *61/06*
U.S. Cl. 180—215 **5 Claims**



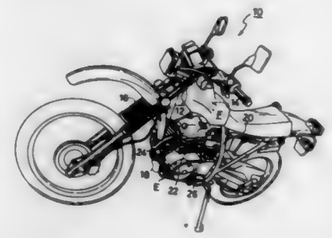
1. In a vehicle or the like comprising frame means, at least one front wheel dirigibly supported by said frame means, trailing arm means comprising a pair of spaced apart members pivotally supported on said frame means at one end of said spaced apart members, an axle supported for rotation at the other end of said trailing arm means, a pair of rear wheels affixed for rotation with said axle, and power means carried by said frame means for driving said axle, the improvement comprising said trailing arm means including tube means extending between said spaced apart members and at least partially enclosing said axle, a pair of spaced apart bearing means for journaling said axle on opposite sides of its point of drive at the free ends of said arm members at the transverse outer edges thereof and in proximity to said rear wheels for minimizing unit loading thereupon, said trailing arm means comprises a rear housing assembly containing a final drive for driving said axle, said bearing means being carried in part by said rear housing assembly and outwardly of said final drive, a drive shaft extending through one of said trailing arm members, said housing assembly comprising a housing defining a final drive cavity for receiving a ring and pinion gear and including a cover plate affixed to said housing and covering said final drive cavity, said bearing means comprising a first bearing supported by said housing at an outer end thereof and a second bearing carried by the outer end of said cover plate.

4,691,800

VEHICLE BODY FRAME FOR MOTORCYCLES

Kohji Kadono, Saitama, and Minoru Tsunoda, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,100
Int. Cl.[4] B62J *19/30*
U.S. Cl. 180—219 **1 Claim**



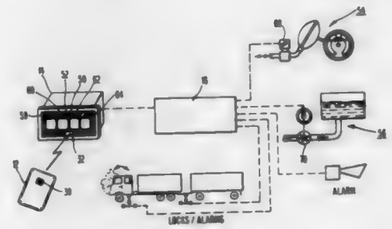
1. A vehicle body frame for a motorcycle having an engine comprising a single-tube main frame extending from a head pipe to the rear of the vehicle body, a single-tube down frame extending downwardly from said head pipe, a pair of center pillars extending downwardly from said main frame rearwardly of an engine, a pair of bottom frame members connecting the lower end of said down frame with the lower ends of said center pillars and extending under said engine and a pair of detachably connected side frame members having a forked portion at their front ends connecting with said down frame and at its rear ends connecting with said center pillars outwardly of said engine and inwardly of a rider's legs.

4,691,801

VEHICLE PROTECTION DEVICE

Yale Mann, 1135 Rydal Rd., Rydal, Pa. 19046, and Pekka Sarasi, Heteniitantie 5 B 10, 00960 Helsinki 96, Finland

Filed Mar. 3, 1986, Ser. No. 835,465
Int. Cl.[4] B60R *25/10*
U.S. Cl. 180—287 **4 Claims**



1. A vehicle anti-theft device for a truck having a parking brake system, said device comprising:

(a) locking means for preventing operation of said truck;

(b) a portable, battery operated infrared light transmitter

comprising a manual switch for selectively activating emission of a; predetermined stream of light pulses and

(c) a control unit, operable only after engagement of said parking brake system, said control unit comprising an infrared detector for receiving said stream of light pulses, a demodulator for converting said stream of light pulses to a digital data stream, and a microprocessor which compares said digital data stream to a digital identification code stored in a read only memory, said microprocessor enabling activation/deactivation of said locking means for preventing operation of said truck whenever said digital data stream is identical to said digital identification code.

4,691,802

AGRICULTURAL TRACTOR

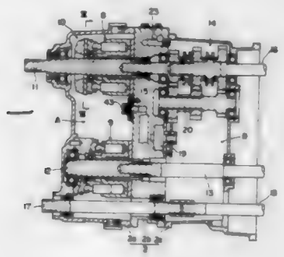
Shoso Ishimori; Seiichi Ishizumi, and Mikio Ishida, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jun. 28, 1985, Ser. No. 750,105

Claims priority, application Japan, Jul. 10, 1984, 59-104657[U]; Jul. 17, 1984, 59-108703[U]; Jul. 17, 1984, 59-140958

Int. Cl.⁴ B60K *17/10*

U.S. Cl. 180—291 **7 Claims**



1. An agricultural tractor comprising:

a front transmission case portion (*2a*),

hydraulic stepless change speed means (**10**) housed in the front transmission case portion (*2a*),

a rear transmission case portion (*2c*),

gearing means (**14**) housed in the rear transmission case portion (*2c*),

a partition wall portion (*2b*) disposed between and interconnecting the front and rear transmission case portions (*2a, 2c*), the partition wall portion (*2b*) having passages defining the sole oil passages (**21,23**) for actuating said hydraulic stepless change speed means (**10**), said partition wall portion (*2b*) having an exterior wall exposed to the ambiance, and

a tractor frame (**3**) carrying an engine (**1**) and fixedly connected to said exterior wall of said partition wall portion (*2b*) by bolt means (**24,25,26**).

4,691,803

PROJECTILE POWERED PISTON

Philip N. Martin, P.O. Box 471143, Tulsa, Okla. 74147-1143

Filed Nov. 18, 1985, Ser. No. 799,350

Int. Cl.⁴ G01V *1/04;* **F41F** *17/06*

U.S. Cl. 181—113 **5 Claims**

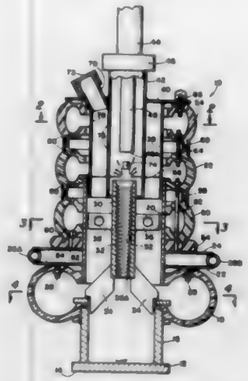
1. A transportable seismic energy source employing a projectile functioning as a piston, comprising:

a base plate having a lower surface adapted for contacting the earth's surface;

a master cylinder affixed at its lower end to said base plate and extending uprightly therefrom;

a receiving cylinder of outside diameter less than the internal diameter of said master cylinder and supported coaxially within the upper portion of said master cylinder, the master cylinder and receiving cylinder being filled with liquid;

a slug firing gun mounted to said master cylinder, the gun having a muzzle extending coaxially and above said receiving cylinder, the lower end of the muzzle being above the liquid level in said master and said receiving cylinder, the internal diameter of said receiving cylinder being



greater than the maximum diameter of a slug as distorted upon impact with liquid in said receiving cylinder whereby a slug will pass downwardly through the interior of said receiving cylinder and enter said master cylinder; and

means to vent blast gas from said gun muzzle to the exterior of said master cylinder.

4,691,804

PORTABLE TREE SEAT AND PLATFORM FOR STANDING

Robert L. Bunker, 429 Crows Mill Rd., Fords, N.J. 08863

Filed Jan. 9, 1986, Ser. No. 817,295

Int. Cl.⁴ A01M *31/02;* **A45F** *3/26*

U.S. Cl. 182—187 **4 Claims**



1. A portable seat comprising:

a seat member having top and bottom surfaces;

a screw threaded fastening member pivotally mounted on the front end of said seat member for threaded penetration of a post or tree to which said portable seat is adapted to be attached, the base of said screw member adjacent to said seat member being enlarged to form a spherical stop member which bears against the tree or post as the screw member is threaded into the post or tree and which limits the penetration of the screw member into the post or tree and provides stability to the seat member and prevents lateral movement with respect to the tree or post;

said seat member including a supporting framework having a storge compartment for receipt of said screw threaded fastening member when not in use;

a V-shaped stabilizing member pivotally attached at its wide end to said seat member for preventing pivoting of said seat member; and

a peg member connected to the lower end of said V-shaped member and having a penetrating point for penetrating a post or tree to which said portable seat is adapted to be attached.

4,691,805

LIFTING APPARATUS

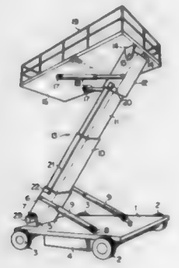
Mitsuhiro Kishi, Ashikaga, Japan, assignor to Kabushiki Kaisha Hikoma Seisakucho, Ashikaga, Japan

Filed Mar. 28, 1986, Ser. No. 845,687

Claims priority, application Japan, Mar. 28, 1985, 60-064803; Jul. 26, 1985, 60-166577; Sep. 19, 1985, 60-207155; Sep. 19, 1985, 60-207156

Int. Cl.⁴ B66B *9/20*

U.S. Cl. 187—9 R **29 Claims**



1. A lifting apparatus comprising:

(a) a mobile vehicle;

(b) a platform disposed over said mobile vehicle;

(c) a stretchable boom pivotally joined at the lower end thereof with a pin to said mobile vehicle and at the upper end thereof with a pin to said platform, for raising or lowering said platofrm relative to said mobile vehicle;

said stretchable boom comprising a lowermost boom pivotally joined to said mobile vehicle with the pin, an uppermost boom pivotally joined to said platform with the pin, and a plurality of intermediate booms slidably inserted one in another in a telescopic fashion with the lowermost intermediate boom slidably inserted in said lowermost boom and said uppermost intermediate boom inserted in and fixed to said uppermost boom;

(d) an extension detecting unit for detecting the existing length, of said stretchable boom represented by the center distance between the pin pivotally joining the stretchable boom to said mobile vehicle and the pin pivotally joining said stretchable boom to said platform;

(e) an inclination detector for detecting the existing inclination of said stretchable boom;

(f) a hydraulic control system comprising a control circuit and a hydraulic circuit;

said control circuit being capable of controlling the operation of the hydraulic circuit on the basis of the detection signals given thereto from said extension detecting unit and said inclination detector so that said platform is raised or lowered vertically with respect to and directly above said mobile vehicle and so that said platform is always held in parallel to the upper surface of the deck of said mobile vehicle; and

(g) a power unit including a hydraulic pump for supplying the pressurized working fluid to said hydraulic circuit, and driving means for driving said hydaulic pump, and mounted on said mobile vehicle.

4,691,806

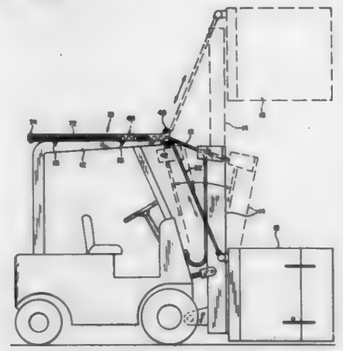
APPARATUS FOR TAKING UP AND PLAYING OUT LINES

Norman A. Jansen, 18965 S. Pear Rd., Oregon City, Oreg. 97045, and Beryl D. Randall, 4025 NE. 109th Ave., Portland, Oreg. 97220

Continuation of Ser. No. 529,952, Sep. 6, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,379

Int. Cl.⁴ B66B *9/20;* **A62C** *35/00;* **B65H** *75/34*

U.S. Cl. 187—9 R **6 Claims**



1. In a forklift vehicle, the improvement comprising in combination:

a vehicle body having a roof or overhead support members;

a movable mast mounted to the body;

an actuator mounted to the mast and operable in response to hydraulic or electrical power;

at least one elonaged flexible line, such as an electrical power line or hydraulic hose lines, coupled from the body to the actuator;

line handling attachment means mounted to the roof or overhead support members so as to be above and out of the forward field of vision of an operator of the vehicle, the line handling attachment means comprising:

an elongated housing defining a line receiving opening through which at least one loop of line may be passed;

traveling means within the housing for engaging a loop of the line which is passed into the housing through the line receiving opening, said traveling means being slidable relative to the housing for movement in a first direction which plays out a length of the loop through the line receiving opening and for movement in a second direction which takes up a length of the loop through the line receiving opening; and

biasing means mounted to the housing and coupled to said traveling means for biasing said traveling means in the second direction to take up slack in the loop.

4,691,807

ELEVATOR CONTROL APPARATUS

Shigemi Iwata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 5, 1986, Ser. No. 836,522

Int. Cl.⁴ B66B *5/08*

U.S. Cl. 187—117 **7 Claims**

1. An elevator control apparatus for controlling operation of a cage in an elevator system, said elevator control apparatus conpirising:

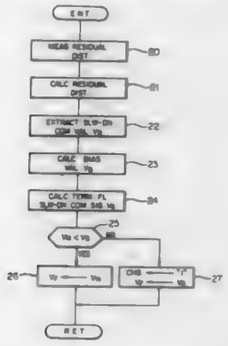
means for generating a normal speed command signal having

a normal pattern providing gradually decreasing terminal speed as the cage approaches a level of a terminal floor;

means for generating a terminal-floor slowdown signal including means for calculating a slowdown command value on the basis of actual residual distance to the level of the terminal floor and means for determining a bias value, the slowdown command value and bias value being used in generating the terminal-floor slowdown command signal and providing a normal pattern generally similar to the normal pattern of the normal speed command signal and separated therefrom by a magnitude determined by the bias value;

means for comparing the normal speed command signal and the terminal-floor slowdown command signal;

means for choosing the normal speed command signal as a



final terminal slowdown command signal for controlling terminal speed of the cage when, based on comparing the command signals, the normal speed command signal is less than the terminal-floor slowdown command signal, or

the terminal-floor slowdown command signal as the final terminal slowdown command signal for controlling terminal speed of the cage when, based on comparing the command signals, the normal speed command signal is not less than the terminal-floor slowdown command signal; and

means for correcting the terminal-floor slowdown command signal when chosen as the final terminal slowdown command signal by changing the bias value used in generating the final terminal-floor slowdown command signal;

whereby the final terminal slowdown command signal follows at least a final portion of the normal pattern of the normal speed command signal.

4,691,808

ADAPTIVE ASSIGNMENT OF ELEVATOR CAR CALLS

Frederick H. Nowak, Southington, and Isabel Hovey, Simsbury, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 17, 1986, Ser. No. 931,599
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—125 9 Claims

1. An elevator system comprising two or more cars servicing a plurality of floors in a building and processor means controlling the motion and door openings of the cars characterized by:

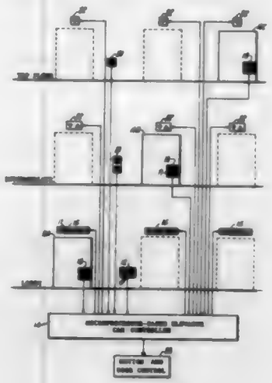
means disposed at a single floor, such as at the lobby, for entering destination calls;

means associated with the processor means for initiating an up-peak service mode;

means associated with the processor means for assigning priority levels to the cars in the up-peak service mode;

means associated with the processor means for determining a maximum number of destination calls to be assigned to a car in the up-peak service mode;

means associated with the processor means for assigning the maximum number of destination calls to the cars in order of their priority level in the up-peak service mode; and



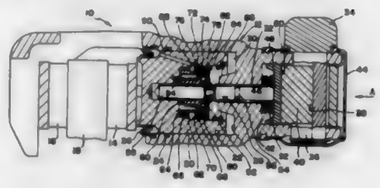
means disposed in the lobby for indicating to passengers the destination calls that have been assigned to each car.

4,691,809

DISC BRAKE WITH AUTOMATIC ADJUSTMENT

Claude Le Marchand, Domont, and Jean-Louis Gerard, Paris, both of France, assignors to Bendix France, Paris, France

Filed Mar. 26, 1986, Ser. No. 844,487
Claims priority, application France, Mar. 27, 1985, 85 04556
Int. Cl.[4] F16D *65/56*
U.S. Cl. 188—71.9 4 Claims



1. A disc brake with automatic adjustment of the type including a caliper, a brake actuator which is adapted to act directly upon a first friction component and, by reaction through the caliper, upon a second friction component, the brake actuator including a mechanical control acting upon a hydraulic control piston by means of an automatic adjustment device, the automatic adjustment device formed by a screw and nut device with reversible pitch which is operable by the hydraulic control piston when the control piston travels beyond a predetermined distance defined by a clearance between an annular component and a thrust bearing, the thrust bearing adapted to act upon the screw and nut device and the clearance variable as a function of pressure applied to the control piston, characterized in that when a predetermined control pressure is reached said annular component is moved axially relative to said control piston by means of a monitoring piston slideably and sealingly mounted within said control piston, the annular component movable against a biasing force exerted by a resilient member engaging the annular component and the movement of the annular component neutralizing the automatic adjustment device, the monitoring piston engaging sealingly a surface of a bore in the control piston and within which the monitoring piston is disposed, and that for any control pressure which is less than said predetermined pressure, the predetermined distance is defined by said annular component coming to

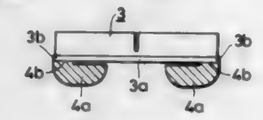
bear, by means of said resilient member, against the monitoring piston which bears axially against a bottom of the bore of the control piston and which houses said monitoring piston.

4,691,810

DISC BRAKE WITH PAD PRESSED ONLY AT ENDS WHERE ANTINODES OF VIBRATION OCCUR

Mikio Matsuzaki, Kasukabe, Japan, assignor to Akebono Brake Industry Company Ltd., Japan

Continuation of Ser. No. 693,893, Jan. 23, 1985, abandoned. This application Sep. 12, 1986, Ser. No. 906,658
Claims priority, application Japan, Feb. 2, 1984, 59-12350[U]
Int. Cl.[4] F16D *65/00, 65/38*
U.S. Cl. 188—73.1 9 Claims



1. A disc brake comprising:

a caliper slidable in the axial direction of a rotor to be damped, said caliper including pressure means disposed on one side of said rotor and a pair of pawls having peripheral margins located on the other side of said rotor and spaced circumferentially of said rotor to extend radially thereof,

a pair of pads, one pad being adapted to engage said rotor on one side thereof by said pressure means, the other pad adapted to engage said rotor on the other side thereof by said pair of said pawls under reaction, said other pad having a back metal portion, one of said back metal portion of said other pad and said pair of pawls being provided with ledges at the outer peripheral margins of each of said pawls abutting and in superposed relationship to the other of said back metal portion of said other pad and said pair of pawls along a plane, said ledges defining recesses wherein inward of said outer peripheral margins said pair of pawls are in spaced facing relationship with said back metal portion, and

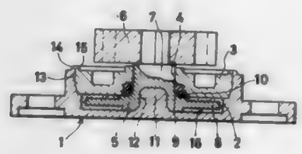
transmission means for imparting said reaction to said other pad in said plane where said pair of pawls of said caliper and said other pad are in superposed relationship to each other and only at the peripheral margins of the pawls of said caliper and said other pad such that ends of said other pad are pressed at antinodes of vibration.

4,691,811

ROTARY DAMPER

Masaru Arakawa, Chigasaki, and Masanori Numata, Hayamamachi, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Feb. 19, 1986, Ser. No. 831,430
Claims priority, application Japan, Feb. 21, 1985, 60-31418
Int. Cl.[4] F16D *57/00*
U.S. Cl. 188—290 1 Claim



1. A rotary damper comprising:

a cylindrical case closed at the bottom and having a housing containing a viscous liquid;

a lid mounted in said case to close said housing and having a central circular hole; and

a rotor having a shaft passing through said hole of said lid, a driven gear secured to its distal end and a brake plate rotatably disposed in the viscous liquid in said housing;

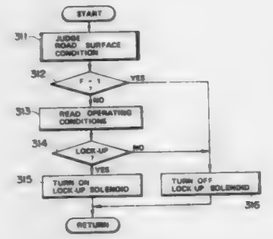
said central circular hole having an increased diameter counterbore portion provided adjacent to said housing opening radially inwardly toward said shaft and axially toward said brake plate, and an O-ring being fitted on said shaft of said rotor and received in said increased diameter counterbore portion such that is axially abuts said lid in said counterbore portion and is radially compressed by the peripheral wall of said increased diameter portion and is exposed axially toward and thereby engages with said brake plate as well as said shaft.

4,691,812

APPARATUS FOR CONTROLLING LOCK-UP CLUTCH OF LOCK-UP TYPE AUTOMATIC TRANSMISSION OF AUTOMOBILE

Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 15, 1986, Ser. No. 852,240
Claims priority, application Japan, Apr. 23, 1985, 60-85309
Int. Cl.[4] F16D *47/06*; B60K *41/22*
U.S. Cl. 192—3.3 9 Claims



1. An apparatus for controling engagement of a lock-up clutch of a lock-up type torque converter of an automatic transmission mounted within an automobile having road wheels drivingly connected to the automobile transmission, the apparatus comprising:

means for detecting a road surface condition which provides a friction coefficient, between the road surface and the road wheels, less than a predetermined level and generating an output signal indicative of said road surface condition; and

means for prohibiting engagement of the lock-up clutch in response to said output signal.

4. A method of controlling engagement of a lock-up clutch of a lock-up type torque converter of an automatic transmission mounted within an automobile having a wiper system operable by a wiper switch having a rest position and an operation position, and road wheels drivingly connected to the automatic transmission, said method comprising the steps of:

detecting a road surface condition which provides a friction coefficient, between the road surface and the road wheels, less than a predetermined level and generating an output signal indicative of said road surface condition; and

prohibiting engagement of the lock-up clutch in response to said output signal.

4,691,813

FRICTION CLUTCH OPERATED PRESSURE MODULATOR

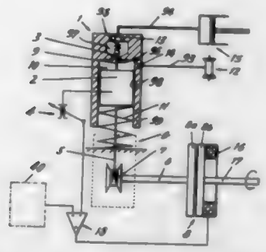
Adam Dittner, Höchstadt; Werner Hutterer, Fürth, and Joachim Sauer, Erlagen, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 899,212

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530286

Int. Cl.⁴ B60T *8/42*

U.S. Cl. 192—13 R **7 Claims**



1. Hydraulic braking apparatus for a wheel-supported land vehicle; said apparatus including:

operator actuated first means for generating hydraulic pressure in said apparatus;

hydraulically operated second means for exerting pressure to stop rotation of a wheel means;

third means for communicating hydraulic pressure from said first means to said second means, said third means including an expandable chamber having an inlet for fluid flow between said chamber and said first means;

said second means communicating with said chamber independently of said inlet;

a valve and first biasing means urging said valve in a direction to close said inlet;

a movable section partially defining said chamber, and second biasing means urging said movable section in a first direction to reduce the volume of said chamber and toward operative engagement with said valve to operate same in a direction to open said inlet;

fourth means which when activated operates said movable section in a second direction to increase the volume of said chamber and away from operative engagement with said valve to permit same to close said inlet;

a control means operatively connected to said fourth means to actuate and deactivate same under predetermined conditions of deceleration for a vehicle having wheel means that is to be braked by said apparatus; and

said fourth means including an electromagnetic clutch having an output operatively connected to said movable section and a driven rotating input that is coupled to said output when said fourth means is actuated.

4,691,814

CLUTCH RELEASE MECHANISM

Maurice J. Wimbush, Whitnash, England, assignor to Automotive Products plc, Leamington Spa Warwickshire, England

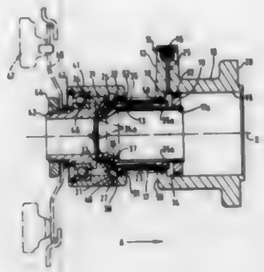
Filed Apr. 25, 1986, Ser. No. 855,719

Claims priority, application United Kingdom, Apr. 27, 1985, 8510781

Int. Cl.⁴ F16D *25/00*

U.S. Cl. 192—91 A **17 Claims**

1. A clutch release mechanism for a pull type clutch including a fluid actuator having an actuator member movable by fluid pressure in a clutch release direction to release the clutch, a release bearing assembly for connection to part of the clutch, and coupling means for connecting the release bearing assembly to the actuator, said coupling means comprising a latch member movable by fluid pressure transverse to said direction of clutch release and latch engaging means whereby in a first condition the latch member occupies a position in which it engages the latch engaging means and locks the release bearing assembly axially to the actuator member so that clutch release force applied by said actuator member is transmitted to the



release bearing assembly through the latch member to release the clutch, and in a second condition the latch member is disengageable from the latch engaging means to allow axial separation and coupling of the release bearing assembly and the actuator member.

4,691,815

FRICTION CLUTCH AND CLUTCH RELEASE MECHANISM FOR A VEHICLE

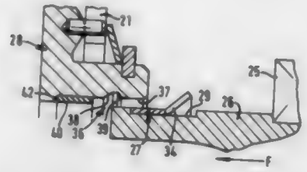
Ian C. Maycock, and Derek Hodgson, both of Leamington Spa, England, assignors to Automotive Products Plc, Leamington Spa, England

Continuation of Ser. No. 552,257, Nov. 16, 1983, Pat. No. 4,632,237. This application Aug. 14, 1986, Ser. No. 896,459

Claims priority, application United Kingdom, Nov. 19, 1982, 8233091

Int. Cl.⁴ F16D *23/14*

U.S. Cl. 192—98 **18 Claims**



1. A friction clutch for a vehicle, comprising a pressure plate, a driven plate, a spring for urging the pressure plate against the driven plate, and a clutch release mechanism for releasing the driven plate; the clutch release mechanism comprising a first member, a second member, a detent having sections which locate the first member relative to the second member in a non-return manner by moving the first member in one direction relative to the second member whereby a clutch release force subsequently applied to said first member in an opposite direction will be transmitted to said second member to release the clutch, and detent release means having a surface engageable with the detent and which enables the detent to be released by initially urging said first member further in said one direction relative to said second member so that the first and second members can thereafter be separated by subsequently moving said first member in said opposite direction relative to the second member.

4,691,816

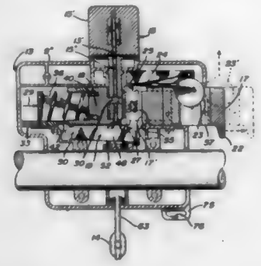
LOCKING DEVICE FOR INTERLOCKING NESTED SHOPPING CARTS

Antoine Trubiano, Pointe aux Trembles, Canada, assignor to Cari-All Inc., Montreal East, Canada

Filed Sep. 19, 1985, Ser. No. 777,526

Int. Cl.⁴ G07F *7/00, 17/10*

U.S. Cl. 194—212 **13 Claims**



1. A locking device for interlocking at least two nested shopping carts, said device comprising a housing having attachment means to immovably secure same at a predetermined location on a shopping cart handle, a coinactivated unlocking actuator movably mounted in said housing for displacement on a working axis, said actuator having coin-carrying means having at least one coin slot in a wall of said actuator, actuator spring biasing means to bias said actuator inwardly of said housing to position said coincarrying means and coin slot inside said housing, arresting means limiting inward displacement of said actuator along said working axis in the absence of at least one coin in said carrying means, a locking mechanism displaceably mounted inside said housing and having a lock pin and a lock pin displacing member, a key element receivable in a key slot in said housing and immovably engageable by said lock pin, and an actuator retention member having at least one retention element, one of which has a pin ejector associated therewith for engaging said actuator in said housing, said key element having at least two lock disengaging contact points in a free end of said key for disengaging said engaging means to thereby release said actuator and cause said locking mechanism to engage said key element in said housing, said contact points lying in two different planes and disposed to contact a respective one of said at least one retention element.

4,691,817

FEEDER FOR INTRODUCING AND FEEDING PLATES INTO A MACHINE TOOL

Thomas Haar, Halstenbek, Fed. Rep. of Germany, assignor to Alfons Haar Maschinenbau GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

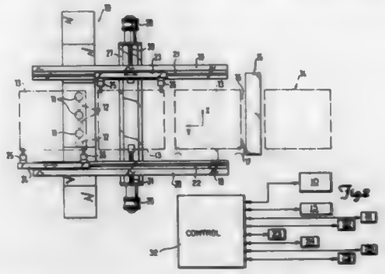
Filed Sep. 19, 1985, Ser. No. 777,938

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437642

Int. Cl.⁴ B65G *25/04*

U.S. Cl. 198—468.2 **2 Claims**

1. A feeder for introducing and feeding plates into a machine tool, comprising a feeding carriage provided with a gripping means for seizing an edge of the plates, said carriage is reciprocated by means of a first feeding drive along a first guide, a second guide the axis of which extends orthogonally with respect to the first guide and along which the first guide is adjustable by means of a second feeding drive, a positioning station in which the plates are positioned one after the other with respect to the orthogonal axes, a transfer section between the machine tool and the positioning station, and an automatic control means sensing the working strokes of the machine tool and controlling the feeding drives in synchronism with the movement of the machine tool, a second first guide parallel to said other first guide extends between the positioning station and the machine tool (10) guiding a respective feeding carriage (23, 24) provided with a gripping means (25, 26), and a respective first feeding drive (21, 22), and the two first guides (19, 20) are guided by the second guide (27) and are adapted to be adjusted relative to each other by said second feeding drive



means (28, 29) and the control means (32) controls the first feeding drive means (21, 22) belonging to each feeding carriage (23, 24) in such a manner that the plate (13) is fed into a first processing position adjacent the machine tool (10) after the last working stroke for a preceding plate (13) and before the machine tool (10) performs a further working stroke.

4,691,818

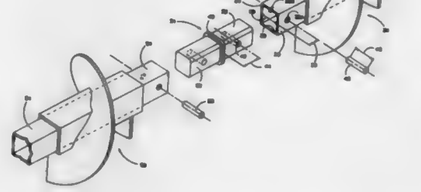
CONCEALED DRIVE COUPLING FOR USE WITH MODULAR SCREW CONVEYOR

Peter G. Weber, LaPlace, La., assignor to The Laitram Corp., Harahan, La.

Filed Jan. 27, 1986, Ser. No. 822,641

Int. Cl.⁴ B65G *33/32*

U.S. Cl. 197—666 **9 Claims**



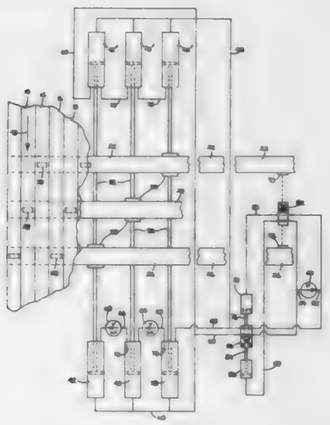
1. A concealed drive coupling system for use with an integrally formed modular screw conveyor comprising:

an elongated drive shaft having a first and further end and an outside perimeter defining a first non-circular cross-section, said first end defining a first aperture extending axially from said first end toward said second end, said first aperture having a second non-circular cross-sectional shape and size, and said first end further defining a second aperture extending from a first location on said perimeter toward a second location on said perimeter;

coupling means having a connecting end and work end, said connecting end having a cross-sectional shape and size for cooperating with said second cross-sectional shape, and being axially and slidably received by said first aperture to join said drive shaft and said coupling means so as to prevent rotation therebetween, said coupling means defining a locking pin recess located in register with said sec-

ond aperture when said coupling means is joined to said drive shaft;
a locking pin extending through said second aperture in said drive shaft and into said locking pin recess in said coupling means so as to prevent axial movement between said coupling means and said drive shaft; and
an integrally formed screw conveyor module having an aperture therethrough extending aixally of said module, said aperture, having a size and cross-sectional shape for slidably receiving said first end of said drive shaft so as to prevent rotation therebetween and to prevent the removal of said locking pin.

4,691,819
RECIPROCATING CONVEYOR
Olof A. Hallstrom, Jr., 1920 Hallstrom Rd., Tillamook, Oreg. 97141
Filed Apr. 9, 1984, Ser. No. 598,164
Int. Cl.[4] B65G *25/04*
U.S. Cl. 198—750 **9 Claims**



1. A reciprocating conveyor, comprising:
(a) a frame,
(b) a plurality of elongated slat members mounted adjacent each other on the frame for independent longitudinal reciprocation,
(c) a plurality of pairs of longitudinally spaced, longitudinally reciprocative fluid pressure drive cylinders, one pair for each slat member, each drive cylinder including a piston component and a cylinder component,
(d) means mounting one component of said drive cylinders of each pair on the frame and enabling reciprocation of the other component of said drive cylinders of each pair,
(e) means connecting the confronting ends of said other components of each pair of said drive cylinders operatively to the associated slat member with said drive cylinders of the pair extending in opposite directions from said connection,
(f) a source of fluid pressure for reciprocating said other components of said drive cylinders,
(g) fluid pressure control means communicating the source of fluid pressure to the drive cylinders selectively to effect simultaneous extension of said other component of said one drive cylinder of a pair and contraction of said other component of said other drive cylinder of the pair and to reciprocate said other components of said drive cylinders in a manner to effect reciprocation of the slat members in a load conveying direction and in a retracting direction, and
(h) sequencing valve means interposed between the fluid pressure source and one of said drive cylinders of each pair of said drive cylinders for opening and closing communication between said fluid pressure source and said drive cylinder, the sequencing valve means being operable at a predetermined fluid pressure to open said communication for applying fluid pressure to both of said drive cylinders of the pair and operable at a predetermined lower fluid pressure to close said communication for applying fluid pressure only to the other drive cylinder of the pair.

4,691,820
PACKAGE FOR HYDROPHILIC CONTACT LENS
Robert Martinez, Flemington, N.J., assignor to Vistakon, Inc., Jacksonville, Fla.
Continuation of Ser. No. 800,573, Nov. 18, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 940,710
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206—205 **12 Claims**

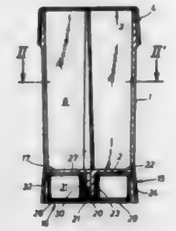


1. A package for a hydrophilic contact lens maintained in a sterile aqueous solution comprising:
a molded base having a cavity for containing said contact lens and a flange extending outwardly about the periphery of said cavity,
said cavity being defined by a bottom surface and side wall surfaces extending between said bottom surface and said flange,
a portion of said side wall surface being inclined away from said bottom surface at an angle of from about 130 to 160 degrees, said inclined side wall surface forming a ramp between the bottom of the cavity and said flange, and
a flexible cover sheet releasably sealed to said flange around the perimeter of said cavity, said cover sheet and said flange adjacent the edge of said inclined side wall surface extending outwardly to beyond the area of said seal,
the unsealed edges of said cover sheet and said flange comprising gripping means for separating said cover sheet from said flange to expose said inclined side wall and said cavity;
said package being impermeable to bacteria to preserve sterility,
said package having negligible moisture vapor transmission rate to avoid loss of water; and,
said package being sterilizable.

4,691,821
RECEPTACLE WITH AT LEAST TWO CHAMBERS FOR ACCOMMODATING LIQUIDS AND PULVERIZED SUBSTANCE, ESPECIALLY COFFEE POWDER, MILK AND/OR SUGAR
Raimund Hofmann, Kreuzwertheim, Fed. Rep. of Germany, assignor to Jan Folkmar, Zurich, Switzerland
Filed Jan. 13, 1986, Ser. No. 818,530
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1985, 3527124
Int. Cl.[4] B65D *83/06, 81/32*
U.S. Cl. 206—216 **9 Claims**

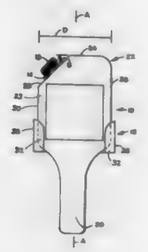
1. Apparatus for retaining substances in the form of a liquid or pulverized solid and for delivering portions of one of said substance of preselected volume, said apparatus comprising:
a receptacle of cylindrical shape with at least two compartments;
a chamber of said preselected volume being arranged on one end of said receptacle and having a chamber opening;

a ring-shaped operating member being arranged at said one end of said receptacle and defining said chamber of said preselected volume within the reing-shaped operating member, and being rotationally mounted on said one end of said receptacle;
said chamber being movable together with said operating member between a first position providing a passage communication with one of said compartments of the receptacle, and a second position closing said passage and opening said chamber to the atmosphere;



a cover secured to said receptacle and being arranged on the side of said receptacle opposing to said operating member; and
a closure of sufficient size to seal said chamber opening against the armosphere when the chamber is not in the second position;
further comprising an opening in said receptacle and an opening in said closure, and in which said chamber contains a first opening communicating with said receptacle opening when said chamber is in said first position, and a second opening communicating with said closure opening when said chamber is in said second position.

4,691,822
CONTAINER AND HOLDER FOR DISPENSING BAKING SODA
Irvin P. Malancon, Jr., P.O. Box 383, Cut Off, La. 70345
Filed Apr. 7, 1986, Ser. No. 849,261
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—229 **19 Claims**



1. A container and holder assembly for containing and dispensing baking soda comprising:
a. a hollow container body means for holding baking soda adapted for mounting in a vertical position, said container body means having an elongated, generally cylindrical handle axially aligned with a generally rectangular upper portion integrally molded with said handle, said upper portion having spout means integrally molded therewith, said upper portion having two generally vertical sidewalls parallel to each other and to the longitudinal axis of said container body means, said upper portion having a front wall and a back wall parallel to each other and to the longitudinal axis of said container, said upper portion having a generally rectangular top section perpendicular to said longitudinal axis of said container body means, said upper portion having a sloping planar section connected to said top section and forming an angle B therewith, said spout means being located on said planar section, and
b. holder means for slidably receiving said container body means.

4,691,823
GOLF BAG INSERT
Kenneth R. Pape, 1011 Marlowe Ave., Orlando, Fla. 32809
Filed Dec. 22, 1986, Ser. No. 944,576
Int. Cl.[4] A63B *55/00*
U.S. Cl. 206—315.6 **6 Claims**

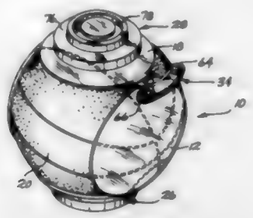


1. An insert for a golf bag for separating groups of clubs within the golf bag, said insert including a first divider body for extending generally across the golf bag, and a second divider body extending generally perpendicularly to said first divider body, a first cap piece fixed to said first divider body and defining a first opening therethrough, a second cap piece fixed to said second divider body and defining a second opening therethrough, and strap means passing through said second opening for fixing said second cap piece to the upper end of the golf bag, said first divider body having a length to extend to the bottom of the golf bag, and said first divider body further including an angled portion adapted for lying against the bottom surface of the golf bag, said second divider body having a length to extend to the bottom of the golf bag, and said second divider body further including an angled portion adapted for lying against said angled portion of said first divider body, means for fixing said angled portion of said second divider body to said angled portion of said first divider body, and means for fixing said angled portions to the bottom of the golf bag.

4,691,824
WRAP-AROUND PACKAGING
Edgar C. Schindler, 11723 136th Ave. E., Puyallup, Wash. 98374
Filed Oct. 30, 1986, Ser. No. 924,990
Int. Cl.[4] B65D *25/28, 8/18, 85/00*
U.S. Cl. 206—315.9 **11 Claims**

1. An apparatus for packaging an item, comprising:
a plurality of at least four cupping members each having an inwardly directed recess shaped to substantially form-fit against a portion of the item's outer surface, said members being connected together in juxtapositional series in a

manner so that they cooperatively circumscribe said item; and



snap fastening means for releasably connecting a first member of said series to a last member of said series, to hold said item between said members.

4,691,825

NEEDLE PACKAGE

Peter-Nikolaus Schmetz, Herzogenrath, and Peter Klöcker, Würselen, both of Fed. Rep. of Germany, assignors to Firma Ferdinand Bernhard Schmetz, Herzogenrath, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,745
Int. Cl.⁴ B65D *85/24*
U.S. Cl. 206—380 **7 Claims**



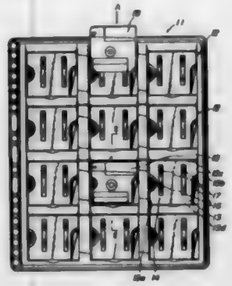
1. Needle package formed of a plate-like panel having a front side and a back side, said panel having a plurality of elongated side-by-side needle pockets recessed inwardly from the front side of said panel and closed by the back side of said panel, said panel forming a plurality of side walls extending from the front side toward the back side of said panel and forming oppositely elongated side walls of said needle pockets, a removal cavity extending transversely of the elongated direction of said needle pockets, wherein the improvement comprises that said needle pockets have opposite ends spaced apart in the elongated direction thereof, each of said side walls having a clamping web extending into said needle pocket for holding a needle between said clamping webs on the opposite side of each said needle pocket, a bottom bar located in the back side of said plate-like panel for each said needle pocket and extending between said clamping webs of the associated said needle pocket, and said clamping webs being displaceable outwardly away from one another and relative to said bottom bar when a needle is inserted into said needle pocket.

4,691,826

INFORMATION RECORDING CARRIER-HOLDING FRAME

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,898
Claims priority, application Japan, Nov. 26, 1985, 60-263660
Int. Cl.⁴ B65D *1/24, 85/30, 85/57*
U.S. Cl. 206—456 **7 Claims**



1. An information recording carrier-holding frame comprising:

a file sheet including a substantially perpendicular depression peripheral wall defining a rectangular depression having a bottom wall and four side walls;

planar lugs projecting inwardly from two of said four side walls, said two side walls being opposed to each other;

support means rising from said bottom wall for supporting an information recording carrier in contact with said planar lugs, said support means being spaced at a specific interval from said four side walls, the remaining two of said four side walls being opposed to each other and one of said two remaining side walls being located at an insertion side of the information recording carrier holding frame for insertion of the information recording carrier, and

a portion of said support means located furthest away from said one wall located at said insertion side being located further away from said one wall located at said insertion side than a portion of said planar lugs located closest to said one wall located at said insertion side to provide a fulcrum point about which the information recording carrier is pivoted to raise an edge of said information recording carrier above said one wall located at said insertion side for removal of the information recording carrier from said information recording carrier-holding frame.

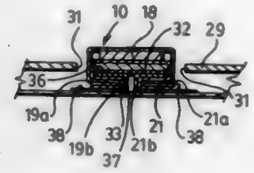
4,691,827

SUPPORTED PACKAGE ATTACHED TO PANEL IN PARALLEL SLOTS

Ronald Grace, and Mary D. Grace, both of 61 Inverlochy Boulevard, Unit 11, Thornhill, Ontario, Canada L3T 3R4

Filed May 8, 1986, Ser. No. 861,337
Int. Cl.⁴ B65D *73/00*; A45C *11/28*
U.S. Cl. 206—465 **8 Claims**

1. A supported package for displaying small items, comprising a generally tubular sleeve comprising transparent material through which small items placed inside the sleeve can be viewed, and a generally planar support member on which the sleeve in flattened form is disposed, the support member comprising an upper sheet having a pair of spaced parallel slots therein, a lower sheet parallel to the upper sheet, and an auxilaiary portion extending rearwardly from the upper sheet between said slots toward said lower sheet and defining a recess on each side of the auxilaiary portion between the upper and lower sheets, each end of said flattened sleeve being folded over on itself and inserted through a respective said slot and disposed in a respective recess and the upper and lower sheets compress each folded over end of the sleeve between them in



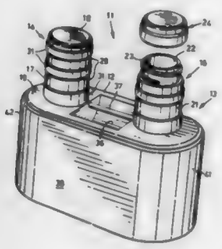
each respective said, whereby movement of the end of the sleeve transversely of the slot in the direction parallel to the plane of the upper sheet and unfolding of the folded over end and withdrawal thereof from the slot is resisted.

4,691,828

CONTAINER FOR LIQUIDS

Joseph Z. Slusarczyk, and Nancy L. Slusarczyk, both of R.R. 190 1, Burford, Ontario, Canada N0E 1A0

Filed Dec. 10, 1985, Ser. No. 807,466
Int. Cl.⁴ B65D *21/02*
U.S. Cl. 206—509 **9 Claims**



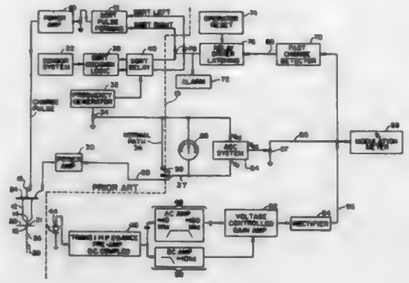
1. A container for liquids comprising a shell of resilient plastic defining an elongated generally rectangular hollow body having a longitudinal axis, two longitudinally spaced hollow posts upstanding from an upper generally planer side thereof, each post being closely adjacent a respective end of said elongated hollow body, a generally planar lower side on which the container can stably support itself on a planar surface having therein two recesses aligned with said posts in which the posts of similar containers may be snugly received, one post having an opening at its upper end for filling the container and emptying liquid from it, the ends of the body being convexly rounded and the lateral walls and ends of the body being continuously smooth, and wherein the body is provided with a cavity extending downwardly in said upper side between the posts in which an elongated handle grip is formed, the handle grip being disposed below the general plane of said upper side and extending between the posts along said longitudinal axis.

4,691,829

METHOD OF AND APPARATUS FOR DETECTING CHANGE IN THE BREAKOFF POINT IN A DROPLET GENERATION SYSTEM

Robert E. Auer, Miami, Fla., assignor to Coulter Corporation, Hialeah, Fla.

Continuation-in-part of Ser. No. 203,121, Nov. 3, 1980, Pat. No. 4,487,320. This application Dec. 6, 1984, Ser. No. 678,613
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.⁴ B07C *5/342*
U.S. Cl. 209—3.1 **5 Claims**



1. In an apparatus for analyzing and sorting particles suspended in a liquid, said apparatus including first means for producing a jet stream from said liquid suspension, second means for vibrating said jet stream to produce undulations on the surface of said stream and subsequent breakup of said stream into droplets for collection downstream, said stream having a breakpoint region, the improvement comprising:

radiation means for impinging a beam of radiation upon an uninterrupted portion of said jet stream during its analyzing and/or sorting mode at a fixed location thereon prior to the breakpoint region,

sensing means, coupled to said second means, responsive to radiation from said radiation means which is scattered by said stream, for providing an output to said second means which is proportional to the amplitude of undulation at said location, and

wherein said second means is positioned above said radiation means.

4,691,830

INSPECTION AND SORTING OF MOLDED CONTAINERS AS A FUNCTION OF MOLD OF ORIGIN

Alan D. Ahl, Toledo; Joseph F. Billmaier, Maumee; Paul W. L. Graham, Toledo, all of Ohio; Mark B. Schenk, Lexington, Ky., and Stephen H. Zylka, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 26, 1985, Ser. No. 769,527
Int. Cl.⁴ B07C *5/34*
U.S. Cl. 209—523 **12 Claims**

1. A system for inspecting and sorting molded containers formed in a mold machine having a plurality of mold cavities, each said container containing readable indicia indicative of mold cavity of container origin, said system comprising

first conveyor means for transporting containers along a predetermined path,

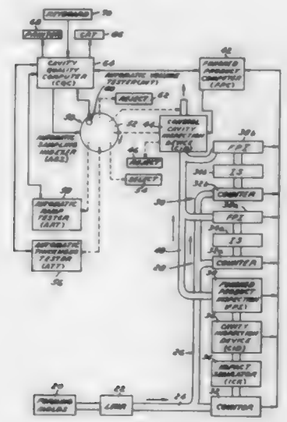
inspection means disposed in said path for inspecting containers travelling in said path and including first cavity identification means for identifying mold cavity of origin of defective containers,

second cavity identification means disposed in said path for reading said indicia on containers travelling in said path and including means for selectively sorting containers

from said path as a controllable function of cavity identification,

first control means coupled to said inspection means for receiving information identifying mold cavity of origin of defective containers and to said second cavity identification means for selectively controlling said second cavity identification means to sort all containers having indicia indicative of mold cavities of defective containers,

sample testing means including second conveyor means coupled to said second cavity identification means for receiving a sampling of said containers from said path, and means coupled to said second conveyor means for automatically testing physical quality of said sampled containers and identifying mold of origin of defective ones of said sampled containers, and



second control means coupled to said sample testing means and through said first control means to said second cavity identification means for automatically sorting said sampling of containers wherein said sample comprises a preselected sample of containers from each cavity and routing said preselected sample of containers to said sample testing means,

said second control means including means forming a cavity map which relates cavity identification to physical location of the associated mold cavity in the mold machine, means responsive to said first control means for identifying mold cavity indicia read by said second cavity identification means associated with mold cavities absent from said map, and means for automatically routing a preselected number of consecutive containers bearing said absent indicia to said automatic sample testing means to certify quality of said absent cavity.

4,691,831

IC TEST EQUIPMENT

Kenpei Suzuki; Yushi Iwanaga; Hiroshi Sato; Kohei Sato; Noriyuki Igarashi, and Shinichi Koya, all of Tokyo, Japan, assignors to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,560

Claims priority, application Japan, Jun. 25, 1984, 59-95641[U]; Jun. 27, 1984, 59-97581[U]; Jun. 29, 1984, 59-98841[U]

Int. Cl.⁴ B07C *5/344*

U.S. Cl. 209—573 **14 Claims**

1. IC test equipment comprising:

a loader for loading IC elements to be tested;

a testing station for testing the IC elements supplied from the loader;

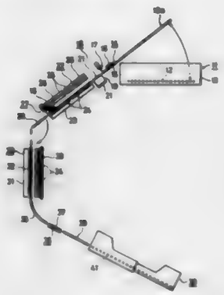
a sorting station supplied with the IC elements tested in the testing station, for sorting them according to their test results; and

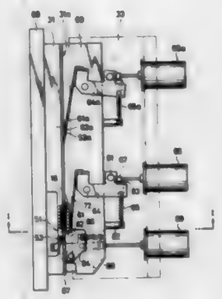
an unloader for receiving the IC elements sorted by the sorting station;

wherein the testing station comprises:

rails for guiding the IC elements supplied from the loader;

an auxiliary stopper disposed opposite but aslant to the IC element sliding surface of each rail so that it goes away from the sliding surface of the rail as the IC element supply side is approached, the end portion of the auxiliary stopper on the opposite side from the IC element supply





side being bent substantially at right angles to the sliding surface of the rail to form an engaging piece, the auxiliary stopper resiliently pressing the IC element sliding down the rail against the sliding surface thereof and engaging the IC element with the engaging piece to stop it;

means for controlling the auxiliary stopper to disengage it from the IC element; and

a main stopper disposed slightly ahead of the engaging piece of the auxiliary stopper whereby the IC element disengaged by the disengaging means from the auxiliary stopper and sliding down the rail is stopped at the position for test.

4,691,832

STEP-LIKE FLOWER-BOX SUPPORT STRUCTURE

Horea Steiger, Untermaettli, 8913 Ottenbach/Zurich, Switzerland

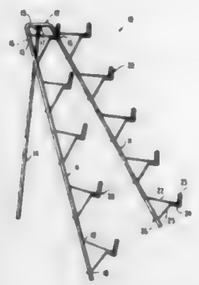
Filed Nov. 4, 1986, Ser. No. 926,535

Int. Cl.⁴ A47F *7/00*

U.S. Cl. 211—71 **18 Claims**

1. A step-like flower-box support structure consisting of relatively few parts which can be easily shipped and assembled at the customer to support thereon a relatively great weight of flower boxes, comprising two tubular members, a substantially bow-shaped member for connecting the two tubular members into a generally U-shaped assembly, a third tubular member,

first means for connecting said third tubular member with said substantially bow-shaped member to form a tripod support structure of generally pyramid-like configuration, a plurality of flower-box support members, and second means for detach-



ably connecting said support members to said two tubular members in such a manner as to form the step-like flower-box support structure whose support members extend forwardly of the support structure.

4,691,833

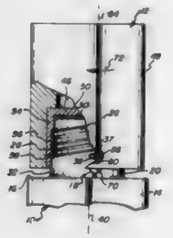
CAP ALIGNMENT STRUCTURE

Warren S. Ahrens, Milford, Conn., assignor to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.

Filed Feb. 15, 1985, Ser. No. 701,976

Int. Cl.⁴ B65D *41/04*

U.S. Cl. 215—227 **23 Claims**



1. A container and a cap assembly therefor comprising:

a. a container having a main body member with a noncircular circumference and an imaginary center plane therethrough and a neck member with a pair of integrally formed exterior double lead threads emanating from a base portion thereof, said double lead threads and said base portion cooperating to define a pair of diametrically opposed abutment end walls, said main body member of said container includes a shoulder having diametrically opposed projections thereon; and

b. a cap assembly having a noncircular circumference and an imaginary center plane therethrough, and a pair of integrally formed interior double lead threads adapted for mating engagement with said double lead threads of said neck member, said double lead threads of said cap assembly having diametrically opposed leading end walls defining abutment surfaces, said cap assembly also having diametrically opposed projections thereon, whereby said cap assembly is adapted to be screwed on to the neck of said container until said abutment surfaces of said cap assembly engage said abutment end walls of said neck member so that said center planes of said container and said cap assembly achieve coplanarity, said projections of said container and said cap assembly cooperatively dimensioned to produce a force tending to hold said container and cap assembly in assembly when said abutment end walls and said abutment surfaces are in engagement.

4,691,834

CAP AND NECK STRUCTURE FOR A WIDE MOUTH JAR

Joseph J. Bullock, III, Atherton, Calif., assignor to Bankers Trust Company, New York, N.Y.

Continuation-in-part of Ser. No. 689,859, Jan. 3, 1985, Pat. No. 4,625,876, which is a continuation of Ser. No. 515,275, Jul. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 387,550, Jul. 12, 1982, Pat. No. 4,438,857. This application May 2, 1986, Ser. No. 858,811

Int. Cl.⁴ B65D *41/48*

U.S. Cl. 215—232 **15 Claims**



1. A cap of the type having a central top disc, a thin-walled substantially cylindricl outer skirt depending from said disc, first bead means on the interior of said outer skirt adapted to engage cooperating second bead means on the neck of a container, a circumferential score line in said outer skirt above at least a lower portion of said bead means, a portion of said outer skirt below said score line being cut away to form a pull tab extending in a direction parallel to said score line, whereby upon pulling said tab circumferentially, said outer skirt severs along said score line, said lower portion of said bead means being removed as said tab is pulled, the improvement comprising a horizontal slit formed in said outer skirt in line with said circumferential score line and extending in a curve to a terminus, the portion of said skirt within said slit comprising said tear tab, there being a frangible link between said tear tab and the adjacent portion of said skirt, said skirt being formed with a notch extending up to the bottom edge of said link and said terminus being at the upper edge of said link, said link being spaced up from said bottom edge to a position about midway of the height of said tear tab.

4,691,835

TAMPER-EVIDENT SEALED CONTAINER AND TAMPER-EVIDENT TUBE AND BANDS AND APPARATUS AND METHOD OF MAKING AND USING SAME

Martin L. Mueller, 4929 East Lake Shore Dr., Wonder Lake, Ill. 60097

Continuation of Ser. No. 451,401, Dec. 20, 1982, abandoned. This application Feb. 4, 1986, Ser. No. 827,208

Int. Cl.⁴ B65D *55/02;* **B65B** *13/02*

U.S. Cl. 215—246 **3 Claims**

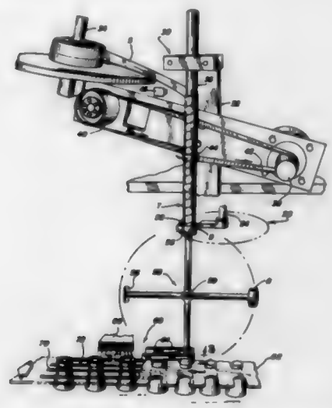
1. A method of continuous making and applying a plurality of individual heat-shrinkable cylindrical tubular bands each adapted for subsequent heat-shrink application to a container, comprising the steps of:

providing an elongated continuous strip entirely comprising heat-shrinkable, expanded polystyrene foam plastic material, wherein said plastic material is oriented and heat-shrinkable primarily in the direction of the length of said strip;

providing a relatively fixed, cylindrical winding mandrel means having a free end;

continuously advancing said strip onto said winding mandrel means at a portion thereof spaced from the free end of the mandrel means, said strip being advanced onto said mandrel means at an acute angel with respect to a plane perpendicular to the axis of said winding mandrel means to continuously spirally wind said continuous strip on and

about winding mandrel means, including overlapping and joining edge portions of said continuous strip, to thereby continuously form a generally cylindrical spirally-wound heat-shrinkable tube of said plastic material which includes a spiral heat-shrinkable seam at said overlapping edge portions, said tube being advanced axially of said winding mandrel means toward said free end thereof, wherein said continuous strip is wound at said acute angle to provide an angle of intersection between said primary direction of orientation and a plane perpendicular to the axis of said tube such that said orientation and shrinkability of said strip primarily in the direction of its length results in said spirally-wound tube being primarily heat-shrinkable in a radial direction;



continuously severing spirally-wound lengths from said tube to provide said individual heat-shrinkable tubular bands each in a generally cylindrical spirally-wound configuration wherein each said tubular band is primarily heat-shrinkable in a radial direction;

positioning each said individual tubular band in respective association with one of a plurality of said containers; and

heating said individual tubular bands whereby each said band is heat-shrunk primarily in the radial direction thereof to embrace the respective one of said containers.

2. The combination of a container having a heat-shrunk, spirally-wound tubular band thereon formed in accordance with the method of claim 1.

4,691,836

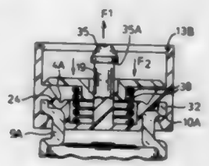
APERTURED CLOSURE DEVICE WITH DEPRESSIBLE DISC PORTION

Victor Wassilieff, 84, rue de l'Assomption, 75016 Paris, France

Continuation of Ser. No. 456,114, Jan. 6, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,667

Int. Cl.⁴ B65D *39/16*

U.S. Cl. 215—298 **3 Claims**



1. A closure device for a fluid receptacle having an outlet aperture, said closure device comprising a first generally annular member adapted to be fixed relative to the receptacle adjacent the aperture in the receptacle, coupling means for fixedly coupling the first annular member to the receptacle adjacent the aperture in the receptacle, a second generally annular member substantially coaxial with said first annular member, said second annular member being axially movable mounted between an axially inward closed position and an axially outward open position, said second annular member being disposed generally radially inwardly of said first annular member, both the open and closed positions being stable positions, an elastically deformable annular membrane member having one end fixed relative to said first annular member and another end of retaining said second annular member, said annular membrane member defining a flip-over position intermediate a first stable position and a second stable position corresponding to said open and closed positions of said second annular member, said membrane member having oppositely tapering frustoconical configuration in its first and second stable positions, said membrane member having its radially inner periphery joined to said second annular member and its radially outer periphery joined to said first annular member, portions of at least one of said members defining a fluid passageway for communication between the interior of the receptacle and the surroundings for discharging fluid from the receptacle when said second annular member is in the open position, and valve means defined by one of said second annular member and said membrane member co-operatable with a valve seating means for closing off the passageway in the closed position of said second annular member, said membrane member defining means for biasing said first annular member into its closed position, the vertical position of said membrane member in the closed position of said second annular member being between its first stable position and the position in which it is molded, and immediately above the latter, so that the said membrane member elastically forces said second annular member valve means axially against said valve seating means for tightly closing off said passageway. Wherein said first annular member comprises a generally cylindrical skirt, said second annular member having a central stem, a disc received around said stem and extending between the central stem and the inner wall of said cylindrical skirt, abutment means at the outer end of said stem for retaining said disc and resilient means operatively disposed between said disc and said second member to urge said disc into engagement with said abutment means, whereby said disc is depressible to grasp said stem to gain access to said second annular member to permit displacement from the closed position to the open position.

4,691,837

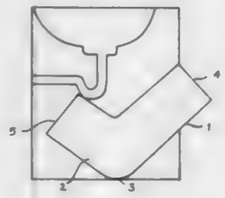
GARBAGE CAN

Linwood E. Dillon, 1511 W. 14th St., Hastings, Minn. 55033

Filed Oct. 23, 1986, Ser. No. 923,016

Int. Cl.⁴ B65D *33/00*

U.S. Cl. 220—1 T **1 Claim**



1. A garbage can suitable for use under a sink, said garbage can comprising:

a generally J-shaped chute formed as a single piece, said chute having a first, vertical leg formed at generally right angles to a second, horizontal leg;

said right angle formed between said first and second legs being a curved bend so as to provide a pivot point on the exterior bottom surface of said right angle bend;

said first leg having a generally rectangular opening at the top;

said second leg being closed at its generally rectangular end;

said garbage can being capable of being positioned under said sink so that said garbage can is upright when the door to the undersink area is closed, and is tipping outward but prevented from tipping completely over by the gooseneck pipe of said sink when said door is open.

4,691,838

PAINT CONTAINERS

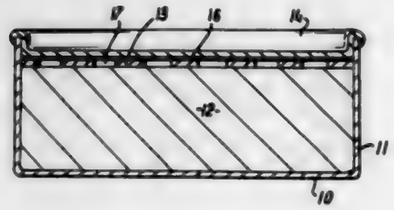
Thomas Graham, Clitheroe; Leslie A. Perrins, Blackburn, and Kevin Morris, Bury, all of England, assignors to Reed International plc, London, England

Filed Dec. 13, 1984, Ser. No. 681,317

Claims priority, application United Kingdom, Dec. 16, 1983, 8333664; Aug. 31, 1984, 8422049

Int. Cl.⁴ B44D *3/12*

U.S. Cl. 220—93 **3 Claims**



1. Structured paint of non-pouring consistency presented in a flat nominally rectangular container having side walls, the paint supporting at its surface a membrane with multiple openings of mean transverse dimension greater than 5 mm lying in lines which are inclined to said side walls through which openings the paint can pass when the membrane is swept by a roller-applicator and having, taken with the paint, these features:

(a) the membrane is non-flaccid but flexible to allow paint to pass through the openings by extrusion so that when the roller-applicator sweeps the membrane surface the paint presents itself as extruded reliefs of structured paint at the openings in the membrane to give the roller-applicator an application of structured paint reliefs while the membrane still remains supported by the paint surface at at least points other than in the vicinity of the roller-applicator, the membrane flexing from the pressure of the roller-applicator as it sweeps the membrane surface, the flexing causing the paint to extrude through the membrane openings and the membrane returning to a substantially unflexed state upon removal of the roller-applicator pressure, and

(b) the membrane can follow the fall of the surface of the paint as it is consumed.

4,691,839

SINGLE FINGER-OPENING RESILIENT CAP

Myron Ullman, Canfield, Ohio, assignor to The Dover Molded Products Company, Youngstown, Ohio

Filed Oct. 17, 1986, Ser. No. 920,929

Int. Cl.⁴ B65D *43/04*

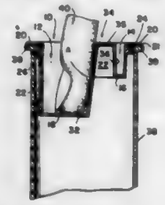
U.S. Cl. 220—281 **14 Claims**

1. A single finger opening resilient cap for insertion into a container opening to releasably close the opening, comprising:

a top wall with edge portions which form a rim having a size which is greater than that of a container opening that is to be closed by the cap, said rim being configured to overlay container portions which surround the container opening, said top wall defining a first plane;

a finger-receiving well formed in said top wall, including a bottom wall and a slanted side wall extending between said top wall and said bottom wall, said slanted side wall defining a second plane disposed at an angle relative to said first plane, said well being of size sufficiently large to receive therewithin a finger;

a contractably-biasing well formed in said top wall including a bottom wall at a level higher than the bottom wall of said finger receiving well, and a slanted side wall extending between said top wall and said bottom wall, said



slanted side wall defining a third plane disposed at an angle relative to said first plane, said contractably-biasing well being smaller than said finger-receiving well;

a circumferentially-surrounding side wall portion which depends from said top wall at locations inset from said rim and which forms at least part of the walls of said wells;

locking means carried on said circumferentially-surrounding side wall portion for engaging said closure opening;

whereby single finger force exerted on said slanted side wall within said finger-receiving well will deform said cap thereby disengaging said locking means from said closure opening and thereby releasing said cap from said closure opening.

4,691,840

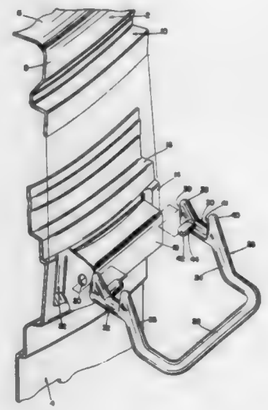
LID LOCKING HANDLE FOR WASTE CONTAINER

Raymond B. Ferbrache, Winfield, Kans., assignor to Gott Corporation, Winfield, Kans.

Filed Nov. 12, 1986, Ser. No. 929,488

Int. Cl.⁴ B65D *45/00*

U.S. Cl. 220—318 **20 Claims**



1. A refuse container comprising:

a receptacle body having vertical side walls and a central cavity extending downwardly there between;

a lid having a downturned peripheral rim receivable over a

top end of said receptacle body, said lid having peripherally located detent means;

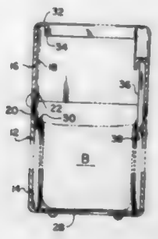
at least one lid locking handle having an inward end pivotally coupled to said receptacle body side walls and an outward free end; said handle having camming handle locking projection means and lid locking projection means for respective engagement against said receptacle body side walls and said lid detent means as said handle free end is pivoted toward said receptacle body.

4,691,841

CONTAINER FOR A PLASTIC TRASH BAG OR THE LIKE

Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069

Filed Jan. 21, 1986, Ser. No. 819,933
Int. Cl.⁴ B65D *25/10*
U.S. Cl. 220—404 **5 Claims**



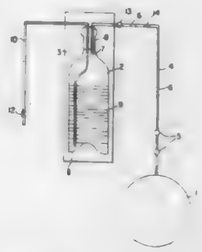
1. The trash container comprising an open top box-like body having a plurality of side walls arranged in polygonal cross section, a vane located in each corner of said body having means at its upper end to ensnare a flexible bag and an open cap frame having a plurality of side walls arranged in a conforming cross section to that of said body and adapted to fit over the top of said body, said frame having a finger extending downwardly along at least one of its side walls below the lower edge thereof to overlay the edge of said bag ensnared on said vanes and to thereby hold said bag open in substantially conforming cross section to that of said body.

4,691,842

PROCESS APPARATUS AND SYSTEM FOR PRESERVING AND DISPENSING WINE

Jacques Foures, Domaine de la Meunière Cenac, 33360 La Tresne, France

Continuation of Ser. No. 209,141, Nov. 21, 1980, abandoned. This application Mar. 18, 1985, Ser. No. 712,924
Int. Cl.⁴ B67D *1/04*
U.S. Cl. 222—1 **3 Claims**



1. A method for preserving and dispensing wine from a bottle partially filled with said wine, said method comprising:

(a) providing an apparatus for preserving and dispensing wine including:

(i) a hermetically and thermally sealed enclosure for said wine bottle;

(ii) at least one reservoir adapted to contain said inert gas;

(iii) a first line for gas flow having one end connected to said reservoir and a second end terminating within said wine bottle adjacent to said plug, said second end being located between said plug and said wine;

(iv) at least one pressure reducing valve positioned along said first line adjacent said reservoir;

(v) at least one valve located in said first line downstream of said pressure reducing valve for preventing surges or blasts of pressure within said first line;

(vi) a second line for liquid flow having one end positioned within said wine bottle adjacent the bottom of said wine bottle and within said wine and a second end located outside said wine bottle and enclosure;

(vii) a spigot for controlling the flow of wine through said second line wherein said gas under pressure is compressed gas and wherein the low pressure gas introduced into said void space is sufficient to force said wine into said second line; and

(viii) means including a manually variable adjustment valve in communication with said wine bottle for venting said gas from said bottle so as to minimize the exposure of said wine to said gas, and for controlling the pressure in the void space within the bottle, so as to control the flow or non-flow and diminish the flow of wine;

(b) directing a compressed inert gas via said first line from said reservoir into said wine bottle;

(c) conducting said wine from said one end of said second line through said second line and outwardly from said wine bottle towards said second end of said second line so as to dispense wine from said wine bottle; and

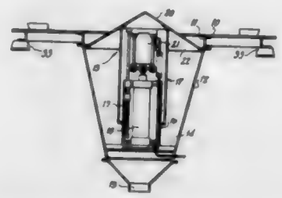
(d) operating said manually variable adjustment valve to vent said gas from said wine bottle during periods of storage of said wine bottle in said enclosure between periods of dispensing so as to minimize exposure of wine to said gas.

4,691,843

MATERIAL DISCHARGE APPARATUS

Andrew J. Dunan, Tufley, England, assignor to Solitec Limited, Gloucester, England

Continuation of Ser. No. 652,461, Sep. 20, 1984, abandoned, Continuation of Ser. No. 284,501, Jul. 17, 1981, abandoned. This application Nov. 29, 1985, Ser. No. 802,817
Claims priority, application United Kingdom, Jul. 11, 1983, 83 19314
Int. Cl.⁴ B65G *69/06*
U.S. Cl. 222—58 **6 Claims**



1. Material discharge apparatus comprising: a material receiving chute having an upper and lower portion; a closure member having a continuous surface extending transversely across the upper portion of said material receiving chute in a closed, lowered position of said closure member and movable relative to the chute along a vertical axis between raised and lowered positions to control flow of material into the lower portion of said material receiving chute from a bulk store thereof above the latter; a discharge opening in the lower portion of said chute; an actuating device having a movable part for moving said closure member between raised and lowered positions; and vibrating means located within the material receiving chute and aligned with the vertical axis of said closure member to impart thereto a linear oscillatory motion in a direction parallel to the direction of movement of the closure member by said actuating device, characterized in that said actuating device is mounted centrally beneath the closure member and within the material receiving chute, and in that the movable part of the actuating device is attached to said vibrating means and moves along a single central axis aligned with the vertical axis of the closure member, thus serving to move said closure member and said vibrating means between raised and lowered positions.

4,691,844

IMMERSION NOZZLE FOR CONTINUOUS CASTING

Yoshihiro Ishino; Sadanobu Sugiura, and Kunishige Tokunaga, all of Kariya, Japan, assignors to Toshiba Ceramics Co., Ltd., Japan

Filed Mar. 5, 1987, Ser. No. 22,058
Claims priority, application Japan, Aug. 8, 1986, 61-186522
Int. Cl.⁴ B22D *11/10*
U.S. Cl. 222—591 **10 Claims**



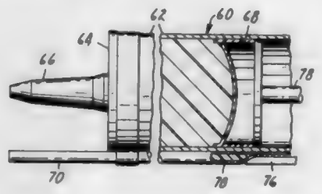
1. An immersion nozzle for continuous casting, comprising an elongated nozzle body and a conduit extending longitudinally through said nozzle body, said nozzle body having an interior surface defining said conduit, at least a portion of said interior surface being formed of a refractory material including 40–92 wt.% ZrO_2, 5–40 wt.% C, and 3–20 wt.% of an admixture of RO and RO_2 wherein RO is at least one member selected from the group consisting of CaO, MgO and MnO; and RO_2 is at least one member selected from the group consisting of SiO_2 and TiO_2.

4,691,845

DISPENSING CONTAINER

Thomas W. Schwartz, Troy, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 31, 1985, Ser. No. 739,687
Int. Cl.⁴ B65D *35/22, 88/54*
U.S. Cl. 222—94 **4 Claims**



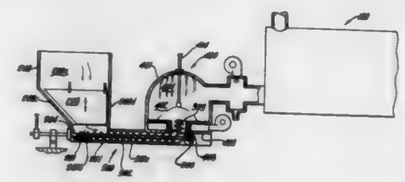
2. In a dispensing container of the type comprising a tube having an axis and first and second ends, a transverse end wall fixed at the second end of said tube, a nozzle having one end attached in said end wall and projecting from the side of said end wall opposite end tube, a first material to be dispensed contained within said tube, and a plunger slidably mounted within said tube for movement from a first position adjacent the first end of said tube to a second position adjacent said end wall to dispense said first material through said nozzle, the improvement wherein said container further includes at least one hose of a uniform cross sectional area along its length, said hose being fixed along and in contact with the outer surface of said tube, extending from adjacent said first end past and through said end wall; and having a flexible wall; a second material to be dispensed contained within said hose; and means for affording displacement of said second material from said hose in an amount proportional to the amount of said first material displaced from said tube upon movement of said plunger toward said second position by flattening of the wall of said hose against said tube.

4,691,846

METHOD AND APPARATUS FOR GASIFYING SOLID ORGANIC MATERIALS

Henry L. Cordell, 795 Gordon Rd., and David G. Galer, 1657 Mapes Rd., both of Mio, Mich. 48647

Filed Jun. 11, 1985, Ser. No. 743,529
Int. Cl.⁴ G01F *11/20*
U.S. Cl. 222—198 **10 Claims**



1. A storage hopper for storing solid materials and for dispensing said solid materials, said storage hopper comprising:

wall means defining a chamber that has an opening at the top for receiving said solid materials and a restricted opening at the bottom of said chamber for dispensing said solid materials, said wall means comprising:

a first portion which extends outwardly and upwardly from said restricted opening; and

an opposed second portion which extends outwardly and upwardly from said restricted opening for directing said solid materials toward said restricted opening;

first reciprocable plate means lying along and substantially parallel to said first portion of said wall means;

second reciprocable plate means lying along and substantially parallel to said second portion for preventing the compaction of said solid materials as said solid materials move downwardly through said chamber from said top to said restricted opening by the reciprocation of said first reciprocable plate means and said second reciprocable plate means;

means for reciprocating said first reciprocable plate means and said second reciprocable plate means, said means for reciprocating comprising:

first support arm means attached to said first reciprocable plate means, said first support arm means extending from said first reciprocable plate means through said wall means;

oscillatable means disposed externally of said chamber, said oscillatable means further contacting said first support arm means externally of said chamber, said oscillatable means comprising a link having an end pivotally attached to said first support arm means;

means for oscillating said oscillatable means, said means for oscillating comprising a shaft non-pivotally attached to an

opposite end of said link and means for rotating said shaft in a first direction and then in a reverse direction, said means for rotating said shaft in a first direction and then in a reverse direction comprising:

a second link having a first end and an opposite end, said first end of said second link being non-pivotally attached to said shaft;

a rod having a first end and an opposite end, said first end of said rod being pivotally attached to said opposite end of said second link; and

means for reciprocating said rod;

rotatable screw feeding means disposed beneath said storage hopper for receiving solid materials dispensed from said chamber through said restricted opening and for conveying said solid materials away from said storage hopper by the rotation of said rotatable screw feeding means;

means for rotating said rotatable screw feeding means; and

said means for reciprocating said rod comprising a cam bearing, said cam bearing being rotatable with said rotatable screw feeding means, said opposite end of said rod being attached to said cam bearing.

4,691,847

PASTY PRODUCT DISPENSER HAVING COMBINATION ACTUATOR AND OUTLET VALVE

John M. B. Ford, and David G. Moore, both of Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Dec. 27, 1983, Ser. No. 565,540
Int. Cl.⁴ G01F *11/00*
U.S. Cl. 222—259 **5 Claims**



1. A dispenser for pasty products comprising:

a tubular body;

a discharge spout at one end of the body having an outlet;

a floating take-up piston at the opposite end of the body movable toward said spout by atmospheric pressure against the underside of the piston but having anti-reverse means associated therewith preventing movement away from the spout;

a reciprocable pumping piston contained within the body adjacent said one end and cooperating with said floating piston to define a pumping chamber therebetween,

said pumping piston having a passage therethrough communicating said chamber with the outlet of the spout,

said passage being continuously open along the entire length thereof from said pumping chamber to said outlet of the spout;

a depressible actuator operably coupled with said pumping piston for shifting the latter through a pumping stroke toward the floating piston when the actuator is depressed;

resilient means for returning the actuator to its undepressed position and the pumping piston to its unshifted position following each pumping stroke of the pumping piston; and

an external check valve integral with said actuator and movable therewith during said depression and return thereof,

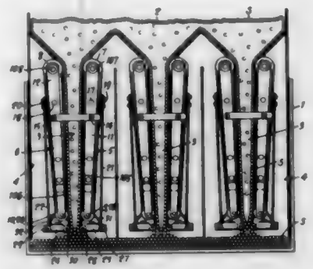
said valve being disposed to open and uncover said outlet when the actuator is depressed and to cover and close the outlet from outside of the spout when the actuator is in its undepressed position, whereby to prevent suck-back of product in the spout when the valve is closed before subatmospheric pressure in the body from the retracted pumping piston and dispensed volume of product has drawn product back through the spout.

4,691,848

DEVICE FOR FEEDING CIGARETTES OR THE LIKE ROD-LIKE ARTICLES

Goffredo Gianese, Bologna, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Dec. 3, 1984, Ser. No. 677,352
Claims priority, application Italy, Dec. 9, 1983, 12691 A/83
Int. Cl.⁴ G01F *11/00*
U.S. Cl. 222—269 **18 Claims**



1. A device for feeding rod-like articles to a receptacle, comprising:

a downwardly extending article-guiding channel, having opposite sides and having a lower end with a mouth that has opposite sides, through which horizontally disposed articles descend as a mass flow, and are delivered from the mouth to the receptacle; and

interruption means fior interrupting at will the descent of the articles through the channel, said interruption means including

two endless conveyor members,

mounting means for movably mounting the conveyor members in an oppositely arranged relation so that the conveyor members delimit the sides of the mouth of the channel and so that both conveyor members are shiftable, the conveyor members being shiftable from a mouth-closing position in which they are drawn near to each other so as to close the mouth of the channel and hinder the articles from flowing out therefrom, into a mouth-opening position in which they are drawn away from each other so as to open the mouth of the channel and allow the articles to flow out therefrom,

urging means, cooperating with the mounting means, for urging the conveyor members toward one another, so that they tend to move into the mouth-closing position, and

driving means for applying a driving force to the articles in the channel to thrust the articles toward the receptacle, the thrust of the articles tending to spread the conveyor members so that they move into their mouth-opening position, the driving force being additional to the force of gravity and to the pressure applied by any overlying articles in the channel and being selectively reducible, annullable, and reversible to decrease the thrust applied by the articles on the conveyor members so that the urging means is allowed to move them into the mouth-closing position,

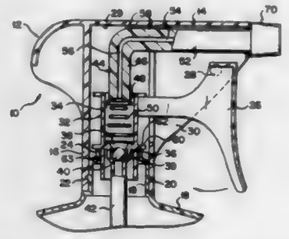
wherein the mounting means comprises two support members, each conveyor member being mounted on a respective support member, and wherein the urging means comprises means for swingably mounting the support members in an out-of-balance condition, such that they tend to move by gravity into a position corresponding to the mouth-closing position of the respective endless conveyor members.

4,691,849

MANUALLY OPERATED TRIGGER TYPE DISPENSER

Atsushi Tada, 2-6-3 Kakinokizaka, Meguro-ku, Tokyo 152, Japan

Filed Dec. 5, 1985, Ser. No. 805,272
Int. Cl.⁴ B67D *5/40*; **B05B** *9/043*
U.S. Cl. 222—382 **9 Claims**



1. A manually operated trigger type dispenser comprising:

a dispenser body adapted to be detachably mounted onto a neck of a container containing liquid to be dispensed, said dispenser body being molded of plastic material and including an upper body portion on which a trigger is swingably pivoted and a vertically extending lower tubular portion,

a tube formed separately from the dispenser body in an L-shape having a horizontal portion thereof disposed in the upper body portion and a vertical portion thereof disposed in the vertically extending lower tubular portion, the lower end of said vertical portion having a piston disposed thereon,

a cylinder defining a pump chamber, coupled to the trigger and disposed in the lower tubular portion to reciprocate along the piston between its upper operation position and its lower non-operation position,

inlet conduit means formed in the cylinder and communicating with the pump chamber to enable flow of liquid therethrough from the container to the pump chamber,

nozzle means mounted on the terminal end of the horizontal portion of said tube and including an orifice,

outlet conduit means formed in the horizontal portion of said tube, and communicating with the pump chamber to dispense compressed liquid from the pump chamber through said orifice, and

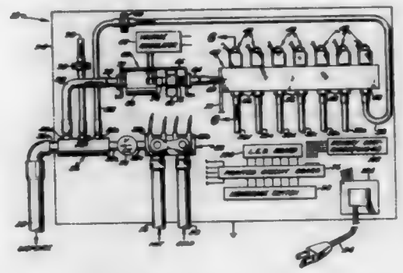
means for biasing the cylinder to its lower non-operation position.

4,691,850

CHEMICAL DISPENSING SYSTEM

John D. Kirschmann, 933 Anderson St., Bismarck, N. Dak. 58501, and John P. Soberg, 1280 W. Larpenteur Ave., St. Paul, Minn. 55113

Filed Aug. 9, 1984, Ser. No. 639,248
Int. Cl.⁴ G04C *23/00*
U.S. Cl. 222—642 **20 Claims**



1. A system for mixing chemical solutions comprising:

a distribution manifold comprising:

a main passage;

a plurality of inlet ports connected to said passage;

an outlet connected to said passage; and

a flush port, said flush port being operatively connected to a supply of flush fluid;

a pump having an inlet and an outlet, said pump inlet being connected to said manifold outlet to draw solutions through said manifold and said pump;

selectively controllable valve means associated with at least one of said ports; and

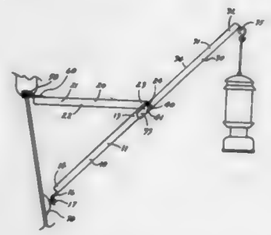
an outlet manifold comprising an inlet connected to a source of pressurized flush fluid, a flush outlet from said manifold connected in fluid flow communication to said flush port, a dispensing outlet, and a fluid inlet connected to said pump outlet to receive fluid discharged by said pump.

4,691,851

APPARATUS FOR HANGING ITEMS FROM VEHICLES

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Filed Jun. 12, 1986, Ser. No. 874,284
Int. Cl.⁴ B60R *9/00*
U.S. Cl. 224—42.45 R **4 Claims**



1. An apparatus for hanging an item from a vehicle comprising:

(A) an elongated rigid bracket arm having a first end, a second end and a central portion connecting said first and second ends; (1) said first end having a means for attaching said bracket arm removably rigidly into an upper window channel of said vehicle when the window is closed (2) said second end possessing proximate its end remote from said central portion a common hinge point;

(B) an elongated rigid support arm having an upper first end,

a lower second end and a central portion connecting said first end and said second end; (3) said lower second end having means for resiliently contacting the window of the vehicle and said first end pivotally engaging the second end of said elongated rigid bracket arm at the common hinge point;

(C) an elongated extension arm having an upper first end, a lower second end and a central portion connecting said first end and said second end; (4) at said common hinge point said lower second end pivotally engaging both the second end of said elongated rigid bracket arm and the first end of said elongated rigid support arm and said upper first end having proximate thereto a means for hanging an item therefrom;

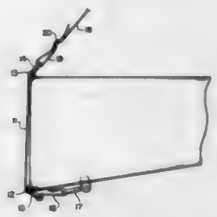
(D) said rigid bracket arm, rigid support arm and extension arm share a common hinge point and are foldable capable of nesting one in the other in a nested configuration.

4,691,852

GUN SLING

Warren C. Phelps, Rte. 2, Sidney, Nebr. 69162

Filed Oct. 21, 1983, Ser. No. 544,262
Int. Cl.⁴ F41C *33/00*
U.S. Cl. 224—150 **7 Claims**



1. In combination with a firearm having a stock with a butt end and a sling strap or web for carrying said firearm, the improvement comprising a sling adapter having:

an elongated, generally planar member having first and second ends and being commensurate in length with the longitudinal dimension of the butt end of the stock of the firearm;

means at said first end of said elongated planar member rotatably attaching said first end of said member to said sling strap or web;

means at said second end of said elongated planar member releasably and rotatably attaching said second end of said member to the underside of the stock; and

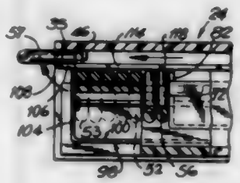
wherein said sling adapter is so constructed and arranged with respect to the butt end of said firearm that (1) the firearm can be carried in a substantially horizontal stable position while suspended from a shoulder of the bearer of the firearm in position for firing, (2) when tension is removed from said sling strap web by lifting said firearm to a conventional firing position, said sling planar member pivots downwardly and away from said butt end of the stock and said stock is unhindered by the sling and said firearm may be readily aimed without interference, and (3) the generally planar nature of said adapter allows said sling strap or web to be positioned in a tight sling position for tight sling firing.

4,691,853

SURGICAL STAPLER

Anthony Storace, Norwalk, Conn., assignor to Technalytics, Inc., Montvale, N.J.

Filed Dec. 30, 1985, Ser. No. 814,666
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 227—19 **41 Claims**



1. A stapling device for use in ejecting a single staple to close an incision or wound comprising:

a barrel having a bottom and a top side and a staple discharge area,

a cartridge assembly adapted to receive a plurality of staples in the form of a stack disposed wihtin said barrel,

a pusher assembly engageable with said stack of staples and movable between a first rearward position and a second forward position to advance said stack of staples,

a control means for turning a single staple of the stack of staples to be ejected from a first position to a second position at a significant angle to said first position at a vertical plane other than the vertical plane of the stack of staples,

forming means for forming the staple into a closed gripping configuration, said forming means including an anvil having a staple transport surface upon which said staple is transported and a staple forming surface extending generally upwardly from said staple transport surface; and a former engageable with the cross-arm of the staple to be ejected to cooperate with means to restrain said staple and displaceable between an intermediate position wherein said staple is unformed and in its plane of ejection and a final position wherein said staple is formed within the incision in a closed gripping configuration, and

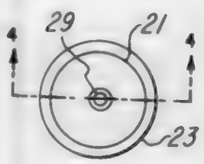
stripping means for disengaging the staple to be ejected from said device and to eject the fully formed staple.

4,691,854

COATINGS FOR CERAMIC BONDING CAPILLARIES

James F. Haefling, Richardson; James W. Pritchard, Garland, and Roger J. Stierman, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1984, Ser. No. 684,654
Int. Cl.⁴ B23K *37/00*
U.S. Cl. 228—4.5 **10 Claims**



1. An apparatus for bonding a wire to interconnect first and second metalized surfaces comprising:

a ceramic non-conductive capillary means for passing a first end of wire from a supply of wire, wherein the capillary means includes a pressure bearing surface and an inner guide passage with an inner surface;

an oxide of silicon, or an oxide of aluminum, non-conducting coating on the pressure bearing surface and on the inner surface of the inner guide passage in the region near the pressure bearing surface;

forming means for forming a ball on the first end of the wire;

retracting means for retracting the ball to a first end of the capillary means;

heating means for heating the ball, first surface, and second surface to a bonding temperature;

stitching means for forming a stitch of wire from the first metalized surface to the second metalized surface and to bond the wire thereto;

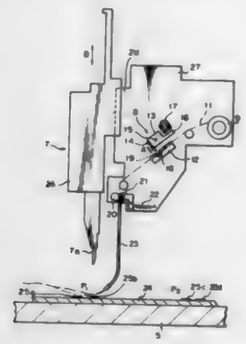
wherein the layer of an oxide of silicon, or an oxide of aluminum, is for resisting the collection of metal splatter, on the surfaces of the capillary means in the region near the pressure bearing surface, resulting from the forming of the ball on the first end of the wire by drawing an arc to the first end of the wire.

4,691,855

TWIN WIRE SPLITTER SYSTEM

Harumi Yagi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 30, 1985, Ser. No. 814,257
Int. Cl.⁴ H05K *13/06*
U.S. Cl. 228—4.5 **5 Claims**



1. A twin wire splitter system comprising:

an X-Y table for mounting a printed circuit board thereon;

wire bonding means for continuously bonding a twin wire to a plurality of wire connecting positions on said printed circuit board;

means defining a twin wire feeding path;

feeding means for feeding the twin wire along said twin wire feeding path;

splitting means for selectively splitting the twin wire at predetermined, relatively displaced splitting positions therein;

said wire splitting means and said wire bonding means being disposed at corresponding splitting and bonding postions of said twin wire feeding path displaced by a first predetermined distance;

a splitting operation controlling means for controlling the start and the end of each twin wire splitting operation carried out by said splitting means as a function of said first predetermined distance along said twin wire feeding path between said bonding position of said wire bonding means and said splitting position of said splitting means, the split length of one split portion of the twin wire, and the length of said twin wire to be fed for each successive bonding operation corresponding to a sequence of positions to be interconnected by said twin wire on said printed circuit board;

said feeding means comprising a stepping motor and a counter circuit connected to said splitting operation controlling means to detect the length of the twin wire which is fed and for driving said stepping motor in accordance with successive pulses; and

said splitting operation controlling means comprises:

a central processing unit for calculating the start and end points of each split portion in the twin wire, required for and associated with each feed of the twin wire;

a split start buffer circuit and a split end buffer circuit for storing results of the start and end point calculations performed by said central processing unit;

a split start point comparator circuit and a split end point comparator circuit for comparing outputs of the respective said buffer circuits with an output of said counter circuit and producing respectively corresponding outputs;

a gate circuit for driving said splitting means according to the outputs of said comparator circuits; and

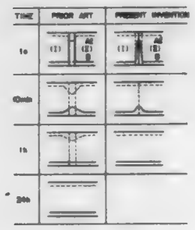
said central processing unit calculating the total number of pulses required for feeding the twin wire by each successive feed length by said stepping motor and calculating each of said start and end points and representing same by the number of pulses required for feeding the remaining length of the twin wire required to be fed, from each of the start and end points to the end of the feed length, by the stepping motor.

4,691,856

DIFFUSION BONDING METHOD USING A HIGH ENERGY BEAM

Takashi Haramaki, Tohkai; Takao Funamoto, Hitachi; Satoshi Kokura, Hitachiohta; Masahisa Inagaki, Hitachi; Ryutaro Jimbou, Hitachiohta; Toshimi Sasaki, Mito, and Kousei Nagayama, Tohkai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 397,048, Jul. 12, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 749,764
Claims priority, application Japan, Jul. 13, 1981, 56-109872
Int. Cl.⁴ B23K *19/00*
U.S. Cl. 228—194 **7 Claims**



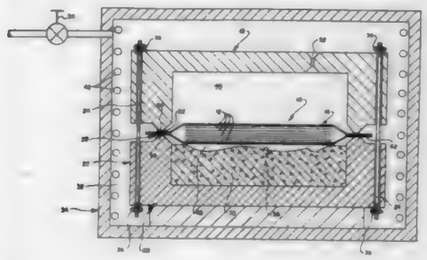
1. A diffusion bonding method comprising: forming, in advance, a low melting alloy layer on at least one of the joint surfaces of base metals, said base metals each comprising a superalloy based on an element selected from the group consisting of Ni, Co, Fe and Ti, said forming of said low melting alloy layer being accomplished by melting which is carried out by a high energy beam used for melting said at least one of the joint surfaces and by incorporating at least one additional element from a material comprising a boron powder and an organic binder, said at least one additional element having a higher diffusion speed than that of the principal constituent element of said base metals, and said low melting alloy layer having a lower melting point than that of said base metals; then bringing the joint surfaces into contact; and heating the joint surfaces of a temperature in the range of the melting point of said alloy layer to that of said base metals in a non-oxidizing atmospheric furnace so as to diffuse said at least on additional element away from said joint surfaces and to bond said metals to each other.

4,691,837

METHOD OF SHAPING A WORKPIECE

Gerald Friedman, Cleveland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 7, 1985, Ser. No. 796,322
Int. Cl.[4] B23K 20/14
U.S. Cl. 228—265 6 Claims



1. A method of bonding and shaping a plurality of pieces of material, said method comprising the steps of enclosing the plurality of pieces of material in a fluid tight container, providing a housing having a plurality of components at least some of which have different coefficients of thermal expansion, the components of the housing including a first section and a second section having a forming surface, positioning the container and housing relative to each other with the first housing section in engagement with a first side of the container and the second housing section in engagement with a second side of the container to form a joint between the housing sections and the container, enclosing the housing sections and container in a main chamber, increasing the fluid pressure in the main chamber, increasing the fluid pressure applied against opposite sides of the container from a first fluid pressure to a second fluid pressure, said step of increasing the fluid pressure applied against opposite sides of the container including increasing the fluid pressure in the main chamber from the first fluid pressure to the second fluid pressure, sealing the joint between the container and the housing sections, said step of sealing the joint between the container and the housing sections including heating the housing, expanding components of the housing having different coefficients of thermal expansion to different extents during heating of the housing, and pressing the first and second sections of the housing against the container under the influence of forces resulting from thermally expanding components of the housing to different extents, and, thereafter, pressing the second side of the container against the forming surface, said step of pressing the second side of the container against the forming surface including increasing the fluid pressure to which the first side of the container is exposed to a third fluid pressure which is greater than the second fluid pressure by increasing the fluid pressure in the main chamber to the third fluid prssure and maintaining the fluid pressure to which the second side of the container is exposed substantially constant.

4,691,858

MILK CARTON BLANK AND MILK CARTON WITH POUR SPOUT

A. Dean Peer, Jr., Parker, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Jul. 25, 1983, Ser. No. 517,324
Int. Cl.[4] B65D 5/74
U.S. Cl. 206—621.2 6 Claims

1. A carton blank for forming a liquid tight carton comprising:

a unitary sheet of laminated composite material comprising an inner layer of paper material having a first side and a second side; first layer of plastic material bonded to said first side of said paper material by a first adhesive layer; a second layer of plastic material bonded to said second side of said paper material said layers of plastic material and said layer of adhesive being coextensive, said first plastic layer being back printed with predetermined carton display graphics;

said unitary sheet of composite material comprising:

a left side edge, a right side edge, a top edge, and a bottom edge, said left and right side edge being perpendicular to said top and bottom edges;

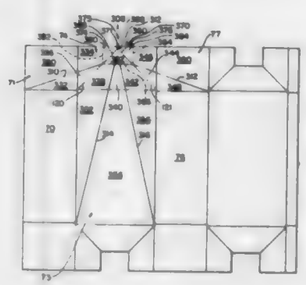
first, second, third and fourth longitudinal fold lines extending from said top edge to said bottom edge in perpendicular relationship thereto;

upper and lower transverse fold lines extending from said left side edge to said right side edge in perpendicular relationship thereto;

said longitudinal fold lines dividing the carton blank into left, front, right, back and edge flap longitudinal portions, said left portion being adjacent said front portion, said front portion being adjacent said right portion, said right portion being adjacent said back portion, said back portion being adjacent said edge flap portion;

said left longitudinal portion being identical in lateral dimension to said right longitudinal portion and said front longitudinal portion being identical in lateral dimension to said back longitudinal portion, said edge flap longitudinal portion being of substantially smaller lateral dimension than said other longitudinal portions;

said transverse fold lines dividing said carton into upper, middle and lower transverse portions;



associated, oppositely positioned upper and lower transverse portions having identical longitudinal dimensions, said longitudinal dimension of associated upper and lower portions being substantially smaller than the longitudinal dimension of an associated middle transverse portion;

said longitudinal and transverse fold lines forming a grid pattern dividing the carton into a left lateral side panel, a left top panel, a left bottom panel, a front lateral side panel, a front top panel, a front bottom panel, a right lateral side panel, a right top panel, a right bottom panel, a back lateral side panel, a back top panel, a back bottom panel, an edge flap lateral side panel, an edge flap top panel, and an edge flap bottom panel;

said front bottom panel, said back top panel and said back bottom panel comprising rectangular cutout portions therein of identical size and shape, each said cutout portion comprising two spaced apart longitudinal cutout edge surfaces extending perpendicularly and inwardly from an associated carton blank transversely extending peripheral edge surface, and a transverse cutout edge surface intersecting said longitudinal cutout edge surfaces in substantially perpendicular relationship therewith at cutout inner corners, said cutout portions being laterally symmetrically positioned within associated panel portions;

diagonal fold lines extending between said cutout corners and adjacent inwardly positioned corner portions of associated panels, said cutout portions being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said associated panel portions;

the length of a longitudinal edge surface of a cutout portion being no greater than the length of a transverse edge surface of a cutout portion but greater than one half the length of said cutout portion transverse edge surface;

the perpendicular distance between a cutout transverse edge surface and a transverse fold line bordering an associated panel being at least one half the lateral dimension of said carton blank left longitudinal portion;

said front top panel comprising a rectangular perforated portion therein, said rectangular perforated portion comprising two spaced apart longitudinal perforation lines extending perpendicularly and inwardly from said top edge surface, and transverse perforation lines intersecting said longitudinal perforation lines in substantially perpendicular relationship therewith at perforated portion inner corners, said perforation lines extending through one plastic layer, one adhesive layer and at least a portion of said paper material layer of said laminated composite material whereby said perforation lines are readily tearable, said perforated portion being laterally symmetrically positioned within said top front panel;

diagonal fold lines extending between said perforated portion corners and adjacent inwardly positioned corner portions of said top front panel, said perforated portion being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said top front panel portion;

the length of said longitudinal perforation lines being no greater than the length of said transverse perforation line but greater than one half the length of said transverse perforation line;

the perpendicular distance between a cutout transverse perforation line and the transverse fold line bordering said top front panel being at least one half the lateral dimension of said carton blank left longitudinal portion;

pour spout left and right central fold lines extending from opposite lower corner portions of said front lateral side panel to the transverse perforation line of said front top panel perforated portion; said pour spout left and right central fold lines being laterally symmetrically positioned within said front top panel and said front lateral side panel;

pour spout left and right upper fold lines extending respectively from a lower left corner of said left top panel to a lower left corner of said perforation portion and from a lower right corner of said right top panel to a lower right corner of said perforation portion;

perforation portion inner diagonal fold lines extending upwardly and inwardly from said perforation portion lower corners in bisecting relationship therewith and intersecting at a diagonal intersection point;

said perforation portion having a perforation cutout portion defined by left and right upper edge surfaces extending in projecting relationship with said perforation portion diagonal fold lines from said diagonal intersection point to the intersection points of said blank upper edge and said left and right longitudinal perforation lines respectively.

3. A method of utilizing a carton blank of the type including a unitary sheet of laminated composite material comprising an inner layer of paper material having a first side and a second side; a first layer of plastic material bonded to said first side of said paper material by a first adhesive later; a second layer of plastic material bonded to said second side of said paper material;

said unitary sheet of composite material comprising:

a left side edge, a right side edge, a top edge, and a bottom edge, said left and right side edge being perpendicular to said top and bottom edges;

first, second, third and fourth longitudinal fold lines extending from said top edge to said bottom edge in perpendicular relationship thereto;

upper and lower transverse fold lines extending from said left side edge to said right side edge in perpendicular relationship thereto;

said longitudinal fold lines dividing the carton blank into left, front, right, back and edge flap longitudinal portions, said left portion being adjacent said front portion, said front portion being adjacent said right portion, said right portion being adjacent said back portion, said back portion being adjacent said edge flap portion;

said left longitudinal portion being identical in lateral dimension to said right longitudinal portion and said front longitudinal portion being identical in lateral dimension to said back longitudinal portion, said edge flap longitudinal portion being of substantially smaller lateral dimension than said other longitudinal portions;

said transverse fold lines dividing said carton into upper, middle and lower transverse portions;

said longitudinal and transverse fold lines forming a grid pattern dividing the carton into a left lateral side panel, a left top panel, a left bottom panel, a front lateral side panel, a front top panel, a front bottom panel, a right lateral side panel, a right top panel, a right bottom panel, a back lateral side panel, a back top panel, a back bottom panel, and edge flap lateral side panel, and edge flap top panel, and an edge flap bottom panel;

said front bottom panel, said back top panel and said back bottom panel comprising rectangular cutout portions therein of identical size and shape, each said cutout portion comprising two spaced apart longitudinal cutout edge surfaces extending perpendicularly and inwardly from an associated carton blank transversely extending peripheral edge surface and a transverse cutout edge surface, intersecting said longitudinal cutout edge surfaces in substantially perpendicular relationship therewith at cutout inner corners, said cutout portions being laterally symmetrically positioned within associated panel portions;

diagonal fold lines extending between said cutout corners and adjacent longitudinally inwardly positioned corner portions of associated panels, said cutout portions being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of associated panel portions;

said front top panel comprising a rectangular perforated portion therein, said rectangular perforated portion comprising two spaced apart longitudinal perforation lines extending perpendicularly and inwardly form said top edge surface, and a transverse perforation line intersecting said longitudinal perforation lines in substantially perpendicular relationship therewith at perforated portion inner corners, said perforation lines extending through one plastic layer, one adhesive layer and at least a portion of said paper material layer of said laminated composite material whereby said perforation lines are readily tearable, said perforated portion being laterally symmetrically positioned within said top front panel;

diagonal fold lines extending between said perforated portion corners and adjacent inwardly positioned corner portions of said top front panel, said perforated portion being constructed and arranged whereby said diagonal fold lines bisect the angles formed by associated longitudinal and transverse fold lines defining said inwardly positioned corner portions of said top front panel portion;

the perpendicular distance between a cutout transverse perforation line and said upper transverse fold line being at least one half the lateral dimension of said carton blank left longitudinal portion;

pour spout left and right central fold lines extending from opposite lower corner portions of said front lateral side panel to the transverse perforation line of said front top panel perforated portion; said pour spout left and right central fold lines being laterally symmetrically positioned within said front top panel and said front lateral side panel;

pour spout left and right upper fold lines extending respec-

tively from a lower left corner of said left top panel to a lower left corner of said perforation portion and from a lower right corner of said right top panel to a lower right corner of said perforation portion;

perforation portion inner diagonal fold lines extending upwardly and inwardly from said perforation portion lower corners in bisecting relationship therewith and intersecting at a diagonal intersection point; comprising the steps of:

(a) folding each said longitudinal carton blank portions into perpendicular relationship with an adjacent longitudinal portion so as to provide a rectangular, tubular configuration with said edge flap longitudinal portion in overlapping relationship with said left longitudinal portion;

(b) sealingly affixing said overlapping portions along a sealing area extending the longitudinal length of said carton;

(c) folding said upper and lower transverse carton portion into perpendicular relationship with said middle transverse portion so as to enclose an upper end and lower end of said tubular configuration by overlapping upper panel portions and overlapping lower panel portions respectively and so as to provide a pair of outwardly projecting multilayered tongues at each said upper and lower end of said tubular configuration;

(d) sealingly affixing said overlapping portions of said upper portions and said lower portions along a sealing area extending between outer most positions on each upper and lower pair of tongues;

(e) folding each pair of tongues inwardly with a tongue comprising said perforated portion positioned outwardly of the associated tongue;

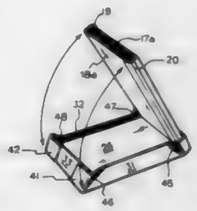
(f) affixing said tongues in said inwardly folded relationship whereby a sealed carton of regular parallelepiped configuration is provided.

4,691,859

COLLAPSIBLE BULK SHIPPING CONTAINER

Teddy R. Snyder, Maumee, Ohio, assignor to OI Forest Products STS Inc., Toledo, Ohio

Filed May 5, 1986, Ser. No. 859,957
Int. Cl.[4] B65D *5/36*
U.S. Cl. 229—23 R **21 Claims**



1. A collapsible bulk shipping container comprising:

a tray-type bottom, said tray-type bottom having:

a rectangular bottom panel, said rectangular bottom panel having first and second opposed, spaced-apart short edges and first and second opposed, spaced-apart long edges, said first and second opposed, spaced-apart long edges extending transversely between said first and second opposed, spaced-apart short edges;

first and second long panel means, one of said first and second long panel means being foldably attached to one of said first and second opposed, spaced-apart long edges of said rectangular bottom panel, at least a portion of said one of said first and second long panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said one of said first and second long panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said one of said first and second long panel means extends generally normally from said rectangular bottom panel, at least a portion of the other of said first and second long panel means being foldably attached to the other of said first and second opposed, spaced-apart long edges of said rectangular bottom panel, said at least a portion of said other of said first and second long panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said other of said first and second long panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said other of said first and second long panel means extends generally normally from said rectangular bottom panel;

first and second short panel means, one of said first and second short panel means being foldably attached to one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel, said one of said first and second short panel means being foldable, with respect to said rectangular bottom panel, from a first position in which said one of said first and second short panel means extends generally parallel to said rectangular bottom panel to a second position in which said one of said first and second short panel means extends generally normally from said rectangular bottom panel, the other of said first and second short panel means being foldably attached to the other of said first and second opposed, spaced-apart short edges of said rectangular bottom panel; and

an intermediate panel, said intermediate panel being directly foldably attached to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel, said one of said first and second short panel means being foldably attached to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel by being foldably attached to said intermediate panel, said one of said first and second short panel means being foldably attached to said intermediate panel along a fold line which is spaced from and which extends generally parallel to said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel; and

a collapsible tubular structure which is partially telescopically disposed within said tray-type bottom and which is collapsible from a first, open configuration in which said collapsible tubular structure has a generally rectangular configuration to a second, collapsed configuration, said collapsible tubular structure extending generally normally from said rectangular bottom panel of said tray-type bottom when said collapsible tubular structure is in said first, open configuration and in which said collapsible tubular structure, when in said second, collapsed configuration, is foldable with respect to said tray-type bottom to extend generally parallel to said rectangular bottom panel, the space between said fold line of said tray-type bottom and said one of said first and second opposed, spaced-apart short edges of said rectangular bottom panel of said tray-type bottom being substantially at least as great as the thickness of said collapsible tubular structure in its second collapsed configuration so that said collapsible tubular structure when in its second, collapsed configuration, will be contained within the outline of said intermediate panel, said collapsible tubular structure having;

first and second opposed short sides, one of said first and second opposed short sides of said collapsible tubular structure being disposed adjacent to, and being substantially coextensive with, one of said first and second short panel means of said tray-type bottom, said one of said first and second opposed short sides being secured to said one of said first and second short panel means of said tray-type bottom, the other of said first and second opposed short sides being disposed adjacent to, and being substantially coextensive with, the other of said first and second short panel means of said tray-type bottom, when said collapsible tubular structure is in said first, open configuration, said other of said first and second opposed short sides being movable away from said other of said first and second short panel means of said tray-type bottom and toward said one of said first and second opposed short sides upon the collapsing of said collapsible tubular structure into said second, collapsed configuration; and

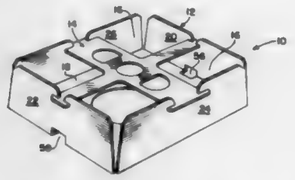
first and second opposed long sides, each of said first and second opposed long sides being foldably attached to and extending between each of said first and second opposed short sides, one of said first and second opposed long sides being disposed adjacent to and being substantially coextensive with one of said first and second long panel means of said tray-type bottom when said collapsible tubular structure is in said first, open configuration, the other of said first and second opposed long sides being disposed adjacent to and being substantially coextensive with the other of said first and second long panel means of said tray-type bottom when said collapsible tubular structure is in said first, open configuration, each of said first and second opposed long sides further having vertical fold line means therein to permit said each of said first and second opposed long sides to be folded inwardly about said vertical fold line means toward the other of said first and second opposed long sides upon the collapsing of said collapsible tubular structure into said second, collapsed configuration.

4,691,860

FOLDABLE CONTAINER CARRIER COLLAPSIBLE CONTAINER CARRIER WITH CRUCIFORM HANDLE

Mindaugas J. Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 15, 1986, Ser. No. 941,229
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 A **7 Claims**



1. A two-piece foldable container carrier comprising:

a base member having first and second pairs of opposing sidewall panels which divide said base member into a central base panel between four foldable sidewall panels, each of said sidewall panels having a slot formed in its distal end opposite said central base panel;

a handle member having a generally cruciform shape formed by arm members which extend a distance corresponding to the dimensions of said central base panel for sliding engagement with said slots of said sidewall panels, and

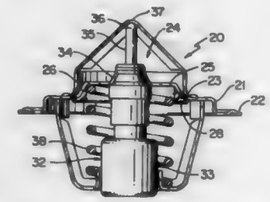
retention means integral with distal ends of said arm members for retaining said arm members within said slots whereby said sidewalls are relatively perpendicular to said central base panel when in use and are folded inwardly to a relatively flat position for storage and said retention means is capable of restricting said sidewall panels from folding outwardly when said sidewalls are perpendicular to said central base while being capable of permitting said sidewall panels to fold inwardly to a relatively flat position while slidingly engaging said arm members of said handle member.

4,691,861

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Boyd P. Sliger, Concord, and Joseph P. Wagner, Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation of Ser. No. 791,378, Oct. 25, 1985, Pat. No. 4,630,770. This application Aug. 26, 1986, Ser. No. 900,439
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] F16K *51/00, 1/00*
U.S. Cl. 236—34.5 **6 Claims**



1. In a valve construction having an annular valve seat means and a movable valve member for opening and closing said valve seat means and being operatively interconnected to a thermal power element that is carried by said valve construction, said valve member having an annular rigid part for engaging said valve seat means and having an annular flexible part for also engaging said valve seat means at a point upstream of said rigid part, said parts of said valve member being so constructed and arranged that said rigid part moves out of engagement with and away from said valve seat means a certain distance before said flexible part moves out of engagement with said valve seat means, said flexible part of said valve member having an annular peripheral outer edge means that extends outwardly beyond said rigid part, said rigid part having an annular peripheral outer edge means provided with an outer end surface that is adapted to engage said valve seat means and is disposed radially inwardly in spaced relation to said outer end surface of said flexible part, the improvement wherein said rigid part of said valve member has first opening means therethrough and said flexible part of said valve member has second opening means therethrough said first and second opening means being adapted to provide a certain sized fluid flow path through said flexible part of said valve member when said rigid part of said valve member is engaging said valve seat means and is adapted to provide a larger certain sized fluid flow path therethrough when said end surface of said rigid part of said valve member has moved out of engagement with said valve seat means and said flexible part of said valve member is still in engagement with said valve seat means.

4,691,862

HEATER UNIT FOR VEHICLES

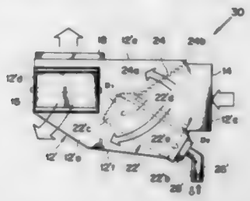
Yoshihiko Muto; Toshio Ohashi, both of Atsugi, and Tsunenari Adachi, Tochigi, all of Japan, assignors to Nissan Motor Co., Ltd. and Nihon Radiator Co., Ltd., both of, Japan

Filed May 30, 1986, Ser. No. 868,555
Claims priority, application Japan, Jun. 6, 1985, 60-121484
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 A **6 Claims**

1. A heater unit for a vehicle, said heater unit comprising:

a casing having a box-like shape and including a pair of top and bottom end walls, a pair of opposed first and second lateral end walls, and a pair of opposed third and fourth lateral end walls, said first lateral end wall being formed with an air inlet while said top end wall, third lateral end wall, and said bottom end wall are each respectively formed with an air outlet, air entering said casing in one direction through said inlet and flowing through said casing to said outlets;

a heater core disposed within said casing for heating air passing therethrough, said heater core having a rectangular heater core main body portion which is disposed vertically to extend between said top and bottom end walls in such a manner as to have a pair of opposed inner and outer lateral ends the outer one of which is positioned adjacent said fourth lateral end wall and the inner one of which is positioned between said third and fourth lateral end walls, said heater core having a first tank portion attached to said inner lateral end of said heater core main body portion and a second tank portion attached to said outer lateral end of said heater core main body portion, said second tank portion being disposed in a corner portion of said casing between said first lateral end wall and said fourth lateral end wall, said casing being so formed as to allow said second tank portion to project outward therefrom; and



an air mix door disposed within said casing and having a pivotal end about which it is swingable for controlling the amount of air passing through said heater core and the amount of air bypassing the same, said pivotal end of said air mix door being located adjacent said inner lateral end of said heater core main body portion such that said first tank portion is disposed adjacently behind said pivotal end of said air mix door with respect to the direction of air flow, said air mix door having another end which is opposite to said pivotal end and movable between said outer lateral end of said heater core main body portion and said third lateral end wall of said casing,

said heater core further comprising a pair of inlet and outlet pipes attached to said second tank portion for supply and discharge of heating medium to and from said second tank portion.

4,691,863

RAILROAD GRADE CROSSING STRUCTURE

Gene M. Smith, 4602 Beauchamp Rd., Plant City, Fla. 33566

Filed May 15, 1986, Ser. No. 863,687
Int. Cl.[4] E01B *2/00*
U.S. Cl. 238—8 **10 Claims**



1. A railroad grade crossing structure for use with a paved thoroughfare and a rail roadway having a roadbed, a series of elongated, spaced apart crossties having a lower surface resting upon the roadbed and an upper surface facing away from the roadbed, and a pair of rails overlying and supported by said crossties, each said rail having a wheel supporting track with an upper surface facing away from said crossties, an inside surface facing toward the other said rail and an outside surface facing away from said other rail, a pair of opposed, lower laterally projecting flanges and a supporting web extending in the center of said rail between said track and said flanges, said grade crossing structure comprising

a metal rail support plate interposed between each said rail and each said crosstie underlying said grade crossing structure, and rail support plate having a substantially flat and horizontal upward facing surface extending outwardly from each said rail flange to an outer edge located a distance equal to at least twice the width of said flange measured from the center of each said rail;

decking structure for each said rail, said decking structure comprising an inner decking element positioned adjacent and extending along said rail track inside surface of one of said pair of rails and an outer decking element positioned adjacent and extending along said rail track outer surface of said one rail;

each said decking element being formed of substantially rigid metal plate members and comprising a structure having a generally z-shaped cross section and comprising a lower panel and upper panel generally parallel thereto and joined together by a connector panel;

said lower panel being attached to the upper surface of a plurality of said crossties and having a lower surface extending generally parallel to and engaging said upper surfaces of said crossties and an upper surface facing away from said crossties, with a first edge of said lower panel adjacent said connector panel and extending generally parallel to and in abutting engagement with said outer edges of a plurality of said rail support plates such that the combination of said affixation to said crossties and said rail support plate engagement will serve to hold said decking structure rigidly in place relative to said rails;

said upper panel having a first edge adjacent said connector panel and a second edge spaced from said first edge and having both an upper surface extending generally coplaner with said rail track upper surface and also a lower surface facing said rail support plate, with an upper panel support structure extending between and engaging said upper panel lower surface and said rail support plate, while remaining free of engagement with said rail flanges and said rail supporting web, for carrying loads imposed downwardly upon said upper panel to said rail support plate, whereby at least a portion of any downward loads imposed upon the upper panel is carried by the rail support plate and a crosstie bearing the rail support plate with substantially none of such upper panel downward loads being borne by any portion of the rail; and

thoroughfare paving material substantially filling the space between said lower panel upper surface and a plane generally parallel to said upper panel upper surface.

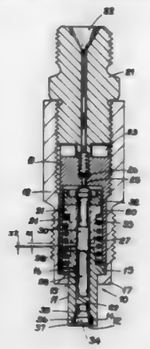
4,691,864

FUEL INJECTION NOZZLES

Godfrey Greeves, Hatch End, England, assignor to Lucas Industries public limited company, Birmingham, England

Division of Ser. No. 550,096, Nov. 9, 1983, abandoned. This application Jan. 17, 1986, Ser. No. 799,868
Claims priority, application United Kingdom, Nov. 25, 1982, 8233641
Int. Cl.[4] B05B *1/32*
U.S. Cl. 239—453 **4 Claims**

1. A fuel injection nozzle for supplying fuel to an internal combustion engine, the nozzle being of the so-called outwardly opening type and comprising a valve assembly including a body defining an outlet opening, a bore in the body extending into the outlet opening, a valve member including a stem in the bore, a valve head carried by the stem, said head being located in said outlet opening and being shaped for co-operation with a seating defined at the entrance to the bore from the opening, resilient means acting on the valve member for biasing the head into contact with the seating, a fuel inlet to said bore, the nozzle including a nozzle inlet connected to said fuel inlet, the nozzle inlet in use being connected to the outlet of a high pressure fuel supplying device, said valve member controlling the flow of fuel from said nozzle inlet through said outlet opening, a chamber, part of the wall of which is defined by the valve stem, the free volume of the chamber increasing as the valve head moves away from the seating, a groove or passage formed in a part of said stem through which said chamber is connected to said nozzle inlet, said part of said stem having the same diameter as the bore, the portion of the stem between said part and the valve head defining a clearance with the bore, the clearance communicating with said nozzle inlet, said groove or passage communicating with said clearance and extending beyond an end of said bore to communicate with said chamber



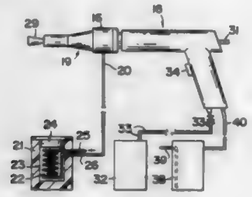
in the closed position of the valve member, the wall of the bore obturating said groove or passage during the movement of the valve member to the open position so that said groove or passage is closed after a predetermined movement of the valve head away from said seating, continued movement of the valve head away from the seating after said groove or passage has closed causing a reduction in the pressure in said chamber, thereby creating a restraining force on said valve member additional to the force exerted by said resilient means.

4,691,865

DEVICE FOR CHILLING STREAM OF GAS-SUSPENDED PARTICLES

Reinhold Hoffman, Sprockhovel, and Walter Klimke, Dusseldorf, both of Fed. Rep. of Germany, assignors to Interlock Corporation, Cleveland, Ohio

Filed Jan. 23, 1986, Ser. No. 821,801
Int. Cl.[4] B05B *1/34, 5/02*
U.S. Cl. 239—690 **12 Claims**



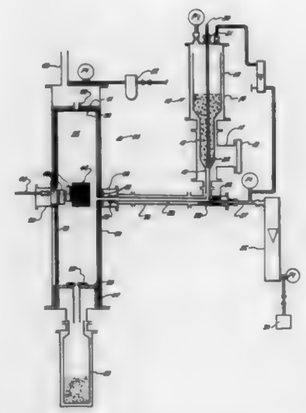
1. A device capable of being handheld and capable of being held in a relatively horizontal position for the chilling of a gas stream containing particles suspended therein comprising a nozzle having (a) a passageway extending linearly therethrough, a first end of said passageway comprising the end through which said gas stream having particles therein is admitted to said passageway, the other end of said passageway comprising the end through which said stream exits from said passageway, (b) a cooling means for chilling gas, (c) a source of gas to be chilled, (d) a source of a gas stream containing particles, and (e) an inlet channel for admitting a chilled gas to the interior of said nozzle connecting and communicating with said passageway whereby the chilled gas admitted through said inlet channel intermingles with the gas suspension passing through said passageway and out.

4,691,866

GENERATION OF SEED PARTICLES

Thomas J. Belk, St. Louis, Mo., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 8, 1985, Ser. No. 796,190
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—5 **14 Claims**



1. A method of generating silicon seed particles, said method comprising the steps of:

dispensing silicon feed particles of about 300–2000 microns from a feed particle vessel into a stream of inert gas moving at a rate sufficient to accelerate and propel said feed particles from said vessel;

directing said stream of inert gas into a target chamber containing a disc-shaped, movable silicon target and impacting the feed particles entrained in said stream into said movable silicon target thereby splitting said feed particles and forming seed particles of about 88–400 microns;

rotatably moving said movable silicon target so that said feed particles in said stream impact on a different portion of said silicon target; and

collecting said silicon seed particles.

4,691,867

METHOD AND APPARATUS FOR CONTINUOUSLY MIXING AND KNEADING PULVERULENT BODIES SUCH AS PULVERIZED COAL, OIL COKE TO PREPARE SLURRY THEREOF

Motonari Iwako, and Masaaki Nakao, both of Tokyo, Japan, assignors to Kabushiki Kaisha Hunken, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 821,917
Int. Cl.[4] B02C *23/40*
U.S. Cl. 241—21 **4 Claims**

1. A continuously mixing and kneading apparatus for preparing slurry of pulverulent bodies comprising:

a mixing chamber having a center axis, covered with a base plate;

a supply tube for connection to a fixed rate supply of pulverulent bodies, having an outlet opening axially into said mixing chamber through said base plate;

a rotary mixing disk rotatably disposed in the mixing chamber for rotation about said center axis to spatter and disperse the pulverulent bodies supplied thereonto from the supply tube;

an overflow tube of inverse conical type surrounding in

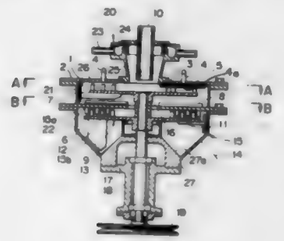
radially outwardly spaced relation said outlet of the supply tube, said tube being disposed on an upper central portion of the mixing chamber for directing a main liquid as an annular overflow film to the spattered and dispersed pulverulent bodies on the rotary mixing disk;

a plurality of injection nozzles having outlets opening into the mixing chamber for injecting a small amount of liquid to the spattered and dispersed pulverulent bodies;

a plurality of upper surface scrapers provided on said rotary mixing disk and disposed to cross the outlet ports of said injection nozzles as the rotary mixing disk rotates so as to disperse the liquid flowing from the outlets of the nozzles;

side face scrapers provided on said rotary mixing disk to turn along the inner wall of said mixing chamber;

a collecting blade disposed on a bottom surface of said mixing chamber for collecting the pulverulent bodies to a center portion of the mixing chamber;



a mixing and kneading chamber provided below said mixing chamber;

means for directing the pulverent bodies from the center portion of the mixing chamber to a center portion of the mixing and kneading chamber;

a rotary mixing and kneading disk rotatably disposed in the mixing and kneading chamber for dispersing centrifugally the humidified pulverulent bodies supplied from said mixing chamber;

fixed mixing and kneading pins secured to an upper wall of the mixing and kneading chamber;

movable mixing and kneading pins planted in said rotary mixing and kneading disk; and

a mixing and kneading type scraper blade provided on said rotary mixing and kneading disk for discharging the mixed and kneaded pulverulent bodies to a discharge port.

4,691,368

SCREEN SIZER

Gilbert Y. Whitten, Jr., Charlotte; Kenneth E. Joyner, Jr., Midland, and Benjamin E. Boren, Charlotte, all of N.C., assignors to Midrex International, B.V., Zurich, Switzerland

Filed Feb. 18, 1986, Ser. No. 830,437

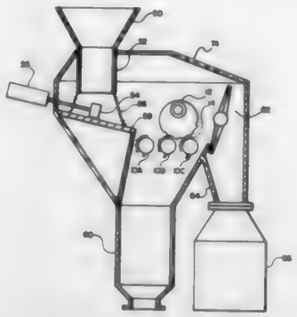
Int. Cl.[4] B02L *73/08*

U.S. Cl. 241—24 **20 Claims**

1. Apparatus for classifying and breaking clumps of material, comprising:

a plurality of rolls having parallel axes, mounted for simultaneous reciprocal rotation, each roll being rotatable at the same speed and in the same direction simultaneously;

each roll being provided with a plurality of equi-spaced breaker and carrier anvils extending from about 80° to about 120° about the circumference of the roll, each of



said anvils being spaced from each adjacent anvil a distance equal to its own width.

4,691,869

APPARATUS FOR CONTROLLING THE OPERATION OF A GRINDING SYSTEM

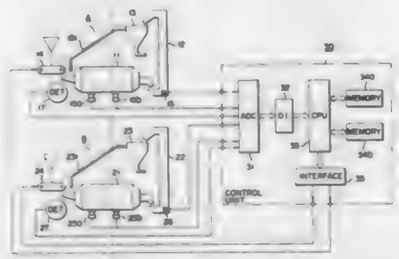
Eiichi Onuma, Narashino; Youji Kawamura, Tsukumi; Hiroshi Obana, Narashino; Takemi Aizawa, Funabashi; Motomi Tamai, Tsukumi; Tsuguya Inagaki, Yokohama, and Minoru Tokita, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Yamaguchi and Sankyo Dengyo Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 610,622, May 16, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 888,626

Claims priority, application Japan, May 23, 1983, 58-90484

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—34 **7 Claims**



1. Apparatus for controlling operation of a dry type grinding system, comprising:

at least a first dry type grinding mill and a second dry type grinding mill arranged to be operated in a parallel fashion;

first material supplying means for supplying material to be pulverized to the first mill, and second material supplying means for supplying material to be pulverized to the second mill;

first detecting means for detecting a first characteristic value of a physical quantity corresponding to an amount of material pulverized per unit time in the first mill, and second detecting means for detecting a second characteristic value of a physical quantity corresponding to an amount of material pulverized per unit time in the second mill, wherein said characteristic values vary according to operation conditions of the first and the second mills;

first memory means for storing a first initial setting value of a physical quantity corresponding to an amount of material desired to be pulverized per unit time in the first mill, and second memory means for storing a second initial setting value of a physical quantity corresponding to an amount of material desired to be pulverized per unit time in the second mill;

first control means for performing a predetermined computation between the initial setting value stored in the first memory means and the characteristic value detected by the first detecting means, and for performing a predetermined computation between the initial setting value stored in the second memory means and the characteristic value detected by the second detecting means, and for producing a first control signal for controlling amounts of material supplied from the first and the second material supplying means so that the first setting value coincides with the first characteristic value, and so that the second setting value coincides with the second characteristic value;

first calculating means for calculating an amount of material pulverized in the first mill per unit time according to the characteristic value detected by the first detecting means, and for calculating an amount of material pulverized in the second mill per unit time according to the characteristic value detected by the second detecting means;

second calculating means for calculating a difference between the amount of material pulverized in the first mill per said unit time and the amount of material pulverized in the second mill per said unit time as calculated by the first calculating means;

third calculating means, associated with said second calculating means, for calculating an amount of variation between said difference between the amounts of material pulverized for a previous said unit time prior to a present said unit time as calculated by said second calculating means, and the difference between the amounts of material pulverized for the present said unit time as calculated by said second calculating means;

means for judging if the amount of variation calculated by the third calculating means is greater or smaller than a predetermined value;

second control means for producing a second control signal which, when said amount of variation is judged by the judging means as being greater than the predetermined value, causes only the initial setting value stored in one of the first and the second memory means to be changed so that the difference between the amounts of material pulverized in the first mill and the second mill as calculated at a next said unit time following the present said unit time by the second calculating means is greater than that at the present said unit time, and so that the amounts of material supplied by the first and the second material supplying means are selectively controlled; and

third control means for producing a third control signal which, when said amount of variation is judged by the judging means as being smaller than the predetermined value, causes only the initial setting value stored in the other of the first and the second memory means to be changed so that the difference between the amounts of material pulverized in the first mill and the second mill as calculated at the next said unit time by the second calculating means is greater than that at the present said unit time, and so that the amounts of material supplied by the first and the second material supplying means are selectively controlled;

wherein pulverizing efficiency of each of said first and said second mills is optimized continuously, and disturbances to the mills of the kind which equally affect production efficiencies of the mills are without influence on the changing of the setting values by the second and the third control means.

4,691,870

ELECTRIC FOOD PROCESSOR

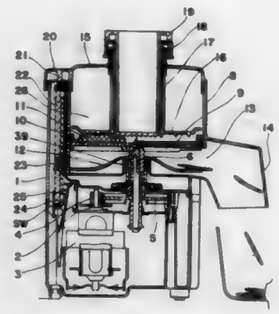
Masao Fukunaga, Yokaichi, and Hiroshi Nonoguchi, Yao, both of Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed Oct. 3, 1985, Ser. No. 783,919

Claims priority, application Japan, Oct. 9, 1984, 59-212029; Oct. 9, 1984, 59-212025

Int. Cl.[4] B02C *18/12*

U.S. Cl. 241—36 **9 Claims**



1. An electric food processor for processing food, said processor comprising:

a main body having an electric motor therein;

a generally cylindrical retaining container detachably mountable on said main body for containing the food processed by the food processor when mounted on said main body, said generally cylindrical retaining container having an upper open end through which the food to be processed is placed therein, and an engagement means at said upper open end;

a rotatable S-shaped cutter for cutting food within said retaining container, said S-shaped cutter operatively connectable to said motor to be rotated thereby within said retaining container when said retaining container is mounted on said main body;

a discharge container detachably mountable on said main body so as to be exchangeable with said cylindrical retaining container, said discharge container having a discharge passage extending therethrough through which food processed within said discharge container is discharged outside of said discharge container, and said discharge container having an upper open end through which food to be processed is placed therein;

a rotatable disc-shaped rotary base having a cutting blade thereon for cutting food within said discharge container, said rotary base operatively connectable to said motor so as to be exchangeable with said S-shaped cutter and so as to be rotated by said motor within said discharge container when said discharge container is mounted on said main body;

a rotary disc operatively connectable to said motor to be rotated thereby when said discharge container is mounted on said main body, said rotary disc being disposed below said rotary base and adjacent said discharge path for discharging the food therethrough that is cut by said cutting blade of said rotary base; and

a removable container lid for covering either of said upper open ends of said retaining container and said discharge container when either of said containers is mounted on said main body, said container lid having a shaft portion slidably mounted thereto and a pressing plate fixed to and extending around one end of said shaft portion, said shaft portion and said pressing plate slidable within said discharge container when said container lid covers said discharge container for pressing food therewithin toward

said rotary base when said discharge container is mounted on said main body and said rotary base is operatively connected to said motor, and said pressing plate and said shaft portion engaging said engagement portion at said upper end of said retaining container when said container lid covers said retaining container such that said pressing plate and said shaft portion are prevented from sliding toward said S-shaped cutter when said retaining container is mounted on said main body and said S-shaped cutter is operatively connected to said motor.

4,691,871

CUTTING APPARATUS

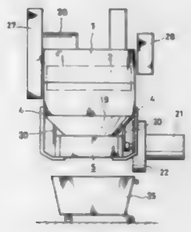
Nobumasa Mochizuki, Kawagoe, Japan, assignor to Mochizuki Precision Machine Industries Co., Ltd., Kawagoe, Japan

Filed Aug. 30, 1985, Ser. No. 771,130

Claims priority, application Japan, Aug. 31, 1984, 59-133480[U]; Nov. 15, 1984, 59-173551[U]; Dec. 15, 1984, 59-264762; Mar. 28, 1985, 60-45284[U]

Int. Cl.⁴ B02C *18/16*

U.S. Cl. 241—166 **6 Claims**



1. A cutting apparatus, comprising:
a conveyor having a takeout end;
a pair of upper side plates disposed immediately below said takeout end; first and second cutter shafts disposed substantially in parallel to each other with a prescribed spacing, and interposed between said pair of upper side plates;
a pair of lower side plates, each having first semi-circular bearing notches bored therein, each of said pair of upper side plates having second semi-circular bearing notches bored therein and having detachably connected thereto respective ones of said lower side plates such that said first semi-circular bearing notches, in cooperation with said second semi-circular bearing notches, form circular openings admitting said first and second cutter shafts;
a motor attached to said first cutter shaft for rotating said first cutter shaft;
means for rotating said second cutter shaft in a direction opposed to the direction in which said first cutter shaft is rotated;
a plurality of first substantially disklike cutters fitted around said first cutter shaft;
a plurality of first substantially disklike spacers fitted around said first cutter shaft; said first cutters and said first spacers fitted around said first cutter shaft being alternately arranged and brought into intimate contact with each other in the axial direction of said first cutter shaft;
a plurality of second substantially disklike cutters fitted around said second cutter shaft; and
a plurality of second substantially disklike spacers fitted around said second cutter shaft, said second cutters and said second spacers fitted around said second cutter shaft being alternately arranged and brought into intimate contact with each other in the axial direction of said second cutter shaft, each of said first cutters and each of said second spacers being closely opposed to each other and each of said second cutters and each of said first spacers being closely opposed to each other so as to hold said first and second cutters in mesh with each other.

4,691,872

TOROIDAL WINDING APPARATUS

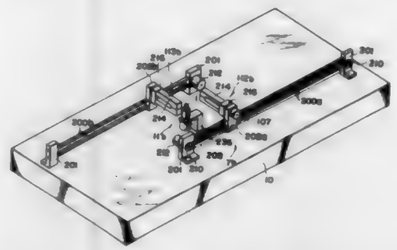
Masahiro Ishida; Shuaichi Kato, and Noboru Takaru, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 633,888, Jul. 24, 1984, Pat. No. 4,568,032. This application Dec. 5, 1985, Ser. No. 805,208

Claims priority, application Japan, Jul. 26, 1983, 58-135176; Aug. 23, 1983, 58-152436; Sep. 17, 1983, 58-170598; Oct. 19, 1983, 58-194032; Oct. 25, 1983, 58-199484; Oct. 31, 1983, 58-203836; May 8, 1984, 59-91224; May 8, 1984, 59-91225; May 8, 1984, 59-91226

Int. Cl.⁴ H01F *41/08*

U.S. Cl. 242—4 R **23 Claims**



1. A winding apparatus for winding a wire through a through hole of an object on which the wire is to be wound, comprising:
first rotating means for rotating the object about an axis perpendicular to an axis of the through hole of the object between a first position and a second position 180° separated therefrom;
first and second wire feeding means, on opposite sides of the object, for clamping a leading end of the wire and feeding the wire in a direction through the through hole from one end thereof;
first and second moving means for independently moving the first and second wire feeding means, respectively 180° between a front position adjacent to the object and a rear position separated from the object;
second and third rotating means for independently rotating the first and second wire feeding means, respectively 180? about axes perpendicular to the direction of said feeding; and
control means for causing the first moving means to move the first feeding means to the front position thereof so as to clamp the leading end of the wire passing through the through hole,
causing the first moving means to move the first wire feeding means to the rear position thereof so as to suspend the wire between the object and the first wire feeding means, and causing the first rotating means to pivot the object form the first position to the second position so as to wind the wire around the object,
causing the second rotating means to rotate the first wire feeding means by 180° to face the leading end of the wire to the object and causing the first moving means to move the first wire feeding means to the front position thereof,
causing the second moving means to move the second wire feeding means to the front position thereof, thereafter driving the first wire feeding means to feed the wire from the first wire feeding means through the through hole of the object, and causing the second wire feeding means to clamp the leading end of the wire fed from the first wire feeding means,
causing the second moving means to move the second wire feeding means to the rear position thereof to suspend the wire, causing the first rotating means to pivot the object to the first position so as to wind the wire around the object,

causing the third rotating means to rotate the second wire feeding means by 180° to face the leading end of the wire to the object, and causing the second moving means to move the second wire feeding means to the front position thereof,
causing the second wire feeding means to feed the wire through the through hole, and thereafter continuously repeating the above sequential steps.

4,691,873

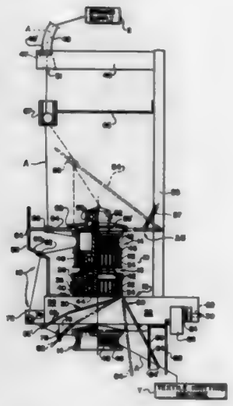
STRAND STORING AND DELIVERING DEVICE

Alan Gutschmit, P.O. Box 708, Troy, N.C. 27371

Filed Jun. 6, 1986, Ser. No. 872,210

Int. Cl.⁴ B65H *51/20*

U.S. Cl. 242—47.01 **23 Claims**



1. A device for transiently storing and delivering a traveling strand to a textile machine or the like, comprising strand storage means having rotatable first and second circumferential portions about and from each of which said strand may be wound and unwound, means for rotatably driving said first and second circumferential portions synchronously, means for guiding said strand to travel in sequence a plurality of windings about said first circumferential portion and a plurality of windings about said second circumferential portion, first stop motion means for monitoring said strand intermediate said first and second circumferential portions for detecting breakages in said strand, whereby said first stop motion means is isolated from tension variations in said strand upstream of said first circumferential portion to detect only actual breakages of said strand, and second stop motion means for monitoring said strand upstream of said first circumferential portion for detecting tension increases in said strand in excess of a predetermined amount without detecting breakages in said strand and other tension decreases in said strand, thereby to prevent at least some breakages in said strand.

4,691,874

METHOD AND APPARATUS FOR WINDING WIRE ROD

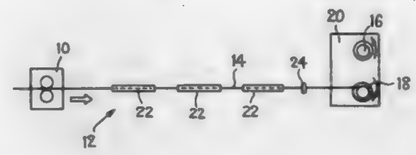
Hiroo Inamori, Nagoya; Sigeyuki Nasuda, Chita; Yoshio Morimoto, Aichi, and Takayuki Haruna, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 769,694, Aug. 27, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,328

Int. Cl.⁴ B65H *54/00, 54/80*

U.S. Cl. 242—80 **3 Claims**

1. A method of winding wire rods into coils, said method comprising the steps of:
(a) feeding a plurality of wire rods in succession from a rolling mill along a single linear wire path;
(b) providing a first wire winder and a second wire winder in mutually spaced apart relation and mounted on a carriage which is movable to and fro on a linear carriage path that intersects and is perpendicular to said single linear wire path, said first and second wire winders each being rotatable about a vertical axis, said first wire winder having a first side that faces said second wire winder and a second side that is remote from said second wire winder and said second wire winder having a first side that faces said first wire winder and a second side that is remote from said first wire winder;



(c) positioning said carriage so that the first side of said first wire winder is in alignment with said single wire path; then
(d) rotating said first wire winder in a first angular direction so as to wind a first wire rod into a first coil; then
(e) positioning said carriage so that the first side of said second wire winder is in alignment with said single wire path; and then
(f) rotating said second wire winder in a second angular direction, opposite from said first angular direction, so as to wind a second wire rod into a second coil.

4,691,875

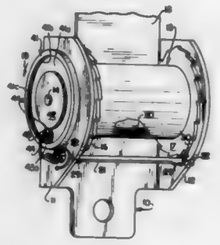
PLANETARY INERTIAL SEAT BELT RETRACTOR

Wallace C. Higbee, Romeo, Mich., assignor to TRW Automotive Products Inc., Lyndhurst, Ohio

Filed Nov. 13, 1985, Ser. No. 797,593

Int. Cl.⁴ B60R *22/38;* **B65H** *75/38*

U.S. Cl. 242—107.4 B **12 Claims**



1. A seat belt retractor comprising:
a seat belt reel rotatable about an axis in belt retraction and belt withdrawal directions;
a locking pawl movable between a lock position preventing rotation of said reel in said belt withdrawal direction and a release position allowing rotation of said reel in said belt withdrawal direction;
a planetary gear system including a sun gear, a planet gear, and a ring gear, said planet gear meshing with said sun gear and ring gear;
one of said sun and ring gears being connected to rotate about its axis as a function of the rotation of said reel and the other of said sun and ring gears being journaled for free rotation about its axis;
connecting means between said planet gear and pawl for

moving said pawl to said lock position in response to bodily movement of said planet gear to an operative position and for moving said pawl to said release position in response to bodily movement of said planet gear to a non-operative position; and

spring means for biasing said pawl toward said release position;

said planet gear and said other of said sun and ring gears having a predetermined inertia such that said planet gear remains in said non-operative position when said reel rotates in said belt withdrawal direction at a rate of acceleration less than a predetermined rate and moves to said operative position and causes said pawl to lock said reel when said reel rotates in said belt withdrawal direction at a rate of acceleration greater than said predetermined rate;

said connecting means comprising a part projecting axially of said planet gear and connected to said pawl and operable to move said pawl from said release position to said lock position in response to movement of said planet gear to said operative position;

said pawl being radially spaced from the axis of said reel beyond said ring gear; and

said part being a shaped wire extending from said planet gear to said pawl.

4,691,876

BRAKE AND RELEASE APPARATUS FOR A ROTARY NOZZLE BODY

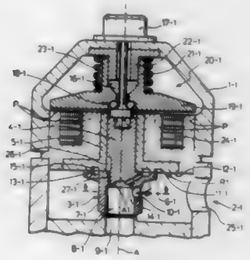
Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,501

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3519892

Int. Cl.⁴ F42B *15/033*

U.S. Cl. 244—3.22 **15 Claims**



1. Brake and release apparatus for a rotary nozzle body having a rotary shaft disposed in a missile casing and which for guiding the missile delivers a gas thrust jet substantially perpendicular to the direction of the axis of rotation, wherein for adjusting the thrust jet direction, friction coupling means is provided comprising first and second friction surface means, said first and second friction surface means being brought into and out of engagement with one another by setting means, the first friction surface means being disposed on the rotary nozzle body and the second friction surface means being disposed on the missile, wherein when said setting means is not actuated, the first friction surface means is held in frictional engagement against the second friction surface means by a tensioning force, said setting means acting on a rotary shaft of the rotary nozzle body through a thrust/pivot bearing means and providing an actuating force directed counter to the tensioning force.

4,691,877

COMPOUND HELICOPTER AND POWERPLANT THEREFOR

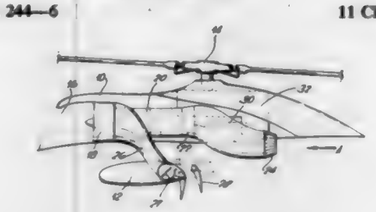
Ralph M. Denning, Bristol, England, assignor to Rolls-Royce plc, London, England

Continuation of Ser. No. 555,090, Nov. 25, 1983, abandoned. This application Nov. 14, 1986, Ser. No. 930,990

Claims priority, application United Kingdom, Dec. 1, 1982, 8234318

Int. Cl.⁴ B64C *27/22*

U.S. Cl. 244—6 **11 Claims**



1. A compound helicopter comprising:

at least one helicopter rotor:

at least one wing having at least one lift augmentation device for producing lift in addition to that normally produced by the wings in forward flight;

at least one gas turbine powerplant having:

a core engine;

a low pressure compressor driven by the core engine, and

a power turbine driven by the exhaust of the core engine and connected to drive the at least one helicopter rotor;

ducting to convey at least part of the air compressed by the low pressure compressor to said at least one wing; and

a variable area final propulsion nozzle downstream of the power turbine, said nozzle receiving the exhaust from the power turbine and being operable to vary the power absorbed by the power turbine.

4,691,878

TILT-ROTOR WING FOLD MECHANISM AND METHOD

John C. Vaughan, Rockville, Md., and Russel G. Perkins, Jr., Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1985, Ser. No. 795,303

Int. Cl.⁴ B64C *27/28, 3/56*

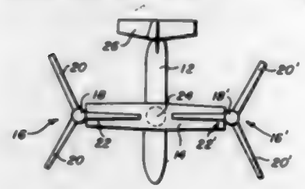
U.S. Cl. 244—7 R **16 Claims**

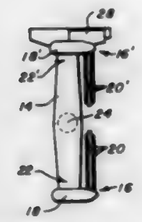
8. A method for folding the wing of a tilt-rotor-aircraft, said aircraft including a fuselage, a single segment tilt-rotor wing having a tilting rotor-prop assembly on each wing tip and engine cross-shafting therebetween, a tail empennage having a foldable control surface, a rotatable load bearing member disposed between the wing and the fuselage, and at least one lockable load bearing pin joint radially disposed concentric to the rotatable load bearing member, said method comprising the steps of:

folding the rotors of each tilt-rotor-prop assembly inboard;

unlocking each load bearing pin joint;

rotating the single segment tilt-rotor wing relative to the





fuselage on the rotatable load bearing member to a configuration substantially parallel to said fuselage; and

locking each load bearing pin joint.

4,691,879

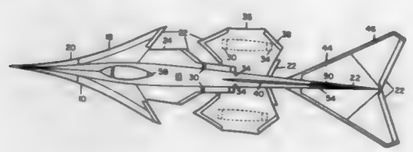
JET AIRPLANE

Vibert F. Greene, 19400 Sorenson Ave., Cupertino, Calif. 95014

Filed Jun. 16, 1986, Ser. No. 875,024

Int. Cl.⁴ B64C *39/08*

U.S. Cl. 244—45 R **13 Claims**



1. A high performance jet airplane comprising:

a fuselage having a delta nose wing and nose strake;

a winglet on the fuselage rearwardly of the nose wing;

a midspan wing coupled with the fuselage rearwardly of the winglet, each of said nose wing, said winglet and said midspan wing having flap means thereon near the rear marginal edge thereof;

a pair of high performance jet engines on each side, respectively, of the fuselage, one of the engines of each side being forwardly of the other engine of the corresponding side;

an upper body stabilizer on the fuselage rearwardly of the midspan wing;

a vertical tail on the fuselage rearwardly of the upper body stabilizer, the vertical tail having flap means at the rear marginal edge thereof;

a V-tail delta wing having two adjustable wing sections and a flap at the rear marginal edge of each adjustable section, respectively; and

an air flow regulator for directing and controlling the flow field of the air along the underside of the delta nose wing and nose strake, said airplane having an aft center of gravity to provide the pilot full control, the airplane being highly maneuverable at high accelerations and at large angles of attack.

4,691,880

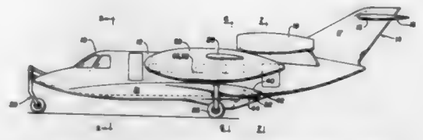
TORSION SPRING POWERED MISSILE WING DEPLOYMENT SYSTEM

Arthur M. Frank, Plainview, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 14, 1985, Ser. No. 798,207

Int. Cl.⁴ B64C *3/38, 3/56*

U.S. Cl. 244—49 **3 Claims**



1. A foldable wing deployment system comprising:

a fixed wing section;

a foldable wing section hinged to the fixed wing section;

an overcenter linkage connecting the fixed and foldable wing sections for securely deploying the foldable wing section to a coextensive position with the fixed wing section;

a first torsion bar having a first end connected to a first gear;

a hollowed cylindrical torsion member mounted over the torsion bar, a first end of the member being fixed and a second end being connected to a corresponding second end of the torsion bar;

a second torsion bar located in parallel proximity to the cylindrical torsion member and connected to the overcenter linkage; and

a second gear mounted on the second torsion bar and contacting the first gear for exerting supplementary bias on the overcenter linkage during initial operation thereof for ensuring a substantially linear actuating drive on the linkage, necessary for smooth and reliable wing deployment.

4,691,881

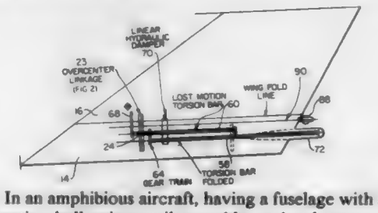
HIGH PERFORMANCE AMPHIBIOUS AIRPLANE

G. Leonard Gioia, 255 Fortenberry Rd., A, Merritt Island, Fla. 32952

Filed Oct. 8, 1985, Ser. No. 785,470

Int. Cl.⁴ B64C *35/00, 35/02*

U.S. Cl. 244—106 **14 Claims**



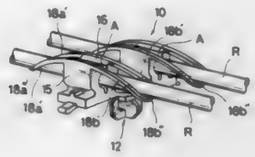
1. In an amphibious aircraft, having a fuselage with a water-contacting hull, wings, tail assembly, and at least one engine, the improvement wherein said fuselage hull includes sponsons integral therewith extending outwardly on either side of the fuselage, wherein the underside of the combination fuselage and sponsons includes a substantially constant cross section inverted channel, the fuselage further including twin keels extending fore to aft on the underside of said hull, the inner surfaces of said twin keels being substantially extensions of the walls of said channel, and further wherein the top to bottom thickness of the aft portion of said sponsons diminishes continuously without any hydrodynamic step toward the aft end thereof so as to terminate in a sharp trailing edge and the hull portion between said sponsons blends smoothly with said tail assembly of the aft end, without a hydrodynamic step.

4,691,882
CO-OPERATIVE SATELLITES
Ronald W. Young, Stevenage, England, assignor to British Aerospace PLC, London, England
Continuation of Ser. No. 570,281, Jan. 12, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 843,846
Claims priority, application United Kingdom, Jan. 12, 1983, 8300747
Int. Cl.[4] B64G 1/10
U.S. Cl. 244—158 R 2 Claims



1. Satellite apparatus in orbit including a plurality of co-operative satellites which orbit as a generally geostationary cluster of co-operative satellites in which inter-satellite communication is to be maintained substantially constantly, and an inter-satellite communication satellite arranged to effect such constant communication, each satellite of the cluster being oriented so that a given region is always earth directed and being placed in its own orbit such that the satellites of the cluster follow each other around a path centered substantially at a given longitude with reference to an earth fixed frame, each satellite of the cluster having its own receptor means directed at all times toward the inter-satellite communication satellite, the inter-satellite communication satellite being placed in an orbit so selected that it follows a path centered substantially at a further longitude spaced from said given longitude to maintain approximate station with the cluster but positioned remotely therefrom whereby the receptor of each satellite of the cluster is directed toward the inter-satellite communication satellite at all times without the receptor rotating through more than one half of one revolution with reference to its satellite.

4,691,883
DEVICE FOR HOLDING ROD-LIKE OBJECTS
Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Jul. 28, 1986, Ser. No. 890,868
Claims priority, application Japan, Aug. 8, 1985, 60-122447
Int. Cl.[4] F16L 3/10
U.S. Cl. 248—74.2 3 Claims



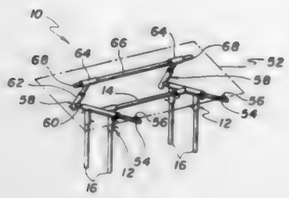
1. A device for retaining and guiding a rod-like object comprising: a base portion; a lock portion projecting from one side of said base portion; a holding arm section projecting from an opposite side of said base portion and having a receiving recess for receiving a rod-like object therein inserted in a direction substantially perpendicular to the lengthwise direction of said rod-like object and for retaining said rod-like object sufficiently loosely to permit longitudinal motion; and a damper having canter levered arms laterally extending from a free end of said holding arm section in the direction of the longitudinal axis of said rod-like object and having an engagement portion provided at the free end thereof for engaging with the rod-like object received in said holding arm section with an elastic restoring force in the direction opposite to the direction of insertion of said rod-like object.

4,691,884
GOLF BAG SUPPORT
A. Philip Parduhn, 14501 Wilson Rd., Edmond, Okla. 73034
Filed Dec. 2, 1985, Ser. No. 803,484
Int. Cl.[4] A63B 55/04; A45F 3/44
U.S. Cl. 248—96 2 Claims



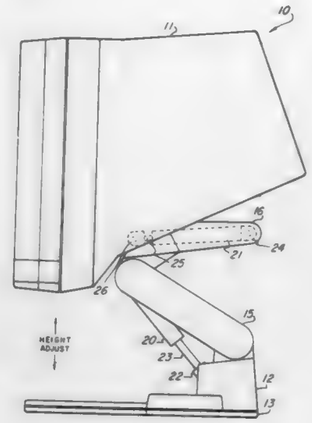
1. Apparatus for supporting a golf bag on the ground, comprising:
a tubular housing having a first end and an open second end, the housing having at least one open-ended, unobstructed longitudinal slot formed therein communicating with said second end;
a ground-engaging element, comprising:
a spike section having a first end and a ground-engaging second end, the spike section movable between a retracted position within the housing and an extended position in which at least the second end of the spike section projects from the open end of the housing;
a pedal section, positioned outside the housing, having a depressable first surface and an opposed second surface; and
a ground-engagable wing section means interengaging the spike section and the second surface of the pedal section, the wing section means extending through the slot in the housing when the spike section is in a retracted position; said wing section means being positioned to be pushed into the ground when the pedal section is fully depressed;
biasing means, disposed intermediate the first end of the housing and the first end of the spike section, for biasing the spike section toward a normally retracted position within the housing said biasing means comprising:
a coiled expansion spring positioned within the housing, the spring having a first end anchored at the housing, and a second end;
connecting means for interengaging the second end of the spring and the ground-engaging element; and
stop means for preventing depression of the pedal section beyond the second end of the housing; said stop means comprising;
a cross member anchored to the housing and positioned to obstructively engage the connecting means when the pedal section is depressed to a position adjacent the second end of the housing;
attachment means for operatively securing the housing to a gold bag to be supported.

4,691,885
DISPLAY STAND
George F. Lawrance, 2004 Suttle Ct., Rio Rancho, N. Mex. 87124
Filed May 5, 1986, Ser. No. 859,393
Int. Cl.[4] A47B 47/02
U.S. Cl. 248—165 9 Claims



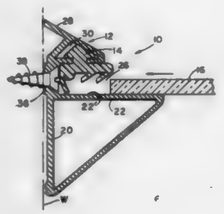
1. A support structure for a display stand, comprising:
a pair of oppositely facing primary coupling units, each of said coupling units including a base tube having an open forward end and an open rearward end, the base tube further having attached thereto near the opposite forward and rearward ends at least a pair of spaced lateral tubes which extend parallel to one another perpendicularly away from said base tube, a central tube attached to and extending from said base tube between said pair of lateral tubes, said central tube extending perpendicular to both said base tube and said lateral tubes, and means for clamping fittings, plugs or the like inserted into any open end of said tubes to retain those fittings, plugs or the like therein, said clamping means including means for adjustably engaging the fittings, plugs or the like inserted into any open end of said tubes, to press the inserted fittings, plugs or the like against an inner surface of said tubes and frictionally hold the inserted fittings, plugs or the like between said inner surface and said engaging means;
a center support bar extending between said coupling units, said center support bar being dimensioned so that its ends can be received within, respectively, said central tube of said coupling units;
at least four display stand legs, each of said legs being dimensioned so that one end thereof can be received within, respectively, said lateral tubes of said coupling units, said oppositely facing primary coupling units being positioned with respect to each other to align all of said legs in a parallel manner downwardly for contact with the ground;
a pair of retainer fittings positioned within and extending from the respective forward ends of said base tubes;
a corresponding pair of riser coupling units positioned within and extending from the respective rearward open ends of said base tubes;
a pair of T-coupling units positioned within and extending generally upwardly from respective ones of said riser coupling units, each of said T-coupling units having an upper tube positioned substantially parallel to said center support bar; and
an upper support bar extending between said upper tubes substantially parallel to said center support bar, said upper support bar being dimensioned so that its ends can be received within, respectively, said upper tubes.

4,691,886
ADJUSTABLE DISPLAY STAND
Robert W. Wendling; John W. Kurtz, and Juan M. Perez, all of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 18, 1985, Ser. No. 724,742
Int. Cl.[4] F16M 11/12
U.S. Cl. 248—183 9 Claims



1. A tilt adjustable display stand comprising:
(a) base means;
(b) display means;
(c) linkage means, connecting the base means to the display means, the linkage means including a tilt housing connected to support the display means and a support housing to which the tilt housing is pivotally attached; and
(d) a tilt gas spring, connected to the tilt housing at one end and to the support housing at the other end, positioned to counterbalance the weight of the display means to enable low force tilting of the display means.

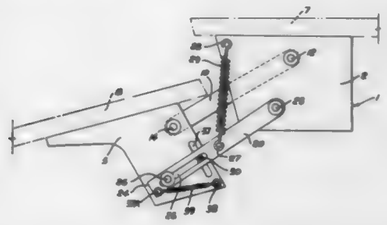
4,691,887
SHELF ANCHOR
Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.
Filed Aug. 11, 1986, Ser. No. 895,297
Int. Cl.[4] A47B 96/06
U.S. Cl. 248—250 10 Claims



1. A cantilever shelf support for a shelf having a rear portion and a rear edge, comprising:
a bracket having a laterally oriented throat to receive the rear portion of a shelf;
said throat having a lower support platform forming a bottom, an upper overhang forming a top, and an inner end;
a resilient insert in said throat;

said insert having depending finger means extending downwardly toward said platform and being resiliently flexible inwardly of said throat for engagement thereof, and inward flexure thereof, by an inserted rear portion of a shelf;
said insert having depending compression pad means in said throat for supporting abutment with the inserted shelf; and
said insert having a resilient apron depending in front of said throat inner end for protective abutment with the rear edge of the shelf.

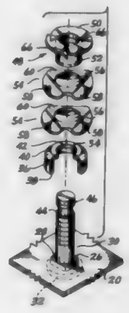
4,691,888
KEYBOARD SUPPORT
Michael J. Cotterill, 43 Rocklea Crescent, Sylvania Heights, New South Wales 2224, Australia
Filed Sep. 9, 1985, Ser. No. 773,552
Int. Cl.[4] A47B *57/06*
U.S. Cl. 248—284 **11 Claims**



1. Keyboard support apparatus comprising keyboard support means, a mounting bracket adapted in use to mount the apparatus to a stationary support, and a linkage system connecting the keyboard support means and the mounting bracket, said linkage system including first means permitting adjustment of the altitude of the keyboard support means relating to the stationary support and including second means permitting adjustment of tilt of the keyboard support means about a horizontal axis, the adjustment of said first means being independent of the adjusted tilt of said keyboard support means and the adjustment of said second means being independent of the adjusted altitude of said keyboard support means, and single control means connected to said linkage system for enabling or disabling both said adjustment of altitude and said adjustment of tilt, said keyboard support means including a keyboard support bracket connected to a first member for pivotal motion about a first axis, the first member being pivotally connected to the mounting bracket for swing motion about a second axis parallel to the first; a second member parallel to the first member and connected to the mounting bracket for pivotal motion about a third axis parallel to and spaced from the second axis, the second member being connected to the keyboard support bracket for pivotal motion about a fourth axis parallel to the first, said members with said brackets forming a four bar linkage and comprising said linkage system and said single control means including clamping means for locking the four bar linkage against movement, the keyboard support bracket being pivotally connected to the first member by slidably cooperating pin means and slot means.

4,691,889
JOINT CONSTRUCTION AND OVERHEAD HANGER
Peter S. Richards, 100 Mt. Si Pl., NW., Issaquah, Wash. 98027
Continuation-in-part of Ser. No. 811,939, Dec. 20, 1985. This application Jul. 18, 1986, Ser. No. 887,749
Int. Cl.[4] F16B *7/10*
U.S. Cl. 248—343 **20 Claims**

16. A mounting structure for a suspended object, comprising:
a support leg member having a lower end socket defined by a cylindrical sidewall having an inner surface;
a frame member including a connector assembly, said connector assembly comprising
a threaded rod projecting from said second member and having a base and a free end;
a cam member at the base of the rod having a base end and an opposite end, said cam member being smaller in diameter than the inside diameter of said socket, said cam member including a camming portion at its opposite end;
at least one locking disk having a center opening through which the threaded rod extends, and a plurality of wings spaced around the disk and bent to extend towards the cam portion of the cam member, said locking disk having a plan form sized to allow the locking disk to slip fit into said socket;
a nut threaded onto the threaded portion of the rod axially outwardly of the locking disk, said nut having a thin washer-like head portion and a tubular body portion connected to the head portion and extending axially towards the cam member through the center opening in the locking disk, and a plurality of peripheral barbs with pointed



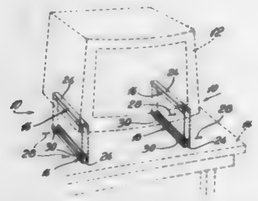
ends, wherein said peripheral barbs are struck out barbs at the periphery of the head of the nut, said nut having a plan form dimension which in the region of the pointed ends of the barbs is larger than the inner diameter of the socket; and
wherein the first and second members are connected together by firstly a movement of the connector assembly on the second member into the tubular socket of the first member, such first movement causing a force fit of the pointed ends of the barb into the socket, attended by such pointed ends penetrating into and gripping the inner surface of the socket and holding the nut against rotation, and secondly by a tightening rotation of the second member relative to the first member, wherein the points of the barbs connect the nut to the first member during such rotation while allowing relative axial travel of the nut on the threaded rod towards the cam member, such axial travel causing the cam portion of the cam member to push the wings of the locking disk outwardly, so as to press the edges of the wings into tight penetrating engagement with the inner surface of the socket.

4,691,890
RECLINER
Myong-ja Han, 170-47, Kaebong-Dong, Kuro-Ku, Seoul, Rep. of Korea
PCT No. PCT/KR85/00008, § 371 Date Jan. 24, 1986, § 102(e) Date Jan. 24, 1986, PCT Pub. No. WO85/05542, PCT Pub. Date Dec. 19, 1985
PCT Filed Apr. 16, 1985, Ser. No. 827,304
Claims priority, application Rep. of Korea, May 26, 1984, 84-4902
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—412 **6 Claims**



1. A locking device for adjusting an angle of height of two parts of a seat comprising:
a housing having a rear end and a forward end, said housing being fixed at first part of said seat;
a rod placed within said housing with a rear end thereof slidably extending from said rear end of said housing, said rear end being fixed at second part of said seat;
a push rod slidably inserted within said rod;
a first spring urging said rod forwardly;
a spring cylinder provided within said forward end of said housing;
a cylindrical collet fixed at the forward end of said rod, said collet having an elasticity to be compressed inwardly and being provided with a cleaved portion and engagement portion at the forward end periphery thereof for engaging said spring cylinder;
a cone fixed at the forward end of said push rod and movable within said collet;
a second spring placed in a space between said push rod and collet biasing said cone, and;
a drive means fixed on said second part of said seat for driving said push rod longitudinally of said housing;
whereby when said cone engages with said collet by the action of said second spring, said forward end periphery of said collet abuts with said cylinder thereby locking said rod and said housing together and, when said cone disengages from said collet, said collet is released from said spring cylinder by its own resilient force thereby releasing said rod from said housing.

4,691,891
DEVICE FOR PREVENTING UNAUTHORIZED REMOVAL OF PORTABLE OBJECTS
Robert Dionne, 32 Place Gabriel, Candiac, Quebec, Canada J5R 3Y1
Filed Sep. 25, 1985, Ser. No. 780,096
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—551 **10 Claims**



1. An anti-theft device in combination with a portable object retained by said device against removal from a support, said device being interposed between said object and support and comprising a pair of members each formed with an attachment base having an adhesive securing surface facing one direction and with at least one connecting arm projecting from said base in an opposite direction, said members interconnecting said object and said support through said connecting arms with one member having its attachment base adhesively secured to said object and the other member having its attachment base adhesively secured to said support, said connecting arms extending in side-by-side relationship, and tamper-proof fastening means coupling together said connection arms to thereby securely connect said object to said support while supporting said object in spaced-apart relationship from said support.

4,691,892
SIGN AND SIGN STAND
Ronald E. Grewe; David U. Hillstrom, both of Novi, Mich.; James R. Seely, Avon, and Cecil Ursprung, West Hartford, both of Conn., assignors to Marketing Displays, Inc., Farmington Hills,, Mich.
Continuation-in-part of Ser. No. 442,418, Nov. 17, 1982, Pat. No. 4,548,379, and Ser. No. 751,561, Jul. 3, 1985, Pat. No. 4,593,879, which is a division of Ser. No. 442,418, Nov. 17, 1982, and Ser. No. 719,623, Apr. 2, 1985, Pat. No. 4,569,499, which is a division of Ser. No. 442,378, Nov. 17, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,659
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—624 **72 Claims**



1. A sign and sign stand assembly comprising: a base for supporting said assembly, a generally longitudinally-extending stand member, connecting means for connecting said stand member to said base, a sign-supporting member, attaching means for attaching said sign-supporting member to said stand member, resilient biasing means for normally biasing said stand member into a generally upright position, said resilient biasing means being resiliently yieldable to allow said stand member to deflect in a generally downward direction in response to first predetermined forces exerted on said assembly, a substantial portion of said sign-supporting member being free of said stand member and substantially unsupported thereby in order to allow said sign and at least said substantially unsupported portion of said sign-supporting member to pivotally swing relative to the axis of said stand member in response to second predetermined forces exerted on said assembly in a direction generally transverse to said first predetermined forces.

4,691,893

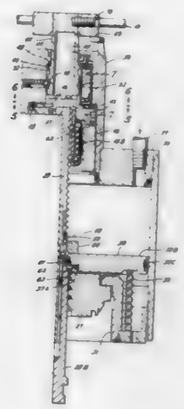
FAIL SAFE GATE VALVES AND ACTUATORS THEREFOR

Neil H. Akkerman, and Gonzalo Vazquez, both of Houston, Tex., assignors to AVA International Corporation, Houston, Tex.

Continuation of Ser. No. 884,869, Jul. 10, 1986, abandoned, which is a continuation of Ser. No. 689,969, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 342,585, Jan. 25, 1982, abandoned. This application Jan. 28, 1987, Ser. No. 9,655

Int. Cl.⁴ F16K *31/14, 31/60*

U.S. Cl. 251—14 **80 Claims**



1. A fail safe valve, comprising

a body having a flowway therethrough and a closure member movable therein between positions opening and closing the flowway, an actuator having a stem including one portion connected to the closure member and mounted for reciprocation in opposite directions to move the closure member between said positions, piston means responsive to the supply of a control fluid thereto for urging the one stem portion in one direction in order to move the closure member to one position and maintain it in that position as long as the control fluid is maintained at a predetermined pressure level, means for yieldably urging the one stem portion in the other direction in order to move the closure member to its other position in the event the control fluid is not so maintained, operating means mounted on the actuator and manipulatable from the exterior thereof for moving another portion of the stem in the one direction to move the closure member to its one position, and means automatically responsive to the failure of a predetermined environmental temperature condition for rendering said operating means inoperative to move said other portion of the stem in said one direction upon reestablishment of said control fluid to said piston means at said predetermined pressure level.

4,691,894

VALVE

Jousi K. Pyötsiä, Helsinki, and Esko T. Yli-Koski, Kerava, both of Finland, assignors to Neles OY, Helsinki, Finland

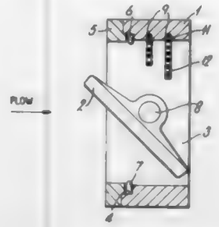
Filed Dec. 23, 1985, Ser. No. 812,324

Claims priority, application Finland, Jan. 9, 1985, 850106

Int. Cl.⁴ F16K *47/08*

U.S. Cl. 251—127 **12 Claims**

1. A valve comprising a body provided with a flow passage and a closing member movably mounted in said passage to be pivotable about pivot means between a first position wherein said member blocks flow through said passage and a second position wherein flow through said passage is permitted, sealing means for cooperating with said member when in said first position to seal said passage, said pivot means being disposed in said passage to thereby divide the flow passage between first and second segments, said closing member having a section which is disposed relative to said pivot means so as to pivot in



a generally upstream direction when said closing member moves from said first toward said second position, said passage having a portion downstream of said section of said closing member and at least one attenuation member mounted in said downstream portion of said passage and out of flow impeding relation with the remainder of said flow passage.

4,691,895

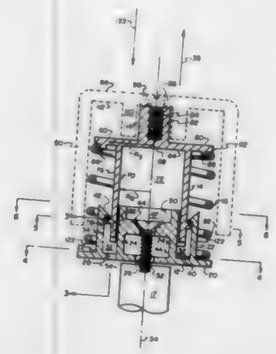
FAUCET HANDLE ARRANGEMENT

Jeffrey L. Garff, 2586 W. 4700 South, #212, Salt Lake City, Utah 84118

Filed Jul. 18, 1986, Ser. No. 886,735

Int. Cl.⁴ F16K *35/02*

U.S. Cl. 251—292 **10 Claims**



10. A handle arrangement for a water faucet having a control valve which incorporates a spindle rotatably mounted to open said valve by rotation in a first direction and to close said valve by rotation in a second opposite direction, said handle arrangement comprising;

a connection means for connecting said handle arrangement to said spindle, said connection means defining a retention member;

driving means for mechanically cooperating with said connection means to turn said spindle, said driving means including grasping means for receiving and retaining said retention member to form a mechanical union;

spring means interconnecting said driving means with said connection means, said spring means biasing said driving means away from said connection means;

wherein said mechanical union of said retention member and said grasping means resists forces directed thereagainst in all but one direction and exerts a force against said drive means directed opposite that of said spring means.

4,691,896

OPTICAL FIBRE TRANSMISSION LINE

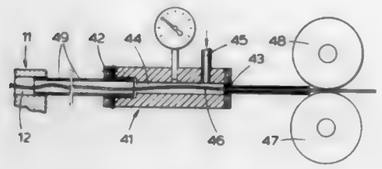
Michael H. Reeve, and Stephen A. Cassidy, both of Ipswich, England, assignors to British Telecommunications, Great Britain

Continuation of Ser. No. 551,640, Nov. 8, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 848,950

Claims priority, application United Kingdom, Nov. 8, 1982, 8231840; Apr. 8, 1983, 8309671

Int. Cl.⁴ B66F *3/24*

U.S. Cl. 254—134.4 **37 Claims**



1. A method of advancing a lightweight and flexible optical fibre member along a previously installed tubular pathway in situ, said tubular pathway extending between two points, said method comprising:

(a) inserting the free end of a lightweight and flexible optical fibre member into the previously installed pathway by applying to said fibre member a force in the direction of insertion;

(b) inserting a gaseous medium into the pathway with a flow velocity much higher than the desired rate of advance of said fibre member through said pathway; and

(c) propelling the free end and following portions of a fibre member along the pathway continuance of said insertion force in cooperation with fluid drag of said gaseous medium passed throughout the length of the pathway in the desired direction of advance such that the pulling force on the optical fibre is distributed throughout the length of said fibre then present in the pathway enabling the fibre member and its advancing free end to be advanced past bends which may be present in the pathway without an unacceptable pulling force being concentrated on any portion of the fibre, said gaseous medium having substantially higher velocity than said fibre member throughout the length of the pathway.

33. Apparatus for installing a lightweight flexible optical fibre member into and along a length of previously installed tubular pathway between first and second ends of the pathway, said apparatus comprising:

first means for flowing a gaseous medium within said pathway toward said second end at a flow velocity substantially higher than the desired fibre member advancement rate;

second means for inserting and advancing a free end of said fibre member into said flowing gaseous medium by applying to said fibre member an insertion force directed towards said second end; and

said first and second means cooperating to propel said fibre member through said tubular pathway by producing viscous drag forces distributed along the advancing length of the fibre member then disposed within the pathway while the fibre member advances at a velocity substantially less than the gaseous flow velocity until said free end of the fibre member reaches said second end of the pathway.

4,691,897

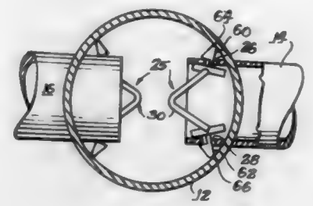
RAIL LOCK DEVICE FOR TUBULAR FENCE

Donald R. Frush, Warsaw, Ind., assignor to CTB, Inc., Milford, Ind.

Filed Mar. 18, 1986, Ser. No. 840,891

Int. Cl.⁴ E04H *17/14*

U.S. Cl. 256—65 **14 Claims**



14. A releasable rail locking device for a tubular fence comprising:

a generally V-shaped flexible bow-like portion elastically deformable over a predetermined range of angles;

said bow-like portion terminating in respective oppositely oriented outwardly extending gripping portions each for releasably grippingly engaging a wall internally and externally thereof of a tubular fence rail member about aligned diametrically opposed through apertures therein;

said gripping portions and said bow-like portion being sized to extend the gripping portions into engagement with said through apertures in said tubular fence rail wall while maintaining said bow-like portion in a partially compressed condition and with said gripping portions configured to encourage a toggle-like action of said device between a first position wherein said bow-like portion is directed into said rail member and a second position wherein said bow-like portion is directed out of said rail member.

4,691,898

CONTINUOUS ANNEALING FURNACE FOR METALLIC STRIP

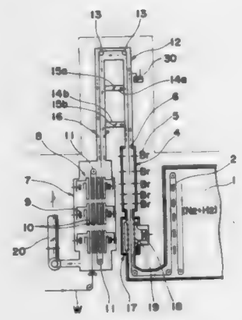
Masayuki Imose, Kawanishi, Japan, assignor to Chugai Ro Co., Ltd., Osaka, Japan

Filed Dec. 10, 1985, Ser. No. 807,228

Claims priority, application Japan, Dec. 28, 1984, 59-278457

Int. Cl.⁴ C21D *9/56*

U.S. Cl. 266—89 **3 Claims**



1. A continuous annealing furnace for annealing a metallic strip travelling therethrough, said furnace comprising:

a vertical direct firing type non-oxidizing furnace in which exhaust gases are generated as the metallic strip travels therethrough in a downward vertical direction;

a radiation type preheating zone upstream from said direct firing type non-oxidizing furnace relative to the direction of travel of the metallic strip through said direct firing type non-oxidizing furnace, the exhaust gases generated in said direct firing type non-oxidizing furnace passing back through said radiation type preheating zone,

said radiation type preheating zone having a first vertical portion connected at one end thereof to and above one end of said direct firing type non-oxidizing furnace and through which the metallic strip travels in a downward vertical direction before travelling through said direct firing type non-oxidizing furnace, an upper portion extending at one end thereof from the other end of said first portion and through which the metallic strip travels before travelling through said first portion, a second vertical portion connected at one end thereof to the other end of said upper portion and through which the metallic strip travels in an upward vertical direction before travelling through said upper portion, and direction changing roller means in said upper portion and over which the metallic strip is guided in said upper portion for changing the direction of travel of the metallic strip from the upward vertical direction in which the metallic strip travels through said second vertical portion to the downward vertical direction in which the metallic strip travels through said first vertical portion;

a vertical forced convection type preheating zone connected at one end thereof to the other end of said second vertical portion below said second vertical portion and juxtaposed with said direct firing type non-oxidizing furnace and through which the metallic strip travels in an upward vertical direction before travelling through said second portion; and

at least one gas bypass duct open to and connected between said first portion and said second portion of said radiation type preheating zone below said upper portion thereof for causing a portion of the exhaust gases passing back through said radiation preheating zone to pass therethrough and bypass said upper portion and said direction changing roller means therein, said at least on gas bypass duct having an adjustable damper therein for selecting the amount of exhaust gases that are caused to pass therethrough.

4,691,899

APPARATUS FOR REACTOR IRON MAKING

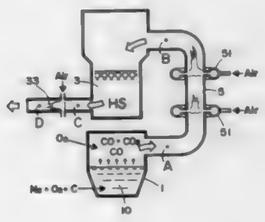
Kiyohide Hayashi; Saburo Sugiura, both of Aichi, and Noboru Demukai, Gifu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Jun. 24, 1985, Ser. No. 748,280

Claims priority, application Japan, Jun. 29, 1984, 59-134479; Jun. 29, 1984, 59-134659; Jun. 29, 1984, 59-134660

Int. Cl.[4] F27D *17/00*

U.S. Cl. 266—140 **5 Claims**



1. An apparatus for reactor iron making comprising:

a furnance body provided with tuyeres for blowing into the furnace body carbonaceous powder and oxygen, a waste gas outlet attached thereto, and a cover positioned over the furnace body, the cover is opened when the furnace body is charged with material to be melted;

a heating shaft above the furnace body and cover, the heating shaft provided with a combustion gas inlet in its upper portion, and a combustion gas outlet in its lower portion to which an air duct is connected so that combustion gas flows into the heating shaft from the upper inlet, and leaves the heating shaft from the lower outlet, and into which heating shaft a raw material is intermittently charged, heated by the heat of combustion gas flowing through the heating shaft, while being held in the shaft, and transferred to the above-mentioned furnace body;

a raw material bucket positioned over the heating shaft which periodically supplies raw materials to the above-mentioned heating shaft, the furnace body, the heating shaft, and the raw material bucket being arranged nearly vertically; and

a gas combustion tower closely adjacent to the heating shaft, the gas combustion tower being provided with air-introducing slits, a gas combustion tower inlet connected to the waste gas outlet of the above-mentioned furnace body, and a gas combustion tower outlet connected to the combustion gas inlet of the above-mentioned heating shaft.

4,691,900

METAL MELTING FURNACE

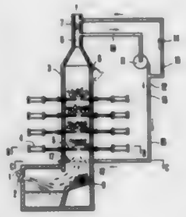
Isamu Maeda, Kanagawa, Japan, assignor to Kankyo Souken Consultant, Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1986, Ser. No. 896,764

Claims priority, application Japan, Aug. 23, 1985, 60-185300

Int. Cl.[4] C22B *1/00*

U.S. Cl. 266—156 **3 Claims**



1. A metal melting furnace equipped with a preheating tower having a plurality of fork-shaped shelfplates extending into the inside thereof, comprising:

a gas mixing chamber provided in the lower end portion of the tower, communicating with the upper portion of the melting furnace,

a duct for circulating combustion exhaust gas from the top portion of the tower into the gas mixing chamber,

a damper arranged in the duct for controlling the amount of the combustion exhaust gas circulated into the gas mixing chamber, and

a plurality of nozzles connected to the duct and opening into the gas mixing chamber.

4,691,901

GAS RINSING STOPPER PREVENTING MIXING OF AIR WITH RINSING GAS

Gerd-Erich Dobner, Neukirchen-Vluyn, Fed. Rep. of Germany, assignor to Didier-Werke Ag, Wiesbaden, Fed. Rep. of Germany

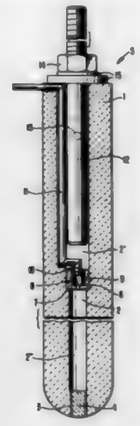
Filed Dec. 16, 1986, Ser. No. 942,627

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545763

Int. Cl.[4] B22D *41/10, 11/10*

U.S. Cl. 266—236 **9 Claims**

1. in a gas rinsing stopper for use with a vessel containing molten metal, said stopper including a stopper member having therethrough an axial gas passage, a mounting fixture extending into a first end of said gas passage, a gas feed opening at a second end of said gas passage, and a gas supply line extending into said gas passage for supplying rinsing gas thereto and thereby for discharging said rinsing gas through said gas feed opening, the improvement comprising means for preventing said supplying of said rinsing gas to said gas passage from creating a reduced pressure at said first end of said gas passage



and causing atmospheric air to be drawn inwardly through said first end of said gas passage and mixing with said rinsing gas within said gas passage, said preventing means comprising:

a seal member positioned within said gas passage and forming a gas tight seal separating said gas passage into a first section including said mounting fixture and a second section leading to said gas feed opening; and

said gas supply line opening into said second section of said gas passage, whereby said rinsing gas is isolated from said first section of said gas passage.

4,691,902

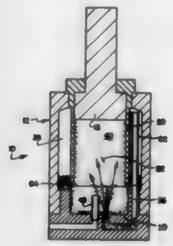
SELF-LUBRICATING DIE CYLINDER

Paul M. Kadis, Chardon, Ohio, assignor to Teledyne Industries, Inc., Brecksville, Ohio

Filed Apr. 15, 1985, Ser. No. 723,036

Int. Cl.[4] F16F *9/00*

U.S. Cl. 267—119 **11 Claims**



8. A cushion for use in a press, said cushion assembly comprising a piston, a cylinder at least partially enclosing said piston, said piston and cylinder cooperating to at least partially define a variable volume working chamber which expands during operation of the press from a closed condition to an open condition and contracts during operation of the press from the open condition to the closed condition, said cylinder having a cylindrical inner side surface disposed in engagement with said piston and a cylindrical outer side surface which is coaxial with said inner side surface and said piston, a housing connected with and circumscribing said cylinder, said housing having a cylindrical inner side surface disposed in a coaxial relationship with and spaced from the cylindrical outer side surface of said cylinder, said inner side surface of said housing and said outer side surface of said cylinder cooperating to at least partially define an annular reservoir chamber which is coaxial with said cylinder, circumscribes said cylinder, and is coextensive with said cylinder for at least a major portion of the length of said cylinder, a standpipe disposed in said annular reservoir chamber and having a longitudinal axis which is parallel to the central axis of said cylinder and disposed on a radius of the cylindrical inner side surface of said housing at a location between the outer side surface of said cylinder and the inner side surface of said housing, and passage means for conducting a flow of lubricating liquid along a flow path from said standpipe to said working chamber during expansion of said working chamber and for conducting a flow of lubricating liquid from said working chamber back along the same flow path toward said reservoir chamber during contraction of said working chamber.

4,691,903

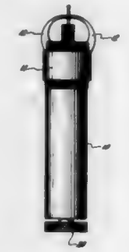
HOLDER FOR SMALL PARTS

Leopold A. Castille, Rte. 7, Box 17 E15, Opelousas, La. 70570

Filed Apr. 11, 1986, Ser. No. 850,705

Int. Cl.[4] B25B *1/00*

U.S. Cl. 269—6 **7 Claims**



1. An adjustable small parts holder which comprises:

(a) a cylindrical body having an externally threaded upper portion traversed at equidistant intervals around the perimeter of its uppermost portion by a plurality of radially aligned vertical slots and having an axially aligned hollow channel extending throughout its entire length, at least a portion of said channel being internally threaded;

(b) a plurality of jaws individually disposed in and extending upwardly and outwardly from said slots and pivotally attached therein to said body at the lower portions of the respective jaws, said jaws (i) being bowed outwardly along their lengths and having convex outer surfaces, (ii) having inwardly projecting upper end portions convergeable toward a common center external to and axially aligned with the body, and (iii) having their respective centers of gravity external to the locus of their respective pivotal attachments to the body;

(c) an internally threaded collar threadably secured to the external threaded upper portion of the body and (i) adapted upon rotation in one direction to engage an outwardly bowed convex outer surface portion of each of the jaws and to cause the upper end portions thereof to converge toward said common center, and (ii) adapted upon rotation in the other direction to allow the jaws to pivot away from each other by the force of gravity;

(d) linear supporting means coaxially disposed within and extending throughout the entire length of said hollow

channel, the lower portion of the supporting means extending below the body and the uppermost portion of the supporting means extending above the uppermost portion of the body and being adapted to be moved upwardly into close proximity with said common center and alternatively to be moved downwardly away from said common center, at least a portion of the supporting means being externally threaded so as to threadably secure the supporting means to the internally threaded channel of the body; and

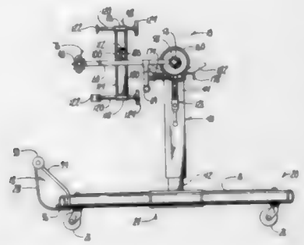
(e) an adjusting screw knob disposed on the lower portion of the supporting means below the body and (i) adapted upon rotation in one direction to move the uppermost portion of the supporting means into close proximity with said common center, and (ii) adapted upon rotation in the other direction to move the uppermost portion of the supporting means downwardly away from said common center.

4,691,904

AUTOMATIC OR STANDARD TRANSMISSION HANDLING DEVICE

Max D. Armstrong, Des Moines, Iowa, assignor to Robert J. Williams, Des Moines, Iowa, a part interest

Filed Aug. 8, 1985, Ser. No. 763,670
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—17 **16 Claims**



1. An equipment handling device, comprising:

a frame having forward and rearward ends and opposite sides;

column means extending upwardly from said frame and having a first end fixed to said frame and a spaced apart second end;

a horizontally disposed elongated shaft mounted on said second end of said column means;

arm means having a first end mounted on said shaft and a spaced apart second end;

support means on said arm means for holding said equipment remote from said first end of said arm means;

said arm means being pivotable about a horizontal axis defined by the longitudinal axis of said shaft whereby said equipment is selectively positionable along an arc centered on said horizontal axis for work thereon;

said arm means including a pair of spaced apart arm members each being mounted on said shaft for rotation therewith;

said arm members each including first support means for securely engaging a first portion of said equipment and supporting said equipment in said fixed position;

second support means mounted on said arm means for engaging a second portion of said equipment to hold said equipment in said fixed position; and

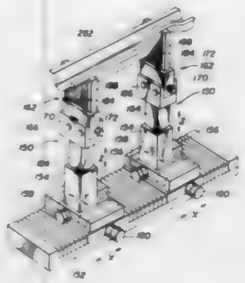
said second support means including a crossbar extending between said arm members and having at least one head member thereon for engaging said equipment.

4,691,905

MACHINE FOR HOLDING WORKPIECE

Kinichi Tamura, Tokyo; Susumu Kawada, Kamakura; Yoshitada Sekine, Tokyo; Kazuyoshi Abe, Tokyo; Ryosuke Ishikawa, Tokyo, and Fumiki Yokota, Yamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 18, 1985, Ser. No. 724,577
Int. Cl.[4] B25B *27/14*
U.S. Cl. 269—45 **8 Claims**



1. A holding unit comprising:

a laminated body having a number of substantially identical shaped elongate plates, each having one end and an opposite end, said elongate plates being abuttingly engaged one after another with the one ends thereof cooperating one after another to form a workpiece supporting surface;

means for moving said elongate plates in a longitudinal direction thereof so as to vary the shape of said workpiece supporting surface to create a new one;

means for biasing said laminated body so that said elongate plates are firmly engaged one after another so as to keep the newly created shape of said workpiece supporting surface; and

a housing mounted to said guiding and positioning means, said housing having mounted thereto means for carrying said laminated body;

wherein said carrying means comprises:

a pair of parallel guide plates having therebetween a first spacer and a second spacer, said pair of parallel guide plates, and said first and second spacers cooperating with each other to define a space within which said laminated body is disposed;

each of said elongate plates being formed with a guide hole running in the longitudinal direction thereof;

a beam extending through said guide holes between said first and second spacers;

a pair of sliders slidably mounted relative to said first and second spacers, respectively, and connected to said beam, respectively; and

extendable-contractible means for urging said first and second sliders to slide to bring all of the ends of said elongate plates to substantially flush with one after another, thus breaking the shape of the workpiece supporting surface.

4,691,906

APPARATUS FOR SUPPORTING THE WALLS OF APPLIANCES AND THE LIKE DURING FOAMING

Thomas S. Zastrow, St. Paul, Minn., assignor to Remmele Engineering, Inc., St. Paul, Minn.

Filed Apr. 19, 1985, Ser. No. 725,319
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—48.1 **29 Claims**

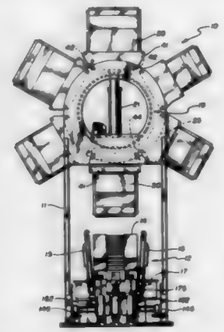
1. An apparatus for supporting the walls of an appliance or the like during foaming comprising:

an apparatus frame;

a support bed connected with said apparatus frame for supporting said appliance during foaming;

a pair of exterior side support panels connected to a portion of said apparatus frame and movable relative to said support bed between a retracted position and a foaming position in which said exterior side support panels are in supporting engagement with the exterior surface of a corresponding pair of appliance walls;

a plurality of plugs each having at least a pair of interior support surfaces for supporting engagement with the interior surface of a corresponding pair of appliance walls;



plug carrier means connected with said apparatus frame for moving a selected one of said plurality of plugs between a first position in which said plug is fully inserted within the interior of the appliance and a second position in which said plug is fully withdrawn from the appliance;

plug storage means connected with said apparatus frame for storing those plugs other than said selected one; and

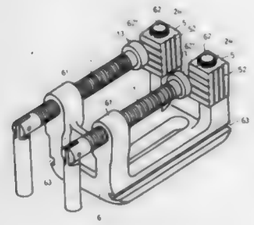
plug transfer and connection means for selectively transferring and connecting said selected plug either from said plug storage means to said plug carrier means or from said plug carrier means to said plug storage means.

4,691,907

C-CLAMP STRUCTURE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Mar. 6, 1985, Ser. No. 708,883
Int. Cl.[4] B25B *1/00*
U.S. Cl. 269—152 **1 Claim**



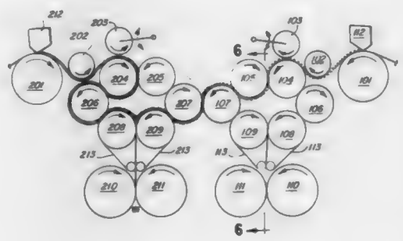
1. A unitary integrally casted dual C-clamp structure, comprising, in combination, a common base having forward and rearward ends, said base having a slot formed therein, facilitating mounting the base on a support, a first pair of substantially-parallel supports formed integrally with the forward end of the base transversely thereof, each of the supports being non-movable relative to one another and having a threaded hole formed therein along an axis substantially transverse thereto, a threaded rod in each hole, the rods having respective longitudinal axes and extending substantially parallel to each other and to the slot of the base, the rods having respective forward and rearward end portions, the forward end portion of each rod extending forwardly beyond the respective upstanding support, a crank handle pivotably carried by the extending forward end portion of each rod, said handle being pivotable a full 180 degrees, a clamping element carried by the rearward end of each rod, a second pair of substantially-parallel spaced-apart upwardly extending supports formed integrally with the rearward end of the base transversely thereof, each of said supports terminating below the longitudinal axes of the threaded rods, each second support having a respective end portion defining a respective shoulder thereon, each respective end portion provided with a shaft thereon, each of the shafts having a respective longitudinal axis extending substantially parallel to the other respective longitudinal axis and perpendicular to the longitudinal axes of the threaded rods, a freely rotatable prismatically-shaped clamping block carried on each respective shaft end abutting and being supported by the shoulder of each respective second support, each clamping block being substantially uniformly polygonal in cross-section and having a plurality of faces, and each of the faces of the clamping blocks being provided with grooves formed thereon, the grooves of each face being substantially parallel to one another and further being substantially perpendicular to the grooves of the faces immediately adjacent thereto, each clamping block being spaced from the other and each being freely rotatable on its respective second support independently of one another and may be automatically angularly adjusted by a workpiece being clamped relative to its respective second support about an axis substantially perpendicular to the longitudinal axis of its respective threaded rod, thereby facilitating the clamping of an irregularly-shaped workpiece in the C-clamp structure, wherein each clamping block is rotatably retained on one of said shafts by a retaining means which permits free rotation of the clamp block by the workpiece.

4,691,908

APPARATUS FOR INTERFOLDING

John J. Bradley, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 6, 1986, Ser. No. 816,441
Int. Cl.[4] B41F *13/56*
U.S. Cl. 270—21.1 **10 Claims**



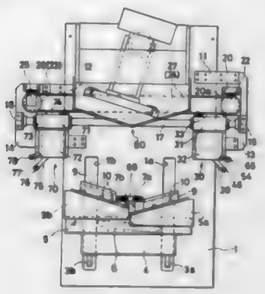
1. Apparatus for interfolding webs comprising two pluralities of vacuum rolls, web cutoff means operably associated with each of said roll pluralities, means for feeding a web to each of said cutoff means, an interfolding means operably associated with each of said roll pluralities and spaced from its associated web cutoff means, said vacuum rolls being arranged to develop four equal length single web paths between said cutoff means and said interfolding means, and switching means operably associated with said vacuum rolls for altering the vacuum applied to certain of said rolls to direct web segments to either of said interfolding means.

4,691,909

DEVICE FOR TURNING OVER BOOK LEAVES

Toshiro Owada; Kenichi Kosugi, both of Atsugi, and Yasuo Nagase, Machida, all of Japan, assignors to Ministry of International Trade & Industry and Agency of Industrial Science & Technology, both of Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,443
Claims priority, application Japan, Apr. 18, 1985, 60-81226
Int. Cl.⁴ B65H *39/02*; G09F *11/00*
U.S. Cl. 270—58 **4 Claims**



1. A device for turning over book leaves comprising:
- a book holder having means for supporting a book in an open state;
- a moveable unit disposed above said book holder and mounted on means for moving said movable unit substantially vertically with respect thereto and also in direction substantially perpendicular to a seam of the book supported on said book holder;
- a turn-over roller rotatably mounted on said movable unit such that said turn-over roller may be brought into forced contact from above with the surface of the book on said book holder, then rotated in this contacting state to turn up towards the book seam several leaves of the book and then rotated in an opposite direction to release the turned-up leaves other than the leaf to be turned over; and
- a pinch member rotatably mounted on said movable unit at a position for clamping the remaining turned-up leaf being turned over in co-operation with an upper portion of said turn-over roller;
- wherein said turn-over roller is brought into contact with the book supported on said book holder with a relative movement of said movable unit and said book holder, said turn-over roller being then rotated to turn up towards the book seam a plurality of leaves of the book including the leaf to be turned over while holding said leaf to be turned over in between said turn-over roller and said pinch member, said turn-over roller being then rotated in the opposite direction to cause the turned-up leaves other than the leaf to be turned over to escape from between side turn-over roller and said pinch member, the leaf to be turned over being then clamped between said turn-over roller and said pinch member, said movable unit being then moved relative to said book holder toward the book seam.

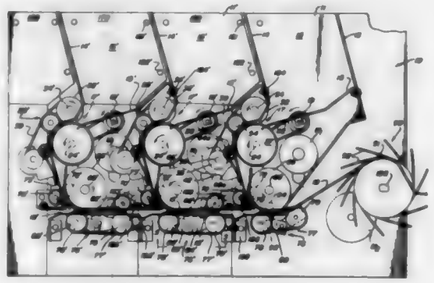
4,691,910

DOCUMENT DISPENSER

N. Allen Cargill, Warminster, and Michail Malashkin, Chalfont, both of Pa., assignors to Technitrol, Inc., Philadelphia, Pa.

Filed Aug. 13, 1986, Ser. No. 896,071
Int. Cl.⁴ B65H *5/06, 3/44*
U.S. Cl. 271—3 **22 Claims**

1. A document dispenser for dispensing documents from a plurality of stacks of documents comprising:
- a feeder/stacker module including
- a frame,
- means on said frame defining a bin for holding a first stack of documents,
- a stacker means for receiving successively fed documents and stacking them, and
- means for feeding documents from said first stack through a first document feed path to said stacker means,
- said document feeding means being mounted on said frame and including
- document feeding and separating apparatus for feeding documents from the first stack so they move individually in a successive condition through the initial portion of said first document feed path,
- document acceleration means for providing a space between the successively fed documents, and
- document delivery means for feeding the spaced apart documents through a delivery portion of said first document feed path to said stacker means; and
- a feeder module including
- a frame,
- means on said frame defining a bin for holding a second stack of documents, and
- means for feeding documents from said second stack through a second document feed path,



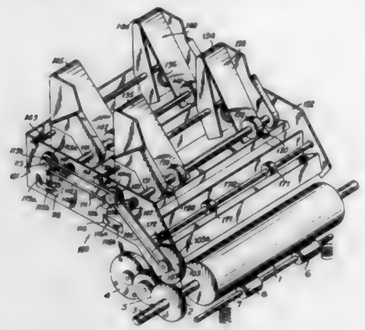
- said last-named document feeding means being mounted on said frame and including
- documeht feeding and separating apparatus for feeding doucments from said second stack so they move individually in a successive condition through the initial portion of said second document feed path,
- document acceleration means for providing a space between the successively fed documents, and
- document delivery means for feeding the spaced apart documents through a delivery portion of said second document feed path and into the entrance of said delivery portion of said first document feed path of said feeder/stacker module,
- whereby the documents fed through said first document feed path pass from said first stack, are separated, and pass through the document delivery means of said feeder/-stacker module to said stacker means, and
- the documents fed through said second document feed path pass from said second stack, are separated, and pass through the document delivery means of said feeder module and then through the document delivery means of said feeder/stacker module to said stacker means.

4,691,911

PAPER FEEDING APPARATUS FOR PRINTERS

Hitoshi Nakagawa, and Kohei Kitahara, both of Nagano, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,574
Claims priority, application Japan, Jul. 31, 1985, 60-169440
Int. Cl.⁴ B65H *3/44*
U.S. Cl. 271—9 **24 Claims**



1. A paper feeding apparatus for a printer having a paper feed motor, comprising:
- at least two mounting means each of which is adapted to contain sheets of paper;
- paper feeding means associated with each of the mounting means and contacting the paper in the mounting means for feeding single sheets of paper from the mounting means;
- paper feed gear means operatively coupled to each of the paper feeding means for co-rotation therewith;
- sun gear means proximate each of the paper feeding gear means, each being rotatable about a center point;
- transmission means for transmitting rotational power in first and second directions, said directions being opposite to one another, from the paper feed motor in the printer to each of the sun gear means;
- selector means associated with each of the paper feeding means having a planet gear on a first arm and a protrusion on a second arm, the selector means being rotatable about the center point of the corresponding sun gear means, said planet gear engaging with said corresponding sun gear means; and
- selective camming means associated with each of the paper feeding means for controlling the rotation of the corresponding selector means by interaction with the protrusion on corresponding selector means to cause the selective engagement of the corresponding planet gear and paper feed means so that rotational power from the paper feed motor is transmitted to the paper feeding means when said paper feed motor rotates in the proper combination of said first and second directions;
- whereby a single sheet of paper is fed to the printer from a selected mounting means which is determined by the sequence of rotations of the paper feed motor in the first and second directions.

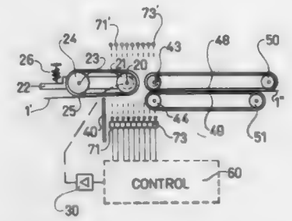
4,691,912

DEVICE FOR SEPARATING FLAT OBJECTS

Hanno Gillmann, Constance, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,608
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424397
Int. Cl.⁴ B65H *3/04*
U.S. Cl. 271—10 **1 Claim**

1. A device for singling and separating flat objects, in particular letters, from a stack of flat objects, comprising:
- drawoff means for drawing flat objects one at a time from a stack of flat objects and feeding them onto a feed path in a feed direction;
- transport means on said feed path spaced from said drawoff means for receiving flat objects from said drawoff means and feeding them on said feed path, the flat objects being fed in succession on said feed path and having an actual gap therebetween;
- a plurality of sensors disposed along said feed path in an area between said drawoff means and said transport means and over at least a portion of said drawoff means for sensing the passage of flat objects and the actual gaps therebetween;



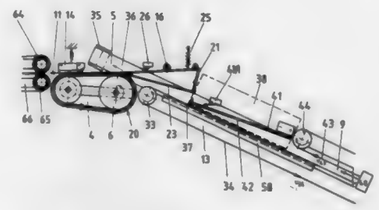
- drive means connected to said drawoff means and activatable to start and stop said drawoff means to start and stop feeding of flat objects on said feed path; and
- control means connected to said sensors and to said drive means for measuring the actual gap between successive flat objects on said feed path and for comparing the measured actual gap with a predetermined desired gap minus an allowance for acceleration behavior of the flat objects, and for actuating said drive means at a time to change the actual gap to approximately equal the desired gap minus the allowance for acceleration behavior, the change being used by said control means to determine the acceleration behavior for a subsequent flat object on said feed path.

4,691,913

SEPARATING APPARATUS FOR FLAT OBJECTS

Werner Frank, Insel Reichenau, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

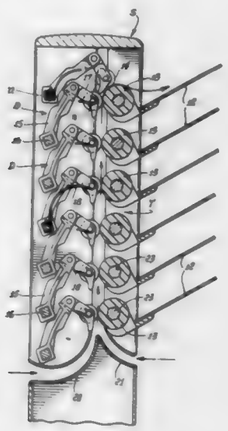
Filed Nov. 22, 1985, Ser. No. 801,147
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1984, 3444335
Int. Cl.⁴ B65H *3/04*
U.S. Cl. 271—34 **25 Claims**



15. Singling apparatus for flat objects which are aligned on one of their edges along a feed direction, comprising guiding means defining a transport path for the objects extending in the feed direction, deflecting means having at least one movable part for moving a belt along a draw-off path in a draw-off direction, a draw-off belt engaged on said deflecting means and movable in said draw-off direction, said belt defining a contact region which is tangential to said transport path, exit means defining an exit gap with said belt on said draw-off path spaced from said contact region, and transport means for feeding

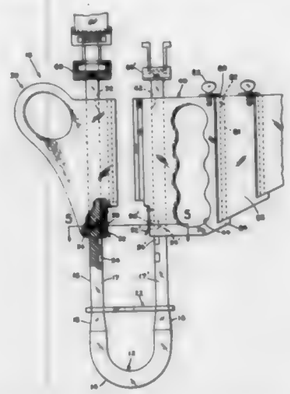
objects along a transport path in the feed direction and into contact with the belt at the contact region, said deflecting means being shaped so that there results a singling of the objects by a substantially tangential admission of the objects onto said draw-off belt, said belt then moving the objects to the exit gap in the draw-off direction, whereby only the objects coming into direct contact with the moving draw-off belt are drawn off by application of the objects against the draw-off belt and by means of friction between the draw-off belt and the objects, in the draw-off direction, said guiding means comprising a pair of guiding members lying on opposite sides of the transport path for guiding objects therebetween, one guiding member on one side of the transport path having a first portion extending along the transport path and at least a point corresponding to a normally occuring object length away from the contact region, to the contact region, and a second portion extending approximately parallel to the draw-off belt from the contact region along the draw-off direction, said first portion extending at an acute angle with respect to said second portion of said one guiding member and at least one of said first and second portions being mounted for pivoting with respect to the transport path for accommodating between said one guiding member and the other of said guiding members flat objects of different widths and biasing means connected to said at least one of said first and second portions of said one guiding member for biasing said at least one of said first and second portions toward the other of said pair of spaced guiding members, said other of said pair of spaced guiding members extending parallel to transport path.

4,691,914
SHEET RECEIVER
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco Systems, Inc., Irvine, Calif.
Filed Jan. 21, 1986, Ser. No. 819,969
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—297 **6 Claims**



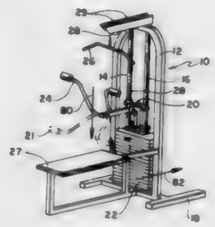
1. Sheet receiver apparatus comprising: a frame structure, a plurality of trays in spaced relation to receive sheets, sheet transport means in said frame structure to carry sheets by a straight path from an inlet past ends of said trays, said transport means including a plurality of driven sheet feed rolls and sheet diverters having nip rolls opposing said feed rolls, said feed rolls and said nip rolls normally being in positions confronting one another on a common plane extending between said feed and nip rolls and defining said straight path, means for actuating said diverters to move between said normal position and a position at which the nip roll is confronting a next adjacent feed roll and is offset from said plane towards a tray, whereby a sheet is diverted from said straight path into a tray.

4,691,915
VERSATILE FITNESS KIT
Bernard Sutton, 128 Lafayette Ave., Brooklyn, N.Y. 11238
Filed Dec. 27, 1985, Ser. No. 814,107
Int. Cl.[4] A63B *11/08*
U.S. Cl. 272—68 **4 Claims**



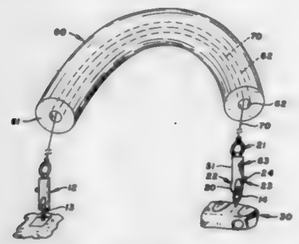
1. A versatile fitness kit including a U-shaped spring resistance device having elongated legs, a weighted thumb gripping means, a weighted finger gripping means, said weighted thumb gripping means including a joining means, said weighted finger gripping means including another joining means, said weighted thumb gripping means detatchably mounted on one of said elongated legs, said weighted finger gripping means detachably mounted on the other of said elongated legs, whereby the fingers of the hand engage the finger gripping means and the thumb engages the thumb gripping means and said hand may be manipulated to squeeze said U-shaped spring resistance device, and said weighted thumb gripping means and said finger gripping means when detached may be interconnected to each other by each said joining means to form a hand weight.

4,691,916
EXERCISE APPARATUS WITH TROLLEY SYSTEM
Harvey C. Voris, Garden Grove, Calif., assignor to Paramount Fitness Corporation, Los Angeles, Calif.
Filed Jan. 9, 1985, Ser. No. 691,033
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **15 Claims**



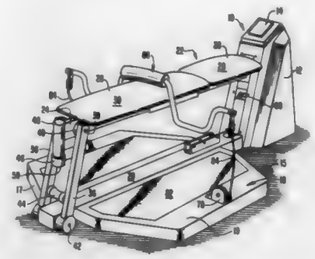
1. An exercise apparatus, comprising:
a frame support structure;
at least one guide rod secured to the support structure;
a plurality of resistance weights slidably disposed on said at least one guide rod;
a trolley slidably connected by coupling means to the at least one guide rod for upward and downward movement, the coupling means comprising only two sets of rollers which sets are vertically spaced apart and are positioned only on opposite sides of said at least one guide rod;
means for applying force to the trolley positioned on the same side of said at least one guide rod as the uppermost set of said rollers; and
means for connecting the trolley to one or more of the resistance weights and for interacting with the resistance weights to help maintain the alignment of the trolley on said at least one guide rod.

4,691,917
BI-BRACHIAL MOTIVE SUPPLEMENTING DEVICE
Dino Battista, 11900 NE. 16th Ave., N. Miami, Fla. 33161
Continuation-in-part of Ser. No. 666,440, Oct. 30, 1984, abandoned. This application Nov. 19, 1985, Ser. No. 799,554
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—126 **10 Claims**



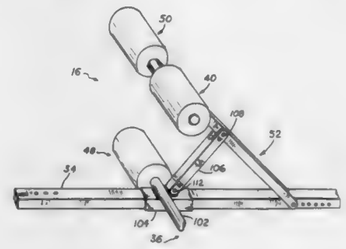
1. An arm movement enhancing device capable of providing users who cannot otherwise raise their arms to functional positions, the ability to raise either arm by the application of downward force to said device by the opposite arm, wherein said device comprises:
an inelastic member having a length and two ends,
a collar, short enough to allow the hands of the user to come into proximate association with the user's face when worn on the user's neck, which during use is so arranged and disposed to be capable of being comfortably worn by the user at the back of said user's neck said collar comprising;
channel means therethrough with an opening at each end of said channel means wherein a portion of the length of said inelastic member is slidably contained within said channel means and one of said inelastic member ends extends from one of said openings and the other end extends from said other opening, and wherein said openings are positionable such that one opening is on one side of the head of the user and the other is positionable at the other side of the head, and wherein said channel means further comprises a stiffening means for providing a firmness to the shape of said collar and so arranged and disposed with respect to said collar so as to provide for the comfortability to the user and so as to interfere with the slidability of said inelastic means,
cushioning means so arranged and disposed to fit against the neck of the use, being comfortably shaped to be supportable thereon by said channel means and stiffening means,
a right and a left attachment means for attachment of the right and left arms of the user, respectively, connected to that end of said inelastic means which is on the right or left side of the user, respectively.

4,691,918
MULTIPLE EXERCISE DEVICE
Gary L. Rockwell, LaGrange, Ga., assignor to Diversified Products Corporation, Opelika, Ala.
Filed Oct. 8, 1985, Ser. No. 785,440
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **16 Claims**



1. A floor-supported multiple exercise device comprising:
a floor-supported base having a platform with front and back ends and a pulley guide extending from said front end to said back end;
a bench assembly attached to said base for supporting a user of the exercise device, and including a bench disposed above said platform;
variable resistance means operatively connected to said base for providing a variable amount of exercising resistance through an extensible and retractable load cable emanating adjacent said front end of said platform;
a traveling pulley assembly connected to said load cable and longitudinally slidable within said pulley guide;
an exercise cable trained around said traveling pulley and extending through said pulley guide toward the back end of said platform;
cable guide means fixed to said floor-supported base for guiding said exercise cable from the back end of said platform upwardly on both sides of said bench, and
at least one user-engageable handle selectively attached to the ends of said exercise cable or to said load cable.

4,691,919
THERAPY TABLE WITH FEET ANCHOR APPARATUS
Jerry L. Roberson, 301 S. Cage, Pharr, Tex. 78577
Continuation-in-part of Ser. No. 869,227, Jun. 2, 1986, abandoned. This application Nov. 13, 1986, Ser. No. 930,644
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—145 **17 Claims**



1. Apparatus for anchoring a person's feet to an object, comprising:
foot engaging means attachable to said object for anchoring the feet of the person, said foot engaging means including lower foot support means for engaging one area of the

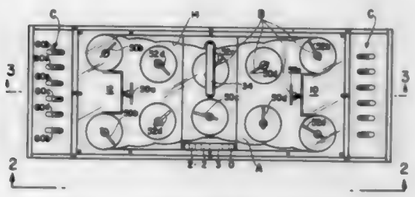
person's feet, said lower foot support means being movable toward and away from the person, and including upper foot support means pivotally fixed to said foot engaging means for swinging into a position proximate another area of the person's feet to thereby anchor the feet to said foot engaging means, and means for linking said lower foot support means to said upper foot support means so that when said lower foot support means is pushed away from the person said upper and lower foot support means open, and when said lower foot support means is moved toward said person said upper and lower foot support means close together to thereby capture the person's feet and anchor the feet.

4,691,920

ELECTRONIC HOCKEY GAME

Dale P. Murphy, 863 Cliffside Dr., Akron, Ohio 44313, and Paul D. Murphy, 6 E. Walnut, P.O. Box 266D, Frankfort, Ohio 44628

Filed Jan. 10, 1986, Ser. No. 817,549
Int. Cl.[4] A63F *7/06*
U.S. Cl. 273—85 A **20 Claims**



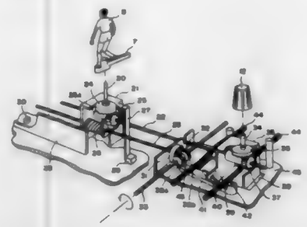
1. A mechanical action game apparatus comprising:
a generally planar playing surface;
a plurality of playing figures mounted adjacent the playing surface for movement relative thereto, each figure having a figure sensing means for electronically sensing interaction between the figure and a playing piece;
figure control means for controlling movement of the figures relative to the playing surface, whereby the figures are adapted to move the playing piece around the playing surface;
goal means for defining at least one goal area in conjunction with the playing surface;
goal sensing means for sensing passage of the playing piece into the goal area;
path means for selectively defining a plurality of optically visible straight paths, at least some of the paths extending from at least some of the figures to the goal area, each path having at least a more readily visible state and a less visible state; and
means for schematic representation of action replay causing at least one of the paths to assume its more visible state in response to the goal sensing means sensing passage of the playing piece into the goal, the schematic representation means including scoring means for determining which figure last contacted the playing piece before the playing piece passed into the goal area, and for directing the instant schematic representation means to cause a path which extends between the last contacted figure and the goal area to assume its more visible state, the schematic representation means being operatively connected with the figure sensing means, the goal sensing means and the path means, whereby after each goal is scored an instant schematic replay is provided to show which figure scored.
audio response means providing a preselected sequence of audio sounds which vary in composition, intensity and rate, depending upon the type and rate of play action.

4,691,921

AUTOMATED GAME PANEL

Takeo Iseki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,282
Claims priority, application Japan, Nov. 8, 1985, 60-171748[U]
Int. Cl.[4] A63F *7/06*
U.S. Cl. 273—85 B **11 Claims**



4. An automated game panel for moving player dolls so as to move an object, comprising:
(a) a casing having an upper portion with a surface having slits formed therein, and a lower portion;
(b) power means for generating a drive force having a forward direction and a reverse direction;
(c) rotating means for manually rotating the player dolls about an axis normal to the surface;
(d) manual input means for receiving a manual input and for providing the drive force in response to the received manual input;
wherein said manual input means includes
(i) a control member movable in response to said received manual input,
(ii) transmission means, operatively connected to said control member, for selectively providing to said drive means one of the forward direction drive force, the reverse direction drive force and no drive force in accordance with the movement of said control member, and
(iii) biasing means for biasing said control member in a neutral position so that said transmission means provides no drive force to said drive means in the absence of said manual input; and
(e) movement means for automatically moving respective ones of the player dolls along corresponding slits in response to the drive force provided by said manual input means;
(f) drive means for receiving the drive force from said manual input means, the drive means including
(i) a shaft,
(ii) a first worm gear mounted on said shaft, and
(iii) a first crown gear mounted on said shaft;
(g) carriage means, operatively connected to receive the drive force from said drive means, for moving respective ones of the player dolls along corresponding slits in response to the received drive force,
wherein the carriage means includes a slidable support member slidably mounted on said shaft and having housed therein said first worm gear; and
(h) a rack mounted on said casing so as to engage said first worm gear.

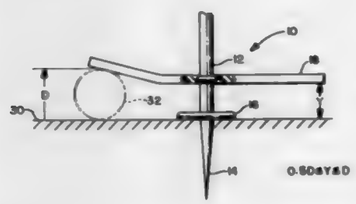
10. An automated game panel for moving player dolls so as to move an object, comprising:
(a) a casing having an upper portion with a surface having slits formed therein, a lower portion and goal areas;
(b) power means for generating a drive force;
(c) rotating means for manually rotating the player dolls about an axis normal to the surface;
(d) manual input means for receiving a manual input and for providing the drive force in response to the received manual input;
(e) movement means for automatically moving respective ones of the player dolls along corresponding slits in response to the drive force provided by said manual input means,
wherein said movement means includes-
(i) drive means for receiving the drive force from said manual input means,
(ii) carriage means, operatively connected to receive the drive force from said drive means, for moving respective ones of the player dolls along corresponding slits in response to the received drive force; and
(f) centering means, mounted within said casing, and operatively connected to said power means, for automatically projecting the object towards the goal areas.

4,691,922

GOLF PRACTICE DEVICE

Robert M. Peel, 2328 Newton St., Akron, Ohio 44305, and John T. Darner, 150 Davenport Ave., Arkon, Ohio 44312

Filed Mar. 10, 1986, Ser. No. 837,794
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—177 B **12 Claims**



1. A golf practice device comprising:
(a) an elongated shaft having one end adapted to be inserted into the ground for supporting said shaft in a substantially upright postion with its other end uppermost; and
(b) a thin, relatively stiff, flexible, bendable, generally planar target having memory, said target being mounted on said shaft near said one end thereof and extending outwardly at a right angle therefrom, the diameter of said target being about equal to the diameter of a golf hole, and means for connecting said target to said shaft so that said target will bend in response to a golf ball rolling thereunder and contacting same when said target is held by said shaft at a predetermined distance above a putting surface.

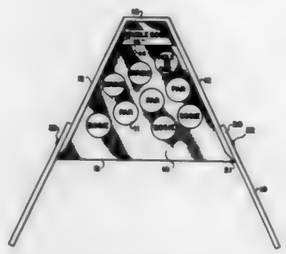
4,691,923

GOLF GAME APPARATUS

Walter Schwartz, 680 Bardal Bay, Winnipeg, Manitoba, Canada R2G 0J2

Filed Mar. 21, 1986, Ser. No. 842,229
Claims priority, application Canada, Mar. 29, 1985, 477962
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—180 **2 Claims**

1. A ball receiver for use in playing a game of carpet golf or the like on a substantially planar surface and comprising in combination a multi-apertured ramp board including a front edge, a rear edge and side edges, two front rows of apertures and a plurality of further apertures rearwardly thereof formed through said ramp board, a surrounding frame consisting of a side member along each side edge of the board defining an open front entrance to said board and means at the rear of said side members, spaced from the rear edge of said board, closing off the rear of the receiver, said side members and said means at the rear thereof extending above the plane of the board, and a rear recess at the rear of the board defined by the rear edge thereof, said side members and the means at the rear of the side members, said apertures being positioned so that the front two rows of apertures act as traps to the remaining apertures situated rearwardly of said front two rows thereby reducing the width of the path along which the ball may travel to reach said further apertures, forwardly extending side members each pivoted by one end thereof to adjacent the distal or front end of one of the side members and movable through approximately 180° in an arc in a vertical plane from a stored position



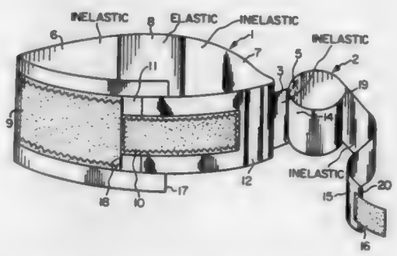
whereby said extension side members lie substantially horizontally alongside the corresponding side member, to a playing position whereby said extending side members lie as forward extensions of said corresponding side members and in longitudinal alignment therewith, with the height of both the side members and the extension side members being substantially similar when in the playing position and the stored position.

4,691,924

GOLFER'S ARM MOVEMENT CONTROL DEVICE

Michael P. Strong, Miami, Fla., assignor to J. B. Golf Enterprises, Inc., Birmingham, Ala.

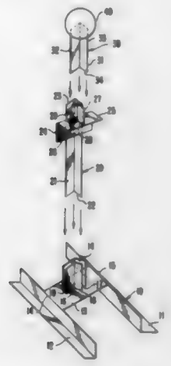
Filed May 7, 1986, Ser. No. 861,861
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—189 R **6 Claims**



6. A golf training device having a first band (1) adapted to surround the chest of a golfer and a second inelastic band (2) adapted to surround and restrain the lead arm of a golfer, said first band (1) having a first end (17) with attachment means (9) on the outer surface adjacent said first end (17) and a second end (18) with first attachment means (11) on the inner surface adjacent said second end (18) for attaching said second end (18) of said first band with said attachment means (9) on the outer surface of said first band (1) adjacent said first end (17) of said first band and second attachment means (10) on the outer surface of said first band (1) adjacent said second end (18), a flexible inelastic strap (3) having a first end attached (4) to the outer surface of said first band (1) intermediate said first and second ends (17 & 18) of said first band (1) and a second end attached (5) to said second band (2) intermediate the ends (19 & 20) of said second band (2) and attachment means (16) on one end (20) of said second band (7) for attaching one end (20) of said second band (2) with said second attachment means (10) on the outer surface of said first band (1), whereby said second

band (2) contacts the lead arm of a golfer to restrain the lead arm and control the golfer's swing.

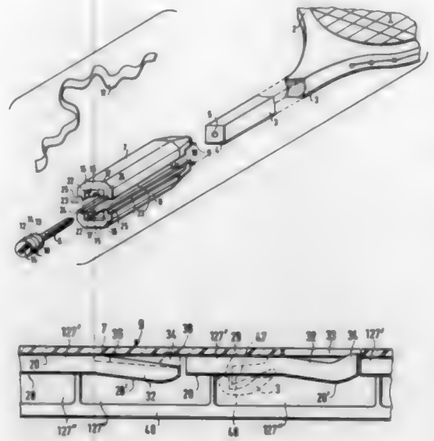
4,691,925
PORTABLE STEEL TARGET FOR PISTOL SHOOTING
Paul Scholem, P.O. Box 418, Grant, Fla. 32949
Filed Sep. 18, 1985, Ser. No. 777,422
Int. Cl.⁴ F41J *1/10*
U.S. Cl. 273—407 **11 Claims**



1. A firearms target support structure comprising a base unit having a pair of leg members and a horizontal support plate member affixed to said leg members along spaced apart portions of said plate member, said plate member having a vertically extending engagement section which engages an upright leg member upon which a firearms target is retained, an upright unit having a vertical leg portion one end of which is mechanically engaged by the vertically extending engagement section of said base unit and the other end of which retains thereon said target, and wherein said vertically extending engagement section, said upright leg member and said vertical leg portion of said upright unit are comprised of interfitting angle iron members.

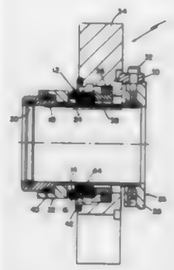
4,691,926
RACKET, ESPECIALLY A TENNIS RACKET, HAVING A GRIP SLEEVE WITH SPRING ELEMENTS
Gunter Adam, Straubing, Fed. Rep. of Germany, assignor to PUMA AG Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany
Filed Aug. 24, 1984, Ser. No. 644,016
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332289; Jan. 4, 1984, 3400174
Int. Cl.⁴ A63B *49/08*
U.S. Cl. 273—73 J **40 Claims**

28. A racket, especially a tennis racket, with a frame surrounding a ball hitting area, said frame having a shaft onto which a grip sleeve is mounted to form a hand-grip, and an adjustment means for adjusting the length of the racket by changing the position of the hand-grip on the shaft, wherein said grip sleeve is formed of at least two at least similar sleeve parts that are formed of a hard, elastically resilient material and that have projections which extend inwardly toward the shaft and run in a longitudinal direction relative to the shaft, and wherein said projections of the sleeve parts comprise resiliently deflectable means for balancing of tolerances between



the grip sleeve and the shaft by resiliently resting against the shaft.

4,691,927
TEMPERATURE-COMPENSATING MECHANICAL FACE SEAL
Walter J. Sudol, Plaistow, N.H., and Michael P. Habich, North Reading, Mass., assignors to A. W. Chesterton Company, Stoneham, Mass.
Filed Dec. 1, 1986, Ser. No. 936,326
Int. Cl.⁴ F16J *15/36*
U.S. Cl. 277—26 **11 Claims**



1. In a mechanical face seal of the diaphragm bellows type, comprising:

a face seal ring having a body defining a substantially flat, annular sealing surface, and

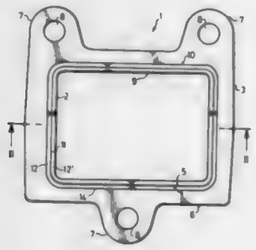
a holder adapted to be disposed radially about said face seal ring in interference fit with a loaded surface of said seal ring, said holder defining a shoulder surface for engaging upon a corresponding shoulder surface of said face seal ring, said holder positioning said seal ring for sealing engagement with an opposed sealing surface of a relatively rotating, second seal ring, and said holder defining a loading surface adapted to apply radially inwardly directed contact pressure upon the opposed loaded surface of said face seal ring,

said face seal ring and said holder having different coefficients of thermal expansion,

the improvement wherein

the contact pressure applied by said holder upon said face seal ring is applied to an area of said face seal ring loaded surface, the resultant of said contact pressure being disposed axially between said sealing surface and the centroid of said face seal ring thereby to cause the sealing surface to lie substantially flat at varying temperatures of operation.

4,691,928
ANTI-VIBRATIONAL ELECTRICAL-CONDUCTIVITY-CONFORMED SEAL ARRANGEMENT
Berthold W. Abele, Walheilm, Fed. Rep. of Germany, assignor to KSA Dichtsysteme GmbH, Vaihingen, Fed. Rep. of Germany
Filed Sep. 11, 1985, Ser. No. 774,655
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433376
Int. Cl.⁴ F16J *15/10*
U.S. Cl. 277—235 B **16 Claims**

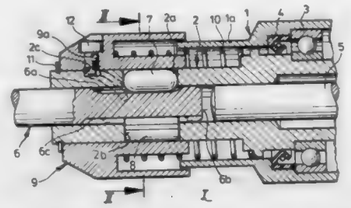


1. A seal having an elastomeric sealing part provided with sealing portions, and an associated carrier part, with structural parts which are to be sealed off being adapted to be pressed against surfaces of said carrier part;

the improvement wherein said sealing part has a coaxially extending peripheral surface disposd between said sealing portions, which are provided on opposite sides of said sealing part having two sealing lips provided on opposite sides of said sealing part as well as including two surfaces cutting into each other in a sealing edge and extending from said peripheral surface as well as from inner periphery of said sealing part; wherein said carrier part consists of synthetic material resistant to compression; wherein said surfaces of said carrier part against which said structural parts are to be pressed are in the form of two parallel abutment surfaces of said synthetic material, with a side surface of said synthetic material being disposed transversely between said abutment surfaces, said sealing lips projecting over said abutment surfaces; and wherein said peripheral coaxially extending surface of said sealing part is vulcanized to said side surface of said carrier part, said peripheral coaxially extending surface of said sealing part being axially equal in length to said side surface of said carrier part.

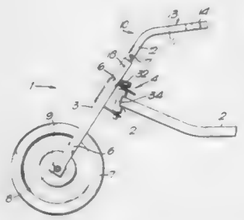
4,691,929
DRILL BIT CHUCK FOR DRILLING AND CUTTING DEVICES
Anton Neumaier, Fürstenfeldbruck; Hans-Jürgen Hoereth, Langenbach, and Gerhard Rumpp, Inning, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Liechtenstein
Filed Nov. 12, 1986, Ser. No. 929,919
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539912
Int. Cl.⁴ B23B *31/10*
U.S. Cl. 279—19.3 **8 Claims**

1. Tool chuck for securing one end of an axially extending tool bit in a device for use in drilling and cutting operations, with the tool bit having at least one axially extending first slot closed at the opposite ends thereof and at least one axially extending second slot with one and thereof being open at the one end of the tool bit, wherein said tool chuck comprises an axially extending guide tube having at least one first aperture extending radially therethrough, and at least one second aperture extending radially therethrough with said first and second apertures being in spaced relation, a locking member positioned within said at least one first aperture, an entrainment strip positioned within said at least one second aperture, an axially extending adjusting sleeve closely encircling said guide



tube, said adjusting sleeve having a first pocket therein arranged to receive said locking member and a second pocket arranged to receive said entrainment strip and said adjusting sleeve being displaceable relative to said guide tube for retaining said locking member and entrainment strip in a radially inner position in engagement with the first and second slots in the tool bit and for receiving said locking member and entrainment strip in a radially outer position in engagement with said first and second pockets out of engagement with the first and second slots in the tool bit so that the tool bit can be removed from said tool chuck.

4,691,930
WHEELED VEHICLE
Michael Samuel, Flat J, Queens Drive, Finsbury Park, London, United Kingdom N42HW
PCT No. PCT/GB85/00396, § 371 Date May 30, 1986, § 102(e) Date May 30, 1986, PCT Pub. No. WO86/01480, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 4, 1985, Ser. No. 864,189
Claims priority, application United Kingdom, Sep. 5, 1984, 8422410
Int. Cl.⁴ B62K *13/00*
U.S. Cl. 280—7.1 **20 Claims**



1. A convertible wheeled vehicle which is capable of assembly into any one of a plurality of different vehicles, the convertible vehicle comprising:

(a) a front wheel frame assembly;

(b) means for mounting at least one wheel to said front wheel frame assembly;

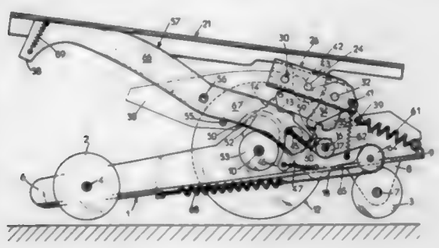
(c) a chassis assembly;

(d) means for mounting at least one wheel to said chassis assembly; and,

(e) means for pivotally connecting said chassis assembly to

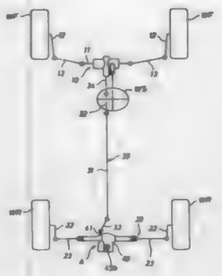
said front wheel frame assembly in a selected one of a plurality of different orientations of said chassis assembly, each orientation of said chassis assembly corresponding to a different vehicle, said connecting means comprising a pair of vertically spaced plates rigidly connected to said front wheel frame assembly, a mounting assembly fixed at one end of said chassis assembly and adapted to be received between said spaced plates, and retaining means for retaining said mounting assembly between said spaced plates in one of at least two selectable orientations relative to said plates.

4,691,931
PROPELLING ROLLER SKATE
Yvon M. Vincent, 1 Avenue des Bosquets, 91800 Brunoy, France
Filed Jul. 23, 1986, Ser. No. 888,335
Claims priority, application France, Aug. 5, 1985, 85 11947
Int. Cl.⁴ A63C *17/12*
U.S. Cl. 280—11.115 **8 Claims**



1. A propelling roller skate comprising a roller frame carrying drive wheels; a drive shaft carried by the frame; pedal means for supporting a foot, the pedal means supported above the frame and pivotable relative to the frame about a transverse axis from a standby position to one of a propulsion position and a braking position; propulsion means carried by the frame; braking means carried by the frame; selection means pivotably supported on a pivot carried by the pedal means and having two positions, namely a "propulsion" position for controlling the propulsion means and a "braking position" for controlling the braking means, wherein the selection means includes a selector on which the pedal is articulated and which selector carries positioning studs adapted to cooperate with positioning notches carried on the frame, stop snugs carried by the selector and adapted to cooperate with the braking means when the selector turns about the pivot carried by the pedal means, in order to select the "propulsion" position, a stop finger carried by the selector for defining a propulsion stop and a brake stop; a propulsion lever pivotally carried by the braking means and cooperatively engageable with the propulsion stop; wherein the braking means is articulated on the drive shaft, about which it is adapted to turn in a "braking" selection position in order to act on the driving wheels, and wherein the brake stop cooperates with a catch for locking the selection means in a "propulsion" selection position, and elastic means connected with the selector for returning the selector to a "standby" position between the propulsion position and the braking position when no pressure is applied to the pedal.

4,691,932
FOUR-WHEEL STEERING SYSTEM FOR AUTOMOTIVE VEHICLES
Youichi Hyodo, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Jun. 3, 1986, Ser. No. 869,891
Claims priority, application Japan, Jun. 4, 1985, 60-84400[U]
Int. Cl.⁴ B62D *3/02*
U.S. Cl. 280—91 **6 Claims**

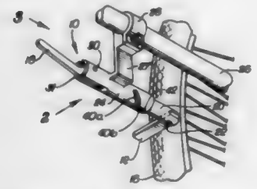


1. A four-wheel steering system for an automotive vehicle having a pair of dirigible front road wheels and a pair of dirigible rear road wheels, comprising:
a front wheel steering mechanism operable in response to a steering operation to steer the front road wheels;
a rear wheel steering mechanism including an operation rod axially movable in response to operation of said front wheel steering mechanism to steer the rear road wheels;
a linkage arranged in a fore-and-aft direction of the vehicle and having one end drivingly connected to said front wheel, steering mechanism; and
a connecting mechanism assembled in combination with said rear wheel steering mechanism and being drivingly connected to the other end of said linkage for effecting axial movement of the operation rod in response to operation of said front wheel steering mechanism;
wherein said connecting mechanism comprises:
a housing to be mounted on a body structure of the vehicle;
a carrier rotatably mounted within said housing and being arranged to rotate about a first axis perpendicular to the longitudinal axis of said operation rod;
drive means mounted on said housing to effect rotary motion of said carrier about said first axis;
a bell crank rotatably mpunted on said carrier and arranged to rotate about a second axis in parallel with the longitudinal axis of said operation rod when said carrier is retained in a neutral position, said bell crank having a first arm extending therefrom at a predetermined angle to said first axis and a second arm extending therefrom along said first axis;
a first link having one end pivotally connected with the first arm of said bell crank and the other end operatively connected to said linkage to be moved along said first axis in response to operation of said front wheel steering mechanism; and
a second link pivotally connected with the second arm of said bell crank and operatively connected to said operation rod.

4,691,933
WHEELCHAIR PARKING BRAKE
Herbert Strauss, 688 W. Lynwood St., Thousand Oaks, Calif. 91360
Filed Mar. 6, 1984, Ser. No. 586,850
Int. Cl.⁴ B60T *1/04*
U.S. Cl. 280—289 WC **6 Claims**

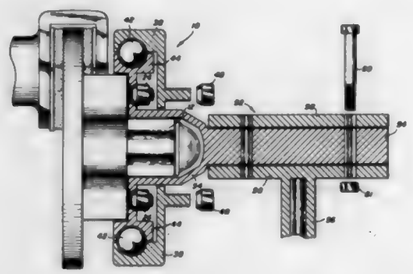
1. A parking brake for a wheelchair, comprising:
a locking bar; and

mechanical means for moving the locking bar between a first angular position in which the locking bar is not intersecting the plane of a wheel of the wheelchair, and a second angular position in which the locking bar intersects the plane of the wheel, and for moving the locking bar in a substantially radial direction with respect to the wheel, between a released position and a locking position, the bar being in locking contact with the wheel when in the second angular position and the locking position, wherein the mechanical means for moving the locking bar includes
a tube rigidly connected to the wheelchair,
a shaft connected to the locking bar and mounted for sliding and rotational movement within the tube,



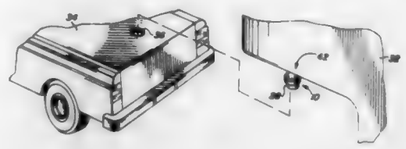
hand-operated means for applying axial motion to the shaft within the tube, to move it in the radial direction, and
camming means for converting axial movement of the shaft to an angular movement between the first and second angular positions;
wherein the mechanical means functions to apply the brake by moving the locking bar initially to the second angular position and an intermediate radial position, and then to the locking position while maintaining the second angular position.

4,691,934
TOWING SYSTEM FOR VEHICLES
Jack Tomse, 119 Third St., LaSalle, Ill. 61301
Filed May 7, 1986, Ser. No. 860,748
Int. Cl.⁴ B60D *1/00*
U.S. Cl. 280—503 **10 Claims**



1. A steer bar device attachable to a vehicle for towing of said vehicle and for enhancing steering action response in the steering system of said vehicle, comprising:
means for coupling a towing vehicle to said steer bar device; and
frame means for connecting selected wheel hubs of said vehicle to said coupling means, said frame means transmitting steering action from said towing vehicle to said selected wheel hubs and in turn to the steering system of said vehicle.

4,691,935
ANTI-THEFT TRAILER ASSEMBLY AND TRAILER HITCH LOCK
Louis Brandt, 44643 Fern Ave., Lancaster, Calif. 93534
Filed Aug. 4, 1986, Ser. No. 892,296
Int. Cl.⁴ B60R *25/00*
U.S. Cl. 280—507 **2 Claims**

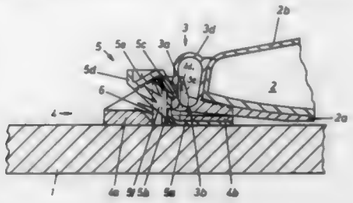


1. An improved automatically locking trailer lock, said lock comprising, in combination:
(a) a lock body having two halves, including a generally inverted U-shaped upper half having a pair of depending spaced arms releasably disposed against a pair of upstanding arms of a generally U-shaped lower half, said two halves defining therebetween a central opening extending transversely therethrough and dimensioned to receive the generally central annular recessed portion of a trailer hitch post; and
(b) an automatic locking mechanism disposed in said lock body, said mechanism comprising:
i. a pair of posts secured in the arms of said upper half and depending therefrom into openings in the arms of said lower half, the lower portions of said posts bearing facing notches,
ii. a generally transverse locking plate having opposite ends received in said notches to lock said posts and said upper half to said lower half,
iii. a key lock component fixedly secured to said plate and extending to the lower end of said lower half, said key lock component being rotatable with a key to correspondingly rotate said plate to an unlocked position wherein said opposite plate ends are out of said notches, thereby permitting withdrawal of said upper half from said lower half; and
iiii. biasing means biasing said plate into said locked position,
(c) wherein said locking mechanism includes a return spring biasing said plate into said locked position and wherein the bottom ends of said posts are dimensional and tapered to temporarily move said plate ends into the unlocked position against said biasing spring force during insertion of said posts into said openings,
(d) wherein said spring is generally V-shaped, wherein the lower ends of said depending arms have further depending peripheral rims and wherein the upper ends of said upstanding arms have recessed peripheries to receive said peripheral rims, whereby said halves have improved resistance against prying apart.

4,691,936
SKI BINDING, IN PARTICULAR FOR USE IN CROSS-COUNTRY SKIING
Gerhard Nowak, Biedermannsdorf; Alfred Winter; Hans P. Morbitzer, both of Vienna; Klaus Kruschik, Gumpoldskirchen, and Rudolf Theuer, Trumau, all of Austria, assignors to TMC Corporation, Baar, Switzerland
Filed Feb. 12, 1986, Ser. No. 828,953
Claims priority, application Austria, Feb. 18, 1985, 474/85
Int. Cl.⁴ A63C *9/00*
U.S. Cl. 280—615 **8 Claims**

1. A cross-country skiing assembly, comprising a bearing block secured to a ski, a ski shoe receiving part stationarily fixedly connected to a bearing block, a hook element provided on a toe portion of a ski shoe, a locking element supported on

said bearing block and having at least one locking protuberance thereon said hook element is secured against movement on said receiving, said hook element including a hook bar which extends generally vertically to an upper surface of said ski in front of said toe portion and having means thereon operatively engaged by said locking protuberance, a spring means yieldably urging said locking element into operative locking relation with said hook bar, said receiving part having at least, in a skiing position, guide bars operatively engaging said hook



element, said guide bars extending approximately perpendicularly to an upper side of said ski and project inwardly from said receiving part, and a pair of elastic web members, one of said web members being connected to and extending between a top part of said toe portion of said ski shoe and a top part of said hook bar, and the other of said web members being connected to and extending between a bottom part of said toe portion of said ski shoe and a bottom part of said hook bar, said web members both being elastically yieldable in response to a movement of said ski shoe relative to said ski.

4,691,937

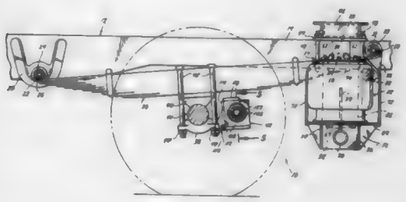
VEHICLE SUSPENSION ASSEMBLY

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed May 19, 1986, Ser. No. 864,334

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—711 **19 Claims**



1. In a vehicle having a chassis and an axle, a vehicle suspension system for instatllation between the chassis and the axle comprising, an elongated leaf spring assembly having first and second ends, means for connecting the leaf spring assembly to the axle at a point intermediate the first and second ends, means for supporting the first end of the leaf spring asembly from the chassis with the second end free to move vertically and longitudinally relative to the chassis, a first spring seat, means for joining the first spring seat to the second end of the leaf spring assembly, a second spring seat spaced vertically from the first spring seat, means, for connecting the second spring seat to the chassis, and air spring means connected between the first and second spring seats whereby in addition to functioning as a spring, the leaf spring assembly functions as a beam extending from the first end to the axle and to the air spring means.

4,691,938

GUIDING RAIL OF USE IN PARTICULAR IN A PASSIVE SAFETY BELT DEVICE FOR A MOTOR VEHICLE

Jean Monsigny, Saverne, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Feb. 18, 1986, Ser. No. 829,887

Claims priority, application France, Feb. 15, 1985, 85-02235

Int. Cl.⁴ B60R *22/06*

U.S. Cl. 280—804 **6 Claims**



6. A passive safety belt device, in particular for a motor vehicle, comprising a guiding rail having a slot and in combination with a slidable element which is slidable in the rail and connected to a bolt which projects through the slot for cooperation with a passive safety belt buckle, said rail comprising, at least in a part thereof guiding the slidable element, two lateral portions for guiding the displacement of the slidable element and disposed on each side of said slot, and a bearing portion for the slidable element disposed in facing relation to said slot, and wherein said lateral guiding portions are constituted, in section, by substantially semi-circular lobes disposed on each side of said slot and said bearing portion is constituted, in section, by a substantially semi-circular lobe disposed in facing relation to said slot.

4,691,939

RELEASE SYSTEM FOR SEAT OCCUPANT IN VEHICLE

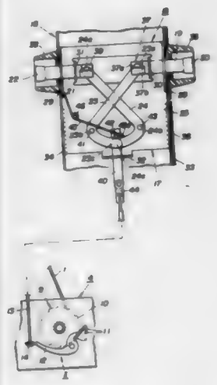
Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 22, 1985, Ser. No. 790,157

Claims priority, application Japan, Nov. 14, 1984, 59-240334; Nov. 28, 1984, 59-181194[U]

Int. Cl.⁴ B60R *22/36*

U.S. Cl. 280—806 **18 Claims**



1. A release system for a seat occupant restrained by a seat belt in a vehicle, comprising:

a seat belt retractor having a lock locking said seat belt retractor when a vehicle body experiences more than a predetermined degree of deceleration;

means for emergency-releasing said seat belt retractor after said seat belt retractor has been locked; and

an emergency release control comprising:

(a) a chassis mounted on the vehicle body,

(b) a manually actuated inboard slider slidably mounted on said chassis,

(c) a first L-shaped control lever pivotably mounted at an angle thereof on said chassis, said first L-shaped control lever having a relatively long arm pivotally linked with said inboard slider and having a relatively short leg,

(d) a manually actuated outboard slider slidably mounted on said chassis,

(e) a second L-shaped control lever pivotably mounted at an angle thereof on the chassis, said second L-shaped control lever having a relatively long arm pivotally linked with said outboard slider and having a relatively short leg, and

(f) a control terminal movable to exert a control power for actuating said emergency-releasing means, said control terminal being actuably associated with said short leg of said first and said second L-shaped control levers, respectively.

4,691,940

PRINTED SECURITY WITH HALLMARKS

Gerhard Stenzel, Munich, and Wittich Kaule, Gauting, both of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 293,761, Aug. 17, 1981, abandoned, which is a division of Ser. No. 82,266, Oct. 5, 1979, abandoned. This application Jan. 2, 1985, Ser. No. 688,209

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845401

Int. Cl.⁴ B42D *15/00*

U.S. Cl. 283—70 **17 Claims**

1. In a method for verifying the authenticity of a security paper comprising a single-layer, sheet-like paper substrate and a coating applied to an outer surface of said security paper by cathode sputtering, the steps comprising cathode sputtering a coating consisting essentially of a fluorescent substance which emits light in a first spectral range when excited by light of a second spectral range onto a surface portion of said paper substrate; exposing said coating to light of a within said second spectral range; measuring the light emission of said substance as a result of such light exposure; verifying the substance of said coating from such measurement, and thereby verifying the authenticity of said security paper.

2. In a method for verifying the authenticity of a security paper comprising a single-layer, sheet-like paper substrate and a coating applied to an outer surface of said security paper by cathode sputtering, the steps comprising cathode sputtering a coating consisting essentially of a photoconducting substance having a measurable electrically conductive property when exposed to light of a certain spectral range onto a surface portion of said paper substrate; exposing said coating to light within said certain spectral range; measuring the electrical conductivity of said coating while exposed to said light; verifying the substance of said coating from such conductivity measurement and thereby verifying the authenticity of said security paper.

4,691,941

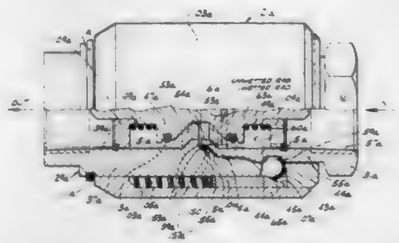
TENSION ACTUATED UNCOUPLER

Charles Rabushka, 1359 Whispering Pines, St. Louis, Mo. 63141, and Layton J. Reprogle, 4430 Eminence, Berkeley, Mo. 63134

Continuation-in-part of Ser. No. 619,120, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 465,242, Feb. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 401,083, Jul. 23, 1982, abandoned. This application Aug. 2, 1985, Ser. No. 761,865

Int. Cl.⁴ F16L *37/10*

U.S. Cl. 285—1 **7 Claims**



1. Tension actuated uncoupler installable in a line for permitting the flow of a fluid therethrough when coupled and for uncoupling at least a portion of said line from another portion thereof in the event a tension load above a predetermined limit being applied to said line, said uncoupler comprising a female quick disconnect fitting secured to one of said line portions and a male quick disconnect fitting secured to the other portion of said line, said male and female fittings each having a flowpath therethrough which, when said fittings are coupled, permits the flow of fluid through said line, a plurality of apertures in said female fitting, a plurality of securing balls carried by said female fitting, one said ball in a respective aperture, said balls being engagable with said male fitting for positively holding the fittings together in coupled relation, said balls being movable radially inwardly and outwardly relative to said male fitting for holding the fittings together in coupled relation and for permitting uncoupling thereof, respectively, cam means on said male fitting cammingly engagable with said balls, a retainer having cam means and being movable axially relative to said female fitting from a retaining position in which said balls are cammingly engagable with said male fitting and with said cam means on said retainer for holding said fittings in coupled relation and a retracted position permitting said balls to move radially thereby to permit uncoupling of said fittings, said retainer being cammingly engaged by said balls upon a tension load being applied to said fittngs, and spring means resiliently biasing said retainer in axial direction toward its retaining position, a seal carried by one of said fittings for sealingly engaging the other fitting upon the fittings being secured together in said coupled relation and upon said fittings moving axially into and out of said coupled relation, said seal being so located with respect to the centerline of said fittings that the cross sectional area of said flowpaths of said fittings are substanially equal to the cross sectional area of seal means so that upon the application of axial tension loading to said fittings, said predetermined load limit being substantially unaffected by fluid pressure within said uncoupler.

4,691,942

HOSE QUICK COUPLING APPARATUS

Michael B. Ford, General Delivery, Veraal, Utah 84078

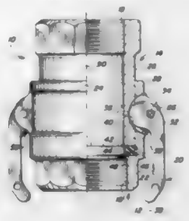
Filed Aug. 13, 1986, Ser. No. 896,599

Int. Cl.⁴ F16L *37/18*

U.S. Cl. 285—84 **18 Claims**

1. A quick-disconnect cam locking safety coupling having a hollow male plug with an external peripheral groove, a hollow

socket receiving said male plug and forming said coupling, said socket having a pair of opposed side openings aligned with said peripheral groove; mounting ears on opposed sides of the opening; means, including a gasket, for sealing between the male plug and the socket; a pair of cam members each having a lever extending therefrom and lying adjacent the socket with there being a cam portion passing through one of said side openings and engaging said peripheral groove; a shaft supported by said ears by which each of said cam members are pivotally connected to the socket for outward movement of the levers away from the socket to disengage the cam portions from the said peripheral groove; the improvement comprising:



a bore formed through said cam member, said bore communicates with said shaft and is perpendicular thereto; a detent formed in said shaft adjacent said bore, a piston reciprocatingly received within said bore, biasing means urging said piston towards the detent;

said shaft is non-rotatably supported by said ears, said cam member pivots about the fixed shaft;

said bore and detent are oriented respective to said socket whereby said cam member is releasably locked when the lever is moved against the socket.

4,691,943

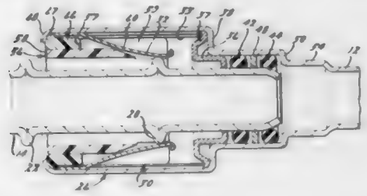
QUICK CONNECT FLUID FITTING ASSEMBLY

Daniel L. DeLand, Millington, and Leon F. LaVesse, Durand, both of Mich., assignors to Schmelzer Corporation, Flint, Mich.

Continuation-in-part of Ser. No. 726,839, Apr. 24, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 897,608

Int. Cl.⁴ F16L *21/00*

U.S. Cl. 285—315 **13 Claims**



1. A quick-connect fitting assembly for releasably connecting a pair of fluid conduits to one another for fluid communication therebetween, said quick-connect fitting assembly comprising:

socket means on a first of the fluid conduits for receiving a second of said fluid conduits inserted longitudinally inwardly into said socket means, said second fluid conduit having a laterally-extending protuberance thereon;

retainer means within said socket means for releasably retaining said second fluid conduit within said socket means, said retainer means including one or more resilient finger members disposed within said socket means and being resiliently deflectable into a longitudinally interlocking engagement with said protuberance as said second fluid conduit is inserted into said socket means;

removal means longitudinally insertable into said socket means and being selectively movable longitudinally inwardly from a predetermined longitudinal position therein for urging said finger members out of said interlocking engagement with said protuberance, said removal means including longitudinally-extending legs thereon, means for limiting the longitudinal movement of said removal means within said socket means, and lateral guidance means for substantially preventing lateral movement of said removal means as said removal means is moved longitudinally within said socket means, said lateral guidance means including circular segments on said retainer means disposed circumferentially between said finger members, said longitudinally-extending legs on said removal means being disposed adjacent said cylindrical segments of said retainer member for slidable contact therewith; and

lateral support means for laterally supporting said second fluid conduit relative to said socket means at longitudinal position outward of said finger member.

4,691,944

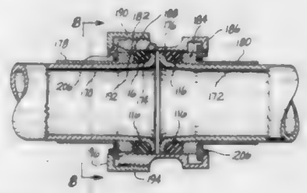
TUBING CONNECTOR

Wilton S. Viall, Jr., Des Moines, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 22, 1986, Ser. No. 866,123

Int. Cl.⁴ F16L *19/02*

U.S. Cl. 285—348 **13 Claims**



1. A tubing connector, comprising:

an elongated section of tubing comprising a cylindrical sidewall defining a central fluid conveying passageway, and an end portion including an outwardly directed radial flange;

means to be joined to said tubing section, in a manner providing a fluid-tight joint between said means to be joined and said tubing section, said means to be joined comprising a tubular member into which the end portion of the section of tubing is received, said tubular member and said tubing section defining an annular space between them;

an elastomeric O-ring in said annular space snugly surrounding said tubing section and contacting the radial flange at the end of the tubing section;

a sliding, O-ring compressing, sleeve, comprising an elongated cylindrical sidewall portion which surrounds said section of tubing, an inner end, an outwardly directed radial flange at said inner end, an inner end surface in contact with the O-ring, and a radial shoulder surface formed where the sidewall portion of the sleeve meets the outwardly directed radial flange;

a pressure exerting means having a radial surface which contacts the radial shoulder surface on said sleeve;

rotatable screw joint means between said tubular member and said pressure exerting means;

wherein in response to a tightening rotation of the screw joint means said pressure exerting means exerts an axial force on the shoulder surface of the sleeve, for moving said sleeve axially against the O-ring, to cause the O-ring to compress axially and expand radially, for sealing between said tubing section and said tubular member;

said tubular member has a threaded axial portion which concentrically surrounds said sleeve, and said rotatable screw joint means has a mating threaded axial portion which concentrically surrounds the sleeve, and wherein the radial surface on the rotatable screw joint means is an end surface; and

said section of tubing includes a conical region immediately axially inwardly of the radial flange, which increases in diameter as it extends outwardly towards the flange, and wherein the inner end of the sleeve is of such a size and shape that its axial outward movement, in response to a tightening of the screw joint means will be effectively stopped by a tight fit between it and the conical region when the O-ring has been compressed a predetermined desirable amount.

4,691,945

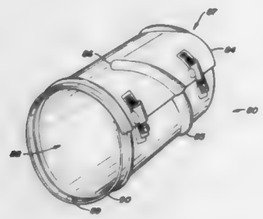
CONDUIT COUPLINGS

Henry L. Cottrell, 4168 W. Fallon, Fresno, Calif. 93722, and William L. Venturi, Oakhurst, Calif., assignors to Henry Lloyd Cottrell, Fresno, Calif.

Filed Oct. 31, 1986, Ser. No. 926,050

Int. Cl.⁴ F16L *21/06*

U.S. Cl. 285—419 **13 Claims**



1. A coupling for conduits at least one of which is circular tubing having a spiral lock seam protruding outward, said coupling comprising:

a band curved to encircle said circular tubing;

a groove in said band to receive said spiral lock seam and angled to align therewith, said groove having a depth not greater than the distance by which said spiral lock seam protrudes from said circular tubing and a width having a substantially uniform depth exceeding the width of said spiral lock seam to define a gap between said groove and said spiral lock seam on one side of the latter which permits shifting of said groove over said spiral lock seam in a direction transverse to said groove upon tightening said band around said circular tubing; and

means for tightening said band around said circular tubing.

4,691,946

UNIT FOR CONNECTING A SEAT TO MOTOR VEHICLE FLOOR

Luigi Sburlati, Turin; Giovanni Acuto, Orbassano, and Giuseppe Stacchino, Moncalieri, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Aug. 6, 1985, Ser. No. 763,129

Claims priority, application Italy, Aug. 9, 1984, 53718/84[U]

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—429 **8 Claims**

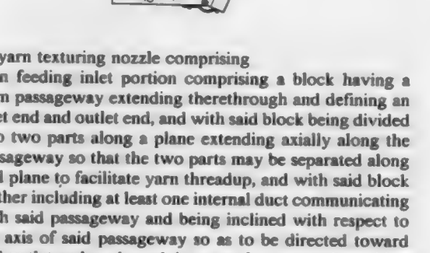
1. A unit for connecting a seat to a motor vehicle foor, comprising guide means resting on a frame fixable to the floor in such a manner as to enable said seat to be supported by said floor and to undergo translational movement relative to said floor;

said guide means comprising two first portions and two second portions;

each of said first portions being fixed to said seat and translatable relative to one of said second portions;

said seat having first and second ends;

each of said second portions being connected to said frame by one positioning means connected between said frame and each of said second portions at one of said ends of said seat and by one locking means connected between said frame and each of said second portions at the other of said ends of said seat; and



each said locking means including a cooperating screw and a nut, one of which is premounted on a respective bracket fixed to a respective second portion, and the other of which is arranged to engage a corresponding open seating provided in said frame.

4,691,947

YARN TEXTURING NOZZLE

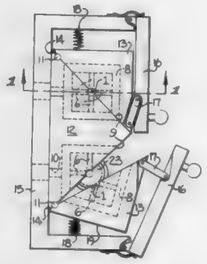
Klaus Burkhardt, Schwelm; Klaus Gerhards; Manfred Greb, both of Hückeswagen; Rainer Keuth, and Erich Lenk, both of Remscheid, all of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,260

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501662; Mar. 15, 1985, 3509323

Int. Cl.⁴ D02G *1/12, 1/16*

U.S. Cl. 28—255 **22 Claims**



1. A yarn texturing nozzle comprising

a yarn feeding inlet portion comprising a block having a yarn passageway extending therethrough and defining an inlet end and outlet end, and with said block being divided into two parts along a plane extending axially along the passageway so that the two parts may be separated along said plane to facilitate yarn threadup, and with said block further including at least one internal duct communicating with said passageway and being inclined with respect to the axis of said passageway so as to be directed toward said outlet end, and conduit means for connecting said at least one internal duct to a source of a pressurized treatment fluid and such that the pressurized fluid entering said passageway through said internal duct is adapted to advance a yarn through said passageway and toward said outlet end, and

a tubular stuffer box mounted to abut the outlet end of said block in coaxial communication with said outlet end of said passageway, said stuffer box including a peripheral side wall having opening means extending therethrough for permitting the treatment fluid to exhaust laterally

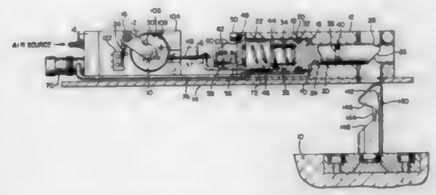
through said side wall, and wherein said stuffer box further includes a yarn inserting slot extending through said side wall to facilitate yarn threadup, and means for selectively closing said yarn inserting slot.

4,691,948

FAIL-SECURE LOCK SYSTEM

George K. Austin, Jr., Newberg, and Larry D. Lietz, Dundee, both of Oreg., assignors to A-DEC, Inc., Newberg, Oreg.

Filed Nov. 27, 1985, Ser. No. 802,533
Int. Cl.[4] E05C *1/12*
U.S. Cl. 292—171 9 Claims



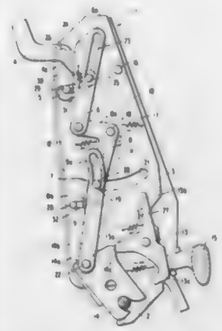
1. A lock mechanism for a door or the like comprising:
a frame,
a latch bolt,
a cylinder body fixedly mounted on said frame and slidably receiving the latch bolt for movement between an extended locking position and a retracted unlocked position,
spring means operatively arranged between said body and latch bolt to bias said latch bolt toward said locking position,
said body and latch bolt defining a piston and cylinder means adapted upon the introduction of air therebetween to cause said latch bolt to be urged toward said unlocked position,
conduit means for supplying air under pressure to said piston and cylinder means, said conduit means including a solenoid operated three-way valve for controlling the flow of air to and from said piston and cylinder means,
circuit means connected to said solenoid for effecting operation thereof,
switch means in said circuit,
a mortise lock having a key rotatable plug mounted in said frame,
an operating lever mounted on said plug and operatively connected to said switch to cause the same to close the circuit through said solenoid upon predetermined rotation of said plug whereby said solenoid operates said three-way valve to supply air under pressure to the cylinder body to move said latch bolt toward the unlocked position, said lever causing the switch to open the circuit through said solenoid upon counterrotation of said plug, whereby said solenoid operates said three-way valve to release air from the cylinder body and enable the spring means to bear said latch bolt toward the locking position,
a spool,
means rotatably mounting said spool in said frame,
cable means connected to said latch bolt and to said spool whereby rotation of said spool will cause movement of said latch bolt toward said unlocked position,
and means on said spool for operatively engaging said operating lever as the same is rotated with said key beyond a predetermined degree whereby further rotation of said key and operating lever causes said cable to be wound on said spool and said latch bolt to be moved to said unlocked position.

4,691,949

LOCK ARRANGEMENT FOR A MOTOR VEHICLE DOOR

Helmut Grantz, and Wolfgang Odebrecht, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,281
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1985, 3507405
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 21 Claims



1. A lock arrangement for a motor vehicle door, comprising lock housing means including rotary catch means rotatable to an open and locked position and acting on a locking bolt on a side of a vehicle body, a spring-loaded locking latch means holding the rotary catch means in a locked position, a knee lever means engaging at the catch means and at the housing means which is formed by two lever members connected in a deflectable dead-center joint means, and actuating means, two end positions of the dead-center joint means are coordinated to the locked and open position of the rotary catch means are determined by control abutment means limiting the deflection of the dead-center joint means, a torque being introduced into the rotary catch means by means of the actuating means moving the knee lever means to deflect the dead-center joint means, by means of which the door is adapted to be transferred into the locked position against the force of an elastically deformable door seal, the knee lever means being displaceable by means of a pivotally supported pull handle, which is spring-loaded against an outward pivoting direction to deflect the dead-center joint means, from the end position of the dead-center joint means which is coordinated to the open position of the catch means, into the end position of the dead-center joint means which is coordinated to the locked position of the rotary catch means by pivoting-in the pull handle.

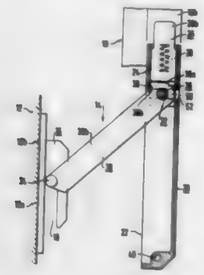
4,691,950

DEVICE FOR DETACHABLY SECURING PIVOTALLY CONNECTED MEMBERS IN A PREDETERMINED RELATIVE POSITION

Siegfried Mayer, Münster-Wolbeck, and Paul Greisner, Telgte, both of Fed. Rep. of Germany, assignors to Aug. Winkhaus GmbH & Co. KG

Filed May 27, 1986, Ser. No. 867,912
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521492
Int. Cl.[4] E05C *17/16*
U.S. Cl. 292—269 12 Claims

1. A device for detachably securing pivotally connected first and second members in a predetermined relatively open position into which they have been moved from a relatively closed position, the said device comprising a slide guide having a longitudinal direction adapted to be secured to the first member; a sliding member slidable in the longitudinal direction of said slide guide; resilient means in contact with the sliding member for urging the sliding member towards a normal position in the slide guide; a swivel joint carried by said sliding member; a rectilinearly extending swivel-slide joint fitting adapted to be secured to the second member; a bar one end of which is connectdd to the swivel joint and the other end of which is rectilinearly slidably connectable to and disconnectable from the swivel-slide joint fitting; a releasing and locking cam located on the bar, the slide guide having a cam-engaging edge therein which is engageable with the cam so as automatically to lock the bar in a predetrmined angular position only when the bar has been moved into the latter in a predetermined direction as a result of the first and second members having been moved into the said relatively open position; the cam having a cam surface which cooperates with the cam-engaging edge during the movement of the bar in the said predetermined direction to cause movement of the sliding member against the



action of the resilient means until the bar is in the said predetermined angular position; and said sliding member includes a manually operable releasing means for effecting sliding movement of the sliding member away from the said normal position and against the action of the resilient means to release the cam from the cam-engaging edge and thus permit the bar to be swivelled around the swivel joint so that the first member may be moved from the relatively open to the relatively closed position; the bar being disconnectable from and removable out of a slot of the swivel-slide joint fitting when the first and second members are in the relatively closed position by moving the sliding member out of its normal position against the action of the resilient means; the bar being formed of two sections which are parallel to each other and which at one end receive the sliding member between them and at the other end are connected by a slot-engaging bolt, the swivel-slide joint fitting having a portion engaging between the two sections.

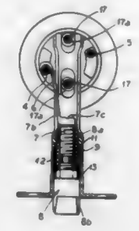
4,691,951

BOLT ASSEMBLY FOR A DOOR SET

Gerhard Fildan, D-7250 Leonberg, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,441
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 8529711[U]; Dec. 30, 1985, 8536672[U]
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—337 18 Claims

1. A bolt assembly for a door set, said assembly comprising:
a bolt guide sleeve;
a bolt pin mounted to be axially displaceable in said sleeve, said bolt pin having a latching head adapted to project from said sleeve and engage in a recess, and a tubular shank extending from said head in said sleeve;
a coil spring disposed in said sleeve and bearing against said head for yieldably urging said head out of said sleeve;
a screw threadedly engaged in said shank and axially displaceable therein by rotation of said screw relative to said bolt pin;
at least one knob rotatably mounted on said assembly; and
an eye formed unitarily on said screw and extending therefrom away from said head for engagement with a formation connected to said knob and excentric with respect to



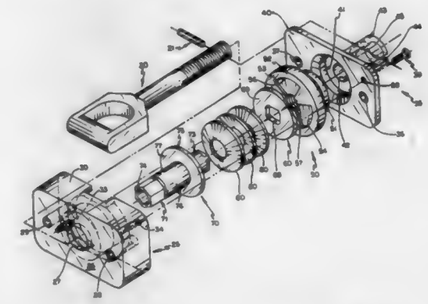
an axis of rotation thereof whereby rotation of said knob can displace said head against a force of said spring.

4,691,952

CLUTCHING ADJUSTABLE KEEPER MECHANISM

Raymond E. Harmon, Orange, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Oct. 6, 1986, Ser. No. 915,588
Int. Cl.[4] E05B *15/02;* E05C *3/04*
U.S. Cl. 292—341.18 2 Claims



1. A mechanism for adjusting a load applied through a keeper in a tension latch assembly, said mechanism comprising:
a housing;
a drive system constructed and arranged to react against said housing for adjustment of the keeper relative to a fixed-position hook in a latch assembly; and
means for preventing said drive system from effecting additional adjustment of the keeper when a pre-determined load is achieved between the keeper and the hook;
said housing having a first portion, and a second portion separate from said first portion, said second portion being secured to said first portion;
said drive system including:
a nut having a first bearing surface and a second bearing surface for reacting against said first housing portion and said second housing portion respectively, and a threaded through-hole constructed for engagement with a threaded portion of the keeper, and
a drive element having a through-hole therein through which the keeper extends for movement relative thereto, a surface constructed and arranged so as to be contained within and to bear against said first housing portion, and a portion accessible externally from said housing and constructed for effecting adjustment of the keeper;
said means for preventing said drive system from effecting additional adjustment of the keeper including:
said nut having a free end surface and at least two recessed areas thereon,

a backing plate constructed for rotational movement with said drive element, said backing plate having at least two raised surface areas each constructed to be engaged with one of said nut recessed areas, and a ramp surface formed integral with each of said raised surface areas, and

spring means, intermediate said backing plate and said drive element surface, for applying a pre-determined static spring load,

said backing plate ramp surfaces being constructed and arranged to permit said backing plate to disengage from said nut when a pre-determined load between the keeper and the hook, achieved by operation of said drive system, exceeds said spring means pre-determined static spring load.

4,691,953

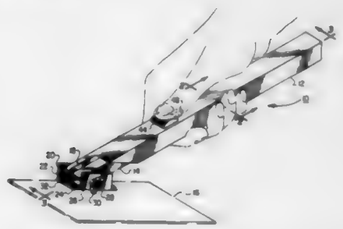
SHEET GRIPPER TONGS

Bruce O. Kofoed, 7347 Elmridge Dr., Dallas, Tex. 75240

Filed Apr. 15, 1986, Ser. No. 852,191

Int. Cl.⁴ B25J *1/02*

U.S. Cl. 294—19.1 **13 Claims**



1. A portable tongs for the gripped handling of sheet materials comprising in combination:

(a) an elongated handle;

(b) a plunger coaxially slidable relative to said handle;

(c) opposed cooperable jaw faces for defining a gripping plane therebetween and displaceable between relatively open and closed positions, one of said jaw faces being contained on a first jaw unit supported at the lower distal end of said handle and the other of said jaw faces being contained on a second jaw unit supported at the lower distal end of said plunger;

(d) actuator means to manually operate said jaw units relatively toward and away from each other between the closed and open positions respectively of their respective jaw faces; and

(e) support means separately supporting each of said jaw units for rotatable displacement about a respective axis extending substantially normal to the longitudinal axis of said handle, said support means enabling arcuate displacement of the jaw faces and their effected gripping plane about the axes of said support means for presetting a preferred angular orientation between the gripping plane of said jaw units and the longitudinal axis of said handle.

4,691,954

SNOW SHOVEL

Ronald J. Shaud, 722 Madison Ave., Reading, Pa. 19610

Filed Aug. 15, 1986, Ser. No. 896,975

Int. Cl.⁴ B25G *1/04;* **E01H** *5/02*

U.S. Cl. 294—54.5 **2 Claims**

1. A snow shovel comprised of a handle and a shovel blade attached at one end of the handle

the handle comprising a pair of elongated telescoping tubular members configured and dimensioned to mate in intimate axial sliding relationship one to another;

an elongated compression spring contained within the tubular members having a first end secured to one of the pair of telescoping tubular members and a second end secured to the other of the pair of tubular members;

whereby, when an axial force is applied in the direction of the blade to the tubular member that is remote from the



blade, the tubular members will telescope with respect to each other against the bias of the compression spring and, conversely, when the axial force is relieved, relaxation of the compression spring urges the tubular members toward an extended position.

4,691,955

RIGID PLACE MAT

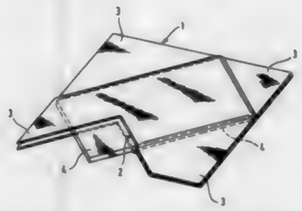
Kurt Pousár, Helsinki, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland

Filed Jun. 18, 1986, Ser. No. 875,629

Claims priority, application Finland, Jun. 25, 1985, 852498

Int. Cl.⁴ B65D *73/00*

U.S. Cl. 294—142 **14 Claims**



1. A rigid place mat, which can be used as an individual tray or support for dishes or drinking vessels on a table or in the lap, comprising a flexible sheet-form member in which there is formed a pouch-like case, and a rigid plate arranged in the pouch-like case as a stiffener.

4,691,956

COUNTERBALANCED TAILGATE FOR DUMP BOXES

Harold F. Hodge, Santa Clara, Calif., assignor to Cook's Truck Body Mfg., Inc., Santa Clara, Calif.

Filed Aug. 12, 1985, Ser. No. 753,641

Int. Cl.⁴ B62D *25/00*

U.S. Cl. 296—51 **7 Claims**

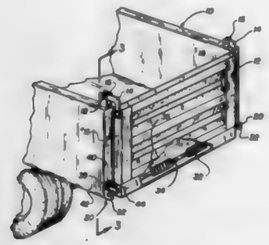
1. In a tail gate assembly for closing the rear end of a dump box including a generally rectangular gate means, upper attachment means for releasably and pivotally attaching the top of the gate to each side wall of the dump box, and lower attachment means for releasably and pivotally attaching the bottom of the gate to each said side wall, an improved lower attachment means comprising:

selectively actuatable pawl means disposed generally interiorally of the rearmost and lowermost extremities of each said side wall, each said side wall having a rearwardly facing opening provided therein proximate said pawl means, and support and pivot bracket means extending rearwardly from the lower most extremity of each said side wall with shaft receiving socket means formed therein;

shaft means having end portions extending through the lower extremity of each side of said gate and along a longitudinal axis lying parallel to a plane including a face of said gate, said shaft means being rotatable about said longitudinal axis and carried by said gate;

resilient means disposed within said gate and coupled between said shaft means and said gate and operative to apply a torsional counterbalancing force between said shaft means and said gate; and

elongated latch arm means rigidly affixed to said end portions of said shaft means and extending forwardly and generally normal to said plane, said arm means being



positioned on said shaft means so as to extend through said openings when the outermost extremities of said end portions of said shaft means are engaged with said socket means, said arm means having notches formed therein and disposed proximate the foremost portions thereof for facilitating locking engagement with said pawl means, whereby when said upper attachment means is detached and said pawl means and arm means are engaged, the top of said gate may be rotated downwardly about said shaft means with said resilient means providing said torsional counterbalancing force thereto, and when said upper attachment means is attached and said pawl means is disengaged from said arm means, the bottom of said gate may be rotated upwardly, pivoting about said upper attachment means and withdrawing said arm means from said openings.

4,691,957

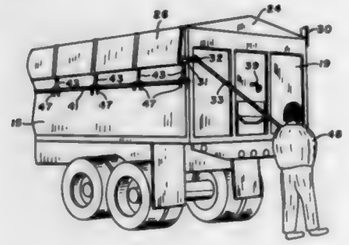
ROLL-TIGHT TARP SYSTEM

Hartley Ellingson, Wahpeton, N. Dak., assignor to Frontier, Inc., Wahpeton, N. Dak.

Continuation of Ser. No. 725,658, Apr. 22, 1985, abandoned, which is a continuation of Ser. No. 476,118, Mar. 17, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 904,800

Int. Cl.⁴ B60P *7/04;* **B65D** *43/26*

U.S. Cl. 296—98 **31 Claims**



1. A tarp assembly for an open top container having a pair of generally parallel, longitudinal first and second side walls with upper edges at least partially defining the top opening of the container, said tarp assembly comprising:

a tarp having a longitudinal dimension longer than the longitudinal dimension of the top opening and a lateral dimension greater than the distance between the container side walls; said tarp having a first longitudinal edge secured to the first side wall and a movable second longitudinal edge extendable in overlapping relationship to the second side wall; first means for securing the first longitudinal edge of the tarp to the first side wall; rigid linear means having a bottom wall portion and side wall portions spaced from a longitudinal axis thereof, second means securing the movable second longitudinal edge of the tarp to a bottom wall portion of the linear means, means for selectively rotating the linear means about the longitudinal axis in a first direction to unroll the tarp from the linear means to cover the open top of the container, rotating the linear means in a second direction to roll up the tarp on the linear means to uncover the open top of the container, said second direction being opposite the first direction, and selectively holding the linear means and tarp rolled thereon in a first position covering the open top of the container and a second position uncovering the open top of the container; hold means fixed to the movable second longitudinal edge of the tarp; said hold means including a longitudinal hold bar, and strap means connected at one end thereof to the hold bar and connected at the other end thereof to the bottom wall portion of the rigid linear means with said second means holding a vertically depending portion of the strap means in horizontal offset relationship to the longitudinal axis and to a vertically depending portion of the tarp when the tarp is fully unrolled; downwardly open hook means adapted to be fixed to an outside surface of the second side wall; said hook means comprising a plurality of hooks longitudinally spaced along the length of the second side wall to guide the strap means and retain the hold bar in alignment for mutual engagement with said hooks, said hooks being positioned in pairs to straddle the strap means when the tarp covers the container opening, said strap means being of sufficient length to position the hold bar beneath the hook means with the rigid linear means above the hook means when the tarp is fully rolled; said hold bar being engageable with said hook means to retain the tarp in the closed position upon continued rolling of the tarp on the linear means in the first direction after the tarp has been fully unrolled, and releasable from the hook means upon unrolling of the tarp from the linear means in the second direction.

4,691,958

DOOR STOP AND LATCH

Mahlon A. Miller, Nappanee, Ind., assignor to Newmar Corporation, Nappanee, Ind.

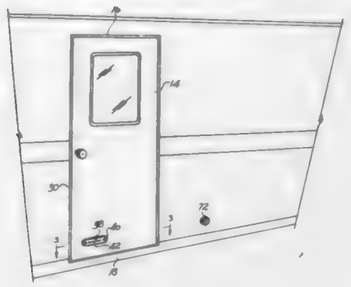
Filed Feb. 2, 1987, Ser. No. 930,733

Int. Cl.⁴ B60R *3/00;* **E05C** *17/04*

U.S. Cl. 296—146 **9 Claims**

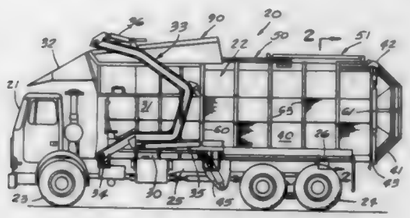
1. In combination a vehicle including a side wall having a door opening and an access door spanning said opening swingable between open and closed positions, and a latch means associated with said door and structure side wall for securing the door in its open position, said latch means comprising a latch pin swingably mounted to one of said door and structure sidewall between a retracted position within said one door and

side wall and an extended position projecting outwardly of the one door and side wall, stop means located on the other of said



door and side wall for accepting said latch pin in an interlock fashion when the latch pin is in its said extended position.

4,691,959
REFUSE PICKUP AND COMPACTOR BODY
Verner Michael L., Norwalk, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.
Division of Ser. No. 754,521, Jul. 12, 1985, Pat. No. 4,648,775. This application Oct. 15, 1986, Ser. No. 919,013
Int. Cl.[4] B60P *1/00*
U.S. Cl. 296—184 **6 Claims**



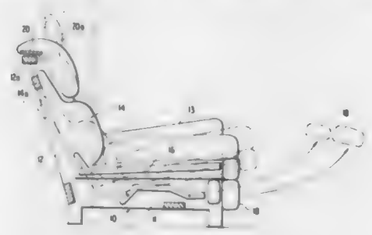
1. In a refuse compactor body, the improvement comprising:
a parallel pair of longitudinally extending floor beams for a tank of the body;
a plurality of rectangular metal sheets of a high tensile strength including some sheets which have been bent to define a polygonal wall for a tank of said body;
said tank having at least six flat sides defining a uniform polygonal right section of said tank from end to end;
a series of girth reinforcements for said wall that are axially spaced apart along the length of said tank;
each of said reinforcements comprising a series of rigidly end-to-end interconnected short straight sections of a stiff material completely peripherally embracing said flat sides of said tank in the same polygonal shape as said wall;
each of said reinforcements being rigidly interconnected with said pair of beams;
said bent sheets having bends on bend lines extending transversely of the direction of final rolling of the sheet;
the direction of rolling of the bent sheet being oriented in the direction of said girth reinforcements;
the maximum angle of bend of said bent sheets being less than the angle at which a sheet of the guage and high tensile strength of the sheet would crack at the line of bending during cold bending.

4,691,960
CONSOLE BOX FOR AUTOMOBILE
Kazuhiko Miyadera, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Apr. 23, 1986, Ser. No. 854,769
Claims priority, application Japan, Apr. 25, 1985, 60-62544
Int. Cl.[4] B60R *7/00*
U.S. Cl. 296—37.8 **8 Claims**



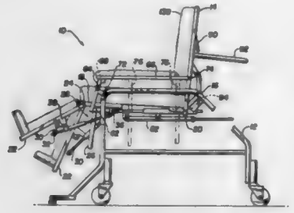
1. A console box divided into front and rear blocks for an automobile comprising:
a front block secured to an automotive body;
a rear block coupled with said front block;
a flange formed on a rear edge of said front block;
at least one boss formed on an inner surface of said front block having an upper flat surface lying in a generally horizontal plane;
an extending flange formed on a front edge of said rear block;
a groove formed on an upper surface of said extending flange for engaging with the flange of said front block;
at least one guide rib formed on said rear block having a surface contacting with said upper surface of said at least one boss, wherein
said front and rear blocks of the console box are integrally coupled in position by engaging the flange with the groove, and contacting the upper flat surface of the at least one boss with the surface of the at least one guide rib.

4,691,961
RECLINER WITH HEADREST
Walter C. Rogers, Jr., Denton, and Raymond E. Holobaugh, Jamestown, both of N.C., assignors to Parma Corporation, Denton, N.C.
Filed Feb. 14, 1986, Ser. No. 829,209
Int. Cl.[4] A47C *1/036*
U.S. Cl. 297—61 **9 Claims**



1. A recliner seating unit comprising a stationary frame including a base, a movable seat and a movable backrest mounted on the frame for movement between a generally upright position and a reclined position, said stationary frame including a fixed backrest mounting portion located above the base and behind an upper portion of the backrest, a headrest mounted to the headrest mounting portion for pivotal movement between a retracted generally horizontal position when the backrest is in the upright position and an extended generally vertical position overlying the backrest when the backrest is in the reclined position, and means for pivoting said headrest about a first axis located at a forward portion of the headrest mounting portion for moving the headrest between said retracted and extended positions upon movement of the backrest between said upright and reclined position, and wherein said headrest generally overlies and headrest mounting portion when in the retracted position and projects vertically upwardly from the headrest mounting portion when in the extended position, and said headrest positions are spaced from each other approximately ninety degrees, and wherein said means for actuating said headrest includes a linkage interconnecting the backrest and the headrest, and wherein said linkage includes a first bracket link fixed to the headrest, a second bracket link fixed to said fixed headrest mounting portion and extending forwardly of said headrest mounting portion for providing said first axis about which said headrest pivots, said first bracket link being pivotally mounted to said second bracket link at said first axis, a crank pivoted intermediate its ends to said second bracket link for rotational movement about a second axis spaced from said first axis relative to the headrest mounting portion, a link pivotally interconnected between one end of said crank and said first bracket link on one side of said second axis, and a link pivotally interconnected between the other end of said crank and the backrest on the opposite side of said second axis.

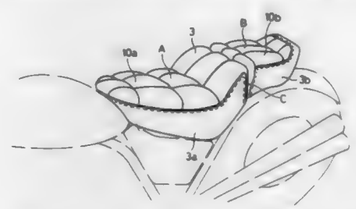
4,691,962
CONVERTIBLE WHEELCHAIR/LITTER
Donald H. Holdt, Cambridge, Md., assignor to Cambridge Technologies, Inc., Cambridge, Md.
Division of Ser. No. 673,850, Nov. 21, 1984. This application Jul. 16, 1986, Ser. No. 886,008
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—84 **17 Claims**



1. In seating equipment, the combination comprising upholstered cushion means, means to permit rapid assembly and disassembly of said upholstered cushion means from said seating equipment without the use of tools, said seating equipment comprising frame portions cooperable with said upholstered cushion means, said assembly and disassembly means comprising pin means on said upholstered cushion means and tab means formed with openings adapted to receive said pin means, means to mount said tab means on said cooperating frame portions, and manually removable locking means to removable secure said pin means in said openings in said tab means, whereby said assembly and disassembly means comprises quick release holding means between said upholstered cushion means and said cooperating frame portions.

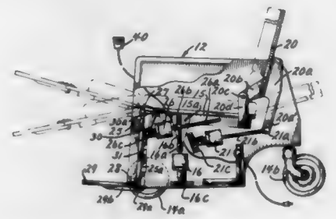
4,691,963
TANDEM SEAT FOR A TWO-WHEELED VEHICLE
Kunio Mikuniya, and Akira Kojima, both of Akishima, Japan, assignors to Tachikawa Spring Co. Ltd., Tokyo, Japan
Filed Aug. 22, 1985, Ser. No. 768,448
Claims priority, application Japan, Aug. 30, 1984, 59-132555[U]; Aug. 31, 1984, 59-133281[U]
Int. Cl.[4] B62J *1/00*
U.S. Cl. 297—195 **2 Claims**

1. In a tandem seat for a two-wheeled vehicle having a bottom with lateral side portions, a pad placed onto said bottom, and a trim cover assembly for covering said pad, said trim cover assembly including a front seat section, a rear seat section integrally formed with said front seat section, and an interface portion formed between said front and rear seat sections,
the improvement comprising:
a front pad portion formed in said pad in such dimensions as to correspond to dimensions of said front seat section;
a rear pad portion formed in said pad in such dimensions as to correspond to dimensions of said rear seat section;
an interface portion defined between said front and rear pad



portions and having a first recessed groove formed thereat so as to extend along a transverse direction of said front and rear pad portions;
said lateral side portions of said bottom having second recessed grooves extending in a direction perpendicular to said transverse direction of said first recessed groove;
said front and rear seat sections of said trim cover assembly, having formed therebetween an inverted U-shaped connecting portion extending along said interface portion of said trim cover assembly, whereby said connecting portion of said trim cover assembly is thrust into and engaged with both said first and second recessed grooves.

4,691,964
POWERED RECLINING CHAIR
John A. Morgan, 2911 Coal Mine Rd., Newburgh, Ind. 47630
Filed Jun. 30, 1986, Ser. No. 880,591
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—330 **4 Claims**



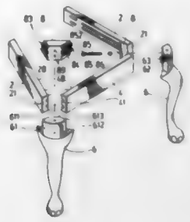
1. A powered reclining chair comprising a framework mounting a seat portion, a back portion and a leg portion, and independent electrical motors operatively connecting each of said portions in a selective positioning relationship, where said leg portion includes a foot section pivotal to and from a normal and an in-line position with respect to the longitudinal direction of said leg portion, and where said pivotal movement of said foot section is accomplished by structure including a hinge connecting said leg portion and said foot portion, a support member disposed on the rear surface of said leg portion, a control member slidable on said support member in response to pivotal movement of said leg portion from a first position maintaining said foot section in a normal relationship with said leg portion to a second position releasing said foot section to an in-line relationship with said leg portion.

4,691,965

JOINT ARRANGEMENT FOR KNOCKDOWN FURNITURE

Shu-Jen Hsiung, No. 549, Hsin Shu Road, Hsin Chuang City, Taipei Hsien, Taiwan

Filed Sep. 12, 1986, Ser. No. 906,447
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—440 3 Claims



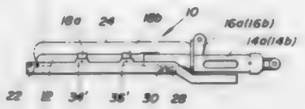
1. An improved knockdown chair, including a back rest frame having two back legs integrally formed therewith; a plurality of substantially trapezoidal joint pieces; a quadrilateral seat support member for supporting a seat having a back support fixed on said back rest frame at an appropriate location for a seat, a front support and two side supports, each support having two end faces, said seat support member extending perpendicularly from said back frame; and front legs extending downward respectively from said seat support member at two ends of said front support, said supports being attached at respective said end faces thereof to said back frame and said front legs with said joint pieces in a joint arrangement wherein said joint arrangement comprises one of said legs of said chair having two mounting surfaces at lateral sides thereof; a pair of said side supports each attached perpendicularly at one end face thereof to one of said mounting surfaces therefore providing two inward faces forming an angle therebetween; one of said trapezoidal joint pieces having two side surfaces conforming to said angle for being screw attached to said seat support member; and a guiding means comprising a ridge on one of said side surfaces and said inward faces and a corresponding groove on the other of said side surfaces and said inward faces, whereby said joint piece can be positioned easily and accurately during assembly to strengthen said joint said supports and said legs being respectively attached by attaching means, each attaching means being disposed in and between one of said supports and one of said legs, including a bolt and a cylindrical member, each bolt having a head at one end and a screw thread at another, said cylindrical member having a bolt hole in one end thereof for receiving said bolt and a pin hole in a side of said cylindrical member extending perpendicularly to a longitudinal axis of said bolt hole, means forming a cylindrical hole in one of said mounting surfaces of one of said legs, said cylindrical hole being sized to seat said respective cylindrical member, locking pin means for insertion into said pin hole of said cylindrical member, means forming a longitudinal guide recess in a side of said support near an end thereof, means forming a bolt hole extending from an interior side of said guide recess to an end face of said support respectively, a longitudinal axis of said recess being parrallel to a longitudinal axis of said bolt hole, said bolt hole being sized to receive said threaded portion of said bolt, said guide recess being sized to allow passage of said threaded portion of said bolt and receive said head portion in a deep portion thereof away from the surface of the support, whereby, said bolt may be inserted into said bolt hole and received in said cylindrical member seated in said leg, and said head will rest inside the guide recess of said support, completely out of sight.

4,691,966

SEAT WITH GARNISHED SEAT CUSHION

Hidekazu Maruyama, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 25, 1986, Ser. No. 878,238
Claims priority, application Japan, Aug. 6, 1985, 60-120758[U]
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 8 Claims



1. A seat cushion assembly of a seat, comprising:
a generally rectangular frame including a front portion, two side portions and a rear portion;
a seat cushion including a cushion material and a skin member which covers said cushion material, said seat cushion being mounted on said frame with said skin member covering said front portion of said frame;
a zig-zag wire of resilient material including a first series of protrusions protruding in one direction, a second series of protrusions protruding in the other direction and intermediate portions interconnecting the first and second series of protrusions, said second series of protrusions being secured to said front portion of the frame having said first series of protrusions pressed against a rear surface of said skin member, thereby to provide the skin member with a plurality of outwardly raised portions;
a generally rectangular garnish of plastics arranged to conceal portions of said frame and said seat cushion, said garnish including a rectangular flat portion and a bank portion, said bank portion being formed at the inboard side thereof with a recess into which said outwardly raised portions of said skin member are snugly received, said recess extending in a direction generally parallel to said front frame portion; and
connecting means for connecting at least a portion of said garnish other than the recessed portion or the bank portion of the garnish to said frame.

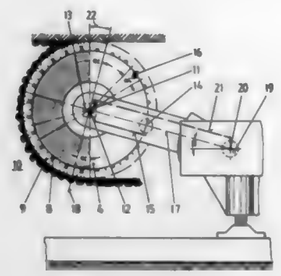
4,691,967

APPARATUS FOR CONTROLLING THE DISCHARGE OF PRESSURIZED LIQUID FROM NOZZLES ON A CUTTING DRUM OF A MINING MACHINE

Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 31, 1985, Ser. No. 793,224
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441397
Int. Cl.[4] E21C *35/22, 25/60*; E21F *5/02*
U.S. Cl. 299—1 25 Claims

1. In a mining machine used in underground mining, the combination of a cutter drum, nozzles distributed in rows about the periphery of said drum for discharging pressurized liquid outwardly from said drum, liquid control valve means for controlling the supply of pressurized liquid to each nozzle or a group of nozzles, at least one initiator means responsive to rotation of said drum for producing a signal, and microprocessor means responsive to the signal produced by said initiator means for controlling said valve means for limiting the discharge of pressurized liquid from said nozzles toward only that part of the mineral face which is in front of said drum.

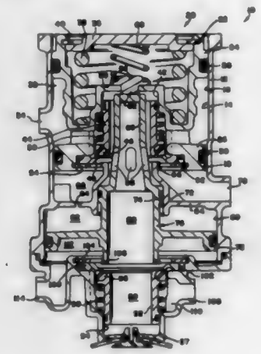


4,691,968

DUAL CIRCUIT BRAKE VALVE

James G. Pugh, Elyria; Duane R. Johnson, Oberlin, and Roy E. Bartholomew, Elyria, all of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 24, 1986, Ser. No. 831,891
Int. Cl.[4] B60T *15/06*
U.S. Cl. 303—52 10 Claims



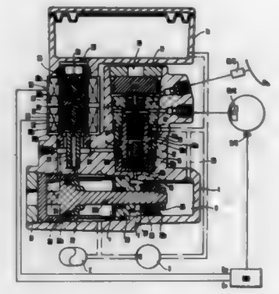
1. Dual brake valve comprising a housing having a pair of inlets, a pair of outlets, and an exhaust, said housing defining a stepped bore therewithin having larger and smaller diameter portions, an operator-actuated stepped plunger assembly slidably mounted in said bore having larger and smaller diameter sections slidably engaged with the larger and smaller diameter portions of the bore, a first set of cooperating valve members mounted in said bore and adapted to control communication between said exhaust, one of said inlets, and a corresponding one of said outlets, a second set of cooperating valve members mounted in said bore and adapted to control communication between said exhaust, the other inlet, and the other outlet, said plunger assembly operating said first set of cooperating valve members to control opening and closing of fluid communication between said one inlet, said exhaust and the corresponding outlet, and means operated by said plunger assembly for operating said second set of cooperating valve members to control communication between said exhaust, the other inlet and the other outlet in accordance with said first set of cooperating valve members, said plunger assembly cooperating with the wall of said bore to define an inlet chamber communicating with said one inlet and presenting a fluid pressure effective area equal to the differential area between the sections of the plunger assembly whereby the fluid pressure level in said inlet chamber acts on the differential area to urge the plunger assembly toward a position establishing a predetermined condition of said first and second sets of cooperating valve members.

4,691,969

ANTISKID CONTROL SYSTEM

Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 896,137
Claims priority, application Japan, Aug. 22, 1985, 60-184572
Int. Cl.[4] B60T *8/42*
U.S. Cl. 303—113 3 Claims



1. An antiskid control system for a vehicle, comprising:
a gate valve device inserted in a braking hydraulic pressure transmission line disposed between a master cylinder device and a braking device and is provided with a valve mechanism which receives a pressure fluid from a pressure accumulator and is arranged to close said braking hydraulic pressure transmission line and to initiate communication with said braking device through a branch line;
an electromagnetic valve device including a first solenoid valve which is arranged to normally close a transmission pressure fluid supply line provided for supplying the pressure fluid from said accumulator to said gate valve device and to open said transmission pressure fluid supply line when the pressure of said braking device must be lowered and a second solenoid valve which is arranged to normally open a hydraulic pressure release line to release hydraulic pressure from the pressure fluid input chamber of said gate valve device to a reservoir and to close said release line when the pressure of said braking device must be lowered; and
a braking hydraulic pressure control device including a control fluid chamber connected to said branch line coming from said gate valve device and a control piston arranged to increase or decrease the internal volume of said control chamber approximately in proportion to the value of the hydraulic pressure which is received from the pressure fluid input chamber of said gate valve device.

4,691,970

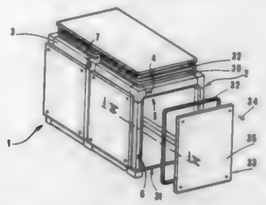
DUSTPROOF CABINET, IN PARTICULAR FOR ELECTRICAL EQUIPMENT

Armando Neri, Via Napoli 7, 40139, Bologna, Italy

Filed Apr. 7, 1986, Ser. No. 848,475
Claims priority, application Italy, Apr. 12, 1985, 4851/85[U]
Int. Cl.[4] A47F *3/00*; A47B *96/00*
U.S. Cl. 312—257 SK 11 Claims

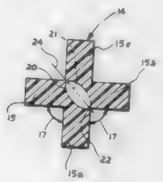
1. A dustproof cabinet for electrical equipment or the like comprising:
a framework of substantially parallelepiped shape including a plurality of outwardly facing openings each substantially in the shape of a parallelogram;

said framework including a plurality of joints and members with each joint having means for detachable interconnection with a plurality of said members so as to form said framework, each joint being located in the framework at a vertex of at least three of said openings;
said cabinet further including fastener means for securing each said member removably and detachably in a respective joint;
a plurality of panels each for mounting over a said opening, said members and joints when assembled providing for



each said opening a peripheral frontal abutment for receiving a said panel;
a mounting means extending continuously about the periphery of each said opening and carried by said members and joints so as to provide support for sealing means; and
dustproof sealing means removably lodged between each said panel and said framework and engaging the entire periphery of each said panel with said respective mounting means preventing outward movement of said respective sealing means with respect of a said panel.

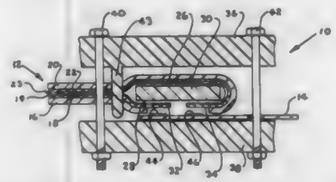
4,691,971
CONNECTOR WITH COMPLIANT RETAINER
Marlyn E. Hahn, York, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sep. 17, 1986, Ser. No. 910,456
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—78 **2 Claims**



1. An apparatus for locating and holding a connector housing to a printed wiring board having locating holes therein, said apparatus comprising: a post extending from said housing for engaging said holes with an interference fit to locate the housing with respect to said printed wiring board, said post having a plurality of ribs extending outwardly from the post at locations around the post and an elongated longitudinal bore having its major axis aligned with directly opposed junctures of adjoining ribs and sized to provide a frangible juncture which separates when said post is inserted in a locating hole.

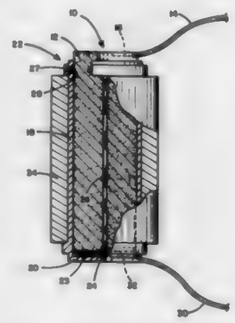
4,691,972
SOLDERLESS CONNECTION APPARATUS
Herman B. Gordon, Phoenix, Ariz., assignor to Rogers Corporation, Rogers, Conn.
Continuation-in-part of Ser. No. 707,239, Mar. 1, 1985, abandoned. This application Jun. 10, 1986, Ser. No. 872,709
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—77 **19 Claims**

1. In a solderless connector wherein mechanical means applies force against an elastomeric element to effect electrical contact between terminal portions of circuit devices, at least one of the circuit devices being a multi-layer flexible circuit having at least a first and second circuit layer, the improvement comprising:
said first layer of said flexible circuit including a first nonconductive substrate and a first cover film, said substrate and cover film sandwiching a first conductive pattern means therebetween;
said second layer of said flexible circuit including a second nonconductive substrate and having a second conductive pattern means thereon, said first and second conductive pattern means facing inwardly toward each other and being separated by said first cover film;
said first and second layers being bonded together to form a laminate;
said first and second pattern means respectively extending



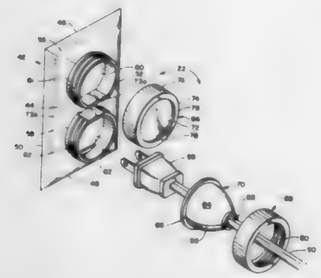
outwardly of said first and second substrates and defining first and second extended circuit portions, one of said first or second extended circuit portion having a longer length than the other first or second extended circuit portion, said first and second extended circuit portions having terminal portions at each end thereof;
said elastomeric element having oppositely disposed first and second surfaces wherein said one of said first or second extended portion is wrapped about all of said first surface and a portion of said second surface; and
wherein the other of said first or second extended portion is wrapped along a portion of said second surface so that both said first and second terminal portions are electrically isolated from each other and are positioned on said second surface of said elastomeric element, said terminal portions being adapted to electrically contact another circuit device.

4,691,973
SUPERCONDUCTING CONNECTOR
Mark E. Rosheim, St. Paul, Minn., assignor to Sperry Corporation, Blue Bell, Pa.
Filed Jun. 5, 1986, Ser. No. 871,213
Int. Cl.[4] H01R *13/20*
U.S. Cl. 439—161 **6 Claims**



1. A superconducting connector comprising a cylindrical male pin consisting of a superconducting material, a cylindrical mating female member consisting of superconducting material for receiving the male pin therein in sliding contact therewith, a cylindrical sleeve surrounding the outside of said cylindrical female member which consists of a material which has a higher thermal coefficient of expansion than said superconducting material wherein when said connecting assembly is cooled to superconducting temperature range said sleeve constricts said cylindrical female member so that said female member secures said male pin therein at a superconducting operating temperature range and when the temperature is elevated above said superconducting operating temperature range said male pin may be removed from said female member, first electrical conductor means connected to said male pin and second electrical conductor means connected to said female member, wherein said male pin is cylindrical and has a centrally located venting channel which extends throughout its entire length.

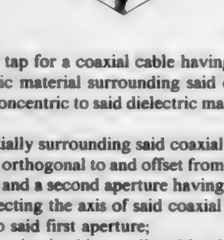
4,691,974
SAFETY COVERS FOR ELECTRIC OUTLETS
Michael B. Pinkerton, 2015 144th SE., Bellevue, Wash. 98007, and David Moskowitz, 1803 127th SE., Bellevue, Wash. 98005
Filed Mar. 17, 1986, Ser. No. 815,528
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—147 **4 Claims**



1. A protective cover for an electrical outlet having an exposed female connector, said cover including: a plate which is adapted to fit over and be attached to said outlet, there being an aperture through said plate which is than aligned with said female connector and thereby allows a male connector to be plugged into the female connector; an externally threaded, cylindrical boss protruding from said plate and surrounding said aperture; and means which is or comprises an internally threaded cap adapted to be threaded onto said boss to prevent access to said female connector through said aperture, the external threads on said boss and the internal threads on said cap forming press and twist means requiring both that pressure be exerted on said cap to move it toward said plate and that the cap be simultaneously rotated to engage said external and internal threads to allow said cap to be removed from said boss.

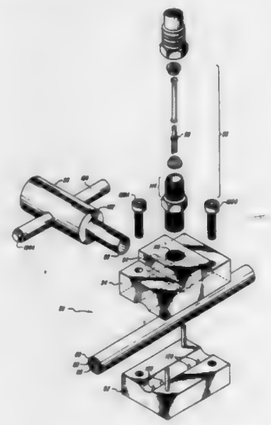
4,691,975
INTEGRATED CIRCUIT TESTER SOCKET
Masami Fukunaga, and Tomoyoshi Yamaguchi, both of Kawaguchi, Japan, assignors to Dai-Ichi Seiko Kabushiki Kaisha, Kawaguchi, Japan
Filed Oct. 21, 1986, Ser. No. 921,255
Claims priority, application Japan, Oct. 21, 1985, 60-235054
Int. Cl.[4] H01R *13/635*
U.S. Cl. 439—266 **4 Claims**

1. An IC-tester socket, comprising:
a socket body capable of accomodating therein an IC package having a plurality of outwardly projecting lead terminals;
a plurality of contact pins provided within said socket body, each having a first and a second resilient arm capable of anchoring, at predetermined positions within said socket body, said IC package as said arms in their normal state nip each of said lead terminals; and
a releaser vertically movably mounted within said socket body and having a plurality of downwardly extending projections each engaging said second arm,



whereby when said releaser is depressed downwardly, said second arm is warped by said downwardly extending projections, thereby the nipping of said lead terminals by said first and second arms is released.

4,691,976
COAXIAL CABLE TAP CONNECTOR
Judith A. Cowen, Palo Alto, Calif., assignor to LRC Electronics, Inc., Horseheads, N.Y.
Filed Feb. 19, 1986, Ser. No. 831,007
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—394 **7 Claims**



1. A connector tap for a coaxial cable having a center conductor, a dielectric material surrounding said center conductor, and a shield concentric to said dielectric material, comprising:
a top piece partially surrounding said coaxial cable having a first aperture orthogonal to and offset from the axis of said coaxial cable and a second aperture having an axis normal to and intersecting the axis of said coaxial cable disposed orthogonal to said first aperture;
a bottom piece maintained integrally with said top piece and partially surrounding said coaxial cable;
means for forming a conductive path between said concentric shield and at least one of said top piece and said bottom piece; and
a center contact pin further including axially extending laterally-displaceable parallel pins passing through said second aperture to mechanically and electrically engage

said center conductor of the coaxial cable at two surfaces thereof,

wherein said bottom piece and said top piece are integrally maintained as selected portions of said concentric shield and said dielectric material are removed through said first aperture and said center contact pin is inserted through said second aperture to displace some of the unremoved portion of said dielectric material and mechanically and electrically engage said center conductor at two surfaces thereof.

4,691,977

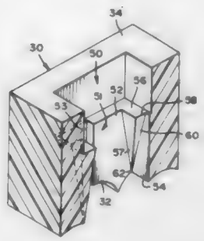
COVER FOR FLAT CABLE CONNECTOR

Joseph C. Marzili, Hershey, and Brian D. Stephenson, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 721,255, Apr. 8, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 885,378

Int. Cl.[4] H01R *11/20*

U.S. Cl. 439—404 4 Claims



1. An electrical connector for electrical termination to a flat cable comprising:

housing means having a mating face and an opposed cable receiving face;

a plurality of terminals mounted in the housing means having substantially planar slotted portions extending above the cable receiving face, each slotted plate portion comprising a pair of insulation piercing arms defining a slot therebetween and a pair of outwardly directed barbs adjacent the free ends of respective arms;

cover means having a terminal receiving face, an opposed outer face, and passages therethrough aligned to accept the arms of respective slotted plate portions;

each passage having opposed internal sidewalls and opposed internal endwalls, each endwall having thereon a ledge on which a shoulder of a respective barb is seated to retain the cover when a cable is terminated thereto; and

ramp means provided in each passage, each ramp defining a bearing surface against which the respective arm of the slotted plate portion engages as the cover means is inserted into the housing means, directing the arm normally of the plane of the slotted plate portions during termination of the flat cable to the slotted plate portions of the terminals causing the slotted plate portions to transversely wipe respective conductors of the flat cable, ensuring a positive electrical connection therewith.

4,691,978

CIRCUIT BREAKER, IN PARTICULAR AN ACCESSORY OR MOTOR CONTACTOR

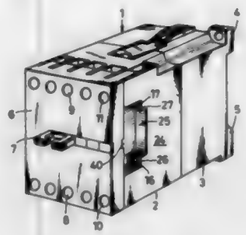
Helmut Lemmer, Marienheide-Kalsbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 838,251

Claims priority, application European Pat. Off., Apr. 15, 1985, 85 10 4537.7

Int. Cl.[4] H01R *13/70*

U.S. Cl. 439—620 17 Claims



1. A circuit breaker comprising a housing, coil connector screws and associated connection rails carried by said housing, a module associated with said housing and being adapted to limit or attenuate voltage peaks, said module having electrical connector means for electrically connecting said module to said connection rails otherwise than through said coil connector screw, and said electrical connector means include a pair of metallic leaf springs each in contact with one of said connection rails.

4,691,979

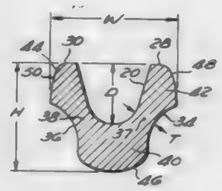
COMPLIANT PRESS-FIT ELECTRICAL CONTACT

Wayne E. Manska, Anaheim, Calif., assignor to Manda R & D, Anaheim, Calif.

Filed Aug. 4, 1983, Ser. No. 520,151

Int. Cl.[4] H01R *13/41*

U.S. Cl. 439—82 25 Claims



25. A compliant electrical contact comprising:

a compliant section, formed in said compliant electrical contact, said compliant section comprising a pair of arm portions and a base portion between said arm portions, and including a central longitudinal trough, each of said arm portions and said base portion including respective hole contact surfaces for engaging said hole during insertion of said contact into said hole such that said arm portions deflect inwardly towards each other, said arm portions including respective relief areas, the cross-sectional material thickness at said relief areas being (i) thinner than the cross-sectional thickness of the base portion and (ii) selected to weaken said arm portions at said relief areas to cause said arm portions preferentially bend at said relief areas more than at said base portion and the rest of the arm portions in response to interference of said contact with said hole, such that most of said bending of said arm portions occurs at said relief areas, thereby causing said compliant section to readily comply to the dimensions of said hole and be retained in said hole by interference fit.

4,691,980

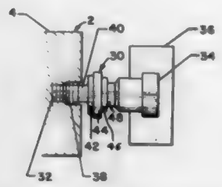
QUICK DISCONNECT BATTERY TERMINAL

Jules A. Sandor, 12012 Bambi Pl., Granada Hills, Calif. 91344

Filed Aug. 15, 1986, Ser. No. 896,728

Int. Cl.[4] H01R *11/26*

U.S. Cl. 439—476 9 Claims



1. A battery terminal for a battery, cable combination comprising:

a bolt including a noncircular head portion with a first diameter and a body portion having a diameter less than said first diameter and having a longitudinal axis, and a handle molded onto said head portion and onto a part of said body portion so as to preclude movement of said handle along said longitudinal axis.

4,691,981

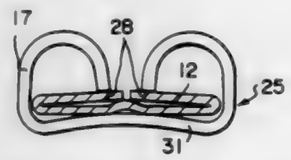
TAB-FORM TERMINAL

Daniel R. Coldren, Enola, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 842,962, Mar. 24, 1986. This application Feb. 27, 1987, Ser. No. 19,839

Int. Cl.[4] H01R *13/05*

U.S. Cl. 439—816 6 Claims



1. A tab-form terminal for mating with a receptacle of the type comprising a generally channel section body having a base and opposite side walls which have free ends rolled over to provide stiffly resilient arms which overlie the base, which terminal is stamped and formed from a single strip of sheet metal stock, having opposite marginal portions and a medial base portion, the opposite marginal portions having been folded towards each other to overlie and extend away from opposite edges of the medial base portion at a small angle thereto, bringing free ends of the marginal portions into spaced-apart adjacent relation, the marginal portions forming resilient flaps that are resiliently flexed towards the base portion during mating by engagement with the edges of the rolled-over ends of a receptacle.

4,691,982

OPTICAL COUPLER

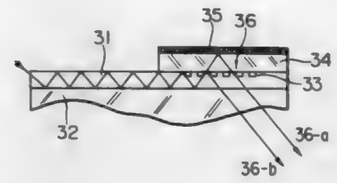
Yukuo Nishimura, Sagamihara; Mamoru Miyawaki, Tokyo; Noriyuki Nose, Kawasaki, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1985, Ser. No. 709,300

Claims priority, application Japan, Mar. 10, 1984, 59-44829; Mar. 10, 1984, 59-44830; Mar. 10, 1984, 59-44831

Int. Cl.[4] G02B *6/10, 6/34*

U.S. Cl. 350—96.12 10 Claims



1. An optical coupler which comprises an optical waveguide with a flat grating included therein, and a substrate on which the waveguide is formed, the optical waveguide being comprised of a film of an organic compound having both a hydrophobic moiety and a hydrophilic moiety, and the grating being comprised of a film having a different refractive index from that of the optical waveguide.

4,691,983

OPTICAL WAVEGUIDE AND METHOD FOR MAKING THE SAME

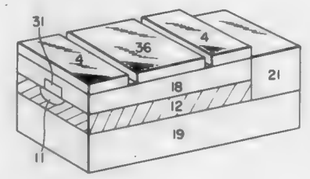
Toshio Kobayashi; Kazumasa Takagi, both of Tokyo, and Tokumi Fukazawa, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,144

Claims priority, application Japan, Oct. 14, 1983, 58-190739; Oct. 14, 1983, 58-190740

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.12 12 Claims



1. An optical waveguide comprising:

a substrate;

a garnet layer formed over said substrate, said garnet layer containing no iron and having a monocrystal region formed in a part thereof; and

an iron garnet monocrystal layer provided on said monocrystal region.

4,691,984

WAVELENGTH-INDEPENDENT POLARIZATION CONVERTER

Suwat Thaniyavarn, Pasadena, Calif., assignor to TRW Inc., Redondo Beach, Calif.

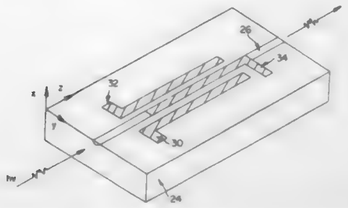
Filed Sep. 26, 1985, Ser. No. 781,151

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.14 14 Claims

1. A wavelength-independent electrooptical polarization mode converter, comprising:

an electrooptical crystal substrate cut in a plane defined by a direction perpendicular to the optical axis of the crystal;
an optical waveguide formed by diffusion of material into a surface of the substrate, the waveguide being oriented to provide for the propagation of light from one end to the other, in a direction parallel with the optical axis of the substrate; and



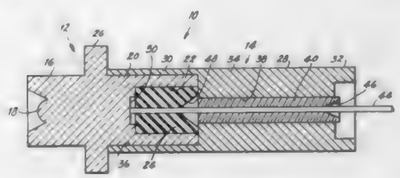
electrode means disposed on the surface of the substrate and positioned with respect to the waveguide to provide control of a coupling coefficient for conversion between one polarization mode and another, and control of the relative phase between the two modes;
whereby both modes experience the same material refractive index, and any phase mismatch between the modes can be corrected by applying a suitable bias voltage through the electrode means.

4,691,985

FIBER OPTIC CONNECTOR

Jeffrey B. Skank; Steve E. Swanson, and Barry J. Opdahl, all of Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 23, 1985, Ser. No. 779,018
Int. Cl.⁴ G02B *6/32*
U.S. Cl. 350—96.18 **6 Claims**



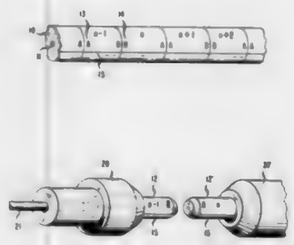
4. An optical fiber lens-connector assembly comprising: a lens body formed of transparent material, said lens body including a head end having a lens formed therein, a tail end of substantially cylindrical configuration having an axial cavity therein formed to receive an elastomeric fiber holder, and a shoulder formed intermediate said head end and said tail end and projecting radially outward from said lens body; and a connector for joining an optical fiber to said lens body, said connector comprising: a generally cylindrical body having a longitudinal axis, said body being formed of a metallic material having a low thermal expansion coefficient and having a first end, a second end, and an intermediate portion therebetween; said first end having a longitudinal cavity of a given diameter formed to fittingly receive said tail end of said lens body; said intermediate portion having a longitudinal cavity therein having a diameter less than said given diameter; and a borosilicate glass tube having a longitudinal aperture therethrough fitted into said longitudinal cavity in said intermediate portion.

4,691,986

ALIGNED PLUG OPTICAL FIBER CONNECTOR WITH "CONTIGUOUS" PLUGS, AND METHOD FOR USING SAME

James A. Aberson, Jr., Atlanta; George F. DeVeau, Jr., Stone Mountain; Terry D. Mathis, Lilburn, and Calvin M. Miller, Roswell, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 6, 1985, Ser. No. 795,483
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **25 Claims**



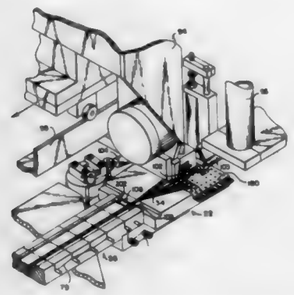
1. Optical fiber connector comprising
(a) a first and a second tubular member, to be referred to as the first and the second plug, respectively, each plug having an outer cylinder surface, an axis, a bore that is substantially concentric with the outer cylinder surface, and an end face, an end portion of an optical fiber to be inserted into the bore of each of the plugs and to be maintained therein fixed relative to the plug;
(b) first means for maintaining the outer cylinder surface of the first plug essentially concentric with the outer cylinder surface of the second plug, with the first plug end face facing the second plug end face; and
(c) second means for maintaining the first plug in essentially fixed axial relationship with the second plug;
CHARACTERIZED IN THAT
(d) the first and second plugs are contiguous plugs, where by "contiguous plugs" we mean herein plugs fabricated by a process that comprises:
providing a length of tubular stock comprising a multiplicity of segments, a "segment" being a portion of the tubular stock which is to be transformed, by a process comprising separating two contiguous segments, into a plug, a first and a second contiguous segment to be transformed into the first and second contiguous plugs, respectively, the two surfaces that result when two contiguous segments are separated to be termed the "contiguous" faces of the resulting plugs; and further CHARACTERIZED IN THAT the connector comprises:
(e) a feature or features that permit idenfitication of the contiguous face of the first and of the second plug, respectively, with the first and second plugs to be oriented such that the contiguous faces are the end faces; and
(f) a feature or features that permit identification of that rotational relationship between the first and the second plug which corresponds to the rotational relationship that existed between the first and the second segment prior to their separation.

4,691,987

OPTICAL FIBER CABLE PRODUCER AND METHOD OF BONDING OPTICAL FIBERS TO LIGHT EMITTING DIODES

Peter R. Ebner, Hollis; Emanual C. Ebner, Jr., Hudson, both of N.H.; John H. Shaw, Manomet, Mass.; John G. Miller, Mont Vernon, and Donald E. Gorelick, Nashua, both of N.H., assignors to Itek Graphix Corp., Waltham, Mass.

Filed Jul. 8, 1983, Ser. No. 512,403
Int. Cl.⁴ G02B *6/44*; H01J *5/16*; B65H *69/02*
U.S. Cl. 350—96.23 **12 Claims**



1. An automated fiber optic cable producer comprising:
a fiber filament feed mechanism;
an elongated fiber optic cable mold;
an LED emitter array fixed to said cable mold;
a fiber optic cable mold mounted for x/y movement relative to said fiber optic feed mechanism for locating an end of a fiber optic filament at an emitter in said emitter array and routing that filament along said mold;
a mapping means for determining the most intense area of illumination for each of said LED's of said array; and
a storage means for storing the precise location of the most intense area of illumination in an electronically readable memory.

10. A method for automated bonding of fiber optic filaments to LED's comprising the steps of:
placing one or more LED's upon a carrier of predetermined length and width;
mapping the most intense area of illumination for each of said LED's and storing the precise location of the most intense area of illumination in an electronically readable memory, said mapping step completed prior to starting any subsequent step;
electronically controlling relative movement between said carrier and a filament placement device to position said filament placement device and carrier one with respect to the other in accordance with said electronically stored precise locations; and
placing filaments onto individual LED's by means of said filament placement device.

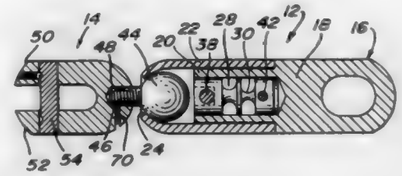
4,691,988

PULLING EYE ASSEMBLY

Paul Tremblay, Pointe-aux Trembles, and Georges Tzabanakis, Montreal, both of Canada, assignors to Tekna Recherche & Developpment Inc., Canada

Filed Nov. 26, 1985, Ser. No. 802,046
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **12 Claims**

1. An articulatable pulling eye assembly for attachment to a terminal end of a communication optic fiber carrying cable which is subjected to tensional and rotational loads as said cable is pulled along trunking paths and the like by a pulling device, said assembly comprising:
an elongated body;
attachment means at one end of said body for attaching said assembly to said pulling device;
swivel means mounted at the opposite end of said body;
cable engaging means on said swivel means, an engaged cable being thereby freed from rotational loads transmitted by said pulling device through said body;



load bearing link means connecting said attachment means and said swivel means;
at least two independently rupturable tension responsive means in said link means for effecting separation of said cable from said pulling device when the tension exerted by said pulling device exceeds a predetermined value, said value being less than that required to damage optic fibers in said cable.

4,691,989

OPTICAL FIBER CABLE

Lee L. Blyler, Jr., Basking Ridge, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 528,529, Sep. 1, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 880,959
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **11 Claims**



1. A cable containing (1) at least one coated optical fiber that for a distance of at least 10 meters lies other than along the neutral axis of said cable, (2) at least one member disposed in the axial direction of said cable and (3) an elastomeric composition in addition to said coated fiber that contacts and surrounds said coated fiber and said member characterized in that said elastomeric composition has an average elastic modulus greater than 300 psi and said elastomeric composition is capable of being removed without substantially affecting said coating of said fiber.

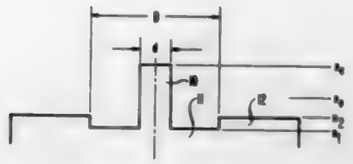
2. The cable of claim 1 wherein said elastomer satisfies at least one removal criterion and wherein said removal criteria are that (1) said elastomer is dissolvable in a non-reactive solvent, and (2) said elastomer melts at a temperature below 190 degrees C.

4,691,990

OPTICAL FIBER WITH DEPRESSED INDEX OUTER CLADDING

Leonard G. Cohen, Berkeley Heights; David W. Johnson, Jr., Pluckemin, and John B. MacChesney, Lebanon, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 13, 1984, Ser. No. 670,280
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 12 Claims



1. Multimode optical fiber comprising a core, at least a first cladding surrounding the core and being in intimate contact therewith, and a second cladding surrounding the first cladding, the core and the first cladding consisting essentially of glass produced in-situ by means of a glass-forming reaction, the second cladding being the outermost glass portion of the optical fiber and consisting essentially of glass derived from a preexisting tube comprising silica as a major constituent, the second cladding having an effective refractive index n_2,

characterized in that

the second cladding comprises at least one index-lowering dopant, and the effective refractive index n_2 is at least 0.001 less than the refractive index of essentially pure silica.

4,691,991

SINGLE MODE MODIFIED W-FIBER

Hans-Georg Unger, Brunswick, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,701
Claims priority, application European Pat. Off., Jun. 29, 1983, 83106312.8
Int. Cl.[4] G02B *6/22*
U.S. Cl. 350—96.33 7 Claims

5. A single-mode W-fiber consisting essentially of:

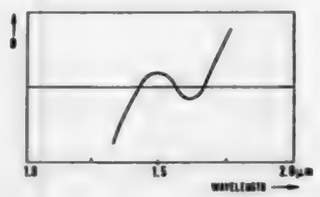
a cylindrical core;

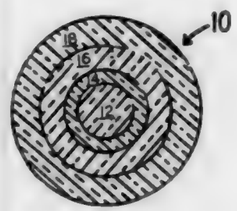
a cylindrical inner cladding layer surrounding the core;

an outer cladding layer surrounding the inner layer; and

means, cooperating with the core and the inner and outer cladding layers, for imparting to the fiber a wavelength dispersion coefficient that is zero at three different wavelengths, said means including a cylindrical threshold cladding layer disposed between the inner and outer cladding layers, the index of refraction of the threshold cladding layer being greater than the index of refraction of the outer cladding layer,

wherein the ratio of the outer diameter of the threshold cladding layer to the inner diameter thereof as well as the ratio of the inner diameter of the threshold cladding layer to the core diameter range from about 1.4 to about 1.8, and wherein the index of refraction of the threshold cladding layer ranges from about 0.05% to about 0.15% greater than the index of refraction of the outer cladding layer, while the index of refraction of the inner cladding ranges from 0.2% to 0.8% lower than the index of refraction of the outer cladding layer and the index of refraction of the





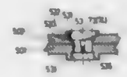
core ranges from 0.15% to 0.8% greater than the index of refraction of the outer cladding layer.

4,691,992

REFLECTOR FOR A SPOKED WHEEL

Weng-Pin Lin, and Nelson Chang, both of 30 Chien Yung Street, Tai Chung City, Taiwan

Filed Aug. 27, 1985, Ser. No. 770,161
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 1 Claim







1. A reflector for a spoked wheel, comprising:

a reflector plate having a first side, a second side and a wall forming a circular through hole extending from said first side to said second side, said wall forming a smaller diameter central portion between two large diameter outer remaining portions so that said wall defines a first annular shoulder between said central portion and one of said remaining portions near said first side, said first shoulder including inclined toothed surfaces, said wall also forming a second annular shoulder between said central portion and another of said remaining portions, said wall forming said central portion including an axial groove converging from said first annular shoulder to said second annular shoulder, said wall extending from said first side to form a first circular boss on said first side, said wall also extending from said second side to form a second circular boss on said second side, said second circular boss including two diametrically opposed notches at the edge thereof for receiving a spoke; and

a cylindrical locking body insertable into said through hole, comprising;

a headed end including axially inward projecting inclined toothed surfaces engageable with said toothed surfaces of said first annular shoulder of said reflector plate.

a forked end extending opposite said headed end forming two legs spaced to define a diametral access for a spoke, said legs including grooves in their inner portions to define retaining walls shaped to retain a spoke in a diameter position angled relative to said diametral access, in order to clamp said spoke against said notches of said reflector plate, and

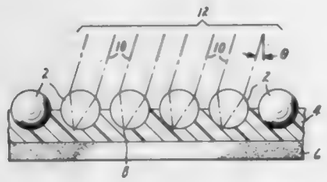
a protrusion extending from the periphery of said locking body near said forked end, said protrusion of a shape and size permitting it to move within said axial groove of said central portion when said locking body is inserted into said through hole, but causing said protrusion to be retained by said second shoulder when said locking body is rotated after being inserted into said through hole, so that said protrusion is not aligned with said groove.

4,691,993

TRANSPARENT SHEETS CONTAINING DIRECTIONAL IMAGES AND METHOD FOR FORMING THE SAME

Gerald R. Porter, Burnsville; Thomas I. Bradshaw, Afton, and Eric N. Hockert, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1985, Ser. No. 733,066
Int. Cl.[4] G02B *5/128*
U.S. Cl. 350—105 15 Claims



10. A substantially transparent sheet comprising a monolayer of microlenses, there being a deformation in the rear portion of at least some of the microlenses, which deformations together are viewable as an image across a predetermined conical field in ordinary diffuse light conditions.

4,691,994

METHOD FOR A SOLAR CONCENTRATOR MANUFACTURING

Viktor V. Afian, ulitsa Sevaka, 2, kv. 13; Albert V. Vartanian, Aigestan-10, 2, kv. 57; Ruben G. Martirosian, ulitsa Shinararneri, 27, kv. 32, all of Erevan; Stanislav V. Ryabikov, pereulok Vasnetsova, 12, kv. 64, Moscow; Dmitry S. Strebkov, Kirovogradsky proezd, 3, korpus 1, kv. 17, Moscow, and Eduard V. Tveryanovich, Malo-Kolkhoznaya ploschad, 1, kv. 90, Moscow, all of U.S.S.R.

Filed Oct. 6, 1981, Ser. No. 309,044
Int. Cl.[4] G03H *3/00*
U.S. Cl. 350—320 2 Claims

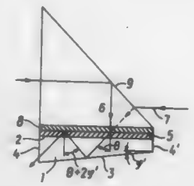
1. A method of manufacturing a solar concentrator employing a prism having a radiation input face, a reflection face and at least one radiation output face, said method comprising the steps of:

providing said prism with said reflection face angularly disposed with respect to said input face;

depositing a layer of light-sensitive material on said input face of the prism;

providing an auxiliary prism and a substance having a refractive index close to that of said light-sensitive material and placing said substance between said light-sensitive material and said auxiliary prism;

recording an interference pattern to obtain a three dimensional hologram in said light-sensitive layer by the use of a reference laser beam and an object laser beam by sending said reference laser beam to said light-sensitive layer via



said auxiliary prism and said substance in the direction of propagation of the incident radiation to be concentrated and by directing said object laser beam via said auxiliary prism at an angle with respect to said light-sensitive layer such that fringe planes are formed therein in order to diffract said incident radiation at angle;

removing said auxiliary prism and said substance; and

developing said light-sensitive layer;

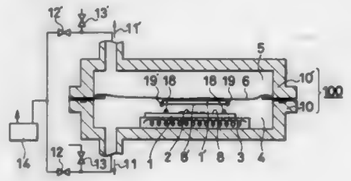
wherein the angular relationship between said reflection face, said input face and said angle are chosen to preclude the diffraction of a beam which has been reflected from said reflection face.

4,691,995

LIQUID CRYSTAL FILLING DEVICE

Shunpei Yamazaki, Tokyo; Toshimitsu Konuma, Atsugi; Toshiji Hamatani, Atsugi; Akira Mase, Atsugi; Kaoru Koyanagi, Saku; Shinji Imato, Atsugi; Toshiharu Yamaguchi, Zama; Mitsunori Sakama, Hiratsuka, and Takashi Inujima, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Jul. 15, 1986, Ser. No. 885,662
Claims priority, application Japan, Jul. 15, 1985, 60-155835; Jul. 15, 1985, 60-155836; Jul. 15, 1985, 60-155837
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 R 9 Claims



1. A liquid crystal filling system comprising:

a vacuum chamber;

a flexible sheet provided in the chamber and separating the chamber into first and second spaces in an air tight manner; and

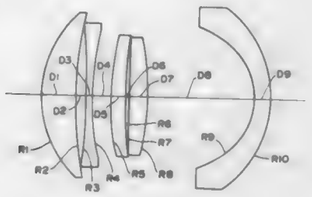
first and second evacuating devices for said first and second spaces.

5. A liquid crystal filling method comprising:

(1) a step of preparing first and second substrates;

(2) a step of placing an amount of liquid crystal on the first substrate;
(3) a step of laying the second substrate on the first substrate coincident with each other;
(4) a step of applying pressure to the second substrate toward the first substrate; and
(5) a step of making a sealing structure on the periphery of the substrates.

4,691,996
WIDE-ANGLE PHOTOGRAPHIC LENS
Michio Cho, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sep. 20, 1985, Ser. No. 778,070
Claims priority, application Japan, Oct. 9, 1984, 59-210577
Int. Cl.⁴ G02B *9/60, 13/18*
U.S. Cl. 350—465 **9 Claims**



1. A wide-angle photographic lens system having a shortened overall length and consisting essentially of first lens means comprising a positive meniscus lens having a convex surface directed to the object, second lens means comprising a negative lens, third and fourth lens means comprising positive lenses, and fifth lens means consisting of a negative meniscus lens having a concave surface directed to the object, arranged in this order from the object side, said lens system satisfying the following conditions:

$$0.5<(f_A/f)<0.9 \quad \text{(i)}$$

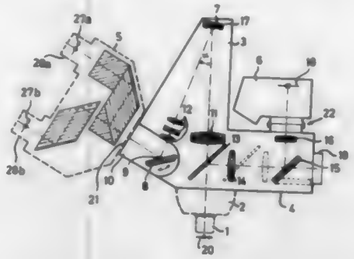
$$-5<(R_5+R_6)/(R_5-R_6)<0 \quad \text{(ii)}$$

$$0<(R_7+R_8)/(R_7-R_8)<4 \quad \text{(iii)}$$

where f is the focal length of the overall lens system, f_A is the resultant focal length of the first to fourth lens means, R_5 is the radius of curvature of the object side surface of the third lens means, R_6 is the radius of curvature of the image side surface of the third lens means, R_7 is the radius of curvature of the object side surface of the fourth lens means, and R_8 is the radius of curvature of the image side surface of the fourth lens means;
said lens system being adapted to correct positive distortion, field curvature and lateral chromatic aberrations.

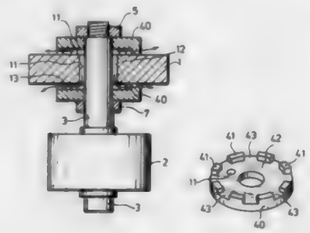
4,691,997
MICROSCOPE TUBE
Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany
Filed Feb. 24, 1986, Ser. No. 831,880
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508306
Int. Cl.⁴ G02B *17/08, 21/00*
U.S. Cl. 350—503 **9 Claims**

1. A microscope tube comprising an optical system producing a first intermediate image of an object and a further image of said first intermediate image in a viewing plane of a viewing eyepiece, the image in said viewing plane of said eyepiece being an erect image of said object, right-way up and right-way round, said tube and its optical system including:
(a) means providing a linear and substantially vertical observation light path from a microscope objective to said first intermediate image;
(b) a concave reflecting mirror in the vicinity of said first intermediate image;
(c) means forming a light path exit port and eyepiece attachment place at a location below said first intermediate image;
(d) a flat mirror located in the vicinity of said exit port;



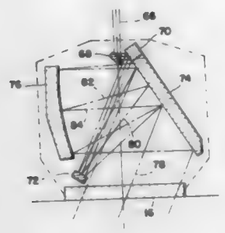
(e) said concave mirror serving to reflect said light path at an acute angle downwardly toward said flat mirror;
(f) said flat mirror serving to reflect said light path forwardly toward said exit port and toward an eyepiece mounted at said port; and
(g) an intermediate imaging optical system operatively located in said light path between said concave mirror and said flat mirror.

4,691,998
POLYGON MIRROR CONSTRUCTION
Yukuo Sakagaito, Yokohama; Katsutoshi Yonemochi, Zama; Koichi Kawata, Tama, and Takeshi Masaki, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Continuation of Ser. No. 647,848, Sep. 6, 1984, abandoned. This application Mar. 17, 1986, Ser. No. 841,020
Claims priority, application Japan, Sep. 9, 1983, 58-166968; Apr. 13, 1984, 59-74087; Apr. 13, 1984, 59-74088; Apr. 13, 1984, 59-74089
Int. Cl.⁴ G02B *5/08, 5/10*
U.S. Cl. 350—616 **12 Claims**



12. A polygon mirror assembly comprising:
a polygon mirror of unitary construction having a central hole for a motor shaft;
a motor shaft extending through said hole;
an abutment on said shaft;
a nut threaded onto one end of said shaft spaced from and facing said abutment for receiving said mirror therebetween;
a pair of spacers respectively having a central hole for said motor shaft and at least one recess for flow of air therethrough, and at least one of said spacers having at least one through hole for flow of air from or to said recess, one of said spacers being between said nut and said mirror and the other of said spacers being between said abutment and said mirror.

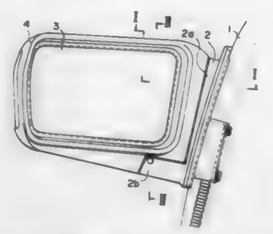
4,691,999
AFOCAL BEAM EXPANSION APPARATUS AND METHOD
Bryce A. Wheeler, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 4, 1986, Ser. No. 848,182
Int. Cl.⁴ G02B *5/10, 17/06, 26/10*
U.S. Cl. 350—620 **12 Claims**



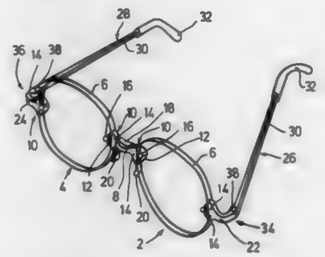
1. A compact expansion and pointing system, comprising:
a pointing reflector means oriented to receive an incident beam along a predetermined incident axis and to reflect and point the beam along a desired output axis,
expansion reflector means adapted to receive an input collimated beam, to apply an angular divergence to the input beam so that it's cross-section expands, and to direct the expanding beam onto the pointing reflector means along an axis other than said incident axis, and
a collimating reflector means positioned to receive the expanding beam reflected from the pointing reflector means and to reflect the beam back to the pointing reflector means along said predetermined incident axis, the collimating reflector means applying a collimation to the expanding beam so that it is reflected by the pointing reflector means along the desired output axis as a substantially collimated beam of greater cross-section than the input beam.

4,692,000
MOTOR-DRIVEN COLLAPSIBLE DOOR MIRROR
Yasuto Wada, Machida; Yoshihiko Ishiyama, Isehara, and Makoto Yamashita, Ayase, all of Japan, assignors to Ichikoh Industries, Ltd., Tokyo, Japan
Filed Nov. 12, 1985, Ser. No. 796,697
Claims priority, application Japan, Nov. 12, 1984, 59-236594; Jan. 14, 1985, 60-3097[U]; Jan. 29, 1985, 60-9998[U]; Aug. 26, 1985, 60-129833[U]; Aug. 26, 1985, 60-129834[U]; Aug. 26, 1985, 60-129835[U]
Int. Cl.⁴ B60R *1/06;* **G02B** *7/18*
U.S. Cl. 350—637 **12 Claims**

1. A motor-driven collapsible door mirror comprising:
a base fixed to a door of a car;
a fixed shaft attached to the base;
a mirror housing supported, rotatable round the fixed shaft, to hold a mirror adjustable;
a drive motor housed, parallel to the fixed shaft, in the mirror housing;
a speed reducer mechanism housed, serial to the drive motor and parallel to the fixed shaft, in the mirror housing;
a system for transmitting a power of the drive motor through the speed reducer mechanism to the mirror housing;
a means provided in the power transmission system for absorbing overload added thereto;
a fixed gear attached to the fixed shaft and included in the power transmission system;
a bracket provided on the mirror housing, and having a cylindrical portion through which the fixed shaft is inserted and a holder member for the speed reducer mechanism is attached to the cylindrical portion of the bracket; and
a switch mechanism provided on a top portion of the fixed shaft for detecting a predetermined position of the mirror housing rotated.

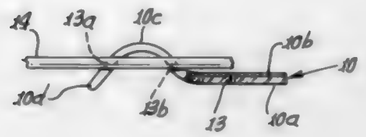


4,692,001
RIMLESS SPECTACLES FOR CORRECTION PURPOSES
Wilhelm Anger, Via Brattas 4, CH-7500 St. Moritz, Switzerland
Filed Oct. 15, 1984, Ser. No. 660,739
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429090
Int. Cl.⁴ G02C *1/02, 5/02*
U.S. Cl. 351—41 **7 Claims**



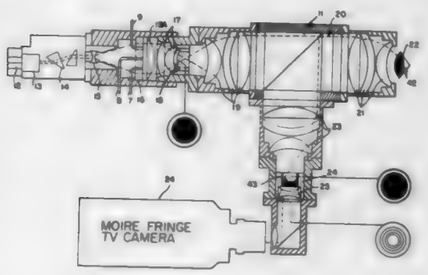
1. Rimless spectacles for correction purposes comprises a central portion and two side components,
a. said central portion including two lenses, a bridge, fastening devices for connecting the bridge with one each of the respective lenses, two side bridges or one saddle bridge, and bridge supports for connecting the bridge with the side bridges or the saddle bridge;
b. each side component including a hinge piece, a fastening device for connecting the hinge piece with one of the two lenses, a hinge bolt and a temple having a temple end piece which goes beyond the ear;
c. each hinge piece being engaged with the associated temple via at least one hinge eye and the hinge bolt penetrating it; and
d. the bridge, the fastening devices, the two hinge pieces and the two temples being made substantially of synthetic plastic material selected from the group consisting of polyetherimide and polyethersulfone.

4,692,002
HEADBAND ATTACHABLE TO SPECTACLES FRAME STEMS
Robert W. Meistrell, Redondo Beach, Calif., assignor to Dive N'Surf, Hermosa Beach, Calif.
Filed Nov. 18, 1985, Ser. No. 799,175
Int. Cl.[4] G02C 3/00
U.S. Cl. 351—156 9 Claims



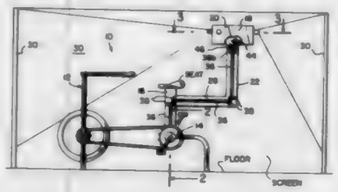
1. An eye-glass frame retainer comprising
(a) an elongated band that is lengthwise stretchable, the band of a length to extend about the back of the wearer's head,
(b) the band having substantially the same width throughout its length, including end portions thereof,
(d) each of said end portions containing a series of lengthwise spaced through perforations sized to stretchably pass an eyeglasses frame stem so as to grip the stem and retain the end portion thereon, when the band is stretched about the wearer's head, exerting endwise force on said band end portions,
(d) the band consisting of a layer of elastomeric foam which is lined on one side with a sheet of stretchable fabric, all said perforations extending through both said layer and sheet,
(e) and whereby when the frame having two stems is projected through perforations in said end portions, the perforations stretch open to pass and grip the stems.

4,692,003
REAL-TIME ANALYSIS KERATOMETER
Iwao P. Adachi; Yoshifumi Adachi, both of 15042 Temple St., Westminster, Calif. 92683, and Robert E. Frazer, 317 San Juan Way, La Canada, Calif. 91011
Filed Nov. 7, 1983, Ser. No. 549,157
Int. Cl.[4] A61B 3/10
U.S. Cl. 351—212 10 Claims



1. A method for real-time analysis of corneal curvature by measurement of aberration in a fiducial line image reflected from the corneal surface, comprising the steps of:
projecting a polarized electromagnetic radiated fiducial line image on said corneal surface, which reflects said projected image;
separating said reflected image from said projected image by shifting the plane of polarization of said reflected image with respect to said projected image to produce a polarization shifted reflected image having information of curvature of said corneal surface;
superimposing a replica of said projected polarized fiducial line image on said polarization shifted reflected image, concentric therewith, to produce a composite moire image, including fringes and background;
detecting the moire image including fringes created by said superimposing step, and filtering said moire fringes from said background;
digitizing said filtered moire image for computing;
computing the number, and distance between said moire fringes to indicate the transverse aberration of said polarization shifted reflected image from said replica of said projected fiducial line image; and
displaying the computed distances for interpretation of said corneal curvature, in real-time.

4,692,004
PROJECT-O-CYCLE
Delores A. Wainscott, 6446 Bamboo Ave., Cocoa, Fla. 32927, and George Spector, 233 Broadway, Rm 3815, New York, N.Y. 10007
Filed Oct. 14, 1986, Ser. No. 918,706
Int. Cl.[4] G03B 29/00
U.S. Cl. 352—132 4 Claims

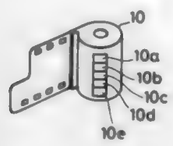


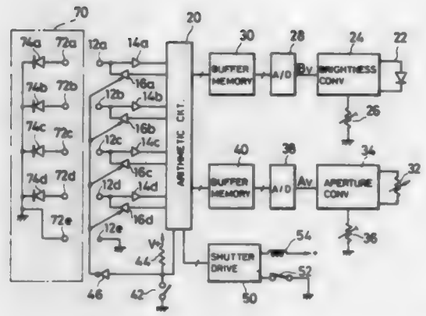
1. A projector cycle which comprises:
(a) an exercise bicycle having a crankset and a seat tube;
(b) four projectors being mounted adjacent to and extending above said seat tube, each of said projectors having a film transport for moving a single frame of film in said projector; and
(c) a mechanical mechanism connecting said crankset to each of said film transports and capable of moving said film a frame at a time in coordination with rotation of said crankset so that each of said projectors will project motion pictures in a different direction from said exercise bicycle onto a screen.

4,692,005
DIGITAL DATA OUTPUT FROM A CAMERA
Satoshi Takami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 8, 1986, Ser. No. 904,574
Claims priority, application Japan, Sep. 6, 1985, 60-195757; Jun. 30, 1986, 61-151784
Int. Cl.[4] G03B 7/24, 17/18
U.S. Cl. 354—21 8 Claims

1. A camera, comprising:
at least one electrical terminal for contacting at different times a film cartridge and a reading device;
switching means having a first state and a second state;
means for reading an exposure code from said film cartridge through said electrical terminal when said switching means is in said first state;

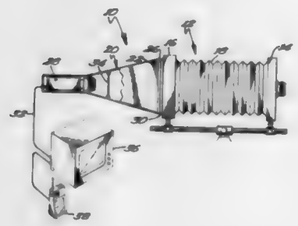
digital means responsive to said reading means for controlling photographic operations; and





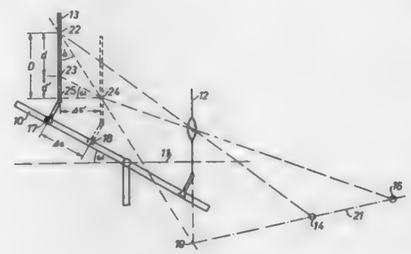
means for impressing upon said electrical terminal a digital signal derived from said digital means when said switching means is in said second state.

4,692,006
VIDEO VIEWFINDER SYSTEM
Mark Rice, and Douglas Meisner, both of Minneapolis, Minn., assignors to Interscan, Incorporated, Minneapolis, Minn.
Filed Feb. 28, 1986, Ser. No. 834,429
Int. Cl.[4] G03D 13/02, 17/04
U.S. Cl. 354—75 20 Claims



1. Viewfinder system for use with a camera having a lens for forming an image of a photographic set to be photographically recorded on film, with the viewfinder system comprising, in combination: a viewfinder hood having a first end and a second end, with the viewfinder hood being attached to the camera adjacent to its first end; a ground glass located in the viewfinder hood adjacent its first end for forming a primary image by the camera lens; a video camera located in the viewfinder hood adjacent to its second end for aiming at the primary image formed on the ground glass by the camera lens; at least one video monitor for displaying a derived image of the primary image from the video camera, with the video camera and the video monitor being interconnected by means for transmitting signals between the video camera and the video monitor allowing a photographer to view the primary image formed by the camera lens on the video monitor at locations remote from the camera; a fresnel lens associated with the ground glass for concentrating the outgoing light rays from the ground glass to the video camera for providing more uniform brightness of the derived image from its center to its edges; and an anti-vignetting filter located intermediate the video camera and the ground glass, with the anti-vignetting filter having graduated density from highly dense at the center of the filter to clear at a radial distance away from the center for selectively absorbing the outgoing light rays from the ground glass to the video camera for providing more uniform brightness of the derived image from its center to its edges.

4,692,007
PHOTOGRAPHIC CAMERA
Philippe Vogt, Frohalpstrasse 65, CH-8038 Zurich, Switzerland
PCT No. PCT/CH85/00152, § 371 Date Aug. 8, 1986, § 102(e) Date Aug. 8, 1986, PCT Pub. No. WO86/02465, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 9, 1985, Ser. No. 894,672
Claims priority, application Switzerland, Oct. 10, 1984, 4959/84
Int. Cl.[4] G03B 19/10, 27/68
U.S. Cl. 354—160 7 Claims



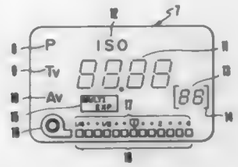
1. A professional camera having a rail which forms the base of the camera and can be inclined to the horizontal and having a lens standard and an image standard which are displaceable on said rail independently of each other and on which a lens support and an image holder respectively which are swingable around at least one axis which is directed transverse to the base of the camera are arranged, and having a ground glass which is adapted to be attached to the image holder and has at least two focusing lines which extend parallel to the axis of swing of said holder, characterized by the fact that the rail (10) which forms the base of the camera has, associated with it, an electronic measurement sensor (37, 38) for its angle of inclination (ω) and at least the image standard has associated with it an electronic measurement sensor (42, 43) for its displacement along the base of the camera, and furthermore there is also provided an electronic circuit (30) which, from the inputted measurement values for the distance (d) between the two image point (22, 23) on the ground glass measured perpendicular to the swivel axis, the angle of inclination (ω) of the base of the camera and the displacement (Δs) of the vertically standing image standard along the base of the camera, calculates the angle of swing (δ) of the image holder which is necessary for the simultaneously sharp focusing of the two image points on the ground glass.

4,692,008

DISPLAY DEVICE FOR CAMERA

Kazuhiko Arakawa, Tokyo; Go Tokura, Kanagawa; Kazuo Fujibayashi, Kanagawa; Masayoshi Kiuchi, Kanagawa, and Yoshihito Harada, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jan. 29, 1986, Ser. No. 823,621
Claims priority, application Japan, Feb. 1, 1985, 60-16623
Int. Cl.[4] G03B *1/66, 17/18, 17/36*
U.S. Cl. 354—217 **6 Claims**



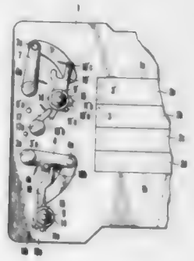
1. A display device for a camera comprising:
(a) a plurality of patterns adjacently disposed to each other;
(b) a drive circuit for detecting a film feeding operation by a film feeding mechanism and for having said plurality of patterns change their forms of display time-serially, one after another, during film feeding, said circuit having a first display mode for fixing a particular display pattern upon completion of the film feeding operation, and a second display mode for selecting and displaying one of said patterns corresponding to a set information in response to an operation of an exposure information setting operation member; and
(c) a control circuit for prohibiting a response by the drive circuit to the operation of said operation member when the film feeding operation is being performed by said film feeding mechanism, and allowing a shift to said second display mode by an operation of said operation member upon completion of the film feeding operation.

4,692,009

BRAKING DEVICE FOR SHUTTER

Yasuhiro Toyoda, Kanagawa; Fumio Shimada, and Katsumi Yoshida, both of Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 659,724, Oct. 11, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,858
Claims priority, application Japan, Oct. 18, 1983, 59-161748[U]
Int. Cl.[4] G03B *9/40*
U.S. Cl. 354—246 **8 Claims**



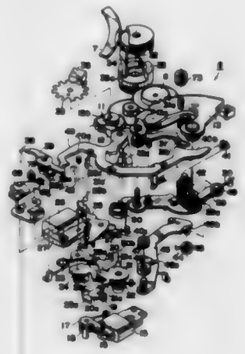
1. A braking device for a focal plane shutter comprising:
(a) a shutter operating member arranged to move when a shutter curtain runs;
(b) a first brake member arranged upon engagement with said shutter operating member to be rotatable;
(c) a second brake member arranged upon engagement with said first brake member to be rotatable; and
(d) a frictional member and a spring member for giving a frictional force to said first and said second brake members, whereby said first brake member engages with said shutter operating member in the early stage of braking and then turns in engagement therewith to give a relatively weak braking force to said shutter operating member, and said second brake member engages with said first brake member in the closing stage of braking and then turns along therewith to give a strong braking force to said shutter operating member.

4,692,010

DEPTH-OF-FIELD PREVIEW APPARATUS FOR A SINGLE LENS REFLEX CAMERA

Akira Kataoka, Sennan; Yasuo Hawai, Higashiosaka; Hidehiko Fujii, Sakai; Tetsuro Oya, Osaka, and Akihiko Fujino, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 9, 1986, Ser. No. 883,641
Claims priority, application Japan, Jul. 10, 1985, 60-152854
Int. Cl.[4] G03B *9/02*
U.S. Cl. 354—273 **3 Claims**



1. In a single lens reflex camera including an objective lens system, a diaphragm in said objective lens system and a diaphragm stop-down mechanism for stopping-down said diaphragm, a depth-of-field preview apparatus comprising:
an operating member mounted in said camera to be manually moved between an operated position and a non-operated position, and urged in a direction from said operated to said non-operated positions;
a first switch adapted to be changed over from a first condition to a second condition in response to the movement of said operating member to said operated position and from said second condition to said first condition in response to the movement of said operating member to said non-operated position;

means for actuating said diaphragm stop-down mechanism in repsonse to said change-over of said first switch from said first to said second condition;
means for stopping said diaphragm stop-down mechanism to set said diaphragm to a reduced aperture size;
a second switch adapted to be changed over from a first condition to a second condition with said diaphragm stop-down mechanism stopped by said stopping means;
a control circuit for producing a preview display signal with at least one of said first and second switches being in said second position; and
a display means for displaying that the camera is in the preview condition, in response to said preview display signal.

4,692,011

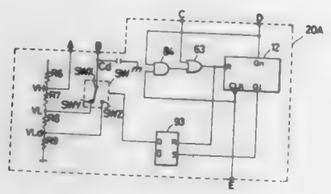
Patent Not Issued For This Number

4,692,012

AUTOMATIC FOCUS ADJUSTMENT APPARATUS

Touru Tano, Kakogawa; Akihiro Fujita, Mie, and Takayuki Utsumi, Gifu, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

Filed Mar. 24, 1986, Ser. No. 843,180
Claims priority, application Japan, Mar. 27, 1985, 60-60994
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **7 Claims**



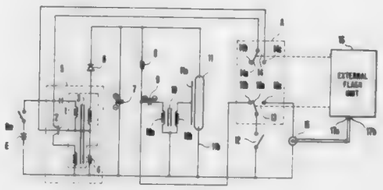
1. An automatic focus adjustment apparatus for use with a photographic or video camera comprising:
a light emitting element for radiating light to a subject to be photographed;
a pair of photo-detector means;
an optical system for directing into said pair of photo-detector means a reflected light portion of the light radiated from said light emitting element to said subject to be photographed;
an imaging optical system for imaging said subject;
a first integrator connected to one of said pair of photo-detector means for integrating an amount of light received by said one photo-detector means and for producing a first integral signal corresponding thereto;
a second integrator connected to the other of said pair of photo-detector means for integrating an amount of light received by said other photo-detector means and for producing a second integral signal corresponding thereto;
comparator means having first and second reference levels with which said first and second integral signals are compared, said first reference level being higher than said second reference level;
an automatic focusing means for shifting said imaging optical system along its optical axis when said first integral signal has reached said first high reference level before said second integral signal has reached said second low reference level, so that each of said pair of photo-detector means receives a substantially equal amount of light reflected from said subject to be photographed; and
counting means for producing a time signal when a predetermined time has elapsed, and means for lowering said second low reference level to enlarge an in-focus range when neither of said first and second integral signals reaches said first high reference level until said counting means produces said time signal.

4,692,013

CAMERA INCORPORATING FLASH UNIT

Tadashi Okino, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 536,352, Sep. 27, 1983, abandoned. This application May 22, 1985, Ser. No. 736,977
Claims priority, application Japan, Sep. 29, 1982, 57-170629
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—413 **16 Claims**



1. A flash unit incorporated in a camera permitting a detachable flash unit to be mounted thereon, comprising:
(A) electric load means for the camera; and
(B) an internal flash unit including:
(a) light generating means for emitting light to illuminate an object in response to a trigger signal;
(b) trigger signal producing means connected between the light generating means and a synchronous switching means for generating the trigger signal upon actuation of the synchronous switching means;
(c) an external synchronizing terminal connected to a trigger circuit of the detachable flash unit for transmitting a synchronous signal which is produced upon actuation of the synchronous switching means;

(d) supply means for applying electric energy from a source to the internal flash unit and the electric load means; and

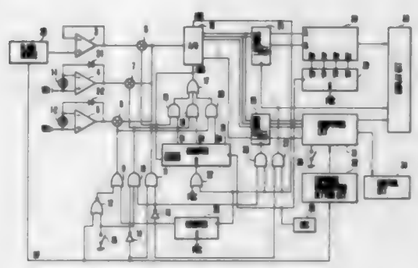
(e) control means responsive to outputs of a distance measuring device for allowing transmission of the synchronous signal to the trigger circuit of the detachable flash unit and rendering said internal flash unit inoperative when the distance measuring device produces a signal indicating a long distance.

4,692,014

DISPLAY DEVICE FOR CAMERA

Masayoshi Kiuchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 659,719, Oct. 11, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,577
Claims priority, application Japan, Oct. 14, 1983, 58-193133
Int. Cl.⁴ G03B *17/18*
U.S. Cl. 354—471 **13 Claims**



1. A camera which is arranged to A-D convert photographic information by an A-D conversion circuit and to display the information by display means on the basis of a digital value obtained through an A-D converting operation of said A-D conversion circuit, comprising:

(a) an input circuit arranged to supply to said A-D conversion circuit, in place of said photographic information, a brightness modulating datum required for determining a display brightness of display information to be displayed by said display means, said circuit supplying alternatively said photographic information and said modulating datum, with a predetermined timing, to said A-D conversion circuit; and

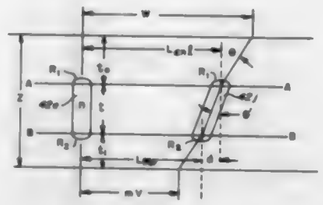
(b) an adjustment circuit which adjusts said display brightness of display information displayed by said display means on the basis of said A-D converted modulating datum.

4,692,015

SHORT FOCAL LENS ARRAY WITH MULTI-MAGNIFICATION PROPERTIES

Robert P. Loce, Webster; James D. Rees, Pittsford, and John A. Durbin, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1986, Ser. No. 839,667
Int. Cl.⁴ G03B *27/00*
U.S. Cl. 355—1 **10 Claims**



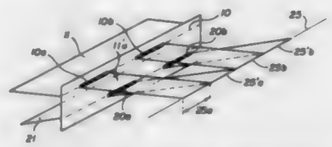
1. A short focal length lens array comprising a homogenous photosensitive glass body having formed therethrough a plurality of lenslets, at least one face of each lenslet having a spherical surface extending above the glass body surface, the lens array characterized by the center axes of said lenslets being tilted with respect to each other from the center of the array out to the array edges and by the array having a two-dimensional, full frame configuration.

4,692,016

PROCESS FOR ELECTROPHOTOGRAPHIC MATRIX PRINTING AND DEVICE FOR CARRYING OUT THE PROCESS

Pierre Genequand, Geneva, Switzerland, assignor to Fondation Suisse pour la Recherche en Microtechnique, Neuchatel, Switzerland

Filed Mar. 14, 1986, Ser. No. 839,911
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—1 **10 Claims**



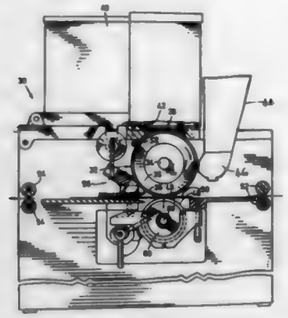
1. Process for electrophotographic matrix printing, wherein a light beam is projected onto an array of electrooptical modulators disposed along line segments, wherein this beam is recombined, after passage through said modulators, in one continuous line on a photosensitive support in motion, wherein the modulator line segments are placed alternately along two parallel lines, the incident light beam is divided into two convergent light sheets, each of which is projected onto one line of segments, and wherein the spacing of the segments and the direction of the light rays of each sheet are defined in such a manner that the succession of rays derived from each modulator, when going over the successive segments alternately from one line to the other, forms, on the line of convergence, of the two sheets, a continuous succession of images of the modulators of the array.

4,692,017

TONER TRANSFER APPARATUS

Andrzej Maczuszenko, Etobicoke; Sotos M. Theodoulou, Bramalea, both of Canada, and John Ramsey, Charlestown, Mass., assignors to Delphax Systems, Mississauga, Canada

Filed Dec. 23, 1985, Ser. No. 812,027
Claims priority, application Canada, Dec. 24, 1984, 470985
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **10 Claims**



1. Apparatus for use with a magnetic toner transfer system, the toner mix including a particulate non-magnetic flow enhancer and the system comprising:

a hopper having a bottom opening;

a screen placed across the opening to support toner in the hopper with the toner bridging the openings in the screen;

an element in contact with an upper surface of the screen;

means operable to drive the element across the upper surface of the screen whereby said toner bridging is disrupted and toner falls through the screen into the toner system until bridging again occurs;

magnetized means located below the screen for attracting and collecting toner for transfer; and

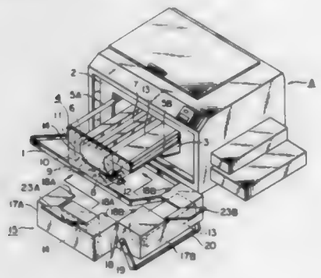
a scavenger for coupling to the toner system to apply a small negative pressure to the system whereby air is caused to flow through the falling toner mix and into the scavenger thereby carrying with it the unattracted flow enhancer.

4,692,018

CARTRIDGE-TYPE APPARATUS FOR EXCHANGING A DEVELOPING DEVICE AND TONER SUPPLY CONTAINER

Takashi Tamura, Higashimine, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 772,251
Claims priority, application Japan, Sep. 10, 1984, 59-189061
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—3 R **11 Claims**



1. A cartridge-type parts exchange assembly for an image recording device, said cartridge-type parts exchange assembly removably containing at least a developing device and a toner supply container but not an image holding member, said developing device and said toner supply container being adapted to be removably installed in said image recording device,

said parts exchange assembly comprising:

a cartridge housing including a pair of hollow vessels, said vessels each having an open end, one of said vessels removably containing said developing device and the other of said vessels removably containing said toner supply container;

hinge means pivotally connecting said vessels together so that said vessels are rotatable about said hinge means between a closed position whereat said open ends of said vessels face each other, and an open position whereat said open ends are accessible and do not face each other; and

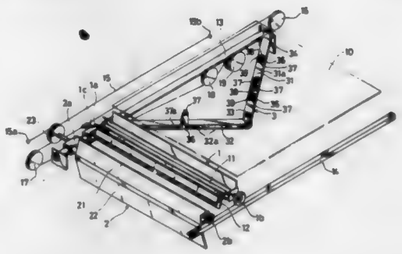
an openable lid provided on each of said vessels for selectively covering respective access openings of said vessels to permit access to the interior of said vessels when said lids are opened to permit a user to slide a respective developing device and a toner supply container out of a respective open end of its associated vessel when said vessels are in said open position, thereby facilitating installation of said developing device and said toner supply container in said image recording device.

4,692,019

DOCUMENT SIZE DETECTING DEVICE

Kiyoshi Morimoto, Osaka; Masuo Kawamoto, Daito; Hiroshi Kobayashi, Kobe; Masahiro Hashizume, Yao; Hideaki Tsudaka, Neyagawa, and Hiroshi Kimura, Habikino, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1986, Ser. No. 880,859
Claims priority, application Japan, Jul. 5, 1985, 60-148780
Int. Cl.⁴ G03G *15/04*; G03B *27/62*
U.S. Cl. 355—8 **3 Claims**



1. A document size detecting device adapted to be mounted on an image forming device which exposes a document for forming an image thereon by moving an optical section, said document size detecting device comprising

an arm foldable at a predetermined portion thereof, and connected at one end thereof to a body of the image forming device at a predetermined position thereon and at the other end thereof to a movable frame at a predetermined position thereof which supports the optical section, so that the arm can be folded and unfolded in operative association with the movement of the optical section, and

a plurality of optical sensors attached to said arm corresponding to various format sizes of documents.

4,692,020

SHEET REVERSING IN COPYING MACHINE AND OTHER SHEET-HANDLING MACHINES

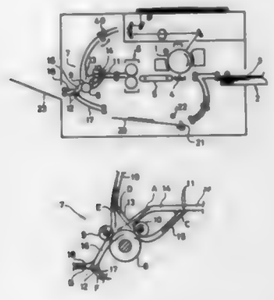
Sotohiro Tsujihara, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,265

Claims priority, application Japan, Nov. 17, 1984, 59-174684[U]

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 SH 11 Claims



1. Apparatus comprising:

a main sheet inlet for receiving sheets leading edge first, which branches into a normal sheet inlet and a reverse sheet inlet, an inlet switch which is located at the branching point and has a normal position for directing the sheets leading edge first into the normal sheet inlet and a reversing position for directing the sheets leading edge first into the reverse sheet inlet, a switchback path, and an outlet path;

a main roller rotating in a selected direction;

a feed-in roller which is in rotational contact with the main roller adjacent the reverse sheet inlet to feed sheets therefrom into the switchback path leading edge first; and

a feed-out roller which is in rotational contact with the main roller adjacent the normal sheet inlet and the switchback path, to feed sheets from the normal sheet inlet into the outlet path leading edge first and to feed sheets which have been fed into the switchback path leading edge first, from the switchback path into the outlet path trailing edge first;

wherein a sheet fed leading edge first into the main sheet inlet travels, depending on the position of the inlet switch, either (i) into the normal sheet inlet leading edge first, then into the nip between the main roller and the feed-out roller and then into the outlet path leading edge first, or (ii) into the reverse sheet inlet leading edge first, then into the nip between the main roller and the feed-in roller, then into the switchback path leading edge first, then out of the switchback path trailing edge first and into the nip between the main roller and the feed-out roller trailing edge first and then into the outlet path trailing edge first.

4,692,021

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 16, 1985, Ser. No. 788,209

Claims priority, application Japan, Oct. 19, 1984, 59-219923

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R 18 Claims

1. An image forming apparatus for forming a magnified/reduced image from an original onto a sheet in accordance with a selected magnification/reduction factor, comprising:

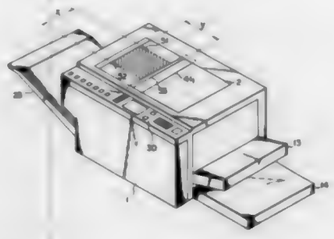
photosensitive means for holding an electric charge on a surface thereof;

charging means for uniformly applying said electric charge to said surface of the photosensitive means;

original table means for carrying an original thereon;

image exposure means for exposing said surface of said photosensitive means with a light beam corresponding to an image of said original, thereby forming an electric charge pattern corresponding to the original image on said surface of said photosensitive means;

developing means for developing said electric charge pattern;



magnification/reduction setting means for setting said magnification/reduction factor;

display means and optical scanning means for displaying an inner-reproducible range corresponding to said magnification/reduction factor and the size of the sheet on which said image is formed;

pulse motor means for moving said optical scanning means;

interlocking means for interlockingly moving said display means with a movement of said optical scanning means; and

control means for controllably driving said interlocking means in accordance with the image-reproducible range.

4,692,022

AUTOMATIC DUPLEX COPYING MACHINE AND METHOD OF TREATING PAPER JAMMING THEREFOR

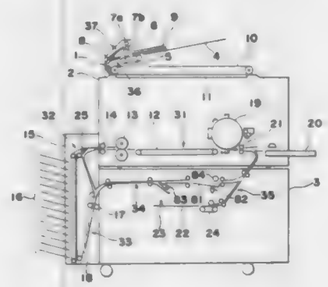
Shiyougo Iwai, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 1, 1986, Ser. No. 846,957

Claims priority, application Japan, Apr. 17, 1985, 60-82045; May 17, 1985, 60-106255

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—24 3 Claims



1. A method of treating a paper jam during a reverse-side copying operation for one-side copied paper sheets in a double-side copying process of an automatic duplex copying machine, wherein a copying operation is carried out on each of the originals having an odd page number during a first circulation

of a plurality of one-sided originals placed on an original tray of a circulatory document feeder, and wherein each of the originals having an even page number is copied on the reverse side of each one-side copied paper sheet during a second circulation of said originals, with each of said one-side copied paper sheets being temporarily stored in an intermediate tray, said method comprising the steps of:

(a) carrying out a copying operation for an insufficient number of copied paper sheets by supplying copy paper sheets from a paper supplying portion with respect to the original having an even page number placed on an original platform which is to be copied on the reverse side of said one-side copied paper sheet;

(b) storing each one-side copied paper sheet according to the above described step in an intermediate sub-tray;

(c) supplying said one-side copied paper sheet from said intermediate sub-tray with respect to the original having an odd page number which is subsequently transported from said original tray for reverse-side copying operation on said one-side copied paper sheet; and

(d) carrying out a copying operation on the reverse side of said one-side copied paper sheet.

4,692,023

OPTICAL ADAPTER FOR A LIGHT-WAVE RANGEFINDER

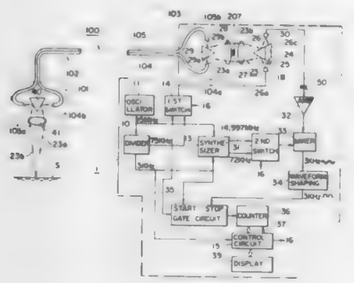
Fumio Ohtomo; Nobuo Hori; Yoshio Horikawa; Kazuaki Kimura, and Hiroo Sugai, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 634,547, Jul. 26, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,581

Claims priority, application Japan, Jul. 30, 1983, 58-138742; Jan. 9, 1985, 60-1879; Jan. 9, 1985, 60-1881; Jan. 19, 1985, 60-1322

Int. Cl.[4] G01F *23/00*; G01B *11/14*

U.S. Cl. 356—5 28 Claims



1. Liquid level measuring apparatus, comprising:

first light generation means for generating a distance measuring light modulation by a given modulation signal;

second light generation means for generating a reference light which is modulated by said given modulation signal, said reference light having a wavelength different from the wavelength of said distance measuring light;

photoconduction means for optically conducting said distance measuring light and said reference light;

objective optical means including

objective lens means for projecting at least said distance measuring light onto a liquid surface to be measured and for condensing at least a reflected distance measuring light reflected from the liquid surface, and

light selection means for leading said distance measuring light exited from said photoconduction means toward the liquid surface and said reflected distance measuring light toward said photoconduction means respectively, and for returning said reference light exited from said photoconduction means toward said photoconduction means;

light receiving means for receiving both said reflected distance measuring light and said reference light returned through said photoconduction means; and

distance measuring means for determining a liquid level of the liquid surface based on a time delay between said distance measuring light and said reflected distance measuring light.

4,692,024

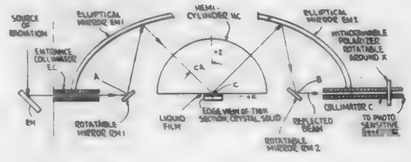
AUTOMATIC REFRACTOMETER

F. Donald Bloss, Blacksburg, Va., assignor to Electro-tec Corporation, Blacksburg, Va.

Filed May 10, 1985, Ser. No. 732,689

Int. Cl.[4] G01N *21/41*

U.S. Cl. 356—135 42 Claims



1. An optical refractometer capable of being adapted for automatically determining the principal indices of a specimen, comprising:

a means for receiving an incident radiation beam;

a first elliptical mirror having first and second foci;

a first rotatable surface for reflecting said incident radiation beam onto a reflecting surface of said first elliptical mirror and having an axis of rotation extending through said first focus of said first elliptical mirror;

a hemicylinder having a center of curvature at said second focus of said first elliptical mirror and including means for rotatably mounting and translating a specimen respectively about a first axis and along a second and third axes such that a portion of said specimen is located at said second focus to receive the reflected incident beam from said first rotatable surface;

a second elliptical mirror having third and fourth foci; and a second rotatable surface for reflecting the incident radiation beam from said second elliptical mirror and having an axis of rotation extending through said fourth focus, said third focus being at said first axis coincident with said second focus for producing a reflected beam output.

4,692,025

SEMICONDUCTOR COLOR SENSOR DETECTION CIRCUIT

Zempei Tani, Tondabayashi; Yoshifumi Masuda, Tenri, and Toshihide Miyake, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1985, Ser. No. 734,341

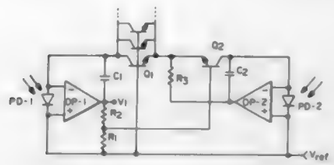
Claims priority, application Japan, May 30, 1984, 59-112744; Nov. 8, 1984, 59-236256

Int. Cl.[4] G01J *5/60*

U.S. Cl. 356—45 8 Claims

1. A semiconductor color sensor circuit comprising two photodiodes having mutually different wavelength sensitivity characteristics and two types of transistors for logarithmic

compression of signals from said photodiodes, said two type of transistors being so adjusted that the current densities there-



through are nearly equal to each other at a certain color temperature between 2000° K. and 8000° K.

4,692,026

PROCESS AND APPARATUS FOR CONTINUOUS DETERMINATION OF THE STATES OF ANISOTROPY OF OPTICALLY ACTIVE MATERIALS

Wolfgang Gawrisch, Gau-Bischofsheim; Walter Valentin, Hohenstein, and Helmut Czepl, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,979

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435059

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—345 **10 Claims**



1. An apparatus for the continuous determination of the state of anisotropy of an optionally active material comprising:

(i) a light source;

(ii) a polarizer;

(iii) a compensating wedge;

(iv) an analyzer;

(v) means for photosensitive scanning of said analyzer wherein the optically visible transmission from said analyzer is scanned as a function of its point-wise brightness; and

(vi) a computer having a discriminator circuit; in combination such that light from said light source passes sequentially through said polarizer, said compensating wedge, and said analyzer before striking said means for photosensitive scanning of said analyzer, wherein said light is converted into electrical signals which are subsequently screened by said discriminator circuit so that higher than zeroth order interference stripes are not transmitted by said discriminator circuit and only the zeroth order interference stripe is operated on by said computer.

4,692,027

SPATIAL PROCESSING FOR SINGLE OR DUAL SHEAR WAVEFRONT SENSOR

Alan J. MacGovern, Acton, and Richard A. Hutchin, Marlboro, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jul. 3, 1985, Ser. No. 751,635

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—353 **5 Claims**

1. A method of measuring the shape of a wavefront at an aperture divided into a plurality of subapertures with a wavefront sensor having a limited dynamic range, comprising the steps of:

a. utilizing said wavefront sensor to produce a map interferogram of said wavefront phase differences;

b. producing a matrix of loops of wavefront phase difference measurements derived from said wavefront sensor having values indicative of wavefront slopes, each loop corresponding to a subaperture portion of said wavefront;



c. summing said difference measurements in a particular direction around each of said loops in a closed path to provide closed loop positive or negative sums;

d. setting each closed loop sum of said sums to a modified sum equal to the nearest positive or negative integer or zero to provide a plurality of modified sums of positive or negative integers; and

e. utilizing each modified sum produced by step d to measure the slopes of said wavefront.

4,692,028

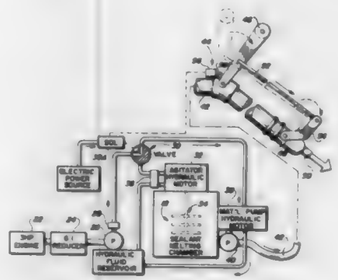
SEALANT MELTER/APPLICATOR WITH AUTOMATIC LOAD SWITCHING SYSTEM

Floyd D. Schave, Mesa, Ariz., assignor to Crafco, Inc., Phoenix, Ariz.

Filed Aug. 19, 1986, Ser. No. 897,870

Int. Cl.⁴ B28C *1/22*

U.S. Cl. 366—22 **12 Claims**



1. A load switching system for a sealant melter/applicator comprising:

a. a sealant melting chamber;

b. an internal combustion engine for rotating a power output shaft;

c. an hydraulic pump for converting the rotary motion of said power output shaft into a flow of pressurized hydraulic fluid;

d. a first hydraulic motor having an output shaft for driving a sealant agitator positioned within said sealant melting chamber;

e. a second hydraulic motor for driving a sealant pump to transfer sealant from said sealant melting chamber through an applicator hose to a sealant discharge nozzle;

f. a sealant flow control valve coupled in series with said hose for regulating the flow of sealant through said sealant discharge nozzle, said valve including open and closed positions;

g. means for sensing the position of said sealant flow control valve; and

h. flow diverter means coupled to said position sensing means and to said hydraulic pump for directing the flow of pressurized hydraulic fluid from said hydraulic pump to said first hydraulic motor when said sealant flow control valve is in the closed position and for directing the flow of pressurized hydraulic fluid from said hydraulic pump to said second hydraulic motor when said sealant flow control valve is in the open position;

whereby the load on said engine is maintained substantially constant as sealant is intermittently discharged through said sealant flow control valve.

4,692,029

COMESTIBLE BEATER

William L. Davis, 880 E. 1st S., Salt Lake City, Utah 84102

Filed Apr. 1, 1985, Ser. No. 718,560

Int. Cl.⁴ A23G *9/00*; **B01F** *7/00*

U.S. Cl. 366—149 **6 Claims**



1. In apparatus for preparing a beaten product including a chamber into which the ingredients of said product are introduced, said chamber having a generally vertical axis and a cylindrical side wall, said apparatus further including a beater assembly rotatively mounted within said chamber and a motor for imparting rotational movement to said beater assembly, an improved beater assembly comprising

an elongate rotor body disposed in said chamber to rotate about the generally vertical axis of said chamber, said rotor body having a longitudinal surface formed by at least three, elongate, rectangular, flat faces which are equally spaced around the circumference of said rotor body and which face radially outwardly from said vertical axis of said chamber,

a plurality of blades with at least one blade projecting outwardly from each of the respective flat faces of said rotor body toward the cylindrical side wall of said chamber, with each of said blades being formed integrally with said rotor body and inclined at an acute angle from the vertical when the rotor body is disposed in said chamber, whereby said blades beat the product and advance the product downwardly as said rotor body rotates with said chamber, and

distributor means are provided adjacent to the uppermost blades of said beater assembly when the beater assembly is positioned within said chamber, said distributor means comprising

a dish-shaped flange extending from the rotor body, and

a plurality of arcuately-shaped projections attached to the upper dished surface of said flange.

4,692,030

STATIC MIXING DEVICE FOR VISCOUS MELTS

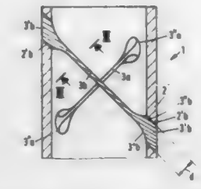
Willy Tauscher, Winterthur, and Gottlieb Schneider, Seuzach, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 1, 1985, Ser. No. 707,230

Claims priority, application Switzerland, Mar. 5, 1984, 1070/84

Int. Cl.⁴ B01F *5/06*; **B29B** *1/06*

U.S. Cl. 366—337 **13 Claims**



1. A static mixing device for a viscous material comprising a tubular casing having a wall disposed along a longitudinal axis to define a flow path for the viscous material; and

at least one mixing element disposed in and across said casing in said flow path, said mixing element including at least two webs disposed in crossing relation to each other and at an inclination to said longitudinal axis, each said web having a pair of terminal ends secured within said casing wall, said webs being transversely spaced from each other to define a space therebetween for passage of viscous material therethrough without hindrance.

4,692,031

MOON PHASE DISPLAY CLOCK

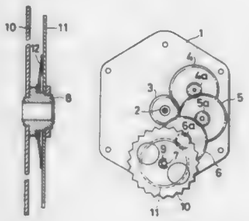
Koichi Kaneko, and Masado Hanya, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,990

Claims priority, application Japan, Jun. 20, 1985, 60-93786[U]

Int. Cl.⁴ G04B *19/26*

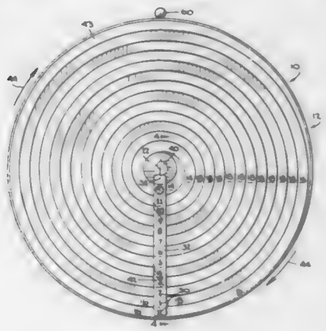
U.S. Cl. 368—18 **8 Claims**

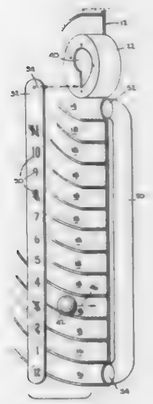


1. A clock for indicating the moon phase comprising: a base; an axle projecting from the base; a hub rotatably supported on the axle; a moon phase dial fixed to the hub for indicating the moon phase according to the angular position thereof relative to the axle, the moon phase dial having a set of circumferentially spaced projections around the periphery thereof which are manually engageable to effect correction of the angular position of the moon phase dial; a moon phase gear slideably disposed around the hub in spaced relation from the moon phase dial and being driven to continuously rotate around the axle at a period of rotation related to the period of the moon phase; a slip mechanism disposed between the moon phase dial and the moon phase gear and frictionally and directly engaged between the face of the moon phase gear which opposes the moon phase dial and the periphery of the hub, the slip mechanism having means operative during the correction of the angular position of the moon phase dial for decoupling the

moon phase gear from the hub to enable the moon phase dial to be manually rotated independently of the moon phase gear, and operative during the normal operation of the clock for coupling the moon phase gear to the hub to enable the moon phase dial to be continuously rotated in response to the rotation of the moon phase gear; an hour shaft protruding from the base and driven to undergo a clock rotation at a period of rotation shorter than the period of rotation of the moon phase gear; and a reduction gear train connected between the hour shaft and the moon phase gear for continuously transmitting the clock rotation of the hour shaft to the moon phase gear at a reduction rate corresponding to the ratio of the moon phase gear rotation period to the hour shaft rotation period.

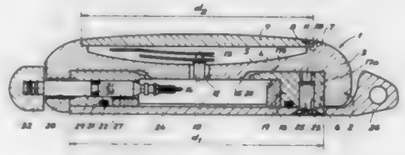
4,692,032
ORBIT CLOCK
Kenneth Rubin, 33 College Pl., Brooklyn Heights, N.Y. 11201
Filed Aug. 25, 1986, Ser. No. 900,286
Int. Cl.[4] G04B *19/00, 25/00*
U.S. Cl. 368—76 **15 Claims**





1. Apparatus comprising
(A) a rotatable spiral raceway having an inner spiral, an outer spiral, and at least one intercommunicating intermediate spiral therebetween;
(B) means for supporting said raceway in a vertical orientation;
(C) means for rotaing said raceway in a given direction at a given rate;
(D) first indicator means mounted within said raceway and adapted for movement relative thereto along said spirals under the influence of gravity as said raceway rotates;
(E) a vertically extending set of indicia; and
(F) means for associating each of said indicia with respective spirals;
whereby rotation of said raceway causes said first indicator means to be lifted in a straight line from the bottom of said outer spiral to the bottom of said inner spiral, the presence of said first indictor means in a given spiral being a selection of the indicium associated with said spiral.

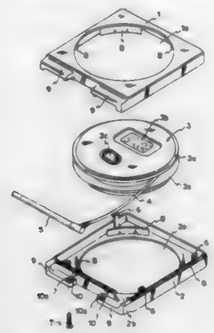
4,692,033
TIMEPIECE HAVING CASE FORMED OF ROCK-LIKE MATERIAL
Elmar Mock, Péry, and Georges A. Gabus, Bienne, both of Switzerland, assignors to ETA SA Fabriques d'Ebauches, Granges, Switzerland
Filed Apr. 2, 1986, Ser. No. 847,369
Claims priority, application Switzerland, Oct. 7, 1985, 4329/85
Int. Cl.[4] G04B *37/00*
U.S. Cl. 368—280 **1 Claim**



1. A timepiece, comprising:
(a) a case (1) formed at least partially from a hard natural or artificial material,
(b) a movement (18) housed within said case,
(c) said case comprising an inner caseband (16) of machinable material which includes a housing adapted to receive said movement, and an outer caseband (3) surrounding said inner caseband and covering entirely the edge thereof, said outer caseband being formed from said hard material,
(d) a hub portion (4) providing the timepiece dial (5) formed as one piece with the outer caseband and being concave on the dial side thereof,
(e) a crystal (9) covering said hub portion,
(f) means (8) for positioning and fastening said crystal girdling said hub portion and arranged in the outer caseband,
(g) a back cover (24) embedded in the outer caseband and fastened (25) to said inner caseband, and
(h) bracelet fastening lugs (26) integral with the back cover and extending out from the outer caseband,
(i) said inner caseband having an outer diameter (d_1) greater than the outer diameter (d_2) of the crystal.

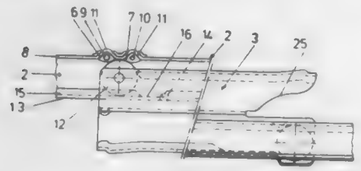
4,692,034
ELECTRONIC THERMOMETER
Ryoichi Fukui, Matsuzaka, and Susumu Minamikawa, Ise, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Dec. 16, 1985, Ser. No. 809,034
Claims priority, application Japan, Dec. 17, 1984, 59-264442
Int. Cl.[4] G01K *1/08, 1/14, 7/00*
U.S. Cl. 374—208 **5 Claims**

1. An electronic thermometer, comprising:
a casing;
an electric cord accommodated within the casing so as to be pulled outwardly as desired;
a temperature sensing probe mounted at a free end of the cord;
a main body which houses the thermometer rotatably mounted within the casing with a display field being exposed through said casing, wherein
a base portion of said cord connected to the thermometer housed in the main body and which extends outwardly from a peripheral portion of said main body in such a manner in which said main body serves also as a reel for winding said cord therearound; and
a probe holder integral to the casing for accommodating the probe within a peripheral portion of the casing being



located on at least one side of the casing, and wherein the main body which houses the thermometer contains a display means with the display field for showing a temperature value, a battery for supplying power to the electronic thermometer and an electronic circuit for processing the temperature value.

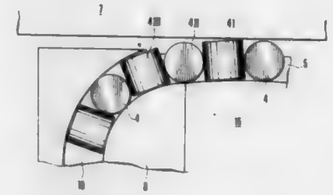
4,692,035
EXTENSION PULL-OUT GUIDE ASSEMBLY FOR DRAWERS
Erich Röck, Höchst, and Felix Schwärzler, Hohenems, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria
Filed May 7, 1986, Ser. No. 860,485
Claims priority, application Austria, May 9, 1985, 1394/85
Int. Cl.[4] F16C *29/00;* **A47B** *88/00*
U.S. Cl. 384—18 **13 Claims**



1. A guide assembly for use on each of opposite sides of a drawer of the type wherein the drawer is slidably insertable in an insertion direction into and removable in a withdrawal direction from a body, said assembly comprising:
a pull-out rail to be mounted on a drawer;
a supporting rail to be mounted on a side of a body, said supporting rail including a lower horizontal flange having extending upwardly therefrom a vertical flange;
a center rail mounted between said pull-out and supporting rails and having rollers rollingly contacting said supporting rail;
first stop means on said supporting rail for contacting one of said rollers when the drawer is in a withdrawn position to prevent unintentional insertion of the drawer into the body from said withdrawn position, said first stop means being formed on a resilient material that is sufficiently deformable to enable said one roller to overrun said first stop means; and
second stop means on said supporting rail for limiting movement of said one roller and said center rail in said withdrawal direction and which cannot be overrun by said one roller.

4,692,036
ROLLER BEARING FOR ENDLESS LINEAR MOTION
Yoshifumi Kawaguchi, Seki, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1986, Ser. No. 939,006
Claims priority, application Japan, Jul. 18, 1986, 61-167826
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **2 Claims**





1. A bearing for endless linear motion, wherein said bearing comprises
rolling elements being rollers arranged in a cross-roller mode,
a slide unit provided with an endless circuit having a linear track groove, and
a long-size track rail provided with a track groove formed in its outer face,
the track groove of the slide unit and the track groove in the outer face of the track rail being positioned opposite each other to form a load zone of the endless circulation path for the rollers,
characterized in that
a slightly inclined clearance groove is provided respectively at the both ends of the track groove on the side of the slide unit,
each angle of the clearance grooves is formed greater than the angle of the track groove, and
the boundary line formed between the track groove and the clearance groove takes shape of V, as seen from the side of the end face of the track rail, and the apex of the V-shape is porjecting to the side of the clearance groove.

4,692,037
ROLLER BEARING FOR AN INFINITE RECTILINEAR MOTION
Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1986, Ser. No. 947,609
Claims priority, application Japan, Mar. 4, 1986, 61-46666
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—44 **2 Claims**

1. In a roller bearing for an infinite rectilinear motion comprising:
a long truck rail in which a truck face is formed on the outside face thereof;
a casing which is mounted astride the truck rail, and in

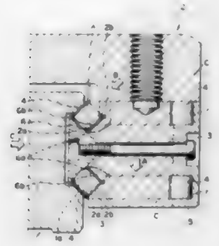
which a truck face is formed at a location opposite to the truck face of the truck rail; and

a number of rollers to be inserted between the truck face of the truck rail and the truck face of the casing;

the rollers being arranged on the basis of a parallel-roller type;

a return passage for the rollers being formed in the casing,

a side plate where a direction change passage is formed being attached to the both longitudinal end portions of the



casing, and the direction change passage connecting the truck face and the return passage,

the roller bearing for an infinite rectilinear motion is characterized in that

a twisting passage is formed in a portion of said direction change passage, and

an angle made by the axis of the roller relative to a plane in the sliding direction, viewed from the sliding direction of the bearing, will change in the twisting passage.

4,692,038

LINEAR MOTION ROLLING CONTACT BEARING ASSEMBLY HAVING A LOAD DEPENDENT VARIABLE RESISTANCE

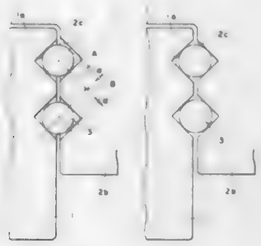
Naomi Kasai, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,636

Claims priority, application Japan, May 20, 1985, 60-73562[U]

Int. Cl.⁴ F16C *31/06*

U.S. Cl. 384—45 **7 Claims**



1. A linear motion rolling contact bearing assembly, comprising:

a rail having at least one first guide groove;

a slider slideably mounted on said rail and having at least one second guide groove opposite to said first guide groove, thereby defining a load section therebetween, said slider including at least one endless path which includes said second guide groove as a part thereof;

a plurality of circular balls received in said endless path, said plurlaity of balls circulating along said endless path including along said load section as said slider moves along said rail; and

wherein said first and second guide grooves are each configured with a first surface tangently touching said balls in said load section such that each of said balls in said load section contacts at one point only with each of said first and second guide grooves at any one instant as long as an applied load by said slider remains smaller than a predetermined load operating level.

4,692,039

RECIRCULATING-BALL LINEAR BEARING AND GUIDE RAIL THEREFOR

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

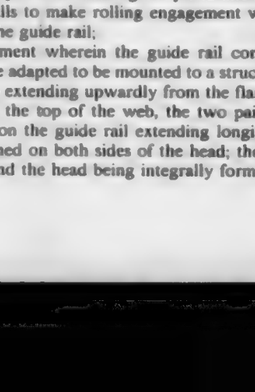
Filed Feb. 10, 1983, Ser. No. 465,646

Claims priority, application Japan, Feb. 25, 1982, 57-29454

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.⁴ F16C *29/00, 29/06*

U.S. Cl. 384—45 **14 Claims**



1. In a recirculating-ball linear bearing apparatus capable of withstanding the load acting thereon in four orthogonal directions, comprising:

(a) guide rail having two pairs of parallel raceways of arcuate cross section, each pair of raceways being vertically spaced, and angled away, from each other;

(b) a bearing body of substantially inverted-U-shaped cross section mounted astride the guide rail for rolling motion along the same and having two pairs of raceways of arcuate cross section formed longitudinally thereon in opposed relation to the two pairs of raceways on the guide rail, the bearing body also having a return passageway formed longitudinally therethrough in the vicinity of each raceway thereon;

(c) a pair of end covers secured to the opposite ends of the bearing body and each having formed therein four grooves each intercommunicating one raceway on the bearing body and one adjacent return passageway in the bearing body;

(d) groups of antifriction balls rollably interposed between the raceways on the guide rail and the raceways on the bearing body, each group of antifriction balls being capable of recirculation along one raceway on the bearing body and through one adjacent return passageway in the bearing body which are in communication with each other via two of the grooves in the end covers; and

(e) cage means for rollably holding the antifriction balls on the raceways on the bearing body and allowing the antifriction balls to make rolling engagement with the raceways on the guide rail;

the improvement wherein the guide rail comprises a flat flange base adapted to be mounted to a structure, an elongated web extending upwardly from the flange base, and a head on the top of the web, the two pairs of parallel raceways on the guide rail extending longitudinally and being formed on both sides of the head; the flange base, the web and the head being integrally formed with each

other and jointly serving as a rigid structural member of a building or a frame member of a machine.

4,692,040

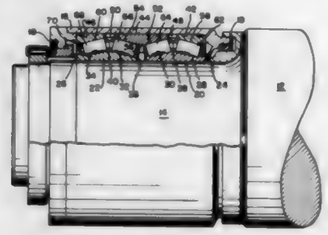
MULTIROW ROLLER BEARING WITH SEALS BETWEEN THE RACES

Roger L. Ebaugh, Winsted, and Jerry P. Rhodes, Avon, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 730,835, May 6, 1985, abandoned. This application Sep. 5, 1986, Ser. No. 904,763

Int. Cl.⁴ F16C *33/78*

U.S. Cl. 384—484 **3 Claims**



1. A multirow bearing comprising: inner race means having a pair of intermediate raceways and a pair of end raceways, each end raceway tapering inwardly toward the axis of the bearing so that the small diameter ends of the end raceways are located toward the ends of the inner race means the ends of the inner race means having squared off end faces; outer race means having a pair of intermediate raceways surrounding the intermediate raceways of the inner race means and a pair of one-piece end races, each having an end raceway to provide end raceways surrounding the end raceways of the inner race means so that each raceway on the outer race means surrounds and corresponds to a different raceway on the inner race means and to provide an inner race means-outer race means annulus, the end raceway on each one-piece end race tapering inwardly toward the axis of the bearing so that the small diameter ends of the end raceways are located toward the outer ends of the one-piece end races, the outer ends of each one-piece end race extending along the same transverse plane through the axis of the bearing as the adjacent squared off inner race means end face; rollers arranged in rows between corresponding raceways of the inner and outer race means, there being a different row of rollers between each set of corresponding intermediate and end raceways, the rollers in the end racewasys being tapered rollers; individual end roller cages circumferentially separating said tapered rollers, each end roller cage having an outer end rim with a bore of larger diameter than the outside diameter of the adjacent part of the the inner raceway means; an end seal fitted with the inner race means-outer race means annulus adjacent each end of said annulus, the end seals being configured to fit entirely within said annulus, each end seal having a generally C-shaped metal seal case in cross-section with the vertical portion of the C-shape extending generally along the same transverse plane as the adjacent outer race means one-piece end race outer end and inner race means squared off end face, the horizontal parts of the C-shaped metal seal case being a generally axially extending radially inner metal portion and a shorter generally axial extending radially outer portion, said radially inner metal portion extending into the corresponding end roller cage bore, each end seal also having an elastomeric portion attached to said generally axially extending inner metal portion and fitting substantially entirely within the corresponding end roller cage bore and cooperating with the inner race means to form barriers at the ends of the bearing.

4,692,041

DOCUMENT ENCODER

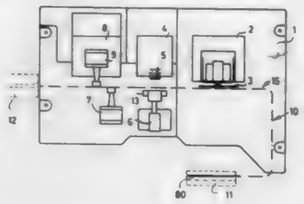
Horst Dyna, and Armin Heindke, both of Villingen-Schweaningen, Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,608

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 3347168

Int. Cl.⁴ B41J *3/54*

U.S. Cl. 400—82 **8 Claims**



1. A document encoder means encoding commercial paper, for arranged as a compact desk set including an input station for a document, a transport device transporting of the document to a storage station, said document passing several modularly designed and selectively combinable printing devices applying diverse markings partly on a front- and partly on a back side of the document, the improvement comprising: at least two printing devices arranged to act selectively respectively on the front and back sides of said document;

a chassis including installation means for carrying parts of the printing devices and print backings, the printing devices and print backings being stationary in the direction of the print lines, with only the transport device generating relative movement between the printing devices and the documents; said transport device having a U-shaped transport path extending from an input station located at the end of one leg of said transport path, all of said combinable printing devices being located along the other leg of said path;

said installation means for the printing devices and the print backings being provided along and on both sides of said other leg of said U-shaped path, such that the printing devices impacting the front- and back side of the documents operate together with the document in at least a partially overlapping way.

4,692,042

COMPUTERIZED PRINTING SYSTEM

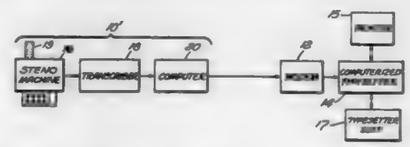
William A. Cuff, Sylmar, and Jerrold P. Lefler, Encino, both of Calif., assignors to Digitext, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 502,532, Jun. 13, 1983, Pat. No. 4,632,578, which is a continuation of Ser. No. 250,785, Apr. 3, 1981, abandoned. This application Oct. 24, 1986, Ser. No. 922,648

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.⁴ B41J *3/26, 3/516*

U.S. Cl. 400—94 **4 Claims**



1. The method for translating a plurality of shorthand strokes, generated according to a preselected shorthand system, to text, comprising the steps of:

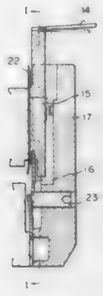
(a) storing a dictionary of a preselected shorthand system in a computer, said shorthand system comprising the utilization of distinct parameter strokes to represent each homonym, thereby distinguishing a desired word from its homonym so that said distinct parameter strokes have an unambiguous text translation, at least some of the distinct parameter strokes being predefined as pointers;
(b) then producing a computer readable record in accordance with said preselected shorthand system;
(c) then applying the computer readable record to the computer for translating such shorthand strokes of said record, the step of applying the record to the computer comprising the steps of:
(1) comparing the record against the dictionary to identify the portions of the record corresponding to said predefined pointers;
(2) using the predefined pointers in the record to locate beginnings of words not represented by distinct parameter strokes, said word beginnings being defined to be the portion of the record immediately following the predefined pointers;
(3) comparing a selected sequence of shorthand strokes starting with the first shorthand stroke immediately following the pointer, against the dictionary for locating an unambiguous match, the first located unambiguous match defining a translatable portion of the record and further defining a next pointer; and
(4) repeating steps (2) and (3) for each pointer so defined which has an untranslated portion of the record which follows immediately thereafter to define additional pointers until all of said pointers have been located and defined.

4,692,043

WIRE DOT-PRINTING HEAD

Hirokazu Ando; Kazumasa Fukushima; Yasuo Ohmori, and Tatsuya Koyama, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1986, Ser. No. 822,587
Claims priority, application Japan, Jan. 16, 1985, 60-2826
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **6 Claims**



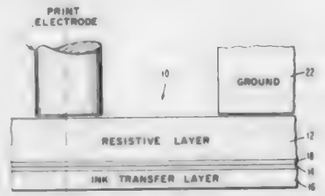
1. A wire dot-print head, comprising:
a print wire;
a leaf spring having a U-shaped slit therein defining between opposite sides of said slit a tongue-shaped spring branch part of said spring;
an armature fixedly mounted on one end thereof to one end of said leaf spring, said print wire being fixedly mounted to an end of said armature opposite said one end of armature;
a leaf spring supporting member fixedly mounting thereto a fixed end of said leaf spring opposite said one end of said leaf spring, said supporting member having a threaded groove therein;
an adjusting screw threadedly engaging said threaded groove so as to be screwable therein in a direction substantially perpendicular to said tongue-shaped spring branch part into engagement with said tongue-shaped spring branch part; and
drive means for selectively electrically driving said armature.

4,692,044

INTERFACE RESISTANCE AND KNEE VOLTAGE ENHANCEMENT IN RESISTIVE RIBBON PRINTING

Ari Aviram, Croton-on-Hudson, and Kwang K. Shih, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 728,996
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] B41J *31/02*
U.S. Cl. 400—241.1 **18 Claims**



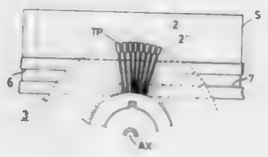
1. An improved resistive ribbon for electrothermal printing, comprising:
a resistive layer through which electric current passes from an electrode to produce localized heating to effect printing,
an ink layer comprised of an ink which is transferrable when heated by said localized heating,
a metal layer along which said electrical current passes, and
an electrical interface layer located between said resistive layer and said metal layer, wherein said current passes through said electrical interface layer to produce hearing due to the resistance of said electrical interface layer, said electrical interface layer increasing the interface resistance of said ribbon and introducing a non-linear current-voltage characteristic with a knee voltage in excess of 6 volts.

4,692,045

PRINTING APPARATUS CAPABLE OF CORRECTING PRINTED CHARACTERS BY OFFSET PRINTS

Masaru Makita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 473,205, Mar. 8, 1983, abandoned. This application May 1, 1985, Ser. No. 728,461
Claims priority, application Japan, Mar. 19, 1982, 57-42947
Int. Cl.[4] B41J *11/36*
U.S. Cl. 400—697 **9 Claims**



1. A printing apparatus for printing on a printing sheet, said apparatus comprising:
a carriage movable along a printing sheet;
printing means drivable for printing indicia on a printing sheet and mounted on said carriage for movement therewith; and
control means for controlling both the position and drive of said printing means, said control means being operable in an erasing mode for controlling the position of said printing means, at one stationary position of said carriage, to stop at a central position, at a first position which is slightly displaced away from the central position, and at a second position which is slightly displaced away from the central position in a direction opposite to displacement of said printing means from the central position to the first position, said control means further controlling said printing means to be driven at the central position, the first position and the second position, respectively, for erasing on printed indicia.

4,692,046

PEN WITH SELECTIVE MULTI-COLOR CORES

Charng-Ching Lan, No. 18, Sec. 1 Yuan Lin Road, Ta Hsi Chien, Taoyuan Hsien, Taiwan

Filed Mar. 20, 1986, Ser. No. 843,913
Int. Cl.[4] B43K *24/06, 24/14*
U.S. Cl. 401—32 **1 Claim**



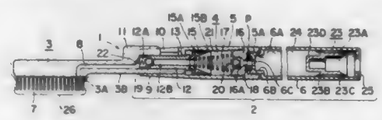
1. A marking pen with a plurality of colored cores comprising:
a pen body comprising a hollow tube having a top end, a bottom end, an inner wall, and an outer wall, and a plurality of elongated tube-holding projections on the inner wall of the pen body;
a recessed groove at the top end of said pen body;
the bottom end of said pen body being cone-shaped and comprising a plurality of core outlets on the exterior thereof;
a pluriality of core-receiving tubes housed in said pen body, in the tube-holding projections, each tube having an oval cross-section and a smooth three-faceted top end, a small groove on the topmost end thereof, and a hollow interior containing fluid-absorbent material for storing ink, and a core at the bottom end;
a spring removably disposed on the bottom end of each of said core-receiving tubes;
a turnable knob comprising a top cylindrical portion and a bottom cylindrical portion, the top portion and bottom portion having differing diameters, the top portion thereof being denticulated externally, and a groove disposed on the bottom portion thereof;
an opened ring located partially on the bottom portion of said knob and partially in a recessed groove on the inner wall of said pen body;
a projecting edge on the circumference of the bottom end of said knob which is in cam engagement with the three-faceted cam surface on the top of a core-receiving tube to enable the tube to be pushed downwardly to allow the core to project out of said core outlets;
a cap attached to the bottom end of said pen body.

4,692,047

BRUSH FOR APPLYING MATERIAL IN LIQUID OR EMULSION FORM

Sasuke Endo, 802, Hiroo Nashonaru Koto, 10-32, Minami Azabu 5-Chome, Minato-Ku, Tokyo-To, Japan

Continuation-in-part of Ser. No. 601,850, Apr. 19, 1984. This application Jul. 12, 1985, Ser. No. 754,835
Claims priority, application Japan, Apr. 20, 1983, 58-68450; Aug. 15, 1983, 58-148137; Feb. 8, 1984, 59-16570; Feb. 8, 1985, 60-22042; Apr. 30, 1985, 60-92877
Int. Cl.[4] B43K *5/02, 7/10*
U.S. Cl. 401—141 **15 Claims**



1. A brush for applying liquid or emulsion material comprising:
(a) a handle having a container for containing material in liquid or emulsion form and a main body, a rear end of which is connected detachably to a mouth of the container, the container having a movable bottom body which moves along an inner wall of the container as the material is sucked through the mouth of the container;
(b) a rod provided, at its head, with brush means for application of the material and slidable inserted, at its root portion, into a forward bearing portion of the main body in such a manner that rotation of the rod can be avoided and the rod can be reciprocated axially, and the rod having a material feeding passage extending from its root portion to the brush means at the head of the rod;
(c) a pumping mechanism disposed within the main body for sucking the material from the container and feeding the sucked material to the head of the rod, and operated in accordance with reciprocal axial movements of the rod, the pumping mechanism including a suction chamber disposed within the main body and sealing means within the suction chamber for keeping the suction chamber airtight in order to prevent foreign matters from being sucked thereinto and for effecting a vacuum in the suction chamber to suck the material from the container into the suction chamber, the suction chamber being in fluid communication with the material feeding passage in the rod and the mouth of the container, the sealing means being connected to the rod for reciprocal axial movement therewith for pumping material to the bursh means and sucking material out of the container;
(d) elastic means dipsosed within the suction chamber for biasing the rod in an axial position with respect to the main body of the handle;
(e) a rotation preventing means including an operational projection formed on a peripheral surface of the root portion of the rod and functioning as a pushing member on which a finger is put when the rod is pushed axially; and
(f) a slit means, axially provided in a bearing portion of the main body, for slidably receiving the operational projection.

4,692,048

PRESSURE ROLLER APPLICATOR

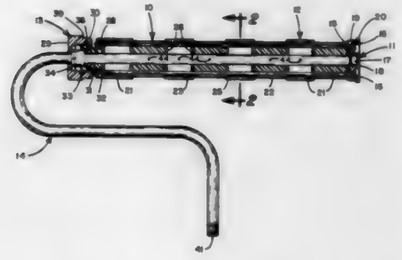
Duane D. Krohn, Westminister, Colo., and Allan Boogerman, Bedford, N.H., assignors to Graco Inc., Minneapolis, Minn.

Filed Jun. 9, 1986, Ser. No. 871,907
Int. Cl.[4] B05C *17/02, 1/10*
U.S. Cl. 401—197 **11 Claims**

1. A modular roller applicator sized to internally accept and fit about a pressure feed tube and to fit inside a rigid tubular permeable roller sleeve comprising,

(a) a first circular end cap, having an inner recess adapted for fitting about said feed tube and an outer circumferential surface adapted for fitting into said tubular permeable roller;

(b) a plurality of identical modular sections, each having a regular polygonal cross section having outer faces, and end surfaces, and having an elongated groove inwardly extending from each outer face and along the length thereof between each end surface, forming alternate ridges and grooves on the outer face, and the elongated grooves and the outer faces of the modular sections and the tubular permeable roller sleeve defining a plurality of reservoirs around each modular section, and each modular section having a central aperture extending between the end surfaces thereof, and each central aperture having



elongated inner slots extending outwardly therefrom along the length thereof between the end surfaces toward vertices of the polygonal cross section of each modular section whereby the inner slots overlap the outer face grooves in the adjacent modular section;

(c) a second circular end cap having an inner edge, an outer edge, and a circumferential surface adapted for fitting into said tubular permeable roller; and

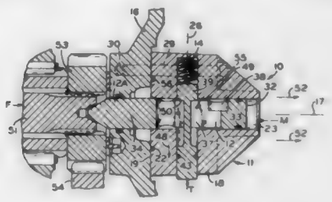
(d) an elongated fastening means extending from the first end cap to the second end cap and cooperating with the plurality of modular sections to retain the modular sections adjacently therebetween and further cooperating to axially locate and fixedly position the elongated inner slots of the one modular section confronting the elongated outer face grooves of the adjacent modular section.

4,692,049

QUICK DISENGAGEMENT APPARATUS FOR POWER WHEEL MECHANISMS

James L. Engle, Auburn, Ind., assignor to Auburn Gear, Inc., Auburn, Ind.

Filed Jun. 12, 1985, Ser. No. 743,794
Int. Cl.[4] F16D *1/06*
U.S. Cl. 403—1 **12 Claims**



1. A quick disengagement apparatus for selectively controlling a conventional disengageable power wheel assembly wherein an axially shiftable power shaft may be translated from a first position whereat said power shaft is operatively engaged with an associated hub assembly to enable mutual coaxial rotation, to, in opposition to a yieldable bias acting axially on said power shaft, maintain said engagement, a second position whereat said power shaft is disengaged from its associated hub assembly to enable independent coaxial rotations thereof, said quick disengagement apparatus comprising:

a housing, disposed in a fixed location relative to said hub assembly;

axial translatable means, carried by said housing, for communicating an axially directed external force applied thereto to said power shaft in opposition to said yieldable bias acting thereon so as to cause said power shaft to assume its disengaged position, said axially translatable means including a shoulder surface and a detent cavity formed therein at appropriate longitudinal positions respectively corresponding to said engaged and disengaged positions;

transversely translatable means, carried by said housing, for releasably interlocking with said detent cavity and for retaining said axially translatable means in its axially translated position whereat said power shaft is disengaged from said hub assembly, release of said interlocking enabling said axially translatable means to translate to its axially translated position whereat said power shaft is engaged with said hub assembly;

means for yieldably biasing said transversely translatable means into interlocking engagement with said detent cavity of said axially translatable means when said axially translatable means has attained said disengaged condition; and

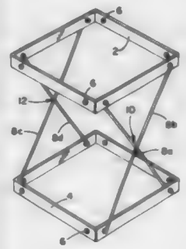
said axially translatable means further including a longitudinal slot formed diametrically therethrough at a laterally central region, the transversely translatable means extending through said slot and being supported in said housing on opposite sides of said axially translatable means, the slot enabling said axially translatable means to be shifted with respect to said transversely translatable means at least between its engaged position and its disengaged position, the assembly of the transversely translatable means through the slot of the axially translatable means allowing the transversely translatable means to serve as the sole means for retaining the axially translatable means in the housing.

4,692,050

JOINT AND METHOD OF UTILIZING IT

Yaacov Kaufman, 17 Alexander Yanai Street, Tel Aviv, Israel

Filed Sep. 16, 1985, Ser. No. 776,702
Claims priority, application Israel, Sep. 19, 1984, 73030
Int. Cl.[4] F16C *11/00*; F16M *11/00*; F16D *1/2*
U.S. Cl. 403—3 **5 Claims**



1. A joint comprising:

two members,

a plurality of apertures formed in each of said two members, and

two pairs of resilient rods positioned opposite to each other and interconnecting said two members,

each end of each rod of said two pairs of rods being pivotably mounted in an aperture defined in a different one of said two members,

one rod of each of said two pairs of rods having both its ends extending through said apertures in a direction opposite to the direction of extension through said apertures of both ends of the other rod of the same pair of rods, and

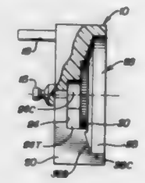
each rod of each of said two pairs of rods being mounted to cross the other rod of the same pair of rods in frictional engagement, each member thereby being pivotably movable with respect to the other member and being held in a desired position by the frictional engagement of the two rods of each of said two pairs of rods.

4,692,051

HOT WATER HEATER KNOB ADAPTOR

Benjamin H. Stansbury, Jr., 803 N. Doheny Dr., Beverly Hills, Calif. 90210, and Richard E. Henderson, 1760 Monrovia, Unit B10, Costa Mesa, Calif. 92627

Filed Dec. 6, 1982, Ser. No. 446,884
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—3 **5 Claims**



1. An adapter for coupling an automatic adjusting mechanism to different configurations of manual control knobs comprising:

(a) coupling means on a rear portion of said adapter for coupling said adapter to said mechanism;

(b) recess means on an internal front portion of said adapter for matingly receiving said different external configurations;

(c) tensioning means for securing said adapter snugly upon the relevant control knob, such that said adapter and said knob rotate one with the other; and

(d) said tensioning means applying a radially inwardly directed gripping force on said relevant control knob to secure said adpater upon same.

4,692,052

SPLICE SLEEVE FOR OVERLAPPING REINFORCING BARS

Alfred A. Yee, Honolulu, Hi., assignor to Elizabeth W. Yee, Honolulu, Hi.

Filed Jun. 25, 1986, Ser. No. 878,336
Int. Cl.[4] B25G *3/00*; F16D *1/00*
U.S. Cl. 403—13 **14 Claims**

7. In combination, a pair of axially extending reinforcing bars having peripheral projections thereon, said bars having overlapping ends disposed in adjacent, generally parallel spaced relation, a rigid splice sleeve with means locating said end portions of the axially extending reinforcing bars therein, and hardened medium enclosing the overlapping ends of the reinforcing bars and filling the transverse cross-sectional area of the sleeve for resisting forces perpendicular to the longitudinal axes of the reinforcing bars when axial tension is exerted on the overlapping reinforcing bars with the sleeve imposing opposite forces toward the overlapping ends of the reinforcing bars to develop a secure frictional engagement between the reinforcing bars and hardened medium to securely retain the



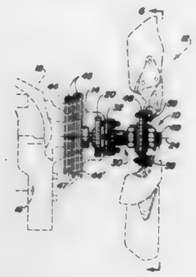
overlapping ends of the reinforcing bars in overlapped relation.

4,692,053

DIRECT DRIVE FAN COUPLING ASSEMBLY

Manuel Sampedro, 21011 S.W. 122 Ct., Miami, Fla. 33177, assignor to Manuel Sampedro, Miami and Russell T. Kohuth, Hollywood, both of, Fla., a part interest to each

Continuation-in-part of Ser. No. 842,784, Mar. 24, 1986, abandoned. This application Sep. 29, 1986, Ser. No. 912,523
Int. Cl.[4] F01P *1/00, 7/00*; F16D *1/00*
U.S. Cl. 403—24 **13 Claims**



1. A direct drive coupling assembly of the type primarily designed to rotatably support and interconnect a cooling fan structure to a drive shaft therefor in an internal combustion engine for an automobile or like vehicle absent any interceding clutch mechanism, said coupling assembly comprising:

(a) an elongated support shaft of one piece, integral construction mounted at one of two opposite ends thereof to said drive shaft and extending coaxially outwardly therefrom into supporting engagement with the cooling fan structure,

(b) connecting means for adjustably and selectively securing the cooling fan at any one of a plurality of predetermined locations along the length of said support shaft and at a preferred location relative to a radiator structure of the internal combustion engine,

(c) fan support means for interconnecting the cooling fan to said support shaft for rotation therewith mounted on said support shaft between said opposite ends thereof and

comprising a support disc having a central aperture integrally formed therein and being structured for connection to at least a portion of said connecting means, said support disc disposed in surrounding, coaxial relation to said support shaft,

(d) said support disc including a fan support structure formed thereon and disposed and configured for direct removable attachment to the cooling fan for support thereon if the cooling fan is within predetermined standard dimensional parameters, said predetermined standard dimensional parameters defined by the dimension of an inside diameter of a central bore of the cooling fan,

(e) an adaptor means removably securable to said support disc for direct attachment to and support of a cooling fan structure which is outside of said predermined dimensional parameters and therefore unattachable to said support disc,

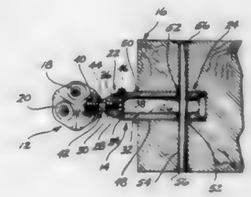
(f) said adapter means being attached to said support disc in supporting relation to the fan structure only if the fan structure utilized is outside said predetermined dimensional parameters.

4,692,054

CONNECTOR SYSTEM FOR STRUCTURAL FRAMEWORK

Charles A. Kirby, Gig Harbor, Wash., assignor to Northwest Design Products, Inc., Tacoma, Wash.

Filed Aug. 26, 1985, Ser. No. 769,484
Int. Cl.⁴ F16B *7/18;* **F04H** *12/06*
U.S. Cl. 403—171 **11 Claims**



1. A connector system for structural frameworks comprising:

(a) a strut element having a first end portion and a second end, portion the first end of the strut element having a longitudinal bore therein;

(b) a bolt member having a head and shank, said bolt member beng mounted within said longitudinal bore, the head of the bolt member being retained within the bore and a portion of the shank of the bolt member extending outwardly from the bore, the shank portion having a plurality of threads formed thereon;

(c) a drive nut fixed about the shank portion and being immovable relative to the shank portion, the drive nut being configured so that rotation of the drive nut causes corresponding rotation of the bolt member; and

(d) antirotation means secured to the first end portion of the strut element and being selectively engageable with the bolt member for preventing rotation of the strut element relative to the bolt member.

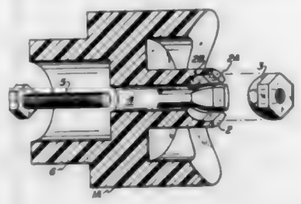
4,692,055

UNIFASTENER

Paul F. Seymour, 1104 Stillwater Dr., Jupiter, Fla. 33458

Filed Apr. 9, 1984, Ser. No. 598,033
Int. Cl.⁴ F16B *7/08*
U.S. Cl. 403—190 **1 Claim**

1. A Joint fitting for connecting a pair of tubular members, are being provided with an aperture in its wall, comprising a plug having a longitudinal bore therethrough adapted at one end to fit into an end of one of the members and having a split projection at the other end adapted to enter the aperture of the other member, and expansion means longitudinally movable in the split projection for expanding the split projection on the plug for clamping engagement with the other member, said split projection terminating in a split socket having plural segments with each segment having extending axially from its free end a planar internal face and arcuate internal face together forming a socket having a generally spherical bottom and planar sides, said expansion means being a bolt extending thru said longitudinal bore and a threaded nut thereon having a generally spherical bottom at one end and terminating in planar sides at the other end for non-rotative engagement with said split socket.

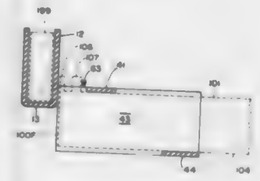


4,692,056

GARMENTS HANG-RAIL COUPLING

Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130

Filed Jul. 29, 1986, Ser. No. 890,381
Int. Cl.⁴ F16B *9/02*
U.S. Cl. 403—233 **11 Claims**



1. A garments hang-rail coupling securely removably mountable at the forward portion of each of a plurality of parallel horizontal brackets, each said bracket forward portion terminating as a frontal-end and being cross-sectionally rectangularly defined by left-side, right-side, bottom-side, and also by a top-side that is forwardly provided with upstanding lug means, said garments hang-rail coupling comprising:

(A) as the coupling forward portion, an upwardly open trough adapted to removably support a garments hang-rail extending perpendicularly to the bracket at the frontal-end thereof; and

(B) a housing having forward and rearward open-ends, said housing being rigidly attached at and depends from a rearward portion of said trough, said housing including:

(i) a substantially horizontal roof-panel located a finite-gap rearwardly of the housing forward open-end whereby the roof-panel is adapted to abuttably overlie the bracket top-side rearwardly of said upstanding lug means,

(ii) substantially parallel upright side-panels including a left-panel and right-panel having their upper portions rigidly attached to said roof-panel and having their forward portions rigidly attached to said trough, said left-panel and right-panel being adapted to lie alongside said bracket left-side and right-side, respectively, and

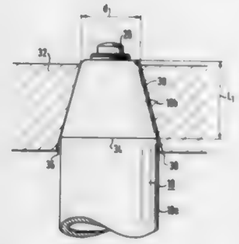
(iii) base means extending substantially horizontally between lower portions of said side-panels and being adapted to abuttably underlie the bracket bottom-side, and said base means being relegated remotely rearwardly of said roof-panel thereby facilitating insertion of said forwardly lugged bracket through the housing rearward open-end and permitting emergence of said lug means into said housing upper finite-gap.

4,692,057

TAPER CONNECTION ON A CHAIR OR TABLE COLUMN OF ADJUSTABLE HEIGHT

Leo Lauderbach, Steinbach, Fed. Rep. of Germany, assignor to Stabilus GmbH, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,085
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3517003
Int. Cl.⁴ B25G *3/00;* **F16M** *11/00*
U.S. Cl. 403—334 **10 Claims**



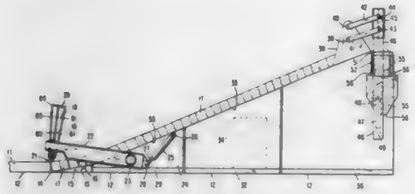
1. In a combination of a height-adjustable carrier column, having a carrier column component (**18**), and a component (**32**) carried by the carrier column the improvement comprising: said carrier column component (**18**) of said carrier column comprising an integrally formed tube-shaped member having a lower cylindrical section (**18***a*) and an upper conical external taper section (**18***b*) having a nominal length (**L1**), said taper section (**18***b*) adjoining said cylindrical section (**18***a*) at the upper end thereof at a transition section (**34**), and said component (**32**) carried by the carrier column having an internal taper (**30**) for accomodating said conical external taper section (**18***b*), said internal taper (**30**) being sized relative to said external taper section (**18***b*) to protrude out beyond said conical external taper section (**18***b*) towards said cylindrical section (**18***a*) and overlies said transition section (**34**).

4,692,058

APPARATUS AND METHOD FOR REMOVING PAVEMENT

William F. Mengel, Custer, Wis., assignor to F. F. Mengel Company, Custer, Wis.

Filed Jul. 8, 1985, Ser. No. 752,686
Int. Cl.⁴ E01C *23/12*
U.S. Cl. 404—72 **20 Claims**



1. An apparatus for removing road pavement, inclusive of any metal reinforcement incorporated therein, and rendering the same into small pieces for easy disposal thereafter, comprising:

movable pavement lifting means for applying a lifting force to an end of said road pavement substantially across the width of said pavement;

a first movable pavement breaking means, cooperating with said pavement lifting means, for applying a downwardly directed impact force substantially across the width of said pavement, at a predetermined position adjacent a forward end of said pavement lifting means forwardly of said pavement end being subjected to said lifting force, for generating resultant tensile forces in the lower portions of said lifted pavement under the applied impact force for breaking said pavement thereby;

movable ramp means cooperating with said pavement breaking means, substantially supported by and moving generally over the area from which said pavement has been broken by said first pavement breaking means, for lifting said broken pavement and any said metal reinforcement incorporated therein by movement behind said movable pavement lifting means; and

a second movable pavement breaking means, cooperating with said ramp means and positioned adjacent the highest point to which said ramp means lifts said broken pavement, for rendering said broken pavement and any said metal reinforcement incorporated therein into smaller pieces of predetermined size.

16. A method of breaking up and removing road pavement, inclusive of any metal reinforcement therein, comprising the steps of:

introducing an acute angled hollow wedge between an end of said road pavement and the ground below, said wedge being oriented transverse to said road and extending beyond the width of said road pavement on both sides thereof;

applying an external force directed to force said wedge forwardly under said pavement, whereby an upwardly directed force is exerted on said pavement end by an upper surface of said wedge;

applying a downwardly directed impact force substantially across the width of said pavement a predetermined distance forward of said pavement end while said wedge is exerting said upwardly directed force thereon, so that resultant tensile forces are generated in the lower portions of said lifted pavement under the applied impact force whereby a portion of said road pavement breaks and is supported by said wedge; and

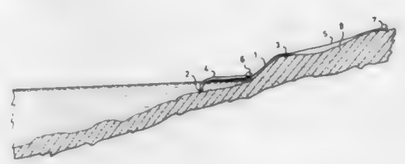
repeating said application of downwardly directed impact force while maintaining said external force on said wedge, whereby additional portions of said road pavement are broken and previously broken portions are caused to slide further up along said upper surface of said wedge.

4,692,059

METHOD OF AND A MEANS FOR PROTECTING SHORES AGAINST OIL POLLUTANTS

Holger Juutilainen, Tampere, Finland, assignor to Tamfelt Oy Ab, Tampere, Finland

Filed Feb. 6, 1986, Ser. No. 826,619
Claims priority, application Finland, Feb. 6, 1985, 850492
Int. Cl.⁴ E02B *15/04*
U.S. Cl. 405—63 **8 Claims**



1. Method of protecting shores against oil pollutants, wherein a web-like oil-retaining textile (1) is positioned in the

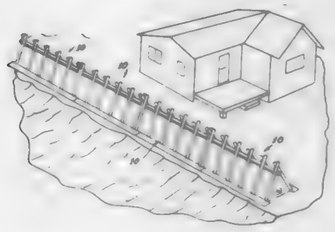
way of oil in the water to prevent the oil from spreading up on a shore, comprising the steps of (a) lowering the textile into the water in parallel with the shore and (b) drawing the textile in the direction perpendicular to the water's edge up on the shore over a strip of land (8) whichis in danger of getting polluted, in such a manner that a longitudinal edge (2) of the textile remains in the water.

4,692,060

WATER-BAG DAM OR DIKE AND METHOD

James G. Jackson, III, 424 Douglas Ave., Kalamazoo, Mich. 49007

Filed Jul. 3, 1986, Ser. No. 882,081
Int. Cl.[4] E02B *7/20, 7/50;* **E01F** *7/00*
U.S. Cl. 405—115 **18 Claims**



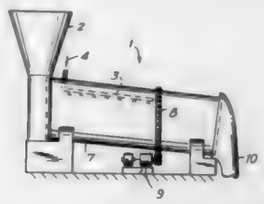
1. A water-bag dam or dike which comprises:
- a closed-end tube of water-impermeable, pliable sheeting having a bottom and two side panels of substantially the same length and breadth connected to equilateral generally triangular end panels;
- lateral support members in the form of an inverted V;
- lateral-support-fastening means on said side panels attaching the same to said lateral support members;
- longitudinal support means located between said lateral support members adjacent the apex of the V;
- longitudinal-support-fastening means at the apex of said side panels attaching the same to said longitudinal support means;
- water-inlet means for filling said water-bag with water whereby it is caused to assume a tubular shape having an equilateral cross section; and
- water-outlet means whereby said tube can be drained.

4,692,061

PROCESS FOR DUMPING OF PARTICULATE SOLID WASTE MATERIALS IN UNDERGROUND SALT ENCLOSED CAVITIVES

Walter Lindörfer, Kassel, and Wilhelm Jahn-Held, Staufenberg, both of Fed. Rep. of Germany, assignors to Wintershall AG, Kassel, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,399
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3411998; Jun. 25, 1984, 3423387; Jul. 21, 1984, 3426960
Int. Cl.[4] B09B *3/00;* **E02D** *3/12*
U.S. Cl. 405—128 **13 Claims**



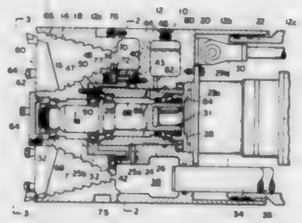
1. A process for dumping of particulate solid waste materials in an underground salt enclosed cavity containing rock salt solution and equipped with pipelines for filling and evacuation, comprising the steps of pumping out as much rock salt solution as possible from the cavity, rendering the particulate solids dust-free by treatment with a dust suppressant in an amount which does not appreciably impair free-flowing characteristics of the particulate solid waste materials, introducing the dust-free particulate solids into the pipelines used to fill the cavity until about two thirds to three quarters of the cavity is filled without dust generation, solidifying any water present in the dust suppressant together with any rock salt solution remaining in the cavity and sealing the cavity.

4,692,062

SHIELD TYPE TUNNELING MACHINE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,388
Claims priority, application Japan, Oct. 25, 1984, 59-160343[U]
Int. Cl.[4] E21D *9/08*
U.S. Cl. 405—141 **5 Claims**



1. A shield type tunneling machine comprising:
- a shield body having a front portion converging gradually rearward;
- a diaphragm provided in a rear of said front portion to cross said shield body;
- a crankshaft rotatably journalled by the diaphragm and having one end connected to a drive mechanism provided in a rear of said diaphragm and the other end extending to a front of said diaphragm;
- a conical or frustconical rotary head supported rotatably by said other end of the crankshaft so that the axis of the rotary head is eccentric to the axis of the crankshaft, the rotary head being disposed in the front portion of said shield body;
- a gear mechanism for forcibly rotating said rotary head and including an internal gear fixed to one of said diaphragm and said rotary head and an external gear fixed to the other; and
- a means for discharging debris from a front area of said diaphragm to a rear area.

4,692,063

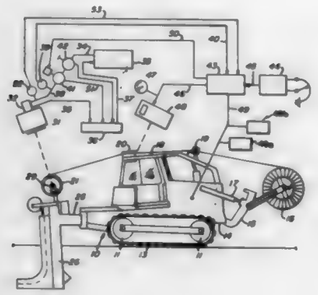
SYSTEM TO CONTROL TENSION IN A CABLE DURING UNDERGROUND PLACEMENT

Allen C. Conti, San Jose, Calif., assignor to Arnco Corporation, Westlake, Ohio

Filed Nov. 1, 1985, Ser. No. 793,770
Int. Cl.[4] F16L *1/02*
U.S. Cl. 405—177 **10 Claims**

1. A system for controlling tension in a cable supplied from a reel carried on a land vehicle while propelled along a cable placement site, said land vehicle including an implement to prepare a subgrade for buried placement of the cable, said system including the combination of:
- a capstan wheel operatively engaging the cable extending along a course between said reel and subgrade.

- a drive motor connected to said capstan wheel for establishing tension on the cable extending between said capstan wheel and said reel,
- control means to energize said drive motor for establishing said tension at a level less than a predetermined maximum setpoint tension level while said land vehicle advances along the cable placement site,



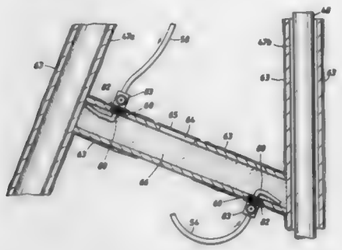
- means for producing a tension signal corresponding to tension in the cable extending along said course, and
- detector means responsive to said tension signal for indicating an increase in cable tension to the predetermined maximum setpoint tension level.

4,692,064

METHOD TO DRILL AND TAP A HOLLOW UNDERWATER MEMBER

Richard N. Wankmuller, New Orleans, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Apr. 9, 1986, Ser. No. 849,645
Int. Cl.[4] E02D *5/60*
U.S. Cl. 405—211 **17 Claims**



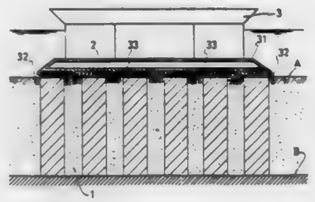
1. A method of strengthening a hollow underwater member by converting it to a substantially solid underwater member, said method comprising the steps of:
- forming fluid inlet and outlet ports through the wall of said hollow member at substantially opposite ends of said member;
- ascertaining the need for strengthening said hollow member by revealing leak holes in said member caused by corrosion or structural damage; and
- injecting grout into said member through one of said ports and discharging the fluid therein through the outer port thereof to subtantially fill said member with grout.

4,692,065

OFFSHORE UNIT STRUCTURE

Yoshio Suzuki; Mitsuoki Yamamoto, both of Tokyo, and Hisashi Hosomi, Saitama, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

PCT No. PCT/JP85/00240, § 371 Date Aug. 26, 1985, § 102(e) Date Aug. 26, 1985, PCT Pub. No. WO85/05138, PCT Pub. Date Nov. 21, 1985
PCT Filed Apr. 26, 1985, Ser. No. 774,588
Claims priority, application Japan, Apr. 23, 1984, 59-87379
Int. Cl.[4] E02B *17/00;* **E02D** *27/52*
U.S. Cl. 405—211 **1 Claim**



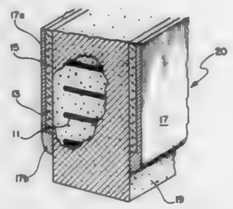
1. An offshore structure comprising:
- an improved ground solidified by impregnating a cement type agent into a soft sea bottom ground and mixing them, the improved ground having at least one top open vertical hole;
- a rubble mound laid on the improved ground;
- a unit structure installed on the rubble mound;
- a skirt extending downwardly from a lower periphery of the unit structure and encircling an upper part of the improved ground; and
- at least one raised strip which is provided at an underside of the unit structure and which is thrust into the rubble mound;
- wherein a part of the rubble mound is pressed into an upper part of the vertical hole by the vertical load of the unit structure.

4,692,066

CATHODIC PROTECTION OF REINFORCED CONCRETE IN CONTACT WITH CONDUCTIVE LIQUID

Kenneth C. Clear, 201 Davis Dr., Unit GG, Sterling, Va. 22170

Filed Mar. 18, 1986, Ser. No. 840,737
Int. Cl.[4] E02D *31/06*
U.S. Cl. 405—216 **20 Claims**



1. A steel reinforced concrete structure adapted for contact with conductive liquid, and particularly for contact with saline water subject to variations in level, said variations thereby creating a high corrosion zone for steel reinforced concrete that comes in and out of liquid contact, said structure comprising:
- an anode assembly adjacent to the surface of said reinforced concrete and located at least in part along said high corrosion zone;
- a grout in contact with said anode assembly as well as in

contact with said reinforced concrete, said grout having a low specific resistivity; and

an air porous concrete covering over said grout, said concrete covering having a high specific resistivity.

4,692,067

CONTROL SYSTEMS

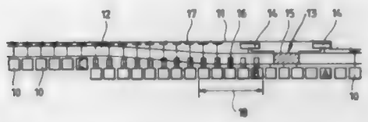
Richard Ward, Worsley, and Archelaius D. Allen, Preston, both of England, assignors to Dobson Park Industries Plc., Nottingham, England

Filed Jun. 18, 1984, Ser. No. 621,388

Claims priority, application United Kingdom, Jun. 21, 1983, 8316838

Int. Cl.⁴ E21D *23/12*

U.S. Cl. 405—302 **17 Claims**



1. A mine roof support system suitable for use along a working face of a long wall mining operation, said working face having first and second face ends, said system comprising:

a plurality of mine roof supports, each support comprising:

hydraulic rams for controlling the height of said support;

hydraulic valve means for controlling said hydraulic rams; and

rotary electric motor means for operating said hydraulic valve means; and

control means for controlling said system, said control means including:

an electronic control box mounted on each mine roof support; and

face end computer means positioned at at least one of said first and second face ends, said computer means being connected to said electronic control boxes for receiving control signals from said electronic control boxes and for transmitting control signals to said electronic control boxes.

4,692,068

APPARATUS FOR DISTRIBUTION AT A REGULATED RATE OF A FLUIDIZABLE POWDERY MATERIAL

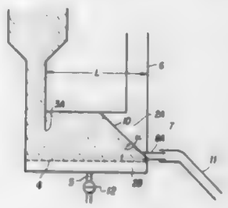
Jean-Pascal Hanrot, Aix-En-Provence, and Jacky Volpeliere, Gardanne, both of France, assignors to Aluminium Pechiney, Gardanne, France

Filed Jan. 8, 1986, Ser. No. 817,121

Claims priority, application France, Jan. 8, 1985, 85 00469

Int. Cl.⁴ B65G *53/18*

U.S. Cl. 406—89 **2 Claims**



1. An apparatus for the distribution at a regulated rate of a fluidizable powdery material, comprising:

a casing divided into upper and lower parts by a porous fluidization wall and having a vertical face;

material storage means connected to one end of said upper part of said casing opposite said vertical face by a feed column;

a balancing and degassing column connected to another end of said upper part of said casing adjacent said vertical face;

means for regulating a distribution rate of said powdery material from said casing, said means for regulating comprising an outlet orifice connected to said vertical face at a vertical position immediately above said porous fluidization wall and having a controlled sectional area smaller than that of said vertical face;

means for introducing fluidization gas at a regulated pressure into said lower part of said casing; and

an outlet nozzle connected to said outlet orifice and having a horizontal bottom surface extending from the orifice, said nozzle having a diameter greater than that of said orifice, wherein said feed column is connected to an upper wall of said casing at a lower edge of said feed column, and wherein a distance L between said lower edge and said vertical face is such that unfluidized material delivered from said feed column to said casing reaches no further than said orifice.

4,692,069

CUTTER HEAD

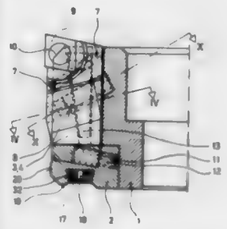
Walter Kieninger, Lahr, Fed. Rep. of Germany, assignor to Walter Kieninger GmbH, Diamantwerkzeugfabrik, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,390

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441821

Int. Cl.⁴ B23C *5/24*

U.S. Cl. 407—39 **12 Claims**



1. A cutter head having a substantially cylindrical main body and a plurality of replaceable cutting members disposed at the periphery of said main body and having at least one cutting edge extending in the axial and/or radial direction of said main body, wherein each cutting member is mounted on a carrier member secured to said main body and adapted to be radially and axially adjusted with respect to said main body by means of separate adjustment means disposed between said main body and said carrier member, and to be fixed in position on said main body with the aid of clamping means, each carrier member being mounted in a groove extending substantially radially of the axis of rotation of said main body and having substantially parallel surfaces in the radial direction, the adjustment means for the axial adjustment of said carrier member comprising an axial adjustment wedge which is disposed on the side of said carrier member opposite to the intended axial advance direction of said main body and provided with a substantially radially extending threaded bore in alignment with a threaded bore in said main body, the two threaded bores being adapted to be threadedly engaged by a differential screw for the displacement of said axial adjustment wedge, and the adjustment means for the radial adjustment of said carrier member comprising a radial adjustment wedge which is disposed on the side of said carrier member facing away from the direction of intended rotation of said main body and adapted to be engaged with a substantially radially outwardly facing engagement surface of said carrier member, and the main body being

formed with a substantially axially extending threaded bore adjacent said radial adjustment wedge adapted to be threadedly engaged by a headed screw, the bottom side of the head of said screw being adapted to be engaged with said radial adjustment wedge for displacing the radial adjustment wedge.

4,692,070

CUTTING TOOL

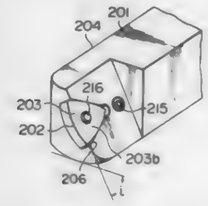
Hiroshi Shikata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 657,126, Oct. 3, 1984, Pat. No. 4,636,117. This application Aug. 26, 1986, Ser. No. 900,410

Claims priority, application Japan, Apr. 12, 1984, 59-73570

Int. Cl.⁴ B23B *27/00, 27/16*

U.S. Cl. 407—104 **12 Claims**



1. An oblique edged cutting tool for machining a work, comprising:

(a) a holder having a front end;

(b) an indexable throw-away tip comprising:

(1) a curved surface projecting outwardly;

(2) a flat surface;

(3) a curved cutting edge defined by a contacting line between an edge of said curved surface and an edge of said flat surface; and

(4) an outer configuration radially symmetrical about a geometric center of said tip;

(c) means for releasably securing said tip to said front end; and

(d) means for positioning said tip at an inclination angle of from about 30° to about 70° so that said flat surface constitutes a rake face and is positioned substantially normally to a surface of the work to be machined and said curved surface projects outwardly from the front end of said holder so that said curved cutting edge projects forwardly when said tip is secured to said holder;

wherein said inclination angle is defined as an angle formed by (1) a line tangent to substantially the central portion of an effective cutting edge portion of said cutting edge and (2) a line normal to a cutting velocity direction of said cutting tool and parallel to said work surface.

4,692,071

THREAD CUTTING MACHINE

Akio Hirota, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 12, 1986, Ser. No. 861,821

Claims priority, application Japan, Jun. 28, 1985, 60-143346

Int. Cl.⁴ G05B *19/407*

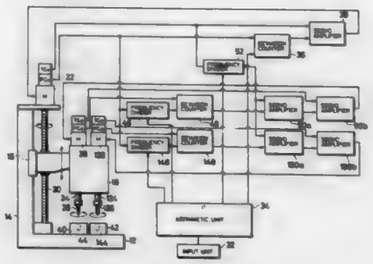
U.S. Cl. 408—9 **7 Claims**

1. A thread cutting machine, comprising:

a workpiece supporting stand having a surface for holding a workpiece; a spindle head movably supported with respect to said workpiece supporting stand; means to move said spindle head in opposite directions towards and away from said workpiece holding surface; a rotatable spindle for holding a thread cutting tool, said spindle being rotatably supported by said spindle head; and means for rotating said spindle;

first and second means operable to control the position of said thread cutting tool;

said first means being responsive to said spindle head moving means to generate a signal corresponding to the movement of said spindle head; and



said second means for rotating said spindle in accordance with said signal to synchronize the amount of movement per revolution of said spindle with the movement of said spindle head relative to said workpiece holding surface.

4,692,072

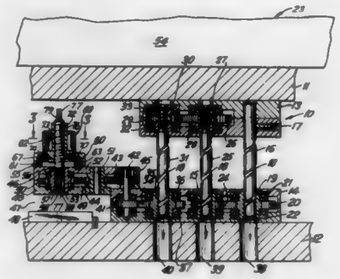
TAPPING DEVICE FOR RECIPROCATIVE PRESS

William R. Pfister, Brick, and William H. Pfister, Seaside Park, both of N.J., assignors to Automated Tapping Systems Inc., Bricktown, N.J.

Filed Jul. 25, 1986, Ser. No. 889,206

Int. Cl.⁴ B23B *47/18*

U.S. Cl. 408—124 **11 Claims**



1. A tapping device for a punch press or the like comprising a top plate, a bottom plate opposite the top plate, electrical power means to reciprocate the top plate with respect to the bottom plate, a top gear block secured to the top plate, a bottom gear block secured to the bottom plate, a gear train carried within each of the gear blocks, a helically grooved first cam shaft secured at one end to the top gear box and extending therefrom, a first helically splined bushing carried within the bottom gear box in driving engagement with the first cam shaft, a first gear within the bottom gear train around the first bushing and secured thereto, a floating second gear within the bottom gear train in mesh with said first gear, a second helically grooved cam shaft operatively coupled at one end to the floating second gear and extending outwardly thereof toward the top gear block, a second helically splined bushing within the top gear block in driving engagement with the second camp shaft, a third gear within the top gear train around the second bushing and secured thereto, a fourth gear within the top gear train in mesh with the third gear, a third helically grooved cam shaft, secured at one end to the fourth gear and extending outwardly thereof toward the bottom gear block, a

third helically splined bushing within the bottom gear block in driving engagement with the third cam shaft, a fifth gear around the third bushing and secured thereto, an extension on the bottom gear block, a pinion gear member within the extension in mesh with the fifth gear, a tap receiving tapping station carried by the extension, a chuck assembly on the tapping station, a chuck driving gear in the chuck assembly, a tapping head on the said station, a threaded bushing in said tapping head for advancing the chuck toward a work part, a speed reducing gear train interconnecting the pinion gear member and chuck driving gear, whereby rapid reciprocation of the top and bottom plates toward and away from each other will be translated into rotation of the chuck assembly at a suitable tapping speed, fail safe means within the tapping head responsive to vertical movement of the threaded bushing to interrupt the plate reciprocation means, said first, second and third helically grooved cam shafts being axially stationary with respect to said top plate, and means for permitting said first, second and third helically grooved cam shafts to extend downward at least into said bottom plate during reciprocation of said top plate whereby motion of said first, second and third helically grooved cam shafts into said top plate is not required.

4,692,073

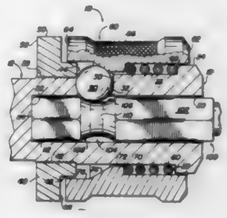
HANDLE ADAPTER AND CHUCK APPARATUS FOR POWER BITS

J. Richard Martindell, P.O. Box 490, Hill Rd., Bernalillo, N. Mex. 87004

Continuation of Ser. No. 704,949, Feb. 25, 1985, abandoned. This application Jul. 1, 1986, Ser. No. 880,811

Int. Cl.[4] B23B *31/22*

U.S. Cl. 408—239 A **19 Claims**



1. Hand tool apparatus including a handle for a tool bit having a non-circular shank and having a groove extending circumferentially about the shank with a flat center portion and a radiused portion on the groove, comprising, in combination:

spindle means including

a non-circular bore having an inner end for receiving the non-circular shank of the tool bit,

a radial bore communicating with the non-circular bore, and

a ball having a radius substantially the same as, or slightly less than, the radiused portion of the groove of the tool bit disposed in the radial bore and extendable into the non-circular bore and against the radiused portion of the groove of the shank of the tool bit for locking the tool bit within the non-circular bore and against the inner end of the non-circular bore;

sleeve means disposed about the spindle means, and including

a front bore disposed about the spindle means,

a conically tapered bore disposed adjacent to the radial bore and disposed against the ball, and

a rear bore adjacent to the conically tapered bore for receiving the ball when the ball is moved out of the non-circular bore; and

spring means for biasing the sleeve means against the ball whereby the conically tapered bore contacts the ball to apply normal and tangential forces against the radiused portion of the shank to lock the bit in the non-circular bore and against the inner end of the non-circular bore to prevent longitudinal movement of the tool bit.

4,692,074

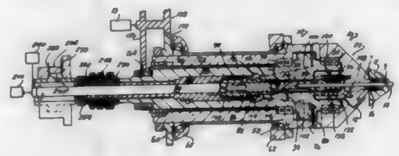
TOOL COUPLING ARRANGEMENT FOR A TOOLING ASSEMBLY

Michael D. Smith, Troy, and Daniel F. Dobat, Sterling Heights, both of Mich., assignors to The Cross Company, Fraser, Mich.

Filed Apr. 11, 1986, Ser. No. 850,652

Int. Cl.[4] B23B *31/26*

U.S. Cl. 409—233 **15 Claims**



1. A tool coupling arrangement of the type adapted to detachably couple a tooling assembly (**10**) insertable into a spindle assembly (**12**),

said tooling assembly (**10**) having a plurality of elements, at least one of said elements (**20**) axially moveable independently of the other elements of said tooling assembly (**10**);

drive means (**54, 56, 156, 164, 158**) for rotating each of said elements about aligned axes of rotation;

an inner draw bar (**84**);

an outer draw bar (**82**);

each of said inner and outer draw bars (**84, 82**) mounted in said spindle assembly (**12**) for independent axial movement therein;

actuator means (**210, 258**) for axially moving said inner and outer draw bars (**84, 82**) independently in said spindle assembly (**12**);

first coupling means (**30, 86, 92**) operable by axial movement of said outer draw bar (**82**) to couple said tooling assembly (**10**) to said spindle assembly (**12**), characterized by:

second coupling means (**116, 108, 240, 224**) operable upon limited axial advance of said inner draw bar (**84**) to couple said independently moveable element (**2**) of said tooling assembly (**10**) to said inner draw bar (**84**) for axial movement together therewith.

4,692,075

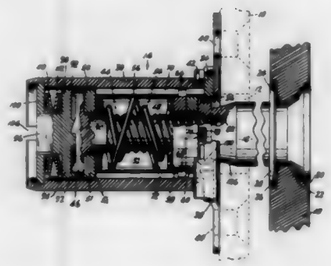
PANEL FASTENER

Joseph R. Metz, Ridgefield, Conn., assignor to Norco,Inc., Ridgefield, Conn.

Filed May 2, 1986, Ser. No. 858,643

Int. Cl.[4] F16B *31/00*

U.S. Cl. 411—7 **18 Claims**



1. A fastener for releasably securing a panel to an underlying

supporting structure having an access opening, comprising in combination:

(a) a tubular housing having a longitudinal bore,

(b) means for securing said housing to the supporting structure, with the bore of the housing located at the access opening thereof,

(c) a screw member carried in the housing bore, having a threaded portion extending toward an open end thereof and accessible from said access opening, said screw member having a head disposed in said housing,

(d) the panel having an opening adapted to be located at the access opening in the supporting structure,

(e) a stud having a bore with internal threads adapted to mate with the threaded portion of the screw member when the panel is placed over the supporting structure with its opening adjacent said access opening and the stud engaged with and turned with respect to the screw member,

(f) a detent device in said housing for engagement by the stud to prevent inadvertent rotation thereof with respect to the housing and consequent loosening thereof on the screw member under conditions of vibration,

(g) means providing a movable mounting for the screw member in the housing to enable turning movement, and

(h) a yieldable uni-directional detent means carried by the housing and continually engaging the head of the screw member so as to normally prevent its turning in one direction during application of the stud to the threaded portion of the screw member except under conditions of excessive torque, thereby reducing the likelihood of damage occurring to the screw member or stud from possible overtightening,

(i) said uni-directional detent means at all times positively preventing turning of the screw member in the opposite direction so as to insure removal of the stud therefrom when the latter is turned in unscrewing direction.

4,692,076

EXPANSION DOWEL WITH ANCHORED STATE INDICATOR

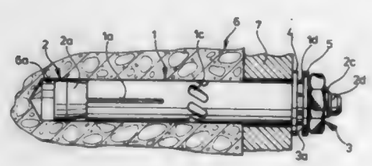
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to "L'Oreal" , Paris, France

Filed Feb. 26, 1986, Ser. No. 833,813

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1985, 3507022

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—55 **4 Claims**



1. Expansion dowel comprising an axially elongated cylindrically shaped expansion having a leading end arranged to be inserted first into a borehole in a receiving material in which the expansion dowel is anchored and a trailing end, an expansion body located at the leading end of said expansion sleeve and shaped to expand an axially extending section of said expansion sleeve from the leading end thereof when the expansion body is drawn axially into the leading end of said expansion sleeve toward the trailing end thereof, an axially elongated bolt having a leading end and a trailing end with the leading end thereof secured to said expansion body and said bolt being threaded for an axially extending section from the trailing end toward the leading end, means engageable with the threaded section of said bolt for drawing the expansion body into the leading end of said expansion sleeve, and said means forming a shoulder for securing a load on said dowel, said expansion sleeve having an axially deformable region intermediate the leading and trailing ends thereof, wherein the improvement comprises an annular disc encircling and fitted on the outside of said expansion sleeve adjacent the trailing end thereof and spaced axially from said shoulder, said disc acts as an axial stop for the initial insertion of said expansion sleeve into a receiving material, means on said sleeve for securing said disc against axial displacement toward said shoulder, and said disc being axially displaceable on said expansion sleeve toward said shoulder and overcoming said securing means after a minimum anchoring value has been achieved as said expansion body expands said expanding sleeve in the axial direction extending from the leading end thereof, and said axially deformable region being deformable only when said minimum anchoring value is achieved so that the axial deformation of said sleeve and the displacement of said disc overcoming said securing means takes place at the same time, said means for securing said disc are deformable members, said deformable members are formed as circumferentially spaced protuberances extending outwardly from the outside surface of said sleeve, and a spacing disc is positioned around the outside surface of said expansion sleeve between said protuberances and said shoulder.

4,692,077

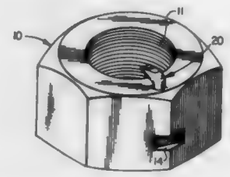
SELF-LOCKING NUT WITH ROCKING ANTI-REVERSING PIN

Jack R. Kerr, 15015, Arlington, Tex. 76015; Thomas V. Shelton, #6 Woodland Dr., Mansfield, Tex. 76014, and Jerry L. Dunsmore, #5 Woodlands Dr., Mansfield, Tex. 76063

Filed Dec. 30, 1985, Ser. No. 814,904

Int. Cl.[4] F16B *39/30*

U.S. Cl. 411—206 **13 Claims**



1. In a self-locking nut which includes: an annular body having internal threads; said body having a small bore at one side parallel to the thread axis thereof; an L-shaped anti-reversing pin fabricated from an elastic material, having one leg disposed within said small bore and having its other leg extending generally radially from said bore toward said thread axis for interference engagement with a mating bolt; said one leg having a latching recess disposed adjacent to its free end and facing away from said other leg; said latching recess being engaged by displaced metal of said nut body flowed into said small bore to retain said pin within said bore; the improvement comprising

said latching recess including two contiguous abutment surfaces disposed in intersecting planes parallel to the longitudinal axis of said one leg and inclined at respective selected acute angles from a reference plane parallel to said longitudinal axis and perpendicular to the plane defined by the legs of said pin;

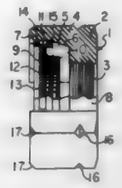
said displaced metal of said body being disposed within said recess to limit oscillation of said free end of said one leg within said small bore through the alternating abutting of said two abutment surfaces with said displaced metal, to allow swinging of said other leg of said locking pin between alternative anti-reversing positions with resultant reduced stress on said locking pin.

4,692,078

NUT DEVICE HAVING AUTOMATIC POSITIVE LOCKING

Alexis A. J. Dessouroux, Belgique, Belgium, assignor to Shurlok International S.A., Belgique, Belgium

Continuation of Ser. No. 526,810, Aug. 26, 1983, abandoned. This application May 23, 1986, Ser. No. 870,302
Claims priority, application France, Aug. 30, 1982, 82 14808
Int. Cl.⁴ F16B *39/12*
U.S. Cl. 411—231 **8 Claims**



1. A nut device having an automatic positive locking, comprising a nut having a longitudinal axis and an internal screwthread, a cavity in the nut, a collar constituting a brake disposed in the cavity and having an internal screwthread substantially similar to the screwthread of the nut, means for retaining the collar in the cavity, means for connecting the collar to the nut so as to cause the collar to rotate with the nut, the collar being axially movable in the cavity between an innermost position in the cavity in which its screwthread is in phase with the screwthread of the nut and an outermost position relative to the cavity in which said screwthreads are no longer in phase with each other, elastically yieldable means interposed between the collar and the nut for biasing the collar in a direction from said innermost position to said outermost position, the collar including axially extending internal keying means formed in the internal screwthread of the collar for cooperating with complementary axially extending external keying means formed in threads of a screwthreaded shaft on which the nut is adapted to be screwed, so that the collar is capable of being immobilized in rotation on said shaft when, in the course of screwing the device on the shaft, the collar is moved by the shaft away from said innermost position toward said outermost position in the cavity and has engaged said external keying means on the screwthread of the shaft and the screwthreads of the collar and the nut are no longer in phase with each other and the collar is freely axially slidable along the shaft, without rotating relative to the shaft and relative to the nut, to said outermost position under the action of said elastically yieldable means, said cavity having an outwardly divergent frustoconical shape and a diameter greater than the diameter of said collar and a radially inwardly extending first flange defining an opening having a diameter which is substantially equal to the diameter of the collar, said collar having a cylindrical body and a radially extending second flange having a diameter roughly equal to the diameter of said opening defined by the first flange, the device further comprising, for retaining the collar in the cavity, a resilient ring which is disposed between the first flange and the second flange and has a section in a plane perpendicular to said axis whose diameter is greater than the opening defined by the first flange, and said elastically yieldable means comprise a resilient split ring disposed at the rear of the collar between the second flange and an axially inner end of said frustoconical cavity and operative to resiliently bias the collar outwardly toward the first flange to said outermost position.

4,692,079

BOWED INTERNAL SPRING RETAINING RING THAT FUNCTIONS REGARDLESS OF ITS ORIENTATION WHEN INSTALLED IN A GROOVE

Edmund F. Killian, Merrick, and Wallace H. Berliner, Woodside, both of N.Y., assignors to Waldes Truarc Inc., Long Island City, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,703
Int. Cl.⁴ F16B *21/18*
U.S. Cl. 411—353 **4 Claims**



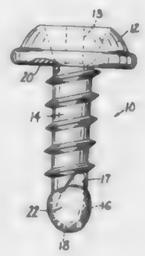
1. In combination, a first component having an internal annular groove, a bowed internal spring retaining ring disposed in said groove, and a second component retained by said ring, said ring being formed of a spring material and comprising a middle section, a pair of spaced apart end sections, and a pair of intermediate sections connecting said middle section with said end sections, said intermediate sections each including a generally radially outwardly projecting first tab, said middle section including a generally radially outwardly projecting second tab, said end sections each including a generally radially outwardly projecting third tab, said ring being symmetrically bowed about an imaginary transverse line disposed between said middle section and said end sections and passing through said intermediate sections, said second tab and said third tabs being flat and coplanar, said flat second tab and said flat third tabs being longer in the radial direction than the radial depth of said groove so as to project radially inwardly beyond said groove and into the path of said second component.

4,692,080

SELF DRILLING FASTENERS AND PROCESS FOR MAKING THE SAME

Jacob Hyner, Waterbury, and Steven Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.

Filed Dec. 13, 1985, Ser. No. 808,514
Int. Cl.⁴ F16B *25/00*
U.S. Cl. 411—387 **1 Claim**



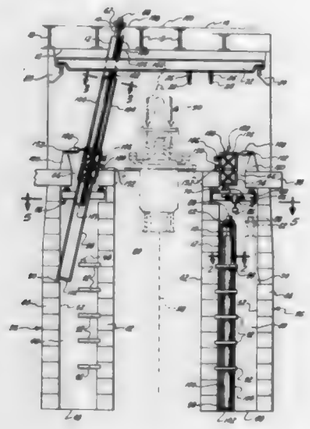
1. A fastener comprising, a screw having a tip area configured as a drill point said tip area being free of corrosion resistant metal electroplating and covered with a cured, frangible coating having a thickness of between 0.01 inches (0.25 mm) and 0.10 inches (2.54 mm), the uncoated remainder of said screw being covered with a deposit of a corrosion resistant electroplated metal having a thickness of from about 0.001 inches (0.025 mm) to about 0.003 inches (0.076 mm).

4,692,081

RISER PIPE ELEVATOR

William Bennett, Ste. 2100, 935 Gravier St., New Orleans, La. 70112, and Angel F. Jimenez, P.O. Box 2769-70459, Slidell, La. 70458

Filed Feb. 25, 1985, Ser. No. 705,102
Int. Cl.⁴ E21B *19/14*
U.S. Cl. 414—22 **25 Claims**



15. A method for storing and retrieving a riser pipe, comprising the steps of:

providing an upright annular magazine comprised of an inside annular wall and an outside annular wall, the magazine having an open top;

storing the riser pipe in a substantially vertically oriented position within the annular magazine; and

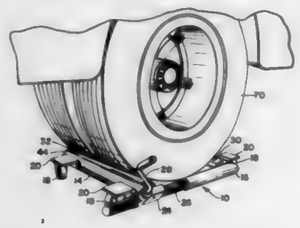
moving the riser pipe upwardly through the open top of the annular magazine at an angle to the vertical along at least a portion of the length of the riser pipe.

4,692,082

ADJUSTABLE DUAL-WHEEL CADDY

Otis O. Smith, Box 352, Frankston, Tex. 75763

Filed Dec. 17, 1985, Ser. No. 809,780
Int. Cl.⁴ B66F *9/12*
U.S. Cl. 414—429 **1 Claim**



1. An adjustable wheel caddy comprising:

a normally horizontally disposed U-shaped support having opposed legs and a connecting bight therebetween, said bright having an integral rack on an upper surface thereof, one of said legs being integral with said bight and one of said legs being movable, said support being adapted to receive a wheel on the upper portion of said legs;

opposed roller members mounted internally to said support, said members extending along the internal surfaces of said opposed legs and disposed so that when a wheel is resting on said caddy it will be supported on said rollers;

wheel means affixed to the lower surface of said U-shaped support for permitting horizontal movement of said caddy; and

adjustment means connecting said movable leg and the bight for displacing said leg toward or away from the leg, said adjustment means including a manual actuator means for permitting displacement of said movable leg only in response to said actuator means so that when a wheel is supported thereon the weight thereof will not displace the leg, said adjustment means comprising

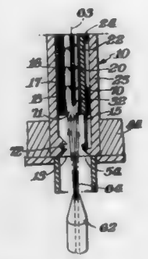
a sleeve and upwardly extending housing mounted on an end of said movable leg adjacent said bight, said sleeve slidably receiving said rack, a spur gear rotatably mounted within said housing in mesh with said rack, a worm gear rotatably mounted within said housing in mesh with said spur gear and a crank handle integral with said spur extending upwardly and outwardly from said housing and being rotatable relative thereto to drive said spur which in turn translates rotation to linear movement of said sleeve, housing and movable leg along said rack whereby said bight will be increased or decreased in length only in response to rotation of said crank handle.

4,692,083

METHOD AND APPARATUS FOR AIR JET ASSISTED FILM UNLOADING FROM X-RAY CASSETTES

Donald F. LeRoux, Elkton, Md., and Quayton R. Stottlemyer, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 22, 1984, Ser. No. 643,186
Int. Cl.⁴ G03B *42/04*
U.S. Cl. 414—411 **12 Claims**



1. An x-ray cassette unloading apparatus, said cassette having adjacent plates contacting a film sheet therebetween and an exit slot, said apparatus having a housing defining a film sheet entrance slot and guide means adapted to position the cassette exit slot in alignment therewith, said apparatus including:

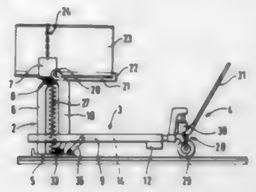
means to separate said plates, and means to direct a fluid stream through said entrance and exit slots of sufficient momentum to loosen a film sheet from contact with the cassette plates, thereby permitting the film sheet to slide freely from the cassette into the entrance slot.

4,692,084

LIFTING APPARATUS

Bertil Persson, Stora Uppåkra 6, S-225 90 Lund, Sweden

Filed Nov. 25, 1985, Ser. No. 802,052
Claims priority, application Sweden, Nov. 28, 1984, 8405994
Int. Cl.⁴ B65F *3/00*
U.S. Cl. 414—607 **9 Claims**



1. A lifting apparatus operable by a lift truck provided with a lift fork movably mounted on lift means, wheel means and a power unit, which lifting apparatus comprises:

(a) a base member;

(b) a lifting unit connected by means of pivotal linkage means to the base member and movable relative thereto:

(c) the base member including means for selective engagement by the wheel means of the lift truck;

(d) the lifting unit including means engageable by the lift fork of the lift truck; and

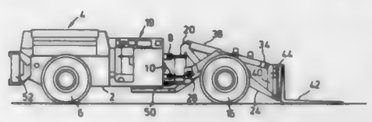
(e) wherein when the wheel means of the lift truck are in overlying engagement with the base member, the lift fork of the lift truck may impart a lifting movement to the lifting unit while the base member resting on a support surface remains in a stationary position on said support surface, and when the wheel means of the lift truck are not in engagement with the base member and the lift fork changes lateral position relative to the engageable means of the lifting unit, the lift fork of the lift truck may lift both the lifting unit and the base member from said support surface.

4,692,085

MATERIAL HANDLING SYSTEM

Michael Parsons, Sudbury, Canada, assignor to Teledyne Canada Limited, Thornbury, Canada

Filed Oct. 22, 1985, Ser. No. 790,131
Claims priority, application Canada, Feb. 27, 1985, 475349
Int. Cl.⁴ B66F *7/00;* **B66C** *23/72*
U.S. Cl. 414—633 **10 Claims**



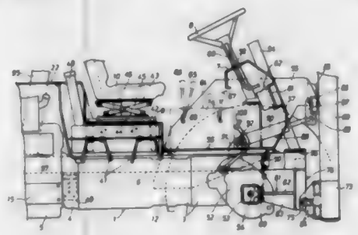
1. A vehicle having a chassis, a prime mover, and an operating console, a first set of driven wheels supporting the chassis, a subframe articulated by pivot means in a vertical axis to one end of the chassis by a second set of wheels supporting the subframe, and means to swing said subframe about the pivot to steer the vehicle; wherein a linkage is mounted to said subframe and extends away from the chassis relative to said pivot so as to swing laterally with the subframe, and a counterweight is mounted on the subframe extending in the opposite direction to the linkage so as to swing with the subframe beneath the chassis, the linkage having a rear generally vertically extending link supported or formed by the subframe, a front generally vertically extending link located forwardly of the second set of wheels and supporting lifting fork means, upper and lower longitudinal links extending generally forwardly from pivotal connections to the rear link to upper and lower spaced pivotal connections to said front link, first actuator means operable to cause relative longitudinal displacement of the upper and lower pivotal connections on the front link, whereby to tilt the front link and hence the lifting fork means backward or forward relative to the subframe, and second actuator means operative to swing the front ends of the upper and lower links up and down relative to the subframe whereby to raise and lower the front link and the lifting fork means.

4,692,086

LOAD HANDLING VEHICLE

Shigeru Morita, and Nobuhide Yanagawa, both of Osaka, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 801,338
Claims priority, application Japan, Nov. 27, 1984, 59-180274[U]; Nov. 27, 1984, 59-251077
Int. Cl.⁴ B66F *9/075*
U.S. Cl. 414—635 **16 Claims**



1. A load handling vehicle including steering means disposed between a pair of front wheel fenders on opposite sides of the body of the vehicle for covering front wheels, a front cover disposed between the pair of front wheel fenders and covering the lower portion of the steering means from the front, a load handling device disposed in front of the front cover and tiltably attached to the front end of the vehicle body, and a pair of opposite tilting cylinders provided between the load handling device and the vehicle body for tilting the device, the load handling vehicle being characterized in that a main frame extends longitudinally of the vehicle and is fixed to each side of the vehicle body at a plurality of locations spaced apart longitudinally thereof, each of the tilting cylinders extending longitudinally of the vehicle and positioned above and close to the corresponding main frame in the vicinity of the front wheel fender inside thereof, each tilting cylinder being connected to a bracket on the main frame in the vicinity of and above a front axle supporting the front wheel, each tilting cylinder terminating at a position below the steering means,

the load handling device is tiltably mounted on a support member extending downward from the front end of each main frame, and the support member is connected by a reinforcing member to a front axle case attached to each side of the vehicle body for supporting the front wheel.

4,692,087

HANDLING SYSTEM AND METHOD FOR SHIP CONSTRUCTION AND REPAIR

Ralph A. Olsen, Santa Barbara, Calif., assignor to Ametek, Inc., Santa Barbara, Calif.

Filed Nov. 4, 1983, Ser. No. 549,268
Int. Cl.⁴ B66F *9/00, 9/06*
U.S. Cl. 414—680 **8 Claims**

6. A material handling apparatus comprising:

a horizontal base having a width and front and rear portions;

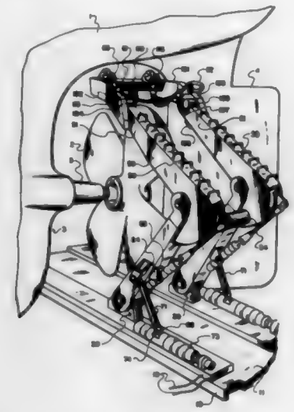
lower arm means comprising a pair of spaced-apart lower arms, each having top and bottom ends, lower pivot means on the bottom end of each lower arm and the base for pivotally mounting the bottom end of each lower arm to the base about an axis extending along the width;

a pair of lower drive means each extending between the base end and one of the lower arms for pivoting the lower arms on the base at the lower pivot means;

upper arm means comprising a pair of spaced-apart upper arms, each having a top end for carrying loads and a bottom end opposite the top end, upper pivot means near the bottom end of each upper arm and on the top end of a lower arm for pivotally mounting each upper arm to a lower arm, the portion of each upper arm from the upper pivot means to the top end extending over the lower arm,

a pair of upper drive means each extending between an upper and lower arm for pivoting the upper and lower arms relative to each other; and

a carriage and receiving means at the top of each upper arm for receiving the carriage between the upper arms, the carriage comprising a pair of shafts extending outwardly into the receiving means, the receiving means receiving the shafts for pivoting the carriage freely between the upper arms relative to the ground.



4,692,088

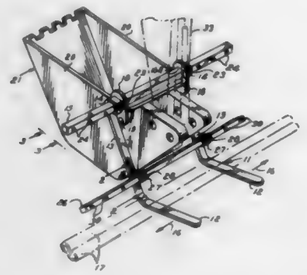
Patent Not Issued For This Number

4,692,089

ATTACHMENT FOR A BACK HOE BUCKET

Charles E. Rodgers, 9007 Noroad, Jacksonville, Fla. 32210, and Herman R. Rodgers, P.O. Box 43, Ellersile, Ga. 31807

Continuation-in-part of Ser. No. 587,054, Mar. 7, 1984, Pat. No. 4,560,318. This application Nov. 25, 1985, Ser. No. 801,200
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.
Int. Cl.⁴ B66F *9/12*
U.S. Cl. 414—724 **22 Claims**



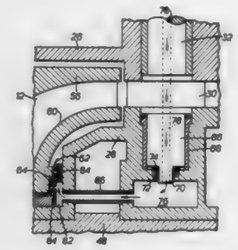
1. In an attachment for a back hoe bucket comprising a pair of elongated spaced support arms secured to and extending above respective side walls of a back hoe bucket adjacent a rear wall thereof, each of said arms having an opening therethrough adjacent its upper end in substantial alignment laterally of a back hoe bucket with each bottom wall forming said opening being generally flush with an upper edge of respective side wall of a back hoe bucket, an elongated upper bar extending laterally outwardly through said aligned openings in said arms and supported by said arms and adapted to be supported by an upper edge of respective side wall of a back hoe bucket, a pair of elongated generally upright members having lower ends and upper ends supported by said upper bar outboard of respective said arms, selective means releasably attaching said upper ends of said upright members in selected lateral positions on said upper bar, an elongated lower bar extending substantially parallel to said upper bar, and means to attach said lower bar to each of said upright members spacedly above said lower ends and generally below a back hoe bucket attachment to a boom of a back hoe vehicle to dispose said lower bar supportingly against a back wall of a back hoe bucket spaced adjacently above its bottom wall.

4,692,090

MULTISTAGE HYDRAULIC MACHINE

Shigekatsu Naka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 729,091, May 2, 1985, abandoned, which is a continuation of Ser. No. 357,147, Mar. 11, 1982, abandoned. This application Aug. 8, 1986, Ser. No. 893,464
Claims priority, application Japan, Mar. 23, 1981, 56-41890; Jan. 14, 1982, 57-3368
Int. Cl.⁴ F04D *9/00, 29/14*
U.S. Cl. 415—112 **2 Claims**



1. A dual purpose electricity generating and water pumping multistage hydraulic machine including coaxially and vertically arranged stages, the highest-pressure stage being uppermost, the machine comprising:

a rotatable shaft;

a plurality of runners mounted on said rotatable shaft, each of said runners being contained in an individual runner chamber to form a plurality of stages;

a stationary element associated with each of said runners;

a seal gap between each of said runners and its associated stationary element;

means for cooling said seal gap particularly when said machine is running dry, said means including:

water chamber means formed in said stationary element of said highest-pressure stage for retaining water, said water chamber means including a plurality of water chambers arranged around each of said plurality of runners associated with said highest-pressure stage and within said stationary element of said highest-pressure stage;

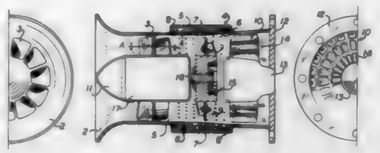
means for communicating water from said water chamber means to said seal gap of at least said highest-pressure stage;

means for supplying water to said water chamber means; and

movable guide vanes formed with upper and lower stems, said movable guide vanes being arranged in a circular

pattern around said runner of at least said highest-pressure stage, wherein said supplying means includes a supply passage in said movable guide vanes and the upper and lower stems.

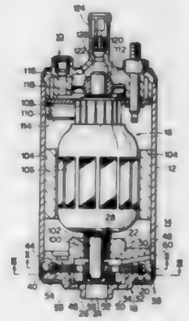
4,692,091
LOW NOISE FAN
Paul E. Ritenour, P.O. Box 27318, San Diego, Calif. 92128
Filed Sep. 23, 1985, Ser. No. 779,059
Int. Cl.⁴ F04D *29/66*
U.S. Cl. 415—119 **16 Claims**



1. A low noise axial flow fan assembly for suppling fluid to a fluid distribution system which comprises:
an external duct having fluid inlet and discharge means;
turning vane means within said duct adjacent to said inlet means for imparting a swirl velocity component to said fluid discharing from said turning vanes;
fan means spaced from said turning vane means for drawing said fluid through said inlet means and exiting said fluid out said exit means, said fan means having rotating blades configured to redirect said swirl velocity component of said fluid in a substantially axial direction through said discharge means; an axial vaned discharge means comprising short vaned diffuser sections position within said duct intermediate said fan means and said fluid discharge means;
acoustical means, positioned intermediate the discharge of said turning vane means and a place prior to said short vaned diffuser section for attenuating sound produced by fluid exiting said vane means and said rotating fan blades:
means to support and rotate said fan wherein said inlet turning vanes, when projected on a plane perpendicular to the axis of said fan, substantially covers the fluid flow area projection thereby substantially preventing sound from discharging from the space between said turning vane means and fan through said turning vane means, wherein said external duct inlet and diffuser sections consist of modular detachable segments, one segment enclosing said turning vanes, a second segment forming a sound cell, closely enclosing said fan tips and a third segment enclosing said short diffuser.

4,692,092
FUEL PUMP APPARATUS FOR INTERNAL COMBUSTION ENGINE
Takeshi Matsuda; Masasi Miyamoto, both of Kariya, and Toshihiro Takei, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Continuation of Ser. No. 671,309, Nov. 14, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 946,164
Claims priority, application Japan, Nov. 25, 1983, 58-220524; Apr. 16, 1984, 59-77275
Int. Cl.⁴ F04D *9/00*
U.S. Cl. 415—143 **9 Claims**

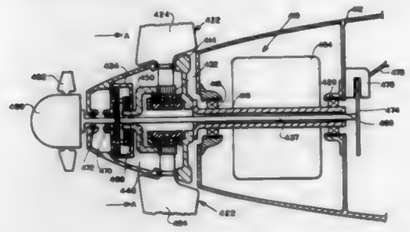
1. A fuel pump to be positioned in a fuel tank of an internal combustion engine the fuel pump having a pump housing and an upright drive shaft, comprising:
(1) a first stage pump section including
(a) a first pump passage formed in said pump housing and communicated at one end with an inlet port of said pump housing;
(b) a first impeller operatively connected to said shaft and operatively arranged in said first pump passage for separating, during rotation thereof, fuel vapor from liquid fuel, introduced from said inlet port, within said first pump passage and pressurizing said liquid fuel; and
(2) a second stage pump section including
(c) a second pump passage formed in said pump housing and communicated at one end to the other end of said first pump passage and at the other end to an outlet port of said pump;
(d) a second impeller operatively arranged in said second pump passage and operatively connected to said first impeller for further pressurizing the liquid fuel supplied from said first pump passage, said second impeller having a larger diameter than said first impeller, said second impeller being arranged at a vertically upper side of said first impeller;



(e) a vapor discharge port formed in said second impeller at a radially inward portion facing said first impeller and communicated at a vertically lower side thereof with the radial inward portion of said first pump passage for causing the fuel vapor separated on said first impeller to flow vertically and upwardly therethrough; and
(f) a vapor discharge passage formed upwardly and radially in said pump housing for communicating a vertically upper side of said vapor discharge port with the outside of said pump within the fuel tank, whereby the fuel vapor flowing out of said vapor discharge port is returned to a portion within the fuel tank vertically higher than said inlet port wherein said first impeller is of a centrifugal type, and said second impeller is of a regenerative type.

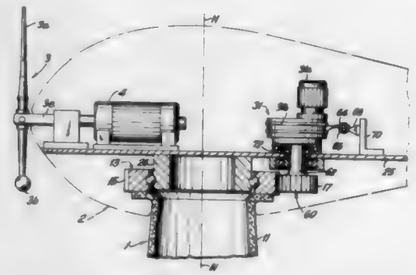
4,692,093
RAM AIR TURBINE
William F. Safarik, Manhatten Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.
Division of Ser. No. 383,084, May 28, 1982, Pat. No. 4,578,019. This application Apr. 10, 1985, Ser. No. 721,736
Int. Cl.⁴ F01D *7/02*
U.S. Cl. 416—1 **13 Claims**

1. In the operation of a ram air turbine, the method of pivotally adjusting the relative pitch of a fluid energy reactive blade member carried upon a rotor member comprising the steps of providing a reference speed shaft, coupling said reference speed shaft to said blade member via linkage means rotatable with said rotor member, and pivoting said blade member via said linkage means in response to a rotational speed difference between said reference speed shaft and said rotor member in a sense to decrease said speed difference, including the step of selectively rotating said reference speed shaft at a chosen



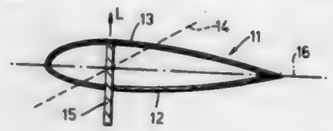
speed, and the alternative step of using a brake apparatus to completely stop rotation of said reference speed shaft.

4,692,094
ROTARY POSITIONABLE INSTALLATION
Ernst Kulinyak, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH
Continuation-in-part of Ser. No. 403,519, filed as PCT WE/81/00177 on Oct. 21, 1981, published as WO 82/01747 on May 27, 1982, abandoned. This application Jan. 31, 1986, Ser. No. 825,069
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043611
Int. Cl.⁴ F03D *11/04*
U.S. Cl. 416—11 **10 Claims**



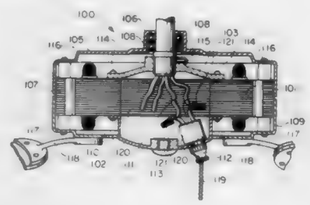
1. A rotary positionable installation, such as a wind energy installation, including an upwardly extending tower (1) of considerable height having a vertical axis and an upper end, an apparatus carrier (2) supported on the upper end of said tower and being rotatable on the upper end about the vertical axis of said tower, and a drive (31) located on the upper end of said tower in operative engagement with said apparatus carrier and the upper end of said tower for positioning said apparatus carrier rotationally about the vertical axis of said tower, said tower with said apparatus carrier and said drive form a combination capable of oscillating around the vertical axis of the tower and having a natural yawing frequency, wherein the improvement comprises adjusting means (18, 19, 27, 29, 33; 42, 44, 46, 48, 50; 66, 68, 74) for variably adjusting the natural yaw frequency of the combination of said tower, apparatus carrier and drive, said adjusting means comprises at least one force transmission element (28, 48, 66, 74) positioned in said combination and connected to said drive and said apparatus carrier, and said at least one force transmission element has a variably adjustable spring stiffness means for adjusting the natural yawing frequency of the installation.

4,692,095
WIND TURBINE BLADES
Henry Lawson-Tancred, Boroughbridge, United Kingdom, assignor to Sir Henry Lawson-Tancred, Sons & Co. Ltd., Boroughbridge, United Kingdom
PCT No. PCT/GB85/00173, § 371 Date Dec. 12, 1985, § 102(e) Date Dec. 12, 1985, PCT Pub. No. WO85/04930, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 23, 1985, Ser. No. 816,127
Claims priority, application United Kingdom, Apr. 26, 1984, 8410669; Sep. 26, 1984, 8424339; Mar. 8, 1985, 8506060
Int. Cl.⁴ F03D *7/04*
U.S. Cl. 416—23 **27 Claims**



1. A wind turbine blade having an envelope which defines an airfoil profile having, in normal operation, a first, high pressure side, a second, low pressure side, and further having a leading edge and a trailing edge, which edges define an airfoil chord line extending between them, and comprising
a blade structure incorporating a fixed blade spar which extends outwardly on said first side from within the blade envelope and perpendicularly across said chord line to a position with respect to the blade cross-section which is external of the blade surface and spaced from said airfoil profile,
said blade spar comprising a strengthening member mounted along the length of the blade and disposed to disrupt air flow over the blade only in the event that the instantaneous wind direction is reversed so that said first side becomes the low pressure side.

4,692,096
CEILING FAN
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan
Filed Jul. 11, 1986, Ser. No. 884,594
Int. Cl.⁴ F04D *29/64*
U.S. Cl. 416—170 R **8 Claims**



1. A ceiling fan to be energized from an external alternating current power source, the ceiling fan consisting essentially of:
a motor housing;
an a.c. motor housed within said motor housing and having a stator which is stationary during operation of the fan, said stator having a longitudinal void formed therethrough, said motor further having a rotor annularly positioned about the stator, said rotor being rotationally moveable during the operation of the fan;
means for securing the motor housing to the rotor for rotational movement therewith;
a plurality of fan blades fixed to the motor motor housing, said blades being equidistantly positioned about the motor housing for rotational movement with said motor housing and said rotor;
a hollow suspension conduit having an upper portion to be

secured to a ceiling for suspension therefrom and a lower portion extending into said motor housing and secured to the stator within said motor housing, said suspension conduit being disposed through the motor housing and being journaled in bearings, wherein rotational movement of the motor housing about the conduit is facilitated;

a single piece switch housing and support positioned substantially directly below the void of the stator and including an inner surface and an aperture;

means within the motor housing for securing the switch housing and support to the stator;

an electrical on/off switch means positioned adjacent to the aperture on the inner surface of the switch housing and support for controlling the operation of the motor, said switch means having an actuator thereof extending through said aperture in the switch housing and support thereby providing manual access to said switch means via the actuator for the operation thereof; and

electrical cables for providing electrical communication between the external power source and the on/off switch means, said electrical cables being disposed through the suspension conduit and the void;

wherein said motor housing consists of an upper cover having a base provided with an aperture centrally formed therein receiving the suspension conduit therethrough and a bearing housing annularly positioned about said aperture in said upper cover, said upper cover further having a downwardly extending skirt portion fixed to periphery of said rotor and being contiguous with said base and a lower cover having a base provided with an aperture centrally formed therein in substantial alignment with the void, said aperture in said lower cover receiving the switch housing therethrough, said lower cover further having an upwardly extending side wall fixed to the periphery of said rotor and being contiguous with said base of said lower cover; and

wherein the switch housing consists of a base, an upwardly extending side wall contiguous with said base of said switch housing, and an outwardly extending rim annularly positioned about and contiguous with said side wall of said switch housing, said rim being fixed to said stator.

4,692,097

PROPELLER WITH REMOVABLE AND ADJUSTABLE BLADES

Bernard Bibollet, Cesson La Foret, France, assignor to Fonderie Musil, Dammarie Les Lys, France

Filed Jun. 25, 1986, Ser. No. 878,304
Claims priority, application France, Jun. 26, 1985, 85 10367
Int. Cl.⁴ B63H *3/12*; B64C *11/06*
U.S. Cl. 416—207 **7 Claims**

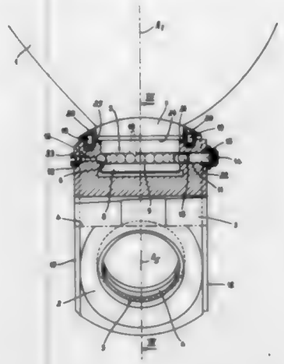
1. A propeller comprising:

a hub centered on and rotatable about a hub axis and formed with a bore extending along the axis and with a plurality of identical, radially outwardly open, substantially cylindrical, and angularly equispaced sockets centered on socket axes extending at least generally radially of the hub axis and formed with an annular groove open inwardly radially of the respective socket axis;

respective identical blades each having a substantially cylindrical base complementary to and snugly fittable in the respective socket coaxial with the respective socket axis and an outer part extending radially outward from the hub along the respective socket axis when the respective base is fitted therein, whereby the blades can turn about the respective socket axes on the hub, each base being formed with an annular but outwardly open groove confronting the respective inwardly open groove when the base is fitted in the respective socket and forming with the respective inwardly open groove an annular chamber, the hub being formed at each socket with a substantially radially extending loading passage having an outer outwardly open and threaded end and an inner end opening at the respective inwardly open groove; and lock means including:

a respective annular array of holding balls generally filling each chamber, each passage being sufficiently large that balls can be introduced through it into the respective chamber,

a respective locking ball radially displaceable in each passage and engageable between two of the holding balls of the respective array, and



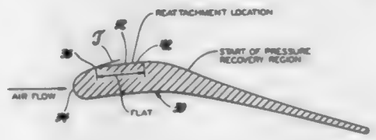
means screwed into the outer end of each passage for pressing the locking ball radially between the respective two holding balls and for thereby releasably locking the bases in the respective sockets against relative movement between the respective blades and the hub and pressing the respective holding balls against the respective grooves.

4,692,098

AIRFOIL FOR HIGH EFFICIENCY/HIGH LIFT FAN

Elias H. Razinsky, Toledo, Ohio; William B. Roberts, Fremont, Calif., and Richard E. Longhouse, Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 297,874, Aug. 31, 1981, abandoned. This application Oct. 15, 1985, Ser. No. 787,503
Int. Cl.⁴ F04D *25/08, 29/68*
U.S. Cl. 416—223 R **13 Claims**



1. An airfoil defining the shape of the blades of an engine cooling fan of a land vehicle which optimally operates in a range of low Reynolds numbers and varying turbulence intensity conditions, said airfoil having a suction surface and a pressure extending from a leading edge to a trailing edge thereof, said suction surface being curved and having triggering means formed thereon closely adjacent to the leading edge of said airfoil to trigger establishment of a discrete laminar air flow separation bubble with a terminal end upstream of said trailing edge of said airfoil which effects the separation of laminar boundary air flowing onto said suction surface of said airfoil at a substantially constant and predetermined point forward of said bubble when operating in said range of low Reynolds numbers and varying turbulence intensity conditions and which provides for the reattachment of air circumventing said laminar separation bubble on said suction surface subsequent to passage over said bubble to thereby provide for high lift and low drag for high efficiency fan performance.

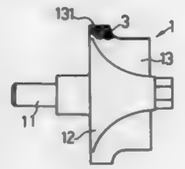
7. A method of improving the air pumping efficiency of a fan having a plurality of blades radiating from a centralized hub to terminal tip portions, each of said blades having a pressure surface and a suction surface leading rearwardly from a forward and radially extending nose portion to a terminal and radially extending edge portion defining an airfoil comprising the steps of designing a mathematical model of a cross section of said airfoil which provides optimized lift and reduced drag and which recognizes the existence of a laminar flow separation bubble and establishes the point of separation of laminar boundary air flowing across said suction surface and said bubble, plotting a section of said airfoil from said mathematical model to provide the shape thereof, establishing a surface discontinuity along a line on said suction surface of said airfoil which corresponds to said point of separation and in a region upstream of a zone on said suction surface in which boundary air naturally transits from a laminar to turbulent flow, tripping the laminar boundary air flowing across said suction surface with said discontinuity to physically establish a laminar flow separation bubble that terminates upstream of said terminal radial edge portion so that laminar boundary air flowing onto said suction surface will become detached adjacent to said discontinuity and flow over said bubble and back onto said suction surface downstream of said bubble in a pressure recovery region of said suction surface thereby providing inproved lift and reduced drag of said blades.

4,692,099

ROTARY COMPONENT OF A ROTARY DEVICE FOR HEAT ENGINES AND A METHOD OF MANUFACTURING THE SAME

Takahiko Homma, Aichi, and Shigetaka Wada, Mie, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jun. 17, 1986, Ser. No. 875,195
Claims priority, application Japan, Jun. 18, 1985, 60-132779
Int. Cl.⁴ F01D *5/34*; C04B *35/64*
U.S. Cl. 416—229 A **8 Claims**



1. In a rotary component of a rotary device for heat engines, formed in an integral ceramic-fiber-reinforced sintered ceramic structure comprising:

a shaft;

a hub; and

vanes radially extending from the circumference of the hub, the improvement wherein:

reinforcing ceramic fibers are distributed in an edge portion of each of the vanes, including side surfaces of each of the vanes, and are oriented substantially parallel to the side surfaces of each of the vanes and radially outward of each of the vanes.

7. A method of manufacturing a rotary component of a rotary device for heat engines, formed in an integral ceramic-fiber-reinforced sintered ceramic structure comprising a shaft, a hub, and vanes radially extending from the circumference of the hub, reinforcing ceramic fibers in the edges of the vanes being oriented substantially in parallel to the side surfaces of the vanes and radially outward of the vanes, which comprises the steps of:

preparing a mold having a cavity of a shape corresponding to that of the rotary component to be formed except that the depth of sections of the cavity corresponding to the vanes is greater than the height of the vanes to be formed;

injecting a fluidized mixture of a ceramic powder, ceramic fibers and an organic additive or additives into the cavity of the mold;

heating a molding thus molded to remove the organic additive or additives;

sintering the molding after the removal of the organic additive or additives to produce a sintered molding; and

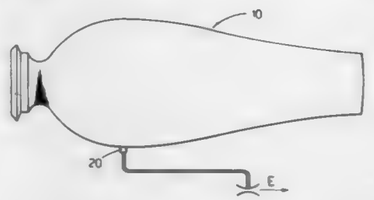
cutting the outer extremities of the vanes to form the vanes in a predetermined height after said molding or said sintering.

4,692,100

VACUUM BLADE FOR A HOLLOW TYPE FAN AND PROCESS

Massimiliano Nardella, Milan, Italy, assignor to F.B.M. Hudon Italiana S.p.A., Italy

Filed Feb. 27, 1985, Ser. No. 706,266
Claims priority, application Italy, Feb. 29, 1984, 19856 A/84
Int. Cl.⁴ F04D *29/38*
U.S. Cl. 416—232 **3 Claims**



1. An improved propeller blade for an industrial fan, the blade having enhanced rigidity and reduced noise production during rotation comprising an airtight hollow shell in the configuration of a blade, the interior of substantially the entire shell defining an inner space, and the inner space being in a vacuum condition.

4,692,101

LIQUID RING VACUUM PUMP ARRANGEMENT HAVING MINIMIZED OPERATING LIQUID CONSUMPTION

Werner Fink, Bardowick, and Heinz Bohn, Rullstorf, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,419
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425616
Int. Cl.⁴ F04C *19/00*; B01D *19/00*
U.S. Cl. 417—68 **9 Claims**

1. An arrangement to minimize the consumption of cooling liquid in liquid ring vacuum pumps, said arrangement comprising:

a liquid ring vacuum pump;

a gas-liquid separator including a gas chamber portion;

an exhaust pipe leading from said pump to said separator;

an operating liquid pipe leading from said separator to said pump;

a cooling liquid pipe coupled to said pump to supply cooling liquid thereto;

a first pipe connecting said gas chamber with said operating liquid pipe and having means for adjusting gas flow to prevent cavitation;

a temperature sensor for measuring the temperature of cooling liquid exhausted from said pump; and

means for adjusting the amount of cooling liquid supplied to said pump in response to the temperature measured by said temperature sensor.

8. An arrangement to minimize the consumption of cooling liquid in liquid ring vacuum pumps, said arrangement comprising:

a liquid ring vacuum pump;

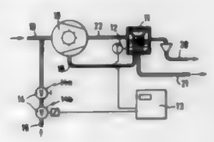
a two stage gas-liquid separator including a cyclone separator first stage and a potential vortex separator second stage;

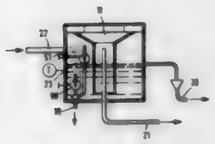
an exhaust pipe leading from said pump to said separator;

a cooling liquid pipe coupled to said pump to supply cooling liquid thereto;

a temperature sensor for measuring the temperature of cooling liquid exhausted from said pump; and

means for adjusting the amount of cooling liquid supplied to said pump in response to the temperature measured by said temperature sensor;





said cyclone separator comprising a cylindrical jacket, a cover part and a bottom part, a tangential pipe inlet on said jacket coupled to said exhaust pipe, a by-pass outlet on said cylindrical jacket for operating liquid, a separator exhaust pipe on said bottom part for exhausting operating liquid, a gas exhaust pipe extending through said bottom part for drawing off of gas, said pipe having its inlet located above said by-pass outlet; and

said potential vortex separator comprising a cylindrical case positioned coaxially within said cylindrical separator, said case having a bottom opening positioned below said by pass outlet and an upper opening connected with the interior of said cyclone separator by a plurality of sheet metal guides which extend essentially tangentially from the interior of said cyclone separator into the interior of said vortex separator.

4,692,102

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Walter Häfele, Fellbach, and Bernhard Schenk, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

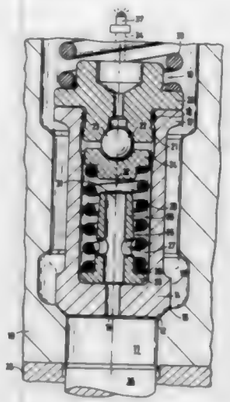
Filed Jul. 15, 1982, Ser. No. 398,513

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138211

Int. Cl.⁴ F04C *49/08*

U.S. Cl. 417—296 **2 Claims**

1. A fuel injection pump for internal combustion engines having a piston defining a work chamber, said pump further including a pressure valve inserted into a pressure line which leads from a pump work chamber to an injection valve, said pressure valve having a valve closing body guided in a carrier and said pressure valve arranged to open in a supply direction of the fuel counter to the force of a restoring spring, said valve closing body provided with a check valve having a movable closing member and a valve seat carrier, said seat carrier of said check valve having an outer flange and provided with an outer first set of threads being secured on said valve closing body provided with an inner second set of threads, and the closing member of said check valve arranged to open counter to the supply direction of the fuel via a spring supported on a base of said valve closing body, characterized in that for the purpose of axially securing said valve seat carrier on said valve closing body, said restoring spring simultaneously engages said valve seat carrier and presses said outer flange of said valve seat carrier against said valve closing body, and further that



both said sets of threads on said valve seat carrier and in said valve closing body cooperate only in a transit position, while in a functional position said first set of threads on said valve seat carrier are screwed all the way through said second set of threads in the valve closing body and are thus released from engagement with said first set of threads and juxtaposed therewith.

4,692,103

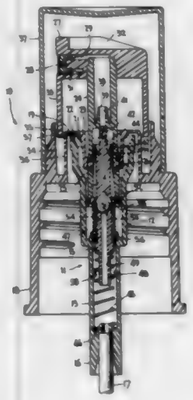
PRECISE OUTPUT PUMP SPRAYER

Walter F. Anderson, West Covina, Calif., assignor to Calmar, Inc., Watchung, N.J.

Filed Apr. 3, 1986, Ser. No. 847,453

Int. Cl.⁴ F04B *21/04, 39/10*

U.S. Cl. 417—547 **4 Claims**



1. A pump sprayer comprising, aligned first and second pistons of relatively large and small diameters respectively working in different diameter portions of a common pump chamber having one end thereof adapted for communication

with a supply of liquid to be dispensed from a container through a dip tube connected to said one end, a valve controlled discharge passage extending through said first piston from said chamber, a valve controlled inlet passage extending into said chamber, a discharge valve seat in said discharge passage facing said pump chamber, said second piston having a discharge valve member engageable with said valve seat in a valve closed position, said discharge valve member being movable together with said second piston away from said valve seat toward said one end into a valve open position in response to a build-up of pressure within said chamber during pumping, means for reciprocating said pistons, a first limit stop on said valve member, a second limit stop on the wall of said discharge passage spaced from said valve seat a predetermined distance for limiting said movement of said valve member upon interengagement of said stops to thereby control the duration during which said discharge passage is open irrespective of different external reciprocating pressures applied during pumping, whereby the output of the sprayer is controlled during pumping.

4,692,104

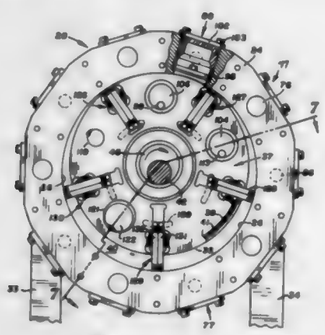
ROTARY PUMPING APPARATUS WITH RADIAL SEAL ASSEMBLIES ON PISTON

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Filed Feb. 18, 1986, Ser. No. 830,335

Int. Cl.⁴ F04C *18/344, 27/00, 29/00*

U.S. Cl. 418—61 R **38 Claims**



1. An apparatus for pumping a fluid comprising: housing means having an inner wall surrounding a chamber, means for controlling the flow of fluid into and out of said chamber, a piston means located within said chamber, eccentric means rotatably mounted on the housing means, said piston being rotatably mounted on the eccentric means whereby angular movement of the eccentric means moves the piston within the chamber, a plurality of seal assemblies movably mounted on said housing means, said seal assembly being located in sealing engagement with said inner wall of the housing means and arranged around said piston means to divide the chamber arcuate chamber segments, each seal assembly having blade means extended between the piston means and housing means, said piston means having generally radial movement relative to each seal assembly, each seal assembly and housing means having cooperating means for allowing limited arcuate movement of the seal assembly comprising a plurality of arcuate slots in said housing means open to the piston means and spaced radially inward of said inner wall, each slot having a radius that is substantially the same as the radius of the inner wall, each blade means having projection means extended into the aligned arcuate slots to restrict movement of the blade means and maintain the seal assembly in sealing engagement with said inner wall of the housing means during movement of the piston means in the chamber whereby said moving piston draws fluid into said chamber segments and pumps the fluid from said chamber segments.

4,692,105

ROLLER DISPLACEMENT MOTOR

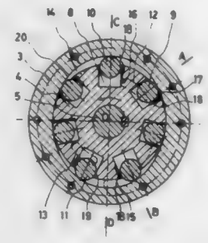
André Leroy, 64 Chaussée de Binche, B 7030 Saint Symphorien, Belgium

Filed May 14, 1985, Ser. No. 733,807

Claims priority, application France, May 21, 1984, 84 08299

Int. Cl.⁴ F03C *2/00;* **F01C** *1/00;* **F04C** *2/00*

U.S. Cl. 418—184 **7 Claims**



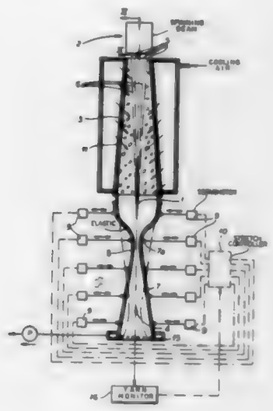
1. A roller-type positive displacement fluid machine including at least a motor unit capable of working reciprocally as a pump and a compressor, the motor unit comprising a housing formed by a cylindrical stator ring and first and second end plates, the stator ring having a cylindrical inner surface with a generally elliptical profile, a shaft rotatably supported within the housing for rotation about an axis, a cylindrical rotor fixed on the shaft within the housing, the rotor having a circular rotor profile and a plurality of slots disposed at equal angular intervals about the surface of the rotor, each slot being defined by a substantially planar leading face and a substantially planar trailing face, a cylindrical roller disposed in each slot, the rollers being sized to have a minimum clearance with respect to the slots so that they freely move radially within the slot for contact with the inner surface of the stator ring, the points of contact between the roller and the leading face over one complete revolution of the rotor describing a geometrical locus of points which define an imaginary closed curve, and the space defined by two consecutive rollers, the rotor surface, and the inner surface of the stator ring constituting a working fluid chamber, the trailing face of each slot having an open channel therein connecting the portion of the slot beneath the roller with the surface of the rotor and the working chamber, and fluid inlet ports and outlet ports disposed within said housing, the inlet ports being entirely located at a radius less than the radius of said imaginary curve formed by said geometrical locus of points and such that the inlet ports may be opened and closed by the leading and trailing faces, respectively, of said slots, and said outlet ports being entirely located at a radius greater than the radius of said imaginary curve formed by said geometrical locus of points and such that the outlet ports are opened and closed by said rollers contacting the inner surface of the stator ring, and wherein the outlet ports are angularly located such that they are opened at substantially the position of a roller at which the roller has reached its maximum radial stroke and will start an inward stroke, and the inlet ports being angularly located such that they are closed by the trailing face of each slot.

4,692,106

APPARATUS FOR STRETCHING THE INDIVIDUAL STRANDS OF A BUNDLE OF FIBERS OR THREADS

Robert Grabowski, Troisdorf, and Walter Krüner, Bonn, both of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jan. 31, 1986, Ser. No. 824,622
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503818
Int. Cl.[4] D01D *5/12*
U.S. Cl. 425—66 7 Claims



1. An apparatus for spinning and stretching a multiplicity of monofilaments, comprising:

a spinning bar formed with a plurality of spinning orifices from which individual monofilaments emerge;

means adjacent said spinning bar forming an elongated blowing compartment receiving said individual monofilaments, said blowing compartment being formed with a plurality of blowing nozzles training jets of stretching and cooling air upon said monofilaments, said blowing compartment having an outlet at which said monofilaments and an air stream formed in said compartment emerge;

flexible wall means forming an elongated stretching chamber connected to said outlet and completely and directly surrounding a bundle formed by all of the monofilaments traversing said stretching chamber, said stretching chamber having the configuration of a venturi nozzle having an annular converging portion proximal to said outlet merging continuously and smoothly into an annular constriction and then continuously and smoothly into an annular diverging portion in a direction of movement of said bundle and said air stream through said stretching chamber;

a multiplicity of motor-driven adjusting mechanisms, each including a control motor, positioned along said flexible wall means and spaced apart in said direction for varying the shape of said venturi nozzle; and

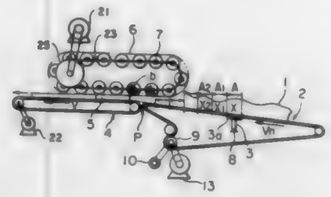
control means connected with said motors for selectively operating same to select said shape.

4,692,107

APPARATUS FOR CONTINUOUSLY PRODUCING AT A FLOW RATE A STRIP OF DOUGH OF CONSTANT DIMENSIONS

Michio Morikawa, and Torahiko Hayashi, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Japan

Filed Mar. 11, 1986, Ser. No. 838,338
Claims priority, application Japan, Mar. 12, 1985, 60-49108
Int. Cl.[4] C01G *1/00*
U.S. Cl. 425—140 3 Claims



1. An apparatus for continuously producing at a constant flow rate of a strip of daugh of constant dimensions comprising:

a variable speed conveyor for feeding dough,

a dough weighing device continuously measuring the weight of each portion of the dough conveyed past the weighing device, the weighing device being located between the opposite ends of the conveyance path of the conveyor,

a constant speed conveyor arranged downstream of and adjacent to the variable speed conveyor,

a control unit for controlling the speed of the variable speed conveyor at a speed inversely proportional to the weight of a dough portion measured by the dough weighing device,

dough defining means positioned on the conveyance path of the constant speed conveyor to define the outer sides of the dough, and

dough holding means including a roller mechanism to hold the dough at portions on the variable speed conveyor and on the constant speed conveyor,

said roller mechanism comprising a plurality of rollers rotatable about their axes and movable along a path including a straight portion above the conveyors,

the straight portion of the roller path being positioned over both the variable speed conveyor and the constant speed conveyor, thereby holding the dough fed between the roller mechanism and the conveyors to produce the strip of dough of constant dimensions.

4,692,108

MOLD FOR THE COVERING AND TRIMMING OF PRODUCTS OF PLASTICS MATERIAL

Franco Cesano, S. Secondo di Pinerolo, Italy, assignor to G.O.R. Applicazioni Speciali S.p.A., Turin, Italy

Filed Mar. 21, 1986, Ser. No. 842,250
Claims priority, application Italy, Jul. 31, 1985, 12550 A/85
Int. Cl.[4] B29C *51/32*
U.S. Cl. 425—292 5 Claims

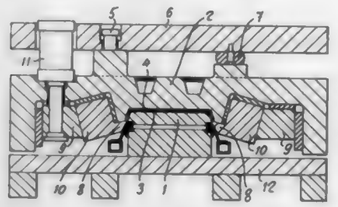
1. A molding apparatus for the production of a shaped laminate having a thermoplastic substrate and a covering material of a flexible sheet material adhering on said substrate, said apparatus comprising:

a male mold member and a female mold member;

each of said mold members having a molding surface and a perimeter corresponding to the desired outline of the substrate;

said mold members being movable in a reciprocating manner relative to each other between a first position wherein the mold members are spaced apart and a second position wherein said molding surfaces are near each other and define a mold substantially corresponding to said shaped laminate;

at least three trimming knives, each of said trimming knives, having a cutting edge located adjacent the perimeter of said male member, said trimming knives being movable substantially transversely to said male member and being adapted to cut both the substrate and the covering material along pre-established edges when said male and female members are in said second position;



said trimming knives including at least two rectilinear side knives associated with rectilinear sides of the perimeter of said male member and at least one shaped knife having a cutting edge corresponding to curved or corner sections of the perimeter of said male member;

said side knives each having planar tapered end extensions and said shaped knife having end portions being slidably engageable with said extensions as said trimming knives are moved substantially transversely to said male member; and

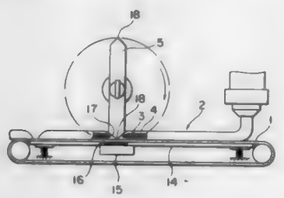
means for simultaneously moving said side knives and said shaped knife substantially transversely to said male member.

4,692,109

APPARATUS FOR CUTTING FILLED CYLINDRICAL DOUGH BODY

Torahiko Hayashi, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Japan

Filed Oct. 15, 1985, Ser. No. 787,619
Claims priority, application Japan, Oct. 13, 1984, 59-215006
Int. Cl.[4] A21C *11/12*
U.S. Cl. 425—308 4 Claims



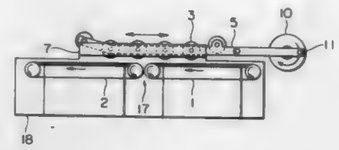
1. An apparatus for cutting a filled cylindrical dough body into pieces without exposing the filler, comprising a conveyor belt and at least one cutter member, arranged above and perpendicularly to the conveyance path of the conveyor belt and provided with a blade having means including a wedge shape of sufficient width for closing the dough over the filler when the blade cuts through the dough body, means for moving said blade to progress in synchronization with the conveyor belt as the blade cuts through the dough body and for lowering the blade into cutting contact with the dough body and then raising it, and means for repeatedly reciprocating it from side to side perpendicularly to the conveyance path as it is lowered.

4,692,110

APPARATUS FOR STRETCHING PLASTIC DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Filed Sep. 3, 1985, Ser. No. 771,887
Claims priority, application Japan, Aug. 31, 1984, 59-183405
Int. Cl.[4] A21C *3/02*
U.S. Cl. 425—335 4 Claims



1. An apparatus to stretch plastic dough, comprising:

a plurality of serially disposed conveyors operable at different speeds;

a plurality of rollers above the conveyors, the rollers being freely rotatable about their axes and driven together in linear reciprocation only back and forth along the conveyance path of the conveyors, the lower portion of the rollers forming a straight portion spaced apart from and above the conveyors by a selected distance for the desired thickness of the dough;

means for driving said plurality of conveyors in the same direction with a conveyor downstream in said direction being driven at a faster speed than a conveyor upstream of said direction in order to provide a stretching action to said plastic material; and

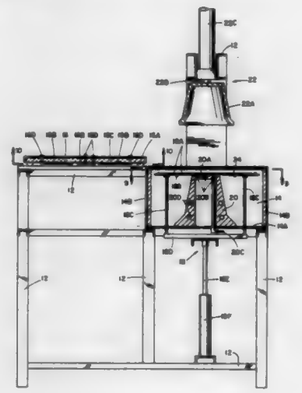
means for driving said plurality of rollers together in linear reciprocation only back and forth above the conveyance path.

4,692,111

APPARATUS FOR FORMING PLASTIC ARTICLES

Curtis D. Wagner, P.O. Box 55753, Houston, Tex. 77255

Division of Ser. No. 595,560, Mar. 30, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 749,734
Int. Cl.[4] B29C *51/00, 51/42*
U.S. Cl. 425—388 6 Claims



1. Apparatus for thermoforming a plastic sheet into an article, comprising:

a first mold means;

platten assembly means for disposing said sheet adjacent said first mold including
means for providing relative motion between said platten assembly and said mold; and
a platform disposable about said mold;
heating means for heating said sheet in an amount sufficient to cause at least a portion of said sheet to conform to said mold; wherein
said means for providing relative motion moves said platform between locations generally upwards of and downward relative to said mold; and
a second mold means removably disposable about said first mold means;
wherein said platform defines a pattern of plural radially extending apertures at which said sheet is free of subjacent support, said apertures providing droop locations for a heated said sheet.

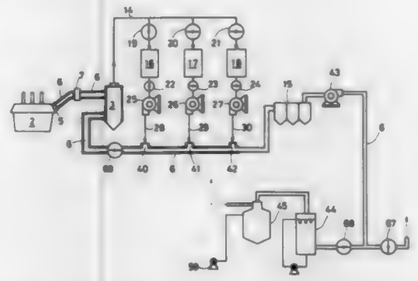
4,692,112
MULTI-PURPOSE LIGHTER ASSEMBLY
Cheng-Ming Chen, No. 5-1, Te-Hui Street, Taipei, Taiwan
Filed Sep. 8, 1986, Ser. No. 904,863
Int. Cl.⁴ F23Q *2/32*
U.S. Cl. 431—253 **1 Claim**



1. A multi-purpose lighter assembly which is characterized by a lighter having a cylindrical fuel container disposed on a right portion thereof and a writing instrument detachably mounted on a left portion thereof in a side by side relationship, a circular protrusion disposed on the top of said writing instrument, a counter-bore in the left portion of the lighter and a counter-bore in the bottom of the fuel container, so that the writing instrument can be attached either to the left portion or under the said cylindrical fuel container of the lighter by engaging said circular protrusion with the respective counter-bore, and a shoehorn with a clip element and a bottom portion so shaped that it can accommodate an end of the writing instrument.

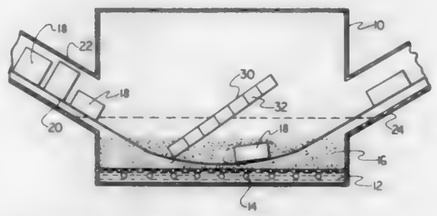
4,692,113
SYSTEM USING ELECTRIC FURNACE EXHAUST GAS TO PREHEAT SCRAP FOR STEELMAKING
Kiyoshi Takai, and Kiyoshi Iwasaki, both of Hyogo, Japan, assignors to Godo Steel, Ltd., Osaka, Japan
Division of Ser. No. 721,461, Apr. 9, 1985, Pat. No. 4,619,693. This application Sep. 10, 1986, Ser. No. 906,120
Claims priority, application Japan, Jul. 23, 1984, 59-152300
Int. Cl.⁴ C21B *3/04;* **F23J** *15/00*
U.S. Cl. 432—72 **4 Claims**

1. A method for clean preheating of scrap contaminated with oil and organic matter, for steelmaking, using heat from exhaust gas flow from an electric furnace, comprising the steps of:
burning any combustibles present in said exhaust gas flow and simultaneously separating out dust particles from said exhaust gas flow;
heating a predetermined amount of said scrap by heat exchange with a predetermined portion of said exhaust gas flow;
removing and collecting dust from said exhaust gas flow after preheating of scrap thereby;



sensing the temperature of said exhaust flow;
scrubbing said exhaust gas flow with an aqueous solution of a deodorant solvent flowing at a rate regulated to be in a predetermined relationship related to said exhaust gas temperature sensed prior to scrubbing, thereby generating saturated vapor and reducing the temperature of said exhaust gas flow by a predetermined amount; and
electrostatically precipitating out oil mist attached to saturated water vapor and liquid droplets in said exhaust gas flow.

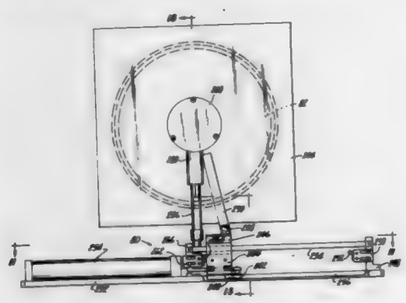
4,692,114
VAPOR LEVEL CONTROL FOR VAPOR PROCESSING SYSTEM
Gerald E. Waldron, Foxboro, and Edward J. Wilson, Wilmington, both of Mass., assignors to Dynapert-HTC Corp., Farmington, Conn.
Filed Mar. 26, 1986, Ser. No. 844,396
Int. Cl.⁴ F23D *5/00*
U.S. Cl. 432—198 **5 Claims**



1. A vapor processing system comprising:
a vessel for containing a processing vapor,
heater means for heating an electronic liquid contained within said vessel to establish a saturated vapor zone, said heater means having a variable output,
means for conveying work product to the saturated vapor zone,
means for defining a selected saturated vapor zone level for work product delivered to the vapor zone including
means for generating a signal representative of the actual temperature at one of at least a plurality of spaced locations within said vessel,

means for generating a signal representative of the desired temperature at the selected vertical location for a saturated vapor zone having a level selected for the work product being conveyed to the saturated vapor zone, and
means for comparing the signals representative of the actual and desired temperatures at the selected vertical location and for varying the output of said heater means to change the actual sensed temperature to the desired temperature so that the actual saturated vapor zone level will conform to the desired saturated vapor zone level.

4,692,115
SEMICONDUCTOR WAFER FURNACE DOOR
Robert E. Aldridge, Anaheim; Russell Elloway, Riverside; William O. Fritz, Anaheim; Ralph D. Goff, and Michael J. Herrera, both of Placentia, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.
Division of Ser. No. 719,409, Apr. 3, 1985, Pat. No. 4,636,140. This application Jun. 30, 1986, Ser. No. 880,422
Int. Cl.⁴ F27D *1/18*
U.S. Cl. 432—242 **8 Claims**



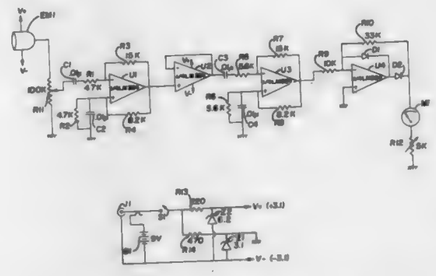
1. In apparatus for treating semiconductor wafers or the like which are carried by a boat, and of the type including the combination of a furnace having a processing tube provided with an opening in one end thereof and a loader adjacent said tube for loading boats into and unloading boats from said tube, said loader being movable along the axis of the tube and passing through said tube opening, the improvement comprising:
a door for engaging and sealing one end of said tube; and,
control means for moving said door along first and second axes between a closed position sealing said one end of said tube and an open position spaced from said end of said tube, said control means including a mechanism for guiding said door along said first and second axes, said mechanism including
first and second elongate guides respectively extending parallel and transverse to said tube axis,
a guide block slidable on said second guide, said door being carried by said guide block,
a carriage slideably mounted in said first guide,
a motor having a drive member transversely shiftable relative to the tube axis, and
means for interconnecting said slide block and said carriage with said drive member.

4,692,116
DENTAL PIN AND HOLDER
Stuart J. Filhol, Castlefreke, County Cork, Ireland
Filed Oct. 16, 1985, Ser. No. 787,981
Claims priority, application United Kingdom, Oct. 16, 1984, 8426117; Jan. 5, 1985, 8500283
Int. Cl.⁴ A61C *5/04*
U.S. Cl. 433—225 **14 Claims**



1. A dental pin comprises an elongate threaded pin portion for insertion into a tooth and a shank releasably connected to the threaded portion, wherein the shank includes at least two shank portions whose axes are inclined at an acute angle to the axis of the threaded portion and the two shank portions are inclined in opposite directions to one another.

4,692,117
ACOUSTIC ENERGY, REAL-TIME SPECTRUM ANALYZER
Allen W. Goodwin, 3051 Kirklevington, #102, Lexington, Ky. 40502
Continuation-in-part of Ser. No. 404,708, Aug. 3, 1982, abandoned. This application Jan. 8, 1984, Ser. No. 689,718
Int. Cl.⁴ G09B *15/00, 19/04*
U.S. Cl. 434—185 **1 Claim**

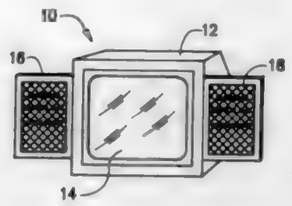


1. A real-time spectrum analyzer for monitoring and visually displaying acoustic energy solely in the range of singer's formant, comprising means for converting said energy to an electrical signal, filtering means having a non-adjustable bandwidth extending from about 2500 to about 3500 Hz and a non-adjustable passband shape consisting of essentially no attenuation throughout the 2500–3500 Hz passband and attenuation at a rate of at least 18 db per octave outside the passband, said filtering means comprising two band-pass filters, one tuned to about 2750 Hz center frequency and the other to about 3,200 Hz center frequency, and unidimensional real-time display means for displaying visually the magnitude of the total amplitude of energy within the fixed said passband while not responding or adjusting to respond to energy outside said passband.

4,692,118
VIDEO SUBCONSCIOUS DISPLAY ATTACHMENT
Richard E. Mould, 291 Gardendale Rd., Encinitas, Calif. 92024
Filed Jan. 28, 1986, Ser. No. 823,456
Int. Cl.⁴ G09B *19/00*
U.S. Cl. 434—236 **17 Claims**

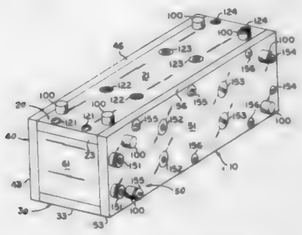
1. An apparatus for the introduction of messages to the subconscious mind, comprising:
panel means defining a generally flat planar surface for

supporting a desired message in a selcted position in the peripheral vision of an observer;
said panel means is designed to be positioned adjacent a television screen during normal viewing thereof;



a message graphically depicted on said panel means; and,
means for partially masking said message in a manner for subconscious awareness without said message interfering with conscious thought.

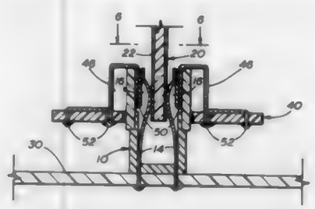
4,692,119
EDUCATIONAL PUZZLE BOX
Hoyt D. Ussery, 5 Elmwood Pl., St. Charles, Mo. 63301
Continuation of Ser. No. 746,967, Jun. 20, 1985, abandoned.
This application Nov. 18, 1986, Ser. No. 933,317
Int. Cl.[4] G09B *19/24;* A63F *9/08*
U.S. Cl. 434—259 6 Claims

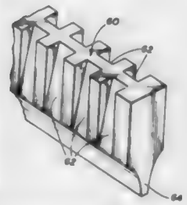


1. An educational puzzle box comprising:
(a) a plurality of non-coded side portions each having a plurality of unthreaded fastener-receiving openings having at least two different dimensions,
(b) a plurality of non-coded cross-members disposed in perpendicular relation to said side portions, each cross member having a plurality of threaded openings associated with the unthreaded openings of the side portions,
(c) a plurality of threaded fastener elements selectively receivable by associated openings of the side portions and the cross members for connecting said side portions and cross members together when said side portions and cross members are properly oriented, at least two fastener elements having different dimensions compatible with the dimensions of the associated openings, and
(d) the threaded and unthreaded openings being alignable to receive compatible fastener elements but the compatibility of all of said openings and fasteners not being immediately apparent so that the assembly of the box presents a puzzle.

4,692,120
ELECTRONIC CARD FOR SHARING THE SAME EDGEBOARD CONNECTOR WITH ANOTHER ELECTRONIC EDGEBOARD
David Y. Feinstein, 7722 Fawn Ter., Houston, Tex. 77071
Filed Oct. 1, 1986, Ser. No. 914,452
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—62 15 Claims

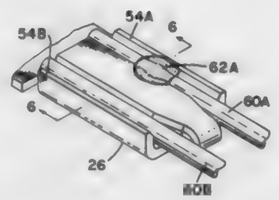
1. An electronic card for sharing the same edgeboard connector with an electronic edgeboard that is to be inserted into the edgeboard connector, wherein said electronic card has a hole with a shape and dimensions matching the outer surface of said edge connector, and wherein said electronic card is further equipped with a plurality of contact means for electrically connecting the various circuits of said electronic card with the





contacts of said edgeboard connector, said electronic card is mechanically supported by said contact means around said edgeboard connector in a plane perpendicular to the plane of said electronic edgeboard so that said electronic edgeboard can be inserted into said edgeboard connector through said hole of said electronic card.

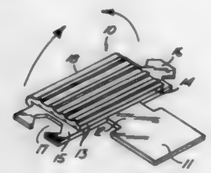
4,692,121
DUAL SLOT ELECTRICAL CONTACT AND METHOD OF MAKING SAME
William C. Arbogast, Jr., Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 3, 1986, Ser. No. 882,126
Int. Cl.[4] H01R *4/02*
U.S. Cl. 439—874 12 Claims



1. An electrical connection of a contact terminal and two conductor wires, comprising:
two conductor wires having selected diameters and being exposed for terminating; and
a contact terminal including a termination section having a spaced pair of conductor-receiving slots extending forwardly from a rearward end thereof, said slots defined by a central portion of said termination section bent back from a rearward end thereof having a selected width and parallel, vertical side edge surfaces, and parallel side walls of said termination section bent vertically upwardly from side portions thereof and spaced from respective said side edge surfaces of said central portion a selected distance at

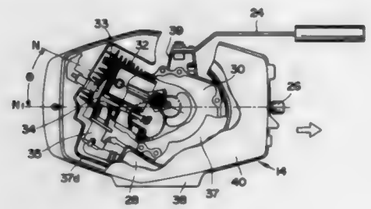
at least one axial location defining a slot width thereat selected to be just less than the diameter of a respective said conductor wire to hold a said wire in interference fit therein and terminated thereto by a weld joint.

4,692,122
ELECTRICAL TERMINAL
Peter Moutalbano, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 6, 1986, Ser. No. 915,416
Int. Cl.[4] H01R *4/18*
U.S. Cl. 439—882 11 Claims



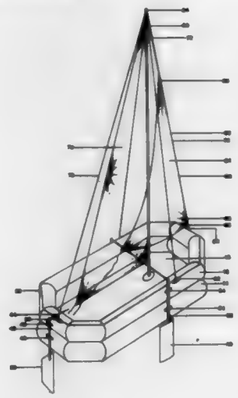
1. An electrical interconnection terminal having a connector portion usable for being in contact with other objects, and having a tubular portion with a wall means surrounding a passageway in which an extended interconnection member can be accepted and secured by said wall means being crimped thereagainst, said wall means having a first portion of a sheet of material folded toward said connection portion and against a second portion of said sheet of material such that said first portion forms an interior surface about said passageway with that junction region resulting between said first and second portions extending between opposite sides of said sheet of material, said second portion having an opening at one said side thereof in which is positioned a mating protuberance extending from said opposite side thereof.

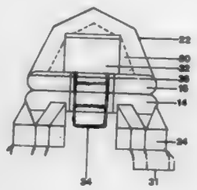
4,692,123
OUTBOARD MOTOR
Yukio Tada; Hiroshi Umeno; Yasuhiro Sugimoto, and Hideo Oka, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 639,295, Aug. 10, 1984, abandoned.
This application Nov. 17, 1986, Ser. No. 931,881
Claims priority, application Japan, Aug. 10, 1983, 58-146979[U]; Aug. 23, 1983, 58-129301[U]; Dec. 3, 1983, 58-187176[U]; Mar. 1, 1984, 59-29679[U]
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—77 23 Claims



1. An outboard engine comprising:
(a) a power unit;
(b) an extension case extending vertically and having the upper end thereof coupled to said power unit;
(c) a propeller mounted on the lower end of said extension case and driven by said power unit;
(d) a handlebar mounted on said power unit;
(e) said power unit comprising:
an internal combustion engine; and
a cover assembly covering said internal combustion engine;
(f) said cover assembly having a foot on one side thereof to form a base for laying down the outboard engine;
(g) said internal combustion engine having a generally vertically extending crankshaft and a cylinder having an axis generally horizontal and perpendicular with respect to said crankshaft and the axis of said cylinder being inclined to another side with respect to the axis of said propeller when viewed in plan, said cylinder axis being inclined away from the side of the cover assembly having said foot, said internal combustion engine having no cylinders which are not inclined to said another side with respect to the axis of said propeller; and
(h) said handlebar being disposed on a side of said power unit toward which the axis of said cylinder is inclined.

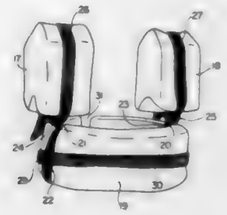
4,692,124
SAIL RAFT - CONVERTIBLE INFLATABLE LIFE RAFT
Terry Harper, Box 731, Venice, Calif. 90294
Filed Oct. 17, 1985, Ser. No. 788,418
Int. Cl.[4] B63C *9/02, 9/04*
U.S. Cl. 441—40 1 Claim





1. A life raft comprising: an inflatable hull; a mast; means for removably supporting the mast in the hull; at least one sail supported by said mast; a tiller/rudder assembly; and means for removably mounting the tiller/rudder assembly to the hull; a lee board/weather jack assembly; and means for removably mounting the lee board/weather jack to the hull, which includes at least one self-filling water ballast bag retractably secured to the side of the hull so the bag can be retracted for sailing and movement of the boat or lowered for stabilizing the boat.

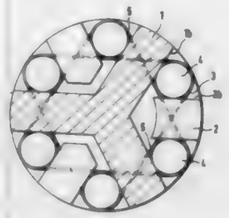
4,692,125
SWIMMING AND BATHING AID
Börje Wessman, Korsuddsvägen 19, Saltsjö-Boo S-13200, Sweden
PCT No. PCT/EP83/00248, § 371 Date Jun. 27, 1984, § 102(e) Date Jun. 27, 1984, PCT Pub. No. WO84/01757, PCT Pub. Date May 10, 1984
Continuation of Ser. No. 626,832, Jun. 27, 1984, abandoned.
This PCT application Sep. 23, 1983, Ser. No. 898,861
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239924
Int. Cl.[4] A63B 31/00
U.S. Cl. 441—112 18 Claims



18. A swimming and bathing aid for a person, comprising:
a generally annular chest ring of buoyant material disposed about the chest of a person and generally beneath the person's armpits and above the person's center of gravity, and defining a gap therein disposed substantially adjacent the person's back, said ring generally maintaining the person in a vertical position in water for swimming and bathing therein; and
a pair of generally block-like arm floating members of buoyant material secured to said chest ring with respective first strips which also surround the respective arm floating members and the person's upper arms so that such members are disposed above the person's upper arms, respectively, in contact with the outer sides of same for following movement therewith, said block-like arm floating members being adapted for generally conforming to the shape of the person's arms for contacting same with defined contact surfaces thereof, and for providing increasing buoyancy thereto as such arms progressively enter water, and such increasing buoyancy providing a force to the person for also generally maintaining same in a vertical position in water for swimming and bathing therein.

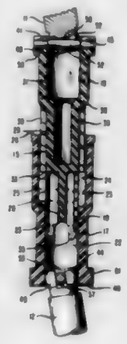
4,692,126
CLAW COUPLING ASSEMBLY FOR TORQUE TRANSMISSION
Klaus Ehrlenspiel; Thomas John, and Wolfgang Streinz, all of Munich, Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany
Filed Apr. 29, 1985, Ser. No. 728,320
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415908
Int. Cl.[4] F16D 3/16
U.S. Cl. 464—103 7 Claims

1. A claw coupling assembly for transmitting torque between two shafts, comprising:
a driving member and a power takeoff member;
a plurality of claws on said driving member and an equal number of claws on said power takeoff member, said claws having lateral surfaces which define therebetween spaces which narrow radially;
movable transmission members interposed between said claws on said driving member and said claws on said power takeoff member within said spaces;
traction means engaging said transmission members on sides thereof remote from the narrowed portions of said spaces, said traction means comprising two flexible endless traction members, one of said traction members being guided around said transmission members and contacting said claws on said driving member in one rotational direction and the other of said traction members being guided around said transmission members contacting said claws in the other rotational direction;
said lateral surfaces on said claws on said driving member and on said power takeoff member comprising in axially central areas thereof a lateral surface projecting in one



rotational direction and being formed in axial border areas on both sides of said central areas with lateral surfaces projecting in another respective rotational direction, wherein said transmission members in said spaces with said projecting lateral surfaces and in said central area and in the border areas also have projecting support surfaces in said central area and in said border areas respectively and wherein said traction means are guided around said surfaces which are recessed relative to said support surfaces.

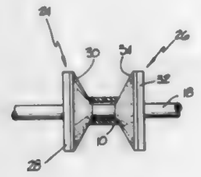
4,692,127
DEVICE FOR A FORCE TRANSMITTING CONNECTION BETWEEN TWO SHAFTS
Alois Wagner, Olching, Fed. Rep. of Germany, assignor to Hasler AG Bern, Bern, Switzerland
Filed Oct. 28, 1985, Ser. No. 792,038
Int. Cl.[4] F16D 3/16, 3/06
U.S. Cl. 464—119 8 Claims

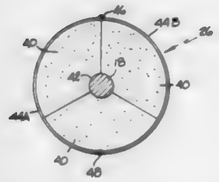


1. A universal joint coupling device for the accomodation of misalignment comprising
a drive shaft have a ball-shaped joint head rigidly attached thereto at one end thereof;
a driven shaft having a ball-shaped joint head rigidly attached thereto at one end thereof;
each ball-shaped joint head having a dog driver slot extending radially therethrough and formed as a groove open to the outer end of said ball-shaped joint head, the bootom of each said groove having a centered protrusion;

an intermediate shaft disposed between said drive and driven shafts, said intermediate shaft comprising an outer tubular part having first and second ends and an inner part having first and second ends, said inner part first end being telescopically received in torque transmitting engagement in said outer tubular part first end, each of said outer tubular part and said inner part having an axial cylindrical bore at said second end, respectively receiving one of said ball-shaped joint heads of said drive and driven shafts; and
a first dog driver bolt anchored to said second end of said outer tubular part; and
a second dog driver bolt anchored to said second end of said inner part, said first dog driver bolt having a length which corresponds to the outer diameter of said outer tubular part and said second dog driver bolt having a length which corresponds to the outer diameter of said inner part, each dog driver bolt having a thickened middle region received in each said dog driver slot which corresponds in length to the respective diameter of said axial cylindrical bores;
said outer tubular part including a radially inwardly extending collar section intermediate the ends thereof;
said inner part including an extension axially extending from said inner part first end and terminating in barbed spring support levers which are snapped past said collar section and limit axial separation of said outer tubular part and said inner part;
said intermediate shaft further including a helical spring interposed between said collar section and said inner part first end to bias said outer tubular part and said inner part in opposite directions to thereby bring the dog driver bolts into continuous close engagement with said centered protrusions.

4,692,128
CONTINUOUSLY VARIABLE TRANSMISSION PULLEY
Thomas H. Sadler, Highlands Ranch, Colo., assignor to Manville Corporation, Denver, Colo.
Filed Jun. 25, 1986, Ser. No. 878,547
Int. Cl.[4] F16H 55/52
U.S. Cl. 474—8 9 Claims





1. In a power transmission arrangment having a drive shaft, a pulley mounted on the drive shaft, a driven shaft, a pulley mounted on the driven shaft, and a drive belt trained over and operatively connecting the pulleys, the improvement comprising:
each pulley having a base portion and a belt engaging face portion;
each belt engaging face portion comprising a plurality of connecting segments, having wear surfaces which together are forming a conical surface,
the wear surfaces of said segments being comprised of a composition including friction modifying material which will erode to a greater extent than the belt as a result of its operative contact with the belt; and
means for removable attaching the face portions of the puleys to the base portions thereof.

4,692,129
TIMING CHAIN DRIVE
Wataru Fuchigami, Iwata, and Yoshiharu Nakayama, Hamamatsu, both of Japan, assignors to Yamaha Motor Co., Ltd., Japan
Continuation of Ser. No. 753,643, Jul. 10, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 5,320
Claims priority, application Japan, Jul. 27, 1984, 59-155469
Int. Cl.[4] F16H 7/06
U.S. Cl. 474—148 1 Claim

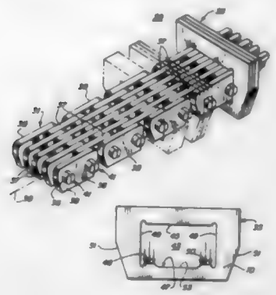


1. A timing drive for driving an overhead mounted camshaft from the crankshaft of an internal combustion engine, said crankshaft having at least one main bearing surface fromed therein for journaling said crankshaft for rotation and a sprocket adjacent said main bearing surface for driving the camshaft, said sprocket having its dedendum diameter smaller than the diameter of said main bearing surface, said crankshaft having a plurality of throws and said sprocket being formed between an adjacent pair of the throws, said dedendum diameter being substantially the same as the diameter of the adjacent portions of said crankshaft.

4,692,130
LOAD BLOCK FOR CHAIN-BELT
Gary J. Novak, Villa Park, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 719,401, Apr. 3, 1985, abandoned. This application May 6, 1986, Ser. No. 860,379
Int. Cl.[4] F16G 5/18
U.S. Cl. 474—201 2 Claims

1. A load block for an endless chain-belt for a pulley transmission having at least two pulleys, which chain-belt comprises:
a carrier including a plurality of links arranged in alternating sets, said sets of links interlaced and joined by pivot means;
a plurality of load blocks, at least one of said load blocks positioned on said carrier between adjacent pivot means;
each of said load blocks defining a single window to receive said carrier therethrough, which window includes a bottom surface, a top surface and two mirrored side surfaces defining said window;
wherein the improvement comprises a pair of coplanar load bearing surfaces adjacent the side surfaces separated by a

central relief segment therebetween below the plane of said load bearing surfaces forming said window bottom



surface, which load bearing surfaces provide the sole means of stress support in the window of said load blocks.

4,692,131

REAR DERAILLEUR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 14, 1986, Ser. No. 862,972

Claims priority, application Japan, May 20, 1985, 60-108562; May 7, 1986, 61-105711

Int. Cl.⁴ F16H *11/00*

U.S. Cl. 474—80 **15 Claims**



1. A rear derailleur for a bicycle, for shifting a driving chain from one to another of multistage rear chain gears of the bicycle, said derailleur comprising:

(a) a base member;

(b) a linkage mechanism comprising a support member, a pair of linkage members and a movable member;

(c) a first horizontal shaft supporting said linkage mechanism swingably to said base member;

(d) a chain guide including a guide sprocket and a tension sprocket;

(e) a second horizontal shaft supporting said chain guide swingably to said movable member of said linkage mechanism;

(f) a first spring interposed between said base member and said linkage mechanism and biasing said linkage mechanism in a direction of moving said guide sprocket away from said rear chain gears;

(g) a second spring interposed between said movable member and said chain guide and biasing said chain guide in a direction of applying tension to said chain, said first and second springs each having a spring force by which a distance between said guide sprocket and said rear chain gear is optimum when said chain engages with one of a smallest diameter rear chain gear and a largest diameter rear chain gear of said multistage rear chain gear; and

(h) a spring force control means for changing the spring force of one of said first and second springs with respect to the other by swinging motion of at least one of said linkage mechanism and said chain guide in excess of a predetermined angle of swing.

4,692,132

PROCESS FOR PREPARING A SEALED LAMINATED VESSEL

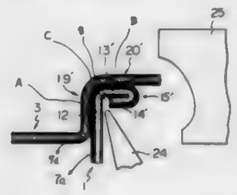
Fumio Ikushima, Yokohama; Senji Itoh, Ayase, and Kiyonori Kogashiwa, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 681,086, Dec. 13, 1984, which is a continuation of Ser. No. 507,921, Jun. 27, 1983, abandoned. This application Feb. 18, 1986, Ser. No. 829,938

Claims priority, application Japan, Jun. 30, 1982, 57-111475; Jul. 9, 1982, 57-118430; Jul. 19, 1982, 57-124430

Int. Cl.⁴ B31B *9/64, 1/90*

U.S. Cl. 493—103 **5 Claims**



1. A process for the preparation of a sealed laminated vessel, which comprises (i) applying to a laminate comprising a paper substrate and a metal foil and having heat-sealable resin layers on both the surface portions of the substrate and the foil a heat-sealable resin layer over at least that portion of the laminate to be formed into an inner side of a seam to cover a cut edge of the paper substrate, (ii) forming the laminate into a cylinder so that the metal foil is located on the inner side and the paper substrate is located on the outer side and lap-bonding an inner end of the laminate to an outer end of the laminate by heat sealing to form a barrel having a straight seam on the side surface thereof, (iii) bending outwardly the laminate on at least one open end of the barrel and bending inwardly a part of the bent portion so that it is lapped on the lower side of the remaining part of the bent portion to form a flat circumferential end portion on at least one open end of the barrel, (iv) fitting a lid member on the circumferential end portion of the barrel, said lid member being composed of a laminate comprising a heat-sealable resin layer and a metal foil, said lid member having a peripheral portion for engagement with the circumferential end portion through the heat-sealable resin layer, said lid member having a vertical rim-like inner wall and a horizontal flange wall, (v) heat sealing the lid member and the circumferential end portion of the barrel, and (vi) engaging the lid member and the circumferential end portion of the barrel with a molding roller having a section conforming to the final shape of the sealed portion to downwardly bend the flange wall of the lid member together with the circumferential end portion of the barrel heat-sealed thereto.

4,692,133

METHOD AND MACHINE TO FORM BOX PARTS

Alan L. Leeper, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Apr. 1, 1986, Ser. No. 847,078

Int. Cl.⁴ B31B *1/62*

U.S. Cl. 493—128 **28 Claims**

28. A method of forming a unit of a box from a blank comprising two sides, a bottom and, at each end, an end flap supporting a cantilevered sealing tab, and two side tabs, one projecting from each of the two sides, the connection between each end flap and the bottom constituting a fold line, which method comprises:

receiving the blank on a table having a surface to receive the blank;

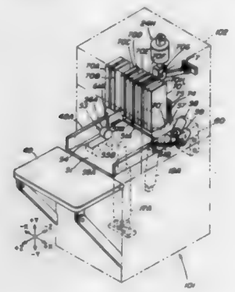
moving the blank along the surface of the table;

folding the two side tabs inwardly and toward each other;

folding the end flap inwardly;

folding the sealing tab inwardly and toward the inner surface of the end flap with the two side tabs sandwiched between the sealing tab and the end flap;

introducing the sides to a finger assembly comprising at least two pairs of press fingers adjacent to the table but initially spaced therefrom, the press fingers being movable be-



tween two alternate stable positions wherein the fingers of a pair are spaced from one another and closed upon one another respectively to receive a folded side of the blank and to close upon that side;

closing the space between the press fingers and the table thereby to move one of the said two sides between each of the spaced finger pairs;

closing the spaced fingers of each pair toward the other finger of the pair to close upon the side therebetween; and

closing the sealing tab and the end flap toward one another with the two side tabs pressed therebetween to adhere these last-named parts to one another, whereby an end is formed on said unit.

4,692,134

MACHINE FOR MAKING UNITIZED STACKS OF BAGS

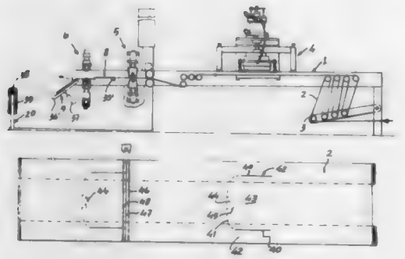
Carlos R. dos Santos Copia, Sao Paulo, Brazil, assignor to Maquinas NPU Ltda., Sao Paulo, Brazil

Filed Jun. 5, 1986, Ser. No. 870,881

Claims priority, application Brazil, Sep. 17, 1985, 8504518[U]

Int. Cl.⁴ B31B *1/98, 23/86*

U.S. Cl. 493—196 **4 Claims**



1. In a machine for making a unitized stack of vest type bags from a tubular web of plastic film comprising, essentially, a horizontal frame, adjoining one of the extremities of which is a unit for unwinding the plastic film, the frame supporting, at the intermediate portion, means comprising transverse rollers for pulling the plastic film and cutting means for cutting the film to define straps and a joining area of the bags, and a sealing and cutter unit being provided at the opposite extremity of said frame to effect transverse seals for closing the bottom and interconnecting the straps of bags being formed in adjacent sections of the plastic film, and to effect transverse cuts for separating adjacent bags and, at the outlet of said sealing and cutter unit, there being provided a bundling and ejector unit for joining a plurality of bags to form a block and for ejecting the then finished block, the improvement comprising the bundling and ejector unit (6) having a sealing table (7), made up by a length of stock with an inverted "U" section, seated fixedly and transversely on the frame (1) and interposed between a tilting vane (8) and a tilting table (9), said length of "U"-section stock having a section thereof provided with a groove (10), adjoining which are lateral and external rubber seats (11) and through which extend one or more sealing electrodes in the shape of pins (12) that perform the joining of the plurality of bags making up a block and alongside of which are needles (13) to stabilize the bags on the sealing table (7), both sealing electrodes (12) and needles (13) being seated on a support (14) for moving upwards or downwards to apply or to withdraw said electrodes (12) and needles (13) from said groove (10) on the sealing table (7) and there being, above the latter, a corresponding depressing bar (15) formed by a length of stock with a rectangular section with the surface thereof facing the sealing table (7) being provided with a longitudinal groove (16) corresponding to groove (10) on the latter and adjoining which an external rubber seat (17) is also provided, said depressing bar (15) moving vertically for urging the plastic film (2) against the sealing electrodes (12) and stabilizing needles (13) and upon which a duct (18) is seated with a plurality of air-emitting nozzles (19) being turned toward the tilting vane (8) and which act in cooperation with the latter, the tilting vane (8) being interposed between the sealing table (7) and the sealing and cutter unit (5), whereas the tilting table (9) is interposed between the referenced sealing table (7) and a support carrier (20), the tilting vane (8) being in a horizontal position for, supporting the plastic film (2) in the displacement thereof from the sealing and cutter unit (5) to the table (7) and moving to a vertical position for extracting a finished bag from the sealing and cutter unit (5), which finished bag is extracted from above the tilting vane (8) by jets of air coming from the air-emitting nozzles (19), with the tilting table (9) being positioned slantingly and downwardly relative to the sealing table (7) and for supporting a block being formed and moving angularly for throwing a then formed block onto the support (20).

4,692,135

SEALER FOR SIDE GUSSETED BAGS

James R. Johason, 3819 Greenhill Dr., Chamblee, Ga. 30341

Filed Apr. 7, 1986, Ser. No. 849,054

Int. Cl.⁴ B31B *1/64, 37/64*

U.S. Cl. 493—394 **7 Claims**

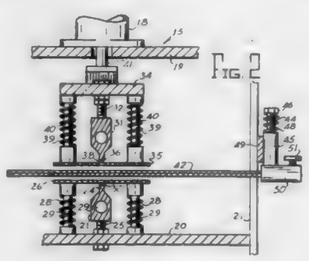
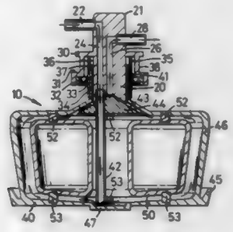


FIG. 2

1. In converting apparatus wherein a web traverses a path and actions are performed on said web as said web traverses said path, said web having an upper portion and a lower por-

tion which are to receive actions separately, said converting apparatus including a dual sealer for sealing said upper portion and said lower portion simultaneously, said dual sealer including a first sealing bar disposed on a first side of said web and fixed with respect to said converting apparatus, a second sealing bar parallel to said first sealing bar and disposed on the opposite side of said web, and means for moving said second sealing bar towards said first sealing bar for sealing said web therebetween, and platen means between said upper portion and said lower portion of said web to maintain such portions separate, said platen means being disposed between said first sealing bar and said second sealing bar so that said upper portion of said web is sealed between said second sealing bar and said platen means and said lower portion of said web is sealed between said first sealing bar and said platen means, said platen means being movable towards and away from said first sealing bar.

4,692,136
CENTRIFUGE
Louis W. Feldman, and David H. Yawn, both of Houston, Tex., assignors to Cardiovascular Systems Inc., The Woodlands, Tex.
Continuation-in-part of Ser. No. 786,780, Oct. 11, 1985. This application Feb. 25, 1986, Ser. No. 833,940
Int. Cl.[4] B04B *7/08*
U.S. Cl. 494—38 **9 Claims**



1. A centrifuge for processing liquids having a first and second assembly of components one of which is capable of rotating relative to the other, the centrifuge comprising

said first assembly of components comprising core means for receiving and expelling the liquid and for transmitting the liquid to said second assembly, said core means having outwardly extending core shoulder means,

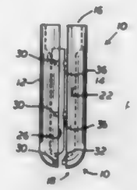
said second assembly of components comprising bowl means rotatively mounted about said core means for receiving the liquid and holding it, said bowl means not tapering outwardly from top to bottom,

hollow interior shell means mounted within said bowl means forming an area in the interior periphery of the bowl means in which elements in the liquid can accumulate,

said bowl means having upwardly extending neck means for receiving said core means, the neck means rotating about said core means during operation of the centrifuge, the neck means having outwardly extending neck shoulder means and wherein seal means are provided between said core means and said neck means for preventing the egress of liquid from between said core means, and

said seal means comprising first ring means connected to said core shoulder means and second ring means connected to said neck shoulder means so that said first ring means and said second ring means sealingly contact each other.

4,692,137
SPLIT TUBE CENTRIFUGE ROTOR ADAPTER
Linda J. Anthony, Mountain View, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Apr. 3, 1985, Ser. No. 719,179
Int. Cl.[4] B01D *00/00*
U.S. Cl. 494—85 **10 Claims**



1. An adapter for retaining a centrifuge sample tube in a generally cylindrical bucket of a centrifuge having a larger diameter than the centrifuge sample tube, comprising:

a first adapter section having a first portion formed generally as a semicylinder with a first longitudinal trough formed in a planar face of said semicylinder and a second portion formed generally as one fourth of a sphere with a cavity therein, said cavity being contiguous with said first trough for receiving a closed end of a centrifuge tube; and

a second adapter section having a second longitudinal trough therein, said first and second adapter sections and said first and second longitudinal troughs being configured such that said first and second longitudinal troughs cooperate to form an enclosed void when said first and second adapter sections are juxtaposed in facing relationship, said void having predetermined dimensions for receiving a centrifuge tube therein, said first and second sections having outer surfaces cooperating to form a generally cylindrical structure for fitting within a centrifuge rotor bucket comprising a generally cylindrical cavity.

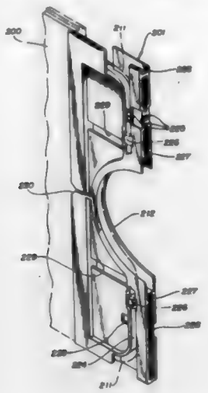
4,692,138
PUMP BLOCK FOR INTERFACING IRRADIATION CHAMBER TO PHOTOACTIVATION PATIENT TREATMENT SYSTEM
Vernon H. Troutner, St. Petersburg, and Martin J. King, Seminole, both of Fla., assignors to McNeilab, Inc., Fort Washington, Pa.
Continuation-in-part of Ser. No. 665,833, Oct. 29, 1984, Pat. No. 4,578,056. This application Feb. 27, 1986, Ser. No. 834,257
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—4 **8 Claims**

1. For use in a patient treatment system, a pump block assembly for interfacing a pump with an irradiation chamber, said assembly comprising:

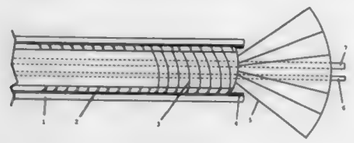
(a) a fluid conduit comprising a first segment having a first fluid port and being linked by linkages serially in flow communication with, first, a metal tube provided for incorporating therein a thermocouple, and second, a second segment, said second segment terminating in a second fluid port and having a flexible pumping section for engagement with said pump for pumping fluid through said conduit;

(b) a pump block having a track-like recess for retaining said fluid conduit, said recess including an arcuate track portion for retaining said flexible pumping section of said second segment, said second segment having first and second expansions, said first expansion being provided between said metal tube and said pumping section and said second expansion being provided between said pumping section and said second port; and

(c) enlarged portions of said track-like recess in said pump block for engaging said expansions, whereby said expansions cooperate with said enlarged portions to prevent creeping movement of said conduit during pumping while isolating said conduit linkages from creeping forces.



4,692,139
CATHETER FOR EFFECTING REMOVAL OF OBSTRUCTIONS FROM A BIOLOGICAL DUCT
Frank B. Stiles, P.O. Box 41, Carp, Ontario, Canada K0A 1L0
Filed Sep. 30, 1985, Ser. No. 781,927
Claims priority, application Canada, Mar. 9, 1984, 449331
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—22 **25 Claims**



1. A catheter for effecting removal of obstructions from a biological duct, comprising a flexible aspiration tube for insertion into said duct such that a first end thereof is disposed in the vicinity of said obstruction and an opposite end thereof is connectable to a source of vacuum for providing suction within said duct at said first end in the vicinity of said obstruction, an injection tube disposed within said aspiration tube for injecting medication into said duct in the vicinity of said obstruction, and an ultrasonic energy source for transmitting ultrasound through said aspiration tube to the vicinity of said obstruction,

whereby said ultrasonic energy and medication cooperate to emulsify and fragment said obstruction and the emulsified and fragmented obstruction is removed from said duct through the aspiration tube in response to suction being provided by said source of vacuum, and

further including a flexible delivery sleeve enveloping said aspiration tube and screw threaded thereto at said first end, said aspiration tube being movable between extended and retracted positions relative to said sleeve by rotation therein.

4,692,140
LAVAGE/SUCTION TIP WITH DUAL SPLASH SHIELD
Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio
Filed Jul. 1, 1985, Ser. No. 750,613
Int. Cl.[4] A61M *7/00*
U.S. Cl. 604—40 **17 Claims**



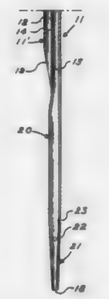
1. A lavage/suction tip or the like comprising:

a first elongated barrel including a distal tip and a proximal end, the first barrel having a first fluid passageway therein extending from one end to the other end;

a first shield connected to the first barrel and extending radially and distally outwardly from the distal tip of the first barrel defining an expanded state of the first shield; and

a second shield located about the first barrel and extending outwardly from the first barrel and adapted to fit about the first shield when the first shield is in said expanded state, and wherein the first shield has a first end and a second end connected therebetween by a wall member, wherein the first end is connected to the distal tip of the first barrel and the second end extends in a direction away from the distal tip and opposite the proximal end, the wall member forms an enlarged chamber therewithin which is in fluid communication with the first passageway, the chamber being open at its second end.

4,692,141
DOUBLE LUMEN CATHETER
Sakharam D. Mahurkar, 6171 N. Sheridan, Suite 1112, Chicago, County of Cook, Ill. 60660
Continuation of Ser. No. 356,081, Mar. 8, 1982, abandoned, and a continuation of Ser. No. 656,601, Oct. 4, 1984, Pat. No. 4,568,329. This application Jan. 29, 1986, Ser. No. 823,592
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—43 **13 Claims**



1. A double lumen catheter having an elongated tube with a proximal first cylindrical portion enclosing first and second lumens separated by an internal divider, the proximal end of said elongated tube connecting to two separate connecting tubes communicating with the respective first and second lumens for the injection and removal of fluid, the first lumen extending from the proximal end of said elongated tube to a

first opening at the distal end of said elongated tube, and the second lumen extending from the proximal end of said elongated tube to a second opening at approximately the distal end of said first cylindrical portion, wherein the improvement comprises;

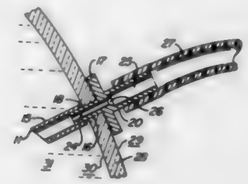
said elongated tube having at its distal end a smooth conical tapered tip that smoothly merges with a second cylindrical portion of said elongated tube, and said second cylindrical portion enclosing the first lumen from the conical tapered tip to approximately the location of said second opening, wherein said second sylindrical portion has a diameter substantially less than a full diameter of said first cylindrical portion but larger than said first lumen in the transverse direction normal to the plane of said flat divider.

4,692,142

SUTURELESS INFUSION CANNULA FOR OPHTHALMIC SURGERY

Bernard J. Dignam, deceased,, late of Belvedere, and Bonnie M. Dignam, heiress, 250 Bay View Ave., Belvedere, both of Calif. 94920

Filed Feb. 24, 1986, Ser. No. 832,906
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—51 **6 Claims**



1. An ocular infusion cannula comprising:

a first tube segment having an open end cut at an acute angle with respect to the axis thereof;

a second tube segment of lesser outer diameter than said first tube segment, joined coaxially to said first tube segment at the end opposite said open end to form a shoulder; and

a flange encircling said second tube segment and spaced apart from said shoulder.

4,692,143

UNIT PACKAGE CONTAINING READY-TO-USE VAGINAL CONTRACEPTIVE

Ilona B. Gero, 180 East End Ave., New York, N.Y. 10028

Continuation-in-part of Ser. No. 598,208, Apr. 9, 1984, abandoned. This application May 19, 1986, Ser. No. 864,497
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—55 **10 Claims**



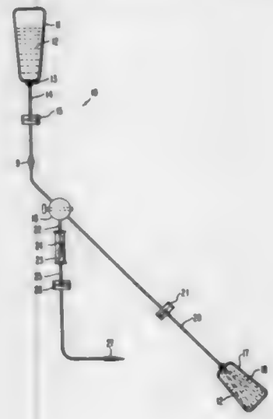
1. A vaginal contraceptive device comprising a sealed packet enclosing therein a porous polyurethane sponge premoistened prior to enclosure in the packet with a sterile bacteria-free aqueous solution of a small but spermicidally effective amount of a water-soluble spermicide, pectin and a pH control and swelling agent and preservative, the sealed packet being readily rupturable for removal of the porous polyurethane sponge with its absorbed components which is immediately ready for use by intravaginal insertion for the prevention of conception during coitus over a period of time up to about 24 hours, said premoistened polyurethane sponge after removal from said packet assuming dimensions exerting non-irritating pressure against the vaginal wall of the user and blocking entrance to the cervix when inserted, means being provided for removing the sponge at will after use.

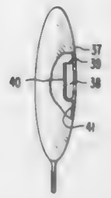
4,692,144

SYSTEM FOR PROVIDING INTRAVENOUSLY ADMINISTRABLE DRUG FORMULATION

Peter F. Carpenter, Atherton, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 642,233, Aug. 20, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,242
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—56 **6 Claims**





1. A method for administering a drug formulation to a warm-blooded animal, wherein the method comprises:

(a) admitting intravenously into an animal in need of a drug formulation a delivery member connected to an intravenously thesapeutic delivery system, the system comprising:

(1) a first container housing an intravenously acceptable fluid;

(2) a second container housing an intravenously acceptable drug, said second container having an internal pouch that houses said drug, said pouch having fluid impermeable sidewalls, a fluid impermeable bottom wall and an upwardly facing opening so that a drug in the pouch leaves the pouch solely via said upwardly facing opening when fluid is introduced into said second container;

(3) means for conveying fluid from the first container into the second container;

(b) conveying fluid from the first container into the second container by moving at last one of said containers to a position whereby the second container is lower than the first container;

(c) letting fluid from the first container into the second container for contacting the drug, thereby forming in situ a drug formulation acceptable for intravenous administration; and,

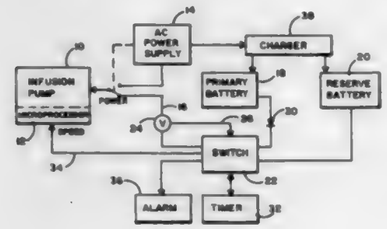
(d) administering the drug formulation to the warm-blooded animal in a therapeutically effective amount by positioning the second container above the first container to permit drug formulation to flow from the second container to the delivery member for administering to said animal.

4,692,145

POWER SYSTEM FOR INFUSION PUMPS

Robert R. Weyant, Claremont, Calif., assignor to American Hospital Supply Corporation, Deerfield, Ill.

Filed Oct. 15, 1984, Ser. No. 660,940
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—65 **12 Claims**



1. The method of providing operational safety for a variable-speed, battery operated infusion pump, comprising the steps of:

(a) operating said pump at normal operating speed substantially above the KVO speed in a primary mode wherein said pump is powered by a primary battery, as long as the primary battery voltage remains above a predetermined threshold level;

(b) operating said pump at normal operating speed in a reserve mode wherein said pump is powered at least by a reserve battery for a predetermined time interval after said primary battery voltage drops below said threshold;

(c) operating said pump at said KVO speed under reserve battery power following said interval.

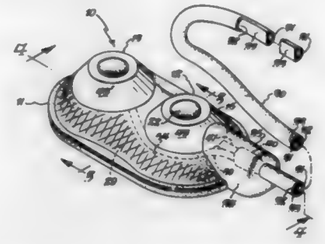
4,692,146

MULTIPLE VASCULAR ACCESS PORT

Gerald E. Hilger, Medina, N.Y., assignor to Cormed, Inc., Murray Hill, N.J.

Filed Oct. 24, 1985, Ser. No. 791,124
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—93 **17 Claims**

13. A double lumen implantable vascular access port comprising a base, first and second separate lumens in said base with a base portion therebetween, first catheter means having first and second ends with said first end in communication with said first lumen and said second end remote from said first lumen, second catheter means having a first end in communication with said second lumen and a second end remote from said second lumen, a portion of said second catheter passing alongside said first lumen and through said base portion to said second lumen, a cap forming an upper portion of said first lumen, and an outer portion on said cap, said portion of said second catheter being located under said outer portion of said cap to thereby protect said portion of said second catheter



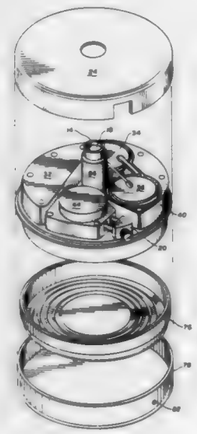
against inadvertent puncture by a needle passing alongside said outer portion of said cap.

4,692,147

DRUG ADMINISTRATION DEVICE

Stephen R. Duggan, Rosemount, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 591,739, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 348,384, Feb. 12, 1982, abandoned, which is a continuation of Ser. No. 136,510, Apr. 2, 1980, abandoned. This application Jul. 19, 1985, Ser. No. 757,092
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—93 **11 Claims**



1. A medical device comprising:

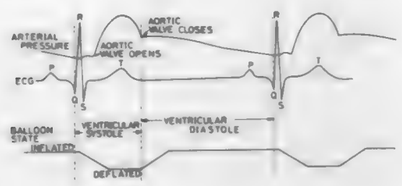
reservoir for the storage of liquid;

means operatively coupled to said reservoir for dispensing said liquid;

means operatively coupled to said dispensing means for controlling said dispensing means in response to programming signals; and

means for generating programming signals wherein said programming signals further comprise a set of dispensing signals wherein each of said dispensing signals further comprises a dosage value and an interval value representing a time period wherein no liquid is dispensed.

4,692,148
INTRA-AORTIC BALLOON PUMP APPARATUS AND METHOD OF USING SAME
Adrian Kantrowitz, Pontiac; Paul S. Freed, Bloomfield Hills, both of Mich.; Hiroyuki Tachi, Tokyo, and Akira Suzuki, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Mar. 28, 1986, Ser. No. 845,557
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—96 **9 Claims**



1. A method of disposing a balloon inside an aorta, comprising the steps of:
disposing at least a pair of spaced electrodes inside a thoracic aorta near a patient's heart;
sensing a R-wave and a P-wave by said electrodes,
and
using the P-wave and R-wave morphologies and their related magnitude to determine the optimal placement of the balloon pump, as close as possible to the atria.

4,692,149
CATHETER WITH REMOVABLE CONNECTOR
Helmut W. G. Rosenberg, McHenry, Ill., and George W. Drach, Tucson, Ariz., assignors to The Kendall Company, Boston, Mass.
Continuation of Ser. No. 683,055, Dec. 18, 1984, abandoned. This application Aug. 12, 1986, Ser. No. 895,770
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—99 **6 Claims**



1. A nephrostomy catheter, comprising:
an elongated shaft having a drainage lumen extending through the shaft, wherein the shaft includes an inflation lumen extending along the shaft, the catheter includes an elastic sleeve bonded in circumferential zones to a distal portion of the shaft, and an inflation valve of relatively small diameter permanently attached to the shaft and communicating with the inflation lumen;
said catheter having a hollow connector removably connected to a proximal end of the shaft
an adapter removably received in the connector; and
a drainage tube fixedly attached to the adapter.

4,692,150
TAMPER EVIDENT BAND
James P. Cianci, Gary, and James R. Gross, St. Charles, both of Ill., assignors to The Kendall Company, Boston, Mass.
Filed Sep. 25, 1985, Ser. No. 780,042
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—111 **13 Claims**



1. A catheter drainage assembly comprising:
a catheter having a funnel at its proximal end;
a drainage tube adapter matable with said funnel; and
a tamper-evident band means comprising a tearable solvent expandable annular ring disposed about the juncture of said funnel and said drainage tube adapter.

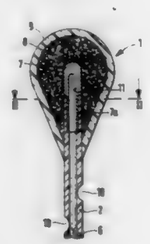
4,692,151
PARENTERAL FLUID MEDICATION RESERVOIR PUMP
Seymour N. Blackman, 1530 Palisade Ave., Fort Lee, N.J. 07024
Filed Mar. 4, 1986, Ser. No. 835,942
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—132 **4 Claims**



1. A disposable parenteral fluid medication pump, comprising:
(a) an elongated reservoir expandable to an expanded position and collapsible to an original position, said reservoir having a pair of end walls spaced longitudinally apart of each other by a constant longitudinal distance, a pair of generally planar side walls integral with and extending longitudinally between the end walls, said side walls lying in parallel planes and being movable toward and away from each other in mutual parallelism in a transverse direction generally perpendicular to their planes to bound a variable transverse distance, and a pair of elastic walls integral with and extending between the side walls, said elastic walls being foldable toward and away from each other, all of said walls bounding an interior;
(b) a closeable inlet at one end wall and through which a parenteral fluid medication is introduced into the interior of the reservoir to expand the reservoir due to outward pressure exerted by the medication to the expanded position in which the side walls are moved far apart of each other and the elastic walls are unfolded to form a generally rectangular cross-section for the reservoir;
(c) a needle mounted at and extending through the other end wall, said needle being in fluid communication with the interior of the reservoir and having a pointed end insertable into a patient to be administered with the medication; and

(d) said elastic walls having a memery characteristic with a slow rate of return and being foldable toward each other, while concomitantly linearly and transversely moving the side walls closer together, from the expanded position to the original position during which the linearly moving side walls controllably and continuously discharge the medication through the pointed end of the needle in small doses over an extended period of time.

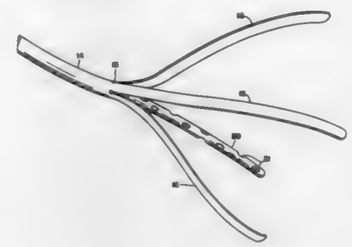
4,692,152
MEDICAL TUBE
Carsten Emde, Berlin, Fed. Rep. of Germany, assignor to Fresenius AG, Fed. Rep. of Germany
Filed Mar. 15, 1985, Ser. No. 712,265
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409663
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—164 **10 Claims**



1. A medical device, particularly a catheter or feeding tube comprising: a tube having a passage therethrough, having a proximal end for receiving a flowable substance, a closed leading end portion closing the distal end of said tube, and at least one radial opening in said tube located close to but proximal from said closed end portion, said leading end portion comprising a metallic head portion having an axial bore journalled thereinto, and a withdrawable mandrin passing axially through said tube and into said bore in said head portion, and a substantially teardrop shaped bolus surrounding said metallic head portion, the portion of greater radius being at the distal end, said bolus comprising an inner segment of a pharmacologically harmless substance capable of being safely absorbed by the human system and a coating layer coating said inner segment of a physiologically acceptable material substantially resistant to stomach acids.

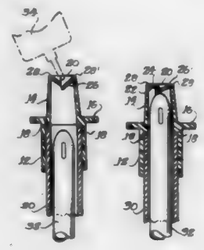
4,692,153
SURGICAL WOUND DRAIN DEVICE
Richard B. Berlin; Richard B. Berlin, Jr., both of 309 Engle St., and Stephen L. Javna, 163 Engle St., all of Englewood, N.J. 07631
Filed Apr. 3, 1986, Ser. No. 847,704
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—171 **14 Claims**

1. A polyfunctional surgical drain device for a closed wound drainage system which comprises (1) an outer elongated flexible tubular member; (2) a detachably removable inner elongated flexible tubular member which is in a coextensive and slidable relationship with the outer tubular member, wherein the outer tubular member has one or more thin pliable tail strips extending from the distal end periphery, and the inner tubular member is a catheter with a central lumen and a plurality of perforated drainage ports and with the distal end extending beyond the distal end of the outer tubular member, and the catheter has a rim-flanged proximal end which is in abutting contact with the proximal end periphery of the outer tubular member; and (3) a hollow sleeve member with an end which forms a sealed attachment to the abutting proximal ends of the



tubular members, and with an end which is adapted to connect with a suction drainage fluid reservoir.

4,692,154
CATHETER GUIDE
Denis C. Singery, Hoffman Estates, and Ronald O. Gordon, Rolling Meadows, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Jun. 2, 1986, Ser. No. 869,416
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—172 **3 Claims**



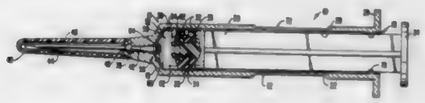
1. A catheter guide for use in inserting a catheter through a urethra into a bladder comprising a molded one-piece device of resilient material having a tubular portion of a predetermined length which is insertable partially into the urethra, and a plurality of flaps integral with the tubular portion and located at a distal end of said tubular portion, said flaps being molded in a first position, said flaps in said first position extending toward each other and away from said distal end into said tubular portion and said flaps having lengths such that an opening is formed for allowing lubricating material to be inserted into the guide through said opening after the catheter has been inserted partially into the tubular portion, said flaps being manipulatable by the catheter into a second closed position, the length of said flaps allowing said flaps to abut one another for preventing contamination of the catheter as said guide enters a urethra and said flaps being manipulatable by the catheter into a third position with said flaps extending out of said tubular portion for permitting the catheter to pass therethrough.

4,692,155
CATHETER
Gabriele Zimmer, Homburg, Fed. Rep. of Germany, assignor to pfm, Plastik fur die Medizin GmbH, Cologne, Fed. Rep. of Germany
Filed Dec. 12, 1985, Ser. No. 808,280
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445560
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—177 **7 Claims**



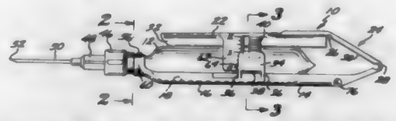
1. A two piece cut elastic catheter tube having a closed distal end having perforations and having a connecting part arranged at the rear end and having a metal cannula having a pair of plastic wings secured thereto inserted between the cut catheter tube in the proximity of the rear end of the catheter tube, the parts of the cut catheter being attached onto the metal cannula and fastened by means of fixing threads, the catheter tube being pressed on ring grooves on the exterior side of the metal cannula.

4,692,156
DISPOSABLE SYRINGE WITH RETRACTABLE CANNULA
Irene Haller, 7981 Stonehurst Ct., Pleasanton, Calif. 94566
Continuation-in-part of Ser. No. 806,100, Dec. 6, 1985, abandoned. This application Apr. 14, 1986, Ser. No. 851,532
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—195 **11 Claims**



1. An improved hypodermic syringe, comprising:
a hollow barrel substantially closed at a forward end and provided with an open rearward end;
a piston means in reciprocable sealing engagement with the interior of said barrel, defining a chamber in said barrel for containing fluid;
a cannula, the rearward end of which is mounted at the closed end of said barrel, the forward end of which protrudes from said barrel, said cannula having an interior passage; and
an aperture at the forward end of said barrel communicating said cannula interior passage with said chamber, the improvement which comprises a means for retracting said cannula within said chamber, said retracting means including an engaging means at the forward end of said piston means attachable to the rearward end of said cannula, whereby subsequent to discharge of fluid from said chamber, said piston means engages and retracts said cannula, and wherein said barrel has a thin-walled section between its forward and rearward ends so that the barrel may be deformed after said cannula is retracted thereby preventing all subsequent protrusion of said cannula from said barrel or complete removal of said plunger from said barrel.

4,692,157
SQUEEZE-ACTUATED SYRINGE WITH POSITION-SELECTABLE LOCK
Boris Landau, Huntington Beach, and Marius Saines, Los Angeles, both of Calif., assignors to Ergomed, Huntington Beach, Calif.
Continuation-in-part of Ser. No. 695,457, Jan. 28, 1985, Pat. No. 4,581,021. This application Dec. 23, 1985, Ser. No. 812,773
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—214 **22 Claims**



1. A syringe for use with a collapsible ampul adapted for attachment to a hypodermic needle, said syringe comprising:
a body having an exterior surface and an interior surface defining a receptacle adapted to receive said ampul, said body having a proximal end and a distal end;
pressure application means, operatively connected to the distal end of said body for applying pressure against said ampul received in said receptacle when said pressure application means is squeezed toward said interior surface; and
pressure-responsive locking means, engageable between said body and said pressure application means, for (a) defining a plurality of selectable positions for said pressure application means relative to said receptacle, and (b) releasably locking said pressure application means in a selected one of said selectable positions;
whereby said locking means engaged said pressure application means with successive ones of said selectable positions as said pressure application means is squeezed toward said interior surface.

4,692,158
PORTABLE IRRIGATION ASSEMBLY
Ingrid B. Bloxom, Jr., P.O. Box 357, Wicomico, Va. 23184
Continuation-in-part of Ser. No. 719,175, Apr. 2, 1985, Pat. No. 4,617,011. This application Feb. 3, 1986, Ser. No. 825,506
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—260 **11 Claims**



1. An irrigation assembly of the type designed for the flushing of fecal matter from an intestine, said assembly comprising:
(a) a container structure to contain irrigating liquid therein and thereby define a reservoir for storage of irrigating liquid prior to and during an irrigating process,

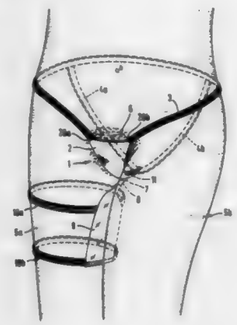
(b) introduction means for introducing the irrigating liquid into the intestine being flushed,
(c) a conduit having an elongated configuration and a hollow interior extending along the length thereof, said conduit attached at its opposite ends to said container and said introduction means respectively,
(d) said conduit interconnected in fluid communication with and between said container and said introduction means and structured to define a path of fluid fow of said irrigating liquid between said reservoir and an intestine to which that introduction means is secured,
(e) an indicator element dimensioned and configured to pass along a flow path on the interior of said conduit, said flow path defined by a predetermined length of said conduit spaced from said opposite end thereof,
(f) said indicator element structured to have a specific gravity substantially equal to water and be substantially suspended therein when said conduit is disposed in a substantially upright orientation,
(g) said indicator element further structured and disposed to travel in a direction of liquid flow along said flow path to a first end thereof as said irrigating liquid passes from said reservoir to said introduction means,
(h) said indicator element further structured to travel from said first end of said flow path to a second end thereof upon reverse flow of irrigating liquid along said path of fluid flow caused by establishment of peristaltic action within the intestine being flushed,
(i) said conduit being constructed along at least a portion of said flow path for monitoring of travel of said indicator element along the length of said flow path between said first and second end thereof,
(j) said first and said second ends of said flow path each comprising flow restricting structures formed on said conduit and dimensioned to prevent passage of said indicator element therebeyond,
(k) flow control means attached to said conduit and disposed and structured for controlling flow of said irrigating liquid from said reservoir to said introduction means and the intestine being flushed, and
(l) said flow control means activated to stop flow to the intestine upon travel of said indicator element to said second end of said flow path.

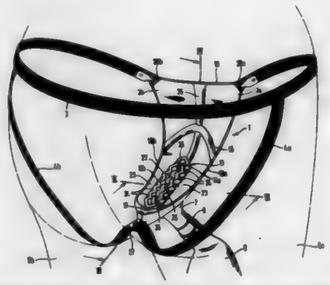
4,692,159
OSTOMY POUCH FLUSH NOZZLE
James J. Kuzemchak, P.O. Box 741, Indiana, Pa. 15701
Continuation of Ser. No. 773,294, Sep. 6, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 917,303
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—277 **3 Claims**



1. A flushing device for a ostomy bag wherein the ostomy bag has an opening therein and a flexible annular ring having walls forming a U-shaped cross-section surrounding the opening in the bag extending outwardly away from said bag of a predetermined width, said flushing device comprising a circular plastic disk means, said disk means having a rear face and front face and comprises:
a base flange extending from the rear face of said disk means,
a cylindrical adaptor extending from said base flange and being smaller in diameter than said base flange and slightly larger in diameter than the inner diameter of the U-shaped flexible annular ring at the opening of said ostomy bag,
said cylindrical projection including a forward circular flange slightly larger in diameter than said cylindrical projection and smaller in diameter than said base flange, said forward lip positioned at the front end of said cylindrical projection at a distance from said base flange substantially the same as said width of said flexible annular ring surrounding the opening of said ostomy bag,
said disk means having an enlarged opening therein extending from the rear face thereof through the base flange and said cylindrical projection and terminating at the inner surface of said front face of said disk means, said enlarged opening having internal thread means therein for receiving and forming a water-tight seal with a male-threaded water nozzle from a hose,
at least one opening through the the front face of said disk means whereby when said disk means is attached to a hose and the front face is forced into the opening with the U-shaped annular ring surrounding the opening of said ostomy bag, said cylindrical projection between said base flange and said forward lip fits inside the opening within the walls forming said U-shaped flexible ring to retain the ring between said lip and base flange, so that the ring is firmly retained in water tight arrangement to enable the ostomy bag to be flushed without leakage.

4,692,160
URINE COLLECTOR FOR INCONTINENT WOMEN HAVING ZIG-ZAG WALLS
Max Nussbaumer, Scheibenstrasse 13, CH-3014 Bern CH, Switzerland
PCT No. PCT/CH85/00081, § 371 Date Jan. 14, 1986, § 102(e) Date Jan. 14, 1986, PCT Pub. No. WO85/05264, PCT Pub. Date Dec. 5, 1985
PCT Filed May 14, 1985, Ser. No. 818,805
Claims priority, application Switzerland, May 15, 1984, 2375/84
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—331 **9 Claims**





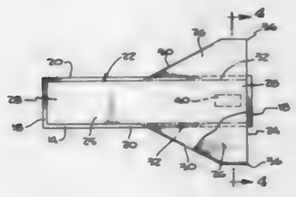
1. A urine collector for incontinent women comprising a

crotch piece having a substantially longitudinal axis and provided with attachment points at each corner for support belts and an outlet for connection to a urine collecting bag; characterized in that a collector structure is disposed in the crotch piece with a collecting cavity disposed under said collector structure and said outlet leading out of said cavity, wherein said collector structure comprises two side walls having a zig-zag shape in plan view extending along the longitudinal axis of said collector and joining at the respective ends of said collector structure, the urine collector further characterized in having boundary means as part of the crotch piece defining a moist zone surrounding the collector structure beyond which boundary means urine cannot penetrate said boundary means comprising a border of said crotch piece and undergoing transition to front and rear beads inwardly of the front and rear edges of said crotch piece.

4,692,161
HOT MELT ADHESIVE WASTE BARRIER

Paul P. Puletti, and Stanley J. Decowski, Jr., both of Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 719,196, Apr. 3, 1985, Pat. No. 4,627,847. This application Jun. 26, 1986, Ser. No. 878,908
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—366 **2 Claims**

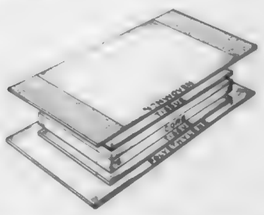


1. A disposable bed pad comprising an absorbent core encased in a liquid permeable nonwoven sheeting, wherein substantially the entire surface of the nonwoven sheeting which is in direct contact with the bottom surface of the absorbent core is coated with a water insoluble or water impermeable hot melt adhesive thereby providing a leakage resistant barrier.

4,692,162
SANITARY NAPKIN WITH INTEGRAL DISPOSAL WRAPPER

Norman Binker, and Sandra Miranda, both of 4344 Winchester, Apt. #15, Los Angeles, Calif. 90032

Filed Apr. 17, 1986, Ser. No. 853,174
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 R **5 Claims**



1. A disposable sanitary napkin comprising an elongated absorbent pad having two opposite faces extending between two pad ends and two side edges;

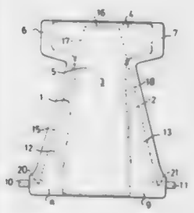
a reversible bag affixed to one said face of said absorbent pad between said pad ends;

said bag including a wide portion including an open bag end oriented towards one of said pad ends and an elongated narrow bag portion terminating in a closed bag end oriented towards the opposite pad end, said folded bag being affixed to said pad face at both bag ends, said wide portion being normally folded to a width comparable to said narrow portion and flat against said pad face prior to and during use of said pad, said wide portion being reversible over the rolled pad as a disposal wrapper such that the bag may be reversed to receive and contain said pad for hygienic disposal after use and after said pad has been rolled up over the other of said pad faces with the bag bearing pad face facing outwardly of the roll, the rolling beginning with the pad end proximal to the closed end of the bag, said narrow portion being disposed and held between coil turns of the roll so as to at least partially roll up with said pad so as to more securely anchor said bag to said pad during reversal of said wide portion.

4,692,163
ABSORPTION ARTICLE SUCH AS A DIAPER OR A SANITARY NAPKIN, AND A METHOD FOR THE MANUFACTURE THEREOF

Leif U. R. Widlund, and Maj I. Ternstrom, both of Mölnlycke, Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

Filed Nov. 26, 1985, Ser. No. 802,216
Claims priority, application Sweden, Nov. 30, 1984, 8406071
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **24 Claims**



1. Absorption article such as a diaper or a sanitary napkin, comprising a liquid permeable first outer layer and a preferably liquid impermeable second outer layer being applied to either side of an absorption body for enclosing it, as well as elastic members applied in a prestretched condition for causing the edge portions of the article to fit closely around the body of the wearer, characterized in that the elastic members are included in a network of interesting elastic members extending over the crotch portion of the article and so disposed as to give the article elasticity in more than one direction.

4,692,164
BIOPROSTHETIC HEART VALVE, METHODS AND DEVICE FOR PREPARATION THEREOF

Sergei L. Dzemeshkevich, Moscow; Nikolai N. Zavalishin, Moskovskaya; Svetlana M. Krasovskaya, Moscow; Valery M. Sagalevich, Moscow; Boris A. Konstantinov, Moscow; Alexandr K. Nenjukov, Moscow, and Alexei S. Ivanov, Moscow, all of U.S.S.R., assignors to Moskovskoe Vyshee Tekhnicheskoe Uchilische, Imeni N.E. Baumana, Moscow, U.S.S.R.

Filed Mar. 6, 1986, Ser. No. 837,094
Int. Cl.[4] A61F *2/24, 2/76*; A61B *17/00*
U.S. Cl. 623—2 **11 Claims**

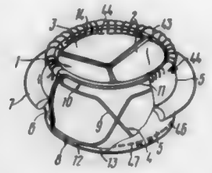
2. A bioprosthetic heart valve comprising:
a frame of a resilient material with a circular base consisting

of separate arcuate portions; struts being a continuation of said arcuate portions and arranged over a toroidal surface; an additional ring arranged axially with relation to said circular base, consisting of separate arcuate portions which are a continuation of said struts;

an isolating spacer of a biologically inert material, impermeable to in growth of biological tissue, fitting around the external surface of said frame and replicating its toroidal shape;

a covering of a biologically inert material, fitting around the external surface of said frame, replicating its toroidal shape and located directly on top of said isolating spacer;

threads passing through said covering and spacer and stitching them to said frame;



a biological transplant made from a flap of biological tissue and having at least three sinus-like envelopes shaped like the aortic sinuses of the aortic heart vale, and cusps whose number corresponds to the number of said sinus-like envelopes, attached to said sinus-like envelopes and joining them smoothly; the upper edge of said biological transplant is secured on said additional ring and said covering so that the upper edge of each of said sinus-like envelope is located on said adjacennt arcuate portions of said additional ring; the lower edge of said biological transplant is secured to said covering above said arcuate portions of the circular base;

threads passing through said biological transplant and stitching it to said rings and covering.

4,692,165
HEART VALVE

Jack C. Bokros, Austin, Tex., assignor to CarboMedics, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 653,960, Sep. 24, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,032
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 **15 Claims**

1. A heart valve prosthesis comprising

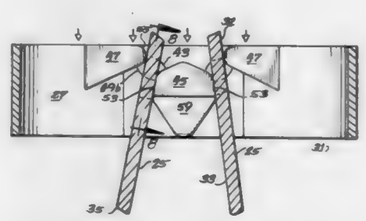
a generally annular body which has an interior surface that defines a central passageway for blood flow therethrough,

occluder means supported on said body for alternately blocking and then allowing the flow of blood through said passageway in a predetermined direction,

said occluder means having upstream and downstream major surfaces and being formed with aligned notch means at opposite locations in the periphery thereof,

a pair of aligned pivot posts projecting generally radially inward from said interior surface of said body, which posts have arcuate convex opposite lateral surfaces and are receivable within said notch means, and

stop means projecting inward from said interior surface at locations generally flanking each of said pivot posts and extending radially farther inward than said pivot posts,



said stop means presenting a pair of curved surfaces in regions adjacent to said pivot posts and overlying major surfaces of said occluder means, each of which curved surfaces lies in a region located intermediate of said opposite arcuate convex side surfaces of said post and extends radially inward thereof so as to provide a pair of oppositely disposed fulcrums that face each other, flanking said pivot posts,

said posts being proportioned to be received in said notch means so as to allow at least some nonrotational displacement of said occluder means away from one of said curved surfaces toward the other of said curved surfaces whereby supporting contact is alternated between respective curved surfaces and occluder means major surfaces as said occluder means repeatedly open and close.

4,692,166

USE OF HALOGENATED 4,5-METHYLENEDIOXYPHENOL IN THE DYEING OF KERATINOUS FIBRES

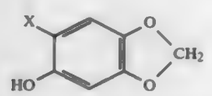
Alex Junino, Livry-Gargan; Gerard Lang, Saint-Gratien; Herve Andrean, Paris, and Jean Cotteret, Limay, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 20, 1986, Ser. No. 841,813
Claims priority, application France, Mar. 21, 1985, 85 04224
Int. Cl.[4] A61K *7/13;* **C07D** *317/48, 317/52, 317/54*
U.S. Cl. 8—410 **18 Claims**

1. Oxidation dyeing composition for human hair, comprising in a cosmetically acceptable medium, and in sufficient amounts for dyeing the said human hair:

(a) one or several para type oxidation dye precursor containing two amino groups or an amino group and a hydroxy group bound in the para position on benzene rings, or alternatively on heterocyclic rings, this precursor being present in the form of free base or in salt form;

(b) at least one coupler of formula (I):



(I)

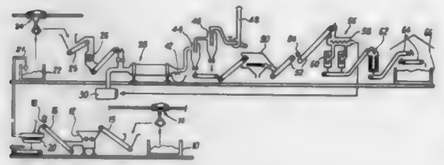
in which X denotes a chlorine or bromine atom.

4,692,167

APPARATUS FOR PROCESSING SOLID WASTES TO PRODUCE A FUEL

Jean-Pierre Levasseur, St Germain en Laye, France, assignor to Omnium de Traitements et de Valorisation (O.T.V.), Courbevoie, France

Filed Jan. 31, 1986, Ser. No. 824,317
Claims priority, application France, Feb. 13, 1985, 85 02032
Int. Cl.[4] C10L *5/46*
U.S. Cl. 44—2 **12 Claims**



1. Apparatus for obtaining a solid fuel from residential, industrial or similar types of wastes, comprising in combination, and successively from upstream to downstream:

(a) first grinding means to reduce the particle size of the initial wastes;

(b) magnetic separation means to eliminate ferrous metals;

(c) first screening means to separate smaller-sized fermentable organic materials from the rest of the wastes, or combustible fraction, able to be transformed into fuel;

(d) second grinding means designed to reduce the particle size of the fuel fraction still further;

(e) pneumatic drying means designed to reduce the water content of the fuel fraction and outputting a gas stream charged with said fuel fraction;

(f) gravity separation means designed to separate from the gas stream the heavy products contained in the fuel fraction;

(g) cyclone separation means designed to separate from the gas stream the fuel fraction freed of said heavy products;

(h) second screening means designed to eliminate the inorganic fines having a high ash content; and

(i) press granulating means designed to transform the fuel fraction coming from the second screening means into fuel granules;

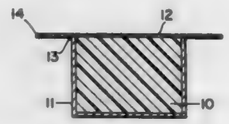
the mesh sizes of the first and second screening means being adjustable.

4,692,168

FLAMMABLE BARRIER WRAP FOR SOLID FUEL/FIRESTARTER COMPOSITION

Duane L. Dotson, Mountain Lakes, and Alex Forschirm, Parsippany, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 10, 1986, Ser. No. 872,590
Int. Cl.[4] C10L *7/00*
U.S. Cl. 44—7.1 **20 Claims**



1. A packaged solid or gelled heating fuel comprising: a shaped solid fuel formed from a normally liquid fuel or a meltable fuel, and a flammable plastic film wrapped around said shaped fuel, at least one edge of said plastic film extending freely beyond the mass of said shaped fuel to provide an easily accessible ignition point for said packaged fuel.

4,692,169

USE OF ETHERIFIED POLYGALACTOMANNAN GUMS AS CARBONACEOUS SLURRY STABILIZERS

Warren W. Howland, Champlin; Robert E. Arquette, Minneapolis, and Shang-Ren Wu, St. Anthony, all of Minn., assignors to Henkel Corp., Ambler, Pa.

Continuation-in-part of Ser. No. 686,787, Dec. 27, 1984. This application Nov. 12, 1985, Ser. No. 795,521
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **30 Claims**

1. In a carbonaceous slurry containing a stabilizer in an amount sufficient to stabilize said slurry wherein said stabilizer is selected from the group consisting of:

(a) an alkyl ether of a polygalactomannan

(b) a mixture of said alkyl ether and xanthan gum

(c) a mixture of an hydroxyalkyl ether of a polygalactomannan and xanthan gum

(d) a mixture of said alkyl ether and said hydroxyalkyl ether and xanthan gum wherein said alkyl group contains from 1–20 carbon atoms; said polygalactomannan gum alkyl ether has a degree of substitution of 0.05 to 3 and said xanthan gum in mixture (b), (c) and (d) comprises up to about 85 weight percent of the total mixture of said ether and said xanthan gum.

4,692,170

CHEMICAL COMPOUNDS TO BE USED AS SOLID CARRIERS FOR FUEL ADDITIVES

Alberto Santambrogio, Corsico, and Luciano Mattei, Milan, both of Italy, assignors to Agip Petroli, S.p.A., Rome, Italy

Filed Nov. 29, 1983, Ser. No. 556,137
Claims priority, application Italy, Dec. 2, 1982, 24561 A/82
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—63 **6 Claims**

1. Compositions of dosing additives to fuel for internal combustion engines, comprising (1) solid carrier chemical compounds, which have a melting point between 70° C. and 130° C., are soluble in hydrocarbons and are selected from the group consisting of alkyl-substituted phenols, aromatic carbonates, alkyl-substituted pyrocatechols, and polymers of alkyl-substituted 1,2-dihydroquinoline; and (2) additives for fuel for

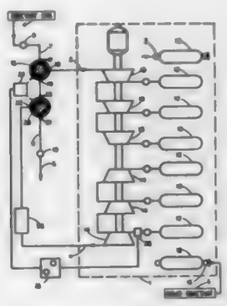
internal combustion engines which are liquid at room temperature.

4,692,171

SOLID WITH GAS REACTOR PLANT

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Oct. 28, 1985, Ser. No. 791,798
Int. Cl.[4] C10J *3/02, 3/20*
U.S. Cl. 48—61 19 Claims



1. A solid with gas reactor plant comprising:
a fresh reactant gas connector pipe;
a product reacted gas connector pipe;
a number of different sources of fresh reactant gas, said number being at least one;
a number of separate sources of solid reactant, said number being at least one;
a number of separate product gas delivery pipes, said number being at least one;
means for connecting said fresh reactant gas connector pipe to said at least one source of fresh reactant gas;
means for connecting said product reacted gas connector pipe to said at least one product gas delivery pipe;
a cyclic char gasifier apparatus comprising:
a compressor means for compressing gases from a lower pressure to a higher pressure and comprising an integral number of stages, said integral number of stages being at least one, and each of said stages comprising a supply end and a delivery end;
means for driving said compressor means;
an expander means for expanding gases from a higher pressure to a lower pressure and comprising an integral number of stages, said integral number of stages being at least one, and each of said stages comprising an inlet end and a discharge end;
at least two separate containers, each of said at least two containers comprising pressure vessel means for containing any gas compressed thereinto, each of said at least two containers comprising at least one refuel end through which solid reactant can be placed inside said container, each of said at least two containers comprising at least one removal end through which non-gas products can be removed from the inside of said container;
a product gas collector pipe;
a reactant gas inlet;
wherein said number of compressor stages exceeds one and further comprises fixed open gas flow connections from the delivery end of each of said compressor stages, except one, to the supply end of one other stage of said compressor means, whereby said stages of said compressor means are connected in series so that the pressure of a particular gas mass, at delivery from each of said stages, increases as the gas mass is compressed through said series connected stages, from the supply end to the delivery end of each of said stages with a first of said stages in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose supply end does not have a fixed open gas flow connection from the delivery end of any other stage of said compressor means, and with a last stage in said series through which a gas mass last flows being both the highest pressure stage and also the one stage whose delivery end does not have a fixed open gas flow connection to the supply end of any other of said stages of said compressor means;
fixed open gas flow connections from the supply end of the lowest pressure stage of said compressor means to said reactant gas inlet,
wherein said number of expander stages exceeds one and further comprises fixed open gas flow connections from the discharge end of each of said expander stages, except one, to the inlet end of one other of said stages of said expander means, whereby said stages of said expander means are connected in series so that the pressure of a particular gas mass, at discharge from each of said stages, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each of said stages, with a first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander means, and with a last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other of said stages of said expander means;
fixed open gas flow connections from the discharge end of the lowest pressure stage of said expander means to said product gas collector pipe;
changeable gas flow connections, which are openable and closeable, from each of said at least two containers to each delivery end of each of said stage of said compressor means, and to each inlet end of each of said stages of said expander means;
wherein said at least two containers comprises a number of containers, at least equal to the sum of the number of compressor stages and the number of expander stages;
at least one refuel mechanism, said at least one refuel mechanism comprising:
means for transferring a volume of solid material from said at least one source of said reactant into said at least two containers when said refuel transfer means is connected to said refuel end of said at least two containers;
means for connecting said refuel transfer means to said refuel end of said at least two containers for a time period for refueling and for disconnecting said refuel transfer means from said refuel end of said at least two containers at the end of said refuel time period;
means for sealing said means for connecting and disconnecting and said refuel end of said at least two containers against gas leakage;
at least one means for removing non-gas products comprising:
means for transferring a volume of non-gas materials out of said at least two containers when said at least one means for removing is connected to said removal end of said at least two containers;
means for connecting said at least one means for removing to said removal end of said at least two containers for a time period for non-gas product removal and for disconnecting said at least one means for removing from said removal end of said at least two containers at the end of said non-gas product removal time period;
means for sealing said means for connecting and disconnecting and said removal end of said at least two containers against gas leakage;
means for opening and closing said changeable gas flow connections so that each of said at least two containers is opened for a time period to each delivery end of each of said stages of said compressor means, in a subsequence of time periods of open gas flow connections to compressor stages, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, and is opened for a time period to each inlet end of each of said stages stage of said expander means, in a sub-sequence of time periods of open gas flow connections to expander stages, said sub-sequence of said expander stages proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressor stages being followed by said sub-sequence of connections to said expander stages, and these together comprise one sequence of time periods of open gas flow connections, each of said at least two containers is opened to only one of said stages during any one time period of said sequence of time periods, said sequence of time periods of open gas flow connections to said compressor stages and to said expander stages is repeated for each of said at least two containers by said means for opening and closing, for each of said at least two containers each said one sequence of open gas flow connections to said compressor stages and to said expander stages is a single cycle of compression and expansion;
means for controlling said means for opening and closing, and said means for connecting said refuel transfer means and said means for connecting said at least one non-gas product removing means, so that said repeated sequences of time periods of open gas flow connections, and any time periods available only for refueling and for non-gas product removal, are a continuous series of time periods for any one of said at least two containers, and so that the delivery end of each of said stages of said compressor means has an open gas flow connection to at least one of said at least two containers, and the inlet end of each of said stages of said expander means has an open gas flow connection to at least one of said at least two containers, during all time periods, whenever said plant is operating;
recycle means for connecting said product gas collector pipe to said reactant gas inlet and for disconnecting said product gas collector pipe from said reactant gas inlet;
supply means for connecting said fresh reactant gas connector pipe to said reactant gas inlet and for disconnecting said fresh reactant gas connector pipe from said reactant gas inlet;
diverting means for connecting said product gas collector pipe to said product reacted gas connector pipe;
means for driving said recycle means for connecting and disconnecting and said supply means for connecting and disconnecting and said diverting means for connecting so that:
said reactant gas inlet is connected to said product gas collector pipe whenever said product reacted gas connector pipe is disconnected from said product gas collector pipe, whereby product reacted gas is recycled to said reactant gas inlet;
and so that said product reacted gas connector pipe is connected to said product gas collector pipe whenever said reactant gas inlet is connected to said fresh reactant gas connector pipe, whereby fresh reactant gas is supplied to said reactant gas inlet and product reacted gas is diverted into said product gas connector pipe;
and so that, at any one time, said reactant gas inlet is connected to one and only one of the two, said product gas collector pipe, said fresh reactant gas connector pipe;
means for controlling said means for driving said recycle means, said supply means, and said diverting means, so that:
said reactant gas inlet is connected to said product gas collector pipe during a recycle sequence of cycles of compression and expansion on each of said at least two containers, said recycle sequence comprising a recycle integral number of cycles, said recycle integral number being at least one;
said reactant gas inlet is connected to said fresh reactant gas connector pipe during a fresh reactant sequence of cycles of compression and expansion on each of said at least two containers, said fresh reactant sequence comprising a fresh reactant integral number of cycles, said fresh reactant integral number being at least one;
each said recycle sequence is followed by at least one said fresh reactant sequence, and the last of said following fresh reactant sequence is followed by a recycle sequence, and each said recycle sequence followed by at least one fresh reactant sequence comprises a group of sequences, and said groups of sequences follow one another continuously whenever said plant is running;
whenever a recycle sequence is underway a fresh reactant sequence is not underway and whenever a fresh reactant sequence is underway a recycle sequence is not underway;
plural reaction chambers, the number of said plural reaction chambers being equal to the number of said at least two containers multiplied by a chamber integral number, and each of said plural reaction chambers comprising means for containing solid reactants and non-gas products so that gas can readily flow into said reaction chambers during compression and gas can readily flow out of said reaction chambers during expansion, and each of said plural reaction chambers further comprising a refuel end through which solid reactant can be placed inside said reaction chambers, and each of said plural reaction chambers further comprising a removal end through which non-gas products can be removed from the inside of said reaction chambers, and said chamber integral number being at least one;
means for fastening said plural reaction chambers separately inside said at least two containers so that:
each of said at least two containers contains and encloses a chamber integral number of said plural reaction chambers;
each of said plural reaction chambers refuel end connects to but one refuel end of its enclosing container;
each of said plural reaction chambers removal end connects to but one removal end of its enclosing container.

4,692,172

COAL GASIFICATION PROCESS

Robert J. Stellaccio, Spring, Tex., and Robert M. Suggitt, Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 632,351, Jul. 19, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 827,858
Int. Cl.[4] C10J *3/46*
U.S. Cl. 48—197 R 19 Claims

1. A partial oxidation process comprising: (1) mixing together an ash-containing solid carbonaceous fuel containing less than about 2.0 wt. % sulfur, and in the noncombustible portion of said solid carbonaceous fuel less than 10 wt. % iron and less than about 8.0 wt. % of calcium with a sufficient amount of an ash-combining agent comprising iron sulfide containing material or supplemental iron containing reactant materials and sulfur containing reactant materials that react in the reaction zone in (2) to produce iron containing compounds and sulfur containing compounds that combine with the fuel ash; (2) reacting said mixture of materials optionally suspended in a liquid or gaseous medium by partial oxidation with a free-oxygen containing gas in the presence of H_2O in a free-flow reaction zone in a reducing atmosphere at a temperature

greater than about 2000° F. and below the fluid temperature of the ash in the solid carbonaceous fuel feed to the reaction zone and high enough to keep the ash produced in the molten state, and a pressure in the range of about 1 to 200 atmospheres, wherein the weight ratio of H_2O to the solid carbonaceous fuel is in the range of about 0.33 to 1.0, to produce a raw effluent gas stream which is discharged downward through a bottom outlet in the reaction zone and which substantially comprises H_2, CO, CO_2, H_2O, H_2S, COS, entrained particulate matter including molten ash containing iron compounds whose iron content is greater than 10 wt. % of the molten ash, and optionally at least one material from the group CH_4, N_2, Ar, and NH_3; wherein sufficient iron and sulfur are in the reaction zone so that the melting point of the solid carbonaceous fuel ash is decreased and the fluid temperature of the molten ash entrained in the raw gas stream is reduced about 100° F. or more below the fluid temperature of the ash in the solid carbonaceous fuel without the addition of said ash-combining agent; excess H_2S is present in the reaction zone and no free iron remains, and the mole ratio H_2S/H_2+CO in the raw gas stream is greater than 0.01; and (3) separating at least a portion of said particulate matter and molten ash from the raw gas stream.

4,692,173

PROCESS FOR CLEANING FILTER ELEMENTS

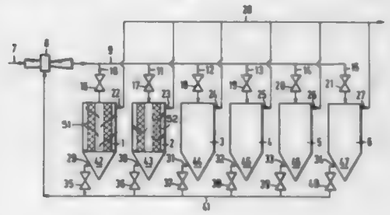
Hans Roos, Meerbusch, Fed. Rep. of Germany, assignor to Deutsche Filterbau GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,481

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505729

Int. Cl.⁴ B01D *46/04*

U.S. Cl. 55—96 **1 Claim**



1. A method of cleaning filter elements in at least one of a plurality of filter chambers, in which each filter element has a dust-collecting side and a clean side, and each filter chamber has a closable connection from a conduit carrying pressurized dust-laden gas to the dust-collecting side of the respective filter element and also has a connection between a conduit carrying pressurized clean gas and the clean side of the respective filter element, and a closable outlet to a conduit for dust-laden scavenging gas; said method comprising the steps of: closing the connection between the conduit carrying the pressurized dust-laden gas and said at least one filter chamber, opening the connection to the dust-laden scavenging gas conduit of said at least one filter chamber; passing clean gas as a scavenging gas from the conduit carrying clean gas to the clean side of the filter element in said at least one filter chamber to thereby remove dust collected on the dust-collecting side of said at least one filter element, and adding the scavenging gas from said at least one filter chamber to the conduit carrying the pressurized dust-laden gas via a compressed air jet pump.

4,692,174

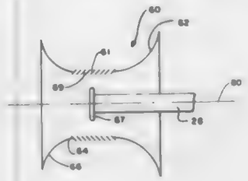
IONIZER ASSEMBLY HAVING A BELL-MOUTH OUTLET

Peter C. Gelfand, 56 Friar La., Trumbull, Conn. 06611; Walter V. Piulle, 960 Glennan Dr., Redwood City, Calif. 94061, and Louis F. Rettenmaier, 8790 W. Jefferson Ave., Denver, Colo. 80235

Continuation-in-part of Ser. No. 352,779, Feb. 26, 1982, abandoned, which is a continuation of Ser. No. 163,299, Jun. 26, 1980, abandoned. This application Nov. 1, 1983, Ser. No. 547,752

Int. Cl.⁴ B03C *3/12, 3/40*

U.S. Cl. 55—129 **10 Claims**



1. A high-intensity ionizer assembly, comprising:

a venturi unit having an inlet connected to a source of particulate-laden gases, an outlet of a Rogowski shape, and a central throat section formed intermediate of said inlet and outlet; and

means for establishing a high-intensity electric field within said throat section wherein said electric field extends across the path of the particulate-laden gases flowing therethrough to charge the particles therein.

4,692,175

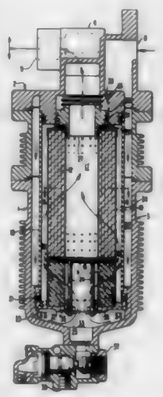
TWO-STAGE PRECOALESCER UNIT

Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Mar. 17, 1986, Ser. No. 839,956

Int. Cl.⁴ B01D *39/08, 53/26*

U.S. Cl. 55—218 **9 Claims**



1. A two-stage precoalescer unit interposable in the flow path of contaminated compressed gas between a compressor or other source and desiccant-containing decontaminating means for coalescing and separating in successive stages loose oil and water and oil and water aerosol from the gas, comprising a housing having separable upper and lower parts, a perforate-walled canister in said housing, first and second stage coalescers mounted in tandem in said canister for respectively filtering, coalescing and separating loose oil and water and coalescing and separating oil and water aerosol from said gas, means

in said canister separating said coalescers and forcing said gas to flow therethrough in different directions, and an imperforate tube contained in said housing and containing said canister for defining with said housing and canister flow paths of said gas through said precoalescer unit.

7. A plural-stage precoalescer unit positionable in the flow path of contaminated gas from a compressor or other source for coalescing and separating loose oil and water and oil and water vapor from the gas in a plurality of successive stages, comprising a housing, a perforate-walled canister in said housing, first and second stage coalescers contained in tandem in said canister for respectively filtering, coalescing and separating loose oil and water and coalescing and separating oil and water vapor from said gas, inlet, outlet and draing ports in said housing, normally open outlet and normally closed drain valves in the housing and alternately seatable in vertically spaced internal valve seats, a piston mounting said outlet valve and having a head exposable to actuating gas, said valves being mounted on opposite end portions of a common stem for movement in unison against opposing spring forces respectively to open said drain port and close said outlet port on application of actuating gas to said piston.

4,692,176

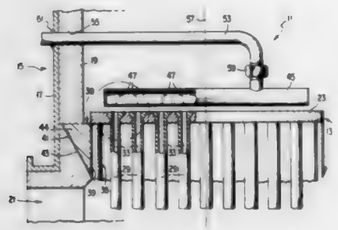
THERMAL EXPANSION COMPENSATING BACK FLUSH MANIFOLD

Gordon A. Israelson, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1986, Ser. No. 816,783

Int. Cl.⁴ B01D *29/32*

U.S. Cl. 55—302 **19 Claims**



9. A high temperature gas filtration system incorporating compensation for thermal expansion in the system, comprising:

a vessel having a longitudinal axis, an inlet for receiving high temperature gases containing particulates, and a filtered gas outlet;

a filter assembly disposed between said inlet and said outlet for filtering particulates out of the gas, said filter assembly including a plate disposed transverse to and intersecting the longitudinal axis, said plate being made of a material having a first coefficient of thermal expansion and having a plurality of openings, filter elements mounted in the openings, and a flexible support surrounding said plate and connecting said plate to the vessel, said flexible support permitting said plate to thermally expand uniformly radially outwardly from the longitudinal axis upon an increase in temperature; and

a back flush manifold assembly mounted for back flushing a gas through the openings in said plate for back flushing particulates out of said filter elements, the back flush manifold assembly including a back flush manifold pipe disposed over said plate, made of the same material as said plate and having a plurality of back flush orifices each having a desired alignment over a respective one of the openings in said plate for directing a back flush gas into such openings, and a gas supply pipe having a selected length and being connected for delivering back flush gas to said back flush manifold pipe, the longitudinal axis intersecting the back flush manifold pipe at a given point at a base temperature, said gas supply pipe having one end forming a rigid connection with said vessel and another end forming a rigid connection with said back flush manifold pipe, said gas supply pipe being made of a material having a second coefficient of thermal expansion, said gas supply pipe thermally expanding away from said one end and said back flush manifold pipe thermally expanding from its connection with said gas supply pipe upon an increase in temperature, the material for said plate and said back flush manifold pipe and the material for and length of said gas supply pipe being selected based upon a predetermined relationship of the length of the gas supply pipe with the first and second coefficients of thermal expansion for causing the thermal expansion of said gas supply pipe to compensate for thermal expansion of said back flush manifold pipe so that upon an increase in temperature from the base temperature the given point at the back flush manifold pipe remains coincident with the longitudinal axis, whereby said back flush manifold pipe thermally expands uniformly radially from the longitudinal axis to maintain the desired alignment of the back flush orifices with the openings in said plate.

4,692,177

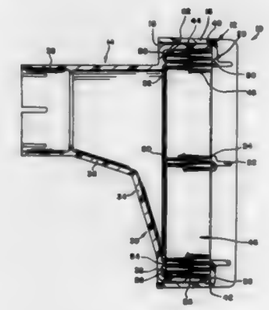
SIMPLIFIED AIR FILTER

Allen B. Wright, Coventry, R.I., and Willard L. Chichester, Battle Creek, Mich., assignors to Allied Corporation, Morristown, N.J.

Continuation of Ser. No. 773,279, Sep. 6, 1985, abandoned. This application Dec. 5, 1986, Ser. No. 939,642

Int. Cl.⁴ B01D *46/52*

U.S. Cl. 55—499 **8 Claims**



6. Fluid filter assembly comprising first and second molded housing members, said first housing member having integral side walls and an end wall connecting said side walls of the first housing member to define a box-like structure having an open end, the second housing member having integral side walls and an end wall connecting said side walls of the second housing member to define a box-like structure having an open end, the end wall of one of said members having structure defining openings to permit fluid flow therethrough, the end wall of said other housing member defining an outlet tube, the open end of said first housing member receiving the integral side walls of said second housing member, means joining said side walls of said members to assemble said members into a completed housing assembly, and a panel filter cartridge received within said housing assembly for filtering fluid communicated through said openings, said end walls of said housing members include portions engaging opposite sides of said panel filter cartridge to locate the latter within said housing assembly, the end wall of said other member receives an adhesive for sealing the cartridge against a portion of the end wall of said other housing member, the thickness of said cartridge causing the

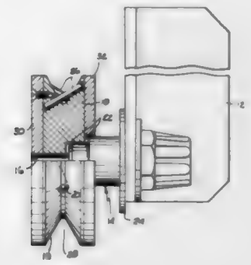
latter to be embedded in said adhesive when the cartridge is forced thereagainst during assembly of said housing assembly by engagement of the end wall of said one housing member with the side of said cartridge opposite the side of the cartridge embedded in the adhesive, and a perimetrically extending bead extends around the end wall of said other member and cooperating with the corresponding side walls of said other member to define a perimetrically extending groove therebetween for receiving said adhesive, said adhesive being constrained by said bead to be forced up a corresponding side wall as said pleats are forced into said adhesive.

4,692,178

FILAMENT GATHERING APPARATUS, SYSTEM AND METHOD

Henry D. Smith, Jr.; Russell D. Arterburn, both of Athens, Tenn., and John H. Miller, Littleton, Colo., assignors to Manville Corporation, Denver, Colo.

Filed Sep. 15, 1986, Ser. No. 906,864
Int. Cl.[4] C03B *37/028*
U.S. Cl. 65—2 **33 Claims**



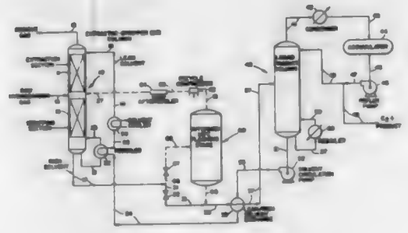
26. A method of producing glass strand from heat softenable, fiberizable glass material comprising: (a) drawing or attenuating glass filaments from molten streams of glass through use of an attenuation means, (b) gathering a plurality of filaments into a strand on a rotatable, gathering wheel assembly, said gathering wheel assembly including a rotatable, generally disk-shaped hub having walls for supporting a plurality of generally cylindrical rods about the hub's peripheral edge, said rods being secured to the walls of said hub such that each of said rods traverses the peripheral edge, said rods further being spaced apart from one another and arranged so as to define an annular gathering path upon which said filaments are gathered as the wheel rotates, the spacing between the rods being such that said path is at least 50 percent discontinuous, said discontinuity reducing the wrapping of glass filaments and strand about the gathering wheel by reducing surface contact between the filaments and strand and the wheel; and (c) collecting said strand with or without other strands.

4,692,179

PROCESS FOR USING ALKYL SUBSTITUTED C8-C10 AROMATIC HYDROCARBONS AS PREFERENTIAL PHYSICAL SOLVENTS FOR SELECTIVE PROCESSING OF HYDROCARBON GAS STREAMS

Yuv R. Mehra, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 784,566, Oct. 4, 1984, Pat. No. 4,617,038, which is a continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, Pat. No. 4,623,371, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, Pat. No. 4,601,738, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Dec. 13, 1985, Ser. No. 808,463
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 **27 Claims**



1. In a process for the removal of hydrocarbon gas liquids, comprising hydrocarbons heavier than methane, from a hydrocarbon gas stream, the improvement of selectively extracting said hydrocarbon gas liquids from said hydrocarbon gas stream with a preferential physical solvent which provides selective capability for recovery according to said selected degree of (a) ethane in amounts ranging from 2–98%, (b) propane in amounts ranging from 2–99%, (c) butane in amounts ranging from 2–100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100% which comprises:

A. selectively extracting and stripping said hydrocarbon gas stream with said physical solvent to produce a residue hydrocarbon gas stream of pipeline specifications and a rich solvent stream containing ethane and heavier hydrocarbon components, said preferential physical solvent being:

(1) rich in C_8–C_{10} aromatic compounds having methyl, ethyl, or propyl aliphatic groups and

(2) selective for ethane and heavier hydrocarbon components of the gas stream such that: (a) the relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in solvent, is at least 0.25 standard cubic feet of ethane per gallon of solvent, or (b) the preferential factor determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, of at least 1.25; and

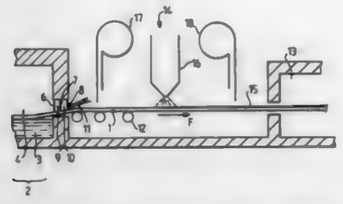
B. distilling said rich solvent to produce said hydrocarbon gas liquids and said physical solvent.

4,692,180

APPARATUS AND METHOD FOR DEPOSITING A METAL OXIDE COATING ON A GLASS SUBSTRATE

Jean-Marie Villain, Monchecourt, and Jacques Fremaux, Bougival, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Apr. 18, 1986, Ser. No. 853,817
Claims priority, application France, Apr. 24, 1985, 85 06242
Int. Cl.[4] C03B *18/20*
U.S. Cl. 65—32 **18 Claims**



1. In an apparatus for producing a glass ribbon wherein molten glass is directed across a top surface of molten metal float bath means having an enclosure containing a reducing atmosphere comprising a mixture of nitrogen and hydrogen gas supplied at a slightly positive pressure, said enclosure including at least one lock chamber for preventing the escape of the reducing atmosphere, the improvement comprising means for reducing the pressure within said at least one lock chamber wherein said lock chamber includes at least one air-tight curtain means for separating said lock chamber from said molten metal float bath means, said curtain means being located crosswise in relation to the direction of advance of said glass ribbon, and said apparatus further comprising blower means located downstream from and proximal to the airtight curtain means located furtherest downstream from the float bath means in the direction of advance of the glass ribbon for directing an antiflame gas in the direction of a base portion of said curtain means.

13. In a method for depositing a coating of metal oxide powder onto a glass ribbon as said glass ribbon exits from a lock chamber of molten metal float bath means which contains a reducing atmosphere of a mixture of hydrogen and nitrogen gasses therein, and wherein a flame extending from said lock chamber of said molten metal float bath means in the direction of travel of the glass ribbon is generated due to the combustion of a portion of said hydrogen gas, the improvement which comprises:

reducing the intensity and size of said flame by venting said lock chamber so that the flame does not impinge upon the powder as it is being deposited, and

directing a flow of an antiflame gas towards said flame at an angle of approximately 45 degrees in relation to the vertical; thus improving the quality of said coating by reducing the amount of blemishes formed on a coated surface of said glass ribbon.

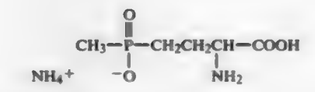
4,692,181

HERBICIDAL COMPOSITIONS

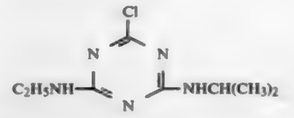
Hermann Bieringer, and Friedhelm Schwerdtle, both of Eppstein, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 72,934, Sep. 6, 1979, abandoned. This application Jan. 22, 1982, Ser. No. 341,803
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839087
Int. Cl.[4] A01M *57/12*
U.S. Cl. 71—86 **7 Claims**

1. A herbicidal composition containing as an active ingredient, herbicidally effective amounts of compound A and compound B, wherein compound A has the formula



and compound B has the formula



wherein the proportion by weight of compound A to compound B is in the range of from 1:1.5 to 1:4.

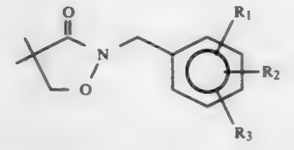
4,692,182

HERBICIDAL ISOXAZOLIDINONE DERIVATIVES

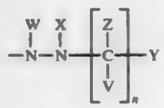
Jun H. Chang, Princeton Junction, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 19, 1986, Ser. No. 864,686
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] A01N *43/80*; C07D *261/04*
U.S. Cl. 71—88 **18 Claims**

1. A herbicidal isoxazolidinone of the formula



or an agriculturally acceptable salt thereof in which R_1 and R_2 are independently selected from -hydrogen and -halogen; and R_3 is of the formula



wherein

n is 0 or 1, and

when n is 0

W is selected from -hydrogen, one to six carbon alkyl, one to six carbon haloalkanoyl, and -benzoyl;

X is selected from -hydrogen and one to six carbon alkyl; and

Y is selected from -hydrogen, one to six carbon alkyl, three to eight carbon -cycloalkyl, one to six carbon alkanoyl, one to six carbon haloalkanoyl, -benzoyl, -2-nitro-5-(2-chloro-4-trifluoromethylphenoxy)benzoyl, -2,4-dichlorophenoxyacetyl, one to six carbon alkyloxy-carbonyl, one to six carbon alkylaminocarbonyl, -phenylaminocarbonyl, and one to six carbon alkylthiocarbonyl, provided that when Y and W are both haloalkanoyl or benzoyl groups, Y is the same as W; or

W and X together constitute a chemical bond; and Y is selected from =N and one to six carbon alkyloxycarbonyl; and

when n is 1,

X and Z together constitute a chemical bond;

W is -hydrogen;

V is selected from -hydrogen and one to six carbon alkyl; and

Y is selected from one to six carbon alkyl, -phenyl, -carboxyl, and one to six carbon alkyloxycarbonyl, or

V and Y together are an alkyl chain of 4–6 carbon atoms.

17. A herbicidal composition comprising a herbicidally effective amount of at least one compound of claim 1 in admixture with agriculturally acceptable adjuvants, carriers, diluents, or complementary pesticides.

4,692,183

DIPHENOXYMETHYLPYRIDINES AND COMPOSITIONS CONTAINING SAME HAVING HERBICIDAL PROPERTIES

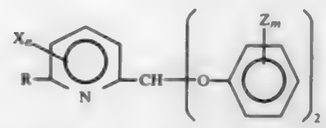
Sudarshan K. Malhotra, Walnut Creek, and Ingrid L. Evoy, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 656,834, Oct. 2, 1984, Pat. No. 4,606,757, which is a continuation-in-part of Ser. No. 452,584, Dec. 23, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 814,155

Int. Cl.[4] **C07D** *213/57;* **A01N** *43/40*

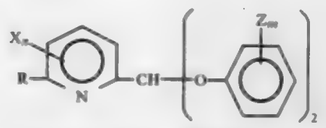
U.S. Cl. 71—94 **6 Claims**

1. A compound corresponding to the formula



wherein R represents cyano; X represents bromo, chloro or fluoro; n repreants an integer of 0 or 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

5. A method for controlling the growth of undesirable plants which comprises applying to plants, plant parts or their habitat a composition which comprises an inert carrier in admixture with a herbicidally effectiver amount of a compound corresponding to the formula



wherein R represents cyano; X represents bromo, chloro or fluoro; n represents an integer of 0 or 1; Z represents bromo, chloro, fluoro, alkylthio of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and m represents an integer of 0 or 1.

4,692,184

2,6-SUBSTITUTED PYRIDINE COMPOUNDS

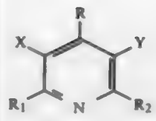
Len F. Lee, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 24, 1984, Ser. No. 602,021

Int. Cl.[4] **C07D** *213/80, 401/04, 405/04;* **A01N** *43/40*

U.S. Cl. 71—94 **34 Claims**

1. A compound represented by the structural formula



wherein:

R is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower alkenylalkyl, haloalkyl, haloalkenyl, C_{3-7} cycloalkyl, C_{3-6} cycloalkanylalkyl, phenyl, alkoxyalkyl, benzyloxymethyl, alkylthioalkyl, dialkoxyalkyl, (1-alkoxy-1-alkylthio)alkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkylsulfonylalkyl, alkylsulfinylalkyl, alkyl substituted with a dialkylsulfonium salt, cyanoalkyl, carbamoylalkyl, carbalkoxyalkyl, carbalkoxyalkenyl, formylalkyl, dialkylaminoalkenyl, saturated and unsaturated heterocyclic radicals selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl wherein the radical is joined to the pyridine ring by a C—C bond, and lower alkyl substituted with a saturated or unsaturated heterocyclic radical selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl;

R_1 and R_2 are independently selected from alkyl, fluorinated methyl, and chlorofluorinated methyl radicals, provided that one of R_1 and R_2 must be a fluorinated methyl or chlorofluorinated methyl radical;

X is



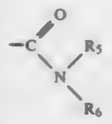
where R_3 is as defined below; and Y is selected from the group consisting of



wherein Z_1 is selected from O and NR_7 where R_7 is selected from hydrogen and lower alkyl and wherein Z_2 is selected from O and S, and wherein R_3 in each occurrence is independently selected from hydrogen, alkyl C_{1-4}, alkenylalkyl C_{3-4}, haloalkyl C_{1-4}, cyanoalkyl, cycloalkanylalkyl, alkynylalkyl C_{3-4}, provided that when Z_2 is S, R_3 must be lower alkyl C_{1-2};



wherein R_4 is selected from hydrogen and halogen;

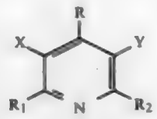


wherein R_5 and R_6 are independently selected from hydrogen, lower alkyl, and phenyl;

—CH_2OH; and

—C≡N.

13. A herbicidal composition containing a herbicidally effective amount of a compound represented by the structural formula



wherein:

R is selected from the group consisting of lower alkyl, lower alkenyl, lower alkynyl, lower alkenylalkyl, haloalkyl, haloalkenyl, C_{3-7} cycloalkyl, C_{3-6} cycloalkanylalkyl, phenyl, alkoxyalkyl, benzyloxymethyl, alkylthioalkyl, dialkoxyalkyl, (1-alkoxy-1-alkylthio)alkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, alkylsulfonylalkyl, alkylsulfinylalkyl, alkyl substituted with a dialkylsulfonium salt, cyanoalkyl, carbalkoxyalkyl, carbalkoxyalkenyl, dialkylaminoalkenyl, saturated and unsaturated heterocyclic radicals selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl wherein the radical is joined to the pyridine ring by a C—C bond, and lower alkyl substituted with a saturated or unsaturated heterocyclic radical selected from the group consisting of furyl, pyridyl, thienyl, thiiranyl, oxiranyl, and aziridinyl;

R_1 and R_2 are independently selected from alkyl, fluorinated methyl, and chlorofluorinated methyl radicals, provided that one of R_1 and R_2 must be a fluorinated methyl or chlorofluorinated methyl radical; and

X is



where R_3 is as defined below; and

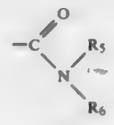
Y is selected from the group consisting of



wherein Z_1 is selected from O and NR_7 where R_7 is selected from hydrogen and lower alkyl and wherein Z_2 is selected from O and S, and wherein R_3 in each occurrence is independently selected from hydrogen, alkyl C_{1-4}, alkenylalkyl C_{3-4}, haloalkyl C_{2-4}, cyanoalkyl, cycloalkanylalkyl, alkynylalkyl C_{3-4}, provided that when Z_2 is S, R_3 must be lower alkyl C_{1-2};



wherein R_4 is selected from hydrogen and halogen;



wherein R_5 and R_6 are independently selected from hydrogen, lower alkyl, and phenyl;

—CH_2OH; and

—C≡N.

4,692,185

N-(ORTHO-SUBSTITUTED) BENZYL, 3-TRIFLUOROMETHYLPHENOXY NICOTINAMIDES AS HERBICIDES

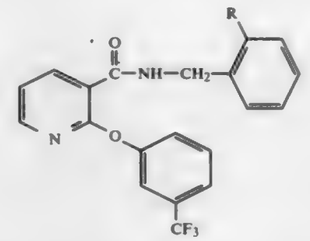
William J. Michaely, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 13, 1986, Ser. No. 818,149

Int. Cl.[4] **A01N** *43/40;* **C07D** *211/72*

U.S. Cl. 71—94 **11 Claims**

1. A compound having the formula



in which R is methyl, trifluoromethyl or bromo.

5. A method of controlling undesirable vegetation comprising applying to said vegetation or to a locus where control is desired a herbicidally effective amount of a compound according to claim 1.

4,692,186

S-N-BUTYL-N,N-DIISOPROPYL THIOCARBAMATE AS A SELECTIVE HERBICIDE IN SUGARBEETS, CARROTS AND CABBAGE

Reed A. Gray, Saratoga, and Grant K. Joo, Cupertino, both of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Filed Oct. 1, 1982, Ser. No. 432,220

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] **A01N** *37/00;* **C07C** *155/02*

U.S. Cl. 71—100 **3 Claims**

1. A method of selectively controlling undesirable vegetation in sugarbeets comprising applying an herbicidally effective amount of S-n-butyl-N,N-diisopropylthiocarbamate.

4,692,187

ISOUREAS AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Karl Kiehs, Lampertheim; Bruno Würzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,627

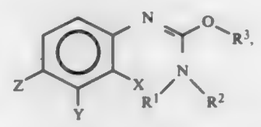
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504453

Int. Cl.[4] **C07C** *127/26;* **A01N** *47/42*

U.S. Cl. 71—107 **8 Claims**

1. An isourea of the formula

(I)



where X, Y and Z are identical or different and are each hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_3-haloalkyl, or are each phenoxy which is unsubstituted or substituted by halogen or C_1–C_4-alkyl, or are each aryl-C_1–C_4-alkoxy, where the aryl radical may be alkylated, R^1 is C_1–C_3-alkyl, R^2 is

methoxy, R^3 is benzyl or is phenyl which can be monosubstituted or polysubstituted by C_1–C_5-alkyl, halogen, C_1–C_4-alkoxy, C_1–C_3-haloalkoxy, nitro, hydroxyl, C_2- or C_3-alkoxycarbonylmethoxy, 1-(C_2- or C_3-alkoxycarbonyl)-ethoxy or a radical —NH—R^4, where R^4 is C_2–C_4-alkoxycarbonyl, C_2–C_4-alkylcarbonyl, C_6–C_7-cycloalkylcarbonyl, N-(C_1–C_4-alkyl)-N-(C_1–C_4-alkoxy)-aminocarbonyl, N,N-di-(C_1–C_4-alkyl)-aminocarbonyl or C_2–C_3-alkoxycarbonyl-C_1–C_4-alkyl.

8. A process for combatting the growth of unwanted plants, wherein the unwanted plants or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of an isourea of the formula I as set forth in claim 1.

4,692,188

PREPARATION OF INK JET COMPOSITIONS

Christopher K. Ober, Oakville, and Randolph E. Branston, Sarnia, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1985, Ser. No. 787,594
Int. Cl.[4] B01J *13/02*; C09D *11/00, 11/10*
U.S. Cl. 106—23 22 Claims

1. A process for the preparation of ink compositions useful for jet printing processes which comprises (1) dissolving in a water immiscible organic solvent a polymer composition and an organic oil soluble dye; (2) adding an aqueous phase water surfactant mixture thereto; (3) effecting emulsification thereof; and (4) subsequently evaporating from the aforementioned mixture the solvent thereby resulting in an ink having particles consisting of polymer and entrained or entrapped dye suspended in the aqueous phase.

4,692,189

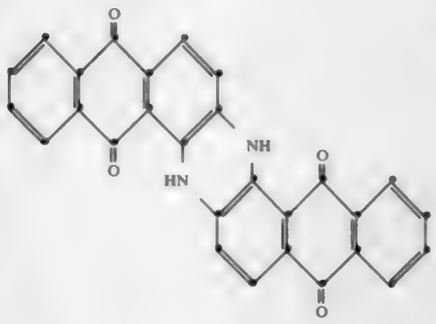
NOVEL COMPOSITIONS BASED ON INDANTHRONE BLUE PIGMENTS

Fridolin Bäbler, Marly, Switzerland; Edward E. Jaffe, Wilmington, Del., and Bernhard Medinger, Giffers, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 21, 1986, Ser. No. 887,776
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—308 S 5 Claims

1. A composition comprising

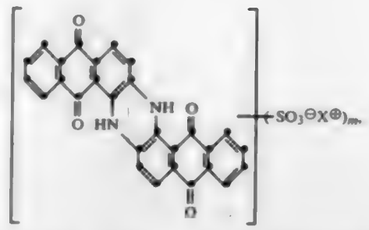
(a) an indanthrone blue pigment of formula I



(I)

and

(b) a sulfonated indanthrone blue derivative of formula II



(II)

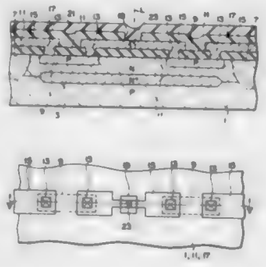
wherein $X^{\oplus}$ is $H^{\oplus}$ or a group of the formula $M^{*\oplus}/n$ or $N^{\oplus}(R)(R_1)(R_2)(R_3)$, M is a monovalent, divalent or trivalent metal cation, n is 1, 2 or 3, each of R, R_1, R_2 and R_3 independently is hydrogen, C_1-C_{18}alkyl, C_5-C_6cycloalkyl, phenyl or phenyl which is substituted by C_1-C_{18}alkyl, or R_2 and R_3, together with the linking nitrogen atom, are a pyrrolidine, imidazolidine, piperidine, piperazine or morpholine radical, or R_1, R_2 and R_3, together with the linking nitrogen atom, are a pyrrole, pyridine, picoline, pyrazine, quinoline or isoquinoline radical, and m is a value from 0.2 to 3.

4,692,190

TRIMMING OF METAL INTERCONNECTION LAYER BY SELECTIVE MIGRATION OF METAL ATOMS BY ENERGY BEAMS

Shigeru Komatsu, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1985, Ser. No. 813,039
Claims priority, application Japan, Dec. 27, 1984, 59-273740
Int. Cl.[4] H01C *7/00*; B23K *26/00*
U.S. Cl. 437—189 9 Claims



1. A method for manufacturing a semiconductor device, comprising the steps of:

preparing a semiconductor body;

forming at least one insulating layer on said semiconductor body;

forming at least one interconnection layer on said insulating layer;

forming a first insulating film above and contacting at least one predetermined are including at least a portion of said interconnection layer;

forming a second insulating film above and contacting said interconnection layer at an area other than said predetermined area, a ratio of a thermal expansion coefficient of said first insulating film to that of said interconnection layer being smaller than a ratio of a thermal expansion coefficient of said second insulating film to that of said interconnection layer to apply a stress at the predetermined area of said interconnection layer at times when said interconnection layer is heated; and

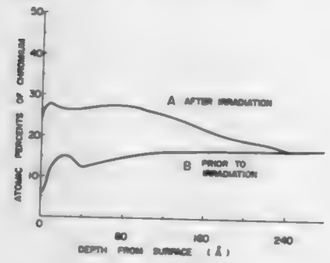
directing an energy beam onto the predetermined area of the interconnection layer, thus heating the predetermined area to a temperature between 400° to 600° C. to permit migration of atoms of the predetermined area of said interconnection layer into said first insulating film at times when said interconnection layer is heated by said energy beam to a temperature between 400° to 600° C.

4,692,191

METHOD OF IMPROVING FUNCTIONS OF SURFACE OF ALLOY STEEL BY MEANS OF IRRADIATION OF LASER BEAM, AND ALLOY STEEL AND STRUCTURE MADE BY THE METHOD

Shigeyoshi Maeda; Masahiro Yamamoto; Hiroyasu Omata, and Hideya Okada, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 869,783
Claims priority, application Japan, Jun. 4, 1985, 60-120967; Oct. 8, 1985, 60-222770; Mar. 8, 1986, 61-49543
Int. Cl.[4] C23C *22/50*
U.S. Cl. 148—6.14 R 10 Claims



1. A method of improving surfaced function of a chromium containing alloy steel, comprising the steps of:

providing a chromium containing alloy steel having a surface,

providing an aqueous solution of an oxidizing acid or of salt of said acid so that the solution is in contact with the surface of the alloy steel,

irradiating the surface of the alloy steel with laser beams through said aqueous solution so that at least the chromium constituent of the alloy steel is concentrated in at least a part of said surface.

4,692,192

ELECTROCONDUCTIVE SPRING MATERIAL

Kazuo Ikushima, Nagoya; Takaharu Iwadachi, and Syuhei Ishikawa, both of Handa, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 16, 1985, Ser. No. 776,454
Claims priority, application Japan, Oct. 30, 1984, 59-228499; Jan. 22, 1985, 60-10620; Jan. 22, 1985, 60-10621
Int. Cl.[4] C22C *9/06*; C22F *1/08*
U.S. Cl. 148—12.7 C 15 Claims

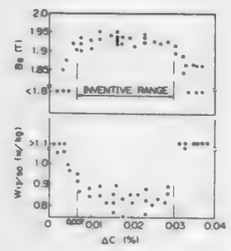
1. An electroconductive spring material comprising 1.8 to 3.0% by weight of Ni, 0.15 to 0.35% by weight of Be, 0.2 to 1.2% by weight of Si and a remainder of the spring material being copper, said spring material having a stress relaxation of at least 84%, a tensile strength of at least 75 kgf/mm^2 and a bending formability of 1–3 R/t.

4,692,193

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET HAVING A LOW WATT LOSS

Yasunari Yoshitomi; Katsuro Kuroki, and Kenzo Iwayama, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,294
Claims priority, application Japan, Oct. 31, 1984, 59-228014
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 4 Claims



1. A process for producing a grain-oriented electrical steel sheet, comprising the steps of:

annealing a hot-rolled strip consisting of from 2.5 to 4.0% of Si, from 0.03 to 0.10% of C, from 0.015 to 0.040% of acid-soluble Al, from 0.0040 to 0.0100% of N, from 0.01 to 0.04% of S, from 0.02 to 0.2% of Mn, at least one element selected from the group consisting of 0.04% or less of Se, 0.08% or less of Cu, and 0.4% or less of Sn, Sb, As, Bi, and Cr, and Fe in balance;

cold-rolling at least twice to obtain a sheet having a thickness of from 0.10 to 0.23 mm, in which the final cold-rolling is carried out at a heavy reduction of from more than 80% to 95%;

intermediate annealing between the cold-rolling steps:

decarburization annealing after the final cold-rolling; and,

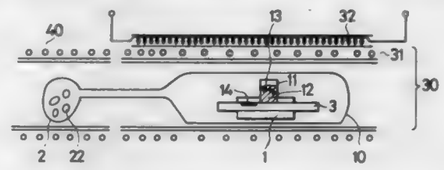
finishing annealing, wherein said process is characterized by providing an intermediate decarburization annealing step after the hot-rolling step and prior to the completion of final cold-rolling and wherein said intermediate decarburization step reduces the C content in an amount of from 0.0070 to 0.0300% based on the total composition of the strip.

4,692,194

METHOD OF PERFORMING SOLUTION GROWTH OF A GAAS COMPOUND SEMICONDUCTOR CRYSTAL LAYER UNDER CONTROL OF CONDUCTIVITY TYPE THEREOF

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation-in-part of Ser. No. 729,054, Apr. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 473,675, Mar. 8, 1983, abandoned. This application Sep. 25, 1986, Ser. No. 904,759
Claims priority, application Japan, Mar. 9, 1982, 57-37526
Int. Cl.[4] H01L *21/208*
U.S. Cl. 437—120 4 Claims



1. A method of epitaxially growing a GaAs crystal layer on

a GaAs substrate using a solution growth method which controls the conductivity type of the GaAs crystal layer being grown from a solution comprising a Ga melt as the solvent and a GaAs source crystal as a solute, said method comprising the steps of;

(a) conducting an epitaxial growing process using a solution growth method to control the conductivity type of the GaAs crystal layer being grown at constant temperature and temperature difference, the crystal layer being grown from a solution comprising a Ga Melt as the solvent and a GaAs source crystal as a solute;

(b) introducing into said solution an amount of amphoteric element Si to serve as an impurity for determining the conductivity type of the GaAs layer; and

(c) supplying, throughout the growth process, As vapor onto the surface of said solution contacting said GaAs substrate on which said crystal layer is to be grown, while controlling the pressure of said As vapor in the range of:

$$P_{As1} = \log P_{As} > -0.8 \log (Si/Ga) - 0.3 \text{ for n-type,}$$

and

$$P_{As2} = \log P_{As} < -0.8 \log (Si/Ga) - 0.3 \text{ for p-type}$$

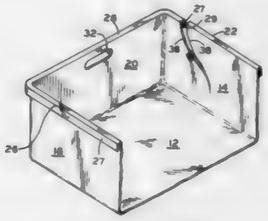
where P_{As} is expressed in Torr and Si/Ga in weight % and Si/Ga is $\leq 1 \times 10^{-1}$ weight %, thereby forming an epitaxial GaAs crystal layer on a GaAs substrate.

4,692,195

METHOD FOR REPAIRING AND REINFORCING A PLASTIC TOTE

Danny T. Allen, 2519 Cass St., Fort Wayne, Ind. 46808, and Mark S. Allen, 1823 Woodhaven Dr., Fort Wayne, Ind. 46819

Filed Jun. 9, 1986, Ser. No. 872,116
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—98 **9 Claims**



1. A method for repairing and reinforcing a plastic tote, said tote including a plurality of upstanding sidewalls, at least one of said sidewalls including at least one tear therein, said method comprising:

bevelling the edges of said tear;

welding said tear with a plastic material of a type which is compatible with the material of said plastic tote;

providing a closed loop of plastic material;

placing said loop around said plurality of upstanding walls; and

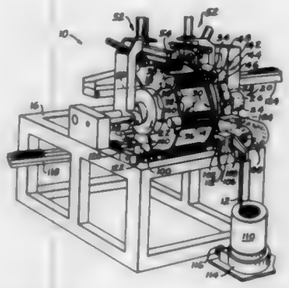
welding said loop to said upstanding walls.

4,692,196

APPARATUS AND METHOD FOR WRAPPING AN EXTERNAL TAPE SUPPORT ABOUT A FILTER ELEMENT ASSEMBLY

Norman W. Ellegood, Fremont; Joel L. Fritsche, Sunnyvale, both of Calif.; John J. Groezinger, Dunlap, Ill.; Keichi Ikeda, San Jose, Calif., and Ronald W. Streitmatter, Toulon, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1985, Ser. No. 812,678
Int. Cl.[4] B32B *1/00*
U.S. Cl. 156—187 **9 Claims**



1. An apparatus for wrapping an external tape support about a pleated filter element, the apparatus comprising:

a frame;

an indexable turret assembly rotatably mounted on said frame;

means for sequentially rotating said turret assembly in one direction between a plurality of predetermined radial positions;

a plurality of filter element clamps rotatably mounted at spaced radial positions on said indexable turret;

means at a first of said predetermined radial positions for controllably rotating one of said filter element clamps about a longitudinal axis in response to said one clamp being radially aligned with said first predetermined radial position, said means including a drive motor mounted on said frame at said first radial position and clutch means for selectively connecting said motor to a preselected one of said filter element clamps;

means for selectively positioning a strand of tape along said longitudinal rotational axis of said clamp in a spaced-apart spiral pattern about said pleated filter element; and

means for severing said strand of tape and wrapping the severed ends of said tape about respective pleated filter elements, said severing and tape-end wrapping means being mounted on said frame at a position between said first predetermined radial position and an adjacent second radial position on said indexable turret.

9. A method for wrapping an external tape support about a pleated filter element, including the steps of:

conveying a first pleated filter to a clamp fixture mounted on an indexable turret assembly;

clamping said first pleated filter between opposed face surfaces of said clamp fixture;

indexing said turret assembly and aligning said clamp fixture with a first radial position;

contacting a continuous strand of adhesive-coated tape with at least one outer edge surface of said first pleated filter carried in said clamp fixture;

cutting said continuous strand of tape at a position between said first radial position and a radial position at which a second pleated filter element has a spirally-wound tape support previously disposed thereon;

pressing a severed end of said adhesive-coated tape into contact with the outer edge surfaces of said first pleated filter assembly at said first radial position;

rotating said first pleated filter element at said first radial position about a longitudinal axis and simultaneously moving the position of said tape material in one direction along said longitudinal axis to spirally wrap said tape externally about said first pleated filter element;

indexing said spirally-wound first pleated filter element to said second radial position;

contacting the continuous strand of adhesive-coated tape with at least one outer edge pleat of a third pleated filter element positioned at said first radial position;

cutting said continuous strand of tape at a position between said first and second radial positions;

pressing a severed end of said adhesive coated tape into contact with the outer edge surfaces of said first pleated filter element;

indexing said spirally-wrapped first pleated filter element to a third radial position; and,

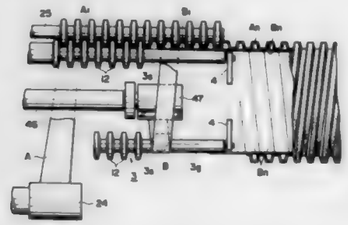
conveying said spirally-wrapped first pleated filter element from said third radial position.

4,692,197

METHOD FOR MANUFACTURING CORRUGATED TUBES

Koutarou Ueda, Fuji; Noboru Hasegawa, Fujisawa; Akio Machihara, Yokohama; Masaharu Kusaka, Yokosuka; Kohei Orii, Miura, and Yoshiro Noguchi, Odawara, all of Japan, assignors to Toyo Chemical Co., Ltd., Kamakura, Japan

Division of Ser. No. 615,977, May 31, 1984, Pat. No. 4,575,400.
This application Nov. 20, 1985, Ser. No. 800,002
Claims priority, application Japan, Jun. 8, 1983, 58-102465; Mar. 22, 1984, 59-53582; Mar. 23, 1984, 59-54483
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—189 **4 Claims**



1. A method of manufacturing a corrugated tube having a smooth inner wall surface along a length of the tube and axially extending spiral convolutions to define a corrugated outer wall in longitudinal cross-section comprising the steps of:

arranging in a circular array a plurality of rollers each rotating at the same speed such that an imaginary cylinder is defined about a central axis by said rollers, said rollers having longitudinal axes parallel to each other but offset with respect to the central axis of the imaginary cylinder;

continuously feeding a first strip of synthetic resin material in a softened state generally perpendicularly to a length of said rollers in such a manner that said strip is helically wrapped around and advanced axially along said imaginary cylinder defined by the rollers with portions of adjacent turns of the strip overlapping one another and welding together to form a continuous tube, each of said rollers having a first portion with axially spaced annular ridges around an outer periphery thereof and a second portion with a smooth surface, said ridges of a respective roller being so arranged that associated successive ridges of each adjacent roller are aligned in a spiral path around said imaginary cylinder, said first strip of synthetic resin material being fed onto the imaginary cylinder while being pressed onto at least one of said first portions of the rollers so that said convolutions are formed on the strip by the ridges, while one turn of the first strip being wrapped around said imaginary cylinder is overlapped by a next succeeding turn of the strip, thereby forming said corrugated outer wall; and

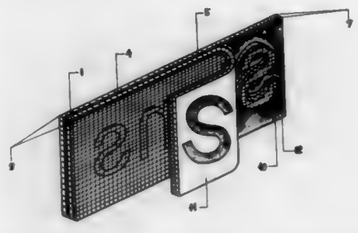
continuously feeding a second strip of synthetic resin material from inside said imaginary cylinder, said second strip of synthetic resin material in a softened state being fed onto an inner surface of said outer wall and bonded thereto and guided by and spirally wrapped around said second portion of each roller so that the smooth inner wall is formed on the inner surface of said outer wall, while one turn of the second strip being wrapped around said second portions of the rollers is overlapped by a next succeeding turn of the second strip, thereby forming said smooth inner wall surface.

4,692,198

METHOD OF PRINTING A PATTERN ON A SURFACE RECEPTIVE TO SUBLIMATION PRINTING

Peter A. Borresen, Vejle, Denmark, assignor to A/S Modulex, Billund, Denmark

PCT No. PCT/DK84/00039, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04496, PCT Pub. Date Nov. 22, 1984
PCT Filed May 16, 1984, Ser. No. 694,828
Claims priority, application Denmark, May 17, 1983, 2193/83
Int. Cl.[4] B44C *1/17;* **B32B** *31/00;* **D06P** *1/02*
U.S. Cl. 156—235 **1 Claim**



1. A method of printing a pattern on a surface receptive to sublimation dye comprising the steps of

(a) providing a sublimation foil comprising a carrier foil having a layer of sublimation dye on its front side, its back side being bonded to an auxiliary carrier by means of an adhesive of greater adhesiveness to the auxiliary carrier than the carrier foil;

(b) cutting or punching the pattern to be transferred in mirror-reversed form in said carrier foil without cutting or punching through the auxiliary carrier;

(c) removing the excess carrier foil from the auxiliary carrier so as to expose the adhesive surrounding a positive pattern or surrounded by a negative pattern;

(d) contacting the surface with the auxiliary carrier whereby said exposed adhesive surrounded by or surrounding the pattern fixes said auxiliary carrier to the surface; and,

(e) thereafter heating said dye under pressure to transfer said pattern to said surface.

4,692,199

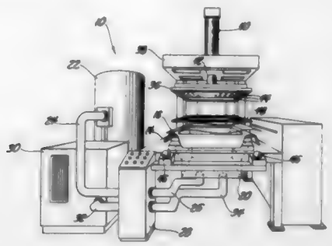
METHOD AND APPARATUS FOR BONDING FABRIC TO A FOAM PAD

Eric F. Kozlowski, and Edmund R. Kruger, both of Sterling Heights, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 13, 1985, Ser. No. 808,841
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—245 **18 Claims**

1. A method of fabricating a cushion assembly (**50**, **50'**) comprising the steps of; placing a fabric layer (**14**) over a mold surface of a mold (**18**), placing an air impervious adhesive film

(16) over the fabric layer (14), applying a vacuum pressure over the mold surface (18) and through the fabric layer (14) to draw the adhesive film (16) down against the fabric layer (14) and to urge the fabric layer (14) against the mold surface (18),



characterized by placing a cellular foam pad (12) in facing engagement with the adhesive film (16), and heating and diffusing the adhesive layer (16) into the foam pad (12) and fabric layer (14) respectively, and curing the diffused adhesive to secure the fabric layer (14) to the foam pad (12).

4,692,200

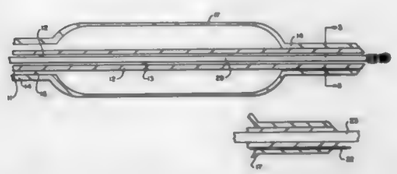
SELF-VENTING BALLOON DILATATION CATHETER AND METHOD

Philip E. Powell, Mountain View, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Division of Ser. No. 760,637, Jul. 30, 1985, Pat. No. 4,638,805. This application Sep. 15, 1986, Ser. No. 907,108

Int. Cl.⁴ B29C *27/00*

U.S. Cl. 156—289 **3 Claims**



1. In a method for fabricating a self-venting balloon dilatation catheter, providing a first tubular element having a lumen extending therethrough, providing a second tubular element having a lumen disposed therein, forming a balloon onto the second tubular element near the distal extremity of the second tubular element, placing the first tubular element within the second tubular element so that the second tubular element extends coaxially of the first tubular element and forming a flow passage open to ambient between the distal extremities of the first and second tubular elements and in communication with the interior of the balloon which has a size less than 0.001 inches to permit the escape of air from the interior of the balloon but inhibiting the escape of liquid from the interior of the balloon.

4,692,201

SMOOTHING AND PRESSING DOWN DEVICE IN LABELING MACHINES

Rudolf Zodrow, Dusseldorf, and Josef Tomashauser, Willich, both of Fed. Rep. of Germany, assignors to Jagenberg Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

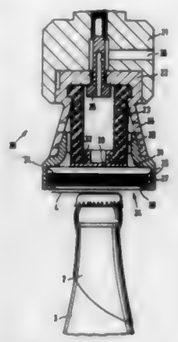
Filed May 13, 1985, Ser. No. 733,440

Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417; Oct. 11, 1984, 3417283

Int. Cl.⁴ B65C *3/22, 9/34*

U.S. Cl. 156—488 **7 Claims**

1. In a device for a labeling machine, for smoothing and pressing down a point of a blank of foil wrapped around neck and head portions of a bottle with the point projecting at the head portion, the device having a pot-like housing with a pressing down structure connected thereto and which housing is axially movable into a pressing down position wherein the pressing down structure acts on the bottle head portion, the improvement wherein the pressing down structure comprises a first axially compressible upper component and a second multilayer elastic component disposed below the first component



and separated from the first component, and further comprising means coactive with the second component to form a recess in a face of the pressing-down structure toward the bottle that is configured to embrace at least the head portion of the bottle on all sides subject to slight tension on the head portion when the housing is in the pressing-down position wherein the multilayer elastic component consists of several separate flat pressing-down disks.

4,692,202

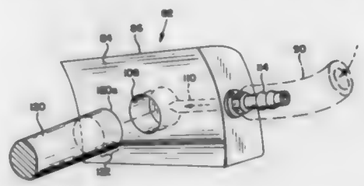
MEANS FOR APPLYING LIQUID TO ROLLER IN LINE APPLICATOR

John L. Getz, Blachly, Oreg., assignor to Industrial Adhesives, Inc., Eugene, Oreg.

Filed Oct. 18, 1982, Ser. No. 434,722

Int. Cl.⁴ B31F *5/04*; B32B *31/04*

U.S. Cl. 156—554 **10 Claims**



1. In a line applicator having a frame and a rotatable roller with a peripheral contacting surface for pressing an elongate line to a moving workpiece, means for applying liquid to the contacting surface of the roller comprising:

a shoe mounted on the frame having a curved face which is contoured to the curvature of the contacting surface of the roller and establishing sealed contact with the contacting surface, said surface of the roller moving under said face with rotation of the roller,

a liquid-holding well formed in said shoe communicating through an opening with said curved face of said shoe, with said opening completely encompassed by said curved face and the sealed contact established by the curved face, and

liquid-supply means connected to said well for supplying liquid thereto.

4,692,203

PROCESS FOR MAKING BETA-ZINC DIPHOSPHIDE MONOCRYSTALS (WHISKERS)

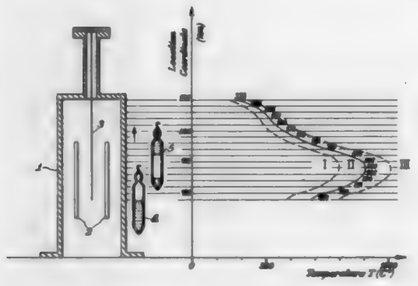
Thomas Betz, Wiehl-Bielstein; Hans-Georg von Schnering, Aidlingen, and Erich Schönherr, Leonberg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,941

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531949

Int. Cl.⁴ C30B *23/00*

U.S. Cl. 156—610 **2 Claims**



1. A process for making β-zinc diphosphide monocrystals (β-ZnP_2) having a diameter of at least 7 mm which comprises: filling a quartz ampoule having a constriction formed in the upper end portion up to 70–90% its volume with polycrystalline β-ZnP_2; sealing the ampoule; subliming the polycrystalline β-ZnP_2 followed by condensing the β-ZnP_2 from the gas phase into the upper ampoule portion to form monocrystalline β-ZnP_2 wherein the ampoule is conveyed in upright position at a velocity of 0.5–2.5 mm/day over a period of 24 to 120 days through a kiln in which the temperature gradient from below to above is defined by a lower inlet temperature of 580°–780° C., a mean maximum temperature of 800°–950° C. and an upper outlet temperature of 350°–400° C.; maintaining the quartz ampoule under an outer inert gas pressure of 20–60 bars while being conveyed through the heated kiln; crushing the ampoule coming from the furnace and recovering the β-ZnP_2 monocrystal.

4,692,204

METHOD OF PLANARIZING THE SURFACE OF A SEMICONDUCTOR DEVICE, IN WHICH SILICON NITRIDE IS USED AS ISOLATING MATERIAL

Raymond Fabien, Douvres la Delivrande, and Jean-Michel Decrouen, Argences, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,709

Claims priority, application France, Sep. 20, 1985, 85 13987

Int. Cl.⁴ H01L *21/306, 21/318*

U.S. Cl. 156—626 **2 Claims**



1. In a method of planarizing the surface of a semiconductor device comprising a substrate carrying in relief on its surface at least one contact configuration cut out of a contact layer, which method comprises successively carrying out the following steps:

(a) depositing a silicon nitride layer having a thickness substantially equal to that of the contact layer,

(b) depositing a lacquer layer having a given thickness and then treating the layer, wherein the kind, the thickness and the treatment of the lacquer layer are such that the free surface of this layer is substantially flat,

(c) progressively attacking by plasma the lacquer layer until the farthest projecting parts of the silicon nitride layer are completely exposed in order that a new free surface is reproduced, whose flatness is an image of that of the free surface of the lacquer layer, the complete appearance of the farthest projecting parts of the nitride layer being detected by means of a device for recording the intensity variations of an emitted jet of nitrogen, and

(d) attacking simultaneously, also by plasma, the silicon nitride layer and the remaining lacquer until the contact configuration appears completely; the improvement comprising choosing the conditions of attack during the step of simultaneously attacking the silicon nitride layer and the remaining lacquer so that the rate of attack of the lacquer is higher than the rate of attack of the silicon nitride so that the lacquer is completely removed before the appearance of the contact configuration, in order to detect with increased sensitivity by means of the recording device the complete appearance of the contact configuration.

4,692,205

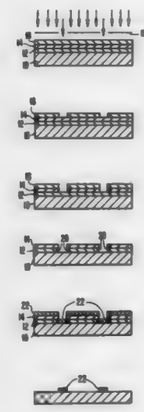
SILICON-CONTAINING POLYIMIDES AS OXYGEN ETCH STOP AND DUAL DIELECTRIC COATINGS

Krishna G. Sachdev; Ranee W. Kwong; Mani R. Gupta, all of Wappingers Falls; Mark S. Chace, Poughkeepsie, and Harbans S. Sachdev, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,893

Int. Cl.⁴ B44C *1/22*; C03C *15/00, 25/06*; B29C *37/00*

U.S. Cl. 156—643 **14 Claims**



1. A method for depositing metal conductors on a substrate comprising the following steps:

providing a substrate;

depositing a lift-off polymer layer on the substrate;

depositing a layer of silicon-containing polyimide on the lift-off layer;

depositing a radiation sensitive layer on the silicon-containing polyimide layer;

imagewise exposing the radiation sensitive layer to radiation;

developing the imagewise exposed radiation sensitive layer;

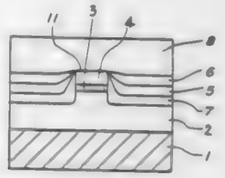
etching the silicon-containing polyimide layer using the developed radiation sensitive layer as an etch mask;
etching the lift-off layer using the silicon-containing polyimide layer as an oxygen etch mask;
blanket depositing a layer of metal on the silicon-containing polyimide layer and exposed substrate;
removing the lift-off layer, the silicon-containing polyimide layer and overlying metal layer, leaving the metal conductors on the substrate.

4,692,206

METHOD FOR PRODUCING A SEMICONDUCTOR LASER DEVICE HAVING A BURIED HETEROSTRUCTURE

Shinji Kaneiwa; Haruhisa Takiguchi, both of Nara; Toshihiko Yoshida, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1986, Ser. No. 830,857
Claims priority, application Japan, Feb. 19, 1985, 60-33601
Int. Cl.⁴ H01S *3/18*
U.S. Cl. 156—649 **1 Claim**



1. A method for the production of semiconductor laser devices comprising:
growing a multi-layered crystal structure, containing an active layer for laser oscillation, on a p-substrate,
etching said multi-layered crystal structure to form a striped mesa-portion,
disposing a first layer of a first conductivity type over the entirety of an upper face of said multi-layer structure with the exception of an upper face of said striped mesa-portion, said first layer surrounding both sides of said striped mesa-portion to form a heterojunction at each of both side faces of said active layer;
disposing a second layer of a second conductivity type, opposite to said first conductivity type, over said first layer;
disposing a third layer of said first conductivity type over said second layer; and
disposing a burying layer of said second conductivity type over said third layer and said upper face of said striped mesa-portion.

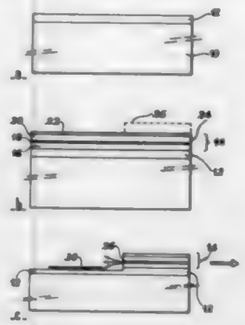
4,692,207

PROCESS FOR THE PRODUCTION OF AN INTEGRATED LASER-PHOTODETECTOR STRUCTURE

Noureddine Bouadma, 17 rue du val de Marne, 94250 Gentilly; Francois Brillouet, 17 Rue der Fontaines, 92310 Sevres, and Angelika Kampfer, 146 rue der Théâtre, 75015 Paris, all of France

Filed Oct. 14, 1986, Ser. No. 917,860
Claims priority, application France, Oct. 14, 1985, 85 15217
Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—649 **5 Claims**

1. A process for producing an integrated laser-photodetector structure, wherein on a substrate are deposited a buffer layer, followed by a double heterostructure having a first confinement layer, an active layer and a second confinement layer; part of the double heterostructure is etched to produce an uncleaved face serving as a reflecting face for the laser; a photodetector is produced in the vicinity of the laser and on the side of the uncleaved face, wherein in order to produce the photodetector, part of the double heterostructure is etched at



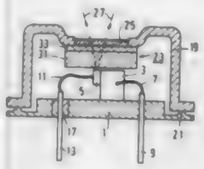
least up to the buffer layer and the photodetector is produced on the thus freed buffer layer.

4,692,208

METHOD OF MANUFACTURING A LIGHT-EMITTING DEVICE

Giok D. Khoe, and Henricus M. De Vriese, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,834
Claims priority, application Netherlands, Sep. 28, 1983, 8303316
Int. Cl.⁴ B44C *1/22*; H01L *21/00*
U.S. Cl. 156—659.1 **2 Claims**



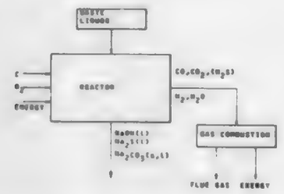
1. A method of manufacturing a light-emitting device in which a cap comprising a flat, transparent window on a support which supports a light-emitting semiconductor device, said cap being hermetically sealed to the support and said window being provided with a lens, said method comprising the steps of forming the window and the lens by providing a transparent multiple-layer plate in the cap at the area where said window is to be formed, the innermost layer of said plate which faces the semiconductor device being made of a material having a higher refractive index than that of the outermost layer, providing a layer of photosensitive lacquer on the outer side of the plate after connecting the cap to the support, then exposing a part of the layer of lacquer to light emitted by the semiconductor device and the developing said exposed layer part, so that only the exposed part which is situated opposite the semiconductor device remains, then heating said exposed part to the melting point to form a droplet of lacquer, then removing an outer layer of the plate and the droplet of lacquer by a non-selective etching method to form the lens opposite the semiconductor device and a flat window surrounding the lens at the same time.

4,692,209

RECOVERY OF CHEMICALS FROM PULP WASTE LIQUOR

Sven Santén, Hofors; Ragnar Bernhard, and Sven-Erik Malmeblad, both of Falun, all of Sweden, assignors to SKF Steel Engineering AB, Hofors and Stora Kopparbergs Bergslags AB, Falun, both of, Sweden

Continuation of Ser. No. 597,396, Apr. 6, 1984, Pat. No. 4,601,786. This application May 27, 1986, Ser. No. 866,660
Claims priority, application Sweden, Apr. 21, 1983, 8302245
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.⁴ D21C *11/12, 11/00*
U.S. Cl. 162—30.1 **9 Claims**



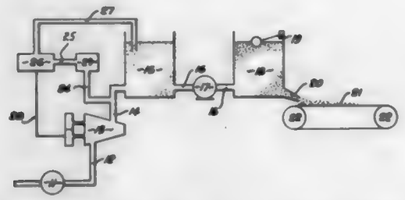
1. A method of recovering chemicals from waste liquor of wood pulp production, comprising in combination:
(a) feeding a pulp waste liquor of organic and inorganic constituents into a reaction zone of a reactor;
(b) heating the pulp waste liquor by supplying thermal energy, independent of combustion, for raising the temperature of the reaction zone independently of the oxidation level in the reactor zone such that the pulp waste liquor is substantially completely vaporized and converted in the reaction zone to a product mixture consisting essentially of sodium sulfide, sodium hydroxide, monatomic sodium, hydrogen, and carbon monoxide;
(c) cooling the product mixture in a cooling zone of the reactor;
(d) withdrawing the inorganic constituents of the pulp waste liquor as a white liquor melt or solution; and
(e) withdrawing the organic constituents as a combustible synthesis gas of hydrogen and carbon monoxide such that the organic constituents can be used to power a separate steam generator.

4,692,210

METHOD AND APPARATUS FOR MEASURING THE DISTRIBUTION OF FIBER WIDTHS AND ADJUSTING THE REFINING OF FIBROUS STOCK

Gilbert Forrester, 10/62 Alexandra Street, Hunters Hill, New South Wales, 2110, Australia

Filed Oct. 21, 1985, Ser. No. 789,783
Claims priority, application Australia, Oct. 25, 1984, PG7821
Int. Cl.⁴ D21D *1/20*; G01N *15/02*
U.S. Cl. 162—49 **6 Claims**



1. A method of making paper of a selected quality from a type of fibrous stock, said method comprising the steps of refining the stock, analysing the refined stock to produce a measurement of the distribution of fibre widths over a selected range of fibre widths, comparing said measurement with a reference measurement of the distribution of fibre widths over said selected range of fibre widths obtained from a prior analysis of the same type of stock refined to a degree known to produce paper of said selected quality, and adjusting the refining of the stock to produce a stock the analysis of which produces a measurement of the distribution of fibre widths substantially the same as said reference measurement.

6. An apparatus for making paper of a selected quality from a type of fibrous stock, said apparatus comprising adjustable refining means to produce refined stock, a fibre fineness distribution analyser to produce a measurement of the distribution of fibre widths over a selected range of fibre widths in a sample of the refined stock, storage means to store a reference measurement of the distribution of fibre widths over said selected range of fibre widths obtained from a prior analysis of the same type of stock refined to a degree known to produce paper of said selected quality, means to compare said measurement with said reference measurement, and means responsive to the difference between said measurement and said reference measurement to adjust the refining means to produce a stock the analysis of which produces a measurement of the distribution of fibre widths substantially the same as said reference measurement.

4,692,211

HIGH STRENGTH, CELLULOSIC-GEL-CONTAINING KRAFT PAPER AND PROCESS FOR MAKING THE SAME

James R. Roberts, Palatine, Ill., assignor to Eucatex S.A. Industria é Comercio of Sao Paulo, Sao Paulo, Brazil

Continuation of Ser. No. 661,977, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 417,874, Sep. 14, 1982, abandoned. This application May 23, 1986, Ser. No. 868,881
Int. Cl.⁴ D21H *5/12, 3/20*
U.S. Cl. 162—147 **6 Claims**

1. The process of making high strength kraft paper which comprises:
(a) mechanically refining kraft paper-making pulp to a freeness value of about CSF 500–800;
(b) forming a fluid mixture of from about 90 to about 99% of the resulting refined pulp and from about 1 to about 10% of hydrated cellulosic gel binder having a TAPPI drain time of at least 350 seconds, percent being expressed as percent by weight on a dry solids basis,
(c) the draft paper-making pulp comprising from about 40 to about 100% by weight virgin kraft pulp and from about 0 to about 60% by weight, dry weight basis, short fibered hardwood papermaking pulp or short fibered reclaim papermaking pulp,
(d) running the fluid mixture into a felted sheet and
(e) pressing and drying the sheet to form the kraft paper product.

4,692,212

KRAFT LINERBOARD BY DENSIFICATION AND HEAT TREATMENT

Roy S. Swenson, Ringwood, N.J.; Donald M. MacDonald, Monroe, N.Y.; Michael Ring, Warwick, N.Y., and Jasper H. Field, Goshen, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Aug. 23, 1985, Ser. No. 768,776
Int. Cl.⁴ D21F *11/00*
U.S. Cl. 162—206 **11 Claims**

1. A method of maximizing the folding endurance of linerboard produced from unbleached kraft pulp while improving its wet strength by heat treatment, comprising the steps of
forming a wet web of cellulose fibers from an aqueous suspension of fibers; then, without first drying the web,
press drying said wet web, by compressing it sufficiently to produce a product having a density of at least 700 kg/m^3 and drying the product until its water content by weight is less than 10%, and then
heat treating the product at an internal temperature of at

least 420° F. (216° C.) for a time sufficient to increase the wet strength thereof.

4,692,213

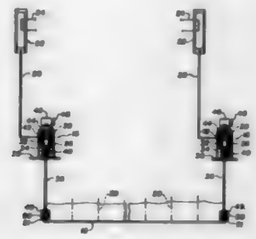
ADJUSTMENT DEVICE FOR A LIP OF A HEADBOX SLICE

Norman F. Dove, 1144 Hilary Place, North Vancouver, B.C., Canada V7J 3N6

Continuation-in-part of Ser. No. 363,307, Jan. 25, 1984, abandoned. This application Jan. 8, 1985, Ser. No. 689,650

Int. Cl.⁴ D21F *1/02, 1/06*

U.S. Cl. 162—259 **7 Claims**



1. A control for a lip of a head box slice, the control comprising:

a first vessel;

an incompressible liquid in the first vessel;

a heating element within the first vessel to vary the temperature of the liquid in a controllable manner within any range whose upper limit is below the boiling point of said incompressible liquid;

a second vessel able to expand;

an incompressible fluid in the second vessel;

a passageway communicating between the first vessel and the second vessel;

a member movable by the second vessel and attached at its end remote from the second vessel to the lip of the head box slice whereby heating of the incompressible liquid in the first vessel causes expansion of that liquid to pass along the passageway into the second vessel to move the member in a direction toward the lip, and whereby cooling of the incompressible liquid in the first vessel causes liquid from the second vessel to flow into the passageway to move the member in a direction away from the lip.

4,692,214

APPARATUS FOR PRODUCING MECHANICAL PULP WITH A REFINER HAVING ITS DRIVE SHAFT CONNECTED TO A STEAM TURBINE OUTPUT SHAFT

Bengt Nilsson, Skognall, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Oct. 29, 1984, Ser. No. 665,910

Int. Cl.⁴ D21C *11/06;* **D21D** *1/00*

U.S. Cl. 162—261 **14 Claims**

1. Apparatus for producing mechanical pulp comprising:

a refiner having a drive shaft operatively connected to at least one rotatable refining element;

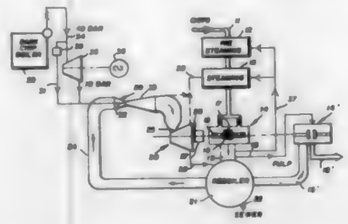
separating means for separating steam from refined material;

a process steam discharge means for discharging process steam from said separating means;

a pulp discharge means for discharging refined material from said separating means;

a steam turbine having a steam input and a rotating output shaft;

means for connecting said process steam discharge means to said steam turbine input, comprising reboiling means; and



means for connecting said turbine output shaft and said refiner drive shaft.

4,692,215

APPARATUS FOR CONVEYING A WEB LEAD-IN STRIP IN A PAPER MACHINE

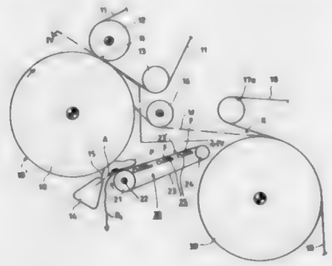
Reima Kerttula, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Filed Jul. 2, 1985, Ser. No. 751,014

Claims priority, application Finland, Jul. 5, 1984, 842711

Int. Cl.⁴ D21F *1/42*

U.S. Cl. 162—289 **10 Claims**



1. Apparatus for conveying a reduced-width lead-in strip of a full width web in a paper machine, comprising:

a conveyor belt arranged in a loop around at least one reversing roll and having a conveying run on which the lead-in strip is conveyed, said conveyor belt being formed of a fabric which is pervious to air; and

means situated within said loop of said conveyor belt for creating a dynamic vacuum on said conveying run of said conveyor belt so that the web lead-in strip adheres thereto, said vacuum creating means comprising air jet equipment including a plurality of guide plates situated within said belt loop arranged consecutively with respect to each other proximate to and extending substantially parallel to said conveying run of said conveyor belt, each guide plate being spaced a short distance from the next consecutive guide plate and having a substantially planar guide surface proximate to and extending substantially parallel to said conveying run of said conveyor belt forming a space therebetween, said planar guide surface having a leading edge and a free trailing edge in the running direction of said conveying run, air distributing header means extending substantially tranversely with respect to the running direction of said conveying run and situated substantially at said leading edge of said guide surface, and air jet discharge means formed in said air distributing header means for directing air jets over at least a portion of the length of said guide plate substantially parallel thereto within said space between said guide plate and said conveying run of said conveyor belt; and

means for adjustably mounting at least one of said plurality of guide plates with respect to said conveying run of said conveyor belt so that the distance between said guide plate and said conveying run can be varied whereby the distribution of pressure in the running direction of said conveying run can be adjusted.

4,692,216

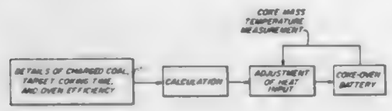
METHOD FOR CONTROLLING HEAT INPUT INTO A COKE OVEN

Jon L. Polansky; Douglas N. Rice, both of Penn Hills Township, Allegheny County; William J. Tomcanin, Penn Township, Westmoreland County, all of Pa., and Timothy B. Cribbs, Baytown, Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 24, 1983, Ser. No. 544,925

Int. Cl.⁴ C01B *47/00*

U.S. Cl. 201—1 **20 Claims**



1. Method of controlling heat input into a coke oven to obtain a desired temperature of the coke mass of said oven at the time of pushing comprising:

(1) determine the moisture content and heat of carbonization of a sample of coal scheduled for transfer into said oven;

(2) determine a coal mass, a target coking time, and an efficiency for said oven;

(3) calculate the heat requirement and temperature of the coke mass during the coking operation of said coke oven based upon said coal moisture, said heat of carbonization, said coal mass, said target coking time, and said efficiency;

(4) determine the temperature of said coke mass during the coking operation;

(5) compare the temperature determined from step 4 with the calculated temperature based upon the calculation of step (3);

(6) analyze any deviations noted in step (5) to obtain a more accurate heat requirement for said oven, and

(7) vary the heat input into said oven in accordance with said more accurate heat requirement.

4,692,217

READJUSTMENT DEVICE FOR COKE OVEN BATTERIES

Otto Lemke, Recklinghausen, and Manfred Krause, Herten-Langenbochum, both of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

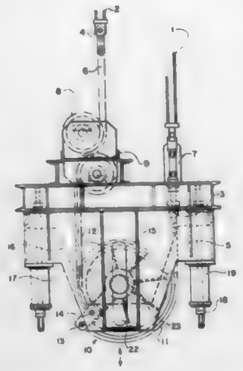
Filed Jul. 29, 1985, Ser. No. 760,314

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1984, 3427991

Int. Cl.⁴ C10B *21/10, 21/14*

U.S. Cl. 202—151 **13 Claims**

1. A device for moving two linkages in opposite directions, each linkage being adapted for connection to its own set of shutoff circuit members of individual coke ovens of a coke oven battery, the device comprising two linkages, a guide pulley assembly having an axis and two pulley segments which are connected to each other, said pulley segments being mounted to each other for common rotation around said axis, each pulley segment including a curved arc portion having a radius from said axis which is different from the radius of the curved arc portion of the other pulley segment, each arc portion having a circumferential fastening point, support means mounting said guide pulley assembly for rotation of said pulley segments around said axis, two flexible connecting members, each flexible connecting member having one end connected to one of said fastening points and an opposite end, each flexible connecting member being engagable against and trained around said curved arc portion of its pulley segment in opposite directions around said axis with said opposite ends of said connecting members being movable by different amounts and



in opposite directions with rotation of said pulley segments due to the difference in radii of said curved arc portions, one of the linkages being connected to said opposite end of one flexible connecting member and the other of the linkages being connected to said opposite end of the other flexible connecting member so that rotation of said pulley segment around said axis caused the linkages to move in opposite directions and by different stroke lengths.

4,692,218

PROCESS FOR PRODUCING ETHANOL

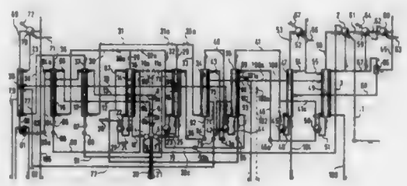
Heinz Houben, Monchen-Gladbach; Hans U. Petzoldt, Leverkusen, and Joachim Stegemann, Hürth-Hermülheim, all of Fed. Rep. of Germany, assignors to Fried, Krupp GmbH, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,785

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208743; Feb. 3, 1983, 3303571

Int. Cl.⁴ B01D *3/36;* **C07C** *29/80*

U.S. Cl. 203—19 **17 Claims**



1. A process for the production of ethanol, said process requiring the input of a predetermined quantity of process heat and comprising the steps of:

(a) admitting a first stream of fermented mash containing about 1.5 to about 15.0 percent by volume of alcohol into a first fluid path having spaced first and second zones;

(b) distilling, without reflux, said first mash stream in said first zone to recover a first alcohol-enriched stream;

(c) rectifying, with reflux, at least part of said first alcohol-enriched stream in said second zone to recover a first alcohol-rich product;

(d) admitting a second stream of fermented mash containing about 1.5 to about 15.0 percent by volume of alcohol into

a second fluid path having spaced first and second zones distinct from said first and second zones of said first fluid path;

(e) distilling, without reflux, said second mash stream in said first zone of said second fluid path to recover a second alcohol-enriched stream;

(f) rectifying, with reflux, at least part of said second alcohol-enriched stream in said second zone of said second fluid path to recover a second alcohol-rich product;

(g) admitting said predetermined quantity of process heat into one of said fluid paths at a single location thereof; and

(h) conveying at least one stream of said heat along a third path, the heat conveying step including transferring heat between said first and second fluid paths in such a manner that said third path includes all of said zones and said one heat stream successively passes through said first zones, and thereafter successively passes through said second zones.

4,692,219

SEPARATION OF FORMIC ACID FROM ACETIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, Bozeman, Mont., assignor to Celanese Chemical Co., Pampa, Tex.

Filed Dec. 3, 1986, Ser. No. 937,401
Int. Cl.⁴ B01D *3/40;* **C07C** *53/02*
U.S. Cl. 203—51 **17 Claims**

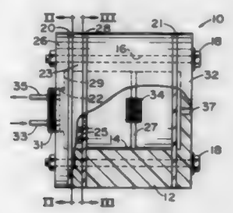
1. A method for recovering formic acid from a mixture comprising formic acid and acetic acid which comprises distilling a mixture comprising formic acid and acetic acid in a rectification column in the presence of about one to two parts of an extractive agent per part of formic acid - acetic acid mixture, recovering the formic acid as overhead product, obtaining the acetic acid and the extractive agent from the stillpot, separating the acetic acid from the extractive agent by distillation in another column, the extractive agent comprises at least a mono carboxylic acid containing from five to ten carbon atoms.

4,692,220

ELECTROCHEMICAL DETERMINATION OF FORMALDEHYDE

RaeAnn M. Anel, Westminster; Joseph D. Joison, and David A. Stewart, both of Baltimore, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 24, 1986, Ser. No. 822,488
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—1 T **3 Claims**



1. A method of electrochemically determining formaldehyde in a gas comprising exposing the gas to an iridium electrode in contact with an electrolyte,

maintaining the electrode at a fixed potential of from about 1.1 to 1.5 volts with respect to the reversible hydrogen couple in the electrolyte, whereby formaldehyde is oxidized,

and measuring the current flowing through the electrode.

4,692,221

IN-SITU DENDRITIC TREATMENT OF ELECTRODEPOSITED FOIL

Arvind Parthasarathi, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 22, 1986, Ser. No. 944,776
Int. Cl.⁴ C25D *1/04*
U.S. Cl. 204—13 **17 Claims**

1. An apparatus for forming in-situ surface treated metal foil, said apparatus comprising:

a cell containing an electrolyte having a concentration of metal values to be plated;

a moving cathode at least partially immersed in said electrolyte;

means for electroforming metal foil on said cathode in a first zone and for applying a surface treatment comprising a plurality of dendritic structures to said foil in a second zone;

said electroforming and surface treatment applying means comprising an anode having a first portion spaced a first distance from said cathode and defining said first zone and a second portion spaced a second distance from said cathode and defining said second zone; and

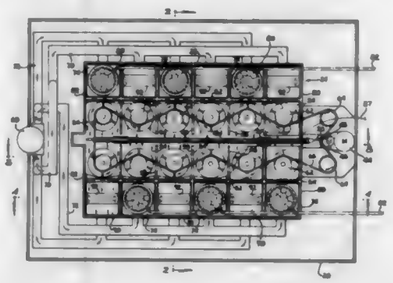
said second distance being sufficiently small to create a localized current density sufficient to form said dendritic structures on said foil.

4,692,222

ELECTROPLATING METHOD AND APPARATUS FOR ELECTROPLATING HIGH ASPECT RATIO THRU-HOLES

Peter P. Pellegrino, 216 Edgewood La., Apple Valley, Minn. 55124, and Damian Pellegrino, 17029 Harbor Bluff Cir., Huntington Beach, Calif. 92649

Division of Ser. No. 672,601, Nov. 19, 1984, Pat. No. 4,587,000. This application Feb. 21, 1986, Ser. No. 832,057
Int. Cl.⁴ C25D *5/02*
U.S. Cl. 204—15 **4 Claims**



1. A method of plating through holes in a printed circuit board comprising the steps of

(a) emersing the printed circuit board containing the through holes in the placing solution;

(b) mechanically agitating the plating solution adjacent the through holes by repetitive movement of said circuit board back and forth in a plane substantially coincident with the plane of the circuit board; and

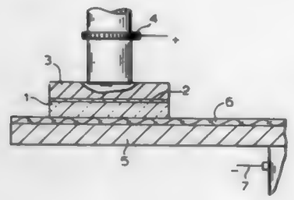
(c) encouraging flow of the agitated plating solution throug the through holes to provide fresh plating solution to inner surfaces through said holes.

4,692,223

PROCESS FOR POLISHING SILICON WAFERS

Ingolf Lampert, and Herbert Jacob, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,636
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517665
Int. Cl.⁴ B24B *1/00*
U.S. Cl. 204—34.5 **13 Claims**



1. In a process for polishing silicon wafer surfaces, the improvement comprising the steps of:

initially polishing the wafer surface in a conventional manner under alkaline conditions until a high quality of said polished surface is achieved; and

thereafter, without interruptiôn of the polishing, continuing and completing the polishing operation under oxidizing conditions by adding an oxidizing agent or anodic oxidation, thereby producing a film of silicon dioxide on the polished silicon wafer surface.

4,692,224

VOLATILE ANODIZING ELECTROLYTES FOR TANTALUM

Walter J. Bernard, and Steven M. Florio, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Aug. 11, 1986, Ser. No. 895,062
Int. Cl.⁴ C25D *11/00*
U.S. Cl. 204—56.1 **5 Claims**

1. An anodized film formed over the voltage range of 100 V to 350 V throughout the pores of tantalum pellets suspended from an aluminum alloy bar in a volatile electrolyte comprising an organic carboxylic acid selected from the group of acetic and salicylic acids, said electrolyte during anodization provides concentrated free acid within said pores of said pellets of a conductivity that supports anodization over said voltage range, said acid being cleanly volatile from said pores at 200° C. or less.

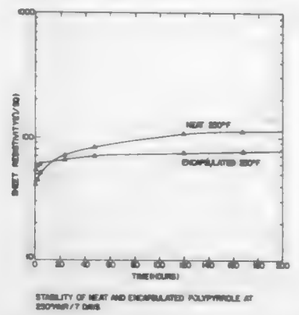
4,692,225

METHOD OF STABILIZING CONDUCTIVE POLYMERS

Edward F. Witucki, Van Nuys; Leslie F. Warren, Jr., Camarillo, and Paul R. Newman, Newbury Park, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 8, 1986, Ser. No. 883,253
Int. Cl.⁴ C25B *3/00*
U.S. Cl. 204—59 R **20 Claims**

1. A process for stabilizing an electrically conductive polymer which comprises encapsulating a conductive polymer selected from the group consisting of polypyrrole and polyaniline with a resin selected from the group consisting of epoxy, polyixide and bis-maleimide resins.



STABILITY OF HEAT AND ENCAPSULATED POLYPYRROLE AT 250°/WR / 7 DAYS

4,692,226

PROCESS TO MANUFACTURE GLYOXYLIC ACID BY ELECTROCHEMICAL REDUCTION OF OXALIC ACID

Isabelle Gimenez; Marie-Jeanne Barbier, both of Grenoble; Suzanne Maximovitch, Meylan, and Yani Christidis, Paris, all of France, assignors to Societe Francaise Hoechst, Puteaux, France

Filed Aug. 29, 1986, Ser. No. 901,792
Claims priority, application France, Sep. 10, 1985, 85 13385
Int. Cl.⁴ C07B *29/06;* **C07C** *51/40*
U.S. Cl. 204—73 R **7 Claims**

1. A process for manufacturing glyoxylic acid by electrochemical reduction of oxalic acid at a temperature of from 0° to 30° C. in an electrolysis apparatus comprising:

at least one anode compartment containing an anode and an anolyte, the anolyte comprising an aqueous acid solution;

at least one cathode compartment containing a cathode and a catholyte, the catholyte comprising an aqueous solution of oxalic acid; and

at least one separator between the two compartments;

wherein the anode consists of a solid conductor selected from the group consisting of compact graphite, vitreous carbon, titanium, gold, and platinum, the conductor being coated before use with an electrolytic deposit of a uniform layer of lead dioxide.

4,692,227

OXIDATION OF ORGANIC COMPOUNDS USING THALLIUM IONS

Robert M. Spotnitz, Baltimore, and Robert P. Kreh, Jessup, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 1, 1986, Ser. No. 936,521
Int. Cl.⁴ C25B *3/02*
U.S. Cl. 204—78 **31 Claims**

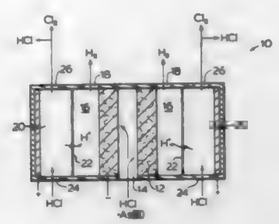
1. A process for oxidizing organic compounds comprising contacting an organic compound having an index of hydrogen deficiency greater than zero with a solution containing thallic organosulfonate salt in the presence of an excess of the corresponding free organosulfonic acid, said organosulfonic acid having the general formula RSO_3H wherein R represents methyl, trifluoromethyl, benzyl, tolyl and mitures thereof and said solution being substantially free of extraneous anions of inorganic acids and having at least 0.1 molar thallium concentration; and separating and recovering the oxidized product from the solution to yield a spent solution rich in thallous salts.

4,692,228

REMOVAL OF ARSENIC FROM ACIDS

Zbigniew Twardowski, Mississauga, Canada, assignor to Tenneco Canada Inc. (ERCO division), Islington, Canada

Filed May 21, 1986, Ser. No. 865,457
Claims priority, application United Kingdom, Jul. 23, 1985, 8518601
Int. Cl.[4] C25R *1/00*
U.S. Cl. 204—105 R **16 Claims**



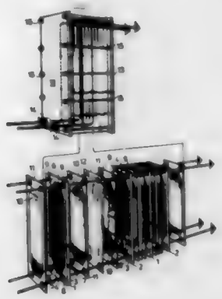
1. A method for removal of dissolved arsenic (III) ions from hydrochloric acid, which comprises cathodically reducing the dissolved arsenic (III) ions to metallic arsenic in an electrolytic cell having a large surface area cathode with interstices through which said arsenic-contaminated hydrochloric acid flows during said cathodic reduction, said interstices defining a three-dimensional electrolyte-contacting surface, and depositing the arsenic metal so produced on said cathode.

4,692,229

ELECTRODE CHAMBER UNIT FOR AN ELECTRO-CHEMICAL CELL HAVING A POROUS PERCOLATION ELECTRODE

Ake Bjäreklint, Vallentuna, and Daniel Simonsson, Täby, both of Sweden, assignors to ElectroCell AB, Åkersberga, Sweden

Filed Jun. 15, 1984, Ser. No. 621,101
Claims priority, application Sweden, Jun. 17, 1983, 8303494
Int. Cl.[4] C02F *1/46*; C25B *9/00, 11/03, 11/12*
U.S. Cl. 204—151 **21 Claims**



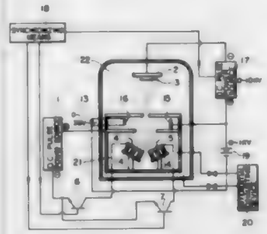
21. A method for purifying water comprising the steps of:
providing an electrochemical cell including at least one porous percolation electrode in the form of a bed of electrically conductive particles and which includes at least one thin, substantially flat frame, which frame defines a central opening that is filled with the electrically conductive particles so that these form a porous bed, the particles being kept in place in the central opening of the frame by sufficiently dense separators which are arranged to cover the central opening on either side of the frame to form an electrode chamber of substantially the same thinness as the frame, the frame provided with at least one first hole for supplying and at least one second hole for discharging electrolyte, said holes being in communication via inlet and outlet channels respectively with the central opening of the frame;
supplying a flow water to said first hole; and
during said water supplying step, supplying electric current to an electrode element located within said electrode chamber and in electrical contact with said porous bed so that electric current is supplied to said conductive particles while said electrode element is immersed in the supplied water, said electric current and said water flow being directed in a crossflow pattern in relation to each other.

4,692,230

THIN FILM FORMING METHOD THROUGH SPUTTERING AND SPUTTERING DEVICE

Masayasu Nihei, Hitachi; Masateru Suwa, Ibaraki, and Mitsuo Chigasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1986, Ser. No. 852,314
Claims priority, application Japan, Apr. 15, 1985, 60-79758
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.31 **9 Claims**



1. A method for forming film, comprising the steps of:
preparing a plurality of targets formed of different materials;
switching electric powers from one target to another to sputter said targets so as to deposit produced particles on a substrate;
ionizing the particles produced from the sputtering and thereafter depositing the ionized particles on the substrate;
accelerating the ionized particles and thereafter depositing them on a substrate so as to form said film; and
controlling an accelerating voltage of said ionized particles in synchronism with a switching frequency of said electric powers supplied to the targets.

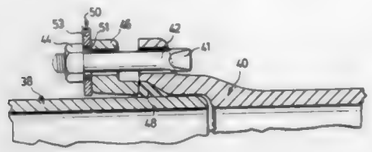
7. A sputtering device comprising:
at least two targets formed of different materials;
a sputtering power source for supplying electric powers to said targets;
switching means for switching the electric powers from one of said at least two targets to another of said at least two targets at a switching frequency;
ionizing means for ionizing particles sputtered by means of said sputtering power source;
ion accelerating means for accelerating said ionized particles with an accelerating voltage; and
controlling means for controlling said accelerating voltage in synchronism with said switching frequency.

4,692,231

APPARATUS FOR CATHODIC PROTECTION OF METAL PIPING

Henri S. St. Onge, 75 Nugget Avenue, Scarborough, Ontario M1S 3B1, Canada

Filed Feb. 6, 1985, Ser. No. 698,908
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—197 **10 Claims**



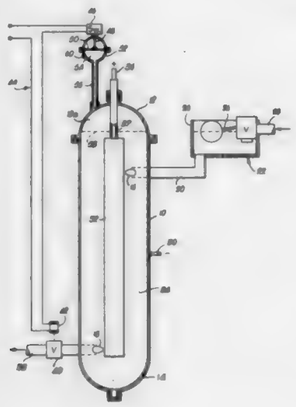
1. A length of iron pipe for use in a piping system subject to corrosion, said iron pipe having a bellmouth connection at one end thereof and a spigot connection at the opposite end for insertion in the bellmouth connection of a similar length of pipe, said bellmouth having a flat annular surface about the end thereof to which a sacrificial ring anode is mechanically secured in a manner to be in electrical conduction with said iron pipe, said sacrificial ring anode being made of a high grade zinc and having a substantial area of contact with said flat annular surface, said flat annular surface and said ring anode being of essentially the same internal and external diameters.

4,692,232

APPARATUS FOR INCREASING THE RESIDENCE TIME OF WASTE LIQUIDS IN AN ELECTRIC TREATER

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66026

Filed Aug. 5, 1985, Ser. No. 762,210
Int. Cl.[4] C25B *9/00*
U.S. Cl. 204—278 **3 Claims**



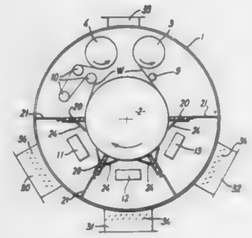
1. In a treater for exposing industrial waste water to an electric field to promote flocculation of solids therefrom, the improvement comprising:
means defining a pair of spaced electrodes having a treating region therebetween;
means for connecting said electrodes across a source of electrical potential to oppositely charge the electrodes and establish said electric field within said treating region;
inlet means for introducing waste water to said region for treatment by electrolysis, causing the formation of gas;
outlet means for discharging treated water from said region; and
flow control means operably associated with said outlet means for regulating the residence time of water within said region,
said control means having a shut-off valve and mechanism for opening and closing said valve in response to the generation of gas from the water during treatment thereof.

4,692,233

VACUUM COATING APPARATUS

Frank Casey, Rochdale, England, assignor to General Engineering Radcliffe Limited, Radcliffe, England

Filed Apr. 5, 1984, Ser. No. 597,123
Claims priority, application United Kingdom, Apr. 6, 1983, 8309324; Sep. 9, 1983, 8324192
Int. Cl.[4] C23C *14/56, 14/36*
U.S. Cl. 204—298 **7 Claims**



1. A vacuum coating apparatus for coating a length of sheet material comprising: a housing defining a vacuum chamber and having an interior wall and an axis; a transport cylinder having a central axis positioned within said housing; a plurality of radially extending peripherally spaced partitions dividing the chamber into at least three sub-chambers; each partition having a first part closely spaced from the transport cylinder and being in a fixed relationship to the position of the transport cylinder, a second part radially spaced from the first part, fixed to the interior wall and adapted to slide relative to the first part in the direction of the central axis of the transport cylinder, and sealing means interposed between the two partition parts; at least two treatment stations disposed in two respective sub-chambers; transporting means within the housing cooperating with the transport cylinder to transport a length of material past the treatment stations, said transport cylinder including a transport surface over which the sheet material passes, the transport surface defining at least one inner wall of each of said sub-chambers; and means for activating the treatment stations to treat sequentially the length of material as it passes the respective stations, one of the stations comprising a source of a coating substance which when activated coats the length of material as it passes that station.

4,692,234

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 9, 1986, Ser. No. 849,644
Int. Cl.[4] C10G *9/16*; C23C *18/12*
U.S. Cl. 208—48 AA **30 Claims**

1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a composition comprising silicon and tin, a composition comprising silicon and antimony and a

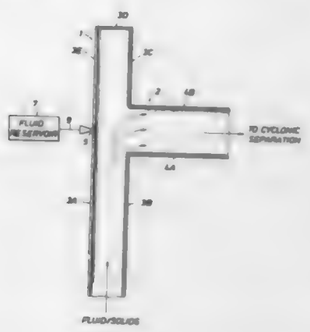
composition comprising silicon, tin and antimony, wherein said silicon, tin and antimony are present in said composition in a form selected from the group consisting of elemental metals, organic compounds and inorganic compounds.

4,692,235

SELECTIVE PLACEMENT OF FLUID INJECTION IN A RISER REACTOR EQUIPPED WITH A HORIZONTAL TEE JOINT CONNECTION TO SUBSTANTIALLY REDUCE BACK PRESSURE IN THE RISER REACTOR

Wesley A. Parker, Houston; Donald E. Hardesty, Brookshire, and Jack E. Stanley, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 28, 1986, Ser. No. 867,663
Int. Cl.[4] B01J *8/18*
U.S. Cl. 208—113 **22 Claims**



1. An apparatus for passing combined phases of an admixture of a vapor phase and fine solid particles upward through a first passageway and forcing said combined phases to a second passageway positioned at a substantially right angle with respect to said first passageway which comprises:

(a) a first passageway comprising a vertical passageway having a diameter and being situated in a substantially vertical upright position, said first passageway having a plurality of side walls, an imperforate top, and a bottom portion, wherein said bottom portion of said first passageway includes an inlet means to permit entry into said first passageway of a combined fine solid particle-vapor phase stream;

(b) a second passageway comprising a relatively horizontal elongated passageway situated substantially perpendicular to said first passageway and interconnecting and communicating openly at one end with a first of said side walls at an upper portion of said passageway to define a tee joint interconnection wherein a first portion of said first passageway is situated below said second passageway and a second portion of said first passageway is situated above said second passageway, and wherein said second portion terminates at said imperforate top, and wherein said second passageway communicates with, at the other end, a solid particle-vaporous phase separation means; and

(c) a fluid inlet injection means selectively located juxtaposed or attached to a second of said side walls to inject fluid in a direction substantially perpendicular to the vertical axis of said first passageway and to project said fluid into said second passageway, wherein said select location of said fluid inlet injection means is below the uppermost interconnection of the first passageway and the second passageway and above the lowermost interconnection of the first passageway and the second passageway, and wherein said fluid injection at the selected situs acts to aid the volume of said fine solid particles transferred from said first passageway to said second passageway and acts to prevent the backflow of said fine solid particles from said upper portion of said first passageway to a portion of said first passageway located below said tee joint interconnection.

4,692,236

CATALYTIC CRACKING PROCESS FOR HEAVY OIL WITH MIXTURE OF ALUMINA AND ZEOLITE

Goro Sato; Masamitsu Ogata; Tatsuo Masuda, and Takanori Ida, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Inc., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,891
Claims priority, application Japan, Sep. 25, 1984, 59-199733; Nov. 27, 1984, 59-250787
Int. Cl.[4] C10G *11/05, 25/09*
U.S. Cl. 208—114 **11 Claims**

1. A catalytic cracking process for heavy oil containing metallic impurities, which comprises: contacting said heavy oil, under catalytic cracking conditions, with a catalyst composition consisting essentially of a physical admixture of (A) particles of a crystalline aluminosilicate zeolite dispersed in a siliceous matrix, and (B) particles of alumina, the weight ratio of (A)/(B) being in the range of from 75/25 to 25/75, said catalyst composition containing from 20 to 50% by weight of said zeolite, so that the metallic impurities in said heavy oil are preferentially captured by said alumina particles whereby to reduce the production of hydrogen and coke and increase the yield of gasoline.

4,692,237

PROCESS FOR THE REMOVAL OF SOLIDS FROM AN OIL

Edward C. Hsu, Bridgewater, N.J.; Philip Merchant, Jr., Houston, Tex.; Dean L. Smith, Jr., Mountainside, N.J.; Kevin P. Kelly, Houston, and Sylvia M. Lacy, Pearland, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Apr. 1, 1985, Ser. No. 718,134
Int. Cl.[4] C10G *29/20, 33/04*
U.S. Cl. 208—177 **6 Claims**

1. A process for reducing the particulate solids content of a hydrocarbon oil fraction comprising:

providing a hydrocarbon oil fraction containing less than 10 wt % water;

treating said hydrocarbon oil fraction with an agglomeration aid introduced as a water-in-oil emulsion wherein the water to oil ranges from 5:1 and 1:10 and wherein the resulting mixture contains from 10 to 1000 weight parts per million (WPPM) of said aid based on the total weight of said mixture, said agglomeration aid being a water soluble polyelectrolyte of Mw ranging from 0.5 million to 25,000,000 and forming a polymer-water particles suspended in said oil, said particle agglomerating solids contacted therewith;

removing substantial portions of the polymer-water particles with solids agglomerated thereon; and

recovering a hydrocarbon oil bottoms portion having a reduced content of filterable solids.

4,692,238

SOLVENT EXTRACTION OF ORGANIC OILS AND SOLVENT RECOVERY

William W. Bodle, Deerfield, and Paul B. Tarman, Elmhurst, both of Ill., assignors to Institute of Gas Tehnology, Chicago, Ill.

Filed Aug. 12, 1986, Ser. No. 895,724
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—407 **22 Claims**

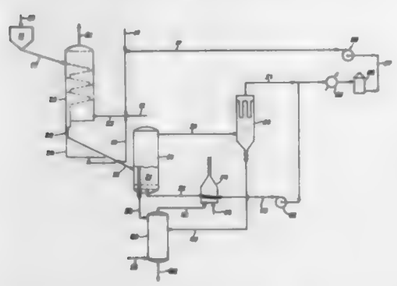
1. A process for solvent extraction of organic oils and residues in association with inorganic solids and solvent recovery comprising the steps of:

countercurrently contacting said solids with upflowing liquid organic solvent in a staged solvent extraction reactor;

withdrawing said liquid solvent having a substantial portion of said organic oils and residues dissolved therein from said solvent extraction reactor, separating said organic oils and residues from said solvent, and recycling liquid solvent to said solvent extraction reactor;

withdrawing liquid solvent extracted solids having a substantially reduced portion of said organic oils and residues in association therewith and solvent associated therewith from said solvent extraction reactor and conveying said liquid solvent extracted solids and associated solvent to a fluidized bed solvent recovery contactor, said solids fluidized by fluidizing gas comprising superheated vapor of said solvent vaporizing an additional portion of said associated solvent;

discharging said fluidizing gas and additional vaporized solvent from said solids from said fluidized bed solvent recovery contactor and liquefying and recycling said solvent for utilization in said process;



withdrawing said solids containing residual solvent and organic oil from said fluidized bed solvent recovery contactor and conveying said solids containing residual solvent and organic oils to a solids/combustion gas contactor;

countercurrently contacting said solids in said solids/combustion gas contactor with an upwardly flowing combustion gas stream at ambient lower temperature than said solids, physically stripping solvent from said solids and heating said combustion gas, combusting said combustion gas comprising stripped solvent in a solvent vapor superheater for producing said superheated vaporized solvent; and

discharging spent solids having reduced residual solvent from said solids/combustion gas contactor.

4,692,239

METHOD OF RECOVERING HYDROCARBON FROM OIL SHALE

Robert H. Friedman, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

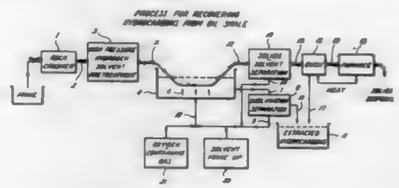
Filed Jun. 30, 1986, Ser. No. 880,362
The portion of the term of this patent subsequent to Jan. 28, 2003, has been disclaimed.
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—430 **29 Claims**

1. A method for recovering hydrocarbons from oil shale comprising mineral rock and kerogen materials comprising:

(a) crushing the oil shale to a coarse texture including chunks of one inch or more;

(b) exposing the crushed oil shale to a hydrogen doning solvent including tetralin for at least 3 days sufficient to accomplish at least partial disistegration of the oil shale mineral;

(c) exposing the oil shale material to an oxidative environment comprising a free oxygen-containing gas at a temperature of at least 60° C. for sufficient time to cause oxidative scission of a portion of the kerogen which produces organic fragments removed from the kerogen, said oxidative environment also including a liquid solvent for the organic fragments;



(d) separating the solent and organic fragments from the residual solids; and

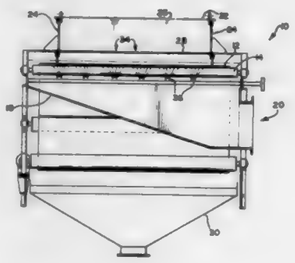
(e) separating the organic fragments from the solvent.

4,692,240

APPARATUS AND A METHOD FOR SEPARATING ONE SOLID COMPONENT FROM ANOTHER SOLID COMPONENT IN SUSPENSION IN A LIQUID

Ian M. Arbuthnot, Northcliff; Errol T. Amm, Bryanston, and Raymond J. Davidson, Victory Park, all of South Africa, assignors to Delkor Technik (Proprietory) Ltd. of Delkor House, Parktown, South Africa

Filed Jun. 26, 1985, Ser. No. 749,171
Claims priority, application South Africa, Jun. 27, 1984, 84/4920; Feb. 28, 1985, 85/1540
Int. Cl.[4] B07B *1/10, 1/50*
U.S. Cl. 209—254 **13 Claims**



1. A gravity operable separator for separating out a first solid component from a mixture thereof with a liquid and a second solid component which is of smaller average particle size than the first solid component, the first and second solid components being in suspension in the liquid and with the percentage by mass of the second solid component being substantially greater than that of the first solid component, which includes

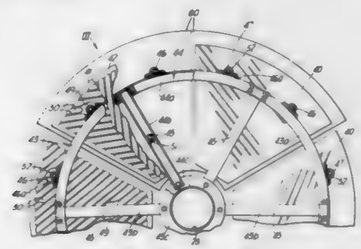
an endless cloth which is foraminous and has foramen which are of a suitable size to permit the second solid component to pass therethrough and to impede the passage therethrough of the first solid component, a part of the cloth being substantially horizontal and defining an extended operative separating region;

a feed means for feeding the liquid and the solid components onto the cloth in a distributed and continuous manner directly onto a substantial portion of that part of the cloth that defines the operative separating region, the feed means including a feed box that has a floor plate with a number of distributed feed openings and which is spaced from the cloth;

a liquid collecting means for collecting liquid and material that has passed through the cloth, the liquid collecting means being located beneath that part of the cloth defining the operative separating region;

a first component removal and collecting means for removing material from the cloth and collecting it; and
a drive means for continuously displacing the cloth past the feed means, the liquid collecting means and the first component removal and collecting means whilst liquid and the solid components are being fed onto the cloth.

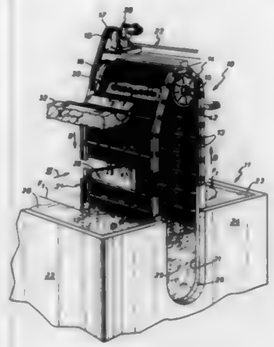
4,692,241
SEWAGE TREATMENT BIOLOGICAL ROTORS
John L. Nicholson, Thame, United Kingdom, assignor to Klargester Environmental Engineering Ltd., Aylesbury, United Kingdom
Filed Dec. 12, 1985, Ser. No. 808,429
Claims priority, application United Kingdom, Dec. 18, 1984, 8431866; Jun. 11, 1985, 8514680
Int. Cl.[4] C02F *3/08*
U.S. Cl. 210—150 9 Claims



1. A method of assembling a biomass rotor from sector-shaped packs of preformed plastics sheets having (at least two) a triangular array of three rigid through-members penetrating all the sheets in the pack, comprising the steps of securing the packs between a pair of spider-like support assemblies each extending normal to the axis of a shaft to thereby constitute a coplanar pair and each including arranging a ring concentric with the shaft and extending radial arms inwardly from the ring towards the shaft, locating the radial arms in each pair of support assemblies in respective axial planes of the shaft, securing two rigid through members of each pack at each end to the respective rings of the pair, characterized by forming each of the radial arms as channel-shaped members with the channels in each coplanar pair opening towards one another to thereby confront each other and by locating ends of the remaining rigid through-member of each pack in the confronting channels of a respective axially coplanar pair of raidal arms.

4. A biomass rotor comprising a plurality of sector-shaped packs of preformed plastics sheets, each pack having three rigid through-members penetrating all the sheets in the pack, the packs being secured between a pair of spider-like support assemblies each extending normal to the axis of a shaft of the rotor to thereby constitute a coplanar pair, each support assembly including a ring concentric with the shaft and radial arms extending inwardly from the ring towards the shaft, the arms in each pair of support assemblies being located in respective axial planes of the shaft, two of the rigid through-members being secured at each end to the respective rings of the pair, characterized in that each radial arm is a channel-shaped member with the channels in each coplanar pair opening towards one another to thereby confront each other, the remaining rigid through-member of each pack having its ends located in the confronting channels of a respective axially coplanar pair of radial arms.

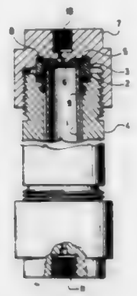
4,692,242
SCREEN COMPRISING A TRAVELLING ENDLESS SCREENING BAND
Philip Jackson, 15 Rue Las Cases, 75007 Paris, France
Filed Dec. 26, 1985, Ser. No. 813,672
Claims priority, application France, Dec. 28, 1984, 84 20004
Int. Cl.[4] B01D *33/04*
U.S. Cl. 210—160 19 Claims



1. A screen comprising a travelling endless screening band defining a loop and having a longitudinal direction of movement and including a plurality of screening panels connected to one another in succession substantially perpendicularly to the longitudinal direction of movement, each of said screening panels including a substantially plane chassis, and a screening element carried by said chassis, said screening elements forming relative to a general plane of said chassis part-cylindrical projections extending parallel to the longitudinal direction of movement, generatrices of the part-cylindrical projections being parallel to the longitudinal direction of movement, the improvement wherein the screen is adapted to filter water flowing from outside to inside the screen, and there are means for washing the screening band disposed inside the loop defined by said screening band in a position to preclude interference with movement of said screening band, said means for washing said screening band comprising a washing manifold spaced inwardly and beyond the path of movement of said chassis and lying generally perpendicular to the direction of movement, said washing manifold including a plurality of nozzles arranged in first and second rows staggered with respect to the direction of movement, a first plurality of said nozzles being directed at a first oblique angle relative to the general longitudinal plane of the screen and a second plurality of said nozzles being directed at a second oblique angle relative to said general longitudinal plane opposite the first oblique angle, whereby respective ones of said first and second pluralities of nozzles are in crossed relationship for washing respective surfaces of said projections.

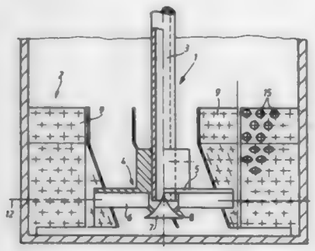
4,692,243
COLUMN FOR LIQUID CHROMATOGRAPHY
Bedrich Porsch; Jaroslav Voslar, and Jaroslav Rosol, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia
Continuation of Ser. No. 662,695, Jun. 20, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,234
Claims priority, application Czechoslovakia, Jun. 24, 1983, 4677-83
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—198.2 6 Claims

1. Column for liquid chromatography consisting of a glass tube having an inner diameter of at least 5.8 mm and a wall thickness of at least 2.45 mm, said glass tube being placed inside a metallic tube, the glass tube and the metallic tube each having a through bore, wherein the said metallic tube (4) has recesses in its inner wall at both ends, which recesses accommodate conic circumferential packings (2) from plastics, together with metallic conic tightening rings (3), and further consisting of front packings (5) from plastics, which have gauzes or porous disks (6) pressed into their recesses, and wherein the both packings are tightened with metallic terminal elements (7) screwed on the ends of tube (4), whereas the metallic terminal



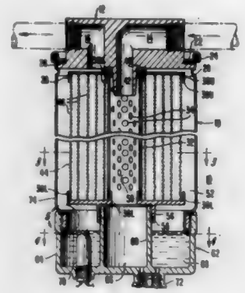
elements (7) are provided, at sides adjacent to the front packings (5), with expansion slots (8), whereby the circumferential packing (2), tightening ring (3) and terminal element (7), at each respective end of the metallic tube (4), co-act to seal the glass tube through bore from the metallic tube through bore, said column being characterized in that it is capable of withstanding a pressure of up to 72 MPa without destruction of the glass tube.

4,692,244
DISPERSER FOR A FLOTATION SYSTEM
Armin Supp, Hamm, and Rainer Nebe, Mühlheim, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany
Filed Nov. 15, 1984, Ser. No. 671,599
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, 3400593
Int. Cl.[4] C02F *1/24;* B01F *3/04*
U.S. Cl. 210—219 9 Claims



1. In a flotation disperser having a rotatable agitator rotor and a plurality of stabilizer plates provided with holes encircling the rotor, each of said stabilizer plates having an upper vertical portion and a lower portion inclined at an angle of between 30°–60° relative to the vertical, the improvement wherein the stabilizer plates are angularly offset against the direction of rotation of the rotor relative to a substantially radial position with respect to the rotor.

4,692,245
FILTER ASSEMBLY WITH HIGH PRESSURE CONNECTION TO COLLECTION BOWL
John F. Church, and Walter H. Stone, both of Modesto, Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 733,808, May 14, 1985. This application Oct. 7, 1985, Ser. No. 784,292
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—232 4 Claims



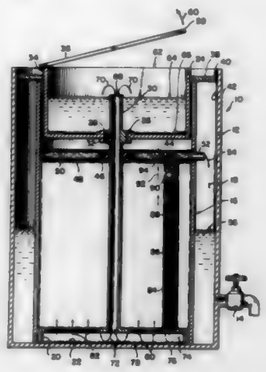
1. An invention comprising a fuel filter unit including:
(a) a casing having a cylindrical peripheral wall and first and second fuel ports to define a fuel flow path through said filter unit;
(b) a first filter medium extending in a loop within said casing and separating a central fuel chamber from a peripheral fuel chamber, said peripheral fuel chamber disposed directly between said first filter medium and said casing, said first filter medium disposed intermediate said first and second fuel ports in said fuel flow path;
(c) a peripheral contaminant outlet operable to allow contaminants to directly exit from said peripheral fuel chamber by way of at least one contaminant channel;
(d) an end cap disposed below said first filter medium, said contaminant channel inwardly extending in said end cap; and
(e) an annular threaded portion distinct from said cylindrical peripheral wall and disposed in line below said end cap and at said cylindrical peripheral wall and operable to threadingly engage mating threads on a cylindrical peripheral wall of a collection bowl such that the engagement between said threaded portion and the mating threads separates said peripheral fuel chamber from ambient air,
said filter unit including a plurality of peripheral contaminant outlets allowing contaminants to directly exit from said peripheral fuel chamber by way of a corresponding plurality of contaminant channels extending inwardly in said end cap, said end cap including a plurality of downwardly projecting ribs, said contaminant channels extending between adjacent ones of said ribs,
said end cap including a lower annular first ridge, said ribs extending radially out from said first ridge to define a plurality of lower surface portions having peripheral edges and disposed between each pair of adjacent ribs, said ribs extending out beyond said lower surface portions to provide offset between said peripheral edges and an inner surface of said peripheral wall,
said annular threaded portion being distinct from said end cap and having said ribs at least partially resting thereon, all of said lower surface portions being co-planar and unbounded at their peripheral edges,
said end cap having a lower annular second ridge, concentric and within said first ridge, and an annular isolation seal disposed between said first and second ridges and operable to mate with a cylindrical interior wall of a collection bowl.

4,692,246

CARTRIDGE FILTER WITH PLURAL MEDIAS

Abraham E. Simon, 1122 Kenyon Ave., Plainfield, N.J. 07060

Filed Apr. 17, 1986, Ser. No. 853,053
Int. Cl.[4] B01D *27/02, 27/08*
U.S. Cl. 210—232 **6 Claims**



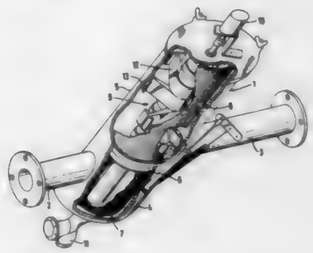
1. A fluid filter apparatus comprising a housing, a dish, a cartridge-like filter having a filter medium, means to removably secure said cartridge-like filter within a cavity formed by said housing, means to removably secure said dish to said cartridge-like filter, means to fluidly communicate the interior of said dish to the lowermost regions of said cartridge-like filter, means to fluidly communicate said lowermost regions of said cartridge-like filter to the interior of said cartridge-like filter, means to fluidly communicate the uppermost regions of said cartridge-like filter into the interior of said housing, an annular cartridge, said annular cartridge being disposed resting in the uppermost regions of said cartridge-like filter adjacent the uppermost filter medium thereof, said annular cartridge having one or more discharge ports, said discharge ports being engagable with openings in said outermost wall of said cartridge-like filter, and means to manually fluidly communicate into the interior of said housing.

4,692,247

FLUID FILTERING DEVICE

Itzhak Orlans, Hevel Korazim, Israel, assignor to Amiad Sinun Vehashkaya, M.P. Hevel Korazim, Israel

Filed Feb. 10, 1986, Ser. No. 828,557
Claims priority, application Israel, Mar. 7, 1985, 74527
Int. Cl.[4] B01D *25/02*
U.S. Cl. 210—314 **3 Claims**



1. A fluid filtering device comprising a housing with inlet and outlet ports through which fluid to be filtered flows into and out of the housing;

a tubular filter located in the housing with an inner side thereof in flow communication with the inlet port and an outer side thereof in flow communication with the outlet port so that all flow of said fluid through the housing passes through the filter; a tubular, contaminant discharge conduit centrally disposed in the filter and substantially coaxial therewith;

one or more transversely directed, tubular inlet limbs of said discharge conduit, each limb extending from the discharge conduit to a free mouthlike opening juxtaposed with respect to the inner side of the filter so as to provide a flowpath therefrom to the discharge conduit, each inlet limb terminating in a pair of flanges which extend outwardly with respect to the inlet limb mouthlike opening so as to present a flowing surface juxtaposed with respect to the inner filter surface;

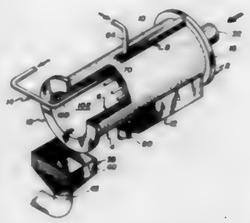
said tubular filter being formed of a plurality of stacked annular filter discs, each disc being of crenellated shape having outwardly directed bay portions alternating with inwardly directed projecting portions which have edges substantially located on a circular envelope substantially concentric with the disc, the stacked edges forming successive component cylindrical surfaces, the arrangement being such that rotational displacement of the discharge conduit together with at least one discharge limb results in the mouthlike opening of each discharge limb sweeping by a preselected section of the inner side of the tubular filter with the limb flanges bridging successive component cylindrical surfaces.

4,692,248

DRUM FILTER WITH RESIN BOUND PARTICULATE FILTER MEDIA

Forrest B. Stannard, Inverness, and Edward J. Highstreet, Crystal River, both of Fla., assignors to The Dehydro Corporation, Charlotte, N.C.

Filed Feb. 26, 1986, Ser. No. 833,000
Int. Cl.[4] B01D *33/02*
U.S. Cl. 210—403 **9 Claims**



1. A filter device designed to mitigate problems in the filtration of fluid suspensions that form flow resistant filter cake resistant to the flow of liquid and thereby rapidly reduce the rate of filtration, said device comprising in combination:

a cylindrical filter unit with means for rotation about an approximately horizontal axis, said unit having:

a tubular member with an inlet end and an outlet end, said member comprising:

an external porous wall formed of spirally wound wire with substantially uniform spacings between each revolution of said wire,

a plurality of spaced-apart bars or rods fixed normal to said spiralled wire on the inner surface thereof forming a multitude of cavities between said bars or rods above said wire, and

rigid filter media formed of particulate material bound in a resin matrix covering the inner surface of said wire and filling said cavities,

means to introduce influent to be filtered into said inlet end,

means to receive filtered solid material discharged from said outlet end,

first longitudinal means positioned atop said filter unit to force pressurized gas through a cylindrical surface from the back side thereof, and

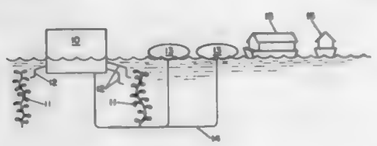
second longitudinal means beneath said filter unit to apply a vacuum to said filter unit to assist in removal of liquid from said influent by suction thereof through said rigid filter media.

4,692,249

FLOTATION PROCESS FOR SLUDGE RECOVERY AND ENERGY CONVERSION

Gerard Hammel, 440 Senator St., Brooklyn, N.Y. 11220

Filed Sep. 23, 1986, Ser. No. 910,477
Int. Cl.[4] C02F *11/04, 3/28*
U.S. Cl. 210—603 **3 Claims**



1. A process for offshore sewage treatment comprising:

(a) separating sewage into a watery effluent and a sludge;

(b) placing the sludge in flexible buoyant balloon storage tanks for anaerobic digestion;

(c) recovering and drying methane produced from the sludge during said digestion;

(d) transferring the sludge to drying barges;

(e) drying the sludge; and

(f) supplying the watery effluent to surrounding seaweed farms as a nutrient.

4,692,250

SIMULTANEOUS C AND N BIO-OXIDATION WITH MULTI-STAGE RBC RECYCLING

Gary E. Miller, P.O. Box 2838, West Lafayette, Ind. 47906

Filed Mar. 17, 1987, Ser. No. 27,011
Int. Cl.[4] C02F *3/08*
U.S. Cl. 210—619 **6 Claims**



1. In an improved wastewater treatment process for a raw influent wastewater containing from about 50 to 500 milligrams per liter of suspended solids, more than about 100 milligrams per liter of materials measurable as soluble biological oxygen demand, and/or more than about 15 milligrams per liter of dissolved ammonia-nitrogen compounds, wherein simultaneously and continuously the following processing steps are occurring:

(A) particulates are separated from said raw influent wastewater to produce a starting clarified influent,

(B) such diluted influent is passed through successive stages of a multistage aerobic rotating biological contactor, said rotating biological contactor being characterized by having at least two stages and at least sufficient media surface area to reduce the soluble biological oxygen demand materials level and the amonia-nitrogen level to respective predetermined extents based upon assumed average clarified influent throughput rate, thereby to produce a biologically treated effluent,

(C) said biologically treated effluent is clarified to produce a treated clarified effluent, and

(D) said treated clarified effluent is removed as treated wastewater the rate of removal thereof being approximately equal to the rate at which said clarified influent is charged to said rotating biological contactor, said process further including the improvement which comprises the steps of:

(a) recycling a portion of said treated clarified effluent to said starting influent,

(b) admixing said recycled effluent with said starting influent at a rate sufficient to produce a composite diluted influent containing not more than an averagge of about 30 milligrams per liter of suspended solids, not more than an average of about 30 milligrams per liter of dissolved organic compounds producing biological oxygen demand, and not more than an average of about 5 milligrams per liter of dissolved ammonia-nitrogen compounds, and

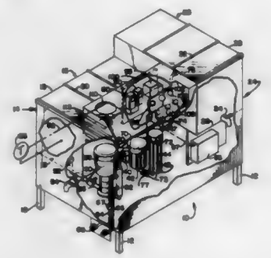
(c) passing said composite diluted influent through said rotating biological contactor at a rate such that the hydraulic loading with respect to said rotating biological contactor ranges from about 5 to 30 gallons of said diluted influent per square foot of total media surface area per 24 hour day, said media surface area being such that, at said hydraulic loading, the respective amounts of said dissolved soluble biological oxygen demand organic compounds and of said dissolved ammonia-nitrogen compounds are each at least about 10 weight percent less than in said diluted influent before said passing.

4,692,251

SOLVENT CLEANSING APPARATUS

Wallace L. Hilgren, 7204 Fleetwood Dr., Minnesota, Minn. 55435

Filed Jul. 7, 1986, Ser. No. 882,540
Int. Cl.[4] B01C *13/00*
U.S. Cl. 210—651 **8 Claims**



8. A method for cleansing an aliphatic hydrocarbon solvent of the type having flash point temperatures in a range of about 100° F. to about 200° F. wherein said solvent is contaminated by a uniformly dispersed oil based contaminant, said method comprising:

prefiltering said contaminated solvent in a particulate filter selected to filter from said solvent contaminants sized greater than a predetermined minimum size;

filtering at least a portion of said oil based contaminant from said solvent subsequent to said prefiltering with said filtering performed in membrane filtration means having a semi-permeable membrane with a concentrate portion disposed on one side of said membrane and a permeate portion disposed on an opposite side of said membrane;

recycling a concentrate solvent from said concentrate portion and admixing said concentrate with contaminated solvent to form a mixture thereof and prefiltering and filtering said mixture of said concentrate solvent and said contaminated solvent;

passing solvent from said permeate portion to an outlet;

monitoring a temperature of solvent within said apparatus;

cooling said solvent until said temperature approximates a predetermined desired operating temperature;

discontinuing said filtering and prefiltering if a monitored temperature exceeds a predetermined safety temperature;

monitoring a pressure of said solvent; and

discontinuing said filtering and prefiltering if a monitored pressure exceeds a predetermined maximum.

4,692,252

METHOD OF REMOVING SCALE FROM WET OXIDATION TREATMENT APPARATUS

Mark T. Atwood, Arvada; Frank Carlson, Broomfield, and Hermann Peterscheck, Longmont, all of Colo., assignors to Ver-Tech Treatment Systems, Inc., Denver, Colo.

Filed Mar. 24, 1986, Ser. No. 843,461
Int. Cl.[4] C02F *1/74*
U.S. Cl. 210—761 **23 Claims**

1. A method of removing inorganic and organic scales from surfaces of a vertical tube reaction apparatus having a plurality of concentric tubes extending vertically downward into the earth to a depth exceeding 3,000 feet in which a waste stream enters the apparatus in an influent flow and exits the apparatus in an effluent flow, said waste stream undergoes a chemical reaction as it is subjected to pressures and temperatures which increase with the depth of the fluid waste stream in the tubes and which also results in scale build-up comprising substances having retrograde solubility on the surface of the tubes as a function of the increase in temperature and pressure of the waste stream in the influent flow and effluent flow, said method comprising the steps of:

(a) interrupting the influent flow of the waste stream into the vertical tube reaction apparatus;

(b) circulating a quantity of an aqueous base solution through the vertical tube reaction apparatus to form a column of said aqueous base solution which exerts a selected fluid pressure and which contacts said scale with said aqueous base solution under the pressure of said column to convert a layer of scale into an acid soluble layer;

(c) circulating a quantity of an aqueous acid solution through the vertical tube reaction apparatus to form a column of said aqueous acid solution which exerts a selected fluid pressure and which contacts said scale with said aqueous solution under the pressure of said column to dissolve the acid soluble layer; and

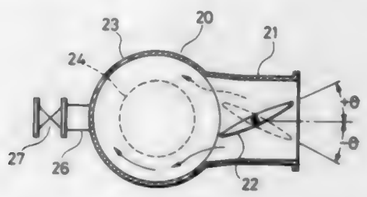
(d) resuming the influent flow of the waste stream into the vertical tube reaction apparatus.

4,692,253

METHOD AND APPARATUS FOR REMOVING EXTRANEOUS MATTERS

Katsumoto Otake, Hitachi; Masahiko Miyai, Mito; Yasuteru Mukai, and Isamu Okouchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,223
Claims priority, application Japan, Aug. 1, 1983, 58-139449
Int. Cl.[4] B10D *23/24*
U.S. Cl. 210—791 **5 Claims**



1. A method of removing extraneous matters from cooling water, comprising the steps of:

introducing cooling water into a casing;

passing said cooling water at a flow rate within an operating range of flow rates through a filter element disposed in said casing, and filter separating extraneous matters contained in said cooling water therefrom, so that at least some of the separated extraneous matter deposit on the upstream side of said filter element to increase the clogging of the filter element;

delivering said cooling water passing through said filter element from said casing;

detecting the pressure difference between the portions upstream and downstream of said filter element, and generating a pressure difference signal during said step of passing;

detecting the flow rate of said cooling water, and generating a flow rate signal during said step of passing;

providing characteristic pressure differences versus flow rates for a specific percent of filter clogging over the operating range of flow rates;

setting a threshold value of pressure difference in accordance with the provided characteristic pressure difference between the portions upstream and downstream of said filter element at the specific percent of clogging of said filter element and at the flow rate of the flow rate signal of the cooling water, during said step of passing;

comparing said pressure difference signal with said threshold value, and generating a control signal when said pressure difference signal exceeds said threshold value;

thereafter generating a turning flow of the cooling water around said filter element in response to said control signal when the pressure difference between the portions upstream and downstream of said filter element exceeds said threshold value so that the turning flow is sufficient for scraping off said extraneous matters deposited to said filter element therefrom; and

discharging said extraneous matters thus scraped off from said casing together with a part of said cooling water in response to said control signal.

4. An apparatus for removing extraneous matters from cooling water, comprising:

a casing;

an inlet pipe for introducing cooling water containing extraneous matters, disposed in said casing;

an outlet pipe for delivering said cooling water, disposed in said casing;

a filter element means for separating said extraneous matters from said cooling water, disposed in said casing;

means for passing said cooling water at a flow rate within an operating range of flow rates through the filter element disposed in said casing, and for filter separating extraneous matters contained in said cooling water therefrom, so that at least some of the separated extraneous matters deposit on the upstream side of said filter element to increase the clogging of the filter element;

a butterfly valve for deflecting said cooling water containing said extraneous matters, disposed in said inlet pipe to produce a turning flow around said filter element;

an extraneous matter discharge port for discharging said extraneous matters, disposed in said casing;

a blow-down valve for discharging said extraneous matters outside the system, connected to said discharge port;

a butterfly valve actuator for operating said butterfly valve, disposed in said casing;

a blow-down valve actuator for operating said blow-down valve, disposed in said casing;

means for detecting the pressure difference between the portions upstream and downstream of said filter element, and generating a pressure difference signal;

means for detecting the flow rate of said cooling water, and generating a flow rate signal;

means for providing characteristic pressure differences versus flow rates for a specific percent of filter clogging over the operating range of flow rates;

a setter means for setting a threshold value of pressure difference in accordance with the provided characteristic pressure difference between the portions upstream and downstream of said filter element at the specific percent of clogging of said filter element and at the flow rate of the flow rate signal of the cooling water;

a comparator means for comparing said pressure difference signal with said threshold value, and generating signals for both of said butterfly valve actuator and said blowdown valve actuator when said pressure difference signal exceeds said threshold value;

means for operating said butterfly valve actuator for thereafter generating a turning flow of the cooling water around said filter element in response to said control signal when the pressure difference between the portions upstream and downstream of said filter element exceeds said threshold value so that the turning flow is sufficient for scraping off said extraneous matter deposited to said filter element therefrom; and

means for operating said blow down valve actuator for discharging said extraneous matters thus scraped off from said casing together with a part of said cooling water in response to said control signal.

4,692,254

FRACTURING OF SUBTERRANEAN FORMATIONS

Clare H. Kucera, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Division of Ser. No. 683,974, Oct. 20, 1984, which is a continuation of Ser. No. 316,186, Oct. 29, 1981, abandoned. This application Mar. 13, 1986, Ser. No. 839,837
Int. Cl.[4] C09K *3/00*; E21B *43/16, 43/26*
U.S. Cl. 252—8.551 **15 Claims**

1. A product useful as a crosslinker for aqueous polysaccharide solution produced by reacting by contacting (a) a zirconium alkoxide corresponding to the formula $Zr(OR)_4$ wherein each R independently is an alkyl group of from 1 to about 4 carbon atoms or an inertly-substituted such alkyl group, with (b) an alkanolamine corresponding to the formula $R'-N-CH_2-CH(OH)-R'')_2$, wherein the ratio of a:b is from about 1:2 to about 1:3,

(i) R' is hydrogen or $-CH_2-CH(OH)-R''$, and

(ii) R'' is hydrogen, methyl or ethyl; said process being conducted in a liquid reaction medium under substantially anhydrous conditions.

4,692,255

LUBRICATING GREASE COMPOSITION, ITS PRODUCTION AND USE

Norbert Matzat, and Hans Schreiber, both of Munich, Fed. Rep. of Germany, assignors to Optimol-Oelwerke GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE84/00028, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03100, PCT Pub. Date Aug. 16, 1984
Continuation of Ser. No. 668,723, Oct. 1, 1984, abandoned. This PCT application Feb. 1, 1984, Ser. No. 893,534
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303442
Int. Cl.[4] C10M *105/56*
U.S. Cl. 252—51.5 A **15 Claims**

1. In a lubricating grease composition of the type wherein mineral or synthetic oil is thickened to the properties of a lubricating grease with a polyurea compound as thickening agent, the improvement wherein, said polyurea compound comprises the reaction product of an isocyanate with at least 3 isocyanate groups in the molecule with a long-chained straight-chained or branched aliphatic monoamine.

4,692,256

MOLYBDENUM-CONTAINING LUBRICANT COMPOSITION

Masashi Umemura; Masanori Konishi; Aritoshi Fukushima; Junichi Hisano, and Toshiaki Okamoto, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Jun. 6, 1986, Ser. No. 871,647
Claims priority, application Japan, Jun. 12, 1985, 60-127309; Jun. 12, 1985, 60-127310
Int. Cl.[4] C10M *137/10*
U.S. Cl. 252—32.7 E **11 Claims**

1. A lubricant composition comprising a blend of a sulfur-containing compound and an oil-soluble molybdenum compound wherein the ratio of sulfur atoms to molybdenum atoms is higher than 0.5, said oil-soluble molybdenum compound having been obtained by reacting (1) at least one hexavalent molybdenum compound selected from the group consisting of molybdenum trioxide, molybdic acid and alkali salts of molybdic acid, with (2) a secondary amino compound having the formula



wherein R_2 and R_3, which are the same or different, are hydrocarbon groups having 1 to 30 carbon atoms.

4,692,257

BORATED HYDROXY-CONTAINING COMPOSITIONS AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 753,098, Jul. 9, 1985, abandoned, which is a continuation of Ser. No. 304,482, Sep. 22, 1981, abandoned. This application May 12, 1986, Ser. No. 862,155
Int. Cl.[4] C10M *139/00*
U.S. Cl. 252—49.6 **8 Claims**

1. A lubricant composition comprising a major amount of lubricant selected from the group consisting of mineral lubricating oil, a synthetic lubricating oil, mixtures thereof or greases from any of these, and a friction-reducing amount of a borated 1,2-hydrocarbyl vicinal diol containing from 10 to 30 carbon atoms.

4,692,258

TETRAHYDROQUINOLINES AS ANTIOXIDANTS FOR LUBRICANTS

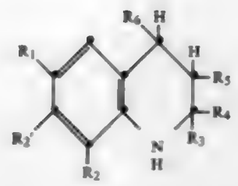
Michael Rasberger, Riehen; Paul Dubs, Basel, and Samuel Evans, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 742,245, Jun. 7, 1985, abandoned, which is a continuation of Ser. No. 623,630, Jun. 25, 1984, abandoned, which is a continuation of Ser. No. 557,558, Dec. 2, 1983, abandoned, which is a continuation of Ser. No. 403,696, Jul. 30, 1982, abandoned. This application Dec. 18, 1985, Ser. No. 810,543
Claims priority, application Switzerland, Aug. 10, 1981, 5130/81
Int. Cl.[4] C10M *105/56*
U.S. Cl. 252—50 **10 Claims**

1. A lubricant composition, having excellent lubricating properties, which comprises

(a) a mineral oil, a synthetic oil, a hydraulic fluid or a lubricating grease, and

(b) 0.05 to 5% by weight, based on component (a), of a compound of formula I



(I)

wherein

R_1 and R_2 independently of one another are each hydrogen, C_1–C_{18}-alkyl or benzyl,

R'_2 is hydrogen or C_1–C_{12}-alkyl, or together with R_2 it forms a butadienediyl group,

R_3 and R_4 independently of one another are each C_1–C_{18}-alkyl, phenyl or benzyl, or R_3 and R_4 together with the carbon atom to which they are bound form a C_5–C_{12}-spiro-cycloalkyl ring,

R_5 is hydrogen or C_1–C_{18}-alkyl, and

R_6 is C_1–C_{18}-alkyl, or R_5 and R_6 together with the two carbon atoms to which they are bound are a C_5–C_{12} cycloaliphatic group.

4,692,259

WATER-ACTIVATED, EXOTHERMIC CHEMICAL DEICING FORMULATIONS

Ronald J. Roman, Renton, Wash., assignor to L-Bar Products Incorporated, Ravensdale, Wash.

Filed Aug. 29, 1986, Ser. No. 901,916

Int. Cl.[4] C09K *5/00, 3/18*

U.S. Cl. 252—70 **22 Claims**

1. A method for melting snow or ice on surfaces, comprising:

applying to the surface an effective amount of a chemical formulation comprising magnesium metal, magnesium oxide, and at least one chloride salt.

4,692,260

DISHWASHING COMPOSITIONS COMPRISING AN ENZYME AND A C_8–C_{10} ALKANOL WITH 0–2 MOLES OF PROPYLENE OXIDE

Eric Sung, Monheim; Peter Jeschke, Neuss; Klaus Schumann, Erkrath, and Theodor Altenschoepfer, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,039

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428534

Int. Cl.[4] C11D *3/075, 3/20, 3/386*

U.S. Cl. 252—99 **19 Claims**

1. A composition of matter comprising from about 0.1 to 5 parts by weight of at least one hydrolase enzyme and from about 0.1 to 10 parts by weight of an alkanol selected from the group consisting of a C_8–C_{10} primary, straight-chain or branched chain alkanol and a C_8–C_{10} primary, straight-chain or branched chain alkanol propoxylated with from 1 to 2 moles of propylene oxide per mole of alkanol, said composition being useful as a cleaning booster to dishwashing compositions and being present therein in an amount effective to improve the removal of a food substance from a food containing substrate at washing temperatures of about 40° C., the balance of said composition comprising polymeric alkali metal phosphate and/or phosphate substitutes, alkali metal silicates, and alkali metal carbonates.

4,692,261

SKIN BLEACHING DETERGENT BAR

Vito G. Filomeno, Mount Arlington, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 20, 1985, Ser. No. 811,602

Int. Cl.[4] C11D *1/12, 3/20*; A61K *7/135*

U.S. Cl. 252—105 **14 Claims**

1. A detergent bar composition having a pH of about 4 to about 7 comprising a compressed mixture of:

(a) an anionic detergent selected from the group consisting of sodium cocoyl isethionate, sodium methyl cocyl taurate and mixtures thereof;

(b) hydroquinone in amounts to effect depigmentation;

(c) tertiary butyl hydroquinone in amounts to maintain the stability of said hydroquinone against oxidation;

(d) a buffer which maintains the pH of said composition at about 4 to about 7;

(e) a paraffin, wax, starch, or dextrin constituent, or mixtures thereof; and

(f) water.

2. The composition of claim 1 which further comprises an additional stabilizer, in amounts to maintain the stability of said hydroquinone against oxidation, selected from the group consisting of sodium sulfite, sodium bisulfite, alpha tocopherol and mixtures thereof.

4,692,262

SKIN CLEANSER CAPABLE OF SOFTENING AND REMOVING SMEGMA

Robert L. Brown, 3917 Evergreen, Irving, Tex. 75061, and Elizabeth C. Stewart, No. 6 Pinecreek La., Houston, Tex. 77055

Filed Sep. 18, 1986, Ser. No. 908,697

Int. Cl.[4] C11D *3/48*

U.S. Cl. 252—106 **4 Claims**

1. A skin cleanser capable of softening and removing smegma and microbiological organisms which may be associated therewith from the human skin which comprises a mixture containing:

from a trace to 0.2% by weight, based on the total weight of said composition, as an active material of cetylpyridinium chloride,

from a ttace to not more than 20 ppm chlorine dioxide,

from a trace to 2% by weight, based on the total weight of said composition as an active material, of polyoxyethylene (20) sorbitan monostearate; and

from a trace to not more than 2% sodium lauryl sulfate.

4,692,263

STRIPPING PASTE FOR REMOVING LACQUER AND PAINT COATINGS

Werner Eberhardt, Leichlingen, and Rudolf Ziegler, Kuerten, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,987

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534278

Int. Cl.[4] C11D *7/50*

U.S. Cl. 252—122 **20 Claims**

1. A stripping paste for removing lacquer and paint coatings, said stripping paste being based on substantially involatile, low-toxicity solvents and thickeners based on fatty acid salts, and comprising:

(a) from about 94 to about 66% by weight of a diethylene glycol monoalkyl ether corresponding to the general formula

$$R—O—CH_2CH_2—O—CH_2CH_2—OH$$

wherein R is an ethyl or propyl group;

(b) from about 1 to about 4% by weight of the sodium salt of a C_{14}–C_{18} fatty acid; and

(c) from about 5 to about 30% by weight of water, all weights being based on the weight of said stripping paste.

4,692,264

STABLE, PUMPABLE AQUEOUS ZEOLITE SUSPENSIONS

Robert Gresser, Lyon, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Aug. 12, 1985, Ser. No. 764,644

Claims priority, application France, Aug. 10, 1984, 84 12649

Int. Cl.[4] C11D *3/12*

U.S. Cl. 252—140 **18 Claims**

1. A composition of matter which comprises a stable, pumpable aqueous suspension of a zeolite having a pH ranging from about 10 to about 11.5, said zeolite suspension comprising stabilizing material in an amount effective to prevent sedimentation upon storage, said stabilizing material consisting essentially of alkaline earth metal cations wherein said alkaline earth metal cations alone are suitable for the stabilization of the zeolite suspension.

4,692,265

DRYING COMPOSITION AND METHOD

Stephen R. Burghardi, Minnetonka, Minn., assignor to Domain, Inc., New Richmond, Wis.

Filed Jun. 22, 1984, Ser. No. 623,336

Int. Cl.[4] C09K *3/00*; F26B *3/00*; A23K *3/02*

U.S. Cl. 252—194 **7 Claims**

1. A drying composition for plants comprising an aqueous, sprayable solution essentially free of water-insoluble ingredients and consisting essentially of sodium sesquicarbonate in an amount not less than about 20% by weight, potassium carbonate in an amount not less than about 5% by weight and sodium carbonate in an amount not less than about 20% by weight, all based upon the total dry carbonate weight.

4,692,266

SOLID SCINTILLATOR COUNTING COMPOSITIONS

Lorenzo F. Costa; David C. Harrington, and Raymond S. Miller, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,232

Int. Cl.[4] C09K *11/06*

U.S. Cl. 252—301.17 **12 Claims**



1. A dry particulate scintillator counting composition for the detection of radiative substances in a liquid, comprising a mixture of fluor particles and a binder bonding said particles into a coherent structure, the weight amount of said fluor being sufficiently greater than the weight amount of said binder as to render said structure sufficiently porous between the disposed particles of fluor to provide transport of a saturating amount of liquid throughout at least 50% of the volume of the composition.

4,692,267

USE OF POLYMERS OF ALKYLVINYL ETHERS TO PREVENT OR ELIMINATE FOAM ON AQUEOUS MEDIA

Jürgen Fock, Düsseldorf; Eberhard Esselborn; Hans-Ferdi Fink, both of Essen, and Wernfried Heilen, Rheinberg, all of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,637

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442727

Int. Cl.[4] C09K *3/00*; B01D *19/04*

U.S. Cl. 252—321 **22 Claims**

1. In a method for preventing or eliminating foam in aqueous media wherein a foam preventing or eliminating effective amount of defoaming agent is added to the aqueous media, the improvement which comprises said defoaming agent comprising one or more polymers of alkylvinyl ethers having alkyl radicals containing from 1 to 18 carbon atoms and a weight average molecular weight ,eovs/M/ $_w$ of from 400 to 10,000.

4,692,268

METHOD FOR CONTROLLING VISCOSITY OF ORGANIC LIQUIDS AND COMPOSITIONS

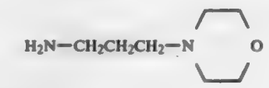
Robert D. Lundberg, Bridgewater; Robert R. Phillips, Spring Lake Heights; L. Sherwood Minckler, Watchung, and David Y. Chung, Edison, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 30, 1985, Ser. No. 814,403

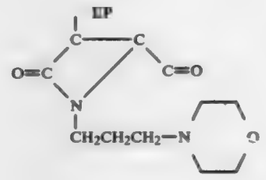
Int. Cl.[4] C10M *149/00, 155/00*

U.S. Cl. 252—33.4 **12 Claims**

1. A hydrocarbon solution containing a polymer complex, said complex being present at a level of 0.05 to 20 weight percent of said solution, said polymer complex being a complex of: a metal sulfonated ethylene propylene terpolymer having a sulfonate content of 4 to 100 milliequivalents per 100 grams and a metal cation selected from the group consisting of zinc and transition elements, and an ethylene propylene copolymer or terpolymer having pendant basic amine groups, said pendant basic groups ranging from about 4 meg. to about 100 meg. wherein the ratio of the polymer containing the metal cation to the polymer containing basic amine groups being about 10 to about 0.1, wherein said ethylene propylene copolymers are grafted with maleic anhydride and subsequently reacted with N-aminopropyl morpholine on



thereby forming



4,692,269

GAS-RELEASING COMPOSITION FOR TAILORING GAS EVOLUTION OF SYSTEM

Chester J. Kmiec, Amherst, and Michael F. Novita, Buffalo, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 780,124, Sep. 25, 1985. This application May 13, 1986, Ser. No. 862,846
Int. Cl.[4] C08V *9/10*; C06D *5/00*
U.S. Cl. 252—350 6 Claims

1. A gas-generating composition consisting essentially of a t-alkylhydrazinium salt and/or carbonylhydrazine and at least one compound selected from free radical forming sources; metal oxides selected from ZnO, PbO, Pb_3O_4 or MgO; and sulfur or sulfur donor compounds wherein when sulfur and/or a sulfur donor compound is used, the composition will also contain one or more members selected from sulfur accelerators, metal oxides, and amino-alcohols.

4,692,270

SURFACE ACTIVE AGENT

Atsushi Sato, Tokyo; Yoshikazu Murai, Yokohama; Tatsuo Yamaguchi, Hino; Kanji Mochizuki, and Kunio Sugisawa, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

PCT No. PCT/JP85/00059, § 371 Date Sep. 23, 1985, § 102(e) Date Sep. 23, 1985, PCT Pub. No. WO85/03647, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 14, 1985, Ser. No. 783,225
Claims priority, application Japan, Feb. 14, 1984, 59-24513
Int. Cl.[4] B01F *17/02, 17/12*; C07C *139/06*
U.S. Cl. 252—353 7 Claims

1. A water soluble surface active agent obtained by sulfonating a reaction product boiling higher than hydrocarbons contained in a mixture and not lower than 260° C., under sulfonating conditions, followed by neutralization, which reaction product is obtained by treating said mixture in liquid phase in the presence of an acid catalyst at a reaction temperature of 0° to 330° C. to alkylate aromatics with aliphatic olefins followed by distillation, said mixture consisting of:

(A) 20–95 weight percent of a thermal-cracked oil distillate obtained from a delayed coking process for coking a petrolic heavy residual oil at a temperature not lower than 400° C. and not exceeding 700° C., said distillate containing aliphatic olefins; and, either

(B) 80–5 weight percent of one or more members boiling in the range of 150° to 250° C. and selected from the following (a) through (c):

(a) a thermal-cracked by-product oil distillate obtained by thermal cracking of a petrolic light oil at a temperature of 750° to 850° C. followed by treatment for reducing the content of unsaturated compounds;

(b) an reformate distillate obtained by catalytic reforming of a petrolic light oil boiling in the range of 50° to 250° C., followed by treatment for reducing the content of unsaturated compounds if necessary; and

(c) an aromatic distillate consisting mainly of aromatic hydrocarbons and obtained by separation from said thermal-cracked by-product oil distillate (a) and/or said reformate distillate (b); or

(C) 80–5 weight percent of aromatic hydrocarbons having a boiling range lower than 150° C. and not having an aliphatic double bond.

4,692,271

CONCENTRATED AQUEOUS SURFACTANT COMPOSITIONS

Edward T. Messenger, Workington; Douglas E. Mather, and Brinley M. Phillips, both of Whitehaven, all of United Kingdom, assignors to Albright & Wilson Ltd., Oldbury, Warley, England

Continuation of Ser. No. 967,576, Dec. 8, 1978, abandoned. This application Jul. 24, 1980, Ser. No. 171,998
Claims priority, application United Kingdom, Dec. 9, 1977, 51293/77
Int. Cl.[4] B01F *17/02, 17/10, 17/12*
U.S. Cl. 252—354 30 Claims

1. A pumpable aqueous surfactant composition consisting essentially of water, and an active surfactant mixture in an amount between above 45% and below 80% by weight and sufficient to form the "G" phase with said water, said active mixture consisting of at least 5% each by weight of the composition, of different surfactant products selected respectively from at least 2 of the classes consisting of: alkyl sulphates; alkyl ether sulphates; olefin sulphonates; alkyl benzene sulphonates; alkyl sulphosuccinates; alkanolamide sulphosuccinates; paraffin sulphonates; fatty carboxylates; alkyl ether carboxylates; alkyl phosphates; alkyl ether phosphates; alkyl phenol sulphates; alkyl phenol ether sulphates; alkyl phenol ether sulphonates; fatty ester sulphonates; fatty acid sulphonates; acyl sarcosinates; and acyl taurides; wherein, in each case, there are alkyl, alkenyl or acyl groups which have an average total of from 8 to 22 carbon atoms and any ether groups comprise glyceryl groups and/or polyoxyalkylene groups, which polyoxyalkylene groups comprise from 1 to 20 ethylene oxide and/or propylene oxide units, said aqueous surfactant composition being in the "G" phase at a temperature below 23° C.

27. A composition according to any one of claims 1, 4, 5, 6, 7 or 2 wherein the active mixture comprises at least 10% by weight of an alkyl sulphosuccinate and at least 10% by weight of an alkyl sulphate.

4,692,272

THERMALLY STABLE ADHESIVE COMPRISING SOLUBLE POLYIMIDE RESIN AND EPOXY RESIN

Jagadish C. Goswami, New City, N.Y., and Joseph A. Aurichio, Anderson, S.C., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 660,593, Oct. 15, 1984, Pat. No. 4,604,230. This application Sep. 12, 1985, Ser. No. 774,431
Int. Cl.[4] H01B *1/021*
U.S. Cl. 252—514 53 Claims

1. An adhesive composition comprising: (a) a soluble polyimide resin; (b) a solvent for said polyimide resin; (c) an epoxy resin; (d) a cross-linking agent reactive with the polyimide solvent of (b); and (e) a catalyst which catalyzes the cross-linking reaction of (b) and (d).

4,692,273

NOVEL GEL COMPOSITIONS, PROCESSES FOR MAKING SAME AND USES IN TRANSMITTING AND MEASURING ELECTRICAL IMPULSES

Katherine Lawrence, Trabuico Canyon, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 15, 1985, Ser. No. 723,391
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 11 Claims

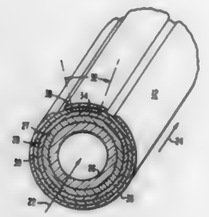
1. An aqueous gel specially adapted for transmitting electrical impulses in connection with mammalian skin which comprises about 0.1% by weight of an organic titanate, about 1.5% up to about 10% by weight of at least one galactomannan gum, and a small but effective amount of from about 1% up to about 25% by weight of a conductive salt.

4,692,274

PROTECTIVE INTERLAYER FOR HIGH TEMPERATURE SOLID ELECTROLYTE ELECTROCHEMICAL CELLS

Arnold O. Isenberg, Forest Hills Boro, and Roswell J. Ruka, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 749,365, Jun. 27, 1985, Pat. No. 4,598,467, which is a division of Ser. No. 657,923, Oct. 5, 1984, Pat. No. 4,547,437. This application Jun. 6, 1986, Ser. No. 871,233
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—521 2 Claims



1. A doped yttrium chromite composition selected from the group consisting of:

(a) a chromite having the chemical formula $Y_{1-x}Ca_xCr_{1-y}Co_yO_3$, where x=0.005 to about 0.5 and y=0.005 to about 0.5, and

(b) a chromite having the chemical formula $YCR_{1-y}Co_yO_3$, where x=0.005 to about 0.5 and y=0.005 to about 0.5.

4,692,275

DETERGENT COMPOSITIONS CONTAINING AN ALKYLBENZENE SULFONATE AND ALCOHOL ETHOXYSULFATE SURFACTANT SYSTEM

Isaac I. Secemski, Flushing, N.Y., and Jesse L. Lynn, Jr., Englewood, N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 23, 1986, Ser. No. 856,069
Int. Cl.[4] C11D *1/37, 3/075*
U.S. Cl. 252—534 12 Claims

1. A detergent composition consisting essentially of:

(i) a C_8–C_{18} alkylbenzene sulfonate;

(ii) a C_{12}–C_{15} alcohol ethoxysulfate formed with from 6 to 30 units ethylene oxide, and where the average weight of ethylene oxide is from 60 to 80% by weight based on non-sulfated ethoxylated alcohol; and

(iii) from 20 to 50% by weight of a builder

wherein the amount of (i) to (ii) ranges from 10 to 20% and the ratio of said sulfonate to said sulfate is from 3.5:1 to 1.5:1.

6. A detergent composition according to claim 1 wherein the builder salt is sodium tripolyphosphate present in an amount from about 20% to about 40%.

4,692,276

NON-ALKALINE, FOAMABLE BATHROOM CLEANER

Charles H. Schramm, 53 Black Mount Ct., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 623,494, Jun. 22, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,688
Int. Cl.[4] C11D *1/29, 3/32*
U.S. Cl. 252—545 11 Claims

1. An aqueous, non-alkaline, spray foamable bathroom cleaning composition that is particularly effective in removing lime soap residues and hard water salt deposits from sinks, toilet bowls, bathtubs, shower enclosures and metal surfaces, said cleaning composition consisting essentially of:

a. 1 to 30% by weight of a substance selected from the group consisting of alcohol sulfates of the formula

$$RO(CH_2CH_2O)_nSO_3X$$

where R is a straight chain hydrocarbon radical having from about 10 to 18 carbon atoms, n is a number from 0 to 6 and X is sodium, potassium, hydrogen, ammonium, mono-, di-, and tri-lower alkylammonium, and alkanolammonium in which lower alkyl and alkanol embrace methyl, ethyl and propyl;

b. 1 to 15% by weight of a substance selected from the group consisting of alkyl and alkanolamides of the structure

$$RCON(R')(R'')$$

where R is a straight chain hydrocarbon radical having from about 9 to 19 carbon atoms, R′ and R″ can be hydrogen, hydroxyethyl, hydroxypropyl, and alkyl, with the latter having from about 1 to 4 carbon atoms;

c. 1 to 40% by weight of a substance selected from the hydrotropes consisting of short chain alkylbenzene sulfonates of the formula

$$RSO_3X$$

where R is tolyl, xylyl and cumyl, X is sodium, potassium, hydrogen, ammonium, alkylammonium and alkanolammonium as described in (a) above;

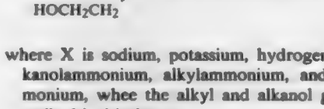
d. 2 to 30% by weight of a nitrilotriacetate of the formula

$$N(CH_2COOX)_3$$

or, an amineacetate of the formulae

$$(XOOCCH_2)_2NCH_2CH_2N(CH_2COOX)_2,$$

and



where X is sodium, potassium, hydrogen, ammonium, alkanolammonium, alkylammonium, and alkylalkanolammonium, whee the alkyl and alkanol groups are as described in (a) above.

e. 0 to 12% by weight of a conventional nonionic or anionic sulfonate surfactant

f. 55 to 90% by weight water, and

g. an amount of mineral acid (sulfuric or hydrochloric acid) to provide a pH within the range of pH 3 to 7.

4,692,277

HIGHER MOLECULAR WEIGHT DIOLS FOR IMPROVED LIQUID CLEANERS

Michael P. Siklosi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1985, Ser. No. 811,268
Int. Cl.[4] C11D *1/22, 3/20*
U.S. Cl. 252—558 12 Claims

1. A hard surface liquid cleaner composition consisting essentially of:

(a) from about 0.1% to about 10% of a nonsoap surfactant selected from the group consisting of: anionic, cationic, nonionic, zwitterionic, amphoteric surfactants and mixtures thereof;

(b) from about 0.5% to about 25% of a diol selected from the group consisting of C_6–C_{12} diols and mixtures thereof; wherein at least one hydroxy group of said diol is a primary or secondary hydroxy group and wherein said diol has a maximum solubility of about 12 g/100 g of water at 20° C.;

(c) from about 1% to about 30% of a detergency builder salt; and

(d) at least about 60% water.

4,692,278

PROCESS FOR THE PREPARATION OF 1,4-DIAMINOANTHRAQUINONES

Rudolf Blattner, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

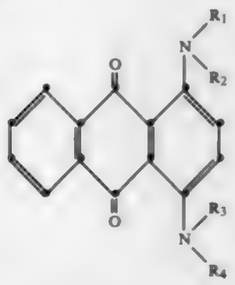
Filed Mar. 26, 1986, Ser. No. 844,410

Claims priority, application Switzerland, Apr. 1, 1985, 1399/85

Int. Cl.⁴ C07C *97/24*

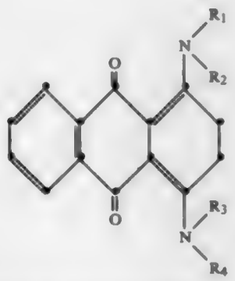
U.S. Cl. 260—367 **19 Claims**

1. In a process for the preparation of a 1,4-diaminoanthraquinone of formula (1)



(1)

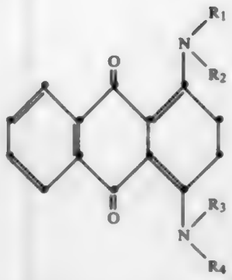
wherein each of R_1, R_2, R_3 and R_4 independently of one another is hydrogen, C_1–C_{12}-alkyl which is unsubstituted or substituted by phenyl, hydroxy, cyano, sulfo or dialkylamino, naphthyl, or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, phenoxy, C_1–C_4-alkylcarbonyl or phenyl, by oxidation of a 2,3-dihydro-1,4-diaminoanthraquinone of formula (2)



(2)

wherein R_1, R_2, R_3 and R_4 are as defined above, with nitrobenzene, at elevated temperature, in the presence of an organic base and/or an inorganic base, wherein the improvement comprises carrying out the reaction at a temperature in the range from 100° to 200° C. at reduced pressure while simultaneously distilling off 3 to 20 moles of nitrobenzene per mole of compound of formula (2).

13. A process for the preparation of an anthraquinone imide, which process comprises oxidizing a 2,3-dihydro-1,4-diaminoanthraquinone of formula (2)



(2)

wherein R_1 is hydrogen and each of R_2, R_3 and R_4 independently of one another is hydrogen, C_1–C_{12}-alkyl which is unsubstituted or substituted by phenyl, hydroxy, cyano, sulfo or dialkylamino, naphthyl, or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, phenoxy, C_1–C_4-alkylcarbonyl or phenyl, with nitrobenzene, said reaction being carried out at a temperature in the range from 100° to 200° C. at reduced pressure while simultaneously distilling off 3 to 20 moles of nitrobenzene per mole of compound of the formula (2), and subsequently condensing the resultant 1,4-diaminoanthraquinone, without isolating it, with an aromatic halogen compound in the presence of a base and a copper catalyst to give the anthrimide, the condensation being effected by heating the halogen compound and the resultant suspension of the 1,4-diaminoanthraquinone very rapidly to the reaction temperature.

4,692,279

PREPARATION OF ACYLOXY BENZENE SULFONATE

Marvin Nussbaum, Skokie, Ill., assignor to Stepan Company, Northfield, Ill.

Filed Apr. 15, 1985, Ser. No. 723,217

Int. Cl.⁴ C07C *143/90, 69/00*

U.S. Cl. 260—402 **13 Claims**

1. A process for making an acyloxy benzene sulfonate salt of at least about 80 weight percent purity on a total composition dry weight basis from a corresponding acyloxy benzene comprising the steps of

(a) contacting substantially pure acyloxy benzene with SO_3 at a temperature ranging from about −20° to 50° C. to produce an intermediate reaction product which comprises about a 1:1 molar adduct of said SO_3 and said acyloxy benzene,

(b) maintaining said intermediate reaction product at an average temperature in the range from about 25° to 75° C. for a time inversely ranging from about 0.1 to 4 hours sufficient to produce a product composition containing at least about 80 weight percent of the corresponding acyloxy benzene sulfonic acid, and

(c) admixing the resulting said acyloxy benzene sulfonic acid with an aqueous solution of a base of a cation selected from the group consisting of alkali metal salts, alkaline earth metals, and ammonium to produce an aqueous solution containing the corresponding salt of said acyloxy benzene sulfonic acid.

4,692,280

PURIFICATION OF FISH OILS

John Spinelli; Virginia F. Stout, and William B. Nilsson, all of Seattle, Wash., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Dec. 1, 1986, Ser. No. 936,305

Int. Cl.⁴ C11B *3/00*

U.S. Cl. 260—420 **4 Claims**

1. A process for the purification of fish oil which comprises extracting the fish oil with supercritical carbon dioxide at a pressure of 1070 to 10,000 psi and at a temperature of 35° C. to 95° C. first to remove odoriferous and volatile impurities present in the fish oil and then with additional supercritical carbon dioxide to separate lightly colored fish oil from a more darkly colored residue.

4,692,281

CARBOXYTETRALINEPHOSPHONIC ACIDS AND PROCESS FOR MAKING THEM

Werner Pieper, Kerpen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

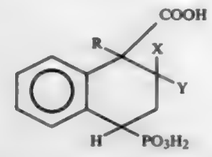
Filed May 2, 1986, Ser. No. 859,077

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517970

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.4 R **3 Claims**

1. Mono- and dicarboxytetralinephosphonic acids of the general formula I



in which R stands for hydrogen or an alkyl group, X stands for hydrogen or a carboxylic group, and Y stands for hydrogen or an alkyl group.

4,692,282

PHENYLTETRALINE-DIPHOSPHONIC ACIDS AND PROCESS FOR MAKING THEM

Werner Pieper, Kerpen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

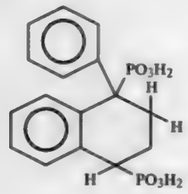
Filed May 2, 1986, Ser. No. 859,123

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517969

Int. Cl.⁴ C07F *9/38*

U.S. Cl. 260—502.4 P **5 Claims**

1. 1-phenyl-tetraline-1,4-diphosphonic acids of the formula



4,692,283

CENTRIFUGAL GAS-LIQUID CONTACT APPARATUS

James Wem, Marton, and Rowland J. P. Brierley, Yarm, both of England, assignors to Imperial Chemical Industries plc, London, England

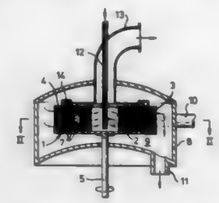
Continuation of Ser. No. 435,302, Oct. 19, 1982, abandoned. This application Sep. 29, 1986, Ser. No. 912,661

Claims priority, application United Kingdom, Oct. 26, 1981, 8132249

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—89 **1 Claim**

1. Gas-liquid contact apparatus comprising a rotor having a generally cylindrical outer wall parallel to the axis of rotation of said rotor, a permeable element mounted within the rotor for rotation therewith, means to supply liquid and gas to the rotor and means for conducting gas and liquid respectively from the rotor, said permeable element being a plurality of strips of permeable material selected from the group consisting of knitted fabrics, woven fabrics, non-woven fabrics and skeletal foams, superimposed progressively from the outer wall inwards towards said axis of rotation and together forming a plurality of discrete concentric layers in contact with each



other, the strips having a width substantially equal to the axial depth of the rotor and having a length less than the circumferential length of the outer wall of the rotor, the strips being in end-to-end abutment, and th abutments being staggered circumferentially in adjacent layers, said strips forming a permeable element which is stable in use.

4,692,284

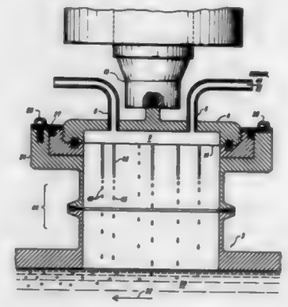
METHOD AND APPARATUS FOR FORMING DROPLETS AND MICROCAPSULES

William I. Braden, Norfolk, Mass., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Filed Apr. 30, 1986, Ser. No. 857,854

Int. Cl.⁴ A61K *9/62*; B01J *13/02*; B28B *1/54*

U.S. Cl. 264—4.3 **16 Claims**



1. Apparatus for forming microcapsules of a desired size from a fluid medium containing living culture material by the atomization of the medium, such apparatus comprising:

a flow chamber for flowing the medium therethrough and including

(a) a flow cap, having an inlet port and

(b) a wall member having first and second opposing sides, said wall member being attached to the cap such that the cap and said first side define said chamber, said wall also having a plurality of orifices formed therethrough;

pressure means, for pressurizing the flow chamber to drive the medium through the orifices;

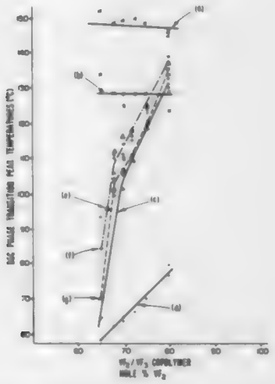
vibration means for vibrating the chamber to atomize the medium flowing through the orifices; and

means for coupling the apparatus to a collection vessel on the second side of the wall so as to deliver to the collection vessel said atomizing flow.

8. A method for forming microcapsules of a fluid medium containing living culture material by the atomization of the medium and the treatment of atomized droplets thereof with a treatment fluid, such method comprising the steps of:

flowing the medium through an inlet port into a flow chamber having a flow cap and a wall member having first and second opposing sides, said wall member being attached to the cap such that the cap and said first side define said chamber, said wall also having a plurality of orifices formed therethrough;
providing pressure in said chamber to drive the medium through the orifices,
vibrating the chamber to atomize the medium driven through the orifices, and
receiving said atomized flow in a vessel of the treatment fluid on the second side of the wall.

4,692,285
PROCESS OF PREPARING NONFIBROUS, PIEZOELECTRIC POLYMER SHEET OF IMPROVED ACTIVITY
Philip E. Bloomfield, Bala Cynwyd, and Seymour Preis, Allentown, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.
Filed Jul. 1, 1985, Ser. No. 750,443
Int. Cl.[4] B29C *71/04*
U.S. Cl. 264—22 **6 Claims**



1. A process for preparing a sheet having improved piezoelectric properties when electrically poled comprising heating a nonfibrous, unoriented copolymer resin sheet of at least about 25 micrometers thick and comprising about 65 to 85 mol % of vinylidene fluoride and from 15 to about 35 mol % of at least one other copolymerizable, substituted, monolefinic monomer having from 2 to 4 carbon atoms in the olefinic chain to a temperature within a range of above the crystalline melting temperature (T_m) and below the dielectric strength degradation temperature (T_d) of said sheet for a time period of at least 20 minutes whereby said sheet has improved dielectric strength and, after poling, has a hydrostatic coefficient (g_h) of magnitude at least 0.100 V-m/N.

4,692,286
METHOD OF PRODUCING A CONTINUOUS LENGTH STRUCTURE
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Continuation-in-part of Ser. No. 738,403, May 28, 1985, Pat. No. 4,598,755. This application Apr. 3, 1986, Ser. No. 847,702
The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.
Int. Cl.[4] B22C *9/10*; B22D *11/00*; B29C *35/10, 41/24*
U.S. Cl. 264—29.1 **9 Claims**

1. A process for making a continuously-produced structure comprising the steps of:
continuously molding greensand to form a molded greensand core;
forming a mold pattern in said core;
pouring liquid material in the mold pattern formed in said greensand core;
solidifying said poured material; and
removing said greensand from said solidified material structure.

4,692,287
PROCESS FOR MAKING A MOLDED POROUS FLUOROPLASTIC RESIN MATERIAL
Robert D. Timmons, R.F.D. Meadowdale Rd., Prairie Du Sac, Wis. 53578
Filed Aug. 25, 1983, Ser. No. 526,387
Int. Cl.[4] C08J *9/24, 9/26*; C01N *1/14*; B21B *49/08*
U.S. Cl. 264—41 **6 Claims**

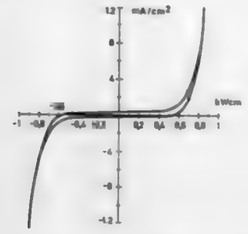


1. A process for making a shaped filter material comprising blending a fluoroplastic resin, said resin being a polymer including recurring fluoroplastic monomers each having the formula $(CF_2—CF_2)_n$ with powdered stearic acid as a sacrificial agent which will volatize at a temperature in the range of 350° F. to 450° F. to form a vaporous mixture which distributes itself in channels within said resin, molding the resulting blend to shape it into a desired form for use as a filter, applying pressure to the formed blend, removing the formed blend from the mold, heating the formed blend to a temperature in the range of 350°0 F. to 450° F. at which said sacrificial agent vaporizes and removes itself from said resin, heating said resin, free of said sacrificial agent, to a high temperature in the range of about 400° F. to 750° F. for a time sufficient to sinter the resin, wherein said blend contains about 5 to 99 percent of fluoroplastic resin and correspondingly 95 to 1 percent of stearic acid.

4,692,288
METHOD OF HOT ISOSTATIC PRESSING OF A POROUS SILICON CERAMIC COMPACT
Axel Rossmann, and Werner Huther, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany
Filed Oct. 21, 1980, Ser. No. 199,152
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1979, 2945513
Int. Cl.[4] C04B *35/62*
U.S. Cl. 264—56 **12 Claims**

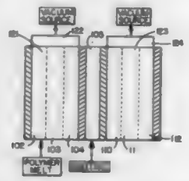
1. A method of hot isostatic pressing of a porous silicon ceramic compact, comprising the steps of:
providing a fluid impermeable container and a powder,
placing the compact and the powder within the container so that the compact is completely embedded in the powder, the powder thereby separating the compact from the container, and
subjecting the container and its contents to heat and fluid pressure, the pressure being transmitted to the compact through the container and the powder, the heat and pressure being insufficient to sinter the powder and insufficient to cause the powder to chemically react with the compact.

4,692,289
METHOD OF MANUFACTURING VOLTAGE-DEPENDENT RESISTOR
Detlev Hennings; Axel Schnell, and Herbert Schreinemacher, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 382,910, May 28, 1982, Pat. No. 4,581,159. This application Jul. 11, 1985, Ser. No. 753,757
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121289
Int. Cl.[4] C04B *33/34*
U.S. Cl. 264—61 **12 Claims**



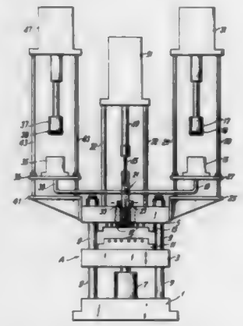
1. A method of manufacturing a voltage-dependent resistor having a ceramic sintered body consisting of a polycrystalline alkaline earth metal titanate doped to N-type conductance with a metal oxide and which body is provided with electrodes on opposite located surfaces thereof, has a Perowskite structure, consists of a strontium titanate containing excess TiO_2 which titanate has a formula selected from the group consisting of $(Sr_{1-x}Ln_x)TiO_3.YTiO_2$ and $Sr(Ti_{1-x})Me_x)O_3.YTiO_2$ wherein Ln is a rare earth metal, Me is a metal having a valence of at least 5, $0.0005 < x <$ solubility limit of the Ln in the Perowskite crystal phase and Y equals 0.001 to 0.02 and is provided on its grain boundaries with insulating layers produced by diffusion into the surface layers of said grains by a metal oxide or a metal oxide compound, each of said metal oxide and said metal oxide compound having a melting point below that of said sintered body, characterized by the steps of forming a molded product of the starting substances of the composition of said body, sintering said molded product in a reducing atmosphere to form a sintered body, covering the surface of said thus sintered body with a suspension comprising at least a metal oxide or a metal oxide compound each having a melting-point below that of said sintered body and then heating said thus covered sintered body in an oxidizing atmosphere at a temperature which lies above the melting-point of the suspension component(s).

4,692,290
PROCESS FOR DEVOLATILIZING MOLTEN OXYMETHYLENE POLYMER
Douglas W. Steele, Bishop; George S. Nash, Kingsville; John W. Dorsey, Bishop; Ronald S. Christy, Kingsville, all of Tex., and Timothy L. Burns, Edgewood, Ky., assignors to Celanese Corporation, New York, N.Y.
Filed Nov. 12, 1985, Ser. No. 797,054
Int. Cl.[4] B29B *7/84*
U.S. Cl. 264—101 **11 Claims**



1. A process for removing volatile materials from a molten oxymethylene polymer, comprising passing the molten polymer through a rotating disk polymer processor having at least three stages, the three stages comprising in sequence a first devolatilization stage, a stabilization stage and a last devolatilization stage, the molten polymer in the first devolatilization stage being maintained at a temperature above its melting point in the temperature range of from about 160° C. to about 220° C. and at a vapor space pressure of from about 0.1 to about 300 Torr, the polymer in the stabilization stage being maintained in the molten state at a temperature of from 160° C. to about 220° C., the polymer in the last devolatilization stage being maintained in the molten state at a temperature of from about 160° C. to 190° C. and at a vapor space pressure of from about 0.1 to about 100 Torr.

4,692,291
MOLDING METHOD USING FAST CURING FIBER REINFORCED, LOW VISCOSITY THERMOSETTING RESIN
Richard G. Angell, Jr., Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.
Continuation of Ser. No. 135,906, Apr. 14, 1980, which is a continuation-in-part of Ser. No. 35,011, May 1, 1979, abandoned. This application May 9, 1984, Ser. No. 607,733
Filed May 9, 1984, Ser. No. 607,733
Int. Cl.[4] B29C *43/20, 45/16*
U.S. Cl. 264—109 **29 Claims**



1. A process for rapidly fabricating fiber reinforced thermoset resin articles in which the fiber reinforcement comprises one or more fibers with a melting point or a glass transition temperature above about 130° C., which process comprises the steps of:
(a) providing one or more of such fibers in the form of an interlocked mass in a heated matched metal die mold in an amount such that from about 15 to about 80 weight percent of the fabricated fiber reinforced thermoset resin article is comprised of such fibers;
(b) providing in an accumulator zone a liquid body of a thermosettable organic material having a viscosity determined at 120° C., in the absence of curing agents therefor, of less than about 50 centipoise, and which is curable within three minutes upon heating to a thermoset resin composition, the viscosity of said liquid body being maintained essentially constant in the accumulator zone by keeping its temperature below that at which curing of said material is substantial;
(c) closing the mold containing the interlocked mass of fibers;
(d) continously injecting at least a portion of said thermosettable organic material under a substantially constant pressure of from about 2 to about 200 atmospheres from said accumulator zone into the closed mold to thereby fill the cavity in said mold;
(e) curing said thermosettable organic material at such a

temperature in said mold that said thermosettable organic material cures within about 3 minutes after being injected into the mold; and then

(f) opening said mold and removing the cured thermoset molded article therefrom.

4,692,292

PROCESS FOR THE MANUFACTURE OF MOLDED OBJECTS

Hans-Joachim Kollmeier, Essen, and Helmut Lammerting, Herbede, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Dec. 26, 1985, Ser. No. 813,667

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522659

Int. Cl.[4] **B27J** *5/00*; **B29C** *33/64, 43/00*

U.S. Cl. 264—126 **13 Claims**

1. In a process for the manufacture of molded objects wherein lignocellulose-containing materials with polyisocyanates as a binder are subjected to hot pressing in a caul or mold and wherein an agent is applied to the surface of the caul or mold to facilitate release of the molded article from the press, the improvement which comprises using as the release agent a mixture comprising

(a) 20 to 65 weight percent of a silicone resin of the general formula

$$(CH_3)_a-SiO_{\frac{4-(a+b)}{2}}(OR^1)_b$$

in which

R^1 is a low molecular weight alkyl radical with 1 to 4 carbon atoms,

a has a value of 1 to 1.7,

b has a value of 0.3 to 1.0;

(b) 30 to 65 weight percent of an α,ω-methylsiloxanediol with an average molecular weight of 1,000 to 20,000;

(c) 5 to 15 weight percent of a silicate ester of the general formula

$$(R^2O)_cSiO_{\frac{4-c}{2}}$$

in which

R^2 is a low molecular weight hydrocarbon radical with 2 to 4 carbon atoms,

c has a value of 2.1 to 4.0;

wherein the sum of components (a), (b), and (c) amounts to 100, and after applying the mixture to the surface of the caul or mold, subjecting the mixture to curing at temperatures from 100° C. to 200° C.

4,692,293

MOLD METHOD FOR MULTI-COLOR PLASTIC SHELLS

John D. Gray, New Durham, N.H., assignor to Ex-Cell-O Corporation, Walled Lake, Mich.

Division of Ser. No. 794,805, Nov. 4, 1985, Pat. No. 4,634,360. This application Jun. 2, 1986, Ser. No. 869,789

Int. Cl.[4] **B29C** *39/12, 65/02*

U.S. Cl. 264—245 **3 Claims**

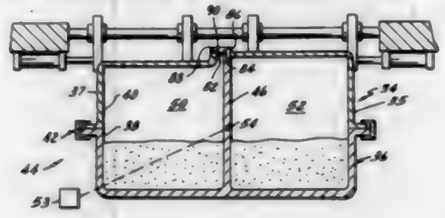
1. In a process for molding a single-piece multi-color plastic shell the steps comprising:

(1) heating an open-ended mold to a temperature near the melt temperature of a plastisol thermoplastic material;

(2) connecting a charge box to the mold to fold a closed system with at least two color plastisol sources;

(3) providing first and second split mold portions movable between clamping and unclamping positions with respect to a mold divider contained in the interior of the charge box; clamping said mold portions to the mold divider and charge box thereby defining the closed system including two chambers and first and second casting surfaces formed by the first and second mold portions and separated by the mold divider;

(4) thereafter rotating the charge box and mold in a plastisol casting sequency for releasing plastisol particles of a separate color onto each of the casting surfaces by gravity to



build up separate partially fused plastisol shells of desired shape and size on each of the split mold portions;

(5) separating the split mold portions for removal of the divider and charge box from the mold;

(6) and thereafter positioning the split mold portions together to clamp the separate partially fused shells together and finally fusing the shells to form an integral joint therebetween.

4,692,294

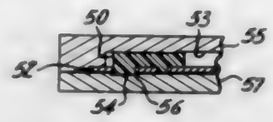
METHOD OF MOLDING AN INTEGRAL SPUR GEAR AND TOOTHED SPROCKET ASSEMBLY

Alfred J. Fisher, III, Grosse Pointe Farms, and Timothy J. Schmidt, Troy, both of Mich., assignors to General Safety Corporation, St. Clair Shores, Mich.

Division of Ser. No. 640,468, Aug. 13, 1984, Pat. No. 4,605,180. This application Apr. 3, 1986, Ser. No. 835,361

Int. Cl.[4] **B29C** *45/14*

U.S. Cl. 264—259 **4 Claims**



4. A method of manufacturing an integral spur gear and toothed sprocket assembly for use in an emergency locking seat belt retractor of the type having an inertia sensitive actuator which prevents seat belt webbing from being withdrawn when said retractor is subjected to deceleration above a predetermined level, wherein the method comprises the steps of:

providing a sprocket having radially outwardly projecting teeth and having a plurality of apertures through said sprocket which are radially spaced and positioned in a predetermined orientation with respect to said teeth of said sprocket,

inserting said toothed sprocket within an injection molding die cavity, said die cavity defining the configuration of said spur gear including a plurality of radially outward projecting spur gear teeth,

precisely positioning said toothed sprocket within said die cavity such that portions of said die cavity defining said spur gear teeth are in registry with said sprocket apertures,

injecting molding material within said die cavity such that said material defines said spur gear and flows through said sprocket apertures thereby interlockingly engaging each of said spur gear teeth with said sprocket, and

removing said integral spur gear and toothed sprocket assembly from said die cavity.

4,692,295

THERMOPLASTIC RESIN COMPOSITION FOR BIAXIAL ORIENTATION

Bernard Vinatier, Coye la Foret, France, assignor to Produits Chimiques Ugine Kuhlmann, France

Continuation of Ser. No. 605,577, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 446,457, Dec. 3, 1982, abandoned. This application Sep. 9, 1985, Ser. No. 774,375

Claims priority, application France, Dec. 11, 1981, 81 23149

Int. Cl.[4] **C08L** *25/06, 25/08, 25/12, 27/06*

U.S. Cl. 264—291 **2 Claims**

1. A process for biaxially orienting a non-foamed thermoplastic resin article comprising forming said article from an admixture of a thermoplastic resin selected from homopolymers and copolymers of vinyl chloride or acrylonitrile-butadiene-styrene copolymers capable of biaxial orientation and an additive resin having a molecular weight above 10^6 and selected from copolymers of styrene-acrylonitrile, methacrylonitrile-styrene, alpha methylstyrene-styrene-acrylonitrile, methyl acrylate-ethyl acrylate, methyl methacrylate-ethyl acrylate, methyl methacrylate-styrene-alpha methylstyrene, methyl methacrylate-alpha methylstyrene, or methyl methacrylate-styrene-acrylonitrile, said admixture requiring a lower force to stretch during orientation than a thermoplastic resin article absent the additive resin, heating said article to a temperature of from about 5° to 20° C. above the glass transition temperature of said thermoplastic resin, and biaxially orienting said thermoplastic resin composition at said temperature.

4,692,296

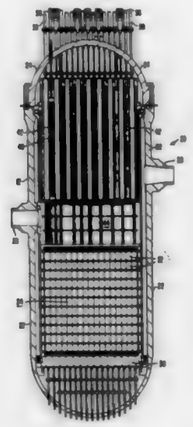
MECHANICAL SPECTRAL SHIFT REACTOR

Donald G. Sherwood, Monroeville; John F. Wilson, Murrysville; Robert B. Salton, and Howard F. Fensterer, both of Plum, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 564,363, Dec. 22, 1983, abandoned, which is a continuation of Ser. No. 217,053, Dec. 16, 1980, abandoned. This application Dec. 24, 1986, Ser. No. 946,111

Int. Cl.[4] **G21C** *7/26*

U.S. Cl. 376—209 **4 Claims**



1. A spectral-shift pressurized-water nuclear reactor comprising:

a vertically disposed elongated pressure vessel enclosing a reactor core which includes fissile material and fertile material and which generates heat by nuclear fission, said pressure vessel having an inlet and an outlet for circulating water coolant moderator upwardly through and in heat transfer relationship with said core, said core disposed toward the bottom portion of said reactor vessel and comprising a plurality of vertically disposed adjacent fuel assemblies, and said fuel assemblies having a fuel enrichment which provides a measure of excess reactivity at the beginning of core life which is later drawn upon to lengthen core life;

a plurality of spaced vertical guide tubes disposed in each of said fuel assemblies, and different types of rod members operable to be inserted into said guide tubes and said core and moved out of said guide tubes and said core during reactor operation;

one of said types of said rod members adapted to be inserted into said guide tubes comprising vertically disposed neutron-absorbing control rods so that insertion of said control rods into said core will substantially decrease reactivity and withdrawal of said control rods from said core will substantially increase reactivity, another of said types of said rod members adapted to be inserted into said guide tubes comprising vertically disposed neutron-spectral-shift displacer rods which have a substantially lower absorptivity for neutrons than said control rods, each said neutron-spectral-shift displacer rod comprising a hollow thin-walled Zircaloy member containing a filling of solid or annular zirconium- or aluminum-containing material for providing internal support and mass for said thin-walled tubular member, each said displacer rod having overall neutron-absorbing and -moderating characteristics essentially not exceeding those of hollow tubular Zircaloy members with or without a filling of zirconium oxide pellets or aluminum oxide pellets, said neutron-spectral-shift displacer rods collectively have a sufficiently low absorption for neutrons that when all of said neutron-spectral-shift displacer rods are fully inserted into said core at the beginning of core life, supplemental neutron-absorption is required to control reactor operation, said control rods and said neutron-spectral-shift displacer rods having approximately the same diameter, and the total number of said neutron-spectral shift displacer rods very substantially exceeding the total number of said control rods so that when all of said neutron-spectral-shift displacer rods are fully inserted into said core at the beginning of core life the neutron spectrum is hardened by the decreased volume of said water coolant moderator;

spider members and associated shafts and drive members therefor positioned above said core, each of said spider members connected to and supporting only one type of said rods by a series of strut members, and movement of said spider members operating to move said rods supported thereby into and out of said guide tubes in said core;

a plurality of rigidly restrained vertically disposed slotted guide tubes positioned above said core within said pressure vessel and operable to receive selected strut members of said spider members to retain the received strut members of said spider members and said rods connected thereto in their vertical path of movement;

a calandria positioned above the upper end of said core and beneath said slotted guide tubes, said calandria comprising a plurality of vertically positioned fixed unslotted tubes positioned at their lower ends directly over said guide tubes in said core and aligned at their upper ends to receive said rods, and said outlet of said pressure vessel positioned at the same elevation as said calandria so that during reactor operation said water coolant moderator moves upwardly through and from said fuel assemblies and is then changed in flow path to a lateral direction to discharge through said outlet in said pressure vessel; and

at the beginning of core life and throughout extended operation of said reactor said neutron-spectral-shift displacer rods are fully inserted into said core and are protected from possible vibrations induced by the lateral flow of said water coolant moderator by said calandria comprising said unslotted tubes, whereby the hardened neutron spectrum resulting from said fully inserted neutron-spectral-

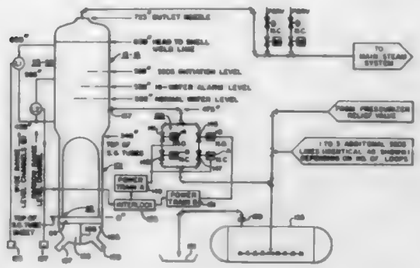
shift rods operates to convert fertile material to fissile material.

4,692,297

CONTROL OF NUCLEAR REACTOR POWER PLANT ON OCCURRENCE OF RUPTURE IN COOLANT TUBES

James S. Schlonski, Monroeville, and Tobias W. T. Burnett, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1985, Ser. No. 692,156
Int. Cl.[4] G21C *7/32, 19/42, 17/00, 9/00*
U.S. Cl. 376—211 **10 Claims**



1. The method of controlling the operation of a nuclear-reactor plant on the occurrence of rupture in the coolant channel of the steam generator which rupture raises the level of the liquid in said steam generator; the said method including the steps of:

(a) monitoring the level of the liquid in the vaporizing means of the steam generator, and

(b) when said level reaches a predetermining height , conducting said liquid to said pressurizer relief tank of said nuclear reactor plant to maintain the liquid in said vaporizing means at a predetermined level at which flooding of the steam line of the steam generator is precluded.

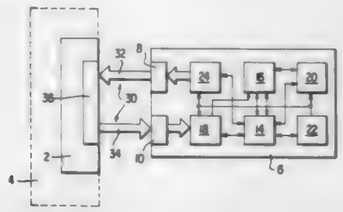
3. The method of claim 1 wherein the monitoring step includes the additional substeps of enabling an alarm when the liquid in the vaporizing means reaches a first predetermined level below the predetermined height, and thereafter enabling the conduction of the liquid to the pressuirzer relief tank when the predetermined height is thereafter reached, a predetermined time interval after the enabling of the alarm in the event of a rupture in the channel.

4,692,298

ANALOG PROCESS CONTROL SYSTEM TESTING

Michael D. Coradi, Harmar Township, Allegheny County, and Carl A. Vitalbo, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,982
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—215 **12 Claims**



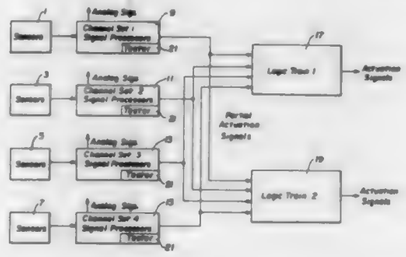
1. A method for testing an analog system which controls a process, the system being composed of a plurality of channels, with each channel having an input terminal normally connected for receiving a signal to be monitored, at least one signal monitoring component for deriving a control signal from the signal applied to the input terminal, and an output terminal normally connected in circuit with that at least one component for delivering the control signal to a further device for controlling the process, said method comprising testing each channel individually by: switching the channel input terminal to receive at least one test signal in place of the signal to be monitored; providing the at least oae test signal to the channel input terminal; monitoring the response of the at least one component to the at least one test signal; and causing the channel output terminal to present a simulated control signal during the time when the channel input terminal is switched to receive the at least one test signal, the simulated control signal corresponding to the control signal produced when the input and output terminals have their normal connections, and the signal to be monitored has a value indicative of normal process operation.

4,692,299

TESTING SENSOR SIGNAL PROCESSORS

Albert W. Crew; William D. Ghrist, III, both of Pittsburgh, and Gilbert W. Remley, Blawnox, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1985, Ser. No. 788,983
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 **11 Claims**



1. A method of testing sensor signal processing apparatus which applies dynamic compensation defined by a predetermined non-linear transfer function to the sensor signal to generate a compensated signal and generates a digital output signal having a first level when the magnitude of the compensated signal is less than a set point value and a second level when it equals or exceeds the set point value, said method comprising the steps of:

generating a dynamic reference signal;

generating a test signal by applying to the dynamic reference signal, dynamic compensation defined by the inverse of the non-linear transfer function of the processing apparatus;

removing the sensor signal from the processing apparatus and applying in its place the test signal; and

comparing the compensated signal generated by the processing means with said dynamic reference signal.

4,692,300

DEVICE FOR THE UNDERWATER MEASUREMENT OF THE HARDNESS OF A VERTICAL WALL OF THE PARTITIONING OF THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR

Gerard Grespin, Paris, France, assignor to Framatome & Cie., Courbevoie, France

Filed Nov. 2, 1984, Ser. No. 667,692
Claims priority, application France, Nov. 4, 1983, 83 17524
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **6 Claims**

1. Underwater measuring device, for the hardness of a vertical wall of the partitioning of the core of a pressurized water nuclear reactor comprising vertical partitions arranged in parallel and facing pairs and each assembled at a right angle with other vertical walls of the partitioning, said device comprising:

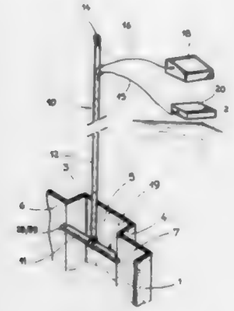
a hollow pole for the manipulation of the device from the edge of the pool of the reactor, the pole being vertical in service position,

a body fastened to the pole at its lower end having an axis perpendicular to the pole and hence horizontal in service position,

a first chamber formed in the horizontal body along its axis and at one of its ends,

a first piston mounted axially movable in the first chamber bearing a support means intended to come into contact with a first set of two walls aranged at right angles,

a second chamber formed in the horizontal body, along its axis and at its end opposite the first chamber,



a second piston mounted axially movable in this second chamber bearing a hardness measuring head intended to come to make an impression on one of the walls opposite the support walls, the horizontal body being intercalated between these opposite walls during the hardness measurement,

hydraulic fluid supply means for each of the chambers of the horizontal body passing axially through the hollow vertical pole,

measuring means for the stress exerted by the second piston on the hardness measuring head,

accurate measuring means of the movement of the measuring head,

and conductors passing axially through the vertical pole for the transmission of the measuring results to a measuring station arranged above the pool of the reactor.

4,692,301

STEAM GENERATOR HEATED WITH THE COOLING GAS OF A NUCLEAR REACTOR

Josef Schoening, Hambuckes; Claus Elter, Bad Durkheim, and Jürgen Rautenberg, Stettfeld, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Dortmund, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 735,922
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418528
Int. Cl.[4] G21D *5/12*
U.S. Cl. 376—391 **14 Claims**

1. A steam generator heated with cooling gas of a nuclear reactor, arranged in a vertical shaft clad with a metal liner in a reactor pressure vessel, with a blower following in line and installed above the steam generator in the vertical shaft, comprising:

a cold gas conduit and a hot gas conduit entering the vertical shaft, the hot gas conduit serves to supply hot gas and the cold gas conduit serves to remove cold gas from the steam generator wherein the cold gas conduit is positioned above the hot gas conduit;

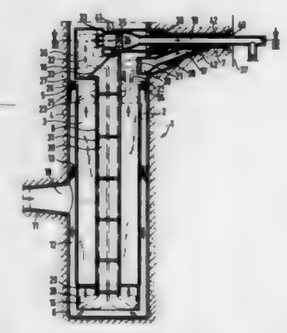
feed water and live steam lines leading out of the reactor pressure vessel, connected to heat transfer surfaces laid out as a helical bundle and surrounded by a bundle jacket of the steam generator open in a downward direction and not extending to the bottom of the shaft wherein the heat transfer surfaces extend past an inlet location of the hot gas conduit;

a reversing area located between a lower end of the bundle and the bottom of the shaft, defined by a downward extension of the bundle jacket;

an annular canal for conducting the hot gas in a downward direction, formed between the metal liner and the bundle jacket;

means for blocking upward flow of cooling gas and performing earthquake support functions of said steam generator and comprising a sliding gasket in the annular canal positioned directly above the inlet location of the hot gas conduit between the metal liner and the bundle jacket;

wherein the feed water line and the live steam line lead out



laterally from the vertical shaft and through the reactor pressure vessel in an upper portion or cold gas range of the steam generator between said blower and an upper end of said bundle, and that the bundle of heat transfer surfaces are made up of individual tubes;

a center tube arranged within said helical bundle and surrounding a straight tube bundle of said individual tubes deflected 180° from said helical bundle in said reversing area;

a perforated plate, welded to said center tube, traversed by said straight tube bundle and arranged to block flow of cooling gas into said center tube;

a plurality of recycling tubes, arranged in an expansion zone, connecting said straight tube bundle to said live steam lines;

an insulated sheet metal jacket surrounding said expansion zone, connected to said center tube;

means for immobilizing said individual tubes comprising a plurality of vertical support plates with upper ends welded on top of the bundle jacket and said center tube, a support flange on the metal liner of the vertical shaft supporting an upper end of said bundle jacket.

4,692,302

COOLANT FLOW MIXER GRID FOR A NUCLEAR REACTOR FUEL ASSEMBLY

Edmund E. DeMario, Penn Hills; Raymond F. Boyle, Monroeville, and Peter J. Kuchirka, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

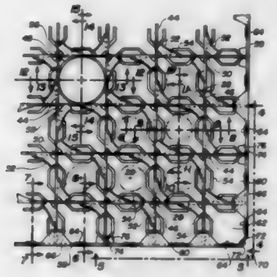
Filed Dec. 30, 1983, Ser. No. 567,450
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—439 **3 Claims**

1. In a nuclear reactor fuel assembly including a number of

longitudinally extending control rod guide thimbels, and a plurality of transverse grids axially spaced along said thimbles for supporting an array of upstanding fuel rods, a flow mixing nonsupport grid structure mounted on said thimbles and disposed between a pair of adjacent fuel rod support grids for promoting the mixing of a coolant as it flows longitudinally upwardly along and between the fuel rods, said grid structure comprising:

(a) a plurality of inner interleaved straps arranged in an egg-crate configuration in defining a plurality of inner cell openings for receiving therethrough respective ones of said fuel rods;

(b) at least one mixing vane mounted on one of the inner straps associated with each inner cell opening having a fuel rod extending therethrough, said mixing vane projecting upwardly and inwardly toward the longitudinal axis of said cell opening for deflecting the upwardly flowing coolant laterally from one fuel rod to an adjacent fuel rod; and



(c) a protrusion associated with each mixing vane and mounted on said inner strap and extending into said cell opening toward said longitudinal axis of said cell to a greater extent than said mixing vane so as to prevent damaging impact of said fuel rod with said vane, but not so far as to normally contact the fuel rod, should said fuel rod move transversely across said cell opening, the distance across each said inner cell opening between said interleaved straps with said protrusion mounted thereon being greater than the diameter of said one fuel rod received through said inner cell opening such that said fuel rod is unsupported within said cell opening, said protrusion being a generally transversely running arch which is rigid and generally trapezoidal shaped, projects generally perpendicularly toward said longitudinal axis of said cell opening and is oriented to permit the upwardly flowing coolant to pass therethrough in thereby reducing the pressure drop of said coolant flow through said grid structure.

4,692,303

SPACER CAPTURE ROD TO SPACE GRID ATTACHMENT DEVICE

Jon L. Osborne, West Richland, Wash., assignor to Exxon Nuclear Company, Inc., Florham Park, N.J.

Filed Aug. 23, 1984, Ser. No. 643,440
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **9 Claims**

1. In a nuclear fuel assembly having a parallel array of fuel rods, at least one of said fuel rods serving as a spacer capture rod, said fuel rods being positioned for longitudinally extending through openings formed from intersecting walls of a grid spacer, some of said walls being flat and others of said walls having protrusions extending into said openings and coacting springs for holding said fuel rods in laterally fixed positions, said protrusions and springs being horizontally and vertically oriented, relative to the longitudinal axes of said fuel rods, a spacer capture system which secures said grid spacer in fixed position relative to said fuel rods, comprising a cylindrical-like sleeve rigidly fixed to said spacer capture rod, said sleeve including:

a longitudinal guide slot; and

a plurality of spaced apart horizontally oriented pairs of vertically opposed bosses extending radially outward from the outer face of an upper portion of said sleeve for engaging at least one of said protrusions from said grid



spacer walls between one of said pair of bosses such that movement of said grid spacer in either longitudinal direction is substantially prevented and the vertical location of said spacer grid is fixed; and

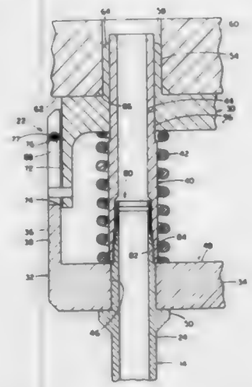
at least one vertically oriented slot located in a lower portion of said sleeve for receiving and locking against one of said springs, the coaction therebetween substantially preventing axial rotation of said capture rod relative to said grid spacer.

4,692,304

REMOVABLE AND REUSABLE LOCKING PIN FOR TOP NOZZLE ASSEMBLY AND DISASSEMBLY

Robert K. Gjertsen, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 23, 1985, Ser. No. 812,041
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **13 Claims**



1. In fuel assembly top nozzle, the combination comprising:

(a) a lower adapter plate;

(b) an upper hold-down plate;

(c) resilient means disposed between said lower and upper plates so as to bias said plates to move away from one another, but being yieldable so as to permit said plates to move toward one another;

(d) a first structure mounted on said lower plate and extending toward said upper plate;

(e) a second structure mounted on said upper plate and extending toward said lower plate and along said first structure;

(f) means defining at least one slot in one of said first and second structures so as to extend toward said lower and upper plates;

(g) at least one protruding element attached on the other of said first and second structures and extending into said slot, said protruding element being slidably moved along said slot as said lower and upper plates move toward and away from one another; and

(h) closure means mounted to said one of said first and second structures containing said slot, said closure means defining an end of said slot so as to limit the extent of movement of said protruding element along said slot in a direction in which said plates move away from each other and thereby prevent disassembly of said lower and upper plates from one another, said closure means being releasable and reusable for permitting opening of said slot end for facilitating disassembly of said plates from one another and then reassembly of said plates back together.

4,692,305

CORROSION AND WEAR RESISTANT ALLOY

Subramaniam Rangaswamy, Port Jefferson Station, and John H. Harrington, Warwick, both of N.Y., assignors to Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 5, 1985, Ser. No. 795,057
Int. Cl.[4] C22C *19/05, 19/07, 30/00*
U.S. Cl. 420—436 **12 Claims**

1. An alloy characterized by high resistance to wear and corrosion, consisting essentially of, as percent by weight:

2 to 25% chromium,
5 to 30% molybdenum,
3 to 15% tungsten,
2.0 to 8% copper,
0.2 to 2.0% boron, and
0.2 to 2.0% carbon;

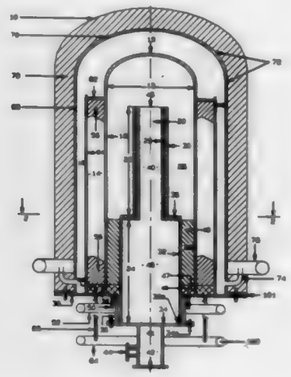
the balance being incidental impurities and at least 30% of a metal selected from the group consisting of nickel, cobalt and combinations thereof; and the total of molybdenum and tungsten being at least 16%.

4,692,306

CATALYTIC REACTION APPARATUS

Ronald G. Minet, South Pasadena, and David Warren, Studio City, both of Calif., assignors to Kinetics Technology International Corporation, Monrovia, Calif.

Filed Mar. 24, 1986, Ser. No. 842,830
Int. Cl.[4] B01J *7/00, 8/06*
U.S. Cl. 422—49 **17 Claims**



1. Endothermic catalytic reaction apparatus comprising:

(a) an axially extending reaction chamber, and an axially extending regenerative heat transfer chamber,

(b) an internally disposed, axially extending burner chamber about which the reaction chamber extends, the burner chamber containing an infrared burner assembly, means defining a radiant chamber, and means defining a convection chamber wherein said burner chamber supplies endothermic reaction heat to the reaction chamber, said burner chamber defined by a generally cylindrical inner wall means of said reaction chamber, said burner chamber also including burner gas exhaust means associated therewith,

(c) said axially extending reaction chamber being disposed generally concentrically about said burner chamber, said reaction chamber defined by said inner wall means which is exposed to burner gases within said burner chamber and also by a generally concentric cylindrical outer wall means exposed to hot product gases within said regenerative heat transfer chamber, there being a first space between said reaction chamber inner and outer wall means defining a generally annular chamber which is substantially filled with catalyst and which is a passageway for conducting reactant gases over said catalyst,

(d) said axially extending regenerative heat transfer chamber disposed in a generally concentric arrangement about said reaction chamber, said regenerative heat transfer chamber defined by said outer wall means of the reaction chamber and by a generally concentric cylindrical outer shell means of the catalytic reaction apparatus, there being a second space between said outer wall means and said outer shell means defining a generally annular passageway for flow of said hot product gases,

(e) said infrared burner assembly comprising an upper radiant burner portion and a lower burner stock portion, said radiant burner portion being vertically disposed within said radiant chamber of the burner chamber, and said burner stock portion defining an inner wall means of said convection chamber,

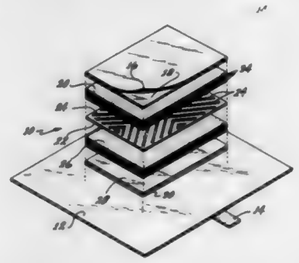
(f) and wherein said radiant burner portion comprises a gas permeable support structure having an internal volume defining a burner core and wherein said support structure includes a ceramic fiber material defining a radiant skin enclosing a substantial portion on said support structure.

4,692,307

ADJUSTABLE TEST PACK

Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 605,084, Apr. 30, 1984, Pat. No. 4,576,795, which is a continuation-in-part of Ser. No. 536,798, Sep. 28, 1983, Pat. No. 4,579,715. This application Sep. 23, 1985, Ser. No. 779,175
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] G01N *21/78*
U.S. Cl. 422—58 **5 Claims**



1. A disposable pack for testing the efficiency of a steam sterilizer apparatus to create a vacuum which comprises:

a porous bundle comprising a plurality of selectively porous

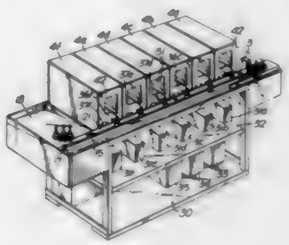
layers wherein said bundle has a top surface and a bottom surface with an edge therebetween;
a first nonporous gas impermeable layer positioned against said top surface of said bundle to block the passage of gas therethrough;
a porous sheet with a steam sensitive indicator ink printed thereon positioned between layers of said bundle to indicate the efficiency of a sterilizer;
a foam layer positioned against said bottom surface of said bundle having an edge substantially aligned with the edge of said bundle to permit circulation of gas over said bottom surface;
a second nonporous gas impermeable layer positioned against said foam layer opposite said bundle to direct the passage of air through the edge of said foam layer; and
a porous overwrap folded around said bundle, said sheet, said foam layer, said first nonporous gas impermeable layer, and said second nonporous gas impermeable layer to maintain the integrity thereof.

4,692,308

AUTOMATIC CHEMICAL ANALYSIS

Clifford Riley, Burgess Hill, and Christopher J. Mears, Guilford, both of United Kingdom, assignors to Vickers, PLC, London, England

Continuation of Ser. No. 525,818, Aug. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 493,382, Mar. 17, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 827,151
Claims priority, application United Kingdom, Mar. 17, 1982, 8207814
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **14 Claims**



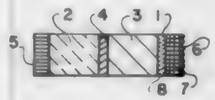
1. Automatic analysis apparatus, comprising:
a first endless conveyor;
a second endless conveyor being disposed in a side by side relationship with said first endless conveyor; such that respective longitudinal side edges of said first and second endless conveyors are adjacent to one another;
means for driving said first and second endless conveyors continuously and in first and second respectively opposite directions during operation of the apparatus;
means for transferring a sample vial from said second endless conveyor to said first endless conveyor;
an entry gate disposed along said first endless conveyor, for retaining sample vials carried by the first endless conveyor and selectively admitting sample vials to the first endless conveyor downstream of the entry gate;
a plurality of analytical modules disposed adjacent to said first endless conveyor, downstream of said entry gate, each of said analytical modules comprising:
a moveable stop member for retaining a sample vial on the conveyor in a position adjacent to the module; a sample probe for removing sample from a vial retained by the stop member;
means for moving the sample probe between a first operative position in which the probe may be inserted into a vial held by said stop member to remove sample therefrom and a second operative position in which the sample probe is clear of the vial;
means for processing a sample removed by the sample probe; and
means for controlling the movement of the stop member to enable it to retain a sample vial to allow a sample to be removed therefrom and to release the vial when the sample has been removed therefrom;
identification means adjacent said entry gate for reading an identifying code carried by a sample vial; and
synchronizing means for controlling the operation of the entry gate, the identification means, the means for moving the sample probe and the means for controlling the stop member, wherein the synchronizing means and the identification means are arranged so that information carried by a vial can be processed to determine the modules to which the vial is to be directed, thereby allowing selective testing of the sample in the vial.

4,692,309

DIFFUSION SAMPLE COLLECTOR FOR GASEOUS MEDIA

Karl-Heinz Panawitz, Lübeck, Fed. Rep. of Germany, assignor to Dragerwerk AG, Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 904,888
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531650
Int. Cl.[4] G01J *1/48*
U.S. Cl. 422—87 **6 Claims**



1. Diffusion sample collector and indicator arrangement for gas components in gaseous media, comprising in combination
a transparent container having an opening at both ends,
a non-permeable wall between the ends and dividing the container into two separate compartments, each compartment communicating with a separate open end,
an indicator layer of material in one of the compartments for indicating the effect of a gas component to which the indicator layer is exposed, and
a collector layer of material in the other of the compartments for collecting a gas component whose quantity is to be later determined upon the presence of such gas component being indicated by the indicator layer in the one of the compartments.

4,692,310

SUBSTANCE K-259-2 AND A PROCESS FOR PRODUCING THE SAME

Hiroshi Kase, Koganei, Japan; Yuzuru Matsuda, Rockville, Md.; Isao Kawamoto, Hiratsuka, Japan; Kozo Asano, Machida, Japan; Kunikatsu Shirahata, Komae, Japan; Tohru Yasuzawa, Machida, Japan, and Koji Yamada, Machida, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 771,530, Aug. 30, 1985, abandoned. This application Apr. 16, 1986, Ser. No. 852,590
Claims priority, application Japan, Sep. 3, 1984, 59-184320
Int. Cl.[4] A61K *35/74*; C12P *1/06*
U.S. Cl. 424—122 **5 Claims**

1. A substance K-259-2 having the following physico-chemical characteristics:
(1) Nature: Reddish needle crystal. Alkaline substance.
(2) Melting point:
140°–145° C. (decomp.). Becomes brownish at a temperature of more than about 140° C. Melting point indefinite.

(3) Specific rotation:
$[\alpha]_D^{20} = 0°$ (c=0.33, CH_3OH)
(4) Solubility:
Readily soluble in acetic acid, soluble in methanol and water, and hardly soluble in chloroform, ethyl acetate, acetone and ethanol.
(5) Color reaction:
Positive in iodine and anisaldehyde reactions.
(6) Visible absorption spectrum:
As shown in FIG. 1 (82% methanol-water, v/v)
(7) Ultraviolet absorption spectrum:
As shown in FIG. 2 (82% methanol-water, v/v)
(8) Infrared absorption spectrum:
3425, 2960, 2924, 2852, 1626, 1562, 1442, 1386, 1326, 1259, 1227, 1176, 1157, 1108, 1052, 1023 cm^{-1}
(KBr method)
(9) Mass spectrum:
382 (M^+), 353, 334, 311, 308, 268.
(10) ^{1}H-NMR spectrum (100 MHz, DMSO-d_6+CD_3OD, δ):
0.78 (3H, t, J=7.3), 1.67 (3H, br.d, J=5.9), ca. 1.7 (2H, m), 4.38 (2H, br.s), ca. 5.1 (1H, m), 6.36 (1H, d, J=2.4), 6.93 (1H, d, J=2.4), 7.36 (1H, s).
(11) Molecular formula: $C_{21}H_{18}O_7$
(12) Molecular weight: 382

	H	C	N	O
Found:	4.50	65.53	0	
Calculated ($C_{21}H_{18}O_7$)	4.71	65.97	0	29.32

(14) Rf values obtained by silica gel thin layer chromatography:

Solvent system	Rf value*
1. Chloroform/methanol/ethanol/water = 10:4:4:2 (v/v)	0.56
n-butanol/ethanol/chloroform/ aqueous ammonium (28%) = 4:5:2:4 (v/v)	0.35

*Thin layer . . . Kieselgel 60 (Art 5631, product of Merck AG., West Germany)

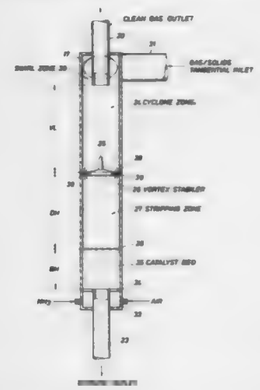
4,692,311

APPARATUS FOR THE SEPARATION OF FLUID CRACKING CATALYST PARTICLES FROM GASEOUS HYDROCARBONS

Wesley A. Parker; Thomas S. Dewitz; George P. Hinds, Jr., all of Houston; John E. Gwyn, Katy; A. Haluk Bilgic, Houston, and Donald E. Hardesty, La Porte, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 452,599, Dec. 23, 1982, Pat. No. 4,455,220. This application Feb. 10, 1984, Ser. No. 878,321
Int. Cl.[4] F27B *15/08*; C10G *11/18*
U.S. Cl. 422—144 **6 Claims**

1. An apparatus for separating suspensions of catalyst particles and gaseous hydrocarbons and for stripping hydrocarbons from said catalyst particles after traversing a riser conduit which comprises:
(a) an upright hollow housing having a lower portion, a middle portion an upper portion, a gaseous hydrocarbon vortex outlet with a diameter in said upper portion of said housing for removing clean gaseous hydrocarbons, and a stripped catalyst outlet means in said lower portion of said housing for removing stripped catalyst, said housing having a tangential inlet means in said upper portion to form a swirl zone wherein suspensions of catalyst particles and gaseous hydrocarbons entered through said inlet means form a fluix vortex;
(b) a vortex stabilizer means having a perimeter and coaxially mounted in said middle portion of said housing and having a diameter of at least the diameter of said gaseous hydrocarbon vortex outlet and positioned a distance from said gaseous hydrocarbon vortex outlet means to define a cyclone zone, wherein catalyst particles are separated from gaseous hydrocarbons to form a clean fluid, wherein said vortex stabilizing means stabilizes and centers said vortex to minimize reentrainment of said particles into said clean gaseous fluid, wherein said vortex stabilizing means is spaced a distance equal to a distance of at least two of said gaseous hydrocarbon vortex outlet diameters below said hydrocarbon vortex outlet and wherein said vortex stabilizer means is supported, by vortex stabilizer support means in said housing to provide an annular space intermediate said perimeter of said vortex stabilizer means and said housing sufficient to pass separated catalyst downward through said annular space into a stripping zone and pass stripping gas upward through said annular space into said cyclone zone;



(c) means for supporting a fluidized catalyst bed below said vortex stabilizer means near said bottom of said hollow housing and having a fluidized bed of catalyst being supported thereon and defining, intermediate said fluidized catalyst support means and said vortex stabilizer means, a stripping zone in gaseous communication with said cyclone zone through said annular space and including a catalyst disengaging space of sufficient height to avoid slugs of catalyst carryover into said cyclone zone and where, in said stripping zone, gaseous hydrocarbons are stripped from the catalyst particles to thereby terminate cracking reactions of said hydrocarbons; and
(d) means for injecting stripping gas into said fluidized catalyst to minimize adsorbed hydrocarbons on the catalyst particles.

4,692,312

APPARATUS FOR PRODUCING CARBON BLACK

Meredith N. Dilbert, Orange, Tex.; Glenn J. Forseth; William R. Jones, Jr., both of Bartlesville, Okla., and Richard T. Divis, Orange, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

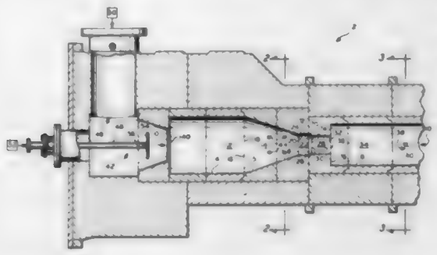
Division of Ser. No. 652,027, Sep. 19, 1984, Pat. No. 4,582,695. This application Apr. 14, 1986, Ser. No. 851,999
Int. Cl.[4] C09C *1/48*
U.S. Cl. 422—151 **5 Claims**

1. A carbon black reactor comprising a means for defining a reaction flow path having the following zones, (a)–(e), in sequential, generally axial alignment along a reactor axis:
(a) a first generally cylindrical zone having a first end and a second end and a first diameter;
(b) a first converging zone having a first end and a second end, with the first end of the first converging zone being connected to the second end of the first generally cylindrical zone;
(c) a second generally cylindrical zone having a first end and

a second end and a second diameter, with the first end of the second generally cylindrical zone being connected to the second end of the first converging zone;

(d) a third generally cylindrical zone which forms a throat of the reaction flow path, said third generally cylindrical zone having a first end and a second end and a third diameter which is less than the second diameter, said third diameter being in the range of from about 4 inches to about 16 inches, with the first end of the third generally cylindrical zone being connected by a first wall means to the second end of the second generally cylindrical zone;

(e) a fourth generally cylindrical zone which forms the pyrolysis zone of the reaction flow path, said fourth generally cylindrical zone having a first end and a second end and a fourth diameter which is greater than the third diameter, the first end of the fourth generally cylindrical zone being connected to the second end of the third generally cylindrical zone by a second wall means;



a means for establishing generally axial flow of hot combustion gases from the first generally cylindrical zone to the fourth generally cylindrical zone;

a means for introducing a carbonaceous feedstock generally radially inwardly into the hot combustion gases along the reaction flow path;

and a means for introducing a quench fluid into the pyrolysis zone, said means for introducing the quench fluid defining the second end of the pyrolysis zone.

4,692,313

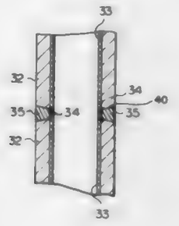
APPARATUS FOR THERMAL CRACKING OF OR HEATING OF HYDROCARBONS

Yoji Watanabe, Oita; Toshio Morimura, Kawaguchi, and Yukio Toyoda, Oita, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 331,782, Dec. 17, 1981, Pat. No. 4,454,021. This application Apr. 6, 1984, Ser. No. 597,314

Int. Cl.⁴ B01J *19/02;* **C10G** *9/12;* **C01G** *9/16*

U.S. Cl. 422—241 **6 Claims**



1. An apparatus for heating of hydrocarbons, comprising a radiation chamber for thermal cracking of starting hydrocarbons, a convection chamber communicating with said radiation chamber, a preheating conduit for starting hydrocarbon extending from a source of starting hydrocarbons into said convection chamber, a steam conduit communicating with said preheating conduit, a thermal cracking reaction conduit having at least the inner surface thereof made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels for preheated starting hydrocarbons located in said radiation chamber, and a heat recovery device made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels communicating with said cracking reaction conduit via an intermediate conduit made of one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels, wherein a carbon-deposition-suppressing amount of at least one member selected from the group consisting of an alkali metal, an alkaline earth metal, an alkali metal-oxide and an alkaline earth metal-oxide is incorporated, as one of a solid solution and dispersed phase into at least an inner surface portion of said one of a heat resistant material selected from the group consisting of non-ferrous nickel-chrome alloys and nickel-chrome steels of said thermal cracking reaction conduit, said heat recovery device and said intermediate conduit.

4,692,314

WATER TREATMENT SYSTEMS

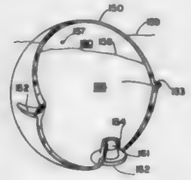
Kenji Etani, P.O. Box 102, West Townsend, Mass. 01474

Continuation-in-part of Ser. No. 40,302, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Apr. 22, 1983, Ser. No. 488,597

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ C23F *11/00;* **B01D** *11/02, 35/00;* **C02F** *1/68*

U.S. Cl. 422—265 **26 Claims**



1. A water treatment system for utilization apparatus comprising

(a) a pump;

(b) an intermediate velocity chamber;

(c) piping to interconnect pump, chamber, and utilization apparatus in a recirculating loop;

(d) a quantity of water within said pump, chamber, piping, and apparatus; and

(e) a feeder within said chamber comprising a shell containing a dose of water-treatment chemical;

(f) wherein said feeder is small enough and close enought to spherical in shape and to neutral buoyancy, dependent on the velocity of flow with said chamber, resulting from the operation of said pump, to be free to move about and roll in said water when said water is circulated by said pump, and

(g) wherein said feeder is of a volume between 0.1 and 24 cubic inches, and is perforated by a plurality of holes each less than 1/10 and greater than five thousandths of an inch (0.005") in diameter to control the feeding of said chemical to a proper rate.

4,692,315

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS

Brian Greaves, and Paul Ingham, both of Runcorn, England, assignors to Dearborn Chemicals Limited, Widnes, England

Filed Apr. 17, 1985, Ser. No. 724,229

Claims priority, application United Kingdom, Apr. 25, 1984, 8410589

Int. Cl.⁴ C23F *11/14, 11/08*

U.S. Cl. 422—18 **44 Claims**

1. A method for inhibiting corrosion in an aqueous system which comprises adding to the system at least one corrosion inhibiting zinc salt capable of forming a passivating film of a water insoluble salt of zinc at the cathode, and adding to the system a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said polymer containing quaternary ammonium groups or protonated amine groups and being derived from reacting epichlorohydrin with amines selected from the group consisting of dimethylamine, triethanolamine, ethylene diamine and polyalkylene polyamines; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

4,692,316

METHOD OF INHIBITING CORROSION IN AQUEOUS SYSTEMS

Brian Greaves, Runcorn, and Stuart J. Grenside, Gatecrc, both of England, assignors to Dearborn Chemicals Limited, Widnes, United Kingdom

Filed Mar. 20, 1985, Ser. No. 713,934

Claims priority, application United Kingdom, Mar. 20, 1984, 8407150

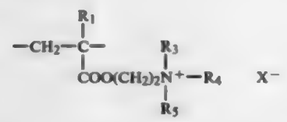
Int. Cl.⁴ C23F *11/14, 11/18*

U.S. Cl. 422—16 **48 Claims**

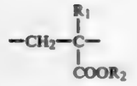
1. A method for inhibiting corrosion in an aqueous system which comprises adding to the system at least one corrosion inhibiting salt capable of forming a passivating film at the anode selected from the group of salts consisting of 2-phosphono-butane-1,2,4-tricarboxylic acid salts, orthophosphates, nitrites, and chromates, and a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said polymer containing quaternary ammonium groups or protonated amine groups and being derived from reacting epichlorohydrin with amines selected from the group consisting of dimethylamine, triethanolamine, ethylene diamine and polyalkylene polyamines; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

26. A method for inhibiting corrosion in an aqueous system which comprises adding to the system a corrosion inhibiting orthophosphate salt capable of forming a passivating film at the anode, and a substantially linear cationic polymer having a molecular weight between about 400 and about 10,000; said cationic polymer being derived by polymerizing ethylenically unsaturated monomers and incorporating quaternary ammonium groups or protonated amine groups therein, and said polymer being selected from the group consisting of

(i) polymers containing 10 to 100 mol % of recurring units of the formula:

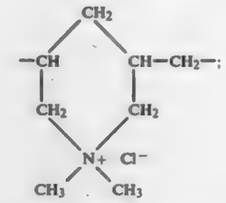


and 0 to 90 mol % of recurring units of the formula:



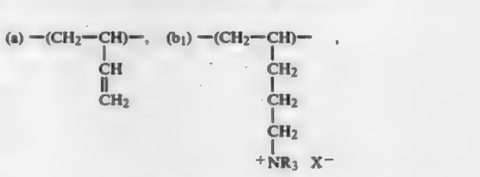
in which R_1 represents hydrogen or a lower alkyl radical, R_2 represents a long chain alkyl group having 8 to 18 carbons, R_3, R_4, and R_5 independently represent hydrogen or a lower alkyl group while X represents a anion;

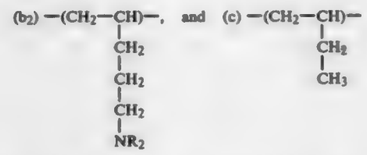
(ii) polymers possessing recurring units of the formula;



and

(iii) polymers possessing recurring units of:





in the molar proportions $a:b_1:b_2:c$ respectively, where each R independently represents a lower alkyl radical; and said polymer being added in an effective amount to significantly reduce the amount of said salt needed in the system for corrosion protection.

4,692,317

CORROSION CONTROL IN AQUEOUS SYSTEMS USING CATIONIC POLYMERS IN COMBINATION WITH PHOSPHONOHYDROXYACETIC ACID

Brian Greaves, Runcorn, England, assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,933

Claims priority, application United Kingdom, Nov. 8, 1984, 8428258

Int. Cl.⁴ C23F *11/16*

U.S. Cl. 422—15 **42 Claims**

1. A method for inhibiting corrosion of steel and the like in an aqueous system which comprises adding to the system phosphonohydroxyacetic acid or a salt thereof and a cationic polymer having a molecular weight between about 400 and about 10,000; said cationic polymer being selected from the group consisting of

(a) polymers derived by polymerizing ethylenically unsaturated monomers and incorporating quaternary ammonium groups or protonated amine groups therein, and

(b) polymers containing quaternary ammonium groups or

protonated amine groups and derived from reacting epichlorohydrin with amines; and

the cationic polymer component being added to the system in a weight ratio to the phosphonohydroxyacetic acid component in the system of between about 1:8 and about 2:1.

4,692,318

PROCESS FOR SIMULTANEOUSLY REMOVING NITROGEN OXIDES, SULFUR OXIDES, AND PARTICULATES

Thomas W. Tolpin, Highland Park, and Richard A. Kretchmer, Clarendon Hills, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 640,675, Aug. 13, 1984, Pat. No. 4,609,537. This application Mar. 6, 1986, Ser. No. 836,687

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.⁴ B01J *8/00*; **C01I** *17/00, 21/00*; **B01D** *45/00*

U.S. Cl. 423—239 **11 Claims**

1. A gas purification process, comprising the steps of:

simultaneously substantially removing nitrogen oxides, sulfur oxides, and particulates in a common vessel from a gaseous stream containing nitrogen oxides, sulfur oxides, and particulates by contacting said gaseous stream with a nitrogen oxide-capturing reducing agent and passing said gaseous stream generally vertically through at least a portion of a bed of granular sulfur oxide-capturing and particulate-removing material, liberating nitrogen and steam and leaving spent granular material carrying removed particulates and sulfur-containing deposits thereon comprising at least one member of the group consisting of sulfur oxides, sulfates, and combinations thereof;

said sulfur oxide-capturing and particulate-removing material being selected from the group consisting essentially of adsorbers and adsorbers with at least one promoter thereon, said adsorbers comprising an oxide of at least one metal selected from the group consisting of aluminum, bismuth, manganese, yttrium, antimony. tin, rare earth metals, Group 1*a* metals, and Group 2*a* metals, and said promoter comprising at least one member, in a free or combined form, selected from the group consisting of rare earth metals, Group 8 noble metals, chromium, vanadium, rhenium, antimony, silver, and combinations thereof;

said nitrogen oxides being substantially removed by a nitrogen oxide-capturing reducing agent selected from the group consisting essentially of hydrogen, ammonia, ammonia-liberating compounds, light hydrocarbon gases, and combinations thereof;

simultaneously removing said particulates and sulfur-containing deposits from said spent material in a regenerator while converting said sulfur-containing deposits to hydrogen sulfide in said regenerator by reacting said spent material with a regenerating reducing gas selected from the group consisting essentially of hydrogen, ammonia, ammonia-liberating compounds, carbon monoxide, gas oils, light hydrocarbon gases, and combinations thereof, to provide regenerated material for use in said bed; and

feeding said regenerated material directly from said regenerator to said bed in said vessel without substantially heating, cooling, or tempering said regenerated material.

4,692,319

METHOD FOR DESULFURIZING FLUE GAS IN FUEL OIL FIRING SYSTEMS

Zoltan Farago, Adelsheim-Seanfeld, and Winfried Buschulte, Neuenstadt, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuch-Sanstalt für Luft- und Raumfahrt E.V., Bonn, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,162

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401471

Int. Cl.⁴ C01B *17/00*

U.S. Cl. 423—242 **5 Claims**

1. A process for separating sulfur dioxide from flue gas in household fuel oil firing systems having a fuel oil burner, a boiler heated by said burner, a heating water return conduit and a residual heat exchanger connected to the output side of said boiler for cooling said flue gas to about 30°-35° C. and heating thereby the water in said return conduit, said residual heat exchanger forming condensate water in cooling said flue gas, comprising the steps of:

dissolving the sulfur dioxide in the form of sulfite solely in said condensate water formed in said residual heat exchanger without additional water supply;

adding a neutralising agent to said condensate water containing said sulfite to bring the pH of said condensate water in the range of 5 to 8;

recirculating said neutralised condensate water by a pump to the residual heat exchanger for the purpose of avoiding formation of acid condensate water and dissolving further sulfur dioxide;

introducing air into said recirculated condensate water to convert the dissolved sulfite to sulfate;

diluting the recirculating condensate with water once it reaches a predetermined sulfate concentation; and

exhausing said diluted surplus condensate water containing said sulfate.

4,692,320

METHOD OF MAKING OXYNITRIDES

Elaine C. Beckwith, Riverview, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 813,169

Int. Cl.⁴ C01F *17/00*

U.S. Cl. 423—263 **9 Claims**

1. A method of making a ultrapure silicon yttrium oxynitride, comprising the steps of:

(a) heating hydrated yttrium nitrate in an inert flowing atmosphere to a molten condition and to a temperature just below its dehydration temperature to form a dehydrated yttrium-nitrogen-oxygen complex;

(b) agitatingly adding to such molten yttrium-nitrogen-oxygen complex an amount of $Si(NH)_2$ to form a substantially uniform suspension of stoichiometric dehydrated yttrium-nitrogen-oxygen complex; and

(c) heating said suspension of silicon imide, silica, and dehydrated yttrium-nitrogen-oxygen complex to a sufficient, second temperature and for sufficient time to chemical react said suspension and form said silicon yttrium oxynitride.

4,692,321

OXIDATION OF AMMONIA OVER A MIXED CATALYST BED OF COBALT AND ALUMINUM OXIDES

Leonard E. James, Shaker Heights, Ohio; William B. Fisher; Lamberto Crescentini, both of Chester, Va., and Joseph M. Browning, Richmond, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 456,127, Jan. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 270,164, Jun. 3, 1981, abandoned. This application Jul. 21, 1986, Ser. No. 887,752

Int. Cl.⁴ C01B *21/26*

U.S. Cl. 423—404 **2 Claims**

1. In a method of oxidizing ammonia by contacting ammonia and air with a catalyst of cobalt oxide, the improvement comprising

using separate particles of activated alumina in conjunction with

the separate particles of cobalt oxide catalyst

and wherein about 10 to about 50 percent by weight alumina is added and

the catalyst particle size is 6 to 14 mesh, the ammonia and air mixture has an ammonia concentration by volume of 7.5 to 12 percent introduced at a space velocity of from between about 15,000 to 100,000 liters of gas per liter of catalyst bed, the inlet gas temperature is from between about 25° C. to 250° C. and upon ignition the bed temperature ranges from 500° C. to 900° C.

4,692,322

PROCESS FOR PRODUCING A PRODUCT GAS CONTAINING CARBON OXIDES AND HYDROGEN FROM METHANOL

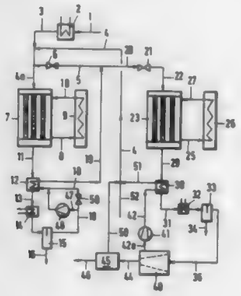
Friedrich-Wilhelm Möller, Friedrichsdorf; Walter Boll, Frankfurt am Main; Friedemann Marschner, Oberursel, and Wolf-Dieter Müller, Bad Homburg, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,997

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1985, 3537152

Int. Cl.⁴ C01B *31/18, 1/13*

U.S. Cl. 423—415 A **14 Claims**



1. A process for producing a product gas containing carbon oxides and hydrogen which comprises the steps of:

(a) mixing methanol vapor with a gas mixture consisting at least predominantly of carbon dioxide and hydrogen to form a high-methanol mixed feedstock;

(b) feeding said mixed feedstock with an entrance temperature of 300° to 400° C. to a first catalytic reaction zone operated with a zinc-containing catalyst at a temperature up to about 600° and a pressure of 10 to 50 bars to produce an intermediate having a methanol content not exceeding 1% by volume;

(c) withdrawing said intermediate from said first catalytic reaction zone,

(c_1) cooling said intermediate to condense water therein,

(c_2) removing at least part of the condensed water from the intermediate, and

(c_3) reheating the cooled intermediate from which condensed water has been removed to a temperature of about 320° C. to 420° C.,

(d) supplying at least 30% of the reheated intermediate to a second catalytic reaction zone operated with a zinc-containing catalyst at a temperature up to about 600° C. and a pressure of 10 to 50 bars to produce a precursor product at a temperature of about 350° C. to 600° C.;

(e) withdrawing said precursor product from said second catalytic reaction zone,

(e_1) cooling the withdrawn precursor product, and

(e_2) removing an aqueous condensate from the cooled precursor product;

(f) separating the precursor product from which said aqueous condensate has been removed into at least two gas streams by passing the precursor product through a plurality of selectively permeable membranes in a separating zone;

(g) withdrawing a first gas stream containing at least 90% by volume hydrogen and carbon dioxide from said separating zone,

(g_1) mixing additional carbon dioxide with the withdrawn first gas stream, and

(g_2) feeding the first gas stream with which additional carbon dioxide has been mixed to step (a) and said gas mixture thereof; and

(h) withdrawing as a second gas stream from said separating zone a product stream containing at least 30% by volume carbon monoxide.

4,692,323

PROCESS FOR SEPARATION OF MAGNESIUM-BASED, AND POSSIBLY FLUORINE-AND ALUMINUM-BASED IMPURITIES FROM A WET-PRODUCED PHOSPHORIC ACID

Gilbert Bonel, Toulouse; Jean C. Heughebaert, Castanet-Tolosan, both of France; Mohamed Chaabouni, and Hassine Ayedi, both of Sfax, Tunisia, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France

PCT No. PCT/FR85/00247, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1986, PCT Pub. No. WO86/01792, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 13, 1985, Ser. No. 878,976

Claims priority, application France, Sep. 14, 1984, 84 14734

Int. Cl.⁴ C01B *25/16*

U.S. Cl. 423—321 R **13 Claims**

1. A process for the separation of impurities of magnesium, aluminum and fluorine from wet-process produced phosphoric acid by precipitating the impurities as a crystalline complex comprising adjusting the atomic ratio of fluorine to magnesium in the acid to at least 4 by the addition of a fluorine compound, adjusting the atomic ratio of aluminum to magnesium in the acid to at least 0.5 by the addition of an aluminum compound, adding an ammonium compound soluble in the phosphoric acid to the phosphoric acid so as to cause a reaction forming an insoluble complex of ammonium, magnesium, fluorine and aluminum, and causing a physical separation of said insoluble complex from said phosphoric acid.

4,692,324

METHOD AND COMPOSITION FOR IN VIVO RADIOLABELING OF RED BLOOD CELLS WITH ^{99m}TC

Michael H. Davis, 2040 S. Broadway Ave., Springfield, Mo. 65807

Filed Oct. 4, 1985, Ser. No. 784,020
Int. Cl.[4] A61K *43/00, 49/02, 49/00;* G01N *33/15*
U.S. Cl. 424—1.1 23 Claims

1. A method of treating a mammalian patient for tinning red blood cells in vivo, said method comprising

orally administering to the patient about 8.9 mg/kg body weight to about 10 mg/kg body weight of a composition consisting essentially of

(1) about 10 mg to about 30 mg stannous chloride, and

(2) about 250 mg to about 1000 mg potassium perchlorate; and

incubating red blood cells in vivo for a time sufficient for Sn^{2+} to be absorbed by the red blood cells.

14. A method of carrying out equilibrium blood pool imaging in a patient, said method comprising

orally administering to the patient about 8.9 mg/kg body weight to about 42 mg/kg body weight of a composition consisting essentially of

(1) about 10 mg to about 30 mg stannous chloride, and

(2) about 250 mg to about 1000 mg potassium perchlorate;

incubating red blood cells in vivo in the presence of Sn^{2+} for a time sufficient for tin to be absorbed by red blood cells in the patient;

contacting the resulting tinned red blood cells with ^{99m}Tc;

incubating the tinned red blood cells with the ^{99m}Tc for a time sufficient to radiolabel the cells; and

imaging a blood pool of the patient with means for detecting and reporting radioactivity emitted by the ^{99m}Tc.

15. A kit for tinning red blood cells of a patient in vivo in preparation for radiolabeling the cells with ^{99m}Tc, wherein the kit contains a drug consisting essentially of

(1) a solid, unit dose of stannous compound consisting essentially of about 10 mg to about 30 mg of stannous chloride sufficient to tin the red blood cells in vivo; and

(2) a solid, unit dose of potassium perchlorate in an amount of about 250 mg to about 1000 mg sufficient to substantially inhibit absorption of ^{99m}Tc by the gut of a patient, while permitting the tinning of red blood cells and radiolabeling of red blood cells with ^{99m}Tc;

wherein the stannous chloride and potassium perchlorate are in a weight ratio of about 1:5 to about 1:100.

4,692,325

RADIOPAQUE MEDIUM

Steven Kritzler, Cronulla, Australia, assignor to Field Group Chemicals Pty. Ltd., New South Wales, Australia

Continuation of PCT AU 84/00101, filed Jun. 5, 1984, published as WO 84/04888 on Dec. 20, 1984. This application Feb. 1, 1985, Ser. No. 697,338
Claims priority, application Australia, Jun. 9, 1983, PF9771
Int. Cl.[4] A61K *37/26*
U.S. Cl. 424—4 2 Claims

1. A system for use in double contrast radiography of patient, said system comprising:

a first part comprising an aqueous medium which contains finely divided barium sulphate,

a second part which is a liquid adapted for administration separately from the first part and which is substantially radiolucent,

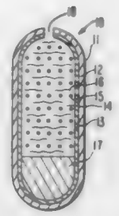
said first and second parts, after contact, forming a compound or complex at their interface which inhibits migration of the finely divided barium sulphate from the first part to the part.

4,692,326

DISPENSER COMPRISING INNER POSITIONED SOFT OR HARD CAPSULE

James B. Eckenhoff; Felix Theeuwes, both of Los Altos, and Joseph C. Deters, Mountain View, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 591,824, Mar. 21, 1984, abandoned. This application Feb. 14, 1986, Ser. No. 829,353
Int. Cl.[4] A61K *9/48, 9/52*
U.S. Cl. 424—15 1 Claim



1. A dispenser for dispensing a beneficial drug to a biological environment of use, wherein the dispenser comprises:

(a) a wall comprising in at least a part a semipermeable composition permeble to the passage of fluid and substantially impermeable to the passage of the beneficial drug which wall surrounds;

(b) a capsule, which capsule is a member selected from the group consisting of a hard capsule and a soft capsule;

(c) means in the capsule for forming a dispensable composition in response to the temperature of the biological environment of use, which thermo-responsive means is a member selected from the group consisting of a wax, butter, stearate, partially hydrogenated oil, hydrogenated oil, ester, ether, polyoxyalkylene, glyceride of fatty acid, fatty acid, and copolymer of alkylene oxide;

(d) a dosage amount of a beneficial drug present in the thermo responsive means for forming the dispensable composition;

(e) means in the capsule for increasing in volume and for occupying an increasing amount of the capsule for urging the dispensable composition from the dispenser, said means a solid osmotically effective polymeric composition that interacts with fluid and expands; and,

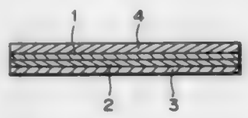
(f) at least one orifice in the dispenser for delivering the dispensable composition comprising the beneficial drug from the dispenser.

4,692,327

LAMINATED FILM FOR PACKAGING

Toru Takahashi, and Taro Yoshida, both of Tokyo, Japan, assignors to Fujimori Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,685
Claims priority, application Japan, Sep. 6, 1984, 59-186843; May 9, 1985, 60-96680
Int. Cl.[4] B27N *5/02*
U.S. Cl. 428—35 21 Claims



1. A laminated film for packaging which comprises an innermost layer and an outer layer laminated thereover, said innermost layer and said outer layer forming a laminated film that is suitable for the production of a container that is capable of containing cosmetics and contents having flavoring ingredients, wherein said innermost layer is formed with a polyester film obtained from a mixture of (1) a polyester resin with an average molecular weight of from 20,000 to 40,000 as a main resin component and (2) an auxiliary resin component selected from the group consisting of a polyamide and a polyester resin with an average molecular weight of from 5,000 to 20,000, whereby said innermost layer prevents adsorption and penetration of said cosmetics and said contents having flavoring ingredients into said laminated film, wherein the polyester film is obtained from a mixture of from 5 to 30 parts by weight of the auxiliary resin component and 100 parts by weight of the main resin component.

4,692,328

BIOLOGICALLY USEFUL POLYMER PREPARATIONS

Judith P. Kitchell, Newton, Mass., and Stanton R. de Riel, Pembroke Pines, Fla., assignors to Dynatech Corporation, Cambridge, Mass.

Filed Sep. 24, 1985, Ser. No. 780,162
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—78 6 Claims

1. A biologically useful polymer preparation prepared by

A. mixing a first solution comprising 20–60% (weight per volume) copolymer comprising vinyl pyrrolidone and allylamine in a ratio of 10 parts by weight vinyl pyrrolidone to 0-1 part by weight allylamine with a second solution comprising glutaraldehyde to give a final concentration of 0.04–3.6% (weight per volume) glutaraldehyde; and

B. forming a film from the mixture of step A.

4,692,329

ERYTHROMYCIN/BENZOYL PEROXIDE ANTIACNE COMPOSITIONS

Robert W. Klein, Blue Bell, Pa., and Mary E. Foxx, Plainsboro, N.J., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 455,283, Jan. 3, 1983, Pat. No. 4,497,794, which is a continuation of Ser. No. 214,124, Dec. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 843,007, Oct. 17, 1977, abandoned, which is a continuation of Ser. No. 637,613, Dec. 4, 1975, abandoned. This application Jul. 3, 1984, Ser. No. 627,351
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.[4] A61K *31/70, 31/78*
U.S. Cl. 424—81 7 Claims

1. A therapeutic aqueous gel composition comprising:

about 2.5 to about 15% by weight of micronized benzoyl peroxide having particle size of less than about 150 microns; and

about 0.5 to about 5% of an erythromycin compound selected from the group consisting of erythromycin and its stearate, and glucoheptonate derivatives; and

wherein the amount of said peroxide is about one-half to about thirty times the weight of said erythromycin compound.

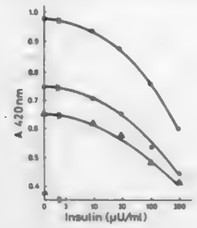
4,692,330

PROCESS FOR ACCELERATING ANTIGEN-ANTIBODY REACTION

Yamamoto Ryohei; Kimura Shigeki, both of Aichi, and Matsuura Akira, Kasugai, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Japan

Filed Sep. 20, 1985, Ser. No. 778,558
Int. Cl.[4] A61K *39/00, 43/00, 39/395*
U.S. Cl. 424—85 24 Claims

1. Process for accelerating an antigen-antibody reaction which comprises adding dextran to the reaction mixture of an immunochemical reaction in vitro of at least one of an antigen and a modified antigen, with at least one of an antibody therefor and a modified antibody therefor, to thereby accelerate the and said modified antibody each independently being modified



by being immobilized on an insoluble carrier or by being labeled with a detectable substance.

4,692,331

GAMMA-GLOBULIN PREPARATION FOR INTRAVENOUS ADMINISTRATION

Yahiro Uemura, Hirakata, Japan, and Satoshi Funakoshi, Los Angeles, Calif., assignors to The Green Cross Corporation, Osaka, Japan

Filed Feb. 24, 1984, Ser. No. 583,268
Claims priority, application Japan, Feb. 25, 1983, 58-31460
Int. Cl.[4] A61K *39/395*
U.S. Cl. 424—85 4 Claims

1. An intravenously administrable γ-globulin dry preparation obtained by fractionating human plasma using polyethylene glycol, which preparation is substantially free of any remaining polyethylene glycol, the preparation comprising γ-globulin and from 0.2 to 2.0 parts by weight, based on one part by weight of γ-globulin, of glucose to stabilize the γ-globulin.

4,692,332

IMMUNOTHERAPEUTIC METHODS AND COMPOSITIONS EMPLOYING ANTIGENS CHARACTERISTIC OF MALIGNANT NEOPLASMS

John McMichael, P.O. Box 81, R.D. 3, Cambridge Springs, Pa. 16403

Filed Jan. 18, 1985, Ser. No. 692,822
Int. Cl.[4] A61K *39/00, 45/05, 39/40*
U.S. Cl. 424—88 4 Claims

1. A method for tumor reduction in a disease victim comprising the steps of:

administering to the disease victim a member selected from the group consisting of human chorionic gonadotropin and equine chorionic gonadotropin and pharmaceutically effective fragments and pharmaceutically effective derivatives thereof, in a pharmacuetically effective amount which is less than the lowest amount necessary to provoke a humoral immune response, as exemplified by the presence of a positive wheal upon subcutaneous administration; and

co-administering a lysate of Staphylococcus aureus in an amount which is less than the lowest amount necessary to provoke a humoral immune response in combination with the member, as exemplified by the presence of a positive wheal upon subcutaneous administration.

4,692,333

ANTIMICROBIAL AND ANTITUMOR ANTIBIOTIC M 9026 AND ITS PURE INDIVIDUAL FACTORS 1, 2, AND 3 AND MICROBIAL PROCESS FOR PRODUCTION THEREOF

Giorgio Pirali, Saronno; Maria Grandi, Reggio Emilia; Hermes Pagani, Sesto San Giovanni; Manuela Paternoster, Meda; Giorgio Tamoni, Milan, and Giovanni Cassani, Pavia, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Aug. 4, 1983, Ser. No. 520,088

Claims priority, application United Kingdom, Aug. 26, 1982, 8224512

Int. Cl.⁴ A61K *35/74;* **C12D** *13/02;* **C12N** *1/20;* **C12R** *1/29*

U.S. Cl. 424—122 **18 Claims**

1. Antibiotic M 9026 complex obtainable by culturing the strain Micromonospora sp. NRRL 15,118, or M 9026 complex producing mutants thereof, under submerged aerobic conditions, in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts until substantial M 9026 complex activity is imparted to the culture medium, filtering the fermented medium, extracting the antibiotic M 9026 complex from the filtrate, causing the antibiotic M 9026 complex to precipitate from the extract, and collecting the solid precipitate, wherein the antibiotic M 9026 complex has the following infrared absorption maxima (cm^{-1}): 3260 (broad), 3060, 2730, 1735, 1720 (shoulder), 1650, 1630, 1545, 1515, 1495, 1300, 1260, 1210, 1170, 1090, 1030, 980, 940, 830, 760, 720, 700; and has an ultraviolet terminal absorption in methanol at 215 nm.

4,692,334

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH CRYPTOCIDIN

Harry W. Gordon, Bronx, N.Y., assignor to Schmid Laboratories

Continuation of Ser. No. 271,566, Jun. 8, 1981, Pat. No. 4,482,540, which is a continuation of Ser. No. 029,198, Apr. 12, 1979, Pat. No. 4,292,310, which is a division of Ser. No. 794,920, May 9, 1977, Pat. No. 4,163,050, which is a division of 521,289, Nov. 6, 1974, Pat. No. 4,039,659, which is a division of Ser. No. 177,512, Sep. 2, 1971, Pat. No. 3,855,409, and a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, Apr. 1, 1970, abandoned, which is a continuation of Ser. No. 627,313, Mar. 31, 1967, Pat. No. 3,627,879. This application Aug. 29, 1984, Ser. No. 645,484

Int. Cl.⁴ A61K *35/74*

U.S. Cl. 424—122 **3 Claims**

1. A method for treating hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering an effective dose for treating hypercholesterolemia of cryptocidin to said mammal.

4,692,335

CALCIUM HYPOCHLORITE TABLET

Donald P. Iwanski, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 3, 1985, Ser. No. 771,868

Int. Cl.⁴ A01N *25/00*

U.S. Cl. 424—149 **12 Claims**

1. A solid article comprising a compressed mixture of granular calcium hypochlorite and from about 0.5 to about 5.0 weight percent of a solid wax binder selected from the group consisting of microcrystalline hydrocarbon wax and alkali metal salts of oxidized microcrystalline hydrocarbon wax.

4,692,336

SELF CONTROLLED RELEASE DEVICE FOR ADMINISTERING BENEFICIAL AGENT TO RECIPIENT

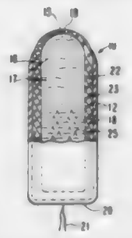
James B. Eckenhoff, Los Altos; Richard Cortese, Los Gatos, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 390,778, Mar. 19, 1984, Pat. No. 4,595,583. This application Aug. 7, 1985, Ser. No. 763,365

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.⁴ A61K *9/22;* **A61M** *31/00*

U.S. Cl. 424—468 **23 Claims**



1. A delivery device for delivering a beneficial agent formulation to an environment of use, the delivery device comprising;

(a) wall means that surrounds and defines an internal compartment;

(b) means in the compartment for expanding and occupying an increasing area of the compartment;

(c) means in the compartment for absorbing thermal energy from the environment and for carrying a beneficial agent;

(d) a dosage unit amount of a beneficial agent present in the means for absorbing thermal energy from the environment; and,

(e) means in the wall for delivering the beneficial agent from the delivery device to the environment over time.

4,692,337

SUSTAINED RELEASE PHARMACEUTICAL TABLET OF THEOPHYLLINE AND PRODUCTION PROCESS THEREOF

Tadashi Ukigaya, and Keizaburo Ogawa, both of Kawagoe, Japan, assignors to Nikken Chemicals Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,738

Claims priority, application Japan, Apr. 9, 1983, 58-61524

Int. Cl.⁴ A61K *9/26, 31/52*

U.S. Cl. 424—469 **2 Claims**

1. A sustained release tablet consisting essentially of theophylline and ethyl cellulose produced by uniformly mixing together said theophylline and ethyl cellulose in an amount of 5 to 200 parts by weight of ethyl cellulose based on 100 parts by weight of the theophylline, and thereafter directly compressing the mixture into tablets having a hardness of from 0.5 to 16.0 kg.

4,692,338

MILK SUBSTITUTE

Sheila M. Irvine, 8 Starling Way, Brickhill, Bedfordshire; Alistair Pearman, 8 Bewcastle Close, Bedford, and Geoffrey B. Wood, 41 Salisbury Road, Harpenden, Hertfordshire, all of England

Continuation of Ser. No. 469,473, Mar. 2, 1983, abandoned, which is a continuation of Ser. No. 301,198, Sep. 11, 1981, abandoned, which is a continuation of Ser. No. 194,294, Apr. 21, 1980, abandoned. This application Mar. 28, 1985, Ser. No. 716,609

Claims priority, application United Kingdom, Aug. 25, 1978, 34723/78

Int. Cl.⁴ A23K *1/18*

U.S. Cl. 426—2 **24 Claims**

1. A milk substitute in dry powder form, reconstitutable with water to provide a milk-like liquid suitable for feeding to mammalian young, the unreconstituted powder consisting essentially of, by weight, from 50 to 80 percent skim milk powder, at least 0.5% by weight of an acid-responsive food grade preservative selected from the group consisting of water-soluable propionates, acetates, formates, and mixtures thereof, and an edible acidifying system selected from the group consisting of malic acid, citric acid, tartaric acid, formic acid, acetic acid and mixtures thereof, in an amount sufficient to generate a pH value in the range of 6.0 to 5.2.

4,692,339

PROCESS FOR ADDITION AND STABILIZATION OF VITAMIN C IN A HARD CANDY-LIKE COMESTIBLE

Charles G. Stetson, P.O. Box 76, Yankton, S. Dak. 57078, and Catherine C. Stetson, 2794 E. 8th, #202, Sioux Falls, S. Dak. 57103

Continuation-in-part of Ser. No. 430,598, Sep. 30, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 670,006

Int. Cl.⁴ A23L *1/302;* **A23G** *3/00*

U.S. Cl. 426—72 **13 Claims**

1. A method for making a cooked, hard Vitamin C-containing comestible comprising:

dissolving a candy-forming compound, selected from the group consisting of sugars, polyhydric alcohols and mixtures thereof, in water;

heating the resulting solution to a temperature whereat a hard candy will be formed upon cooling to thereby form a molten candy;

removing the molten candy from the heat source and, while said candy is hot and fluid, dispersing within the molten candy solid Vitamin C-containing compound selected from the group consisting of ascorbic acid, sodium ascorbate and mixture thereof to form a uniform admixture thereof;

immediately thereafter casting said admixture into molds, and

rapidly cooling the cast admixture within the molds to a solid, crystalline state wherein the elasped time between introduction of the Vitamin C-containing compound into the molten candy and its cooling to a solid crystalline state in molds is less than one minute.

4,692,340

PROCEDURE FOR THE PRODUCTION OF A GRANULATED INFANT MILK FOOD PRODUCT

Friedrich-Karl Grütte, Caputh; Heinrich Petzold, Bergholz-Rehbrücke; Ulrich Walter, Potsdam-Bornstedt; Gunhild Bogs; Joachim Domeratzky, both of Halle; Helmut Gärtner, Kleinmachnow; Jürgen Schulze, Bergholz-Rehbrücke; Hans-Joachim Zunft, Kleinmachnow; Otto Pulz, Potsdam-Babelsberg; Christa Luft, Potsdam; Walheide Müller, Potsdam-Wildpark; Petra Wölk; Hannelore Dahlke, both of Potsdam, and Margret Volkmer, Potsdam-Babelsberg, all of German Democratic Rep., assignors to Institut für Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee, Bergholz-Rehbrucke, German Democratic Rep.

Continuation of Ser. No. 496,707, May 20, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 785,023

Claims priority, application German Democratic Rep., Dec. 2, 1982, 245460

Int. Cl.⁴ A23C *11/00, 9/00, 21/06*

U.S. Cl. 426—72 **10 Claims**

1. A method for the production of a granulate for infant food, for reconstitution with water to form a liquid analogous to mother's milk, said granulate having a moisture content of 0.5 to 5%, comprising feeding lactose or lactose and whey protein powder into a fluidized bed granulator and spraying a caseinate-fat emulsion containing vitamins and minerals onto the lactose or lactose and whey protein powder in the granulator, the caseinate-fat having a fat particle maximum size of 10μ and a moisture content of 20 to 70%, and the caseinate being of a casein acid-precipitated from cow's milk which is lower in calcium and phosphate content than bound calcium and phosphate in casein in cow's milk, the minerals containing at least one water soluble or water insoluble calcium salt and a water soluble source of anions and being added in such quantities that the total content of calcium is from 240 mg to 500 mg per 100 g granulate and the total content of phosphate is from 360 to 1200 mg per 100 g granulate, wherein the concentration of calcium ions is below 10^{-2} Mol/l and the phosphate content does not exceed 60 mg/ml when the granulate is reconstituted with water and the lactose is fed into the granulator in such a quantity that the lactose content of the granulate is at least 40g/100 g granulate and the granulate has a final moisture content of 0.5 to 5% and the total calcium and phosphate contents are each based on granulate having a moisture content of 0.5 to 5%.

4,692,341

METHOD FOR PRODUCING A FOOD PRODUCT SIMULATING SHELLFISH

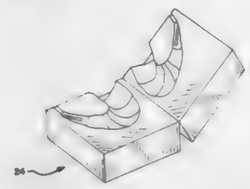
Hiroji Ikeuchi, and Kiyoaki Ikeuchi, both of Akashi, Japan, assignors to Kabushiki Kaisha Ikeuchi Tekkosho, Akashi, Japan

Filed Jun. 13, 1986, Ser. No. 818,618

Claims priority, application Japan, Sep. 24, 1985, 60-211805; Dec. 2, 1985, 60-271789

Int. Cl.⁴ A23L *1/27, 1/325;* **A23P** *1/00*

U.S. Cl. 426—250 **1 Claim**



1. A process for producing a food product simulating shellfish using a split mold having a mold cavity therein which generally conforms to the shape of a shellfish to be simulated, said mold cavity having a cavity wall including flat portions and crosswise projecting striations, said striations having upstream sides and behind sides, comprising the steps of closing said mold, spraying said cavity wall with an aqueous food coloring and forming pools of the food coloring on said flat segments on said upstream sides and leaving said behind sides substantially clear of said coloring, filling the cavity with a meat paste under pressure, heating the mold to a sufficient temperature to solidify and color the meat paste, and removing the meat paste from the cavity by opening the split mold.

4,692,342

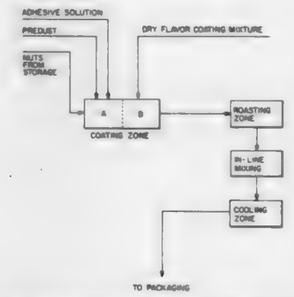
PROCESS FOR HONEY-ROASTING NUTS

Peter M. Gannis, Stamford; Howard Wilkins, Brookfield, both of Conn., and Oris E. Holloway, Jr., Sparta, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 14, 1985, Ser. No. 797,914

Int. Cl.⁴ A23L *1/36*

U.S. Cl. 426—293 **12 Claims**



1. A process for preparing honey-roasted nuts which comprises the steps of:

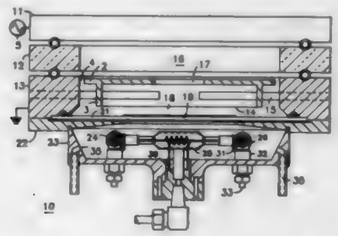
admixing raw nuts with a dry adhesive for a time effective to achieve a uniform coating of the dry adhesive on the nuts;
applying an adhesive solution comprising a mixture of honey, water, and dissolved adhesive to the nuts and tumbling for a period of time effective to provide a uniform, tacky coating of adhesive on the nuts;
admixing with the resulting adhesive coated nuts, a dry flavor coating mixture comprising honey, sugar and salt; and
roasting the resulting coated nuts.

4,692,343

PLASMA ENHANCED CVD

J. B. Price, Scottsdale, and Schyi-Yi Wu, Mesa, both of Ariz., assignors to Spectrum CVD, Inc., Phoenix, Ariz.

Continuation of Ser. No. 762,354, Aug. 5, 1985, abandoned. This application May 12, 1986, Ser. No. 861,793
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **6 Claims**



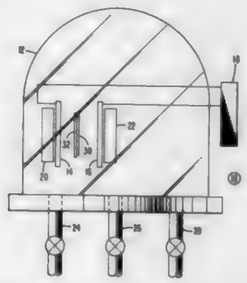
1. A process for depositing a layer of tungsten silicide on a workpiece comprising the steps of:
placing said workpiece in a plasma reaction chamber;
providing a mixture of a tungsten bearing gas and a silicon bearing gas within said chamber;
heating said workpiece to a predetermined temperature;
causing a plasma discharge within said chamber for a first period of time during which deposition of said layer begins; and
maintaining said workpiece at said predetermined temperature for a second, longer period of time during which said layer continues to be deposited.

4,692,344

METHOD OF FORMING A DIELECTRIC FILM AND SEMICONDUCTOR DEVICE INCLUDING SAID FILM

Grzegorz Kaganowicz, Belle Mead; Alfred C. Ipri, and Richard S. Crandall, both of Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1986, Ser. No. 834,384
Int. Cl.⁴ H01L *21/318*
U.S. Cl. 427—39 **6 Claims**



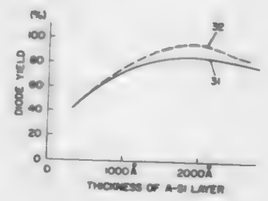
1. A method of forming a dielectric film on a semiconductor body comprising
subjecting a first major surface of said semiconductor body to a glow discharge in the presence of silane and a nitrogen-containing material; and
depositing a hydrogen-containing, silicon nitride film substantially free of silicon-to-hydrogen bonds, over said first major surface, said silicon nitride film having a silicon to nitrogen ratio of between about 0.65:1 and 0.80:1.

4,692,345

METHOD FOR GETTERING HEAVY METAL FROM A SILICON PLATE

Masaharu Nishiura, Yokosuka, and Hiromu Haruki, Yokohama, both of Japan, assignors to Fuji Electric Corporate Research and Devel., Ltd., Japan

Continuation of Ser. No. 649,524, Sep. 11, 1984, abandoned. This application May 20, 1986, Ser. No. 868,153
Claims priority, application Japan, Dec. 1, 1983, 58-227663
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—39 **7 Claims**



1. A method for gettering a heavy metal from a single crystal silicon plate comprising
(a) depositing a layer of amorphous silicon of between 1000 Å and 2500 Å in thickness on one surface of a single crystal silicon plate; and
(b) heating said layer of amorphous silicon to a temperature exceeding the crystallizing temperature of amorphous silicon, thereby converting said layer of amorphous silicon into a layer of polycrystalline silicon and gettering the heavy metal from the single crystal plate by way of the layer of polycrystalline silicon.

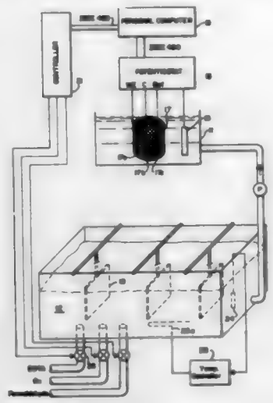
4,692,346

METHOD AND APPARATUS FOR CONTROLLING THE SURFACE CHEMISTRY ON OBJECTS PLATED IN AN ELECTROLESS PLATING BATH

Donald G. McBride, Binghamton, and Robert G. Rickert, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,262
Int. Cl.⁴ C23C *3/02*
U.S. Cl. 427—8 **10 Claims**

1. A method for controlling the chemical state of an electroless plating bath comprising:
immersing a plating working electrode, counter electrode and reference electrode in said plating bath;
applying a varying electrical potential between said plating working electrode and counter electrode;
measuring each current peak produced in response to said varying electrical potential, whereby the transition state of a chemical component being plated by said bath for a present pH level of said bath is identified, and storing the open circuit voltage measured between said reference electrode and said plating working electrode for each measured current peak;
monitoring the open circuit potential between said working electrode and said reference electrode during plating of an object, whereby the chemical phase of said chemical component being plated is continuously monitored; and
changing the concentration of said chemical constituent of said bath to maintain a predetermined voltage differential between the open circuit potential and a setpoint voltage



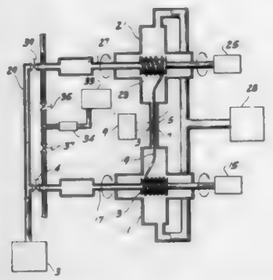
level whereby the chemical state for said chemical component remains the same.

4,692,347

METHOD OF INTERIORLY COATING TUBING

Hirotsuga K. Yasuda, Newburg, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 511,461, Jul. 7, 1983, abandoned. This application Jan. 9, 1985, Ser. No. 689,934
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—40 **6 Claims**



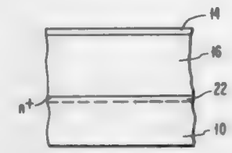
1. A method for providing a thin, substantially uniform polymeric coating on the inside surface of tubing comprising:
passing flexible tubing constituted of dielectric plastic material through a glow discharge zone, said glow discharge being procuded by reactance coupling utilizing power provided by a radio requency power source; and
simultaneously with the movement of said tubing through said glow discharge zone, passing an organic monomer that is subject to glow discharge polymerization through said glow discharge zone in the interior of said tubing while maintaining an absolute pressure of between about 300 and about 900 mtorr in said interior within said zone, thereby effecting glow discharge polymerization of said monomer to form a thin polymeric coating on the inside surface of said tubing.

4,692,348

LOW TEMPERATURE SHALLOW DOPING TECHNIQUE

Gary W. Rubloff, Katonah, and Marc F. Wittmer, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 622,949, Jun. 21, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,893
Int. Cl.⁴ B05D *5/12*
U.S. Cl. 437—82 **30 Claims**



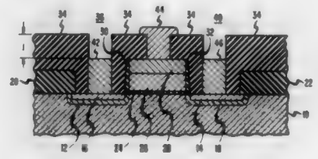
1. A method for producing a very shallow doped region in a substrate, comprising the steps of:
depositing at least two overlayers on the top surface of said substrate, one of which contains metal atoms, to produce a multilayered structure, said overlayers being capable of forming a metal compound when treated at a temperature less than 700° C., and wherein at least one of said overlayers contains an element to be introduced as an n-type dopant into said substrate to produce said shallow doped region therein,
treating said multilayer structure at a temperature less than 700° C. to form said metal compound, the formation of said metal compound releasing said element and producing a sharp compound formation interface which moves toward said substrate and pushes said n-type dopant by the snowplow effect toward said substrate and pushes said dopant by the snowplow effect toward said silicon substrate, and
continuing said treating step for a time sufficient to move said interface to said substrate to push said n-type dopant into the body of said substrate a distance not exceeding 300 angstroms from the top surface of said substrate.

4,692,349

SELECTIVE ELECTROLESS PLATING OF VIAS IN VLSI DEVICES

George E. Georgiou, Gillette, and Gary N. Poli, High Bridge, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1986, Ser. No. 835,355
Int. Cl.⁴ C23C *18/34*
U.S. Cl. 437—230 **5 Claims**



1. A selective electroless plating method of forming microminiature conductive plugs in high-aspect-ratio vias defined in a dielectric layer disposed on one main planar surface of a wafer in which integrated-circuit devices are to be fabricated, at least one of said vias having at the bottom thereof an active layer comprising a material selected from the group consisting of tantalum silicide and titanium silicide, said method comprising the step of
immersing said wafer in a plating bath comprising a metallic

source that provides ions selected from the group consisting of cobalt and nickel.

4,692,350

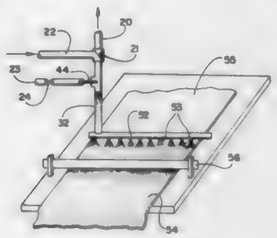
ASPHALT COATING METHOD

Aubrey R. Clarke, Brighton South; Colin L. Martin, East Kew, and Robert H. Bowering, Mount Waverley, all of Australia, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 681,062, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 444,403, Nov. 22, 1982, abandoned, which is a continuation of Ser. No. 153,428, May 27, 1980, which is a continuation of Ser. No. 965,363, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 638,243, Dec. 8, 1975, abandoned, said Ser. No. 638,243, is a continuation-in-part of Ser. No. 313,312, Dec. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 92,771, Nov. 25, 1970, abandoned. This application Apr. 1, 1986, Ser. No. 846,840

Int. Cl.[4] B05D *5/10;* **E01C** *5/12*

U.S. Cl. 427—138 **24 Claims**



1. A method of forming a coating of an asphaltic base material on a substrate which comprises:

(a) combining a heated, liquid asphaltic base material with a liquid foaming agent in an adiabatic dispersion zone to form a dispersion of the foaming agent and base material, wherein the heat content of the dispersion so formed is sufficient to cause vaporization of the foaming agent at atmospheric pressure,

(b) discharging the dispersion from the adiabatic dispersion zone to atmospheric pressure thereby forming a foam of the base material and

(c) applying the foam so formed to the substrate without substantial heating of the substrate.

4,692,351

METHOD AND APPARATUS FOR DRAWING A THICK FILM CIRCUIT

Yukio Maeda; Shinichi Kudo, and Keiji Saeki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

PCT No. PCT/JP85/00199, § 371 Date Dec. 16, 1985, § 102(e) Date Dec. 16, 1985, PCT Pub. No. WO85/05005, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 15, 1985, Ser. No. 817,833

Claims priority, application Japan, Apr. 16, 1984, 59-76008

Int. Cl.[4] B05D *1/26;* **B05C** *9/02;* **G01D** *15/16;* **F04B** *43/04*

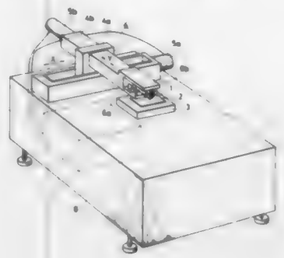
U.S. Cl. 427—196 **10 Claims**

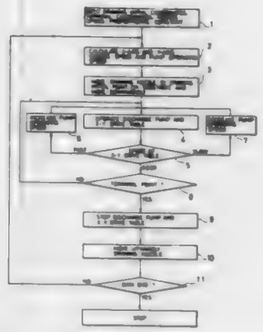
1. A method for drawing a thick film circuit on a substrate by discharging a paste from a discharge hole provided at one end of a drawing nozzle, said drawing nozzle being located close to said substrate and being moved parallel relative to a surface of said substrate, said method comprising the steps of:

(a) determining in advance a desired relative moving speed of said drawing nozzle with respect to said substrate and a proportional constant to be used for obtaining a discharge rate of the paste corresponding to the desired relative moving speed of said drawing nozzle;

(b) detecting an actual relative moving speed of said drawing nozzle with respect to said substrate;

(c) comparing the detected actual relative moving speed





with the desired relative moving speed of said drawing nozzle; and

(d) correcting said discharge rate in accordance with the results of said comparison.

4,692,352

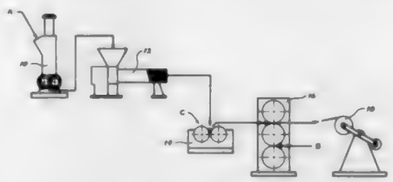
METHOD OF MAKING AN ADHESIVE TAPE

Elwyn G. Huddleston, Franklin, Ky., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 29, 1986, Ser. No. 857,692

Int. Cl.[4] B05D *5/10*

U.S. Cl. 427—208.4 **26 Claims**



1. In a method for making an adhesive tape comprising a backing sheet carrying a rubber-based adhesive wherein the rubber components of said adhesive are admixed at an elevated temperature at a first mixing station to form a premix for said adhesive; a material is incorporated in said premix at a second mixing station at an elevated temperature to form said adhesive; and said adhesive is thereafter coated onto said backing sheet at an elevated temperature, said material being reactive with at least one component of said premix at said elevated temperature;

the improvement comprising the steps of employing a cavity transfer mixer as said second mixing station; thereafter rapidly coating said adhesive onto said backing sheet to form said tape before any more than at most only minimal amounts of said material can react with said component; and rapidly cooling said tape to a temperature at which said material cannot react with said component.

4,692,353

METHOD OF INHIBITING DEGENERATION OF DIRECT REDUCED IRON

Jaleel K. Ahmed, Babylon, Iraq, assignor to Ministry of Industry & Minerals Specialized Institute for Engineering Industries, Baghdad, Iraq

Filed Jan. 3, 1984, Ser. No. 567,782

Int. Cl.[4] B05D *7/00*

U.S. Cl. 427—216 **14 Claims**

1. A method of processing iron ore, the method comprising:

directly reducing iron ore to form porous or spongy direct reduced iron (DRI) material;

immersing said DRI material in molten wax to impregnate said material while the material is still hot from the direct reduction process and prior to reoxidation or other deterioration thereof; and

removing the DRI material from the molten wax, allowing wax to drain from the exterior surface of the DRI material, and permitting the wax within the pores of the DRI material to cool and harden, whereby the DRI material is protected against oxidation or other deterioration under adverse conditions.

4,692,354

METHOD FOR PREPARING CERAMIC MEMBRANE FOR SEPARATION OF CONDENSED COMPONENT

Masashi Asaeda, 19-15,Kogo-naka 2-chome, Nishi-ku, Hiroshima City, Hiroshima Pref.; Kazutaka Mori, and Hiroshi Makihara, both of Hiroshima, all of Japan, assignors to Masashi Asaeda and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,862

Int. Cl.[4] B05D *5/00*

U.S. Cl. 427—244 **6 Claims**

1. A method for preparing a ceramic membrane for the separation of a condensed component which is characterized by comprising the steps of impregnating pores of a ceramic porous material with an alumina sol produced by hydrolyzing an aluminum alcoholate or an aluminum chelate; immersing said ceramic porous material into an aqueous sodium silicate solution; and subjecting said ceramic porous material to a water vapor treatment in a high temperature water vapor.

4,692,355

METHOD FOR IMPARTING FLAME RESISTANCE TO WOOD USING DIMETHYL (OXIRANYLMETHYL) PHOSPHONATE AND A CATALYST

H. Nelson Beck, Walnut Creek, and Dalton C. MacWilliams, Alamo, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1986, Ser. No. 866,539

Int. Cl.[4] D06M *1/02;* **C09D** *5/16, 5/18;* **B05D** *3/12*

U.S. Cl. 427—297 **17 Claims**

3. A method for imparting flame resistance to a wood having a fabricated shape which comprises:

(a) impregnating exposed surfaces of the wood having the fabricated shape with a reactive amount of dimethyl(oxiranylmethyl)phosphonate and with a catalytic amount of a catalyst which promotes reaction of an epoxide group in a confined chamber at a differential pressure; and

(b) reacting the dimethyl(oxiranylmethyl)phosphonate with the wood at an elevated temperature to produce a flame resistant treated wood having the fabricated shape with the reacted phosphonate chemically bound in the treated wood.

6. The method of claim 3 wherein the differential pressure for impregnating the wood is an elevated pressure between about 5 and 1000 psig or a reduced pressure between about −3 and −14.5 psig.

4,692,356

PROCESS FOR METALLIZING A SOLID BODY

Robert Ostwald, Ulm, and Gabriele Voit, Biberach, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP84/00223, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/00623, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 18, 1984, Ser. No. 703,679

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326253

Int. Cl.[4] B05D *3/10*

U.S. Cl. 427—304 **11 Claims**

1. Process for metallizing a solid body having a cleaned non-metallic surface comprising:

(a) applying a first layer comprising at least one material selected from the group consisting of at least one alloy of indium-tin and at least one oxide of an alloy of indium-tin to the cleaned surface of a nonmetallic solid body, said at least one alloy of indium-tin comprising the first layer being selected such that a subsequently applied catalyst metal compound is reduced to the catalyst metal by it;

(b) depositing at least one catalyst metal compound onto the first layer;

(c) allowing the catalyst metal compound to be reduced by the first layer to a catalyst metal, thereby forming a catalytic germination layer; and

(c) depositing a metal by a process selected from the group consisting of a currentless chemical process and the process of electroplating onto the catalytic germination layer.

4,692,357

PRIMER COMPOSITION FOR OLEFIN RESIN

Junji Mayumi, and Riichiro Maruta, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 831,506, Feb. 21, 1986, abandoned. This application Sep. 18, 1986, Ser. No. 908,956

Claims priority, application Japan, Feb. 21, 1985, 60-33199

Int. Cl.[4] B05D *3/02, 1/36*

U.S. Cl. 427—393.5 **11 Claims**

1. A method for coating a polyolefin substrate, consisting of:

(I) applying to said substrate an acidic-group containing resin prepared by polymerizing an α,β-unsaturated carboxylic acid or its anhydride onto a styrene-butadiene-styrene block copolymer or its hydrogenated product wherein said resin is dissolved in an organic solvent at a resin concentration of 5–50 weight percent, and

(II) obtaining a coated polyolefin substrate.

4,692,358

APPARATUS AND METHOD FOR APPLYING MATERIAL TO ARTICLES

Peter Marsden, Harrow, and Paul R. Bradwell, London, both of United Kingdom, assignors to Haden Drysys International Limited, London, United Kingdom

PCT No. PCT/GB85/00111, § 371 Date Nov. 21, 1985, § 102(e) Date Nov. 21, 1985, PCT Pub. No. WO85/04350, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 22, 1985, Ser. No. 803,408

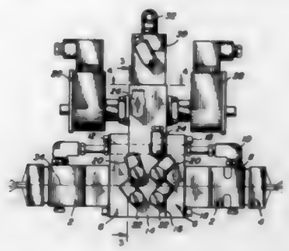
Claims priority, application United Kingdom, Mar. 23, 1984, 8407650

Int. Cl.[4] B05B *7/12;* **B05D** *1/02*

U.S. Cl. 427—421 **11 Claims**

1. A method of applying material to a plurality of surface areas using an arrangement of plurality of appplicator nozzles mounted in fixed relation to a common manifold, wherein said nozzle have fluid outlets, all of which face in different directions, the method comprising the steps of orienting said mani-

fold such that a first one of said nozzle outlets is facing in a first direction toward a first surface area, applying material through said manifold and said nozzle onto said first surface area, terminating application of the material through said first nozzle, and



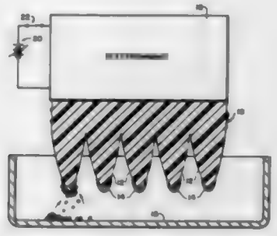
then moving the manifold as necessary to orient a second one of said nozzles to face a further surface area in a direction substantially angularly displaced from the first direction, and applying material through said manifold and said second nozzle onto said further surface area.

4,692,359

MAGNETIC APPLICATION OF LIGHT-ABSORBING PARTICLES TO A LENTICULAR SCREEN

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,664
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—45.1 **10 Claims**



1. A method for selectively applying light-absorbing particles to a light-transmissive screen having a surface contoured to include a a multiplicity of raised lenticules having respective peaks and sidewalls, said sidewalls defining grooves between the lenticules, said method comprising the steps of:

(a) disposing near a supply of the light-absorbing particles a carrier sheet comprising a multiplicity of projections having tips including magnetically-permeable material, said tips being shaped and spaced to positionally correspond with the grooves in the screen, said particles consisting essentially of a magnetically-permeable material and having heat-fusible outer surfaces;

(b) applying a magnetic field to the tips to effect attraction thereto of a substantial quantity of the particles;

(c) continuing to apply the magnetic field while positioning the sheet and the screen such that the tips are proximately disposed with respect to the grooves;

(d) reducing the strength of the magnetic field applied to the tips to a magnitude below that needed to maintain attraction of the particles to the tips, thereby effecting release of a substantial quantity of the particles from the tips and into the respective grooves to mask predefined portions of the sidewalls; and

(e) transfusing the screen and the particles in the grooves with microwave radiation of sufficient energy to fuse the particles to each other and to the screen, but of insufficient energy to optically distort the screen material.

4,692,360

METAL INTERLAYERS IN FILMS BY COUNTER-CURRENT DIFFUSION

Lewis E. Manring, and Stephen Mazur, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1986, Ser. No. 820,234
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—443.1 **27 Claims**



1. Metal interlayer deposition (MID) process by means of which metal is deposited in its zero-valent state within a film having first and second surfaces, the process comprising supplying a solution of ions of the metal to at least part on the first surface and a solution of a reducing agent to at least part of the second surface, the metal ions being in a positive oxidation state and in a coordination state such that they are mobile within the film and are transported in solution through the film in a general direction towards the second surface and the reducing agent being in a negative oxidation state relative to the metal cation and in a coordination state such that it is mobile within the film and is transported in solution through the film in a general direction towards the first surface, the metal ions and reducing agent contacting in a reaction region wherein the metal ions are reduced by the reducing agent to produce a metal interlayer, within the film, having a thickness (l_{int}) which is less than the thickness (L) of the film.

4,692,361

FILM LAMINATE WITH GAS BARRIER FOR STERILE FLEXIBLE CONTAINERS

William D. Johnston, Buffalo Grove; Leonard Czuba, Lombard; R. D. Webster, Barrington, all of Ill.; Yasuhiko Hori, Kawasaki, Japan; Masanori Nagata, Tokyo, Japan, and Shigeki Imano, Kawasaki, Japan, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 28, 1984, Ser. No. 655,493
Int. Cl.[4] B65D *85/72*; B32B *27/08*
U.S. Cl. 428—35 **34 Claims**

1. A laminate film structure having sufficient flexibility, strength, heat sealability, and slip properties for producing on a packaging machine flexible containers having fitments attached thereto and capable of containing a liquid to be maintained under sterile conditions comprising:

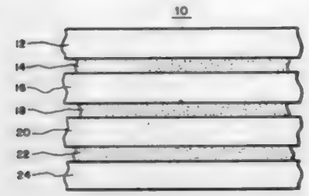
an inner layer constructed from polyethylene, the inner layer having a thickness of approximately 40 to 100 microns;

a gas barrier layer having a thickness of approximately 25 to 50 microns;

a core layer constructed from biaxially oriented polyamide,

the core layer having a thickness of approximately 10 to 40 microns;

an outer layer constructed from polyethylene and having a thickness of approximately 40 to 100 microns, the outer



layer including a slip agent and having a coefficient of friction of approximately 0.2 to about 0.4; and

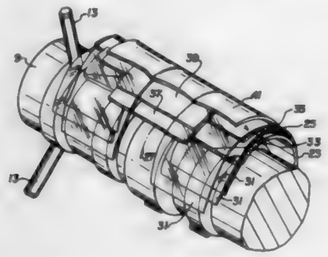
three layers of an aliphatic polyurethane bonding the layers together.

4,692,362

FABRIC REINFORCED TUBULAR RUBBER BLADDERS AND METHOD OF MAKING SAME

James L. Johnson, Johnson City, Tenn., assignor to McCreary Industrial Products Co., Piney Flats, Tenn.

Filed Mar. 25, 1986, Ser. No. 843,583
Int. Cl.[4] B65D *35/02*; B60T *11/10*; B32B *7/14*
U.S. Cl. 428—35 **25 Claims**



1. A reinforced rubber bladder comprising:

a flattened tubular open-ended multi-layer body member formed from a plurality of rubber body plies, at least some of which are fabric reinforced, having two flat sides and two rounded side edges; and

a fabric reinforced rubber end patch folded substantially in half over the full width of each open end of the flattened tubular body member between body plies with the halves of each patch pinched together at, and trimmed off along, the rounded side edges of the tubular body member without overlapping.

4,692,363

THERMAL INSULATION

Harald Reiss, Leimen, and Botho Ziegenbein, Nickarsteinach, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Continuation of Ser. No. 742,631, Jun. 6, 1985, abandoned, which is a continuation of Ser. No. 536,178, Sep. 27, 1983, abandoned. This application Jul. 22, 1986, Ser. No. 889,581
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235708
Int. Cl.[4] A47J *41/02*; B65D *81/38*; F16L *59/05, 59/06, 59/08*
U.S. Cl. 428—36 **4 Claims**

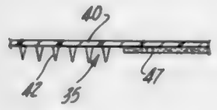
1. Thermal insulation with a gas-tight and at least partially evacuated space, filled with insulating sheets stacked immediately adjacent one another with no metal foil interposed between respective sheets, each of the insulating sheets has a thickness of about 0.5 mm built of interlaced borosilicate glass fibers and with at least 5 through 60% by weight of substances in form of powder or fibers for absorbing and scattering thermal radiation, at least one of said absorbing substances in fiber or powder form has primary particle diameters smaller than one micron and the indices of refraction of the particles of said scattering substances correspond to optimum values determined from a scatter calculation, taking spectral ranges of the thermal insulation into consideration.

4,692,364

RETAINER FOR AUTOMOTIVE FLOOR MAT

Mark Altus, Huntington Woods, Mich., assignor to The 2500 Corporation, Birmingham, Mich.

Filed Nov. 12, 1985, Ser. No. 797,610
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] B32B *3/06*; B60J *9/00*
U.S. Cl. 428—85 **48 Claims**



1. An improved retainer for an automotive floor mat used on automotive carpets having heel pads, said retainer including:

(a) a planar surface;

(b) a lower bristled surface having bristles of uniform height depending downwardly from said planar surface and covering the entire area thereof except where said lower bristled surface is to contact said heel pad of said automotive carpet, and

(c) a non-slip surface being provided where said bristles have been removed,

(d) mounting means for attaching said retainer to said floor mat.

4,692,365

USE OF AIR-JET TEXTURED YARNS IN THE MANUFACTURING OF ABRASIVES ON SUBSTRATES

Eberhard Kratzsch, Wuppertal; Wolfgang Cygan, Erkrath, and Nandor Kiss, Wuppertal, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, New York, N.Y.

Filed Oct. 30, 1984, Ser. No. 666,522
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339911
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—87 **14 Claims**

1. A coated abrasive comprising a substrate having an abrasive agent thereon; wherein said substrate has been formed from a polyester filament yarn which has been air-jet textured and heatset, and which has loops and bows, of which at least a part of the loops and bows are freely protruding from the core of the yarn.

4,692,366

FLOCKING ADHESIVES BASED ON EVA-MALEATE COPOLYMERS

Paul R. Mudge, Somerville, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 8, 1986, Ser. No. 905,352
Int. Cl.[4] B05D *1/14, 1/16*; B32B *3/02, 33/00*
U.S. Cl. 428—90 **18 Claims**

12. A process for manufacturing a flocked article which comprises the steps of:

(I) applying to the substrate to be flocked a composition comprising a flocking adhesive composition characterized

by an excellent balance of softness and strength, comprising sufficient thickener selected from the group consisting of hydroxyethylcellulose, carboxymethylcellulose, polyacrylate-hydrolyzed acrylonitrile and carboxylic acid/acrylate emulsions or solutions to provide a viscosity of 10,000 to 30,000 cps., pigments, 0–10% by weight of the solids of a foaming agent comprising a water soluble salt of an aliphatic carboxylic acid containing 16 to 20 carbon atoms, and an aqueous emulsion, the latter prepared by the emulsion polymerization of a copolymer consisting essentially of:

(a) a vinyl ester of an alkanoic acid having 1 to 13 atoms interpolymerized with the following comonomers:
(b) 10 to 30% by weight of ethylene;
(c) 15 to 40% by weight of a C_4–C_{10} dialkyl maleate or the corresponding fumarate;
(d) 1 to 5% by weight of N-methylol acrylamide or N-methylol methacrylamide;
(e) 0 to 4% by weight of an olefinically unsaturated carboxylic acid having 3 to 6 atoms; and
(f) 0 to 1% by weight of a polyethylenically unsaturated comonomer; the vinyl ester being added in an amount to total 100%; said adhesive being applied in an amount of 0.5 to 3.0 ounces per square yard;

(II) applying the flocking fibers to the coated substrate; and
(III) drying the flocked substrate.

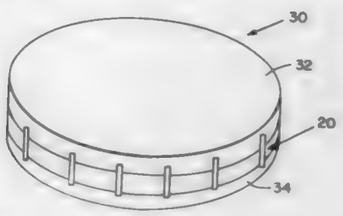
18. A flocked article formed by the process of claim 12.

4,692,367

METHOD OF MAKING A THERMALLY STABLE COMPOSITE HONEYCOMB PANEL

Mark A. Richter, Jupiter, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 24, 1986, Ser. No. 856,064
Int. Cl.⁴ B32B *7/04, 31/20*
U.S. Cl. 428—116 **2 Claims**



1. A method for forming a thermally stable honeycomb panel comprised of a core member, a faceplate member, and a backplate member with each of said members being constructed of one or more thermally stable composite planks comprised of about 50% graphite fibers and of about 50% borosilicate glass and formed by hot pressing in vacuum, said method comprising first constructing a core member by a process A which comprises completing the steps (i-vii) of said process A as follows:

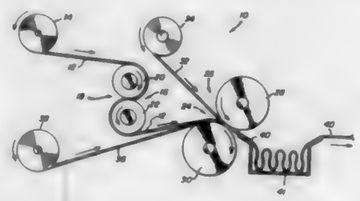
(i) providing a plurality of said thermally stable composite planks having a predetermined length of l, predetermined width of w, and predetermined thickness of t;
(ii) notching said planks individually along said length of l to form a series of equally spaced notches with a depth equal to ½w and a width equal to t;
(iii) applying to each of said notched surfaces, a wet frit paste which additionally contains a volatile carrier to adjust fludity, said wet frit paste comprised of a borosilicate glass suspended in an organic binder designed to boil out completely below the glass melting temperature of said thermally stable planks, said borosilicate glass having a thermal expansion of from about 67 to about 46×10^{-7} inch/inch/°C. over the temperature range from 0° C.–300° C. and a glass melting temperature of about 450° C. to about 600° C.;
(iv) assembling said plurality of notched planks to form a series of square honeycomb cells and then allowing the assembled plurality of notched planks to dry at room temperature for a predetermined time period to allow the volatile carrier to evaporate;
(v) completing a bonding process for the dried assembly which comprises placing the dried assembly in an oven in an air atmosphere and heating to a predetermined temperature which is melting point of the glass contained in said frit;
(vi) maintaining the predetermined temperature long enough to ensure that the entire dried assembly has reached the proper temperature to achieve bonding;
(vii) turning the oven off and allowing the dried assembly to cool to room temperature to yield a thermally stable core member; and said method further comprising completing process B set forth hereinbelow for forming said thermally stable honeycomb panel having said core member with a faceplate member and a backplace member bonded at the respective top and bottom outer surfaces thereof of said core member, said process B comprising completing the additional steps (viii–xi) of said process B as follows:
(viii) providing a pair of said thermally stable composite planks of a predetermined length, width, and thickness to serve as a faceplate member and backplate member of said core member when bonded thereto;
(ix) applying a wet frit paste, as defined in step (iii) of process A hereinabove, to the joining surface of said faceplate member and said backplate member and to said core member;
(x) placing said backplate member on a flat surface, placing said core member with applied wet frit paste on top and bottom of exposed thermally stable plank edges, placing said faceplate member on top of said core member, and then allowing said core member, faceplate member, and backplate member to dry at room temperature for a predetermined time period to allow volatile carrier to evaporate; and
(xi) completing an equivalent bonding process for the dried honeycomb panel comprised of said core member, said backplate member, and said faceplate member as defined in steps (v–vii) of process A hereinabove and additionally applying a small load on top of said faceplate member to ensure contact between the parts being bonded during said bonding process to thereby complete the forming of a thermally stable honeycomb panel.

4,692,368

ELASTIC SPUNLACED POLYESTER-MELTBLOWN POLYETHERURETHANE LAMINATE

Jack D. Taylor, Roswell, and L. Warren Collier, IV, Dunwoody, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 15, 1986, Ser. No. 919,297
Int. Cl.⁴ B32B *3/10*
U.S. Cl. 428—137 **22 Claims**



1. A laminate which is elastic in at least one direction, said laminate comprising:
an elastic sheet comprising a polyetherurethane material;

at least one nonelastic nonwoven web of spunlaced hydraulically entangled polyester fibers joined to said elastic sheet at least at two areas, said nonelastic web being gathered between said two areas.

4,692,369

WATER-VAPOR-PERMEABLE, WATERPROOF, HIGHLY ELASTIC FILMS

Haruo Nomi, Wake, Japan, assignor to Japan Gore-Tex, Inc., Japan

Filed Dec. 9, 1985, Ser. No. 806,702
Claims priority, application Japan, Dec. 11, 1984, 59-259968
Int. Cl.⁴ B32B *3/26*
U.S. Cl. 428—198 **4 Claims**



1. A water-vapor-permeable, gas impermeable, liquid waterproof, highly elastic composite film comprising a film of expanded, porous, unsintered polytetrafluoroethylene having completely impregnated within its pores a water-vapor-permeable polymeric resin, said composite film having elongation percentage in at least one direction exceeding 40% and durability in repeated stretching to 80% of its elongation percentage of more than 200,000 cycles.

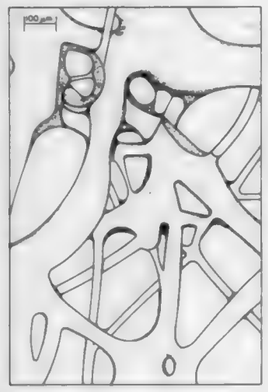
4. The composite film of claim 1 laminated to a two-way stretch fabric by a point-to-point adhesive wherein the total adhesion area coverage is about 40%.

4,692,370

PROCESS FOR NONSLIP FINISHING OF SMOOTH SURFACES OF OBJECTS AND OBJECTS PRODUCED THEREBY

Erich Reckziegel, and Heinz Holzapfel, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,853
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1984, 3431002; Oct. 5, 1984, 3436620
Int. Cl.⁴ B32B *27/12;* **B05D** *1/02, 5/02*
U.S. Cl. 428—198 **11 Claims**



1. A process for the nonslip finishing of smooth surfaces of plastic objects consisting essentially of applying to said smooth surfaces a coating of a fine-filament hotmelt thermoplastic polymer in the form of a microfine random-strand nonwoven, the diameter of the filaments of said nonwoven being essentially beteen 300 and 10 µm, the random-strand nonwoven filaments being welded firmly to one another where they cross, said nonwoven being applied in 1 to 4 layers, said coating being applied to said smooth surfaces from 0.5 to 2.5 mm diameter nozzles at temperatures of from 150° to 210° C. and under an excess pressure of from 0.5 to 8 bar, whereby some adhesion of said coating to said smooth surfaces occurs but whereby said smooth surfaces are not appreciably melted.

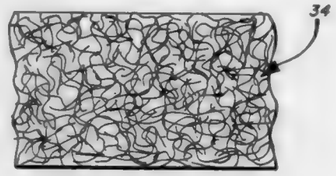
3. Plastic objects having the nonslip surfaces produced by the process of claim 1.

4,692,371

HIGH TEMPERATURE METHOD OF MAKING ELASTOMERIC MATERIALS AND MATERIALS OBTAINED THEREBY

Michael T. Morman, Alpharetta, Ga., and Tony J. Wisneski, Kimberly, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 30, 1985, Ser. No. 760,366
Int. Cl.⁴ D01F *6/28;* **C08F** *297/04*
U.S. Cl. 428—224 **12 Claims**



1. A nonwoven elastomeric material comprising a coherent matrix of entangled elastomeric fibers having a diameter of from about 0.5 micron to about 100 microns, said fibers consisting essentially of an A-R-A′ block copolymer where A and A′ are each a thermoplastic endblock containing a styrenic moiety and B is a poly(ethylene-butylene) midblock.

4,692,372

CEILING AND WALL TILE

William S. Parkinson, Dallas, and Villy E. Djerf, Grand Saline, both of Tex., assignors to Bunker Plastics, Inc., Grand Saline, Tex.

Filed Jun. 25, 1986, Ser. No. 878,250
Int. Cl.⁴ D04H *1/16;* **B32B** *7/12, 15/04, 17/06*
U.S. Cl. 428—282 **14 Claims**



1. A tile, comprising a light-transmitting film layer of polycarbonate, said film layer having a mirrored backing on one side thereof and having another side opposite said one side being left uncovered, a backing means for providing dimensional stability for said tile, and means for securing said backing means to said mirrored backing.

2. A tile as defined in claim 1 in which said backing means includes a fiber board formed from glass fibers and compressed into flattened form and having a phenolic coating sprayed thereon.

4,692,373

LAMINATE BONDED BY ADHESION PROMOTING LAYER AND ADHESIVE LAYER

Martin Weiz, Bad Duerkheim; Bernhard Czanderna, Hirschberg, and Karl-Heinz Stoffel, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 782,929
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1984, 3436820
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—285 8 Claims

1. A laminate comprising a layer A of a polyolefin, reinforced with from 10 to 50% by weight of glass fiber mats, and a layer D of a metal, which are bonded to one another by means of a mechanically adhesion-promoting layer B and an adhesive layer C, wherein the adhesive is a thermoplastic polyurethane elastomer, wherein the adhesion promoting layer B is a non-woven fabric which is anchored in the polyolefin layer.

4,692,374

ANTIMICROBIALLY ACTIVE, NON-WOVEN WEB USED IN A WET WIPER

Michael P. Bouchette, Appleton, Wis., assignor to James River Corporation, Richmond, Va.

Division of Ser. No. 772,845, Sep. 5, 1985, Pat. No. 4,615,937. This application Jul. 16, 1986, Ser. No. 886,073
The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.
Int. Cl.[4] D04H *1/58*
U.S. Cl. 428—288 27 Claims

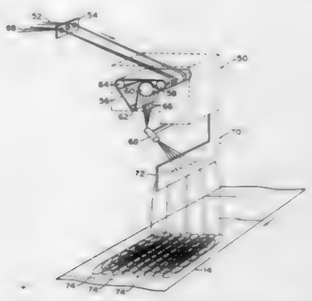
19. An antimicrobially active wet wiper comprising:
(a) an antimicrobially active non-woven web comprising:
(i) bonded fibers;
(ii) a binder in an amount effective to bind the fibers;
(iii) an antimicrobial agent being substantive to the fibers and to the binder when the web is either wet or dry to prevent the antimicrobial agent from substantially diffusing from the fibers or the binder; and
(b) a substantially preservative free liquid in which the web is maintained in a wet condition until use.

4,692,375

THERMOPLASTIC SHEET

Jeffrey A. Neubauer, Lewisville, Tex.; Walter J. Reese, North Huntington, Pa., and Dennis O. Spencer, Shelby, N.C., assignors to Azdel, Inc., Shelby, N.C.

Continuation of Ser. No. 861,797, May 12, 1986, abandoned, which is a division of Ser. No. 780,777, Sep. 27, 1985, Pat. No. 4,615,717. This application Mar. 5, 1987, Ser. No. 22,614
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—299 12 Claims



1. A thermoplastic fiber glass reinforced sheet comprising a thermoplastic resin filled mat of glass fiber strands which have been needled and wherein the mat is formed from loops of continuous glass strands which are elliptical and loops of continuous glass strands which are circular, the majority of the strands being elliptical and the long axis of the elliptical loops being parallel to each other and one side of the sheet.

4,692,376

MICROPOROUS COATING FOR SOLID MEMBERS TO REDUCE STRESS, WEAR AND FATIGUE AT LIQUID INTERFACES

Daniel H. Deutsch, 141 Kenworthy Dr., Pasadena, Calif. 91105

Filed Dec. 1, 1986, Ser. No. 936,128
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—315.5 13 Claims

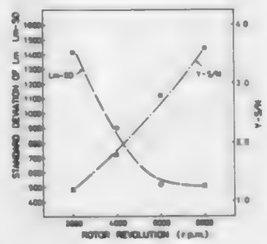
1. A surface coating for areas of a solid member which are subject to high negative pressure in a liquid, comprising
a porous outer layer of material affixed to the solid member which is non wetted by the liquid and has an average pore diameter in the range of about 10^{-6} mm to 1 mm.

4,692,377

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Hiroshi Ota, Komoro, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,447
Claims priority, application Japan, Jul. 1, 1985, 60-142604
Int. Cl.[4] G11B *5/70, 5/716*
U.S. Cl. 428—323 2 Claims



1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer coated on the support, said recording layer consisting of a ferromagnetic powder dispersed in a binder, characterized in that said ferromagnetic powder is selected from ferromagnetic powders which satisfy the multiple regression formula:
Y-
$S/N=-0.0006\times Em+0.5707\times(Lm/Wm)-0.0005\times(Lm\text{-}SD)+4.6424$ and Y-S/N being more than 2 and the standard deviation of the formula being 2.0 or less, where Y-S/N, Lm, Em, Wm and Lm-SD are as defined in the specification.

4,692,378

MAGNETIC RECORDING MEDIA

Heigo Ishihara, Tokyo, and Tomoyuki Ohno, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,261
Claims priority, application Japan, Nov. 7, 1984, 59-233148
Int. Cl.[4] G11B *5/71*
U.S. Cl. 428—340 10 Claims

1. Magnetic recording medium having a lubricating film thereon which comprises a lubricating film containing polar perfluoroalkylpolyether with a polar terminal group and a nonpolar perfluoroalkylpolyether without a polar terminal group being laid on the surface of a magnetic recording medium having a magnetic layer comprising a film formed of a material selected from the group consisting of a magnetic metal, a magnetic oxide and magnetic powders dispersed in a thermosetting binder; a coating weight of the polar and nonpolar perfluoroalkylpolyethers on the surface of the magnetic recording medium being 10 to 100 mg/m^2, and a ratio of coating weight of the nonpolar perfluoroalkylpolyether to that of the polar perfluoroalkylpolyether being 0.5–4:1.

4,692,379

HEAT SEALABLE FILM AND METHOD FOR ITS PREPARATION

Jay K. Keung, Macedon, N.Y.; Kevin M. Donovan, Milford, Conn., and Ricardo Balloni, Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,159
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—349 22 Claims

1. An oriented, heat sealable polymer film laminate possessing a low coefficient of friction, good receptivity for water-based coatings and good optical clarity which comprises:
(a) an upper heat sealable, water-based coating-receiving layer coextensively adherent to the upper surface of a core layer (b), said upper layer (a) being formed from a polymer selected from the group consisting of ethylene-propylene-butene-1 terpolymer, ethylene-propylene random copolymer and blends thereof, said polymer being compounded with an anti-blocking effective amount of anti-blocking agent but being substantially devoid of silicone oil, the exposed surface of upper layer (a) being coated with a coefficient of friction-reducing amount of silicone oil transferred to said surface through contact with a silicone oil coating present upon the exposed surface of a lower heat sealable surface layer (c);
(b) a core layer derived from an isotactic polypropylene; and,
(c) a lower heat sealable layer coextensively adherent to the lower surface of core layer (b), said lower layer (c) being formed from a polymer selected from the group consisting of ethylene-propylene-butene-1 terpolymer, ethylene-propylene random copolymer and blends thereof, said polymer being compounded with an anti-blocking effective amount of anti-blocking agent and a quantity of silicone oil such that a coefficient of friction-reducing amount thereof will be present on the exposed surface of layer (c) as well as the exposed surface of layer (a) following mutual contact of said surfaces.

4,692,380

METALLIZABLE POLYPROPYLENE FILM

Donald E. Reid, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 762,905, Aug. 6, 1985, Pat. No. 4,604,322. This application Apr. 21, 1986, Ser. No. 854,202
The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.
Int. Cl.[4] B32B *15/08, 15/20*
U.S. Cl. 428—349 7 Claims

1. A polypropylene film comprising a homopolypropylene core containing about 0.03 to 0.15% by weight based on the polymer of a fatty acid amide slip agent and having on one of its surfaces a 1 to 20 gauge layer comprised of a corona-treated propylene-ethylene copolymer containing about 1 to 10 wt. % ethylene and having no slip agent included therein and having a metal coating applied to said corona-treated layer.

4,692,381

FOAMABLE POLYVINYLIDENE FLUORIDE AND METHODS

Roger L. Pecsok, Berwyn, assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 885,978, Jul. 15, 1986, Pat. No. 4,675,345, which is a division of Ser. No. 630,924, Jul. 16, 1984, Pat. No. 4,615,850. This application Mar. 9, 1987, Ser. No. 23,172
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—375 9 Claims

1. A foamed polyvinylidene fluoride material consisting essentially of a polymer selected from the group of polymers consisting essentially of a homopolymer of polyvinylidene fluoride, copolymers or terpolymers containing a major portion of vinylidene fluoride with at least one copolymerizable monomer selected from the group consisting essentially of hexafluoropropylene, trifluoroethylene, chlorotrifluoroethylene and tetrafluoroethylene and mixtures of the homopolymer, copolymer, and terpolymer; said polymer having from 0.25 to 5.0 percent by weight of the polymer of a nucleating agent of discreet, insoluble particles with an average size distribution less than about 5 microns in the longest dimension dispersed throughout the polymer, and uniformly dispersed therein 0.05 to 5.0 percent by weight of the polymer of (i) of a dispersing aid selected from the group consisting of dialkyl phthalate, dibutoxyethyl phthalate, diisononyl phthalate, ditridecyl phthalate, dicyclohexyl phthalate, diphenyl alkyl adipate, methyl phthalyl ethyl glycolate, and diethylene glycol monobutyl ether; said material having a void content within the range of 35% to 55% and a corresponding density of 1.15 to 0.80 g/cc.

4,692,382

ELASTOMERIC COATING COMPOSITIONS

Robert J. Schmitt; Leon A. Perez, both of Pittsburgh; Robert A. Montague, Allison Park; Marvin T. Tetenbaum, Pittsburgh, and Ellor J. Van Buskirk, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1986, Ser. No. 887,455
Int. Cl.[4] B32B *27/38;* B05D *3/02;* C08F *283/00*
U.S. Cl. 428—414 26 Claims

17. A method of providing a substrate with a multilayer coating comprising:
(a) applying a flexible primer coating composition to a substrate, said coating composition comprising (i) an isocyanate terminated urethane containing material; and (ii) a phosphatized polyepoxide essentially free of oxirane groups.
(b) applying at least one pigmented coating composition to the coated substrate of (a);
(c) at least partially curing the coated substrate of step (b); said multilayer coating having an elongation of at least 50 percent when cured.
26. A coated article produced by the method of claim 17.

4,692,383

POLYCARBONATE BASED ELASTOMERIC COATING COMPOSITIONS

Robert J. Schmitt; Leon A. Perez, both of Pittsburgh; Robert A. Montague, Allison Park, and Marvin T. Tetenbaum, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 21, 1986, Ser. No. 887,456
Int. Cl.[4] B32B *27/38;* B05D *3/02;* C08F *283/00*
U.S. Cl. 428—414 29 Claims

20. A method of providing a substrate with a multilayer coating comprising:
(a) applying a flexible primer coating composition to a substrate, said coating composition comprising a material or mixture of materials adapted to provide a source of (i) carbonate moieties, (ii) isocyanate groups; and (iii) phosphatized polyepoxide essentially free of oxirane groups;

(b) applying at least one pigmented coating composition to the coated substrate of (a);

(c) at least partially curing the coated substrate of step (b); said multilayer coating having an elongation of at least 50 percent when cured.

29. A coated article produced by the method of claim 20.

4,692,384

POLYESTER POLYOLS AND THEIR USE AS POLYOL COMPONENT IN TWO COMPONENT POLYURETHANE LACQUERS

Josef Pedain, Cologne; Klaus König, and Manfred Schönfelder, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 737,603, May 24, 1985, Pat. No. 4,656,243.
This application Oct. 28, 1986, Ser. No. 923,986
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421122
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—423.3 6 Claims

1. A coated, molded plastics part prepared by coating a molded plastics part with a polyurethane prepared from a polyisocyanate and a polyol component comprising a polyester polyol having a hydroxyl number range of about 80 to 250 and which is reaction product of

(a) 54–58 mol-% of a polyol component comprising (i) about 70 to 90 mol-% of hexane-1,6-diol and (ii) about 10 to 30 mol-% of at least one higher hydric alcohol selected from the group consisting of trimethylolpropane, glycerol, pentaerythritol and mixtures of these polyols, and

(b) 42–46 mol-% of a dicarboxylic acid component comprising (iii) about 50 to 80 mol-% of isophthalic acid, (iv) about 20 to 30 mol-% of at least one dicarboxylic acid of the formula HOOC—$(CH_2)_n$—COOH, wherein n is an integer from 2 to 8, and (v) up to about 20 mol-% of at least one dicarboxylic acid or at least one dicarboxylic acid anhydride selected from the group consisting of terephthalic acid, phthalic acid, phthalic acid anhydride, tetrahydrophthalic acid, tetrahydrophthalic acid anhydride, hexahydrophthalic acid and hexahydrophthalic acid anhydride.

4,692,385

TRIPLEX ARTICLE

Philip C. Johnson, Lexington, Mass., assignor to Materials Development Corporation, Medford, Mass.

Filed Apr. 14, 1986, Ser. No. 851,086
Int. Cl.[4] B22D *25/00*
U.S. Cl. 428—469 27 Claims

1. A coated article comprising an alloy substrate of an alloy selected from the group consisting of iron, nickel, cobalt and titanium base alloys, a diffusion layer formed thereon comprising an intermetallic boride of the substrate alloy, a coating on said layer of a material selected from the group consisting of refractory, ceramic and intermetallic compounds having desired wear and/or corrosion resistent properties superior to those of said alloy substrate.

4,692,386

SEALABLE MULTILAYER POLYOLEFIN FILMS

Ingo Schinkel, Walsrode, and Jürgen Böhner, Bomlitz, both of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,772
Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517082
Int. Cl.[4] B32B *27/08, 27/32*
U.S. Cl. 428—515 10 Claims

1. A heat-sealable, at least monoaxially-oriented multiple-layer film which comprises a base layer comprising a polymer of propylene and optionally up to 10%, by weight, of one or more other up to C_8 α-olefins and at least one sealable layer comprising:

(a) from 66.5 to 94.5%, by weight, of a linear, statistical low-density ethylene copolymer (LLDPE);

(b) from 5 to 30%, by weight, of a low molecular weight resin compatible with (a); with the exception of a low molecular weight resin of α-olefins containing at most 3 carbon atoms;

(c) from 0.3 to 2%, by weight, of a mixture of a polyethylene wax and an oxazoline wax;

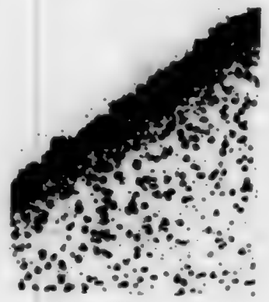
(d) from 0.2 to 1.5%, by weight, of polydiorganosiloxane.

4,692,387

SINTERING OF METAL INTERLAYERS WITHIN ORGANIC POLYMERIC FILMS

Shymon Reich, Rehovoth, Israel, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 657,011, Oct. 2, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 874,817
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—545 19 Claims



1. Process for modifying in situ the electrical and/or optical properties of an electrochemically-deposited interlayer within a polyimide film, the interlayer being comprised of particulate silver and/or gold, by heating the interlayer, either in its entirety or in a spatially selective manner, so as to sinter the particulate silver and/or gold without adversely affecting the properties of the polyimide.

4,692,388

LAMINATED ARTICLE

Henry W. Lavendel, Palo Alto, and John C. Robinson, Cupertino, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 747,635, Jun. 24, 1985. This application Dec. 2, 1986, Ser. No. 939,826
Int. Cl.[4] B32B *7/04*
U.S. Cl. 428—621 1 Claim

1. A first and a second substrate material mated together, said materials being selected from the group of materials consisting of metals and ceramics, and a solid boron-silicon-hydrogen alloy film at the interface between said first and second substrate material, wherein said film bonding said first and second substrate material together has been heat treated at a temperature sufficient to convert said boron-silicon-hydrogen film to solid boron-silicon alloy film which reacts with at least one substrate material to form a liquid reaction product which chemically interacts with said material.

4,692,389

STAINLESS STEEL OVERCOAT FOR SPUTTERED FILMS

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 530,570, Sep. 9, 1983, Pat. No. 4,594,137.
This application Mar. 17, 1986, Ser. No. 840,259
Int. Cl.[4] C03C *27/02, 27/04*
U.S. Cl. 428—622 6 Claims

1. An article of manufacture comprising:

a. a transparent nonmetallic substrate;

b. a transparent coating of a metal selected from the group consisting of silver, copper, gold, platinum, palladium and mixtures thereof; and

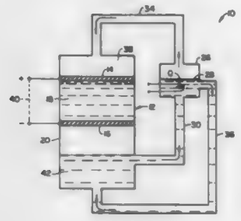
c. a transparent protective overcoat comprising a metal having a dense oxide surface layer.

4,692,390

METHOD AND SYSTEM FOR HYDROGEN THERMAL-ELECTROCHEMICAL CONVERSION

Prodyot Roy, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Aug. 18, 1986, Ser. No. 897,243
Int. Cl.[4] H01M *8/06*
U.S. Cl. 429—17 12 Claims



1. A method for producing electricity, said method comprising:

flowing hydrogen through an electric conversion cell comprising a pair of spaced-apart solid metal electrodes which are permeable to hydrogen and which have an electrolyte therebetween chosen to selectively pass ionized hydrogen, whereby an electric current is induced through an external circuit connecting the electrodes.

4,692,391

CELL STACK ASSEMBLY STRUCTURE FOR FUEL CELL

Toshio Hirota, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Continuation of Ser. No. 689,977, Jan. 9, 1985. This application Jun. 12, 1986, Ser. No. 873,485
Claims priority, application Japan, Jan. 10, 1984, 59-1519[U]
Int. Cl.[4] H01M *2/00, 2/08*
U.S. Cl. 429—34 9 Claims

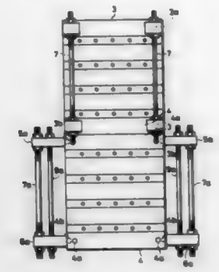
1. A subassembly of a fuel cell, wherein said fuel cell is comprised of a plurality of stacked arrays of fuel cell elements, said subassembly comprising:

a plurality of planar fuel cell elements stacked adjacent the planar sufaces of one another to form an array;

a pair of planar end plates on each planar end of said array, said end plates being disposed to compress said array in a direction perpendicular to the planar surface of said elements;

an end plate engaging means which is disposed to allow the end plate of one array to abut the end plate of an adjacent array while pressure is applied to each of said arrays, and which is removable while the end plate of one array is disposed to abut the end plate of the adjacent array; and

fastening means passing outside said array and engaging said end plate engaging means, said fastening means upon engaging said end plate engaging means being adjustable



for applying a selected tension to said end plate engaging means to induce said pressure to said array through said end plates.

4,692,392

COLOR ELECTROPHOTOGRAPHIC PROCESS USES LAYERED PHOTOSENSITIVE ELEMENT HAVING CONDUCTIVE FILM ON SIDE PORTION

Kenichi Ichimura, Moriyama, and Hiroshi Ichida, Kusatsu, both of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jun. 4, 1986, Ser. No. 873,432
Claims priority, application Japan, Jun. 10, 1985, 60-125895
Int. Cl.[4] G03G *5/08, 13/22*
U.S. Cl. 430—46 16 Claims

1. In a color electrophotography process comprising sequentially repeating the imaging steps of supporting photosensitive material sheet on a conductive conveyor, charging said photosensitive material sheet, exposing said charged photosensitive material sheet to an optical image to form an electrostatic latent image, and developing said latent image with a liquid developer to produce a toner image, thereby to superpose multicolor toner images, the improvement wherein said photosensitive material sheet comprises:

a base sheet having an extremely smooth surface and high specific resistivity;

a conductive layer on one face of said base sheet;

a photosensitive coating including titanium dioxide dispersed in an insulating resin on said conductive layer;

a conductive film on at least a side edge portion of said photosensitive material sheet and on at least a part of the face of said base sheet opposite said one face, said one face being essentially free of said conductive film, whereby said photosensitive material sheet is grounded, through said conductive layer, to said conductive conveyor.

4,692,393

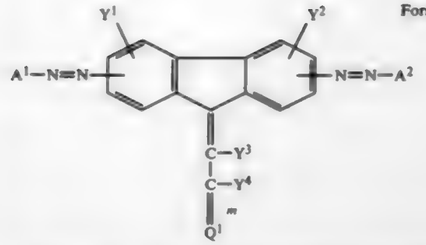
PHOTORECEPTOR HAVING A PHOTOSENSITIVE LAYER CONTAINING AN AZO COMPOUND

Akira Kinoshita; Kazumasa Watanabe; Hiroshi Yamazaki, and Naohiro Hirose, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

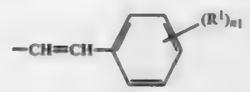
Filed Oct. 28, 1985, Ser. No. 791,793
Claims priority, application Japan, Oct. 31, 1984, 59-229793
Int. Cl.[4] G03G *5/06, 5/14*
U.S. Cl. 430—59 48 Claims

1. A photoreceptor comprising a support and thereon a photosensitive layer containing an azo compound represented by the following Formula [I]

Formula [I]



wherein Y^1 and Y^2 each represent hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, or



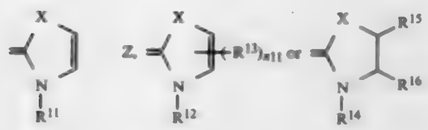
in which R^1 represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acryl group, a dialkylamino group, a diarylamino group, a diaralkylamino group, or a hydroxy group; and n_1 is an integer of from 1 to 5, provided that, when n_1 is not less than 2, R^1 is allowed to be a different substituent;

Y_3 and Y_4 each represent hydrogen, an alkyl group, a halogen, a cyano group, an acyl group, an ester group, or

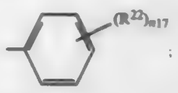


in which R^2 represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano gradation, an ester group, an acyl group, a dialkylamino group, a diarylamino group, a diaralkylamino group, or a hydroxy group; and n_2 is an integer of from 1 to 5, provided that, when n_2 is not less than 2, R^2 is allowed to be a different substituent;

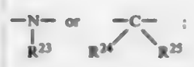
Q^1 represents



in which Z represents a group of atoms necessary for forming a substituted or unsubstituted aromatic carbon ring or a substituted or unsubstituted aromatic heterocyclic ring; R_{11}, R_{12} and R_{14} each represent hydrogen, an alkyl group, an aralkyl group, or

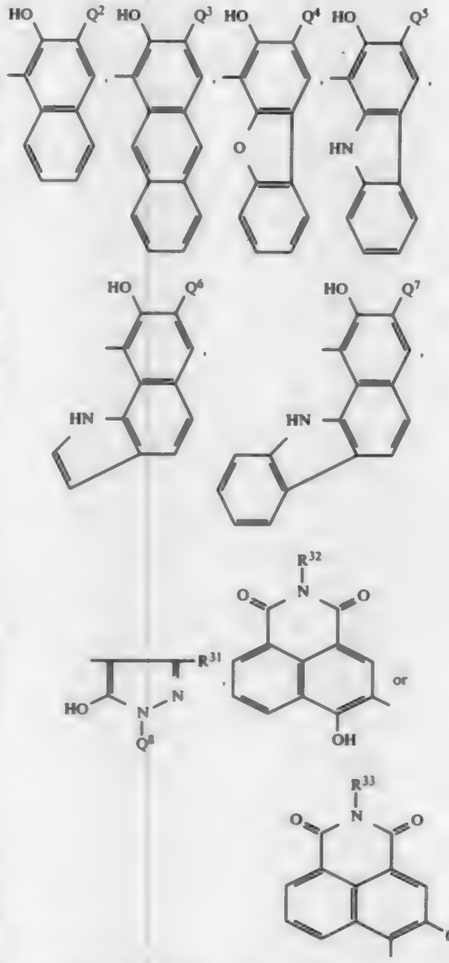


R^{13}, R^{15} and R^{16} and R_{22} each represent hydrogen, an alkyl group, an aryl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, a nitro group, an amino group, or a hydroxy group; n_{11} is an integer of 1 or 2; n_{17} is an integer of from 1 to 5, provided that, when n_{11} and n_{17} are not less than 2, respectively, R^{13} and R^{22} are allowed to be the same or different from each other, respectively, and it is also allowed to form an aliphatic carbon ring or an aliphatic heterocyclic ring with R^{15} and R^{16}; X represents —O—, —S—,

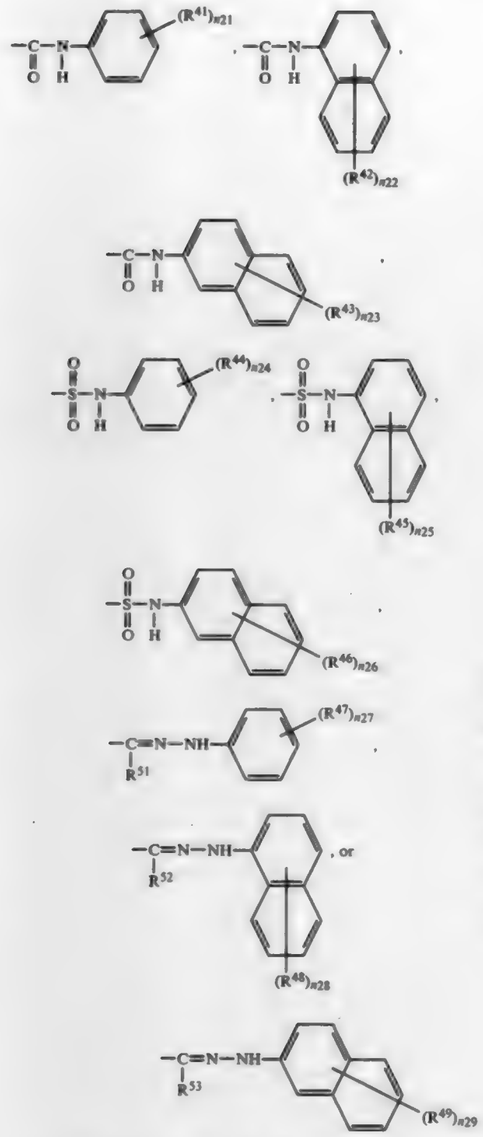


R^{23} represents hydrogen, an alkyl group, an aralkyl group, or a phenyl group allowed to have a substituent; R_{24} and R_{25} each represent hydrogen, an alkyl group, an aralkyl group, or a phenyl group allowed to have a substituent;

A^1 and A^2 each represent



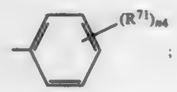
in which Q^2, Q^3, Q^4, Q^5, Q^6 and Q^7 represent



in which R^{41}, R^{42}, R^{43}, R^{44}, R^{45}, R^{46}, R^{47}, R^{48} and R^{49} each represent hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, an diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{21}, n_{24} and n_{27} are an integer of from 1 to 5, provided that, when n_{21}, n_{24} and n_{27} are not less than 2, R^{41}, R^{44} and R^{47} are allowed to be different substituents from each other, respectively, and n_{22}, n_{23}, n_{25}, n_{26}, n_{28} and n_{29} are an integer of from 1 to 7, provided that, when n_{22}, n_{23}, n_{25}, n_{26}, n_{28} and n_{29} are not less than 2, R^{42}, R^{43}, R^{45}, R^{46}, R^{48} and R^{49} are allowed to be the same or different from each other; R^{51}, R^{52}, and R^{53} each represent an alkyl group; Q^8 represents



in which R^{61} represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{31} is an integer of from 1 to 5, provided that, when n_{31} is not less than 2, R^{61} is allowed to be a different substituent; R^{31} represents hydrogen, an alkyl group, an amino group, a dialkylamino group, a diarylamino group, a diaralkylamino group, a carbamoyl group, a carboxyl group or the ester groups thereof, or a cyano group; R^{32} and R^{33} each represent an alkyl group, an aralkyl group, or



R^{71} represents hydrogen, an alkyl group, an alkoxy group, a halogen, a cyano group, an ester group, an acyl group, a dialkylamino group, a diaralkylamino group, a diarylamino group, or a hydroxy group, and n_{41} is an integer of from 1 to 5, provided that when n_{41} is not less than 2, R^{71} is allowed to be a different substituent; and m is zero, 1 or 2.

4,692,394

METHOD OF FORMING A PERSONAL INFORMATION CARD

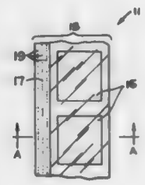
Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,856

The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

Int. Cl.[4] G03C *5/14*; B42D *15/00*

U.S. Cl. 430—140 **18 Claims**



1. A method for recording personal information comprising,

creating visually readable information on a piece of photographic material, said information relating to a person,

disposing said visually readable information in a wallet-size card,

disposing a high data capacity laser recordable direct-read-after-write optical data storage lamella in said wallet-size card, and

recording information indicia related to said person onto said optical data storage lamella, in situ, by means of a laser, said laser recorded information indicia being data spots representing changes in reflectivity in a surrounding

optically contrasting field of said lamella, said data spots being spaced at most ten microns apart from edge to edge.

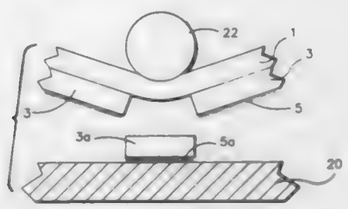
8. The method of claim 1 wherein said information recorded on said lamella is the digital recorded voice of the card owner.

4,692,395

TRANSFER ELEMENT AND PROCESS FOR RADIATION DEFINED IMAGES

Hugh T. Findlay, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,708
Int. Cl.[4] G03C *1/68*; G03F *7/26*
U.S. Cl. 430—254 **8 Claims**



7. The method of applying a colored image to a porous substrate comprising applying a pattern or radiation in the form of said image through the substrate of a transfer medium having a substrate transparent to said radiation, an intermediate layer which cures in response to said radiation to change in melting point and an outer layer comprising a pigment, said pigment being at least 50% by weight of the weight of said outer layer; contacting said outer layer with said porous substrate, and heating during said contacting to flow by melting portion of said intermediate layer having a lower melting point than other portions of said intermediate layer as a result of said curing in response to said radiation.

4,692,396

PHOTOPOLYMERIZABLE RESIN COMPOSITION FOR PRODUCING AQUEOUS-DEVELOPMENT TYPE DRY FILM RESISTS

Hiroyuki Uchida, 5-10, Nishisakae-2-chome, Ohtake-shi, Japan

Filed Apr. 3, 1985, Ser. No. 719,567
Claims priority, application Japan, Apr. 10, 1984, 59-71348
Int. Cl.[4] G03C *1/68*; C08F *8/00*
U.S. Cl. 430—284 **4 Claims**

1. A photopolymerizable resin composition which comprises

(A) 40 to 85% by weight of a binder resin comprising a copolymer of methyl methacrylate, methyl acrylate, and methacrylic acid, wherein the methacrylic acid unit content of the copolymer constituting the binder resin is 20 to 50% by weight and the methyl acrylate unit content of the copolymer constituting the binder resin is 2 to 70% by weight,

(B) 15 to 60% by weight of a crosslinkable monomer having at least two ethylenically unsaturated groups in the molecule, and

(C) 0.5 to 10% by weight, based on the toal amount of the above components (A) and (B), of a photoinitiator.

3. A photopolymerizable resin composition according to claim 1 wherein the crosslinkable monomer is a member selected from the group consisting of polyester acrylate, polyester methacrylates, epoxy acrylate, epoxy methacrylates urethane acrylate and urethane methacrylates.

4,692,397

PROCESS FOR DEVELOPING AN AQUEOUS ALKALINE DEVELOPMENT DIAZO PHOTOGRAPHIC ELEMENT

Shuchen Liu, Clinton, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Nov. 27, 1985, Ser. No. 802,655
Int. Cl.[4] G03F *7/08, 7/26*
U.S. Cl. 430—325 **16 Claims**

1. A method for producing and using a photographic element which comprises coating a substrate with a light sensitive composition, which composition comprises in admixture:

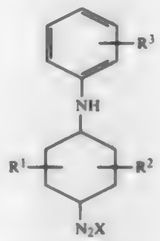
(i) from about 1% by weight to about 21% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a polyvinyl acetal resin; and

(ii) from about 1.1% by weight to about 22% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a colorant; and

(iii) from about 63% by weight to about 92% by weight, based on the total weight of the non-solvent parts of said light sensitive composition, of a light-sensitive, water insoluble diazonium group-containing polycondensation product, which product is obtained first by condensation of

(a) a diazonium salt corresponding to formula I

(I)



wherein

R^1, $R^2$and R^3each denote separately a hydrogen atom, a halogen atom, an alkyl group having from 1 to 3 carbon atoms, or an alkoxy group having from 1 to 6 carbon atoms, and

X denotes the anion of the diazonium salt;

(b) with a compound corresponding to formula II

$$R^4—O—CH_2—R^5 \quad \text{(II)}$$

wherein

R_4denotes a hydrogen atom, an alkyl group or an aliphatic acyl radical and

R^5denotes a mononuclear or polynuclear aromatic radical, which is unsubstituted or substituted by a halogen atom, an alkyl group, a halogenated alkyl group, an alkoxy group having from 1 to 3 carbon atoms, a carboxy group, an aryl group, an arylmercapto group, or an aryloxy group, in a strongly acidic medium, and thereafter condensing with

(c) a compound corresponding to formula III

$$R^6—O—CH_2—R^8—CH_2—O—R^7 \quad \text{(III)}$$

wherein

$R^6$and R^7 each denote separately a hydrogen atom, an alkyl group, or an aliphatic acyl radical, and

R^8denotes an aromatic hydrocarbon radical selected from the group consisting of a phenol, a phenolether, an aromatic thioether, an aromatic heterocyclic compound, and an organic acid amide,

with the radicals resulting from compound II being directly linked to the units of the diazonium salt I; and thereafter imagewise exposing said coated substrate to actinic radiation and removing all or substantially all of

the non-radiation-exposed areas with a non-organic solvent containing aqueous alkaline developer composition which consists essentially of in admixture:

A. from about 80% by weight to about 95% by weight, based on the weight of said developer composition, water; and

B. from about 7.7% by weight to about 17% by weight, based on the weight of said developer composition, of one or more salts selected from the group consisting of sodium, potassium, and ammonium hydroxides, silicates, phosphates, bicarbonates, oxalates, carbonates, sulfates, chlorides, acetates, benzoates, borates, citrates, salicylates, and pyrophosphates; and

C. from about .3% by weight to about 3.0% by weight, based on the weight of said developer composition, of a anionic surfactant.

4,692,398

PROCESS OF USING PHOTORESIST TREATING COMPOSITION CONTAINING A MIXTURE OF A HEXA-ALKYL DISILAZANE, PROPYLENE GLYCOL ALKYL ETHER AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Dana Durham, Bloomsbury, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Oct. 28, 1985, Ser. No. 791,876
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—329 **6 Claims**

1. A method of treating a photoresist coating on a substrate, which photoresist comprises a resin selected from the group consisting of novolaks and paravinyl phenols, and at least one o-quinone diazide photosensitizer, which method comprises contacting said photoresist coating for sufficient time to strip, thin, clean or promote adhesion of the coating with a mixture which comprises from about 3 to about 50% by weight of the mixture of a hexa-alkyl disilazane and from about 50 to about 97% by weight of the mixture of a solvent composition which comprises both a propylene glycol mono alkyl ether and a propylene glycol mono alkyl ether acetate.

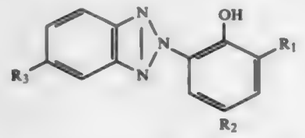
4,692,399

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

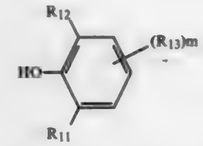
Masao Sasaki; Takashi Kadowaki, and Kaoru Onodera, all of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,781
Claims priority, application Japan, Jul. 5, 1985, 60-148026
Int. Cl.[4] G03C *1/46*
U.S. Cl. 430—507 **19 Claims**

1. A silver halide photographic light-sensitive material comprising a reflective support end, provided thereon, a light-sensitive silver halide emulsion layer containing a yellow coupler, a light-sensitive silver halide emulsion layer containing a magenta coupler, a light-sensitive silver halide emulsion layer containing a cyan coupler, and a non-light-sensitive layer being provided at a further side of the light-sensitive emulsion layer being provided at the furthest position from said support, wherein said non-light-sensitive layer contains at least three kinds of UV absorbers represented by the general formula



wherein R_1, R_2 and R_3 are independently selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkenyl group, a nitro group and a hydroxy group, provided that one of said UV absorbers is selected from a first class of UV absorbers which are in a liquid state at 30° C. and two of said UV absorbers are selected from a second class UV absorbers which are in a solid state at the same temperature, that said first class UV absorber is present in a proportion of 30% to 99% by weight based on total amount of said UV absorbers and that at least one of said second class UV absorbers has a total of at least 8 carbon atoms in the groups represented by R_1 and R_2 of said general formula [UV-I] and constitutes 35% to 100% by weight of the total amount of said second class UV absorbers, and said emulsion layer containing the yellow coupler contains a compound represented by the general formula [A]:



wherein R_{11} and R_{12} are independently an alkyl group, and R_{13} is an alkyl group, —NR′R″ group, —SR′, or —COOR″ group, wherein R′ is a monovalent organic group and R″ is a hydrogen atom or a monovalent organic group, and m is an integer 0 to 3.

4,692,400

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kenji Kumashiro, Hachioji; Toshifumi Iijima, Kokubunji; Hideo Akamatsu, and Syoji Matsuzaka, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Apr. 29, 1986, Ser. No. 857,024
Claims priority, application Japan, Apr. 30, 1985, 60-92689
Int. Cl.[4] G03C *1/40, 7/34, 1/02*
U.S. Cl. 430—553 **37 Claims**

1. A silver halide photographic light-sensitive material comprising at least one silver halide emulsion layer, wherein said silver halide emulsion layer comprises

a phenol-type cyan coupler having at the 2-position of the phenol nucleus thereof a group selected from the group consisting of a phenyl-ureido group, a naphthyl-ureido group and a heterocyclic ureido group, and having at the 5-position thereof an acylamino group, and

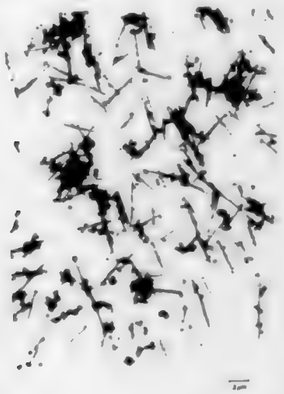
a negative type silver halide grains of a core-shell structure which consists of an inner core essentially consisting of silver bromide or silver iodobromide and a plurality of shells essentially consisting of silver bromide or silver iodobromide, said plurality of shells comprising an outermost shell containing 0 to 10 mol% of silver iodide, a highly iodide-containing shell provided inside said outermost shell of which silver iodide content is at least 6 mol% higher than that of said outermost shell, and an intermediate shell provided between said outermost shell and said highly iodide-containing shell of which a silver iodide content is at least 3 mol% higher than that of said outermost shell, and at least 3 mol% lower than that of said highly iodide-containing shell.

4,692,401

PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SENSITIZING DYE IN THE FORM OF HOST CRYSTALS

Gary L. House, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1986, Ser. No. 899,193
Int. Cl.[4] G03C *1/12, 1/19, 1/46*
U.S. Cl. 430—570 12 Claims



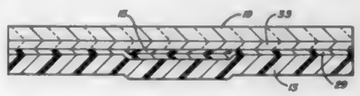
1. A photographic emulsion comprising
grains containing a silver salt capable of forming a latent image,
a sensitizing dye, and
a dispersing medium,
characterized in that
said sensitizing dye is present in the form of host crystals and said grains are in conductive contact with said host dye crystals.

4,692,402

ULTRATHIN OPTICAL RECORDING MEDIUM WITH MOISTURE BARRIER

Eric Bouldin, Atherton; Richard Haddock, and Christopher J. Dyball, both of Redwood City, all of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 831,652, Feb. 20, 1986, abandoned. This application May 2, 1986, Ser. No. 859,116
Int. Cl.[4] G01D *9/00, 15/24;* B32B *3/00*
U.S. Cl. 430—945 25 Claims



1. An optical data storage medium comprising,
a laser recordable data storage material disposed on a substrate, and
a transparent, hydrophobic laminating sheet covering said storage material, the substrate, storage material and laminating sheet having a maximum total thickness not exceeding 40 mils.

4,692,403

METHODS AND COMPOSITIONS FOR THE DETECTION OF ACQUIRED IMMUNE DEFICIENCY SYNDROME

Luther E. Lindner, College Station, and Stephen R. Wechter, Houston, both of Tex., assignors to The Texas A&M University System, College Station, Tex.

Filed Nov. 28, 1984, Ser. No. 675,601
Int. Cl.[4] C12Q *1/70;* G01N *33/53, 33/566, 33/554*
U.S. Cl. 435—5 12 Claims

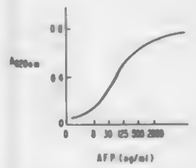
1. A method of immunodiagnosing Acquired Immune Deficiency Syndrome in a suspected carrier comprising:
(a) admixing a lymphoid cell sample obtained from the suspected carrier with an immunoreagent comprising tracer tagged antibodies selectively reactive with AIDS infected tissue, said antibodies obtained from marmoset monkeys, wherein the marmoset monkeys are either afflicted with or have recovered from marmoset wasting syndrome;
(b) incubating the admixture under conditions to form an immune complex; and
(c) detecting a positive immunoreaction which is indicative of Acquired Immune Deficiency Syndrome.

4,692,404

METHOD OF MEASURING BIOLOGICAL LIGAND BY THE USE OF ENZYMES

Yoshihiro Ashihara, and Yasushi Kasahara, both of Tokyo, Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,764
Claims priority, application Japan, Nov. 18, 1983, 58-217145; Dec. 9, 1983, 58-231241
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.
Int. Cl.[4] C12Q *1/34, 1/40;* G01N *33/536*
U.S. Cl. 435—5 14 Claims



1. A method of determining a biological ligand which comprises,
using an antibody or ligand binding fragments thereof, against the ligand to be measured and an enzyme capable of acting on a water-insoluble macromolecular substrate and which conjugates with said antibody or ligand binding fragments thereof,
contacting said antibody or ligand binding fragments thereof, with said ligand,
contacting said enzyme with a water-insoluble macromolecular substrate, and
thereafter measuring the change in activity of the enzyme after it has acted on said substrate, relating said change in the activity of the enzyme to the concentration of the ligand.

4,692,405

MONOCLONAL ANTIBODIES TO ANTIGEN ON ACTIVATED HUMAN B-CELLS AND ASSAY THEREFOR, PROTEIN ANTIGENIC DETERMINANT THEREFOR AND METHOD OF MAKING SAME

Arnold Freedman; Lee Nadler, both of Newton, and Stuart Schlossman, Newton Center, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Mar. 5, 1985, Ser. No. 708,176
Int. Cl.[4] G01N *53/00, 33/53;* C12P *21/00;* C12N *5/00*
U.S. Cl. 435—7 22 Claims

1. A monoclonal antibody recognizing an antigenic determinant on activated human B-cells, said antigenic determinant being characterized in that it is a protein distinct from B-LAST-1 and BB-1 and is a protein on the surface of activated B-cells having an apparent molecular weight of approximately 75,000 daltons under reducing conditions and 67,000 daltons under non-reducing conditions, said antibody being a protein of the IgM isotype and being reactive with less than 1% of unstimulated human B-cells, with less than 6% of stimulated or resting T-cells and monocytes, and unreactive with neoplasms of non-B-cell origin, or neoplasms of B-cell origin corresponding to stages of differentiation other than the mid-stage of B-cell differentiation.

4,692,406

PROCESS AND A REAGENT FOR THE SIMULTANEOUS DETERMINATION OF FIBRINOGEN AND FIBRINOGEN FISSION PRODUCTS IN PLASMA

Udo Becker, Marburg, and Peter Roeschlau, Seeshaupt, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 20, 1984, Ser. No. 642,421
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330699
Int. Cl.[4] C12Q *1/56*
U.S. Cl. 435—13 12 Claims

1. A process for the simultaneous determination of fibrinogen and fibrinogen fission products in plasma, comprising adding 0.01 to 1U of a snake venom enzyme with thrombin-like activity per ml. of sample plasma, measuring the period of time between the addition of the enzyme and the commencement of a turbidity formation as a measure of the amount of fibrinogen fission products, and subsequently measuring the speed of the turbidity formation as a measure of the amount of fibrinogen.

4,692,407

METHOD FOR THE DETERMINATION OF *STREPTOCOCCUS MUTANS*

Harold V. Jordan, Wellesley Hills, Mass., and Max Marmel, Toronto, Canada, assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Jan. 31, 1985, Ser. No. 696,593
Int. Cl.[4] C12Q *1/14;* C12N *1/20*
U.S. Cl. 435—36 13 Claims

1. A method for the quantitative determination of *Streptococcus mutans* in a test sample, which method comprises:
(a) adding to an aseptic, aqueous, diluent solution a predetermined amount of a bacitracin composition and a test sample, taken from the oral cavity of a patient, on which a quantitative determination of *Streptococcus mutans* is to be made;
(b) uniformly wetting an aseptic flat surface dip slide having at least one side coated with a selected medium and a saccharide compound with the bacitracin-test sample diluent solution, both the saccharide compound and the bacitracin present in combination on wetting the slide in a concentration insufficient to prevent the growth of *Streptococcus mutans,* but sufficient to prevent the growth in sufficient quantities of any interfering microorganisms;
(c) incubating the wetted slide in an atmosphere containing carbon dioxide for a defined incubation time an temperature; and
(d) quantitatively determining the amount of the *Streptococcus mutans* of the test sample by comparing the colony density of the *Streptococcus mutans* of the incubated slide against a visual standard comparison of *Streptococcus mutans* colony density thereby providing for the quantitative determination of *Streptococcus mutans* in the test sample.

4,692,408

FERMENTATION PROCESS FOR THE PRODUCTION OF POLYSACCHARIDES

Geoffrey T. Banks, Horsham, and Paul D. Browning, Orpington, both of United Kingdom, assignors to Imperial Biotechnology Limited, London, England

Filed Nov. 29, 1983, Ser. No. 556,020
Claims priority, application United Kingdom, Nov. 30, 1982, 8234111
Int. Cl.[4] C12P *19/08, 19/04;* C12Q *3/00;* C12N *1/38;* C12R *1/64*
U.S. Cl. 435—104 8 Claims

1. A method for the synthesis of polysaccharides comprising culturing polysaccharide-producing microorganisms in a nutrient containing medium, in a first stage involving an increase in the number of microorganisms in said medium by multiplication of said microorganisms, and a second stage in which polysaccharide is synthesized by said microorganisms, said first stage comprising adding carbohydrate capable of supporting polysaccharide biosynthesis to said medium at an exponentially increasing rate, or by using, as sole carbon source, a predetermined quantity of a carbohydrate which does not support polysaccharide biosynthesis, and said second stage being conducted in the absence of at least one nutrient essential for growth of the microorganism.

4,692,409

METHOD FOR PRODUCING L-ASPARTIC ACID

Masahiko Kisumi, Kobe; Saburo Komatsubara, Kusatsu, and Tomoyasu Taniguchi, Izumiohtsu, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed May 30, 1984, Ser. No. 615,290
Claims priority, application Japan, Jun. 15, 1983, 58-107573
Int. Cl.[4] C12P *13/20;* C12N *15/00, 1/20, 1/00*
U.S. Cl. 435—109 3 Claims

1. *Escherichia coli* TA-5004 (FERM BP-532).

4,692,410

INFECTIONS BRONCHITIS VIRUS STRAINS

Peter Apontowell, Leersum, and Manfred M. Kranselt, De Bilt, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 409,996, Aug. 20, 1982, Pat. No. 4,481,188. This application Jun. 15, 1984, Ser. No. 621,077
Claims priority, application European Pat. Off., Aug. 28, 1981, 81-200960.3
Int. Cl.[4] A61K *39/215*
U.S. Cl. 435—235 2 Claims

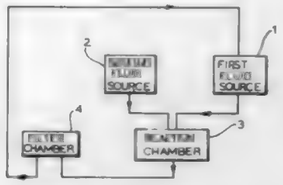
1. Infectious bronchitis virus strains of a novel serotype of the virus strain identified by means of the internal notation Gelderland.901 deposited at the Czechoslovak National Collection of Type Cultures of the Institute of Hygiene and Epidemiology in Prague under No. CNCTC AO 17/81 and deposited at the Collection Nationale de Cultures de Micro organismes d'Institute Pasteur, Paris, under No. I-168.

4,692,411

SEPARATION OF SPECIFIC BIOLOGICAL CELLS BY A BIOCHEMICAL FILTER

Rabindra N. Ghose, 8167 Mulholland Ter., Los Angeles, Calif. 90046

Filed Sep. 6, 1983, Ser. No. 529,347
Int. Cl.[4] C12N *1/00, 1/02;* A01N *1/02;* C12Q *1/24*
U.S. Cl. 435—243 **28 Claims**



1. A biochemical filter system comprising;
(a) a chamber containing specific biological cells to be separated in a fluid mixture of these cells, other biological cells and particulates;
(b) a complementary source storage chamber containing corresponding complementary agglutinins which can react specifically with the biological cells to be separated to form clumps;
(c) a reaction chamber, where specific reaction occurs, leading to the formation of clumps, said chamber having first and second inlets and and outlet;
(d) means for connecting said chamber containing said biological cells to be separated to the first inlet of the reaction chamber and for introducing said specific biological cells into said reaction chamber;
(e) means for connecting said chamber containing complementary agglutinins to the second inlet of the reaction chamber and for introducing said complementary agglutinins into said reaction chamber;
(f) filter means coupled to said outlet of said reaction chamber for filtering the fluid containing the clumps and other cells and particulates following the reaction in the reaction chamber so as to retain the clumps as filter residue;
(g) means for introducing the fluid containing the clumps and other cells and particulates following reaction in the reaction chamber into said filter means; and
(h) means for returning the fluid filtrate following filtering to the chamber containing said biological cells.

4,692,412

METHOD OF PREPARING AN AUTOGENOUS VACCINE

Virginia W. Livingston, 8492 Prestwick Dr., LaJolla, Calif. 92037; Eleanor G. Alexander-Jackson, 390 Riverside Dr., New York, N.Y. 10025, and Afton M. Livingston, 8492 Prestwick Dr., LaJolla, Calif. 92037

Continuation of Ser. No. 569,253, Jan. 9, 1984, abandoned, which is a continuation of Ser. No. 171,543, Jul. 23, 1980, abandoned, which is a continuation of Ser. No. 955,878, Oct. 30, 1978, abandoned, which is a continuation of Ser. No. 776,360, Mar. 10, 1977, abandoned, which is a continuation of Ser. No. 672,965, Apr. 2, 1976, abandoned, which is a continuation of Ser. No. 295,720, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 82,806, Oct. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 831,985, Jun. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 490,629, Sep. 27, 1965, abandoned. This application Mar. 11, 1986, Ser. No. 839,457
Int. Cl.[4] C12N *1/20;* A61K *39/085*
U.S. Cl. 435—253 **5 Claims**

1. A method of preparing an autogenous vaccine for immunization against neoplastic diseases characterized by the presence of a *Progenitor cryptocides* organism identified by ATCC 31,874, which comprises:
(a) admixing a sterile blood sample containing *Progenitor cryptocides* with sterile distilled water;
(b) incubating the admixture;
(c) killing or inactivating the *Progenitor crytocides* in the admixture;
(d) microfiltering the admixture to remove blood cells, and
(e) diluting the filtrate containing the attenuated *Progenitor cryptocides* with a sterile saline solution, thereby forming autogenous vaccine.

4,692,413

USE OF RLDM TM 1-6 AND OTHER LIGNINOLYTIC ENZYMES FOR THE DECOLORIZATION OF E1 EFFLUENT

Roberta L. Farrell, Danvers, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 755,245, Jul. 15, 1985, abandoned. This application Mar. 28, 1986, Ser. No. 845,657
Int. Cl.[4] D21C *3/00, 3/20;* C12R *1/645;* C02F *3/00*
U.S. Cl. 435—278 **18 Claims**

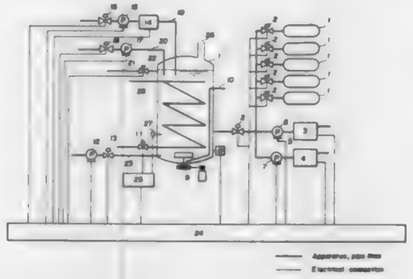
1. A process for decolorizing E1 effluent which comprises treating said effluent with the Ligninolytic Mixture TM from a *Phanerochaete chrysosporium* fermentation consisting essentially of rLDM TM 1 through 6, and other ligninolytic enzymes.

4,692,414

APPARATUS FOR AUTOMATICALLY CONTROLLING THE FEED RATE OF ALCOHOL SOLUTION AS RAW MATERIAL IN A VINEGAR PRODUCTION PROCESS

Mikio Yamada; Yoshinori Tsukamoto, and Masahiro Mizuno, all of Handa, Japan, assignors to Nakano Vinegar Co., Ltd., Aichi, Japan

Division of Ser. No. 722,783, Apr. 12, 1985, Pat. No. 4,654,215. This application Dec. 4, 1986, Ser. No. 938,166
Claims priority, application Japan, Apr. 23, 1984, 59-80306
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—291 **9 Claims**



1. In apparatus for automatically controlling the feed rate of an alcohol solution as raw material in a process for producing vinegar from a fermenting broth in a fermentation tank, the improvement comprising:
an automatic alcohol analyzer for measuring the alcohol concentration in said fermenting broth in said fermentation tank;
feeding means for feeding alcohol solution as raw material to said fermentation tank;
control computer means coupled to said analyzer and to said feeding means for energizing said alcohol analyzer to initiate an automatic alcohol concentration measurement and for receiving an output signal from said analyzer corresponding to the measured alcohol concentration, said control computer means including calculating means for calculating a feed rate of alcohol solution as raw material to said fermenting broth responsive to said output from said alcohol analyzer, and for generating an output signal responsive to said calculations to control operation of said feeding means to feed alcohol solution as raw material to said fermenting broth so as to control the alcohol concentration in said fermenting broth at a desirable concentration, said control computer means including means for periodically causing said analyzer to measure said alcohol concentration in said fermenting broth at given intervals over a plurality of cycles of measurement.

4,692,415

PROCESS FOR THE DETERMINATION OF CYANAMIDE IN PLANTS AND PLANT PARTS

Ulrich Rust, Trostberg, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Aug. 14, 1986, Ser. No. 896,950
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530013; Jul. 25, 1986, 3625205
Int. Cl.[4] G01N *33/00, 33/02*
U.S. Cl. 436—20 **21 Claims**

1. A process for the determination of cyanamide in plants or plant parts, comprising
(a) extracting cyanamide from plants or plant parts,
(b) reacting the cyanamide in aqueous alkaline medium with 1,2-naphthoquinone-4-sulphonate to give 4-cyanimido-1, 2-naphthoquinone,
(c) separating the 4-cyanamido-1,2-naphthoquinone from the aqueous medium by high performance liquid chromatography on a reverse phase and
(d) determining the 4-cyanimido-1, 2-naphthoquinone spectrophotometrically at a wavelength of 485 nm or 272 nm as a measure of the cyanamide extracted from the plants or plant parts.

4,692,416

MONOCLONAL ANTIBODIES REACTIVE WITH SHARED IDIOTYPES ON HUMAN ANTIBODIES TO NATIVE DNA FROM PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

Betty A. Diamond, New York, N.Y., assignor to Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 446,718, Dec. 3, 1982, abandoned. This application Nov. 16, 1983, Ser. No. 552,290
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] G01N *33/564, 33/577*
U.S. Cl. 436—508 **30 Claims**

1. Monoclonal antibodies capable of reacting with a shared idiotype on human anti-native DNA antibody, said idiotype shared between genetically nonidentical individuals.

4,692,417

IMMUNOLOGICAL IDENTIFICATION TEST FOR GROUP D STREPTOCOCCI USING ACHROMOPEPTIDASE

Martyn F. Webster, Basingstoke, England, assignor to Oxoid Limited, Hampshire, England

Filed May 30, 1985, Ser. No. 739,462
Claims priority, application United Kingdom, Jun. 5, 1984, 8414273
Int. Cl.[4] G01N *33/53;* C12Q *1/38, 1/14*
U.S. Cl. 436—518 **18 Claims**

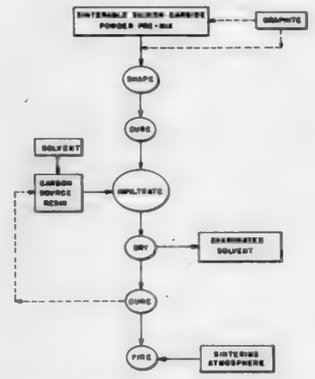
1. An immunological agglutination test method for identifying Lancefield group D streptococcus, which comprises treating a sample suspected of containing group D streptococcus with achromopeptidase, contacting the sample with antibody specific for Lancefield group D streptococcal antigen to form a mixture, said antibody being bound to minute, insoluble carrier particles and examining the mixture for agglutination as an indication of the presence of Lancefield Group D streptococci.

4,692,418

SINTERED SILICON CARBIDE/CARBON COMPOSITE CERAMIC BODY HAVING FINE MICROSTRUCTURE

Wolfgang D. G. Boecker, and George I. Reini, both of Lewiston, N.Y., assignors to STEMCOR Corporation, Cleveland, Ohio

Continuation of Ser. No. 645,462, Aug. 29, 1984, abandoned. This application Feb. 19, 1987, Ser. No. 16,459
Int. Cl.[4] C04B *35/56*
U.S. Cl. 501—90 **19 Claims**



1. A process for producing a sintered silicon carbide/carbon composite ceramic body consisting essentially of:
a. forming a homogeneous mixture comprising the components of:
(1) a carbon-containing additive selected from the group consisting of amorphous carbon, and a solvent soluble, organic material which can be coked at temperatures below about 1000° C. to form amorphous carbon or mixtures thereof, in an amount between 0.5 and 5 percent by weight of uncombined carbon;
(2) from about 0.15 to about 15 percent by weight of a sintering aid selected from the group consisting of aluminum, beryllium or boron or compounds containing any one or more of these elements or a mixture of any of the foregoing elements or compounds, said sintering aid containing from about 0.15 to about 5 percent by weight of aluminum, boron or beryllium or a mixture of any of these elements;
(3) up to about 25 percent by weight of organic temporary binder;
(4) a balance of silicon carbide powder having a surface area of from about 5 to about 100 square meters per gram;
b. shaping the mixture in such a way as to produce a microporous shaped object having a density of at least about 45 percent of theoretical; and
c. infiltrating the shaped object with a sufficient amount of an organic material which can be coked at temperatures below sintering temperature to form amorphous carbon, in an amount between about 1 and 25 percent by weight of the shaped object;
d. firing the infiltrated object in the absence of any substantial externally applied pressure under such conditions of time and temperature in an atmosphere inert to silicon carbide or in a vacuum at a temperature of between about 1900° C. and 2300° C. until a sintered body having a homogeneous microstructure of silicon grains having a maximum size of about 5 microns, said microstructure having

carbon substantially uniformly dispersed throughout, is formed.

4,692,419

SILICON NITRIDE SINTERED BODY AND MANUFACTURING METHOD THEREOF

Minoru Matsui, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,249

Claims priority, application Japan, Sep. 17, 1985, 60-204986

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 501—97 **8 Claims**

1. A silicon nitride sintered body consisting essentially of Sr in an amount of from 0.1 to 18% by weight calculated as SrO, Mg in an amount of from 0.2 to 25% by weight calculated as MgO, Ce in an amount of from 0.1 to 20% by weight calculated as CeO_2, Zr in an amount of from 0.1 to 15% by weight calculated as ZrO_2 and Al in an amount of from 1 to 20% by weight calculated as Al_2O_3, the balance being silicon nitride.

4,692,420

SILICON NITRIDE SINTERED BODY AND MANUFACTURING METHOD THEREOF

Isao Oda, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,362

Claims priority, application Japan, Sep. 17, 1985, 60-204985

Int. Cl.⁴ C04B *35/58*

U.S. Cl. 501—97 **6 Claims**

1. A silicon nitride sintered body consisting essentially of Mg in an amount of from 0.5 to 5% by weight calculated as MgO, Sr in an amount of from 0.5 to 5% by weight calculated as SrO, Ce in an amount of from 1 to 10% by weight calculated as CeO_2 and Al in an amount of from 1 to 20% by weight calculated as Al_2O_3, the balance being silicon nitride.

4,692,421

DIELECTRIC CERAMICS

Kazutoshi Matsumoto, Matsudo; Tetsuro Nakamura, Yokohama; Takehiro Hyuga, Ichikawa, and Hiroshi Ichimura, Matsudo, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,569

Claims priority, application Japan, Feb. 27, 1985, 35-38515

Int. Cl.⁴ C04B *35/02*

U.S. Cl. 501—136 **3 Claims**

1. Dielectric ceramics which substantially have a K_2NiF_4-type crystal structure and which display an unloaded Q value of 6000 or greater, said dielecrtic ceramics having the formula:

$$aSrO.bCaO.cTiO_2.dSnO_2$$

wherein $0.39 \leqq a \leqq 0.70$, $0 \leqq b \leqq 0.28$, $0.27 \leqq c \leqq 0.35$, $0 \leqq d \leqq 0.04$, $0.65 \leqq a+b \leqq 0.70$, and $a+b+c+d=1$.

4,692,422

HIGH DIELECTRIC PORCELAIN COMPOSITION AND METHOD OF REDUCING SINTERING TEMPERATURE THEREOF

Shinobu Fujiwara; Atsushi Satoh; Tetsuya Hattori, and Junichi Sutoh, all of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed May 2, 1986, Ser. No. 858,945

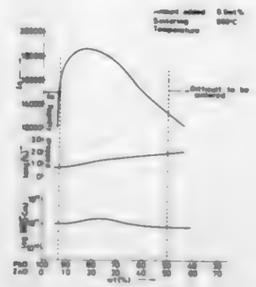
Claims priority, application Japan, May 2, 1985, 60-93741

Int. Cl.⁴ C04B *35/46*

U.S. Cl. 501—136 **10 Claims**

1. High dielectric porcelain composition consisting essentially of a $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ - $PbTiO_3$- $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ system having about 95 mol. % of $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$, about 5 mol. % of $PbTiO_3$, about 0.5 weight % of $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$, and having distributed therethrough, in addition, a sintering temperature lowering effective amount of PbO and ZnO,

wherein said sintering temperature lowering effective amount of said PbO and ZnO is between about 0.25–1.25% by weight of the weight of said $Pb(Mg\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ - $PbTiO_3$ - $Pb(Mn\ \frac{1}{3}, Nb\ \frac{2}{3})O_3$ system, and



wherein said sintering temperature lowering effective amount includes about 50–93% by weight of said PbO and about 7–50% by weight of said ZnO.

4,692,423

METHOD FOR PREPARING STRUCTURED CATALYTIC SOLIDS

Philip D. Caesar, St. John, British Virgin Isls., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1985, Ser. No. 804,552

Int. Cl.⁴ B01J *29/06, 27/20*

U.S. Cl. 502—62 **28 Claims**

1. A method for manufacturing a structured catalytic solid comprising a zeolite and a porous support, said zeolite being uniformly distributed on a surface of said porous support, which comprises admixing said zeolite with an organic polymerizable cyclic oxide solvent under polymerizing conditions thereby forming a fluid sol comprising a polymerized organic component and reactively deflocculated zeolite, contacting said sol with said surface of said porous support thereby coating said surface, and substantially removing residual solvent and said polymerized organic component from the coated surface, provided that where said porous support is an inorganic oxide, the particle size of said support ranges from about 20 μ to 1 inch.

8. The method described in claim 1 wherein said porous support comprises carbon.

10. The method described in claim 1 wherein said organic polymerizable cyclic oxide solvent is selected from the group consisting of tetrahydrofuran, 1,2-epoxycyclohexane and 1,2-epoxypropane.

14. The method described in claim 1 wherein said zeolite contains 0.01 to 10 wt. % of a platinum-group metal.

4,692,424

DRY IMPREGNATED MANGANESE ZEOLITE

Raymond Le Van Mao, Montreal, Canada, assignor to The Asbestos Institute, Montreal, Canada

Continuation-in-part of Ser. No. 688,639, Jan. 3, 1985, Pat. No. 4,615,995. This application Jun. 17, 1986, Ser. No. 875,191

Int. Cl.⁴ B01J *29/28, 21/16*

U.S. Cl. 502—68 **2 Claims**

1. A process for the dry incorporation of manganese ions on the external reactive sites of Zn-ZSM-5 or Zn-ZSM-11 pentasil which comprises mixing a Zn-ZSM-5 or Zn-ZSM-11 zeolite with bentonite, impregnating the dry mixture with a minimum amount of a solution of a manganese salt thereby to form a malleable paste and extruding said paste under pressure whereby the manganese ions are affixed to the surface reactive sites of the treated zeolite.

4,692,425

CATALYST FOR REDUCING THE NITROGEN OXIDE CONTENT OF FLUE GASES

Michael Schneider, Ottobrunn-Riemerling; Karl Kochloefl, Moosburg; Gerd Maletz, Landshut, and Hans J. Wernicke, Geretsried, all of Fed. Rep. of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,168

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524160

Int. Cl.⁴ B01J *20/12*

U.S. Cl. 502—81 **18 Claims**

1. A catalyst, active for the reduction of NO_x in flue gases, which comprises an acid-activated, three layer silicate, in which the three layered structure is substantially intact after acid activation.

2. A catalyst, as defined in claim 1, in which said multilayer silicate has a cation exchange capacity of ≧30 mVal/100 g before acid activation.

3. A catalyst, as defined in claim 1, in which the acid activation of said layer silicate has increased the BET surface area by at least 15%, as compared to the BET surface area of said layer silicate prior to acid activation.

7. A catalyst, as defined in claim 1, in which the acid-activated layer silicate is a smectite.

4,692,426

PHOSPHITE-PROMOTED RUTHENIUM-COBALT CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ACETALS TO FORM GLYCOL ETHERS

D. Michael Duggan, Drexel Hill; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,971, Oct. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 623,059, Jun. 21, 1984, abandoned. This application Aug. 29, 1986, Ser. No. 901,861

Int. Cl.⁴ B01J *31/20*

U.S. Cl. 502—154 **24 Claims**

1. Composition consisting essentially of

(a) an organophosphite of the formula

$$P(OR')_3$$

wherein each of the R' groups, which may be the same or different, is hydrogen, alkyl, cycloakyl, or aryl; and

(b) a ruthenium-cobalt carbonyl compound or mixture of ruthenium carbonyl and cobalt carbonyl compounds selected from the group consisting of:

(1) a mixture of $Co_2(CO)_8$ and $Ru_3(CO)_{12}$;

(2) $Co_2Ru(CO)_{11}$; and

(3) a mixture of $R^5CCo_3(CO)_9$ and $Ru_3(CO)_{12}$,

wherein R^5 is hydrogen; alkyl; cycloalkyl or alkyl-substituted cycloalkyl; alkoxy; aryl or alkyl-, cyclo-alkyl-, alkoxy-, halo-, or cyano-substituted aryl; or a silyl moiety of the formula R_3^6Si, wherein R^6 is alkyl or aryl.

4,692,427

DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM

Ronald L. Pastorino, San Anselmo, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, Richmond, Calif.

Filed Nov. 25, 1986, Ser. No. 934,734

Int. Cl.⁴ C08J *9/08*

U.S. Cl. 502—160 **14 Claims**

1. An aqueous dispersion for use in foaming and curing polyester resins comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; a dispersion stabilizing amount of magnesium aluminum silicate and alkali metal carboxymethyl cellulose; and sufficient water to form an aqueous dispersion.

4,692,428

PREPARATION AND USE OF CATALYSTS COMPRISING MIXTURES OF TUNGSTEN OXIDE AND SILICA ON ALUMINA

Lawrence L. Murrell, South Plainfield; Nicholas C. Dispenziere, Jr., Wall, and Richard S. Polizzotti, Milford, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 31, 1985, Ser. No. 815,201

Int. Cl.⁴ B01J *23/30, 21/12*

U.S. Cl. 502—254 **12 Claims**

1. As a composition of matter, a compound prepared by (i) forming a composite of a mixture of (a) tungsten-containing particles selected from the group consisting of tungsten oxide, tungstic acid, tungsten compounds capable of being converted to tungsten oxide when treated with steam, and mixtures thereof, (b) silicon-containing particles selected from the group consisting of silica, silicic acid and silicon compounds insoluble in polar and non-polar solvents and which are capable of being converted to silica when treated with steam in a non-reducing atmosphere and (c) particles of porous alumina, and (ii) steaming said composite at an elevated temperature of at least about 500° C. in a non-reducing environment and in the presence of steam for a time sufficient for at least a portion of the tungsten oxide and silica to react with the alumina surface.

4,692,429

CATALYST COMPOSITION AND MULTI-FUNCTIONAL SENSOR

Satoshi Sekido, Yawata; Hirokazu Tachibana, Kyoto, and Yasuharu Yamamura, Katano, all of Japan, assignors to Research Association of Electric Conductive Inorganic Compounds, Tokyo, Japan

PCT No. PCT/JP85/00163, § 371 Date Dec. 23, 1985, § 102(e) Date Dec. 23, 1985, PCT Pub. No. WO85/04859, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 3, 1985, Ser. No. 826,495

Claims priority, application Japan, Apr. 25, 1984, 59-84353; May 30, 1984, 59-109812; Jul. 6, 1984, 59-140878

Int. Cl.⁴ B01J *23/10, 23/58, 23/78*

U.S. Cl. 502—303 **14 Claims**

1. A composition comprising a mixture of $Sr_{(1+x)/2}La_{(1-x)/2}Co_{1-x}Me_xO_{3-\delta}$ wherein $0 \leqq x \leqq 1$; δ represents loss of oxygen, and Me is at least one of Fe, Mn, Cr and V;

$SrMeO_3$, wherein Me is at least one of Ti, Zr and Hf; and at least one Pt group metal.

4,692,430

ZINC ALUMINATE DOUBLE BOND ISOMERIZATION CATALYST AND PROCESS FOR ITS PRODUCTION

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 745,556, Jun. 17, 1985, Pat. No. 4,620,053. This application Jun. 30, 1986, Ser. No. 880,266

Int. Cl.⁴ B01J *21/04, 23/06*

U.S. Cl. 502—342 **8 Claims**

1. A process for preparing an activated double bond isomerization catalyst, said process comprising the steps of:

calcining a composition which essentially consists of zinc aluminate in an oxygen containing atmosphere at a temperature of about 250° C. to about 800° C. for a time of about 1 hour to about 30 hours;

contacting the thus calcined composition with a reducing gas selected from the group consisting of carbon monoxide and nitric oxide at a temperature of about 400° C. to about 750° C. for a time of about 1 minute to about 30 hours.

4,692,431

HYDROUS OXIDE ACTIVATED CHARCOAL

Joseph P. Weller, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1985, Ser. No. 809,441

Int. Cl.[4] B01J *20/20, 20/10, 20/08;* **B01D** *15/04*

U.S. Cl. 502—417 **15 Claims**

1. A process for preparing of an ion exchanger, comprising:

treating an ionically inert activated charcoal porous support with an aqueous solution of metal oxychloride selected from the group consisting of zirconium and titanium oxychlorides so as to impregnate the pores of said support with said solution;

separating said treated support from excess metal oxychloride solution;

converting said metal oxychloride to a hydrous metal oxide precipitate in the pores of said support at a pH above 8 and above the pH whereat the hydrous metal oxide and activated charcoal support have opposite zeta potentials and sufficient to hydrolyze said metal oxychloride.

13. A process for preparing an ion exchanger comprising:

treating granulated activated charcoal with a concentrated solution of a metal oxychloride from the group consisting of zirconium and titanium oxychlorides.

degassing said mixture; and

treating the resultant mixture with a base selected from the group consisting of ammonium hydroxide and alkali metal hydroxides so as to precipitate said oxychloride within the pores of said activated carbon granules as hydrous metal oxide at a pH above 8 and above the pH whereat the hydrous metal oxide and activated charcoal have opposite zeta potentials.

4,692,432

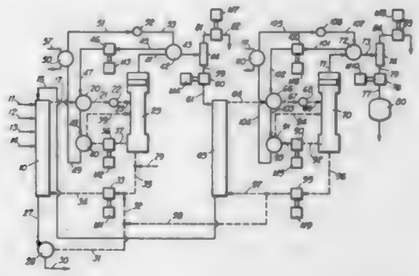
TWO CYCLE PROCESS FOR PRODUCING FUEL-GRADE ETHANOL FROM DILUTE AQUEOUS MIXTURES

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 534,262, Sep. 21, 1983, Pat. No. 4,517,298, which is a continuation of Ser. No. 265,328, May 18, 1981, abandoned, and a continuation-in-part of Ser. No. 544,813, Oct. 10, 1983, Pat. No. 4,510,242, which is a continuation of Ser. No. 283,739, Jul. 15, 1981, abandoned. This application Aug. 12, 1985, Ser. No. 764,390

Int. Cl.[4] C07C *29/86, 31/08*

U.S. Cl. 568—916 **17 Claims**



1. A process of producing alcohol comprising feeding a dilute aqueous mixture containing said alcohol to a first solvent extraction column, feeding an organic solvent for said alcohol, which solvent is essentially immiscible with water, to said first extraction column for admixing with said aqueous mixture containing said alcohol, to dissolve the alcohol therefrom for forming an alcohol-organic solvent extract phase containing residual amounts of water, and a raffinate containing water and residual amounts of entrained solvent, alcohol and solids, separating said alcohol-organic solvent phase from said raffinate, vacuum stripping the water and alcohol from said extract phase, condensing the vacuum stripped water and alcohol and passing said alcohol-water to a second solvent extraction column serving as a drying column to obtain a second alcohol-organic solvent extract phase being relatively water free, separating the entrained solvent from said raffinate and returning said entrained solvent to said first solvent extraction column, passing the second alcohol-solvent extract phase from said second solvent extraction column to a vacuum stripper for separating the alcohol from the organic solvent and returning the organic solvent to said second solvent extraction column.

4,692,433

METHOD AND COMPOSITION FOR REGULATING SERUM CALCIUM LEVELS OF MAMMALS

Karl Y. Hostetler, and Leonard J. Deftos, both of Del Mar, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 541,125, Oct. 12, 1983, abandoned. This application Aug. 1, 1985, Ser. No. 761,751

Int. Cl.[4] A61K *31/245, 9/42, 37/30, 37/24*

U.S. Cl. 514—12 **22 Claims**

1. A method for regulating blood calcium levels in a mammal which comprises: orally administering to said mammal a blood calcium-regulating effective amount of a composition consisting essentially of an aqueous solution of a polypeptide hormone selected from the group consisting of parathyroid hormone and calcitonin, said polypeptide hormone being encapsulated in a liposome.

4,692,434

DIFLUORO ANTIVIRALS AND INTERMEDIATE THEREFOR

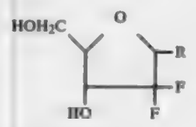
Larry W. Hertel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 473,883, Mar. 10, 1983, Pat. No. 4,526,988. This application Dec. 4, 1984, Ser. No. 677,146

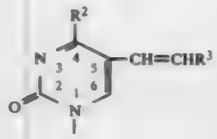
Int. Cl.[4] A61K *31/70;* **C07H** *17/00*

U.S. Cl. 514—49 **4 Claims**

1. A nucleoside of the formula



wherein R is a base of the formula



wherein

R^2 is amino;

R^3 is hydrogen, bromo, chloro or iodo.

3. A method of treating Herpes viral infections in mammals comprising administering to a mammal in need of such treatment an anti-Herpes viral effective amount of a compound of claim 1.

4,692,435

MUCOPOLYSACCHARIDE COMPOSITION HAVING A REGULATORY ACTION ON COAGULATION, MEDICAMENT CONTAINING SAME AND PROCESS OF PREPARATION

Jean-Claude Lormeau, Maromme-la-Maine; Jean Goulay, Oissel, and Jean Choay, Paris, all of France, assignors to Choay, S.A., Paris, France

Continuation of Ser. No. 204,505, Nov. 5, 1980, abandoned. This application Apr. 23, 1985, Ser. No. 726,178

Claims priority, application France, Nov. 6, 1978, 78 31357; Jul. 20, 1979, 79 18873

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **48 Claims**

33. A therapeutic composition which presents less risks than heparin of blood hypercoagulation and of a host hemorrhaging, which composition has improved antithrombotic activity (anti-X_a activity) and improved selectivity with respect to anti-X_a activity than heparin in vivo and a lower and slower anticoagulation activity than heparin, and which composition comprises a therapeutically acceptable carrier and an antithrombotic effective amount of heparinic mucopolysaccharide fractions having constituents of a molecular weight not in excess of about 10,000 daltons, which fractions have (1) a mixture of lower molecular weight fractions in the range of about 2,000 to about 4,000 daltons with higher molecular weight fractions of a molecular weight in the range of about 4,000 to about 10,000 daltons, (2) a Yin-Wessler of at least 40, and (3) a ratio of Yin-Wessler to USP titer in the range of 3 to 5, which mixture of fractions have improved antithrombotic activity in vivo which is higher than that of heparin and a whole anticoagulation activity lower than that of heparin, and the physiologically acceptable salts thereof.

4,692,436

PHOSPHOROIMIDATES AS PESTICIDES

Toyohiko Kume; Shinichi Tsuboi, and Kunihiro Isono, all of Hino, Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

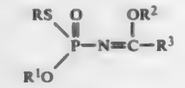
Filed May 9, 1986, Ser. No. 861,471

Claims priority, application Japan, May 14, 1985, 60-100607

Int. Cl.[4] A01N *57/02;* **C07F** *9/24*

U.S. Cl. 514—129 **10 Claims**

1. A phosphoroimidate of the formula



wherein

R represents n-propyl or sec.-butyl,

R^1 represents methyl or ethyl,

R^2 represents methyl or ethyl, and

R^3 represents alkyl having from 3 to 4 carbon atoms.

9. A method of combating insects, acarids or nematodes which comprises applying thereto or to a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 1.

4,692,437

ANTI-HYPERTENSIVE AGENTS

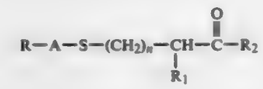
James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation-in-part of Ser. No. 116,951, Jan. 30, 1980, abandoned, Ser. No. 116,950, Jan. 30, 1980, Ser. No. 64,897, Aug. 14, 1979, Ser. No. 64,898, Aug. 14, 1979, Ser. No. 64,899, Aug. 14, 1979, Ser. No. 64,900, Aug. 14, 1979, Ser. No. 64,901, Aug. 14, 1979, Ser. No. 64,902, Aug. 14, 1979, and Ser. No. 64,903, Aug. 14, 1979, said Ser. No. 116,950, is a continuation of Ser. No. 941,289, Sep. 11, 1978, abandoned. This application Jun. 5, 1980, Ser. No. 156,749

Int. Cl.[4] A61K *31/425, 31/40;* **C07D** *207/00, 277/04*

U.S. Cl. 514—165 **8 Claims**

1. A new compound comprising physiologically acceptable salts of compounds having the formula



wherein

R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-lysyl, L-arginyl or pyro-L-glutamyl;

A is phenylalanyl, glycyl, alanyl, tryptophyl, tyrosyl, isoleucyl, leucyl, histidyl or valyl, the α-amino group thereof being in amide linkage with R unless R is hydrogen;

R_1 is hydrogen or methyl;

R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline, L-thiazolidine-4-carboxylic acid, or L-5-oxo-proline, the imino group thereof being in imide linkage with the adjacent



and,

n is 0 or 1, such that when n is 0, R_1 is methyl.

4,692,438

PYRIDAZO-DIAZEPINES, DIAZOCINES, AND -TRIAZEPINES HAVING ANTI-HYPERTENSIVE ACTIVITY

Cedric H. Hassall, Harpenden; Geoffrey Lawton, Hitchin, and Sally Redshaw, Stevenage, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

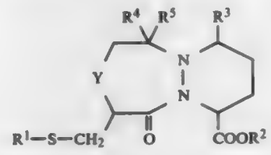
Filed Aug. 12, 1985, Ser. No. 764,372

Claims priority, application United Kingdom, Aug. 24, 1984, 8421493; May 29, 1985, 8513541

Int. Cl.[4] A61K *31/50;* **C07D** *245/00, 487/06, 237/02*

U.S. Cl. 514—183 **18 Claims**

1. A diastereomeric compound of the formula



I

wherein R^1 is hydrogen, alkanoyl of up to 8 carbon atoms, benzoyl, or benzoyl substituted by one substituent selected from the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoro-

methyl; R^2 is hydrogen or alkyl of 1 to 8 carbon atoms; R^3 is hydrogen, phenyl or phenyl substituted by one substituent selected form the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoromethyl; R^4 and R^5 each are hydrogen or R^4 and R^5 taken together are oxo; and Y is $—CH_2—$, $—CH_2CH_2—$ or $—N(R^6)—$ in which R^6 is hydrogen, alkyl of 1 to 8 carbon atoms or alkyl of 1 to 8 carbon atoms bearing a phenyl or a phenyl substituted by one substituent selected from the group consisting of halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms and trifluoromethyl,

its diastereomeric racemate or mixtures thereof, as well as a pharmaceutically acceptable salt thereof with a base when R^2 is hydrogen, or a pharmaceutically acceptable salt thereof with an acid when Y is $—N(R^6)—$.

6. A compound, in accordance with claim 1, wherein R^1, R^2 and R^3 each are hydrogen, and R^4 and R^5 taken together are oxo.

4,692,439

THERAPEUTIC USE OF TIN DIIODODEUTEROPORPHYRIN

Darryl Rideout, Del Mar, Calif.; Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, N.Y.

Division of Ser. No. 876,921, Jan. 20, 1986, Pat. No. 4,668,670. This application Jan. 29, 1987, Ser. No. 8,869

Int. Cl.⁴ A61K *31/555*

U.S. Cl. 514—185 **1 Claim**

1. A method of increasing the rate of tryptophan metabolism in the liver of humans in need of such increase which comprises parenteral administration of an amount of tin diiododueteroporphyrin which is effective to increase such rate.

4,692,440

THERAPEUTIC USE OF TIN MESOPORPHYRIN

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 715,515, Mar. 25, 1985, Pat. No. 4,657,902. This application Oct. 24, 1986, Ser. No. 922,699

Int. Cl.⁴ A61K *31/555*

U.S. Cl. 514—185 **10 Claims**

1. A method of increasing the rate at which heme is excreted by a mammal in need of such increased disposal of heme, which comprises parenteral administration of an amount of the tin mesoporphyrin which is sufficient to effect such increase.

10. A method of increasing the rate of tryptophan metabolism in the liver of humans in need of such increase which comprises parenteral administration of an amount of tin mesoporphyrin which is effective to increase such rate.

4,692,441

CHORINE ESTERS AS ABSORPTION-ENHANCING AGENTS FOR DRUG DELIVERY THROUGH MUCOUS MEMBRANES OF THE NASAL, BUCCAL, SUBLINGUAL AND VAGINAL CAVITIES

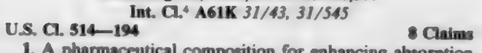
Jose Alexander; A. J. Repta, and Joseph A. Fix, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 16, 1985, Ser. No. 766,377

Int. Cl.⁴ A61K *31/43, 31/545*

U.S. Cl. 514—194 **8 Claims**

1. A pharmaceutical composition for enhancing absorption from the nasal, buccal, sublingual or vaginal cavities comprising a therapeutically effective dosage amount of a β-lactam antibiotic drug and choline ester a absorption enhancing agent of the formula:



wherein R is saturated acyl (C_2–C_{20}), acyl (C_2–C_{20}) with 1 to 6 double bonds, hydroxyacyl (C_2–C_{20}) with 1 to 3 hydroxy groups, ketoacyl (C_4–C_{20}), unsaturated hydroxyacyl (C_5–C_{20})-,carboxyacyl (C_4–C_{20}), arylacyl (C_7–C_{20}), alkylaroyl(C_7–C_{20}) or carbalkoxyacyl (C_5–C_{20}) and X is a pharmaceutically acceptable counterion.

4,692,442

6-SUBSTITUTED PENEM COMPOUNDS

Jacques Gosteli, Basel; Ivan Ernest, Birsfelden, both of Switzerland; Marc Lang, Mulhouse, France, and Robert B. Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

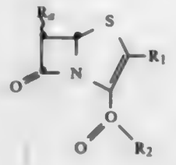
Continuation of Ser. No. 7,453, Jan. 29, 1979, abandoned. This application Nov. 18, 1980, Ser. No. 208,105

Claims priority, application Switzerland, Feb. 2, 1978, 1140/78-3

Int. Cl.⁴ C07D *499/00*; A61K *31/43*

U.S. Cl. 514—195 **16 Claims**

1. A 2-penem-3-carboxylic acid compound of the formula



(I)

wherein R_a is hydroxy-lower alkyl; R_1 is hydrogen, lower alkyl, hydroxy-lower alkyl, lower alkoxy-lower alkyl, lower alkanoyloxy-lower alkyl, lower alkylthio-lower alkyl, amino lower alkyl, lower alkanoyl-amino-lower alkyl, carboxy-lower alkyl, phenyl; phenyl substituted by lower alkyl, lower alkoxy, hydroxy, halogen, nitro, or by amino; furyl, thienyl, pyridyl; lower alkenylthio or lower alkylthio which is unsubstituted or substituted by lower alkoxy, lower alkanoyloxy, lower alkoxycarbonyl, carbamoyl, cyano, nitro, amino or by amino which is mono or di substituted by (a) lower alkyl or (b) lower alkanoyl; and R_1 is not 2-aminoethylthio; and R_2 is hydroxy; the corresponding compounds in which the functional groups are conventionally protected, or a pharmaceutically acceptable salt thereof.

4,692,443

3-BICYCLICPYRIDINIUM-METHYL CEPHALOSPORINS

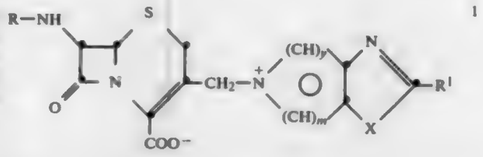
Allen S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 542,619, Oct. 17, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 679,717

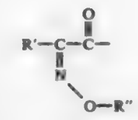
Int. Cl.⁴ C07D *501/38*; A61K *31/545*

U.S. Cl. 514—206 **59 Claims**

1. A compound of the formula

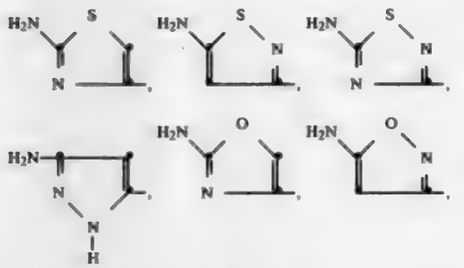


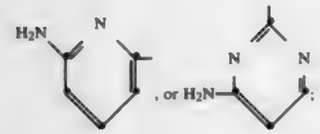
wherein R is hydrogen, formyl, α-aminodipoyl, protected α-aminoadipoyl, or an acyl group of the formula



wherein

R' is 5- or 6-membered heterocyclic ring of the formulas

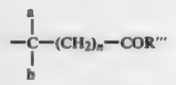




, or

;

R'' is hydrogen, C_1–C_4 alkyl, a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group of the formula



wherein n is 0–3; a and b when taken separately are independently hydrogen or C_1–C_3 alkyl, and when taken together with the carbon to which they are bonded form a C_3–C_7 carbocyclic ring; R''' is hydroxy, C_1–C_4 alkoxy, amino, or OR*, wherein R* is indanyl, phthalidyl, or an acyloxymethyl group of the formula $—CH_2—O—C(O)—R_2$ wherein R_2 is C_1–C_4 alkyl or phenyl; or R* is a carboxy-protecting group;

or R'' is an N-substituted carbamoyl group of the formula



wherein

R'''' is C_1–C_4 alkyl, phenyl or C_1–C_3 alkyl substituted by phenyl;

y and m independently are integers equal to 0, 1, 2 or 3, provided that y plus m equals 3;

R^1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, thienyl, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino, di-C_1–C_4 alkylamino, hydroxycarbonyl, C_1–C_4 alkoxycarbonyl, or phenyl or phenylcarbonyl in which the phenyl groups may be subsituted by one or two groups selected from C_1–C_4 alkoxy, C_1–C_4 alkyl or C_1–C_4 alkylthio;

X is O or S; and the pharmaceutically acceptable salts and biologically labile esters thereof.

4,692,444

1,4-DIHYDRO[1]BENZOTHIOPYRANO[4,3-c]PYRAZOLE DERIVATIVES, COMPOSITIONS CONTAINING THEM, AND PHARMACOLOGICAL METHODS OF USING THEM

Ikuo Ueda, Uenohigashi; Yonichi Shiokawa, Ibaraki; Takashi Manabe, Kawanishi, and Yousuke Katsura, Uenonishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

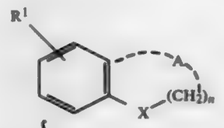
Filed Mar. 5, 1986, Ser. No. 836,402

Claims priority, application United Kingdom, Mar. 26, 1985, 8507782

Int. Cl.⁴ A61K *31/415*; C07D *495/04*

U.S. Cl. 514—406 **17 Claims**

1. A compound of the formula:



(I)

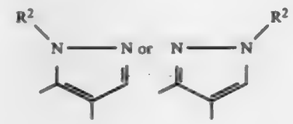
wherein R^1 is halogen, nitro, amino, hydroxy, lower alkyl, lower alkoxy or acylamino,

X is



n is an integer of 1 or 2 and

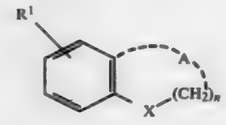
A is a group of the formula:



in which

R^2 is hydrogen, lower alkyl, lower alkynyl, carboxy(lower-)alkyl or protected carboxy(lower)alkyl, or pharmaceutically acceptable salt thereof.

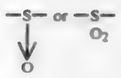
15. A method of treatment of a subject requiring a diuretic agent, uricosuric agent or antihypertensive agent which comprises administering to said subject in need of said treatment an effective amount of compound I, or pharmaceutically acceptable salt thereof, compound I being of the formula:



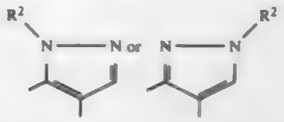
wherein

R^1 is halogen, nitro, amino, hydroxy, lower alkyl, lower alkoxy or acylamino,

x is -S-,



n is an integer of 1 or 2 and
A is a group of the formula:



in which
R^2 is hydrogen, lower alkyl, lower alkynyl, carboxy(lower-)alkyl or protected carboxy(lower)alkyl, or pharmaceutically acceptable salt thereof.

4,692,445

BICYCLIC BENZENOID AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

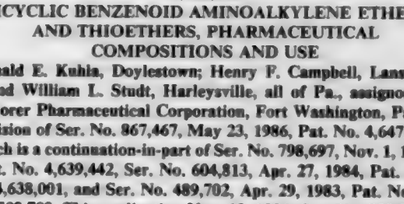
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 867,467, May 23, 1986, Pat. No. 4,647,559, which is a continuation-in-part of Ser. No. 798,697, Nov. 1, 1985, Pat. No. 4,639,442, Ser. No. 604,813, Apr. 27, 1984, Pat. No. 4,638,001, and Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Nov. 12, 1986, Ser. No. 929,592

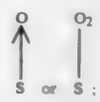
Int. Cl.[4] A61K *31/425, 31/535;* **C07D** *275/06, 413/12*

U.S. Cl. 514—212 **19 Claims**

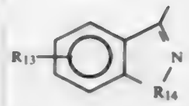
1. A compound of the formula:



wherein:
a is 0, 1 or 2;
b is 0 or 1;
c is b, 1−b, 2−b or 3−b;
d is 0 or 1
e is 2, 3 or 4;
X is oxygen, sulfur,



Z is $-NHR_4$;
R, R′ and R″ are each independently H, alkyl, or aralkyl;
R_1 is $-NR_2R_3$;
R_2 and R_3 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;
R_4 is selected for the group consisting of



R_{13} is H, halo, amino, nitro, cyano, hydroxy, lower alkyl, lower alkoxy, lower alkanoyl, cycloloweralkyl, mono- or dilower alkyl amino, lower alkanoyl, lower alkanoyl amino, halololweralkyl, aryl, mercapto, loweralkoxy carbonyl, carboxy, loweralkylthio, loweralkylsulfonyl, sulfamoyl, or lower alkyl sulfamoyl;
R_{14} is SO_2, SO, S or C=O;
or a pharmaceutically acceptable salt thereof.

18. A method for the treatment of gastrointestinal hyperacidity and ulceration in a mammal comprising administering thereto an effective amount of a compound according to claim 1.

4,692,446

ESTERS OF ARYLOXYPROPANOLAMINE DERIVATIVES AND MEDICINAL USES

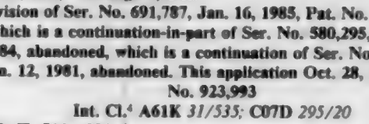
Paul W. Erhardt, Long Valley, N.J., and William L. Matier, Libertyville, Ill., assignors to E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.

Division of Ser. No. 691,787, Jan. 16, 1985, Pat. No. 4,623,652, which is a continuation-in-part of Ser. No. 580,295, Feb. 21, 1984, abandoned, which is a continuation of Ser. No. 320,772, Jan. 12, 1981, abandoned. This application Oct. 28, 1986, Ser. No. 923,993

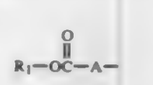
Int. Cl.[4] A61K *31/535;* **C07D** *295/20*

U.S. Cl. 514—234 **10 Claims**

1. A compound of the formula



wherein R_1 is lowenalkyl, lower cycloalkyl, aryl, or aralkyl; A is a direct bond, lower alkylene, or lower alkenylene; x is 1 or 2, provided that when x is greater than 1, different occurrences of the



group may be the same or different; Ar is phenyl, or naphthyl unsubstituted or substituted with lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, halogen, acetamido, amino, nitro, lower alkylamino, hydroxy, lower hydroxyalkyl, or cyano; W is alkylene containing from 1 to about 10 carbon atoms; B is $-NR_2CONR_3R_4$, wherein R_2 is hydrogen or alkyl of from 1 to about 6 carbon atoms and wherein R_3 and R_4 together with N form a morpholinyl group, or a pharmaceutically acceptable salt thereof.

7. A method for the treatment of prophylaxis of cardiac disorders in a mammal comprising administering to such mammal a short-acting β-blocking compound of the formula as in claim 1 and the pharmaceutically acceptable salts thereof.

9. A method of treating glaucoma or lowering intraocular pressure in a mammal, which comprises topically applying to the eye of said mammal an intraocular pressure-lowering effective amount of a compound of the formula as in claim 1 and the pharmaceutically acceptable salts thereof.

4,692,447

TRICYCLIC DIHYDROPYRIDAZINONES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Giorgio Cignarella; Carmelo A. Gandolfi; Odoardo Tofanetti; Piervitto Cipolla, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin, S.p.A., Milan, Italy

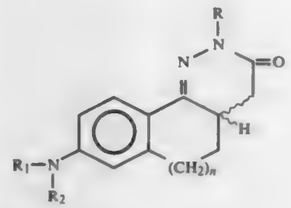
Filed Jul. 22, 1985, Ser. No. 757,429

Claims priority, application United Kingdom, Jul. 27, 1984, 8419253

Int. Cl.[4] C07D *237/36;* **A61K** *31/50*

U.S. Cl. 514—248 **7 Claims**

7. An antihypertensive, vasodilating, anti-aggregating, anti-thrombotic or cytoprotective pharmaceutical or veterinary composition in a form suitable for adminstration by intravenous, subcutaneous, intramuscular, rectal or implant routes, said composition comprising a pharmaceutically and/or veterinarily acceptable carrier and/or diluent and an antihypertensively, vasodilatingly, anti-aggregatingly, anti-thrombotically or cytoprotectively effective amount of a compound of formula I



wherein;
n is zero or an integer of 1 to 2
R is hydrogen, C_1–C_6 lower alkyl, $-CH_2-CH=CH_2$, $-CH_2-C\equiv CH$ and $(CH_2)_m-C_6H_5$ where m is zero or an integer of 1 to 3;
at least one of R_1 and R_2 is selected from the group consisting of
(a) R_3-CO- wherein R_3 is selected from the group consisting of a C_1–C_{16} branched or unbranched alkyl chain which may be substituted by hydroxy, amino, halogen, thiol, or free or esterified carboxy group; a heterocyclic ring wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of nictoinic, isonicotinic, pyrazol-3-carboxylic, isoxazol-3-carboxylic, isoxazol-5-carboxylic, 2-thiophencarboxylic and 2-furylcarboxylic acids; an aromatic ring wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of benzoic, toluic, 3,4,5-trimethoxybenzoic, p-hydroxy-3,5-dimethoxybenzoic, p-fluorobenzoic, p-chlorobenzoic, p-aminobenzoic, salicyclic, and p-hydroxybenzoic acid; a C_3–C_7 cycloaliphatic ring; a C_4–C_{15} cycloaliphatic alkyl group; phenyl lower alkyl or phenoxy lower alkyl; moieties wherein R_3CO is the acyl part of a carboxylic acid R_3CO_2H selected from the group consisting of 1-imidazolylacetic, 2-furylpropionic, 2-tetrahydrofurylpropionic, cinnamic, 2-fluoro-cinnamic, and caffeic acid; a lower C_1–C_6 alkoxy, benzyloxy or NHR_6 group, wherein R_6 is hydrogen, C_1–C_6 lower alkyl or $-CH_2-C_6H_5$;
(b) R_4SO_2-, wherein R_4 is CH_3, C_2H_5, phenyl or p-methylphenyl; and the other of R_1 and R_2 is selected from the group consisting of hydrogen, C_1–C_6 lower alkyl, $(CH_2)_m-C_6H_5$, $(CH_2)_m-C_6H_{11}$, $(CH_2)_m-C_5H_9$ where m is zero or an integer of 1 to 3, $-CH_2-CH=CH_2$, $-CH_2-C\equiv CH$, R_3-CO-, and R_4SO_2-
and racemic or optically active enantiomers;
and pharmaceutically acceptable salts thereof.

4,692,448

BIS(ARYLPIPERAZINYL)SULFUR COMPOUNDS

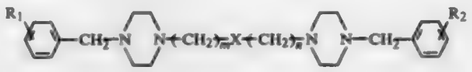
John P. Devlin, Sharon, and Karl D. Hargrave, Brookfield Center, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Filed Nov. 20, 1984, Ser. No. 673,474

Int. Cl.[4] A61K *31/495;* **C07D** *403/12*

U.S. Cl. 514—252 **18 Claims**

1. A compound of the formula:



wherein
R_1 and R_2 are each independently hydrogen, lower alkyl, halogen, nitrile or methylthio; m and n are each independently 2 or 3; and X is dithio or thio, and nontoxic, pharmaceutically acceptable addition salts thereof.

4,692,449

SUBSTITUTED QUINOLINEDIONES

Jeffrey B. Medwid, West Nyack, and Lawrence W. Torley, Washingtonville, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

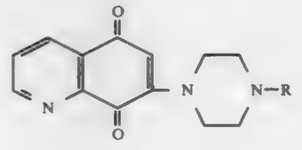
Filed Jun. 20, 1986, Ser. No. 876,600

Int. Cl.[4] A61K *31/495;* **C07D** *401/04*

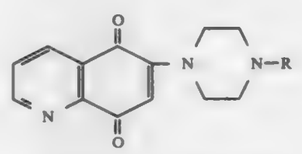
U.S. Cl. 514—254 **10 Claims**

1. A compound selected from the group consisting of those of the formulae:

(I)



(II)



wherein R is alkyl(C_1–C_3), carboalkoxy(C_2–C_4), alkanoyl(C_1–C_3), benzyl, phenyl, m-trifluoromethylphenyl, 2-pyridyl, 2-pyrimidyl, 2-benzoxazolyl or 2-benzo-thiazolyl and the pharmacologically acceptable acid-addition salts thereof.

8. A method of treating asthma and allergic diseases in a mammal which comprises administering to said mammal an effective amount of a compound of claim 1.

4,692,450

PHENYL-PYRIMIDINIUM, THIAZOLIUM OR IMIDAZOLIUM SALTS AND USE IN INHIBITING INTESTINAL RESORPTION OF CHOLESTEROL AND BILE SALTS

Jean-Marie Cassal, Mulhouse, France; Albrecht Edenhofer, Riehen, and Henri Ramuz, Birsfelden, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jan. 10, 1986, Ser. No. 817,638

Claims priority, application Switzerland, Jan. 16, 1985, 187/85

Int. Cl.[4] C07D *211/70, 211/82, 213/46, 239/02*

U.S. Cl. 514—256 **7 Claims**

1. A polycyclic salt of the formula



I

wherein
A^- is an anion of a strong organic or inorganic acid;
XN^+ is, pyrimidinium, thiazolium or imidazolium substituted by R^1, R^2 and R^3;
n, q and r individually are the integer 1 or 0 and p is an integer from 1 to 15;
Y is CH_2, C(H,OH) or C(O);
Z is O, S, CH_2, C(O), NQ^1, SO_2, C(O)O, OC(O), $C(O)N(Q^1)$ or $N(Q^1)C(O)$;
L is p-phenylene substituted by R^4; and
M is phenyl substituted by R^5 and R^6,
T has one of the meanings given above, for Z or is $C(CH_3)_2$, C_2H_4, $C(Q^2)=C(Q^3)$, (C)C, $CH_2C(O)$, $C(O)CH_2$, CH_2O or OCH_2,
R^1 is a group Ar, Ar—C_{1-4}-alkyl, ArO or ArC(O),
Ar is phenyl substituted by R^7, R^8 and R^9;
R^2 and R^3 individually are H, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_6H_5,
with the proviso that the N-atom in the 3-position of an imidazolium group XN^+ is substituted by Ar, Ar—C_{1-4}-alkyl or C_{1-4}-alkyl,
R^4, R^5, R^6, R^7, R^8 and R^9 individually are H, halogen, CF_3, NO_2, CN, C_{1-4}-(alkyl, alkoxy, alkylthio or alkylsulphonyl), $SO_2N(R,Q)$, C(O)N(Q^4,Q^5), C(O)Q^4, C(O)OQ^4 or OC(O)Q^4,
R, Q, Q^1, Q^2 and Q^3 individually are H or C_{1-4}-alkyl, and
Q^4 and Q^5 individually are C_{1-4}-alkyl.

6. A method of inhibiting the intestinal resorption of cholesterol or of a bile salt in a mammal, comprising administering to the mammal a salt of the formula

$$A^-XN^+CH_2—(Y)_n—(CH_2)_p—(Z)_q—L—(T)_r—M \qquad I$$

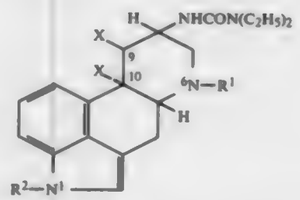
wherein
A^- is an anion of a strong organic or inorganic acid;
XN^+ is, pyrimidinium, thiazolium or imidazolium substituted by R^1, R^2 and R^3;
n, q and r individually are the integer 1 or 0 and p is an integer from 1 to 15;
Y is CH_2, C(H,OH) or C(O);
Z is O, S, CH_2, C(O), NQ^1, SO_2, C(O)O, OC(O), $C(O)N(Q^1)$ or $N(Q^1)C(O)$;
L is p-phenylene substituted by R^4; and
M is phenyl substituted by R^5 and R^6,
T has one of the meanings given above, for Z or is $C(CH_3)_2$, C_2H_4, $C(Q^2)=C(Q^3)$, (C)C, $CH_2C(O)$, $C(O)CH_2$, CH_2O or OCH_2,
R^1 is a group Ar, Ar—C_{1-4}-alkyl, ArO or ArC(O),
Ar is phenyl substituted by R^7, R^8 and R^9;
R^2 and R^3 individually are H, C_{1-4}-alkyl, C_{1-4}-alkoxy or C_6H_5,
with the proviso that the N-atom in the 3-position of an imidazolium group XN^+ is substituted by Ar, Ar—C_{1-4}-alkyl or C_{1-4}-alkyl,
R^4, R^5, R^6, R^7, R^8 and R^9 individually are H, halogen, CF_3, NO_2, CN, C_{1-4}-(alkyl, alkoxy, alkylthio or alkylsulphonyl, $SO_2N(R,Q)$, C(O)N(Q^4,Q^5), C(O)Q^4, C(O)OQ^4 or OC(O)Q^4,
R, Q, Q^1, Q^2 and Q^3 individually are H or C_{1-4}-alkyl, and
Q^4 and Q^5 individually are C_{1-4}-alkyl.

4,692,451
METHOD FOR PREVENTING STEREOTYPIC BEHAVIOR IN ANIMALS
Nicholas H. Dodman, Grafton, and Louis Shuster, Brookline, both of Mass., assignors to Trustees of Tufts College, Medford, Mass.
Filed Dec. 11, 1985, Ser. No. 807,814
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—282 9 Claims

1. A method of treating an animal exhibiting stereotypic behavior which comprises administering a therapeutically effective amount of a narcotic antagonist to said animal.

4,692,452
METHOD FOR TREATMENT OF ENDOMETRITIS IN MAMMALIAN FEMALES
Antonin Cerny; Jiri Krepelka; Karel Rezabek; Maria Fruhaufova; Milan Pesak, all of Prague; Bohumil Sevcik; Josef Kral, both of Jilove u Prahy; Antonin Borovicka, Davle; Petr Bilek; Dagmar Picmausova, both of Prague; Josef Stuchlik, Hrabyne; Josef Picha, Jilove u Prahy, and Jana Strakova, Prague, all of Czechoslovakia, assignors to SPOFA, spojene podniky pro zdravotnickou vyrobu, Prague, Czechoslovakia
Filed Jun. 12, 1986, Ser. No. 873,616
Claims priority, application Czechoslovakia, Jun. 12, 1985, 4746-85
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—288 6 Claims

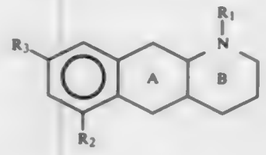
1. A method for the treatment of endometritis in mammalian females in need of said treatment comprising the administration to said mammalian female of an effective amount for treating endometritis of 1-(8-alpha-ergolinyl)-3,3-diethylurea derivative or a pharmaceutically acceptable acid addition salt thereof of Formula I



wherein R^1 is alkyl having from 1 to 3 carbon atoms, R^2 is selected from the group consisting of hydrogen and alkyl having 1 to 3 carbon atoms, and X is selected from the group consisting of hydrogen and a double bond between the carbon atoms at positions 9 and 10.

4,692,453
PHARMACEUTICAL ACTIVE 1,2,3,4,4A,5,10,10A-OCTAHYDROBENZO[G] QUINOLINE DERIVATIVES, AND THEIR USE
Max P. Seiler, Basle, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 573,513, Jan. 25, 1984, abandoned. This application Nov. 13, 1985, Ser. No. 797,563
Claims priority, application Switzerland, Feb. 1, 1983, 560/83
Int. Cl.[4] A61K *31/47*; C07D *221/08*
U.S. Cl. 514—290 7 Claims

1. A benzo[g]quinoline of formula I



(I)

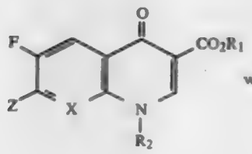
wherein
the rings A and B are trans-fused and
wherein
R_1 is (C_{1-5})alkyl,
R_2 is hydroxy or (C_{1-5})alkoxy, and
R_3 is hydrogen,
and when R_2 is hydroxy, its physiologically-hydrolysable and

-acceptable esters, in free base or in pharmaceutically acceptable salt form.

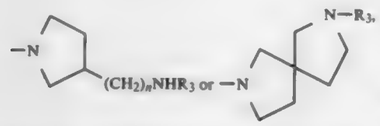
6. A method of inhibiting prolactin secretion in a subject in need of such treatment which method comprises administering to said subject an effective amount of a compound according to anyone of claims 1 in free or pharmaceutically acceptable salt form.

4,692,454
OPTHALMIC USE OF QUINOLONE ANTIBIOTICS
Thomas F. Mich, and Carl L. Heifetz, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Feb. 3, 1986, Ser. No. 825,007
Int. Cl.[4] A61K *31/47*
U.S. Cl. 514—312 10 Claims

1. A method of treating ocular bacterial infections which comprises topical ocular administration to an infected eye of an antibacterially effective amount of a compound of the formula



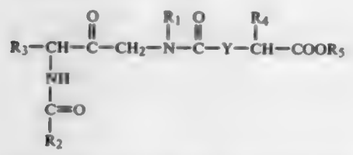
wherein Z is



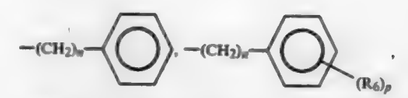
in which n is zero or one and R_3 is hydrogen, methyl, ethyl, 1- or 2-propyl; X is CH, or CF; R_1 is hydrogen or alkyl having from one to six carbon atoms; R_2 is alkyl having from one to four carbon atoms, vinyl, haloalkyl, hydroxyalkyl having from two to four carbon atoms, or cycloalkyl having three to six carbon atoms, or an ophthalmologically acceptable acid addition or base salt thereof in admixture with a nontoxic pharmaceutical organic or inorganic carrier.

4,692,455
CERTAIN ACYCLIC, ALICYCLIC, AROMATIC OR HETEROCYCLIC DERIVATIVES OF 3-BENZOYLAMINO-2-OXO-BUTYL-AMINO-CARBONYL-OXY-3-PROPANOIC ACIDS, ESTERS THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND THEIR ENKEPHALINASE INHIBITING PROPERTIES
Eric M. Gordon, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Jan. 25, 1985, Ser. No. 694,871
Int. Cl.[4] C07C *125/04, 149/437*; C07D *213/55*; A61K *31/44*
U.S. Cl. 514—332 10 Claims

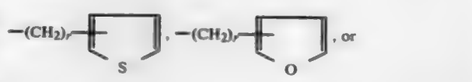
1. A compound of the formula

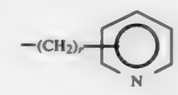


or a pharmaceutically acceptable salt thereof wherein:
Y is oxygen or sulfur;
R_1 is hydrogen, lower alkyl,

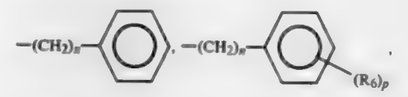


—$(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,

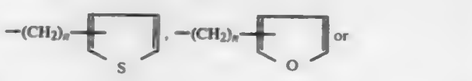


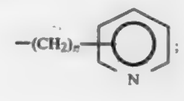


R_2 is hydrogen, lower alkyl,

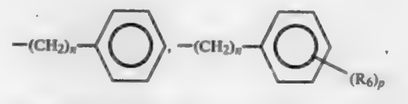


—$(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



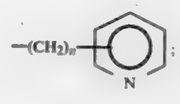


R_3 is hydrogen, lower alkyl,

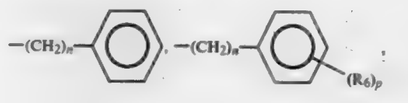


—$(CH_2)_n$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,



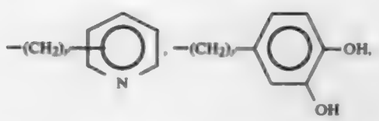


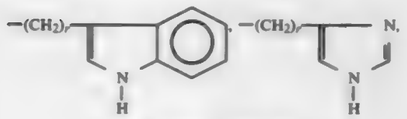
R_4 is hydrogen, lower alkyl,



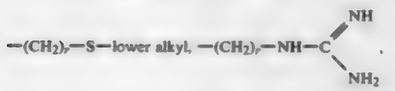
$-(CH_2)_m$-cycloalkyl wherein cycloalkyl is a saturated ring of 3 to 7 carbons,

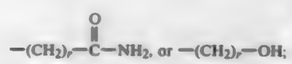




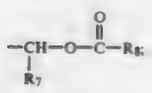


$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$,





R_5 is hydrogen, lower alkyl, benzyl, benzhydryl, a pharmaceutically acceptable salt forming ion, or



R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

n is zero, one, two, three, or four;

r is one, two, three, or four;

p is one, two, or three provided that p is more than one only if R_6 is methyl, methoxy, methylthio, chloro, or fluoro;

R_7 is hydrogen, lower alkyl, a saturated cycloalkyl ring of 3 to 7 carbons, or phenyl; and

R_8 is hydrogen, lower alkyl, lower alkoxy or phenyl.

4,692,456

3-PYRIDYLAMINOALKYLENEAMINO-4-AMINO-1,2,5-THIADIAZOLE-1-OXIDES, COMPOSITION CONTAINING THEM, AND USE OF THEM TO BLOCK HISTAMINE H_2-RECEPTORS

Robert J. Ife, Stevenage, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

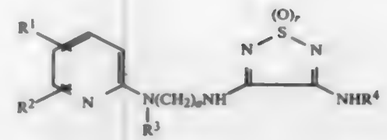
Filed Mar. 12, 1986, Ser. No. 838,972

Claims priority, application United Kingdom, Apr. 11, 1985, 8509276

Int. Cl.[4] A61K *31/44, 31/41;* **C07D** *417/12, 417/14*

U.S. Cl. 514—333 **18 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof, where:

R^1 and R^2 are the same or different and are hydrogen, C_{1-6}alkyl, C_{1-6}alkoxy or halogen;

R^3 is C_{1-6}alkyl or optionally substituted phenyl or optionally substituted pyridyl, where the optional substituents are one or more C_{1-6}alkyl, C_{1-6}alkoxy, or hydroxy groups or halogen atoms;

a is from 2 to 4

R^4 is $(CH_2)_bR^5$ where b is 1–6 and

R^5 is

phenyl optionally substituted by one or more C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy, carboxy (or an C_{1-6} alkyl ester thereof) or sulphonamido groups or halogen atoms;

pyridyl optionally substituted by one or more C_{1-6}alkyl, C_{1-6}alkoxy or hydroxy groups or halogen atoms;

or N-oxo-pyridyl optionally substituted by C_{1-6}alkyl; and

r is 1 or 2.

18. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim **1**.

4,692,457

ACARICIDES

Peter J. West, Great Shelford; Russell G. Hunt, Burwell, and Duncan A. Gates, Littlebury, all of England, assignors to FBC Limited, England

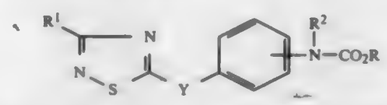
Filed Apr. 15, 1986, Ser. No. 852,181

Claims priority, application United Kingdom, Apr. 16, 1985, 85/09752

Int. Cl.[4] C07D *285/08;* **A01N** *47/18*

U.S. Cl. 514—361 **13 Claims**

1. A thiadiazole of the formula:



where: R^1 and R^2, which may be the same or different, are each hydrogen, optionally-halo or C_{1-4} alkoxy substituted alkyl of 1 to 10 carbon atoms, or optionally-halo or C_{1-4} alkoxy substituted phenyl, or R^1 is alkylthio of 1 to 6 carbon atoms; R is a halo or C_{1-4} alkoxy substituted or unsubstituted alkyl group of 1 to 8 carbon atoms, a halo or C_{1-4} alkoxy substituted or unsubstituted alkenyl or alkynyl group of 2 to 6 carbon atoms, a cycloalkyl group fo 3 to 6 carbon atoms, or a halo or C_{1-4} alkoxy substituted or unsubstituted aryl group; Y is oxygen or sulphur; and the carbamate grouping is in the 3- or 4-position on the phenyl ring.

4,692,458

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Mar. 5, 1980, Ser. No. 127,472

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **78 Claims**

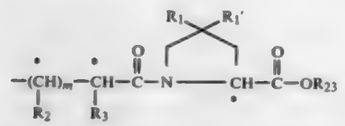
1. A new compound having the general formula I. R—A—S—Z, and the physiologically acceptable salts thereof, wherein:

R is selected from hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonylL-lysyl, pyro-L-glutamyl-L-lysyl, L-arginyl, L-lysyl and pyro-L-glutamyl,

A is selected from phenylalanyl, glycyl, alanyl, tryptophyl, tyrosyl, isoleucyl, leucyl, histidyl and valyl and the -amino group of A is in amide linkage with R when R is an acyl group and forms a primary amino group with R when R is hydrogen;

S is a sulfur atom joined to A in a thioester linkage; and

Z is selected from the following:



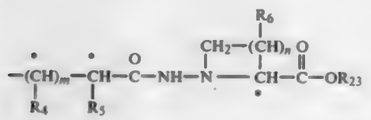
II.

wherein

(i) R_1 and R_1' are each hydrogen or halogen, and R_2 and R_3 are each hydrogen, lower alkyl or trifluoromethyl provided that only one of R_2 and R_3 may be trifluoromethyl and further provided that at least one of R_1, R_1', R_2 and R_3 must be halogen or trifluoromethyl;

(ii) R_{23} is hydrogen or lower alkyl and

(iii) m is 0 or 1;



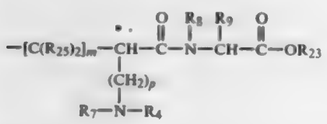
III.

wherein (i) R_4 and R_5 are each hydrogen, lower alkyl or phenyl-lower alkylene;

(ii) n is 1, 2 or 3;

(iii) R_6 is hydrogen or hydroxy or when n is 2, R_6 may also be halogen, and

(iv) m and R_{23} are as stated in II. above;



wherein

(i) R_7 is hydrogen, lower alkanoyl or amino (imino)-methyl;

(ii) p is 0 or an integer of from 1 to 4;

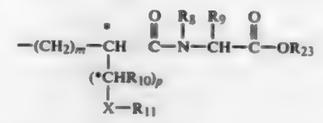
(iii) R_{25} is hydrogen but when m is 1, p is 0, R_4 is hydrogen and R_7 is lower alkanoyl, R_{25} may also be lower alkyl;

(iv) R_8 is selected from hydrogen, lower alkyl and hydroxy lower alkylene

when R_9 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylthio-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene but R_8 and R_9 may together constitute a $(CH_2)_v$ bridge wherein v is 3 or 4, thus forming a 5 or 6-membered ring with the N and C to which R_8 and R_9 are respectively attached and in such instance when v is 3 one hydrogen of $(CH_2)_v$ may be replaced by OH or halogen and when v is 4, one such hydrogen may be replaced by OH;

(v) m and R_{23} are each as defined in II. above; and

(iv) R_4 is as defined in III. above, provided further, however, that m and p may not both be 0.



V.

wherein

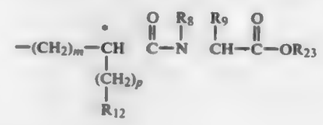
(i) r_{10} is hydrogen or lower alkyl;

(ii) R_{11} is hydrogen, lower alkyl or lower alkanoyl;

(iii) X is 0 or S;

(iv) m and R_{23} are as stated in II. above, and

(v) R_8, R_9 and p are as stated in IV. above;



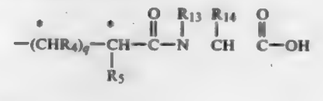
VI.

wherein

(i) R_{12} is selected from carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl and cyano;

(ii) m and R_{23} are as stated in II. above; and

(iii) R_8, R_9 and p are as stated in IV. above;



VII.

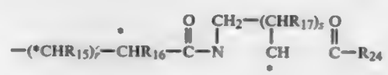
wherein

(i) R_{13} is hydrogen, lower alkyl or phenyl-lower alkylene;

(ii) R_{14} is selected from hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene;

(iii) R_4 and R_5 are as stated in III. above; and

(iv) q is 0, 1 or 2



VIII.

wherein

(i) R_{15} and R_{16} are each hydrogen, lower alkyl, phenyl or phenyl-lower alkylene;

(ii) r is 0, 1 or 2;

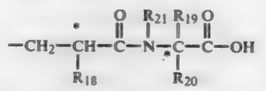
(iii) s is 1, 2, or 3;

(iv) R_{17} is hydrogen, hydroxy or lower alkyl and when s is 2, R_{17} may also be halogen; and

(v) R_{24} is hydroxy, amino or lower alkoxy; provided that when R_{24} is OH, s is 2, and R_{17} is H or OH:

(a) if r is 0, R_{16} may not be methyl or H, and

(b) if r is 1, R_{15} and R_{16} may not both be H and R_{16} may not be methyl if R_{15} is H

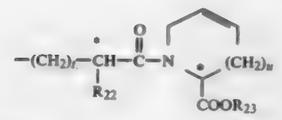


IX.

wherein

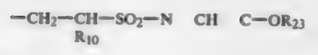
(i) R_{18} is hydrogen or lower alkyl;
(ii) R_{19} and R_{20} are each lower alkyl and may together constitute a $(CH_2)_w$ bridge wherein w is 4, to form a ring of 5-carbons with the carbon to which they are each attached;
(iii) R_{21} is hydrogen or lower alkyl and may constitute with R_{19} a $(CH_2)_x$ bridge wherein x is 3, to form a five-membered ring with the N and C to which they are respectively attached;
provided, however, that when R_{19} and R_{21} constitute $(CH_2)_x$, R_{18} may not be hydrogen or methyl

X.



wherein
(i) R_{22} is hydrogen or lower alkyl;
(ii) t and u are each 0 or 1;
(iii) R_{23} is as stated in II. above;
provided, however, that u may not be zero when R_{23} is H; and

XI.



wherein
(i) z is 2 or 3;
(ii) R_{10} is as stated in V. above, and
(iii) R_{23} is as stated in II above.

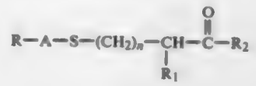
4,692,459

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation-in-part of Ser. No. 64,897, Aug. 14, 1979, Ser. No. 64,898, Aug. 14, 1979, Ser. No. 64,899, Aug. 14, 1979, Ser. No. 64,900, Aug. 14, 1979, Ser. No. 64,901, Aug. 14, 1979, Ser. No. 64,902, Aug. 14, 1979, Ser. No. 64,903, Aug. 14, 1979, Ser. No. 116,950, Jan. 30, 1980, abandoned, and Ser. No. 116,951, Jan. 30, 1980, abandoned, said Ser. No. 116,950, is a continuation of Ser. No. 941,289, Sep. 11, 1978, abandoned, said Ser. No. 116,951, is a continuation of Ser. No. 958,180, Nov. 6, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 121,188
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.⁴ A61K *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **6 Claims**

1. A new compound having the formula:



wherein
R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-lysyl, L-arginyl or pyro-L-glutamyl;
A is D-phenylalanyl, D,L-alanyl, D-alanyl, D,L-tryptophyl, D-tryptophyl, D,L-tyrosyl, D-tyrosyl, D,L-isoleucyl, D-isoleucyl, D,L-leucyl, D-leucyl, D,L-histidyl, D-histidyl, D,L-valyl, or D-valyl, the α-amino group thereof being in amide linkage with R unless R is hydrogen; when R is not hydrogen, it being understood that when R is benzoyl and R_2 is a residue of L-proline or a dehydroproline, A may also be L-phenylalanyl
R_1 is hydrogen or methyl;
R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline, L -thiazolidine-4-carboxylic acid, or L-5-oxo-proline, the imino group thereof being in imide linkage with the adjacent



and,
n is 0 or 1, such that when n is 0, R_1 is methyl.

4,692,460

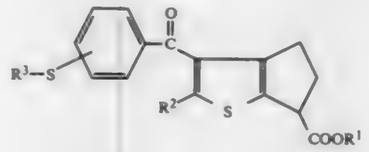
CYCLOPENTA[B]THIOPHENES HAVING ANTI-INFLAMMATORY ACTIVITY SIMILAR TO STEROIDS

John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

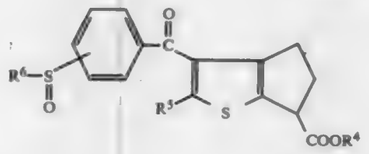
Filed Dec. 24, 1986, Ser. No. 946,555
Int. Cl.⁴ A61K *31/38;* **C07D** *333/56*
U.S. Cl. 514—443 **15 Claims**

1. A cyclopentathiophene of the following formula (I) or (II)

(I)



(II)



wherein
R^1 and R^4 are hydrogen or alkyl;
R^2 and R^5 are alkyl; and
R^3 and R^6 are alkyl,
and the pharmaceutically acceptable base-addition salts thereof where R^1 or R^4 is hydrogen.

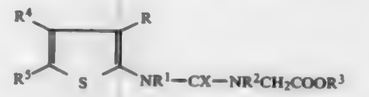
4,692,461

FUNGICIDAL THIENYLUREA DERIVATIVES

Werner Hallenbach, Langenfeld; Hans Lindel, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 21, 1986, Ser. No. 933,492
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541628
Int. Cl.⁴ A01N *43/02;* **C07D** *333/56*
U.S. Cl. 514—443 **17 Claims**

1. A thienylurea derivative of the formula



in which
X represents oxygen or sulphur,
R represents cyano, hydroxycarbonyl or alkoxycarbonyl,
R^1 represents hydrogen or alkyl,
R^2 represents hydrogen or alkyl,
R^3 represents hydrogen, alkyl or optionally substituted aryl,
R^4 represents hydrogen, alkyl or optionally substituted aryl,
R^5 represents hydrogen, alkyl or optionally substituted aryl,
III
R^4 and R^5 together represent the radical $—(CH_2)_n—$, and
n represents the numbers 3, 4, 5 or 6,
or an acid addition salt thereof.

4,692,462

COMPOSITIONS AND METHOD OF CONTROLLING TRANSDERMAL PENETRATION OF TOPICAL AND SYSTEMIC AGENTS

Pradip K. Banerjee, King of Prussia, Pa., assignor to Menley & James Laboratories, Ltd., Philadelphia, Pa.

Filed Mar. 18, 1985, Ser. No. 713,068
Int. Cl.⁴ A61L *15/03;* **A61F** *13/00*
U.S. Cl. 514—449 **11 Claims**

1. A pharmaceutical composition for the controlled transdermal delivery of one or more pharmacologically active systemic drugs comprising a safe and effective amount of a systemic drug-ion exchange resin complex and a salt effective to control the drug release note, containing the appropriate counter ion for the ion-exchange resin, selected from the group consisting of sodium chloride, monobasic sodium phosphate, dibasic sodium phosphate, zinc sulfate, magnesium chloride, calcium chloride, potassium chloride, sodium sulfate, sodium acetate, magnesium acetate and sodium citrate in a gel-forming vehicle.

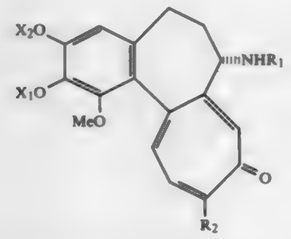
4,692,463

ANTIINFLAMMATORY 2,3-DIDEMETHYLCOLCHICINE AND ADDITIONAL DERIVATIVES

Arnold Brossi, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 705,709, Feb. 26, 1985, abandoned. This application Nov. 29, 1985, Ser. No. 802,680
Int. Cl.⁴ A61K *31/36, 31/16*
U.S. Cl. 514—463 **8 Claims**

1. A method of treating inflammatory disorders in a mammal which comprises injecting said mammal with an effective anti-inflammatory amount of an anti-inflammatory agent set out below



X_1=X_2=H or Acyl or X_1—X_2=—CH_2—;
R_1=acyl;
R_2=OCH_3.

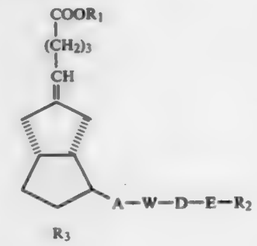
4,692,464

NOVEL PROSTACYCLIN DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

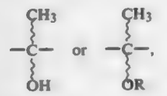
Werner Skuballa; Bernd Radüchel; Helmut Vorbrüggen; Gerda Mannesmann; Wolfgang Losert, and Jorge Casals, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Berkgamen, Fed. Rep. of Germany

Division of Ser. No. 86,506, Oct. 19, 1979, abandoned. This application Feb. 26, 1982, Ser. No. 352,411
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845770
Int. Cl.⁴ C07C *177/00;* **A61K** *31/557*
U.S. Cl. 514—530 **31 Claims**

1. A prostane derivative of the formula



wherein
R_1 is (a) hydrogen, (b) C_{1-10} alkyl, (c) C_{1-10} alkyl substituted by halogen; C_{1-4} alkoxy; C_{6-10} aryl; C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; di-C_{1-4}-alkylamino; or tri-C_{1-4}-alkylammonium; (d) C_{4-10} cycloalkyl, (e) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms;
A is $—CH_2—CH_2—$, trans—CH=CH— or —C≡C—;
W is hydroxymethylene, RO-methylene,



wherein OH or OR is in the α- and/or β-position and
R is tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid;
D is C_{1-10} alkylene, C_{2-10} alkenylene or C_{2-10} alkynylene or one of these groups substituted by fluorine, and
E is —C≡C—;
R_2 is (a) a C_{1-10} hydrocarbon aliphatic radical, (b) a C_{6-10} hydrocarbon aliphatic radical substituted by C_{6-10} aryl or by C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; (c) C_{4-10} cycloalkyl, (d) C_{4-10} cycloalkyl substituted by C_{1-4} alkyl, (e) C_{6-10} aryl, (f) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group; or (h) an aromatic heterocycle of 5 or 6 ring atoms, one of which is O, N or S, the remainder being carbon atoms; and
R_3 is OH or OR; or, when R_1 is hydrogen, a physiologically compatible salt thereof with a base.

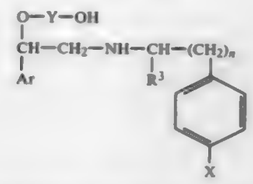
4,692,465

2-PHENYLETHYLAMINE DERIVATIVES

Richard M. Hindley, Reigate, and John Berge, Redhill, both of England, assignors to Beecham Group PLC, Middlesex, England

Filed Aug. 15, 1984, Ser. No. 640,850
Claims priority, application United Kingdom, Aug. 17, 1983, 8322137; Dec. 22, 1983, 8334293
Int. Cl.⁴ A61K *31/24;* **C07C** *101/30*
U.S. Cl. 514—539 **13 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

Ar is benzofuran-2-yl, or phenyl optionally substituted by groups R^1 and/or R^2 wherein R^1 is halogen, trifluoromethyl or hydroxy and R^2 is halogen;

R_3 is hydrogen or methyl;

X is $—O(CH_2)_2CO_2H$ or $—CO_2H$ or a pharmaceutically acceptable ester or amide thereof, or $O(CH_2)_bM$ in which

a is an integer from 1 to 6,

b is an integer from 2 to 7,

M is hydroxy, C_{1-6} alkoxy, phenyl C_{1-6} alkoxy, or $—NR^4R^5$ in which R^4 and R^5 are each hydrogen or C_{1-6} alkyl or together form a five or six membered heterocyclic ring;

Y is C_{2-6} straight or branched alkylene, with at least two carbon atoms between the —O— and —OH; and

n is 1 or 2.

9. A pharmaceutical composition for the treatment and/or prophylaxis of obesity and/or hyperglycaemia comprising an effective amount of compound according to claim 1 together with a pharmaceutically acceptable carrier.

10. A method of treatment and/or prophylaxis of obesity and/or hyperglycaemia in mammals including humans which method comprises administering an effective, non-toxic amount of a compound according to claim 1, to the mammal.

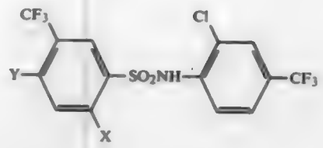
4,692,466

N-(2-CHLORO-4-TRIFLUOROMETHYLPHENYL)-3-TRIFLUOROMETHYLBENZENESULFONAMIDE DERIVATIVE AND AGRICULTURAL FUNGICIDE CONTAINING SAME

Takeo Yoshimoto, Yokohama; Mitsumasa Umemoto, Ohmuta; Keiichi Igarashi, Musashino; Yutaka Kubota; Hideo Yamazaki, both of Yokohama, Yuji Enomoto, Yokohama, and Hirohisa Yanagita, Chigasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,546
Claims priority, application Japan, Feb. 28, 1985, 50-37701; Mar. 8, 1985, 50-44698
Int. Cl.⁴ C07C *143/78;* **A01N** *41/04*
U.S. Cl. 514—604 **8 Claims**

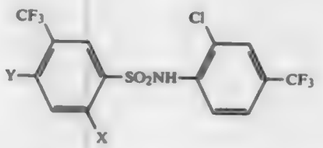
1. N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X and Y individually are a hydrogen or chlorine atom.

5. Agriculatural fungicidal composition comprising (a), as an active ingredient, a fungicidally effective amount of an N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative represented by the following formula (I):



(I)

wherein X and Y individually are a hydrogen or chlorine atom, and (b) a carrier.

4,692,467

N'-CYANO-N-TETRAHYDROWNAPHTHYL-S-METHYISOTHIOUREA AS A GROWTH PROMOTING AGENT

Joseph E. Dunbar, Midland, Mich., and Kimiaki Maruyama, Hastings, Nebr., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 641,810, Aug. 17, 1984. This application Dec. 29, 1986, Ser. No. 947,128
Int. Cl.⁴ A61K *31/155;* **C07C** *157/14*
U.S. Cl. 514—609 **3 Claims**

1. A method for promoting the growth of animals comprising administering to said animals an effective amount of the compound N'-cyano-N-(1,2,3,4-tetrahydro-1-naphthyl)-S-methylisothiourea.

3. The compound N'-cyano-N-(1,2,3,4-tetrahydro-1-naphtyl)-S-methylisothiourea.

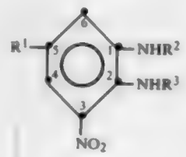
4,692,468

CONTROL OF COLONIAL INSECTS EMPLOYING O-PHENYLENEDIAMINES

Rudolph J. Boisvenue, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 174,371, Aug. 1, 1980, abandoned. This application Sep. 9, 1982, Ser. No. 416,426
Int. Cl.⁴ A01N *37/18, 47/10*
U.S. Cl. 514—616 **7 Claims**

1. Method for eradicating a fire ant colony, which comprises supplying to the colony an effective amount of an active agent which is a compound of the formula



wherein R^1 represents

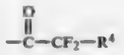
(1) halo,

(2) CF_3,

(3) CF_2H, or

(4) CF_2Cl;

one of R^2 and R^3 represents a 2,2-difluoroalkanoyl radical of the formula



wherein R^4 represents

(1) H,

(2) Cl,

(3) F,

(4) difluoromethyl, or

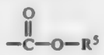
(5) trifluoromethyl;

and the other of R^2 and R^3 represents

(1) H,

(2) the same 2,2-difluoroalkanoyl radical represented by the first of R^2 and R^3,

(3) a radical of the formula



wherein R^5 represents loweralkyl of C_1–C_4 or phenyl,

(4) lower alkanoyl of C_2–C_5,

(5) benzoyl, or

(6) halogenated lower alkanoyl of C_2–C_5, subject to the limitation that the alpha position bears at least one substituent selected from the group consisting of hydrogen and halogen of atomic weight from 35 to 127, both inclusive;

subject to the further limitation that when R^3 represents a 2,2-difluoroalkanoyl radical, R^2 is a group other than H.

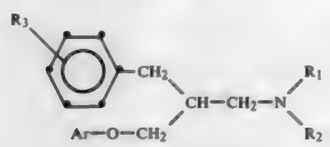
4,692,469

PROPYLAMINE DERIVATIVES

Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Continuation of Ser. No. 568,000, Jan. 4, 1984, Pat. No. 4,588,746, which is a continuation-in-part of Ser. No. 415,000, Sep. 7, 1982, abandoned. This application Apr. 4, 1986, Ser. No. 848,661
Int. Cl.⁴ A61K *31/135*
U.S. Cl. 514—651 **3 Claims**

1. A method for the treatment of excessive appetite in mammals which consists of administering to a mammal in need thereof an effective appetite suppressing amount of a selective serotonin uptake inhibiting compounds of the formula



(IA)

wherein R_1 represents hydrogen or methyl; R_2 represents methyl; R_3 represents hydrogen; and Ar represents 4-trifluoromethylphenyl; or a pharmaceutically acceptable salt thereof; in combination with one or more pharmaceutically acceptable carriers.

4,692,470

PROCESS FOR INCORPORATING POWDERS IN VISCOUS FLUIDS

Bernard D. Bauman, Coopersburg, and Patricia E. Burdick, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 4, 1986, Ser. No. 825,832
Int. Cl.⁴ C08J *9/40*
U.S. Cl. 521—55 **16 Claims**

1. The method of facilitating incorporation of finely divided polymeric solid particles into viscous liquids which comprises the use of a wetting agent effective in displacing adsorbed air from the surface, crevices and pores of such particles, said wetting agent being applied by pretreatment of the solid particles therewith prior to their admixture with the viscous liquid or by direct admixture with the viscous liquid prior to admixture of the solid particles into said viscous liquid, said wetting agent being a volatile organic blowing agent.

4,692,471

EXPANDABLE POLYPROPYLENE INTERPOLYMER PARTICLES

Kent D. Fudge, Glen Mills, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 851,391, Aug. 11, 1986. This application Dec. 29, 1986, Ser. No. 947,339
Int. Cl.⁴ C08J *9/18*
U.S. Cl. 521—59 **6 Claims**

1. An expandable composition comprising a blend of

(1) 75–96% by weight of mixture of a polypropylene-poly(-vinyl aromatic monomer) interpolymer made by polymerizing 40 to 80% by weight based on interpolymer of a vinyl aromatic monomer in the presence of an aqueous suspension of a copolymer of propylene and sufficient olefin comonomer to give said copolymer a melting peak of less than 150° C., and

(2) 4–25% by weight of mixture of a polymer selected from the group consisting of polyethylene, ionomers, ethylene-vinyl acetate copolymers, ethylene-ethyl acrylate copolymers, chlorinated polyethylenes, chlorosulfonated polyethylenes, ethylene-propylene-diene monomer rubbers, ethylene-propylene rubbers, styrene-butadiene block copolymers, and polyethylene-poly(vinyl aromatic monomer) interpolymer;

(3) 0–5% by weight of a lubricant and cell control agent; and said composition having been heated to 175° C. to 185° C. in order to viscbreak the interpolymer of (1), supra

(4) 3–20% by weight of a blowing agent.

4,692,472

DIVINYLBENZENE IN EXPANDABLE BEADS FOR CUP MOLDING

Alvin R. Ingram, West Chester, and Adolph V. DiGiulio, Wayne, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 5, 1986, Ser. No. 859,976
Int. Cl.⁴ C08J *9/18*
U.S. Cl. 521—60 **2 Claims**

1. The process of making expandable styrenic polymer beads for use in producing foamed cups with improved strength and thermal properties comprising the steps of:

(a) forming an aqueous suspension of a vinyl aromatic monomer, divinylbenzene, and a mixture of monomer-soluble free-radical-producing catalysts, with the aid of a suitable suspending agent system, said monomers being used in a monomer/water ratio of 0.3 to 1.5 parts by weight monomer solution per 1.0 part by weight water;

(b) heating the suspension at a temperature of about 50°–95° C. for 3–7 hours to copolymerize said monomers;

(c) heating the resulting bead slurry to a temperature of about 100°–150° C. for a period of about 0.25–5.0 hours to

complete the copolymerization while forming copolymers;

having a gel content of 0–50% by weight and a toluene soluble portion having a weight average molecular weight of between 280,000 and 750,000, a polydispersity of 3.0–7.0, and bead size of through 30 and on 80 mesh, U.S. Standard Sieve;

(d) adding 3 to 12% by weight of a blowing agent selected from the group consisting of aliphatic hydrocarbons containing 4–6 carbon atoms, halogenated hydrocarbons which boil at a temperature below the softening point of the polymer, and mixtures thereof;

(e) heating the suspension at a temperature of from 80°–150° C. to impregnate the polymer beads with blowing agent; and

(f) cooling the suspension to room temperature, and separating the impregnated beads from the aqueous system.

4,692,473

WATER BORNE POLYMER FOAMABLE COMPOSITION

Thomas C. Wright, and Grover L. Johnson, both of Arlington, Tex., assignors to Orin Chemical Company, Arlington, Tex.

Filed Apr. 26, 1985, Ser. No. 727,497

Int. Cl.[4] C08J *9/30*

U.S. Cl. 521—72 **8 Claims**

1. A multi-part composition for preparing a foamed polyvinyl product wherein the compositions contains at least two separate parts which are to be mixed to prepare the foamed product in a manner known per se, said first part being a vinyl acetate polymer selected from the group consisting of vinyl acetate polymer and vinyl acetate-ethylene copolymers and the second part being selected from the group consisting of sodium bicarbonate and a carbonate foaming agent and wherein with said carbonate foaming agent there is included in one of or both of the first and second parts an acid compound selected from the group consisting of citric acid, acetic acid, tartaric acid, alkali citrate, alkali bitatrate, calcium phosphate, and mixtures thereof; and the carbonate is selected from the group consisting of sodium bicarbonate, magnesium carbonate, ammonium bicarbonate and zinc carbonate; and wherein the composition comprises:

100 parts by weight of a water based emulsion of said polymer;

2–15 parts by weight of sodium bicarbonate or said carbonate foaming agent and said acid compound;

0–25 parts by weight of cross-linking reagents;

0–20 parts by weight of filler;

0–5 parts by weight of thickners.

4,692,474

METHOD FOR PREPARING PLASTIC FOAMS

Hans Mayer; Rudolf Mühlhofer; Bernward Deubzer, all of Burghausen, and Walter Mayerhofer, Marktl, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,329

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524493

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—88 **7 Claims**

1. A method for preparing plastic foams, which comprises reacting a compound containing Si-bonded hydrogen and at least one SiC-bonded radical having at least one basic nitrogen atom in the same molecule with a compound containing at least one hydroxyl group.

4,692,475

BLOWING AGENT COMPOSITION

Donald G. Rowland, Woodbridge, Conn.; Byron A. Hunter, Alpine, and Lee D. Hansen, Orem, both of Utah, assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 825,401, Mar. 25, 1986, Pat. No. 4,655,962.

This application Dec. 10, 1986, Ser. No. 940,873

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—92 **10 Claims**

1. A foamable polymeric composition, comprising (a) at least one member selected from the group consisting of foamable polymers and monomers or coreactants polymerizable under blowing conditions, and (b) an effective amount of a blowing agent composition (i) azodicarbonamide; (ii) at least one member selected from the group consisting of zinc oxide and zinc carbonate; and (iii) at least one member selected from the group consisting of zinc salts of C_1–C_6 organic acids, and C_1–C_6 carboxamides.

4,692,476

COMPLEX BLOCK MULTIPOLYMER SURFACTANTS

Scott Simpson, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 559,823, Dec. 9, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 727,544

Int. Cl.[4] C08G *77/04*; C08J *9/00*

U.S. Cl. 521—112 **17 Claims**

1. A complex block multipolymer surfactant having a molecular weight of between about 15,000 and about 100,000 produced by combining:

(a) a linear polysiloxane having terminating groups containing a hydroxyl group, said linear polysiloxane having a molecular weight of between about 1,000 and about 5,000;

(b) at least one diol, said diol having a molecular weight of less than about 5,000; and

(c) a diisocyanate having isocyanate reactive groups, said diisocyanate having a molecular weight of between about 100 and about 2,000;

the ratio of hydroxyl groups to isocyanate reaction groups being from about 0.80:1.0 to about 1.16:1.0; and

wherein said surfactant has a silicon content of between about 0.5 to about 35.0 percent by weight.

17. A polyurethane foam containing a stabilizer comprising a complex block multipolymer surfactant having a molecular weight of between about 15,000 and about 100,000 produced by combining:

(a) a linear polysiloxane having terminating groups containing a hydroxyl group, said linear polysiloxane having a molecular weight of between about 1,000 and about 5,000;

(b) at least one diol, said diol having a molecular weight of less than about 5,000; and

(c) a diisocyanate having isocyanate reactive groups, said diisocyanate having a molecular weight of between about 100 and about 2,000;

the ratio of hydroxyl groups to isocyanate reaction groups being from about 0.80:1.0 to about 1.16:1.0; and

wherein said surfactant has a silicon content of between about 0.5 to about 35.0 percent by weight.

4,692,477

POLYISOCYANURATE FOAMS DERIVED FROM OXYPROPYLATED POLYOLS AND INSULATING STRUCTURES THEREFROM

Charles E. Jacobina, Belleair Beach, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed May 15, 1986, Ser. No. 863,648

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—174 **20 Claims**

1. A rigid polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol, the polyol comprising a sufficient proportion of at least one polyoxyalkylene polyol having (i) terminal oxypropylene oxide blocks, (ii) a molecular weight of from about 300 to 3000, and (iii) an average hydroxyl functionality of from about 2 to 5 form a foamed polyisocyanurate whose gel time is greater than about 70 seconds and friability is less than about 20 percent as measured by the ASTM C-421 friability test, and the catalyst being one whose use gives rise to the gel time of greater than about 70 seconds.

4,692,478

PROCESS FOR PREPARATION OF RESIN AND RESIN OBTAINED

Tito Viswanathan, Little Rock, Ark., and Donald H. Westermann, Greenfield, Wis., assignors to Chemical Process Corporation, Greenfield, Wis.

Filed Mar. 14, 1986, Ser. No. 839,513

Int. Cl.[4] C08L *3/02, 5/00, 5/02*

U.S. Cl. 527—300 **13 Claims**

1. The process for preparing a thermosetting resin for bonding lignocellulosic materials to form a product, such as plywood and particle board, which process comprises first reacting an aqueous preparation consisting essentially of carbohydrate in a closed reactor at an elevated temperature of about 140° C. to about 250° C. with sufficient mineral acid, to produce a pH of about 0.5 to 2.0, and to convert the carbohydrate to polymerizable reactants, and then when that reaction is over reacting the thus obtained reactants with ammonia at a pH above 3.0 to form a storage stable, water soluble, thermosetting resin which can be further cross-linked by exposure to heat.

4,692,479

SELF-SETTING URETHANE ADHESIVE PASTE SYSTEM

James T. Schneider, Powell, and Albert L. Haugse, Dublin, both of Ohio, assignors to Ashland Oil, Inc., Russell, Ky.

Filed Jul. 19, 1985, Ser. No. 756,632

Int. Cl.[4] B22B *1/22*; C08K *3/36, 9/06*; C08L *61/06*

U.S. Cl. 523—209 **49 Claims**

1. An adhesive paste comprising in admixture a resin component, a hardener component, a filler component and a curing agent, said resin component including a polyol having at least two hydroxyl groups, said hardener component including a liquid polyisocyanate containing at least two isocyanate groups, said curing agent comprising a base, and said filler component comprising a hydrophobic filler material which is a thixotropic agent, such that the relative weight ratio of resin component to hardener component is from 45:55 to 55:45, the relative weight ratio of curing agent to resin component is from 0.01:99:99 to 15:85, and the relative weight ratio of the hydrophobic filler to hardener component is from 0.5:99.5 to 20:80.

4,692,480

THERMOPLASTIC RESIN COMPOSITION

Katsuhiko Takahashi, Fuji, and Michiyuki Sugita, Shizuoka, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Apr. 10, 1986, Ser. No. 850,205

Claims priority, application Japan, Apr. 12, 1985, 60-77793

Int. Cl.[4] C08K *7/28, 7/24*

U.S. Cl. 523—218 **9 Claims**

1. A thermoplastic resin composition which comprises a thermoplastic resin and a spherical, hollow filler wherein said filler has a wall thickness ratio of about 2.5 to about 10, said ratio defined by the ratio of the outer diameter of the filler to the wall thickness of the filler.

4,692,481

PROCESS FOR MATCHING COLOR OF PAINT TO A COLORED SURFACE

Renee J. Kelly, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1984, Ser. No. 655,088

Int. Cl.[4] C08K *7/28, 7/00, 3/08*; C09D *5/38*

U.S. Cl. 523—219 **20 Claims**

1. An improved process for visually matching the color characteristics at at least three viewing angles of a dried paint film formed from a wet paint comprising film forming binder, a liquid carrier of solvent or water, colored pigments and flake pigments to the color characteristics of a surface layer that contains flake pigments: wherein the improvement comprises

adding to the wet paint a dispersion comprising a liquid carrier of solvent or water, a dispersing agent and extender pigment consisting of hollow glass spheres having a diameter of about 0.1–50 microns in an amount sufficient for a dried film of the paint to match the color characteristics of the surface layer.

4,692,482

METHOD OF CONCENTRATING POLYPHENYLENE ETHER SOLUTIONS

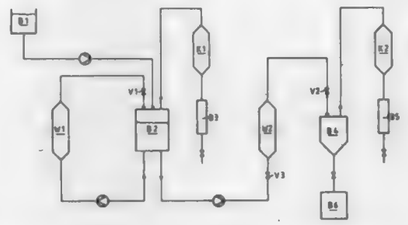
Gregor Lohrengel, Essen, Fed. Rep. of Germany, assignor to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 921,463

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600754

Int. Cl.[4] C08J *3/00*; C08L *71/04*

U.S. Cl. 523—340 **6 Claims**



1. A method for the continuous production of a polyphenylene ether solution, comprising the steps of:

continuously feeding a dilute solution of polyphenylene ether in an organic solvent to a first flash evaporatoring stage which is processed by

recycling a slightly concentrated polyphenylene ether solution

feeding a portion of this slightly concentrated solution to a second flash evaporatoring stage which is processed in a direct flow through manner and

collecting the concentrated polyphenylene ether effluent solution from said second flash evaporator.

4,692,483

WATER-BASED PAINT COMPOSITION

Yasuyuki Tsuchiya, Hirakata, and Hiroyuki Sakamoto, Nishinomiya, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 25, 1986, Ser. No. 855,644

Claims priority, application Japan, Apr. 26, 1985, 60-91715; Apr. 26, 1985, 60-91716

Int. Cl.[4] C08K *3/20*; C08L *83/00, 37/00*

U.S. Cl. 523—406 **15 Claims**

1. A water-based paint composition comprising:

(A) 100 parts by weight of a hydrophilic film-forming resin component capable of curing through an oxidative polymer-

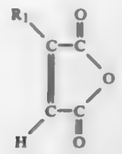
ization reaction and having a plurality of pendant free carboxy groups; and

(B) 10 to 200 parts by weight of a hydrophobic film-forming resin component having a plurality of polymerizable carbon-to-carbon double bonds at terminals;

said component (A) being

(I) reaction product prepared by the steps of

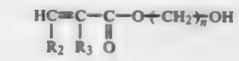
(a) reacting (i) a butadiene-based polymer having an average number molecular weight of 500 to 5,000 and an iodine number of 100 to 500, a drying oil having an iodine number greater than 100, or a mixture thereof, with 100 to 300 millimoles, per 100 g of (i), of (ii) a dicarboxylic acid anhydride of the formula:



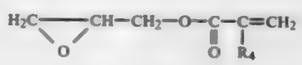
wherein R_1 represents a hydrogen atom, a halogen atom or methyl, and

(b) reacting the resultant product with at least 0.8 moles per mole of said acid anhydride of (iii) water, a primary monoalcohol, a dialkylamine or a mixture thereof, or

(II) either (i) a product prepared by reacting the product of said step (a) with 10 to 300 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of a compound of the formula:



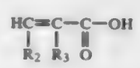
wherein R_2 and R_3 are as defined, and n is 2 or 3, and then optionally with less than 290 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of water, a primary monoalcohol, a dialkylamine or a mixture thereof; (ii) a product prepared by reacting the product of said step (a) with 80 to 300 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of water, a primary monoalcohol, a dialkylamine or a mixture thereof, and then with 10 to 500 millimoles per 100 g of said butadiene-based polymer and/or said drying oil of a monoglycidyl ester of the formula:



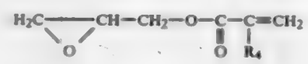
wherien R_4 is as defined; or a mixture of said products (i) and (ii); or

(III) a mixture of (I) and (II);

said component (B) being (i) a product prepared by reacting a compound having at least one glycidyl group and an average molecular weight of 300 to 4,000 with 0.8 to 1.1 moles per said glycidyl group of an ethylenically unsaturated carboxylic acid of the formula:



wherein R_2 and R_3 independent represent a hydrogen atom or methyl, or an unsaturated fatty acid having a molecular weight of 100 to 350 and an iodine number greater than 100, or (ii) a product prepared by reacting a polymeric phenol derivative having an average number molecular weight of 300 to 4,000 with at least 0.8 moles per moles of said phenol derivative of a monoglycidyl ester of the formula:



wherein R_4 represents a hydrogen atom or methyl, or (iii) a mixture of (i) and (ii);

said components (A) and (B) being dispersed in an aqueous medium containing an amount of a base sufficient to neutralize at least 20% of said free carboxylic groups to form a stable emulsion of resinous particles composed of a core of said component (B) surrounded by a shell layer of said component (A).

4,692,484

EPOXY-PHOSPHATE/PHENOLIC ELECTROCOATING COMPOSITIONS

Donald R. Roberts, Roselle, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Sep. 25, 1985, Ser. No. 779,947

Int. Cl.[4] C08K *5/06;* **C08L** *63/02, 61/12*

U.S. Cl. 523—414 **17 Claims**

1. An aqueous dispersion adapted for electrocoating metal surfaces comprising from about 5 percent to about 50 percent, based on the total weight of nonvolatile resin solids, of a water insoluble, heat-hardening bisphenol-A-based phenolic resin as curing agent; the balance of the resin solids consisting essentially of an epoxy-free epoxy-phosphate comprising the reaction product of orthophosphoric acid with a diglycidyl ether of bisphenol having an average molecular weight of from about 500 to about 5000 and a 1,2-epoxy equivalence in the range of about 1.3–2.0, said reaction product containing from about 0.05 mol to about 0.9 mol of phosphoric acid per epoxide equivalent in said diglycidyl ether; and a volatile amine in an amount sufficient to react with from about 50 percent to about 400 percent of the acid content of the epoxy-free epoxy-phosphate, said dispersion being effected with the aid of a water miscible organic solvent comprising at least about 10 percent of an ether alcohol to provide organic solvent in a weight ratio relative to water of about 5.95 to about 50:50.

4,692,485

VINYL BENZYL 2,2,6,6-TETRAMETHYL PIPERIDINES

William E. Leistner, Atlantic Beach, N.Y.; Yutaka Nakahara, Okegawa, Japan; Bunji Hirai, Kuki, Japan, and Mitsuharu Kanai, Kuki, Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

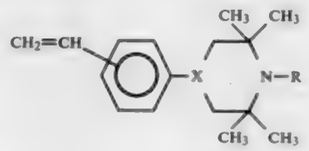
Filed Dec. 5, 1985, Ser. No. 806,251

Claims priority, application Japan, Dec. 5, 1984, 59-257060

Int. Cl.[4] C07D *498/10;* **C08K** *5/34, 5/35*

U.S. Cl. 524—99 **25 Claims**

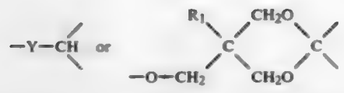
1. A vinyl benzyl 2,2,6,6-tetramethyl piperidine having the formula:



wherein:

R is selected from the group consisting of hydrogen; oxyl; acyl and alkyl having from one to about eighteen carbon atoms;

X is



in which Y is —O— or —N(R_2)—, R_1 is alkyl having from one to about eighteen carbon atoms and R_2 is hydrogen or alkyl having from one to about eighteen carbon atoms.

20. An α-olefin polymer composition having improved resistance to deterioration upon exposure to light, comprising an α-olefin polymer and a vinyl benzyl 2,2,6,6-tetramethyl piperidine according to claim 1.

4,692,486

SYNERGISTIC MIXTURE OF LOW-MOLECULAR AND HIGH-MOLECULAR POLYALKYLPIPERIDINES

Francois Gugumus, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

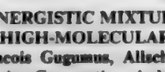
Continuation of Ser. No. 433,764, Oct. 12, 1982, abandoned. This application Jul. 21, 1986, Ser. No. 887,961

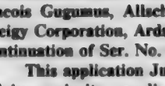
Claims priority, application Switzerland, Oct. 16, 1981, 6623/81

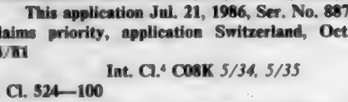
Int. Cl.[4] C08K *5/34, 5/35*

U.S. Cl. 524—100 **6 Claims**

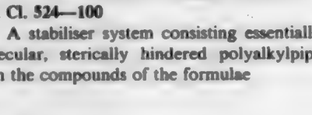
1. A stabiliser system consisting essentially of (A) a low-molecular, sterically hindered polyalkylpiperidine selected from the compounds of the formulae



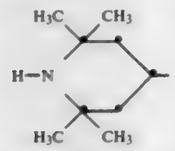




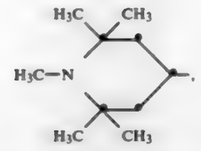
and



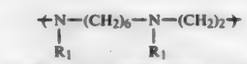
in which R_1 is a group of the formula



and R_2 is a group of the formula

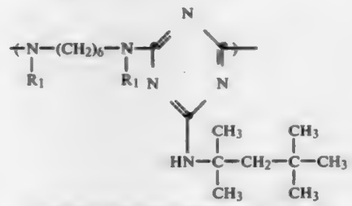


and (B) a high-molecular, sterically hindered polyalkylpiperidine selected from the compounds of formulae



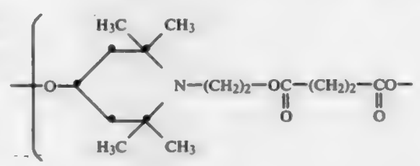
(B-2)

with degree of polymerization of 5–50,



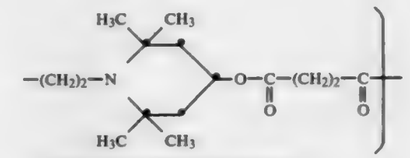
(B-4)

with degree of polymerization of 3–50, and



(A-1)

(B-5)



(A-2)

(A-9)

with degree of polymerization of 2–25

wherein R_1 is as defined above, said components being present in a weight ratio of 5:1 to 1:5.

6. Organic polymeric material containing 0.01 to 5% by weight, based on the organic material, of the stabiliser system according to claim 1.

(A-11)

4,692,487

1,2-ETHANEDIYL-BIS-2-PIPERAZINONE ESTERS, OLIGOMERS THEREOF, AND COMPOSITIONS STABILIZED THEREBY

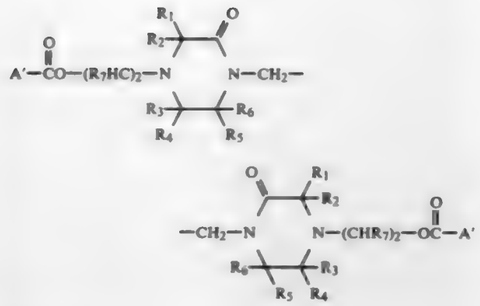
Pyong-Nae Son, Akron, and John T. Lai, Broadview Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 696,123, Jan. 29, 1985, abandoned. This application Sep. 2, 1986, Ser. No. 902,541

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—100 **8 Claims**

1. An esterified bis-polysubstituted piperazinone ("bis-PSP") represented by the structure



wherein,

A′ represents

CH_3—$(CH_2)_x$— wherein x is an integer in the range from 6 to about 20; and,

hydroxyphenyl having C_1–C_{10} alkyl substituents;

R_1–R_4 each independently represent C_1–C_{12} alkyl; C_5–C_{14} cycloalkyl or hydroxycycloalkyl having from 5 to 8 ring C atoms, C_7–C_{14} alkenyl or aralkyl; C_2–C_7 alkylene;

R_1 and R_2, or R_3 and R_4 together with the ring C atom of the piperazinone ring represent cycloalkyl having from 5 to about 8 ring C atoms; and,

R_5 and R_6 are the same as R_1–R_4 defined above, and additionally may be H; and,

R_7 represents lower alkyl C_1–C_6, and H.

4,692,488

THERMOPLASTIC POLYCARBONATE MOULDING COMPOSITIONS

Hans-Jürgen Kress, Krefeld; Friedemann Müller, Neuss; Christian Lindner, Cologne; Horst Peters, Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,495

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523314

Int. Cl.⁴ C08K *5/53, 5/52*

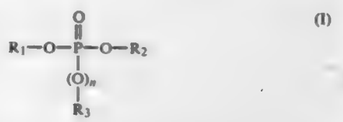
U.S. Cl. 524—139 **18 Claims**

1. A thermoplastic moulding composition comprising

A. 60 to 90% by weight of a thermoplastic, halogen-free aromatic polycarbonate,

B. 10 to 40% by weight of a halogen-free thermoplastic copolymer of 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene or mixtures thereof and 5 to 50% by weight of (meth)acrylonitrile,

C. 1 to 20 parts by weight, per 100 parts by weight of the total weight of A. and B., of a halogen-free phosphorus compound of the general formula



(I)

in which

R_1, R_2 and R_3 independently of one another denote a C_1–C_8-alkyl radical or an optionally alkyl-substituted C_6–C_{20}-aryl radical and n is 0 or 1, and

D. 0.05 to 2.0 parts by weight, per 100 parts by weight of the total weights of A. and B., of a tetrafluoroethylene polymer with average particle sizes of 0.05 to 20 μm and a density of 1.2 to 1.9 g/cm³, component D. being employed in the form of a coagulated mixture of emulsions of the tetrafluoroethylene polymers D. with emulsions of not more than 3 parts by weight, but at least 0.1 parts by weight, per 100 parts by weight of the sum of components A. and B., of

E. graft polymer(s) of

1. 5 to 90 parts by weight of a mixture of

(i) 50 to 95% by weight of styrene, α-methylstyrene, nuclear-substituted styrene, methyl methacrylate or mixtures thereof and

(ii) 50 to 5% by weight of (meth)acrylonitrile, methyl methacrylate, maleic anhydride, N-substituted maleimide or mixtures thereof, on

2. 95 to 10 parts by weight of a rubber with a glass transition temperature $T_G \leqq 10°$ C., and the weight ratio of graft polymer E. to tetrafluoroethylene polymer D. being between 95:5 and 60:40.

4,692,489

POLYPROPYLENE COMPOSITIONS OF IMPROVED CLARITY

Harold K. Ficker, Wayne, N.J., and Frederick M. Teskin, Herndon, Va., assignors to El Paso Products Company, Odessa, Tex.

Filed Aug. 6, 1985, Ser. No. 762,904

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.⁴ C08K *5/09, 5/17*

U.S. Cl. 524—243 **6 Claims**

1. A method for improving the color and clarity of an undeashed propylene polymer prepared in the presence of a high-activity catalyst composition containing a magnesium halide-supported titanium halide catalyst component, which method consists essentially of

(a) adding (i) from about 0.01 to about 3% by weight of a neutralizer selected from the group consisting of hydroxides of sodium, potassium and calcium, oxides of calcium and magnesium, sodium carbonate, calcium carbonate, magnesium hydroxycarbonates and mixtures thereof,

(ii) from about 0.01 to about 1% by weight of sodium benzoate and

(iii) from about 0.05 to about 0.5% by weight of an ethoxylated amine to the polymer in the absence of calcium stearate, all percentages being based on the polymer weight,

(b) melting the resulting mixture and

(c) solidifying the melted mixture.

4,692,490

FLAME RETARDANT POLYPHENYLENE ETHER COMPOSITION CONTAINING POLYBROMINATED DIPHENYOXYBENZENE AND ANTIMONY OXIDE

Visvaldis Abolins, Delmar, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Mar. 19, 1986, Ser. No. 841,441

Int. Cl.⁴ C08K *5/06*

U.S. Cl. 524—371 **13 Claims**

1. A flame retardant thermoplastic composition comprising

(a) a polyphenylene ether resin;

(b) a rubber modified, high impact polystyrene resin;

(c) a polybrominated 1,4-diphenoxybenzene in an amount which improves the flame retardancy of the combination of (a) and (b); and

(d) antimony oxide in an amount which synergistically enhances the flame retardancy of the combination of (a), (b) and (c).

4,692,491

POLYMER EMULSION PRODUCTS

Ajay I. Ranka, Allison Park, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 814,458, Dec. 30, 1985, Pat. No. 4,647,612. This application Sep. 15, 1986, Ser. No. 907,563

Int. Cl.⁴ C08L *41/00*

U.S. Cl. 524—458 **10 Claims**

10. The polymer of claim 1 in which the salt of the carboxylic acid group-containing polymer is a salt of a carboxylic acid group-containing acrylic polymer.

4,692,492

NON-STAINING, NON-STICKING STYRENIC POLYMERS

Binnur Z. Gunesin, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 614,081, May 25, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,886

Int. Cl.⁴ C08K *5/54*

U.S. Cl. 524—731 **9 Claims**

1. A method for preparing a non-staining, non-sticking, high impact polystyrene, which comprises: (a) a solution formed by dissolving a rubber in a mixture consisting essentially of a styrene, a polysiloxane and a solvent; (b) heating the resultant solution to graft polymerize the styrene onto the rubber; and (c) separating the solvent and any unreacted styrene present.

4,692,493

STABLE, AQUEOUS, COLLOIDAL DISPERSIONS OF COPOLYMERS OF THE TETRAFLUORETHYLENE/ETHYLENE TYPE AND A PROCESS FOR THEIR PREPARATION

Reinhard A. Sulzbach, Burghausen, and Konrad von Werner, Halsbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,640

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512633

Int. Cl.⁴ C08L *27/12*

U.S. Cl. 524—805 **9 Claims**

1. A process for the preparation of a stable, aqueous, colloidal dispersion of a copolymer comprising at most 60 mol % of copolymerized tetrafluoroethylene units, 60 to 40 mol % of copolymerized ethylene units and 0 to 15 mol % of copolymerized units of at least one further α-olefinic comonomer, said dispersion being substantially free of non-fluorinated emulsifiers, which process includes the step of copolymerizing these comonomers in aqueous phase in the presence of conventional initiators forming free radicals and the in the presence of fluorinated carboxylic acids or salts thereof, said fluorinated carboxylic acids or salts thereof consisting essentially of a mixture of

(a) 98 to 80% by weight of perfluorooctanoic acid or alkali metal or ammonium salts thereof and

(b) 2 to 20% by weight of perfluorononanoic acid or perfluorodecanoic acid or alkali metal or ammonium salts thereof.

4,692,494

WATER SOLUBLE FILMS OF POLYVINYL ALCOHOL AND POLYACRYLIC ACID AND PACKAGES COMPRISING SAME

Gerard G. Soaenstein, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 216,358, Dec. 15, 1980, abandoned. This application Aug. 13, 1981, Ser. No. 292,477

Int. Cl.⁴ C08L *29/04*

U.S. Cl. 525—57 **7 Claims**

1. A coherent self-supporting water-soluble film comprising a uniform mixture of-water soluble polyvinyl alcohol which is about 79% to about 95% hydrolyzed polyvinylacetate and has a weight average molecular weight of about 10,000 to about 50,000, and polyacrylic acid having a weight average molecular weight of about 30,000 to 400,000 in a weight ratio of about 10:1 to about 1:1, which film further contains an effective biocidal amount of a non-toxic biocide.

4,692,495

REINFORCED POLYMER PRODUCT, METHOD FOR MANUFACTURING A REINFORCED POLYMER PRODUCT OF THIS TYPE AND A PLASTIC COMPOUND SUITABLE FOR PRODUCING SUCH A REINFORCED POLYMER PRODUCT

Anne K. van der Vegt, Delft, Netherlands, assignor to Technische (Rijks) Hogeschool, Delft, Netherlands

Filed Jul. 11, 1983, Ser. No. 512,768

Claims priority, application Netherlands, Jul. 12, 1982, 82 02813

Int. Cl.⁴ C08L *23/06, 23/12, 33/22, 68/00*

U.S. Cl. 525—184 **5 Claims**

1. A reinforced polymer product produced by extrusion or injection molding melted plastics through a nozzle, said product comprising a thermoplastic basic polymer and reinforcing fibrous polymer elements which comprise oblong elements of a reinforcing polymer more stongly orientated and crystallized than the basic polymer, said elements at least being molecularly oriented during the molding of the polymer product by conveying the plasticized basic polymer surrounding the still melted elements of the reinforcing polymer at a temperature of at most 10° C. above the melting point of the reinforcing polymer while passing through the nozzle so that the elements of the reinforcing polymer are able to crystallize at a temperature near the melting point of the reinforcing polymer while surrounded by the still melted basic polymer, the articles as moulded comprising 10–70% by volume of the reinforcing polymers.

2. A reinforced polymer product as claimed in claim 1, wherein the oblong elements consist of a crosslinked polymer.

4,692,496

FILMS OF LLDPE, PP AND EPR HAVING IMPROVED STIFFNESS, TEAR AND IMPACT STRENGTH

Surinder K. Bahl, Chandigarh, India; Peter J. Canterino, Towaco, and Richard G. Shaw, Piscataway, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 568,014, Jan. 4, 1984, Pat. No. 4,565,847. This application Jan. 21, 1986, Ser. No. 821,086

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.⁴ C08L *23/18, 23/16, 23/12*

U.S. Cl. 525—240 **9 Claims**

1. A film of thermoplastic blend comprising:

60 to 95 weight percent of a linear low density copolymer of ethylene and an olefin having 4 to 10 carbon atoms (LLDPE);

2 to 30 weight percent of a propylene polymer selected from the group consisting of polypropylene (PP) or propylene-ethylene copolymer with a high propylene content; and

less than 2 weight percent of a ethylene-propylene rubber (EPR) in an amount sufficient to improve the MD tear strength and the dart drop impact strength of the LLDPE/PP blend by at least 10 percent.

4,692,497

PROCESS FOR CURING A POLYMER AND PRODUCT THEREOF

Paul M. Gendreau, Swansea; Francisco M. Llort, Dighton, both of Mass., and Raymond A. Berard, Portsmouth, R.I., assignors to Acushnet Company, New Bedford, Mass.

Division of Ser. No. 646,853, Sep. 4, 1984, Pat. No. 4,546,980. This application Jun. 27, 1985, Ser. No. 749,434

Int. Cl.⁴ C08L *19/00, 9/00;* **C08K** *5/09, 5/14*

U.S. Cl. 525—263 **13 Claims**

1. In the method of making a product from an admixture of

a polymer formed from a diene monomer at least a portion of which is polybutadiene and a metal salt of an alpha, beta ethylenically unsaturated carboxylic acid having 3 to 8 carbon atoms the improvement comprising the use of at least two free radical initiators, one of the free radical initiatiors having a half life which is at least three times greater than the half life of another of the free radical initiators at 320° F. the two free radical initiators being present in the amount of from about 0.2 to about 10 parts by weight of the polymer content and being present in a ratio of from about 1:9 to about 9:1.

4,692,498

NOVEL RUBBER-MODIFIED THERMOPLASTIC RESIN COMPOSITIONS

Christopher L. Bodolus, Cleveland, Ohio, and David A. Woodhead, S. Glamorgan, Wales, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 535,726, Sep. 26, 1983, Pat. No. 4,542,189. This application Aug. 5, 1985, Ser. No. 762,311

Int. Cl.⁴ C08F *279/02, 255/06, 283/06*

U.S. Cl. 525—285 **18 Claims**

1. A process for the preparation of novel rubber modified thermoplastic resin compositions in a reactor, capable of intimately mixing multiple immiscible phases, comprising the steps of:

dissolving a rubber polymer in a monomer selected from the group consisting of monovinyl aromatic monomers, olefinically unsaturated nitriles and mixtures thereof to form a feed solution;

introducing said feed solution into a rector;

introducing into said reactor a separate liquid monomer feed stream said monomers being selected from the group consisting of unsaturated dicarboxylic acid anhydrides, olefinically unsaturated nitriles and mixtures thereof;

heating said feed solution and feed stream under pressure to a temperature sufficient for polymerization to begin; and

intimately mixing and polymerizing said monomers around said rubber polymer in said reactor to form a thermoplastic resin composition having a composition comprising:

from about 43 to about 75 parts by weight derived from a monovinyl aromatic monomer;

from about 20 to about 40 parts by weight derived from an olefinically unsaturated nitrile monomer; and

from about five to about 35 parts by weight derived from an unsaturated dicarboxylic acid anhydride monomer, providing 100 parts of a thermoplastic terpolymer; and

from about two to 30 parts of a rubber polymer per 100 parts of said thermoplastic terpolymer.

4,692,499

UNIQUE EPOXY RESIN COMPOSITIONS AND COMPOSITE MOLDED BODIES FILLED THEREWITH

Kevork A. Torossian; Mark Markovitz, both of Schenectady, and Frederick E. Cox, Gloversville, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 595,599, Apr. 2, 1984, Pat. No. 4,631,230. This application May 15, 1986, Ser. No. 863,643

Int. Cl.⁴ C08L *63/00*

U.S. Cl. 525—524 **3 Claims**

1. A thermosetting resin composition having an unique combination of properties and consequent special utility in the production of electrical insulation in the form of composite molded bodies, said composition consisting essentially of an epoxy resin mixture of 25–75% of 1,2 epoxy resin having at least two epoxide groups per molecule and 75–25% of a polyglycol diepoxide having viscosity from 2,000–5,000 cps at 25° C., and small but effective amounts of both a phenolic accelerator and a catalytic hardener which is an organic titanate having only titanium-to-oxygen primary valence bonds.

4,692,500

POLYSULFIDE MODIFIED EPOXY RESINS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1986, Ser. No. 882,641

Int. Cl.⁴ C08F *283/10*

U.S. Cl. 525—529 **28 Claims**

1. A polysulfide modified epoxy resin composition comprising the copolymerization product of an epoxy resin, a (vinylaryl)alkyl substituted polysulfide, and a polymerizable ethylenically unsaturated compound.

4,692,501

PROCESS FOR CONTINUOUS MULTI-STAGE POLYMERIZATION OF OLEFINS

Hideo Mineshima; Haruyuki Koda, both of Ohtake, and Ryoichi Yamamoto, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 556,899, Dec. 1, 1983, abandoned. This application Jul. 31, 1985, Ser. No. 761,330

Claims priority, application Japan, Feb. 6, 1982, 57-92999

Int. Cl.⁴ C08F *2/14, 6/24*

U.S. Cl. 526—65 **9 Claims**

1. In a process for producing an olefin polymer which comprises continuously polymerizing an olefin in the presence of a catalyst composed of a transition metal compound component and a organometallic compound component in at least two independent polymerization zones connected in series by a pipeline while feeding the olefin and the catalyst into an upstream zone of polymerization and withdrawing the resulting polymer from a downstream zone of polymerization; the improvement wherein

(1) the polymerization in the upstream polymerization zone is carried out in a liquid medium selected from the group consisting of liquid olefins and inert hydrocarbons having 3 to 10 carbon atoms under conditions for slurry polymerization,

(2) a solid polymer-containing slurry is discharged from the upstream polymerization zone and is fed into a liquid medium exchanging zone through an upper feed opening (A) in the upper portion thereof, said liquid medium exchanging zone being provided between the upstream polymerization zone and the downstream polymerization zone and connected to these zones by pipelines, and an additional supply of liquid medium selected from the group consisting of liquid olefins and inert hydrocarbons having 3 to 10 carbons atoms is fed into said exchanging zone through a lower feed opening (B) in the lower portion of said exchanging zone,

(3) a discharge flow from an upper discharge opening (C) in the exchanging zone above the upper feed opening (A) is recycled to the upstream polymerization zone, and a discharge flow from a bottom discharge opening (D) in the exchanging zone below the lower feed opening (B) is fed into the downstream polymerization zone, and

(4) the amount of the liquid medium in the discharge flow from the bottom discharge opening (D) is adjusted to 1 to 1.5 times the volume of the additional liquid medium fed from the lower feed opening (B), and thus a precipitated solid polymer is discharged from the bottom discharge opening (D) while the same is concurrent with, and in contact with, the liquid medium from the lower feed opening (B).

4,692,502

POLYMERIZATION PROCESS FOR CARBOXYL CONTAINING POLYMERS UTILIZING OIL SOLUBLE IONIC SURFACE ACTIVE AGENTS

Curtis E. Uebele, Bedford; Lawrence E. Ball, Akron; Richard J. Jorkasky, II, Maple Heights, and Eddie Wardlow, Jr., Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 9, 1986, Ser. No. 872,065

Int. Cl.⁴ C08F *2/08, 2/26, 2/28*

U.S. Cl. 526—193 **20 Claims**

1. A method for polymerizing olefinically unsaturated carboxylic acid monomers containing at least one activated carbon to carbon olefinic double bond and at least one carboxyl group, wherein the monomers are polymerized in an organic media consisting essentially of organic liquids, in the presence of free radical forming catalysts and at least one oil soluble ionic surface active agent selected from the group consisting of:

(a) anionic surface active agents of the formula:

$$[(R\text{-}R_a')_b\text{-}X]^-M^+$$

(b) cationic surface active agents of the formula:

$$[(R\text{-}R_a')_xNR_y]^+A^-$$

and

(c) amphoteric surface active agents of the formula:

$$(R\text{—}R_a')_m\text{—}N^+\text{—}(CR_2)_c\text{—}X^-$$

$$R_n$$

wherein

R is a hydrophobic moiety having eight or more carbons,

R′ is a hydrophilic moiety,

R″ is each independently hydrogen, an alkyl group, an aryl group or an alkyl/aryl group,

X^- is a carbonate, sulfonate, sulfate or phosphate group,

M^+ is a water soluble cation,

A^- is a water soluble anion,

a is 0, 1, 2, 3, 4, 5, 6, 7 or 8,

b is 0, 1, 2 or 3,

c is 1, 2, 3, 4, 5, 6, 7 or 8

x and y are each 0, 1, 2, 3 or 4 with the proviso that x+y=4, and

m and n are each 0, 1, 2 or 3 with the proviso that m+n=3.

4,692,503

COATING COMPOSITIONS COMPRISING FREE RADICAL ADDITION POLYMERS WITH CROSSLINKABLE INTEGRAL ISOCYANATO GROUPS

Suryya K. Das, Pittsburgh, and Charles M. Kania, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 220,620, Dec. 29, 1980, abandoned. This application May 13, 1983, Ser. No. 493,045

Int. Cl.⁴ C08F *12/26*

U.S. Cl. 526—301 **2 Claims**

1. A coating composition comprising an acrylic polymer which is prepared by polymerizing under free radical polymerization conditions a mixture of monomers comprising:

(A) from about 5 to about 50 percent by weight of a polymerizable ethylenically unsaturated amino group-containing monomer which is an amino group-containing acrylate or methacrylate, or amino group-containing heterocyclic compound having a hetero-nitrogen atom bearing a vinyl group and/or a polymerizable ethylenically unsaturated carboxylic acid group-containing monomer which is an acrylic acid, methacrylic acid, itaconic acid, crotonic acid, fumaric acid or maleic acid; the amino or carboxyl acid group is at least partially neutralized with an acid or a base;

(B) from about 5 to 85 percent by weight of a polymerizable ethylenically unsaturated blocked monoisocyanato group-containing monomer which is a blocked 2-isocyantoalkyl ester of acrylic or methacrylic acid,

(C) from about 5 to 90 percent by weight of a polymerizable ethylenically unsaturated hydroxyl group-containing monomer which is a hydroxyalkyl acrylate or hydroxalkyl methacrylate; and

(D) from about 0 to 85 percent by weight of at least one polymerizable ethylenically unsaturated monomer different from (a), (b) and (c) which is an alkyl acrylate or methacrylate or styrene; the percent by weight is based on the total weight of the monomers.

4,692,504

DEACTIVATION OF PHOSPHONIUM SALT CATALYST

Harry Frank, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 30, 1986, Ser. No. 858,311

Int. Cl.⁴ C08G *59/68*

U.S. Cl. 528—89 **17 Claims**

1. A process for deactivating a hydrocarbyl phosphonium salt catalyst comprising contacting the catalyst with a sulfonic acid.

10. A process for preparing an advanced epoxy resin, the process comprising:

contacting in a reaction mixture a polyepoxide having an average of more than one vincinal epoxide group per molecule and a weight per epoxide less than about 500 with a fusion compound selected from the group consisting of phenols, thiophenols, carboxylic acids and carboxylic acid anhydrides in the presence of a catalytic amount of a hydrocarbyl phosphonium salt catalyst, at a temperature in the range of about 100° C. to about 200° C., for a time sufficient to produce an epoxy resin having a weight per epoxide of at least about 500; and

thereafter, adding to the reaction mixture an amount of a sulfonic acid effective to reduce the activity of the hydrocarbyl phosphonium salt catalyst.

4,692,505

PROCESS FOR PREPARING OXYMETHYLENE POLYMERS USING BORON TRIFLUORIDE IN ADMIXTURE WITH AN INERT GAS

Clifford R. Boldt, Corpus Christi, Tex., and Richard K. Greene, Kenet Square, Pa., assignors to Celanese Engineering Resins, Inc., Chatham, N.J.

Filed Jul. 22, 1986, Ser. No. 888,809

Int. Cl.⁴ C08G *2/10*

U.S. Cl. 528—241 **10 Claims**

1. In a process for producing oxymethylene polymers by continuously polymerizing in bulk a monomer mixture containing at least 85 weight percent trioxane in the presence of a boron trifluoride catalyst, the improvement which comprises introducing into the reactor containing a monomer mixture the boron trifluoride catalyst as a gas in admixture with gaseous nitrogen in the volume ratio of nitrogen to boron trifluoride of about 5:1 to about 40:1.

4,692,506

FIVE-COMPONENT COPOLYESTER, PROCESS FOR PREPARATION THEREOF, AND SHAPED ARTICLES THEREOF

Tadao Yatsu, Iwakuni; Takayuki Nakano, Ohtake; Nobuya Hinooka, and Tatsuo Kato, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 675,189, Nov. 27, 1984, Pat. No. 4,622,268. This application Jul. 23, 1986, Ser. No. 888,476

Claims priority, application Japan, Nov. 28, 1983, 58-222182

Int. Cl.⁴ C08G *63/12*

U.S. Cl. 528—296 **7 Claims**

1. A five-component copolyester composed of the following

components (a) to (d) and having the following characteristics (e) and (f):

(a) 25 to 45 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of two aromatic dicarboxylic acid components composed of 70 to 90 mole % of an isophthalic acid component and 30 to 10 mole % of an aromatic dicarboxylic acid component other than the isophthalic acid component, each based on the total moles of the two aromatic dicarboxylic acid components,

(b) 45 to 50 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a diol component composed of 50 to 100 mole % of an ethylene glycol component and 0 to 50 mole % of a diol component other than the ethylene glycol component, each based on the total moles of the two diol components,

(c) 2 to 25 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of an aromatic monohydroxy-monocarboxylic acid component having 7 to 12 carbon atoms, and

(d) 0.01 to 2 mole %, based on the total moles of the components (a), (b), (c) and (d) of the copolyester, of a polyfunctional compound component having 3 to 15 carbon atoms and at least three functional groups selected from the class consisting of carboxyl and hydroxyl groups; and

(e) an intrinsic viscosity [η], determined at 25° C. in a mixed solvent of phenol and tetrachloroethane in a weight ratio of 1:1, of 0.5 to 1.5 dl/g, and

(f) a glass transition temperature of 50° to 120° C.

4,692,507

PROPYLENE-BASE RANDOM COPOLYMER PARTICLES AND PRODUCTION PROCESS THEREOF

Hiroyuki Akiyama, Hiratsuka; Susumu Izawa, Utsunomiya, and Hideki Kuwabara, Hadano, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Division of Ser. No. 795,431, Nov. 6, 1985, Pat. No. 4,602,082. This application Apr. 16, 1986, Ser. No. 852,574
Claims priority, application Japan, Mar. 20, 1985, 60-57454
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—481 **5 Claims**

1. Propylene-base random copolymer particles suitable for use in the production of pre-foamed particles, characterized in that said copolymer particles have been heated to the crystallization temperature thereof or higher and then quenched in an atmosphere of temperature of (the crystallization temperature—30° C.) or lower and are columnar particles made of an ethylene-propylene random copolymer resin and having an average diameter D of 1.7 mm or less and an average length L which has the following relation with the average diameter D:

$L/D \geqq 1.$

4,692,508

VINYLIDENE CHLORIDE INTERPOLYMER POSSESSING IMPROVED EXTRUDABILITY

Mark J. Hall, and Kun S. Hyun, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1985, Ser. No. 811,214
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—503 **9 Claims**

1. A process for improving the extrudability of a vinylidene chloride interpolymer, said vinylidene chloride interpolymer being formed from a monomer mixture comprising at least 40 weight percent vinylidene chloride and being in the form of pellets, said vinylidene chloride interpolymer pellets displaying a first endotherm, as determined by differential scanning calorimetry according to American Society for Testing and Materials Test Method D-3417, below 75° Celsius, wherein the process comprises: exposing said vinylidene chloride interpolymer pellets to a temperature above about 55° Celsius for a length of time sufficient to raise said first endotherm to 75° Celsius or above.

4,692,509

RADIOACTIVE LABELING OF PROTEINS WITH NUCLEOSIDES OR NUCLEOTIDES

Nanibhushan Dattagupta, New Haven, Conn., assignor to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Nov. 27, 1984, Ser. No. 675,373
Int. Cl.[4] A61K *43/00*; A61N *5/12*
U.S. Cl. 530—303 **12 Claims**

1. A radioactively labeled protein comprising a protein, and a radioactive nucloeside or nucleotide, wherein a radioactive moiety is present in the nucleoside or nucleotide, the protein being convalently linked to the nucleoside or nucleotide.

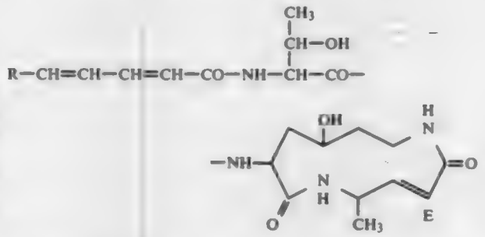
4,692,510

PEPTIDE ANTIBIOTICS

Masataka Konishi, Kawasaki; Koji Tomita, Setagaya; Masahisa Oka, Yokohama, and Ken-ichi Numata, Fuchu, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 771,090, Aug. 30, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 855,649
Int. Cl.[4] C07K *5/12*; C07D *210/00*
U.S. Cl. 530—317 **4 Claims**

1. Compounds of the formula



wherein R is $CH_3—(CH_2)_6$, $CH_3—(CH_2)_4—CH=CH—(CH_2)_2$ or $CH_3—(CH_2)_8$.

4,692,511

PEPTIDE ANTAGONISTS FOR THE C5A ANAPHYLATOXIN

Gary S. Hahn, San Diego, Calif., assignor to Immunetech Pharmaceuticals, San Diego, Calif.

Filed Jul. 3, 1984, Ser. No. 627,702
Int. Cl.[4] C07K *5/08, 5/10, 7/06, 7/08, 7/10*
U.S. Cl. 530—325 **16 Claims**

1. A peptide antagonist for C5a activity, said peptide having an amino acid sequence A-B-C-R-D-E-F wherein:

A is an amino-terminal hydrogen or an amino acid or polypeptide selected from the following list:

Lys—His—Ser—Val—Val—Lys—Lys—
His—Ser—Val—Val—Lys—Lys—
Ser—Val—Val—Lys—Lys—
Val—Val—Lys—Lys—
Val—Lys—Lys—
Lys—Lys—
Lys—;

B is said amino-terminal hydrogen or an amino acid selected from the following list:
Cys
or
Ser;

C is said amino-terminal hydrogen or an amino acid selected from the following list:

Cys
or
Ser

R is a "core" tetrapeptide:
Tyr-Asp-Gly-Ala or Asp-Gly-Ala-Tyr
or a "core" tripeptide:
Asp-Gly-Ala;

D is a carboxy-terminal hydroxyl or an amino acid selected from the following list:
Cys
Ser
or
Tyr;

E is said carboxy-terminal hydroxyl or an amino acid selected from the following list:
Val
or
Arg;

F is said carboxy-terminal hydroxyl or an amino acid or polypeptide selected from the following list:
Asn-Asn-Asp-Glu-Thr-Cys-Glu-Gln-Arg
Asn-Asn-Asp-Glu-Thr-Cys-Glu-Gln
Asn-Asn-Asp-Glu-Thr-Cys-Glu
Asn-Asn-Asp-Glu-Thr-Cys
Asn-Asn-Asp-Glu-Thr
Asn-Asn-Asp-Glu
Asn-Asn-Asp
Asn-Asn
Asn

and polypeptides identical to the first four listed in which Ser is substituted for Cys; and wherein the above amino acids and polypeptides are composed of L-enantiomeric amino acids.

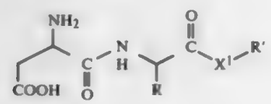
4,692,512

ALPHA-L-ASPARTYL-D-PHENYLGLYCINE ESTERS AND AMIDES USEFUL AS HIGH INTENSITY SWEETENERS

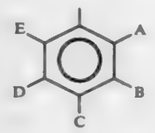
John M. Janusz, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 630,504, Jul. 13, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 811,585
Int. Cl.[4] A23L *1/236*
U.S. Cl. 530—801 **22 Claims**

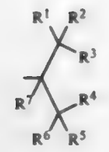
1. A compound of formula:

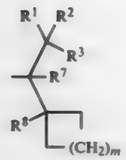


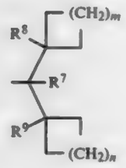
wherein the said ester or amide is the L, D stereochemical isomer; wherein X^1 is O or NH; and wherein R is a phenyl group having the formula:

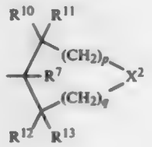


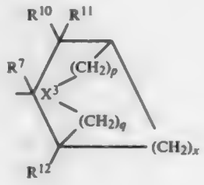
wherein, A, B, C, D and E are H, OH, F, Cl, Br, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; and wherein R′ is selected from the group consisting of hydrocarbyl radicals having formulas (a) (b) (c) (d) (e) (f) and (g):

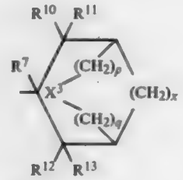
(a)


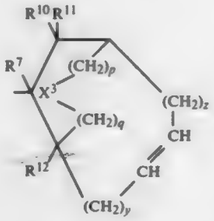
(b)


(c)


(d)


(e)


(f)


(g)


wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} are H, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; X^2 is CH_2, O, S, SO, SO_2, C═O, $CR^{14}OH$, NR^{14}



wherein R^{14} is H or C_1–C_2 alkyl or hydroxyalkyl; X^3 is CH_2, O, S, SO, SO_2, C═O, $CR^{14}OH$, NR^{14},



provided that when X^3 is other than CH_2, R^{10}, R^{11}, R^{12} and R^{13} are each H; m is 0, 1, 2, 3, or 4; n is 0, 1, 2, 3, or 4; p and q are 0. 1, 2 or 3 and the sum of p+q is not greater than 3; x is 1, 2 or 3; y and z are 0, 1 or 2 and the sum of y+z is not greater than 2; and nontoxic salts thereof.

4,692,513

ALPHA-L-ASPARTYL-D-HETEROAROMATIC-SUBSTITUTED GLYCINE ESTERS AND AMIDES USEFUL AS HIGH INTENSITY SWEETENERS

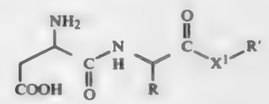
Robert B. Blum, Santiago, Chile; John M. Gardlik, Cincinnati, Ohio; John M. Janusz, Fairfield, Ohio, and George P. Rizzi, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 20, 1985, Ser. No. 811,609

Int. Cl.[4] C07D *271/02, 285/06, 285/08, 285/12, 331/02, 333/02, 251/00, 213/00*

U.S. Cl. 530—801 **23 Claims**

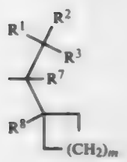
1. A compound of the formula:



and nontoxic salts thereof; wherein the said ester or amide is the L,D stereochemical isomer; wherein X^1 is O or NH; and wherein R is a heteroaromatic group having a 5 or 6 member heteroaromatic ring selected from the group consisting of furyl, thienyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, isoxazolyl, isothiazolyl, pyrazolyl, oxadiazolyl, thiadiazolyl, triazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; and wherein R′ is selected from the group consisting of hydrocarbyl radicals having formulas (a) (b) (c) (d) (e) (f) and (g):



(a) wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{11}, R^{12} and R^{13} are H, or C_1–C_4 alkyl, hydroxyalkyl or alkoxy; X^2 is CH_2, O, S, SO, SO_2, C═O, $CR^{14}OH$, NR^{14}



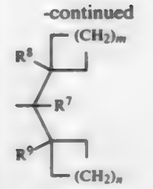
(b)



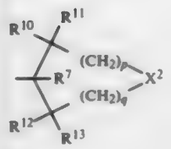
wherein R^{14} is H or C_1–C_2 alkyl or hydroxyalkyl; provided that when R^1 is a hydrocarbyl radical of formal (e), (f) or (g), R^{10}, R^{11}, R^{12} and R^{13} are each H when X^2 is other than CH_2 or O; m is 0, 1, 2, 3 or 4; n is 0, 1, 2, 3, or 4; p and q are 0, 1, 2 or 3 and the sum of p+q is not greater than 3; x is 1, 2 or 3; y and z are 0, 1 or 2 and the sum of y+z is not greater than 2.

-continued

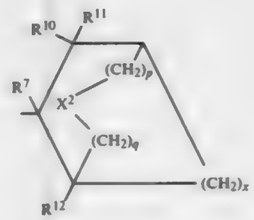
(c)



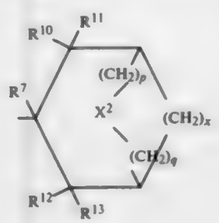
(d)



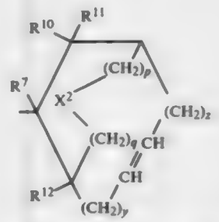
(e)



(f)



(g)



4,692,514

PROCESS FOR SEPARATING KETOSES FROM ALKALINE- OR PYRIDINE-CATALYZED ISOMERIZATION PRODUCTS

Chin-Hsiung Chang, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1985, Ser. No. 811,588

Int. Cl.[4] C07H *1/00*

U.S. Cl. 536—127 **7 Claims**

1. A process for separating psicose from an aqueous feed mixture containing psicose and at least one other ketose selected from the group consisting of fructose, sorbose, tagatose and ribulose, which comprises contacting at adsorption conditions said mixture with an adsorbent comprising a type Y zeolite having calcium cations at exchangeable cationic sites, selectively adsorbing said psicose to the substantial exclusion of said other ketoses, removing the nonadsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering high purity psicose by desorption at desorption conditions.

4,692,515

ADAMANTANE-SPIROLACTAMS

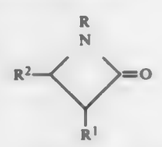
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 653,632, Sep. 24, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,917

Int. Cl.[4] C07D *205/12;* **A61K** *31/395*

U.S. Cl. 540—203 **16 Claims**

1. A spiro[azetidin-2-one-4,2′(or 3,2′)adamantane] compound having the following structure:



where R is hydrogen, —SO_2Cl, ór an alkyl group and one of R^1 and R^2 is an adamantyl group which shares a ring carbon with the lactam moiety and the other is an alkyl, a hydroxy substituted alkyl, a phenyl, or a phenyl group substituted with a haloalkyl, alkoxy or formyl radical, said alkyl groups having from 1 to 8 carbon atoms.

4,692,516

PROCESS FOR THE MANUFACTURE OF 3-PYRIDINIUM-METHYL-CEPHALOSPORINS

Reiner Kirrstetter, Kelkheim; Walter Dürckheimer, Hattersheim am Main; Rudolf Lattrell, Königstein/Taunus, and Wilfried Schwab, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,593

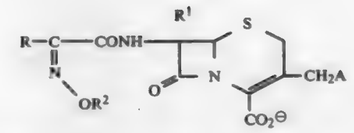
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316797

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] C07D *501/46*

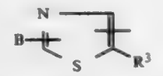
U.S. Cl. 540—222 **2 Claims**

1. A process for the preparation of a cephem compound of the formula I

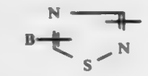


(I)

in which R denotes a thiazolyl radical



or a 1,2,4-thiadiazolyl radical

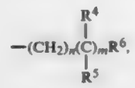


in which

R^3 represents hydrogen or halogen and B represents an amino group or an amino group substituted with an amino protective group, and wherein

R^1 denotes hydrogen,

R^2 denotes hydrogen, C_1–C_6-alkyl, which can be mono-substituted or polysubstituted by halogen, C_1–C_6-alkylthio, C_1–C_6-alkoxy, phenyl or 1,3-thiazol-4-yl or denotes C_2–C_6-alkenyl, which can be monosubstituted or polysubstituted by halogen; or denotes C_2–C_3-alkynyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_6-alkyl, C_4–C_7-cycloalkenyl, or the group

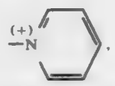


in which m and n are each 0 or 1,

R^4 and R^5 can be identical or different and denote hydrogen, phenyl or a C_1–C_4-alkyl group, or, together with the carbon to which they are bonded, form a methylene or C_3–C_7-cycloalkylidene group, R^6 denotes a COOH, CN or $CONH_2$ group, it being possible for the latter to be monosubstituted or disubstituted on the nitrogen by methyl or ethyl, A denoes a quinolinium or isoquinolinium radical, each of which can also be monosubstituted or polysubstituted by identical or different substituents from the group comprising C_1–C_6-alkyl, which can be substituted by hydroxyl; halogen, trifluoromethyl and

hydroxyl,

or denotes a pyridinium radical



which can be monosubstituted or polysubstituted by identical or different substituents from the group comprising C_1–C_6-alkyl, which can be monosubstituted or polysubstituted by hydroxyl; formyl and C_1–C_6-alkylcarbonyl, sulfo, carbamoyl, C_1–C_6-alkoxy and hydroxy-C_1–C_6-alkoxy, it also being possible for 2 neighbouring alkyl groups to be linked to form a tri- to pentamethylene ring in which one ring carbon atom can be replaced by an oxygen or sulfur atom and which can furthermore also contain one or two double bonds, and which may be substituted by C_1–C_6-alkyl,

C_1–C_4-alkoxy, hydroxymethyl, halogen, hydroxyl, oxo or exomethylene, C_2–C_6-alkenyl, which can be substituted by hydroxyl, C_2–C_6-alkynyl,

C_3–C_7-cycloalkyl and C_3–C_7-cycloalkylmethyl, it being possible for the ring in these two substituents also to be substituted by hydroxyl or halogen,

C_4–C_7-cycloalkenyl,

C_1–C_6-alkoxy, which can be substituted by hydroxyl,

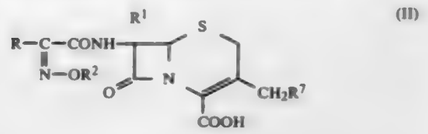
C_2–C_6-alkenyloxy and C_2–C_6-alkynyloxy,

halogen, trifluoromethyl and hydroxyl; phenyl, benzyl which can also be substituted by halogen, 2'-thienyl or 3'-thienyl, formyl, C_1–C_6-alkylcarbonyl, which can also be substituted by hydroxyl,

phenylcarbonyl and

carbamoyl,

and in which the R^2O group is in the syn-position, which comprises reacting a compound of the formula II



(II)

or salts thereof, in which R, R^1 and R^2 have the meaning given for formula I and R^7 denotes a group which can be replaced by the base corresponding to the radicals A of formula I, with a molar excess of this base in the presence of a tri-C_1–C_4-alkyliodosilane to form a compound of the formula I and said base is also present in molar excess related to said tri-C_1–C_4-alkyliodosilane and

(a) splitting off any protective group present and

(b) if necessary, converting the resulting product into a physiologically acceptable acid addition salt.

4,692,517

C-3' ACYLAMINOOXY-7-[(2-AMINOTHIAZOL-4-YL)-α-(SUBSTITUTED-OXIMINO)ACETYL]CEPHALOSPORIN DERIVATIVES

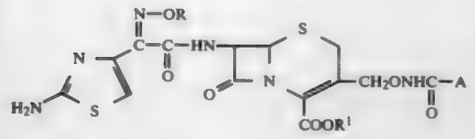
Jerauld S. Skotnicki, Chadds Ford, and Thomas J. Commons, Wayne, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 20, 1986, Ser. No. 842,123

Int. Cl.[4] C07D *501/34*

U.S. Cl. 540—222 **2 Claims**

1. A compound having the formula



wherein

R is hydrogen, lower alkyl, or cyclo lower alkyl, the said foregoing groups being optionally substituted with carboxy or lower alkoxycarbonyl;

R^1 is hydrogen, lower alkyl or an alkali metal cation; and

A is lower alkoxy or aryloxy of 6–10 carbon atoms.

4,692,518

CRYSTALLINE (7R)-7-AMINO-3-(1'-PYRIDINIUMMETHYL)-3-CEPHEM-4-CARBOXYLATE MONOHYDRATE COMPOUND

Gary E. Lord, West Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 6, 1985, Ser. No. 795,568

Int. Cl.[4] C07D *501/38*; A61K *31/44*

U.S. Cl. 540—224 **1 Claim**

1. The crystalline monohydrate of 7-(R)-amino-3-(1'-pyridiniummethyl)-3-cephem-4-carboxylate which has the following X-ray powder diffraction obtained with nickel-filtered copper radiation of λ = 1.5418 angstroms, wherein d represents the interplanar spacing and I/I_1 the relative intensity:

d	I/I_1
10.49	.06
7.85	.32
7.27	.06
6.93	.24 b
6.14	.30
5.33	.20
5.00	.56
4.79	.12
4.30	1.00
4.03	.28
3.92	.14
3.85	.14
3.62	.82
3.50	.60
3.37	.26
3.16	.08
3.09	.02
3.03	.08
2.95	.02
2.83	.06 b
2.66	.26
2.61	.06 b
2.49	.20
2.42	.06
2.35	.02
2.27	.12
2.15	.12
2.09	.14
1.927	.02
1.891	.02
1.874	.02.

4,692,519

CRYSTALS OF SODIUM CEPHEMCARBOXYLATE

Kenzo Naito, Kyoto; Kazuo Tsukamura, Hyogo, and Sakae Aoyagi, Saitama, all of Japan, assignors to Lederle (Japan), Ltd., Kyobashi and Takeda Chemical Industries, Ltd., Juso-honmachi, both of, Japan

Filed Nov. 26, 1984, Ser. No. 674,745

Claims priority, application Japan, Dec. 2, 1983, 58-228868

Int. Cl.[4] C07D *501/56*; A61K *31/545*

U.S. Cl. 540—227 **1 Claim**

1. Crystals of sodium 7β-[2-(2-aminothiazol-4-yl)-(Z)-2-methoxyiminoacetamido]-3-[(1,2,3-thiadiazol-5-yl)thiomethyl]ceph-3-em-4-carboxylate showing their characteristic peaks at interplanar spacings (d) of 9.3, 8.9, 5.3, 5.1, 4.4, 4.3, and 3.89 Å in the powder X-ray diffraction pattern.

4,692,520

N-SUBSTITUTED ACYL-LACTAM COMPOUND

Albert A. Van Geenen, Brunssum, and Jozef J. M. Bongers, Elsloo (L.), both of Netherlands, assignors to Stamicarbon B.V. (Subsidiary of DSM), Geleen, Netherlands

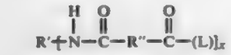
Filed Dec. 13, 1985, Ser. No. 808,559

Claims priority, application Netherlands, Dec. 20, 1984, 8403860

Int. Cl.[4] C07D *223/10*

U.S. Cl. 540—451 **11 Claims**

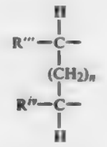
1. N-substituted acyl-lactam compound having the formula



wherein

R' is a bivalent alkyl, aralkyl, alkaryl or aryl residue radical of a polyisocyanate,

R'' is a bivalent radical of a dicarboxylic acid anhydride having the following formula



wherein

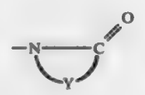
R''' is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl,

R^{iv} is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl, where

R''' and R^{iv}, together with the carbon atom to which each is bonded, may jointly form a cycloalkyl residue,

n is 0 or 1,

(L) represents a non-opened lactam ring having the formula



wherein

Y has 3–11 carbon atoms, and X is a number ≧ to 1.

4,692,521

N-SUBSTITUTED ACYL-LACTAM COMPOUND

Jozef J. M. Bongers, Elsloo, and Albert A. Van Geenen, Brunssum, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

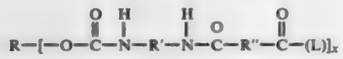
Filed Dec. 13, 1985, Ser. No. 808,558

Claims priority, application Netherlands, Dec. 20, 1984, 8403861

Int. Cl.[4] C07D *223/10*

U.S. Cl. 540—451 **11 Claims**

1. N-substituted acyl-lactam compound, characterized by the formula:

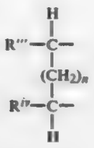


where

R is a residue originating from a polyol having the formula $R—(OH)_x$ where x is a number ≧2 and having an equivalent weight of at least 300 and up to 5,000;

R' a bivalent cyclic or non-cyclic alkyl, aralkyl, alkaryl or aryl radical;

R'' a bivalent radical residue from a dicarboxylic acid, anhydride having the following formula



wherein

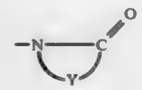
R''' is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl,

R^{iv} is H, alkyl, cycloalkyl, aryl, alkaryl or aralkyl, where

R''' and R^{iv} may jointly, together with the carbon atom to which is respectively bonded, form a substituted or unsubstituted cycloalkyl residue;

n is 0 or 1; and

(-L) represents a non-opened lactam ring of the formula



wherein Y has 3–11 carbon atoms.

5. The compound according to claim 1 wherein:

R' is the bivalent radical residue of 1,5-hexane diisocyanate, 1,6 hexanediisocyanate, isophoronediisocyanate, toluenediisocyanate, MDI, hydrogenated MDI, modified MDI, xylylenediisocyanate and hydrogenated toluenediisocyanate;

R is a residue of a polyether polyol, a polyester polyol, a polybutadiene polyol, a siloxane-containing polyol(s), polymeric polyol(s), or mixtures thereof;

R'' is the bivalent radical residue of a dicarboxylic acid anhydride selected from the group consisting of glutaric acid anhydride, succinic acid anhydride, or 1,2 cyclohexane dicarboxylic acid anhydride; and

L represents a lactam ring wherein the lactam of said lactam ring is selected from the group consisting of 2-pyrrolidone, 2-piperidone, enantholactam, decanolactam, undecanalactam, lauryll lactam, caprolactam and mixtures thereof.

4,692,522

BENZOFUSED LACTAMS USEFUL AS CHOLECYSTOKININ ANTAGONISTS

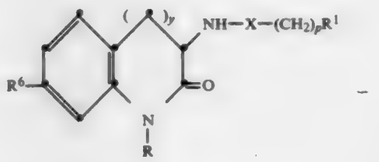
William H. Parsons, Rahway, and Arthur A. Patchett, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 718,597, Apr. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,856, Jun. 26, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 871,340

Int. Cl.[4] C07D *223/16, 225/06, 215/22*

U.S. Cl. 540—523 **3 Claims**

1. A compound of the formula:



wherein:

X is absent or carbonyl;

R is unsubstituted or mono-, di-, or trisubstituted C_1–C_8-

straight- or branched-alkyl, where the substituent(s) is/are selected from the group consisting of C_1–C_4-alkylthio, C_1–C_4-alkyloxy, C_1–C_4-alkylamino, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryloxy, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10} -arylthio, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl, and unsubstituted or mono-, di-, or tri-substituted heteroaryl, and the substituent(s) on the C_6- or C_{10}-aryloxy, the C_6-or C_{10}-arylthio, the C_6- or C_{10}-aryl and the heteroaryl being selected from C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; substituted carbonyl-C_1–C_4-alkyl, which carbonyl group is substituted with hydroxy, C_1–C_8-straight- or branched-alkoxy, C_1–C_8-straight- or branched-alkyl, unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, and unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, where the substituent(s) on the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_8-alkyl or the C_6- or C_{10}-aryl-C_1–C_4-alkoxy is/are selected from the group consisting of hydroxy, C_1–C_8-straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4-alkylamino, or NR_4R_5, where R_4 R_5 are independently selected from hydrogen, C_1–C_6-straight- or branched-alkyl, unsubstituted or mono-, di-, or trisubstituted-carboxy-C_1–C_8-straight- or branched-alkyl, or unsubstituted or mono-, di-, or trisubstituted-carboxamido-C_1–C_8-straight- or branched-alkyl, wherein the substituent(s) on the carboxy-C_1–C_8-straight- or branched-alkyl or on the carboxamido-C_1–C_8-straight- or branched-alkyl is/are selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, amino-C_1–C_4-alkyl, unsubstituted or mono-, di-, or trisubstituted C6- or C10-aryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, and unsubstituted or mono-, di-, or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, where the substituent(s) on the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_8-alkyl or the C_6- or C_{10}-aryl-C_1–C_4-alkoxy is/are selected from the group consisting of hydroxy, C_1–C_8straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, and mono- or di-C_1–C_4-alkylamino;

R^1 is R^a or R^b;

R^a is unsubstituted or mono-, di- or trisubstituted aryl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl, and the substitutent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-straight- or branched-alkyl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_1–C_8-straight- or branched-alkyl, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6-or C_{10}-aryl-C_2–C_4-alkenyl, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4 alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_2–C_4-alkenyl, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryloxy, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryloxy, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-arylthio, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroarylthio, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkyloxy, where the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted heteroaryl-C_1–C_4-alkyloxy, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio or mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted mono- or C_{10}-aryl-C_1–C_4-alkylthio, where substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio and mono- or di-C_1–C_4-alkylamino; unsubstituted or mono-, di- or trisubstituted mono- or C_{10}-aryl-C_1–C_4-alkylthio, and the substituent(s) is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio and mono- or di-C_1–C_4-alkylamino; C_3–C_{10}-cycloalkyl; C_3–C_{10}-cycloalkyl-C_1–C_4-alkyl; C_1–C_6-straight- or branched-alkyl-Q-$(CH_2)_m$, here m is 1-to-3, and Q is O, S, SO, SO_2, —HC=CH–, or substituted-amino, wherein the substituent is hydrogen, C_1–C_8-straight- or branched-alkyl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl, unsubstituted or mono-, di or trisubstituted heteroaryl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkyl, or unsubstituted or mono-, di- or trisubstituted heteroaryl where the substituent(s) on the C_6- or C_{10}-aryl, the heteroaryl, the C_6- or C_{10}-aryl-C_1–C_4-alkyl, or the heteroaryl C_1–C_4-alkyl is/are selected from the group consisting of C_1–C_8-straight- or branched-alkyl, hydroxy, C_1–C_4alkoxy, halo, nitro, amino, C_1–C_4-alkyl-thio and mono- or di-C_1–C_4-alkylamino; or C_9–C_{12}-benzofused cycloalkyls; and

R^b is —CHR^2R^3, where R^2 is R^a, as defined above, and

R^3 is substituted carbonyl, wherein the substituent is hydroxy, C_1–C_4-alkoxy, C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, amino, C_1–C_8-straight- or branched-alkylamino, C_6- or C_{10}-aryloxy, C_6- or C_{10}-aryl-C_1–C_6-alkylamino, C_6- or C_{10}-aryl-C_1–C_4-alkyloxy, carboxy-C_1–C_8-straight- or branched-alkylamino, or carboxamido-C_1–C_8-straight- or branched-alkylamino; NR^7R^8 wherein R^7 and R^8 are independently selected from hydrogen, substituted carbonyl, unsubstituted or mono-, di- or trisubstituted-carboxy-C_1–C_8-straight- or branched-alkyl, and unsubstituted- or mono-, di- or trisubstituted-carboxamido-C_1–C_8-straight- or branched-alkyl, where the substituents on the carbonyl, the carboxy-C_1–C_8-alkyl or the carboxamido-C_1–C_8-alkyl is/are selected from C_1–C_4-alkyl, C_1–C_4-alkyloxy, amino-C_1–C_4-alkyl, unsubstituted or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_8-alkyl, unsubstituted- or mono-, di- or trisubstituted C_6- or C_{10}-aryl, unsubstituted- or mono-, di- or trisubstituted C_6- or C_{10}-aryl-C_1–C_4-alkoxy, and mono-, di- or trisubstituted-C_1–C_8-alkyl, wherein the substituent(s) on the C_6- or C_{10}-aryl-C_1–C_8-alkyl, the C_6- or C_{10}-aryl, the C_6- or C_{10}-aryl-C_1–C_4-alkoxy or the C_1–C_8-alkyl is/are selected from hydroxy, C_1–C_8-straight- or branched-alkyl, C_1–C_4-alkoxy, halo, nitro, amino, C_1–C_4-alkylthio, or mono- or di-C_1–C_4-alkylamino;

R^6 is hydrogen; halo; hydroxy; nitro; amino; C_1–C_4-alkylthio; C_1–C_8-alkyl; or C_1–C_8alkoxy;

y is 1 to 3;

p is 0 to 2, with the proviso that when p is 0, X is carbonyl;

wherein heteroaryl represents a group selected from the group consisting of pyridyl, thienyl, furyl, imidazoyl, thiazolyl, indolyl, quinolinyl, isoquinolinyl, benzimidazolyl, benzothiazolyl, and benzthienyl; and the pharmaceutically-acceptable salts thereof.

4,692,523

PROCESS FOR THE PREPARATION OF 1-SUBSTITUTED AZA-CYCLOALKAN-2-ONES

Manfred Schorr, Frankfurt am Main, and Wilfried Schmitt, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,373

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1985, 3536028

Int. Cl.[4] **C07D** *207/267, 211/76, 223/10, 225/02*

U.S. Cl. 540—533 **3 Claims**

1. A process for the preparation of 1-substituted azacycloalkan-2-ones of the formula I



I

in which R denotes hydrogen or lower alkyl having 1–4 carbon atoms, m denotes 3–7 and n denotes 0–17, which comprises reacting a 1-trimethylsilylazacycloalkan-2-one of the formula III

III

in which R and m have the above-mentioned meanings with an alkali metal alcoholate or an alkali metal oxide and, for the introduction of the alkyl radical —$(CH_2)_nCH_3$, reacting the alkali metal salt of the azacycloalkan-2-one thus formed with an alkylating agent.

4,692,524

PROCESS FOR THE PREPARATION OF PYRIMIDINE DERIVATIVES

Robert Hüssig, Sisseln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 2, 1986, Ser. No. 858,636

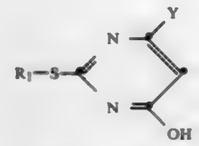
Int. Cl.[4] **C07D** *239/60, 239/56*

U.S. Cl. 544—303 **23 Claims**

1. A process for the preparation of a 2-mercapto-4,6-bis-fluoroalkoxypyrimidine of formula I

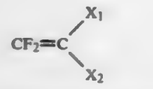
(I)

wherein R_1 is C_1–C_4alkyl, phenyl or benzyl and each of T_1 and T_2 independently of the other is hydrogen or a —CHX_1X_2 group, wherein each of X_1 and X_2 independently of the other is trifluoromethyl, fluorine, chlorine or bromine, which process comprises reacting a 2-mercapto-4-halo-6-hydroxypyrimidine of formula II



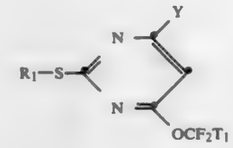
(II)

wherein R_1 is as defined for formula I and Y is chlorine or bromine, with chlorodifluoromethane or a 1,1-difluoroalkene of formula III



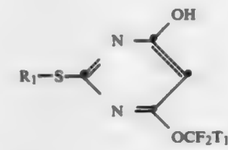
(III)

wherein each of X_1 and X_2 independently of the other is trifluoromethyl, fluorine, chlorine or bromine, in an inert solvent and in the presence of a strong base, to give a 2-mercapto-4-halo-6-fluoroalkoxypyrimidine of formula IV



(IV)

wherein R_1, Y and T_1 are as defined above, converting said 2-mercapto-4-halo-6-fluoroalkoxypyrimidine of formula IV by subsequent reaction with an alkali metal nitrite or an alkaline earth metal nitrite, in a polar solvent, into a 2-mercapto-4-hydroxy-6-fluoroalkoxypyrimidine of formula V



(V)

wherein R_1 and T_1 are as defined above, and then converting said 2-mercapto-4-hydroxy-6-fluoroalkoxypyrimidine of formula V by reaction with chlorodifluoromethane or a 1,1-difluoroalkene of formula III, in an inert solvent and in the presence of a strong base, into a 2-mercapto-4,6-bis-fluoroalkoxypyrimidine of formula I.

4,692,525

PROCESS FOR THE SEPARATION OF OPTICAL ISOMERS OF RACEMIC 1-PYRIDYL-ALKYL-4-ARYL PIPERAZINES, AND OPTICAL ISOMERS OBTAINED THEREBY

Graziano Bonacchi; Mauro Fedi, and Mario Giannini, all of Florence, Italy, assignors to Maleci S.p.A. Istituto Farmacobiologico, Florence, Italy

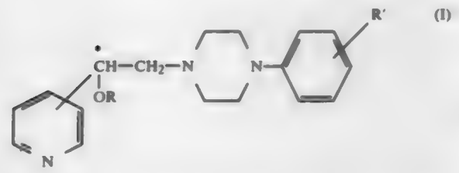
Division of Ser. No. 627,583, Jul. 3, 1984, Pat. No. 4,578,467. This application Dec. 11, 1985, Ser. No. 807,714

Claims priority, application Italy, Jul. 11, 1983, 48664 A/83

Int. Cl.[4] C07D *401/06, 401/12;* A61K *31/495*

U.S. Cl. 544—360 **7 Claims**

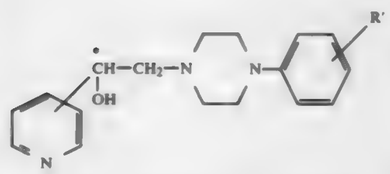
1. A process for the separation of the optical antipodes of the compound of the formula:



(I)

which process is characterized in that, according to the flowsheet C:

(a) the racemic alcoholic derivative corresponding to the formula:



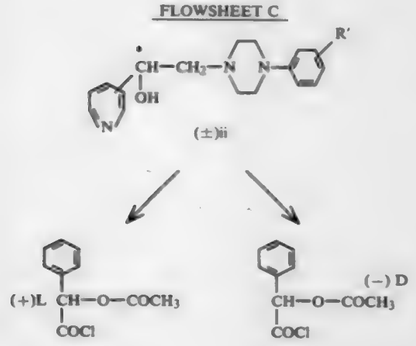
(±)II

is reacted with the chloride of the optically active acetylmandelic acid;

(b) the diastereoisomeric compound so obtained is hydrolyzed with hydroalcoholic KOH at room temperature;

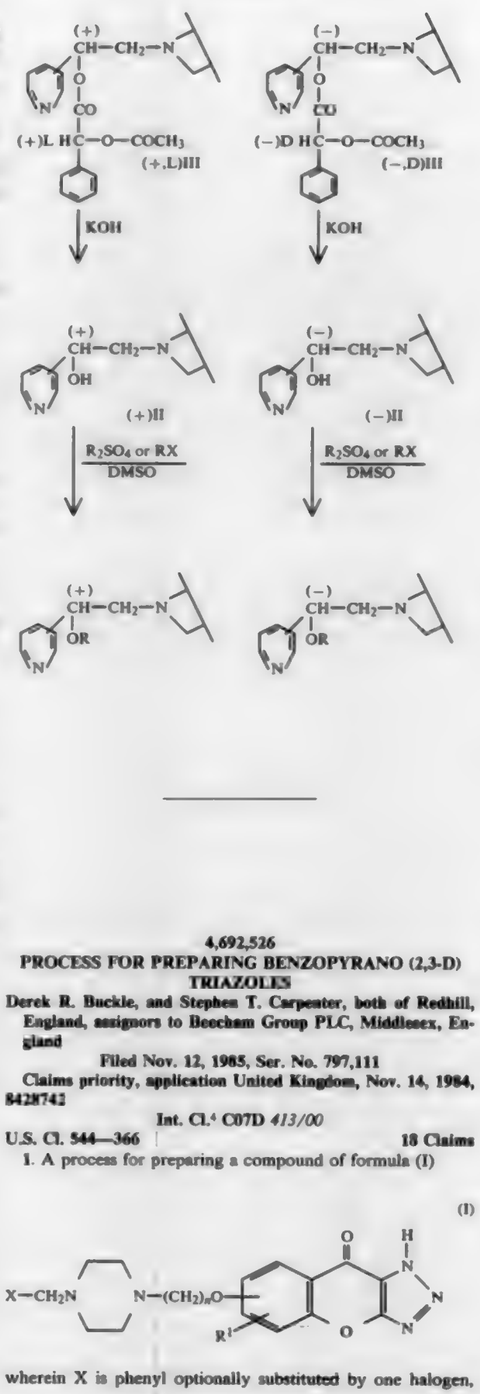
(c) the optically active alcoholic derivative so obtained, after salification with alkaline hydrides or hydrates in a solvent medium is treated with alkylating agents according to the following flowsheet:

FLOWSHEET C



-continued

FLOWSHEET C



4,692,526

PROCESS FOR PREPARING BENZOPYRANO (2,3-D) TRIAZOLES

Derek R. Buckle, and Stephen T. Carpenter, both of Redhill, England, assignors to Beecham Group PLC, Middlesex, England

Filed Nov. 12, 1985, Ser. No. 797,111

Claims priority, application United Kingdom, Nov. 14, 1984, 8428743

Int. Cl.[4] C07D *413/00*

U.S. Cl. 544—366 **18 Claims**

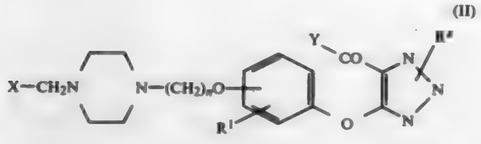
1. A process for preparing a compound of formula (I)

(I)

wherein X is phenyl optionally substituted by one halogen,

C_{1-4} alkyl or C_{1-4} alkoxy; or pyridyl; R_1 is hydrogen or C_{1-6} alkyl; and n is an integer of from 1 to 6;

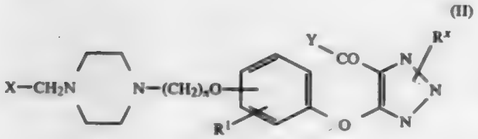
which process comprises, cyclising a compound of formula (II):



(II)

wherein X, R^1 and n are as defined in relation to formula (I); Y is an hydroxy or an acid activating group and R^x is hydrogen or an N-protecting group and thereafter if desired carrying out one or more of the following steps: (i) removing any protecting group R^x, (ii) preparing a salt of the compound of formula (I).

17. A compound of formula II



(II)

wherein X is phenyl optionally substituted by one halogen, C_{1-4} alkyl or C_{1-4} alkoxy; or pyridyl; R^1 is hydrogen or C_{1-6} alkyl; n is an integer of from 1 to 6; COY is an acid, acid halide or anhydride and R^x is hydrogen or C_{2-6} alkoxy substituted benzyl group.

4,692,527

2-AMINO-3,5-DI-(HALOMETHYL)-PYRAZINES AND THEIR PREPARATION

Hartmut Leininger, Neustadt; Wolfgang Littmann, Mannheim; Joachim Paust, Neuhofen, and Walter Trautmann, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

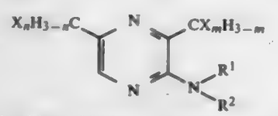
Filed Sep. 16, 1985, Ser. No. 776,460

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1984, 3433959

Int. Cl.[4] C07D *403/04, 241/20*

U.S. Cl. 544—405 **3 Claims**

1. A 2-amino-3,5-di-(halomethyl)-pyrazine of the formula I



(I)

where X is either chlorine or bromine, m is 1 or 2 and n is=m+1, and R^1 and R^2 are each hydrogen or together form a phthalimido radical.

4,692,528

INTERMEDIATES FOR OCTAHYDROBENZOFURO[3,2-e]ISOQUINOLINES

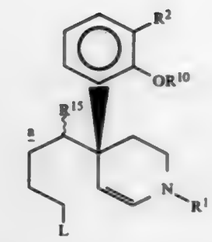
Ashokkumar B. Shenvi, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 522,094, Aug. 11, 1983, Pat. No. 4,537,963, which is a division of Ser. No. 334,839, Dec. 28, 1981, Pat. No. 4,421,916. This application Jun. 11, 1985, Ser. No. 743,415

Int. Cl.[4] C07D *491/08*

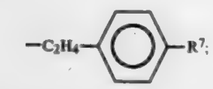
U.S. Cl. 546—115 **3 Claims**

1. The compound, Compound VIII, having the formula:



wherein

R^1 is C_{1-10} alkyl, $—CH_2R^6$ or



R^2 is —H or C_{1-12} alkoxy;

R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group;

R^7 is —H or C_{1-3} alkyl;

R^{10} is C_{1-10} alkyl;

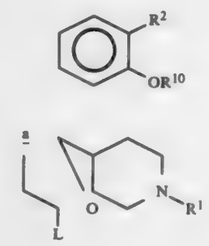
R^{15} is C_{1-3} alkyl carbonyloxy, —OH, or $—OCH(R^{12})OR^{13}$; wherein

R^{12} and R^{13} are —H or C_{1-3} alkyl and taken together may form a C_{2-5} alkylene group optionally substituted with a methyl group, except that R^{12} and R^{13} may not both be —H;

L is —Cl, —Br, —I, p—$MeC_6H_4SO_3$— or $MeSO_3$; and

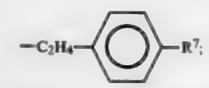
a is — or ---.

2. The compound, Compound VII, having the formula:



wherein

R^1 is C_{1-10} alkyl, $—CH_2R^6$ or



R^6 is C_{3-6} cycloalkyl, phenyl or 2-tetrahydrofuryl optionally substituted with a methyl group and R^7 is —H or C_{1-3} alkyl;

R^2 is —H or C_{1-12} alkoxy;

R^{10} is C_{1-10} alkyl;

L is —Cl, —Br, —I, p—$MeC_6H_4SO_3$— or $MeSO_3$; and

a is — or

4,692,529

METHOD FOR SYNTHESIZING A MAGENTA COUPLER BY SELECTIVELY ETHERIFYING 4-HYDROXY-5-PYRAZOLONE

Kasaku Masuda, Akishima; Ryosuke Sato; Fumio Ishii, both of Hino; Kazuhiko Kimura, and Hidetaka Ninomiya, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

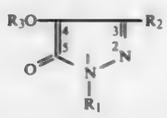
Continuation of Ser. No. 312,317, Oct. 16, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,510

Claims priority, application Japan, Oct. 17, 1980, 55-146074

Int. Cl.[4] C07D *231/28, 401/12*

U.S. Cl. 546—141 **6 Claims**

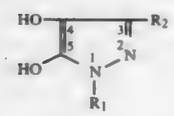
2. A method for synthesizing a photographic magenta coupler having the general formula I:



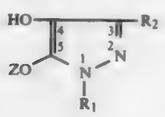
I

wherein R_1 is selected from the group consisting of an aryl group and a heterocyclic group, R_2 is selected from the group consisting of an acylamide group, an anilino group and a ureido group; and R_3 is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group and a heterocyclic group, comprising the steps of:

(a) reacting a compound having the general formula



wherein R_1 and R_2 are as defined above, with a blocking agent to obtain a compound having the general formula II



II

wherein R_1 and R_2 are as defined above and Z represents a blocking group selected from the group consisting of (1)



wherein X is oxygen or sulfur; and R_4 is selected from the group consisting of hydrogen, alkyl, aryl, heterocyclic, alkoxy, aryloxy, heterocyclic oxy, amino, alkylthio and heterocyclic thio; (2) $—SO_2R_5$, wherein R_5 is selected from the group consisting of alkyl, aryl, heterocyclic, hydroxy and amino; and (3) $—R_6$, wherein R_6 is selected from the group consisting of silyl, phosphoryl, benzyl, methoxymethyl, 2-pyranyl and phenacyl;

(b) reacting the compound having the general formula II with an etherification agent selected from the group consisting of an alkyl-etherification agent, an aryl-etherification agent and a heterocyclic-etherification agent to etherify the hydroxy group in the fourth position of said compound; and

(c) removing said blocking group Z from the etherified compound having the general formula II to obtain said coupler having the general formula I.

4,692,530

CHEMICAL AGENTS

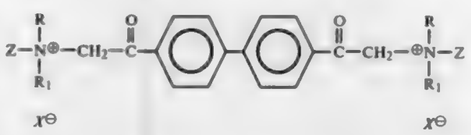
Harold Z. Sommer, Havre de Grace, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1967, Ser. No. 624,649

Int. Cl.[4] C07D *213/69;* **C07C** *125/06*

U.S. Cl. 546—261 **3 Claims**

1. Chemical compound having the formula:



where X is one equivalent of an anion selected from the group consisting of monovalent and polyvalent, said anions being selected from the group consisting of halide, hydrogen sulfate, nitrate, hydrogen oxalate, and perchlorate, R and R_1 are methyl groups and Z is a radical selected from the group consisting of 3-dimethylcarbamoxyphenyl, 2-dimethylcarbamoxybenzyl, and 3-dimethylcarbamoxy-α-picolinyl.

4,692,531

SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

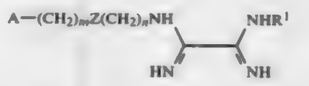
Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, Wallingford, Conn.

Division of Ser. No. 623,588, Jun. 22, 1984, Pat. No. 4,644,006. This application Sep. 25, 1986, Ser. No. 911,613

Int. Cl.[4] C07D *277/48*

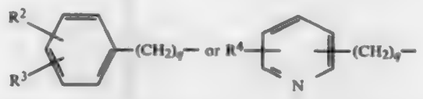
U.S. Cl. 548—193 **5 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



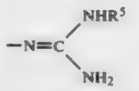
in which q is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 or R^3, taken together, may be methlenedioxy, and R^4 is hydrogen, (lower-)alkyl or (lower)alkoxy:

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is a imidazole, thiazole, thiadiazole, oxazole, oxadiazole or pyrimidine; provided that A may contain one or two substituents, the first substituent being selected from



or $—CH_2NR^6R^7$ and the second substituent selected from (lower)alkyl, halogen or (lower)alkoxy;

R^5 is hydrogen, branched or unbranched (lower)alkyl, (lower)cycloalkyl, or (lower)cycloalkyl(lower)alkyl, in which R^5 may optionally contain one or more halogen atoms selected from fluorine, chlorine and bromine, provided that there is no halogen substituent on the carbon atom directly attached to the nitrogen atom;

R^6 and R^7 each are independently hydrogen or (lower)alkyl, or, R^6 and R^7, taken together with the nitrogen to which they are attached, may be pyrrolidino, methylpyrrolidino, piperidino, methylpiperidino, homopiperidino or heptamethyleneimino, and a nontoxic pharmaceutically acceptable salt thereof.

4,692,532

SUBSTITUTED N-(4-HYDROXYPHENYLTHIOALKYL) CYCLIC IMIDES

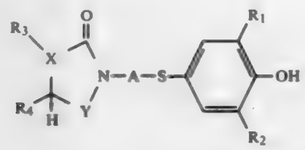
John D. Spivack, Spring Valley; Ramanathan Ravichandran, and Stephen D. Pastor, both of Yonkers, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 23, 1984, Ser. No. 674,217

Int. Cl.[4] C07D *233/70, 233/72, 233/80, 487/04*

U.S. Cl. 548—312 **11 Claims**

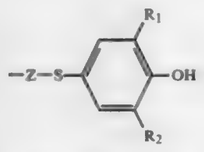
1. A compound of the formula



wherein

R_1 and R_2 independently are alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 12 carbon atoms,

R_3 and R_4 independently are hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms or the group



or together can also form cycloalkyl of 5 to 6 carbon atoms, pyrrolidine or piperidine;

A is alkylene of 1 to 18 carbon atoms or substituted alkylene of the formula $(R_5)(R_6)C<$ wherein R_5 and R_6 independently are hydrogen, alkyl of 1 to 12 carbon atoms or phenyl;

X is



or nitrogen;

Y is $—CH_2—$or



; and

Z is A or a direct bond.

9. N-(3,5-di-tert-butyl-4-hydroxyphenylthiomethyl)-2-dodecen-2-yl-succinimide.

10. 3-(3,5-di-tert-butyl-4-hydroxyphenylthiomethyl)-5,5dimethyl hydantoin.

4,692,533

SELECTIVE PREPARATION OF N-(AMIDOALKYL)IMIDES AND RELATED COMPOUNDS

Pen-Chung Wang, and Steven P. Crain, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 774,220

Int. Cl.[4] C07D *487/04, 233/74*

U.S. Cl. 548—312 **18 Claims**

1. A process comprising contacting a 2-oxazoline and an imide under reaction conditions such that a corresponding N-(amidoalkyl)imide is formed.

4,692,534

PREPARATION OF CAFESTOL

Raymond Bertholet, Bloney, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Filed Apr. 3, 1986, Ser. No. 847,488

Int. Cl.[4] C07D *307/77*

U.S. Cl. 549—456 **18 Claims**

1. A process for converting kahweol to cafestol comprising hydrogenating kahweol in the presence of a palladium catalyst which has been partially deactivated by lead and which is on a support selected from the group consisting of a calcium carbonate support and an active carbon support.

4,692,535

PURIFICATION OF PROPYLENE OXIDE

Harold V. Larson, Houston, Tex., and Hyman D. Gillman, Spring City, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 22, 1986, Ser. No. 944,896

Int. Cl.[4] C07D *301/32*

U.S. Cl. 549—542 **8 Claims**

1. A method of purifying propylene oxide containing greater than 0.1 p.p.m. of poly(propylene oxide) polymer contaminant of a molecular weight of at least about 50,000 which comprises contacting said propylene oxide at a temperature ranging from between about 10° C. and 100° C. with an adsorbent selected from the group consisting of activated carbon and attapulgite, for a time sufficient to reduce the concentration of said polymer contaminant to below 0.1 p.p.m. and recovering the purified propylene oxide product.

4,692,536

PROCESS FOR THE PREPARATION OF HEMIAMINALS, AND THE USE THEREOF

Robert W. Lang, Prattein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

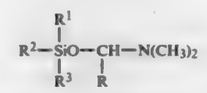
Filed Oct. 14, 1986, Ser. No. 917,948

Claims priority, application Switzerland, Oct. 21, 1985, 4515/85

Int. Cl.[4] C07F *7/10, 7/18*

U.S. Cl. 556—413 **13 Claims**

1. A process for the preparation of a hemiaminal of formula I



(I)

wherein R is unsubstituted or substituted polyhalogenated alkyl, cycloalkyl or aralkyl containing at least one fluorine

atom and R^1, R^2 and R^3 are each independently a hydrogen atom, alkyl, cycloalkyl or aryl, which process comprises

(a) reacting with one another at least equimolar amounts of dimethylformamide, a silane of formula II

$$R^1R^2R^3SiX \quad (II)$$

wherein X is chlorine or bromine and R^1, R^2 and R^3 are as defined above, and a compound of formula III

$$RY \quad (III)$$

wherein R is as defined above and Y is chlorine, bromine or iodine, in the presence of zinc, or

(b) reacting with one another at least equimolar amounts of dimethylformamide, a silane of formula II and a zinc compound of formula IV

$$RZnY.yL \quad (IV)$$

wherein R and Y are as defined above, L is a ligand and Y is 1 or 2.

4,692,537

ORGANOSILICON COMPOUNDS

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

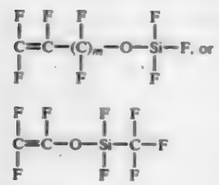
PCT No. PCT/US84/00521, § 371 Date Dec. 9, 1985, § 102(e) Date Dec. 9, 1985, PCT Pub. No. WO85/04660, PCT Pub. Date Oct. 24, 1985

Continuation-in-part of Ser. No. 312,073, Oct. 16, 1981, Pat. No. 4,458,087. This PCT application Apr. 9, 1984, Ser. No. 810,307

Int. Cl.⁴ C07F *7/08, 7/18*

U.S. Cl. 556—484 **11 Claims**

1. A fluorine containing compound which has the formula



(III)

(IV)

where m is 0 or 1.

4,692,538

TRICHLOROETHANIMIDIC ACID ESTERS

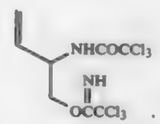
Dolatrai M. Vyas; Terrence W. Doyle, both of Fayetteville, and Yulin Chiang, Clay, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 368,180, Apr. 14, 1982, abandoned. This application May 28, 1985, Ser. No. 737,752

Int. Cl.⁴ C07C *119/18, 103/127*; C07D *261/02, 321/00*

U.S. Cl. 558—6 **3 Claims**

1. The intermediate having the formula



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4,692,539

PENTAERYTHRITOL DIPHOSPHITE STABILIZERS AND PROCESS

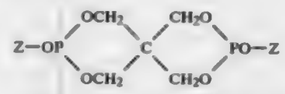
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 685,370, Dec. 24, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 922,803

Int. Cl.⁴ C07F *9/15*; C08K *5/52*

U.S. Cl. 558—78 **6 Claims**

1. In the method for the preparation of a pentaerythritol diphosphite of the formula



wherein Z is alkyl, alkenyl, aryl, aralkyl, or alkanoyl-substituted aryl or each of these groups substituted by hydroxy, alkoxy or halogen; which comprises reacting at elevated temperatures a compound of the formula Z-OM wherein M is hydrogen or an alkali or alkaline earth metal with 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane in the presence of a solvent and a strong base, the improvement comprising conducting the reaction in the presence of a catalytic amount of a mono- or polyalkylene glycol ether catalyst.

4,692,540

PROCESS FOR THE PREPARATION OF CYCLIC PHOSPHITES

Hugo Illy, Reinach, Switzerland; Björn Schliebs, Lindenfels-Glattbach, and Wilhelm Hess, Jugenheim, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

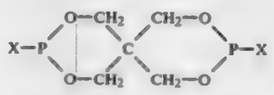
Filed Apr. 15, 1985, Ser. No. 723,115

Claims priority, application Switzerland, Apr. 17, 1984, 1945/84; Jun. 26, 1984, 3066/84

Int. Cl.⁴ C07F *9/15*

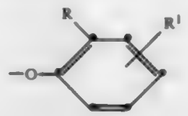
U.S. Cl. 558—78 **9 Claims**

1. A process for the preparation of a pentaerythritol ester of a phosphorous acid derivative of formula I



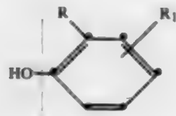
(I)

wherein X is chlorine, bromine, or a group of formula II



(II)

wherein each of R and R_1 independently of the other is hydrogen or C_1–C_8alkyl, by reacting pentaerythritol with a phosphorous trihalide, in an inert organic solvent, and, if X is a group of formula II, additionally with a phenol of formula III



(III)

which process comprises carrying out the reaction in the presence of a catalyst selected from the group consisting of quaternary ammonium, phosphonium, arsonium, pyridinium, piperazinium and thiazolium salts, tertiary sulfonium salts, crown ethers and linear polyethers, in an amount of 0.5 to 20 mol%, based on pentaerythritol, said phenol of formula III being added at the start of, during or after the reaction of pentaerythritol with the phosphorous trihalide.

4,692,541

PHOSPHORUS-CONTAINING α-AMINO NITRILES AND A PROCESS FOR THEIR PREPARATION

Hans-Joachim Zeiss, Sulzbach, and Hilmar Mildenberger, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

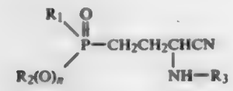
Filed Mar. 7, 1986, Ser. No. 837,721

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508573

Int. Cl.⁴ C07F *9/32, 9/50*

U.S. Cl. 558—87 **23 Claims**

1. A process for the preparation of a compound of the formula I



(I)

in which

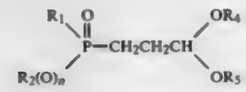
R_1 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen or by alkoxycarbonyl, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_2 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_3 is hydrogen, (C_1–C_6)-alkyl or -phenalkyl, (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, or (C_6–C_{10})-aryloxycarbonyl, and

n is zero or one,

which comprises reacting a compound of the formula II

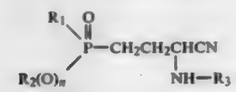


(II)

in which R_4 and R_5, independently of one another, are (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, phenoxycarbonyl or naphthoxycarbonyl, in the presence of alkali metal cyanides, with amines of the formula III

$$H_2H—R_3 \quad (III).$$

18. a compound of the formula I



(I)

in which

R_1 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen or by alkoxycarbonyl, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_2 is (C_1–C_6)-alkyl which is unsubstituted, monosubstituted or polysubstituted by halogen, or is (C_6–C_{10})-aryl, (C_7–C_{10})-aralkyl, or (C_3–C_{10})-cycloalkyl,

R_3 is hydrogen, (C_1–C_6)-alkyl or -phenalkyl, (C_1–C_6)-acyl, (C_1–C_6)-alkoxycarbonyl, or (C_6–C_{10})-aryloxycarbonyl, and

n is zero or one.

4,692,542

PHOSPHORYLATING AGENT

Godefridus I. Tesser, and Christianus A. A. Claesen, both of Nijmegen, Netherlands, assignors to Stichting Katholieke Universiteit, Nijmegen, Netherlands

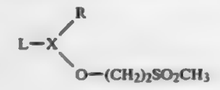
Filed Jun. 20, 1984, Ser. No. 622,571

Claims priority, application Netherlands, Jul. 1, 1983, 8302353

Int. Cl.⁴ C07F *9/146, 9/14, 9/65*

U.S. Cl. 558—184 **4 Claims**

1. A phosphorylating agent having the formula:



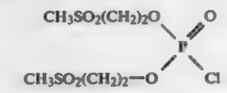
wherein

X is P or P=O;

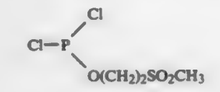
L is a leaving group; and

R is a leaving group L, or —O—$(CH_2)_2SO_2CH_3$.

3. The phosphorylating agent having the formula:



4. The phosphorylating agent having the formula:



4,692,543

OPTICALLY-ACTIVE DI-[3-CHLORO-2-OXY-PROPYLTRIMETHYLAMMONIUM]-TARTRATE

Leander Tenud, Visp, and Jacques Gosteli, Basel, both of Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 717,547, Mar. 29, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 832,760

Claims priority, application Switzerland, Apr. 4, 1985, 1704/85

Int. Cl.⁴ C07C *120/04, 121/16*

U.S. Cl. 558—342 **4 Claims**

1. Process for producing optically-active carnitine nitrile chloride from optically-active di-(3-chloro-2-oxy-propyltrimethylammonium)-tartrate comprising (a) dissociating the di-(3-chloro-2-oxy-propyltrimethylammonium)-tartrate (i) with $CaCl_2$ into Ca-tartrate and optically active 3-chloro-2-oxy-propyltrimethylammonium chloride, or (ii) with two equivalents of HCl and one equivalent of KOH or one equivalent of HCl and one equivalent KCl into K-H-tartrate and optically-active 3-chloro-2-oxy-propyltrimethylammonium chloride, and (b) converting the optically-active 3-chloro-2-oxy-propyltrimethylammonium chloride with an inorganic cyanide into the optically-active carnitine nitrile chloride.

4,692,544

INHIBITING POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Richard N. Goerner, Mount Holly; J. Michael Hipp, and Ruth H. Hipp, both Iron Station, all of N.C., assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 23, 1985, Ser. No. 768,709

Int. Cl.[4] C07C *69/54, 69/56, 7/20, 29/94, 51/50, 85/26, 121/30*

U.S. Cl. 560—4 **38 Claims**

1. A composition comprising a mixture of

(A) a polymerizable ethylenically unsaturated monomer selected from the group consisting of unsaturated carboxylic acids and the esters, anhydrides, amides, halides and nitriles thereof, vinyl halides, vinyl acetate, vinyl alcohol and aromatic vinyl compounds and

(B) an amount sufficient to inhibit polymerization of said monomer of a compound or mixture of compounds of formula (I)

$$R—X—Ar_1—NH—Ar_2—Y—H \quad (I)$$

wherein

Ar_1 and Ar_2 are, independently, substituted or unsubstituted phenylene, naphthylene, anthrylene or phenanthrylene,

X and Y, independently, are —NH—, —S— or —O—,

R is hydrogen; substituted or unsubstituted C_{1-10} alkyl; substituted or unsubstituted C_{5-10} cycloalkyl; substituted or unsubstituted phenyl, naphthyl, anthryl or phenanthryl; substituted or unsubstituted phenyl C_{1-10} alkyl or naphthyl C_{1-10} alkyl; or substituted or unsubstituted phenyl C_{5-10} cycloalkyl or naphthyl C_{5-10} cycloalkyl;

and any substituent on Ar_1, Ar_2 or R is C_{1-10} alkyl, phenyl, naphthyl, phenyl C_{1-10} alkyl, naphthyl C_{1-10} alkyl, C_{1-10} alkoxy, hydroxy, C_{1-10} alkylamino, amino, thiol, C_{1-10} alkylthio, C_{5-10} cycloalkyl, C_{5-10} cycloalkyloxy or C_{5-10} cycloalkylamino.

4,692,545

METHOD FOR PREPARATION OF MERCAPTOBENZOATES

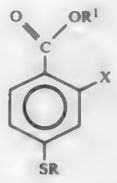
Charles G. Carter, Columbia, Md., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 12, 1986, Ser. No. 940,997

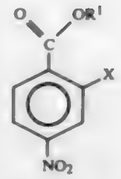
Int. Cl.[4] C07C *149/40*

U.S. Cl. 560—18 **10 Claims**

1. A method of preparing a compound of the formula



wherein R is alkyl, alkenyl, aryl or benzyl; R^1 is alkyl; and X is halogen or nitro comprising reacting a benzoate of the formula



with a mercaptan of the formula R—SH in the presence of a polar aprotic solvent and an inorganic base.

4,692,546

PROCESS FOR PRODUCING ACYLOXY AROMATIC CARBOXYLIC ACIDS

Kenneth G. Davenport, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 633,832, Jul. 24, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 779,893

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] C07B *41/08*; **C07C** *51/245, 59/52, 69/017*

U.S. Cl. 560—130 **9 Claims**

1. A process comprising oxidizing an alkyl alkanoyloxy aryl ketone with oxygen in the presence of a soluble salt of the manganese cation, a lower-alkylcarboxylic acid anhydride and a co-reductant or promoter to form an alkanoyloxy aryl carboxylic acid.

2. The process of claim 1 wherein said ketone is 4-acetoxyacetophenone, said lower-alkylcarboxylic acid anhydride is acetic anhydride, said co-reductant is acetaldehyde, and said product is 4-acetoxybenzoic acid.

4. A process comprising reacting an alkyl hydroxy aryl ketone with a lower-alkylcarboxylic acid anhydride to form an alkyl lower-alkanoyloxy aryl ketone, and oxidizing said alkyl alkanoyloxy aryl ketone with oxygen in the presence of a soluble salt of the manganese cation, a lower-alkylcarboxylic acid anhydride and a co-reductant or promoter to form a lower-alkanoyloxy aryl carboxylic acid.

4,692,547

PROCESS FOR THE PREPARATION OF GLYOXYLIC HEMIACETAL ESTERS

Robert K. Driscoll, Frankfurt am Main; Ernst I. Leupold, Neu-Anspach, and Wolfgang Ebertz, Bonn, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,519

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446528

Int. Cl.[4] C07C *67/31*

U.S. Cl. 560—186 **8 Claims**

1. A process for the preparation of a glyoxylic hemiacetal ester, which comprises catalytically oxydehydrogenating a glycolic ester in a gas phase at a temperature between 100° and 600° C. and a residence time between 0.05 and 1 second to give a gaseous reaction mixture containing a glyoxylic ester, introducing the gaseous reaction mixture with 1 to 30 mole of a saturated primary or secondary alcohol per mole of the glyoxylic ester into a distillation column, said alciohol having 2 to 8 carbon atoms and being suitable as an entraining agent, and then reacting the glyoxylic ester with the alcohol and distilling overhead the water of reaction, other low boilers and part of the excess alcohol to yield a glyoxylic hemiacetal ester and the remainder of the excess alcohol as the bottom product.

4,692,548

PROCESS FOR THE PREPARATION OF UNSATURATED COMPOUNDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

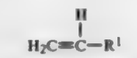
Filed May 14, 1986, Ser. No. 862,927

Claims priority, application United Kingdom, Jun. 14, 1985, 8515139

Int. Cl.[4] C07C *67/347, 2/32*

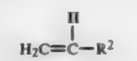
U.S. Cl. 560—202 **15 Claims**

1. A process for dimerization in the liquid phase which comprises reacting an ethylenically unsaturated compound of the formula:



(I)

in which R^1 represents a hydrogen atom, an alkyl group having not more than two carbon atoms, a vinyl group or a hydrocarbyloxycarbonyl group, with an ethylenically unsaturated compound of the formula:



(II)

in which R^2 represents a hydrogen atom or a hydrocarbyloxycarbonyl group, with the restriction that, when R^1 represents an alky group, R^2 does not represent a hydrogen atom, which process is carried out in the presence of a catalytic system formed by combining:

(a) a palladium and/or ruthenium compound;

(b) a monodentate ligand which comprises a compound containing one trivalent N or P atom as coordinating atom;

(c) a silver and/or cupric salt having a non-coordinating anion, and

(d) a quinone.

4,692,549

CARBOALKOXYLATION OF BUTADIENE TO FORM DIALKYL ADIPATE

Harold S. Bruner, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1986, Ser. No. 879,399

Int. Cl.[4] C07C *67/38*

U.S. Cl. 560—204 **11 Claims**

1. A process for the preparation of dialkyl adipate which comprises adding to a mixture containing alkyl 3-pentenoate, cobalt catalyst, a tertiary nitrogen base cocatalyst, a lower alkyl alcohol, and carbon monoxide, an amount of an alkanoic acid having a pKa of greater than 3 in an amount sufficient to keep the cobalt catalyst active and reacting the resulting mixture to form alkyl adipate by the carboalkyxylation of alkyl 3-pentenoate.

4,692,550

CONTINUOUS PROCESS FOR THERMAL SPLITTING OF CARBAMIC ACID ESTERS

Theodor Engbert; Günter Hammen, both of Dormagen; Hartmut Knöfel, Odenthal, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,347

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215591

Int. Cl.[4] C07C *118/00*

U.S. Cl. 560—345 **10 Claims**

1. A continuous process for thermally splitting N-monosubstituted carbamic acid esters comprising:

(a) thermally splitting an N-monsubstituted carbamic acid ester which is flowed down or passed over an inner wall of a tube reactor at a temperature of from 150° to 450° C. and under a pressure of from 0.001 to 20 bar into a fraction which is predominantly isocyanate and a fraction which is predominantly hydroxyl compound; and

(b) removing any gaseous fraction formed under the splitting conditions at the head of the tube reactor and collecting any liquid fraction which accumulates at the base of the tube reactor under the splitting conditions.

4,692,551

PREPARATION OF CARBOXYPROPYLATED NON-IONIC SURFACTANTS

Kou-Chang Liu, Wayne, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Jul. 23, 1986, Ser. No. 887,298

Int. Cl.[4] C07C *59/48*

U.S. Cl. 562—471 **15 Claims**

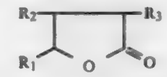
1. The process which comprises reacting an alcohol ether having the formula

$$RY(OCH_2CH_2)_nOH$$

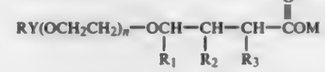
with a metal hydroxide having the formula MOH, to produce the corresponding salt having the formula

$$RY(OCH_2CH_2)_nOM \text{ and}$$

reacting said salt with a butyrolactone having the formula



at a temperature of between about 50 and about 300° C., under a pressure of from about 14 to about 70 psig. until the desired conversion has taken place to produce the corresponding carboxypropylated polyethylene glycol salt having the formula



wherein n has an average value of 2 to 50; R is a saturated or olefinically unsaturated aliphatic radical having from 4 to 50 carbon atoms; Y is a direct bond or an aryl group optionally substituted with a member selected from the group consisting of halogen, trihalomethyl, cyano, nitro, alkyl and alkoxy; R_1, R_2 and R_3 are each independently hydrogen or alkyl having from 1 to 4 carbon atoms and M is a cation selected from the group consisting of Na^+, K^+ and Li^+.

4,692,552

PROTEASE INHIBITORS

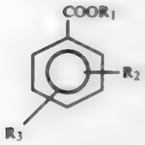
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 664,447, Oct. 24, 1984, which is a continuation of Ser. No. 492,842, May 9, 1983, Pat. No. 4,499,295. This application Feb. 18, 1986, Ser. No. 831,238

Int. Cl.[4] C07C *65/04, 69/88*

U.S. Cl. 562—475 **2 Claims**

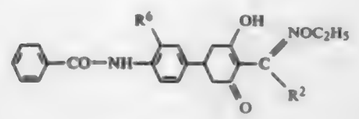
1. Compounds of the formula:



wherein R_1 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R_2 is:
(a) hydroxy; or
(b) alkoxy of 1 to 6 carbon atoms, inclusive;
wherein R_3 is —CH=CHR$_4$
wherein R_4 is alkyl of 13 to 25 carbon atoms inclusive or the pharmacologically acceptable addition salts thereof.

4,692,553
CYCLOHEXENONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH
Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Durkheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jul. 26, 1985, Ser. No. 759,257
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1984, 3427695; Sep. 14, 1984, 3433767
Int. Cl.[4] C07C *131/10, 131/04;* **A01N** *37/22, 37/24*
U.S. Cl. 564—185 **3 Claims**

1. A cyclohexenone of the formula



wherein R^6 is a member selected from the group consisting of chlorine, bromine and fluorine and R^2 is a member selected from the group consisting of ethyl and n-propyl.

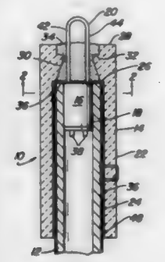
4,692,554
PROCESS FOR PRODUCING 1,3-BIS(3-AMINOPHENOXY)BENZENE
Keizaburo Yamaguchi; Yukihiro Yoshikawa; Yoshimitsu Tanabe; Kenichi Sugimoto, and Akihiro Yamaguchi, all of Tokyo, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Aug. 7, 1984, Ser. No. 638,732
Claims priority, application Japan, Oct. 18, 1983, 58-193428; Dec. 6, 1983, 58-229075; Dec. 6, 1983, 58-229076
Int. Cl.[4] C07C *41/09, 93/14*
U.S. Cl. 564—430 **6 Claims**

1. A process for producing 1,3-bis(3-aminophenoxy) benzenes which comprises reacting a halogenobenzene selected from the group consisting of 1,3,5-trihalogenobenzenes, 1,2,3,4-tetrahalogenobenzenes and 1,2,4,5-tetrahalogenobenzenes with 3-aminophenol in the presence of a dehydrohalogenating agent in an aprotic polar solvent and in the absence of an Ullmann reaction promotor to obtain 1,3-bis(3-aminophenoxy)-5-halogenobenzen, 1,3-bis(3-aminophenoxy)-2,4-dihalogenobenzen or 1,5-bis(3-aminophenoxy)-2,4-dihalogenobenzen and dehalogenating the resulting bis(3-aminophenoxy) halobenzene by its reduction.

4,692,555
PREPARATION OF DIPHENOLICS
Kju H. Shin, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed Apr. 9, 1984, Ser. No. 598,225
Int. Cl.[4] C07C *39/12, 37/11*
U.S. Cl. 568—722 **25 Claims**

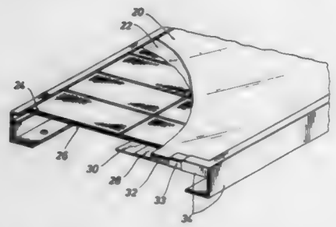
1. A process for preparation of diphenolic compounds, said process comprising:
(1) reacting in the presence of a catalytic amount of a secondary amine catalyst: an aldehyde, an alcohol, and a first phenol having exactly two of the three positions ortho and para to the hydroxyl group substituted and the other two meta positions optionally substituted with independently selected alkyl, cycloalkyl, aryl, alkaryl, aralkyl, halogen, or a group of the formula —(R'''')$_n$—CX$_3$ where R'''' is a divalent hydrocarbon preferably containing about one to twelve carbon atoms, n is zero or one, and X is halogen to form as the predominant product a hydroxybenzyl ether of said alcohol; and
(2) reacting said ether product of step (1) in the presence of an acid catalyst with a second phenol having at least one position ortho or para to the hydroxyl group unsubstituted except for H.

4,692,556
REPEATING TEMPERATURE SENSING IMMERSION PROBE
Theo P. C. Bollen, Genk, Belgium, and John E. Cassidy, Churchville, Pa., assignors to Electro-Nite Company, Philadelphia, Pa.
Continuation-in-part of Ser. No. 626,498, Jun. 29, 1984, Pat. No. 4,645,865. This application Mar. 24, 1986, Ser. No. 843,436
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541326
Int. Cl.[4] H01L *35/02*
U.S. Cl. 136—234 **11 Claims**



1. A temperature sensing device suitable for repeated immersion into a molten metal bath comprising: a protection sleeve made of a fibrous refractory material capable of withstanding repeated immersions into a molten metal bath having a central longitudinally extending bore therethrough; a support tube within the bore of the protection sleeve; and a thermocouple unit having a body portion supported by the support tube within one end thereof and a thermocouple extension portion extending from the body portion through the end of the protection sleeve, the support tube wrapped with a reflective foil material which substantially covers the entire surface of the support tube within the protection sleeve.

4,692,557
ENCAPSULATED SOLAR CELL ASSEMBLAGE AND METHOD OF MAKING
Gay M. Samuelson, Tempe, Ariz., and David J. St. Clair, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Oct. 16, 1986, Ser. No. 919,918
Int. Cl.[4] H01L *25/02, 31/18, 21/56*
U.S. Cl. 136—251 **28 Claims**

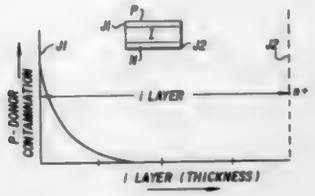


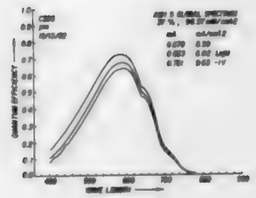
1. A solar cell assemblage comprising:
(a) a pre-treated silanized transparent substrate;
(b) a layer of semiconductor material comprising at least one solar cell;
(c) an electrical contact on the surface of said layer of semiconductor material;
(e) an extruded transparent film for encapsulating the assemblage comprising (a), (b) and (c), said film comprising about 75 to about 91 parts by weight of a blend of:
about 65 to about 75 parts by weight of a selectively hydrogenated two-block polymer wherein one polymer block is designated by A and a second polymer block is designated by B such that prior to hydrogenation,
(1) each A is a polymer block of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said A blocks comprising from about 10 to about 40% by weight of the total block copolymer, and
(2) each B is a polymer block having a number average molecular weight in the range of from about 10,000 to about 150,000 and is formed by polymerizing a conjugated diene having from 4 to 10 carbon atoms per molecule, and said B blocks comprising from about 90 to about 60% weight of the total block copolymer, and
about 25 to about 35 parts by weight of a selectively hydrogenated multiblock copolymer which contains at least two kinds of polymer blocks wherein one polymer block is designated by A and a second polymer block is designated by B such that:
(1) each A is a polymer endblock of a monovinyl or alpha alkyl monovinyl arene having a number average molecular weight in the range of from about 5,000 to about 75,000, said A blocks comprising from about 10 to about 40% by weight of the total block copolymer, and
(2) each B is a polymer midblock having a number average molecular weight in the range of from about 10,000 to about 150,000 and is formed by polymerizing a conjugated diene having from 4 to 10 carbon atoms per molecule, and said B blocks comprising from about 90 to about 10% weight of the total block copolymer,
about 8.5 to about 23.5 parts by weight of an (alpha) methyl styrene polymer tackifying resin; and
about 0.5 to about 1.5 parts by weight of a mixture of a phenolic antioxidant, a UV absorber with benzotriazole functionality and a UV absorber with hindered amine functionality;
(f) a frame to contain said encapsulated solar cell laminate; and
(g) sealant to seal the frame to the solar cell laminate.

4,692,558
COUNTERACTION OF SEMICONDUCTOR IMPURITY EFFECTS
Alan E. Delahoy, Princeton; Vikram L. Dalal, Lawrenceville, both of N.J., and Erter Eser, New York, N.Y., assignors to Chronar Corporation, Princeton, N.J.
Filed May 11, 1983, Ser. No. 493,700
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—258 **17 Claims**

9. An amorphous semiconductor device of multi-layer structure wherein an undesired contaminant present in a limited

region of one layer thereof is slightly over-compensated by a dopant incorporated in said limited region.





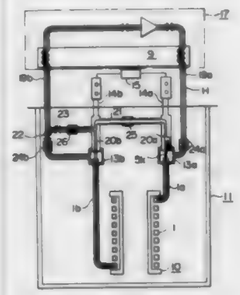
10. The semiconductor device of claim 9 wherein said limited region is part of a layer of intrinsic material and said device is a solar cell.

4,692,559
THIN GAAS SOLAR CELL STRUCTURES
M. Edmund Ellion, Arcadia, and George Wolff, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Division of Ser. No. 773,910, Sep. 9, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 918,585
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—262 2 Claims



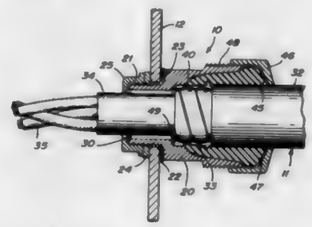
1. A solar cell, comprising:
a layer of p-type gallium arsenide haviang a thickness of not greater than about 0.5 micrometers;
a layer of n-type gallium arsenide, said layer of p-type gallium arsenide and the layer of n-type gallium arsenide together constituting an active semiconductor solar cell;
a glass cover in contact with said active semiconductor solar cell, said solar cell having no charge recombination inhibitory layer in contact with said layer of p-type gallium arsenide.

4,692,560
FORCED FLOW COOLING-TYPE SUPERCONDUCTING COIL APPARATUS
Yoshiji Hotta, Hitachi; Kunishige Kuroda, Mito; Hiroshi Kimura, Tokyo; Nobuhiro Hara, Hitachi, and Naofumi Tada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 16, 1986, Ser. No. 886,045
Claims priority, application Japan, Jul. 19, 1985, 60-158384
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—15 CA 10 Claims



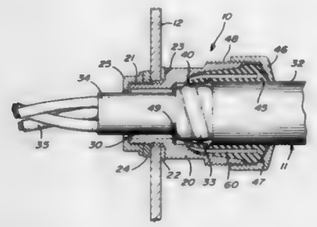
1. A forced flow cooling-type superconducting coil apparatus comprising:
a superconducting coil made of a coiled superconducting conductor having a hollow conduit and having superconducting wires inserted into said conduit;
current leads for supplying currents to superconducting wires of said superconducting coil, said current leads being respectively connected to ends of said superconducting coil;
first cooling means for forcibly flowing coolant for cooling said superconducting wires from one end of said hollow conduit of said superconducting coil to the other end thereof through said hollow conduit; and
second cooling means including branch means for branching a part of said coolant to flow from a position near said one end of said hollow conduit of said first cooling means to another position near said another end of said hollow conduit along at least a part of each of said current leads thereby cooling said current leads by said branched coolant.

4,692,561
CABLE CONNECTOR
William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., Quebec, Canada
Filed Sep. 26, 1985, Ser. No. 780,451
Int. Cl.[4] H02G *3/18*
U.S. Cl. 174—65 SS 4 Claims



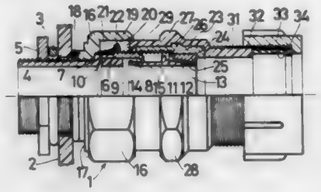
1. An electrical cable connector for sealing a cable passing through a partition, comprising:
a rigid tubular housing with external attachment means for attachment to an aperture in the partition, the tubular housing having a passage therethrough for a cable, and a concave curved shoulder at a small termination of a frusto-conical inner surface within the passage,
a substantially tubular seal made from firm resilient elastromeric material, the seal having a cylindrical inner surface, a frusto-conical outer surface extending from a small end, having a convex curved lip at the small end where the outer surface and the inner surface join, the convex curved lip (adapted to match the) having substantially the same curvature as the concave curved shoulder of the housing, a large end surface on the tubular seal at the other end of the seal joining the inner surface and the outer surface, the seal fitting within the housing with the curved lip against the curved shoulder, and
a threaded cover to fit on an external thread on the housing to push against the large end surface of the seal so that the curved lip of the seal is swivelled inwards and is adapted to contact the cable in the housing.

4,692,562
SEAL FOR A CABLE CONNECTOR
William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., Quebec, Canada
Filed Sep. 26, 1985, Ser. No. 780,452
Int. Cl.[4] H02G *3/18*
U.S. Cl. 174—65 SS 6 Claims



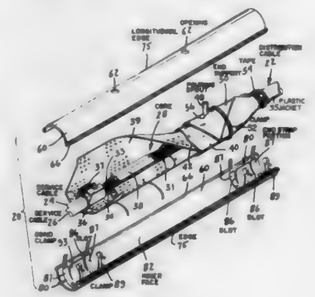
1. An electrical cable connector for sealing a cable passing through a partition, comprising:
a rigid tubular housing with external attachment means for attachment to an aperture in the partition, the tubular housing having a passage therethrough for a cable, and a concave curved shoulder at a small termination of a frusto-conical inner surface within the passage,
a substantially tubular seal made from firm resilient elastomeric material, the seal having a cylindrical inner surface, a fursto-conical outer surface extending from a small end, having a convex curved lip at the small end where the outer surface and the inner surface join, the convex curved lip having substantially the same curvature as the concave curved shoulder of the housing, a large end surface on the tubular seal at the other end of the seal joining the inner surface and the outer surface, and longitudinal recesses formed in the seal between the inner surface and the outer surface, the recesses extending from the convex curved lip at the small end towards the large end surface, the seal fitting within the housing with the curved lip against the curved shoulder, and
a threaded cover to fit on an external thread on the housing to push against the large end surface of the seal so that the curved lip of the seal is compressed and adapted to contact the cable in the housing.

4,692,563
CABLE GLAND EMBODYING MOISTURE-PROOF SEAL
Franz Lackinger, Krugersdorp, South Africa, assignor to Westward Investments Limited, Hong Kong
Continuation-in-part of Ser. No. 668,215, Nov. 5, 1984, Pat. No. 4,629,825. This application Aug. 20, 1986, Ser. No. 898,110
Claims priority, application South Africa, Feb. 28, 1986, 86/1512
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—65 SS 10 Claims



1. An electrical cable gland comprising at least two tubular parts, a first one of which has an externally screw-threaded zone co-operating with an internally screw-threaded zone of the other or second part, said first part having, in addition, at a location remote from the internally screw-threaded second part, a smooth outer sealing surface with which co-operates an end region of an elastomeric sealing sleeve, the opposite end region of which is supported or preformed so as to flare outwardly upon axial compression thereof, the wall thickness of the sealing sleeve being small relative to its length so as to promote flaring and not simply axial compression, the arrangement being such that, upon operative installation, the adjacent end face of the internally screw-threaded second part contacts and seals against said opposite end region of the elastomeric sealing sleeve while urging the adjacent end region of the sleeve radially outwardly as the two parts are moved together by means of the screw-thread to effectively seal the screw-threads of the two parts from the exterior.

4,692,564
CABLE SUPPORT SYSTEM
Eric R. Campbell, Alpharetta, and Joe B. Moss, Lawrenceville, both of Ga., assignors to American Telephone & Telegraph Company, AT&T Technologies, Inc., Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.
Filed Feb. 28, 1986, Ser. No. 835,022
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—92 13 Claims



1. A cable and cable support system, which comprises: a length of cable;
substrate means for enclosing a portion of said length of cable to shield the portion of the length of cable from a surrounding environment;

stabilizing means attached to said substrate means and disposed within said substrate means for inhibiting movement of the portion of the cable, said stabilizing means having a portion thereof disposed between the portion of the length of the cable and said substrate means and extending from said portion of said stabilizing means between the portion of the length of the cable and said substrate means about and in engagement with at least a portion of the periphery of said cable; and

means for securing said stabilizing means to the cable and cooperating with said stabilizing means to provide sufficient engagement with the cable to inhibit any movement of the portion of the length of the cable relative to said substrate means.

7. A kit of parts adapted to be assembled together to provide a cable support system, said kit comprising:

substrate means adapted to enclosed a length of a cable;

stabilizing means adapted to be connected to said substrate means with said substrate means at a location external to a portion of the length of the cable, said stabilizing means adapted to have a portion thereof disposed between the length of the cable and said substrate means and adapted to extend from said portion of said stabilizing means between the cable and said substrate means about at least a portion of the cable; and

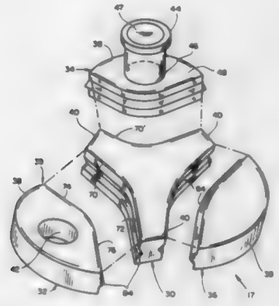
means adapted to secure said stabilizing means to the cable for cooperating with said stabilizing means to provide sufficient engagement with the cable to inhibit substantially any movement of the portion of the length of the cable relative to said substrate means.

4,692,565

SEGMENTED END SEAL AND CLOSURE

Lowell Kohl, Cary, and Gerald L. Shimirak, Fuquay-Varina, both of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1986, Ser. No. 826,716
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—93 18 Claims



10. A closure comprising

a closure body having at least one segmented end seal wherein said segmented end seal comprises:

a support structure comprising a central solid portion and a plurality of legs emanating from the central portion; wherein the distal end of each of the legs comprises a segment of the periphery of the assembled segmented end seal;

at least two pie shaped end sections sized and configured for mating with said support structure in that each leg of said support structure has a first surface and an adjacent leg has a second surface for abutting complementary first and second surfaces, respectively, of each of said end sections, each of said sections having a portion of its periphery which comprises a segment of the periphery of the assembled segmented end seal so that when said sections and said support structure are mated together, said assembled segmented end seal has a uniform periphery;

wherein at least one of said sections contains an aperture for receiving a cable, the aperture being located entirely within the periphery of said section; and

wherein the assembled segmented end seal is configured such that:

(a) the central portion of said support structure is positioned so as to be the center of said end seal;

(b) each pie shaped end section may be removed without disturbing any other end section; and

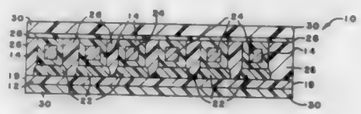
(c) each pie shaped end section is seated in said support structure by the first and second surfaces of said support structure.

4,692,566

RIBBON CABLE

John C. Kauffman, Fort Wayne, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Jul. 24, 1984, Ser. No. 634,040
Int. Cl.[4] H01B *7/08*
U.S. Cl. 174—117 FF 19 Claims



11. A ribbon cable comprising a plurality of spaced elongated conductors extending the full length of said cable, said conductors each having an axis in a common plane, and an essentially continuous and concentric coat of flexible insulation material superimposed on said conductor, a ribbon of flexible insulation material extending the full length of said cable, said ribbon having an axis parallel to said conductor axes, said conductors being bonded to said ribbon, and a continuous and uniform coat of flexible bonding material superimposed on said ribbon, said ribbon being between said conductors and said coat of bonding material.

4,692,567

ELECTRIC FENCE HOLDER

Donald L. Crum, R.R. #4, Box 108, Carlinville, Ill. 62626

Filed May 14, 1985, Ser. No. 733,874
Int. Cl.[4] H01B *17/16*; A01K *3/00*
U.S. Cl. 174—158 F 10 Claims

8. An electric fence holder for supporting an uninsulated electrically conductive wire from a fence wherein the fence is of the kind having parallel wire strands, comprising a flexible, resilient strap formed of electrical insulating material creating a bias toward a normally flat condition, the flexible strap having opposite ends and being yieldable to manual pressure applied toward the ends directed against a common side of the strap tending to shape the strap in the form of a bow moving the ends toward one another, means at the opposite ends of the flexible strap defining clamps for engaging two parallel wire strands of a fence upon moving the ends of the strap toward one another and projecting the apex of the bow created thereby laterally away from the existing fence, the means defining clamps comprising hooks at the ends of the strap, the hooks having concave closed sides and having openings opposite thereto toward a common face of the strap whereby the resilience of the strap when formed as a bow and attached to said two wire strands causes the closed sides of the hooks to bear against the said two parallel wire strands, and means on a face of the flexible strap at the apex of the bow for retaining the uninsulated electrically conductive wire comprising a transverse curvature defining a cavity in the strap with an open side in a face of the strap, said common face being opposite the face having the open side of the cavity, whereby when the strap is





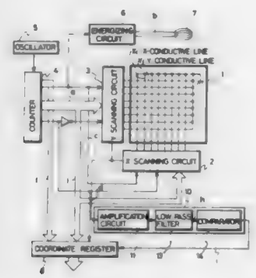
in the form of a bow as aforesaid, the opening of the cavity is restricted.

4,692,568

DIGITIZER USING PHASE INVERSION DETECTION SYSTEM

Yoshiyuki Morita, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 865,075
Claims priority, application Japan, May 17, 1985, 60-105399
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 3 Claims



1. A digitizer using phase inversion detection system comprising:

a winding coil for generating magnetic field to indicate coordinate in response to an energizing signal,

a tablet having a plurality of conductive lines arranged in parallel with each other,

detection means for detecting phase inversion of an induction signal induced on said conductive lines,

counting means for measuring time interval between a starting time of selecting one of said conductive lines and a detecting time of phase inversion,

a scanning circuit for selecting one of said conductive lines in turn, said scanning circuit receiving a gate signal from said counting means at an input terminal thereof in synchronism with said energizing signal and including circuit means for selecting said one of conductive lines during existence of said gate signal, and

coordinate storing means for holding coordinate value.

4,692,569

AIRLINE ELECTRICAL GROUND CABLE FEED OUT AND RETRIEVAL STORAGE APPARATUS

Sol N. Winner, 28 Nassau Cir., Creve Coeur, Mo. 63141

Filed Apr. 4, 1983, Ser. No. 481,667
Int. Cl.[4] H02G *11/00*
U.S. Cl. 191—12 R 27 Claims

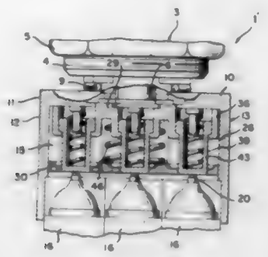


1. An aircraft ground cable handling mechanism for use in the feed out, retrieval, and storage of an electrical cable, comprising, a storage compartment, a cable moving assembly housing, said storage compartment and assembly housing being in communication with each other, said assembly housing being arranged upwardly and extending forwardly of the said storage compartment, a pair of side walls forming the side walls for both the storage compartment and the assembly housing, a common upper wall for both the storage compartment and the assembly housing connecting to the said side walls, a back wall for the storage compartment connecting to the said side walls, a bottom wall for the storage compartment connecting to the said side walls, and a front wall for the storage compartment connecting to the side walls, said front wall arranged inclined towards the assembly housing for facilitating the feed out and retrieval of the ground cable from the said storage compartment during operation of the cable handling mechanism, a cable moving assembly provided within the assembly housing and when operative functioning to withdraw said cable from the storage housing for delivery to the aircraft or retrieving said cable for return into the said storage compartment, said cable moving assembly being disposed adjacent the storage compartment and substantially aligned therewith for delivery of a quantity of cable for unencumbered storage within the said compartment or withdrawal therefrom, said cable moving assembly being supported upon a base means, said base means being shiftably mounted between said pair of side walls and capable of at least partial removal therefrom to facilitate servicing of the cable moving assembly, said cable moving assembly including a pair of friction wheels aligned for biasing against said cable when arranged intermediate thereof, one of said friction wheels being shiftable with respect to the other wheel, and pressure biased in a direction towards the same to exert a pressure against said electrical cable arranged intermediate thereof, and a motor means operatively associated with the cable moving assembly for turning of at least one of the said friction wheels to achieve the said feed out or retrieval of the ground cable.

4,692,570
ELECTRIC SWITCH

Reinhold Barlian, Dieseistr. 6, 6990 Bad Mergentheim; Martin Fischle, Bad Mergentheim, and Karl-Heinz Lux, Weikersheim, all of Fed. Rep. of Germany, assignors to Reinhold Barlian, Bad Mergentheim, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 746,974
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423177
Int. Cl.[4] H01H *9/00*
U.S. Cl. 200—4 13 Claims



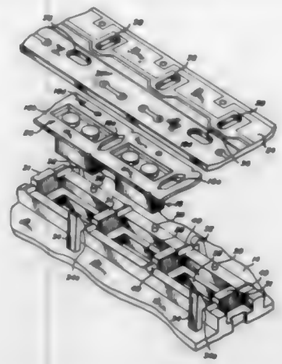
1. An electric switch comprising a support frame;
key switching elements disposed in an inner space of the support frame and individually attachable to the support frame;
a pressure pin;
a compression spring;
a base body movable by the pressure pin against the force of the compression spring;
a bow spring;
an actuating front attachment mountable to a front plate and supported by the bow spring where the bow spring contacts the front plate;
two telescoping thrust journals supported by the base body;
two overthrow springs individually disposed at a corresponding thrust journal;
rams associated to the key switching elements and coordinated to the corresponding telescoping thrust journal via the overthrow springs; and
transmission means disposed in the inner space of the support frame below the plane of the bow spring and between a pressure pin of the actuating front attachment and the rams of the key switching elements, where the two thrust journals are joined to the transmission means.

4,692,571
PANEL ASSEMBLY WITH EASILY DETACHABLE SWITCH ACTUATORS

Vinh-Dinh D. Trinh, Arlington Heights; Ronald P. Scholtes, Cary, and Terence E. Sumner, Roselle, all of Ill., assignors to Motorola, Inc., Schaumberg, Ill.

Filed Sep. 2, 1986, Ser. No. 902,909
Int. Cl.[4] H01H *9/02*
U.S. Cl. 200—5 A 14 Claims

8. A front panel assembly modifiable at final assembly and intended for inclusion with associated electrical apparatus, comprising in combination:
a printed circuit board;
a control panel housing with means for mounting the associated PC board; and
an elastomeric key strip assembly having multiple switch assemblies with associated breakaway switch actuators mounted between said housing and PC board with each of said switch actuators extending through an associated opening in said housing for accessibility by a user,
said switch actuators being selectively and individually detachable by being pulled through said panel openings so

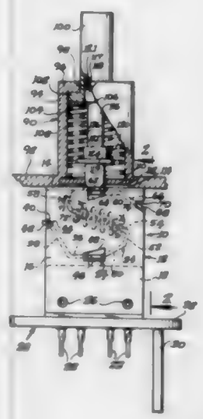


that the remaining switch assemblies conform to the options provided by said PC board.

4,692,572
OVER-CENTER ACTUATOR SWITCH

James G. Heath, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 10, 1986, Ser. No. 827,896
Int. Cl.[4] H01H *5/00*
U.S. Cl. 200—17 R 19 Claims

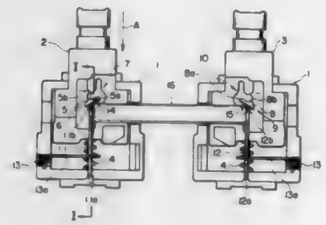


1. An over-center actuator switch assembly comprising base means having a pair of spaced apart walls, switch means mounted between said walls and having depressible switch operating means, a switch operating lever, means pivotally mounting said lever from said walls and engageable with said switch operating means to depress said switch operating means, a control lever, means pivotally mounting said control lever from said walls, compression spring means bearing against said control lever and said switch operating lever and normally biasing said control lever to a rest position and said switch operating lever to switch operating means depressing position, rest position means on said base means against which said control lever bears to establish rest position for said control lever, said control lever being pivotable away from rest position in response to an actuating force with said levers and said spring means thereupon moving through over-center position to pivot said switch operating lever to move said switch operating means to non-depressed position and returning to its rest position upon removal of said actuating force.

4,692,573
INTERLOCK PUSH-PUSH SWITCH DEVICE

Takahiko Fukuyama, Gifu; Seiji Hori, Aichi; Yoshihiro Ota, and Yoshikazu Hayashi, both of Gifu, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Dec. 17, 1985, Ser. No. 809,738
Claims priority, application Japan, Dec. 17, 1984, 59-190994[U]; Dec. 21, 1984, 59-194883[U]
Int. Cl.[4] H01H *9/20*
U.S. Cl. 200—50 C 6 Claims

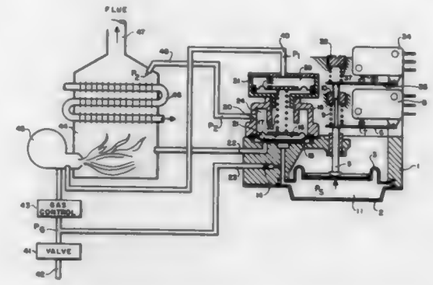


1. A switch device comprising:
a first base and a first operating piece having a portion received in said first base, said first operating piece being movable with respect to said first base between an actuated position and a release position;
a second base and a second operating piece having a portion received in said second base, said second operating piece being movable with respect to said second base between an actuated position and a release position;
means for biasing said first operating piece relative to said first base and said second operating piece relative to said second base to said respective release positions therefor;
a first cam part on said first operating piece including a first cam protrusion and a first cam groove, said first cam protrusion having a first cam surface inclined obliquely;
a second cam part on said second operating piece including a second cam protrusion and a second cam groove, said second cam protrusion having a second cam surface inclined obliquely;
a first lock pin having a first base portion received in said first base and a first top end portion adapted for movement in said first cam groove and engagement with and movement along said first cam surface during movement of said first operating piece between said release position and said actuation position thereof;
a second lock pin having a second base portion received in said second base and a second top end portion adapted for movement in said second cam groove and engagement with and movement along said second cam surface during movement of second operating piece between said release position and said actuated position thereof;
an operating member having a first end in abutment with said first lock pin and a second end in abutment with said second lock pin, said operating member for biasing said lock pin of one of said operating pieces to disenage said top end portion thereof from said cam protrusion of said cam part associated with said lock pin in response to the movement of the other of said operating pieces from said release position to said actuated position thereof; and
damage proof means for allowing said top end portion of said lock pin to move over said cam protrusion of said cam part.

4,692,574
DIFFERENTIAL PRESSURE RESPONSIVE SWITCH

Hendrikus Berkhof, Emmen, Netherlands, assignor to Honeywell B.V., Amsterdam, Netherlands

Filed Apr. 21, 1986, Ser. No. 854,261
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521646
Int. Cl.[4] H01H *35/32*
U.S. Cl. 200—81.5 9 Claims

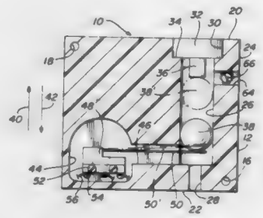


1. A differential pressure responsive switch with an operating diaphragm having a position controlled by a pressure which is to be monitored and acting via a transmission member upon an electrical switch comprising
a first chamber divided by a control diaphragm,
an inlet means applying the pressure which is to be monitored to one side of said control diaphragm,
a bleed valve having a closure member carried by the other side of said control diaphragm and a valve seat,
a throttle means connecting the side of said valve seat which is opposite to said control diaphragm to a source of operating pressure,
pipe means connecting said side of said valve seat to a second chamber which is closed by the operating diaphragm and
a spring means engaging the transmission member and acting against the pressure acting on the operating diaphragm in said second chamber.

4,692,575
VACUUM SENSITIVE SWITCH

William J. Eberle, 2812 Riverlake Ct., Irving, Tex. 75060

Filed Feb. 10, 1986, Ser. No. 827,389
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—82 C 4 Claims



1. A switch responsive to vacuum pressure from a vacuum source, comprising:
(a) a body defining a chamber;
(b) a ball within said chamber and moveable between an upper position and a lower position therewithin;
(c) an electrical switch mounted on said body and having an actuating portion within said chamber and beneath said

ball and in contact with said ball when said ball is in said lower position, said actuating portion being resiliently biased upwardly to a first position and shifted by the weight of said ball to a second position when said ball is in said lower position; and

(d) means including an unobstructed conduit extending through said body from an upper end of said chamber to the outside of said body for continuously applying vacuum pressure to an upper portion of said ball, at all times regardless of whether the ball is rising or falling, whereby the vacuum pressure will exert an upward suction force on said ball so as to lift said ball from said actuating means and shift said actuating means from said second to said first position when the level of the vacuum pressure attains a value necessary to lift said ball to said upper position.

4,692,576

FLOAT SWITCH USING FOAM BODY FOR FLOATABILITY

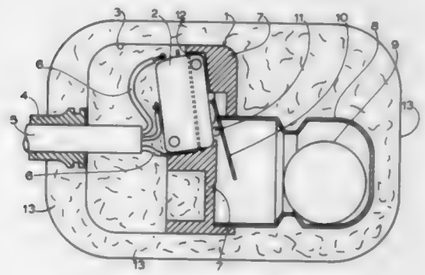
Dieter Frede, Ennigerloh, Fed. Rep. of Germany, assignor to Condor-Werk Gebr. Frede GmbH & Co. KG, Ennigerloh, Fed. Rep. of Germany

Filed May 27, 1986, Ser. No. 866,745

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 8516863[U]

Int. Cl.⁴ H01H *35/18*

U.S. Cl. 200—84 R **5 Claims**



1. A float switch comprising

a holding and sealing component;

an electric switch accomodated in said holding and sealing component;

electric conductor means connected to said electric switch, including a current supply cable having an end portion situated at a connection zone and electric conductors extending from said end portion of said current supply cable through said connection zone to said electric switch and electrically connected to said electric switch;

means for actuating said electric switch, including a gravity actuation arrangement having a separate gravity switch body, said gravity actuation arrangement being also accomodated in said holding and sealing component; and

a float housing constituted solely by a body of a closed-pore integral foam which surrounds said holding and sealing component, said electric switch, said gravity actuation arrangement, and said electric conductors at said connection zone, and seals said connection zone against penetration of moisture therethrough, said separate gravity switch body having a relatively small air space compared to space occupied by said float housing,

whereby floatability in the sense of achievement of buoyancy is accomplished substantially only by said float housing, wherein said switch body has an open insertion end; wherein said holding and sealing component forms a receiving chamber receiving said electric switch and a receiving space receiving said switch body; and wherein said receiving chamber and said receiving space have respective end regions which communicate with one another to form a switching zone which is enclosed with respect to the interior; and additionally comprising means separately further sealing said end region of said receiving chamber for said electric switch in said holding and sealing component, including a circumferentially extending sealing lip on said holding and sealing component at said end region of said receiving chamber, which engages with a casing of said electric switch.

4,692,577

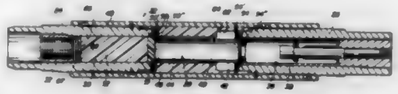
SWITCH FOR A HIGH-VOLTAGE INTERRUPTING MODULE

Roy T. Swanson, North Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Oct. 25, 1985, Ser. No. 791,178

Int. Cl.⁴ H01H *33/06*

U.S. Cl. 200—151 **8 Claims**



1. An improved switch for a high-voltage device; the switch being of the type in which an insulative piston is arranged to be moved at high speeds from its normally located position in a more formed in a conductive member, away from the bore and into a passageway formed in an insulative liner, such movement of the piston moving a movable contact through the passageway and away from the conductive member to break an electrical interconnection between the conductive member and the movable contact and to form a gap therebetween, thereby opening the switch; the bore and the passageway being aligned; wherein the improvement comprises the provision of energy-absorbing means for inhibiting rebounding of the piston from the movable contact, said energy-absorbing means comprising an element disposed between the piston and the movable contact, said element including interstices and being crushed in response to forces transmitted from the piston to the movable contact.

4,692,578

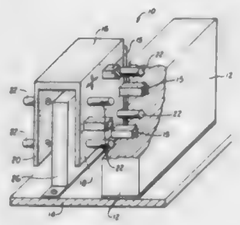
UNIVERSAL MATRIX SWITCHING DEVICE

John E. Wallace, Athens, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 758,783, Jul. 25, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 9,027

Int. Cl.⁴ H01H *63/00, 67/00;* **H02B** *1/02;* **H04Q** *1/02*

U.S. Cl. 200—175 **2 Claims**



1. In a universal matrix switching device including a matrix board having a plurality of pins disposed for axial movement in respective transverse apertures in said board for selective electrical contact with transversely-spaced conductor strips disposed in said board and exposed for contact in said apertures, a position table associated with said board for selectively moving in a plane parallel to said board, actuator means for selectively axially moving said pins into and out of electrical contact with said strips, and control means for selectively controlling said position table and said actuator means, the improved actuator means comprising:

a plurality of unidirectional linear actuators disposed in two planar arrays on opposite sides of said matrix board, each said actuator including a rod disposed for selective axial movement between positions retracted from and extended toward said matrix board, and

means operatively connected to said position table for supporting said actuators in said planar arrays at an axial distance from said matrix board such that when said rods are in said retracted positions said supporting means is moveable relative to said matrix board and when said rods are moved into said extended positions, axially-aligned pins in said matrix board are axially moved in said apertures for selective electrical contact with said conductor strips, said pins in said matrix board being axially moved in one direction by actuator rods in one said planar array and axially moved in the other direction by actuator rods in the other said planar array.

4,692,579

ELECTRON BEAM LITHOGRAPHY APPARATUS

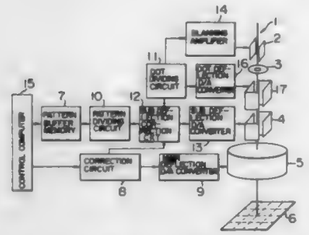
Norio Saitou, Iruma; Susumu Ozasa, Kashiwa; Masahide Okumura, Sagamihara; Mitsuo Ooyama, Hachioji; Tsutomu Komoda, Nishitama; Katsuhiro Harada; Minpei Fujinami, both of Tokyo, and Kazumi Iwadate, Higashimurayama, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Corporation, both of Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,184

Claims priority, application Japan, May 18, 1984, 59-98675; May 18, 1984, 59-98676; May 18, 1984, 59-98677

Int. Cl.⁴ H01J *37/00*

U.S. Cl. 250—492.2 **7 Claims**



1. An electron beam lithography apparatus comprising:

means for generating a spot beam;

means for exposing a desired pattern onto a wafer using said spot beam to form said pattern as dots on said wafer;

means for dividing said pattern into small regions;

main deflecting means for deflecting said spot beam to one of a plurality of sub-fields dividing a field to be exposed on said wafer;

sub-deflecting means for deflecting said spot beam and for designating an origin of said small region in said sub-field; and

dot deflecting means for digitally scanning and for fully exposing the portion inside said small region by a fixed correction amount by use of said spot beam.

4,692,580

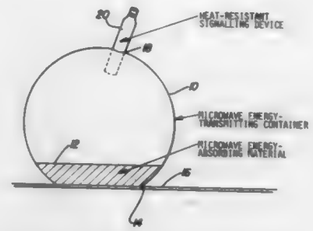
MICROWAVE OVEN WARNING DEVICE

Ronald D. L. Bell, 28 Keewatin Crescent, Nepean, Ontario, Canada K2E 6Z1

Filed Apr. 14, 1986, Ser. No. 851,945

Int. Cl.⁴ H05B *6/80*

U.S. Cl. 219—10.55 M **1 Claim**



1. A process for preventing damage to a microwave oven comprising the steps of:

providing a device which is operative in response to receipt of microwave energy to absorb the microwave energy for a predetermined period of time and also generate a warning signal; and

placing the warning device in the empty microwave oven when the oven is not in use so that in the event of accidental or unintended switching on of the oven the warning device operates to absorb the microwave energy for said predetermined period of time to avoid damage to the oven for said predetermined period of time and also operates to produce a warning sound to alert the operator that the oven is operating so that the oven may be turned off to avoid damage to the oven beyond said predetermined period of time.

4,692,581

CONDENSATION RESISTANT ELECTRODE FOR USE IN A DIELECTRIC HEATING APPARATUS

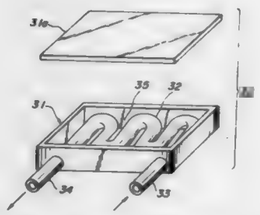
Isao Mizutani, Nagoya and Akio Enomoto, Chita, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 3, 1986, Ser. No. 835,364

Claims priority, application Japan, Mar. 12, 1985, 60-34064[U]

Int. Cl.⁴ H05B *6/54*

U.S. Cl. 219—10.81 **3 Claims**



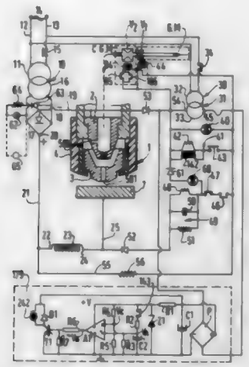
1. A dielectric heating apparatus comprising a pair of oppositely located electrodes; a means for supplying electrical power to said electrodes; at least one of the electrodes including a zigzag tube inside thereof, said zigzag tube having, one inlet opening and one outlet opening, wherein a heated fluid enters only from the inlet opening and exits the interior portion only from the outlet opening, such that said at least one electrode is heated by radiant energy emitted from said zigzag tube to prevent condensation on the electrode.

4,692,582

PLASMA WELDING OR CUTTING SYSTEM PROVIDED WITH A DELAY

Gérard Marhic, Cergy, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Feb. 18, 1986, Ser. No. 830,112
Claims priority, application France, Feb. 22, 1985, 85 02554
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PT 12 Claims



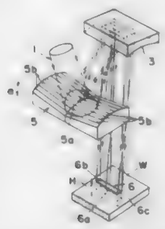
1. A gas-cooled plasma welding or cutting system comprising: a torch including a torch body, at least one electrode mounted in said body and a nozzle having a gas outlet orifice; gas supply means for providing said torch with plasma-producing gas; and electrical supply means for producing, maintaining or breaking a plasma welding or cutting arc, wherein said nozzle is axially movable relative to said torch body between an arc-producing position in which it engages the electrode and a normal operation position spaced from the electrode and is provided with elastic return means elastically yielding the nozzle towards its normal operation position, said return means comprising a gas flow, said system further comprising means for providing a maximum gas flow during a cutting operation which is responsive to the breaking of said arc to at least reduce said gas flow after a predetermined period of time following said arc breaking.

4,692,583

SURFACE HEAT TREATING APPARATUS

Seiichiro Kimura, Koganei, and Hidekazu Aoki, Tachikawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 12, 1986, Ser. No. 895,735
Claims priority, application Japan, Aug. 12, 1985, 60-177196
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 L 3 Claims



1. A surface heat-treating apparatus in which an emitted laser beam is reflected and focused into a heat-treating area formed on a surface of a workpiece, comprising:

a composite cylindrical segment mirror made of two convex-cylindrical segment mirrors joined together so as to have a V-shaped configuration; and

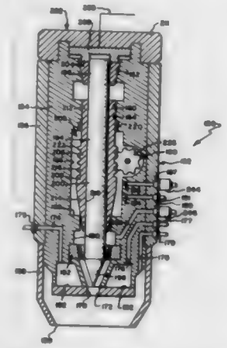
a concave cylindrical mirror located on a path of a laser beam reflected by said composite cylindrical segment mirror fopr focusing the laser beam on the surface of the workpiece.

4,692,584

GAS CONTROL SYSTEM FOR A PLASMA ARC WELDING APPARATUS

Clifford Caneer, Jr., Rte. 2, Box 24A, Cornersville, Tenn. 37047

Filed Nov. 29, 1985, Ser. No. 802,984
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—121 PU 5 Claims



1. In automatically-controlled plasma arc welding apparatus including a plasma torch positionable in operative relationship with a workpiece for working thereon and control means including a gas slope valve controlling various welding parameters such as plasma gas slope, the torch including a body defining a flow passage for plasma gas and an orifice through which plasma gas exits the torch as a high-temperature jet stream, the improvement comprising:

the operative positioning of the gas slope valve in relatively close flow proximity to the torch orifice for controllably regulating the flow of plasma gas through the torch orifice between two preselected flow rates to thereby accurately control the plasma gas exiting the torch during a welding operation,

pressure-sensing means associated with the gas flow line for sensing the pressure of plasma gas immediately upstream and downsteam of the gas slope valve and generating signals corresponding to the sensed pressure and

control means for sensing the signals generated by the pressure-sensing means and controlling the various welding parameters in response to the received signals.

4,692,585

APPARATUS FOR A-C ARC WELDING WITH A CONSUMABLE ELECTRODE

Igor I. Zaruba; Vladimir V. Dymenko, and Viktor I. Bolotko, all of Kiev, U.S.S.R., assignors to Institute Electrosvarki Imeni Patona, Kiev, U.S.S.R.

Filed Nov. 12, 1986, Ser. No. 930,550
Int. Cl.[4] B23K *9/06*
U.S. Cl. 219—130.4 1 Claim

1. An apparatus for a-c arc welding with a consumable electrode, comprising;

a welding transformer, a secondary winding of said welding transformer being connected to an electrode gap;

a first pulse generator;

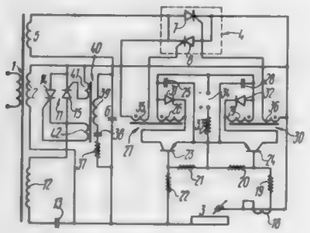
a power circuit of said first pulse generator connected in parallel with said electrode gap and having a series circuit including a thyristor switch having control inputs, a power supply winding, and a switched capacitor;

a control unit for controlling said thyristor switch of said first pulse generator;

a zero detector of said control unit connected in parallel with said electrode gap, and an output of said zero detector;

a control pulse former of said control unit having an input connected to said output of said zero detector and outputs connected to said control inputs of said thyristor switch;

a second pulse generator;



a power circuit of said second pulse generator connected in parallel with said electrode gap and having a series circuit including a thyristor switch having control inputs, a power supply winding, and a switched capacitor;

a control unit for controlling said thyristor switch of said second pulse generator;

a zero detector of said control unit fo said thyristor switch of said second pulse generator connected in parallel with said switched capacitor of said power circuit of said first pulse generator, and an output of said zero detector;

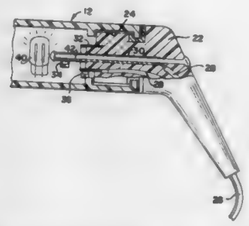
a control pulse former of said control unit of said thyristor switch of said second pulse generator having an input connected to said output of said zero detector and outputs connected to said control inputs of said thyristor switch of said second pulse generator.

4,692,586

PILOT LIGHT ARRANGEMENT FOR STYLING IRON WITH SWIVEL CORD

George R. Fromm, Glenview, and Philip S. Stefaniak, Hanover Park, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Jun. 6, 1986, Ser. No. 871,361
Int. Cl.[4] A45D *1/04*
U.S. Cl. 219—225 6 Claims



5. A pilot light arrangement for a hand-holdable electrical appliance having a housing, comprising:

a swivel cord mount rotatably connected to said housing for rotation relative thereto about an axis;

a pilot light positioned within said housing for indicating supply of electrical power to said appliance;

first and second generally tubular, concentrically arranged electrically conductive members, said first and second conductive members being connected to said swivel cord mount for rotation therewith, with the axes of said conductive members arranged generally coaxially with said axis of rotation of said swivel cord mount, said first conductive member extending through said second conductive member;

first and second electrical contacts mounted within housing for respective electrical contact with said first and second conductive members; and

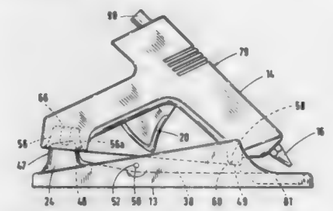
fiber optic means extending through said first conductive member in said swivel cord mount generally along said axis of rotation of said swivel cord mount, said fiber optic means having one end positioned in operative association with said pilot light, and an opposite end positioned at the exterior of said swivel cord mount, whereby operation of said pilot light is visible from the exterior of said appliance by light transmission through said fiber optic means;

4,692,587

HAND TOOL AND SUPPORT

John W. Spirk, Jr., 50 Stonewood Dr., and John R. Nottingham, 60 Stonewood Dr., both of Moreland Hills, Ohio 44022

Filed Feb. 19, 1986, Ser. No. 831,720
Int. Cl.[4] H05B *3/42*
U.S. Cl. 219—242 34 Claims



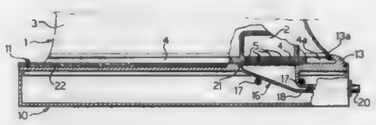
1. A support for releasably securing a hand tool thereto, comprising a post having means for engaging a portion of a hand tool thereon, and releasing means for applying a force to the portion of a hand tool engaged with said post for disengaging the portion of the hand tool from said post, said releasing means comprising a lever having a first end disposed adjacent said post, and said lever being pivotally mounted in a manner that enables said first end to exert a prying force on a portion of the hand tool engaged with said post.

4,692,588

STEAM GENERATING APPARATUS FOR DIFFERENT HOUSEHOLD APPLICATION OUTLETS

Alfredo Cavalli, Via Galileo Galilei, 9, Pesano con Bornago (Milano-Italy), Italy

Filed Apr. 5, 1985, Ser. No. 720,403
Claims priority, application Italy, Apr. 6, 1984, 21467/84[U]
Int. Cl.[4] D06F *75/08*
U.S. Cl. 219—245 10 Claims



1. A steam generating apparatus for different household application outlets, said apparatus comprising:

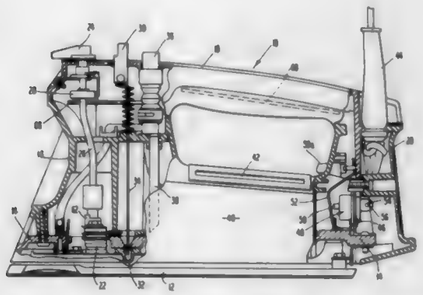
a steam jet iron having an ironing plate formed with steam delivery orifices,
a steam manifold removably associated with said ironing plate at said orifices,
sealing means interposed between said steam manifold and said ironing plate,
a steam delivery conduit hydraulically connected to said steam manifold, and
thermostat-controlled heating means associated with said steam manifold.

4,692,589

ELECTRIC IRON HAVING SAFETY CUTOFF SWITCH AND TEMPERATURE INDICATOR

Allen S. Borsari, Hamden; Stanley J. Brym, Torrington, both of Conn.; Laura A. Markure, Framingham, Mass., and Ronald G. Arpino, Branford, Conn., assignors to Hamilton Beach Inc., Waterbury, Conan.

Filed Feb. 5, 1986, Ser. No. 826,228
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—251 **6 Claims**



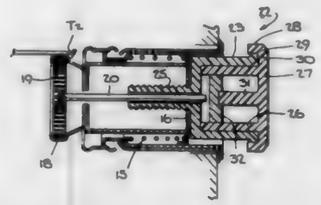
1. An electric pressing iron having a soleplate, a main heating element in the soleplate, a manually resettable thermostatic cutoff switch in series with the heating element, said cutoff switch being manually resettable externally of the iron, a control circuit including a heating resistor mounted on the cutoff switch, an orientation responsive switch and a timing circuit including a capacitor which charges when the circuit is energized, whereby when said orientation responsive switch because of lack of movement of the iron fails to discharge the capacitor for a preset period of time, the heating resistor is activated to trigger said cutoff switch opening the main heating element of the iron.

4,692,590

AROMA-GENERATING AUTOMOBILE CIGARETTE LIGHTER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087
Continuation-in-part of Ser. No. 835,223, Mar. 3, 1986, which is a continuation-in-part of Ser. No. 658,778, Oct. 9, 1984, Pat. No. 4,574,181. This application Oct. 14, 1986, Ser. No. 918,141
Int. Cl.[4] F22B *1/28;* **A61L** *9/03;* **F23Q** *7/00*
U.S. Cl. 219—275 **6 Claims**

1. A cigarette lighter adapted to function also as an aroma generator, the lighter being insertable into a socket having terminals which are connected to a power source, one of which is a latching bi-metallic element, said lighter comprising:
A. a cylindrical case that fits into the socket;
B. a spring-biased hollow plunger formed from a cylindrical shell telescopically received in the case, said plunger being provided with a rear end closure plate having a center hole therein;
C. an electrical heater unit attached to the front end of the shell and which in the inactive state of the plunger lies within the case, the unit having a center contact and an outer contact, whereby when a user presses in the plunger to activate the lighter, the contacts are engaged by the socket terminals to energize the unit and the unit is then latched by the latching element which engages the outer contact, the resultant heat also acting to deform the latching element, thereby disengaging the terminals and causing the released plunger to return to its inactive state;
D. a cylindrical cage secured to the rear of the plunger and having an outer cage diameter somewhat smaller than the inner diameter of said case, said cage being provided at its base with a hollow plug that projects into the center hole in the rear end closure plate of the plunger;

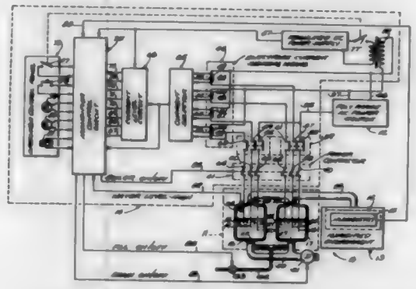


E. a hollow cylindrical cartridge insertable into said cage and supporting a heat-responsive, aroma-generating element that is activated by heat to exude an aromatic vapor; and
F. a thermally conductive electrode rod forming the center contact of the unit and extending through the plunger and the hollow plug into the hollow cartridge to a point adjacent said element to transfer heat thereto when the lighter is activated.

4,692,591

HUMIDIFIER CONTROLLER HAVING MULTIPLE-PHASE ELECTRODE CURRENT SENSOR

Stephen E. Cooley, and Martin J. Jensen, both of Madison, Wis., assignors to Wehr Corporation, Milwaukee, Wis.
Filed Mar. 21, 1986, Ser. No. 842,639
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—295 **20 Claims**

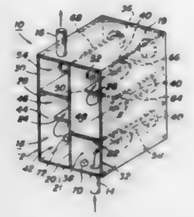


1. A controller for regulating the operation of an electronic steam humidifier of the type having an electrode boiler operable from a source of polyphase electrical alternating current, said controller comprising:
current sensing means for sensing the current provided to the electrode boiler through each phase of the polyphase electrical alternating current; and
control means responsive to the highest of the individual phase currents sensed by said current sensing means for developing a control effect in response to said highest individual phase current reaching a predetermined threshhold.

4,692,592

COMPARTMENTALIZED ELECTRIC LIQUID HEATER

Hemant D. Kale, 5145 N. Kenton Ave., Chicago, Ill. 60630
Continuation-in-part of Ser. No. 583,052, Feb. 23, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 774,049
Int. Cl.[4] F24H *1/14*
U.S. Cl. 219—298 **8 Claims**

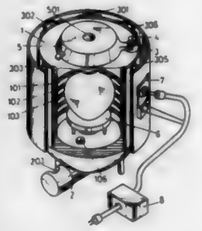


1. A compartmentalized, storage-tank-type, electric heater for heating liquids, having a reduced recovery time, comprising:
a housing;
a plurality of partition panels wholly disposed within the housing to form a plurality of compartments, each partition having flow passage means for fluid communication with only the immediately adjacent compartment(s);
said flow passage means disposed wholly within the housing;
a fluid inlet in a first upstream compartment disposed within the housing;
a fluid outlet in a final downstream compartment disposed within the housing;
heating means in the housing for heating fluid in at least some of the compartments;
automatic thermostatic control(s) to maintain the fluid temperature; and,
said automatic thermostatic control(s) electrically wired to shift heating output from at least one compartment to at least one other compartment, said automatic thermostatic control(s) progressively shifting heating output from upstream compartments to downstream compartments during withdrawal of fluid and progressively shifting heating output from downstream compartments to upstream compartments when fluid withdrawal stops so that all of the heating means are not energized simultaneously thereby limiting maximum energy usage to a preselected amount.

4,692,593

DOMESTIC ELECTRIC KILN

Chui-Wen Chiu, 7f, No. 27, Lane 330 Tun Hwa S. Rd., Taipei, Taiwan
Filed Jan. 25, 1985, Ser. No. 694,780
Int. Cl.[4] F27D *7/02*
U.S. Cl. 219—362 **2 Claims**

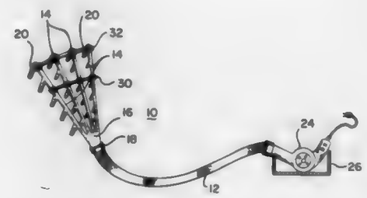


1. A domestic electric kiln which can also be used as an ordinary electric radiator comprising:
a double walled housing having a heated inner chamber;
a cover with an opening in the center thereof;
safety lock means for normally preventing removal of the cover during operation of the kiln;
a water pipe set beneath the bottom of the kiln for generating steam and having three openings, the first one being the water inlet, the third one being a heat conducting block seated in one opening of the water pipe and being in communication with the heated inner chamber to thereby supply heat to the water pipe to generate steam, and the third one being the steam outlet;
a supporting rack which also facilitates the spread of steam throughout the inner chamber;
means for allowing air to circulate between the double walls which serves as an air cooling mechanism; and
a temperature regulator,
both steam and hot air being in continuous flow in the kiln chamber.

4,692,594

APPARATUS FOR DRYING HAIR FROM THE INSIDE OUT

Jack Martin, 434 Rahway Ave., Woodbridge, N.J. 07095
Filed Oct. 31, 1985, Ser. No. 793,207
Int. Cl.[4] H05B *1/00;* **A45D** *20/00, 24/00*
U.S. Cl. 219—373 **9 Claims**



1. Apparatus for drying hair from the inside out, comprising:
a supply tube adapted for connection to a source of air;
a plurality of feeder tubes in communication with said supply tube;
a plurality of fingers extending from each of said feeder tubes, each of said fingers being in communication with and extending from differing portions of respective ones of said plurality of feeder tubes and having a distal end and a length sufficient for supporting said plurality of feeder tubes at locations which for the most part are removed from said hair, and each finger having a plurality of openings for permitting air from the source to dry the hair from the inside out;
adjustment belt means connecting to said plurality of feeder tubes for maintaining said feeder tubes in an established spaced relationship; and
fastener means cooperating with at least selected ones of said plurality of feeder tubes and said adjustment belt means for individually and selectively varying the spacing of said selected ones of said plurality of feeder tubes within said established spaced relationship.

4,692,595

ELECTRICALLY OPERATED HEATING ELEMENT FOR A HOT-RUNNER TOOL

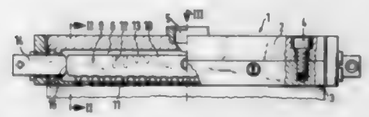
Walter Muller, Battenberg, Fed. Rep. of Germany, assignor to Ewikon Entwicklung und Konstruktion GmbH & Co., Herford, Fed. Rep. of Germany

Division of Ser. No. 653,990, Sep. 24, 1984, Pat. No. 4,631,389. This application May 7, 1986, Ser. No. 860,593

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335296; Sep. 29, 1983, 3335294; Nov. 7, 1983, 3425518

Int. Cl.[4] B29C *45/74, 45/30;* **H05B** *3/06*

U.S. Cl. 219—421 **10 Claims**



1. In an electrically operated heating element for a hot-runner tool that has a heat conductor and is positioned in a hot runner and in runners that derive from the heat conductor and lead to a series of outflow channels from the hot-runner tool, the improvement wherein the heat conductor comprises a flat body with tongues on the side toward the outflow channels, each tongue extending to the vicinity of one outflow channel and further comprising recesses in the flat body above each tongue.

4,692,596

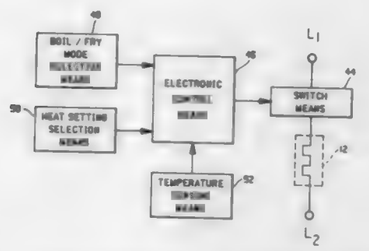
POWER CONTROL ARRANGEMENT FOR AUTOMATIC SURFACE UNIT

Thomas R. Payne, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 6, 1986, Ser. No. 816,616

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—450 **7 Claims**



1. In a cooking appliance of the type including at least one surface unit for supporting and heating a cooking utensil placed thereon and adapted for energization by an external power supply, temperature sensing means for sensing the temperature of a utensil supported on the surface unit, user operable input selector means enabling a user to select a FRY mode, and to select for the FRY mode one of a plurality of different heat settings, each heat setting having associated with it a predetermined steady state temperature range defined by a predetermined minimum and maximum temperature and electronic control means responsive to the temperature sensing means and the input means for controlling energization of the temperature sensing means and improvement wherein said electronic control means comprises:

means for establishing first and second error signals as functions of the difference between the sensed temperature and the selected steady state temperature range; and

means operative to control energization of the surface unit as a function of the first error signal during the transient heat up phase prior to the sensed utensil temperature first reaching the steady state temperature range and as a function of the second error signal during the steady state phase after the sensed utensil temperature first reaches the steady state temperature range, whereby tighter control of the utensil temperature during the steady state phase is achieved while maintaining minimal overshoot in the transient heat up phase.

4,692,597

HEATING APPLIANCE WITH UNIFORM HEATING CONTROL

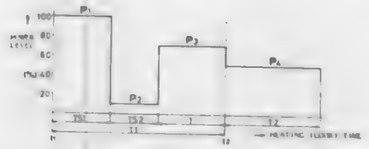
Tatsuya Tsuda, Osaka, and Masako Nogi, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1985, Ser. No. 808,486

Claims priority, application Japan, Dec. 14, 1984, 59-265071

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—492 **5 Claims**



1. A heating appliance comprising:

(a) heating means having at least a first, a second, a third and a fourth power level for heating an object, said heating means applying heat to the object during each power level, said third power level being greater than said second power level, said fourth power level being lower than said first power level;

(b) sensor means for sensing the heating condition of said object and outputting a signal representative thereof;

(c) detecting means, responsive to said output signal of said sensor means, for detecting whether said object has been heated to a predetermined heat completion condition;

(d) switching means for switching from said first power level to said second power level to said third power level of said heating means prior to the detection of said predetermined heat completion condition of said object being heated; and

controlling means for controlling said heating means to provide an additive heating period at the fourth power level for heating said object after said detecting means detects that said predetermined heat completion condition has been reached, said additive heating period being determined by the type of said object and the length of time from the start of said heating to the detection of said heating completion condition.

4,692,598

TEMPERATURE CONTROLLER SYSTEM

Naoki Yoshida, Sagamihara, and Nobutoshi Kobayashi, Tokyo, both of Japan, assignors to Yamato Scientific Co., Ltd., Tokyo, Japan

Division of Ser. No. 526,267, Aug. 25, 1983. This application Feb. 14, 1986, Ser. No. 829,715

Claims priority, application Japan, Oct. 16, 1982, 57-181778

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **2 Claims**

1. For use with a heater connected in series with a power source and arranged in a chamber or the like to maintain the temperature in said chamber at a selected level, a temperature controller comprising:

a temperature sensor in said chamber;

a temperature setting means adapted to be set at said selected level;

a main comparator circuit for developing an OFF-control output when the detected output of said temperature sensor is higher than the output of said temperature setting means;

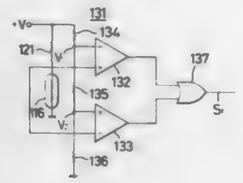
a sub-comparator circuit for developing an OFF-control output when the detected output of said temperature sensor exceeds an overheating level which is higher than said selected level;

a control output circuit for emitting an "AND" output signal of the output signal of said main comparator circuit and said sub-comparator circuit as the OFF-control output for a switch which is connected in series with said heater and said power source;

a temperature judging circuit for detecting a malfunction of said temperature sensor;

a temperature setting means judging circuit for detecting a malfunction of said temperature setting means; and

a switch circuit for interrupting the supply of power from



said power source to said heater when a malfunction is detected by either of said judging circuits;

said temperature setting means judging circuit comprising a third comparator for judging a disconnection;

first and second resistors connected in series between said power source and ground;

third and fourth resistors connected in series between said power source and ground;

means for applying a divided voltage obtained at a connection point between said first and second resistors to the negative input terminal of said third comparator; and means for applying a divided voltage obtained at the connection point between said third and fourth resistors to the positive input terminal of said third comparator, whereupon the output of said third comparator constitutes the output of said temperature setting means judging circuit.

4,692,599

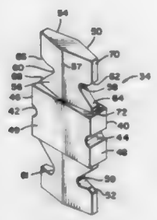
COIL SUPPORT INSULATOR FOR AN ELECTRIC HEATER

H. Keith Howard, and Jimmy L. Sherrill, both of Cookeville, Tenn., assignors to Tutco, Inc., Cookeville, Tenn.

Continuation of Ser. No. 597,701, Apr. 6, 1984, Pat. No. 4,559,412, which is a division of Ser. No. 206,899, Nov. 14, 1980, Pat. No. 4,458,141. This application Oct. 8, 1985, Ser. No. 785,595

Int. Cl.[4] H05B *3/06;* **H01B** *17/56*

U.S. Cl. 219—532 **6 Claims**



1. An electric heater comprising an elongate structural member and an insulator means for supporting a heater coil, wherein said insulator means comprises an integral elongate element having at least one notch therein adapted to support said heater coil by engaging at least one individual convolution thereof, said insulator having groove means in an exterior surface engaging said structural member, said structural member comprising an elongate rod at least partially encircling said insulator means and recieve in said groove means to support said insulator means.

4,692,600

SYSTEM AND METHOD FOR AUTOMATIC TRANSACTION

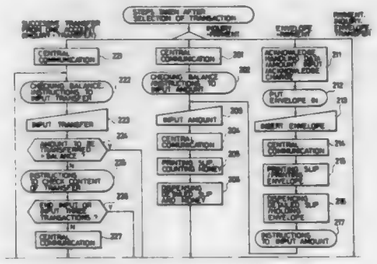
Kenichi Takahashi, Niigata, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1985, Ser. No. 736,702

Claims priority, application Japan, Jul. 31, 1984, 59-159060

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—379 **10 Claims**



1. A system for automatic transactions, comprising:

a medium reader for receiving an inserted medium from a customer and for reading data from said medium in which information identifying said customer is recorded;

a operation unit provided with transaction selection keys comprising single transaction and combination keys to input transactions of different kinds in combination, and a numerical key to input numerical values and personal code number of said customer;

a display unit for displaying instructions for operation to said customer; and

a control unit for performing a single transaction based on data read by said medium reader and of said selection keys, and for performing a plurality of different transactions based on data read from said medium and said combination keys, in repsonse to one insertion of said medium to said medium reader and one input of the personal code number by said customer.

4,692,601

IDENTIFICATION CARD INCLUDING SWITCHING MEANS FOR BUILT-IN BATTERY

Harumi Nakano, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1986, Ser. No. 840,938

Claims priority, application Japan, Mar. 25, 1985, 60-42777[U]

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **12 Claims**

1. An identification card comprising:

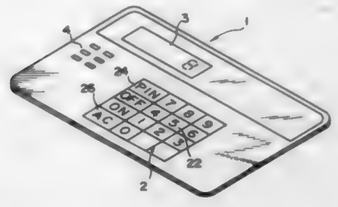
a built-in type battery;

means for processing data necessary for the identification card;

storage means for storing at least said data upon being energized by said battery;

first switching means interposed between said battery and said storage means; and

switching control means, energized by said battery, for controlling said switching means to be turned off in a first condition and to be turned on in a second condition in response to a command signal externally supplied via said



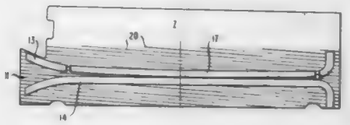
identification card to said switching control means, whereby said storage means is not energized by said battery in the first condition, but is energized in the second condition.

4,692,602

APPARATUS FOR SENSING AND/OR WRITING INFORMATION ON CARDS, PASSPORTS AND CHECKS AND THE LIKE

Curtis T. Conant, Rancho Palos Verdes, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed May 23, 1985, Ser. No. 737,198
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235—446 **5 Claims**



1. A multimedia apparatus for writing and/or reading information on a medium and adapted to accept media of different thicknesses, first and second rail means spaced apart from one another in opposition in a manner to define an acceptance slot of maximum width therebetween, said apparatus also including a wear plate against a first surface of which the edge of a medium is urged when passed through said acceptance slot, at least a portion of said first surface including striations of a depth and at an angle to said opposing rail means.

4,692,603

OPTICAL READER FOR PRINTED BIT-ENCODED DATA AND METHOD OF READING SAME

Robert L. Brass, Westport; John Glaberson, Stratford; Richard W. Mason, Cos Cob; Arthur J. L'Heureux, III, Bethel; Scott Santulli, Danbary; G. Thomas Roth, Fairfield, all of Conn.; John Frega, Holmdel, and Henry S. Imiolek, Clark, both of N.J., assignors to Cauzin Systems, Incorporated, Waterbury, Conn.

Filed Apr. 1, 1985, Ser. No. 718,219
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—454 **70 Claims**

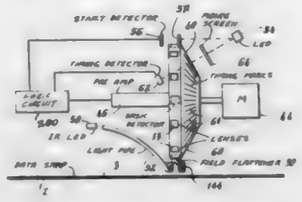
1. An apparatus for scanning data encoded in bit form on a planar data strip, said data strip having a series of data lines of bit areas running transversely across said strip, said data lines being parallel to, contiguous with, and conterminous with, each other, whereby the totality of said lines defines the length of said strip, said encoded data being sequentially encoded along each said data line and thereafter along the contiguous said data line,

said apparatus including,

a chassis adapted to be positioned proximate to said data strip,

a first cylindrical lens mounted on said chassis parallel to the plane of said data strip and parallel to said data lines, and means for moving said chassis longitudinally of said strip,

at least one second cylindrical lens mounted in said chassis parallel to the plane of said data strip and perpendicular to



said data lines, and means for moving said second lens transversely along said first lens,

a detector mounted on said chassis at the focal point of said lenses relative to said data strip,

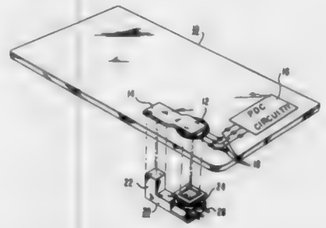
whereby bit areas on a given said data line are focused in sequence on said detector and said data lines are focused in sequence on said detector.

4,692,604

FLEXIBLE INDUCTOR

Robert L. Billings, Andover, Mass., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 25, 1984, Ser. No. 664,555
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—493 **11 Claims**



1. In combination with a portable data card having at least one electronic device, a flexible inductor for converting transmitted magnetic energy into electric energy to energize said electronic device comprising a flat electrically conductive multiturn coil and a flexible magnetic and nonmagnetrostrictive core piece attached to said card to direct said transmitted magnetic energy through said coil.

4,692,605

SYSTEM FOR FINE FOCUSING A CAMERA ON A MOVING CURVED SURFACE

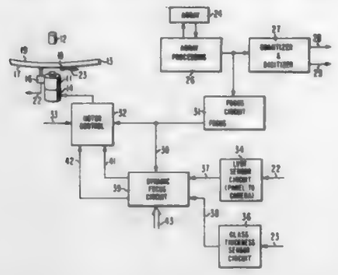
Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 24, 1986, Ser. No. 832,129
Int. Cl.[4] G03B *3/10*; **G01N** *21/00*; **H04N** *17/00*
U.S. Cl. 250—201 **8 Claims**

1. A system for fine focusing a lensing mechanism on one surface of a curved transparent object as said object moves with respect to said lensing mechanism whereby the distance between the other surface of said object and said lensing mechanism varies, said system comprising:

displacement transducer means for providing a displacement signal representative of the distance between said other surface and said lensing system;

thickness transducer means for providing a thickness signal representative of the thickness of said object; and



focusing circuit means, responsive to said displacement signal and to said thickness signal, for fine focusing said lensing mechanism in accordance with changes in said displacement and thickness signals.

4,692,606

MODULATED LIGHT SOURCE WITH POWER STABILIZED ACCORDING TO DATA SIGNAL

Mitsugu Sakai, and Shoji Yoshikawa, both of Hachioji, Japan, assignors to Olympus Optical Company, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,911
Claims priority, application Japan, Oct. 9, 1984, 59-212357
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **11 Claims**

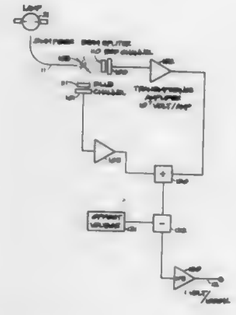
1. An optical power stabilizing device for generating stabilized light power comprising a light source for generating light power having switchable light emitting quantities of a first level and a second level larger than the first level, a photodetecting means coupled to said light source for detecting at least a part of the light power of said light source to generate a photodetected signal, means for driving said light source, a signal source for generating input signals, means for generating at least one control reference signal by processing said input signals, a first feedback loop control circuit for feeding back to said means for driving said light source the output of said photodetecting means at the light power of said first level by comparing it with said control reference signal, and a second feedback loop control circuit for feeding back to said means for driving said light source the output of said photodetecting means at the light power of said second level, said second feedback loop control means comprising first low-pass filter means for filtering said photodetected signal, second low-pass filter means for filtering said input signals, a subtractor means connected to said first low-pass filter means for subtracting the output thereof from the control reference signal, and a differential amplifier connected to said subtractor means and said second low-pass filter means for comparing the output of said subtractor and the output of said second low-pass filter means.

4,692,607

CONTROLLED COLOR LIGHT SOURCE

John T. LaBelle, Long Beach; David A. Pringle, Pacific Palisades, both of Calif., and Daniel McKenna, Kahuku, Hi., assignors to Optech Inc., Burbank, Calif.

Filed Oct. 25, 1985, Ser. No. 791,215
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 **13 Claims**



1. A controlled color high intensity light source comprising:

(a) a lamp for projecting a beam of light, said lamp being installed in an enclosure, said enclosure having an opening through which said beam projects;

(b) a power supply external of said enclosure for energizing the lamp;

(c) a light fiber for sampling a portion of the light emitted from the lamp, said fiber having one end thereof located inside said enclosure adjacent said lamp and another end external of said enclosure;

(d) a beam splitter arranged to split the light from the fiber into two channels;

(e) a pair of photo detectors, one for each channel arranged to receive the light from said another end of the fiber via the beam splitter;

(f) a divider circuit having a pair of inputs and an output, the inputs being connected to the two photo detectors;

(g) output means connected to the output of the divider for providing an output signal which is proportional to the color of light captured by said fiber; and

(h) means for controlling said power supply in response to said output means to automatically adjust the color of light projected by said lamp.

4,692,608

COMPACT OPTICAL IMAGING SYSTEM

David H. Cooper, Saratoga, Calif.; Makoto Toyota, and Satoshi Arakawa, both of Omiya, Japan, assignors to Fuji Photo Optical Company, Ltd., Uetake, Japan

Filed May 18, 1984, Ser. No. 611,618
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—216 **23 Claims**

1. A compact optical imaging system comprising:

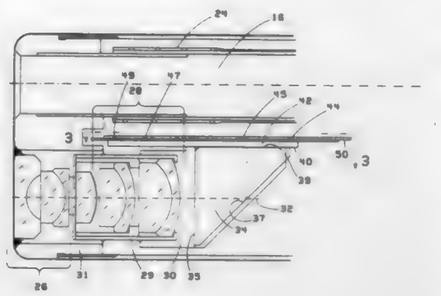
a lens assembly for gathering and focusing light from objects within the field of view of the lens;

an image-forming sensor having a signal output corresponding to the intensities and colors of patterns of light falling on the sensor, oriented in a plane other than perpendicular to the optical axis of the lens assembly;

means for directing light from the lens assembly to cause the light to strike the image-forming sensor, and;

means for supporting the lens assembly, light directing

means and image-forming sensor such that the image-forming sensor is placed in the focal plane of



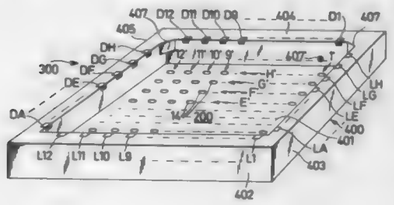
the optical system formed by the lens assembly and the light directing means.

4,692,609

METHOD AND APPARATUS FOR INDICATING AND SENSING PIPETTING POSITIONS

Ingvar Pettersson, Sundbyberg, Sweden, assignor to Scomas AB, Sundbyberg, Sweden

Filed Jun. 9, 1986, Ser. No. 872,008
Claims priority, application Sweden, Jun. 18, 1985, 8503027
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **15 Claims**



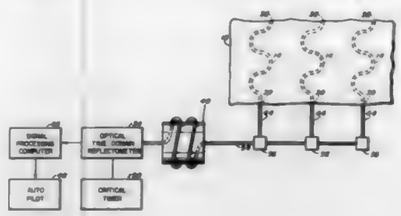
8. Apparatus for indicating and sensing pipetting positions in a pipetting sequence which is manually performed at a test plate (**100**) having a matrix of wells (**114**), characterized by a station (**400**) which is arranged to receive the test plate (**100**) in a predetermined orientation and a predetermined position, an illumination device (**200**) in the station for distinguishing illumination of the rim (**115**) of a well (**114**) at which a pipetting operation is to be performed, a program control means (**600**) which previously has been programmed for a certain pipetting sequence and which is arranged to control the illumination means (**200**) to illuminate that well (**114**) in the test plate (**100**) at which a pipetting operation shall be carried out according to the sequence, a sensing means (**300**) in the station for sensing the position for a pipette which is inserted in a well, and a comparison means (**700,800**) for comparing the position of the illuminated well (**114**) and the sensed pipette position, said comparison means (**700,800**) being arranged, if the compared positions coincide, to bring the program control means (**600**) to initiate the next sequence step or, if the positions do not coincide, to emit an alarm triggering signal.

4,692,610

FIBER OPTIC AIRCRAFT LOAD RELIEF CONTROL SYSTEM

Nicholas C. Szuchy, Babylon, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,124
Int. Cl.[1] G01N *3/00*
U.S. Cl. 250—227 **14 Claims**



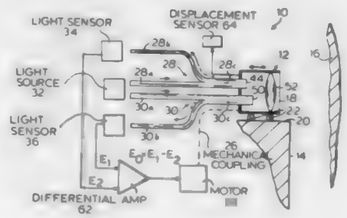
1. A fiber optic load measuring system comprising:
(a) an optical pulse generator;
(b) an optical bus connected to said optical pulse generator;
(c) a plurality of optical pulse routing switches serially disposed along the length of said optical bus;
(d) a plurality of optical attenuators, each of said optical attenuators being disposed along a dedicated surface where an applield load is to be measured, each of said optical attenuators further being connected to a dedicated optical pulse routing switch and being operative to vary the attenuation of the optical pulse in response to the applied load as said optical pulse is reflected by said optical attenuators;
(e) said optical pulse routing switches being operative to selectively direct said optical pulses to individual optical attenuators such that each of said optical attenuators is separately pulsed;
(f) an optical pulse receiver connected to said optical bus and operative to receive optical pulses reflected from said optical attenuators; and
(g) a signal processor connected to said optical receiver and operative to process the signal received by said optical pulse receiver to determine the load along each of said surfaces.

4,692,611

FIBER OPTIC PROXIMITY SENSOR WITH FEEDBACK SERVO IMAGING MEANS

Leo Hoogenboom, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,600
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **8 Claims**



1. A proximity sensor for determining a distance to a target comprising:
a light source;
first and second bifurcate bundles of optical fibers;

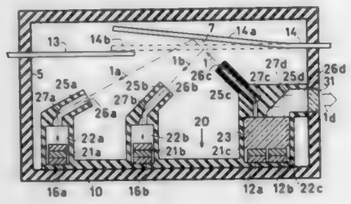
first and second light detectors for generating first and second detected sensor signals corresponding to the light intensities detected by the detectors;
imaging means;
said first and second bundles having respective first and second front faces and being positioned and arranged to direct light from said light source to said target through said imaging means and to transmit reflected light from said target to the first and second sensors respectively to generate sensor signals which have equal amplitudes when said bundles are at a preselected distance from the target;
means for generating a control signal corresponding to the difference between said first and second detector signals; and
means for moving said imaging means in accordance with said control signal for tracking said target while maintaining a constant distance between said faces and said imaging means.

4,692,612

SWITCH POSITION DETECTOR AND INDICATOR WITH MULTICOLOR LIGHT EMITTER

Karel Havel, 15 Kensington Road, Apartment #704, Bramalea, Ontario, Canada L6T 3W2

Filed Jun. 13, 1986, Ser. No. 874,028
Int. Cl.[4] G01D *5/34;* **H01J** *1/56*
U.S. Cl. 250—229 **14 Claims**



1. The method of indicating a position of a contact element movable among a plurality of positions in a switching device, said contact element including a reflecting surface, by:
directing on said reflecting surface of said contact element a multicolor light beam capable of illuminating in one of a plurality of different colors;
obtaining from said contact element a reflected light beam having a direction in accordance with the position of said contact element;
determining the direction of said reflected light beam; and
controlling the color of said multicolor light beam in accordance with the direction of said reflected light beam to thereby indicate the position of said movable contact element.

4,692,613

ANGLE SENSOR

Sumio Masuda, Tokyo; Hiroshi Iiyama, and Kazuyuki Tamura, both of Kanagawa, all of Japan, assignors to Jeco Co., Ltd., Kawasaki, Japan

Filed Apr. 17, 1985, Ser. No. 724,092
Claims priority, application Japan, Apr. 24, 1984, 59-81212
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **6 Claims**

1. An angle sensor comprising:
a horizontal shaft rotated by an object at a rotation angle which is to be measured;
a disc shaped light shielding member penetrated by said shaft at a center thereof, rotated about said shaft and formed with a spiral slit, a distance between said slit and an axis of said shaft increasing uniformly from a first slit end to a second slit end, said first and second slit ends being first and second distances from said shaft, respectively, said second distance being greater than said first distance;
a light source for illuminating one side of said light shielding member;
a single linear light receiving means which is capable of determining a longitudinal position thereof on which a light beam from said light source strikes, said linear light receiving means being disposed on the opposite side of said light source with respect to said light shielding member in such manner that a longitudinal axis line of said light receiving means coincides with a line which is orthogonal to and includes the axis of said shaft and is parallel to the surface of said light shielding member, said linear light receiving means having a predetermined length so that when said light shielding member is rotated by said object, light passing through said first and second slit ends each are received, respectively, by opposite end portions of said light receiving means; and
a weight coupled to said light shielding member.

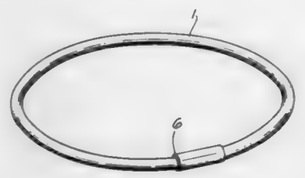


4,692,614

ROTATIONAL MOTION FLUID LOOP SENSOR USING MAGNETICALLY LEVITATED DETECTING ELEMENT

David J. M. Wilson, and Paul E. G. Cope, both of Hampshire, England, assignors to The Marconi Company Limited, England

Filed Apr. 23, 1986, Ser. No. 855,184
Claims priority, application United Kingdom, Apr. 27, 1985, 8510771
Int. Cl.[4] G01P *15/00*
U.S. Cl. 250—231 R **9 Claims**



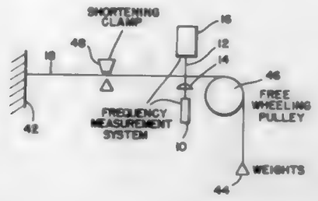
1. A rotational motion sensor comprising a fluid loop and a piston to act as the detecting element which is magnetically levitated to keep it from direct contact with any part of the sensor other than the fluid itself, and which moves in proportion to the motion of the element of fluid it substitutes and which behaves in all dynamical respects to high accuracy as a damped simple harmonic oscillator with respect to the body and tube of the sensor.

4,692,615

APPARATUS AND METHOD FOR MONITORING TENSION IN A MOVING FIBER BY FOURIER TRANSFORM ANALYSIS

Thomas O. Monsah, Big Flats; Dale R. Powers, Painted Post, and Clement D. Burton, Ithaca, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,750
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R **16 Claims**



8. Apparatus for monitoring the tension in a moving fiber comprising:

(a) means for sensing the motion of the fiber in a direction transverse to the direction in which the fiber is moving;

(b) means for analyzing the sensed motion to determine at least one frequency component thereof, said means performing a Fourier transform to determine said at least one frequency component of the sensed motion of the fiber; and

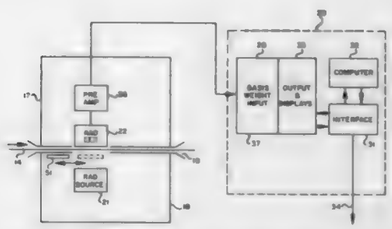
(c) means for monitoring the frequency component so determined so as to monitor the tension in the fiber.

4,692,616

BASIS WEIGHT GAUGE STANDARDIZING METHOD AND SYSTEM

Philip Hegland, San Jose, and Lee Chase, Los Gatos, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Mar. 14, 1984, Ser. No. 589,607
Int. Cl.[4] G01D *18/00*
U.S. Cl. 250—252.1 **8 Claims**



1. A method of standarizing a basis weight gauge for measuring the weight per unit area of a sheet material, such gauge having a radiation source and radiation detector with a gap therebetween for directing radiation along a path towards said material and for detecting the amount of radiation transmitted through said material, said transmitted radiation being a measure of the basis weight of said material, said gauge also including standard means having a predetermined and stable basis weight and movable to be interposed in said radiation path, said method comprising the following steps:

(a) constructing two calibration curves each showing basis weight on a first axis versus a function of transmission ratio on a second axis, the first calibration curve being constructed without simulated dirt and the second calibration curve being constructed with simulated dirt;

(b) constructing a standardization curve by plotting the displacement of one calibration curve relative to the other

(c) operating the gauge to measure the weight per unit area of the sheet material by determining a measured transmission ratio;

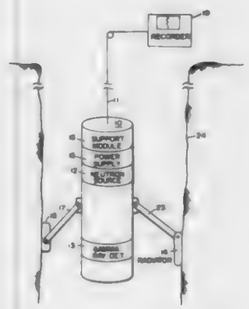
(d) standardizing the gauge during operation, the standardizing step including determining a correction factor C, based upon the value of the standardization curve at a point corresponding to the measured transmission ratio.

4,692,617

METHOD AND SYSTEM FOR NEUTRON LIFETIME LOGGING

Linus S. Allen, Dallas; William R. Mills, Jr., Duncanville, and David C. Stromswold, Addison, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,599
Int. Cl.[4] G01V *5/10*
U.S. Cl. 250—270 **14 Claims**



1. A method for neutron lifetime logging of subterranean formations surrounding a borehole, comprising the steps of:

(a) positioning a radiator having a neutron absorbing and gamma ray radiating material in juxtaposition with the borehole wall,

(b) shielding said radiator from neutron radiation from the borehole fluid, such that the directional sensitivity of said radiator is maximized with respect to secondary formation neutron radiation and is minimized with respect to borehole neutron radiation,

(c) irradiating the formations surrounding the borehole with bursts of fast neutrons,

(d) absorbing secondary formation neutron radiation entering the borehole from the irradiated formations with said radiator,

(e) radiating neutron capture gamma rays from said radiator in response to absorption of said secondary formation neutron radiation by said radiator, and

(f) detecting said neutron capture gamma rays as a measure of the neutron lifetime characteristic of the formations surrounding said borehole.

4,692,618

DETECTOR SIGNAL CONDITIONER

Robert W. Klatt, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 2, 1985, Ser. No. 729,825
Int. Cl.[4] G01J *5/26*
U.S. Cl. 250—330 **9 Claims**

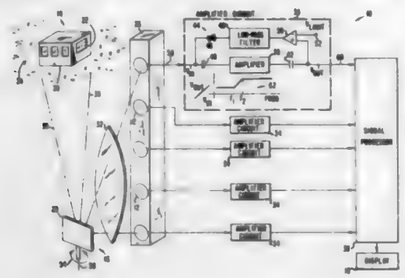
1. An imaging system comprising:

means for scanning radiation from a subject to be imaged, said scanning means including a set of detectors of the radiation;

a set of amplifying circuits connected by AC coupling to corresponding ones of said detectors; and

means coupled to said amplifying circuits for extracting imaging data to provide an image of said subject;

said amplifying circuits each including means for limiting the



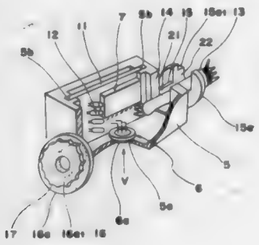
magnitude of an output signal of said corresponding one of said detectors, and a feedback branch for operating said limiting means to limit a signal amplitude of said one detector to a preset limit value.

4,692,619

PYROELECTRIC TYPE DETECTING DEVICE

Noboru Masuda, Kawaguchi; Kenji Tomaki, Kawasaki; Tetsuo Oosawa, Tokyo, and Michihiro Murata, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 19, 1986, Ser. No. 876,182
Claims priority, application Japan, Jun. 20, 1985, 60-93838[U]
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—338 **4 Claims**



1. A pyroelectric type detecting device comprising:

a converging mirror including a mirror member;

a pyroelectric type sensor element for detecting light converged by said converging mirror, which has a window for receiving the light;

an amplifier for amplifying an output signal of said sensor element into an amplified signal and outputting the amplified signal at a low impendance; and

a casing for accommodating said sensor element and said amplifier therein;

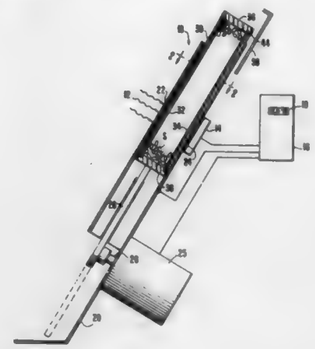
said casing being rotatably mounted on a portion of said converging mirror such that said window of said sensor element confronts said mirror member of said converging mirror.

4,692,620

NEAR INFRARED MEASURING INSTRUMENT WITH SAMPLE HOLDER

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed May 31, 1985, Ser. No. 739,679
Int. Cl.[4] G01N *21/03, 21/35*
U.S. Cl. 250—343 **15 Claims**



1. A near infrared measuring instrument for measuring a constituent of a material, the instrument being of the type having a source of near infrared radiation, a detector for near infrared radiation, a means for holding a sample between the source and the detector, and means for data processing connected to the detector to read the detector and measure a constituent in a sample of the material by the amount of near infrared radiation transmitted through the sample, with the improvements comprising:

(a) means for providing a plurality of different predetermined uniform thicknesses of samples to be measured, comprising at least one cuvette for holding a sample between the source and the detector, the cuvette having opposing faces with at least a portion thereof being transparent to near infrared radiation, the cuvette providing at least one predetermined uniform thickness between the source and the detector in order to hold a predetermined uniform thickness of sample,

(b) means for moving the cuvette relative to the near infrared radiation source and the detector and for stepwise placing a plurality of locations of the radiation-transparent portion of the cuvette and the at least one predetermined uniform thickness of sample into relative stationary alignment between the source and the detector,

(c) means for reading the detector when the cuvette is stationary, and

(d) means in the cuvette for measuring the temperature of the sample.

4,692,621

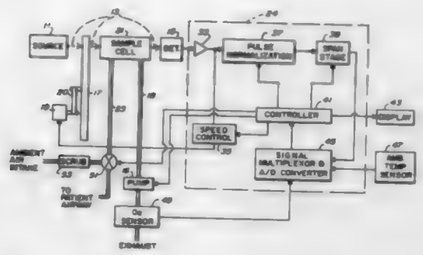
DIGITAL ANESTHETIC AGENT ANALYZER

Robert E. Passaro, Richmond; Kevin G. Williams, Pinole; George K. Parnoff, Walnut Creek, and Raymond E. Rogers, Oakland, all of Calif., assignors to Andros Anlayzers Incorporated, Berkeley, Calif.

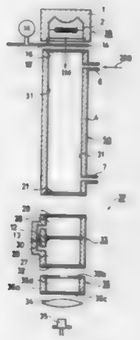
Filed Oct. 11, 1985, Ser. No. 786,736
Int. Cl.[4] G01N *21/35*
U.S. Cl. 250—343 **6 Claims**

1. A gas analyzer comprising, a sample cell for containing a gas mixture to be analyzed, source means for producing and directing infrared energy through said sample cell, a rotary filter wheel having at least one filter thereon for passing infrared energy limited to a wavelength band within the characteristic absorption band of a predetermined gas and having a dark level region substantially opaque to infrared energy, drive

means for supporting and rotating said filter wheel to successively interpose said filter and said dark level region between said source means and said sample cell in the path of the infrared energy directed by said source means, detector means for detecting infrared energy passing through said sample cell and producing an electrical signal representative thereof, signal processing means connected to said detector means for producing an output indicating the concentration of the predetermined gas in the sample cell by comparing the electrical signals produced by said detector means with said filter positioned in the infrared energy path and with said dark level regions positioned in the infrared energy path, said filter wheel including a second filter for passing first and second infrared wavelength bands, one of which is within a region of infrared absorption by water vapor and the other of which is not, both of said first and second wavelength bands of said second filter being outside the characteristic wavelength absorption regions of other gases present in the sample cell, the amplitude of transparency of said second filter at each of said first and second infrared wavelength bands being selected to track the variation in absorption of infrared energy at the wavelength of said first filter due to the presence of water vapor in said sample cell.

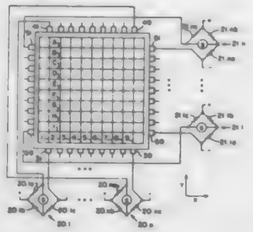


4,692,622
INFRARED ANALYZER
Harutaka Taniguchi, and Takafumi Fumoto, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd. and Fuji Electric Corporate Research and Development Ltd., both of Kanagawa, Japan
Filed Dec. 3, 1985, Ser. No. 803,967
Claims priority, application Japan, Dec. 4, 1984, 59-255900
Int. Cl.[4] G01N *21/37*
U.S. Cl. 250—343 6 Claims



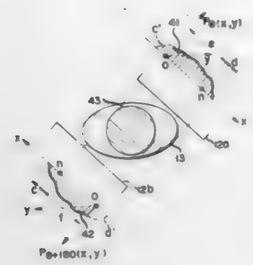
1. An infrared analyzer comprising;
a source of infrared radiation;
a measurement cell for receiving material to be analyzed and transmitting said radiation therethrough, said material containing a first component which absorbs infrared radiation of a first wavelength and a second component which absorbs infrared radiation of a second wavelength;
an infrared detecting means, said detecting means including a first detector, said first detector comprising a first detecting chamber and a second detecting chamber, said detecting chambers having different path lengths, said first detector measuring the amount of infrared radiation absorbed by said first component and generating a first detector output signal;
an optical filter for absorbing infrared radiation of said second wavelength;
a second detector, sensitive to infrared radiation in the wavelengths other than said first wavelength and said second wavelength, said second detector measuring the amount of infrared radiation passed through said first detector and said optical filter and generating a second detector output signal; and
means for using the first and second detector output signal to determine the concentration of said first component in said material.

4,692,623
PRECISION LASER BEAM POSITIONER AND SPATIALLY RESOLVED LASER BEAM SAMPLING METER
Thomas G. Roberts, Huntsville; Raymond W. Conrad, Russellville; William F. Otto, Huntsville, and Thomas E. Honeycutt, Somerville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 13, 1986, Ser. No. 835,826
Int. Cl.[4] G01K *17/00*
U.S. Cl. 250—349 11 Claims



1. An analyzer for an energy beam comprising a first set of plurality of wire resistors arranged on a substrate such that they present a plurality of straight line segments each in a horizontal plane and parallel to each other, a second set of plurality of wave resistors located on the substrate positioned behind said first set of wave resistors such that they present a plurality of straight line segments in a plane and parallel to each other, said resistors being positioned on said substrate such that the beam will impinge on at least a portion of said resistors so as to cause heating of said resistors and therefore a change in the resistance in accordance to the power output of the beam and its position relative to said resistors and a plurality of measuring means individually connected to different ones of said wire resistors for measuring the resistance of each resistor.

4,692,624
EMISSION COMPUTED TOMOGRAPHY APPARATUS
Takashi Ichihara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 10, 1986, Ser. No. 850,048
Claims priority, application Japan, Apr. 11, 1985, 60-78029
Int. Cl.[4] G01T *1/164*
U.S. Cl. 250—363 S 2 Claims

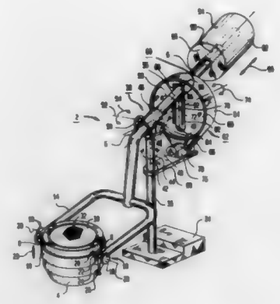


2. An emission computed tomography apparatus comprising:
a radiation detector for detecting radiation from a subject dosed with radioisotope while moving along an elliptical orbit about said subject, said radiation detector having a predetermined effective field of view to detect perpendicularly incident radiation, said predetermined effective field of view being reduced because a region where radiation emitted from said subject in 360-degree directions can be detected is restricted due to said elliptical orbit of said radiation detector;
an image reconstruction section responsive to said radiation detector for reconstructing a tomogram representing radiation distribution in said subject; and
a display unit for displaying an image reconstructed by said image reconstruction section;
said radiation detector having a first effective field-of-view region and a second effective field-of-view region at each of first and second positions opposed to each other with the subject interposed therebetween, said first effective field-of-view region at each of said first and second positions detecting radiation emitted from the same part of said subject, said second effective field of view of said detector at said first position detecting radiation emitted from part of said subject outside the effective field of view of said radiation detector at said second position, and said second effective field-of-view region at said second position detecting radiation emitted from part of said subject outside the effective field of view of said radiation detector at said first position;
said image reconstruction section being arranged to perform an arithmetic operation given by

$$K1 \cdot P2a + (P2b + P1b) + K2 \cdot P1c$$

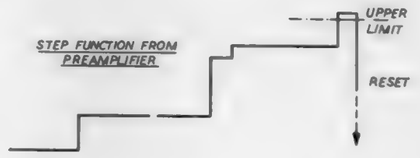
where P1b represents radiation information detected by said first effective field-of-view region of said radiation detector at said first position, P1c represents radiation information detected by said second effective field-of-view region of said radiation detector at said first position, P2b represents radiation information detected by said first effective field-of-view region of said radiation detector at said second position, P2a represents radiation information detected by said second effective field-of-view region of said radiation detector at said second position, and K1 and K2 represent coefficients.

4,692,625
DETECTOR HEAD MOUNTING MECHANISM AND SUPPORTING STRUCTURE
George J. Hanz, Bloomingdale, Ill.; Guenter Jung, Roettenbach, and Michael Pflaum, Aisch, both of Fed. Rep. of Germany, assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.
Filed Jun. 24, 1985, Ser. No. 747,731
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—363 R 25 Claims



1. A mechanism for mounting a detector head including a collimator, comprising:
(a) a supporting structure supporting the detector head including the collimator, said supporting structure having a single trunnion axis for the detector head;
(b1) a shifting means for shifting the detector head including the collimator and the supporting structure with respect to each other in a manner that the detector head including the collimator is balanced with respect to the single trunnion axis,
(b2) the shifting means including a slider housing and a slider slidably inserted in the slider housing, wherein
(b3) one is secured to the supporting structure in the single trunnion axis and the other one is secured to the detector head.

4,692,626
NUCLEAR AND X-RAY SPECTROMETRY AND LOW-PASS FILTER AND FILTERING METHOD THEREFOR
Georg P. Westphal, Schmidlergasse 7, A-1238 Wien, Austria
Filed Jun. 20, 1985, Ser. No. 747,137
Claims priority, application Austria, Jun. 20, 1984, 2021/84; Feb. 15, 1985, 454/85
Int. Cl.[4] G01T *1/17*
U.S. Cl. 250—389 12 Claims



1. In a method of measuring the energy of a quantum of nuclear of X-ray radiation in which said radiation liberates electric charge by ionization in a detector, the liberated electrical charge which is proportional to the adsorbed energy of the radiation quanta is transformed into energy proportional voltage steps in a preamplifier and the preamplifier output is subjected to filtering in a low-pass filter to reduce the effect of

electronic noise from the preamplifier, the improvement which comprises:

(a) before beginning the measurement of a voltage step of a quantum setting a storage element of said low-pass filter at a starting voltage value corresponding substantially to an unfiltered value of the voltage step of the quantum to preload said low-pass filter to an amplitude of signals represented by said quantum;

(b) terminating the measurement of the energy of said quantum no later than the arrival of the next quantum; and

(c) forming as the energy-proportional measured value of the quantum a noise-reduced voltage step difference (B−A) by storing a filter output value (A) directly before beginning the measurement of the quantum and subtracting the stored filter output value (A) from the filter output value (B) directly following the termination of the measurement operation.

4,692,627

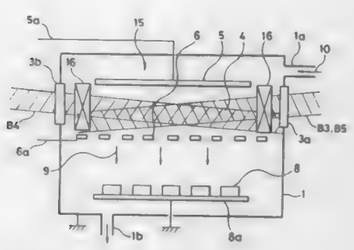
ION BEAM GENERATOR

Yoshihiro Ueda; Kouichi Ono; Tatsuo Oomori, and Shigeto Fujita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,541

Int. Cl.⁴ H01J *37/08, 27/24*

U.S. Cl. 250—423 P **30 Claims**



1. An ion beam generator, which comprises:

an ion generating section for wherein a first material to be ionized is introduced;

gas discharge means for exciting said first material to be ionized to a low excited state;

light source means for introducing a light into the ion generating section which light has a wavelength such that it excites said first material to be ionized to an intermediate state from the low excited state of said first material by a resonance excitation;

a pair of electrodes for generating a first electric field for ionizing said first material excited to said intermediate state using the Stark effect; and

material support means for supporting a second material to which ions produced by the ionizing of said first material are irradiated, said material support means being heard as an electrode for generating a second electric field in cooperation with one of said pair of electrodes, said second electric field introducing said ions to said material.

4,692,628

PIPELINE SWITCH

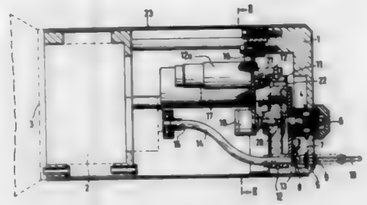
Kurt Sauerwein, Kattendahl 7, 4006 Erkrath 2; Norbert Kinzer, Wuppertal, both of Fed. Rep. of Germany, and Felix W. Mick, Bronx, N.Y., assignors to Kurt Sauerwein, Erkrath, Fed. Rep. of Germany

Continuation of Ser. No. 532,580, Sep. 15, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 798,158

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313857

Int. Cl.⁴ G21F *5/02*

U.S. Cl. 250—497.1 **5 Claims**



1. A pipeline switch apparatus for use in a radiation transfer environment including a radiation shielded afterbody device for holding a radiation source capsule located within said afterbody device in readiness for use, a radiation source head connected to said afterbody device, a loading pipe connected at one end to said head, a cable connected to said radiation source capsule for guiding the capsule from said afterbody device through said head into said loading pipe, a plurality of secondary pipes spaced from said loading pipe and arranged so that a selected one of said secondary pipes can receive said radiation source capsule, wherein the improvement comprises a housing enclosing said radiation source head and said loading pipe, a first plate rigidly secured to said housing and located between said loading pipe and said secondary pipes, said first plate having a plurality of spaced through-holes therethrough each arranged to be aligned with a different one of said secondary pipes, means for interconnecting said through-holes and said secondary pipes, said interconnecting means comprises hollow plug-connectors mounted in said through-holes in said first plate and engaged with said secondary pipes, said through-holes being centered about and spaced radially outwardly from an axis extending perpendicularly through said first plate, a second plate located within said housing between said afterbody device and said first plate and disposed parallel to said first plate and being rotatable about an axis coaxial with the axis through said first plate about which said through-holes are centered, said loading pipe is secured rigidly at the other end thereof in a loading pipe conduit hole in said second plate so that said loading pipe rotates with said second plate for alignment with said interconnecting means and a selected one of said through-holes in said first plate, recesses formed in said second plate and arranged concentrically about the axis of said second plate, drive means for rotating said second plate around the axis thereof, said drive means arranged for rotating said second plate relative to said first plate for interconnecting said loading pipe to one of said secondary pipes whereby a radiation source capsule can be introduced from said afterbody device through said radiation source head and said loading pipe and then through one of said plug-in connectors into one of said secondary pipes, safety switching means actuable by said interconnecting means so that without actuation said safety switching means prevents the displacement of said radiation source capsule from said afterbody device through said second plate when said loading pipe is not aligned with one of said through-holes in said plate, and locking means engageable with said second plate for securing said second plate against rotation when said loading pipe is aligned with one of said through holes in said first plate.

4,692,629

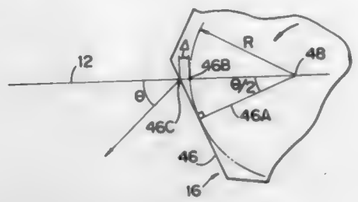
OPTICAL TYPE MEASURING SCANNER

Taizo Nakamura, Mitaka, Japan, assignor to Mitutoyo Mfg., Co., Ltd., Japan

Filed Jun. 10, 1985, Ser. No. 742,785

Int. Cl.⁴ G01N *121/86*

U.S. Cl. 250—560 **4 Claims**



1. An optical measuring device wherein:

said device comprises a parallel scanning light beam generator including a polygonal rotary mirror for reflecting an incident light beam from a beam generator into a rotary scanning light beam and a collimator lens for converting said rotary scanning light beam into a parallel scanning light beam, said rotary scanning light beam being incident upon an inlet side of the collimator lens and said parallel scanning light beam exiting from an outlet side of the collimator lens, said collimator lens having a focal point between said inlet side and said polygonal rotary mirror for light passing through said collimator lens from the inlet side to the outlet side, and

a light receiving element for detecting bright and dark portions of said parallel scanning light beam, which was scanned a work to be measured, and

a time duration of the dark portion or the bright portion is detected, which has been generated by the obstruction of a part of said parallel scanning light beam by said work to be measured interposed between said parallel scanning light beam generator and said light receiving element, to thereby determine a dimension of said work to be measured in the scanning direction;

characterized in that when $\theta/2$ is an angle of rotation between a normal line to a reflecting surface of said polygonal rotary mirror and an optical axis of the incident light beam and R is a distance on said normal line between the reflecting surface and a rotary center of said polygonal rotary mirror, said collimator lens is an $f\theta$ lens having a spherical aberration such that a light beam incident upon the outlet side of said collimator lens and directed toward said polygonal rotary mirror parallel to an optical axis of said collimator lens intersects the optical axis of said collimator lens at a position shifted from said focal point an amount Δ, wherein $\Delta = R/\cos(\theta/2) - R$.

4,692,630

WAVELENGTH SPECIFIC DETECTION SYSTEM FOR MEASURING THE PARTIAL PRESSURE OF A GAS EXCITED BY AN ELECTRON BEAM

Carl A. Gogol, Cazenovia, N.Y., assignor to Inficon Leybold-Heraeus, E. Syracuse, N.Y.

Filed May 27, 1986, Ser. No. 867,093

Int. Cl.⁴ H01J *27/00*

U.S. Cl. 250—573 **11 Claims**

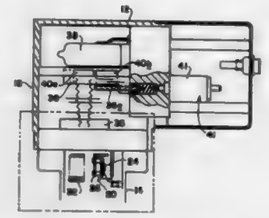
1. A sensor for measuring the relative amount of a specific gas within a vacuum chamber comprising:

electron beam generating means providing in a given direction a beam of electrons having sufficient energy to excite the atoms and molecules of said gas whereby said atoms and molecules exite photons indicative of said gas,

means in communication with said chamber for conducting said gas to said electron beam,

photodetector means for viewing photons emitted by said atoms and molecules, the photodetector means having a predetermined viewing direction from which said photons are received, and including discriminating means for selecting the photons of said wavelength and excluding others, and means for detecting the intensity of the photons of said selected wavelength and converting said intensity to a proportional electric signal; and

means mounting said photodetector means relative to said electron beam generating means so that the viewing direction of said photodetector means is substantially orthogonal to said electron beam.



4,692,631

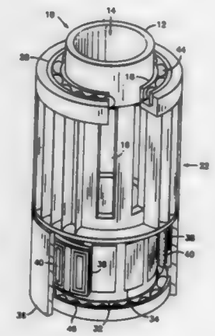
TURBINE ALTERNATOR WITH A CENTRAL CLEAR OPTICAL PATH

Randy L. Dahl, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 4, 1986, Ser. No. 892,552

Int. Cl.⁴ F01D *15/10;* **H02K** *21/12;* **H02P** *9/04*

U.S. Cl. 290—55 **7 Claims**



1. A tubine alternator with a central clear optical path comprising:

a hollow, cylindrical center tube defining said central clear optical path;

a hollow, cylindrical assembly of turbine blades including a lower cylinder rotatably mounted on said center tube;

at least one magnet mounted on the periphery of said lower cylinder of said assembly of turbine blades; and

wire windings fixedly positioned about said magnets.

4,692,632

PROCEDURE AND APPARATUS FOR UNINTERRUPTIBLE POWER SUPPLY

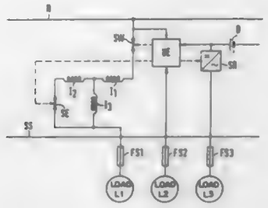
Hartmut Gaul, Roettenbach; Hermann Mickal, Erlangen, and Adolf Haboeck, Roettenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 832,925

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506572

Int. Cl.⁴ H02J *9/06*

U.S. Cl. 307—66 **11 Claims**



1. A procedure for an operation of uninteruptible power supply supplying power over an uninterruptible bus to an a.c. load, said a.c. load being connectable to an a.c. power supply network by means of an inductive arrangement having a variable effective impedance and a switch in series with said inductive arrangement, the procedure comprising the steps of:

varying the effective impedance to a low value, closing said switch, and maintaining an energy storage unit at a fully charged level by a static converter arrangement connected to said storage unit, when said network status is changed to normal, and

varying the effective impedance to a high value, opening said switch, and supplying power to said a.c. load from said storage unit by means of said static converter arrangement when said network status is changed to malfunctioning.

4,692,633

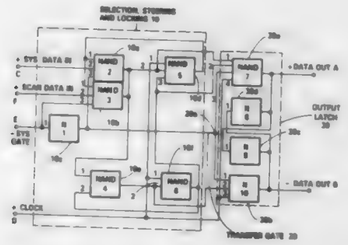
EDGE SENSITIVE SINGLE CLOCK LATCH APPARATUS WITH A SKEW COMPENSATED SCAN FUNCTION

Chuck H. Ngai, Endwell, and Gerald J. Watkins, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1984, Ser. No. 627,268

Int. Cl.⁴ H03K *19/00, 19/02, 5/13*

U.S. Cl. 307—269 **5 Claims**



1. A latch circuit including a system data input line, a scan data input line, and a system gate input line, each of the input lines conducting a signal having a binary state, comprising:

selection means responding to the binary state of the signal on the system data input line, the scan data input line, and the system gate input line for selecting either said system data input line or said scan data input line in response to the binary state of the signal on said system gate input line and developing an output signal having the binary state of the selected data input line;

clock pulse conducting input means for conducting clock pulses, each of the clock pulses having a binary state;

circuit means connected to an output of said selection means and responding to the binary state of said output signal from said selection means and to the binary state of a clock pulse conducted via said clock pulse conducting input means for storing the binary state of said output signal from said selection means in response to said binary state of said clock pulse, said circuit means developing an output signal in response to the storage of said binary state of said output signal from said selection means,

said selection means receiving said output signal from said circuit means and, in response thereto, forcedly maintaining the development of said output signal from said selection means thereby locking the storage of said binary state of said output signal from said selection means in said circuit means; and

output latch means connected to the output of said selection means and responding to said output signal from said selection means, to the binary state of said clock pulse and to the binary state of the signal on said system gate input line for storing said output signal from said selection means therein when the signal on said system gate input line has a predetermined binary state during the development of said clock pulse, said output latch means developing a data out signal, representing an output signal from said latch circuit, in response to the storage of said output signal from said selection means therein.

4,692,634

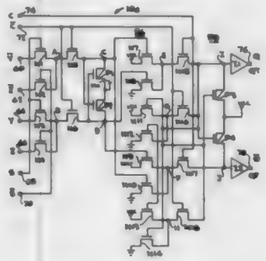
SELECTABLE MULTI-INPUT CMOS DATA REGISTER

Sheng Fang, Milpitas, and Sam H. Lee, Campbell, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 28, 1986, Ser. No. 856,920

Int. Cl.⁴ H03K *3/356;* **G11C** *11/40*

U.S. Cl. 307—272.1 **9 Claims**



1. A CMOS data register comprising:

a master stage having first transfer gating means and first storage means;

said first transfer gating means being formed of first and second MOS transistors, said first transistor having its drain connected to a first node for receiving a data input signal, its source connected to a second node and its gate connected to a first clock input terminal for receiving a clock signal, said second transistor having its drain connected to a third node for receiving a signal complementary to the data input signal, its source connected to a fourth node and its gate connected to the first clock input terminal;

said first storage means being formed of third, fourth, fifth and sixth MOS transistors, said third transistor having its drain connected to a supply potential, its source connected to a fifth node and its gate connected to the second node, said fourth transistor having its drain connected to a ground potenial, its source connected to the fifth node and its gate connected to the fourth node, said fifth transistor having its drain connected to the supply potential, its source connected to a sixth node and its gate connected to the fourth node, said sixth transistor having its drain connected to the ground potential, its source connected to the sixth node and its gate connected to the second node;

a slave stage having second transfer gating means, second storage means, and third transfer gating means;

said second transfer gating means being formed of seventh and eighth MOS transistors, said seventh transistor having its drain connected to the fifth node, its source connected to a seventh node and its gate connected to a second clock input terminal for receiving a signal complementary to the clock signal, said eighth transistor having its drain connected to the sixth node, its source connected to an eighth node and its gate connected to the second clock input terminal;

said second storage means being formed of ninth, tenth, eleventh and twelfth MOS transistors, said ninth transistor having its drain connected to the supply potential, its source connected to a ninth node and its gate connected to the seventh node, said tenth transistor having its drain connected to the ground potential, its source connected to the ninth node and its gate connected to the eighth node, said eleventh transistor having it drain connected to the supply potential, its source connected to a tenth node and its gate connected to the eighth node, said twelfth transistor having its drain connected to the ground potential, its source connected to the tenth node and its gate connected to the seventh node; and

said third transfer gating means being formed of thirteenth and fourteenth MOS transistors, said thirteenth transistor having its drain connected to the ninth node, its source connected to the seventh node and its gate connected to the first clock input terminal, said fourteenth transistor having its drain connected to the tenth node, its source connected to the eighth node and its gate connected to the first clock input terminal.

4,692,635

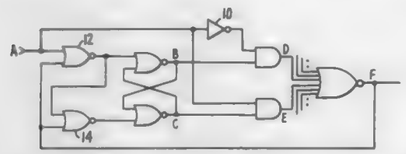
SELF-TIMED LOGIC LEVEL TRANSITION DETECTOR

A. Karl Rapp, Los Gatos, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jun. 26, 1986, Ser. No. 878,635

Int. Cl.⁴ H03K *3/356*

U.S. Cl. 307—279 **7 Claims**



1. A self-timed transition detector for detecting a change in the logic level of an input signal, said detector comprising:

storage means for storing a signal indicative of the logic level of the input signal, coupled to receive the input signal;

means responsive to a change in the logic level of the input signal to generate a change-indicator flag, said change-indicator flag being fed back to said storage means to update said stored signal to be indicative of said changed logic level of the input signal, said storage means being responsive to receipt of said change-indicator flag to generate an output which cancels the change-indicator flag when the stored signal is updated.

4,692,636

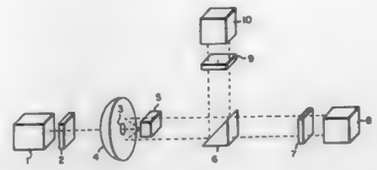
PYRILIUM DYE NONLINEAR OPTICAL ELEMENTS

Ying Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1985, Ser. No. 797,027

Int. Cl.⁴ H03F *7/00*

U.S. Cl. 307—427 **18 Claims**



1. A nonlinear optical device comprising a nonlinear optical element and a source of coherent optical radiation, said nonlinear optical element comprising pyrilium dye and polymeric material having an alkylidene diarylene moiety in the recurring unit; and said element being in the form of a multiphase heterogeneous composition comprising a continuous phase of the polymeric material having therein a discontinuous phase comprising the pyrilium dye present in an aggregated ordered form.

4,692,637

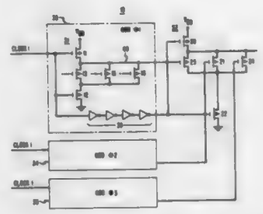
CMOS LOGIC CIRCUIT WITH SINGLE CLOCK PULSE

Masakazu Shoji, Warren, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 8, 1985, Ser. No. 752,662

Int. Cl.⁴ H03K *19/096, 19/003, 19/20, 17/284*

U.S. Cl. 307—443 **8 Claims**



1. A dynamic complementary MOS (CMOS) logic circuit comprising

first and second cascaded logic stages having, respectively, a first plurality and a second plurality of logic input terminals, a first and a second clock input terminal, and a first and a second output terminal.

said first stage having a logic array of field effect transistors of one channel conductivity type (N or P), said array being connected between the first logic input terminals and the first output terminal, said first output terminal being connected to one of the second plurality of logic input terminals,

means for applying a sequence of clock pulses to said first clock input terminal.

delay means, having an even number of cascade-connected CMOS inverter stages, responsive to the sequence of clock pulses for developing and applying delayed clock pulses to said second clock input terminal,

the first output terminal being precharged during the absence of a clock pulse, the first stage having a characteristic delay of a first type (pullup or pulldown) with respect to an initial edge of a clock pulse and to logic signals applied to its first input terminals,

and the delay means being arranged such that the sum of the

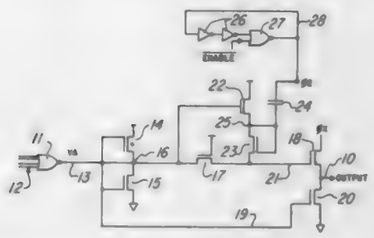
delays of said first type of all odd numbered inverter stages numbered from the first clock input is greater than, but less than two times, the first type delay of the first logic stage, and the sum of the delays of a second type (pulldown or pullup) of all even numbered inverter stages is small compared to the sum of the first type delays of the odd inverter stages.

4,692,638

CMOS/NMOS DECODER AND HIGH-LEVEL DRIVER CIRCUIT

Harvey J. Stiegler, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 2, 1984, Ser. No. 626,576
Int. Cl.[4] G11C *80/00*; H03K *19/094*
U.S. Cl. 307—449 **9 Claims**



1. A CMOS row decoder and row line driver circuit, comprising:

a logic gate having a plurality of address and address-complement inputs, and an output which is of one logic state for selection and the other logic state for non-selection,

a CMOS inverter with a P-channel transistor and an N-channel transistor, said transistors having source-to-drain paths connected in series between a voltage supply and ground, and an output node at the juncture of such source-to-drain paths, the gates of said transistors being connected to said output of said logic gate,

an output stage having first and second transistors, each having a source-to-drain path and a gate, and a first clock source, the source-to-drain path of the first transistor connecting said first clock source to a row line output, the source-to-drain path of said second transistor connecting said row line output to ground, the gate of said second transistor being connected to said output of said logic gate,

a voltage-boost circuit connected to the gate of said first transistor and including a series transistor having a source-to-drain path and a gate, the source-to-drain path of said series transistor being connected between a voltage supply and an intermediate node, and the gate of said series transistor being connected to said output node of said inverter, unidirectional conductive means connecting said intermediate node to said gate of said first transistor,

a second clock source connected to said intermediate node through a gated capacitor.

4,692,639

REGENERATIVE STROBE CIRCUIT FOR CMOS PROGRAMMABLE LOGIC ARRAY

Paul A. Jordan, Middlebury, Conn., assignor to General DataComm., Inc., Middlebury, Conn.

Filed Dec. 23, 1985, Ser. No. 812,176
Int. Cl.[4] G11C *80/00*; H03K *17/16, 19/096, 17/687*
U.S. Cl. 307—449 **17 Claims**

1. A regenerative strobe circuit for a CMOS logic gate comprising:

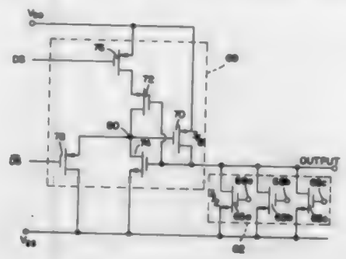
(a) an output node;

(b) a first transistor of a first channel type connected between said output node and a first potential level;

(c) a second transistor of said first channel type having a source connected to said first potential level, and a gate connected to a strobe signal;

(d) a third transistor connected between a gate of said first transistor and a second potential level, with a gate of said third transistor connected to a signal related to said strobe signal;

(e) a complementary transistor inverter connected between said second transistor and said second potential level, the complementary transistor inverter including a transistor



of said first channel type and a transistor of said second channel type having common gates connected to said output node and common drains connected to said gate of said first transistor, with a source of said first channel type transistor of said complementary transistor inverter connected to a drain of said second transistor, and a source of said second channel type transistor of said complementary transistor inverter connected to said second potential level, wherein

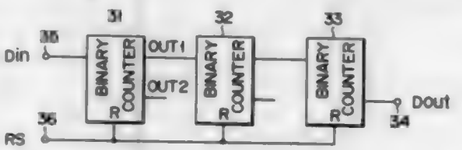
said logic gate comprises a plurality of transistors of a second channel type connected between said second potential level and said output node.

4,692,640

MAJORITY CIRCUIT COMPRISING BINARY COUNTER

Seigo Suzuki, Tokyo; Yukihiko Yabe, and Masumi Kawakami, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1985, Ser. No. 811,449
Claims priority, application Japan, Dec. 26, 1984, 59-273422
Int. Cl.[4] H03K *23/48*
U.S. Cl. 307—464 **7 Claims**



1. A circuit for indicating the binary logic level of a majority of bits in a serial data input of n bits, in which n is an odd integer not less than 3, comprising:

a serial data input terminal for receiving the serial data input of n bits;

a majority output terminal for providing a majority output signal for indicating the binary logic level of the majority of bits in the serial data input, in which the majority is an integer equal to $(n+1)/2$; and

a k-bit counter circuit for counting the number of bits in the serial data input that are at one binary logic level, in which k is the smallest integer such that 2^k is not less than $(n+1)$, and for generating the majority output signal at times when at least $(n+1)/2$ bits at the said logic level have been counted,

in which the counter circuit comprises a plurality of serially connected counter stages, including a first counter stage and a last counter stage, and the total number of counter stages is equal to k, with each counter stage having a corresponding stage input terminal and stage output terminal for providing a stage output corresponding to one of the k bits of the counter circuit, wherein

the stage input terminal of said first counter stage is coupled to the serial data input terminal,

the stage output terminal of said last counter stage is coupled to the majority output terminal, and

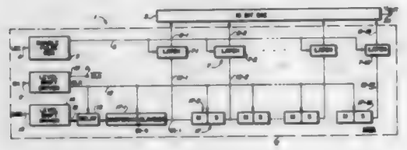
the counter stage output terminal of each counter stage other than the last is coupled to the stage input terminal of the next counter stage in said series.

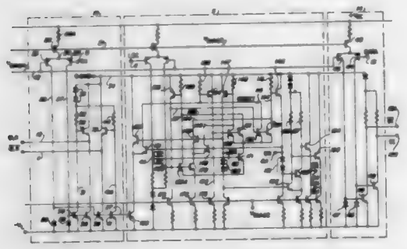
4,692,641

LEVEL SHIFTING CIRCUITRY FOR SERIAL-TO-PARALLEL CONVERTER

Frederick J. Highton, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 13, 1986, Ser. No. 829,707
Int. Cl.[4] H03K *19/003, 19/086, 19/092, 21/14*
U.S. Cl. 307—475 **23 Claims**





1. An integrated level shifting circuit for converting a first signal having TTL logic levels to corresponding complementary second and third signals having ECL logic levels, the TTL logic level signals being between a ground voltage on a ground voltage conductor and a positive first supply voltage on a first supply voltage conductor, the ECL logic levels being between the ground voltage and a negative second supply voltage on a second supply voltage conductor, the integrated level shifting circuit comprising in combination:

(a) means for providing a constant current;

(b) a first lateral PNP transistor having an emitter coupled to the constant current producing means and a base coupled to a first voltage reference conductor, the constant current producing means also being coupled to the first supply voltage conductor;

(c) a second lateral PNP transistor having an emitter coupled to the emitter of the first lateral PNP transistor and a base coupled to receive the first signal;

(d) a first diode having an anode coupled to a collector of the first lateral PNP transistor and a cathode coupled to the second supply voltage conductor, and a second diode having an anode coupled to the collector of the second lateral PNP transistor and a cathode coupled to the second supply voltage conductor;

(e) a first NPN current mirror transistor having an emitter coupled to the second supply voltage conductor and a base coupled to the anode of the first diode, and a second NPN current mirror transistor having an emitter coupled to the second supply voltage conductor and a base coupled to the anode of the second diode;

(f) first pull-up load circuit means coupled between the ground voltage conductor and a collector of the first NPN current mirror transistor, and second pull-up load circuit means coupled between the ground voltage conductor and a collector of the second NPN current mirror transistor; and

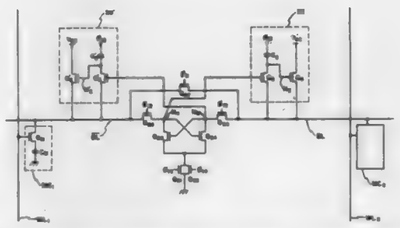
(g) first coupling means for coupling the collector of the first NPN current mirror transistor to a first output conductor to produce the second signal on the first output conductor, and second coupling means for coupling the collector of the second NPN current mirror transistor to a second output conductor to produce the third signal on the second output conductor.

4,692,642

ACTIVE PULL-UP CIRCUIT CONTROLLED BY A SINGLE PULL-UP CLOCK SIGNAL

Yukio Fukuzo, and Yasukazu Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 10, 1985, Ser. No. 753,715
Claims priority, application Japan, Jul. 10, 1984, 59-143004
Int. Cl.[4] H03K *3/356*
U.S. Cl. 307—530 **6 Claims**



1. A field effect transistor circuit comprising first and second data nodes, means for setting said first and second data nodes at an intermediate level at a first timing, data means for applying a voltage difference between said first and second data nodes at a second timing which is subsequent to said first timing, and an active pull-up circuit which is operable only in response to a single control signal generated at a third timing which subsequent to said second timing, said active pull-up circuit being composed of only a first field effect transistor of an enhancement type having a source-drain path coupled between a power voltage terminal and said second data node, a second field effect transistor of a depletion type having a source-drain path coupled between said second data node and a gate of said first transistor and a gate connected to said first data node, and a capacitor having a first end connected to the gate of said first transistor and a second end for receiving said control signal, said intermediate level being set at approximately half the voltage at said power voltage terminal, said second transistor meeting the condition of $0 > VTD > -\frac{1}{4}$ Vcc, wherein Vcc represents the voltage at said power voltage and VTD represents the threshold voltage of said second transistor.

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SEMICONDUCTOR SWITCHING DEVICE HAVING PLURAL MOSFET'S, GTO'S OR THE LIKE CONNECTED IN SERIES

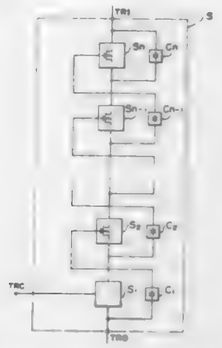
Norikazu Tokunaga; Hiroshi Fukui; Kouzou Watanabe; Hisao Amano, and Masayoshi Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,132

Claims priority, application Japan, Oct. 28, 1983, 58-200892; Nov. 2, 1983, 58-204696; Feb. 17, 1984, 59-27106; Feb. 22, 1984, 59-30243; Apr. 25, 1984, 59-81834; May 23, 1984, 59-102582

Int. Cl.⁴ H03K *17/687, 17/60*

U.S. Cl. 307—584 **26 Claims**



1. A semiconductor switching device including a row of a plurality of switching elements (S_1–S_n) connected in series between an input and an output terminal of said semiconductor switching device, an input terminal of the input-nearest switching element S_n and an output terminal of the output-nearest switching element S_1 among said row being connected with said input terminal and said output terminal of said semiconductor switching device, respectively, and a control signal being applied to a control terminal of the output-nearest switching element, wherein said semiconductor switching device comprises a first plurality of capacitive elements each of which is connected between the output terminal of the output-nearer switching element and the control terminal of the input-nearer switching element of the adjacent switching elements among the switching element row, and a second capacitive element connected between the output terminal and input terminal of said input-nearest switching element, said switching elements (S_2–S_n) having insulating gates, respectively,

wherein a constant voltage element is connected between a control terminal and one of the inpt and output terminals of at least each of said switching elements other than the output-nearest one, each said constant voltage element being arranged so that it will be in series with said first and second capacitive elements when said switching elements are turned-off.

4,692,644

FLUID COOLED ACYCLIC GENERATOR ROTOR HAVING A COPPER CONDUCTOR DIFFUSION BONDED TO A MAGNETIC STEEL CORE

Henry G. Lenz, Scotia; Leonard Coffman, Schenectady, and Adrian M. Beltran, Ballston Spa, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 812,033, Dec. 23, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 923,358

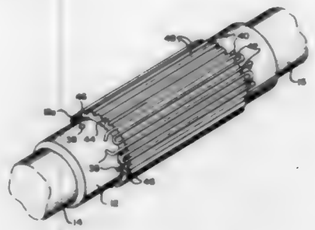
Int. Cl.⁴ H02K *9/197*

U.S. Cl. 310—178 **6 Claims**

1. A rotor for an acyclic electromagnetic machine, said rotor comprising, in combination:

A. a core formed of ferromagnetic steel, said core having a peripheral surface and a plurality of internal passages opening into said peripheral surface for accommodating the circulation of a coolant;

B. a current conductor diffusion bonded to said core peripheral surface; and



C. a plurality of coolant tubes totally embedded in said conductor and affixed in coolant flow communication with said passages.

4,692,645

ROTATING ELECTRIC MOTOR WITH REDUCED COGGING TORQUE

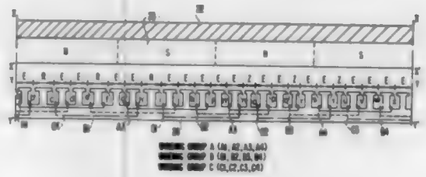
Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 11, 1985, Ser. No. 753,964

Claims priority, application Japan, Jul. 11, 1984, 59-144902; Jul. 11, 1984, 59-144903; Jul. 31, 1984, 59-161710

Int. Cl.⁴ H02K *3/00*

U.S. Cl. 310—184 **58 Claims**



1. A rotating electric motor comprising:

a field permanent magnet member having permanently magnetized N and S poles alternately positioned in a substantially circular form around a rotary shaft of said rotating electric motor, said member having P poles, wherein P is an even number which is at least equal to 4; and

an armature core of a magnetic material having a plurality of teeth disposed between respective adjacent winding slots of a plurality of winding slots wherein a plurality of overlapping winding coils of polyphase winding groups are wound, said teeth being opposed to said poles of said magnet member, said core having T teeth, wherein T is an integral multiple of P and at least equal to 2P, and wherein said motor has H polyphase winding groups, wherein H is at least equal to 2;

wherein said teeth of said armature core are composed of standard-teeth each having an effective pitch $D=(360/T)$ degrees, and short-teeth each having an effective pitch smaller than D, and long-teeth each having an effective pitch larger than D, where the effective pitch of a tooth is defined by an angle between centers of entrance parts of two adjacent winding slots forming the tooth; and

wherein said teeth of said armature core form, alternately around said rotary shaft, at least a short-block having only short-teeth and standard-teeth including at least two of said short-teeth and at least one of said standard-teeth, and a long-block having only long-teeth and standard-teeth including at least two of said long-teeth and at least one of said standard-teeth.

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ROTOR CONSTRUCTION IN AN INDUCTION MOTOR FOR ELIMINATING ROTOR REACTION

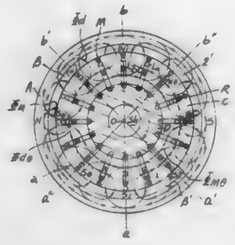
Sang S. Oh, 205 Han Yang Apt. 7 Dong, Sihung Dong, Kuro Ku, Seoul, Rep. of Korea, and Jang K. Oh, 132 E. Cardinal St., North Park, Wheeling, W. Va. 26003

Continuation-in-part of Ser. No. 162,571, Jun. 24, 1980, which is a continuation of Ser. No. 874,664, Feb. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 321,544, Jan. 5, 1973, abandoned. This application Apr. 12, 1982, Ser. No. 367,680

Claims priority, application Rep. of Korea, Apr. 14, 1981, 1981/1273

Int. Cl.⁴ H02K *17/18*

U.S. Cl. 310—212 **9 Claims**



1. An induction motor comprising a stator having North and South poles, a rotor within said stator to form an air gap therewith, said rotor being rotatable relative to the stator, said rotor including a rotor core of magnetic material, a main winding on said rotor core effecting a magnetic interaction between said rotor and stator, a second winding at right angles to said first winding, said second winding including first and second independent sets of respective, isolated coils of closed loop configuration, said first and second sets of coils producing flux due to transformer induced m.m.f. in the coils, said rotor further including a non-magnetic means fixed within said rotor core and extending the axial extent thereof for opposing passage of flux produced in said first and second sets of coils to cause said flux to pass to said air gap and oppose rotor reaction flux in said air gap, said rotor and stator being concentric cylinders, the outer of which is said stator and the inner of which is said rotor, said main winding being wound on the periphery of said rotor, said first and second sets of coils being wound in radial planes on said rotor.

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ROTATING ELECTRIC MOTOR WITH REDUCED COGGING TORQUE

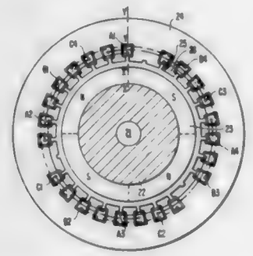
Makoto Gotou, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 30, 1985, Ser. No. 760,509

Claims priority, application Japan, Aug. 1, 1984, 59-161866; Aug. 1, 1984, 59-161867

Int. Cl.⁴ H02K *3/00*

U.S. Cl. 310—184 **30 Claims**



1. A rotating electric motor comprising:

a field permanent magnet member substantially of a circular form having permanently magnetized N and S poles alternately positioned around a rotary shaft of said rotary electric motor, said magnet member having a number of poles P which is an even number at least equal to 4; and

an armature core of a magnetic material having a plurality of teeth each disposed between an adjacent pair of a plurality of winding slots where a plurality of overlapping winding coils of polyphase winding groups are wound, said teeth being opposed to the poles of said magnet member, said core having a number of said teeth T which is an integral multiple of P and at least equal to 2P, and said polyphase winding groups having a number of phases H which is at least equal to 2;

wherein said teeth are composed of short-teeth each having an effective pitch smaller than $D=360/T$ and long-teeth each having an effective pitch larger than D, wherein the effective pitch of a tooth is defined by an angle between centers of entrance parts of adjacent pairs of slots forming the tooth;

wherein said long-teeth are positioned at intervals of an equal angle, and said core has a number of said long-teeth which is less than or equal to T/2 and other than an integral multiple of P; and

wherein each of said long-teeth has a dummy-slot portion opposed to said magnet member and an effective pitch defined by an angle between centers of entrance parts of said dummy-slot and each of adjacent pairs of slots forming each of said long-teeth being equal to the effective pitch of each of said short-teeth.

4,692,648

ROTATING COLLECTOR ASSEMBLY FOR ELECTRICAL MACHINES

Karl-Heinz Knoerzer, Im Kleegärtle 7a, 7818 Vogtsburg/Achkarren, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 863,734

Int. Cl.⁴ H02K *13/00;* **H01R** *39/16*

U.S. Cl. 310—233 **5 Claims**

1. A collector for electrical machines, comprising:

(a) a carrier bushing having an outer mantle on which are provided, extending in the circumferential direction,

(i) first, swallowtail-type attachment devices in the form of crosspieces with first and second sides,

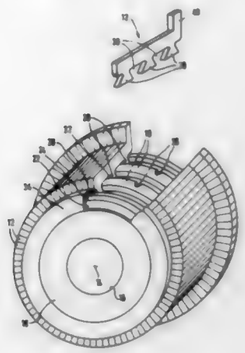
wherein each of at least two of the crosspieces has formed therein a slit of a particular width, and

(ii) ring grooves formed adjacent the crosspieces;

(b) a plurality of collector segments, each of which has a particular width and which can be attached to the carrier bushing by means of second, complementary, swallowtail-type attachment devices formed thereon in an intermeshing swallowtail arrangement, when the collector segments (12) are oriented axially, in which a neck of a swallowtail-type opening is so narrow that a corresponding swallow-

tail-type head which is fitted into each neck does not fit through the neck; and

(c) an intermediate space remaining between the carrier bushing and the collector segments, which can be filled with a casting material,



wherein the slits formed in the crosspieces enable the insertion of the second swallowtail type attachment devices of each collector segment, when the collector segment is oriented at an angle to the axial direction, so that the intermeshing swallowtail arrangement can be achieved when each collector segment is oriented in the axial direction.

4,692,649

DRIVING CIRCUIT OF A VIBRATION WAVE MOTOR

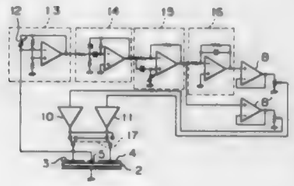
Kazuhiro Izukawa, Yokohama, and Kho Ishizuka, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,653

Claims priority, application Japan, Mar. 1, 1985, 60-41403; Mar. 26, 1985, 60-62836; Mar. 26, 1985, 60-62837

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—316 **11 Claims**



1. A driving circuit for a vibration wave driving body in which a travelling vibration wave is generated in a vibration member having at least a pair of electro-mechanical energy converting element groups arranged or polarized in the fashion of a phase difference by applying a periodic signal to said electro-mechanical energy converting elements while endowing the periodic signal with a phase difference and said vibration member and a contact member contacing it are moved relative to each other by said travelling vibration wave, said driving circuit comprising:

(a) detecting means for detecting a vibration corresponding to the vibration wave of said vibration member, said detecting means being disposed at a position on said vibratory member except for said electromechanical converting elements to which said periodic signal is applied;

(b) an oscillator putting out said periodic signal at a frequency corresponding to an output signal put out from said detecting means;

(c) phase shifting means for shifting the phase of the output signal put out from said detecting means by a predetermined amount so as to be a phase which is in a predetermined relation to the phase of said periodic signal put out from said oscillator; and

(d) application means for applying said periodic signal to said electro-mechanical energy converting element groups while endowing said periodic signal with a phase difference.

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VIBRATION WAVE MOTOR

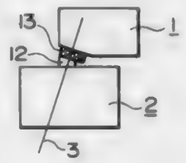
Ichiro Okumura, Yokohama; Takayuki Tsukimoto, Fujisawa; Takuo Okuno; Kazuhiro Izukawa, both of Yokohama; Hiroyuki Seki, Sagamihara; Hitoshi Mukohjima, Yokohama; Naoya Kaneda, Yokohama, and Akira Hiramatsu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,624

Claims priority, application Japan, Mar. 29, 1985, 60-065457

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **10 Claims**



1. A vibration wave motor for generating a travelling wave in a vibration member to drive a movable member by said travelling wave comprising:

an elastic projection projecting from said moveable member, an edge of said projection contacting said vibration member, said projection being elestically deformed by the vibration of said vibration member under the condition that a supporting point of said projection becomes a fixed point, and said projection contacting said vibration member such that a direction of locus of the elastic deformation of said projection is essentially coincident with a direction of locus of vibration in an area of said movable member in contact with said vibration member.

4,692,651

VIBRATION WAVE MOTOR

Akira Hiramatsu; Hitoshi Mukohjima; Naoya Kaneda; Takuo Okuno, all of Yokohama; Hiroyuki Seki, Sagamihara; Takayuki Tsukimoto, Fujisawa; Kazuhiro Izukawa, and Ichiro Okumura, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,330

Claims priority, application Japan, Mar. 29, 1985, 60-65456

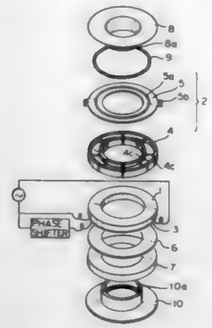
Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **6 Claims**

1. A vibration wave motor comprising:

(a) vibration means having electro-mechanical conversion elements for generating a travelling vibration wave when electrical signals having a phase difference therebetween are applied to said elements; and

(b) movable means adopted to be frictionally driven by the travelling vibration wave generated in said vibration means, a press-contact portion of said movable means which is in contact with said vibration means being divided into a plurality of sections along a direction of movement of said movable means and the rigidity of the surface of said divided press-contact portion, which is parallel with a forward moving direction of the travelling



vibration wave, being lower than that of the surface of said divided press-contact portion, which is perpendicular to the forward moving direction of the travelling vibration wave.

4,692,652

VIBRATION WAVE MOTOR

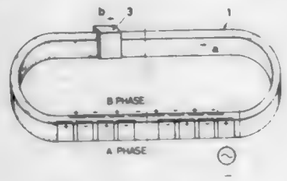
Hiroyuki Seki, Sagamihara, and Takuo Okuno, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1986, Ser. No. 843,551

Claims priority, application Japan, Mar. 29, 1985, 60-066092; Jul. 12, 1985, 60-153750

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—323 **6 Claims**



1. A vibration wave motor comprising:

(a) elliptical shaped vibration means; and

(b) electro-mechanical energy conversion means recessed into said elliptical shaped vibration means so as to make uniform the rigidity of said vibration means, the electro-mechanical energy conversion means being symmetrically arranged with respect to a minor axis of said vibration means.

4,692,653

ACOUSTIC TRANSDUCERS UTILIZING ZNO THIN FILM

Keiko Kushida, Kunitachi; Hiroshi Takeuchi, Matsudo, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

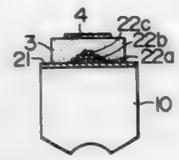
Filed Mar. 18, 1985, Ser. No. 712,852

Claims priority, application Japan, Mar. 23, 1984, 59-55756; Jul. 6, 1984, 59-139004; Jul. 9, 1984, 59-141745

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **8 Claims**

2. In an acoustic transducer comprising a first electrode comprised of a chromium film formed on a substrate and a gold film superposed thereon, a zinc oxide thin film formed by high frequency sputtering on said first electrode and at least one second electrode formed on said zinc oxide thin film, the improvement wherein the thickness of said chromium film is smaller than 30 nm, wherein the thickness of said gold film varies positionally so that the piezoelectric activity of said zinc oxide



thin film varies positionally depending on the thickness of said gold film.

4,692,654

ULTRASONIC TRANSDUCER OF MONOLITHIC ARRAY TYPE

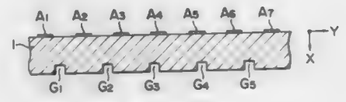
Shinichiro Umemura, Hachioji; Hiroshi Takeuchi, Matsudo, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,323

Claims priority, application Japan, Nov. 2, 1984, 59-230224

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **18 Claims**



1. An ultrasonic transducer cmprising:

a piezoelectric plate having a first face which is flat and having a second face opposite to said first face which is provided with a plurality of grooves; and

electrodes formed in array by splitting said first face of said piezoelectric plate into a plurality of areas so that each area of said piezoelectric plate may operate as an independent transducer element, said first face having said electrodes of array form disposed thereon being used for transmitting and receiving the ultrasonic wave.

4,692,655

PLASMA DISPLAY HAVING HEATER AND METHOD OF MAKING SAME

Herman R. Person; Dennis L. Raesner, and Gayle L. Meints, all of Columbus, Nebr., assignors to Dale Electronics, Inc., Columbus, Nebr.

Filed Nov. 14, 1985, Ser. No. 797,921

Int. Cl.[4] H01J *17/49, 7/24*

U.S. Cl. 313—15 **7 Claims**

1. A gas discharge display device comprising:

a lower substrate and an upper glass substrate;

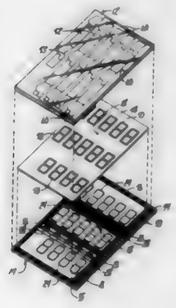
sealing means joining said upper and lower substrates together in spaced apart relation to form a sealed envelope therebetween;

an ionizable gas filling said envelope;

at least one anode on said upper substrate and within said envelope;
at least one cathode segment positioned on said lower substrate and within said envelope;
heater means separate from said cathode segment on said lower substrate, said heater means being positioned adjacent said cathode segment and within said envelope;
a layer of dielectric material overlying both said heater means and said cathode segment, and having at least one cathode opening therein exposing said cathode segment to said ionizable gas within said envelope;
said layer of dielectric material covering and electrically insulating said heater means from said ionizable gas so that said heater means does not affect light discharge between said anode and said cathode segment, said heater means being capable of radiating heat through said dielectric layer to maintain said ionizable gas at a predetermined minimum temperature when the external ambient temperature is below said predetermined minimum temperature.

7. A gas discharge display device made according to the method comprising:

placing a plurality of cathode elements on the upper surface of a lower substrate in a predetermined pattern;



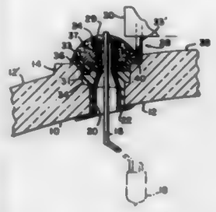
placing a heater element on said upper surface of said lower substrate in a position adjacent and horizontally displaced from said cathode elements, said heater element being electrically separate from said cathode elements;
placing a layer of dielectric material over both said cathode elements and said heater element, said dielectric material having cathode openings therein for exposing said cathode elements upwardly through said layer of dielectric material, said dielectric material completely covering said heater element;
sealing an upper substrate in upwardly spaced relation to said upper surface of said lower substrate so as to form a sealed envelope between said upper and lower substrates, said upper substrate having at least one anode element thereon positioned within said envelope;
filling said envelope with an ionizable gas so that said cathode elements are exposed through said cathode openings in said dielectric material and said heater element is not exposed to said gas;
actuating said heater element to cause heat to radiate through said dielectric material to maintain said gas within said envelope at a predetermined minimum temperature.

4,692,656

MOTOR VEHICLE HEADLIGHT WITH SELF-CENTERING LUG ASSEMBLY

John C. Poyner, Seymour, Ind., assignor to GTE Products Corporation, Danvers, Mass.

Filed Feb. 28, 1986, Ser. No. 835,023
Int. Cl.[4] H01K *1/18, 1/40, 1/44*
U.S. Cl. 313—113 4 Claims



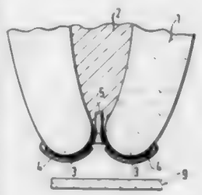
1. In a motor vehicle headlight including an electric lamp, a glass reflector defining at least one opening therein and having a first reflective surface for reflecting light from said electric lamp and a second external surface including a boss portion extending above said second surface and surrounding said opening, a metal eyelet positioned substantially within said opening and including an outer portion projecting above said boss portion, a quantity of adhesive located within said opening and surrounding said eyelet, an external contact lug having an upstanding leg portion and a base portion, said base portion having an aperture therein, said outer portion of said eyelet attached to said base portion of said contact lug, and a lead-in support wire extending within said aperture within said base portion of said contact lug for being electrically connected to said electric lamp, the improvement comprising means formed within said base portion of said contact lug for centering said base portion of said contact lug within said opening in said reflector to maintain said contact lug in a fixed orientation within said opening during said attachment of said eyelet to said contact lug, said centering means extending within said opening within said glass reflector in contact with the interior walls of said opening.

4,692,657

SPARK PLUG FOR AN OTTO-TYPE INTERNAL COMBUSTION ENGINE

Werner Grünwald, Gerlingen, and Kurt Schmid, Ditzingen-Schöckingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 808,333
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446128
Int. Cl.[4] H01T *13/20*
U.S. Cl. 313—130 8 Claims



1. A spark plug for an ignition system of an internal combustion engine having
a rotation-symmetrical ceramic hollow support body (1, 11) of insulating, heat-resistant material;
a center electrode located at an end portion of said body;

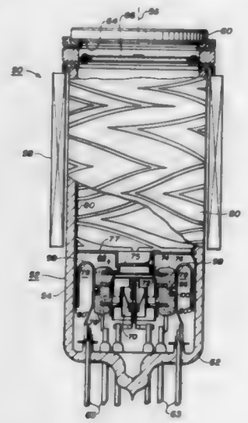
and an electrically conductive material (2, 5; 12, 13) located within said hollow support body to establish an electrical connection with the ignition system, and electrically connected to the center electrode,
wherein the center electrode comprises
an electrode layer of platinum or a mixture of platinum and a ceramic material and of a thickness of between 5 to 15 micrometers applied to an end face of the end portion of said support body (1, 11) and
a ceramic protective layer (4, 15) is provided, covering the electrode layer (3, 14),
said ceramic protective layer (4, 15) having a thickness of between 5 to 10 micrometers.

4,692,658

IMAGING SYSTEM HAVING AN IMPROVED SUPPORT BEAD AND CONNECTOR

Louis D. Miller, Leola, and Donald B. Kaiser, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1986, Ser. No. 856,279
Int. Cl.[4] H01J *29/02, 29/82, 31/26*
U.S. Cl. 313—365 5 Claims



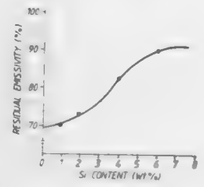
1. In an imaging system for focusing and deflecting an electron beam comprising:
an evacuated envelope structure having a longitudinal axis;
magnetic field means for generating a substantially uniform magnetic field along said axis within said envelope;
electric field means for generating a variable substantially uniform electric field within said envelope to deflect said electron beam along two coordinates of said system, said electric field being orthogonal to said magnetic field;
an electron gun disposed within said envelope for generating and directing said electron beam through said magnetic and electric fields, said electron gun including a cathode, a first grid electrode and a second grid electrode secured in spaced-apart relation by a plurality of support beads located-substantially symmetrically around said electron gun; and
a target located within said envelope opposite said electron gun, said target being disposed in a plane perpendicular to said longitudinal axis, the improvement wherein
each of said support beads of said electron gun comprising a body of insulating material having a first major surface and an oppositely disposed second major surface, said first major surface having a recess formed therein which extends into said body of the insulating material to a depth less than the thickness of the bead, and
a plurality of connectors corresponding in number to said plurality of support beads, each of said connectors comprising a single integral conductive member having a proximal end, a distal end and a central body interconnecting said proximal and distal ends, said proximal end of each of said connectors being attached to a portion of said envelope structure, said distal end of each of said connectors being in contact with said electric field means, said central body including a flat support portion adjacent to said proximal end and a reverse-bend portion disposed between said flat support portion and said distal end, said flat support portion of each of said connectors having a protrusion extending therefrom, the protrusions projecting into the recesses formed in said support beads to secure said electron gun, said reverse-bend portion of each of said connectors providing biasing means to radially position said electron gun on said longitudinal axis.

4,692,659

COLOR CATHODE RAY TUBE HAVING SHADOW MASK WITH SILICON

Shigeo Takenaka; Norio Koike; Takeo Itou, and Hidemi Matsuda, all of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1986, Ser. No. 843,247
Claims priority, application Japan, Mar. 27, 1985, 60-60908
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 4 Claims



1. A color cathode ray tube comprising:
a panel formed with a phosphor screen on its inside face;
a neck having an electron gun assembly facing said phosphor screen;
a funnel joining said neck to said panel constituting an envelope;
a shadow mask assembly comprising a shadow mask arranged close to and facing the electron gun side of said phosphor screen and a mask frame supporting said shadow mask;
and an inner shield extending on the electron gun side from said shadow mask assembly along the inner face of said funnel, wherein at least one surface of said shadow mask assembly and said inner shield is provided with a blackened region containing Al, Fe and Si, and the Si content in the vicinity of the surface of said blackened region is greater than 1.5 wt% and less than 30 wt%.

4,692,660

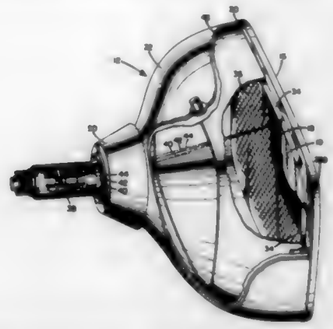
IMPROVED INDEXING MEANS WITH OPTIMIZED GROOVE ANGLE

Robert Adler, Northfield, and Paul Strauss, Chicago, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 21, 1986, Ser. No. 831,697
Int. Cl.[4] H01J *29/86, 9/24*
U.S. Cl. 313—477 R 12 Claims

3. Components of a color cathode ray tube including at least a faceplate, a frame, and a funnel with mutual sealing areas, said components having indexing means for use in the manufacture and assembly of the components, said indexing means comprising three V-grooves located in the sealing area of a first of said components, and three indexing protuberances in

the sealing area of a second of said components in apposition to said V-grooves for mating in registration with said V-grooves,



said indexing means being characterized by said grooves each having a subtended angle in the range of 34 to 75 degrees.

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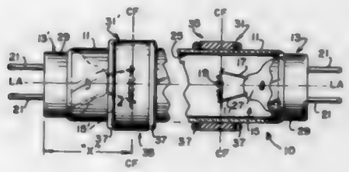
FLUORESCENT LAMP WITH STATIC MAGNETIC FIELD GENERATING MEANS

Philip E. Moskowitz, Peabody, and Jakob Maya, Brookline, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Feb. 18, 1986, Ser. No. 830,152

Int. Cl.[4] H01J *61/42, 1/50*

U.S. Cl. 313—485 **8 Claims**



1. In a fluorescent lamp including an elongated tubular envelope having first and second opposing end portions an including therein an atmosphere of mercury and a rare gas, and first and second electrodes disposed within said first and second opposing end portions, respectively, each of said electrodes including a pair of lead wires and a filament, the improvement comprising:

first and second magnetic field generating means substantially surrounding said first and second electrodes, respectively, each of said magnetic field generating means applying a static magnetic field across said respective electrode and in a substantially axial pattern along the longitudinal axis of said elongated tubular envelope such that the maximum field strength of said field is substantially located at said filament thereof, whereby the efficacy of said fluorescent lamp is increased.

4,692,662

HIGH CONTRAST DISPLAY DEVICE

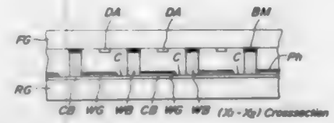
Masatoshi Wada, Osaka, and Tetsuo Sakai, Tokyo, both of Japan, assignors to Okuno Chemical Industries Co. Ltd. and Nippon Hoso Kyokai, Japan

Filed Jul. 8, 1985, Ser. No. 752,542

Claims priority, application Japan, Jul. 13, 1984, 59-144112; Oct. 4, 1984, 59-206979

Int. Cl.[4] H01J *61/35*

U.S. Cl. 313—493 **19 Claims**



1. A display device including a plurality of light-emitting elements arranged in a matrix plane, each of said light-emitting elements comprising:

an envelope;

a light emitting member, within said envelope;

means for energizing said light-emitting member; and

a light-reflecting white member of glassy material coated and fired on at least a portion of an inner wall of said envelope, for reflecting light emitted from said light-emitting member, said light-reflecting white member comprising fired glassy material including at least 20% by weight of a glass powder containing substantially no black pigment and 5 to 80% by weight of at least one transparent material having a refractive index other than that of said glass powder.

4,692,663

FLUORESCENT DISPLAY TUBE FOR LIGHT SOURCE

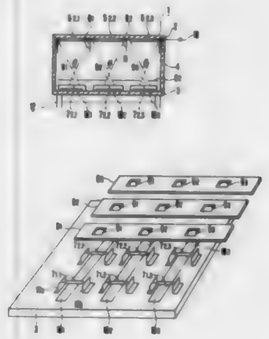
Masaaki Kobayashi; Yosiyuki Okubo, and Kazunori Tatsuda, all of Ise, Japan, assignors to Ise Electronics Corporation, Ise, Japan

Filed Jun. 30, 1986, Ser. No. 880,139

Claims priority, application Japan, Jul. 8, 1985, 60-148215

Int. Cl.[4] H01J *63/06*

U.S. Cl. 313—495 **4 Claims**



1. A fluorescent display tube comprising:

an envelope constituted by a front panel, a rear panel, and a side panel, at least said front panel being able to transmit light therethrough;

a plurality of phosphor screens formed on an inner surface of said front panel to constitute a matrix in a first direction and in a second direction perpendicular to the first direction;

a plurality of anodes, respectively arranged around said phosphor screens, for accelerating electron beams;

a plurality of cathodes, respectively corresponding to said phosphor screens and supported to float from an inner surface of said rear panel, for emitting the electron beams;

plate-like control grids which are respectively arranged between said phosphor screens and said cathodes arranged in the first direction, and which have apertures for transmitting the electron beams from said cathodes to said phosphor screens; and

stripe-like back electrodes which oppose said cathodes aligned on said inner surface of said rear panel along the second direction,

wherein voltages applied to said control and back electrodes are higher or lower than those applied to said cathodes, thereby controlling light emission of said phosphor screens.

4,692,664

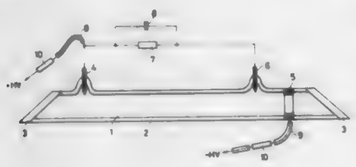
GASEOUS DISCHARGE DEVICE

Gnian C. Lim, Los Angeles, Calif., assignor to Amada Engineering & Service Co., Inc., La Mirada, Calif.

Filed Sep. 12, 1985, Ser. No. 775,336

Int. Cl.[4] H01J *7/44*

U.S. Cl. 315—60 **4 Claims**



1. A gaseous discharge device comprising:

a discharge tube enclosing lasing gas medium therein;

a pin-shaped main discharge anode whose sharp end projects inside said discharge tube and a cylindrical ring main discharge cathode mounted along the inner circumference of and inside said discharge tube; and

a pin-shaped auxiliary electrode, the sharp end of which projects inside said discharge tube, located in the immediate vicinity of said main discharge cathode, wherein said main discharge anode is electrically connected to a positive terminal of a high voltage power supply and said main discharge cathode is connected to a negative terminal of said power supply, and said auxiliary electrode is electrically connected to said main discharge anode through a resistor and a capacitor which are connected in parallel to each other, wherein the resistance value of the resistor is $R = V/BI$ and the capacitance value of the capacitor is $C = 10tI/V$, in which V is an operating discharge voltage applied across the main anode and main cathode, I is an operating discharge current, t is a rise time of said voltage V from the power supply, and B is a value from 0.01 to 0.05.

4,692,665

DRIVING METHOD FOR DRIVING PLASMA DISPLAY WITH IMPROVED POWER CONSUMPTION AND DRIVING DEVICE FOR PERFORMING THE SAME METHOD

Hiraku Sakuma, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 7, 1986, Ser. No. 882,174

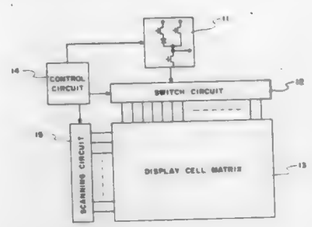
Claims priority, application Japan, Jul. 5, 1985, 60-148615; May 15, 1986, 61-112173

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.4 **18 Claims**

1. A method of driving a plasma display device including a plurality of plasma display cells arranged in a form of matrix, said plasma display cells arranged in each line being connected to a line electrode and said plasma display cells arranged in each column being connected to a column electrode, said method comprising the steps of:

applying a scan pulse to said line electrodes, sequentially;



applying a signal having a predetermined voltage to selected ones of said column electrodes connected to said plasma display cell or cells to be illuminated; and

reducing said predetermined voltage of said signal to a value lower than said predetermined voltage after said cell or cells initiate illuminating.

4,692,666

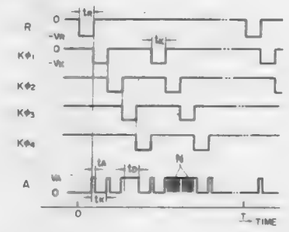
GAS-DISCHARGE DISPLAY DEVICE

Yukio Okamoto, Sagamihara, and Shinichi Shinada, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,298

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.4 **6 Claims**



1. A gas-discharge device comprising:

a plurality of cathodes disposed on a substrate to extend in one direction in a relation parallel to and equally spaced apart from each other, said cathodes being connected to respective cathode terminals by multiphase connection;

a plurality of barrier ribs disposed above said cathodes to extend in a direction crossing with the extending direction of said cathodes and in a relation parallel to and equally spaced apart from each other;

a plurality of anodes disposed in a relation parallel to and equally spaced apart from each other so as to be located between said barrier ribs, said anodes being connected to respective anode terminals;

a face plate disposed on said anodes, said face plate and said substrate defining therebetween a space which is filled with a gas and maintained gas-tight; and

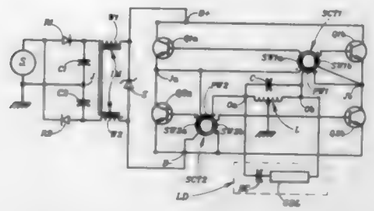
means for applying time-serial multiphase pulse voltages to said respective cathode terminals and for applying a pulse voltage including pulses of small width occurring at a timing corresponding to that of said multiphase pulse voltages and pulses of large width representing display information superposed on said small width pulses to each of said anode terminals.

4,692,667

PARALLEL-RESONANT BRIDGE-INVERTER FLUORESCENT LAMP BALLAST

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Oct. 16, 1984, Ser. No. 661,468
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **9 Claims**



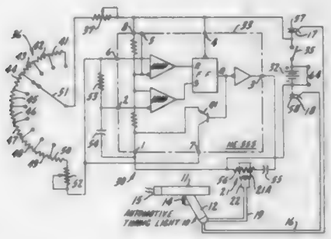
1. Ballasting means for a gas discharge lamp, comprising:
a source of relatively low frequency AC voltage, said source having a first and a second AC source terminal, said first AC source terminal being connected with earth ground;
DC voltage supply powered from said source of AC voltage and operable to provide a DC voltage across a pair of DC terminals, said DC voltage supply having a symmetrical center-tap directly connected with said first AC source terminal;
bridge inverter connected with said pair of DC terminals and operable to provide a relatively high frequency AC voltage between a first inverter output terminal and a second inverter output terminal, there existing a first voltage between the center and tap of the first inverter output terminal and a second voltage between the center tap and the second inverter output terminal, the first voltage being approximately equal in absolute magnitude but opposite in polarity as compared with the second voltage, and bridge inverter being operable periodically and alternatively to connect each of the inverter output terminals with the DC terminals; and
output circuit means connected with said inverter output terminals and operable to connect with and to power said lamp.

4,692,668

STROBE ADAPTOR FOR AUTOMOTIVE TIMING LIGHT

Francis J. Brown, Chicago, Ill., assignor to Deniston Company, Alsip, Ill.

Filed Jul. 25, 1983, Ser. No. 516,598
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—241 S **12 Claims**



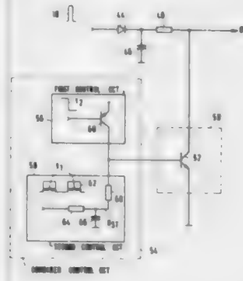
1. A compact strobe adaptor for converting a hand-held automotive timing light into a portable, compact industrial troubleshooting stroboscope without modification of the timing light, the timing light being of the kind comprising a light source operable over a broad frequency range, a driver circuit for the light source, an external power cord for energizing the driver circuit that terminates in two terminal clamps connectable to the terminals of an automotive battery of predetermined voltage, and a pickup cord connected to the drive circuit that terminates in a clamp-type inductive pickup, the strobe adaptor comprising:
a housing;
a D.C. power source of said predetermined voltage, mounted in the housing;
an oscillator mounted in the housing and connected to the power source;
a frequency adjustment circuit, connected to the oscillator, for adjusting the operating frequency of the oscillator over a broad range;
a pair of power terminals mounted externally on the housing and connected to the power source, each power terminal having a configuration suitable for engagement by one of the timing light power cord terminal clamps;
and a load circuit, connected to the oscillator, including a load element mounted externally on the housing and having a configuration suitable for encompassing engagement by the inductive pickup clamp of the timing light.

4,692,669

PICTURE TUBE SCREEN GRID POTENTIAL CONTROL

Karl-Heinz Black, and Günter Schuchardt, both of Hildesheim, Fed. Rep. of Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,740
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407388
Int. Cl.[4] H01J *29/52;* **H04N** *5/68*
U.S. Cl. 315—381 **8 Claims**



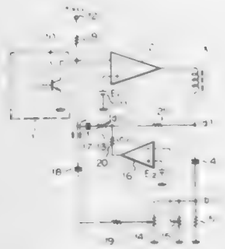
1. Electrode voltage control circuit for the screen grid of a picture tube interposed between a rectifier diode and said screen grid, said diode being interposed in circuit between a source of high voltage pules and said screen grid, said control circuit comprising;
at least one resistance (**48, 74**) connected in series between said diode and said screen grid, said one resistance having a first terminal electrically nearer said diode and a second terminal electrically nearer said screen grid;
a transistor (**52**) having its controlled path connected between ground and said second terminal of said resistance, said transistor also having a control electrode, and
means connected to said control electrode of said transistor for maintaining the voltage normally applied to said screen grid at an adjustably pre-set value, for reducing the voltage applied to said screen grid to a low or zero value in response to a persistence of an excessive value of electron beam current in said picture tube and for allowing the voltage applied to said screen grid to rise to said pre-set value after said excessive value of electron beam current no longer persists, said means connected to said control electrode of said transistor including a first control branch circuit (**56**) and a second control branch circuit (**58**) which have their outputs connected together and to said control electrode of said transistor.

4,692,670

VERTICAL DEFLECTION CIRCUIT

Norio Imaizumi, Gunma, Japan, assignor to Sanyo Electric Co., Osaka, Japan

Filed Nov. 4, 1985, Ser. No. 794,830
Claims priority, application Japan, Nov. 13, 1984, 59-239107
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—388 **6 Claims**



1. A vertical deflection circuit for providing saw-tooth wave deflection current in a vertical deflection coil for a CRT tube comprising:
a first amplifier with an input terminal coupled with an output of a vertical oscillation circuit;
a first resistor coupled between said input terminal of the first amplifier and a power source;
a first capacitor one end of which is coupled with said input terminal of the first amplifier;
an output of said first amplifier being coupled with one end of the deflection coil, the other end of said deflection coil is grounded through a second capacitor and a second resistor,
the other end of said first capacitor being coupled with a first junction point of said second capacitor and said second resistor, to provide a first feedback path; and
a second feedback path is provided so that a sum voltage of a parabolic voltage at a second junction point of said deflection coil and said second capacitor, and saw-tooth wave voltage at the first junction point of said second capacitor and said second resistor, is applied to said input terminal of the first amplifier, said second feedback path comprises a second amplifier with an input terminal coupled with the first junction point of said second capacitor and said second resistor, a resistor network for providing sum of voltages at the second junction point of the deflection coil and the second capacitor, and output of the second amplifier and a third capacitor are coupled between said resistor network and the input terminal of the first amplifier.

4,692,671

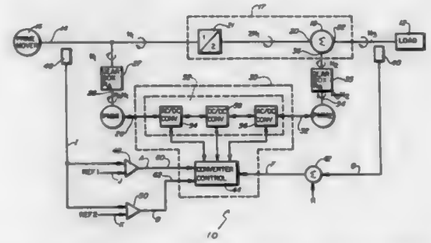
ELECTRICALLY-COMPENSATED CONSTANT SPEED DRIVE

Bryan W. Dishner, Roscoe, Ill.; Richard D. Juarros, Los Lunas, N. Mex., and P. John Dhyanchand, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 812,396, Dec. 23, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 893,946
Int. Cl.[4] F01D *15/10;* **H02P** *9/00*
U.S. Cl. 318—11 **24 Claims**

1. An electrically-compensated constant speed drive (CSD) for developing motive power at a constant speed from variable speed motive power developed at an output shaft of a prime mover, comprising:
a control permanent magnet machine (PMM) having electrical power windings and a motive power shaft;
a speed-compensating permanent magnet machine (PMM) having electrical power windings coupled to the windings of the control PMM and a motive power shaft;
a differential speed summer having a first input coupled to the prime mover output shaft, a second input coupled to the motive power shaft of the speed-compensating PMM and an output at which the constant speed motive power is produced, the motive power shaft of the control PMM being coupled to the output of the speed summer; and
a power converter interconnecting the windings of the PMM's for managing the flow of electrical power therebetween whereby motive power is developed by the speed-compensating PMM in an amount sufficient to maintain the output of the speed summer at a desired speed.

5. An electrically-compensated constant speed drive (CSD) for developing motive power at a constant speed from variable speed motive power developed at an output shaft of a prime mover, comprising:
a control permanent magnet machine (PMM) having electrical power windings and a motive power shaft;



a speed-compensating permanent magnet machine (PMM) having electrical power windings coupled to the windings of the control PMM and a motive power shaft;
a differential speed summer having a first input coupled to the prime mover output shaft, a second input coupled to the motive power shaft of the speed-compensating PMM and an output at which the constant speed motive power is produced, the motive power shaft of the control PMM being coupled to the output of the speed summer;
a first bi-directional AC/DC converter coupled to the electrical power windings of the control PMM;
a second bi-directional AC/DC converter coupled to the electrical power windings of the speed-compensating PMM;
a bi-directional DC/DC converter coupled between the AC/DC converters; and
means for controlling the AC/DC converters and the DC/DC converter so that electrical power developed by one of the permanent magnet machines is delivered to the other of the permanent magnet machines whereby motive power is developed by the motive power shaft of the speed-compensating PMM in an amount sufficient to maintain the output of the speed summer at a desired speed.

4,692,672

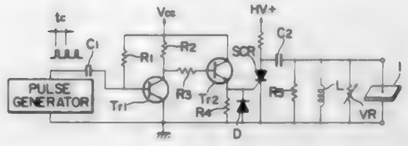
VIBRATION WAVE MOTOR

Takuo Okuno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1985, Ser. No. 695,719
Claims priority, application Japan, Feb. 10, 1984, 24024
Int. Cl.[4] H01L *41/08*
U.S. Cl. 318—116 **5 Claims**

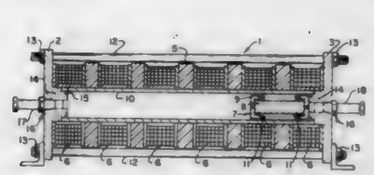
1. A vibration wave motor comprising:

(a) a vibration member including first and second electrostrictive means;
(b) a control circuit for intermittently applying frequency signals of different phases, respectively, to said first and second electrostrictive means, thereby producing a travelling wave in said vibration member according to the application of the frequency signals to said first and second electrostrictive means;



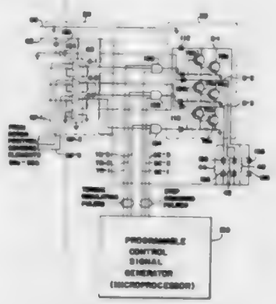
(d) a movable member in operational relationship with said vibration member is driven by the travelling wave; and
(d) an adjusting means for adjusting a ratio of a first interval during which the frequency signal is applied to said electrostrictive means to a second interval during which the frequency signal is not applied to said electrostrictive means, thereby controlling motor drive speed.

4,692,673
ELECTROMAGNETIC RECIPROCATING PUMP AND MOTOR MEANS
Sanford D. DeLong, 1367 Macklin, Ellisville, Mo. 63011, assignor to Sanford D. DeLong, Ellisville, Mo.
Division of Ser. No. 351,272, Feb. 22, 1982, Pat. No. 4,541,787. This application Jul. 29, 1985, Ser. No. 760,255
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—132 **7 Claims**



1. An electromagnetic reciprocating means for use for providing mechanical force for actuation of other means comprising a cylinder means, electromagnetic reciprocating means comprising a motor means, a closure means provided at each end of the said cylinder means, at least a pair of electromagnets operatively associated with said cylinder means, a magnetically responsive piston provided within said cylinder means and capable of longitudinally shifting reciprocally within said cylinder means upon the sequential energization of said electromagnets, an electrical circuitry means connecting with said electromagnets and upon energization charging said electromagnets in progressively timed sequence for inducing the reciprocal shifting of said piston within said cylinder means, said motor means comprising a linear reciprocating motor means, a drive shaft connecting with said piston, there being an aperture provided through a closure means at least at one end of said cylinder means, said drive shaft extending through the closure means aperture and furnishing linear moving force upon the reciprocating movement of said motor means piston, a seal formed between the reciprocating moving drive shaft and the closure means aperture, a spacer means provided between each of the adjacent electromagnets and the closure means, each electromagnet and the said spacer means provided substantially surrounding the internally arranged cylinder means, fastener means tightly securing the closure means, internally arranged cylinder means, spacer means, and electromagnets together, said reciprocating means as secured together being hermetically sealed, and seal provided between the internally arranged cylinder and the closure means to prevent leakage at their areas of contact.

4,692,674
BRUSHLESS DC MOTOR CONTROL SYSTEM RESPONSIVE TO CONTROL SIGNALS GENERATED BY A COMPUTER OR THE LIKE
Douglas T. Packard, La Canada, and Donald E. Schmitt, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 26, 1985, Ser. No. 727,838
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **27 Claims**



5. In a system for controlling a brushless DC motor of the type having a multiphase winding and a rotor mounted on a shaft, the combination which comprises:
(a) shaft position-sensing means for deriving shaft position signals indicative of the angular position of the motor shaft;
(b) commutation signal-generating means responsive to the shaft position signals for generating commutation signals representative of each commutation period for each phase winding;
(c) driving means individually associated with each phase winding for selectively applying current to the associated winding;
(d) control signal-generating means for generating independent control signals for each phase winding; and
(e) gating means individually connected to the driving means for each phase winding and responsive to the commutation and control signals for the respective phase winding for enabling the driving means associated with each phase winding to thereby apply current to the respective winding only upon the occurence of the commutation signal and control signal for said winding, whereby the motor shaft can be incrementally advanced to a selected position.

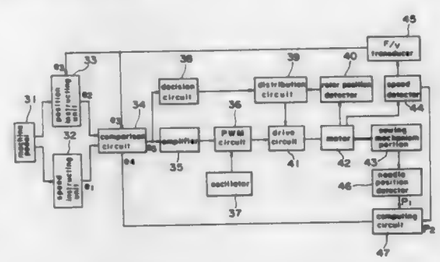
25. In a system for synchronizing the motion of a plurality of brushless DC motors wherein each motor includes a rotor and a multiphase wound stator with each phase winding being arranged to be energized in succession to provide a rotating magnetic field; a commutation signal generator responsive to the position of the rotor for generating commutation signals representative of (the) commutation time for each phase winding; a driving circuit individually associated with each phase winding for selectively applying current to the associated winding; and a gating circuit individually connected to the driving circuit for each phase winding and responsive to the commutation signals and to an input control signal for enabling the driving circuit associated with each phase winding upon the occurrence of the commutation signal and the input control signal, the combination which comprises:
(a) gating means individually responsive to the commutation signals associated with each respective phase winding of each motor for producing an output signal when each commutation signal for an associated phase winding is completed; and
(b) input control signal-generating means for applying said input control signal to the driving circuit associated with the next succeeding phase winding to be energized in response to an output signal from the gating means.

4,692,675
CONTROL AND ENERGIZATION CIRCUIT FOR A BRUSHLESS D-C MOTOR
Gerhard Falk, Rossdorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Aug. 5, 1986, Ser. No. 893,333
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528765
Int. Cl.[4] H02K *29/10*
U.S. Cl. 318—254 **12 Claims**



1. Control and energization circuit for a brushless d-c motor having
a stator (S) and a magnetic rotor (L);
a stator winding comprising a plurality of winding sections (I, II . . . XI), ring-connected and located on the stator, adjoining winding sections being coupled by a junction (1, 2 . . . 11) serially connecting said adjoining winding sections;
a rotor position sensing means (26) associated with respective junctions and determining of the rotor has a predetermined relative position with respect to any selected junction;
a source (15, 16) of d-c power; and
a control and supply network selectively connecting the terminals (15, 16) of the source to selected junctions in accordance with the position of the rotor,
said control and supply network comprising:
a plurality of network systems associated with the junctions (1, 2 . . . 11), each network system including
a first switch (21) controllably connecting a first terminal (15) of the source to the associated junction;
a second switch (20) controllably connecting a second terminal (16) of the source to the associated junction;
and a logic network (25, 23; 28, 29, 30, 24, 22) responsive to a signal from the rotor position sensing means and, selectively, controlling said first switch of the associated junction and a second switch of another junction, in accordance with a predetermined switching logic.

4,692,676
SEWING MACHINE DRIVING APPARATUS
Takashi Dohi, Hirakata; Nobuho Shibata, Katano, and Kenichi Ohara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
PCT No. PCT/JP85/00087, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/03958, PCT Pub. Date Sep. 12, 1985
PCT Filed Feb. 26, 1985, Ser. No. 798,279
Claims priority, application Japan, Mar. 2, 1984, 59-41149; Mar. 19, 1984, 59-52529
Int. Cl.[4] H02P *3/10*
U.S. Cl. 318—269 **6 Claims**

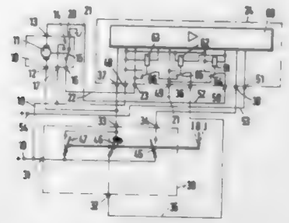


1. A machine driving apparatus comprising a driving motor composed of a brushless motor for driving a machine shaft, a rotor position detector for detecting the rotor position of said motor, a distribution circuit which switches the energization phase of the stator winding of a motor in accordance with a signal from said rotor position detector, a speed detector for detecting the rotational speed of the machine shaft or the motor, a needle position detector for detecting the position of the needle shaft, a speed instructing unit for generating a speed instruction signal in accordance with the operation of the machine pedal, a position instructing unit for generating a position instructing signal which becomes a stop instructing signal in accordance with the operation of said machine pedal, a comparison circuit which compares a speed instructing signal with a speed detecting signal or a position instructing signal with a position detecting signal to output a difference signal, a drive circuit which closes a current proportional to said difference signal to the stator winding selected by said distribution circuit to drive said motor, a decision circuit which decides the positive and negative of the difference signal to be outputted from said comparison circuit to switch the operational mode of said distribution circuit into a positive operational torque generating mode and a reverse operational torque generating mode, wherein said motor is damped in reverse operation by a position instructing signal in accordance with the operation of said machine pedal and a needle position detecting signal detected by said needle position detector to stop the machine needle in a given position.

4,692,677
WINDSHIELD WIPER SYSTEM
Kurt Bauer, Ingersheim, and Theodor Schneider, Freudental, both of Fed. Rep. of Germany, assignors to SWF Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany
Filed Dec. 16, 1985, Ser. No. 809,934
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446761
Int. Cl.[4] B60S *1/08*
U.S. Cl. 318—443 **15 Claims**

1. A windshield wiper system, comprising:
an operating switch;
an electric motor having a shaft rotatable in a first direction and driving at least one wiper to and fro between two reversing positions within a wiping area when said operating switch is in at least a first position and rotatable in a

second direction to drive said wiper to a concealed park position outside said wiping area when said operating switch is switched to an off position;
a rotating drive member coupled to said shaft;
a switching member coupled to said rotating drive member;
a position switch for providing a signal for causing said motor to reverse directions from said first direction to said



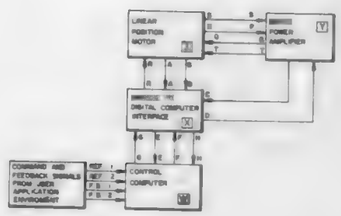
second direction after said operating switch is switched to said off position and for providing a signal to switch said motor off at said parking position, said position switch being coupled to said rotating drive member by said switching member, said position switch being operable whereby it always changes over at the same position of said drive member and independently of the direction of rotation of said shaft.

4,692,678

CLOSED LOOP SERVO CONTROL SYSTEM

Robert E. Lee, 68 Dean St., Westwood, N.J. 07675

Continuation-in-part of Ser. No. 680,137, Dec. 10, 1984, Pat. No. 4,616,153. This application Oct. 2, 1986, Ser. No. 916,993
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—687 9 Claims



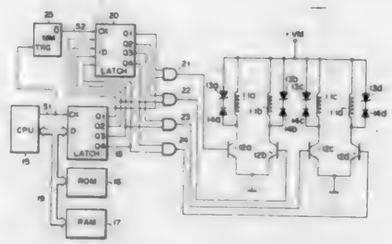
1. A method for controlling a closed-loop linear position servo motor having an armature including a first group of excitation windings and a second group of excitation windings, and a stator including field magnets disposed radially opposite said first winding group, and feedback windings disposed radially opposite said second winding group, the method comprising the steps of:
(a) applying a positional zero reference to said feedback windings, said zero reference correlating to a zero position of said armature;
(b) monitoring time-dependent changes in the electromagnetic coupling between said feedback windings and said second armature winding group, relative to the coupling value of said zero reference;
(c) translating said electromagnetic coupling changes of said Step (b) into a positional data signal; and
(d) re-iteratively applying a compensation current to said second winding group to compensate the value of said electromagnetic coupling to thereby positionally regulate said armature in conformance with external command signals;
Contemporaneously with Steps (a) thru (d) above:
(e) applying a reference current to said first armature winding group, said reference current corresponding to an armature coupling reference value and to an armature output force reference value;
(f) monitoring time dependent changes in the electromagnetic coupling between said first armature winding group and said field magnets relative to said reference coupling value of Step (e) above;
(g) translating electromagnetic coupling changes monitored in Step (f) above into a force data signal; and
(h) re-iteratively applying a compensation current to said first winding group to compensate the value of said first group armature coupling to thereby regulate the positive and negative force of said armature in conformance with external command signals.

4,692,679

PULSE MOTOR

Yutaka Hujita, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,563
Claims priority, application Japan, May 21, 1985, 60-108719
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 8 Claims



1. A pulse motor comprising:
A- and C-phase coils wound on a common pole;
B- and D-phase coils wound on a common pole;
first, second, third and fourth switching means connected in series with the A-, B-, C- and D-phase coils, respectively, and having an ON state for passing current to the respective phase coils and an OFF state for blocking current to the respective phase coils; and
control means including means for generating phase control signals for controlling respective conduction states of said first, second, third and fourth switching means to permit a sequential excitation of the A-and B-phase coils, B-and C-phase coils, C-and D-phase coils, and D-and A-phase coils in this order and so as to excite the A, C coils and B, D coils to generate, respectively, oppositely directed magnetic fluxes, and delay means for, after a predetermined time following a start of a transition from said ON state to said OFF state of one of the first, second, third and fourth switching means in the respective phase switching operation time, changing the state of another one of said switching means from the OFF state to the ON state.

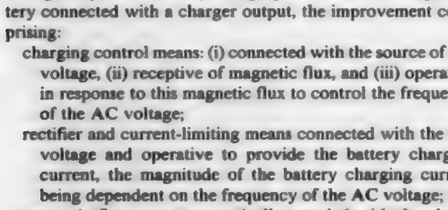
4,692,680

PORTABLE BATTERY CHARGING APPARATUS AND METHODS THEREFOR

Paul Sherer, Costa Mesa, Calif., assignor to Seacliff International, Inc., South El Monte, Calif.

Filed Aug. 12, 1985, Ser. No. 764,656
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—2 20 Claims

1. Portable apparatus for charging a lead-acid battery comprising means for providing a preselected direct current voltage and current for charging a discharged lead-acid battery, said means including a plurality of dry cell batteries connected in a series circuit relationship, means for connecting said lead-acid battery to be charged in a series circuit relationship with said direct current means for transferring a pre-selected quantity of charge to the lead-acid battery, electronic circuit means coupled across said direct current means in a parallel circuit relationship with the lead-acid battery, the electronic circuit means including means for providing an electrical current



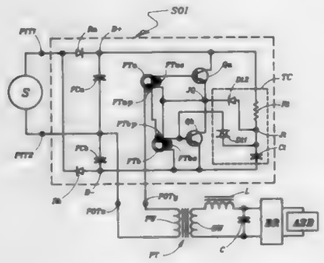
signal representative of the actual current transferred to a battery being charged, means for converging said electrical current signal to a voltage control signal, voltage controlled oscillator means coupled to be responsive to the voltage control signal for controlling the oscillation cycles thereof, and electronic counting means for accumulating the oscillator cycles therein until a preselected count is reached, the preselected count being representative of the transfer of a preselected quantity of electric charge to the lead-acid battery.

4,692,681

BATTERY CHARGER WITH ADJUSTABLE CHARGING CURRENT

Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010

Filed Apr. 21, 1986, Ser. No. 853,936
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—2 20 Claims



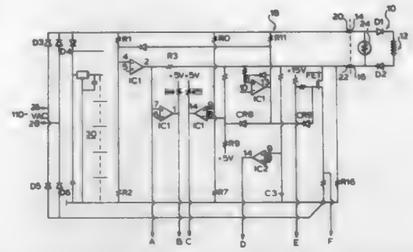
1. In a battery charger adapted by way of a source of AC voltage to provide battery charging current to a storage battery connected with a charger output, the improvement comprising:
charging control means: (i) connected with the source of AC voltage, (ii) receptive of magnetic flux, and (iii) operative in response to this magnetic flux to control the frequency of the AC voltage;
rectifier and current-limiting means connected with the AC voltage and operative to provide the battery charging current, the magnitude of the battery charging current being dependent on the frequency of the AC voltage; and
magnetic flux means magnetically coupled with the charging control means and adapted to provide controllable magnetic flux to this control means, thereby to permit control of the frequency of the AC voltage and thereby the magnitude of the charging current.

4,692,682

NICAD BATTERY CHARGER

Kerry S. Lane, Newmarket, and Derek V. Moore, Rexdale, both of Canada, assignors to Levitt Safety Limited, Canada

Filed Dec. 23, 1985, Ser. No. 812,633
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—35 40 Claims



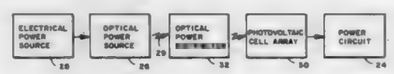
1. A method of charging a battery pack made up of one or more rechargeable cells comprising applying a charging current to said battery pack, reducing charging current when a predetermined value for a battery characteristic which includes temperature, or voltage or combination thereof is sensed, to permit said battery pack to cool for a period to a lower temperature, resuming charging said battery pack when said battery pack has cooled during said period to said lower temperature and selecting effective magnitude of charging current to prevent subsequent significant increase of battery pack temperature beyond a predetermined increment above said lower temperature.

4,692,683

OPTICAL POWER DISTRIBUTION SYSTEM

Richard G. Lalmond, Candia, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 24, 1986, Ser. No. 832,119
Int. Cl.[4] G02B *5/14*
U.S. Cl. 322—2 R 7 Claims



1. Apparatus for supplying electrical power to a plurality of electrical components mounted on a circuit board, comprising:
a printed circuit board;
a plurality of electrical components mounted on said printed circuit board;
a plurality of electrically powered sources of optical energy;
a plurality of photovoltaic cell arrays;
each photovoltaic cell array being mounted on a corresponding one of said electrical components to provide electrical power to the electrical component on which it is mounted; and
means for coupling the optical energy from said plurality of electrically powered sources of optical energy to said photovoltaic cell arrays.

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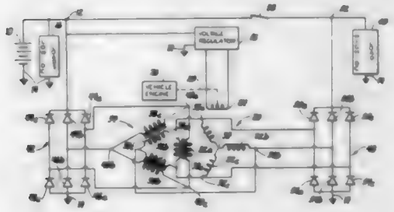
HIGH/LOW DC VOLTAGE MOTOR VEHICLE ELECTRICAL SYSTEM

Eric S. Schaeffer, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1986, Ser. No. 908,219
Int. Cl.[4] H03J *7/14*; B60L *1/02*
U.S. Cl. 322—90 4 Claims

1. A dual voltage electrical system for a motor vehicle, comprising:
a storage battery connected between a main power terminal and system ground for providing standby power therebe-

tween at a DC voltage of predetermined low magnitude;
various DC voltage loads connected between the main power terminal and system ground for energization by the DC voltage appearing therebetween;
a three-phase AC generator mechanically driven by the vehicle motor and having output windings and a field winding for producing a three-phase AC voltage across the output windings having an amplitude determined by the amount of current fed through the field winding;
a three-phase transformer connected to the output windings of the generator for stepping down the amplitude of the three-phase AC voltage in accordance with a predetermined voltage step-down ratio;
a first three-phase full-wave rectifier connected to the transformer for rectifying the stepped-down three-phase AC voltage put out by the transformer to provide a first full-wave rectified DC voltage between the main power terminal and system ground when the same is enabled;
a second three-phase full-wave rectifier connected to the output windings of the generator for rectifying the three-phase AC voltage to provide a second full-wave rectified DC voltage between an auxiliary power terminal and system ground;
a voltage regulator responsive to the DC voltage appearing between the main power terminal and system ground to control the amount of current fed through the field winding of the generator to cause the amplitude of the three-



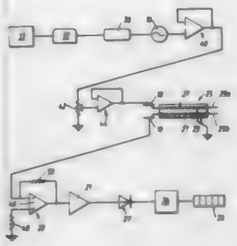
phase AC voltage produced by the generator to be correct to establish and maintain such DC voltage at the predetermined low magnitude; and
a selector switch connected between the auxiliary power terminal and the main power terminal and operable between opened and closed states such that when the switch is in the closed state the first rectifier is disabled and the three-phase AC voltage put out by the generator is at a first amplitude correct when rectified by the second rectifier to establish and maintain the DC voltage between the main power terminal and system ground at the predetermined low magnitude, and such that when the switch is in the opened state the first rectifier is enabled and the three-phase AC voltage put out by the generator is at a second higher amplitude correct when stepped down by the transformer and rectified by the first rectifier to establish and maintain the DC voltage between the main power terminal and system ground at the predetermined low magnitude and further correct when rectified by the second rectifier to establish and maintain the DC voltage between the auxiliary power terminal and system ground at a predetermined high magnitude greater than the predetermined low magnitude by a voltage step-up ratio which is the converse of the voltage step-down ratio of the transformer thereby to provide a high-magnitude DC voltage capable of energizing a high DC voltage load connected between the auxiliary power terminal and system ground.

4,692,685

ELECTRICAL MEASURING APPARATUS, AND METHODS FOR DETERMINING THE CONDITION OR IDENTITY OF BIOLOGICAL MATERIAL

Kevin L. Blaze, 29 Severn Street, Box Hill North, Victoria, Australia

Filed Mar. 14, 1985, Ser. No. 711,795
Claims priority, application Australia, Mar. 14, 1984, PG4064
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 QS **10 Claims**



1. Apparatus for determining a measure of the admittance of biological tissue and an admittance ratio for the tissue, for assessing the condition or identity of the tissue, comprising:
A pair of electrical conductors connectable to the respective contacts of a probe having a fixed spacing, between which contacts tissue is disposed in use of the apparatus;
means to generate a constant AC voltage at each of two distinct frequencies at which both the resistance and the capacitance of the tissue between said contacts are significant components of the impedance therebetween;
means to apply said constant AC voltage across said contacts first at one of said frequencies, then at the other;
precision voltage stabilization means coupled to said generation means to maintain the amplitude of said AC voltage at the two frequencies at the same accurately constant value;
buffer means in series with and between said voltage generation means and one of said conductors to minimize the loading effect of the impedance of the tissue on the impedance of the generating means;
amplifier means coupled to the other said conductor, in series with tissue when disposed between said contacts, to receive the current through the tissue and to generate an output AC voltage signal directly proportional to the current through the tissue and therefore to the admittance of the tissue on application of said AC voltage across a portion of the circuit which includes the tissue and the amplifier means; and
means to convert said output AC voltage signal to a DC output which is a measure of the admittance of the tissue between the probe contacts, the admittance ratio, for the two frequencies being thereby determinable from the respective DC outputs at the two frequencies.

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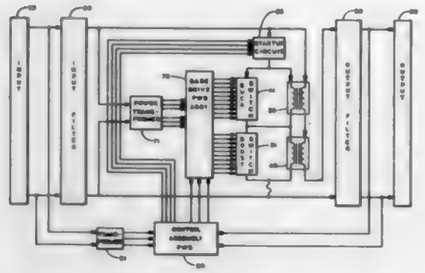
LOW-DISTORTION LINE VOLTAGE REGULATOR

Charles E. Thomas, P.O. Box 29109, New Orleans, La. 70189

Filed Aug. 20, 1985, Ser. No. 767,624
Int. Cl.[4] G05F *1//26*
U.S. Cl. 323—263 **17 Claims**

1. An AC voltage regulator having input terminals for receiving an input voltage having a predetermined frequency, and output terminals for discharging an instantaneously-regulated output voltage, said AC voltage regulator comprising:
means for generating an AC reference voltage signal which has a frequency equal to the frequency of the input voltage, which is in phase with the input voltage, and which

has a predetermined amplitude proportional to a predetermined, desired output voltage;
comparing means for instantaneously comparing said AC reference voltage signal to a portion of the instantaneously-regulated output voltage to determine an error between



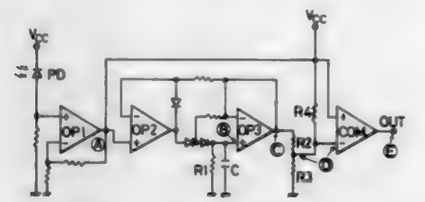
the instantaneously-regulated output voltage and said predetermined, desired output voltage; and
means for instantaneously correcting said error by altering said instantaneously-regulated output voltage to conform to said predetermined, desired output voltage.

4,692,687

OPTICAL PULSE RECEIVING DEVICE

Makoto Yokoyama, Seto, Japan, assignor to Kawamura Electric Industry Co., Ltd., Seto, Japan

Filed May 9, 1986, Ser. No. 861,517
Claims priority, application Japan, May 17, 1985, 60-106664
Int. Cl.[4] G05F *1/46*
U.S. Cl. 323—284 **2 Claims**



1. An optical pulse receiving device comprising:
a. photoelectric conversion means for converting an optical pulse signal into an electric signal;
b. peak hold means for maintaining a maximum value of a signal emitted from said photoelectric conversion means;
c. thresholding means comprising resistors for dividing the voltage of said value of said peak hold means into two half voltages, said thresholding means setting a threshold voltage at a said half voltage; and
d. comparison circuit means for comparing a first output signal from said photoelectric conversion means and a second output signal from said thresholding means and emitting a pulse on the basis of the comparison of said two output signals.

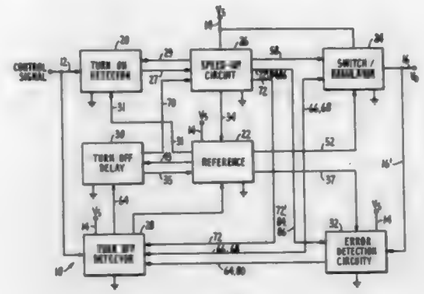
4,692,688

ZERO STANDBY CURRENT SWITCH METHOD AND APPARATUS

Silvo Stanojevic, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 9, 1985, Ser. No. 806,738
Int. Cl.[4] G05F *1//56*
U.S. Cl. 323—285 **21 Claims**

1. A solid state apparatus responsive to a control signal for supplying power from a power source to a load comprising:
detect means having an input coupled to receive the control signal for detecting the presence of a turn on state in the control signal and an output for producing an actuate signal at said output, said detect means including circuitry for performing said detect means function that is powered initially solely from the control signal; and



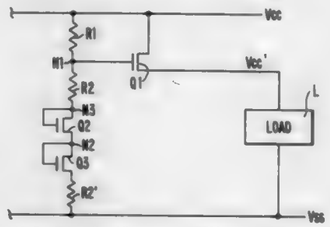
supplying means coupled between the power source and the load and having an input responsive to the actuate signal for supplying power to the load, said supplying means including means for switching from an "off" state to an "on" state in response to said actuate signal, and wherein said supplying means requires no quiescent bias current in the "off" state.

4,692,689

FET VOLTAGE REFERENCE CIRCUIT WITH THRESHOLD VOLTAGE COMPENSATION

Yoshihiro Takemae, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 663,712, Oct. 22, 1984, abandoned. This application Feb. 12, 1987, Ser. No. 15,529
Claims priority, application Japan, Nov. 11, 1983, 58-212083
Int. Cl.[4] G05F *3/24*
U.S. Cl. 323—313 **10 Claims**



1. A voltage converting circuit for receiving a power source voltage and providing a constant voltage having a level of a predetermined proportional division of said power source voltage, comprising:
an output MIS transistor, having a gate and a threshold voltage, for outputting said constant voltage, wherein the gate of said output MIS transistor receives a gate control voltage; and
gate control means for providing said gate of said output MIS transistor with said gate control voltage, comprising an output node for outputting said gate control voltage,
resistive means, including pairs of resistive elements connected in series via said output node and connected to receive said power source voltage, for determining said predetermined proportional division, each resistive element having a resistance being independent of said threshold voltage, and

compensating means, including a plurality of compensation MIS transistors connected in series with said resistive means, for compensating for the value of the threshold voltage of said output MIS transistor in the value of said gate control such that said constant voltage corresponding to said predetermined proportional division is output by said output MIS transistor irrespective of a common variation of the threshold voltage of each of said output and said compensation MIS transistors, the number of said compensation MIS transistors being in accordance with the proportion of said predetermined proportional division.

4,692,690

PATTERN DETECTING APPARATUS

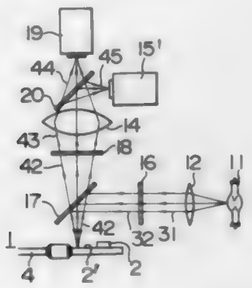
Yasuhiko Hara, Machida; Koichi Karasaki, Hadano; Noriaki Ujiie, and Akira Sase, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 686,007

Claims priority, application Japan, Dec. 26, 1983, 58-243850; Dec. 26, 1983, 58-243851

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—73 PC **9 Claims**



1. A pattern detecting apparatus for inspecting a body which has a wiring pattern on a material capable of generating fluorescent light, comprising:

a light source which emits light having both an exciting light component for generating said fluorescent light from a surface of said material and an infrared light component which is separable from the exciting light component for producing reflected light from a surface of the said wiring pattern;

a first filter which transmits not only said exciting light component but also said infrared light component from the said light source;

a first mirror which directs light received from said first filter to the said body and which transmits fluorescent light from the body and reflected light from the body;

a second filter which transmits the fluorescent light received via said first mirror and the reflected light received via said first mirror, and which removes all exciting light reflected from the body through the first mirror;

an optical system which includes a second mirror, a fluorescent light detector, a reflected-light detector and a lens for focussing the fluorescent light received from said second filter on said fluorescent-light detector via said second mirror and for focussing the reflected light received from said second filter on said reflected-light detector via said second mirror; and

a detection circuit including means for contracting, enlarging and masking pattern images detected by the said detectors.

4,692,691

TEST SYSTEM FOR KEYBOARD INTERFACE CIRCUIT

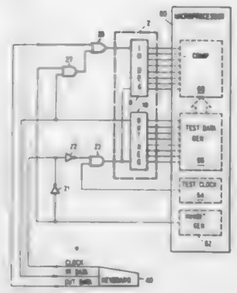
Yoshihisa Saeta, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1985, Ser. No. 806,077

Claims priority, application Japan, Dec. 14, 1984, 59-263156

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 324—73 R **4 Claims**



1. A test system for identifying an error condition between a keyboard interface and a processor comprising, in combination,

a first shift register for storing, shifting and outputting coded data signals generated by said keyboard,

a second shift register for storing, shifting and inputting coded data signals to be supplied to said keyboard,

clock means for generating first and second timing signal sequences to facilitate operation of said first and second shift registers,

means connecting the output of said second shift register to the input of said first shift register,

said test system having an operating sequence comprising means for generating a test clock signal sequence and an inhibit signal sequence,

clock switching means responsive to said inhibit signal sequence for inhibiting said first timing signal sequence being applied from said keyboard to said first and second shift registers and for applying said test clock signal sequence to said first and second shift registers,

means responsive to said inhibit signal sequence for inhibiting coded data signals being applied from said keyboard to said first shift register, and

comparison means for comparing said test clock signal sequence applied to said second shift register with the output signals from said first shift register to identify an error condition associated with said first and second shift registers.

4,692,692

ELECTRONIC APPARATUS FOR DETECTING STRAY VARIATIONS IN AN ELECTRICAL VOLTAGE AS A FUNCTION OF TIME

Jean-Paul Prulhiere, Chambray-les-Tours, France, assignor to Commissariat a l'Energie Atomique, Paris, France

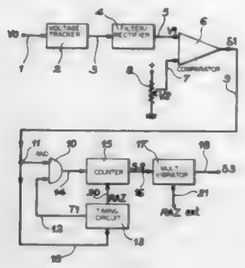
Filed Oct. 4, 1985, Ser. No. 784,119

Claims priority, application France, Oct. 5, 1984, 84 15300

Int. Cl.¹ G08B *21/00*

U.S. Cl. 324—102 **11 Claims**

1. Apparatus for detecting the presence, in an alternating electrical signal having a low frequency component and which may contain background noise and parasitic signals, of a desired signal comprising a packet of elevated frequency oscillations exceeding a predetermined number of oscillation cycles, the apparatus comprising means for filtering the electrical signal to remove therefrom the low frequency component and to diminish the parasitic signals; means for rectifying the filtered signal to convert the filtered signal to a unipolar signal; means for comparing the unipolar signal to a predetermined reference level; means for determining a number of calibrated pulses produced during a preselected period of time, the preselected period of time being sufficient for the oscillations of the



desired signal to exceed said predetermined number of oscillation cycles; and means responsive to the determining means for furnishing an output signal upon the number of said calibrated pulses exceeding, within said preselected period of time, said predetermined number of oscillation cycles in order to indicate the presence of said desired signals.

4,692,693

APPARATUS FOR MEASURING LOW CURRENTS WITH HIGH DYNAMICS

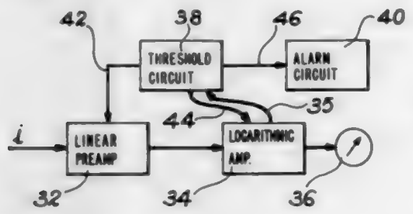
Serge Rabeyrolles, Cestas, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 24, 1985, Ser. No. 694,439

Claims priority, application France, Jan. 27, 1984, 84 01317

Int. Cl.⁴ G01R *15/08*

U.S. Cl. 324—123 R **2 Claims**



1. An apparatus for measuring low electric currents with high dynamics comprising:

(a) a linear preamplification having an input for receiving a low current signal and an output providing a voltage signal, said linear preamplifier comprising:

(1) a first differential amplifier having an inverting input, a non-inverting input and an output, said low current signal being applied to said inverting input;

(2) a first feedback chain comprising a plurality of impedance groups, each of said groups being connectable between said output and said inverting input of said first differential amplifier, each of said groups comprising in series a switch and an impedance element, said switch being connectable to said output, and said impedance element being connectable to said inverting input;

(3) means for controlling each switch of said impedance groups;

(4) a zero point adjustment means for adjusting an offset of said preamplifier, comprising a first preset control means connected to said first differential amplifier, and a fine adjustment means connected to the non-inverting input of said differential amplifier;

(5) a testing means for testing a gain of said first differential amplifier, said testing means being connectable to the inverting input of said first differential amplifier;

(6) a second differential amplifier having an inverting input, a non-inverting input and an output constituting said preamplifier output, said non-inverting input being connected to said output of said first differential amplifier, and said second differential amplifier output delivering said voltage signal; and

(7) a second feedback chain comprising a first resistor connected between the inverting input and the output of said second differential amplifier, and a second resistor connected between earth ground and the inverting input of said second differential amplifier, said second feedback chain having an impedance substantially lower than the said first feedback chain of said first differential amplifier;

(b) a logarithmic amplifier having an input connected to the output of said linear preamplifier, and a logarithmic amplifier output supplying an amplified voltage signal, said logarithmic amplifier including a gain control input;

(c) a thresholding means having an input for receiving the amplified voltage signal supplied by said logarithmic amplification means and supplying, as a function of said amplified voltage signal:

(1) a control signal for controlling the said switches of the impedance groups of the first feedback chain of said first differential amplifier,

(2) an alarm signal when a level of said amplified voltage signal is higher than a predetermined level, and

(3) a gain control signal to the gain control input of said logarithmic amplification means;

(d) an alarm means receiving said alarm signal and triggering an alarm as a function of said alarm signal; and

(e) a reading means for displaying the amplified voltage signal supplied by said logarithmic amplifier.

4,692,694

LOAD TESTING APPARATUS FOR ELECTRONIC COMPONENTS

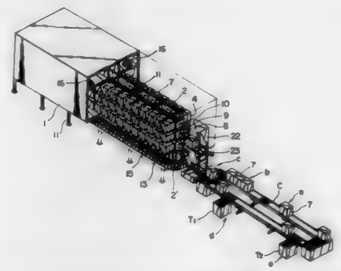
Satoru Yokoi, and Hirokazu Kondo, both of Osaka, Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Aug. 29, 1984, Ser. No. 645,364

Claims priority, application Japan, Nov. 28, 1983, 58-182077[U]

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 F **4 Claims**



3. A load testing apparatus for testing electronic components by applying direct current power at high temperatures, said apparatus comprising:

a high temperature compartment,

a plurality of shelf frames connected with one another in a multiple-row endless arrangement, said shelf frames being disposed generally in said compartment, but with extended portions extending outside of said compartment,

a plurality of shelves mounted in multiple layers on said frames, said shelves being contained entirely in said com-

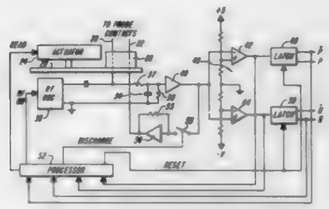
partment, and each shelf receiving a plurality of the electronic components therein,
contact elements on each shelf for feeing direct current to the electronic components therein,
driving means operatively connected to the extended portions of each of said shelf frames for horizontally circulating said frames within said compartment, said driving means being provided outside of said compartment,
an AC feed rail disposed outside of said compartment,
a plurality of rectifiers positioned outside of said compartment, each rectifier being fixed to and movable with the extended portion of each of said shelf frames, each rectifier being electrically connected by cable means to said contact elements on the shelves of a corresponding shelf frame for proving direct current thereto and having a current-collecting trolley in slide contact with said AC feed fail for receiving AC power.

4,692,695

CONDUCTIVITY-TYPE SENSOR

Noel S. Poduje, Needham Heights, Mass., assignor to ADE Corporation, Newton, Mass.

Continuation of Ser. No. 379,560, May 18, 1982, abandoned. This application May 19, 1986, Ser. No. 865,939
Int. Cl.[4] G01R 31/26; H05F 3/00
U.S. Cl. 324—158 R **6 Claims**



1. A testing system for a semiconductor wafer having a conductivity-type to be determined and an undesirable surface static charge to be discharged, comprising:
means for electrically and mechanically contacting said wafer;
sensing means coupled to said contacting means for providing a first signal indicating the polarity of the static charge on said semiconductor wafer;
accelerated discharge means coupled to said contacting means and responsive to said first signal for applying a second signal having a polarity that is opposite to the polarity of said static charge to said semiconductor wafer for discharging the static charge thereon through said contacting means; and
detecting means coupled to said contacting means and operative only after said second signal has been applied to said wafer for determining the conductivity-type thereof.

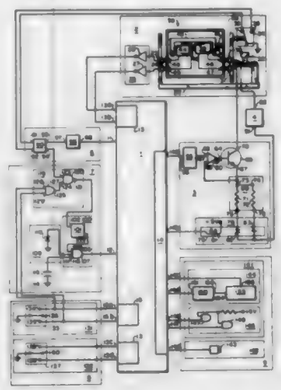
4,692,696

METHOD FOR ADJUSTING AND TESTING CURRENT SENSORS

Bernard D. Bray, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Jul. 29, 1985, Ser. No. 760,210
Int. Cl.[4] G01R 35/00, 31/02
U.S. Cl. 324—158 R **9 Claims**

1. A method of adjusting and testing a current sensing apparatus to a predetermined operated condition and a predetermined non-operated condition, comprising the steps of:
automatically applying a threshold current value to said apparatus, under control of a microcomputer;
automatically adjusting said apparatus to a state just past the threshold of operation, under control of a microcomputer;
automatically applying a non-operate current value to said apparatus, under control of a microcomputer;
automatically first checking said apparatus for a nonoperate output signal, under control of a microcomputer;



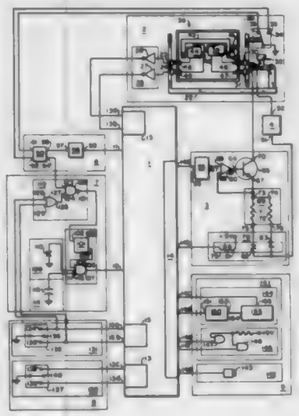
automatically applying an operate current value to said apparatus, under control of a microcomputer; and
automatically second checking said apparatus for an operate output signal, under control of a microcomputer.

4,692,697

CURRENT SENSOR ADJUSTMENT AND TEST APPARATUS

Bernard D. Bray, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Jul. 29, 1985, Ser. No. 760,228
Int. Cl.[4] G01R 35/00, 31/02
U.S. Cl. 324—158 R **21 Claims**



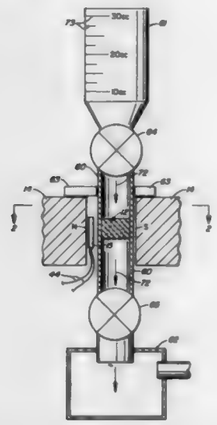
1. Apparatus for adjusting and checking a current sensor including a Hall Effect Switch and an electromagnetic coil for operating said switch, said apparatus comprising:
a microprocessor connected to said current sensor;
a constant current source;
a test power source including a ground terminal and a power terminal; and said constant current source including a digital-to-analog converter connected to said microprocessor, an operational amplifier connected via a noninverting input to an output of said converter, a current pass transistor including a base terminal connected to an output of said operational amplifier and having a collector terminal connected to a first terminal of an electromagnetic coil of said current sensor under test, and at least one constant sensing element including a first terminal connected to an emitter terminal of said current pass transistor and also to an inverting input of said operational amplifier, said current element including a second terminal connected to said test power source ground terminal; and said coil connected to said power source power terminal via a second terminal;
said constant current source, operated in response to said microprocessor to apply at least a first and a second current value to said coil, said coil generating magnetic flux of different levels in response to said first and said second current values, said Hall Effect switch transmitting a first output signal to said microprocessor in response to the presence of a magnetic flux within a first predetermined range, and in the alternative said Hall Effect switch operated to transmit a second output signal to said microprocessor in response to the presence of magnetic flux within a second predetermined range;
indicating means connected to said microprocessor, operated in response to said microprocessor receiving at least one of said output signals to provide an indication of the operation of said sensor.

4,692,698

METHOD AND DEVICE INCLUDING A BED OF FERROMAGNETIC FIBERS AND MAGNETIC FLUX SENSOR FOR MEASURING THE AMOUNT OF MAGNETIC PARTICLES ON A LIQUID

Robert T. Lewis, Albany, Calif., assignor to Tribometrics, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 764,552, Aug. 12, 1985. This application May 7, 1986, Ser. No. 860,575
Int. Cl.[4] G01N 27/74; G01R 33/12
U.S. Cl. 324—204 **16 Claims**



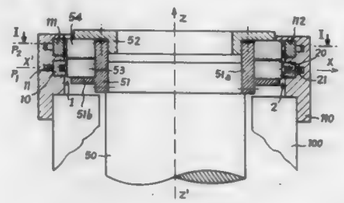
1. A device for measuring the amount of magnetic particles in a liquid, said device including a magnet, a bed of ferromagnetic fibers supported in the magnetic field of said magnet to capture said particles as said liquid is passed through said bed and a means to measure the magnetic flux of the captured particles, wherein the improvement comprises:
means providing a flow path for said liquid including said bed and a means to flow a known amount of said liquid along said flow path through said bed, said magnet comprising a pair of pole faces between which said bed is supported and having sufficient strength to substantially completely magnetize said particles, and said means to measure the magnetic flux comprising a magnetic flux sensor positioned between a pole face of said magnet and said bed, said bed being dimensioned such that the distance from said sensor to the fibers in said bed farthest from said sensor is not greater than about 6 millimeters.

4,692,699

RADIAL DISPLACEMENT MAGNETIC DETECTOR DEVICE FOR A ROTOR

Maurice L. Brunet, Saint Marcel, and Jean-Pierre Jolivet, Gasny, both of France, assignors to Societe Anonyme Styled: Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 12, 1985, Ser. No. 775,438
Claims priority, application France, Sep. 19, 1984, 84 14374
Int. Cl.[4] G01B 7/14, 7/31; F16C 41/00
U.S. Cl. 324—207 **10 Claims**



1. A radial displacement magnetic detector device for a rotor mounted relative to a stator on active magnetic bearings for rotation about an axis of rotation, comprising:
a plurality of inductive elements integral with the stator on which are mounted said bearings; and
at least one magnetic flux conducting reference ring integral with the rotor, confronting said inductive elements and defining with said inductive elements a variable air-gap therebetween;
said inductive elements each include a magnetic circuit element having a U-shaped cross-section viewed along the axis of rotation of the rotor and a coil adapted for connection to a source of excitation mounted to the magnetic circuit element such that the coil induces an axial magnetic flux in the confronting reference ring;
said inductive elements being distributed in axially spaced first and second radial planes;
said at least one magnetic flux conducting reference ring including a first magnetic flux conducting reference ring integral with said rotor in said first plane;
said inductive elements including first and second diametrically opposite inductive elements in said first plane operatively associated with said first reference ring;
said at least one magnetic flux conducting reference ring further including a second magnetic flux conducting reference ring integral with the rotor in said second plane;
said inductive elements further including third and fourth diametrically opposite inductive elements in said second plane operatively associated with said second reference ring;
each of said inductive elements extending over a circular arc of substantially 120 degrees, the coils of said inductive elements collectively providing an output indication of the radial displacement of said rotor with respect to the stator.

4,692,700

ROLLING MAGNETIC PROBE FOR CONTINUOUS THICKNESS MEASUREMENT

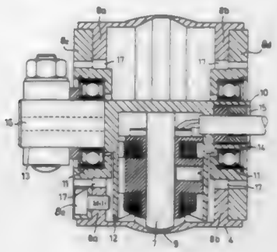
Hans F. Nix, Cologne, Fed. Rep. of Germany, assignor to Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever KG, Cologne, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,719

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401466

Int. Cl.⁴ G01B *7/10*; **G01R** *33/12*

U.S. Cl. 324—229 **22 Claims**



1. Probe means for the continuous measurement of the thickness of a moving strip of material, or of a layer deposited on said moving strip, comprising:

measurin gpole means;

external housing means for said measuring pole means, said external housing means configured as a hollow roller means including a ring-shaped crowned middle part forming a narrow running surface pivotally mounted for rotation about said measuring pole means and for rolling contact with one side of the strip to be measured;

ferromagnetic supporting surface means for contact with the other side of said strip; and

said measuring pole means mounted within said hollow roller means whereby said measuring pole means is within said crowned middle part and continuously spaced from said one side of the strip by said roller means.

4,692,701

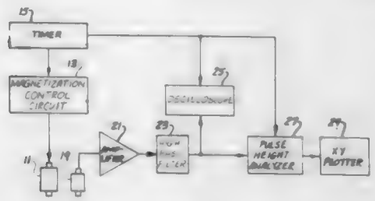
METHOD OF TESTING STEAM TURBINE ROTORS TO DETERMINE IF THEY SHOULD BE RETIRED BECAUSE OF EMBRITTLEMENT

Robert E. Dundas, Duxbury, and Fred W. Tator, Dedham, both of Mass., assignors to Factory Mutual Research, Norwood, Mass.

Filed Dec. 13, 1984, Ser. No. 681,280

Int. Cl.⁴ G01N *27/82*; **G01B** *7/24*

U.S. Cl. 324—240 **8 Claims**



1. A method of testing a steam turbine rotor in order to avoid failure of said rotor comprising testing said steam turbine rotor for embrittlement, wherein said embrittlement testing includes subjecting portions of the steam turbine rotor which may become embrittled to a magnetic field varying over a time interval with a predetermined waveform to generate a magnetic flux in said rotor and cause a detectable Barkhausen effect in said magnetic flux, said Barkhausen effect being characterized by step changes in said magnetic flux, generating pulses in response to said step changes in magnetic flux and comparing the Barkhausen effect as represented by the pulses produced from said rotor with Barkhausen data obtained from a test sample.

4,692,702

DEVICE WITH TWO GENERATORS FOR MEASURING THE GRADIENTS OF MAGNETIC FIELDS

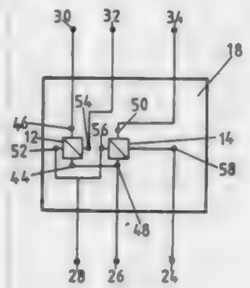
Gerhard Hüschelrath, Laufach-Frohnhofen, and Herbert Diehl, Erlensee, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau an Main, Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,258

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435455

Int. Cl.⁴ G01R *33/06, 33/022*; **G01N** *27/87*

U.S. Cl. 324—251 **5 Claims**



1. A device with two multiple electrode Hall generators for measuring the gradients of magnetic leakage fields in the non-destructive testing of materials, characterized in that the Hall generators comprise thin rectangular wafers each arranged with a broad surface thereof lying on a flat rectangular shaped, four sided substrate, said Hall generators being spaced apart longitudinally along a common line with the same alignment to the line respectively and close to the periphery of two opposite sides of the substrate respectively, the two sides being free of connections, a rectangular-shaped, four sided housing having six external connections, three of which are arranged on one side of the rectangular-shaped housing and three of which are arranged on the opposite side, the other two opposite sides of said housing being free of external connections, said housing overlying the substrate, with the two opposite sides of said substrate which are free of connections being adjacent the opposite sides of said housing which are free of external connections, respectively, with one control electrode of each Hall generator being together joined to a first external connection, with one other control electrode of each Hall generator being joined, respectively, to second and third external connections, with two Hall electrodes, one from each Hall generator, whose opposite polarities correspond respectively to the Hall voltages of said two Hall generators, being joined together to a fourth external connection, and with the other Hall electrode of each Hall generator being, respectively, joined to fifth and sixth external connections.

4,692,703

MAGNETIC FIELD SENSOR HAVING A HALL EFFECT DEVICE WITH OVERLAPPING FLUX CONCENTRATORS

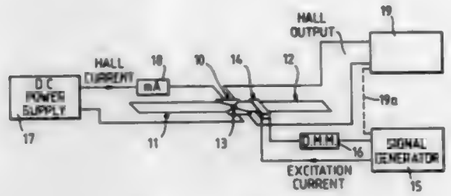
Philip Extance; Roger E. Jones, both of Cambridge, England, and Stewart O. Martin, Adelaide, Australia, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Feb. 22, 1985, Ser. No. 704,253

Claims priority, application United Kingdom, Feb. 25, 1984, 8404967

Int. Cl.⁴ G01R *33/06*

U.S. Cl. 324—251 **15 Claims**



1. A magnetic field sensor comprising:

a Hall effect device with a Hall element and flux concentrator means associated with the Hall element;

means for generating a varying magnetic field in the flux concentrator means such as to drive said flux concentrator means alternately into or out of magnetic saturation, said varying magnetic field generating means comprising a coil through which said flux concentrator means extends, and means for generating an a.c. excitation current and applying said a.c. excitation current to said coil during use of the sensor; and

means for detecting a second harmonic term in the output voltage of the Hall element when a Hall current is applied to the Hall element and in the presence of a d.c. magnetic field, the amplitude of said second harmonic term providing a measure of the d.c. magnetic field.

4,692,704

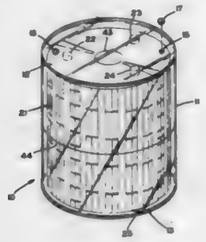
SLICE THICKNESS AND CONTIGUITY PHANTOM FOR A MAGNETIC RESONANCE IMAGING SCANNER

Joel E. Gray, Rochester, Minn., assignor to Mayo Medical Resources, Rochester, Minn.

Filed Feb. 6, 1986, Ser. No. 826,747

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—318 **32 Claims**



1. A phantom for calibrating a magnetic resonance imaging system comprising:

a hollow enclosure adapted to be inserted into a magnetic resonance imaging system;

a plurality of generally planar leaves positioned in a stacked relationship, each leaf having a portion thereof removed to form a slice, said leaves being oriented in said stack with said slices in predetermined positions; and

means for attaching said stack of leaves inside said hollow enclosure whereby said leaves form a predetermined calibration image upon being subjected to a magnetic field in a magnetic resonance imaging system.

4,692,705

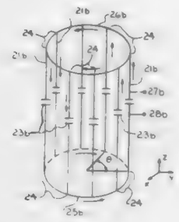
RADIO FREQUENCY FIELD COIL FOR NMR

Cecil E. Hayes, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 23, 1983, Ser. No. 565,254

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—318 **72 Claims**



1. An NMR radio-frequency (RF) coil comprising:

a pair of conductive end-cap elements disposed in a spaced-apart relation along a common longitudinal axis; and

a plurality of conductive segments each having at least one reactive element in series therewith, said segments electrically interconnecting said end-cap elements at points spaced along the periphery of each of said end-caps, said segments being disposed substantially parallel to said longitudinal axis such that the resulting configuration has four-fold symmetry.

4,692,706

WELL LOGGING MEANS AND METHOD FOR DETERMINING WATER SATURATION OF A PETROLEUM RESERVOIR HAVING TWO TRANSMITTERS AND TWO RECEIVERS

Roy P. Mazzagatti, Bellaire, and Donald J. Dowling, Houston, both of Tex., assignors to Texaco Inc, White Plains, N.Y.

Filed Feb. 27, 1985, Ser. No. 706,376

Int. Cl.⁴ G01V *3/30*

U.S. Cl. 324—338 **10 Claims**

1. A well logging system for determining the water saturation of a petroleum reservoir earth formation comprising:

a well logging sonde which includes:

first transmitter means for transmitting electromagnetic energy into the earth formation at a first frequency selected from a range of frequencies from 0.01 MHz to 100 MHz,

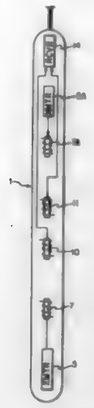
second transmitter means for transmitting electromagnetic energy into the earth formation at a second frequency selected from the range of frequencies,

first receiving means spaced predetermined distances from said first and second transmitter means for receiving the transmitted electromagnetic energies from the earth formation and providing a signal corresponding thereto,

second receiving means spaced predetermined distances from the first and second transmitting means for receiving the transmitted electromagnetic energies from the earth formation and providing a signal corresponding thereto, and

processing means for processing the signals provided by both receiving means to provide an output signal related to the received electromagnetic energies;

well logging cable means for conducting the output signal from the well logging sonde to the surface; and



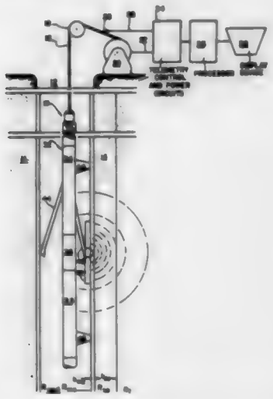
means at the surface receiving the output signal provided by the well logging cable means for deriving the water saturation of the petroleum reservoir earth formation in accordance with the received electromagnetic energies.

4,692,707

METHOD AND APPARATUS FOR MEASURING THE EARTH FORMATION RESISTIVITY OF A PLURALITY OF RADIAL REGIONS AROUND A BOREHOLE

Stanley Locke, and Michel Gouilloud, both of Norwalk, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,414
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.
Int. Cl.⁴ G01V *3/20*
U.S. Cl. 324—374 **14 Claims**



1. An apparatus for providing signals indicative of the electrical resistivity of a subsurface formation traversed by a borehole, comprising:

an elongate sonde body adapted for longitudinal movement though said borehole, said body including a first electrically conductive body section operative to emit electrical current, an insulating section, and a second electrically conductive body section in endwise connection;

a pad connected to said sonde body and having a borehole wall engaging face of conductive material, said pad including at least three current electrodes disposed at different longitudinal locations along said conductive face, said electrodes being operative to emit survey current;

means electrically connected to said conductive face and to said first conductive body section for maintaining said conductive face and said first conductive body section at substantially equal electrical potentional;

electrical conductor means carried by said apparatus for returning current emitted from said first conductive body section and said conductive face; and

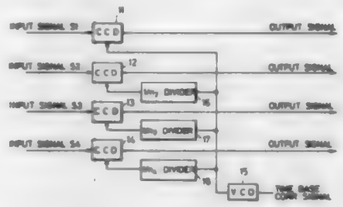
means connected to said pad and to said sonde body for urging said conductive face into engagement with the wall of a borehole and for maintaining said conductive face at least partially within a current field emitted from said conductive body section.

4,692,708

TIME BASE CORRECTION CIRCUIT

Tetsuo Shimizu, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,356
Claims priority, application Japan, Feb. 29, 1984, 59-29643[U]
Int. Cl.⁴ H03K *1/17, 5/13;* **H04N** *5/78, 9/89*
U.S. Cl. 328—63 **2 Claims**



1. In a time base correction circuit comprising: a plurality of clocked delay elements for correcting the same time base error present in a plurality of input signals, and a single clock generator for supplying clock pulse signals to said clocked delay elements, the improvement wherein a frequency divider is provided between said clock generator and each clocked delay element other than the one to which an input signal among said plurality of input signals having a highest maximum frequency is supplied.

4,692,709

PARALLEL INPUT SIGNAL PROCESSOR FOR LOW-LEVEL SIGNAL, HIGH-NOISE ENVIRONMENTS

Vladimir A. Shvartsman, Louisville, Ky., assignor to Electronic Design & Research, Inc., Louisville, Ky.

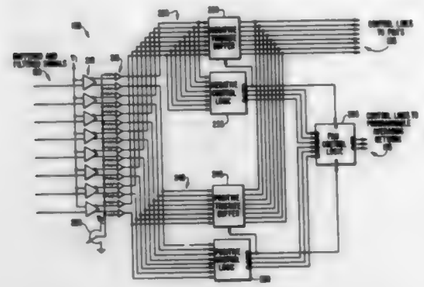
Filed Apr. 5, 1985, Ser. No. 720,264
Int. Cl.⁴ H03K *5/22, 19/23;* **H03F** *1/26*
U.S. Cl. 328—108 **4 Claims**

1. A device for receiving M input signals and processing at least N of M input signals, said at least N of M input signals being processed only if said at least N input signals have identical instantaneous polarities with respect to a predetermined and user-adjustable threshold value and comprise at least a majority of the M input signals, said device comprising:

threshold value determination means for outputting a predetermined threshold value, said threshold value being variable and adjustable by a user;

threshold means connected to said threshold value determination means for receiving said predetermined threshold value and the M input signals and determining the instantaneous polarity of each of the M input signals with respect to said predetermined threshold value;

N-signal selection means connected to said threshold means for selecting said N of M input signals having identical instantaneous polarities with respect to said predetermined threshold value and not selecting the (M-N) input signals whose instantaneous polarities are not identical with respect to the instantaneous polarities of said N input signals;



determination means connected to said N-signal selection means for outputting a control signal indicative of the value of N; and

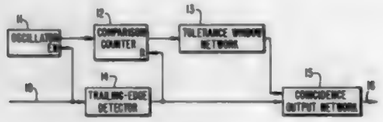
processing means connected to said N-signal selection means for processing said N selected signals according to said control signal if and only if said control signal is indicative of the fact that N is greater than M/2.

4,692,710

FUNDAMENTAL AND HARMONIC PULSE-WIDTH DISCRIMINATOR

Vladimir A. Shvartsman, Louisville, Ky., assignor to Electronic Design & Research, Inc., Louisville, Ky.

Filed Sep. 4, 1985, Ser. No. 772,471
Int. Cl.⁴ H03K *9/08*
U.S. Cl. 328—111 **28 Claims**



1. A device for indicating whether an input pulse, having a leading edge, an unknown width, and a trailing edge, is at least as wide as a predetermined minimum pulse width and within a predetermined tolerance window, said device comprising:

first oscillator means, enabled by the leading edge of the input pulse, for outputting pulses at a first frequency;

first comparison counter means, coupled to said first oscillator means, for counting said first frequency pulses, comparing said first frequency pulse count to a first predetermined value representative of the minimum pulse width, and outputting a trigger pulse when said first frequency pulse count reaches said first predetermined value;

tolerance window means, coupled to said first comparison counter means, for receiving said trigger pulse and outputting a pulse having a first pulse-width duration representative of the tolerance window;

trailing-edge detector means, enabled by the trailing edge of the input pulse, for outputting a pulse having a second pulse-width duration; and

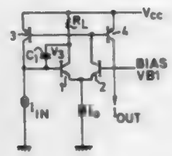
coincidence output means, having a first input coupled to said tolerance window means and a second input coupled to said trailing-edge detector means, for outputting a pulse having a third pulse-width duration when said first pulse-width duration and said second pulse-width duration are in coincidence.

4,692,711

CURRENT MIRROR CIRCUIT

Yoji Miyasako, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 7, 1986, Ser. No. 882,356
Claims priority, application Japan, Jul. 17, 1985, 60-157890
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—257 **3 Claims**



1. A current mirror circuit comprising:

first and second transistors which have their emitters in common and constitute a differential amplification circuit;

third and fourth transistors which have their bases in common;

emitters of said first and second transistors are coupled with a constant current source;

a collector of said second transistor is coupled with bases of said third and fourth transistors;

a collector of said third transistor is coupled with a base of said first transistor and an input current source;

a base of said second transistor is coupled with a bias node;

emitters of said third and fourth transistors are coupled with a reference power source;

a collector of said fourth transistor is coupled with an output node;

a collector of said first transistor is coupled with said reference power source through a load resistance; and

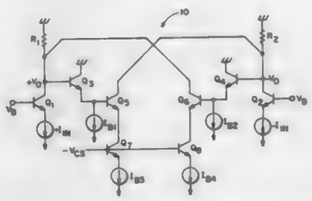
a capacitor for coupling the base and the collector of said first transistor each other.

4,692,712

DIFFERENTIAL IMPEDANCE NEUTRALIZATION CIRCUIT

Patrick A. Quinn, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 14, 1986, Ser. No. 917,867
Int. Cl.⁴ H03F *3/45, 1/26*
U.S. Cl. 330—261 **5 Claims**



1. A parasitic impedance neutralization circuit for an amplifier, comprising:

means for sensing an output signal at opposing output terminals of the amplifier and reproducing each output signal in isolation from each output terminal, the parasitic impedance at each terminal producing a distortion signal;

neutralizing impedances proportional to the parasitic impedances at each output terminal;

means coupled to the sensing means for applying the isolated output signal from each terminal across a neutralizing impedance to produce a correction signal proportional to

but opposite in sign to the distortion signal produced by the parasitic impedance at the opposite terminal; and

means for passing each correction signal to the opposite terminal to be summed with the distortion signal to provide a substantially error-free output signal.

4,692,713

READ ONLY MEMORY CONTROL CIRCUIT FOR USE IN A PHASE LOCK LOOP

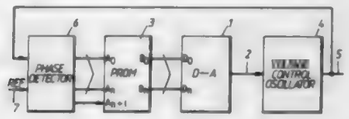
Brian Cordwell, Merley, and Paul M. Hayes, Poole, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Dec. 11, 1985, Ser. No. 807,629

Claims priority, application United Kingdom, Dec. 21, 1984, 8432552

Int. Cl.⁴ H03L *7/08;* **H03M** *1/70*

U.S. Cl. 331—1 A **7 Claims**



1. A control circuit comprising:

(A) An addressable memory, said addressable memory having a first storage area comprising n/2 addressable words and a second storage area comprising n/2 addressable words;

(B) addressing means to cause ouput of a word from said first storage area in dependence upon digital signals applied to address inputs of said addressable memory;

(C) means to cause a change of addressing from the word addressed in said first storage area to a corresponding word in the second storage area to cause output of said corresponding word in place of the first said word;

each of said n/2 addressable words in said first storage area representing a respective predetermined value and each of said n/2 addressable words in said second storage area representing a respective predetermined value; each of said respective predetermined values stored in said second storage area equalling a corresponding one of said respective predetermined values stored in the first storage area incremented by a fixed value, the circuit effecting a predetermined stepwise change in output value on change of addressing from one of said first or second storage areas to a corresponding one of said second or first storage areas.

4,692,714

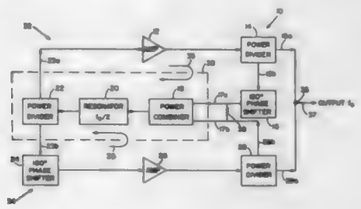
SINGLE RESONATOR PUSH-PUSH OSCILLATOR

Zvi Galani, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 20, 1986, Ser. No. 920,403

Int. Cl.⁴ H03B *5/18;* **H03L** *7/02*

U.S. Cl. 331—1 R **6 Claims**



1. A microwave push-push oscillator utilizing first and second active amplifying elements, each amplifying element having a feedback loop and an output, comprising:

(a) a resonator;

(b) first means for connecting said resonator in the feedback loop of siad first amplifying element;

(c) second means for connecting said resonator in the feedback loop of said second amplifying element; and

(d) means for maintaining a 180° phase relationship between the output of said first and said second amplifying elements

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4,692,715

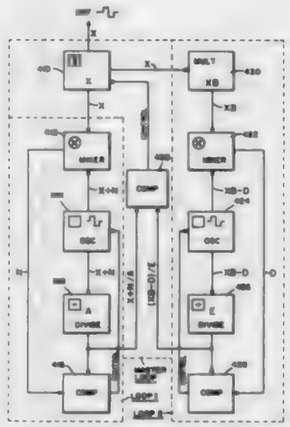
CONSTANT FREQUENCY SIGNAL GENERATOR CIRCUIT AND METHOD

Lewis C. Spence, 3084 N.W. 74th Ter., Okeechobee, Fla. 33472

Filed Mar. 3, 1986, Ser. No. 835,295

Int. Cl.⁴ H03L *7/06*

U.S. Cl. 331—2 **20 Claims**



1. A signal generator, which comprises:

(a) master oscillator means for generating an output signal having a preselected frequency value X;

(b) first loop means connected to said master oscillator means, and having a first local oscillator means, for generating in response to said output signal a first comparator signal having a first value indicative of the frequency deviation of said output signal from said preselected frequency value X;

(c) second loop means, connected to said master oscillation means, and having a second local oscillator means, for generating in response to said output signal a second comparator signal having a second value indicative of the frequency deviation of said output signal from said preselected frequency value X, said second value having an offset component which is twice the offset component of said first value for a given frequency deviation of said output signal from said preselected frequency value X; and

(d) master loop means, connected to said master oscillator means, first loop means and second loop means, for producing a master control signal in accordance with the difference between said offset component of first comparator signal and said offset component of said second comparator signal, said master control signal being supplied to said master control means to cause said output signal to be changed to have said preselected frequency value X.

4,692,716

METHOD AND A DEVICE FOR THE FREQUENCY CONTROL OF AN ATOMIC OR MOLECULAR BEAM FREQUENCY STANDARD

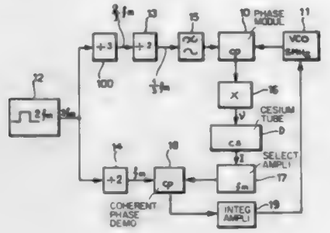
Andrea De Marchi, Via Sperino 13, Lessona (Vercelli), and Giovanni D. Rovera, Pacsana, both of Italy, assignors to Andrea DeMarchi, Lessona, Italy

Filed May 21, 1986, Ser. No. 866,202

Claims priority, application Italy, May 20, 1985, 20790 A/85

Int. Cl.⁴ H03L *7/26*

U.S. Cl. 331—3 **5 Claims**



1. A method for the frequency control of a frequency standard including an atomic or molecular beam device with two cavities to which an electromagnetic field is fed, whose frequency is modulated in time in a substantially sinusoidal way about an interrogation frequency near to the characteristic frequency of a selected transition of the atoms or molecules of said beam, and in which device a current is generated proportional to the number of atoms or molecules of the beam which have undergone said transition as an effect of their passage through the cavities; the method including the phases of:

generating a control signal as a function of a preselected detected characteristic of said current, and

modifying the frequency of said field as a function of said control signal, in such a way as to minimize the difference between said characteristic frequency and the interrogation frequency,

the improvement therein is in the fact that from said current the component is extracted whose frequency is an odd harmonic, higher than the first, of the frequency which modulates the interrogation frequency, and that said control signal is generated by coherently demodulating said component, in amplitude and sign.

4,692,717

VOLTAGE CONTROLLED OSCILLATOR WITH HIGH SPEED CURRENT SWITCHING

Kenneth W. Ouyang, Huntington Beach, and Melvin Marmet, Placentia, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 839,504, Mar. 14, 1986, abandoned. This application Dec. 8, 1986, Ser. No. 940,212

Int. Cl.⁴ H03K *3/023, 3/354*

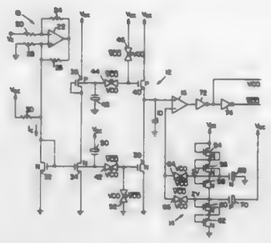
U.S. Cl. 331—111 **14 Claims**

1. A voltage controlled oscillator, comprising:

a reference capacitor which is periodically charged and discharged;

comparison means for comparing the voltage on the reference capacitor to a first reference voltage when the capacitor is charging and a second reference voltage when the capacitor is discharging, wherein the output of the comparison means is the output of the oscillator and switches from a first level to a second level when the voltage on the capacitor equals the first reference voltage and from the second level to the first level when the voltage on the capacitor equals the second reference voltage; and

pump means for charging and discharging the reference capacitor at a rate determined by the value of an input voltage, said pump means including a first MOS transistor for discharging the reference capacitor and a second complementary MOS transistor for charging the reference capacitor, third and fourth complementary MOS transistors having a current flowing through them corresponding to the value of the input voltage, switching means for alternately connecting together the gates of the



first and third transistors to turn on the first transistor and the gates of the second and fourth transistors to turn on the second transistor, and first and second capacitors connected to the gates of the third and fourth transistors, respectively, said capacitors storing a charge to facilitate rapid turn-on of the first and second transistor.

4,692,718

TUNABLE ASTABLE MULTIVIBRATOR WITH BUFFER TRANSISTORS

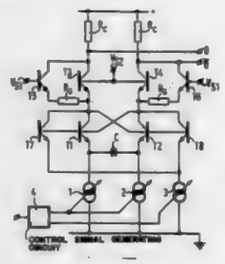
Engel Roza, and Hendrik G. Van Veenendaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,532

Claims priority, application Netherlands, Apr. 12, 1985, 8501088

Int. Cl.⁴ H03K *3/282*

U.S. Cl. 331—113 R **6 Claims**



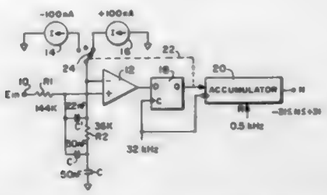
1. A tunable oscillator circuit provided with a pair of oscillator transistors whose bases are connected crosswise to the opposite collectors, and a capacitance which is arranged between the emitters of the oscillator transistors, each emitter being connected via an emitter current source to a reference voltage, characterized by a pair of buffer transistors in common base configuration, whose two collectors are connected via a pair of collector resistors to a supply voltage and constitute an output of the tunable oscillator circuit, said pair of buffer transistors being arranged in a cascode configuration with the pair of oscillator transistors, the emitter current of the buffer transistors being equal to the sum of the base and collector currents of the oscillator transistors.

4,692,719

COMBINED PACEMAKER DELTA MODULATOR AND BANDPASS FILTER

Robert H. Whigham, Aurora, Colo., assignor to Telectronics N.V., Caracao, Netherlands Antilles

Filed Aug. 1, 1986, Ser. No. 891,478
Int. Cl.⁴ H03K *13/22*
U.S. Cl. 332—11 D **7 Claims**



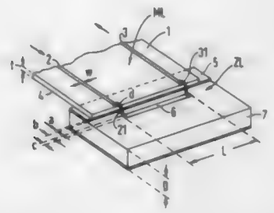
1. A combined pacemaker delta modulator and bandpass filter comprising a differential amplifier having plus and minus inputs, means for coupling an input signal to said plus input, means for connecting an RC bandpass filter network between said plus and minus inputs, and means for periodically sampling the output of said differential amplifier and, depending upon its polarity, applying a constant current of respective polarity to said minus input.

4,692,720

ARRANGEMENT FOR PRODUCING A JUNCTION BETWEEN A MICROSTRIP LINE AND A COPLANAR TRANSMISSION LINE

Franz Auracher, Baierbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1985, Ser. No. 717,116
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420599
Int. Cl.⁴ H01P *5/08*
U.S. Cl. 333—33 **3 Claims**



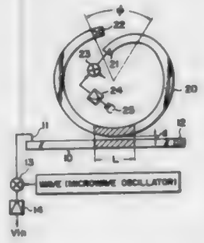
1. A broadband junction structure for a microstrip line and a coplanar twin-band line, comprising:
first and second electrically-insulating substrates each including first and second spaced apart surfaces, all of said surfaces being in respective parallel spaced apart planes;
a first ground electrode carried on said first surface of said first substrate and a second ground electrode carried on said first surface of said second substrate, said first and second ground electrodes electrically contacting one another;
first and second spaced apart parallel strip electrodes on said second surface of said first substrate which together with said first ground electrode constitute a microstrip line, said strip electrodes extending perpendicular to said second ground electrode;
at least one narrow electrode on said first surface of said second substrate spaced from said second ground electrode, said at least one narrow electrode including opposite ends and together with said second ground electrode constituting a twin-band line; and
first and second electrical connections respectively connecting said first and second strip electrodes to said opposite ends of said at least one narrow electrode.

4,692,721

DIELECTRIC ROTARY COUPLER

Yujiro Ito; Yasutoshi Kamatsu, and Takashi Otobe, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,726
Claims priority, application Japan, Oct. 18, 1984, 59-217371; Oct. 25, 1984, 59-223003; Apr. 25, 1985, 60-87483
Int. Cl.⁴ H01P *5/08, 5/18, 3/16*
U.S. Cl. 333—109 **11 Claims**



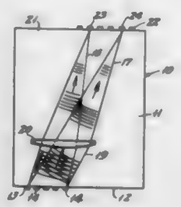
1. In a rotary coupler for transmitting signals between signal treatment portions installed on a rotary member and a stationary member, a dielectric rotary coupler comprising a first dielectric line installed on said rotary member, a second dielectric line installed on said stationary member, a first signal input and/or output portion installed on said first dielectric line, a second input and/or output portion installed on said second dielectric line, and means for attaining a coupling between said first and second dielectric lines, one of said first and second dielectric lines being substantially ring-shaped with a center which is coincident with the axis of the rotation of said rotary member, wherein said rotary member rotates during the signal transmission between said first and second input and/or output portions.

4,692,722

COMPACT FREQUENCY DISPERSIVE BULK ACOUSTIC WAVE CHANNELIZER

Paul Reichel, deceased, late of New York, and Gilbert Reichel, administrator, Woodbury, both of N.Y., assignors to Loral Corporation, Yonkers, N.Y.

Filed Oct. 12, 1984, Ser. No. 660,491
Int. Cl.⁴ H03H *9/40*
U.S. Cl. 333—142 **1 Claim**



1. In a radio frequency bulk acoustic channelizer, including an acoustic medium of hexagonal crystalline material, having a low acoustic isotropy in at least one plane therein perpendicular to the axis of hexagonal symmetry, said medium being bounded by a plurality of opposed surfaces normal to said

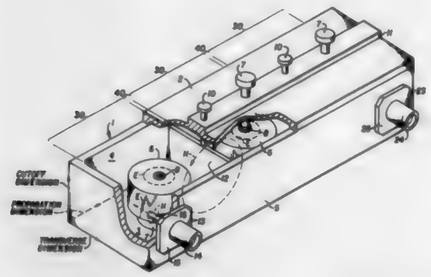
plane; a frequency steered ultrasonic array disposed upon one of said surfaces, including plural beam radiating elements in mutually spaced relation, said one of said surfaces being curved whereby said radiating elements refract received beams to focus upon a second oppositely disposed surface; and an all acoustic receptor array, including plural receptor elements disposed upon said second oppositely disposed surface to receive focused beams of differing frequencies to effect channelization of said beams in accordance with given frequencies, the improvement comprising: said plural receptor elements each comprising a pair of small conducting parallel plates with a piezo electric material therebetween, said receptor elements being disposed in adjacent generally parallel relation; said receptor elements also being arranged in slanted relation relative to the direction of a received beam to result in frequency overlap in the band received by each receptor element; said receptor elements being of ovate configuration so as to favor the mid-frequencies of a received range of frequencies.

4,692,723

NARROW BANDPASS DIELECTRIC RESONATOR FILTER WITH MODE SUPPRESSION PINS

Slawomir J. Fiedziuszko, Palo Alto, and Craig A. Ziegler, Mountain View, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

PCT No. PCT/US85/01289, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO87/00204, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 8, 1985, Ser. No. 758,631
Int. Cl.⁴ H01P *1/20, 1/162*
U.S. Cl. 333—202 **5 Claims**



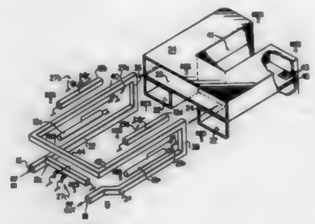
1. A narrow bandpass filter for filtering electromagnetic energy comprising dielectric resonators positioned within an elongated waveguide having a rectangular cross-section, four elongated electrically conductive walls, and wherein the dimensions of the waveguide are sufficiently small such that the electromagnetic energy would be cut off and would not propagate through the filter in the absence of the dielectric resonators; wherein:
said waveguide comprises at least two active sections each containing a dielectric resonator;
each two adjacent active sections are coupled by means comprising an electrically conductive partition which continuously abuts three of the waveguide walls and constricts the waveguide cross-section thereby forming a coupling opening for passing the electromagnetic energy between adjacent active sections;
one of a set of elongated electrically conductive mode suppression rods bisects each coupling opening, and physically and electrically connects the remaining one of the waveguide walls with the partition corresponding to said coupling opening thereby forming an electrical short circuit between a first pair of opposing waveguide walls midway between a second pair of opposing waveguide walls; and
the electromagnetic energy within the waveguide propagates in a single TE_{10} evanescent mode.

4,692,724

HIGH POWER TUNABLE FILTER

Mark A. Harris, Clearwater, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Oct. 21, 1985, Ser. No. 789,669
Int. Cl.⁴ H01P *1/20, 1/203*
U.S. Cl. 333—202 **20 Claims**



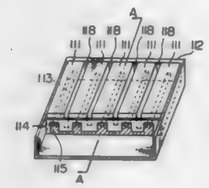
1. A high power tunable filter, comprising:
a transmission line having an input, for receiving a signal to be filtered, and on an output, the transmission line having first and second portions and means for interconnecting the first and second portions, the first portion of the transmission line located in a first plane and the second portion of the transmission line located in a second plane substantially parallel to the first plane;
a plurality of resonators, each parallel-coupled to said transmission line and having a controllable resonant frequency;
an electronic tuning network coupled to each of said resonators for controlling the resonant frequency thereof, each such tuning network including:
one or more tunable reactive elements; and
one or more switches, each of said switches connected to one of said tunable reactive elements to enable said switch to connect the associated tunable reactive element in and out of said tuning network, thereby controlling the resonant frequency of the resonator coupled to said tuning network; and
means for driving said electronic tuning networks to set a frequency characteristic of said tunable filter.

4,692,725

DIELECTRIC FILTER HAVING TRIMMABLE CAPACITOR

Atsushi Fukasawa; Kenichiro Hosoda; Takuro Sato, and Tatumasa Yoshida, all of Tokyo, Japan, assignors to OKI Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 490,881, May 2, 1983, Pat. No. 4,546,333. This application Jun. 26, 1985, Ser. No. 749,185
Claims priority, application Japan, May 10, 1982, 57-76565
Int. Cl.⁴ H01P *1/205*
U.S. Cl. 333—203 **8 Claims**



1. A dielectric filter comprising:
(a) a conductive closed housing,

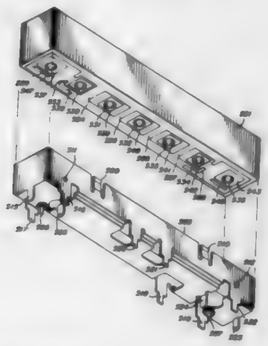
(b) at least two resonators fixed in said housing,
(c) input means for coupling one end resonator of said at least two resonators to an external circuit, and output means for coupling the other end resonator of said at least two resonators to an external circuit,
(d) each resonator comprising an elongated linear inner conductor one end of which is fixed commonly at the bottom of said housing, and the other end of which is free standing with respect to the housing and a dielectric body surrounding the inner conductors,
(e) the thickness of said dielectric body surrounding said inner conductor being sufficient to hold all the electromagnetic energy in the dielectric body except for the energy for coupling between two adjacent resonators,
(f) an unplated air gap groove provided between adjacent resonators;
(g) said dielectric body surrounding the inner conductors being a bulk body common to all the resonators in which said unplated air gap groove between two adjacent resonators extends parallel to the conductors the entire distance along the body from the free standing end of the body to the fixed end of the body and in which the depth of said groove extends only a portion of the thickness of said body, and said groove operates as said air gap between resonators for effecting static coupling between the resonators independently of magnetic coupling, and
(h) a conductive layer electrically isolated from the inner conductors and adapted to be trimmed and spaced from the end of the dielectric body which is free standing with respect to the housing, said conductive layer having a respective extended portion associated with each resonator and covering at least a portion of the end of the respective inner conductor of each resonator so that a capacitor is formed between said conductive layer and the inner conductor of each resonator wherein the respective extended portions are directly electrically coupled to each other.

4,692,726

MULTIPLE RESONATOR DIELECTRIC FILTER

Steven R. Green, Glendale Hts.; David M. De Muro, Schaumburg, and Raymond L. Sokola, Lake Zurich, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 25, 1986, Ser. No. 890,686
Int. Cl.⁴ H01P *1/202, 7/04*
U.S. Cl. 333—206 **14 Claims**



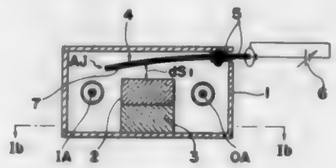
1. A filter comprising:
dielectric means comprised of a dielectric material and having first, second, and side surfaces, said second and side surfaces of the dielectric means being substantially covered with a conductive material;
at least first, second, and third holes having surfaces substantially covered by a conductive material, extending from the first surface of the dielectric means toward the second surface thereof and having openings on the first surface of the dielectric means that are disposed at predetermined distances relative to one another and substantially aligned with one another;
first and second coupling means coupled to said first and third holes, respectively;
first, second, and third capacitive means each including electrode means coupled to and surrounding the openings of first, second, and third holes, respectively, for capacitively coupling said first hole to said second hole and said second hole to said third hole and capacitively coupling said holes to the conductive material on the side surfaces of said dielectric means; and
strip electrode means coupled to the conductive coating on the side surfaces of said dielectric means and extending at least partially between two of said holes for adjusting the capacitive coupling therebetween.

4,692,727

DIELECTRIC RESONATOR DEVICE

Kikuo Wakino, Muko; Hiroshi Tamura, and Youhei Ishikawa, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 3, 1986, Ser. No. 870,088
Claims priority, application Japan, Jun. 5, 1985, 60-123136
Int. Cl.⁴ H01P *7/10*
U.S. Cl. 333—219 **7 Claims**



1. A dielectric resonator device comprising:
a casing for defining a chamber therein;
a dielectric resonator provided in said chamber;
a piezoelectric frequency adjusting unit provided in said casing;
a portion of said piezoelectric frequency adjusting unit being located adjacent said dielectric resonator; and
means for applying a voltage to said piezoelectric frequency adjusting unit;
said piezoelectric frequency adjusting unit being adapted to alter its shape by the voltage applied thereto so as to control a distance between said portion and said dielectric resonator, thereby controlling the resonance frequency of said dielectric resonator device.

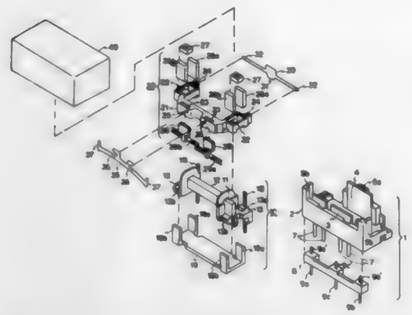
4,692,728

SELF-ALIGNING SPRING MECHANISM FOR AN ELECTRICAL SWITCH

Kozo Maenishi, Nagaokakyo, and Youichi Nakanishi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation-in-part of Ser. No. 657,589, Oct. 4, 1984, Pat. No. 4,647,885. This application Sep. 26, 1985, Ser. No. 780,454
Claims priority, application Japan, Oct. 5, 1983, 58-187232
Int. Cl.⁴ H01H *3/00*
U.S. Cl. 335—192 **18 Claims**

1. A movable block switch mechanism which compensates for unevenness of spring force on the movable block, comprising:
a base;
a movable block having projections; and
a sheet spring having openings which engage to the projections of the movable block and having ends which engage to the base, and wherein deflection of at least one of the ends of the sheet spring causes the portion of the spring between the spring openings to bulge in a direction opposite to the direction of deflection of the spring.

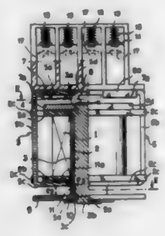


4,692,729

DIRECT CURRENT ELECTROMAGNET HAVING A MOVEMENT OF TRANSLATION

Gérard Koehler, Ville d'Avray, France, assignor to La Telemecanique Electrique, Nanterre Cedex, France

Filed Aug. 11, 1986, Ser. No. 895,457
Claims priority, application France, Aug. 16, 1985, 85 12459
Int. Cl.⁴ H01F *7/08*
U.S. Cl. 335—259 **10 Claims**



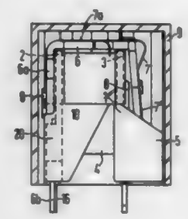
1. A direct current electromagnet having a movement of translation, comprising a first magnetic assembly (**3, 4**) and a second magnetic assembly (**5, 6**), said assemblies being movable with respect to one another, and a winding (**1**) wound on a coil former (**2**) surrounding a core (**3**) which belongs to the first assembly and one end (**3***a*) of which is provided with a pole shoe (**4**) facing a first zone (**5***a*, **6***a*) of the second assembly (**5**), thus defining a first large-surface air-gap (**4**/**5***a*, **6***a*), characterised in that the second end (**3***b*) of the core (**3**) is continued beyond the coil former (**2**) and is provided with a second pole shoe (**9**), and the second magnetic assembly (**5, 6**) has a second zone (**5***c*, **6***c*) disposed between the coil former (**2**) and the second pole shoe (**9**), thus defining with the latter (**9**) a second large-surface air-gap (**9**/**5***c*, **6***c*) disposed magnetically in series with the first air-gap (**4**/**5***a*, **6***a*) and closing simultaneously therewith.

4,692,730

ELECTROMAGNETIC RELAY HAVING AN INSULATING CAP AND A METHOD FOR MANUFACTURING THE INSULATING CAP

Erwin Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 827,502
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506354
Int. Cl.⁴ H01F *5/06*
U.S. Cl. 335—278 **3 Claims**



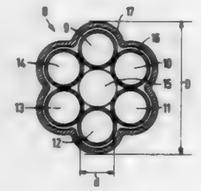
1. In an electromagnetic relay of the type in which a coil body carrying a winding having an axis, in which the coil body comprises end flanges perpendicular to the axis, and in which an insulating cap surrounds at least that portion of the coil body and winding lying above a plane extending through the axis, the improvement comprising:
a central section of the insulating cap shaped complementary to the outer contour of and receiving the winding therein;
a pair of pockets perpendicular to the axis and connected to said central section and receiving respective ones of the flanges;
a yoke including a first leg extending parallel to the axis adjacent and external of the insulating cap and a second leg extending perpendicular to the axis adjacent one of the pockets and external of the insulating cap; and
an axially extending core projecting out of each end of the coil body, the insulating cap comprising means defining clearances for receiving the projecting ends of the core.

4,692,731

COMPOSITE WIRE, COIL AND DEFLECTION UNIT FOR HF APPLICATIONS

Halbe Osinga, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,988
Claims priority, application Netherlands, Apr. 4, 1985, 8500993; Feb. 12, 1986, 8600341
Int. Cl.⁴ H01F *5/00*
U.S. Cl. 335—299 **13 Claims**



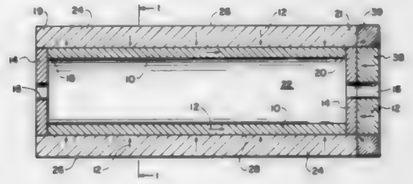
1. A composite wire for high-frequency applications, comprising: at least one bare wire strand and a plurality of single wire strands of electrically conductive material; each of the single wire strands having a thin insulating layer and extending

in pre-determined parallel positions with respect to each other and parallel to the length of the composite wire; all of said wire strands being bundled to form a solid assembly; and a layer of electrically insulating material enveloping such solid assembly.

4,692,732
REMANENCE VARYING IN A LEAKAGE FREE PERMANENT MAGNET FIELD SOURCE

Herbert A. Leupold, Eatontown; Ernest Potenziani, II, Ocean, and John Clarke, Cranford, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1986, Ser. No. 868,862
Int. Cl.[4] H01F *7/02*
U.S. Cl. 335—302 **14 Claims**



1. A magnetic circuit having low magnetic leakage comprising:

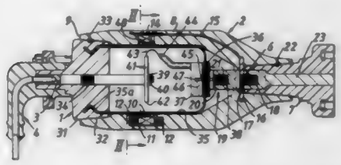
a constant radial thickness, remanence varying axially magnetized cylindrical magnet having an axial bore therethrough with a longitudinally linearly increasing magnetic field therein; and

a constant radial thickness, remanence varying radially magnetized cladding magnet coaxially circumscribing said cylindrical magnet.

4,692,733
FUSE FOR AN ALTERNATING CURRENT POWER CIRCUIT

Martin C. Oakes, Leeds, England, assignor to Y. S. Securities Limited, West Yorkshire, England

Filed Jul. 17, 1986, Ser. No. 887,547
Claims priority, application United Kingdom, Jul. 20, 1985, 8518081
Int. Cl.[4] H01H *85/04*
U.S. Cl. 337—158 **25 Claims**

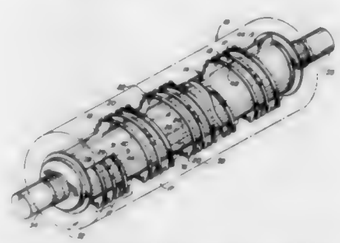


1. A fuse for an alternating current power circuit in the voltage range of 3.3 kV to 38 kV, the fuse comprising a sealed chamber; a first electrode mounted within the chamber, the first electrode having a substantially circular periphery and being electrically connected to a first terminal to which a first conductor may be connected; a second electrode with a conductive surface internally of the chamber, the conductive surface being spaced from the first electrode; a second terminal to which a second conductor may be connected; a coil connected in an electrical path between the second electrode and the second terminal; an additional electrical contact mounted within the chamber and in direct electrical connection with the second terminal; a fusible element directly electrically connected between the first electrode and the additional electrical contact, and an electronegative halogenated medium filling free space within the chamber; the normal current path between the first and second terminals being by way of the first electrode, the fusible element and the additional electrical contact; and the arrangement being such that when the fusible element breaks, the resulting fault current forms an arc between the first electrode and the additional contact, one root of the arc subsequently commutates from the additional contact to the second electrode, the fault current flows through the coil and induces a magnetic field, the magnetic field causes the arc to rotate around the first electrode in the electronegative medium, and the arc is thereby extinguished, so interrupting the fault current.

4,692,734
INTERRUPTING DEVICE WITH IMPROVED CURRENT-LIMITING ARRANGEMENT

Roy T. Swanson, Riverside; Leonard V. Chabala, Maywood, and Hiram S. Jackson, Glenview, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Jul. 21, 1986, Ser. No. 888,560
Int. Cl.[4] H01H *85/04, 85/12*
U.S. Cl. 337—162 **20 Claims**



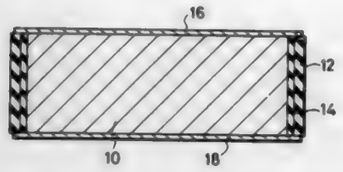
1. A current-limiting arrangement for an interrupting device that includes a main current path in parallel with the current-limiting arrangement, the main current path including a switch which is operable to rapidly open the main current path, the current-limiting arrangement comprising:

means comprising a plurality of fusible elements for improving the transfer of high currents from the main current path to the current-limiting arrangement without substantially increasing the minimum current that is interruptable by the current-limiting arrangement, each of said plurality of fusible elements comprising an elongated, thin, conductive ribbon, one or more of said plurality of fusible elements having holes, slots, or notches formed through or in said ribbon and spaced along the length of said ribbon with the length of each of said holes, slots, or notches not exceeding a first predetermined dimension along the length of said ribbon, the remaining one or more of said plurality of fusible elements having holes, slots, or notches formed through or in said ribbon and spaced along the length of said ribbon with the length of each of said holes, slots, or notches being greater than or equal to a second predetermined dimension along the length of said ribbon, said second predetermined dimension being greater than said first predetermined dimension.

4,692,735
NONLINEAR VOLTAGE DEPENDENT RESISTOR AND METHOD FOR MANUFACTURING THEREOF

Moritaka Shoji; Takeo Yamazaki, and Satoru Ogihara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,584
Claims priority, application Japan, Apr. 25, 1984, 59-81831
Int. Cl.[4] H01C *7/10*
U.S. Cl. 338—21 **5 Claims**

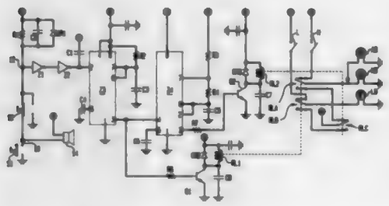


1. A nonlinear voltage dependent resistor comprising a zinc oxide (ZnO) based sintered body constituting a current flowing passage having high-resistance layer formed on the side thereof and electrodes (18) formed on the upper and lower ends thereof characterized in that said high-resistance side layer contains silicon, antimony, bismuth, and lithium, the average composition of the portion from the side surface to a depth of 200 μm being 5 to 70 mol % of silicon (in terms of SiO_2), 2 to 30 mol % of antimony (in terms of Sb_2O_3), 2 to 10 mol % of bismuth (in terms of Bi_2O_3), 0.01 to 5 mol % of lithium (in terms of Li_2CO_3), and 10 to 90 mol % of zinc (in terms of ZnO).

4,692,736
VEHICLE FLASHER

Victor Crisci, 70 Lenox Rd., Wayne, N.J. 07470

Filed Apr. 17, 1985, Ser. No. 724,455
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—81 R **15 Claims**



1. A flasher for flashing a vehicle light normally powered by a power switch, comprising:

a manual switch;

an interval means coupled to said manual switch for providing in response to its operation a duration signal of at least a predetermined duration;

cycling means coupled to said interval means for providing a periodic cycling signal in response to and for the duration of said duration signal, said predetermined duration of said duration signal exceeding the period of said periodic cycling signal;

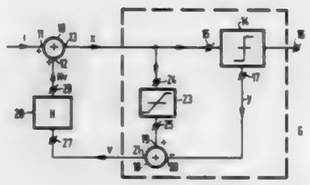
pulsing means for providing a power output, said pulsing means being coupled to said cycling means for blanking said power output in response to and synchronously with said cycling signal; and

substitution means coupled to said power switch, said interval means and said pulsing means for repowering said light from said pulsing means instead of said power switch in response to and for the duration of said duration signal, said substitution means being operable by said interval means in the absence of said periodic signal from said cycling means to power said vehicle light for said predetermined duration, whereby said vehicle light is flashed for said predetermined duration.

4,692,737
ENCODING DEVICE

Eduard F. Stikvoort; Arthur H. M. van Roermund, and Peter J. A. Naus, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1986, Ser. No. 920,490
Claims priority, application Netherlands, Apr. 4, 1986, 8600862
Int. Cl.[4] H03M *1/00*
U.S. Cl. 340—347 DD **14 Claims**



1. An encoding device comprising a quantizer for converting an input signal into an one-bit encoded signal, which quantizer comprises an input for receiving the input signal and an output for supplying the one-bit encoded signal, and further comprising error-feedback means for feeding back to the quantizer input a quantization-error signal caused by the quantizer, which error-feedback means comprise an at least third-order filter having an input and an output, wherein the transfer function of the filter is given by

$$H_n(Z)=1-(Z-b)^n/(Z-a)^n$$

where:

$n \geqq 3$ is the order of the filter

b is a constant substantially equal to unity, and

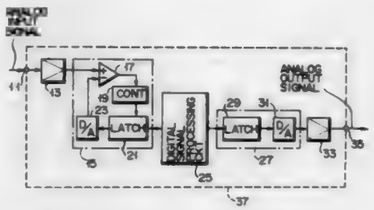
a is a constant for which $0<a<b$,

and in that the device comprises limiting means for limiting the quantization-error signal applied to the input of the filter.

4,692,738
ANALOG SIGNAL PROCESSING APPARATUS

Seigo Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 13, 1985, Ser. No. 711,382
Claims priority, application Japan, Mar. 14, 1984, 59-48606
Int. Cl.[4] G06G *7/12*; G06J *1/00*; H03K *13/02*
U.S. Cl. 340—347 C **9 Claims**



1. An analog signal processing apparatus comprising:

analog-to-digital converting means for receiving an analog input signal and converting said analog signal to a digital signal in accordance with a predetermined converting function and outputting the digital signal;

digital signal processing means connected to said analog-to-

digital converting means for receiving the output digital signal of said analog-to-digital converting means and performing a predetermined digital signal process upon the output digital signal of said analog-to-digital converting means; and

digital-to-analog converting means, connected to said digital signal processing means and separate from said analog-to-digital converting means, for receiving and converting the output digital signal of said digital processing means to an output analog signal in accordance with a converting function which is substantially equal to the inverse function of said converting function of said analog-to-digital converting means;

said analog-to-digital converting means represented by the relationship:

$$D_1 = f(A_i)$$

in which A_i is the analog input signal, D_i is the digital output signal, and f is the converting function; and said digital-to-analog converting means represented by the relationship:

$$Aj = f^{-1}(D_j)$$

in which D_j is the output digital signal of the digital signal processing means, Aj is the output analog signal, and f^{-1} is the converting function substantially equal to the inverse of the converting function f; thereby correcting error occuring when said analog-to-digital converting means converts the input analog signal to the digital signal.

4,692,739

CONTROL DEVICE USING LIGHT-EMITTING DIODES FOR BOTH MANUAL INPUT AND DISPLAY OF DATA

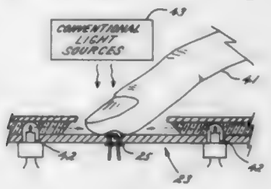
Alfred Dorn, Rodgau, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 750,673

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1984, 3424412

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 340—365 P **17 Claims**



1. An apparatus for the input and display of data of the kind having at least one light-emitting diode and means for selectively applying current to said light-emitting diode to display to an operator at least some of said data, wherein the improvement comprises, in combination,

said means for selectively applying current provides means for repetitively limiting the applied current to said light-emitting diode, and

means responsive to a photo-current produced by said light-emitting diode in response to surrounding illumination for generating at least some of said data when said means for selectively applying current repetitively limits said applied current so that said light-emitting diode functions both as a data display device and as a data input device responsive to the covering of said light-emitting diode by said operator.

4,692,740

KEY INPUT DEVICE

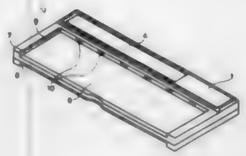
Isamu Washizuka, Kyoto, and Kiyoshi Kinugawa, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1984, Ser. No. 581,799

Claims priority, application Japan, Feb. 21, 1983, 58-24563[U]

Int. Cl.⁴ G06F *3/02*

U.S. Cl. 340—365 R **8 Claims**



1. A key input device for an electronic apparatus that has a body, comprising:

selectable keyboard means for producing key input signals, said selectable keyboard means including a plurality of key switches; and

connector means for connecting said selectable keyboard means to the body of the electronic apparatus so that said key input signals can be input to the electronic apparatus, said connector means providing a non-fixed connection of said selectable keyboard means and the body of the electronic apparatus so that said selectable keyboard means and the body of the electronic apparatus are disconnectable without damage to said connector means,

wherein said connector means comprises a plurality of lock projections provided on said selectable keyboard means and a plurality of locks provided on the body of the electronic apparatus for engaging said plurality of lock projections, and

wherein said connector means further comprises at least one mode selection projection, attached to said selectable keyboard means, said selectable keyboard means being identified by the type of mode selection projection and number of mode selection projections, and a plurality of mode selection receptors attached to the body of the electronic apparatus, said mode selection receptors coupled to said at least one mode selection projection to connect and to indentify said selectable keyboard means to the body of the electronic apparatus.

4,692,741

MOTOR ACTUATED BUZZER ASSEMBLY WITH A PLURALITY OF LEAF SPRINGS OF DIFFERENT FREQUENCIES

Shigeo Shimoya, Kitamoto; Yutaka Iwasaki, Kumagaya; Tadashi Ishii, Tokyo, and Hikoji Iwasaki, Konosu, all of Japan, assignors to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,219

Claims priority, application Japan, Jun. 29, 1984, 59-98357[U]; Jul. 14, 1984, 59-105681[U]

Int. Cl.⁴ G10K *1/00, 1/08*

U.S. Cl. 340—392 **6 Claims**

1. A motor actuated buzzer comprising:

(a) a body;

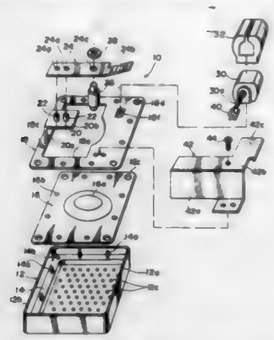
(b) a motor mounted on said body and having a rotatable output shaft;

(c) cam means comprising at least one cam member fixedly mounted on said output shaft and having a plurality of radial protrusions;

(d) a sound generating plate mounted on said body;

(e) a hammer for striking said sound generating plate; and

(f) resilient means comprising a plurality of leaf springs placed one upon the other, each of said springs being fixed to said body at one end thereof and urged toward said cam member, one of said leaf springs carrying said hammer intermediate opposite ends thereof and having at a free end thereof a projection, said radial protrusions being engageable with said projection upon rotation of said cam



member, said plurality of leaf springs having such different frequencies that, when said cam member rotates, said plurality of leaf springs cooperate with one another to oscillate as a combined leaf spring which is wider in bandwidth than any one of said plurality of leaf springs, whereby said sound generating plate is intermittently struck by said hammer to produce a buzzing sound.

4,692,742

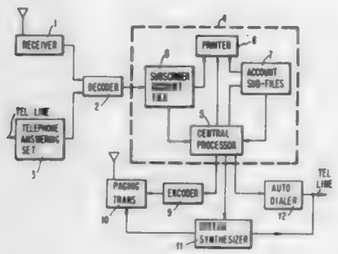
SECURITY SYSTEM WITH CORRELATED SIGNALLING TO SELECTED SATELLITE STATIONS

David T. Raizen, 31 Meadow Rd., Scarsdale, N.Y. 10583, and Richard A. Wilmot, 9 Woodlawn Ave., Albany, N.Y. 12209

Filed Oct. 21, 1985, Ser. No. 789,568

Int. Cl.⁴ G08B *1/08;* **H04Q** *7/00*

U.S. Cl. 340—539 **9 Claims**



1. A security system comprising:

a plurality of sensors respectively adapted to produce an alarm signal upon occurrence of a predetermined alarm condition at a location monitored by such sensor;

a plurality of encoders respectively connected to said sensors, each encoder being responsive to the alarm signal produced by the sensor connected thereto to encode such alarm signal to identify the corresponding alarm condition and sensor location;

means connected to each of said encoders for transmitting the encoded alarm signals produced thereby over at least one transmission channel;

a plurality of satellite stations respectively adapted to receive correlated signals which uniquely address each of such satellite stations;

a central control station comprising means for receiving and decoding the transmitted encoded alarm signals from said transmission channels;

a computer further comprised in said central control station programmed to correlate each of the decoded alarm signals with information stored in the computer memory relating to each sensor location and alarm condition, and adapted to produce correlated signals which respectively address one or a plurality of particular satellite station to be notified of respective alarm conditions and include the correlated signals to be transmitted to each such satellite station and further adapted to select the number and identities of the satellite stations to be notified, which selection being a function of the nature of the alarm condition and of the location being monitored by said sensor;

and means comprised in said central control station and connected to said computer for transmitting such correlated signals to the satellite stations identified thereby.

4,692,743

ALARM SYSTEM

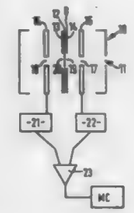
Harold C. Holden, and June Holden, both of Glen Dhoo Cottage Ballaugh Glen, Isle of Man

Filed Oct. 15, 1985, Ser. No. 787,404

Claims priority, application United Kingdom, Apr. 6, 1984, 84 08937

Int. Cl.⁴ G08B *13/20*

U.S. Cl. 340—544 **6 Claims**



1. An alarm system comprising a sensor responsive to air pressure within an enclosed space, the sensor providing electrical signals as a function of the sensed air pressure, and a signal processor to which the electrical signals are supplied and operative to initiate an alarm indication when the signal supplied by the sensor is indicative of an intrusion into the enclosed space, said alarm system being characterized in that the signal processor is operative to cause the sensor to measure the air pressure in the enclosed space at intervals and to compare the measured value with a plurality of predetermined discrete narrow reference ranges of values and select the reference range within which the measured value lies, and also to cause the sensor to measure the air pressure in the enclosed space at other more frequent intervals and compare the measured value with the reference range selected at that time, an alarm indication being given if a value measured at one of the more frequent intervals lies outside the reference range selected at that time.

4,692,744

GLAZING UNIT ALARM SYSTEMS

James A. A. Hickman, 14a Seaforth Drive, Edinburgh, Scotland

Filed Jan. 2, 1986, Ser. No. 815,586

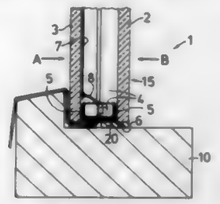
Claims priority, application United Kingdom, Jan. 4, 1985, 8500203

Int. Cl.⁴ G08B *13/00*

U.S. Cl. 340—550 **12 Claims**

1. A glazing unit alarm system comprising a glazing panel and electric alarm means including a light transmitting electrically conductive coating extending over at least most of the area of the glazing panel and detection means for detecting a

change in resistance of the electrically conductive coating occasioned by a breakage or an attempted breakage of the glazing panel, wherein the electrically conductive coating comprises an emissivity coating which reflects the majority of incident heat radiation having wavelengths in a first wavelength band and which transmits the majority of incident heat



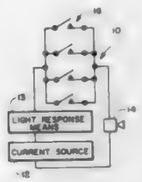
radiation having wavelengths in a second wavelength band, the first and second wavelength bands being non-overlapping and each lying in the infra-red region of the electromagnetic spectrum, one of the wavelength bands containing shorter wavelength solar heat radiation and the other wavelength band containing longer wavelength room heat radiation.

4,692,745

CREDIT CARD ALARM

Solly Simanowitz, 6009 Bellevue Ave., La Jolla, Calif. 92037

Filed Dec. 23, 1985, Ser. No. 812,520
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—568 **7 Claims**



1. In a foldable wallet having two inner portions which fold together when said wallet is not in use and are unfolded when said wallet is in use, an alarm system for one of said portions comprising a credit card holder having a plurality of receptacles for receiving and maintaining credit cards, said alarm system comprising:

a plurality of switches, one of which is associated with each of said plurality of receptacles, said switches being switched to an open state when an object is received therein and being switched to a closed state when the object is removed therefrom;

a photoconductive means positioned in the inner portion of said foldable wallet, which inhibits current flow when exposed to light energy when the wallet unfolded and conducts current in the absence of light energy when the container is folded for non-use,

a current source;

an audio alarm;

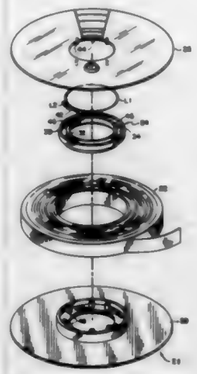
said plurality of switches, photoconductive means, current source and audio alarm being operatively interconnected so as to sound the audio alarm only when one or more of said plurality of switches are closed, by a removed credit card, and said wallet is in a folded non-use position wherein said photoconductive means receives no light energy.

4,692,746

RECORDING-TAPE-REEL ASSEMBLY WITH ELECTRONIC TAG

Richard J. Bodin, Clearwater; James G. Wyatt, Jr., Treasure Island, and Fred W. Herman, Tampa, all of Fla., assignors to Security Tag Systems, Inc., St. Petersburg, Fla.

Filed Feb. 26, 1986, Ser. No. 833,824
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **5 Claims**



1. A recording-tape-reel assembly, comprising

a reel for holding a recording tape;

an electronic tag for enabling detection of the presence of the assembly in a presence detection system; and

means for housing the electronic tag in the assembly so that the electronic tag is isolated from said tape and is inaccessible to users of the assembly;

wherein the reel comprises a hub on which said tape is wound and flanges attached on opposite sides of the hub;

wherein one exterior side of the hub defines a slot;

wherein the tag is disposed in said slot; and

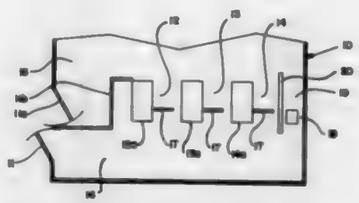
wherein one of the flanges covers the slot to isolate the tag from said tape and to make the tag inaccessible to users of the assembly.

4,692,747

ARTICLE SECURITY SYSTEM

Albert E. Wolf, Philadelphia, Pa., assignor to Checkpoint Systems, Inc., Thorofare, N.J.

Filed Jul. 17, 1986, Ser. No. 886,418
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **10 Claims**



1. In a check-out system for premises having an interior area which houses articles protected against unauthorized removal from said premises, said articles having affixed thereto security tags which are detectable by an electronic article surveillance system, said premises being provided with a plurality of check-out aisles for said articles, each aisle having one end facing said interior area and an opposite end facing a common passageway

connecting all of said opposite ends to each other and to an exit from said premises, the improvement which comprises:

means for barring persons desiring to remove articles from said premises via said check-out aisles from accompanying said articles through said aisles to their said opposite ends;

at least one path separate from said check-out aisles and leading from said interior area to said common passageway, through which path said persons are able to reach said opposite ends of the check-out aisles for article retrieval; and

an electronic article surveillance system associated with said at least one separate path for detecting security tags carried through said separate path.

4,692,748

APPARATUS FOR DETERRING THUMBSUCKING

George F. Pinsak, 1102 E. Franklin St., Monroe, N.C. 28110, and Henry H. Morton, Jr., 100 Covington St., Wadesboro, N.C. 28170

Filed Jul. 18, 1986, Ser. No. 887,863
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—573 **10 Claims**



5. Glove apparatus for deterring a person from thumbsucking, said glove apparatus comprising a glove body adapted to be worn on the person's hand, a first electrical contact affixed to said glove body for electrical contact with the person's skin, a second electrical contact affixed to said glove body for exposure outwardly of the person's thumb in electrically insulated relation therefrom, circuit means electrically connecting said first and second electrical contacts for potential electrical current flow therebetween, battery means attached to said glove body in electrical association with said circuit means for supplying electrical current thereto, and alarm means attached to said glove body in electrical association with said circuit means for activation of an audible signal by electrical current flow through said circuit means, said first and second electrical contacts being adapted to complete a continuous electrical circuit through said circuit means and through the body of the person when the thumb is inserted in the person's mouth in electrical contact therewith for permitting flow of electrical current from said battery means through said circuit means to activate said alarm means to alert the person to remove the thumb from the mouth.

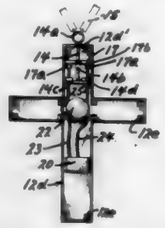
4,692,749

WEARABLE ALARM

Wilfred C. Bussing, Jr., 2905 Bayard Park Dr., Evansville, Ind. 47714

Filed Aug. 29, 1985, Ser. No. 770,597
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—574 **4 Claims**

1. A wearable alarm comprising a first portion positioned on the person of a user, a second portion slidable on said first portion, where said first portion includes first electrical contact means, and where said second portion includes second electrical contact means slectively engaging said first electrical contact means, and signaling means on said second portion responsive to said selective engagement of said second electrical contact means with said first electrical contact means, where said first portion and said second portion are disposed within a housing, where said second portion slides on a stem on said first portion, where said stem includes a bulbous portion,



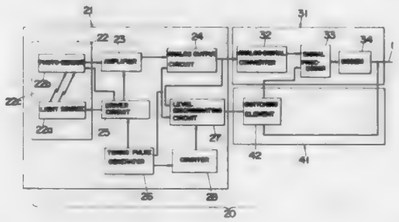
and where said bulbous portion engages a portion of said housing when said second electrical contact means selectively engages said first electrical contact means.

4,692,750

FIRE ALARM SYSTEM

Kazumasa Murakami, and Motoharu Terada, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,786
Claims priority, application Japan, Mar. 31, 1986, 61-74654; Mar. 31, 1986, 61-74655
Int. Cl.[4] G08B *17/00, 23/00*
U.S. Cl. 340—588 **11 Claims**



1. In a fire alarm system comprising a receiver in combination with fire detecting terminal means connected thereto through a common signal transmission line comprising two wires,

said fire detecting terminal means including:

a sensor for sensing a fire-indicative parameter such as a smoke density to be measured and producing an analog signal representative thereof;

a level-signal output section for transmitting a level signal to the receiver, said level-signal output section including level-shifting means connected between the wires of the transmission line so as to cause the level-shifting of the level signal when the sensed parameter has a level higher than a predetermined threshold level;

an analog-digital converter converting the analog signal from the sensor into a corresponding digital signal;

a binary information transmission section for transmitting the digital signal in the form of a superimposed signal upon the level signal,

the level signal and the digital signal being transmitted in a time-division multiplexing manner over the transmission line; and

said receiver including:

first means responsive to the level-shifting of the level signal for determining fire presence;

second means responsive to the digital signal transmitted

from the analog-digital converter for determining fire presence based thereon independently of the first means; the improvement comprising:

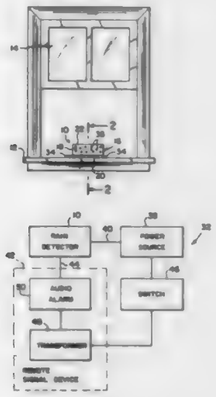
said fire detecting terminal means including: comparator means connected to the level-shifting means, said comparator means has the threshold level with which the value of the analog signal from the sensor is compared so that it actuates the level-shifting means to make the shifting of the level signal when the analog signal has a level higher than the threshold level, and said threshold level being selected independently of a criterion utilized in determining fire presence by the second means receiving the superimposed signal including the information of the sensed parameter.

4,692,751

RAIN DETECTOR

Gain Upton, R.R. 1, Box 61, Flora, Ind. 46929, and George Spector, 233 Broadway RM 3015, New York, N.Y. 10007

Filed Sep. 2, 1986, Ser. No. 902,771
Int. Cl.[4] H01H *35/00*; G08B *21/00*
U.S. Cl. 340—602 **4 Claims**



1. A rain detector to be placed on a sill of an open window, said detector comprising:

(a) an insulated housing having a plurality of upright walls forming a walled enclosure, a bottom wall and an open top;

(b) a first contact member mounted to said bottom wall within said housing;

(c) a pair of springs mounted vertically to said bottom wall within said housing at opposite sides of said first contact member;

(d) an insulated plate mounted on said springs so as to vibrate within the cavity defined by said upright walls of said housing;

(e) a second contact member mounted to underside of said plate and being spaced apart from said first contact member; and

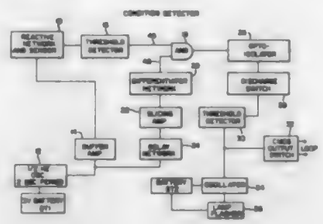
(f) an alarm circuit electrically connected to said first and second contact members so that rain drops falling on said plate will cause said plate adjacent to said open top to vibrate up and down within the cavity defined by said upright walls of said housing allowing said first and second contact members to momentarily touch each other producing a pulsating action through said alarm circuit.

4,692,752

MOISTURE DETECTOR

William E. Abel, Portland, Oreg., assignor to Sentrol, Inc., Portland, Oreg.

Filed Aug. 27, 1984, Ser. No. 644,553
Int. Cl.[4] G08B *29/00*
U.S. Cl. 340—604 **8 Claims**



1. A moisture detector detecting the presence of moisture in a region to be tested comprising:

(a) a pair of electrically conductive members disposed within said region;

(b) a reactive network including said pair of electrically conductive members;

(c) oscillator means for producing an alternating current signal having a predetermined period, said signal being coupled to said reactive network;

(d) threshold detection means responsive to said reactive network for providing a periodic output signal as long as the conductivity between said electrically codnuctive members stays below a predetermined level;

(e) pulse circuit means connected to said oscillator means for developing a delayed sampling pulse from the output of said oscillator means;

(f) gate means responsive to both an output of said threshold detection means and said delayed sampling pulse for producing a periodic maintenance pulse;

(g) electrically isolating means responsive to said periodic enabling signal for generating an alarm control signal; and

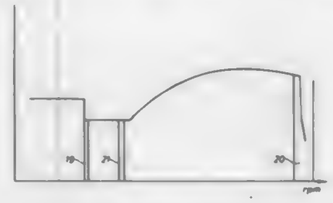
(h) alarm means responsive to said alarm control signal for remaining in a non-alarm state when the moisture level within said region remains below a predetermined threshold but switching to an alarm state after a predetermined time period in the absence of said alarm control signal.

4,692,753

IGNITION SYSTEM WITH AN R.P.M. INDICATOR

Bo C. Andreasson, Göteborg, and Bo R. Rangert, Mölnlycke, both of Sweden, assignors to AB Electrolux, Stockholm, Sweden

Filed Nov. 23, 1984, Ser. No. 674,071
Claims priority, application Sweden, Nov. 24, 1983, 8306487
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—671 **11 Claims**



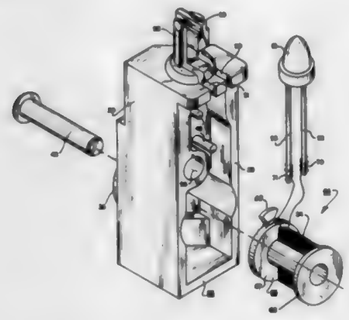
1. In an internal combustion engine system having a carburetor adjustable to control an r.p.m. of the engine, means for providing a signal corresponding to the r.p.m. of said engine, and ignition control means responsive to said signal for controlling the ignition of said engine; the improvement comprising an indicator, and means responsive to said signal for energizing said indicator to provide a substantially constant indication in an idle range of r.p.m. of the engine while de-energizing said indicator at r.p.m. immediately above and below said idle range, said responsive means being further responsive to energize said indicator to provide a substantially constant indication in a range of predetermined race r.p.m. of said engine corresponding to the highest allowable r.p.m. range of said engine.

4,692,754

ROTATION INDICATING DEVICE

Merardo P. Edejer, Westlake; Roger S. Ford; John J. Jailor, both of North Ridgeville, all of Ohio, and Michael J. Jeas, Burns, Tenn., assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed May 30, 1986, Ser. No. 868,956
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—671 **16 Claims**



1. A rotation indicating device for use in a machine having a rotating magnet on a rotating member in a casing;

said rotation indicating device comprising, in combination:

a housing having a longitudinal wall, a first end wall through which a longitudinal axis extends and an open side;

longitudinal locator means on said first end wall generally along said longitudinal axis;

a longitudinally facing locator shoulder on said housing adapted to be complementary to a shoulder on the machine casing;

a preassembled subassembly of a flexible wire coil and an indicator lamp having two leads;

means connecting said lamp leads to the ends of the flexible wire coil;

the flexibility of said wire ends establishing said coil and said indicator lamp subassembly as having a variable length;

a magnetically permeable core for said coil;

said subassembly being inserted in said housing through said open side with said wire coil received on said core and said lamp received on said longitudinal locator means; and

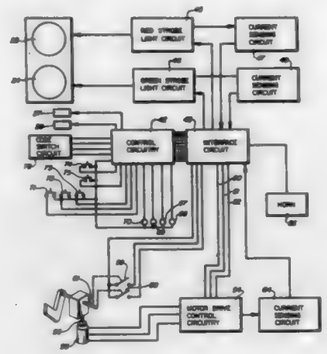
means to fix said coil in said housing and fix said indicator lamp on said longitudinal locator means to establish a predetermined length of the entire rotation indicating device whereby said lamp is adapted to be positioned at an aperture in the machine casing upon said locator shoulder engaging the shoulder in the machine casing.

4,692,755

LOADING DOCK SIGNAL AND CONTROL SYSTEM

Norbert Hahn, South Milwaukee, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Feb. 22, 1985, Ser. No. 704,430
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—687 **8 Claims**



1. A signalling and control system for a dock facility including a loading dock and a releasable locking device operative to retain a parked vehicle at the dock, said locking device including a locking member having a lower unlocked position and an upper locked position in which it is lockingly engageable with a safety bar of a parked vehicle to hold the parked vehicle against the dock during loading and unloading of the vehicle, and electrically controllable reversible actuating means for moving said locking device between said unlocked and locked positions, said reversible drive means including drive means and a slip coupling between said drive means and said locking member said system comprising: outside and inside signal light means positioned and energizable to give vehicle operators and dock personnel clearly visible indications of when it is safe and unsafe to park or remove a vehicle and when it is safe to load and/or unload a parked vehicle, manually operable switch means accessible to dock personnel, and operating means coupled to said signal light means, to said switch means and to said actuating means for controlling said actuating means from said switch means and for energizing said signal light means in accordance with the condition of said locking device, said operating means being operative in response to actuation of said switch means to a lock condition to operate said drive means in a locking direction for a time interval of predetermined duration sufficient to normally effect upward movement of said locking member from said lower unlocked position and at least to said upper locked position, said operating means being operative in a slippage control mode for energizing said drive means to effect upward return movement of said lock member toward said locked position following downward slipping movement of said member from said locked position to a position intermediate said locked and unlocked positions.

4,692,756

DEVICE FOR GENERATING A 2-AXIS CONTROL SIGNAL

David G. Clark, Redhill, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

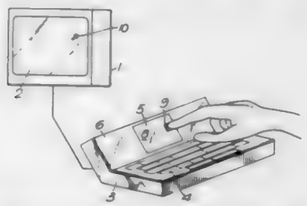
Filed Jul. 5, 1984, Ser. No. 628,012
Claims priority, application United Kingdom, Jul. 4, 1983, 8318103
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—709 **16 Claims**

1. A manually operable signal generating device for generating two-axis control signals, comprising

an element defining a substantially planar window area, said window having a length in a first direction at least equal to a first given distance, and a width in a second direction, orthogonal to said first direction, at least equal to a second given distance,

mounting means defining an axis parallel to said second direction, and having two guide surfaces and means for supporting said guide surfaces with respect to each other, said guide surfaces extending parallel to said second direction and having a dimension in said second direction greater than said second given distance, said guide surfaces being spaced apart a distance greater than said first given distance,

a continuous loop member, at least parts of which are flexible, extending around said guide surfaces in slidable contact therewith, and between said guide surfaces in said first direction, at least those parts of said member in contact with said guide surfaces having a width in said



second direction such that the ratio of such width to said distance by which the guide surfaces are spaced apart is sufficient to resist skewing about said guide surfaces, and said means for supporting further supporting said guide surfaces with respect to said element such that said window area is adjacent said loop member between said guide surfaces,

an actuating part fixed at a location on said loop member, adjacent to and accessible through said window area, and movable by finger pressure to any position within said window area, movement of the actuating part in the second direction thereby sliding the entire loop member in the second direction; and movement of the actuating part in the first direction thereby causing said loop member to rotate about said axis and slide over said guide surfaces, and

signal means responsive to movement in at least one of said directions for generating control signals representative of said movements.

4,692,757

MULTIMEDIA DISPLAY SYSTEM

Susumu Tsuhara, Sagamihara; Kuniaki Tabata, Tokyo, and Yasuyuki Okada, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,496

Claims priority, application Japan, Dec. 24, 1982, 57-226120

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—721 **4 Claims**

1. A system for displaying at least one specified partial region of a page of a document information, comprising:

display means having a screen for displaying a frame of information;

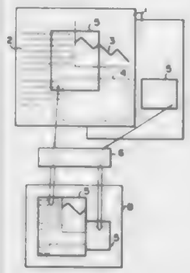
file means for storing therein a plurality of pages of document information, including character information and picture image information, said character information containing coded data, while said picture image information contains dot data;

first memory means for temporarily storing therein a page of document information including character information and picture image information read out from said file means;

second memory means for storing therein a frame of information in the form of dot patterns to be supplied to said display means for display on said screen;

means for specifying at least one page of said document information stored in said file means and at least one partial region of said specified page of said document information;

controlling means responsive to said specifying means for reading out said specified page of said document information from said file means, for storing the read-out page of document information in said first memory means and for



extracting therefrom that portion of the character information and that portion of the picture image information which exist in said specified partial region of said specified page of said document information;

means for converting only said extracted portion of the character information to dot patterns and for storing the dot patterns obtained by said conversion in said second memory means; and

means for storing said extracted portion of the picture image information in said second memory means.

4,692,758

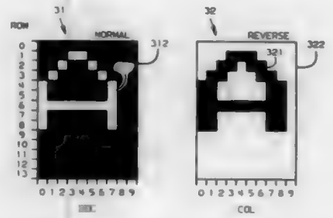
LEGIBILITY ENHANCEMENT FOR ALPHANUMERIC DISPLAYS

Bradley W. Fawcett, Byron, and Lee A. Sendelbach, Rochester, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,770

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—735 **6 Claims**



1. Apparatus for enhancing the legibility of character images of a display for alphanumeric character images made up of a matrix of individual dots having character generating means for producing a video signal having first and second levels, and having attribute means for producing an attribute signal specifying a display attribute having first and second modes, the improvement comprising:

first generator means in said character generator means for producing a first font of character shapes;

second generator means in said character generator means for producing a second font of character shapes, said second font having substantially the same overall size as said first font and being complementary thereto; and,

logic means resopnsive to said attribute signal for producing said video signal from said first font of character shapes when said atrribute signal is said first mode and for producing said video signal from said second font of characteer shapes when said attribute signal is in said second mode.

4,692,759

APPARATUS FOR MODIFYING THE APPEARANCE OF THE POINTS OF AN IMAGE ON THE SCREEN OF A GRAPHIC IMAGE DISPLAY CONSOLE

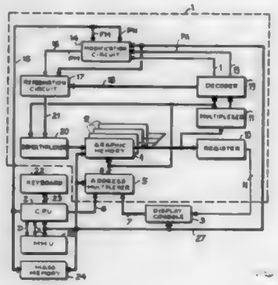
Luc Phan Van Cang, Savigny sur Orge, France, assignor to Thomson Video Equipement, Gennevilliers, France

Filed Apr. 15, 1985, Ser. No. 723,359

Claims priority, application France, Apr. 17, 1984, 84 06052

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—748 **7 Claims**



1. An apparatus for modifying the appearance of the points of an image on a screen of a graphic image television display, controlled by a graphic processor, said apparatus comprising:

a graphic memory storing all the points of the screen interposed between the screen of the display console and the processor, said graphic memory being organized in words of n bits, each bit being representative of the state of a point of the image and having a value of 1 or 0 depending on whether the point which it represents in the image is visible or merges with the background of the image,

an attribute memory containing the attributes of each of the points of the image,

a decoder for selecting a bit from each word read out from the graphic memory,

a modification circuit memory connected to the decoder, to the attribute memory and to the graphic processor for modifying the value of each attribute of the point corresponding to the bit selected of a word by means of modification bits supplied by the processor and a reformation circuit register coupled to the modification circuit, to the decoder and to the graphic memory for updating each modified word and storing it in the graphic memory and storing each modified attribute in the attribute memory, said modification circuit being formed by programmable memories containing function tables for calculating new attribute for modifying the appearance of the points of the graphic image, said function tables being addressed by function bits and modification bits generated by the graphic processor and the attribute bits of each bit of a word selected from the graphic memory.

4,692,760

DISPLAY APPARATUS

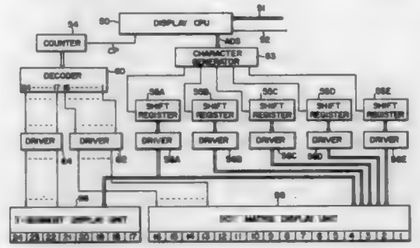
Shohei Unno, Numazu; Mikio Nakakawazi, and Kazufumi Suzuki, both of Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 752,456

Claims priority, application Japan, Jul. 24, 1984, 59-153860

Int. Cl.[4] G09G *3/04, 3/20*

U.S. Cl. 340—756 **5 Claims**



1. A display apparatus comprising:

a dot matrix display unit having a plurality of display regions each having M dot display elements which are arranged substantially in a m×n=M matrix;

a segment display unit having a plurality of display regions each having N (<M) segment display elements which are arranged to have a predetermined pattern;

control means including means for generating display data to designate a character to be displayed in each of the display regions in said dot matrix display unit and segment display unit, and means for sequentially and cyclically activating the display regions in said dot matrix display unit and segment display unit; and

dot data generating means having M output terminals and including character generating means for generating M dot data at said M output terminals, said M dot data corresponding to the display data from said control means, and a driver circuit means for receiving the M dot data from said character generating means for supplying the received M dot data to the M dot display elements in each of the display regions in said dot matrix display unit, and also for supplying N dot data among said received M dot data to said N segment display elements in each of the display regions of said segment display unit, said driver circuit means comprising m register means each for temporarily storing n dot data among m×n dot data from said character generating means, and m drivers connected to respectively receive n dot data from said m register means and which each have output terminals connected to said n dot display elements on the corresponding one of the m columns in each of the display regions of said dot matrix display unit;

and means coupled to the control means for activating only one of the dot matrix display unit and the 7-segment display unit.

4,692,761

ADAPTIVE COMMUNICATION NETWORK AND METHOD

Michael A. Robinton, Palo Alto, Calif., assignor to Robinton Products, Inc., Sunnyvale, Calif.

Filed Jun. 21, 1985, Ser. No. 747,806

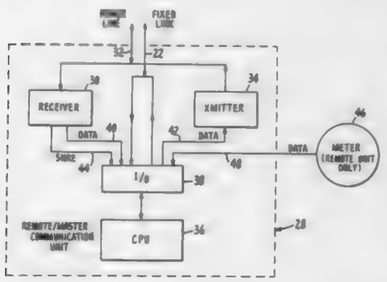
Int. Cl.[4] H04Q *11/00*; H04J *3/00*

U.S. Cl. 340—825.01 **78 Claims**

1. A communication system for use in a network of interconnected communication paths, said system comprising a plurality of communication nodes capable of transmitting messages over the network including a master unit and a plurality of remote units which are also capable of receiving said messages

over the network, with each of said nodes having an associated identifying address, wherein said remote units are capable of initiating a down link message sequence wherein a data package associated with one of said nodes is transferred from a sequence-originating remote unit to said master unit by transmission of at least one of said messages, designated as down link messages, with said down link messages including said data package a source address identifying which of said nodes is associated with said data package in said message, an intermediate source address identifying which of said nodes transmitted said down link message, an intermediate destination address identifying which of said nodes is intended to receive said down link message and wherein said master unit is capable of initiating a responding up link message sequence in response to receipt by said master unit of one of said down link messages, wherein said sequence-originating remote unit is informed of said receipt by said master unit of said data package by transmission of at least one of said messages, designated as an up link message, with said up link messages including an intermediate source address identifying which of said nodes transmitted said up link message, an intermediate destination address identifying which of said nodes is intended to receive said up link message and a final destination address identifying said node associated with said data package received by said master unit with each of said remote units including:

(a) remote input means for receiving said data package, said remote input means including remote receiver means for receiving said messages, said remote receiver means including



direction means for discriminating between said up and down link messages and store and forward means for identifying received messages requiring a transmit action by said receiving remote unit;

(b) remote transmitter means for transmitting said messages in response to receipt of one of said messages requiring said transmit action by said receiving remote unit, said remote transmitter means including down link transmit means for transmitting one of said down link messages containing said data package obtained from said received message in the event said received message is one of said down link messages, said down link transmit means including down link address means for determining said intermediate destination address of said down link messages transmitted by said receiving remote unit utilizing at least one parameter indicative of network conditions obtained, at least in part, from said messages received by said receiving remote unit containing one one of said intermediate destination addresses other than said address of said receiving remote unit and including up link transmit means for transmitting one of said up link messages in the event said received message is one of said up link messages, said up link transmit means including up link address means for determining said intermediate destination address of said transmitted up link message; and

wherein said master unit includes:

(a) master receiver means for receiving said messages, said master receiver means including direction means for discriminating between said up and said down link received messages; and

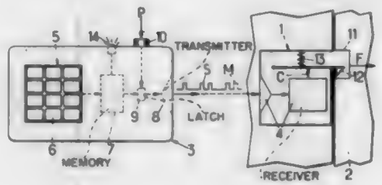
(b) master transmitter means for transmitting said up link messages in response to receipt by said master unit of one of said down link messages.

4,692,762

REMOTE CONTROL CODED DEVICES

Jacques Lewiner, 5, rue Bory d'Arnex, 92210 Saint Cloud, and Claude Hennion, 18, rue Flatters, 75005 Paris, both of France

Continuation of Ser. No. 495,401, May 17, 1983, abandoned. This application Dec. 31, 1985, Ser. No. 815,751
Claims priority, application France, Jun. 4, 1982, 82 09791
Int. Cl.[4] G08C *19/00*; G08B *5/00*
U.S. Cl. 340—825.69 **6 Claims**



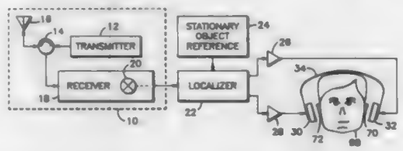
1. A device for providing remote control of a member by means of coded signals, said device comprising a portable pocket size case including transmitter means for transmitting coded signals and a receiver means, mounted on the member to be controlled, for receiving the coded signals, for comparing coded signals with a previously stored reference and for providing predetermined control of said member responsive to a coded signal received by said receiver means and the reference compared therewith being identical, said transmitter means of the case comprising a keyboard with at least two control keys and means for transforming the sequence of actuation of said keys into said coded signals, said transmitter means further comprising means for recording each of said coded signals, for storing each recorded signal in memory for a period of time t_0 of between 3 and 10 minutes and for automatically erasing a stored coded signal at the end of said time period t_0 irrespective of whether the stored code signal has been transmitted and means for ensuring instanteous transmission of the stored coded signal in response to actuation of a single control member.

4,692,763

BINAURAL DOPPLER RADAR TARGET DETECTOR

Ralph C. Gregg, Jr., Tempe, Ariz., assignor to Motorola, Inc., Schaumberg, Ill.

Filed Dec. 23, 1985, Ser. No. 812,601
Int. Cl.[4] G01S *13/56*
U.S. Cl. 342—28 **19 Claims**



1. A target detector providing an auditory output for a target detector operator having left and right ears, said target detector comprising:

a radar having an output which provides a Doppler signal;

a localizer having an input coupled to said radar output and having left and right outputs, said localizer being for providing left and right audio signals;

a left speaker coupled to the left output of said localizer; and

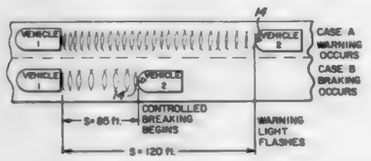
a right speaker coupled to the right output of said localizer, said left and right speakers producing left and right sounds, respectively, when activated by the left and right audio signals, respectively, and said left and right sounds together causing an auditory effect perceivable as originating from a location having a predetermined relationship to the Doppler signal when heard by the left and right ears, respectively, of the target detector operator.

4,692,764

AUTOMATIC RANGE FINDER AND REMOTE CONTROLLER BRAKING SYSTEM

George D. Bonar, 333 Bowery, New York, N.Y. 10003

Filed Jun. 20, 1986, Ser. No. 876,979
Int. Cl.[4] G01S *13/93*
U.S. Cl. 342—71 **6 Claims**



1. An automatic range finder and remote controlled braking system, comprising:

(a) a radar receiver;

(b) an antenna connected to said radar transceiver, mounted to a vehicle such that said antenna faces in the forward direction relative to the normal direction of travel of said vehicle;

(c) an electrical braking distance setting whose output is an electrical analog of the distance at which said vehicle's brakes are to begin actuating in the presence of an object in front of said antenna;

(d) a distance comparator having three output signals, said comparator compares the distance output of said radar to the distance setting of said braking distance setting system and outputs a first output signal when the distance output of said radar is less than or equal to the distance setting of said braking distance setting system;

(e) a braking system is actuated by the first output signal of said distance comparator, wherein said first output signal of said comparator is proportional to the rate of change of distance between said vehicle and an object with respect to time, and wherein said braking system is capable of proportional control, such that the first output of said distance comparator causes harder braking when said distance between said vehicle and said object is closing rapidly and causes softer braking when said closing is more gradual;

(f) a braking flasher and a braking lamp which are connected to a second output signal of said distance comparator such that when said braking system is actuated said braking lamp flashes, thereby warning the operator that the system is causing said vehicle to brake;

(g) an electrical warning distance setting system whose output is an electrical analog of the distance at which a warning is to be outputted telling an operator of said vehicle that a desired minimum separation has been reached between said operator's vehicle and an object in front of said vehicle; wherein the distance comparator's third output signal is activated whenever the distance between said vehicle and said object are less than the preset warning distance; and

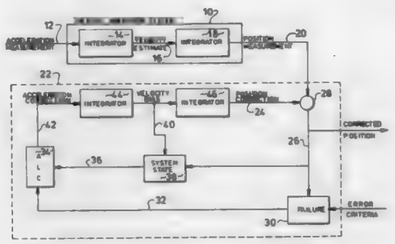
(h) a warning flasher and warning light which are connected to said third output signal of said distance comparator such that when the distance between said vehicle and said object are less than the preset warning distance said warning distance said warning light flashes.

4,692,765

ADAPTIVE LEARNING CONTROLLER FOR SYNTHETIC APERTURE RADAR

Demetrios T. Politis, and William H. Licata, both of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Dec. 5, 1985, Ser. No. 805,186
Int. Cl.[4] G01S *13/86, 13/90*; G01C *21/16*
U.S. Cl. 342—106 **7 Claims**



1. For use with an inertial navigation system adapted to produce a position measurement signal by integrating both an acceleration measurement signal and the resulting velocity estimate signal, an apparatus for generating velocity bias estimate and position correction signals in order to correct bias errors in the acceleration measurement signal, comprising:

means for adding the position correction signal to the position measurement signal, thereby generating a corrected position signal;

means for comparing the corrected position signal to first predetermined error criteria and generating a first failure signal indicative of a failure of the corrected position signal to meet the first predetermined error criteria;

means, adapted to receive the corrected position signal and velocity bias estimate signal, for generating a system state signal;

adaptive learning controller means, adapted to receive the first failure signal, a second failure signal and the system state signal, for generating an acceleration correction signal in response thereto;

means for integrating the acceleration correction signal to generate the velocity bias estimate signal;

means for integrating the velocity bias estimate signal to create the position correction signal;

means for averaging the acceleration correction signal over a period of time; and

means for comparing the time-averaged acceleration correction signal to second predetermined error criteria and generating a second failure signal indicative of a failure of the time-averaged acceleration correction signal to meet the second predetermined error criteria.

4,692,766

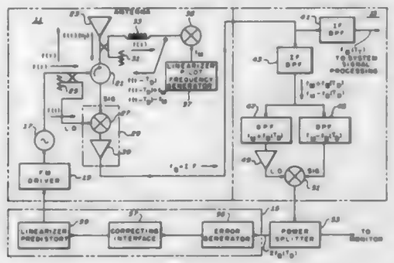
LINEARIZER FREQUENCY DISCRIMINATOR FOR FREQUENCY MODULATED RADAR TRANSMITTERS

John C. Rolfs, deceased, late of Palm Harbor, and by Margaret H. Rolfs, executrix, 1637 Wendle Way, Palm Harbor, both of Fla. 33563

Filed Sep. 25, 1985, Ser. No. 780,114
Int. Cl.[4] G01S *13/32, 7/40*
U.S. Cl. 342—200 **6 Claims**

1. An improved linearizer circuit for use in a frequency modulated continuous wave radar system of the type employing a VCO for generating frequency swept signals to be transmitted and a linearizer feedback circuit which couples a series

of frequency correction signals to the VCO during each frequency sweep, the improved linearizer comprising first and second means for continuously sampling output signals of said VCO, first mixer means coupled to receive signals from said first sampling means, amplitude modulation means for amplitude modulating signals at a modulating frequency, signal delay means coupled between said second sampling means and said amplitude modulation means for providing a time delay to signals incident to and reflected from said amplitude modulation means to couple delayed amplitude modulated signals to



said first mixer means, said delayed amplitude modulated signals having a delay relative to said output signals equal to twice said time delay such that said delayed amplitude modulated signals and sampled output signals coupled from said second sampling means are mixed in said first mixer means to produce an intermediate frequency signal having upper and lower sidebands, filter means coupled to receive said intermediate frequency signal for separating said upper and lower sidebands, and second mixer means coupled to receive said upper and lower sidebands for producing a beat frequency control signal for controlling operations of said linearizer.

4,692,767

METHOD OF MEASURING THE NUCLEAR MAGNETIC RESONANCE FOR USE IN NMR TOMOGRAPHY

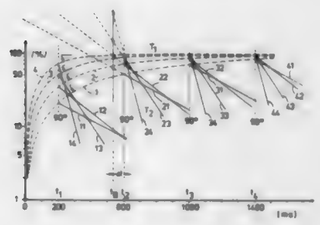
Gernot Bielke, Oestrich-Winkel, Fed. Rep. of Germany, assignor to Bruker Medizintechnik GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1984, Ser. No. 655,168

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3343966

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—309 **4 Claims**



1. A method for measuring the nuclear magnetic resonance in selected areas of a body for two-or three-dimensional image recording (NMR tomography) comprising the steps of:

exposing initially the nuclear spins of a selected type present in the selected areas of the body to a static magnetic field and at least one superimposed gradient field, and exciting them selectively by means of a pulse sequence which causes the nuclear spins to supply in a single pass a plurality of successive induction signals, and

processing thereafter by calculation the induction signals corresponding to each other as regards their succession in time, to form sets of image signals proportional to the induction signals in associated volume elements of the body so that a single measurement provides a plurality of image signal sets corresponding to a sequence of section images differing by the intensity of the induction signals which vary according to the relaxation time T_2,

establishing for each image point associated with a single volume element of the body cross-section a function describing the variation in time of the image signals associated with the respective image points in the different image signal sets, generating thereafter a further image signal set by extrapolating the functions thus established to a pre-determined point of time situated before the measuring moment defined by the start of said pulse sequence, and using the image signal set thus obtained for producing a section image.

4,692,768

FEED DEVICE FOR A SWEEP BEAM ARRAY ANTENNA

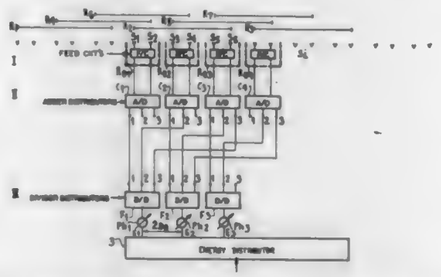
Henri G. Becavin, Bretigny sur Orge, France, assignor to Thomson CSF, Paris, France

Filed Oct. 24, 1983, Ser. No. 545,008

Claims priority, application France, Oct. 26, 1982, 82 17917

Int. Cl.⁴ H01Q *3/22, 3/24, 3/26*

U.S. Cl. 342—368 **14 Claims**



1. A feed device for a sweep beam array antennae, the elementary antennae of said array being spaced apart by an elementary interval and divided into several sub-arrays overlapping at their ends, comprising:

means for forming a plurality of elementary groups, each comprising N antennae of said sub-arrays and having N inputs and N outputs, and

means for combining together an arbitrary number of said elementary groups comprising MN antennae, where M is a whole number greater than N, these means including a number of outputs N equal to the number of inputs of said forming means to which they are connected, and M inputs connected to an energy distributor, spacing between two said sub-arrays being equal to N elementary intervals, said means for combining including a plurality of adder distributor means, each having N outputs coupled to said N inputs of a respective one of said elementary groups, and each having M inputs, each one of said plurality of adder distributor means including weighting means for delivering on said adder distributor means N outputs weighted sums of energies received on said adder distributor means M inputs.

4,692,769

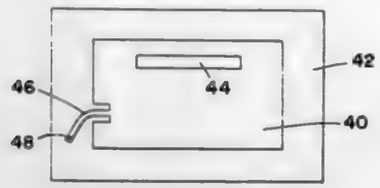
DUAL BAND SLOTTED MICROSTRIP ANTENNA

Michael J. Gegan, Menlo Park, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1986, Ser. No. 856,569

Int. Cl.⁴ H01Q *00/00*

U.S. Cl. 343—700 MS **14 Claims**



1. A dual-band microstrip antenna comprising:

(a) a thin dielectric substrate;

(b) a thin conductive layer disposed on one surface of said substrate, said conductive layer forming a ground plane;

(c) a thin conductive slotted radiating element disposed on the other surface of said substrate, said radiating element having a first resonance corresponding to the dominant radiation mode that would occur in an unslotted radiating element otherwise identical to the slotted radiating element, said radiating element having a first slot disposed in an area of the radiating element away from the main current path of the radiating element's dominant mode, said radiating element having a second resonance created by said first slot; and

(d) a single microstrip feedline for coupling radio frequency signals to said slotted radiating element, said single feedline being coplanar with said slotted radiating element.

4,692,770

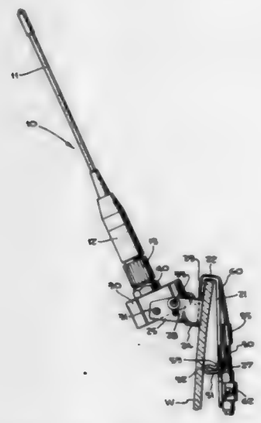
VEHICLE WINDOW MOUNT FOR PORTABLE ANTENNA

Norihisa Kadokura, Tokyo, Japan, assignor to Alliance Research Corporation, Chatsworth, Calif.

Filed Oct. 16, 1985, Ser. No. 788,041

Int. Cl.⁴ H01Q *1/32, 1/12*

U.S. Cl. 343—715 **12 Claims**



1. A mounting clamp assembly adapted for removably mounting the antenna of a portable communication equipment onto the window of an automotive vehicle such that the antenna will be outside the metal frame of the vehicle while its output signal is delivered to the equipment inside the vehicle, said mounting clamp assembly comprising:

a clamping frame adapted to hook over the upper edge of the window, said clamping frame having depending interior and exterior parts;

a base member secured to said exterior part of said clamping frame;

means for fastening the antenna in a generally vertical position to said base member;

a latch member pivotally attached to said interior part of said frame, said latch member being pivoted between open and locked positions and in its locked position engaging the interior surface of the window so as to frictionally secure said frame upon the window;

a coaxial cable secured upon said frame interior part for connection to the equipment; and

circuit means interconnecting said coaxial cable with the antenna but without interfering with the operation of either the window or said latch member.

4,692,771

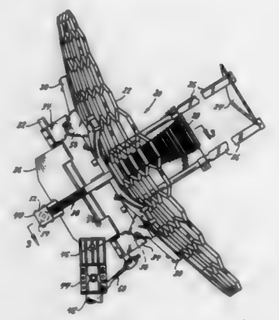
ANTENNA DISH REFLECTOR WITH INTEGRAL AZIMUTH TRACK

James N. Rothbarth, St. Louis, Mo., and Edward W. Smith, Los Angeles, Calif., assignors to Satellite Technology Services, Inc., St. Louis, Mo.

Filed Mar. 28, 1985, Ser. No. 717,498

Int. Cl.⁴ H01Q *3/02, 3/00*

U.S. Cl. 343—882 **26 Claims**



1. An antenna for receiving satellite broadcast data comprising a main reflector dish, means pivotally mounting said main reflector dish from a support, means to adjust the declination of the dish with respect to the pivotal mounting means, and means to selectively move said main reflector dish about said pivotal mounting means, said moving means comprising an integrally mounted arcuate track and drive means, said arcuate track being secured to the rear of the main reflector dish wherein said arcuate track and drive means are mounted so as not to interfere with the declination adjustment of the dish with respect to the pivotal mounting means.

4,692,772

ANTENNA EXTENDED SURFACE ATTACHMENT

Joseph P. Bell, #40 Cedar Village, Punta Gorda, Fla. 33950

Continuation-in-part of Ser. No. 588,332, Mar. 12, 1984, abandoned. This application Sep. 13, 1984, Ser. No. 650,069

Int. Cl.⁴ H01Q *9/40*

U.S. Cl. 343—899 **14 Claims**

1. In a supplemental device for mounting on a rod-type antenna of the type in which a pair of assemblies each comprise at least one conductive ring member and a plurality of cooper-

able conductive rod members connected to said at least one ring member symmetrically arranged and physically intersecting each other and the axis of said at least one ring, said at least one ring and the rod members of each assembly connected together and lying in substantially a common plane with the assemblies spaced and connected together substantially coaxially in parallel planes via a cross member which is adapted for mechanical and electrical connection to the antenna such that the antenna is substantially centered between the aforementioned planes, the improvement wherein:



each of said rings comprises a core of plastic material and an outer layer of metal;

the rod-type antenna comprises a first member including a bore, and a second member; and

a metal clad structure constituting said second member and including a winding and first and second projections extending substantially parallel to the axis of the winding, one of said projections received in and making electrical contact with the bore of the first member.

4,692,773

IMAGE FORMING METHOD USING IMAGE FORMING ELEMENTS HAVING DIFFERENT CONCENTRATIONS AND PITCHES

Asao Saito, Fujisawa, and Kunio Watanabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 514,622, Jul. 18, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,677

Claims priority, application Japan, Jul. 23, 1982, 57-128567; Jul. 23, 1982, 57-128568; Jul. 23, 1982, 57-128569; Jul. 23, 1982, 57-128570

Int. Cl.[4] G01D *15/16;* **H04N** *1/23*

U.S. Cl. 346—1.1 **10 Claims**

1. A method of forming on a medium an image with areas having different light-reflecting properties providing different optical reflection densities, the method comprising:

providing on the medium a plurality of image forming elements, at least one color of which is provided in different concentrations, with different pitches therebetween in different areas of the image; and

selecting the concentrations of said image forming elements and the pitch thereof in accordance with the optical reflection densities of respective areas of the image to be formed, wherein the pitches of higher concentration

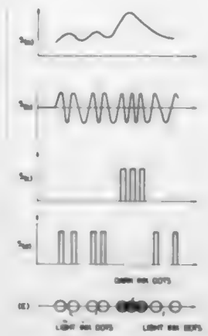


image forming elements are greater than the pitches of lower concentration image forming elements.

4,692,774

MULTI-COLOR RECORDING APPARATUS

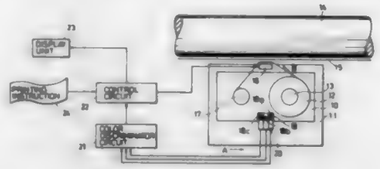
Masasumi Nagashima, Yokosuka; Minoo Nozaki, Kawasaki; Osamu Asakura, Tokyo, and Yoshio Uchikata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 564,407, Dec. 22, 1983, abandoned. This application Nov. 14, 1985, Ser. No. 831,049

Claims priority, application Japan, Dec. 28, 1982, 57-227582

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **15 Claims**



1. A multi-color recording apparatus comprising:

feeding means for feeding a recording material of a determined color;

recording means for depositing the recording material supplied from said feeding means onto a recording sheet in a pattern corresponding to recording information;

detecting means for detecting the color of the recording material supplied from said feeding means;

control means for comparing color information contained in the recording information with the result of detection by said detecting means and, when there is a lack of of coincidence therebetween, prohibiting the recording operation by said recording means; and

alarm means for requesting that said feeding means be changed to another feeding means of a different color when all the recording information of the color detected by said detecting means has been recorded.

4,692,775

DEVICE TO MONITOR PRESS FITTINGS

Edward R. Erwin, 8 Woodbridge Rd., Hamilton, Ontario, Canada L8K 3C7

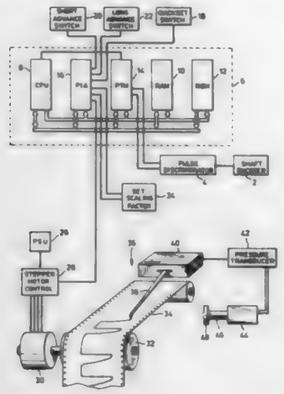
Filed Oct. 28, 1985, Ser. No. 792,329

Int. Cl.[4] G01D *15/16, 9/00*

U.S. Cl. 346—118 **5 Claims**

1. A recorder for monitoring press operations on mechanical

components, comprising a chart recorder having a pen driven by a transducer monitoring pressure applied by a press ram, a chart, and a chart drive operable to displace the chart substantially proportionately to displacement of the press ram, wherein the chart drive is a stepping motor, the press ram is mechanically linked to a displacement decoder providing



output signals indicative both of increments of displacement of said ram and the direction of said increments, said recorder further including means receiving said signals for algebraically summing the value of said increments over discrete intervals of time, and means for applying forward stepping pulses to said motor in predetermined proportions to said increments summed in each said discrete interval.

4,692,776

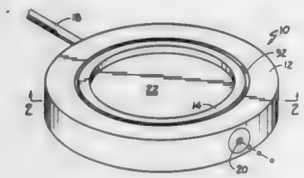
DROP DISPENSING DEVICE AND METHOD FOR ITS MANUFACTURE

Philip M. Kimball, Norwell, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 15, 1986, Ser. No. 906,978

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **14 Claims**



1. In a drop dispensing device having a planar electroactuator bounded by a peripherally circumferential surface for applying a peripherally directed force in response to electrical excitation, means including concentric inner and outer rings for defining an annular chamber about said circumferential surface, and means defining a fluid inlet and a fluid outlet orifice in communication with said annular chamber for dispensing a drop of fluid upon electrical excitation of said electroactuator, the improvement comprising:

means consisting essentially of peripheral contact between and hoop stress in said rings for retaining said inner and outer rings in fluid tight relationship about said annular chamber.

4,692,777

MEANS FOR RESTORING LIQUID DISCHARGE FUNCTION OF A LIQUID JET RECORDER

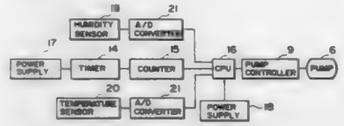
Hiroyuki Hasumi, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 667,365, Nov. 1, 1984, abandoned. This application Dec. 15, 1986, Ser. No. 942,029

Claims priority, application Japan, Nov. 8, 1983, 58-208245

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **8 Claims**



1. A liquid jet recorder comprising:

liquid droplet discharge means for discharging liquid droplets to print a record on a record medium;

droplet discharge function restoring means for restoring said discharge means by performing at least one of a plurality of different discharge restoring functions; and

control means for selecting one of the functions of said droplet discharge function restoring means on the basis of the duration of the time period that said liquid jet recorder has rested without operation of said discharge means and controlling the selected function in accordance with the duration of the time period.

4,692,778

IMAGE FORMATION APPARATUS WITH A RECORDING UNIT AND PAPER FEED COVER AND A SEALING MEMBER

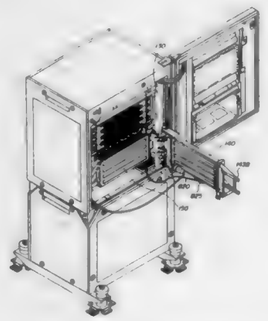
Shigeru Yoshimura, Yokohama; Tetsuo Suzuki, Kawasaki, and Makoto Takemura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1986, Ser. No. 844,132

Claims priority, application Japan, Mar. 28, 1985, 60-65103; Mar. 28, 1985, 60-65106; Mar. 28, 1985, 60-65108; Mar. 28, 1985, 60-65112; Mar. 28, 1985, 60-65114; Mar. 28, 1985, 60-65116; Mar. 28, 1985, 60-65117; Mar. 28, 1985, 60-65118; Mar. 28, 1985, 60-65119; Mar. 28, 1985, 60-65120; Mar. 28, 1985, 60-65121

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—145 **1 Claim**



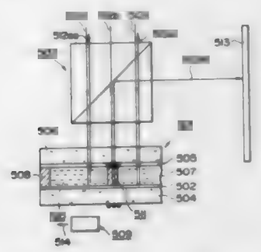
1. An image formation apparatus comprising:

recording means storage means for storing recording means for recording on a recording medium at a recording position;

convey means storage means for storing convey means for guiding the recording medium to the recording position

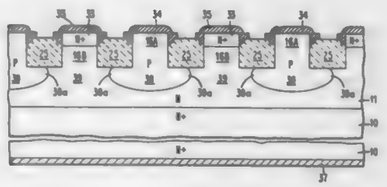
and for detaching the recording medium from the recording position;
open/close means for allowing opening/closure of said convey means storage means and said recording means storage means;
fixing means for keeping said recording means storage means and said convey means storage means in a closed state;
releasing means including an operation member for releasing the closed state obtained by said fixing means; and
a sealing member for closing a mounting portion of said operation member to provide dustproof properties.

4,692,779
IMAGE FORMING METHOD AND APPARATUS THEREFOR
Yujiro Ando, Yokohama, and Shuzo Kaneko, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 20, 1984, Ser. No. 683,862
Claims priority, application Japan, Jan. 6, 1984, 59-000598
Int. Cl.⁴ G01D *15/06, 9/42;* **G02F** *1/13*
U.S. Cl. 346—153.1 **68 Claims**



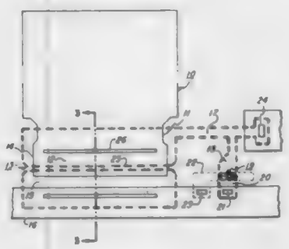
1. An image forming apparatus comprising:
a device which comprises an electroconductive member, an electric charge accepting member, and a liquid crystal interposed between the electroconductive member and the electric charge accepting member, and
an ion generator for imparting an electric charge to the electric charge accepting member sufficient to form an electric field exceeding the threshold voltage of the liquid crystal between the electric charge accepting member and the electroconductive member.

4,692,780
JUNCTION FIELD EFFECT TRANSISTOR AND METHOD OF FABRICATING
Izak Bencuya, and Adrian I. Cogan, both of San Jose, Calif., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Division of Ser. No. 729,025, Apr. 30, 1985, Pat. No. 4,611,384. This application May 12, 1986, Ser. No. 861,681
Int. Cl.⁴ H01L *29/80*
U.S. Cl. 357—22 **5 Claims**



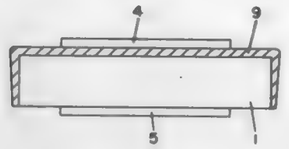
1. A junction field effect transistor comprising
a body semiconductor material including a first layer of semiconductor material of one conductivity type of relatively low resistivity contiguous with said first layer, said first layer having a surface at a surface of the body;
said first layer having a plurality of parallel grooves therein extending from said surface thereof with ridges of semiconductor material interposed between the grooves, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and having a bottom, the width of each of said grooves being approximately the same as the width of each of said ridges, alternate ridges being gate ridges and intervening ridges between the gate ridges being source ridges;
each of said grooves containing a layer of protective material which is nonconductive at the bottom thereof;
a source region of the one conductivity type of relatively low resistivity in each of said sources ridges at said surface;
a plurality of gate regions of the opposite conductivity type in said first layer and spaced from said second layer, each of said gate regions encompassing a gate ridge and having portions extending laterally beneath the bottoms of the adjacent grooves; and
said first layer of semiconductor material other than said source regions and said gate regions being of the one conductivity type of relatively high resistivity, the portions of adjacent gate regions extending laterally toward each other producing channel regions of the one conductivity of relatively high resistivity therebetween.

4,692,781
SEMICONDUCTOR DEVICE WITH ELECTROSTATIC DISCHARGE PROTECTION
Robert N. Rountree, Richmond, and Troy H. Herndon, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 6, 1984, Ser. No. 617,876
Int. Cl.⁴ H01L *27/04, 29/78*
U.S. Cl. 357—23.13 **10 Claims**



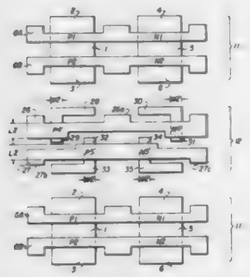
1. An input protection structure for an MOS device, comprising:
(a) a metal input pad on a face of a silicon chip,
(b) a transistor having a thick gate oxide, having a source-to-drain path connecting said metal input pad to a voltage-supply conductor, having a metal gate, and having a drain region directly connected to said metal gate and metal input pad at an elongated contact area parallel to the width of said source-to-drain path,
(c) wherein the width of said source-to-drain path is at least about 25 times the length of the source-to-drain path, and wherein the spacing along said face between said source-to-drain path and said elongated contact area is at least about twice said length of the source-to-drain path.

4,692,782
SEMICONDUCTOR RADIOACTIVE RAY DETECTOR
Yasukazu Seki, Tokyo; Noritada Sato, and Masaya Yabe, both of Kanagawa, all of Japan, assignors to Fuji Electric Corporate Research & Development Co., Ltd., Japan
Filed May 24, 1984, Ser. No. 613,890
Claims priority, application Japan, Jun. 8, 1983, 58-102381
Int. Cl.⁴ H01L *27/14;* **G01T** *1/22*
U.S. Cl. 357—29 **4 Claims**



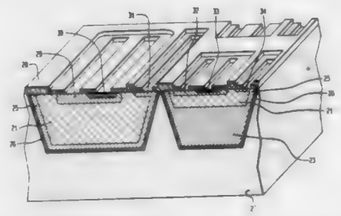
1. A semiconductor radiation detector comprising
a single crystal semiconductor substrate having a specific resistance of at least 10 KΩ-cm, and having electrode surfaces separated by side surfaces,
an undoped amorphous semiconductor layer having a specific resistance substantially higher than that of said substrate, said amorphous layer coating at least one of said electrode surfaces at least up to the side surfaces,
a first electrode deposited on said amorphous layer, and
a second electrode deposited over the other of said electrode surfaces.

4,692,783
GATE ARRAY
Hideo Monma, Kawasaki; Masato Ishiguro, Machida, and Tetsuo Kawano, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Continuation of Ser. No. 656,640, Oct. 1, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 922,787
Claims priority, application Japan, Sep. 30, 1983, 58-181996
Int. Cl.⁴ H01L *27/04, 29/78*
U.S. Cl. 357—42 **6 Claims**



1. A basic cell including a plurality of transistors formed in a semiconductor substrate, said basic cell comprising:
a first p-channel MIS (Metal-Insulator-Semiconductor) transistor and a first n-channel transistor having a first single common gate electrode, a second p-channel MIS transistor and a second n-channel MIS transistor having a second single common gate electrode, said first and second gate electrodes being of substantially the same length and extending parallel to each other in close proximity;
said first p-channel and n-channel transistors having source or drain regions with a gate portion conduction channel of width W formed near opposite ends of said first common gate electrode, a portion of each said source or drain region extending toward the other along said gate electrode at a side opposited to said second common gate electrode;
said second p-channel and n-channel transistors having source or drain regions with a gate portion conduction channel of width W formed apart from each other near the center of said second common gate electrode, a portion of each said source or drain region extending away from the other along said gate electrode at a side opposite to said first common gate electrode;
said first and second gate electrodes being broadened in width at each gate portion thereof to provide a gate portion conduction channel of length L whereby a specified W/L ratio is attained in each transistor.

4,692,784
DIELECTRIC INSULATION TYPE SEMICONDUCTOR INTEGRATED CIRCUIT HAVING LOW WITHSTAND VOLTAGE DEVICES AND HIGH WITHSTAND VOLTAGE DEVICES
Tatsuo Negoro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Apr. 11, 1984, Ser. No. 599,158
Claims priority, application Japan, Apr. 12, 1983, 58-64069
Int. Cl.⁴ H01L *29/06, 27/12, 29/04*
U.S. Cl. 357—49 **8 Claims**



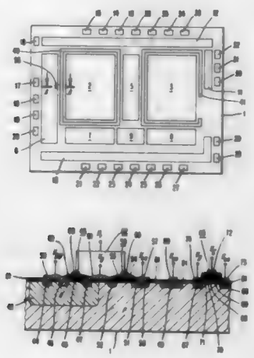
1. A dielectric isolation type semiconductor integrated circuit, comprising:
first and second island regions, each having bottom and side surfaces, each formed of the same conductivity type semiconductor material, and said first and second island regions having substantially the same depth;
each island region having a first portion of a single layer with a first predetermined impurity concentration and a second portion of a single layer with a second predetermined impurity concentration higher than said first predetermined impurity concentration;
the second portion of said first island region being thinner than the second portion of said second island region, the first portion of said first island region having a greater depth than the first portion of the second island region;
a first base portion and a first emitter portion formed in the first portion of each of said first and second island regions, so that a high withstand voltage transistor is formed in said first island region and a low withstand voltage transistor is formed in said second island region;
first and second insulator films coating the bottom and side surfaces of said first and second island regions, respectively; and
a polycrystalline semiconductor layer in contact with said first and second insulator films and integrally combining said first and second island regions.

4,692,785

INTEGRATED CIRCUIT DEVICE FOR WRITING AND READING INFORMATION

Masashi Wada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 13, 1981, Ser. No. 263,252
Claims priority, application Japan, May 19, 1980, 55-66245
Int. Cl.⁴ H01L *29/36*
U.S. Cl. 357—52 **4 Claims**



1. An integrated circuit device for writing and reading information comprising:

a semiconductor substrate of one conductivity type having at least one first semiconductor region of opposite conductivity type;

plural sets of two complementary insulated-gate type field effect transistors which constitute a control circuit for writing and reading information, one of the two transistors of each of the sets being of said one conductivity channel type including a first source region and a first drain region of said one conductivity type and formed spaced-apart from each other in said first semiconductor region, a first insulator layer formed on the first semiconductor region between said first source region and said first drain region, and a first gate electrode formed on said first insulator layer, the other of the two transistors of each of the sets being of said opposite conductivity channel type including a second source region and a second drain region of the opposite conductivity type, formed spaced-apart from each other in said semiconductor substrate, a second insulator layer formed on said substrate between said second source region and said second drain region, and a second gate electrode formed on said second insulator layer; wherein a predetermined voltage is applied between said first and second source regions of said two transistors of each set, the first and second gate electrodes are connected commonly to form an input terminal, and said first and second drain regions of said two transistors of each set are connected commonly to form an output terminal;

a plurality of non-volatile memory elements for storing said information, which memory elements are formed and arranged like a matrix on said semiconductor substrate spaced-apart from said plural sets of two transistors, said non-volatile memory elements being insulated-gate type elements each including a third source region and a third drain region of said opposite conductivity type and being formed spaced-apart from each other in said semiconductor substrate, a third insulator layer formed on said substrate between said third source region and said third drain region, and a third gate electrode formed on said third insulator layer; the information being read out therefrom and being written thereinto by selecting voltages applied to said third source region, said third drain region and said third gate electrode under the control of said control circuit;

a second semiconductor region of said one conductivity type and of a higher impurity concentration than that of said semiconductor substrate, formed near at least one of said field effect transistors of said opposite conductivity channel type, and to which second semiconductor region at a predetermined voltage is applied; and

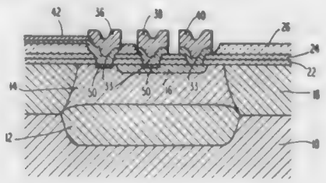
means for suppressing latch-up of a parasitic thyristor formed by said first source region, said first semiconductor region, said substrate, and said second source region as a result of introducing charges into the gate regions of said non-volatile memory elements produced through impact ionization, said means for suppressing comprising a third semiconductor region of said one conductivity type, having an impurity concentration higher than that of the semiconductor substrate and formed surrounding said plurality of non-volatile memory elements in the semiconductor substrate and spaced-apart from the drain regions thereof, and also spaced-apart from both said plural sets of two transistors and from said second semiconductor region, and to which third semiconductor region a predetermined voltage is directly applied to cause current generated in said substrate by operation of said memory elements to be absorbed at said third semiconductor region.

4,692,786

SEMI-CONDUCTOR DEVICE WITH SANDWICH PASSIVATION COATING

Timothy M. Lindenfelser, 1500 Towerview Rd., Eagan, Minn. 55164

Division of Ser. No. 699,028, Feb. 7, 1985, Pat. No. 4,614,666. This application Aug. 21, 1986, Ser. No. 898,717
Int. Cl.⁴ H01L *21/316*
U.S. Cl. 357—54 **2 Claims**



1. A semi-conductor device comprising a silicon base with a functional semi-conductor area on the surface thereof and a metallic contact layer overlying and in contact with at least a portion of said semi-conductor area,

said device further including a composite passivation coating overlying substantially all of the remainder of said device surface,

said metallic contact coating including at least one conductive lead extending from a contact point with said underlying semi-conductor area, said conductive lead also overlying said composite passivation coating,

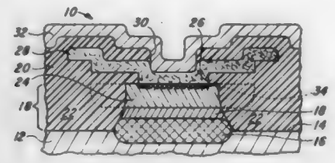
said composite passivation coating comprising a first relatively thin (300–500 Å) silica layer in contact with said device surface, a second nitride layer overlying said first silica layer, and a third silica layer overlying said second layer and interposed between said nitride layer and said overlying conductive lead, the thickness of said third silica layer being 2400–3000 Å, so as to provide, in combination with said first silica layer, preselected electrical characteristics, and to substantially eliminate the adverse effects of undercut of said nitride layer by excessive etching of said first silica layer.

4,692,787

PROGRAMMABLE READ-ONLY-MEMORY ELEMENT WITH POLYCRYSTALLINE SILICON LAYER

Glen G. Possley, Lewisville, and Earl C. Wilson, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 153,463, May 23, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 476,888
Int. Cl.⁴ H01L *29/04, 27/04*
U.S. Cl. 357—59 **11 Claims**



1. A programmable read-only-memory element, comprising:

a substrate;

a monocrystalline silicon layer on the substrate;

a first N-type region in the monocrystalline silicon layer above the substrate;

a second N-type region in the monocrystalline silicon layer above and adjacent to the first N-type region, the second N-type region having a higher resistivity than the first N-type region;

a P-type region in the monocrystalline silicon layer above and adjacent to the second N-type region;

a first PN junction formed at the interface of the P-type region and the second N-type region;

a third N-type region in the monocrystalline silicon layer above and adjacent to the P-type region;

a second PN junction formed at the interface of the third N-type region and the P-type region;

an N-type polycrystalline silicon layer on an upper surface of the monocrystalline silicon layer in contact with the third N-type region;

a metal layer consisting essentially of aluminum contacting the polycrystalline silicon layer above and spaced from the third N-type region;

wherein the vertical dimension from the first PN junction to the polycrystalline silicon layer greatly exceeds the vertical dimension from the second PN junction to the polycrystalline silicon layer, such that a programming voltage impressed on the metal layer relative to the first N-type region to reverse bias the second PN junction will cause aluminum to migrate through the polycrystalline silicon layer to short the second PN junction without shorting the first PN junction.

4,692,788

SEMICONDUCTOR DEVICE WITH SOLDER OVERFLOW PREVENTION GEOMETRY

Masanori Nakatsuka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

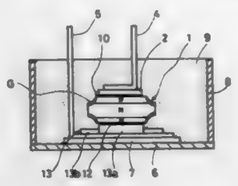
Continuation of Ser. No. 659,349, Oct. 10, 1984. This application Dec. 24, 1986, Ser. No. 946,127
Claims priority, application Japan, Nov. 5, 1983, 58-207721
Int. Cl.⁴ H01L *23/28*
U.S. Cl. 357—72 **4 Claims**

1. A semiconductor apparatus, comprising:

a semiconductor pellet having upper and lower main surfaces,

upper and lower protector plates respectively soldered to said upper and lower main surfaces of said semiconductor pellet to reduce thermal stress,

the whole area of the lower protector plate being larger than the whole area of said lower main surface, said lower protector plate having a separate inner part of molybdenum with its entire upper surface substantially entirely in contact with and of smaller area than the lower main surface and an outer part of copper or like material of lesser thickness than the separate inner part to define therewith a step, the inner part being soldered along said



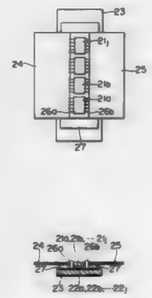
upper surface to said pellet at said lower main surface region thereof, an upper surface of said outer part thereby being spaced from said lower main surface by a distance corresponding to the height of said step wherein said outer part has a central aperture receiving said inner part in force fitting engagement.

4,692,789

SEMICONDUCTOR APPARATUS

Yoshio Nakamura; Susumo Sugiyama, both of Aichi; Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Miyagi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Jul. 22, 1983, Ser. No. 516,543
Claims priority, application Japan, Jul. 23, 1982, 57-127584; Oct. 30, 1982, 57-189983
Int. Cl.⁴ H01L *23/02*
U.S. Cl. 357—74 **8 Claims**



1. A semiconductor apparatus for controlling large current at high speed, comprising:

a plurality of rectangular semiconductor device substrates each having first and second principal surfaces and including a first main electrode and a control electrode on said first principal surface and a second main electrode on said second principal surface,

a first lead conductor of sheet-like metal having good thermal conductivity, said plurality of semiconductor device substrates being aligned in an array on said first lead conductor, said first lead conductor having a sufficient width and length for the placement of said plurality of semiconductor device substrates thereon, said first conductor being electrically connected to said second main electrode,

an insulator surrounding said plurality of semiconductor device substrates, and

relatively wide second and third sheet-like lead conductors having substantially constant widths along the entire cur-

rent paths and electrically insulated from each other in spaced opposed relationship with the array of said semiconductor device substrates interposed therebetween, said second and third lead conductors each having a width greater than the spacing therebetween and at least equal to the sum of the longer sides of said plurality of semiconductor device substrates, said second lead conductor being electrically connected to said first main electrode of each of said semiconductor device substrates, and said third lead conductor being electrically connected to said control electrode of each of said semiconductor device substrates.

4,692,790

STRUCTURE FOR CONNECTING LEADLESS CHIP CARRIER

Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 4, 1985, Ser. No. 772,342
Claims priority, application Japan, Sep. 6, 1984, 59-135548[U]; Nov. 27, 1984, 59-179656[U]
Int. Cl.⁴ H01L *23/10, 23/02, 23/32*
U.S. Cl. 357—79 **11 Claims**



1. A structure for connecting a first connection pattern provided on a leadless chip carrier to a second connection pattern provided on a receiving surface, said structure comprising:

a support cover receiving and retaining said leadless chip carrier therein and having a plurality of resilient portions for biasing said leadless chip carrier inwardly of said support cover from positions around said periphery of said leadless chip carrier;

a frame for accommodating said support cover in an interior portion thereof in such a manner that said first and second connection patterns are connected to each other, said support cover being retained on the substrate; and

a cover for pressing said support cover toward said substrate to retain said support cover and said leadless chip carrier within said interior of said frame.

4,692,791

MONOLITHIC IMPATT WITH STRIPLINE LEADS

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 630,485, Jul. 13, 1984, Pat. No. 4,596,069. This application Apr. 8, 1986, Ser. No. 849,312
Int. Cl.⁴ H01L *23/14, 23/50, 29/90;* **H01P** *3/08*
U.S. Cl. 357—81 **8 Claims**

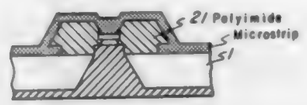
1. A monolithic semiconductor structure which comprises:

(a) a first semiconductor layer including at least one circuit element and having a heat sink on a surface thereof,

(b) a second semiconductor layer disposed on said heat sink,

(c) insulating means insulating said second semiconductor layer from said first semiconductor layer; and

(d) electrically conductive means disposed on said insulating means and coupling by microstrip on said first layer said at



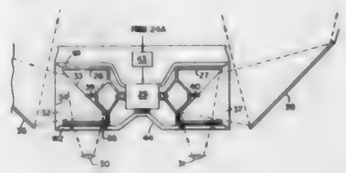
least one circuit element to a microwave diode on or in said second semiconductor layer.

4,692,792

METHOD AND APPARATUS FOR PRODUCING STEREOSCOPIC IMAGES

Graham S. B. Street, Reading, England, assignor to Brightad Limited, United Kingdom

Continuation of Ser. No. 638,414, Aug. 7, 1984, Pat. No. 4,641,178. This application Dec. 8, 1986, Ser. No. 939,059
Claims priority, application United Kingdom, Aug. 12, 1983, 8231727
Int. Cl.⁴ H04N *15/00*
U.S. Cl. 358—3 **5 Claims**



2. A recording member for forming a stereoscopic image having a plurality of spectral components and which is viewable by supplying to a viewer's left and right eyes respectively light representing first and second perspectives of said image, said recording member including a plurality of first recording locations containing representations of substantially only the first spectral component of light representing said first perspective and the second spectral component of light representing the second perspective, and a plurality of second recording locations containing representations of substantially only the second spectral component of light representing the first perspective and the first spectral component of light representing the second perspective, said first and second recording locations alternating with each other, whereby reproduction from said first and second recording locations in succession provides alternating spectral components for each of said first and second perspectives.

4,692,793

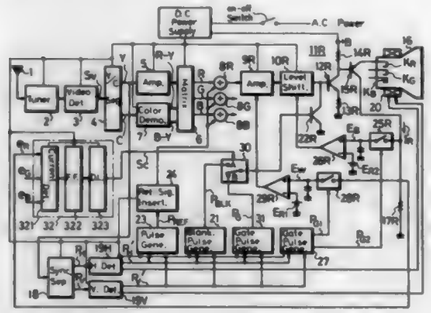
CIRCUIT FOR BLANKING THE VIDEO OF A TELEVISION SET FOR A TIME AFTER TURN-ON

Takahiko Tamura, Tokyo, and Yoshinari Sengoku, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,025
Claims priority, application Japan, Feb. 14, 1985, 60-27420
Int. Cl.⁴ H04N *9/73, 9/16*
U.S. Cl. 358—29 **5 Claims**

4. A color television receiver comprising, a three gun color picture tube for displaying a color picture, means for receiving and separating three color drive signals for said three gun color picture tube, a power on-off switch for supplying power to said television receiver, a switching circuit, a gate pulse generator which blanks except during reference signal insertion connected to turn-off said three color drive signals and connected to said switching circuit to deliver a blanking signal, current detecting means connected to said three gun color picture tube

to detect current therein, a switching control signal generator connected to said current detecting means and supplying a control signal to said switching circuit and producing a blanking command signal for a time after said power switch has been



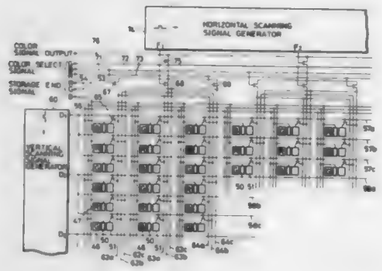
turned on and producing a blanking off signal when the power switch has been turned on for a time sufficient such that said current detecting means detects a sufficient level of current in any of the three guns of said color picture tube.

4,692,794

COLOR IMAGE SENSOR WITH PICTURE ELEMENTS EACH COMPRISING AN M×N MATRIX OF RED, GREEN, AND BLUE PHOTOELECTRIC CONVERSION ELEMENTS FEATURING CONTROLLABLE CHARGE STORAGE TIME AND SELECTIVE READOUT FOR EACH COLOR

Kenji Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 18, 1986, Ser. No. 830,115
Claims priority, application Japan, Feb. 18, 1985, 60-28188
Int. Cl.⁴ H04N *9/077, 9/04;* **G03B** *27/80*
U.S. Cl. 358—44 **9 Claims**



1. A color image sensor comprising:

three kinds of photoelectric conversion elements (**45, 46, 47**) for photoelectrically converting three primary color components of light, respectively, into signal charges and storing the signal charges therein, said photoelectric conversion elements being arranged in a predetermined order to form a matrix of picture elements, each picture element comprising a matrix of m rows and n columns of said photoelectric conversion elements, m and n being positive integers at least one of which is at least three;

means (**60, 65, 74, 75**) for scanning said picture elements one by one in order to extract said stored signal charges from said photoelectric conversion elements making up said picture elements as color signals;

means (**67, 68, 69, 71, 72, 73**) for specifying which of said three kinds of photoelectric conversion elements is subjected to said extraction of said stored signal charges; and

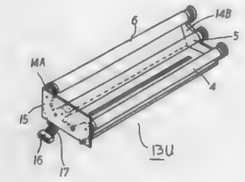
means (**62a, 62b, 62c, 63a, 63b, 63c, 64a, 64b, 64c**) for adding together the stored signal charges extracted from the photoelectric conversion elements of each picture elements as it is scanned by said scanning means such that stored signals extracted from the same kind of photoelectric conversion element are added together.

4,692,795

COLOR IMAGE READOUT DEVICE WITH DETACHABLE LIGHT SOURCE UNIT

Motokazu Nakao, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1985, Ser. No. 797,893
Claims priority, application Japan, Dec. 17, 1984, 59-191535[U]
Int. Cl.⁴ H04N *1/028, 1/46*
U.S. Cl. 358—75 **6 Claims**



1. A color image readout device comprising:

a main body,

a light source support unit housed in said main body, said light source support unit comprising a plurality of light sources of different color emissions and means for integrally supporting said plurality of light sources,

means for sequentially actuating said plurality of light sources, and

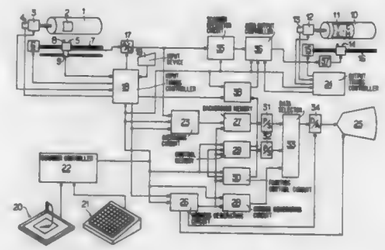
means for receiving light reflected from a document irradiated by said light sources and outputting a color separation signal.

4,692,796

METHOD FOR MANUFACTURING ELECTRIC MASKS USING A COLOR SCANNER AND AN APPARATUS FOR USE THEREIN

Mitsuhiko Yamada; Kyohei Fujisawa, both of Kyoto, and Hideaki Kitamura, Takatsuki, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 7, 1985, Ser. No. 731,559
Claims priority, application Japan, Jun. 18, 1984, 59-126193
Int. Cl.⁴ H04N *1/46*
U.S. Cl. 358—76 **2 Claims**



1. A method for manufacturing electric masks using a color scanner having a CRT monitor and a coordinate input device, comprising:

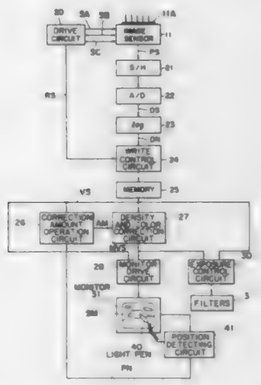
setting a cutout area of an original picture adhered to an input drum by means of the coordinate input device prior to a subsequent step of duplicating and recording;
roughly scanning an image in said output area at a pitch that is coarser than a scanning pitch in said subsequent step of duplicating and recording, so as to obtain a picture signal;
averaging the picture signal obtained by said rough scanning into rough sampling data;
writing said rough sampling data into the background memory of the CRT monitor;
displaying the rough sampling data written in the memory of the CRT monitor as a picture on the CRT monitor as an image having a matched origin by means of said coordinate input device;
displaying a contour of a desired electric mask while writing the contour of the desired electric mask into a control memory on said picture by using the coordinate input device, and observing the display picture;
manufacturing an electric mask by solidly painting out the contour;
writing electric mask data obtained from said step of manufacturing into said control memory;
duplicating and recording said image including scanning of said image;
reading out the electric mask data written into the control memory in synchronization with the output timing of picture data so as to mask the picture data in real time; and
interpolating and smoothing the electric mask data written into the control memory by means of a smoothing pattern composed of pattern elements equal in size to picture elements corresponding to the picture data at the time of reading out the mask data in synchronization with the output timing of the picture data.

4,692,797

PHOTOGRAPHIC PRINTING SYSTEM

Fumio Matsumoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 26, 1985, Ser. No. 802,221
Claims priority, application Japan, Dec. 7, 1984, 59-258753; Apr. 8, 1985, 60-73794; Aug. 26, 1985, 60-185791
Int. Cl.⁴ G03B *27/73*; H04N *1/46*
U.S. Cl. 358—76 **21 Claims**



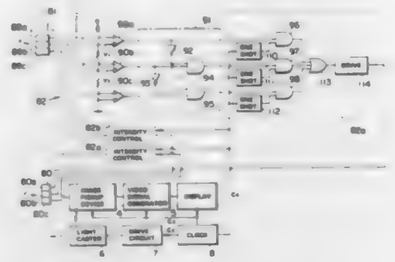
1. A photographic printing system of the type in which a picture image of an original film lighted by a light source is printed on a photographic paper, comprising:
a two-dimensional image sensor for receiving a transmitting light through or reflected light from said picture image on the original film;
a signal processing circuit for processing and storing a signal regarding the picture image from said two-dimensional image sensor;
a correction amount operation circuit for extracting characterized information of the original film from data of the picture image stored in said signal processing circuit and calculating density and color correction amount of the picture image to be printed;
a density and color correction circuit for correcting the picture image data stored in said signal processing circuit in accordance with the calculated density and color correction amount;
a monitor for displaying a picture in response to the picture image data after the correction of said density and color correction circuit;
a device for designating a position of the picture displayed on said monitor; and
a density and color recorrection circuit for recorrecting the picture data of said density and color correction circuit so as make the density or lighted amount of the picture displayed on said monitor to a predetermined value, whereby a photographic printing operation is performed with the recorrected picture data of said density and color recorrection circuit.

4,692,798

APPARATUS AND PROCESS FOR IMPROVING VISIBILITY OF OBJECT WITHIN VISUAL FIELD

Yasutoshi Seko, Yokohama, and Yuichi Abe, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 7, 1985, Ser. No. 689,243
Claims priority, application Japan, Jan. 9, 1984, 59-1717; Jan. 9, 1984, 59-1719
Int. Cl.⁴ H04N *7/18, 5/225*
U.S. Cl. 358—93 **16 Claims**



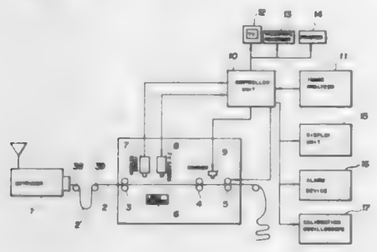
1. An apparatus comprising:
means for casting visible light toward a reflective object at a frequency of no less than the critical fusion frequency;
means for picking up an image of the object and outputting image data in accordance with the picked-up image;
a light-intensity sensor monitoring the intensity of a light incident on said image pickup means and outputting a signal representing the level of the intensity of the incident light;
an optical shutter of liquid crystal filtering the incident light;
a light-intensity control circuit opening and shutting said optical shutter in accordance with the frequency of the casting of the visible light and controlling a duty cycle of said optical shutter in response to a level of said signal so as to control an effective transmissivity of said optical shutter;
means for generating a picture signal in accordance with the image data; and
means for displaying a picture of the object in response to the picture signal.

4,692,799

AUTOMATIC INSPECTION SYSTEM FOR DETECTING FOREIGN MATTER

Michihiro Saitoh; Takatoshi Gogami, and Toshiyuki Osada, all of Kanagawa, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Japan

Continuation of Ser. No. 819,471, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 537,114, Sep. 20, 1983, abandoned, which is a continuation-in-part of Ser. No. 374,904, May 4, 1982, abandoned. This application Dec. 29, 1986, Ser. No. 943,813
Claims priority, application Japan, Apr. 5, 1982, 57/56467; Sep. 2, 1983, 58/162395
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—106 **3 Claims**



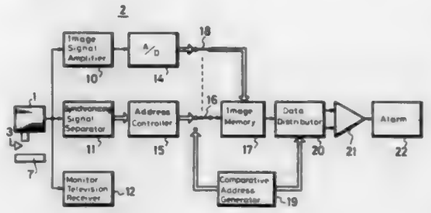
1. An automatic inspection system for detecting foreign materials in a resin material sheet, comprising:
an extruder for extruding a resin material into a soft sheet capable of passing light therethrough;
a source of light disposed on one side of said path of travel of said sheet; and
an image sensor camera disposed on the other side of said path of travel of said sheet in confronting relation to said source of light for receiving light emitted from said source of light and having passed through said sheet to detect foreign material included in said sheet;
a pair of freely rotatable rollers disposed between said extruder and said image sensor camera for permitting said sheet to hang down by gravity into a U-shape of a length sufficient to cool and harden said soft sheet, portions of said sheet while hanging down by gravity in a U-shape being substantially perpendicular to said path of travel of said sheet;
sensor means for detecting a vertical position of said U-shaped portion of said sheet, said sensor means including only two sensors spaced apart in a vertical direction at a distance so that said sheet is not detected by either sensor when said sheet hangs down to a positon between said sensors;
means for withdrawing said sheet along a path of travel;
controller means for adjusting the speed of sheet withdrawal for said withdrawing means in response to the output signal for said sensor means, said controller means comprising a main synchronous control system for maintaining the speed of the withdrawal of said sheet by the withdrawing means in synchronization with the rate of extrusion by the extruder, said main synchronous control system including a rotary encoder for detecting the rate of extrusion, the output of said encoder being fed to a digital-to-analog converter that produces an analog signal that is processed and fed to an analog-to-digital converter, the output of the analog-to-digital converter being applied to a pulse amplifier which feeds an amplified signal to a pulse motor for driving said means for withdrawing said sheet, said controller means also comprising a corrective control system for compensating a speed difference between the extrusion rate and the withdrawal speed in response to the output signal from said sensor means, said corrective control system including a voltage to frequency converter for receiving said output signal from said sensor means, the output of said voltage to frequency converter being applied to said pulse amplifier.

4,692,800

AUTOMATIC INSPECTION DEVICE

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,759
Claims priority, application Japan, Nov. 22, 1984, 59-247743
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—106 **8 Claims**



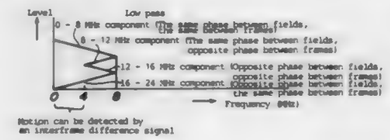
1. A method of automatically inspecting an object, comprising the steps of:
(a) illuminating the object to be inspected;
(b) viewing said object with a single optical image sensor having a target screen which includes a number of picture elements arranged in a mesh pattern to provide an optical image thereof in the form of a video signal;
(c) dividing the optical image of said object received by said sensor into at least two portions which are mutually symmetrical to each other with respect to a line or point; and
(d) comparing sequentially video signals from each of the picture elements at corresponding positions in specifically corresponding parts of said mutually symmetrical portions sequentially with respect to the line or point to thereby determine whether said object has a defect or not.

4,692,801

BANDWIDTH COMPRESSED TRANSMISSION SYSTEM

Yuichi Ninomiya; Yoshimichi Ohtsuka; Yoshinori Izumi, and Sei'ichi Goushi, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,232
Claims priority, application Japan, May 20, 1985, 60-106132; Jan. 27, 1986, 61-13631; Jan. 27, 1986, 61-13632
Int. Cl.⁴ H04N *7/13*
U.S. Cl. 358—133 **14 Claims**



1. An encoder for compressing a frequency band of a television signal of 2:1 interlace system by carrying out interfield offset subsampling and interframe offset subsampling, comprising:
first sampling means for carrying out interfield offset subsampling of a video signal of said television signal at a timing of a sampling pulse having a first sampling frequency corresponding to a substantially upper limit frequency of said video signal;
a low pass filter to which an output signal from said first

sampling means is applied and for passing a signal component having an aliased portion resulting from said interfield offset subsampling, said low pass filter having a cut-off frequency substantially equal to one half (½) of said first sampling frequency; and

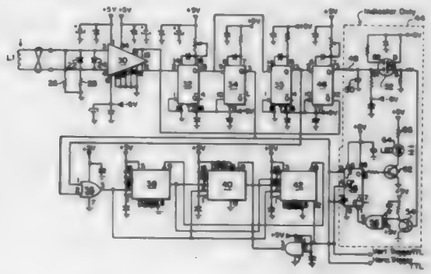
second sampling means to which an output signal from said low pass filter is applied and for carrying out interframe offset subsampling of said output signal at a timing of a sampling pulse having a second sampling frequency which is lower than said first sampling frequency and is higher than one half of said first sampling frequency, so that a multiplexed subsampled transmission signal which does not include an aliased portion of reverse phase results from said interframe offset subsampling.

4,692,802

APPARATUS FOR GENERATING OSCILLOSCOPE TRIGGER SIGNALS

Richard Erski, Fort Wayne, Ind., assignor to NAP Consumer Electronics Corp., New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,146
Int. Cl.⁴ H04N *17/04*
U.S. Cl. 358—139 **9 Claims**



1. Apparatus for monitoring horizontal synchronization signals generated in a horizontal synchronization circuit of a television receiver, comprising

inductive pick-up circuit means located in operative proximity to said television receiver for receiving energy radiated by said horizontal synchronization circuit and for generating pick-up signals in response thereto;

processing means connected to said pick-up circuit means for generating horizontal frequency output signals having a predetermined pulse width in response to said pick-up signals; and

output means connected to said processing means for furnishing an output signal indicative of the absence or presence of said pick-up signals.

4,692,803

CATV CONVERTER HAVING PHASE LOCKED LOOP FOR SOUND C•RRIER WAVE FREQUENCY CONTROL

Katsumi Tobita, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 4, 1986, Ser. No. 848,731
Claims priority, application Japan, Apr. 4, 1985, 60-72044
Int. Cl.⁴ H04N *5/06, 7/06, 7/16*
U.S. Cl. 358—143 **3 Claims**

1. A CATV converter comprising:

a tuner receiving an input CATV signal for a signal of a selected channel;

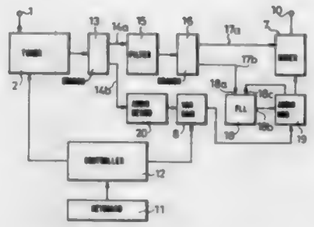
first branching means for bifurcating the selected signal from the tuner into a video carrier and a sound carrier;

an audio demodulator receiving the sound carrier for demodulating the sound carrier into an audio signal and providing the audio signal to an audio modulator;

second branching means for bifurcating the video carrier from the first branching means into two parts;

a mixer receiving a first part of said branched video carrier and a sound carrier output from said audio modulator for providing an output TV signal;

a phase locked loop circuit receiving as inputs a second part of said branched video carrier and a part of the sound carrier output of said audio modulator for providing an output control signal to said audio modulator representing



a selected frequency difference to be maintained between a frequency of the video carrier and a frequency of the sound carrier output provided to said mixer; and

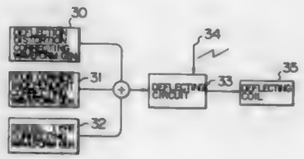
said audio modulator receiving as inputs the audio signal from said audio demodulator and the output control signal of said PLL circuit for providing the sound carrier output having a said sound carrier output frequency which is variably modulated in accordance with the output control signal of said PLL circuit in order to maintain said frequency difference from the video carrier frequency.

4,692,804

IMAGE DISTORTION CORRECTING APPARATUS FOR TELEVISION CAMERA COMBINING GLOBAL AND LOCAL CORRECTIONS

Akira Aoki, Koganei, and Fumio Ukigaya, Higashiyamato, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 831,856
Claims priority, application Japan, Feb. 22, 1985, 60-32722
Int. Cl.⁴ H04N *5/228*
U.S. Cl. 358—163 **4 Claims**



1. An image distortion correcting apparatus for a television camera incorporating a plurality of imaging elements, comprising:

at least, a distortion correcting waveform generating circuit of analogue type in which an imaging plane of said television camera is divided into four corner areas for correcting image distortions at said corner areas, respectively, independent of one another;

a distortion correcting waveform generating circuit of digital type in which said imaging plane is divided into horizontal and vertical directions by given numbers of dividing lines, respectively, said digital-type correcting waveform generating circuit storing correcting values for every intersection defined by said dividing lines in the form of digital quantities for generating correcting waveforms on the basis of said digital quantities;

an adder circuit for adding the distortion correcting waveforms produced by both of said distortion correcting waveform generating circuits; and

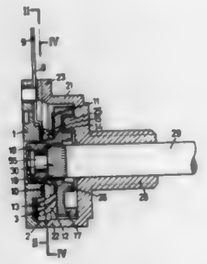
a deflecting circuit supplied with the output from said adder circuit.

4,692,805

DEVICES USED FOR VARYING THE RESISTANCE OF ELECTRICAL CIRCUITS AND THE CONDUCTION OF CURRENT IN ELECTRICAL CIRCUITS

Carlos Lopez, and Jose L. Serrano, both of Tudela, Spain, assignors to Piher Navarra, S.A., Tudela, Spain

Filed Jan. 23, 1985, Ser. No. 694,043
Claims priority, application Spain, Jan. 24, 1984, 529.109
Int. Cl.⁴ H01C *10/50*
U.S. Cl. 338—198 **10 Claims**



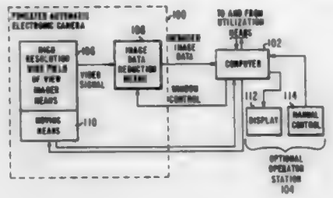
1. A device forming a combined potentiometer and switch, comprising: a rotatable component having a central protuberance thereon; a potentiometer portion for varying the resistance of an electrical circuit, said potentiometer portion including a casing and a plate joined together to form a body for said potentiometer, said rotatable component extending into said potentiometer body and having a portion of said central protuberance extending through said plate; a first discoidal component carried by said rotatable component; a metallic cursor connected to said discoidal component; a resistance track stationarily mounted on said plate in said body; a metallic collector stationarily mounted on said plate in said body; said cursor being continuously and simultaneously in contact with said resistance track and said collector; a switch portion for changing the state of current conduction in the electrical circuit, said switch portion including a switch protective casing; a second discoidal component mounted in said switch protective casing for engagement by the portion of said central protuberance which extends out of said potentiometer body; cooperating means on the portion of said central protuberance extending through said plate and on said second discoidal component for releasably coupling said second discoidal component to said rotatable component when said switch portion is coupled to said potentiometer portion whereby said second discoidal component can be rotated by said rotatable component; a fixed contact mounted on said switch protective casing; a movable contactor arm movably mounted on said switch protective casing; a contact means on said movable contactor arm for contacting said fixed contact for establishing electrical connection in the electrical circuit; means for moving said movable contactor arm to move said contact means out of contact with said fixed contact and including means connected to said second discoidal component to move said movable contact arm when said rotatable component is rotated; and further including fastening means for connecting said potentiometer body to said switch protective casing.

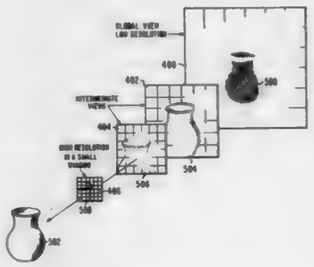
4,692,806

IMAGE-DATA REDUCTION TECHNIQUE

Charles H. Anderson, Somerset County, and Curtis R. Carlson, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 698,787, Feb. 6, 1985, abandoned. This application Apr. 8, 1986, Ser. No. 850,432
Claims priority, application United Kingdom, Jul. 25, 1985, 8518803
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—209 **41 Claims**





1. An image data reduction method for use with an input video signal representing a relatively high-spatial-resolution, wide-field-of-view image that is comprised of a first given number of pixels, said method comprising the steps of:

first processing said input video signal to derive therefrom (1) a certain output video signal representing a derived relatively low-spatial-resolution image having a given field-of-view that corresponds to the field of the image represented by said input video signal, said image represented by said certain video signal being comprised of a second given number of pixels smaller than said first given number, and (2) at least one other output video signal representing a derived image having said given field-of-view, said image represented by said one other output video signal exhibiting a resolution equal to or less than said relatively high-spatial-resolution image represented by said input video signal but larger than said relatively low-spatial-resolution derived image represented by said certain output video signal, and said derived image represented by said one other output video signal being comprised of a number of pixels that is equal to or less than said first given number but larger than said second given number; and

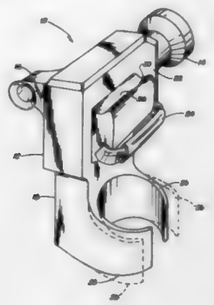
then further processing said one other output video signal to reduce the number of pixels of the derived image represented thereby by passing a spatially-localized subset of pixels thereof through a spatial window, said subset being comprised of no greater number of pixels than said second given number.

4,692,807

ELECTRONIC CAMERA HANDLE CONFIGURATION

Richard C. Kee, Chestnut Hill, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 14, 1986, Ser. No. 852,025
Int. Cl.[4] H04N 5/30
U.S. Cl. 358—229 10 Claims



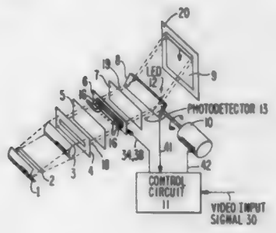
1. A video camera comprising:
a housing including an upper housing portion operatively connecting an objective lens having an optical center axis therethrough and viewfinder display and a lower housing portion extending downwardly from said upper housing portion;
a hand grip extending laterally outward from a side portion of said upper housing portion and oriented with respect to said upper housing portion so as to extend longitudinally in a direction generally parallel to the optical center axis of said objective lens; and
support sections extending laterally outward from a side portion of said lower housing portion at a location generally underlying said hand grip for engaging the wrist and/or forearm of a camera user so as to steady his hand when his hand grasps the hand grip to hold the camera in its normally intended operative position.

4,692,808

PASSIVELY MODULATED PUSH BROOM DISPLAY

Samuel B. Chism, Jr., Houston, Tex., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 2, 1986, Ser. No. 902,811
Int. Cl.[4] H04N 5/74
U.S. Cl. 358—231 8 Claims



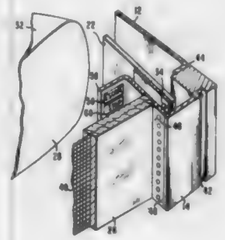
1. Apparatus for producing a projected real-time two-dimensional display, comprising:
a stationary two-dimensional screen for receiving the display;
a light source and associated optics for producing a collimated light beam;
a linear array of electronically controlled optical elements for modulating the collimated light beam with input image line-segmented data to form a modulated light beam; and
a nutating mirror for sweeping the modulated light beam, in a direction orthogonal to that of the linear array of optical elements, in synchronism with the input image line-segmented data, thereby converting the modulated light beam into a two-dimensional display projected onto the screen.

4,692,809

INTEGRATED TOUCH PAINT SYSTEM FOR DISPLAYS

August H. Beining, Fullerton, and William A. Smith, Laguna Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,306
Int. Cl.[4] H04M 5/65
U.S. Cl. 358—247 50 Claims



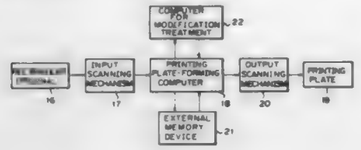
1. An integrated, electromagnetic energy interference shielding, light beam touch panel system for use in conjunction with a display apparatus having a screen upon which information is displayed, comprising:
a substantially optically transparent faceplate disposed across the screen through which the screen may be viewed;
first means for shielding the faceplate against the propagation through it of electromagnetic energy interference;
a raised border through which the light beams pass disposed at a preselected position in relation to the faceplate to define an active touch panel area over the faceplate;
second means for shielding the raised border against the propagation through it of electromagnetic energy interference, the second means being in electrical contact with the first means;
a bezel mounted at the front of the display apparatus and adjacent the active touch panel area;
third means for shielding the bezel against the propagation through it of electromagnetic energy interference, the third means being in electrical contact with the second means;
an outer enclosure mounted around the sides, top, bottom, and back of the display apparatus and to the bezel; and
fourth means for shielding the outer enclosure against the propagation through it of electromagnetic energy interference, the fourth means being in electrical contact with the third means.

4,692,810

PROCESS FOR PRINTED DRAW-FORMED BODY, AND CONTAINER FORMED BY THIS PROCESS

Akihiko Machii; Hiroo Ikegami, both of Yokohama; Masao Ishinabe, Atsugi; Katsuhiro Imaza, Yokohama, and Hiroshi Ueno, Yokosuka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,465
Claims priority, application Japan, May 22, 1985, 60-108377; May 22, 1985, 60-108378; Oct. 17, 1985, 60-229828
Int. Cl.[4] H04H 1/00
U.S. Cl. 358—256 8 Claims



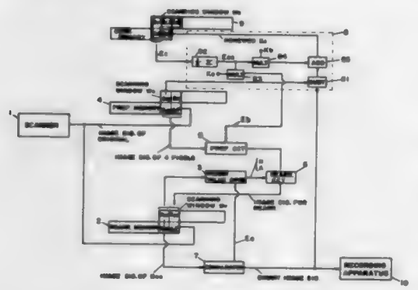
1. A process for the preparation of a printed draw-formed body having a printed image on the side wall thereof by subjecting a prior-printed blank to draw-forming, which comprises converting an image of an original to be printed to a digital image element signal on a rectangular coordinate, converting the image element signal on the rectangular coordinate to an image signal or image signals on a corresponding conversion coordinate formed by developing the rectangular coordinate to an annular plane having an area substantially equal to the area of said rectangle, substantially equal to the area of said rectangle, reading image element signals on the conversion coordinate in order of the coordinate, photo-electrically converting the read image element signals to a printing plate for the blank and printing the blank by using the formed printing plate.

4,692,811

APPARATUS FOR PROCESSING IMAGE SIGNAL

Hiroyoshi Tsuchiya, Kawasaki; Toshiharu Kurosawa, Yokohama; Hirotaka Otsuka, Tama; Yuuji Maruyama, Inagi, and Katsuo Nakazato, Shinjuku, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,961
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—282 17 Claims



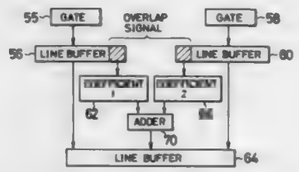
16. An apparatus for processing image signal comprising;
a memory means for storing error data neighboured to a referred picture element xy, first calculating means for calculating a weighted mean value E_w of said error data neighboured to the referred picture element xy,
second calculating means for adding original image data I_{xy} and a mean error E_a which consists of said weighted mean value E_w as upper bits and lower bits data $E_{x\text{-}1,y}(L)$ of the error data of one picture element before as lower bits to obtain a value $I'xy(=Ea+I'xy)$,
a comparator for comparing said value I'xy with a predetermined value to obtain binary signal Pxy,
third calculating means for calculating a difference between said value I'xy and binary signal Pxy as the error data Exy,
means for supplying upper U bits data of said error data Exy to said memory means, and
means for holding lower L bits data of said error data Exy until next picture element processing.

4,692,812

PICTURE IMAGE READER

Shuzo Hirahara, Yokohama; Kiyoshi Yamada, Tokyo; Kazuhiko Higuchi, Kawasaki, and Tutomu Saito, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1986, Ser. No. 837,846
Claims priority, application Japan, Mar. 26, 1985, 60-059358; Oct. 28, 1985, 60-240966
Int. Cl.[4] H04N 1/04
U.S. Cl. 358—285 18 Claims



1. A picture image reader which reads picture image information in an original by illuminating the original with light and by receiving the transmitted or reflected light from the original, comprising:
(a) sensing means for reading picture image information by receiving the light from the original which is illuminated;
(b) moving means for relatively moving said sensing means to the original;
(c) overlapping means for overlapping portions of reading picture images in the picture image reading by said sensing means; and
(d) synthetic picture image formation means for synthesizing picture images of the overlapped portion so as to obtain the picture images coinciding with the picture images in the original, based on each of the picture image information that is read by overlapping the picture images with said sensing means.

4,692,813

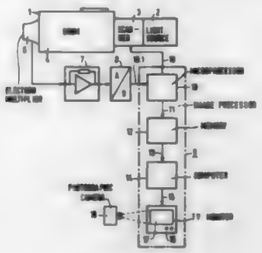
APPARATUS FOR CONVERTING RADIATION IMAGE INFORMATION CARRIED BY A STORAGE LAYER INTO A TELEVISION SIGNAL SEQUENCE

Bernhard Conrad, Erlangen, and Guenther Tressl, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,438
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435315
Int. Cl.[4] H04N 1/06
U.S. Cl. 358—294 33 Claims

1. An apparatus for converting image information into an electrical signal comprising:
a stationary drum having a radiation-sensitive image storage layer on a longitudinal surface thereof said image storage layer containing image information and emitting radiation corresponding to said information upon stimulation by stimulating radiation;
multiplier means for converting emitted radiation incident thereon into an electrical signal;

a rotatable stimulating radiation deflector disposed substantially centrally inside said drum for directing stimulating radiation onto said storage layer, said rotatable radiation deflector and said storage layer being axially displaceable;
means for conducting said stimulating radiation into an interior of said drum onto said radiation deflector; and



an emitted radiation-guide disposed between said radiation deflector and said multiplier means for coupling a portion of said radiation emitted by said storage layer to said multiplier means.

4,692,814

JITTER-IMMUNE TIME EXPANSION FOR TIME-COMPRESSED LINE-SEQUENTIAL VIDEO SIGNALS

Naomichi Nishimoto, Tokyo, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

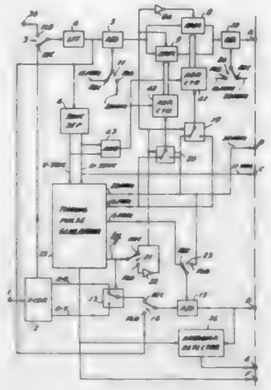
Filed Oct. 31, 1984, Ser. No. 666,732

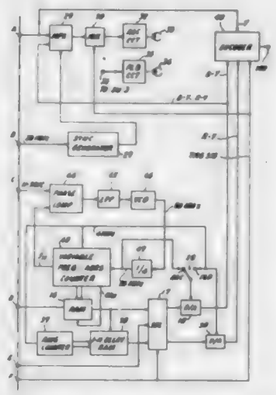
Claims priority, application Japan, Oct. 31, 1983, 58-205631; Oct. 31, 1983, 58-205632

Int. Cl.[4] H04N *9/89*

U.S. Cl. 358—320 **4 Claims**

1. Apparatus for processing a line sequential video signal including time compressed luminance and chrominance signals, horizontal sync pulses and vertical sync pulses, one of said horizontal sync pulses coinciding with each of said vertical sync pulses, said video signal being formatted in blocks of video lines, each of said lines containing a group of luminance samples and a group of chrominance samples, the group of said luminance samples being compressed in accordance with a ratio M/N and the group of said chrominance samples being compressed in accordance with a ratio (N-M/N, wherein M and N are integers and is greater than N-M, comprising:
first and second storage means associated with said time compressed luminance signal;
timing means responsive to said horizontal and vertical sync pulses for generating first, second and third frequencies corresponding to the integers, N, M and N-M, respectively;
coincidience detecting means for detecting a coincidence between one of said horizontal sync pulses and each of said vertical sync pulses;
first read-write control means responsive to the detection of said coincidence for initiating writing the group of luminance samples during alternate line intervals into said first and second storage means at said first frequency so that the line intervals during which said luminance samples are written into sad first storage means alternate with those during which the luminance samples are written into said second storage means, and reading luminance samples from said first and second storage means during alternate line intervals at said second frequency so that the line intervals during which said luminance samples are read out of said first storage means alternate with those during which the luminance samples are read out of said second storage means;
third storage means associated with said time compressed chrominance signal; and
second read-write control means responsive to each of said horizontal sync pulses for storing the group of said chrominance samples of each video line into said third storge





means at said first frequency and subsequently reading chrominance samples out of the third storage means at said third frequency.

4,692,815

PHOTOGRAPHING AND RECORDING METHOD AND APPARATUS FOR ELECTRONIC STILL PICTURE CAMERAS

Atsushi Kawahara, Kawasaki, and Masaya Okita, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 634,409, Jul. 25, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 921,844

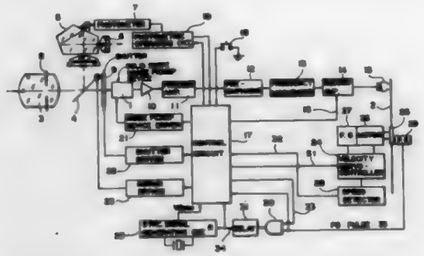
Claims priority, application Japan, Jul. 28, 1983, 58-136749; Dec. 23, 1983, 58-242102

Int. Cl.[4] H04N *5/781*

U.S. Cl. 358—335 **5 Claims**

1. An apparatus for an electrical still picture camera including image pickup means for storing charges corresponding to an image of an object at a photosensitive surface and generating a picture signal indicative of said image, exposure means for controlling an exposure of said photosensitive surface by said image, first generating means for generating a vertical synchronizing signal, means for recording said picture signal

on a disk in accordance with said vertical synchronizing signal, and a motor for rotating said disk, said apparatus comprising:
(a) means for controlling said motor so that the period of the rotation of said disk substantially coincides with the period of said vertical synchronizing signal;
(b) means for detecting that the period of the rotation of said disk substantially coincides with the period of said vertical synchronizing signal and for producing a detection signal;



(c) second generating means connected to said motor for genreating a pulse every rotation of said disk: and
(d) shifting means responsive to said detecting signal following a beginning of said exposure for causing for causing said first generating means to shift a phase of said vertical synchronizing signal for every pulse generated, said shifting means shifting the phase of said vertical synchronizing signal to produce a predetermined phase difference between said pulses and said vertical synchronizing signal.

4,692,816

DIGITAL DATA TRANSMITTING SYSTEM FOR TRANSMITTING DIGITAL DATA A NUMBER OF TIMES DEPENDING ON AN INFORMATION CONTENT OF THE DIGITAL DATA

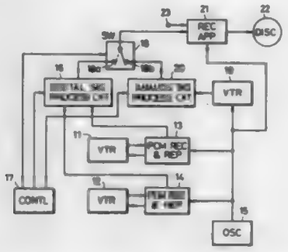
Hiroyuki Sugiyama, Isehara; Nobuaki Takahashi, Yamato; Takeshi Shibamoto, Sagamihara; Kazunori Nishikawa, Machida, and Makoto Komura, Tokyo, all of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Filed Jul. 2, 1984, Ser. No. 626,700

Claims priority, application Japan, Jul. 8, 1983, 58-124217; Jul. 8, 1983, 58-124218

Int. Cl.[4] H04N *5/85*; G11B *20/12*

U.S. Cl. 358—342 **5 Claims**



1. A digital data transmitting system for transmitting a plurality of channels of digital data through a transmitting medium such as a recording medium, said plurality of channels of digital data being obtained by subjecting information signals to a digital modulation, said information signals comprising a non-compressed audio signal, a video signal, and an information signal other than the non-compressed audio signal and the video signal, said digital data transmitting system comprising:
first means for transmitting a channel of digital information signal data which are obtained by subjecting said information signal to the digital modulation, said digital information signal data being divided into sectors each having k words, where k is a natural number, and being transmitted within a predetermined transmission time period so that a sector is transmitted once or repeatedly a number of times depending on an information content of the sector; and
second means for adding a first code and a first synchronizing signal to each sector of said digital information signal data which are obtained from said first means, and for transmitting the digital information signal data which have the sectors added with said first code and said first synchronizing signal, said first code assuming the same value for sectors which are repeatedly transmitted within said predetermined transmission time period,
each of said sectors being transmitted with a signal format in which a mode code indicative of a kind of the information content of the sector, a first error detecting code, and a second code indicative of a sequence of the sector within said predetermined transmission time period, are time-sequentially transmitted together with said first code and said first synchronizing signal which are obtained from said second means, said mode code being made up of a first mode code indicative of the kind of the information content of the sector when upper and lower parts of each word of the sector are of the same kind, and a second mode code indicative of a combination of the different kinks when the upper and lower parts of each word of the sector are of different kinds.

4,692,817

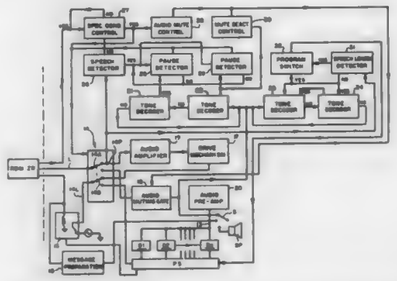
PROGRAMMED CONVERSATION RECORDING SYSTEM

Peter F. Theis, McHenry, Ill., assignor to Morgan Industries, Inc., Gurnee, Ill.

Continuation of Ser. No. 334,243, Dec. 24, 1981, Pat. No. 4,539,436, which is a continuation-in-part of Ser. No. 856,105, Nov. 30, 1977, Pat. No. 4,328,396, which is a continuation-in-part of Ser. No. 605,240, Aug. 18, 1975, Pat. No. 4,506,393, which is a continuation-in-part of Ser. No. 439,445, Feb. 4, 1974, Pat. No. 4,496,601, and a continuation-in-part of Ser. No. 604,390, Aug. 15, 1975, Pat. No. 4,660,120. This application May 9, 1985, Ser. No. 732,513

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—12 **2 Claims**



1. An apparatus for carrying on a programmed conversation with a respondent, comprising:
a message storage unit operative to store a sequence of audio messages for playback to the respondent;
a response recorder unit operative to record responses of the respondent after individual ones of the audio messages;
a pause detector coupled to the message storage unit to initiate playback of a next one of the audio messages automatically following a pause exceeding a selected duration in a response of the respondent;
an alternate message storage unit operative to store an alternate audio message for playback to the respondent; and

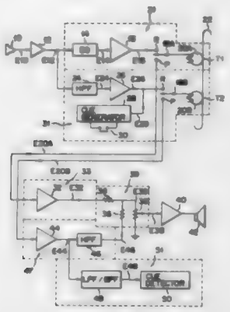
means for activating the alternate message storage unit to cause playback of the alternate audio message only in the event the respondent responds to a designated one of the audio messages and the respondent's response to said designated one of the audio messages has a duration within a selected time interval.

4,692,818

DUAL AUDIO TRACK RECORDING SYSTEM IN WHICH ONE TRACK ALSO CONTAINS A CONTROL SIGNAL

Kenji Fujibayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,890
Int. Cl.[4] G11B *15/087*
U.S. Cl. 360—22 **15 Claims**



3. A multitrack cue recording system for a magnetic recorder, wherein a first track of the multitrack is used for a recording signal and a second track is used for a cue signal of a certain frequency and a signal derived from the recording signal, said recording system comprising:

means for producing a recording signal;

first recording means coupled to said signal producing means for recording, on said first track, first information representing only said recording signal, said first recording means including equalizer means for boosting, recording said first information, a first low-frequency component of said recording signal over a first low-frequency component range which includes a cue signal frequency;

cue signal generating means for producing said cue signal at a frequency within said first low-frequency component range;

second recording means coupled to said signal producing means and including first filtering means for removing a second low-frequency component of said recording signal over a second low-frequency component range to form a low-cut signal, means for producing second information representing said cue signal and the low-cut signal, the magnitude of said low-cut signal at the frequency of said cue signal being smaller than the magnitude of said recording signal at the cue signal frequency, and means for recording said second information on said second track;

first reproducing means for reproducing, from said first track, a first reproduction signal representing said first information wherein said first low-frequency component of the recording signal is boosted by said equalizer means;

second reproducing means including second filtering means for reproducing, from said second track, a second reproduction signal at an output of said second filtering means representing only said low-cut signal, said second reproducing means providing at an output of said second filtering means, a third reproduction signal representing said second information;

signal mixing means for mixing said first reproduction signal with said second reproduction signal, and for providing a playback signal corresponding only to said recording signal wherein said removed second low-frequency component is compensated by said boosted first low-frequency component so that low-frequency components of said recording signal are reproduced substantially flat in said playback signal absent said cue signal; and

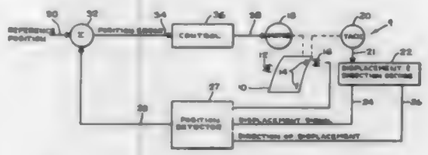
cue signal detecting means coupled to said input of said second filtering means for detecting, from said third reproduction signal, said cue signal.

4,692,819

METHOD AND APPARATUS FOR CONTROLLING THE POSITION OF A TRANSPORTED WEB

Robert Steele, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 646,619, Aug. 31, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 854,711
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—72.1 **18 Claims**



18. Method for the determining of a distance between a selected location on a transportable web and a fixed point along the web's path of travel, comprising the steps of:

generating a first signal indicating the distance between the selected location on the web and the fixed point according to one of a plurality of periodic location indicators located contiguously with the web;

generating a second signal, independently of the periodic location indicators, indicating the distance between the selected location on the web and the one of the periodic location indicator;

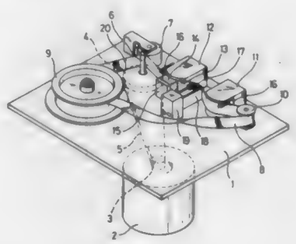
generating a location in response t the first signal and the second signal such that said location signal reflects the location of said web.

4,692,820

HEAD-POSITIONING MECHANISM FOR AN ENDLESS TAPE

Koichi Sakurai, 316-77, Oaza Kozenji, Oora-machi, Oora-gun, Gunma, and Minoru Kojima, 22-7, Misono-machi, Tatebayashi-shi, Gunma, both of Japan

Filed Jul. 3, 1986, Ser. No. 881,621
Claims priority, application Japan, May 19, 1986, 61-114365
Int. Cl.[4] G11B *15/06, 23/32*
U.S. Cl. 360—74.7 **1 Claim**



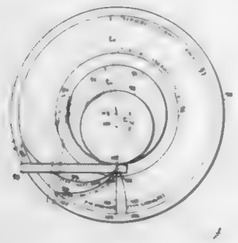
1. A head-positioning mechanism for an endless tape, in which the endless tape fed between the capstan rotatable at a constant speed by a DC motor and a pinch roller urged against the tape is run in a closed loop through a feeding/winding reel and a tape guide, said endless tape having an inner and an outer surface, said tape on its outer surface between said pinch roller and said tape guide being contacted sequentially with a surface of an erasing, recording or playing-back head, characterized in that the endless tape on its inner side between the capstan and the tape guide is provided with an electrically conductive sensor, that the endless tape at a predetermined site thereof is provided with a cut-line and that the endless tape on its inner surface is normally supplied with a faint current for deenergizing a power source for said DC motor upon contact of said cut-line with said sensor, thereby to arrest a head of the endless tape at a starting position.

4,692,821

DISC MEMORY STORAGE APPARATUS AND METHOD

George E. Zezefilis, 27 Vicatos Rd., Camarillo, Calif. 93010

Filed Dec. 31, 1985, Ser. No. 815,371
Int. Cl.[4] G11B *5/55, 27/10*
U.S. Cl. 360—78 **23 Claims**



1. A disc memory storage device for recording and reading information magnetically, comprising:

a rotating set of parallel discs having a plurality of concentrically arranged circular storage tracks serviced by a plurality of magnetic heads, one or more per disc surface, and each provided with an operative gap for transducing information to and from said tracks; and

means for displacing each of said heads on a path substantially in the form of an involute of a circle, the gap of each of said heads being substantially tangent to said path, said involute path having a basic circle substantially concentric with the magnetic disc center and whose radius is equal to the radius of the innermost track serviced.

5. A disc memory storage device for recording and reading information magnetically, comprising:

a rotating set of parallel discs having a plurality of concentrically arranged circular storage tracks serviced by a plurality of magnetic heads, one or more per disc surface, and each provided with an operative gap for transducing information to and from said tracks;

means for displacing each of said heads on a path substantially rectilinear, the gap of each of said heads being substantially perpendicular to said path; and

means for delaying the issuing of the disc index or clock and hence the recording directly proportional to the travel of said heads, starting from their innermost position.

7. A system for enhancing the storage capability of a disc storage medium storing information in a plurality of rotary tracks as a series of changes of state of the incremental storage medium induced by a transducer traversing the surface of the disc between inner and outer tracks as the disc rotates, the stored information being phase coherent from track to track with the imprints corresponding to changes of state for respective data elements between innermost and outermost tracks forming a plurality of elemental lines representing the transducer progress path, said system comprising:

a transducer positioning mechanism for supporting and driving the transducer to traverse the disc surface between inner and outer tracks; and

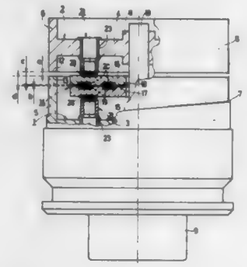
means for controlling said mechanism to cause the transducer to traverse the disc surface between inner and outer tracks along a predetermined transducer progress path, thereby forming a plurality of elemental lines representing the storage of information on the disc, each elemental line being substantially an involute curve in the portion between innermost and outermost tracks.

4,692,822

MAGNETIC TAPE SCANNING UNIT AND METHOD OF ASSEMBLY THEREOF

Mariusz Kabucinski, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,560
Claims priority, application Austria, Apr. 30, 1984, 1434/84
Int. Cl.[4] G11B *5/027, 15/60*
U.S. Cl. 360—84 **5 Claims**



1. A drum-shaped magnetic tape scanning unit around whose circumferential surface a record-carrier tape can be wrapped at a predetermined angle, such scanning unit comprising: a stationary drum section and a rotatable drum section coaxial therewith, one end of each drum section facing one end of the other drum section; and a two-part rotary transformer comprising two planar transformer discs of ferrite material, each disc carrying at least one transformer winding; the discs being arranged coaxially on the facing ends of the rotatable drum section and the stationary drum section, respectively, so that a surface of each disc faces and is spaced from a surface of the other disc; at least one of the drum sections having at least three angularly spaced parallel bores therein holding respective supporting elements for supporting the transformer disc on such drum section, characterized in that:

said supporting elements are in the form of cylindrical sleeves of weldable material which are open at one end and closed at the other end, the closed end of each sleeve projecting from the end of said at least one of the drum sections which faces the end of the other drum section;

the transformer disc on said at least one of the drum sections has planar mounting elements thereon, a surface of respective ones of said mounting elements being coaxial with and facing the closed end of respective ones of the sleeves held by said at least one of the drum sections, such mounting elements being of a weldable material; and

the closed end of each of said sleeves is welded to the surface of the mounting element facing such closed end.

4,692,823

TAPE LOADING DEVICE FOR A VIDEO TAPE RECORDER

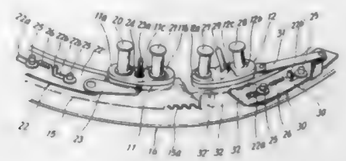
Seong T. Gwon, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 28, 1985, Ser. No. 749,647

Claims priority, application Rep. of Korea, Jun. 30, 1984, 3765/84

Int. Cl.⁴ G11B *15/61, 15/665*

U.S. Cl. 360—85 **4 Claims**



1. A tape loading device for a video tape recorder comprising:

a deck having an upper surface for loading a tape cassette on the front portion thereof;

an inclined rotary head drum disposed at the center portion of said deck, said drum having a helical tape guide;

a loading plate disposed around said rotary drum having a lower surface and provided with a main guideway extending substantially throughout the periphery thereof and a by-pass way branching out at one side of said main guideway said loading plate having a predetermined inclination;

upper and lower loading rings disposed between said upper surface of said deck and said lower surface of said loading plate;

means for driving said loading rings through a plurality of gears, the driving force from said means being transferred to said upper loading ring through a plurality of gears including an upper loading gear, and to said lower loading ring through a lower loading gear which is interlocked with said upper loading gear according to the rotation of said upper loading ring being progressed;

upper and lower over-stroke absorbing units mounted on respective surfaces of both loading rings;

a lead base connected to said upper over-stroke absorbing unit mounted on said upper loading ring guided along said main guideway for traveling to the final travel end thereof, said lead base having a front-upper surface carrying a first rotatable post thereon, a rear-upper surface carrying a second rotatable post thereon, and an inclined surface disposed between said front and rear upper surfaces and provided with a hole;

a trailer base connected to said over-stroke absorbing unit mounted on said lower loading ring and guided first along said main guideway and then along said by-pass way by traveling to the final travel end thereof, said trailer base having a front-upper surface carrying a first rotatable post thereon, a rear-upper surface carrying a second rotatable post thereon, and an inclined surface disposed between said front and rear upper thereon; and

two stoppers disposed respectively on the final travel ends of said main guideway and said by-pass way and adapted to stop the travel of said lead base and said trailer base;

said lead and trailer bases moving from a preload position to a full load position with related posts according to various loading positions thereof engaging the tape in a cassette and drawing the tape to full load positions on and relative to said head drum, said second rotatable post of the trailer base being vertically disposed with respect to the base plane of the deck in the full loading state of the tape so that the tape traveling between said vertical second rotatable post and the tape supplying area of the tape cassette is horizontally fed with respect to the base plane of the deck, said first rotatable post of said trailer base and both rotatable posts of said lead base being vertically positioned with respect to the inclined surface of said loading plate, so that they have respective inclinations and orientations corresponding to the direction of the tape coming in an inlet side of said rotary drum.

4,692,824

MAGNETIC RECORDING/REPRODUCING APPARATUS

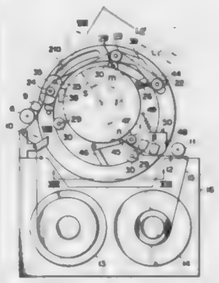
Masayuki Takahara, and Motoyasu Momoki, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 564,336, Dec. 22, 1983. This application Sep. 16, 1986, Ser. No. 910,276

Claims priority, application Japan, Dec. 28, 1982, 57-231343

Int. Cl.⁴ G11B *5/08*

U.S. Cl. 360—85 **9 Claims**



1. A μ-type of magnetic recording/reproducing apparatus using a tape loading system comprising: a rotary head cylinder mounted on a chassis in an inclined manner and which rotates in one direction; a loading ring to be rotated around said rotary head cylinder; a first guide roller mounted on said loading ring, being movable, upon rotation of said loading ring, between a first position wherein said first guide roller is located in an opening of a cassette, said cassette being located in a vicinity of said rotary head cylinder and storing a magnetic recording tape therein, and a second position wherein said first guide roller is located outside said opening of said cassette, engaged with the magnetic recording tape stored in said cassette and retaining the magnetic recording tape so that it is wound from a tape entrance point to a tape exit point on the peripheral surface of said rotary head cylinder as said first guide roller moves from the first position to the second position thereof; said first guide roller when located in said second position being positioned substantially less than 28 mm upstream of said rotary head cylinder along a tape travel direction for guiding the magnetic recording tape onto the peripheral surface of said rotary head cylinder; a second guide roller being movable between a first position wherein said second guide roller is located in said opening of said cassette and a second position wherein said second guide roller is located outside said opening of said cassette, its movement from the first position to the second position thereof corresponding to movement of said first guide roller from the first position to the second position thereof upon rotation of said loading ring, said second guide roller when in its second position engaging magnetic recording tape pulled out from said cassette and being positioned upstream of said first guide roller along a tape travel direction to retain said magnetic recording tape traveling from upstream of said second guide roller to said first guide roller from being brought into contact with said peripheral surface of said rotary head cylinder; a tilt post being movable between a first position wherein said tilt post is located in said opening of said cassette and a second position wherein said tilt post is located outside said opening, its movement from the first position to the second position thereof corresponding to movement of said first guide roller from the first position to the second position thereof upon rotation of said loading ring, said tilt post in its second position engaging magnetic recording tape pulled out from said cassette and being positioned upstream of said second guide roller along the tape travel direction to prevent said magnetic recording tape traveling from said cassette to said second guide roller from being brought into contact with said peripheral surface of said rotary head cylinder and guiding the magnetic recording tape from said cassette to said first guide roller through said second guide roller; a tilt subpost; and means to dispose said tilt subpost in the immediately adjacent vicinity of the tape exit point on the outer surface of said rotary cylinder to bring the tilt subpost into contact with the magnetic recording tape fed from said rotary head cylinder to align a longitudinal edge of said magnetic recording tape between the tape exit point and a capstan to be substantially parallel with said chassis,

said rotary head cylinder being inclined toward a point located on the peripheral surface of said rotary head cylinder through an angular distance of 139° to 229° in a direction of the running of said magnetic recording tape on the peripheral surface of said rotary head cylinder from a point where the magnetic recording tape is separated from said rotary head cylinder, whereby a size reduction of a μ-type magnetic recording/reproducing apparatus is achieved.

4,692,825

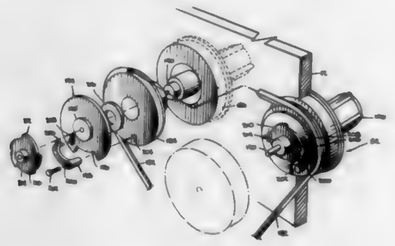
ONE-WAY CLUTCH ASSEMBLY WITH PAWL AND RATCHET

Andre Debaudringhien, Norwalk, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,855

Int. Cl.⁴ G11B *15/24;* **F16D** *11/00*

U.S. Cl. 360—96.3 **7 Claims**



1. A one way clutch assembly, comprising:

a frame;

a bearing member having a central bore therein fixedly secured to said frame;

a pulley rotatably mounted on said bearing member;

a drive spindle rotatably mounted within said bearing member central bore;

a cam plate rotatably mounted about said drive spindle, said cam plate being substantially circular in cross-section and including an arcuate shaped recess in one segment of the circular periphery and also provided with a camming surface interior of the peripheral extent;

a mounting stud fixedly secured to and projecting from said pulley through said arcuate recess in said cam plate;

a pawl rotatably mounted at one end on said mounting stud and having a pin at the other end extending into said interior camming surface of said cam plate and in operable contact therewith so that said pawl is engageable with said camming surface and movable radially inwardly and outwardly solely by its engagement with said interior camming surface; and

a ratchet plate fixedly mounted on said drive spindle for rotation therewith, said ratchet plate having a plurality of ratchet teeth for engagement and disengagement with said pawl.

4,692,826

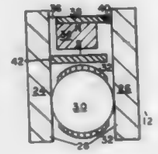
BEARING ASSEMBLY WITH INTEGRATED FERROFLUID SEAL

Kuldip Raj, Merrimack, and Raoul Casciari, Bedford, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Continuation of Ser. No. 526,781, Aug. 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 450,339, Dec. 16, 1982, Pat. No. 4,407,508. This application Apr. 14, 1986, Ser. No. 851,799

Int. Cl.⁴ G11B *5/012*

U.S. Cl. 360—97 **15 Claims**



1. A bearing assembly with an integrated ferrofluid seal, which assembly comprises:

(a) a magnetically permeable bearing assembly adapted to surround a rotatable shaft and having an inner race and a spaced-apart outer race to define a raceway therebetween, and roller elements retained in the raceway to provide for rotating of the inner and outer races relative to one another; and

(b) a ferrofluid seal appratus in the raceway and generally closely adjacent the roller elements of the bearing assembly, which ferrofluid seal apparatus comprises:

(i) a single magnetic pole piece having a one and other end, the one end radially extending into a close, noncontacting relationship with a surface of the inner or outer race, to define a small radial gap,

(ii) an annular, axially-polarized permanent magnet having a radially disposed one periphery and another periphery relative to the axis of the shaft, the one periphery of the permanent magnet extending toward said radial gap to form an air gap with said race surface,

(iii) ferrofluid retained in the radial gap by magnetic flux of the permanent magnet, to provide a ferrofluid exclusion seal with the said surface,

(iv) a nonmagnetic housing positioned about the other periphery of the permanent magnet to divert the magnetic flux of the permanent magnet toward the said magnetically permeable race surface which forms the said radial and air gap, and

(v) the magnetic flux circuit passing through the pole piece, the permanent magnet, the ferrofluid in the radial gap, said surface and the air gap.

4,692,827

DIVIDED HOUSING FOR A MAGNETIC DISK DRIVE COMPRISING A PERIPHERAL SEALING RING

Johann Biermeier, Munich, and Heinz Obermayer, Grafrath, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,204

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1964, 3404241

Int. Cl.⁴ G11B *00/00*

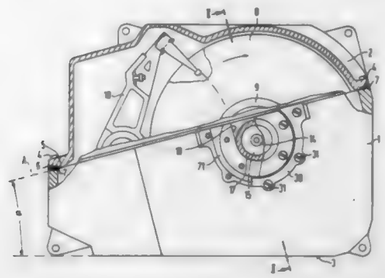
U.S. Cl. 360—97 **7 Claims**

1. In a housing for a magnetic disk drive in which the housing is formed of a support shell and a cover each having a peripheral edge for mating with the peripheral edge of the other at a parting plane and in which the support shell has a pair of parallel lateral walls each connected to a respective one

of a pair of end bearing of a magnetic disk pack, and in which one of the lateral walls includes a slot opening through the peripheral edge of the support shell for receiving one of said bearing means, the improvement therein comprising:

a sealing ring disposed between said peripheral edges, said sealing ring comprising a first portion shaped complementary to the peripheral edges of the support shell and the cover and mounted therebetween and an annular second portion extending generally perpedicular to said first portion for embracing said one of the bearing means which is disposed in the slot; and

means for securing said annular second portion to said one of the lateral walls.



4,692,828

MAGNETIC DISK DRIVE CAPABLE OF MECHANICAL CONNECTION TO A DATA PROCESSING INSTRUMENT WITHOUT DEFORMATION

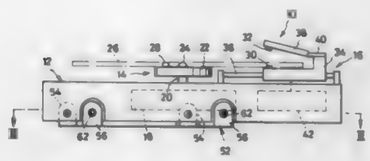
Yasushi Noda, and Toshihiro Kitahara, both of Tokyo, Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Jul. 30, 1985, Ser. No. 760,407

Claims priority, application Japan, Jul. 31, 1984, 59-119414[U]

Int. Cl.⁴ G11B *17/02*

U.S. Cl. 360—97 **3 Claims**



1. A magnetic disk drive to be mounted between a pair of disk drive holder plates of data processing equipment, the disk drive including a base structure having mounted thereon a disk drive mechanism and a head transport mechanism, wherein the improvement resides in connector means through which the base structure is to be fastened to the disk drive holder plates of the data processing equipment, the connector means comprising a pair of metal made connectors disposed one on each side of the base structure, each connector having an elongated connective strip secured to the base structure, and a pair of connector lugs formed adjacent both ends of the connective strip in one piece therewith and protruding therefrom each connector lug having defined therein a hole for receiving a fastener element for fastening the base structure to the disk drive holder plates, the connector lugs being less in rigidity than the disk drive holder plates and the base structure so that the connector lugs are deformable, when the fastener elements are inserted in their holes for mounting the base structure to the disk drive holder plates, to take up possible positional errors between the base structure and the disk drive holder plates and hence to protect the base structure from deformation.

4,692,829

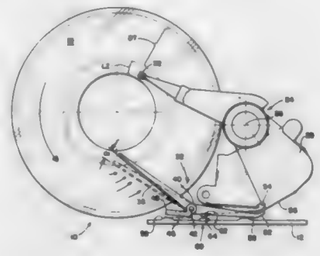
MAGNETICALLY BIASED AERODYNAMICALLY RELEASED INTEGRAL SAFETY LATCH FOR RIGID DISK DRIVE

Steve G. Campbell, San Jose, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Sep. 13, 1985, Ser. No. 775,840

Int. Cl.⁴ G11B *5/54, 21/22*

U.S. Cl. 360—105 **9 Claims**



1. In a data storage device including a frame and a plurality of rigid rotatable disks, at last one of which provides a data storage surface for storage and retrieval of useful data, at least one moveable data transducer for reading and writing data from and to selectable concentric data tracks of said data storage surface, said transducer adapted for flying in close non-contacting proximity to said data storage surface upon an air cushion provided during disk rotation, there being a landing zone for the transducer on the surface during non-rotation of the disks, and there being a carriage for moving the transducer from the landing zone to any one of the selectable data tracks during operation of the device,

an improved safety latch for locking the transducer carriage to restrain the transducer to the landing zone during non-rotation of the disks and for releasing the carriage in response to airflow generated by disk rotation, the latch including moveable airvane means disposed between two disks for being deflected means responsive to deflection of the airvane means to release the carriage, and the carriage including engagement means for enabling locking engagement by the safety latch during disk non-rotation and release by the safety latch in response to airflow so that the transducer may thereafter be moved to the data tracks,

the safety latch further including magnetic bias spring means for providing a predetermined bias force by repulsion of oppositely facing, like magnetic poles to the safety latch in order to urge the safety latch into engagement with the carriage in the absence of airflow sufficient ot deflect the airvane means to overcome the bias and thereby release the safety latch.

4,692,830

CLEANING CASSETTE FOR HIGH SPEED CASSETTE RECORDERS INCLUDING MANUALLY OPERABLE DRIVE MEANS

Ulrich Willburger, Auf der Schuchen 27, 8110 Seehausen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 623,147

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 8318007[U]

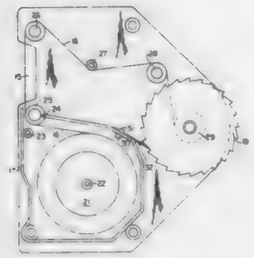
Int. Cl.⁴ G11B *5/10, 5/127, 5/41*

U.S. Cl. 360—128 **14 Claims**

1. A cleaning cassette for a high speed cassette recorder, comprising:

a cassette case dimensioned to correspond to a magnetic tape cassette operative in the cassette recorder, the cassette case having means preventing the cassette recorder from detecting presence of the cleaning cassette in an operative position of the cassette case, whereby the cassette recorder is inoperative when the cleaning cassette is inserted and operatively movable parts of the cassette recorder are stationary;

a cleaning tape guided in the cassette case, the cleaning tape being dispensed from a supply reel to a take-up reel, the cleaning tape being guided in the cassette case along a path corresponding to an operative path of a magnetic tape in the magnetic tape cassette, and the cleaning tape being movable over a stationary magnetic head of the cassette recorder, the tape having a configuration similar to the magnetic tape in the area of the magnetic head; and



a manually-operable drive means for manual transfer of the cleaning tape from the supply reel over the stationary magnetic head to the take-up reel during cleaning, the manually operable drive means being readily accessible for manual operation to advance the tape over the stationary magnetic head when the cleaning cassette is inserted in the operative position, the cassette recorder detecting presence of a cassette by contact with an area of a case thereof, the cassette case of the cleaning cassette being indented at the area of contact;

whereby full speed operation of the cassette recorder is precluded when the cleaning cassette is in the operative position and manual advancement of the cleaning tape over the stationary magnetic head occurs in a manner identical to cassette operation except at a slower speed.

4,692,831

DISC CARTRIDGE HAVING POSITIVE ISOLATION MEANS WHEN IN STORAGE

Katsuhiro Suzuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,583

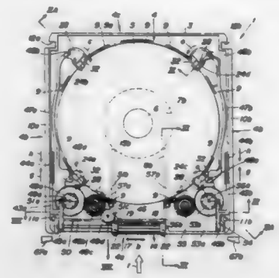
Claims priority, application Japan, Sep. 12, 1984, 59-191339

Int. Cl.⁴ G11B *23/02, 19/00*

U.S. Cl. 360—133 **26 Claims**

1. A disc cartridge for use with a disc player, comprising a case assembly (**4**) and an information recording disc (**5**) rotatably housed in said case assembly, which is characterized by a disc holding mechanism which is constructed in such an arrangement that when said disc cartridge is not in use, said disc holding mechanism holds said disc keeping the same away from the inner periphery of said case assembly and when said disc cartridge is in use with said disc player, said disc holding mechanism releases said disc complete for free rotation of the same, a plurality of disc supporting members (**24***a*, **24***b*, **24***c*, **24***d*) arranged in said case assembly, each having both a disc holding position wherein each said disc supporting member contacts and positively holds the periphery (**5***a*) of said disc away from said case assembly and a disc releasing position wherein said disc supporting member releases the disc;

biasing means (**57***a*, **57***b*) for biasing each of said disc supporting members to assume said disc holding position; and



an actutating means (**43***a*, **50**), (**43***b*, **54**) for forcing each of said disc supporting members to assume said disc releasing position against the force of said biasing means when said disc cartridge is thrusted into said disc player.

4,692,832

METHOD FOR LOWERING THE FRICTIONAL COEFFICIENT OF THE MAGNETIC HEAD-DISK INTERFACE IN A LUBRICATED MAGNETIC DISK STORAGE SYSTEM

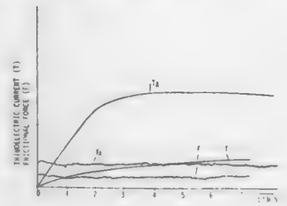
Upali Bandara, Stuttgart, and Holger Hinkel, Boblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,646

Claims priority, application European Pat. Off., Aug. 6, 1985, 85109546.7

Int. Cl.⁴ G11B *21/02, 5/55*

U.S. Cl. 360—137 **5 Claims**



1. A method for lowering the frictional coefficient of the magnetic head-disk interface in a magnetic disk storage system of the type having at least one magnetic disk with data tracks and a lubricated surface and at least one magnetic head mounted on a slider, the slider being supported on an air cushion formed between an air bearing surface of the slider and the rotating disk surface during operation of the system and being in contact with the disk surface during sliding phases at starting and stopping of the system, the method comprising the steps of:

rotating the disk at a rotational velocity lower than normal operational velocity so that the slider slides in contact on its associated disk surface, the disk rotation being performed in an atmosphere of gas at relatively low humidity; and

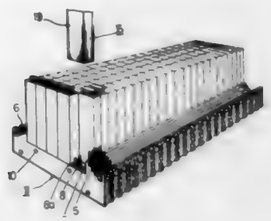
moving the slider over all tracks of the disk during rotation of the disk, so that the complete recording surface of the disk is conditioned by the slider.

4,692,833

SAFETY DEVICE FOR COMMUNICATION EQUIPMENT

Ki Ho Chung, Seoul, Rep. of Korea, assignor to Samhwa Electric Industrial Co., Seoul, Rep. of Korea

Filed Mar. 27, 1986, Ser. No. 844,548
Claims priority, application Rep. of Korea, May 11, 1985, 1985-5469; Sep. 26, 1985, 1985-12567
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **12 Claims**



1. A safety device for protecting communications equipment that is coupled to a communications line, comprising

a plurality of substantially identical base stand units adapted to be held in side-by-side relationship to form a terminal stand, each base stand unit being associated with a respective group of communication lines,

a plurality of terminal inserting grooves on a face of each base stand unit,

input and output terminals, ground terminals and connecting terminals inserted into the ends of said grooves in the base stand units,

rigid communicating bars in said grooves for conductively connecting an input terminal at one end of a groove with a connecting terminal at the opposite end of the groove, for conductively connecting an output terminal at one end of a different groove with a connecting terminal at the opposite end of that different groove, and for conductively connecting a connecting terminal at a still different groove with a ground conductor at the opposite end of said still different groove,

safety connector means comprising a housing that includes a ground conductor adapted to be connected to a ground conductor connecting terminal and overcurrent and overvoltage protection means adapted to be connected between connecting terminals of a pair of input and output terminals associated with a communications line,

said overcurrent protection means including first and second elongated switch elements, at least one of which is a bimetal element that operates to close said switch elements together when it is heated beyond a predetermined temperature,

means connecting said switch elements to said ground conductor when the switch elements close,

a heating means closely adjacent said bimetal element and adapted to be connected in circuit between the input and output terminals associated with a given communications line, whereby an overcurrent on said communication line heats the heating means to close said switch elements and connect the communications line to ground,

said overvoltage protection means responding to voltages on said communications line that exceed a predetermined magnitude to connect the communication line to ground,

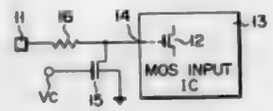
said overcurrent and overvoltage protection means automatically returning to an initial, operative condition that disconnects the ground connection after the overcurrent or overvoltage ceases.

4,692,834

ELECTROSTATIC DISCHARGE PROTECTION CIRCUIT WITH VARIABLE LIMITING THRESHOLD FOR MOS DEVICE

Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo, and Akira Narita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Toshac Computer System Co., Ltd., Tokyo, both of, Japan

Filed Aug. 2, 1985, Ser. No. 761,707
Claims priority, application Japan, Aug. 20, 1984, 59-172559
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **12 Claims**



1. A variable-threshold electrostatic discharge protection circuit in combination with an associated semiconductor device containing an input MOS transistor having an input gate, said input MOS transistor being operative from a power source potential and a reference potential and being responsive to a reference level input signal and to high and low level input signals, said protection circuit comprising:

an input terminal receiving said reference level input signal and said high and low level input signals, said input terminal being coupled to said input gate of said input MOS transistor of said associated semiconductor device; and

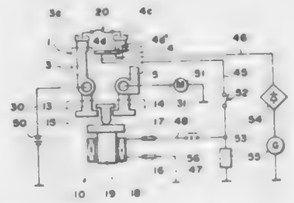
a gate-controlled MOS diode connected between said input gate of said input MOS transistor of said associated semiconductor device and said reference potential of said input MOS transistor for limiting at a variable threshold the voltage applied to said input gate of said MOS input transistor, said diode having a control gate and being responsive to a given threshold control potential applied to said control gate to increase said variable threshold to limit the voltage at said input terminal to a value above said high level input signal when said high level input signal is applied to said input terminal.

4,692,835

FUSE CIRCUIT UNIT FOR COMBINATION WITH AN ELECTROMAGNETIC SWITCH

Syohati Setoguti; Yoshiteru Nakatake, both of Miyazaki; Mitsuru Uehara, Kawagoe, and Masayuki Kudou, Shiki, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo and Honda Manufacturing Co., Ltd., Miyazaki, both of, Japan

Filed Sep. 26, 1985, Ser. No. 780,395
Claims priority, application Japan, Oct. 3, 1984, 59-206297; Oct. 3, 1984, 59-148966[U]; Oct. 9, 1984, 59-210495
Int. Cl.[4] H02H *5/04*
U.S. Cl. 361—104 **9 Claims**



1. The combination of a fuse circuit unit and an electromagnetic switch,

said electromagnetic switch having an input terminal which connects to a power supply means; an output terminal which connects to a first load circuit; and a closed switch casing; and

said fuse circuit unit comprising:

a first terminal member having one end thereof which is connectable to one terminal of a main fuse of a second load circuit, and another end which is connectable to said input terminal of said electromagnetic switch and to said power supply means;

a second terminal member having one end thereof which is connectable to another terminal of said fuse, and another end which is connectable to said second load circuit;

a casing supporting said first and second terminal members;

engaging means provided on said casing of said fuse circuit unit for mechanical engagement with engaging means provided on said electromagnetic switch; and

fastening means for removably fastening said first terminal member to said input terminal of said electromagnetic switch to mechanically and electrically connect said fuse circuit unit and said electromagnetic switch together;

said engaging means and said fastening means cooperatively mechanically and electrically interconnecting said fuse circuit unit and said electromagnetic switch together such that said first load circuit is fed from said power supply means via said input and output terminals of said electromagnetic switch, and said second load circuit is fed from said power supply means via said first and second terminals of said main fuse, said fuse circuit unit and said electromagnetic switch being independently operable.

4,692,837

COEXTRUDED, BIAXIALLY ORIENTED, MULTI-LAYER AND CAPACITOR MADE THEREFROM

Guenther Crass, Taunusstein; Lothar Bothe, Mainz-Gonsenheim, and Gunter Schloegl, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 929,287
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540214
Int. Cl.[4] H01G *4/04, 4/22*
U.S. Cl. 361—313 **22 Claims**

1. A coextruded, biaxially oriented, multi-layer film comprising:

a base layer and

two outer layers on either side of said base layer, said base layer and said two outer layers including a high-purity electrical insulation plastic film material, having a maximum residual ash content of less than about 100 ppm, and a stabilizer,

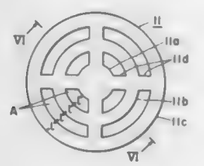
wherein the ratio of the amount of said stabilizer present in said two outer layers and the amount of said stabilizer present in said base layer lies within the range from about 3:1 to about 10:1.

4,692,836

ELECTROSTATIC CHUCKS

Yoshio Suzuki, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,408
Claims priority, application Japan, Oct. 31, 1983, 58-204239; Oct. 31, 1983, 58-204240; Oct. 31, 1983, 58-204241
Int. Cl.[4] H01T *20/00*
U.S. Cl. 361—234 **9 Claims**



1. In an electrostatic chuck of the type wherein an electrode is covered by an insulating dielectric member, an object to be electrostatically attracted is mounted on said dielectric member and a potential difference is applied across said object and said electrode,

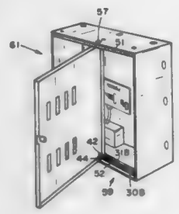
the improvement wherein said electrode is constituted by a solid electroconductive portion and an intangible portion which are arranged so as to make non-uniform a distribution of an electrostatic attractive force applied to said object, wherein said solid electroconductive portion of said electrode comprises a central portion and a plurality of radially spaced annular portions concentric therewith, and wherein said central portion and said annular portions are electrically interconnected by a plurality of circumferentially spaced radially extending electroconductive members.

4,692,838

FIRE PANEL WITH DOOR PROVIDING EASE OF SERVICE

David E. Merchant, Lincoln, Nebr., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jul. 7, 1986, Ser. No. 882,398
Int. Cl.[4] H05K *5/00*
U.S. Cl. 361—380 **7 Claims**



1. A fire panel comprising:

a housing having an opening;

fire panel electronics within said housing;

a door closing said opening in said housing; and

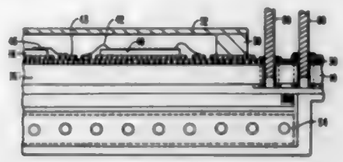
attaching means attaching said door to said housing while permitting said door to be pivoted about one end and permitting the pivoted end of said door to be moved from one side of said opening to the opposite side without detaching it from said housing, said attaching means including means permitting the pivoted end of said door to be detached from said housing when said pivoted end is located in at least one location away from the side of said opening where said pivoted end is located when said door is closed, while preventing said pivoted end from being detached from said housing when said door is closed.

4,692,839

MULTIPLE CHIP INTERCONNECTION SYSTEM AND PACKAGE

James C. K. Lee, Los Altos; Richard L. Beck, Cupertino, and Francisca Tung, Los Gatos, all of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 24, 1985, Ser. No. 748,087
Int. Cl.[4] H05K *7/20*; **H01L** *23/12*
U.S. Cl. 361—386 **15 Claims**



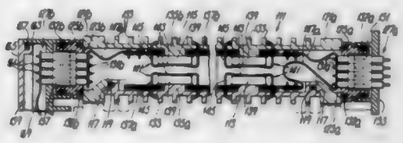
1. A module for interconnecting integrated circuits comprising:
a thermally-conductive substrate having a first surface;
a first layer of electrically-insulating material disposed across the first surface;
at least one layer of electrical interconnections disposed on the layer of electrically-insulating material;
a second layer of electrically-insulating material disposed across the at least one layer of electrical interconnections and including openings therethrough to selected portions of the at least one layer of electrical interconnections;
an upper layer of electrical interconnections disposed over the second layer electrically-insulating material and extending through the openings to contact selected portions of the at least one layer;
a plurality of integrated circuits attached to the upper layer; and
means for electrically connecting the integrated circuits to the upper layer.

4,692,840

ELECTRIC CIRCUIT MODULE ARRANGEMENTS

Stafford M. Ellis, East Preston, England, assignor to GEC Avionics Limited, England

Filed Mar. 6, 1986, Ser. No. 836,988
Claims priority, application United Kingdom, Mar. 29, 1985, 8508278; Apr. 4, 1985, 8508941
Int. Cl.[4] H05K *7/00*
U.S. Cl. 361—393 **20 Claims**



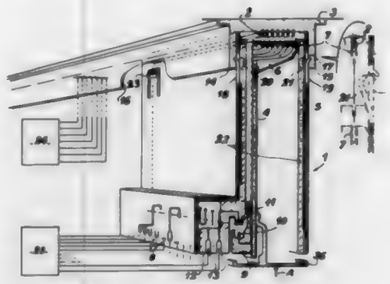
1. An electric circuit module arrangement adapted for mounting in racking comprising: a plurality of electric circuit modules secured together in side by side relationship; a plurality of first electric connector parts respectively secured to individual ones of said modules at corresponding ends thereof; a plurality of second electric connector parts, complementary to said first connector parts, and respectively mated with said first connector parts; a wiring arrangement connected with said second connector parts thereby to provide electrical interconnections between said modules; and at least one third electric connector part, mounted on a said module at the opposite end to the first connector part secured to that module, via which electrical connections between the module arrangement and electric circuits external of the module arrangement may be made.

4,692,841

ELECTRONIC MODULE THAT CAN BE PLUGGED INTO A BUS CONNECTOR

Alain Andrieux, Lessarts; Yves Trequilly, Meudon, and Jean-Claude Lavoine, Montrouge, all of France, assignors to CGEE Alsthom Direction Red, Societe Anonyme, Clamart, France

Filed Mar. 31, 1986, Ser. No. 846,002
Claims priority, application France, Apr. 2, 1985, 85 04978
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—395 **4 Claims**



1. A connecting unit comprising:
a U-shaped support base, a bus connector locked with the support base and adapted to be electrically connected to a bus, an electric module plugged into the bus connector,
said module comprising a housing engaged in the support base and containing a printed circuit board having mounted thereon electric components,
an auxiliary connector connected to the circuit board and adapted to connect the circuit board to outside wiring,
said support base being a U-shaped elongated element defined by a bottom portion integrally connected to opposed wings extending from opposite sides of the bottom portion, said bus connector comprising parallel conductive strips insulated from one another and insulated from the support base, said parallel conductive strips located at the bottom portion of the U-shaped support base, the two wings of the support base each having opposed grooves facing each other parallel to the bottom of the U-shaped portion, and
said housing comprising locking means for engaging the grooves of the opposed wings of the U-shaped base so that the housing and support base are locked together.

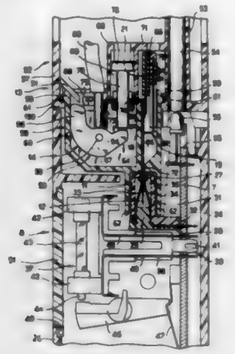
4,692,842

INPUT/OUTPUT DEVICE FOR AN APPARATUS OF THE PROGRAMMABLE AUTO-CONTROL TYPE, A RANGE OF SUCH DEVICES

Jean Joly, Houilles, and Yves Oehlert, Rueil; Jean Neyroud, Domaines; Olivier Penot, Antibes; Jacky Pergent, Carros; Gilbert Barillier, Gattieres; Bernard Le Blanc, Biot all of France, assignors to La Telemecanique Electrique, Nanterre, France

PCT No. PCT/FR84/00093, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/04223, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 6, 1984, Ser. No. 691,487
Claims priority, application France, Apr. 15, 1983, 83 06175
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—413 **5 Claims**

1. An apparatus for controlling an automatic installation, said apparatus comprising a plurality of cards (7) each supporting a plurality of electronic channels (17, 23) for processing and transmitting signals exchanged between a bus (103) and equipment incorporating both sensors (16) detecting an operating condition of said installation and actuators (22) to which output control signals are delivered, each card (7) being connected to a control unit through the bus (103) and to a terminal box (13), each card being contained in a housing (8) which is slidably inserted in a container (1), wherein each terminal box (13) comprises a portion (58) which is removably inserted in a



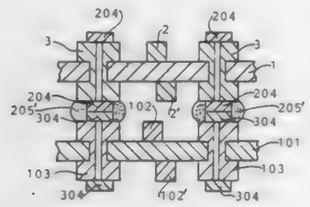
front aperture (112) of said housing (8), and which when inserted therein engages at least one latch (117) displaceably carried by the housing (8), and wherein upon insertion said latch is in a position wherein said latch further engages a retriever portion (119) of the container (1) so as to lock the housing (8) in a position of insertion in the container (1).

4,692,843

MULTILAYER PRINTED WIRING BOARD

Masaru Matsumoto, Yamato; Mikio Nishihara, Tokyo, and Kiyoshi Kuwabara, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,819
Claims priority, application Japan, Nov. 19, 1985, 60-176877[U]
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 **2 Claims**



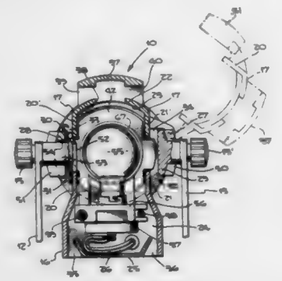
1. A multilayer printed wiring board comprising:
a plurality of printed wiring boards each comprising a board and a plurality of conductor patterns provided onto said board;
a plurality of through-hole pads each made of electric conductor material, provided onto said board so as to pass through said board, arranged at the same position on said board as those on other said boards, having the same height from a surface of said board as those of other said pads on said board, and having an end face at both ends of said pad having the same size respectively as those of other said pads on said board and on other said boards;
a plurality of air gaps each provided between said printed wiring boards being adjacent to each other, for providing a designated space between surfaces of said conductor patterns provided respectively onto said printed wiring boards being adjacent to each other;
a plurality of spacers each made of electric conductor material, provided onto said both end faces of each said through-hole pad, joined to another said spacer provided to opposite said through-hole pad, having a thickness being adequate for providing said air gap, and having an end face having size being smaller than a size of said end face of said through-hole pad for providing a drop part around a periphery of said spacer looking from a side surface of said through-hole pad; and
solder which stays at each said drop part for joining said spacers and said through-hole pads, which are opposite to each other respectively, of said printed wiring boards being adjacent to each other.

4,692,844

ADJUSTABLE LIGHT PROJECTOR

Jean Galerne, Guerville, France, assignor to LTM Corporation of America, Hollywood, Calif.

Filed Jul. 12, 1985, Ser. No. 754,166
Int. Cl.[4] F21V *19/02, 29/00*
U.S. Cl. 362—3 **11 Claims**



1. An adjustable light projector comprising a housing having side walls, a rear wall and front wall forming a chamber, an opening in the front wall for emission of light and means at the opening for mounting a lens, a carriage having a lamp socket, support means in the chamber extending between the front and rear walls, said carriage having a movable mounting on the support means and adjusting means between the carriage and the housing for shifting the position of the carriage relative to the front wall, a lower stationary section of said housing comprising portions of said side walls and an upper section comprising remaining portions of said side walls, there being a movable connection between the upper section and the stationary section on one side of the housing and a releasable connection on an opposite side of the housing whereby to provide access to said chamber, said remaining portions of said side walls forming in part said upper section of the housing being spaced from said portions of said side walls forming in part said lower stationary section thereby forming vents.

4,692,845

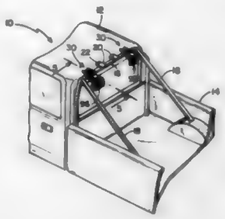
FLIP-OVER LAMP BRACKET FOR VEHICLES

Michael J. Widhalm, 16900 Yolite St., NW., Anoka, Minn. 55303, and Thomas G. Widhalm, 1322 119th La., Coon Rapids, Minn. 55433

Filed Apr. 11, 1986, Ser. No. 850,823
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—80 **6 Claims**

1. In combination with a vehicle having a roll bar, a flip-over auxiliary lamp bracket comprising first horizontal base means attached to a portion of said roll bar, second base means, an auxiliary lamp mounted on one side of said second base means, means for hingedly connecting one end of said first means to one end of said second means, and over-center springe means

for retaining said second means in either an overlapping, generally parallel, relationship in which said one side of said second base means is uppermost with said auxiliary lamp facing forwardly of the vehicle and in which the then underside of said



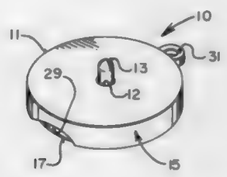
second base means bears against the upper side of said first base means or in an extended, substantially straight line, relationship with said first means in which said one side of said second means is lowermost and said auxiliary lamp faces rearwardly of said vehicle.

4,692,846

BATTERY HOLDER FOR COIN TYPE BATTERIES

Randall Johnson, 222 Avery La., No. 3, Los Gatos, Calif. 95030, assignor to Deborah Donkerbrook; Ronald Carstersen; Gail Carstersen and Randall Johnson, all of Los Gatos, Calif.

Filed Sep. 2, 1986, Ser. No. 902,612
Int. Cl.[4] F21L *15/08*; H01M *2/10*
U.S. Cl. 362—104 **5 Claims**



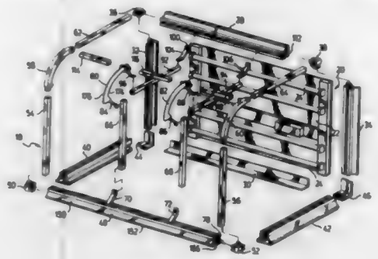
1. A battery holder for use with a coin type battery comprising a cup-shaped receptacle for receiving a coin-type battery, said receptacle having a wall and an annular rim protruding substantially normally away from one side face of said wall, a socket formed in said wall adapted to hold an electric device therein of a type having first and second leads coupled thereto, said leads having a predetermined diameter, a slot formed in said one side face to extend radially from said socket to said rim, said slot continuing substantially normal to said one side face in the inner surface of said rim, said radial slot having a depth substantially equal to or greater than said predetermined diameter, said first lead lying in said radial slot and in the slot continuing in the inner surface of said rim, said continuing slot having a depth substantially less than said predetermined diameter to cause a lead therein to be forced against the edge of a coin-type battery disposed within said socket, a layer of insulation covering that portion of said first lead lying in said one side face while leaving exposed that portion of said first lead continuing in the slot in the inner surface of said rim, said second lead lying exposed against said one side face of said wall whereby insertion of a coin type battery into said receptacle causes positive and negative portions of the battery to contact the exposed portions of said first and second leads.

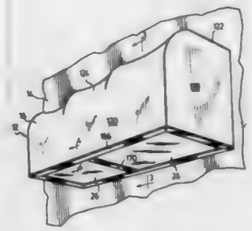
4,692,847

ILLUMINATED AWNING ASSEMBLY

James Gandy, Mississauga, Canada, assignor to Signtech Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 761,286, Aug. 1, 1985, abandoned. This application Aug. 27, 1985, Ser. No. 769,825
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—152 **21 Claims**





1. An illuminated awning assembly comprising a frame having:

an upright rear frame portion having upper and lower frame members and a pair of upright side members extending between respective opposite ends of the upper and lower frame members,

a horizontal frame portion having a pair of horizontal side members extending forwardly from respective junctions of the rear lower frame member and the upright side members, and a lower front frame member extending between front ends of the horizontal side members,

a pair of further side frame members on opposite ends of the frame, each further side frame member extending from a junction of the lower front frame member and respective horizontal side frame member to a junction of the upper frame member and the respective upright side member,

a sheet of translucent flexible sign material extending upwardly from the lower front frame member over the further side frame members to the upper rear frame member, and extending from the further side frame members to the horizontal side members and to the rear upright side members,

the lower front frame member, the upper rear frame member, the horizontal side members and the rear upright side members each having a series of adjustable sheet tensioning devices spaced along their length, each tensioning device comprising sheet retaining means gripping an edge portion of the sign sheet and means for adjusting the position of the gripping means relative to the member to tension the sign sheet between the respective members,

the lower front frame member, the upper rear frame member, the horizontal side members and the rear upright side members each having a flange with a free end over which the sign sheet passes and a recess in which the sheet tensioning devices are located, each tensioning device being positioned to cause the sign sheet to turn through an angle

of over 90 degrees as the sign sheet passes over the respective frame flange free end, and

illuminating means located within the frame.

4,692,848

OUTDOOR LIGHTING FIXTURE WITH U-SHAPED FLUORESCENT LAMP

David D. Poyer, 858 Roseway St., Naples, Fla. 33942

Filed Jul. 15, 1986, Ser. No. 885,674
Int. Cl.[4] F21S *5/00*; F21V *21/00*
U.S. Cl. 362—216 **6 Claims**



1. A fluorescent lighting fixture designed for outdoor use comprising:

a cylindrical housing of polyvinyl chloride and having an upper end, a lower end, generally concentric inner and outer walls, and an annular ring projecting inwardly from its inner walls;

a cylindrical housing extension made of polyvinyl chloride and having upper and lower ends, generally concentric inner and outer walls and an outer diameter slightly less than the inner diameter of the housing, said extension being fitted into the lower end of said housing;

a generally flat circular base plate made of thermoplastic material sized to fit snugly into the lower end of the housing extension;

a fluorescent lamp assembly consisting of a U-shaped fluorescent lamp, a socket for said lamp, and a 120 volt transformer wired in series, the socket and the transformer being mounted on the upper surface of said base plate;

a circular mirror-surfaced reflector surrounding the lower end of the fluorescent lamp and secured against the annular ring of said housing; and

a flat circular transparent lens bonded to the upper end of said housing.

4,692,849

HEAT FREE EXAMINATION LIGHT WITH FULLY ROTATABLE HEAD AND ARM

Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356

Filed Aug. 16, 1985, Ser. No. 766,572
Int. Cl.[4] F21V *21/18*
U.S. Cl. 362—402 **5 Claims**

1. An examination light comprising:

a base support means which has four horizontal projections placed at right angles to each other to provide stability; affixed to the underside and at the distal end of each is a castered wheel to enable the light to be rolled across a floor; superior to the horizontal projections and rigidly attached thereto is a case means for enclosing electrical power conversion means and for providing a support and rotation means for the structures of the light, which are:

a shaft means projecting vertically from the base means,

a housing means attached to the upper end of the vertical shaft means,

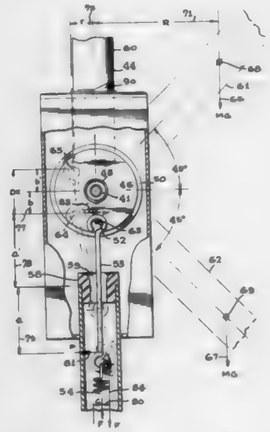
a counterbalance means within the housing means for balancing a moveable arm exterior to the housing means comprising:

a horizontal shaft supported within the housing means, mounted on bearings located in opposing walls of the housing means with one end projecting through one wall to the outside of the housing means and to which is rigidly affixed to that end an arm means, and,

a metal disc within the housing means rigidly affixed to the shaft close to one wall of the housing means; located on the disc and projecting away from the nearby wall is a pin perpendicular to the plane of the disc,

a fiber plate through which the horizontal shaft passes located between the metal disc and the nearby wall of the housing means,

a compression spring through which the horizontal shaft passes located betwen the metal disc and the far wall of the housing means, terminating in a bearing washer against the housing means, such that the compression spring acting against the housing means reacts against the metal disc causing the horizontal shaft to displace along its axis until the metal disc impinges on the fiber plate thereby compressing the fiber plate between the metal disc and the nearby wall of the housing means, and establishing a frictional resistance to any rotation of the metal disc,



a rod means extending from the projecting pin on the metal disc in a direction away from the orizontal shaft and passing through a ferrule, said ferrule being rigidly fixed with the housing means, said ferrule limiting the lateral travel of the rod means, said rod means presenting a loop on each end, one end for encircling the pin and providing an attachment with pivoting freedom as the metal disc is rotated, and the other end for attaching to an extension spring,

an extension spring attached to the end of the rod away from the metal disc and the ferrule, pre-extended a determined distance between the rod and an attachment and adjustment means rigid with the housing means, to apply a counterforce opposing the force imposed by the arm means for any position of the arm means; said counterforce being the product of the direct tension of the extension spring on the pin as it is applied to the off-center position of the pin on the disc, and to the side force against the pin on the disc caused by the restrictive effect of the ferrule against the rod preventing a lateral displacement of the rod for the off-center position of the pin,

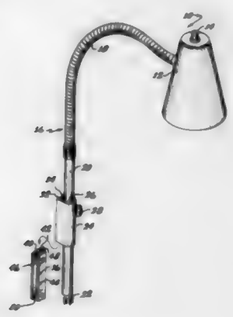
a moveable arm means pivoted and supported from a horizontal shaft extending from the housing means,

a lamp head means affixed and pivoted on the distal end of the moveable arm means,

a light source within the lamp means,

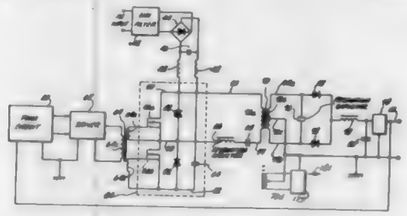
an optical means within the lamp head means for directing the light from the lamp head in the form of an optical beam, and,
a heat rejection means within the lamp head means that separates the heat from the light, and,
a means that dissipates the heat rejected from the light within the lamp head means to the surrounding atmosphere.

4,692,850
LAMP FOR TEMPORARILY ATTACHING TO A SUPPORT
John P. LeDoux, 1509 Old Fashion Way, Anaheim, Calif. 92804
Filed Dec. 30, 1985, Ser. No. 814,329
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—432 **11 Claims**



1. A lamp consisting of
a first bracket for attaching to a support surface, said first bracket comprising an integrally formed elongated member having a front, a flat planar back, a top, a bottom, and essentially parallel left and right sides;
said first bracket further including at least one aperture extending between said front and back of said first bracket, said aperture for receiving a fastening member for attaching said first bracket to a support surface with the back of said first bracket positioned towards said support surface;
a second bracket for attaching to said first bracket, said second bracket being elongated and including at least a back, a top, a bottom, and essentially parallel left and right side edges;
one of said first bracket and said second bracket including first and second elongated grooves formed on one of said first and said second brackets, said first and said second elongated grooves located essentially parallel to one another and spaced apart from one another and oriented with respect to one another so as to open opposed to one another;
the other of said first and said second brackets including first and second elongated ribs, said first and said second elongated ribs located essentially parallel to one another and sized and shaped and positioned on the other of said first and said second brackets in a spaced relationship such that said first elongated rib fits into said first groove and said second elongated rib fits into said second groove to mate said second bracket to said first bracket;
limiting means located on one of said first and said second brackets for maintaining said second bracket mated to said first bracket to temporarily attach said second bracket to said first bracket;
an elongated lamp neck having ends, said lamp neck being hollow;
an electric light attaching to one of said ends of said lamp neck and including electrical wiring attaching to said electric light and passing through said hollow lamp neck and exiting out of the other of said ends of said hollow neck;
said second bracket including an elongated hollow cylindrical opening in said second bracket, said opening extending between the top and bottom of said second bracket, said neck opening sized and shaped to accept at least a portion of said elongated lamp neck in said opening;
said elongated lamp neck operatively attaching to said second bracket proximal to said other of said ends of said neck by fitting into said elongated hollow cylindrical opening in said second bracket whereby said neck and said lamp attached therto are supported by said second bracket which in turn is supported on said first bracket which is in turn supported on a support surface.

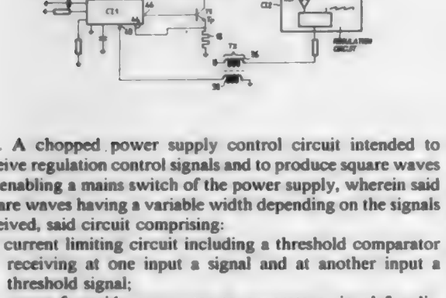
4,692,851
HARMONIC-RESONANT POWER SUPPLY
Brian E. Attwood, Sestri, 49 Smithbarn, Horsham, Sussex, England
Filed Mar. 4, 1985, Ser. No. 708,011
Claims priority, application United Kingdom, Feb. 2, 1985, 8507689
Int. Cl.[4] H02M *3/337*
U.S. Cl. 363—16 **12 Claims**



1. A power supply for producing a main DC output froma DC input comprising:
(a) an isolation transformer having a primary winding and a main secondary winding:
(b) switching means for driving the primary winding from the DC input, the switching means being responsive to a switching signal;
(c) means for rectifying and filtering a voltage at the main secondary winding to produce the main DC output;
(d) control means for producing the switching signal to provide pulse-width modulation of the switching means at a fixed frequency in response to changes in the main DC output voltage; and
(e) means for producing resonance in the isolation transformer at a resonant frequency of from about five to about twenty times the fixed frequency during operation of the switching means for preventing electromagnetic interference by the power supply.

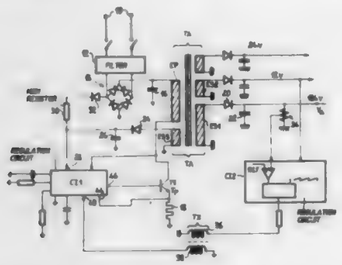
4,692,852
SWITCHING POWER SUPPLY WITH RASTER WIDTH STABILIZATION
Alan A. Hoover, New Palestine, Ind., assignor to RCA Corporation, Princeton, N.J.
Filed Jun. 25, 1986, Ser. No. 878,234
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **35 Claims**

1. A switching power supply for a video display apparatus, comprising:
a source of energy;
a power transformer;
output switching means coupled to a first winding of said transformer and to said source;
a deflection circuit of said video display apparatus coupled as a first load circuit to a second winding of said transformer and taking energy from said source for producing a raster;
a first feedback winding of said transformer for developing a first feedback voltage representative of variations in loading on said transformer;
a second feedback winding of said transformer for developing a second feedback voltage representative of variations in loading on said transformer; and



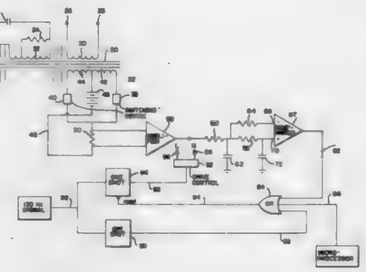
a control circuit coupled to said first and second feedback windings and to said output switching means for controlling the switching thereof in accordance with said first and second feedback voltages to regulate the energy transfer beween said source and said deflection circuit for stabilizing the size of said raster.

4,692,853
CONTROL CIRCUIT FOR A CHOPPED POWER SUPPLY WITH PROGRESSIVE START UP
Jean de Sartre, Meylan, and Philippe Maige, Sysginet Pariset, both of France, assignors to Thomson-CSF, Paris, France
Filed Feb. 7, 1986, Ser. No. 826,986
Claims priority, application France, Feb. 8, 1985, 85 01822
Int. Cl.[4] H02P *13/22*
U.S. Cl. 363—49 **7 Claims**



1. A chopped power supply control circuit intended to receive regulation control signals and to produce square waves for enabling a mains switch of the power supply, wherein said square waves having a variable width depending on the signals received, said circuit comprising:
a current limiting circuit including a threshold comparator receiving at one input a signal and at another input a threshold signal;
a means for said comparator to generate a signal for disabling the switch when the threshold is exceeded, in order to ensure gradual start-up of the chopped power supply at the beginning of its operation and in the case of a disturbance of operation;
a means for establishing a variable threshold signals in response to circuit means which establish a first fixed threshold value under normal established operating conditions,
establish periodically a threshold variation cycle in the opposite case, this cycle comprising
means to cause the threshold to pass to a second value at a time representing the beginning of a periodic threshold variation cycle, the second threshold value corresponding to a lower current in the switch,
means to bring the threshold gradually back from the second value to the first in a first part of the threshold variation cycle,
means for maintaining the threshold at the first value until the end of the current cycle,
means to begin a second start-up cycle again at the end of the current cycle if regulation control signals are still not received at the end of the first cycle,
means for stopping the establishment of threshold variation cycles when regulation control signals are received.

4,692,854
METHOD AND APPARATUS FOR MODULATING INVERTER PULSE WIDTH
Richard V. Baxter, Jr., Appleton; Robert F. Bourke, Fairchild; David R. Ellingson, Tomah; Terrance D. Paul, Port Edwards, and David L. Layden, New Lisbon, all of Wis., assignors to Best Power Technology, Inc, Necedah and Pensar Corporation, Appleton, both of, Wis.
Filed Mar. 4, 1986, Ser. No. 835,950
Int. Cl.[4] H02M *7/00*
U.S. Cl. 363—75 **20 Claims**



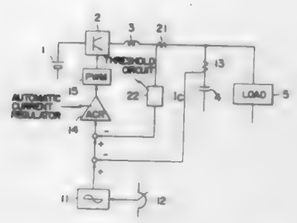
1. In an inverter for use with a ferroresonant transformer for powering an A.C. load from a D.C. source, the inverter having at lesat one current pulse from the D.C. source per A.C. half cycle, said current pulse being variable in width, the ferroresonant transformer having at least one input winding for said D.C. source and an output winding for said A.C. load, the improvement comprising means for detecting when the current flow for said input winding for the inverter-ferroresonant transformer is substantially at zero slope and a low value prior to saturation, and means for terminating the pulse width of the inverter, said means for terminating the pulse width being operated by said means for detecting substantially upon the occcurance of said zero slope and low value of said current prior to saturation, whereby the inverter pulse width is terminated before saturation can occur.

4,692,855

CONSTANT VOLTAGE AND FREQUENCY TYPE PWM INVERTER WITH MINIMUM OUTPUT DISTORTION

Akihiko Kuroiwa, Fuchu, and Suzuo Saito, Higashimurayama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 4, 1986, Ser. No. 903,472
Claims priority, application Japan, Sep. 9, 1985, 60-197572; Jan. 29, 1986, 61-17364
Int. Cl.⁴ H02M *7/44*
U.S. Cl. 363—95 **6 Claims**



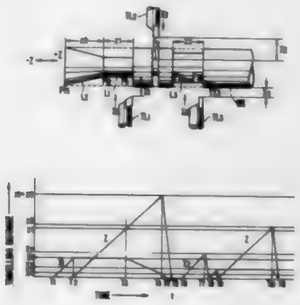
1. An ac power supply device comprising:
a voltage type inverter;
a reactor and a capacitor connected to the output of said inverter;
a circuit for generating a sine wave reference signal;
means for detecting a current flowing through said capacitor; and
means responsive to said sine wave reference signal and said current flowing through said capacitor to control said voltage type inverter in accordance with a compared result thereof.

4,692,856

POSITION CONTROL OF MULTIPLE TOOLS BASED ON ELAPSED TIME OF TOOL OPERATION

Hidetsugu Komiya, Tokyo, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP84/00134, § 371 Date Nov. 28, 1984, § 102(e) Date Nov. 28, 1984, PCT Pub. No. WO84/03956, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 27, 1984, Ser. No. 681,867
Claims priority, application Japan, Mar. 28, 1983, 58-52016
Int. Cl.⁴ G05B *19/18, 23/02*
U.S. Cl. 364—167 **6 Claims**



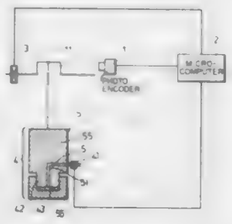
1. A numerical control method for numerically controlling a machine tool having two or more tools, each tool having an axis of movement with respect to a workpiece, comprising the steps of:
(a) creating a time chart representing a relationship between time and position of one of said tools along its associated axis of movement;
(b) creating numerical control data specifying said relationship between time and position of one of said tools along its associated axis of movement;
(c) numerically controlling the position of said tools along each of the axes of movement on the basis of a portion of said numerical control data;
(d) monitoring elapsed time of said numerically controlled positioning;
(e) monitoring whether said elapsed time corresponds to a time specified by said first portion of said numerical control data for each tool and its associated axis of movement;
(f) determining when said elapsed time equals a time specified by said first portion of said numerical control data; and
(g) numerically controlling the position of one of said tools along its axis of movement in accordance with a succeeding position of said numerical control data for said axis of movement.

4,692,857

METHOD AND APPARATUS FOR PROTECTING PRESS FROM BEING DAMAGED BY OVERLOAD CONDITIONS

Charles H. Chi, 218 Chung Hua W. Road, Chang Hua, Taiwan

Filed Jul. 1, 1985, Ser. No. 751,361
Claims priority, application Taiwan, Jun. 18, 1984, 7324604
Int. Cl.⁴ G06F *15/46;* **G05B** *9/02;* **B30B** *15/28*
U.S. Cl. 364—184 **11 Claims**



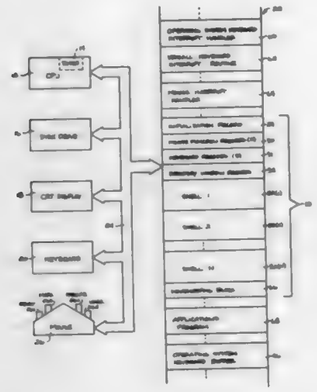
1. A method of protecting a press, which includes a fly wheel, a crank shaft connected with said fly wheel, a ram connected with said crank shaft having hydraluic buffer means mounted therein, and braking means, from being damaged by a pressure overload, a torsion overload, an energy overload, or a power overload, said method comprising the steps of:
(a) detecting an angular displacement of said crank shaft or said fly wheel of said press;
(b) calculation an angular velocity based on said detected angular displacement;
(c) calculating a pressure load value, a torsion load value, an energy load value, and a power load value based on said calculated angular velocity;
(d) respectively determining whether said calculated load values exceed their respective permitted safe load limits; and
(e) generating an overload signal sent to said braking means to actuate it to brake said press, and to said hydraulic buffer means to release said hydraulic buffer means when at least one of said calculated values exceeds its permitted safe load limit.

4,692,858

VISUAL INTERFACE BETWEEN USER AND COMPUTER SYSTEM

Peter M. Redford, and Rita A. Redford, both of Los Gatos, Calif., assignors to Trillian Computer Corporation, Los Gatos, Calif.

Filed Feb. 2, 1984, Ser. No. 576,535
Int. Cl.⁴ G06F *3/00*
U.S. Cl. 364—200 **12 Claims**



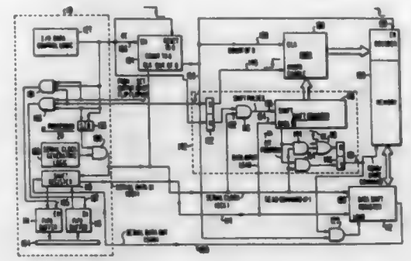
1. A method for providing visual mediation between a computer operating system and a user, said operating system being associated with a computer of the type including a processor, a memory, a display and means for displaying a cursor at a selected disposition on said display, said method comprising the steps of:
selectively forming, on said display, indicia of at least one overlay window containing, at predetermined dispositions therein, display indicia of at least one user determinable task assocaited with said overlay window, said task corresponding to an operation by said computer, said selectively forming step comprising the steps of:
developing, for each overlay window, window definition datum corresponding to said overlay window, said window deifinition datum including, with respect to each assocaited task, task designation datum designating at least one task, and a task definition code string representing a predetermined operation by said computer;
determining the number of task associated with said overlay window;
determining, from said determined number of assocaited tasks, an appropriate geometry for said overlay window and relative dispositions of said display indicia of said tasks in said overlay window;
developing, from said window definition datum, a window definition block corresponding to said overlay window, said window definition block including at least one task definition record corresponding to each associated task, said task definition record including indicia of said task designation datum, indicia of the realtive disposition of the task display indicia in said overlay window, and indicia of said task definition code string; and
storing said window definition block in said memory;
sensing correspondence of the relative disposition of said cursor on said display and the relative dispositions of said task display indicia; and
selectively effecting a predetermined operation by said computer in accordance with the task definition of the task having display indicia at a disposition on said display corresponding to the disposition on said display of said cursor.

4,692,859

MULTIPLE BYTE SERIAL DATA TRANSFER PROTOCOL

Russell G. Ott, Cranford, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed May 16, 1983, Ser. No. 495,115
Int. Cl.⁴ G06F *15/00, 12/06*
U.S. Cl. 364—200 **3 Claims**



1. In a data processing system comprising a central processing unit (CPU), a random access memory (RAM) having a memory address terminal for receiving memory address signals and having a data terminal into which and out of which pass data signals, first means coupled between said CPU and RAM for bit serially transferring data ordered in bytes between said CPU and RAM data terminal and for transferring said memory address signal as a byte to said RAM memory address terminal and a clock pulse generating means producing time spaced pulses synchronized with the transfer of data, the improvement in said first means for the control of message signal transfer between said CPU and RAM, where the message signal comprises a single RAM address byte followed in succession by a plurality of data bytes, comprising in combination:
second means coupled to receive clock pulses from said clock pulse generating means and in response thereto producing a pulse marking the termination of each of said bytes (data or address) transferred in said first means;
third means having a terminal for receiving said RAM address byte thereat to be stored therein and coupled to said RAM address terminal to pass address signals thereto; and
fourth means responsive to a first of said pulses from said second means and coupled to said first means for transferring said address byte of said message to said third means terminal;
said third means being coupled to said second means for receiving said pulses therefrom and, response to each pulse, incrementing the value of RAM address byte stored therein in correspondance with the transfer of succeeding data bytes whereby said RAM is addressed to said address byte of said message and responsive to subsequent ones of said pulses for passing said data bytes serially between said CPU and RAM.

4,692,860

APPARATUS FOR LOAD REGULATION IN COMPUTER SYSTEMS

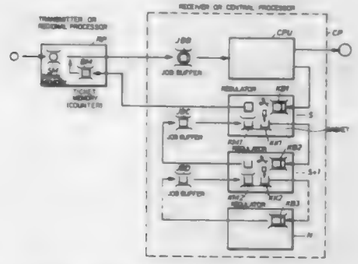
Ib N. Andersen, Trångsund, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 12, 1984, Ser. No. 588,796
Claims priority, application Sweden, Mar. 18, 1983, 8301507
Int. Cl.⁴ G06F *15/00, 9/00;* **H04J** *3/24*
U.S. Cl. 364—200 **4 Claims**

1. A computer-controlled telecommunication system comprising a regional processor adapted to transmit message signals in response to an acknowledgement signal, and a central processor which receives the message signals for processing on at least three priority program levels, said central processor including means for insuring that all priority program levels

get a share of the central processor's capacity, said means comprising:

first, second and third job buffer means for storing message signals related to said priority program levels, said first job buffer means receiving message signals from the regional processor; a first priority level regulator comprising a first first-level memory means for storing ticket signals from said first job buffer means, second first-level memory means for storing basket signals received from said second job buffer means, third first-level memory means for storing the ticket signals from said first first-level memory means as coupon signals, first first-level control means responsive to the presence of the ticket and basket signals in said first and second first-level memory means respectively for transmitting a ticket signal to said third first-level memory means and a ticket signal as an acknowledgement signal to the regional processor and second first-level control means responsive to a predetermined number of coupon signals being stored in said third first-level memory means for clearing the latter, deleting a basket signal stored in said second first-level memory means, and for transmitting first carry signals; a second priority level regulator comprising a first second-level memory means for storing said first carry signals as ticket signals; second second-level memory means for storing basket signals received from said third job buffer means, third second-level memory means for storing the ticket



signals received from said first second-level memory means as coupon signals, first second-level control means responsive to the presence of the ticket and basket signals in said first and second second-level memory means respectively for transmitting a ticket signal to said third second-level memory means and a ticket signal to said second job buffer means, and second second-level control means responsive to a given number of coupon signals being stored in said third second-level memory means for clearing the latter, deleting a basket signal stored in said second second-level memory means, and for transmitting second carry signals; a third priority level regulator comprising a first third-level memory means for storing second carry signals as ticket signals, and first third level-control means for transmitting a ticket signal to said third job buffer means when a ticket signal is present in said first third-level memory means; first control means associated with said first priority level regulator responsive to the absence of message signals being stored in said first job buffer for transferring a basket signal, if present, from said second job buffer means to said second first-level memory means; and second control means associated with said second regulator means responsive to the simultaneous absence of message signals in said first and second job buffer means for transferring a ticket signal, if present, from said third job buffer means to said second second-level memory means whereby said message signals are processed at said three priority program levels.

4,692,861

MICROCOMPUTER WITH INTERPROCESS COMMUNICATION

Michael D. May, Bristol, United Kingdom, assignor to Inmos Limited, Bristol, England

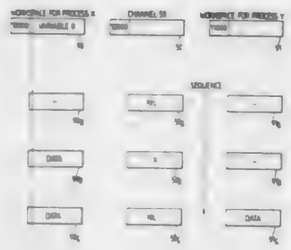
PCT No. PCT/GB84/00124, § 371 Date Dec. 4, 1984, § 102(e) Date Dec. 4, 1984, PCT Pub. No. WO84/04188, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 11, 1984, Ser. No. 679,041

Claims priority, application United Kingdom, Apr. 11, 1983, 8309770

Int. Cl.⁴ G06F *9/06*

U.S. Cl. 364—200 **36 Claims**



1. A microcomputer comprising memory and a processor coupled to read from and write into said memory, said processor for executing a plurality of concurrent processes having sequential instructions in respective programs, said instructions including a communication instruction of a first type to output data and a communication instruction of a second type to input data, said microcomputer comprising:

(i) process scheduling means having:

a. means for identifying one or more processes which form a collection awaiting execution by the processor,

b. means, cooperating with said means for identifying, for descheduling a process by interrupting execution of the current process,

c. means, cooperating with said means for identifying, for scheduling a process by adding it to said collection, and

(ii). a synchronizing channel for enabling a synchronized communication between a pair of said processes each having a single communication instruction in its program to enable said synchronized communication between the pair of processes, said channel comprising means for holding either a first value indicating that one of said pair of processes has reached a communication instruction in its program requiring communication through said channel, or a different value indicating that neither process of said pair has reached a communication instruction in its program requiring communication through said channel, and

(iii). control means responsive to execution of a communication instruction by one of said pair of processes to test the contents of said channel, said control means being responsive to location of said first value in said channel to continue executing instructions of the current process and responsive to location of a different value in said channel to deschedule the current process,

whereby both processes in said pair are at corresponding program instructions when said communication occurs, and neither process of said pair is descheduled more than once to effect said synchronized communication.

4,692,862

RAPID MESSAGE TRANSMISSION SYSTEM BETWEEN COMPUTERS AND METHOD

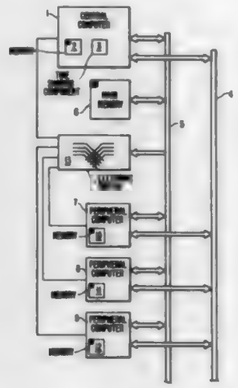
Daniel Cousin, Asnieres; Jean-Francois Garnier, Rueil-Malmaison, and Jean-Pierre Georges, Sevres, all of France, assignors to Jeumont-Schneider Corporation, France

Continuation-in-part of Ser. No. 726,944, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 324,387, Nov. 10, 1981, abandoned. This application Dec. 11, 1985, Ser. No. 807,697

Claims priority, application France, Mar. 6, 1981, 8005287

Int. Cl.⁴ G06F *13/38*

U.S. Cl. 364—200 **5 Claims**



1. A computer network including a central computer, a plurality of peripheral computers, a common memory accessible by said central computer and said peripheral computers over a single bus connected to said common memory, time-sharing means connected to said central computer and said peripheral computers for regulating access to said common memory by said central computer and said peripheral computers, and electronic switch means having switchable connections to the respective central and peripheral computers and having control means connected to said bus for receiving control signals from said central computer, whereby direct connections between respective members of one or more selected pairs of computers may be effected through said electronic switch means so that the respective members of each of said pairs of computers may communicate directly through said switch means.

4,692,863

ELECTRONIC APPARATUS FOR GENERATING SETS OF NUMERICAL VALUES FOR PLAYING LOTTERY GAMES

Alexander P. Moosz, 240 Cadillac, Beaconsfield, Quebec, Canada

Filed Mar. 18, 1985, Ser. No. 712,725

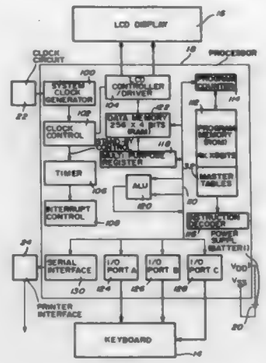
Int. Cl.⁴ G06F *15/28, 15/44*

U.S. Cl. 364—412 **22 Claims**

1. An electronic apparatus for generating combinations of numbers to be used by a player when selecting his bets for a lottery game of the 6/36, 6/44 or 6/49 type more generally expressed as m/k wherein m is the number of distinct numbers forming a combination C_j and wherein said distinct numbers being chosen from an array A_k constituted by a number k of consecutive numbers usually ranging from 1 to k, said apparatus generating a plurality of different combinations C_j taking into consideration parameters dictated by the player, said apparatus comprising:

input means for entering said parameters, namely for entering n distinct selected numbers chosen from said array A_k thus forming a sub-array a_i wherein n is greater than m and less than k, and for entering p, a redundancy index whose numerical value is less than m;

processor means operatively connected to said input means for storing said n distinct selected numbers and said redundancy index p, said processor means successively generating a comprehensive series of combinations C_j of said



distinct selected numbers n chosen from said sub-array a_i, the combinations C_j from said comprehensive series satisfying a predetermined relationship with the selected redundancy index p; and

output means operatively connected to said processor means for successively outputting the combinations C_j generated by said processor means.

4,692,864

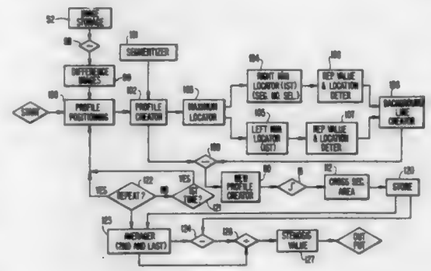
METHOD OF DETERMINING STENOSIS OF BLOOD VESSELS

Yair Shimoni, Jerusalem; Paul Fenster, Petach Tikva, and Bilha Nissenson, Herzlia, all of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed May 23, 1985, Ser. No. 737,144

Int. Cl.⁴ G01N *23/00*; A61B *5/02*

U.S. Cl. 364—414 **29 Claims**



1. A method for using digital subtraction angiography (DSA) equipment to obtain quantitative measurements of stenosis, said method comprising the steps of:

obtaining a DSA pixelized image of a blood vessel including a stenotic portion and a normal portion of the blood vessel;

determining a number proportional to the cross sectional area of the blood flowing through the blood vessel at said stenotic portion of the blood vessel;

determining a number proportional to the cross sectional area of the blood flowing through the blood vessel at said normal portion of the blood vessel;

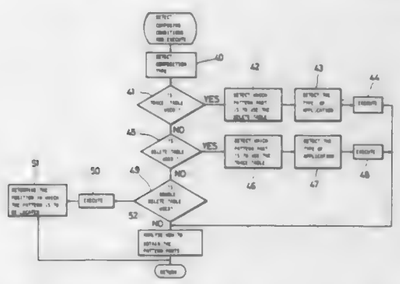
said steps of determining a number proportional to the cross section area of the blood flowing comprising the steps of:
creating density profiles across the blood vessel at said stenotic portion and at said normal portion;
detecting the edges of the blood vessel on the density profiles;
evaluating residual density background values along the density profiles;
compensating total density values for said residual density background values to obtain compensated total density values which are numbers proportional to the cross sectional area of the blood flowing through the blood vessel at the normal portion and at the stenotic portion; and
using the compensated total density values at the normal portion and at the stenotic portion of the blood vessel to quantitatively determine stenosis.

4,692,865

METHOD AND A SYSTEM FOR COMPOSING THE PATTERN OF THE CHINESE CHARACTER

Chi-Ching Hsu, Taipei, Taiwan, assignor to Multitech Industrial Corporation, Taipei, Taiwan

Filed Mar. 13, 1985, Ser. No. 711,101
Int. Cl.⁴ G06F *15/38;* **G06G** *7/60;* **G09G** *1/06;* **B41J** *5/00*
U.S. Cl. 364—419 **16 Claims**



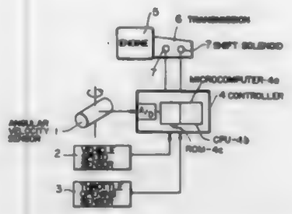
1. A method for composing a series of requested Chinese characters which are a part of a plurality of predetermined less-frequently-used Chinese characters using a digital computer system, said method comprising the steps of:
(a) a storing in a first memory section of said digital computer system a plurality of entire patterns of predetermined frequently-used Chinese characters;
(b) storing in a second memory section of said digital computer system command data for composing said predetermined less-frequently-used Chinese characters;
(c) retrieving a datum of said command data from said second memory section for one of said requested Chinese characters;
(d) processing said retrieved command datum to obtain two selected entire patterns from said first memory section, to obtain two pattern parts, a first pattern part and a second pattern part, from said two selected entire patterns, and to compose said requested Chinese character by using said two pattern parts; and
(e) repeating said steps (c) and (d) until said series of requested Chinese characters is entirely composed.

4,692,866

AUTOMATIC SHIFT CONTROL SYSTEM

Shuichi Kosuge, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 13, 1985, Ser. No. 701,222
Claims priority, application Japan, Feb. 14, 1984, 59-26845
Int. Cl.⁴ F16H *5/66;* **B60K** *41/06;* **G06F** *15/50*
U.S. Cl. 364—424.1 **5 Claims**



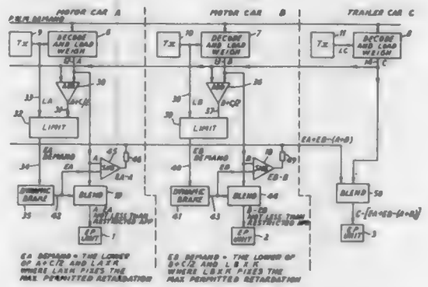
4. A control system for an automatic transmission of a vehicle comprising:
speed sensing means for sensing a running speed of said vehicle;
throttle sensing means for sensing an opening angle of a throttle valve of an engine of said vehicle;
curve sensing means for sensing an angular velocity of said vehicle;
means for storing a shift pattern of said automatic transmission in relation to the running speed of said vehicle and the opening angle of said throttle valve;
controlling means, coupled to said speed sensing means, throttle sensing means, curve sensing means and storing means, for: (1) correcting said sensed opening angle of said throttle valve in accordance with the sensed angular velocity of said vehicle so that a corrected opening angle of said throttle valve increases with the increase in the angular velocity of said vehicle and (2) commanding shifts of said automatic transmission in response to the sensed running speed of said vehicle and the corrected opening angle of said throttle valve based on said stored shift pattern.

4,692,867

BRAKE CONTROL SYSTEM

John D. Poole, Devizes, England, assignor to Westinghouse Brake and Signal Co., Ltd., Wiltshire, England

Filed Jan. 31, 1985, Ser. No. 696,583
Claims priority, application United Kingdom, Feb. 13, 1984, 8403721
Int. Cl.⁴ B60T *8/04*
U.S. Cl. 364—426 **11 Claims**



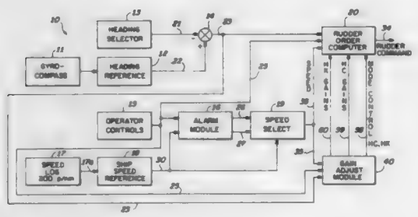
1. A brake control system for a multiple unit train, of motor and trailer units, which has a mixed braking system of dynamic and friction brakes in which the dynamic brakes are applied preferentially, said system comprising means for generating a brake demand signal calling for a rate of retardation of the train, load responsive means on each unit operative to provide for a unit, a load weighed brake signal corresponding to the brake demand signal and in accordance with the load of the unit, summing means having inputs connected to receive the load weighed brake signals from all units and an output connected to control actuation of the dynamic brake system, friction brake controlling means on each unit connected to control the level of friction braking of a respective unit in response to the difference between the load weighed brake signal for the unit and a further signal which, on a dynamically braked unit, represents the dynamic braking effort achieved or, on a trailer unit, the excess of dynamic brake effort achieved over that required by the load weighed signals of the dynamically braked units and dynamic brake control signal limiting means operative to effectively limit dynamic braking to a calculated maximum adhesion limit.

4,692,868

ADAPTIVE AUTOPILOT

Charles R. Wesner, Crozet; John F. Yancey, Charlottesville, and Albert L. Coleman, Scottsville, all of Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 18, 1985, Ser. No. 692,465
Int. Cl.⁴ G06F *15/50;* **G05D** *1/08*
U.S. Cl. 364—447 **14 Claims**



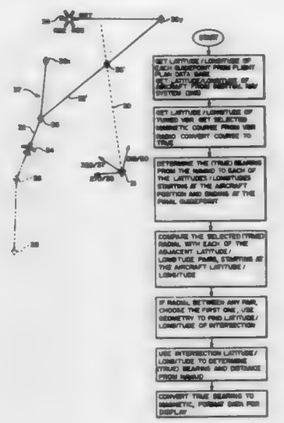
1. A method of heading keeping to minimize propulsion losses in a marine vessel utilizing an adaptive autopilot that has been calibrated to establish allowable minimum and maximum rudder order signal gains, comprising the steps of:
establishing a plurality of intermediate rudder order signal gain steps lying between said minimum and maximum rudder order signal gains,
measuring a reference heading error signal over a selected time period,
comparing said reference heading error signal with a current heading error signal,
increasing or decreasing said rudder order signal gain in said intermediate steps to one of said steps in response to said comparison of said reference and current heading error signals for providing an optimum rudder order signal gain that minimizes propulsion losses,
maintaining said optimum rudder order signal gain until changing conditions cause said comparison of reference and current heading error signals to exceed a predetermined limit thereby initiating selection of a new optimum rudder order signal gain for controlling the rudder of said marine vessel so as to provide said heading keeping.

4,692,869

AIRCRAFT NAVIGATIONAL SYSTEMS AND METHODS FOR CREATING NAVIGATIONAL GUIDEPOINTS

Ethmer W. King; Robert C. Kircher, Jr., and David S. Yotsuuye, all of King County, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 28, 1985, Ser. No. 716,979
Int. Cl.⁴ G06F *15/50*
U.S. Cl. 364—448 **48 Claims**



1. An aircraft navigational system comprising:
a. receiver means for
1. receiving electronic navigational signals from a selected navigational station, and
2. for outputting a navigational signal defining a first selected navigational radial of the selected navigational station;
b. computer means, including a memory, responsive to said first navigational signal and arranged to:
1. provide a first informational signal indicating geographical locations of a plurality of selected guidepoints which define a navigational route;
2. respond to said first navigational signal and to provide a second informational signal indicating a first point of intersection of said navigational route with said first navigational radial to define the geographical location of a first new guidepoint;
3. determine the geographical location of said first guidepoint by
(i) determining the position of said selected navigational radial between two of said selected guidepoints, and
(ii) measuring a distance along said navigational route between said navigational radial and at least one of said two selected guidepoints; and
4. storing data defining the geographical location of said first guidepoint in said memory.

4,692,870

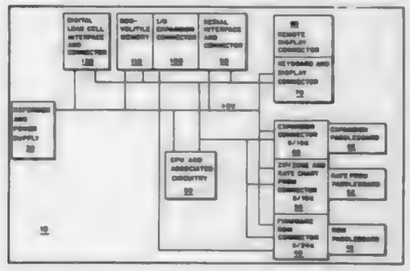
GENERAL PURPOSE PROCESSOR MODULE FOR MAILROOM EQUIPMENT

Flavio Manduley, Woodbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 20, 1984, Ser. No. 684,411
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—466 **15 Claims**

1. An electronics module suitable for use in a plurality of different postage scales which may have various weight ranges and capabilities as well as in other types of mailroom equipment such as electronic accounting systems, comprising:

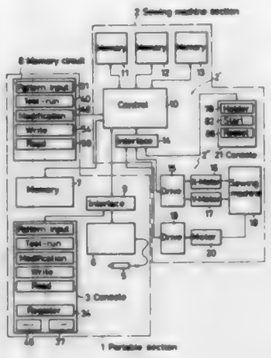
(a) means for mounting electronic components and connectors;
(b) processing means mounted on said mounting means for processing weight information or postal information relating to an item to be mailed;
(c) a first connector mounted on said mounting means for connecting read-only-memory (ROM) modules for storing selected firmware to said processing means so that appropriate firmware to program said processing means in accordance with a preselected set of capabilities is provided;
(d) a second connector mounted on said mounting means for connecting PROM modules for storing selected postal



rate information to said processing means so that appropriate information for the determination of postage values is provided;
(e) an input/output connector mounted on said mounting means for connecting keyboard means and display means to said processor means so as to provide an operator interface for entry of postal information and commands;
(f) a serial data interface for the transmission of information relating to items to be mailed by said processing means; and,
(g) a non-volatile memory module connected to said processing means through one of said first or second connectors, said non-volatile memory module containing information defining said keyboard means.

4,692,871
INPUT DEVICE FOR SEWING MACHINE
Tomoaki Kinoshita; Kunio Takano; Masanori Nukushina; Minoru Wada, and Hiroshi Tokunaga, all of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Chofu, Japan
Filed Jul. 30, 1985, Ser. No. 760,650
Claims priority, application Japan, Jul. 31, 1984, 59-160778
Int. Cl.[4] G06F *15/46;* **D05B** *3/02*
U.S. Cl. 364—470 **3 Claims**

1. A sewing machine input device for inputting stitch patterns of a workpiece, comprising:
a first portion including a digitizer for inputting stitching patterns, a first memory circuit logically coupled through control means to said digitizer for storing said stitching patterns, a second memory circuit logically coupled to said control means for storing various control programs, and command generating means logically coupled through said control means to said second memory circuit for selecting among said control programs; and
a second portion including said control means, said control means being adapted to execute said selected control programs;
said first portion being coupled to said second portion through said control means during the inputting operation;
said second portion being provided in a sewing machine; and wherein said control means is adapted to control inputting of a stitch pattern, test-running the stitch pattern, modifying



the stitch pattern, writing the stitch pattern and reading the stitch pattern.

4,692,872
NUMERICAL CONTROL SYSTEM WITH PLURAL GROUPS OF MISCELLANEOUS FUNCTIONS
Nobuyuki Kiya, Hachioji, Japan, assignor to Fanuc LTD, Minamitsuru, Japan
PCT No. PCT/JP85/00380, § 371 Date Feb. 13, 1986, § 102(e) Date Feb. 13, 1986, PCT Pub. No. WO86/00726, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 5, 1985, Ser. No. 834,245
Claims priority, application Japan, Jul. 6, 1984, 59-138930
Int. Cl.[4] G06F *3/04;* **G05B** *19/18*
U.S. Cl. 364—474 **5 Claims**



1. A numerical control system for controlling a machine based on a machining program, comprising:
a numerical control section for outputting numerical control signals based on the machining program, comprising:
memory means for storing miscellaneous function instructions divided into plural groups; and
interface means for outputting a specific miscellaneous function instruction from among the divided miscellaneous function instructions as well as a code read command signal including a group number to which the specific miscellaneous function instruction belongs; and
a programmable controller section, operatively connected to the numerical control section and the machine, for executing sequential control of the machine based on the numerical control signals from said numerical control section, comprising:
decoding means for decoding the specific miscellaneous function instruction on the basis of the code read command signal sent by the numerical control section; and
miscellaneous function executing means for executing the sequential control of the machine in accordance with a plurality of decoded miscellaneous function instructions.

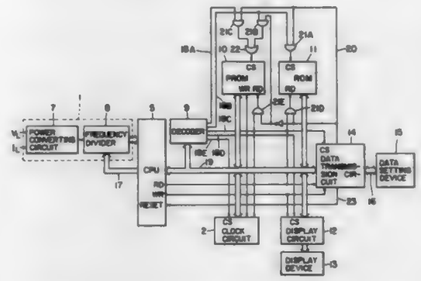
4,692,873
MACHINE TOOL PICK FEED METHOD
Hajimu Kishi, and Kunio Tanaka, both of Tokyo, Japan, assignors to Fanuc Ltd., Yamanashi, Japan
Filed Jun. 25, 1985, Ser. No. 752,075
Claims priority, application Japan, Oct. 31, 1983, 58-204575
Int. Cl.[4] B23Q *15/013*
U.S. Cl. 364—474 **5 Claims**



1. A method of machining using a machine tool having a tool and axes of rotation for subjecting a workpiece to desired machining, said method comprising the steps of:
moving the tool, having a central axis, relative to a workpiece in one direction along a first cutting parh from a first maching start point;
positioning the tool at a machining starting point on a second cutting path after the completion of machining along said first cutting path at a cutting path end point Pe;
moving the tool relative to the workpiece along said second cutting path in said one direction to perform machining;
specifying a tool retraction quantity for retracting the tool from the cutting path end point Pe;
specifying a plane containing a path along which the tool is moved toward the second cutting starting point Ps, on said second cutting path;
obtaining coordinate values of a point Pa distanced from the cutting path end point Pe by said tool retraction quantity in the direction of the central axis of the tool at the cutting path end point Pe;
obtaining coordinate values of a point Pb in said plane on a perpendicular dropped from said plane to the point Pa;
obtaining coordinate values of a point Pd distanced from the second cuttting path starting point Ps by said tool retraction qunatity in the direction of the central axis of the tool at the second cutting path starting point Ps;
obtaining coordinate values of a point Pc in said plane on a perpendicular dropped from said plane to the point Pd;
creating NC data, in accordance with the obtained coordinates, for positioning the tool at the second cutting startin point Ps along a pick feed path Pe→Pa→Pb→Pc→Pd→Ps;
positioning the tool at the second cutting starting point by moving the tool along said pick feed path in accordance with said NC data; and
performing machining by moving the tool along said second cutting path in said one direction.

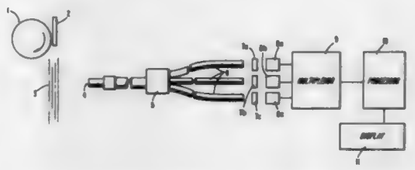
4,692,874
ELECTRONIC WATT-HOUR METER
Yuji Mihara, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
PCT No. PCT/JP84/00523, § 371 Date Jun. 25, 1985, § 102(e) Date Jun. 25, 1985, PCT Pub. No. WO 85/01901, PCT Pub. Date May 9, 1985
PCT filed Oct. 30, 1984, Ser. No. 668,866
Claims priority, application Japan, Nov. 11, 1983, 58-212049
Int. Cl.[4] G01R *21/00;* **G06F** *15/56*
U.S. Cl. 364—483 **1 Claim**

1. An electronic watt-hour meter comprising:
an electric power measuring device;
a data setting device for setting data including time zone data and holiday data, and for setting programs for displaying measurement results with respect to different time zones in the form of effective, reactive, or apparent electric power as desired by using said data setting device;
a data transmission circuit to which the data setting device is connected detachably;
a programmable read only memory circuit (PROM) which receives the data and programs set by the data setting device through the data transmission circuit and stores the set data and programs;
a read only memory (ROM) which preliminarily stores transmission programs for controlling said data transmission circuit;
a central processing unit (CPU) which controls the power measuring device so as to receive measurement results therefrom in accordance with the set data and programs stored in said PROM, and which also controls receiving



and storing data and programs in said PROM in accordance with said transmission programs in said ROM;
a display device which displays the measured results under the control of said CPU; and
a switch means for making said CPU operate in accordance with the data and programs in said PROM when said data setting device is detached from said data transmission circuit, and for making said CPU operate in accordance with the transmission programs in said ROM when said data setting device is attached to said data transmission circuit.

4,692,875
METAL ALLOY IDENTIFIER
William D. Riley, and Robert D. Brown, Jr., both of Avondale, Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Jun. 22, 1984, Ser. No. 623,753
Int. Cl.[4] G01J *3/06, 3/30;* **G06F** *15/46*
U.S. Cl. 364—497 **18 Claims**



1. An apparatus for identifying a metal alloy comprising:
a grinding wheel adapted to be applied against a surface of a sample of the metal alloy and rotated to generate solely by said application glowing hot sparks from the surface;
an optical probe exposed to said glowing hot sparks and adapted to generate a multiwavelength visual signal therefrom;
signal dividing means for dividing the multiwavelength visual signal into separate parts;
filter means for filtering the separate parts of said divided multiwavelength visual signal;
detector means for measuring respective intensities of the single wavelength filtered signals; and
data processing means coupled to the detector means for

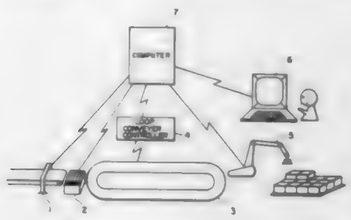
generating ratios of the measured intensities with respect to at least one other of the measured intensities.

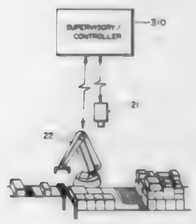
4,692,876

AUTOMATIC FREIGHT STACKING SYSTEM

Tadashi Tenma, Sagamihara; Kichizo Akashi, Ebina; Yozo Konishi, Tochigi, and Hideo Watase, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,455
Claims priority, application Japan, Oct. 12, 1984, 59-212517; Dec. 26, 1984, 59-272917
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—513 **6 Claims**





1. An automatic freight stacking system comprising: loading scheduler means for determining respective loading positions of articles on a transporting means, the loading order of said articles, the allocation of a plurality of loading means and the preparation of an operation sequence for a plurality of freight articles of various configurations to be transported; marshalling means for receiving said freight articles in a given sequence and delivering said freight articles in a predetermined loading order; feeding means for supplying said freight articles from said marshalling means to the places of respective one of said plurality of loading means allocated to said freight articles, in dependence on the configurations thereof, by said loading scheduler means; conveyor means for moving said transporting means to the places of respective ones of said plurality of loading means allocated by said loading scheduler means; each of said plurality of loading means loading said freight articles allocated thereto in dependence on the configurations thereof on said transporting means in accordance with said operation sequence; and general control means receiving data from said loading scheduler means for controlling said marshalling, feeding, conveyor and plurality of loading means in a coordinated manner.

4,692,877

DIGITAL TIMING CONTROL SYSTEM WITH MEMORY LOOK AHEAD

Kent A. Byerly, Tucson, Ariz.; Marvin E. Feldhacker, Longmont, and Duane E. Grant, Boulder, both of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,247
Int. Cl.[4] H04N *1/27*
U.S. Cl. 364—514 **10 Claims**



1. A pel clock generator especially suited for a resonant galvanometer scanner with non-linear displacement profile comprising:

memory means with a plurality of memory positions for storing a parameter for a plurality of pels in a scan;

preset counter means loaded from said memory means and responsive to a regular clock signal for generating a pel clock each time said preset counter means counts to a specified condition,

address counter means with an output for addressing said memory means, and

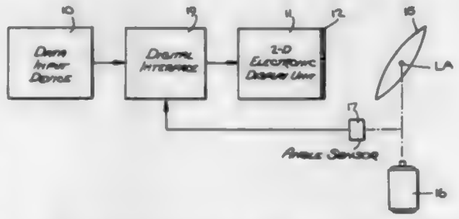
means for changing state of said address counter means in response to an output of said preset counter means.

4,692,878

THREE-DIMENSIONAL SPATIAL IMAGE SYSTEM

Bernard M. Clongoli, Totowa, N.J., assignor to Ampower Technologies, Inc., Totowa, N.J.

Filed Mar. 29, 1985, Ser. No. 717,796
Int. Cl.[4] G06F *15/40*; G09G *3/20*; G06K *9/42*
U.S. Cl. 364—518 **10 Claims**



1. A three-dimensional spatial image system comprising:

A. a data input device having stored therein a three-dimensional image of an object in the form of a family of points, each point of which is defined by digital data representing x-y-z Cartesian coordinates of that point,

B. an electronic display on whose face is presented a two-dimensional image of the object defined by activated luminous pixels whose positions correspond to the x-y Cartesian coordinates in said family of points;

C. a lens rotating at a constant rate on an axle normal to its optical axis and parallel to the display face whereby the angle of the lens relative to the face undergoes continuous change in the course of each revolution thereof, the lens projecting each of the luminous pixels into a model space in front of a viewer to produce a corresponding luminous dot at a location therein that depends on the lens angle;

D. a sensor associated with the rotating lens to produce a reference pulse each time the lens is at a predetermined angle whereby a reference pulse is produced during each revolution of the lens; and

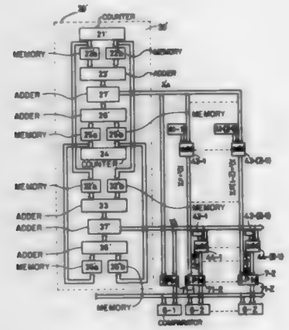
E. a digital interface connecting the data input device to said electronic display, said interface being constituted by a computer functioning in response to said reference pulse to compute the changing angles assumed by said lens in the course of each revolution to produce lens-angle digital signals and to process the x-y-z digital data signals received from the input device in relation to the lens angle digital signals to cause activation of the related pixel in the electronic display at the instant at which the lens angle is such as to project the corresponding luminous dot into the model space at a location in accordance with the z-coordinate whereby rotation of the lens results in a family of luminous dots in the model space at respective x-y-z locations therein to create a three-dimensional spatial image of the stored object.

4,692,879

METHOD OF AND APPARATUS FOR FORMING THE ADDRESS SIGNALS OF A SCREEN MEMORY OF A HALF TONE DOT GENERATOR

Kunio Ikuta, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Feb. 5, 1985, Ser. No. 698,522
Claims priority, application Japan, Feb. 9, 1984, 59-23705
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 364—518 **13 Claims**



7. An apparatus for forming halftone dots onto a photosensitive film according to a recording signal obtained by comparing an image signal from an original with corresponding thresholds from a screen memory comprising:

(a) a means for generating the sub-scanning addresses x_n and the main scanning addresses y_n of recording points of a recording beam;

(b) table memories for respectively storing according to the equations:

$$X = y_{n'} \cdot \Delta X + x_{n'} \cdot \Delta' X, \text{ and}$$

$$Y_A = y_{n'} \cdot \Delta Y + x_{n'} \cdot \Delta' Y$$

(i) the values $y_{n'} \cdot \Delta X$ according to the addresses y_n,
(ii) the values $x_{n'} \cdot \Delta' X$ according to the addresses x_n,
(iii) the values $y_{n'} \cdot \Delta X$ according to the addresses x_n, and
(iv) the values $x_{n'} \cdot \Delta' Y$ according to the addresses y_n; wherein
X_A = the sub-scanning addresses of the screen memory,
Y_A = the main scanning addresses of the screen memory,
x_n = the sub-scanning recording addresses (pixel numbers),
y_n = the main scanning recording addresses (pixel numbers),

$$\Delta X = -P \sin \theta / \frac{S}{m},$$

$$\Delta Y = P \cos \theta / \frac{S}{m},$$

$$\Delta' X = P \cos \theta / \frac{S}{m}, \text{ and}$$

$$\Delta' Y = P \sin \theta / \frac{S}{m},$$

P = the length of each side of one pixel,
S = the length of each side of one unit of a screen memory, and

(c) two adders for respectively obtaining the sub-scanning addresses X_A and the main scanning addresses Y_A by respectively summing up the values (α) $y_{n'} \cdot \Delta X$ and $x_{n'} \cdot \Delta' X$, and the values (β) $y_{n'} \cdot \Delta Y$ and $x_{n'} \cdot \Delta' Y$;

(d) a screen memory for storing halftone sub-cell thresholds with the addresses X_A and Y_A; and

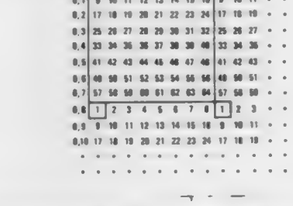
(e) means for applying the recording beam on said photosensitive film in accordance with said addresses X_A and Y_A.

4,692,880

MEMORY EFFICIENT CELL TEXTURING FOR ADVANCED VIDEO OBJECT GENERATOR

Donald M. Merz, Ormond Beach; Jimmy E. Chandler, Ponce Inlet, and Richard Economy, Ormond Beach, all of Fla., assignors to General Electric Company, Philadelphia, Pa.

Filed Nov. 15, 1985, Ser. No. 798,313
Int. Cl.[4] G09B *9/00*; G09G *1/00*; G06F *15/626*
U.S. Cl. 364—521 **8 Claims**



1. An improved advanced video object generator including data memory means for storing cell-by-cell object data for a plurality of objects for retrieval and processing for video display, vector processing means for calculating object transformations for translating operator inputs into image orientation control signals for calculating pixel-bypixel image data, cell texture address means for determining the memory location to be accessed for retrieval of cell texture data for display, cell texture output means for outputing said cell texture data, span processing means for translating said cell texture data into pixel-by pixel display data, and video monitor means for displaying images of objects comprising pixel-by-pixel displays of said display data, the improvement comprising:

at least one memory hardware map coupled to said data memory means, said at least one memory map having a plurality of n×n memory locations for storing n^2 cell sets of cell texture data;

means for reading out two independent n^2 cell sets simultaneously coupled to said cell texture output means, each of the two independent n^2 cell sets indicative of corresponding object data at respectively different levels of detail;

means for blending the data in said two independent n^2 cell sets, the means for blending coupled to the means for reading out two independent n^2 cell sets;

wherein each of said two independent n^2 cell sets are allo-

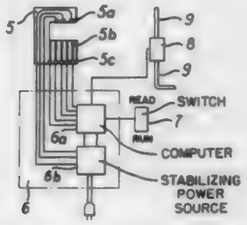
cated to a respective subspan at the respective levels of detail for simultaneously obtaining data for a plurality of pixel calculation paths, said cell texture address means including means for addressing the memory locations of an n×n cell set by a single subspan address or the single subspan address plus one.

4,692,881

DEVICE FOR DISCRIMINATING ATTITUDE OF PARTS

Tsutomu Miyata, and Masahide Nagai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 505,777, Jun. 20, 1983, abandoned. This application Oct. 7, 1986, Ser. No. 917,244
Claims priority, application Japan, Dec. 18, 1981, 56-204795
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—551 **14 Claims**



1. A device for discriminating the attitude of parts comprising: a detector composed of a plurality of light receiving elements disposed in a singular line or in plural lines extending in a direction perpendicular to a feeding direction of the parts, and at least one light emitting element spaced from and facing said light receiving elements; a RAM for memorizing a reference signal pattern for use as a standard obtained by successively detecting the shape of a part as it travels past said detector in a preselected desired attitude; and a CPU for comparing the reference signal pattern memorized in said RAM with the signal data pattern obtained when the parts to be discriminated travel successively past said detector in arbitrary attitudes and producing a discrimination output signal in response to each unfavorable comparison thereby denoting those parts which are not in the preselected attitude.

4,692,882

APPARATUS FOR RECORDING THE SPEED OF A VEHICLE

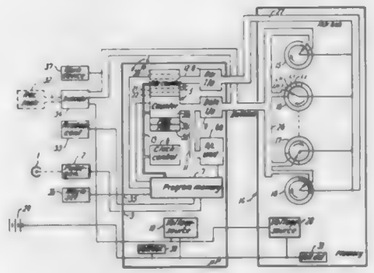
Helge Skovgaard, No. 4 Holmegårdsparken, 2980 Kokkedal, and Kent Johansen, Paul Bergsoe Kollegiet, No. 190 Skodsborgvej, 2850 N rum, both of Denmark

PCT No. PCT/DK83/00050, § 371 Date Dec. 19, 1984, § 102(e) Date Dec. 19, 1984, PCT Pub. No. WO84/04415, PCT Pub. Date Nov. 8, 1984
PCT Filed Apr. 27, 1984, Ser. No. 689,549
Int. Cl.[4] G07C *5/08*
U.S. Cl. 364—565 **6 Claims**

1. A digital vehicle speed recorder for recording successive speed values of a motor vehicle over a predetermined road distance, comprising:

a pulse generator connected to a velocity sensor in the vehicle for generating control pulses with a pulse separation corresponding to a given road length, a clock generator for generating internal clock pulses, a microcomputer for calculating said speed values on the basis of said control pulses and said clock pulses, a speed value memory for storing successive speed values with a recording rate dependent on the road distance covered, and read-out means associated with said memory for connection with a reproducing instrument for obtaining a visual presentation of the speed values stored in the memory, said microcomputer having a first interrupt input connected to said pulse generator, said microcomputer including in its working memory a counter connected to said clock generator to be incremented by said clock pulses, a memory location for storing a predetermined maximum of the counter value, and comparator means connected to said counter and said memory location for continuously comparing the actual counter value in said counter with said maximum counter value and generating an internal interrupt signal when said counter value exceeds said maximum counter value, said counter and said memory location both being connected to said speed value memory to transfer, in response to each pulse supplied from said pulse generator to said first interrupt input or in response to said internal interrupt signal, whichever occurs first, said actual counter value or said maximum counter value, respectively, or a speed value derived therefrom to said speed value memory,

said speed value memory comprising a plurality of memory blocks coupled in series and each having a number of memory locations connected in a circular arrangement, said locations being individually addressed from addressing means in the working memory of said microcomputer in a cyclically repeated order of succession, said memory locations in each block except the last block being grouped in a number of memory sections such that:



a first memory block is addressed from said addressing means in response to each interrupt signal at said first interrupt input or said internal interrupt, whichever occurs first, for successively recording said counter values or said maximum, respectively, or speed values derived therefrom in the memory locations of the first memory block,

all memory blocks except the last one are controlled by said addressing means to address all memory locations of the memory section containing the latest addressed memory location for transferring the speed values in said memory locations to an arithmetic-logic unit of said microcomputer in response to addressing of a predetermined one of said memory locations for calculating a single function value on the basis of all the speed values stored in said memory locations, and

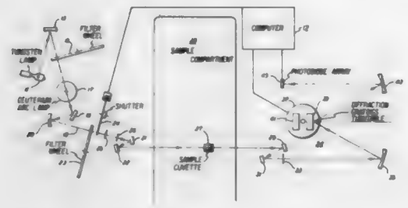
the memory locations of each memory block after the first block are successively addressed by said addressing means for recording function values calculated from the speed values stored in memory sections in the preceding memory block.

4,692,883

AUTOMATIC DIGITAL WAVELENGTH CALIBRATION SYSTEM FOR A SPECTROPHOTOMETER

Michael R. Nelson, Downers Grove; Roy E. Boostrom, Elmhurst, both of Ill.; Jerry E. Cahill, Trumbull, Conn., and Tzong Hwang, Villa Park, Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 21, 1985, Ser. No. 704,356
Int. Cl.[4] G01C *25/00*; G06F *15/46*
U.S. Cl. 364—571 **8 Claims**



1. A digital wavelength calibration system for a spectrophotometer comprising, in combination:

a photodiode array forming an output detector for said spectrophotometer and having an ordered number of spaced pixels, each pixel being identifiable by an ordinal number;

a light source for generating at least one reference emission line of known peak wavelength;

means for causing the peak of said reference line to fall in close proximity to the center of a preselected pixel of said photodiode array;

peak location means for computing the exact position data of said peak relative to said pixel center in terms of pixel spacing and the ordinal number of said preselected pixel and for retaining said position data for subsequent wavelength computation;

wavelength identification means for computing the numerical relationship data of the ordinate number of each pixel to the wavelength falling on that pixel and for retaining said relationship data for subsequent correlation with data generated by said pixel, and

means for computational processing and display of said pixel generated data correlated with the associated wavelength value.

4,692,884

REMOTE OPERATION OF OPTICAL SYSTEM

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto, Ltd., Canada

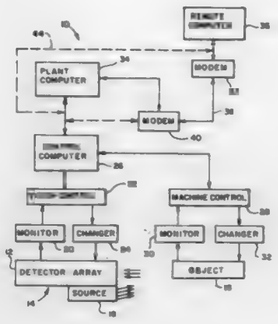
Filed Jan. 3, 1983, Ser. No. 454,989
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—573 **19 Claims**

1. A control system for a detector array based optical system for machine vision having a detector array which receives light reflected sequentially from a plurality of succeedingly presented objects, comprising:

a transmitting means for remotely locating the control system from the optical system;

a detecting means for detecting a light characteristic of the reflected light received by the detector array during use on a presented object and for transmitting an electrical signal indicative of said light characteristic via said transmitting means to the control system; and

an adjusting means for adjusting a light characteristic variable of said optical system for the succeeding objects when the received light characteristics of the detector array for at least one of the previous objects is deficient, wherein said adjusting means adjusts a light characteristic



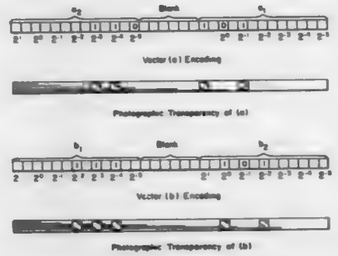
variable which is one of detector array scan rate, integration time, and light output level.

4,692,885

OPTICAL FLOATING-POINT MATRIX-VECTOR MULTIPLIER

Richard P. Bocker, San Diego, and William J. Micelí, La Jolla, both of Calif., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1985, Ser. No. 813,738
Int. Cl.[4] G06J *1/00*; G06G *9/00*
U.S. Cl. 364—606 **15 Claims**



1. An apparatus for performing optical matrix-vector multiplication using floating-point arithmetic comprising:

a source of collimated light;

first means disposed to be illuminated by the collimated light for providing an encoded representation of a first vector element in a serial bit stream, the first vector encoded representation providing means is adapted to have the bit stream incrementally displaced in a first direction past the collimated light source;

second means disposed to be illuminated by the portion of collimated light passing through the first vector encoded representation providing means for providing an encoded representation of a matrix in parallel bit streams, the matrix encoded representation providing means is adapted to have the bit stream incrementally displaced in a second direction that is opposite said first direction as it passes the collimated light source and the interposed first vector encoded representation providing means, the encoded representations of the first vector and matrix are normalized floating-point representation, and the passing of colli-

mated light that traverses the encoded representations of the first vector encoded representations of the matrix encoded representation providing means effects a multiplication and a convolving thereof; and

means disposed in an aligned relationship with the first vector encoded representation providing means and the matrix encoded representation providing means for adding multiplied encoded information.

4,692,886

DIGITAL PATTERN GENERATOR

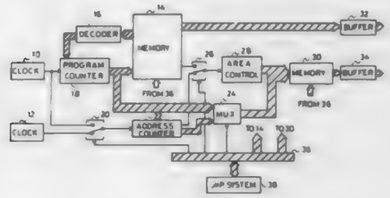
Yasahiko Miki, and Kentaro Takita, both of Tokyo, Japan, assignors to Sony/Tektronix Corporation, Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,599

Claims priority, application Japan, May 7, 1984, 59-90445

Int. Cl.⁴ G06F *1/02;* **G10H** *1/00*

U.S. Cl. 364—718 **9 Claims**



1. A digital pattern generator comprising:

a first memory for storing an execution control signal, an area control signal and a digital pattern;

a clock generator for generating a clock signal;

a program counter for generating a first address signal in accordance with said clock signal from said clock generator and said execution control signal from said first memory, said first address signal addressing said first memory;

an address counter for generating a second address signal by counting said clock signal from said clock generator; and

a second memory having a plurality of memory areas each storing a digital pattern, one of said memory areas being selected in accordance with said area control signal from said first memory, and the selected memory area being addressed by said second address signal from said address counter;

whereby first and second digital patterns are derived from said first and second memories respectively.

4,692,887

CIRCLE AND CIRCULAR ARC GENERATOR

Katsuro Hashidate, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,057

Claims priority, application Japan, May 10, 1983, 58-81467; May 10, 1983, 58-81468; May 10, 1983, 58-81469; May 10, 1983, 58-81471

Int. Cl.⁴ G06F *1/02, 7/64*

U.S. Cl. 364—720 **16 Claims**

1. A circle generator, comprising:

means for supplying a radius of a circle and start and end angles thereof;

digital differential analyzer (DDA) means coupled to said supplying means for receiving a radius of a circle, and including means for generating x and y coordinates to define a circle having said radius with a center at an origin;

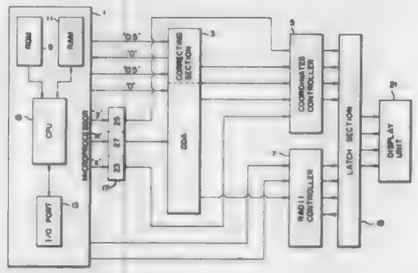
first means coupled at least to said digital differential analyzer means for receiving said radius and one specified coordinate of a target circle center point along one axis of a two-axis system, and including means for performing addition and subtraction with respect to said radius and the one specified coordinate to generate coordinates of rightmost and leftmost points of a target circle along said one axis;

second means coupled to said first means for receiving the one-axis coordinates of the rightmost and leftmost points generated by said first means and another specified coordinate of the target circle center, and including means for providing four points on the target circle that are symmetrical about the center point in accordance with the x and y coordinates generated by said DDA means;

status bit generating means coupled to said supplying means for receiving start and end angles which define circular arcs to be displayed, and including means for generating status bits of respective quadrants of the target circle;

start and end point calculating means coupled to said supplying means for receiving the start and end angles and including means for calculating x and y coordinates of start and end points;

position bit generating means coupled to said start and end point calculating means for receiving outputs from said start and end point calculating means and for receiving said radius, and including means for generating position bits which represent relationships between coordinates of



a current point and the coordinates of the start point, and between the coordinates of the current point and the coordinates of the end point;

determining means coupled to said supplying means, and including means for comparing the start angle with the end angle, and means for determining whether the start angle is larger or smaller than the end angle;

processing means coupled to said status bit generating means and to said position bit generating means, and including means for processing the status bits generated from said status bit generating means and the position bits generated from said position bit generating means, and means for generating enable/disable data which determines whether or not circular arc dots of the responsive quadrants are to be displayed;

inverting means coupled to said processing means and to said determining means to inverting the enable/disable data in accordance with a predetermined result of said determining means; and

display means coupled to said processing means for displaying a dot pattern corresponding to the respective quadrants of the target circle in accordance with the operation of said processing means and said inverting means.

4,692,888

METHOD AND APPARATUS FOR GENERATING AND SUMMING THE PRODUCTS OF PAIRS OF NUMBERS

Bernard J. New, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 3, 1984, Ser. No. 657,563

Int. Cl.⁴ G06F *7/38*

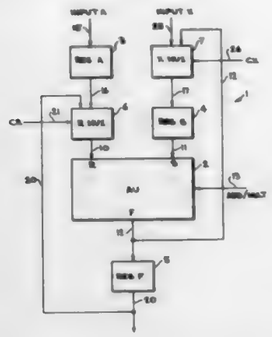
U.S. Cl. 364—728 **5 Claims**

1. A method of generating and summing the products of a predetermined number of successive pairs of numbers comprising the steps of:

(a) transferring a first pair of said numbers to a first and a second register, respectively;

(b) multiplying the contents of said first and said second registers and storing the product thereof in a third register; thereafter

(c) transferring another pair of numbers to said first and said second registers, respectively; thereafter



(d) multiplying the contents of said first and said second registers and storing the product thereof in said second register; thereafter

(e) adding the contents of said third register and said second register and storing the sum thereof in said third register; thereafter

(f) repeating steps (c)–(e) for each remaining pair of said predetermined number of successive pairs of numbers until the contents of said third register comprises the sum of the products of all of said pairs of numbers.

4,692,889

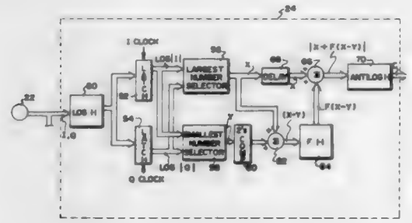
CIRCUITRY FOR CALCULATING MAGNITUDE OF VECTOR SUM FROM ITS ORTHOGONAL COMPONENTS IN DIGITAL TELEVISION RECEIVER

David L. McNeely, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 28, 1984, Ser. No. 655,657

Int. Cl.⁴ G06F *7/556*

U.S. Cl. 364—730 **12 Claims**



1. Apparatus for generating the magnitude value of the vector sum of a pair of quadrature-related component vectors comprising:

means for receiving the magnitude values I and Q of said pair of quadrature-related component vectors;

means for generating an associated pair of logarithmic values $Log_B |I|$ and $Log_B |Q|$ to a base B;

means for calculating the absolute value |D| of the difference between said logarithmic values $Log_B |I|$ and $Log_B |Q|$;

means for generating a correction value $F(|D|)$ equal to $0.5\ Log_B(1+B^{-2|D|})$;

means including means for determining the larger of said logarithmic values $Log_B |I|$ and $Log_B |Q|$, and for adding the correction value to the larger of the logarithmic values $Log_B |I|$ and $Log_B |Q|$; and

means for producing the antilog of the sum of the correction value and the larger of the logarithmic values $Log_B |I|$ and $Log_B |Q|$, to generate a value C substantially equal to the magnitude of the vector sum of said quadrature-related component vectors.

4,692,890

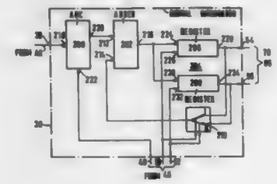
METHOD AND INTEGRATOR CIRCUIT FOR INTEGRATING SIGNALS, IN PARTICULAR FOR SCINTILLATION GAMMA CAMERA

Roger E. Arseneau, Arlington Heights, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed May 29, 1984, Ser. No. 614,886

Int. Cl.⁴ G06F *7/38*

U.S. Cl. 364—733 **21 Claims**



3. An integrator circuit for digitally integrating sequentially occurring groups of digital signals, each group including a plurality of sequentially occurring digital signals wherein the first digital signal of a given group occurs at a time after the first digital signal of the group which immediately precedes said given group but not necessarily after the last signal of said immediately preceding group, comprising:

(a) a digital adder having a first digital input for receiving said sequential digital signals to be integrated, a second digital input and a digital output for supplying added digital signals;

(b) a digital storage means including at least first and second digital stores, each store having a digital input connected with the digital output of the adder and having a digital output connected with the second digital input of the adder; and

(c) an integrator control means for controlling the adder and the storage means such that

beginning with said first digital signal of said immediately preceding group, each of said added digital signals from the digital output of the adder are supplied to the first store of said storage means and then supplied form the digital output of the first store of said storage means to the second digital input of the adder for being added to the next succeeding digital signal appearing at the first digital input of the adder and,

beginning with the first digital signal of said given group, each of said added digital signals from the digital output of the adder are supplied to the second store of said storage means and then supplied from the digital output of the second store of said storage means to the second digital

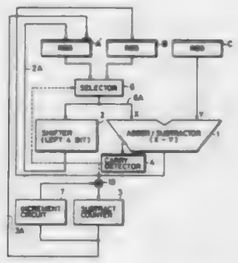
input of the adder for being added to the next succeeding digital signal appearing at the first digital input of the adder.

4,692,891

CODED DECIMAL NON-RESTORING DIVIDER

Akira Yamaoka, Hatano; Kenichi Wada, Sagamihara, and Kazunori Kuriyama, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1984, Ser. No. 668,842
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—763 **16 Claims**



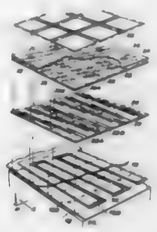
1. A decimal division apparatus comprising:
a first register for storing a dividend;
a second register;
a third register for storing a divisor;
a selection circuit for first selecting a signal from said first register and for thereafter selecting a signal from either of said first and second registers depending on whether or not a first signal is applied thereto;
a subtracter circuit including means for subtracting the signal in said third register from the signal selected by said selection circuit, means for storing the result of subtraction in said first register, and means for generating said first signal when the result of subtraction is not negative;
a shift circuit for shifting the signal selected by said selection circuit by one digit portion, and for storing the shift result in said second register; and
a counting circuit for counting the number of said first signals generated by said generating means.

4,692,892

PARALLEL ANALOG DEVICE FOR THE LOCAL PROCESSING OF A BIDIMENSIONAL SIGNAL

Paul Anizan, A2, Res d'Armor; Daniel Collobert, Ker Skrivell Izellan Ploulec'h, both of 22300 Lannion, and Dominique Massaloux, 109 Rue St Guirec-Ploumanac'h, 22700 Perros-Guirec, all of France

Filed Nov. 7, 1985, Ser. No. 795,839
Claims priority, application France, Nov. 7, 1984, 84 16948
Int. Cl.[4] G06G *7/00*; G06K *9/36*; G02F *1/13*
U.S. Cl. 364—807 **10 Claims**



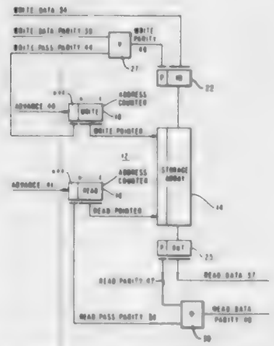
1. An analog parallel device for the local processing of a bidimensional signal comprising a substrate; an input means formed from at least one thin film, said films being deposited and etched on said substrate, said input means receiving said bidimensional signal and supplying a group of parallel electrical input signals to a group of elementary points organized in matrix-like manner; a processing means constituted by at least one thin film, said thin films being deposited and etched on said input means, said processing means receiving said parallel electrical input signals and supplying a group of elementary points organized in matrix-like manner, at least one electrical output signal being obtained by the linear or non-linear combination of a plurality of electrical input signals; and an output means formed from at least one thin film, said films being deposited and etched on said processing means, said output means receiving said parallel electrical output signals.

4,692,893

BUFFER SYSTEM USING PARITY CHECKING OF ADDRESS COUNTER BIT FOR DETECTION OF READ/WRITE FAILURES

Daniel F. Casper, Poughkeepsie, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,514
Int. Cl.[4] G06F *11/10*
U.S. Cl. 364—900 **6 Claims**



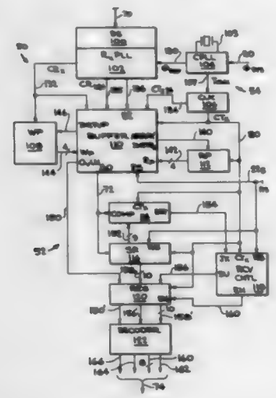
1. A buffer memory system for transmitting a succession of data words between components of a data processing system, comprising,
a buffer memory having 2^n word storage locations addressable by an address of n bits,
means for accessing the buffer memory as a circular queue, said accessing means including a modulo n write address counter, means for forming an intermediate code signifying the parity of a data word to be stored, means for storing a data word and a parity code at the buffer memory location addressed by the write address counter, and means for advancing the write address counter for successive write operations, a modulo n read address counter, means for reading a data word from the location addressed by the read address counter and means for advancing the read address counter, and means for checking parity of a data word read from the buffer memory and signaling an error or the absence of an error,
wherein the improvement comprises,
means connected to the write address counter for identifying alternate passes through the write address counter and the corresponding passes through the buffer memory as odd and even, and means for forming said parity code stored at a buffer location as a predetermined parity function (odd or even) of said intermediate code on an odd write pass and the opposite parity on an even write pass,
means connected to the read address counter for identifying said alternate odd and even passes through the buffer memory and cooperating with said data word parity checking means to check a word read from the buffer memory during an odd read pass for said predetermined parity and during an even read pass for the opposite parity,
whereby a parity error is signaled by said means for checking parity in case the read operation does not proceed in the same parity sequence as the write operation.

4,692,894

OVERFLOW/UNDERFLOW DETECTION FOR ELASTIC BUFFER

Gerald L. Bemis, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 18, 1984, Ser. No. 683,434
Int. Cl.[4] G06F *13/00*; H04J *3/00*
U.S. Cl. 364—900 **9 Claims**



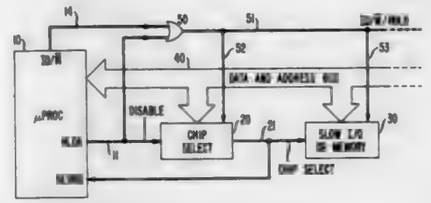
1. An elastic buffer receiving a first data stream at a first predetermined rate, converting said first data stream to a second data stream at a second predetermined rate, and providing said second stream, said elastic buffer generating a stable buffer overflow/underflow signal, said elastic buffer comprising:
a source of clock signals;
means for generating a plurality of first and a plurality of second read select signals and a plurality of write select signals;
a plurality of addressable storage means connected to said read/write select means each for storing said received data when a predetermined one of said first plurality of read signals is received and for generating signals indicative of said stored data when a predetermined one of said plurality of write signals is received;
wherein said plurality of addressable storage means have addresses arranged in linear numerical order, a currently-read storage means having adjacent storage means corresponding to a storage means last-read and to a storage means next-to-be-read, a second plurality of read select signals corresponding to said currently-read storage means, a first plurality of read select signals corresponding to said last-read storage means, and a third plurality of read select signals corresponding to said next-to-be-read storage means;
a plurality of addressable means connected to said read/write select means and each connected to a predetermined one of said plurality of addressable storage means for generating a bi-level flag signal (Fn) indicative of whether a read or a write was most recently performed on said storage means connected to said flag means; and
means for generating said stable buffer overflow/underflow signal including a plurality of overflow/underflow logic means each receiving said flag (Fn) signal from a predetermined one of said flag means, a predetermined one of said plurality of first read signals and a predetermined one of said plurality of second read signals, and a predetermined one of said write signals for generating a write overflow signal when said flag Fn signal is at a first predetermined level and said write signal is received, and, for generating a read underflow signal when said flag F signal is at a second predetermined level and said second read select signal is received.

4,692,895

MICROPROCESSOR PERIPHERAL ACCESS CONTROL CIRCUIT

Jacque S. Huffman, Morristown, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1983, Ser. No. 564,931
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **3 Claims**



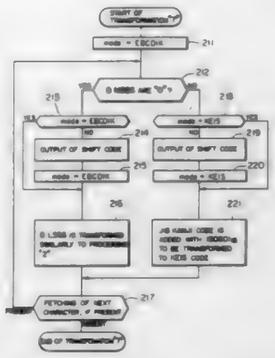
1. A microcomputer system comprising:
a microprocessor,
a peripheral data handling device including a chip select input and an IO/$\overline{M}$ input,
a data and address bus interconnecting the microprocessor and the peripheral data handling device
a chip select device coupled to the data and address bus and responsive to selected addresses to enable a chip select input of an addressed device, the peripheral data handling device being one of the devices connected to be enabled by the chip select by having its chip select input enabled,
the microprocessor having a fixed time interval allowance between completion of a data transfer and release of the data bus by the peripheral data handling device during which it is quiescent and the peripheral data handling device having a release time between completion of a data transfer and release of the bus greater than the fixed time interval allowance,
the microprocessor having a hold state which it enters in response to a hold request input signal, the hold state being operative to disconnect the microprocessor from the data and address bus and additionally operative for generating a hold acknowledge signal,
feedback means from the chip select device to apply a hold request input signal to the microprocessor when the peripheral data handling device is being addressed,
the chip select device being coupled to receive and responsive to the hold acknowledge signal applied to remove the hold request input signal to the microprocessor, and
means for supplying a control signal which is applied to the IO/$\overline{M}$ input of the peripheral data handling device during the hold state including means to gate the hold acknowledge signal to the peripheral data handling device as the control signal.

4,692,896

METHOD OF PROCESSING A PLURALITY OF CODE SYSTEMS

Kousuke Sakoda, Hino; Masahiro Kainaga, Yokohama; Hidehiko Akita, Tokyo; Fumiya Murata, Hadano, and Yoshitake Nakaoas, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,853
Claims priority, application Japan, Jul. 6, 1984, 59-139002
Int. Cl.[4] G06F *5/00*
U.S. Cl. 364—900 **12 Claims**



1. A method of processing a plurality of code systems in an information processing apparatus including an operating system, comprising:

a step of inputting a source program; and

a compiling step of analyzing meaning of said source program to create a series of instructions and data required for executing processing equivalent to said meaning;

wherein said compiling step including a substep of transforming character type constants to a first code system occupying a region including a first number of bits and transforming character string constants to a second code system occupying a region including a number of bits which is equal to a product of a sum of the number of characters of said character string constants plus one and multiplied with said first bit number so that character type variables designated in said source program correspond, respectively, to the region of said first bit number while a character type array corresponds to a region including a number of bits which is equal to a product resulting from multiplication of said first bit number with the number of elements of said array.

4,692,897

ARRANGEMENT FOR DYNAMIC RANGE CHECKING OR MATCHING FOR DIGITAL VALUES IN A SOFTWARE SYSTEM

Edwin P. Crabbe, Jr., Peoria, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Continuation of Ser. No. 646,728, Sep. 4, 1984, abandoned. This application Jan. 28, 1987, Ser. No. 9,042
Int. Cl.[4] G06F *11/30*
U.S. Cl. 364—900 **9 Claims**

1. In a software development system having a processor, a matcher arrangement comprising:

processor bus means for transmitting dynamically changeable predetermined digital values under control of said processor;

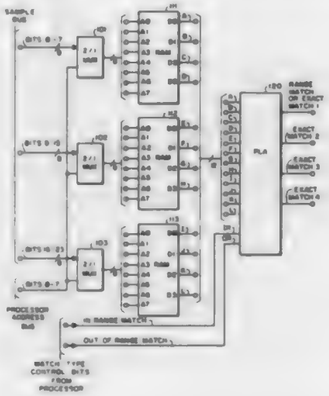
sample bus means for transmitting dynamically changeable digital values;

said processor being operated to provide match control signals on corresponding match control leads;

means for storing connected to said sample bus means and to said processor via said processor bus means, said means for storing being operated in response to said digital values of said processor to retain said dynamically changeable pluralities of predetermined digital values;

said means for storing being further operated to produce one plurality of said predetermined digital values of said processor in response to a comparison of said dynamically changeable digital values transmitted on said sample bus means with said digital values stored in said means for storing by said processor;

programmable logic array means connected to said processor via match control lead and to said means for storing, said programmable logic array means being operated in



response to first values of said match control signals of said processor and to one plurality of said predetermined digital values to produce a range match signal for said digital value of said sample bus means being within a range of said predetermined digital values, said range match signal being transmitted to said processor; and

said programmable logic array means being operated in response to second values of said match control signals of said processor and to said one predetermined digital value to produce at least one of a set of exact match signals for said digital values of said sample bus means being equal to at least one of said stored predetermined digital values, said exact match signals being transmitted to said processor.

4,692,898

BUBBLE MEMORY BIAS FIELD STRUCTURE

Gale A. Jallen, Roseville, and Gene P. Bonnie, Bloomington, both of Minn., assignors to Control Data Corp., Minneapolis, Minn.

Filed Nov. 6, 1980, Ser. No. 204,728
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—27 **3 Claims**

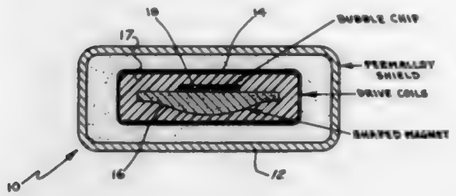
1. A bubble memory structure comprised of:

a magnetic field shielding structure,

means for generating a rotating magnetic field within said magnetic field shielding structure,

a bubble memory chip, and

a magnet for generating a bias magnetic field for said bubble memory chip, said magnet consisting of a single element permanent plate magnet of low permeability material placed in continuous, physical, thermal contact with said bubble memory chip and within said means for generating a rotating magnetic field, said magnet further characterized by having a contoured surface disposed opposite a comparatively flat surface in continuous, physical, thermal contact with said bubble memory chip, said contoured surface creating a thicker magnet structure in the central area of the bubble memory chip so that an enhanced magnetic field is



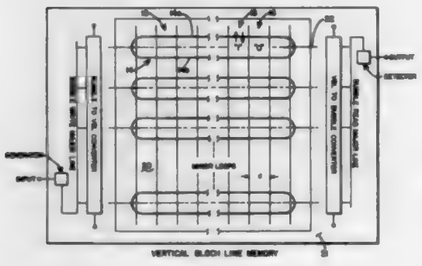
essentially uniform over the entire bubble memory device and the magnetic field is stronger in the central area of said magnet than that which would be produced in a uniformly thick device.

4,692,899

PROPAGATIONAL CONTROL FOR VERTICAL BLOCH LINE MEMORIES

David S. Lo, Burnsville, and Stanley J. Lins, Bloomington, both of Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Dec. 12, 1985, Ser. No. 808,200
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—29 **4 Claims**



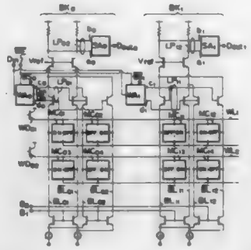
1. In a Vertical Bloch Line pair memory comprising at least one elongated storage loop, means for writing Vertical Bloch Line pair storage bits into each of said storage loops, means for propagating said Vertical Bloch Line pair storage bits around each of said storage paths, and means for detecting said Vertical Bloch Line pair storage bits, the improvement comprising a deposited stripe domain magnetic film over said storage loops, and the stripe domain provides contiguous, spatially periodic, parallel, magnetic potential wells, each which have a periodicity in the range of 0.1 to 1 micron wide in the direction along the elongated direction of said storage loops.

4,692,900

SEMICONDUCTOR MEMORY DEVICE HAVING BLOCK PAIRS

Kazuo Ooami; Yasuhisa Sugo, both of Yokohama, and Tohru Takeshima, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1985, Ser. No. 715,835
Claims priority, application Japan, Mar. 30, 1984, 59-060600
Int. Cl.[4] G11C *5/06, 29/00*
U.S. Cl. 365—63 **9 Claims**



1. A semiconductor memory device provided with a plurality of blocks, each of said plurality of blocks comprising:

a plurality of bit line pairs;

a plurality of word lines defining intersections with said bit line pairs;

a plurality of memory cells respectively located at said intersections between said bit line pairs and the word lines;

means for writing data into the memory cells of each of said blocks so that complementary data is written in the memory cells of adjacent ones of said bit line pairs of the same block; and

means for reading stored data from the memory cells, said means for reading stored data including a data output terminal for outputting the stored data;

said writing means in each of said blocks has a wiring pattern having a mirror image with respect to that of said writing means in each other one of said blocks that is adjacent thereto, so that logic levels appearing at respective adjacent ones of said bit lines of said adjacent blocks are complementary, and

said reading means in each said block has a wiring pattern having a mirror image with respect to that of said reading means in each other one of said blocks that is adjacent thereto.

4,692,901

SEMICONDUCTOR MEMORY

Masaki Kumanoya; Kazuyasu Fujishima; Hideshi Miyatake; Hideto Hidaka; Katsumi Dosaka, and Yasunasa Nishimura, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,632
Claims priority, application Japan, Aug. 30, 1984, 59-183018; Aug. 30, 1984, 59-183019; Aug. 30, 1984, 59-183020
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—201 **12 Claims**

1. A semiconductor memory comprising:

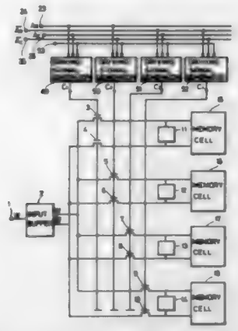
a data writing terminal;

n-bit memory cells coupled in parallel to said data writing terminal, n being an integer not less than 2;

designating signal generating means for generating memory cell designating signals for designating any one of said n-bit memory cells to be written with data;

memory cell writing means of said number n each provided for respective ones of said n-bit memory cells for receiving said memory cell designating signals respectively from said designating signal generating means thereby to write data in designated memory cells; and

driving signal generating means operative during a memory test mode of operation of said memory for generating



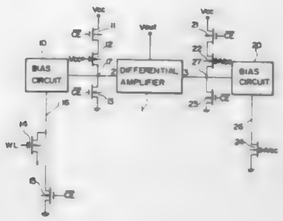
driving signals for simultaneously driving all of said memory cell writing means of said number n to write memory function test data in said memory cells.

4,692,902

SEMICONDUCTOR READ ONLY MEMORY DEVICE WITH IMPROVED ACCESS TIME

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama, and Shigeru Atsumi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1984, Ser. No. 654,215
Claims priority, application Japan, Sep. 26, 1983, 58-177584
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—210 **11 Claims**



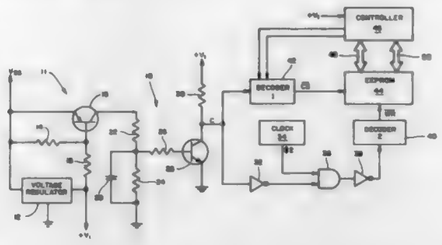
1. A semiconductor memory device comprising:
memory cells storing information;
a bit line connected to said memory cells;
static-type differential amplifier means havig a first input temrinal at which the potential of said bit line is fed as an input, a second input terminal at which a reference potential is fed as an input, and an output temrinal independent of said first and second input terminals, said differential amplifier means comparing potentials fed at said first and second input terminals with each other and detecting information stored in each of said memory cells;
first means responsive to a chip enable inverted signal for discharging said bit line to a predetermined potential level; and
second means responsive to said chip enable inverted signal for discharging said reference potential to substantially the same level as said predetermined potential level.

4,692,903

MEMORY LOSS PROTECTION CIRCUIT

Arthur N. Borg, Lake Forest, and Giora Bar-Hai, River Forest, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 15, 1985, Ser. No. 755,509
Int. Cl.⁴ G11C *11/34*
U.S. Cl. 365—226 **7 Claims**



1. For use in a data processing system energized by a line voltage subject to transients, wherein data is written into a nonvolatile memory for storage therein and is read from the nonvolatile memory under the control of a system controller coupled to the nonvolatile memory, a memory protection circuit for preventing the alteration of data stored in the nonvolatile memory arising from line voltage transients comprising:
voltage regulation means coupled to the system controller and responsive to the line voltage for providing a regulated DC voltage to the system controller;
voltage level sensing means coupled across said voltage regulation means for detecting a decrease in the line voltage below a predetermined threshold level and for outputting a control signal in response thereto; and
decoding means coupled to the nonvolatile memory and to said voltage level sensing means and responsive to said control signal for deselecting and write disabling the nonvolatile memory when the voltage across said voltage regulation means drops below said predetermined threshold level in preventing the writing of data into the nonvolatile memory.

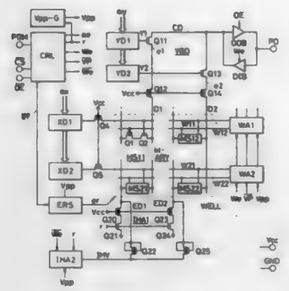
4,692,904

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Nobuyuki Sato, Tokoroszawa; Kazuaki Ujiie, Tokyo; Masaaki Terasawa, Akishima, and Shinji Nabetani, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed May 28, 1985, Ser. No. 737,882
Claims priority, application Japan, May 25, 1984, 59-104629
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—226 **16 Claims**

1. A semiconductor integrated circuit device comprising:
a memory circuit which includes a memory element for storing data, wherein a voltage equal to greater than a predetermined level is required to be applied to said memory element to change the state of data stored in said memory element;
a voltage converter circuit which receives a power source voltage supplied from a power source through an external terminal as its power source voltage, and which forms an output voltage of a level different from that of said power source voltage, said output voltage being equal to or greater than the predetermined voltage level required to change the state of data stored in said memory element;
means for receiving an external control signal indicative of when data stored in said memory element is to be changed, and for generating a control signal on a control line which control signal changes from a first level to a second level when the external control signal indicates that the stored data of said memory element is to be changed;
a power source closure detector circuit coupled to said control line and to said power source which power source closure detector circuit assumes a first condition when the power source is closed and which assumes a second condition when the control signal having the first level is produced; and
a control circuit coupled to said power source closure detector circuit, said control circuit including means for preventing the output voltage of said voltage converter circuit from being applied to said memory element during a period in which the power source closure detector circuit is assuming the first condition.



4,692,905

METHOD FOR GEOPHYSICAL PROSPECTING OF COMPLEX OREBODIES

Gennady A. Sobolev; Vladislav M. Demin; Vladimir F. Los, and Zinovy-Jury Y. Maibuk, all of Moscow, U.S.S.R., assignors to Institut Fiziki Zemli Imeni O.Ju. Shmidta Akademii Nauk SSSR, Moscow, U.S.S.R.

PCT No. PCT/SU84/00048, § 371 Date Apr. 11, 1986, § 102(e) Date Apr. 11, 1986, PCT Pub. No. WO86/01609, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 21, 1984, Ser. No. 863,380
Int. Cl.⁴ G01V *3/00*
U.S. Cl. 367—14 **1 Claim**



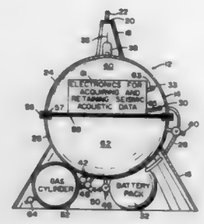
1. A method for geophysical prospecting comprising the steps of exciting, at least two times, elastic waves in ground containing orebodies and recording arrival time of a first pulse of each pulse train of electromagnetic radiation in the radio frequency range generated by the orebodies, the number of these pulse trains during each excitation being equal to the number of orebodies, characterized by recording the arrival time of the last pulse of each pulse train (1,2,3,4,5,6) resulting from each excitation of elastic waves, then calculating the difference between the maximum arrival time of the last pulses and the minimum arrival time of the first pulses of the pulse trains (1,3,5 and 2,4,6) representing one orebody, and determining, based on said difference, the thickness of said one orebody.

4,692,906

OCEAN BOTTOM SEISOMETER

Walter P. Neeley, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 568,305, Jan. 4, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,704
Int. Cl.⁴ G01V *1/38*
U.S. Cl. 367—15 **16 Claims**



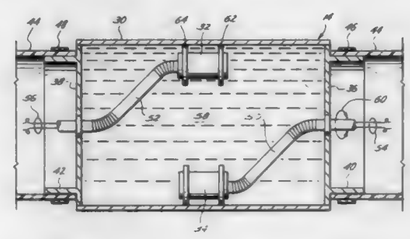
1. An improved ocean bottom seismometer comprising:
a spherical-shaped main housing having a seismic acquisition portion and a ballast portion below said acquisition portion, said ballast portion controlling ascent and descent of said ocean bottom seismometer;
a conical skirt fixed to said main housing elevating said main housing above a horizontal plane coincident with a base of said skirt, said skirt capable of confining fluid under said main housing when said base rests on an ocean bottom;
a plurality of spherical compartments mounted inside said skirt; and
a lifting hook mounted on the outside of said main housing.

4,692,907

MEANS FOR MAINTAINING A FIXED RELATIVE ORIENTATION OF TWO SENSORS

Paul Jubinski, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Continuation of Ser. No. 679,813, Dec. 10, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 911,718
Int. Cl.⁴ G01V *1/18*; H01K *17/00*
U.S. Cl. 367—20 **11 Claims**



11. A sensor module adapted for use in a seismic cable comprising:
an enclosed housing;
a volume of fluid within said housing;
a first sensor unit having a specific gravity less than the specific gravity of said fluid and deployed within said housing so that said first sensor unit floats at the top of said fluid as the orientation of said housing changes;
a second sensor unit having a specific gravity greater than the specific gravity of said fluid and deployed within said housing so that said second sensor unit remains at the

bottom of said fluid as the orientation of said housing changes;

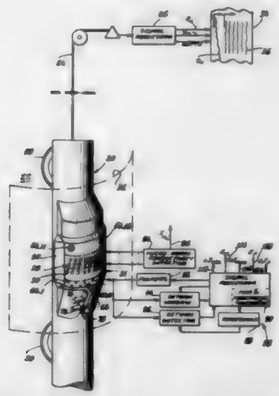
a first and second flexible tether securing said first and second sensor units, respectively, to opposite ends of said housing, said tethers including signal conductors for coupling signal from said sensor units to the exterior of said housing.

4,692,908

METHOD AND APPARATUS FOR INVESTIGATING STAND-OFF IN A BOREHOLE

Michael P. Ekstrom, Redding, and R. Mark Havira, New Fairfield, both of Conn., assignors to Schlumberger-Doll Research, Ridgefield, Conn.

Filed Mar. 24, 1982, Ser. No. 361,224
Int. Cl.⁴ G01V *1/00, 3/02;* G01U *3/04;* H04B *17/00*
U.S. Cl. 367—27 **28 Claims**



1. A method for investigating an earth formation penetrated by a borehole with a tool having a segment which is provided with a laterally extending array of small current emitting electrodes arranged to make resistivity measurements in such spatial relationship that a contiguous lateral area of the borehole is investigated as the tool segment, while being pressed towards the borehole wall, is operatively moved along the borehole wall, said electrodes being sized to enable a high resolution resistivity investigation of the earth formation with a resolution of the order of millimeters, comprising the steps of:

generating high resolution beams of acoustic energy in the form of pulses and directing these at segments of the borehole wall from places that are from at least laterally separated places that are generally in vertical alignment with the array of electrodes and are pressed with the array towards the borehole wall;

detecting at said places acoustic reflections originating from the borehole wall segments and caused by said pulses of acoustic energy; and

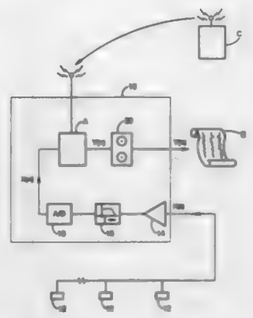
deriving from the detected acoustic reflections acoustic travel times indicative of the magnitude of tool standoff at said places as well as lateral tool lift-off at said array of electrodes with an accuracy and resolution sufficient to resolve, in said resistivity measurements, ambiguities attributable to stand-off, and vertical and lateral tool tilt.

4,692,909

ADAPTIVE SEISMIC SIGNAL PROCESSOR

Michael F. Gard, Catoosa, Okla.; Ralph E. Warnock, Kingwood, Tex.; Kyong H. Lee, Albuquerque, and Robert H. Maschhoff, Cedar Crest, both of N. Mex., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 29, 1984, Ser. No. 626,491
Int. Cl.⁴ G01V *1/22, 1/36*
U.S. Cl. 367—45 **9 Claims**



1. An adaptive seismic signal processor with a portable seismic data acquisition unit for providing a plurality of sampling rates for recording digitized seismic signals in the portable seismic data acquisition unit, comprising:

processor means with the seismic data acquisition unit for sampling digitized seismic signals at a plurality of sampling rates and for passing cooperatively coupled frequency domains of the sampled digitized seismic signal so as to preclude the generation of alias frequencies, wherein pass band frequency domains are determined from a set of digital filter coefficients;

programmable memory means with the seismic data acquisition unit for storing a plurality of sets of filter coefficients for determining pass band frequency domains; and

selector means with the seismic data acquisition unit responsive to command signals from a remote location for selecting one of the plurality of sampling rates and for addressing one of the sets of filter coefficients in the programmable memory means to the processor means whereby the processor means samples and passes a cooperatively coupled pass band frequency domain of the digitized seismic signal.

4,692,910

METHODS OF DETERMINING LITHOLOGICAL CHARACTERISTICS OF AN UNDERGROUND FORMATION WHICH UTILIZE COMPRESSIONAL VELOCITY AND SHEAR VELOCITY DATA

Carl H. Sondergeld; Albert L. Frisillo, both of Broken Arrow, and Janice O. Norris, Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

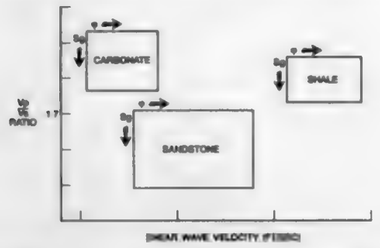
Filed Mar. 11, 1985, Ser. No. 711,115
Int. Cl.⁴ G01V *1/28*
U.S. Cl. 367—75 **8 Claims**

1. A method of determining the formation material type at a particular location in an underground formation by utilizing compressional velocity data (V_p) and shear velocity data (V_s), comprising:

(a) calculating bulk velocity (V_B) utilizing V_p and V_s data wherein

$$V_B = (V_p^2 - (4/3)V_s^2)^{\frac{1}{2}} = \left[\frac{\text{bulk modulus } (K)}{\text{density } (\rho)}\right]^{\frac{1}{2}};$$

(b) plotting V_B on one axis and V_p on a second axis to define a field of data points, wherein each data point corresponds to a particular location in the underground formation;



(c) including velocity boundaries of V_B and V_p within the plot of (b) for at least one formation material type; and

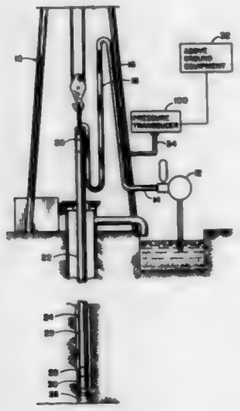
(d) determining from the position of a data point relative to the velocity boundaries, the formation material type.

4,692,911

METHODS AND APPARATUS FOR REDUCING INTERFERING EFFECTS IN MEASUREMENT WHILE DRILLING OPERATIONS

Serge A. Scherbatskoy, 3921 Clayton Rd. E., Fort Worth, Tex. 76116

Continuation of Ser. No. 309,469, Jun. 17, 1982, which is a division of Ser. No. 110,848, Jan. 10, 1980, Pat. No. 4,351,037, which is a division of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Jun. 25, 1986, Ser. No. 878,425
Int. Cl.⁴ G01V *1/40*
U.S. Cl. 367—83 **29 Claims**



1. A telemetering arrangement for use in conjunction with drilling operations of a borehole for transmitting information expressed in terms of data signals and employing a fluid circulation system including mud pump means wherein interfering signals having a distinguishable characteristic are produced, said distinguishable characteristic resulting from pressure changes which are induced in the fluid of said circulation system by the drilling operations and are recurrent in accordance with an identifiable pattern, and wherein said circulation system forms at least in part a communication channel between a transmitting means at a first location for transmitting data signals representing said information, and a signal receiving means at a second location, said signal receiving means being operable to receive a mixture of said data signals and of said interfering signals to produce electrical mixed signals representing said mixture, said arrangement comprising,

means operable independent of transmission properties of any portion of said circulation system for producing electrical control signals representative of said identifiable pattern,

electronic processing apparatus comprising signal extractor means to which said electrical mixed signals are applied, and which is controlled by said electrical control signals to produce processed signals in which interfering signals are diminished, and

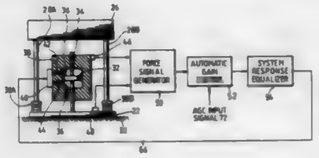
means for deriving said information from said processed signals.

4,692,912

AUTOMATIC FORCE CONTROL FOR A SEISMIC VIBRATOR

Allan H. Mueller, Houston; Dean P. Perkins, Pasadena, and Rhys M. Evans, Houston, all of Tex., assignors to Geosource, Inc., Houston, Tex.

Filed Nov. 30, 1984, Ser. No. 676,718
Int. Cl.⁴ H04R *23/00*
U.S. Cl. 367—190 **13 Claims**



9. A hydraulic seismic vibrator, comprising:

a baseplate;

a reaction mass;

an electrohydraulic mechanism responsive to an electrical input signal for actuating said baseplate;

means for generating a first signal representative of the force of said baseplate when said vibrator is actuated;

means for generating a second signal representative of the integral of the absolute value of said first signal over a sample time period including at least one cycle;

means for comparing said second signal to a reference value;

means for generating an error signal in response to said comparison between said second signal and said reference value; and

means for correlating said error signal and said electrical input signal to generate a drive signal to actuate said baseplate.

4,692,913

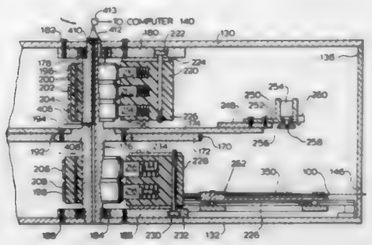
METHOD AND APPARATUS FOR READING A DATA RECORD CARRIER

Richard Ackerman, Fremont, Calif.; Donovan W. Huribut, Whitewater, and Alan A. Jewer, Ft. Atkinson, both of Wis., assignors to News Log International, Inc., Janesville, Wis.

Continuation-in-part of Ser. No. 210,847, Nov. 26, 1980, Pat. No. 4,416,001. This application Nov. 14, 1983, Ser. No. 551,638
The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.
Int. Cl.⁴ G11B *7/09*
U.S. Cl. 369—44 **29 Claims**

1. A method of reading data from a data record carrier on which data has been recorded in arcuately nested, equal radii data rows which are equally spaced apart along a common centerline that is coextensive with a radius for each data row, comprising the steps of: incrementally moving the data record carrier in steps transversely of the data rows; projecting a light beam onto the plane in which the data record carrier moves; rotating the light beam about an axis parallel to the axis of said light beam to rotate said light beam in an arcuate path across

the data record carrier, the radius of the arcuate path being the same or approximately the same radius of each data row; detecting scattered light outside the cone of specular reflection from the light beam impinging on the data record carrier, or the lack of scattered light, as the light beam traverses each data



row; and sensing, and correcting for, difference between the arcuate path of said light beam and the arcuate path of the data row being traversed by said light beam to ensure that said light beam traverses approximately the same arc as that of each data row.

4,692,914

REPRODUCING DEVICE FOR FREQUENCY MODULATED SIGNALS

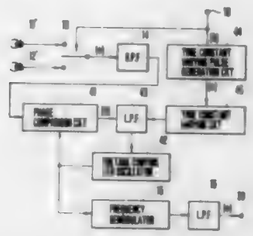
Hiroto Yasumura, Kanagawa; Susumu Kozuki, Tokyo, and Masahiro Takei, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,785

Claims priority, application Japan, May 31, 1983, 58-97276; May 31, 1983, 58-97277; Jul. 6, 1983, 58-123700; Jul. 15, 1983, 58-129247

Int. Cl.⁴ G11B *20/24*

U.S. Cl. 369—49 **10 Claims**



1. A reproducing device for a frequency modulated signal, comprising:

(a) reproducing means for reproducing a frequency modulated signal from a recording medium;

(b) demodulating means for frequency demodulating a signal reproduced by said reproducing means;

(c) generating means for generating a pilot signal relative to a discontinued part of the signal reproduced by said reproducing means;

(d) removing means for removing a high frequency zone of a signal produced from said demodulating means; and

(e) control means for controlling in accordance with said pilot signal the frequency zone which is to be removed by said removing means.

4,692,915

RECORDING AND REPRODUCTION APPARATUS HAVING IMPROVED RELIABILITY WITH RESPECT TO EXTERNALLY APPLIED VIBRATION OR IMPACT

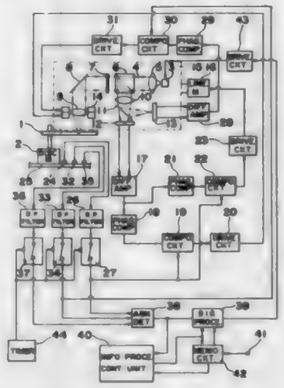
Mitsuro Moriya, Neyagawa; Kazuharu Shiragami, and Hiroyuki Yamaguchi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 28, 1985, Ser. No. 738,464

Claims priority, application Japan, Jun. 15, 1984, 59-123000

Int. Cl.⁴ G11B *27/36*

U.S. Cl. 369—53 **19 Claims**



11. A recording and reproduction apparatus which includes means such that a light beam which converged and projected onto a recording medium is displaceable in a direction parallel to a surface of the recording medium and perpendicular to a track thereon so as to record signals on the track or to reproduce signals recorded on the recording medium, said recording and reproduction apparatus comprising an acceleration detecting means for detecting acceleration of the apparatus due to vibrations or impacts externally applied thereto and for supplying an output signal corresponding thereto, an abnormal state detecting means for detecting that a magnitude of the vibrations or impacts applied to the apparatus has exceeded a predetermined value based on said output signal from said acceleration detecting means and for supplying an output signal corresponding thereto, and a means for inhibiting recording in accordance with said output signal from said abnormal state detecting means.

4,692,916

DISC-RECORD PLAYER COMPRISING A DISC-LOADING MECHANISM AND DISC-HOLDER FOR USE IN SUCH A PLAYER

Petrus L. A. Rouwa, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 617,066, Jun. 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 571,225, Jan. 16, 1984, abandoned. This application Dec. 13, 1985, Ser. No. 808,654

Claims priority, application Netherlands, Jun. 15, 1983, 8302130

Int. Cl.⁴ G11B *17/04, 23/02*

U.S. Cl. 369—75.2 **15 Claims**

1. A disc-record player comprising:

(a) a housing;

(b) a chassis supported in said housing;

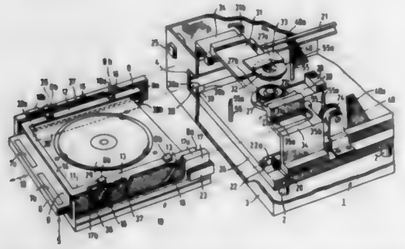
(c) a turntable rotatably mounted on said chassis, the axis of rotation of said turntable defining an axial direction;

(d) a disc reading means displaceably mounted on said chassis;

(e) a loading mechanism for loading a disc onto said turntable comprising;

(i) a disc holder for holding said disc prior to loading, said disc holder having a cylindrical wall defining a cylindrical space of circular cross section for receiving said disc, said space being completely open toward an upper side of the holder, said disc holder having an opening formed in a lower side, said disc holder having at least one spring-loaded, radially movable latching element arranged adjacent said cylindrical wall and formed to axially latch said disc when in a first radial position and to axially release said disc when in a second radial position, and said disc holder having a surface adjacent each latching element for axially supporting said disc on one side;

(ii) a frame provided with guide means for slidably receiving said disc holder, said frame being axially movable relative to said chassis between an upper position corresponding to said disc not being loaded on said turntable and a lower position corresponding to said disc being loaded on said turntable, said opening formed in the lower side of said disc holder being arranged such that said turntable extends therethrough when said frame is in said lower position;



(iii) a pressure member which is axially movable relative to said chassis for pressing said disc against said turntable; and

(iv) control means for controlling the axial movements of said frame and said pressure member; and

(f) at least one release element axially upwardly directed relative to said chassis;

wherein at least one pair of latching and release elements is arranged such that each latching element is radially displaced by said corresponding release element as said frame is moved to its lower position, following which said disc is released and cleared from said disc holder and urged against said turntable by said pressure member.

4,692,917

PACKET SWITCHING SYSTEM

Masanobu Fujioka, Tokyo, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,116

Claims priority, application Japan, Nov. 27, 1984, 59-249781

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **6 Claims**

1. A packet switching system comprising:

a plurality of incoming circuits;

a plurality of outgoing circuits;

a plurality of packet handlers, one for each incoming circuit;

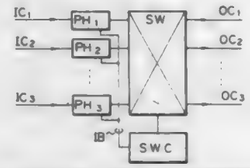
a cross-point switch of circuit switching capability to connect and switch the incoming circuits and the outgoing circuits through the packet handlers;

a switch controller to select idle circuits in the desired outgoing routes and to control the establishment, and release of the connections of the cross-point switch; and

an internal bus to transfer control information signals between each of the packet handlers and the switch controller;

wherein each of the packet handlers processes the header of each incoming packet from the corresponding incoming circuit, analyzes the routing information included in the header so as to determine an outgoing route for the packet and transfers to the switch controller through the internal bus a request for the connection of the packet handler and one of the outgoing circuits in the outgoing route;

the switch controller, upon receipt of the connection request from the packet handler, connects one of the outgoing circuits in the outgoing route and the packet handler through the cross-point switch and transfers a connection completion signal to the packet handler through the internal bus;



(a) FUNDAMENTAL STRUCTURE OF SWITCHING SYSTEM

the packet handler, upon receipt of the connection completion signal, transmits the data field following the header of the packet to the above-mentioned outgoing circuit and after the completion of transmission of the entire packet, transfers a transmission completion signal to the switch controller through the internal bus; and

the switch controller repeats the establishment and the release of the connection, between each of the packet handlers and one of the outgoing circuits by opening and closing the cross-point switch for each packet,

wherein only a part of the packet is stored in the switching system and the switching of the packet is performed by a circuit switching operation.

4,692,918

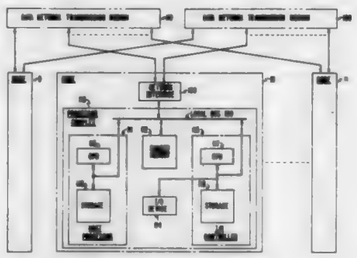
RELIABLE LOCAL DATA NETWORK ARRANGEMENT

Roger A. Elliott, Naperville, and Wayne V. Lindquist, Lisle, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1984, Ser. No. 682,096

Int. Cl.⁴ H04J *3/02*

U.S. Cl. 370—85 **28 Claims**



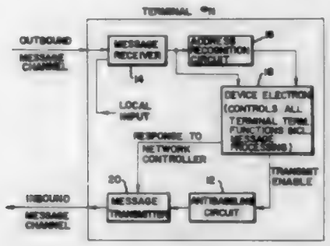
1. In a distributed processing system comprising a plurality of processor complexes, each complex comprising at least one processor, means for transmitting data packets among said processor complexed comprising:

two local data network transmission media; and

a network interface uniquely associated with and connected to each of said processor complexes and connected to both of said transmission media for conveying operational

data packets between the associated processor complex and one of said transmission media and comprising a maintenance processor for receiving control data packets from the other of said transmission media and responsive to received control data packets for controlling maintenance operations of said network interface.

4,692,919
COMMUNICATIONS NETWORK
Lamar E. West, Jr., Maysville, Ga., assignor to Scientific Atlanta, Inc., Atlanta, Ga.
Filed Nov. 29, 1985, Ser. No. 802,488
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—96 **9 Claims**



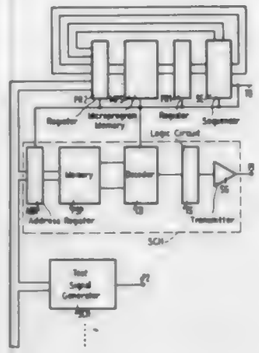
1. In a communications network having a plurality of terminals which transmit and receive messages over a common communication channel for predetermined intervals and with a predetermined frequency in a sequence determined by control signals from a controller which is connected to the common channel and enables said terminals to have access to said channel, an improved terminal which comprises means responsive to said control signals for providing an enable signal, means for transmitting messages local to said terminal onto said channel, means responsive to said enable signal for enabling said means for transmitting its local messages, and means included in said last named means for inhibiting a response to said enable signal which would enable said means for transmitting its local messages for a period substantially greater than the predetermined interval in each said sequence or at a frequency substantially greater than the predetermined frequency in each said sequence.

4,692,920
APPARATUS FOR GENERATING PATTERNS OF TEST SIGNALS
Rolf Tannhaeuser, Kraifling, and Franz Herrmann, Schoenmerhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 528,646, Sep. 1, 1983, abandoned. This application Apr. 30, 1986, Ser. No. 859,847
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237365
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **9 Claims**

1. An arrangement for generating and applying patterns of test pulses to a plurality of terminal elements of a unit under test, comprising:

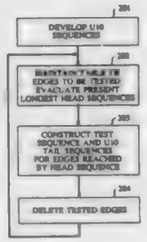
a plurality of test signal generators each storing respective test signals in coded form, and each connected to a respective terminal element, and each comprising storage means storing the test signals in coded form and generating means responsive to the coded test signals to generate the patterns of test signals; and

an address control connected to said plurality of test signal generators and operable to sequentially address the storage means thereof to cause the respective generating



means to generate test signals at said terminal elements in a predetermined sequence.

4,692,921
METHOD FOR GENERATING VERIFICATION TESTS
Anton T. Dahbura, Bedminster, and Krishan K. Sabnani, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Aug. 22, 1985, Ser. No. 768,500
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—27 **7 Claims**



1. A method for developing test sequences for evaluating a design or operation of a finite state machine characterized by a state diagram having states and edges interconnecting such states, comprising:

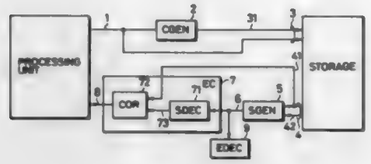
a step of evaluating unique input/output sequences for states of said finite state machine;

a step of evaluating a head sequence for a selected edge of said finite state machine, said edge having a head state and a tail state, wherein said head sequence places said finite state machine in said head state;

a step of constructing a test sequence for said selected edge by concatenating said head sequence with an input/output sequence characteristic of said edge and with a unique input/output sequence of said tail state derived from said step of evaluating unique input/output sequences; and

returning to said step of evaluating a head sequence for another selected edge of said finite state machine until all edges of said finite state machine have been selected.

4,692,922
METHOD FOR CORRECTING AND DETECTING ERRORS
Yoshio Kirin; Shigeru Kaneko, and Hiroshi Kosuge, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 11, 1985, Ser. No. 807,682
Claims priority, application Japan, Dec. 12, 1984, 59-260709
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **12 Claims**



1. A method for correcting and detecting error caused in a unit of information which consists of plurality of blocks each block being made up of (b) bits, said method comprising the steps of:

generating check bits from said unit of information on the basis of a parity matrix which consists of a plurality of partial matrices, each partial matrix including a b×b matrix Xq (q=1 to b) which is obtained by rotating each row of a b×b matrix

$$\begin{bmatrix} 1 & 1 & 1 & \cdots & 1 \\ & 1 & & & \\ & & 1 & & \\ & & & \ddots & \\ & & & & 1 \end{bmatrix}$$

along the column direction by a number (q) and each partial matrix being acted upon for each corresponding block;

generating a syndrome from said unit of information and said check bits on the basis of said parity matrix;

decoding said generated syndrome on the basis of said parity matrix to indicate an error bit position of said unit of information;

correcting an error from said unit of information and said error bit position thereof to complete said unit of information free from correctable error; and

detecting an uncorrectable error by decoding said generated syndrome on the basis of said parity matrix.

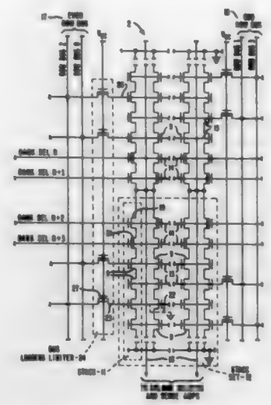
4,692,923
FAULT TOLERANT MEMORY
Alan D. Poeppelman, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio
Filed Sep. 28, 1984, Ser. No. 655,854
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **17 Claims**

1. A memory array having addressable data storage cells and comprised of:

a first section, having first and second subsections and providing information for a first data bit position upon addressing by first and second select signals;

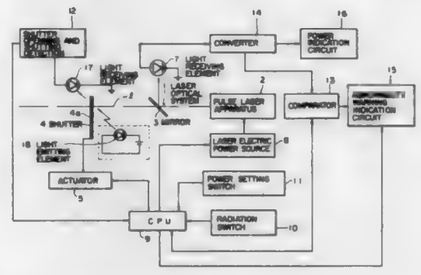
a second section, having first and second subsections and providing information for a second data bit position upon addressing by first and third select signals;

signal means for providing first select signals to address the subsections of the first and second sections, second select signals to address alternate subsections of the first section,



and third select signals to address alternate subsections of the second section.

4,692,924
LASER TREATMENT APPARATUS
Hiroshi Koizumi, Saitama; Masatsugu Kijima, and Sinya Tanaka, both of Tokyo, all of Japan, assignors to Tokyo Kagaku Kakai Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 4, 1985, Ser. No. 783,967
Claims priority, application Japan, Oct. 6, 1984, 59-150720[U]
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—30 **16 Claims**



1. A laser treatment apparatus comprising:

a laser source for generating a treatment pulse beam;

a laser optical path for guiding said treatment laser pulse beam toward an object to be treated thereby;

a power setting means for controlling said laser source to set the power output of said treatment laser pulse beam;

a radiation switch for selectively switching said laser source to output said treatment laser pulse beam or to stop the output of said treatment laser pulse beam;

a safety device for enabling said laser source to output a checking laser pulse beam prior to the transmission of said treatment laser pulse beam through said laser optical path and after the activation of said radiation switch to select the output of said treatment laser pulse beam, said checking laser pulse beam having a power corresponding to the actual power of said treatment laser pulse beam outputted by said laser source;

a power detector for detecting the power output of said

checking laser pulse beam outputted from said laser source; and

a comparator for comparing said detected power output of said checking laser pulse beam with a predetermined power level corresponding to the power of a treatment laser pulse beam as set by said power setting means, said safety device for preventing the transmission of said treatment laser beam from said laser source if said comparator determines that said power of said checking laser pulse does not correspond to said predetermined power level corresponding to a treatment laser pulse beam as set by said power setting means.

4,692,925

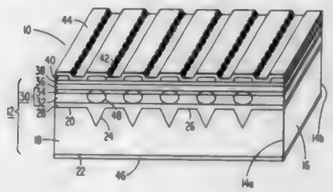
PHASE-LOCKED LASER ARRAY

Dan Botez, Randolph Township, Morris County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1984, Ser. No. 681,206

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—46 **6 Claims**



1. In a phase-locked laser array including a body of semiconductor material having therein a cavity region and means for defining a plurality of substantially parallel lasing zones in said cavity region, said zones being spaced an effective distance apart so that the modes of oscillation in adjacent lasing zones are phase-locked to one another, and first and second electrodes on said body;

the improvement wherein said first electrode comprises a plurality of spaced apart electrically connected electrical contacts to said body over the regions between said lasing zones.

4,692,926

MUSHROOM-SHAPED SEMICONDUCTOR STRIPE LASER

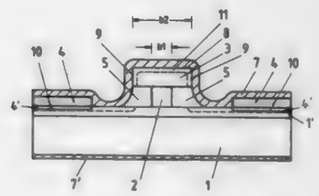
Peter Marschall, Neu-Ulm; Ewald Schlosser, Senden, and Hans-Peter Vollmer, Brandenburgweg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main and ANT Nachrichtentechnik GmbH, Backnang, both of, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 727,251

Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419600

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—46 **19 Claims**



1. A mushroom-shaped semiconductor stripe laser, particularly with transversal, monomode light distribution comprising: a semiconductor double heterostructure including a semiconductor substrate of one conductivity type, a stripe-shaped semiconductor laser-active zone disposed on one major surface of said substrate and a stripe-shaped semiconductor cover layer of the opposite conductivity type disposed on the outer surface of said laser-active zone, said laser-active zone having a width which is less than the width of said cover layer, as a result of said cover layer being underetched, so as to form a mushroom-shaped structure with the ratio of said width of said cover layer to said width of said laser-active zone lying in a range between two and five; a metal ohmic contact on the other major surface of said substrate; and a metal layer ohmically contacting said cover layer on its outer major surface and on at least one of its side surfaces.

4,692,927

LIGHT EMITTING DEVICE WITH IMPROVED ELECTRODE STRUCTURE TO MINIMIZE SHORT CIRCUITING

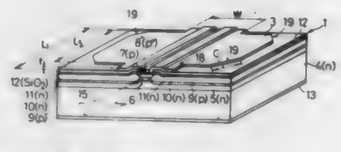
Masaaki Sawai, Takasaki; Masamichi Kobayashi, Maebashi; Shoji Hayashi, Takasaki; Hiroshi Naka, Komoro, and Masahiro Ichiki, Tamamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,029

Claims priority, application Japan, Mar. 16, 1984, 59-49033; Apr. 13, 1984, 59-72819

Int. Cl.⁴ H01S 3/19

U.S. Cl. 372—46 **15 Claims**



1. A light emitting device comprising:

(1) a semiconductor block consisting essentially of:

(a) a first main plane;

(b) a second main plane facing said first main plane;

(c) a first end surface interposed between said first and second main planes;

(d) a second end surface facing said first end surface and interposed between said first and second main planes;

(e) a first side wall interposed between said first and second main planes and said first and second end surfaces;

(f) a second side wall facing said first side wall and interposed between said first and second main planes and said first and second end surfaces; and

(g) a light emitting region having one of the ends thereof exposed on said first end surface and the other end thereof exposed on said second end surface, wherein said second main surface has a periphery including end peripheral edges at intersections of said second main surface and said first and second end surfaces and side peripheral edges at the intersections of said second main surface and said first and second side walls; and

(2) an electrode consisting essentially of:

(a) a first electrode portion disposed on said second main plane of said semiconductor block along said light emitting region, and having the width thereof greater than the width of said light emitting region; and

(b) a second electrode portion disposed on said second main plane of said semiconductor block, connected completely integrally with said first electrode portion, and having a periphery thereof recessed along said second main plane to be out of contact from both the end peripheral edges and the side peripheral edges of the periphery of said second main plane.

4,692,928

METHOD FOR IMPROVING THE POWER OF AN AXIAL GAS LASER

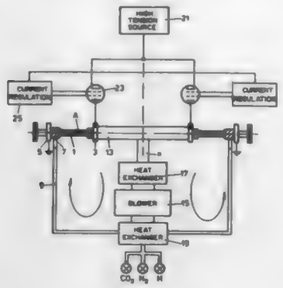
Hardy P. Weiss, Hütten, Switzerland, assignor to PRC Corporation, Landing, N.J.

Filed Oct. 10, 1985, Ser. No. 786,058

Claims priority, application Switzerland, Oct. 10, 1984, 4561/84

Int. Cl.⁴ H01S 3/03

U.S. Cl. 372—63 **22 Claims**



1. In a method of lasing gas in a fast axial flow gas transport laser comprising generating a flow of a gas along an excitation tube and wherein said gas is loaded with thermal energy increasing in the flow direction of said gas within said excitation tube and wherein said flow of gas forms within cross-sections of said tube a circumferential low speed, speed dependent boundary layer and a central area of higher speed gas flow, the improvement comprising enlarging the thermal energy applicable to said gas per massflow unit of said gas through said tube by controlling at least along a part of said tube the extent of said central area by steadily varying the cross-section area of said tube at least along said part to compensate for said circumferential low speed boundary layer.

4,692,929

SELF-BAKING ELECTRODE FOR ELECTRIC ARC FURNACES AND THE LIKE

Mario Cavigli, Mestre, Italy, and Lorenzo Ferrari, Lugano, Switzerland, assignors to Kinglor-LTD, Lugano, Switzerland

PCT No. PCT/EP85/00504, § 371 Date May 19, 1986, § 102(e) Date May 19, 1986, PCT Pub. No. WO86/02800, PCT Pub. Date May 9, 1986

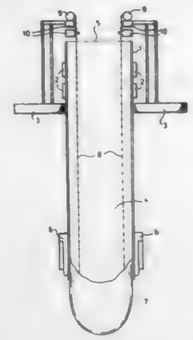
PCT Filed Sep. 30, 1985, Ser. No. 871,432

Claims priority, application European Pat. Off., Oct. 23, 1984, 84112756.6

Int. Cl.⁴ H05B 7/09

U.S. Cl. 373—89 **8 Claims**

1. A self-baking electrode for electric arc furnaces comprising a containing and guiding metal casing, an electrodic carbonaceous mass flowing in said containing casing, and a supporting structure for said electrodic mass, said supporting structure



being composed of braided carbon fibres arranged in a manner so as to form a supporting element for said carbonaceous mass.

4,692,930

FLOOR OF ELECTRICALLY HEATED MELTING FURNACE, PARTICULARLY A DIRECT CURRENT FURNACE

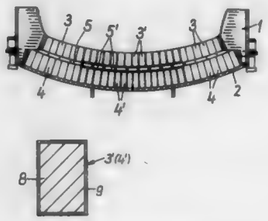
Dietrich Radke, Ratingen; Peter Meger, Willich, and Heinz Zörcher, Siegen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 912,913

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534750

Int. Cl.⁴ F27D 1/04

U.S. Cl. 373—72 **17 Claims**



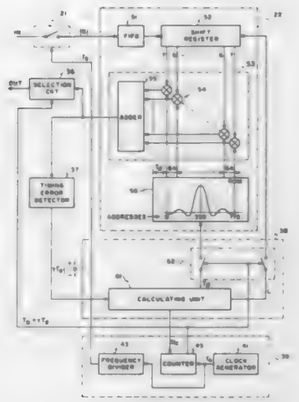
1. In an electrically heated melting furnace, particularly a direct current furnace, having a floor provided with a lining of refractory material and with an electrode comprised of a plurality of electrically conductive paths which extend through said lining of refractory material starting from the inner surface of the floor and continuing toward the exterior; the improvement wherein said conductive paths are composed of layers of at least one high melting point, electrically conductive, nonmetallic material which are connected with said refractory material, and which have a thickness of at most 5 mm.

4,692,931

SYNCHRONIZATION CIRCUIT CAPABLE OF ESTABLISHING SYNCHRONISM EVEN WHEN A SAMPLING RATE IS INVARIABLE

Tomoki Ohsawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 30, 1985, Ser. No. 792,765
Claims priority, application Japan, Oct. 31, 1984, 59-229508; Mar. 14, 1985, 60-50936; Sep. 11, 1985, 60-202365
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—106 **5 Claims**



1. A synchronization circuit responsive to an input signal carrying a transmission data signal and being received at a transmission rate for producing an output signal which is representative of reproductions of said transmission data signal, said circuit comprising:

sampling means responsive to said input signal for sampling it at a predetermined sample rate to produce a sequence of sampled signals at said predetermined sample rate;

interpolating means coupled to said sampling means for interpolating said sampled signal sequence to produce an interpolated signal sequence; and

processing means coupled to said interpolating means for processing said interpolated signal sequence to produce said output signal at said transmission rate;

said interpolating means comprising:

storage means for successively storing said sampled signal sequence at said predetermined sample rate to produce a sequence of stored signals at said transmission rate;

interpolation means responsive to said stored signal sequence and to first and second control signals for interpolating said stored signal sequence with reference to said first and second control signals in order to produce first and second partial interpolated signals and responsive thereto said interpolated signal sequence; and

said processing means comprising:

detection means responsive to said interpolated signal sequence for detecting phases of said first partial interpolated signals in relation to said sampling rate to produce a sequence of phase signals which are representative of said phases;

calculating means responsive to said phase signals for calculating first and second internal control signals related to said first and second partial interpolated signals, respectively; and

reference timing signal generating means operatively coupled to said detection means for generating a sequence of reference timing signals with reference to the phases of said first partial interpolated signals; and

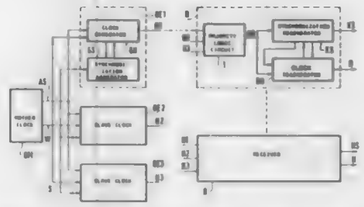
delivery means coupled to said calculating means and said interpolation means for delivering said first and second internal control signals to said interpolation means as said first and second control signals, respectively.

4,692,932

TRIPLICATED CLOCK DISTRIBUTION DEVICE FOR USE WHEN EACH CLOCK SIGNAL COMPRISES A SYNCHONIZATION SIGNAL

Alain Dunhez, Velizy-Villacoublay; Francis Hargoaa, Paris, and Jean Aubrée, Bougival, all of France, assignors to Alcatel, Paris, France

Filed Feb. 6, 1986, Ser. No. 826,705
Claims priority, application France, Feb. 7, 1985, 85 01721
Int. Cl.[4] H04L *7/00*; H04J *3/06*
U.S. Cl. 375—107 **9 Claims**



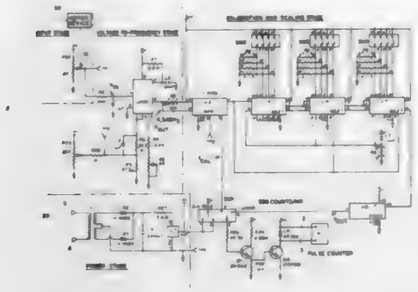
1. Triplicated clock distribution device for use when each clock signal comprises a synchronization signal, the device comprising at least one mother clock, three slave clocks and receivers each having a majority logic circuit connected to the three slave clocks each of which has an oscillator driven by the mother clock, in which device each slave clock comprises a clock generator and a synchronization generator, the clock generator comprises, in addition to the oscillator, a frequency doubler, a frequency divider connected to the frequency doubler and adapted to divide by two the frequency of the signal delivered by said frequency doubler, and an initialization circuit having its output connected to the frequency divider, the synchronization generator comprises an input circuit having its input connected to the synchronization generators of the other two slave clocks and receiving therefrom a clock synchronization signal and a first output connected to the initialization circuit of the frequency divider, a counter having an input connected to the frequency doubler and an initialization input connected to a second output of the input circuit, a JK type flip-flop having a clock input connected to a first output of the counter delivering a first signal, and a shift register driven by the frequency doubler and having its input connected to a complemented output of the flip-flop, said shift register has a first output connected by a first wire to the frequency divider and to the initialization circuit of the frequency divider, a second output connected to a reset input of the flip-flop and a third output connected by a second wire to the frequency divider and to the initialization circuit of the frequency divider, said frequency divider functions as a divider by four when it receives a pulse from each of the first and third outputs and delivers via an output inverter a clock signal comprising a synchronization signal, the clock signal has the same frequency as the first signal delivered by the counter and the synchronization signal has one half the frequency and a duration of one period of the clock signal, the counter comprises a second output delivering a second signal the frequency of which is half that of the first signal and connected on the one hand to another input of the input circuit and on the other hand to each input circuit of the other two slave clocks through an inverter, and each inverter delivers a clock synchronization signal.

4,692,933

ELECTRO-MECHANICAL INTEGRATOR

David J. Wroblewski, Willoughby, and John W. Robertson, Jr., Chesterland, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 24, 1986, Ser. No. 843,369
Int. Cl.[4] H03K *21/02, 21/18*; G01R *23/10*
U.S. Cl. 377—29 **8 Claims**



1. An electronic integrator for integrating a linear voltage signal over time, comprising:

input means for applying the linear voltage signal;

voltage-to-frequency conversion means for converting the linear voltage signal to an input frequency signal having a frequency proportional to the linear voltage signal;

a binary counter connected to said converter for counting pulses of the input frequency signal and for generating an operating frequency signal having a relatively low frequency, and a calibrating frequency signal having a relatively high frequency with respect to the operating frequency signal;

binary rate multiplying means connected to said binary counter for receiving the operating frequency and for generating a counting rate signal which has pulses that are at a scaled proportion of the operating frequency signal, said binary rate multiplying means having scaling means for changing the proportion;

a pulse counter for counting pulses of the counting rate signal and for counting pulses of the calibrating frequency signal; and

switch means having a first input connected to said binary counter for receiving the calibrating frequency signal, a second input connected to said binary rate multiplying means for receiving the counting rate signal, and an output connected to said pulse counter, said switch means being selectively switchable between a calibration position connecting said first input to said pulse counter for incrementing the pulse counter rapidly, and an operating position connecting said second input to said pulse counter for incrementing said pulse counter more slowly and at a rate proportional to the linear voltage signal.

4,692,934

X-RAY LITHOGRAPHY SYSTEM

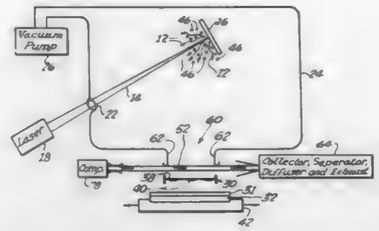
James M. Forsyth, Pittsford, N.Y., assignor to Hampshire Instruments, Rochester, N.Y.

Filed Nov. 8, 1984, Ser. No. 669,442
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—34 **15 Claims**

1. An X-ray lithography system comprising: a laser beam source for generating a laser beam;

a target of a given material upon which said laser beam is focused, said laser beam being of sufficient intensity to create a plasma from said given material, there being soft X-rays and debris emitted from said plasma along a given path;

an X-ray mask positioned to pass a pattern of X-rays to an object; and



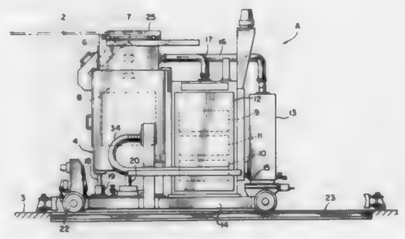
means to generate sheet of an X-ray transparent gas across said path between said mask and said target to displace said debris away from said mask, said sheet having a thickness selected to displace the most energetic debris emitted from said plasma.

4,692,935

AUTOMATIC STEEL ANALYSIS APPARATUS

Koichi Kumakura; Akira Ryuzono, and Yoshinori Hosokawa, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 27, 1985, Ser. No. 803,214
Claims priority, application Japan, Nov. 28, 1984, 59-252596
Int. Cl.[4] G01N *23/223*
U.S. Cl. 378—49 **4 Claims**



1. An automatic steel analysis apparatus for analyzing the composition of steel materials moving along a conveying path in a harsh environment by carrying out an element analysis using an X-ray excited energy dispersion type fluorescent analysis along the conveying path of the steel materials, comprising:

a movable housing mounted on said apparatus below the conveying path and having a window in the top thereof and an X-ray permeable membrane filling said window, said movable housing being mounted for vertical up and down movement toward and away from the conveying path;

a detector means consisting of an X-ray tube and a semiconductor detection element housed in said movable housing;

a computing apparatus to which said detection element is connected for supplying analysis information thereto for enabling said computing apparatus to determine the composition of steel materials;

an air conditioning apparatus connected to said movable housing for controlling the temperature and humidity within said movable housing;

a leaded rubber packing means mounted around the outside of said window for engaging with the under side of the steel material located in the conveying path when said housing is raised;

an openable and closable protective shutter mounted on said housing and movable between a position in which it covers said window to protect said X-ray permeable membrane and a position away from said window and in said window is uncovered;

a sensor connected with said leaded rubber packing means for sensing the engagement of said leaded rubber packing means with the under side of a steel material; and

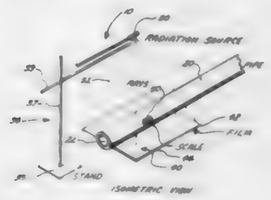
an X-ray shutter operatively associated with said X-ray tube and including means for opening said X-ray shutter for a predetermined time sufficient for carrying out analysis in response to the sensing by said sensor of the engagement of said leaded rubber packing means with a steel material.

4,692,936

METHOD AND APPARATUS FOR RADIOGRAPHIC INSPECTION

James K. Billeaudeaux, 100 Bon Wier La., Lafayette, La. 70506

Filed Jun. 4, 1984, Ser. No. 617,126
Int. Cl.[4] G01B *15/06*; H05G *1/28*
U.S. Cl. 378—59 **10 Claims**



1. A method for radiographically inspecting the wall thickness of a section of pipe comprising the step of:

a. providing a source of radiation;

b. providing film means;

c. providing means positioned adjacent the wall of the section of pipe to be inspected, the means further including a plurality of equally spaced cuts of known equal width along at least one edge, each cut being of a width equal to the width of metal between each cut, and defining a graduated measurement scale;

d. directing a stream of radiation through the wall of the section of pipe and the scale onto the film means;

e. calipering the thickness of the pipe wall appearing on the film means;

f. comparing the calipered wall thickness against the number of graduations measured along the scale image recorded on the film means for determining the actual thickness of the pipe wall.

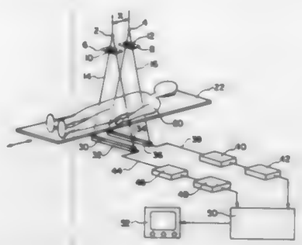
4,692,937

RADIOGRAPHY APPARATUS AND METHOD

Donald Sashin, Pittsburgh, Pa., and Ernest J. Sternglass, Bloomington, Ind., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed May 2, 1984, Ser. No. 606,057
Int. Cl.[4] A61B *6/00*; G03B *42/02*; H05G *1/60*
U.S. Cl. 378—062 **22 Claims**

1. A method of radiographic imaging of an object having a beating heart comprising establishing a first planar fan beam of penetrating radation and a second planar fan beam of penetrating radiation substantially parallel to said first beam, said first beam and said second beam both impinging on said object and being spaced apart along a given line substantially perpendicular to the planes of the beams, establishing relative movement between said object and both of said first and second beams in a direction substantially parallel to said given line and at a speed such the time interval between the two beams poassing through the identical section of the object is substantially less than the time period for said beating heart, converting the portion of said first beam which passes through said object into a first electrical signal, converting the portion of said second beam which passes through said object into a second electrical signal, processing said first and second electrical signals to obtain first image information and second image information



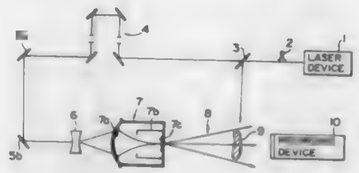
respectively, subtracting said first image information from said second image information to form final image information such that information about portions of the object which are stationary, except for said relative movement, is nullified and displaying said final image information.

4,692,938

X-RAY SHADOW GRAPH DEVICE

Koichiro Oba, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 4, 1985, Ser. No. 805,426
Claims priority, application Japan, Dec. 11, 1984, 59-261439
Int. Cl.[4] G01N *23/04*
U.S. Cl. 378—62 **5 Claims**



1. An X-ray shadow graph device for observing dynamic changes in a sample comprising

a light source for generating a light pulse having a time duration of approximately 1 ps.;

an X-ray tube including a photocathode and an X-ray target, said X-ray target generating an X-ray pulse in response to electrons emitted by said photocathode impinging thereon;

means coupling said light source to the photocathode of said X-ray tube, said photocathode emitting said electrons when said light pulse impinges thereon;

an image recording device positioned for receiving and recording an X-ray transmission image of said sample; and

means for exciting said sample in synchronism with said light pulse.

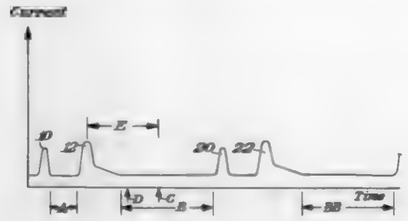
4,692,939

SWITCH TESTING

Donald F. Parsons, West Chester, Pa., assignor to Communications Test Design, Inc., West Chester, Pa.

Filed Mar. 19, 1986, Ser. No. 841,173
Int. Cl.[4] H04M *3/28*
U.S. Cl. 379—16 **9 Claims**

1. In the testing of a telephone switching grid having a matrix of individual switches by applying path-establishing pulses that successively close the individual switches to establish talk paths and determining whether the electrical resistance of the talk paths is within tolerance, the improvement according to which the switches are subsequently checked for



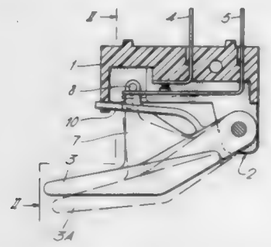
response time by determining whether the electrical resistance is within tolerance before about 50 milliseconds have elapsed after the path-establishing pulse.

4,692,940

TELEPHONE HOOK SWITCH

Peter J. Baines, Colchester, England, assignor to Standard Telephones and Cables Public Limited Company, London, England

Filed Mar. 14, 1985, Ser. No. 711,821
Claims priority, application United Kingdom, Mar. 17, 1984, 8407019
Int. Cl.[4] H04M *1/08*
U.S. Cl. 379—424 **2 Claims**



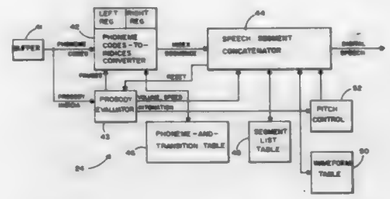
1. A telephone hook-switch arrangement, which includes a base assembly on which the hook-switch contacts are mounted, a hook-switch lever which is substantially T-shaped in side view, support means for the hook-switch lever on the base assembly, with one-end of the cross-piece of the T of said lever pivotally mounted on said support means, and a hook-switch member on the base assembly which in the on-hook condition is held non-operated by handset against the urgence of spring means, wherein when the telephone which includes the arrangement is in the on-hook condition the handset member depresses the other end of the cross-piece of the T, wherein a pin on the leg of the T is adjacent to one of the hook-switch contacts, wherein there is a spring strip integral with the cross-piece, wherein said spring strip extends across the leg of the T and engages a fixed portion of the base assembly, and wherein when the handset is off-hooked the lever rotates about its pivot against the urgence of the spring means to close the hook-switch contacts via said pin, which rotation of the lever occurs under the influence of the spring means associted with the hook-switch member.

4,692,941

REAL-TIME TEXT-TO-SPEECH CONVERSION SYSTEM

Richard P. Jacks, Manhattan Beach, and Richard P. Sprague, Tustin, both of Calif., assignors to First Byte, Long Beach, Calif.

Filed Apr. 10, 1984, Ser. No. 598,892
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—52 **17 Claims**



1. A machine method of converting electrical signals representing text to audible speech in real time, comprising the steps of:

(a) storing, in the memory of a data processing device, a plurality of digitized waveforms consisting of groups of digitally encoded samples, said waveforms being representative of portions of phonemes and of transitions between phonemes;

(b) analyzing said signals to determine a sequence of phonemes and transitions indicative of the pronunciation of said text;

(c) generating a sequence of codes representing said phonemes and transitions;

(d) using said codes to select groups of said digitized waveforms, each said group representing a phoneme or a transition;

(e) concatenating the waveforms in each of said groups to form a waveform representing the speech sound corresponding to one of said phonemes or transitions;

(f) alternatingly concatenating said phoneme-representing waveform groups and said transition-representing waveform groups to form a composite waveform train representing in digitized form, the spoken equivalent of said text; and

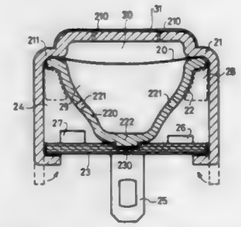
(g) converting said digitized composite waveform into an audible analog signal representative thereof.

4,692,942

ELECTROACOUSTIC TRANSDUCER WITH PIEZOELECTRIC DIAPHRAGM

Jean P. Morgand, La Celle sur Loup, France, assignor to Thomson CSF, Paris, France

Filed Oct. 23, 1985, Ser. No. 790,451
Claims priority, application France, Oct. 30, 1984, 84 16594
Int. Cl.[4] H04C *17/02*
U.S. Cl. 381—114 **6 Claims**



1. An electroacoustic transducer assembly comprising:

tubular shaped metal body means having an open end and a closed end, said closed end having a plurality of holes formed therein to admit accoustic pressure, said body means further defining an inwardly extending shoulder portion proximate said closed end;

metal cup means having a small base with a tenon projection extending outwardly therefrom, and a large ring shaped open end;

piezoelectric diaphragm means for mounting between said shoulder of said body means and said ring shaped open end of said cup means; and

circuit board means for mounting in said open end of said body means, said tenon projection extending into a mortice in said circuit board means, whereby said circuit board means secures said cup means against said metal body means.

4,692,943

METHOD OF AND SYSTEM FOR OPTO-ELECTRONIC INSPECTION OF A TWO-DIMENSIONAL PATTERN ON AN OBJECT

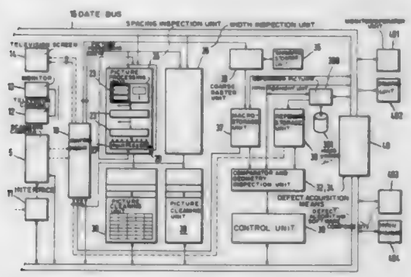
Ludwig Pietzsch, Karlsruhe; Knud Overlach; Detlef Senger, both of Ettlingen, and Walter Breunig, Karlsruhe, all of Fed. Rep. of Germany, assignors to Dr. Ludwig Pietzsch GmbH, Ettlingen, Fed. Rep. of Germany

Filed Dec. 27, 1984, Ser. No. 686,663

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1983, 3347645

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—8 | **9 Claims**



1. A system for opto-electronic inspection of a two-dimensional pattern on an object, especially a printed board, comprising a scanning camera for line-by-line scanning of the object, an X-Y-table for supporting the object, said table permitting relative movement of the object with respect to the scanning camera, and a picture processing apparatus in which picture operations are performed for the purpose of defect detection, characterized in that the picture processing apparatus comprises a micro-inspection unit (**22**) and a macro-inspection unit (**24**) connected in parallel relationship, output signals from the scanning camera (**5**) which are converted into digital signals being supplied as inputs to said units, further characterized in that the macro-inspection unit (**24**) comprises a coarse-raster unit (**33**) in which a picture information "bright" or "dark" characteristic for an entire frame is formed from a plurality of pixels of said frame according to a majority vote, a macro-storage (**37**) for said picture information, a reference storage (**39**) for corresponding picture information of the reference picture, a comparator (**32**) for comparing the characteristic picture information with the reference picture information, and a geometry inspection unit (**34**) for inspecting the obtained picture information on the basis of predetermined geometric criteria.

4,692,944

IMAGE DATA PROCESSING SYSTEM

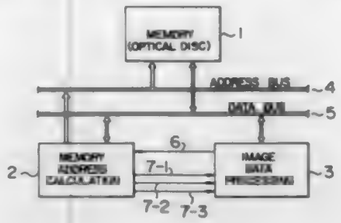
Hidefumi Masuzaki, Odawara, and Etsuo Horikawa, Minami-ashigara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,158

Claims priority, application Japan, Dec. 28, 1983, 58-245487

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—41 | **19 Claims**



1. An image data processing system, comprising:

an optical disc storage memory for storing image data;

a bit-serial processing type image data processing unit for processing the image data stored in said memory; and

an address calculation unit of the bit-parallel processing type which operates in parallel with said image data processing unit for calculating the address of the image data in said memory and controlling input/output of said image data to and from said image data processing unit.

4,692,945

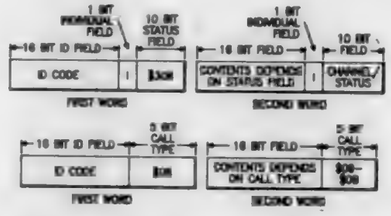
DISPATCH TRUNKED RADIO SYSTEM

Kenneth J. Zdunek, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 687,810, Dec. 31, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 933,367

Int. Cl.[4] H04B 7/14

U.S. Cl. 455—17 | **16 Claims**



15. A method of transmitting and receiving messages between a transmitter and a receiver, comprising the steps of:

in the transmitter:

(a) transmitting a first data packet having at least one dedicated field contained therein, wherein said dedicated field is compriaed of coded data that is first data packet information, and wherein said dedicated field can selectively be an indication that an associated second data packet will be transmitted following transmission of said first data packet; and

(b) optionally transmitting a second data packet, wherein said second data packet includes at least one field that comprises coded data that is second data packet information, provided that said second data packet is only transmitted following transmission of a first data packet having said indication that an associated second data packet will be subsequently transmitted; and

in the receiver:

(c) decoding, if received by said receiver, said first data packet to determine its contents, such that:

(1) if said first data packet does not include said indication that an associated second data packet will be transmitted, said receiver accepts information contained in said first data packet;

(2) if said first data packet does include said indication that an associated second data packet will be transmitted, said receiver does not yet accept information contained in said first data packet; and

(d) decoding, if transmitted by said transmitter and received by said receiver, said second data packet to determine its contents, such that;

(1) if said second data packet was not preceded by reception, within a predetermined period of time, of a first data packet having an indication that an associated second data packet would be subsequently transmitted, said receiver will not accept information contained in said second data packet; and

(2) if said second data packet was preceded by reception, within a predetermined period of time, of a first data packet having an indication that an associated second data packet would be subsequently transmitted, said receiver will accept information contained in both said second data packet and in said first data packet.

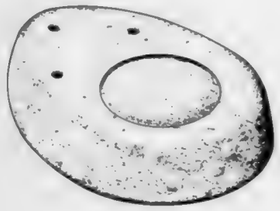
DESIGN PATENTS

GRANTED SEP. 8, 1987

ERRATA

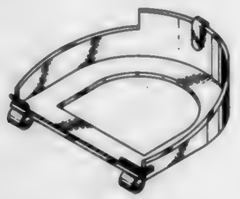
For CLASS	See PATENT NO.
D32-025	291,837

291,740
PET FOOD BISCUIT
Albert Spiel, Yonkers, N.Y.; James Roe, Wayne, and Henry C. Spanier, West Milford, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.
Filed Oct. 12, 1984, Ser. No. 659,902
Term of patent 14 years
U.S. Cl. D1—106





291,741
PROTECTIVE SHIELD FOR SHOE HEELS
Ulysses C. Beaty, 1825 E. 1st St., Lubbock, Tex. 79403
Filed May 3, 1985, Ser. No. 729,935
Term of patent 14 years
U.S. Cl. D2—277



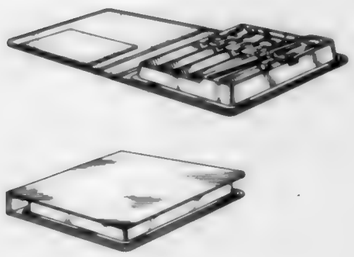
291,742
SHOE HEEL INSERT
Vijay Surpuriya, Memphis, Tenn., and Charles J. Gudas, Hinsdale, Ill., assignors to Scholl, Inc., Memphis, Tenn.
Filed Jun. 22, 1984, Ser. No. 623,758
Term of patent 14 years
U.S. Cl. D2—314



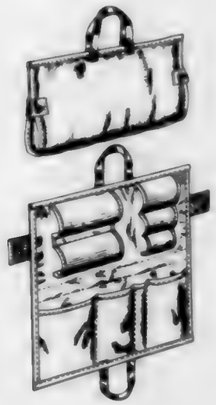
291,743
SHOE SOLE
Masanobu Inohara, and Yoshiaki Hase, both of Akashi, Japan, assignors to Asics Corporation, Japan
Filed Apr. 17, 1985, Ser. No. 724,609
Claims priority, application Japan, Jan. 19, 1985, 60-1436
Term of patent 14 years
U.S. Cl. D2—320



291,744
COMPUTER MAINTENANCE TOOL CARRYING CASE
Robert M. Cohen, Rockville, Md., assignor to Micro Connection, Inc., Marlow, N.H.
Filed Oct. 22, 1984, Ser. No. 663,449
Term of patent 14 years
U.S. Cl. D3—74



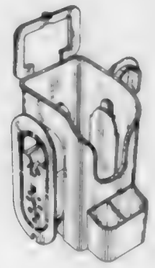
291,745
MEDICAL IMPLEMENT CASE
Ole Q. Hansen, Seminole, Fla., assignor to Buffalo Medical Specialties, Mfg., Inc., St. Petersburg, Fla.
Filed Mar. 4, 1985, Ser. No. 707,751
Term of patent 14 years
U.S. Cl. D3—30.1



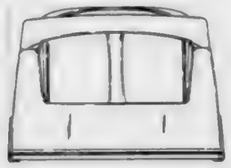
291,746
COMBINED HOLDER FOR POLICE NIGHTSTICK AND FLASHLIGHT
Alan C. Evans, 10333 Leverman Rd., Aumsville, Oreg. 97325
Filed Jun. 29, 1984, Ser. No. 626,198
Term of patent 14 years
U.S. Cl. D3—105



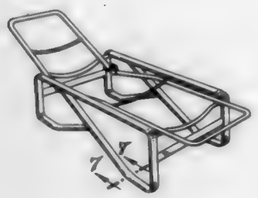
291,747
STORAGE AND CARRYING CONTAINER FOR AN ELECTRIC DRILL AND ACCESSORIES
John M. Bunge, 5 Melton Court, London, SW7, England
Filed Jan. 7, 1985, Ser. No. 689,398
Term of patent 14 years
U.S. Cl. D3—30.1



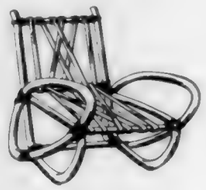
291,748
BABY CHAIR
Kjell Henriksson, Bredaryd, Sweden, assignor to Baby Bjorn Aktiebolag, Bredaryd, Sweden
Filed Nov. 7, 1984, Ser. No. 668,931
Claims priority, application Sweden, May 10, 1984, 84-1490
Term of patent 14 years
U.S. Cl. D6—333



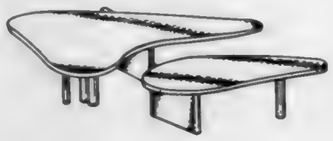
291,749
FRAME FOR AN ADJUSTABLE CHAISE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,240
Term of patent 14 years
U.S. Cl. D6—361



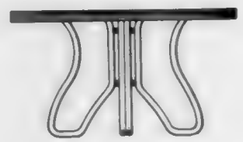
291,750
ARM CHAIR OR SIMILAR ARTICLE
Terrance A. Baroody, Orange Park, and Jerry R. Bass, Green Cove Springs, both of Fla., assignors to Baroody Spence Furniture Industries, Inc., Jacksonville, Fla.
Filed May 30, 1984, Ser. No. 615,372
Term of patent 14 years
U.S. Cl. D6—369



291,751
TABLE
Maurizio Salvato, Gallarate, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,363
Claims priority, application Italy, Sep. 18, 1984, 23174/84[U]
Term of patent 14 years
U.S. Cl. D6—482



291,752
TABLE OR THE LIKE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,237
Term of patent 14 years
U.S. Cl. D6—487

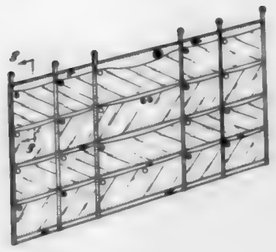


291,753
TOWEL HOLDER
Daniel L. Pool, Paradise Valley, Ariz., assignor to Designer Bathware, Inc., Phoenix, Ariz.
Division of Ser. No. 514,002, Jul. 15, 1983, Pat. No. Des. 283,188. This application Mar. 24, 1986, Ser. No. 845,772
Term of patent 14 years
U.S. Cl. D6—522





291,754
COMBINED BOOK AND MAGAZINE DISPLAY
Judith Griswold, 1101 Southside Dr., Elko, Nev. 89801
Filed Jul. 26, 1985, Ser. No. 759,292
Term of patent 14 years
U.S. Cl. D6—553



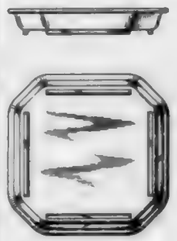
291,755
SPICE RACK
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Aug. 16, 1985, Ser. No. 766,182
Term of patent 14 years
U.S. Cl. D6—566



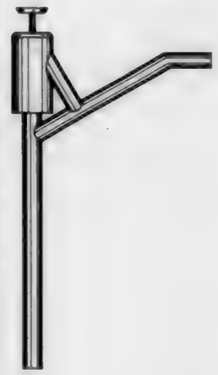
291,756
BAG ORGANIZER
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Aug. 16, 1985, Ser. No. 766,183
Term of patent 14 years
U.S. Cl. D6—566



291,757
PLATE
Joost R. Ritman, Bloemgracht 15-19, 1016 KB Amsterdam, Netherlands
Filed Nov. 23, 1984, Ser. No. 674,265
Term of patent 14 years
U.S. Cl. D7—1



291,758
MANUALLY OPERABLE STRAW
William H. Albury, II, 130 NE. 8th Ave., Boynton Beach, Fla. 33435
Filed Nov. 14, 1985, Ser. No. 804,986
Term of patent 14 years
U.S. Cl. D7—42



291,759
CONDIMENT SHAKER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Feb. 22, 1985, Ser. No. 704,562
Term of patent 14 years
U.S. Cl. D7—84

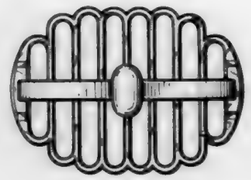


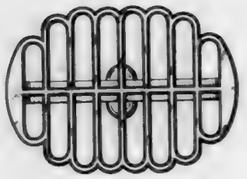


291,760
ROLLING PIN
James C. Fallgatter, and Taria A. Fallgatter, both of 2045 Sea Cove La., Costa Mesa, Calif. 92627
Filed Nov. 16, 1984, Ser. No. 672,416
Term of patent 14 years
U.S. Cl. D7—99



291,761
MASHER
George Hoehne, Glen Cove, N.Y., assignor to Bonny Products, Inc., Lynbrook, N.Y.
Filed Jan. 22, 1985, Ser. No. 692,988
Term of patent 14 years
U.S. Cl. D7—101

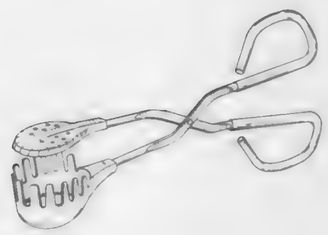




291,762
MEAT TENDERIZER
Raymond D. Collins, Sr., 810 Curtiss, Schertz, Tex. 78154
Filed Feb. 11, 1985, Ser. No. 700,110
Term of patent 14 years
U.S. Cl. D7—101



291,763
COMBINATION PASTA AND VEGETABLE TONGS
James R. Dunn, Fairfield, Conn., and Lee R. Chasen, Port Chester, N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Feb. 21, 1985, Ser. No. 703,937
Term of patent 14 years
U.S. Cl. D7—105



291,764
STEAK KNIFE
Irving L. Mark, Highland Park, Ill., assignor to Tip Top Corporation, Omaha, Nebr.
Filed Jan. 24, 1985, Ser. No. 694,264
Term of patent 14 years
U.S. Cl. D7—151



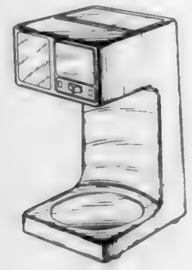
291,765
COFFEE MAKER
Kazuo Takada, Nara; Teruaki Egashira; Yoichi Ikegami, both of Osaka; Kazuhiro Konishi, and Tadao Suzuki, both of Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Jan. 18, 1985, Ser. No. 692,899
Claims priority, application Japan, Jul. 19, 1984, 59-30131
Term of patent 14 years
U.S. Cl. D7—309

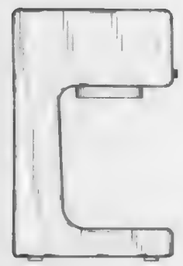




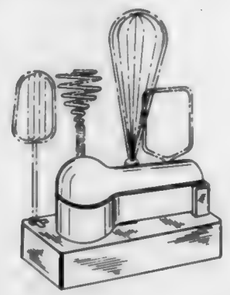


291,766
COFFEEMAKER
Norman A. Steinkamp, La Grange Park, and Dennis N. Burmeister, Libertyville, both of Ill., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Mar. 22, 1985, Ser. No. 715,212
Term of patent 14 years
U.S. Cl. D7—309



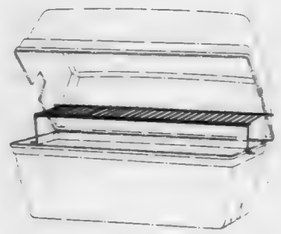


291,767
COMBINED KITCHEN APPLIANCE AND BASE ASSEMBLY
Robert Ozit, Shelton, Conn., assignor to Black & Decker, Inc., Newark, Del.
Continuation of Ser. No. 651,927, Sep. 19, 1984, which is a continuation of Ser. No. 652,059, Sep. 19, 1984. This application Jun. 4, 1986, Ser. No. 870,735
Term of patent 14 years
U.S. Cl. D7—379

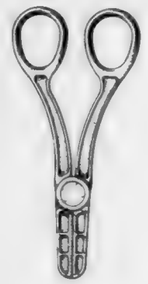


291,768
WARMING RACK
Armand Murphy, Columbus, Ga., assignor to W. C. Bradley Enterprises, Inc., Columbus, Ga.
Filed Nov. 30, 1984, Ser. No. 676,940
Term of patent 14 years
U.S. Cl. D7—408

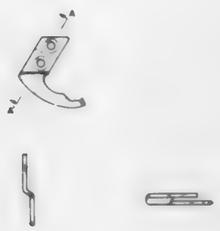




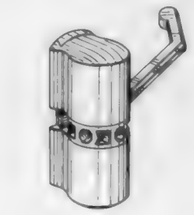
291,769
FLOWER SHEARS
Harland Lemcke, Corona, Calif., assignor to Corona Clipper Co., Corona, Calif.
Filed Jul. 11, 1985, Ser. No. 753,954
Term of patent 14 years
U.S. Cl. D8—4



291,770
ANVIL FOR A STAPLER
Masaho Takami, Hirakata, Japan, assignor to Shoko Kiko Co., Ltd., Shijo Nawate, Japan
Filed May 30, 1984, Ser. No. 615,245
Term of patent 14 years
U.S. Cl. D8—50

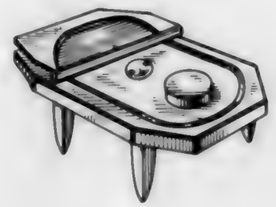


291,771
DOOR CLOSER
Fred Vandergeest, 131 Finchdene Square, Units 1 & 2, Scarborough, Ontario, Canada M1X 1A6
Filed Nov. 21, 1985, Ser. No. 806,023
Term of patent 14 years
U.S. Cl. D8—330

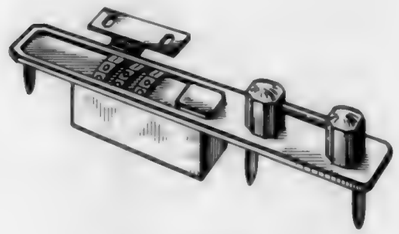




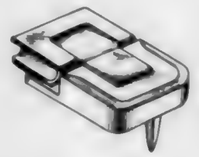
291,772
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Jun. 14, 1984, Ser. No. 620,423
Claims priority, application Hague, Dec. 15, 1983, 73673
The portion of the term of this patent subsequent to Oct. 30, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—331



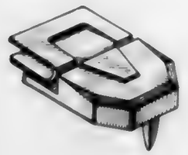
291,773
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Aug. 14, 1984, Ser. No. 640,520
Claims priority, application Hague, Mar. 30, 1984, 73939
Term of patent 14 years
U.S. Cl. D8—331



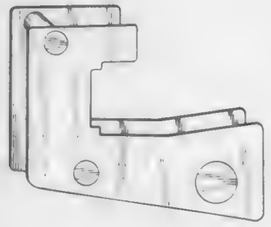
291,774
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Oct. 12, 1984, Ser. No. 660,064
The portion of the term of this patent subsequent to Sep. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—341



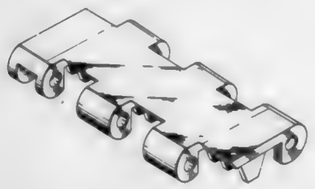
291,775
LUGGAGE LOCK
Urs Gisiger, Selzach, Switzerland, assignor to Amiet AG, Switzerland
Filed Oct. 12, 1984, Ser. No. 660,095
The portion of the term of this patent subsequent to Sep. 8, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—341



291,776
CABLE CONNECTING PULL FOR AN AUTOMATIC DEAD END AND A TENSIONING DEVICE
Dale E. Miller, 27500 Idaho St., Bonita Springs, Fla. 33923
Filed Nov. 19, 1984, Ser. No. 673,148
Term of patent 14 years
U.S. Cl. D8—382



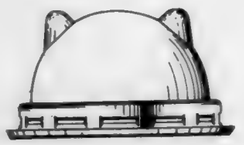
291,777
CONVEYOR BELT MODULE
James M. Lapeyre, New Orleans, and William G. Faulkner, Marrero, both of La., assignors to The Laitram Corporation, New Orleans, La.
Filed Nov. 15, 1985, Ser. No. 805,240
Term of patent 14 years
U.S. Cl. D9—499



291,778
BOTTLE, OR SIMILAR ARTICLE
Karen A. Rosenwinkel, Oak Park, Ill., assignor to W. Braun Company, Chicago, Ill.
Division of Ser. No. 598,228, Apr. 9, 1984, Pat. No. Des. 287,823. This application Jun. 9, 1986, Ser. No. 872,463
Term of patent 14 years
U.S. Cl. D9—413



291,779
CAP FOR PACKAGES
Koichi Inaba, 1994 Denpo Takishita, Fuji-shi, Shizuoka-ken, Japan
Filed Dec. 13, 1984, Ser. No. 681,330
Claims priority, application Japan, Jun. 22, 1984, 59-25866
Term of patent 14 years
U.S. Cl. D9—445



291,780
DISPENSING NOZZLE FOR CONTAINER
Fred E. Guttormson, Minnetonka, Minn., assignor to C. R. Mfg. Co., Mound, Minn.
Filed Mar. 29, 1985, Ser. No. 717,894
Term of patent 14 years
U.S. Cl. D9—447



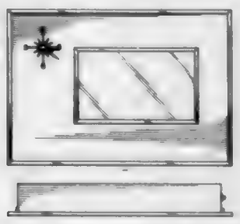
291,781
COMBINED OIL SPOUT AND VALVE
Loren A. Jacobson, 14825 Camero Ln., Rosemount, Minn. 55068
Filed Nov. 19, 1984, Ser. No. 672,459
Term of patent 14 years
U.S. Cl. D9—448



291,782
AEROSOL CAN OVERCAP
William J. O'Neil, Jr., Cincinnati, Ohio; Daniel J. Sims, Belleville, Mich., and Randy Embertson, Cincinnati, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Feb. 22, 1985, Ser. No. 704,126
Term of patent 14 years
U.S. Cl. D9—448



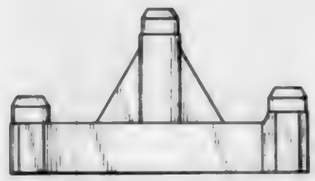
291,783
COMBINED CLOCK AND AQUARIUM OR THE LIKE
Walter Baumer, 1120 Nightingale Ave., Miami Springs, Fla. 33166
Filed Dec. 23, 1985, Ser. No. 812,370
Term of patent 14 years
U.S. Cl. D10—2

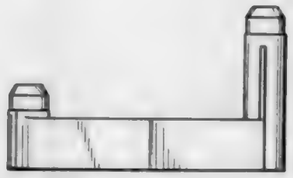


291,784
COMBINED WATCH AND BRACELET
Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 17, 1985, Ser. No. 724,312
Claims priority, application Italy, Oct. 23, 1984, 36175/84[U]
Term of patent 14 years
U.S. Cl. D10—32



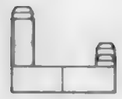
291,785
ADAPTOR FOR ADJUSTING THE AIM OF AN AUTOMOBILE HEADLIGHT
Selim R. Rahme, 33514 Jefferson, St. Clair Shores, Mich. 48082
Filed Mar. 1, 1985, Ser. No. 707,402
Term of patent 14 years
U.S. Cl. D10—46





291,786
ADAPTOR FOR ADJUSTING THE AIM OF AN AUTOMOBILE HEADLIGHT
Selim R. Rahme, 33514 Jefferson, St. Clair Shores, Mich. 48062
Filed Mar. 1, 1985, Ser. No. 707,403
Term of patent 14 years
U.S. Cl. D10—46

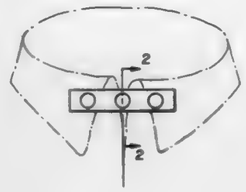




291,787
JOYSTICK CONTINUITY TESTER
Robert L. Sheldon, 8659 University Point Cir. NE., Bremerton, Wash. 98310
Filed May 17, 1985, Ser. No. 735,826
Term of patent 14 years
U.S. Cl. D10—78

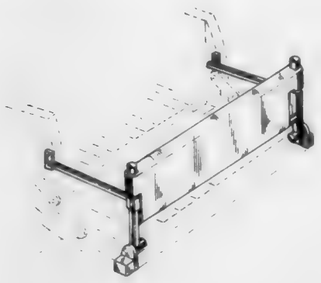


291,788
COLLAR ORNAMENT
Earl R. Caulkins, P.O. Box 1173, Fallon, Nev. 89406
Filed Oct. 25, 1984, Ser. No. 664,750
Term of patent 14 years
U.S. Cl. D11—213

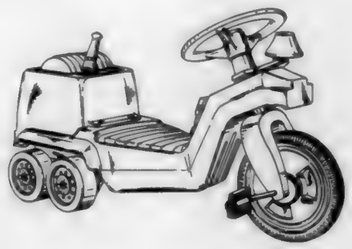




291,789
TRUCK BED EXTENSION
Robert A. Noga, 13404 Calais Dr., Del Mar, Calif. 92014
Filed Oct. 24, 1984, Ser. No. 664,077
Term of patent 14 years
U.S. Cl. D12—98



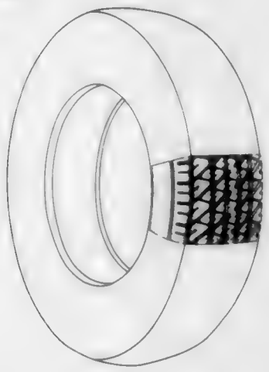
291,790
CHILDREN'S RIDE-ON SIMULATED DUMP TRUCK
Michael J. Clarke, Plantsville; Paul S. Santaraiero, Avon, and John P. Kearney, West Suffield, all of Conn., assignors to Coleco Industries, Inc., West Hartford, Conn.
Filed Feb. 11, 1985, Ser. No. 700,437
Term of patent 14 years
U.S. Cl. D12—108



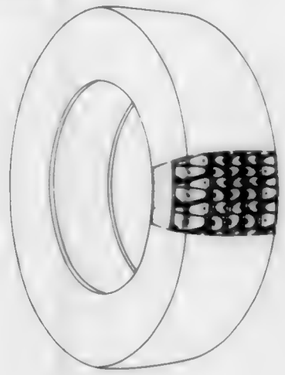
291,791
FOLDING WALKER
Lewis Bean, R.F.D. 8, #302, Claremore, Okla. 74017
Filed Jan. 25, 1985, Ser. No. 694,837
Term of patent 14 years
U.S. Cl. D12—130



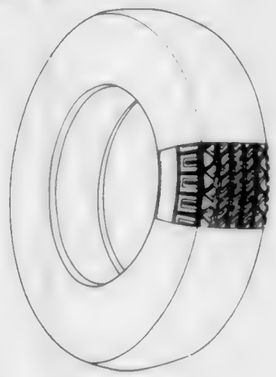
291,792
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,521
Term of patent 14 years
U.S. Cl. D12—147



291,793
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin et Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,744
Term of patent 14 years
U.S. Cl. D12—147



291,794
TIRE
Kevin F. Clemens, Simpsonville, S.C., assignor to Michelin Recherche et Technique, Switzerland
Filed Feb. 28, 1985, Ser. No. 706,745
Term of patent 14 years
U.S. Cl. D12—147



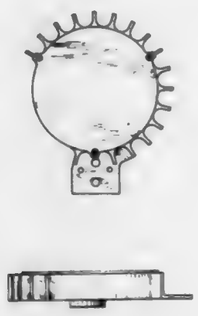
291,795
RADIATOR GRILLE
Ryoichi Sasaoka, Yokosuka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 30, 1985, Ser. No. 739,457
Term of patent 14 years
U.S. Cl. D12—163



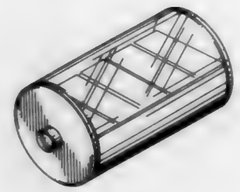
291,796
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Aug. 26, 1985, Ser. No. 769,514
Term of patent 14 years
U.S. Cl. D12—209



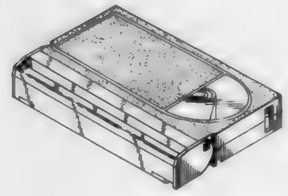
291,797
ELECTRIC MOTOR HOUSING
Wolfgang Spiegelstein, Glendale, Calif., assignor to Kennedy Company, Monrovia, Calif.
Filed Dec. 18, 1984, Ser. No. 683,301
Term of patent 14 years
U.S. Cl. D13—1



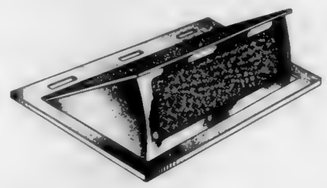
291,798
SOLAR BATTERY
Raymond F. Curiel, P.O. Box 30355, Phoenix, Ariz. 85046
Filed Oct. 18, 1984, Ser. No. 662,362
Term of patent 14 years
U.S. Cl. D13—8



291,799
VIDEOCASSETTE
Anne L. Marshall, Elmhurst, and Michael S. Joss, Chicago, both of Ill., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Mich.
Filed Apr. 26, 1985, Ser. No. 727,559
Term of patent 14 years
U.S. Cl. D14—11

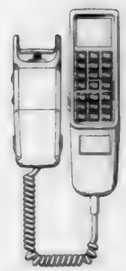


291,800
RETRACTABLE SPEAKER ENCLOSURE
Allen M. Morris, Rte. 9 Box 184, Benton, Ky. 42025
Filed Apr. 19, 1985, Ser. No. 725,310
Term of patent 14 years
U.S. Cl. D14—33

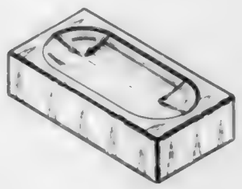


291,801
COMBINATION HANDSET AND STAND CELLULAR TELEPHONE UNIT
Takeshi Suzuki, and Mamoru Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,978
Claims priority, application Japan, Aug. 8, 1984, 59-33631
Term of patent 14 years
U.S. Cl. D14—53

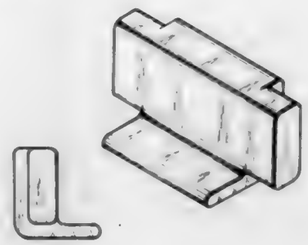




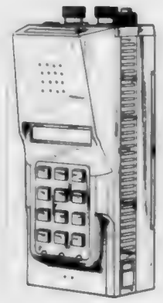
291,802
IMPLEMENT FOR ACTIVATING AND DEACTIVATING A TELEPHONE HOOK SWITCH
Robert D. Mantell, 3135 N. Ellington Dr., Los Angeles, Calif. 90068
Filed Jul. 18, 1985, Ser. No. 756,241
Term of patent 14 years
U.S. Cl. D14—59

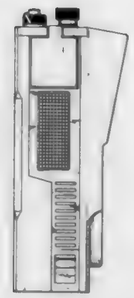


291,803
IMPLEMENT FOR ACTIVATING AND DEACTIVATING A TELEPHONE HOOK SWITCH
Robert D. Mantell, 3135 N. Wellington Dr., Los Angeles, Calif. 90068
Filed Jul. 18, 1985, Ser. No. 756,242
Term of patent 14 years
U.S. Cl. D14—59

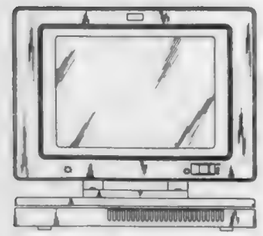


291,804
PORTABLE RADIO TELEPHONE AND FM TWO-WAY RADIO
David L. George, Indianapolis, Ind., assignor to Uniden Corporation, Indianapolis, Ind.
Filed Jan. 27, 1986, Ser. No. 822,469
Term of patent 14 years
U.S. Cl. D14—64

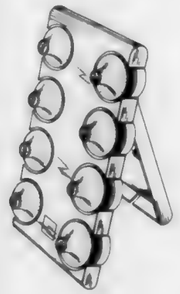




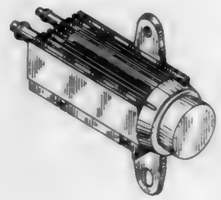
291,805
ADJUSTABLE DISPLAY TERMINAL
Michael H. Sharp, Palmhall Close, England, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 27, 1984, Ser. No. 675,928
Claims priority, application United Kingdom, May 30, 1984, 1019970
Term of patent 14 years
U.S. Cl. D14—113



291,806
MULTIPLE CONTROL ELEMENT UNIT FOR DATA PROCESSING APPARATUS
Ronald I. Conway, Port Ewen; Samuel A. Lucente, Glenford, and David L. Schaum, Woodstock, all of N.N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 24, 1984, Ser. No. 664,125
Term of patent 14 years
U.S. Cl. D14—114



291,807
ELECTRIC VACUUM REGULATOR VALVE FOR USE WITH AUTOMOTIVE EMISSIONS CONTROL
Kwang Yew, and Hugh S. Carrothers, both of Chatham, Canada, assignors to Canadian Fram Limited, Chatham, Canada
Filed Aug. 30, 1984, Ser. No. 646,347
Term of patent 14 years
U.S. Cl. D15—5



291,808
SUNGLASSES
Bernhard Meyerspeer, Zell am See, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Oct. 9, 1984, Ser. No. 659,190
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 11AR1618/84
Term of patent 14 years
U.S. Cl. D16—102



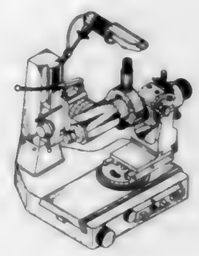
291,809
GUITAR PICK
Robert S. Jasper, 16581 Buena Vista, Orange, Calif. 92665
Filed Nov. 1, 1985, Ser. No. 793,920
Term of patent 14 years
U.S. Cl. D17—20



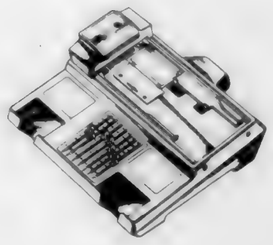
291,810
TYPING UNIT
Vid Bratsovec, Koper, Yugoslavia, assignor to Iskra-Delta, Proizvodnja Racunalniskih Sistemov in Inzeniring, P.O., Ljubljana, Yugoslavia
Filed Nov. 5, 1985, Ser. No. 795,110
Claims priority, application Yugoslavia, May 6, 1985, 210/85
Term of patent 14 years
U.S. Cl. D18—12



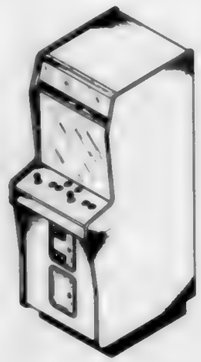
291,811
ENGRAVER FOR FINGER RING AND BRACELET
Yen-Shen Jen, No. 64, Alley 75, Ya-Pin Lane, Sec. 3, Du-Hsin Road, Pan Chiao City, Taipei Hsien, Taiwan
Filed Aug. 9, 1985, Ser. No. 764,178
Term of patent 14 years
U.S. Cl. D18—13



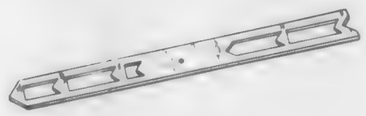
291,812
VARIABLE DATA IMPRINTER
Eric G. Giagras, Reston, Va., assignor to Security Imprinter Corporation, Walkersville, Md.
Filed May 7, 1985, Ser. No. 731,575
Term of patent 14 years
U.S. Cl. D18—14



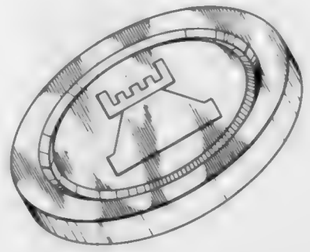
291,813
VIDEO GAME CABINET
Lance N. Barr, Redmond, Wash., assignor to Nintendo of America Inc., Redmond, Wash.
Filed May 9, 1985, Ser. No. 732,505
Term of patent 14 years
U.S. Cl. D21—13



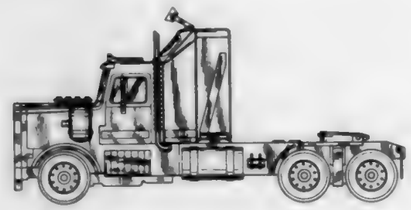
291,814
APERTURED SPINNER FOR A GAME BOARD
Abele Cafaro, Jr., 51 Lockwood Ave., Howell, N.J. 07731
Filed Mar. 14, 1985, Ser. No. 711,619
Term of patent 14 years
U.S. Cl. D21—22



291,815
POP TOP CHESS GAME PIECE
Michael Harris, Rte. 1, Hennessey, Okla. 73742
Filed Aug. 16, 1984, Ser. No. 641,504
Term of patent 14 years
U.S. Cl. D21—52



291,816
TOY TRUCK
Howard N. Bollinger; Mark D. Boudreaux; Robert E. Cordrey; Charles E. Ligon; David A. Myers; Walter E. Stroud, all of Cincinnati, Ohio; Earl M. Wood, Jr., Newport, Ky., and Jan Van de Merwe, III, Cincinnati, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 14, 1985, Ser. No. 701,581
Term of patent 14 years
U.S. Cl. D21—134



291,817
FINGER PUPPET OR SIMILAR ARTICLE
A. Edward Fogarty; Bonnie R. Fogarty, both of Sarasota, Fla., and Sabrina M. Danna, West Warick, R.I., assignors to Hasbro-Bradley, Pawtucket, R.I.
Filed Apr. 29, 1985, Ser. No. 728,603
Term of patent 14 years
U.S. Cl. D21—153



291,818
TALKING BEAR
Earl K. Forsse, Granada Hills, Calif., assignor to Alchemy II, Inc., Chatsworth, Calif.
Filed Oct. 3, 1984, Ser. No. 657,178
Term of patent 14 years
U.S. Cl. D21—159



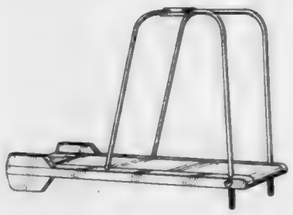
291,819
TOY STUFFED FIGURE OR SIMILAR ARTICLE
Thomas P. Schneider, Westlake, and Susan E. Trentel, Lakewood, both of Ohio, assignors to Those Characters From Cleveland, Inc., Cleveland, Ohio
Filed Oct. 7, 1985, Ser. No. 784,957
Term of patent 14 years
U.S. Cl. D21—161



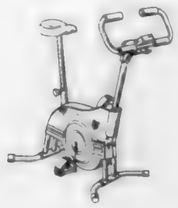
291,820
FRAME FOR BARBELL WEIGHTS OR SIMILAR ARTICLE
Stanley R. Carter, Jr., 1945 Mathew Dr., Layton, Utah 84041
Filed May 22, 1985, Ser. No. 736,958
Term of patent 14 years
U.S. Cl. D21—191



291,821
EXERCISE TREADMILL
Heikki Kiiski, Turku, Finland, assignor to Tunturipyörä OY, Turku, Finland
Filed Mar. 12, 1985, Ser. No. 710,666
Claims priority, application Finland, Dec. 13, 1984, 1182/84
Term of patent 14 years
U.S. Cl. D21—192



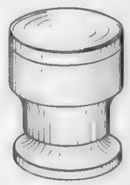
291,822
EXERCISE BICYCLE
King Liu, No. 19, Shun Fan Road, Ta Chia Chen, Taichung Hsien, Taiwan
Filed Jun. 3, 1985, Ser. No. 740,222
Term of patent 14 years
U.S. Cl. D21—194



291,823
EXERCISE ROWING MACHINE
David B. Smith, Mercer Island, and Randolph F. Miller, Mt. Vernon, both of Wash., assignors to Precor Incorporated, Redmond, Wash.
Filed Sep. 16, 1985, Ser. No. 775,182
Term of patent 14 years
U.S. Cl. D21—195



291,824
FAUCET KNOB
Bethany Lathrop, Los Angeles, Calif., assignor to Aloys F. Dornbracht GmbH & Co., Iserlohn, Fed. Rep. of Germany
Filed Oct. 18, 1985, Ser. No. 789,059
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, MR 7435
Term of patent 14 years
U.S. Cl. D23—28

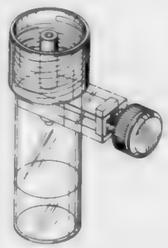


291,825
AQUARIUM FILTER CARTRIDGE
Jerome Goldman, New York; Marvin Goldman, Great Neck, and Gerald Phillips, Glen Cove, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.
Filed Dec. 21, 1984, Ser. No. 685,140
Term of patent 14 years
U.S. Cl. D23—4





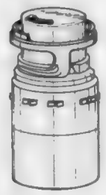
291,826
FLOW CONTROLLER VALVE
Mitchell E. Maddock, 541 W. Coolidge Ave., Coolidge, Ariz. 85228
Filed Jul. 16, 1984, Ser. No. 631,247
Term of patent 14 years
U.S. Cl. D23—19



291,827
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,683
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34



291,828
VIAL ENCLOSURE
Mark E. Larkin, Lindenhurst; Edward S. Tripp, Park City, and Richard A. Johnson, Winthrop Harbor, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Feb. 7, 1985, Ser. No. 699,518
Term of patent 14 years
U.S. Cl. D24—56



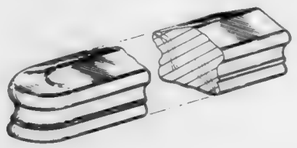
291,829
NEBULIZER
Albert H. Torongo, Yardley, Pa., and Thomas B. Aldrich, III, Spring Valley, N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Mar. 21, 1985, Ser. No. 714,527
Term of patent 14 years
U.S. Cl. D24—62



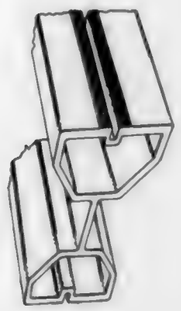
291,830
FINGER SPLINT
John F. Murtaugh, III, 3060 Tecumseh Ct., Tucson, Ariz. 85715; Carol A. Rae, 6720 N. Camino Padre Isidoro, Tucson, Ariz. 85718, and Arnold J. Arem, 460 S. Colonia Ave., Tucson, Ariz. 85711
Filed Mar. 22, 1985, Ser. No. 714,833
Term of patent 14 years
U.S. Cl. D24—64



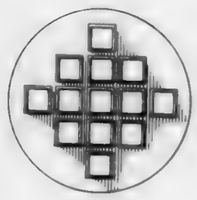
291,831
HAND RAIL
John B. Noyce, Grosse Ile, Mich., assignor to Manufacturer's Merchandising Corporation, Grosse Ile, Mich.
Filed Sep. 21, 1984, Ser. No. 652,674
Term of patent 14 years
U.S. Cl. D25—73



291,832
STRUCTURAL BEAM
Lars-Birger Lundström, Skelleftetl, Sweden, assignor to HB Megaron, Skelleftea, Sweden
Filed Aug. 21, 1984, Ser. No. 642,942
Claims priority, application Sweden, Feb. 21, 1984, 84-0570
Term of patent 14 years
U.S. Cl. D25—77



291,833
MANHOLE COVER
John E. (Bud) Shore, 11422 - 75 Avenue, Edmonton, Alberta T5G 0H7; Cornelius P. Smythe, 49 Farrell Properties, 52307 Range Road, 213, Sherwood Park, Alberta T8G 1C1, and Jack W. McKinley, Ste. 207, 9909 - 104 Street, Edmonton, Alberta, all of Canada
Filed May 7, 1984, Ser. No. 608,074
Term of patent 14 years
U.S. Cl. D25—36





291,834
SYNTHETIC RESIN TUBE
Yoshiyuki Matsui, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Japan
Filed Oct. 22, 1984, Ser. No. 663,721
Claims priority, application Japan, Apr. 24, 1984, 59-16455
Term of patent 14 years
U.S. Cl. D25—73



291,835
LUMINAIRE
Anthony J. Michael, 4205 Adobe Dr., Tallahassee, Fla. 32303
Filed Oct. 29, 1984, Ser. No. 666,160
Term of patent 14 years
U.S. Cl. D26—24

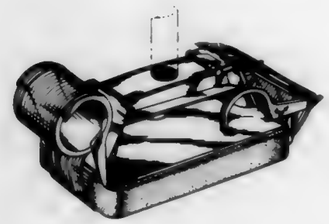




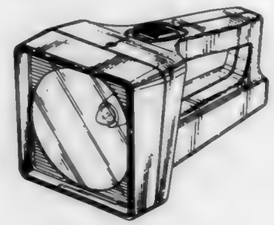
291,836
FLASHLIGHT
Raymond A. Benoit, 9, rue des Peupliers, 78 790 Septeuil, France
Filed Aug. 14, 1984, Ser. No. 640,617
Claims priority, application France, Feb. 15, 1984, 840658
Term of patent 14 years
U.S. Cl. D26—37



291,837
HEAD FOR AN ADHESIVE TAPE CLEANER
Leonard N. Flemming, 326 Blitch St., Valdosta, Ga. 31601
Filed Nov. 13, 1984, Ser. No. 670,298
Term of patent 14 years
U.S. Cl. D32—25



291,838
RECHARGEABLE FLASHLIGHT
Tse T. Tung, New Territories, Hong Kong, assignor to Motor Electric Manufacturing Co., Ltd., Kwai Chung, Hong Kong
Filed Apr. 8, 1985, Ser. No. 721,065
Claims priority, application United Kingdom, Dec. 4, 1984, 1023697
Term of patent 14 years
U.S. Cl. D26—48



291,839
CARPET SCRAPER
Steve Phillips, 910 Wildwood Rd., Mahtomedi, Minn. 55115
Filed Apr. 22, 1985, Ser. No. 725,748
Term of patent 14 years
U.S. Cl. D32—49



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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-DEC, Inc.: *See*—
Austin, George K., Jr.; and Lietz, Larry D., 4,691,948, Cl. 292-171.000.

A. Konrad Feinmechanik AG.: *See*—
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A/S Modulex: *See*—
Borresen, Peter A., 4,692,198, Cl. 156-235.000.

A. W. Chesterton Company: *See*—
Sudol, Walter J.; and Habich, Michael P., 4,691,927, Cl. 277-26.000.

A. Y. McDonald Manufacturing Co.: *See*—
Zorb, Larry D.; and Wicklund, L. Harvey, 4,691,727, Cl. 137-15.000.

Aaserude, Gordon V. Apparatus for hanging items from vehicles. 4,691,851, Cl. 224-42.45R.

AB Electrolux: *See*—
Andreasson, Bo C.; and Rangert, Bo R., 4,692,753, Cl. 340-671.000.
Blomberg, Peter E.; and Gurt, Sven A., 4,691,529, Cl. 62-332.000.

AB Volvo: *See*—
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.

Abe, Kazuyoshi: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Abe, Yuichi: *See*—
Seko, Yasutoshi; and Abe, Yuichi, 4,692,798, Cl. 358-93.000.

Abel, William E., to Sentrol, Inc. Moisture detector. 4,692,752, Cl. 340-604.000.

Abele, Berthold W., to KSA Dichtsysteme GmbH. Anti-vibrational electrical-conductivity-conformed seal arrangement. 4,691,928, Cl. 277-235.00B.

Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Aligned plug optical fiber connector with "contiguous" plugs, and method for using same. 4,691,986, Cl. 350-96.210.

Abolins, Visvaldis, to General Electric Company. Flame retardant polyphenylene ether composition containing polybrominated diphenyoxybenzene and antimony oxide. 4,692,490, Cl. 524-371.000.

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Monsigny, Jean, 4,691,938, Cl. 280-804.000.

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Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., to News Log International, Inc. Method and apparatus for reading a data record carrier. 4,692,913, Cl. 369-44.000.

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Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,692,497, Cl. 525-263.000.

Acuto, Giovanni: *See*—
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, 4,691,946, Cl. 248-429.000.

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Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

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Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.

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Adamtek Corporation: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

ADE Corporation: *See*—
Poduje, Noel S., 4,692,695, Cl. 324-158.00R.

Adeka Argus Chemical Co., Ltd.: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

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Peer, A. Dean, Jr., 4,691,858, Cl. 206-621.200.

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Powell, Philip E., 4,692,200, Cl. 156-289.000.

Advanced Extraction Technologies, Inc.: *See*—
Mehra, Yuv R., 4,692,179, Cl. 62-17.000.

Advanced Micro Devices, Inc.: *See*—
Bemis, Gerald L., 4,692,894, Cl. 364-900.000.
Fang, Sheng; and Lee, Sam H., 4,692,634, Cl. 307-272.100.
New, Bernard J., 4,692,888, Cl. 364-728.000.
Sokolovsky, Paul J., 4,691,747, Cl. 140-147.000.

Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., to General Connectors Corporation. Shroud for aircraft duct. 4,691,741, Cl. 138-113.000.

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Agip Petroli, S.p.A.: *See*—
Santambrogio, Alberto; and Mattei, Luciano, 4,692,170, Cl. 44-63.000.

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Komulainen, Viljo S., 4,691,751, Cl. 144-357.000.

Aine, Harry E. Immersed thermal fluid flow sensor. 4,691,566, Cl. 73-204.000.

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Bauman, Bernard D.; and Burdick, Patricia E., 4,692,470, Cl. 521-55.000.

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Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.
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Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Akamatsu, Hideo: *See*—
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.

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Tenma, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, 4,692,876, Cl. 364-513.000.

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Maehara, Toshifumi, 4,691,969, Cl. 303-113.000.
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Ryohei, Yamamoto; Shigeki, Kimura; and Akira, Matsuura, 4,692,330, Cl. 424-85.000.

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Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

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Akzona Incorporated: *See*—
Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, 4,692,365, Cl. 428-87.000.

Albright & Wilson Ltd.: *See*—
Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., 4,692,271, Cl. 252-354.000.

Alcatel: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,692,932, Cl. 375-107.000.

Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., to Thermco Systems, Inc. Semiconductor wafer furnace door. 4,692,115, Cl. 432-242.000.

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Livingston, Virginia W.; Alexander-Jackson, Eleanor G.; and Livingston, Alton M., 4,692,412, Cl. 435-253.000.

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Haar, Thomas, 4,691,817, Cl. 198-468.200.

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Ward, Richard; and Allen, Archelaius D., 4,692,067, Cl. 405-302.000.

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Allen, Mark S.: *See*—
Allen, Danny T.; and Allen, Mark S., 4,692,195, Cl. 156-98.000.

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Durst, Felix, 4,691,764, Cl. 165-68.000.

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Scott, Michael J., 4,691,458, Cl. 40-300.000.

Alliance Research Corporation: *See*—
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James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.
Portolese, Larry A.; and Leathers, Thomas M., 4,691,730, Cl. 137-101.000.
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., 4,691,968, Cl. 303-52.000.
Sebo, Milan J., 4,691,737, Cl. 137-625.260.
Taig, Alistair G., 4,691,583, Cl. 74-422.000.
Wright, Allen B.; and Chichester, Willard L., 4,692,177, Cl. 55-499.000.

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Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., 4,691,741, Cl. 138-113.000.

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Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.

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Hanrot, Jean-Pascal; and Volpeliere, Jacky, 4,692,068, Cl. 405-89.000.

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Carpenter, Peter F., 4,692,144, Cl. 604-56.000.
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,692,326, Cl. 424-15.000.
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Amada Engineering & Service Co., Inc.: *See*—
Lim, Gnian C., 4,692,664, Cl. 315-60.000.

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Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

Amano Pharmaceutical Co., Ltd.: *See*—
Ryohei, Yamamoto; Shigeki, Kimura; and Akira, Matsuura, 4,692,330, Cl. 424-85.000.

American Cyanamid Company: *See*—
Medwid, Jeffrey B.; and Torley, Lawrence W., 4,692,449, Cl. 514-254.000.

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American Home Products Corporation: *See*—
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Coldren, Daniel R., 4,691,981, Cl. 439-816.000.
Marzili, Joseph C.; and Stephenson, Brian D., 4,691,977, Cl. 439-404.000.

Ampex Corporation: *See*—
Steele, Robert, 4,692,819, Cl. 360-72.100.

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Ciongoli, Bernard M., 4,692,878, Cl. 364-518.000.

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Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., to Peco Controls Corporation. Filler line monitoring system. 4,691,496, Cl. 53-53.000.

Anderson, Steven. Seed planter attachment. 4,691,645, Cl. 111-86.000.

Anderson, Thomas L., to Craig Systems Corporation. Shelter. 4,691,483, Cl. 52-79.100.

Anderson, Walter F., to Calmar, Inc. Precise output pump sprayer. 4,692,103, Cl. 417-547.000.

Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, to Oki Electric Industry Co., Ltd. Wire dot-printing head. 4,692,043, Cl. 400-124.000.

Ando, Yujiro; and Kaneko, Shuzo, to Canon Kabushiki Kaisha. Image forming method and apparatus therefor. 4,692,779, Cl. 346-153.100.

Andoh, Munesato, to Jidosha Kiki Co., Ltd. Master cylinder. 4,691,519, Cl. 60-535.000.

Andreau, Herve: *See*—
Junino, Alex; Lang, Gerard; Andreau, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.

Andreas Stihl: *See*—
Hoppner, Klaus; and Kiefel, Bernhard, 4,691,681, Cl. 123-556.000.

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Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.

Angell, Richard G., Jr., to Union Carbide Corporation. Molding method using fast curing fiber reinforced, low viscosity thermosetting resin. 4,692,291, Cl. 264-109.000.

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Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.
Unger, Hans-Georg, 4,691,991, Cl. 350-96.330.

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Kimura, Seiichiro; and Aoki, Hidekazu, 4,692,583, Cl. 219-121.00L.

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Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

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Yoshida, Shoji; Haru, Yasuhiko, Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

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Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

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Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Arbogast, William C., Jr., to AMP Incorporated. Dual slot electrical contact and method of making same. 4,692,121, Cl. 439-874.000.

Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., to Delkor Technik (Proprietory) Ltd. of Delkor House. Apparatus and a method for separating one solid component from another solid component in suspension in a liquid. 4,692,240, Cl. 209-254.000.

Archery Designs, Inc.: *See*—
Peck, Paul L., 4,691,683, Cl. 124-35.00A.

Arendorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, to Strom-Tec, Inc. Knee support. 4,691,697, Cl. 128-80.00L.

Arieh, Simon: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Arkansas Precision Hydraulics, Inc.: *See*—
Purkott, Hans D., 4,691,617, Cl. 91-167.00R.

Armstrong, Max D., to Williams, Robert J., a part interest. Automatic or standard transmission handling device. 4,691,904, Cl. 269-17.000.

Arnco Corporation: *See*—
Conti, Allen C., 4,692,063, Cl. 405-177.000.

Arneson, Howard M. Article buffing apparatus and method. 4,691,400, Cl. 15-3.000.

Arnold, George D. Mc.: *See*—
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.

Arpino, Ronald G.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

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Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, 4,692,169, Cl. 44-51.000.

Arseneau, Roger E., to Siemens Gammasonics, Inc. Method and integrator circuit for integrating signals, in particular for scintillation gamma camera. 4,692,890, Cl. 364-733.000.

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Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.

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Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Takami, Satoshi, 4,692,005, Cl. 354-21.000.

Asakura, Osamu: *See*—
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.

Asano, Kozo: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Asano, Masamichi: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

Asano, Shinzo, to Asano Tekkosho Co., Ltd.; and Fsk Co., Ltd. Ink-applying mechanism of a printing machine having a reciprocative printing roll. 4,691,630, Cl. 101-212.000.

Asano Tekkosho Co., Ltd.: *See*—
Asano, Shinzo, 4,691,630, Cl. 101-212.000.

Asbestos Institute, The: *See*—
Le Van Mao, Raymond, 4,692,424, Cl. 502-68.000.

Ashihara, Yoshihiro; and Kasahara, Yasushi, to Fujirebio Kabushiki Kaisha. Method of measuring biological ligand by the use of enzymes. 4,692,404, Cl. 435-5.000.

Ashland Oil, Inc.: *See*—
Schneider, James T.; and Haugse, Albert L., 4,692,479, Cl. 523-209.000.

Asmussen, Jes: *See*—
Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., 4,691,662, Cl. 118-50.100.

Aspen Laboratories, Inc.: *See*—
McCune, William L., 4,691,738, Cl. 137-627.500.

AT&T Bell Laboratories: *See*—
Campbell, Eric R.; and Moss, Joe B., 4,692,564, Cl. 174-92.000.
Elliott, Roger A.; and Lindquist, Wayne V., 4,692,918, Cl. 370-85.000.
Shoji, Masakazu, 4,692,637, Cl. 307-443.000.

Atlantic Richfield Company: *See*—
Fudge, Kent D., 4,692,471, Cl. 521-59.000.
Ingram, Alvin R.; and DiGiulio, Adolph V., 4,692,472, Cl. 521-60.000.
Larson, Harold V.; and Gillman, Hyman D., 4,692,535, Cl. 549-542.000.

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Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, 4,692,902, Cl. 365-210.000.

Attwood, Brian E. Harmonic-resonant power supply. 4,692,851, Cl. 363-16.000.

Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, to VerTech Treatment Systems, Inc. Method of removing scale from wet oxidation treatment apparatus. 4,692,252, Cl. 210-761.000.

Aubert, Paul: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,691,597, Cl. 74-869.000.

Aubree, Jean: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,692,932, Cl. 375-107.000.

Auburn Gear, Inc.: *See*—
Engle, James L., 4,692,049, Cl. 403-1.000.

Auel, RaeAnn M.; Jolson, Joseph D.; and Stewart, David A., to Mine Safety Appliances Company. Electrochemical determination of formaldehyde. 4,692,220, Cl. 204-1.00T.

Auer, Robert E., to Coulter Corporation. Method of and apparatus for detecting change in the breakoff point in a droplet generation system. 4,691,829, Cl. 209-3.100.

Aug. Winkhaus GmbH & Co. KG: *See*—
Mayer, Siegfried; and Greisner, Paul, 4,691,950, Cl. 292-269.000.

Aul, George N.: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.

Aur Hydropower Limited: *See*—
Smith, Iain M., 4,691,514, Cl. 60-503.000.

Auracher, Franz, to Siemens Aktiengesellschaft. Arrangement for producing a junction between a microstrip line and a coplanar transmission line. 4,692,720, Cl. 333-33.000.

Aurichio, Joseph A.: *See*—
Goswami, Jagadish C.; and Aurichio, Joseph A., 4,692,272, Cl. 252-514.000.

Austin, George K., Jr.; and Lietz, Larry D., to A-DEC, Inc. Fail-secure lock system. 4,691,948, Cl. 292-171.000.

Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., to Board of Regents, University of Washington. Thermal cautery system. 4,691,703, Cl. 128-303.100.

Auto-Flush Systems Ltd.: *See*—
Gilmour, Alfred J., 4,691,748, Cl. 141-165.000.

Automated Tapping Systems Inc.: *See*—
Pfister, William R.; and Pfister, William H., 4,692,072, Cl. 408-124.000.

Automotive Products Plc: *See*—
Maycock, Ian C.; and Hodgson, Derek, 4,691,815, Cl. 192-98.000.
Wimbush, Maurice J., 4,691,814, Cl. 192-91.00A.

AVA International Corporation: *See*—
Akkerman, Neil H.; and Vazquez, Gonzalo, 4,691,893, Cl. 251-14.000.

Aviram, Ari; and Shih, Kwang K., to International Business Machines Corporation. Interface resistance and knee voltage enhancement in resistive ribbon printing. 4,692,044, Cl. 400-241.100.

Avni, Zion: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.

Ayedi, Hassine: *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Azdel, Inc.: *See*—
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,692,375, Cl. 428-299.000.

B. D. Wait Co. Limited: *See*—
Shepherd, Charles G.; and Travale, Samuel, 4,691,689, Cl. 126-295.000.

B. F. Goodrich Company, The: *See*—
Soo, Pyong-Nae; and Lai, John T., 4,692,487, Cl. 524-100.000.

Babcock & Wilcox Company, The: *See*—
Wroblewski, David J.; and Robertson, John W., Jr., 4,692,933, Cl. 377-29.000.

Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, to Ciba-Geigy Corporation. Novel compositions based on indanthrone blue pigments. 4,692,189, Cl. 106-308.00S.

Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., to Mobil Oil Corporation. Films of LLDPE, PP and EPR having improved stiffness, tear and impact strength. 4,692,496, Cl. 525-240.000.

Baier, Paul. Roll shutter for hinged-casement type roof windows. 4,691,753, Cl. 160-32.000.

Baines, Peter J., to Standard Telephones and Cables Public Limited Company. Telephone hook switch. 4,692,940, Cl. 379-424.000.

Baisch, Friedhelm: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

Ball, Lawrence E.: *See*—
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Balloni, Ricardo: *See*—
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.

Baltimore Aircoil Company, Inc.: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Bandara, Upali; and Hinkel, Holger, to International Business Machines Corporation. Method for lowering the frictional coefficient of the magnetic head-disk interface in a lubricated magnetic disk storage system. 4,692,832, Cl. 360-137.000.

Banerjee, Pradip K., to Menley & James Laboratories, Ltd. Compositions and method of controlling transdermal penetration of topical and systemic agents. 4,692,462, Cl. 514-449.000.

Bankers Trust Company: *See*—
Bullock, Joseph J., III, 4,691,834, Cl. 215-232.000.

Banks, Geoffrey T.; and Browning, Paul D., to Imperial Biotechnology Limited. Fermentation process for the production of polysaccharides. 4,692,408, Cl. 435-104.000.

Banks, Ridgway. Laterally oscillating nitinol engine. 4,691,517, Cl. 60-527.000.

Banks, Ridgway. Vertically oscillating heat engine. 4,691,518, Cl. 60-527.000.

Bar-Hai, Giora: *See*—
Borg, Arthur N.; and Bar-Hai, Giora, 4,692,903, Cl. 365-226.000.

Barber, Stephen C. Safety power tool. 4,691,553, Cl. 72-444.000.

Barbier, Marie-Jeanne: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.

Bardi, Gianluca: *See*—
Lombardini, Lapo; and Bardi, Gianluca, 4,691,534, Cl. 62-55.500.

Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, to Barlian, Reinhold. Electric switch. 4,692,570, Cl. 200-4.000.

Barmag AG: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Barnhart, Ronald W.: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,691,795, Cl. 180-6.480.

Barten, Axel: *See*—
Richter, Gerhard; and Barten, Axel, 4,691,548, Cl. 72-21.000.

Bartholomew, Roy E.: *See*—
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., 4,691,968, Cl. 303-52.000.

Bascou, Jacques, to Regie Nationale des Usines Renault. Gearmotor for the alternate drive of two operations. 4,691,581, Cl. 74-30.000.

BASF Aktiengesellschaft: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.000.
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.
Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, 4,692,373, Cl. 428-285.000.

Battista, Dino. Bl-brachial motive supplementing device. 4,691,917, Cl. 272-126.000.

Bauer, Kurt; and Schneider, Theodor, to SWF Electric GmbH. Windshield wiper system. 4,692,677, Cl. 318-443.000.

Bauman, Bernard D.; and Burdick, Patricia E., to Air Products and Chemicals, Inc. Process for incorporating powders in viscous fluids. 4,692,470, Cl. 521-55.000.

Baumgartner, Hans-Ulrich: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., to Best Power Technology, Inc; and Pensar Corporation. Method and apparatus for modulating inverter pulse width. 4,692,854, Cl. 363-75.000.

Baxter Travenol Laboratories, Inc.: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Bayer Aktiengesellschaft: *See*—
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, 4,692,384, Cl. 428-423.300.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Monolithic IMPATT with stripline leads. 4,692,791, Cl. 357-81.000.

Beattie, Patrick J., to John D. Brush & Co., Inc. Safe door bushing. 4,691,544, Cl. 70-329.000.

Becavin, Henri G., to Thomson CSF. Feed device for a sweep beam array antenna. 4,692,768, Cl. 342-368.000.

Beck, H. Nelson; and MacWilliams, Dalton C., to Dow Chemical Company, The. Method for imparting flame resistance to wood using dimethyl (oxiranylmethyl) phosphonate and a catalyst. 4,692,355, Cl. 427-297.000.

Beck, Richard L.: *See*—
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Becker, Rainer: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.

Becker, Udo; and Roeschlau, Peter, to Boehringer Mannheim GmbH. Process and a reagent for the simultaneous determination of fibrinogen and fibrinogen fission products in plasma. 4,692,406, Cl. 435-13.000.

Beckman Instruments, Inc.: *See*—
Anthony, Linda J., 4,692,137, Cl. 494-85.000.

Beckwith, Elaine C., to Ford Motor Company. Method of making oxynitrides. 4,692,320, Cl. 423-263.000.

Becton, Dickinson and Company: *See*—
Chantzis, Constantin B., 4,691,702, Cl. 128-207.160.

Beecham Group PLC: *See*—
Buckle, Derek R.; and Carpenter, Stephen T., 4,692,526, Cl. 544-366.000.
Hindley, Richard M.; and Berge, John, 4,692,465, Cl. 514-539.000.

Behlert, Austin. Adjustable gun trigger mechanism. 4,691,461, Cl. 42-69.010.

Beining, August H.; and Smith, William A., to Hughes Aircraft Company. Integrated touch paint system for displays. 4,692,809, Cl. 358-247.000.

Belk, Thomas J., to Ethyl Corporation. Generation of seed particles. 4,691,866, Cl. 241-5.000.

Bell, Joseph P. Anteana extended surface attachment. 4,692,772, Cl. 343-899.000.

Bell, Ronald D. L. Microwave oven warning device. 4,692,580, Cl. 219-10.55M.

Beltran, Adrian M.: *See*—
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.

Bemis, Gerald L., to Advanced Micro Devices, Inc. Overflow/Underflow detection for elastic buffer. 4,692,894, Cl. 364-900.000.

Bencuya, Izak; and Cogan, Adrian I., to GTE Laboratories Incorporated. Junction field effect transistor and method of fabricating. 4,692,780, Cl. 357-22.000.

Bendix France: *See*—
Kervagoret, Gilbert, 4,691,619, Cl. 91-459.000.
Le Marchand, Claude; and Gerard, Jean-Louis, 4,691,809, Cl. 188-71.900.

Bennett, William; and Jimenez, Angel F. Riser pipe elevator. 4,692,081, Cl. 414-22.000.

Benzak, William: *See*—
Rohrbach, Peter; and Benzak, William, 4,691,641, Cl. 104-166.000.

Berard, Raymond A.: *See*—
Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,692,497, Cl. 525-263.000.

Berg, Lloyd, to Celanese Chemical Co. Separation of formic acid from acetic acid by extractive distillation. 4,692,219, Cl. 203-51.000.

Berge, John: *See*—
Hindley, Richard M.; and Berge, John, 4,692,465, Cl. 514-539.000.

Berkhof, Hendrikus, to Honeywell B.V. Differential pressure responsive switch. 4,692,574, Cl. 200-81.500.

Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L. Surgical wound drain device. 4,692,153, Cl. 604-171.000.

Berlin, Richard B., Jr.: *See*—
Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L., 4,692,153, Cl. 604-171.000.

Berliner, Wallace H.: *See*—
Killian, Edmund F.; and Berliner, Wallace H., 4,692,079, Cl. 411-353.000.

Bermudez, Jorge E.: *See*—
Lalin, Hill S.; Bermudez, Jorge E.; and Fleming, William T., 4,691,577, Cl. 73-861.050.

Bernard, Walter J.; and Florio, Steven M., to Sprague Electric Company. Volatile anodizing electrolytes for tantalum. 4,692,224, Cl. 204-56.100.

Berner, Paul C., Jr.: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Bernhard, Ragnar: *See*—
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Bertholet, Raymond, to Nestec S.A. Preparation of cafestol. 4,692,534, Cl. 549-456.000.

Bessinger, Walter L., to Knape & Vogt Manufacturing Co. Shelf anchor. 4,691,887, Cl. 248-250.000.

Best Power Technology, Inc: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Betz, Thomas; von Schaering, Hans-Georg; and Schonherr, Erich, to Hoechst Aktiengesellschaft. Process for making beta-zinc diphosphide monocrystals (whiskers). 4,692,203, Cl. 156-610.000.

Bhatia, Harsaran S.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Bibollet, Bernard, to Fonderie Musil. Propeller with removable and adjustable blades. 4,692,097, Cl. 416-207.000.

Bielke, Gernot, to Bruker Medizintechnik GmbH. Method of measuring the nuclear magnetic resonance for use in NMR tomography. 4,692,767, Cl. 324-309.000.

Bieringer, Hermann; and Schwerdtle, Friedhelm, to Hoechst Aktiengesellschaft. Herbicidal compositions. 4,692,181, Cl. 71-86.000.

Biermeier, Johann; and Obermayer, Heinz, to Siemens Aktiengesellschaft. Divided housing for a magnetic disk drive comprising a peripheral sealing ring. 4,692,827, Cl. 360-97.000.

Bilek, Petr: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Bilgic, A. Haluk: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Billeaudeaux, James K. Method and apparatus for radiographic inspection. 4,692,936, Cl. 378-59.000.

Billings, Robert L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Flexible inductor. 4,692,604, Cl. 235-493.000.

Billmaier, Joseph F.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Bingham & Taylor: *See*—
Zinn, Frank R., 4,691,733, Cl. 137-364.000.

Binker, Norman; and Miranda, Sandra. Sanitary napkin with integral disposal wrapper. 4,692,162, Cl. 604-385.00R.

Biodex Corporation: *See*—
Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., 4,691,694, Cl. 128-25.00R.

Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V. Apparatus for medical treatments. 4,691,695, Cl. 128-38.000.

Bjareklint, Ake; and Simonsson, Daniel, to ElectroCell AB. Electrode chamber unit for an electro-chemical cell having a porous percolation electrode. 4,692,229, Cl. 204-151.000.

Black, Karl-Heinz; and Schuchardt, Gunter, to Blaupunkt-Werke GmbH. Picture tube screen grid potential control. 4,692,669, Cl. 315-381.000.

Blackman, Seymour N. Parenteral fluid medication reservoir pump. 4,692,151, Cl. 604-132.000.

Blain, William A.; and Zabrodsky, John, III, to Nabisco Brands, Inc.; and Nabisco Brands, Inc. Continuous pretzel dough manufacture. 4,691,625, Cl. 99-348.000.

Blair, Arthur A.: *See*—
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.

Blattner, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of 1,4-diaminoanthraquinones. 4,692,278, Cl. 260-367.000.

Blaupunkt-Werke GmbH: *See*—
Black, Karl-Heinz; and Schuchardt, Gunter, 4,692,669, Cl. 315-381.000.

Blaze, Kevin L. Electrical measuring apparatus, and methods for determining the condition or identity of biological material. 4,692,685, Cl. 324-61.0QS.

Blohm & Voss AG: *See*—
Otto, Wilheim, 4,691,560, Cl. 73-116.000.

Blomberg, Peter E.; and Gurt, Sven A., to AB Electrolux. Absorption refrigerator for ice-making. 4,691,529, Cl. 62-332.000.

Bloomfield, Philip E.; and Preis, Seymour, to Pennwalt Corporation. Process of preparing nonfibrous, piezoelectric polymer sheet of improved activity. 4,692,285, Cl. 264-22.000.

Bloss, F. Donald, to Electro-tec Corporation. Automatic refractometer. 4,692,024, Cl. 356-135.000.

Bloxom, Ingrid B., Jr. Portable irrigation assembly. 4,692,158, Cl. 604-260.000.

Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., to Procter & Gamble Company, The. Alpha-L-aspartyl-D-heteroaromatic-substituted glycine esters and amides useful as high intensity sweeteners. 4,692,513, Cl. 530-801.000.

Blyler, Lee L., Jr., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber cable. 4,691,989, Cl. 350-96.230.

Board of Regents, University of Washington: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.

Bock, Lawrence A.: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,692,427, Cl. 502-160.000.

Bocker, Richard P.; and Miceli, William J., to United States of America, Navy. Optical floating-point matrix-vector multiplier. 4,692,885, Cl. 364-606.000.

Bodle, William W.; and Tarman, Paul B., to Institute of Gas Tehnology. Solvent extraction of organic oils and solvent recovery. 4,692,238, Cl. 208-407.000.

Bodolus, Christopher L.; and Woodhead, David A., to Standard Oil Company, The. Novel rubber-modified thermoplastic resin compositions. 4,692,498, Cl. 525-285.000.

Boecker, Wolfgang D. G.; and Reini, George I., to STEMCOR Corporation. Sintered silicon carbide/carbon composite ceramic body having fine microstructure. 4,692,418, Cl. 501-90.000.

Boehringer Biochemia Robin, S.p.A.: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Boehringer Ingelheim Pharmaceuticals, Inc.: *See*—
Devlin, John P.; and Hargrave, Karl D., 4,692,448, Cl. 514-252.000.

Boehringer Mannheim GmbH: *See*—
Becker, Udo; and Roeschlau, Peter, 4,692,406, Cl. 435-13.000.

Boeing Company, The: *See*—
Ganz, Ulrich W.; and Topness, Paul C., 4,691,561, Cl. 73-117.100.
Gupta, Alankar; and Lloyd, Adam J. P., 4,691,760, Cl. 165-26.000.
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., 4,692,869, Cl. 364-448.000.
Viall, Wilton S., Jr., 4,691,944, Cl. 285-348.000.
Wallace, John E., 4,692,578, Cl. 200-175.000.

Bogs, Gunhild: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Bohn, Heinz: *See*—
Fink, Werner; and Bohn, Heinz, 4,692,101, Cl. 417-68.000.

Bohner, Jurgen: *See*—
Schinkel, Ingo; and Bohner, Jurgen, 4,692,386, Cl. 428-515.000.

Boisvenue, Rudolph J., to Eli Lilly and Company. Control of colonial insects employing o-phenylenediamines. 4,692,468, Cl. 514-616.000.

Bokros, Jack C., to CarboMedics, Inc. Heart valve. 4,692,165, Cl. 623-2.000.

Boldt, Clifford R.; and Greene, Richard K., to Celanese Engineering Resins, Inc. Process for preparing oxymethylene polymers using boron trifluoride in admixture with an inert gas. 4,692,505, Cl. 528-241.000.

Boll, Walter: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Bollen, Theo P. C.; and Cassidy, John E., to Electro-Nite Company. Repeating temperature sensing immersion probe. 4,692,556, Cl. 136-234.000.

Bolotko, Viktor I.: *See*—
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.

Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, to Malesci S.p.A. Istituto Farmacobiologico. Process for the separation of optical isomers of racemic 1-pyridyl-alkyl-4-aryl piperazines, and optical isomers obtained thereby. 4,692,525, Cl. 544-360.000.

Bonar, George D. Automatic range finder and remote controller braking system. 4,692,764, Cl. 342-71.000.

Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, to Centre National de la Recherche Scientifique (C.N.R.S.). Process for separation of magnesium-based, and possibly fluorine-and aluminum-based impurities from a wet-produced phosphoric acid. 4,692,323, Cl. 423-321.00R.

Bongers, Jozef J. M.; and Van Geenen, Albert A., to Stamicarbon B.V. N-substituted acyl-lactam compound. 4,692,521, Cl. 540-451.000.

Bongers, Jozef J. M.: *See*—
Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,692,520, Cl. 540-451.000.

Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, to Bayerische Motoren Werke Aktiengesellschaft. Installation for the control of the charging cycle in internal combustion engines. 4,691,670, Cl. 123-52.0MF.

Bonnie, Gene P.: *See*—
Jallen, Gale A.; and Bonnie, Gene P., 4,692,898, Cl. 365-27.000.

Bontrager, Ivan W.: *See*—
Mullet, David L.; and Bontrager, Ivan W., 4,691,784, Cl. 172-15.000.

Boogerman, Allan: *See*—
Krohn, Duane D.; and Boogerman, Allan, 4,692,048, Cl. 401-197.000.

Boone, David D., to Lynx Golf, Inc. Golf glove. 4,691,388, Cl. 2-161.00A.

Boostrom, Roy E.: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.

Boren, Benjamin E.: *See*—
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.

Borg, Arthur N.; and Bar-Hai, Giora, to Zenith Electronics Corporation. Memory loss protection circuit. 4,692,903, Cl. 365-226.000.

Borg-Warner Corporation: *See*—
Novak, Gary J., 4,692,130, Cl. 474-201.000.

Borger, Heinz J.: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

Borovicka, Antonin: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Borresen, Peter A., to A/S Modulex. Method of printing a pattern on a surface receptive to sublimation printing. 4,692,198, Cl. 156-235.000.

Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., to Hamilton Beach Inc. Electric iron having safety cutoff switch and temperature indicator. 4,692,589, Cl. 219-251.000.

Botez, Dan, to RCA Corporation. Phase-locked laser array. 4,692,925, Cl. 372-46.000.

Bothe, Lothar: *See*—
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.

Bouadma, Noureddine; Brillouet, Francois; and Kampfer, Angelika. Process for the production of an integrated laser-photodetector structure. 4,692,207, Cl. 156-649.000.

Bouchette, Michael P., to James River Corporation. Antimicrobially active, non-woven web used in a wet wiper. 4,692,374, Cl. 428-288.000.

Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., to Drexler Technology Corporation. Ultrathin optical recording medium with moisture barrier. 4,692,402, Cl. 430-945.000.

Bourke, Robert F.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Bowering, Robert H.: *See*—
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.

Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., to Biodex Corporation. Muscle exercise and rehabilitation apparatus. 4,691,694, Cl. 128-25.00R.

Boyle, Raymond F.: *See*—
DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., 4,692,302, Cl. 376-439.000.

Brades, William I., to Damon Biotech, Inc. Method and apparatus for forming droplets and microcapsules. 4,692,284, Cl. 264-4.300.

Bradley, John J., to Paper Converting Machine Company. Apparatus for interfolding. 4,691,908, Cl. 270-21.100.

Bradshaw, Thomas I.: *See*—
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.

Bradwell, Paul R.: *See*—
Marsden, Peter; and Bradwell, Paul R., 4,692,358, Cl. 427-421.000.

Brandes, Wilhelm: *See*—
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.

Brandl, Gerhard: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Brandt, Louis. Anti-theft trailer assembly and trailer hitch lock. 4,691,935, Cl. 280-507.000.

Branston, Randolph E.: *See*—
Ober, Christopher K.; and Branston, Randolph E., 4,692,188, Cl. 106-23.000.

Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., to Cauzin Systems, Incorporated. Optical reader for printed bit-encoded data and method of reading same. 4,692,603, Cl. 235-454.000.

Braun, Douglas J.: *See*—
Carlson, Larry M.; and Braun, Douglas J., 4,691,600, Cl. 82-4.00C.

Bray, Bernard D., to GTE Communication Systems Corporation. Method for adjusting and testing current sensors. 4,692,696, Cl. 324-158.00R.

Bray, Bernard D., to GTE Communication Systems Corporation. Current sensor adjustment and test apparatus. 4,692,697, Cl. 324-158.00R.

Bremer, Ross L. Tibial torsion splint with multiple degrees of freedom of adjustment. 4,691,698, Cl. 128-80.00R.

Breunig, Walter: *See*—
Pietzach, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Bridgeport Metal Goods Mfg. Co., The: *See*—
Ahrens, Warren S., 4,691,833, Cl. 215-227.000.

Brierley, Rowland J. P.: *See*—
Wem, James; and Brierley, Rowland J. P., 4,692,283, Cl. 261-89.000.

Brightad Limited: *See*—
Street, Graham S. B., 4,692,792, Cl. 358-3.000.

Brillouet, Francois: *See*—
Bouadma, Noureddine; Brillouet, Francois; and Kampfer, Angelika, 4,692,207, Cl. 156-649.000.

Brimmer, Craig A. Bait holder and method for making. 4,691,467, Cl. 43-44.400.

Bristol-Myers Company: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,692,531, Cl. 548-193.000.
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.

British Aerospace PLC: *See*—
Young, Ronald W., 4,691,882, Cl. 244-158.00R.

British Telecommunications: *See*—
Reeve, Michael H.; and Cassidy, Stephen A., 4,691,896, Cl. 254-134.400.

Brochand, Max, to Pomagalski. Rope coupling carriage having concave track between grips. 4,691,643, Cl. 104-202.000.

Broitman, Kalman: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Brossi, Arnold, to United States of America, Health and Human Services. Antiinflammatory 2,3-didemethylcolchicine and additional derivatives. 4,692,463, Cl. 514-463.000.

Brostik, Miroslav: *See*—
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Brother Albert Welsh Foundation: *See*—
Kennedy, Michael, 4,691,763, Cl. 165-54.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirota, Akio, 4,692,071, Cl. 408-9.000.

Brotz, Gregory R. Method of producing a continuous length structure. 4,692,286, Cl. 264-29.100.

Brown, Boveri & Cie AG: *See*—
Reiss, Harald; and Ziegenbein, Botho, 4,692,363, Cl. 428-36.000.

Brown, Francis J., to Deniston Company. Strobe adaptor for automotive timing light. 4,692,668, Cl. 315-241.00S.

Brown, George T., Jr., to American Thermometer Co., Inc. Device for detecting, measuring, and recording body thermal emissivity. 4,691,712, Cl. 125-736.000.

Brown, Oswald. Bivalve mollusk shucker. 4,691,412, Cl. 17-74.000.

Brown, Robert D., Jr.: *See*—
Riley, William D.; and Brown, Robert D., Jr., 4,692,875, Cl. 364-497.000.

Brown, Robert L.; and Stewart, Elizabeth C. Skin cleanser capable of softening and removing smegma. 4,692,262, Cl. 252-106.000.

Brown, William G., II. Solar power generation. 4,691,522, Cl. 60-641.800.

Browne Brothers, Inc.: *See*—
Browne, Donald V., 4,691,505, Cl. 56-503.000.

Browne, Donald V., to Browne Brothers, Inc. Stalk shredder for self-propelled cotton stripper. 4,691,505, Cl. 56-503.000.

Browning, Joseph M.: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.

Browning, Norman F.: *See*—
Alsobrook, Lawrence C.; and Browning, Norman F., 4,691,469, Cl. 43-54.100.

Browning, Paul D.: *See*—
Banks, Geoffrey T.; and Browning, Paul D., 4,692,408, Cl. 435-104.000.

Bruker Medizintechnik GmbH: *See*—
Bielke, Gernot, 4,692,767, Cl. 324-309.000.

Bruner, Harold S., Jr., to Du Pont de Nemours, E. I., and Company. Carboalkoxylation of butadiene to form dialkyl adipate. 4,692,549, Cl. 560-204.000.

Brunet, Maurice L.; and Jolivet, Jean-Pierre, to Societe Anonyme Styled: Societe Europeenne de Propulsion. Radial displacement magnetic detector device for a rotor. 4,692,699, Cl. 324-207.000.

Brunswick Corporation: *See*—
Staerzl, Richard E., 4,691,680, Cl. 123-491.000.

Brunton, Loren F. M-16 rifle, improved to more safely accomodate left handed shooters. 4,691,615, Cl. 89-33.400.

Bruso, Loran H., to Warner-Lambert Company. Adjustable test pack. 4,692,307, Cl. 422-58.000.

Brustle, Klaus: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.

Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, to Konstructa Trencin, narodny podnik. Anaesthetical circuit with reverse inhalation equipped with an injector of escaped anaesthetics. 4,691,700, Cl. 128-200.210.

Brym, Stanley J.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Buckle, Derek R.; and Carpenter, Stephen T., to Beecham Group PLC. Process for preparing benzopyrano (2,3-d) triazoles. 4,692,526, Cl. 544-366.000.

Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., to Security Tag Systems, Inc. Recording-tape-reel assembly with electronic tag. 4,692,746, Cl. 340-572.000.

Buekers, Josef: *See*—
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.

Bullock, Joseph J., III, to Bankers Trust Company. Cap and neck structure for a wide mouth jar. 4,691,834, Cl. 215-232.000.

Bunker Plastics, Inc.: *See*—
Parkinson, William S.; and Djerf, Villy E., 4,692,372, Cl. 428-282.000.

Bunker, Robert L. Portable tree seat and platform for standing. 4,691,804, Cl. 182-187.000.

Burdick, Patricia E.: *See*—
Bauman, Bernard D.; and Burdick, Patricia E., 4,692,470, Cl. 521-55.000.

Burghardt, Stephen R., to Domain, Inc. Drying composition and method. 4,692,265, Cl. 252-194.000.

Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, to Barmag AG. Yarn texturing nozzle. 4,691,947, Cl. 28-255.000.

Burnett, Tobias W. T.: *See*—
Schlonski, James S.; and Burnett, Tobias W. T., 4,692,297, Cl. 376-211.000.

Burns, Timothy L.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Burr-Brown Corporation: *See*—
Highton, Frederick J., 4,692,641, Cl. 307-475.000.

Burton, Clement D.: *See*—
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.

Burton Mechanical Contractors, Inc.: *See*—
Grooms, John M.; and Jones, Mark A., 4,691,731, Cl. 137-205.000.

Buschulte, Winfried: *See*—
Farago, Zoltan; and Buschulte, Winfried, 4,692,319, Cl. 423-242.000.

Bussing, Wilfred C., Jr. Wearable alarm. 4,692,749, Cl. 340-574.000.

Butler, George. Artificial aquarium. 4,691,459, Cl. 40-406.000.

Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., to International Business Machines Corporation. Digital timing control system with memory look ahead. 4,692,877, Cl. 364-514.000.

Caesar, Philip D., to Mobil Oil Corporation. Method for preparing structured catalytic solids. 4,692,423, Cl. 502-62.000.

Cahill, Jerry E.: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.

Calderara, Reto: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Calmar, Inc.: *See*—
Anderson, Walter F., 4,692,103, Cl. 417-547.000.

Cambridge Technologies, Inc.: *See*—
Holdt, Donald H., 4,691,962, Cl. 297-84.000.

Camco, Incorporated: *See*—
Pringle, Ronald E., 4,691,776, Cl. 166-319.000.

Cameron Iron Works, Inc.: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Campbell, Eric R.; and Moss, Joe B., to American Telephone & Telegraph Company, AT&T Technologies, Inc.; and AT&T Bell Laboratories. Cable support system. 4,692,564, Cl. 174-92.000.

Campbell, Henry F.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Campbell, Steve G., to Quantum Corporation. Magnetically biased aerodynamically released integral safety latch for rigid disk drive. 4,692,829, Cl. 360-105.000.

Caneer, Clifford, Jr. Gas control system for a plasma arc welding apparatus. 4,692,584, Cl. 219-121.0PU.

Canon Kabushiki Kaisha: *See*—
Ando, Yujiro; and Kaneko, Shuzo, 4,692,779, Cl. 346-153.100.
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.
Hasumi, Hiroyuki, 4,692,777, Cl. 346-140.00R.
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Izukawa, Kazuhiro; and Ishizuka, Kho, 4,692,649, Cl. 310-316.000.
Kiuchi, Masayoshi, 4,692,014, Cl. 354-471.000.
Makita, Masaru, 4,692,045, Cl. 400-697.000.
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Otamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.
Okino, Tadashi, 4,692,013, Cl. 354-413.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Okuno, Takuo, 4,692,672, Cl. 318-116.000.
Saito, Asao; and Watanabe, Kunio, 4,692,773, Cl. 346-1.100.
Seki, Hiroyuki; and Okuno, Takuo, 4,692,652, Cl. 310-323.000.
Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, 4,692,009, Cl. 354-246.000.
Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Canterino, Peter J.: *See*—
Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., 4,692,496, Cl. 525-240.000.

Capps, Grover. Surveyor's level with constant instrument height and method. 4,691,444, Cl. 33-290.000.

CarboMedics, Inc.: *See*—
Bokros, Jack C., 4,692,165, Cl. 623-2.000.

Card, Joseph L.; and Card, Roy T., to Card-Monroe Corporation. Knife holder for tufting machine. 4,691,646, Cl. 112-80.600.

Card-Monroe Corporation: *See*—
Card, Joseph L.; and Card, Roy T., 4,691,646, Cl. 112-80.600.

Card, Roy T.: *See*—
Card, Joseph L.; and Card, Roy T., 4,691,646, Cl. 112-80.600.

Cardiovascular Systems Inc.: *See*—
Feldman, Louis W.; and Yawn, David H., 4,692,136, Cl. 494-38.000.

Cargill, N. Allen; and Malashkin, Michail, to Technitrol, Inc. Document dispenser. 4,691,910, Cl. 271-3.000.

Cari-All Inc.: *See*—
Trubiano, Antoine, 4,691,816, Cl. 194-212.000.

Carl Still GmbH & Co. KG, Firma: *See*—
Lemke, Otto; and Krause, Manfred, 4,692,217, Cl. 202-151.000.

Carl-Zeiss-Stiftung: *See*—
Muchel, Franz, 4,691,997, Cl. 350-503.000.

Carlson, Curtis R.: *See*—
Anderson, Charles H.; and Carlson, Curtis R., 4,692,806, Cl. 358-209.000.

Carlson, Frank: *See*—
Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, 4,692,252, Cl. 210-761.000.

Carlson, Larry M.; and Braun, Douglas J. Pipe shaver. 4,691,600, Cl. 82-4.00C.

Carmichael, Kenneth, to Peerless Machine & Tool Corporation. Anti-jamming die. 4,691,604, Cl. 83-164.000.

Carpenter, Peter F., to ALZA Corporation. System for providing intravenously administrable drug formulation. 4,692,144, Cl. 604-56.000.

Carpenter, Stephen T.: *See*—
Buckle, Derek R.; and Carpenter, Stephen T., 4,692,526, Cl. 544-366.000.

Carson, John R., to McNeilab, Inc. Cyclopenta[b]thiophenes having anti-inflammatory activity similar to steroids. 4,692,460, Cl. 514-443.000.

Carstersen, Gail: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Carstersen, Ronald: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Carter, Charles G., to Stauffer Chemical Company. Method for preparation of mercaptobenzoates. 4,692,545, Cl. 560-18.000.

Casals, Jorge: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Casciari, Raoul: *See*—
Raj, Kuldip; and Casciari, Raoul, 4,692,826, Cl. 360-97.000.

Casey, Frank, to General Engineering Radcliffe Limited. Vacuum coating apparatus. 4,692,233, Cl. 204-298.000.

Casio Computer Co., Ltd.: *See*—
Hashidate, Katsuro, 4,692,887, Cl. 364-720.000.
Nakano, Harumi, 4,692,601, Cl. 235-380.000.
Sasaki, Hiroyuki; and Hanzawa, Kohtaro, 4,691,608, Cl. 84-1.010.

Casper, Daniel F., to International Business Machines Corp. Buffer system using parity checking of address counter bit for detection of read/write failures. 4,692,893, Cl. 364-900.000.

Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, to Hoffmann-La Roche Inc. Phenyl-pyrimidinium, thiazolium or imidazolium salts and use in inhibiting intestinal resorption of cholesterol and bile salts. 4,692,450, Cl. 514-256.000.

Cassani, Giovanni: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Cassidy, John E.: *See*—
Bollen, Theo P. C.; and Cassidy, John E., 4,692,556, Cl. 136-234.000.

Cassidy, Stephen A.: *See*—
Reeve, Michael H.; and Cassidy, Stephen A., 4,691,896, Cl. 254-134.400.

Castille, Leopold A. Holder for small parts. 4,691,903, Cl. 269-6.000.

Catalysts & Chemicals Industries Co., Inc.: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.

Caterpillar Inc.: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Cauzin Systems, Incorporated: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Cavalli, Alfredo. Steam generating apparatus for different household application outlets. 4,692,588, Cl. 219-245.000.

Cavigli, Mario; and Ferrari, Lorenzo, to Kinglor-LTD. Self-baking electrode for electric arc furnaces and the like. 4,692,929, Cl. 373-89.000.

Celanese Chemical Co.: *See*—
Berg, Lloyd, 4,692,219, Cl. 203-51.000.

Celanese Corporation: *See*—
Davenport, Kenneth G., 4,692,546, Cl. 560-130.000.
Dotson, Duane L.; and Forschirm, Alex, 4,692,168, Cl. 44-7.100.
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Celanese Engineering Resins, Inc.: *See*—
Boldt, Clifford R.; and Greene, Richard K., 4,692,505, Cl. 528-241.000.

Cellucap Manufacturing Company: *See*—
McKeown, Thomas J., 4,691,390, Cl. 2-200.000.

Celotex Corporation, The: *See*—
Jacobina, Charles E., 4,692,477, Cl. 521-174.000.

Center, Warren A., to K. W. Thompson Tool Company, Inc. Sight system for a firearm. 4,691,442, Cl. 33-253.000.

Centre National de la Recherche Scientifique (C.N.R.S.): *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, to SPOFA, spojene podniky pro zdravotnickou

vyrobu. Method for treatment of endometritis in mammalian females. 4,692,452, Cl. 514-288.000.
Cesano, Franco, to G.O.R. Applicazioni Speciali S.p.A. Mold for the covering and trimming of products of plastics material. 4,692,108, Cl. 425-292.000.
Ceskoslovenska akademie ved: *See*—
Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, 4,692,243, Cl. 210-198.200.
COEE Alsthom Direction Red, Societe Anonyme: *See*—
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.
Chaabouni, Mohamed: *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.
Chabala, Leonard V.: *See*—
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.
Chace, Mark S.: *See*—
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.
Chandler, Jimmy E.: *See*—
Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.
Chang, Chin-Hsiung, to UOP Inc. Process for separating ketoses from alkaline- or pyridine-catalyzed isomerization products. 4,692,514, Cl. 536-127.000.
Chang, Jun H., to FMC Corporation. Herbicidal isoxazolidinone derivatives. 4,692,182, Cl. 71-88.000.
Chang, Nelson: *See*—
Lin, Weng-Pin; and Chang, Nelson, 4,691,992, Cl. 350-99.000.
Chantzis, Constantin B., to Becton, Dickinson and Company. Aspirating device. 4,691,702, Cl. 128-207.160.
Chase, Lee: *See*—
Hegland, Philip; and Chase, Lee, 4,692,616, Cl. 250-252.100.
Checkpoint Systems, Inc.: *See*—
Wolf, Albert E., 4,692,747, Cl. 340-572.000.
Chemical Process Corporation: *See*—
Viswanathan, Tito; and Westermann, Donald H., 4,692,478, Cl. 527-300.000.
Chen, Cheng-Ming. Multi-purpose lighter assembly. 4,692,112, Cl. 431-253.000.
Chen, Henry C. J.: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.
Cherne Industries, Inc.: *See*—
Mathison, Allen D., 4,691,728, Cl. 137-15.000.
Chi, Charles H. Method and apparatus for protecting press from being damaged by overload conditions. 4,692,857, Cl. 364-184.000.
Chiang, Yulin: *See*—
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.
Chichester, Willard L.: *See*—
Wright, Allen B.; and Chichester, Willard L., 4,692,177, Cl. 55-499.000.
Chigasaki, Mitsuo: *See*—
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.
Chism, Samuel B., Jr., to Ford Aerospace & Communications Corporation. Passively modulated push broom display. 4,692,808, Cl. 358-231.000.
Chiu, Chui-Wen. Domestic electric kiln. 4,692,593, Cl. 219-362.000.
Cho, Michio, to Fuji Photo Film Co., Ltd. Wide-angle photographic lens. 4,691,996, Cl. 350-465.000.
Choay, Jean: *See*—
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.
Choay, S.A.: *See*—
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.
Christidis, Yani: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.
Christy, Ronald S.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.
Chronar Corporation: *See*—
Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-258.000.
Chugai Ro Co., Ltd.: *See*—
Imose, Masayuki, 4,691,898, Cl. 266-89.000.
Chung, Alfred: *See*—
Ryan, James W.; and Chung, Alfred, 4,692,437, Cl. 514-165.000.
Ryan, James W.; and Chung, Alfred, 4,692,458, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,692,459, Cl. 514-362.000.
Chung, David Y.: *See*—
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.
Chung, Ki Ho, to Samhwa Electric Industrial Co. Safety device for communication equipment. 4,692,833, Cl. 361-91.000.
Church, John F.; and Stone, Walter H., to Parker Hannifin Corporation. Filter assembly with high pressure connection to collection bowl. 4,692,245, Cl. 210-232.000.
Cianci, James P.; and Gross, James R., to Kendall Company, The. Tamper evident band. 4,692,150, Cl. 604-111.000.
Ciba-Geigy Corporation: *See*—
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.
Blattner, Rudolf, 4,692,278, Cl. 260-367.000.
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.
Gugumus, Francois, 4,692,486, Cl. 524-100.000.
Hassig, Robert, 4,692,524, Cl. 544-303.000.
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, 4,692,540, Cl. 558-78.000.
Lang, Robert W., 4,692,536, Cl. 556-413.000.
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.
Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.
Spivack, John D., 4,692,539, Cl. 558-78.000.
Watthey, Jeffrey W. H., 4,692,469, Cl. 514-651.000.
Ciccarelli, Angelo. Dental floss applicator. 4,691,719, Cl. 132-92.00R.
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, to Boehringer Biochemia Robin, S.p.A. Tricyclic dihydropyridazinones and pharmaceutical compositions containing them. 4,692,447, Cl. 514-248.000.
Ciongoli, Bernard M., to Ampower Technologies, Inc. Three-dimensional spatial image system. 4,692,878, Cl. 364-518.000.
Cipolla, Piervitto: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.
Cladcolor Profiling Limited: *See*—
Lilley, Raymond A., 4,691,491, Cl. 52-481.000.
Claesen, Christianus A. A.: *See*—
Tesser, Godefridus I.; and Claesen, Christianus A. A., 4,692,542, Cl. 558-184.000.
Clark, David G., to U.S. Philips Corporation. Device for generating a 2-axis control signal. 4,692,756, Cl. 340-709.000.
Clarke, Alan: *See*—
Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., to Mobil Oil Corporation. Asphalt coating method. 4,692,350, Cl. 427-138.000.
Clarke, John: *See*—
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.
Claude, John P.: *See*—
Ingle, Frank W.; and Claude, John P., 4,691,418, Cl. 29-25.350.
Clear, Kenneth C. Cathodic protection of reinforced concrete in contact with conductive liquid. 4,692,066, Cl. 405-216.000.
Clegg, Roy, to Davy McKee (Sheffield) Limited. Rolling mill control for tandem rolling. 4,691,546, Cl. 72-9.000.
Clift, Miner E. Reverse-buckling rupture disk with replaceable disk and blade. 4,691,729, Cl. 137-68.100.
Clifton, Kevin; and Delaney, Sean, to Clifton, Kevin. Central air conditioning system. 4,691,531, Cl. 62-263.000.
Cline, David E.: *See*—
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.
Coffman, Leonard: *See*—
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.
Cogan, Adrian I.: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,692,780, Cl. 357-22.000.
Cohen, Donald M., to Cordis Corporation. Apparatus for measuring velocity of blood flow in a blood vessel. 4,691,709, Cl. 128-667.000.
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber with depressed index outer cladding. 4,691,990, Cl. 350-96.330.
Coldren, Daniel R., to AMP Incorporated. Tab-form terminal. 4,691,981, Cl. 439-816.000.
Coleman, Albert L.: *See*—
Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., 4,692,868, Cl. 364-447.000.
Colgate-Palmolive Company: *See*—
Sonenstein, Gerard G., 4,692,494, Cl. 525-57.000.
Collier, L. Warren, IV: *See*—
Taylor, Jack D.; and Collier, L. Warren, IV, 4,692,368, Cl. 428-137.000.
Collobert, Daniel: *See*—
Anizan, Paul; Collobert, Daniel; and Massaloux, Dominique, 4,692,892, Cl. 364-807.000.
Columbia Gas System Service Corp: *See*—
Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., 4,691,532, Cl. 62-476.000.
Commander Electrical Materials, Inc.: *See*—
Nattel, William, 4,692,561, Cl. 174-65.0SS.
Nattel, William, 4,692,562, Cl. 174-65.0SS.
Commissariat a l'Energie Atomique: *See*—
Lance, Jacques; and Muller, Georges, 4,691,425, Cl. 29-402.080.
Prulhiere, Jean-Paul, 4,692,692, Cl. 324-102.000.
Rabeyrolles, Serge, 4,692,693, Cl. 324-123.00R.
Commons, Thomas J.: *See*—
Skotnicki, Jerauld S.; and Commons, Thomas J., 4,692,517, Cl. 540-222.000.
Communications Test Design, Inc.: *See*—
Parsons, Donald F., 4,692,939, Cl. 379-16.000.

Conant, Curtis T., to American Magnetics Corporation. Apparatus for sensing and/or writing information on cards, passports and checks and the like. 4,692,602, Cl. 235-446.000.
Condor-Werk Gebr. Frede GmbH & Co. KG: *See*—
Frede, Dieter, 4,692,576, Cl. 200-84.00R.
Connell, Eugene W.: *See*—
Elkins, William; Connell, Eugene W.; and Short, Robert E., 4,691,762, Cl. 165-46.000.
Conner, John M.: *See*—
Conner, Leo B., Jr.; and Conner, John M., 4,691,692, Cl. 126-422.000.
Conner, Leo B., Jr.; and Conner, John M. Solar energy system with delayed drain-back. 4,691,692, Cl. 126-422.000.
Conrad, Bernhard; and Tressl, Guenther, to Siemens Aktiengesellschaft. Apparatus for converting radiation image information carried by a storage layer into a television signal sequence. 4,692,813, Cl. 358-294.000.
Conrad, Raymond W.: *See*—
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Conti, Allen C., to Arnco Corporation. System to control tension in a cable during underground placement. 4,692,063, Cl. 405-177.000.
Control Data Corp.: *See*—
Jallen, Gale A.; and Bonnie, Gene P., 4,692,898, Cl. 365-27.000.
Convey, Frank H., Jr., to Harris Graphics Corporation. Apparatus for placing a card on a bundle of sheet-like articles. 4,691,502, Cl. 53-529.000.
Cook, F. Bert: *See*—
Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., 4,691,532, Cl. 62-476.000.
Cook's Truck Body Mfg., Inc.: *See*—
Hodge, Harold F., 4,691,956, Cl. 296-51.000.
Cool Water Corporation, The: *See*—
Crowell, William H., 4,691,664, Cl. 119-61.000.
Cooley, Stephen E.; and Jensen, Martin J., to Wehr Corporation. Humidifier controller having multiple-phase electrode current sensor. 4,692,591, Cl. 219-295.000.
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, to Fuji Photo Optical Company, Ltd. Compact optical imaging system. 4,692,608, Cl. 250-216.000.
Cope, Paul E. G.: *See*—
Wilson, David J. M.; and Cope, Paul E. G., 4,692,614, Cl. 250-231.00R.
Coradi, Michael D.; and Vitalbo, Carl A., to Westinghouse Electric Corp. Analog process control system testing. 4,692,298, Cl. 376-215.000.
Cordell, Henry L.; and Galer, David G. Method and apparatus for gasifying solid organic materials. 4,691,846, Cl. 222-198.000.
Cordis Corporation: *See*—
Cohen, Donald M., 4,691,709, Cl. 128-667.000.
Kane, James, 4,691,708, Cl. 128-667.000.
Cordwell, Brian; and Hayes, Paul M., to Plessey Overseas Limited. Read only memory control circuit for use in a phase lock loop. 4,692,713, Cl. 331-1.00A.
Cormed, Inc.: *See*—
Hilger, Gerald E., 4,692,146, Cl. 604-93.000.
Corning Glass Works: *See*—
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.
Corsetti, John A. Waterbed frames. 4,691,395, Cl. 5-400.000.
Cortese, Richard: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,692,336, Cl. 424-468.000.
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., to Eastman Kodak Company. Solid scintillator counting compositions. 4,692,266, Cl. 252-301.170.
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, to Mayer & Cie. GmbH & Co.; and Sipra Patententwicklungs - und Beteiligungsgesellschaft mbH. Method of and apparatus for joining a selected yarn to a yarn being knitted. 4,691,535, Cl. 66-144.000.
Cotteret, Jean: *See*—
Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.
Cotterill, Michael J. Keyboard support. 4,691,888, Cl. 248-284.000.
Cottrell, Henry L.; and Venturi, William L., to Cottrell, Henry Lloyd. Conduit couplings. 4,691,945, Cl. 285-419.000.
Cottrell, Henry Lloyd: *See*—
Cottrell, Henry L.; and Venturi, William L., 4,691,945, Cl. 285-419.000.
Coulter Corporation: *See*—
Auer, Robert E., 4,691,829, Cl. 209-3.100.
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, to Jeumont-Schneider Corporation. Rapid message transmission system between computers and method. 4,692,862, Cl. 364-200.000.
Coutant, Patrick: *See*—
Leorat, Francois; Coutant, Patrick; and Aubert, Paul, 4,691,597, Cl. 74-869.000.
Cowen, Judith A., to LRC Electronics, Inc. Coaxial cable tap connector. 4,691,976, Cl. 439-394.000.
Cox, Frederick E.: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.
Crabbe, Edwin P., Jr., to GTE Communication Systems Corporation. Arrangement for dynamic range checking or matching for digital values in a software system. 4,692,897, Cl. 364-900.000.
Crafco, Inc.: *See*—
Schave, Floyd D., 4,692,028, Cl. 366-22.000.
Craig Systems Corporation: *See*—
Anderson, Thomas L., 4,691,483, Cl. 52-79.100.
Crain, Steven P.: *See*—
Wang, Pen-Chung; and Crain, Steven P., 4,692,533, Cl. 548-312.000.
Crandall, Richard S.: *See*—
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Coextruded, biaxially oriented, multi-layer and capacitor made therefrom. 4,692,837, Cl. 361-313.000.
Creative Metal Designs Ltd.: *See*—
Kane, Patrick J., 4,691,492, Cl. 52-519.000.
Creissels, Denis. Multicable cable-car or gondola lift. 4,691,642, Cl. 104-173.100.
Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,692,531, Cl. 548-193.000.
Crescentini, Lamberto: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.
Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., to Westinghouse Electric Corp. Testing sensor signal processors. 4,692,299, Cl. 376-216.000.
Cribbs, Timothy B.: *See*—
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.
Crisci, Victor. Vehicle flasher. 4,692,736, Cl. 340-81.00R.
Criss, Russell C.: *See*—
Gillery, F. Howard; and Criss, Russell C., 4,692,389, Cl. 428-622.000.
Cross Company, The: *See*—
Smith, Michael D.; and Dobat, Daniel F., 4,692,074, Cl. 409-233.000.
Crowell, William H., to Cool Water Corporation, The. Pet receptacle. 4,691,664, Cl. 119-61.000.
Crum, Donald L. Electric fence holder. 4,692,567, Cl. 174-158.00F.
CTB, Inc.: *See*—
Frush, Donald R., 4,691,897, Cl. 256-65.000.
Cuff, William A.; and Lefler, Jerrold P., to Digitext, Inc. Computerized printing system. 4,692,042, Cl. 400-94.000.
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen. Mock linking process and apparatus for joining two pieces of knitted fabric, and knitted edging trim for use therewith. 4,691,537, Cl. 66-172.00R.
Cullen, Owen: *See*—
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen, 4,691,537, Cl. 66-172.00R.
Cullen, Paul M.: *See*—
Cullen, John C.; Cullen, Paul M.; and Cullen, Owen, 4,691,537, Cl. 66-172.00R.
Cummins Atlantic, Inc.: *See*—
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.
Cygan, Wolfgang: *See*—
Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, 4,692,365, Cl. 428-87.000.
Czauderna, Bernhard: *See*—
Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, 4,692,373, Cl. 428-285.000.
Czepl, Helmut: *See*—
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.
Czuba, Leonard: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.
Dahbura, Anton T.; and Sabnani, Krishan K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for generating verification tests. 4,692,921, Cl. 371-27.000.
Dahl, Randy L., to Motorola, Inc. Turbine alternator with a central clear optical path. 4,692,631, Cl. 290-55.000.
Dahlke, Hannelore: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.
Dai-Ichi Seiko Kabushiki Kaisha: *See*—
Fukunaga, Masami; and Yamaguchi, Tomoyoshi, 4,691,975, Cl. 439-266.000.
Daido Tokushuko Kabushiki Kaisha: *See*—
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.
Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.
Grantz, Helmut; and Odebrecht, Wolfgang, 4,691,949, Cl. 292-216.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Ikuta, Kunio, 4,692,879, Cl. 364-518.000.
Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, 4,692,796, Cl. 358-76.000.

Dalal, Vikram L.: *See*—
Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-258.000.

Dale Electronics, Inc.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.

Damon Biotech, Inc.: *See*—
Braden, William I., 4,692,284, Cl. 264-4.300.

Dana-Farber Cancer Institute, Inc.: *See*—
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.

Danforth, Ronald V.; and Pleau, Medric H., to Packaging Systems International, Inc. Lid sealing machine. 4,691,500, Cl. 53-478.000.

Darner, John T.: *See*—
Peel, Robert M.; and Darner, John T., 4,691,922, Cl. 273-177.00B.

Das, Suryya K.; and Kania, Charles M., to PPG Industries, Inc. Coating compositions comprising free radical addition polymers with cross-linkable integral isocyanato groups. 4,692,503, Cl. 526-301.000.

Das, Suryya K.: *See*—
Ranka, Ajay I.; and Das, Suryya K., 4,692,491, Cl. 524-458.000.

Dattagupta, Nanibhushan, to Molecular Diagnostics, Inc. Radioactive labeling of proteins with nucleosides or nucleotides. 4,692,509, Cl. 530-303.000.

Davenport, Kenneth G., to Celanese Corporation. Process for producing acyloxy aromatic carboxylic acids. 4,692,546, Cl. 560-130.000.

Davidson, Raymond J.: *See*—
Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., 4,692,240, Cl. 209-254.000.

Davis, Michael H. Method and composition for in vivo radiolabeling of red blood cells with ^{99m}Tc. 4,692,324, Cl. 424-1.100.

Davis, William L. Comestible beater. 4,692,029, Cl. 366-149.000.

Davy McKee (Sheffield) Limited: *See*—
Clegg, Roy, 4,691,546, Cl. 72-9.000.

Day International Corporation: *See*—
Haren, Doyle V.; and Wiley, Lawrence V., 4,691,432, Cl. 29-527.200.

Dearborn Chemicals Limited: *See*—
Greaves, Brian; and Ingham, Paul, 4,692,315, Cl. 422-18.000.
Greaves, Brian; and Grenside, Stuart J., 4,692,316, Cl. 422-16.000.

Debaudringhien, Andre, to Dictaphone Corporation. One-way clutch assembly with pawl and ratchet. 4,692,825, Cl. 360-96.300.

de Brie Perry, Forbes G., to National Research Development Corporation. Continuously-variable ratio transmission. 4,691,592, Cl. 74-691.000.

Decowski, Stanley J., Jr.: *See*—
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,692,161, Cl. 604-366.000.

Decrouen, Jean-Michel: *See*—
Fabien, Raymond; and Decrouen, Jean-Michel, 4,692,204, Cl. 156-626.000.

Deere & Company: *See*—
Frerich, Josef, 4,691,503, Cl. 53-587.000.
Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.

Deftos, Leonard J.: *See*—
Hostetler, Karl Y.; and Deftos, Leonard J., 4,692,433, Cl. 514-12.000.

Deguchi, Hiroyuki: *See*—
Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

Dehydro Corporation, The: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,692,248, Cl. 210-403.000.

Deiana, Salvatore. Self-adjusting breakwater for artificial harbors. 4,691,661, Cl. 114-267.000.

DeKezel, James A.; and Lerachen, James R. Buoyant water fowl decoy and method for making same. 4,691,463, Cl. 43-3.000.

Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, to Chronar Corporation. Counteraction of semiconductor impurity effects. 4,692,558, Cl. 136-258.000.

DeLand, Daniel L.; and LaVene, Leon F., to Schmelzer Corporation. Quick connect fluid fitting assembly. 4,691,943, Cl. 285-315.000.

Delaney, Sean: *See*—
Clifton, Kevin; and Delaney, Sean, 4,691,531, Cl. 62-263.000.

Delatorre, Leroy C. Capacitance transducer. 4,691,574, Cl. 73-708.000.

Delkor Technik (Proprietory) Ltd. of Delkor House: *See*—
Arbuthnot, Ian M.; Amm, Errol T.; and Davidson, Raymond J., 4,692,240, Cl. 209-254.000.

DeLong, Sanford D., to DeLong, Sanford D. Electromagnetic reciprocating pump and motor means. 4,692,673, Cl. 318-132.000.

Delphax Systems: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

De Marchi, Andrea; and Rovera, Giovanni D., to DeMarchi, Andrea. Method and a device for the frequency control of an atomic or molecular beam frequency standard. 4,692,716, Cl. 331-3.000.

DeMarchi, Andrea: *See*—
De Marchi, Andrea; and Rovera, Giovanni D., 4,692,716, Cl. 331-3.000.

DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., to Westinghouse Electric Corp. Coolant flow mixer grid for a nuclear reactor fuel assembly. 4,692,302, Cl. 376-439.000.

Demin, Vladislav M.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

DeMoore, Howard W. Method and apparatus for attaching anti-smear net to printing press transfer cylinder. 4,691,632, Cl. 101-426.000.

Dempsey, Edward J. Sawblade collar assembly. 4,691,685, Cl. 125-14.000.

Demukai, Noboru: *See*—
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.

De Muro, David M.: *See*—
Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., 4,692,726, Cl. 333-206.000.

Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, to Alcatel. Triplicated clock distribution device for use when each clock signal comprises a synchonization signal. 4,692,932, Cl. 375-107.000.

Deniston Company: *See*—
Brown, Francis J., 4,692,668, Cl. 315-241.00S.

Denning, Ralph M., to Rolls-Royce plc. Compound helicopter and powerplant therefor. 4,691,877, Cl. 244-6.000.

de Riel, Stanton R.: *See*—
Kitchell, Judith P.; and de Riel, Stanton R., 4,692,328, Cl. 424-78.000.

de Sartre, Jean; and Maige, Philippe, to Thomson-CSF. Control circuit for a chopped power supply with progressive start up. 4,692,853, Cl. 363-49.000.

DeSoto, Inc.: *See*—
Roberts, Donald R., 4,692,484, Cl. 523-414.000.

Dessouroux, Alexis A. J., to Shur-lok International S.A. Nut device having automatic positive locking. 4,692,078, Cl. 411-231.000.

Deters, Joseph C.: *See*—
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,692,326, Cl. 424-15.000.

Deubzer, Bernward: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Deutsch, Daniel H. Microporous coating for solid members to reduce stress, wear and fatigue at liquid interfaces. 4,692,376, Cl. 428-315.500.

Deutsche Filterbau GmbH: *See*—
Roos, Hans, 4,692,173, Cl. 55-96.000.

Deutsche Forschungs- und Versuch-Sanstalt fur Luft- und Raumfahrt E.V.: *See*—
Farago, Zoltan; and Buschulte, Winfried, 4,692,319, Cl. 423-242.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfart e.V.: *See*—
Birk, Josef; Baisch, Friedhelm; and Borger, Heinz J., 4,691,695, Cl. 128-38.000.

DeVeau, George F., Jr.: *See*—
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.

Devlin, John P.; and Hargrave, Karl D., to Boehringer Ingelheim Pharmaceuticals, Inc. Bis(arylpiperazinyl)sulfur compounds. 4,692,448, Cl. 514-252.000.

De Vrieze, Henricus M.: *See*—
Khoe, Giok D.; and De Vrieze, Henricus M., 4,692,208, Cl. 156-659.100.

Dewitz, Thomas S.: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Dhyanchand, P. John: *See*—
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,692,671, Cl. 318-11.000.

Diamond, Betty A., to Yeshiva University. Monoclonal antibodies reactive with shared idiotypes on human antibodies to native DNA from patients with systemic lupus erythematosus. 4,692,416, Cl. 436-508.000.

Dickens, Judith F.; and Loughlin, John J. Medical apparatus and system. 4,691,710, Cl. 128-673.000.

Dictaphone Corporation: *See*—
Debaudringhien, Andre, 4,692,825, Cl. 360-96.300.

Didier-Werke Ag: *See*—
Dobner, Gerd-Erich, 4,691,901, Cl. 266-236.000.

Diehl, Herbert: *See*—
Huschelrath, Gerhard; and Diehl, Herbert, 4,692,702, Cl. 324-251.000.

Diesel Kiki Co., Ltd.: *See*—
Otsuka, Shojiro; and Komada, Hideaki, 4,691,674, Cl. 123-299.000.

Dietzel, Klaus. Method and apparatus for making a pressure hose socket. 4,691,550, Cl. 72-68.000.

Diffracto, Ltd.: *See*—
Pryor, Timothy R., 4,692,884, Cl. 364-573.000.

Digital Equipment Corporation: *See*—
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Digitext, Inc.: *See*—
Cuff, William A.; and Lefler, Jerrold P., 4,692,042, Cl. 400-94.000.

DiGiulio, Adolph V.: *See*—
Ingram, Alvin R.; and DiGiulio, Adolph V., 4,692,472, Cl. 521-60.000.

Dignam, Bernard J., deceased; and Dignam, Bonnie M., heiress. Sutureless infusion cannula for ophthalmic surgery. 4,692,142, Cl. 604-51.000.

Dignam, Bonnie M., heiress: *See*—
Dignam, Bernard J., deceased; and Dignam, Bonnie M., heiress, 4,692,142, Cl. 604-51.000.

Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., to Phillips Petroleum Company. Apparatus for producing carbon black. 4,692,312, Cl. 422-151.000.

Dillon, Linwood E. Garbage can. 4,691,837, Cl. 220-1.00T.

DiMucci, Vito A.: *See*—
Anderson, P. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.

Dionne, Robert. Device for preventing unauthorized removal of portable objects. 4,691,891, Cl. 248-551.000.

Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, to Sundstrand Corporation. Electrically-compensated constant speed drive. 4,692,671, Cl. 318-11.000.

Dispenziere, Nicholas C., Jr.: *See*—
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.

Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, to FAG Kugelfischer Georg Schafer KGaA. Friction clutch operated pressure modulator. 4,691,813, Cl. 192-13.00R.

Dive N'Surf: *See*—
Meistrell, Robert W., 4,692,002, Cl. 351-156.000.

Diversified Products Corporation: *See*—
Rockwell, Gary L., 4,691,918, Cl. 272-134.000.

Divis, Richard T.: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.

Djerf, Villy E.: *See*—
Parkinson, William S.; and Djerf, Villy E., 4,692,372, Cl. 428-282.000.

Dobat, Daniel F.: *See*—
Smith, Michael D.; and Dobat, Daniel F., 4,692,074, Cl. 409-233.000.

Dobner, Gerd-Erich, to Didier-Werke Ag. Gas rinsing stopper preventing mixing of air with rinsing gas. 4,691,901, Cl. 266-236.000.

Dobson Park Industries Plc.: *See*—
Ward, Richard; and Allen, Archelaius D., 4,692,067, Cl. 405-302.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Mueller, Robert, 4,691,593, Cl. 74-714.000.

Dr. Ludwig Pietzach GmbH: *See*—
Pietzach, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.

Dodman, Nicholas H.; and Shuster, Louis, to Tufts College, Trustees of. Method for preventing stereotypic behavior in animals. 4,692,451, Cl. 514-282.000.

Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, to Matsushita Electric Industrial Co., Ltd. Sewing machine driving apparatus. 4,692,676, Cl. 318-269.000.

Dohi, Takashi: *See*—
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.

Dollison, William W., to Otis Engineering Corporation. Hydraulic well pump. 4,691,511, Cl. 60-414.000.

Domain, Inc.: *See*—
Burghardi, Stephen R., 4,692,265, Cl. 252-194.000.

Domeratzky, Joachim: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Donahue, Robert L.: *See*—
Hamilton, Harold F.; and Donahue, Robert L., 4,691,443, Cl. 33-288.000.

Donkerbrook, Deborah: *See*—
Johnson, Randall, 4,692,846, Cl. 362-104.000.

Donovan, Kevin M.: *See*—
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.

Dooley, Patrick D. Gaff for landing fish. 4,691,465, Cl. 43-5.000.

Dorina Nahmaschinen GmbH: *See*—
Meier, Willi, 4,691,654, Cl. 112-303.000.

Dorn, Alfred, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Control device using light-emitting diodes for both manual input and display of data. 4,692,739, Cl. 340-365.00P.

Dorsey, John W.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

dos Santos Copia, Carlos R., to Maquinas NPU Ltda. Machine for making unitized stacks of bags. 4,692,134, Cl. 493-196.000.

Dosaka, Katsumi: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Dotson, Duane L.; and Forschurm, Alex, to Celanese Corporation. Flammable barrier wrap for solid fuel/firestarter composition. 4,692,168, Cl. 44-7.100.

Dove, Albert W.: *See*—
New, Dane S.; and Dove, Albert W., 4,691,658, Cl. 114-66.000.

Dove, Norman F. Adjustment device for a lip of a headbox slice. 4,692,213, Cl. 162-259.000.

Dover Molded Products Company, The: *See*—
Ullman, Myron, 4,691,839, Cl. 220-281.000.

Dow Chemical Company, The: *See*—
Beck, H. Nelson; and MacWilliams, Dalton C., 4,692,355, Cl. 427-297.000.

Dunbar, Joseph E.; and Maruyama, Kimiaki, 4,692,467, Cl. 514-609.000.

Hall, Mark J.; and Hyun, Kun S., 4,692,508, Cl. 528-503.000.

Hefner, Robert E., Jr., 4,692,500, Cl. 525-529.000.

Malhotra, Sudarshan K.; and Evoy, Ingrid L., 4,692,183, Cl. 71-94.000.

Wang, Pen-Chung; and Crain, Steven P., 4,692,533, Cl. 548-312.000.

Weller, Joseph P., 4,692,431, Cl. 502-417.000.

Dowell Schlumberger Incorporated: *See*—
Kucera, Clare H., 4,692,254, Cl. 252-8.551.
Nelson, Erik B., 4,691,774, Cl. 166-291.000.

Dowling, Donald J.: *See*—
Mazzagatti, Roy P.; and Dowling, Donald J., 4,692,706, Cl. 324-338.000.

Doyle, Terrence W.: *See*—
Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, 4,692,538, Cl. 558-6.000.

Drach, George W.: *See*—
Rosenberg, Helmut W. G.; and Drach, George W., 4,692,149, Cl. 604-99.000.

Dragerwerk AG: *See*—
Pannwitz, Karl-Heinz, 4,692,309, Cl. 422-87.000.

Drent, Eit, to Shell Oil Company. Process for the preparation of unsaturated compounds. 4,692,548, Cl. 560-202.000.

Dresser Industries, Inc.: *See*—
Lustig, Lee M.; and Ellis, Gary D., 4,691,775, Cl. 166-317.000.

Drexler, Jerome, to Drexler Technology Corporation. Method of forming a personal information card. 4,692,394, Cl. 430-140.000.

Drexler Technology Corporation: *See*—
Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., 4,692,402, Cl. 430-945.000.
Drexler, Jerome, 4,692,394, Cl. 430-140.000.

Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, to Hoechst Aktiengesellschaft. Process for the preparation of glyoxylic hemiacetal esters. 4,692,547, Cl. 560-186.000.

Drummond, George S.: *See*—
Kappas, Attallah; and Drummond, George S., 4,692,440, Cl. 514-185.000.
Rideout, Darryl; Kappas, Attallah; and Drummond, George S., 4,692,439, Cl. 514-185.000.

Dubs, Paul: *See*—
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.

Duff Norton Company: *See*—
Ferguson, George R., 4,691,452, Cl. 34-119.000.

Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., to Sun Refining and Marketing Company. Phosphite-promoted ruthenium-cobalt catalysts for the dealkoxyhydroxymethylation of acetals to form glycol ethers. 4,692,426, Cl. 502-154.000.

Duggan, Stephen R., to Medtronic, Inc. Drug administration device. 4,692,147, Cl. 604-93.000.

Duke, Christopher C.: *See*—
Varnum, Gerald F.; and Duke, Christopher C., 4,691,573, Cl. 73-702.000.

Dunan, Andrew J., to Solitec Limited. Material discharge apparatus. 4,691,843, Cl. 222-58.000.

Dunbar, Joseph E.; and Maruyama, Kimiaki, to Dow Chemical Company, The. N'-cyano-n-tetrahydrownaphthyl-s-methyisothiourea as a growth promoting agent. 4,692,467, Cl. 514-609.000.

Dundas, Robert E.; and Tatar, Fred W., to Factory Mutual Research. Method of testing steam turbine rotors to determine if they should be retired because of embrittlement. 4,692,701, Cl. 324-240.000.

Dunn, William J.; and Silver, Brian H., to Kendall Company, The. Acoustic coupling assembly with retaining connector for noninvasive sensing of sampling chamber fluid. 4,691,557, Cl. 73-32.00A.

Dunsmore, Jerry L.: *See*—
Kerr, Jack R.; Shelton, Thomas V.; and Dunsmore, Jerry L., 4,692,077, Cl. 411-206.000.

Du Pont de Nemours, E. I., and Company: *See*—
Bruner, Harold S., Jr., 4,692,549, Cl. 560-204.000.
Erhardt, Paul W.; and Matier, William L., 4,692,446, Cl. 514-234.000.
Hahn, Marlyn E., 4,691,971, Cl. 439-78.000.
Kelly, Renee J., 4,692,481, Cl. 523-219.000.
LeRoux, Donald F.; and Stottlemyer, Quayton R., 4,692,083, Cl. 414-411.000.
Manring, Lewis E.; and Mazur, Stephen, 4,692,360, Cl. 427-443.100.
Reich, Shymon, 4,692,387, Cl. 428-545.000.
Shenvi, Ashokkumar B., 4,692,528, Cl. 546-115.000.
Wang, Ying, 4,692,636, Cl. 307-427.000.

Durbin, John A.: *See*—
Loce, Robert P.; Rees, James D.; and Durbin, John A., 4,692,015, Cl. 355-1.000.

Durckheimer, Walter: *See*—
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.

Durham, Dana, to American Hoechst Corporation. Process of using photoresist treating composition containing a mixture of a hexa-alkyl disilazane, propylene glycol alkyl ether and propylene glycol alkyl ether acetate. 4,692,398, Cl. 430-329.000.

Durst, Felix, to Allenspach, Norbert. Heat exchanger unit with support ring and radial brackets. 4,691,764, Cl. 165-68.000.

Dusch, Albert, to Pfaff Industriemaschinen GmbH. Lockswitch sewing machine having a rotary hook. 4,691,650, Cl. 112-231.000.

Dyball, Christopher J.: *See*—
Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., 4,692,402, Cl. 430-945.000.
Dyna, Horst; and Heindle, Armin, to Mannesmann Kienzle GmbH. Document encoder. 4,692,041, Cl. 400-82.000.
Dymax Corporation: *See*—
Matzuk, Terrance, 4,691,571, Cl. 73-632.000.
Dymenko, Vladimir V.: *See*—
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.
Dynamit Nobel Aktiengesellschaft: *See*—
Mattarelli, Ennio, 4,691,462, Cl. 42-75.040.
Dynapert-HTC Corp.: *See*—
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Dynatech Corporation: *See*—
Kitchell, Judith P.; and de Riel, Stanton R., 4,692,328, Cl. 424-78.000.
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Ikeda, Sakio; and Yonamine, Shozen, 4,691,717, Cl. 131-365.000.
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Gordon, Eric M., 4,692,455, Cl. 514-332.000.
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Harris, Mark A., 4,692,724, Cl. 333-202.000.
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House, Gary L., 4,692,401, Cl. 430-570.000.
Eaton Corporation: *See*—
Hoppie, Lyle O., 4,691,682, Cl. 123-558.000.
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Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.
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Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.
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Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.
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Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.
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Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.
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Eidos Corporation: *See*—
Rudolph, Thomas E., 4,691,464, Cl. 43-3.000.
Ekola, Kenneth E. Tension transducer. 4,691,579, Cl. 73-862.480.
Ekstrom, Michael P.; and Havira, R. Mark, to Schlumberger-Doll Research. Method and apparatus for investigating stand-off in a borehole. 4,692,908, Cl. 367-27.000.
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Ficker, Harold K.; and Teskin, Frederick M., 4,692,489, Cl. 524-243.000.
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Bollen, Theo P. C.; and Cassidy, John E., 4,692,556, Cl. 136-234.000.
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Bloss, F. Donald, 4,692,024, Cl. 356-135.000.
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Bjareklint, Ake; and Simonsson, Daniel, 4,692,229, Cl. 204-151.000.
Electronic Design & Research, Inc.: *See*—
Shvartsman, Vladimir A., 4,692,709, Cl. 328-108.000.
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Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever KG: *See*—
Nix, Hans F., 4,692,700, Cl. 324-229.000.
Eli Lilly and Company: *See*—
Boisvenue, Rudolph J., 4,692,468, Cl. 514-616.000.
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Katner, Allen S., 4,692,443, Cl. 514-206.000.
Lord, Gary E., 4,692,518, Cl. 540-224.000.
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Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., to Caterpillar Inc. Apparatus and method for wrapping an external tape support about a filter element assembly. 4,692,196, Cl. 156-187.000.
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Ellingson, Hartley, to Frontier, Inc. Roll-tight tarp system. 4,691,957, Cl. 296-98.000.
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Ellis, Gary D.: *See*—
Lustig, Lee M.; and Ellis, Gary D., 4,691,775, Cl. 166-317.000.
Ellis, Stafford M., to GEC Avionics Limited. Electric circuit module arrangements. 4,692,840, Cl. 361-393.000.
Elloway, Russell: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.
Elscint Ltd.: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.
Eltek S.p.A.: *See*—
Fornasari, Paolo, 4,691,516, Cl. 60-527.000.
Elter, Claus: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.
Emde, Carsten, to Fresnius AG. Medical tube. 4,692,152, Cl. 604-164.000.
Emhart Industries, Inc.: *See*—
Merchant, David E., 4,692,838, Cl. 361-380.000.
Endo, Sasuke. Brush for applying material in liquid or emulsion form. 4,692,047, Cl. 401-141.000.
Energy Transportation Group Inc.: *See*—
Tornay, Edmund, 4,691,660, Cl. 114-248.000.
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, to Bayer Aktiengesellschaft. Continuous process for thermal splitting of carbamic acid esters. 4,692,550, Cl. 560-345.000.
Engelbach, Thomas S. System for automatically preventing turnover of two wheeled vehicles. 4,691,798, Cl. 180-209.000.
Engineered Air Systems, Inc.: *See*—
Mutchler, Paul A., 4,691,687, Cl. 126-104.00A.
Engle, James L., to Auburn Gear, Inc. Quick disengagement apparatus for power wheel mechanisms. 4,692,049, Cl. 403-1.000.
Engstrom, David A. Spanner for torsion springs and method for its use. 4,691,428, Cl. 29-426.600.
Enomoto, Akio, to NGK Insulators, Ltd.; and Mizutani, Isao. Condensation resistant electrode for use in a dielectric heating apparatus. 4,692,581, Cl. 219-10.810.
Enomoto, Yuji: *See*—
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.
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Politis, Demetrios T.; and Licata, William H., 4,692,765, Cl. 342-106.000.
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Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.
Ergomed: *See*—
Landau, Boris; and Saines, Marius, 4,692,157, Cl. 604-214.000.
Erhardt, Paul W.; and Matier, William L., to Du Pont de Nemours, E. I., and Company. Esters of aryloxypropanolamine derivatives and medicinal uses. 4,692,446, Cl. 514-234.000.

Erion, Terry L.: *See*—
Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.
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Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.
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Mierswa, Christian; and Schmutz, Friedrich, 4,691,723, Cl. 134-167.00C.
Erski, Richard, to NAP Consumer Electronics Corp. Apparatus for generating oscilloscope trigger signals. 4,692,802, Cl. 358-139.000.
Erwin, Edward R. Device to monitor press fittings. 4,692,775, Cl. 346-118.000.
Erwin Sick GmbH Optik Elektronik: *See*—
von Stein, Walter, 4,691,647, Cl. 112-80.180.
Escache, Gerard: *See*—
Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, 4,691,633, Cl. 102-202.000.
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Delahoy, Alan E.; Dalal, Vikram L.; and Eser, Erter, 4,692,558, Cl. 136-[illegible].000.
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Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.
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Sander, Wilfried; Essig, Gunder; and Wacker, Erich, 4,691,622, Cl. 92-233.000.
ETA SA Fabriques d'Ebauches: *See*—
Mock, Elmar; and Gabus, Georges A., 4,692,033, Cl. 368-280.000.
Etani, Kenji. Water treatment systems. 4,692,314, Cl. 422-265.000.
Ethyl Corporation: *See*—
Belk, Thomas J., 4,691,866, Cl. 241-5.000.
Shin, Kju H., 4,692,555, Cl. 568-722.000.
Eucatex S.A. Industria e Comercio of Sao Paulo: *See*—
Roberts, James R., 4,692,211, Cl. 162-147.000.
Evangelista, Richard A.: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.
Evans, Rhys M.: *See*—
Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., 4,692,912, Cl. 367-190.000.
Evans, Samuel: *See*—
Rasberger, Michael; Dubs, Paul; and Evans, Samuel, 4,692,258, Cl. 252-50.000.
Evoy, Ingrid L.: *See*—
Malhotra, Sudarshan K.; and Evoy, Ingrid L., 4,692,183, Cl. 71-94.000.
Ewikon Entwicklung und Konstruktion GmbH & Co.: *See*—
Muller, Walter, 4,692,595, Cl. 219-421.000.
Ex-Cell-O Corporation: *See*—
Gray, John D., 4,692,293, Cl. 264-245.000.
Excel Industries, Inc.: *See*—
Mullet, David L.; and Bontrager, Ivan W., 4,691,784, Cl. 172-15.000.
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., to Standard Telephones and Cables Public Limited Company. Magnetic field sensor having a Hall effect device with overlapping flux concentrators. 4,692,703, Cl. 324-251.000.
Exxon Chemical Patents Inc.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.
Exxon Nuclear Company, Inc.: *See*—
Osborne, Jon L., 4,692,303, Cl. 376-446.000.
Exxon Research and Engineering Company: *See*—
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.
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Nardella, Massimiliano, 4,692,100, Cl. 416-232.000.
F. F. Mengel Company: *See*—
Mengel, William F., 4,692,058, Cl. 404-72.000.
Fabien, Raymond; and Decrouen, Jean-Michel, to U.S. Philips Corporation. Method of planarizing the surface of a semiconductor device, in which silicon nitride is used as isolating material. 4,692,204, Cl. 156-626.000.
Factory Mutual Research: *See*—
Dundas, Robert E.; and Tatar, Fred W., 4,692,701, Cl. 324-240.000.
FAG Kugelfischer Georg Schafer KGaA: *See*—
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.
Falconer, Ralph A.: *See*—
Johnson, Bruce R.; and Falconer, Ralph A., 4,691,732, Cl. 137-268.000.
Falk, Gerhard, to Robert Bosch GmbH. Control and energization circuit for a brushless d-c motor. 4,692,675, Cl. 318-254.000.
Fang, Sheng; and Lee, Sam H., to Advanced Micro Devices, Inc. Selectable multi-input CMOS data register. 4,692,634, Cl. 307-272.100.
Fanuc Ltd.: *See*—
Kishi, Hajimu; and Tanaka, Kunio, 4,692,873, Cl. 364-474.000.
Komiya, Hidetsugu, 4,692,856, Cl. 364-167.000.
Fanuc LTD: *See*—
Kiya, Nobuyuki, 4,692,872, Cl. 364-474.000.
Farago, Zoltan; and Buschulte, Winfried, to Deutsche Forschungs- und Versuch-Sanstalt fur Luft- und Raumfahrt E.V. Method for desulfurizing flue gas in fuel oil firing systems. 4,692,319, Cl. 423-242.000.
Farfan de los Godos, Henry F., to 102160 Canada Inc. Lumbar spinal brace. 4,691,696, Cl. 128-78.000.
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., to General Motors Corporation. Steering column with selectively adjustable and preset preferred positions. 4,691,587, Cl. 74-493.000.
Farrell, Roberta L., to Repligen Corporation. Use of rLDM TM 1–6 and other ligninolytic enzymes for the decolorization of E1 effluent. 4,692,413, Cl. 435-278.000.
Fawcett, Bradley W.; and Sendelbach, Lee A., to International Business Machines Corporation. Legibility enhancement for alphanumeric displays. 4,692,758, Cl. 340-735.000.
FBC Limited: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.
Fedi, Mauro: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.
Feinstein, David Y. Electronic card for sharing the same edgeboard connector with another electronic edgeboard. 4,692,120, Cl. 439-62.000.
Feldhacker, Marvin E.: *See*—
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.
Feldman, Louis W.; and Yawn, David H., to Cardiovascular Systems Inc. Centrifuge. 4,692,136, Cl. 494-38.000.
Fenster, Paul: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.
Fensterer, Howard F.: *See*—
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.
Ferbrache, Raymond B., to Gott Corporation. Lid locking handle for waste container. 4,691,840, Cl. 220-318.000.
Ferdinand Bernhard Schmetz, Firma: *See*—
Schmetz, Peter-Nikolaus; and Klocker, Peter, 4,691,825, Cl. 206-380.000.
Ferguson, George R., to Duff Norton Company. Articulable siphon tube assembly for dryer drum. 4,691,452, Cl. 34-119.000.
Ferm, Joyce E.: *See*—
Torgerson, Gary D.; and Ferm, Joyce E., 4,691,409, Cl. 16-250.000.
Ferm & Torgerson Partnership: *See*—
Torgerron, Gary D.; and Ferm, Joyce E., 4,691,409, Cl. 16-250.000.
Fernbach, James L. Fishing weight assembly. 4,691,468, Cl. 43-44.900.
Ferranti plc: *See*—
Pitches, Brian E.; and Wright, David A., 4,691,446, Cl. 33-516.000.
Ferrari, Lorenzo: *See*—
Cavigli, Mario; and Ferrari, Lorenzo, 4,692,929, Cl. 373-89.000.
Ferrofluidics Corporation: *See*—
Raj, Kuldip; and Casciari, Raoul, 4,692,826, Cl. 360-97.000.
Fiat Auto S.p.A.: *See*—
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, 4,691,946, Cl. 248-429.000.
Ficker, Harold K.; and Teskin, Frederick M., to El Paso Products Company. Polypropylene compositions of improved clarity. 4,692,489, Cl. 524-243.000.
Fiedziuszko, Slawomir J.; and Ziegler, Craig A., to Ford Aerospace & Communications Corporation. Narrow bandpass dielectric resonator filter with mode suppression pins. 4,692,723, Cl. 333-202.000.
Field Group Chemicals Pty. Ltd.: *See*—
Kritzler, Steven, 4,692,325, Cl. 424-4.000.
Field, Jasper H.: *See*—
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.
Fields, Loranza D., Jr. Horizontal evaluation datum scope. 4,691,445, Cl. 33-367.000.
Fildan, Gerhard. Bolt assembly for a door set. 4,691,951, Cl. 292-337.000.
Filhol, Stuart J. Dental pin and holder. 4,692,116, Cl. 433-225.000.
Fillet, Pierre R., to Vallourec. Knuried drill stem. 4,691,791, Cl. 175-320.000.
Filomeno, Vito G., to Warner-Lambert Company. Skin bleaching detergent bar. 4,692,261, Cl. 252-105.000.
Findlay, Hugh T., to International Business Machines Corporation. Transfer element and process for radiation defined images. 4,692,395, Cl. 430-254.000.
Fink, Hans-Ferdi: *See*—
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.
Fink, Werner; and Bohn, Heinz, to ITT Industries, Inc. Liquid ring vacuum pump arrangement having minimized operating liquid consumption. 4,692,101, Cl. 417-68.000.
Firey, Joseph C. Solid with gas reactor plant. 4,692,171, Cl. 48-61.000.
First Byte: *See*—
Jacks, Richard P.; and Sprague, Richard P., 4,692,941, Cl. 381-52.000.
Fischer, Francois: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.
Fischer, Helmut. Device for measuring the properties of solid materials which can be derived from the behavior of a penetrating body. 4,691,559, Cl. 73-81.000.

Fischer & Porter Company: *See*—
Herzl, Peter J., 4,691,578, Cl. 73-861.380.

Fischle, Martin: *See*—
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,692,570, Cl. 200-4.000.

Fisher, Alfred J., III; and Schmidt, Timothy J., to General Safety Corporation. Method of molding an integral spur gear and toothed sprocket assembly. 4,692,294, Cl. 264-259.000.

Fisher Controls International, Inc.: *See*—
Varnum, Gerald F.; and Duke, Christopher C., 4,691,573, Cl. 73-702.000.

Fisher, William B.: *See*—
James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., 4,692,321, Cl. 423-404.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Magnetic application of light-absorbing particles to a lenticular screen. 4,692,359, Cl. 427-45.100.

Fix, Joseph A.: *See*—
Alexander, Jose; Repta, A. J.; and Fix, Joseph A., 4,692,441, Cl. 514-194.000.

Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., to Baltimore Aircoil Company, Inc. Compression sealing of tubes within shell and tube heat exchanger. 4,691,769, Cl. 165-158.000.

Fleming, William T.: *See*—
Lalm, Hill S.; Bermudez, Jorge E.; and Fleming, William T., 4,691,577, Cl. 73-861.050.

Floran, Robert J.: *See*—
Ebenhack, Ben W.; and Floran, Robert J., 4,691,772, Cl. 166-254.000.

Florio, Steven M.: *See*—
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Flowdril Corporation: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.

FMC Corporation: *See*—
Chang, Jun H., 4,692,182, Cl. 71-88.000.

Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, to TH. Goldschmidt AG. Use of polymers of alkylvinyl ethers to prevent or eliminate foam on aqueous media. 4,692,267, Cl. 252-321.000.

Folkmar, Jan: *See*—
Hofmann, Raimund, 4,691,821, Cl. 206-216.000.

Fondation Suisse pour la Recherche en Microtechnique: *See*—
Genequand, Pierre, 4,692,016, Cl. 355-1.000.

Fonderie Musil: *See*—
Bibollet, Bernard, 4,692,097, Cl. 416-207.000.

Ford Aerospace & Communications Corporation: *See*—
Chism, Samuel B., Jr., 4,692,808, Cl. 358-231.000.
Fiedziuszko, Slawomir J.; and Ziegler, Craig A., 4,692,723, Cl. 333-202.000.

Ford, John M. B.; and Moore, David G., to Realex Corporation. Pasty product dispenser having combination actuator and outlet valve. 4,691,847, Cl. 222-259.000.

Ford, Michael B. Hose quick coupling apparatus. 4,691,942, Cl. 285-84.000.

Ford Motor Company: *See*—
Beckwith, Elaine C., 4,692,320, Cl. 423-263.000.

Ford, Roger S.: *See*—
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.

Fornasari, Paolo, to Eltek S.p.A. Thermally-activated device for creating considerable power. 4,691,516, Cl. 60-527.000.

Forrester, Gilbert. Method and apparatus for measuring the distribution of fiber widths and adjusting the refining of fibrous stock. 4,692,210, Cl. 162-49.000.

Forschirm, Alex: *See*—
Dotson, Duane L.; and Forschirm, Alex, 4,692,168, Cl. 44-7.100.

Forseth, Glenn J.: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.

Forsyth Dental Infirmary for Children: *See*—
Jordan, Harold V.; and Marmel, Max, 4,692,407, Cl. 435-36.000.

Forsyth, James M., to Hampshire Instruments. X-ray lithography system. 4,692,934, Cl. 378-34.000.

Fort, Edward S., to Fort Vale Engineering Ltd. Valve seals. 4,691,734, Cl. 137-493.400.

Fort Vale Engineering Ltd.: *See*—
Fort, Edward S., 4,691,734, Cl. 137-493.400.

Fosbinder, Larry L.: *See*—
Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., 4,691,754, Cl. 164-9.000.

Fosslien, Egil, to Fosslien, Egil. Fluid sampling apparatus. 4,691,580, Cl. 73-864.840.

Foures, Jacques. Process apparatus and system for preserving and dispensing wine. 4,691,842, Cl. 222-1.000.

Foxx, Mary E.: *See*—
Klein, Robert W.; and Foxx, Mary E., 4,692,329, Cl. 424-81.000.

Framatome & Cie.: *See*—
Grespin, Gerard, 4,692,300, Cl. 376-245.000.

Frank, Arthur M., to Grumman Aerospace Corporation. Torsion spring powered missile wing deployment system. 4,691,880, Cl. 244-49.000.

Frank, Harry, to Shell Oil Company. Deactivation of phosphonium salt catalyst. 4,692,504, Cl. 528-89.000.

Frank, Werner, to Licentia Patent-Verwaltungs-GmbH. Separating apparatus for flat objects. 4,691,913, Cl. 271-34.000.

Frantz, Virgil L., to Roanoke College. Two-stage precoalescer unit. 4,692,175, Cl. 55-218.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,691,565, Cl. 73-146.000.

Frazer, Robert E.: *See*—
Adachi, Iwao P.; Adachi, Yoshifumi; and Frazer, Robert E., 4,692,003, Cl. 351-212.000.

Frede, Dieter, to Condor-Werk Gebr. Frede GmbH & Co. KG. Float switch using foam body for floatability. 4,692,576, Cl. 200-84.00R.

Freed, Paul S.: *See*—
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, to Dana-Farber Cancer Institute, Inc. Monoclonal antibodies to antigen on activated human B-cells and assay therefor, protein antigenic determinant therefor and method of making same. 4,692,405, Cl. 435-7.000.

Frega, John: *See*—
Brass, Robert L.; Globerson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Fremaux, Jacques: *See*—
Villain, Jean-Marie; and Fremaux, Jacques, 4,692,180, Cl. 65-32.000.

Frerich, Josef, to Deere & Company. Housing for holding a supply roll of large round bale wrap material. 4,691,503, Cl. 53-587.000.

Fresnius AG: *See*—
Emde, Carsten, 4,692,152, Cl. 604-164.000.

Fried, Krupp GmbH: *See*—
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,692,218, Cl. 203-19.000.
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Friedman, Gerald, to TRW Inc. Method of shaping a workpiece. 4,691,857, Cl. 228-265.000.

Friedman, Robert H., to Texaco Inc. Method of recovering hydrocarbon from oil shale. 4,692,239, Cl. 208-430.000.

Frisillo, Albert L.: *See*—
Sondergeld, Carl H.; Frisillo, Albert L.; and Norris, Janice O., 4,692,910, Cl. 367-75.000.

Fritsche, Joel L.: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Fritz, William O.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Fromm, George R.; and Stefaniak, Philip S., to Helene Curtis, Inc. Pilot light arrangement for styling iron with swivel cord. 4,692,586, Cl. 219-225.000.

Frontier, Inc.: *See*—
Ellingson, Hartley, 4,691,957, Cl. 296-98.000.

Fruhaufova, Maria: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Frush, Donald R., to CTB, Inc. Rail lock device for tubular fence. 4,691,897, Cl. 256-65.000.

Frydman, Georges. Frame structure especially for a cabinet, e.g. of the shelved type. 4,691,644, Cl. 108-111.000.

FSI Corporation: *See*—
Silvernail, James M.; and Miller, Clifford C., 4,691,722, Cl. 134-155.000.

Fsk Co., Ltd.: *See*—
Asano, Shinzo, 4,691,630, Cl. 101-212.000.

Fuchigami, Wataru; and Nakayama, Yoshiharu, to Yamaha Motor Co., Ltd. Timing chain drive. 4,692,129, Cl. 474-148.000.

Fudge, Kent D., to Atlantic Richfield Company. Expandable polypropylene interpolymer particles. 4,692,471, Cl. 521-59.000.

Fuji Electric Company, Ltd.: *See*—
Hirota, Toshio, 4,692,391, Cl. 429-34.000.
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Fuji Electric Corporate Research and Devel., Ltd.: *See*—
Nishiura, Masaharu; and Haruki, Hiromu, 4,692,345, Cl. 427-39.000.

Fuji Electric Corporate Research & Development Co., Ltd.: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.

Fuji Electric Corporate Research and Development Ltd.: *See*—
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Nagai, Masaaki, 4,691,678, Cl. 123-425.000.

Fuji Kogyo Kabushiki Kaisha: *See*—
Nakajima, Junichi, 4,691,750, Cl. 144-208.00B.

Fuji Machinery Company, Ltd.: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Fuji Photo Film Co., Ltd.: *See*—
Cho, Michio, 4,691,996, Cl. 350-465.000.
Matsumoto, Fumio, 4,692,797, Cl. 358-76.000.
Suzuki, Kenji, 4,692,794, Cl. 358-44.000.

Fuji Photo Optical Company, Ltd.: *See*—
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Fujibayashi, Kazuo: *See*—
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Fujibayashi, Kenji, to Olympus Optical Co., Ltd. Dual audio track recording system in which one track also contains a control signal. 4,692,818, Cl. 360-22.000.

Fujii, Hidehiko: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Fujimori Kogyo Co., Inc.: *See*—
Takahashi, Toru; and Yoshida, Taro, 4,692,327, Cl. 428-35.000.

Fujinami, Minpei: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Fujinawa, Hirotaka: *See*—
Sakuma, Shuji; and Fujinawa, Hirotaka, 4,691,718, Cl. 132-84.00R.

Fujino, Akihiko: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Fujioka, Masanobu, to Kokusai Denshin Denwa Co., Ltd. Packet switching system. 4,692,917, Cl. 370-60.000.

Fujirebio Kabushiki Kaisha: *See*—
Ashihara, Yoshihiro; and Kasahara, Yasushi, 4,692,404, Cl. 435-5.000.

Fujisawa, Kyohei: *See*—
Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, 4,692,796, Cl. 358-76.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Fujishima, Kazuyasu: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Fujita, Akihiro: *See*—
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.

Fujita, Masahiro; and Uemura, Yukio, to Maeda Metal Industries Ltd.; and Nissan Motor Co., Ltd. Bolt-nut tightening device having means for preventing abnormal rotation. 4,691,786, Cl. 173-12.000.

Fujita, Shigeto: *See*—
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.

Fujitsu Limited: *See*—
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.
Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, 4,692,783, Cl. 357-42.000.
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.
Sato, Takuso; and Ichida, Nobuyuki, 4,691,569, Cl. 73-596.000.
Takemae, Yoshihiro, 4,692,689, Cl. 323-313.000.
Yagi, Harumi, 4,691,855, Cl. 228-4.500.

Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, to TDK Corporation. High dielectric porcelain composition and method of reducing sintering temperature thereof. 4,692,422, Cl. 501-136.000.

Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, to OKI Electronics Co., Ltd. Dielectric filter having trimmable capacitor. 4,692,725, Cl. 333-203.000.

Fukazawa, Tokuumi: *See*—
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.

Fukuda, Moritoshi: *See*—
Nakayama, Hiromichi; and Fukuda, Moritoshi, 4,691,416, Cl. 24-90.00B.

Fukui, Hiroshi: *See*—
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

Fukui, Ryoichi; and Minamikawa, Susumu, to Omron Tateisi Electronics Co. Electronic thermometer. 4,692,034, Cl. 374-208.000.

Fukunaga, Masami; and Yamaguchi, Tomoyoshi, to Dai-Ichi Seiko Kabushiki Kaisha. Integrated circuit tester socket. 4,691,975, Cl. 439.266.000.

Fukunaga, Masao; and Nonoguchi, Hiroshi, to Matsushita Electric Industrial Co. Electric food processor. 4,691,870, Cl. 241-36.000.

Fukushima, Aritoshi: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Fukushima, Kazumasa: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.

Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Interlock push-push switch device. 4,692,573, Cl. 200-50.00C.

Fukuzawa, Soichi: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.

Fukuzo, Yukio; and Inoue, Yasukazu, to NEC Corporation. Active pull-up circuit controlled by a single pull-up clock signal. 4,692,642, Cl. 307-530.000.

Fumoto, Takafumi: *See*—
Taniguchi, Harutaka; and Fumoto, Takafumi, 4,692,622, Cl. 250-343.000.

Funakoshi, Satoshi: *See*—
Uemura, Yahiro; and Funakoshi, Satoshi, 4,692,331, Cl. 424-85.000.

Funamoto, Takao: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Fyrnetics, Inc.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,692,552, Cl. 562-475.000.

G.O.R. Applicazioni Speciali S.p.A.: *See*—
Cesano, Franco, 4,692,108, Cl. 425-292.000.

G. R. Potts Associates, Inc.: *See*—
Potts, Gerald R.; and Ryder, John C., 4,691,564, Cl. 73-146.000.

Gabori, Andor: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Gabus, Georges A.: *See*—
Mock, Elmar; and Gabus, Georges A., 4,692,033, Cl. 368-280.000.

GAF Corporation: *See*—
Liu, Kou-Chang, 4,692,551, Cl. 562-471.000.

Galani, Zvi, to Raytheon Company. Single resonator push-push oscillator. 4,692,714, Cl. 331-1.00R.

Galer, David G.: *See*—
Cordell, Henry L.; and Galer, David G., 4,691,846, Cl. 222-198.000.

Galerne, Jean, to LTM Corporation of America. Adjustable light projector. 4,692,844, Cl. 362-3.000.

Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., to Cameron Iron Works, Inc. Subsea wellhead structure. 4,691,780, Cl. 166-348.000.

Gandolfi, Carmelo A.: *See*—
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Gandy, James, to Signtech Inc. Illuminated awning assembly. 4,692,847, Cl. 362-152.000.

Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., to Nabisco Brands, Inc. Process for honey-roasting nuts. 4,692,342, Cl. 426-293.000.

Gano, John C., to Otis Engineering Corporation. Well drilling and completion apparatus. 4,691,781, Cl. 166-368.000.

Ganz, Robert H.: *See*—
Johnson, Roy A.; and Ganz, Robert H., 4,691,606, Cl. 83-175.000.

Ganz, Ulrich W.; and Topness, Paul C., to Boeing Company, The. Inflow control device for engine testing. 4,691,561, Cl. 73-117.100.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Stenzel, Gerhard; and Kaule, Wittich, 4,691,940, Cl. 283-70.000.

Garcia, Raoul; Michaux, Daniel; and Sales, Andre , to SCP Biscornet. Ultrasonic device. 4,691,724, Cl. 134-169.00R.

Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., to Amoco Corporation. Adaptive seismic signal processor. 4,692,909, Cl. 367-45.000.

Gardlik, John M.: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.

Garff, Jeffrey L. Faucet handle arrangement. 4,691,895, Cl. 251-292.000.

Garnier, Jean-Francois: *See*—
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862. Cl. 364-200.000.

Garrett Corporation, The: *See*—
Safarik, William F., 4,692,093, Cl. 416-1.000.

Gartner, Helmut: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Gates, Duncan A.: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.

Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, to Siemens Aktiengesellschaft. Procedure and apparatus for uninterruptible power supply. 4,692,632, Cl. 307-66.000.

Gaur, Santosh P.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, to Hoechst Aktiengesellschaft. Process and apparatus for continuous determination of the states of anisotropy of optically active materials. 4,692,026, Cl. 356-345.000.

Geary, David F.: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Schupphaus, Herbert, 4,691,967, Cl. 299-1.000.

Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik: *See*—
Himmler, Gunther; and Knoll, Gunter, 4,691,567, Cl. 73-483.000.

Gebruder Junghans GmbH: *See*—
Winterhalter, Walter; and Halsig, Andreas, 4,691,635, Cl. 102-251.000.

Gebruder Linck Maschinenfabrik und Eisengiesserei "Gatterlinck" : *See*—
Reuter, Alfred, 4,691,749, Cl. 144-39.000.

GEC Avionics Limited: *See*—
Ellis, Stafford M., 4,692,840, Cl. 361-393.000.

Gegan, Michael J., to United States of America, Navy. Dual band slotted microstrip antenna. 4,692,769, Cl. 343-700.0MS.

Gelderloos, Pouwel J., to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek. Method of operating an absorption heat pump or refrigerator, and an absorption heat pump or refrigerator. 4,691,525, Cl. 62-101.000.

Gelfand, Peter C.; Piulle, Walter V.; and Rettenmaier, Louis F. Ionizer assembly having a bell-mouth outlet. 4,692,174, Cl. 55-129.000.

Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., to Acushnet Company. Process for curing a polymer and product thereof. 4,692,497, Cl. 525-263.000.

Gendron, Kevin: *See*—
Galle, Edward M., Jr.; Gendron, Kevin; and Berner, Paul C., Jr., 4,691,780, Cl. 166-348.000.

Genequand, Pierre, to Fondation Suisse pour la Recherche en Microtechnique. Process for electrophotographic matrix printing and device for carrying out the process. 4,692,016, Cl. 355-1.000.

General Connectors Corporation: *See*—
Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., 4,691,741, Cl. 138-113.000.

General DataComm., Inc.: *See*—
Jordan, Paul A., 4,692,639, Cl. 307-449.000.

General Electric Company: *See*—
Abolins, Visvaldis, 4,692,490, Cl. 524-371.000.
Hayes, Cecil E., 4,692,705, Cl. 324-318.000.
Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., 4,692,644, Cl. 310-178.000.
Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, 4,692,880, Cl. 364-521.000.
Payne, Thomas R., 4,692,596, Cl. 219-450.000.
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.
Roy, Prodyot, 4,692,390, Cl. 429-17.000.
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.

General Engineering Radcliffe Limited: *See*—
Casey, Frank, 4,692,233, Cl. 204-298.000.

General Motors Corporation: *See*—
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587, Cl. 74-493.000.
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.
Schaeffer, Eric S., 4,692,684, Cl. 322-90.000.

General Safety Corporation: *See*—
Fisher, Alfred J., III; and Schmidt, Timothy J., 4,692,294, Cl. 264-259.000.

Georges, Jean-Pierre: *See*—
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862, Cl. 364-200.000.

Georgia Tech Research Corporation: *See*—
Tedder, Daniel W., 4,692,432, Cl. 568-916.000.

Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Adamantane-spirolactams. 4,692,515, Cl. 540-203.000.

Georgiou, George E.; and Poli, Gary N., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Selective electroless plating of vias in VLSI devices. 4,692,349, Cl. 437-230.000.

Geosource, Inc.: *See*—
Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., 4,692,912, Cl. 367-190.000.

Gerard, Jean-Louis: *See*—
Le Marchand, Claude; and Gerard, Jean-Louis, 4,691,809, Cl. 188-71.900.

Gerhards, Klaus: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Geringer, Miles S.; and Kaufman, Vernan R., to Tecumseh Products Company. Connecting rod design with voids. 4,691,590, Cl. 74-579.00E.

Gero, Ilona B. Unit package containing ready-to-use vaginal contraceptive. 4,692,143, Cl. 604-55.000.

Getz, John L., to Industrial Adhesives, Inc. Means for applying liquid to roller in line applicator. 4,692,202, Cl. 156-554.000.

Gezari, Daniel Y.: *See*—
Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., 4,691,694, Cl. 128-25.00R.

Ghose, Rabindra N. Separation of specific biological cells by a biochemical filter. 4,692,411, Cl. 435-243.000.

Ghrist, William D., III: *See*—
Crew, Albert W.; Ghrist, William D., III; and Remley, Gilbert W., 4,692,299, Cl. 376-216.000.

Gianese, Goffredo, to Sasib S.p.A. Device for feeding cigarettes or the like rod-like articles. 4,691,848, Cl. 222-269.000.

Giannini, Mario: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.

Gilbert, David S., to Howard, William H. Guitar stand with fold-away, substantially concealable legs. 4,691,610, Cl. 84-327.000.

Gildenblat, Gennady: *See*—
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.

Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Stainless steel overcoat for sputtered films. 4,692,389, Cl. 428-622.000.

Gilley, J. Kyle: *See*—
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.

Gillilan, James. Rotary power transducer system. 4,691,513, Cl. 60-491.000.

Gillman, Hyman D.: *See*—
Larson, Harold V.; and Gillman, Hyman D., 4,692,535, Cl. 549-542.000.

Gillmann, Hanno, to Licentia Patent-Verwaltungs-GmbH. Device for separating flat objects. 4,691,912, Cl. 271-10.000.

Gilmour, Alfred J., to Auto-Flush Systems Ltd. Improved filler tube tip and centering bell bushing. 4,691,748, Cl. 141-165.000.

Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, to Societe Francaise Hoechst. Process to manufacture glyoxylic acid by electrochemical reduction of oxalic acid. 4,692,226, Cl. 204-73.00R.

Gioia, G. Leonard. High performance amphibious airplane. 4,691,881, Cl. 244-106.000.

Giorgis, Roberto. Hair dryer. 4,691,451, Cl. 34-68.000.

Gist-Brocades N.V.: *See*—
Apontoweil, Peter; and Krasselt, Mansfred M., 4,692,410, Cl. 435-235.000.

Gjertsen, Robert K., to Westinghouse Electric Corp. Removable and reusable locking pin for top nozzle assembly and disassembly. 4,692,304, Cl. 376-446.000.

Glaberson, John: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Glaser, Dieter; and Klemm, Theobald, to VEB Kombinat Textima. Method and apparatus for the removal of liquid from a running yarn. 4,691,450, Cl. 34-23.000.

Glunk, Josef, to Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr. Rotary mower for a tractor. 4,691,504, Cl. 56-192.000.

Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, to Societe Nationale des Poudres et Explosifs. Igniter intended for gas-generating charges in shells. 4,691,633, Cl. 102-202.000.

Godo Steel, Ltd.: *See*—
Takai, Kiyoshi; and Iwasaki, Kiyoshi, 4,692,113, Cl. 432-72.000.

Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., to Sandoz Ltd. Inhibiting polymerization of ethylenically unsaturated monomers. 4,692,544, Cl. 560-4.000.

Goff, Ralph D.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Gogami, Takatoshi: *See*—
Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, 4,692,799, Cl. 358-106.000.

Gogol, Carl A., to Inficon Leybold-Heraeus. Wavelength specific detection system for measuring the partial pressure of a gas excited by an electron beam. 4,692,630, Cl. 250-573.000.

Goldstar Co., Ltd.: *See*—
Gwon, Seong T., 4,692,823, Cl. 360-85.000.

Gonen, Amos: *See*—
Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.

Goodea, Richmond A., to United Aircraft Products, Inc. Bootstrap reservoir. 4,691,739, Cl. 138-31.000.

Goodnow, Ronald F.; and Reid, Robert A., to Thermo Electron-Web Systems, Inc. Doctoring apparatus. 4,691,406, Cl. 15-256.530.

Goodsmith, Dale H., to Multifastener Corporation. Quick disconnect coupler. 4,691,429, Cl. 29-432.000.

Goodwin, Allen W. Acoustic energy, real-time spectrum analyzer. 4,692,117, Cl. 434-185.000.

Goodwin, Graham C.: *See*—
Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.

Gordon, Eric M., to E. R. Squibb & Sons, Inc. Certain acyclic, alicyclic, aromatic or heterocyclic derivatives of 3-benzoylamino-2-oxobutyl-amino-carbonyl-oxy-3-propanoic acids, esters thereof, pharmaceutical compositions containing same and their enkephalinase inhibiting properties. 4,692,455, Cl. 514-332.000.

Gordon, Harry W., to Schmid Laboratories. Method for treating hypercholesterolemia with cryptocidin. 4,692,334, Cl. 424-122.000.

Gordon, Herman B., to Rogers Corporation. Solderless connection apparatus. 4,691,972, Cl. 439-77.000.

Gordon, Ronald O.: *See*—
Singery, Denis C.; and Gordon, Ronald O., 4,692,154, Cl. 604-172.000.

Gorelick, Donald E.: *See*—
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.

Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., to Ciba-Geigy Corporation. 6-substituted penem compounds. 4,692,442, Cl. 514-195.000.

Gosteli, Jacques: *See*—
Tenud, Leander; and Gosteli, Jacques, 4,692,543, Cl. 558-342.000.

Goswami, Jagadish C.; and Aurichio, Joseph A., to Stauffer Chemical Company. Thermally stable adhesive comprising soluble polyimide resin and epoxy resin. 4,692,272, Cl. 252-514.000.

Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Rotating electric motor with reduced cogging torque. 4,692,645, Cl. 310-184.000.

Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Rotating electric motor with reduced cogging torque. 4,692,646, Cl. 310-184.000.

Gott Corporation: *See*—
Ferbrache, Raymond B., 4,691,840, Cl. 220-318.000.

Gottfried, Achberger, to Zahnradfabrik Friedrichshafen AG. Gear shift device. 4,691,585, Cl. 74-473.00R.

Goudreau, Noel: *See*—
Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, 4,691,697, Cl. 128-80.00L.

Gouilloud, Michel: *See*—
Locke, Stanley; and Gouilloud, Michel, 4,692,707, Cl. 324-374.000.

Goulay, Jean: *See*—
Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, 4,692,435, Cl. 514-56.000.

Goushi, Sei'ichi: *See*—
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.

Gover, Gary W. Band security lock. 4,691,539, Cl. 70-18.000.

Governale, Bernard C., to Peachtree Doors, Inc. Rigidifying system for window assembly during its shipment and installation. 4,691,477, Cl. 49-380.000.

Grabowski, Robert; and Kramer, Walter, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for stretching the individual strands of a bundle of fibers or threads. 4,692,106, Cl. 425-66.000.

Grace, Mary D.: *See*—
Grace, Ronald; and Grace, Mary D., 4,691,827, Cl. 206-465.000.

Grace, Ronald; and Grace, Mary D. Supported package attached to panel in parallel slots. 4,691,827, Cl. 206-465.000.

Graco Inc.: *See*—
Krohn, Duane D.; and Boogerman, Allan, 4,692,048, Cl. 401-197.000.

Gradco Systems, Inc.: *See*—
Lawrence, Frederick J., 4,691,914, Cl. 271-297.000.

Gradowski, Steven: *See*—
Hyner, Jacob; and Gradowski, Steven, 4,692,080, Cl. 411-387.000.

Graham, Paul W. L.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, to Reed International plc. Paint containers. 4,691,838, Cl. 220-93.000.

Grandi, Maria: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Grant, Duane E.: *See*—
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.

Grantz, Helmut; and Odebrecht, Wolfgang, to Daimler-Benz Aktiengesellschaft. Lock arrangement for a motor vehicle door. 4,691,949, Cl. 292-216.000.

Gray, Joel E., to Mayo Medical Resources. Slice thickness and contiguity phantom for a magnetic resonance imaging scanner. 4,692,704, Cl. 324-318.000.

Gray, John D., to Ex-Cell-O Corporation. Mold method for multi-color plastic shells. 4,692,293, Cl. 264-245.000.

Gray, Reed A.; and Joo, Grant K., to Stauffer Chemical Co. S-n-butyl-N,N-diisopropyl thiocarbamate as a selective herbicide in sugarbeets, carrots and cabbage. 4,692,186, Cl. 71-100.000.

Greaves, Brian; and Ingham, Paul, to Dearborn Chemicals Limited. Method of inhibiting corrosion in aqueous systems. 4,692,315, Cl. 422-18.000.

Greaves, Brian; and Grenside, Stuart J., to Dearborn Chemicals Limited. Method of inhibiting corrosion in aqueous systems. 4,692,316, Cl. 422-16.000.

Greaves, Brian, to W. R. Grace & Co. Corrosion control in aqueous systems using cationic polymers in combination with phosphonohydroxyacetic acid. 4,692,317, Cl. 422-15.000.

Greb, Manfred: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Green Cross Corporation, The: *See*—
Uemura, Yahiro; and Funakoshi, Satoshi, 4,692,331, Cl. 424-85.000.

Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., to Motorola, Inc. Multiple resonator dielectric filter. 4,692,726, Cl. 333-206.000.

Greene, Richard K.: *See*—
Boldt, Clifford R.; and Greene, Richard K., 4,692,505, Cl. 528-241.000.

Greene, Vibert F. Jet airplane. 4,691,879, Cl. 244-45.00R.

Greeves, Godfrey, to Lucas Industries public limited company. Fuel injection nozzles. 4,691,864, Cl. 239-453.000.

Gregg, Ralph C., Jr., to Motorola, Inc. Binaural Doppler radar target detector. 4,692,763, Cl. 342-28.000.

Greisner, Paul: *See*—
Mayer, Siegfried; and Greisner, Paul, 4,691,950, Cl. 292-269.000.

Grenside, Stuart J.: *See*—
Greaves, Brian; and Grenside, Stuart J., 4,692,316, Cl. 422-16.000.

Grespin, Gerard, to Framatome & Cie. Device for the underwater measurement of the hardness of a vertical wall of the partitioning of the core of a pressurized water nuclear reactor. 4,692,300, Cl. 376-245.000.

Gresser, Robert, to Rhone-Poulenc Chimie de Base. Stable, pumpable aqueous zeolite suspensions. 4,692,264, Cl. 252-140.000.

Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, to Marketing Displays, Inc. Sign and sign stand. 4,691,892, Cl. 248-624.000.

Groezinger, John J.: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.

Grooms, John M.; and Jones, Mark A., to Burton Mechanical Contractors, Inc. Vacuum sewerage system with in pit breather. 4,691,731, Cl. 137-205.000.

Gross, James R.: *See*—
Cianci, James P.; and Gross, James R., 4,692,150, Cl. 604-111.000.

Grumman Aerospace Corporation: *See*—
Frank, Arthur M., 4,691,880, Cl. 244-49.000.
Szuchy, Nicholas C., 4,692,610, Cl. 250-227.000.

Grunwald, Werner; and Schmid, Kurt, to Robert Bosch GmbH. Spark plug for an otto-type internal combustion engine. 4,692,657, Cl. 313-130.000.

Gruppo Lepetit S.p.A.: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, to Institut fur Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee. Procedure for the production of a granulated infant milk food product. 4,692,340, Cl. 426-72.000.

GTE Communication Systems Corporation: *See*—
Bray, Bernard D., 4,692,696, Cl. 324-158.00R.
Bray, Bernard D., 4,692,697, Cl. 324-158.00R.
Crabbe, Edwin P., Jr., 4,692,897, Cl. 364-900.000.

GTE Laboratories Incorporated: *See*—
Bencuya, Izak; and Cogan, Adrian I., 4,692,780, Cl. 357-22.000.

GTE Products Corporation: *See*—
Moskowitz, Philip E.; and Maya, Jekob, 4,692,661, Cl. 313-485.000.
Poyner, John C., 4,692,656, Cl. 313-113.000.
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.

Gugumus, Francois, to Ciba-Geigy Corporation. Synergistic mixture of low-molecular and high-molecular polyalkylpiperidines. 4,692,486, Cl. 524-100.000.

Gunesin, Binnur Z., to Mobil Oil Corporation. Non-staining, non-sticking styrenic polymers. 4,692,492, Cl. 524-731.000.

Gupta, Alankar; and Lloyd, Adam J. P., to Boeing Company, The. Cooling and visor defogging system for an aircraft pilot and crew. 4,691,760, Cl. 165-26.000.

Gupta, Mani R.: *See*—
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.

Gurt, Sven A.: *See*—
Blomberg, Peter E.; and Gurt, Sven A., 4,691,529, Cl. 62-332.000.

Gutschmit, Alan. Strand storing and delivering device. 4,691,873, Cl. 242-47.010.

Gwon, Seong T., to Goldstar Co., Ltd. Tape loading device for a video tape recorder. 4,692,823, Cl. 360-85.000.

Gwyn, John E.: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Gwynne, Jacob M. Metal framing system. 4,691,494, Cl. 52-729.000.

Gyorgy, Makara, to Innovator Mernok Kiszovetkezet. Process for rearing and transporting arrangements of epiphytic plants. 4,691,472, Cl. 47-58.000.

Haar, Thomas, to Alfons Haar Maschinenbau GmbH & Co. KG. Feeder for introducing and feeding plates into a machine tool. 4,691,817, Cl. 198-468.200.

Habich, Michael P.: *See*—
Sudol, Walter J.; and Habich, Michael P., 4,691,927, Cl. 277-26.000.

Haboeck, Adolf: *See*—
Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, 4,692,632, Cl. 307-66.000.

Haddock, Richard: *See*—
Bouldin, Eric; Haddock, Richard; and Dyball, Christopher J., 4,692,402, Cl. 430-945.000.

Haden Drysys International Limited: *See*—
Marsden, Peter; and Bradwell, Paul R., 4,692,358, Cl. 427-421.000.

Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., to Texas Instruments Incorporated. Coatings for ceramic bonding capillaries. 4,691,854, Cl. 228-4.500.

Hafele, Walter; and Schenk, Bernhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,692,102, Cl. 417-296.000.

Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, to Toyota Jidosha Kabushiki Kaisha; and OSG Mfg. Company. Rolling method and rolling tools. 4,691,551, Cl. 72-88.000.

Hahn, Gary S., to Immunetech Pharmaceuticals. Peptide antagonists for the C5a anaphylatoxin. 4,692,511, Cl. 530-325.000.

Hahn, Marlyn E., to Du Pont de Nemours, E. I., and Company. Connector with compliant retainer. 4,691,971, Cl. 439-78.000.

Hahn, Norbert, to Rite-Hite Corporation. Loading dock signal and control system. 4,692,755, Cl. 340-687.000.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,692,800, Cl. 358-106.000.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred; Brostman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Hall, Larry D., to Moog Inc. Piston-and-cylinder arrangement with radially-yieldable piston head. 4,691,621, Cl. 92-184.000.

Hall, Mark J.; and Hyun, Kun S., to Dow Chemical Company, The. Vinylidene chloride interpolymer possessing improved extrudability. 4,692,508, Cl. 528-503.000.

Hall, Phillip E.: *See*—
Titus, John D.; and Hall, Phillip E., 4,691,634, Cl. 102-245.000.

Hallenbach, Werner; Liedel, Hans; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Fungicidal thienylurea derivatives. 4,692,461, Cl. 514-443.000.

Haller, Irene. Disposable syringe with retractable cannula. 4,692,156, Cl. 604-195.000.

Halliburton Company: *See*—
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.
Vinson, Edward F.; and Smith, William H., 4,691,558, Cl. 73-64.100.

Hallstrom, Olof A., Jr. Reciprocating conveyor. 4,691,819, Cl. 198-750.000.

Halsig, Andreas: *See*—
Winterhalter, Walter; and Halsig, Andreas, 4,691,635, Cl. 102-251.000.

Hamamatsu Photonics Kabushiki Kaisha: *See*—
Oba, Koichiro, 4,692,938, Cl. 378-62.000.

Hamatani, Toshiji: *See*—
Yamazaki, Shunpei; Kosuna, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Hamilton Beach Inc.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Hamilton, Harold F.; and Donahue, Robert L., to Hein-Werner Corporation. Drive-in, drive-out vehicle alignment system. 4,691,443, Cl. 33-288.000.

Hammel, Gerard. Flotation process for sludge recovery and energy conversion. 4,692,249, Cl. 210-603.000.

Hammen, Gunter: *See*—
Engbert, Theodor; Hammen, Gunter, Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.

Hampshire Instruments: *See*—
Forsyth, James M., 4,692,934, Cl. 378-34.000.

Han, Myong-ja. Recliner. 4,691,890, Cl. 248-412.000.

Hanrot, Jean-Pascal; and Volpeliere, Jacky, to Aluminium Pechiney. Apparatus for distribution at a regulated rate of a fluidizable powdery material. 4,692,068, Cl. 406-89.000.

Hansen, Craig N., to Hansen Engine Corporation. Rotary pumping apparatus with radial seal assemblies on pistons. 4,692,104, Cl. 418-61.00R.

Hansen Engine Corporation: *See*—
Hansen, Craig N., 4,692,104, Cl. 418-61.00R.

Hansen, James E. Holder for leaders. 4,691,471, Cl. 43-57.200.

Hansen, Lee D.: *See*—
Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., 4,692,475, Cl. 521-92.000.

Hanya, Masado: *See*—
Kaneko, Koichi; and Hanya, Masado, 4,692,031, Cl. 368-18.000.

Hanz, George J.; Jung, Guenter; and Pflaum, Michael, to Siemens Gammasonics, Inc. Detector head mounting mechanism and supporting structure. 4,692,625, Cl. 250-363.00R.

Hanzawa, Kohtaro: *See*—
Sasaki, Hiroyuki; and Hanzawa, Kohtaro, 4,691,608, Cl. 84-1.010.

Hara, Nobuhiro: *See*—
Hotta, Yoshiji; Kuroda, Kunihige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.

Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, to Hitachi, Ltd. Pattern detecting apparatus. 4,692,690, Cl. 324-73.0PC.

Harada, Katsuhiro: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Harada, Yoshihito: *See*—
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, to Hitachi, Ltd. Diffusion bonding method using a high energy beam. 4,691,856, Cl. 228-194.000.

Hardesty, Donald E.: *See*—
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., 4,692,235, Cl. 208-113.000.
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Haren, Doyle V.; and Wiley, Lawrence V., to Day International Corporation. A method of making a reinforced hard porous ink roll assembly. 4,691,432, Cl. 29-527.200.

Hargoaa, Francis: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,692,932, Cl. 375-107.000.

Hargrave, Karl D.: *See*—
Devlin, John P.; and Hargrave, Karl D., 4,692,448, Cl. 514-252.000.

Harmon, Raymond E., to Rexnord Inc. Clutching adjustable keeper mechanism. 4,691,952, Cl. 292-341.180.

Harper, Terry. Sail raft - convertible inflatable life raft. 4,692,124, Cl. 441-40.000.

Harrington, David C.: *See*—
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., 4,692,266, Cl. 252-301.170.

Harrington, John H.: *See*—
Rangaswamy, Subramaniam; and Harrington, John H., 4,692,305, Cl. 420-436.000.

Harris Graphics Corporation: *See*—
Conwey, Frank H., Jr., 4,691,502, Cl. 53-529.000.

Harris, Mark A., to E-Systems, Inc. High power tunable filter. 4,692,724, Cl. 333-202.000.

Harris Press and Shear, Inc.: *See*—
Simpson, Edwin K., 4,691,628, Cl. 100-37.000.

Harte Industries, Inc.: *See*—
Schmidt, E. Michael; and Price, P. Michael, 4,691,424, Cl. 29-261.000.

Haru, Yasuhiko: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Haruki, Hiromu: *See*—
Nishiura, Masaharu; and Haruki, Hiromu, 4,692,345, Cl. 427-39.000.

Haruna, Takayuki: *See*—
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.

Hasegawa, Akira: *See*—
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.

Hasegawa, Noboru: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Hashidate, Katsuro, to Casio Computer Co., Ltd. Circle and circular arc generator. 4,692,887, Cl. 364-720.000.

Hashizume, Masahiro: *See*—
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Hasler AG Bern: *See*—
Wagner, Alois, 4,692,127, Cl. 464-119.000.

Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, to Hoffmann-La Roche Inc. Pyridazo-diazepines, diazocines, and -triazepines having anti-hypertensive activity. 4,692,438, Cl. 514-183.000.

Hassig, Robert, to Ciba-Geigy Corporation. Process for the preparation of pyrimidine derivatives. 4,692,524, Cl. 544-303.000.

Hassler, Dietrich. Method and apparatus for ultrasonically scanning a subject with an ultrasound head. 4,691,570, Cl. 73-626.000.

Hasumi, Hiroyuki, to Canon Kabushiki Kaisha. Means for restoring liquid discharge function of a liquid jet recorder. 4,692,777, Cl. 346-140.00R.

Hatanaka, Keiji: *See*—
Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, 4,691,521, Cl. 60-602.000.

Hattori, Tetsuya: *See*—
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Satoh, Junichi, 4,692,422, Cl. 501-136.000.

Haugse, Albert L.: *See*—
Schneider, James T.; and Haugse, Albert L., 4,692,479, Cl. 523-209.000.

Havel, Karel. Switch position detector and indicator with multicolor light emitter. 4,692,612, Cl. 250-229.000.

Haver & Boecker: *See*—
Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, 4,691,744, Cl. 139-425.00R.

Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, to Haver & Boecker. Filter wire cloth. 4,691,744, Cl. 139-425.00R.

Havira, R. Mark: *See*—
Ekstrom, Michael P.; and Havira, R. Mark, 4,692,908, Cl. 367-27.000.

Hawai, Yasuo: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, to Nippon Petrochemicals Co., Ltd. Binder for dry sand mold and method of its usage. 4,691,759, Cl. 164-526.000.

Hayashi, Hiroaki: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, to Daido Tokushuko Kabushiki Kaisha. Apparatus for reactor iron making. 4,691,899, Cl. 266-140.000.

Hayashi, Shoji: *See*—
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.

Hayashi, Torahiko; and Tashiro, Yasunori, to Rheon Automatic Machinery Co., Ltd. Apparatus for cutting filled cylindrical dough body. 4,692,109, Cl. 425-308.000.

Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for stretching plastic dough. 4,692,110, Cl. 425-335.000.

Hayashi, Torahiko: *See*—
Morikawa, Michio; and Hayashi, Torahiko, 4,692,107, Cl. 425-140.000.

Hayashi, Yoshikazu: *See*—
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.

Hayata, Naohiro, to Sumitomo Rubber Industries, Ltd. Method of making a metal mold for tire vulcanization. 4,691,431, Cl. 29-526.00R.

Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMR. 4,692,705, Cl. 324-318.000.

Hayes, Paul M.: *See*—
Cordwell, Brian; and Hayes, Paul M., 4,692,713, Cl. 331-1.00A.

Heath, James G., to Illinois Tool Works Inc. Over-center actuator switch. 4,692,572, Cl. 200-17.00R.

Hefner, Boby R., to Hefner Plastics, Inc. Hummingbird feeder. 4,691,665, Cl. 119-77.000.

Hefner Plastics, Inc.: *See*—
Hefner, Boby R., 4,691,665, Cl. 119-77.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polysulfide modified epoxy resins. 4,692,500, Cl. 525-529.000.

Hegland, Philip; and Chase, Lee, to Measurex Corporation. Basis weight gauge standardizing method and system. 4,692,616, Cl. 250-252.100.

Heifetz, Carl L.: *See*—
Mich, Thomas F.; and Heifetz, Carl L., 4,692,454, Cl. 514-312.000.

Heil-Quaker Corporation: *See*—
Obosu, Charles B., 4,691,768, Cl. 165-151.000.

Heilen, Wernfried: *See*—
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.

Hein-Werner Corporation: *See*—
Hamilton, Harold F.; and Donahue, Robert L., 4,691,443, Cl. 33-288.000.

Heindke, Armin: *See*—
Dyma, Horst; and Heindke, Armin, 4,692,041, Cl. 400-82.000.

Heinemann, Horst D.; and Jost, Alfred, to Heinemann, Horst D. Roof construction. 4,691,482, Cl. 52-3.000.

Helene Curtis, Inc.: *See*—
Fromm, George R.; and Stefaniak, Philip S., 4,692,586, Cl. 219-225.000.

Helle, Hans-Joachim, to Montanwerke Walter GmbH. Machine and process for cutting chipping-grooves into elongated peripheral milling cutters with hemispherical tips. 4,691,479, Cl. 51-165.710.

Henderson, Richard E.: *See*—
Stansbury, Benjamin H., Jr.; and Henderson, Richard E., 4,692,051, Cl. 403-3.000.

Henderson, Roger L.: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.

Henkel Corp.: *See*—
Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, 4,692,169, Cl. 44-51.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Eberhardt, Werner; and Ziegler, Rudolf, 4,692,263, Cl. 252-122.000.
Reckziegel, Erich; and Holzapfel, Heinz, 4,692,370, Cl. 428-198.000.
Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.

Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, to U.S. Philips Corporation. Method of manufacturing voltage-dependent resistor. 4,692,289, Cl. 264-61.000.

Hennion, Claude: *See*—
Lewiner, Jacques; and Hennion, Claude, 4,692,762, Cl. 340-825.690.

Herb, Armin, to "L'Oreal". Expansion dowel with anchored state indicator. 4,692,076, Cl. 411-55.000.

Hercules Incorporated: *See*—
Reid, Donald E., 4,692,380, Cl. 428-349.000.

Herman, Fred W.: *See*—
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.

Hermann, Peter: *See*—
Schleuniger, Kurt; and Hermann, Peter, 4,691,576, Cl. 73-821.000.

Herndon, Troy H.: *See*—
Rountree, Robert N.; and Herndon, Troy H., 4,692,781, Cl. 357-23.130.

Herrera, Michael J.: *See*—
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Herrmann, Franz: *See*—
Tannhaeuser, Rolf; and Herrmann, Franz, 4,692,920, Cl. 371-27.000.

Hertel, Larry W., to Eli Lilly and Company. Difluoro antivirals and intermediate therefor. 4,692,434, Cl. 514-49.000.

Herzl, Peter J., to Fischer & Porter Company. Coriolis-type mass flowmeter. 4,691,578, Cl. 73-861.380.

Hess, Wilhelm: *See*—
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, 4,692,540, Cl. 558-78.000.

Heughebaert, Jean C.: *See*—
Bonel, Gilbert; Heughebaert, Jean C.; Chaabouni, Mohamed; and Ayedi, Hassine, 4,692,323, Cl. 423-321.00R.

Hewlett-Packard Company: *See*—
Lawrence, Katherine, 4,692,273, Cl. 252-518.000.

Hibshman Corporation: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Hickman, James A. A. Glazing unit alarm systems. 4,692,744, Cl. 340-550.000.

Hickox, John: *See*—
Scott, James W.; and Hickox, John, 4,691,699, Cl. 128-91.00A.

Hidaka, Hideto: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Higashimoto Kikai Co., Ltd.: *See*—
Higashimoto, Tsuyoshi, 4,691,411, Cl. 17-49.000.

Higashimoto, Tsuyoshi, to Higashimoto Kikai Co., Ltd. Method and apparatus for feeding meat. 4,691,411, Cl. 17-49.000

Higbee, Wallace C., to TRW Automotive Products Inc. Planetary inertial seat belt retractor. 4,691,875, Cl. 242-107.40B.

Highstreet, Edward J.: *See*—
Stannard, Forrest B.; and Highstreet, Edward J., 4,692,248, Cl. 210-403.000.

Highton, Frederick J., to Burr-Brown Corporation. Level shifting circuitry for serial-to-parallel converter. 4,692,641, Cl. 307-475.000.

Higuchi, Kazuhiko: *See*—
Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.

Hilger, Gerald E., to Cormed, Inc. Multiple vascular access port. 4,692,146, Cl. 604-93.000.

Hilgren, Wallace L. Solvent cleansing apparatus. 4,692,251, Cl. 210-651.000.

Hill, Delmar J., to Vanguard-Hill, Inc. Tape fastening system. 4,691,427, Cl. 29-426.500.

Hillstrom, David U.: *See*—
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Hilti Aktiengesellschaft: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.

Himmler, Gunther; and Knoll, Gunter, to Gebr. Hofmann GmbH & Co. KG. Maschinenfabrik. Apparatus for determination of the static unbalance in a body. 4,691,567, Cl. 73-483.000.

Hindley, Richard M.; and Berge, John, to Beecham Group PLC. 2-phenylethylamine derivatives. 4,692,465, Cl. 514-539.000.

Hinds, George P., Jr.: *See*—
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.

Hinkel, Holger: *See*—
Bandara, Upali; and Hinkel, Holger, 4,692,832, Cl. 360-137.000.

Hinooka, Nobuya: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Hipp, J. Michael: *See*—
Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.

Hipp, Ruth H.: *See*—
Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.

Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, to Nissan Motor Co., Ltd. Supercharger pressure control system for internal combustion engine with turbocharger. 4,691,521, Cl. 60-602.000.

Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, to Kabushiki Kaisha Toshiba. Picture image reader. 4,692,812, Cl. 358-285.000.

Hirai, Bunji: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,651, Cl. 310-323.000.

Hiramatsu, Akira: *See*—
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Hirao, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Method for fabricating a bipolar semiconductor device by undercutting and local oxidation. 4,691,436, Cl. 437-33.000.

Hirose Manufacturing Company, Limited: *See*—
Hirose, Tokuzo, 4,691,648, Cl. 112-121.110.

Hirose, Naohiro: *See*—
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.

Hirose, Tokuzo, to Hirose Manufacturing Company, Limited. Device for detecting the residual amount of bobbin thread in a lock stitch sewing machine. 4,691,648, Cl. 112-121.110.

Hirota, Akio, to Brother Kogyo Kabushiki Kaisha. Thread cutting machine. 4,692,071, Cl. 408-9.000.

Hirota, Toshio, to Fuji Electric Company, Ltd. Cell stack assembly structure for fuel cell. 4,692,391, Cl. 429-34.000.

Hisano, Junichi: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Hitachi Construction Machinery Co., Ltd.: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Aoki, Akira; and Ukigaya, Fumio, 4,692,804, Cl. 358-163.000.
Hitachi, Ltd.: *See*—
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.
Ishihara, Heigo; and Ohno, Tomoyuki, 4,692,378, Cl. 428-340.000.
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, 4,692,922, Cl. 371-37.000.
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Masuzaki, Hidefumi; and Horikawa, Etsuo, 4,692,944, Cl. 382-41.000.
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.
Okamoto, Yukio; and Shinada, Shinichi, 4,692,666, Cl. 315-169.400.
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Sakoda, Kousuke; Kanaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, 4,692,735, Cl. 338-21.000.
Takahashi, Kenichi, 4,692,600, Cl. 235-379.000.
Tenma, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, 4,692,876, Cl. 364-513.000.
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.
Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, 4,692,891, Cl. 364-763.000.
Hitachi Medical Corporation: *See*—
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.
Hitachi Microcomputer Engineering, Ltd.: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.
Hiyama, Isao: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Hochtemperatur-Reaktorbau GmbH: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.
Hockert, Eric N.: *See*—
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.
Hodge, Harold F., to Cook's Truck Body Mfg., Inc. Counterbalanced tailgate for dump boxes. 4,691,956, Cl. 296-51.000.
Hodgson, Derek: *See*—
Maycock, Ian C.; and Hodgson, Derek, 4,691,815, Cl. 192-98.000.
Hoechst Aktiengesellschaft: *See*—
Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, 4,692,203, Cl. 156-610.000.
Bieringer, Hermann; and Schwerdtle, Friedhelm, 4,692,181, Cl. 71-86.000.
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.
Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.
Pieper, Werner, 4,692,281, Cl. 260-502.40R.
Pieper, Werner, 4,692,282, Cl. 260-502.40P.
Schorr, Manfred; and Schmitt, Wilfried, 4,692,523, Cl. 540-533.000.
Sulzbach, Reinhard A.; and von Werner, Konrad, 4,692,493, Cl. 524-805.000.
Zeiss, Hans-Joachim; and Mildenberger, Hilmar, 4,692,541, Cl. 558-87.000.
Hoereth, Hans-Jurgen: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.
Hoffman, Gregory C. Holster mount. 4,691,396, Cl. 5-503.000.
Hoffman, Reinhold; and Klimke, Walter, to Interlock Corporation. Device for chilling stream of gas-suspended particles. 4,691,865, Cl. 239-690.000.
Hoffmann-La Roche Inc.: *See*—
Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.
Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, 4,692,438, Cl. 514-183.000.
Hofmann, Raimund, to Folkmar, Jan. Receptacle with at least two chambers for accommodating liquids and pulverized substance, especially coffee powder, milk and/or sugar. 4,691,821, Cl. 206-216.000.
Hogel, Joseph E.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.
Holden, Harold C.; and Holden, June. Alarm system. 4,692,743, Cl. 340-544.000.
Holden, June: *See*—
Holden, Harold C.; and Holden, June, 4,692,743, Cl. 340-544.000.
Holdt, Donald H., to Cambridge Technologies, Inc. Convertible wheelchair/litter. 4,691,962, Cl. 297-84.000.
Holley Engineering Company, Inc.: *See*—
Holley, John D., 4,691,639, Cl. 104-16.000.
Holley, John D., to Holley Engineering Company, Inc. Rail tie plate placing vehicle and method. 4,691,639, Cl. 104-16.000.
Holloway, Oris E., Jr.: *See*—
Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., 4,692,342, Cl. 426-293.000.
Holobaugh, Raymond E.: *See*—
Rogers, Walter C., Jr.; and Holobaugh, Raymond E., 4,691,961, Cl. 297-61.000.
Holscher, Hugo, to Shell Oil Company. Energy storage and recovery. 4,691,524, Cl. 60-652.000.
Holzapfel, Heinz: *See*—
Reckziegel, Erich; and Holzapfel, Heinz, 4,692,370, Cl. 428-198.000.
Homma, Takahiko; and Wada, Shigetaka, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Rotary component of a rotary device for heat engines and a method of manufacturing the same. 4,692,099, Cl. 416-229.00A.
Homs, Marinus H.: *See*—
van den Berg, Wilhemus H.; Homs, Marinus H.; and van Oorschot, Bob P. J., 4,691,572, Cl. 73-643.000.
Honda Giken Kogyo K.K.: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kadono, Kohji; and Tsunoda, Minoru, 4,691,800, Cl. 180-219.000.
Nishikawa, Masao; and Sakurai, Yoshimi, 4,691,596, Cl. 74-869.000.
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.
Honda Manufacturing Co., Ltd.: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.
Honeycutt, Thomas E.: *See*—
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Honeywell B.V.: *See*—
Berkhof, Hendrikus, 4,692,574, Cl. 200-81.500.
Honeywell Inc.: *See*—
Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, 4,691,638, Cl. 102-434.000.
Hoogenboom, Leo, to Mechanical Technology Incorporated. Fiber optic proximity sensor with feedback servo imaging means. 4,692,611, Cl. 250-227.000.
Hoover, Alan A., to RCA Corporation. Switching power supply with raster width stabilization. 4,692,852, Cl. 363-21.000.
Hoppie, Lyle O., to Eaton Corporation. Method and apparatus for maximizing internal combustion engine work output by controlled heat release. 4,691,682, Cl. 123-558.000.
Hoppner, Klaus; and Kiefel, Bernhard, to Andreas Stihl. Arrangement for controlling the intake air for the carburetor of a hand-held portable tool. 4,691,681, Cl. 123-556.000.
Hori, Nobuo: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.
Hori, Seiji: *See*—
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.
Hori, Yasuhiko: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.
Horiba, Ltd.: *See*—
Kumakura, Koichi; and Hosokawa, Yoshinori, 4,691,793, Cl. 177-50.000.
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.
Horikawa, Etsuo: *See*—
Masuzaki, Hidefumi; and Horikawa, Etsuo, 4,692,944, Cl. 382-41.000.
Horikawa, Yoshio: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Borated hydroxy-containing compositions and lubricants containing same. 4,692,257, Cl. 252-49.600.
Horton, James B. Plunger valve apparatus for oil well pump. 4,691,735, Cl. 137-494.000.

Hosoda, Kenichiro: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.
Hosokawa, Yoshinori: *See*—
Kumakura, Koichi; and Hosokawa, Yoshinori, 4,691,793, Cl. 177-50.000.
Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.
Hosomi, Hisashi: *See*—
Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, 4,692,065, Cl. 405-211.000.
Hostetler, Karl Y.; and Deftos, Leonard J., to University of California, The Regents of the. Method and composition for regulating serum calcium levels of mammals. 4,692,433, Cl. 514-12.000.
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, to Mazda Motor Corp. Throttle valve control system for internal combustion engine. 4,691,677, Cl. 123-399.000.
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, to Hitachi, Ltd. Forced flow cooling-type superconducting coil apparatus. 4,692,560, Cl. 174-15.0CA.
Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, to Fried, Krupp GmbH. Process for producing ethanol. 4,692,218, Cl. 203-19.000.
House, Gary L., to Eastman Kodak Company. Photographic emulsions and elements containing sensitizing dye in the form of host crystals. 4,692,401, Cl. 430-570.000.
Hovey, Isabel: *See*—
Nowak, Frederick H.; and Hovey, Isabel, 4,691,808, Cl. 187-125.000.
Howard, H. Keith; and Sherrill, Jimmy L., to Tutco, Inc. Coil support insulator for an electric heater. 4,692,599, Cl. 219-532.000.
Howard, William H.: *See*—
Gilbert, David S., 4,691,610, Cl. 84-327.000.
Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, to Henkel Corp. Use of etherified polygalactomannan gums as carbonaceous slurry stabilizers. 4,692,169, Cl. 44-51.000.
Hsiung, Shu-Jen. Joint arrangement for knockdown furniture. 4,691,965, Cl. 297-440.000.
Hsu, Chi-Ching, to Multitech Industrial Corporation. Method and a system for composing the pattern of the chinese character. 4,692,865, Cl. 364-419.000.
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., to Exxon Chemical Patents Inc. Process for the removal of solids from an oil. 4,692,237, Cl. 208-177.000.
Huddleston, Elwyn G., to Kendall Company, The. Method of making an adhesive tape. 4,692,352, Cl. 427-208.400.
Huffman, Jacque S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Microprocessor peripheral access control circuit. 4,692,895, Cl. 364-900.000.
Hughes Aircraft Company: *See*—
Beining, August H.; and Smith, William A., 4,692,809, Cl. 358-247.000.
Ellion, M. Edmund; and Wolff, George, 4,692,559, Cl. 136-262.000.
Klatt, Robert W., 4,692,618, Cl. 250-330.000.
Wheeler, Bryce A., 4,691,999, Cl. 350-620.000.
Hughes Tool Company: *See*—
Wheeler, Dale E., 4,691,430, Cl. 29-451.000.
Hujita, Yutaka, to Tokyo Electric Co., Ltd. Pulse motor. 4,692,679, Cl. 318-696.000.
Huls Aktiengesellschaft: *See*—
Lohrengel, Gregor, 4,692,482, Cl. 523-340.000.
Hultsch, Gunther: *See*—
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.
Hunt, Russell G.: *See*—
West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., 4,692,457, Cl. 514-361.000.
Hunter, Byron A.: *See*—
Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., 4,692,475, Cl. 521-92.000.
Hurlbut, Donovan W.: *See*—
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.
Huscheirath, Gerhard; and Diehl, Herbert, to Nukem GmbH. Device with two generators for measuring the gradients of magnetic fields. 4,692,702, Cl. 324-251.000.
Hutchin, Richard A.: *See*—
MacGovern, Alan J.; and Hutchin, Richard A., 4,692,027, Cl. 356-353.000.
Huther, Werner: *See*—
Rossmann, Axel; and Huther, Werner, 4,692,288, Cl. 264-56.000.
Hutterer, Werner: *See*—
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.
Hwang, Tzong: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.
Hyner, Jacob; and Gradowski, Steven, to Whyco Chromium Company, Inc. Self drilling fasteners and process for making the same. 4,692,080, Cl. 411-387.000.
Hyodo, Youichi, to Toyota Jidosha Kabushiki Kaisha. Four-wheel steering system for automotive vehicles. 4,691,932, Cl. 280-91.000.
Hyuga, Takehiro: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.
Hyun, Kun S.: *See*—
Hall, Mark J.; and Hyun, Kun S., 4,692,508, Cl. 528-503.000.
Ichida, Hiroshi: *See*—
Ichimura, Kenichi; and Ichida, Hiroshi, 4,692,392, Cl. 430-46.000.
Ichida, Nobuyuki: *See*—
Sato, Takuso; and Ichida, Nobuyuki, 4,691,569, Cl. 73-596.000.
Ichihara, Issey: *See*—
Tachibna, Natsuki; and Ichihara, Issey, 4,691,663, Cl. 118-658.000.
Ichihara, Takashi, to Kabushiki Kaisha Toshiba. Emission computed tomography apparatus. 4,692,624, Cl. 250-363.00S.
Ichiki, Masahiro: *See*—
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.
Ichikoh Industries, Ltd.: *See*—
Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, 4,692,000, Cl. 350-637.000.
Ichimura, Hiroshi: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.
Ichimura, Kenichi; and Ichida, Hiroshi, to Ishihara Sangyo Kaisha, Ltd. Color electrophotographic process uses layered photosensitive element having conductive film on side portion. 4,692,392, Cl. 430-46.000.
Ida, Takanori: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.
Ife, Robert J., to Smith Kline & French Laboratories Limited. 3-Pyridylaminoalkyleneamino-4-amino-1,2,5-thiadiazole-1-oxides, composition containing them, and use of them to block histamine h_2-receptors. 4,692,456, Cl. 514-333.000.
Igarashi, Keiichi: *See*—
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.
Igarashi, Noriyuki: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.
Iida, Takeo: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.
Iijima, Toshifumi: *See*—
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.
Iiyama, Hiroshi: *See*—
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.0SE.
Ikawa, Shoji: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.
Ikeda Bussan Co., Ltd.: *See*—
Maruyama, Hidekazu, 4,691,966, Cl. 297-452.000.
Ikeda, Hideo, to Sanden Corporation. Control device for refrigerated display case. 4,691,527, Cl. 62-234.000.
Ikeda, Keichi: *See*—
Ellegood, Norman W.; Fritsche, Joel L.; Groezinger, John J.; Ikeda, Keichi; and Streitmatter, Ronald W., 4,692,196, Cl. 156-187.000.
Ikeda, Sakio; and Yonamine, Shozen, to Dynic Corporation; and Mine Kinzoku Kogyo K.K. Cigarettes. 4,691,717, Cl. 131-365.000.
Ikeda, Toshimichi: *See*—
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.
Ikegami, Hiroo: *See*—
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, to Kabushiki Kaisha Ikeuchi Tekkosho. Method for producing a food product simulating shellfish. 4,692,341, Cl. 426-250.000.
Ikeuchi, Kiyoaki: *See*—
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, 4,692,341, Cl. 426-250.000.
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, to Toyo Seikan Kaisha, Ltd. Process for preparing a sealed laminated vessel. 4,692,132, Cl. 493-103.000.
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, to NGK Insulators, Ltd. Electroconductive spring material. 4,692,192, Cl. 148-12.70C.
Ikuta, Kunio, to Dainippon Screen Mfg. Co., Ltd. Method of and apparatus for forming the address signals of a screen memory of a half tone dot generator. 4,692,879, Cl. 364-518.000.
Illinois Tool Works Inc.: *See*—
Heath, James G., 4,692,572, Cl. 200-17.00R.
Klygis, Mindaugas J., 4,691,860, Cl. 229-52.00A.
Singery, Denis C.; and Gordon, Ronald O., 4,692,154, Cl. 604-172.000.
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, to Ciba-Geigy Corporation. Process for the preparation of cyclic phosphites. 4,692,540, Cl. 558-78.000.
Imaizumi, Norio, to Sanyo Electric Co. Vertical deflection circuit. 4,692,670, Cl. 315-388.000.

Imano, Shigeki: *See—*
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Imato, Shinji: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Imazu, Katsuhiro: *See—*
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Imiolek, Henry S.: *See—*
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Immunetech Pharmaceuticals: *See—*
Hahn, Gary S., 4,692,511, Cl. 530-325.000.

Imoae, Masayuki, to Chugai Ro Co., Ltd. Continuous annealing furnace for metallic strip. 4,691,898, Cl. 266-89.000.

Imperial Biotechnology Limited: *See—*
Banks, Geoffrey T.; and Browning, Paul D., 4,692,408, Cl. 435-104.000.

Imperial Chemical Industries plc: *See—*
Wem, James; and Brierley, Rowland J. P., 4,692,283, Cl. 261/49.000.

Inagaki, Masahisa: *See—*
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Inagaki, Tsuguya: *See—*
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, to Daido Tokushuko Kabushiki Kaisha. Method and apparatus for winding wire rod. 4,691,874, Cl. 242-80.000.

Industrial Adhesives, Inc.: *See—*
Getz, John L., 4,692,202, Cl. 156-554.000.

Inficon Leybold-Heraeus: *See—*
Gogol, Carl A., 4,692,630, Cl. 250-573.000.

Ingham, Paul: *See—*
Greaves, Brian; and Ingham, Paul, 4,692,315, Cl. 422-18.000.

Ingle, Frank W.; and Claude, John P., to Medasonics Inc. Ultrasonic transducer method. 4,691,418, Cl. 29-25.350.

Ingram, Alvin R.; and DiGiulio, Adolph V., to Atlantic Richfield Company. Divinylbenzene in expandable beads for cup molding. 4,692,472, Cl. 521-60.000.

Inmos Limited: *See—*
May, Michael D., 4,692,861, Cl. 364-200.000.

Innovator Mernok Kisazovetkezet: *See—*
Gyorgy, Makara, 4,691,472, Cl. 47-58.000.

Inoue, Yasukazu: *See—*
Fukuzo, Yukio; and Inoue, Yasukazu, 4,692,642, Cl. 307-530.000.

Insolio, Thomas A. Constant force manual glass cutter. 4,691,438, Cl. 30-164.950.

Institut Fiziki Zemli Imeni O.Ju. Shmidta Akademii Nauk SSSR: *See—*
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Institut fur Getreideverarbeitung im VEB Kombinat Nahrungsmittel und Kaffee: *See—*
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Institute Electrosvarki Imeni Patona: *See—*
Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., 4,692,585, Cl. 219-130.400.

Institute of Gas Tehnology: *See—*
Bodle, William W.; and Tarman, Paul B., 4,692,238, Cl. 208-417.000.

Interlock Corporation: *See—*
Hoffman, Reinhold; and Klimke, Walter, 4,691,865, Cl. 239-690.000.

International Business Machines Corporation: *See—*
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.
Aviram, Ari; and Shih, Kwang K., 4,692,044, Cl. 400-241.100.
Bandara, Upali; and Hinkel, Holger, 4,692,832, Cl. 360-137.000.
Byerly, Kent A.; Feldhacker, Marvin E.; and Grant, Duane E., 4,692,877, Cl. 364-514.000.
Casper, Daniel F., 4,692,893, Cl. 364-900.000.
Fawcett, Bradley W.; and Sendelbach, Lee A., 4,692,758, Cl. 340-735.000.
Findlay, Hugh T., 4,692,395, Cl. 430-254.000.
McBride, Donald G.; and Rickert, Robert G., 4,692,346, Cl. 427-8.000.
Ngai, Chuck H.; and Watkins, Gerald J., 4,692,633, Cl. 307-269.000.
Roucek, Joseph A.; and Tessier, James R., 4,691,426, Cl. 29-402.180.
Rubloff, Gary W.; and Wittmer, Marc F., 4,692,348, Cl. 437-82.000.
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.
Sueta, Yoshihisa, 4,692,691, Cl. 324-73.00R.

International Paper Company: *See—*
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

International Shoe Machine Corporation: *See—*
Leeper, Alan L., 4,692,133, Cl. 493-128.000.

Interscan, Incorporated: *See—*
Rice, Mark; and Meixner, Douglas, 4,692,006, Cl. 354-75.000.

Inujima, Takashi: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Ipri, Alfred C.: *See—*
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.

Irvine, Sheila M.; Penman, Alistair; and Wood, Geoffrey B. Milk substitute. 4,692,338, Cl. 426-2.000.

Isc Electronics Corporation: *See—*
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.

Iseki, Takeo, to Tomy Kogyo Co., Inc. Automated game panel. 4,691,921, Cl. 273-85.00B.

Isenberg, Arnold O.; and Ruka, Roswell J., to Westinghouse Electric Corp. Protective interlayer for high temperature solid electrolyte electrochemical cells. 4,692,274, Cl. 252-521.000.

Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, to Kabushiki Kaisha Toshiba. Toroidal winding apparatus. 4,691,872, Cl. 242-4.00R.

Ishida, Mikio: *See—*
Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, 4,691,802, Cl. 180-291.000.

Ishiguro, Masato: *See—*
Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, 4,692,783, Cl. 357-42.000.

Ishihara, Heigo; and Ohno, Tomoyuki, to Hitachi, Ltd. Magnetic recording media. 4,692,378, Cl. 428-340.000.

Ishihara Sangyo Kaisha, Ltd.: *See—*
Ichimura, Kenichi; and Ichida, Hiroshi, 4,692,392, Cl. 430-46.000.

Ishii, Fumio: *See—*
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.

Ishii, Koji; and Okuda, Yukito, to Ryobi Ltd. Cylinder setting mechanism for an offset printing machine. 4,691,631, Cl. 101-218.000.

Ishii, Susumu: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Ishii, Tadashi: *See—*
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.

Ishiizumi, Seiichi: *See—*
Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, 4,691,802, Cl. 180-291.000.

Ishikawa, Kikuo: *See—*
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.

Ishikawa, Ryosuke: *See—*
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Ishikawa, Syuhei: *See—*
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.

Ishikawa, Youhei: *See—*
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, to Kubota, Ltd. Agricultural tractor. 4,691,802, Cl. 180-291.000.

Ishinabe, Masao: *See—*
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, to Toshiba Ceramics Co., Ltd. Immersion nozzle for continuous casting. 4,691,844, Cl. 222-591.000.

Ishiyama, Yoshihiko: *See—*
Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, 4,692,000, Cl. 350-637.000.

Ishizuka, Kho: *See—*
Izukawa, Kazuhiro; and Ishizuka, Kho, 4,692,649, Cl. 310-316.000.

Isomura, Hiroyasu: *See—*
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Isono, Kunihiro: *See—*
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.

Israelson, Gordon A., to Westinghouse Electric Corp. Thermal expansion compensating back-flush manifold. 4,692,176, Cl. 55-302.000.

Itaba, Tunesaku: *See—*
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

Itek Corporation: *See—*
MacGovern, Alan J.; and Hutchin, Richard A., 4,692,027, Cl. 356-353.000.

Itek Graphix Corp.: *See—*
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Goretick, Donald E., 4,691,987, Cl. 350-96.230.

Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, to Tokyo Keiki Company, Ltd. Apparatus for steering joystick of ship. 4,691,659, Cl. 114-144.00R.

Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, to Sony Corporation. Dielectric rotary coupler. 4,692,721, Cl. 333-109.000.

Itoh, Senji: *See—*
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.

Itou, Takeo: *See—*
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.

ITT Industries, Inc.: *See—*
Fink, Werner; and Bohn, Heinz, 4,692,101, Cl. 417-68.000.

Ivanov, Alexei S.: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-1.000.

Iwadachi, Takaharu: *See—*
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.

Iwadate, Kazumi: *See—*
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, to Kabushiki Kaisha Toshiba; and Tosbac Computer System Co., Ltd. Electrostatic discharge protection circuit with variable limiting threshold for MOS device. 4,692,834, Cl. 361-91.000.

Iwai, Shiyougo, to Sharp Kabushiki Kaisha. Automatic duplex copying machine and method of treating paper jamming therefor. 4,692,022, Cl. 355-24.000.

Iwaki, Masato, to Mazda Motor Corp. Idling speed control systems for internal combustion engines. 4,691,675, Cl. 123-339.000.

Iwako, Motonari; and Nakao, Masaaki, to Kabushiki Kaisha Hunken. Method and apparatus for continuously mixing and kneading pulverulent bodies such as pulverized coal, oil coke to prepare slurry thereof. 4,691,867, Cl. 241-21.000.

Iwanaga, Yushi: *See—*
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Iwanski, Donald P., to PPG Industries, Inc. Calcium hypochlorite tablet. 4,692,335, Cl. 424-149.000.

Iwasaki, Hikoji: *See—*
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.

Iwasaki, Kiyoshi: *See—*
Takai, Kiyoshi; and Iwasaki, Kiyoshi, 4,692,113, Cl. 432-72.000.

Iwasaki, Yutaka: *See—*
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.

Iwata, Shigemi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,691,807, Cl. 187-117.000.

Iwayama, Kenzo: *See—*
Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, 4,692,193, Cl. 148-111.000.

Izawa, Susumu: *See—*
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.

Izukawa, Kazuhiro; and Ishizuka, Kho, to Canon Kabushiki Kaisha. Driving circuit of a vibration wave motor. 4,692,649, Cl. 310-316.000.

Izukawa, Kazuhiro: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Izumi, Yoshinori: *See—*
Ninomiya, Yuichi; Obtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.

J. B. Golf Enterprises, Inc.: *See—*
Strong, Michael P., 4,691,924, Cl. 273-189.00R.

J.M. Voith GmbH: *See—*
Schiel, Christian; and Kotitschke, Herbert, 4,691,420, Cl. 29-116.00R.
Schiel, Christian, 4,691,421, Cl. 29-116.0A.D.

Jacks, Richard P.; and Sprague, Richard P., to First Byte. Real-time text-to-speech conversion system. 4,692,941, Cl. 381-52.000.

Jackson, Hiram S.: *See—*
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.

Jackson, James O., III. Water-bag dam or dike and method. 4,692,060, Cl. 405-115.000.

Jackson, Philip. Screen comprising a travelling endless screening band. 4,692,242, Cl. 210-160.000.

Jacob, Herbert: *See—*
Lampert, Ingolf; and Jacob, Herbert, 4,692,223, Cl. 204-34.500.

Jacobina, Charles E., to Celotex Corporation, The. Polyisocyanurate foams derived from oxypropylated polyols and insulating structures therefrom. 4,692,477, Cl. 521-174.000.

Jacobs, Hans-Juergen: *See—*
Ehrig, Dietrich; and Jacobs, Hans-Juergen, 4,691,515, Cl. 60-526.000.

Jacobson, Luke. Bass drum pedal. 4,691,613, Cl. 84-422.00R.

Jaffe, Edward E.: *See—*
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.

Jagenberg Aktiengesellschaft: *See—*
Zodrow, Rudolf; and Tomashauser, Josef, 4,692,201, Cl. 156-488.000.

Jahn, Dieter: *See—*
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.

Jahn-Held, Wilhelm: *See—*
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,692,061, Cl. 405-128.000.

Jailor, John J.: *See—*
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.

Jallen, Gale A.; and Bonnie, Gene P., to Control Data Corp. Bubble memory bias field structure. 4,692,898, Cl. 365-27.000.

James, Leonard E.; Fisher, William B.; Crescentini, Lamberto; and Browning, Joseph M., to Allied Corporation. Oxidation of ammonia over a mixed catalyst bed of cobalt and aluminum oxides. 4,692,321, Cl. 423-404.000.

James River Corporation: *See—*
Bouchette, Michael P., 4,692,374, Cl. 428-288.000.

Jandy Industries, Inc.: *See—*
Johnson, Bruce R.; and Falconer, Ralph A., 4,691,732, Cl. 137-268.000.

Janome Sewing Machine Co. Ltd.: *See—*
Sano, Yasuro, 4,691,655, Cl. 112-466.000.

Jansen, Norman A.; and Randall, Beryl D. Apparatus for taking up and playing out lines. 4,691,806, Cl. 187-9.00R.

Janusz, John M., to Procter & Gamble Company, The. Alpha-L-aspartyl-D-phenylglycine esters and amides useful as high intensity sweeteners. 4,692,512, Cl. 530-801.000.

Janusz, John M.: *See—*
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.

Japan Gore-Tex, Inc.: *See—*
Nomi, Haruo, 4,692,369, Cl. 428-198.000.

Japan Styrene Paper Corporation: *See—*
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.

Javna, Stephen L.: *See—*
Berlin, Richard B.; Berlin, Richard B., Jr.; and Javna, Stephen L., 4,692,153, Cl. 604-171.000.

Jeco Co., Ltd.: *See—*
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.0SE.

Jens, Michael J.: *See—*
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.

Jensen, Erling. Frying device. 4,691,690, Cl. 126-390.000.

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Cooley, Stephen E.; and Jensen, Martin J., 4,692,591, Cl. 219-295.000.

Jeschke, Peter: *See—*
Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.

Jeumont-Schneider Corporation: *See—*
Cousin, Daniel; Garnier, Jean-Francois; and Georges, Jean-Pierre, 4,692,862, Cl. 364-200.000.

Jewer, Alan A.: *See—*
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.

Jidosha Kiki Co., Ltd.: *See—*
Andoh, Munesato, 4,691,519, Cl. 60-535.000.

Jimbou, Ryutaro: *See—*
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Jimenez, Angel F.: *See—*
Bennett, William; and Jimenez, Angel F., 4,692,081, Cl. 414-22.000.

Johansen, Kent: *See—*
Skovgaard, Helge; and Johansen, Kent, 4,692,882, Cl. 364-565.000.

John D. Brush & Co., Inc.: *See—*
Beattie, Patrick J., 4,691,544, Cl. 70-329.000.

John Lysaght (Australia) Limited: *See—*
Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., 4,691,547, Cl. 72-16.000.

John O. Butler Company: *See—*
Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.

John, Thomas: *See—*
Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, 4,692,126, Cl. 464-103.000.

Johnson, Bruce R.; and Falconer, Ralph A., to Jandy Industries, Inc. Pool chlorinator. 4,691,732, Cl. 137-268.000.

Johnson, David W., Jr.: *See—*
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., 4,691,990, Cl. 350-96.330.

Johnson, Duane R.: *See—*
Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., 4,691,968, Cl. 303-52.000.

Johnson, Grover L.: *See*—
Wright, Thomas C.; and Johnson, Grover L., 4,692,473, Cl. 521-72.000.

Johnson, James L., to McCreary Industrial Products Co. Fabric reinforced tubular rubber bladders and method of making same. 4,692,362, Cl. 428-35.000.

Johnson, James R. Sealer for side gusseted bags. 4,692,135, Cl. 493-394.000.

Johnson, Philip C., to Materials Development Corporation. Triplex article. 4,692,385, Cl. 428-469.000.

Johnson, Randall, to Donkerbrook, Deborah; Carstersen, Ronald; Carstersen, Gail; and Johnson, Randall. Battery holder for coin type batteries. 4,692,846, Cl. 362-104.000.

Johnson, Roy A.; and Gaaz, Robert H., to Mead Corporation, The. Web perforating apparatus. 4,691,606, Cl. 83-175.000.

Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, to Baxter Travenol Laboratories, Inc. Film laminate with gas barrier for sterile flexible containers. 4,692,361, Cl. 428-35.000.

Jolivet, Jean-Pierre: *See*—
Brunet, Maurice L.; and Jolivet, Jean-Pierre, 4,692,699, Cl. 324-207.000.

Jolson, Joseph D.: *See*—
Auel, RaeAnn M.; Jolson, Joseph D.; and Stewart, David A., 4,692,220, Cl. 204-1.00T.

Joly, Jean; and Oehlert, Yves, to La Telemecaniqae Electrique. Input-/output device for an apparatus of the programmable auto-control type, a range of such devices. 4,692,842, Cl. 361-413.000.

Jones, Horace L. Cybernetic engine. 4,691,672, Cl. 123-90.110.

Jones, Mark A.: *See*—
Grooms, John M.; and Jones, Mark A., 4,691,731, Cl. 137-205.000.

Jones, Roger E.: *See*—
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., 4,692,703, Cl. 324-251.000.

Jones, William R., Jr.: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.

Joo, Grant K.: *See*—
Gray, Reed A.; and Joo, Grant K., 4,692,186, Cl. 71-100.000.

Jordan, Harold V.; and Marmel, Max, to Forsyth Dental Infirmary for Children. Method for the determination of *Streptococcus mutans*. 4,692,407, Cl. 435-36.000.

Jordan, Paul A., to General DataComm., Inc. Regenerative strobe circuit for CMOS programmable logic array. 4,692,639, Cl. 307-449.000.

Jorkasky, Richard J., II: *See*—
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Jost, Alfred: *See*—
Heinemann, Horst D.; and Jost, Alfred, 4,691,482, Cl. 52-3.000.

Joyner, Kenneth E., Jr.: *See*—
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.

Juarros, Richard D.: *See*—
Dushner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,692,671, Cl. 318-11.000.

Jubinski, Paul, to Western Geophysical Company of America. Means for maintaining a fixed relative orientation of two sensors. 4,692,907, Cl. 367-20.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.
Rock, Erich; and Schwarzler, Felix, 4,692,035, Cl. 384-18.000.

Junemann, Hubert, to Kochs Adler AG. Tiltable sewing head and underarm for a sewing machine used in conjunction with a workpiece supporting carrier plate. 4,691,651, Cl. 112-259.000.

Jung, Guenter: *See*—
Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,692,625, Cl. 250-363.00R.

Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, to L'Oreal. Use of halogenated 4,5-methylenedioxyphenol in the dyeing of keratinous fibres. 4,692,166, Cl. 8-410.000.

Juutilainen, Holger, to Tamfelt Oy Ab. Method of and a means for protecting shores against oil pollutants. 4,692,059, Cl. 405-63.000.

K. W. Thompson Tool Company, Inc.: *See*—
Center, Warren A., 4,691,442, Cl. 33-253.000.

Kabacinski, Mariusz, to U.S. Philips Corporation. Magnetic tape scanning unit and method of assembly thereof. 4,692,822, Cl. 360-84.000.

Kabe, Kazuyuki; and Morikawa, Tuneo, to Yokohama Rubber Co., Ltd. Pneumatic radial tire. 4,691,752, Cl. 152-527.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Miyata, Tsutomu; and Nagai, Masahide, 4,692,881, Cl. 364-551.000.

Kabushiki Kaisha Hikoma Seisakucho: *See*—
Kishi, Mitsuhiro, 4,691,805, Cl. 187-9.00R.

Kabushiki Kaisha Hunken: *See*—
Iwako, Motonari; and Nakao, Masaaki, 4,691,867, Cl. 241-21.000.

Kabushiki Kaisha Ikeuchi Tekkosho: *See*—
Ikeuchi, Hiroji; and Ikeuchi, Kiyoaki, 4,692,341, Cl. 426-250.000.

Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Akesaka, Toshio, 4,691,787, Cl. 173-145.000.
Akesaka, Toshio, 4,692,062, Cl. 405-141.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Shintani, Fumio, 4,691,792, Cl. 177-1.000.

Kabushiki Kaisha Riken: *See*—
Kobayashi, Dansaku; Itabe, Tunesaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

Kabushiki Kaisha Sangi: *See*—
Sakuma, Shuji; and Fujinawa, Hirotaka, 4,691,718, Cl. 132-84.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.

Kabushiki Kaisha Toshiba: *See*—
Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.
Ichihara, Takashi, 4,692,624, Cl. 250-363.00S.
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,691,872, Cl. 242-4.00R.
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.
Kimura, Seiichiro; and Aoki, Hidekazu, 4,692,583, Cl. 219-121.00L.
Komatsu, Shigeru, 4,692,190, Cl. 437-189.000.
Kuroiwa, Akihiko; and Saito, Suzuo, 4,692,855, Cl. 363-95.000.
Mihara, Yuji, 4,692,874, Cl. 364-483.000.
Miyasako, Yoji, 4,692,711, Cl. 330-257.000.
Shikata, Hiroshi, 4,692,070, Cl. 407-104.000.
Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, 4,692,640, Cl. 307-464.000.
Suzuki, Seigo, 4,692,738, Cl. 340-347.00C.
Tachibna, Natsuki; and Ichihara, Isacy, 4,691,663, Cl. 118-658.000.
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.
Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, 4,692,902, Cl. 365-210.000.
Watanabe, Junji, 4,692,021, Cl. 355-14.00R.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Homma, Takahiko; and Wada, Shigetaka, 4,692,099, Cl. 416-229.00A.
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Kadis, Paul M., to Teledyne Industries, Inc. Self-lubricating die cylinder. 4,691,902, Cl. 267-119.000.

Kadogawa, Kouji; and Watanabe, Tsunenori, to Leader Company Limited. Shoe making machine. 4,691,398, Cl. 12-77.000.

Kadokura, Norihisa, to Alliance Research Corporation. Vehicle window mount for portable antenna. 4,692,770, Cl. 343-715.000.

Kadono, Kohji; and Tsunoda, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle body frame for motorcycles. 4,691,800, Cl. 180-219.000.

Kadowaki, Takashi: *See*—
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, 4,692,399, Cl. 430-507.000.

Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., to RCA Corporation. Method of forming a dielectric film and semiconductor device including said film. 4,692,344, Cl. 427-39.000.

Kagiyama, Tsutomu: *See*—
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.

Kainaga, Masahiro: *See*—
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

Kaiser, Donald B.: *See*—
Miller, Louis D.; and Kaiser, Donald B., 4,692,658, Cl. 313-365.000.

Kaiya, Atsushi: *See*—
Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, 4,691,759, Cl. 164-526.000.

Kale, Hemant D. Compartmentalized electric liquid heater. 4,692,592, Cl. 219-298.000.

Kamatsu, Yasutoshi: *See*—
Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, 4,692,721, Cl. 333-109.000.

Kamigaito, Osami: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Kampfer, Angelika: *See*—
Bouadma, Noureddine; Brillouet, Francois; and Kampfer, Angelika, 4,692,207, Cl. 156-649.000.

Kamyr AB: *See*—
Nilsson, Bengt, 4,692,214, Cl. 162-261.000.

Kanai, Mitsuharu: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Kane, James, to Cordis Corporation. Optical pressure sensor for measuring blood pressure. 4,691,708, Cl. 128-667.000.

Kane, Patrick J., to Creative Metal Designs Ltd. Interlocking roof tile. 4,691,492, Cl. 52-519.000.

Kaneda, Naoya: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Method for producing a semiconductor laser device having a buried heterostructure. 4,692,206, Cl. 156-649.000.

Kaneko, Koichi; and Hanya, Masado, to Seikosha Co., Ltd. Moon phase display clock. 4,692,031, Cl. 368-18.000.

Kaneko, Shigeru: *See*—
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, 4,692,922, Cl. 371-37.000.

Kaneko, Shinobu: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Kaneko, Shuzo: *See*—
Ando, Yujiro; and Kaneko, Shuzo, 4,692,779, Cl. 346-153.100.

Kania, Charles M.: *See*—
Das, Suryya K.; and Kania, Charles M., 4,692,503, Cl. 526-301.000.

Kankyo Souken Consultant, Co., Ltd.: *See*—
Maeda, Isamu, 4,691,900, Cl. 266-156.000.

Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha. Intra-aortic balloon pump apparatus and method of using same. 4,692,148, Cl. 604-96.000.

Kao, David T., to University of Kentucky, Board of Trustees of the. Self-flushing fluid seal assembly. 4,691,620, Cl. 92-80.000.

Kappas, Attallah; and Drummond, George S., to Rockefeller University, The. Therapeutic use of tin mesoporphyrin. 4,692,440, Cl. 514-185.000.

Kappas, Attallah: *See*—
Rideout, Darryl; Kappas, Attallah; and Drummond, George S., 4,692,439, Cl. 514-185.000.

Karasaki, Koichi: *See*—
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC

Karatson, Laszlo : *See*—
Nagy, Istvan; Nagy, Fereac; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Kartridg Pak Co., The: *See*—
Roberts, Gary F., 4,691,627, Cl. 99-450.600.

Kasahara, Yasushi: *See*—
Ashihara, Yoshihiro; and Kasahara, Yasushi, 4,692,404, Cl. 435-5.000.

Kasai, Naomi, to Nippon Thompson Co., Ltd. Roller bearing for an infinite rectilinear motion. 4,692,037, Cl. 384-44.000.

Kasai, Naomi, to Nippon Thompson Co., Ltd. Linear motion rolling contact bearing assembly having a load dependent variable resistance. 4,692,038, Cl. 384-45.000.

Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Substance K-259-2 and a process for producing the same. 4,692,310, Cl. 424-122.000.

Katakura, Kageyoshi: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.

Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, to Minolta Camera Kabushiki Kaisha. Depth-of-field preview apparatus for a single lens reflex camera. 4,692,010, Cl. 354-273.000.

Katernberg, Helmut; and Kohler, Ingolf, to M.A.N.Maschinenfabrik Augsburg-Nurnberg. Floating dock construction. 4,691,656, Cl. 114-45.000.

Katner, Allen S., to Eli Lilly and Company. 3-bicyclicpyridiniummethyl cephalosporins. 4,692,443, Cl. 514-206.000.

Kato, Kaoru: *See*—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Kato, Shunichi: *See*—
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,691,872, Cl. 242-4.00R.

Kato, Tatsuo: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Katsura, Yousuke: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Kauffman, John C., to Phelps Dodge Industries, Inc. Ribbon cable. 4,692,566, Cl. 174-117.0FF.

Kaufman, Vernan R.: *See*—
Geringer, Miles S.; and Kaufman, Vernan R., 4,691,590, Cl. 74-579.00E.

Kaufman, Yaacov. Joint and method of utilizing it. 4,692,050, Cl. 403-3.000.

Kaule, Wittich: *See*—
Stenzel, Gerhard; and Kaule, Wittich, 4,691,940, Cl. 283-70.000.

Kawada, Susumu: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Kawaguchi, Yoshifumi, to Nippon Thompson Co., Ltd. Roller bearing for endless linear motion. 4,692,036, Cl. 384-44.000.

Kawahara, Atsushi; and Okita, Masaya, to Nippon Kogaku K.K. Photographing and recording method and apparatus for electronic still picture cameras. 4,692,815, Cl. 358-335.000.

Kawai, Katsunori: *See*—
Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, 4,691,526, Cl. 62-217.000.

Kawakami, Masumi: *See*—
Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, 4,692,640, Cl. 307-464.000.

Kawamoto, Isao: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Kawamoto, Masuo: *See*—
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Kawamura Electric Industry Co., Ltd.: *See*—
Yokoyama, Makoto, 4,692,687, Cl. 323-284.000.

Kawamura, Youji: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Kawano, Tetsuo: *See*—
Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, 4,692,783, Cl. 357-42.000.

Kawata, Koichi: *See*—
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.

Kee, Richard C., to Polaroid Corporation. Electronic camera handle configuration. 4,692,807, Cl. 358-229.000.

Keeler, Brian G.; and Whitley, George J., to RCA Corporation. Robot end effector for processing component leads. 4,691,419, Cl. 29-39.000.

Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. Cyclohexenone derivatives and their use for controlling undesirable plant growth. 4,692,553, Cl. 564-185.000.

Kelly, Kevin P.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Kelly, Renee J., to Du Pont de Nemours, E. I., and Company. Process for matching color of paint to a colored surface. 4,692,481, Cl. 523-219.000.

Kelly, Thomas P.: *See*—
Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.

Kelsey, John R. Valve seat grinding apparatus. 4,691,480, Cl. 51-241.00A.

Kendall Company, The: *See*—
Cianci, James P.; and Gross, James R., 4,692,150, Cl. 604-111.000.
Dunn, William J.; and Silver, Brian H., 4,691,557, Cl. 73-32.00A.
Huddleston, Elwyn G., 4,692,352, Cl. 427-208.400.
Rosenberg, Helmut W. G.; and Drach, George W., 4,692,149, Cl. 604-99.000.

Kennedy, Michael, to Brother Albert Welsh Foundation. Ventilator including a double pass countercurrent heat exchanger. 4,691,763, Cl. 165-54.000.

Kerr, Jack R.; Shelton, Thomas V.; and Dunsmore, Jerry L. Self-locking nut with rocking anti-reversing pin. 4,692,077, Cl. 411-206.000.

Kerttula, Reima, to Valmet Oy. Apparatus for conveying a web lead-in strip in a paper machine. 4,692,215, Cl. 162-289.000.

Kervagoret, Gilbert, to Bendix France. Regulated device for controlling flow in a hydraulic installation, particularly for the assisted steering of a vehicle. 4,691,619, Cl. 91-459.000.

Kessler, Gerald. Drain tube for windows. 4,691,487, Cl. 52-209.000.

Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, to Mobil Oil Corporation. Heat sealable film and method for its preparation. 4,692,379, Cl. 428-349.000.

Keuth, Rainer: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Khoe, Giok D.; and De Vrieze, Henricus M., to U.S. Philips Corporation. Method of manufacturing a light-emitting device. 4,692,208, Cl. 156-659.100.

Khuri-Yakub, Pierre: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Kiefel, Bernhard: *See*—
Hoppner, Klaus; and Kiefel, Bernhard, 4,691,681, Cl. 123-556.000.

Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. Isoureas and their use for controlling undesirable plant growth. 4,692,187, Cl. 71-107.000.

Kieninger, Walter, to Walter Kieninger GmbH. Cutter head. 4,692,069, Cl. 407-39.000.

Kijima, Masatsugu: *See*—
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Kikuchi, Kazuhiro, to Nissan Motor Company, Limited. Apparatus for throttle valve control. 4,691,676, Cl. 123-399.000.

Killian, Edmund F.; and Berliner, Wallace H., to Waldes Truarc Inc. Bowed internal spring retaining ring that functions regardless of its orientation when installed in a groove. 4,692,079, Cl. 411-353.000.

Kim, Jai B.; and Yadlosky, John M. Rehabilitation of steel truss bridges by means of reinforcing arches. 4,691,399, Cl. 14-2.000.

Kimball, Philip M., to Polaroid Corporation. Drop dispensing device and method for its manufacture. 4,692,776, Cl. 346-140.00R.

Kimberly-Clark Corporation: *See—*
Morman, Michael T.; and Wisneski, Tony J., 4,692,371, Cl. 428/224.000.
Taylor, Jack D.; and Collier, L. Warren, IV, 4,692,368, Cl. 428-137.000.

Kimura, Hiroshi: *See—*
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Kimura, Kazuaki: *See—*
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.

Kimura, Kazuhiko: *See—*
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.

Kimura, Seiichiro; and Aoki, Hidekazu, to Kabushiki Kaisha Toshiba. Surface heat treating apparatus. 4,692,583, Cl. 219-121.00L.

Kinanen, Ilmari; and Ranne, Sulo, to Orion-yhtyma Oy. Planetary transmission based on friction. 4,691,595, Cl. 74-798.000.

Kinetics Technology International Corporation: *See—*
Minet, Ronald G.; and Warren, David, 4,692,306, Cl. 422-49.000.

King, Arthur S. Apparatus for increasing the residence time of waste liquids in an electric treater. 4,692,232, Cl. 204-278.000.

King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., to Boeing Company, The. Aircraft navigational systems and methods for creating navigational guidepoints. 4,692,869, Cl. 364-448.000.

King, Martin J.: *See—*
Troutner, Vernon H.; and King, Martin J., 4,692,138, Cl. 604-4.000.

King Plastics, Inc.: *See—*
King, Robert F., 4,691,501, Cl. 53-485.000.

King, Robert F., to King Plastics, Inc. Method of feeding and applying ridged container closures. 4,691,501, Cl. 53-485.000.

Kinglor-LTD: *See—*
Cavigli, Mario; and Ferrari, Lorenzo, 4,692,929, Cl. 373-89.000.

Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, to Konishiroku Photo Industry Co., Ltd. Photoreceptor having a photosensitive layer containing an azo compound. 4,692,393, Cl. 430-59.000.

Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, to Tokyo Juki Industrial Co., Ltd. Input device for sewing machine. 4,692,871, Cl. 364-470.000.

Kinugawa, Kiyoshi: *See—*
Washizuka, Isamu; and Kinugawa, Kiyoshi, 4,692,740, Cl. 340-365.00R.

Kinzer, Norbert: *See—*
Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., 4,692,628, Cl. 250-497.100.

Kirby, Charles A., to Northwest Design Products, Inc. Connector system for structural framework. 4,692,054, Cl. 403-171.000.

Kircher, Robert C., Jr.: *See—*
King, Ethmer W.; Kircher, Robert C., Jr.; and Yotsuuye, David S., 4,692,869, Cl. 364-448.000.

Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, to Hitachi, Ltd. Method for correcting and detecting errors. 4,692,922, Cl. 371-37.000.

Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, to Hoechst Aktiengesellschaft. Process for the manufacture of 3-pyridinium-methyl-cephalosporins. 4,692,516, Cl. 540-221.000.

Kirschmann, John D.; and Soberg, John P. Chemical dispensing system. 4,691,850, Cl. 222-642.000.

Kishi, Hajimu; and Tanaka, Kunio, to Fanuc Ltd. Machine tool pick feed method. 4,692,873, Cl. 364-474.000.

Kishi, Mitsuhiro, to Kabushiki Kaisha Hikoma Seisakucho. Lifting apparatus. 4,691,805, Cl. 187-9.00R.

Kiss, Nandor: *See—*
Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, 4,692,365, Cl. 428-87.000.

Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, to Tanabe Seiyaku Co., Ltd. Method for producing L-aspartic acid. 4,692,409, Cl. 435-109.000.

Kitahara, Kohei: *See—*
Nakagawa, Hitoshi; and Kitahara, Kohei, 4,691,911, Cl. 271-9.000.

Kitahara, Toshihiro: *See—*
Noda, Yasushi; and Kitahara, Toshihiro, 4,692,828, Cl. 360-97.000.

Kitamura, Hideaki: *See—*
Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, 4,692,796, Cl. 358-76.000.

Kitchell, Judith P.; and de Riel, Stanton R., to Dynatech Corporation. Biologically useful polymer preparations. 4,692,328, Cl. 424-78.000.

Kito, Masahiro; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Heat exchanger. 4,691,761, Cl. 165-32.000.

Kiuchi, Masayoshi, to Canon Kabushiki Kaisha. Display device for camera. 4,692,014, Cl. 354-471.000.

Kiuchi, Masayoshi: *See—*
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Kiya, Nobuyuki, to Fanuc LTD. Numerical control system with plural groups of miscellaneous functions. 4,692,872, Cl. 364-474.000.

Klargester Environmental Engineering Ltd.: *See—*
Nicholson, John L., 4,692,241, Cl. 210-150.000.

Klatt, Robert W., to Hughes Aircraft Company. Detector signal conditioner. 4,692,618, Cl. 250-330.000.

Klein, Robert W.; and Polli, Mary E., to William H. Rorer, Inc. Erythromycin/benzoyl peroxide antiacne compositions. 4,692,329, Cl. 424-81.000.

Klemm, Theobald: *See—*
Glaser, Dieter; and Klemm, Theobald, 4,691,450, Cl. 34-23.000.

Klimacek, Dusan: *See—*
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Klimke, Walter: *See—*
Hoffman, Reinhold; and Klimke, Walter, 4,691,865, Cl. 239-690.000.

Klocker, Peter: *See—*
Schmetz, Peter-Nikolaus; and Klocker, Peter, 4,691,825, Cl. 706-380.000.

Klockner-Humboldt-Deutz AG Zweigniederlassung Fahr: *See—*
Glunk, Josef, 4,691,504, Cl. 56-192.000.

Kluttermann, Jurgen; and Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Sliver coiler. 4,691,413, Cl. 19-159.00R.

Kluttermann, Jurgen, to Trutzschler GmbH & Co. KG. Sliver coiler drive. 4,691,414, Cl. 19-159.00R.

Klygis, Mindaugas J., to Illinois Tool Works Inc. Foldable container carrier collapsible container carrier with cruciform handle. 4,691,860, Cl. 229-52.00A.

Kmiec, Chester J.; and Novits, Michael F., to Pennwalt Corporation. Gas-releasing composition for tailoring gas evolution of system. 4,692,269, Cl. 252-350.000.

Knape & Vogt Manufacturing Co.: *See—*
Bessinger, Walter L., 4,691,887, Cl. 248-250.000.

Knoerzer, Karl-Heinz. Rotating collector assembly for electrical machines. 4,692,648, Cl. 310-233.000.

Knofel, Hartmut: *See—*
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.

Knoll, Gunter: *See—*
Himmler, Gunther; and Knoll, Gunter, 4,691,567, Cl. 73-483.000.

Koba, Yoshinori, to Meinan Machinery Works, Inc. Apparatus for dehydrating crude veneer. 4,691,629, Cl. 100-121.000.

Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, to Kabushiki Kaisha Riken; and Aisin Seiki Kabushiki Kaisha. Rod seal device for stirling engines. 4,691,591, Cl. 74-606.00A.

Kobayashi, Fumio: *See—*
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.

Kobayashi, Hiroshi: *See—*
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Kobayashi, Hisao; Kawai, Katsunori; and Deguchi, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Air conditioning unit for vehicle. 4,691,526, Cl. 62-217.000.

Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, to Ise Electronics Corporation. Fluorescent display tube for light source. 4,692,663, Cl. 313-495.000.

Kobayashi, Masamichi: *See—*
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.

Kobayashi, Nobutoshi: *See—*
Yoshida, Naoki; and Kobayashi, Nobutoshi, 4,692,598, Cl. 219-497.000.

Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, to Hitachi, Ltd. Optical waveguide and method for making the same. 4,691,983, Cl. 350-96.120.

Kobishi Electric Co., Ltd.: *See—*
Shimoya, Shigeo; Iwasaki, Yutaka; Ishii, Tadashi; and Iwasaki, Hikoji, 4,692,741, Cl. 340-392.000.

Koch, Magnus: *See—*
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.

Kochloefl, Karl: *See—*
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Kochs Adler AG: *See—*
Junemann, Hubert, 4,691,651, Cl. 112-259.000.

Koda, Haruyuki: *See—*
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, 4,692,501, Cl. 526-65.000.

Koehler, Gerard, to La Telemecanique Electrique. Direct current electromagnet having a movement of translation. 4,692,729, Cl. 335-259.000.

Kofoed, Bruce O. Sheet gripper tongs. 4,691,953, Cl. 294-19.100.

Kogashiwa, Kiyonori: *See—*
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.

Kohl, Jerry. Decorative plaque with replaceable decorative element. 4,691,460, Cl. 40-618.000.

Kohler, Ingolf: *See—*
Katernberg, Helmut; and Kohler, Ingolf, 4,691,656, Cl. 114-45.000.

Koht, Lowell; and Shimirak, Gerald L., to Raychem Corporation. Segmented end seal and closure. 4,692,565, Cl. 174-93.000.

Kohuth, Russell T.: *See—*
Sampedro, Manuel, 4,692,053, Cl. 403-24.000.

Koike, Norio: *See—*
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.

Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, to Tokyo Kagaku Kaisi Kabushiki Kaisha. Laser treatment apparatus. 4,692,924, Cl. 372-30.000.

Kojima, Akira: *See—*
Mikuniya, Kunio; and Kojima, Akira, 4,691,963, Cl. 297-195.000.

Kojima, Minoru: *See—*
Sakurai, Koichi; and Kojima, Minoru, 4,692,820, Cl. 360-74.700.

Kojima, Takio; and Taniguchi, Masato, to NGK Spark Plug Co., Ltd. Ceramic auxiliary combustion chamber. 4,691,673, Cl. 123-271.000.

Kokura, Satoshi: *See—*
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Kokusai Denshin Denwa Co., Ltd.: *See—*
Fujioka, Masanobu, 4,692,917, Cl. 370-60.000.

Kollmeier, Hans-Joachim; and Lammerting, Helmut, to Th. Goldschmidt AG. Process for the manufacture of molded objects. 4,692,292, Cl. 264-126.000.

Komada, Hideaki: *See—*
Otsuka, Shojiro; and Komada, Hideaki, 4,691,674, Cl. 123-299.000.

Komatsu, Shigeru, to Kabushiki Kaisha Toshiba. Trimming of metal interconnection layer by selective migration of metal atoms by energy beams. 4,692,190, Cl. 437-189.000.

Komatsubara, Saburo: *See—*
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.

Komiya, Hidetsugu, to Fanuc Ltd. Position control of multiple tools based on elapsed time of tool operation. 4,692,856, Cl. 364-167.000.

Komoda, Tsutomu: *See—*
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.

Komulainen, Viljo S., to Aihiko Ky. Method for sawing a tree trunk and for treating a uniformly thick slice of wood sawed off the trunk. 4,691,751, Cl. 144-357.000.

Komura, Makoto: *See—*
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.

Kondo, Hirokazu: *See—*
Yokoi, Satoru; and Kondo, Hirokazu, 4,692,694, Cl. 324-158.00F.

Konig, Klaus: *See—*
Engbert, Theodor; Hammen, Gunter; Knofel, Hartmut; and Konig, Klaus, 4,692,550, Cl. 560-345.000.
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, 4,692,384, Cl. 428-423.300.

Konishi, Masanori: *See—*
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.

Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Kenichi, to Bristol-Myers Company. Peptide antibiotics. 4,692,510, Cl. 530-317.000.

Konishi, Yozo: *See—*
Tenma, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, 4,692,876, Cl. 364-513.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, 4,692,399, Cl. 430-507.000.
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Konstantinov, Boris A.: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Konstructa Trencin, narodny podnik: *See—*
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Konuma, Toshimitsu: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Kosaka, Etsuji: *See—*
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Kosuge, Hiroshi: *See—*
Kiriu, Yoshio; Kaneko, Shigeru; and Kosuge, Hiroshi, 4,692,922, Cl. 371-37.000.

Kosuge, Shuichi, to Nippondenso Co., Ltd. Automatic shift control system. 4,692,866, Cl. 364-424.100.

Kosugi, Kenichi: *See—*
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, 4,691,909, Cl. 270-58.000.

Kotitschke, Herbert: *See—*
Schiel, Christian; and Kotitschke, Herbert, 4,691,420, Cl. 29-116.00R.

Kovac, Andrew J. Amphibious vehicle. 4,691,657, Cl. 114-61.000.

Kowa Company Ltd.: *See—*
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.

Kowalski, Slawomir, to Marotta Scientific Controls, Inc. Valve for fire suppression. 4,691,736, Cl. 137-557.000.

Koya, Shinichi: *See—*
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Koyama, Tatsuya: *See—*
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.

Koyanagi, Kaoru: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Kozlowski, Eric F.; and Kruger, Edmund R., to Lear Siegler, Inc. Method and apparatus for bonding fabric to a foam pad. 4,692,199, Cl. 156-245.000.

Kozuki, Susumu: *See—*
Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.

Kral, Josef: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Kramer, Walter: *See—*
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Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Brake and release apparatus for a rotary nozzle body. 4,691,876, Cl. 244-3.220.

Krasovskaya, Svetlana M.: *See—*
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Krasselt, Mansfred M.: *See—*
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Kratzsch, Eberhard; Cygan, Wolfgang; and Kiss, Nandor, to Akzona Incorporated. Use of air-jet textured yarns in the manufacturing of abrasives on substrates. 4,692,365, Cl. 428-87.000.

Krause, Manfred: *See—*
Lemke, Otto; and Krause, Manfred, 4,692,217, Cl. 202-151.000.

Krauss-Maffei A.G.: *See—*
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.

Kreh, Robert P.: *See—*
Spotnitz, Robert M.; and Kreh, Robert P., 4,692,227, Cl. 204-78.000.

Krepelka, Jiri: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate moulding compositions. 4,692,488, Cl. 524-139.000.

Kretchmer, Richard A.: *See—*
Tolpin, Thomas W.; and Kretchmer, Richard A., 4,692,318, Cl. 423-239.000.

Kristal Instrumente AG: *See—*
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Kritzler, Steven, to Field Group Chemicals Pty. Ltd. Radiopaque medium. 4,692,325, Cl. 424-4.000.

Krohn, Duane D.; and Boogerman, Allan, to Graco Inc. Pressure Roller Applicator. 4,692,048, Cl. 401-197.000.

Krufka, Frank S., to RCA Corporation. System for fine focusing a camera on a moving curved surface. 4,692,605, Cl. 250-201.000.

Kruger, Edmund R.: *See—*
Kozlowski, Eric F.; and Kruger, Edmund R., 4,692,199, Cl. 156-245.000.

Krukowski, Richard: *See—*
Boyd, Robert L.; Krukowski, Richard; and Gezari, Daniel Y., 4,691,694, Cl. 128-25.00R.

Krupp Polysius AG: *See—*
Supp, Armin; and Nebe, Rainer, 4,692,244, Cl. 210-219.000.

Kruschik, Klaus: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

KSA Dichtsysteme GmbH: *See—*
Abele, Berthold W., 4,691,928, Cl. 277-235.00B.

Kubota, Ltd.: *See—*
Ishimori, Shoso; Ishiizumi, Seiichi; and Ishida, Mikio, 4,691,802, Cl. 180-791.000.
Morita, Shigeru; and Yanagawa, Nobuhide, 4,692,086, Cl. 414-635.000.

Kubota, Yutaka: *See—*
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Kucera, Clare H., to Dowell Schlumberger Incorporated. Fracturing of subterranean formations. 4,692,254, Cl. 252-8.551.

Kuchirka, Peter J.: *See*—
DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., 4,692,302, Cl. 376-439.000.

Kuck, Jay L., to Midmark Corporation. Angular tilt control mechanism for a wheeled stretcher. 4,691,393, Cl. 5-62.000.

Kudo, Shinichi: *See*—
Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, 4,692,351, Cl. 427-196.000.

Kudou, Masayuki: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.

Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., to Rorer Pharmaceutical Corporation. Bicyclic benzenoid aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,692,445, Cl. 514-212.000.

Kulinyak, Ernst, to Messerschmitt-Bolkow-Blohm GmbH. Rotary positionable installation. 4,692,094, Cl. 416-11.000.

Kumakura, Koichi; and Hosokawa, Yoshinori, to Horiba, Ltd. Apparatus for detecting amount of liquid nitrogen. 4,691,793, Cl. 177-50.000.

Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, to Horiba, Ltd. Automatic steel analysis apparatus. 4,692,935, Cl. 378-49.000.

Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory. 4,692,901, Cl. 365-201.000.

Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,692,400, Cl. 430-553.000.

Kumatani, Hiroshi; and Yamaura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Lever mechanism in combination with a sewing machine driving device. 4,691,588, Cl. 74-512.000.

Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, to Nihon Tokushu Noyaku Seizo K.K. Phosphoroimidates as pesticides. 4,692,436, Cl. 514-129.000.

Kuo, Dai-Ming. Toilet having wire-adjusted water-spray nozzles. 4,691,391, Cl. 4-447.000.

Kurihara, Kazumasa, to Nifco Inc. Device for holding rod-like objects. 4,691,883, Cl. 248-74.200.

Kuriyama, Kazunori: *See*—
Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, 4,692,891, Cl. 364-763.000.

Kuriyama, Minoru; and Yamamoto, Tadashi, to Ube Industries. Degassing apparatus for a metal mold. 4,691,755, Cl. 164-305.000.

Kuroda, Kunishige: *See*—
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.

Kuroiwa, Akihiko; and Saito, Suzuo, to Kabushiki Kaisha Toshiba. Constant voltage and frequency type PWM inverter with minimum output distortion. 4,692,855, Cl. 363-95.000.

Kuroki, Katsuro: *See*—
Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, 4,692,193, Cl. 148-111.000.

Kurosawa, Toshiharu: *See*—
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Kurtz, John W.: *See*—
Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., 4,691,886, Cl. 248-183.000.

Kusaka, Masaharu: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd. Acoustic transducers utilizing ZnO thin film. 4,692,653, Cl. 310-334.000.

Kuwabara, Hideki: *See*—
Akiyama, Hiroyuki; Izawa, Susumu; and Kuwabara, Hideki, 4,692,507, Cl. 528-481.000.

Kuwabara, Kiyoshi: *See*—
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.

Kuzemchak, James J. Ostomy pouch flush nozzle. 4,692,159, Cl. 604-277.000.

Kwong, Ranee W.: *See*—
Sachdev, Krishna G.; Kwong, Ranee W.; Gupta, Mani R.; Chace, Mark S.; and Sachdev, Harbans S., 4,692,205, Cl. 156-643.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

L-Bar Products Incorporated: *See*—
Roman, Ronald J., 4,692,259, Cl. 252-70.000.

La Telemecanique Electrique: *See*—
Joly, Jean; and Oehlert, Yves, 4,692,842, Cl. 361-413.000.
Koehler, Gerard, 4,692,729, Cl. 335-259.000.

LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, to Optech Inc. Controlled color light source. 4,692,607, Cl. 250-205.000.

Lackinger, Franz, to Westward Investments Limited. Cable gland embodying moisture-proof seal. 4,692,563, Cl. 174-65.0SS.

Lacy, Sylvia M.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

LaFrance Corporation: *See*—
Peroni, Peter A., 4,691,457, Cl. 40-20.00A.

Lai, John T.: *See*—
Son, Pyong-Nae; and Lai, John T., 4,692,487, Cl. 524-100.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Marhic, Gerard, 4,692,582, Cl. 219-121.0PT.

Laitram Corp., The: *See*—
Weber, Peter G., 4,691,818, Cl. 197-666.000.

Lakin, David F., to Lucas Limited public limited company. Fuel injection pumping apparatus. 4,691,679, Cl. 123-450.000.

Lalin, Hill S.; Bermudez, Jorge E.; and Fleming, William T. Soap film gas flowmeter. 4,691,577, Cl. 73-861.050.

Lalmond, Richard G., to Sanders Associates, Inc. Optical power distribution system. 4,692,683, Cl. 322-2.00R.

Lamb, Timothy K. Current killer, swift water floater. 4,691,466, Cl. 43-43.130.

Lammerting, Helmut: *See*—
Kollmeier, Hans-Joachim; and Lammerting, Helmut, 4,692,292, Cl. 264-126.000.

Lampert, Ingolf; and Jacob, Herbert, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for polishing silicon wafers. 4,692,223, Cl. 204-34.500.

Lan, Charng-Ching. Pen with selective multi-color cores. 4,692,046, Cl. 401-32.000.

Lancaster, William G., to Lantech, Inc. Film lamination stretch wrapping. 4,691,497, Cl. 53-399.000.

Lance, Jacques; and Muller, Georges, to Commissariat a l'Energie Atomique. Method and apparatus for replacing a filter in a vessel. 4,691,425, Cl. 29-402.080.

Landau, Boris; and Saines, Marius, to Ergomed. Squeeze-actuated syringe with position-selectable lock. 4,692,157, Cl. 604-214.000.

Landell, Harper; and Woolworth, Richard G., to Woodstream Corporation. Lighted tackle box. 4,691,470, Cl. 43-55.000.

Landrau, Felix A.: *See*—
Eckenhoff, James B.; Cortese, Richard; and Landrau, Felix A., 4,692,336, Cl. 424-468.000.

Landrevie, Bernard: *See*—
Godfrin, Jean-Philippe; Landrevie, Bernard; and Escache, Gerard, 4,691,633, Cl. 102-202.000.

Lane, Kerry S.; and Moore, Derek V., to Levitt Safety Limited. Nicad battery charger. 4,692,682, Cl. 320-35.000.

Lang, Gerard: *See*—
Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.

Lang, Marc: *See*—
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.

Lang, Robert W., to Ciba-Geigy Corporation. Process for the preparation of hemiaminals, and the use thereof. 4,692,536, Cl. 556-413.000.

Langer, Hans J.: *See*—
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.

Lantech, Inc.: *See*—
Lancaster, William G., 4,691,497, Cl. 53-399.000.

Larsen, Anders, to Nord-Plan Stalreoler A/S. Thin plate structure. 4,691,493, Cl. 52-588.000.

Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., to Fymetics, Inc. Weight scales and strain gauge assemblies useable therein. 4,691,794, Cl. 177-211.000.

Larson, Harold V.; and Gillman, Hyman D., to Atlantic Richfield Company. Purification of propylene oxide. 4,692,535, Cl. 549-542.000.

Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., to U.S. Philips Corporation. Arrangement for fire control. 4,691,616, Cl. 89-41.070.

Lasarray Holding AG: *See*—
Percival, Richard; and Uhlmann, Ernst, 4,691,434, Cl. 437-173.000.

Lattrell, Rudolf: *See*—
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.

Lauderbach, Leo, to Stabilus GmbH. Taper connection on a chair or table column of adjustable height. 4,692,057, Cl. 403-334.000.

Lavendel, Henry W.; and Robinson, John C., to Lockheed Missiles & Space Company, Inc. Laminated article. 4,692,388, Cl. 428-621.000.

LaVene, Leon F.: *See*—
DeLand, Daniel L.; and LaVene, Leon F., 4,691,943, Cl. 285-315.000.

Lavoine, Jean-Claude: *See*—
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.

Lawrance, George F. Display stand. 4,691,885, Cl. 248-165.000.

Lawrence, Dale M.: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.

Lawrence, Frederick J., to Gradco Systems, Inc. Sheet receiver. 4,691,914, Cl. 271-297.000.

Lawrence, Katherine, to Hewlett-Packard Company. Novel gel compositions, processes for making same and uses in transmitting and measuring electrical impulses. 4,692,273, Cl. 252-518.000.

Lawson-Tancred, Henry, to Sir Henry Lawson-Tancred, Sons & Co. Ltd. Wind turbine blades. 4,692,095, Cl. 416-23.000.

Lawton, Geoffrey: *See*—
Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, 4,692,438, Cl. 514-183.000.

Layden, David L.: *See*—
Baxter, Richard V., Jr.; Bourke, Robert F.; Ellingson, David R.; Paul, Terrance D.; and Layden, David L., 4,692,854, Cl. 363-75.000.

Leader Company Limited: *See*—
Kadogawa, Kouji; and Watanabe, Tsunenori, 4,691,398, Cl. 12-77.000.

Lear Siegler, Inc.: *See*—
Kozlowski, Eric F.; and Kruger, Edmund R., 4,692,199, Cl. 156-245.000.

Lease, Michael E.: *See*—
Risser, Dale M.; and Lease, Michael E., 4,691,410, Cl. 17-11.000.

Leathers, Thomas M.: *See*—
Portolese, Larry A.; and Leathers, Thomas M., 4,691,730, Cl. 137-101.000.

Leaver, James M. Cementitious modular panel and panel assembly for building walls and method of construction. 4,691,490, Cl. 52-293.000.

Leclaire, Charly, to Prouvost S.A. Method and sewing machine for automatically providing end of stitching at a given distance from the edge of a piece of fabric. 4,691,652, Cl. 112-262.100.

Lederle (Japan), Ltd.: *See*—
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

LeDoux, John P. Lamp for temporarily attaching to a support. 4,692,850, Cl. 362-432.000.

Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, to Digital Equipment Corporation. Multiple chip interconnection system and package. 4,692,839, Cl. 361-386.000.

Lee, Kyong H.: *See*—
Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., 4,692,909, Cl. 367-45.000.

Lee, Len F., to Monsanto Company. 2,6-substituted pyridine compounds. 4,692,184, Cl. 71-94.000.

Lee, Robert E. Closed loop servo control system. 4,692,678, Cl. 318-687.000.

Lee, Sam H.: *See*—
Fang, Sheng; and Lee, Sam H., 4,692,634, Cl. 307-272.100.

Leeper, Alan L., to International Shoe Machine Corporation. Method and machine to form box parts. 4,692,133, Cl. 493-128.000.

Leffel, Leon E.; and Leffel, Rick G. Nonsymmetrical compensator for handgun. 4,691,614, Cl. 89-14.300.

Leffel, Rick G.: *See*—
Leffel, Leon E.; and Leffel, Rick G., 4,691,614, Cl. 89-14.300.

Lefler, Jerrold P.: *See*—
Cuff, William A.; and Lefler, Jerrold P., 4,692,042, Cl. 400-94.000.

Leigh, John W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Modular ground mine. 4,691,637, Cl. 102-406.000.

Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, to BASF Aktiengesellschaft. 2-amino-3,5-di-(halomethyl)-pyrazines and their preparation. 4,692,527, Cl. 544-405.000.

Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, to Adeka Argus Chemical Co., Ltd. Vinyl benzyl 2,2,6,6-tetramethyl piperidines. 4,692,485, Cl. 524-99.000.

Le Marchand, Claude; and Gerard, Jean-Louis, to Bendix France. Disc brake with automatic adjustment. 4,691,809, Cl. 188-71.900.

Lemke, Otto; and Krause, Manfred, to Carl Still GmbH & Co. KG, Firma. Readjustment device for coke oven batteries. 4,692,217, Cl. 202-151.000.

Lemmer, Helmut, to Square D Starkstrom GmbH. Circuit breaker, in particular an accessory or motor contactor. 4,691,978, Cl. 439-620.000.

Lenk, Erich: *See*—
Burkhardt, Klaus; Gerhards, Klaus; Greb, Manfred; Keuth, Rainer; and Lenk, Erich, 4,691,947, Cl. 28-255.000.

Lenz, Henry G.; Coffman, Leonard; and Beltran, Adrian M., to General Electric Company. Fluid cooled acyclic generator rotor having a copper conductor diffusion bonded to a magnetic steel core. 4,692,644, Cl. 310-178.000.

Leorat, Francois; Coutant, Patrick; and Aubert, Paul, to Regie Nationale des Usines Renault. Control system for a four-speed automatic transmission. 4,691,597, Cl. 74-869.000.

LeRoux, Donald F.; and Stottlemyer, Quayton R., to Du Pont de Nemours, E. I., and Company. Method and apparatus for air jet assisted film unloading from x-ray cassettes. 4,692,083, Cl. 414-411.000.

Leroy, Andre . Roller displacement motor. 4,692,105, Cl. 418-184.000.

Lerschen, James R.: *See*—
DeKezel, James A.; and Lerschen, James R., 4,691,463, Cl. 43-3.000.

Leung, Wing K.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.

Leupold, Ernst I.: *See*—
Driscoll, Robert K.; Leupold, Ernst I.; and Ebertz, Wolfgang, 4,692,547, Cl. 560-186.000.

Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, to United States of America, Army. Remanence varying in a leakage free permanent magnet field source. 4,692,732, Cl. 335-302.000.

Le Van Mao, Raymond, to Asbestos Institute, The. Dry impregnated manganese zeolite. 4,692,424, Cl. 502-68.000.

Le Vantine, Allan D. Heat free examination light with fully rotatable head and arm. 4,692,849, Cl. 362-402.000.

Levasseur, Jean-Pierre, to Omnium de Traitements et de Valorisation (O.T.V.). Apparatus for processing solid wastes to produce a fuel. 4,692,167, Cl. 44-2.000.

Lever Brothers Company: *See*—
Secemski, Isaac I.; and Lyna, Jesse L., Jr., 4,692,275, Cl. 252-534.000.

Levitt Safety Limited: *See*—
Lane, Kerry S.; and Moore, Derek V., 4,692,682, Cl. 320-35.000.

Lewiner, Jacques; and Hennion, Claude. Remote control coded devices. 4,692,762, Cl. 340-825.690.

Lewis, Robert T., to Tribometrics, Inc. Method and device including a bed of ferromagnetic fibers and magnetic flux sensor for measuring the amount of magnetic particles on a liquid. 4,692,698, Cl. 324-204.000.

L'Heureux, Arthur J., III: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Licata, William H.: *See*—
Politis, Demetrios T.; and Licata, William H., 4,692,765, Cl. 342-106.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Frank, Werner, 4,691,913, Cl. 271-34.000.
Gillmann, Hanno, 4,691,912, Cl. 271-10.000.
Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.
Ostwald, Robert; and Voit, Gabriele, 4,692,356, Cl. 427-304.000.

Licinvest AG: *See*—
Ackeret, Peter, 4,691,456, Cl. 40-10.00R.

Lietz, Larry D.: *See*—
Austin, George K., Jr.; and Lietz, Larry D., 4,691,948, Cl. 292-171.000.

Life Support Systems, Inc.: *See*—
Elkins, William; Connell, Eugene W.; and Short, Robert E., 4,691,762, Cl. 165-46.000.

Lilley, Raymond A., to Cladcolor Profiling Limited. Support systems. 4,691,491, Cl. 52-481.000.

Lim, Gnian C., to Amada Engineering & Service Co., Inc. Gaseous discharge device. 4,692,664, Cl. 315-60.000.

Lin, Min-Shin. Clamping apparatus for hammering a hardened nail. 4,691,598, Cl. 81-44.000.

Lin, Weng-Pin; and Chang, Nelson. Reflector for a spoked wheel. 4,691,992, Cl. 350-99.000.

Lindel, Hans: *See*—
Hallenbach, Werner; Lindel, Hans; and Brandes, Wilhelm, 4,692,461, Cl. 514-443.000.

Lindenfelser, Timothy M. Semi-conductor device with sandwich passivation coating. 4,692,786, Cl. 357-54.000.

Lindholm, Rolf C.: *See*—
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., 4,691,616, Cl. 89-41.070.

Lindner, Christian: *See*—
Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.

Lindner, Luther E.; and Wechter, Stephen R., to Texas A&M University System, The. Methods and compositions for the detection of acquired immune deficiency syndrome. 4,692,403, Cl. 435-5.000.

Lindorfer, Walter; and Jahn-Held, Wilhelm, to Wintershall AG. Process for dumping of particulate solid waste materials in underground salt enclosed cavitives. 4,692,061, Cl. 405-128.000.

Lindquist, Wayne V.: *See*—
Elliott, Roger A.; and Lindquist, Wayne V., 4,692,918, Cl. 370-85.000.

Lins, Stanley J.: *See*—
Lo, David S.; and Lins, Stanley J., 4,692,899, Cl. 365-29.000.

Lion's Sports, Inc.: *See*—
Lopez, Lionel P., 4,691,387, Cl. 2-161.00A.

Lips, Hendrik: *See*—
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.

Littmann, Wolfgang: *See*—
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.

Liu, Kou-Chang, to GAF Corporation. Preparation of carboxypropylated non-ionic surfactants. 4,692,551, Cl. 562-471.000.

Liu, Shuchen, to American Hoechst Corporation. Process for developing an aqueous alkaline development diazo photographic element. 4,692,397, Cl. 430-325.000.

Livingston, Afton M.: *See*—
Livingston, Virginia W.; Alexander-Jackson, Eleanor G.; and Livingston, Afton M., 4,692,412, Cl. 435-253.000.

Livingston, Virginia W.; Alexander-Jackson, Eleanor G.; and Livingston, Afton M. Method of preparing an autogenous vaccine. 4,692,412, Cl. 435-253.000.

Llort, Francisco M.: *See*—
Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,692,497, Cl. 525-263.000.

Lloyd, Adam J. P.: *See*—
Gupta, Alankar; and Lloyd, Adam J. P., 4,691,760, Cl. 165-26.000.

Lo, David S.; and Lins, Stanley J., to Sperry Corporation. Propagational control for Vertical Bloch Line memories. 4,692,899, Cl. 365-29.000.

Loce, Robert P.; Rees, James D.; and Durbin, John A., to Xerox Corporation. Short focal lens array with multi-magnification properties. 4,692,015, Cl. 355-1.000.

Locke, Stanley; and Gouilloud, Michel, to Schlumberger Technology Corporation. Method and apparatus for measuring the earth formation resistivity of a plurality of radial regions around a borehole. 4,692,707, Cl. 324-374.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Lavendel, Henry W.; and Robinson, John C., 4,692,388, Cl. 428-621.000.

Lohrengel, Gregor, to Huls Aktiengesellschaft. Method of concentrating polyphenylene ether solutions. 4,692,482, Cl. 523-340.000.

Lombardini, Lapo; and Bardi, Gianluca, to Officine Galileo S.p.A. Cryogenic pump with refrigerator with the geometry of the shields, suitable for achieving a high efficiency and an extended life. 4,691,534, Cl. 62-55.500.

Longhouse, Richard E.: *See*—
Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.

Loxza Ltd.: *See*—
Tenud, Leander; and Gosteli, Jacques, 4,692,543, Cl. 558-342.000.

Lopez, Carlos; and Serrano, Jose L., to Piher Navarra, S.A. Devices used for varying the resistance of electrical circuits and the conduction of current in electrical circuits. 4,692,805, Cl. 338-198.000.

Lopez, Lionel P., to Lion's Sports, Inc. Glove apparatus. 4,691,387, Cl. 2-161.00A.

Loral Corporation: *See*—
Reichel, Paul, deceased; and Reichel, Gilbert, administrator, 4,692,722, Cl. 333-142.000.

Lord, Gary E., to Eli Lilly and Company. Crystalline (7R)-7-amino-3-(1'-pyridiniummethyl)-3-cephem-4-carboxylate monohydrate compound. 4,692,518, Cl. 540-224.000.

"L'Oreal" : *See*—
Herb, Armin, 4,692,076, Cl. 411-55.000.
Junino, Alex; Lang, Gerard; Andrean, Herve; and Cotteret, Jean, 4,692,166, Cl. 8-410.000.

Lorg, John W. Infiltration control device. 4,691,478, Cl. 49-499.000.

Lormeau, Jean-Claude; Goulay, Jean; and Choay, Jean, to Choay, S.A. Mucopolysaccharide composition having a regulatory action on coagulation, medicament containing same and process of preparation. 4,692,435, Cl. 514-56.000.

Los, Vladimir F.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Losert, Wolfgang: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Loughlin, John J.: *See*—
Dickens, Judith F.; and Loughlin, John J., 4,691,710, Cl. 128-673.000.

LRC Electronics, Inc.: *See*—
Cowen, Judith A., 4,691,976, Cl. 439-394.000.

LTM Corporation of America: *See*—
Galerne, Jean, 4,692,844, Cl. 362-3.000.

Lucas Electrical Electronics and Systems Limited: *See*—
West, John G. W., 4,691,668, Cl. 123-41.120.

Lucas Industries public limited company: *See*—
Greeves, Godfrey, 4,691,864, Cl. 239-453.000.

Lucas Limited public limited company: *See*—
Lakin, David F., 4,691,679, Cl. 123-450.000.

Lufkin, John R.: *See*—
Otteman, John H.; and Lufkin, John R., 4,691,669, Cl. 123-41.150.

Luft, Christa: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Boga, Gunhild; Domeratzky, Joachim; Gartner, Heimut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., to Exxon Research and Engineering Company. Method for controlling viscosity of organic liquids and compositions. 4,692,268, Cl. 252-33.400.

Lustig, Lee M.; and Ellis, Gary D., to Dresser Industries, Inc. Isolation valve with frangible flapper element. 4,691,775, Cl. 166-317.000.

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Haver, Eitel F.; Lutke-Foller, Heinz; and Woosmann, Reinhard, 4,691,744, Cl. 139-425.00R.

Lux, Karl-Heinz: *See*—
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,692,570, Cl. 200-4.000.

Lynn, Jesse L., Jr.: *See*—
Secemski, Isaac I.; and Lynn, Jesse L., Jr., 4,692,275, Cl. 252-534.000.

Lynx Golf, Inc.: *See*—
Boone, David D., 4,691,388, Cl. 2-161.00A.

Lyons, James E.: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

M.A.N.Maschinenfabrik Augsburg-Nurnberg: *See*—
Katernberg, Helmut; and Kohler, Ingolf, 4,691,636, Cl. 114-45.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Dorn, Alfred, 4,692,739, Cl. 340-365.00P.

MacChesney, John B.: *See*—
Cohen, Leonard G.; Johnson, David W., Jr.; and MacChesney, John B., 4,691,990, Cl. 350-96.330.

MacDonald, Donald M.: *See*—
Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., 4,692,212, Cl. 162-206.000.

MacGovern, Alan J.; and Hutchin, Richard A., to Itek Corporation. Spatial processing for single or dual shear wavefront sensor. 4,692,027, Cl. 356-353.000.

Machihara, Akio: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, to Toyo Seikan Kaisha, Ltd. Process for printed draw-formed body, and container formed by this process. 4,692,810, Cl. 358-256.000.

Machin, Roy. Washing apparatus for a motor vehicle. 4,691,401, Cl. 15-53.00A.

Macht, Alwin: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

MacWilliams, Dalton C.: *See*—
Beck, H. Nelson; and MacWilliams, Dalton C., 4,692,355, Cl. 427-297.000.

Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, to Delphax Systems. Toner transfer apparatus. 4,692,017, Cl. 355-3.0DD.

Maeda, Isamu, to Kankyo Souken Consultant, Co., Ltd. Metal melting furnace. 4,691,900, Cl. 266-156.000.

Maeda Metal Industries Ltd.: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.

Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, to Nippon Steel Corporation. Method of improving functions of surface of alloy steel by means of irradiation of laser beam, and alloy steel and structure made by the method. 4,692,191, Cl. 148-6.14R.

Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for drawing a thick film circuit. 4,692,351, Cl. 427-196.000.

Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd. Antiskid control system. 4,691,969, Cl. 303-113.000.

Maekawa, Junichi, to Ohi Seisakusho Co., Ltd. Window regulator. 4,691,475, Cl. 49-352.000.

Maenishi, Kozo; and Nakanishi, Youichi, to Omron Tateisi Electronics Co. Self-aligning spring mechanism for an electrical switch. 4,692,728, Cl. 335-192.000.

Magdolen, Viktor: *See*—
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

Magnetic Massage Company: *See*—
Sato, Ray S., 4,691,693, Cl. 128-24.100.

Mahurkar, Sakharam D. Double lumen catheter. 4,692,141, Cl. 604-43.000.

Maibuk, Zinovy-Jury Y.: *See*—
Sobolev, Gennady A.; Demin, Vladislav M.; Los, Vladimir F.; and Maibuk, Zinovy-Jury Y., 4,692,905, Cl. 367-14.000.

Maige, Philippe: *See*—
de Sartre, Jean; and Maige, Philippe, 4,692,853, Cl. 363-49.000.

Majoch, Tim R.: *See*—
Auth, David C.; Lawrence, Dale M.; and Majoch, Tim R., 4,691,703, Cl. 128-303.100.

Makihara, Hiroshi: *See*—
Asaeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.

Makita, Masaru, to Canon Kabushiki Kaisha. Printing apparatus capable of correcting printed characters by offset prints. 4,692,045, Cl. 400-697.000.

Malancon, Irvin P., Jr. Container and holder for dispensing baking soda. 4,691,822, Cl. 206-229.000.

Malashkin, Michail: *See*—
Cargill, N. Allen; and Malashkin, Michail, 4,691,910, Cl. 271-3.000.

Malesci S.p.A. Istituto Farmacobiologico: *See*—
Bonacchi, Graziano; Fedi, Mauro; and Giannini, Mario, 4,692,525, Cl. 544-360.000.

Maletz, Gerd: *See*—
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Malhotra, Sudarshan K.; and Evoy, Ingrid L., to Dow Chemical Company, The. Diphenoxymethylpyridines and compositions containing same having herbicidal properties. 4,692,183, Cl. 71-94.000.

Malmeblad, Sven-Erik: *See*—
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, 4,692,209, Cl. 162-30.100.

Manabe, Takashi: *See*—
Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, 4,692,444, Cl. 514-406.000.

Manda R & D: *See*—
Manska, Wayne E., 4,691,979, Cl. 439-82.000.

Manduley, Flavio, to Pitney Bowes Inc. General purpose processor module for mailroom equipment. 4,692,870, Cl. 364-466.000.

Mann, Yale; and Sarssi, Pekka. Vehicle protection device. 4,691,801, Cl. 180-287.000.

Mannesmann, Gerda: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Mannesmann Kienzle GmbH: *See*—
Dyma, Horst; and Heindke, Armin, 4,692,041, Cl. 400-82.000.

Manring, Lewis E.; and Mazur, Stephen, to Du Pont de Nemours, E. I., and Company. Metal interlayers in films by counter-current diffusion. 4,692,360, Cl. 427-443.100.

Manska, Wayne E., to Manda R & D. Compliant press-fit electrical contact. 4,691,979, Cl. 439-82.000.

Manville Corporation: *See*—
Sadler, Thomas H., 4,692,128, Cl. 474-8.000.
Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.

Maquinas NPU Ltda.: *See*—
dos Santos Copia, Carlos R., 4,692,134, Cl. 493-196.000.

Marconi Company Limited, The: *See*—
Wilson, David J. M.; and Cope, Paul E. G., 4,692,614, Cl. 250-231.00R.

Marhic, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Plasma welding or cutting system provided with a delay. 4,692,582, Cl. 219-121.0PT.

Maric, Dane: *See*—
Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., 4,691,404, Cl. 15-167.00R.

Marketing Displays, Inc.: *See*—
Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Markovitz, Mark: *See*—
Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., 4,692,499, Cl. 525-524.000.

Markure, Laura A.: *See*—
Borsari, Allen S.; Brym, Stanley J.; Markure, Laura A.; and Arpino, Ronald G., 4,692,589, Cl. 219-251.000.

Marmel, Max: *See*—
Jordan, Harold V.; and Marmel, Max, 4,692,407, Cl. 435-36.000.

Marmet, Melvin: *See*—
Ouyang, Kenneth W.; and Marmet, Melvin, 4,692,717, Cl. 331-111.000.

Marotta Scientific Controls, Inc.: *See*—
Kowalski, Slawomir, 4,691,736, Cl. 137-557.000.

Marra, Gerardo J. Powered roof shingle detacher and stripper apparatus. 4,691,439, Cl. 30-170.000.

Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, to Licentia Patent-Verwaltungs-GmbH; and ANT Nachrichtentechnik GmbH. Mushroom-shaped semiconductor stripe laser. 4,692,926, Cl. 372-46.000.

Marschner, Friedemann: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Marsden, Peter; and Bradwell, Paul R., to Haden Drysys International Limited. Apparatus and method for applying material to articles. 4,692,358, Cl. 427-421.000.

Martin, Colin L.: *See*—
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.

Martin, Gregory C., to Pulse Electronics, Inc. Railroad coupler mount. 4,691,563, Cl. 73-129.000.

Martin, Jack. Apparatus for drying hair from the inside out. 4,692,594, Cl. 219-373.000.

Martin, Philip N. Projectile powered piston. 4,691,803, Cl. 181-113.000.

Martin, Stewart O.: *See*—
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., 4,692,703, Cl. 324-251.000.

Martindell, J. Richard. Handle adapter and chuck apparatus for power bits. 4,692,073, Cl. 408-239.00A.

Martinez, Robert, to Vistakon, Inc. Package for hydrophilic contact lens. 4,691,820, Cl. 206-205.000.

Martirosian, Ruben G.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Maruta, Riichiro: *See*—
Mayumi, Junji; and Maruta, Riichiro, 4,692,357, Cl. 427-393.500.

Maruyama, Hidekazu, to Ikeda Bussan Co., Ltd. Seat with garnished seat cushion. 4,691,966, Cl. 297-452.000.

Maruyama, Kimiaki: *See*—
Dunbar, Joseph E.; and Maruyama, Kimiaki, 4,692,467, Cl. 514-609.000.

Maruyama, Yuuji: *See*—
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Marzili, Joseph C.; and Stephenson, Brian D., to AMP Incorporated. Cover for flat cable connector. 4,691,977, Cl. 439-404.000.

Masaki, Takeshi: *See*—
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.

Maschhoff, Robert H.: *See*—
Gard, Michael F.; Warmack, Ralph E.; Lee, Kyong H.; and Maschhoff, Robert H., 4,692,909, Cl. 367-45.000.

Mase, Akira: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

Mason, Richard W.: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

Massaloux, Dominique: *See*—
Anizan, Paul; Collobert, Daniel; and Massaloux, Dominique, 4,692,892, Cl. 364-807.000.

Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, to Konishiroku Photo Industry Co., Ltd. Method for synthesizing a magenta coupler by selectively etherifying 4-hydroxy-5-pyrazolone. 4,692,529, Cl. 546-141.000.

Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, to Murata Manufacturing Co., Ltd. Pyroelectric type detecting device. 4,692,619, Cl. 250-338.000.

Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, to Jeco Co., Ltd. Angle sensor. 4,692,613, Cl. 250-231.0SE.

Masuda, Tatsuo: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.

Masuda, Yoshifumi: *See*—
Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.

Masuzaki, Hidefumi; and Horikawa, Etsuo, to Hitachi, Ltd. Image data processing system. 4,692,944, Cl. 382-41.000.

Materials Development Corporation: *See*—
Johnson, Philip C., 4,692,385, Cl. 428-469.000.

Mather, Douglas E.: *See*—
Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., 4,692,271, Cl. 252-354.000.

Mathis, Terry D.: *See*—
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.

Mathison, Allen D., to Cherne Industries, Inc. Electronic test and seal apparatus and method. 4,691,728, Cl. 137-15.000.

Matier, William L.: *See*—
Erhardt, Paul W.; and Matier, William L., 4,692,446, Cl. 514-234.000.

Matsuda, Fumio: *See*—
Takekawa, Yujiro; and Matsuda, Fumio, 4,691,745, Cl. 139-435.000.

Matsuda, Hidemi: *See*—
Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, 4,692,659, Cl. 313-402.000.

Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, to Nippondenso Co., Ltd. Fuel pump apparatus for internal combustion engine. 4,692,092, Cl. 415-143.000.

Matsuda, Yuzuru: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Matsui, Minoru; and Soma, Takao, to NGK Insulators, Ltd. Silicon nitride sintered body and manufacturing method thereof. 4,692,419, Cl. 501-97.000.

Matsui, Sadayoshi: *See*—
Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.

Matsumoto, Fumio, to Fuji Photo Film Co., Ltd. Photographic printing system. 4,692,797, Cl. 358-76.000.

Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, to Sumitomo Metal Mining Company Limited. Dielectric ceramics. 4,692,421, Cl. 501-136.000.

Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, to Fujitsu Limited. Multilayer printed wiring board. 4,692,843, Cl. 361-414.000.

Matsumoto, Ryouhei: *See*—
Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, 4,691,499, Cl. 53-451.000.

Matsushita Electric Industrial Co.: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,691,870, Cl. 241-36.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, 4,692,676, Cl. 318-269.000.
Gotou, Makoto, 4,692,645, Cl. 310-184.000.
Gotou, Makoto, 4,692,646, Cl. 310-184.000.
Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, 4,692,351, Cl. 427-196.000.
Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, 4,692,915, Cl. 369-53.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Matsushita Electric Works, Ltd.: *See*—
Murakami, Kazumasa; and Terada, Motoharu, 4,692,750, Cl. 340-588.000.

Matsushita Refrigeration Company: *See*—
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Matsuzaka, Syoji: *See*—
Kumashiro, Kenji; Iijima, Toshifumi; Akamatsu, Hideo; and Matsuzaka, Syoji, 4,692,400, Cl. 430-553.000.

Matsuzaki, Mikio, to Akebono Brake Industry Company Ltd. Disc brake with pad pressed only at ends where antinodes of vibration occur. 4,691,810, Cl. 188-73.100.

Mattarelli, Ennio, to Dynamit Nobel Aktiengesellschaft. Break-open action for sporting rifles. 4,691,462, Cl. 42-75.040.

Mattei, Luciano: *See*—
Santambrogio, Alberto; and Mattei, Luciano, 4,692,170, Cl. 44-63.000.

Matzat, Norbert; and Schreiber, Hans, to Optimol-Oelwerke GmbH. Lubricating grease composition, its production and use. 4,692,255, Cl. 252-51.50A.

Matzuk, Terrance, to Dymax Corporation. Tissue signature tracking transceiver having upconverted IF amplification. 4,691,571, Cl. 73-632.000.

Mauer, John L., IV: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Mauer, John L., IV, 4,691,435, Cl. 437-175.000.

Maximovitch, Suzanne: *See*—
Gimenez, Isabelle; Barbier, Marie-Jeanne; Maximovitch, Suzanne; and Christidis, Yani, 4,692,226, Cl. 204-73.00R.

Maxon Industries, Inc.: *See*—
Verner Michael L., 4,691,959, Cl. 296-184.000.

May, Gordon H. Electronic percussion instrument. 4,691,611, Cl. 84-421.000.

May, Michael D., to Inmos Limited. Microcomputer with interprocess communication. 4,692,861, Cl. 364-200.000.

Maya, Jakob: *See*—
Moskowitz, Philip E.; and Maya, Jakob, 4,692,661, Cl. 313-485.000.

Maycock, Ian C.; and Hodgson, Derek, to Automotive Products Plc. Friction clutch and clutch release mechanism for a vehicle. 4,691,815, Cl. 192-98.000.

Mayer & Cie. GmbH & Co.: *See*—
Cottenceau, Remi; Fischer, Francois; and Arieh, Simon, 4,691,535, Cl. 66-144.000.

Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, to Wacker-Chemie GmbH. Method for preparing plastic foams. 4,692,474, Cl. 521-88.000.

Mayer, Siegfried; and Gressner, Paul, to Aug. Winkhaus GmbH & Co. KG. Device for detachably securing pivotally connected members in a predetermined relative position. 4,691,950, Cl. 292-269.000.

Mayerhofer, Walter: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Beraward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Mayo Medical Resources: *See*—
Gray, Joel E., 4,692,704, Cl. 324-318.000.

Mayumi, Junji; and Maruta, Riichiro, to Mitsubishi Petrochemical Co., Ltd. Primer composition for olefin resin. 4,692,357, Cl. 427-393.500.

Mazda Motor Corp.: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.
Iwaki, Masato, 4,691,675, Cl. 123-339.000.

Mazur, Stephen: *See*—
Manring, Lewis E.; and Mazur, Stephen, 4,692,360, Cl. 427-443.100.

Mazzagatti, Roy P.; and Dowling, Donald J., to Texaco Inc. Well logging means and method for determining water saturation of a petroleum reservoir having two transmitters and two receivers. 4,692,706, Cl. 324-338.000.

McAlister, Roy E. Organosilicon compounds. 4,692,537, Cl. 556-484.000.

McBride, Donald G.; and Rickert, Robert G., to International Business Machines Corporation. Method and apparatus for controlling the surface chemistry on objects plated in an electroless plating bath. 4,692,346, Cl. 427-8.000.

McCreary Industrial Products Co.: *See*—
Johnson, James L., 4,692,362, Cl. 428-35.000.

McCune, William L., to Aspen Laboratories, Inc. Control valve for use with tourniquet system. 4,691,738, Cl. 137-627.500.

McDonald, Michael C.: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.

McDow, William R.: *See*—
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587, Cl. 74-493.000.

McKenna, Daniel: *See*—
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.

McKeown, Thomas J., to Cellucap Manufacturing Company. Sanitary headdress. 4,691,390, Cl. 2-200.000.

McLeod, Roderick D. Well casing packer. 4,691,770, Cl. 166-73.000.

McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., to Halliburton Company. Hydrostatic referenced safety-circulating valve. 4,691,779, Cl. 166-321.000.

McMichael, John. Immunotherapeutic methods and compositions employing antigens characteristic of malignant neoplasms. 4,692,332, Cl. 424-88.000.

McNeely, David L., to RCA Corporation. Circuitry for calculating magnitude of vector sum from its orthogonal components in digital television receiver. 4,692,889, Cl. 364-730.000.

McNeilab, Inc.: *See*—
Carson, John R., 4,692,460, Cl. 514-443.000.
Troutner, Vernon H.; and King, Martin J., 4,692,138, Cl. 604-4.000.

McQuade, Donald E., Sr. Gate locking device. 4,691,541, Cl. 70-77.000.

Mead Corporation, The: *See*—
Johnson, Roy A.; and Ganz, Robert H., 4,691,606, Cl. 83-175.000.
Schuh, Rudolf, 4,691,495, Cl. 53-48.000.

Mears, Christopher J.: *See*—
Riley, Clifford; and Mears, Christopher J., 4,692,308, Cl. 422-65.000.

Measurex Corporation: *See*—
Hegland, Philip; and Chase, Lee, 4,692,616, Cl. 250-252.100.

Mechanical Technology Incorporated: *See*—
Hoogenboom, Leo, 4,692,611, Cl. 250-227.000.

Meckler, Milton. Cogeneration and central regeneration multi-contactor air conditioning system. 4,691,530, Cl. 62-238.100.

Medasonics Inc.: *See*—
Ingle, Frank W.; and Claude, John P., 4,691,418, Cl. 29-25.350.

Medinger, Bernhard: *See*—
Babler, Fridolin; Jaffe, Edward E.; and Medinger, Bernhard, 4,692,189, Cl. 106-308.00S.

Medtronic, Inc.: *See*—
Duggan, Stephen R., 4,692,147, Cl. 604-93.000.

Medwid, Jeffrey B.; and Torley, Lawrence W., to American Cyanamid Company. Substituted quinolinediones. 4,692,449, Cl. 514-254.000.

Meger, Peter: *See*—
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Mehra, Yuv R., to Advanced Extraction Technologies, Inc. Process for using alkyl substituted C8-C10 aromatic hydrocarbons as preferential physical solvents for selective processing of hydrocarbon gas streams. 4,692,179, Cl. 62-17.000.

Meier, Willi, to Dorina Nahmaschinen GmbH. Lateral movement feed dog for a sewing machine. 4,691,654, Cl. 112-303.000.

Meinan Machinery Works, Inc.: *See*—
Koba, Yoshinori, 4,691,629, Cl. 100-121.000.

Meints, Gayle L.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.

Meisner, Douglas: *See*—
Rice, Mark; and Meisner, Douglas, 4,692,006, Cl. 354-75.000.

Meistrell, Robert W., to Dive N'Surf. Headband attachable to spectacles frame stems. 4,692,002, Cl. 351-156.000.

Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, to AB Volvo. Load-sensing faceform for crash dummy instrumentation. 4,691,556, Cl. 73-12.000.

Mengel, William F., to F. F. Mengel Company. Apparatus and method for removing pavement. 4,692,058, Cl. 404-72.000.

Menke, Andrew: *See*—
Niekrasz, Frank; and Menke, Andrew, 4,691,486, Cl. 52-172.000.

Menley & James Laboratories, Ltd.: *See*—
Banerjee, Pradip K., 4,692,462, Cl. 514-449.000.

Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., to Corning Glass Works. Apparatus and method for monitoring tension in a moving fiber by Fourier transform analysis. 4,692,615, Cl. 250-231.00R.

Merchant, David E., to Emhart Industries, Inc. Fire panel with door providing ease of service. 4,692,838, Cl. 361-380.000.

Merchant, Philip, Jr.: *See*—
Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.

Merck & Co., Inc.: *See*—
Alexander, Jose; Repta, A. J.; and Fix, Joseph A., 4,692,441, Cl. 514-194.000.
Parsons, William H.; and Patchett, Arthur A., 4,692,522, Cl. 540-523.000.

Merz, Donald M.; Chandler, Jimmy E.; and Economy, Richard, to General Electric Company. Memory efficient cell texturing for advanced video object generator. 4,692,880, Cl. 364-521.000.

Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., to Albright & Wilson Ltd. Concentrated aqueous surfactant compositions. 4,692,271, Cl. 252-354.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Kranz, Walter, 4,691,876, Cl. 244-3.220.
Kulinyak, Ernst, 4,692,094, Cl. 416-11.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.
Sander, Wilfried; Essig, Gunder; and Wacker, Erich, 4,691,622, Cl. 92-233.000.

Methane Drainage Ventures: *See*—
Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.

Metz, Joseph R., to Norco,Inc. Panel fastener. 4,692,075, Cl. 411-7.000.

Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, to Honeywell Inc. Cased telescoped ammunition. 4,691,638, Cl. 102-434.000.

Meyer, Eugene F., to Town Talk, Inc. Cap having stiffeners. 4,691,389, Cl. 2-195.000.

Meyer, Norbert: *See*—
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.000.

Miceli, William J.: *See*—
Bocker, Richard P.; and Miceli, William J., 4,692,885, Cl. 364-606.000.

Mich, Thomas F.; and Heifetz, Carl L., to Warner-Lambert Company. Opthalmic use of quinolone antibiotics. 4,692,454, Cl. 514-312.000.

Michaely, William J., to Stauffer Chemical Company. N-(ortho-substituted) benzyl, 3-trifluoromethylphenoxy nicotinamides as herbicides. 4,692,185, Cl. 71-94.000.

Michaux, Daniel: *See*—
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.

Michigan State University: *See*—
Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., 4,691,662, Cl. 118-50.100.

Mick, Felix W.: *See*—
Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., 4,692,628, Cl. 250-497.100.

Mickal, Hermann: *See*—
Gaul, Hartmut; Mickal, Hermann; and Haboeck, Adolf, 4,692,632, Cl. 307-66.000.

Midmark Corporation: *See*—
Kuck, Jay L., 4,691,393, Cl. 5-62.000.

Midrex International, B.V.: *See*—
Whitten, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., 4,691,868, Cl. 241-24.000.

Mierswa, Christian; and Schmutz, Friedrich, to Ernst Schmutz GmbH. Apparatus for cleaning radioactive tube banks. 4,691,723, Cl. 134-167.00C.

Mihara, Yuji, to Kabushiki Kaisha Toshiba. Electronic watt-hour meter. 4,692,874, Cl. 364-483.000.

Miki, Yasuhiko; and Takita, Kentaro, to Sony/Tektronix Corporation. Digital pattern generator. 4,692,886, Cl. 364-718.000.

Mikuniya, Kunio; and Kojima, Akira, to Tachikawa Spring Co. Ltd. Tandem seat for a two-wheeled vehicle. 4,691,963, Cl. 297-195.000.

Mildenberger, Hilmar: *See*—
Zeiss, Hans-Joachim; and Mildenberger, Hilmar, 4,692,541, Cl. 558-87.000.

Miller, Calvin M.: *See*—
Aberson, James A., Jr.; DeVeau, George F., Jr.; Mathis, Terry D.; and Miller, Calvin M., 4,691,986, Cl. 350-96.210.

Miller, Clifford C.: *See*—
Silvernail, James M.; and Miller, Clifford C., 4,691,722, Cl. 134-155.000.

Miller, Gary E. Simultaneous C and N bio-oxidation with multi-stage RBC recycling. 4,692,250, Cl. 210-619.000.

Miller, John G.: *See*—
Ebner, Peter R.; Ebner, Emanual C., Jr.; Shaw, John H.; Miller, John G.; and Gorelick, Donald E., 4,691,987, Cl. 350-96.230.

Miller, John H.: *See*—
Smith, Henry D., Jr.; Arterburn, Russell D.; and Miller, John H., 4,692,178, Cl. 65-2.000.

Miller, Laurence L., to TRW Inc. Fluid flow control apparatus for a power steering system. 4,691,797, Cl. 180-143.000.

Miller, Louis D.; and Kaiser, Donald B., to RCA Corporation. Imaging system having an improved support bead and connector. 4,692,658, Cl. 313-365.000.

Miller, Mahlon A., to Newmar Corporation. Door stop and latch. 4,691,958, Cl. 296-146.000.

Miller, Raymond S.: *See*—
Costa, Lorenzo F.; Harrington, David C.; and Miller, Raymond S., 4,692,266, Cl. 252-301.170.

Mills, William R., Jr.: *See*—
Allen, Linus S.; Mills, William R., Jr.; and Stromswold, David C., 4,692,617, Cl. 250-270.000.

Milton, Thomas J.: *See*—
Farrand, Robert M.; Milton, Thomas J.; and McDow, William R., 4,691,587, Cl. 74-493.000.

Minamikawa, Susumu: *See*—
Fukui, Ryoichi; and Minamikawa, Susumu, 4,692,034, Cl. 374-208.000.

Minckler, L. Sherwood: *See*—
Lundberg, Robert D.; Phillips, Robert R.; Minckler, L. Sherwood; and Chung, David Y., 4,692,268, Cl. 252-33.400.

Mine Kinzoku Kogyo K.K.: *See*—
Ikeda, Sakio; and Yonamine, Shozen, 4,691,717, Cl. 131-365.000.

Mine Safety Appliances Company: *See*—
Auel, RaeAnn M.; Jobson, Joseph D.; and Stewart, David A., 4,692,220, Cl. 204-1.00T.

Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, to Mitsui Petrochemical Industries, Ltd. Process for continuous multi-stage polymerization of olefins. 4,692,501, Cl. 526-65.000.

Minet, Ronald G.; and Warren, David, to Kinetics Technology International Corporation. Catalytic reaction apparatus. 4,692,306, Cl. 422-49.000.

Ministry of Industry & Minerals Specialized Institute for Engineering Industries: *See*—
Ahmed, Jaleel K., 4,692,353, Cl. 427-216.000.

Ministry of International Trade & Industry: *See*—
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, 4,691,909, Cl. 270-58.000.

Minnesota Mining and Manufacturing Company: *See*—
Montalbano, Peter, 4,692,122, Cl. 439-882.000.
Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., 4,691,993, Cl. 350-105.000.
Schwartz, Thomas W., 4,691,845, Cl. 222-94.000.

Minolta Camera Kabushiki Kaisha: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.

Miranda, Sandra: *See*—
Binker, Norman; and Miranda, Sandra, 4,692,162, Cl. 604-385.00R.

Mita Industrial Co., Ltd.: *See*—
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Hirao, Tadashi, 4,691,436, Cl. 437-33.000.
Iwata, Shigemi, 4,691,807, Cl. 187-117.000.
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.
Kumatani, Hiroshi; and Yamaura, Yutaka, 4,691,588, Cl. 74-512.000.
Nakatsuka, Masanori, 4,692,788, Cl. 357-72.000.
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Aseeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Mayumi, Junji; and Maruta, Riichiro, 4,692,357, Cl. 427-393.500.

Mitsui Petrochemical Industries, Ltd.: *See*—
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, 4,692,501, Cl. 526-65.000.
Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Mitutoyo Mfg., Co., Ltd.: *See*—
Nakamura, Taizo, 4,692,629, Cl. 250-560.000.

Miyadera, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Console box for automobile. 4,691,960, Cl. 296-37.800.

Miyai, Masahiko: *See*—
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.

Miyake, Toshihide: *See*—
Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.

Miyamoto, Masasi: *See*—
Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.

Miyamoto, Toshiyuki: *See*—
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.

Miyasako, Yoji, to Kabushiki Kaisha Toshiba. Current mirror circuit. 4,692,711, Cl. 330-257.000.

Miyata, Tsutomu; and Nagai, Masahide, to Kabushiki Kaisha Daini Seikosha. Device for discriminating attitude of parts. 4,692,881, Cl. 364-551.000.

Miyatake, Hideshi: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.

Miyawaki, Mamoru: *See*—
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.

Mizuno, Masahiro: *See*—
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.

Mizusawa, Akira, to Nifco Inc. Ventilator device for vehicle. 4,691,623, Cl. 98-2.180.

Mizutani, Isao: *See*—
Enomoto, Akio, 4,692,581, Cl. 219-10.810.

Mobil Oil Corporation: *See*—
Allen, Linus S.; Mills, William R., Jr.; and Stromswold, David C., 4,692,617, Cl. 250-270.000.
Bahl, Surinder K.; Canterino, Peter J.; and Shaw, Richard G., 4,692,496, Cl. 525-240.000.
Caesar, Philip D., 4,692,423, Cl. 502-62.000.
Clarke, Aubrey R.; Martin, Colin L.; and Bowering, Robert H., 4,692,350, Cl. 427-138.000.
Gunesin, Binnur Z., 4,692,492, Cl. 524-731.000.
Horodysky, Andrew G., 4,692,257, Cl. 252-49.600.
Keung, Jay K.; Donovan, Kevin M.; and Balloni, Ricardo, 4,692,379, Cl. 428-349.000.
Neeley, Walter P., 4,692,906, Cl. 367-15.000.

Mochizuki, Kanji: *See*—
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Mochizuki, Nobumasa, to Mochizuki Precision Machine Industries Co., Ltd. Cutting apparatus. 4,691,871, Cl. 241-166.000.

Mochizuki Precision Machine Industries Co., Ltd.: *See*—
Mochizuki, Nobumasa, 4,691,871, Cl. 241-166.000.

Mock, Elmar; and Gabus, Georges A., to ETA SA Fabriques d'Ebauches. Timepiece having case formed of rock-like material. 4,692,033, Cl. 368-280.000.

Molecular Diagnostics, Inc.: *See*—
Dattagupta, Nanibhushan, 4,692,509, Cl. 530-303.000.

Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, to Metallgesellschaft Aktiengesellschaft. Process for producing a product gas containing carbon oxides and hydrogen from methanol. 4,692,322, Cl. 423-415.00A.

Molnlycke AB: *See*—
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,692,163, Cl. 604-385.00A.

Momoki, Motoyasu: *See*—
Takahara, Masayuki; and Momoki, Motoyasu, 4,692,824, Cl. 360-85.000.

Momose, Yutaka: *See*—
Kobayashi, Daisaku; Itaba, Tuneaku; and Momose, Yutaka, 4,691,591, Cl. 74-606.00A.

Monma, Hideo; Ishiguro, Masato; and Kawano, Tetsuo, to Fujitsu Limited. Gate array. 4,692,783, Cl. 357-42.000.

Monsanto Company: *See*—
Lee, Len F., 4,692,184, Cl. 71-94.000.

Monsigny, Jean, to Aciers et Outillage Peugeot. Guiding rail of use in particular in a passive safety belt device for a motor vehicle. 4,691,938, Cl. 280-804.000.

Montague, Robert A.: *See*—
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., 4,692,383, Cl. 428-414.000.

Montalbano, Peter, to Minnesota Mining and Manufacturing Company. Electrical terminal. 4,692,122, Cl. 439-882.000.

Montanwerke Walter GmbH: *See*—
Helle, Hans-Joachim, 4,691,479, Cl. 51-165.710.

Moog Inc.: *See*—
Hall, Larry D., 4,691,621, Cl. 92-184.000.

Moore, David G.: *See*—
Ford, John M. B.; and Moore, David G., 4,691,847, Cl. 222-259.000.

Moore, Denny L. Chimney flue cover. 4,691,624, Cl. 98-59.000.

Moore, Derek V.: *See*—
Lane, Kerry S.; and Moore, Derek V., 4,692,682, Cl. 320-35.000.

Mooaz, Alexander P. Electronic apparatus for generating sets of numerical values for playing lottery games. 4,692,863, Cl. 364-412.000.

Morbitzer, Hans P.: *See*—
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Morgan Industries, Inc.: *See*—
Theis, Peter F., 4,692,817, Cl. 360-12.000.

Morgan, John A. Powered reclining chair. 4,691,964, Cl. 297-330.000.

Morgand, Jean P., to Thomson CSF. Electroacoustic transducer with piezoelectric diaphragm. 4,692,942, Cl. 381-114.000.

Mori, Katsuhiro: *See*—
Kito, Masahiro; and Mori, Katsuhiro, 4,691,761, Cl. 165-32.000.

Mori, Kazutaka: *See*—
Aaeda, Masashi; Mori, Kazutaka; and Makihara, Hiroshi, 4,692,354, Cl. 427-244.000.

Mori, Yutaka: *See*—
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.

Morikawa, Michio; and Hayashi, Torahiko, to Rheon Automatic Machinery Co., Ltd. Apparatus for continuously producing at a flow rate a strip of dough of constant dimensions. 4,692,107, Cl. 425-140.000.

Morikawa, Tuneo: *See*—
Kabe, Kazuyuki; and Morikawa, Tuneo, 4,691,752, Cl. 152-527.000.

Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, to Mita Industrial Co., Ltd. Document size detecting device. 4,692,019, Cl. 355-8.000.

Morimoto, Seiji: *See*—
Yorisue, Shozo; and Morimoto, Seiji, 4,691,536, Cl. 66-168.000.

Morimoto, Yoshio: *See*—
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.

Morimura, Toshio: *See*—
Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, 4,692,313, Cl. 422-241.000.

Morisawa, Kunio: *See*—
Taga, Yutaka; and Morisawa, Kunio, 4,691,594, Cl. 74-869.000.

Morita, Shigeru; and Yanagawa, Nobuhide, to Kubota, Ltd. Load handling vehicle. 4,692,086, Cl. 414-635.000.

Morita, Yoshiyuki, to Seiko Instruments & Electronics Ltd. Digitizer using phase inversion detection system. 4,692,568, Cl. 178-19.000.

Moriya, Mitsuro; Shiragami, Kazaharu; and Yamaguchi, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Recording and reproduction apparatus having improved reliability with respect to externally applied vibration or impact. 4,692,915, Cl. 369-53.000.

Morman, Michael T.; and Winneski, Tony J., to Kimberly-Clark Corporation. High temperature method of making elastomeric materials and materials obtained thereby. 4,692,371, Cl. 428-224.000.

Morris, Kevin: *See*—
Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, 4,691,838, Cl. 220-93.000.

Morton, Henry H., Jr.: *See*—
Pinsak, George P.; and Morton, Henry H., Jr., 4,692,748, Cl. 340-573.000.

Moser, Alfred: *See*—
Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, 4,691,757, Cl. 164-416.000.

Moskovskoe Vysshee Tekhnicheskoe Uchilische, Imeni N.E. Baumana: *See*—
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Moskowitz, David: *See*—
Pinkerton, Michael B.; and Moskowitz, David, 4,691,974, Cl. 439-147.000.

Moskowitz, Philip E.; and Maya, Jakob, to GTE Products Corporation. Fluorescent lamp with static magnetic field generating means. 4,692,661, Cl. 313-485.000.

Moss, Joe B.: *See*—
Campbell, Eric R.; and Moss, Joe B., 4,692,564, Cl. 174-92.000.

Motamedi, M. Ed: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Motorola, Inc.: *See*—
Dahl, Randy L., 4,692,631, Cl. 290-55.000.
Green, Steven R.; De Muro, David M.; and Sokola, Raymond L., 4,692,726, Cl. 333-206.000.
Gregg, Ralph C., Jr., 4,692,763, Cl. 342-28.000.
Rendek, Peter M., 4,691,568, Cl. 73-517.00R.
Titus, John D.; and Hall, Phillip E., 4,691,634, Cl. 102-245.000.
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.
Zdunek, Kenneth J., 4,692,945, Cl. 455-17.000.

Mould, Richard E. Video subconscious display attachment. 4,692,118, Cl. 434-236.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See*—
Roesmann, Axel; and Huther, Werner, 4,692,288, Cl. 264-56.000.

Muchel, Franz, to Carl-Zeiss-Stiftung. Microscope tube. 4,691,997, Cl. 350-503.000.

Mudge, Paul R., to National Starch and Chemical Corporation. Flocking adhesives based on eva-maleate copolymers. 4,692,366, Cl. 428-90.000.

Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., to Geosource, Inc. Automatic force control for a seismic vibrator. 4,692,912, Cl. 367-190.000.

Mueller, Martin L. Tamper-evident sealed container and tamper-evident tube and bands and apparatus and method of making and using same. 4,691,835, Cl. 215-246.000.

Mueller, Richard A.; and Partis, Richard A., to G. D. Searle & Co. Protease inhibitors. 4,692,552, Cl. 562-475.000.

Mueller, Robert, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Limited slip differential system for a motor vehicle with all-wheel drive. 4,691,593, Cl. 74-714.000.

Muhlhofer, Rudolf: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Mukai, Yasuteru: *See*—
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.

Mukohjima, Hitoshi: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Mullen, George B.: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,692,515, Cl. 540-203.000.

Muller, Erwin, to Siemens Aktiengesellschaft. Electromagnetic relay having an insulating cap and a method for manufacturing the insulating cap. 4,692,730, Cl. 335-278.000.

Muller, Friedemann: *See*—
Kreas, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.

Muller, Georges: *See*—
Lance, Jacques; and Muller, Georges, 4,691,425, Cl. 29-402.080.

Muller, Walheide: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Muller, Walter, to Ewikon Entwicklung und Konstruktion GmbH & Co. Electrically operated heating element for a hot-runner tool. 4,692,595, Cl. 219-421.000.

Muller, Wolf-Dieter: *See*—
Moller, Friedrich-Wilhelm; Boll, Walter; Marschner, Friedemann; and Muller, Wolf-Dieter, 4,692,322, Cl. 423-415.00A.

Mullet, David L.; and Bontrager, Ivan W., to Excel Industries, Inc. Lawn edger attachment for tractors. 4,691,784, Cl. 172-15.000.

Multifastener Corporation: *See*—
Goodsmith, Dale H., 4,691,429, Cl. 29-432.000.

Multitech Industrial Corporation: *See*—
Hsu, Chi-Ching, 4,692,865, Cl. 364-419.000.

Murai, Masasumi, to Tsubakimoto Chain Co. Automotive body, floor conveyor, having pivotal carriers. 4,691,640, Cl. 104-140.000.

Murai, Yoshikazu: *See*—
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Murakami, Kazumasa; and Terada, Motohara, to Matsushita Electric Works, Ltd. Fire alarm system. 4,692,750, Cl. 340-588.000.

Murase, Mikio, to Osaka Trunk Material Co., Ltd. Lock for slide fastener. 4,691,540, Cl. 70-68.000.

Murata, Fumiya: *See*—
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Youhitake, 4,692,896, Cl. 364-900.000.

Murata Kikai Kabushiki Kaisha: *See*—
Sakai, Shoji; and Noda, Koshi, 4,691,415, Cl. 19-262.000.

Murata Manufacturing Co., Ltd.: *See*—
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Murata, Michihiro: *See*—
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.

Murayama, Kimimasa: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Murphy, Dale P.; and Murphy, Paul D. Electronic hockey game. 4,691,920, Cl. 273-85.00A.

Murphy, Paul D.: *See*—
Murphy, Dale P.; and Murphy, Paul D., 4,691,920, Cl. 273-85.00A.

Murphy, William P. Die transfer system. 4,691,554, Cl. 72-448.000.

Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., to Exxon Research and Engineering Company. Preparation and use of catalysts comprising mixtures of tungsten oxide and silica on alumina. 4,692,428, Cl. 502-254.000.

Mutchler, Paul A., to Engineered Air Systems, Inc. Portable air heating apparatus. 4,691,687, Cl. 126-104.00A.

Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, to Nissan Motor Co., Ltd.; and Nihon Radiator Co., Ltd. Heater unit for vehicles. 4,691,862, Cl. 237-12.30A.

Myers, Harry K., Jr.: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

Nabetani, Shinji: *See*—
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Nabisco Brands, Inc.: *See*—
Blain, William A.; and Zabrodsky, John, III, 4,691,625, Cl. 99-348.000.
Blain, William A.; and Zabrodsky, John, III, 4,691,625, Cl. 99-348.000.
Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., 4,692,342, Cl. 426-293.000.

Nadler, Lee: *See*—
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.

Nagai, Masaaki, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the ignition timing of an internal combustion engine. 4,691,678, Cl. 123-425.000.

Nagai, Masahide: *See*—
Miyata, Tsutomu; and Nagai, Masahide, 4,692,881, Cl. 364-551.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,692,131, Cl. 474-80.000.

Nagase, Yasuo: *See*—
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, 4,691,909, Cl. 270-58.000.

Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, to Canon Kabushiki Kaisha. Multi-color recording apparatus. 4,692,774, Cl. 346-76.0PH.

Nagata, Masanori: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. 428-35.000.

Nagayama, Kousei: *See*—
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.

Nagy, Ferenc: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, to Epitestudomanyi Intezet & Konnyuipari Szerelo es Epito Vallalat. Apparatus and process for the construction of monolithic ceilings. 4,691,485, Cl. 52-125.100.

Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, to Lederle (Japan), Ltd.; and Takeda Chemical Industries, Ltd. Crystals of sodium cephemcarboxylate. 4,692,519, Cl. 540-227.000.

Naka, Hiroshi: *See*—
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, 4,692,927, Cl. 372-46.000.

Naka, Shigekatsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Multistage hydraulic machine. 4,692,090, Cl. 415-112.000.

Nakagawa, Hitoshi; and Kitahara, Kohei, to Seiko Epson Kabushiki Kaisha. Paper feeding apparatus for printers. 4,691,911, Cl. 271-9.000.

Nakagiri, Takashi: *See*—
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.

Nakahara, Yutaka: *See*—
Leistner, William E.; Nakahara, Yutaka; Hirai, Bunji; and Kanai, Mitsuharu, 4,692,485, Cl. 524-99.000.

Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, to Sanden Corporation. Coffee roaster. 4,691,447, Cl. 34-4.000.

Nakajima, Junichi, to Fuji Kogyo Kabushiki Kaisha. Barking machine. 4,691,750, Cl. 144-208.00B.

Nakakawazi, Mikio: *See*—
. Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Nakamura, Taizo, to Mitutoyo Mfg., Co., Ltd. Optical type measuring scanner. 4,692,629, Cl. 250-560.000.

Nakamura, Tetsuro: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Nakamura, Yasuhide: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Semiconductor apparatus. 4,692,789, Cl. 357-74.000.

Nakanishi, Youichi: *See*—
Maenishi, Kozo; and Nakanishi, Youichi, 4,692,728, Cl. 335-192.000.

Nakano, Harumi, to Casio Computer Co., Ltd. Identification card including switching means for built-in battery. 4,692,601, Cl. 235-380.000.

Nakano, Takayuki: *See*—
Yatsu, Tadao; Nakano, Takayuki; Hincoka, Nobuya; and Kato, Tatsuo, 4,692,506, Cl. 528-296.000.

Nakano Vinegar Co., Ltd.: *See*—
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.

Nakao, Masaaki: *See*—
Iwako, Motonari; and Nakao, Masaaki, 4,691,867, Cl. 241-21.000.

Nakao, Motokazu, to Sharp Kabushiki Kaisha. Color image readout device with detachable light source unit. 4,692,795, Cl. 358-75.000.

Nakaosa, Yoshitake: *See*—
Sakoda, Kousuke; Kainaga, Masahiro; Akita, Hidehiko; Murata, Fumiya; and Nakaosa, Yoshitake, 4,692,896, Cl. 364-900.000.

Nakatake, Yoshiteru: *See*—
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.

Nakatsuka, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with solder overflow prevention geometry. 4,692,788, Cl. 357-72.000.

Nakayama, Hiromichi; and Fukuda, Moritoshi, to Nifco Inc. Hook device for ornamental button on seat cover. 4,691,416, Cl. 24-90.00B.

Nakayama, Yoshiharu: *See*—
Fuchigami, Wataru; and Nakayama, Yoshiharu, 4,692,129, Cl. 474-148.000.

Nakazato, Katsuo: *See*—
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.

Nakazumi, Tadataka: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.

NAP Consumer Electronics Corp.: *See*—
Erski, Richard, 4,692,802, Cl. 358-139.000.

Nardella, Massimiliano, to F.B.M. Hudon Italiana S.p.A. Vacuum blade for a hollow type fan and process. 4,692,100, Cl. 416-232.000.

Narita, Akira: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

Nash, George S.: *See*—
Steele, Douglas W.; Nash, George S.; Dorsey, John W.; Christy, Ronald S.; and Burns, Timothy L., 4,692,290, Cl. 264-101.000.

Nasuda, Sigeyuki: *See*—
Inamori, Hiroo; Nasuda, Sigeyuki; Morimoto, Yoshio; and Haruna, Takayuki, 4,691,874, Cl. 242-80.000.

National Research Development Corporation: *See*—
de Brie Perry, Forbes G., 4,691,592, Cl. 74-691.000.

National Semiconductor Corp.: *See*—
Rapp, A. Karl, 4,692,635, Cl. 307-279.000.
Stanojevic, Silvo, 4,692,688, Cl. 323-285.000.

National Starch and Chemical Corporation: *See*—
Mudge, Paul R., 4,692,366, Cl. 428-90.000.
Puletti, Paul P.; and Decowski, Stanley J., Jr., 4,692,161, Cl. 604-366.000.

Nattel, William, to Commander Electrical Materials, Inc. Cable connector. 4,692,561, Cl. 174-65.0SS.

Nattel, William, to Commander Electrical Materials, Inc. Seal for a cable connector. 4,692,562, Cl. 174-65.0SS.

Naus, Peter J. A.: *See*—
Stikvoort, Eduard F.; van Roermund, Arthur H. M.; and Naus, Peter J. A., 4,692,737, Cl. 340-347.0DD.

NCR Corporation: *See*—
Poeppelman, Alan D., 4,692,923, Cl. 371-38.000.

Nebe, Rainer: *See*—
Supp, Armin; and Nebe, Rainer, 4,692,244, Cl. 210-219.000.

NEC Corporation: *See*—
Fukuzo, Yukio; and Inoue, Yasukazu, 4,692,642, Cl. 307-530.000.
Negoro, Tatsuo, 4,692,784, Cl. 357-49.000.
Ohsawa, Tomoki, 4,692,931, Cl. 375-106.000.
Oyamada, Takashi, 4,692,790, Cl. 357-79.000.
Sakuma, Hiraku, 4,692,665, Cl. 315-169.400.

Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek: *See*—
Gelderloos, Pouwel J., 4,691,525, Cl. 62-101.000.

Neeley, Walter P., to Mobil Oil Corporation. Ocean bottom seismometer. 4,692,906, Cl. 367-15.000.
Negoro, Tatsuo, to NEC Corporation. Dielectric insulation type semiconductor integrated circuit having low withstand voltage devices and high withstand voltage devices. 4,692,784, Cl. 357-49.000.
Negron-Crespo, Jorge L. Apparatus for modifying building blocks. 4,691,684, Cl. 125-3.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Sewing machine control apparatus. 4,691,653, Cl. 112-275.000.
Neles OY: *See*—
Pyotsia, Jousi K.; and Yli-Koski, Esko T., 4,691,894, Cl. 251-127.000.
Nelson, Erik B., to Dowell Schlumberger Incorporated. Novel ferrofluids for use in cementing wells. 4,691,774, Cl. 166-291.000.
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, to Perkin-Elmer Corporation, The. Automatic digital wavelength calibration system for a spectrophotometer. 4,692,883, Cl. 364-571.000.
Nenjukov, Alexandr K.: *See*—
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.
Neri, Armando. Dustproof cabinet, in particular for electrical equipment. 4,691,970, Cl. 312-257.0SK.
Nestec S.A.: *See*—
Bertholet, Raymond, 4,692,534, Cl. 549-456.000.
Netzer, Ronald G. Life support carrying apparatus. 4,691,397, Cl. 5-507.000.
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., to Azdel, Inc. Thermoplastic sheet. 4,692,375, Cl. 428-299.000.
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, to Hilti Aktiengesellschaft. Drill bit chuck for drilling and cutting devices. 4,691,929, Cl. 279-19.300.
New, Bernard J., to Advanced Micro Devices, Inc. Method and apparatus for generating and summing the products of pairs of numbers. 4,692,888, Cl. 364-728.000.
New, Dane S.; and Dove, Albert W. Aquatic sport device. 4,691,658, Cl. 114-66.000.
Newman, Daniel A.: *See*—
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.
Newman, Ira R.: *See*—
Affa, Steven N.; Newman, Ira R.; and Allison, Robert S., 4,691,741, Cl. 138-113.000.
Newman, Paul R.: *See*—
Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., 4,692,225, Cl. 204-59.00R.
Newman, Russell L. Trenching equipment with hinged side plates. 4,691,455, Cl. 37-103.000.
Newmar Corporation: *See*—
Miller, Mahlon A., 4,691,958, Cl. 296-146.000.
News Log International, Inc.: *See*—
Ackerman, Richard; Hurlbut, Donovan W.; and Jewer, Alan A., 4,692,913, Cl. 369-44.000.
Ngai, Chuck H.; and Watkins, Gerald J., to International Business Machines Corporation. Edge sensitive single clock latch apparatus with a skew compensated scan function. 4,692,633, Cl. 307-269.000.
NGK Insulators, Ltd.: *See*—
Enomoto, Akio, 4,692,581, Cl. 219-10.810.
Ikushima, Kazuo; Iwadachi, Takaharu; and Ishikawa, Syuhei, 4,692,192, Cl. 148-12.70C.
Matsui, Minoru; and Soma, Takao, 4,692,419, Cl. 501-97.000.
Oda, Isao; and Soma, Takao, 4,692,420, Cl. 501-97.000.
NGK Spark Plug Co., Ltd.: *See*—
Kojima, Takio; and Taniguchi, Masato, 4,691,673, Cl. 123-271.000.
Nicholson, John L., to Klargester Environmental Engineering Ltd. Sewage treatment biological rotors. 4,692,241, Cl. 210-150.000.
Niekrasz, Frank; and Menke, Andrew. Glass assembly for refrigerator doors and method of manufacture. 4,691,486, Cl. 52-172.000.
Nifco Inc.: *See*—
Arakawa, Masaru, 4,691,589, Cl. 74-573.00F.
Arakawa, Masaru; and Numata, Masanori, 4,691,811, Cl. 188-290.000.
Kurihara, Kazumasa, 4,691,883, Cl. 248-74.200.
Mizusawa, Akira, 4,691,623, Cl. 98-2.180.
Nakayama, Hiromichi; and Fukuda, Moritoshi, 4,691,416, Cl. 24-90.00B.
Nihei, Masayasu; Sawa, Masateru; and Chigasaki, Mitsuo, to Hitachi, Ltd. Thin film forming method through sputtering and sputtering device. 4,692,230, Cl. 204-192.310.
Nihon Radiator Co., Ltd.: *See*—
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.
Nikken Chemicals Co., Ltd.: *See*—
Ukigaya, Tadashi; and Ogawa, Keizaburo, 4,692,337, Cl. 424-469.000.
Nilsaen, Ole K. Parallel-resonant bridge-inverter fluorescent lamp ballast. 4,692,667, Cl. 315-209.00R.
Nilsaen, Ole K. Battery charger with adjustable charging current. 4,692,681, Cl. 320-2.000.
Nilsson, Bengt, to Kamyr AB. Apparatus for producing mechanical pulp with a refiner having its drive shaft connected to a steam turbine output shaft. 4,692,214, Cl. 162-261.000.
Nilsson, Stefan: *See*—
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.
Nilsson, William B.: *See*—
Spinelli, John; Stout, Virginia F.; and Nilsson, William B., 4,692,280, Cl. 260-420.000.
Ninomiya, Hidetaka: *See*—
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, to Nippon Hoso Kyokai. Bandwidth compressed transmission system. 4,692,801, Cl. 358-133.000.
Nippon Hoso Kyokai: *See*—
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.
Wada, Masatoshi; and Sakai, Tetsuo, 4,692,662, Cl. 313-493.000.
Nippon Kogaku K.K.: *See*—
Kawahara, Atsushi; and Okita, Masaya, 4,692,815, Cl. 358-335.000.
Nippon Paint Co., Ltd.: *See*—
Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, 4,692,483, Cl. 523-406.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Hayakawa, Masaru; Yoshida, Takeshi; and Kaiya, Atsushi, 4,691,759, Cl. 164-526.000.
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.
Nippon Steel Corporation: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.
Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, 4,692,193, Cl. 148-111.000.
Nippon Telegraph & Telephone Corporation: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Nippon Thompson Co., Ltd.: *See*—
Kasai, Naomi, 4,692,037, Cl. 384-44.000.
Kasai, Naomi, 4,692,038, Cl. 384-45.000.
Kawaguchi, Yoshifumi, 4,692,036, Cl. 384-44.000.
Nippondenso Co., Ltd.: *See*—
Kosuge, Shuichi, 4,692,866, Cl. 364-424.100.
Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.
Nishihara, Mikio: *See*—
Matsumoto, Masaru; Nishihara, Mikio; and Kuwabara, Kiyoshi, 4,692,843, Cl. 361-414.000.
Nishikawa, Kazunori: *See*—
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.
Nishikawa, Masao; and Sakurai, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission with anti creep device. 4,691,596, Cl. 74-869.000.
Nishikawa, Toshio: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.
Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Jitter-immune time expansion for time-compressed line-sequential video signals. 4,692,814, Cl. 358-320.000.
Nishimura, Seiichi, to Sanshin Kogy Kabushiki Kaisha. Carburetor icing preventing device. 4,691,671, Cl. 123-73.00V.
Nishimura, Yasumasa: *See*—
Kumanoya, Masaki; Fujishima, Kazuyasu; Miyatake, Hideshi; Hidaka, Hideto; Dosaka, Katsumi; and Nishimura, Yasumasa, 4,692,901, Cl. 365-201.000.
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Optical coupler. 4,691,982, Cl. 350-96.120.
Nishiura, Masaharu; and Haruki, Hiromu, to Fuji Electric Corporate Research and Devel., Ltd. Method for gettering heavy metal from a silicon plate. 4,692,345, Cl. 427-39.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Method of performing solution growth of a GaAs compound semiconductor crystal layer under control of conductivity type thereof. 4,692,194, Cl. 437-120.000.
Nishizawa, Jun-ichi: *See*—
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Nissan Motor Co., Ltd.: *See*—
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.
Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, 4,691,521, Cl. 60-602.000.
Kikuchi, Kazuhiro, 4,691,676, Cl. 123-399.000.
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Sato, Yoshimi, 4,691,939, Cl. 280-806.000.
Seko, Yasutoshi; and Abe, Yuichi, 4,692,798, Cl. 358-93.000.
Takizawa, Satoshi, 4,691,812, Cl. 192-3.300.
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.
Ushiro, Masayuki, 4,691,742, Cl. 139-1.00R.

Nissenson, Bilha: *See*—
Shimoni, Yair; Fenster, Paul; and Nissenson, Bilha, 4,692,864, Cl. 364-414.000.
Nix, Hans F., to Elektro-Physik Hans Nix & Dr.-Ing. E. Steingroever K.G. Rolling magnetic probe for continuous thickness measurement. 4,692,700, Cl. 324-229.000.
Noda, Koshi: *See*—
Sakai, Shoji; and Noda, Koshi, 4,691,415, Cl. 19-262.000.
Noda, Yasushi; and Kitahara, Toshihiro, to Teac Corporation. Magnetic disk drive capable of mechanical connection to a data processing instrument without deformation. 4,692,828, Cl. 360-97.000.
Nogi, Masako: *See*—
Tsuda, Tatsuya; and Nogi, Masako, 4,692,597, Cl. 219-492.000.
Noguchi, Masato: *See*—
Hirabayashi, Yuji; Noguchi, Masato; and Hatanaka, Keiji, 4,691,521, Cl. 60-602.000.
Noguchi, Yoshiro: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.
Nomi, Haruo, to Japan Gore-Tex, Inc. Water-vapor-permeable, waterproof, highly elastic films. 4,692,369, Cl. 428-198.000.
Nonoguchi, Hiroshi: *See*—
Fukunaga, Masao; and Nonoguchi, Hiroshi, 4,691,870, Cl. 241-36.000.
Noor, Sybille: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.
Norco,Inc.: *See*—
Metz, Joseph R., 4,692,075, Cl. 411-7.000.
Nord-Plan Stalreoler A/S: *See*—
Larsen, Anders, 4,691,493, Cl. 52-588.000.
Norris, Janice O.: *See*—
Sondergeld, Carl H.; Frisillo, Albert L.; and Norris, Janice O., 4,692,910, Cl. 367-75.000.
North American Philips Corporation: *See*—
Fitzpatrick, Brian J., 4,692,359, Cl. 427-45.100.
Northwest Design Products, Inc.: *See*—
Kirby, Charles A., 4,692,054, Cl. 403-171.000.
Nose, Noriyuki: *See*—
Nishimura, Yukuo; Miyawaki, Mamoru; Nose, Noriyuki; and Nakagiri, Takashi, 4,691,982, Cl. 350-96.120.
Nottingham, John R.: *See*—
Spirk, John W., Jr.; and Nottingham, John R., 4,692,587, Cl. 219-242.000.
Novak, Gary J., to Borg-Warner Corporation. Load block for chain-belt. 4,692,130, Cl. 474-201.000.
Novits, Michael F.: *See*—
Kmiec, Chester J.; and Novits, Michael F., 4,692,269, Cl. 252-350.000.
Nowak, Frederick H.; and Hovey, Isabel, to Otis Elevator Company. Adaptive assignment of elevator car calls. 4,691,808, Cl. 187-125.000.
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, to TMC Corporation. Ski binding, in particular for use in cross-country skiing. 4,691,936, Cl. 280-615.000.
Nozaki, Mineo: *See*—
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.
Nukem GmbH: *See*—
Huschelrath, Gerhard; and Diehl, Herbert, 4,692,702, Cl. 324-251.000.
Nukushina, Masanori: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.
Numata, Ken-ichi: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Numata, Masanori: *See*—
Arakawa, Masaru; and Numata, Masanori, 4,691,811, Cl. 188-790.000.
Nussbaum, Marvin, to Stepan Company. Preparation of acyloxy benzene sulfonate. 4,692,279, Cl. 260-402.000.
Nussbaumer, Max. Urine collector for incontinent women having zig-zag walls. 4,692,160, Cl. 604-331.000.
Nystuen, David L., to Ecolab Inc. Volumetric gravity feed liquid dispenser. 4,691,721, Cl. 134-96.000.
Oakes, Martin C., to Y. S. Securities Limited. Fuse for an alternating current power circuit. 4,692,733, Cl. 337-158.000.
Oba, Koichiro, to Hamamatsu Photonics Kabushiki Kaisha. X-ray shadow graph device. 4,692,938, Cl. 378-62.000.
Obana, Hiroshi: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.
Ober, Christopher K.; and Branston, Randolph E., to Xerox Corporation. Preparation of ink jet compositions. 4,692,188, Cl. 106-23.000.
Obermayer, Heinz: *See*—
Biermeier, Johann; and Obermayer, Heinz, 4,692,827, Cl. 360-97.000.
Obosu, Charles B., to Heil-Quaker Corporation. Lanced fin condenser for central air conditioner. 4,691,768, Cl. 165-151.000.
O'Brien, T. B.: *See*—
Reichman, James M.; McDonald, Michael C.; and O'Brien, T. B., 4,691,790, Cl. 175-67.000.
Oda, Isao; and Soma, Takao, to NGK Insulators, Ltd. Silicon nitride sintered body and manufacturing method thereof. 4,692,420, Cl. 501-97.000.
Odebrecht, Wolfgang: *See*—
Grantz, Helmut; and Odebrecht, Wolfgang, 4,691,949, Cl. 292-216.000.
Oehlert, Yves: *See*—
Joly, Jean; and Oehlert, Yves, 4,692,842, Cl. 361-413.000.
Oehling, Karl-Heinz: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.
Officine Galileo S.p.A.: *See*—
Lombardini, Lapo; and Bardi, Gianluca, 4,691,534, Cl. 62-55.500.
Ogata, Masamitsu: *See*—
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, 4,692,236, Cl. 208-114.000.
Ogawa, Keizaburo: *See*—
Ukigaya, Tadashi; and Ogawa, Keizaburo, 4,692,337, Cl. 424-469.000.
Ogihara, Satoru: *See*—
Shoji, Moritaka; Yamazaki, Takeo; and Ogihara, Satoru, 4,692,735, Cl. 338-21.000.
Oh, Jang K.: *See*—
Oh, Sang S.; and Oh, Jang K., 4,692,647, Cl. 310-212.000.
Oh, Sang S.; and Oh, Jang K. Rotor construction in an induction motor for eliminating rotor reaction. 4,692,647, Cl. 310-212.000.
Ohara, Kenichi: *See*—
Dohi, Takashi; Shibata, Nobuho; and Ohara, Kenichi, 4,692,676, Cl. 318-269.000.
Neki, Shigeo; Ohara, Kenichi; Shibata, Nobuho; and Dohi, Takashi, 4,691,653, Cl. 112-275.000.
Ohashi, Toshio: *See*—
Muto, Yoshihiko; Ohashi, Toshio; and Adachi, Tsunenari, 4,691,862, Cl. 237-12.30A.
Ohi Seisakusho Co., Ltd.: *See*—
Maekawa, Junichi, 4,691,475, Cl. 49-352.000.
Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.
Ohmi, Tadahiro: *See*—
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.
Ohmori, Yasuo: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.
Ohno, Tomoyuki: *See*—
Ishihara, Heigo; and Ohno, Tomoyuki, 4,692,378, Cl. 428-340.000.
Ohsawa, Tomoki, to NEC Corporation. Synchronization circuit capable of establishing synchronism even when a sampling rate is invariable. 4,692,931, Cl. 375-106.000.
Ohsugi, Hiroshi: *See*—
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, to Tokyo Kagaku Kikai Kabushiki Kaisha. Optical adapter for a light-wave rangefinder. 4,692,023, Cl. 356-5.000.
Ohtsuka, Yoshimichi: *See*—
Ninomiya, Yuichi; Ohtsuka, Yoshimichi; Izumi, Yoshinori; and Goushi, Sei'ichi, 4,692,801, Cl. 358-133.000.
OI Forest Products STS Inc.: *See*—
Snyder, Teddy R., 4,691,859, Cl. 229-23.00R.
Oka, Hideo: *See*—
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.
Oka, Masahisa: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.
Okada, Hideya: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.
Okada, Shiro: *See*—
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.
Okada, Tsutomu, to Olympus Optical Co., Ltd. Calculus crushing apparatus. 4,691,705, Cl. 128-328.000.
Okada, Yasuyuki: *See*—
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.
Okamoto, Toshiaki: *See*—
Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, 4,692,256, Cl. 252-32.70E.
Okamoto, Yuji: *See*—
Yao, Hiroyuki; and Okamoto, Yuji, 4,691,476, Cl. 49-374.000.
Okamoto, Yukio; and Shinada, Shinichi, to Hitachi, Ltd. Gas-discharge display device. 4,692,666, Cl. 315-169.400.
Oki Electric Industry Co., Ltd.: *See*—
Ando, Hirokazu; Fukushima, Kazumasa; Ohmori, Yasuo; and Koyama, Tatsuya, 4,692,043, Cl. 400-124.000.

OKI Electronics Co., Ltd.: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.
Okino, Tadashi, to Canon Kabushiki Kaisha. Camera incorporating flash unit. 4,692,013, Cl. 354-413.000.
Okita, Masaya: *See*—
Kawahara, Atsushi; and Okita, Masaya, 4,692,815, Cl. 358-335.000.
Okiyama, Yoichi: *See*—
Takano, Kunio; Nukushima, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.
Okouchi, Isamu: *See*—
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, 4,692,253, Cl. 210-791.000.
Okubo, Yosiyuki: *See*—
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.
Okuda, Yukito: *See*—
Ishii, Koji; and Okuda, Yukito, 4,691,631, Cl. 101-218.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,650, Cl. 310-323.000.
Okumura, Ichiro: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Masahide: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Okuno Chemical Industries Co. Ltd.: *See*—
Wada, Masatoshi; and Sakai, Tetsuo, 4,692,662, Cl. 313-493.000.
Okuno, Itaru: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.
Okuno, Takuo, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,672, Cl. 318-116.000.
Okuno, Takuo: *See*—
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Seki, Hiroyuki; and Okuno, Takuo, 4,692,652, Cl. 310-323.000.
Olin Corporation: *See*—
Parthasarathi, Arvind, 4,692,221, Cl. 204-13.000.
Olsen, Ralph A., to Ametek, Inc. Handling system and method for ship construction and repair. 4,692,087, Cl. 414-680.000.
Olson, Daniel H., to Snyder Laboratories, Inc. Lavage/suction tip with dual splash shield. 4,692,140, Cl. 604-40.000.
Olympus Optical Company: *See*—
Sakai, Mitsugu; and Yoshikawa, Shoji, 4,692,606, Cl. 250-205.000.
Takayama, Syuichi, 4,691,706, Cl. 128-328.000.
Olympus Optical Co., Ltd.: *See*—
Fujibayashi, Kenji, 4,692,818, Cl. 360-22.000.
Okada, Tsutomu, 4,691,705, Cl. 128-328.000.
Takahara, Masayuki; and Momoki, Motoyasu, 4,692,824, Cl. 360-85.000.
Omata, Hiroyasu: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.
Omnium de Traitements et de Valorisation (O.T.V.): *See*—
Levasseur, Jean-Pierre, 4,692,167, Cl. 44-2.000.
Omron Tateisi Electronics Co.: *See*—
Fukui, Ryoichi; and Minamikawa, Susumu, 4,692,034, Cl. 374-208.000.
Maenishi, Kozo; and Nakanishi, Youichi, 4,692,728, Cl. 335-192.000.
Ono, Kouichi: *See*—
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.
Onoda Cement Co., Ltd.: *See*—
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.
Onodera, Kaoru: *See*—
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, 4,692,399, Cl. 430-507.000.
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, to Onoda Cement Co., Ltd.; and Sankyo Dengyo Co., Ltd. Apparatus for controlling the operation of a grinding system. 4,691,869, Cl. 241-34.000.
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, to Fujitsu Limited. Semiconductor memory device having block pairs. 4,692,900, Cl. 365-63.000.
Oomori, Tatsuo: *See*—
Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, 4,692,627, Cl. 250-423.00P.
Oono, Akihiro: *See*—
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.
Oosawa, Tetsuo: *See*—
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.
Ooyama, Mitsuo: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Opdahl, Barry J.: *See*—
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.
Optech Inc.: *See*—
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.
Optimol-Oelwerke GmbH: *See*—
Matzat, Norbert; and Schreiber, Hans, 4,692,255, Cl. 252-51.50A.
Orii, Kohei: *See*—
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.
Orin Chemical Company: *See*—
Wright, Thomas C.; and Johnson, Grover L., 4,692,473, Cl. 521-72.000.
Orion-yhtyma Oy: *See*—
Kinanen, Ilmari; and Ranne, Sulo, 4,691,595, Cl. 74-798.000.
Orlans, Itzhak, to Amiad Sinun Vehashkaya. Fluid filtering device. 4,692,247, Cl. 210-314.000.
Osada, Toshiyuki: *See*—
Saitoh, Michihiro; Gogami, Takatoshi; and Osada, Toshiyuki, 4,692,799, Cl. 358-106.000.
Osaka Trunk Material Co., Ltd.: *See*—
Murase, Mikio, 4,691,540, Cl. 70-68.000.
Osborne, Jon L., to Exxon Nuclear Company, Inc. Spacer capture rod to space grid attachment device. 4,692,303, Cl. 376-446.000.
Osborne, Lyle E. Hydraulic brake system. 4,691,520, Cl. 60-593.000.
OSG Mfg. Company: *See*—
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.
Osinga, Halbe, to U.S. Philips Corporation. Composite wire, coil and deflection unit for HF applications. 4,692,731, Cl. 335-299.000.
Ostwald, Robert; and Voit, Gabriele, to Licentia Patent-Verwaltungs-GmbH. Process for metallizing a solid body. 4,692,356, Cl. 427-304.000.
Ota, Hiroshi, to TDK Corporation. Magnetic recording medium and process for producing the same. 4,692,377, Cl. 428-323.000.
Ota, Yoshihiro: *See*—
Fukuyama, Takahiko; Hori, Seiji; Ota, Yoshihiro; and Hayashi, Yoshikazu, 4,692,573, Cl. 200-50.00C.
Otake, Katsumoto; Miyai, Masahiko; Mukai, Yasuteru; and Okouchi, Isamu, to Hitachi, Ltd. Method and apparatus for removing extraneous matters. 4,692,253, Cl. 210-791.000.
Otis Elevator Company: *See*—
Nowak, Frederick H.; and Hovey, Isabel, 4,691,808, Cl. 187-125.000.
Otis Engineering Corporation: *See*—
Dollison, William W., 4,691,511, Cl. 60-414.000.
Gano, John C., 4,691,781, Cl. 166-368.000.
Williamson, Jimmie R., Jr., 4,691,777, Cl. 166-319.000.
Otobe, Takashi: *See*—
Ito, Yujiro; Kamatsu, Yasutoshi; and Otobe, Takashi, 4,692,721, Cl. 333-109.000.
Otsuka, Hirotaka: *See*—
Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, 4,692,811, Cl. 358-282.000.
Otsuka, Shojiro; and Komada, Hideaki, to Diesel Kiki Co., Ltd. Multistage fuel injection system for internal combustion engines. 4,691,674, Cl. 123-299.000.
Ott, Russell G., to RCA Corporation. Multiple byte serial data transfer protocol. 4,692,859, Cl. 364-200.000.
Otteman, John H.; and Lufkin, John R. Engine overheat protection system. 4,691,669, Cl. 123-41.150.
Ottieri Enterprises: *See*—
Ottieri, Marco T., 4,691,454, Cl. 36-117.000.
Ottieri, Marco T., to Ottieri Enterprises. Ski boot closure system. 4,691,454, Cl. 36-117.000.
Otto, Wilheim, to Blohm & Voss AG. Method and apparatus for the performance testing of the engine of a ship while the engine is installed in the hull of a ship. 4,691,560, Cl. 73-116.000.
Otto, William F.: *See*—
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Ouyang, Kenneth W.; and Marmet, Melvin, to Western Digital Corporation. Voltage controlled oscillator with high speed current switching. 4,692,717, Cl. 331-111.000.
Overlach, Knud: *See*—
Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, 4,692,943, Cl. 382-8.000.
Owada, Toshiro; Kosugi, Kenichi; and Nagase, Yasuo, to Ministry of International Trade & Industry; and Agency of Industrial Science & Technology. Device for turning over book leaves. 4,691,909, Cl. 270-58.000.
Owens-Illinois, Inc.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.
Oxoid Limited: *See*—
Webster, Martyn F., 4,692,417, Cl. 436-518.000.
Oy Wartsila Ab: *See*—
Pousar, Kurt, 4,691,955, Cl. 294-142.000.

Tomma, Kauko, 4,691,488, Cl. 52-223.00R.
Oya, Tetsuro: *See*—
Kataoka, Akira; Hawai, Yasuo; Fujii, Hidehiko; Oya, Tetsuro; and Fujino, Akihiko, 4,692,010, Cl. 354-273.000.
Oyamada, Takashi, to NEC Corporation. Structure for connecting leadless chip carrier. 4,692,790, Cl. 357-79.000.
Ozasa, Susumu: *See*—
Saitou, Norio; Ozasa, Susumu; Okumura, Masahide; Ooyama, Mitsuo; Komoda, Tsutomu; Harada, Katsuhiro; Fujinami, Minpei; and Iwadate, Kazumi, 4,692,579, Cl. 250-492.200.
Ozeki, Jiro, to Slidex Corporation. Information recording carrier-holding frame. 4,691,826, Cl. 206-456.000.
Packaging Systems International, Inc.: *See*—
Danforth, Ronald V.; and Pleau, Medric H., 4,691,500, Cl. 53-478.000.
Packard, Douglas T.; and Schmitt, Donald E., to United States of America, National Aeronautics and Space Administration. Brushless DC motor control system responsive to control signals generated by a computer or the like. 4,692,674, Cl. 318-254.000.
Pagani, Hermes: *See*—
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.
Pagano, Amleto, to SETEC s.r.l. Safety lock with plural tumblers, having a shaped consent stud. 4,691,545, Cl. 70-352.000.
Paikert, Paul: *See*—
Wurz, Dieter; and Paikert, Paul, 4,691,766, Cl. 165-135.000.
Palmer, Forrest M. Two-drum, two-layer continuous meld-casting method. 4,691,758, Cl. 164-461.000.
Pannwitz, Karl-Heinz, to Dragerwerk AG. Diffusion sample collector for gaseous media. 4,692,309, Cl. 422-87.000.
Pape, Kenneth R. Golf bag insert. 4,691,823, Cl. 206-315.600.
Paper Converting Machine Company: *See*—
Bradley, John J., 4,691,908, Cl. 270-21.100.
Paramount Fitness Corporation: *See*—
Voris, Harvey C., 4,691,916, Cl. 272-118.000.
Parduhn, A. Philip. Golf bag support. 4,691,884, Cl. 248-96.000.
Parisi, Tulio T., to Ultramed Corporation. Lens cleaner. 4,691,725, Cl. 134-184.000.
Parker Hannifin Corporation: *See*—
Church, John F.; and Stone, Walter H., 4,692,245, Cl. 210-232.000.
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., to Shell Oil Company. Selective placement of fluid injection in a riser reactor equipped with a horizontal tee joint connection to substantially reduce back pressure in the riser reactor. 4,692,235, Cl. 208-113.000.
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., to Shell Oil Company. Apparatus for the separation of fluid cracking catalyst particles from gaseous hydrocarbons. 4,692,311, Cl. 422-144.000.
Parkinson, William S.; and Djerf, Villy E., to Bunker Plastics, Inc. Ceiling and wall tile. 4,692,372, Cl. 428-282.000.
Parma Corporation: *See*—
Rogers, Walter C., Jr.; and Holobaugh, Raymond E., 4,691,961, Cl. 297-61.000.
Parnoff, George K.: *See*—
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.
Parsons, Donald F., to Communications Test Design, Inc. Switch testing. 4,692,939, Cl. 379-16.000.
Parsons, Michael, to Teledyne Canada Limited. Material handling system. 4,692,085, Cl. 414-633.000.
Parsons, William H.; and Patchett, Arthur A., to Merck & Co., Inc. Benzofused lactams useful as cholecystokinin antagonists. 4,692,522, Cl. 540-523.000.
Parthasarathi, Arvind, to Olin Corporation. In-situ dendritic treatment of electrodeposited foil. 4,692,221, Cl. 204-13.000.
Partis, Richard A.: *See*—
Mueller, Richard A.; and Partis, Richard A., 4,692,552, Cl. 562-475.000.
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., to Andros Anlayzers Incorporated. Digital anesthetic agent analyzer. 4,692,621, Cl. 250-343.000.
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Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.
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Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., 4,691,789, Cl. 175-62.000.
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Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.
Payne, Thomas R., to General Electric Company. Power control arrangement for automatic surface unit. 4,692,596, Cl. 219-450.000.
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Governale, Bernard C., 4,691,477, Cl. 49-380.000.
Peck, Paul L., to Archery Designs, Inc. Bow string release. 4,691,683, Cl. 124-35.00A.
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Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.
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Peer, A. Dean, Jr., to Adolph Coors Company. Milk carton blank and milk carton with pour spout. 4,691,858, Cl. 206-621.200.
Peerless Machine & Tool Corporation: *See*—
Carmichael, Kenneth, 4,691,604, Cl. 83-164.000.
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Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.
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Bloomfield, Philip E.; and Preis, Seymour, 4,692,285, Cl. 264-22.000.
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Kmiec, Chester J.; and Novits, Michael F., 4,692,269, Cl. 252-350.000.
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Risser, Dale M.; and Lease, Michael E., 4,691,410, Cl. 17-11.000.
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Perkin-Elmer Corporation, The: *See*—
Nelson, Michael R.; Boostrom, Roy E.; Cahill, Jerry E.; and Hwang, Tzong, 4,692,883, Cl. 364-571.000.
Rangaswamy, Subramaniam; and Harrington, John H., 4,692,305, Cl. 420-436.000.
Perkins, Dean P.: *See*—
Mueller, Allan H.; Perkins, Dean P.; and Evans, Rhys M., 4,692,912, Cl. 367-190.000.
Perkins, Russel G., Jr.: *See*—
Vaughan, John C.; and Perkins, Russel G., Jr., 4,691,878, Cl. 244-7.00R.
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Graham, Thomas; Perrins, Leslie A.; and Morris, Kevin, 4,691,838, Cl. 220-93.000.
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., to Dale Electronics, Inc. Plasma display having heater and method of making same. 4,692,655, Cl. 313-15.000.
Persson, Bertil. Lifting apparatus. 4,692,084, Cl. 414-607.000.
Pesak, Milan: *See*—
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Kress, Hans-Jurgen; Muller, Friedemann; Lindner, Christian; Peters, Horst; and Buekers, Josef, 4,692,488, Cl. 524-139.000.
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Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, 4,692,252, Cl. 210-761.000.

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Pettersson, Ingvar, to Scomas AB. Method and apparatus for indicating and sensing pipetting positions. 4,692,609, Cl. 250-221.000.

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Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

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Houben, Heinz; Petzoldt, Hans U.; and Stegemann, Joachim, 4,692,218, Cl. 203-19.000.

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Dusch, Albert, 4,691,650, Cl. 112-231.000.

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Pfister, William R.; and Pfister, William H., 4,692,072, Cl. 408-124.000.

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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,692,625, Cl. 250-363.00R.

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Zimmer, Gabriele, 4,692,155, Cl. 604-177.000.

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Phelps Dodge Industries, Inc.: *See*—
Kauffman, John C., 4,692,566, Cl. 174-117.0FF.

Phelps, Warren C. Gun sling. 4,691,852, Cl. 224-150.000.

Phillips, Brinley M.: *See*—
Messenger, Edward T.; Mather, Douglas E.; and Phillips, Brinley M., 4,692,271, Cl. 252-354.000.

Phillips Petroleum Company: *See*—
Dilbert, Meredith N.; Forseth, Glenn J.; Jones, William R., Jr.; and Divis, Richard T., 4,692,312, Cl. 422-151.000.
Porter, Randall A.; and Reed, Larry E., 4,692,234, Cl. 208-48.0AA.
Welch, M. Bruce, 4,692,430, Cl. 502-342.000.
Wood, Roy F., 4,691,740, Cl. 138-109.000.

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Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

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Pietzsch, Ludwig; Overlach, Knud; Senger, Detlef; and Breunig, Walter, to Dr. Ludwig Pietzsch GmbH. Method of and system for optoelectronic inspection of a two-dimensional pattern on an object. 4,692,943, Cl. 382-8.000.

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Lopez, Carlos; and Serrano, Jose L., 4,692,805, Cl. 338-198.000.

Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, to General Electric Company. Hybrid extended drain concept for reduced hot electron effect. 4,691,433, Cl. 437-44.000.

Pinkerton, Michael B.; and Moskowitz, David. Safety covers for electric outlets. 4,691,974, Cl. 439-147.000.

Pinsak, George F.; and Morton, Henry H., Jr. Apparatus for deterring thumbsucking. 4,692,748, Cl. 340-573.000.

Pioneer Electronic Corporation: *See*—
Shimizu, Tetsuo, 4,692,708, Cl. 328-63.000.

Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, to Gruppo Lepetit S.p.A. Antimicrobial and antitumor antibiotic M 9026 and its pure individual factors 1, 2, and 3 and microbial process for production thereof. 4,692,333, Cl. 424-122.000.

Pitches, Brian E.; and Wright, David A., to Ferranti plc. Three-dimensional position measuring apparatus. 4,691,446, Cl. 33-516.000.

Pitney Bowes Inc.: *See*—
Manduley, Flavio, 4,692,870, Cl. 364-466.000.

Piulle, Walter V.: *See*—
Gelfand, Peter C.; Piulle, Walter V.; and Rettenmaier, Louis F., 4,692,174, Cl. 55-129.000.

Pleau, Medric H.: *See*—
Danforth, Ronald V.; and Pleau, Medric H., 4,691,500, Cl. 53-478.000.

Plessey Overseas Limited: *See*—
Cordwell, Brian; and Hayes, Paul M., 4,692,713, Cl. 331-1.00A.
Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.

Pochmarski, Luzian: *See*—
Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, 4,691,757, Cl. 164-416.000.

Poduje, Noel S., to ADE Corporation. Conductivity-type sensor. 4,692,695, Cl. 324-158.00R.

Poeppelman, Alan D., to NCR Corporation. Fault tolerant memory. 4,692,923, Cl. 371-38.000.

Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, to Voest-Alpine Aktiengesellschaft. Arrangement provided at a continuous casting plant. 4,691,757, Cl. 164-416.000.

Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., to United States Steel Corporation. Method for controlling heat input into a coke oven. 4,692,216, Cl. 201-1.000.

Polaroid Corporation: *See*—
Kee, Richard C., 4,692,807, Cl. 358-229.000.
Kimball, Philip M., 4,692,776, Cl. 346-140.00R.

Poli, Gary N.: *See*—
Georgiou, George E.; and Poli, Gary N., 4,692,349, Cl. 437-230.000.

Poling, Denzil C. Hydraulic control valve. 4,691,618, Cl. 91-326.000.

Politis, Demetrios T.; and Licata, William H., to Environmental Research Institute of Michigan. Adaptive learning controller for synthetic aperture radar. 4,692,765, Cl. 342-106.000.

Polizzotti, Richard S.: *See*—
Murrell, Lawrence L.; Dispenziere, Nicholas C., Jr.; and Polizzotti, Richard S., 4,692,428, Cl. 502-254.000.

Polyplastics Co., Ltd.: *See*—
Takahashi, Katsuhiko; and Sugita, Michiyuki, 4,692,480, Cl. 523-218.000.

Pomagalski: *See*—
Brochand, Max, 4,691,643, Cl. 104-202.000.

Poole, John D., to Westinghouse Brake and Signal Co., Ltd. Brake control system. 4,692,867, Cl. 364-426.000.

Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, to Ceskoslovenska akademie ved. Column for liquid chromatography. 4,692,243, Cl. 210-198.200.

Porter, Gerald R.; Bradshaw, Thomas I.; and Hockert, Eric N., to Minnesota Mining and Manufacturing Company. Transparent sheets containing directional images and method for forming the same. 4,691,993, Cl. 350-105.000.

Porter, Randall A.; and Reed, Larry E., to Phillips Petroleum Company. Antifoulants for thermal cracking processes. 4,692,234, Cl. 208-48.0AA.

Portolese, Larry A.; and Leathers, Thomas M., to Allied Corporation. Constant percentage flow divider. 4,691,730, Cl. 137-101.000.

Posnley, Glen G.; and Wilson, Earl C., to Texas Instruments Incorporated. Programmable read-only-memory element with polycrystalline silicon layer. 4,692,787, Cl. 357-59.000.

Post Brothers Construction Co.: *See*—
Post, Charles R., 4,691,785, Cl. 172-212.000.

Post, Charles R., to Post Brothers Construction Co. Reversible plow and carriage. 4,691,785, Cl. 172-212.000.

Potenziani, Ernest, II: *See*—
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.

Potts, Gerald R.; and Ryder, John C., to G. R. Potts Associates, Inc. High speed tire uniformity testing device. 4,691,564, Cl. 73-146.000.

Pousar, Kurt, to Oy Wartsila Ab. Rigid place mat. 4,691,955, Cl. 294-142.000.

Powell, Philip E., to Advanced Cardiovascular Systems, Inc. Self-venting balloon dilatation catheter and method. 4,692,200, Cl. 156-289.000.

Powers, Dale R.: *See*—
Mensah, Thomas O.; Powers, Dale R.; and Burton, Clement D., 4,692,615, Cl. 250-231.00R.

Poyer, David D. Outdoor lighting fixture with U-shaped fluorescent lamp. 4,692,848, Cl. 362-216.000.

Poyner, John C., to GTE Products Corporation. Motor vehicle headlight with self-centering lug assembly. 4,692,656, Cl. 313-113.000.

Pozsgai, Istvan: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

PPG Industries, Inc.: *See*—
Das, Suryya K.; and Kania, Charles M., 4,692,503, Cl. 526-301.000.
Gillery, F. Howard; and Criss, Russell C., 4,692,389, Cl. 428-622.000.
Iwanski, Donald P., 4,692,335, Cl. 424-149.000.
Ranka, Ajay I.; and Das, Saryya K., 4,692,491, Cl. 524-458.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., 4,692,383, Cl. 428-414.000.

PRC Corporation: *See*—
Weiss, Hardy P., 4,692,928, Cl. 372-63.000.

Precision Fukuhara Works, Ltd.: *See*—
Yorisue, Shozo; and Morimoto, Seiji, 4,691,536, Cl. 66-168.000.

Preis, Seymour: *See*—
Bloomfield, Philip E.; and Preis, Seymour, 4,692,285, Cl. 264-22.000.

Preston, Brian C.: *See*—
Vanetik, Anatoly; and Preston, Brian C., 4,691,605, Cl. 83-175.000.

Price, J. B.; and Wu, Schyi-Yi, to Spectrum CVD, Inc. Plasma enhanced CVD. 4,692,343, Cl. 427-38.000.

Price, P. Michael: *See*—
Schmidt, E. Michael; and Price, P. Michael, 4,691,424, Cl. 29-261.000.

Pringle, David A.: *See*—
LaBelle, John T.; Pringle, David A.; and McKenna, Daniel, 4,692,607, Cl. 250-205.000.

Pringle, Ronald E., to Camco, Incorporated. Retrievable well safety valve with expandable external seals. 4,691,776, Cl. 166-319.000.

Pritchard, James W.: *See*—
Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., 4,691,854, Cl. 228-4.500.

Procter & Gamble Company, The: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.
Janusz, John M., 4,692,512, Cl. 530-801.000.
Siklosi, Michael P., 4,692,277, Cl. 252-558.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Vinatier, Bernard, 4,692,295, Cl. 264-291.000.

Prouvost S.A.: *See*—
Leclaire, Charly, 4,691,652, Cl. 112-262.100.

Prulhiere, Jean-Paul, to Commissariat a l'Energie Atomique. Electronic apparatus for detecting stray variations in an electrical voltage as a function of time. 4,692,692, Cl. 324-102.000.

Pryor, Timothy R., to Diffracto, Ltd. Remote operation of optical system. 4,692,884, Cl. 364-573.000.

Pugh, James G.; Johnson, Duane R.; and Bartholomew, Roy E., to Allied Corporation. Dual circuit brake valve. 4,691,968, Cl. 303-52.000.

Puletti, Paul P.; and Decowski, Stanley J., Jr., to National Starch and Chemical Corporation. Hot melt adhesive waste barrier. 4,692,161, Cl. 604-366.000.

Pulse Electronics, Inc.: *See*—
Martin, Gregory C., 4,691,563, Cl. 73-129.000.

Pulz, Otto: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

PUMA AG Rudolf Dassler Sport: *See*—
Adam, Gunter, 4,691,926, Cl. 273-73.00J.

Purkott, Hans D., to Arkansas Precision Hydraulics, Inc. Multi-section sweep cycle compaction cylinder. 4,691,617, Cl. 91-167.00R.

Purvis, Edgar M.: *See*—
Reid, Edward A.; Cook, F. Bert; and Purvis, Edgar M., 4,691,532, Cl. 62-476.000.

Pyne, R. David G. Downhole water flow controller for aquifer storage recovery wells. 4,691,778, Cl. 166-320.000.

Pyotsia, Jousi K.; and Yli-Koski, Esko T., to Neles OY. Valve. 4,691,894, Cl. 251-127.000.

Quantum Corporation: *See*—
Campbell, Steve G., 4,692,829, Cl. 360-105.000.

Quinn, Patrick A., to Tektronix, Inc. Differential impedance neutralization circuit. 4,692,712, Cl. 330-261.000.

Rabeyrolles, Serge, to Commissariat a l'Energie Atomique. Apparatus for measuring low currents with high dynamics. 4,692,693, Cl. 324-123.00R.

Rabushka, Charles; and Reprogle, Layton J. Tension actuated uncoupler. 4,691,941, Cl. 285-1.000.

Radiation Dynamics, Inc.: *See*—
Stine, Clifford R., 4,691,782, Cl. 168-12.000.

Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Floor of electrically heated melting furnace, particularly a direct current furnace. 4,692,930, Cl. 373-72.000.

Raduchel, Bernd: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Raesner, Dennis L.: *See*—
Person, Herman R.; Raesner, Dennis L.; and Meints, Gayle L., 4,692,655, Cl. 313-15.000.

Ragen, Peter D. Circular plant mobile. 4,691,473, Cl. 47-67.000.

Raidel, John E. Vehicle suspension assembly. 4,691,937, Cl. 280-711.000.

Raizen, David T.; and Wilmot, Richard A. Security system with correlated signalling to selected satellite stations. 4,692,742, Cl. 340-539.000.

Raj, Kuldip; and Casciari, Raoul, to Ferrofluidics Corporation. Bearing assembly with integrated ferrofluid seal. 4,692,826, Cl. 360-97.000.

Ramuz, Henri: *See*—
Cassal, Jean-Marie; Edenhofer, Albrecht; and Ramuz, Henri, 4,692,450, Cl. 514-256.000.

Randall, Beryl D.: *See*—
Jansen, Norman A.; and Randall, Beryl D., 4,691,806, Cl. 187-9.00R.

Rangaswamy, Subramaniam; and Harrington, John H., to Perkin-Elmer Corporation. Corrosion and wear resistant alloy. 4,692,305, Cl. 420-436.000.

Rangert, Bo R.: *See*—
Andreasson, Bo C.; and Rangert, Bo R., 4,692,753, Cl. 340-671.000.

Ranka, Ajay I.; and Das, Suryya K., to PPG Industries, Inc. Polymer emulsion products. 4,692,491, Cl. 524-458.000.

Ranne, Sulo: *See*—
Kinanen, Ilmari; and Ranne, Sulo, 4,691,595, Cl. 74-798.000.

Rapp, A. Karl, to National Semiconductor Corp. Self-timed logic level transition detector. 4,692,635, Cl. 307-279.000.

Rasberger, Michael; Dubs, Paul; and Evans, Samuel, to Ciba-Geigy Corporation. Tetrahydroquinolines as antioxidants for lubricants. 4,692,258, Cl. 252-50.000.

Rautenberg, Jurgen: *See*—
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, 4,692,301, Cl. 376-391.000.

Ravichandran, Ramanathan: *See*—
Spivack, John D.; Ravichandran, Ramanathan; and Pastor, Stephen D., 4,692,532, Cl. 548-312.000.

Raychem Corporation: *See*—
Koht, Lowell; and Shimirak, Gerald L., 4,692,565, Cl. 174-93.000.

Raytheon Company: *See*—
Galani, Zvi, 4,692,714, Cl. 331-1.00R.

Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., to General Motors Corporation. Airfoil for high efficiency/high lift fan. 4,692,098, Cl. 416-223.00R.

RCA Corporation: *See*—
Anderson, Charles H.; and Carlson, Curtis R., 4,692,806, Cl. 358-209.000.
Botez, Dan, 4,692,925, Cl. 372-46.000.
Hoover, Alan A., 4,692,852, Cl. 363-21.000.
Kaganowicz, Grzegorz; Ipri, Alfred C.; and Crandall, Richard S., 4,692,344, Cl. 427-39.000.
Keeler, Brian G.; and Whitley, George J., 4,691,419, Cl. 29-39.000.
Krufka, Frank S., 4,692,605, Cl. 250-201.000.
McNeely, David L., 4,692,889, Cl. 364-730.000.
Miller, Louis D.; and Kaiser, Donald B., 4,692,658, Cl. 313-365.000.
Ott, Russell G., 4,692,859, Cl. 364-200.000.

Realex Corporation: *See*—
Ford, John M. B.; and Moore, David G., 4,691,847, Cl. 222-259.000.

Reckziegel, Erich; and Holzapfel, Heinz, to Henkel Kommanditgesellschaft auf Aktien. Process for nonslip finishing of smooth surfaces of objects and objects produced thereby. 4,692,370, Cl. 428-198.000.

Redford, Peter M.; and Redford, Rita A., to Trillian Computer Corporation. Visual interface between user and computer system. 4,692,858, Cl. 364-200.000.

Redford, Rita A.: *See*—
Redford, Peter M.; and Redford, Rita A., 4,692,858, Cl. 364-200.000.

Redshaw, Sally: *See*—
Hassall, Cedric H.; Lawton, Geoffrey; and Redshaw, Sally, 4,692,438, Cl. 514-183.000.

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Goodnow, Ronald F.; and Reid, Robert A., 4,691,406, Cl. 15-256.530.

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Grabowski, Robert; and Kramer, Walter, 4,692,106, Cl. 425-66.000.

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Farrell, Roberta L., 4,692,413, Cl. 435-278.000.

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Rabushka, Charles; and Reprogle, Layton J., 4,691,941, Cl. 285-1.000.

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Alexander, Jose; Repta, A. J.; and Fix, Joseph A., 4,692,441, Cl. 514-194.000.

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Gelfand, Peter C.; Piulle, Walter V.; and Rettenmaier, Louis F., 4,692,174, Cl. 55-129.000.

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Harmon, Raymond E., 4,691,952, Cl. 292-341.180.

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Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

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Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.

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Hayashi, Torahiko; and Tashiro, Yasunori, 4,692,109, Cl. 425-308.000.
Hayashi, Torahiko, 4,692,110, Cl. 425-335.000.
Morikawa, Michio; and Hayashi, Torahiko, 4,692,107, Cl. 425-140.000.

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Ebaugh, Roger L.; and Rhodes, Jerry P., 4,692,040, Cl. 154-484.000.

Rhone-Poulenc Chimie de Base: *See*—
Gresser, Robert, 4,692,264, Cl. 252-140.000.

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Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.

Rice, Mark; and Meisner, Douglas, to Interscan, Incorporated. Video viewfinder system. 4,692,006, Cl. 354-75.000.

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Accocella, Richard A., 4,691,609, Cl. 84-322.000.

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Richards, Walter L.; Henderson, Roger L.; Aul, George N.; and Pauley, Barry W., to Methane Drainage Ventures. Process for establishing a clear horizontal borehole in a subterranean formation. 4,691,789, Cl. 175-62.000.

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Richter, Mark A., to United States of America, Army. Method of making a thermally stable composite honeycomb panel. 4,692,367, Cl. 428-116.000.

Rickert, Robert G.: *See*—
McBride, Donald G.; and Rickert, Robert G., 4,692,346, Cl. 427-8.000.

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Tsujihara, Sotohiro, 4,692,020, Cl. 355-14.0SH.

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Ring, Michael: *See*—
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Risser, Dale M.; and Lease, Michael E., to Perdue Incorporated. Gizzard harvester. 4,691,410, Cl. 17-11.000.

Rite-Hite Corporation: *See*—
Hahn, Norbert, 4,692,755, Cl. 340-687.000.

Ritenour, Paul E. Low noise fan. 4,692,091, Cl. 415-119.000.

Rizzi, George P.: *See*—
Blum, Robert B.; Gardlik, John M.; Janusz, John M.; and Rizzi, George P., 4,692,513, Cl. 530-801.000.

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Frantz, Virgil L., 4,692,175, Cl. 55-218.000.

Roberson, Jerry L. Therapy table with feet anchor apparatus. 4,691,919, Cl. 272-145.000.

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Falk, Gerhard, 4,692,675, Cl. 318-254.000.
Grunwald, Werner; and Schmid, Kurt, 4,692,657, Cl. 313-130.000.
Hafele, Walter; and Schenk, Bernhard, 4,692,102, Cl. 417-296.000.

Roberts, Donald R., to DeSoto, Inc. Epoxy-phosphate/phenolic electrocoating compositions. 4,692,484, Cl. 523-414.000.

Roberts, Gary F., to Kartridg Pak Co., The. Apparatus for making filled food articles. 4,691,627, Cl. 99-450.600.

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Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., to United States of America, Army. Precision laser beam positioner and spatially resolved laser beam sampling meter. 4,692,623, Cl. 250-349.000.

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Razinsky, Elias H.; Roberts, William B.; and Longhouse, Richard E., 4,692,098, Cl. 416-223.00R.

Robertshaw Controls Company: *See*—
Sliger, Boyd P.; and Wagner, Joseph P., 4,691,861, Cl. 236-34.500.

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Wroblewski, David J.; and Robertson, John W., Jr., 4,692,933, Cl. 377-29.000.

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Lavendel, Henry W.; and Robinson, John C., 4,692,388, Cl. 428-621.000.

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Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, to Julius Blum Gesellschaft m.b.H. Furniture hinge having a resilient catch and spacer mechanism. 4,691,408, Cl. 16-241.000.

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Kappas, Attallah; and Drummond, George S., 4,692,440, Cl. 514-185.000.
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Rockwell, Gary L., to Diversified Products Corporation. Multiple exercise device. 4,691,918, Cl. 272-134.000.

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Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., 4,692,225, Cl. 204-59.00R.

Rodgers, Charles E.; and Rodgers, Herman R. Attachment for a back hoe bucket. 4,692,089, Cl. 414-724.000.

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Becker, Udo; and Roeschlau, Peter, 4,692,406, Cl. 435-13.000.

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Gordon, Herman B., 4,691,972, Cl. 439-77.000.
Simpson, Scott, 4,692,476, Cl. 521-112.000.

Rogers, Raymond E.: *See*—
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.

Rogers, Walter C., Jr.; and Holobaugh, Raymond E., to Parma Corporation. Recliner with headrest. 4,691,961, Cl. 297-61.000.

Rohrbach, Peter; and Benzak, William, to SI Handling Systems, Inc. Vehicle accumulation system. 4,691,641, Cl. 104-166.000.

Rokicki, Stanley. Sliding door assembly with mullion lock. 4,691,474, Cl. 49-220.000.

Rolfs, John C., deceased; and by Rolfs, Margaret H., executrix. Linearizer frequency discriminator for frequency modulated radar transmitters. 4,692,766, Cl. 342-200.000.

Rolfs, Margaret H., executrix: *See*—
Rolfs, John C., deceased; and Rolfs, Margaret H., executrix, 4,692,766, Cl. 342-200.000.

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Denning, Ralph M., 4,691,877, Cl. 244-6.000.

Roman, Ronald J., to L-Bar Products Incorporated. Water-activated, exothermic chemical deicing formulations. 4,692,259, Cl. 252-70.000.

Roos, Hans, to Deutsche Filterbau GmbH. Process for cleaning filter elements. 4,692,173, Cl. 55-96.000.

Roppel, Thaddeus A.; Asmussen, Jes; and Reinhard, Donnie K., to Michigan State University. Dual plasma microwave apparatus and method for treating a surface. 4,691,662, Cl. 118-50.100.

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Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Rosado, Serafin M. Thermodynamic process for a practical approach to the Carnot cycle. 4,691,523, Cl. 60-649.000.

Rose, Leslie C.: *See*—
Ware, Charles H.; and Rose, Leslie C., 4,691,771, Cl. 166-245.000.

Rosenberg, Helmut W. G.; and Drach, George W., to Kendall Company, The. Catheter with removable connector. 4,692,149, Cl. 604-99.000.

Rosenthal, Robert D., to Trebor Industries, Inc. Near infrared measuring instrument with sample holder. 4,692,620, Cl. 250-343.000.

Rosheim, Mark E., to Sperry Corporation. Superconducting connector. 4,691,973, Cl. 439-161.000.

Rosol, Jaroslav: *See*—
Porsch, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, 4,692,243, Cl. 210-198.200.

Rossmann, Axel; and Huther, Werner, to MTU Motoren-und Turbinen-Union Munchen GmbH. Method of hot isostatic pressing of a porous silicon ceramic compact. 4,692,288, Cl. 264-56.000.

Roth, G. Thomas: *See*—
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.

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Roucek, Joseph A.; and Tessier, James R., to International Business Machines Corporation. Repair of strip conductor on electrical circuit board. 4,691,426, Cl. 29-402.180.

Rountree, Robert N.; and Herndon, Troy H., to Texas Instruments Incorporated. Semiconductor device with electrostatic discharge protection. 4,692,781, Cl. 357-23.130.

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De Marchi, Andrea; and Rovera, Giovanni D., 4,692,716, Cl. 331-3.000.

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Roy, Prodyot, to General Electric Company. Method and system for hydrogen thermal-electrochemical conversion. 4,692,390, Cl. 429-17.000.

Roza, Engel; and Van Veenendaal, Hendrik G., to U.S. Philips Corporation. Tunable astable multivibrator with buffer transistors. 4,692,718, Cl. 331-113.00R.

Rubin, Kenneth. Orbit clock. 4,692,032, Cl. 368-76.000.

Rubloff, Gary W.; and Wittmer, Marc F., to International Business Machines Corporation. Low temperature shallow doping technique. 4,692,348, Cl. 437-82.000.

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Ruka, Roswell J.: *See*—
Isenberg, Arnold O.; and Ruka, Roswell J., 4,692,274, Cl. 252-521.000.

Rumpp, Gerhard: *See*—
Neumaier, Anton; Hoereth, Hans-Jurgen; and Rumpp, Gerhard, 4,691,929, Cl. 279-19.300.

Rumsey, John: *See*—
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

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Rock, Erich; Rupprechter, Helmut; and Brustle, Klaus, 4,691,408, Cl. 16-241.000.

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Ryabikov, Stanislav V.: *See*—
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Antihypertensive agents. 4,692,437, Cl. 514-165.000.

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Potts, Gerald R.; and Ryder, John C., 4,691,564, Cl. 73-146.000.

Ryobi Ltd.: *See*—
Ishii, Koji; and Okuda, Yukito, 4,691,631, Cl. 101-218.000.

Ryohei, Yamamoto; Shigeki, Kimura; and Akira, Matsuura, to Amano Pharmaceutical Co., Ltd. Process for accelerating antigen-antibody reaction. 4,692,330, Cl. 424-85.000.

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Kumakura, Koichi; Ryuzono, Akira; and Hosokawa, Yoshinori, 4,692,935, Cl. 378-49.000.

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Swanson, Roy T., 4,692,577, Cl. 200-151.000.
Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., 4,692,734, Cl. 337-162.000.

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Dahbura, Anton T.; and Sabnani, Krishan K., 4,692,921, Cl. 371-27.000.

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Sadler, Thomas H., to Manville Corporation. Continuously variable transmission pulley. 4,692,128, Cl. 474-8.000.

Saeki, Keiji: *See*—
Maeda, Yukio; Kudo, Shinichi; and Saeki, Keiji, 4,692,351, Cl. 427-196.000.

Safarik, William F., to Garrett Corporation, The. Ram air turbine. 4,692,093, Cl. 416-1.000.

Sagalevich, Valery M.: *See*—
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Landau, Boris; and Saines, Marius, 4,692,157, Cl. 604-214.000.

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Samuelson, Gay M.; and St. Clair, David J., 4,692,557, Cl. 136-251.000.

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Villain, Jean-Marie; and Fremaux, Jacques, 4,692,180, Cl. 65-32.000.

St. Onge, Henri S. Apparatus for cathodic protection of metal piping. 4,692,231, Cl. 204-197.000.

Saito, Asao; and Watanabe, Kunio, to Canon Kabushiki Kaisha. Image forming method using image forming elements having different concentrations and pitches. 4,692,773, Cl. 346-1.100.

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Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.

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Hirahara, Shuzo; Yamada, Kiyoshi; Higuchi, Kazuhiko; and Saito, Tutomu, 4,692,812, Cl. 358-285.000.

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Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

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Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.

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Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, 4,692,483, Cl. 523-406.000.

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Sakuma, Hiraku, to NEC Corporation. Driving method for driving plasma display with improved power consumption and driving device for performing the same method. 4,692,665, Cl. 315-169.400.

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Sakurai, Koichi; and Kojima, Minoru. Head-positioning mechanism for an endless tape. 4,692,820, Cl. 360-74.700.

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Nishikawa, Masao; and Sakurai, Yoshimi, 4,691,596, Cl. 74-869.000.

Sales, Andre : *See*—
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.

Salton, Robert B.: *See*—
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Samhwa Electric Industrial Co.: *See*—
Chung, Ki Ho, 4,692,833, Cl. 361-91.000.

Sampedro, Manuel, to Sampedro, Manuel; and Kohuth, Russell T., a part interest to each. Direct drive fan coupling assembly. 4,692,053, Cl. 403-24.000.

Samuel, Michael. Wheeled vehicle. 4,691,930, Cl. 280-7.100.

Samuelson, Gay M.; and St. Clair, David J., to Shell Oil Company. Encapsulated solar cell assemblage and method of making. 4,692,557, Cl. 136-251.000.

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Ikeda, Hideo, 4,691,527, Cl. 62-234.000.
Nakai, Masayuki; Ishikawa, Kikuo; and Okada, Shiro, 4,691,447, Cl. 34-4.000.

Sander, Wilfried; Essig, Gunder; and Wacker, Erich, to Metallgesellschaft Aktiengesellschaft. Light alloy piston. 4,691,622, Cl. 92-233.000.

Sanders Associates, Inc.: *See*—
Lalmond, Richard G., 4,692,683, Cl. 322-2.00R.
Vanetik, Anatoly; and Preston, Brian C., 4,691,605, Cl. 83-175.000.

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Goerner, Richard N.; Hipp, J. Michael; and Hipp, Ruth H., 4,692,544, Cl. 560-4.000.
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Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.
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Sanshin Kogy Kabushiki Kaisha: *See—*
Nishimura, Seiichi, 4,691,671, Cl. 123-73.00V.
Santambrogio, Alberto; and Mattei, Luciano, to Agip Petroli, S.p.A. Chemical compounds to be used as solid carriers for fuel additives. 4,692,170, Cl. 44-63.000.
Santen, Sven; Bernhard, Ragnar; and Malmeblad, Sven-Erik, to SKF Steel Engineering AB; and Stora Kopparbergs Bergslags AB. Recovery of chemicals from pulp waste liquor. 4,692,209, Cl. 162-30.100.
Santulli, Scott: *See—*
Brass, Robert L.; Glaberson, John; Mason, Richard W.; L'Heureux, Arthur J., III; Santulli, Scott; Roth, G. Thomas; Frega, John; and Imiolek, Henry S., 4,692,603, Cl. 235-454.000.
Sanyo Electric Co.: *See—*
Imaizumi, Norio, 4,692,670, Cl. 315-388.000.
Sarsi, Pekka: *See—*
Mann, Yale; and Sarsi, Pekka, 4,691,801, Cl. 180-287.000.
Sasaki, Hiroyuki; and Hanzawa, Kohtaro, to Casio Computer Co., Ltd. Waveform normalizer for electronic musical instrument. 4,691,608, Cl. 84-1.010.
Sasaki, Masao; Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,692,399, Cl. 430-507.000.
Sasaki, Toshimi: *See—*
Haramaki, Takashi; Funamoto, Takao; Kokura, Satoshi; Inagaki, Masahisa; Jimbou, Ryutaro; Sasaki, Toshimi; and Nagayama, Kousei, 4,691,856, Cl. 228-194.000.
Sase, Akira: *See—*
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.
Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Radiography apparatus and method. 4,692,937, Cl. 378-062.000.
Sasib S.p.A.: *See—*
Gianese, Goffredo, 4,691,848, Cl. 222-269.000.
Satellite Technology Services, Inc.: *See—*
Rothbarth, James N.; and Smith, Edward W., 4,692,771, Cl. 343-882.000.
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, to Nippon Petrochemicals Company, Limited. Surface active agent. 4,692,270, Cl. 252-353.000.
Sato, Goro; Ogata, Masamitsu; Masuda, Tatsuo; and Ida, Takanori, to Catalysts & Chemicals Industries Co., Inc. Catalytic cracking process for heavy oil with mixture of alumina and zeolite. 4,692,236, Cl. 208-114.000.
Sato, Hiroshi: *See—*
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.
Sato, Kohei: *See—*
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.
Sato, Masayoshi: *See—*
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Semiconductor integrated circuit device. 4,692,904, Cl. 365-226.000.
Sato, Noritada: *See—*
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.
Sato, Ray S., to Magnetic Massage Company. Massage device. 4,691,693, Cl. 128-24.100.
Sato, Ryosuke: *See—*
Masuda, Kasaku; Sato, Ryosuke; Ishii, Fumio; Kimura, Kazuhiko; and Ninomiya, Hidetaka, 4,692,529, Cl. 546-141.000.
Sato, Takuro: *See—*
Fukasawa, Atsuhi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,692,725, Cl. 333-203.000.
Sato, Takuso; and Ichida, Nobuyuki, to Fujitsu Limited. Apparatus for observing sound field of ultrasonic wave. 4,691,569, Cl. 73-596.000.
Sato, Yoshimi, to Nissan Motor Company, Limited. Release system for seat occupant in vehicle. 4,691,939, Cl. 280-806.000.
Satoh, Atsushi: *See—*
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, 4,692,422, Cl. 501-136.000.
Sauer, Joachim: *See—*
Dittner, Adam; Hutterer, Werner; and Sauer, Joachim, 4,691,813, Cl. 192-13.00R.
Sauerwein, Kurt; Kinzer, Norbert; and Mick, Felix W., to Sauerwein, Kurt. Pipeline switch. 4,692,628, Cl. 250-497.100.
Sautter, Sieghart: *See—*
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.
Sawai, Masaaki; Kobayashi, Masamichi; Hayashi, Shoji; Naka, Hiroshi; and Ichiki, Masahiro, to Hitachi, Ltd. Light emitting device with improved electrode structure to minimize short circuiting. 4,692,927, Cl. 372-46.000.
Sburlati, Luigi; Acuto, Giovanni; and Stacchino, Giuseppe, to Fiat Auto S.p.A. Unit for connecting a seat to motor vehicle floor. 4,691,946, Cl. 248-429.000.
Schaeffer, Eric S., to General Motors Corporation. High/low DC voltage motor vehicle electrical system. 4,692,684, Cl. 322-90.000.
Scharf, Stephen. Combination base board/corner & floor brush holder. 4,691,403, Cl. 15-114.000.
Schave, Floyd D., to Crafco, Inc. Sealant melter/applicator with automatic load switching system. 4,692,028, Cl. 366-22.000.
Schenk, Bernhard: *See—*
Hafele, Walter; and Schenk, Bernhard, 4,692,102, Cl. 417-296.000.
Schenk, Mark B.: *See—*
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.
Scherbatskoy, Serge A. Methods and apparatus for reducing interfering effects in measurement while drilling operations. 4,692,911, Cl. 367-83.000.
Scherer, Richard M., to Stratus Corporation. Liquid heater with closed loop heat transfer system. 4,691,666, Cl. 122-33.000.
Schering Aktiengesellschaft: *See—*
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.
Schiel, Christian; and Kotitschke, Herbert, to J.M. Voith GmbH. Stone pressure roll for a web of fibers. 4,691,420, Cl. 29-116.00R.
Schiel, Christian, to J. M. Voith GmbH' . Press roll with adjustable sag. 4,691,421, Cl. 29-116.0AD.
Schiele, Herbert: *See—*
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.
Schindler, Edgar C. Wrap-around packaging. 4,691,824, Cl. 206-315.900.
Schinkel, Ingo; and Bohner, Jurgen, to Wolff Walsrode Aktiengesellschaft. Sealable multilayer polyolefin films. 4,692,386, Cl. 428-515.000.
Schinner, Edward N.: *See—*
Flamm, Katherine K.; Gilley, J. Kyle; Geary, David F.; and Schinner, Edward N., 4,691,769, Cl. 165-158.000.
Schirmer, Ulrich: *See—*
Keil, Michael; Schirmer, Ulrich; Jahn, Dieter; Becker, Rainer; Wuerzer, Bruno; and Meyer, Norbert, 4,692,553, Cl. 564-185.000.
Schleuniger, Kurt; and Hermann, Peter, to Strausak AG. Method of testing the mechanical stress resistance of a sample of material and apparatus for carrying out the method. 4,691,576, Cl. 73-821.000.
Schliebs, Bjorn: *See—*
Illy, Hugo; Schliebs, Bjorn; and Hess, Wilhelm, 4,692,540, Cl. 558-78.000.
Schloegl, Gunter: *See—*
Crass, Guenther; Bothe, Lothar; and Schloegl, Gunter, 4,692,837, Cl. 361-313.000.
Schlonski, James S.; and Burnett, Tobias W. T., to Westinghouse Electric Corp. Control of nuclear reactor power plant on occurrence of rupture in coolant tubes. 4,692,297, Cl. 376-211.000.
Schlosser, Ewald: *See—*
Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.
Schlossman, Stuart: *See—*
Freedman, Arnold; Nadler, Lee; and Schlossman, Stuart, 4,692,405, Cl. 435-7.000.
Schlueter, Edward. Punch and ejector assembly. 4,691,602, Cl. 83-128.000.
Schlumberger-Doll Research: *See—*
Ekstrom, Michael P.; and Havira, R. Mark, 4,692,908, Cl. 367-27.000.
Schlumberger Technology Corporation: *See—*
Locke, Stanley; and Gouilloud, Michel, 4,692,707, Cl. 324-374.000.
Schmelzer Corporation: *See—*
DeLand, Daniel L.; and LaVene, Leon F., 4,691,943, Cl. 285-315.000.
Schmetz, Peter-Nikolaus; and Klocker, Peter, to Ferdinand Bernhard Schmetz, Firma. Needle package. 4,691,825, Cl. 206-380.000.
Schmid, Kurt: *See—*
Grunwald, Werner; and Schmid, Kurt, 4,692,657, Cl. 313-130.000.
Schmid Laboratories: *See—*
Gordon, Harry W., 4,692,334, Cl. 424-122.000.
Schmidt, E. Michael; and Price, P. Michael, to Harte Industries, Inc. Pipe cap extractor apparatus. 4,691,424, Cl. 29-261.000.
Schmidt, Timothy J.: *See—*
Fisher, Alfred J., III; and Schmidt, Timothy J., 4,692,294, Cl. 264-259.000.
Schmitt, Donald E.: *See—*
Packard, Douglas T.; and Schmitt, Donald E., 4,692,674, Cl. 318-254.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., to PPG Industries, Inc. Elastomeric coating compositions. 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., to PPG Industries, Inc. Polycarbonate based elastomeric coating compositions. 4,692,383, Cl. 428-414.000.
Schmitt, Wilfried: *See—*
Schorr, Manfred; and Schmitt, Wilfried, 4,692,523, Cl. 540-533.000.
Schmitz, Wolfgang. Appliance for partially dyeing the hair. 4,691,720, Cl. 132-112.000.

Schmutz, Friedrich: *See—*
Mierswa, Christian; and Schmutz, Friedrich, 4,691,723, Cl. 134-167.00C.
Schneider, Gottlieb: *See—*
Tauscher, Willy; and Schneider, Gottlieb, 4,692,030, Cl. 366-337.000.
Schneider, James T.; and Haugse, Albert L., to Ashland Oil, Inc. Self-aetting urethane adhesive paste system. 4,692,479, Cl. 523-209.000.
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., to Sud-Chemie Aktiengesellschaft. Catalyst for reducing the nitrogen oxide content of flue gases. 4,692,425, Cl. 502-81.000.
Schneider, Theodor: *See—*
Bauer, Kurt; and Schneider, Theodor, 4,692,677, Cl. 318-443.000.
Schnell, Axel: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.
Schoening, Josef; Elter, Claus; and Rautenberg, Jurgen, to Hochtemperatur-Reaktorbau GmbH. Steam generator heated with the cooling gas of a nuclear reactor. 4,692,301, Cl. 376-391.000.
Scholem, Paul. Portable steel target for pistol shooting. 4,691,925, Cl. 273-407.000.
Scholer, Jurgen: *See—*
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.
Scholles, Herbert: *See—*
Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, 4,691,636, Cl. 102-387.000.
Scholtes, Ronald P.: *See—*
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.
Schonfelder, Manfred: *See—*
Pedain, Josef; Konig, Klaus; and Schonfelder, Manfred, 4,692,384, Cl. 428-423.300.
Schonherr, Erich: *See—*
Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, 4,692,203, Cl. 156-610.000.
Schorr, Manfred; and Schmitt, Wilfried, to Hoechst Aktiengesellschaft. Process for the preparation of 1-substituted aza-cycloalkan-2-ones. 4,692,523, Cl. 540-533.000.
Schourup, William E.: *See—*
Studer, Robert L.; and Schourup, William E., 4,691,726, Cl. 137-15.000.
Schramm, Charles H. Non-alkaline, foamable bathroom cleaner. 4,692,276, Cl. 252-545.000.
Schreiber, Hans: *See—*
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Schreinemacher, Herbert: *See—*
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.
Schuchardt, Gunter: *See—*
Black, Karl-Heinz; and Schuchardt, Gunter, 4,692,669, Cl. 315-381.000.
Schuh, Rudolf, to Mead Corporation, The. Product retard device for drop-loading packaging machine. 4,691,495, Cl. 53-48.000.
Schultz, Jerald. Lug wrench extension handle. 4,691,599, Cl. 81-177.200.
Schulze, Jurgen: *See—*
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.
Schumann, Klaus: *See—*
Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, 4,692,260, Cl. 252-99.000.
Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik and Eisengiesserei m.b.H. Apparatus for controlling the discharge of pressurized liquid from nozzles on a cutting drum of a mining machine. 4,691,967, Cl. 299-1.000.
Schuster, Hans D.: *See—*
Abthoff, Joerg; Schuster, Hans D.; Langer, Hans J.; Zahn, Wolfgang; and Ebinger, Gunther, 4,691,562, Cl. 73-118.100.
Schwab, Wilfried: *See—*
Kirrstetter, Reiner; Durckheimer, Walter; Lattrell, Rudolf; and Schwab, Wilfried, 4,692,516, Cl. 540-222.000.
Schwartz, Thomas W., to Minnesota Mining and Manufacturing Company. Dispensing container. 4,691,845, Cl. 222-94.000.
Schwartz, Walter. Golf game apparatus. 4,691,923, Cl. 273-180.000.
Schwarzler, Felix: *See—*
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Schweiger, Raimund: *See—*
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Schwerdtle, Friedhelm: *See—*
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Schwitters, Wayne J., to WIC, Inc. Apparatus for defoliating sugar beets and the like utilizing flexible flails with rigid cutting members at the free ends thereof. 4,691,506, Cl. 56-121.400.
Schwitters, Wayne J., to WIC, Inc. Polyurethane flail for use in defoliating sugar beets and the like. 4,691,507, Cl. 56-121.400.
Scientific Atlanta, Inc.: *See—*
West, Lamar E., Jr., 4,692,919, Cl. 370-96.000.
Scomas AB: *See—*
Pettersson, Ingvar, 4,692,609, Cl. 250-221.000.
Scott & Fetzer Company, The: *See—*
Edejer, Merardo P.; Ford, Roger S.; Jailor, John J.; and Jens, Michael J., 4,692,754, Cl. 340-671.000.
Scott, James W.; and Hickox, John. Orthopedic cast spacing and spreading device. 4,691,699, Cl. 128-91.00A.
Scott, Michael J., to Allflex International Limited. Tags. 4,691,458, Cl. 40-300.000.
SCP Biscornet: *See—*
Garcia, Raoul; Michaux, Daniel; and Sales, Andre , 4,691,724, Cl. 134-169.00R.
Seacliff International, Inc.: *See—*
Sherer, Paul, 4,692,680, Cl. 320-2.000.
Sebo, Milan J., to Allied Corporation. Brake control valve. 4,691,737, Cl. 137-625.260.
Secemski, Isaac I.; and Lynn, Jesse L., Jr., to Lever Brothers Company. Detergent compositions containing an alkylbenzene sulfonate and alcohol ethoxysulfate surfactant system. 4,692,275, Cl. 252-534.000.
Security Tag Systems, Inc.: *See—*
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.
Sedgewick, Richard D. Flat windings, coil forms, and winding method. 4,691,746, Cl. 140-92.100.
Sedlmayer, Peter: *See—*
Alstetter, Franz; Schiele, Herbert; Sedlmayer, Peter; and Hultsch, Gunther, 4,691,448, Cl. 34-8.000.
Seely, James R.: *See—*
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Seiko Epson Kabushiki Kaisha: *See—*
Nakagawa, Hitoshi; and Kitahara, Kohei, 4,691,911, Cl. 271-9.000.
Seiko Instruments & Electronics Ltd.: *See—*
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Seikosha Co., Ltd.: *See—*
Kaneko, Koichi; and Hanya, Masado, 4,692,031, Cl. 368-18.000.
Seiler, Max P., to Sandoz Ltd. Pharmaceutical active 1,2,3,4,4A,5,10,-10A-octahydrobenzo[g] quinoline derivatives, and their use. 4,692,453, Cl. 514-290.000.
Seki, Hiroyuki; and Okuno, Takuo, to Canon Kabushiki Kaisha. Vibration wave motor. 4,692,652, Cl. 310-323.000.
Seki, Hiroyuki: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, to Fuji Electric Corporate Research & Development Co., Ltd. Semiconductor radioactive ray detector. 4,692,782, Cl. 357-29.000.
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, to Research Association of Electric Conductive Inorganic Compounds. Catalyst composition and multi-functional sensor. 4,692,429, Cl. 502-303.000.
Sekine, Yoshitada: *See—*
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.
Seko, Yasutoshi; and Abe, Yuichi, to Nissan Motor Company, Limited. Apparatus and process for improving visibility of object within visual field. 4,692,798, Cl. 358-93.000.
Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 4,691,995, Cl. 350-331.00R.
Sendelbach, Lee A.: *See—*
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Senger, Detlef: *See—*
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Sengoku, Yoshinari: *See—*
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Abel, William E., 4,692,752, Cl. 340-604.000.
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Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, to Honda Giken Kogyo K.K.; and Honda Manufacturing Co., Ltd. Fuse circuit unit for combination with an electromagnetic switch. 4,692,835, Cl. 361-104.000.
Sevcik, Bohumil: *See—*
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.
Seymour, Paul F. Unifastener. 4,692,055, Cl. 403-190.000.
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., to GTE Products Corporation. Fiber optic connector. 4,691,985, Cl. 350-96.180.
Shappir, Joseph: *See—*
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Kaneiwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.
Nakao, Motokazu, 4,692,795, Cl. 358-75.000.
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Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, 4,692,025, Cl. 356-45.000.
Tsuda, Tatsuya; and Nogi, Masako, 4,692,597, Cl. 219-492.000.
Washizuka, Isamu; and Kinugawa, Kiyoshi, 4,692,740, Cl. 340-365.00R.
Shaud, Ronald J. Snow shovel. 4,691,954, Cl. 294-54.500.
Shaw, John H.: *See—*
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Shea, John R., Jr. Joint seal assembly. 4,691,489, Cl. 52-235.000.
Shell Offshore Inc.: *See—*
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Shell Oil Company: *See—*
Drent, Eit, 4,692,548, Cl. 560-202.000.
Frank, Harry, 4,692,504, Cl. 528-89.000.
Holscher, Hugo, 4,691,524, Cl. 60-652.000.
Parker, Wesley A.; Hardesty, Donald E.; and Stanley, Jack E., 4,692,235, Cl. 208-113.000.
Parker, Wesley A.; Dewitz, Thomas S.; Hinds, George P., Jr.; Gwyn, John E.; Bilgic, A. Haluk; and Hardesty, Donald E., 4,692,311, Cl. 422-144.000.
Samuelson, Gay M.; and St. Clair, David J., 4,692,557, Cl. 136-251.000.
van den Berg, Wilhemus H.; Homs, Marinus H.; and van Oorschot, Bob P. J., 4,691,572, Cl. 73-643.000.
Shelton, Thomas V.: *See—*
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Shenvi, Ashokkumar B., to Du Pont de Nemours, E. I., and Company. Intermediates for octahydrobenzo[4,5]furo[3,2-c]isoquinolines. 4,692,528, Cl. 546-115.000.
Shepherd, Charles G.; and Travale, Samuel, to B. D. Wait Co. Limited. One piece adjustable damper. 4,691,689, Cl. 126-295.000.
Sherer, Paul, to Seacliff International, Inc. Portable battery charging apparatus and methods therefor. 4,692,680, Cl. 320-2.000.
Sherrill, Jimmy L.: *See—*
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Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., to Westinghouse Electric Corp. Mechanical spectral shift reactor. 4,692,296, Cl. 376-209.000.
Shibamoto, Takeshi: *See—*
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Shibata, Nobuho: *See—*
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Rohrbach, Peter; and Benzak, William, 4,691,641, Cl. 104-166.000.
Siac Industria Accessori Cavaria S.p.A.: *See—*
Vaglini, Franco, 4,691,437, Cl. 29-753.000.
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Biermeier, Johann; and Obermayer, Heinz, 4,692,827, Cl. 360-97.000.
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Muller, Erwin, 4,692,730, Cl. 335-278.000.
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Hanz, George J.; Jung, Guenter; and Pflaum, Michael, 4,692,625, Cl. 250-363.00R.
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Gandy, James, 4,692,847, Cl. 362-152.000.
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Slusarczyk, Joseph Z.; and Slusarczyk, Nancy L., 4,691,828, Cl. 206-509.000.
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Hsu, Edward C.; Merchant, Philip, Jr.; Smith, Dean L., Jr.; Kelly, Kevin P.; and Lacy, Sylvia M., 4,692,237, Cl. 208-177.000.
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Smith, Gene M. Railroad grade crossing structure. 4,691,863, Cl. 238-8.000.
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Ife, Robert J., 4,692,456, Cl. 514-333.000.
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Olson, Daniel H., 4,692,140, Cl. 604-40.000.
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Venot, Jean, 4,691,743, Cl. 139-291.00C.
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Brunet, Maurice L.; and Jolivet, Jean-Pierre, 4,692,699, Cl. 324-207.000.
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Dunan, Andrew J., 4,691,843, Cl. 222-58.000.
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Sonenstein, Gerard G., to Colgate-Palmolive Company. Water soluble films of polyvinyl alcohol and polyacrylic acid and packages comprising same. 4,692,494, Cl. 525-57.000.
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Souch, Julius. Dopatick transfer jig device and method for using same. 4,691,481, Cl. 51-277.000.
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Young, Quentin H., 4,691,542, Cl. 70-129.000.
Spector, Donald. Aroma-generating automobile cigarette lighter. 4,692,590, Cl. 219-275.000.
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Wainscott, Delores A.; and Spector, George, 4,692,004, Cl. 352-132.000.
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Stern, Geoffrey S.; Avni, Zion; Gonen, Amos; and Peleg, Amiram, 4,691,783, Cl. 169-61.000.
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Price, J. B.; and Wu, Schyi-Yi, 4,692,343, Cl. 427-38.000.
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Lo, David S.; and Lins, Stanley J., 4,692,899, Cl. 365-29.000.
Rosheim, Mark E., 4,691,973, Cl. 439-161.000.
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Sprague, Richard P.: *See—*
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Square D Starkstrom GmbH: *See—*
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Van Geenen, Albert A.; and Bongers, Jozef J. M., 4,692,520, Cl. 540-451.000.
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Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.
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Baines, Peter J., 4,692,940, Cl. 379-424.000.
Extance, Philip; Jones, Roger E.; and Martin, Stewart O., 4,692,703, Cl. 324-251.000.
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Goswami, Jagadish C.; and Aurichio, Joseph A., 4,692,272, Cl. 252-514.000.
Gray, Reed A.; and Joo, Grant K., 4,692,186, Cl. 71-100.000.
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Steele, Robert, to Ampex Corporation. Method and apparatus for controlling the position of a transported web. 4,692,819, Cl. 360-72.100.

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Nussbaum, Marvin, 4,692,279, Cl. 260-402.000.

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Sashin, Donald; and Sternglass, Ernest J., 4,692,937, Cl. 378-061.000.

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LeRoux, Donald F.; and Stottlemyer, Quayton R., 4,692,083, Cl. 414-411.000.

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Strakova, Jana: *See*—
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Arensdorf, Stephen C.; Stromgren, Lawrence T.; and Goudreau, Noel, 4,691,697, Cl. 128-80.00L.

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Strong, Michael P., to J. B. Golf Enterprises, Inc. Golfer's arm movement control device. 4,691,924, Cl. 273-189.00R.

Stuchlik, Josef: *See*—
Cerny, Antonin; Krepelka, Jiri; Rezabek, Karel; Fruhaufova, Maria; Pesak, Milan; Sevcik, Bohumil; Kral, Josef; Borovicka, Antonin; Bilek, Petr; Picmausova, Dagmar; Stuchlik, Josef; Picha, Josef; and Strakova, Jana, 4,692,452, Cl. 514-288.000.

Studer, Robert L.; and Schourup, William E. Method and apparatus for valve assembly for a hot water tank. 4,691,726, Cl. 137-15.000.

Studt, William L.: *See*—
Kuhla, Donald E.; Campbell, Henry F.; and Studt, William L., 4,692,445, Cl. 514-212.000.

Sud-Chemie Aktiengesellschaft: *See*—
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Sudol, Walter J.; and Habich, Michael P., to A. W. Chesterton Company. Temperature-compensating mechanical face seal. 4,691,927, Cl. 277-26.000.

Sueta, Yoshihisa, to International Business Machines Corporation. Test system for keyboard interface circuit. 4,692,691, Cl. 324-73.00R.

Sugai, Hiroo: *See*—
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.

Suggitt, Robert M.: *See*—
Stellaccio, Robert J.; and Suggitt, Robert M., 4,692,172, Cl. 48-197.00R.

Sugimoto, Kenichi: *See*—
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Sugimoto, Yasuhiro: *See*—
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.

Sugisawa, Kunio: *See*—
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

Sugita, Michiyuki: *See*—
Takahashi, Katsuhiko; and Sugita, Michiyuki, 4,692,480, Cl. 523-218.000.

Sugiura, Masahiro: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Sugiura, Saburo: *See*—
Hayashi, Kiyohide; Sugiura, Saburo; and Demukai, Noboru, 4,691,899, Cl. 266-140.000.

Sugiura, Sadanobu: *See*—
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, to Victor Company of Japan Ltd. Digital data transmitting system for transmitting digital data a number of times depending on an information content of the digital data. 4,692,816, Cl. 358-342.000.

Sugiyama, Susumo: *See*—
Nakamura, Yoshio; Sugiyama, Susumo; Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,692,789, Cl. 357-74.000.

Sugo, Yasuhisa: *See*—
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.

Sulmone, Michael: *See*—
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Sulzbach, Reinhard A.; and von Werner, Konrad, to Hoechst Aktiengesellschaft. Stable, aqueous, colloidal dispersions of copolymers of the tetrafluorethylene/ethylene type and a process for their preparation. 4,692,493, Cl. 524-805.000.

Sulzer Brothers Limited: *See*—
Tauscher, Willy; and Schneider, Gottlieb, 4,692,030, Cl. 366-337.000.

Sumitomo Metal Mining Company Limited: *See*—
Matsumoto, Kazutoshi; Nakamura, Tetsuro; Hyuga, Takehiro; and Ichimura, Hiroshi, 4,692,421, Cl. 501-136.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Hayata, Naohiro, 4,691,431, Cl. 29-526.00R.

Sumner, Terence E.: *See*—
Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., 4,692,571, Cl. 200-5.00A.

Sun Refining and Marketing Company: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,692,426, Cl. 502-154.000.

Sundstrand Corporation: *See*—
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,692,671, Cl. 318-11.000.

Sung, Eric; Jeschke, Peter; Schumann, Klaus; and Altenschoepfer, Theodor, to Henkel Kommanditgesellschaft auf Aktien. Dishwashing compositions comprising an enzyme and a C_8–C_{10} alkanol with 0–2 moles of propylene oxide. 4,692,260, Cl. 252-99.000.

Supp, Armin; and Nebe, Rainer, to Krupp Polysius AG. Disperser for a flotation system. 4,692,244, Cl. 210-219.000.

Suringh, Jan F.: *See*—
van Leijenhorst, Harro M.; and Suringh, Jan F., 4,691,586, Cl. 74-479.000.

Sussman, Howard. Container for a plastic trash bag or the like. 4,691,841, Cl. 220-404.000.

Sutoh, Junichi: *See*—
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Sutoh, Junichi, 4,692,422, Cl. 501-136.000.

Sutton, Bernard. Versatile fitness kit. 4,691,915, Cl. 272-68.000.

Suwa, Masateru: *See*—
Nihei, Masayasu; Suwa, Masateru; and Chigasaki, Mitsuo, 4,692,230, Cl. 204-192.310.

Suzuki, Akira: *See*—
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Suzuki, Katsuhiro, to Sony Corporation. Disc cartridge having positive isolation means when in storage. 4,692,831, Cl. 360-133.000.

Suzuki, Kazufumi: *See*—
Unno, Shohei; Nakakawazi, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, to Takeda Riken Co., Ltd. IC test equipment. 4,691,831, Cl. 209-573.000.

Suzuki, Kenji, to Fuji Photo Film Co., Ltd. Color image sensor with picture elements each comprising an M×N matrix of red, green, and blue photoelectric conversion elements featuring controllable charge storage time and selective readout for each color. 4,692,794, Cl. 358-44.000.

Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, to Kabushiki Kaisha Toshiba. Majority circuit comprising binary counter. 4,692,640, Cl. 307-464.000.

Suzuki, Seigo, to Kabushiki Kaisha Toshiba. Analog signal processing apparatus. 4,692,738, Cl. 340-347.00C.

Suzuki, Takashi, to Sharp Kabushiki Kaisha. Electronic clinical thermometer. 4,691,713, Cl. 128-736.000.

Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Molding material and mold. 4,691,756, Cl. 164-361.000.

Suzuki, Tetsuo: *See*—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, to Takenaka Komuten Co., Ltd. Offshore unit structure. 4,692,065, Cl. 405-211.000.

Suzuki, Yoshio, to Toshiba Kikai Kabushiki Kaisha. Electrostatic chucks. 4,692,836, Cl. 361-234.000.

Swanson, Roy T., to S&C Electric Company. Switch for a high-voltage interrupting module. 4,692,577, Cl. 200-151.000.

Swanson, Roy T.; Chabala, Leonard V.; and Jackson, Hiram S., to S&C Electric Company. Interrupting device with improved current-limiting arrangement. 4,692,734, Cl. 337-162.000.

Swanson, Steve E.: *See*—
Shank, Jeffrey B.; Swanson, Steve E.; and Opdahl, Barry J., 4,691,985, Cl. 350-96.180.

Swenson, Roy S.; MacDonald, Donald M.; Ring, Michael; and Field, Jasper H., to International Paper Company. Kraft linerboard by densification and heat treatment. 4,692,212, Cl. 162-206.000.

SWF Electric GmbH: *See*—
Bauer, Kurt; and Schneider, Theodor, 4,692,677, Cl. 318-443.000.

Szuchy, Nicholas C., to Grumman Aerospace Corporation. Fiber optic aircraft load relief control system. 4,692,610, Cl. 250-227.000.

Tabata, Kuniaki: *See*—
Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, 4,692,757, Cl. 340-721.000.

Tachi, Hiroyuki: *See*—
Kantrowitz, Adrian; Freed, Paul S.; Tachi, Hiroyuki; and Suzuki, Akira, 4,692,148, Cl. 604-96.000.

Tachibana, Hirokazu: *See*—
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, 4,692,429, Cl. 502-303.000.

Tachibna, Natsuki; and Ichihara, Isey, to Kabushiki Kaisha Toshiba. Developing device. 4,691,663, Cl. 118-658.000.

Tachikawa Spring Co. Ltd.: *See*—
Mikuniya, Kunio; and Kojima, Akira, 4,691,963, Cl. 297-195.000.

Tada, Atsushi. Manually operated trigger type dispenser. 4,691,849, Cl. 222-382.000.

Tada, Naofumi: *See*—
Hotta, Yoshiji; Kuroda, Kunishige; Kimura, Hiroshi; Hara, Nobuhiro; and Tada, Naofumi, 4,692,560, Cl. 174-15.0CA.

Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, to Honda Giken Kogyo Kabushiki Kaisha. Outboard motor. 4,692,123, Cl. 440-77.000.

Taga, Yutaka; and Morisawa, Kunio, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for automatic transmission. 4,691,594, Cl. 74-869.000.

Taig, Alistair G., to Allied Corporation. Self-adjusting rack support. 4,691,583, Cl. 74-422.000.

Takada, Yasuo: *See*—
Suzuki, Takatoshi; Takada, Yasuo; Sakakibara, Yuji; Sugiura, Masahiro; Hayashi, Hiroaki; and Kamigaito, Osami, 4,691,756, Cl. 164-361.000.

Takagi, Kazumasa: *See*—
Kobayashi, Toshio; Takagi, Kazumasa; and Fukazawa, Tokuumi, 4,691,983, Cl. 350-96.120.

Takahara, Masayuki; and Momoki, Motoyasu, to Olympus Optical Co., Ltd. Magnetic recording/reproducing apparatus. 4,692,824, Cl. 360-85.000.

Takahashi, Katsuhiko; and Sugita, Michiyuki, to Polyplastics Co., Ltd. Thermoplastic resin composition. 4,692,480, Cl. 523-218.000.

Takahashi, Kenichi, to Hitachi, Ltd. System and method for automatic transaction. 4,692,600, Cl. 235-379.000.

Takahashi, Nobuaki: *See*—
Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.

Takahashi, Toru; and Yoshida, Taro, to Fujimori Kogyo Co., Inc. Laminated film for packaging. 4,692,327, Cl. 428-35.000.

Takai, Kiyoshi; and Iwasaki, Kiyoshi, to Godo Steel, Ltd. System using electric furnace exhaust gas to preheat scrap for steelmaking. 4,692,113, Cl. 432-72.000.

Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, to Ohi Seisakusho Co., Ltd. Actuator for remote devices or the like. 4,691,584, Cl. 74-471.00R.

Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Digital data output from a camera. 4,692,005, Cl. 354-21.000.

Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, to Tokyo Juki Industrial Co., Ltd. Input device for sewing machine. 4,691,649, Cl. 112-121.120.

Takano, Kunio: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

Takasu, Noboru: *See*—
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,691,872, Cl. 242-4.00R.

Takayama, Syuichi, to Olympus Optical Co. Calculus disintegrating apparatus. 4,691,706, Cl. 128-328.000.

Takeda Chemical Industries, Ltd.: *See*—
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

Takeda Riken Co., Ltd.: *See*—
Suzuki, Kempei; Iwanaga, Yushi; Sato, Hiroshi; Sato, Kohei; Igarashi, Noriyuki; and Koya, Shinichi, 4,691,831, Cl. 209-573.000.

Takei, Masahiro: *See*—
Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, 4,692,914, Cl. 369-49.000.

Takei, Toshihiro: *See*—
Matsuda, Takeshi; Miyamoto, Masasi; and Takei, Toshihiro, 4,692,092, Cl. 415-143.000.

Takekawa, Yujiro; and Matsuda, Fumio, to Tsudakoma Kogyo Kabushiki Kaisha. Multi-nozzle weft insertion device for a fluidic jet shuttleless-loom. 4,691,745, Cl. 139-435.000.

Takemae, Yoshihiro, to Fujitsu Limited. FET voltage reference circuit with threshold voltage compensation. 4,692,689, Cl. 323-313.000.

Takemura, Makoto: *See*—
Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, 4,692,778, Cl. 346-145.000.

Takenaka Komuten Co., Ltd.: *See*—
Suzuki, Yoshio; Yamamoto, Mitsuoki; and Hosomi, Hisashi, 4,692,065, Cl. 405-211.000.

Takenaka, Shigeo; Koike, Norio; Itou, Takeo; and Matsuda, Hidemi, to Kabushiki Kaisha Toshiba. Color cathode ray tube having shadow mask with silicon. 4,692,659, Cl. 313-402.000.

Takeshima, Tohru: *See*—
Ooami, Kazuo; Sugo, Yasuhisa; and Takeshima, Tohru, 4,692,900, Cl. 365-63.000.

Takeuchi, Hiroshi: *See*—
Kushida, Keiko; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,653, Cl. 310-334.000.
Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, 4,692,654, Cl. 310-334.000.

Takeuchi, Kobuo: *See*—
Hotate, Makoto; Nishikawa, Toshio; Takeuchi, Kobuo; Okuno, Itaru; and Nakazumi, Tadataka, 4,691,677, Cl. 123-399.000.

Takiguchi, Haruhisa: *See—*
Kanerwa, Shinji; Takiguchi, Haruhisa; Yoshida, Toshihiko; and Matsui, Sadayoshi, 4,692,206, Cl. 156-649.000.

Takita, Kentaro: *See—*
Miki, Yasuhiko; and Takita, Kentaro, 4,692,886, Cl. 364-718.000.

Takizawa, Satoshi, to Nissan Motor Co., Ltd. Apparatus for controlling lock-up clutch of lock-up type automatic transmission of automobile. 4,691,812, Cl. 192-3.300.

Tamai, Motomi: *See—*
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Tamfelt Oy Ab: *See—*
Juutilainen, Holger, 4,692,059, Cl. 405-63.000.

Tamoni, Giorgio: *See—*
Pirali, Giorgio; Grandi, Maria; Pagani, Hermes; Paternoster, Manuela; Tamoni, Giorgio; and Cassani, Giovanni, 4,692,333, Cl. 424-122.000.

Tamura, Hiroshi: *See—*
Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, 4,692,727, Cl. 333-219.000.

Tamura, Kazuyuki: *See—*
Masuda, Sumio; Iiyama, Hiroshi; and Tamura, Kazuyuki, 4,692,613, Cl. 250-231.05E.

Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, to Nissan Motor Co., Ltd. Machine for holding workpiece. 4,691,905, Cl. 269-45.000.

Tamura, Takahiko; and Sengoku, Yoshinari, to Sony Corporation. Circuit for blanking the video of a television set for a time after turn-on. 4,692,793, Cl. 358-29.000.

Tamura, Takashi, to Konishiroku Photo Industry Co., Ltd. Cartridge-type apparatus for exchanging a developing device and toner supply container. 4,692,018, Cl. 355-3.00R.

Tanabe Seiyaku Co., Ltd.: *See—*
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.

Tanabe, Yoshimitsu: *See—*
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Refrigeration Company. Heat exchanger. 4,691,767, Cl. 165-151.000.

Tanaka, Kunio: *See—*
Kishi, Hajimu; and Tanaka, Kunio, 4,692,873, Cl. 364-474.000.

Tanaka, Sinya: *See—*
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Tanaka, Sumio; Saito, Shinji; and Atsumi, Shigeru, to Kabushiki Kaisha Toshiba. Semiconductor read only memory device with improved access time. 4,692,902, Cl. 365-210.000.

Tani, Zempei; Masuda, Yoshifumi; and Miyake, Toshihide, to Sharp Kabushiki Kaisha. Semiconductor color sensor detection circuit. 4,692,025, Cl. 356-45.000.

Taniguchi, Harutaka; and Fumoto, Takafumi, to Fuji Electric Co., Ltd.; and Fuji Electric Corporate Research and Development Ltd. Infrared analyzer. 4,692,622, Cl. 250-343.000.

Taniguchi, Masato: *See—*
Kojima, Takio; and Taniguchi, Masato, 4,691,673, Cl. 123-271.000.

Taniguchi, Tomoyasu: *See—*
Kisumi, Masahiko; Komatsubara, Saburo; and Taniguchi, Tomoyasu, 4,692,409, Cl. 435-109.000.

Tanne, Emanuel. Automatic corneal surgery system. 4,691,715, Cl. 128-774.000.

Tanne, Emanuel. Automatic corneal surgery system. 4,691,716, Cl. 128-774.000.

Tannhaeuser, Rolf; and Herrmann, Franz, to Siemens Aktiengesellschaft. Apparatus for generating patterns of test signals. 4,692,920, Cl. 371-27.000.

Tanno, Satoshi: *See—*
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, to Kowa Company Ltd. Autonatic focus adjustment apparatus. 4,692,012, Cl. 354-403.000.

Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, to Toyota Jidosha Kabushiki Kaisha. Control apparatus for power-assisted steering system. 4,691,796, Cl. 180-142.000.

Tarman, Paul B.: *See—*
Bodle, William W.; and Tarman, Paul B., 4,692,238, Cl. 208-407.000.

Tarrson, Emanuel B.; Maric, Dane; and Kelly, Thomas P., to John O. Butler Company. Toothbrush. 4,691,404, Cl. 15-167.00R.

Tashiro, Yasunori: *See—*
Hayashi, Torahiko; and Tashiro, Yasunori, 4,692,109, Cl. 425-308.000.

Tasson, Brian B.: *See—*
Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, 4,691,638, Cl. 102-434.000.

Tatar, Fred W.: *See—*
Dundas, Robert E.; and Tatar, Fred W., 4,692,701, Cl. 324-240.000.

Tatsuda, Kazunori: *See—*
Kobayashi, Masaaki; Okubo, Yosiyuki; and Tatsuda, Kazunori, 4,692,663, Cl. 313-495.000.

Tauscher, Willy; and Schneider, Gottlieb, to Sulzer Brothers Limited. Static mixing device for viscous melts. 4,692,030, Cl. 366-337.000.

Taylor, Jack D.; and Collier, L. Warren, IV, to Kimberly-Clark Corporation. Elastic spunlaced polyester-meltblown polyetherurethane laminate. 4,692,368, Cl. 428-137.000.

Taylor, Peter J.; Clarke, Alan; and Thompson, John S., to Plessey Overseas Ltd. Fuel supply systems. 4,691,510, Cl. 60-39.094.

TDK Corporation: *See—*
Fujiwara, Shinobu; Satoh, Atsushi; Hattori, Tetsuya; and Satoh, Junichi, 4,692,422, Cl. 501-136.000.
Ota, Hiroshi, 4,692,377, Cl. 428-323.000.

Teac Corporation: *See—*
Noda, Yasushi; and Kitahara, Toshihiro, 4,692,828, Cl. 360-97.000.

Technalytica, Inc.: *See—*
Storace, Anthony, 4,691,853, Cl. 227-19.000.

Technitrol, Inc.: *See—*
Cargill, N. Allen; and Malashkin, Michail, 4,691,910, Cl. 271-3.000.

Tecumseh Products Company: *See—*
Geringer, Miles S.; and Kaufman, Vernan R., 4,691,590, Cl. 74-579.00E.

Tedder, Daniel W., to Georgia Tech Research Corporation. Two cycle process for producing fuel-grade ethanol from dilute aqueous mixtures. 4,692,432, Cl. 568-916.000.

Tekna Recherche & Developpment Inc.: *See—*
Tremblay, Paul; and Tzabanakis, Georges, 4,691,988, Cl. 350-96.230.

Tektronix, Inc.: *See—*
Quinn, Patrick A., 4,692,712, Cl. 330-261.000.

Telectronics N.V.: *See—*
Whigham, Robert H., 4,692,719, Cl. 332-11.00D.

Teledyne Canada Limited: *See—*
Parsons, Michael, 4,692,085, Cl. 414-633.000.

Teledyne Industries, Inc.: *See—*
Kadis, Paul M., 4,691,902, Cl. 267-119.000.

Telefonaktiebolaget LM Ericsson: *See—*
Andersen, Ib N., 4,692,860, Cl. 364-200.000.

Teams, Tadashi; Akashi, Kichizo; Konishi, Yozo; and Watase, Hideo, to Hitachi, Ltd. Automatic freight stacking system. 4,692,876, Cl. 364-513.000.

Tenneco Canada Inc. (ERCO division): *See—*
Twardowski, Zbigniew, 4,692,228, Cl. 204-105.00R.

Tenud, Leander; and Gonteli, Jacques, to Lonza Ltd. Optically-active di-[3-chloro-2-oxy-propyltrimethylammonium]-tartrate. 4,692,543, Cl. 558-342.000.

Teoh, Eam K.; Goodwin, Graham C.; and Edwards, William J., to John Lysaght (Australia) Limited. Rolling mill strip thickness controller. 4,691,547, Cl. 72-16.000.

Terada, Motoharu: *See—*
Murakami, Kazumasa; and Terada, Motoharu, 4,692,750, Cl. 340-588.000.

Teramachi, Hiroshi. Recirculating-ball linear bearing and guide rail therefor. 4,692,039, Cl. 384-45.000.

Terasawa, Masaaki: *See—*
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Ternstrom, Maj I.: *See—*
Widlund, Leif U. R.; and Ternstrom, Maj I., 4,692,163, Cl. 604-385.00A.

Teske, Richard E.: *See—*
Eberhardt, H. Alfred; Broitman, Kalman; Evangelista, Richard A.; Teske, Richard E.; and Sulmone, Michael, 4,691,667, Cl. 123-633.000.

Teskin, Frederick M.: *See—*
Ficker, Harold K.; and Teskin, Frederick M., 4,692,489, Cl. 524-243.000.

Tesser, Godefridus I.; and Claesen, Christianus A. A., to Stichting Katholieke Universiteit. Phosphorylating agent. 4,692,542, Cl. 558-184.000.

Tessier, James R.: *See—*
Roucek, Joseph A.; and Tessier, James R., 4,691,426, Cl. 29-402.180.

Tetenbaum, Marvin T.: *See—*
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Elliot J., 4,692,382, Cl. 428-414.000.
Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; and Tetenbaum, Marvin T., 4,692,383, Cl. 428-414.000.

Texaco Inc: *See—*
Mazzagatti, Roy P.; and Dowling, Donald J., 4,692,706, Cl. 324-338.000.

Texaco Inc.: *See—*
Friedman, Robert H., 4,692,239, Cl. 208-430.000.
Stellaccio, Robert J.; and Suggitt, Robert M., 4,692,172, Cl. 48-197.00R.

Texas A&M University System, The: *See—*
Lindner, Luther E.; and Wechter, Stephen R., 4,692,403, Cl. 435-5.000.

Texas Instruments Incorporated: *See—*
Bayraktaroglu, Burhan, 4,692,791, Cl. 357-81.000.
Haefling, James F.; Pritchard, James W.; and Stierman, Roger J., 4,691,854, Cl. 228-4.500.
Possley, Glen G.; and Wilson, Earl C., 4,692,787, Cl. 357-59.000.

Rountree, Robert N.; and Herndon, Troy H., 4,692,781, Cl. 357-23.130.
Stiegler, Harvey J., 4,692,638, Cl. 307-449.000.
Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., 4,691,886, Cl. 248-183.000.

TH. Goldschmidt AG: *See—*
Fock, Jurgen; Esselborn, Eberhard; Fink, Hans-Ferdi; and Heilen, Wernfried, 4,692,267, Cl. 252-321.000.
Kollmeier, Hans-Joachim; and Lammerting, Helmut, 4,692,292, Cl. 264-126.000.

Thaniyavarn, Suwat, to TRW Inc. Wavelength-independent polarization converter. 4,691,984, Cl. 350-96.140.

Theeuwes, Felix: *See—*
Eckenhoff, James B.; Theeuwes, Felix; and Deters, Joseph C., 4,692,326, Cl. 424-15.000.

Theis, Peter F., to Morgan Industries, Inc. Programmed conversation recording system. 4,692,817, Cl. 360-12.000.

Theissen, Mario: *See—*
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Theissen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Theodoulou, Sotos M.: *See—*
Maczuszenko, Andrzej; Theodoulou, Sotos M.; and Rumsey, John, 4,692,017, Cl. 355-3.0DD.

Thermco Systems, Inc.: *See—*
Aldridge, Robert E.; Elloway, Russell; Fritz, William O.; Goff, Ralph D.; and Herrera, Michael J., 4,692,115, Cl. 432-242.000.

Thermo Electron-Web Systems, Inc.: *See—*
Goodnow, Ronald F.; and Reid, Robert A., 4,691,406, Cl. 15-256.530.

Theuer, Rudolf: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for measuring track parameters. 4,691,565, Cl. 73-146.000.

Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., to UNIPAT AG. Rotary hydrostatic machines or transmissions. 4,691,512, Cl. 60-456.000.

Thomas, Charles E. Low-distortion line voltage regulator. 4,692,686, Cl. 323-263.000.

Thompson, John S.: *See—*
Taylor, Peter J.; Clarke, Alan; and Thompson, John S., 4,691,510, Cl. 60-39.094.

Thomson CSF: *See—*
Becavin, Henri G., 4,692,768, Cl. 342-368.000.
de Sartre, Jean; and Maige, Philippe, 4,692,853, Cl. 363-49.000.
Morgand, Jean P., 4,692,942, Cl. 381-114.000.

Thomson Video Equipement: *See—*
Phan Van Cang, Luc, 4,692,759, Cl. 340-748.000.

Tifre, Salustiano. Space skating shoe. 4,691,453, Cl. 36-8.300.

Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, to SKF Gleitlager GmbH. Method and apparatus for making ball and socket joints incorporating a slip liner. 4,691,422, Cl. 29-149.50B.

Timmons, Robert D. Process for making a molded porous fluoroplastic resin material. 4,692,287, Cl. 264-41.000.

Titus, John D.; and Hall, Phillip E., to Motorola, Inc. Electro-explosive safety and arming device. 4,691,634, Cl. 102-245.000.

Tlucko, Jozef: *See—*
Brychta, Ondrej; Tlucko, Jozef; Magdolen, Viktor; Brostik, Miroslav; and Klimacek, Dusan, 4,691,700, Cl. 128-200.210.

TMC Corporation: *See—*
Nowak, Gerhard; Winter, Alfred; Morbitzer, Hans P.; Kruschik, Klaus; and Theuer, Rudolf, 4,691,936, Cl. 280-615.000.

Tobita, Katsumi, to Alps Electric Co., Ltd. CATV converter having phase locked loop for sound carrier wave frequency control. 4,692,803, Cl. 358-143.000.

Tofanetti, Odoardo: *See—*
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Tognella, Sergio: *See—*
Cignarella, Giorgio; Gandolfi, Carmelo A.; Tofanetti, Odoardo; Cipolla, Piervitto; and Tognella, Sergio, 4,692,447, Cl. 514-248.000.

Tokita, Minoru: *See—*
Onuma, Eiichi; Kawamura, Youji; Obana, Hiroshi; Aizawa, Takemi; Tamai, Motomi; Inagaki, Tsuguya; and Tokita, Minoru, 4,691,869, Cl. 241-34.000.

Tokunaga, Hiroshi: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

Tokunaga, Kunishige: *See—*
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, to Hitachi, Ltd. Semiconductor switching device having plural MOSFET's, GTO's or the like connected in series. 4,692,643, Cl. 307-584.000.

Tokura, Go: *See—*
Arakawa, Kazuhiko; Tokura, Go; Fujibayashi, Kazuo; Kiuchi, Masayoshi; and Harada, Yoshihito, 4,692,008, Cl. 354-217.000.

Tokyo Electric Co., Ltd.: *See—*
Hujita, Yutaka, 4,692,679, Cl. 318-696.000.
Unno, Shohei; Nakakawari, Mikio; and Suzuki, Kazufumi, 4,692,760, Cl. 340-756.000.

Tokyo Gas Co., Ltd.: *See—*
Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, 4,691,788, Cl. 175-62.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.
Takano, Kunio; Nukushina, Masanori; Okiyama, Yoichi; and Miyamoto, Toshiyuki, 4,691,649, Cl. 112-121.120.

Tokyo Kagaku Kakai Kabushiki Kaisha: *See—*
Koizumi, Hiroshi; Kijima, Masatsugu; and Tanaka, Sinya, 4,692,924, Cl. 372-30.000.

Tokyo Kagaku Kikai Kabushiki Kaisha: *See—*
Ohtomo, Fumio; Hori, Nobuo; Horikawa, Yoshio; Kimura, Kazuaki; and Sugai, Hiroo, 4,692,023, Cl. 356-5.000.

Tokyo Keiki Company, Ltd.: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Naka, Shigekatsu, 4,692,090, Cl. 415-112.000.
Wada, Masashi, 4,692,785, Cl. 357-52.000.

Tolpin, Thomas W.; and Kretchmer, Richard A., to Amoco Corporation. Process for simultaneously removing nitrogen oxides, sulfur oxides, and particulates. 4,692,318, Cl. 423-239.000.

Tomaki, Kenji: *See—*
Masuda, Noboru; Tomaki, Kenji; Oosawa, Tetsuo; and Murata, Michihiro, 4,692,619, Cl. 250-338.000.

Tomashauser, Josef: *See—*
Zodrow, Rudolf; and Tomashauser, Josef, 4,692,201, Cl. 156-488.000.

Tomcanin, William J.: *See—*
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.

Tomita, Koji: *See—*
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,692,510, Cl. 530-317.000.

Tomms, Kauko, to Oy Wartsila AB. Method for producing a concrete-filled steel body for suppressing vibrations. 4,691,488, Cl. 52-223.00R.

Tomse, Jack. Towing system for vehicles. 4,691,934, Cl. 280-503.000.

Tomy Kogyo Co., Inc.: *See—*
Iseki, Takeo, 4,691,921, Cl. 273-85.00B.

Tongu, Shinji, to Yazaki Corporation. Air-cooled absorption type water cooling/heating apparatus. 4,691,528, Cl. 62-238.300.

Topness, Paul C.: *See—*
Ganz, Ulrich W.; and Topness, Paul C., 4,691,561, Cl. 73-117.100.

Torgerson, Gary D.; and Ferm, Joyce E., to Ferm & Torgerson Partnership. Hinge mask. 4,691,409, Cl. 16-250.000.

Torley, Lawrence W.: *See—*
Medwid, Jeffrey B.; and Torley, Lawrence W., 4,692,449, Cl. 514-254.000.

Tornay, Edmund, to Energy Transportation Group Inc. Tug/barge apparatus. 4,691,660, Cl. 114-248.000.

Torossian, Kevork A.; Markovitz, Mark; and Cox, Frederick E., to General Electric Company. Unique epoxy resin compositions and composite molded bodies filled therewith. 4,692,499, Cl. 525-524.000.

Torrington Company, The: *See—*
Ebaugh, Roger L.; and Rhodes, Jerry P., 4,692,040, Cl. 384-484.000.

Tosbac Computer System Co., Ltd.: *See—*
Iwahashi, Hiroshi; Asano, Masamichi; and Narita, Akira, 4,692,834, Cl. 361-91.000.

Toshiba Ceramics Co., Ltd.: *See—*
Ishino, Yoshihiro; Sugiura, Sadanobu; and Tokunaga, Kunishige, 4,691,844, Cl. 222-591.000.

Toshiba Kikai Kabushiki Kaisha: *See—*
Suzuki, Yoshio, 4,692,836, Cl. 361-234.000.

Toshimitsu, Hiroyuki: *See—*
Shikamori, Tamotsu; Toshimitsu, Hiroyuki; Ohsugi, Hiroshi; Hiyama, Isao; and Fukuzawa, Soichi, 4,691,538, Cl. 68-12.00R.

Toth, Kalman: *See—*
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Town Talk, Inc.: *See—*
Meyer, Eugene F., 4,691,389, Cl. 2-195.000.

Toyo Chemical Co., Ltd.: *See—*
Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, 4,692,197, Cl. 156-189.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Ikushima, Fumio; Itoh, Senji; and Kogashiwa, Kiyonori, 4,692,132, Cl. 493-103.000.
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, to Canon Kabushiki Kaisha. Braking device for shutter. 4,692,009, Cl. 354-246.000.

Toyoda, Yukio: *See—*
Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, 4,692,313, Cl. 422-241.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Haga, Minoru; Kaneko, Shinobu; Ikawa, Shoji; Murayama, Kimimasa; Nakamura, Yasuhide; and Saito, Mitsuo, 4,691,551, Cl. 72-88.000.
Hyodo, Youichi, 4,691,932, Cl. 280-91.000.

Miyadera, Kazuhiko, 4,691,960, Cl. 296-37.800.
Taga, Yutaka; and Morisawa, Kunio, 4,691,594, Cl. 74-869.000.
Tanooka, Shigeo; Mori, Yutaka; Oono, Akihiro; and Hasegawa, Akira, 4,691,796, Cl. 180-142.000.
Yao, Hiroyuki; and Okamoto, Yuji, 4,691,476, Cl. 49-374.000.

Toyota, Makoto: *See—*
Cooper, David H.; Toyota, Makoto; and Arakawa, Satoshi, 4,692,608, Cl. 250-216.000.

Trautmann, Walter: *See—*
Leininger, Hartmut; Littmann, Wolfgang; Paust, Joachim; and Trautmann, Walter, 4,692,527, Cl. 544-405.000.

Travale, Samuel: *See—*
Shepherd, Charles G.; and Travale, Samuel, 4,691,689, Cl. 126-295.000.

Trayco, Inc.: *See—*
Whitney, Thomas H., 4,691,392, Cl. 4-595.000.

Trchnische (Rijks) Hogeschool: *See—*
van der Vegt, Anne K., 4,692,495, Cl. 525-184.000.

Trebor Industries, Inc.: *See—*
Rosenthal, Robert D., 4,692,620, Cl. 250-343.000.

Tremblay, Paul; and Tzabanakis, Georges, to Tekna Recherche & Developpment Inc. Pulling eye assembly. 4,691,988, Cl. 350-96.230.

Trequilly, Yves: *See—*
Andrieux, Alain; Trequilly, Yves; and Lavoine, Jean-Claude, 4,692,841, Cl. 361-395.000.

Tresal, Guenther: *See—*
Conrad, Bernhard; and Tresal, Guenther, 4,692,813, Cl. 358-294.000.

Tribometrics, Inc.: *See—*
Lewis, Robert T., 4,692,698, Cl. 324-204.000.

Trillian Computer Corporation: *See—*
Redford, Peter M.; and Redford, Rita A., 4,692,858, Cl. 364-200.000.

Trinh, Vinh-Dinh D.; Scholtes, Ronald P.; and Sumner, Terence E., to Motorola, Inc. Panel assembly with easily detachable switch actuators. 4,692,571, Cl. 200-5.00A.

Troutner, Vernon H.; and King, Martin J., to McNeilab, Inc. Pump block for interfacing irradiation chamber to photoactivation patient treatment system. 4,692,138, Cl. 604-4.000.

Trubiano, Antoine, to Cari-All Inc. Locking device for interlocking nested shopping carts. 4,691,816, Cl. 194-212.000.

Trumbauer, David V.; Fosbinder, Larry L.; and Erion, Terry L., to Deere & Company. Method for forming castings having inserts. 4,691,754, Cl. 164-9.000.

Trutzschler GmbH & Co. KG: *See—*
Kluttermann, Jurgen; and Trutzschler, Hermann, 4,691,413, Cl. 19-159.00R.
Kluttermann, Jurgen, 4,691,414, Cl. 19-159.00R.

Trutzschler, Hermann: *See—*
Kluttermann, Jurgen; and Trutzschler, Hermann, 4,691,413, Cl. 19-159.00R.

TRW Automotive Products Inc.: *See—*
Higbee, Wallace C., 4,691,875, Cl. 242-107.40B.

TRW Inc.: *See—*
Friedman, Gerald, 4,691,857, Cl. 228-265.000.
Miller, Laurence L., 4,691,797, Cl. 180-143.000.
Thaniyavarn, Suwat, 4,691,984, Cl. 350-96.140.

Tsubakimoto Chain Co.: *See—*
Murai, Masasumi, 4,691,640, Cl. 104-140.000.
Yokoi, Satoru; and Kondo, Hirokazu, 4,692,694, Cl. 324-158.00F.

Tsuboi, Shinichi: *See—*
Kume, Toyohiko; Tsuboi, Shinichi; and Isono, Kunihiro, 4,692,436, Cl. 514-129.000.

Tsuchiya, Hiroyoshi; Kurosawa, Toshiharu; Otsuka, Hirotaka; Maruyama, Yuuji; and Nakazato, Katsuo, to Matsushita Electric Industrial Co., Ltd. Apparatus for processing image signal. 4,692,811, Cl. 358-282.000.

Tsuchiya, Yasuyuki; and Sakamoto, Hiroyuki, to Nippon Paint Co., Ltd. Water-based paint composition. 4,692,483, Cl. 523-406.000.

Tsuda, Tatsuya; and Nogi, Masako, to Sharp Kabushiki Kaisha. Heating appliance with uniform heating control. 4,692,597, Cl. 219-492.000.

Tsuda, Yoshiyuki: *See—*
Tanaka, Hiroyoshi; Adachi, Masaaki; Tsuda, Yoshiyuki; Aoyama, Shigeo; Tanno, Satoshi; and Kato, Kaoru, 4,691,767, Cl. 165-151.000.

Tsudaka, Hideaki: *See—*
Morimoto, Kiyoshi; Kawamoto, Masuo; Kobayashi, Hiroshi; Hashizume, Masahiro; Tsudaka, Hideaki; and Kimura, Hiroshi, 4,692,019, Cl. 355-8.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Takekawa, Yujiro; and Matsuda, Fumio, 4,691,745, Cl. 139-435.000.

Tsuhara, Susumu; Tabata, Kuniaki; and Okada, Yasuyuki, to Hitachi, Ltd. Multimedia display system. 4,692,757, Cl. 340-721.000.

Tsujihara, Sotohiro, to Ricoh Company, Ltd. Sheet reversing in copying machine and other sheet-handling machines. 4,692,020, Cl. 355-14.0SH.

Tsukamoto, Yoshinori: *See—*
Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, 4,692,414, Cl. 435-291.000.

Tsukamura, Kazuo: *See—*
Naito, Kenzo; Tsukamura, Kazuo; and Aoyagi, Sakae, 4,692,519, Cl. 540-227.000.

Tsukimoto, Takayuki: *See—*
Hiramatsu, Akira; Mukohjima, Hitoshi; Kaneda, Naoya; Okuno, Takuo; Seki, Hiroyuki; Tsukimoto, Takayuki; Izukawa, Kazuhiro; and Okumura, Ichiro, 4,692,651, Cl. 310-323.000.
Okumura, Ichiro; Tsukimoto, Takayuki; Okuno, Takuo; Izukawa, Kazuhiro; Seki, Hiroyuki; Mukohjima, Hitoshi; Kaneda, Naoya; and Hiramatsu, Akira, 4,692,650, Cl. 310-323.000.

Tsunoda, Minoru: *See—*
Kadono, Kohji; and Tsunoda, Minoru, 4,691,800, Cl. 180-219.000.

Tufts College, Trustees of: *See—*
Dodman, Nicholas H.; and Shuster, Louis, 4,692,451, Cl. 514-282.000.

Tung, Francisca: *See—*
Lee, James C. K.; Beck, Richard L.; and Tung, Francisca, 4,692,839, Cl. 361-386.000.

Tutco, Inc.: *See—*
Howard, H. Keith; and Sherrill, Jimmy L., 4,692,599, Cl. 219-532.000.

Tveryanovich, Eduard V.: *See—*
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

Twardowski, Zbigniew, to Tenneco Canada Inc. (ERCO division). Removal of arsenic from acids. 4,692,228, Cl. 204-105.00R.

Tzabanakis, Georges: *See—*
Tremblay, Paul; and Tzabanakis, Georges, 4,691,988, Cl. 350-96.230.

Ube Industries: *See—*
Kuriyama, Minoru; and Yamamoto, Tadashi, 4,691,755, Cl. 164-305.000.

Uchida, Hiroyuki. Photopolymerizable resin composition for producing aqueous-development type dry film resists. 4,692,396, Cl. 430-284.000.

Uchikata, Yoshio: *See—*
Nagashima, Masasumi; Nozaki, Mineo; Asakura, Osamu; and Uchikata, Yoshio, 4,692,774, Cl. 346-76.0PH.

Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., to Standard Oil Company, The. Polymerization process for carboxyl containing polymers utilizing oil soluble ionic surface active agents. 4,692,502, Cl. 526-193.000.

Ueda, Ikuo; Shiokawa, Youichi; Manabe, Takashi; and Katsura, Yousuke, to Fujisawa Pharmaceutical Co., Ltd. 1,4-Dihydro[1]benzothiopyrano[4,3-c]pyrazole derivatives, compositions containing them, and pharmacological methods of using them. 4,692,444, Cl. 514-406.000.

Ueda, Koutarou; Hasegawa, Noboru; Machihara, Akio; Kusaka, Masaharu; Orii, Kohei; and Noguchi, Yoshiro, to Toyo Chemical Co., Ltd. Method for manufacturing corrugated tubes. 4,692,197, Cl. 156-189.000.

Ueda, Yoshihiro; Ono, Kouichi; Oomori, Tatsuo; and Fujita, Shigeto, to Mitsubishi Denki Kabushiki Kaisha. Ion beam generator. 4,692,627, Cl. 250-423.00P.

Uehara, Mitsuru: *See—*
Setoguti, Syohati; Nakatake, Yoshiteru; Uehara, Mitsuru; and Kudou, Masayuki, 4,692,835, Cl. 361-104.000.

Uemura, Yahiro; and Funakoshi, Satoshi, to Green Cross Corporation, The. Gamma-globulin preparation for intravenous administration. 4,692,331, Cl. 424-85.000.

Uemura, Yukio: *See—*
Fujita, Masahiro; and Uemura, Yukio, 4,691,786, Cl. 173-12.000.

Ueno, Hiroshi: *See—*
Machii, Akihiko; Ikegami, Hiroo; Ishinabe, Masao; Imazu, Katsuhiro; and Ueno, Hiroshi, 4,692,810, Cl. 358-256.000.

Ueno, Koichi: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Ueno, Tetsuo: *See—*
Ito, Kimiaki; Ueno, Tetsuo; Ueno, Koichi; and Ishii, Susumu, 4,691,659, Cl. 114-144.00R.

Uhlmann, Ernst: *See—*
Percival, Richard; and Uhlmann, Ernst, 4,691,434, Cl. 437-173.000.

Ujiie, Kazuaki: *See—*
Sato, Nobuyuki; Ujiie, Kazuaki; Terasawa, Masaaki; and Nabetani, Shinji, 4,692,904, Cl. 365-226.000.

Ujiie, Noriaki: *See—*
Hara, Yasuhiko; Karasaki, Koichi; Ujiie, Noriaki; and Sase, Akira, 4,692,690, Cl. 324-73.0PC.

Ukigaya, Fumio: *See—*
Aoki, Akira; and Ukigaya, Fumio, 4,692,804, Cl. 358-163.000.

Ukigaya, Tadashi; and Ogawa, Keizaburo, to Nikken Chemicals Co., Ltd. Sustained release pharmaceutical tablet of theophylline and production process thereof. 4,692,337, Cl. 424-469.000.

Ullman, Myron, to Dover Molded Products Company, The. Single finger-opening resilient cap. 4,691,839, Cl. 220-281.000.

Ultramed Corporation: *See—*
Parisi, Tulio T., 4,691,725, Cl. 134-184.000.

Umeda, Yoshiaki; Matsumoto, Ryouhei; Isomura, Hiroyasu; and Shimotaka, Hisakuni, to Fuji Machinery Company, Ltd. Method of tensioning a web of packaging material. 4,691,499, Cl. 53-451.000.

Umemoto, Mitsumasa: *See—*
Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, 4,692,466, Cl. 514-604.000.

Umemura, Masashi; Konishi, Masanori; Fukushima, Aritoshi; Hisano, Junichi; and Okamoto, Toshiaki, to Asahi Denka Kogyo K.K. Molybdenum-containing lubricant composition. 4,692,256, Cl. 252-32.70E.

Umemura, Shinichiro; Takeuchi, Hiroshi; and Katakura, Kageyoshi, to Hitachi, Ltd.; and Hitachi Medical Corporation. Ultrasonic transducer of monolithic array type. 4,692,654, Cl. 310-334.000.

Umeno, Hiroshi: *See—*
Tada, Yukio; Umeno, Hiroshi; Sugimoto, Yasuhiro; and Oka, Hideo, 4,692,123, Cl. 440-77.000.

Unger, Hans-Georg, to ANT Nachrichtentechnik GmbH. Single mode modified W-fiber. 4,691,991, Cl. 350-96.330.

Uni-Cardan Aktiengesellschaft: *See—*
Ehrlenspiel, Klaus; John, Thomas; and Streinz, Wolfgang, 4,692,126, Cl. 464-103.000.

Union Carbide Corporation: *See—*
Angell, Richard G., Jr., 4,692,291, Cl. 264-109.000.

Union Oil Company of California: *See—*
Ebenhack, Ben W.; and Floran, Robert J., 4,691,772, Cl. 166-294.000.

UNIPAT AG: *See—*
Thoma, Christian H.; Arnold, George D. Mc.; and Blair, Arthur A., 4,691,512, Cl. 60-456.000.

Uniroyal Chemical Company, Inc.: *See—*
Rowland, Donald G.; Hunter, Byron A.; and Hansen, Lee D., 4,692,475, Cl. 521-92.000.

United Aircraft Products, Inc.: *See—*
Gooden, Richmond A., 4,691,739, Cl. 138-31.000.

United Engineering Rolling Mills, Inc.: *See—*
Adair, James R., 4,691,549, Cl. 72-38.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Leigh, John W., 4,691,637, Cl. 102-406.000.

United States of America
Army: *See—*
Leupold, Herbert A.; Potenziani, Ernest, II; and Clarke, John, 4,692,732, Cl. 335-302.000.
Richter, Mark A., 4,692,367, Cl. 428-116.000.
Roberts, Thomas G.; Conrad, Raymond W.; Otto, William F.; and Honeycutt, Thomas E., 4,692,623, Cl. 250-349.000.
Sommer, Harold Z., 4,692,530, Cl. 546-261.000.

Commerce: *See—*
Spinelli, John; Stout, Virginia F.; and Nilsson, William B., 4,692,280, Cl. 260-420.000.

Health and Human Services: *See—*
Brossi, Arnold, 4,692,463, Cl. 514-463.000.

Interior: *See—*
Riley, William D.; and Brown, Robert D., Jr., 4,692,875, Cl. 364-497.000.

National Aeronautics and Space Administration: *See—*
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Bocker, Richard P.; and Miceli, William J., 4,692,885, Cl. 364-606.000.
Gegan, Michael J., 4,692,769, Cl. 343-700.0MS.
Vaughan, John C.; and Perkins, Russel G., Jr., 4,691,878, Cl. 244-7.00R.

U.S. Philips Corporation: *See—*
Clark, David G., 4,692,756, Cl. 340-709.000.
Fabien, Raymond; and Decrouen, Jean-Michel, 4,692,204, Cl. 156-626.000.
Hennings, Detlev; Schnell, Axel; and Schreinemacher, Herbert, 4,692,289, Cl. 264-61.000.
Kabacinski, Mariusz, 4,692,822, Cl. 360-84.000.
Khoe, Giok D.; and De Vrieze, Henricus M., 4,692,208, Cl. 156-659.100.
Larsson, Klas G. I.; Lindholm, Rolf C.; and Strom, Johan P., 4,691,616, Cl. 89-41.070.
Osinga, Halbe, 4,692,731, Cl. 335-299.000.
Rouws, Petrus L. A., 4,692,916, Cl. 369-75.200.
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Stikvoort, Eduard F.; van Roermund, Arthur H. M.; and Naus, Peter J. A., 4,692,737, Cl. 340-347.0DD.

United States Steel Corporation: *See—*
Polansky, Jon L.; Rice, Douglas N.; Tomcanin, William J.; and Cribbs, Timothy B., 4,692,216, Cl. 201-1.000.

University of California, The Regents of the: *See—*
Hostetler, Karl Y.; and Deftos, Leonard J., 4,692,433, Cl. 514-12.000.
Sankar, Pat V., 4,691,707, Cl. 128-660.000.

University of Kentucky, Board of Trustees of the: *See—*
Kao, David T., 4,691,620, Cl. 92-80.000.

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Ryan, James W.; and Chung, Alfred, 4,692,437, Cl. 514-165.000.
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University of Missouri, The Curators of the: *See—*
Yasuda, Hirotsuga K., 4,692,347, Cl. 427-40.000.

University of Pittsburgh: *See—*
Sashin, Donald; and Sternglass, Ernest J., 4,692,937, Cl. 378-062.000.

Unno, Shohei; Nakakawari, Mikio; and Suzuki, Kazufumi, to Tokyo Electric Co., Ltd. Display apparatus. 4,692,760, Cl. 340-756.000.

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Chang, Chin-Hsiung, 4,692,514, Cl. 536-127.000.

Upton, Gain; and Spector, George. Rain detector. 4,692,751, Cl. 340-602.000.

Urso, Charles L. Safety heater. 4,691,688, Cl. 126-208.000.

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Grewe, Ronald E.; Hillstrom, David U.; Seely, James R.; and Ursprung, Cecil, 4,691,892, Cl. 248-624.000.

Ushigome, Hideji. Forked shell and membrane stripper for boiled eggs. 4,691,440, Cl. 30-322.000.

Ushiro, Masayuki, to Nissan Motor Co., Ltd. Surplus warp yarn treating device of loom. 4,691,742, Cl. 139-1.00R.

Ussery, Hoyt D. Educational puzzle box. 4,692,119, Cl. 434-259.000.

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Takaishi, Tatsuyuki; Kobayashi, Fumio; Usui, Keizaburo; and Kagiyama, Tsutomu, 4,691,584, Cl. 74-471.00R.

Utsumi, Takayuki: *See—*
Tano, Touru; Fujita, Akihiro; and Utsumi, Takayuki, 4,692,012, Cl. 354-403.000.

Vaglini, Franco, to Sisc Industria Accessori Cavaria S.p.A. Devices for applying terminals and similar metal elements to conductors, lengths of elastic material and the like. 4,691,437, Cl. 29-753.000.

Valentin, Walter: *See—*
Gawrisch, Wolfgang; Valentin, Walter; and Czepl, Helmut, 4,692,026, Cl. 356-345.000.

Vallourec: *See—*
Fillet, Pierre R., 4,691,791, Cl. 175-320.000.

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Kerttula, Reima, 4,692,215, Cl. 162-289.000.

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Schmitt, Robert J.; Perez, Leon A.; Montague, Robert A.; Tetenbaum, Marvin T.; and Van Buskirk, Ellor J., 4,692,382, Cl. 428-414.000.

van den Berg, Wilhemus H.; Homs, Marinus H.; and van Oorschot, Bob P. J., to Shell Oil Company. Transducing device for contactless ultrasonic inspection of pipelines or tubings. 4,691,572, Cl. 73-643.000.

van der Vegt, Anne K., to Trchnische (Rijks) Hogeschool. Reinforced polymer product, method for manufacturing a reinforced polymer product of this type and a plastic compound suitable for producing such a reinforced polymer product. 4,692,495, Cl. 525-184.000.

Vanetik, Anatoly; and Preston, Brian C., to Sanders Associates, Inc. Cutter assembly with rotating knife blade. 4,691,605, Cl. 83-175.000.

Van Geenen, Albert A.; and Bongers, Jozef J. M., to Stamicarbon B.V. (Subsidiary of DSM). N-substituted acyl-lactam compound. 4,692,520, Cl. 540-451.000.

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Bongers, Jozef J. M.; and Van Geenen, Albert A., 4,692,521, Cl. 540-451.000.

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Hill, Delmar J., 4,691,427, Cl. 29-426.500.

Van Horsen, Charles A. Thread gauge. 4,691,441, Cl. 33-199.00R.

van Leijenhorst, Harro M.; and Suringh, Jan F., to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telfonie). Fine-adjusting device for accurate positioning an adjusting element. 4,691,586, Cl. 74-479.000.

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van Roermund, Arthur H. M.: *See—*
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Varnum, Gerald F.; and Duke, Christopher C., to Fisher Controls International, Inc. Pressure sensor. 4,691,573, Cl. 73-702.000.

Vartanian, Albert V.: *See—*
Afian, Viktor V.; Vartanian, Albert V.; Martirosian, Ruben G.; Ryabikov, Stanislav V.; Strebkov, Dmitry S.; and Tveryanovich, Eduard V., 4,691,994, Cl. 350-320.000.

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VEB Kombinat Textima: *See—*
Glaser, Dieter; and Klemm, Theobald, 4,691,450, Cl. 34-23.000.

Venot, Jean, to Societe Alsacienne de Construction de Material Textile. Method and device for removal of waste slivers in a weaving loom. 4,691,743, Cl. 139-291.00C.

Venturi, William L.: *See—*
Cottrell, Henry L.; and Venturi, William L., 4,691,945, Cl. 285-419.000.

Verner Michael L., to Maxon Industries, Inc. Refuse pickup and compactor body. 4,691,959, Cl. 296-184.000.

VerTech Treatment Systems, Inc.: *See—*
Atwood, Mark T.; Carlson, Frank; and Peterscheck, Hermann, 4,692,252, Cl. 210-761.000.

Veselka, Kenneth R. Adjustable single lock gutter broom mechanism. 4,691,402, Cl. 15-87.000.

Viall, Wilton S., Jr., to Boeing Company, The. Tubing connector. 4,691,944, Cl. 285-348.000.

Vickers, PLC: *See—*
Riley, Clifford; and Mears, Christopher J., 4,692,308, Cl. 422-65.000.

Victor Company of Japan, Ltd.: *See—*
Nishimoto, Naomichi, 4,692,814, Cl. 358-320.000.

Sugiyama, Hiroyuki; Takahashi, Nobuaki; Shibamoto, Takeshi; Nishikawa, Kazunori; and Komura, Makoto, 4,692,816, Cl. 358-342.000.

Villain, Jean-Marie; and Fremaux, Jacques, to Saint-Gobain Vitrage. Apparatus and method for depositing a metal oxide coating on a glass substrate. 4,692,180, Cl. 65-32.000.

Vinatier, Bernard, to Produits Chimiques Ugine Kuhlmann. Thermoplastic resin composition for biaxial orientation. 4,692,295, Cl. 264-291.000.

Vincent, Yvon M. Propelling roller skate. 4,691,931, Cl. 280-11.115.

Vinson, Edward F.; and Smith, William H., to Halliburton Company. Pressure pulse gelation test apparatus and method. 4,691,558, Cl. 73-64.100.

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Martinez, Robert, 4,691,820, Cl. 206-205.000.

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Polanschutz, Wolfgang; Pochmarski, Luzian; and Moser, Alfred, 4,691,757, Cl. 164-416.000.

Vogel, Jurgen: *See*—
Tilgner, Leopold; Scholer, Jurgen; Sautter, Sieghart; and Vogel, Jurgen, 4,691,422, Cl. 29-149.50B.

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Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Boga, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Vollmer, Hans-Peter: *See*—
Marschall, Peter; Schlosser, Ewald; and Vollmer, Hans-Peter, 4,692,926, Cl. 372-46.000.

Vollmer, Robert F.: *See*—
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Volpeliere, Jacky: *See*—
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von Schnering, Hans-Georg: *See*—
Betz, Thomas; von Schnering, Hans-Georg; and Schonherr, Erich, 4,692,203, Cl. 156-610.000.

von Stein, Walter, to Erwin Sick GmbH Optik Elektronik. Optical thread breakage monitoring apparatus. 4,691,647, Cl. 112-80.180.

von Werner, Konrad: *See*—
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Vorbruggen, Helmut: *See*—
Skuballa, Werner; Raduchel, Bernd; Vorbruggen, Helmut; Mannesmann, Gerda; Losert, Wolfgang; and Casals, Jorge, 4,692,464, Cl. 514-530.000.

Voris, Harvey C., to Paramount Fitness Corporation. Exercise apparatus with trolley system. 4,691,916, Cl. 272-118.000.

Voslar, Jaroslav: *See*—
Porach, Bedrich; Voslar, Jaroslav; and Rosol, Jaroslav, 4,692,243, Cl. 210-198.200.

Vuillaume, Andre. Device for the manufacture of non-woven fabrics with impressed or embossed designs. 4,691,417, Cl. 28-105.000.

Vyas, Dolatrai M.; Doyle, Terrence W.; and Chiang, Yulin, to Bristol-Myers Company. Trichloroethanimidic acid esters. 4,692,538, Cl. 558-6.000.

W. R. Grace & Co.: *See*—
Greaves, Brian, 4,692,317, Cl. 422-15.000.
Spotnitz, Robert M.; and Kreh, Robert P., 4,692,227, Cl. 204-78.000.

Wacker-Chemie GmbH: *See*—
Mayer, Hans; Muhlhofer, Rudolf; Deubzer, Bernward; and Mayerhofer, Walter, 4,692,474, Cl. 521-88.000.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
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Wacker, Erich: *See*—
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Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, 4,692,891, Cl. 364-763.000.

Wada, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Integrated circuit device for writing and reading information. 4,692,785, Cl. 357-52.000.

Wada, Masatoshi; and Sakai, Tetsuo, to Okuno Chemical Industries Co. Ltd.; and Nippon Hoso Kyokai. High contrast display device. 4,692,662, Cl. 313-493.000.

Wada, Minoru: *See*—
Kinoshita, Tomoaki; Takano, Kunio; Nukushina, Masanori; Wada, Minoru; and Tokunaga, Hiroshi, 4,692,871, Cl. 364-470.000.

Wada, Shigetaka: *See*—
Homma, Takahiko; and Wada, Shigetaka, 4,692,099, Cl. 416-229.00A.

Wada, Yasuto; Ishiyama, Yoshihiko; and Yamashita, Makoto, to Ichikoh Industries, Ltd. Motor-driven collapsible door mirror. 4,692,000, Cl. 350-637.000.

Wadsworth, Legrand D. Ligature tool and process for castrating large animals. 4,691,704, Cl. 128-306.000.

Wagner, Alois, to Hasler AG Bern. Device for a force transmitting connection between two shafts. 4,692,127, Cl. 464-119.000.

Wagner, Curtis D. Apparatus for forming plastic articles. 4,692,111, Cl. [illegible].

Wagner, Joseph P.: *See*—
Sliger, Boyd P.; and Wagner, Joseph P., 4,691,861, Cl. 236-34.500.

Wainscott, Delores A.; and Spector, George. Project-O-cycle. 4,692,004, Cl. 352-132.000.

Wakino, Kikuo; Tamura, Hiroshi; and Ishikawa, Youhei, to Murata Manufacturing Co., Ltd. Dielectric resonator device. 4,692,727, Cl. 333-219.000.

Waldes Truarc Inc.: *See*—
Killian, Edmund F.; and Berliner, Wallace H., 4,692,079, Cl. 411-353.000.

Waldron, Gerald E.; and Wilson, Edward J., to Dynapert-HTC Corp. Vapor level control for vapor processing system. 4,692,114, Cl. 432-198.000.

Wallace, John E., to Boeing Company, The. Universal matrix switching device. 4,692,578, Cl. 200-175.000.

Walter Kieninger GmbH: *See*—
Kieninger, Walter, 4,692,069, Cl. 407-39.000.

Walter, Ulrich: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Boga, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Wang, Pen-Chung; and Crain, Steven P., to Dow Chemical Company, The. Selective preparation of N-(amidoalkyl)imides and related compounds. 4,692,533, Cl. 548-312.000.

Wang, Roger C.: *See*—
Anderson, F. Allan; Chen, Henry C. J.; DiMucci, Vito A.; and Wang, Roger C., 4,691,496, Cl. 53-53.000.

Wang, Ying, to Du Pont de Nemours, E. I., and Company. Pyrilium dye nonlinear optical elements. 4,692,636, Cl. 307-427.000.

Wankmuller, Richard N., to Shell Offshore Inc. Method to drill and tap a hollow underwater member. 4,692,064, Cl. 405-211.000.

Ward, Charles E.: *See*—
Ward, George D.; and Ward, Charles E., 4,691,773, Cl. 166-261.000.

Ward Douglas & Co. Inc.: *See*—
Ward, George D.; and Ward, Charles E., 4,691,773, Cl. 166-261.000.

Ward, George D.; and Ward, Charles E., to Ward Douglas & Co. Inc. Insitu wet combustion process for recovery of heavy oils. 4,691,773, Cl. 166-261.000.

Ward, Richard; and Allen, Archelaius D., to Dobson Park Industries Plc. Control systems. 4,692,067, Cl. 405-302.000.

Wardlow, Eddie, Jr.: *See*—
Uebele, Curtis E.; Ball, Lawrence E.; Jorkasky, Richard J., II; and Wardlow, Eddie, Jr., 4,692,502, Cl. 526-193.000.

Ware, Charles H.; and Rose, Leslie C., to WorldEnergy Systems, Inc. Recovery of oil by in-situ combustion followed by in-situ hydrogenation. 4,691,771, Cl. 166-245.000.

Warmack, Ralph E.: *See*—
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Warner, Charles Y.: *See*—
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Warner-Lambert Company: *See*—
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Filomeno, Vito G., 4,692,261, Cl. 252-105.000.
Mich, Thomas F.; and Heifetz, Carl L., 4,692,454, Cl. 514-312.000.

Warren, David: *See*—
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Meyer, David A.; Tasson, Brian B.; Vollmer, Robert F.; and Warren, J. Bruce, 4,691,638, Cl. 102-434.000.

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Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., 4,692,225, Cl. 204-59.00R.

Washizuka, Isamu; and Kinugawa, Kiyoshi, to Sharp Kabushiki Kaisha. Key input device. 4,692,740, Cl. 340-365.00R.

Wassileff, Victor. Apertured closure device with depressible disc portion. 4,691,836, Cl. 215-298.000.

Watanabe, Hiromitsu, to Yamaha Hatsudoki Kabushiki Kaisha. Drive arrangement for three wheeled vehicles. 4,691,799, Cl. 180-215.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,692,021, Cl. 355-14.00R.

Watanabe, Kazumasa: *See*—
Kinoshita, Akira; Watanabe, Kazumasa; Yamazaki, Hiroshi; and Hirose, Naohiro, 4,692,393, Cl. 430-59.000.

Watanabe, Kouzou: *See*—
Tokunaga, Norikazu; Fukui, Hiroshi; Watanabe, Kouzou; Amano, Hisao; and Sato, Masayoshi, 4,692,643, Cl. 307-584.000.

Watanabe, Kunio: *See*—
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Watanabe, Tsunenori: *See*—
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Watanabe, Yoji; Morimura, Toshio; and Toyoda, Yukio, to Showa Denko Kabushiki Kaisha. Apparatus for thermal cracking of or heating of hydrocarbons. 4,692,313, Cl. 422-241.000.

Watase, Hideo: *See*—
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Watkins, Gerald J.: *See*—
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Watthey, Jeffrey W. H., to CIBA-GEIGY Corporation. Propylamine derivatives. 4,692,469, Cl. 514-651.000.

Watts, John R. Deadlock with key operated locking cylinder. 4,691,543, Cl. 70-143.000.

Webb, Floyd A. Radial arm saw positioner. 4,691,607, Cl. 83-468.000.

Weber, Peter G., to Laitram Corp., The. Concealed drive coupling for use with modular screw conveyor. 4,691,818, Cl. 197-666.000.

Webster, Martyn F., to Oxoid Limited. Immunological identification test for group D streptococci using achromopeptidase. 4,692,417, Cl. 436-518.000.

Webster, R. D.: *See*—
Johnston, William D.; Czuba, Leonard; Webster, R. D.; Hori, Yasuhiko; Nagata, Masanori; and Imano, Shigeki, 4,692,361, Cl. [illegible].

Wechter, Stephen R.: *See*—
Lindner, Luther E.; and Wechter, Stephen R., 4,692,403, Cl. 435-5.000.

Wehmeyer, Donald T.; and Barnhart, Ronald W., to Economy Engineering, Inc. Vehicle fluidic drive circuit. 4,691,795, Cl. 180-6.480.

Wehr Corporation: *See*—
Cooley, Stephen E.; and Jensen, Martin J., 4,692,591, Cl. 219-295.000.

Wei, Ching-Yeu: *See*—
Pimbley, Joseph M.; Gildenblat, Gennady; Wei, Ching-Yeu; and Shappir, Joseph, 4,691,433, Cl. 437-44.000.

Weiss, Hardy P., to PRC Corporation. Method for improving the power of an axial gas laser. 4,692,928, Cl. 372-63.000.

Welch, M. Bruce, to Phillips Petroleum Company. Zinc aluminate double bond isomerization catalyst and process for its production. 4,692,430, Cl. 502-342.000.

Weller, Joseph P., to Dow Chemical Company, The. Hydrous oxide activated charcoal. 4,692,431, Cl. 502-417.000.

Welz, Martin; Czauderna, Bernhard; and Stoffel, Karl-Heinz, to BASF Aktiengesellschaft. Laminate bonded by adhesion promoting layer and adhesive layer. 4,692,373, Cl. 428-285.000.

Wem, James; and Brierley, Rowland J. P., to Imperial Chemical Industries plc. Centrifugal gas-liquid contact apparatus. 4,692,283, Cl. 261-89.000.

Wendling, Robert W.; Kurtz, John W.; and Perez, Juan M., to Texas Instruments Incorporated. Adjustable display stand. 4,691,886, Cl. 248-183.000.

Wenger, Alfred: *See*—
Sonderegger, Hans-Conrad; Calderara, Reto; Wenger, Alfred; and Baumgartner, Hans-Ulrich, 4,691,575, Cl. 73-756.000.

Wernicke, Hans J.: *See*—
Schneider, Michael; Kochloefl, Karl; Maletz, Gerd; and Wernicke, Hans J., 4,692,425, Cl. 502-81.000.

Wesner, Charles R.; Yancey, John F.; and Coleman, Albert L., to Sperry Corporation. Adaptive autopilot. 4,692,868, Cl. 364-447.000.

Wessman, Borje. Swimming and bathing aid. 4,692,125, Cl. 441-112.000.

West, John G. W., to Lucas Electrical Electronics and Systems Limited. Engine cooling systems. 4,691,668, Cl. 123-41.120.

West, Lamar E., Jr., to Scientific Atlanta, Inc. Communications network. 4,692,919, Cl. 370-96.000.

West, Peter J.; Hunt, Russell G.; and Gates, Duncan A., to FBC Limited. Acaricides. 4,692,457, Cl. 514-361.000.

Westermann, Donald H.: *See*—
Viswanathan, Tito; and Westermann, Donald H., 4,692,478, Cl. 527-300.000.

Western Digital Corporation: *See*—
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Western Geophysical Company of America: *See*—
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Westinghouse Electric Corp.: *See*—
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DeMario, Edmund E.; Boyle, Raymond F.; and Kuchirka, Peter J., 4,692,302, Cl. 376-439.000.
Gjertsen, Robert K., 4,692,304, Cl. 376-446.000.
Isenberg, Arnold O.; and Ruka, Roswell J., 4,692,274, Cl. 252-521.000.
Israelson, Gordon A., 4,692,176, Cl. 55-302.000.
Schlonski, James S.; and Burnett, Tobias W. T., 4,692,297, Cl. 376-211.000.
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Westphal, Georg P. Nuclear and X-ray spectrometry and low-pass filter and filtering method therefor. 4,692,626, Cl. 250-389.000.

Westward Investments Limited: *See*—
Lackinger, Franz, 4,692,563, Cl. 174-65.0SS.

Weyant, Robert R., to American Hospital Supply Corporation. Power system for infusion pumps. 4,692,145, Cl. 604-65.000.

Weyer, Paul P. Thin profile rotary actuator with backlash elimination. 4,691,582, Cl. 74-409.000.

Wheeler, Bryce A., to Hughes Aircraft Company. Afocal beam expansion apparatus and method. 4,691,999, Cl. 350-620.000.

Wheeler, Dale E., to Hughes Tool Company. Method and means for sealing electrical conductor rods in a tubular housing. 4,691,430, Cl. 29-451.000.

Whigham, Robert H., to Telectronics N.V. Combined pacemaker delta modulator and bandpass filter. 4,692,719, Cl. 332-11.00D.

Whitley, George J.: *See*—
Keeler, Brian G.; and Whitley, George J., 4,691,419, Cl. 29-39.000.

Whitney, Thomas H., to Trayco, Inc. Joint and trim for bathtubs and the like. 4,691,392, Cl. 4-595.000.

Whittea, Gilbert Y., Jr.; Joyner, Kenneth E., Jr.; and Boren, Benjamin E., to Midrex International, B.V. Screen sizer. 4,691,868, Cl. 241-24.000.

Whyco Chromium Company, Inc.: *See*—
Hyner, Jacob; and Gradowski, Steven, 4,692,080, Cl. 411-387.000.

Wiberg, Per-Arne. Method and apparatus for drying a moist fibre web. 4,691,449, Cl. 34-9.000.

WIC, Inc.: *See*—
Schwitters, Wayne J., 4,691,506, Cl. 56-121.400.
Schwitters, Wayne J., 4,691,507, Cl. 56-121.400.

Wicklund, L. Harvey: *See*—
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Widhalm, Michael J.; and Widhalm, Thomas G., 4,692,845, Cl. 362-80.000.

Widlund, Leif U. R.; and Ternstrom, Maj I., to Molnlycke AB. Absorption article such as a diaper or a sanitary napkin, and a method for the manufacture thereof. 4,692,163, Cl. 604-385.00A.

Wiley, Lawrence V.: *See*—
Haren, Doyle V.; and Wiley, Lawrence V., 4,691,432, Cl. 29-527.200.

Wilkins, Howard: *See*—
Gannis, Peter M.; Wilkins, Howard; and Holloway, Oris E., Jr., 4,692,342, Cl. 426-293.000.

Willburger, Ulrich. Cleaning cassette for high speed cassette recorders including manually operable drive means. 4,692,830, Cl. 360-128.000.

Wille, Milton G.: *See*—
Mellander, Hugo; Nilsson, Stefan; Warner, Charles Y.; Wille, Milton G.; and Koch, Magnus, 4,691,556, Cl. 73-12.000.

William H. Rorer, Inc.: *See*—
Klein, Robert W.; and Foxx, Mary E., 4,692,329, Cl. 424-81.000.

Williams, Kevin G.: *See*—
Passaro, Robert E.; Williams, Kevin G.; Parnoff, George K.; and Rogers, Raymond E., 4,692,621, Cl. 250-343.000.

Williams, R. Tudor. Carbon dioxide detector. 4,691,701, Cl. 128-207.140.

Williams, Robert J.: *See*—
Armstrong, Max D., 4,691,904, Cl. 269-17.000.

Williamson, Jimmie R., Jr., to Otis Engineering Corporation. Standing and injection valve. 4,691,777, Cl. 166-319.000.

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Wilmot, Richard A.: *See*—
Raizen, David T.; and Wilmot, Richard A., 4,692,742, Cl. 340-539.000.

Wilson, David J. M.; and Cope, Paul E. G., to Marconi Company Limited, The. Rotational motion fluid loop sensor using magnetically levitated detecting element. 4,692,614, Cl. 250-231.00R.

Wilson, Earl C.: *See*—
Possley, Glen G.; and Wilson, Earl C., 4,692,787, Cl. 357-59.000.

Wilson, Edward J.: *See*—
Waldron, Gerald E.; and Wilson, Edward J., 4,692,114, Cl. 432-198.000.

Wilson, James W. Expandable deck system. 4,691,484, Cl. 52-79.600.

Wilson, John F.: *See*—
Sherwood, Donald G.; Wilson, John F.; Salton, Robert B.; and Fensterer, Howard F., 4,692,296, Cl. 376-209.000.

Wimbush, Maurice J., to Automotive Products plc. Clutch release mechanism. 4,691,814, Cl. 192-91.00A.

Windmoller & Holscher: *See*—
Winnemoller, Aloys, 4,691,603, Cl. 83-151.000.

Winnemoller, Aloys, to Windmoller & Holscher. Cutting apparatus for cutting sheet material. 4,691,603, Cl. 83-151.000.

Winner, Sol N. Airline electrical ground cable feed out and retrieval storage apparatus. 4,692,569, Cl. 191-12.00R.

Winslow, Donald W.: *See*—
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.

Winter, Alfred: *See*—
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Winterhalter, Walter; and Halssig, Andreas, to Gebruder Junghans GmbH. Safety fuse for a spinning-type projectile. 4,691,635, Cl. 102-251.000.

Wintershall AG: *See*—
Lindorfer, Walter; and Jahn-Held, Wilhelm, 4,692,061, Cl. 405-128.000.

Wisneski, Tony J.: *See*—
Morman, Michael T.; and Wisneski, Tony J., 4,692,371, Cl. 428-224.000.

Witco Corporation: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,692,427, Cl. 502-160.000.

Witt, Wolfram; Lips, Hendrik; Scholles, Herbert; and Schweiger, Raimund, to Rheinmetall GmbH. Exploding missile. 4,691,636, Cl. 102-387.000.

Wittmer, Marc F.: *See*—
Rubloff, Gary W.; and Wittmer, Marc F., 4,692,348, Cl. 437-82.000.

Witucki, Edward F.; Warren, Leslie F., Jr.; and Newman, Paul R., to Rockwell International Corporation. Method of stabilizing conductive polymers. 4,692,225, Cl. 204-59.00R.

Wodiczka, Ernst: *See*—
Bonisch, Heinz-Jurgen; Brandl, Gerhard; Noor, Sybille; Oehling, Karl-Heinz; Riedl, Walter; Thessen, Mario; Wodiczka, Ernst; and Macht, Alwin, 4,691,670, Cl. 123-52.0MF.

Wolf, Albert E., to Checkpoint Systems, Inc. Article security system. 4,692,747, Cl. 340-572.000.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Spinning of twisting machine with a drive belt performance monitor. 4,691,508, Cl. 57-78.000.

Wolff, George: *See*—
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Wolff Walsrode Aktiengesellschaft: *See*—
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Wolk, Petra: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., to Adamtek Corporation; and Hibshman Corporation, a part interest. Rheological testing apparatus and method. 4,691,714, Cl. 128-738.000.

Wong, Marcus Y.: *See*—
Wong, Jacob Y.; Khuri-Yakub, Pierre; Motamedi, M. Ed; and Wong, Marcus Y., 4,691,714, Cl. 128-738.000.

Woo, Chi Goo. Collapsible hammock. 4,691,394, Cl. 5-120.000.

Wood, Geoffrey B.: *See*—
Irvine, Sheila M.; Penman, Alistair; and Wood, Geoffrey B., 4,692,338, Cl. 426-2.000.

Wood, Roy F., to Phillips Petroleum Company. Pipeline lining. 4,691,740, Cl. 138-109.000.

Woodhead, David A.: *See*—
Bodolus, Christopher L.; and Woodhead, David A., 4,692,498, Cl. 525-285.000.

Woodstream Corporation: *See*—
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Woodward, Robert B.: *See*—
Gosteli, Jacques; Ernest, Ivan; Lang, Marc; and Woodward, Robert B., 4,692,442, Cl. 514-195.000.

Woolworth, Richard G.: *See*—
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WorldEnergy Systems, Inc.: *See*—
Ware, Charles H.; and Rose, Leslie C., 4,691,771, Cl. 166-245.000.

Wossmann, Reinhard: *See*—
Haver, Eitel F.; Lutke-Foller, Heinz; and Wossmann, Reinhard, 4,691,744, Cl. 139-425.00R.

Wozniczka, George, to Zenith Electronics Corporation. Heat sink. 4,691,765, Cl. 165-80.300.

Wright, Allen B.; and Chichester, Willard L., to Allied Corporation. Simplified air filter. 4,692,177, Cl. 55-499.000.

Wright, David A.: *See*—
Pitches, Brian E.; and Wright, David A., 4,691,446, Cl. 33-516.000.

Wright, Thomas C.; and Johnson, Grover L., to Orin Chemical Company. Water borne polymer foamable composition. 4,692,473, Cl. 521-72.000.

Wroblewski, David J.; and Robertson, John W., Jr., to Babcock & Wilcox Company, The. Electro-mechanical integrator. 4,692,933, Cl. 377-29.000.

Wu, Schyi-Yi: *See*—
Price, J. B.; and Wu, Schyi-Yi, 4,692,343, Cl. 427-38.000.

Wu, Shang-Ren: *See*—
Howland, Warren W.; Arquette, Robert E.; and Wu, Shang-Ren, 4,692,169, Cl. 44-51.000.

Wuerzer, Bruno: *See*—
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Wulfhorst, David E.: *See*—
Willyard, Dewey L., Jr.; Cline, David E.; and Wulfhorst, David E., 4,691,423, Cl. 29-156.40R.

Wurz, Dieter; and Paikert, Paul. Finned tube arrangement for heat exchangers. 4,691,766, Cl. 165-135.000.

Wurzer, Bruno: *See*—
Kiehs, Karl; Wurzer, Bruno; and Meyer, Norbert, 4,692,187, Cl. 71-107.000.

Wyatt, James G., Jr.: *See*—
Budin, Richard J.; Wyatt, James G., Jr.; and Herman, Fred W., 4,692,746, Cl. 340-572.000.

Xerox Corporation: *See*—
Loce, Robert P.; Rees, James D.; and Durbin, John A., 4,692,015, Cl. 355-1.000.
Ober, Christopher K.; and Branston, Randolph E., 4,692,188, Cl. 106-23.000.

Y. S. Securities Limited: *See*—
Oakes, Martin C., 4,692,733, Cl. 337-158.000.

Yabe, Masaya: *See*—
Seki, Yasukazu; Sato, Noritada; and Yabe, Masaya, 4,692,782, Cl. 357-29.000.

Yabe, Yukihiko: *See*—
Suzuki, Seigo; Yabe, Yukihiko; and Kawakami, Masumi, 4,692,640, Cl. 307-464.000.

Yadlosky, John M.: *See*—
Kim, Jai B.; and Yadlosky, John M., 4,691,399, Cl. 14-2.000.

Yagi, Harumi, to Fujitsu Limited. Twin wire splitter system. 4,691,855, Cl. 228-4.500.

Yamada, Kiyoshi: *See*—
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Yamada, Koji: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Yamada, Mikio; Tsukamoto, Yoshinori; and Mizuno, Masahiro, to Nakano Vinegar Co., Ltd. Apparatus for automatically controlling the feed rate of alcohol solution as raw material in a vinegar production process. 4,692,414, Cl. 435-291.000.

Yamada, Mitsuhiko; Fujisawa, Kyohei; and Kitamura, Hideaki, to Dainippon Screen Mfg. Co., Ltd. Method for manufacturing electric masks using a color scanner and an apparatus for use therein. 4,692,796, Cl. 358-76.000.

Yamaguchi, Akihiro: *See*—
Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,692,554, Cl. 564-430.000.

Yamaguchi, Hiroyuki: *See*—
Moriya, Mitsuro; Shiragami, Kazuharu; and Yamaguchi, Hiroyuki, 4,692,915, Cl. 369-53.000.

Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Tanabe, Yoshimitsu; Sugimoto, Kenichi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Process for producing 1,3-bis(3-aminophenoxy)benzene. 4,692,554, Cl. 564-430.000.

Yamaguchi, Tatsuo: *See*—
Sato, Atsushi; Murai, Yoshikazu; Yamaguchi, Tatsuo; Mochizuki, Kanji; and Sugisawa, Kunio, 4,692,270, Cl. 252-353.000.

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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamaha Motor Co., Ltd.: *See*—
Fuchigami, Wataru; and Nakayama, Yoshiharu, 4,692,129, Cl. 474-148.000.

Yamamoto, Masahiro: *See*—
Maeda, Shigeyoshi; Yamamoto, Masahiro; Omata, Hiroyasu; and Okada, Hideya, 4,692,191, Cl. 148-6.14R.

Yamamoto, Mitsuoki: *See*—
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Yamamoto, Ryoichi: *See*—
Mineshima, Hideo; Koda, Haruyuki; and Yamamoto, Ryoichi, 4,692,501, Cl. 526-65.000.

Yamamoto, Tadashi: *See*—
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Yamamura, Yasuharu: *See*—
Sekido, Satoshi; Tachibana, Hirokazu; and Yamamura, Yasuharu, 4,692,429, Cl. 502-303.000.

Yamaoka, Akira; Wada, Kenichi; and Kuriyama, Kazunori, to Hitachi, Ltd. Coded decimal non-restoring divider. 4,692,891, Cl. 364-763.000.

Yamashita, Makoto: *See*—
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Yamato Scientific Co., Ltd.: *See*—
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Yamaura, Yutaka: *See*—
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Yamazaki, Hiroshi: *See*—
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Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Koyanagi, Kaoru; Imato, Shinji; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, to Semiconductor Energy

Laboratory Co., Ltd. Liquid crystal filling device. 4,691,995, Cl. 350-331.00R.

Yamazaki, Takeo: *See*—
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Yanagawa, Nobuhide: *See*—
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Yancey, John P.: *See*—
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Yang, Tai-Her. C-clamp structure. 4,691,907, Cl. 269-152.000.

Yang, Tai-Her. Ceiling fan. 4,692,096, Cl. 416-170.00R.

Yao, Hiroyuki; and Okamoto, Yuji, to Toyota Jidosha Kabushiki Kaisha. Vehicle door structure. 4,691,476, Cl. 49-374.000.

Yasuda, Hirotsuga K., to University of Missouri, The Curators of the. Method of interiorly coating tubing. 4,692,347, Cl. 427-40.000.

Yasumura, Hiroto; Kozuki, Susumu; and Takei, Masahiro, to Canon Kabushiki Kaisha. Reproducing device for frequency modulated signals. 4,692,914, Cl. 369-49.000.

Yasuzawa, Tohru: *See*—
Kase, Hiroshi; Matsuda, Yuzuru; Kawamoto, Isao; Asano, Kozo; Shirahata, Kunikatsu; Yasuzawa, Tohru; and Yamada, Koji, 4,692,310, Cl. 424-122.000.

Yatsu, Tadao; Nakano, Takayuki; Hinooka, Nobuya; and Kato, Tatsuo, to Mitsui Petrochemical Industries, Ltd. Five-component copolyester, process for preparation thereof, and shaped articles thereof. 4,692,506, Cl. 528-296.000.

Yawn, David H.: *See*—
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Yazaki Corporation: *See*—
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Yee, Alfred A., to Yee, Elizabeth W. Splice sleeve for overlapping reinforcing bars. 4,692,052, Cl. 403-13.000.

Yee, Elizabeth W.: *See*—
Yee, Alfred A., 4,692,052, Cl. 403-13.000.

Yeshiva University: *See*—
Diamond, Betty A., 4,692,416, Cl. 436-508.000.

Yli-Koski, Esko T.: *See*—
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Yokohama Rubber Co., Ltd.: *See*—
Kabe, Kazuyuki; and Morikawa, Tuneo, 4,691,752, Cl. 152-527.000.

Yokoi, Satoru; and Kondo, Hirokazu, to Tsubakimoto Chain Company. Load testing apparatus for electronic components. 4,692,694, Cl. 324-158.00F.

Yokota, Fumiki: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,691,905, Cl. 269-45.000.

Yokoyama, Makoto, to Kawamura Electric Industry Co., Ltd. Optical pulse receiving device. 4,692,687, Cl. 323-284.000.

Yonamine, Shozen: *See*—
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Yonemochi, Katsutoshi: *See*—
Sakagaito, Yukuo; Yonemochi, Katsutoshi; Kawata, Koichi; and Masaki, Takeshi, 4,691,998, Cl. 350-616.000.

Yorisue, Shozo; and Morimoto, Seiji, to Precision Fukuhara Works, Ltd. Dust removing device for circular knitting machine. 4,691,536, Cl. 66-168.000.

Yoshida, Hajime, to Hajime Industries Ltd. Automatic inspection device. 4,692,800, Cl. 358-106.000.

Yoshida, Katsumi: *See*—
Toyoda, Yasuhiro; Shimada, Fumio; and Yoshida, Katsumi, 4,692,009, Cl. 354-246.000.

Yoshida, Naoki; and Kobayashi, Nobutoshi, to Yamato Scientific Co., Ltd. Temperature controller system. 4,692,598, Cl. 219-497.000.

Yoshida, Shoji; Haru, Yasuhiko; Kosaka, Etsuji; Ikeda, Toshimichi; Aoyama, Mikio; and Iida, Takeo, to Hitachi Construction Machinery Co., Ltd.; and Tokyo Gas Co., Ltd. Lateral hole boring method and apparatus. 4,691,788, Cl. 175-62.000.

Yoshida, Takeshi: *See*—
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Yoshida, Taro: *See*—
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Yoshida, Tatumasa: *See*—
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Yoshida, Toshihiko: *See*—
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Yoshimoto, Takeo; Umemoto, Mitsumasa; Igarashi, Keiichi; Kubota, Yutaka; Yamazaki, Hideo; and Enomoto, Yuji, to Mitsui Toatsu Chemicals, Incorporated. N-(2-chloro-4-trifluoromethylphenyl)-3-trifluoromethylbenzenesulfonamide derivative and agricultural fungicide containing same. 4,692,466, Cl. 514-604.000.

Yoshimura, Shigeru; Suzuki, Tetsuo; and Takemura, Makoto, to Canon Kabushiki Kaisha. Image formation apparatus with a recording unit and paper feed cover and a sealing member. 4,692,778, Cl. 346-145.000.

Yoshitomi, Yasunari; Kuroki, Katsuro; and Iwayama, Kenzo, to Nippon Steel Corporation. Process for producing a grain-oriented electrical steel sheet having a low watt loss. 4,692,193, Cl. 148-111.000.

Yotsuuye, David S.: *See*—
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Young, Quentin H., to Southern Steel Company. Door locking system. 4,691,542, Cl. 70-129.000.

Young, Ronald W., to British Aerospace PLC. Co-operative satellites. 4,691,882, Cl. 244-158.00R.

Yung, Richard C. S.: *See*—
Larsen, Larry D.; Yung, Richard C. S.; Leung, Wing K.; and Hogel, Joseph E., 4,691,794, Cl. 177-211.000.

Zabrodsky, John, III: *See*—
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Zahn, Wolfgang: *See*—
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Zahnradfabrik Friedrichshafen AG: *See*—
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Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
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Zaruba, Igor I.; Dymenko, Vladimir V.; and Bolotko, Viktor I., to Institute'Electrosvarki Imeni Patona. Apparatus for a-c arc welding with a consumable electrode. 4,692,585, Cl. 219-130.400.

Zastrow, Thomas S., to Remmele Engineering, Inc. Apparatus for supporting the walls of appliances and the like during foaming. 4,691,906, Cl. 269-48.100.

Zavalishin, Nikolai N.: *See*—
Dzemeshkevich, Sergei L.; Zavalishin, Nikolai N.; Krasovskaya, Svetlana M.; Sagalevich, Valery M.; Konstantinov, Boris A.; Nenjukov, Alexandr K.; and Ivanov, Alexei S., 4,692,164, Cl. 623-2.000.

Zdunek, Kenneth J., to Motorola, Inc. Dispatch trunked radio system. 4,692,945, Cl. 455-17.000.

Zeiss, Hans-Joachim; and Mildenberger, Hilmar, to Hoechst Aktiengesellschaft. Phosphorus-containing α-amino nitriles and a process for their preparation. 4,692,541, Cl. 558-87.000.

Zenith Electronics Corporation: *See*—
Adler, Robert; and Strauss, Paul, 4,692,660, Cl. 313-477.00R.
Borg, Arthur N.; and Bar-Hai, Giora, 4,692,903, Cl. 365-226.000.
Wozniczka, George, 4,691,765, Cl. 165-80.300.

Zenzefilis, George E. Disc memory storage apparatus and method, 4,692,821, Cl. 360-78.000.

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Ziegler, Craig A.: *See*—
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Ziegler, Rudolf: *See*—
Eberhardt, Werner; and Ziegler, Rudolf, 4,692,263, Cl. 252-122.000.

Zimmer, Gabriele, to pfm, Plastik fur die Medizin GmbH. Catheter. 4,692,155, Cl. 604-177.000.

Zimmern, Bernard. Refrigeration system with a centrifugal economizer. 4,691,533, Cl. 62-512.000.

Zinn, Frank R., to Bingham & Taylor. Undercover valve cover assembly and valve support. 4,691,733, Cl. 137-364.000.

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Zorcher, Heinz: *See*—
Radke, Dietrich; Meger, Peter; and Zorcher, Heinz, 4,692,930, Cl. 373-72.000.

Zubretzky, Jeno: *See*—
Nagy, Istvan; Nagy, Ferenc; Pozsgai, Istvan; Karatson, Laszlo ; Gabori, Andor; Toth, Kalman; and Zubretzky, Jeno, 4,691,485, Cl. 52-125.100.

Zunft, Hans-Joachim: *See*—
Grutte, Friedrich-Karl; Petzold, Heinrich; Walter, Ulrich; Bogs, Gunhild; Domeratzky, Joachim; Gartner, Helmut; Schulze, Jurgen; Zunft, Hans-Joachim; Pulz, Otto; Luft, Christa; Muller, Walheide; Wolk, Petra; Dahlke, Hannelore; and Volkmer, Margret, 4,692,340, Cl. 426-72.000.

Zunkel, Gary D.: *See*—
McMahan, Michael E.; Newman, Daniel A.; Winslow, Donald W.; and Zunkel, Gary D., 4,691,779, Cl. 166-321.000.

Zylka, Stephen H.: *See*—
Ahl, Alan D.; Billmaier, Joseph F.; Graham, Paul W. L.; Schenk, Mark B.; and Zylka, Stephen H., 4,691,830, Cl. 209-523.000.

102160 Canada Inc.: *See*—
Farfan de los Godos, Henry F., 4,691,696, Cl. 128-78.000.

2500 Corporation, The: *See*—
Altus, Mark, 4,692,364, Cl. 428-85.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anahara, Meiji; and Muramatsu, Shigeru, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Friction spinning frame. Re. 32,494, Cl. 57-401.000.

Canfield, Douglas M., to Canso Solar Corporation. Glass furnace with heat sensing means. Re. 32,497, Cl. 65-162.000.

Cars & Concepts, Inc.: *See*—
Chrysler, Richard R., Re. 32,496, Cl. 296-218.000.

Canso Solar Corporation: *See*—
Canfield, Douglas M., Re. 32,497, Cl. 65-162.000.

Chrysler, Richard R., to Cars & Concepts, Inc. Removable roof panels for vehicles. Re. 32,496, Cl. 296-218.000.

Coates, J. Randall, to Smith International, Inc. Chip relief for rock bits. Re. 32,495, Cl. 175-339.000.

Hitachi, Ltd.: *See*—
Tomita, Yoshifumi; and Nakai, Hiromitsu, Re. 32,498, Cl. 430-28.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Anahara, Meiji; and Muramatsu, Shigeru, Re. 32,494, Cl. 57-401.000.

Mansell, Richard L.: *See*—
Weiler, Elmar W.; and Mansell, Richard L., Re. 32,499, Cl. 435-7.000.

Muramatsu, Shigeru: *See*—
Anahara, Meiji; and Muramatsu, Shigeru, Re. 32,494, Cl. 57-401.000.

Nakai, Hiromitsu: *See*—
Tomita, Yoshifumi; and Nakai, Hiromitsu, Re. 32,498, Cl. 430-28.000.

Smith International, Inc.: *See*—
Coates, J. Randall, Re. 32,495, Cl. 175-339.000.

Tomita, Yoshifumi; and Nakai, Hiromitsu, to Hitachi, Ltd. Method of manufacturing fluorescent screens of cathode ray tubes. Re. 32,498, Cl. 430-28.000.

University of South Florida: *See*—
Weiler, Elmar W.; and Mansell, Richard L., Re. 32,499, Cl. 435-7.000.

Weiler, Elmar W.; and Mansell, Richard L., to University of South Florida, a part interest. Method for quantitative analysis for limonin. Re. 32,499, Cl. 435-7.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Application Art Laboratories Co., Ltd.: *See*—
Morita, Tamao, B1 4,021,891, Cl. 24-303.000.

Bhatia, Kishan: *See*—
Burnes, Edward E.; and Bhatia, Kishan, B1 4,515,759, Cl. 423-220.000.

Burnes, Edward E.; and Bhatia, Kishan, to NL Industries, Inc. Process of removing hydrogen sulfide from gas mixtures. B1 4,515,759, 9-8-87, Cl. 423-220.000.

Dow Chemical Co., The: *See*—
Havens, Carl B., B1 4,315,963, Cl. 428-35.000.

Havens, Carl B., to Dow Chemical Co., The. Thermoplastic film with integral ribbed pattern and bag therefrom. B1 4,315,963, 9-8-87, Cl. 428-35.000.

Morita, Tamao, to Application Art Laboratories Co., Ltd. Magnetic lock closure. B1 4,021,891, 9-8-87, Cl. 24-303.000.

NL Industries, Inc.: *See*—
Burnes, Edward E.; and Bhatia, Kishan, B1 4,515,759, Cl. 423-220.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., 291,828, Cl. D24-56.000.

Albury, William H., II. Manually operable straw. 291,758, 9-8-87, Cl. D7-42.000.

Alchemy II, Inc.: *See*—
Forsse, Earl K., 291,818, Cl. D21-159.000.

Aldrich, Thomas B., III: *See*—
Torongo, Albert H.; and Aldrich, Thomas B., III, 291,829, Cl. D24-62.000.

Aloys F. Dornbracht GmbH & Co.: *See*—
Lathrop, Bethany, 291,824, Cl. D23-28.000.

Amiet AG: *See*—
Gisiger, Urs, 291,772, Cl. D8-331.000.
Gisiger, Urs, 291,773, Cl. D8-331.000.
Gisiger, Urs, 291,774, Cl. D8-341.000.
Gisiger, Urs, 291,775, Cl. D8-341.000.

Arem, Arnold J.: *See*—
Murtaugh, John F., III; Rae, Carol A.; and Arem, Arnold J., 291,830, Cl. D24-64.000.

Asics Corporation: *See*—
Inohara, Masanobu; and Hase, Yoshiaki, 291,743, Cl. D2-320.000.

Baby Bjorn Aktiebolag: *See*—
Henriksson, Kjell, 291,748, Cl. D6-333.000.

Baroody Spence Furniture Industries, Inc.: *See*—
Baroody, Terrance A.; and Bass, Jerry R., 291,750, Cl. D6-369.000.

Baroody, Terrance A.; and Bass, Jerry R., to Baroody Spence Furniture Industries, Inc. Arm chair or similar article. 291,750, 9-8-87, Cl. D6-369.000.

Barr, Lance N., to Nintendo of America Inc. Video game cabinet. 291,813, 9-8-87, Cl. D21-13.000.

Bass, Jerry R.: *See*—
Baroody, Terrance A.; and Bass, Jerry R., 291,750, Cl. D6-369.000.

Baumer, Walter. Combined clock and aquarium or the like. 291,783, 9-8-87, Cl. D10-2.000.

Bean, Lewis. Folding walker. 291,791, 9-8-87, Cl. D12-130.000.

Beaty, Ulysses C. Protective shield for shoe heels. 291,741, 9-8-87, Cl. D2-277.000.

Benoit, Raymond A. Flashlight. 291,836, 9-8-87, Cl. D26-37.000.

Black & Decker, Inc.: *See*—
Onit, Robert, 291,767, Cl. D7-379.000.

Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, to Kenner Parker Toys Inc. Toy truck. 291,816, 9-8-87, Cl. D21-134.000.

Bonny Products, Inc.: *See*—
Hoehne, George, 291,761, Cl. D7-101.000.

Boudreaux, Mark D.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.

Bratasevec, Vid, to Iskra-Delta, Proizvodnja Racunalniskih Sistemov in Inzeniring, P.O. Typing unit. 291,810, 9-8-87, Cl. D18-12.000.

Buffalo Medical Specialties, Mfg., Inc.: *See*—
Hansen, Ole Q., 291,745, Cl. D3-30.100.

Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Combined watch and bracelet. 291,784, 9-8-87, Cl. D10-32.000.

Bunge, John M. Storage and carrying container for an electric drill and accessories. 291,747, 9-8-87, Cl. D3-30.100.

Burmeister, Dennis N.: *See*—
Steinkamp, Norman A.; and Burmeister, Dennis N., 291,766, Cl. D7-309.000.

C. R. Mfg. Co.: *See*—
Guttormson, Fred E., 291,780, Cl. D9-447.000.

Cafaro, Abele, Jr. Apertured spinner for a game board. 291,814, 9-8-87, Cl. D21-22.000.

Canadian Fram Limited: *See*—
Yew, Kwang; and Carrothers, Hugh S., 291,807, Cl. D15-5.000.

Carrothers, Hugh S.: *See*—
Yew, Kwang; and Carrothers, Hugh S., 291,807, Cl. D15-5.000.

Carter, Stanley R., Jr. Frame for barbell weights or similar article. 291,820, 9-8-87, Cl. D21-191.000.

Caulkins, Earl R. Collar ornament. 291,788, 9-8-87, Cl. D11-213.000.

Chap, John P., to Selfix, Inc. Spice rack. 291,755, 9-8-87, Cl. D6-566.000.

Chap, John P., to Selfix, Inc. Bag organizer. 291,756, 9-8-87, Cl. D6-566.000.

Chasen, Lee R.: *See*—
Dunn, James R.; and Chasen, Lee R., 291,763, Cl. D7-105.000.

Clarke, Michael J.; Santarsiero, Paul S.; and Kearney, John P., to Coleco Industries, Inc. Children's ride-on simulated dump truck. 291,790, 9-8-87, Cl. D12-108.000.

Clemens, Kevin F., to Michelin Recherche et Technique. Tire. 291,792, 9-8-87, Cl. D12-147.000.

Clemens, Kevin F., to Michelin et Recherche et Technique. Tire. 291,793, 9-8-87, Cl. D12-147.000.

Clemens, Kevin F., to Michelin Recherche et Technique. Tire. 291,794, 9-8-87, Cl. D12-147.000.

Coats & Clark, Inc.: *See*—
Dunn, James R.; and Chasen, Lee R., 291,763, Cl. D7-105.000.

Cohen, Robert M., to Micro Connection, Inc. Computer maintenance tool carrying case. 291,744, 9-8-87, Cl. D3-74.000.

Coleco Industries, Inc.: *See*—
Clarke, Michael J.; Santarsiero, Paul S.; and Kearney, John P., 291,790, Cl. D12-108.000.

Collins, Raymond D., Sr. Meat tenderizer. 291,762, 9-8-87, Cl. D7-101.000.

Conn, Marks M., to Mallin Company. Frame for an adjustable chaise. 291,749, 9-8-87, Cl. D6-361.000.

Conn, Marks M., to Mallin Company. Table or the like. 291,752, 9-8-87, Cl. D6-487.000.

Conway, Ronald I.; Lucente, Samuel A.; and Schaum, David L., to International Business Machines Corporation. Multiple control element unit for data processing apparatus. 291,806, 9-8-87, Cl. D14-114.000.

Cordrey, Robert E.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.

Corona Clipper Co.: *See*—
Lemcke, Harland, 291,769, Cl. D8-4.000.

Curiel, Raymond F. Solar battery. 291,798, 9-8-87, Cl. D13-8.000.

Daiwa Seiko, Inc.: *See*—
Matsui, Yoshiyuki, 291,834, Cl. D25-73.000.

Danna, Sabrina M.: *See*—
Fogarty, A. Edward; Fogarty, Bonnie R.; and Danna, Sabrina M., 291,817, Cl. D21-153.000.

Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,827, 9-8-87, Cl. D24-34.000.

Designer Bathware, Inc.: *See*—
Pool, Daniel L., 291,753, Cl. D6-522.000.

Drackett Company, The: *See*—
O'Neil, William J., Jr.; Sims, Daniel J.; and Embertson, Randy, 291,782, Cl. D9-448.000.

Dunn, James R.; and Chasen, Lee R., to Coats & Clark, Inc. Combination pasta and vegetable tongs. 291,763, 9-8-87, Cl. D7-105.000.

Durand, Jean-Jacques. Condiment shaker or similar article. 291,759, 9-8-87, Cl. D7-54.000.

Egashira, Teruaki: *See*—
Takada, Kazuo; Egashira, Teruaki; Ikegami, Yoichi; Konishi, Kazuhiro; and Suzuki, Tadao, 291,765, Cl. D7-309.000.

Embertson, Randy: *See*—
O'Neil, William J., Jr.; Sims, Daniel J.; and Embertson, Randy, 291,782, Cl. D9-448.000.

Evans, Alan C. Combined holder for police nightstick and flashlight. 291,746, 9-8-87, Cl. D3-105.000.

Fallgatter, James C.; and Fallgatter, Tarla A. Rolling pin. 291,760, 9-8-87, Cl. D7-99.000.

Fallgatter, Tarla A.: *See*—
Fallgatter, James C.; and Fallgatter, Tarla A., 291,760, Cl. D7-99.000.

Faulkner, William G.: *See*—
Lapeyre, James M.; and Faulkner, William G., 291,777, Cl. D8-499.000.

Flemming, Leonard N. Head for an adhesive tape cleaner. 291,837, 9-8-87, Cl. D32-25.000.

Fogarty, A. Edward; Fogarty, Bonnie R.; and Danna, Sabrina M., to Hasbro-Bradley. Finger puppet or similar article. 291,817, 9-8-87, Cl. D21-153.000.

Fogarty, Bonnie R.: *See*—
Fogarty, A. Edward; Fogarty, Bonnie R.; and Danna, Sabrina M., 291,817, Cl. D21-153.000.

Forsse, Earl K., to Alchemy II, Inc. Talking bear. 291,818, 9-8-87, Cl. D21-159.000.

George, David L., to Uniden Corporation. Portable radio telephone and FM two-way radio. 291,804, 9-8-87, Cl. D14-64.000.

Gillette Company, The: *See*—
Torongo, Albert H.; and Aldrich, Thomas B., III, 291,829, Cl. D24-62.000.

Gingras, Eric G., to Security Imprinter Corporation. Variable data imprinter. 291,812, 9-8-87, Cl. D18-14.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,772, 9-8-87, Cl. D8-331.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,773, 9-8-87, Cl. D8-331.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,774, 9-8-87, Cl. D8-341.000.

Gisiger, Urs, to Amiet AG. Luggage lock. 291,775, 9-8-87, Cl. D8-341.000.

Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, to Penn Plax Plastics, Inc. Aquarium filter cartridge. 291,825, 9-8-87, Cl. D23-4.000.

Goldman, Marvin: *See*—
Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, 291,825, Cl. D23-4.000.

Griswold, Judith. Combined book and magazine display. 291,754, 9-8-87, Cl. D6-553.000.

Gudas, Charles J.: *See*—
Surpuriya, Vijay; and Gudas, Charles J., 291,742, Cl. D2-314.000.

Guttormson, Fred E., to C. R. Mfg. Co. Dispensing nozzle for container. 291,780, 9-8-87, Cl. D9-447.000.

Hansen, Ole Q., to Buffalo Medical Specialties, Mfg., Inc. Medical implement case. 291,745, 9-8-87, Cl. D3-30.100.

Harris, Michael. Pop top chess game piece. 291,815, 9-8-87, Cl. D21-52.000.

Hasbro-Bradley: *See*—
Fogarty, A. Edward; Fogarty, Bonnie R.; and Danna, Sabrina M., 291,817, Cl. D21-153.000.

Hase, Yoshiaki: *See*—
Inohara, Masanobu; and Hase, Yoshiaki, 291,743, Cl. D2-320.000.

HB Megaron: *See*—
Lundstrom, Lars-Birger, 291,832, Cl. D25-77.000.

Henriksson, Kjell, to Baby Bjorn Aktiebolag. Baby chair. 291,748, 9-8-87, Cl. D6-333.000.

Hoehne, George, to Bonny Products, Inc. Masher. 291,761, 9-8-87, Cl. D7-101.000.

Ikegami, Yoichi: *See*—
Takada, Kazuo; Egashira, Teruaki; Ikegami, Yoichi; Konishi, Kazuhiro; and Suzuki, Tadao, 291,765, Cl. D7-309.000.

Inaba, Koichi. Cap for packages. 291,779, 9-8-87, Cl. D9-445.000.

Inohara, Masanobu; and Hase, Yoshiaki, to Asics Corporation. Shoe sole. 291,743, 9-8-87, Cl. D2-320.000.

International Business Machines Corporation: *See*—
Conway, Ronald I.; Lucente, Samuel A.; and Schaum, David L., 291,806, Cl. D14-114.000.
Sharp, Michael H., 291,805, Cl. D14-113.000.

Iskra-Delta, Proizvodnja Racunalniskih Sistemov in Inzeniring, P.O.: *See*—
Bratasevec, Vid, 291,810, Cl. D18-12.000.

Jacobson, Loren A. Combined oil spout and valve. 291,781, 9-8-87, Cl. D9-448.000.

Jasper, Robert S. Guitar pick. 291,809, 9-8-87, Cl. D17-20.000.

Jen, Yen-Shen. Engraver for finger ring and bracelet. 291,811, 9-8-87, Cl. D18-13.000.

Johnson & Johnson Products Inc.: *See*—
Denny, Thomas, 291,827, Cl. D24-34.000.

Johnson, Richard A.: *See*—
Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., 291,828, Cl. D24-56.000.

Joss, Michael S.: *See*—
Marshall, Anne L.; and Joss, Michael S., 291,799, Cl. D14-11.000.

Kearney, John P.: *See*—
Clarke, Michael J.; Santarsiero, Paul S.; and Kearney, John P., 291,790, Cl. D12-108.000.

Kelsey-Hayes Company: *See*—
Reid, Donald J., 291,796, Cl. D12-209.000.

Kennedy Company: *See*—
Spiegelstein, Wolfgang, 291,797, Cl. D13-1.000.

Kenner Parker Toys Inc.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.

Kiiski, Heikki, to Tunturipyora OY. Exercise treadmill. 291,821, 9-8-87, Cl. D21-192.000.

Konishi, Kazuhiro: *See*—
Takada, Kazuo; Egashira, Teruaki; Ikegami, Yoichi; Konishi, Kazuhiro; and Suzuki, Tadao, 291,765, Cl. D7-309.000.

Laitram Corporation, The: *See*—
Lapeyre, James M.; and Faulkner, William G., 291,777, Cl. D8-499.000.

Lapeyre, James M.; and Faulkner, William G., to Laitram Corporation, The. Conveyor belt module. 291,777, 9-8-87, Cl. D8-499.000.
Larkin, Mark E.; Tripp, Edward S.; and Johnson, Richard A., to Abbott Laboratories. Vial enclosure. 291,828, 9-8-87, Cl. D24-56.000.
Lathrop, Bethany, to Aloys F. Dornbracht GmbH & Co. Faucet knob. 291,824, 9-8-87, Cl. D23-28.000.
Lemcke, Harland, to Corona Clipper Co. Flower shears. 291,769, 9-8-87, Cl. D8-4.000.
Ligon, Charles E.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.
Liu, King. Exercise bicycle. 291,822, 9-8-87, Cl. D21-194.000.
Lucente, Samuel A.: *See*—
Conway, Ronald I.; Lucente, Samuel A.; and Schaum, David L., 291,806, Cl. D14-114.000.
Lundstrom, Lars-Birger, to HB Megaron. Structural beam. 291,832, 9-8-87, Cl. D25-77.000.
Maddock, Mitchell E. Flow controller valve. 291,826, 9-8-87, Cl. D23-19.000.
Mallin Company: *See*—
Conn, Marks M., 291,749, Cl. D6-361.000.
Conn, Marks M., 291,752, Cl. D6-487.000.
Mantell, Robert D. Implement for activating and deactivating a telephone hook switch. 291,802, 9-8-87, Cl. D14-59.000.
Mantell, Robert D. Implement for activating and deactivating a telephone hook switch. 291,803, 9-8-87, Cl. D14-59.000.
Manufacturer's Merchandising Corporation: *See*—
Noyce, John B., 291,831, Cl. D25-73.000.
Mark, Irving L., to Tip Top Corporation. Steak knife. 291,764, 9-8-87, Cl. D7-151.000.
Marshall, Anne L.; and Joss, Michael S., to Minnesota Mining and Manufacturing Company. Videocassette. 291,799, 9-8-87, Cl. D14-11.000.
Matsui, Yoshiyuki, to Daiwa Seiko, Inc. Synthetic resin tube. 291,834, 9-8-87, Cl. D25-73.000.
McKinley, Jack W.: *See*—
Shore, John E. (Bud); Smythe, Cornelius P.; and McKinley, Jack W., 291,833, Cl. D25-36.000.
Meyerspeer, Bernhard, to Optyl Eyewear Fashion International Corporation. Sunglasses. 291,808, 9-8-87, Cl. D16-102.000.
Michael, Anthony J. Luminaire. 291,835, 9-8-87, Cl. D26-24.000.
Michelin et Recherche et Technique: *See*—
Clemens, Kevin F., 291,793, Cl. D12-147.000.
Michelin Recherche et Technique: *See*—
Clemens, Kevin F., 291,792, Cl. D12-147.000.
Clemens, Kevin F., 291,794, Cl. D12-147.000.
Micro Connection, Inc.: *See*—
Cohen, Robert M., 291,744, Cl. D3-74.000.
Miller, Dale E. Cable connecting pull for an automatic dead end and a tensioning device. 291,776, 9-8-87, Cl. D8-382.000.
Miller, Randolph F.: *See*—
Smith, David B.; and Miller, Randolph F., 291,823, Cl. D21-195.000.
Minnesota Mining and Manufacturing Company: *See*—
Marshall, Anne L.; and Joss, Michael S., 291,799, Cl. D14-11.000.
Morris, Allen M. Retractable speaker enclosure. 291,800, 9-8-87, Cl. D14-33.000.
Motor Electric Manufacturing Co., Ltd.: *See*—
Tung, Tse T., 291,838, Cl. D26-48.000.
Murphy, Armand, to W. C. Bradley Enterprises, Inc. Warming rack. 291,768, 9-8-87, Cl. D7-408.000.
Murtaugh, John F., III; Rae, Carol A.; and Arem, Arnold J. Finger splint. 291,830, 9-8-87, Cl. D24-64.000.
Myers, David A.: *See*—
Bollinger, Howard N.; Boudreaux, Mark D.; Cordrey, Robert E.; Ligon, Charles E.; Myers, David A.; Stroud, Walter E.; Wood, Earl M., Jr.; and Van de Merwe, Jan, III, 291,816, Cl. D21-134.000.
Nabisco Brands, Inc.: *See*—
Spiel, Albert; Roe, James; and Spanier, Henry C., 291,740, Cl. D1-106.000.
NEC Corporation: *See*—
Suzuki, Takeshi; and Takahashi, Mamoru, 291,801, Cl. D14-53.000.
Nintendo of America Inc.: *See*—
Barr, Lance N., 291,813, Cl. D21-13.000.
Noga, Robert A. Truck bed extension. 291,789, 9-8-87, Cl. D12-98.000.
Noyce, John B., to Manufacturer's Merchandising Corporation. Hand rail. 291,831, 9-8-87, Cl. D25-73.000.
O'Neil, William J., Jr.; Sims, Daniel J.; and Embertson, Randy, to Drackett Company, The. Aerosol can overcap. 291,782, 9-8-87, Cl. D9-448.000.
Optyl Eyewear Fashion International Corporation: *See*—
Meyerspeer, Bernhard, 291,808, Cl. D16-102.000.
Osit, Robert, to Black & Decker, Inc. Combined kitchen appliance and base assembly. 291,767, 9-8-87, Cl. D7-379.000.
Partecipazioni Bulgari S.p.A.: *See*—
Bulgari, Gianni, 291,784, Cl. D10-32.000.
Penn Plax Plastics, Inc.: *See*—
Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, 291,825, Cl. D23-4.000.
Phillips, Gerald: *See*—
Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, 291,825, Cl. D23-4.000.
Phillips, Steve. Carpet scraper. 291,839, 9-8-87, Cl. D32-49.000.
Pool, Daniel L., to Designer Bathware, Inc. Towel holder. 291,753, 9-8-87, Cl. D6-522.000.
Precor Incorporated: *See*—
Smith, David P.; and Miller, Randolph F., 291,823, Cl. D21-195.000.
Rae, Carol A.: *See*—
Murtaugh, John F., III; Rae, Carol A.; and Arem, Arnold J., 291,830, Cl. D24-64.000.
Rahme, Selim R. Adaptor for adjusting the aim of an automobile headlight. 291,785, 9-8-87, Cl. D10-46.000.
Rahme, Selim R. Adaptor for adjusting the aim of an automobile headlight. 291,786, 9-8-87, Cl. D10-46.000.
Reid, Donald J., to Kelsey-Hayes Company. Vehicle wheel center. 291,796, 9-8-87, Cl. D12-209.000.
Ritman, Joost R. Plate. 291,757, 9-8-87, Cl. D7-1.000.
Roe, James: *See*—
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Santarsiero, Paul S.: *See*—
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Chap, John P., 291,756, Cl. D6-566.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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4,692,589
275 4,692,590
295 4,692,591
298 4,692,592
4,692,593
373 4,692,594
421 4,692,595
450 4,692,596
492 4,692,597
497 4,692,598
532 4,692,599

CLASS 220
1 T 4,691,837
93 4,691,838
281 4,691,839
318 4,691,840
404 4,691,841

CLASS 221
1 4,691,842
58 4,691,843
4,691,845
4,691,846
259 4,691,847
269 4,691,848
4,691,849
4,691,844
4,691,850

CLASS 224
42.45 R 4,691,851
4,691,852

CLASS 227
19 4,691,853

CLASS 228
4.5 4,691,854
4,691,855
4,691,856
4,691,857

CLASS 229
23 R 4,691,859
52 A 4,691,860

CLASS 235
379 4,692,600
4,692,601
4,692,602
4,692,603
493 4,692,604

CLASS 236
34.5 4,691,861

CLASS 237
12.3 A 4,691,862

CLASS 238
4,691,863

CLASS 239
4,691,864
4,691,865

CLASS 241
5 4,691,866
21 4,691,867
24 4,691,868
34 4,691,869
4,691,870
166 4,691,871

CLASS 242
4 R 4,691,872
47.01 4,691,873
80 4,691,874
107.4 B 4,691,875

CLASS 244
3.22 4,691,876
6 4,691,877
7 R 4,691,878
45 R 4,691,879
4,691,880
4,691,881
158 R 4,691,882

CLASS 248
74.2 4,691,883
96 4,691,884
165 4,691,885
183 4,691,886
4,691,887
4,691,888
343 4,691,889
412 4,691,890
429 4,691,946
551 4,691,891
624 4,691,892

CLASS 250
4,692,605
4,692,606
4,692,607
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4,692,610
4,692,611
4,692,612
4,692,614
4,692,615
231 SE 4,692,613
252.1 4,692,616
4,692,617
4,692,618
338 4,692,619
343 4,692,620
4,692,621
4,692,622
349 4,692,623
363 R 4,692,625
363 S 4,692,624
4,692,626
423 P 4,692,627
492.2 4,692,579
497.1 4,692,628
560 4,692,629
573 4,692,630

CLASS 251
14 4,691,893
127 4,691,894
292 4,691,895

CLASS 252
8.551 4,692,254
32.7 E 4,692,256
33.4 4,692,268
49.6 4,692,257
4,692,258
51.5 A 4,692,255
4,692,259
99 4,692,260
105 4,692,261
4,692,262
122 4,692,263
4,692,264
4,692,265
301.17 4,692,266
321 4,692,267
4,692,269
353 4,692,270
354 4,692,271
514 4,692,272
518 4,692,273
521 4,692,274
534 4,692,275
545 4,692,276
4,692,277

CLASS 254
134.4 4,691,896

CLASS 256
65 4,691,897

CLASS 260
367 4,692,278
402 4,692,279
420 4,692,280
502.4 P 4,692,282
502.4 R 4,692,281

CLASS 261
89 4,692,283

CLASS 264
4.3 4,692,284
22 4,692,285
29.1 4,692,286
41 4,692,287
4,692,288
81 4,692,289
101 4,692,290
4,692,291
126 4,692,292
245 4,692,293
4,692,294
291 4,692,295

CLASS 264
89 4,691,898
4,691,899
4,691,900
236 4,691,901

CLASS 267
119 4,691,902

CLASS 269
6 4,691,903
17 4,691,904
45 4,691,905
48.1 4,691,906
152 4,691,907

CLASS 270
21.1 4,691,908
58 4,691,909

CLASS 271
3 4,691,910
9 4,691,911
10 4,691,912
34 4,691,913
297 4,691,914

CLASS 272
68 4,691,915
4,691,916
126 4,691,917
134 4,691,918
145 4,691,919

CLASS 273
73 J 4,691,926
85 A 4,691,920
85 B 4,691,921
177 B 4,691,922
180 4,691,923
189 R 4,691,924
407 4,691,925

CLASS 277
26 4,691,927
235 B 4,691,928

CLASS 279
19.3 4,691,929

CLASS 280
7.1 4,691,930
11.115 4,691,931
4,691,932
289 WC 4,691,933
4,691,934
507 4,691,935
615 4,691,936
711 4,691,937
4,691,938
4,691,939

CLASS 283
70 4,691,940

CLASS 284
1 4,691,941
4,691,942
315 4,691,943
4,691,944
419 4,691,945

CLASS 296
55 4,692,631

CLASS 292
171 4,691,948
216 4,691,949
269 4,691,950
337 4,691,951
341.18 4,691,952

CLASS 294
19.1 4,691,953
54.5 4,691,954
142 4,691,955

CLASS 296
37.8 4,691,960
51 4,691,956
98 4,691,957
146 4,691,958
184 4,691,959
218 Re.32,496

CLASS 297
61 4,691,961
4,691,962
195 4,691,963
4,691,964
4,691,965
452 4,691,966

CLASS 299
1 4,691,967

CLASS 303
52 4,691,968
113 4,691,969

CLASS 307
4,692,632
4,692,633
272.1 4,692,634
279 4,692,635
427 4,692,636
443 4,692,637
449 4,692,638
4,692,639
464 4,692,640
475 4,692,641
530 4,692,642
584 4,692,643

CLASS 310
178 4,692,644
184 4,692,645
4,692,646
212 4,692,647
233 4,692,648
316 4,692,649
323 4,692,650
4,692,651
4,692,652
334 4,692,653
4,692,654

CLASS 312
257 SK 4,691,970

CLASS 313
15 4,692,655
113 4,692,656
130 4,692,657
365 4,692,658
4,692,659
477 R 4,692,660
4,692,661
493 4,692,662
4,692,663

CLASS 315
60 4,692,664
4,692,665
4,692,666
4,692,667
241 S 4,692,668
381 4,692,669
4,692,670

CLASS 318
11 4,692,671
116 4,692,672
132 4,692,673
254 4,692,674
4,692,675
269 4,692,676
443 4,692,677
687 4,692,678
696 4,692,679

CLASS 320
2 4,692,680
4,692,681
35 4,692,682

CLASS 322
2 R 4,692,683
90 4,692,684

CLASS 323
263 4,692,686
284 4,692,687
285 4,692,688
313 4,692,689

CLASS 324
61 QS 4,692,685
73 PC 4,692,690
73 R 4,692,691
4,692,692
123 R 4,692,693
158 F 4,692,694
158 R 4,692,695
4,692,696
4,692,697
4,692,698
207 4,692,699
4,692,700
240 4,692,701
251 4,692,702
4,692,703
4,692,767
318 4,692,704
4,692,705
4,692,706
374 4,692,707

CLASS 328
63 4,692,708
4,692,709
111 4,692,710

CLASS 330
257 4,692,711
4,692,712

CLASS 331
1 A 4,692,713
1 R 4,692,714
2 4,692,715
4,692,716
111 4,692,717
113 R 4,692,718

CLASS 332
11 D 4,692,719

CLASS 333
33 4,692,720
4,692,721
142 4,692,722
4,692,723
4,692,724
4,692,725
4,692,726
219 4,692,727

CLASS 335
192 4,692,728
4,692,729
4,692,730
4,692,731
4,692,732

CLASS 337
158 4,692,733
4,692,734

CLASS 338
4,692,735
4,692,805

CLASS 340
4,692,736
4,692,738
4,692,737
4,692,739
4,692,740
392 4,692,741
4,692,742
4,692,743
4,692,744
4,692,745
572 4,692,746
4,692,747
4,692,748
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4,692,750
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4,692,756
721 4,692,757
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4,692,759
4,692,760
4,692,761
4,692,762

CLASS 342
4,692,763
4,692,764
4,692,765
200 4,692,766
4,692,768

CLASS 343
700 MS 4,692,769
4,692,770
882 4,692,771
4,692,772

CLASS 346
1:1 4,692,773
76 PH 4,692,774
4,692,775
140 R 4,692,776
4,692,777
4,692,778
153.1 4,692,779

CLASS 350
96.12 4,691,982
4,691,983
4,691,984
4,691,985
4,691,986
4,691,987
4,691,988
4,691,989
96.33 4,691,990
4,691,991
4,691,992
4,691,993
320 4,691,994
331 R 4,691,995
4,691,996
4,691,997
4,691,998
4,691,999
4,692,000

CLASS 351
41 4,692,001
4,692,002
4,692,003

CLASS 352
4,692,004
4,692,850

CLASS 363
4,692,851
4,692,852
4,692,853
75 4,692,854
4,692,855

CLASS 364
4,692,856
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4,692,864
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474 4,692,872
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4,692,890
4,692,891
4,692,892
4,692,893
4,692,894
4,692,895
4,692,896
4,692,897

CLASS 365
27 4,692,898
29 4,692,899
63 4,692,900
201 4,692,901
210 4,692,902
226 4,692,903
4,692,904

CLASS 366
22 4,692,028
149 4,692,029
337 4,692,030

CLASS 367
14 4,692,905
15 4,692,906
4,692,907
27 4,692,908
45 4,692,909
75 4,692,910
4,692,911
4,692,912

CLASS 368
18 4,692,031
76 4,692,032
4,692,033

CLASS 369
4,692,913
49 4,692,914
53 4,692,915
75.2 4,692,916

CLASS 370
60 4,692,917
85 4,692,918
96 4,692,919

CLASS 371
27 4,692,920
4,692,921
37 4,692,922
38 4,692,923

CLASS 372
30 4,692,924
46 4,692,925
4,692,926
63 4,692,928

CLASS 373
72 4,692,930
89 4,692,929

CLASS 374
208 4,692,034

CLASS 375
106 4,692,931
107 4,692,932

CLASS 376
4,692,296
4,692,297
215 4,692,298
216 4,692,299
245 4,692,300
391 4,692,301
439 4,692,302
4,692,303
4,692,304

CLASS 377
29 4,692,933

CLASS 378
4,692,934
49 4,692,935
59 4,692,936
4,692,938
4,692,937

CLASS 379
4,692,939
424 4,692,940

CLASS 381
4,692,941
4,692,942

CLASS 382
4,692,943
41 4,692,944

CLASS 384
4,692,035
44 4,692,036
4,692,037
45 4,692,038
4,692,039
4,692,040

CLASS 400
82 4,692,041
94 4,692,042
124 4,692,043
241.1 4,692,044
697 4,692,045

CLASS 401
32 4,692,046
141 4,692,047
197 4,692,048

CLASS 403
1 4,692,049
3 4,692,050
4,692,051
13 4,692,052
24 4,692,053
171 4,692,054
190 4,692,055
233 4,692,056
334 4,692,057

CLASS 404
72 4,692,058

CLASS 405
63 4,692,059
115 4,692,060
128 4,692,061
141 4,692,062
177 4,692,063
211 4,692,064
4,692,065
216 4,692,066
312 4,692,067

CLASS 406
89 4,692,068

CLASS 407
39 4,692,069
104 4,692,070

CLASS 408
9 4,692,071
124 4,692,072
239 A 4,692,073

CLASS 409
233 4,692,074

CLASS 411
4,692,075
55 4,692,076
4,692,077
231 4,692,078
353 4,692,079
387 4,692,080

CLASS 414
22 4,692,081
411 4,692,083
429 4,692,082
4,692,084
633 4,692,085
635 4,692,086
680 4,692,087
724 4,692,089

CLASS 415
112 4,692,090
119 4,692,091
143 4,692,092

CLASS 416
1 4,692,093
11 4,692,094
23 4,692,095
170 R 4,692,096
4,692,097
223 R 4,692,098
229 A 4,692,099
232 4,692,100

CLASS 417
68 4,692,101
296 4,692,102
547 4,692,103

CLASS 418
61 R 4,692,104
184 4,692,105

CLASS 420
436 4,692,305

CLASS 422
15 4,692,317
16 4,692,316
4,692,315
4,692,306
4,692,307
65 4,692,308
4,692,309
144 4,692,311
151 4,692,312
241 4,692,313
265 4,692,314

CLASS 423
B1 4,515,759
239 4,692,318
242 4,692,319
263 4,692,320
321 R 4,692,323
4,692,321
415 A 4,692,322

CLASS 424
1.1 4,692,324
4,692,325
15 4,692,326
4,692,328
81 4,692,329
4,692,330
4,692,331
122 4,692,310
4,692,333
4,692,334
149 4,692,335
4,692,336
4,692,337

CLASS 425
4,692,106
140 4,692,107
292 4,692,108
4,692,109
335 4,692,110
4,692,111

CLASS 426
2 4,692,338
72 4,692,339
4,692,340
250 4,692,341
293 4,692,342

CLASS 427
8 4,692,346
38 4,692,343
39 4,692,344
4,692,345
4,692,347
45.1 4,692,359
138 4,692,350
4,692,351
4,692,352
216 4,692,353
244 4,692,354
297 4,692,355
4,692,356
393.5 4,692,357
421 4,692,358
443.1 4,692,360

CLASS 428
35 4,692,327
4,692,361
4,692,362
B1 4,315,963
36 4,692,363
85 4,692,364
87 4,692,365
90 4,692,366
116 4,692,367
137 4,692,368
198 4,692,369
4,692,370
224 4,692,371
282 4,692,372
285 4,692,373
288 4,692,374
299 4,692,375
315.5 4,692,376
323 4,692,377
340 4,692,378
349 4,692,379
4,692,380
375 4,692,381
414 4,692,382
4,692,383
423.3 4,692,384
469 4,692,385
515 4,692,386
545 4,692,387
621 4,692,388
622 4,692,389

CLASS 429
17 4,692,390
34 4,692,391

CLASS 430
Re.32,498
46 4,692,392
59 4,692,393
140 4,692,394
254 4,692,395
284 4,692,396
325 4,692,397
329 4,692,398
4,692,399
553 4,692,400
4,692,401
4,692,402

CLASS 431
253 4,692,112

CLASS 432
72 4,692,113
4,692,114
242 4,692,115

CLASS 433
225 4,692,116

CLASS 434
185 4,692,117
236 4,692,118
259 4,692,119

CLASS 435
4,692,403
4,692,404
7 Re.32,499
4,692,405
13 4,692,406
4,692,407
104 4,692,408
109 4,692,409
235 4,692,410
243 4,692,411
253 4,692,412
278 4,692,413
291 4,692,414

CLASS 436
20 4,692,415
508 4,692,416
518 4,692,417

CLASS 437
33 4,691,436
44 4,691,433
82 4,692,348
4,692,194
173 4,691,434
175 4,691,435
4,692,190
230 4,692,349

CLASS 439
4,692,120
77 4,691,972
4,691,971
4,691,979
147 4,691,974
161 4,691,973
4,691,975

394	4,691,976		4,692,422		4,692,461	240	4,692,496		CLASS 544		CLASS 562
[illegible]	4,691,977		CLASS 502	[illegible]	4,692,462	263	4,692,497	303	4,692,524	471	4,692,551
476	4,691,980	[illegible]	4,692,423	[illegible]	4,692,463	[illegible]	4,692,498	360	4,692,525	475	4,692,552
[illegible]	4,691,978	68	4,692,424	[illegible]	4,692,464	524	4,692,499	366	4,692,526		CLASS 564
[illegible]	4,691,981	81	4,692,425	539	4,692,465	[illegible]	4,692,500	405	4,692,527	185	4,692,553
[illegible]	4,692,121	154	4,692,426	604	4,692,466		CLASS 526		CLASS 546	430	4,692,554
882	4,692,122	[illegible]	4,692,427	609	4,692,467	65	4,692,501	115	4,692,528		CLASS 568
	CLASS 440	254	4,692,428	[illegible]	4,692,468	193	4,692,502	141	4,692,529	722	4,692,555
77	4,692,123	303	4,692,429	651	4,692,469	[illegible]	4,692,503	261	4,692,530	916	4,692,432
	CLASS 441	342	4,692,430		CLASS 521		CLASS 527		CLASS 548		CLASS 604
40	4,692,124	417	4,692,431	55	4,692,470	300	4,692,478	193	4,692,531	4	4,692,138
112	4,692,125		CLASS 514	59	4,692,471		CLASS 528	312	4,692,532	22	4,692,139
	CLASS 485	12	4,692,433	[illegible]	4,692,472	[illegible]	4,692,504		4,692,533	40	4,692,140
17	4,692,945	49	4,692,434	72	4,692,473	241	4,692,505		CLASS 549	43	4,692,141
	CLASS 464	56	4,692,435	88	4,692,474	[illegible]	4,692,506	456	4,692,534	51	4,692,142
103	4,692,126	129	4,692,436	92	4,692,475	[illegible]	4,692,507	542	4,692,535	55	4,692,143
119	4,692,127	165	4,692,437	112	4,692,476	303	4,692,508		CLASS 554	56	4,692,144
	CLASS 474	183	4,692,438	174	4,692,477		CLASS 530	413	4,692,536	65	4,692,145
6	4,692,128	[illegible]	4,692,439		CLASS 523	[illegible]	4,692,509	484	4,692,537	93	4,692,146
80	4,692,131	[illegible]	4,692,440	209	4,692,479	317	4,692,510		CLASS 558		4,692,147
148	4,692,129	[illegible]	4,692,441	218	4,692,480	325	4,692,511	6	4,692,538	96	4,692,148
201	4,692,130	[illegible]	4,692,442	219	4,692,481	[illegible]	4,692,512	78	4,692,539	99	4,692,149
	CLASS 483	[illegible]	4,692,443	340	4,692,482		4,692,513		4,692,540	111	4,692,150
[illegible]	4,692,132	212	4,692,445	406	4,692,483		CLASS 536	87	4,692,541	132	4,692,151
128	4,692,133	234	4,692,446	414	4,692,484	127	4,692,514	184	4,692,542	164	4,692,152
[illegible]	4,692,134	248	4,692,447		CLASS 524		CLASS 540	342	4,692,543	171	4,692,153
[illegible]	4,692,135	252	4,692,448	[illegible]	4,692,485	203	4,692,515		CLASS 560	172	4,692,154
	CLASS 494	254	4,692,449	[illegible]	4,692,486	222	4,692,516	4	4,692,544	177	4,692,155
38	4,692,136	256	4,692,450	139	4,692,487		4,692,517	18	4,692,545	195	4,692,156
85	4,692,137	[illegible]	4,692,451	243	4,692,488	224	4,692,518	130	4,692,546	214	4,692,157
	CLASS 501	[illegible]	4,692,452	371	4,692,489	227	4,692,519	186	4,692,547	260	4,692,158
90	4,692,418	[illegible]	4,692,453	[illegible]	4,692,490	451	4,692,520	202	4,692,548	277	4,692,159
97	4,692,419	312	4,692,454	731	4,692,491	523	4,692,521	204	4,692,549	331	4,692,160
	4,692,420	332	4,692,455	[illegible]	4,692,492	533	4,692,522	345	4,692,550	366	4,692,161
136	4,692,421	333	4,692,456	[illegible]	4,692,493		4,692,523			385 A	4,692,163
		361	4,692,457		CLASS 525					385 R	4,692,162
		[illegible]	4,692,458	57	4,692,494						CLASS 623
		[illegible]	4,692,459	[illegible]	4,692,495					2	4,692,164
		[illegible]	4,692,444								4,692,165
		443	4,692,460								

CLASSIFICATION OF DESIGNS

D1—	[illegible]	291,740	D7—	1	291,757		341	291,774		130	291,791	D16—	102 [illegible]
D2—	277	291,741		42	291,758			291,775		147	291,792	D17—	20 291,809
	314	291,742		[illegible]	291,759		382	291,776			291,793	D18—	12 291,810
	[illegible]	291,743		[illegible]	291,760		[illegible]	291,777			291,794		13 291,811
D3—	30.1	291,745		101	291,761	D9—	413	291,778		163	291,795		14 291,812
		291,747			291,762		[illegible]	291,779		[illegible]	291,796	D21—	13 291,813
	74	291,744		105	291,763		447	291,780	D13—	1	291,797		22 291,814
	103	291,746		151	291,764		[illegible]	291,781		[illegible]	291,798		52 291,815
D6—	333	291,748		[illegible]	291,765			291,782	D14—	[illegible]	291,799	D25—	36 291,833
	[illegible]	291,749			291,766	D10—	2	291,783		33 [illegible]			73 291,831
	[illegible]	291,750		379	291,767		32	291,784		53	291,801		153 291,817
	[illegible]	291,751		[illegible]	291,768		[illegible]	291,785		59	291,802		159 291,818
	[illegible]	291,752	D8—	[illegible]	291,769			291,786			291,803		[illegible] 291,819
	522	291,753		[illegible]	291,770		[illegible]	291,787		[illegible]	291,804		191 291,820
	553	291,754		330	291,771	D11—	213	291,788		113	291,805		192 291,821
	[illegible]	291,755		331	291,772	D12—	98	291,789		114	291,806		[illegible] 291,822
		291,756			291,773		108	291,790	D15—	5	291,807		195 291,823

D23—	4	291,825											
	[illegible]	291,826											
	[illegible]	291,824											
D24—	34	291,827											
	[illegible]	291,828											
	62	291,829											
	[illegible]	291,830											
D25—	36	291,833											
	73	291,831											
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	77	291,832											
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	37	291,836											
	[illegible]	291,838											
D32—	25	291,837											
	[illegible]	291,839											

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	4,691,639	4,691,785	4,692,390	4,691,808	4,692,724	4,692,660
	4,692,578	4,691,789	4,692,394	4,691,833	4,692,746	4,692,667
	4,692,623	4,691,798	4,692,402	4,691,853	4,692,766	4,692,668
02 :	4,691,465	4,691,834	4,692,411	4,692,040	4,692,772	4,692,671
04 :	4,691,441	4,691,851	4,692,412	4,692,075	4,692,848	4,692,681
	4,691,568	4,691,879	4,692,427	[illegible]	4,692,880	4,692,696
	4,691,614	4,691,914	4,692,433	4,692,174	13 : 4,691,477	4,692,697
	4,691,634	4,691,916	4,692,439	4,692,221	4,691,606	4,692,726
	4,691,692	4,691,933	4,692,511	4,692,276	4,691,628	4,692,734
	4,691,972	4,691,935	4,692,559	4,692,342	4,691,699	4,692,817
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	4,692,631	4,691,976	4,692,618	4,692,589	4,692,371	4,692,945
	4,692,641	4,691,979	4,692,621	4,692,603	4,692,432	18 : 4,691,424
	4,692,763	4,691,980	4,692,634	4,692,639	4,692,564	4,691,480
	4,692,877	4,691,984	4,692,635	4,692,707	4,692,919	4,691,520
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05 :	4,691,617	4,692,002	4,692,674	4,692,835	17 : 4,691,397	4,691,604
	4,692,478	4,692,003	4,692,680	4,692,870	4,691,404	4,691,730
06 :	4,691,388	4,692,042	4,692,688	4,692,908	4,691,445	4,691,731
	4,691,396	4,692,051	4,692,698	10 : 4,692,360	4,691,463	4,691,797
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	4,691,405	4,692,087	4,692,723	4,692,549	4,691,557	4,691,958
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	4,691,427	4,692,093	4,692,761	12 : 4,691,395	4,691,615	4,692,049
	4,691,455	4,692,103	4,692,769	4,691,494	4,691,627	4,692,195
	4,691,460	4,692,115	4,692,780	4,691,698	4,691,765	4,692,250
	4,691,490	4,692,118	4,692,809	4,691,708	4,691,794	4,692,434
	4,691,496	4,692,124	4,692,819	4,691,719	4,691,835	4,692,443
	4,691,501	4,692,137	4,692,821	4,691,778	4,691,860	4,692,468
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	4,691,518	4,692,144	4,692,839	4,691,823	4,692,130	4,692,566
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	4,691,555	4,692,156	4,692,849	4,691,841	4,692,149	4,692,749
	4,691,566	4,692,157	4,692,850	4,691,863	4,692,150	4,692,751
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	4,691,707	4,692,245	[illegible] : 4,691,738	4,692,089	4,692,514	4,691,840
	4,691,709	4,692,273	4,691,858	4,692,138	4,692,552	4,692,232
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	4,691,732	4,692,326	4,692,252	4,692,437	4,692,572	4,691,497
	4,691,741	4,692,336	4,692,719	4,692,458	4,692,577	4,691,620
	4,691,747	4,692,355	[illegible] : 4,691,438	4,692,459	4,692,586	4,692,117
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188-995 O.G.-87-1

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

June 2, 1987.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 11, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,470,155 through 4,471,494
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 28, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,389,743	06/276,173	6/28/83
4,389,753	06/308,431	6/28/83
4,389,774	06/281,813	6/28/83
4,389,782	06/352,939	6/28/83
4,389,790	06/254,691	6/28/83
4,389,792	06/225,402	6/28/83
4,389,795	06/255,767	6/28/83
4,389,802	06/320,330	6/28/83
4,389,810	06/371,972	6/28/83
4,389,813	06/228,469	6/28/83
4,389,816	06/247,221	6/28/83
4,389,835	06/289,528	6/28/83
4,389,836	06/281,421	6/28/83
4,389,838	06/375,724	6/28/83
4,389,842	06/245,144	6/28/83
4,389,844	06/272,568	6/28/83
4,389,846	06/318,369	6/28/83
4,389,849	06/308,204	6/28/83
4,389,874	06/245,711	6/28/83
4,389,877	06/248,552	6/28/83
4,389,883	06/298,165	6/28/83
4,389,887	06/271,639	6/28/83
4,389,900	06/219,705	6/28/83
4,389,905	06/287,144	6/28/83
4,389,913	06/239,987	6/28/83
4,389,918	06/267,126	6/28/83
4,389,926	06/273,433	6/28/83
4,389,963	06/247,806	6/28/83
4,389,964	06/322,235	6/28/83
4,389,977	06/290,327	6/28/83
4,389,978	06/272,035	6/28/83
4,389,984	06/247,900	6/28/83
4,389,985	06/233,952	6/28/83
4,389,988	06/251,289	6/28/83
4,389,989	06/279,668	6/28/83
4,389,990	06/305,353	6/28/83
4,390,009	06/379,185	6/28/83
4,390,014	06/310,889	6/28/83
4,390,015	06/223,254	6/28/83
4,390,017	06/290,820	6/28/83
4,390,030	06/328,855	6/28/83
4,390,037	06/371,242	6/28/83
4,390,048	06/277,717	6/28/83
4,390,051	06/250,605	6/28/83
4,390,057	06/259,093	6/28/83
4,390,060	06/285,430	6/28/83
4,390,061	06/221,534	6/28/83
4,390,070	06/266,864	6/28/83
4,390,078	06/351,439	6/28/83
4,390,085	06/295,321	6/28/83
4,390,087	06/299,725	6/28/83
4,390,089	06/240,907	6/28/83
4,390,093	06/248,977	6/28/83
4,390,095	06/236,779	6/28/83
4,390,096	06/254,023	6/28/83
4,390,101	06/219,800	6/28/83
4,390,108	06/320,384	6/28/83
4,390,113	06/353,217	6/28/83
4,390,115	06/249,112	6/28/83
4,390,140	06/242,766	6/28/83
4,390,142	06/291,356	6/28/83
4,390,144	06/230,898	6/28/83
4,390,145	06/236,566	6/28/83
4,390,146	06/245,050	6/28/83
4,390,147	06/295,769	6/28/83
4,390,154	06/307,370	6/28/83
4,390,157	06/230,441	6/28/83
4,390,159	06/257,753	6/28/83
4,390,161	06/240,096	6/28/83
4,390,163	06/387,952	6/28/83
4,390,164	06/305,026	6/28/83
4,390,168	06/324,587	6/28/83
4,390,170	06/359,774	6/28/83
4,390,179	06/279,530	6/28/83
4,390,183	06/324,176	6/28/83
4,390,190	06/297,506	6/28/83
4,390,195	06/236,839	6/28/83
4,390,211	06/326,035	6/28/83
4,390,222	06/301,308	6/28/83
4,390,271	06/330,117	6/28/83
4,390,285	06/292,213	6/28/83
4,390,304	06/365,198	6/28/83
4,390,312	06/237,088	6/28/83
4,390,313	06/247,274	6/28/83
4,390,322	06/233,217	6/28/83
4,390,323	06/347,034	6/28/83
4,390,338	06/322,422	6/28/83

Patent Number	Serial Number	Issue Date
4,390,381	06/376,669	6/28/83
4,390,389	06/338,624	6/28/83
4,390,390	06/258,964	6/28/83
4,390,397	06/334,656	6/28/83
4,390,400	06/266,951	6/28/83
4,390,403	06/286,387	6/28/83
4,390,408	06/278,226	6/28/83
4,390,417	06/285,197	6/28/83
4,390,427	06/301,317	6/28/83
4,390,434	06/391,592	6/28/83
4,390,435	06/396,252	6/28/83
4,390,462	06/322,726	6/28/83
4,390,463	06/322,872	6/28/83
4,390,464	06/366,091	6/28/83
4,390,469	06/258,384	6/28/83
4,390,479	06/394,518	6/28/83
4,390,485	06/337,852	6/28/83
4,390,486	06/245,563	6/28/83
4,390,491	06/361,593	6/28/83
4,390,498	06/284,198	6/28/83
4,390,518	06/254,723	6/28/83
4,390,529	06/221,647	6/28/83
4,390,537	06/379,604	6/28/83
4,390,538	06/297,884	6/28/83
4,390,540	06/292,315	6/28/83
4,390,541	06/327,146	6/28/83
4,390,564	06/294,774	6/28/83
4,390,583	06/350,776	6/28/83
4,390,604	06/278,896	6/28/83
4,390,619	06/306,322	6/28/83
4,390,620	06/216,911	6/28/83
4,390,643	06/299,168	6/28/83
4,390,649	06/349,781	6/28/83
4,390,661	06/382,945	6/28/83
4,390,704	06/281,042	6/28/83
4,390,705	06/343,861	6/28/83
4,390,715	06/282,190	6/28/83
4,390,730	06/287,384	6/28/83
4,390,733	06/263,598	6/28/83
4,390,737	06/316,781	6/28/83
4,390,743	06/301,322	6/28/83
4,390,755	06/272,373	6/28/83
4,390,758	06/225,752	6/28/83
4,390,759	06/255,040	6/28/83
4,390,760	06/340,352	6/28/83
4,390,761	06/226,079	6/28/83
4,390,770	06/286,390	6/28/83
4,390,774	06/247,112	6/28/83
4,390,800	06/280,052	6/28/83
4,390,804	06/275,517	6/28/83
4,390,820	06/298,973	6/28/83
4,390,822	06/288,681	6/28/83
4,390,828	06/359,021	6/28/83
4,390,854	06/239,955	6/28/83
4,390,857	06/326,090	6/28/83
4,390,860	06/286,242	6/28/83
4,390,861	06/242,742	6/28/83
4,390,875	06/359,135	6/28/83
4,390,892	06/313,163	6/28/83
4,390,920	06/331,610	6/28/83
4,390,922	06/345,920	6/28/83
4,390,927	06/379,928	6/28/83
4,390,928	06/288,781	6/28/83
4,390,976	06/228,847	6/28/83
4,390,978	06/279,183	6/28/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c);37 CFR 1.378)

The patent listed below is considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,358,096	06/242,511	11/9/82	3/10/81	8/12/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,899,091, Re. S.N. 077,431, Filed July 24, 1987, Cl. 219/10.554, REFUSE COLLECTION APPARATUS, Fred T. Smith, Owner of Record: *Sargent Industries, Inc., Wayne, Mich.,* Attorney or Agent: Ellsworth R. Roston, et al., Ex. Gp.: 214

3,999,669, Re. S.N. 077,432, Filed July 24, 1987, Cl. 414/517, REFUSE COLLECTION APPARATUS, Fred T. Smith, Owner of Record: *Sargent Industries, Inc., Wayne, Mich.,* Attorney or Agent: Ellsworth R. Roston, et al., Ex. Gp.: 317

4,536,714, Re. S.N. 076,635, Filed July 23, 1987, Cl. 324/338, SHIELDS FOR ANTENNAS OF BOREHOLES LOGGING DEVICES, Brian Clark, Owner of Record: *Schlumberger Technology Corp., New York, N.Y.,* Attorney or Agent: Kenneth Olsen, Ex. Gp.: 267

4,587,940, Re. S.N. 076,464, Filed July 22, 1987, Cl. 123/503, FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, Walter Schmid, Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany,* Attorney or Agent: Edwin E. Greigg, et al., Ex. Gp.: 342

4,614,690, Re. S.N. 072,217, Filed July 10, 1987, Cl. 428/614, INORGANIC FIBER-REINFORCED METALLIC COMPOSITE MATERIAL, Takemi Yamamura, et al., Owner of Record: *Ube Industries Ltd., Ube, Japan,* Attorney or Agent: Leonard J. Robbins, et al., Ex. Gp.: 111

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,485,383, Reexam. No. 90/001,291, Requested: July 28, 1987, Cl. 212/195, AUXILIARY SUPPORT FOR CRANES, Daniel E. Beduhn, Owner of Record: *Manitowoc Co., Inc., Manitowoc, Minn.,* Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: American Hoist & Derrick Co., St. Paul, Minn.

4,071,312, Reexam. No. 90/001,293, Requested: July 30, 1987, Cl. 8/648, GREEN-YELLOW TO ORANGE MONDAZO PAPER DYES, John Blackwell, Owner of Record: *Mobay Corp., Pittsburgh, Pa.,* Attorney or Agent: Unknown, Ex. Gp.: 110, Requester: Owner

4,189,834, Reexam. No. 90/001,299, Requested: Aug. 3, 1987, Cl. 32/15, DENTAL REINFORCING PINS, Andrew J. Smith, Owner of Record: *Fairfax Dental Ltd., Dublin, Ireland,* Attorney or Agent: Beveridge, DeGrandi, et al., Ex. Gp.: 330, Requester: Berj A. Terzian, New York, N.Y.

4,200,866, Reexam. No. 90/001,292, Requested: July 27, 1987, Cl. 340/703, STROKE WRITTEN SHADOW-MASK MULTI-COLOR CRT DISPLAY SYSTEM, Lyle R. Strathman, Owner of Record: *Rockwell International Corp., El Segundo, Calif.,* Attorney or Agent: Unknown, Ex. Gp.: 260, Requester: Owner

4,330,122, Reexam. No. 90/001,265, Requested: June 18, 1987, Cl. 273/51, CONVERTIBLE BOWLING ALLEY, Zena Sheinberg, et al., Owner of Record: *Zena Sheinberg & Alex Wortman, Ann Arbor, Mich.,* Attorney or Agent: Myron Cohen, Ex. Gp.: 330, Requester: Shur-Scope, Inc., Clifton, N.J.

4,375,321, Reexam. No. 90/001,298, Requested: July 31, 1987, Cl. 354/23, EXPOSURE AMOUNT CONTROL DEVICE, Ryoichi Suzuki, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Toren, McGeady, et al., Ex. Gp.: 210, Requester: Charles R. Donohoe, Washington, D.C.

4,394,329, Reexam. No. 90/001,297, Requested: Aug. 3, 1987, Cl. 558/484, 2-HYDROXYMETHYL-1,3-PROPANEDIOL NITRATE ESTER, Michael W. Barnes, Owner of Record: *Morton Thiokol, Inc., Chicago, Ill.,* Attorney or Agent: Gerald K. White, Ex. Gp.: 220, Requester: Owner

4,429,001, Reexam. No. 90/001,294, Requested: July 31, 1987, Cl. 428/283, SHEET PRODUCT CONTAINING SORBENT PARTICULATE MATERIAL, Barbara E. Kolpin, et al., Owner of Record: *Minnesota Mining & Mfg. Co., St. Paul, Minn.,* Attorney or Agent: Roger Tamte, Ex. Gp.: 150, Requester: Kimberly-Clark Corp., Roswell, Ga.

4,456,590, Reexam. No. 90/001,296, Requested: July 31, 1987, Cl. 424/101, HEAT TREATMENT OF LYOPHILEZED BLOOD CLOTTING FACTOR VIII CONCENTRATE, Alan Rubinstein, Owner of Record: *Cedars-Sinai Medical Ctr., Los Angeles, Calif.,* Attorney or Agent: Lyon & Lyon, Ex. Gp.: 120, Requester: Rorer Group, Inc., Fort Washington, Pa.

4,556,558, Reexam. No. 90/001,295, Requested: July 31, 1987, Cl. 424/101, TREATMENT OF FACTOR VIII CONCENTRATE TO MINIMIZE THE AFFECT OF UNDESIRABLE MICROORGANISMS, Alan Rubinstein, Owner of Record: *Cedars-Sinai Medical Ctr., Los Angeles, Calif.,* Attorney or Agent: Lyon & Lyon, Ex. Gp.: 120, Requester: Rorer Group, Inc., Fort Washington, Pa.

Use of Color Drawings in Utility Patents

This notice supersedes the Official Gazette notice, dated Aug. 6, 1986, published at 1070 O.G. 10 on Sept. 9, 1986.

Under 37 CFR 1.84, the drawings of a utility patent application must be in black and white. However, on occasion, color drawings may be appropriate. In this circumstance, the Patent and Trademark Office will entertain a petition under 37 CFR 1.183 to waive the requirements of §1.84 to the extent that color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) will be accepted for the purposes and under the conditions set forth below.

The petition must be accompanied by five (5) sets of color drawings on DIN size A4 sheets (21.0 by 29.7 cm.) for examination, copying and archival purposes.

In light of the substantial administrative and economic burden associated with printing a utility patent with color drawings, the patent copies which are printed at issuance of the application will depict the drawings in black and white only. However, a set of color drawings will be attached to the Letters Patent. Moreover, copies of the patent with color drawings attached thereto will be provided by the Patent and Trademark Office upon special request and payment of the fee necessary to recover the actual costs associated therewith.

Accordingly, the petition must also be accompanied by a proposed amendment to insert the following language as the first paragraph in the portion of the specification containing a brief description of the drawings:

> The file of this patent contains at least one drawing executed in color. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

It is anticipated that such a petition will be granted only when the Patent and Trademark Office has determined that a color drawing is the only practical medium by which to disclose in a printed utility patent the subject matter sought to be patented.

It is emphasized that a decision to grant the petition should not be regarded as an indication that color drawings are necessary to comply with a statutory requirement. In this latter respect, clearly it is desirable to file any desired color drawings as part of the original application papers in order to avoid issues concerning statutory defects (e.g., lack of enablement under 35 USC 112 or new matter under 35 USC 132). The filing of the petition, however, may be deferred until acceptable drawings are required by the examiner.

The petition should be directed to the attention of the Office of the Deputy Assistant Commissioner for Patents.

July 24, 1987.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Goodman & Suss Clothes Corp., New York, N.Y., Reg. No. 515,376, for the mark "TRANS-ATLANTIC", Canc. No. 16,088.

Dorothy Lee Vick (nee Dorothy Lee) dba Dottie Lee Bakeries, Amarillo, Tex., Reg. No. 575,260, for the mark "DOTTIE LEE & DESIGN", Canc. No. 16,032.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

McMorris & Associates, Inc., dba Oh! Naturelle, Atlanta, Ga., Reg. No. 1,376,395, for the mark "OH! NATURELLE AND DESIGN", Canc. No. 16,228.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Lourdes Garcia, dba Adopt-A-Pet, Peachtree City, Ga., Reg. No. 1,231,217, for the mark "ADOPT-A-PET (Plus other Notations) AND DESIGN", Canc. No. 16,274.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 15, 1987

D. 289,329	4,619,357	4,644,934	4,663,180
4,230,533	4,619,645	4,646,531	4,663,263
4,278,872	4,621,888	4,647,560	4,663,340
4,413,176	4,622,358	4,647,753	4,663,406
4,428,744	4,622,948	4,647,986	4,663,450
4,475,161	4,624,319	4,648,466	4,663,534
4,504,298	4,624,324	4,648,864	4,663,582
4,508,778	4,624,905	4,650,003	4,663,672
4,515,909	4,624,912	4,650,917	4,663,778
4,519,338	4,625,156	4,650,988	4,663,896
4,528,246	4,626,259	4,651,175	4,663,926
4,531,073	4,626,330	4,652,348	4,664,146
4,535,171	4,626,488	4,652,514	4,664,259
4,540,573	4,627,007	4,652,556	4,664,583
4,560,997	4,627,245	4,652,629	4,664,721
4,564,287	4,627,824	4,652,823	4,664,810
4,564,489	4,629,777	4,653,062	4,665,255
4,572,168	4,630,626	4,653,232	4,665,991
4,575,669	4,631,198	4,653,903	4,666,152
4,576,671	4,631,283	4,653,955	4,666,188
4,584,152	4,631,571	4,654,223	4,666,199
4,590,187	4,631,676	4,654,375	4,666,221
4,590,321	4,632,132	4,654,784	4,666,314
4,590,322	4,633,441	4,655,168	4,666,357
4,591,304	4,635,162	4,655,228	4,666,484
4,591,670	4,635,640	4,655,311	4,666,544
4,592,049	4,636,002	4,655,779	4,666,914
4,592,967	4,636,161	4,656,006	4,667,049
4,596,736	4,636,783	4,656,027	4,667,110
4,596,932	4,637,212	4,657,335	4,667,246
4,597,630	4,637,399	4,657,898	4,667,906
4,599,311	4,637,560	4,658,275	4,667,931
4,600,503	4,637,889	4,658,959	4,668,086
4,603,220	4,638,209	4,659,014	4,668,256
4,605,102	4,638,930	4,659,517	4,668,496
4,606,196	4,639,920	4,661,284	4,668,562
4,608,254	4,640,531	4,661,910	4,670,287
4,609,673	4,640,810	4,662,071	4,670,510
4,610,126	4,641,739	4,662,202	4,673,115
4,610,288	4,641,892	4,662,453	4,673,572
4,611,059	4,643,771	4,662,834	4,679,453
4,618,619	4,644,001	4,663,065	

Disclaimers

4,108,837.—*Robert N. Johnson*, New Market; *Alford G. Farnham*, Mendham, both of N.J. POLYARYLENE POLYETHERS. Patent dated Aug. 22, 1978. Disclaimer filed Apr. 30, 1987, by the assignee, *Amoco Corp.*

Hereby enters this disclaimer to claim 58 of said patent.

4,124,570.—*Anthony S. Scheibelhoffer*, Norton; *Richard E. Meier*, Stow, both of Ohio. POLY(NEOPENTYL TEREPHTHALATE/TRIMELLITATE)THERMOSETTING RESIN. Patent dated Nov. 7, 1978. Disclaimer filed July 20, 1987, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to all claims of said patent.

4,513,699.—*Gyula Cser*, Budapest, Hungary. INTAKE GAS RESONANCE SYSTEM FOR INTERNAL COMBUSTION ENGINES. Patent dated Apr. 30, 1985. Disclaimer filed May 8, 1987, by the assignee, *Autoipari Kutato es Fejleszto Vallalat.*

Hereby enters this disclaimer to claim 3 of said patent.

4,538,437.—*Robert E. Wisebaker*, Tiffin, Ohio. FORGING MACHINE KICKOUT DRIVE WITH RUNNING ADJUSTMENT. Patent dated Sept. 3, 1985. Disclaimer filed June 1, 1987, by the assignee, *National Machinery Co.*

Hereby enters this disclaimer to claims 1, 2, 3 and 11 of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
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	Miami–Dade Public Library	(305) 375-2665
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
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	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 15, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-13-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-16-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-25-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,522,401 to 3,526,003, inclusive

Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 15, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,166,328 (757th)

SHOE REPAIR DEVICE

James C. Hamilton, 6307 Valley Rd., Bethesda, Md. 20034

Reexamination Request No. 90/001,151, Jan. 14, 1987.
Reexamination Certificate for Patent No. 4,166,328, issued Sep. 4, 1979, Ser. No. 781,568, Mar. 28, 1977.
Int. Cl.[4] A43B *13/22, 5/00*
U.S. Cl. 36—72 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A device for covering a worn area on a shoe comprising

an opened topped member of flexible material having a side wall and a bottom member lying in a plane generally at right angles to said side wall,

said side wall having an upper edge and extending from a first region of the shoe intended to lie under the ball of the foot of the foot of the wearer and terminating at a second region adjacent the longitudinal center of the front of the shoe,

said side wall having a generally straight section along the side of the shoe and a section of increasing curvature adjacent the intended location of the big toe of the wearer whereby the curvature of said side wall conforms to the side of the shoe between said first and second regions,

said bottom member having an outer edge extending between said ends of said side wall, and

said device having a region of maximum thickness in the region of said device intended to lie both under the big toe and forward of the big toe of the wearer of the shoe,

said device tapering from said maximum thickness to a lesser thickness at said upper edge, said first and second regions and said outer edge.

B1 4,225,345 (758th)

PROCESS FOR FORMING METAL PARTS WITH LESS THAN 1 PERCENT CARBON CONTENT

James M. Adee, San Diego, and John A. MacPherson, Chula Vista, both of Calif., assignors to Form Physics Corp., San Diego, Calif.

Reexamination Request No. 90/000,961, Feb. 18, 1986.
Reexamination Certificate for Patent No. 4,225,345, issued Sep. 30, 1980, Ser. No. 931,966, Aug. 8, 1978.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—36

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

New claims **10–24** are added and determined to be patentable.

1. A process for forming a metal part having a carbon content of less than 1% comprised of the steps of:

forming a substantially uniform mixture comprised of a powdered metal, a plasticizer, at least one first binder which is selectively extractable from said mixture without sintering and at least one further binder which is not removable by said selective extraction,

the total quantities of said binders and plasticizer being selected to form a readily moldable mixture and the quantity of binder not removable by said selective extraction being sufficient to maintain the shape of the molded mixture but less than that forming a carbon content of 1.0% after sintering;

shaping said mixture into said part;

removing said plasticizer and extractable binder from said part without sintering to form a porous part having a reduced binder content which, when decomposed by sintering, leaves said part with less than said predetermined carbon content; and

heating said porous part at a temperature and in an atmosphere to decompose and remove residual binder to a carbon content less than 1% and to sinter said powdered metal into a shaped metal part.

B1 4,556,658 (759th)

7-AMINO-1-CYCLOPROPYL-6,8-DIFLUORO-1,4-DIHYDRO-4-OXO-QUINOLINE-3-CARBOXYLIC ACIDS AND ANTIBACTERIAL AGENTS CONTAINING THESE COMPOUNDS

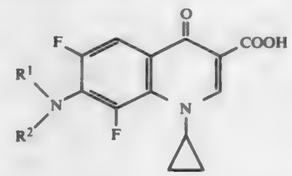
Klaus Grohe, Odenthal; Uwe Petersen, Leverkusen; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Reexamination Request No. 90/000,981, Apr. 7, 1986.
Reexamination Certificate for Patent No. 4,556,658, issued Dec. 3, 1985, Ser. No. 603,480, Apr. 24, 1984.
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318145
Int. Cl.[4] A61K *31/495*
U.S. Cl. 514—254

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

1. A 7-amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinolinecarboxylic acid of the formula (I)



(I)

in which

R^1 and R^2 are identical or different and represent a C_1–C_4-alkyl radical which is optionally substituted by a hy-

droxyl, amino, methylamino or dimethylamino group, and R^1 and R^2, together with the nitrogen atom to which they are bonded, furthermore form a 5-membered or 6-membered heterocyclic ring, which can additionally have, as a ring member, the atoms or groups —O—, —S—, —SO—, —SO_2— or >N-R^3 and which is optionally monosubstituted, disubstituted or trisubstituted at the carbon atoms by C_1–C_4-alkyl, hydroxyl, alkoxy having 1–3 carbon atoms, amino, methylamino or ethylamino, and each carbon atom carries no more than one substituent, and R^3 represents hydrogen, a branched or straight-chain alkyl, alkenyl or alkinyl group with has 1 to 6 carbon atoms and is optionally substituted by a hydroxyl, trifluoromethylmercapto, alkoxy, alkylmercapto, alkylamino or dialkylamino group having 1 to 3 carbon atoms per alkyl radical, the cyano group or the alkoxycarbonyl group having 1 to 4 carbon atoms in the alcohol part, or represents the benzyloxycarbonyl group, a phenylalkyl group which has up to 4 carbon atoms in the aliphatic part and is optionally substituted in the phenyl radical by nitro or amino, a phenyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine or fluorine, a phenylacyl radical which is optionally monosubstituted or disubstituted by hydroxyl, methoxy, chlorine and fluorine, an oxoalkyl radical having up to 6 carbon atoms and a cycloalkyl-alkyl radical having up to 6 carbon atoms in the cyclic part and up to 3 carbon atoms in the acyclic part, and furthermore denotes a radical COR^4, CN or SO_2R^5,

wherein

R^4 represents hydrogen or straight-chain or branched alkyl which has 1 to 4 C atoms and is optionally substituted by 1 or 2 substituents selected from amino, alkoxycarbonyl having 1 to 3 carbon atoms in the alkyl part, carboxyl, alkoxy having 1 to 3 carbon atoms and trifluoromethylthio, or represents phenyl which is optionally substituted by chlorine, hydroxyl, amino or carboxyl, or represents alkoxy having 1 to 4 C atoms, alkylthio having 1 to 2 C atoms, benzyloxy or amino, or represents alkylamino which has 1 to 5 C atoms and is optionally substituted by alkoxycarbonyl having 1 to 3 C atoms in the alkyl part or carboxyl, and

R^5 represents straight-chain or branched alkyl having 1 to 3 C atoms, phenyl or methylphenyl, and its pharmaceutically useful salts.

15. A method of combatting bacterial infection in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of an active compound of claim 1 either alone, in admixture with a diluent or in the form of a medicament.

REISSUES

SEPTEMBER 15, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,500

BUTTON HAVING PLASTIC RESIN HEAD

Akihiko Takata, Fujisawa, Japan, assignor to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Original No. 4,580,320, dated Apr. 8, 1986, Ser. No. 593,345, Mar. 26, 1984. Application for reissue Aug. 15, 1986, Ser. No. 897,173

Claims priority, application Japan, May 9, 1983, 58-67842[U]

Int. Cl.[4] A44B *1/12*

U.S. Cl. 24—113 MP **12 Claims**



1. An attaching button for attaching a fastener member to a fabric by the application of a mechanical force comprising:

a button head of rigid polyester resin with an outer surface and an internal cavity having an inlet and an internally expanded surface, and

a metallic leg piece comprised of a generally hollow base and at least one leg, said base being generally circular in cross section and having an outer periphery at least slight larger in diameter than the inlet of the cavity, said base having a first surface shaped to complement the internal surface of said cavity and a second generally flat annular surface, said at least one leg extending outwardly from said second base surface [proximate the outer periphery thereof].

Re. 32,501

ROTARY CUTTER

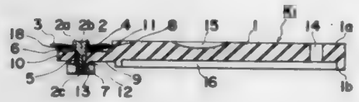
Yoshio Okada, Osaka, Japan, assignor to Okada Kogyo Kabushiki Kaisha, Osaka, Japan

Original No. 4,432,137, dated Feb. 21, 1984, Ser. No. 408,718, Aug. 16, 1982. Application for reissue Feb. 19, 1986, Ser. No. 830,886

Claims priority, application Japan, Sep. 29, 1981, 56-145180[U]

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—292 **16 Claims**



1. A rotary cutter comprising:

a disc blade having a central opening;

an elongated handle having, *at its one end, a platform for rotatably supporting said disc blade, said platform having* an aperture extending *therethrough and a bearing means for frictionally supporting an inner surface of said disc blade at only one of a central portion and a peripheral portion of said disc blade said inner surface at the other of said central portion and said peripheral portion being unsupported;* [through one end thereof;

said handle being formed with a bearing projection coaxial with said aperture;]

a shaft [having] *which extends through the central opening of said disc blade and the aperture of said platform and which has, at its one end,* a head portion [at one end thereof], which [extends through said aperture so as to be supported by said handle] *frictionally supports an outer surface of said disc blade only at the other one of the central portion and the peripheral portion of the disc blade, said outer surface of the one of said central portion and said peripheral portion being unsupported; and*

[a disc blade having a central opening, which is rotatably mounted on said shaft in a plane perpendicular to the longitudinal axis of said shaft with said shaft extending through said central opening so that said disc blade may be caused to roll on a material to be cut during a cutting operation;

said disc blade being interposed between said head portion and said bearing projection, said bearing projection and said head portion respectively bearing on said disc blade at radially spaced locations on opposite sides of said disc blade; and]

a [fastening member engageable with] *securing means for securing* said shaft [for urging said head portion against] *to said platform so as to urge* said disc blade [so as to urge said disc blade against said bearing projection, whereby] *towards said platform such that* said disc blade is subjected to curved elastic deformation [between said radially spaced locations and is caused to rotate in the curved state].

Re. 32,502

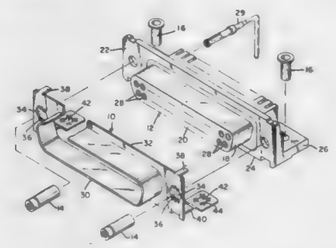
GROUNDING MATING HARDWARE

Vijay Kumar, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original No. 4,512,618, dated Apr. 23, 1985, Ser. No. 473,935, Mar. 10, 1983. Application for reissue Oct. 3, 1985, Ser. No. 783,985

Int. Cl.[4] H01R *4/66, 13/648*

U.S. Cl. 439—92 **7 Claims**



1. [In combination with an] *An* electrical connector having a housing of rigid insulative material defining a mating face and a mounting face with a plurality of terminal passages extending between the faces, a peripheral flange around said mating face and mounting flanges on said mounting face, each said peripheral and mounting flange being provided with at least one hole to receive locking and mounting means, respectively, therein, a plurality of electrical terminals mounted in said housing, each terminal having a mating portion directed toward the mating face and a mounting portion extending from the mounting face, a metal shell providing grounding interconnect between a *complementary* shielded connector and [the] *a* mounting

surface [characterized by a unitary metallic member], *said metal shell* having a shroud portion encircling the mating face to engage shielding of said *complementary* shielded connector [and], an integral flange extending normal to [the axis of] the shroud portion, [at least one mounting tab extending from a first edge of said flange adapted to engage one edge of said peripheral flange of said housing] and at least one [mounting tab] *ground strap* adapted to lie adjacent said mounting face, [each] *characterized by* said *integral* flange and said [mounting tab] *ground strap* being provided with [a profiled aperture providing] *an aperture having inwardly directed tines which provide* wiping engagement between the shell and the respective locking means and mounting means.

Re. 32,503

SILICIC ACID FOR THE FILTRATION OF BEVERAGES PARTICULARLY BEER

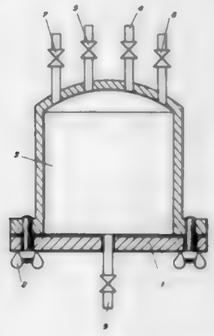
Gerhard Steenken, Berzbuir bei Duren, Fed. Rep. of Germany, assignor to Akzona Incorporated, New York, N.Y.

Original No. 4,457,900, dated Jul. 3, 1984, Ser. No. 373,476, Apr. 30, 1982. Application for reissue Nov. 8, 1984, Ser. No. 669,576

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117345

Int. Cl.⁴ C01B *33/12*; B01D *39/14*

U.S. Cl. 423—339 **20 Claims**



1. Process for the preparation of finely divided silicic acid particles, which are simultaneously suitable as a filtering auxiliary and as a stabilizing agent for beer in the filtration thereof, said silicic acid particles being of an essentially spherical or spheroidal shape and having an SiO_2 content of at least 95% by weight, said content being based upon said particles after drying at about 110° C., an Na_2O content of less than 0.25% by weight, and wherein the pH value of said particles comprising a 10% suspension in water is from about 4 to 7, said particles further having a surface according to Carman no greater than 100 m^2/g. and said particles having a standard test filtration time t_o of 20 seconds to 6 minutes and a ratio of

$$t\frac{1000}{120}/t_o$$

of about 0.7 to 6.5, with

$$t\frac{1000}{120}$$

being the test filtration time after a stirring stress of 120 minutes at 1000 rpm, comprising forming an aqueous charge containing 0.4 to 2.0% dissolved common salt by weight, said charge being between 33% and 70% by volume of the final volume of said charge and said silicic acid after precipitation of particles of said silicic acid, and wherein said aqueous charge has added uniformly and separately thereto a sodium silicate solution and an acid to form a silicic acid suspension that contains said silicic acid, said sodium silicate solution being metered into said charge whereby the pH value in the charge is about 3 to 10 during the addition, the temperature of said charge being maintained between about 50° C. and 95° C. during said addition, adjusting the pH value of said silicic acid suspension to about 7 to 4 after termination of the addition, filtering said silicic acid, washing said silicic acid with water and immediately drying said silicic acid while avoiding elevated shear stresses, followed by screening said acid in the absence of grinding with the aid of a sieving device.

6. Finely divided non-crystalline silicic acid particles, which are simultaneously suitable as a filtering auxiliary and as a stabilizing agent for beer in the filtration thereof, said silicic acid particles being of an essentially spherical or spheroidal shape and having an SiO_2 content of at least 95% by weight, said content being based upon said particles after drying at about 100° C., an Na_2O content of less than 0.25% by weight, and wherein the pH value of said particles comprising a 10% suspension in water is from about 4 to 7, said particles further having a surface according to Carman no greater than 100 m^2/g., said particles having a particle size distribution determined according to the method of screen analysis with a set of ultrasound wet screens pursuant to Seitz, with a residue of at least 60% with a hole size of 40μ, a residue of about 1 to 5% with a hole size of 5μ, and an ultra-fine constituent below 5μ no greater than 5%, said particles being made from an aqueous charge containing 0.4 to 2.0 weight percent dissolved common salt and having a volume of 33–70% of the final volume of the silicic acid suspension, said aqueous charge having added uniformly and separately thereto a sodium silicate solution and an acid to form said silicic acid suspension, said particles having a standard test filtration time t_o of 20 seconds to 6 minutes and a ratio of

$$t\frac{1000}{120}/t_o$$

of about 0.7 to 6.5 with

$$t\frac{1000}{120}$$

being the test filtration time stress of 120 minutes at 1000 rpm, said particles being prepared by wet precipitation and drying while avoiding elevated shear stresses to form a dried mass and in the absence of grinding of said dried mass.

Re. 32,504

ROOM TEMPERATURE STABLE ORGANOPOLYSILOXANE COMPOSITIONS

Ulrich Michel, Burghausen, and Josef Radecker, Emmerting, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

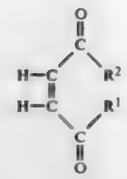
Original No. 4,530,989, dated Jul. 23, 1985, Ser. No. 590,314, Mar. 16, 1984. Application for reissue May 30, 1986, Ser. No. 868,990

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315060

Int. Cl.⁴ C08G *77/06*

U.S. Cl. 528—15 **14 Claims**

1. A crosslinkable organopolysiloxane composition comprising an organosilicon compound having Si-bonded hydrogen atoms, in organosilicon compound having aliphatic multiple bonds, a platinum catalyst capable of promoting the addition of the Si-bonded hydrogen atoms to the aliphatic multiple bonds and an inhibitor which delays or prevents crosslinking at room temperature which is selected from the group consisting of maleinimide and a maleic acid derivative selected from the group consisting of



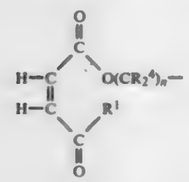
and $R^6(SiR_2^7O)_x(SiR^7R^6O)_ySiR_2^7R_6$, where R^1 is [selected from the group consisting of a hydroxyl group and] a trimethylsiloxy group, R^2 is a radical selected from the group consisting of a hydrocarbonoxy radical which is bonded to the carbon atom of the



group and a hydrocarbonoxy radical which is bonded to the carbon atom of the



group and is substituted with at least one triorganosilyl group, at least one R^6 is a radical of the formula



and the other R^6 radicals are selected from the group consisting of the formula

$$-O(CR_2^4)_nOH$$

and R^7, where R^1 is the same as above, R^4 is selected from the group consisting of hydrogen and an alkyl radical having from 1 to 6 carbon atoms per radical, R^7 is selected from the group consisting of phenyl and alkyl radicals having 2 or 3 carbon atoms per radical and halogenated phenyl and alkyl radicals having 2 or 3 carbon atoms per radical, n is an integer having a value of from 3 to 19, x is 0 or an integer having a value of from 1 to 200 and y is an integer having a value of from 1 to 10.

Re. 32,505

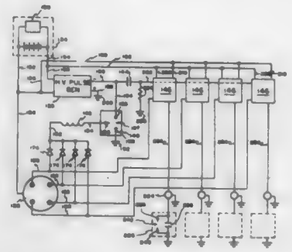
COMBUSTION INITIATION SYSTEM

George H. Hensley, Star Route, Box 150L, Alameda, N. Mex. 87114, and Raymond E. Hensley, 3805 Garcia Northeast, Albuquerque, N. Mex. 87111

Original No. 4,333,125, dated Jun. 1, 1982, Ser. No. 119,869, Feb. 8, 1980. Application for reissue Jun. 1, 1984, Ser. No. 616,509

Int. Cl.⁴ F23Q *3/00*

U.S. Cl. 361—257 **63 Claims**



1. A device for generating a high energy plasma jet for initiating combustion of fuel, comprising:

a first electrode including a rod shaped member and a tip on one extremity of said rod shaped member; [and]

a second electrode electrically insulated from said first electrode and including an annular portion circumscribing the longitudinal axis of said rod shaped member,

said tip being substantially spaced along said longitudinal axis from said annular portion of said second electrode,

said tip and said annular portion defining an annular space therebetween across which electrical current may flow to produce an annularly shaped electrical discharge for initiating combustion of said fuel, the longitudinal spacing between said tip and said annular [position] *portion* being sufficient to allow said discharge to generate [a generally cylindrical] *an* electromagnetic field [surrounding said discharge and sufficient in strength to temporarily radially confine] *for urging* said discharge *radially outward from said longitudinal axis; and*

means continuous with said first and second electrodes for temporarily storing a quantity of electrical energy therein sufficient to produce said electrical discharge, said device having an inherent inductance sufficiently low to result in the discharge of the stored quantity of electrical energy across said annular space within 60 nanoseconds .

PLANT PATENTS

GRANTED SEPTEMBER 15, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,010

ROSE PLANT JACSIL

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 30, 1985, Ser. No. 792,908
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unusual pale lavender color (near silver) coupled with attractive dark green foliage, few prickles, high cut flower production and a vigorous upright habit of growth.

6,011

ROSE PLANT JACLIP

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 30, 1985, Ser. No. 792,909
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very dense and compact habit of growth, small glossy leaves, continuous production of attractive pink flower clusters which combine to produce a plant with outstanding landscape appeal.

6,012

GERANIUM PLANT NAMED MACY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,674
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Macy, as described and illustrated, and particularly characterized by its bright red-purple flower color, variegated with scarlet red; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,013

BEGONIA PLANT NAMED CHEERS

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 10, 1985, Ser. No. 807,332
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia named Cheers, as described and illustrated, and particularly characterized by its rose-red flower color, strong and upright petioles which support flowers above foliage, double flower form, floriferous habit, fast growth with good branching, and by its adaptability to 10 or 15 cm. pots.

6,014

GERANIUM PLANT NAMED BETTY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,671
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Betty, as described and illustrated, and particularly characterized by its white flower color, variegated with deep purple; medium green foliage; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation.

6,015

GERANIUM PLANT NAMED SHIRLEY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,673
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Shirley, as described and illustrated, and particularly characterized by its bright red flower color; compact, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,016

SYNGONIUM PLANT NAMED ANGELWING

Michael R. Broyles, Houston, Tex., assignor to Casa Flora, Inc., Dallas, Tex.

Filed Dec. 12, 1985, Ser. No. 808,438
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Syngonium podophyllum* named Angelwing as illustrated and described, and particularly characterized by its clumping habit, vigorous, full and compact growth habit, short nodes, lack of vining habit, long and narrow leaves with a slight sheen, ease of propagation, less inclination to damage at retail outlets due to lack of vines, adaptability to various pot sizes, and its tolerance to lower light levels which make it adaptable to large scale use in interiorscape plantings.

PATENTS

GRANTED SEP. 15, 1987

ERRATA

For CLASS	See PATENT NO.
437-175	4,692,991
437-057	4,692,992
437-053	4,692,993
437-040	4,692,994
437-041	4,692,995
437-073	4,692,996
437-238	4,692,997
437-225	4,692,998
128-663	4,693,319
137-013	4,693,321
098-002	4,693,417
251-129	4,693,447
439-013	4,693,527
439-083	4,693,528
439-067	4,693,529
439-067	4,693,530
439-512	4,693,531
439-594	4,693,532
439-350	4,693,533
439-276	4,693,534
439-277	4,693,535
439-404	4,693,536
439-399	4,693,537
439-460	4,693,538
439-465	4,693,539
439-198	4,693,540
439-626	4,693,542
437-174	4,693,758
437-024	4,693,759
409-244	4,693,813
512-014	4,693,844
514-009	4,693,845
564-236	4,694,086
380-014	4,694,335

PATENTS

GRANTED SEPTEMBER 15, 1987

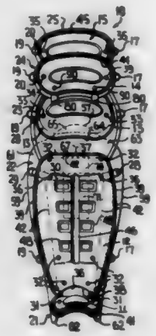
GENERAL AND MECHANICAL

4,692,946

BASEBALL CATCHER'S LEG GUARD

Stanley M. Jurga, Shirley, Mass., assignor to George Frost Company, Shirley, Mass.

Filed Jul. 31, 1986, Ser. No. 891,319
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—22 **38 Claims**



1. A protective leg guard comprising a relatively rigid foot guard, shin guard, knee guard and first and second thigh guards; means for pivotally connecting said shin guard to and between said foot and knee guards, a relatively thick resilient protective foot pad, shin pad and knee pad; means for joining said protective foot, shin and knee pads to said respective foot, shin and knee guards; said shin guard having a peripheral edge defined by an upper edge, a lower concave edge and opposite convex side edges; said shin pad having a peripheral edge defined by an upper edge, a lower concave edge and opposite side edges; each shin pad side edge merging with said shin pad lower concave edge at a lowermost convex radius edge and setting-off therewith an ankle bone protective pad portion of each shin pad projecting appreciably downwardly beyond said shin guard lower edge; each shin pad side edge merging with said shin pad upper edge at an uppermost convex radius edge and setting-off therewith an upper calf protective pad portion of each shin pad projecting appreciably rearwardly beyond the associated shin guard side edges; and said shin pad side edges project rearwardly appreciably beyond said shin guard side edges to set-off therewith relatively rearwardly broad and long inner and outer calf protective pad portions of said shin pad.

4,692,947

PROTECTIVE HELMET, CHIN CUP, AND FACE GUARD

Randy D. Black, 532 Smith Rd., Knoxville, Tenn. 37922, and Walter F. Tomczak, 7450 Fairway Rd., Leesburg, Fla. 32788

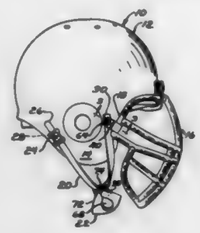
Filed Oct. 28, 1985, Ser. No. 792,002
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—421 **10 Claims**

1. A protective headgear, comprising:

a shell for receiving a wearer's head, and having opposed sides;

a cup to receive the wearer's chin; and

strap means connecting the cup to the shell, said strap means having a first strap segment with one end fixedly attached to one side of the shell and extending to the cup, and a second strap segment having one end releasably attached to the same side of the shell and extending to the cup, including means for securing a face guard to the shell, and



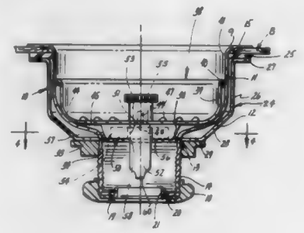
in which the one end of the first strap segment is attached intermediate the securing means and the shell.

4,692,948

SINK STRAINER HAVING A MAGNET

Joseph R. Martin, Highland Beach, Fla., assignor to Jomar International, Ltd., Royal Oak, Mich.

Filed Dec. 22, 1986, Ser. No. 945,029
Int. Cl.[4] E03C *1/26*
U.S. Cl. 4—286 **4 Claims**



1. A sink strainer comprising:

(a) a strainer body having a hollow upper portion and an outlet portion at its lower end;

(b) said outlet portion having an outlet plate of a magnetically attracting material provided with openings for liquid drainage therethrough;

(c) a basket strainer operatively mounted within said hollow body and manually movable between an opened position and a closed position;

(d) said basket strainer having drainage holes formed therethrough and having a rubber stopper on the bottom thereof, for seating on said outlet plate to close the drainage holes in the outlet plate when the basket strainer is in the closed position; and

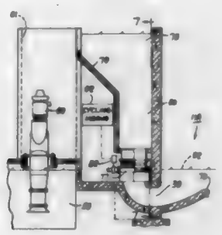
(e) a permanent magnet means embedded within said rubber stopper carried by said sink strainer for magnetically attracting the basket strainer to the sink strainer body outlet plate to assist the water in the sink in creating an efficient sealing action between the rubber stopper and the outlet plate.

4,692,949

HIGH-HEAD, LOW-VOLUME SURFING WAVE POOL

George W. Dunn, Chula Vista, Calif., assignor to WaveTek International, Inc., Mansfield, Ohio

Continuation of Ser. No. 807,774, Dec. 11, 1985, abandoned, which is a continuation of Ser. No. 612,743, May 21, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 897,149
Int. Cl.[4] A47K *3/10*
U.S. Cl. 4—491 9 Claims



1. A high head, low volume surfing wave pool comprising:
a pool for containing water at a nominal level and having a deep end and a shallow end;
at least one water inlet opening in the deep end of the pool below the nominal water level;
elevated reservoir means for containing water periodically with a water head above the nominal water level of the pool;
a conduit connecting a lower portion of the reservoir with the water inlet opening in the deep end of the pool;
the conduit including walls defining a vertical passage extending from at least ten feet above the nominal water level of the pool and with a cross-sectional area less than one-half of the maximum cross-sectional area of the reservoir;
valve means disposed in the conduit movable between open and closed positions to control the flow of water between the reservoir and the pool; and
actuator means located outside the pool, conduit and reservoir for moving the valve means between the closed position in which water is retained in the reservoir and the open position in which water flows from the reservoir through the conduit into the water inlet opening to form a surfing wave in the pool, said actuator means including a hydraulic cylinder located in a dry room and above the quiescent water level of the pool.

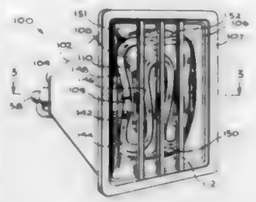
4,692,950

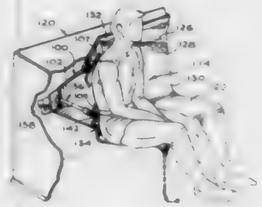
HYDROTHERAPY MASSAGE METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Filed Nov. 12, 1985, Ser. No. 796,987
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 60 Claims

1. Hydrotherapy apparatus for discharging a fluid stream useful for impacting against and massaging an area of a user's body, said apparatus comprising:
fluid supply means;
nozzle means defining a discharge orifice;
conduit means coupling said fluid supply means to said nozzle means for carrying a fluid stream for discharge through said orifice;





means mounting said nozzle means for movement along a nonlinear and noncircular path; and
thrust means for moving said nozzle means along said path.

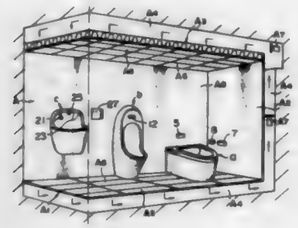
4,692,951

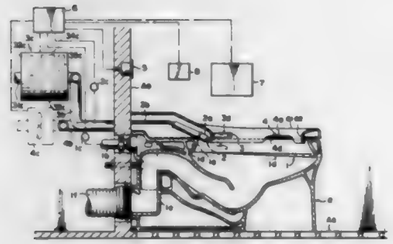
SANITARY FACILITY ROOM FOR CLEAN ROOM

Masaru Taki; Hiroshi Okada; Seijiro Kawamura; Akio Kusumoto; Koji Morita, all of Fukuoka; Takao Ikenaga, Kanagawa; Toshifumi Shigematsu, Kanagawa, and Masami Iida, Kanagawa, all of Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Oct. 24, 1985, Ser. No. 791,155
Claims priority, application Japan, Oct. 31, 1984, 59-230852; Oct. 31, 1984, 59-230860
Int. Cl.[4] A47K *4/00*; E03D *9/04*
U.S. Cl. 4—664 31 Claims

1. A sanitary facility room adapted to be placed within a clean room, said sanitary facility room comprising:
(a) an enclosure including a plurality of upstanding vertical walls, a floor, and a ceiling;
(b) at least one toilet apparatus, said toilet apparatus including means for sensing the presence of a human body using said toilet apparatus, a toilet control device operable in response to signals emitted by said sensing means, and means for supplying water to the interior of said toilet apparatus, said control device comprising means for controlling the amount of clean water supplied to the interior of said toilet apparatus, said means for supplying water comprising means for forming a film of water along an interior surface of said toilet apparatus; and
(c) means for cleaning the hands of said human body, said cleaning means comprising means for sensing the presence of hands of said human allong the interior of a bowl forming part of said cleaning means, a whasing control device operable in response to a signal sent to it by said hands sensing means, means for supplying water to the interior surface of said bowl and for forming a water film along said interior bowl surface, wherein said bowl washing control device comprises means for controlling the water supplied to said interior surface of said bowl by said bowl water supply means, wherein said enclosure, said toilet apparatus, and said cleaning means together comprise means for permitting a user to utilize said toilet apparatus





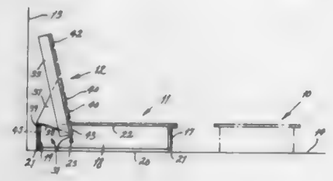
and said cleaning means without touching any object within said sanitary facility room.

4,692,952

SLATTED SOFA-BED CONSTRUCTION

Christine A. Dougher, 3908 Shenandoah, St. Louis, Mo. 63110, and Mary L. Rath, Rte. 1, Belle, Mo. 65013

Filed Nov. 12, 1985, Ser. No. 797,009
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—37 R 6 Claims



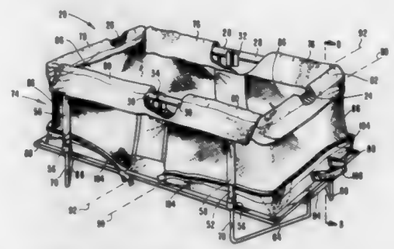
1. Cross-slatted sofa bed construction comprising
a seat section including a foot portion,
a head rail opposite said foot portion,
vertically-extending side rails securing said head rail to said foot portion,
said side rails having longitudinal skid means along their lower edges, whereby to permit sliding movement of said seat section along a floor, and
a slot into the upper edge of each said side rail extending slantingly toward the foot portion and downward from the side rail upper edge and having forward and rear slot surfaces terminating in a slot base substantially above the lower edge of said side rails, the said slots being positioned spacedly from the head rail a distance substantially equal to the depth of said side rails,
said side rails having cross-slats affixed to their upper edges over only that area extending from said foot portion to said slots, whereby to provide an opening from said slots to the head rail, in combination with
a back section comprising left and right back rails so spaced from each other as to be out of correspondence with the spacing of said rails of said seat section, further comprising
a plurality of back cross slats extending across said back rails from a top back slat to a slat in lowermost position when the back section is erected, the end portions of said lowermost position slat being of such thickness as to fit slidably within said slanting slots and be there supported with the lowermost edges thereof resting on said slot bases,
the said back section left and right rails having support means, adjacent to said lowermost position slat, whose depth, measured from said slat, is substantially equal the combined depth of said seat section side rails and their said skid means,
whereby said back section may be erected to serve as a sofa back with its top slat adjacent to a wall, with the end portions of said lowermost position back slat inserted within said diagonal slots and resting on said slot bases, and with the said support means for said back rails projecting into said opening and resting on and against said seat section head rail; or alternatively, on sliding said seat section on its skid means to provide space for the back section between the seat section and such wall, said back section may be supported horizontally with said support means of its left and right rails resting on such floor, for use of the combination as a bed.

4,692,953

PORTABLE COLLAPSIBLE BABY CRIB

G. David Fetters, 247 Schilling St., West Lafayette, Ind. 47906

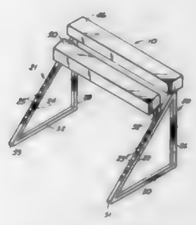
Filed Jul. 11, 1986, Ser. No. 884,487
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—99 R 12 Claims



1. A portable collapsible crib, comprising:
a rigid frame that is separable generally at the midpoints of a pair of opposing sides thereof into a first frame half and a second frame half;
rotatable hinging means, coupling said first and second frame halves at said midpoints, hingingly operable about first axes for foldably collapsing said first and second frame halves one upon the other at said midpoints, defining a frame collapsing position, and rotatably operable about a pair of second axes that are perpendicular to said first axes for rigidly supporting said first and second frame halves in inflexible planar alignment, defining a frame inflexible position;
leg means, mounted to and rotatable about said frame concurrently with said rotatable hinging means, for elevating said frame to a predetermined height when rotated about and disposed downwardly from said frame, said rotatable hinging means being concurrently rotated into said frame inflexible position, said leg means being further rotatable about said frame into the area bounded by said frame, said rotatable hinging means being concurrently rotated into said frame collapsing position; and
a collapsible crib structure mounted to and supported about

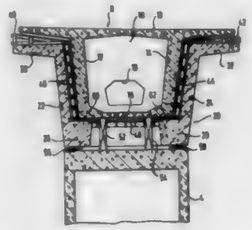
the perimeter of said frame and disposed downwardly therefrom, having rigid floor means removably attached to said leg means at predetermined points below said rigid frame when said leg means are rotated about and disposed downwardly from said frame, and operable to receive said rigid frame, said leg means and said collapsible crib structure within the area bounded by the perimeter of said floor means when said leg means are rotated about said frame into the area bounded by said frame, said rotatable hinge means being concurrently rotated into said frame collapsing position, said rigid floor means being further operable to fold about and enclose said first and second frame halves in said frame collapsing position and said collapsible crib structure, forming a valise structure thereabout.

4,692,954
LEGREST AND FOOTREST FOR BEDS
Eugene E. Scott, Sr., 4619 Longfellow Dr., New Orleans, La. 70127
Filed Sep. 2, 1986, Ser. No. 902,579
Int. Cl.[4] A47C *20/02*
U.S. Cl. 5—443 **1 Claim**



1. A portable leg and foot rest for beds, comprising:
(a) a pair of triangular support means each having an elongated base member having a channel provided therealong in its underside for slidably engaging the side railings of a bed, a vertical member and an angular member having spaced apart apertures therealong;
(b) a crossbar of a length substantially equal to the distance between said side railings of said bed, each end thereof being fixedly connected to one of said triangular support means at approximately the point where said angular member and said vertical member are joined together, whereby said triangular support means are substantially parallel to each other and substantially perpendicular to said crossbar;
(c) plurality of support bars fixedly connected to said crossbar and being substantially perpendicular to said crossbar and substantially parallel to said base members;
(d) an elongated footrest member of approximately the same length as said crossbar and fixedly mounted on said support bars, said footrest member having an elongated cushion with a solid core member and padding thereon;
(e) a legrest member of approximately the same length as said crossbar and having an elongated cushioh with a solid core member and padding, each end of said solid core member fixedly attached to a brace with projections depending downwardly therefrom for selectively and adjustably engaging said spaced apart apertures of said angular support members; and,
(f) means for removably fastening said base members to said side railings of said bed.

4,692,955
METHOD FOR ERECTING A BRIDGE SUPERSTRUCTURE OF PRESTRESSED CONCRETE AND LAUNCHING GIRDER FOR PERFORMING THE SAME
Horst Kinkel, Mozartweg 34, 6100 Darmstadt, Fed. Rep. of Germany
Continuation of Ser. No. 635,798, Jul. 30, 1984, Pat. No. 4,660,243. This application Jul. 14, 1986, Ser. No. 885,411
Claims priority, application European Pat. Off., Aug. 11, 1983, 83107978.5
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] E04C *3/02*; **E01D** *1/00*
U.S. Cl. 14—17 **3 Claims**



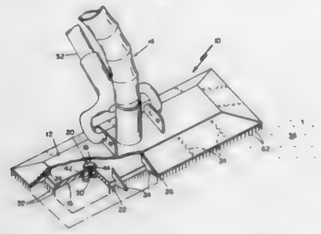
1. A method for the segmented erection of a prestressed concrete superstructure of a bridge having a plurality of bridge supports positioned beneath and adapted to support the superstructure, the method comprising the steps of (a) providing a launching girder having formwork thereon for forming segments of the superstructure, (b) supporting said girder in a concreting position on at least one of said bridge supports, (c) concreting and stressing a superstructure segment utilizing the formwork on said girder, (d) providing bearing means between a previously formed superstructure segment and said girder for supporting said superstrcture onusaid girder as the girder is moved, (e) providing bearing means between said girder and said one bridge support permitting movement of said girder with respect to said bridge support, and (f) launching said girder to another concreting position.

3. Apparatus for the segmental erection of a prestressed concrete superstructure of a bridge having a plurality of bridge supports positioned beneath and adapted to support the superstructure, comprising a launching girder having formwork thereon for forming segments of the superstructure, said girder being adapted to rest on at least one of said bridge supports in concreting position to form a superstructure segment, first bearing means positionable between a previously formed superstructure segment and said girder for supporting said superstructure segment on said girder for permitting movement of said girder relative said superstructure segment, and second bearing means positionable between said girder and said one bridge support for permitting movement of said girder relative said bridge support, said girder possessing sufficient compresive strength to carry the weight of previously formed superstructure segments through said first bearing means as the girder is moved to another concreting position.

4,692,956
POOL VACUUM
Amin I. Kassis, 57 Stockdale Rd., Needham, Mass. 02192
Filed Dec. 31, 1985, Ser. No. 815,214
Int. Cl.[4] E04H *3/20*
U.S. Cl. 15—1.7 **12 Claims**

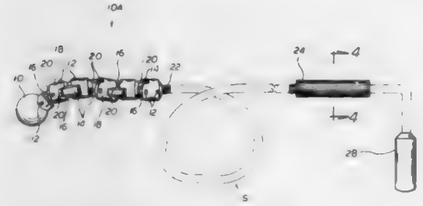
1. A device for removing foreign matter from a water-filled pool, comprising:
a vacuum head having a chamber-defining housing, and a conduit communicating with said housing, said conduit being connectable to a suction means;

a plurality of agitator members comprising an elongated blade rotatably attached to an axial shaft and having fluid deflecting surfaces pitched with respect to said shaft axis, said agitataor members being rotatably connected to the inside of said housing in position above the pool surface to be rotated by fluid suctioned from said housing into said conduit, rotation of said agitator members causing turbulence to dislodge fine particulate matter from a pool surface,



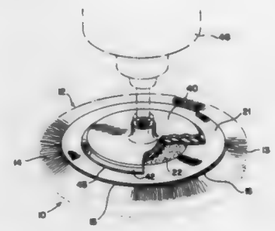
a partition member positioned within said housing to define inner and outer chamber portions,
a plurality of support means supporting said partition member from said housing; and
a plurality of ports in said partition member communicating suction between said inner and outer chamber portions, each said agitator member being positioned within a said port.

4,692,957
BEND FOLLOWING PLUMBERS SNAKE
Julius S. Kovacs, 40 Canterberry Rd., Bridgeport, Conn. 06608
Filed Mar. 13, 1986, Ser. No. 839,204
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.3 SN **4 Claims**



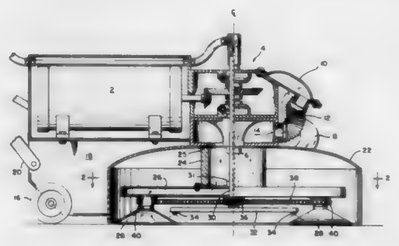
1. A plumber's snake comprising:
an elongated flexible member having a leading end and a trailing end,
means defining a jointed end portion at the leading end of said flexible member,
and a gripping means adjustably disposed along a trailing end of said member,
said gripping means comprising a sleeve mounted on said trailing end so as to slide relative thereto, and which, when squeezed, is frictionally secured in fixed relationship relative to said trailing end,
wherein said means defining said jointed end comprises:
a plurality of spaced apart links,
each of said links having opposed bifurcated end portions to define a slot thereat,
wherein said opposed end slots are disposed in out of phase relationship,
said links having its end slots disposed in phase relationship to the end slot of the next adjacent link,
a connector hingedly connecting the end of one link to the end of the next adjacent link,
and a weight member connected to the leading end of the leading link.

4,692,958
BUFFING PAD ASSEMBLY
Bruce L. McMakin, Hudson, Ohio, assignor to U.S. Chemical & Plastics, Inc., Canton, Ohio
Filed Jan. 8, 1986, Ser. No. 817,076
Int. Cl.[4] B24D *13/14*
U.S. Cl. 15—230.12 **23 Claims**



1. A buffing pad for use with a backing plate adapted to be driven by a power tool comprising:
a fabric pile for application against a work piece;
a backing side carrying said fabric pile;
loop means having a peripheral edge and carried centrally of said pad and against said backing side; and
cover means partially affixed to said backing side and enveloping said peripheral edge.

4,692,959
ROTARY CLEANER/SCRUBBER MECHANISM
Clifford L. Monson, 1765 Ala Moana Blvd., Honolulu, Hi. 96815
Filed Mar. 11, 1986, Ser. No. 838,386
Int. Cl.[4] A47L *11/20*
U.S. Cl. 15—320 **7 Claims**



1. A scrubbing head for use with a carpet cleaning machine or the like comprising:
a hollow vertical drive shaft adapted to be releasably secured to a driving means including a source of cleaning fluid, said drive shaft terminating at the lower end in a spray means for applying the cleaning fluid,
a rotatable, horizontally mounted plenum, removably secured to a vacuum source, said plenum mounted for free rotation upon said drive shaft and including a plurality of downwardly facing ports,
a vacuum nozzle rotatably secured to each port in fluid communication with the plenum, each of said nozzles including a drive means mounted thereon,
means interconnecting the drive shaft and each of said vacuum nozzle drive means whereby the vacuum nozzles

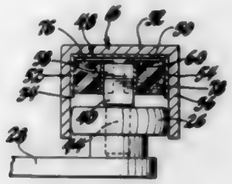
individually rotate while simultaneously moving with the plenum.

4,692,960

CHECK AND CONTROL FOR A SLIDING DOOR

Thadius F. Jozefczak, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1986, Ser. No. 901,394
Int. Cl.⁴ E05D *15/00, 13/08*
U.S. Cl. 16—86 A **4 Claims**



3. In combination with a vehicle sliding door supported and guided by a channel shaped track mounted on the vehicle body and a roller mounted on the door and movable back and forth within the track to open and close the door, a door check and control mechanism comprising:

a follower member mounted on the door adjacent the roller and extending into the track beyond the roller and having a path of travel along the track during back and forth movement of the door,

first and second spring-like leaves mounted within the track at opposite sides of the path of travel of the follower member along the track, said leaves being spaced from the track at least along a portion of the length thereof and projecting into the path of travel of the follower member to interfere therewith so that the leaves are flexed and thereby impede the travel of the door along the track,

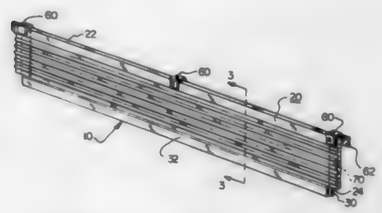
and first and second blocks of elastic material mounted respectively in the spaces between the track and the first and second leaves to yieldably support the leaves against said flexure by the follower member during back and forth movement of the door to an extent determined by the flexibility of the leaves and the elasticity of the blocks of elastic material.

4,692,961

REMOVABLE WATER GUARD FOR SLIDING PATIO DOORS

Jerry W. Brown, 2911 N. Fairway Dr., Burlington, N.C. 27215

Filed Sep. 22, 1986, Ser. No. 909,690
Int. Cl.⁴ E06B *3/32, 7/26*
U.S. Cl. 16—95 R **6 Claims**



1. A water guard for removable attachment to the floor track of a pair of sliding glass doors where the track is formed of at least two opposed sidewalls between which the doors slide, one of said track walls being in the interior room environment and the opposed said wall being in the exterior environment; said water guard including:

(a) a substantially flat, elongated panel having a prescribed height and a width approximately equivalent to that of said doors, upper and lower edges, front and rear faces, and including means for removably attaching said panel in vertical relationship to the room floor, to said interior sidewall of said door track such that said panel rear face lies closely adjacent the interior face of said doors;

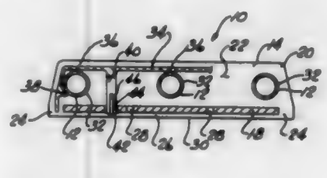
(b) said means for attaching said panel to said track wall including an inverted channel attached along the lower edge of said panel; said inverted channel being substantially U-shaped such that the open side is slipped over said interior track wall for supporting said panel along the lower edge of the interior face of said doors; whereby said water guard substantially seals the lower edges of said sliding doors and prevents flow of water underneath; and further including clip means slidably mounted along said upper edge of said panel for engagement with the sidewalls of the surrounding frame of said doors to prevent said panel from tilting away from said doors.

4,692,962

CONCEALED MOUNTED PUSH BARS AND GRILLS

Sam Avny, 44 Holmes Pl., Fredonia, N.Y. 14063

Continuation of Ser. No. 629,888, Jul. 11, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,116
Int. Cl.⁴ A47H *33/00*
U.S. Cl. 16—111 R **8 Claims**



1. A push bar assembly comprising:

a plurality of elongated coextensive bars;

a pair of unitary mounting members which receive respective opposite axial ends of said bars;

each of said mounting members comprising an elongated base portion adapted to be positioned adjacent a mounting surface and a pair of upstanding flange portions extending longitudinally of said base portion adjacent the opposite longitudinal sides thereof and projecting from said base portion to form therebetween a frontally open elongated recess with said base portion forming a bottom portion of said recess;

plural aperture means formed in one of said flange portions of each said mounting member; each said aperture means receiving a respective axial end of one of said bars in a manner to secure said bars in fixed spaced relationship; the other of said flange portions of each said mounting member forming abutment means for abutting engagement with the respective axial ends of said bars in a manner to secure said bars in fixed longitudinal relationship with the longitudinal ends thereof extending transversely of said recess;

fastener receiving aperture means formed in the respective base portions of said mounting members intermediate the respective said flanges and oriented to receive axially therein via said frontally open recess mounting fasteners for securing said mounting members to such a mounting surface in fixed, spaced relationship to thereby captively retain said bars;

a formed cap means which is cooperable with each said mounting member to cover said frontally open recess and thereby conceal said axial ends of said bars and the mounting fasteners;

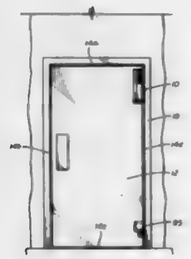
each said cap means includes a retention means which cooperates with at least some of said bars to retain said cap means with respect to the respective said mounting member; and wherein said retention means includes tab means located to interlock under said at least some of said bars intermediate said flanges for biased releasable retention of said cap means with respect to said mounting member.

4,692,963

SELF-CLOSING HINGE AND ISOLATION DOOR INSTALLATION

Louis F. Barroero, 1585 Daniels Dr., San Leandro, Calif. 94577

Continuation-in-part of Ser. No. 689,337, Jan. 7, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,507
Int. Cl.⁴ E05F *1/14*
U.S. Cl. 16—275 **10 Claims**



1. In a self-closing isolation door installation, the combination comprising:

(a) a door adapted for mounting within a door frame and adapted to swing between a closed and an opened position;

(b) resilient gasket means connected about the periphery of said door to insure a tight seal in open spaces about said door;

(c) a first hinge means vertically mounted with the side edge of said door and adapted for mounting to the side of a vertical member of said door frame;

(d) a second self-closing hinge means including a vertically disposed, elongated C-shaped bracket slidably mounted into said side edge of said door;

(e) said bracket including vertical strut, an upper arm, and a lower arm;

(f) a support shaft mounted in fixed relation between said upper arm and said lower arm to complete a structure which is generally rectangular in shape;

(g) a housing bracket mounted in pivotable relation around said shaft and closely adjacent to said upper arm to vertically support said upper arm and adapted for mounting to said vertical side of said door frame and thereby to support said door from said door frame as appropriate;

(h) said housing bracket defining an inverted V-shaped cam surface extending radially around said shaft with the apex of said V-shape being oriented with said door when said door is in said closed position;

(i) a cam follower body including a follower arm carrying a radially spaced apart inner follower roller and outer follower roller, (1) said follower body being mounted in pivotable relation around said shaft with said outer roller engaged for vertical movement within said slot, and (2) said inner roller being engageable to follow said cam surface responsive to relative rotation between said door and said housing bracket; and

(j) resilient compression spring means mounted around said shaft and biasing said follower body to forcefully bias said inner follower roller against said V-shaped cam surface; a rotary bearing mounted on said shaft between said upper arm and said housing bracket and adapted to support the entire weight of said door; said vertical strut, said upper arm and said lower arm are formed with a linear outwardly facing U-shape slidably fitting over the sides of the door and against the side edge of said door.

4,692,964

CONCEALED SELF-CLOSING HINGE

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 5, 1986, Ser. No. 836,248
Int. Cl.⁴ E05D *3/10*
U.S. Cl. 16—367 **12 Claims**



1. Hinge means for supporting a door to swing in an arc relative to a frame about a predetermined hinge axis between a fully closed position and a fully open position, said hinge means comprising first and second members adapted to be secured rigidly to said door and frame, respectively, first and second links each having first and second end portions, means pivotally connecting the first end portion of said first link to said first member and supporting said first link to swing relative to said first member about a first axis which intersects said hinge axis at a predetermined point, means pivotally connecting the first end portion of said second link to said second member and supporting said second link to swing relative to said second member about a second axis which intersects said hinge axis at said point, means connecting the second end portions of said links together and supporting said end portions to pivot relative to one another about a third axis which intersects said point, and self-closing means carried by one of said links and acting against the second end portion of the other link to urge said door to said fully closed position after said door has been swung part way from said fully open position.

4,692,965

SHRIMP PROCESSING METHOD AND DEVICE

Fred W. Stephenson, 1131 E. Commercial Blvd., Ft. Lauderdale, Fla. 33334

Continuation-in-part of Ser. No. 715,669, Mar. 25, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,988
Int. Cl.⁴ A22E *29/02*
U.S. Cl. 17—48 **18 Claims**

4. A method for processing shrimp comprising the steps of:

singulating the shrimp to pass ins ingle file by passing the same substantially horizontally through an opening which will pass only one shrimp at a time,

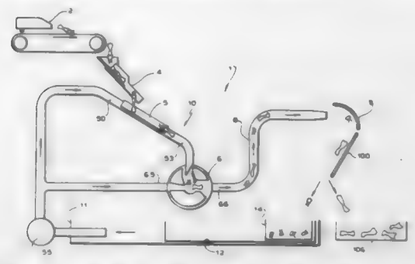
orienting the singulated shrimp to be positioned in a tail-down direction by means of dropping the shrimp one at a time onto a diverging sloped slot,

passing the thus-oriented shrimp into a vertical stream of fluid,

impinging a horizontal faster stream of fluid on the subject shrimp adjacent a fulcrum,

severing the head from the tail fo the shrimp at the fulcrum

by impacting the same with fluid travelling at a greater rate than the shrimp is fed to the fulcrum,



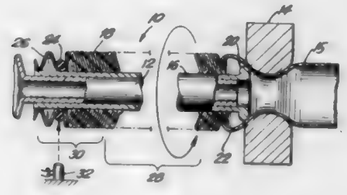
thereafter shaping the flow with a relieved lower recess to direct the tail upwardly,
and thereafter separating the heads and tails.

4,692,966

ARTICLE, METHOD FOR CONTROLLING CASING DEPLETION

Joseph A. Nausedas, Oak Forest, Ill., assignor to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 481,034, Mar. 31, 1983, Pat. No. 4,606,379.
This application Aug. 8, 1986, Ser. No. 895,005
Int. Cl.⁴ A22C *11/02*
U.S. Cl. 17—49 **6 Claims**



1. A method of terminating a casing stuffing operation prior to the exhaustion of a casing supply, said method comprising the steps of:

(a) providing a casing article including a hollow substantially rigid, tubular core and a shirred strand of casing on said core, said strand having a fore end from which casing is first to deshirr and a rear portion which contains the trailing end of said strand and which is last to deshirr, said casing and core being in sufficient contact over the length of said strand to provide a resistance to relative forward movement between said strand and core responsive to the deshirring of casing from said strand, the magnitude of said resistance decreasing as casing is deshirred and the length of said strand decreases;

(b) mounting said casing article to a stuffing apparatus such that the product being stuffed will pass through said hollow tubular core;

(c) stuffing the product through said tubular core and into casing which deshirrs from the fore end of said strand and continuing said stuffing until the supply of casing contained in said strand is deshirred and exhausted back to said rear portion;

(d) during said stuffing step (c), restraining said rear portion and the trailing end of said strand against forward movement along said core by engaging said rear portion against a projection provided on the outer peripheral surface of said tubular core;

(e) continuing said stuffing by deshirring casing from said rear portion adjacent said projection and allowing the deshirring of casing to pull the remaining rear portion of shirred casing towards, but not beyond, said projection;

(f) detecting the longitudinal movement of said trailing end as the rear portion is pulled towards said projection; and

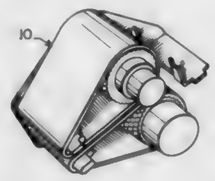
(g) initiating the termination of said stuffing step responsive to the longitudinal movement of said trailing end.

4,692,967

TEXTILE FIBER DRAFTING APRON AND METHOD

John J. Dolan, Blairgowrie, and Charles Dye, Dundee, both of Scotland, assignors to Day International Corporation, Dayton, Ohio

Filed May 25, 1982, Ser. No. 381,667
Int. Cl.⁴ B29C *25/00*
U.S. Cl. 19—244 **4 Claims**



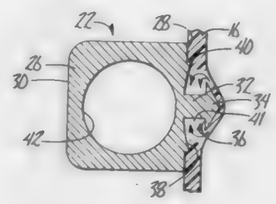
1. In a textile fiber drafting apron in the form of a flexible sleeve having an outer fiber working surface and an inner work member contacting surface, the improvement wherein said apron is comprised of a single monolithic layer of polymeric material free of reinforcement and wherein said outer surface is smooth and unground and provides an acceptable fiber working surface.

4,692,968

METHOD AND MEANS FOR SECURING PLASTIC COVERED EQUIPMENT TO A SUPPORT SURFACE

Leon E. Girard, Ames, Iowa, assignor to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Sep. 16, 1985, Ser. No. 776,304
Int. Cl.⁴ A43C *7/00*
U.S. Cl. 24—145 **2 Claims**



1. A coupling device to be embedded in plastic material for attachment to a locking means, comprising:

a body member having first and second ends, and a central axis;

a stub shaft secured to said first end of said body member and extending outwardly therefrom on said central axis;

a pointed probe head secured to the outer end of said stub shaft, and having an inner face parallel to a portion of said first end of said body member, and with a diameter greater than the diameter and greater than the length of said stub shaft;

a concave surface on said first end and surrounding said stub shaft and terminating in an arcuate annular shoulder on said first end, said annular shoulder having a diameter greater than that of said inner face of said probe head and creating an annular space with respect to said inner face of said probe head, said portion of said first end surrounding said annular shoulder and recessed relative to said annular shoulder, whereby, when said probe head is heated and forcibly embedded into a plastic material, the plastic material will melt and will be induced to flow around said probe head into engagement with said concave surface and thence into said annular space to completely embed said probe head, said stub shaft and said annular shoulder with such melted plastic material; and

means on said body member for attachment to a locking means.

4,692,969

WINDSHIELD ATTACHMENT CLIP

Roy S. Johnson, P.O. Box 2662, Lynnwood, Wash. 98036

Filed Aug. 28, 1986, Ser. No. 901,515
Int. Cl.⁴ A44B *21/00*
U.S. Cl. 24—573 **7 Claims**



1. An attachment for securing a releasable snap fastener component at a selected point along an exposed edge of a windshield, wherein the exposed edge of the windshield carries trim substantially covering that edge, the attachment comprising:

(a) a clip portion comprising a strip of elastic material formed into a generally U-shaped configuration to thereby define two legs extending from a base, the base being bowed inwardly, and the legs being outwardly bowed to fit over and substantially cover the trim at the selected point along the windshield edge, and to be slidably adjustable thereon, with the legs of the clip portion clasping the trim; and

(b) a substantially flat extension piece integrally formed with the extending from one of the legs, and releasable snap fastener component being attached to the extension piece.

4,692,970

BELT BUCKLE WITH EJECT MEANS

James R. Anthony, Carmel, and Michael A. Wiseman, Whiteland, both of Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Continuation-in-part of Ser. No. 762,451, Aug. 5, 1985, Pat. No. 4,617,705
This application Oct. 17, 1986, Ser. No. 920,285
Int. Cl.⁴ A44B *11/26*
U.S. Cl. 24—642 **20 Claims**

1. A buckle comprising:

a reinforcement plate having a longitudinal axis extending through a longitudinal plane and further having legs with distal ends;

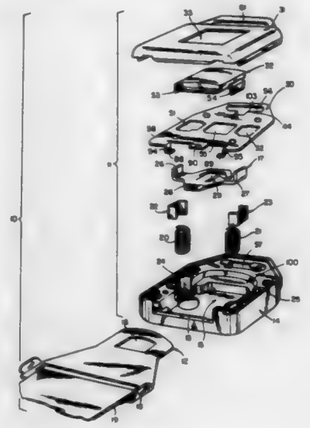
a main body having said plate mounted thereto and including stop surfaces receiving said distal ends and limiting relative movement between said plate and main body, said main body includes yieldable means integral therewith for engaging said plate, said yieldable means being moveable to allow said plate to be inserted in said main body and then moveable back holding said plate therein;

a latch positioned in said main body and held captive therein by said plate, said latch moveable between a latch position and an unlatched position;

spring means contacting said latch to move said latch back and forth between said latch position and said unlatched position;

operator means operable to move said latch to said unlatched position;

a cover mounted to said main body and cooperatively forming a mouth therewith, said plate extending adjacent said mouth with said cover enclosing said latch, said spring means and said plate, said cover including securing means



extending between said plate and said main body securing said cover to said main body; and,

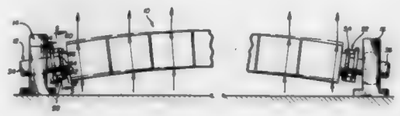
limit means depending from said plate within said main body and spaced apart aft of said mouth and including tongue stop surfaces to limit movement of said tongue when said tongue is in said buckle.

4,692,971

TENSION COMPENSATING WEB EXPANDER ROLLER

James F. Ginter, Jupiter, Fla., assignor to Spencer-Johnson Company, Appleton, Wis.

Filed Oct. 30, 1986, Ser. No. 924,765
Int. Cl.⁴ D06C *3/06*
U.S. Cl. 26—103 **8 Claims**



1. A compensating roll for flexible sheet or web material including a curved axle having opposite ends that are supported by a pair or spaced-apart support assemblies, a series of annular spool assemblies rotatably mounted in axially end-to-end relation on said axle, and a series of annular sleeve sections received over said spools, axle adjusting means for adjusting said curved axle such that the axis thereof may be set in any desired plane about a straight axis common to both of said support assemblies, the improvement comprising,

a curved axle having a center section and an adjustable end section on each of the opposite ends thereof;

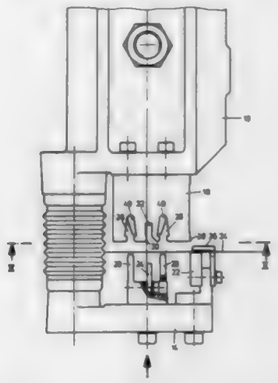
each of said adjustable end sections comprising a shaft coupled to said center section, a hollow cylindrical tube disposed about said shaft, means on said shaft for pivotally supporting one end of said tube, and means on said shaft for adjustably supporting the other end of said tube to adjust said other end with respect to said shaft through the plane of said curved axis of said axle.

4,692,972

DEVICE FOR THE LINING OF SLOTS OF STATOR OR ROTOR LAMINATION PACKS FOR ELECTRICAL MACHINES WITH SLOT LINERS

Otto Schultes, Staudt, Fed. Rep. of Germany, assignor to Stator-Globe Maschinenfabrik GmbH, Niederdorfelden, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,926
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432038
Int. Cl.⁴ B21D *39/03*
U.S. Cl. 29—33 L **7 Claims**



1. An apparatus for simultaneously lining a plurality of radially oriented slots of a stator or rotor lamination pack for a dynamoelectric machine with slot liners, the apparatus comprising;
- a matrix having at least two parallel forming slots therein;
- a die plate relatively movable arranged with respect to said matrix and including at least two forming dies;
- a cutting plate operatively associated with said die plate and located between said at least two dies, said cutting plate having a cutting edge;
- forming means having a beveled surface therein, said forming means adapted to be arranged between said matrix and a stator or rotor lamination pack, said forming means causing predetemined sides of respective slot liners formed in said forming slots to be aligned flush with respective slots in said stator or rotor lamination pack; and
- an insertion punch means relatively laterally movably arranged with respect to said forming dies for simultaneously pushing slot liners out of said at least two forming slots and through said forming means, thereby inserting said slot liners into the slots of said stator or rotor lamination pack.

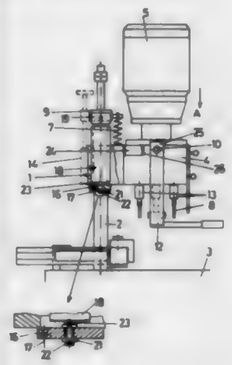
4,692,973

DRILLING AND MOUNTING MACHINE FOR FURNITURE PRODUCTION

Dietmar Blum, Höchst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jul. 26, 1985, Ser. No. 759,285
Claims priority, application Austria, Aug. 27, 1984, 2726/84
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.⁴ B23P *23/04, 19/04*
U.S. Cl. 29—33 K **6 Claims**

1. A drilling and mounting machine, alternatively operable either manually or by fluid pressure, for drilling fastening holes for furniture fittings, for example hinges, in furniture parts, and for mounting the furniture fittings in the thus drilled furniture parts, said machine comprising:
- a frame;
- a housing supporting a drilling mechanism including a gear block for a plurality of drill spindles and a driving motor, said housing being mounted for movement with respect to said frame;
- an inserting member pivotally mounted on said housing for movement between a withdrawn position, whereat movement of said housing relative to said frame enables a drilling operation, and an inserting position, whereat movement of said housing relative to said frame enables a furniture fitting insertion operation;



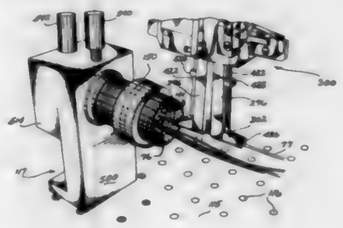
- manually operable feed means for moving said housing relative to said frame and comprising a lever mechanism connected to said frame and to said housing, whereby manual operation of said lever mechanism moves said housing with respect to said frame; and
- fluid operated feed means, operable alternatively to said manually operable feed means, for moving said housing relative to said frame, said fluid operated feed means comprising a fluid operated piston-cylinder unit having a first portion mounted on said frame, a fastening plate mounted on said housing, and means connecting a second portion of said piston-cylinder unit to said mounting plate.

4,692,974

CONNECTOR BLOCK FOR USE WITH A ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM

Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 741,318, Jun. 4, 1985. This application Nov. 18, 1985, Ser. No. 798,828
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—33 M **18 Claims**



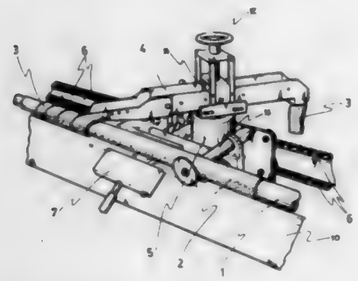
2. A connector block for precisely positioning a connector in any one of a plurality of clocking positions relative to a work surface, comprising:
- (a) a base positionable on the work surface;
- (b) a socket for receiving the connector, the socket being connectable to the base in any one of a plurality of clocking positions;
- (c) means for securing the socket in the selected position and,
- (d) means for indicating to a robot the selected clocking position and the position of the base relative to the work surface.

4,692,975

PAINT ROLLER

Jaime A. Garcia, Ronda Santa Maria 3-7 Barbera Del Valles, Barcelona, Spain

Filed Dec. 11, 1985, Ser. No. 807,818
Claims priority, application Spain, Jan. 11, 1985, 283921
Int. Cl.⁴ B05C *17/02*
U.S. Cl. 29—120 **3 Claims**



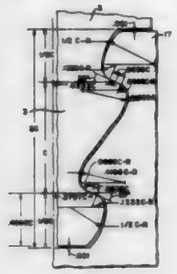
1. In a paint roller including a tubular core and a fabric cover on said core, the improvement comprising:
- the tubular core comprising a thermoplastic material; and
- the fabric cover being heat fused to the surface of the core by heat softening said thermoplastic material without an intermediate adhesive.

4,692,976

METHOD OF MAKING SCALABLE SIDE ENTRY TURBINE BLADE ROOTS

Robert P. Andrews, San Jose, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 760,387, Jul. 30, 1985, abandoned. This application Jun. 11, 1986, Ser. No. 872,987
Int. Cl.⁴ B21K *3/04*
U.S. Cl. 29—156.8 B **4 Claims**



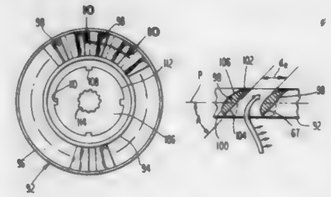
1. A method of making turbine blade roots, steeples and grooves so that stress concentrations in each blade root and steeple are equal, comprising the steps of:
- forming the blade roots, grooves, and steeples so that they have matching shapes;
- forming the blade roots and steeples to have inclined surfaces which abut, providing contact areas between the blade roots and steeples, these inclined surfaces being the only contact areas between the blade roots and steeples;
- providing a proportional dimensional model of a blade groove root and steeple wherein any size blade root, steeple and groove can be scaled from said dimensional model by multiplying all dimensions on said model by a constant which is equal to a distance between a central portion of the inclined surfaces projected normal to a center line of the blade root; and
- providing constant angle inclined contact surfaces on said model whereby any set of blade roots, grooves and steeples scaled from said model has equal stress concentration at all points of stress concentration within each blade root and steeple.

4,692,977

METHOD FOR CONVERTING A SPRAG-TYPE TORQUE CONVERTER INTO A SPRAGLESS TORQUE CONVERTER IN A POWER PLANT HAVING A COAXIAL IMPELLER AND TURBINE UNIT

Robert E. Maze, 3500 Cedar La., Drexel Hill, Pa. 19026

Division of Ser. No. 752,002, Jul. 5, 1985, Pat. No. 4,608,823, which is a continuation of Ser. No. 491,603, May 4, 1983, abandoned. This application Jun. 23, 1986, Ser. No. 877,538
Int. Cl.⁴ B21K *3/04;* **B23P** *15/00, 17/04*
U.S. Cl. 29—156.8 R **3 Claims**



1. A method for converting a sprag-type torque converter into a spragless torque converter comprising the steps of:
- removing a stator member from between impeller and turbine members of the sprag-type torque converter, said stator member including fluid directing vanes between an inner and outer ring thereof, said vanes each having curved first and second surface, said stator having a sprag mounted in said inner ring, said sprag including a plurality of moving parts;
- removing said sprag from within said inner ring;
- grinding a surface of each of said vanes in a manner sufficient to cause said ground surface to be substantially flat;
- inserting a stationary sprag billet in said inner ring, said billet having an aperture formed therethrough, said aperture being of a construction sufficient for maintaining said billet fixed on a stationary shaft, said billet being free of moving parts; and
- mounting said spragless stator between said impeller and turbine.

4,692,978

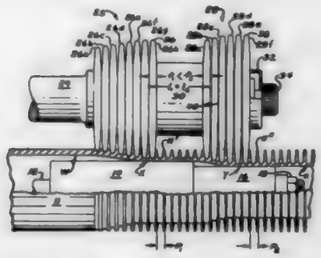
METHOD FOR MAKING HEAT EXCHANGE TUBES

James L. Cunningham, and Bonnie J. Campbell, both of Decatur, Ala., assignors to Wolverine Tube, Inc., Decatur, Ala.

Division of Ser. No. 520,265, Aug. 4, 1983. This application Jun. 24, 1985, Ser. No. 748,099
Int. Cl.⁴ B21D *53/02;* **B23D** *15/26*
U.S. Cl. 29—157.3 A **3 Claims**

1. A method of making a heat exchange tube from difficult to work materials such as titanium and stainless steel in a single finning pass comprising the steps of inserting a mandrel having at least a first larger diameter portion and a second smaller diameter portion inside a plain tube; moving the axes of a plurality of rotating disc carrying finning arobrs toward said

tube so that first and second sets of discs on said arbors, which are separated from each other by a spacer member, will sequentially force portions of said tube toward said first and second portions of said mandrel, said first set of discs serving to initially form the fins on said tube to at least approximately their final outside diameter and said second set of discs, whose



discs are axially spaced so as to have a greater pitch than the discs of the first set, serving to reduce the root diameter of the fins previously formed by the first set of discs without substantially changing the outer diameter of the fins formed by said first set of discs, said greater pitch of said second set of discs causing an elongation of said tube and reducing its tendency to twist during finning.

4,692,979

HEAT EXCHANGER AND A METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

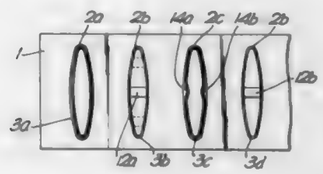
Dirk Pietzcker, Niederwaldstr. 5, D-3500 Kassel, Fed. Rep. of Germany

Filed Aug. 30, 1985, Ser. No. 771,630

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432073

Int. Cl.[4] B21D *53/02;* **B23P** *15/26*

U.S. Cl. 29—157.3 C **10 Claims**



1. A method of attaching at least one fluid conducting metal tube to a plurality of heat dissipating metal fins, comprising the steps of: providing a plurality of heat dissipating fins; providing at least one oval or oblong shaped collar on each of said fins, said collars having openings having oval or oblong initial cross-sections through said fins; providing at least one metal tube having two ends and a generally oval or oblong outer cross section, said tube further having first similarly shaped wall portions at opposite ends of a major axis thereof and second similarly shaped wall portions at opposite ends of a minor axis thereof, and said tube having an outer cross-section slightly smaller than said initial cross-section of said openings; fitting said tube inside said openings of said fins; and attaching said tube to said fins by merely introducing an expansion means into one of said ends of said tube and moving said means through said tube to said other end thereof for progressively expanding said tube so as to progressively bring said first and second wall portions into contact with said collar and for further progressively expanding said tube and said collars to an extend such that said collars and said tube reach a condition in which said tube walls are stretched plastically to an outer cross-section slightly greater than said initial cross-section of said openings, and said collars are expanded elastically, further by providing at least one elongated spacer for supporting said second wall portions within said collars, said spacer substantially having a breadth corresponding to a distance between said second wall portions at a preselected location thereof and in the plastically stretched condition of said tube, and further by introducing said spacer into said tube at said preselected location and at said one end of said tube by moving said spacer directly with or behind said expansion means into said tube for preventing a shrinkback of said tube after plastical stretching thereof, and by terminating said process by leaving said spacer within said tube.

4,692,980

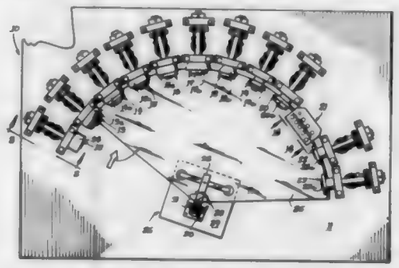
METHOD AND APPARATUS FOR FORMING AN ARCUATE SHEET METAL SEAM

Michael W. Carroll, Roselle, and Michael E. Harwood, Palatine, both of Ill., assignors to North American Agricultural, Inc., Schaumburg, Ill.

Filed Aug. 31, 1984, Ser. No. 646,612

Int. Cl.[4] B21D *39/04*

U.S. Cl. 29—243.52 **11 Claims**



1. An apparatus for forming an arcuate folded edge seam on an arcuate edge of flat workpiece of sheet metal comprising, in combination, a machine frame, a work holder on said machine frame mounted for turning movement relative to said machine frame, a plurality of form roller pairs mounted in said frame and arranged along an arc and about a predetermined axis, the rollers of each pair having mating surfaces that form a nip, the shape of the nips on the successive form roller pairs along the arc being such as to gradually bend the arcuate edge of the flat sheet metal piece to form the arcuate edge seam as the arcuate edge of the workpiece passes through the roller pairs; the length of the arc of the arcuate edge being greater than the length of arcuate folded edge seam and the excess in length causing waves in the seam, straightener means mounted in said frame adjacent said rollers comprising a converging passageway positioned on the arc of the form roller pairs for smoothing the waves in the arcuate seam formed in the workpiece; means mounted on said frame for feeding the workpiece through the form roller pairs and the straightener means; work hold down means for holding the workpiece on said work holder; and drive means mounted on said frame and connected to said means for feeding and effecting relative rotational movement of the workpiece relative to the former rollers and straightener means about said predetermined axis at the center of curvature of the arc defined by the form roller pairs and straightener means.

4,692,981

PROCESS FOR REPLACING BRIDGE BEARINGS

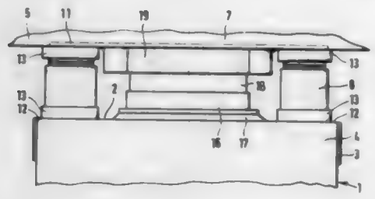
Helmut Homes, Ustar, Fed. Rep. of Germany, assignor to Glacier GmbH—Sollinger Hütte, Ustar, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,415

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446721

Int. Cl.[4] B23P *6/00*

U.S. Cl. 29—402.08 **8 Claims**



1. A process for replacing bridge bearings between a bridge superstructure and supporting piers therefor, said process comprising the steps of:

removing parts of an existing bridge bearing from over a pier contact surface such that multiple mounting surfaces for lifting cylinders are created on said pier contact surface at a position under said superstructure; and around the remainder of the bearing

positioning multiple lifting cylinders on portions of said pier contact surface including said multiple mounting surfaces;

raising said bridge superstructure via said lifting cylinders;

removing additional parts of said existing bearing; and

introducing new bearing parts between said lifting cylinders.

4,692,982

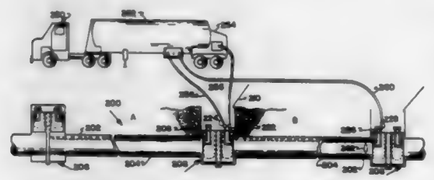
LINING REMOVAL PROCESS

Norman B. Rice, 2062 24th St., Cuyahoga Falls, Ohio 44223

Filed May 22, 1986, Ser. No. 865,757

Int. Cl.[4] F25D *1/00*

U.S. Cl. 29—402.09 **40 Claims**



1. A process for removing an adherent coating from a substrate comprising:

(a) placing said coating under elevated pressure;

(b) contacting said coating with a cryogenic liquid at a cryogenic temperature low enough to substantially weaken the cohesive forces which hold said coating together and the adhesive forces which bind said coating to said substrate while maintaining said coating under said elevated pressure, said elevated pressure being above the vapor pressure of said cryogenic liquid at said cryogenic temperature;

(c) shocking said coating so that it separates from said substrate, and

(d) withdrawing a stream of said cryogenic liquid containing particles of said coating entrained therein.

33. Apparatus for cryogenic treatment of a substrate having an adherent coating thereon in order to remove said coating, said apparatus comprising:

(a) a pressure vessel for receiving said substrate and said coating thereon;

(b) means for pressuring said pressure vessel;

(c) a cryogenic containment vessel for containing a cryogenic liquid under pressure;

(d) transfer line means for transferring said cryogenic liquid from said containment vessel to said pressure vessel;

(e) return line means for withdrawing cryogenic liquid containing suspended particles of coating from said pressure vessel and for returning cryogenic liquid to said containment vessel; and

(f) means in said return line for separating said particles of coating from said cryogenic liquid.

4,692,983

METHOD AND INSTALLATION FOR FITTING NUTS TO A WORKPIECE

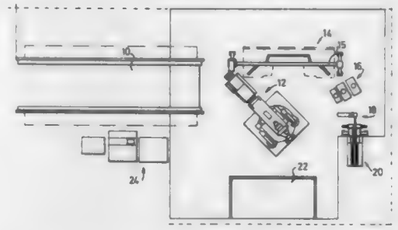
Osvald Kristola, and Paavo Korpela, both of Robertsfors, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Apr. 4, 1986, Ser. No. 848,291

Claims priority, application Sweden, Apr. 9, 1985, 8501734

Int. Cl.[4] B23P *11/00, 21/00, 19/00;* **B23Q** *15/00*

U.S. Cl. 29—432 **8 Claims**



1. A method for fitting nuts to a sheet-metal workpiece, by punching the nuts into the sheet metal, characterized by securing the workpiece in a stationary fixture; mounting a portable nut punching tool on a tool attachment provided on the wrist of an industrial robot for moving said punching tool from a tool storage location to said workpiece in said fixture; with the aid of the robot positioning the nut punching tool sequentially in pre-determined locations on the workpiece to which nuts are to be fitted and secured; and activating the nut punching tool for fitting a nut to the workpiece by punching the nut thereinto.

5. A robot installation for fitting nuts to a sheet-metal workpiece by punching the nuts thereinto, characterized in that the installation comprises.a portable nut punching tool which can be detachably connected to a tool attachment provided on the wrist of an industrial robot said industrial robot having a wrist with a tool attachment thereon for moving said portable nut punching tool from a storage location to predetermined locations on the workpiece; and further comprises a stationary fixture for holding the workpiece during a nut punching operation.

4,692,984

METHOD OF FORMING HOUSING FOR FREE-STANDING CABINET

Thomas J. McKernan, Grand Rapids, and Brian Wilcockson, Holland, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Division of Ser. No. 754,790, Jul. 12, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,623

Int. Cl.[4] B23P *9/00*

U.S. Cl. 29—445 **3 Claims**

1. A method of forming a housing structure for an upright free-standing cabinet, comprising the steps of:

providing a planar and enlarged substantially rectangular sheet of thin metal;

forming four opposed pairs of notches in the top and edges of the sheet;
bending the upper and lower edges of said sheet to form inwardly projecting top and bottom flanges;
bending each side edge of said sheet substantially along one pair of said notches to form a rounded flange which extends longitudinally along said side edge;
positioning a first pair of elongated support rails on the inner surface of said sheet directly adjacent the rounded flanges, and welding said first support rails to said sheet;
positioning a second pair of elongated support rails adjacent the inner surface of said sheet so that the second support rails extend substantially parallel to but are spaced in-



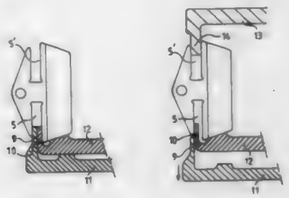
wardly a substantial distance from said side edges, each of said second support rails being positioned in close proximity to a further pair of aligned notches as formed in the upper and lower flanges, and then welding said second rails to said sheet; and
forming said flat sheet with the first and second support rails welded thereto into a substantially U-shaped configuration by bending said flat sheet to form a first rounded corner which extends longitudinally between one said further pair of aligned notches as formed in the top and bottom flanges and by bending the flat sheet to form a second rounded corner which extends longitudinally between the other said further pair of aligned notches.

4,692,985

PROCESS FOR THE ASSEMBLY OF METALLIC DRIVING BELTS AND APPROPRIATE ASSEMBLY MOULD

Johannes A. Van Dijk, Eindhoven, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed May 28, 1986, Ser. No. 867,688
Claims priority, application Netherlands, May 28, 1985, 8501507
Int. Cl.[4] B23P *11/02, 19/02;* B23Q *7/10*
U.S. Cl. 29—450 **7 Claims**



1. A process for the assembly of a composite driving belt having a substantially trapezoidal cross-section and intended for use on V-shaped pulleys, consisting of an endless carrier in the shape of al least one metallic band and of a plurality of transverse elements which rest against one another with the parallel parts of their principal faces and which have been mounted slidably on the carrier, whilst lateral recesses have been provided for receiving the band(s), which elements have been bevelled radially inwards below the neutral line of the driving belt on at least one of their principal faces in order to permit bending of the driving belt, in such a fashion that the transverse elements are in contact with one another on the tilting line where the bevelled zone passes into the parallel zone of the principal face, whilst the transverse elements are provided with means of engagement in the form of at least one embossment on a principal face and a substantially corresponding cavity on the other principal face, characterized in

(a) mounting the elements with an embossment of each element engaging a cavity of each adjacent element and with their recess or one of the recesses on an (ancillary) annular assembly mould whose diameter exceeds that of the endless band or band package;
(b) mounting the ultimately required number of elements and make-up elements, respectively which are needed for the actual diameter of the endless band or band package;
(c) imparting to the aggregate of assembled elements a (smaller) diameter which corresponds with the one required to receive the band(s) or band package(s) into the slot formed by the lateral recess(es) of the transverse elements; and
(d) then inserting the band(s) or band package(s) into the slot formed by the lateral recess(es) of the elements.

3. Apparatus for the assembly of a driving belt composed of transverse elements and provided with one or more metallic bands or band packages according to the process of claim 1, characterized in that it comprises

(a) two rings (**11,12**) which are axially movable relative to one another, both provided with an upturned annular raised rim edge (**9,10**), and which are to be placed such vis-à-vis one another that the inner diameter of the rim of one ring (**11**) which is in lower position (during assembly work) embraces the outer diameter of the rim of the other ring (**12**), the rim edges of the two rings together forming an upright assembly mould for the elements with a joint cross-section not exceeding the width of the lateral recesses (**5**) of the elements, whilst the outer diameter of the outer rim (**9**) exceeds the inner diameter of the band or band package to be inserted and the outer diameter of the inner rim (**10**) virtually coincides with that of the band(s) or band package(s) to be inserted;
(b) means (**13,14**) whereby the elements (**1–8**) to be mounted can be successively delivered to a point over the raised rim edges (the assembly mould **9,10**), whilst in a position in which the corresponding recesses (**5,5'**) of the elements to be mounted are perpendicular;
(c) an arm (**15**) enabling delivered elements to be moved along the upright assembly rim edges (**9,10**) up to a co-travelling arresting arm (**16**);
(d) means for measuring the distance between the element delivered first and the element delivered last and for terminating the delivery of elements when a well-defined distance between these elements has been attained;
(e) means for lowering at least the raised rim edge (**9**) of the lower ring (**11**) to a point beyond the profile of the elements present, after the vacant space has been filled partly to the extent specified for the desired end position;
(f) means whereby
  (i) the outer edge of the slot formed by a continuous row or recesses (**5**) of the elements (**1–8**) is made to fit snugly against the outer edge of the inner rim (**10**); or
  (ii) the elements (**1–8**) are joined together so as to rest against one another;
(g) means for inserting a band or band package into every slot formed by the continuous row of lateral recesses (**5,5'**) of the elements (**1–8**).

4,692,986

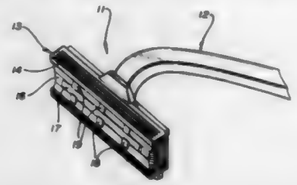
RAZOR CARTRIDGE WITH SHAVING AID

Vincent C. Motta, West Norwalk, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 27, 1985, Ser. No. 780,767
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—451 **5 Claims**

1. A method of attaching an, elongate shaving aid to a face-engaging surface of a razor cartridge comprising:

(a) creating a track in said face-engaging surface, said track including a flared inlet side with spaced restrictions created by bulging spaced portions of said track therein, said track also formed with a stop opposite said inlet,



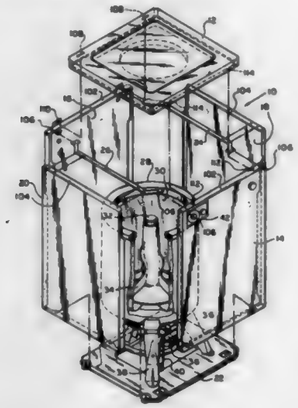
(b) forming said elongate shaving aid by extrusion molding then feeding said shaving aid insert into said track until the end of said insert abuts the stop opposite said inlet; and
(c) frictionally retaining said insert in said track.

4,692,987

METHOD OF CONSTRUCTING A CABINET FOR AN AUTOMATIC WASHER

Victor W. Cuthbert, and Joel M. Saider, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 558,875, Dec. 7, 1983, Pat. No. 4,618,193.
This application May 13, 1986, Ser. No. 862,710
Int. Cl.[4] B21D *39/00;* B23P *19/04*
U.S. Cl. 29—455 R **3 Claims**



1. A method of constructing a cabinet for a domestic appliance comprising the steps:

(1) positioning a base panel in a horizontal orientation,
(2) guiding a front panel toward the base panel at an angle from vertical,
(3) engaging slots in a bottom wall of the front panel with a first set of tabs protruding from the base panel,
(4) sliding the front panel laterally relative to the base panel until the tabs are captured by the bottom wall,
(5) rotating the front panel to a vertical orientation to engage a second set of tabs with openings in the front panel,
(6) repeating steps 2 to 5 for a rear panel,
(7) securing restraining bars to the top ends of the front, and rear panels,
(8) guiding a side panel toward the base panel at an angle from vertical,
(9) engaging slots in a bottom wall of the side panel with a third set of tabs protruding from the base panel,
(10) rotating the side panel to a vertical orientation to engage lock pins protruding from the front and rear panels with corresponding slots in the side panel,
(11) repeating steps 8 and 10 for a second side panel,
(12) securing the top ends of said side panels to said restraining bars,
(13) guiding a top panel toward the top of the rear panel at close to a vertical orientation,
(14) engaging slots in a rear wall of the top panel with hinge tabs protruding from the rear panel,
(15) rotating the top panel to a horizontal position over-lying the tops of the front, side and rear panels, and
(16) engaging a latch between the top panel and front panel to secure the two panels together.

3. A method of constructing a cabinet for a domestic appliance comprising the steps:

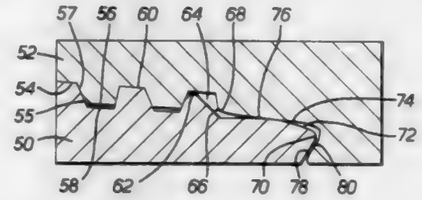
(1) positioning a base panel in a horizontal orientation,
(2) attaching a front panel along one side of the base panel,
(3) attaching a rear panel along an opposite side of the base panel,
(4) securing restraining bars between the top ends of the front and rear panels,
(5) guiding a side panel toward the base panel at an angle from vertical,
(6) engaging slots in one of said side or base panels with a set of tabs protruding from the other of said side or base panels,
(7) rotating the side panel to a vertical orientation to engage locking means between said side panel and said front and rear panels,
(8) repeating steps 5 to 7 for a second side panel,
(9) securing the top ends of said side panels to said restraining bars,
(10) guiding a top panel toward the top of the rear panel at close to a vertical orientation,
(11) engaging slots in one of said top or rear panels with hinge tabs protruding from the other of said top or rear panels,
(12) rotating the top panel to a horizontal position over-lying the tops of the front, side and rear panels, and
(13) engaging a latch between the top panel and at least one of said front or side panels to secure the panels together.

4,692,988

SCREW THREAD PROTECTION

Roderick L. Shulver; John Misselbrook, and Robert Standen, all of Great Yarmouth, England, assignors to Nowsco Well Service (U.K.) Limited, Norfolk, England

Filed Aug. 19, 1986, Ser. No. 897,804
Int. Cl.[4] B23P *25/00;* F16L *17/00*
U.S. Cl. 29—458 **34 Claims**



1. A method of protecting mating screw thread means including first and second screw threads and associated sealing surfaces at least under tightening torques, the method comprising the steps of

applying a dry film lubricant to the screw thread means,
applying a liquid lubricant to the screw thread means,
mating the screw thread means, and
tightening to the required torque value,
the liquid lubricant having substantially no solvent action on the dry film lubricant, good wetability and low viscosity and being non-volatile and non-chemically reactive, and
the method serving both to protect the mating threads and to

avoid any subsequent masking of any leakage path between the screw-threads.

4,692,989

PROCESS AND APPARATUS FOR PROFILING ROD-LIKE WORKPIECES

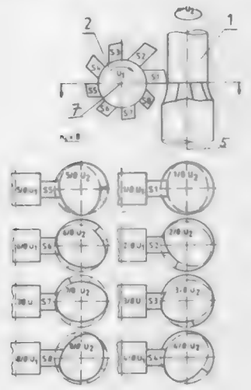
Walter Neubauer, Ohlsdorf, Austria, assignor to Linsinger Maschinenbau Gesellschaft mbH, Steyrermühl, Austria

Filed Jul. 1, 1986, Ser. No. 881,115

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524123

Int. Cl.⁴ B23P *13/00*; B23C *3/04*

U.S. Cl. 29—558 **15 Claims**



1. A process for radially profiling rod-like workpieces having at least one thread, comprising:

providing individual cutting edges arranged on a milling head with different radial positions and profiles and rotating said milling head about its axis;

providing a relative rotary motion of said rod-like workpiece effectively about its longitudinal axis with respect to said milling head to successively move the workpiece into a profile plane to produce the profile in accordance with the number of cutting edges on the milling head;

the profiling process being effected during one rotation about the axis of the milling head by superimposition therewith of said relative rotary motion about the axis of the workpiece.

4,692,990

HOLLOW TOOL EXCHANGING MECHANISM FOR A MACHINE TOOL

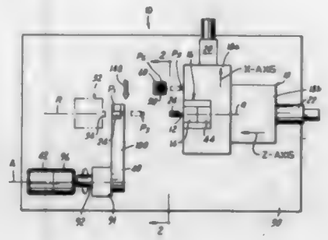
Lawrence I. Millay, Springfield, Vt., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 31, 1985, Ser. No. 739,741

Int. Cl.⁴ B23Q *3/157*

U.S. Cl. 29—568 **7 Claims**

1. A machine having a rotatable quill, a hollow tool releasably held on the quill, slide means for carrying and positioning the quill, tool storage means for storing at least one hollow replacement tool, tool discharge means for receiving a worn hollow tool stripped from the quill, a tool removal arm means rotatable about a rotational axis between a tool removal position and tool discharge position adjacent the tool discharge means and having a tool enter station into which a worn tool on the quill is initially inserted by movement of the slide means and a tool strip station at which the worn tool is subsequently positioned, said tool enter station and tool strip station being spaced apart on the same circular arc relative to the rotational axis of the tool removal arm means and interconnected so that rotation of said arm means relative to said quill places the worn tool subsequently at said tool strip station, said tool strip station including tool trapping means fixed in position on the arm means for engaging the worn tool at the tool removal position, and means for rotating said arm means between the tool removal position and tool discharge position, the worn tool being stripped from the quill at said tool removal position by said slide means retracting the quill from the tool strip station



while the worn tool is held by said tool trapping means and being discharged into said tool discharge means by rotation of said arm carrying the worn tool to said discharge means, said slide means carrying the quill without a hollow tool thereon to said tool storage means for releasably securing the hollow replacement tool on the quill.

4,692,991

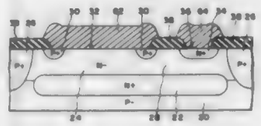
METHOD OF CONTROLLING FORWARD VOLTAGE ACROSS SCHOTTKY DIODE

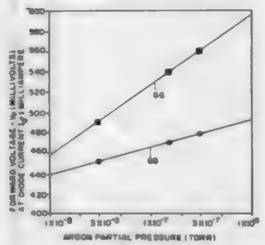
Ronald C. Flowers, Sandy, Utah, assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Jul. 19, 1985, Ser. No. 757,038

Int. Cl.⁴ H01L *29/48*

U.S. Cl. 437—175 **14 Claims**





1. A method wherein a metallic layer is deposited on an N-type semiconductive region of a structure placed in a highly evacuated chamber to form a rectifying junction between a first portion of the N-type region and a segment of the metallic layer; and an electrical conductor is created to ohmically contact a second portion of the N-type region; characterized by the step of introducing at least one gas into the chamber during the deposition step in order to control the voltage V_F between the metallic segment and the conductor when the rectifying junction is forwardly conductive.

4,692,992

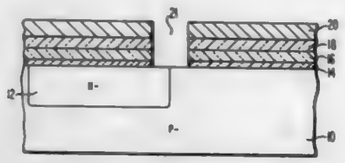
METHOD OF FORMING ISOLATION REGIONS IN A SEMICONDUCTOR DEVICE

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 25, 1986, Ser. No. 878,259

Int. Cl.⁴ H01L *21/425, 21/473*

U.S. Cl. 437—57 **13 Claims**



1. A method of making a semiconductor device comprising the steps of:

providing a semiconductor substrate with abutting regions of the same or opposite conductivity types, said regions extending to the surface of said substrate;

forming in at least one of said abutting regions a heavily doped region of the same conductivity type adjacent the interface with the other abutting region; and

forming a trench in said substrate by removing portions of said substrate, said trench having at least a wall portion extending along said heavily doped region.

2. A method of making a semiconductor device comprising the steps of:

providing a semiconductor substrate with abutting regions of a first and second conductivity type;

forming a first masking layer over said semiconductor substrate;

forming an opening in said first masking layer over at least a portion of the interface of said abutting regions;

forming a second masking layer on at least a portion of said region of a first conductivity type exposed by said opening;

introducing dopants of a second conductivity type through said opening to form a heavily doped region of a second conductivity type, a portion of said heavily doped region of a second conductivity type extending under said first masking layer;

removing said second masking layer; and

forming a trench in the regions of said semiconductor substrate which are not subtended by said first masking layer.

4,692,993

SCHOTTKY BARRIER CHARGE COUPLED DEVICE (CCD) MANUFACTURE

Marion D. Clark, 11725 Montana Ave., Los Angeles, Calif. 90049, and C. Lawrence Anderson, 4409 Henley Ct., Westlake Village, Calif. 91360

Division of Ser. No. 520,745, Aug. 5, 1983, abandoned, which is a continuation of Ser. No. 209,190, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 966,939, Dec. 5, 1978, abandoned. This application Oct. 4, 1985, Ser. No. 784,447

Int. Cl.⁴ H01L *21/24, 29/56*

U.S. Cl. 437—53 **4 Claims**

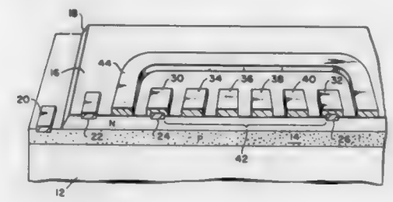
1. A process for fabricating a planar charge-coupled device structure which includes the steps of

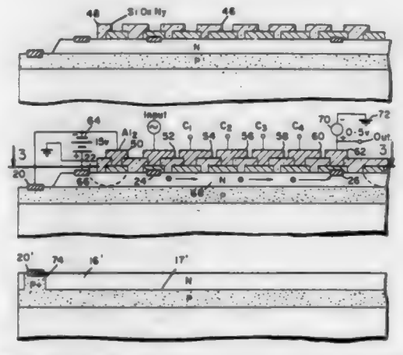
(a) providing a semiconductor body having an outermost channel region suitable for coupling charge between selected locations therein under the control of electrical signals,

(b) forming input, output, and bias ohmic contact electrodes at selected locations on said surface channel region and in a first level or plane above said semiconductor body,

(c) forming a plurality of selectively spaced charge transfer electrodes between said input and output ohmic contacts and having upper surfaces lying in a second level or plane above said semiconductor body, while simultaneously forming a charge isolation electrode surrounding said input, output and charge transfer electrodes and also lying in said second level or plane,

(d) forming an insulating mask atop said input, output, charge transfer and charge isolation electrodes and having openings therein aligned with said input, output, charge transfer and charge isolation electrodes, and





(e) depositing a plurality of cross-over or lead-in electrodes in said openings in said insulating mask and having surfaces lying in a third level or plane atop said semiconductor body, whereby said charge isolation electrode is formed simultaneously with the formation of said charge transfer electrodes to thereby enable close control over the spacing between said charge isolation electrode and other electrodes in the same level of metalization and simultaneously minimize the number of levels of metalization within said structure and thereby maximize process yields and device reliability.

4,692,994

PROCESS FOR MANUFACTURING SEMICONDUCTOR DEVICES CONTAINING MICROBRIDGES

Masahiro Moniwa, Kokubunji; Terunori Warabisako, and Hideo Sunami, both of Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,200

Int. Cl.⁴ H01L *21/425*

U.S. Cl. 437—40 **10 Claims**

1. A process for manufacturing semiconductor devices comprising:

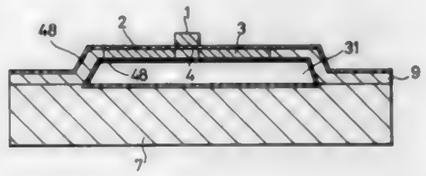
(i) a step for forming at least one first insulating film of a predetermined shape on a substrate;

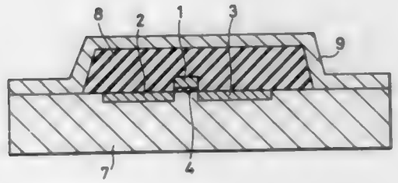
(ii) a step for forming a continuous semiconductor film on said substrate and said first insulating film;

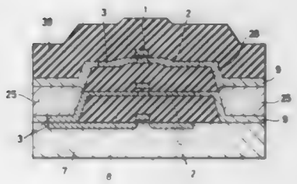
(iii) a step for forming at least one island region of a predetermined shape by a lithography, said island region being comprised of the continuous semiconductor film on said

substrate and on said first insulating film and said first insulating film under said semiconductor film;

(iv) a step for forming a microbridge which consists of said semiconductor film by removing said first insulating film







of said island region from at least the side of said semiconductor film; and

(v) a step for forming a second insulating film on the exposed surface of said microbridge.

4,692,995

METHOD OF OBTAINING A DIODE WHOSE CONTACT TAPPING IS SELF ALIGNED WITH A GATE

Pierre Blanchard, Echirolles, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 24, 1986, Ser. No. 822,028
Claims priority, application France, Jan. 25, 1985, 85 01085
Int. Cl.⁴ H01L *21/225, 21/265*
U.S. Cl. 437—41 **6 Claims**





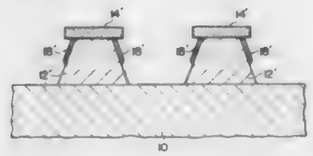
1. A method of obtaining a diode whose electrical contact is self-aligned with a gate, comprising the steps of depositing on a semiconductor substrate at least a first layer of dielectric material, depositing on the last dielectric layer a localized portion of a first layer of polycrystalline silicon for forming the gate, then a second polycrystalline silicon layer above the first layer, etching in the polycrystalline silicon layers essentially at the position desired for the diode until the dielectric layer is laid bare, oxidizing the substrate sufficiently to form an oxidized layer which completely covers the localized polycrystalline silicon layer and only partially covers the bared portion of the dielectric layer and doping the portion of the substrate not covered by the oxide layer so as to form the junction of the diode in such portion of the substrate.

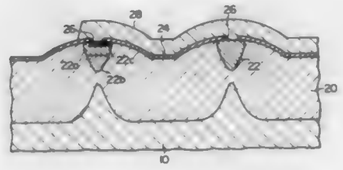
4,692,996

METHOD OF FABRICATING SEMICONDUCTOR DEVICES IN DIELECTRICALLY ISOLATED SILICON ISLANDS

Yukio Minato, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,257
Claims priority, application Japan, Nov. 21, 1984, 59-246605
Int. Cl.⁴ H01L *21/306;* **C03C** *25/06*
U.S. Cl. 437—73 **5 Claims**





1. A method of fabricating a semiconductor device, comprising

(1) preparing a semiconductor substrate of a first conductivity,

(2) forming a semiconductor layer of a second conductivity type on the substrate,

(3) selectively removing the semiconductor layer to leave at least one protruding region gradually reduced in cross section away from said substrate and protruding from the surface of the substrate,

(4) forming oxidation resistive layers on the top surface and a portion of each of the side surfaces of said protruding region, the oxidation resistive layer on said top surface partially overhanging the top surface of said protruding region and the oxidation resistive layer on said portion of each side surface merging with the oxidation resistive layer on said top surface and terminating ahead of the exposed surface of the substrate to allow said semiconductor layer to be exposed adjacent the exposed surface of the substrate, and

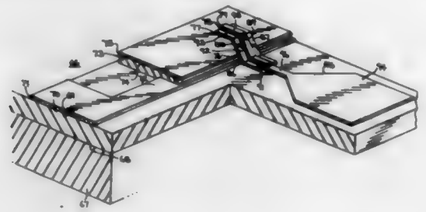
(5) thermally oxidating exposed portions of said substrate and said protruding region to form a silicon oxide layer with at least one semiconductor device region formed within the silicon oxide layer, said semiconductor device region having a surface portion substantially flush with the surface of said silicon oxide layer.

4,692,997

METHOD FOR FABRICATING MOMOM TUNNEL EMISSION TRANSISTOR

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 683,705, Dec. 19, 1984, Pat. No. 4,630,081.
This application May 15, 1986, Ser. No. 863,773
Int. Cl.⁴ H01L *21/02*
U.S. Cl. 437—238 **2 Claims**



1. A method for making an MOMOM tunnel emission transistor comprising the steps of:

providing a substrate having a generally horizontal planar upper surface;

forming a first insulator layer on said upper surface of said substrate;

forming a first metal layer ranging in thickness from 100 to 1,000 angstroms on the upper surface of said first insulator layer;

forming a second insulator layer ranging in thickness from 1,000 to 10,000 angstroms on the upper surface of said first metal layer;

forming a second metal layer ranging in thickness from 50 to 500 angstroms on the upper surface of said second insulator layer;

defining a mesa having generally vertical sides exposing the edges of said layers;

oxidizing the exposed edge of said second metal layer to form a first oxide layer ranging in thickness from 5 to 20 angstroms;

forming a third metal layer extending along a portion of the upper surface of said first insulator layer adjacent said first metal layer and also extending along said side of said mesa;

oxidizing said third metal layer to form a second oxide layer ranging in thickness from 10 to 40 angstroms;

forming a fourth metal layer extending along said second oxide layer and including a portion on said insulator layer proximate said third metal layer and separated therefrom by said second oxide layer,

said second metal layer being one of the emitter and collector of said transistor, said fourth metal layer being the other of the emitter and collector of said transistor, said third metal layer being the base of said transistor.

4,692,998

PROCESS FOR FABRICATING SEMICONDUCTOR COMPONENTS

Albert L. Armstrong, Latham, N.Y., and Joel L. Goodrich, Westford, Mass., assignors to M/A-COM, Inc., Burlington, Mass.

Filed Jan. 12, 1985, Ser. No. 693,477
Int. Cl.⁴ H01L *21/265;* **B01J** *17/00*
U.S. Cl. 437—225 **7 Claims**

1. A process for fabricating semiconductor devices comprising the steps of;

providing a semiconductor substrate in which will be defined an I-region separated by first and second channel defining areas,

disposing a layer of a dielectric material on said substrate including one and another segments thereof,

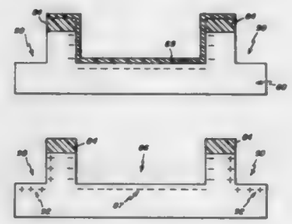
removing portions of said dielectric material in I-regions of the substrate,

disposing a second layer of a dielectric material over said substrate in said I-region,

removing at least said one segment of the first dielectric material in the first channel defining area of the substrate,

removing the substrate in said first channel defining area to define a first exposed substrate channel,

doping the exposed substrate in said first substrate channel with a first dopant,



disposing a protective layer over said doped first substrate channel,

removing at least said another segment of the first dielectric layer of the substrate in said second channel defining area of the substrate,

removing the substrate in said second channel defining area to define a second exposed substrate channel,

doping the exposed substrate in said second substrate channel with a second dopant,

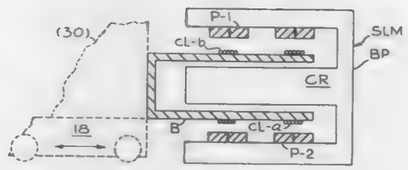
and depositing a metallic layer in said first and second substrate channels.

4,692,999

METHOD OF MAKING A MULTI-COIL/MULTI-MAGNET ACTUATOR

Jorgen Frandsen, Winnipeg, Canada, assignor to Unisys Corp., Detroit, Mich.

Division of Ser. No. 106,721, Dec. 26, 1979, Pat. No. 4,612,592.
This application Jul. 25, 1986, Ser. No. 889,657
Int. Cl.⁴ H02K *15/06*
U.S. Cl. 29—596 **11 Claims**



1. A method of making an improved electromagnetic actuator means including the steps of:

providing a bobbin structure arranged so as to be reciprocatable along a prescribed path;

disposing first and second magnet means along this path, these magnet means being arranged to include respective first and second magnetic pole means, arranged so the bobbin structure can pass operatively adjacent thereto as it proceeds along said path, past the pole means then presenting magnetic flux which is electromagnetically interactive with the bobbin structure; said pole means being opposite in magnetic polarity to one another;

and mounting first drive-coil means and second drive-coil means on said bobbin structure so as to magnetically interact with said flux from said first and second pole means and so generate a prescribed force driving said bobbin structure along said path.

4,693,000

METHOD FOR MANUFACTURING A THREE-DIMENSIONAL GRADIOMETER FOR A DEVICE FOR THE SINGLE OR MULTI-CHANNEL MEASUREMENT OF WEAK MAGNETIC FIELDS

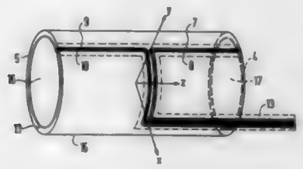
Eckhardt Hoenig, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,595

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442237

Int. Cl.⁴ H01L *39/24*

U.S. Cl. 29—599 **7 Claims**



1. A method for manufacturing a gradiometer having a three-dimensional structure for a single or multichannel device for measuring magnetic fields with field intensities down to below 10^{-10} T and particularly below 10^{-12} T, comprising the steps of connecting superconducting coils of the gradiometer of predetermined dimensions lying in different planes to each other via superconducting connecting lines, and coupling said superconducting coils to at least one superconducting quantum interference element (SQUID), initially placing the gradiometer coils in spaced position with the connecting lines arranged therebetween on an at least largerly planar, flexible foil substrate body; forming the foil substrate body into the three-dimensional gradiometer structure and applying the foil substrate body with the gradiometer coils and connecting lines to a support body, the shape of which corresponds to the three-dimensional gradiometer.

4,693,001

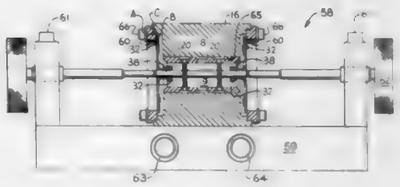
APPARATUS FOR AIR GAPPING THE ARMATURE IN A COMPOUND SPOOL VALVE

Charles A. Van Ornum, Fountain Valley, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 28, 1986, Ser. No. 901,306

Int. Cl.⁴ H01F *41/00*

U.S. Cl. 29—759 **5 Claims**



1. An apparatus for positioning the spool in the valve body bore and setting the armature air gap with respect to the core assembly of a solenoid of a compound, spool type valve having a pressure inlet port and first and second cylinder ports, comprising:

means for supporting said valve body having first means for connecting a gas source with gas flow measuring means to said valve pressure inlet port and second means for interconnecting said valve first and second cylinder ports with a shunt;

means for displacing and locking said valve spool in said valve body while measuring gas flow at said flow measuring means when said first means is connected to a gas source; and

means for supporting said armature in spaced relationship to said valve body while slipped over said spool so as to set the air gap between said armature and said core assembly of said solenoid.

4,693,002

METHOD OF MANUFACTURING CONTACT SPRING PROCEDURE

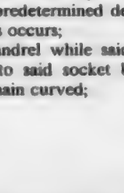
Gerhard Neumann, Waldkraiburg, and Hans Ramisch, Mühldorf, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate, Muhldorf am Inn, Fed. Rep. of Germany

Continuation of Ser. No. 718,447, Apr. 1, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,566

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412875

Int. Cl.⁴ H01R *43/04*

U.S. Cl. 29—882 **2 Claims**



1. A method of manufacturing contact spring sockets, comprising the steps of:

providing a plurality of sections of straight contact springs from said contact spring wire;

providing a socket body having a generally cylindrical sidewall, a first, open end, a bottom, and an interior portion adapted to receive ends of said straight contact springs; including providing a generally disc-shaped central head projecting into said interior portion from said bottom of said socket body disposed generally co-axially within said sidewall body;

inserting said plurality of straight contact springs into said socket such that ends of said straight contact springs are received by said portion of said socket body adapted to receive said ends; said portion being a generally annular space between said central head and said sidewall;

aligning said straight contact springs parallel to one another within said socket body;

fixing said ends to said interior portion between said sidewall and said central head by deforming said central head;

providing a mandrel having an end and an annulus disposed generally concentrically about said end of said mandrel, said end of said mandrel having a diameter sufficiently small to permit entry into said first, open end of said socket body;

inserting said mandrel into said socket body at said first, open end thereof such that a co-axially annular gap exists between an inner wall of said socket body and said end of said mandrel;

moving said mandrel into said socket body until said annulus of said mandrel contracts free ends of said straight contact springs;

continuing movement of said mandrel toward said receiving portion of said socket body until said straight contact springs are deformed inwardly toward said cylindrical projection until a predetermined degree of curvature of said contact springs occurs;

withdrawing said mandrel while said annulus remains in fixed relationship to said socket body, such that said contact springs remain curved;

and deforming a portion of said socket body adjacent said annulus to fixedly retain annulus within said socket body.

4,693,003

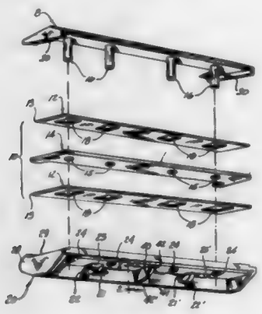
PIVOTABLE RAZOR CARTRIDGE WITH CIRCULAR CAM

Frank A. Ferraro, Trumbull, Conn., assignor to Warner Lambert Company, Morris Plains, N.J.

Filed Sep. 15, 1986, Ser. No. 908,079

Int. Cl.⁴ B26B *21/00*

U.S. Cl. 30—50 **3 Claims**



1. A cartridge for a pivoting head razor said razor including a razor handle, said razor handle including means for pivotally attaching said cartridge and biased cam follower means, said cartridge comprising in combination:

(a) at least one blade having a blade edge;

(b) a cap overlaying said blade;

(c) a blade seat for supporting said blade;

(d) a guard bar extending outward beyond the exposed blade edge from said seat; and

(e) means for joining said blade, seat and cap in a predetermined spatial relationship, with said blade seat having a bottom profile with a substantially rectangular perimeter, said profile including pivotable attachment means for engaging said handle positioned at or near each cartridge end, and a cam which is arcuate in cross-section positioned between said attachment means, said cam having a single flat face with continuous outward curve defining a single cam follower track along the entire extent of the cam, said cartridge maintaining the orientation obtained during shaving after the cartridge is removed from the face due to the lack of biasing force to direct the cam back to a central position.

4,693,004

ENVELOPE OPENER

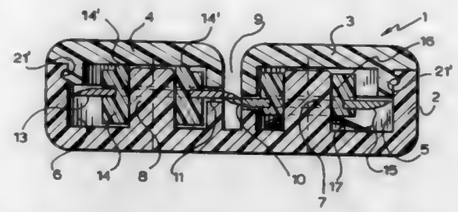
Salvio Plana, 1500, Stanley, #333b, Montreal, Quebec, Canada H3A 1R3

Filed Mar. 28, 1986, Ser. No. 845,852

Int. Cl.⁴ B26B *13/00*

U.S. Cl. 30—265 **4 Claims**

1. An envelope opener comprising a rigid casing having a first recess and a second spaced-apart recess formed therein; each said recess being formed around a fixed axial pin; first and second collars, each being rotatably mounted on one of said axial pins; a first cutting disk, being embedded into an intermediate radially outward annular cavity in said first collar, and a second cutting disk, being embedded into an intermediate radially outward annular cavity in said second collar; a guide-slot extending transversely of said casing between and partially intersecting said recesses; each said cutting disk having a radially outward edge portion extending in said guide-slot in overlapping relationship with the other cutting disk edge portion thereby defining two transversely-spaced cutting nips; a compression spring, fitted around the axial pin of said first collar and intermediate said first collar and the bottom of said first recess; said first cutting disk radially outward edge portion being in a lower position relative to said radially outward edge portion of the second cutting disk in said slot; two covers to close said casing on both sides of said slot; said compression spring thereby upwardly biasing said first cutting disk against said second cutting disk; and a raised inner annular part being formed in the top surface of said second collar, so as to frictionally contact the inner surface of the corresponding said cover.



4,693,005

GUIDE BAR FOR A SAW CHAIN OF A MOTOR-DRIVEN CHAIN SAW

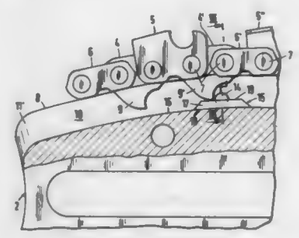
Anton Wehle, Fellbach; Dieter Unrath, Plüderhausen, and Gunther Zimmermann, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 891,628

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528433

Int. Cl.⁴ B23D *57/02, 59/04;* **B27B** *17/12*

U.S. Cl. 30—383 **18 Claims**



1. A guide bar for guiding a saw chain of a motor-driven chain saw as the saw chain is driven, the saw chain including a plurality of cutting links, a plurality of connecting links and a plurality of driving links, the links being pivotally interconnected by rivets or the like and each of the driving links having a raker extending downwardly beyond the connecting links, the rakers having respective lowermost tips, the guide bar comprising:

a flat bar having a peripheral edge;

said bar having two mutually adjacent walls extending along said peripheral edge thereof to conjointly define a groove for receiving the rakers of said driving links therein to guide the saw chain in its movement around the guide bar, the groove having a groove bottom extending between said walls and located at a predetermined distance beneath said tips of said rakers;

lubricating bore means formed in at least one of said walls for conducting lubricating oil to said groove; and,

a stationary part mounted on said groove bottom so as to be immovable with respect thereto and defining surface means for directing the lubricating oil to the immediate vicinity of said tips, said surface means including a first surface for accommodating lubricating oil entering

through said bore means, said first surface extending approximately parallel to and elevated from said groove bottom so as to reduce said distance and permit said tips to pass through the oil on said first surface thereby directing the same upwardly for lubricating the saw chain; and, a second surface extending to said first surface for feeding the incoming lubricating oil to said first surface.

4,693,006

CHAIN SAW HAVING A HANDLE

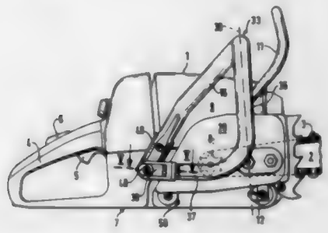
Anton Wehle, Fellbach, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 877,212

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523146

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—383 **10 Claims**



1. A motor-driven chain saw comprising:

a housing having a front wall, a rear wall, two longitudinal side walls extending rearwardly from said front wall to said rear wall, a base wall extending between said side walls, and a top wall extending between said side walls above said base wall;

an elongated guide bar for accommodating a saw chain for movement thereon, said guide bar defining a longitudinal axis along its length and being mounted on one of said side walls and extending outwardly past said front wall;

a drive unit mounted in said housing for moving said saw chain around said guide bar;

a protective cover mounted on said one side wall for covering said saw chain at the housing end thereof;

a first handle on said rear wall of said housing for holding and operating the chain saw;

a second handle for holding and guiding the chain saw, said second handle being substantially disposed in a plane transverse to said guide bar at a location between the latter and said first handle, said second handle being spaced from said top wall and said side walls;

said second handle having a first portion spaced from the other one of said sides and extending past said other side so as to be attached to said base wall; said second handle further having a second portion bent out of said plane so as to be directed and extend rearwardly therefrom substantially parallel to and at an elevation corresponding approximately to that of said longitudinal axis of said guide bar, said second portion having a rearward end portion and being spaced away from said one side wall and said protective cover up to the rearward end portion thereof so as to permit an operator of the chain saw to safely grasp said second handle at said second portion; and,

said end portion being attached to said housing thereby securing said second handle to said housing.

4,693,007

GUIDE BAR FOR A CHAIN SAW

Norbert Apfel; Hans-Peter Stehle, and Wilfried Noll, all of Waiblingen, Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,122

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518990

Int. Cl.[4] B27B *17/02*

U.S. Cl. 30—387 **17 Claims**



1. A guide bar for guiding the saw chain of a chain saw comprising:

two flat side members;

an intermediate member sandwiched between said side members;

said side members extending laterally beyond the outer periphery of said intermediate member for conjointly defining a guide groove therewith for guiding the saw chain in its movement around the guide bar;

said intermdeidate member being made of a material non-weldable to said side members and having a specific weight less than the specific weight of the material of which said side members are made;

form-fitting holding means for holding said intermediate member firmly in position between said side members, said form-fitting holding means including a plurality of apertures formed in said intermediate member; and, a plurality of form-fitting elements seated in corresponding ones of said apertures and made of a material weldable to said side members;

said flat side members being made of a solid material devoid of apertures in the regions thereof adjacent respective ones of said elements;

a first plurality of welds for welding corresponding ones of said elements to one of said two flat side members; and, a second plurality of welds for welding corresponding ones of said elements to the other one of said two flat side members.

4,693,008

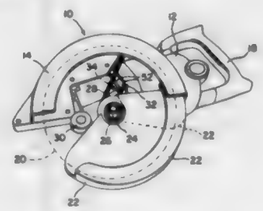
RELEASABLE SEPARATE MEMBER LATCHING DEVICE FOR A PORTABLE HAND TOOL

Wally W. Velie, Ontario, Calif., assignor to Mallard Products, Incorporated, Ontario, Calif.

Filed May 7, 1985, Ser. No. 731,317

Int. Cl.[4] B23D *45/16*

U.S. Cl. 30—390 **18 Claims**



1. A portable hand tool, which comprises:

means for supporting a movable cutting member for performing a cutting operation on an article;

a pivotable guard member movable between guarding and unguarding positions with respect to the tool cutting member;

a pivotable latch member pivotally mounted adjacent the guard member and movable between latched and unlatched positions with respect to the guard member, the latch member including a latching portion for engaging a retaining portion of the guard member to preclude movement of the guard member out of its guarding position;

means for moving the pivotable latch member into its latched position;

means for moving the pivotable latch member from its latched position into its unlatched position; and

cooperative means on the pivotable latch member and the guard member for retaining the latch member in its unlatched position as the guard member is moved into its unguarding position during cutting of an article by the tool cutting member.

4,693,009

SCROLLER JIG SAW

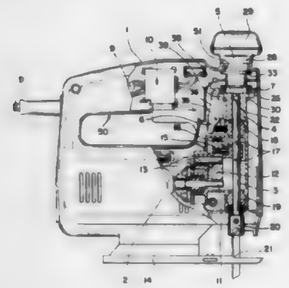
Daniel Bone, Langley Moor, England, assignor to Black & Decker Inc., Newark, Del.

Filed May 9, 1985, Ser. No. 732,419

Claims priority, application United Kingdom, May 11, 1984, 8412057

Int. Cl.[4] B27B *19/09*

U.S. Cl. 30—392 **14 Claims**



1. A scroller jig saw, comprising:

a housing;

a saw blade drive shaft mounted for reciprocating movement relative to said housing along a longitudinal axis and for rotation about said axis;

a motor mounted in said housing and drivingly connected to said drive shaft for reciprocating said drive shaft along said axis;

a scrolling control member accessible to an operator and coupled to said drive shaft for rotation thereof;

locking means for releasably locking said drive shaft against rotation;

said locking means comprising a pivotally mounted lever pivotal between a locking position in which said drive shaft is locked against rotation and a free position in which said drive shaft is free to rotate;

said lever being resiliently biased towards said locking position;

a locking control member accessible to the operator and movable between a scrolling position, in which said locking control member acts upon said lever to hold the latter in said free position, and a non-scrolling position in which said control member allows said lever to be biased into said locking position; and

said locking control member having two manually operable lugs projecting outwardly through openings in opposite sides of said housing at locations adjacent said scrolling control member.

4,693,010

MEASURING EQUIPMENT

Allan W. Sills, Westagon Lodge, Little Hyden Lane, Clanfield, Hampshire PO8 0RU, England

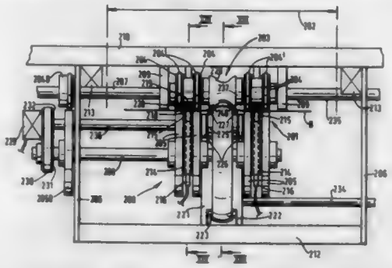
PCT No. PCT/GB85/00249, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO86/00160, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 7, 1985, Ser. No. 829,141

Claims priority, application United Kingdom, Jun. 9, 1984, 8414770; Jun. 4, 1985, 8500228; Jan. 4, 1985, 8500229

Int. Cl.[4] G01B *5/06*

U.S. Cl. 33—147 L **24 Claims**



1. A sheet material thickness measuring apparatus having a measuring station defining a path for sheet material, said measuring station comprising:

two pairs of material transport members, said transport members having sheet material guiding peripheral parts movable in the direction of material travel, said pairs of transport members being spaced apart in a direction transverse to the said path, and each pair being opposite each other on either side of said path; and

transducer means positioned between said pairs of material transport members and comprising:

a fixed sensory element at said measuring station on one side of said path; and

a second sensory element at said measuring station on the other side of said path and opposite said first sensory element and being adapted to be moved away from said fixed sensory element upon the passage of sheet material along said path, the amount of such movement being dependent on the thickness of said sheet material;

said transducer means being adapted to propagate an energy field between said sensory elements and give an output corresponding to the change in said energy field caused by the relative movement of said sensory elements upon passage of said sheet material, both said sensory elements bearing directly on said sheet material during its presence between said sensory elements.

4,693,011

APPARATUS FOR ESTABLISHING ANGLES OF OBJECTS

Stephen G. Strayham, Box 542F, Biloxi, Miss. 39532

Filed Jul. 24, 1986, Ser. No. 888,684

Int. Cl.[4] B43L *7/06*

U.S. Cl. 33—451 **3 Claims**

1. An apparatus for mensuration of an angle comprising:

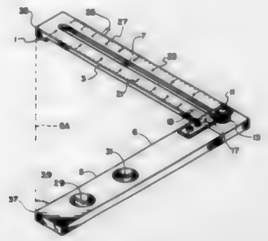
A. a first bar member;

B. a second bar member, slidably affixed substantially perpendicular and co-planar to said first bar member;

C. a first, tangential, graduated scale upon the first bar member;

D. a second, tangential, graduated scale, reciprocally posi-

tioned with respect to the first scale, upon the first bar member; and



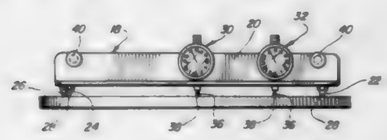
E. index means for indicating the position of said second bar member with respect to said first scale and said second scale.

4,693,012

MEASURING BAR FOR FREE ABRASIVE MACHINES

Joseph V. Cesna, Niles, Ill., assignor to Speedfam Corporation, Des Plaines, Ill.

Filed Jul. 16, 1985, Ser. No. 755,685
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—533 **11 Claims**



1. A measuring bar for determining flatness and deviations therefrom, which comprises: a rigid bar, a plurality of support foot means projecting from said bar, said support foot means having free ends which collectively occupy a common, flat plane, the free ends of each of said support foot means defining a transverse supporting surface essentially 0.005 to 0.025 inch across, and means rigidly carried on said bar from measuring the spacing from said flat plane of at least one point on a target surface against which said support foot means free ends rest, said point being spaced from the support foot means, said spacing measuring means having an area of contact which is essentially 0.005 to 0.025 inch across, for contact with the target surface, one of said support foot means present being adjacent a first end of said bar and a spaced pair of support foot means being present adjacent a second end of said bar, said support foot means being in triangular positional relation to each other, each support foot means of the spaced pair being spaced a different distance from said second end, whereby all three of said support foot means may be positioned equidistantly from the periphery of a disc target surface of predetermined size.

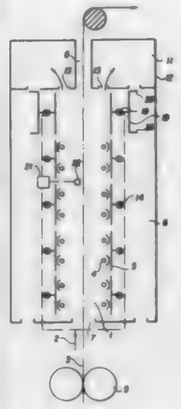
4,693,013

INFRARED DRYER

Manfred Pabst, Cologne, and Peter Mevissen, Erkelenz, both of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 876,379
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522695
Int. Cl.[4] F26B *3/30*
U.S. Cl. 34—4 **5 Claims**

1. Infrared dryer, comprising an operating duct being at least as wide as a spread out textile fabric web passing through said duct for treatment, outer ducts disposed outside said operating duct, heating walls formed of adjacent wall elements substantially parallel to the surface of the fabric web separating said operating duct from said outer ducts, infrared radiators disposed on said wall elements, pivot axes about which said wall



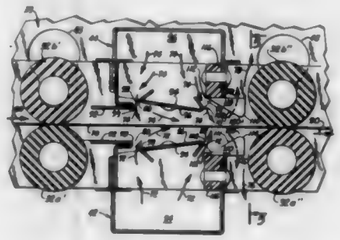
elements are pivotable through substantially 180° for moving said infrared radiators between said operating duct and said outer ducts, an air suction device, and means for directing air into said air suction device from any of said ducts containing said infrared radiators at a given moment.

4,693,014

PHOTOSENSITIVE SHEET DRYER

Jerry A. Caflisch, Longmont, Colo., and John D. Ockuly, Blaine, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Continuation of Ser. No. 762,114, Aug. 2, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,787
Int. Cl.[4] F26B *13/08, 3/04*
U.S. Cl. 34—23 **21 Claims**



1. A dryer apparatus for drying sheets of photosensitive material which comprises:

a plurality of pairs of opposed drive rollers for supporting a sheet of photosensitive material in a generally planar sheet drying path including an upstream pair of opposed drive rollers and at least one downstream pair of opposed drive rollers, with, each pair of opposed drive rollers being spaced longitudinally along the sheet drying path;

drive means for selectively rotating the drive rollers to move the sheet of photosensitive material in a first longitudinal direction along the sheet drying path;

a plurality of pairs of opposed dryer nozzles facing the sheet drying path from each planar side thereof, each pair of opposed dryer nozzles being between adjacent longitudinally spaced pairs of drive rollers and each dryer nozzle including at least one laterally disposed air inlet;

blower means for blowing air through the air inlet of each dryer nozzle toward the sheet of photosensitive material; and

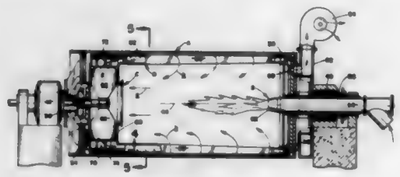
guide means for guiding the sheet of photosensitive material along the sheet drying path and toward each downstream pair of drive rollers, and the guide means having no obstruction to air flow from the air inlets of the dryer nozzles to the sheet of photosensitive material in the sheet drying path between adjacent pairs of opposed drive rollers to permit air from the blower means to flow longitudinally along each planar side of the sheet of photosensitive matarial in a non-turbulent fashion.

4,693,015

DIRECT FIRED CYLINDER DRYER

Klaus H. Hemrath, and Being-I Fu, both of Toledo, Ohio, assignors to Hercules Incorporated, Wilmington, Del.

Filed Aug. 26, 1985, Ser. No. 769,388
Int. Cl.[4] F26B *3/24, 13/08*
U.S. Cl. 34—41 **18 Claims**



14. A method of drying a material, the method comprising the steps of:

rotating a generally cylindrical dryer shell about a central axis;

passing the material to be dried over an exterior surface of the dryer shell;

combusting fuel to produce hot combustion gases;

directing the hot combustion gases in a first axial direction;

directing the hot combustion gases transversely of the central axis to an area adjacent the dryer shell interior surface;

directing the hot combustion gases in a second, opposite axial direction and thereafter directing jets of the hot combustion gases generally radially outward against the dryer shell interior to transfer heat thereto substantially uniformly over the length and circumference thereof; and,

removing the material from the dryer shell exterior surface.

4,693,016

DRYING APPARATUS

Seiichi Yamazaki; Kaoru Uchiyama, and Toshiro Tahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

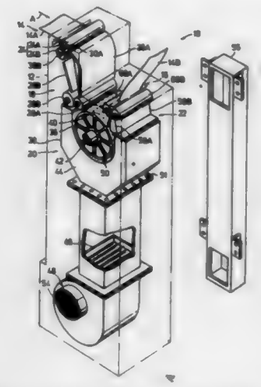
Filed Apr. 14, 1986, Ser. No. 851,194
Claims priority, application Japan, Apr. 15, 1985, 60-079977
Int. Cl.[4] F26B *13/12, 13/16*
U.S. Cl. 34—52 **11 Claims**

1. A drying apparatus for drying photographic paper having an emulsion layer side and a reverse side in a photographic processing, said apparatus comprising:

(a) a rotary drum, the peripheral surface thereof facing the reverse side of the photographic paper opposite to the emulsion layer side thereof;

(b) a duct facing the peripheral surface of said rotary drum so as to define a photographic paper passing area therebetween, said duct being provided with an air outlet bore for blowing drying air onto the emulsion layer side of the photographic paper; and

(c) air blowing means for blowing the drying air out of the air outlet bore of said duct on the photographic paper, whereby the photographic paper is transported in such a manner that the reverse side thereof is in contact with the outer periphery of said rotary drum, while the emulsion layer side thereof is kept away from said duct, and the photographic paper is dried from the reverse side thereof by means of said rotary drum, and wherein said rotary



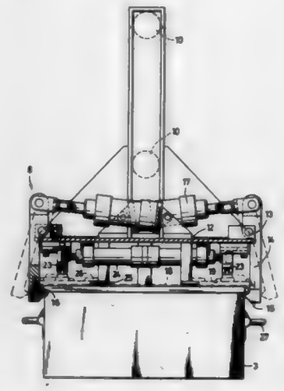
drum is rotated at a higher peripheral speed than the speed of travel of the photographic paper, thereby preventing formation of dents in the photographic paper.

4,693,017

CENTRIFUGING INSTALLATION

Henry Oehler, Hennef; Norbert Peth, Much; Hans W. Holpp, and Wolfgang Sass, both of Hennef, all of Fed. Rep. of Germany, assignors to Gebr. Steimel, Hennef, Fed. Rep. of Germany

Filed Oct. 16, 1985, Ser. No. 788,063
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 8430403[U]
Int. Cl.[4] F26B *11/08*
U.S. Cl. 34—58 **8 Claims**



1. A centrifuging installation, comprising at least one centrifuge which is loaded and emptied automatically and has an axis, said centrifuge having a centrifuge drum which is provided with the receiving frame, the receiving frame being rectangular in a plan view and having four corners spaced at equal distances from said centrifuge axis;

a plurality of containers which can be filled with industrial piece goods and are insertable into said centrifuge, said container having walls with passages for centrifuged liquid and an upper edge, said containers being formed as boxes in a plan view and insertable into the receiving

frame; fixing means provided in said centrifuge and arranged to hold said centrifuge drum after braking in a predetermined position; a cover arranged to close said boxes and provided with locking means; and gripping means for said boxes, said gripping means being provided with actuating means for opening and closing said locking means of said cover, said gripping means being also provided with a cover holder which fixes said cover after opening of said locking means and releases the same after closing of said locking means.

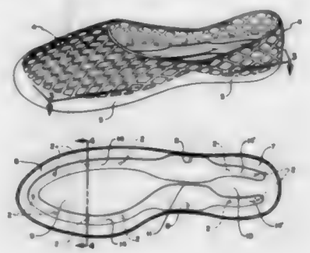
4,693,018
EXTENDIBLE BOOT
John R. K. Maleyko, 609 Belle River Road, Belle River, Ontario N0R 1A0, Canada, and Gerald Grijak, 4721 Pickwick Dr., Sterling Heights, Mich. 48077
Continuation of Ser. No. 639,301, Aug. 10, 1984. This application Feb. 20, 1986, Ser. No. 831,304
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[4] A43B *3/16*
U.S. Cl. 36—1.5 **5 Claims**



1. An extendible boot comprising,
a base portion and an extendible portion,
said extendible portion comprising a flexible sleeve joined to said base portion by a peripherally extending joint and being open at its upper end,
said sleeve being rollable from its upper end to form an annular roll at said joint and thereby provide an unextended boot,
said sleeve being unrollable from said annular roll to a higher position than the position of said joint and thereby provide an extended boot,
a cuff having a fixed end connected with one of said portions in the vicinity of said joint and having an open free end and a foldable part between said ends adapted to be folded over said annular roll,
whereby said annular roll may be retained and concealed by folding said cuff.

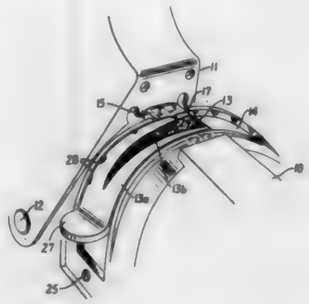
4,693,019
SPORTS SHOE PROTECTOR
Sun K. Kim, 2381 E. 6780 South, Salt Lake City, Utah 84121
Filed Mar. 3, 1986, Ser. No. 835,345
Int. Cl.[4] A43B *1/10, 5/00*
U.S. Cl. 36—7.3 **6 Claims**

1. A sports shoe protector comprising a sole and a means for securing said sole to a shoe having spikes, wherein said sole is comprised of a substantially planar base, a forward U-shaped shoulder extending from the forward peripheral portion of said base, a rear U-shaped shoulder extending from the rear peripheral portion of said base, a forward inner support extending from said base and positioned at least partially within the mouth of said forward U-shaped shoulder, and a rear inner support extending from the said base and positioned at least partially within the mouth of said rear U-shaped shoulder; wherein the peripheral shape of said base is sized and dimensioned to accommodate said shoe; wherein said forward shoulder provides peripheral support to the forward portion of said shoe when said sole is secured to said shoe; wherein said rear shoulder provides peripheral support to the rear portion of said shoe when said sole is secured to said shoe; wherein said forward inner support provides support to the forward position of said shoe when said sole is secured to said shoe; wherein said rear inner support provides support to the rear portion of said shoe when said sole is secured to said shoe; wherein said forward shoulder and said forward inner support form at least one channel area to receive the forward spikes of said spikes;



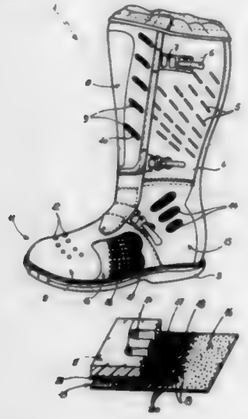
wherein said rear shoulder and said rear inner support form at least one channel area to receive the rear spikes of said spikes; wherein said sole serves to protect against damage by or to said spikes; wherein said sole further comprises bridges extending from said base and connecting said forward shoulder and said rear shoulder; and wherein said bridges are substantially thinner than said shoulders.

4,693,020
FLEXION CONTROL FOR SKI BOOT
Joseph Sains, Salt Lake City, Utah, and Laurent Boix-Vives, Courchevel, France, assignors to Lange International S.A., Fribourg, Switzerland
Filed Jul. 8, 1986, Ser. No. 883,383
Claims priority, application Switzerland, Jan. 24, 1986, 285/86
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **20 Claims**



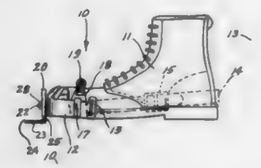
1. A flexion control for a ski boot for controlling the resistance to the forward movement of the upper shell of the ski boot relative to the lower shell, comprising a band of variable elasticity in transversal compression extending transversely across the upper surface of the lower shell, a bumper carried by the lower end of the upper shell to engage one edge of the band, the relative positions of the band and bumper determining the degree of resistance offered by the band to the forward deflection of the upper shell relative to the lower shell, and a rigid surface formed in the lower shell engaging the opposite edge of the band to retain the band.

4,693,021
VENTILATED ITEM OF SPORT FOOTWEAR, PARTICULARLY FOR MOTORCYCLISTS
Sante Mazzarolo, Coste di Maser, Italy, assignor to Alpine Stars S.p.A., Coste di Maser, Italy
Filed Sep. 30, 1985, Ser. No. 781,817
Claims priority, application Italy, Oct. 10, 1984, 59366/84[U]
Int. Cl.[4] A43B *5/14, 7/08, 7/06*
U.S. Cl. 36—131 **6 Claims**



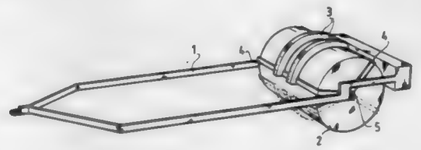
1. A ventilated item of sport footwear comprising:
an upper,
said upper having an inner face in contact with an air-pervious structure,
said structure including:
a mesh in contact with the inner face of the upper; a grid in contact with a side of the mesh opposite the inner face of the upper; and a perforated element in contact with a side of the grid opposite the mesh;
wherein said grid comprises a plurality of knots having spacer elements thereon,
and wherein said upper has a plurality of apertures for allowing air therethrough and through said air-pervious structure.

4,693,022
GARDEN TOOL
John J. Terhune, Sierra Vista, Ariz., assignor to T. Entrepreneur, Inc., Sierra Vista, Ariz.
Filed Feb. 14, 1986, Ser. No. 829,211
Int. Cl.[4] A43C *17/02, 13/00*
U.S. Cl. 36—132 **10 Claims**



1. An agricultural tool attachment for footwear comprising:
a bracket comprising a vertically disposed channel member having a centrally disposed threaded member extending therefrom;
a garden tool comprising a blade having a slotted plate attached to one end thereof and having a free end at the other end thereof, said slotted plate being of a size to be slideably received into said channel member;
cooperating securing means comprising a threaded nut for being threadably received onto said threaded member for attaching said garden tool to said bracket;
encompassing means comprising a toe encompassing member having a plurality of openings including: end openings; lower openings; and, upper openings formed on each side of said encompassing member; wherein the encompassing member extends partially under, partially over, and around the sides of the toe of said footwear;
first strap means attached to selected ones of said plurality of openings on each side of said encompassing member for extending around a portion of the toe of the footwear for holding said encompassing member securely to said footwear; and,
second strap means attached to selected other ones of said plurality of openings on each side of said encompassing member for extending around the rear and side of the footwear.

4,693,023
SNOW SHAPING MEANS
Tapio Niemelä, Linnatie 10 D 5, 99100 Kittilä, Finland
Filed Mar. 25, 1986, Ser. No. 843,787
Claims priority, application Finland, Mar. 27, 1985, 851223
Int. Cl.[4] E01H *4/00*
U.S. Cl. 37—224 **3 Claims**

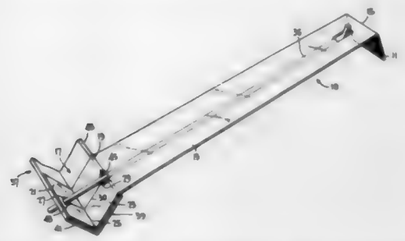


1. A snow shaping means comprising a frame, a cylindrical drum having an axle rotatably mounted in the frame, whereby said drum can be towed by means of said frame e.g. behind a vehicle to compact snow, support members pivotably supported on said axle, track shaping elements carried by said support members so that they are movably disposed adjacent the periphery of the drum but separate therefrom, said track shaping elements being rotatable by said support members between an upper position in which said shaping elements are not in contact with the snow and a lower position in which said shaping elements contact the snow and shape track grooves therein.

4,693,024
PRODUCT INFORMATION TAGS WITH IMPROVED MOUNTING ARRANGEMENTS
Jacob Fast, 7651 NW. 9th St., Plantation, Fla. 33317
Continuation-in-part of Ser. No. 562,067, Dec. 16, 1983, which is a continuation-in-part of Ser. No. 519,226, Aug. 2, 1983, Pat. No. 4,525,944, which is a continuation-in-part of Ser. No. 473,650, Mar. 9, 1983, Pat. No. 4,531,313. This application Dec. 17, 1985, Ser. No. 809,789
Int. Cl.[4] G09F *3/08*
U.S. Cl. 40—20 R **21 Claims**

1. A product information and display tag for use in conjunction with an elongate product support hook carried in a V-shaped elongate support member having respective limbs opening upwardly, the hook projecting forwardly in perpendicular relation to the support member and being mounted in openings in the respective limbs, the tag comprising an elongate plastic sheet having at one end a mounting portion for insertion in the V-shaped support, and an elongate intermediate portion extending from the mounting portion for lengthwise projection over the hook to provide product information

at a distal end thereof, the mounting portion including a pair of panels foldable about a transverse fold line to define an angle therebetween substantially conforming to the angle between said limbs, apertures in the respective panels located on a longitudinal center line of the tag, the apertures being connected by a cut extending along said center line across said fold line, the cut enabling the mounting portion to be pressed over a portion of the hook spanning said limbs to snap the apertures over said portion of the hook and situate the apertures in juxtaposition to said openings.



4,693,025

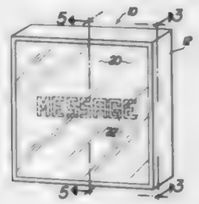
DISPLAY ELEMENT

Pedro Landin, 10807 N.W. 7th St., No. 11, Miami, Fla. 33172

Continuation of Ser. No. 719,084, Apr. 2, 1985, abandoned. This application Aug. 12, 1986, Ser. No. 894,392

Int. Cl.[4] G09F *3/00, 19/00*

U.S. Cl. 40—326 **8 Claims**



1. A display element comprising:

(a) a sealed housing having a transparent front panel and a back panel disposed in spaced relation to said front panel,

(b) a diaphragm-type screen fabricated of thin, pliable material and having a front surface thereof formed of a first particular color and a back surface,

(c) said diaphragm-type screen further comprising a plurality of connecting portions disposed about the margin of said diaphragm-type screen, said connecting portions structured for fixed attachment to an inside portion of said housing,

(d) said diaphragm-type screen further including a mid-portion on which said front surface is formed, and a plurality of marginal portions each formed of pliable material and integrally interconnected between respective ones of said connecting portions and said mid-portion and structured to be movable within said housing for selective positioning of said mid-portion relative to said housing front panel,

(e) said mid-portion and front surface thereon selectively positionable between an aligned, registered and viewable position relative to said housing front panel whereby said front surface is viewable through said housing front panel,

(f) said mid-portion and front surface selectively movable rearwardly from said housing front panel into a non-viewable position, said marginal portions structured for interconnection and restricted placement of said mid-portion and front surface while maintaining interconnection thereof between said connecting portions and said mid-portion of said diaphragm-type screen,

(g) a volume of liquid substantially filling said housing with said diaphragm-type screen therein and having a second particular color which contrasts with said first particular color of said front surface of said diaphragm-type screen,

(h) a plurality of elongated slits each extending along a majority of a different marginal portion and formed contiguous thereto, each slit disposed between the respective marginal portion and said mid-portion,

(i) said marginal portions and said slits being cooperatively disposed to define a movable attachment of said mid-portion of said screen to said connecting portions; said slits disposed and dimensioned to allow passage therethrough of a portion of said volume of liquid, said volume of liquid disposed in part on both sides of said diaphragm-type screen as it moves toward and away from said front panel of said housing, and

(j) displacing means for moving said mid-portion of said diaphragm-type screen relative to said housing front panel being mounted on said housing in communication relation to said back surface of said diaphragm-type screen.

4,693,026

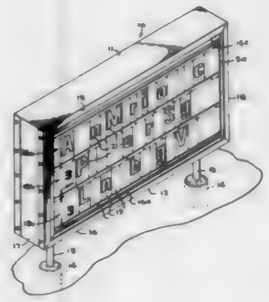
CHANGEABLE MESSAGE OUTDOOR ADVERTISING SIGN

David T. Callahan, and David W. Dobyns, both of Lynchburg, Va., assignors to Allen-Morrison, Inc., Lynchburg, Va.

Filed Aug. 14, 1986, Ser. No. 899,376

Int. Cl.[4] G09F *13/04*

U.S. Cl. 40—576 **20 Claims**



1. A changeable message outdoor advertising sign or the like, comprising a generally rectangular frame forming top, bottom and end walls defining a rectangular surround for an internally illuminated sign section having an interior lamp chamber, a pair of light transmissive thin backing sheet members supported within and spanning the height and horizontal length of the frame and located in spaced apart parallel planes forming opposite faces of the sign, pairs of horizontal track members supported above and below vertically spaced horizontal axes traversing said faces defining plural horizontal rows for displaying plural visible illuminated characters forming messages, a plurality of thin rectangular font panels having parallel planiform front and back surfaces and parallel horizontal edges and parallel vertical edges to be positioned and slidably supported in vertical edge abutting relation with their horizontal edges slidable supported in said tracks between pairs thereof associated with each of said rows and against said backing sheet members, the font panels having clear transparent character image forming areas and having the remainder of each panel of diminished light transmission attenuating properties to render readily visible the characters to be displayed by the image forming areas, the vertical edges of said font panels being shaped in confronting pairs to interfit intimately with each other along paths inclined in non-perpendicular relation to the planes of said front and back surfaces of said font panels, and tension means at each of said rows having a stationary mounting base member supported adjacent an end wall of said frame and a force transfer bracket member for engaging the nearest edge of the adjacent font panel in the associated row and a spring member connected between said base member and bracket member to be compressed by font members arrayed in the associated row and exert spring pressure thereon maintaining the confronting pairs of vertical edges of the font panels in light-leak-resisting interfitting relation.

4,693,027

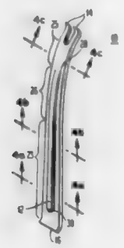
VARIABLE POWER FLAT SPRING FOR REVOLVER-TYPE FIREARMS

Walter C. Wolff, Sr., and Walter C. Wolff, Jr., both of Berwyn, Pa., assignors to W. C. Wolff Company, Ardmore, Pa.

Filed Jul. 26, 1985, Ser. No. 759,468

Int. Cl.[4] F41C *1/00, 19/00*; **F16F** *1/00*

U.S. Cl. 42—59 **4 Claims**



1. A leaf spring for the hammer of a handgun, said spring having a lower butt end and an upper claw end for connection with the hammer, said spring having a tensile-stress face and a compression face, said spring having a rib projecting from the tensile-stress face and forming a channel in the compression face of said spring, said rib and channel extending from near the butt end toward but terminating short of said claw end, said channel having a maximum depth at the butt end and progressively decreasing in depth toward the claw end, whereby during early stages of hammer withdrawal, the potential energy stored in said spring represents a major portion of the total potential energy stored during a complete hammer withdrawal with substantially less potential energy being stored during later stages of hammer withdrawal, thereby to substantially decrease stack-up just prior to hammer release.

4,693,028

METHOD AND APPARATUS FOR SELECTING FISHING LURE COLOR

Loren G. Hill, 2826 Castlewood, Norman, Okla. 73069

Continuation of Ser. No. 665,543, Oct. 26, 1984, Pat. No. 4,599,820. This application Apr. 22, 1986, Ser. No. 855,008

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] A01K *97/00*

U.S. Cl. 43—4.5 **2 Claims**

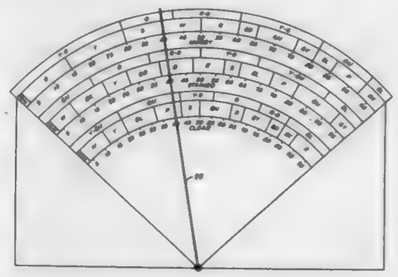
1. The method of catching fish which comprises:

observing the clarity of the water to be fished to determine whether the water is clear or contains material diminishing its clarity in a measurable degree;

measuring the light transmittance at the depth in the water where a fishing lure is to be placed for the purpose of attempting to catch fish;

selecting a color of lure to be used in fishing by matching the observed degree of water clarity and the measured light transmittance with a color of lure which has, by predetermined experimentation, been determined to be that lure color which is the most effective for use under the specific conditions of (a) the light transmittance value measured, and (b) the degree of water clarity observed, said matching of the observed degree of water clarity and the measured light transmittance with a particular lure color being accomplished by:

moving a pointer means in a path of movement in response to the measured light transmittance, so that the magnitude of the movement of the pointer means is directly proportional to the magnitude of the light transmittance measured; and



arranging colors on a chart placed adjacent and parallel to the plane in which the pointer moves so that each of said colors is placed at one or more specific locations on the chart, which one or more specific locations are determined by

(a) the place on the chart to which the pointer means will point after it has complexed its movement in response to a specific magnitude of light transmittance; and

(b) at least one predetermined degree of water clarity at which a bass fish will see the respective specific color better than other colors when located in water of that degree of water clarity and with the light transmittance value at the location of the bass fish during substantially equivalent to said specific magnitude of light transmittance.

4,693,029

FISHING ROD

Shigeru Yamamoto, and Masaru Akiba, both of Tokyo, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,641

Claims priority, application Japan, Jan. 31, 1985, 60-17486

Int. Cl.[4] A01K *87/06*

U.S. Cl. 43—22 **4 Claims**



1. A fishing rod, comprising:

a hollow tubular rod made of a reinforced fiber impregnated with a thermosetting synthetic resin, said rod having a forward portion and a rearward portion, and further having on the upper side thereof a flat reel seat,

a handle securely fitted to said rearward portion of said tubular rod such that a part of said tubular rod rearward portion is exposed for gripping contact by a user's hand,

a front hood mounted on said butular rod forward portion, said front hood defining a rearwardly facing opening,

a rear hood mounted on said tubular rod rearward portion,

said rear hood defining a forwardly facing opening, said front hood and said rear hood together defining means for fixing the feet of a reel mounted on the reel seat of said tubular rod,

said handle including a forward portion for engagement with said rearward portion of said tubular rod, said handle forward portion including laterally disposed engagement grooves, and

a slot in at least one of the upper or lower sides of said rearward portion of said hollow tubular rod, whereby, in cross-section, said rearward portion of said tubular rod includes at least a pair of laterally opposed, spaced arms, said handle forward portion and said tubular rod rearward portion being securely interfitted with said part of said tubular rod being exposed upon insertion of said spaced arms of said tubular rod rearward portion into said engagement grooves of said handle forward portion.

4,693,030

LUMINESCENT FLOATING SINKER

Michael J. Wobead, P.O. Box 295, Naperville, Ill. 60566

Filed Feb. 28, 1986, Ser. No. 834,767
Int. Cl.⁴ A01K *95/00*
U.S. Cl. 43—42.22 **12 Claims**



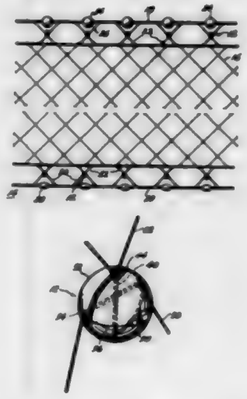
1. A sinker for a fishing lure which sinker rides upright adjacent a bottom of a body of water to carry the lure over snagging obstructions, said sinker comprising an elongated light weight transparent tube having a sealed buoyant chamber, luminescent material in said chamber causing the tube to project light, said tube having a top end above said chamber with means for attachment to a fishing line, said tube having an open bottom chamber below said sealed buoyant chamber, a weight removably mounted in the open bottom chamber of said tube, and means releasably locking said weight in said open bottom chamber of the tube, said means including a pair of slots in a wall of the bottom chamber, a transverse hole in the portion of said weight, a pin extending through said slots and hole and a sleeve slidable on the tube to cover and uncover said slots so that weights of different sizes are selectively carried by said tube to carry the sinker upright at a desired depth in the water.

4,693,031

LINE CONNECTOR

John R. Koetje, 1314 McLean Rd., Mount Vernon, Wash. 98273

Continuation-in-part of Ser. No. 684,912, Dec. 18, 1984, abandoned. This application Jan. 22, 1985, Ser. No. 694,055
Int. Cl.⁴ A01K *71/00, 93/00*
U.S. Cl. 43—44.91 **12 Claims**



4. A connector for attaching a fishing net to a support line, with the net including a plurality of spaced-apart net twines attached to the edge portions of the net and with the support line including a plurality of support line twines spaced along the support line, said connector comprising:

(a) a body;

(b) a first cross hole for reception of a first twine composed of either the net twine or the support line twine;

(c) a slit extending from the outer periphery of said body, through a portion of said body to intersect said first cross hole along the length thereof, said slit adapted to permit passage of the first twine through said body to engage within said first cross hole;

(d) a second cross hole extending through said body generally transversely to said first cross hole and intersecting either said first cross hole or said slit for reception of a second twine composed of the other of the net twine or the support line twine doubled upon itself; and,

(e) a groove extending around substantially the entire periphery of said body to intersect the end portions of the second cross hole but not the length of said second cross hole intermediate the ends of said second cross hole for reception of a looped, central portion of the second twine extending through said second cross hole thereby to render captive the first twine in said first cross hole.

4,693,032

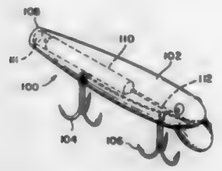
ILLUMINATED FISHING LURE

Robert N. Mattison, 5826 McKinley Pl., North Seattle, Wash. 98103

Continuation-in-part of Ser. No. 607,284, May 4, 1984, Pat. No. 4,589,221, and a continuation-in-part of Ser. No. 648,458, Sep. 7, 1984, Pat. No. 4,581,839. This application Dec. 23, 1985, Ser. No. 813,677
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.⁴ A01K *85/00*
U.S. Cl. 43—17.6 **15 Claims**

1. An illuminated fishing lure for housing an elongated chemiluminescent capsule having a resilient outer surface, comprising;

an elongated body including a longitudinally extending cavity at least as long as the capsule, the cavity being formed in the body by a pair of opposed generally planar sidewalls spaced apart a distance sufficient to receive the chemiluminescent capsule therebetween, the cavity having first and second opposed longitudinally extending openings communicating with the body cavity and sized large enough to allow lateral passage of the capsule therethrough, the body further including at least one protrusion attached to one of the sidewalls and projecting into the first cavity opening a sufficient distance such that a chemiluminescent capsule can be pushed past the protrusion by deforming its resilient outer layer for positioning the capsule within the cavity for use of the lure or removal of the capsule from within the cavity, but cannot pass by the protrusion once within the cavity under the normal forces encountered on the capsule during use of the lure.

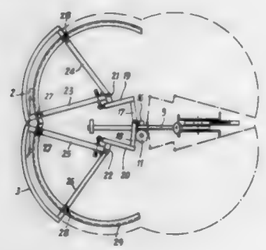


4,693,033

MECHANISM FOR OPENING, CLOSING AND LOCKING TWO LEAVED DOORS FOR CABLE CARS

Francis Tauzin, Veyrins, France, assignor to Sigma Plastique and Pomagalski S.A., both of, France

Filed Apr. 2, 1986, Ser. No. 847,386
Claims priority, application France, Apr. 3, 1985, 85 05055
Int. Cl.⁴ E05C *7/06*
U.S. Cl. 49—122 **6 Claims**



1. In a passenger transporting cable car having a door comprising two leaves symmetrical to each other with respect to a vertical plane passing through the junction line of the two leaves in the closed position, a mechanism for actuating said door which comprises:

a control piece disposed at one of the heightwise ends of the car and having a horizontal rectilinear movement parallel to the vertical plane of symmetry of the two door leaves,

a crank lever integral with said control piece and adapted to actuate a horizontal dead point clearance toggle joint, said toggle joint being formed of two symmetrical links each actuating a lever,

at least one arm fixed to each one of said door leaves and adapted to pivot about a fixed axis, said arm being connected to a lever of said toggle joint,

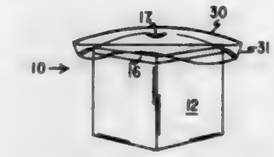
and a resilient connection between said arm and said lever allowing a limited oscillation of the corresponding door leaf in a closed position with respect to the lever, and consequently allowing a gap between the two door leaves in the closed position locked by the position of the toggle joint brought beyond its dead point.

4,693,034

MASTER PATTERN ASSEMBLY FOR LENS CIRCUMFERENCE GRINDING

David F. Vance, Rte. #2, Box 228 EE, Bloomfield, Ky. 40008, and Michael Jakubowicz, 4701 Lacarem Dr., Jeffersontown, Ky. 40299

Filed Sep. 10, 1985, Ser. No. 774,580
Int. Cl.⁴ B24B *9/00*
U.S. Cl. 51—101 LG **5 Claims**



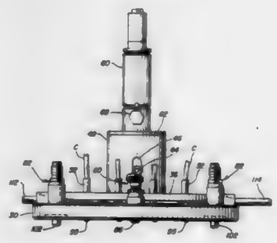
5. A rotatable master pattern assembly for the formation of a circumference on a new lens in an edge grinder using a preexisting eyeglass lens having an optically shaped side surface with a known optical center and having a circumference known to fit in a frame; comprising: a compressible adhesive pad of known shape having first and second opposed surfaces bearing adhesive for optical lenses and defining a throughgoing sight bore centered in said opposed surfaces; a body block defining an axial throughgoing bore adapted to surround and engage a cylindrical penholder of an edge grinder machine; said body block defining a curved top surface to substantially complement the optically shaped side surface of a preexisting eyeglass lens, said top surface of said body block adhering to said first surface of said adhesive pad such that said axial bore is axially aligned with said sight bore and said top surface completely contacts said first surface with the second surface of said adhesive pad adhering to the side surface of the preexisting eyeglass lens and said sight bore being aligned with the optical center of said preexisting eyeglass lens.

4,693,035

MULTIPLE OPTICAL FIBER POLISHING APPARATUS

Ralph R. Doyle, Arlington Heights, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Filed Oct. 30, 1985, Ser. No. 792,785
Int. Cl.⁴ B24B *7/22*
U.S. Cl. 51—125 **17 Claims**



1. Apparatus for simultaneously polishing multiple fiber optic ends which project from the ends of corresponding fiber optic cables, said cables each having a fiber optic connector attached adjacent an end thereof, said apparatus comprising, in combination, connector holder plate means having a plurality of seat means, one for seating each of a plurality of fiber optic connectors, said seat means including openings which permit each fiber optic end to project through said connector holder plate means for engagement with polishing means, and lock plate means mounted coaxially to said connector holder plate means and rotatable relative thereof, said lock plate means

having a plurality of generally keyhole-shaped openings, one opening corresponding to each of said seat means, said lock plate means being rotatable between a loading position where larger portions of said keyhole-shaped openings are aligned with said seat means to permit insertion of a fiber optic connector through each of said keyhole-shaped openings into a corresponding one of said seat means and a locked position where smaller portions of said keyhole-shaped openings are aligned with said set means to lock said fiber optic connectors in said seat means.

4,693,036

SEMICONDUCTOR WAFER SURFACE GRINDING APPARATUS

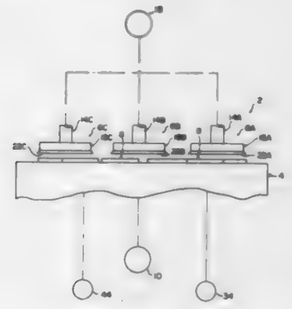
Toshiyuki Mori, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,786

Claims priority, application Japan, Dec. 28, 1983, 58-199451[U]

Int. Cl.[4] B24B *7/04*

U.S. Cl. 51—131.3 **3 Claims**



1. A grinding apparatus comprising a supporting base and at least one grinding wheel assembly disposed to face said supporting base,

said supporting base including at least one holding table,

said grinding wheel assembly including a rotatably mounted supporting shaft and a grinding wheel mounted to said supporting shaft,

the surface of said holding table being adapted to have a semiconductor wafer placed thereon, and said grinding wheel being adapted to act on the surface of a wafer by rotating said grinding wheel by rotating said supporting shaft whereby the surface of a wafer can be ground,

said holding table is ventilative and is adapted to hold a wafer by suction to the surface of said holding table, said holding table being connected to a suction source,

said holding table comprises a nearly disc-shaped surface layer member and a nearly disc-shaped back layer member fixed to the back of said surface layer member,

in said surface layer member, a plurality of ventilation holes piercing through it from its surface to its back are formed at intervals, and

said back layer member being provided with a communicating means for communicating said suction source with said ventilation holes of said surface layer member,

said ventilation holes formed in said surface layer member being arranged along a plurality of concentrically arranged circles,

said communicating means formed in said back layer member comprises a plurality of concentric circular grooves formed on the surface of said back layer member corresponding to the circles of said ventilation holes, a plurality of radial grooves formed on the surface of said back layer member for communicating said circular grooves with one another and at least one communicating hole extending from one end open to said circular grooves and/or said radial grooves to the back of said back layer member piercing through it.

4,693,037

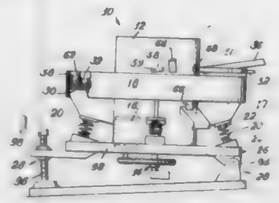
MULTISTAGE FINISHING DEVICE AND METHOD

Gary L. McNeil, Allegan, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Filed Feb. 25, 1986, Ser. No. 833,203

Int. Cl.[4] B24B *31/06*

U.S. Cl. 51—163.2 **49 Claims**



1. A vibratory finishing machine for the surface finishing of parts or workpieces comprising an essentially spiral trough, having a plurality of channels in side-by-side relationship, resiliently mounted for vibration and tilted with respect to the horizontal so as to provide a high side and a low side to said spiral trough.

4,693,038

APPARATUS FOR OPTICALLY MONITORING THE SURFACE FINISH OF GROUND WORKPIECES

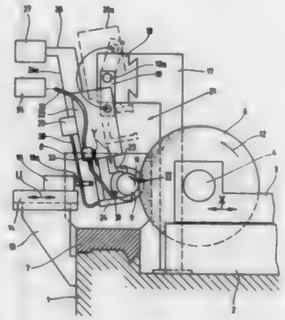
Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1986, Ser. No. 848,728

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512595

Int. Cl.[4] B24B *49/12*

U.S. Cl. 51—165.72 **13 Claims**



1. Apparatus for ascertaining the parameters of a workpiece during treatment in a grinding machine while the workpiece is contacted by the rotary grinding tool of the grinding machine, comprising first monitoring means for ascertaining a first parameter of the workpiece; second monitoring means for ascertaining a second parameter including the quality of surface finish of the workpiece, at least a portion of one of said monitoring means being mounted on the other of said monitoring means, said second monitoring means comprising a radiation source, a radiation focusing device arranged to direct radiation upon the surface which is contacted by the grinding wheel whereby at least some of the thus directed radiation is reflected by the surface of the workpiece, means for conveying radiation from said source to said focusing means, at least one transducer arranged to convert optical signals, and means for conveying reflected radiation to said transducer; means for applying to the surface of the workpiece a coat of a lubricating agent; and means for removing such coat in the region where radiation impinges upon the surface of the workpiece so that radiation is reflected by an uncoated portion of the surface.

4,693,039

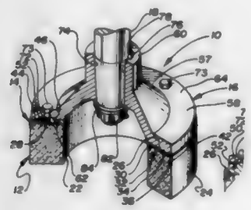
GRINDING HEAD ASSEMBLY

Robert G. Viesa, Plymouth, and William D. Klempke, Brooklyn Park, both of Minn., assignors to Loram Maintenance of Way, Inc., Hamel, Minn.

Continuation of Ser. No. 696,753, Jan. 31, 1985, abandoned. This application Jun. 3, 1986, Ser. No. 871,170

Int. Cl.[4] B24B *41/00*

U.S. Cl. 51—168 **9 Claims**



1. A grinding head assembly, comprising:

an abrasive grinding element having a grinding surface and a generally annular opposed top surface;

a rigid, generally annular backing plate having a generally annular first surface operably coupled to and esentially covering said grinding element top surface, said first surface comprising an annular, generally planar face and a plurality of radially spaced concentric ribs projecting outwardly from said face and an opposed, second surface spaced apart from said first surface to define a backing plate width;

a generally cylindrical attachment boss projecting outwardly from said second surface and spaced apart from said grinding element by said backing plate width, said boss defining a boss diameter extending across at least two of said concentric ribs, and including structure defining an internally threaded boss channel;

a backing plate holder adapted to be drivingly connected for rotation with a drive shaft, said backing plate holder including an attachment surface including structure defining a cavity for receiving said boss in a complementary fit whereby the rotational energy of said backing plate holder is transferred to said boss and distributed along said rigid, generally annular backing plate, through said backing plate width, to said grinding element; and

attachment means extending through said cavity and receivable in threaded engagement by said boss channel for detachably coupling said backing plate to said backing plate holder.

4,693,040

SIMULTANEOUSLY GROUND TYPE BEARING BODY AND UNLIMITED SLIDING BEARING UNIT EMPLOYING THE SAME

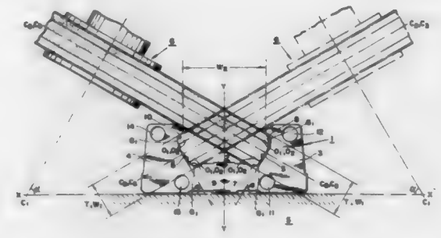
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Continuation of Ser. No. 688,642, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 519,858, Aug. 3, 1983, abandoned. This application Apr. 7, 1986, Ser. No. 851,300

Claims priority, application Japan, Oct. 9, 1982, 57-178162

Int. Cl.[4] B24B *1/00*; F16L *33/64*

U.S. Cl. 51—291 **7 Claims**



1. A method of manufacturing a bearing body of substantially U-shaped cross section having a mounting surface formed on its top and a central cavity defined in its central lower part by a cavity lower surface and two skirts having opposed inner peripheral side surfaces, said method comprising the steps of forming a pair of opposite recesses in the inner peripheral side surfaces of said skirts, each of said recess having a bottom surface inclined at an angle of about 55 degeees to about 65 degrees relative to said mounting surface and a pair of opposite side surfaces extending inwardly from said bottom surface, and simultaneously grinding the opposite sides of each recess by using a grinding wheel having a diameter greater than the width of said cavity at said cavity lower surface and a thickness equal to the width of the recess to be ground so as to form a pair of longitudinally extending ball rolling surfaces in each recess, the grinding wheel being brought into contact with each recess with an infeed angle equal to the angle of inclination of said bottom surface of the related recess.

4,693,041

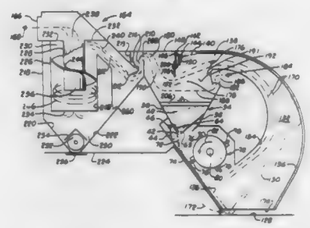
SURFACE BLASTING APPARATUS

Wayne E. Dickson, Tecumseh, Okla., assignor to Dickson Industries, Inc., Tecumseh, Okla.

Division of Ser. No. 498,846, May 27, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,532

Int. Cl.[4] B24C *7/00, 9/00*

U.S. Cl. 51—424 **2 Claims**



1. In a surface blasting apparatus having abrasive projecting means to project abrasive toward a surface to be treated, said abrasive projecting means including a rotating wheel adapted to propel abrasive falling into contact with the wheel along a

line parallel to the rotational axis of the wheel into a curtain extending substantially parallel to that rotational axis and against the surface to be treated, the improvement which comprises a abrasive flow-control system acting in cooperation with said abrasive propelling wheel, and comprising:

an abrasive storage compartment with a lowermost portion defined by a pair of sloping walls each have inclined surfaces which are inclined at an acute angle to the vertical, and which walls converge at thier lower ends to define a flow opening therebetween;

a flow-control valve positioned adjacent said flow opening and movable to open and close said opening, said valve including:

a substantially monoplanar, elongated, substantially horizontally extending main portion which is at least equal, in size to said flow opening; and

a substantially monoplanar, elongated, substantially horizontally extending lip extending perpendiular to said main portion, at one side thereof, said lip being extendible under and into juxtaposition to one of said sloping walls to form a seal preventing abrasive flow from said storage compartment when the valve is in the closed position and said main portion is adjacent the other one of said sloping walls, said main portion and lip forming together an elongated, horizontally extending, abrasive-receiving angle from which abrasive particles will fall in a gravitating curtain of uniform particle density over the transverse width of the curtain;

a hinge hingedly and pivotally attaching one side of said main portion to said storage compartment for pivotation. about a horizontal axis for retaining said main portion and the lip extending therefrom in a horizontally extending status, whereby a closed position of the value is defined when said valve is pivoted to, and covers, said flow opening, said hinge being disposed along the opposite side of said main portion from the side of said main portion from which said lip projects substantially perpendicular to said main portion;

means for rotating, in a selectively variable fashion, said valve about said hinge and toward and away from said flow opening, thus defining a variable open position of said valve, said variable open position allowing a priportionate amount of abrasive to gravitationally flow through said flow opening, said rotating means comprising:

a shaft attached to the main portion of said flowcontrol valve; and

actuation means to rotate said shaft about said hinge to open and close said valve, said actuation means comprising a remotely controlled power cylinder; and

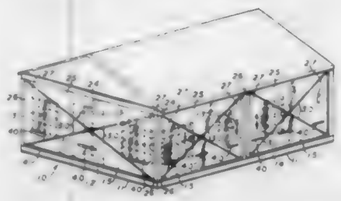
a detachable plate adjustably attached to one of the slanted walls of said abrasive storage compartment above said flow-control valve and defining an internal opening of predetermined size through said plate, which internal opening has a width less than a width of said flow opening between said sloping walls to thereby restrict the width of abrasive flowing through said opening and to ultimately restrict the width of said curtian, said detachable plate thus controlling the rate and pattern by which abrasive is projected from said wheel toward said surface to be treated, said plate being interchangeable with other plates of different configurations from said first mentioned plate to provide selectively predetermined flow patterns of abrasive through said opening in said other plates and into contact with said abrasive propelling wheel, whereby a selectively wider or a narrower curtain of abrasive may be gravitated onto said abrasive propelling wheel.

4,693,042

SYSTEM OF FLOOD PROTECTION FOR BUILDINGS

Carlos E. Villarreal, 22615 Pebworth Pl., Spring, Tex. 77373

Filed Oct. 20, 1986, Ser. No. 920,751
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—169.14 **33 Claims**



1. A system of flood protection for a building having a foundation comprising the combination with said building of;

a lower continuous skirt of plastic film secured to said building foundation by a waterproof seal,

means secured to said building in a fixed position enclosing and supporting said lower plastic film skirt in a rolled or folded condition adjacent to said foundation,

an upper continuous skirt of plastic film secured to an upper level of said building above the maximum projected rise of flood waters,

means secured to said building in a fixed position enclosing and supporting said upper plastic film skirt on said building in a rolled or folded condition at said upper level,

a pair of side skirts of plastic film secured to said building exterior adjacent each end of said upper and said lower skirt supporting means by a waterproof seal, and

means secured to said building in laterally spaced fixed vertical positions enclosing and supporting said side plastic film skirts in a rolled or folded condition adjacent said building exterior,

said upper, said lower, and said side plastic film supporting means each being easily opened to permit said upper, said lower, and said side plastic films to be unrolled or unfolded toward each other, and

said lower, said upper, and said side plastic film skirts each extending around said building and each having edge portions providing a waterproof seal with the other and being of a size and shape permitting said edges to be quickly joined in a water tight seal to prevent flood waters from entering said building.

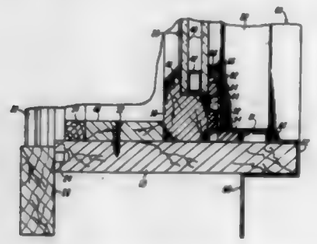
4,693,043

DECORATIVE WINDOW ASSEMBLY

Michael E. Knapp, Dayton, Ohio, assignor to American Woodwork Specialty Co., Inc., Dayton, Ohio

Continuation of Ser. No. 824,855, Jan. 31, 1986, abandoned. This application Jan. 29, 1987, Ser. No. 8,636
Int. Cl.[4] E06B *1/04*; E04F *19/02*
U.S. Cl. 52—211 **3 Claims**

1. A decorative window assembly comprising at least one flat semi-circular window panel of light transmitting material, a semi-circular wood frame extending completely around said window panel and including semi-circular wood jamb members having portions projecting forwardly generally perpendicular to said window panel, a set of wood sash members secured to said jamb members and defining a recess receiving a peripheral edge portion of said window panel, a heat and pressure formed sheet of plastics material having a uniform thickness and forming a one-piece semi-circular cap member mounted on said frame, said cap member including integrally connected U-shaped portions extending completely around said window panel and mounted on said forwardly projecting portions of said jamb members, said U-shaped portions including inner wall sections having a stepped cross-sectional configuration and forming a peripherally extending shoulder, said sheet of plastics material forming an integral outer flange portion projecting outwardly around said U-shaped portions generally parallel to said window panel, said sheet of plastics material also forming integrally connected and coplanar inner flange portions projecting inwardly from said inner wall sections and extending completely around said window panel forwardly of said sash members and said window panel in parallel spaced relation to said window panel, said coplanar inner flange portions covering said sash members and said peripheral edge portion of said window panel within said



recess, said sheet of plastics material further forming an integral lip portion extending completely around said peripheral edge portion of said window panel and projecting rearwardly from said inner flange portions to said window panel, and means forming a fluid-tight seal between said lip portion and said peripheral edge portion of said window panel, whereby said one-piece cap member extends continuously from said outer flange portion to said window panel completely around said semi-circular wood frame and sash members and forms a continuous protective barrier from said outer flange portion to said window panel.

4,693,044

DEVICES FOR PRESTRESSING CONCRETE HAVING STRETCHED SINUOUS CABLES AND THE METHODS FOR IMPLEMENTING SAME

Pierre Jartoux, Epernon, France, assignor to Freyssinet International (Stup), Coignieres, France

Filed Oct. 8, 1986, Ser. No. 916,790
Claims priority, application France, Oct. 10, 1985, 83 15030
Int. Cl.[4] E04C *3/10, 5/08*
U.S. Cl. 52—230 **2 Claims**



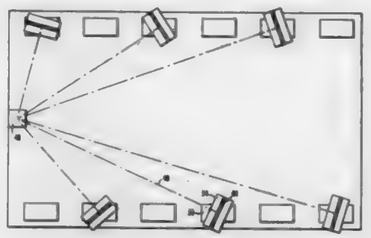
1. A device for prestressing a concrete element comprising at least one elongated sinuous cable formed by a bundle of metal strands, the bundle being housed in an elongate sheath which is embedded over at least a part of its length in the concrete element, each cable strand being contained in a tube of plastic material and the tubes having a transverse distribution which is irregular within the cable, the tubes being fixed in their relative positions by means of a solidified cement grout filling spaces defined between the tubes and the inside of the sheath.

4,693,045

EXHAUST STACK SUPPORT ARRANGEMENT

Thomas J. Rahaim, Claymont, Del., and Nicholas D. Xanthopoulos, Havertown, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1985, Ser. No. 760,380
Int. Cl.[4] E02D *27/42*
U.S. Cl. 52—292 **2 Claims**



1. A support arrangement for mounting, on a concrete or similar material foundation pad, a large exhaust stack for a gas turbine or the like in which the base of the stack is subject to significant thermal expansion and contraction due to changes in base temperature in accordance with the operating condition of the turbine, comprising:

means anchoring and supporting one relatively small, discrete area of said base from said pad in substantially fixed position relative to said base area;

a series of separate support columns between said pad and the underside of said base in an array to adequately support the entire area of said base;

each support column including a structural beam segment including top and bottom flange means and an intermediate web, said top and bottom flange means being fixed against movement to said base and said pad, respectively;

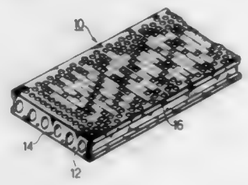
each support column being oriented with the web thereof substantially transverse to a line passing through said anchor location and said web so that each web is disposed to permit bending to the required extent in accordance with the lateral and longitudinal displacement of the base at the particular column location, relative to said anchor location.

4,693,046

METHOD OF CONSTRUCTING FLOOR FOR BUILDINGS OR SIMILAR STRUCTURES

Yoshihiro Murayama, Hongo House 1105, 27-8, Hongo-1-chome, Bunkyo-ku, Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,329
Int. Cl.[4] E04B *5/19*
U.S. Cl. 52—520 **3 Claims**



1. A multi-directional concrete floor comprising:

(a) a precast reinforced concrete slab having generally flat upper and lower surfaces, the upper surface defining a multiplicity of generally cylindrical cavities; and

(b) a concrete layer superimposed only on the slab upper

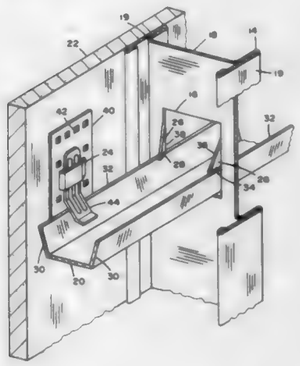
surface, the layer having a generally flat lower surface formed with a multiplicity of generally cylindrical shear members extending downwardly into interlocking contact with the slab cylindrical cavities, so that the shear members prevent relative movement between the slab and layer in all horizontal directions under bending forces.

4,693,047

BENDABLE CHANNEL RETAINER

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Jun. 30, 1986, Ser. No. 880,592
Int. Cl.[4] E04H *1/00*; A43B *23/20*
U.S. Cl. 52—664 **16 Claims**



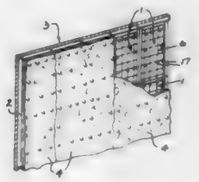
1. A vertical metal stud comprising a pair of opposed face portions and a central web, said web having a plurality of openings for the reception of horizontal channels therethrough, said web openings having a pair of bendable tabs hingedly formed at the two sides of the upper portion of said web opening positioned to firmly abut and restrain a channel in the lower portion of said web opening when said tabs are in an inwardly bent position, said bendable tabs being hingedly bendable to an outwardly bent position sufficient to permit movement of an upwardly opening channel from the upper portion of said web opening to a firm upwardly opening channel position in the lower portion of said web opening.

4,693,048

MEDIA SUPPORT MODULE FOR PAINT SPRAY BOOTHS AND THE LIKE

Timothy L. Guetersloh, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Sep. 15, 1986, Ser. No. 906,932
Int. Cl.[4] E04C *2/42*; B01D *39/04*
U.S. Cl. 52—664 **11 Claims**



1. A support module (1) for use in forming the walls of a paint spray booth or the like and for holding air treatment media (4) thereto, comprising, in combination:

(a) a generally rectangular frame (5) having front and rear portions and spaced top and bottom end members (7) connected by side members (8), and with said end and side members (7, 8) having inwardly extending flanges (10) disposed at the front of the frame,

(b) a generally rectangular grid (6) having spaced horizontal and vertical bars (15, 16), and with said grid being removably mountable to said frame,

(c) first cooperative means (11–13, 15*a*) for removably latching one portion of said grid to said frame top end member (7),

(d) second cooperative means (10, 14, 15*b*) for removably locking another portion of said grid to said frame side members (8),

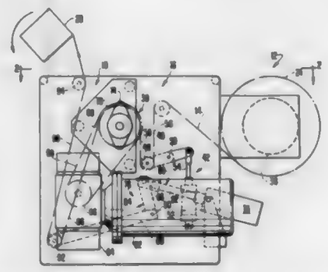
(e) and a plurality of impalement members (17) mounted to said grid and extending outwardly from said front of said frame for receipt of a said media thereon.

4,693,049

STRETCH WRAPPING MACHINE

John R. Humphrey, Naples, Fla., assignor to International Packaging Machines, Inc., Naples, Fla.

Continuation-in-part of Ser. No. 374,741, May 4, 1982, Pat. No. 4,590,746, which is a continuation-in-part of Ser. No. 307,283, Sep. 30, 1981, abandoned. This application Dec. 24, 1985, Ser. No. 813,074
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—64 **9 Claims**



1. A wrapping machine for wrapping a load placed on a rotatable turntable with constant wrapping tension with a stretchable wrapping material which has been prestretched prior to wrapping around the load comprising:

(a) a rotatable holder for holding a roll of stretchable wrapping material which supplies the stretchable wrapping material to be wrapped around the load;

(b) braking means coupled to the rotatable holder for applying a braking force to the holder in accordance with a brake control signal applied thereto to cause the film disposed on the rotatable holder to be restrained as a function of the control signal;

(c) a single driven roller disposed between the roll of stretchable wrapping material and the rotatable turntable which contacts the stretchable wrapping material for applying a force to the stretchable wrapping material to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller and for changing the velocity of stretchable wrapping material being delivered to the load to maintain constant wrapping tension;

(d) a variable speed electric motor and control means for rotating the driven roller to apply the force to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller and to change the velocity of the stretchable wrapping material being delivered to the load to maintain constant wrapping tension;

(e) means for setting an amount of prestretching;

(f) means for maintaining a constant wrapping tension on the stretchable wrapping material being wrapped around the load which is disposed between the driven roller and the rotatable turntable and which controls the speed of the variable speed electric motor as a function of first and second control signals applied to the control means;

(g) said maintaining means including means for sensing an increase in the velocity of the stretchable wrapping material delivered to the load to generate the first control signal which is coupled to the control means to cause an increase in the velocity of the stretchable wrapping material delivered to the load;

(h) said maintaining means including means for sensing a decrease in the velocity of the stretchable wrapping material delivered to the load to generate the second control signal which is coupled to the control means to cause a decrease in the velocity of the stretchable wrapping material delivered to the load;

(i) first velocity sensing means for sensing the peripheral velocity of the roll of stretchable wrapping material and for generating a third signal representative of the sensed peripheral velocity of the roll of stretchable wrapping material;

(j) a second velocity sensing means for sensing the speed of rotation of the driven roller and for generating a fourth signal representative of the speed of rotation of the driven roller which is a function of the amount of prestretching occurring between the roll of stretchable wrapping material and the driven roller and a set constant wrapping tension;

(k) means, coupled to the means for maintaining constant wrapping tension, for setting the amount of constant wrapping tension;

(l) a controller, responsive to the third and fourth signals and the set amount of prestretching, for generating the brake control signal; and

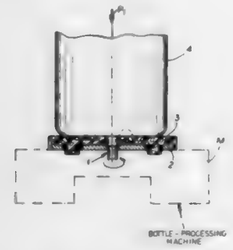
(m) the constant tension stretch wrapping and prestretching being powered by only the driven roller.

4,693,050

BOTTLE PLATE IN A BOTTLE-PROCESSING MACHINE

Egon Höveler, Haan, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,728
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514239
Int. Cl.[4] B32B *5/16*
U.S. Cl. 53—137 **4 Claims**



1. In a bottle-processing machine wherein bottles are individually clamped against a bottle plate which is rotatable to rotatably entrain the bottle thereon, the improvement wherein said bottle plate comprises:

a metal disk; and

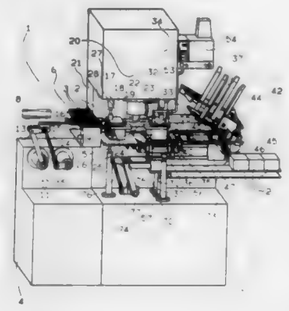
a flexible covering on an upper surface of said disk against which said bottle is pressed, a multiplicity of small hard sharp-edged frangible granules composed of a material selected from the group which consists of corundum, silicon carbide and mixtures thereof being embedded in said flexible covering and having projections exposed on a surface of the covering and engageable with a bottom surface of said bottle when said bottle is pressed against said covering.

4,693,051

MACHINE FOR BOXING ITEMS IN GROUPS

Riccardo Mattei, Bologna; Giordano Gorrieri, Pianoro, and Gualtiero Filippini, Bologna, all of Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Nov. 14, 1986, Ser. No. 930,540
Claims priority, application Italy, Dec. 20, 1985, 3652 A/85
Int. Cl.[4] B65B *19/34, 35/50, 47/04*
U.S. Cl. 53—148 **12 Claims**



1. A machine for boxing items in groups, in particular, sticks (3) of sweets, characterised by the fact that it comprises a combination of at least one pocket member (23) open at the top and bottom and designed to receive a neatly arranged group (2) of the said items (3); a supporting plate (24, 25) arranged substantially contacting the open bottom end of the said pocket member (23); mobile supporting means (18) for moving the said pocket member (23), along the said plate (24), between two positions wherein the said group (2) of items (3) is loaded and boxed respectively; feeding means (8) located in the said loading position and designed to form a said group (2) of items (3) inside the said pocket member (23) and on the said supporting plate (24, 25); a cardboard blank (37) feeding assembly (42) for successively feeding cardboard blanks (37) onto the said plate (24) in the said boxing position, the said plate (24) presenting an opening (29) in the said boxing position; mobile retaining means (36) for securing each blank (37) on the said plate (24) in such a position as to cover the said opening (29); a tubular bending assembly (57) designed to move through the said opening (29) and having an inner passage of substantially the same section as the said group (2) of items (3); and pushing means (31, 33) located in the said boxing position, for forcing the said group (2) of items (3) and the respective cardboard blank (37) through the said pocket member (23), the said bending assembly (57) and the said opening (29), so as to transfer the said group (2) of items (3) from the said boxing position to an unloading position underneath the said plate (24).

4,693,052

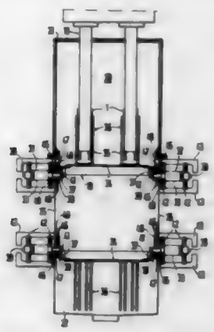
APPARATUS FOR ASEPTIC PACKAGING

Manfred Rebmann, Weinstadt; Otto Rothermel, Stuttgart, and Willi Stirnkorb, Waiblingen-Hegnach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 942,645
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607322
Int. Cl.[4] B65B *55/02*
U.S. Cl. 53—167 **9 Claims**

1. An apparatus for aseptic packaging of products comprising a clean room containing a sterile atmosphere at overpres-

sure, said clean room uncompassed by top, bottom, side and oppositely disposed end walls, said end walls arranged to receive through restrictive apertures upper and lower conveyor flights, endless conveying means provided with chain link holder means mounted exteriorly of each of said side walls of said clean room adapted to communicate by said chain link



holder means which extend through oppositely disposed slit means in said side walls of said clean room with said conveyor flights and labyrinth seal means disposed interiorally of each of said side walls of said clean room with said labyrinth seal means disposed between said upper and lower conveyor flights and said conveyor means.

4,693,053

DEVICE FOR CONTROLLING THE UNWINDING OF A PLASTICS FILM IN A PACKAGING MACHINE

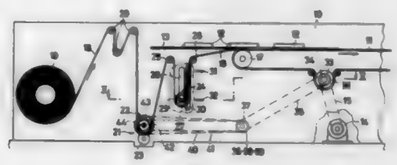
Aris Ballestrazzi, and Lamberto Tassi, both of Savignano sul Panaro, Italy, assignors to SITMA Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy

Filed Jun. 18, 1986, Ser. No. 875,537

Claims priority, application Italy, Jun. 26, 1985, 22272/85[U]

Int. Cl.⁴ B65B *41/12*

U.S. Cl. 53—389 **2 Claims**



1. A device for controlling the unwinding of a plastics film from a reel in a packaging machine comprising a conveyor belt for the products to be packaged and a variable speed motor for driving said conveyor belt by means of a drive roller, characterised in that said film, between the point at which it unwinds from the reel and the point at which it makes contact with said conveyor belt, passes in succession at least through a pair of dragging rollers and about a floating cylindrical bar disposed between two fixed film guide rollers, and in that the drive roller of said pair of dragging rollers receives its motion from the conveyor belt drive roller, driven by said variable speed motor, by way of a linkage comprising two alternately activated transmissions of different ratios, one ratio being such that the linear film unwinding speed induced by said pair of dragging rollers is slightly less than the linear speed of advancement of the conveyor belt, the other ratio being such that the linear film unwinding speed is slightly greater than the linear speed of said belt, said floating bar cooperating with twol microswitches which are vertically superposed at two different levels and arranged to activate respectively one and the other of said transmissions when the floating bar reaches the levels of the relative microswitches during its vertical reciprocating motion.

4,693,054

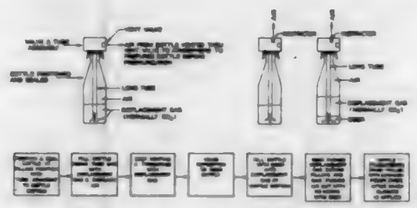
PROCESS FOR FILLING BEER INTO CONTAINERS

William G. Spargo, St. Louis, Mo., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 6, 1984, Ser. No. 668,639

Int. Cl.⁴ B65B *31/00*

U.S. Cl. 53—432 **5 Claims**



1. The method of filling containers with a carbonated beverage which comprises the steps of:

(a) positioning a container having an open top and an interior bottom therebelow, filled with air at atmospheric pressure, in a fixed, sealed position relative to a filling head having tube means of large diameter extending downwardly from the filling head into the container so that the bottom end of the filling tube means is at a fixed height closely adjacent to and directed toward the interior bottom of the container, the filling head having a source of substantially oxygen free gas which is at a predetermined pressure greater than atmospheric and a source of beverage which is substantially at the said predetermined pressure;

(b) prepurging the container by flowing substantially oxygen free gas from the source thereof through the filling tube means while venting the upper end of the container through valve means to ambient atmosphere so that the substantially oxygen free gas is directed at low velocity toward the bottom of the container while the container is in the position of step "a" until a substantially pure blanket of the substantially oxygen free gas has grown in thickness from the bottom to a level above the fixed height of the bottom end of the filling tube, has displaced the air in the container upwardly above the fixed height, and has forced air outwardly to ambient atmosphere through the vent valve;

(c) terminating the valved venting of the interior of the container while continuing the flowing of the substantially oxygen free gas from the source thereof until the interior of the container is substantially at the predetermined pressure of the source of the substantially oxygen free gas;

(d) discontinuing the flowing of the substantially oxygen free gas from the source thereof, thereafter flowing the beverage from its source through the tube means into the bottom of the container while restricting flow of air from the container to control the flow rate of the beverage into the container so that the beverage is filled into an environment of the relatively pure blanket of the oxygen free gas to limit the amount of exposure of the beverage to oxygen and limit the air/oxygen pickup of the beverage while maintaining the predetermined pressure within the container; and

(e) terminating the flow of the beverage into the container when it is filled, separating the filling head from the container, and then closing the container.

4,693,055

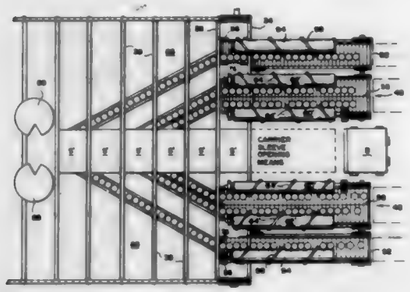
METHOD AND APPARATUS FOR FEEDING CONTAINERS TO A CARRIER SLEEVE

Peter C. Olsen, Jr.; Peter M. Conforto, both of Monroe, La.; David L. Wolf, Cedar Falls, Iowa, and Donald R. Hudson, West Monroe, La., assignors to Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 861,774, May 9, 1986, abandoned. This application Oct. 6, 1986, Ser. No. 915,479

Int. Cl.⁴ B65B *21/06*

U.S. Cl. 53—443 **28 Claims**



1. Apparatus for feeding containers, a substantial portion of each container being cylindrical is shape, to an open-ended carrier sleeve moving in a downstream direction along a support surface, comprising:

conveyor means for moving the containers downstream in a row on either side of an generally parallel to the direction of movement of the carrier sleeves,

container support means aligned with and spaced downstream from the conveyor means for continuing the movement of the containers,

screw means mounted parallel to and extending along substantial portions of the conveyor means so as to engage the containers and separate them into groups containing a predetermined number of containers while the containers are being moved by the conveyor means,

a flight bar conveyor having an upward run which moves the flight bars through the space between the downstream end of the conveyor means and the upstream end of the container support means, and a generally horizontal run which moves the flight bars downstream vertically spaced above the container support means, the flight bar contacting containers on the container support means and pushing them along the container support means during the generally horizontal run of the flight bar conveyor,

means for holding an open-ended carrier sleeve in the pocket formed by successive flight bars during the generally horizontal run of the flight bar conveyor, and

means for moving the containers into the carrier sleeves through the open ends thereof.

20. A method of feeding containers, a substantial portion of each container being cylindrical in shape, to an open-ended carrier sleeve moving in a downstream direction along a support surface, comprising the steps of:

moving open-ended carrier sleeves in the pockets formed by successive flight bars of a flight bar conveyor during the downstream run of the flight bar conveyor,

moving the containers in a row on conveyor means located upstream from the flight bar conveyor and on either side of and generally parallel to the direction of movement of the carrier sleeves,

contacting the containers with screw means to separate the containers into groups of a predetermined number while the containers are being moved by the conveyor means,

moving the flight bars upwardly to the downstream ends of the conveyor means just prior to the downstream run of the flight bar conveyor,

contacting the last container in each group of containers with a flight bar substantially as the flight bar is changing direction from the upward run thereof to the downstream run thereof,

moving the containers on support means spaced downstream from the conveyor means a distance allowing the flight bars to move up between the conveyor means and the support means and to move downstream vertically spaced above the support means,

pushing the groups of containers by means of the flight bars past the support means along a support surface, and

moving the groups of containers into the carrier sleeves through the open ends thereof.

4,693,056

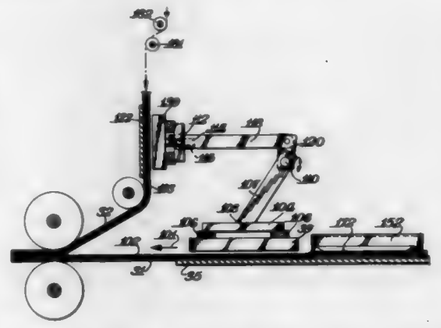
HEAT SEALING AND PACKAGING

Lewis R. Raszewski, Stevensville, Md., assignor to The Crowell Corporation, Newport, Del.

Filed Oct. 4, 1985, Ser. No. 783,430

Int. Cl.⁴ B65B *9/02, 23/00*

U.S. Cl. 53—450 **8 Claims**



1. In the process of packaging articles between two elongated wrapping laminates each having a layer of antistat foam laminated to a backing web and the foam layer of one laminate is heat sealed to the foam layer of the other laminate while the elongated laminates are advanced by side edge rollers through a heat sealing zone as articles to be heat sealed are sandwiched between them, the improvement according to which the laminates are prepared for the heat sealing by melting the foam at the side edges of both laminates at their heat sealing sites, and the laminates with the melted foam edges are pressed together to heat seal them together after an article is sandwiched between them.

4,693,057

APPARATUS FOR ORDERING AND FEEDING A SMALL ITEM LIKE A TABLET, CAPSULE, PILL OR DRAGEE IN A PACKAGING MACHINE

Herbert Rittinger; Detlev H. Gertitschke, both of Laupheim; Karlheinz Rapp, Mittelbiberach, and Bernd Eberle, Laupheim, all of Fed. Rep. of Germany, assignors to Josef Uhlmann Maschinenfabrik GmbH & Co. KG, Laupheim, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,251

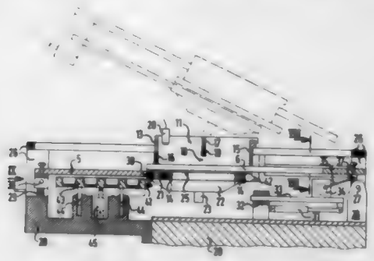
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541672

Int. Cl.⁴ B65B *35/30, 5/08*

U.S. Cl. 53—539 **14 Claims**

1. In an apparatus for feeding and depositing a small item to be packaged like a tablet, capsule, pill or the like in a packaging machine into a plurality of upwardly open cups in a foil strip to package said small item, especially in a deep drawn foil strip,

said apparatus comprising a feed slider and a distributing slider movable substantailly parallel to said foil strip positioned above said foil strip over each other, of which the upper one of said sliders movable transverse to the feed direction of said foil strip is said feed slider and is provided with a plurality of openings each dimensioned for receiving and passing only one of said small items and arranged in a pattern like said cups and of which the lower one of said sliders movable parallel to said feed direction of said foil strip is said distributing slider and is provided with a plurality of holes for the passage of said small items from said openings into said cups, wherein said sliders are slidable into a delivery position in which said openings coincide with said holes and with said cups and at least one of said sliders is slidable into a closed position in which said distributing slider secures said openings in said feed slider underneath against said passage of said small items, the improvement wherein said distributing slider is movable into said closed position and said holes are interrupted in the sliding direction of said distributing slider by a plurality of cross members which are oriented longitudinally in the sliding direction of said feed slider and in said closed postion of said distributing slider are under said openings of said feed slider movable into said delivery position, said feed slider forming the bottom of a



loading box filled with said small items in no particular order provided laterally adjacent said foil strip in said motion direction of said foil strip and being movable back from and into said delivery position with all of said openings into said loading box, further said loading box being closed in the direction of said foil strip on the top side of said feed slider for said small items by a skimmer strip and being provided with a lower base under said feed slider which extends under said loading box to said distributing slider and secures said openings of said feed slider from said distributing slider from below against said passage of said small items as well as aligns with said cross members of said distributing slider and forms a sliding path for said small pieces with said openings of said feed slider during motion of said feed slider, said small pieces in said openings on said lower base being substantially completely shut off with said upper side of said feed slider and said feed slider being movable in a quickly alternating fashion, namely vibrating, shaking or the like, in position with said openings inside said loading box for uniform filling of said openings with said small items and said loading box in comparison to said feed motion is of such a size that in said sliding motion none of said openings reach a position under said skimmer strip or a rear wall opposing said skimmer strip.

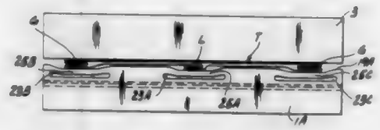
4,693,058

BAG SEALING BAR

Lloyd Kovacs, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Jul. 17, 1986, Ser. No. 887,559
Int. Cl.⁴ B65B *51/26, 51/30, 51/14*
U.S. Cl. 53—552 **14 Claims**

1. A sealing bar for heat sealing a length of heat-sealable material, such as tubing, to form packages and the like, said bar having a metal surface adapted for pressure engagement with the heat-sealable material for flattening it and heating it, said bar having a slot extending substantially therethrough substantially parallel to said surface, said slot being adjacent said surface and defining the portion of the bar between the slot and said surface as a relatively thin resiliently flexible metal bridge which is engageable with a portion of the heat-sealable mate-



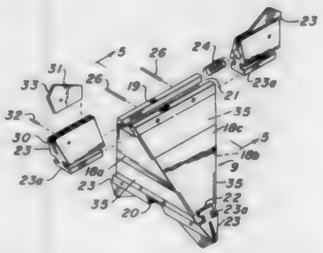
rial, such as a portion of tubing having a longitudinal seam or a gusset, thicker than other portions of the flattened material, and adapted resiliently to yield on engagement with said thicker portion of the material.

4,693,059

MANDREL FOR OPENING A TUBE OF FLEXIBLE MATERIAL

John B. O'Donnell, Sellersville, Pa., assignor to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Feb. 28, 1986, Ser. No. 835,042
Int. Cl.⁴ B65B *9/10*
U.S. Cl. 53—567 **3 Claims**



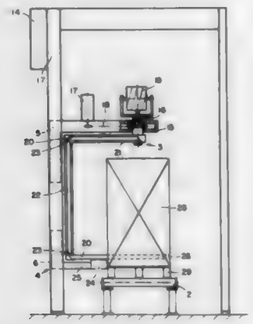
1. A wedging mandrel for opening a tube of flexible, heat-shrinkable banding material or like tubular material wherein the tubular material is delivered in flat ribbon-like form with creased side edges, said tube opening wedging mandrel comprising first and second sets of planar wedge surface regions, the first and second sets of planar wedge surface regions converging towards and respectively terminating in first and second relatively narrow, elongated, wedge surface portions, the first and second wedge surface portions being disposed at 90° to each other, means for supporting said mandrel with the first of said wedge surface portions being positioned and dimensioned to receive and fit within the tube with the ends of said first wedge surface portion adjacent the creased edges of the tube, feed means for advancing the tube relatively lengthwise of the mandrel whereby the tube is wedged to the opened position, each of said first and second elongated wedge surface portions having a grooved key way extending lengthwise thereof, a pair of relatively moveable wedge-shaped parts mounted on each said first and second elongated surface portion and slidably moveable within the key way on said surface portion, biasing means for yieldably urging each said pair of parts to opposite ends of said elongated wedge surface portion on which said pair of parts is mounted, said parts each having a flat end surface and flat converging wide wall surfaces, the flat converging side and end wall surface of each of said parts being substantially coplanar with the planar surface regions which terminate in and define the elongated surface portion on which the pair of parts is mounted, whereby the pair of parts on the first wedge surface portion resiliently bear against the creased edges of the tube and the pair of parts on the second wedge surface portion bear against the tube at positions disposed at 90° to the creased edges of the tube.

4,693,060

APPARATUS FOR WRAPPING STACKED GOODS

Peter Born, Reutenstrasse 15, 4800 Zofingen, Switzerland

PCT No. PCT/CH84/00181, § 371 Date Jul. 9, 1985, § 102(e) Date Jul. 9, 1985, PCT Pub. No. WO85/02161, PCT Pub. Date May 23, 1985
Continuation of Ser. No. 759,040, Jul. 9, 1985, abandoned. This PCT application Nov. 15, 1984, Ser. No. 931,927
Claims priority, application Switzerland, Nov. 15, 1983, 6125/83
Int. Cl.⁴ B65B *13/04*
U.S. Cl. 53—588 **12 Claims**



1. An apparatus for wrapping a load of goods with a flat band, the band to be passed along a horizontal and vertical path orbiting the load, the apparatus comprising:
- a wrapping arm having a horizontal part and a vertical part angled downwards from the horizontal part and attached to the horizontal part, the horizontal part being mounted on a hollow vertical shaft, the vertical shaft being rotatable to carry the vertical part around the load of goods;
- a band supply reel mounted above the hollow vertical shaft, the band being fed inside and through the vertical shaft to the horizontal part of the wrapping arm;
- guide means for guiding the flat band from the supply reel, the guide means being disposed along the wrapping arm and guiding the flat band along the horizontal part and down the vertical part to a discharge where the band is dispensed onto the load, the guide means including a first band-guiding means mounted at a junction between the horizontal and the vertical parts, the first band-guiding mean being inclined to the shaft thereby to guide the band around an angle between the horizontal and the vertical parts;
- a band securing device for securing and severing the band, the band securing device being movably positionable adjacent the discharge for the band; and,
- elevating means associated and cooperating with the wrapping arm such that the wrapping arm is continuously displaced in height during at least part of the wrapping operation.

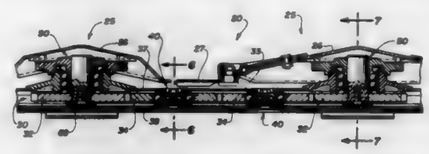
4,693,061

IDLER GEAR MOUNTING FOR DISC CUTTERBARS

Earl E. Koch, Mohnton, and Franja F. Voler, New Holland, both of Pa., assignors to New Holland Inc., New Holland, Pa.

Filed Mar. 31, 1986, Ser. No. 846,651
Int. Cl.⁴ A01D *55/18*
U.S. Cl. 56—13.6 **9 Claims**

1. In a disc cutterbar for severing standing crop material from the ground and having a plurality of disc cutter assemblies rotatably mounted on a transmission casing housing a plurality of intermeshed power transmission gears including a drive gear associated with each respective disc cutter assembly to effect rotation thereof and idler gears positioned between said drive gears to transfer rotational power between said drive gears, each of said idler gears being rotatably mounted within said transmission casing by apparatus extending between an upper surface member and a lower surface member of said casing, an improved idler gear mounting apparatus comprising:
- a spacer member positioned within an opening through said transmission casing and engaging said upper surface member, said lower surface member and a bearing rotatably supporting said idler gear on said spacer member;
- a fastener extending through said spacer member and having a head portion engaging said spacer member and positioned adjacent one of said casing surface members; and
- a securing member releasably engaged with said fastener and engaged with the other of said casing surface members, the engagement of said securing member with said fastener being operable to tightly fix said mounting apparatus between said upper and lower surface members.

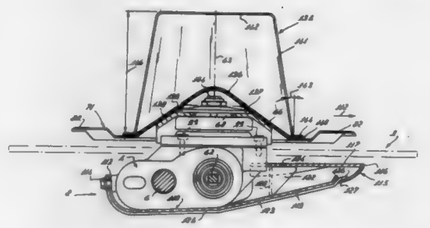


4,693,062

MOWING MACHINE

Ir E. van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van der Lely N.V., Maasland, Netherlands

Filed Sep. 4, 1985, Ser. No. 772,465
Claims priority, application Netherlands, Jan. 4, 1984, 8400028
Int. Cl.⁴ A01D *34/66*
U.S. Cl. 56—13.6 **24 Claims**



1. A mowing machine comprising a cutter bar having a cutting unit which is rotatable about an upwardly extending rotary axis, a crop engaging member, a body for supporting said crop engaging member, a disc included on the upper face of said cutting unit, at least one cutter mounted on the periphery of said disc, said disc comprising a centrally located upwardly extending conical part and a surrounding annular depression, said body having a bottom plate which closely receives said conical part and includes a lug that is received in said annular depression, and securing means said body being connected to said disc by said securing means so as to be quickly centered thereon and at the same time readily releasable therefrom.

4,693,063

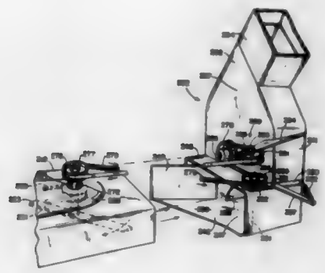
MATERIAL COLLECTION APPARATUS

Thomas L. Hoepfner, 98 Prairiewood Dr., and Keith A. Leistikow, 88 Prairiewood Dr., both of Fargo, N. Dak. 58103

Continuation-in-part of Ser. No. 692,657, Jan. 17, 1985, Pat. No. 4,614,080, which is a continuation-in-part of Ser. No. 557,233, Dec. 1, 1983, abandoned. This application Aug. 18, 1986, Ser. No. 897,329

Int. Cl.⁴ A01D *34/63, 87/10*

U.S. Cl. 56—16.6 **40 Claims**



1. An apparatus for cutting grass and collecting grass clippings comprising: a tractor having an internal combustion engine, a rotary lawn mower having a generally horizontal deck mounted on the tractor, said deck having a grass clipping side discharge section having a discharge opening, a plurality of grass cutting blades located under said deck, means including upright blade shafts rotatably mounting the blades on the deck, drive means for transmitting power from the tractor engine to the blade shafts to rotate the blades whereby the blades cut grass under said deck and move grass clippings through said discharge opening, grass clippings collector means mounted on the tractor, and blower means for receiving grass clippings from said discharge opening and moving the grass clippings to the collector means, said blower means having housing with an internal chamber and an inlet opening aligned with the discharge opening, impeller means located within said chamber, a horizontal shaft rotatably mounting the impeller means on the housing for rotation about a generally horizontal axis, power transmission means drivably connecting the horizontal shaft with one upright blade shaft whereby power is transmitted from said one upright blade shaft to the impeller means to rotate the horizontal shaft, said deck having a hole above said one blade shaft, said power transmission means including an upright shaft extension extended through said hole and secured to said one blade shaft, a generally horizontal first pulley secured to said shaft extension, a generally vertical second pulley secured to said horizontal shaft, support means for a third pulley and a fourth pulley secured to the housing, post means rotatably mounting the third pulley on the support means for rotation about a generally upright first axis, means rotatably mounting the fourth pulley on the support means for rotation about a generally upright second axis, said third and fourth pulleys having outer belt accommodating portions generally aligned with the plane of rotation of the second pulley, and a single endless belt trained about said first and second pulleys and engageable with said third and fourth pulleys whereby said third and fourth pulleys change the orientation of the belt from horizontal to vertical and back to horizontal as the belt travels about said first and second pulleys whereby said belt transmits power from the first pulley to the second pulley to rotate the impeller means concurrently with the rotation of the blades.

4,693,064

GRASS COLLECTION BAG FOR LAWN MOWER

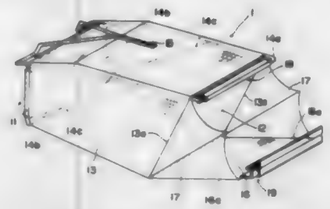
Takao Katayama, Sennan, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 938,694

Claims priority, application Japan, May 2, 1986, 61-102717

Int. Cl.⁴ A01D *34/70*

U.S. Cl. 56—202 **5 Claims**



1. A grass collection bag suited for use with a walking operator type lawn mower having a cutting blade and a steering handle extending rearwardly, which grass collection bag is removably attached to the steering handle to extend in a fore-and-aft direction of the lawn mower, said grass collection bag comprising;

a substantially tubular main body portion defining a grass inlet at a forward end thereof and a grass outlet at a rear end thereof,

a lid member for opening and closing said grass outlet, said lid member being attached to said main body portion to be vertically swingable about an axis adjacent a lower rear edge of said main body portion, and

engaging means including a first engagement member attached to said main body portion adjacent an upper rear edge thereof and a second engagement member attached to said lid member adjacent a free end edge thereof, one of said first and second engagement members defining a slit vertically directed when in an engaged position, and the other of said first and second engagement members defining a projection engageable with said slit, whereby said first and second engagement members are releasably engageable with each other.

4,693,065

FARM MACHINES HAVING FLEXIBLE SKIRTS FOR MOVING AGRICULTURAL PRODUCTS ON THE GROUND

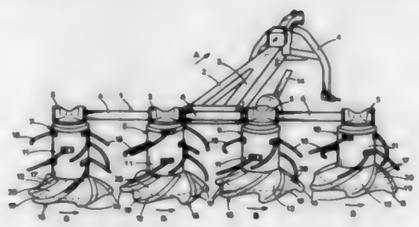
Jerome Aron, Bouxwiller, and Alfred Engel, Saverne, both of France, assignors to Kuhn S.A., Cedex, France

Filed Feb. 6, 1986, Ser. No. 826,815

Claims priority, application France, Feb. 6, 1985, 85 01747

Int. Cl.⁴ A01D *80/00, 84/00*

U.S. Cl. 56—377 **10 Claims**



1. A farm machine comprising:

(a) a frame;

(b) at least one rotor mounted on said frame; and

(c) a resilient flexible skirt at least generally in the shape of a hollow truncated cone for moving products that are on the ground mounted on said at least one rotor, said flexible skirt comprising a first zone and a second zone, said first zone:

(i) having a thickness which is greater than the thickness of said second zone;

(ii) being integrally formed as a part of said flexible skirt;

(iii) extending without interruption over the entire periphery of said flexible skirt;

(iv) extending to the outside edge of said flexible skirt; and

(v) projecting downwardly beyond said second zone on the lower side of said flexible skirt.

4,693,066

COMPRESSED AIR THREAD SPLICING DEVICE

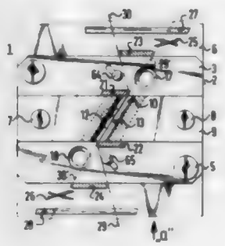
Dieter Oellers, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 866,059

Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518315

Int. Cl.⁴ D01H *15/00;* **B65H** *69/06;* **D02J** *1/08*

U.S. Cl. 57—22 **2 Claims**



1. Compressed air thread splicing device for producing a thread connection by splicing, comprising a splicing chamber having at least one opening formed therein through which compressed air is blown into said splicing chamber for mutually entangling, hooking, intermingling and winding fibers of threads to be spliced together in said splicing chamber, pneumatic holding devices disposed at two sides of said splicing chamber for holding ends of the threads to be prepared for splicing at a given location between said pneumatic holding devices and said splicing chamber, each of said holding devices having a channel for receiving a thread end and a lateral opening for receiving injection air generating a holding air current, a slider having flow channels with ends formed therein for each of said holding devices pointing in different discharge directions, said ends of said flow channels and said lateral openings being disposed substantially vertically below said given location, a compressed air supply channel, and means for alternately conducting the injection air through said flow channels to said lateral opening for determining the discharge direction of the injection air, said injection air conducting means being in the form of means for shifting said slider between a first position in which one of said flow channels is connected to said compressed air supply channel and a second position in which the other of said flow channels is connected to said compressed air supply channel.

4,693,067

MIXING HEAD FOR EQUIPMENT FOR JOINING TEXTILE THREADS WITH THE AID OF COMPRESSED AIR

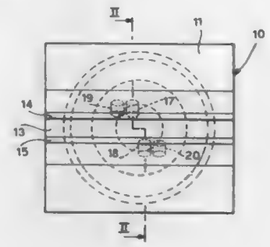
Lorenzo Locatelli, Toscolano, Italy, assignor to Mesdan S.p.A., Salo' , Italy

Filed Sep. 9, 1986, Ser. No. 906,267

Claims priority, application Italy, Sep. 11, 1985, 22978/85[U]

Int. Cl.⁴ B65H *69/06;* **D01H** *15/00*

U.S. Cl. 57—22 **2 Claims**



1. A mixing head for joining textile threads with the aid of compressed air, comprising:

a body having a cylindrical chamber which is open at each end, said chamber having along its longitudinal length an open slot closable by a removable cover; and

a first pair of cylindrical duct means for channeling compressed air into said chamber, the ratio of the cross-sectional area of said cylindrical chamber to the sum of the cross-sectional areas of said cylindrical duct means being in the range of 1.8 to 2.5, said ducts being arranged such that at least one duct is arranged on each side of said cylindrical chamber relative to the cylindrical chamber's longitudinal plane of symmetry; and

wherein said cylindrical ducts are further arranged to be spaced in the longitudinal diection on each side of the median transverse plane of said cylindrical chamber a distance not exceeding one half the diameter of said cylindrical ducts; and

a second pair of cylindrical ducts parallel to and spaced from said first pair of ducts towards the respective open ends of said cylindrical chamber by a distance not exceeding one half the diameter of said second pair of ducts; and

said first and second pairs of ducts being further arranged such that their respective axes of alignment intersect the cylindrical chamber's longitudinal plane of symmetry at an angle in the range of 15° to 32°.

4,693,068

THREAD SLACKENING DEVICE

Carlos Matas Gabalda, Granges les Valence, France, assignor to I.C. ACBF, France

Filed Jun. 5, 1986, Ser. No. 870,998

Claims priority, application France, Jun. 11, 1985, 85 08987

Int. Cl.⁴ D01H *13/10;* **B65H** *59/00*

U.S. Cl. 57—58.86 **4 Claims**

1. A thread slackening device comprising:

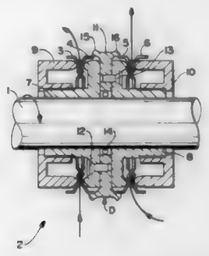
a rotary shaft;

a first hub and a second hub carried by said rotary shaft and being rotatable therewith, each of said hubs having an inner end and an outer end, the inner end of said first hub being juxtaposed with the inner end of said second hub;

a cylindrical track located adjacent the inner ends of said first and second hubs and extending around said rotary shaft, said cylindrical track being fixedly secured to at least one of said hubs;

a first nut mounted on the outer end of said first hub and a second nut mounted on the outer end of said second hub, said nuts being axially movable relative to said hubs; and

first and second pairs of cups mounted on opposite sides of said cylindrical track, said first pair of cups extending radial outwardly from said first hub, terminating in free outer ends which form a first lateral rim, and being carried by said first hub such that the cups are held in position against one another by said first nut to form a first side track, and said second pair of cups extending radially outwardly from said second hub, terminating in free outer ends which form a second lateral rim, and being carried by said second hub such that the cups are held in position against one another by said second nut to form a second side track;



wherein an external diameter of said cylindrical track is at least equal to a diameter of said first side track and at least equal to a diameter of said second side track;

wherein tension communicated to a thread passing between either of said pairs of cup can be varied by axially moving the respective nut to change the pressure exerted upon the cups; and

wherein the thread is in contact with said cylindrical track during a throwing operation and is pushed back onto one of said side tracks after being thrown.

4,693,069

DOUBLING MACHINE

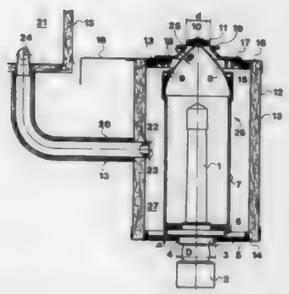
Christian Imhof, Oerlingen, and Gerhard Kempf, Arbon, both of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur and Carl Hamel Spinn-& Zwirnmaschine AG, Arbon, both of, Switzerland

Filed Sep. 3, 1986, Ser. No. 903,552

Claims priority, application Switzerland, Sep. 13, 1985, 3963/85

Int. Cl.⁴ D01H *1/16, 7/18, 13/28*

U.S. Cl. 57—59 **12 Claims**



1. In combination,

a spindle for receiving a feed bobbin;

a wharve having a flange for mounting of said spindle thereon;

a stationary heat insulating jacket disposed concentrically about said spindle to define a chamber;

a bottom closure member peripherally secured to said jacket and spaced from said flange to define a first passage therebetween for a flow of air;

a can mounted on said spindle and said flange and disposed within said jacket;

a top closure member peripherally secured to said jacket and spaced from an upper end of said can to define a second passage therebetween for a flow of air;

an air extraction line connected to said jacket and communicating with said chamber centrally of said closure members to exhaust air therefrom; and

wherein said passages are sized relative to each other to equalize the pressure of air drawn through said passages into said chamber during rotation of said can.

6. In combination

a spindle for receiving a feed bobbin;

a wharve having a flange for mounting of said spindle thereon;

a stationary heat insulating jacket disposed concentrically about said spindle to define a chamber having one end at said wharve and a second opposite end;

a can mounted on said spindle and said flange and disposed within said jacket;

an air extraction line connected to said jacket and communicating with said chamber centrally thereof; and

means for drawing air into said chamber at each end at substantially equal pressure for cooling of said can and to maintain a substantially equal temperature over the height of said can.

4,693,070

THREAD JOINING APPARATUS FOR AN OPEN END SPINNING MACHINE

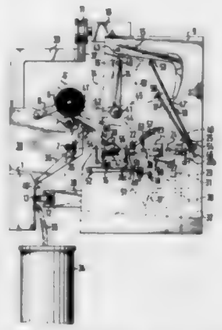
Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,198

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536910

Int. Cl.⁴ D01H *15/00, 13/22*

U.S. Cl. 57—263 **5 Claims**



1. Automatic thread joining apparatus for an open end spinning machine, comprising a device for producing a tension-proof thread connection forming a thread joint, a device for removing the thread joint, a controllable thread storage device for intermediate storage of a length of thread spun during operation of said device for producing a tension-proof thread connection, a thread removal device associated with said thread storage device, and means for activating said thread removal device upon the occurrence of an unsuccessful thread connecting operation.

4,693,071

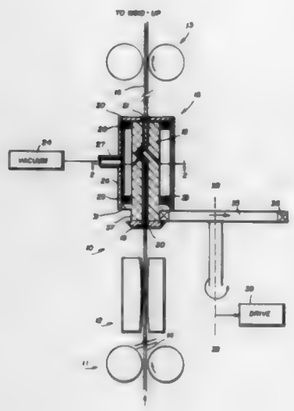
VACUUM TEXTURIZING PROCESS

Elbert F. Morrison, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 20, 1985, Ser. No. 811,747

Int. Cl.⁴ D02G *1/02, 1/04, 1/16*

U.S. Cl. 57—289 **17 Claims**



1. Yarn texturizing apparatus comprising:

feed means for feeding yarn to be texturized;

a heater block;

a spindle comprising a perforated cylinder having a generally axially through-extending passageway;

means for mounting said spindle for rotation about an axis generally coincident with said axial passageway;

means for rotating said cylinder about said axis;

means for applying a vacuum to the exterior of said perforated cylinder such that the yarn is held by the vacuum against an inner wall of the cylinder passageway;

output means from said cylinder for withdrawing texturized yarn from said cylinder;

said feed means, heater block, and spindle mounted with respect to each other so that during operation feed yarn passes through said feed means to said heater block, and then to said spindle, and finally to said output means.

13. A method of texturizing a yarn utilizing a heater block, a spindle comprising a perforated cylinder with a generally axially through-extending passageway, and a source of vacuum, comprising the steps of:

(a) feeding yarn to be texturized through the heater block, in operative contact therewith, to the perforated cylinder generally axially extending passageway;

(b) imparting twist to the yarn in the cylinder, which twist is backed up to the heater block wherein the twist is set in a semi-permanent, false twist configuration; and

(c) removing the yarn from the cylinder at which time the twist relieves itself and a textured, bulk, stretch-type yarn is produced; and

wherein step (b) is practiced by rotating the spindle while applying vacuum to the exterior thereof so that the yarn is held by the force of the vacuum against the inner wall of the cylinder, and the rotation thereof imparts twist to the yarn.

4,693,072

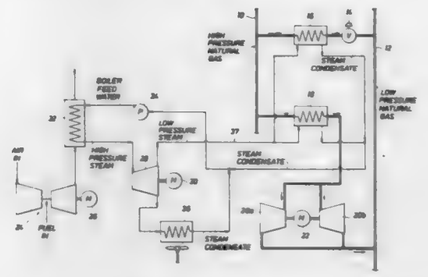
METHOD OF OPERATING A COMBINED CYCLE ELECTRIC POWER PLANT

George S. McLean, La Jolla, Calif.; Paul J. Grimes, Katy, Tex., and Albert van Gucht, Dendermonde, Belgium, assignors to Acec Power Systems Limited, Houston, Tex.

Filed Aug. 25, 1986, Ser. No. 899,732

Int. Cl.⁴ F02C *3/22*

U.S. Cl. 60—39.02 **7 Claims**



1. A method of generating electricity where gas from a high pressure gas transmission line is being delivered to a lower pressure line, such as a gas distribution system, comprising the steps of supplying a portion of the gas to the combustion chamber of a gas turbine to drive a first electrical generator and produce electricity, using the hot gases in the exhaust of the gas turbine to heat water in a boiler and produce steam, supplying the steam to a steam turbine to drive a second electrical generator and produce electricity, reducing the pressure of the gas being delivered to the pressure of the low pressure line, and using the heat of condensation of the exhaust steam from the steam turbine to keep the temperature of the gas at or above a selected minimum as the pressure of the gas is reduced from that of the high pressure line to the pressure of the lower pressure line.

4,693,073

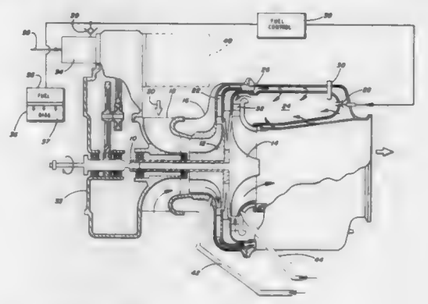
METHOD AND APPARATUS FOR STARTING A GAS TURBINE ENGINE

Ronald Blackburn, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 27, 1986, Ser. No. 886,741

Int. Cl.⁴ F02C *7/268*

U.S. Cl. 60—39.02 **4 Claims**



1. A gas turbine engine comprising:

a rotatable compressor wheel;

a rotatable turbine wheel;

means coupling said wheels for conjoint rotation;

a combustion chamber having an air inlet disposed to receive compressed air from said compressor wheel, a fuel inlet

for receipt of fuel to be oxidized, and a combustion gas outlet disposed to provide combustion gas under pressure to said turbine wheel to rotate the same;

valve means between said compressor wheel and said combustion chamber to said compressor wheel; and

means for starting said engine including means for periodically injecting and combusting fuel in said chamber so as to create a pressurized gas therein and thereafter halting the injecting and combustion of fuel in the chamber so as to allow the pressurized gas to expand through said turbine wheel to accelerate the same followed by pressurization of air by said compressor wheel and opening of said valve means so that compressed air scavenges and recharges said combustion chamber, said valve means comprising a flapper valve acting as a check valve and including plural flappers, each defined by a movable part of a diffuser vane.

4,693,074

COMBUSTION APPARATUS FOR A GAS TURBINE ENGINE

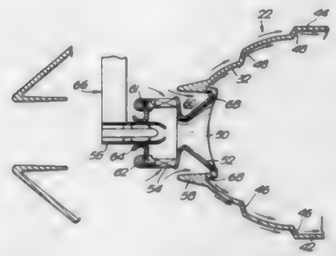
Anthony Pidcock, and Andrew P. Wray, both of Derby, England, assignors to Rolls-Royce plc, London, England

Continuation of Ser. No. 671,785, Nov. 15, 1984, abandoned. This application May 16, 1986, Ser. No. 865,648

Claims priority, application United Kingdom, Nov. 26, 1983, 8331634

Int. Cl.⁴ F02C *1/00*; F02G *3/00*

U.S. Cl. 60—39.32 **16 Claims**



1. Annular combustion equipment for a gas turbine engine comprising an inner annular wall, an outer annular wall and an upstream wall, the upstream wall comprising a single skin and forming part of a dump diffuser, the upstream wall being convectively cooled by cooling and dilution air supplied from the dump diffuser passing over the upstream surface of the upstream wall, the upstream wall having a plurality of circumferentially arranged equi-spaced apertures, each aperture having a convergent/divergent pot positioned coaxially therewith, each convergent/divergent pot being secured at its downstream end to the upstream wall and extending in an upstream direction therefrom, each convergent/divergent pot having a radial swirler assembly positioned coaxially at its upstream end to supply primary air through the convergent/divergent pot into the combustion equipment, each convergent/divergent pot having a fuel injector aligned therewith to supply fuel through the convergent/divergent pot into the combustion equipment, each convergent/divergent pot having an annular air scoop positioned coaxially around the convergent/divergent pot and each annular air scoop being secured to and extending in an upstream direction from the upstream wall, and having an annular upstream end positioned axially adjacent to said radial swirler assembly, an annular chamber being formed between each convergent/divergent pot and the corresponding annular air scoop, each convergent/divergent pot having a plurality of apertures arranged in a ring at its downstream end for supplying cooling air from the annular chamber over the downstream face of the upstream wall, each annular air scoop supplying primary air to the radial swirler assembly of the respective convergent/divergent pot and cooling air to the respective annular chamber, a plurality of said annular air scoops being provided in a circumferentially spaced relation to each other such that the upstream wall between adjacent air scoops is convectively cooled by cooling and dilution air passing over the upstream surface of the upstream wall.

4,693,075

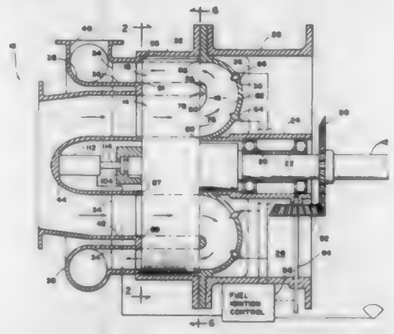
GAS TURBINE ENGINES EMPLOYING FIXED VOLUME COMBUSTION

Andrew Sabatiuk, 336 W. 31st St., Miami Beach, Fla. 33140

Continuation of Ser. No. 666,773, Oct. 31, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 884,862

Int. Cl.⁴ F02C *5/00*

U.S. Cl. 60—39.39 **14 Claims**



1. A gas turbine engine comprising, in series flow relation, an inducer, a combustor into which air is charged by the inducer and in which hot gases are generated, and a turbine rotatably driven by said hot gases, said inducer and turbine being interconnected so that the inducer is driven by the turbine, said turbine and inducer comprising an engine rotor, said engine rotor being rotatable about a common axis, relative to the combustor, said engine rotor further comprising a power output shaft for delivering rotative power to a device to be driven thereby,

said combustor comprising a plurality of circumferentially spaced chambers, each having an entrance and an exit,

said inducer having a radial surface in sealing relation with the combustion chamber entrances and an air flow passageway terminating in a discharge port opening onto said radial surface,

said turbine having a radial surface in sealing relation with the combustion chamber exits and an expansion passageway having an inlet port opening from said radial surface,

said inducer discharge port and said turbine inlet port being successively registerable with the entrances and exits of different combustion chambers, as the inducer and turbine rotate, and as both the entrance and exit of at least one chamber are sealed, and further comprising

operating means including means for introducing fuel into said chambers and means for igniting the fuel in successive chambers when both ends are sealed, characterized in that the igniting means ignites the fuel in less than the total number of combustion chambers during each cycle of engine rotor rotation.

4,693,076

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED RESPONSE CHARACTERISTICS

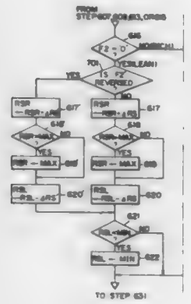
Yoshiki Chujo, Mishima; Nobuaki Kayanuma, Gotenba; Hironori Bessho, Susono; Takatoshi Masui, Mishima; Toshinari Nagai, Susono; Toshiyasu Katsuno, Susono, and Toshio Tanahashi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

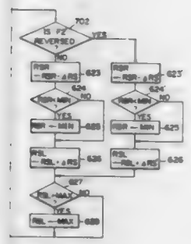
Filed Apr. 7, 1986, Ser. No. 848,580

Claims priority, application Japan, Apr. 9, 1985, 60-73555; Apr. 10, 1985, 60-74439; Sep. 11, 1985, 60-199337

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 60—274 **36 Claims**





1. A method for controlling the air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter for detecting the concentration of a specific component in the exhaust gas, comprising the steps of:

comparing the output of said upstream-side air-fuel ratio sensor with a first predetermined reference voltage;

gradually changing an air-fuel ratio correction amount in accordance with the comparison result of the output of said upstream-side air-fuel ratio sensor;

skipping up said air-fuel ratio correction amount by a rich skip amount when the comparison result of said air-fuel ratio sensor is switched from the lean side to the rich side;

skipping down said air-fuel ratio correction amount by a lean skip amount when the comparison result of said air-fuel ratio sensor is switched from the rich side to the lean side;

adjusting an actual air-fuel ratio in accordance with said air-fuel ratio correction amount;

comparing the output of said downstream-side air-fuel ratio sensor with a second predetermined reference voltage; and

changing at least one of said rich and lean skip amounts in accordance with the comparison result of said downstream-side air-fuel ratio sensor.

4,693,077

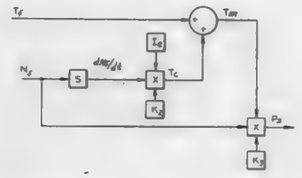
CLOSED-LOOP ENGINE CONTROL WITH FEEDBACK TORQUE ERROR COMPENSATION

Charles A. Skarvan, Indianapolis, and Stephen A. fisher, Whitestown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1986, Ser. No. 886,624

Int. Cl.⁴ F02C *9/28*

U.S. Cl. 60—39.282 **3 Claims**



1. In a closed-loop system in which an engine is controlled to provide power to a load as a function of measured feedback torque, the improvement comprising:

means for modifying the feedback torque by adding to it a synthesized correction torque provided by the product of the engine polar moment of inertia and the engine acceleration thereby to compensate the system for the phase and amplitude error between the measured feedback torque and the actual gross engine torque caused by the circumstance that the measured feedback torque represents the actual gross engine torque less the torque required to accelerate the engine moment of inertia, whereby the modified feedback torque more nearly represents the actual gross engine torque thereby improving the response and stability of the system.

4,693,078

SOOT AFTERBURNER FOR MOTOR-VEHICLE EXHAUST SYSTEM

Hubert Dettling, Waiblingen; Gottlob Haag, Markgröningen; Karl-Heinz Hägele, Vaihingen/Enz; Rolf Leonhard, Schwieberdingen, and Wilhelm Polach, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1985, Ser. No. 807,435

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504299

Int. Cl.⁴ F01N *3/22, 3/26*

U.S. Cl. 60—295 **10 Claims**

1. An afterburner for clearing soot from a particle-laden gas stream, the afterburner comprising:

a housing centered on an upright axis and having

a generally cylindrical upper portion having a downwardly open lower end, and

a lower portion tapering toward the axis from the lower of the upper portion and having at the axis a downwardly closed lower end;

an exhaust tube opening at the axis into the upper housing portion above the lower end thereof;

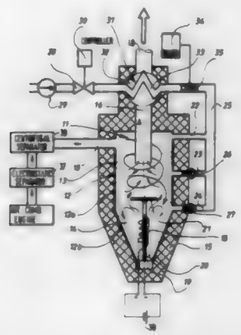
means including a feed tube opening tangentially into the upper housing portion above the lower end thereof for introducing the particle-laden gas stream tangentially into the upper housing portion, whereby the soot particles of the gas stream move inertially radially outward and descend in the housing to collect at the closed lower end of the lower tapering portion;

means including an electrical heating element at the axis the

lower end of the lower tapering portion for burning the soot particles collecting therein;

a plurality of branch conduits having respective inner opening tangentially and at axially spaced locations in the upper portion of the housing and each having a respective outer end;

a feed manifold connected to the outer conduit ends;



means for periodically feeding a combustion-supporting gas under pressure to the feed manifold and thereby injecting the combustion-supporting gas tangentially from the inner ends into the upper housing portion; and

means including a check valve in at least one of the branch conduits and operated for passing the combustion-supporting gas only when it is at a pressure greater than that in the other conduit.

4,693,079

MULTI-PARTITE EXHAUST GAS LINE

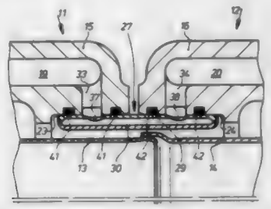
Dieter Wuensche, Friedrichshafen, and Norbert Eisenblaetter, Langenargen, both of Fed. Rep. of Germany, assignors to MTU-Motoren und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 928,019

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 3539778

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—320 **11 Claims**



1. A multi-partite exhaust gas line for a piston internal combustion engine in which each exhaust gas line section includes an inner pipe line means conducting the exhaust gases and a housing means surrounding said pipe line means with a spacing and having a cooling liquid space, the housing means of adjacent exhaust gas line sections being connected with each other, a substantially cylindrical recess means being formed in the adjacent ends of the housing means of two exhaust gas line sections, said recess means cooperating with a connecting nipple means, at least one liquid channel being arranged within the walls of the connecting nipple means that has radial openings, said radial openings corresponding with corresponding radial openings of the cooling liquid spaces in the cylindrical recess means of adjacent housing means.

4,693,080

HYDRAULIC CIRCUIT WITH ACCUMULATOR

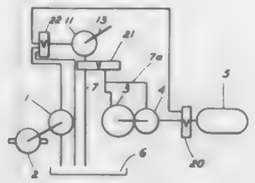
Henricus J. J. M. Van Hooff, Papendrecht, Netherlands, assignor to Van Rietschoten & Houwens Technische Handelmaatschappij B.V., Rotterdam, Netherlands

Filed Sep. 18, 1985, Ser. No. 777,366

Claims priority, application Netherlands, Sep. 21, 1984, 8402899

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—414 **4 Claims**



1. A hydraulic circuit for actuating a first hydraulic motor with an under pressure fluid, comprising an externally driven first hydraulic pump for introduction of fluid into the circuit from an open reservoir and hydraulic accumulator to keep the introduced body of under pressure fluid stand-by, the pressure in the accumulator being sufficient to actuate the first hydraulic motor, characterized by a fluid pressure intensifier comprising a second hydraulic motor (3) and a second hydraulic pump (4) coupled therewith, wherein the second hydraulic pump (4) has a smaller swept volume than the second hydraulic motor (3), and the second hydraulic motor (3) is interconnected in a discharge pipe (7) connected to an outlet of the first hydraulic pump (11) and an outlet of the second hydraulic pump (4) is connected to an inlet of the hydraulic accumulator (5) to introduce a fluid body obtained from discharge pipe (7) into the hydraulic accumulator (5), the second hydraulic motor (3) and the second hydraulic pump (4) being of the rotating type.

4,693,081

CONTROL SYSTEM AND METHOD FOR CONTROLLING OUTPUT TYPE HYDRAULIC FLUID PUMP OF AUTOMATIC TRANSMISSION PROVIDING INCREASED PUMP OUTPUT PRESSURE WITH INCREASE IN ENGINE LOAD

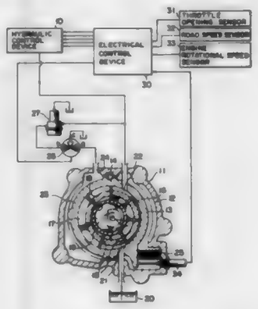
Shinya Nakamura; Seitoku Kubo, and Yutaka Taga, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 8, 1985, Ser. No. 785,404

Claims priority, application Japan, Oct. 8, 1984, 59-210779

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—448 **24 Claims**



1. A control method for a hydraulic fluid pump comprised in a hydraulically actuated automatic transmission system for a vehicle driven by an engine, said transmission system having hydraulic means for establishing a speed ratio thereof, said hydraulic means using hydraulic fluid at a line pressure maintained by said hydraulic fluid pump, said method comprising the steps of:

detecting the load on said engine; and:

controlling said hydraulic fluid pump such that an output thereof increases with an increase of said detected value of the load on said engine.

13. In a hydraulically actuated automatic transmission system for a vehicle driven by an engine, said transmission system having hydraulic means for establishing a speed ratio thereof and hydraulic fluid pump means for supplying pressurized hydraulic fluid to said means for establishing at a line pressure, a control system comprising:

means for detecting the load on said engine; and

means for controlling said hydraulic fluid pump such that an output thereof increases with an increase of said detected value of the load on said engine.

4,693,082

METHOD FOR SUPPLYING HEAT TO AN ENGINE FOR EXTERNAL HEAT SUPPLY BY INTERMITTENT COMBUSTION, AND ENGINE FOR CARRYING OUT THE METHOD

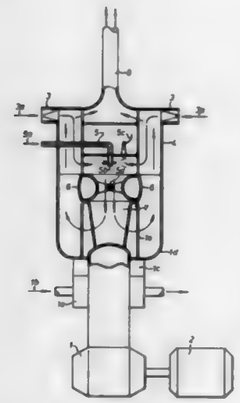
Stig G. Carlqvist, Malmö, Sweden, assignor to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag, Malmö, Sweden

Filed Jan. 13, 1986, Ser. No. 818,459

Claims priority, application Sweden, Jan. 14, 1985, 8500149

Int. Cl.⁴ F02G *1/04*

U.S. Cl. 60—517 **6 Claims**



1. A combustor and a hot gas engine,

said combustor comprising a combustion chamber, means for producing intermittent combustion of the fuel within the combustion chamber and intermittent motion of gases in the combustion chamber, said combustion producing means including means for supplying combustion air to the combustion chamber and means for supplying fuel to the combustion chamber, said combustor also including an exhaust means which is located downstream of the combustion chamber for receiving exhaust gases from the combustion chamber and emitting them from the combustor,

said hot gas engine comprising a closed thermodynamic system which has a working medium flowing therethrough, said thermodynamic system including a heater, a regenerator and a cooler, said heater being operable to supply heat to the working medium, said heater being positioned in the combustion chamber of the combustion upstream of the exhaust means and having a shape and position which does not interfere with the intermittent combustion or prevent the flow of gases in the combustion chamber.

4,693,083

VACUUM BRAKE FORCE BOOSTER

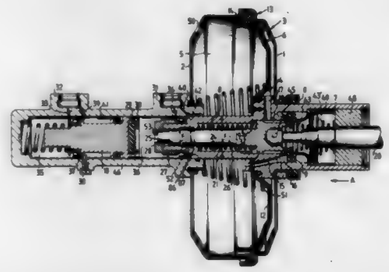
Hans D. Reinartz, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries Incorporated, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,426

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401402

Int. Cl.⁴ B60T *13/00*

U.S. Cl. 60—547.1 **7 Claims**



1. A combination vacuum brake booster and master cylinder comprising:

a booster casing;

a moveable wall sealingly subdividing said casing into a low pressure chamber and a working chamber;

a dual valve including a control valve housing affixed to said moveable wall and mounted to said casing for movement with said wall, said control valve housing having a longitudinal bore;

a poppet valve mounted in said longitudinal bore;

a plunger sealingly, slidably mounted in said bore connected to a pedal operated push rod, said plunger including means cooperating with said poppet valve for selectively connecting said working chamber to a vacuum and a higher differential pressure in response to movement of said push rod, an end of said plunger being exposed at an end of said control valve housing;

a master cylinder housing affixed to said booster casing and having a bore closed at one, open at a second end, said end of said control valve housing slidably sealingly received in said open end of said master cylinder bore;

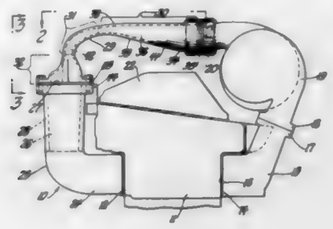
a single free floating master cylinder piston in said master cylinder bore including a rubber reaction member at a first end of said piston facing and being normally spaced apart from said end of said control valve housing, said first end of said master cylinder piston and said end of said control valve housing and said exposed end of said plunger defining a first master cylinder pressure chamber and said closed end of said master cylinder bore and a second end of said master cylinder piston defining a second master cylinder pressure chamber, said end of said control valve housing and said exposed end of said plunger abutting said reaction member upon loss of pressure in said first master cylinder pressure chamber.

4,693,084

CHARGE COOLER ANGLE DUCT

William K. Ahrens, Novi, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1986, Ser. No. 889,278
Int. Cl.[4] F02B *29/04*
U.S. Cl. 60—599 **8 Claims**



1. A curved angle duct for connection between a member having a compact cross section and a charge cooler connection having much larger area and an oblong cross section with wider and narrower sides, said duct comprising

a compact section including a connecting portion with sides defining a compact cross section connectable with said member and merging into a tapered portion with increasingly wider and narrower sides defining increasingly oblong cross sections of smoothly increasing area away from the connecting portion,

a curved elbow section extending from the tapered portion with increasingly extended wider sides defining increasingly oblong cross sections of non-decreasing area away from the connecting section, said elbow section being smoothly curved about an axis generally parallel with the wider sides, and

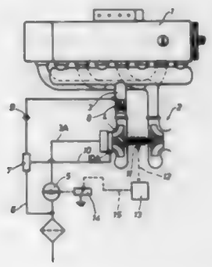
a core attaching section extending away from the elbow section and having oblong cross sections with areas smoothly increasing toward a far end, said core attaching section being defined by wide sides and increasingly extended narrower sides toward the far end, said core attaching section being connectable at its far end with a charge cooler.

4,693,085

DEVICE FOR INCREASING THE ROTATIONAL SPEED OF AN EXHAUST GAS TURBO-CHARGER ON AN INTERNAL COMBUSTION ENGINE

Siegfried Sumser, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,632
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529280
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—611 **7 Claims**



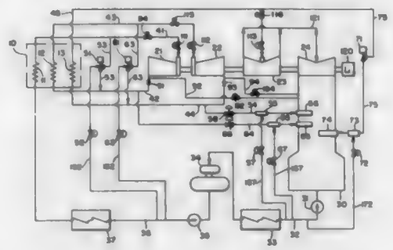
1. Device for increasing the rotational speed of an exhaust gas driven turbo-charger on an internal combustion engine of the type having an air inlet induction duct leading to the engine, a compressor arranged in the induction duct and including a compressor casing defining a compressor inlet duct, and a bypass duct communicating air to said induction duct in bypassing relationship to the compressor, said device comprising an ejector Laval nozzle arranged in the bypass duct and having an annular nozzle shaped induction opening at its constricted throat section surrounded by an annulus which communicates with a connecting duct leading to the compressor inlet duct, whereby flow in said bypass duct effectively evacuates the compressor inlet duct.

4,693,086

STEAM TURBINE PLANT HAVING A TURBINE BYPASS SYSTEM

Shinichi Hoizumi, San Francisco, Calif.; Norio Abe; Takeshi Ueno; Tadao Arakawa, all of Hitachi, and Kunio Hodozuka, Kure, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,106
Claims priority, application Japan, Oct. 15, 1984, 59-214372
Int. Cl.[4] F01K *13/02, 7/24*
U.S. Cl. 60—663 **6 Claims**



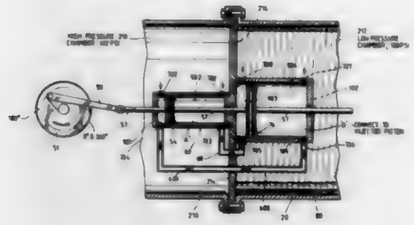
1. A reheat steam turbine power plant including a turbine bypass system, the power plant comprising: a boiler having a superheater and a reheater therein, a high pressure steam turbine driven by steam generated in the superheater and supplied through a main steam pipe, a first control valve means for controlling a flow of the steam through the main steam pipe, a reheat steam turbine driven by reheat steam heated up in the reheater and conducted through a hot reheat steam pipe, a second control valve means for controlling a flow of steam through the hot reheat steam pipe, a condenser for condensing the reheat steam exhausted from the reheat steam turbine, a cold reheat steam pipe connecting an outlet of the high pressure steam turbine with an inlet of the reheater, a check valve means disposed in the cold reheat steam pipe, a condensate pipe means for connecting the condenser with an upstream side of the superheater, a high pressure turbine bypass pipe means for connecting the main steam pipe with the cold reheat steam pipe, a turbine bypass valve disposed in said high pressure turbine bypass pipe, and means for reducing the quantity of the reheat steam introduced into the reheater from the superheater through the high pressure turbine bypass pipe means and for discharging an excess steam from the high pressure turbine bypass pipe means and the cold reheat steam pipe when the high pressure turbine bypass means is operated.

4,693,087

METHOD OF GENERATING POWER FROM A VAPOR

Ralph J. Lagow, Anahuac, Tex., assignor to Thermal Engine Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 664,792, Oct. 25, 1984, Pat. No. 4,603,554. This application Mar. 27, 1986, Ser. No. 844,583
Int. Cl.[4] F01K *11/00*
U.S. Cl. 60—670 **65 Claims**



1. A method of generating power comprising:

heating a working fluid to a superheated vapor;

supplying the superheated vapor to a high pressure zone having a high pressure cylinder and piston operably connected to a working shaft to maintain the high pressure zone at a substantially constant high pressure;

forming an isolated subvolume of working fluid in the high pressure cylinder;

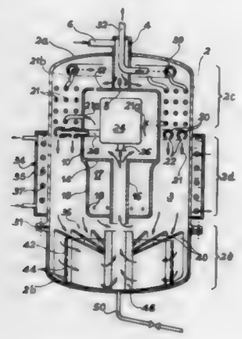
constantly decreasing the subvolume of working fluid in the high pressure cylinder by discharging the subvolume to a low pressure cylinder and piston assembly located in a low pressure zone to constantly increase the subvolume of working fluid in the low pressure cylinder.

4,693,088

COLD TRAP FOR ELIMINATING IMPURITIES FROM A POLLUTED LIQUID METAL

Christian Latge, Aix en Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 30, 1986, Ser. No. 890,480
Claims priority, application France, Aug. 12, 1985, 85 12279
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **9 Claims**



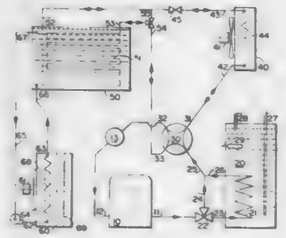
1. A cold trap for eliminating the impurities present in a polluted liquid metal, comprising a body equipped with an admission pipe for the polluted liquid metal and an internal structure defining a path for the metal, said internal structure being successively provided in the direction of flow therethrough with means positioned in said body for cooling the liquid metal so that it can be cooled to a cold point temperature below the impurity saturation temperature for bringing about a crystallization of the impurities, means mounted in said body for receiving liquid metal from said cooling means and for retaining impurities, and a discharge pipe connected to said body to receive liquid metal from said means for retaining impurities for discharging the impurity-free metal from the body, and means located in said body upstream of the cooling means in the direction of liquid metal flow through said body for recycling part of the fluid which has passed through the impurity retention means back through said cooling means and said means for retaining impurities.

4,693,089

THREE FUNCTION HEAT PUMP SYSTEM

Richard C. Bourne, Davis; Martin Fanciullo, Rancho Cordova, and Willem Bos, Sacramento, all of Calif., assignors to Phenix Heat Pump Systems, Inc., Elk Grove, Calif.

Filed Mar. 27, 1986, Ser. No. 844,545
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—79 **13 Claims**



1. A three function heat pump system for providing a heating mode, a cooling mode, and a hot water production mode irrespective of said heating and cooling modes, said system comprising:

compressor means for compressing refrigerant,

reversible flow refrigerant conduit means for providing series communication among a first heat exchanger located within a medium contained in a first storage tank, throttle means for reducing the pressure of said refrigerant, and an external heat exchanger;

reversing valve means for selectively determining the direction of flow in said reversible flow conduit means in response to a desired heating or cooling mode, said reversing valve means in a heating mode directing refrigerant flow in a first direction to said first heat exchanger to condense said refrigerant prior to directing said refrigerant through said throttle means to said external heat exchanger to evaporate said refrigerant, said reversing valve means in a cooling mode directing refrigerant flow in a second direction opposite to said first direction to said external heat exchanger to condense said refrigerant prior to directing said refrigerant through said throttle means to said first heat exchanger to evaporate said refrigerant; and

dual condenser means for producing hot water irrespective of said heating and cooling modes, said dual condenser means including a second heat exchanger associated with a second storage tank containing water and having bypass valve means for selectively bypassing said first heat exchanger, said dual condenser means providing series communication between said second heat exchanger and said first heat exchanger when hot water is desired with said heating and cooling modes and bypassing said first heat exchanger when hot water is desired without heating and cooling modes, said second heat exchanger functioning as a condenser for said system.

10. A method of providing space heating, space cooling and hot water in a reversible heat pump system, said method comprising the steps of:

compressing a refrigerant in a compressor,

providing series communication for said refrigerant to flow among the compressor, a first heat exchanger, a throttle device, and an external heat exchanger, said first heat exchanger being located within a medium in a first reservoir for providing thermal storage,

causing said refrigerant to flow in a first direction for space heating and in an opposite second direction for space cooling, the refrigerant flowing in said first direction for space heating condensing in said first heat exchanger prior to flowing through said throttle device for reducing the pressure of the refrigerant, said refrigerant subsequently evaporating in said external heat exchanger to provide space heating, said refrigerant flowing in the second direction for spacing cooling condensing in said external heat exchanger prior to flowing through said throttle device, said refrigerant subsequently evaporating in said first heat exchanger to provide space cooling,

providing a second heat exchanger for producing hot water and locating said second heat exchanger in series communication with said first heat exchanger to provide hot water in said heating and cooling modes by directing refrigerant flow through said second heat exchanger prior to said first heat exchanger, said second heat exchanger being located within water in a second reservoir for providing thermal storage, and

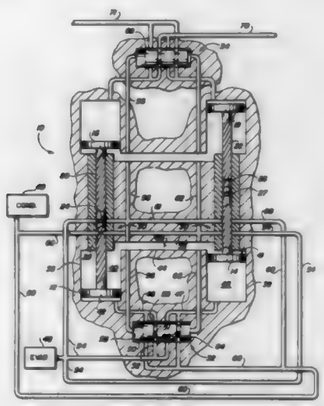
selectively bypassing said first heat exchanger to produce hot water irrespective of said heating and cooling modes, the bypassing of said first heat exchanger including directing refrigerant flow through said second heat exchanger to condense said refrigerant, bypassing said first heat exchanger, and causing said refrigerant to flow directly through said throttle means and said external heat exchanger to evaporate said refrigerant.

4,693,090

THERMALLY POWERED ENGINE UTILIZING THERMALLY POWERED VALVES

Peter M. Blackman, 16035 N. 43rd St., Phoenix, Ariz. 85032

Filed Oct. 16, 1986, Ser. No. 919,469
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—116 **18 Claims**



1. A thermally powered engine comprising:

a pair of power cylinders, each power cylinder defining a closed interior space, with each power cylinder having an upper and lower end;

a power piston reciprocally mounted within the interior space of each cylinder, each power piston dividing the interior space of each cylinder into a first portion and a second portion;

a piston rod connected to each power piston and projecting through an end of each cylinder;

a control fluid substantially filling the first portions of the two cylinders;

means for permitting the control fluid to flow between the first portions of the two power cylinders;

a heat transfer loop including a working fluid, an evaporator, a condenser and the second portion of each of the two cylinders;

mechanically powered control means for controlling the flow of the working fluid through the heat transfer loop and through the second portions of each of the power cylinders so that the movement of the power pistons in each of the cylinders is out of phase, said mechanically powered control means including first and second valve assembly means, each valve assembly means having a first and a second state; the first valve assembly means controlling the flow of working fluid through the second portions of each of the cylinders so that when the first valve assembly means is in its first state one piston executes a power stroke and when the first valve assembly means is in its second state the other piston executes a power stroke; the second valve assembly means in its first state causing the first valve assembly to be placed in its first state and when the second valve assembly is in its second state causing the first valve assembly to be placed in its second state; and

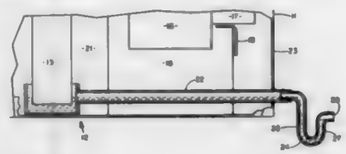
means for converting the motion of two piston rods into useful work.

4,693,091

CONDENSATE DISPOSAL SYSTEM

Raymond D. O'Mara, Mallory, and Ian M. Shapiro, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 19, 1986, Ser. No. 864,354
Int. Cl.[4] F25D *21/00*
U.S. Cl. 62—272 **7 Claims**



1. A condensate disposal apparatus for an air conditioning system of the type having a fan for creating a zone of negative pressure and a coil located in said zone and being susceptible to the formation of condensate on its outer surface; comprising:

a condensate pan disposed below the coil for collecting the condensate as it falls from the coil, said pan having a discharge opening for the flow of condensate from said pan;

a condensate tube fluidly connected to said discharge opening for further conducting the flow of condensate from the pan;

a trap fluidly connected at the other end of said condensate tube for disposing of the condensate from the tube while preventing the flow of air and in the opposite direction; and

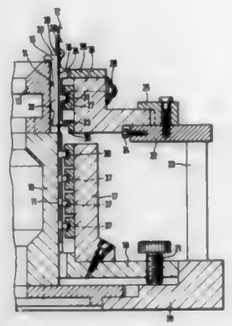
a vent formed in said condensate tube at a location within said negative pressure zone for bleeding off air which may be trapped therein and which would otherwise prevent the flow of condensate from the pan to the trap.

4,693,092

KNITTING MACHINE

Ernst-Dieter Plath, Tailfingen, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungs-Gesellschaft mbH, Tailfingen, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 775,256
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433290
Int. Cl.[4] D04B *15/32, 15/06, 15/24*
U.S. Cl. 66—55 **6 Claims**



1. A knitting machine comprising longitudinally movable latch needles; sinkers longitudinally movable in the same direction as that of said latch needles and pivotable; a sinker support; a needle support, said sinkers being of a small structural length and being positioned in said sinker support which is arranged stationarily relative to said needle support; sinker controlling cams and latch needle controlling cams arranged so that said sinkers during a draw movement of respective needles are longitudinally moved in an opposite direction at least in zones; individual cam supports (**17, 18**), said sinker controlling cams and said needle controlling cams being arranged on said cam supports, respectively, to obtain a predetermined constellation of a needle movement curve (**54**) and a sinker movement curve (**55**), said cam supports being adjustable relative to each other in a longitudinal direction of the sinkers (**15**) and the needles (**12**) and also traversely to said longitudinal direction; at least said cams for said sinkers and said latch needles additionally having loop-sinking cams (**43, 50**) adjustable relative to said cam supports (**17, 18**), said cams being arranged such that the needle movement curve and the sinker movement curve at an end portion of a counter movement have coinciding loop-sinking points (K.N, K.P) in a direction of running.

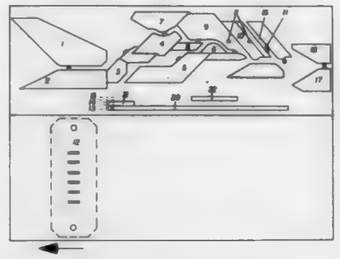
4,693,093

CAM SYSTEM FOR KNITTING MACHINES

Klaus Grüssel, Limbach-Oberfrohna, and Andreas Neuer, Karl-Marx-Stadt, both of German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

Filed Jul. 1, 1986, Ser. No. 880,916
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1985, 2780356
Int. Cl.[4] D04B *7/00*
U.S. Cl. 66—75.1 **4 Claims**

1. In a cam system for knitting machines having a movable knitting carriage, the system comprising a drive cam, a loop transfer cam and a loop acceptance cam integrated in said system, and a needle selecting system in which knitting needles are selected in accordance with sinkers, wherein the knitting needles are provided with lateral expanding springs for enabling a loop transfer without racking a needle bed; and a needle spring cam (**10**), the improvement comprising an additional selection cam for excluding a thread acceptance by the selected knitting needles positioned in a full drive position and for guiding said selected knitting needles over an upper needle sinker away in the region of an upper needle clearing cam (**6**); and an additional needle spring cam for bringing said selected



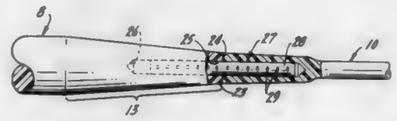
knitting needles to a combing position, said additional needle spring cam being arranged in the direction of moving of the knitting carriage after said aforementioned needle spring cam (**10**).

4,693,094

CIRCULAR KNITTING NEEDLE ASSEMBLY

Jan E. Kahn, Oak Lawn, Ill., assignor to Newell Co., Freeport, Ill.

Filed May 16, 1986, Ser. No. 863,776
Int. Cl.[4] D04B *35/02*
U.S. Cl. 66—117 **1 Claim**



1. In a circular knitting assembly,

a knitting needle,

said knitting needle having a rear end adapted to make abutting engagement with a cable,

a cable,

said cable having an end adapted to make abutting contact with the rear end of a knitting needle,

the rear end of the needle having a smoothly decreasing diameter in the direction of the cable,

the end of the cable having a smoothly increasing diameter in the direction of the needle,

the diameter of the needle and cable being identical at the junction where the respective ends abut,

whereby the junction between each needle and its associated cable end is smooth and uninterrupted throughoutthe useful life of the circular knitting assembly,

connection means for ensuing that no growth appears at the junction between the abutting ends,

said connection means including

a socket having a constant diameter through its operative length formed in the end of the needle,

a socket having the same constant diameter throughout its operative length formed in the end of the cable,

said sockets being axially aligned when the needle and cable are in their final, abutting relationship,

a constant diameter insert received in the aligned sockets in close fitting engagement with the constant diameter sockets in the needle and cable, and

score means on the insert in the area of engagement between the insert and the needle face, and between the insert and the cable face

said cable and needle sockets, where they receive the insert,

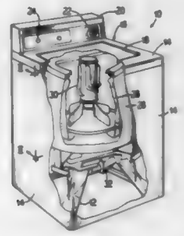
having material integral therewith filling the score means whereby separation of the cable from the socket during the useful of the knitting assembly is precluded.

4,693,095

CLOTHES MOVER AGITATOR FOR AUTOMATIC WASHER

Jeffrey L. Burk, Lincoln Township, Berrien County; Michael J. Bottas, St. Joseph Township, Berrien County; John W. Pielemeier, St. Joseph, and Dale E. Mueller, Benton Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 15, 1986, Ser. No. 941,741
Int. Cl.[4] D06F *17/10*
U.S. Cl. 68—134 **10 Claims**



1. An agitator for use in a wash tub of an automatic washer including a drive motor to rotationally oscillate the agitator within the wash tub to agitate a wash load, comprising:

an agitator body connected for rotational movement by the drive motor about an axis, said agitator body having upper and lower portions, said upper portion having a generally cylindrical surface;

a plurality of blades extending from said lower portion of said agitator body at least a first distance, said plurality of blades agitating the wash load during rotational oscillation of said agitator body; and

a plurality of vanes extending from said upper portion of said agitator body less than said first distance, each of said vanes having an upper end extending substantially parallel to said axis of said agitator body, said upper end being tangential to said cylindrical surface,

each of said vanes having a lower end curving about an arc of said cylindrical surface, said curved lower ends of adjacent ones of said vanes disposed at mutually different radial and longitudinal locations with respect to said axis, said lower curved ends extending further from said cylindrical surface than said upper ends of said vanes,

said plurality of vanes being separate from said plurality of blades.

4,693,096

BRAKE LINE COUPLER LOCK

Sarah F. Mercer, 1007 - 18th St., P.O. Box 1036, Albert Lea, Minn. 56007

Filed Dec. 8, 1986, Ser. No. 939,039
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **12 Claims**

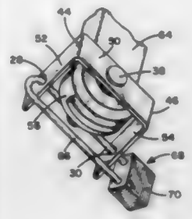
1. A security device for releasable connection to a brake line coupler of a trailer, said device including:

a generally planar, substantially rigid base and means forming an aperture through said base;

an elongate locking pin extended through said aperture and away from the base in a direction generally perpendicular to the plane of said base, and a fastening means on one side of said base for integrally securing the pin with respect to the base;

a first locking arm extended from one end of the base and inclined with respect to said plane; and a second locking arm extended from the opposite end of the base and inclined with respect to said plane;

a substantially rigid retaining member; a first retaining means formed near the free end of said first arm; and a second retaining means formed near the free end of said second arm; said retaining means adapted for mutually releasably



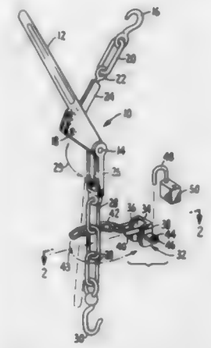
engaging said retaining member and, when so engaging said retaining member with said locking pin inserted into a recess open to one side of a trailer brake line coupler, cooperating to secure said retaining member on the opposite side of said brake line coupler to prevent removal of said pin from said recess.

4,693,097

PORTABLE CHAIN LOCK

Charles A. Rivera, 37849 Birch St., Newark, Calif. 94560

Filed Jun. 9, 1981, Ser. No. 271,978
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—18 **1 Claim**



1. In combination with a chain binder having two halves in the chain tightened position, a portable chain lock adapted to secure said chain binder in the chain tightened position, said chain lock comprising a U-shaped body having a bottom wall and two sidewalls fixed to said bottom wall, said sidewalls having inside and outside surfaces, a pin fixed to said bottom wall between said inside surfaces of said sidewalls, said pin inserted into and held in an opening on one half of said chain binder, a flexible locking chain having two ends, one end fixed to the outside surface of a first of said sidewalls and the other end wrapped around said chain binder and looped over a holding arm fixed to the outside surface of a second of said sidewalls, said holding arm having an opening therein adapted to receive a hasp of a padlock, whereby when said padlock is locked in said opening in said holding arm, said chain lock will be locked in position around said chain binder to prevent opening thereof.

4,693,098

NON-KEY LOCKING CABLE LOCK

Jeffrey L. Davis, 13235 SW. 121st, Tigard, Oreg. 97223; Daniel S. Evans, 1327 Tamarisk Dr., West Linn, Oreg. 97068, and Lawrence P. Hall, 2601 SE. 170th St., Portland, Oreg. 97236

Filed Dec. 22, 1986, Ser. No. 945,000
Int. Cl.[4] B62H *5/00*
U.S. Cl. 70—233 **6 Claims**



1. A cable-lock device for tubular frame vehicles, wherein the cable member is storeable in a hollow frame of the vehicle and is removable without a key from said hollow and capable after insertion into a lock member affixed to said vehicle of locking said vehicle without a key to a stationary structure comprising:

two equal lengths of cables swaged together at one end and having identical halves of a phallic head plug with grooves therein at another end; and

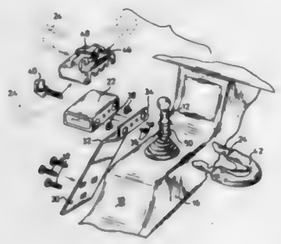
a locking mechanism comprising a sliding latch plate biased in a rest position by a spring, said latch plate having in its lower part of semi-circular opening with an arc at the midpoint of the semi-circle into which said phallic head is inserted to push the latch plate upwardly against said spring until the groove in said phallic head plug is aligned with the semi-circle, said mechanism having a lock plug rotatable cylinder at the opposite end and above said semi-circular opening to release said plug upon rotation of a key inserted in an opening of said lock plug rotatable cylinder.

4,693,099

LOCKING ARRANGEMENT FOR THE GEARSHIFT STICK OF VEHICLES

Josef Cykman, 75 Ben Yehuda St., Tel Aviv, Israel

Continuation-in-part of Ser. No. 650,310, Sep. 12, 1984, abandoned. This application May 13, 1986, Ser. No. 862,682
Claims priority, application Israel, Sep. 16, 1983, 69748
Int. Cl.[4] B60R *25/06;* **E05B** *65/12*
U.S. Cl. 70—247 **6 Claims**



1. An arrangement for preventing motor car theft by locking the gearshift stick to a fixed portion of the motor car comprising a rigid bar rigidly secured to a body portion of the motor car in the vicinity of, parallel to and a length shorter than that of the gearshift stick, a padlock body fixedly mounted onto the bar, and a separable padlock shackle adapted to be locked to the padlock body with the stick enclosed by the shackle, said rigid bar defining a flanged seating portion to which said lock body is affixed and through which the legs of said shackle are inserted in the locked orientation.

4,693,100

SECURITY SYSTEM

Leonard R. Wetz, Jr., Manmouth County, N.J., assignor to Art Metal U.S.A., Inc., Newark, N.J.

Filed Mar. 21, 1986, Ser. No. 842,141
Int. Cl.[4] E05B *15/14*
U.S. Cl. 70—333 A **51 Claims**



1. A tumbler arrangement for a combination lock adapted for having its combination changed either by hand or with the use of a key, said tumbler arrangement comprising:

means for mounting a plurality of tumbler wheels in a stacked relationship for rotation about an axis, each of said tumbler wheels having an inner element releasably engaged with a circumferentially disposed outer element, with each said outer element having a peripheral gate and means for masking said gate;

means for maintaining said inner and outer elements in an engaged condition for simultaneous rotation under normal tumbler operation;

a peripherally gated rotatable driver wheel for rotating said tumbler wheels;

a fence lever having a nose for contact with said driver wheel and a fence for contact with said tumbler wheels;

means for preventing contact by said fence with the circumferential edges of said tumbler wheels while said tumbler wheels are being rotated; and

means for axially disengaging said stacked inner elements from said stacked outer elements by said key while simultaneously preventing rotational and axial movement of said outer elements as the disengaged inner elements are rotated to change the combination of said tumbler arrangement.

4,693,101

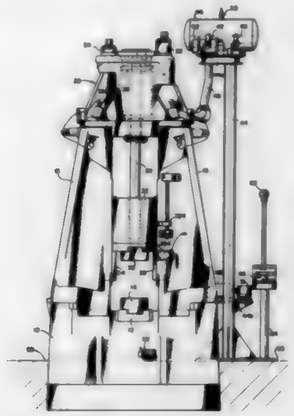
ADAPTIVE, SELF-REGULATING FORGING HAMMER CONTROL METHOD

Charles J. Crout; Charles W. Frame, both of Chambersburg, and Ronald N. Harris, Ft. Loudon, all of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

Division of Ser. No. 695,697, Jan. 28, 1985, Pat. No. 4,653,300. This application Jan. 5, 1987, Ser. No. 576
Int. Cl.[4] B21J *7/38, 7/40*
U.S. Cl. 72—20 **4 Claims**

1. The method of obtaining a preselected kinetic energy at the time of impact in blows of a ram of a forging hammer ina system employing an impact device having a frame supporting at least one cylinder, a piston within said cylinder, means connecting the piston to a ram such that the ram is repeatedly movable relative to the frame from a retracted position into impact position, a driving fluid system including a fluid supply, value means connecting said fluid supply into said at least one cylinder at a position in the cylinder to drive the ram into impact position and permitting release of fluid from the cylinder, and a source of lifting fluid causing the ram to be retracted from impact position when fluid driving the ram into impact is

released from the cylinder, comprising: sensing when the ram and piston are in a predetermined position adjusting the valve means such that fluid flows into the cylinder at a time related to the sensed postion of the ram and piston, determining periodically sensing pressure of the lifting fluid beneath the ram at



regular time intervals to determine the rate of change of pressure with respect to time at various such intervals, employing a computer having a memory to determine maximum velocity from rate of change of pressure with respect to time, calculating from the kinetic energy maximum velocity and ram mass.

4,693,102

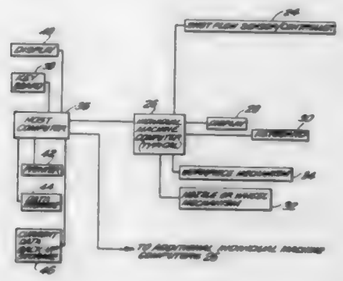
SHOT-PEENING METHOD

A. André Amy, Lafayette, and Jules Babineaux, Scott, both of La., assignors to Metal Improvement Co., Inc., Paramus, N.J.

Filed Nov. 5, 1985, Ser. No. 795,175

Int. Cl.[4] B24C *1/10*

U.S. Cl. 72—53 **3 Claims**



1. A method of producing a series of essentially idential articles in shot-peening equipment having nozzles or wheels for subjecting the articles to shot-peening, comprising the steps of;

(a) developing a set of critical shot-peening parameters yielding specified article properties;

(b) rigidly controlling certain of said shot-peening parameters by using part holding fixtures, Almen strip fixtures, and nozzle fixtures;

(c) continuously controlling shot media by segregating the media both by size and shape;

(d) with a computer controlling, monitoring and documenting said certain critical shot-peening parameters;

(e) with a computer also controlling said controlled shot-peening equipment such that said critical processing parameters stay within preselected maximum and minimum values;

(f) shutting down the shot-peening equipment if the maximum or minimum values are exceeded;

(g) keeping the equipment shut down unless all monitored parameters have been brought with the preselected maximum and minimum values;

(h) documenting via computer print-out, time of any shut down, cause of any shut down, and successful completion of the process; and

(i) documenting the monitored parameters throughout the process, start and successfully completion of process, the maximum and minimum values for each parameter monitored, movement of the nozzles, which nozzles are active, and identification of the articles shot-peened.

4,693,103

FORMING PRESS OF THE PRESSURE CELL TYPE AND A PROCESS FOR CHANGING DIAPHRAMS IN SUCH A PRESS

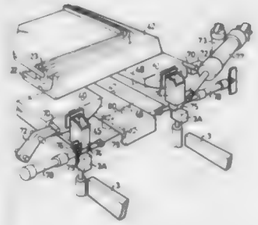
Keijo Hellgren, Västeras, Sweden, assignor to ASEA AB, Västeras, Sweden

Filed Apr. 21, 1986, Ser. No. 853,953

Claims priority, application Sweden, Mar. 4, 1986, 8600973

Int. Cl.[4] B21D *22/12*

U.S. Cl. 72—63 **8 Claims**



1. A forming press of the pressure cell type, comprising a press stand with two opposing pressure absorbing elements defining between them a working space into which a trough for supporting forming tools and a workpiece is insertable; a press plate in communication with a pressure medium source; a diaphragm forming together with the press plate an expansible pressure cell; and side pieces extending along the side surfaces of the working space and retaining the diaphragm in abutting contact with a sealing ring disposed around the periphery of the diaphragm, said side pieces having long sides and end faces, and said ring abutting against the press plate, the side pieces being pivotable into an upwardly swung position so that said long sides thereof abut against the underside of the diaphragm, longitudinal pivot pins projecting outwardly of said end faces, arms pivotally journalled on said press having shaft supports in engagement with said pivot pins so as to define swivels for the side pieces upon pivotable movement thereof, the arms being pivotable into a position out of interference with the side pieces to permit the removal of the unit, and swinging mechanisms mounted on the press and detachably connected to the side pieces for pivoting the side pieces into the upwardly swung position about said swivels, the upwardly swung side pieces and the diaphragm resting thereon comprising a unit removable from the working space, and means on the side pieces for guiding the unit upon removal.

4,693,104

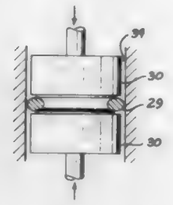
PROCESS FOR MANUFACTURING A SINGLE PIECE ALUMINUM ALLOY WHEEL RIM FOR VEHICLE TIRES

Hiroshi Mori, 2751 Aqua Verde Cir., Los Angeles, Calif. 90077

Filed Apr. 8, 1985, Ser. No. 721,172

Int. Cl.[4] B21H *1/10*

U.S. Cl. 72—68 **4 Claims**



1. A process for forming a single piece rim for vehicle wheels of the type having a radially directed flange for use in securing the rim to a wheel center, said process comprising the steps of pressing against a toroid of alloy material in opposite axial directions to cause said material to flow axially and radially so as to define a hollow tubular element of predetermined length having an annular inwardly directed radial flange intermediary of the ends thereof and spaced predetermined distances from the ends of said element; and bending the ends of said element radially outwardly and axially to define an inner rim flange and an outer rim flange.

4,693,105

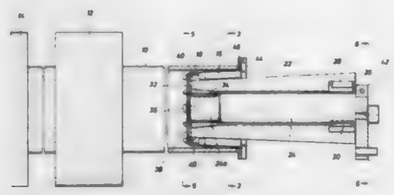
METHOD OF AND APPARATUS FOR STRAIGHTENING, SWAGING, AND THREADING A PIPE

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

Continuation-in-part of Ser. No. 540,342, Oct. 11, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,041

Int. Cl.[4] B21D *3/02*

U.S. Cl. 72—84 **11 Claims**



1. A method of swaging the end of a pipe for threading comprising the steps of rotating the pipe around its longitudinal axis, gripping the pipe with a chuck at a location close enough to the end to be swaged to create bending stresses in the pipe above its yield point when the pipe is forced to rotate on the axis of rotation of the chuck, and moving a plurality of rollers along the axis of rotation of the chuck into engagement with the end of the rotating pipe to force the end of the pipe to rotate around the axis of rotation of the chuck thereby straightening the end of the pipe between the chuck and the rollers and to swage the pipe into the desired thread form concentric with the fixed axis of rotation of the end of the pipe whereby threads can be cut on the thread form that are concentric with the end of the pipe.

4,693,106

APPARATUS FOR AXIALLY SHIFTING ROLLS IN A ROLL STAND

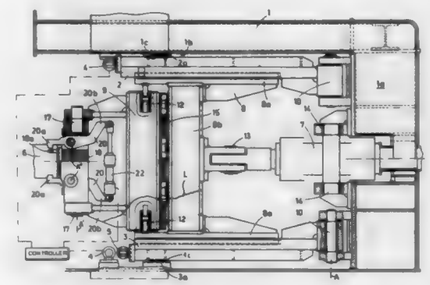
Hans Frosch, Neuss, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,101

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525462

Int. Cl.[4] B21B *31/18*

U.S. Cl. 72—247 **7 Claims**



1. In combination with a roll stand having a roll centered on an axis and provided at one end with a journal block, an apparatus for axially shifting the roll comprising:

an outer frame fixed relative to the stand at the journal block;

a pair of arms extending parallel to one another and having outer ends pivoted on the outer frame at a common arm axis generally perpendicular to the roll axis and inner arm ends adjacent the block;

means including actuators engaged between the inner arm ends and the outer frame for vertically displacing the inner arm ends with pivoting of the arms about the arm axis to a position with the inner arm ends generally level with the journal block;

an inner frame slidable perpendicular to the arm axis on the arms;

a grab mount pivotal on the inner frame about an inner axis parallel to the arm axis;

a grab carried on the mount and axially couplable with the journal block; and

means including an actuator having an inner end pivoted at the arm axis on the outer frame and an outer end pivoted on the inner frame for sliding the frame along the arms and thereby axially displacing the roll coupled to the grab.

4,693,107

METHOD OF MANUFACTURING WOUND BUSH BEARING WITH NOTCH-FREE FLANGE AND MOLD ASSEMBLY FOR MANUFACTURING THE SAME

Masayuki Kohama, Moriyama; Tatsuro Wakabayashi, and Kouichi Tsunoda, both of Shiga, all of Japan, assignors to Oils Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 603,656, Apr. 25, 1984, Pat. No. 4,638,538. This application Sep. 11, 1986, Ser. No. 906,145

Claims priority, application Japan, Apr. 28, 1983, 58-74068

Int. Cl.[4] B21J *13/02*

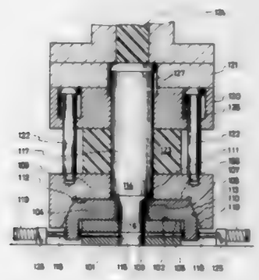
U.S. Cl. 72—354 **12 Claims**

1. A mold assembly for manufacturing a wound bush bearing with a notch-free flange from a substantially cylindrical bush workpiece inserted therein, said workpiece having first and second end portions, the longitudinal axis of said workpiece defining an axial direction, said first end portion being uniformly tapered at at least one of the outer and inner circumferential surfaces so that the radial thickness of said first end

portion is gradually decreased toward the end face of said first end portion, the length of said first end portion in said axial direction being greater than the width of a rear face of said flange to be formed, said mold assembly having an upper mold and a lower mold.

(a) said upper mold comprising:

(i) a punch having a smaller-diameter portion for restricting the radially inward movement of said inner circumferential surface of said workpiece, and a larger-diameter portion continuous with said smaller-diameter portion by way of a shoulder having a smoothly continuous configuration formed by a curved concave portion and an annular end face of said larger-diameter portion, said annular end face being disposed perpendicular to said axial direction when said smaller-diameter portion engages said inner circumferential surface of said workpiece, said punch being capable of applying a pressing force in said axial direction to said first end portion of said workpiece, said shoulder being configured such that said first end portion is bent radially outward during relative axial displacement of said punch and said workpiece in order to form said first end portion into a flange part, and



(ii) a flange clamping mold having a larger-diameter bore for slidably receiving said larger-diameter portion of said punch, and restricting the radially outward movement of said first end portion in order to form said notch-free flange from said flange part, said flange clamping mold being movable axially together with said punch,

(b) said lower mold comprising:

(i) an end face member provided with a first smaller-diameter bore for slidably receiving said smaller-diameter portion of said punch, and restricting the movement of said second end portion of said workpiece on an upper face thereof, and

(ii) a pair of vertically split clamping molds, each mounted on said upper face of said end face member so as to be slidable in a direction perpendicular to said axial direction, said vertically split clamping molds forming a second smaller-diameter bore for restricting the radially outward movement of said outer circumferential surface of said workpiece, the radius of said larger-diameter bore being greater than the radius of said second smaller-diameter bore by an amount substantially equal to the width of said rear face of said flange.

4,693,108

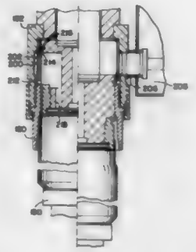
METHOD AND APPARATUS FOR NECKING AND FLANGING CONTAINERS

Edward S. Traczyk, Lockport, and Michael M. Shulski, Northfield, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 453,232, Dec. 27, 1982, Pat. No. 4,519,232. This application Apr. 22, 1985, Ser. No. 725,945

Int. Cl.[4] B21D *41/04*

U.S. Cl. 72—370 **7 Claims**



1. A method of necking an open-ended thin-walled metal container comprising the steps of producing relative movement between a necking die, a punch and said container to (1) initially produce engagement between said necking die and an outer surface of said container; (2) produce relative movement between said container, the necking die and the punch; and, (3) produce engagement between an inner surface of said container and said punch during relative movement so that the metal in the container is drawn into the necking die while being formed to a configuration of the necking die.

4,693,109

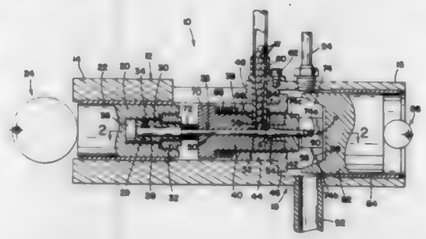
SELF-ALIGNING TOOL ASSEMBLY FOR DIE SHAPING WORKPIECES

Mark J. Connor, Greenville, Del.; George H. Reinemuth, Glen Mills, and Richard S. Cleveland, Swarthmore, both of Pa., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Mar. 4, 1986, Ser. No. 836,045

Int. Cl.[4] B21D *37/10*; B21J *13/04*

U.S. Cl. 72—456 **33 Claims**



1. A self-aligning tool assembly for die shaping workpieces, comprising support means, die means on said support means and having a die axis, tool means on said support means having a tool axis and a working end, means for reciprocating said tool means axially through a stroke including a working portion in which said working end and said die means cooperatively shape a workpiece therebetween, guide means supporting said tool means adjacent said die means, and align-ing means on said guide means and die means clampingly interengaged against relative axial and lateral displacement during said working portion of said stroke and aligning said die and tool during said working portion of said stroke.

4,693,110

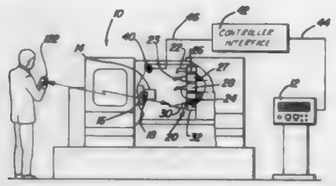
METHOD AND APPARATUS FOR TESTING THE OPERABILITY OF A PROBE

Richard O. Juengel, Romeo, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Jun. 6, 1985, Ser. No. 741,869

Int. Cl.[4] G01D *18/00*; G01M *19/00*; G01B *11/00*

U.S. Cl. 73—1 R **21 Claims**



1. An apparatus for testing the operability of a probe for detecting contact with an object having a displaceable stylus, said probe being used in a machine tool system having a controller, said apparatus comprising:

first circuit means for generating a first signal, said first circuit means able to generate said first signal independently of said controller, said first signal inducing said probe to generate a second signal; and

second circuit means for receiving said second signal, said second circuit means being adapted to generate a third signal indicative of the operability of said probe when said second signal is received, said third signal comprising first and second indicator signals, said first indicator signal being generated when said second signal has a first characteristic, said second indicator signal being generated when said second signal has a second characteristic produced in response to the displacement of said stylus.

4,693,111

POSITION SENSOR FOR A MOVABLE PART IN A MOTOR VEHICLE

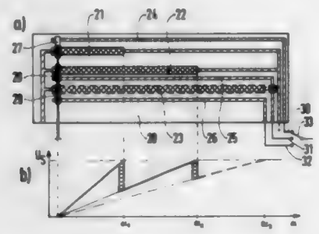
Herbert Arnold, Eberdingen; Walter Bosch, Waiblingen; Michael Horbelt; Wolfgang Maisch, both of Schwieberdingen; Hermann Nusser, Markgröningen; Klaus-Jürgen Peters, Affalterbach; Peter Werner, Wiernsheim, and Clemens Willke, Ditzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,757

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433585

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118.1 **10 Claims**



1. A position detecting device for detecting the position of a movable part over a total range of movement, the device comprising:

a plurality of position pick-ups for picking up a position signal;

a plurality of paths corresponding to respective ones of said pick-ups, said paths being arranged so as to be mutually adjacent and having respectively different lengths over said range so as to conjointly define respective sub-ranges;

a single drive common to all of said pick-ups for simultaneously driving the latter over respective ones of said paths so as to pass sequentially through said sub-ranges; and,

said pick-ups being driven over said paths to engage corresponding ones of said paths at respective times during the movement of said pick-ups over said range thereby providing a variant resolution of said position signal at corresponding ones of said sub-ranges.

4,693,112

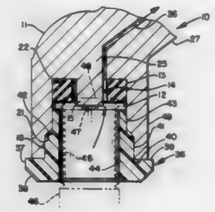
AIR CONDITIONER REFRIGERANT CHECK GAUGE INSERT CONVERTIBLE TO A TIRE CHECK GAUGE

James E. Ferris, 15 High Mesa Pl., Richardson, Tex. 75080

Filed Jun. 12, 1986, Ser. No. 873,386

Int. Cl.[4] B60C *23/02*; G01L *7/16*

U.S. Cl. 73—146.8 **9 Claims**



1. A refrigerant system pressure check gauge comprising: a refrigerant system gas pressure check gauge with a valve head having a valve head opening that fits on and over a refrigeration system valve; a valve pin within said valve head opening positioned to engage and depress a valve stem pin of said refrigeration system valve to open the valve; a resiliently compressible washer, mounted in said valve head opening, and having a center opening sufficiently larger than said valve pin as to not close on said valve pin in order that gas under pressure may pass on through into the valve head; said resiliently compressible washer being so positioned and of such thickness as to be engaged and resiliently compressed by the outher end of said refrigeration system valve as a valve stem pin is being depressed by said valve pin to open said refrigeration system valve; and with said valve pin positioned to engage the said valve stem pin of the refrigeration system valve fitting so that as the pressure gauge is pushed toward the refrigerant valve sitting received in said gauge valve head opening the refrigeration system valve is opened and refrigeration material gases pass from the refrigeration system through internal opening passage means through the pressure gauge to provide a refrigerant gas charge pressure reading for the refrigerant system; wherein a tire valve stem insert guide is provided that is a snug fit in said valve head opening for converting said pressure check gauge from a refrigerant system pressure check gauge to a tire pressure check gauge; and a cylindrically walled insert guide opening through said insert guide with said guide opening sized and centered to be a guide for tire valve stem threaded end insertion to aligned contact of the tire valve stem pin with said valve pin; said resiliently compressible washer is so positioned and of such thickness as to be engaged and resiliently compressed by the outer end of said tire valve stem as the valve stem pin is being depressed by said valve pin to open said tire air valve; said valve pin is positioned to engage said tire valve stem pin of a tire valve so that as the gas pressure gauge is pushed toward the tire valve stem received in said insert guide opening in the insert held in said gauge valve head opening the tire valve is opened for passage of air under tire pressure to and through internal passage means in the pressure gauge to provide an air pressure reading for tire air pressure;

said valve stem insert guide is formed with an enlarged outer head with a shoulder that contacts the end of a gauge valve head opening projection having a circumferential periphery; and with said shoulder extending radially outward beyond the circumferential periphery of said gauge valve head opening projection that facilitates manual removal of said insert guide for conversion of the gauge back to the air conditioner refrigerant pressure check state.

4,693,113

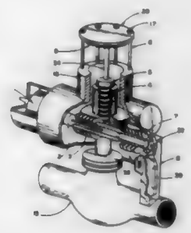
MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

John A. McNeanamy, Cobb; Steven Nafziger, Gwinnett; Arthur G. Charbonneau, Marietta, and Dwaine A. Godfrey, Fulton, all of Ga., assignors to Charbonneau and Godfrey Associates, Marietta, Ga.

Division of Ser. No. 741,861, Jun. 6, 1985, Continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Jun. 23, 1986, Ser. No. 877,974

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—168 **12 Claims**



1. A spring pack movement monitoring device for monitoring the movement of the spring pack found within a valve operator, wherein the valve operator includes a driven worm shaft, which in turn drives a worm, which in turn drives a worm gear which in turn drives a valve stem to open and close a valve attached to the valve stem, and a spring pack provided at one end of the worm shaft for compression by the worm, said spring pack movement monitoring device comprising:

a spring pack engagement member for making contact with the spring pack;

tension means for maintaining said spring pack engagement member in constant contact with the spring pack;

said engagement member moving in direct response to movement of the spring pack;

a linear velocity differential transducer in communication with said spring pack engagement member and comprising a core element movable relative to a bracket element, wherein movement of the spring pack results in a relative movement between said core element and bracket element;

said linear velocity differential transducer further comprising means for detecting the relative movement between said core element and bracket element; and

means for recording the detected movement between said core element and bracket element.

4,693,114

GYROCOMPASS NAVIGATION SYSTEM FOR LAND VEHICLES

Frank S. DeCarlo, Paramus, and Frank L. Rosen, Parsippany, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 5, 1986, Ser. No. 859,542

Int. Cl.[4] G01C *21/00*

U.S. Cl. 73—178 R **12 Claims**

1. A gyrocompass navigation system for land vehicles characterized by:

a case mounted in a vehicle;

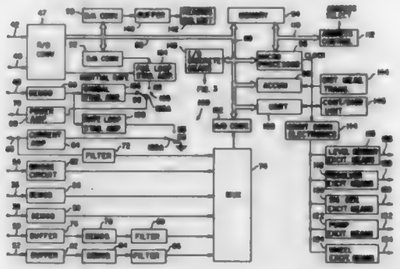
a first gimbal journalled in the case for displacement about a first axis;

a gyro including a second gimbal journalled in the first gimbal for displacement about a second axis;

the gyro being initially in a gyrocompassing mode, said gyro having an input axis which moves in a plane defined by the longitudinal and lateral axes of the vehicle;

means for displacing the first gimbal about the first axis;

means coupled to the first gimbal and responsive to the displacement thereof about the first axis for providing signals corresponding to the displacement of the longitudinal axis of the vehicle from true north, said signals corresponding to the heading of the vehicle;



means coupled to the second gimbal for rotating the gyro input axis substantially ninety degrees, with the gyro thereupon stabilizing the displacement of the first gimbal about the first axis and being rendered in a navigation mode;

means coupled to the first gimbal for detecting gyro drift and for compensating for said drift;

means for providing signals corresponding to the distance travelled by the vehicle; and

means connected to the vehicle distance signal means and the vehicle heading signal means and responsive to the signals therefrom for providing the present position of the vehicle.

4,693,115

DEVICE FOR MEASURING FLOW RATE OF AIR

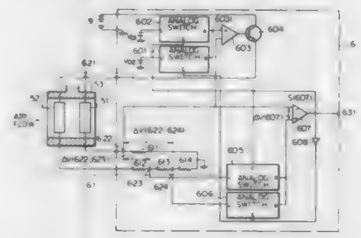
Norihito Tokura, Aichi; Mitiyasu Moritugu, Nishio, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 19, 1985, Ser. No. 724,964

Claims priority, application Japan, Apr. 24, 1984, 59-83269; Jul. 3, 1984, 59-138219; Jan. 15, 1985, 60-5552

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **11 Claims**



1. A device for measuring the flow rate of air comprising:

an electric heater arranged in a path of air flow and having a temperature dependent resistance material;

a temperature compensation resistor disposed at a distance from said heater in said path of air flow, the resistance of said resistor being changed according to the temperature of air, said temperature compensation resistor, and said heater being arranged to form a bridge circuit together with a plurality of fixed resistors;

electric power supply means for supplying said bridge circuit with electric power;

temperature selection means for selecting one of a plurality of temperature values to be attained by said electric heater, said temperature values being determined according to a change of resistance of said temperature compensation resistor;

comparator means for comparing the temperature of said electric heater with said selected one of temperature values selected by said temperature selection means;

electric power value switching means for switching an electric power level of said electric power supply means in response to an output of said comparator means indicative of a condition that one of said selected temperature values is attained or maintained;

temperature switching means for switching the selected temperature of said temperature selection means substantially simultaneously with the switching of said electric power value switching means; and

time measurement means for measuring the time required for the change of temperature between said plurality of temperature values due to the change of the temperature of said electric heater caused by the switching by said electric power value switching means;

the time measured by said time measurement means corresponding to the flow rate of air.

4,693,116

SEMICONDUCTOR-CHIP GAS-FLOW MEASURING APPARATUS

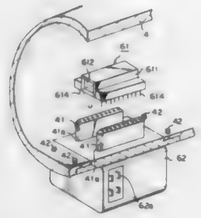
Kazuhiko Miura, Aichi; Tadashi Hattori; Yukio Iwasaki, both of Okazaki; Tokio Kohama, Nishio, and Kenji Kanehara, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 621,628, Jun. 18, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,616

Claims priority, application Japan, Jun. 20, 1983, 58-110399

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **16 Claims**



1. An apparatus for measuring the flow rate of gas through a passage comprising:

a semiconductor chip including an electric heater, a first temperature-detecting element, and a second temperature-detecting element located closer to said electric heater than said first temperature-detecting element;

said semiconductor chip being mounted within said passage so that said electric heater, and said first and second temperature-detecting elements are in line with the direction of the gas stream;

support means for supporting said semiconductor chip so as to expose both the front and back of said semiconductor chip to the gas stream, thereby suppressing the transfer of heat from said semiconductor chip to said support means, said support means comprising two protrusions having approximately the same width as that of said semiconductor chip, the end portions of said semiconductor chip being fixed to said protrusions; and

sensing circuit means, connected to said semiconductor chip, for controlling the power supplied to said electric heater so that the difference in temperature between said first and second temperature-detecting elements is definite, thereby generating a voltage corresponding to a flow rate of said gas flowing through said passage.

4,693,117

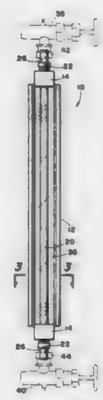
REPLACEMENT ELEMENT FOR AT LIQUID LEVEL GAUGE SIGHT TUBE

Stephen K. Mills, Tulsa, Okla., assignor to Kenco Engineering Company, Tulsa, Okla.

Filed Sep. 13, 1985, Ser. No. 775,804

Int. Cl.[4] G01F *23/02*

U.S. Cl. 73—326 **4 Claims**



1. A shielded tubular gauge for placement between two spaced apart compression type fittings connected to a vessel or the like so as to show a liquid level, comprising:

a single elongated vertical sheet metal structural frame of single thickness throughout its expanse, the frame having an upper end and a lower end, the sheet metal frame being bent into a generally square cross-sectional channel configuration and being open on one side and closed on three sides, the open side providing spaced-apart vertical edges, each edge being bent into a U-shaped cross-sectional shape, the open ends thereof facing each other;

a first connection housing secured to said upper end of said frame and a second connection housing secured to said lower end of said frame, each housing having an opening therethrough, each opening having a portion which is internally threaded, the housings being secured to said frame with said openings in axial alignment and with the threaded portions extending opposite each other;

a transparent tubular member received in said frame and said housing openings;

two packing members, each having an opening therethrough and each having an external threaded portion at one end and an external cylindrical surface at the other end, each of said threaded portions being receivable in a respective one of said connection housing threaded openings, and when so positioned, snuggly receiving an end portion of said transparent member;

packing means within each of said connection housings surrounding the end portion of said transparent member and engaged by said packing member for sealably closing said transparent member and said packing members; and

an elongate sheet of protective material slideably received in said U-shaped portions of said frame vertical edges, said tubular member being visible through said sheet of protec-

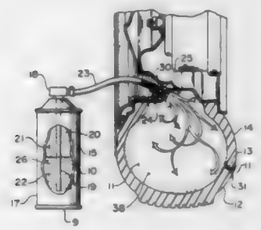
tive material whereby said transparent tubular member is protectively surrounded on all sides and the shielded tubular gauge may directly replace a standard tubular sight glass having an outside diameter substantially the same as the outside diameter of said packing members external cylindrical surfaces.

4,693,118

PNEUMATIC TIRE LEAK DETECTOR

Simon Roberts, 30543 Shoreham, Southfield, Mich. 48076

Division of Ser. No. 750,591, Jul. 1, 1985, Pat. No. 4,612,798. This application Apr. 25, 1986, Ser. No. 856,007
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—40.7 **9 Claims**



8. A leak detector apparatus for detecting the location of a leak in a pneumatic tire comprising in combination:

(a) a pressure sustaining container for storing a powdered pigment;

(b) a powdered pigment stored inside of said container for visually indicating the location of a leak in said tire, said powdered pigment being of a material and a fine enough particle size to be transported by a propellant from the container to the interior of the tire, thence to combine with said propellant and air inside the tire to form an aerosol suspension of powdered pigment throughout the interior of the tire, and thence to flow through and stain the perimeter of a puncture in the tire to visually detect the location of a leak in the tire;

(c) a closure threadably connected to said container for adding said powdered pigment;

(d) an inlet fitting mounted on said closure for admitting a propellant into said container;

(e) a propellant for transporting the powdered pigment to the interior of a tire;

(f) a manually operated outlet valve mounted on said closure for controlling the discharge of powdered pigment and propellant from said container;

(g) a flexible tube for conveying said powdered pigment to said tire;

(h) a fitting attached to one end portion of said tube for connecting said tube to the outlet valve mounted on said closure; and

(i) a fitting attached to the other end portion of said tube for connecting said tube to an inlet valve of the tire, said fitting having a means for sealing the attachment of the tube to the inlet valve and a means for opening the tire inlet valve.

4,693,119

LITHIUM BATTERY ENERGY MONITOR

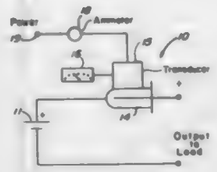
Leopold J. Johnson, Valley Center, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1986, Ser. No. 819,947
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 **8 Claims**

1. An apparatus for monitoring the energy level of a battery delivering a load current comprising:

means for imparting vibratory motion over a predetermined frequency range;

means connected to the battery and operatively coupled to the vibratory motion imparting means having a cantilevered electrode for changing its resonating mass in response to deposits thereon caused by accumulations of the load current; and



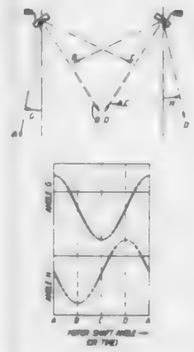
means electrically coupled to the vibratory motion imparting means for indicating a change of resonant frequency of the resonating mass changing means as more deposits are accumulated on the cantilevered electrode thereby monitoring the energy level of the battery.

4,693,120

REAL TIME ULTRASONIC SCANNING METHOD AND APPARATUS

David E. Robinson, Bilgola Plateau, Australia, assignor to The Commonwealth of Australia, Australian Capital Territory, Australia

Filed Jun. 23, 1986, Ser. No. 877,485
Claims priority, application Australia, Jun. 26, 1985, PH1224
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—618 **6 Claims**



1. A method of producing a sectional ultrasonic echogram of an object comprising the steps of

(a) mounting a pair of ultrasonic transducers in spaced-apart relationship adjacent to said object, each transducer transmitting pulses of ultrasonic energy into the object when the transducer is activated and receiving echoes of the pulses from acoustic discontinuities in the object;

(b) oscillating each said transducer about a respective axis which passes through the transducer, each transducer being oscillated through substantially the same predetermined angle with the same period of oscillation;

(c) synchronising the oscillation of the transducers so that when one of the transducers is at substantially the midpoint of its predetermined angle of oscillation, the other transducer is in the region of one of the edges of its predetermined angle of oscillation;

(d) providing a stream of electrical pulses at a constant pulse repetition rate, each of said electrical pulses being adapted to activate the ultrasonic transducers; and

(e) supplying the electrical pulses to the ultrasonic transducers in such a manner that

(i) when one of the transducers is in the region of said mid-point of its predetermined angle of oscillation, it receives a predominance of the electrical pulses, and

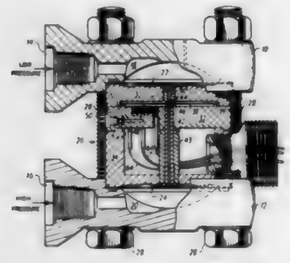
(ii) when the transducers are each between their respective mid-points of their angles of oscillation and an edge of their angles of oscillation, the electrical pulses are supplied alternately to the transducers.

4,693,121

DIFFERENTIAL-PRESSURE MEASURING APPARATUS WITH IMPROVED OVERPRESSURE PROTECTION

Howard W. Nudd, Jr., Foxboro, and David N. De Moura, Taunton, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jun. 5, 1985, Ser. No. 741,538
Int. Cl.[4] G01L *7/08, 9/00*
U.S. Cl. 73—706 **18 Claims**



1. In a differential-pressure measuring instrument of the type including a sealed interior pressure chamber containing a fill-liquid and having a pair of flexible diaphragms through which an input differential pressure may be applied to said fill-liquid, said instrument further including sensing means responsive to said differential pressure to produce a corresponding output signal;

that improvement for protecting the instrument from over-range pressure conditions comprising:

a circular spring plate extending completely across said pressure chamber between said diaphragms dividing said pressure chamber into first and second fill-liquid sections and responsive to said differential pressure to effect corresponding deflection thereof;

a valve-closure member secured to one side of said circular spring plate at the center of the circle defining the outer edges of said plate;

valve seat means in the chamber section adjacent said one plate side and operable upon engagement by said valve-closure member to close off liquid communication between the region adjacent said one side and the remainder of the fill-liquid of the corresponding chamber section;

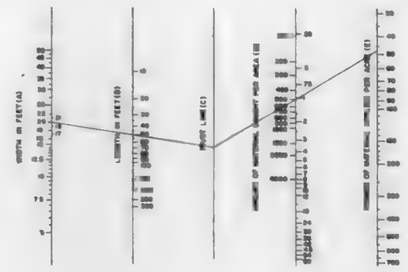
said spring plate being operable to move said valve-closure member into engagement with said valve seat means to close said valve seat means upon deflection of the center of said spring plate by a differential pressure exceeding a predetermined magnitude, whereby the fill-liquid on said one side of said spring plate is locked in place to provide a liquid back-up preventing further deflection of said plate.

4,693,122

METHOD AND APPARATUS FOR CALIBRATING A MATERIAL-SPREADING APPLICATOR

Charles A. Griffith, Rte. 5, Box E44, Ardmore, Okla. 73401

Filed Feb. 18, 1986, Ser. No. 830,226
Int. Cl.[4] G01M *19/00*; G01F *25/00*
U.S. Cl. 73—861 **5 Claims**



1. A method for calibrating an applicator of the type which uniformly spreads material on a surface as the applicator moves thereover, said method comprising the steps of:

determining the width of material spread by such an applicator in a single pass;

moving the applicator over the surface for a measured length;

catching the amount of material which the applicator would have spread over the surface while it was so moved;

weighing said caught material;

locating said width on a first nomograph scale;

locating said length on a second scale of said nomograph;

locating the weight per first unit area of said caught material on a third scale of said nomograph; and

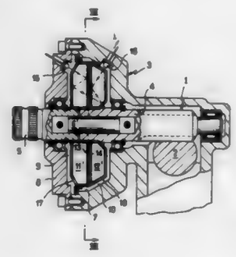
using lines through said located parameters on said first, second, and third scales to locate the weight applied per second unit area on a fourth scale of said nomograph.

4,693,123

ELECTRO-OPTICAL TORQUE SENSING DEVICE FOR AN ACTUATING MECHANISM

Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Mar. 11, 1986, Ser. No. 838,631
Claims priority, application Spain, Mar. 14, 1985, 541.703
Int. Cl.[4] G01L *3/12*
U.S. Cl. 73—862.33 **7 Claims**



1. A torque sensing device for an actuating mechanism, particularly for the steering or the steerable wheels of a vehicle, the mechanism comprising, in a casing, a primary rotary member which is intended to be connected to a control member, a secondary rotary member which is coaxial with said primary member and intended to be connected to an output member, an elastic torsion member which cooperates with said

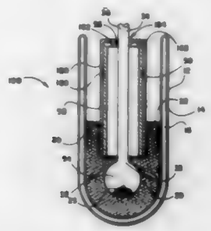
primary and secondary members and allows relative rotation between the latter through a determined angular range on each side of a relative neutral position, and sensor means which is sensitive to the relative rotation between said primary and secondary members so as to provide a corresponding electrical signal, characterized in that the sensor means comprises first and second rotating structures which are rotatably fixed to said primary member and secondary member, respectively, and which comprise zones which are capable of rotating in the vicinity of one another and relative to one another, each zone of each rotating structure comprising a series of optical windows which are angularly spaced and arranged in such a way that each window is capable of crossing a light path between a light source and at least one photo-electric detector of proportional type, said windows of each series being arranged in such a way that in said relative neutral position two corresponding windows each belonging to respective series partially overlap in said light path, the rotating structures comprising two discs which are parallel and axially adjacent, said discs situated in a chamber of said casing, said light source and detector communicating optically with opposite axial zones, respectively, of the chamber, each disc made of a translucent material and comprising an outer axial surface and an inner axial surface which are coated with a layer of an internally reflective opaque coating, said inner axial surfaces of said two discs being adjacent, said windows being formed in said coating of said inner axial surfaces, and said outer axial surfaces each having an annular zone which is not coated and which is adjacent the respective zone of said chamber.

4,693,124

TEMPERATURE CONTROLLING APPARATUS FOR USE WITH PORE VOLUME AND SURFACE AREA ANALYZERS

Graham R. Killip, Doraville; Ronnie W. Camp, Duluth, and Clyde Orr, Jr., Dunwoody, all of Ga., assignors to Micromeritics Instrument Co., Norcross, Ga.

Filed Feb. 25, 1986, Ser. No. 833,079
Int. Cl.[4] G01N *1/28*
U.S. Cl. 73—863.11 **33 Claims**



1. A method of cooling a sample contained in a vessel, comprising the steps of:

immersing said vessel in a container of volatile cooling liquid with a portion of said vessel extending above the surface of said liquid; and

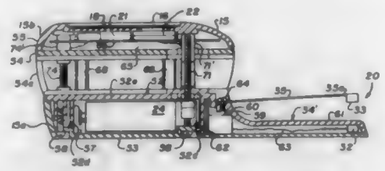
conducting said liquid from a location at or below the surface of said liquid in said container along said vessel to a predetermined point along the length of said vessel, said point being above the surface of said liquid, regardless of changes in the level of the surface of said liquid.

4,693,125

FORCE DETECTING AND INDICATING APPARATUS FOR FISHING RODS

Gary W. Krutz, West Lafayette, and James W. Kruse, Fort Wayne, both of Ind., assignors to Outdoor Electronics, Ltd., West Lafayette, Ind.

Filed Oct. 8, 1985, Ser. No. 785,579
Int. Cl.[4] A01K *97/12*; G01L *5/10*
U.S. Cl. 73—862.39 **23 Claims**



1. Apparatus for detecting and measuring forces on a fishing rod due to pull on a fishing line attached to the rod or to weight hanging on the rod, comprising:

transducer means for detecting the deflection of the fishing rod caused by forces on the fishing rod and providing analog signals representative of such forces;

signal conditioning means coupled to said transducer means for converting the analog signals to digital signals;

digital signal processing means coupled to said signal conditioning means, and having receiving means for receiving said digital signals and computing means for computing the values of the forces on the fishing rod which are causing the deflection of the rod; and

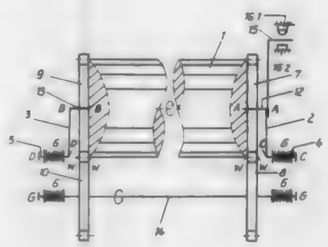
user interface means including indicating means controlled by said signal processing means to provide an indication of at least a rod deflection condition and the maximum value of force detected due to such condition.

4,693,126

FEED ROLL FOR MATERIAL WEB TRANSPORTING AND MEASURING WEB TENSION

Dietrich Haak, and Kerstin Hauer, both of Leipzig, German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed May 8, 1986, Ser. No. 862,307
Claims priority, application German Democratic Rep., Jul. 26, 1985, 2790132
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **4 Claims**



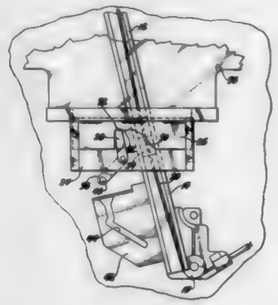
1. In a feed roll for transporting a material web and measuring a tension of a continually movable material web, the feed roll being in contact with an outer surface of the web due to the web tension and wrapping of the web around the roll the improvment comprising two levers (2,3) each positioned at one side of the feed roll so that the feed roll is rotatably and friction-free supported in said levers; said levers being pivotally supported in a machine frame and having axes of rotation (C—C, D—D) which lie on the same straight line and extend through a point of action of a pulling force (F_D) of a portion of the movable material web the web tension of which is not measured and also through a point on a line of action of all resulting drive forces for the feed roll; means for returning said levers to initial positions; and a measure value-receiver (16) corresponding to at least one of said levers and rigidly arranged in the machine frame, said measure value-receiver measuring an amount of pivoting of said at least one lever, proportional to the web tension in a running portion of the movable material web.

4,693,127

DUAL CAM WINDOW REGULATOR APPARATUS AND METHOD

Mark C. Alty, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1986, Ser. No. 877,644
Int. Cl.[4] F16H *25/12*; E05F *11/48*
U.S. Cl. 74—25 **15 Claims**



1. A vehicle window regulator for regulating a window, said regulator comprising in combination:

a drive member;

a drive member guide structure;

means for imparting a reversible linear movement of said drive member along said guide structure;

a first plate for attachment to said window having a first cam surface;

a first plate mounting means attached to said drive member allowing relative motion between said drive menber and said first plate;

a first cam lever pivotally attached with said first plate mounting means for engagement with said first cam surface;

a second cam lever operatively connected with said first cam lever;

and a second cam surface for engagement with said second cam lever being fixed with respect to said drive member guide structure whereby the window is lifted at a variable rate with respect to said drive member.

4,693,128

APPARATUS FOR CONVERTING LINEAR MOTION TO ROTARY MOTION

Arthur E. Plow, Ponchatoula, La., assignor to T K Valve & Manufacturing, Inc., Hammond, La.

Continuation of Ser. No. 663,316, Oct. 22, 1984, abandoned.
This application Apr. 11, 1986, Ser. No. 851,882
Int. Cl.[4] F16H *25/24, 21/44*
U.S. Cl. 74—104 **10 Claims**

1. An apparatus for converting linear motion to rotary motion comprising:

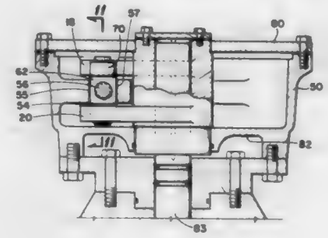
a housing generally circular in shape and having a top and a bottom;

a rib in said housing, said rib having a single elongated rib slot therein with opposite walls;

yoke assembly having a hub and an upper pair of arms and a lower pair of arms extending outwardly from said hub;

a drive screw having two ends and extending through said rib slot, each said end being supported by said housing;

a drive nut on said screw and positioned in said rib slot, said



drive nut having an upper and a lower roller, said upper roller positioned in a slot between said upper pair of arms and said lower roller positioned in a slot between the said lower arms;

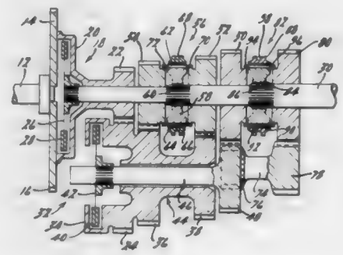
said drive nut being in sliding contact with the walls of said rib slot such that said rib resists any lateral force on said drive screw generated by the force between the yoke assembly and the drive nut.

4,693,129

COUNTERSHAFT AUTOMATIC TRANSMISSION

Stanley L. Pierce, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 25, 1984, Ser. No. 624,317
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—333 **6 Claims**



1. A multiple speed ratio transmission for use in delivering torque from an engine comprising:

an output shaft;

an input pinion continuously driven by the engine;

first clutch means for selectively connecting the engine to the output shaft;

a countershaft mounted for rotation parallel to the output shaft;

gearing defining multiple pairs of meshing gears and pinions including a first group of such pairs having the gears rotatably mounted on the output shaft and the pinions formed integrally with a gear wheel, said pinions being rotatably mounted on the countershaft and driven from the input pinion, said gearing further includes a second gear-pinion pair having the gear of said second gear-pinion pair rotatably mounted on the output shaft and the pinion of said second gear-pinion pair non-rotatably connected to the countershaft;

second clutch means for selectively driveably connecting the input pinion to the countershaft;

first coupler means for selectively driveably connecting the gear of a gear-pinion pair of the first group to the output shaft; and

second coupler means for selectively driveably connecting the gear of the second gear-pinion pair to the output shaft.

4,693,130

MAGNETIC BEARING SUPPORT GEAR TRAIN

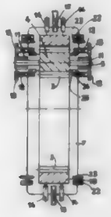
Joachim Kotzur, Oberhausen, Fed. Rep. of Germany, assignor to M.A.N.Maschinenfabrik Augsburg-Nürnberg AG, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,653

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446211

Int. Cl.⁴ F16H *35/06*

U.S. Cl. 74—397 **6 Claims**



1. A gear train comprising a gear case, a central wheel having a toothed circumference and mounted for rotation about a central axis in said gear case, a plurality of toothed pinion spaced around and engaged with said central wheel for rotation with rotation of said central wheel and to hold said central wheel centrally on its central axis, said tooth pinion each having a pinion shaft, first radial magnet bearings receiving each pinion shaft and exerting radial magnetic forces on each pinion shaft, a first radial sensor connected to each said first said radial magnet bearings for controlling each first radial magnet bearing to maintain a radial position of each pinion shaft, second radial sensor for sensing a radial position of said central wheel and being connected to said first radial magnet bearings, said first radial bearings are controlled by said first and second sensors to displace the radial position of each respective pinion shaft for maintain a selective spacing between teeth of said central wheel and of each pinion whereby said spacing is changable to correct for circumferential forces and for heat forces.

4,693,131

FEEDING APPARATUS EMPLOYING BALL SCREW

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

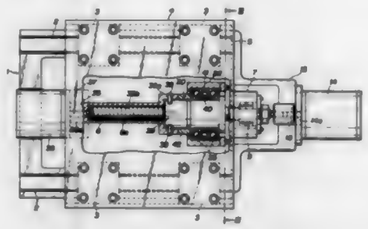
Filed Jun. 11, 1985, Ser. No. 743,698

Claims priority, application Japan, Jun. 13, 1984, 59-119786

Int. Cl.⁴ F16H *25/22*

U.S. Cl. 74—424.8 B **1 Claim**

1. In a feeding apparatus employing a ball screw and ball nut assembly for moving a table axially movably supported on a fixed bed, said apparatus comprising a ball screw supported at one end thereof by the fixed bed in a rotatable and axially immovable manner, a ball nut mounted on said ball screw through balls and supported by said table in an axially immovable manner, and a first drive source mounted on the bed to rotate the ball screw, the improvement in which said ball nut is rotatably supported by said table and a second drive source means mounted on said table for directly rotating said ball nut through a hollow shaft directly receiving the other end of said ball screw so that a fine feed and coarse feed of said table is



provided solely by the separate drive of said ball screw and said ball nut.

4,693,132

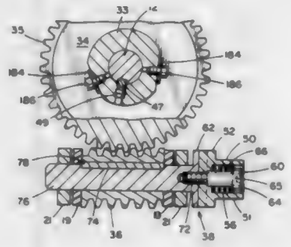
DRIVE MECHANISM FOR DRAWOUT HIGH AMPERAGE MULTI-POLE CIRCUIT BREAKER

Clifford A. Buxton; David C. Higgins, both of Cedar Rapids, and Gary A. Volesky, Newhall, all of Iowa, assignors to Square D. Company, Palatine, Ill.

Division of Ser. No. 697,355, Feb. 1, 1985, abandoned. This application Jul. 8, 1986, Ser. No. 883,251

Int. Cl.⁴ F16H *1/16;* **F16D** *7/04*

U.S. Cl. 74—425 **5 Claims**



1. An improved drive mechanism for a worm gear mounted on a shaft to rotate the shaft about its longitudinal axis in response to operation of said drive mechanism with stop means provided to stop rotation of said shaft at a predetermined position, said mechanism comprising:

a worm operably positioned to turn said worm gear;

a driver shaft assembly including a first head having a top portion, a bottom surface and a central aperture extending longitudinally through said head, a ridge having side walls extending outward from said bottom surface and converging toward each other;

a driver shaft connected to said worm to rotate said worm in response to rotation of said driver shaft, said driver shaft having a second head engaging said bottom surface of said first head and including portions defining a channel shaped and dimensioned to nestingly receive said ridge; and

biasing means for connecting said first head to said second head and biasing said first head towards said second head to transfer rotational movement of said first head to said driver shaft through rotation of said ridge within said channel while permitting said ridge to withdraw from said channel in response to substantially predetermined torque being applied to said first head, said second head including a threaded aperture and said biasing means comprising a shoulder screw having a third head of a specified diameter, a central shaft portion having a lesser diameter than said third head and a threaded shaft portion, and a coil

spring retained in said aperture of said first head about said central shaft portion and retained within said first head by said third head of said screw.

4,693,133

NOISE REDUCTION IN GEAR TRANSMISSION

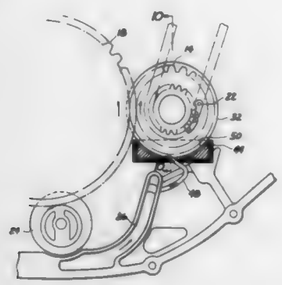
Takao Tomita, and Noriaki Kawai, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 499,879

Claims priority, application Japan, Jun. 18, 1982, 57-104718; Jun. 18, 1982, 57-91034[U]

Int. Cl.⁴ F16H *57/04*

U.S. Cl. 74—467 **7 Claims**



1. A lubricated gear system in a vehicle transmission comprising:

first and second gear wheels including hubs rotatable about spaced, parallel axes and having gear teeth about the periphery of each of said hubs adapted for mutual meshing engagement;

means forming a wall on each side of said gear teeth substantially closing the spaces between adjacent gear teeth about the periphery of said first gear wheel, said means being sufficiently radially extensive to overlie the ends of the gear teeth on both of said gear wheels in th region of their meshing engagement;

a sump containing a body of fluid lubricant disposed subjacent said second gear wheel and whereby the lower peripheral region of said second gear which is immersed in said sump;

a vessel separate from and elevated above said sump in subjacent relation to said first gear wheel and forming an enclosure about the lower peripheral region of said first gear wheel which enclosure extends to a point in close proximity to the region of meshing engagement between the teeth of the respective gear wheels;

means for forming a lubricant supply tube penetrating said vessel and adapted to discharge lubricant directly on the teeth of said first gear wheel; and

a pump operatively connected between said sump and said lubricant supply tube for supplying lubricant from said sump to said supply tube.

4,693,134

HIGH-POWERED VEHICLE DRIVE TRAIN

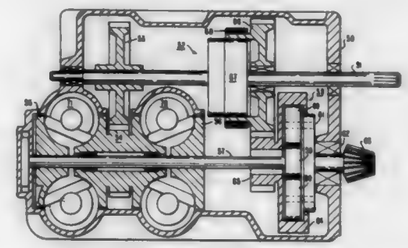
Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Jun. 20, 1985, Ser. No. 746,643

Int. Cl.⁴ F16H *37/06, 15/08*

U.S. Cl. 74—690 **3 Claims**

1. A vehicle comprising: an engine having an infinitely variable transmission operatively coupled thereto for transmitting engine power to the transmission's input shaft, with the transmission output shaft being operatively connected to the vehicle's drive wheels, said transmission comprising a planetary drive structure including a drive ring gear carrying a first gear in engagement with a drive gear on said input shaft for rotation of said drive ring gear with said input shaft, a central sun gear and planetary gear members disposed in the annular space between, and in engagement with, said drive ring gear and said sun gear and rotatably supported on a planetary carrier which is supported for rotation with the transmission output shaft and an infinitely variable toroidal traction roller transmission structure including two parallel toroidal transmissions having a central input toric disc structure common to both toroidal transmissions and operatively connected to said input shaft, the output toric discs being mounted on a shaft associated with the sun gear of said planetary drive, each of said two parallel toroidal transmissions having oppositely disposed toroidal traction discs with traction rollers pivotally supported therebetween and in engagement therewith for the transmission of



motion in opposite directions of rotation and at a transmission ratio which depends on the pivot position of said traction rollers, said input shaft being supported parallel to and spaced from the output shaft and said input toric disc structure being provided with a second gear in engagement with a third gear on said input shaft for rotation therewith and the output toric discs being operatively connected to said sun gear for driving said sun gear in a direction opposite to that of said ring gear and at a speed which depends on the pivot position of said traction rollers for controlling the orbit speed of said planetary gears and, together therewith, of said output shaft, said drive gear being rotatably mounted on said input shaft and provided with a clutch allowing selective engagement of said drive gear with said input shaft for rotation therewith, said drive gear also having braking means for locking said drive gear.

4,693,135

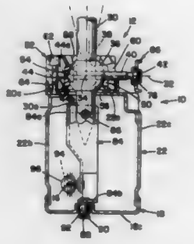
MANUALLY OPERABLE GEARSHIFT MECHANISM

William J. LaRocca, Sterling Heights, and David M. Truth, Warren, both of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Jun. 5, 1986, Ser. No. 870,997

Int. Cl.⁴ G05G *7/00*

U.S. Cl. 74—473 R **27 Claims**



1. A manually operable gearshifting mechanism for displacing a pair of transmission gear actuators comprising support

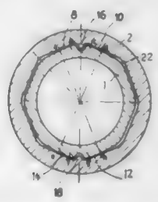
means, a gearshift lever, means mounting said gearshift lever on said support means for pivotal movement about first and second orthogonal axes, means to reciprocate one of said gear actuators in response to pivotal movement of said gearshift lever about said first axis, pin means on said gearshift lever parallel to said first axis, and means actuated by said pin means to reciprocate the other of said gear actuators in response to pivotal movement of said gearshift lever a given angular distance about said second axis, said means to reciprocate said one gear actuator including means responsive to said pivotal movement of said gearshift lever said given angular distance about said second axis to restrain displacement of said one gear actuator to an angular distance less than said given angular distance, said displacement of said one gear actuator being laterally of the direction of reciprocating movement thereof.

4,693,136

TELESCOPIC SUB-ASSEMBLY FOR A STEERING COLUMN

Michel M. Clerc, Valentigney; Frederic M. Mouhot, Voujeaucourt, and Jean-Pierre Barnabé, Valentigney, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Sep. 5, 1986, Ser. No. 903,931
Claims priority, application France, Sep. 6, 1985, 85 13283
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **11 Claims**



1. Telescopic sub-assembly for a steering column comprising an outer hollow shaft, an inner shaft having an end portion which is a force fit inside an end portion of the outer shaft, said end portion of the outer shaft and said end portion of the inner shaft having respectively an inner surface and an outer surface which defines a bore, each of which surfaces has a cross-sectional contour defining two diametrically opposed generally corner-shaped portions extending longitudinally of the respective shaft and two substantially planar narrow surfaces respectively adjoining opposite sides of each corner-shaped portion in narrow zones of the respective surface and extending longitudinally of the respective shaft, said fit occuring between said substantially planar surfaces of the inner shaft and outer shaft in said narrow zones, said inner surface and said outer surface defining a clearance therebetween in the rest of the contour thereof.

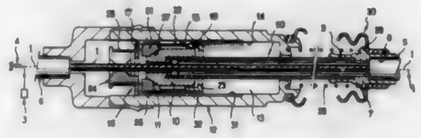
4,693,137

MECHANICAL CONTROL BY CABLE WITH AUTOMATIC ADJUSTMENT

Jean Deligny, Le Mans, France, assignor to Société des Câbles du Mans, Le Mans, France

Filed Feb. 6, 1986, Ser. No. 827,129
Claims priority, application France, Feb. 13, 1985, 85 02047
Int. Cl.[4] F16C *1/22*
U.S. Cl. 74—501.5 R **8 Claims**

1. A mechanical control by a cable sliding in a sheathing conduit, comprising an automatic adjustment device including a releasable locking device interconnecting selectively and firmly together during actuation of the mechanical control an outer ferrule structure and an inner ferrule structure which is fixed firmly to one end of the conduit and housed telescopically in the outer ferrule structure, the ferrule structures biased axially apart relative to one another, the locking device comprising disengageable, radially expandible locking means arranged between the inner and outer ferrule structures and adapted for cooperation with a cam surface formed on one of said ferrule structures and movable between a locked position interconnecting firmly together the ferrule structures and an unlocked position under the action of a control member engaging frictionally the cable, said locking means comprising at least one jaw structure having externally at least one tooth to cooperate with indentations formed in an inside wall of the



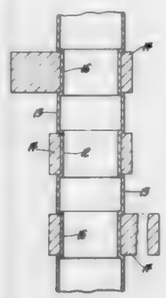
outer ferrule structure, and having internally a ramp surface to cooperate with said cam surface which is formed on the inner ferrule structure, the jaw structure carried by a cage surrounding the inner ferrule structure and associated with the control member, the inner ferrule structure being an end body of enlarged diameter having a portion with an external conical surface forming said cam surface, and the control member formed integral with the cage.

4,693,138

CAM SHAFT WITH EXPANDED HOLLOW SHAFT

Robert W. Hughes, 2155 Fourteen Mile Rd., Sterling Heights, Mich. 48077; Robert H. Brisson, 28078 Alger, and Glenn R. Brisson, 31632 Meadows, both of Madison Heights, Mich. 48071

Filed Dec. 31, 1985, Ser. No. 815,250
Int. Cl.[4] F16H *53/00*
U.S. Cl. 74—567 **1 Claim**



1. A camshaft (10) having lobes (14) with irregularly shaped apertures spaced along the longitudinal axis of a hollow tubular shaft (12), said lobes (14) orientated radially and axially in predetermined positions along the hollow tubular shaft (12), said camshaft (10) characterized by said walls of said hollow shaft (12) expanded outwardly into aperture portions in irregular engagement with the interior of said apertures of said lobes (14) and said walls expanded outwardly radially farther into ballooned portions between adjacent lobes (14) to create corresponding outside and inside shoulders extending between said aperture and ballooned portions, said outside shoulders being disposed immediately adjacent and abutting each side of said lobes (14) circumferentially about said apertures therein to secure said lobes (14) axially upon said shaft (12), said inside shoulders disposed directly opposite said outside shoulders to that said shoulder extend annularly about each end of each of said apertures and said ballooned portions extend between shoulders at adjacent lobes, the exterior circumferences of the lobes (14) being finished to closer tolerances than the interior apertures and the exterior surfaces of the lobes (14) being positioned radially relative to the longitudinal axis with the radial positions of the interior apertures being offset among adjacent lobes (14).

4,693,139

CONNECTING ROD OF RECIPROCATING MOTION SYSTEM AND METHOD FOR PRODUCING THE SAME

Masato Mukai, Saitama, and Koichi Komatsu, Shizuoka, both of Japan, assignors to Honda Gikeo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 775,987
Claims priority, application Japan, Sep. 14, 1984, 193229
Int. Cl.[4] G05G *1/00*
U.S. Cl. 74—579 E **3 Claims**



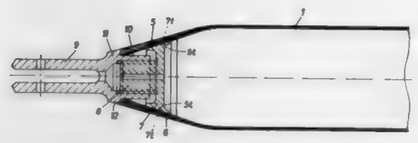
1. An internal combustion engine connecting rod including a larger diameter end portion which has a bearing hole made therein and is broken and divided into a body side bearing half and a bearing cap, with a bearing metal incorporated in said bearing hole, said body side bearing half and said bearing cap being integrally connected to each other by connecting bolts, wherein chamfers are made in the semicircular bearing surfaces of said body side bearing half and said bearing cap along broken and divided surfaces, respectively, of the bearing half and cap, each of said chamfers being made in the form of two stepped surfaces and including a first inclined surface close to said broken and divided surface and a second inclined surface close to said bearing surface, said first inclined surfaces of said chamfers together forming a first angle with respect to said divided surfaces and said second inclined surfaces of said chamfers together forming a second angle with respect to said divided surfaces, with said first angle being smaller than said second angle.

4,693,140

HOLLOW TUBULAR MEMBERS AND A METHOD OF MAKING SUCH MEMBERS

Walter A. Stephan, Braunau, and Josef Knauseder, Aurolzmünster, both of Austria, assignors to Fischer Gesellschaft M.B.H., Ried im Innkreis, Austria

Continuation of Ser. No. 528,154, Aug. 31, 1983, abandoned.
This application Oct. 28, 1986, Ser. No. 925,529
Claims priority, application Austria, Sep. 7, 1982, 3337/82
Int. Cl.[4] G05G *1/00*; F16C *7/00*
U.S. Cl. 74—579 R **5 Claims**



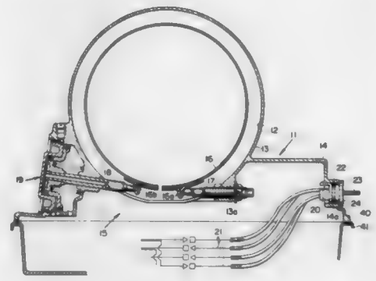
1. A tube-shaped hollow member of fibre-reinforced plastic material suitable for the transmission of compressive, tensile, bending and torsional forces in vehicles comprising a central portion with a substantially circular-shaped cross-section integrally formed with hollow end regions which are tapered conically inward from the central portion, and a pair of connector means for transmitting forces to respective ones of the hollow end regions, wherein each of the pairs of connector means includes a screw-threaded clamping plate pressing against the conical internal wall of the respective hollow end region, and a one-piece connecting member for connecting the tube-shaped hollow member to another device, the one-piece connecting member including a screw-threaded sleeve which extends into the respective hollow end region and is screw-threadably mounted on the clamping plate, and the one-piece connecting member also including an integral circular collar which presses against an annular frontal surface of the respective hollow end region extending essentially transversely to a longitudinal axis of the respective hollow end region.

4,693,141

AUTOMATIC TRANSMISSION CASE

Kazuyoshi Iwanaga, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 595,523, Mar. 30, 1984, abandoned.
This application Jan. 5, 1987, Ser. No. 4,241
Claims priority, application Japan, May 25, 1983, 58-78624
Int. Cl.[4] F16H *57/02*
U.S. Cl. 74—606 R **3 Claims**



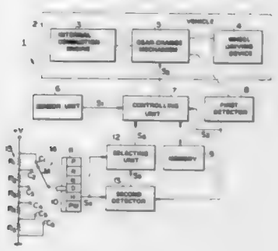
1. A combination comprising:
an automatic transmission case including a first wall defining a transmission chamber and a second wall integral with the first wall, said automatic transmission case being formed with a threaded first hole in said first wall, a band brake, a threaded anchor pin for said band brake being received in said threaded first hole, said anchor pin having a first end terminating within said transmission chamber, and a second end terminating between said first and second walls and a second hole which formed in said second wall and is arranged in alignment with said first hole; and
means for establishing an electrical connection passing through the second hole of the automatic transmission case in a liquid tight manner, the means including an electrical element received in said second hole and a seal between said electrical element and said second wall for sealably closing said second hole in a liquid tight manner.

4,693,142

AUTOMATIC TRANSMISSION SYSTEM FOR VEHICLES

Kazumasa Kurihara, Higashimatsuyama, and Kenji Arai, Higashimatsuyama, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1986, Ser. No. 829,256
Claims priority, application Japan, Feb. 26, 1985, 60-35331
Int. Cl.⁴ B60K *41/06*
U.S. Cl. 74—861 **9 Claims**



1. An automatic transmission system for vehicles powered by an internal combustion engine, comprising:
- a gear-change mechanism connected to an internal combustion engine and adapted to operate in response to an electric signal;
- means for outputting at least one condition signal indicative of an operating condition of the internal combustion engine at each instant;
- a first detection means for detecting a gear position of said gear-change mechanism at each instant;
- a selector having at least a drive position for allowing automatic gear-change operation over a plurality of gear positions of said gear-change mechanism and a gear-holding position provided adjacent to the drive position;
- an output means responsive to the operation of an operation lever of said selector for outputting a command signal indicating a position at which the operation lever for selecting a desired operation mode is set;
- a storage means for storing a plurality of sets of map data corresponding to a plurality of gear change maps;
- a second detection means responsive to an output from said first detection means and the command signal for detecting the gear position of the gear-change mechanism at the time the operation lever is moved from the drive position to the gear-holding position;
- a map selecting means responsive to the command signal and an output from said second detection means for selecting a predetermined set of map data corresponding to the command signal sorted in said storage means when the operation lever is in a position other than the gear-holding position and a set of map data corresponding to the output of said second detection means stored in said storage means when the operation lever is in the gear-holding position, said set of map data corresponding to the output of said second detection means being a gear change map data in which the maximum gear position is limited to that indicated by the result of the detection at that time by said second detection means; and
- a control means responsive to the condition signal for controlling the operation of said gear-change mechanism in accordance with the set of map data selected by said map selecting means.

4,693,143

CONTROL DEVICE FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yoshiharu Harada, Toyota; Yutaka Taga, Aichi; Kagenori Fukumura, Toyota; Yoichi Hayakawa, Toyoake, and Masao Kawai, Chiryu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin-Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 21, 1986, Ser. No. 820,155
Claims priority, application Japan, Jan. 19, 1985, 60-07765
Int. Cl.⁴ B60K *41/18, 37/00*
U.S. Cl. 74—866 **4 Claims**



1. A control device for an automatic transmission having a main transmission, a sub transmission connected to an output shaft of the main transmission, and electronic control means for controlling the speed changing ratios of the main and sub transmissions, wherein the electronic control means comprises:
- means for inputting a signal representing a running state of a vehicle and controlling the speed changing ratios of the main and sub transmissions;
- speed changing ratio detecting means for detecting the speed changing ratio of the sub transmission;
- first output shaft speed detecting means for detecting the rotational speed of the output shaft of the main transmission;
- second output shaft speed detecting means for detecting the rotational speed of the output shaft of the sub transmission;
- means for adjusting a signal of the second output shaft speed detecting means when the speed changing ratio detecting means judges that the speed changing ration of the sub transmission is in a reduced speed range; and
- means for effecting speed change control of the main transmission by selecting either a signal of the first output shaft speed detecting means and the signal of the second output shaft speed detecting means as a result of comparison between the signal of the first output shaft speed detecting means and the signal of the second output shaft speed detecting means.

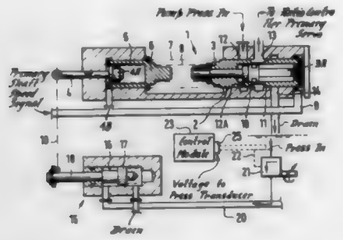
4,693,144

CONTROL VALVE SYSTEM FOR A CONTINUOUSLY VARIABLE BELT DRIVE

Ulrich Eggert, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 641,236, Aug. 16, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,826
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333136
Int. Cl.⁴ B60K *41/16*
U.S. Cl. 74—868 **3 Claims**

1. In a control system for an infinitely variable belt drive transmission adapted to deliver torque to a driven member from an internal combustion engine with an operator controlled fuel supply;
- a ratio control valve mechanism comprising a valve element, a valve bore slidably receiving said valve element, first fluid pressure passage means for distributing a driving speed pressure signal to one end of said valve element, a pressure inlet passage and a pressure outlet passage communicating with said valve bore, the outlet passage being adapted to communicate with a ratio control servo;
- a force transmitting mechanism including a movable spring seat, valve springs between said spring seat and said valve element;
- a secondary valve comprising a movable secondary valve element having a connection with said force transmitting mechanism, second fluid pressure passage means for distributing a pressure signal to said secondary valve element whereby the effective force acting on said ratio control mechanism can be controlled; and
- an electronic control module adapted to store multiple engine torque and speed relationships with respect to a range of engine fuel supply parameters, said module being connected to said secondary valve element through said second pressure distributing means whereby the operator may select the desired stored relationship to effect either optimum fuel economy or optimum performance.

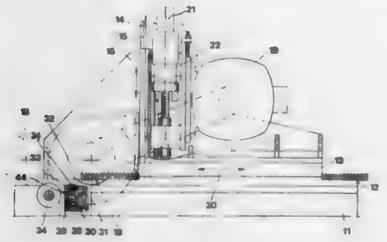


4,693,145

METHOD OF CONTINUOUSLY GRINDING THE TEETH OF SAW BANDS AND SAW BLADES

Harry Gustavsson, Halmstad, Sweden, assignor to AB Wedalco Centerless, Halmstad, Sweden

Filed Oct. 16, 1985, Ser. No. 788,115
Claims priority, application Sweden, Oct. 17, 1984, 8405176-2
Int. Cl.⁴ B23D *63/12, 65/00*
U.S. Cl. 76—112 **4 Claims**



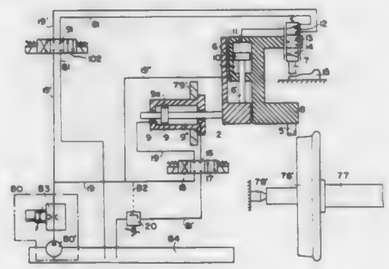
1. Method of continuously grinding the teeth of a number of adjacent saw bands out of the total band material, by a rotating, grinding wheel, reciprocatingly movable transversely to the longitudinal direction of the saw bands, said method comprising: adjusting the position of the grinding wheel, at the beginning of every reciprocating grinding movement, a predetermined amount corresponding to the wear of the grinding wheel after one grinding cycle; passing the grinding wheel on its way towards the band material by a stationary abrasing wheel for the re-shaping of the grinding wheel; effecting step-by-step movement of the saw bands by the return stroke of the grinding wheel to its initial position, after the second passage of the grinding wheel past the saw bands, whereby the grinding wheel once more passes the abrasing wheel.

4,693,146

METHOD AND APPARATUS FOR ACHIEVING CHIP SEPARATION WHILE MACHINING WORK PIECES

Theodor Dombrowski, Erkelenz, and Hartwig Klosterhalfen, Dueren, both of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Division of Ser. No. 842,812, Mar. 21, 1986, Pat. No. 4,667,546. This application Dec. 24, 1986, Ser. No. 946,585
Claims priority, application European Pat. Off., Apr. 9, 1985, 85104285.3
Int. Cl.⁴ B23B *3/28, 5/30*
U.S. Cl. 82—2 B **16 Claims**



1. An apparatus for turning a work piece, comprising work drive means for rotatably supporting a work piece, tool means for machining a work piece, movable tool support means for carrying said tool means in two directions perpendicular to each other, controllable drive means operatively connected to said tool support means for controlling the movement of said tool support means, and drive control means connected to said controllable drive means for causing said tool support means to follow oscillation movements in said perpendicular directions having a certain amplitude and frequency, said oscillation movements resulting in a tool oscillation movement along a feed advance line generated by feed advance vectors forming a work piece contour, said drive control means comprising means for adjusting said amplitude and said frequency of said oscillation movements of said tool support means for assuring chip breakage.

4,693,147

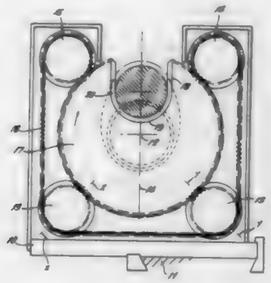
DRIVE MECHANISMS FOR ROTATING CRANKSHAFTS FOR USE IN MACHINE TOOLS

Raymond T. Shackleton, Keighley, United Kingdom, assignor to Butler Newall Machine Tool Company Limited, West Yorkshire, United Kingdom

Filed Dec. 19, 1985, Ser. No. 810,599
Claims priority, application United Kingdom, Mar. 22, 1985, 8507580
Int. Cl.⁴ B23B *31/00, 5/22*
U.S. Cl. 82—40 A **8 Claims**

1. A drive mechanism for rotating a crankshaft so that the crankshaft, when oriented such that its axis of rotation is horizontally oriented, can be operated on by a machine tool, said crankshaft including a throw, the drive mechanism comprising:
- a disc for rotation about a horizontal axis to coincide with the horizontal axis of said crankshaft;
- a radial slot extending into the disc from an outer peripheral part thereof to receive said throw of said crankshaft to rotate the crankshaft with rotation of the disc;
- a plurality of rollers;
- means to mount the rollers in an arc extending around said

horizontal axis of rotation of the disc but not directly above said axis;
an endless flexible drive extending around the arcuately spaced rollers with an inner stretch of the drive engaging the inner sides of the rollers with respect to said horizontal axis and an outer stretch of the drive engaging outer sides of the rollers with respect to said axis;
said disc having a peripheral part in driving engagement



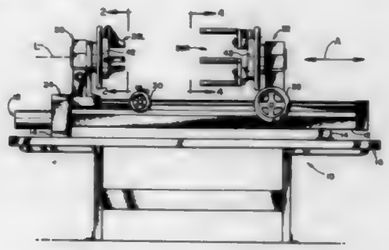
with said inner stretch of the endless drive, said stretch thereby being held in arcuate formation by the periphery of the disc;
drive means for at least one of the rollers for turning the roller and thereby displacing the flexible drive to turn the disc about said horizontal axis; and
guide means on the rollers for engaging the periphery of the disc to restrain the disc against axial movement with respect to said rollers.

4,693,148

GLASSWORKING SCROLL CHUCK WITH INTERCHANGEABLE JAWS

David M. Lobley, Quakertown, Pa., assignor to Andrew J. Wargo, Hellertown, Pa.

Filed Jun. 20, 1986, Ser. No. 876,833
Int. Cl.[4] B23B *31/02*
U.S. Cl. 82—40 R **32 Claims**



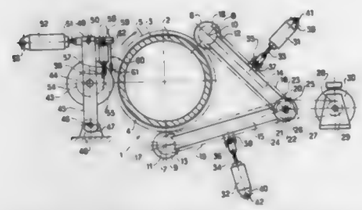
26. A lathe especially adapted for glassworking, comprising:
a. a longitudinally elongated frame;
b. a pair of upright members, mounted on said frame and extending upwardly therefrom, each upright member retaining inwardly facing chucks for holding longitudinally extending generally tubular workpieces therein;
c. a motor;
d. means for transmitting rotational motion from said motor output shaft to said inwardly facing chucks for rotating said chucks and a workpiece held therebetween;
e. at least one of said chucks comprising:
1. chuck body means rotatably driven about a longitudinal axis by said rotational motion transmitting means;
2. a handwheel, rotatable about said longitudinal axis;
3. means for releasably coupling said handwheel to said chuck body for unitary rotation of said handwheel with said chuck body;
4. said handwheel including a longitudinally projecting continuous spiral gear tooth defining a path of spiral movement relative to said axis upon rotation of said handwheel;
5. a plurality of generally radially disposed jaw base members, each having generally I-beam--like radial cross-section, each including spiral gear grooves on the base for meshingly engaging said spiral gear tooth, evenly angularly spaced about said axis and movable radially with respect to said axis upon handwheel rotation with said spiral gear tooth engaging said gear grooves on the bases of said I-beam configured jaw base members; each of said jaw base members including an axially facing surface adapted for complemental mating with a corresponding mating surface of a jaw outer member;
6. said jaw base members each including a radially extending gib connecting to a respective web of said jaw base member, each gib including a radially extending rack projecting outwardly from and generally transversely with respect to said web of said jaw base member;
7. means for adjustably radially positioning said gibs along the length of said webs of said I-beam-- configured jaw base member;
8. means for adjustably longitudinally positioning said gibs along the height of said webs in said longitudinal direction;
9. said outer jaw members having mating surfaces formed for complemental mating with said jaw base member mating surfaces, being adapted to be removably connected to said jaw base members and including longitudinally extending heat-resistant surfaces adapted for contactingly engaging a glass workpiece upon radial covergence of said jaw base members with resultant radially converging closure of said outer jaw members thereabout;
10. means for retaining said outer jaw members in removable connection with said jaw base members at said respective mating surfaces;
11. said chuck body means facing said spiral gear tooth and being rotatable about said axis independently of said headwheel, for retaining said spiral grooves of said jaw base members in meshing engagement with said spiral gear, including radially extending slots having said web portions of said jaw base members resident therein facilitating radial travel of said jaw base members therealong upon rotation of said spiral gear tooth relative to said chuck body;
12. a plurality of planetary beam assemblies adapted for removable pivotal mounting on said chuck body means in sockets adjacent said racks of said gibs, respective beam assemblies engaging said racks of respective ones of said gibs affixed to respective ones of said jaw base members in the absence of said outer jaw members being mounted on said jaw base members, respective beam assemblies being movable rotatably in said sockets about axes parallel said longitudinal axis upon radial movement of a respective jaw base member and its associated gib engaged by said beam assembly responsively to rotation of said handwheel, each planetary beam assembly including:
i. a pivot pin adapted for mounting engagement within one of said sockets to define an axis of rotation of a pinion gear portion of said beam assembly;
ii. a pinion gear rotatable relative to and about said pivot pin and adapted to meshingly engage a radially extending rack of a respective gib affixed to an adjacent jaw base member;
iii. an arm disposed generally transversely with respect to said longitudinal axis and rotatable with said pinion gear about said pivot pin;
iv. a jaw rod extending from said arm member parallal to said longitudinal axis and adapted to secure a workpiece upon rotating closure of said arms about said work piece unitarily with rotation of said pinion gear responsively to rotary movement of said handwheel relative to said chuck body and resultant radial movement of said jaw base member and a gib rack engaging said pinion gear, and
13. means for selectably releasably retaining said planetary beam assemblies in engagement with said sockets with said pine resident within said sockets.

4,693,149

DEVICE FOR THE AUTOMATIC CUTTING OF CARDBOARD AND OTHER TUBES

Georges Sireix, 9, rue Saint-Marc, 68400 Riedisheim, France

Filed Jun. 4, 1985, Ser. No. 740,958
Claims priority, application France, Jun. 8, 1984, 84 09176
Int. Cl.[4] B23B *5/14*
U.S. Cl. 82—53.1 **8 Claims**



1. A device for automatically cutting freshly formed circular tubes comprising: a fixed cylindrical mandrel for freely turnably supporting thereon a freshly formed circular tube which is to be cut; means for supporting said mandrel, drive means for rotationally driving the circular tube so that it rotates around the fixed mandrel, the drive means comprising two rotatable counter-rollers disposed in angularly spaced relation about the fixed mandrel and extending lengthwise of the fixed mandrel, means for urging the counter-rollers against the circular tube, and means for rotationally driving the counter-rollers while the same are urged against the circular tube to thereby effect rotation of the circular tube around the fixed mandrel and cutting means for cutting the circular tube while the same is rotating, the cutting means comprising a rotatable circular knife having a peripheral cutting edge, and means for movably supporting said knife for moving said knife through a cutting range in which the knife cutting edge coacts with the fixed mandrel to effect cutting of the circular tube along a cut line and a non-cutting range in which the knife cutting edge is spaced from the fixed mandrel, means for restraining the knife from rotating while in said cutting range, said restraining means comprising a rachet wheel connected to the knife for movement therewith, and a pawl engageable with the ratchet wheel to hold the ratchet wheel and hence the knife against rotation, and means for actuating said pawl to effect incremental angular displacement of said ratchet wheel and knife while the knife is in the non-cutting range.

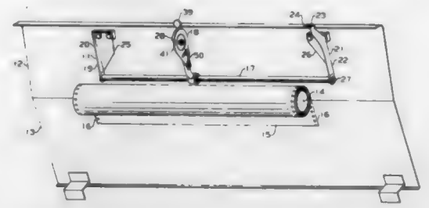
4,693,150

PAPER CUTTING ATTACHMENT

William Barclay, 2042 Whitefield, Dearborn Heights, Mich. 48127, and Alexander C. Stanis, Milan, Mich., assignors to William Barclay, Dearborn Heights, Mich.

Filed Jun. 28, 1985, Ser. No. 749,630
Int. Cl.[4] B26D *1/16, 3/16*
U.S. Cl. 82—93 **2 Claims**

1. Paper cutting attachment for a drum type computer plotting apparatus wherein paper is accumulated in a roll on a take-up drum and thereafter trimmed and divided by a user comprising in combination:
(a) a slender circular cross-shaft for mounting a paper cutter head at parallel spaced relationship to a take-up reel of a drum type plotting apparatus; and
(b) at least one paper cutter head mounted for rotation and translation on the cross-shaft having a housing with an aperture at one end for receiving a stepped bushing, a stepped bushing engaging said housing aperture, said



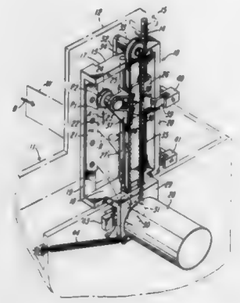
bushing having a groove at one end portion for receiving a retaining ring and a threaded aperture at the other end thereof for receiving a thumb screw and a thumb screw in engagement with the threaded aperture of the stepped bushing for laterally fixing the paper cutter head on the cross-shaft.

4,693,151

CUTTING METHOD AND APPARATUS FOR STACKER

Donald E. Goubeaux, Miamisburg, and Richard A. Miller, Cincinnati, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jan. 9, 1985, Ser. No. 690,064
Int. Cl.[4] B65H *35/04*; B26D *1/60*
U.S. Cl. 83—23 **16 Claims**



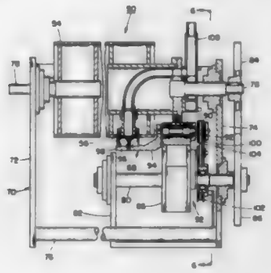
13. Method of cutting and stacking record members, comprising the steps of: providing a cutting mechanism having a generally annular rotatable knife and an elongate knife in contact with the rotatable knife generally along a chord of the rotatable knife, moving the rotatable knife relative to the elongate knife, advancing a web into engagement with the moving knives and moving the knives as a unit together with the web solely by engagement of the knives while the rotatable knife is moving to sever a generally rectangular record member from the web, providing a stacker for accumulating a stack of tags, and wherein the knives sever a record member from the web while a portion of the web is in the stacker.

4,693,152

ROTARY TUBE PUNCHING ARRANGEMENT WITH TUMBLING PUNCH AND METHOD FOR PUNCHING HOLES INTO A FILM WEB

Edward G. Grosz, Sodus Point, and Fox J. Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 6, 1986, Ser. No. 871,334
Int. Cl.[4] B26D *7/14, 7/18;* B26F *1/08*
U.S. Cl. 83—24 **22 Claims**



13. A method for punching holes into a continuously advancing thermoplastic film web, comprising:

(a) advancing said film web over a rotatable anvil roll with said film web extending in surface contact with at least a portion of the circumference of said roll; at least one opening of predetermined size being formed in the circumferential surface of said anvil roll;

(b) causing a rotary punch having a serrated cutting edge at the radially outer end thereof to pierce said film web at right angles to the surface of said web and to enter said opening in said anvil roll at predetermined intervals at a substantially radial motion relative to the anvil roll;

(c) rotating a rotatable arm mounting said rotary punch while concurrently pivoting said rotary punch to effect the radial orientation of said punch while piercing the film web; and rotating said anvil roll in conjunction with the rotation;

(d) and synchronizing the rotational movements of said anvil roll and said arm and the pivoting of said rotary punch with said film web advancing over said opening on the anvil roll facing said punch whereby said serrated cutting edge punches a hole into said web while radially entering said opening in said anvil roll.

4,693,153

METHOD AND APPARATUS FOR CONTROLLING THE CUTTING OF AN OBJECT

Ronald C. Wainwright, Hertfordshire, and Lawrence R. Beesley, Essex, both of England, assignors to Gunson's Sortex Limited, London, England

Filed Jul. 17, 1985, Ser. No. 755,820
Claims priority, application United Kingdom, Jul. 27, 1984, 84 19185
Int. Cl.[4] B26F *3/00*
U.S. Cl. 83—53 **5 Claims**

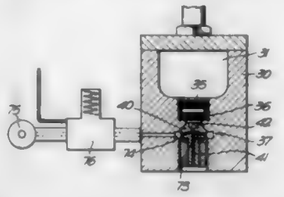
1. A method of controlling the cutting of an object comprising:

pressurizing a first fluid,

passing said pressurized first fluid through a nozzle to form a fluid jet adapted to cut the object;

directing said object-cutting jet towards the object and,

when it is not desired to cut the object, introducing into said nozzle a further fluid which prevents the formation of a jet capable of cutting the object, the introduction of the



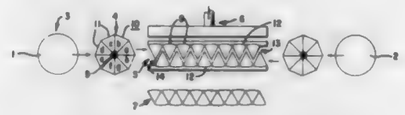
further fluid into the nozzle being effected while maintaining the pressurization of the first fluid.

4,693,154

METHOD AND APPARATUS FOR DIVIDING AND FURTHER TREATMENT OF UNITS OF GOODS

Göta Karlsson, Vimmerby, Sweden, assignor to B & D Autolines AB, Malmo, Sweden

Filed May 2, 1986, Ser. No. 858,819
Int. Cl.[4] A21C *15/04;* B26D *3/24*
U.S. Cl. 83—161 **1 Claim**



1. Apparatus comprising supporting means for supporting a large piece of material such as a cake while cuts are made in it along cutting lines that radiate from a point to divide it into a plurality of small units and to define on each such small unit a pair of convergent surfaces each of which opposes one of said convergent surfaces on an adjacent small unit, and shifting means cooperating with said supporting means for moving said small units into a side-by-side aligned relationship with one another wherein said surfaces of adjacent small units are spaced apart, said apparatus being characterized by:

A. said supporting means comprising a sector plate for each of said small units,

(1) each said sector plate having a top surface upon which its small unit rests and which has a pair of convergent side edges that correspond to adjacent cutting lines, and

(2) each said sector plate having an inner end towards which its said edges converge and an outer end remote from said inner end;

B. articulation means at said outer ends of the sector plates whereby they are so connected with one another as to comprise a chain having opposite ends and having one of said sector plates at each of said ends, said articulation means providing for swinging of the sector plates relative to one another and for maintaining their said top surfaces coplanar; and

C. said shifting means comprising

(1) actuating means connected with one of said sector plates for imparting motion to all of the sector plates in at least one direction transverse to their said edges and parallel to their sad top surfaces,

(2) guide follower means on each sector plate adjacent to said outer end thereof, and

(3) guide means engaged by said guide follower means, arranged to define a path which successive sector plates in said chain are constrained to follow as the sector plates are moved in said one direction and whereby the sector plates, collectively, are shifted between

(a) a starting position in which all of the sector plates have their said edges radial to said point and the sector plates cooperate to support a large piece of material for cutting, and

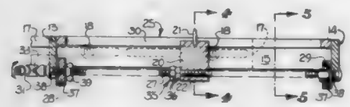
(b) a terminal position in which the sector plates are disposed with their inner ends in spaced apart relation to one another along a substantially straight line.

4,693,155

TABLE SAW ATTACHMENT FOR CUTTING CIRCLES

Hazen Ledford, Jr., 639 Church Rd., Bakersville, N.C. 28705

Filed Apr. 28, 1986, Ser. No. 856,656
Int. Cl.[4] B23D *55/04;* B27B *13/00*
U.S. Cl. 83—410 **8 Claims**



1. In an apparatus for cutting circles or other arcuate shapes from workpieces which includes cutting means for cutting the workpieces and a worktable, the improvement therein comprising attachment means for supporting workpieces of disparate size and shape for cutting without the necessity of prefashioning the workpiece and comprising

a frame mounted on said worktable,

a carriage mounting a workpiece centering pin,

means mounting said carriage on said frame for movement along a predetermined path of travel toward and away from said cutting means,

actuating means for moving said carriage along said path of travel in predetermined increments during cutting of a workpiece, and

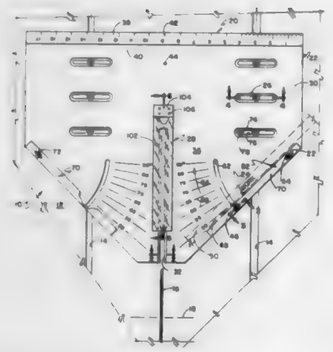
adjustable stop means cooperating with said carriage mounting means for adjusting the length of said path of travel while concurrently permitting incremental movement of the carriage along the path of travel defined by said stop means whereby workpieces of disparate size and shape may be supported and precisely cut into circles or other arcuate shapes of predetermined dimensions without the necessity of prefashioning the workpieces.

4,693,156

TABLE SAW ACCESSORY

Armando C. Olvera, 1126 E. Dewey, Alice, Tex. 78332

Filed Aug. 2, 1985, Ser. No. 761,859
Int. Cl.[4] B23Q *1/04;* B27B *25/08, 27/08*
U.S. Cl. 83—422 **11 Claims**



1. An accessory for use in combination with a stationary saw table having a generally horizontal upper surface providing at least two parallel grooves and a circular saw blade projecting upward through the horizontal surface parallel to the grooves, comprising

a plate having upper and lower surfaces, an elongate blade receiving slot through which the saw blade is extendible and a support receiving opening;

means carried by the plate and mounting the plate for movement on the table parallel to the saw blade, including

at least a pair of rollers parallel to the blade receiving slot and means mounting each the rollers for rotary movement about a vertical axis and comprising a support having an upper end received in an opening of the plate and providing a screw thread, a lower end projecting below the plate for receipt in the table groove and having a polygonal stud thereon, a lip between the upper and lower ends, a threaded fastener received on the upper end screw thread for rigidly captivating the support on the plate, the roller being rotatable on the lower end; and

means preventing rotation of the support comprising a link received on each of the studs; and

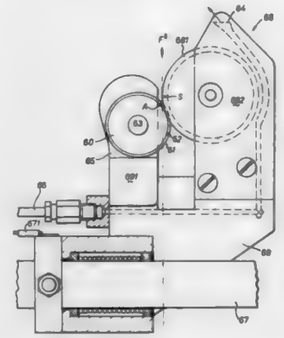
a work rail, on the upper surface of the plate, comprising a shoulder against which a work piece abuts, the work piece being extendible across the saw blade receiving slot.

4,693,157

CUTTING DEVICE

Gottlieb Looser, In der Finne 910, 9496 Balzers, Liechtenstein

Continuation of Ser. No. 298,632, Sep. 2, 1981, abandoned. This application Feb. 19, 1985, Ser. No. 703,216
Claims priority, application Switzerland, Sep. 16, 1980, 6911/80
Int. Cl.[4] B26D *7/06*
U.S. Cl. 83—431 **14 Claims**



1. A device for cutting a web of a predetermined thickness by a relative movement between said web and a cutting edge, comprising:

(I) an indexing blade consisting essentially of a steel sheet disk having

(a) a substantially uniform thickness of the order of magnitude of said predetermined thickness of said web to be cut and in the range of from about 10 micrometers to about 500 micrometers,

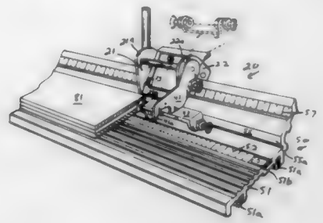
(b) a diameter directly varying in the range of from about 10 millimeters to about 100 millimeters with a variation in said substantially uniform thickness of the indexing blade in said range from about 10 micrometers to about 500 micrometers, and

(c) a substantially continuous cutting edge extending around the periphery of said steel sheet disk,

(II) an automatic indexing actuator in operative connection with said indexing blade, and

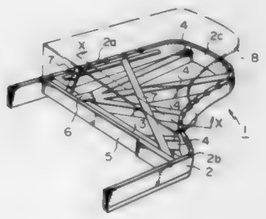
(III) a mounting means for holding said indexing blade in a web cutting position.

4,693,158
FENCE SYSTEM WITH A STOP MECHANISM
T. David Price, 648 Tarin St., S. St. Paul, Minn. 55075
Filed Apr. 24, 1986, Ser. No. 855,844
Int. Cl.[4] B27B *27/10*
U.S. Cl. 83—468 **21 Claims**



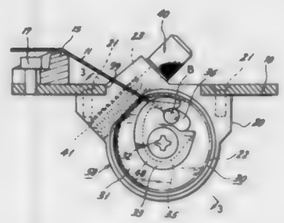
1. A workpiece stop mechanism for use with a fence for power tools, the fence having a measuring device extending along the length of the fence, said mechanism comprising:
(a) a body member defining an opening for enabling said body member to be inserted on and removed from the fence and for sliding on the fence;
(b) said body member having a view plate cooperatively connected thereto for viewing the measuring device;
(c) means for stopping the workpiece, said stopping means cooperatively connected to said body member;
(d) means for securing said body member to the fence, said securing means comprising:
(i) a gate member pivotally mounted to said body member proximate said opening; and
(ii) means for pivoting said gate member between an open position and a closed position, wherein when in said closed position said gate is engaged with the fence and thereby securing said gate and said body to the fence; and
(e) wherein said view plate is positioned over the measuring device and said view plate further comprises a dust wiper cooperatively connected thereto, wherein when said stop mechanism slides along the fence, said dust wiper engages the measuring device and wipes off any dust, thereby preventing dust from entering under said view plate as it passes over the measuring device.

4,693,159
WOODEN FRAME FOR A GRAND PIANO
Ichiro Sawada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed May 30, 1985, Ser. No. 739,363
Claims priority, application Japan, Jun. 8, 1984, 59-084209[U]; Feb. 27, 1985, 60-026299[U]
Int. Cl.[4] G10C *3/04*
U.S. Cl. 84—186 R **16 Claims**



1. A curved wooden frame for a grand piano, comprising:
at least three interconnected sections, including a treble range section, a bass range section, and a middle range section, said bass range section and said treble range section comprising wooden material, the rigidity of the wooden material of said bass range section being greater than that of the wooden material of said treble range section, and said middle range section intervening said treble and bass range sections.

4,693,160
MECHANISM FOR TENSIONING STRINGS OF HEADLESS GUITARS
Yoshiki Hoshino, Owari Asahi, Japan, assignor to Hoshino Gakki Co., Ltd., Japan
Filed Feb. 11, 1986, Ser. No. 828,394
Claims priority, application Japan, Apr. 11, 1985, 60-053954[U]
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—306 **11 Claims**

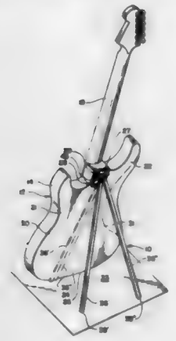


1. String tensioning means for a musical instrument such as a guitar, said string tensioning means including:
an adjusting member, a control member and drive means interposed between said control member and said adjusting member for moving the latter by operating said control member;
said adjusting member including a holding portion for grasping a string at a first end thereof;
said adjusting member also including a tensioning portion which supports a string section adjacent a string first end that is being grasped by said holding portion; and
said string tensioning portion being operatively constructed so that for a given degree of operation for said control member, as magnitude string tension increases, rate of string tensioning decreases.

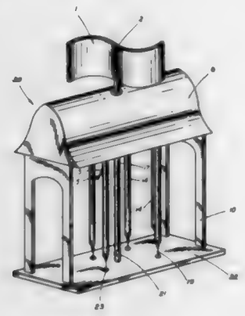
4,693,161
APPARATUS FOR SUPPORTING A MUSICAL INSTRUMENT
Ira J. Uhrig, 4015 Northwest Ave., Bellingham, Wash. 98226
Filed Apr. 14, 1986, Ser. No. 852,536
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—327 **15 Claims**

1. A guitar having a lengthwise axis and a support stand which supports the guitar in a generally upright manner when the guitar is not in use and which remains connected to the guitar when the guitar is being played, the guitar comprising:
a. a guitar body including a front surface across which playing strings are located, a rear surface including a first upper portion and a second lower portion which are separated by said lengthwise axis, and a bottom surface adapted to support the guitar;
b. means for supporting the guitar on a player's body in a substantially horizontal playing position in a manner that the lower portion of the guitar body rear surface is spaced away from the player's body;
c. said support stand including (i) first and second elongate support legs for engaging a supporting surface, (ii) first means for connecting said first and second support legs to said guitar body to permit pivotal movement of said support legs between a first position where said support legs

are spaced away from said guitar rear surface and a second position where said support legs are located adjacent to said guitar rear surface, and (iii) second means for connecting said first and second support legs to said guitar body in a manner to permit movement of said first asnd second support legs between a third position where said first and second support legs are spaced apart from each other at opposite sides of said lengthwise axis, and a fourth position where said first and second support legs are located at a same side of said lengthwise axis, so that when said first and second support legs (i) simultaneously occupy the first and third positions, said guitar is supportable in the upright manner in a support mode, and (ii) simultaneously occupy the second and fourth positions, said first and second support legs are located adjacent to said rear surface lower portion in a stowed mode so that said first and second support legs are spaced away from the player's body when the guitar is in the playing position.

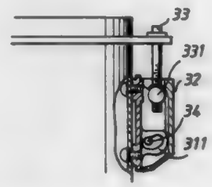


4,693,162
WIND-BELL
Cheng F. Lee, 25, Chang-City, Taipei, Taiwan
Filed Oct. 22, 1986, Ser. No. 921,744
Int. Cl.[4] G10D *13/08*
U.S. Cl. 84—404 **6 Claims**



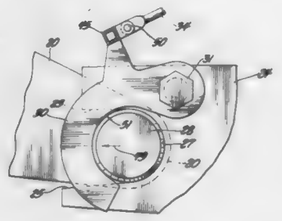
1. An improved wind-bell comprising of a plurality of blades, a central rotating axle, a striking bar, a plurality of sound-producing bars, a hollow stationary post, dragging means, a frame, an annular support and base plate, characterized in that the blades are fixedly connected to the central rotating axle, said axle being rotatably connected with a ball bearing provided on the top of the frame by being inserted therethrough or otherwise rotatably connected, said axle being further inserted into the hollow stationary post to form a vertical axis, said stationary post being secured to the base plate to which said frame is fixedly connected; said annular support is fixed to the top portion of said frame, and that the center of said annular support coincides with the vertical axis of said central rotating axle and said stationary post.

4,693,163
DRUM HEAD LUG ASSEMBLY
Ching L. Hsieh, No. 178, Chung Shan 2nd Road, Lu Chow Hsiang, Taipei Hsien, Taiwan
Filed Aug. 4, 1986, Ser. No. 893,199
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—413 **1 Claim**



1. An improved drum head lug assembly, comprising a fastener with pivot slots, a lug, a dowel, a receiver nut, and a tension rod; said improved lug assembly being further characterized in that: said pivot slot has a first and a second seat with an indentation therebetween on the top periphery of said pivot slot, said second seat is higher than said first seat, said indentation is lower than said first seat and wherein the width of said pivot slot is greater than the diameter of said dowel, said dowel connects to said lug, said dowel is slideably moveable in said pivot slot, said lug engages with said receiver nut when said tension rod is tightened, said lug is outwardly pullable so as to release said tension rod after only slightly loosening said tension rod, said lug has an inner curved portion for engaging with said receiving nut, and said receiving nut has a cylindrical exterior onto which said inner curved portion of said lug engages.

4,693,164
MINE ROLLER ATTACHMENT TO TANK
Israel M. Grinwald, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 22, 1986, Ser. No. 870,063
Int. Cl.[4] F41H *11/12*
U.S. Cl. 89—1.13 **1 Claim**



1. In association with a military tank: a mine roller mechanism, and means for attaching the mine roller mechanism to the tank front end; said attaching mechanism comprising a plural number of vertical bracket walls (**24**) carried on the tank front end, each bracket wall having a leading edge formed with a horizontal notch (**23**) therein; each notch having a concave semi-circular rear surface **27**, a generally horizontal upper

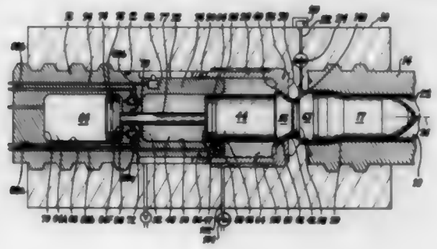
surface (29), and a generally lower horizontal lower surface (25). Said attaching mechanism further comprising a plural number of arms (20) extending rearwardly from the mine roller mechanism for individual entry into spaces between adjacent ones of the bracket walls, each arm having a pair of laterally-extending pins (28) sized to extend into a notch in a bracket wall, each pin having a circular cross section conforming to the aforementioned concave surface (27): the improvement comprising a simplified latch structure for retaining the pins in the notches; said latch structure including a plural number of hook-shaped retainer plates (30) swingably attached to the aforementioned bracket walls on a pivot axis located substantial distances above and behind the aforementioned notches; and a horizontal transverse operator bar (45) interconnecting said retainer plates for conjoint movement; said transverse bar being located above and in front of the aforementioned pivot axis; each retainer plate having a concave semi-circular undersurface (51) conforming to the front surface contour of the associated pin, whereby the retainer plates can be swung downwardly from raised positions above the notches to lowered positions wherein the concave undersurfaces prevent withdrawal of the pins out of the notches; each concave semi-circular undersurface (51) including a surface section that underlies a curved surface of the associated circular pin (28) when the retainer plates are in their lowered positions, whereby mine-explode forces cannot act through said pins (28) to lift the retainer plates from their lowered positions.

4,693,165

LIQUID PROPELLANT GUN

Inder K. Magoon, Pittsfield, and Robert E. Mayer, Williamstown, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Jun. 27, 1986, Ser. No. 879,723
Int. Cl.[4] F41F *1/04*
U.S. Cl. 89—7 **2 Claims**



1. A process of controlling the mass rate of flow in an annular sheet of liquid propellant from a liquid propellant storage chamber to a combustion chamber, wherein the sheet flows through an annular orifice which is defined by the relative movement of two coaxial piston heads, comprising:

providing gas pressure from the combustion chamber to a forward face of each of the two piston heads to provide an aftwardly directed respective force on each of said piston heads;

controlling the aftward movement of one of said piston heads in response to the respective force on its forward face;

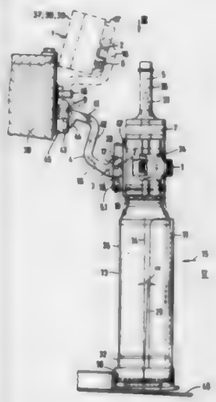
whereby the relative aftward movement of the other of said piston heads determines the cross-sectional area of said annular orifice as a function of the forwardly directed force of liquid propellant on the aft face of said other piston head and said aftwardly directed force from said combustion chamber on said forward face.

4,693,166

AMMUNITION RACK FOR VERTICALLY STANDING CARTRIDGE AMMUNITION

Manfred Pehker; Edelgard Pahlke, both of Duesseldorf, and Josef Metz, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,810
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426761
Int. Cl.[4] F41F *9/00*; A47F *5/08*
U.S. Cl. 89—34 **7 Claims**



1. An improved ammunition rack arrangement for storing vertically standing cartridge ammunition units in the ready room of the loader on the turret platform of a tank and for removing the units therefrom; the ammunition rack having a ready room side, a stay tube for centering the cartridge base, and a clamping device for holding the ammunition unit, wherein the improvement comprises:

a stay tube having a protection shield operatively mounted thereon for protecting the side of a combustible cartridge shaft which faces the ready room, said shield being movably mounted about the longitudinal axis of the ammunition unit for removal of said unit via the ready room side;

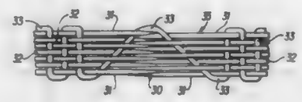
a clamping device pivotally connected via a joint to a bracket of a holding lever having a pair of opposite ends to one of its ends; said holding lever being pivotally mounted at the opposite end to a turret fixed pivot; the clamping device being arranged to move between a locked holding position and a locked removal position.

4,693,167

STRAP FOR LINKED CONTAINER ARTICLE CARRIER

Charles Bagwell, Jr., Tallahassee, Fla., assignor to Howden Coloney, Inc., Tallahasse, Fla.

Filed Mar. 25, 1985, Ser. No. 715,322
Int. Cl.[4] F42B *39/08*
U.S. Cl. 89—35.01 **10 Claims**



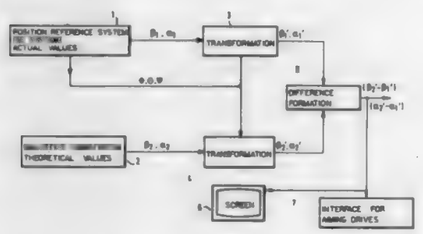
1. A woven strap for use in connecting a plurality of generally parallel disposed tubular carriers comprising first and second material warps which engage with one another at spaced points of intersection along their length, each of said first and second material warps having a plurality of individual filaments which extend generally longitudinally of the strap, a series of loop means formed between said first and second material warps and between adjacent points of intersections of said first and second material warps, each of said loop means having upper and lower material layers, said first and second material warps crossing through one another at a predetermined number of said spaced points of intersection of said first and second material warps so that each of said plurality of filaments of said first and second material warps will alternately form portions of the upper and lower material layers of said loop means, each of said first and second material warps being normally firmly bound by weft material which extends back and forth generally perpendicularly with respect thereto and which are spaced apart a first closely spaced distance, said first and second material warps being loosely bound by said weft material which is spaced apart a second preselected distance greater than said first closely spaced distance adjacent to said predetermined number of spaced points of intersection of said first and second material warps so that said weft material may be extended relatively diagonally with respect to said first and second material warps whereby said first and second material warps are longitudinally moveable with respect to one another adjacent each of said predetermined number of spaced points of intersection thereof so as to permit said loop means adjacent thereto to be expanded relative to one another.

4,693,168

METHOD AND APPARATUS FOR AIMING INDIRECTLY AIMABLE WEAPONS

Bertold Kirst, Lilienthal; Otto Beyer, Freiburg, and Wolfgang Lipp, Denzlingen, all of Fed. Rep. of Germany, assignors to Litef GmbH, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Oct. 8, 1986, Ser. No. 916,537
Claims priority, application European Pat. Off., Oct. 14, 1985, 85113033.8
Int. Cl.[4] F41G *3/10*
U.S. Cl. 89—41.11 **11 Claims**



1. A method for aiming an indirectly aimable weapon comprising the steps of:

a. specifying and storing the theoretical bearing and angle of elevation of the weapon with respect to a first coordinate system fixed in relation to the earth; and

b. determining and storing the actual bearing and angle of elevation of the weapon in said first coordinate system; and

c. determining and storing the tilting angle, tipping angle and the bearing of a second coordinate system, fixed in relation to a weapon support, with respect to the first coordinate system; then

d. continuously computing the actual and theoretical bearing and angle of elevation of said weapon with respect to said second coordinate system; then

e. continuously determining the differences between the theoretical and actual bearings and angles of elevation; and then

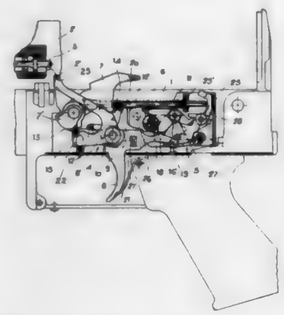
f. driving said weapon in accordance with said differences.

4,693,169

CONTROL DEVICE FOR RAPID FIRING PARTICULARLY AUTOMATIC WEAPONS

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica D'Armi P. Beretta S.p.A., Italy

Filed Mar. 24, 1986, Ser. No. 843,074
Claims priority, application Italy, Mar. 22, 1985, 5139 A/85
Int. Cl.[4] F41D *11/10*
U.S. Cl. 89—129.02 **13 Claims**



1. A device for controlling the firing modes of a portable, automatic weapon, comprising:

(a) a breech block having a firing pin thereon and displaceable from a rear open position to a forward closed position;

(b) a tripping box with a tripping mechanism therein which includes:

(i) a spring-loaded hammer and a spring engaged with said hammer, said hammer being displaceable to a cocked position upon the opening of said breech block, and displaceable to a firing position upon urging by said spring, which spring being mounted on a spring-carrying rod that moves in accordance with the displacements of said hammer;

(ii) a trigger depressable to fire the weapon;

(iii) a safety shaft having a safety position and functioning also as a selector, said shaft having positions for said firing modes, said modes being a first individual shot fire mode, a second uncontrolled rapid fire mode, and a third controlled fire mode;

(iv) a first lever cooperating with said hammer and with said breech block when said safety shaft is in a position for said second fire mode and while said trigger is kept depressed; and

(v) a tripping pawl mounted to interact with said hammer to hold it in the cocked position during said first fire mode;

(c) a pendular, shot counter having at least one series of teeth for counting the shots fired sequentially during said third mode; said counter having a radial portion engaged with said tripping pawl for limiting the displacement of said pawl and preventing the interaction of said pawl with said hammer during said second and third fire modes;

(d) a pivoting reciprocatingly displaceable second lever for said third fire mode, actuated by said hammer through said spring-carrying rod;

(e) a controlling claw connected to said second lever, positively displaceable for engagement with said teeth of said counter and for advancement of said counter by one count following the cocking of said hammer after the firing of each controlled shot, and passively displaceable as a result of its disengagement from said hammer;

(f) a blocking counter-claw for arresting said counter during said passive displacement of said controlling claw; and

(g) a third lever for excluding said second lever from said third fire mode, said third lever engaging a first cammed

portion of said safety shaft for displacement of said second lever to a rest position when the weapon is in one of the safety position, said first fire mode and said second fire mode.

4,693,170

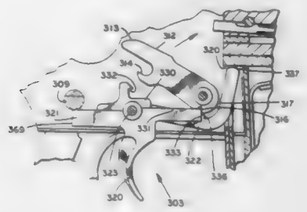
FIRING MECHANISM FOR FIREARM

Maxwell G. Atchisson, 6695 Ridgemore Dr., Doraville, Ga. 30360

Division of Ser. No. 639,526, Aug. 8, 1984, Pat. No. 4,553,469, which is a continuation of Ser. No. 336,328, Dec. 31, 1981, abandoned. This application Oct. 4, 1985, Ser. No. 784,157

Int. Cl.⁴ F41D *11/02*

U.S. Cl. 89—149 **7 Claims**



1. Firearm apparatus comprising:

a hammer;

trigger mechanism means operative to hold said hammer in a cocked condition, and selectably operative to release the hammer;

bolt means normally in a forward position for firing and movable in a recoil direction, said bolt means being operative to engage and cock said hammer in response to recoil movement;

said bolt means being capable of recoil movement behind said hammer so that the bolt means in recoil momentarily overtravels the hammer, wherein the hammer if released by premature operation of said trigger mechanism means could be struck by subsequent forward movement of the bolt means;

hammer timing means operative to engage said hammer while the bolt means is in overtravel behind the hammer, and prevent the hammer from release irrespective of trigger mechanism means operation; and

said hammer timing means being responsive to said bolt means returning forwardly from recoil to a position behind said forward position, but no longer overtraveling the hammer, to disengage the hammer and return control of the hammer to said trigger mechanism means, whereby the hammer is under control of the trigger mechanism means as the bolt means returns to the forward position.

4,693,171

POSITION RESPONSIVE VALVE CONTROL FOR HYDRAULIC CYLINDER

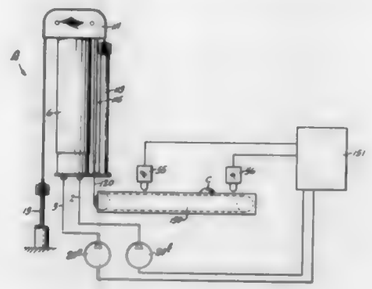
William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 449,823, Dec. 14, 1982, Pat. No. 4,571,939. This application Oct. 9, 1985, Ser. No. 785,874

Int. Cl.⁴ F01B *15/00*

U.S. Cl. 91—216 B **7 Claims**

1. A sensor and hydraulic control device for controlling the extend and retract stroke end limits and stroke length of a hydraulic cylinder controlled by spaced limit valves comprising: limit valves positioned to simulate the hydraulic cylinder extend and retract strokes ends locations; movable mounting means for said limit valves for changing the location of each limit valve and the distance between said limit valves for selectively adjusting the length of the strokes of said hydraulic cylinder and the end limit of the extend and retract strokes of said cylinder; cam operator means for opening and closing each of said limit valves at said ends locations; a flexible cable secured at a first end with said hydraulic cylinder and connected with said cam operator means to move said cam operator means whereby said cam operator means simulates the extend and retract strokes of said hydraulic cylinder; movable



sheave means connected with said operator means; fixed sheave means spaced from said movable sheave means; means biasing said movable sheave means away from said fixed sheave means; and said cable is reeved over said movable and fixed sheave means and secured along the second end thereof at a fixed location.

4,693,172

AUTOMATIC MIST PREVENTING SYSTEM FOR VEHICLE TRANSPARENCIES

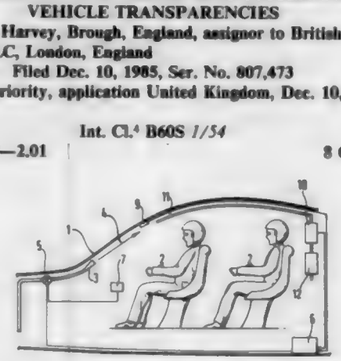
Charles P. Harvey, Brough, England, assignor to British Aerospace PLC, London, England

Filed Dec. 10, 1985, Ser. No. 807,473

Claims priority, application United Kingdom, Dec. 10, 1984, 8431084

Int. Cl.⁴ B60S *1/54*

U.S. Cl. 98—2.01 **8 Claims**



1. An automatic demisting system for vehicle transparencies including:

heating means for the transparency,

control means for the heating means,

means for deriving the dewpoint temperature of the air adjacent the transparency interior surface,

means for deriving the temperature of the transparency interior surface, and computer means comprising;

means for storing a control band of transparency interior surface temperatures with upper and lower temperature levels, both levels being above said derived dewpoint temperature and related to it,

means for comparing the temperature of the transparency interior surface with the upper and lower control band temperature levels, and

means both for signalling said control means to cause said heating means to increase the temperature of the transparency when the temperature of the interior surface thereof decreases towards the lower temperature level and for signalling said control means to cause said heating means to decrease the temperature of the transparency when the temperature of the interior surface thereof increases towards the upper temperature level whereby the temperature of said interior surface is prevented from decreasing to the dewpoint temperature by selective control of the heating means.

2. An automatic demisting system according to claim 1 wherein said heating means for the transparency comprises hot air outlet means and said control means comprises valving means.

4,693,173

CLEAN ROOM

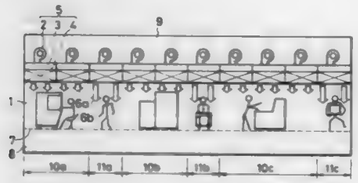
Atsushi Saiki, Koganei; Michio Suzuki, Hino; Hideo Sunami, Nishitama; Shojiro Asai, Tsukui; Michiyoshi Maki, Hachioji, and Kinichiro Asami, Niiza, all of Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

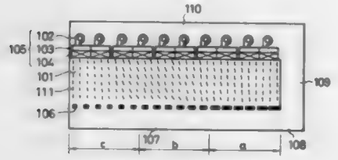
Filed Oct. 11, 1985, Ser. No. 786,550

Claims priority, application Japan, Oct. 11, 1984, 59-211376; Oct. 11, 1984, 59-211375

Int. Cl.⁴ F24F *9/00*

U.S. Cl. 98—31.5 **15 Claims**





1. A clean room comprising an upper portion, a floor means provided with a plurality of openings, filter means provided in said upper portion, means for blowing clean air through said filter means to the floor means and discharging the clean air through the openings, and air return means for returning air discharged through the openings to the blowing means so as to enable blowing the clean air through said filter means to the floor means, the clean room including aisle areas where dust is generated and wafer handling areas into which dust diffuses, and wherein said means for blocking is adapted to provide an air flow rate of said clean air in the aisle which is larger than an air flow rate in the wafer handling areas whereby dust diffusion into the wafer handling areas is reduced.

4,693,174

AIR DEFLECTING MEANS FOR USE WITH AIR OUTLETS DEFINED IN DROPPED CEILING CONSTRUCTIONS

Philip K. Anderson, 72 Franklin Corner Rd., Lawrenceville, N.J. 08648

Filed May 9, 1986, Ser. No. 861,385

Int. Cl.⁴ F24F *13/06*

U.S. Cl. 98—40.05 **22 Claims**

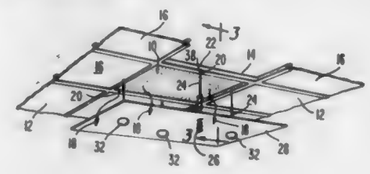
1. For use with air outlets defined in dropped ceiling constructions having a framework of inverted T-shaped support members with ceiling panels suspended therebetween, a means for deflecting air being emitted from the air outlets comprising:

(a) a plurality of suspension bracket means including:

(1) a hook means at the upper end of each of said suspension bracket means being selectively securable with respect to said inverted T-shaped support members;

(2) a rod means at the lower end of each of said suspension bracket means and extending downwardly from said hook means;

(3) a plurality of laterally extending cross-member means along said rod means positioned in spaced relation vertically with respect to one another;



(b) deflecting shield means detachably secured with respect to said suspension bracket means and extending generally horizontally therebetween and spaced downwardly from the ceiling panels and air outlets defined therein to deflect air exiting from the air outlets outwardly therefrom for dispersal thereof, said deflecting shield means defining a plurality of slot means therein adapted to receive said rod means extending therethrough; and

(c) plurality of cover cap means positioned extending over the lower portions of said rod means and the lower of said cross-member means which extend below said deflecting shield means.

4,693,175

CLEAN ROOM SYSTEM

Takayoshi Hashimoto, Kanagawa, Japan, assignor to Takasago Thermal Engineering Co., Ltd., Tokyo, Japan

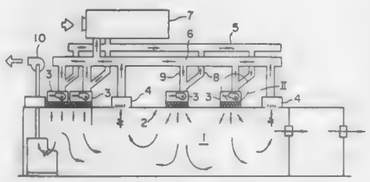
PCT No. PCT/JP85/00516, § 371 Date Apr. 30, 1986, § 102(e) Date Apr. 30, 1986, PCT Pub. No. WO86/01879, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 17, 1985, Ser. No. 862,227

Claims priority, application Japan, Sep. 18, 1984, 59-195072

Int. Cl.⁴ F24I *3/044*

U.S. Cl. 98—31.6 **8 Claims**



1. A clean room system for constructing a clean room having clean zones of different degrees of cleanliness ranging from Class 100 to Class 100,000 according to the U.S. Federal Standard 209b, by forming a ceiling in an exsiting building to form an enclosed space insulated from the ambient atmosphere by said ceiling and suitable floor and walls and installing an air treating equipment for supplying clean air into said enclosed space and withdrawing an air amount therefrom substantially corresponding to the amount of the clean air supplied thereinto, characterized in that:

said ceiling is formed by horizontally suspending ceiling bars

provided with a plurality of rectangular openings having substantially same predetermined configuration and dimension and supporting removably to the openings of the ceiling bars prefabricated ceiling elements each having a base area adapted to close each of said openings so as to close each opening by each ceiling element, said ceiling element being selected from the group consiting of a blind panel, a return air inlet port unit and a fan filter unit having a built-in fan and HEPA filter;

an air conditioner is installed outside the enclosed space,

supply air duct means for introducing air conditioned by the air conditioner into each fan filter unit and return air duct means with a connecting duct which can introduce air taken in at least one of the air inlet port units into each fan filter unit without passing the air through the air conditioner are installed outside the enclosed space; and

the positions and numbers of said ceiling elements removably supported to the openings are selected according to the positions and the degrees of cleanliness of the desired clean zones to form clean zones having different degrees of cleanliness in the enclosed space by ceiling surface exhaling and inhaling air flows.

4,693,176

AIR OUTLET FOR ROOM CONDITIONING SYSTEMS

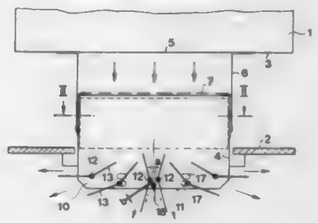
Helmut Deeg, Sulz-Attikon, and Christian Imhof, Oerlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 691,633, Jan. 15, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 839,366

Claims priority, application Switzerland, Jan. 23, 1984, 277/84

Int. Cl.⁴ F24F *13/075*

U.S. Cl. 98—40.12 **5 Claims**



1. A rectangular air outlet for an air intake duct of a room conditioning system, said outlet having

a plurality of vertically disposed deflectors extending downwardly to a common horizontal plane for distributing a flow of air;

a plurality of slats disposed below said horizontal plane in laterally inverted relationship about a central vertical plane, each said slat including a rotatably mounted spindle and a pair of vanes extending from said spindle to define an obtuse angle therebetween, at least one of said slats being rotatable to position a vane thereof in parallel to said horizontal plane for directing a stream of air horizontally outwardly; and a baffle in said central plane downstream of a passage defined between said spindles of the slats adjacent said baffle and spaced from each adjactent spindle a clear distance of less than one-half the width of said passage.

4,693,177

DEVICE FOR APPLYING SURFACE PRESSURE TO AN ADVANCING WORKPIECE

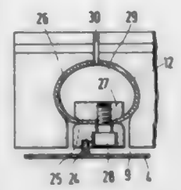
Werner Pankoke, Bielefeld, Fed. Rep. of Germany, assignor to Firma Theodor Hymmen, Bielefeld, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,481

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417289

Int. Cl.⁴ B30B *5/06*

U.S. Cl. 100—154 **9 Claims**



1. In a device for applying surface pressure to an advancing workpiece, particularly wooden plates or the like, comprising at least one endless movable pressing belt which is pressed against the workpiece by a pressure medium; at least one substantially rectangular pressure plate; at least one pressure chamber admitted with the pressure medium; and a sealing supported against the pressing belt and positioned at an edge of said pressure plate, said pressure chamber being defined by a portion of a working strand of said belt, said pressure plate and said sealing; the improvement comprising said sealing being a hollow hose of elastic material, said hose extending over a peripheral edge of said pressure plate, said pressure plate being formed with a groove of the shape corresponding to that of said hose and receiving said hose such that the groove overlaps and encloses a major part of said hose and the hose is locked in said groove, said groove being open towards said pressing belt, said hose having an interior loaded with the pressure medium and a smooth contact surface so that it is pressed by said smooth contact surface immediately against the working strand of said movable belt whereby no leakage of the pressure medium occurs in the entire region of said groove, said hose including a sealing strip projecting outwardly from said groove and supported immediately against the working strand of said belt, an outer rail positioned outwardly of said hose and adjacent thereto, and an inner rail, said outer rail having a groove engaging said sealing strip.

4,693,178

PRINTING MACHINE WITH MANDREL WHEEL SKIP-PRINT VERIFICATION AND RESPONSE

Gordon D. Hudec, Westminster, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Dec. 4, 1986, Ser. No. 938,004

Int. Cl.⁴ B41F *17/22*

U.S. Cl. 101—40 **14 Claims**

1. A continuous printing machine for cylindrical containers comprising:

a blanket wheel carrying printing medium on a circumferential portion thereof for printing on the cylindrical containers;

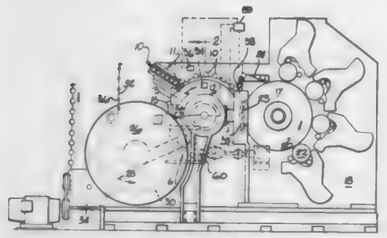
a mandrel wheel having a central axis of rotation positioned parallel to a central axis of rotation of said blanket wheel;

a plurality of mandrels operably mounted on circumferential portions of the mandrel wheel for rotatably supporting said cylindrical containers thereon;

said mandrels and said blanket being displaceable relative one another in a printing region of mandrel travel whereby a mandrel entering the printing region traverses one of two paths including a printing path and a skip-print path;

a first mandrel seating detection means positioned proximate the mandrel wheel upstream of said printing region for detecting a proper seating state of a mandrel when a container mounted thereon is in a position associated with proper printing and an improper seating state of a mandrel when no container is mounted on the mandrel and when a container mounted on the mandrel is in a position associated with improper printing and for generating a detection signal indicative thereof;

a path selection means for receiving said detection signal and for directing a sensed mandrel onto said printing path in response to a proper seating state detection by said first seating detection means and for directing a sensed mandrel onto said skip-print path in response to an improper seating state detection by said first seating detection means;



said first mandrel seating detection means and said path selection means being subject to malfunction whereby a mandrel in an improper seating state is directed along said printing path and contaminated with printing medium;

a malfunction sensing assembly for sensing a malfunction of said first mandrel seating detection means and said path selection means and generating a malfunction signal in response thereto; and

malfunction response means for receiving said malfunction signal and responding to a sensed malfunction for removing printing medium from a mandrel contaminated through a sensed malfunction and for removing cylindrical containers which are misprinted or contaminated by printing medium associated with a sensed malfunction from a normal production flow of properly printed, uncontaminated containers.

4,693,179

TEMPERATURE CONTROLLED ROTARY SCREEN PRINTING APPARATUS

John D. Watts, Woodbury, Conn., assignor to Lockwood Technical, Inc., Monterey, Calif.

Continuation-in-part of Ser. No. 679,996, Dec. 10, 1984, Pat. No. 4,627,345. This application Oct. 31, 1985, Ser. No. 793,675

Int. Cl.⁴ B41L *13/06*

U.S. Cl. 101—119 **16 Claims**

1. A temperature control system for a heated rotary screen printing apparatus for delivering heated coating liquid from the inside of a rotating thin walled print cylinder through patterned openings therein, comprising,

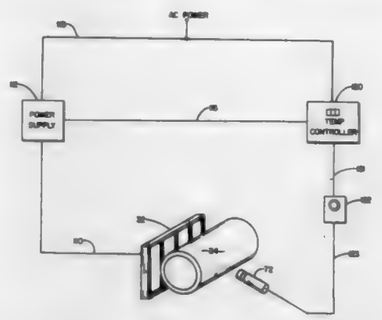
(a) an infrared sensor placed outside in non-contacting proximity to said print cylinder, said sensor having means for receiving radiant energy emitted from said print cylinder and means for generating a signal representative of said received radiant energy;

(b) a rapid response radiant heater placed in proximity to said print cylinder, said heater having an input terminal for receiving electrical energy and having means for generating radiant heat energy in response to said recieved electrical energy;

(c) an electrical power source having an output connected to said input terminal and having a control signal input and means for varying the electrical energy delivered to said output in response to a signal applied to said control signal input; and

(d) means for receiving said infrared sensor signal representative of received radiant energy, and means for translating said signal into a control signal, and means for applying said control signal to said electrical power source control signal input.

whereby the temperature of the coating liquid inside the cylinder is controlled by sensing the outside temperature of the printing cylinder



4,693,180

IMPACT DETONATOR WITH A DETONATOR CAP

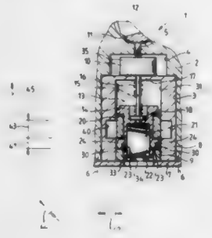
Adolf Weber, Neunkirchen; Hans Strauss, Reichenschwand, and Adolf Bankel, Uttenreuth/Weiher, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,373

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535854

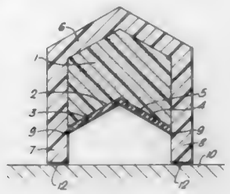
Int. Cl.⁴ F42C *1/02, 1/08, 9/04, 15/22*

U.S. Cl. 102—274 **7 Claims**



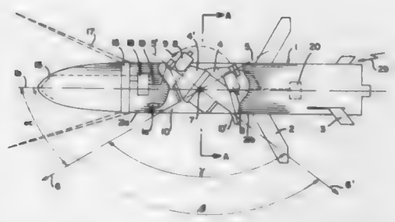
1. Impact or percussion detonator including a detonator cap; a striker actuatable by a spring force for piercing said detonator cap from the rear end of said detonator; a mechanical delay arrangement including blocking members which, in the blocking position of said members are located, on the one side, in recesses formed in said striker and, on the other side, in recesses formed in a detonator component, said detonator component being constituted of an axially-movable securing sleeve; and a base member secured to a housing of said detonator having a cutout for receiving said blocking members at a distance towards the detonating direction.

4,693,181
LINEAR CUTTING CHARGE
David A. Dadley, Sevenoaks, and Peter J. Haskins, Kemsing, both of England, assignors to Royal Ordnance plc, London, England
Filed Oct. 17, 1983, Ser. No. 548,672
Int. Cl.⁴ F42B *1/00*
U.S. Cl. 102—307 **15 Claims**



1. A linear cutting charge including an explosive mass formed in the shape of a bar from a composite of explosive material and a first pliant material, the bar having a groove extending longitudinally along one of its faces, within which groove is located a liner formed from a composite of particulate metal and a second pliant material.

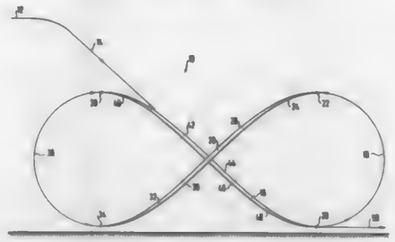
4,693,182
AMMUNITION UNIT
Nils Winblad, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
Filed Jul. 17, 1985, Ser. No. 755,862
Claims priority, application Sweden, Jul. 17, 1984, 8403738
Int. Cl.⁴ F42B *15/26*
U.S. Cl. 102—476 **9 Claims**



1. An ammunition unit comprising: an elongated casing and a shaped charge warhead ignited by means of a direct impact on a target by means of a proximity fuze and an external signal, said warhead being movable in the casing from a first, initial position into a second inclined position, said movement occurring about a tilting axis perpendicular to the longitudinal axis of said casing, and a tilting means performing said movement of said warhead into said inclined position.

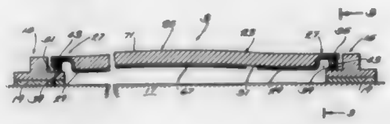
4,693,183
TRACK SYSTEM FOR A PASSENGER-ACCOMMODATING VEHICLE AS PART OF A ROLLERCOASTER
Georg Pötzsch, Westendstrasse 121, D-8000, München 2, Fed. Rep. of Germany
Filed Dec. 12, 1985, Ser. No. 808,123
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446951
Int. Cl.⁴ A63G *21/10*
U.S. Cl. 104—55 **14 Claims**

1. In a track system for a passenger-accomodating vehicle as a part of a rollercoaster comprising:
tracks which form
(a1) an acceleration stretch,
(a2) a rollover stretch consisting of several portions, in which the vehicle is rotated 180° around its lateral axis,
(a3) two helical stretches in which the vehicle is rotated 180° around its longitudinal axis, and



(a4) a coasting stretch,
wherein the individual portions of the rollover stretches and the two helical stretches are arranged such that the shape of the digit "Eight" results in a vertical projection of the track system.

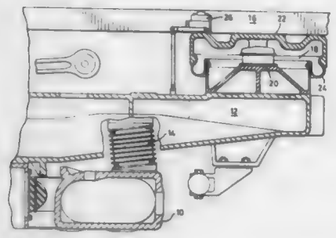
4,693,184
SAFETY FLOOR
Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.
Filed Mar. 17, 1986, Ser. No. 839,966
Int. Cl.⁴ A47B *53/00*
U.S. Cl. 104—295 **5 Claims**



1. A safety module for sensing the presence of a force applied thereto comprising:
a. a generally flat rectangular panel;
b. a leaf spring attached to each corner of the panel for resiliently supporting the panel above a support surface and for deflecting toward the support surface under the influence of the force, each leaf spring having a first free end secured to the panel and a second free end in support contact with the support surface and having a hole therethrough; and
c. a rigid elongated retainer associated with each spring, each retainer being secured to the panel and slidingly passing through the hole in the spring second free end for slidingly guiding the second free end for contacting the support surface as the panel deflects relative to the support surface.

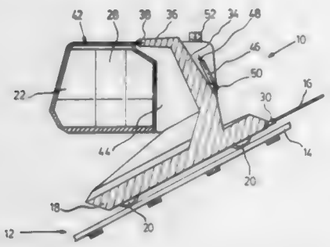
4,693,185
CONTROL SYSTEMS FOR VEHICLE FLUID SUSPENSION SYSTEMS
Trevor A. Easton, Grimsby, and John A. Gaiser, Beamsville, both of Canada, assignors to Dofasco Inc., Hamilton, Canada
Filed Feb. 21, 1986, Ser. No. 831,678
Int. Cl.⁴ B61F *5/36*
U.S. Cl. 105—199.2 **11 Claims**

1. A control system for vehicle support systems for a vehicle of the kind comprising a vehicle body mounted by four spaced supports on two separate longitudinally-spaced vehicle trucks, with two supports on each truck, the two supports on each truck being disposed on opposite sides of the longitudinal centre line of the vehicle; the system comprising:
levelling valve means for a first, second and third of the supports, each adapted to supply fluid to and discharge fluid from its respective first, second and third support so as to maintain the support with a predetermined height between the respective portions of the truck and the vehicle body,
fluid flow control means for the fourth support not having a levelling valve for supplying fluid to the said fourth support and for discharging fluid therefrom,



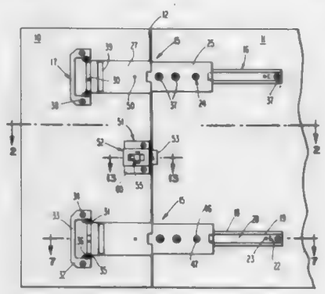
pressure detecting means detecting the first and second fluid pressures in the first and second supports of the truck which both have respective levelling valve means and detecting the difference between the said first and second pressures, and detecting the third and fourth pressures in the third and fourth supports and detecting the difference between the said third and fourth pressures, and
means controlling the said fluid flow control means for the fourth support to adjust the fluid pressure in the fourth support until the difference between the said third and fourth pressures is equal to the difference between the said first and second pressures.

4,693,186
FUNICULAR RAILWAY CAR HAVING COMPARTMENT SUSPENDED ABOVE CHASSIS
Alphonse Lisa, Grenoble, France, assignor to Pomagalski, Fontaine, France
Filed Sep. 3, 1986, Ser. No. 903,228
Claims priority, application France, Sep. 9, 1985, 85 13449
Int. Cl.⁴ B61B *9/00*
U.S. Cl. 105—329.1 **10 Claims**



1. A car, notably of a funicular railway, having a chassis running above a track laid along a slope having a gradient, and a compartment disposed on said chassis, said compartment having a longitudinal symmetry plane parallel to a longitudinal axis of the track, as well as a floor and a roof, said chassis comprising a hanger arm having a free end and a central articulation spindle supported by said free end to which said compartment is suspended, said central articulation spindle extending perpendicularly to said longitudinal plane to allow free movement of the compartment in said longitudinal plane and to hold the floor in a horizontal position independently from the gradient being climbed by the car.

4,693,187
LATCH AND HINGE ASSEMBLY
Robert H. Blabing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.
Continuation of Ser. No. 864,280, May 19, 1986. This application Oct. 10, 1986, Ser. No. 918,589
Int. Cl.⁴ A47B *1/04*
U.S. Cl. 108—69 **19 Claims**

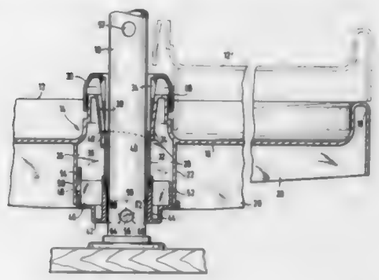


1. A hinge and latch assembly for use in mounting an extension leaf to a support, said assembly comprising in combination:
(a) at least one telescopic hinge mechanism connected at one end to an underside surface of said support and connected at the other end to an underside surface of said extension leaf and having a plurality of members between said end connections in sliding telescopic relation to one another, wherein said other end connected to said extension leaf includes pivot means for the pivoting of said extension leaf, wherein said extension leaf is slidable from a first position adjacent and substantially parallel to the underside surface of said support and is then pivotable substantially 180° to a second position substantially coplanar to said support whereby said support and said extension leaf form a substantially continuous planar surface, and wherein said pivot means comprises means for retaining said extension leaf in said first position when said plurality of members are in the fully retracted condition; and
(b) at least one latch mechanism mounted to the underside surface of said extension leaf for retaining said extension leaf in said second position, wherein said latch mechanism is in an unlatched condition when said extension leaf is in said first position, and wherein said latch mechanism is automatically actuated between latched and unlatched conditions in response to the sliding movement of said extension leaf.

4,693,188
ROTATABLE SHELF INSERT FOR CORNER CUPBOARDS
Guenter Twellmann, Spenge-Lenzinghausen, Fed. Rep. of Germany, assignor to Ninkaplast GmbH, Bad Salzuflen, Fed. Rep. of Germany
Filed Sep. 30, 1985, Ser. No. 781,666
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 8506281
Int. Cl.⁴ A47B *11/00*
U.S. Cl. 108—139 **9 Claims**

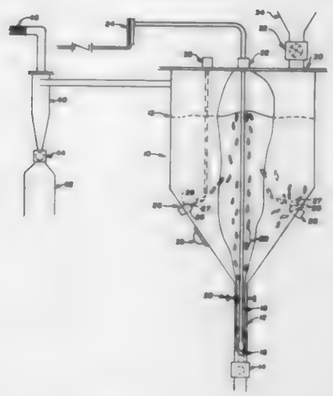
1. A rotatable shelf insert for corner cupboards, comprising:
a substantially circular shelf having a top and a bottom;
a hub centrally disposed in and secured to the shelf and

having a central aperture circumscribed by a first inner wall;
a guide rod for supporting the shelf, and passing through the hub, wherein a radial space is defined between the guide rod and the first inner wall;
means for rotatably mounting said guide rod;
means, including a cylindrical clamping sleeve inserted in the radial space and having a lower end conically tapered from wide to narrow to form a truncated conical shape at said lower end, for radially clamping, via radial force applied at said lower end, the hub and secured shelf to the guide rod for rotation with the guide rod; and



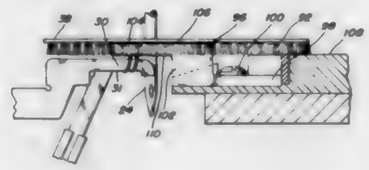
a supporting sleeve comprising a cylindrical sleeve having an inner wall surrounding said guide rod, said cylindrical sleeve having an upper end at which said inner wall conically widens to form a tapered gap between said inner wall and said guide rod, and a supporting member connected to said cylindrical sleeve for supporting the shelf, wherein the cylindrical sleeve of the supporting sleeve extends into said radial space from the bottom of said shelf, wherein the clamping sleeve extends into the radial space from the top of said shelf, and wherein the conically tapered end of said clamping sleeve engages the conically widening inner wall of the supporting sleeve.

4,693,189
FLUIDIZED BED FEEDER
Richard M. Powers, P.O. Box 476, Clifton, Ariz. 85533
Filed Nov. 3, 1986, Ser. No. 926,177
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **35 Claims**



1. A fluidizing bed feeder comprising:
a first hopper having a conical lower portion and a lid element;
a bottom tubular element operatively coupled to a lower most portion of said conical portion;
means for delivering fluidizing gas to said tubular element comprising an elongated fluidizing tube coupled to said lid element, extending through said first hoppper, and having a distal end disposed within said bottom tubular element so as to terminate in a lower portion of said bottom tubular element, said distal end defining a plurality of gas delivering apertures for delivering gas to material in said lower portion of said bottom tubular element; and
means for delivering powered feed material to said first hopper
whereby, said powered feed material may be fluidized by said fluidizing gas.

4,693,190
TUFTING MACHINE FOR OVERTUFTING
Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Dalton, Ga.
Filed Sep. 29, 1986, Ser. No. 912,316
Int. Cl.[4] D05C *15/08*
U.S. Cl. 112—80.3 **9 Claims**

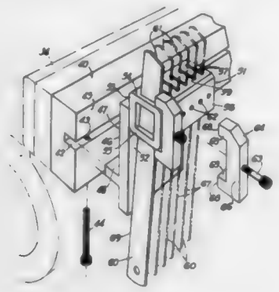


1. In a tufting machine including means for feeding a pile fabric including a backing material having primary yarn tufts extending therefrom, said primary tuft having a first pile height, and a plurality of stitch forming instrumentalities for forming secondary yarn tufts selectively in said backing to provide an overtuft pile fabric, a needle plate having a support surface over which said pile fabric is fed toward said instrumentalities, said needle plate including a plurality of fingers pojecting therefrom for supporting said pile fabric at the locations of said instrumentalities, each of said fingers comprising a mounting portion fastened to said needle plate, a neck extending from and upstanding from said mounting portion and a finger portion extending from the upper end of said neck in a direction oppositely disposed relative to said mounting portion, said finger portion having an upstanding supporting edge over which said pile fabric is fed from said needle plate, said upper supporting edge being disposed at an elevation above said support surface of said needle plate.

4,693,191
KNIFE HOLDER FOR TUFTING MACHINE
Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405, and Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421
Continuation of Ser. No. 508,853, Jun. 29, 1983, abandoned. This application Dec. 15, 1986, Ser. No. 941,718
Int. Cl.[4] D05C *15/10*
U.S. Cl. 112—80.6 **9 Claims**

1. A tufting machine of the type having needles for inserting yarns through a backing material and wherein loopers catch and hold the loops of yarns as they are inserted through backing material by the needles, and a knife assembly supporting means is reciprocated for moving knives for cutting action with respect to the loops caught by the loopers; wherein the improvement comprises: a knife assembly between said knives and said knife assembly supporting means, said knife assembly

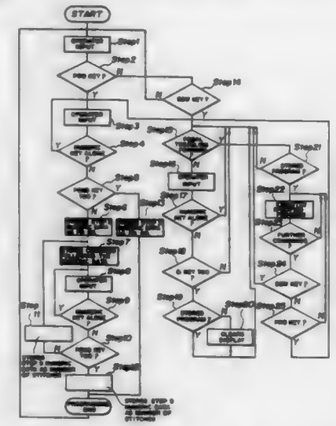
including a knife bar carried by said supporting means, said knife bar having a sidewise opening recess, knife holder means carried by said knife bar, said knife holder means having tongue means protruding into said recess, said tongue means having increments spaced from each other and received at spaced locations in said recess for preventing relative rotational movement of said knife holder means in such recess, said

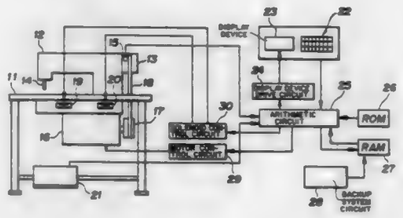


knife holder means being moveable into and out of engagement with said supporting means, and detent means for locking said tongue means in place, said knife holder means having a plurality of equally spaced parallel slots each being disposed at an angle to the plane of said loopers and at an angle to the horizontal, whereby said knife holder holds said knives with their cutting edges against and cooperating with said loopers.

4,693,192
CONTROL DEVICE FOR SEWING MACHINE
Hideo Yasui, Tokyo, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
PCT No. PCT/JP85/00047, § 371 Date Oct. 25, 1985, § 102(e) Date Oct. 25, 1985, PCT Pub. No. WO85/03957, PCT Pub. Date Sep. 12, 1985
PCT Filed Feb. 5, 1985, Ser. No. 799,376
Claims priority, application Japan, Feb. 29, 1984, 53-39317
Int. Cl.[4] D05B *19/00*
U.S. Cl. 112—121.11 **5 Claims**

1. A control device for a sewing machine comprising:
input means capable of individually inputting a variety of information as program date including a first category of program relative information consisting of respective commands for at least formation, execution, combination and termination of a program, a second category of unit sewing pattern relative information consisting of respective commands for lock of needle arm, fabric feed, and thread cut, and a third category of numerical information consisting of a program management number and the number of stitches in relation to a sewing pattern forming program for forming a sewing pattern integrally composed of unit sewing patterns;
discriminator means for discriminating between commands for program formation and commands for program execution from said input means;
memory means for storing input data entered after said command for program formation into the memory as respective allotted program management numbers;
read-out means for reading a program management number out of said memory means in response to said command for program execution;
detector means for detecting the number of stitches and the lock position of said needle arm from the rotational phase of a top shaft driven by a sewing machine drive motor each time said top shaft rotates;
comparison means for comparing the output of said detector means with data concerning the number of stitches in said read-out program data;
output control means for ON/OFF controlling a reverse solenoid of a fabric feed mechanism and a thread cut solenoid of an arm of the sewing machine in accordance with the results obtained from said comparison;
control means for lock of the needle arm at a predetermined position in accordance with the command for lock of the needle arm in the program data;
means for sequentially designating stored management numbers;





means for sequentially storing a designated management number; and
means for reading-out and executing program data corresponding to the designated management number based on a stitching instruction in accordance with the designated sequence, whereby the stitches are sequentially performed by a combination of different program data.

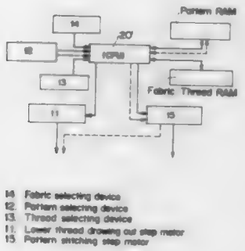
4,693,193
DEVICE OF GUIDING DRAWING-OUT OF A LOWER THREAD FROM A HORIZONTAL BOBBIN CARRIER OF A SEWING MACHINE
Susumu Hanyu; Kazumasa Hara, both of Tokyo; Akiyoshi Sasano, Musashino, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Oct. 3, 1985, Ser. No. 783,751
Claims priority, application Japan, Oct. 5, 1984, 59-208300
Int. Cl.[4] D05B *3/02, 19/00, 57/26*
U.S. Cl. 112—121.11 **8 Claims**

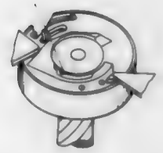
1. A lower thread drawing out device for a computerized sewing machine that includes a needle which is laterally swingable relative to a fabric feeding direction so as to have one needle position at any one time, the needle being formed to carry an upper thread and being vertically reciprocable relative to a fabric to be sewn for penetrating the fabric to be sewn and to concatenate the upper thread with a lower thread to thereby produce lock stitches in a fabric, the lower thread device comprising:
a cup-shaped loop taker with a surrounding wall with a portion formed as an edge in a beak shape for catching thread, said loop taker being rotatable in a timed relation

with a vertical reciprocation of the needle to catch the upper thread to concatenate with the lower thread to thereby form lock stitches;

a bobbin positioned in said loop taker so as to form as space between said surrounding wall of said loop taker and said bobbin, said bobbin being formed to be wound thereabout by a lower thread, said loop taker being formed so that the lower thread is extendable between said bobbin and the needle position, said bobbin being arranged so that the lower thread biases in dependence upon the relative position of the needle positon to the bobbin; and

means for drawing-out a lower thread to compensate for a biasing of a lower thread relative to said bobbin by the





needle position and including a lower thread drawing out element having a free end, said element extending radially and outwardly from said loop taker and terminating at said free end, said free end being arranged in said space between said surrounding wall of said loop taker and said bobbin and being arranged to contact a lower thread between said bobbin and the needle position when the lower thread is extended therebetween, said element and therefore said free end being rotatably movable relative to said loop taker to compensate for said biasing of the lower thread relative to said bobbin by the needle position so that the lower thread is movable in association with said free end.

4,693,194

MECHANISM FOR ACTUATING THE HOOK AND CLAW AND FOR STITCH SETTING IN PORTABLE SEWING MACHINE

Riccardo Buzzi, Milan, Italy, assignor to Matalplast S.r.l., Italy

Filed Mar. 3, 1986, Ser. No. 835,267

Claims priority, application Italy, Mar. 14, 1985, 19904 A/85

Int. Cl.⁴ D05B *1/06, 27/22*

U.S. Cl. 112—199 **9 Claims**

1. In a machine for sewing a double chain stitch in a material, an arrangement comprising:

(a) a sewing needle elongated and reciprocatable along a longitudinal axis, said needle having a needle eye;

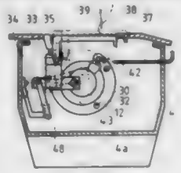
(b) means for feeding a first thread through the needle eye;

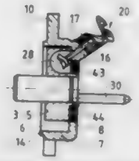
(c) a movable feed dog for feeding the material to be sewn underneath the needle;

(d) a single turnable hook member having a stem elongated along a hook axis which is inclined relative to the longitudinal axis, and an arcuate hook extending circumferentially at least partly about the longitudinal axis and having a hook eye, said hook member being mounted for turning movement in alternate circumferential directions about the inclined hook axis;

(e) means for feeding a second thread through the hook eye; and

(f) means for making a double chain stitch in the material, including a common drive for repetitively moving the feed dog along successive advancement strokes to succes-





sively advance the material to be sewn past the reciprocatable needle and the hook member, and for simultaneously and repetitively turning the hook member along said alternate circumferential directions to intertwine the first and second threads into the double chain stitch.

4,693,195

SEWING SEAM, PARTICULARLY FOR JEAN FABRIC

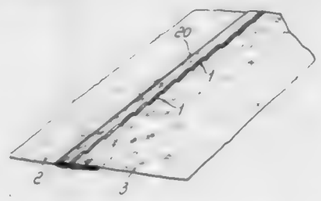
Elio Fiorucci, Milan, Italy, assignor to Fiorucci S.p.A., San Donato Milanese, Italy

Filed Jun. 3, 1986, Ser. No. 871,020

Claims priority, application Italy, Mar. 6, 1986, 21145/86[U]

Int. Cl.⁴ D05B *97/00;* **B32B** *7/08;* **A41D** *27/24*

U.S. Cl. 112—262.1 **4 Claims**



1. A sewing seam particularly for jean fabric having in combination therewith at least one fabric flap having an edge, an edge portion and an overlapped portion and at least one other fabric flap having an other edge and an other edge portion, said sewing seam comprising at least one hemming seam, at least one fold, at least one basting line, and stitches including a plurality of perforations, and at least one cord-like element, said hemming seam being substantially rigidly associated with said edge of said one fabric flap and with said other edge of said other fabric flap, said basting line being substantially rigidly associated with said one fabric flap and said other fabric flap and extending substantially parallel to said hemming seam, between said hemming seam and said basting line there being defined a doubled flap edge portion, said doubled flap edge portion comprising said edge portion of said one fabric flap and said other edge portion of said other fabric flap, said at least one fold being formed substantially at said basting line and causing said doubled flap edge portion to overlie said at least one fabric flap at said overlapped portion thereof, said perforations being formed in said doubled flap edge portion and said overlapped portion of said at least one fabric flap, said cord-like element successively extending through said perforations and thus defining said stitches, said stitches being adapted for joining together said doubled flap edge portion and said overlapped portion of said at least one fabric flap.

4,693,196

APPARATUS FOR MONITORING SHUTTLE THREAD SUPPLY OF A SEWING MACHINE

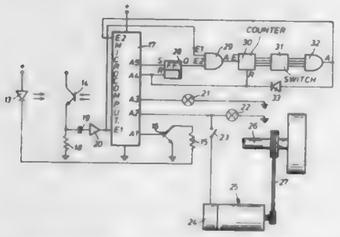
Walter Hager, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,648

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446682

Int. Cl.⁴ D05B *45/00, 69/18*

U.S. Cl. 112—273 **5 Claims**



1. An apparatus for monitoring a shuttle thread supply in a sewing machine with a lockstitch revolving shuttle, comprising a light-emitting diode which sends a beam of light through openings in a bobbin housing and in a bobbin of the shuttle, a photodetector for receiving light from the bobbin housing when a supply of thread on the bobbin falls to a selected amount and which thereby triggers a switching pulse for actuating means, counting means connected to the photodetector for counting to a number corresponding to the selected amount of thread on the bobbin, said counting means counting toward the number each time light is received by the photodetector, the photodetector acting as a pulse generator for said counting means, and additional actuating means connected to and controllable by the counting means when the number has been reached by said counting means.

4,693,197

SEWING MACHINE APPARATUS WITH IMPROVED SHAFT SPEED MEASURING AND INDICATING MEANS

Kazuya Tami, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,794

Int. Cl.⁴ D05B *69/18*

U.S. Cl. 112—277 **1 Claim**

1. A sewing machine apparatus, comprising:

(a) storage means for storing a preset RPM range of the sewing machine;

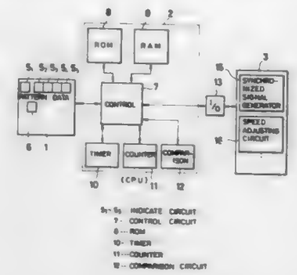
(b) means for detecting signals synchronized with rotation of the main shaft of the sewing machine;

(c) means for determining the cycle of time of the sewing machine by referring to said synchronized signals;

(d) means for comparing said cycle time with said preset RPM range;

(e) indicator means for indicating the RPM of the sewing machine as being within said preset RPM range determined by comparing said cycle time with said preset RPM range; and

(f) indicator means for indicating the direction of adjustment of the sewing machine RPM to bring the sewing machine



RPM within said preset RPM range if the RPM of the sewing machine is not within said preset RPM range.

4,693,198

ADJUSTING DEVICE OF SLACK AMOUNT OF LOWER THREAD IN ZIGZAG SEWING MACHINE

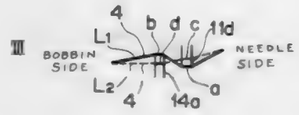
Susumu Hanyu, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

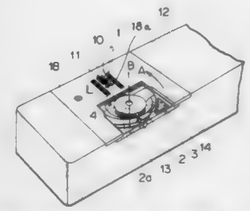
Continuation-in-part of Ser. No. 560,422, Dec. 12, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,954

Claims priority, application Japan, Dec. 27, 1982, 57-226790

Int. Cl.⁴ D05B *3/02, 27/00, 49/00, 57/26*

U.S. Cl. 112—443 **2 Claims**





1. An improved zigzag sewing machine which is provided with a needle plate having a laterally elongated needle dropping hole formed therein into which a needle with an upper thread vertically reciprocates as it laterally swings traversing the maximum range between a right end needle position and a left end needle position of the needle dropping hole **18***a*, a horizontal rotary loop taker having a central rotation axis located forwardly of the needle and rotated to catch an upper thread loop formed at the needle, a bobbin carrier having an upper face **14***b* and disposed horizontally in the loop taker and restrained against rotation, a bobbin loaded with the lower thread and disposed in said bobbin carrier, said lower thread being supplied to said needle dropping hole by way of a guide located leftwardly of the left end needle position, and a feed dog structure including a yoke extending substantially in parallel with the laterally elongated needle dropping hole and located forwardly of the needle dropping hole, the feed dog structure being operated to move vertically and horizontally to

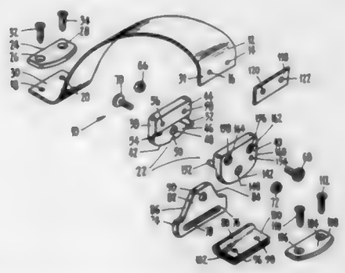
transport a sewn fabric relative to the needle while the yoke **11***c* engages the bobbin thread to draw out the same from the bobbin as the feed dog structure is vertically moved down, wherein the improvement comprises first slack control cam means **11***d* provided on said yoke **11***c* and second slack control cam means **14***a* provided on said upper face **14***b* of said bobbin carrier **14** and located forwardly of said first slack control cam means, said first slack control cam means including a first slack control cam extending substantially in parallel with said needle dropping hole **18***a*, said first slack control cam including a portion (a) most projecting down at a position opposite to said left end needle position L of said needle dropping hole and a portion (c) progressively reducing upward toward said right end needle position R of said needle dropping hole, said second slack control cam means including a second slack control cam extending substantially in parallel with said first slack control cam, said second slack control cam including a portion (b) most projecting up at a position opposite to said left needle position L of said needle dropping hole and a portion (d) progressively reducing down toward said right end needle position R of said needle dropping hole, said first and second slack cams **11***d*, **14***a* cooperating with each other to control the slack of said bobbin thread **4** with respect to the left and right end needle positions of said needle dropping hole during the zigzag stitching operation of the sewing machine.

4,693,199

RELEASE MEANS FOR SAILBOARD FOOTSTRAPS

Ludwig Omachen, 6 Bells Boulevard, Jan Juc, 3228, Victoria, and Stephen Janson, 38 Sheepwash Road, Barwon Heads, 3227, Victoria, both of Australia

Filed Dec. 2, 1985, Ser. No. 804,342
Claims priority, application Australia, Nov. 30, 1984, PG8383
Int. Cl.⁴ B63H *9/04*
U.S. Cl. 114—39 **15 Claims**



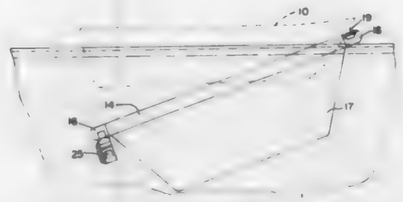
15. A release arrangement for a sailboard footstrap, including male and female members adapted to be connected to a footstrap portion or the sailboard; said female member including two generally parallel flexible portions defining a space; said male member being generally planar and adapted for insertion into said space in said female member; said members being provided with engagement means which normally retain said members in engagement after said insertion, said engagement means comprising a generally frusto-conical boss on each major face of said male member and a mating recess in the inner face of each portion of said female member; said male and female member being permitted limited relative rotational movement about the axis of said engaged bosses and recesses, said male member having lateral surfaces capable of co-operating with lateral surfaces of said female member extending between said portions when the limit of said limited rotational movement is reached under the influence of a rotational force exceeding a predetermined value to lever said bosses from said recesses by flexing said portions, thereby disengaging said members.

4,693,200

APPARATUS FOR ENCLOSING A BOAT HULL

Thomas D. Noble, Chapin, Ill., assignor to Noble Boyd Enterpises, Beardstown, Ill.

Filed Nov. 27, 1985, Ser. No. 802,429
Int. Cl.⁴ B63B *59/02*
U.S. Cl. 114—47 **11 Claims**



1. A selectively semi-submergible apparatus for enclosing the submerged body portion of a boat hull while the body remains floating in water comprising:

(1) a semi-submergible planar rigid framework formed of sealably interconnected water impervious rigid tubular bow, side and stern sections, said framework having a length and width greater than the length and width of a submerged body portion to be enclosed therein,

(2) a depending water impervious continuous envelope secured to said framework with said envelope defining a space having greater dimensions than the submerged body portion,

(3) said tubular bow section having between the ends thereof floatation material which prevents water filling the interior of said bow section and maintains said bow section buoyant while said framework remains in the water,

(4) said tubular side sections and stern section having the interior thereof in fluid flow communication,

(5) pump means in fluid flow communication with the interior of said tubular side sections and stern section,

(6) said pump means being adapted for pumping water into the interior of said tubular side and stern sections to effect pivotally moving said side and stern sections relative to said bow sections as a unit downwardly to completely submerge said stern section below the surface of said water to a depth greater than the draft of said submerged body portion while said bow section remains buoyant on the surface of the water whereby the submerged body portion can be freely moved across the submerged stern section and within the perimeter of said framework, and

(7) said pump means being further adapted to remove water from the interior of said side sections and stern section to effect floating siad side and stern sections and enclosing the submerged body portion within said framework and envelope.

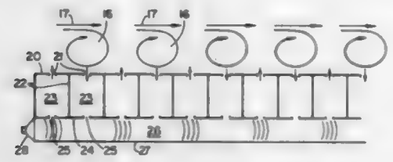
4,693,201

LOW DRAG SURFACE CONSTRUCTION

John E. F. Williams, and Jack Lang, both of Cambridge, England, assignors to Rolls-Royce plc, London, England

Filed Sep. 12, 1985, Ser. No. 796,945
Claims priority, application United Kingdom, Sep. 13, 1984, 8423140
Int. Cl.⁴ B61D *35/00*
U.S. Cl. 114—67 R **5 Claims**

1. A surface construction subject to drag caused by a fluid stream thereacross having a plurality of linear vortices extending parallel with, and adjacent thereto, said surface construction comprising: vortex stabilizing means for producing a regularly spaced variation in boudnary flow streamwise of said surface construction to thereby stabilize the plurality of linear vortices in parallel spaced apart relationship to each other transverse of the boundary flow streamwise of the surface construction, said vortex stabilizing means including a plurality of apertures in said surface construction, energizing means coupled to said apertures to cause fluid to ingress and egress in a predetermined sequence with respect to neighboring apertures, and said variation in boundary flow causing said linear vortices to roll streamwise, at approximately half of freestream speed to thereby minimize drag.

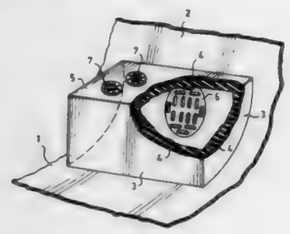


4,693,202

FREEZE RESISTANT BOTTOM WELL

Pentti K. Helpiö, Uusikaupunki, Finland, assignor to Rauma-Repola OY, Uusikaupunki, Finland

Filed Oct. 21, 1985, Ser. No. 789,488
Claims priority, application Finland, May 13, 1985, 851880
Int. Cl.⁴ B63B *25/08*
U.S. Cl. 114—74 A **5 Claims**



1. A bottom well of a vessel, comprising:

at least one of a bottom and a broad side of a vessel;

a wall and cover-plate structure attached to the at least one of the bottom and broad side for together defining a bottom well having an inner space within inside surfaces thereof;

a water inlet in one of the at least one of the bottom and broad side for communication of the inner space with outside water;

a water outlet in one of the wall and cover-plate structure for communication of the inner space with systems of the vessel; and

means comprising at least one resilient body in the inner space for compensating for volume changes of water in the bottom well caused by the water freezing in the bottom well.

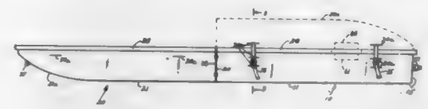
4,693,203

SEGMENTED BOAT

Marvin C. Lewis, P.O. Box 225, Murrels Inlet, S.C. 29576

Filed Jan. 22, 1985, Ser. No. 693590
Int. Cl.⁴ B63B *7/02*
U.S. Cl. 114—353 **12 Claims**

1. A segmented boat comprising a pair of opentopped shells; each said shell having a pair of sides and a pair of ends, each of said sides and one of said ends including an outwardly extending flange terminating in an upstanding flange; each of said shells having a rim therearound along its uppermost edge, each said rim being comprised of a terminal edge of each said upstanding flange along said sides and said one of said ends and a terminal edge of the remaining end, said upstanding flange and rim of one shell being capable of being disposed outwardly of and telescopically overlapping with the upstanding flange and rim of the other said shell when placed together with one shell



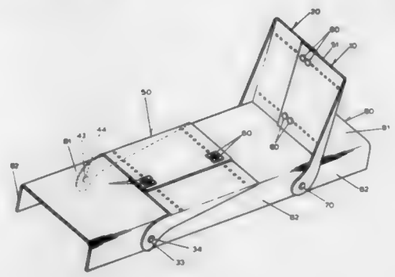
inverted relative the other shell for forming an enclosed box, and means for releasably connecting said shells together in said enclosed condition.

4,693,204

SIDE FACING BACKREST FOR BOATS

Robert A. Klein, 6610 N. Yuba St., Milwaukee, Wis. 53223

Filed Oct. 23, 1986, Ser. No. 922,485
Int. Cl.⁴ B63B *25/00*
U.S. Cl. 114—363 **7 Claims**



1. A two-section backrest comprising:

a right backrest section;

a left backrest section;

said right and left backrest sections being mirror images of each other;

each backrest section having a substantially rectangular back panel, said back panels having a top edge, bottom edge, and free edge, each backrest section having a side panel connected to said back panel by a substantially right angle bend;

said side panels each having an extended portion which extends below the bottom of the back panel of its backrest section, said extended portion also extending substantially out from the plane of the back part of its section;

said back panels having openings which line up with each other when said back panels are over-lapped, allowing the two backrest sections to be fastened to each other by known fastening means inserted through said openings;

said extended portions of said side panels being capable of being fastened to a seat located between them when said back portions are attached together.

4,693,205

EGG DECORATING KIT

Gerald D. Thill, Eden Prairie, Minn., assignor to Spearhead Industries, Inc., Minneapolis, Minn.

Filed Mar. 3, 1986, Ser. No. 835,180
Int. Cl.⁴ B05C *13/02*; **B05D** *5/06*
U.S. Cl. 118—13 **7 Claims**

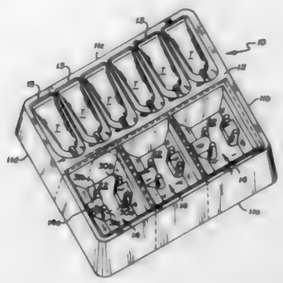
1. An egg decorating kit, including:

a. a base;

b. upwardly directed support means arranged on said base with the uppermost end thereof arranged and constructed

to support an egg thereon to hold the egg in elevated position above said base;

c. a collapsible fluid container for releasably containing decorative fluids for application to the egg; and,



d. a quantity of decorative fluid in said container releasable therefrom upon the application of collapsing pressure to said container for flow over the surface of the egg for decoration application to the egg.

4,693,206

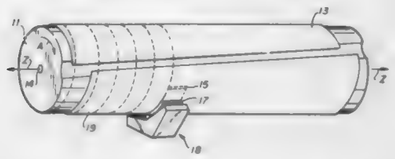
SELF-SEATING TONING SHOE FOR ELECTROSTATIC DRUM PRINTERS

Gene F. Day, Cupertino, Calif., assignor to Precision Image Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 796,872, Nov. 12, 1985, Pat. No. 4,655,165, which is a continuation-in-part of Ser. No. 763,040, Aug. 6, 1985. This application May 9, 1986, Ser. No. 861,521

Int. Cl.[4] B05B *5/02*

U.S. Cl. 118—631 **23 Claims**



1. A toning shoe assembly for an electrostatic drum printer comprising,

a drum having a round outer circumferential surface capable of supporting a sheet carrying an electrostatic latent image,

a toning shoe having a toning surface matching a region of the circumferential surface of the drum, with a raised outer periphery in contact with said sheet and a depressed central region in communication with a supply of fluid developer for applying the developer to the sheet, and

means for positionally biasing said shoe against said sheet at a single point thereof, said shoe being movable relative to a normal orientation about first, second and third mutually orthogonal axes through said single point of said shoe so as to be responsive to the local orientation of said sheet on said drum.

4,693,207

APPARATUS FOR THE GROWTH OF SEMICONDUCTOR CRYSTALS

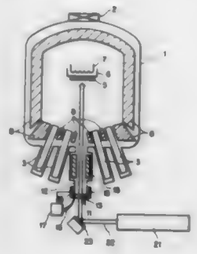
Toshiro Hayakawa, Nara; Takashiro Suyama; Kohsei Takahashi, both of Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1985, Ser. No. 805,517

Claims priority, application Japan, Dec. 7, 1984, 59-259570

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—715 **1 Claim**



1. An apparatus for the growth of semiconductor crystals in which the surface of a substrate is irradiated with molecular beam containing elements by which semiconductor thin films are formed on the substrate within a molecular beam epitaxial growth chamber in a high vacuum, thereby achieving molecular beam epitaxial growth of semiconductor thin films onto the substrate, wherein said molecular beam epitaxial growth chamber comprises an optical window through which light is introduced into said growth chamber and irradiates the surface of said substrate during molecular beam epitaxial growth, and wherein said optical window is mounted on the molecular beam epitaxial growth chamber by a vacuum port containing a cooling means therein, and comprises a window substance and a heater disposed around said window substance for heating said window substance.

4,693,208

FEEDER OF OXYGEN GAS CONTAINING STEAM

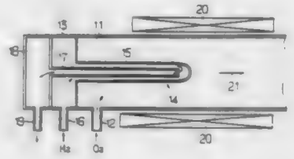
Takamasa Sakai, Kusatsu, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto

Filed Jul. 15, 1986, Ser. No. 885,697

Claims priority, application Japan, Jul. 15, 1985, 60-156708

Int. Cl.[4] C23C *8/16*

U.S. Cl. 118—724 **7 Claims**



1. A feeder of oxygen gas containing steam in which hydrogen gas is fed into an atmosphere of oxygen gas, and oxygen gas containing steam generated by combustion of the hydrogen gas is fed to a treating object, characterized by comprising a combustion chamber, an oxygen gas induction tube which induces the oxygen gas to the combustion chamber, a hydrogen gas chamber separated from said combustion chamber by a hydrogen osmotic film of oxidation catalysis therebetween, a hydrogen gas induction chamber which induces the hydrogen gas to the hydrogen gas chamber, an exhaust tube communicated with said hydrogen gas chamber, and heating means.

4,693,209

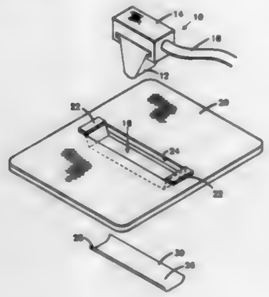
APPARATUS FOR DISPENSING SOLDER PASTE

John L. Leicht, Hawthorn Woods, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 687,886, Dec. 31, 1984, Pat. No. 4,636,406. This application Jul. 17, 1986, Ser. No. 886,462

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—213 **21 Claims**



1. An apparatus for dispensing solder paste onto a surface in a predetermined pattern, said apparatus comprising:

solder paste dispensing means adapted to be coupled to a solder paste supply, said dispensing means having a dispensing opening therein for extruding the solder paste therethrough;

stencil means having a predetermined pattern and raised sides and ends;

means for applying said dispensing means to said stencil pattern and moving said dispensing means across said stenciled pattern while extruding said solder paste from said dispensing means onto said stenciled pattern with said raised sides and ends on said stencil means containing the movement of said dispensing means and thereby selectively controlling the application of said solder paste; and

means for removing said dispensing means and said stenciled pattern from said surface forming said predetermined solder paste pattern on said surface.

4,693,210

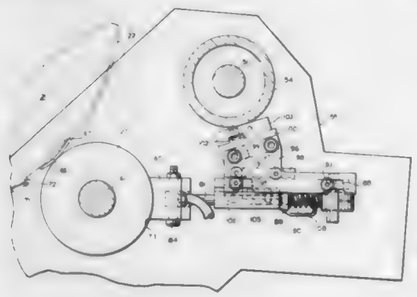
QUICK CHANGE FOUNTAIN

Frank J. DiFrank, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 28, 1986, Ser. No. 856,323

Int. Cl.[4] B05C *1/02*

U.S. Cl. 118—259 **7 Claims**



1. A quick change fountain for the application of a solvent to the surface of a vertical gravure roll, comprising a vertical member extending parallel to but horizontally displaced from the axis of said gravure roll, mounting means extending from said vertical member and including a pair of vertically spaced, outwardly extending, horizontal base holders, a generally rectangular clamp plate having a vertical length approximately equal to the vertical spacing between said base holders, a pair of shoulder bolts extending out from the ends of said clamp plate, a pair of vertical angle slots extending through said base holders, said bolts adapted to seat within said angle slots, a pair of vertically spaced, horizontal shafts, linear bearings mounted on said clamp plate for supporting said shafts for horizontal reciprocation, spring means for biasing said shafts axially in one direction, a vertical fountain adapted to engage the surface of a roll, means for mounting said fountain to ends of said horizontal shafts to bias the fountain into engagement with the roll, and means connecting said clamp plate to said mounting means.

4,693,211

SURFACE TREATMENT APPARATUS

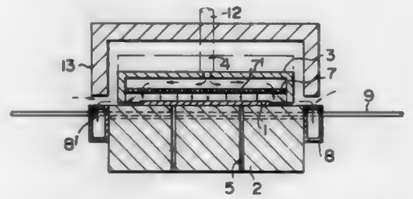
Nobutoshi Ogami, and Masaru Kitagawa, both of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 18, 1985, Ser. No. 810,425

Claims priority, application Japan, Jan. 10, 1985, 60-950[U]

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—725 **11 Claims**



1. In an apparatus for processing a wafer substrate with an adhesion-enhancing agent, said apparatus including a heating or cooling plate having an upper surface for heating or cooling said substrate thereon, conveyer means for conveying said substrate to and from said plate, introducing means for introducing said adhesion-enhancing agent onto said substrate and an insulating housing provided above said plate, the improvement therein comprising:

an inner cover means provided with said housing for defining a processing chamber between said heating or cooling plate and said cover means, said cover means being connected to said introducing means and movable relative to said heating or cooling plate when a substrate is conveyed to and from said heating or cooling plate;

a straightening plate having a plurality of holes over the whole surface thereof and being mounted within said cover means between said introducing means and said plate;

spacer means for defining a space between the upper surface of said heating or cooling plate and the lower peripheral edge of said cover means; and

an exhausting chamber provided entirely around said lower peripheral edge of said housing, said chamber having a port which extends entirely around said peripheral edge of said housing, said chamber being connectable to suction means,

said adhesion-enhancing agent introduced into the processing chamber through said straightening plate and supplied onto the substrate evenly and uniformly through said holes flows out through said space between said heating or cooling plate and said cover means as a natural flow, and is then drawn through said port into said exhausting chamber by said suction means.

4,693,212

ANIMAL RESTRAINT APPARATUS AND METHOD

Kenneth R. Black, P.O. Box 2073, Universal City, Tex. 78148

Filed Feb. 3, 1986, Ser. No. 825,346
Int. Cl.⁴ A61D *3/00*
U.S. Cl. 119—103 **15 Claims**



10. A method of physically restraining the feet of an animal while the animal is in an upright, standing position for grooming or other needs comprising the steps of:

adjusting a plurality of elongate anchoring members slideably and rotatably mounted upon a horizontally disposed base board and each having means at one end for restraining each foot of an animal to a selected position approximating the normal stance of an animal such that the legs of the standing animal are substantially perpendicular to the plane of the base board upon which the animal is standing;

adjustably and releasably securing the elongate anchoring members to the base board in said selected position;

positioning the feet of the animal on the base board in close proximity to the end of the elongate anchoring members having the foot restraining means thereon, said base board means supporting the entire weight of the animal standing upright thereon; and

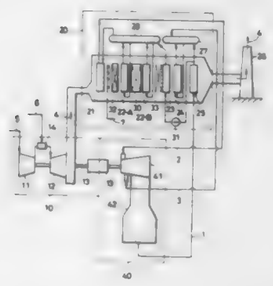
securing each of the foot restraining means around each respective ankle portion of the lower leg of the animal.

4,693,213

WASTE HEAT RECOVERY BOILER

Eiji Yanai, and Tetsuzo Kuribayashi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP85/00466, § 371 Date Mar. 19, 1986, § 102(e) Date Mar. 19, 1986, PCT Pub. No. WO86/01579, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 23, 1985, Ser. No. 841,179
Claims priority, application Japan, Aug. 24, 1984, 59-175030
Int. Cl.⁴ F22D *1/00*
U.S. Cl. 122—7 R **8 Claims**



1. A waste heat recovery boiler of the type which utilizes an exhaust gas of a gas turbine and generates steam for driving a steam turbine, the improvement wherein at least two denitrating devices for removing NOx components in the exhaust gas therefrom are disposed inside said waste heat recovery boiler, said waste heat recovery boiler is equipped with fuel economizers for preheating feed water by said exhaust gas, rear and front evaporators for evaporting the pre-heated feed water, a superheater for for heating the vaporized feed water and generating the driving steam for said steam turbine, all of said constituent members being disposed sequentially from a downstream side to an upstream side of the exhaust gas, and wherein said denitrating devices are disposed between said at least two evaporators and between said front evaporator and said superheater.

4,693,214

TAPPET SYSTEM FOR INTERNAL COMBUSTION ENGINES HAVING SHAFTS WITH VARIABLE-PROFILE CAMS

Andrea Titolo, Turin, Italy, assignor to Fiat Auto S.p.A., Turin

Filed Jun. 24, 1986, Ser. No. 877,937
Claims priority, application Italy, Jul. 2, 1985, 67604 A/85
Int. Cl.⁴ F01L *1/34*
U.S. Cl. 123—90.18 **3 Claims**



1. Tappet system for engines having a head and a camshaft with variable-profile cams, of the type comprising a shoe, a shoe-carrying saddle, and a cup slidable in the head, and in which the shoe has a flat, rectangular cam-shoe contact surface and is provided on its surface opposite the contact surface with a semi-circular-sectioned projection whose axis is perpendicular to a longitudinal axis of the camshaft, wherein the shoe-carrying saddle has a seat in its upper surface for coupling with the projection, two tabs disposed on diametrally opposite faces of the saddle for centering it in the cup, and an extension coaxial with the seat, and wherein a retaining element is fixed in the head and is arranged to cooperate with the extension of the saddle to prevent rotation of the saddle about the valve axis.

4,693,215

INLET PORT FOR INTERNAL COMBUSTION ENGINE

Katsuhiko Sugiyama; Hiromitsu Kawazoe, and Yoshinori Idota, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 531,391, Sep. 12, 1983, abandoned. This application Oct. 21, 1985, Ser. No. 789,370
Claims priority, application Japan, Sep. 18, 1982, 57-162934; Mar. 30, 1983, 58-56113
Int. Cl.⁴ F01L *3/00*
U.S. Cl. 123—188 M **10 Claims**

1. An internal combustion engine comprising:

a cylinder chamber having an end face and a wall surface;

means defining an off-center inlet hole in said end face; and

an inlet port for directing inlet air into said cylinder chamber, said inlet port comprising:

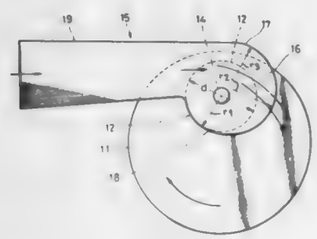
a swirl generating section being connected to said inlet hole; and

a straight, elongated introducing section connected to said swirl generating section, wherein:

said swirl generating section surrounds said valve stem;

said swirl generating section comprises a wall surface having an outside part proximate and substantially parallel to the portion of said wall surface of said cylinder chamber closest to said inlet hole and an inside part coinciding with the edge of said inlet hole;

the width between said peripheral surface of said valve stem and said wall surface of said swirl generating section gradually decreases from said outside part up to said inside part and is constant at said inside part;



the height of said wall surface of said swirl generating section decreases gradually from said outside part to said inside part at an average rate of not less than 0% and not more than 0.18% of the diameter of said inlet hole per 1 degree around said valve stem; and

said elongated introducing section is connected to said outside part smoothly so that the main stream of the inlet air flows from said elongated introducing section into a position between said wall surface of said outside part and the peripheral surface of said valve stem and further flows through said inlet hole into said cylinder chamber along the tangential direction of said wall surface of said cylinder chamber closest to said inlet hole without being turned spirally around said valve stem, whereby the main stream of the inlet air flows along said wall surface of said cylinder chamber to produce swirl.

4,693,216

CRANKSHAFT BEARINGS FOR INTERNAL-COMBUSTION ENGINES

Herbert Ampferer, Bietigheim-Bissingen, and Klaus Gröger, Hemmingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

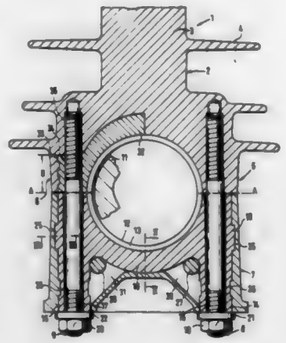
Filed Jul. 17, 1985, Ser. No. 755,795
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426208
Int. Cl.⁴ F02F *7/00*
U.S. Cl. 123—195 R **15 Claims**

1. Crankshaft bearings that consist of a light metal alloy formed by bearing sections and bearing caps, each of said bearing caps being held by screw means to a respective one of said bearing sections and each said bearing cap having a core means of ferrous metallic material, wherein:

said core means having at least two lugs extending between opposite faces of said bearing cap and being separated from one another with a transverse part means extending between and connected to said lugs forming a bearing support section of said crankshaft bearings,

reinforcing means being connected between said lugs for reinforcing said core means,

said lugs receiving said screw means, and wherein



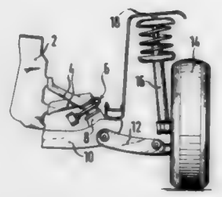
said screw means extend into a bottom of each of said bearing sections for holding each of said bearing caps against the bottom of the respective one of said bearing sections.

4,693,217

ARRANGEMENT FOR MOUNTING AN ENGINE ON THE CHASSIS OF A MOTOR VEHICLE

Wilhelm Beer, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1985, Ser. No. 764,410
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431324
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 123—195 A **8 Claims**

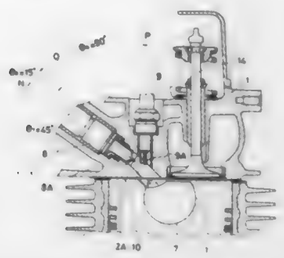


1. Arrangement for mounting an engine or an engine-transmission drive unit on a chassis of a motor vehicle, including a damping assembly interposed between engine load bearing support means and comprised of a metal-rubber component and a vibration attenuating means comprising a lever arm securely connected at one end to elastomeric members, said lever arm having a mass secured to an opposite free end, the improvement comprising:

the lever arm extending between said elastomeric members such that a longitudinal axis of said lever arm projects outwardly from a load bearing axis, said load bearing axis being formed along said load bearing support means,

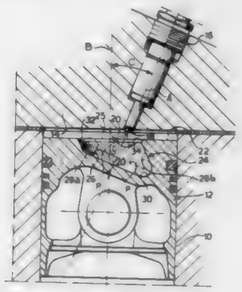
the lever arm having said one end secured to a bent portion of a rigid outer member that is part of the rubber-metal component and operatively connected to the engine.

4,693,218
INTERNAL COMBUSTION ENGINE
Katsuhiko Nagakura, Yawata, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan
Filed Sep. 6, 1985, Ser. No. 773,269
Claims priority, application Japan, Sep. 12, 1984, 59-189810; Apr. 10, 1985, 60-74297; Apr. 26, 1985, 60-88899
Int. Cl.[4] F02B *19/10, 19/12*
U.S. Cl. 123—260 5 Claims



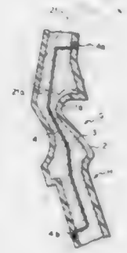
1. An internal combustion engine having a main combustion chamber in a top portion of a piston, and an ignition chamber in a cylinder head, which is provided with a fuel injection valve and an ignition plug, characterized in that the direction in which fuel is ejected from said fuel injection valve is in accordance with the forward direction of a swirl in said main combustion chamber, the axis of the ejected fuel being spaced from a substantially central portion of said main combustion chamber by a distance of not more than $\frac{1}{4}$ of the radius thereof, a recess which is in communication with said main combustion chamber being provided in the section of the top portion of said piston which is on an extension of said ignition chamber, the diameter of said ignition chamber is set larger than that of an atomized fuel spray at the outlet thereof, a spark gap of said ignition plug being provided in a position which is spaced by 4 to 10 mm from the center of the spherical end of a nozzle of said fuel injection valve toward the outlet of said ignition chamber, and 2 to 7 mm from the axis of said fuel injection valve in the radial direction of said ignition chamber.

4,693,219
INTERNAL COMBUSTION ENGINE WITH DIRECT FUEL INJECTION
Antonio Burgio, Moncalieri, Italy, assignor to Fiat Auto S.P.A., Turin, Italy
Filed Apr. 11, 1984, Ser. No. 598,943
Claims priority, application Italy, Apr. 11, 1983, 67393 A/83
Int. Cl.[3] F02B *23/06*
U.S. Cl. 123—276 5 Claims



1. An internal combustion engine, particularly a diesel engine with direct fuel injection, including at least one cylinder having a combustion chamber, a piston moveable within the cylinder and having a crown, a cavity formed in the piston crown and constituting at least part of the combustion chamber of the cylinder, and a fuel injector having a nozzle provided with a plurality of spraying holes facing the cavity in the piston, the fuel injector having an axis oriented at an angle substantially between 15° and 30° to the axis of the cylinder and the cavity in the crown of the piston having an inclined flat substantially elliptical base wall which is oriented perpendicular to the axis of the injector with the center of said base wall being located on an extension of the axis of the injector when the piston is substantially in its top dead center position and a mouth which is centered on the axis of the cylinder.

4,693,220
IDLING SPEED CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES
Hiroshi Hasebe, Hatogaya; Masahiko Asakura, Tokorozawa; Michio Sakaino, Fujimi, and Yukio Miyashita, Hannou, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan
Filed Jul. 1, 1986, Ser. No. 880,788
Claims priority, application Japan, Jul. 5, 1985, 60-146610
Int. Cl.[4] F02M *3/07*
U.S. Cl. 123—339 3 Claims



1. An idling speed control system for controlling idling rotational speed of an internal combustion engine having an intake passage and a throttle valve arranged therein, comprising:

vacuum-operated actuator means having a vacuum chamber, and a diaphragm defining said vacuum chamber chamber, and a diaphragm defining said vacuum chamber and operatively connected to said throttle valve for controlling opening and closing thereof in response to pressure in said vacuum chamber;

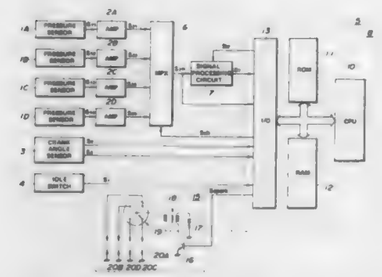
change-over control valve means operatively connected to said vacuum-operated actuator means for supplying said vacuum chamber, selectively, with a first control pressure or opening said throttle valve and a second control pressure for closing said throttle valve;

electronic control means operatively connected to said engine and said change-over control valve means, said electronic control means being adapted to effect control of the idling rotational speed of the engine by generating an on-off control pulse signal having a period corresponding to rotational speed of said engine, one of on-period and off-period of said on-off control pulse signal having a predetermined constant value, supplying said change-over control valve means with said on-off control pulse signal, in response to which said change-over control valve means supplies said vacuum chamber of said vacuum-operated actuator means, selectively, with said first control pressure and said second control pressure, said electronic control means being adapted to determine the rotational speed of said engine and a rate of decrease in the rotational speed of said engine, and halt said control for a predetermined period of time when the determined rotational speed of said engine falls within a predetermined range and at the same time the determined rate of decrease in the engine rotational speed falls within a predetermined range;

valve opening-correcting means operatively connected to said throttle valve and being responsive to at least one predetermined external load applied on said engine for correcting to a larger opening the opening of said throttle valve which is determined by said change-over control valve means in response to said on-off control pulse signal; and

said electronic control means being adapted to actuate said valve opening-correcting means to increase the opening of said throttle valve which is determined by said change-over control valve means in response to said on-off control pulse signal, when said electronic control unit halts said control of the idling rotational speed of said engine for said predetermined period of time.

4,693,221
ENGINE CONTROL SYSTEM
Yuji Nakajima, Yokosuka, and Akito Yamamoto, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Jul. 31, 1986, Ser. No. 891,168
Claims priority, application Japan, Sep. 5, 1985, 60-194877
Int. Cl.[4] F02P *5/15, 11/00*
U.S. Cl. 123—425 7 Claims



1. In an internal combustion engine wherein a spark timing control device adjusts spark timing in accordance with detected value of vibration in combustion pressure, an engine control system comprising;

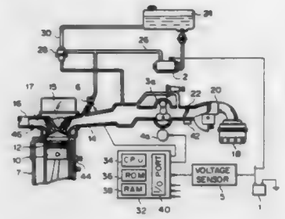
(a) means for detecting vibration in combustion pressure within the engine;

(b) means for converting the detected combustion pressure vibration into a correlation value relating to combustion condition of the engine;

(c) means for determining whether or not a malfunction of the spark timing control device occurs by comparing the current correlation value to a reference value corresponding to the correlation value which was obtained during engine idling; and

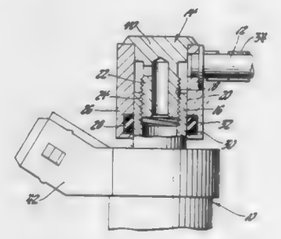
(d) means for controlling the spark timing in accordance with the detected combustion pressure vibration and also with the determination as to whether or not a malfunction of the spark timing control device occurs.

4,693,222
INTAKE AIR CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE
Hiroshi Itou, Nagoya; Yukihiro Okane, Toyota, and Akio Kuramoto, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Dec. 5, 1986, Ser. No. 938,463
Claims priority, application Japan, Dec. 18, 1985, 60-282741
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—432 6 Claims



1. An intake air control device for an internal combustion engine having a battery, an electrically operated fuel pump connected to said battery, fuel injector means supplied with fuel from said fuel pump, an intake air passage communicating with the engine cylinder, an intake air flow control means arranged in said intake air passage and operative in response to the running condition of the engine, an operating means for operating said air flow control means, a detecting means for detecting the voltage of said battery, and a control means for controlling said operating means so as to operate said intake air flow control means such that the amount of the intake air is decreased when the detected voltage is lower than a predetermined value.

4,693,223
FUEL INJECTION VALVE CONNECTION
Edgar S. Eshleman, Holcomb; Martin J. Field, Churchville, and James L. Penwright, Gasport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 21, 1984, Ser. No. 622,953
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—468 1 Claim



1. A fuel injection valve connection comprising a fuel injection valve having a cylindrical inlet fitting, said fitting having a threaded internal surface and a cylindrical external surface, a fuel connector having a projection with a threaded external surface that mates with the threaded internal surface of said fitting, said connector also having a sleeve with a cylindrical internal surface surrounding said fitting and an O-ring sealingly engaging said internal surface of said sleeve and said external surface of said fitting, whereby said valve may be rotated relative to said connector without breaking the sealing engagement between said valve and said connector, and wherein said

connector also has a tab engageable with said injector to prevent unthreading of said valve from said connector.

4,693,224

FUEL INJECTION METHOD AND APPARATUS

Michael L. McKay, Willeton, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

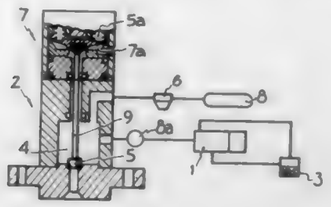
PCT No. PCT/AU84/00150, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1985, PCT Pub. No. WO85/00854, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 3, 1984, Ser. No. 740,067

Claims priority, application Australia, Aug. 5, 1983, PG0718/83

Int. Cl.⁴ F02M *67/02*

U.S. Cl. 123—531 **23 Claims**



1. A method of injecting fuel into a spark ignited internal combustion engine comprising:

controlling the supply of a gas to a fuel holding chamber to maintain a reference pressure that is above atmospheric pressure;

delivering fuel to the holding chamber against said reference pressure and regulating the period of and pressure differential effecting the delivery of the fuel to control the quantity of fuel delivered in accordance with the engine fuel demand;

establishing communication between the holding chamber and the engine after the delivery of the fuel to the holding chamber; and

maintaining said supply of gas to the holding chamber while said communication exists so the pressure of the gas is sufficient to displace the fuel from the holding chamber into the engine.

4,693,225

EXHAUST GAS RECIRCULATION SYSTEM FOR AUTOMATIC TRANSMISSION VEHICLE

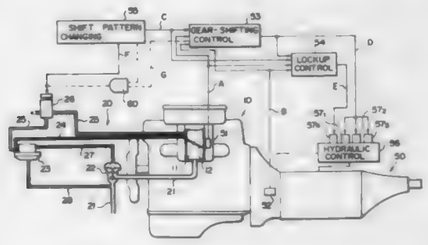
Yoshio Abe; Tetsuo Okano; Tomohiro Omori, and Minoru Kawamoto, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Feb. 28, 1986, Ser. No. 835,109

Claims priority, application Japan, Mar. 6, 1985, 60-45096

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **15 Claims**



1. An exhaust gas recirculation system for an internal combustion engine, comprising an automatic transmission which has a plurality of gear ratios and shifts between said gear ratios in accordance with a selected one of a plurality of shift patterns including an economy pattern in which upshift between successive ones of said plurality of gear ratios occurs at first corresponding predetermined vehicle speeds and a power pattern in which upshift between further successive ones of said plurality of gear ratios occurs at second corresponding predetermined vehicle speeds, wherein said second corresponding predetermined vehicle speeds are respectively greater than said first corresponding predetermined vehicle speeds, one of the shift patterns being selected by operation of a shift pattern changing means, and an exhaust gas recirculation control means which reduces the amount of exhaust gas to be returned to the combustion chamber for substantially all said vehicle speeds and loads in response to the selection of said economy pattern.

4,693,226

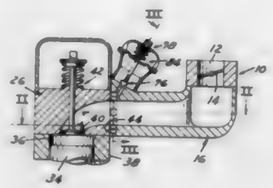
EGR CONTROL SYSTEM

Michael A. Choma, Dearborn Hts., Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 2, 1986, Ser. No. 869,481

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **11 Claims**



1. A self-contained exhaust gas recirculation (EGR) system for insertion as a unit between the cylinder head and the intake manifold of an internal combustion engine having an intake manifold formed with a plurality of laterally spaced individually runners connected individually from a throttle body to separate intake ports in the face of the engine cylinder head for the supply of an air/gas flow therethrough separately to each intake port, comprising an elongated spacer between the ends of the runners and the face of the cylinder head, the spacer having formed therein a plurality of laterally spaced individual air/gas flow passages each aligned with (each) one of the runners and (the) an engine intake port(s), the spacer having an EGR passage connected (at one end) to a source of exhaust gases, a plurality of EGR gas distribution passages formed within the spacer connected at one end in common to the EGR passage and at their other end communicating individually with (to) each of the spacer air/gas flow passages for the flow of exhaust gases thereinto and therefrom individually to the engine intake ports, and an EGR valve reciprocably mounted in the EGR passage on the spacer for controlling the flow of EGR gases to each intake port in approximately equal volumes.

4,693,227

MULTI-FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

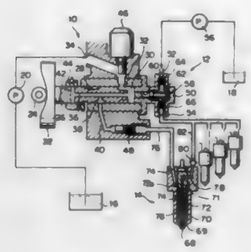
Yasuo Satou, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 7, 1986, Ser. No. 860,584

Claims priority, application Japan, May 21, 1985, 60-106833; Aug. 22, 1985, 60-182992; Oct. 9, 1985, 60-223791; Oct. 12, 1985, 60-155259[U]; Oct. 12, 1985, 60-155261[U]; Oct. 12, 1985, 60-155264[U]

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—575 **22 Claims**



1. A multi-fuel injection system for an internal combustion engine having a plurality of cylinders, said system comprising:

a first fuel injection pump means having a plurality of fuel outlets for delivering a first fuel in a predetermined cycle under a pressure higher than a predetermined value;

a second fuel injection pump means having a single fuel outlet and adapted to be driven synchronously with the first fuel injection pump means for delivering a second fuel under a pressure lower than said predetermined value;

a plurality of fuel injection nozzles arranged one by one for each cylinder of the engine, each of said fuel injection nozzles comprising a body having a cavity therein, at least one fuel injection port for injecting the fuel from said cavity to the relevant cylinder, a valve seat about said fuel injection port, a valve member inserted in said body so as to engage with said valve seat to open or close said fuel injection port, a first and a second fuel inlet passages formed through said body for introducing said first and said second fuels into said cavity, respectively, and means for causing said valve member to open said fuel injection port when the pressure of the introduced fuel is higher than said predetermined value and to close said port when the pressure is lower than said predetermined value;

a first set of fuel pipes for interconnecting the outlets of the first fuel injection pump means and the first inlet passages of the fuel injection nozzles one by one, respectively;

a second set of fuel pipes each having one end thereof commonly connected to said single outlet of said second fuel injection pump means and the other end connected to the second fuel inlet passages of the fuel injection nozzles one by one; and

means for preventing a backflow of the second fuel from each of said second inlet passages to said single outlet of said second fuel injection pump means.

4,693,228

CROSSBOW TRIGGER MECHANISM

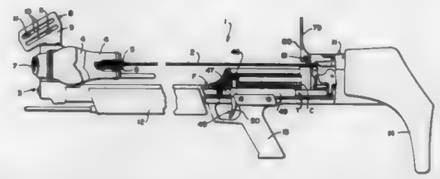
Gary Simonds, Gainesville, Fla.; Thomas P. Jennings, Sun Valley, Calif., and Henry Gallops, Melrose, Fla., assignors to Kidde Recreation Products, Inc., Gainsville, Fla.

Filed Feb. 13, 1986, Ser. No. 829,348

Int. Cl.⁴ F41C *19/00*

U.S. Cl. 124—25 **5 Claims**

2. A crossbow having a frame provided with a bowstring attached to resilient limbs, a trigger mechanism for holding the bowstring in a drawn position and allowing the selective release thereof, characterized in that; said trigger mechanism including a trigger assembly attached to said frame rearwardly of said limbs and having forwardly opening bowstring guide means therein adapted to receive a drawn bowstring, a pivotal bowstring catch member provided with a shoulder normally disposed in a position within the path of said guide means, catch spring means urging said catch shoulder into said normally disposed position, a pivotal sear having means normally precluding forward displacement of said catch member shoulder within said guide means while allowing of free rearward displacement of said shoulder against the force of said catch



spring means as said bowstring is rearwardly drawn into said guide means and rearwardly past said shoulder, a trigger operable to pivot said sear means and allow forward displacement of said catch member shoulder along with the forward release of said drawn bowstring from said guide means, wherein said trigger assembly includes a housing having a lower body and an attached upper arm, and said guide means comprises a horizontal slot through said housing between said lower body and upper arm, and wherein said housing comprises two laterally adjacent sections, and said catch member and sear are carried by one said section.

4,693,229

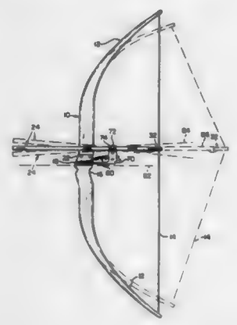
PROJECTILE SHOOTING GUIDE FOR BOWS

Jim Z. Nishioka, 268 Hemlock NW., Salem, Oreg. 97304

Filed Mar. 6, 1986, Ser. No. 836,698

Int. Cl.⁴ F41D *10/00*; **F41B** *5/00, 15/00*; **A63B** *65/02*

U.S. Cl. 124—41 A **14 Claims**



9. For use with a bow of the type having a bowstring and tensioning means connected to the bowstring, a projectile shooting guide comprising

a support for supporting a projectile guide member, said support being mounted for use on a bow,

an elongated guide member for support on a bow by said support,

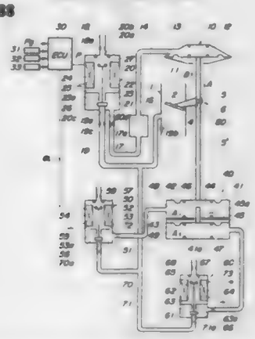
said guide member including forward and rearward portions and in an operative position said rearward portion extends rearwardly from said support,

projectile guiding means in said guide member for guiding a projectile to be shot by a bowstring, and

said support including means to allow vertical movement of

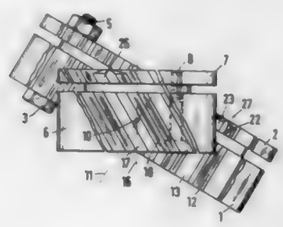
said guide member during drawing and shooting movements of said guide member,
said guide member also including a shooting position substantially perpendicular to a longitudinal axis of a bow,
said shooting guide also including resilient means for urging said guide member to maintain said shooting position during drawing and shooting movements of said shooting guide.

4,693,230
ARCHERY BOW HANDLE RISER
Akira Sugouchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Jan. 6, 1986, Ser. No. 816,194
Claims priority, application Japan, Jan. 11, 1985, 60-001958[U]; Jan. 11, 1985, 60-002929
Int. Cl.⁴ F41B *5/00*
U.S. Cl. 124—88 **3 Claims**



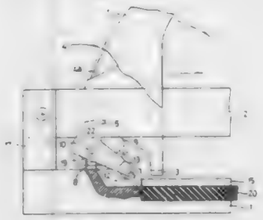
1. An improved archery bow having a grip, comprising:
a handle riser including an FRP shell and a core encased by said FRP shell; and
an elongated connector extending through said core in the longitudinal direction of said handle riser for a length of said grip and secured at both ends to said FRP shell.

4,693,231
GEARLIKE, ABRASIVE PRECISION WORKING TOOL, A METHOD FOR DRESSING OF SUCH A TOOL AND A DRESSING TOOL FOR DRESSING THE TOOL
Dieter Buschmeier, Kirchheim, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany
Filed Nov. 19, 1985, Ser. No. 799,539
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442830
Int. Cl.⁴ B24B *53/00*
U.S. Cl. 125—116 D **6 Claims**



1. In a gearlike tool for the precision working of the flanks of gears, the teeth of which have an abrasive surface free of any uniformly directed cutting edges, the improvement comprising wherein at least one guide gear is arranged in a coaxial relationship to said tool, wherein adjusting means are provided for permitting a relatively rotatably connection of said tool and said guide gear together to maintain said coaxial relationship and to prevent a relative rotation from occurring during a precision working task, wherein a guide pinion is arranged in a coaxial relationship to a dressing tool and wherein securement means are provided for fixedly and nonadjustably connecting said guide pinion and said dressing tool together to main'ain said coaxial relationship, teeth on said guide gear meshingly engaging, during dressing, teeth on said guide pinion while teeth on said dressing tool simultaneously meshingly engage teeth on said tool, wherein said teeth of said guide gear, said guide pinion, said dressing tool and said tool extend axially, said teeth of said guide gear being adjustably angularly offset from said teeth on said tool a first distance to thereby limit the amount of material to be removed from said tool by said dressing tool as said teeth meshingly roll on each other.

4,693,232
TILE-CUTTING MACHINE
Masaki Yasuga, 21-Go, 15-Ban, Minami 3-chome, Oimazato-Higashinari, Osaka, Japan
Filed Apr. 11, 1986, Ser. No. 850,762
Int. Cl.⁴ B28D *1/32*
U.S. Cl. 125—23 T **6 Claims**

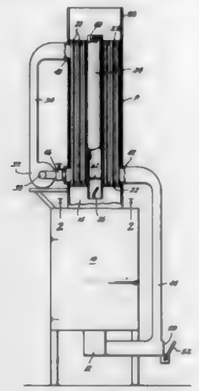


1. A tile-cutting device comprising a base for supporting a tile, an upright post at each end of said base, a guide rail extending between and supported by said posts above said base, and a lever handle having at its lower end a cavity through which said rail passes, said tile-cutting device characterized by the provision of:
a. an elbow member having first and second arms disposed at an angle relative to each other, said first arm being bifurcated having two branches extending upwardly into the handle cavity between said handle and said rail, one branch on each side of said rail;
b. means at the apex of said elbow member securing said elbow member pivotally to said handle; and
c. a cutter at the lower end of said second arm.

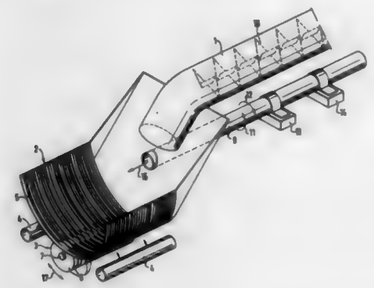
4,693,233
AIR PREHEATER SYSTEM
Hugo C. Meith, and Stanley A. McHugh, both of Houston, Tex., assignors to Energy Technology, Inc., Houston, Tex.
Filed Apr. 3, 1986, Ser. No. 847,927
Int. Cl.⁴ F24H *3/12*
U.S. Cl. 126—117 **4 Claims**

1. A preheater system, comprising:
a combustion chamber;
a preheater located above the combustion chamber and having a series of parallel substantially vertical preheater tubes to provide a substantially straight flow path for combustion gas for the full length of each of said tubes;
means for controlling the velocity and temperature of the combustion gas as it flows in said substantially straight flow path for the full lengths of the tubes to sweep liquid droplets out of the tubes with the combustion gas as it exits from the tubes to inhibit corrosion of the interior of the tubes by liquid droplets; and

said means for controlling the velocity and temperature of the combustion gas controlling the temperature of the preheater tubes between about 10° F. to about 100° F. below the dew point of the combustion gas and also controls the gas velocity in a range from about 10 ft./sec. to about 100 ft./sec., with such velocity varying in amounts which substantially correspond to the variations in the tube temperature range.

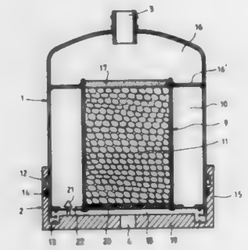


4,693,234
APPARATUS FOR AND METHOD OF BURNING AND/OR THERMALLY DECOMPOSING FUEL, ESPECIALLY SOLID FUELS
Nils Tunströmer, Mullsjö, Sweden, assignor to Stubinen Utveckling AB, Stockholm, Sweden
PCT No. PCT/EP85/00239, § 371 Date Mar. 13, 1986, § 102(e) Date Mar. 13, 1986, PCT Pub. No. WO85/05434, PCT Pub. Date Dec. 5, 1985
PCT Filed May 20, 1985, Ser. No. 827,977
Claims priority, application Fed. Rep. of Germany, May 21, 1984, 3418864
Int. Cl.⁴ F23H *9/04*
U.S. Cl. 126—155 **9 Claims**



1. An apparatus for burning and/or thermally decomposing fuel, especially solid fuels such as peat, coal, wood, straw or refuse, said apparatus comprising:
means for supplying fuel to said apparatus;
a bar grate including a plurality of bars for supporting said fuel a material loosening means mounted adjacent said bar grate, said material loosening means including disks protruding between the grate bars and mounted on a common support shaft that extends perpendicular to the grate bars, said disks being mounted on said shaft at spaced locations along said shaft so that a clearance exists between adjacent disks;
means for causing relative movement between said bar grate and said material loosening means in the direction of said grate bars;
wherein said relative movement causes said material loosening means to act on said fuel to loosen said fuel.

4,693,235
GAS HEATING PROCESS AND APPARATUS
Jean L. Vigneau, Varilhes, and Pierre Trenque, Ramonville St Agne, both of France, assignors to Duffour et Igon S.A. (D.I.), Toulouse, France
Filed Nov. 21, 1985, Ser. No. 800,381
Claims priority, application France, Nov. 23, 1984, 84 17850
Int. Cl.⁴ F24J *1/00*
U.S. Cl. 126—263 **18 Claims**



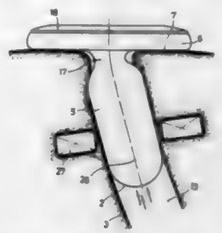
1. A process for heating a gas, which comprises the steps of:
placing soda-lime in a chamber containing a predetermined amount of carbonic gas;
contacting said predetermined amount of carbonic gas with said soda lime so as to initiate an exothermic reaction therebetween;
passing a gas to be heated and a second amount of carbonic gas continuously into said chamber and over said soda-lime so as to maintain said reaction and heat said gas to be heated by heat produced from said reaction; and
withdrawing heated gas from said chamber.

4,693,236
CLOSURE APPLIANCE FOR USE IN CONNECTION WITH SURGICAL OSTOMY
Leonardo Leprevost, Pasaje Maluquer, 9 Barcelona, Spain
Continuation of Ser. No. 617,538, Jun. 5, 1984, abandoned. This application Feb. 28, 1986, Ser. No. 834,515
Claims priority, application Spain, Jun. 9, 1983, 272.994; Nov. 9, 1983, 275.834; Feb. 27, 1984, 277.753
Int. Cl.⁴ A61B *19/00*
U.S. Cl. 128—1 R **17 Claims**

17. A closure appliance for use in cases involving surgical ostomy which comprises
a magnetic ring adapted to be implanted in a patient in the surrounding skin of a stoma,
a body formed by an upper member adapted to be disposed on the outside of the stoma and a lower member adapted to extend inside the stoma, said upper and lower members being securely joined together by an intermediate area of reduced cross section forming a flexible, elastic joint which allows relative angular movement between said two members in a rotula manner,
a magnetic element incorporated in the wall of said lower member, which interacts with said magnetic ring to cause

a seal to form between the stoma and the lower member wall and

at least one passageway extending through said body and providing communication between the upper member and the bottom of the lower member, said upper member



containing a cavity which communicates with the interior of the stoma through said passageway extending through the lower member of the appliance, whereby the lower member of the body is tightly secured within the stoma to selectively permit the evacuation of fluids from the interior of the stoma.

4,693,237

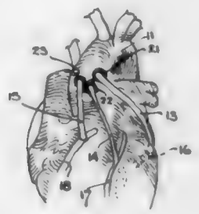
RADIOPAQUE CODED RING MARKERS FOR USE IN IDENTIFYING SURGICAL GRAFTS

Richard B. Hoffman, 73 Portugese Bend Rd., and Jonathan B. Po, 68 Portugese Bend Rd., both of Rolling Hills, Calif. 90274

Filed Jan. 21, 1986, Ser. No. 820,307

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**



1. A surgical procedure for radiographically identifying each site and destination of a surgical bypass graft comprising the steps of:

providing a plurality of marker members in the form of bands of a radiopaque material, each of said marker members having a different geometrical configuration, each of such configurations adapted to identify a different preselected graft destination,

placing each of said differently geometrically configured marker members around a different graft section at the site of the origin of the graft which its configuration is adapted to identify, and

suturing said markers in place at said graft sites to identify each such destination by virtue of the different geometrical configuration of each of said marker members.

4,693,238

MAGNETOTHERAPEUTIC IMPULSE DEVICE

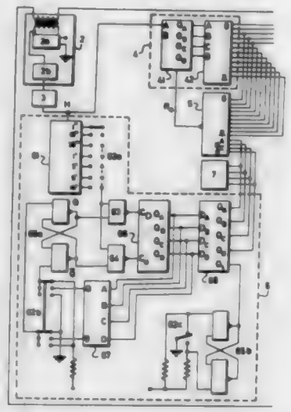
Jiri Jerabek, Prague, Czechoslovakia, assignor to TELSA, koncernovy podnik, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 515,940, Jul. 20, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 772,246

Claims priority, application Czechoslovakia, Jul. 20, 1982, 5549-82

Int. Cl.[4] A61B *17/52*

U.S. Cl. 128—1.5 **7 Claims**



1. Circuit arrangement of a magnetotherapeutic impulse device for treatment of spondylitis, e.g. Bechterew's disease, comprising a voltage source; and circuit means for voltage adjustment;

an electronic selector switch having a plurality of outputs, a zero input and a clock input; a multiplexor; and multiplexor control means, said multiplexor control means also having a clock input;

the circuit means for voltage adjustment being connected by its input to the voltage source and by its output both to the clock input of the electronic selector switch and to the clock input of the multiplexor control means;

a plurality of phasing elements, each output of the electronic selector switch being connected to a corresponding input of one of said phasing elements;

a plurality of power switching elements, each having a control input, the output of each of said phasing elements being connected to a corresponding control input of one of said power switching elements;

a plurality of electromagnet coils each one of which is connected in series with a corresponding one of said power switching elements and the voltage source;

the outputs of the electronic selector switch being furthermore connected, starting with the second output, to the inputs of the multiplexor, the output of the multiplexor being connected to the zero input of the electronic selector switch.

4,693,239

ORTHOSIS

William M. Clover, Jr., Trabuco Canyon, Calif., assignor to Orthomedics, Inc., Brea, Calif.

Filed Jan. 21, 1986, Ser. No. 820,037

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—80 F **8 Claims**

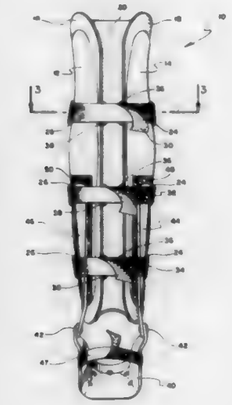
1. A lower leg orthosis for supporting the lower leg comprising:

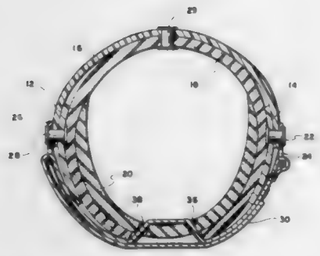
a semi-rigid shell provided with an anterior opening, such that said shell is open across that area of the shell where the anterior part of the leg is adapted to be positioned, and

having posterior, medial and lateral portions, the medial and lateral portions each being coupled to the posterior portion;

a first soft flexible material, more flexible than the semi-rigid shell, being disposed within said shell and adapted to enclose the lateral, medial and posterior parts of the leg;

a second soft flexible material, said second material having substantially the same flexibility as the first flexible material, said second material also being more flexible than said





semi-rigid shell, said second material being wider than the width of said anterior opening when the orthosis is positioned on a leg so as to be adapted to be disposed partially within said shell and to enclose the anterior part of the leg, the exposed portion of said second flexible material being free of any additional material which substantially decreases its flexibility; and

means for urging the lateral and medial shell parts toward each other to secure said shell and flexible materials around the leg.

4,693,240

ORTHOPAEDIC FRACTURE FIXATION APPARATUS

Mervyn Evans, Kidlington, England, assignor to National Research Development Corporation, London, England

Filed Apr. 12, 1985, Ser. No. 722,387

Claims priority, application United Kingdom, Apr. 12, 1984, 8409564

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 Z **5 Claims**

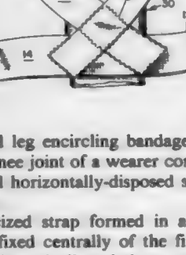
1. For an external orthopaedic fracture fixation apparatus, a clamp comprising:

a housing element having one end portion hollowed to serve as a cylinder; said portion having a pair of diametrally opposed apertures for passage of a pin therethrough, and said apertures being elongated axially of said cylinder;

a slide element of generally open-ended tubular form located in keyed manner in said housing element cylinder for non-rotatable axially reciprocal movement therein as a piston, said slide element having a pair of diametrally opposed apertures aligned with, but axially shorter than, those of said housing element for receipt of the pin, said slide element being axially slotted through one end portion thereof, and said slide element having an inward projection circumferentially around said one end portion;

an annular thrust member coaxially located in said slide element to seat on said inward projection;

a rotation element rotatably located in said slide element to



seat on said thrust member oppositely from said projection, said rotation element having a bore therethrough aligned with said housing element apertures and said sliding element apertures for receipt of the pin, and said rotation element having at least one slot extending therethrough from its exterior to its bore; and

a locking screw axially threadably engaged in said slide element oppositely from said one end portion, said screw being operably movable into said slide element to engage said rotation element to act on said thrust member thereby to urge said thrust member against said projection and to lock said slide element by expansion in said housing element, and simultaneously to lock said rotation element and a pin passing therethrough by compaction of said rotation element between said screw and thrust members.

4,693,241

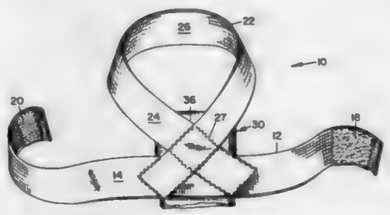
ELASTIC BANDAGE KNEE SUPPORT

Amalia Trzaadel, 32 St. Kolby Dr., Holyoke, Mass. 01040

Filed Jul. 21, 1986, Ser. No. 887,446

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—157 **6 Claims**



1. An elasticized leg encircling bandage knee support for placement at the knee joint of a wearer comprising:

a first elasticized horizontally-disposed strap having opposite free ends;

a second elasticized strap formed in a loop and having crossed ends fixed centrally of the first strap, the loop being disposed vertically relative to the first strap and adapted to encircle the leg of a wearer;

releasable fastening means on the free ends of the first strap permitting releasable interengagement of the free ends with each other when the strap encircles the leg of a wearer;

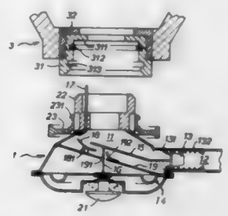
a semi-resilient pad releasably and adjustably fixed to the first and second straps in any selected pressure-exerting position of orientation.

4,693,242

COUPLING CONNECTORS FOR RESPIRATOR MASKS

Jacques Biard, Montreuil, France, assignor to Fenzy S.A., Montreuil, France

Filed Mar. 15, 1983, Ser. No. 475,634
Claims priority, application France, Apr. 2, 1982, 82 05706
Int. Cl.⁴ A62B *7/04*
U.S. Cl. 128—204.26 **11 Claims**



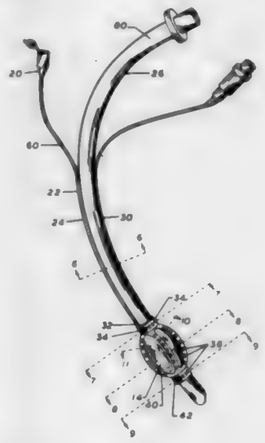
1. In a coupling connector attachable to and detachable from the snout of a respirator mask comprising a housing enclosing a body defining a control chamber having first and second ends, said housing having outlet means adapted to be connected to said snout and be in communication with the mask when in said connected position, said first end of said chamber being in communication with said outlet means, tube means connected to said housing for connection of a source of pressurized breathing gas, a control valve means in said housing to admit or shut off a main flow of gas under pressure from said tube means to said outlet means, biasing means applying a predetermined biasing force on said control valve means to maintain said control valve means in a closed position, said control valve means further comprising a pressure-sensing control diaphragm delimiting the control chamber at the second end thereof, an interlinkage chamber delimited at one side and separated from said control chamber by said pressure-sensing control diaphragm, an interlinkage jet leading into said interlinkage chamber, a return spring mounted between said first end of said control chamber and said pressure-sensing control diaphragm for pushing said control diaphragm towards the interlinkage jet; the improvement in which said control valve means includes a complementary spring, mounted within said control chamber, in series with the return spring, bearing means, against which said complementary spring bears, disposed at said first end of said control chamber, a movable cursor placed in between the return spring and the complementary spring, aperture means in said body and extending longitudinally along opposite sides of said body adjacent said movable cursor, said cursor extending exteriorly from opposite sides of said body through said aperture means, a shoulder formed on the exterior of said body, a lever bearing against said shoulder, said lever having at one end a fork engaging opposite ends of said movable cursor and having an opposite end, a feeler member which is constrained outside said body and inside said housing in a first position when said mask is connected to said snout to engage said opposite end of said lever to apply a force against the complementary spring thereby deactivating the complementary spring when said outlet is connected to said snout and freely movable to a second position when said mask is disconnected from said snout whereby both springs are then stressed which causes said pressure sensing diaphragm to close said interlinkage jet as long as said pressure-sensing control diaphragm senses a pressure equal to or greater than said ambient pressure when said outlet is disconnected from said snout.

4,693,243

CONDUIT SYSTEM FOR DIRECTLY ADMINISTERING TOPICAL ANAESTHESIA TO BLOCKED LARYNGEAL-TRACHEAL AREAS

Sharon Y. Buras, 713 Live Oak, Metairie, La. 70005

Continuation-in-part of Ser. No. 458,074, Jan. 14, 1983, abandoned. This application Mar. 26, 1986, Ser. No. 844,110
Int. Cl.⁴ A61M *25/00*
U.S. Cl. 128—207.15 **12 Claims**



1. A medical system, comprising:

a tubular member;

a pair of annular collar means inserted over said tubular member and fixedly attached to said tubular member in a spaced arrangement on said tubular member for forming a pair of spaced collar means;

an imperforate inflatable annular cuff member disposed over said tubular member between said collar means;

means along said tubular member for communicating with the interior of said cuff member to inflate said cuff member from a first uninflated configuration, to a second configuration having a sealing engagement with the laryngotracheal area of a human body; and

a flexible self-supporting conduit system connected between said collar means and disposed longitudinally over said cuff member;

open passage means in said conduit system when said cuff member is expanded to its second configuration, said open passage means allowing said cuff member to have a constant second inflated configuration to apply a constant pressure on the laryngotracheal area;

a plurality of openings in said conduit system communicating said open passage means with the laryngotracheal area sealingly engaged around said cuff member when said cuff member is expanded to its second configuration;

means along said tubular member communicating with said open passage means for communicating surgical fluid through said open passage means and through said openings into the laryngotracheal area sealingly engaged around said cuff member when said cuff member is expanded to its constant second configuration.

4,693,244

MEDICAL AND SURGICAL LASER PROBE I

Norio Daikuzono, Ichikawa, Japan, assignor to Surgical Laser Technologies, Inc., Cincianati, Ohio

Continuation of Ser. No. 612,672, May 22, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 931,935
Int. Cl.⁴ A61B *17/35*
U.S. Cl. 128—303.1 **8 Claims**



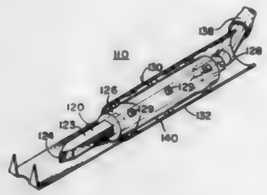
1. A medical and surgical laser probe for contact laser surgery; the probe optically connected to a laser source through an optical laser guide means; which probe is characterized in that the probe is made of an optically transparent solid material and comprised of a laser beam receiving portion and a tapered portion having a laser beam emitting tip end face; the tapered portion defining cross-sections of generally circular form having no surgical cutting edges along the tapered length thereof, and the length and the taper angle of the tapered portion and the radius of the tip end face of the tapered portion are determined and structural so that substantially all laser beam incident on the laser beam receiving portion from the laser beam guide means is emitted from the tip end face of the tapered portion without leaking out from the tapered face of the tapered portion; the laser beam being concentrated at the tip end face whereby said concentrated laser beam facilitates the surgical cutting of tissue.

4,693,245

NUCLEUS SPLITTER

David S. C. Pao, 95 High Point Dr., Churchville, Pa. 18966

Filed Oct. 1, 1985, Ser. No. 782,490
Int. Cl.⁴ A61F *17/32*
U.S. Cl. 128—305 **6 Claims**



1. A nucleus splitter device comprising:

(a) a hollow tubular body having a central axis;

(b) an elongated member slidable within said tubular body along said axis, said elongated member including an end portion having a receiving means;

(c) a platform structure extending from one end portion of the hollow tubular body;

(d) a projecting member supported by said platform structure at an end of said platform remote from the tubular body and adapted for immobilizing a nucleus of a lens, in vivo,

said projecting member having a plurality of projecting tines for piercing and holding said nucleus;

(e) a solid, penetrating tip for splitting said nucleus,

said penetrating tip being removably inserted in said receiving means of said elongated body,

said penetrating tip including a progressively decreasing cross-section ending with a single piercing portion;

(f) a plunger means reciprocally mounted within said hollow tubular body,

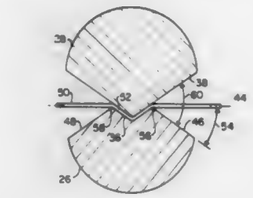
said plunger means including an end portion arranged to abut said elongated member to effect displacement thereof within said hollow tubular body whereby said penetrating tip is displaced in one direction only, to effect a controlled fragmentation of said nucleus.

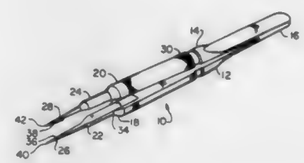
4,693,246

SUTURE TYING FORCEPS

Harry G. Reimels, Braintree, Mass., assignor to Mentor D & O, Inc., Norwell, Mass.

Filed Apr. 5, 1985, Ser. No. 720,505
Int. Cl.⁴ A61B *17/28*
U.S. Cl. 128—321 **5 Claims**





1. Suture tying forceps comprising:

(a) a pair of gripping arms integrally joined at one end, with the free ends thereof being normally in radially spaced relation;

(b) a pair of members respectively secured in said free ends of said pair of gripping arms and terminating in a pair of suture tying tips;

(c) said pair of suture tying tips formed with respective complementary mating surfaces designed to clamp a suture therebetween;

(d) one of said pair of suture tying tips having a longitudinal U-shaped groove providing a cross sectional configuration comprising a U-shaped clamping surface and a pair of substantially flat planar flexing surfaces being contiguous with and extending downwardly from said U-shaped clamping surface;

(e) the other of said pair of suture tying tips having a cross sectional configuration comprising a longitudinal U-shaped form in its central region and a second pair of substantially flat planar flexing surfaces being contiguous with and extending upwardly from said U-shaped form.

4,693,247

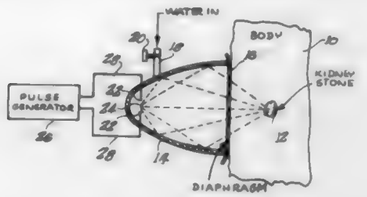
TRIGGERING CIRCUIT

Alfred G. Brisson, Kildeer, and Christopher Nowacki, Arlington Heights, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Sep. 29, 1986, Ser. No. 912,959
Int. Cl.⁴ A61B *17/00*
U.S. Cl. 128—328 **5 Claims**

1. The combination for the extracorporeal disintegration of calculi such as kidney stones comprising a reflector having a fluid therein adapted to be coupled to a body having a heart and a calculus such as a kidney stone, means in said reflector for generating a wave in said fluid, said reflector being positioned to focus said wave on said calculus in said body, ultra-

sound means for detecting when said heart is undergoing a ventricular contraction, electrocardiogram means for detecting when said heart is undergoing a ventricular contraction, a triggering circuit for operating said wave generating means to



generate a calculus disintegrating wave, and means connecting said ultrasound means and said electrocardiogram means to said triggering means to operate said wave generating means only when ventriculating contraction is detected by both of said ultrasound means and said electrocardiogram means.

4,693,248

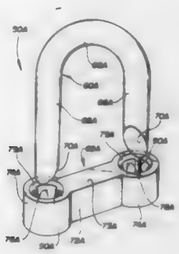
TWO-PIECE TISSUE FASTENER WITH DEFORMABLE RETAINING RECEIVER

Stephen J. Failla, Chester, N.J., assignor to Ethicon, Inc.

Continuation-in-part of Ser. No. 506,144, Jun. 20, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,795

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 C **9 Claims**



1. A polymeric fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

an open loop fastening member comprising a pair of legs with distal ends adapted to penetrate said tissue portions and a link connecting said legs that is adapted to be disposed adjacent one of said tissue portions, said legs being smooth and free of projections; and

a receiver adapted to be disposed against the other of said tissue portions opposite said fastening member, said receiver defining one passage therein for receiving one of said fastening member legs after said legs have been inserted through said tissue portions and defining another passage therein for receiving the other of said fastening member legs after said legs have been inserted through said tissue portions, said receiver further defining a plurality of deformable projections spaced peripherally around the interior surface of each said passage for being deformed as one of said legs is received in said passage to thereby effect an interference fit engagement between the exterior surface of the fastening member legs and the deformable projections and inhibit withdrawal of said leg from said receiver, said receiver being rigid and non-deformable except for said projections.

4,693,249

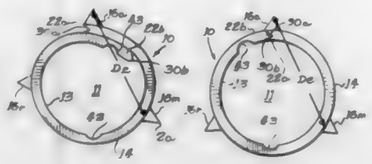
ANASTOMOSIS DEVICE AND METHOD

Robert R. Schenck, 1100 N. Lake Shore Dr., Aptmt. 33A, Chicago, Ill. 60611, and Harry P. Weinrib, 2644 West Estes Ave., Chicago, Ill. 60645

Filed Jan. 10, 1986, Ser. No. 817,825

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 R **20 Claims**



1. An anastomosis device for interconnecting the ends of first and second living vessels without tearing the same, said device comprising:

a ring-like body of biologically compatible material having flexibility to change its shape between a smaller size at a contracted state and a larger size at an expanded state,

said ring-like body being split and having separable ends,

a plurality of points on the ring-like body for impaling the ends of the first and second living vessels in apposition on the exterior of the ring-like body.

said ring-like body being biased to one of said states and being moved by the surgeon to the other of its states.

a first of said points being a primary point located adjacent one of said separable ends and being at a predetermined distance relative to a second remote one of said points when the ring-like body is in its contracted state, said remote point adapted to be impaled before the primary point, said primary point moving with the adjacent end to a distance greater than said predetermined distance and being the last of the points to be impaled prior to the ring-like body moving to its expanded state.

4,693,250

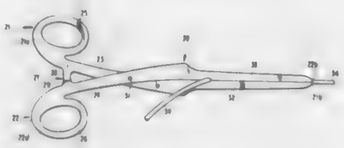
METHOD FOR DILATING PUNCTURE SITE IN THE RENAL PELVIS

Harold G. Coons, San Diego, Calif., assignor to Cook, Incorporated, Bloomington, Ind.

Filed Jan. 29, 1986, Ser. No. 823,767

Int. Cl.[4] A61M *29/00*

U.S. Cl. 128—345 **9 Claims**



5. A process for dilating a puncture site in tissue to allow for insertion of instruments therein, comprising the steps of:

sliding a clamp having jaws with a channel defined therein for receipt of the wire guide along a wire guide inserted in a puncture in tissue until the jaws are within the puncture; and,

enlarging the puncture by opening the jaws.

4,693,251

CLIP FOR THE OCCLUSION OF AN OVIDUCT OR VAS DEFERENS

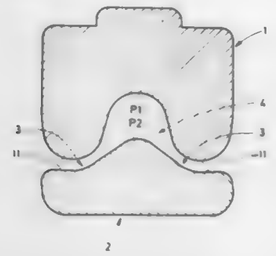
Waldemar Bleier, Saarlouis; Theodor Lutze, Balgheim, and Harald Stallforth, Tuttlingen, all of Fed. Rep. of Germany, assignors to Aesculap-Werke AG, Tuttlingen, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,160

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445874

Int. Cl.[4] A61B *17/28*

U.S. Cl. 128—346 **1 Claim**



1. A clip for the occlusion of an oviduct or vas deferens by clamping, consisting of two parts (branches) to be placed transversely to the duct to be clamped and a latching means, said parts exerting pressure on the section of duct (duct section) positioned between them, said pressure being generated by closure of the latching means and causing occlusion of the duct (duct occlusion), wherein the improvement comprises

the surfaces of the two branches facing the duct section or one another, respectively, have profiles of the type that a pressure effecting duct occlusion may be generated only in two separate regions of said branches while a cavity relieving pressure on said duct and allowing nourishment of its tissue is formed between said two pressure zones,

the substantially wave-like branch profiles having curvatures which are as slight as possible in each sectional plane extending vertically through said duct and having no projecting ridges so as to avoid clamping the tissue under said profiles in a manner that would prevent mourishment of the tissue,

said nutrition zone being continued on both sides of the duct section at right angles thereto and opening outwardly at the two shorter lateral faces or end faces of the clip,

and said clip comprising an upper part having extensions at both ends, said extensions being provided with catch detents, and a lower part having resilient members at both ends, said arms corresponding to said locking members and also being provided with catch detents, in such a manner that when said closing bridge is pressed into said lower part said catch detents of said locking members and said closing arms engage one another and form a self-locking closure of the two parts.

4,693,252

DEVICE FOR GENERATING DRY, COLD GAS FLOW

Klemens Thoma, Krefeld-Huls, and Wolfgang Volker, Tonisvorst, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

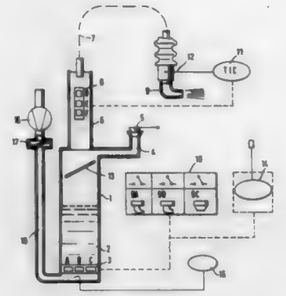
Filed Jan. 22, 1986, Ser. No. 821,347

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3506932

Int. Cl.[4] A61F *7/00*

U.S. Cl. 128—400 **7 Claims**

1. In a device for generating a dry cold gas flow by evaporating a low-boiling liquefied gas for cold thereapy for rheumatic diseases, with a vessel for accomodating the low-boiling liquefied gas, a hose line one end of which is connected to the vessel, and a plurality of interchangeable treatment nozzles of different cross sections for distribution of the evaporated gas attachable to the other end of the hose, the improvement being in that said vessel has only a small storage volume, the bottom of said vessel being provided with an adjustable electrical heater for evaporation of the liquefied gas, means for adjusting



the output of said electrical heater to ensure essentially the same gas exiting speed regardless of which nozzle is attached, and said one end of said hose line being connected to said vessel by means of an adjustable electrical heating line for heating the evaporated gas to the desired temperature.

4,693,253

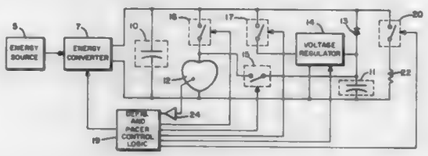
AUTOMATIC IMPLANTABLE DEFIBRILLATOR AND PACER

Theodore Adams, Edina, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 23, 1981, Ser. No. 246,528

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D **4 Claims**



1. An implantable defibrillator and pacer for cardioverting and pacing a patient's heart comprising:

a lead system for coupling the patient's heart to said defibrillator and pacer and for delivering cardioverting and pacing energy to the heart;

a sense amplifier for coupling to the heart for detecting the depolarization of cardiac tissue;

first energy storage means for storing both said cardioverting energy and pacing energy;

a primary energy source means for supplying energy to said first energy storage means;

an energy converter coupled to said primary energy source and said first energy storage means for supplying energy to said first energy storage means at a voltage higher than the voltage of said primary energy means;

second energy storage means for storing said pacing energy;

first switch means coupled to said first energy storage means for delivering said cardioverting energy to said lead system in response to a first control signal;

a voltage regulator coupled to said first storage means for charging said second storage means in response to a second control signal;

a second switch means for coupling said second energy

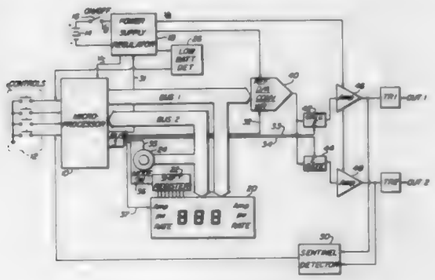
storage means to said lead system in response to a third control signal;
defibrillation and pacer control logic coupled to said sense amplifier for detecting fibrillation, and for producing said first control signal in response to the detection of fibrillation;
said defibrillation and control logic for producing said second control signal after the delivery of said cardioverting energy; and,
said defibrillation pacer control logic defining an escape time interval and for producing said third control signal if no cardiac depolarization is detected by said sense amplifier during said escape time interval.

4,693,254

TRANSCUTANEOUS NERVE STIMULATION DEVICE USING A COMMON CONTROLLER FOR PULSE PRODUCTION AND PARAMETER DISPLAY

Stanley P. Mickiewicz, Stoughton, and Alan Coombes, Hingham, both of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Continuation of Ser. No. 617,442, Jun. 5, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 910,271
Int. Cl.⁴ A61N *1/32*
U.S. Cl. 128—421 **18 Claims**



1. A portable transcutaneous nerve stimulation device for producing therapeutic electrical stimulation pulses comprising:
battery means for energizing the circuitry of said device;
a microprocessor having inputs and outputs;
memory means, connected to said microprocessor, which retains a program for enabling said microprocessor to control treatment pulse production and treatment parameter display in a time-shared manner;
output pulse circuitry having an input coupled to outputs of said microprocessor and an output at which treatment pulses are produced;
a display having inputs coupled to ones of said outputs of said microprocessor and continuously responsive to signal levels at said outputs of said microprocessor for displaying treatment parameters; and
means for applying treatment parameters to an input of said microprocessor.

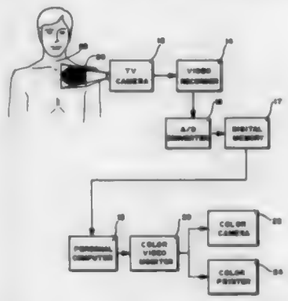
4,693,255

MEDICAL APPARATUS METHOD FOR ASSESSING THE SEVERITY OF CERTAIN SKIN TRAUMAS

Harry C. Beall, 1008 Horton Rd., Durham, N.C. 27704

Filed Apr. 22, 1985, Ser. No. 726,015
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—654 **8 Claims**

1. A method of objective analysis of the condition of traumatized surface tissue of a patient, comprising the steps of:
introducing a tracer dye into the patient;
scanning the surface area of said traumatized surface tissue with a television camera for about 1–20 minutes after introduction of the dye to detect the rate of non-reflective perceptible extrinsic changes in the surface area due to the initial appearance of the dye;
recording analog signals from the television camera on a video recorder;
digitizing a pre-selected plurality of static images on the video recording and storing the digitized data for each of said plurality of images in an electronic memory;
computer processing of the digitized signals by systematically comparing consecutive corresponding digital data from the stored digital data representing the plurality of static images and calculating the rate of change of surface



area appearance of corresponding sections of surface area of the plurality of static images and then storing the new digital data;
computer generating a two-dimensional map of the traumatized surface tissue by first assigning a color code to each of a predetermined plurality of change rates and then generating a two-dimensional color coded mapping of the traumatized surface tissue with each color representing an assigned change rate; and
displaying the two-dimensional color coded map of the traumatized surface tissue on a color display monitor.

4,693,256

RESPIRATORY DEVICE

Daniel A. Taloon, University City, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Jun. 28, 1982, Ser. No. 392,845
Int. Cl.⁴ A61B *5/08*
U.S. Cl. 128—725 **12 Claims**



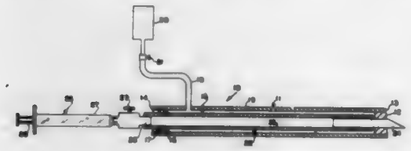
1. A spirometer comprising a chamber, piston means sealingly slidable in said chamber, first and second air flow resistive orifice means connecting said chamber respectively on one and the opposite sides of said piston means in fluid flow communication with the atmosphere, and passage means for connecting the lungs of a person in fluid communication with said chamber at said one side of said piston means to effect a pressure in said chamber at said one side of said piston means proportional to the flow of air in said passage means generated by the lungs of the person, said piston means being movable in response to the pressure for providing an indication of the total volume of air moved by the lungs, said first orifice means having a first predetermined resistance to air flow therethrough, said second orifice means including means for selectively effecting predetermined second and third resistances to air flow through said second orifice means, each of said second and third resistances being greater than said first predetermined resistance.

4,693,257

NEEDLE ASPIRATION BIOPSY DEVICE WITH ENCLOSED FLUID SUPPLY

Charles W. Markham, 667 Snug Island, Clearwater Beach, Fla. 33515

Filed May 12, 1986, Ser. No. 862,263
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—752 **10 Claims**



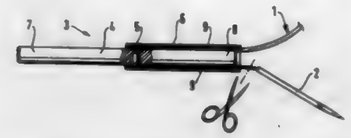
1. A sample taking device comprising,
an external guide catheter having a distal and a proximal end,
a rapidly opening and closing, normally closed, distal valve disposed at the distal end of said guide catheter,
an elongated hollow needle catheter, having a distal and a proximal end, telescopically disposed in said external guide catheter and extending proximally therefrom,
said guide catheter and needle catheter positioned in spaced apart, concentric relation to one another,
an elongate space existing between said guide catheter and said needle catheter,
sealing means at the proximal end of said guide catheter for sealingly connecting said guide catheter and said needle catheter while allowing relative telescopic movement to take place therebetween;
an aspirating syringe removably connected to the proximal end of said needle catheter;
a fluid source confluently connected to said guide catheter at a location intermediate said distal valve and said sealing means for supplying sample carrying fluid to said space,
said needle catheter having a sample taking needle on the distal end thereof whereby upon distal movement of said needle catheter relative to said guide catheter, said sample taking needle moves outwardly of said guide catheter through said distal valve, at which time vacuum supplied to said needle by said aspirating syringe will slightly bring a sample within said needle and upon return of said needle past said distal valve, which valve immediately closes, and into said space, the sample carrying fluid is adapted to flow into said needle and is adapted to be carried therein to said aspirating syringe,
said distal valve operative to retain said sample carrying fluid within said device at all times,
and said syringe and said fluid source being independent elements of said device.

4,693,258

SURGICAL ELECTRODE FOR CARDIAC PACING AND MONITORING

Peter Osypka, Grenzach-Wyhlen, and Hans Gerstmann, Lörrach, both of Fed. Rep. of Germany, assignors to Dr. Ing. P. Osypka GmbH Medizinelektronik, Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,978
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 3445102
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—783 **24 Claims**



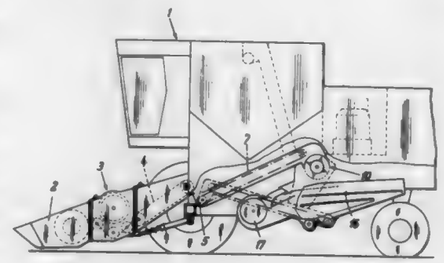
1. A surgical electrode comprising a lead wire arranged to extend from the thorax of a patient for connection to a medical instrument for cardiac pacing or monitoring purposes and having an elongated terminal portion; an electrically conductive elongated male connector having first and second ends and a transversely extending passage remote from said first end, said terminal portion having a first leg extending substantially longitudinally of said connector, an intermediate part in said passage and a second leg extending substantially longitudinally of said connector; and an electrically insulating female connector including an annular portion clampingly surrounding said male connector and said legs intermediate said passage and said first end, at least a portion of said male connector between said intermediate part and said second end being exposed.

4,693,259

SELF-PROPELLED HARVESTER THRESHER

Theodor Freye, and Franz Heidjann, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,674
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426790
Int. Cl.⁴ A10F *7/04, 12/00*
U.S. Cl. 130—27 R **9 Claims**



1. A self-propelled harvester thresher, comprising a housing having two sides; threshing and separating means; flat sieve means arranged after said threshing and separating means as considered in a travelling direction; and a sieve drum extending transversely to the travelling direction between said threshing and separating means and said flat sieve means for acting on a straw-chaff-grain mixture, said sieve drum being located stationarily above said flat sieve means and having two ends, said sieve drum being provided with a feed opening at its one end and an outlet opening at its other end and with trans-

porting means for transporting the product from said feeding opening to said outlet opening; a product supply trough located between said threshing and separating means and said sieve drum; a transporting channel located outside of one side of said housing and having one end which faces toward said sieve drum and is connected with said feeding opening of said sieve drum, and another end which faces away of said sieve drum and is connected with said product supply trough; a grain-chaff returning member loacated immediately before said outlet opening of said sieve drum; and a screw located in said sieve drum and forming transporting means for transporting the product from said feeding opening to said outlet opening.

4,693,260

CONTINUOUS CIGARETTE ROD CUTTING APPARATUS FOR A CIGARETTE MAKING MACHINE

Yutaka Okumoto, Tokyo, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

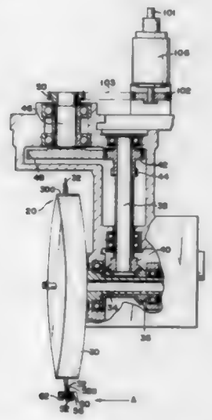
Filed Feb. 26, 1985, Ser. No. 705,809

Claims priority, application Japan, May 4, 1984, 59-88499

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.⁴ A24C *5/28*

U.S. Cl. 131—84.1 **7 Claims**



1. A cutting apparatus for cutting a moving continuous cigarette rod into cigarettes, comprising:

a rotating member rotatable around an axis of rotation tilted with respect to a travelling direction of the continuous cigarette rod;

drive means for rotating said rotating member;

at least one cutting edge attached to the rotating member so as to extend perpendicular to the travelling direction of the continuous cigarette rod and to rotate together with the rotating member, said cutting edge thereby cutting the moving continuous cigarette rod perpendicular to the travelling direction thereof; and

a fixed guide member having a hole through which the continuous cigarette rod travels, said guide member fixedly positioned adjacent a locus of movement of said cutting edge for sliding contact therewith and so that the cutting edge cuts the continuous cigarette rod during rotation thereof by said drive means, wherein said guide member has an inner surface located on the upstream side of the cutting edge with respect to the travelling direction of the continuous cigarette rod, the inner surface including a curved portion having a non-flat curvature conforming to the locus of movement of the cutting edge, said curvature providing a means for maintaining sliding contact with the cutting edge in response to adjustment of the cutting edge along the travelling direction of the rod, thereby preventing the cutting edge from vibrating in the direction of the thickness thereof.

4,693,261

CONTINUOUS CIGARETTE ROD CUTTING APPARATUS FOR A CIGARETTE MAKING MACHINE

Yutaka Okumoto, Musashino, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

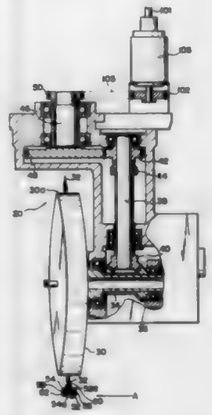
Filed Feb. 26, 1985, Ser. No. 705,890

Claims priority, application Japan, May 2, 1984, 59-87776

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.⁴ A24C *5/28*

U.S. Cl. 131—84.1 **8 Claims**



1. A cutting apparatus for cutting a moving continuous cigarette rod into cigarettes, comprising:

a rotating member rotatable around an axis of rotation tilted with respect to a travelling direction of the continuous cigarette rod;

drive means for rotating said rotating member;

at least one cutting edge attached to the rotating member so as to extend perpendicular to the travelling direction of the continuous cigarette rod and to rotate together with the rotating member, said cutting edge thereby cutting the moving continuous cigarette rod perpendicular to the travelling direction thereof; and

a pair of fixed guide members each having a hole through which the continuous cigarette rod travels and an inner surface, the respective inner surfaces of said two guide members facing each other at a space wider than the thickness of the cutting edge and fixedly positioned adjacent the locus of movement of said cutting edge wherein said pair of guide members includes a first guide member located on the upstream side with respect to the travelling direction of the continuous cigarette rod and a second guide member located downstream thereof, the inner surface of said first guide member including a curved portion having a non-flat curvature conforming to the locus of movement of the cutting edge, said curvature providing a means for maintaining sliding contact with the cutting edge in response to adjustment of the cutting edge along the travelling direction of the rod, thereby preventing the cutting edge from vibrating in the direction of the thickness thereof.

4,693,262

APPARATUS FOR FORMING BATCHES OF TOBACCO AND THE LIKE

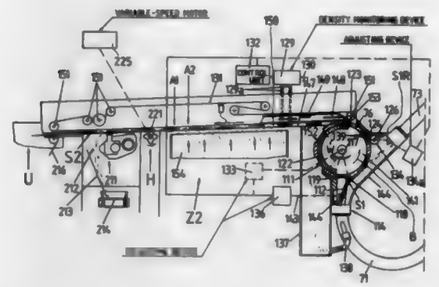
Manfred Goldbach, Hamburg; Siegfrid Marquardt, Westerau, and Jochim Myohl, Wentorf, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,527

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508499

Int. Cl.⁴ A24C *5/18, 5/25, 5/34, 5/39*

U.S. Cl. 131—84.3 **29 Claims**



1. Apparatus for forming batches from fibers of the tobacco processing industry, especially from particles of tobacco leaves, comprising a pneumatic conduit having an outlet; a source of fibers; means for supplying from said source to said conduit a continuous narrow stream of fibers so that such stream advances toward, through and beyond said outlet; and means for converting at least a portion of the stream into a series of batches adjacent to said outlet, comprising a rotary conveyor having a peripheral surface provided with a series of pockets and means for evacuating air from said pockets, said outlet being positioned to deliver at least the major portion of the stream to successive pockets of said rotary conveyor with a component of movement in the direction of rotation of the rotary conveyor whereby the fibers which enter said pockets accumulate into discrete batches.

4,693,263

METHOD AND APPARATUS FOR MAKING A COMPOSITE STREAM FROM FIBROUS MATERIAL OF THE TOBACCO PROCESSING INDUSTRY

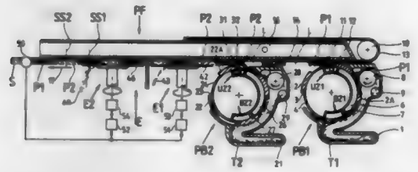
Günter Wahle, Reinbek, and Dieter Ludszeweit, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,313

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509612

Int. Cl.⁴ A24C *5/18, 5/39*

U.S. Cl. 131—84.4 **38 Claims**



1. A method of making a stream of smokable fibrous material, particularly a stream of tabacco, comprising the steps of accumulating first batches from a first smokable fibrous material; gathering second batches from a second smokable fibrous material; and shuffling the first and second batches to form a composite stream wherein first batches alternate with second batches.

32. A method of making a rod-like filler of smokable fibrous material, particularly a stream of tobacco, comprising the steps of accumulating first and second smokable fibrous materials into a composite stream wherein first batches of first smokable fibrous material alternate with second batches of second smokable fibrous material; and trimming the composite stream including removing first fibrous material from at least some of said first batches so that the thus trimmed first batches contain first quantities of first fibrous material, and removing second fibrous material from at least some of said second batches so that the thus trimmed second batches contain different second quantities of fibrous material.

4,693,264

TREATMENT OF TOBACCO

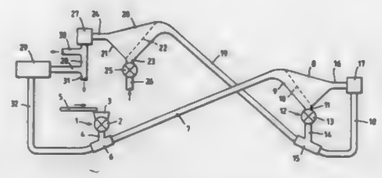
Roger W. Hedge, Lymington, England, assignor to British-American Tobacco Company Limited, London, England

Filed Jun. 13, 1986, Ser. No. 873,989

Claims priority, application United Kingdom, Jun. 15, 1985, 8515217

Int. Cl.⁴ A24B *3/18*

U.S. Cl. 131—296 **10 Claims**



5. Tobacco drying apparatus comprising a first duct, a first gas-flow passage in communication at a downstream end thereof with an upstream end of said first duct, a first tobacco feed path extending to and opening into said first gas-flow passage, first separator means in communication with a downstream end of said first duct, a second duct, a second gas-flow passage in communication at a downstream end thereof with an upstream end of said second duct, a second tobacco feed path extending from said first separator means to and opening into said second gas-flow passage, a gas-flow pipe extending from said first separator means and being in communication with the upstream end of said second gas-flow passage, and second separator means in communication with the downstream end of said second duct, said first separator means being functionable to receive gaseous medium and tobacco from said first duct, to permit said gaseous medium to pass substantially absent said tobacco to said gas-flow pipe and to permit said tobacco to pass substantially absent said gaseous medium to said second feed path.

4,693,265

CIGARETTE FILTER HAVING LOW VISIBLE STAINING

Alan B. Norman, Clemmons, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 19, 1986, Ser. No. 864,363

Int. Cl.⁴ A24D *3/04*

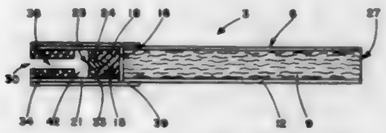
U.S. Cl. 131—340 **16 Claims**

1. A filter cigarette having in combination a cylindrical rod of smokable material, a cylindrical filter element having a front face and a back face and axially aligned in an end-to-end relationship with the rod such the front face of the filter element is adjacent one end of the rod, and a cylindrical mouthpiece element having a substantially tubular shape and axially aligned in an end-to-end relationship with the filter element;

wherein during draw, air and smoke entering the filter element from the rod exits the opposite end of the filter element;

the filter element includes a path of least resistance therethrough such that air and smoke exits the filter element at the back face thereof and in a region towards the periphery thereof;

the mouthpiece element has a longitudinally extending hollow region and a circumscribing wall having a thickness



such that the wall is axially aligned with the region where smoke and air exits the filter element;

the mouthpiece element and the filter element are positioned in a spaced apart relationship such that substantial amounts of air and smoke exiting the back face of the filter element travels through the hollow region of the mouthpiece element.

4,693,266

SMOKING MATERIAL

Robert G. Breckwoldt, Goshen, N.Y., assignor to Tripar Incorporated, Stamford, Conn.

Filed Mar. 3, 1986, Ser. No. 835,351
Int. Cl.[4] A24B *15/00, 15/10*; A24D *1/18*
U.S. Cl. 131—359 **2 Claims**

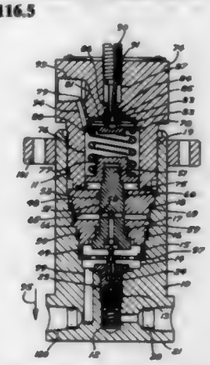
1. A smoking material, which comprises; tobacco in admixture with from about 0.5 to 80 percent by weight of the tobacco of distiller's dried gran with solubles.

4,693,267

SELF-VENTING PRESSURE REDUCING REGULATOR

Daryll D. Patterson, Brooklyn Park, Minn., assignor to Tescom Corporation, Elk River, Minn.

Filed Mar. 31, 1986, Ser. No. 846,286
Int. Cl.[4] G05D *16/10*
U.S. Cl. 137—116.5 **11 Claims**



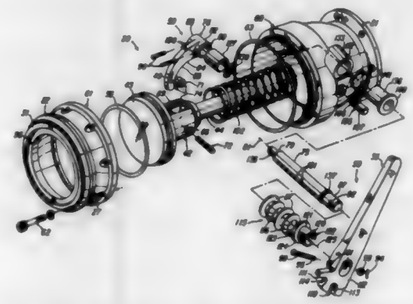
1. A pressure regulator adapted to be connected to sources of inlet and reference pressures and provide an outlet pressure that is higher than the reference pressure, comprising a regulator body having opposite first and second exterior surfaces, a main bore that is axially elongated, has a first end opening through the second surface, an axially opposite end [that is closed by the regulator body and is] axially intermediate said surfaces, a first end bore portion, a second bore portion that at least in part defines a main valve chamber, is of a larger *minimum* diameter than the first end bore portion and opens to the first end bore portion, a third bore portion having a minimum diameter larger than the maximum diameter of the second bore portion and opens thereto, and a fourth bore portion having a minimum diameter larger than the maximum diameter of the third bore portion, opens to the third bore portion and opens through the second surface, an inlet port that [is in fluid communication with] *opens through* the first bore portion *to the main bore*, an outlet port in fluid communication with the main chamber, and a vent passage that opens to the third bore portion and through the valve regulator body to the ambient atmosphere, *the regulator body having a wall portion closing the axial opposite end of the main bore*, operable main valve means mounted in the first bore portion that is resiliently retained in a closed condition to block fluid flow from the first bore portion to the main chamber and is operable to permit fluid flow from the first bore portion to the main chamber, a dome mounted by the body to extend within the fourth bore portion and having a dome chamber opening axially toward the third bore portion and a reference pressure passage opening to the ambient atmosphere and to the dome chamber, a sensor mount mounted by the body in fluid sealing relationship with the dome and body and having [as] *an* axially elongated bore opening to the dome chamber and the main chamber and a vent passage for placing the mount bore in fluid communication with the body vent passage, *the sensor mount at least in part being located within the third bore portion*, a control member mounted by the valve means for axial movement relative thereto to operate the valve means from its closed condition to an open condition, sensor means having a vent passage opening to the mount vent passage and toward the main chamber and extended within the mount bore in fluid sealing relationship therewith for movement axially between a first position spaced from the control member to provide an open fluid passage from the main chamber to the sensor mount passage when the reference pressure decreases in *relationship* [relatiohship] to the outlet pressure to provide an outlet reference pressure differential that is less than a preselected value whereby fluid flows from the main chamber to the vent passages and permits the valve means blocking fluid flow from the inlet port to the main chamber, a second position abutting against the control member to have the control member block fluid flow from the main chamber to the sensor means vent passage and the valve means remain in its closed condition when the pressure differential between the outlet and reference pressure is within a limited range of the preselected pressure differential, and a third position for cooperating with the control member to block fluid flow from the main chamber to the vent passages and operate the valve means to an open condition when the outlet pressure decreases to increase the pressure differential between the outlet and reference pressures more than a preselected amount, and spring means with the dome chamber for resiliently urging the sensor means toward the control member.

4,693,268

POPPET VALVE ASSEMBLY AND METHOD OF MAKING SAME

Richard L. Fahl, Fairfield, Ohio, assignor to Dover Corporation, New York, N.Y.

Filed Dec. 24, 1985, Ser. No. 813,250
Int. Cl.[4] F16K *1/12, 31/52, 35/02*
U.S. Cl. 137—219 **5 Claims**



1. In a poppet valve assembly comprising; a housing; a flow passage in said housing; said passage having a central axis and being adapted to flow fluid in either direction therethrough; a poppet structure for controlling fluid flow through said passage; said poppet structure having a head, a cylindrical stem of a particular diameter, and a longitudinal axis which coincides with said central axis; means supporting said poppet structure during movement thereof along said axes; an actuator contact on said poppet structure between said head and said stem to enable movement of said poppet structure along said axes; and means for engaging said contact to provide said movement; the improvement in which said engaging means comprises a shaft carried by said housing for rotary movements thereof and an actuator detachably fastened to said shaft; said shaft and actuator having outer annular surfaces which together define the sole means engaging structural portions associated with said housing to hold said shaft and actuator against movements parallel to a central axis of said shaft while allowing said rotary movements of said shaft to enable said actuator to engage said contact; said engaging means comprising an actuating handle attached to one end of said shaft to provide said rotary movements of said shaft; and said poppet valve assembly further comprising, a stop on said housing for holding said handle in a plurality of open positions, recess means in an inner portion of said handle defining a plurality of holding surfaces on said inner portion which correspond in number to said plurality of open positions, said handle having means yieldingly urging said inner portion and hence said holding surfaces away from said stop whereby once said inner portion with its holding surfaces is urged away from said stop said poppet structure and valve assembly remain normally closed, a pin extending through aligned holes in said handle and in one end of said shaft to attach said handle to said shaft while allowing pivoting movements of said handle about said pin and thereby allow said inner portion of said handle and said holding surfaces to be pivoted away from said stop by said urging means, said urging means comprising spring means and a cooperating hub member carried concentrically around one end of said shaft, said hub member having a tubular end and transverse slot means provided in said tubular end, said hub member being installed on said shaft with said pin extending through said slot means whereby said hub member cannot rotate relative to said shaft, said hub member also having a central hub axis and a first annular surface disposed in a first plane which is perpendicular to said hub axis and a second annular surface disposed in a second plane which is at an angle to said hub axis, and said second annular and angled surface engaging said handle and serving to hold the handle with its holding surfaces away from said stop due to the action of said spring means urging said angled surface against said handle to thereby cause pivoting movement of said inner portion of said handle away from said stop.

4,693,269

CHECK VALVE ASSEMBLY FOR PIPELINE SYSTEM

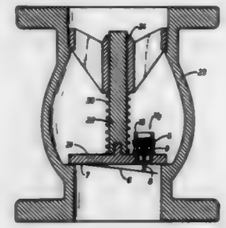
Yutaka Yamada, Tsushima, Japan, assignor to Yutaka Yamada, Kariya and Nippondenso Co., Ltd., Tsushima, both of, Japan

Continuation of Ser. No. 783,993, Oct. 4, 1985, Pat. No. 4,617,959. This application Jun. 16, 1986, Ser. No. 874,848
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—512.1 **3 Claims**

1. A check valve assembly of the quick shutoff type equipped with an auxiliary valve of the slow closure type,

wherein said check valve assembly comprises a valve housing formed therein with a primary cylindrical bore, a primary valve plate arranged within said valve housing to open and close said primary cylindrical bore, and a swingable pressure receiving plate arranged to be applied with a hydraulic pressure at the upstream of said primary valve plate; and

wherein said auxiliary valve comprises a cylindrical valve casing mounted on a portion of said primary valve plate to be located at the downstream of said primary valve plate, said valve casing being formed therein with a secondary cylindrical bore and formed at the peripheral wall thereof with a radial port which is arranged at the downstream of said primary valve plate to permit the flow of hydraulic fluid passing therethrough, a cup-shaped cylinder coupled with one end of said valve casing, a piston slidably disposed within said cup-shaped cylinder to form a chamber in said cylinder, flow restriction means arranged to provide a fluid communication between said chamber and the downstream of said primary valve plate, a valve element slidably disposed within said valve casing to control the quantity of hydraulic fluid flowing through said secondary cylindrical bore and said radial port, and a valve rod arranged to interconnect said piston and said valve element and being engaged at one end thereof with said pressure receiving plate,



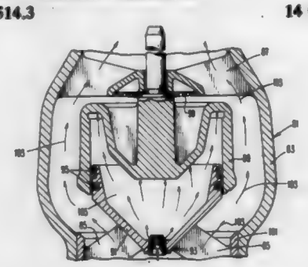
wherein the secondary cylindrical bore of said valve casing is in the form of a stepped cylindrical bore having small and large diameter portions, and wherein said valve body is slidably disposed within the large diameter portion of said stepped cylindrical bore and is integrally formed with a semi-spherical projection which is arranged to be coupled within the small diameter portion of said stepped cylindrical bore.

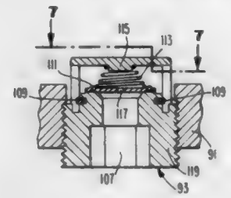
4,693,270

CHECK VALVE

Charles Yaindl, Allentown, Pa., assignor to Durable Manufacturing Co., Lionville, Pa.

Filed Mar. 24, 1986, Ser. No. 843,308
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—514.3 **14 Claims**





1. A check valve apparatus, the valve apparatus having an inlet end and an outlet end, comprising:

(a) a disk means and a seat means, the disk means being mounted for movement within a body, the disk means being biased by a spring means to abut the seat means, the disk means, when abutting the seat means, being located near a central member, the disk means being capable of moving away from the seat means in response to fluid flow originating from the inlet end of the valve,

(b) the disk means including chamber defining means, wherein the disk means, when moved away from the seat means, and the central member together form a chamber for fluid,

(c) pilot valve means, disposed at the inlet end of the appara-

tus, the pilot valve means fluidly communicating with the chamber, the pilot valve means allowing substantially unobstructed fluid flow from the inlet end towards the outlet end of the valve apparatus, the pilot valve means including an orifice means, the orifice means being of known size, wherein the orifice means provides a controlled path for fluid flow, out of the chamber, into the inlet end, and out of the valve, when the disk means is moving towards the seat means, and

(d) means for sealing the space between the disk means and the central member, wherein the only path for flow of fluid, out of the chamber, when the disk means is moving towards the seat means, is through the orifice means of the pilot valve means.

4,693,271

HORIZONTALLY MOUNTED SUBMERSIBLE PUMP ASSEMBLY

Benjamin F. Hargrove, Rte. 9, Box 192B, and Billy J. Kvaternik, Rte. 6, Box 255½, both of West Monroe, La. 71291

Filed Oct. 21, 1985, Ser. No. 789,321

Int. Cl.[4] F04B *35/04, 41/00*

U.S. Cl. 137—565 **3 Claims**



1. A submersible pump assembly for mounting in a water tank provided with a water distribution system, said submersible pump assembly comprising a cylindrically-shaped stainless steel tube extending into the water tank in horizontal relationship, with one end of said tube located inside the water tank and the opposite end of said tube projecting outside of the water tank; a butterfly valve carried by said one end of said tube for selectively allowing water to enter said tube; an elongated valve stem having one end seated in said butterfly valve and the opposite end of said valve stem projecting through the top of the water tank, said valve stem operable to open and close said butterfly valve from outside of the water tank; an elongated pump housing; a motor and a pumping mechanism enclosed in said pump housing; wiring for energizing said motor; and a discharge pipe extending from said pump housing through said opposite end of said tube, with said pump housing, said motor, said wiring and said discharge pipe located inside said tube; an adaptor flange mounted on said opposite end of said tube and an adaptor pipe carried by said adaptor flange, said adaptor pipe having one end extending inside said tube in communication with said discharge pipe of said submersible pump and the other end of said adaptor pipe attached to the water distribution piping; and nipple means projecting through said adaptor flange for receiving said wiring and channeling said wiring from said tube to a selected location outside of the water tank, for pumping water from said tube and the water tank through the water distribution piping when said butterfly valve is open.

4,693,272

POST PRESSURE COMPENSATED UNITARY HYDRAULIC VALVE

Raud A. Wilke, Brookfield, Wis., assignor to Husco International, Inc., Waukesha, Wis.

Continuation of Ser. No. 579,394, Feb. 13, 1984, abandoned. This application Sep. 5, 1986, Ser. No. 904,798

Int. Cl.[4] F15B *13/08*

U.S. Cl. 137—596 **6 Claims**

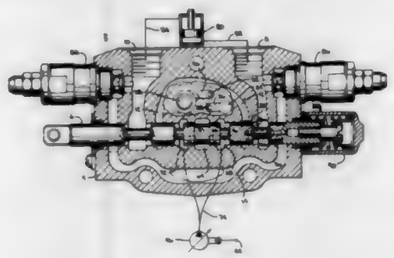
1. A closed center hydraulic control valve assembly comprised of a plurality of control valve sections joined in a bank and for use with a variable displacement pump having output and pressure sensing ports, each of said control valve sections having therein a valve spool movable to an operating position for selectively directing pressure fluid from a supply passage to one of a pair of workports via a feeder passage having upstream and downstream branches with a connecting passage therebetween and with said downstream feeder branch having a U-shaped bridge passage having a pair of legs selectively respectively communicable with said workports by said valve spool, the improvement which comprises:

a check valve biased in one direction toward a position closing said connecting passage and adapted to be moved in the oposite direction to a position opening said connecting passage under force exerted on said check valve in said upstream feeder branch;

metering means on said spool for establishing a predetermined pressure differential across said spool in said operating position;

means for translating workport pressure into force on said check valve and also tending to move said check valve in said closing one direction whereby said check valve can act to hold a load in the absence of pressure in said upstream feeder branch;

means in said housing to communicate workport pressure with said sensing input port of said variable displacement pump having said output port connected with said supply passage, whereby said check valve acts as a pressure compensating valve and moves back and forth to vary the



degree of communication between said feeder branches in response to variations in the forces of opposing fluid pressures acting thereon, to thereby maintain said predetermined pressure differential across said spool and

shuttle means operable to effect subjection of each said check valve to the highest pressure of any said workport in said bank,

said shuttle means comprising a sensing shuttle passage in each said control section between the respective said bridge passage and a shuttle check valve, and a through shuttle passage between said shuttle check valve of its control section and the shuttle check valve of the next control section,

such that if the workport pressure in said bridge passage is greater than the workport pressure in the bridge passage in the previous section, then said shuttle check valve in the present section closes the through shuttle passage of the previous section and opens the sensing shuttle passage of the present section to the through shuttle passage of the present section such that the workport pressure in the bridge passage of the present section is passed through the sensing shuttle passage of the present section to the next section,

and such that if the workport pressure in the bridge passage of the present section is less than the workport pressure in the bridge passage of the previous section, then the shuttle check valve of the present section closes the sensing shuttle passage of the present section such that the workport pressure of the previous section flows through the shuttle passage of the previous section and into the through shuttle passage of the present section and into the next section, such that the highest workport pressure is communicated to said pump and to the other side of each of said pressure compensating check valves in said sections.

4,693,273

CONTROL VALVE

Desmond H. J. Reynolds, and Phillip A. Taft, both of West Midlands, England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 1, 1985, Ser. No. 718,444

Claims priority, application United Kingdom, Apr. 4, 1984, 8408635

Int. Cl.[4] F15B *13/06*

U.S. Cl. 137—596.13 **14 Claims**

1. A control valve comprising:

a housing;

an inlet in said housing for pumped fluid under pressure;

a control device;

a first outlet in said housing for connection to a first working circuit;

a second outlet in said housing for connection to a tank;

a spool valve in said housing operable in response to said control device for controlling flow of said pumped fluid to said first and second outlets;

a supply port in said housing for connection to a second working circuit;

a flow control valve for controlling flow of said pumped fluid from said inlet to said supply port in response to the pressure of said pumped fluid;

a first flow channel in said housing for said pumped fluid extending between said flow control valve and said spool valve;

a second flow channel in said housing for pumped fluid extending between said inlet and said spool valve independently of and parallel to said first flow channel; and

a passageway through said flow control valve for communicating said inlet with said first flow channel so that said flow control valve can close said supply port while maintaining pumped fluid flow to said first flow channel for precluding pumped fluid flow to said second working circuit when the pressure of said pumped fluid supplied to said first outlet is less than a predetermined value;

said spool valve being adapted to control the flow of pumped fluid from said second flow channel to said first outlet.

4,693,274

DEVICE FOR THE SELECTIVE INJECTION OF AN OXIDIZING GAS OR A CARRIER GAS WITH OR WITHOUT CARBONACEOUS MATERIAL TO A LIQUID METAL BATH

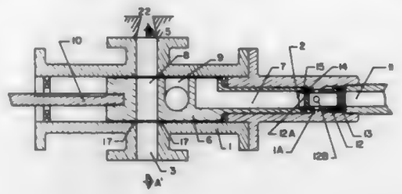
Arturo Lazcano-Navarro; Miguel A. Alcantara, and Jose E. Hernandez-Ruiz, all of Saltillo, Mexico, assignors to Instituto Mexicano De Investigaciones Siderurgicas, Saltillo, Mexico

Continuation-in-part of Ser. No. 642,102, Aug. 20, 1984, abandoned. This application May 14, 1986, Ser. No. 863,001

Claims priority, application Mexico, May 9, 1984, 201284

Int. Cl.[4] F16K *11/00*

U.S. Cl. 137—625.4 **4 Claims**



1. A valve for controlling the selective supply of an oxidizing gas or another gas conveying powdered carbonaceous material to a tuyere for injection of one of such fluids into a liquid metal bath contained in a metallurgical converter vessel; said valve alternatively permitting the entrance of one of said fluids and comprising a casing having a common outlet port and provided with an inner movable cylindrical stem with three internal conduits that depending on said stem position serve for the passage of one of an oxidizing gas from an oxidizing gas casing access port to the common outlet port, the passage of an inert gas from a casing inlet port for said inert gas to the common outlet port, and the passage of a carrier gas with or without carbonaceous material from a casing access port for the carrier gas to the common outlet port for injection; said casing having three inlet ports for alternative entrance of an oxidizing gas, an inert gas, and a carrier gas with or without carbonaceous material, and having one common outlet port to lead the selected fluid to a tuyere for injection;

said carrier gas entry port, and said stem carrier gas internal conduit, and said carrier gas casing common outlet port forming a cylindrical straight flow path for the pneumatic transport of fines within the valve;

said casing inlet ports and stem conduits disposed in such a way that the carrier gas entry port is located far from the oxidizing gas inlet port and having an internal stem conduit with inert gas pressure as a means of separation between the carrier gas flow path and the oxidizing gas flow path;

said casing having an inner wall provided with two circumferential slots on each side of the common outlet port so as to provide pneumatic seal means to the injection fluid and avoid migration of oxidizing gas and carrier gas with carbonaceous powder out of the central injecting flow path;

said housing having one small port to provide pressurized inert gas to an external pressure switch when the carrier gas inlet port is precisely located to connect the casing single outlet port through the carrier gas stem conduit and thus the stem is positioned in the mode of carrier gas injection, and also having another port used to purge said pressure switch when the stem is precisely positioned for the oxidizing gas injection mode;

said cylindricl stem provided with a reduced extension portion disposed axially with respect to said stem with an axial internal conduit to connect the oxidizing gas casing inlet port to the casing single outlet port;

said stem including a reduced extension portion provided with seal means and being able to activate a movable

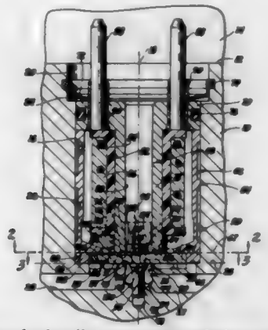
sealing mechanism located in the oxidizing gas entry port of the casing so as to completely isolate the oxygen line from the rest of the valve when the stem is in carrier gas injection position.

4,693,275

ELECTRO-HYDRAULIC PRESSURE REGULATING VALVE

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1986, Ser. No. 936,636
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **2 Claims**



1. An electro-hydraulic pressure regulating valve comprising:

means defining a valve housing having a main axis,

means defining a control pressure chamber in said valve housing connected to a control pressure port,

means defining an annular supply pressure port in said housing between a source of fluid at a supply pressure and said control pressure chamber aligned on said main axis in a first plane perpendicular to said main axis

and having a first predetermined seat area in said first plane through which pressurized fluid is delivered to said control pressure chamber,

means defining an annular exhaust port between a low pressure fluid sump and said control pressure chamber aligned on said main axis in a second plane parallel to said first plane and having a second predetermined seat area in said second plane through which fluid is exhausted from said control pressure chamber,

a magnetically permeable armature plate having a flat supply sealing surface and a flat exhaust sealing surface,

means mounting said armature plate in said control pressure chamber for movement between a supply seated position wherein said supply sealing surface closes said supply pressure port and said exhaust sealing surface opens said exhaust port and an exhaust seated position wherein said exhaust sealing surface closes said exhaust port and said supply sealing surface opens said supply pressure port,

the differential area of said armature plate exposed to said supply pressure in said supply seated position of said armature plate being equal to substantially only said first predetermined seat area,

spring means between said valve housing and said armature plate biasing said armature plate to said supply seated position,

electric solenoid means in said valve housing operative when selectively energized to create a solenoid EMF for moving said armature plate from said supply seated position to said exhaust seated position, and

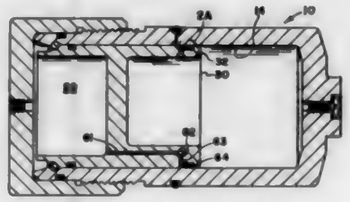
means defining a circular cut-out in said armature plate juxtaposed a portion of said valve housing radially inboard of said annular exhaust port in said exhaust seated position of said armature plate operative to limit the differential area of said armature plate exposed to said control pressure in said exhaust seated position of said armature plate to substantially only said second predetermined seat area thereby to minimize the pressure differential resultant force acting on said armature plate toward said exhaust seated position.

4,693,276

PRESSURE-BALANCED SEALS FOR VENTED ACCUMULATORS

Keith H. Fulmer, Mishawaka, Ind., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 857,901, Apr. 29, 1986, Pat. No. 4,651,782.
This application Sep. 11, 1986, Ser. No. 906,067
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—31 **5 Claims**



1. A pressure accumulator, comprising a housing having a radial opening providing communication between atmospheric pressure and a bore extending longitudinally within said housing, a piston having first and second piston ends disposed slidably within the bore and dividing the bore into respective first and second chambers, first and second fluids within the respective chambers, characterized in that the first piston end has a circumferential groove disposed at a radially outer portion thereof, the circumferential groove having a plurality of sealing devices disposed therein, and a longitudinal piston opening extending longitudinally from one side of said piston to said circumferential groove in order to provide communication between the second fluid in the second chamber and the sealing devices, the sealing devices comprising a ring exposed to fluid pressure transmitted from the second chamber to the circumferential groove, an annular force-transmitting member having an angled portion engaged by the ring, and seal means disposed in the longitudinal groove and engaging a radially extending side of said force-transmitting member and a surface of the bore, so that the fluid pressure transmitted through the longitudinal piston opening to the ring member biases radially outwardly, relative to the accumulator, the ring against the angled portion and causes longitudinal movement of the force-transmitting member against said seal means to increase sealing effected by the seal means between the first piston end and surface of the bore.

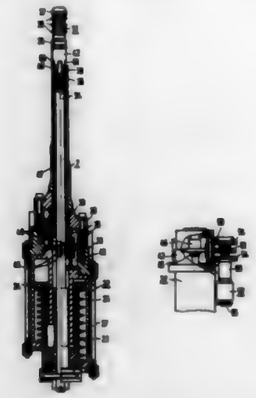
4,693,277

REMOTELY OPERABLE TOOL FOR SETTING PLUGS INTO HEAT EXCHANGER TUBES

Oswald Bieber, Heroldsbach; Erich Haas, Leinburg-Diepersdorf; Rudolf Henglein, Pinzberg, and Bernd Richter, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,802
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324777
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 **8 Claims**

1. Remotely operable tool assembly, comprising a tool for plugging heat exchanger tubes, said tool including a multi-partite plug including parts being screwed together, a rotatable rod, a rotatable sleeve surrounding said rod, a pressurized medium drive connected to said rod for driving said rod into one of said parts of said plug and clamping said parts of said plug together, a coupling interconnecting said rod and said sleeve, and a rotary drive connected to said sleeve for rotating said sleeve.

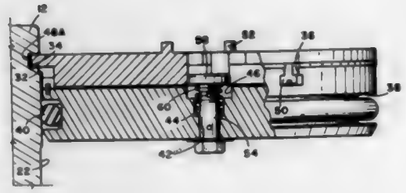


4,693,278

SAFETY CLOSURE MEMBER

Buddy A. Wilson, Sapulpa, and Coy D. Osborn, Tulsa, both of Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed Nov. 10, 1986, Ser. No. 928,833
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 **9 Claims**



1. A closure member for use in a flange having a passageway therethrough communicating with a pressure source, the flange having aninternal circumferential groove, the closure member comprising:

a cylindrical body of external diameter to be slideably received within the flange passageway, the body having a reduced diameter passageway therethrough;

a plurality of leaves slideably supported to said body, each leaf having an outer and an inner end, each leaf being slideable between an outward and an inward position, the outer ends being receivable in said flange groove when the leaves are slidesbly outwardly extended to the outer position to retain said body in the flange passageway;

means to seal the outer periphery of said body to the flange passageway;

a pressure relief member slideably received in said body passageway having an open and a closed position;

means to prevent said leaves from being moved inwardly when said pressure relief member is in the closed position; and

means to move said leaves from the outward to the inward positions and vice versa.

4,693,279

DEVICE FOR REMOVABLY FIXING AN INTERNAL STRUCTURE TO A CIRCULAR WALL INSIDE AN ENVELOPE

Gilles Aubert, Orsay, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 597,667, Apr. 6, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 827,227
Claims priority, application France, Apr. 14, 1983, 83 06110
Int. Cl.[4] F16L *9/18, 57/00*
U.S. Cl. 138—108 **3 Claims**

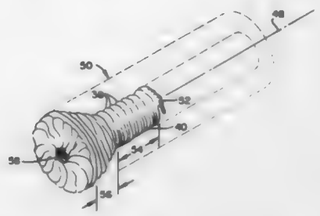
1. A device for fixing an internal structure to an inner wall of an outer cylindrical body, said inner wall having an internal diameter, comprising at least one continuous deformable, resilient annular member constructed of metal having a high yield strength, said body having a fixed length and being provided with a plurality of circumferentially spaced members at each end which extend radially and outwardly of said body, said spaced members being spaced approximately 90° apart each projection terminating in an outer arcuate face conforming to the curvature of the inner wall of said cylindrical body to define an external diameter, the space between the spaced members defining a means for applying an inner radial force to reduce the external diameter, said annular member having a circumferential surface which is completely continuous and uninterrupted throughout the entire circumferential extent thereof, the external diameter of said spaced members exceeding said internal diameter of said inner wall to adapt the device to be placed in a position to fix said annular member to said inner wall, said fixed length of said body causing adjacent spaced members to move radially inward of said body upon application of locallized radially outwardly directed force to said body between said adjacent spaced members to reduce said body outer diameter at said adjacent spaced members to a value less than said inner wall internal diameter to permit fixing and removal of said annular member in relation to the inner wall of said cylindrical body.

4,693,280

END CLOSURE FOR SHIRRED CASING STICKS

Robert A. Beardsley, Osceola, Ark., assignor to Viskase Corporation, Chicago, Ill.

Filed Mar. 21, 1986, Ser. No. 842,225
Int. Cl.⁴ F16L *11/12*
U.S. Cl. 138—118.1 **6 Claims**



1. A tubular shirred stick casing article having an inner peripheral surface which defines an axial bore through the article, and an integral end closure disposed within the bore at a fore end thereof, the end closure being composed of casing drawn from the fore end of the shirred stick and formed into a plug within the bore, said plug comprising:

(a) a generally cylindrical body composed throughout its length of accordion-type pleats including a first end portion facing into said bore, an intermediate portion, and a second end portion facing out from said bore;

(b) said first end portion containing pleats which extend across said bore and which press against said inner peripheral surface to form an imperforate and continuous wall transverse to the longitudinal axis of said bore; and

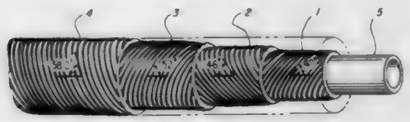
(c) said intermediate portion containing pleats which, in longitudinal cross section, are arranged in two longitudinally extending rows, one of said longitudinally extending rows being composed of pleats of a single ply of casing and the other of said rows being composed of pleats of three plies of casing and the pleats in said rows having proximal ends pressed one against another along a center core about the longitudinal axis of said bore and distal ends pressed against said inner peripheral surface.

4,693,281

VARIABLE MODULUS FILAMENT WOUND PRESSURE TUBE

Richard L. Creedon, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Sep. 23, 1985, Ser. No. 778,696
Int. Cl.⁴ F16L *11/08*
U.S. Cl. 138—174 **7 Claims**



1. A filament wound pressure tube having a longitudinal axis comprising

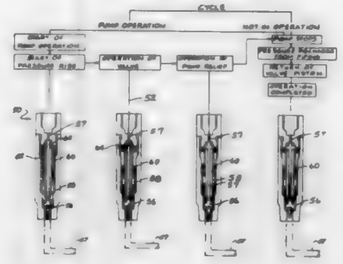
at least two layers of glass filaments wound helically in an epoxy matrix to form said tube wherein the filaments of each such layer are disposed at an angle to a line parallel to the longitudinal axis of said tube which angle is approximately equal to a respective angle θ to said line parallel to said axis, such angle θ being chosen such that the ratio $\sin^2\theta/r$ is approximately the same for all layers, where r is the radial distance from said axis to such layer.

4,693,282

LUBRICATING SYSTEM FOR A WEAVING MACHINE

Leonard Campbell, 209 Park Haywood, Greenville, S.C. 29607

Filed Apr. 22, 1986, Ser. No. 854,845
Int. Cl.⁴ D03J *1/00*
U.S. Cl. 139—1 R **7 Claims**



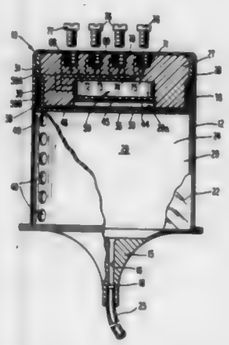
1. A textile fabric weaving machine comprising frame means, means mounted on said frame means for interweaving warp and weft yarns into fabric, comprising, picking instrumentalities which move relative to each other in frictional contact with each other and a gripper projectile for inserting weft yarns into a shed formed by said warp yarns and through a series of projectile guides, and means for lubricating the picking instrumentalities and the gripper projectile comprising a lubricant reservoir, a flow control valve, a pump and piping means for conveying lubricant from said reservoir to said flow control valve under a fluid pressure of between 50 and 300 psi, a lubricant delivery port in at least one of said instrumentalities for lubricating its surface and the surface of other instrumentalities in contact therewith, piping connectign said port to said flow control valve for conveying lubricant from said valve to said ports, and means to operate said pump to deliver drops of lubricant from 0.01 to 0.05 cc to said ports at preselected intervals.

4,693,283

PROCESS FOR CONTINUOUSLY DISPENSING LIQUID MICROBICIDES INTO METALWORKING FLUIDS

Eva E. Talas, Ontario, Canada, assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 683,076, Dec. 19, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,376
Int. Cl.⁴ B67D *5/00*
U.S. Cl. 141—1 **5 Claims**



1. Process for dispensing a first fluid into a contained second fluid from a dispensing device capable of continuously dispensing said first fluid therefrom, said dispensing device having an internal cavity adapted to receive said first fluid and an activatable cell operatively associated with said cavity for generating and supplying gas at a controlled rate to said cavity to dispense said first fluid from said cavity through an associated passageway, comprising the steps of

(a) adding said first fluid to the internal cavity of said dispensing device, activating the gas generating cell of said dispensing device to cause said first fluid added to said dispensing device to be continuously dispensed therefrom while so activated after an initial delay corresponding to the time required for the cell to generate sufficient gas to cause said first fluid to be dispensed;

(b) dropping said activated cell and said first fluid containing dispensing device into said contained second fluid for submergence therewithin, said first fluid being dispensed from said dispensing device while so submerged, said first fluid containing dispensing device and the activated associated cell having a weight per volume sufficient to cause the device and cell to sink in the second fluid and to float on the surface after dispensing the first fluid; and

(c) allowing said submerged dispensing device to rise to the surface of said contained second fluid after said first fluid is dispensed from said dispensing device.

4,693,284

METHOD FOR UNDERGROUND STORAGE TANK ABANDONMENT

Michael D. Dugger, Ladson, S.C., assignor to Petro Fill, Inc., Ladson, S.C.

Filed Jul. 30, 1986, Ser. No. 890,565
Int. Cl.⁴ E02D *29/00*
U.S. Cl. 141—1 **12 Claims**

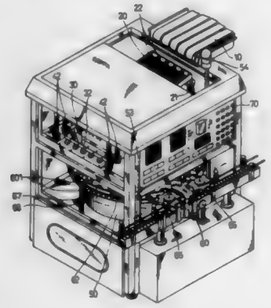
1. A method of abandoning an empty used underground storage tank and rendering the underground tank unusable for the storage of any liquid material, the method comprising the steps of introducing polyurethane foam material into the underground tank and allowing the polyurethane foam material to become rigid whereby the polyurethane foam material substantially completely and tightly fills the underground tank and any of its connecting lines, the method being performed without creating or requiring a large hole in the underground tank.

4,693,285

AUTOMATIC CONTAINER-FILLING APPARATUS

Hong-Tsuan Chang, No. 83, Sec. 2, Ling Sangh Road, Tainan, Taiwan

Filed Sep. 15, 1986, Ser. No. 907,384
Int. Cl.⁴ B65B *3/06*
U.S. Cl. 141—71 **18 Claims**



1. An automatic container-filling device for solid foodstuff comprising:

means for feeding said solid foodstuff from the exterior of the automatic container-filling device to the interior of the automatic container-filling device;

means for directing the flow of said solid foodstuff, connected to said solid foodstuff feeding means, including:

an movably mounted inclined channel for transporting said solid foodstuff fed from said solid foodstuff feeding means, including a lower outlet and a flow control valve set disposed on said channel for flow control of said solid foodstuff through said channel;

a collecting basket for collecting said solid foodstuff dropped from said outlet of said channel, including an upper opening disposed below said outlet of said channel and an openable bottom gate at a bottom of said basket;

a load cell functionally connected to said basket for measuring and indicating the weight of said solid foodstuff contained in said basket,

a funnel for collecting said solid foodstuff dropped from said basket through said openable bottom gate, and

a rotating stand for mounting and rotating said funnel;

a first vibrator for vibrating said channel to move said solid foodstuff downward along said channel;

means for transporting containers to beneath said funnel to receive said solid foodstuff dropped from said funnel, and subsequently transporting said containers filled with a predetermined amount of said solid foodstuff out of said automatic container-filling device; and

an automatic control system, including a central processing unit CPU for controlling the action of said flow control valve, said load cell and said openable bottom gate of said basket;

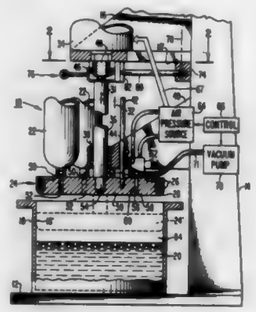
whereby, said channel, said basket and said funnel form collectively a solid foodstuff flow path, and when said solid foodstuff and said containers are fed into said container-filling device, said predetermined amount of said solid foodstuff is filled respectively into each of said containers through said solid foodstuff flow path under the control of said automatic control system, and then said containers filled with said predetermined amount of said solid foodstuff will be transported out of said container-filling device.

4,693,286

FLUID FILLING APPARATUS

Brian E. Lock, Princeton, and Jeffrey S. Wojnar, East Windsor, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 13, 1986, Ser. No. 873,959
Int. Cl.⁴ B65B *31/00*
U.S. Cl. 141—61 **8 Claims**



7. Apparatus for airless filling a container comprising:

a base;

a member having a circular cylindrical cavity secured to the base;

a piston movably secured to the base adapted to mate with

and align with said cavity to form a sealed chamber in said cavity when engaged therewith;

means coupled to the base for selectively displacing the aligned piston into and out of engagement with said cavity;

piston stop means having first and second states, said first state engaging said piston for precluding said piston from disengaging from said chamber and a second state for permitting said piston to disengage from said chamber;

means for forcing said piston in one direction against said stop means in said stop means first state;

means for evacuating said chamber while forcing said piston in said one direction;

means for displacing said piston in a second direction opposite the one direction during said second state to reduce the volume of the chamber and force fluid therefrom; and

container means coupled to said chamber for receiving fluid when said piston is displaced in said second direction.

4,693,287

BUNDLE LIMBER

Franz Wroblewski, Granitvägen 8, S-82600 Söderhamn, Sweden

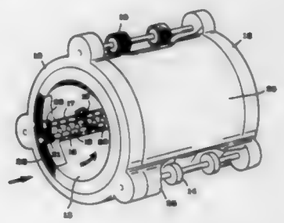
PCT No. PCT/SE85/00432, § 371 Date Jul. 15, 1986, § 102(e) Date Jul. 15, 1986, PCT Pub. No. WO86/02874, PCT Pub. Date May 22, 1986

PCT Filed Nov. 5, 1985, Ser. No. 887,807

Claims priority, application Sweden, Nov. 16, 1984, 8405744

Int. Cl.⁴ A01G *23/02*; B27L *1/00*

U.S. Cl. 144—2 Z **10 Claims**



1. A bundle limber of the type comprising a rotatably mounted drum having infeed and discharge ends at opposite ends thereof, within which a number of processing devices are mounted for mechanically processing a bundle of stems or stem portions with twigs in order to limb and also feed said stems or stem portions longitudinally through the drum, said processing device comprising a rotary shaft which is rotatable about its longitudinal axis and relative to the drum; said rotary shaft including at least one tool adapted to remove, during the rotation of said rotary shaft relative to the drum, the twigs from the stem or stem portions, said rotary shaft being mounted with its longitudinal axis outside the wall of the drum and partially projecting through an opening in the drum wall such that a peripheral portion thereof is located immediately inside the drum wall.

4,693,288

UNIVERSAL JOINT MAKER

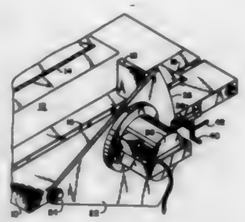
Juergen W. Buechele, and Guenter Fisher, both of LaGrangeville, N.Y., assignors to G & F Precision, Inc., LaGrangeville, N.Y.

Filed Oct. 14, 1986, Ser. No. 918,158

Int. Cl.⁴ B27F *5/00, 1/04*

U.S. Cl. 144—87 **13 Claims**

1. A woodworking tool combination for making interlocking joints in wood parts such as box finger joints and dovetail joints comprising a substantially rectangular body means for attachment to a tool table which includes at least one guide slot in the upper surface thereof for guiding a work feeding means, a work feeding means positioned and arranged for sliding engagement with said guide slot, a router tool, a vertically adjustable tool holder for holding and carrying said router tool with the router cutter axis parallel to said upper surface of said tool table attached to said body means, said body means being attached to a side edge of said tool table parallel to said guide slot, said tool holder being formed substantially in the shape of a sector of a circle and being attached to said body means by a pivotal attachment substantially at the center of the arc of said



sector, said tool holder including a circular arc shaped gear rack at the circular arcuate edge thereof, a pinion gear rotatably attached to said body means and in engagement with said gear rack and including rotating means for vertical adjustment of said tool holder by rotation of said tool holder about said pivotal attachment by rotation of said pinion gear, and means for clamping said circular arcuate edge of said tool holder in a selected vertical position.

4,693,289

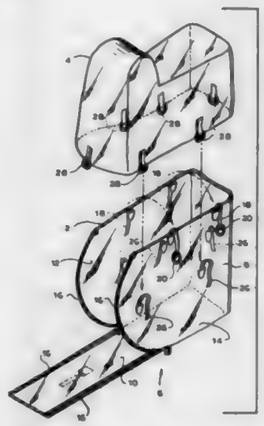
WHEELCHAIR COVER AND METHOD OF USING SAME

Cynthia L. Taylor, and Judith E. M. Nash, both of Orleans, Mass., assignors to Community of Jesus, Inc., Orleans, Mass.

Filed Aug. 23, 1985, Ser. No. 769,160

Int. Cl.⁴ B65D *65/02*

U.S. Cl. 150—52 R **3 Claims**



1. A wheelchair cover comprising a flexible protector enclosure having a bottom section and a top section, the bottom section of the enclosure having four side walls and a floor, one side wall being a flap, which side wall is unitary with the floor and attached to each adjacent side wall by a discrete zipper fastener, with each zipper fastener extending only along the adjacent side walls, so as to allow, when said flap is detached, a wheelchair to be rolled into the bottom section onto the floor of the bottom section and said bottom section being of a size and shape to enclose protectively the lower portion of the wheelchair when said flap is reattached, and the top section of the enclosure having four side walls and one top wall, which top section is of a size and shape to enclose protectively the upper portion of a wheelchair which has its lower portion enclosed by the bottom section of the enclosure, the upper section of the enclosure contacting the bottom section of the enclosure, thereby forming a protective enclosure for a wheelchair.

4,693,290

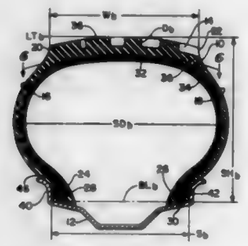
BIAS PLY SNOW TIRE COMPATIBLE WITH RADIAL PLY TIRES

Walter W. Curtiss, Akron, and John E. Lynch, Bedford, Ohio, assignors to The Goodyear & Rubber Company, Akron, Ohio

Continuation of Ser. No. 960,276, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 773,365, Mar. 1, 1977, abandoned. This application Mar. 7, 1983, Ser. No. 472,907

Int. Cl.⁴ B60C *5/00*

U.S. Cl. 152—450 **10 Claims**



1. In combination, a passenger vehicle, a pair of radial ply tires in the front wheel positions of said vehicle, a pair of bias ply tires in the rear wheel positions of said vehicle, each of said radial ply tires having an aspect ratio of between 50 and 83, each of said bias ply tires having a circumferentially extending ground engaging tread portion, a pair of sidewall portions, and a pair of bead portions each having an annular inextensible bead core; characterized by each of said bias ply tires comprising a plurality of carcass plies extending circumferentially about the tire and from bead portion to bead portion with the axially outer ends of said carcass plies being turned axially outwardly about the respective bead core and extending radially outwardly therefrom and terminating in the respective sidewall at a distance from the bead base line equal to between 15 and 40 percent of the maximum section height of the tire, the cords of said carcass plies of said bias ply tires form an angle with respect to the mid-circumferential center line of said bias ply tires of between 20 and 35 degrees, an aspect ratio which is at least 5 percent less than the aspect ratio of said radial ply tires, each of said bias ply tires having a non-skid treat pattern, the depth of the non-skid portion of said bias tires is no more than 35 percent greater than the depth of the non-skid portion of said radial tires, the width of the ground-engaging tread portion of each of said bias ply tires is equal to between 50 percent and 80 percent of the maximum section width of said bias ply tires, the point of maximum section width of each of said bias ply tires is located within the radially inner one-half of the cross-section of the tire and each of said radial ply tires in the front wheel positions of the car have a point of maximum section width located in the radially outer one-half of the cross-section of said radial ply tire.

4,693,291

CURTAIN-HOOK ASSEMBLY

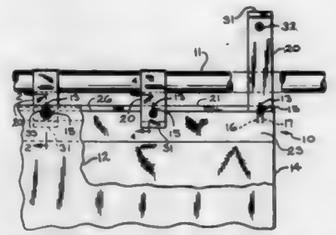
Linda S. Andrews, 3003 W. Lincolnshire, Toledo, Ohio 43606

Filed Jan. 6, 1986, Ser. No. 816,640

Int. Cl.⁴ A47H *15/00, 13/02*

U.S. Cl. 160—388 **3 Claims**

1. An assembly comprising a curtain and a plurality of hooks, each of said hooks having downwardly extending leg which has an upturned free end which constitutes a hook member, said curtain having spaced straps attached at one end to and extending from its upper edge, said hooks being secured to said curtain, one hook in alignment with and adjacent to each strap, said straps having free ends with openings therethrough, and being so sized that the curtain can be installed by



passing said straps over a suitably mounted rod and slipping the openings in the free end of each over one of said hook members, and the hook members of said hooks being so shaped that, when the curtain is so installed, a second curtain can be installed by slipping openings in the vicinity of its upper edge over the hook members.

4,693,292

CASTING OF METAL ARTICLES

John Campbell, Worcester, United Kingdom, assignor to Cosworth Research and Development Limited, Birmingham, Great Britain

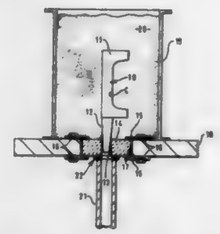
PCT No. PCT/GB85/00235, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO85/05583, PCT Pub. Date Dec. 19, 1985

PCT Filed Jun. 3, 1985, Ser. No. 826,870

Claims priority, application United Kingdom, Jun. 2, 1984, 8414129

Int. Cl.⁴ B22C *9/04, 9/08*; B22D *18/04*

U.S. Cl. 164—34 **14 Claims**



1. A method of precision foundry casting metal articles comprising the steps of supporting an in situ destroyable pattern within a container by means of a feed member, the feed member being mounted within the container, then embedding the pattern in unbonded particulate moulding material and consolidating the moulding material around the pattern to form a mould cavity therein occupied by the pattern, then feeding molten metal through the feed member into the mould cavity by pumping the metal generally upwardly against the force of gravity from a reservoir of molten metal which is at a level which is below the level of the cavity through a passage having one end surrounded by the molten metal and an opposite end which is connected to the mould cavity and an intermediate part which extends through the free surface of the molten metal with a pump formed separately from the reservoir and which draws metal from the reservoir into the pump and discharges metal from the pump into the mould cavity, the pump comprising a part of said passage, then permitting the

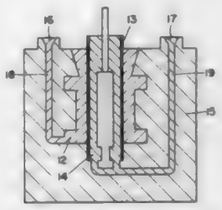
metal to solidify within the cavity and interrupting the feed of said metal and removing the casting from the mould cavity.

4,693,293

METHOD OF CASTING A MACHINE PART BY FUSING METAL LAYERS ON BOTH SIDES OF A SEPARTING PLATE

Harutoshi Yamamoto, Mochizuki; Zenichi, and Sadasue Sakomoto, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 759,101
Int. Cl.⁴ B22D *19/06, 19/16*
U.S. Cl. 164—99 **1 Claim**



1. A method for producing a machine part to be used in a molding machine which is adaped to mold either one of plastic and ceramic materials into molded products having various shapes, comprising the steps of:

preparing a mold provided with a mold cavity therein;

securing a helical-shaped pipe of heating or cooling used to a separating metallic plate;

inserting said separating metallic plate having said helical-shaped pipe secured thereto into said mold for separating said mold cavity into two portions adapted to form a main portion of the machine part and to form a corrosion and wear resistanct portion of the same on both sides of said separating plate;

pouring a metal for forming the main portion and a corrosion and wear resistant metal for forming the corrosion and wear resistant portion, both in melted state, into said mold cavities keeping the levels of said melted metals rising-up in said mold cavities equal to each other, thereby preventing said separating metallic plate from being deformed;

solidifying said metals poured into said mold cavities to metallurgically fuse each of the said metals to the separating metallic plate; and

taking out the thus produced machine part from said mold.

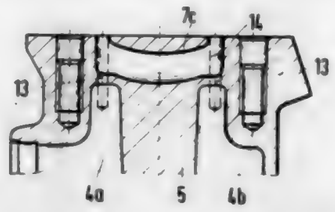
4,693,294

APPARATUS FOR PRODUCING BY THE CASTING TECHNIQUE A COOLING MEANS FOR WEBS BETWEEN ADJACENT CYLINDERS OF A CYLINDER BLOCK AND A CYLINDER BLOCK PRODUCED ACCORDINGLY

Karl-Hans Albrecht, Dillingen; Hartmut Lühr, Saarbrücken-Brebach, and Günter Pieck, Saarbrücken-Fechingen, all of Fed. Rep. of Germany, assignors to Halbergerhutte GmbH, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,745
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3512076
Int. Cl.⁴ B22D *33/04*
U.S. Cl. 164—312 **7 Claims**

1. An apparatus for producing, by the casting technique, a cooling means for webs between adjacent cylinders cast extremely close together in a cylinder block of a reciprocating engine whose cylinder walls are surrounded on both longitudinal sides and front sides of the cylinder block by a water jacket, with a jacket core to form the water jacket, comprising separate cores disposed in the web (5) to form cooling water channels (7, 7a, 7b) which bridge the two opposite longitudinal sides of said jacket core at the level of the cylinder combustion



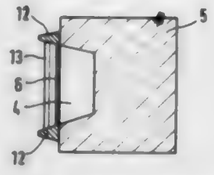
chamber, said separate cores being either fitted at both ends into said jacket core or fixed in an upper bottom core (11).

4,693,295

DEVICE FOR CONTINUOUS CASTING

Siegfried Henders, Geldern, Fed. Rep. of Germany, assignor to Korf Engineering GmbH, Düsseldorf, Fed. Rep. of Germany

PCT No. PCT/DE85/00404, § 371 Date Jun. 17, 1986, § 102(e) Date Jun. 17, 1986, PCT Pub. No. WO86/02298, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 16, 1985, Ser. No. 881,031
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 3438492
Int. Cl.⁴ B22D *11/06*
U.S. Cl. 164—433 **5 Claims**



1. A continuous casting device comprising: a rotatable casting wheel having a circumferential recess which is open radially outwardly for receiving molten material therein which is to harden at least partially therein during rotation of said casting wheel; a band confining said recess radially outwardly of said wheel over at least part of the circumference of the wheel; and a chain passing over said band radially outwardly of said band, said chain having a plurality of individual links; each link having two parallel ribs pressing the band against the circumference of the wheel outside said recess, and also having a bridge connecting said ribs, said bridge being out of contact with said band, whereby pressure is exerted on the band by the chain only outside said recess.

4,693,296

COMPOSITE BREAK RING FOR CONTINUOUS CASTING

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Nov. 7, 1985, Ser. No. 795,837
Int. Cl.⁴ B22D *11/10*
U.S. Cl. 164—440 **7 Claims**

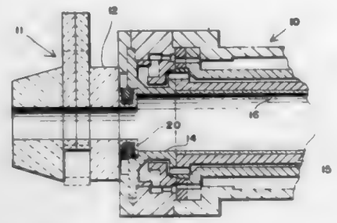
1. A break ring for use with a continuous caster comprising, in combination:

a closed loop body,

said body having an interior first formed U-shaped skin on the inner portion of the loop,

said skin being characterized as a sprayably deposited substance exhibiting the characteristics of a molten metal heat spray deposited outer skin,

a secondary secondly formed U-shaped skin interiorly of the exterior first formed U-shaped skin formed in intimate contact with the exterior first formed skin and exhibiting the characteristics of a molten metal heat sprayed material different from the material of the exterior skin,



and an interior body portion interior of the second formed U-shaped skin,

said interior body portion being a formable material.

4,693,297

INSTALLATION FOR THE STEP BY STEP VERTICAL EXTRACTION OF A CONTINUOUS CAST PRODUCT

Yves Gourmel, Blenod les Pont a Mousson, and Michel Pierrel, Maidieres, both of France, assignors to Pont A Mousson S.A., Nancy, France

Filed Sep. 18, 1986, Ser. No. 909,053
Claims priority, application France, Sep. 30, 1985, 85 14449
Int. Cl.⁴ B22D *11/04, 11/128*
U.S. Cl. 164—447 **3 Claims**

1. Installation for the step by step vertical extraction from an ingot-mould of an elongated solid product (1) obtained by continuous bottom casting, shaping, calibration and solidification in a suitable chamber (2) having an outlet orifice, said installation being characterised by:

a first fixed device (3), situated in the immediate vicinity of the outlet orifice of the chamber, constituted by a ring, surrounding the solid product, having an inner face (4) in the shape of a frustum of a cone having an opening and inner side walls at an angle of between 10° and 20° with respect to the vertical axis of the opening and having its small base towards the bottom, the space situated between the outer surface of the solid product and the inner face of the ring being provided with balls (5) of several diameters able to ensure the wedging of the solid product in the case of the beginning of a movement in the upstream direction of the solid product;

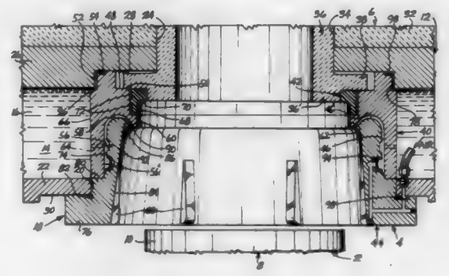
and of a second movable device (6) vertically displaced from the first device and surrounding the solid product and having the same structure as the first device and also comprising balls, the second device having means for carrying out a reciprocating longitudinal movement of the second device along the vertical axis of the second device.

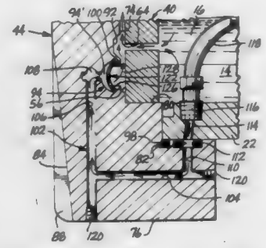
4,693,298

MEANS AND TECHNIQUE FOR CASTING METALS AT A CONTROLLED DIRECT COOLING RATE

Frank E. Wagstaff, Spokane, Wash., assignor to Wagstaff Engineering, Inc., Seattle, Wash.

Filed Dec. 8, 1986, Ser. No. 939,325
Int. Cl.⁴ B22D *11/124*
U.S. Cl. 164—486 **40 Claims**





1. In the process of continuously casting metal as ingot by introducing molten metal to the cavity of an annular mold, through one end opening thereof, and while the metal undergoes partial solidification in the mold to form a body of the same on a support adjacent the other end opening of the cavity, reciprocating the mold and support in relation to one another endwise of the cavity to elongate the body of metal through the latter opening of the cavity, the improvement comprising:

introducing liquid coolant to an annular flow passage which is circumposed about the cavity in the body of the mold and opens into the ambient atmosphere of the mold adjacent the aforesaid opposite end opening thereof to discharge the coolant as a curtain of the same that impinges on the emerging body of metal for direct cooling of the same,

a gas, which is substantially insoluble in the coolant liquid, under pressure into an annular distribution chamber which is disposed about the passage in the body of the mold and opens into the passage through an annular slot disposed upstream from the discharge opening of the passage at the periphery of the coolant flow therein,

releasing the body of gas in the chamber into the passage through the slot,

subdividing the body of gas into a multiplicity of gas jets as the gas discharges through the slot, and

releasing the gas jets into the coolant flow at a temperature and pressure at which the gas is entrained in the flow as a mass of bubbles that tend to remain discrete and undissolved in the coolant as the curtain of the same discharges

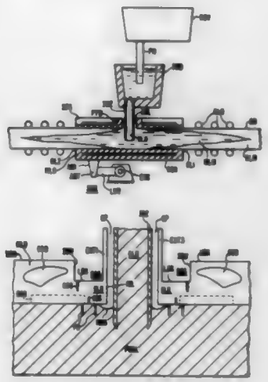
through the opening of the passage and impinges on the emerging body of metal.

4,693,299

CONTINUOUS METAL CASTING APPARATUS

Stephen B. Kuzmetsov, Washington, D.C., and Richard D. Nathenson, Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1986, Ser. No. 871,005
Int. Cl.[4] B22D *11/00, 27/02*
U.S. Cl. 164—502 **11 Claims**



1. Continuous casting apparatus including a casting vessel having an upper wall and a lower wall made of thermally and electrically conductive metal, at least one outlet for extracting solidified metal therefrom and an inlet for admitting molten metal therein said inlet being defined in the upper wall and forming a rim therewith;

a feeding nozzle sunk into the molten metal of said casting vessel through said inlet for maintaining a feeding column of liquid metal above said inlet;

said inlet being defined by an annular portion of said casting vessel;

said nozzle and said annular portion defining a gap therebetween;

means being provided for passing polyphase alternating currents through said annular portion to induce eddy currents in the molten metal adjoining said gap;

a plurality of extensions of the same vessel wall metal being formed vertically at regularly distributed locations on said rim, one such extension being provided for a corresponding phase of said polyphase alternating currents, said alternating current passing means being electrically connected to said plurality of extensions;

whereby electromagnetic forces are generated in the molten metal to prevent escape thereof and to maintain said feeding column.

4,693,300

METHOD AND APPARATUS FOR SPRINKLERLESS SNOW CONTROL

Hideo Adachi, Tokyo, Japan, assignor to Nippon Flute, Co., Iruma, Japan

Filed Aug. 4, 1986, Ser. No. 892,851
Int. Cl.[4] F28D *1/00*
U.S. Cl. 165—1 **19 Claims**

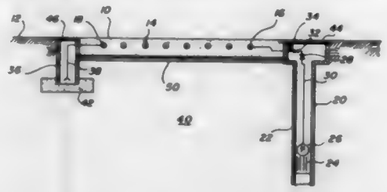
1. A method for minimizing an accumulation of snow upon a roadway, parking lot, roof structure or the like comprising the steps of:

positioning a heat exchange conduit system beneath a surface to be protected from snow accumulation;

pumping relatively warm subsurface water from a lift well beneath the surface of the earth into the heat exchange conduit system to heat the surface and melt snow falling upon the surface;

discharging the subsurface water from the heat exchange conduit system into at least one recharging well for delivery of the water back beneath the surface of the earth;

maintaining a non-return valve positioned at the highest point between the water lift well and the heat exchange conduit system, said non-return valve permitting air to



enter the conduit system upon termination of the subsurface water pumping operation; and

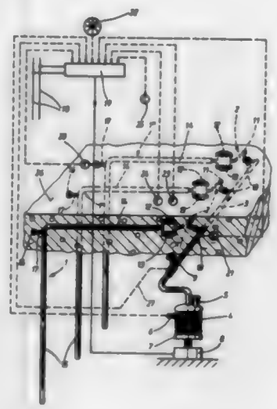
maintaining an air relief conduit between the lift well and the at least one recharging well to equalize air pressure between said said water lift well and said at least one recharging well for preventing a vacuum from forming adjacent said non-return valve which might prevent air from entering the conduit system upon termination of subsurface water pumping operations.

4,693,301

METHOD FOR HEATING A ROAD BY MEANS OF GEOTHERMALLY FED HEATING INSTALLATION AS WELL AS A ROAD-HEATING INSTALLATION FOR CARRYING OUT THE METHOD

Friedrich Baehrle, Kernen-Rommelshausen; Helmut Wulf, Ostfildern, and Helmut Kroeb, Meersburg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 12, 1986, Ser. No. 906,244
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 3532542
Int. Cl.[4] F24J *3/08*
U.S. Cl. 165—45 **28 Claims**



2. A road heating installation, comprising heat pipe means placed heat conductingly near the road surface, each heat pipe means including a condensation zone extending directly underneath the road surface and an evaporation zone extending to a

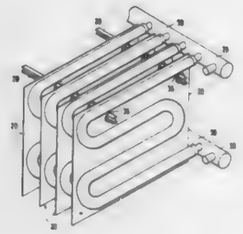
depth in the ground for a heat carrier medium disposed within the heat pipe means, sensor means for detecting the determinative factors of the climate, of the road condition and of the heat pipe means, and a control apparatus including control means, the output of the sensor means being fed as inputs to the control apparatus, and said control means being operable to block the heat transfer output of the heat pipe means with a dry-cold by quantity controlled introduction of an inert gas into the condensation zones of heat pipe means and by cancelling the blockage by controlled return of the inert gas out of the condensation zones with changed prerequisites.

4,693,302

HEAT EXCHANGING APPARATUS FOR COOLING AND CONDENSING BY EVAPORATION

Diego E. F. Dodds, Buenos Aires, Argentina, assignor to Leonard Obeler, Key Biscayne, Fla.

Filed Nov. 14, 1985, Ser. No. 797,734
Claims priority, application Argentina, Dec. 28, 1984, 299141
Int. Cl.[4] F28D *3/02;* **F28F** *3/14, 21/06;* **F28G** *5/00*
U.S. Cl. 165—46 **11 Claims**



1. In a heat exchange apparatus for cooling and condensing by evaporation, said apparatus having first header means for receiving fluid from a source, plastic heat exchange elements defining a plurality of passages through a heat exchange zone and second header means for receiving fluid from said plastic heat exchange elements after passing through said heat exchange zone, means for returning condensed fluid to said source from said second header means and means for flowing a liquid cooling medium in droplet form on the external surfaces of said plastic heat exchange elements, the improvement wherein said plastic heat exchange elements comprises a flexible thin-walled tubular plastic element the operative cross-sectional shape of which is attained when the tube is subjected to predetermined internal pressure, each said flexible thin-walled tubular plastic element being radially expandable by pressure of fluid from said source to avoid scale formation, and one or more rigid horizontal rod means for supporting and rigidifying said flexible thin-walled plastic heat exchange elements.

4,693,303

LIQUID COOLING MODULE WITH SPRINGY CONTACT ELEMENTS AND AN APERTURE PLATE SLIDABLE THEREOVER

Yoshikatsu Okada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 19, 1986, Ser. No. 876,381
Claims priority, application Japan, Jun. 20, 1985, 60-134842
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—80.4 **6 Claims**

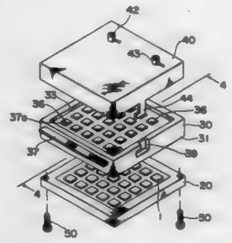
1. A liquid cooling module for heat generating components, comprising:

a substrate on which said heat generating components are mounted;

a thermally conductive member secured to said substrate enclosing said heat generating components, the thermally conductive member having a pair of two-motion coupling means one on each side thereof;

a liquid cooling member having a chamber in which liquid is flowed and a pair of two-motion coupling means respectively engageable with the two-motion coupling means of the thermally conductive member when said thermally conductive member and liquid cooling member are moved toward each other in a first direction and subsequently moved in a second direction with respect to each other normal to said first direction;

an array of thermally conductive, springy contact elements arranged between said thermally conductive member and said liquid cooling member; and



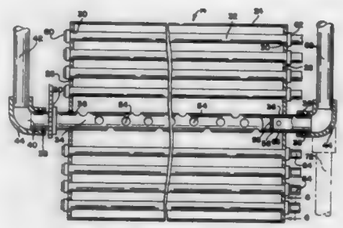
an aperture plate slidable between first and second positions and having an array of apertures corresponding to said contact elements for holding the contact elements in compression when the aperture plate is in said first position to permit said coupling means of said thermally conductive member and liquid cooling member to move in said second direction and allowing said contact elements to partially extend through the corresponding apertures to establish thermal contact between said thermally conductive member and said cooling member when the slidable member is in said second position.

4,693,304

SUBMERGED ROTATING HEAT EXCHANGER-REACTOR

Craig S. Volland, 5615 Kenwood, Kansas City, Mo. 64110

Continuation-in-part of Ser. No. 766,648, Aug. 19, 1985, Pat. No. 4,613,409. This application May 23, 1986, Ser. No. 866,876
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] F28D *11/08*
U.S. Cl. 165—88 **16 Claims**



1. Apparatus for evaporating a feed liquid, comprising:

(a) an enclosure defining a heat storage section containing a hot liquid;

(b) an evaporator module supported within said enclosure for rotation about a substantially horizontal axis and submerged within said heat storage section thereof, comprising:

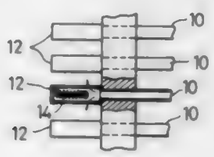
(i) an elongated cylindrical housing sealed off by an influent end plate and an effluent end plate;
(ii) a plurality of spaced apart substantially horizontal open ended heat transfer tubes positioned within said housing having influent and effluent end sections thereof respectively extending through said influent end plate and said effluent end plate for passage of hot liquid from said enclosure therethrough;
(iii) a substantially hollow distribution shaft positioned within said housing having end sections thereof respectively extending through said influent end plate and said effluent end plate;
(iv) said distribution shaft having a plurality of spaced apart openings formed therein; and
(v) said effluent end section of said distribution shaft being closed off by a wall;
(c) Influent conduit means for directing the feed liquid into said distribution shaft for distribution of same through said openings in said shaft into said housing;
(d) means for rotation of said evaporator module about a substantially horizontal axis so as to cause the feed liquid to fall through said housing into heat transferring contact with said heat transfer tubes and thereby vaporize a portion of the feed liquid; and
(e) means for withdrawing the vapor formed in said evaporator module.

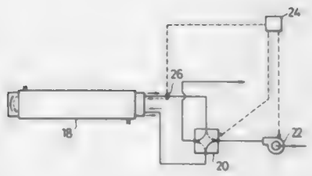
4,693,305

SYSTEM FOR CONTROLLING FLUID FLOW IN A TUBE OF A HEAT EXCHANGER

Masakazu Fujimoto, and Kikuo Kogaito, both of Tokyo, Japan, assignors to Ebara Corporation, Japan

Filed Jan. 18, 1985, Ser. No. 692,850
Int. Cl.[4] F28G *1/02, 1/12*
U.S. Cl. 165—95 **12 Claims**





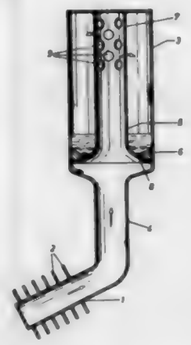
1. System for controlling flow rate of fluid within a heat exchanger tube, a cleaning brush being situated in the tube, comprising
a circulation system for the fluid through the tube,
switching means coupled into said circulation system for switching direction of the fluid flow through the tube, such that the brush moves through the tube to clean the same, and
means coupled into said circulation system for increasing flow rate of the fluid through the tube prior to or during actuation of said switching means.

4,693,306

REGULATOR MEANS FOR USE IN HEAT PIPES

Hans-Ove Nilsson, Kallered, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Feb. 27, 1986, Ser. No. 834,211
Claims priority, application Sweden, Mar. 4, 1985, 8501033
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.21 **2 Claims**



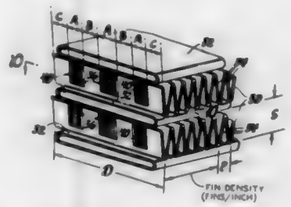
1. An improved regulator means for regulating the transfer of heat inside a heat pipe by means of an operative medium contained inside said pipe, said heat pipe comprising a heat emitting condenser part, a heat-absorbing evaporator part and an interconnecting conduit extending between said two parts, the improvement comprising a valve forming said regulator means, said valve having a valve seat fixed relative to an inner face of said heat pipe and defining a flow opening, and a valve body which is disposed inside said heat pipe and formed from a material having a different coefficient of thermal expansion than the heat pipe material, a first part of said valve body being fixedly secured to said heat pipe at a point spaced from said valve seal and a second part of said valve body being juxtaposed to said valve seat and defining therewith an opening gap of varying area inside said valve in dependence of the degree of heating of said heat pipe.

4,693,307

TUBE AND FIN HEAT EXCHANGER WITH HYBRID HEAT TRANSFER FIN ARRANGEMENT

Louis Scarselletta, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 776,419, Sep. 16, 1985, abandoned, which is a continuation of Ser. No. 642,100, Aug. 20, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 912,575
Int. Cl.[4] F28D *1/02*
U.S. Cl. 165—152 **3 Claims**



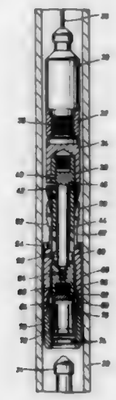
3. A tube and fin heat exchanger comprising a plurality of flat tubes arranged in spaced side-by-side relationship, a folded strip forming a plurality of louvered fins arranged in spaced side-by-side relationship and between and in heat transfer relationship with adjacent ones of said tubes, said fins having a thickness and stacked density such as to constitute not more than about 12% nor less than about 2.5% of the space between the adjacent tubes, said fins further having a total louvered area not more than about 60% nor less than about 40% of the total fin area, said fins having a length along their air flow facing edge per unit of area between the tubes divided by said unit area that as measured in millimeters is not more than about 1.2 mm^{-1} nor less than about 0.68 mm^{-1}, and said fins further having at least one strengthening beam of reverse bent cross-sectional configuration formed integral therewith and extending thereacross between the adjacent flat tubes for strengthening the fins against crushing from external forces and the flat tubes against ballooning from internal forces.

4,693,308

TUBING CONVEYED PERFORATING SAFETY ANCHOR

Robert R. Luke, Houston, and James M. Barker, Katy, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 19, 1985, Ser. No. 810,635
Int. Cl.[4] E21B *31/18*
U.S. Cl. 166—55.1 **16 Claims**



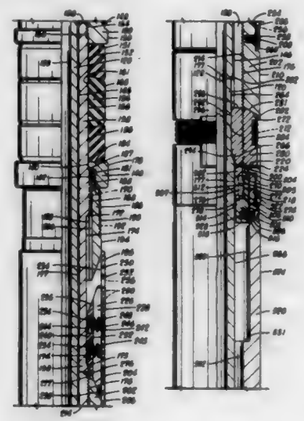
1. In a tubing conveyed perforating gun assembly supported at the lower end of a tubing string and adapted to be fired by a dropped weight bar with fishing neck falling through the tubing string, subject to sticking before initiating detonation of the charges in the tubing conveyed perforating gun assembly, a safety anchor comprising:
(a) an elongate body having connecting means for connection with a supportive wireline enabling said elongate body to be lowered in the tubing string;
(b) fishing neck grapple means supported at the lower end of said elongate body for engaging the fishing neck on the weight bar stuck in the tubing string;
(c) means disconnecting said wireline from said body at said connecting means;
(d) radially expandable slip means on said body and adapted to engage the wall of the tubing string connected to the tubing conveyed perforating gun assembly to secure said body at a specified location along the tubing string to prevent further movement there along during retrieval of the tubing string from the well while supporting the stuck weight bar therebelow;
(e) wherein said body includes:
(1) a central mandrel;
(2) an elongate sleeve telescoped around said mandrel for sliding axial movement;
(3) a set of encircling collet fingers comprising said grapple means;
(4) a surrounding grapple cage about said collet fingers sized to clamp said fingers radially inwardly to clamp the fishing neck; and
(5) means connected to said grapple cage for relatively positioning said grapple cage to enable movement to a locking position relative to said collet fingers.

4,693,309

WIRELINE SET/TUBING RETRIEVABLE BRIDGE PLUG

Kenneth D. Caskey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 750,557, Jun. 27, 1985, Pat. No. 4,648,446. This application Feb. 19, 1986, Ser. No. 831,249
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—123 **20 Claims**



1. A retrievable downhole tool for use in a well bore, said tool comprising:
mandrel means having a shaped recess thereon;
packer mandrel means disposed around said mandrel means and comprising first ratchet means thereon;
ratchet body means disposed around said packer mandrel means and comprising second ratchet means thereon for releasably engaging said first ratchet means;
mandrel case means disposed around said mandrel means and having lug means thereon for engaging said shaped recess in said mandrel means;
packer means on said packer mandrel means for releasably, sealingly engaging said well bore; and
slip means for releasably, grippingly engaging said well bore.

4,693,310

CONFORMANCE CORRECTION TO IMPROVE HYDROCARBON RECOVERY FROM A SUBTERRANEAN FORMATION

David L. Gibbons, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 10, 1986, Ser. No. 939,985
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—270 **28 Claims**

1. A process for substantially reducing the permeability of at least one relatively high permeability region bounded by a relatively low permeability region in a hydrocarbon bearing formation below an earthen surface penetrated by a well bore in fluid communication with said at least one relatively high permeability region, the process comprising the steps of:
(a) adding a monovalent salt, which does not substantially crosslink an acrylamide polymer, to an aqueous acrylamide polymer solution in an amount sufficient to render the viscosity of said polymer solution, when crosslinked by a crosslinking system to form a crosslinked gel, less sensitive

to the concentrations of said polymer and crosslinking system in said gel;

(b) sequentially injecting said salt-containing polymer solution and a crosslinking system solution, comprising a compound of a polyvalent metal ion and a reducing compound, into said at least one relatively high permeability region via said well bore;

(c) mixing said salt-containing polymer solution and crosslinking system solution in situ to form a gelation solution; and

(d) gelling said gelation solution in said at least one relatively high permeability region by reducing said polyvalent metal ion from a higher valence state to a lower valence state by means of said reducing compound and crosslinking said acrylamide polymer by means of said polyvalent metal ion at said lower valence state in the presence of said monovalent salt to produce said crosslinked gel which substantially reduces the permeability of said at least one relatively high permeability region.

4,693,311

STEAM FOAM PROCESS

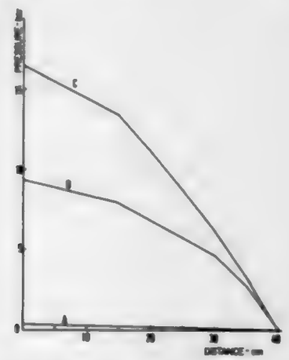
Herman M. Mutja, and Paulus P. M. Keijzer, both of Rijswijk, Netherlands, assignors to Shell Internationale Maatschappij, B.V., Netherlands

Filed Jan. 17, 1986, Ser. No. 875,412

Claims priority, application United Kingdom, Jul. 4, 1985, 8516920

Int. Cl.⁴ E21B *43/24*

U.S. Cl. 166—272 **12 Claims**



1. In a process for displacing oil within an oil-containing subterranean reservoir containing a relatively steam-permeable zone by flowing a steam-containing fluid in conjunction with a surfactant component through the relatively steam-permeable zone within said reservoir, the improvement wherein the surfactant component employed comprises in substantial part at light one linear C_{25}–C_{30}-α-olefin sulphonate.

4,693,312

METHOD OF UTILIZING PARAFFIN INHIBITORS

Gary L. Lenderman, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 3, 1986, Ser. No. 915,196

Int. Cl.⁴ E21B *37/06*

U.S. Cl. 166—279 **2 Claims**

1. An improved method for depositing a polymeric pour point depressant in an oil producing formation so that the polymeric pour point depressant can slowly dissolve in the oil as the oil is produced which comprises the steps of:

A. Adding an activator for the polymeric pour point depressant into the formation, and then;

B. Injecting a dispersion of the polymeric pour point depressant into the activator treated formation.

4,693,313

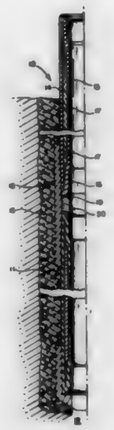
INSULATED WELLBORE CASING

Edgar O. Stephenson, Pierce County, and Raymond C. Howe, King County, both of Wash., assignors to Kawasaki Thermal Systems, Inc., Tacoma, Wash.

Filed Jun. 26, 1986, Ser. No. 878,996

Int. Cl.⁴ E21B *36/00, 43/24*

U.S. Cl. 166—302 **8 Claims**



1. An insulated wellbore casing adapted to be cemented to the surrounding earth of a wellbore, comprising:

an outer tubular member adapted to be cemented to the surrounding earth of the wellbore;

an inner tubular member, concentrically spaced from said outer tubular member, having terminal ends substantially adjacent said outer tubular member and providing an insulating annular cavity therebetween;

insulation material filling said annular cavity between said inner and outer tubulars; and

weldments that join said outer and inner tubular members with said insulation held therebetween, said weldments joined while said inner tubular member is tensioned, whereby an integrated casing unit is formed that is prestressed to accommodate linear thermal expansion of said inner tubular member at well-operating temperatures.

4,693,314

LOW ACTUATION PRESSURE BAR VENT

David S. Wesson, Katy, Tex.; Stanley J. Wall, Oxnard, and John H. Hales, Ventura, both of Calif., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 18, 1986, Ser. No. 831,237

Int. Cl.⁴ E21B *34/06*

U.S. Cl. 166—317 **15 Claims**

1. A tubing vent comprising:

body means, defining a central opening therethrough, attachable to a tool string and having port means thereon for providing a communication between a well annulus and said central opening;

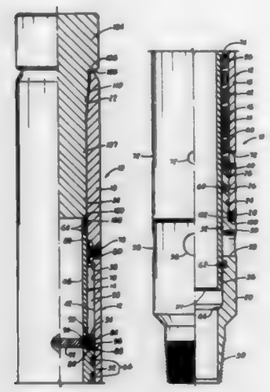
piston means reciprocably disposed in said body means central opening and having a closed position covering said port means and an open position;

biasing means for biasing said piston means toward said open piston;

balancing means for balancing said biasing means and for maintaining said piston in said closed position, said balancing means comprising:

fluid reservoir means between said body means and piston means; and

a volume of fluid disposed in said fluid reservoir means, and sealingly enclosed therby for preventing movement of said piston means from said closed position;



location means for locating and maintaining said piston means in said closed position such that at least a portion of said fluid may be added to said fluid reservoir means, said location means being removable prior to attaching said body means to said tubing string;

and

releasing means for releasing said balancing means and for allowing said biasing means to move said piston means from said closed position to said open position.

4,693,315

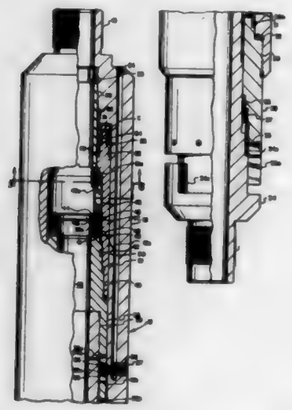
BLEEDOFF TOOL FOR WELL TEST SYSTEM

Frank H. Taylor, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 764,391, Aug. 12, 1985, Pat. No. 4,640,363. This application Sep. 8, 1986, Ser. No. 904,694

Int. Cl.⁴ E21B *34/04*

U.S. Cl. 166—336 **10 Claims**



1. A safety system for testing underwater wells comprising:

(a) a riser on a blowout preventer spaced above a landing shoulder in the well casing; and

(b) a string of test pipe in the well casing and riser including

a retainer valve spaced above a bleedoff tool having

a piston,

a body rotatably mounted and sealed around said piston and

closed flow passage means therein, said passage means openable by relative rotation between

said piston and body to permit flow between the inside of said bleedoff tool and said riser,

said bleedoff tool spaced above a subsea test tree having an upper latch section releasably connectable to a lower body and said subsea test tree spaced above a hanger near the upper end of said string.

4,693,316

ROUND MANDREL SLIP JOINT

Paul D. Ringgenberg; Daniel A. Newman, and Harold K. Beck, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 20, 1985, Ser. No. 800,172

Int. Cl.⁴ E21B *17/07*

U.S. Cl. 166—355 **12 Claims**

1. A slip joint for use in a well string, said slip joint comprising:

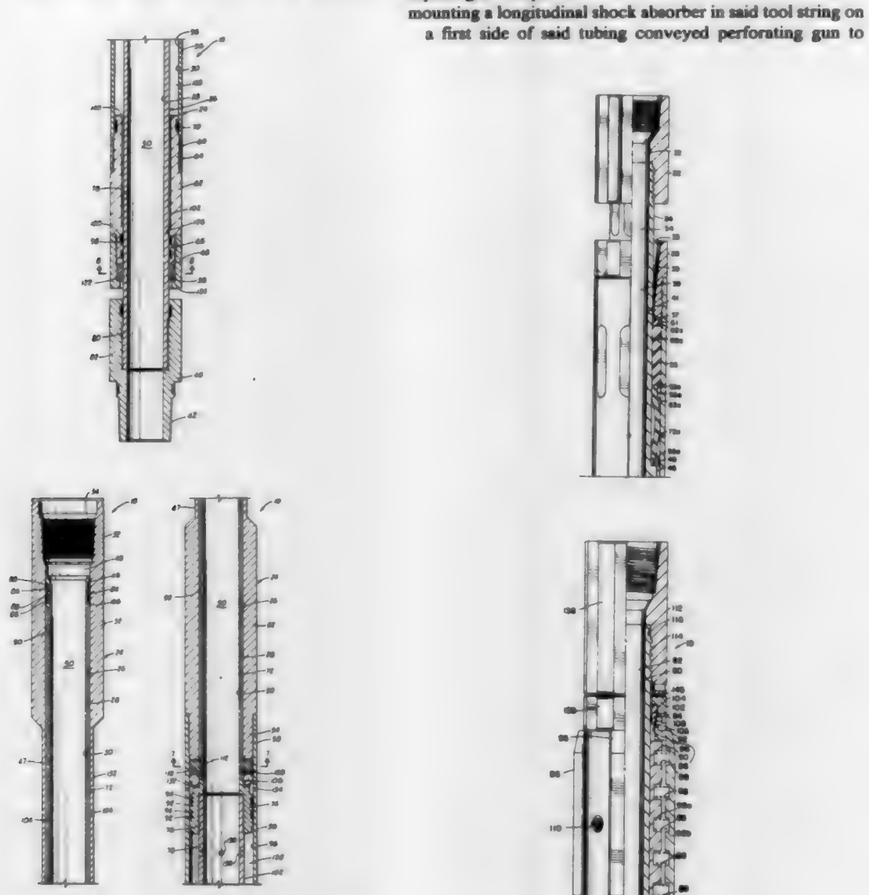
first mandrel means defining a central opening longitudinally therethrough;

second mandrel means defining a central opening therethrough and having a portion reciprocably positioned in said central opening of said first mandrel means such that said second mandrel means central opening and a portion of said first mandrel means central opening define a variable volume internal chamber;

key receiving means defined on both said first and second mandrel means, said key receiving means comprising in part a surface of one of said first and second mandrel means defining a longitudinal slot therealong and in part key engaging means on the other of said first and second mandrel means and adjacent said slot defined on said one of said first and second mandrel means; and

key means engageable with said key receiving means for transmitting torque between said first and second mandrel means and providing guidance during relative movement thereof, said key means being separable from said first and

second mandrel means, and comprising a substantially annular ring portion engaged with said key engaging means and rotatable therewith and a lug portion extending radially from said ring portion and into said slot.



4,693,317

METHOD AND APPARATUS FOR ABSORBING SHOCK

A. Glen Edwards, Hockley; David S. Wesson, Katy, both of Tex., and Emmet F. Brieger, Nogal, N. Mex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 3, 1985, Ser. No. 740,927
Int. Cl.[4] E21B *17/07, 43/11*
U.S. Cl. 166—378 **16 Claims**

7. A tubing conveyed perforating gun tool string assembly for use in an earth borehole, comprising:

a shock sensitive component coupled to said tool string which is to be isolated from a portion of the shock to said asembly;

a tubing conveyed perforating gun coupled to said tool string; and

means for damping a portion of the longitudinal and radial accelerations of said shock sensitive component due to the detonation of said tubing conveyed perforating gun.

11. A method of minimizing the transfer of shock caused by the detonation of a tubing conveyed perforating gun to other components in a tool string, said tubing conveyed perforating gun being releasably connected to said tool string, said tool string extending through a portion of a well bore, said method comprising the steps of:

mounting a longitudinal shock absorber in said tool string on a first side of said tubing conveyed perforating gun to absorb at least a portion of the longitudinal shock to said tool string when said tubing conveyed perforating gun is detonated; and

mounting a radial shock absorber in said tool string to absorb at least a portion of the radial shock to said tool string when said tubing conveyed perforating gun is denotated.

4,693,318

SAND CONTROL DEVICES AND METHOD OF INSTALLATION THEREOF

Ljubisa M. Petrovic, Houston, Tex., assignor to Well Improvement Specialists, Inc., Houston, Tex.

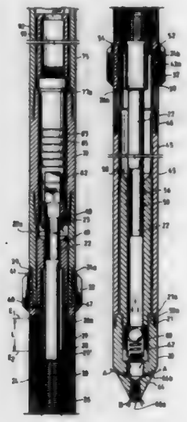
Filed Oct. 10, 1985, Ser. No. 786,050
Int. Cl.[4] E21B *43/08*
U.S. Cl. 166—380 **22 Claims**

1. A double walled sand control filter for installation in fluid bearing formations to prevent sanding and silting in during production, comprising:

(a) a pair of inner and outer spaced, substantially concentric screen members positioned to define an annular filter spaced therebetween adapted to contain a filtrating medium for filtering sand and particulate materials having tendency to pass into a well, said filtrating medium tending to be subjected to compaction during production of formation fluids;

(b) means for connecting said inner and outer screens together so that the openings within the outer screen extend to a maximum elevational position E1 higher than the maximum elevational position E2 of the openings in the inner screen, said openings formed on the inner screen extending elevationally to cover substantially the entire length of said inner screen excepting a portion of the inner screen extending upward from the inner screen openings being an imperforate side wall extending coextensive with the outer screen openings from E1 to E2, said inner screen openings extending to position E2 remaining substantially entirely covered by the compacted filtrating medium so that formation fluid entering the filter always passes through the filtrating medium substantially entirely in a horizontal direction without an appreciable velocity component in a vertical direction prior to entering the inner screen; and

(c) means for defining a sedimentation area below the filter into which particulate materials filtered from formation fluid with the annular filter space pass to allow the filtrating medium to remain essentially unclogged by said particulate materials.



8. A method for installing a sand control filter within an existing well bore formed within a fluid bearing formation, comprising the steps of:

(a) cleaning the well bore by removing sand tending to collect in the bottom of the well;

(b) placing a wash down media into the bottom of the well, said wash down media substantially consisting of loose glass or polymer spheres;

(c) installing into the well the sand control filter carrying a wash pipe and a jet shoe connected below the filter, said sand control filter being lowered into the well until the jet shoe contacts the upper surface of the wash down media, said sand control filter having an outer diameter less than the inner diameter of the well to define an annular space therebetween; and

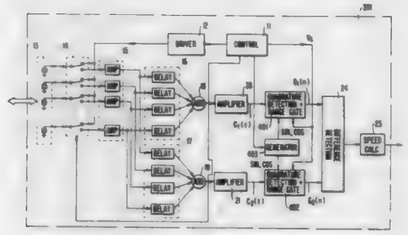
(d) injecting a working fluid in sufficient quantities through the wash pipe for ejection through the jet shoe to displace the wash down media and allow the jet shoe to settle to the well bottom, said sand control filter thereby settling into a common elevational position with fluid bearing formation zones and being entirely surrounded by the wash down media entering the annular space by the action of forceable displacement of the media by ejection of working fluid from the jet shoe, said wash down media tending to prevent abrasion of the sand control filter tending to be caused during initial production of formation fluid as said formation fluid initially enters the sand control filter through the annular space from the surrounding formation carrying abrasive formation sand with it, said wash down medin thereby trapping between open spaces formed between adjacent spheres the large particles of sand and particulate material flowing from the formation fluid, said spheres of the wash down media having a low coefficient of friction with the sand control filter to allow for easy installation and removal of the filter for servicing without destroying the filter.

4,693,319

CORRELATION DETECTION TYPE ULTRASOUND BLOOD FLOWMETER

Shinichi Amemiya, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 2, 1985, Ser. No. 782,921
Claims priority, application Japan, Oct. 8, 1984, 59-210800
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—663 **8 Claims**



1. A correlation detection type ultrasound blood flowmeter for measuring speed of flowing blood in a body, comprising:

first means for repeatedly sending burst ultrasound waves toward two sample volumes, through which said blood is flowing, with a repetition frequency and for receiving echo signals along two lines from the body including echo signals from said flowing blood and fixed substances in the body, said two sample volumes being respectively positioned at the same distance from said blood flowmeter,

sine-cosine generator means for providing a sine signal and a cosine signal;

quadrature means for selecting respective ones of said echo signals, corresponding to said echo signals from said flowing blood passing through said two sample volumes, by eliminating said echo signals reflected by said fixed substances, said quadrature means including

multiplier means for multiplying said echo signals by said sine signal, for multiplying said echo signals by said cosine signal, and for providing output signals varying in response to said multiplications;

low pass filter means for filtering high frequency components of said output signals of said multiplier means and for providing the low pass filtered signals as filtered echo signals;

range gate means for extending a range of each of said two sample volumes by sampling and averaging said filtered echo signals in accordance with a gate pulse and for providing an output responsive to said sampling and averaging;

high pass filter means for filtering low frequency components out of said output of said range gate means and for providing the high pass filtered signals as filtered range signals;

squaring circuit means for squaring said filtered range signals; and

adding means for adding said squared filtered range sig-

nals and for providing added outputs responsive to said adding;

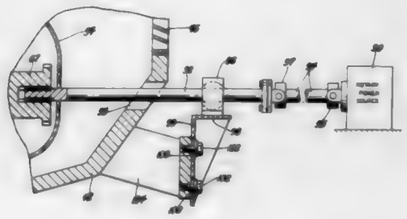
cross-correlation time difference detection means for cross-correlating said added outputs and for providing, based upon said cross-correlation, an output varying in accordance with the speed of said flowing blood in a direction substantially perpendicular to a line midway between said two lines.

4,693,320

FIRE SUPPRESSION TEST APPARATUS

Paul J. Lescoe, Riverview, and Charles E. Scheffler, St. Clair Shores, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 7, 1986, Ser. No. 895,007
Int. Cl.[4] A62C *37/22*
U.S. Cl. 169—61 **5 Claims**



1. In a military tank that includes a hull having a compartment in its aft end sized to house a propulsion power plant; a power plant located within the compartment; said power plant comprising an internal combustion engine occupying the forward portion of the compartment, and a transmission occupying the rearward portion of the compartment; said engine being an air-cooled engine wherein fan means moves compartment air across the engine cylinders and through exhaust openings in a hull wall; said transmission having gear means therein normally operable to drive the fan means when the engine is running; and fire suppression means within the hull, said fire suppression means comprising fire detection means within the compartment, liquid fire suppressant spray means within the compartment, and liquid fire suppressant supply means within the hull forwardly from the power plant compartment, said supply means being electrically connected with the detection means whereby fire suppressant is delivered to the spray means when the detection means senses a fire condition in the compartment:

the improvement comprising an add-on means for running the fan means without running the engine, whereby the fire suppression means can be tested with coolant air flowing through the compartment even though the engine is inoperable; said add-on means comprising a first horizontal shaft extending through the rear wall of the hull into the power plant compartment, an external power source, a second shaft interconnecting the power source and first shaft, a first universal joint between the two shafts, and a second universal joint between the power source and the second shaft.

4,693,321

METHOD USING ENCAPSULATED FLOW IMPROVERS TO REDUCE TURBULENCE

D. Jack Royer, Ponca City, Okla., assignor to Conoco Inc., Wilmington, Del.

Filed Nov. 18, 1985, Ser. No. 799,070
Int. Cl.[4] F17D *1/16*
U.S. Cl. 137—13 **9 Claims**

1. A method for using non-crystalline hydrocarbon soluble polymeric flow improvers capable of reducing turbulence in hydrocarbons flowing through conduits, comprising

(a) encapsulating said flow improver to form free-flowing particles, consisting essentially of normally noncrystalline, hydrocarbon soluble polymers having a molecular weight above 1×10^6

(b) placing said encapsulated flow improver in contact with the hydrocarbon, then

(c) placing the flow improver into intimate

contact with said hydrocarbon by mechanical fracturing, melting, leaching or dissolution of the encapsulating material.

4,693,322

PNEUMATIC HAMMER

Roger H. Gartside, Glenshaw, Pa., assignor to The Pannier Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1985, Ser. No. 786,030
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—116 **7 Claims**



1. Apparatus for stamping a workpiece comprising:

a pneumatic cylinder defining a cylindrical chamber having a leading end closest to said workpiece and a trailing end;

a cylindrical piston rod having a leading end and a trailing end disposed coaxially within said cylindrical chamber and having a piston secured to the trailing end thereof, said piston rod being displacable between a retracted position in which the trailing end of said piston rod is adjacent said trailing end of said cylindrical chamber and an extending position in which the trailing end of said piston rod is remote from said trailing end of said cylindrical chamber, the inner surface of said piston rod defining a cylindrical barrel;

means for applying fluid under pressure to said chamber either to the area between said trailing end of said chamber and said trailing end of said piston rod or to the area between the leading end of said chamber and the leading end of said piston rod and for releasing the fluid pressure in such areas;

an impact piston slidably disposed within and of similar cross-sectional shape to said barrel, said impact piston having a leading end and a trailing end;

means for applying fluid under pressure either to the area between the trailing end of said barrel and the trailing end of said impact piston or to the area between the leading end of said barrel and the leading end of said impact piston and for releasing the fluid pressure in such areas so as to, respectively, either propel said impact piston between a position at the trailing end of said barrel and a position at the leading end of said barrel or to move said impact piston between said position at the leading end of said barrel to said position at said trailing end of said barrel;

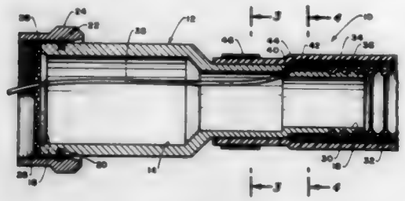
a stamp means movably supported by the leading end of said piston rod and having a stamping face and also having a portion disposed within said barrel whereby when said piston rod is in its extended position said stamping face is disposed adjacent to said workpiece and such that when said impact piston is propelled to the position at the leading end of the barrel it is caused to contact said portion of said stamp means, said contact being effective to cause said stamping face to indentingly contact said workpiece.

4,693,323

FLEXIBLE ELECTROMAGNETIC PULSE SHIELDING CONDUIT

Max T. Owensby, 8116 Deering Ave., Canoga Park, Calif. 91304

Filed Feb. 18, 1986, Ser. No. 830,201
Int. Cl.[4] H05K *9/00*; H02G *3/04*; F16L *33/20*
U.S. Cl. 174—35 C **3 Claims**



3. A flexible electromagnetic pulse shielding conduit for electrical conductors comprising:

a backshell having an internal open-ended chamber, said backshell having an inner end and an outer end, said outer end being adapted to connect with a separate electrical apparatus, said inner end having an exterior screw-threaded portion;

a thin-walled conduit, said conduit being flexible, said conduit including a series of convolutions, said convolutions of an end of said conduit screw threadingly connecting with said screw-threaded portion of said inner end;

an electrically conductive metallic tube assembly concentrically disposed about said conduit, one end of said tube assembly being in direct contact with said backshell;

a first metallic band located about said one end, said first metallic band being shrunk about said one end and thereby tightly binding said one end to said backshell forming a secure connection therebetween;

a rubber sleeve disposed about said electrically conductive metallic tube assembly, a second metallic band located about said rubber sleeve, said second metallic band being shrunk about said rubber sleeve and thereby tightly binding said rubber sleeve to said backshell forming a secure, moisture proof seal therebetween; and

said second metallic band being longitudinally spaced from said first metallic band, said second metallic band being located nearer said outer end than said first metallic band, whereby said rubber sleeve completely encloses said tube assembly and said first metallic band.

4,693,324

CURRENT-CARRYING FLEXIBLE HOSE

Alcide W. Choinière, and George T. Dunn, Jr., both of Abbeville, S.C., assignors to Automation Industries, Inc., Darien, Conn.

Filed Aug. 1, 1986, Ser. No. 891,900
Int. Cl.[4] A47L *9/24*; F16L *11/11*
U.S. Cl. 174—47 **11 Claims**

1. A current-carrying flexible hose comprising:

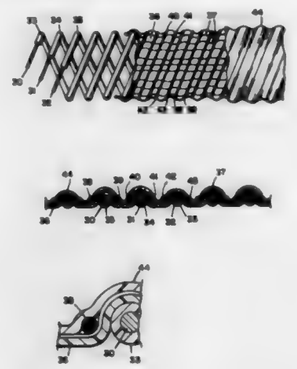
(a) first and second parallel helical support members disposed in double lead fashion with successive convolutions alternating;

(b) an inner plastic strip wrapped helically about said support members with forward and rearward edge portions of said inner plastic strip overlapping convolutions of the second of said support members;

(c) an outer plastic strip wrapped helically about said inner plastic strip with forward and rearward edge portions of said outer plastic strip overlapping convolutions of the first of said support members; and

(d) at least one pair of helical electrical conductors disposed on opposite sides of one of said support members and slidably positioned between said inner and outer plastic strips, each of said helical electrical conductors comprising:

(i) a conductive elements; and



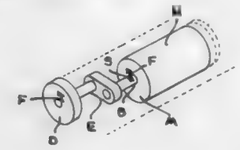
(ii) a dielectric plastic coating disposed around said conductive element.

4,693,325

SONIC DRILL EMPLOYING ORBITING CRANK MECHANISM

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 90503

Continuation-in-part of Ser. No. 725,648, Apr. 22, 1985, Pat. No. 4,615,400. This application Apr. 7, 1986, Ser. No. 848,945
Int. Cl.[4] E21B *7/24*
U.S. Cl. 175—55 **7 Claims**



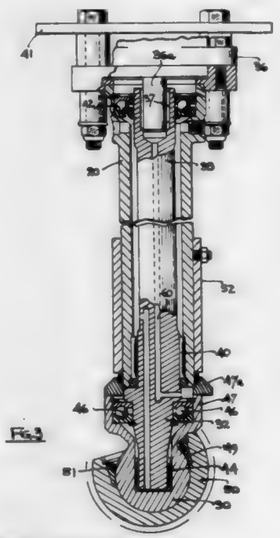


Fig. 2

1. A sonic drilling device comprising:

a housing having inertia;

a drive shaft mounted for rotation in said housing and having

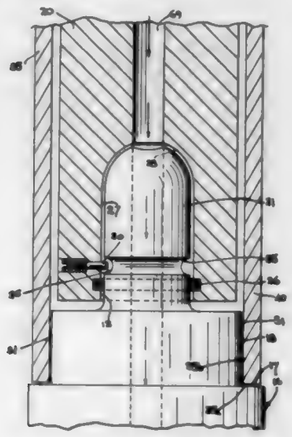
an eccentric portion on one end thereof forming an effective crank arm;
a drill bit supported for universal motion on the end of said crank arm; and
means for rotatably driving said drive shaft at a speed such as to generate sonic vibrational energy in said shaft;
said energy being transferred through said crank arm to said bit and causing said bit to orbit relative to said housing inertia at said sonic frequency thereby effecting drilling action limited in accordance with the throw of the crank arm.

4,693,326

CYCLOIDAL EARTH CUTTING SYSTEM WITH ROCKER-TYPE NUTATING ACTION

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 505,954, Jun. 20, 1983, which is a continuation-in-part of Ser. No. 262,650, May 11, 1981, Pat. No. 4,403,665. This application May 20, 1985, Ser. No. 736,079
Int. Cl.[4] F21B *7/24*
U.S. Cl. 175—55 **12 Claims**



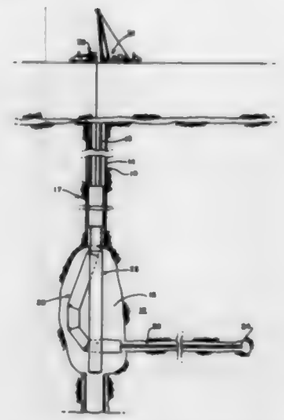
1. In a sonic drilling system for drilling a bore hole including an oscillator for generating sonic energy in a cycloidal mode of vibration said oscillator having a housing which is driven by said sonic energy, and a bit assembly coupled thereto, the improvement being rocker type coupling means for guiding the housing and the bit assembly to form a pivotal fulcrum which permits limited motion of the bit assembly both vertically and laterally in a nutating pattern, comprising:
a horizontal shoulder formed on the top portion of the bit assembly;
a vertical shoulder formed on the top portion of the bit assembly;
vertical motion limiting means positioned directly opposite the horizontal shoulder for permitting limited freedom of vertical motion of the bit assembly relative to the housing; and
lateral motion limiting means positioned directly opposite the vertical shoulder for permitting limited freedom of lateral motion of the bit assembly relative to the housing;
said rocker type coupling means forming the fulcrum of a lever arm for the bit assembly so as to enable the bit assembly to nutate in a rocking fashion against the bore hole in response to the sonic driving.

4,693,327

MECHANICALLY ACTUATED WHIPSTOCK ASSEMBLY

Robert W. Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901; Charles S. Mackey, Kern County, and Irving L. Odgers, Placer County, both of Calif., assignors to Ben Wade Oaks Dickinson and Robert W. Dickinson, both of San Francisco, Calif.

Filed Dec. 23, 1985, Ser. No. 811,571
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—61 **14 Claims**



1. Earth well drilling apparatus comprising structure including whipstock means adapted to be positioned within an earth well adjacent to a mineral bearing formation, said whipstock means comprising a plurality of connected guideway links laterally extendible from a retracted position substantially within the well to an extended position forming a curved tube bending guideway, piping within the well to which said whipstock means is attached, anchor means operatively connected to the rearward side of said whipstock means and having a retracted position for sliding through said earth well and an anchoring position for locking in a fixed position relative to said earth well, and erection means slidable within said earth well, said erection means being pivotally connected at one end to a forward one of said guideway assemblies and at the other end to extension means extending to the earth surface, said pivotal connection being of a type to cause said guideway links to swing into said curved guideway to extend a substantial distance outside of said well into said formation when said extension means is pulled from the earth surface with said whipstock means fixed at its rearward end.

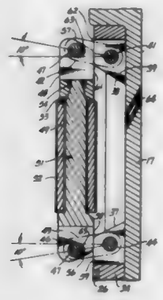
6. A method for placing a radial tube laterally into a mineral bearing formation for drilling from an earth well which extends downwardly from the surface of the formation to the region of radial tube placement, said method making use of a structure comprising whipstock means including a plurality of connected guide links laterally extendible from a retracted position substantially within the earth well to an extended position forming a curved tube bending guideway for a drilling tube to be extended radially into the formation, anchor means operatively connected to the rearward side of said whipstock means and having a retracted position sliding within said earth well and an anchoring position for locking in a fixed position relative to said earth well, and erection means slidable within said earth well, said erection means being pivotally connected to a forward one of said guide links and at the other end to extension means extending to the earth surface, said method comprising moving said whipstock means adjacent to the mineral bearing formation with said whipstock means and anchor means in a retracted position, moving said anchor means into said anchoring position, pulling from the earth surface on said extension means of said erection means to cause said forward one of said guide links to pivot away from said well to a sufficient extent to form said curved tube bending guideway, and moving a drilling tube through said guideway to cause it to bend and pass into said formation forming a radial tube.

4,693,328

EXPANDABLE WELL DRILLING TOOL

John H. Furse; Praful C. Desai, both of Kingwood, and Charles H. Dewey, Houston, all of Tex., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 9, 1986, Ser. No. 871,767
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—273 **33 Claims**



1. An expandable well drilling tool comprising:
an elongated generally cylindrical body;
means at an upper end of the body for connection to a drill string;
a well wall engaging element mounted on the body for movement between a radially retracted position at least in part within the body and a radially extended position at least in part outside the body;
first camming means fixed on the body for camming the wall engaging element from the retracted position toward the extended position;
second camming means for camming the wall engaging element from the retracted position toward the extended position, the wall engaging element being between the first and second camming means in the retracted position; and
means for shifting the second camming means axially along the body toward the first camming means for squeezing the wall engaging element toward the extended position.

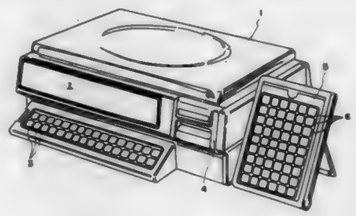
4,693,329

ELECTONIC SCALE WITH LABEL CHARACTER SIZE CHANGE CAPABILITY

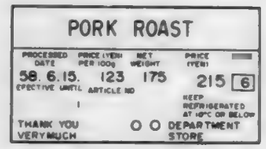
Michiyasu Hikita, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 29, 1984, Ser. No. 676,243
Claims priority, application Japan, Nov. 29, 1983, 58-225174
Int. Cl.[4] G01G *23/38, 23/22*; G01D *9/00*
U.S. Cl. 177—4 **6 Claims**

1. An electronic scale, comprising:
a weighing unit for weighing an article and generating a weight signal corresponding to the weight of the article;
a key input unit for generating a character code signal corresponding to the article, including an article name signal represented by one character corresponding to the article, for generating a recall signal corresponding to each character code signal, and for respectively selecting and specifying the size of characters to be printed in accordance with the name, weight and price of the article, the size capable of being different for each of the name, weight and price;
an arithmetic control unit, operatively connected to said weighing unit and said key input unit, for computing the price of the article based on the weight signal and the character code signal, and for generating a price signal corresponding to the computed price;
a memory for storing characters corresponding to keys included in said key input unit;
storage means for storing the specified size of the characters;
conversion means for converting characters stored in said memory to character codes of the specified character size;



EXAMPLE OF PRINTED LABEL



a storage unit, operatively connected to the arithmetic control unit, for storing article data in accordance with the character code signal;
a display unit, operatively connected to the arithmetic control unit, for displaying characters corresponding to the weight and price of the weighed article in accordance with the weight and price signals using the character codes; and
a printer, operatively connected to the arithmetic control unit, for printing characters of the specified size corresponding to the weight, price and name of the weighed article in accordance with the weight, price and article name signals using the character codes.

4,693,330

LOAD CELL SCALES

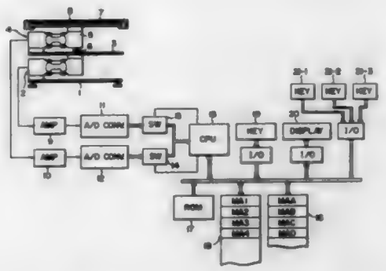
Mitsuo Uchimura, and Tsutomu Masuyama, both of Numazu, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,951
Claims priority, application Japan, May 15, 1985, 60-103530
Int. Cl.[4] G01G *19/40, 19/52, 23/14*
U.S. Cl. 177—25 **9 Claims**

1. A load cell scale comprising:
weight data generating means for generating weight data corresponding to load weight;
said weight data generating means including heavy- and light-range load cells provided one on the other, said load cells producing output signals according to load weight applied thereto, and weight data generating circuit means for converting the output signals from said load cells into weight data;
memory means having first and second memory areas, said memory means including a nonvolatile memory;

first and second keys; and

data processing means including means for storing in response to an operation of said first key the weight data from said weight data generating means, as zero-point data, into the first memory area of said memory means, means for storing in response to an operation of said second key a difference between the zero-point and the weight data from said weight data generating means into the second memory area of said memory means as span data, and means for producing the weight data resulting from multiplication of the weight data from said weight data generating means by a value as obtained by dividing a preset value by the span data.

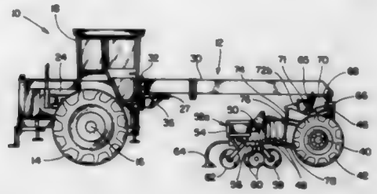


4,693,331

TRACTOR BOOM

James A. Johnson, Cologne; Richard Schulz, Lake Crystal, both of Minn., and Vincent J. Tomlonovic, Colfax, Iowa, assignors to Hiniker Company, Mankato, Minn.

Filed Apr. 23, 1986, Ser. No. 855,146
Int. Cl.[4] B62D *13/00*
U.S. Cl. 180—135 10 Claims



1. An agricultural tractor comprising:

an aft drive frame having an engine and a plurality of aft drive wheels mounted thereto;

a forward frame having a plurality of forward drive/steering wheels mounted thereto;

an elongated boom having an aft end portion pivotally coupled to said aft drive frame and a forward end portion fixedly coupled to said forward frame;

hitch means coupled to an aft portion of said forward frame and adapted to engage and carry a toolbar having a plurality of soil engaging implements positioned in spaced relation along the length thereof;

first control means coupled between said forward frame and said hitch means for raising and lowering said toolbar and the implements mounted thereto between a nonuse and a use position, said first first control means including a hydraulic power system and a plurality of hydraulic cylinders under the control of said hydraulic power system;

a depth control cylinder coupled between said hitch means and said forward frame and further coupled to and actuated by said hydraulic power system for raising and lowering said toolbar and implements positioned thereon in controlling the operating depth of said implements in the soil; and

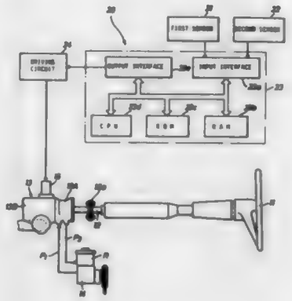
first and second hydraulic motors coupled to said hydraulic power system and to a respective forward drive/steering wheel for rotationally displacing said forward drive/steering wheels in imparting movement to the tractor.

4,693,332

ELECTRIC CONTROL APPARATUS FOR POWER STEERING SYSTEM

Hiroshi Miyata, and Shinji Katoh, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 20, 1985, Ser. No. 767,508
Claims priority, application Japan, Aug. 20, 1984, 59-173546
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—142 7 Claims



1. An electric control apparatus for a power-assisted steering system in a wheeled vehicle including a steering shaft arranged to be rotated by a driver's steering effort applied thereto; a hydraulic power cylinder having a power piston mounted for reciprocating movement in said cylinder and operatively connected to driven members of the steering system; a servo valve interconnecting a hydraulic pressure source and said cylinder and being responsive to rotary motion of said steering shaft for selectively directing the flow of fluid under pressure from said pressure source to one of opposite fluid chambers of said cylinder and permitting the flow of fluid from the other fluid chamber to a fluid reservoir to effect reciprocating movement of said power piston; and an electrically operated bypass valve disposed within a bypass passage for permitting bypass flow of fluid passing therethrough between said pressure source and said reservoir in its energized condition;

the electric control apparatus comprising:

first detecting means for detecting a travel speed of the vehicle to produce a first electric signal indicative thereof;

second detecting means for detecting a rotation speed of a prime mover of the vehicle to produce a second electric signal indicative thereof;

means responsive to said first and second electric signals for determining an optimum steering effort amount based on predetermined respective functions of both of the vehicle speed and the rotation speed of the prime mover, and for producing an electric control signal indicative of such optimum steering effort; and

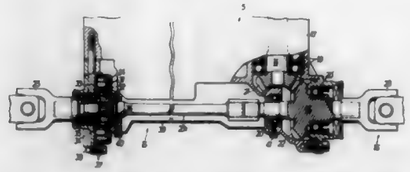
means for applying said electric control signal to said bypass valve to control the opening degree thereof in accordance with the value of said electric control signal.

4,693,333

POWER TRANSMISSION APPARATUS FOR VEHICLES

Yosio Oka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,645
Claims priority, application Japan, Mar. 22, 1985, 60-58058
Int. Cl.[4] F16D *41/02;* B62J *15/00*
U.S. Cl. 180—233 5 Claims



1. A power transmission apparatus for a vehicle comprising:

an output shaft for transmitting power from a power unit to the front and rear wheels of said vehicle;

a front wheel driving device for driving the vehicle front wheel;

a rear wheel driving device for driving the vehicle rear wheel;

a driving shaft operatively driven by said output shaft interposed between said front wheel driving device and said rear wheel driving device and having one end connected to said front wheel driving device and the other end connected to said rear wheel driving device; and

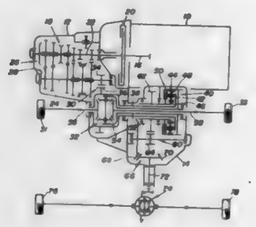
said front wheel driving device including a unidirectional clutch for transmitting a driving force during forward movement of the vehicle only in one direction from said power unit to the vehicle front wheel.

4,693,334

FOUR WHEEL DRIVE SYSTEM

Kazuyoshi Hiraiwa, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1986, Ser. No. 848,490
Claims priority, application Japan, Apr. 9, 1985, 60-73517
Int. Cl.[4] B60K *17/34*
U.S. Cl. 180—249 6 Claims



1. A full-time four wheel drive system comprising:

a transverse engine having a crankshaft;

a transaxle case having a side where it is attached to said engine;

a transfer case attached to said transaxle casing on said side thereof;

a speed change mechanism disposed within said transaxle case and having an input shaft in axial alignment with said crankshaft and an output shaft in parallel with said input shaft;

a final reduction gearing disposed within said transaxle case and having an input portion drivingly connected to said output shaft of said speed change mechanism and an output portion;

a planetary gear type center differential disposed within said transfer case and having an internal gear, a sun gear, a plurality of pinion gears meshing with said internal gear and said sun gear and a pinion carrier rotatably carrying thereon said pinion gears;

a viscous clutch interposed between said internal gear and said sun gear for controlling operation of said center differential;

a first hollow shaft interconnecting said output portion of said final reduction gearing and said pinion carrier of said center differential;

a terminal differential for a pair of left and right road wheels;

a second hollow shaft passing through said first hollow shaft to interconnect one of said internal gear and said sun gear and said terminal differential;

a speed-up mechanism disposed within said transfer case and having an input portion connected to the other of said internal gear and said sun gear and an output portion;

a propeller shaft elongated in the direction intersecting said crankshaft at right angles; and

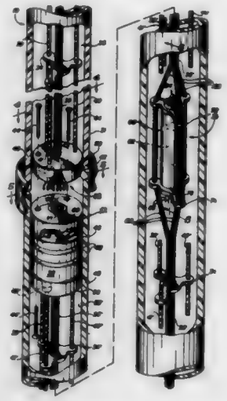
a direction changing mechanism disposed within said transfer case and interconnecting said output portion of said speed-up mechanism and an end of said propeller shaft.

4,693,335

MULTI CHANNEL BOREHOLE SEISMIC SURVEYING TOOL

Harold A. Almon, P.O. Box 3816, Midland, Tex. 79702

Filed Nov. 22, 1985, Ser. No. 800,748
Int. Cl.[4] E21B *47/00;* G01V *1/40*
U.S. Cl. 181—102 8 Claims



1. Apparatus for seismic surveying a borehole drilling into the earth comprising an elongated resilient tubular housing of a size to be telescopingly received within the borehole, a plurality of sensors, a plurality of stress members, and a plurality of fluid block means;

said housing having a closure means at the upper end thereof by which a stress member is connected to a wireline, and by which signals received by the sensors are transmitted along the wireline to the surface of the ground;

said fluid block means are received within said housing in spaced relationship respective to one another, and in sealed relationship respective to the housing, and thereby form axially spaced sealed chambers between adjacent fluid block means; each of said fluid block means is a cylindrical member having an outer cylindrical surface thereof sealed respective to an inner cylindrical surface of the housing, means for arresting relative movement between said fluid block means and said housing;

said stress member is an elongated, flexible load carrying member which has opposed ends affixed to adjacent ones of said fluid block means; there being at least one stress

member located in each of said chambers and arranged parallel to the central axis of the housing;
said stress member having opposed terminal ends connected to adjacent ones of said fluid block means with the tension of one stress member being transferred through each of said fluid block means and into a next adjacent stress member;
support means by which at least one of said sensors is supportedly attached to the stress member and located within each of said chambers;
each sensor is provided with circuit means by which a seismic signal is transferred through the fluid block means and into the wireline;
and an incompressible fluid contained within each said chamber, whereby;
said apparatus can be attached to a wireline, lowered into a borehole, so that seismic energy resulting from the detonation of a nearby seismic charge can be received by each sensor and transmitted uphole for analysis.

4,693,336

UNDERWATER SEISMIC TESTING

Paul Newman, Westerham, United Kingdom, assignor to Horizon Exploration Limited, Swanley, United Kingdom

Continuation of Ser. No. 521,121, Aug. 6, 1983, abandoned. This application Aug. 13, 1986, Ser. No. 894,756

Claims priority, application United Kingdom, Aug. 18, 1982, 8223730

Int. Cl.[4] G01V *1/00, 1/38*

U.S. Cl. 181—111 **10 Claims**



1. A method of marine seismic investigation which comprises:
(1) positioning a reference source at a predetermined point proximate a multi-element seismic source array wherein said reference source is an acoustic pressure wave point source having a far-field seismic signature of broad bandwidth and a radiated pressure wave field having a strength less than that of said multi-element array;
(2) firing the multi-element source array and the point source at separate instances within a predetermined time range;
(3) simultaneously recording seismic signals reflected from sub-surface geological strata in response to firing of the multi-element source array and the point source array wherein the recording is carried out using two hydrophone arrays including a first hydrophone array contained in a conventional hydrophone streamer and a second hydrophone array contained in a streamer having a length less than said conventional streamer and positioned between the source array and the conventional hydrophone streamer; and wherein said second array is a high resolution multi-channel hydrophone array; and
(4) processing the recorded response so that (i) the response derived from the firing of the reference source is used to generate a high-resolution first seismic section and (ii) the response derived from the multi-element source array is used to generate a second seismic section.

4,693,337

COMPACT CATALYTIC CONVERTER

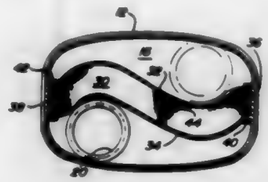
Dieter M. Timmermeister, Waterloo, Canada, assignor to Tri-D-Automotive Industries, Ltd., Waterloo, Canada

Continuation-in-part of Ser. No. 732,311, May 9, 1985, abandoned. This application Dec. 23, 1985, Ser. No. 812,549

Int. Cl.[4] F01N *3/02*

U.S. Cl. 181—231 **14 Claims**

1. A catalytic converter comprising a housing, a gas pervious catalyst support member extanding across the housing and dividing the housing into an upper chamber and a lower chamber, said catalyst support member comprising two parallel spaced apart upper and lower foraminous sheets which undulate across the width of the container and which each has a single peak and a single trough to form a catalyst containing chamber between the two sheets having a generally sinusoidal-type wave configuration when viewed in cross-section along a plane perpendicular to the length of the housing, a bed of



catalyst particles substantially filling the catalyst containing chamber, gas inlet means at one end of the housing positioned to cause gases to enter into one of the upper and lower chambers and pass through the catalyst support member and the catalyst containing chamber to the other of the upper and lower chambers, and gas outlet means at an opposite end of the housing and positioned to cause the gases to leave from the other chamber.

4,693,338

EXHAUST MUFFLER FOR A MOTOR VEHICLE OR THE LIKE

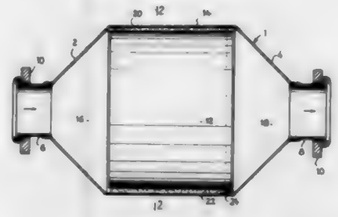
Michel Clerc, Valentigney, France, assignor to Cycles Peugeot, Valentigney, France

Filed Jul. 15, 1986, Ser. No. 885,636

Claims priority, application France, Jul. 16, 1985, 85 10900

Int. Cl.[1] F01N *1/24, 3/02*

U.S. Cl. 181—231 **11 Claims**



1. A catalytic exhaust muffler comprising at least one body of ceramic material, of the honeycomb type, a metal case coaxially enclosing the body and defining with the body an annular space around the body and inlet and outlet chambers at axially opposite ends of the body a blanket of fibres interposed between the body and the case in said annular space, the fibres of the blanket being very resistant to high temperatures, said blanket being substantially devoid of binder and devoid of water of constitution and being highly compressed between the body and the case, said case comprising two half shells which have an arcuate cross-sectional shape and means interconnecting said half-shells, each half-shell having axially opposite end portions extending toward the axis of the body inwardly beyond an outer periphery of the body, and a sealing element surrounding an end of the body of ceramic material which is the closest to the outlet chamber and is compressed between said case and said body.

4,693,339

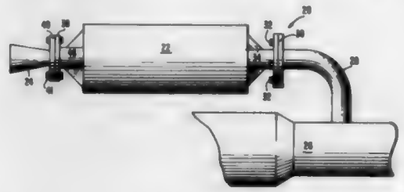
MUFFLER FOR GAS INDUCTING MACHINERY GENERATING LOW FREQUENCY NOISE

Michael C. Beale, Franklin, and David H. Kashy, Hampton, both of Va., assignors to Newport News Shipbuilding and Dry Dock Company, Newport News, Va.

Filed Oct. 16, 1986, Ser. No. 919,439

Int. Cl.[4] F01N *1/08*

U.S. Cl. 181—255 **35 Claims**



1. For gas inducting machinery having a determinable displacement of the largest equivalent cylinder and a gas inlet, a muffler comprising:
a buffer reservoir having an inlet and an outlet,
said outlet being communicable with the gas inlet,
said buffer reservoir having a volume of between twenty and thirty times the displacement of the largest equivalent cylinder of the gas inducting machinery,
a convergent/divergent nozzle connected to said reservoir inlet,
said nozzle including a throat through which the gas passes into said buffer reservoir, and
said throat being dimensioned relative to said machinery to obtain a gas flow speed in said throat of at least Mach 0.7.

4,693,340

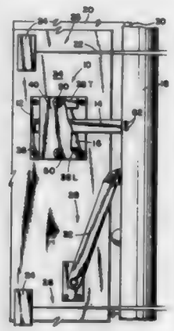
BUMPER GUIDE ASSEMBLY FOR ELEVATOR DOORS

Ernest R. Shanks, 6990 S. Steele St., Littleton, Colo. 80122, and Gerald L. Carnes, 6752 E. Exposition Ave., Denver, Colo. 80224

Filed Sep. 30, 1985, Ser. No. 781,695

Int. Cl.[4] B66B *13/08, 13/26*

U.S. Cl. 187—52 R **2 Claims**



1. For use in an elevator cab door of the type mounting both an electric-eye-triggered optical system and a bumper-triggered mechanical system positioned alongside one another, said systems each being independently operative to actuate a mechanism to open the door when the latter is obstructed, and wherein the bumper of the mechanical system whose function it is to actuate the door-opening mechanism as it moves from its retracted operative position into its extended inoperative position may upon becoming misaligned interrupt the light beam generated by the optical system thus causing the door-opening mechanism to actuate and keep the door open even through unobstructed, the guidance assembly for keeping the bumper aligned and out of the way of the light beam which comprises: a rigid arm attachable to the bumper of the mechanical system for reciprocating movement therewith between its extended and retracted positions and a slotted housing attachable to the cab door for movement therewith, said housing including front and rear guide members with upper and lower spacers positioned therebetween all cooperating to define a side-opening guide slot positioned and adapted to slidably receive the arm and maintain same together with the bumper attached thereto aligned out of the path of the light beam during the excursion thereof between its retracted and extended positions; and, spring means yieldably biasing the front guide member into spaced substantially parallel relation to the rear guide member.

4,693,341

DISC BRAKE FOR AUTOMOTIVE VEHICLES

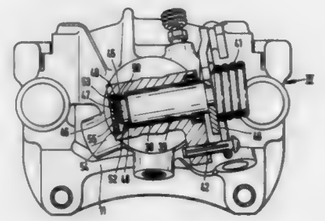
Peter Drott, Frankfurt am Main, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 786,266

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438209

Int. Cl.[4] F16D *65/30*

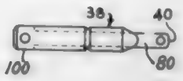
U.S. Cl. 188—72.7 **2 Claims**



1. A disc brake for use in an automotive vehicle comprising, a brake carrier affixed to the vehicle, a brake housing straddling an edge of a rotatable brake disc, said brake housing being arranged axially slidably relative to the brake carrier, two brake linings positioned on opposite sides of said brake disc and straddled by the brake housing, a mechanical actuating device provided in the brake housing including an actuating shaft having a principal longitudinal axis rotatably supported in a bore having a longitudinal axis in the brake housing, said actuating shaft acting on at least one of the brake shoes and being provided with retaining means to limit axial movement of the actuating shaft in said bore said retaining means including,
a section of a circular ring-shaped member on said housing protruding into said bore and having a longitudinal axis offset from the longitudinal axis of said bore defining a crescent shaped projection along a circumferential portion of the bore said projection including a pair of parallel crescent-shaped radial surfaces,
a first cylindrical section proximate an interior end of said shaft concentric with the shaft principal longitudinal axis and having a diameter reduced from the diameter of said shaft, and
a second cylindrical section at the interior end of said shaft, said second cylindrical section being eccentrically arranged with respect to the first cylindrical section an amount defining a crescent shaped groove along a length of a circumferential portion of said shaft corresponding to at least a predetermined minimum angle of rotation of the shaft including a pair of parallel, crescent shaped radial boundaries, said projection receivable within said groove, whereby said shaft is axially retained in said bore and is

freely reversibly rotatable through an angle defined by the length of the circumferential portions of said bore and said shaft over which said respective crescent shaped projection and groove extend.

4,693,342
ROD ACTUATOR FOR AUTOMATIC SLACK ADJUSTING MECHANISMS
Daniel Lavely, Mt. Clemens, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed May 16, 1985, Ser. No. 734,530
Int. Cl.⁴ F16D *65/46*
U.S. Cl. 188—79.5 K **8 Claims**



1. A rod actuator for connecting between a clevis mounted on the end of an actuating rod connected to an actuating lever and a slotted piston in a threaded plunger that adjusts slack in an automatic slack adjusting mechanism having a lever, an actuating rod connected to the lever to move the lever, a clevis attached to the actuating rod, a shaft connected to the lever, a threaded plunger connected to the shaft, a piston mounted for limited movement in the plunger, and an adjusting worm connected to the plunger and an adjusting gear connected to the worm and to the lever, a flexible boot seal provided with an enlarged lip, which actuator comprises an elongate rod member having a first hole therethrough at a first end thereof for attaching to the clevis, and a second hole therethrough at a second end thereof, for attaching to the piston, an elongate jacket member having a longitudinally extending cavity therethrough for receiving the rod member therein and registration of the first end of the rod member, the jacket member including an opening therethrough and positioned such that when the first end of the rod member is registered within the cavity, the first hole is aligned with the opening and a pin passing through the clevis, the first hole and the opening for attaching the rod actuator to the clevis and holding the rod member and the jacket member assembled together.

4,693,343
MULTI-LOBED RECTANGULAR SEALING RING
Richard M. Boyd, St. Louis Park, Minn., assignor to Quadion Corporation, Minneapolis, Minn.
Filed Jun. 12, 1985, Ser. No. 744,055
Int. Cl.⁴ F16J *15/22*
U.S. Cl. 188—322.17 **21 Claims**



1. A sealing device comprising a continuously formed ring made of a resilient flowable material throughout and adapted to fit within a device having a sealing surface of ringlike configuration,

(a) said ring in its free form being uniform and generally rectangular in cross-sectional configuration and including a set of two opposed generally radially extending surfaces and a set of two opposed generally axially extending surfaces connected between adjacent portions of said radially extending surfaces;

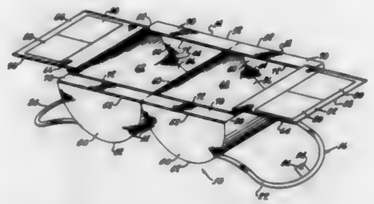
(b) a corner lobe being formed at each of the four corners defined between said radially and axially extending surfaces;

(c) the exterior surface of each of said corner lobes in their free form being smoothly contoured and arcuately curved in shape;

(d) one surface of one of said set of axially extending surfaces being a dynamic sealing surface and having at least a pair of spaced annular sealing lobes, each with a smoothly contoured convexly-shaped exterior disposed intermediate said corner lobes adjacent that surface and in its free form extending a short distance outwardly beyond said corner lobes adjacent said one surface;

(e) the other surface of said set of axially extending surfaces being a passive sealing surface and having an outwardly extending annular sealing lobe with a smoothly contoured convexlyshaped exterior disposed intermediate said corner lobes adjacent said other surface and in its free form extending outwardly beyond said corner lobes adjacent said other surface.

4,693,344
COLLAPSIBLE CARRY BAG WITH FOUR DISCRETE RIGID END PIECES
Steven L. Shuler, 33772B Violet Lantern, Dana Point, Calif. 92629
Filed Feb. 22, 1985, Ser. No. 704,493
Int. Cl.⁴ A45C *7/00*
U.S. Cl. 190—107 **7 Claims**



1. A carry bag comprising:

a flexible outer shell foldable along a centerline thereof and having two longitudinal edges and two transverse edges, said two transverse edges being parallel to one another and to said centerline;

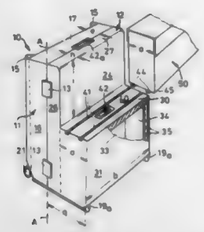
four rigid semicircular end pieces, one attached along each of the flexible outer shell longitudinal edges, each of said end pieces being attached along a first portion of a circumference thereof from the flexible outer shell centerline to one of the flexible outer shell transverse edges enabling the flexible outer shell to be folded along the flexible outer shell centerline to close the flexible outer shell with the flexible outer shell transverse edges meeting one another upon such closure and a second portion of each end piece circumference meeting a corresponding second portion of another end piece upon closure of the flexible outer shell, each rigid semicircular end piece being foldably attached, along the second circumferential portion thereon, to the flexible outer shell for enabling two end pieces on each end of the carry bag to fold against one another with the flexible outer shell therebetween, said rigid end pieces being attached along the second circumferential portion to enable alignment of a pair of said rigid semi-circular end pieces with one another when folded with the flexible outer shell therebetween;

a pair of flexible flaps, one each being attached to each of said flexible outer shell transverse edges and having sufficient length to extend between said flexible outer shell transverse edge and centerline, each said flexible flap being movable about the attached flexible outer shell transverse edge from a position extending between said flexible outer shell transverse edge and centerline to a position extending outwardly from said flexible outer shell transverse edges;

a plurality of flexible strips, one being attached to each of the second circumferential portion of the end pieces and to each transverse edge, each of said flexible strips engaging said centerline when said carry bag is in an open or unfolded configuration; and,

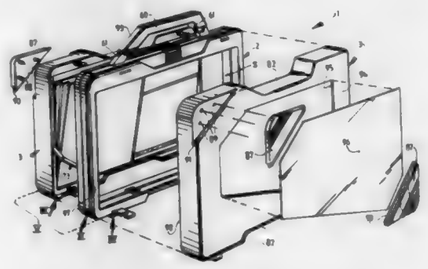
zipper means for releasably attaching said flexible strips to said flexible flaps when the flexible flaps are moved to a position extending between flexible outer shell transverse edge and centerline.

4,693,345
RECTANGULAR PARALLELPIPED ARRANGEMENT OF TWO CASES FOR AIR TRAVEL
Gerhard Mittelmann, Oehningen, Fed. Rep. of Germany, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Jul. 21, 1986, Ser. No. 887,268
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526577
Int. Cl.⁴ B65D *21/02;* **A45G** *5/12, 5/14*
U.S. Cl. 190—108 **11 Claims**



1. A multi-compartment travel case comprising a first clothes hanging compartment defined by first and second case shells hinged together along a hinge axis A, said first and second case shells each having a front wall, a pair of substantially parallel side walls and substantially parallel top and bottom strips; a second storage compartment defined by a top wall section, sidewalls and a bottom wall section projecting out from said front wall of said first case shell in a stepped like manner so as to form a substantially L-shaped configuration, said top wall section being provided with means for securing a storage case thereto; and a third storage compartment having a bottom wall provided with attachment means for attaching said third storage compartment to said securing means on said top wall section of said second storage compartment so as to form a rectangular parallelpiped.

4,693,346
CASE WITH HOLLOW FRAME
Aarnoud W. Eversdijk, 4 Wijkselaan, 2554 GE The Hague, Netherlands
PCT No. PCT/NL84/00040, § 371 Date Jul. 17, 1985, § 102(e) Date Jul. 17, 1985
PCT Filed Nov. 29, 1984, Ser. No. 758,226
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1983, 3343068
Int. Cl.⁴ A45C *5/04, 13/10*
U.S. Cl. 190—111 **13 Claims**



11. A carrying case which comprises the combination of a central section and a pair of side sections separate from and disposed on either side of the central section, said central section comprising a pair of complementary members of molded material, each of generally U-shaped cross section and joined to each other in opposed relation such that their U-shaped cross sections cooperate to define a substantially hollow, box-like rigid main frame of generally rectangular cross-section and of open, generally rectangular plan view extending circumferentially of and thereby circumscribing an open carrying space bounded on opposite sides thereof by said side sections, said side sections being of molded material and of dished form to define respective carrying spaces each open only at that side thereof facing the open carrying space defined by the central section and overlapping peripheral wall portions of the central section, and means carried by said central section and projecting downwardly thereof for defining a pivot axis and including connecting means pivotally mounted on the pivot axis and projecting from said pivot axis for pivotally connecting said side sections to said main frame for movements between closed positions which close the opposite sides of said carrying space to access and open positions exposing respective sides of said carrying space to access.

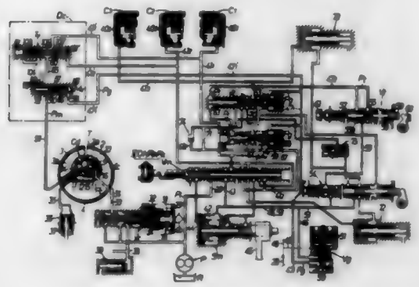
4,693,347
LOCK-UP CONTROL DEVICE FOR TORQUE CONVERTER IN AUTOMATIC TRANSMISSION FOR VEHICLE
Masao Nishikawa, Tokyo; Yoshimi Sakurai, Tanashi; Takashi Aoki, Fujimi, and Yoichi Sato, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 551,739, Nov. 14, 1983, Pat. No. 4,589,537. This application Mar. 13, 1986, Ser. No. 839,259
Claims priority, application Japan, Nov. 12, 1982, 57-198504; Dec. 10, 1982, 57-216355
Int. Cl.⁴ B60K *41/22;* **F16H** *45/02*
U.S. Cl. 192—3.3 **4 Claims**

1. In the automatic transmission for a vehicle, comprising a fluid type torque converter having an input member and an output member; a hydraulic direct coupling clutch provided between the input and output members and capable of being actuated to mechanically couple both members together; and auxiliary transmission connected to the torque converter and having plural stages of gear trains, the auxiliary transmission being capable of being changed in speed to a plurality of speed ratios by selection of the gear trains; and a control mechanism

for automatically effecting the selection of gear trains of the auxiliary transmission in accordance with the running condition of the vehicle,

a lock-up control device for the direct coupling clutch comprising:

a valve for controlling the supply of actuating oil pressure from a common oil pressure source to the direct coupling clutch, said valve having a body movable between opposite end position and adapted to take a first switch position at one of said end positions when applied with a single signal pressure and a second switch position at the other of said end positions, after release of the signal pressure, due to resilient force of a spring means, said signal pressure being of such a characteristic that it becomes high when



an intermediate gear train is selected to assume a specific gear ratio and it becomes low when higher and lower gear trains adjacent said intermediate gear train are selected to assume corresponding gear ratios adjacent said specific gear ratio, and wherein said valve allows flow of the actuating oil pressure to the direct coupling clutch when the valve body is at both the first and second switch positions and interrupts the flow during shifting movement of the valve body from the first to second positions or vice versa in response to gear shifting operation from said specific gear ratio to its adjacent gear ratios or vice versa, thus causing the direct coupling clutch to be instantaneously disconnected during gear shifting operation over adjacent three gear ratios with use of the single signal pressure.

4,693,348

DIRECT COUPLING CLUTCH WITH AN INTEGRAL DAMPER DEVICE FOR A FLUID COUPLING

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Koji Maeda, both of Anjo; Kazuaki Watanabe, Toyota, and Yutaka Taga, Aichi, all of Japan, assignors to Aisin Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Apr. 28, 1986, Ser. No. 856,765

Claims priority, application Japan, Apr. 30, 1985, 60-93453; Apr. 30, 1985, 60-93455

Int. Cl.⁴ F16D *3/66*

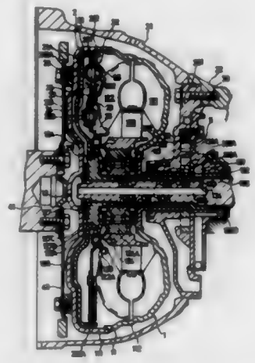
U.S. Cl. 192—3.29 **2 Claims**

1. A direct coupling clutch having an unitary assembled damper device for a fluid coupling comprising:

fluid coupling including at least an input shaft, an output shaft, a fluid casing concentrically secured with said input shaft, a pump impeller mounted on said fluid casing and a turbine runner connected to said input sahft through a turbine hub,

direct coupling clutch including a piston member axially slidably mounted on one of said output shaft and turbine hub and adapted to engage with and disengage from a portion of said fluid casing and a fluid line including at least a fluid passage being capable for selectively connecting a passage existing between said portion of said fluid casing and said piston member to a pressurized fluid source and a drain port; and

a unitary assembled damper device disposed between said turbine hub and piston member and being capable of connecting said hub and piston member, said unitary assembled damper device including a driven plate consisting of two annular guide plates positioned concentrically with each other and forming a double rows of toroidal spaces arranged along two concentric circles in equally spaced apart layout in circumferential directions therebetween, a plurality of resilient members inserted in each of



said toroidal spaces and located between radially extending side edges thereof, an annular drive plate having a number of radially extending edges formed therein and interposed concentrically with and between said guide plates and being slidable with respect to said guide plates in circumferential direction adapted to compress all of said resilient members between said side edges of the spaces formed in said guide plates and edges formed in said drive plate by relative rotation with respect to said driven plate and fastening means located between said two concentric circles to secure said guide plates with each other for unitary assembling said damper device.

4,693,349

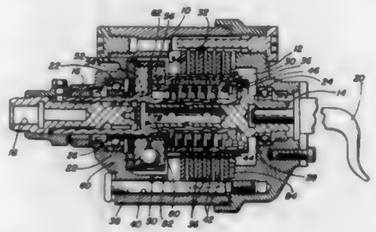
TORQUE LIMITING APPARATUS

John Tyszer, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 25, 1986, Ser. No. 889,369

Int. Cl.⁴ F16D *67/02*; **B60T** *7/12*

U.S. Cl. 192—7 **3 Claims**



1. An apparatus for limiting the amount of torque from a drive source supplied to a torque responsive element, comprising:

a disc-shaped rotatable input cam plate having ramp means;

a disc-shaped rotatable output cam plate having ramp means;

means for biasing the cam plates toward each other;

a plurality of angularly spaced balls for engaging the ramp means of the input and output cam plates; and a disc-shaped retainer plate between the cam plates with angularly spaced holes for freely receiving and radially retaining the balls in engagement with the ramp means, the retainer plate including generally cylindrically shaped, axially projecting wall means for surrounding and axially piloting the cam plates.

4,693,350

CLUTCH-BRAKE UNIT

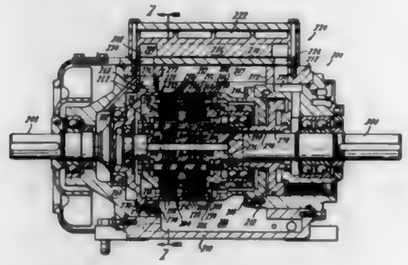
Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Continuation-in-part of Ser. No. 9,606, Feb. 5, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 180,987

The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.

Int. Cl.⁴ F16D *13/72*, *67/04*

U.S. Cl. 192—18 A **1 Claim**



1. A clutch-brake unit comprising:

an external housing, defining a central cavity between opposite longitudinally spaced end walls, having an oil reservoir in a lower portion thereof;

an input shaft extending into said cavity and rotatably journaled in one of said end walls, and having an enlarged diameter, annular extended portion provided thereon, said extended portion having,

a series of circumferentially spaced axially extending splines directed radially inwardly along the internal surface thereof, and

a plurality of integral radially outwardly directed vanes comprising gear teeth spaced circumferentially along a portion of the outer surface thereof;

oil passage means;

a pumping chamber enclosing the portion of said extended portion of said input shaft having said vanes, said pump chamber being separate from said central cavity, having an inlet port communicating with said reservoir, and having an outlet port communicating with said oil passage means;

a series of clutch plates having teeth at the outer periphery thereof wherein said plates are mounted at said teeth to the splines of said input shaft extended portion and said extended portion forms a clutch working chamber around said clutch plates;

an output shaft coaxial with said input shaft, extending into said cavity and rotatably journaled in the other of said end walls, said output shaft having an end portion interfitted within a portion of said input shaft, having a series of circumferentially spaced axially extending splines directed radially outwardly along the outer surface thereof, an axially extending oil passage opening out of said end portion, and radial passages extending outwardly from said axial passage;

a stationary annular inner housing fixedly mounted to said external housing;

a series of brake plates nonrotatably mounted within said stationary annular inner housing, said inner housing forming a brake working chamber around said brake plates;

first and second series of friction discs, having teeth along the inner periphery thereof, said discs mounted in axial spaced relationship on said output shaft wherein said teeth of said discs engage said splines of said output shaft, said first series of discs adapted to cooperate with said clutch plates when actuated to transmit rotational energy from said input shaft to said output shaft and said second series of discs adapted to cooperate with said brake plates when actuated to brake rotational movement of said output shaft;

actuating means for selectively actuating one of said first or second series of friction discs;

said vanes being operative to pump oil from said reservoir through said pump chamber, said oil passage means, said axial passage, said radial passages and across said clutch plates, said brake plates and said first and second series of friction discs in response to the rotation of said input shaft.

4,693,351

REVERSIBLE FREEWHEEL DEVICE

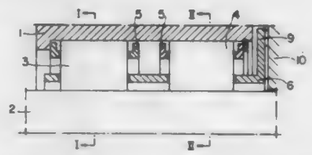
Rune Adolfsson, BorÅs, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Jun. 23, 1986, Ser. No. 877,138

Claims priority, application Sweden, Aug. 30, 1985, 8504032

Int. Cl.⁴ F16D *41/08*

U.S. Cl. 192—48.92 **1 Claim**



1. A reversible freewheel assembly having freewheeling and locking in both directions of rotation comprising drive and driven members having confronting raceways, a plurality of sprags in the annular space between the raceways disposed in a pair of side-by-side rows, the sprags in the rows being oriented in opposite directions, a cage for circumferentially spacing the sprags including biasing means normally biasing the sprags into contact with only one of the raceways to a freewheeling position, a braking ring operatively associated with all the sprags and means providing light contacting engagement with a portion of said braking ring whereby upon relative rotation of said drive and driven members in one direction, the sprags of said one row are moved by said braking ring against the biasing force into contact with both raceways and whereby relative rotation of said drive and driven members in the opposite direction, the braking ring effects contact of the sprags in the opposite row with both raceways.

4,693,352

CLUTCH MECHANISM

David J. Lang, Rockford; John C. Layer, Caledonia, and William G. Durtschi, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 16, 1986, Ser. No. 852,770

Int. Cl.⁴ F16D *13/50*

U.S. Cl. 192—70.27 **9 Claims**

1. A clutch comprising:

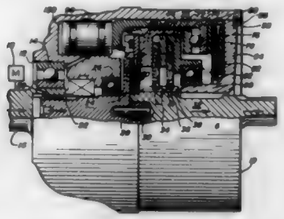
a housing;

a first shaft;

a second shaft coaxial with said first shaft;

a clutch pack comprising a plurality of relatively axially movable friction plates sandwiched by a first reaction plate and a second reaction plate, at least one of said friction plates being sandwiched by two other friction plates and mounted on one of said shafts for rotation therewith and said two other friction plates being mounted on the other of said shafts for rotation therewith;

said reaction plates being associated with one of said shafts for rotation therewith and being axially movable relative to each other to compress and release said friction plates;
a spring for moving said reaction plates toward each other;
a motor carried by said housing; and

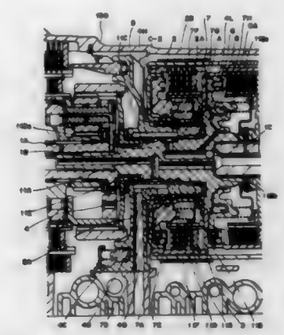


a thrust bearing movable by said motor between a first position non-engaged with said plates and a second position urging at least one of said reaction plates away from the other of said reaction plates.

4,693,353
SUPPORT FOR TRANSMISSION SHAFT AND HYDRAULIC SERVO DRUM

Koji Kobayashi, Toyota; Koji Sumiya, Nishio; Yutaka Taga, Aichi, and Kazuaki Watanabe, Toyota, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 6, 1985, Ser. No. 763,007
Claims priority, application Japan, Aug. 7, 1984, 59-166156
Int. Cl.[4] F16D *25/061, 13/58*
U.S. Cl. 192—85 AA **2 Claims**

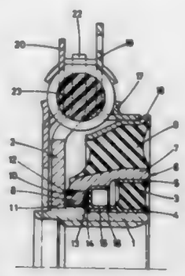


1. In a support for use in an automatic transmission apparatus of the type having a transmission shaft for transmitting power, an annular hydraulic servo drum and a piston fitted in the hydraulic servo drum for engaging and disengaging a friction engaging means, wherein the support has an axially extending tubular supporting portion having an inner peripheral surface for supporting the transmission shaft, an outer peripheral surface for supporting an inner cylindrical portion of the hydraulic servo drum, and working oil passages formed therein and adapted for supplying and discharging a working oil to and from the hydraulic servo drum, the improvement wherein:
said support comprises:
a support body made of light material having a first radially extending oil passage leading from an oil pressure controller for supplying and discharging a working oil and communicating with the inner peripheral surface of said tubular supporting portion, a second radially extending oil passage providing a communication between the outer peripheral surface and the inner peripheral surface of said tubular supporting portion and an inner axially extending oil groove providing a communication between inner peripheral openings of said first and second oil passages;
an inner sleeve of a heavier material than said support body fitting on the inner peripheral surface of said tubular supporting portion to cover said inner axially extending oil groove thereby forming an oil passage for working oil; and
an outer sleeve of a heavier material than said support body fitting on the outer peripheral surface of said tubular supporting portion, said outer sleeve having an outer peripheral surface, a radially extending sleeve hole in said outer sleeve, said slave hole being aligned with a working oil port formed in the inner cylindrical portion of the hydraulic servo drum and communicating with an outer peripheral opening of said second oil passage, an outer oil groove being formed in the outer peripheral surface said outer sleeve to connect said second oil passage to the working oil port through said sleeve hole, and ring grooves formed in the outer peripheral surface of said outer sleeve at both sides of said outer oil groove and seal rings made of resin being received in each of said ring grooves.

4,693,354
CLUTCH DAMPER

Mitsuhiro Umeyama; Kaoru Wakahara; Hisao Ohtani, all of Toyota; Kenichi Kametaka, Fujisawa; Masaru Kinoshita, Fujisawa, and Nobuyuki Kobayashi, Fujisawa, all of Japan, assignors to Toyota Jidosha Kabushikikaisha, Toyota and Nok-Meguiastik Co., Ltd., Tokyo, both of, Japan

Filed Jan. 27, 1986, Ser. No. 822,987
Claims priority, application Japan, Feb. 19, 1985, 60-21332[U]
Int. Cl.[4] F16D *3/60*
U.S. Cl. 192—106.1 **5 Claims**



1. A clutch damper comprising a hub having an approximately cylindrical shape with an outwardly spread first plate provided at one axial end thereof, said hub being slipped over a shaft, a first buffer member formed into an annular body of a rubber-like resilient material and fitted and secured in the outer periphery of said hub, a boss having an approximately cylindrical shape and fitted and secured in the outer periphery of said first buffer member, a second buffer member formed into an annular body of a rubber-like resilient material and secured in the outer periphery of said boss, a cylindrical body and a second plate provided with a double-ring like plate spread outwardly from said cylindrical body and secured in the outer periphery of said second buffer member, a stopper mechanism for stopping relative rotation within a predetermned angle disposed between said hub and said boss and between said first plate of said hub and said double-ring like plate of said second plate, and spacer means for restraining play in both axial and diametral directions interposed between said hub and said boss, said spacer means comprising a center plate, a plate spring, a bearing plate and a fluorine-resin plate.

4,693,355
AUTOMATIC COMBINATORIAL WEIGHTING APPARATUS

Hiroshi Bochi, Gamou; Kenji Ueda, Kyoto, and Satoshi Konishi, Kusatsu, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 12, 1985, Ser. No. 796,742
Claims priority, application Japan, Nov. 12, 1984, 59-170329[U]; Nov. 12, 1984, 59-170330[U]
Int. Cl.[4] B65G *11/00;* **E04B** *1/84*
U.S. Cl. 193—2 R **1 Claim**



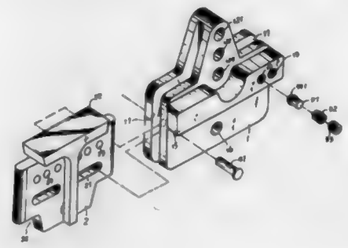
1. An automatic weighing apparatus delivery path system including delivery paths mounted on a frame and for passage of articles to be weighed and a collection chute assembly disposed in and defining said delivery paths and comprising:
an inner collection chute coupled to the frame, in the form of a truncated cone having an outlet and comprising angularly joined flat panels;
a pair of outer collection chutes coupled to the frame, disposed outwardly of said inner collection chute and having respective outlets, and each comprising angularly joined flat panels;
a first discharge chute coupled to the frame, having an outlet and coupled to receive articles from the outlet of the inner collection chute;
a second discharge chute coupled to the frame, having a single outlet and coupled to receive articles from the outlets of said pair of outer collection chutes; and
a vibration damper having a vibration-restriction damping capability and disposed in an area of said delivery paths for damping vibration of said area arising from hitting engagement with the articles, said vibration damper comprising:
a vibration restricting plate contacting the area;
a viscoelastic member contacting said plate;
a vibration damping base contacting said member; and
a urethane coating covering the area, said base, said member and said plate.

4,693,356
STRUCTURE OF ROLLER TYPE CONVEYER

Yang Pi-May, No. 3, Lane 23, Alley 10, Pao-Chien Road, Chung-Ho, Taipei, Taiwan

Filed Mar. 3, 1986, Ser. No. 835,801
Int. Cl.[4] B65G *13/12*
U.S. Cl. 193—35 TE **3 Claims**

1. A conveying device of which the space between rollers and the height of the rollers being adjustable, and said rollers being able to set up at a curved portion of said conveying device; and comprising:
roller rest of which both sides being furnished with grooves for mounting connection plates therein respectively;
connection plates, of which both sides being attached with roller rests respectively; and
the feature of the improvement of said device being that said roller rest being provided with several screw holes, and one end of each of said screw holes being furnished with flange; and a short bolt (31) having a semi-spherical head at one end and a spring being mounted in said screw hole, and one end of said screw hole being closed with an adjustable screw; and the flange furnished on said screw hole being used for preventing said short bolt from falling off,

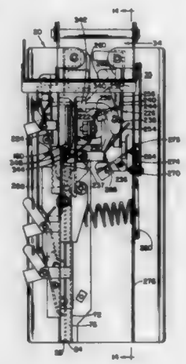


and being used as a means to have the semi-spherical head of said short bolt exposed out of said screw hole; and said connection plate being provided with several semi-spherical holes for receiving the semi-spherical heads of said short bolts respectively upon said roller rest and said connection plate being assembled together so as to have said semi-spherical head portion firmly positioned in place.

4,693,357
MULTIPLE CHUTE COIN MECHANISM

Weldon J. Aschenbeck, Shiner, Tex., and Frank W. Medley, III, Cookeville, Tenn., assignors to Kaspar Wire Works, Inc., Shiner, Tex.

Continuation-in-part of Ser. No. 661,078, Oct. 15, 1984, Pat. No. 4,579,215. This application Feb. 3, 1986, Ser. No. 825,340
Int. Cl.[4] G07F *5/04*
U.S. Cl. 194—202 **21 Claims**



10. A coin mechanism for use in a dispensing machine to receive and detect the presence of a predetermined number of coins, comprising:
at least first and second generally vertical coin chutes for receiving coins of a predetermined dimension and having a width and thickness of about, but greater than, the width and thickness of the coins;
a gate mounted in the mechanism movable between at least first and second gate positions for selectively directing coins into one of said chutes, said gate being operable in said first gate position to direct coins into said first chute

and being operable in said second gate position to direct coins into said second gate chute;

means for moving said gate at least from said first gate position to said second gate position in response to the presence of a coin in said first chute; and

a tilt responsive mechanism movably mounted in the mechanism and configured to move and engage said means for moving and prevent said means for moving from moving said gate from said first gate position to said second gate position when the coin mechanism is rotated in a plane generally parallel to the direction and movement of said gate from said first gate position to said second gate position.

4,693,358

VEHICLE BODY CONVEYANCE IN ASSEMBLY LINE

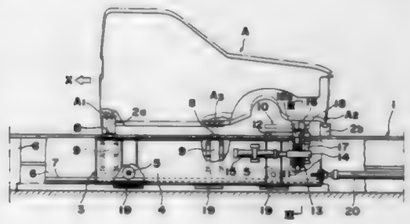
Tetsuro Kondo, and Tsuyoshi Ueda, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 4, 1986, Ser. No. 835,943

Claims priority, application Japan, Mar. 6, 1985, 60-45097

Int. Cl.⁴ B21B *39/14*

U.S. Cl. 198—339.1 **5 Claims**



1. A conveyor system in an automobile assembly line which comprises, in combination:

a slat conveyor for conveying a vehicle body structure from one position towards another position past a door fitting position at which at least one door assembly is fitted to the body structure being conveyed, said slat conveyor having at least one engagement member movable together therewith;

a pair of side carriages arranged on respective sides of the slat conveyor for movement between initial and end positions along the slat conveyor, each of said carriages comprising a clutch mechanism including a catch bar supported for movement between a disengaged position, at which the catch bar is clear from the path of movement of the engagement member on the slat conveyor, and an engaged position at which the engagement member can be brought into engagement with the catch bar for transmitting the movement of the slat conveyor to the carriage to move the latter from the initial position towards the end position in unison with the movement of the slat conveyor, and a plurality of lift cylinders operable to lift the body structure a predetermined height above the slat conveyor during the passage of the body structure being conveyed through the door fitting station; and

a cylinder means for forcibly returning the carriages, once moved to the end position to the accompaniment of the movement of the slat conveyor, and the catch bars in said disengaged position to the initial position.

4,693,359

DEVICE FOR TRANSFERRING BAR-SHAPED ARTICLES

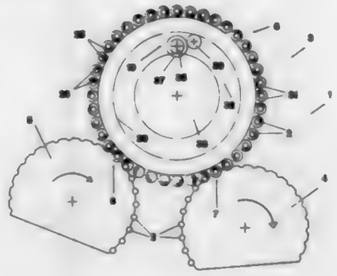
Riccardo Mattei, and Gastone Dall'Osso, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Nov. 18, 1985, Ser. No. 799,326

Claims priority, application Italy, Dec. 6, 1984, 3647 A/84

Int. Cl.⁴ B65G *29/00*; A24C *5/00*

U.S. Cl. 198—474.1 **2 Claims**



1. A device for transferring bar-shaped articles (2) along a determined path and for subjecting said articles (2), at least along part of said path, to a translational movement transverse to their longitudinal axis and a simultaneous rotation about their axis; the device (1) comprising a transfer roller (6), and an inlet roller (4) and outlet roller (5) which are rotatable in directions opposite that of said transfer roller (6) and are tangential to this latter along a first and, respectively, a second generating line of tangency which define along the periphery of said transfer roller (6) a transfer arc and a return arc which are conjugate to each other; said first and second generating lines of tangency being disposed such that the length of each of said transfer and return arcs is either equal to or is a respective whole multiple of a basic arc traversed by each said support element (25) about the axis of said drive shaft (9) during one complete revolution about its own said longitudinal axis; a drive shaft (9) coaxial to said transfer roller (6) and angularly rigid therewith, and operating means for rotating said drive shaft at constant angular speed; a plurality of support elements (25) for respective said articles (2), said support elements (25) being uniformly distributed about said transfer roller (6) and being coupled to this latter such that they each rotate relative to it about their respective longitudinal axis transverse to said path; and transmission means (32) interposed between said drive shaft (9) and said support elements (25) to cause these latter to undero said rotation about their respective said longitudinal axes; characterized in that said transmission means (32) are such as to cause each said support element (25) to make several complete revolutions at constant angular speed about its respective said longitudinal axis for one complete revolution of the same support element (25) about the axis of said drive shaft (9); said transmission means (32) comprising a sun gear (33) keyed on to said drive shaft (9), a fixed gear carrier (17,19), and an outer ring gear (40) coaxial to said drive shaft (9) and rotatable relative thereto; and each said support element (25) comprising a toothed wheel (31) coaxial to its said longitudinal axis and meshing with external toothing (42) coaxial to said drive shaft (9) and angularly rigid with said outer ring gear (40).

4,693,360

CONTINUOUS OPERATION BULK GOODS UNLOADER

Jorma Antikainen; Yrjö Olsoni, and Pentti Vilimiki, all of Hyvinkää , Finland, assignors to Kone Oy, Helsinki, Finland

Filed Aug. 19, 1981, Ser. No. 294,143

Claims priority, application Finland, Aug. 21, 1981, 802635

Int. Cl.⁴ B65G *41/00, 47/16*

U.S. Cl. 198—509 **2 Claims**

1. A continuously operated bulk goods unloader comprising a vertical, tubular jib having an outer circumference, a supporter for said jib for maintaining the jib's direction, said supporter being affixed to a supporting structure carrying the unloader, an endless compartmented belt adapted to operate within the tubular jib, a detacher head supported on said jib for discharging bulk goods onto said belt, said vertical jib being subdivided into a lower part having an upper end and upper part having a lower end interconnected by a pivot, said belt being enclosed within the periphery of said ends, and pressure cylinders for tilting the lower part of the jib about said pivot with reference to the upper part thereof, said pressure cylinders being disposed substantially parallel with the vertical jib between the upper and lower parts thereof when the upper and lower parts are vertical and being positioned within the outer periphery of the ends of both parts of the vertical jib adjacent to the pressure cylinders for protecting these cylinders from impact.

thereof, and turning means for turning said turning arm up and down relative to said central transfer bars, said at least one finger being attached to the leading end of said upper member of said turning arm by a mounting member integrally connected to the leading end of said upper member and extending along the upper surface of said intermediate bar and in the longitudinal direction thereof.

4,693,361

TRANSFER PRESS

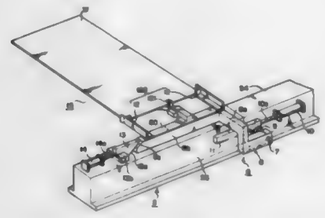
Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,883

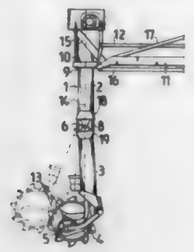
Claims priority, application Japan, Oct. 5, 1982, 57-150493[U]; Oct. 5, 1982, 57-150494[U]; Oct. 5, 1982, 57-150495[U]

Int. Cl.⁴ B65G *25/00*

U.S. Cl. 198—621 **11 Claims**



1. A transfer press comprising workpiece gripping finger units mounted in idle stations between adjacent moving bolsters, said finger units being pivotally mounted on central transfer bars substantially above said individual moving bolsters and between intermediate bars for pivotal movement about an axis on said central transfer bars for pivotally moving said finger units into an upward vertical position above said central transfer bars for movement into and out from the press body together with said bolsters and for pivotally moving said finger units into horizontal position above said intermediate bars when said bolsters and said transfer bars are in said press, said finger units each comprising an approximately L-shaped turning arm pivotally mounted through a pivot shaft on the outside surface of respective end portions of said central transfer bars, an upper member integrally connected to said turning arm and having at least one finger attached to the leading end



4,693,362

CHAIN CONVEYOR FOR THE DELIVERY DEVICE OF PRINTING PRESSES

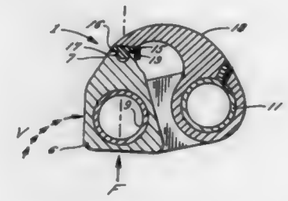
Klemens Kemmerer, Seligenstadt; Valentin Geasheimer, Muhlheim, and Rudolf Melzer, Hainburg, all of Fed. Rep. of Germany, assignors to M. A. N. Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 24, 1986, Ser. No. 822,021

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502663

Int. Cl.⁴ B65G *47/86*

U.S. Cl. 198—803.7 **7 Claims**



1. A chain conveyor for a printing press, said chain conveyor having at least one gripper system being carried by endless conveying chains, the gripper system being secured to the conveying chains by way of connecting members retained by pins on said chains, said gripper system including a gripper shaft and a plurality of pivotably movable sheet engaging gripper members mounted on said gripper shaft,

wherein the improvement comprises, said gripper system having a unitary and elongated body member and a a tubular structural member disposed substantially at the center of gravity of the body member and extending the length thereof for enhancing the structural rigidity of said body member, and said body member having first integrally formed means for supporting said gripper shaft and second integrally formed means form for limiting pivotal movement of said gripper members when in a sheet engaging position.

4,693,363

CONTROL DEVICE AND PROCESS FOR ALIGNING AN ENDLESS BELT UTILIZING THE CONTROL DEVICE

Egbert Kuehnert, Erzhausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,448

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439456

Int. Cl.⁴ B65G *39/16*

U.S. Cl. 198—807 **18 Claims**

1. A control device for aligning, in the running direction, an endless belt, comprising:

an endless belt which revolves around a driven roller and a deflecting roller, wherein said deflecting roller includes an axle extending transversely to the running direction of said endless belt;

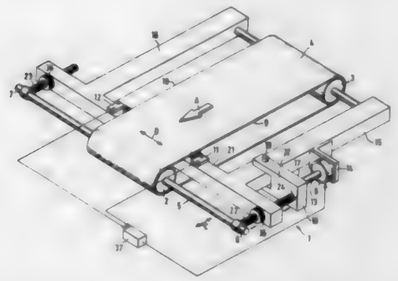
a first longitudinal member extending parallel to the running direction of said endless belt;

a pivotal wing which pivots about a pivot pin extending

through said first horizontal member perpendicularly to said endless belt;

a control circuit which includes at least two microswitches, one of which is positioned near each edge of said endless belt;

a lifting cylinder comprising an extendable ram for adjusting the position of one of the axle ends of said axle responsive to a signal received from one of said microswitches when



said microswitch contacts the belt edge of said endless belt, said ram being arranged to pivot said pivotal wing upon movement of the ram; and

two eyebolts having eye parts for receiving the ends of said axle, said eyebolts being positioned parallel to and on either side of said endless belt, wherein the eyebolt positioned on the same side of said endless belt as said pivotal wing extends to and abuts said wing.

4,693,364

BOX FOR HOLDING THIN OBJECTS

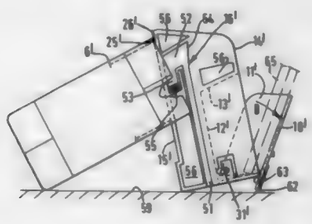
Thomas C. V. Wakelin, Bramcote 1, Norris Close, Firgrove Road, Whitehill, Hampshire GU32 9EG, United Kingdom

Division of Ser. No. 613,155, May 23, 1984. This application Sep. 23, 1986, Ser. No. 910,502

Claims priority, application United Kingdom, Jun. 1, 1983, 8315041; Mar. 27, 1984, 8407936

Int. Cl.[4] B65D *5/50*

U.S. Cl. 206—45.18 **11 Claims**



1. A box for holding thin objects, said box comprising:

an outer part, including two opposite side members and a top member,

a drawer, including two opposite side members and a bottom member, said side members of said outer part and said side members of said drawer being arranged in two adjacent pairs of one outer-part side member and one drawer side member per pair;

engagement means for interconnecting said drawer and said outer part so as to allow said drawer to be at least partially withdrawn from said outer part to a position whence said drawer can be swung through an angle of less than 180 degrees with respect to said outer part and engage in a self-supporting open position; said engagement means comprising:

a respective pin fixedly attached to one of each pair of side members so as to be positioned between its pair of side members,

a respective groove or slot extending in the other of each pair of side members for co-operating with said respective pin to interconnect said drawer and said outer part, and

a stop at an end of each groove or slot for stopping withdrawal movement of said drawer;

a restraining member for restraining the objects from falling out of said box in its self-supporting, open position;

pivotal connection means for pivotally connecting said restraining member to said drawer, the axis of pivotal connection positioned in said side members of said drawer; and

pivotal limitation means for limiting forward pivotal movement of said restraining member so that said restraining member has a forwards inclination in its restraining position when said box is in its open, self-supporting position supported on a flat surface; said pivotal limitation means arranged so that a forward edge of said restraining member abuts the flat surface when in its restraining position with said box open, for steadying of said box against tipping forward under weight of the restrained objects.

4,693,365

PACKAGE, INSTRUMENTATION, SYSTEM AND METHOD FOR PACKAGING FLACCID ITEMS, FILAMENTS AND THE LIKE

Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602

Continuation-in-part of Ser. No. 723,353, Apr. 15, 1985, Pat. No. 4,579,221. This application Mar. 26, 1986, Ser. No. 844,199

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] A61L *17/02*

U.S. Cl. 206—63.3 **23 Claims**



1. A package enclosing at least one continuous, untangled, flaccid item comprising:

a fully sealed enclosure including a compartment;

said flaccid item having an intermediate portion terminating in oppositely disposed end portions, with said intermediate portion being freely housed within said compartment and said oppositely disposed end portions being separately secured to said enclosure; and

said enclosure having a construction for enabling its rupture and access to said flaccid item portion housed within said compartment for untangled removal therefrom.

4,693,366

PACKAGING MEANS IN TWO PARTS

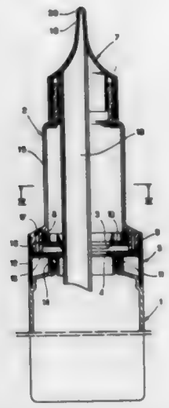
Antonin Goncalves, Grosiay, France, assignor to The French Joint Stock Company "L'Oreal", France

Filed Dec. 29, 1986, Ser. No. 947,381

Claims priority, application France, Jan. 10, 1986, 86 00277

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—222 **16 Claims**



1. In a packaging means comprising first and second parts which can be assembled together, said first part comprising:-

(a) a first compartment;

(b) a second compartment defining a cap surmounting the first compartment;

(c) first and second diaphragms separating first and second compartments from each other; and

(d) an intermediate part joining the said first and second compartments;

the improvement wherein:-

(e) said two diaphragms are fixed to said second compartment;

(f) said second compartment is closed at its upper portion by a releasable stopper; and

(g) said second part of the package is constituted by a perforator cap including means for perforating the first and second diaphragms when said perforator cap is placed in position on the second compartment.

4,693,367

SHIPPING BOX FOR CLOTHING WITH ARTICLE POSITIONING MEANS

Andre Mathieu, St-Hilaire, Canada, assignor to Dorfin Paper Products (Quebec) Limited, Montreal, Canada

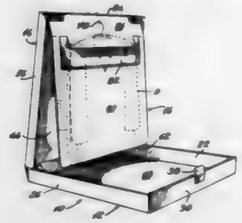
Filed Sep. 22, 1986, Ser. No. 909,627

Claims priority, application Canada, Sep. 16, 1986, 518281

Int. Cl.[4] B65D *85/18, 25/10*

U.S. Cl. 206—289 **5 Claims**

1. A shipping box comprising a tray defined by a first panel and side and front end walls, a hinge panel extending along the rear edge of the first panel, and a lid connected to the hinge panel and including a second panel, the second panel including depending side walls and a front wall extending from the edges thereof, the improvement comprising a third panel insertable within the tray and including a front face and a rear face, the panel having a head portion and a bottom edge, a sub-panel extending from the rear face and defining a slot extending transversely relative to the third panel, garment hanger receiving means provided on the head portion of the panel whereby a garment can be hung from a garment hanger and draped about the bottom edge of the third panel over the rear face of the third panel and further draped through the slot in the



sub-panel to thereby hang from the sub-panel and be retained on the third panel in a firm position.

4,693,368

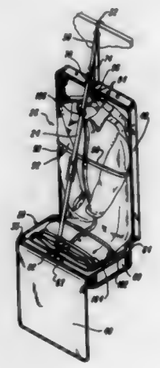
COMBINATION GARMENT BAG AND PACKING CASE LUGGAGE ARTICLE

William L. King, Denver, Colo., and Charles K. Weisbart, Mequon, Wis., assignors to Samsonite Corporation, Denver, Colo.

Filed Feb. 19, 1986, Ser. No. 830,995

Int. Cl.[4] A45C *3/00, 5/12, 13/26, 13/34*

U.S. Cl. 206—287.1 **46 Claims**



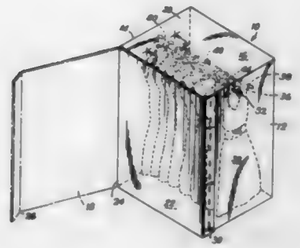
1. A luggage article, comprising:

a flexible garment bag enclosure comprising an exterior elongated panel, an interior elongated panel, and means providing side walls between the interior and exterior panels the interior and the exterior panels having their longer dimensions oriented generally longitudinally, the side walls including a top transverse end side wall, a bottom transverse end side wall, a left longitudinal side wall and a right longitudinal side wall, the panels and side walls defining a space within the garment bag enclosure for receiving garments on hangers attached near the top end side wall; and

a packing case enclosure including means for permanently connecting the packing case enclosure to the interior panel and means for pivotably connecting the packing case enclosure to the bottom end side wall and means for selectively connecting the packing case enclosure to the lower portion of the left and right longitudinal side walls;

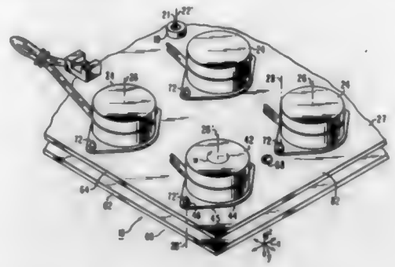
the garment bag enclosure extending sufficiently longitudinally to fold over and substantially embrace a top border piece and an outside partition piece of the packing case enclosure when in a transportation condition, the top end and the bottom end side walls being oriented generally in alignment with a bottom border piece of the packing case enclosure when in the transportation condition.

4,693,369
CLOTHES HANGING SYSTEM AND THEFT-PROOF SHIPPING SYSTEM
Herbert Lagin, 31 Deer Park Rd., Great Neck, N.Y. 11024
Continuation of Ser. No. 627,492, Jul. 6, 1984, abandoned. This application Jun. 25, 1986, Ser. No. 880,341
Int. Cl.[4] B65D *85/18*
U.S. Cl. 206—290 1 Claim



1. A garment support system for both hanging and shipping garments in a creaseless manner and, after shipping, for hanging the garments on a conventional retail garment rack having a horizontal cylinder rod, comprising:
(a) a shipping carton having a pair of opposed side walls;
(b) a plurality of hangers each having
(i) a hanger body with a pair of longitudinally extending shoulders for supporting a garment,
(ii) a first hanger support means centrally located and connected to said hanger body comprising a conventional open-sided horizontal rod engaging supporting hook capable of being selectively secured to and detachable from said conventional retail garment rack,
(c) a horizontally extending rigid, cylindrical support rod for providing complete load support and simultaneous theft prevention, during shipping of said hangers and garments in said shipping carton and wholly exclusive of support provided by said first hanger support means during shipping, said horizontal cylinder support rod being provided, at each end, with connection means for selectively attaching it to said side walls of said shipping carton,
(d) each of said hangers having a second hanger support means mechanically independent from said first hanger support means, comprising an aperture passing through said hanger body, said second hanger support means being capable of selectively being supported by said horizontal cylinder support rod by being first passed through said aperture and attached to said side walls of said shipping carton by said connection means and serving to lock said hanger and said garment thereon to said horizontal cylinder support rod during shipping of a garment and to facilitate, after shipping, the renoval of all hangers and garments simultaneously from said shipping box and the placement of all hangers and garments, simultaneously, on said conventional retail garment rack,
(e) said first hanger support means and said second hanger support means being alternatively usable at the same time without any physical alteration of said hanger or said first or second hanger support means, and
(f) said hangers all being made from a single piece of material.

4,693,370
PALLET
John G. Aceti, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.
Filed Oct. 22, 1984, Ser. No. 663,709
Int. Cl.[4] B65D *19/44*
U.S. Cl. 206—488 10 Claims



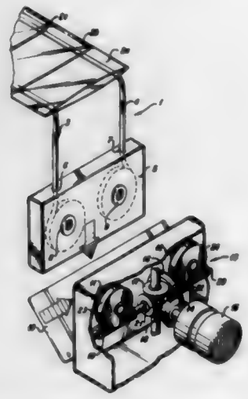
1. A pallet for releasably securing an array of workpieces in predetermined locations and orientations comprising:
first means including a member having a plurality of circular apertures and adapted to receive and locate each workpiece on a member surface in a predetermined location on a respective axis and in a predetermined angular orientation about the respective axis; and
second means secured in spaced relation to said first means including a resilient workpiece friction gripping means adjacent to each location and adapted to resiliently, releasably, and frictionally engage and hold the workpiece to said first means in said predetermined location and orientation upon the receiving of the workpiece by the first means;
each aperture serving as one of said predetermined locations, said member including an array of pins secured to a surface thereof, each pin corresponding to a different one of said apertures, each pin in a given radial position adjacent to the center of the corresponding aperture and adapted to engage a mating reference hole in the workpiece to be received and located in said corresponding aperture.

4,693,371
MEDICATION DISPENSER AND CONTAINER
Jack W. Malpass, Andover, N.J., assignor to Berlex Laboratories, Inc., Cedar Knolls, N.J.
Filed Nov. 16, 1981, Ser. No. 321,665
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—538 23 Claims



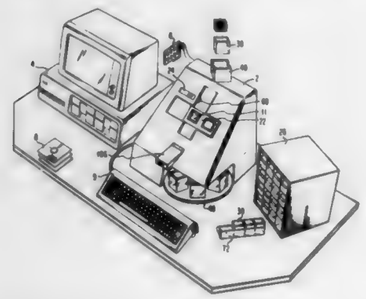
1. An apparatus for dispensing medical preparations comprising:
a tray having a plurality of dispensing means arranged in rows and columns with said dispensing means adapted for having placed thereinto medical preparations in predetermined amounts, and for containing and dispensing medical preparations respectively therefrom; and
display means respectively associated with each of said dispensing means for enclosing and displaying a sample of the medication to be placed in and dispensed from each of said dispensing means, whereby the possibility of locating the wrong medication in a respective dispensing means is substantially reduced by comparision, with the sample medication located in the associated display means.

4,693,372
TAPED BAG CHAIN WITH CASSETTE
Ronan R. O'Neill, Varese, Italy, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.
Filed Dec. 9, 1985, Ser. No. 806,909
Claims priority, application United Kingdom, Jun. 14, 1985, 8515097
Int. Cl.[4] B65D *75/42*
U.S. Cl. 206—554 3 Claims



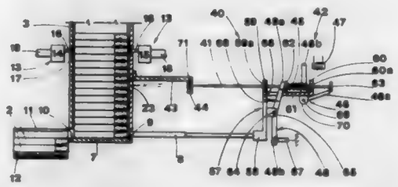
1. A bag chain comprising: a succession of imbricated bags; a pair of side-by-side spaced tapes each having an adhesive face; a cassette releasably mountable in a tape winding drive unit; a pair of tape-winding rotors in said cassette, each said rotor being attached to a respective one of the tapes and adapted for engagement with a respective tape winding drive shaft of the tape-winding drive unit to wind-up the tapes on the rotorsdrive and said tape-winding rotor having spaced apart substantially parallel axes of rotation.

4,693,373
SLIDE ARCHIVAL STORAGE AND RETRIEVAL SYSTEM
Owen L. Lamb, Scotts Valley, and William R. Maclay, Los Gatos, both of Calif., assignors to Slide Management Systems, Inc., Los Gatos, Calif.
Filed Jun. 12, 1985, Ser. No. 730,306
Int. Cl.[4] B07C *5/00*; G02B *27/02*; B65H *31/24*
U.S. Cl. 209—3.3 27 Claims



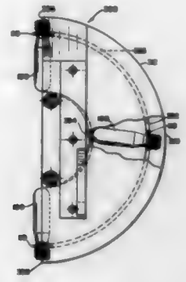
1. A slide sorter comprising:
a movable turntable having a plurality of slide receptacles thereon;
first means for holding a group of slides above said turntable, said first means including releasing means for releasing slides from said group one by one and delivering means for delivering one slide released from said group of slides to a position above said turntable;
second means including means for associating each slide in said group of slides with a previously derived accession number uniquely identifying each said slide, said second means further including means for deriving an updated accession number for said one slide that is delivered by said delivering means;
third means responsive to said second means for utilizing said updated accession number in accordance with a sorting algorithm to move said turntable to locate a particular slide receptacle relative to said position above said turntable; and
fourth means for activating said releasing means so that said one slide is delivered by said delivery means to said position above said turntable, and thence into said receptacle.

4,693,374
DEVICE FOR FEEDING CIGARETTES TO THE WRAPPING LINE OF A PACKETING MACHINE
Gastone Dall'Osso, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy
Filed Nov. 22, 1985, Ser. No. 801,145
Claims priority, application Italy, Dec. 6, 1984, 3648 A/84
Int. Cl.[4] B07C *5/344*
U.S. Cl. 209—535 16 Claims



1. A device for feeding cigarettes to the wrapping line of a packeting machine, comprising a horizontal wall (7); a hopper (1) for feeding cigarettes (2) to said machine, said hopper (1) being divided into a plurality of outlet channels (5) each having a width substantially equal to the diameter of a cigarette (2), and through which the cigarettes (2) descend stepwise until they rest on said horizontal wall (7); a pusher element (8) operable between a first rest position and a second eject position, said second eject position, being spaced from said first rest position and within one of said outlet channels for pushing said cigarettes out of said hopper; sensor means (13) provided along at least one of said channels (5) for checking the cigarettes (2) in succession; and at least one discarding device (40) controlled by said sensor means (13) for removing defective cigarettes (2) from said hopper (1), said discarding device (40) being disposed, with respect to said hopper (1), between said sensor means (13) and said pusher element (8) and being provided, for each of said channels (5), with means (41) which engage, retain and extract the defective cigarettes (2) from said hopper (1) and which during extraction of defective cigarettes (2) are operable between a first and a second end position, said second end position being within at least a wall of said hopper (1); said means (41) being secured with said pusher element so as to be movable therewith.

4,693,375
PREFORM HANDLING APPARATUS
Karl D. Schweers, 22 Meridian Rd., Eatontown, N.J. 07724
Filed Nov. 22, 1985, Ser. No. 800,653
Int. Cl.[4] B07C 5/02; C03B 23/04
U.S. Cl. 209—544 15 Claims



13. Preform handling apparatus for orienting a plurality of preforms, each of said preforms having an outer diameter, an open end and a closed end, a threaded neck adjacent the open end, a shoulder adjacent the neck, and a body extending from the shoulder to the closed end and having an outer diameter, the outer diameter of the preform being largest at the shoulder, said preform handling apparatus being an inverter, said inverter comprising:

I. a frame;

II. two juxtaposed semicircular plates carried by the frame, each of said plates having a straight edge, a semicircular edge and an inner surface having a groove formed therein, each of said grooves extending parallel to the semicircular edge of the plate and said grooves being aligned to form a preform shoulder receiving passage;

III. a spacer positioned between the inner surfaces of the semicircular plates, said spacer maintaining the plates in juxtaposed relation such that the distance between the inner surfaces of the plates is greater than the outer diameter of the body of the preform and less than the outer diameter of the shoulder of the preform;

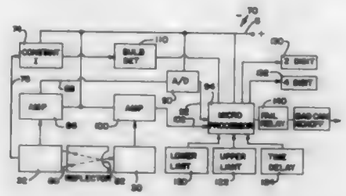
IV. a support rail carried by the spacer, said support rail extending parallel to the semicircular edges of the semicircular plates and circumscribing an arc of less than 180°, said support rail being at a distance from the preform shoulder receiving passage which distance is slightly less than the distance from the shoulder to the closed end of the preform;

wherein preforms fed into the inverter are received in the inverter such that the shoulder of the preform is received in the preform shoulder receiving passage and the open end of the preform is directed upwardly; and

wherein the preform travels through the inverter such that the shoulder of the preform travels through the preform shoulder receiving passage and the preform exits from the inverter having been rotated 180° with the open end of the preform directed downwardly.

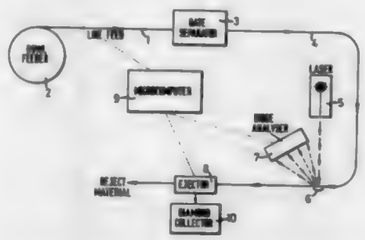
4,693,376
APPARATUS FOR INSPECTING CONTAINERS
Paul R. Marion, Chicago; James J. Nemcoes, Orland Park, and George C. Kolodziej, Oak Park, all of Ill., assignors to National Can Corporation, Chicago, Ill.
Filed May 26, 1981, Ser. No. 266,801
Int. Cl.[4] B07C 5/34
U.S. Cl. 209—552 8 Claims

1. An apparatus for inspecting the surface of articles in an article manufacturing line having an article surface processing station comprising an article presence sensing means for sensing the presence of an article at a selected location in said line; surface sensing means positioned adjacent said location for sensing the condition of at least a portion of the surface, said sensing of said portion of said article will indicate whether said article surface has been properly processed by providing signal means representative of the condition of said surface; computing means for determining a moving average value of said signal means from a preselected number of previously tested articles; comparing means receiving said signal means from



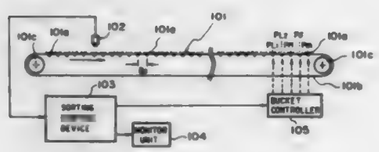
articles being tested and also receiving said moving average value, said comparing means comparing said signal means received with said moving average value and providing a selected output when said signal means indicates an article having a value of a predetermined differences from said moving average value being tested, and means responsive to said selected output to determine the extent of further processing of said article in said manufacturing line.

4,693,377
DIAMOND SEPARATION USING RAMAN SCATTERING
Donald L. Gerrard, Epsom; John E. Preedy, Bromley, and Kenneth P. J. Williams, Camberley, all of England, assignors to The British Petroleum Company p.l.c., London, England
Continuation of Ser. No. 611,740, May 18, 1984, abandoned.
This application Aug. 27, 1986, Ser. No. 902,092
Claims priority, application United Kingdom, May 24, 1983, 8314340
Int. Cl.[4] B07C 5/342
U.S. Cl. 209—579 7 Claims



1. A method for the separation of diamonds from a diamond containing ore comprising the steps of (a) passing the ore through a separator capable of dividing the ore into discrete units (b) shining a beam of laser radiation of known frequency onto successive discrete units of ore (c) filtering the Raman scattered radiation reflected from each discrete unit of ore by means of a filter adapted to remove all radiation except that characteristic of diamond and (d) passing the filtered radiation into a detector, the detector being adapted to actuate a separator capable of separating the units of diamond containing ore from the units of non-diamond containing ore.

4,693,378
METHOD AND APPARATUS FOR SORTING ARTICLES
Osamu Anegami, Fuchu, and Toshifumi Miyake, Ohtsu, both of Japan, assignors to Kabushiki Kaisha Ishida Koki, Kyoto and Yac Co., Limited, Akishima, both of, Japan
Continuation of Ser. No. 474,334, Mar. 11, 1983, abandoned.
This application Sep. 25, 1985, Ser. No. 779,619
Claims priority, application Japan, Mar. 13, 1982, 57-40069; Mar. 13, 1982, 57-40070; Mar. 13, 1982, 57-40071; Mar. 13, 1982, 57-39981; Mar. 13, 1982, 57-39982
Int. Cl.[4] B07C 5/10; G01B 11/28; H04N 7/02
U.S. Cl. 209—586 1 Claim



1. A method of computing the area and number of articles in an automatic sorting apparatus including an image pickup unit for producing images of the articles, an image memory for storing, as a multiplicity of pixels, the images of the articles one frame at a time, a sorting device for deriving the area of an imaged article from the number of pixels forming the article image and for comparing the area of the imaged article with a preset range of grades to produce selection information indicative of a particular grade to which the article belongs, and means for sorting out the article dependent on the size thereof according to the selection information, said method comprising the steps of:

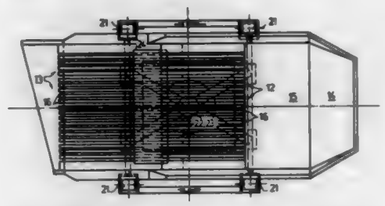
(a) determining the black/white level of each pixel by raster scanning the pixels forming the image of the article and storing the starting and ending positions of a continuous black-level portion in an ith scanning step;

(b) determining whether a black-level portion in an (i+1)th scanning step is contiguous to the black-level portion in the ith scanning step by employing the stored starting and ending positions;

(c) adding the number of pixels of the black-level portion in the (i+1)th scanning step to the total number of pixels of the black-level portions in scanning steps up to the ith scanning step when the black-level portions in the ith and (i+1)th scanning steps are contiguous to each other, or separately storing the number of pixels of the black-level portion in the (i+1)th scanning step when the black-level portions in the ith and (i+1)th scanning steps are discontinuous from each other; and

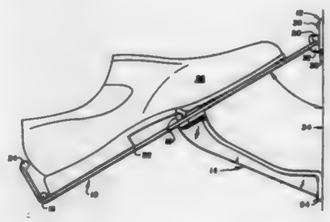
(d) identifying the number of articles in one frame as being two when black-level portions in all scanning steps following the (i+1)th scanning step are discontinuous from the black-level portions in the ith and (i+1)th scanning steps, or adding the number of pixels of the black-level in a current scanning line to the total number of pixels in the ith and (i+1)th scanning steps when black-level portions in scanning steps following the (i+1)th scanning step and up to the current scanning line are contiguous to the black-level portions in the ith and (i+1)th scanning steps and identifying the number of articles in one frame as one, with the total number of pixels representing the area of the one article.

4,693,379
SCREENING APPARATUS
Wolfgang Stehle, Schlier, Fed. Rep. of Germany, assignor to Maschinenfabrik Bezner GmbH & Co. KG, Ravensburg, Fed. Rep. of Germany
PCT No. PCT/EP85/00068, § 371 Date Oct. 23, 1985, § 102(e) Date Oct. 23, 1985, PCT Pub. No. WO85/03889, PCT Pub. Date Sep. 12, 1985
PCT Filed Feb. 23, 1985, Ser. No. 793,690
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407460
Int. Cl.[4] B07B 1/12, 1/38, 1/46; C02F 11/00
U.S. Cl. 209—674 7 Claims



1. A screening apparatus, particularly for screening valuable materials, domestic garbage, industrial garbage, bulky garbage, dry garbage, wet garbage, compost and/or problematic and dangerous materials, comprising: inclined, open-ended bars capable of oscillatory movement arranged in a transport direction and forming at least two bar grating screens forming a stepped arrangement of bar grating with one screen located behind the other in the transport direction, wherein said bar grating screens (12,13) have bars (16) that are tapered in the transport direction; said apparatus further comprising: means forming an inlet portion (14) and a preliminary distributor path (15) for feeding in material upstream of at least the upper bar grating screen (12) of said stepped arrangement; a screen frame (11) accommodating said bar grating screens (12,13) and said means forming the inlet portion (14) and the preliminary distributor path (15), said inlet portion (14) and said preliminary distributor path (15) comprising approximately ⅓ of the entire length of said screening apparatus; rubber oscillating elements on which said screen frame (11) is mounted; and eccentric drive means (22,23) for causing said screen frame (11) to perform a circular oscillating movement with a large circular oscillating diameter of approximately 100 mm.

4,693,380
RACK SUPPORT
William Muth, Ocala, Fla., assignor to Clairson International, Ocala, Fla.
Continuation of Ser. No. 705,504, Feb. 25, 1985, abandoned.
This application Dec. 19, 1986, Ser. No. 943,888
Int. Cl.[4] A47F 7/08
U.S. Cl. 211—35 8 Claims



1. An angled shelf support member comprised of a main body section having a longitudinal axis and integrally formed with upper and lower end sections, said lower end section

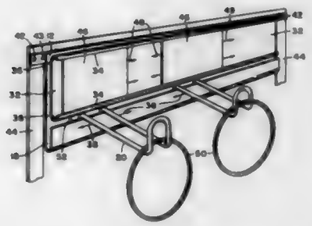
being positioned at an angle to said main body section and including an outwardly facing flat end surface positioned so as to extend perpendicularly across said lower end section, said upper end section including a front portion and opposite side portions, first means defining a first groove extending across the front portion of said upper end section so as to be parallel to said flat surface and second means defining a pair of spaced apart grooves, one extending along each of said opposite side portions of said upper end section, said pair of grooves extending perpendicularly to said first groove, with said pair of grooves being arranged at an angle with respect to said longitudinal axis.

4,693,381

FLOATING HANGER MERCHANDISE RACK AND METHOD

Edith M. Lodge, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 25, 1985, Ser. No. 801,356
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—94 **10 Claims**



1. A rack for storage and display comprising:

a primary mounting strip having a face that is oriented toward a front side of the rack, the mounting strip having at least one edge that is shaped so as to form a trough having a U-shaped configuration when viewed in cross section, the trough having a predetermined depth and defining a substantially uniform slot on the face side of the mounting strip, which is oriented substantially longitudinally in relation to at least a portion of the mounting strip;

at least one hanger having a leg portion angled from an article carrying portion, the leg portion disposed in the slot and free to slide along in the slot, and adapted to keeping the article carrying portion oriented generally perpendicular to the face of the mounting strip, and is fabricated from a rigid material that forms a U-shaped configuration when the hanger is viewed from the front and a Z-shaped configuration when the hanger is viewed from the side;

a secondary mounting strip fixably mounted onto the face of the primary mounting strip, and having at least two edges that have been shaped so as to form upper and lower secondary troughs, which each have a U-shaped configuration when viewed in cross section, the secondary troughs having predetermined and defining substantially uniform slots on the face side of the primary mounting strip, which are oriented substantially longitudinally in relation to at least a portion of the primary mounting strip and which are oriented substantially parallel to each other;

the secondary mounting strip being fixably mounted onto the face of the primary mounting strip at a position such that the lower trough of the secondary mounting strip blocks escape of the hanger from the slot of the primary mounting strip while at the same time permitting substantially longitudinal movement of the hanger along in the slot of the primary mounting strip; and

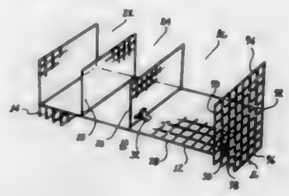
fastening means for fixably mounting the rack to a means for supporting the rack.

4,693,382

SORTER FOR AUTOMOTIVE GLOVE COMPARTMENTS

Neal Galen, 2115 W. Royal Palm Rd., Suite 1014, Phoenix, Ariz. 85021

Division of Ser. No. 797,930, Nov. 14, 1985. This application Aug. 4, 1986, Ser. No. 892,858
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—189 **8 Claims**



1. A sorter for an automotive glove compartment, said sorter comprising in combination:

(a) at least one shelf member for supporting articles to be stored in the glove compartment;

(b) side members for supporting said shelf member within the glove compartment;

(c) each said shelf member and said side member being formed from a lattice like grid, said grid including rungs and junctions and wherein each said rung interconnects a pair of said junctions and wherein each said rung includes opposed tapered sections tapering toward a connected one of said junctions for defining the point of fracture of said rung adjacent each connected one of said junctions;

(d) means for detachably attaching said side members to said shelf member;

(e) at least one divider for segregating articles to be stored upon said shelf member; and

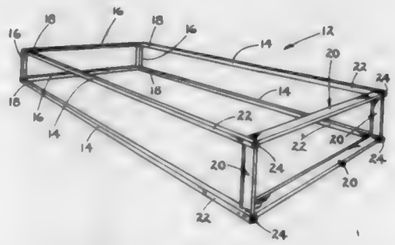
(f) further means for detachably attaching said divider to said shelf member.

4,693,383

MERCHANDISING RACK

Jay G. Fenwick, Albert Lea, Minn., assignor to Joyce International, Inc., Great Neck, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,621
Int. Cl.[4] A47B 47/00
U.S. Cl. 211—192 **34 Claims**



1. A merchandising rack module usable in displaying a plurality of cigarette cartons, said merchandising rack module comprising:

a plurality of spaced, generally vertically oriented, hollow, uprights having a plurality of generally rectangular spaced slots in wall surfaces thereof;

a plurality of elongate tie braces, each of said tie braces extending generally horizontally between two of said spaced uprights, each of said tie braces having a locking blade slidably carried in an inner sleeve positioned within said tie brace adjacent an end of said tie brace, each said locking blade having a locking blade head at a first end and being supported for movement with respect to said inner sleeve in said tie brace by a rotatable elongate locking blade actuator rod having a longitudinal axis perpindicular to the longitudinal axis of the tie brace, said actuator rod comprising an intermediate portion and two end portions, each of the portions having a substantially similar cross-sectional configuration, said intermediate portion of said actuator rod being offset from the longitudinal axis of said rod, the actuator rod further having slotted head portions positioned adjacent outer surfaces of said tie brace, said intermediate offset portion passing through a journal portion in a second end of said locking blade, rotation of said slotted head portion of said actuator rod causing said locking blade to slide with respect to said end of said tie brace and said upright, whereby each of said locking blade heads is insertable from said tie brace through one of said slots in one of said wall surfaces, each of said locking blade head receiving slots being T-shaped, each said tie brace further including at least one T-shaped tab at each end thereof, said at least one T-shaped tab being positionable within said T-shaped slot, said locking blade head being insertable within said T-shaped slot in conjunction with said T-shaped tab to lock said tie brace end in said upright;

a plurality of base plates, each of said base plates extending generally horizontally between two of said uprights, said uprights, tie braces and base plates cooperating to define said merchandising rack module;

a plurality of shelves removably secured and adjustably positioned between said plurality of uprights and providing support surfaces for the cartons of cigarettes; and

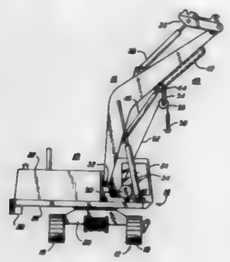
means for separating and retaining cartons of cigarettes on said shelves.

4,693,384

EXCAVATOR BOOM DERRICK

Charles P. Gilmore, Jr., Ash Flat, Ark., assignor to Gilmore Transportation Services, Inc., Houston, Tex.

Filed Dec. 20, 1985, Ser. No. 811,958
Int. Cl.[4] B66C 23/56
U.S. Cl. 212—257 **5 Claims**



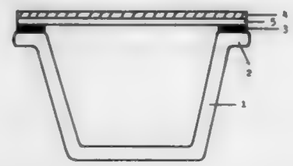
1. A heavy duty excavator having a mobile undercarriage and an overcarriage rotatably mounted upon the undercarriage, said excavator further including a boom pivotally mounted at its proximal end in the overcarriage, a first hydraulic means acting between the overcarriage and the boom for raising and lowering the boom in an ar, rail means secured to the underside of the boom, a trolley movably mounted upon said rail means for movement thereover, a second hydraulic means acting between the boom and the trolley for driving the trolley back and forth over the rail means, a sheave mounted upon said trolley, a winch mounted upon said overcarriage, a cable means wound about the winch and having a free end passing through said sheave whereby the free end of the cable can be attached to a load, a quick disconnect shoe mounted in a pivot at the distal end of the boom, and a third hydraulic means acting between the shoe and the boom for moving the shoe about said pivot whereby a stick mounted tool connected to the shoe can be selectively positioned.

4,693,385

STERILIZATION-RESISTANT GLASS CONTAINER SEALED WITH AN ALUMINUM COMPOSITE FILM

Alfons Lamping, Cerminboeuf, and Beat Karth, Oberöuz, both of Switzerland, assignors to Nyffeler Corti, Kirchberg BE, Switzerland

Filed May 6, 1985, Ser. No. 731,088
Claims priority, application Fed. Rep. of Germany, May 7, 1984, 3416754
Int. Cl.[4] B65D 51/00
U.S. Cl. 215—232 **14 Claims**



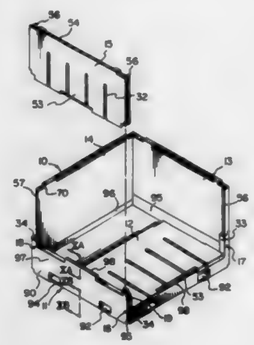
1. A sterilization-resistant, heat sealed glass container which comprises, as a closing membrane, an aluminum/polypropylene composite film sealed to a thermoplastic coating of a baking varnish provided on the rim of the glass container.

4,693,386

COLLAPSIBLE SHIPPING CONTAINER

Larry R. Hughes, Lindsay; Michael L. Dorsey, Sunderland, and David Wensley, Lindsay, all of Canada, assignors to Bonar Rosedale Plastics Ltd., Markham, Canada

Filed Jan. 21, 1986, Ser. No. 820,777
Claims priority, application Canada, Jan. 22, 1985, 472570
Int. Cl.[4] B65D 7/24
U.S. Cl. 220—1.5 **17 Claims**



1. A collapsible shipping container comprising: a rectangular base, and four side walls each attached at a respective side of the base and capable of only pivotal movement on a horizontal axis parallel to that side, each wall being pivotable between an upright position, wherein it extends normal to the base, and a retracted position wherein it overlies the base, the container being adjustable from an erected condition, wherein all four walls are in the upright position, to a collapsed condition wherein all four walls are in the retracted position, the adjacent edges of neighboring walls being configured to provide mutual

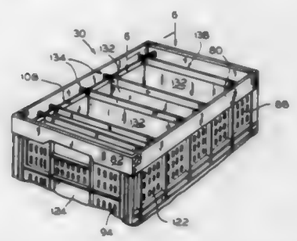
support when in the upright position, said walls carrying captive releasable fastener means that engage between neighboring walls to lock them in the upright position, said fastener means comprising a latch pin and a parallel mounting pin fixedly interconnected by a transverse strap, said mounting pin being axially movably carried in an edge region of one wall whereby the latch pin is selectively insertable axially in a direction generally parallel to said adjacent edge into a socket in an adjacent wall to secure said walls together in the upright position with said latch pins and mounting pins extending in a generally upright orientations on axes normal to any horizontally directed separation forces applied to said walls, there being an auxiliary socket in the wall in which the mounting pin is carried, said auxiliary socket receiving said latch pin in a non-operative stored condition.

4,693,387

FOLDABLE BOX FOR HANGING FILES

Russ W. Stonier, 1340 N. Astor St., Chicago, Ill. 60610

Filed Jun. 11, 1986, Ser. No. 872,829
Int. Cl.⁴ B65D *85/62*
U.S. Cl. 220—6 **17 Claims**



1. A collapsible box for supporting and holding hanging files having hooks projecting from upper corners thereof, said box comprising:

four sides and a bottom panel interconnected to form a generally rectangular shape; a first two of said sides being hinged to fold onto the bottom panel to provide a compact structure form and to fold into an upright and erect box;

the other two of said sides being hinged to swing to a position parallel to said bottom panel when said box is in said compact structure form and to swing to a locking position when said box is in said erect form;

a pair of spaced parallel rail members mounted in the box and separated from each other by a distance equal to a distance between said hooks for supporting the hanging files; and

at least four sockets formed in opposing and confronting sides of the box at locations corresponding to at least the ends of said spaced parallel rail members, said rail members flexing to be installed into or removed from said sockets.

4,693,388

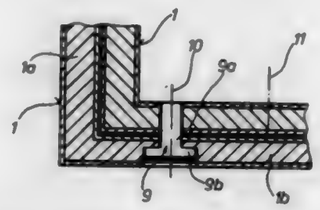
COVER ARRANGEMENT

Kurt Hennig, Munich, Fed. Rep. of Germany, assignor to Gebr. Hennig GmbH, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,442
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522887
Int. Cl.⁴ B65D *8/14*
U.S. Cl. 220—8 **6 Claims**

1. A cover assembly for industrial equipment and the like comprising at least two cover elements (1, 1') with walls which overlap one another and which are telescopically movable relative to one another, and connector means for holding the overlapped walls of the cover elements together in sliding relationship and for guiding the movements of the cover elements with respect to each other, the improvement therein of said connector means comprising

the overlapped wall of one of said cover elements (1) including at least one elongated groove (5) formed in said wall with the length of said groove extending in the directions of the relative movements of the cover elements, said groove comprising a first relatively narrow elongated slot openings (5*a*) formed through the outer surface of said wall and facing the adjacent cover element (1') and an internal relatively wider portion (5*b*) formed internally of the wall and overlapping said narrow width portion, and an opening (8) formed through the other outer surface of said wall and facing away from said adjacent cover element (1'),



the adjacent overlapped wall of said other cover element (1') defining an opening therein aligned with the groove of said first cover element, and

a guide element (9) including a stem (9*a*) inserted into the opening of the adjacent wall of said other cover element and extending through the relatively narrow width portion of said groove and including an enlarged head (9*b*) of a breadth larger than the narrow width portion of said grove positioned in the internal portion of said groove,

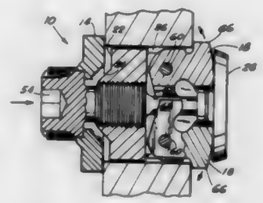
so that when the cover elements are moved relative to one another the guide element slides along the length of the groove and the narrow portion of the groove captures the head of the guide element and access is provided to the guide element when the opening of the other outer layer of the wall of said one cover element is aligned with the connector.

4,693,389

REACTOR INTERNALS CORE BARREL HOLE PLUG

David D. Kalen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 31, 1986, Ser. No. 823,905
Int. Cl.⁴ B65D *53/00*; G21C *13/00*
U.S. Cl. 220—236 **6 Claims**



1. A plug for insertion into reactor core barrel holes, comprising:

a. a plug body having inner and outer ends, said plug body being of a size to closely fit the hole to be plugged and having a rectangular bore adjacent its inner end and a substantially cylindrical bore along its longitudinal axis at its outer end in communication with said rectangular bore;

b. a flange sized larger than the hole to be plugged attached to said plug body and having pins mounted thereon for slidably receiving said plug body adjacent the outer end of said plug body to limit the movement. of said plug body into the hole to be plugged, said flange being contoured to the surface of the core barrel to be plugged;

c. a pawl pivotally mounted in said rectangular bore and moveable between first retracted release position and a second extended locking position; and

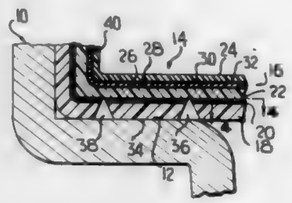
d. an actuator screw threadably engaged in said cylindrical bore and in communication with said rectangular bore and having a cam in communication with said pawl for moving said pawl between said first and second positions.

4,693,390

LID FOR A PLASTIC CONTAINER

Ihab M. Hekal, Stamford, Conn., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Oct. 15, 1986, Ser. No. 919,051
Int. Cl.⁴ B65D *41/00*
U.S. Cl. 220—359 **25 Claims**



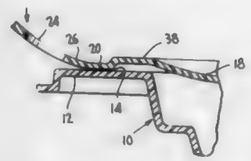
12. A lid for a plastic container, said lid comprising a barrier laminate, a base layer forming means for bonding said lid to a container, an adhesive layer between said base layer and said barrier laminate, and score line means in and through said base layer defining an area of said base layer to be permanently bonded to a container and to be peeled from the remainder of said lid.

4,693,391

CLOSURE HAVING A PULL TAB AND A CONTROLLED SEAL WIDTH AT THE PULL TAB

Donald J. Roth, Westport, Conn., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Oct. 23, 1986, Ser. No. 922,340
Int. Cl.⁴ B65D *41/00*
U.S. Cl. 220—359 **7 Claims**



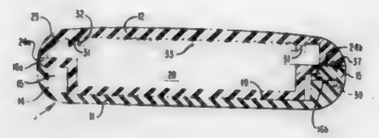
1. A closure, said closure being of the type constructed to have a rupturable bonded seal with a container and including a projecting pull tab for effecting removal of said closure, said pull tab having a radial axis, said closure being circular in outline at least at said pull tab, and said closure in alignment with said pull tab and radially inwardly of said pull tab being upwardly offset to change a configuration of a bonding surface of said closure from circular to angular to reduce an effective width of said bonding surface transversely of said pull tab axis and thus a peeling force required to remove said closure.

4,693,392

HINGE, AND BOSS ASSEMBLY FOR CLOSURE MEMBERS

Joseph P. Contreras, Sr., 6 Brockden Dr., Mendham, N.J. 07945

Filed Sep. 15, 1986, Ser. No. 907,483
Int. Cl.⁴ B65D *43/14*, *51/04*
U.S. Cl. 220—343 **26 Claims**



1. A concealed latch assembly for a closure member pivotally connected to a base member and movable from a closed position to a full open position and vice versa comprising,

a. spaced hinge means including, hinge elements connected respectively to the closure member and the base member to permit movement of the closure member to a full open position,

b. a boss member disposed between the hinge means so that a force must be exerted on the closure member during compressive forces on the closure member and the base member,

c. said boss member made of a material generally harder than the material for the closure member and the base member; and

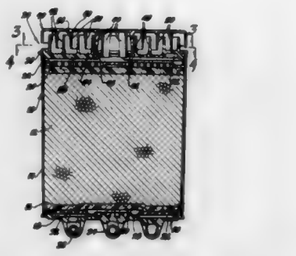
d. the boss member alternatively and selectively sized and shaped to provide a predetermined range of resiliency from rigid and non-yielding to readily flexible as required for movement of the closure member from closed position to a full open position and vice versa.

4,693,393

FUEL VAPOR STORAGE CANISTER HAVING TORTUOUS VENT PASSAGE

Chris M. DeMinco, West Rusk; Martin J. Field, Churchville, and Richard K. Judd, Rochester, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 849,807, Apr. 9, 1986, abandoned. This application Oct. 10, 1986, Ser. No. 917,672
Int. Cl.⁴ B65D *51/16*
U.S. Cl. 220—374 **2 Claims**



1. A fuel vapor storage canister comprising a housing having a bed of material adapted to absorb fuel vapor, an inner cover having a base closing one end of said housing, said base having a central aperture for air flow into said bed, said inner cover further having a plurality of concentric barriers surrounding said aperture and projecting outwardly from said base, an outer cover supported on said inner cover, said outer cover having a roof and a plurality of concentric barriers projecting inwardly from said roof, said outer cover barriers being interleaved with said inner cover barriers to define a labyrinthine

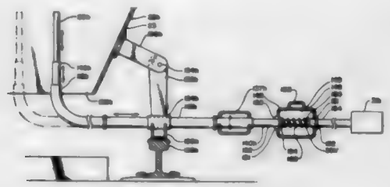
passage for air flow to said aperture, said covers thereby inhibiting the passage of water and dust to said aperture.

4,693,394

APPARATUS AND METHODS FOR DISPENSING COMPACTED MATERIALS

Timothy J. Martin, Jr., 1328 Pangborn Rd., Lynden, Wash. 98264, and Richard T. Henry, Bellingham, Wash., assignors to Timothy J. Martin, Jr., Lynden, Wash.

Filed Jan. 24, 1985, Ser. No. 694,414
Int. Cl.[4] B65G *69/06*
U.S. Cl. 222—1 **12 Claims**



1. Apparatus for loosening particulate material contained in a container, said apparatus comprising:

a. a flexible tubular member in fluid communication with a fluid source, a first end portion of said flexible tubular member located inside said container, second end portion of said flexible tubular member located outside of said container;

b. a support member jacketing said flexible tubular member substantially along the length thereof, a first end portion of said support member providing lateral support for said flexible tubular member first end portion along the longitudinal axis thereof, said support member having lateral flexibility along the longitudinal axis thereof which is less than that of said flexible tubular member, said flexible tubular member slidable within said support member to permit axial movement of said support member and said flexible tubular member relative to each other along the longitudinal axes thereof to expose selected lengths of said flexible tubular member first end portion; and

c. a sleeve member jacketing said support member, said sleeve member having less lateral flexibility along the longitudinal axis thereof than said support member, said support member slidable within said sleeve member to permit axial movement of said support member relative to said sleeve member along the longitudinal axis of said sleeve member to provide support for selected lengths of said support member first end portion.

4,693,395

ETHYLENE PROPYLENE COPOLYMER IN A SUBSTRATE AND COLLAPSIBLE DISPENSING CONTAINER MADE THEREFROM

Edward A. Tavss, Kendall Park; John Santalucia, East Brunswick, and David L. Carroll, Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 687,281, Dec. 28, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,119
Int. Cl.[4] B65D *35/08*
U.S. Cl. 222—107 **10 Claims**

6. A collapsible paste dispensing container of layers of material having low percentage flavor absorption characteristics of 4.8% comprising a first innermost layer of an ethylene propylene copolymer, a second layer of metal foil, a third layer of paper and an outermost fourth layer of an ethylene propylene



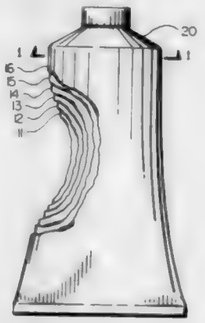
copolymer which is thicker than the first layer, and has a thickness ranging from about 3.5 to about 5.0 mils.

4,693,396

LAMINATE SUBSTRATE AND ARTICLE THEREFROM INCORPORATING FLUORINATED POLYETHYLENE

Edward A. Tavss, Kendall Park, N.J.; Samuel Temin, Needham, Mass.; John Santalucia, East Brunswick, and Davis L. Carroll, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 687,561, Dec. 28, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,120
Int. Cl.[4] B65D *35/08*
U.S. Cl. 222—107 **10 Claims**



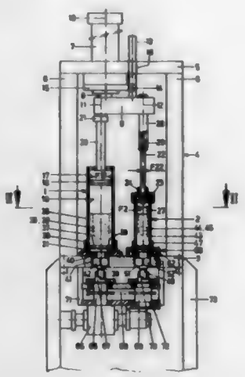
6. A collapsible paste dispensing container of layers of materials having low flavor percentage absorption characteristics of 2.6% comprising a first innermost layer of fluorinated polyethylene of a thickness range of from about 0.5 to about 3.0 mils, a second layer of metal foil of a thickness range of from about 0.5 to 2.0 mils, a third layer of paper of a thickness range of from about 1.5 to about 2.5 mils, and an outermost fourth layer of a fluorinated polyethylene which is thicker than said first on layer and ranges from about 3.5 to about 5.0 mils in thickness.

4,693,397

DOSING DEVICES FOR VISCOUS MATERIALS PARTICULARLY HIGHLY VISCOUS MATERIALS

Hans-Jörg Lang, Biberbach, Fed. Rep. of Germany, assignor to Ludwig Schwerdtel GmbH, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,281
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327420
Int. Cl.[4] B67D *5/52*
U.S. Cl. 222—137 **4 Claims**



1. A dosing device for dosing viscous materials, particularly highly viscous materials, including a dosing cylinder for a main material and at least one dosing cylinder for an additive to be dosed in an in each case fixed but variable volume ratio with respect to the main material, with a pressure feeding of the main material and additive into the dosing cylinders, each dosing cylinder containing a drivable dosing piston, a common drive and said dosing pistons being arranged on a common frame, a respective supply connection issuing into each dosing cylinder and a respective outlet connection issuing therefrom, each of said connections being openable or closable by means of a respective two-way valve, said dosing cylinders being arranged substantially parallel to one another, the dosing pistons of said dosing cylinders being drivable with an identical stroke and the dosing piston of the at least one additive dosing cylinder being contructed as a plunger with a smaller cross-section than the cross-section of the dosing cylinder for said main material and the plunger being sealingly guided in an interchangeable guide bush of said additive dosing cylinder, said at least one additive dosing cylinder being connected as a sub-assembly in an interchangeable manner by means of a rapidly connectable and releasable coupling to said frame, the dosing piston of the cylinder for said main material and the plunger of said at least one additive dosing cylinder engaging with a cross-beam which is displaceable by said drive parallel to itself along the axes of said dosing piston and plunger, the plunger of said at least one additive dosing cylinder not being connected to said cross-beam, the two-way valve being a cone-plug forming one unit with said additive dosing cylinder, said cone-plug of the at least one additive dosing cylinder being connected by means of a detachable coupling to a rotary drive.

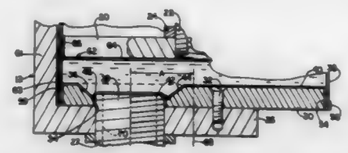
4,693,398

DISPENSING CONTAINER

Klaus-Wilhelm Voss, and Werner Kluj, both c/o Vosschemie GmbH, Ezinger Steinweg 50, Postfach 1355, 2082 Uetersen - Bei Hamburg, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 275,728
Int. Cl.[4] B67D *5/54*
U.S. Cl. 222—327 **4 Claims**

1. In combination with a dispensing container which comprises an annular side wall and a lower end wall closing a lower end of the side wall, the lower end wall being spaced upwardly of a lower edge of the side wall, there being a discharge opening in the lower end wall spaced a selected distance from a center of the lower end wall, a frame, a support member mounted on the frame and received in the space inside a lower end portion of the side wall, there being a space below the lower end wall and inside the lower end portion of the side



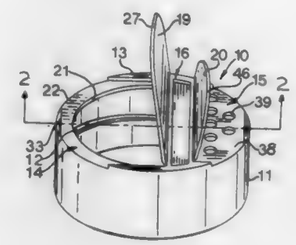
wall for receiving the support member, means for keying the discharge opening to an opening in the support member, a pipe member mounted in the frame and extending through the opening in the support member, the opening in the support member being a distance from the center of the support member equal to the selected distance, and means for urging contents of the container downwardly, the pipe member receiving contents of the container.

4,693,399

TWO-FLAP CLOSURE

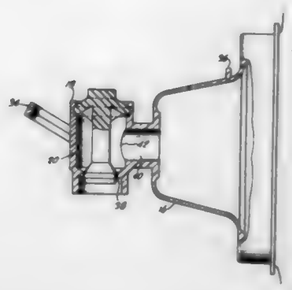
John R. Hickman, Talmadge, and Craig C. Weidman, Wooster, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

Filed Oct. 17, 1986, Ser. No. 920,566
Int. Cl.[4] A47G *19/24*
U.S. Cl. 222—480 **15 Claims**



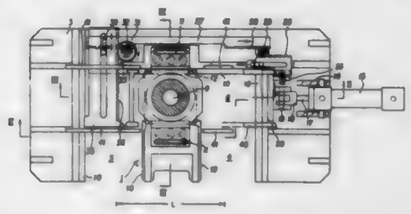
1. A two-mode dispensing cap for a container comprising an injection-molded thermoplastic one-piece body, the body having a generally circular end wall, the end wall having a spoon dispensing side and a shake dispensing side, the shake dispensing side including a plurality of relatively small apertures for dispensing therethrough a pourable product carried in the container, the spoon dispensing side including a relatively large aperture of a size sufficient for allowing passage of a spoon therethrough for spooning out product, each of said sides having an associated hinged flap, the flap of the shake side being arranged to selectively close relatively small apertures, the flap of the spoon side being arranged to selectively close said relatively large aperture, the spoon flap having a free edge defining with the line of the associated hinge substantially the full boundary of the spoon flap, the spoon flap including catch means spaced along a line adjacent its free edge, the catch means being arranged to releassbly secure the spoon flap in a closed position relative to the spoon aperture and extending along said adjacent line a distance substantially at least as great as one-half of the length of the free edge whereby the Flap is uniformly retained along its free edge.

4,693,400
EXTENDABLE-NESTABLE DISPENSING APPARATUS
Carl E. Frahm, 1428 Oak Meadow Rd., and B. Joseph Rokus, 1420 Oak Meadow Rd., both of Arcadia, Calif. 91006
Filed Aug. 26, 1985, Ser. No. 769,570
Int. Cl.[4] B67D *3/00*; B65D *47/30*
U.S. Cl. 222—518 **4 Claims**



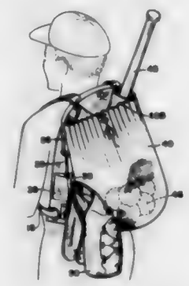
3. An apparatus for dispensing fluid from a container which comprises a selectively-operable dispensing valve in fluid communication with the container, means defining a cavity of sufficient size to allow said dispensing valve to nest inside the cavity, means for mounting the dispensing apparatus to a wall of the container, a flexible-extendable member interconnecting said mounting means and said valve, and a pulling tab for selectively moving the dispensing valve between a nested position in said cavity and an extended position outwardly from said cavity, said pulling tab having a first end attached to the valve and a second end which is movable between a first position for pulling the valve and a second position for locking the valve, and locking means extending from the flexible-extendable member constructed and arranged to engage the pulling tab in its locking position when the valve is nested in the cavity.

4,693,401
APPARATUS FOR COMPRESSIVELY HOLDING CASTING NOZZLES
Takahiro Nishimura, and Masao Ohnuma, both of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan
Filed Jul. 26, 1985, Ser. No. 759,638
Claims priority, application Japan, Jul. 28, 1984, 59-158285; Aug. 24, 1984, 59-177304
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—607 **10 Claims**



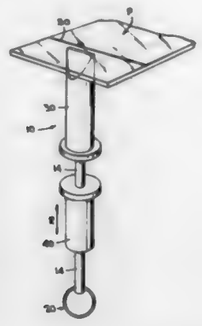
1. An apparatus for holding a casting nozzle against a device for controlling the rate of flow of molten metal comprising, a holder frame fixed to the bottom of said device and defining a casting nozzle travel passageway, a compressive holder disposed in said casting nozzle travel passageway for holding the casting nozzle, a spring box means on said holder having outer side portions resiliently supported by springs on opposite sides of said holder frame and rigidly connected to inner side portions provided with guide rail means forming a part of said passageway located beneath said device, a nozzle moving means mounted on said holder frame for moving the casting nozzle along said guide rail means, and a lifting means for causing the lifting of the casting nozzle against said device by said spring box means in response to movement of the casting nozzle along said guide rail means to fittingly hold said casting nozzle against said device..

4,693,402
SPORTS PACK
Perry Comeau, 7821 W. 100th St., Overland Park, Kans. 66212
Filed Jan. 21, 1986, Ser. No. 820,014
Int. Cl.[4] A45F *3/04*
U.S. Cl. 224—215 **4 Claims**



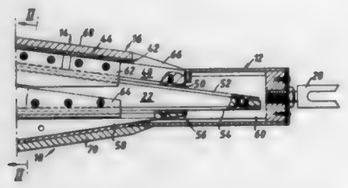
1. A pack for wearing on the back of a user for carrying sport equipment, the pack comprising;
- a back portion of flexible material having a front and back surface and being configured and dimensioned to be received on the back of the user with the front surface in contact with the user, the back portion having an upper edge, a lower edge, a right side edge and a left side edge, and having a first opening therein adjacent the lower edge and right side edge and a second opening therein adjacent the lower edge and left side edge;
- a left shoulder strap and a right shoulder strap, each strap being attached at one end to said back portion upper edge, the right shoulder strap extending forwardly of said back portion and through said first opening and the left shoulder strap extending forwardly of said back portion and through said second opening, the other ends of the straps being attachable to each other in front of the user;
- a generally tubular, elongated member affixed to the said back surface of said back portion and extending diagonally across said back portion, the tubular member being open at the top and closed at the bottom and adapted to receive an elongated sports item therein, such as a baseball bat, hockey stick, tennis racket and the like;
- a second generally tubular member affixed to said back surface of said back portion and extending diagonally at an angle to said first mentioned tubular member and being of length less than said first mentioned tubular member; and
- a sack member of flexible material secured to said back portion back surface and being open in the top and adaptable to receive balls and other playing equipment therein.

4,693,403
GLASS BREAKING TOOL
Michael L. Sprouse, 6304 Woodley Rd., Clinton, Md. 20735
Filed Dec. 31, 1985, Ser. No. 815,017
Int. Cl.[4] C03B *33/02*
U.S. Cl. 225—2 **6 Claims**



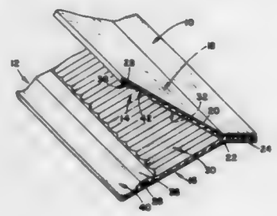
1. A method of breaking glass along a score line, comprising the steps of:
(a) providing a sheet of glass with a score line;
(b) providing an instrument; said instrument having: (1) a first member with a blunt end adapted to contact said sheet of glass; (2) a guiding means connected to said first member; (3) a second member moveable along said guiding means into striking engagement with said first member;
(c) positioning said blunt end of said instrument against said sheet of glass at a location opposite said score line;
(d) moving said second member into striking engagement with said first member, transmitting force to asid blunt end and thence to said sheet of glass, causing breaking of said sheet of glass in the vicinity of said score line.

4,693,404
MAINS BURSTING TOOL
Malcolm Wayman, Darras Hall, and Geoffrey I. Mood, Whitley Bay, both of England, assignors to British Gas Corporation, England
Filed Dec. 18, 1985, Ser. No. 810,245
Claims priority, application United Kingdom, Jan. 10, 1985, 8500565; Feb. 27, 1985, 8505093; May 8, 1985, 8511646
Int. Cl.[4] B23P *17/02*; B26F *3/00*
U.S. Cl. 225—103 **8 Claims**



1. A main bursting tool comprising a body having an elongated shape having a leading end and including a tapered portion which tapers towards said leading end, said body comprising a side-wall assembly partly defining said shape, said assembly comprising in said tapered portion two mutually complementary wall parts together totalling the entire circumferential extent of the tapered portion, at least one of said two parts being a movable part capable of rectilinear reciprocation so as to expand and contract said tapered portion, said at least one movable part having surfaces remaining in close relationship with adjacent surfaces on said assembly notwithstanding said reciprocation, and said tool further comprising operating means comprising hydraulic cylinder means operable to effect said reciprocation, said operating means being supported by said body in a relationship which relieves said hydraulic cylinder means of side and bending loads.

4,693,405
THREADING BELT FOR PULP FLOATER DRYERS
Serge Masse, Lachine, Canada, assignor to Ross Pulp and Paper Inc., La Salle, Canada
Filed Feb. 7, 1985, Ser. No. 699,379
Int. Cl.[4] B65H *20/06*; F26B *13/10*; G03B *1/56*
U.S. Cl. 226—91 **12 Claims**



1. A paper pulp web threading system comprising:
(a) a threading belt for selectively conveying a paper pulp web therewith, the threading belt including:
a main strength member extending longitudinally adjacent a first longitudinal edge of the belt, said main strength member comprising woven synthetic fibers having high tensile strength and minimal elastic stretch;
a polymeric material encompassing the main strength member to form a hermetic seal therearound, the polymeric material defining a pair of gripping portions for gripping the web therebetween, the gripping portions being hingedly connected adjacent the main strength member;
a pair of matingly interengaging lip portions wherein each lip portion includes a tensile member extending longitudinally therethrough and each lip portion is operatively connected with one of the gripping portions adjacent a second longitudinal edge of the belt;
said lip tensile members comprise woven synthetic fibers embedded within the polymeric material, the woven fibers being longitudinally stretchable yet having high tensile strength; and,
said lip tensile members being capable of at least 8% elastic stretch;
(b) guide rollers for guiding the threading belt along a preselected workpath;
(c) a loading station disposed along the workpath for selectively loading the web between the belt gripping portions;
(d) a pulp web dryer disposed along the workpath downstream from the loading station; and,
(e) an unloading station disposed downstream from the dryer for removing the web from the threading belt.

4,693,406
RIVET TOOL HAVING REVERSIBLE ANVIL
Alan Bartholomew; Harold Bauer, both of Newton, Kans.; Loren E. Berry, Rothschild, Wis., and Glen Ediger, Newton, Kans., assignors to Center Industries Corporation, Wichita, Kans.
Division of Ser. No. 701,692, Feb. 14, 1987, Pat. No. 4,602,414.
This application Jun. 4, 1986, Ser. No. 850,052
Int. Cl.[4] B25C *11/00*
U.S. Cl. 227—63 **1 Claim**

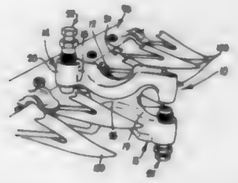
1. A hand tool for removal and replacement of double sickle section rivets, comprising:

a handle having fore and aft ends and presenting a pair of opposed side faces;

two working jaw sets respectively extending in generally opposite directions from said fore and aft ends of said handle, each of said jaws cooperatively presenting a generally C-shaped configuration and open, sickle section-receiving mouth, said mouths being in general horizontal alignment with each other;

means for permitting movement of said working jaw sets between a pair of adjacent, juxtaposed double-sickle sections for operable access to said sickle section rivets, said movement-permitting means comprising walls defining an elongated, fore and aft extending groove in said opposed side faces of said handle portion and in horizontal alignment with said mouths of said jaws;

one of said jaw sets having structure for replacement of a sickle section rivet, including



structure defining a bore in one of said jaws;

an elongated anvil bar having opposed end faces and configured for removable insertion into said bore, said end faces respectively including structure for alternately receiving different types of sickle section rivet heads; and

means carried by the other of said jaws for cooperatively engaging and closing the end of a sickle section rivet remote from said anvil;

the other of said jaw sets having structure for replacement of a sickle section rivet, including

structure defining a bore in one of said jaws; and

means carried by the other of said jaws for cooperatively engaging and pressing the rivet from the sickle and into said bore.

4,693,407

POWER IMPACT DEVICE, PARTICULARLY FOR FASTENERS

Manfred Buck, Nürtingen; Siegfried Fehrle, Leinfelden-Echterdingen; Martin Hölzel, Stuttgart; Wilfried Kabatnik, Leinfelden; Wolfgang Schmid, Filderstadt, and Karl Wanner, Leinfelden-Echterdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

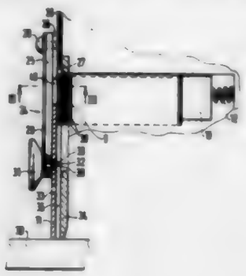
Filed Jul. 1, 1986, Ser. No. 880,915

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3533840

Int. Cl.⁴ B25C *5/06, 5/15*

U.S. Cl. 227—109 **20 Claims**

1. A power impact device, particularly for fasteners, comprising means forming a propelling passage; a driver movable in said propelling passage; a magazine for fasteners and crossing said propelling passage; and an abutment arranged for positioning a set of fasteners for separating a frontmost fastener by said driver, said abutment being formed so that only a part of the cross-section of the set of fasteners is supported and so that it is displaceable relative to said propelling passage, said driver having a cross-section which deviates from a cross-section of said propelling passage over a fit tolerance so as to



allow narrowing of said propelling passage without preventing movement of said driver and reducing its thickness.

4,693,408

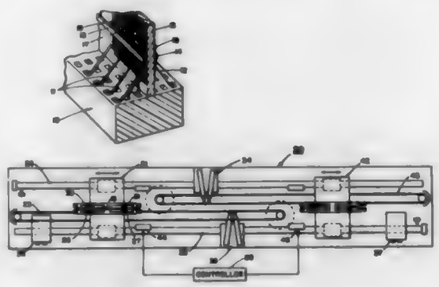
APPARATUS FOR BONDING CONNECTOR TERMINALS TO CIRCUIT BOARDS

David R. Dines, Oklahoma City, and Vertis C. Webb, Shawnee, both of Okla., assignors to American Telephone and Telegraph, Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 701,461, Feb. 14, 1985, Pat. No. 4,653,682. This application May 2, 1986, Ser. No. 858,663

Int. Cl.⁴ B23K *31/02*

U.S. Cl. 228—47 **10 Claims**



1. An apparatus for reflowing solder to bond a series of spaced terminals projecting from a connector onto contact pads located along the edge of a circuit board where either or both of the terminals and the contact pads have solder deposited thereon, which comprises:

a carrier for supporting the circuit board and the connector with its terminals overlaying the contact pads;

heating means for projecting a stream of hot air;

means for guiding said carrier to move the overlaying terminals and contact pads through said stream of hot air;

means for initially moving the carrier past the stream of hot air at a fast rate in a first direction to preheat the overlaying terminals, the contact pads and the solder to a temperature below the reflow temperature of the solder and for returning the carrier at a slow rate in a second opposite direction past the stream of hot air to apply sufficient heat to the solder to reflow and solder bond the terminals to the contact pads; and

means for engaging and holding the connector terminals in overlaying position with the contact pads during the moving and returning of the carrier past the stream of hot air.

4,693,409

METHOD FOR DIRECTLY BONDING CERAMIC AND METAL MEMBERS AND LAMINATED BODY OF THE SAME

Nobuyuki Mizunoya; Hajime Kohama, and Yasuyuki Sugiura, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 507,004, Jun. 23, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,874

Claims priority, application Japan, Jun. 29, 1982, 57-112401; Jun. 29, 1982, 57-112402

Int. Cl.⁴ B23K *35/368*

U.S. Cl. 228—122 **4 Claims**

1. A method for directly bonding a nonoxide-type ceramic member selected from the group consisting of nitride ceramic member and carbide member to a copper member, comprising the steps of:

oxidizing a surface of said ceramic member to form an oxide layer 20 μm or less in thickness,

bringing said copper member into contact with the oxide layer of said nonoxide-type ceramic member, and

heating said copper member and said nonoxide-type ceramic member at a temperature of from 1065° to 1083° C. in an inert gas atmosphere to directly bond said copper member to said nonoxide-type ceramic member.

4,693,410

DRINKING CUP WITH CLOSURE FOR OPEN BOTTLES AND/OR CANS

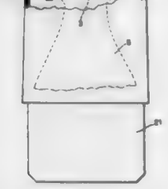
Aloiz Selz, Freiburg, Fed. Rep. of Germany, assignor to Surculus AG, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 561,198, Dec. 14, 1983, abandoned. This application Dec. 12, 1985, Ser. No. 809,059

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3302842; European Pat. Off., Nov. 12, 1983, 83111317.0

Int. Cl.⁴ B65D *41/26, 41/50, 41/58;* **A47G** *19/22*

U.S. Cl. 229—1.5 B **57 Claims**



1. A multiple-purpose vessel for application to the open end portion of a container whose open end portion has a partially spherical external surface, comprising a drinking cup; and at least one closure for the open end portion of the container, said cup having a bottom, and said closure being provided on said cup in the region of said bottom and including a cap which is arranged to overlie and surround the open end portion of the container and has a concave, partially spherical internal surface substantially complementary to the external surface of the container, said cap consisting at least in part of an elastically deformable material and being designed for application to the open end portion of the container by snap action so that said surfaces are in sealing contact with one another to prevent spillage of the contents of the container, and said cap having a section which is disposed on the side of said internal surface remote from said bottom and diverges outwardly in a direction away from said bottom so as flare away from the container when said cap overlies and surround the open end portion thereof, said section and the complementary partially spherical surfaces of the container and said cap providing freedom for said closure to swivel within limits with reference to the open end portion of the container while sealing contact between said surfaces is maintained.

4,693,411

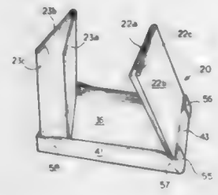
COLLAPSIBLE BULK SHIPPING CONTAINER

Teddy R. Snyder, Maumee, Ohio, assignor to OI Forest Products STS Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 859,957, May 5, 1986, Pat. No. 4,691,859. This application Jun. 13, 1986, Ser. No. 873,929

Int. Cl.⁴ B65D *5/35*

U.S. Cl. 229—23 R **32 Claims**



1. A collapsible bulk shipping container comprising:

a tray-type bottom, said tray-type bottom having:

a rectangular bottom panel, said rectangular bottom panel having a first pair of opposed, 5. spaced-apart edges and a second pair of opposed, spaced-apart edges, said second pair of opposed, spaced-apart edges extending transversely between said first pair of opposed, spaced-apart edges;

a first pair of panel means, one of said 10. first pair of panel means being foldably attached to one of said first pair of opposed, spaced-apart edges of said rectangular bottom panel, at least a portion of said one of said first pair of panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said one of said first pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said at least a portion of said one of said first pair of panel means extends 20. generally normally from said rectangular bottom panel, at least a portion of the other of said first pair of panel means being foldably attached to the other of said first pair of opposed, spaced-apart edges of said rectangular bottom panel, said at least a portion of said other of said first pair of panel means being foldable with respect to said rectangular bottom panel from a first position in which said at least a portion of said other of said first pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said other of said at least a portion of said first pair of panel means extends generally normally from said rectangular bottom panel;

a second pair of panel means, one of said second pair of panel means being foldably attached to one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said one of said second pair of panel means being foldable, with respect to said rectangular bottom panel, from a first position in which said one of said second pair of panel means extends generally parallel to said rectangular bottom panel to a second position in which said one of said second pair of panel means extends generally normally from said rectangular bottom panel, the other of said second pair of panel means being foldably attached to the other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel;

a first intermediate panel, said first intermediate panel being directly foldably attached to one of said second opposed, spaced-apart edges of said rectangular bottom panel, one of said second pair of panel means being foldably attached to said one of said second pair of

opposed, spaced-apart edges of said rectangular bottom panel by being foldably attached to said first intermediate panel, said one of said second pair of panel means being foldably attached to said first intermediate panel along a first intermediate fold line which is spaced from and which extends generally parallel to said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said first intermediate fold line and said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel forming a first space therebetween, said first space having a width extending between said first intermediate fold line and said one of said second pair of opposed, spaced-apart edges of said rectangular bottom panel; and

a second intermediate panel, said second intermediate panel being directly foldably attached to the other of said second opposed, spaced-apart edges of said rectangular bottom panel, said other of said second pair of panel means being foldably attached to said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel by being foldably attached to said second intermediate panel, said other of said second pair of panel means being foldably attached to said second intermediate panel along a second intermediate fold line which is spaced from and which extends generally parallel to said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel, said second intermediate fold line and said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel forming a second space therebetween, said second space having a width extending between said second intermediate fold line and said other of said second pair of opposed, spaced-apart edges of said rectangular bottom panel; and

a pair of body segments, each of said pair of body segments being telescoped within said tray-type bottom and further being collapsible from a first, open configuration in which said pair of body segments form, with one another, a tubular structure having a rectangular configuration to a second, collapsed configuration, each of said pair of body segments having:

a first side having first and second spaced-apart edges, said first side being disposed adjacent to, and being substantially coextensive with, one of said second pair of panel means of said tray-type bottom, said first side of one of said pair of body segments being secured to said one of said second pair of panel means of said tray-type bottom, said first side of the other of said pair of body segments being secured to the other of said second pair of panel means of said tray-type bottom; and

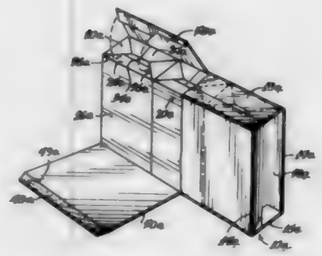
second and third sides, the second side of each of said pair of body segments being foldably attached to one of said first and second spaced-apart edges of said first side of said each of said pair of body segments, the third side of each of said pair of body segments being foldably attached to the other of said first and second spaced-apart edges of said first side of said each of said pair of body segments, each of the second and third sides of each of said pair of body segments being foldable with respect to said first side of said each of said pair of body segments between a first position in which said each of said second and third sides extends generally perpendicularly to said first side of said each of said pair of body segments and a second position in which said each of said second and third sides extends generally parallel to said first side of said each of said pair of body segments, each of said pair of body segments being foldable with respect to said rectangular bottom panel of said tray-type bottom between a first position in which said each of said pair of body segments extends generally perpendicularly to said rectangular bottom panel and a second position in which said each pair of body segments extends generally parallel to said rectangular bottom panel, said second and third sides of said each of said pair of body segments being in said second position with respect to said first side of said each of said pair of body segments when said each of said pair of body segments is in said second position with respect to said tray-type bottom.

4,693,412

SLEEVE PACKAGE HAVING LOCKING TABS FOR HOLDING MULTIPLE ACEPTIC CARTONS

William E. Yeaman, Sr., Park Ridge, Ill., assignor to Yeaman Packaging Group, Inc., Wheeling, Ill.

Filed Sep. 9, 1985, Ser. No. 773,793
Int. Cl.[4] B65D *75/06*
U.S. Cl. 229—40 **16 Claims**



1. A sleeve package for holding a plurality of aceptic cartons in a row, the combination of

each carton being of a block shape having opposed pairs of side walls and a pair of end walls, and the walls of each of such pairs being transverse to one another,

one end wall of each carton comprising an end closure having a main panel and an overlapping flap, said flap having a portion disposed transverse to the main panel,

a paperboard blank formed with adjacent panels, hinged to one another across spaced respective fold lines, the panels including at least one major panel and inner and outer lap panels,

said blank being adapted to be wrapped around the cartons, with the lap panels secured together and overflapping the one end wall of each carton, to define a sleeve having a pair of open ends,

said cartons being in the sleeve with the row aligned with the open ends of the sleeve,

the cartons at the opposite ends of the row being exposed out the open ends of the sleeve,

the end closure flap portion being disposed transverse to the open ends of the sleeve and facing the adjacent open end of the sleeve,

a tab formed off of the inner lap panel adjacent one of the exposed end cartons,

the tab having an edge extended transverse to the fold lines in the blank, and being shaped and located to have said edge cooperate with the carton end closure flap portion, to hold the one carton within the sleeve.

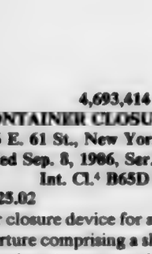
4,693,413

LAMINATED BULK BIN CORNER STRUCTURE

William W. McFarland, Maryville; Russell E. Gandy, Georgetown, both of S.C., and Michael A. Churvis, Murfreesboro, Tenn., assignors to International Paper Company, Purchase, N.Y.

Filed Nov. 20, 1986, Ser. No. 932,821
Int. Cl.[4] B65D *5/42*
U.S. Cl. 229—48 R **4 Claims**

1. A paperboard laminate for forming a bulk bin by folding the laminate, the laminate being planar and adapted to be folded 180 degrees and then to be refolded back 90 degrees to a 90 degree position from its original, planar form, the laminate including a first, bulk bin exterior forming corrugated paperboard layer and a next adjacent corrugated paperboard layer, a common interface surface between said first and second corrugated paperboard layers, said first layer having on its said interface surface a pair of parallel score lines, a score line located substantially midway between said first mentioned pair of score lines and located on the non common interface surface of said first layer, said score lines all being parallel to each other, said second layer being overlapped and adhered to said





first layer, the common interface surface of said second layer being adhered, along an attachment strip thereof, to a corresponding attachment strip on the common interface surface of the first layer, said strip being substantially midway between said first mentioned pair of parallel score lines, whereby a 180 degree fold is formed by folding 90 degrees along each of said parellel lines on the common interface surface of said first layer and whereby upon refolding the 180 degree fold back 90 degrees, the several components of the corrugated paperboard layers do not become distorted and therefore retain their strength and uniform appearance at the refolded, 90 degree position.

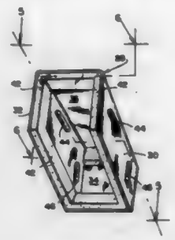
4,693,414

CONTAINER CLOSURE DEVICE

Louis Allen, 166 E. 61 St., New York, N.Y. 10021

Filed Sep. 8, 1986, Ser. No. 904,968
Int. Cl.[4] B65D *5/64*
U.S. Cl. 229—125.02 **21 Claims**

1. A container closure device for a package container having a dispensing aperture comprising a shell including a pair of face plates, a side panel, and a top panel, means for urging at least the face plates toward each other, a compressible lining within the shell conforming to the container for providing a tight seal,



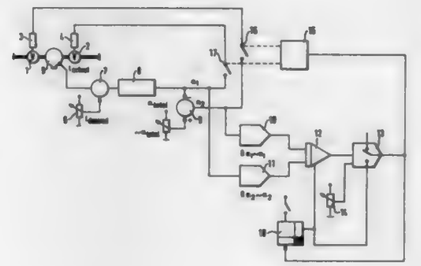
and locking means interacting with the container walls for providing snap-fitting engagement with the container.

4,693,415

METHOD AND CIRCUITRY FOR CONTROL OF A SANITARY MIXER FOR COLD AND HOT WATER

Hans-Josef Sturm, Friedrichsdorf, Fed. Rep. of Germany, assignor to Knebel & Rottger GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,158
Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518645
Int. Cl.[4] G05D *23/185*
U.S. Cl. 236—12.12 **16 Claims**



1. Method for control of a sanitary mixer for cold and hot water by carrying out temperature control by means of a comparison between the actual temperature of the mixed water and a preset temperature, comprising:

continuously measuring the actual temperature in the mixed water and electronically deriving at least two separate, time-varying regulating values, used for electromechanical adjustment both of the cold water supply as well as of the hot water supply, from the difference between the set temperature and the actual temperature and taking into account preset flow rate of the mixed water to be kept constant during temperature control in the determination of the regulating valves; and

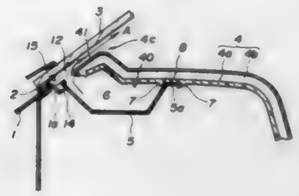
determining from the time-varying regulating values partial flow rates proportional to the regulating values, continuously determining from the partial flow rates the instantaneous cumulative filling volume of the mixed water, and, when a cumulative filling volume value equal to a preset cumulative filling volume is reached, setting the regulatingvalues to zero, thus shutting off the cold water supply and the hot water supply.

4,693,416

DEFROSTER STRUCTURE FOR VEHICLE

Toshihiro Hayakawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 12, 1986, Ser. No. 873,523
Claims priority, application Japan, Jun. 14, 1985, 60-90756[U]
Int. Cl.⁴ B60H *1/00*
U.S. Cl. 98—2.09 **5 Claims**



1. A defroster structure for a vehicle having a defroster member disposed in the vicinity of a cowl and a nozzle opening of the defroster formed in the vicinity of a window shield of an instrument panel comprising:

an enclosed space surrounded by an inner wall of the instrument panel and a tray-shaped defroster member under the inner wall in the vicinity of the window shield; and

a plurality of fins integrally formed with the defroster member for forming the nozzle opening, said nozzle opening formed at the foremost position of the instrument panel in the vicinity of the window shield in the longitudinal direction of a vehicle;

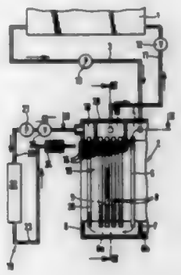
wherein said nozzle opening provides the sole communication between said enclosed space and said window shield.

4,693,417

HEATING OR AIR-CONDITIONING SYSTEM FOR VEHICLES

Klaus Arold; Heinz Koukal, both of Sindelfingen; Hermann Grimm, deceased, late of Ostelsheim (by Christel Grimm, executrix), and Hans Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 871,893
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520553
Int. Cl.⁴ B60H *1/02*
U.S. Cl. 237—12.3 B **14 Claims**



1. A vehicle heating or air-conditioning system comprising:

main heat exchanger means having forward flow tank means and return flow tank means connected to return cooled water to an engine, said tank means being connected to one another by a plurality of parallel flowing ribbed connecting tubes against which air flows that is guided into a vehicle passenger space, and

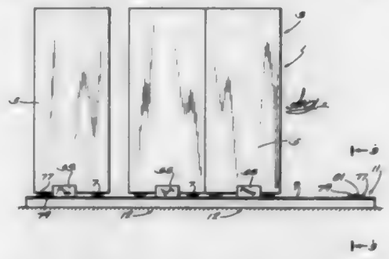
auxiliary heat exchanger means having auxiliary panel radiator means arranged in the vehicle interior, said panel radiator means being supplied by fluid heat medium from an auxiliary heat supply portion of the return flow tank means of the main heat exchanger means.

4,693,418

MODULAR FLOOR

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Aug. 16, 1985, Ser. No. 766,249
Int. Cl.⁴ E01B *23/00*
U.S. Cl. 238—10 R **13 Claims**



1. A floor module for supporting a wheeled carriage above a building floor comprising:

a. a pair of parallel rails adapted to support the carriage wheels for horizontal longitudinal movement therealong;

b. a plurality of longitudinally spaced beams placed transversely under and joined to the rails for supporting the rails, the opposed ends of the transverse beams being provided with upturned tab means outboard of the respective adjacent rails for defining longitudinal channels;

c. at least two vertically adjustable leveling screws received within each transverse beam near the ends thereof and outboard the rails for vertically adjusting the rails;

d. panel means and means for securing said panel means to the transverse beams to form a unitary module; and

e. a ramp extending transversely from each side of the module, each ramp having a first end for being supported on the building floor and a second end defining hook means for being removably received within the transverse beam longitudinal channels defined by the beam upturned tab means, the ramps being of sufficient size and strength for a person to walk on them adjacent the wheeled carriage.

4,693,419

AUTOMATIC CONTROL APPARATUS AND METHOD FOR SPRINKLING WATER OVER A PREDETERMINED AREA

Marvin H. Weintraub, West Bloomfield; Donald R. Bernier, Lake Orion, and Larry Cameron, Sterling Heights, all of Mich., assignors to Water Sentry, Inc., Southfield, Mich.

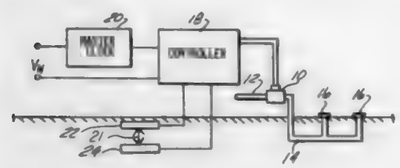
Filed Nov. 2, 1981, Ser. No. 317,334
Int. Cl.⁴ A01G *25/16*
U.S. Cl. 239—63 **1 Claim**

1. A control apparatus for controlling the release of water over a predetermined area comprising:

first and second sensor means for sensing an electrical resistance indicative of the degree of moisutre content of the soil within the predetermined area;

means for mounting the first and second sensor means in a horizontal or entation within the soil, with the first sensor means disposed immediately below the plant root layer and the second sensor means spaced below the first sensor means a predetermined distance related to the wilt point of moisture content of the particular type of soil within the predetermined area , the mounting means including a strip-like member having a plurality of spaced apertures formed therein, the first and second sensor means being removably insertable into selected ones of the apertures at a predetermined horizontal spacing

means for establishing an electrical reference value equivalent to the wilt-point amount of moisture content of the particular type of soil found in the predetermined area;



means for comparing the reference value and the output of the first and second sensor means; and

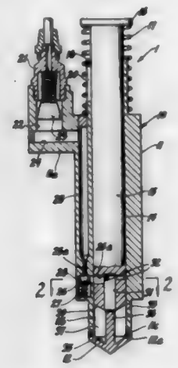
output means, responsive to the comparator means, for controlling the release of water to the predetermined area.

4,693,420

AIR-ASSIST FUEL INJECTION NOZZLE

Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1986, Ser. No. 900,093
Int. Cl.⁴ F02M *47/00*
U.S. Cl. 239—87 **3 Claims**



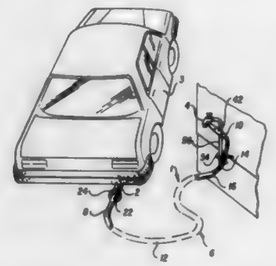
1. An air-assist fuel injection nozzle for use in discharging fuel into an associate combustion chamber of an internal combustion engine, said injection nozzle including a nozzle body means having a spray tip end at one end thereof that includes an outer straight walled, spray tip portion which terminates at an enclosed end having an internal wall of frusto-conical configuration with a central pin upstanding therefrom, said straight walled spray tip portion having a plurality of radial discharge orifices extending therethrough; an axial bore in said body means extending from the opposite end thereof to define a bushing, a needle plunger reciprocably received in said bushing between a fully raised position and a fully depressed position corresponding to the end of a suction stroke and the end of a pump stroke, respectively, one end of said needle plunger extending outward from said opposite end of said nozzle body means so as to be externally actuatable, the opposite end of said needle plunger having a blind bore extending a predetermined axial extent and of an internal diameter to slidably receive said central pin, said needle plunger having a radial supply passage and a plurality of circumferentially spaced apart radial discharge ports angularly aligned with said radial discharge orifices, wherein said discharge ports are in flow communication with said blind bore, said needle plunger and the interior portion of said enclosed end of said nozzle body means defining a variable volume pump chamber, said nozzle body means including a supply passage means with a check valve therein in fluid communication with said radial supply passage when said needle plunger is in said raised position, the opposite end of said supply passage means being connectable so as to sequentially receive a metered quantity of pressurized fuel, said needle plunger allowing seriform fluid flow from said associate combustion chamber into said pump chamber through said radial discharge orifices when said needle plunger is in said raised position and when said needle plunger is on a said pump stroke, said needle plunger blocking flow through said radial discharge orifices until such time as said needle plunger has moved a predetermined axial extent so that said radial discharge ports come into alignment with said radial discharge orifices to initiate an air-assist discharge of air, fuel vapors and fuel from said radial discharge orifices.

4,693,421

APPARATUS FOR CONDUCTING HOT GASES FROM AN EXHAUST PIPE

Allan Cameron, Sr., 4602 Morris Avenue, Terrace, British Columbia, Canada V8G 2H1

Filed Apr. 14, 1986, Ser. No. 851,349
Claims priority, application Canada, Apr. 15, 1985, 479107
Int. Cl.⁴ B05B *1/24, 15/06, 15/08*; F16L *25/00*
U.S. Cl. 239—129 **3 Claims**



1. An apparatus for conducting hot gases from an exhaust pipe, the apparatus comprising:

(a) an elongated, flexible conduit with an inlet end and an outlet end, the conduit having a portion comprising a spirally wound conduit which is flexible when twisted in one direction and locks in a desired position when twisted in a direction opposite the one direction, the portion being adjacent the outlet end;

(b) an outlet fitting on the outlet end of the conduit, shaped to direct the hot gases to an object to be heated;

(c) an inlet fitting on the inlet end of the conduit having a flexible seal for frictionally engaging exhaust pipes of different sizes, the seal comprising a resilient annular member having a central aperture therein for receiving the exhaust pipe, the inlet fitting having a truncated conical shape which has a larger end for facing towards the exhaust pipe, the member being adjacent the larger end and having radial slits extending outwardly from the central aperture whereby the gases can escape between the slits if the conduit or the outlet fitting is blocked; and

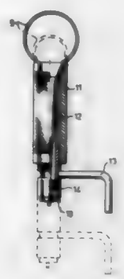
(d) clamp means on the conduit for holding the outlet fitting in position, the clamp means being near an end of the portion of the conduit opposite the outlet fitting, the clamp means including a pair of pivotally connected members which are resiliently biased towards each other.

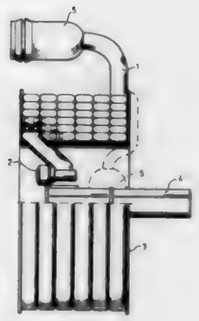
4,693,422

DEVICE FOR FIRE FIGHTING

Karl-Gustav Persson, Gislaved, Sweden, assignor to IKO Kabel AB, Grimsas, Sweden

Continuation of Ser. No. 692,962, Jan. 18, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,665
Claims priority, application Sweden, Jan. 20, 1984, 8400270
Int. Cl.[4] A62C *33/04;* **F16L** *33/02*
U.S. Cl. 239—195 **9 Claims**





5. A device for fire fighting comprising:

a flexible tube having two opposed ends for transmitting fluid;

a nozzle at one of said ends;

a coupling joined to the other of said ends for fitting the tube onto a fluid source connection;

a flexible securing member wound around said coupling for holding said coupling on the fluid source connection, said securing member have two end portions;

operating means joined to said end portions of said securing member for tightening said securing member around said coupling, said operating means including an outer portion and an inner portion extending axially beyond one end of the outer portion when said operating means is in a resting position; and

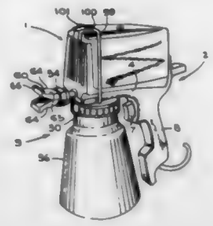
gliding means positioned between the operating means and said end portions for exerting a predetermined amount of pressure therebetween in order to oppose turning movement of said end portions during the tightening operation and to cause said inner portion to recede into the one end of said outer portion when the predetermined amount of pressure is exceeded to indicate that a sufficient tractive force has been applied to said coupling.

4,693,423

POWER PAINT SPRAYER

Elverton O. Roe, and C. Gregg Moore, both of Wooster, Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Feb. 25, 1986, Ser. No. 832,598
Int. Cl.[4] B05B *9/043;* **F16B** *37/08*
U.S. Cl. 239—332 **25 Claims**



1. Sprayer apparatus comprising a pump and container assembly including a pump housing containing a liquid pump and a container for the liquid to be sprayed suspended from said pump housing, a separate power handle assembly including a motor housing containing motor means for driving said pump, said pump housing and said power handle assembly having oppositely facing locating surfaces, and mounting means for detachably mounting said pump housing to said motor housing, said mounting means including a bottom recess in said motor housing for receipt of said pump housing, a flange on said pump housing and a notch in said motor housing, said flange and notch being formed to permit said flange to be inserted into said notch with said locating surfaces initially at an angle to each other and thereafter to be pivoted so as to bring said locating surfaces into abutting engagement, and a bail pivotally connected to said pump housing for pivotal movement into locking engagement with a bail retention surface on said power handle assembly thereby to hold said locating surfaces in engagement with each other to limit relative vertical movement between said pump housing and said power handle assembly.

19. Sprayer apparatus comprising a pump and container assembly including a pump housing containing a liquid pump and a container for the liquid to be sprayed suspended from said pump housing, and a power handle assembly including a motor housing containing motor means for driving said pump, said motor means including an electromagnet and associated armature that reciprocates when an alternating current is applied to said electromagnet, and said pump including an axially movable pump piston, and spring means for biasing said pump piston into engagement with one side of said armature, and said power handle assembly including a stroke limiting screw movable toward and away from the opposite side of said armature for limiting the movement of said armature in a direction away from said pump piston, and split nut means biased into frictional engagement with opposite sides of said stroke limiting screw for applying a friction load to said stroke limiting screw preventing creep of said stroke limiting screw due to vibrations and the like.

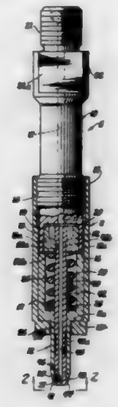
4,693,424

POPPET COVERED ORIFICE FUEL INJECTION NOZZLE

David P. Szromak, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 754,769, Jul. 15, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 889,259
Int. Cl.[4] B05B *1/32;* **F02M** *61/10*
U.S. Cl. 239—453 **3 Claims**

1. A poppet covered orifice fuel injector nozzle for use in a direct injection type diesel engine, said fuel injector nozzle including an injector body means having an inlet for pressurized fuel at one end thereof and having a spray tip at the opposite end thereof; said spray tip having a discharge free end and having an axial stepped through bore of predetermined internal diameter therein at its discharge free end with an annular frusto-conical valve seat encircling said bore at said discharge free end of said spray tip, an outward opening poppet valve operatively positioned in said injector body means, said poppet valve including an annular head with a frusto-conical valve seat surface positioned for movement between a closed position and an outward open position relative to said valve seat and a stem portion extending from said head that is slidably received in said bore; said poppet valve having an internal passage means in fluid communication at one end with said inlet and terminating at its other end in circumferentially



spaced apart radial orifices that are inclined and located so as to discharge fuel parallel to and directly across said valve seat surface of said head; each of said orifices having a Length of orifice to Diameter of orifice ratio on the order of 4 to 8; and spring means operatively associated with said poppet valve to normally bias said head of said poppet valve to said closed position; said frusto-conical valve seat and said valve seat surface together with said discharge free end of said spray tip being configured so that said valve seat surface will effect sealing engagement with said valve seat at substantially the outer peripheral edge thereof with substantially no overhang of these elements with respect to each other whereby to prevent fuel wetting during injection when said head is moved to said open position and to prevent fuel flow from said orifices when said head is in said closed position.

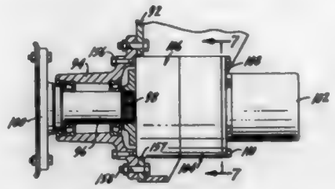
4,693,425

DRIVE FOR MOVABLE IRRIGATION SYSTEM AND THE LIKE

Charles H. Meis, Albion, and Duane B. Overvaag, Columbus, both of Nebr., assignors to Lindsay Manufacturing Co., Lindsay, Nebr.

Division of Ser. No. 626,546, Jun. 29, 1984, Pat. No. 4,618,102, which is a continuation-in-part of Ser. No. 588,376, Mar. 12, 1984, abandoned. This application May 19, 1986, Ser. No. 864,331
Int. Cl.[4] A01G *25/09;* **B05B** *3/18*
U.S. Cl. 239—735 **6 Claims**

2. In a movable irrigation system, an elongated water distribution pipe, a plurality of movable towers supporting the pipe at spaced intervals, ground engaging wheels on each tower, at least one high speed electric motor on each tower, a drive train between the electric motor and at least one of the wheels, and a gear reduction mechanism in the drive train for reducing the speed of rotation and increasing the torque, including input and output shafts therefor, the input shaft being driven by the electric motor and the output shaft driving at least one of the ground engaging wheels, two gear assemblies, the first being constructed and arranged for maximum speed reduction and minimum torque capacity and driven by the input shaft, and



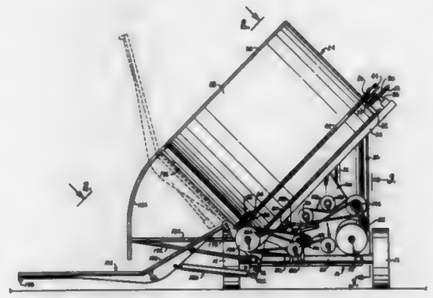
the second being driven by the first and constructed and arranged for minimum speed reduction and maximum torque capacity and driving the output shaft.

4,693,426

TUB CHOPPER

Allen A. White, Rte. 2, Box 9, Peabody, Kans. 66866

Division of Ser. No. 229,347, Jan. 29, 1981, Pat. No. 4,364,526. This application Sep. 7, 1982, Ser. No. 415,655
Int. Cl.[4] B02L *13/286*
U.S. Cl. 241—18 **6 Claims**



1. A method of comminuting material comprising the steps of:

confining the material between a pair of members disposed to define a V-shaped cavity therebetween, the respective angles of inclination of each member being greater than the angle of repose of the material thereon to insure gravitation of the material toward the bottom of the cavity;

maintaining one of said members stationary;

moving the other member across the path of gravitation of material on the stationary member to engage said material with the moving member; and

chopping the material at a station proximal the bottom of the cavity, whereby the moving member and gravitation of the material cooperate to produce uniform feeding of the material to the chopping station.

4,693,427

METHOD FOR IMPROVING HANDLEABILITY OF CALCINED KAOLIN CLAY PRODUCTS

Bomi M. Bilimoria, Tennille; Herbert I. Lewis, Wrens; Jerry A. Cook, Cartersville; Ralph E. Turner Jr., Tennille, and Robert H. Garner, Sandersville, all of Ga., assignors to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 667,400, Nov. 2, 1984, Pat. No. 4,593,860, and a continuation-in-part of Ser. No. 661,266, Oct. 15, 1984, Pat. No. 4,561,597, said Ser. No. 667,400, is a continuation of Ser. No. 341,918, Jan. 21, 1982, abandoned, said Ser. No. 661,266, is a continuation of Ser. No. 390,855, Jun. 22, 1982, abandoned. This application Dec. 30, 1985, Ser. No. 814,644

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ B02C *21/00*

U.S. Cl. 241—23 **9 Claims**

1. A method of preparing a calcined kaolin clay powder having increased bulk density and decreased wet-out time comprising:

(a) heating a kaolin clay powder of fine particle size to at least 400° C. to render same at least substantially anhydrous; and

(b) dry milling said anhydrous clay powder in a media mill using media having a particle size of at least +5 mesh, and using a work input in the range of from about 5 to about 40 HP-hrs/ton of dry clay.

4,693,428

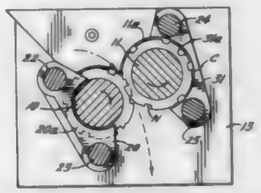
PARTICLE-TYPE SHREDDING MECHANISM

Donald E. Raterman, Deerfield, and James M. Amburn, Mundelein, both of Ill., assignors to Cummins Allison Corporation, Mt. Prospect, Ill.

Filed Nov. 1, 1984, Ser. No. 667,151

Int. Cl.⁴ B02L *18/16*

U.S. Cl. 241—167 **5 Claims**



1. A document shredder comprising the combination of

a pair of spaced apart counter-rotating particle-type document shredder rolls forming integral cutting discs the cutting discs on one roll being interleaved with the cutting discs on the other roll for cutting documents fed between the rolls into multiple strips each disc on a respective roll being spaced from an adjacent disc on the same roll, said discs also having cutting edges extending longitudinally of the rolls for cutting said multiple strips into short segments,

multiple spacers mounted along the length of each roll, a spacer extending into each space between a pair of adjacent cutting discs on the same roll and extending around only a portion of the circumference of the roll on the side thereof which is substantially opposite to the space between the rolls, and

multiple diverters spaced along the length of each roll a diverter being in register with each of a respective cutting disc on the respective rolls, each of said diverters having an arcuate surface having end portions located radially outwardly of the respective cutting disc and closely adjacent to the peripheral outer surfaces respective of said disc on the side thereof which is substantially opposite to the space between the rolls for preventing the accumulation of said short segments of the cut documents adjacent said rolls.

4,693,429

DEVICE AND PROCESS FOR SIMULTANEOUSLY WINDING SEVERAL SEPARATE FIBERS ON A ROTATING SUPPORT

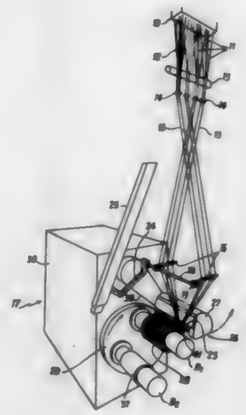
Georges Billiard, Chamberly-Le-Vieux; Francoise Blanchard, Chambery; Willy Klemenz, Cognin; Roger Combet, La Motte Servolex, and Daniel Richard, Montmelian, all of France, assignors to Vetrotex Saint Gobain, Chambery, France

Filed Nov. 14, 1985, Ser. No. 798,071

Claims priority, application France, Jul. 25, 1985, 85 11378

Int. Cl.⁴ B65H *54/08, 54/28*

U.S. Cl. 242—18 G **11 Claims**



1. Apparatus for forming and winding on the same support several continuous fibers of thermoplastic material comprising:

a spinneret receiving said thermoplastic material and keeping said thermoplastic material in a molten state;

a rotating spindle carrying said support and mechanically drawing strands of said material from orifices of said spinneret in the form of elementary filaments;

a gathering and guide device to group said filaments into at least two separate fibers and to guide said fibers to said spindle;

a crisscrossing device near the spindle including a fiber guide driven back and forth by said crisscrossing device along a line of travel in front of said spindle, said fiber guide positively guiding said fibers and moving them back-and-forth to distribute said fibers on said support, said fiber guide having an opening in front of said spindle communicating with an interior guide zone of said fiber guide, at least two notches in said fiber guide communicating with and opening into said interior zone; and

a stop positioned near each end of travel of said fiber guide for engaging at least the outside one of said fibers when said fiber guide reaches its end of travel.

4,693,430

WINDING STATION OF AN AUTOMATIC WINDING MACHINE

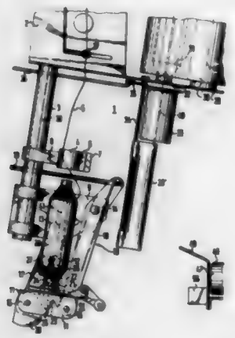
Dietmar Engelhardt, and Hans Grecksch, both of Moenchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Moenchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 26, 1986, Ser. No. 912,765

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534267

Int. Cl.⁴ B65H *49/04, 67/02*

U.S. Cl. 242—18 R **11 Claims**



1. Winding station of an automatic winding machine, comprising a holder, a movable mounting mandrel supported by said holder for receiving a tube of a feeding bobbin, a bobbin delivery slide for feeding a bobbin to said mounting mandrel, an unwinding accelerator for accelerating unwinding of a thread from the bobbin, and a captively controllable displacement apparatus associated with said holder for at least approximately parallel displacement of said mounting mandrel between a tube mounting position below said bobbin delivery slide and an unwinding position below said unwinding accelerator.

4,693,431

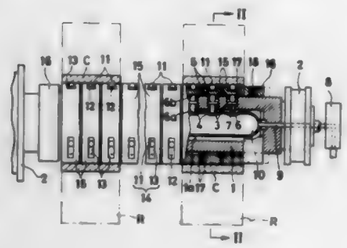
WINDING SHAFT FOR SHEET REWINDER

Hiroshi Katsuoka, 3686, Sangawacho, Iyomishima-shi, Ehime 799-04, Japan

Filed Dec. 31, 1985, Ser. No. 815,013

Int. Cl.⁴ B65H *75/24, 23/195;* **B23B** *5/22*

U.S. Cl. 242—72 B **6 Claims**



1. A sheet winding shaft comprising:

a hollow shaft having a plurality of through-holes formed in the peripheral wall thereof so as to be disposed radially at predetermined intervals, the wall surfaces of said hollow shaft defining each of said plurality of through-holes each of said plurality of through-holes having an inner projection provided at the inner end of each said through-hole;

a plurality of retainer rings each provided in the outer open end of each said through-hole;

a plurality of drum rings rotatably fitted about said hollow shaft to close the outer open end of each said through-hole and each having an inner periphery serving as a frictional suface;

core-locking means each provided on the outer periphery of each said drum ring to come into contact with the inner periphery of a core;

a plurality of pairs of support rings, each pair of which has outer peripheries fixed to the opposite ends of the inner periphery of each said drum ring rings and each pair having the inner peripheries thereof kept in contact with the outer periphery of said hollow shaft, thereby supporting each of said drum rings on said hollow shaft;

a plurality of plungers each provided with a flange and each movably inserted into each said through-hole, each said plunger having a length large enough to project both outwardly from each of said retainer rings and inwardly from each said inner projections, each of said flanges having a diameter larger than the inner diameter of each said retainer ring and also larger than the inner diameter of the inner projections; and

an expansible air tube provided in said hollow shaft and, when being expanded, adapted to outwardly urge said plungers within said through-holes.

4,693,432

WINDING MANDREL ESPECIALLY FOR A SAFETY STRAP

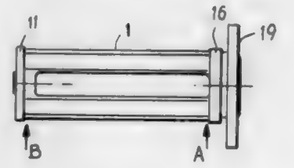
Alain P. Tourret, Audincourt, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Jun. 26, 1986, Ser. No. 878,764

Claims priority, application France, Jun. 26, 1985, 85 09741

Int. Cl.⁴ F16B *21/00*

U.S. Cl. 242—74 **3 Claims**



1. A winding mandrel for a safety strap and having an axis, comprising: a plastic winding body molded on a metal insert (1; 8), the body and the insert having slot means (2; 22*a*) for receiving one end of the strap, wherein the insert is composed of two elements (3, 4) each comprising a central portion (3*a*) and flared wings (3*b*, 3*c*), said elements being fastened to one another at their central portions, so that the wings are arranged symmetrically in relation to the axis of the mandrel.

4,693,433

UNWIND STAND FOR WEB ROLLS

Merrill D. Martin, 5405 Bacon Rd., Oakland, Calif. 94619

Filed Jun. 6, 1986, Ser. No. 871,275

Int. Cl.⁴ B65H *19/30;* **B61H** *13/12*

U.S. Cl. 242—58.6 **7 Claims**

1. An unwind roll stand for handling paper rolls on a spool for supplying a web of paper to a processing machine comprising:

a travelling carriage;

a control cab forming a part of said carriage;

a pair of parallel swing lift arms positioned on movable bases;

said arms being pivoted on and keyed to a rotating shaft to insure their alignment with each other;

one end of said shaft being journaled on said carriage and the other end on an outboard support;

hydraulic means for raising and lowering said lift arms comprising:

hydraulic cylinders pivotally mounted on said arms;

piston rods one end engaging pistons within said cylinders and the opposite end pivotally mounted on said bases to exert a thrust thereon;

hydraulic means to operate said pistons to produce a reciprocating motion;

a pair of parallel steel rails positioned longitudinally beneath said roll stand;

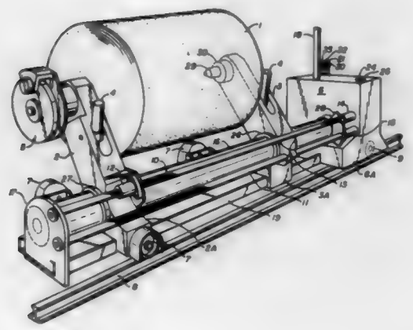
said bases being mounted on wheels engaging said rails;

said carriage being mounted on an axle carrying flanged wheels engaging said rails;

means for moving said bases and said arms simultaneously in a longitudinal direction along said rails independently of said carriage;

means for moving each of said bases and said arms separately in a longitudinal direction along said rails independently of said carriage to accommodate said rolls therebetween;

said means for moving said bases and said arms in a longitudinal direction comprising:



a pair of rotating screws;

hydraulic motors coupled to one end of each of said screws;

said motors being mounted on collars positioned on said carriage;

the opposite end of said screws being journaled into said outboard support;

travelling nuts disposed for engaging said screws;

said nuts being fixedly positioned on said bases;

hydraulic means for turning each of said motors separately;

hydraulic means for turning both of said motors simultaneously;

spindles positioned at the outer ends of the facing sides of said arms and having adjustable brakes mounted thereon;

pointed chuck means positioned on said spindles and disposed to engage axially the ends of said spool in said rolls at their centers and thereby grip them in position;

means for driving said axle and flanged wheels on said carriage and moving it longitudinally along said rails;

means for controlling the movement of said bases, said arms and said carriages positioned in said control cab.

4,693,434

SELF-DEPLOYING STABILIZING-VANE ASSEMBLY FOR PROJECTILE

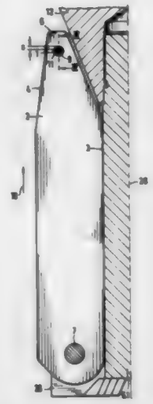
Michael Schwenzer, Duesseldorf; Armin Eskam, Langenfeld; Walter Simon, Herzogenrath, and Wilfried Becker, Duesseldorf, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,228

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434879

Int. Cl.[4] F42B *13/32*

U.S. Cl. 244—328 **10 Claims**



1. A vane assembly for a projectile which is to be fired from a gun barrel, the assembly comprising:

a carrier carrying a plurality of pivots, having at the pivots respective vane elements which are adapted to be secured to an end of the projectile;

each of said respective vane is pivotal on the pivots between an inner position lying immediately adjacent to said carrier and an outer deployed position projecting beyond the carrier; and

means including respective heat-destructible tubular pins engaged between the vane elements and the carrier for normally retaining the vanes in the inner position and for releasing the vanes for movement into the outer position when destroyed by heat, said tubular pins being made of a combustible material which completely burns up about the time the projectile exits from the muzzle of the gun barrel.

4,693,435

HIGH SPEED AIRCRAFT CONTROL SURFACE

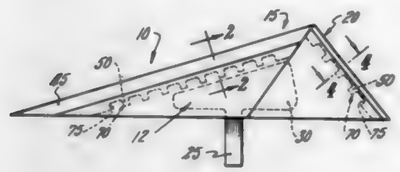
William A. Percival, Granby, and Leon Stoltze, East Harland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 648,617, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 482,386, Apr. 6, 1983, abandoned, which is a continuation of Ser. No. 219,754, Dec. 23, 1980, abandoned. This application Sep. 5, 1985, Ser. No. 773,100

Int. Cl.[4] B64C *3/28, 3/36*

U.S. Cl. 244—91 **10 Claims**

1. A high speed aircraft control surface characterized by said control surface including a body portion formed from a heat resistant, lightweight, high strength composite and including a leading portion formed from a heat resistant metal, said leading portion comprising a leading edge portion and a mounting web disposed along substantially the entire leading edge portion, and extending inwardly along said entire leading edge portion a distance of from approximately 25% to 100% of the width of said control surface measured in a direction normal to said leading edge portion, said web being received within and attached to the interior of said composite, fixing said leading



portion to said body portion at a location remove from said leading edge portion.

4,693,436

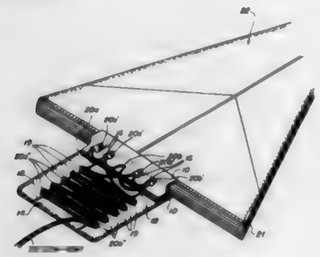
PARACHUTE FLY-AWAY DEPLOYMENT AID

David Gold, deceased, late of Ridgecrest, and Sara Gold, executrix, Glendale, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1986, Ser. No. 898,154

Int. Cl.[4] B64D *17/76*

U.S. Cl. 244—149 **6 Claims**



4. A method of aiding the deployment of a parachute provided with a plurality of suspension lines connected to a skirt comprising:

securing two flexible panels on diametrically opposed positions on the skirt, the panels each having at least one hole therein;

extending a loop from a flexible apron through the hole on both panels after the panels have been brought together and their holes aligned; and

passing a bight from the suspension lines through the loop thereby securing the panels together and the skirt in a closed position.

4,693,437

SPOILERON CONTROL MECHANISM

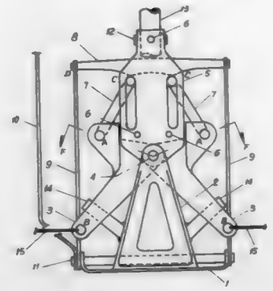
Harry Khachikian, 636 N. Kenwood, Burbank, Calif. 91505

Filed Oct. 11, 1984, Ser. No. 659,943

Int. Cl.[4] B64C *13/04, 13/30, 13/32*

U.S. Cl. 244—225 **3 Claims**

1. A mechanical device, inducing separately or simultaneously braking and rolling effect of an aircraft, and being composed of: a base panel as support for the whole device; two pivot brackets affixed to the said base panel; two bell crank arms supported by a pin on the said pivot brackets and rotating with respect to each other like two scissors blades; a rocker stem pivoting on the same said pivot brackets and being composed of two slotted plates, held together by three spacer studs; a (control) stick, supported in a lug-pin type joint of the said rocker stem and rotating in a plane normal to the rotating plane of the rocker stem; two rocker arms (one on each side) connected with one end to the upper ends of the bell crank



arms in a lug-pin joints and having the other ends sliding into the vertical slots provided in the said rocker stem plates.

4,693,438

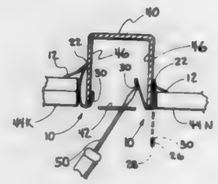
ELECTRICAL BOX RETAINER

Thomas M. Angell, 324 S. Kentucky, Mason City, Iowa 50401

Filed Feb. 10, 1986, Ser. No. 827,426

Int. Cl.[4] H02G *3/12*

U.S. Cl. 248—27.3 **4 Claims**



1. An improved electrical box retainer of a contiguous single piece of relatively thin and soft sheet metal, said retainer having:

(a) an elongate and rectangular generally flat and planar shank;

(b) a leading protrusion on a first and front end of the shank, said protrusion having a nose and a barb;

(c) said nose being upon the shank and being formed by an outside flange folded over and flattened against a portion of the shank, said nose being flattened to a total thickness of less than 2.5 times the thickness of the shank;

(d) said barb being cantilevered and extending rearward and transversely outward from the back of the nose outside flange;

(e) a multiple use catch on an outer and second end of the shank, said of the shank catch being on the same side as the barb and spaced rearward of the barb by a central and elongate length of the shank, said central length being a majority of the length of the retainer.

4,693,439

CAP CARD

Jerome S. Hahn, Boca Raton, Fla., assignor to Concept Engineering and Design Corporation, Tallahassee, Fla.

Filed Mar. 6, 1986, Ser. No. 836,972

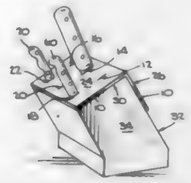
Int. Cl.[4] A47G *21/14*

U.S. Cl. 248—37.6 **15 Claims**

1. A cap card for a holder for at least one knife with a conventional blade, comprising:

a substantially planar material having at least one slot in approximate registry with a corresponding slot in said

holder, said slot in said substantially planar material being slightly narrower than the width of said blade of said knife to be held by said slot in said holder and narrower than the



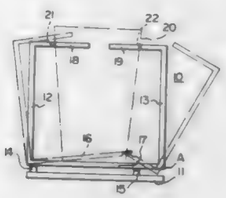
width of said slot of said holder so that when said knife engages said holder, an inteference fit is created between said substantially planar material and said knife thereby securing said knife in said holder.

4,693,440

REFRESHMENT CUP HOLDER

Albert Lalonde, 1045 Cooney Ave., Ottawa, Ontario, Canada K1G 2N9

Filed Jul. 7, 1986, Ser. No. 882,690
Int. Cl.[4] A47G *23/02*
U.S. Cl. 248—154 **2 Claims**



1. A device for releasably holding a cup of coffee, bottle of beer or the like refreshment comprising
(a) a base;
(b) a pair of jaw members carried by said base and projecting upwardly therefrom,
(c) means pivotally mounting each of said jaw members on said base so that the free upper ends thereof are movable toward and away from one another respectively to grasp and release a refreshment container therebetween, said pivot mounting of one of said pair of jaw members being so located relative to the centre of gravity of such jaw member that the jaw is biased to an open position, and
(d) a flange secured to and spaced downwardly from the upper free end of the respective jaw members, said flanges extending horizontally toward one another supporting thereon a container of beverage and wherein the flange of said one jaw member underlies and abutts the flange of the other jaw member causing the jaw to be normally open for receiving a container of beverage, said jaw being caused to move to a jaw closed position as a result of placing the container having beverage therein upon said flanges.

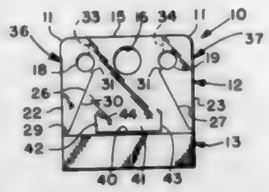
4,693,441

PAD HOLDER AND DISPLAY

Gerald A. Conway, 3133 Fairfax Rd., Cleveland Heights, Ohio 44118

Filed Mar. 25, 1985, Ser. No. 715,355
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—225.1 **18 Claims**

1. A display clip comprising a flexible but stiff sheet having a circular hole therein, a slit in said sheet leading from a side edge of said sheet and extending upwardly to said hole at an angle to said side edge and inwardly from said side edge to a point beyond a vertical line through the center of the hole and then back to join the lower edge of the hole inwardly of such vertical line whereby upon flexing of said sheet said slit may be opened to provide access to the hole, and means for defining a fold line extending upwardly from said hole to an edge of said sheet whereby a portion of said sheet defined by said slit, hole and fold line may be bent along said fold line to a plane extending at an angle to the plane of the sheet to form a downwardly opening hook extending at such angle to the plane of the sheet, said fold line and slit intersecting said hole such that said portion of said sheet defines a part of the hole which has a lower edge extending upwardly to the point of intersection of said slit with said hole when said portion of said sheet is bent along said fold line, whereby said clip may be hung on wires, rods or the like.

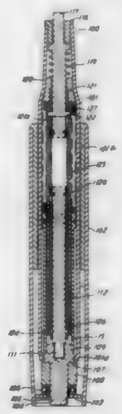


4,693,442

VARIABLE LENGTH COLUMNS

James R. Sills, High Wycombe, England, assignor to DMI Fabrications Limited, High Wycombe, England

Filed Jun. 27, 1986, Ser. No. 879,434
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—406.2 **13 Claims**



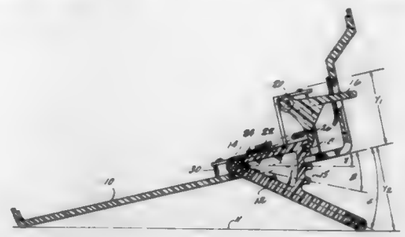
1. A variable length support column comprising first and second elongate members longitudinally slidable together and apart to shorten and to extend the column respectively;
means acting at least indirectly between the first and second elongate members to tend to lengthen the column;
at least one latch member associated with one of the first and second elongate members and displacable to engage against the other of said first and second elongate members at any one of different extensions of the column to lock the column at said extension;
and means for selectively displacing said at least one latch member to lock the column and for releasing said at least one latch member to permit reverse displacement thereof to free the column, wherein the first of said elongate members is a tubular member slideable over the exterior of the second said elongate member and having at least one aperture therein,
the said at least one latch member is protrudable inwardly through a respective said aperture, and
the exterior of said second elongate member is provided with a longitudinally extending series of surface recess formations into which the said at least one latch member is engageable to lock the column.

4,693,444

HEIGHT ADJUST MECHANISM

Glenn T. Williams, Huntsville, and Michael D. Thomas, Arab, both of Ala., assignors to Intergraph Corporation, Huntsville, Ala.

Filed Jul. 22, 1985, Ser. No. 757,378
Int. Cl.[4] A47F *5/12*
U.S. Cl. 248—653 **17 Claims**



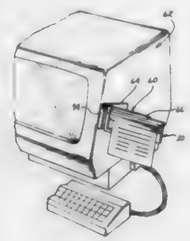
1. Apparatus for adjusting the height of an object comprising:
an object whose height is to be adjusted;
adjustment foot means, pivotally mounted within said object, for raising said object;
adjustment lever means, pivotally mounted within said object, for engaging said adjustment foot means to cause said object to be supported in a raised position; and
a single spring having a first end coupled to said foot means and a second end coupled to said lever means to simultaneously (a) bias said foot means in a direction to cause said foot means to be fully lowered, and (b) bias said lever means in a direction to cause said lever means to engage said foot means.

4,693,443

APPARATUS FOR REMOVEABLY RETAINING SHEET MATERIAL

James M. Drain, Tucson, Ariz., assignor to D. L. West Manufacturing, Inc., Tucson, Ariz.

Filed Feb. 20, 1985, Ser. No. 703,293
Int. Cl.[4] A47F *7/00*
U.S. Cl. 248—447.1 **1 Claim**



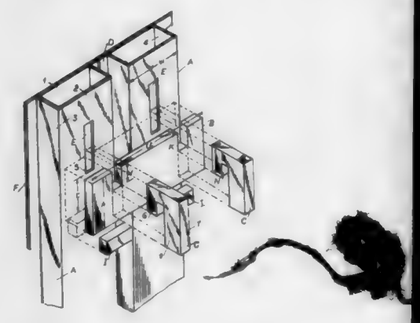
1. Apparatus for releasably securing sheet material, said apparatus comprising in combination:
(a) a holder comprising:
(1) means for providing support for the sheet material placed adjacent thereto, said support means including a pair of edges;
(2) a plurality of generally longitudinally aligned rollers for exerting a compressive force against the sheet material placed intermediate said plurality of rollers and said support means to frictionally retain the sheet material with respect to said support means, each of said rollers including a chamfered circumferential edge for discouraging binding interference with adjacent rollers;
(3) means for guiding said plurality of rollers toward and away from said support means in response to the angle with respect to said support means of a pull in force exerted upon the sheet material to increase and decrease, respectively, the friction force retaining the sheet material adjacent said support means; and
(4) planar means extending perpendicularly from said support means for interconnecting said support means with said guiding means;
(b) a mounting for said holder, said mounting comprising:
(1) means for disengageably engaging said support means, said engaging means comprising a pair of opposed channels for receiving said pair of edges;
(2) means for securing said mounting to a surface and;
(3) means for pivotally interconnecting said engaging means with said securing means.

4,693,445

CONCRETE AND CONSTRUCTION SYSTEM AND MODULAR PLANK ELEMENT FOR THE CONCRETE FORMWORK THEREOF

Enio Sprecace-Pantoli, Colinas del Tamanaco, Calle Sta. Cruz, Quinta "Enti" Caracas 1061, Venezuela

Filed Jul. 30, 1986, Ser. No. 892,121
Int. Cl.[4] E04G *11/00*
U.S. Cl. 249—19 **13 Claims**



1. A falsework for concrete construction, comprising:
a plurality of plank elements, each having a rectangular sheet having a concrete-facing mold-forming side and a reverse side,
a pair of flat tubular elements affixed to said sheet along opposite longitudinal edges thereof on said reverse side, said tubular elements each having a longitudinally extending outwardly projecting flange, and

a plurality of equally spaced slots formed in a side of each of said elements turned away from said sheet and elongated in the longitudinal dimension of the respective element;

a coupling member interconnecting said plank elements with said flanges disposed in substantially contiguous relationship and two said tubular elements being substantially coplanar, said coupling member being formed as a generally rectangular plate overlying said sides of said coplanar tubular elements and formed with respective notches opening along a common edge of said plate in alignment with respective ones of said slots of said coplanar tubular elements; and

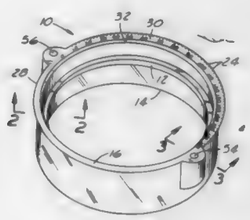
respective hooks each having a short leg, a long leg connected to said short leg and parallel thereto, and an arm connecting said legs having a length substantially equal to the the sum of the thickness of said side and the thickness of said plate, said arm reaching through a respective slot and said short leg engaging the respective side of the respective tubular element on a face thereof turned away from said plate, said long leg engaging said plate on a face thereof turned away from said tubular elements and said arms being received in the respective said notches of said plate.

4,693,446

GASKET FOR MOLDING PLASTIC LENSES

Henry Orlosky, Irvine, Calif., assignor to Techna Vision, Inc., Santee, Calif.

Filed Sep. 20, 1985, Ser. No. 778,321
Int. Cl.⁴ B29D *11/00*
U.S. Cl. 249—53 R **3 Claims**



1. A gasket for holding a pair of half molds used in casting plastic lenses, comprising:

an annular body formed by a cylindrical wall having an inside surface, an outside surface, and first and second opposing annular ends,

an annular shoulder along said inside surface of said wall and disposed about midway between said opposing ends, said shoulder being formed by two seal members which extend outwardly from said inside surface from a common junction, and

a pair of diametrically opposed protrusions on said outside surface of the wall, each of said protrusions having a face surface adjacent one of said ends and a passageway extending therethrough, and

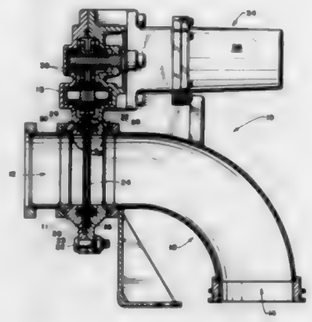
each of said passageways having one end in the face surface of the protrusions through which the passageway extends, and another end extending through said wall and opening at said common junction.

4,693,447

MOTORIZED GATE VALVE FOR A WASTE DISPOSAL SYSTEM

Frederick W. Perez, San Clemente, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Sep. 16, 1986, Ser. No. 908,003
Int. Cl.⁴ F16K *3/04, 31/04*
U.S. Cl. 251—129.12 **9 Claims**



1. In a waste disposal system including a receptacle for receiving waste, a holding chamber for the waste and a waste pipe system communicating between the receptacle and the holding chamber through which waste can be transferred therebetween, the improvement comprising:

valve means connected in the waste pipe system having a hollow housing with an inlet and an outlet connected to the waste pipe system;

a blade disposed in said housing at a substantially right angle to the waste pipe system and selectively movable between a closed position blocking said inlet from said outlet, and an open position allowing flow between said inlet and outlet;

means for selectively moving said blade between the open and closed positions;

a pair of seals disposed in said housing in an abutting relationship aligned to receive therebetween said blade when in the closed position and to seal flow through said inlet and outlet from the interior of said housing when said blade is in the open position;

each of said seals being formed from a resilient elastomer and having a generally D-shaped cross-section with a hollow interior and a gap thereinto, one side wall of each seal having a concave portion adapted to permit said seal to pivot and collapse inwardly into its hollow interior in a mechanical rotation of said seals as said blade is inserted therebetween.

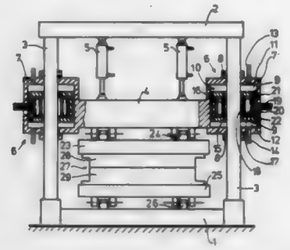
4,693,448

CLOSURE UNIT FOR MOLDING TOOLS

Ferdinand Proksa, Leverkusen; Hans-Michael Sulzbach, Königswinter; Lothar Röhrig, Hennef, and Hans-Wilhelm Fuhrbach, Bonn-Oberkassel, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Oct. 14, 1986, Ser. No. 918,735
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538683
Int. Cl.⁴ B29C *45/67, 33/24*
U.S. Cl. 249—162 **10 Claims**

1. A molding press having a closure unit comprising: a base which is rigidly connected via at least two columns to a fixed cross head, a lower mold clamping plate arranged on the base, an upper mold clamping plate arranged on a movable cross head which is attached by a mounting to each of said columns, the clamping plates facing one another, and actuating means including a hydraulic cylinder which surrounds said column in which a piston surrounding the column is arranged, said piston being an arrestable drag piston and the hydraulic cylinder being a short lift cylinder, said upper clamping plate being movable by means of at least two long lift cylinders arranged between said fixed cross head and said movable cross head.

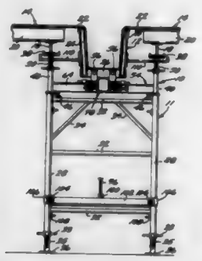


4,693,449

BEAM FORM AND SLAB FORM ADJUSTMENT STRUCTURE

Arthur L. Cunningham, 6055 Windemere Way, Riverside, Calif. 92506

Filed Oct. 24, 1985, Ser. No. 790,864
Int. Cl.⁴ E04G *1/20*
U.S. Cl. 249—210 **10 Claims**



1. A beam form and slab form adjustment structure adapted for mounting to a shoring frame having a pair of upstanding tubular legs, said structure comprising:

longitudinally extending beam form support means includig first hinge means;

an elongated transverse beam including second hinge means cooperative with said first hinge means

to define a transverse pivot axis located above said beam and to enable upward pivotal movement of said transverse beam toward said beam form support means and about said transverse axis to facilitate transport of said beam form support means to a different site;

lateral adjustment means operative upon said transverse beam and said beam form support means for adjusting the lateral position of said beam form support means relative to said transverse beam;

a pair of slab form support means carried by said transverse beam and including a pair of supports for engaging slab forms and a pair of height adjusting means mounting said supports, respectively; and

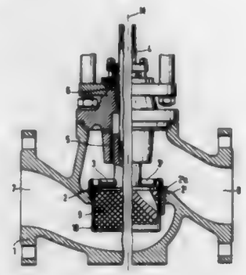
depending portions supported by said transverse beam and telescopably and removably receivable within the upper ends of said legs of said shoring frame, respectively, said pair of height adjustment means being operable to adjust the vertical position of said pair of supports relative to said depending portions said depending portions being operative to transfer loads from said transverse beam to said shoring frame solely through said upper ends of said legs.

4,693,450

LOW-NOISE CONTROL VALVE

Herbert K. Paetzel, Nettetal-Hinsbeck, Fed. Rep. of Germany, assignor to Masoneilan International, Inc., Dallas, Tex.

Filed Jun. 6, 1986, Ser. No. 871,706
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520555
Int. Cl.⁴ F16K *47/02*
U.S. Cl. 251—121 **3 Claims**



1. In a low noise upper control valve with a housing, in which a valve cone is arranged which can be moved in relation to a valve seat for closing or opening the passageway of the medium and which possesses a connecting piece for inflow and a connecting piece for outflow, and in which inside of the housing in the passageway of the medium a noise-attenuating element is arranged and inside of this element the passageway of the medium is divided into a multitude of sub-paths and the cross sections of passage of the sub-paths are small as compared to the cross section of passage of the valve, an improved noise attenuating element, comprising:

lamellas which touch one another and are arranged over the entire cross section of the passage parallel to each other and parallel to the direction of flow, the lamellas being corrugated, with the directions of the corrugations proceeding obliquely with respect to the direction of flow and the directions of the corrugations of two adjacent lamellas intersecting each other;

the valve cone having a hollow-cylindrical extension which extends in the direction of closing, passes through the valve seat in a tight manner and is open at the free end and in which extension the nosie attenuation element is arranged and at least one opening for the medium is arranged in the cylindrical surface of the extension so that when the valve cone is lifted off, the medium flows exclusively through the noise attenuation element; and

the element having a ratio of length to diameter in a range up to a maxium of two.

4,693,451

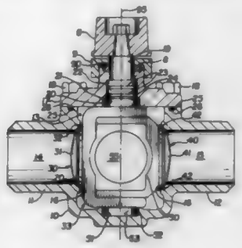
VALVE STRUCTURES

John D. Tricini, Greensburg, Pa., assignor to Valve Systems, Inc., Pittsburgh, Pa.

Filed Oct. 17, 1986, Ser. No. 920,115
Int. Cl.⁴ F16K *5/00*
U.S. Cl. 251—163 **7 Claims**

1. A valve structure comprising a housing having an open top valve chamber and inlet and outlet passages on opposite sides of the valve chamber forming a through passage with the valve chamber through said housing, a generally spherical radius valve seat on each passage at the valve chamber, a bonnet removably covering said chamber, a stem extending through said bonnet generally axially of the valve chamber, said stem including a middle stem portion of generally rectan-

gular shape having an annular opening therethrough, a pair of generally spherical radius closure discs in the valve chamber sealingly adapted to engage the valve seats, each said disc having an annular beveled sealing surface, an annualr groove in said sealing surface, a resilient seal ring in said groove, a disc carrier of generally U-shape for each disc in the valve chamber, each disc carrier having a through passage in a plane transverse to the plane of the disc providing full flow therethrough from the inlet to the outlet passage when the valve is in opening position, eccentric means provided on said stem and



engaging each disc carrier for selectively moving the discs simultaneously into and out of engagement with the valve seats and guide means between the bonnet and at least one of said disc carriers guiding the disc carriers on rotation of the stem from an open position in which the through passages in the disc carrier provides free flow between the inlet and outlet passages and a closed position in which the discs are aligned with the valve seats and holds the disc carriers in that position while the eccentric means moves the discs selectively axially into and out of engagement with the valve seats.

4,693,452

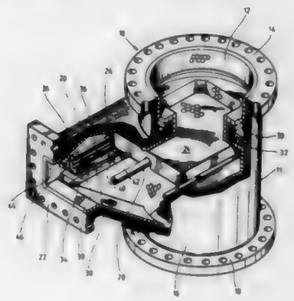
VALVE

Jandrasi Frank J., Houston, Tex., assignor to Triten Corporation, Houston, Tex.

Filed Mar. 12, 1986, Ser. No. 839,003

Int. Cl.[4] F16K *3/316*

U.S. Cl. 251—329 **15 Claims**



1. A valve, the valve having
body means,
the body means having
inlet means,
outlet means, and
disc means,
the disc means disposed within the body means and movable to close off or open the valve,
the disc means movably mounted on guide means, the guide means secured to the interior of the body means,
the guide means having slot means therethrough for conducting through the guide means material falling thereon, and
the guide means mounted on shelf means for supporting and mounting the guide means, the shelf means mountable to the valve body means and having shelf slot means disposed so that material flowing through the guide slot means then flows into and through the shelf slot means.

4,693,453

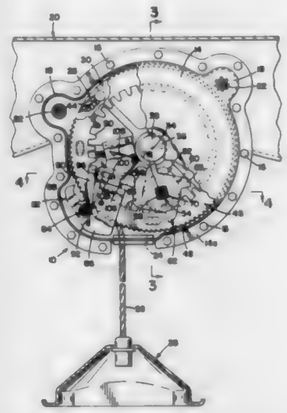
CABLE DRUM LATCHING AND UNLATCHING MECHANISM

Steve D. Ivan, St. Clair Shores, Mich., assignor to Wickes Manufacturing Company, Southfield, Mich.

Filed May 19, 1986, Ser. No. 864,544

Int. Cl.[4] B62D *43/04;* **B66D** *1/06, 5/34*

U.S. Cl. 254—323 **18 Claims**



1. A cable winding and unwinding mechanism comprising cable drum means having a drum axis, a cable having one end connected to said drum means and having a free end, support means supporting said drum means for rotation in opposite directions about said drum axis, drum drive means rotatable in opposite directions about a fixed drive axis, one of said opposite directions of each said drum means and said drive means being a cable winding direction and the other a cable unwinding direction, drum holding means displaceable between holding and release positions respectively holding said drum means against rotation in said unwinding direction and releasing said drum means for rotation in said unwinding direction, and actuator means separate from said drive means and said holding means and mounted on said support means for displacement between first and second positions respectively corresponding to said holding and release positions, and said drive means including means to actuate said actuator means for displacement between said first and second positions respectively in response to rotation of said drive means in said winding and unwinding directions about said drive axis to alternately displace said holding means between said holding and release positions.

4,693,454

AIR PRESSURE SHOCK ABSORBER

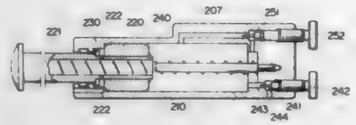
Tatsuo Tsuchiya, and Kazuhiro Hozumi, both of Asahi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma and Kuroda Precision Industries Ltd., Kawasaki, both of, Japan

Continuation of Ser. No. 331,752, Dec. 17, 1981, Pat. No. 4,500,075. This application Aug. 16, 1984, Ser. No. 641,394

Claims priority, application Japan, Dec. 18, 1980, 55-179176

Int. Cl.[4] F16F *1/06*

U.S. Cl. 267—226 **15 Claims**



1. An air pressure shock absorber comprising:
a cylinder defining a first opening at one end of said cylinder;
a chamber defined by the cylinder, said chamber having a forward chamber portion, an intermediate chamber portion and a rear chamber portion;
a piston slidably mounted in said chamber and initially positioned in said rear chamber portion;
a piston rod mounted on said piston, said piston rod extending from the cylinder through said first opening;
spring means located in the cylinder for returning the piston to its initial position in the rear chamber portion by a pressing force after the piston has moved from the rear chamber portion to the forward chamber portion;
a second opening solely defined by an inner wall of the cylinder at the forward chamber portion;
a third opening solely defined by the inner wall of the cylinder at the intermediate chamber portion;
an air inlet passage defined by the cylinder freely communicating between the rear chamber portion and the atmosphere, said air inlet passage being constructed and arranged such that only air is continuously drawn into the chamber behind the piston as the piston moves from the rear chamber portion to the forward chamber portion;
an air exhaust passage defined by the cylinder communicating with the forward chamber portion and the atmosphere, said air exhaust passage being constructed and arranged such that only air is continuously compressed ahead of the piston as the piston moves from the rear chamber portion to the forward chamber portion to produce an area which has an air pressure higher than an area behind the piston;
a bypass passage defined by the cylinder freely communicating between said second opening and said third opening, said bypass passage rapidly releasing air compressed ahead of the piston in the forward chamber portion to increase the air pressure of the rear chamber portion behind the piston when the piston moves a predetermined distance in a direction from the rear chamber portion to the forward chamber portion to position the piston past said third opening and before said second opening due to a force pushing on an end of the extended piston rod;
said piston rod being hollow and its interior communicating with the forward chamber portion, said piston being slidable on said piston rod so as to control at least one radial hole which is provided in said hollow piston rod and which is thereby opened to the rear chamber portion and thus to the atmosphere; and
a retaining ring being provided at the end of said piston rod to retain said piston thereon, and wherein the spring means acts on said piston rod so that the at least one radial hole is opened by said piston when said piston rod is returned by said spring means but is closed when said piston is displaced in the forward direction by said piston rod.

4,693,455

TWO-CHAMBER MOTOR SUPPORT WITH HYDRAULIC DAMPING

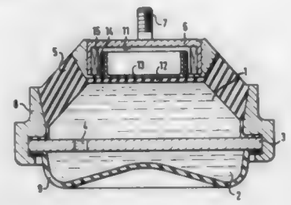
Rainer Andrä, Limburg, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 738,165

Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419437

Int. Cl.[4] F16F *15/02*

U.S. Cl. 267—140.1 **7 Claims**



1. Two-chamber engine mount with hydraulic damping, comprising a housing having rubber-elastic peripheral walls and an engine side to be connected to an engine, an intermediate plate dividing said housing into fluid-filled chambers being in communication with each other through a penetration formed in said intermediate plate, an active electro-dynamic vibration generator being integrated into one of said fluid-filled chambers closest to said engine side and being controllable in dependence on predetermined operating parameters, a membrane chamber disposed in said one fluid-filled chamber closest to said engine side, and a membrane with a quenching mass closing off said membrane chamber, said vibration generator being an electro-dynamically operating vibration generator with an active vibrating part formed by said membrane and said quenching mass.

4,693,456

FLUID-FILLED RESILIENT BUSHING WITH CIRCUMFERENTIAL ORIFICE

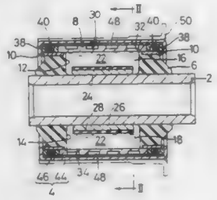
Ryouji Kanda, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan

Filed Sep. 11, 1986, Ser. No. 906,197

Claims priority, application Japan, Sep. 18, 1985, 60-142639[U]

Int. Cl.[4] F16F *5/00*

U.S. Cl. 267—140.1 **10 Claims**



1. A fluid-filled resilient bushing, comprising:
an inner sleeve having a cylindrical outer surface;
a generally annular resilient member secured by vulcanization to the outer surface of said inner sleeve in co-axial relation with each other, and having a plurality of pockets which are open in an outer surface of the resilient member, said plurality of pockets being spaced from each other in a circumferential direction of the resilient member;
an orifice sleeve positioned radially outward of said resilient member, and closing said plurality of pockets formed in said resilient member, thus cooperating with said resilient member to define a plurality of fluid chambers corresponding to said pockets, said orifice sleeve having a

circumferential groove formed continously in an outer surface thereof so as to cover at least one full circumference of said orifice sleeve, and a plurality of radial communication holes which communicate at their outer ends with said circumferential groove and at their inner ends with said plurality of fluid chambers, respectively, said fluid chambers being filled with an incompressible fluid; and

an outer sleeve fitted on the outer surface of said orifice sleeve, and closing said circumferential groove in said orifice sleeve, so as to define a continous circumferential orifice which communicates with said plurality of fluid chambers through said plurality of radial communication holes, said circumferential orifice having a length corresponding to that of said circumferential groove.

4,693,457

VIBRATION DAMPER

Yoshikiyo Kamata, Hachioji, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 711,051, Mar. 12, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,862

Claims priority, application Japan, Mar. 21, 1984, 59-40329[U]

Int. Cl.⁴ F16F *1/54*

U.S. Cl. 267—153 **4 Claims**



1. A vibration damper comprising:

a hollow cylindrical member which is formed of an elastic material and to a bottom end of which an outwardly facing fixture is secured, said cylindrical member defining a bore with a radial bore wall therein, said fixture being essentially coaxial with said bore;

a plug member which is formed of an elastic material which has an integral, radially extended flanged head portion with another outwardly facing fixture secured thereto, said flanged head portion having a diameter larger than the inside diameter of said cylindrical member and said plug member having a integral neck portion within said bore of said cylindrical member, space being defined between said neck portion and a bottom end of said bore of said cylindrical member, the flanged head portion being disposed away from said cylindrical member in the axial direction such as to form spaces therebetween; and

an elastic connecting member for integrally connecting said cylindrical member and said plug member said elastic member defining a plurality of spaces between said plug member and said bore wall of said hollow cylindrical member.

4,693,458

CLAMPING ARRANGEMENT FOR LUMBER ELEMENTS

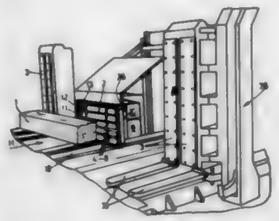
Ernst Lewecke, Lemgo, and Manfred Riesenberg, Horn-Bad Meinberg, Fed. Rep. of Germany, assignors to Lewecke Maschinenbau GmbH, Blomberg, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,194

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635716

Int. Cl.⁴ B25B *11/00*

U.S. Cl. 269—21 **16 Claims**



1. An arrangement for clamping a lumber element during its processing, especially in a sawing installation, comprising

at least two spaced abutment members having abutment surfaces for the lumber element;

a substantially vertically extending suction plate situated between said abutment elements and including an upright contact plane, said suction plate being movable transversely to said contact plane, and having a plurality of suction openings capable of exerting suction effects on the lumber element which is juxtaposed with the contact plane;

sensing means including a plurality of contactless sensors for sensing the presence of the lumber element at the respective suction openings and for generating corresponding indication signals; and

means for controlling the suction effect of said suction openings in dependence on said indication signals.

4,693,459

SHEET FEEDING SYSTEM IN RECORDING APPARATUS

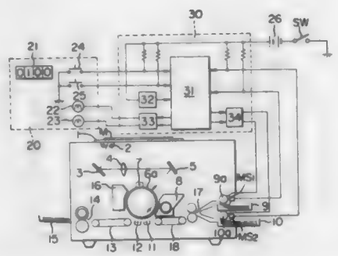
Kazuho Shimoda, and Shunichi Abe, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 478,805, Mar. 25, 1983, abandoned, which is a continuation of Ser. No. 210,137, Nov. 24, 1980, abandoned. This application Dec. 24, 1985, Ser. No. 814,289

Claims priority, application Japan, Nov. 26, 1979, 54-151992

Int. Cl.⁴ B65H *3/44*

U.S. Cl. 271—9 **5 Claims**



1. An electrophotographic copying machine wherein recording paper is supplied to an image transfer mechanism from one of at least two cassettes comprising means for manually changing a selection of a first cassette from which paper is to be supplied, sensing means for detecting a replacement of a second cassette, and controlling means, responsive to signals from said sensing means, for effecting supply of paper to the image transfer mechanism from a replaced cassette irrespective of the prior selection of said first cassette by said manual selecting means.

4,693,460

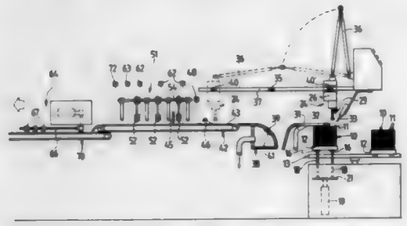
AUTOMATIC GARMENT PORTION LOADER

Fletcher D. Adamson, and James M. Caldwell, both of Alexander City, Ala., assignors to Russell Corporation, Alexander City, Ala.

Division of Ser. No. 803,416, Dec. 2, 1985, Pat. No. 4,633,604. This application May 12, 1986, Ser. No. 861,826

Int. Cl.⁴ B65H *5/00*

U.S. Cl. 271—10 **5 Claims**



1. Apparatus for loading fabric garment portions onto an automated production line wherein each of said garment portions are moved along a plurality of tandem conveyors and each said garment portion is required to have one edge thereof aligned at a predetermined line relative to said plurality of conveyors, comprising:

(a) means for placing individual garment portions on one of said plurality of conveyors at a predetermined position and in a substantially foldless manner;

(b) means responsive to the position of said one edge of said garment portion relative to said predetermined line for urging said garment portion toward said predetermined line with said means for urging being operable only during a specified time; and

(c) means responsive to the position of said one edge of said garment portion relative to said predetermined line at the end of said interval of time for removing misaligned garment portions from the production line.

4,693,461

PAPER SPEED CONTROL IN AUTOMATIC DOCUMENT FEEDER

Kozo Takahashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 24, 1986, Ser. No. 822,213

Claims priority, application Japan, Jan. 30, 1985, 60-17975

Int. Cl.⁴ B65H *29/68*

U.S. Cl. 271—176 **4 Claims**

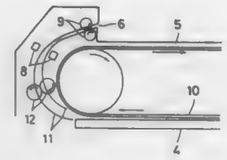
1. An automatic document feeder suitable for an electrophotographic copying machine comprising:

document table means for the placement of documents thereon;

document receiving means for receiving said documents for copying;

document discharge portion of said document feeder, provided adjacent said document receiving means, for discharging said document, said discharge portion comprising a document guide, transport means, sensor means and document discharge means, said sensor means, for detecting the transport of said documents, being positioned between said transport means and document discharge means;

document transport means for automatically transporting said documents from said document table means to said document receiving means to said document discharge portion; and



speed reduction means responsive to a condition whereby said sensor means detects the passing of a trailing edge of said transported document, to thereby reduce the speed of said document discharge means.

4,693,462

SHEET DELIVERY APPARATUS FOR PRINTING MACHINES

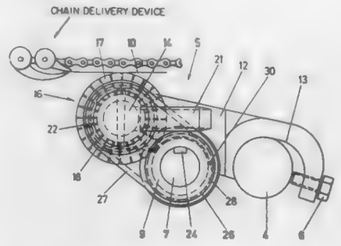
Gerhard Pollich, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelber, Fed. Rep. of Germany

Continuation of Ser. No. 21,954, Mar. 19, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,544

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2811963

Int. Cl.⁴ B65H *29/68*

U.S. Cl. 271—183 **4 Claims**



1. In sheet delivery apparatus for printing machines having a chain delivery device for delivering printed sheets to a delivery pile, pneumatic braking means comprising a plurality of discrete braking roller devices each having means for admitting suction air thereto and respectively having a sheet supporting surface of given width for supporting a printed sheet at non-printed areas thereof, a support shaft extending between side walls of the printing machine adjacent and upstream of the delivery pile in travel direction of the chain delivery device, said support shaft being disposed transversely to said travel direction below the chain delivery device, said plurality of discrete braking roller devices being mounted on said support shaft with the respective sheet supporting surfaces thereof engageable with respective non-printed areas of the sheet for braking and tightening the sheet, the respective sheet supporting surfaces being on respective parts of said braking roller devices which are continuously movable together with the sheet supported thereby in said travel direction of the chain delivery device, said plurality of braking roller devices being each individually exchangeable in the entirety thereof for other respective discrete braking roller devices having sheet supporting surfaces differing in width from said given width

thereof so as to match varying widths on non-printed areas on respective printed sheets, the sheet supporting surface of differing width being on respective parts of said other discrete braking roller devices which are continuously movabhle together with the sheet supported thereby, said braking roller devices being of unipartite construction and comprising respective braking rollers formed in a sheet supporting surface thereof with suction chambers recessed therein and having a suction-air feed integral therewith, and drive means for rotating said braking rollers, said drive means comprising separate drive wheels for the respective braking rollers, said drive wheels being mounted on a drive shaft, fixed against rotation relative thereto and axially slidable thereon.

4,693,463

APPARATUS FOR THE LATERAL REGISTRATION OF SHEETS

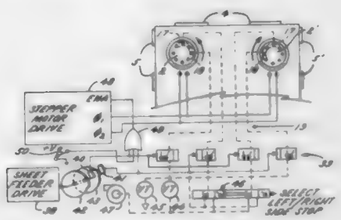
Adolf Schwebel, Offenbach am Main, and Herbert Herrmann, Obertshausen/Hausen, both of Fed. Rep. of Germany, assignors to Mabeg Maschinenbau GmbH & Company, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,873

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1985, 3511897

Int. Cl.[4] B65H *9/00*

U.S. Cl. 271—236 **14 Claims**



1. In an apparatus for the registration of sheets in a sheet stream feedable on a feed table of a sheet treating machine, said feed table including a first and a second suction plate arranged at a distance one from another at right angles to the feed direction, and the apparatus including means for driving each plate rotatably about an axis arranged perpendicular to the feed table, which plates are provided with suction openings which are evenly distributed on a plane of the plate facing away from the feed table and which suction openings are subjected to air suction, enabling the respective frontmost sheet of the sheet stream to be grasped in the region of its leading edge and enabling the sheet to be moved to lie against a side stop and/or a front stop, the improvement comprising providing means enabling the suction plates to be rotatably driven in opposite rotational senses and providing means for selectively applying suction either to the suction openings located momentarily relative to the feed direction to the rear outward facing quadrants or to the suction openings located momentarily relative to the feed direction in the front inward facing quadrants.

4,693,464

APPARATUS FOR ARRANGING THE OBVERSE AND REVERSE SIDES OF THE BILLS OR THE LIKE

Nobuyuki Honma, Matsudo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,384

Claims priority, application Japan, Dec. 20, 1984, 59-193501[U]; Dec. 21, 1984, 59-194028[U]

Int. Cl.[4] B65H *5/26*

U.S. Cl. 271—265 **5 Claims**

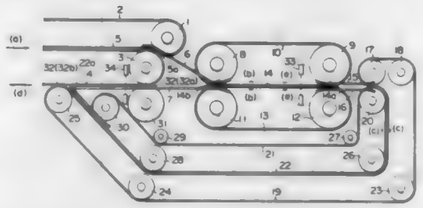
1. An apparatus for arranging the obverse and reverse sides of bills or the like comprising:

a carrying-in passage for carrying in bills or the like with their obverse and reverse sides in the mixed state,

a reversibly conveying passage for receiving said bills or the like therein from said carrying-in passage and conveying said bills or the like forward or backward,

a carrying-out passage for carrying out said bills or the like, arranged in alignment with said reversibly conveying passage so that said reversibly conveying passage and said carrying-out passage form a linear passage,

a return conveying passage for receiving said bills or the like transferred forward from said reversibly conveying passage and transferring said bills or the like to said carrying-out passage,



first sensing means positioned in the reversibly conveying passage for sensing the presence of one of the bills within the reversibly conveying passage and generating a first signal, which is used to control the changing of the reversibly conveying passage from a forward movement state to a backward movement state, and

second sensing means positioned in the carrying-out passage for sensing the presence of one of the bills within the carrying-out passage and generating a second signal, which is used to control the changing of the reversibly conveying passage from the backward movement state to the forward movement state.

4,693,465

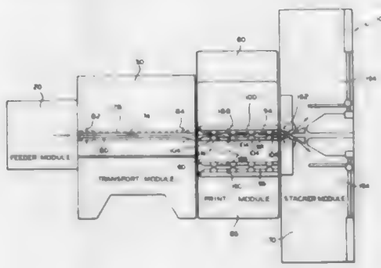
ROTATABLE PRINT MECHANISM FOR PRINTING ON FRONT OR BACK OF MEDIA

Eduard Svyatsky, Chicago, and K. George Rabindran, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 668,140, Nov. 5, 1984, Pat. No. 4,561,352. This application Sep. 9, 1985, Ser. No. 774,234

Int. Cl.[4] B65H *5/06*

U.S. Cl. 271—274 **2 Claims**



1. A document transport for a document printing system for moving documents serially past a print head which prints information entered by an operator on each document, comprising:

a table;

a document drive assembly for transporting said documents across said table, said document drive assembly including

a frame, a motor mounted on the frame, a plurality of document driving pulleys arrayed linearly on the frame, and a belt for connecting the document driving pulleys to the motor;

mounting means for pivotally mounting the document drive assembly to the table including horizontal hinge means at one end of said document drive assembly for pivotally connecting the document drive assembly to the table, and a latch at the other end of said document drive assembly for releasably attaching the document drive assembly to the table;

an outer document transport housing including a plurality of rotatable pressure rollers arrayed linearly in the housing, the rotatable pressure rollers and the plurality of document driving pulleys forming the document path of the document transport assembly;

said outer document transport housing further including vertical hinge means at one end of said housing for pivotally connecting the housing to the table, and a latch at the other end of the housing for releasably attaching the housing to the table.

4,693,466

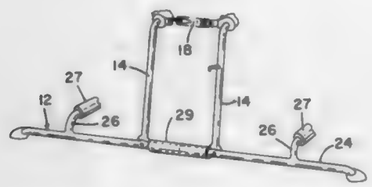
OSCILLATING DEVICE HAVING IMPROVED SUPPORT LEGS AND DEMOUNTABLE BASE

Robert C. Swengel, Sr., York, Pa., assignor to Donsco Inc., Wrightsville, Pa.

Continuation-in-part of Ser. No. 629,334, Jul. 10, 1984, Pat. No. 4,575,071, which is a continuation-in-part of Ser. No. 726,226, Apr. 22, 1985. This application Oct. 21, 1985, Ser. No. 789,439

Int. Cl.[4] A63G *17/00*

U.S. Cl. 272—52 **2 Claims**



1. An oscillating device including a base and a pair of front and rear leg members each having their lower ends pivotally connected to the base while the upper ends of the leg members are pivotally disposed in bearing members as part of a support member of the oscillating device, spring members extending between the upper ends of the leg members holding them within the bearing members, said base characterized in that:

said base is formed of a pair of horizontal members interconnected by transverse members, said horizontal members include front and rear sections with the lower ends of the front leg members being pivotally connected to the front sections of the horizontal members and the lower ends of the rear leg members being pivotally connected to the rear sections of the horizontal members thereby forming said base into front and rear halves, the front end of said rear section and the rear end of said front section forming inner ends of the respective front and rear sections; and

means for maintaining said inner ends of the front and rear sections of the horizontal members in engagement by said spring members and including loose sleeve means in which the inner ends of the horizontal members are disposed when the front and rear halves are assembled into said base for operation of the oscillating device;

said sleeve means having a cross-sectional configuration corresponding to that of said inner ends and being of a length substantially corresponding to that between the pivot connections of the lower ends of the leg members to said horizontal members.

4,693,467

SPRING STRUCTURE INTENDED SPECIFICALLY FOR PLAY OR EXERCISE APPARATUS

Antero Ikäheimo, Rovaniemi, Finland, assignor to Pohjoiskalotti Oy, Rovaniemi, Finland

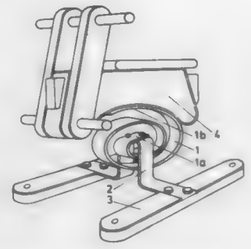
PCT No. PCT/FI85/00004, § 371 Date Sep. 3, 1985, § 102(e) Date Sep. 3, 1985, PCT Pub. No. WO85/03010, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 7, 1985, Ser. No. 777,693

Claims priority, application Finland, Jan. 9, 1984, 840075

Int. Cl.[4] A63G *17/00*

U.S. Cl. 272—52 **5 Claims**



1. A spring structure intended particularly for a play and exercise apparatus, comprising:

a helical spring member made of flat steel material with sides, a predetermined width and turns, said helical spring member having an inner end and an outer end, said outer end being adapted for attachment to a movable member;

a brace member also made of flat steel material and having an essentially U-shaped middle portion, said U-shaped middle portion including arm portions and a substantially horizontal web portion centrally disposed within said U-shaped middle portion and having a predetermined length;

said inner end of said helical spring member being secured to and across said web portion wherein the predetermined length of the web portion is greater than the predetermined width of said helical spring member;

said arm portions of the brace member extending along the sides of the helical spring in a general direction away from said outer end and beyond an outermost turn of the spring member;

a fastening base, said fastening base being substantially horizontally positioned and said inner and outer ends of said helical spring being substantially horizontal with said inner end being affixed to said web portion and said outer end being disposed adjacent to said inner end and spaced apart by turns of said helical spring with said outer end being affixed to said movable member; and

outer ends of said arm portions being bent outwardly in a substantially horizontal position, said outer ends lie essentially in the same plane, said outer ends are fastened to said fastening base for supporting the spring structure.

4,693,468

EXERCISE MACHINE HAVING PEDALS WHICH EXTEND RADIALLY AGAINST RESISTIVE MEANS

Paul C. Kurlytis, 5485 Desert La., Silver Springs, Nev. 89429, and Clayton A. Carpenter, 1175 Yates La., Reno, Nev. 89509

Continuation-in-part of Ser. No. 708,233, Mar. 5, 1985, abandoned. This application Aug. 13, 1985, Ser. No. 765,559

Int. Cl.[4] A63B *21/00;* **G05G** *1/14*

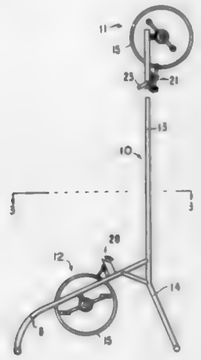
U.S. Cl. 272—73 **5 Claims**

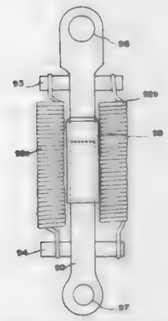
1. An exercise machine for providing extended exercise for the forward and backward muscles of the lower muscle group, comprising:

a frame for supporting at least one bidirectional rotational exercise assembly for exercising the forward and back-

ward muscles of the lower group in a standing position; and

a bidirectional exercise assembly mounted on said frame, said assembly including a central axle having portions extending on either side of said frame, a shank attached to each of said portions of said axle, each of said shanks having a foot pedal attached thereto opposite the end attached to said axle, each of said shanks comprising a first member which is slidably inset within a second member and wherein said first member and said second member





are connected by a spring having a bias strength greater than 200 lbs/inch which holds said first member in a fully seated position within said second member whereby said first member slides outwardly from within said second member when the operator of said exercise machine applies a force to said pedal which exceeds the strength of said spring, said means being extended in the segment of the pedalling cycle from 90° to 270°, whereby the operator in a standing position may exercise said forward and backward muscles of the lower muscle group through an extended range.

4,693,469

AEROBIC EXERCISE DEVICE

Larry Cedar, P.O. Box 319, Van Nuys, Calif. 91408-0319

Filed Nov. 6, 1986, Ser. No. 927,399
Int. Cl.⁴ A63B *5/22*
U.S. Cl. 272—74 **15 Claims**

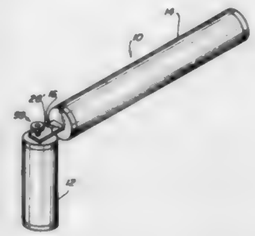
1. An aerobic exercise device for use in simulating rope-jumping and other exercises, comprising:

a handle means for gripping the device comprising a first end and a second end spaced from said first end;

a weight means having a first end and a second end spaced from said first end thereof, said first end thereof being closer to said second end of said handle means than said second end of said weight means;

flexible means having a first end connected with said handle means and a second end operatively associated with said weight means for interconnecting said handle means in spaced apart relationship with said weight means;

said handle means comprising an outer circumferential surface portion, and means mounting said first end of said



flexible means for rotation relative to said handle means so that said weight means may be revolved about said handle means as said handle means is revolved;

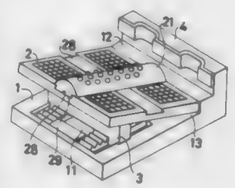
said weight means comprising a substantially hollow tubular element, said flexible means comprising an elongated, axially-stretchable, resilient cord means having an outer diametric extension less than the inner diametric extension of said hollow tubular element, said cord means extending through said hollow tubular element.

4,693,470

AUXILIARY INSTRUMENT FOR STRETCHING AND SOFTENING EXERCISES

Takashi Ogawa, 97 Imolima-1 chome, Gifu-shi, Gifu 500, Japan

PCT No. PCT/JP83/00103, § 371 Date Jun. 26, 1984, § 102(e) Date Jun. 26, 1984, PCT Pub. No. WO84/01723, PCT Pub. Date May 10, 1984
Continuation of Ser. No. 626,870, Jun. 26, 1984, abandoned.
This PCT application Mar. 31, 1983, Ser. No. 919,599
Claims priority, application Japan, Oct. 27, 1982, 57-162602; Dec. 21, 1982, 57-225464
Int. Cl.⁴ A63B *23/04*
U.S. Cl. 272—96 **1 Claim**



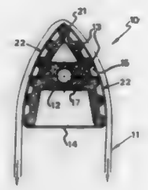
1. An auxiliary instrument for stretching and softening exercises comprising a supporting base positionable on a horizontal surface, a single treading base wide enough to completely support both of the user's feet having a flat top surface on which a user stands with a user's feet being supported by said surface, said treading base being hinged at one end to said supporting base so as to be free to rotate between a closed position and several locked open positions relative to said supporting base, an angle adjusting member interposed between said supporting base and treading base to keep said treading base at a selected one of said several open positions and a stopper erected immediately adjacent said treading base in the region where said treading base is hinged to said supporting base said stopper adapted to engage the user's heels so that the feet rest entirely on said treading base.

4,693,471

RESILIENT SUPPORT

Andrew W. R. Dofel, Castle Hill, Australia, assignor to Supafit Gymnasium Equipment Pty, Limited, Castle Hill, Australia

Filed Aug. 22, 1985, Ser. No. 768,519
Claims priority, application Australia, Aug. 22, 1984, PG6714
Int. Cl.⁴ A63B *21/04*; **B65H** *23/04*
U.S. Cl. 272—136 **11 Claims**



6. In combination a support **10**, and an elongated, resilient exercise element **11**, said support comprising:

a generally rigid body **12** having an external peripheral surface adapted to support the resilient exercise element **11** along the periphery of said surface a passage **17** disposed in body **12** to secure the support **10** to a mounting means; and

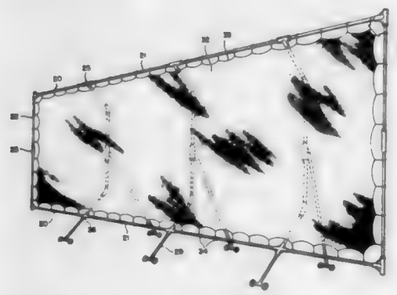
a resilient sleeve **14** adapted to cover the peripheral surface sandwiched between the body **12** and the exercise element **11**, and to move resiliently with the exercise element **11** relative to the body **12**.

4,693,472

BALL REBOUND NET

Vernon H. Newman, 107 Hazel Road, Lakes Entrance, Victoria 3909, and Roland Becker, 26 Munro Street, Brighton, Victoria 3186, both of Australia

PCT No. PCT/AU84/00104, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00019, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 15, 1984, Ser. No. 705,335
Claims priority, application Australia, Jun. 15, 1983, PF9819; Jun. 16, 1983, PF9846; Dec. 8, 1983, PG2755
Int. Cl.⁴ A63B *69/40*
U.S. Cl. 273—29 A **10 Claims**



1. A ball rebound assembly, comprising

(a) a generally rectangular frame including generally horizontal and vertical frame members;

(b) means supporting said frame in a generally upright positin;

(c) a high-tensile net arranged within said frame and including threads interconnected to define a mesh having at the net periphery a plurality of mesh apexes;

(d) a high-tensile perimeter cord threaded in and out through the apexes of the meshes around the periphery of said net, thereby to cause said cord to assume an arcuate configuration between successive connection points, whereby the arc radius increases with increasing cord tension, and vice versa;

(e) means connecting said net to said frame via said cord to cause the rebound assembly to rebound a ball with less than twenty percent loss of kinetic energy, said connecting means including:

(1) a plurality of generally inextensible elements connected between said cord and said frame, respectively,

(2) said elements including means for adjusting the position of the cord relative to the associated frame member,

(3) said elements maintaining said net under high tension with the threads thereof extending obliquely relative to said frame members, thereby forming, when the assembly is in use, a highly-tensioned system of substantially equal square meshes the diagonals of which extend vertically and horizontally, respectively,

(4) said elements being operable to adjust the relative position of the cord engaged therewith, and hence the local configuration of the cord and the balancing tensions in the threads meeting and joined at the apexes through which the cord is threaded,

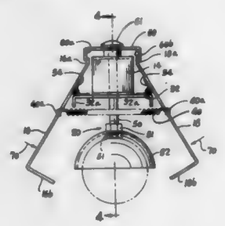
(5) said connecting elements being so distributed around the frame and so fastened and arranged as to provide the desired tensions in the locally-terminating threads and in impact areas corresponding to intersections of contiguous threads.

4,693,473

GOLF BALL RETRIEVER

Eldon E. Miller, 126 Meadow La., Solon, Ohio 44139

Filed Nov. 12, 1985, Ser. No. 796,893
Int. Cl.⁴ A63B *57/00*
U.S. Cl. 273—32 F **7 Claims**



1. A ball retriever comprising:

an elongated handle;

ball capturing means mounted at one end of the handle, said ball capturing means including a rigid support fixed with respect to the handle, first and second arms, each of said first and second arms comprising a planar member pivotally coupled to the rigid support and movable between an open and a closed position, each planar member including a ball capturing portion angled at one end with respect to a support engaging portion to close about a ball in said closed position and angled at an opposite end of the support engaging portion to define a latch engaging portion;

resilient biasing means to continuously bias said arms to a closed position; and

trigger means mounted to the ball capturing means for movement with respect to the ball capturing means, said trigger means including a contoured member for contacting the ball and a latching member for engaging the latch engaging portion of said arms to hold said arms in an open

position, said contoured member rigidly connected to said latching member so that movement of the trigger means releases the latch engaging portion of said arms from the latching member causing said resilient biasing means to close said arms about said ball and secure said ball within the contoured trigger member and said arms.

4,693,474

GAMES RACKET

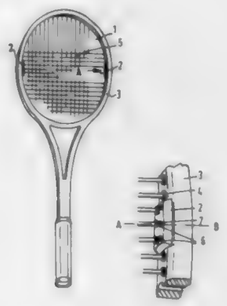
Herbert Glaesugen, Ulm-Wiblingen, and Wolfgang Kleinheinz, Lindau, both of Fed. Rep. of Germany, assignors to Dunlop Limited a British Company, United Kingdom

Filed Jun. 24, 1985, Ser. No. 747,852

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 8415807

Int. Cl.⁴ A63B *49/04*

U.S. Cl. 273—73 C **4 Claims**



1. In a games racket having adjustable playing properties, said racket having a frame comprising a head for stringing and a handle; said frame having at least one weight removably attached thereto at least one position on the circumference thereof,

the improvement which comprises at least one carrier member secured to said head at a position corresponding to the transverse axis extending through the center of percussion of said racket, each said carrier member having recesses to receive said weights; said frame including string-protecting grommets some of which are extended in length, said extended grommets having circumferential recesses to receive said carrier members.

4,693,475

RACKET HAVING ROTATABLY ADJUSTABLE HANDLE

Karl F. Keilhau, Tackheide 96/98, 4150 Krefeld, Fed. Rep. of Germany

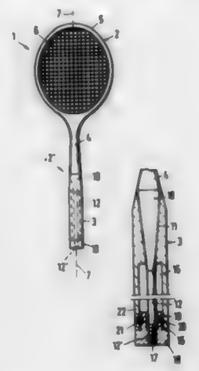
Continuation-in-part of Ser. No. 678,702, Dec. 6, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,854

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344329

Int. Cl.⁴ A63B *49/08*

U.S. Cl. 273—73 J **7 Claims**

1. A racket for ball games, comprising a frame defining a racket head, a handle bar extending from said racket head, a hollow grip for attachment to a portion of said handle bar, said handle bar comprising a shank portion having one end attached to said racket head, a male conical section having one end attached to the end of said shank portion, and a cylindrical section having one end attached to the other end of said male conical section, said male conical section having a large diameter merging into said shank and a small diameter merging into said cylindrical section of said handle bar, said cylindrical section of said handle bar having first threaded means at its end opposite said conical section, and a connecting means further including as part of said hollow grip a female conical recess at a grip end facing said shank for receiving said male conical section of said handle bar, said hollow grip further comprising a cylindrical bore merging into said female conical recess and extending entirely through said hollow grip for receiving said cylindrical section of said handle bar, and second threaded means for cooperation with said first threaded means of said cylindrical section, said second threaded means having a flange bearing against a shoulder of said hollow grip for pulling said conical section into said conical recess to provide an exclusively frictional force locking rigid connection between said hollow grip and said handle bar in a rotational direction about a longitudinal central axis of said handle bar when said first and second threaded means are tightened to each other, said conical section and said conical recess are axially short relative to the length of said hollow grip and wherein said large diameter is slightly larger than said small diameter to provide a conicity which on the one hand assures said exclusively frictional force locking rigid connection while on the other hand being sufficiently slight and short enough for permitting a continuous stepless rotational adjustment of said racket head relative to said hollow grip into any relative angular position between said racket head and said hollow grip when said first and second threaded means are loosened for releasing said frictional force locking.



4,693,476

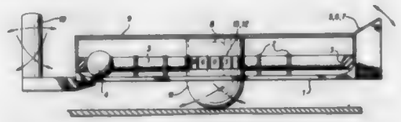
BALL-AND-TARGET GAME WITH TILTABLE PLAYING SURFACE THEREFOR

Rudolph Talamantez, Sr., 9 Oldham Rd., Silver Spring, Md. 20901

Continuation of Ser. No. 596,849, Apr. 4, 1984, abandoned. This application Jun. 5, 1986, Ser. No. 873,097

Int. Cl.⁴ A63F *7/00*

U.S. Cl. 273—110 **5 Claims**



1. A ball-and-target game of skill with pinball machine and video electronic visual display features, said game comprising a tiltable planar upper playing surface and target means disposed thereon, said playing surface also having a pinball member disposed thereon for rolling contact against said target means, said playing surface further having a curved undersurface at which it may be tilted against any surface in contact therewith, and handle means extending from said playing surface for a player to apply a force to tilt said playing surface out of a horizontal plane in any desired direction and thereby direct a pinball member to strike said target means in accordance with his or her skill to obtain a desired score, said game further comprising program means electronically connected with said target means, said target means also comprising a plurality of keys operating in response to being struck by said pinball member to provide inputs to said program means to perform selected mathematical operations including addition, subtraction, division, multiplication, square rooting of an assigned numerical value, and correction by erasing the entire score, said program means also being electronically connected to said target means and said video electronic visual display features to provide a cumulative score as various ones of said keys are caused to be struck by the pinball member.

4,693,477

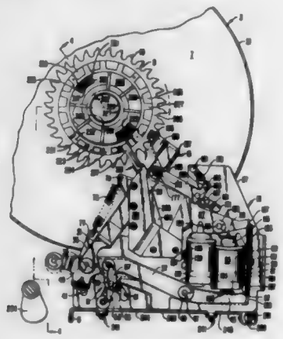
AMUSEMENT MACHINE

Peter D. Dickinson, 520 S. Rock Blvd., Reno, Nev. 89502, and Robert A. Luciano, 14430 Red Rock Rd., Reno, Nev. 89506

Division of Ser. No. 664,185, Oct. 24, 1984, Pat. No. 4,635,937. This application Aug. 11, 1986, Ser. No. 895,552

Int. Cl.⁴ A63F *5/04*

U.S. Cl. 273—143 R **11 Claims**



1. A module for use with an amusement machine having a corresponding reel rotatably mounted therein, said module comprising:

a base plate;

linkage means for coupling a pawl arm to said base plate while guiding said pawl arm through a three-phase movement relative to said base plate, said three-phase movement comprising:

a first phase in which an engaging end of said pawl arm travels from a reel set position to a reel spin position spaced apart from said reel set position;

a second phase in which said engaging end travels from said reel spin position to a cocked position spaced apart from both said reel set and reel spin positions; and

a third phase in which said engaging end travels from said cocked position to said reel set position:

said linkage means comprising:

spring biasing means for biasing said pawl arm toward said reel spin position when said pawl arm is in said reel set position, and for biasing said pawl arm toward said reel set position when said pawl arm is in said cocked position;

at least one trip lever means pivotally mounted to said base plate for locking said pawl arm in said cocked position after said second phase movement is completed, and in said reel set position after said third-phase movement is completed, said at least one trip lever means being pivotable to a release position for releasing said pawl arm from said cocked position and said reel set position; and

cam follower means coupled to said pawl arm for moving said pawl arm from said reel spin position to said cocked position, against the resistance of said spring biasing means, when external force is applied to said cam follower means;

said module further comprising solenoid means cooperating with said trip lever means for pivoting said trip lever means to said release position upon receipt of a predetermined electrical signal

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4,693,478

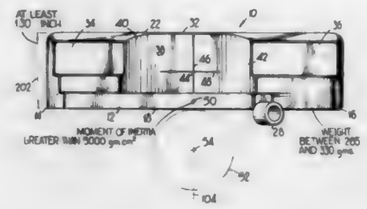
GOLF PUTTER HEAD

Dabbs C. Long, Albany, Ga., assignor to MacGregor Golf Company, Albany, Ga.

Filed Mar. 17, 1986, Ser. No. 840,250

Int. Cl.⁴ A63B *53/04*

U.S. Cl. 273—164 **6 Claims**



1. A golf putter head which weighs between 265 and 330 grams and has a center of mass comprising:

(a) a blade a striking face, a blade sole, a heel end, a toe end, and a rear face wherein the blade has a width, a height greater than the radius of a standard golf ball, and a length of 5.5 inches or greater;

(b) a hosel attached to the blade;

(c) a flange having a top surface and a flange sole and integrally extending rearwardly from the blade adjacent the blade sole wherein the blade sole and the flange sole form a putter sole and the flange has a length equal to the length of the blade and a width greater than the width of the blade and such that the combined width of the blade and flange is at least 1.30 inch and wherein the flange has a reduced thickness center portion to create a cavity behind the blade and increased thickness portions adjacent the heel and toe of the blade,

wherein the mass of the head is distributed to establish a locus for the center of mass approximately one half way along the length of the blade and along the height of the blade at a vertical distance from the sole which when the putter head is raised for putting above a putting surface the center of mass is aligned vertically with a center of a standard golf ball resting on the putting surface and to establish a rotational moment of inertia about the center of mass greater than 5000 gm. cm.^{2}.

4,693,479

GOLF CLUB SWING TRAINING DEVICE

Robert P. McGwire, 150 W. Drake St., Apt. H4, Pomona, Calif. 91767

Continuation-in-part of Ser. No. 678,967, Dec. 6, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 858,570

Int. Cl.⁴ A63B *69/36*

U.S. Cl. 273—186 A **6 Claims**

1. A self-contained detachable device for selective attachment to a golf club to provide a visual indication of the position of the golf club during the backswing, forward swing and follow through portions of a golf swing wherein said visual indication is provided by visual reference to the golf ball being struck and the surface surrounding the golf ball, said golf club including a shaft having a longitudinal axis and a club head, said shaft having a grip portion with an end, said grip portion end having a circumference, said device comprising:

a cylindrical housing having a longitudinal axis, a top end and a bottom end;

means for securely mounting said cylindrical housing to said end of said grip portion of said shaft and for aligning said cylindrical housing coaxially with the longitudinal axis of said shaft;

light bulb means associated with said cylindrical housing top end for providing a directed beam of light extending outward from said housing in a direction along the longitudinal axis of said cylindrical housing and shaft when said housing is mounted thereon, said light bulb means being capable of providing a well-defined spot of light on the surface surrounding said golf ball during said golf swing;



battery means located within said cylindrical housing for providing electric current to said light bulb means; and

switch means associated with said cylindrical housing for providing a selective electrical connection between said battery means and said light bulb means to thereby selectively provide said light beam, wherein said light beam provides said visual indication of the position of said golf club during the golf swing by visual reference to the position of said spot of light relative to the golf ball being struck and the surface surrounding the golf ball when said device is mounted to said grip end.

4,693,480

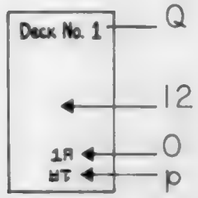
COLOR-CODED CARD GAME

Randolph Smith, 682 Pryor St., SW., Atlanta, Ga. 30315-1042

Filed Jun. 18, 1985, Ser. No. 746,130

Int. Cl.[4] A63F *1/00*

U.S. Cl. 273—296 **1 Claim**



1. A color-coded card game that contains two decks of cards with five kinds of card game accessories to make it easy for the dealer to control the game by instructing the players according to the color(s) and the symbol on each card, and therefore the game comprises:

DECK NUMBER ONE which contains each matching card that has either one or two colors to match the other matching cards found only in deck number one,

DECK NUMBER TWO which contains each instruction card that has one symbol (ball means to buy 2 cards, star means to sell 2 cards, triangle means to trade 2 cards, wall means to win 2 cards, and octagon means to owe 2 cards) and one background (meaning the player who is the color of the symbol must buy, sell, trade, win, or owe 2 cards from/to the player who is the color of the said background) and contains each winning card that has ten colors, each color on a small separate square except for the single color on a big separate square below the said small squares when one of the players who is one of the different colors on the 9 small squares can win all of the colored coins from the first and/or second bank if the said one player has cards that equal 3 whole matching colors the same color of the big separate square on the winning card,

THE COLORED COINS when each said coin, after being dropped into the colored bank, will be won by the player(s) and rarely by the dealer(s) and each one of the said coins can be handed to the dealer while each color of a coin refers to a certain player who is the same color of the coin,

THE ID (identification) TAGS to identify each player and the dealer because each ID tag is a certain color so each player can be a certain color (red player, blue player, etc.),

THE PLAYERS' ASSEMBLE CARD to show the players how to be seated around the dealer and how to find the next player to buy, sell, trade, win, or owe 2 cards from/to when there is at least one missing player,

THE COLORED STICK-TRAY for the dealer to use to receive colored coins, especially from the players who are faraway and must hand coins to the dealer,

THE COLORED BANK for the dealer to use to drop colored coins into and/or for the players to win colored coins from,

AND THE SERIAL NUMBERS on the cards and the colored coins to prevent cheating and discourage any player from trying to cheat in the color-coded card game.

4,693,481

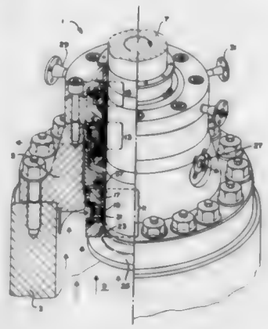
FILM-RIDING SHAFT SEAL FORMED FROM HIGH-PURITY SILICON NITRIDE

Kenneth P. Quinn, Allison Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1985, Ser. No. 739,745

Int. Cl.[4] F16J *15/20*; **C04B** *35/58*

U.S. Cl. 277—96.2 **13 Claims**



1. A sealing assembly for maintaining a pressure boundary in a heated and pressurized fluid that contains abrasive particles while transmitting mechanical energy across said pressure boundary, comprising a sealing ring and a seal runner, each of which includes a substantially flat face for forming a sealing surface, and each of which is substantially formed from silicon nitride, wherein said sealing surfaces are relatively movable with respect to one another, are biased toward one another by a compressive force of up to 90,000 pounds and radially tapered with respect to one another in order to direct said fluid at said pressure boundary into a film of flowing fluid between said surfaces upon which said relatively movable sealing surfaces ride, and wherein said silicon nitride that forms said sealing ring and ring runner is hot pressed and at least 98% pure in order to render said ring and runner resistant to both abrasion from said particles and to thermal shock, and further to render said sealing ring and runner operative in a non-film riding mode for at least 30 minutes without significant wear.

4,693,482

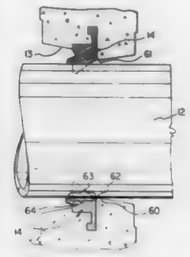
MOLDED ELASTOMERIC CIRCULAR GASKET

Clement Daigle, Saint-Jean Chrysostome, and Emile Gonthier, St.-Henri, Cte Levis, both of Canada, assignors to Les Industries Fortier Ltee, Canada

Filed Sep. 19, 1985, Ser. No. 777,613

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—207 A **4 Claims**



1. A molded elastomeric circular gasket for resiliently supporting a sewer pipe in a manhole opening and sealing the space between the wall of the opening and the surface of the pipe, the transverse cross-section of said gasket having:

(a) a generally triangular head, having a forward face provided with an arcuate depression therein, and a sloping rear face;

(b) a generally rectangular body, integral with said generally triangular head; and

(c) a generally "L" shaped leg depending from said body, and coextensive with the rear face of said body.

4,693,483

COMPOSITE GASKET AND FITTING INCLUDING SAME

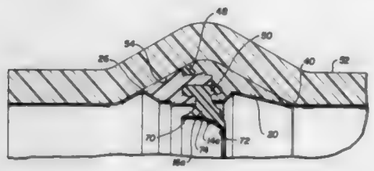
Jose E. Valls, Ponce, P.R., assignor to Vassallo Research & Development Corporation, Ponce, P.R.

Continuation-in-part of Ser. No. 630,527, Jul. 13, 1984, Pat. No. 4,637,618. This application Jan. 18, 1985, Ser. No. 692,700

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—207 A **16 Claims**



1. A composite gasket for forming a seal between a pipe bell and a spigot, comprising:

a major portion of non-elastomeric plastic material; and

a minor portion of elastomeric material, said minor portion being axially encased by said major portion and having a first sealing lip extending from said major portion in a radial direction, said major portion including first and second segments entrapping said minor portion therebetween, said segments having interlocking sections, said sealing lip being triangular in transverse cross section and tapering in a radial direction toward said major portion.

4,693,484

BOOT FOR UNIVERSAL JOINT

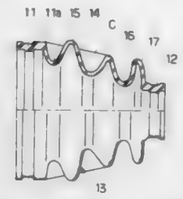
Mikio Ukai, Nagoya, and Ryouji Okumoto, Nakashima, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Toyota Jidoaha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 712,849, Mar. 18, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 848,919

Claims priority, application Japan, Mar. 24, 1984, 59-56534

Int. Cl.[4] F16J *3/04, 15/52*

U.S. Cl. 277—212 FB **3 Claims**



1. A boot for extending between a universal joint and an output shaft, said boot being made of a high-molecular elastomer:

(a) wherein said boot is in the form of a bellows having at least three ridges extending between a larger ring portion fixed to the universal joint and a smaller ring portion fitted to an output shaft, and wherein a valley is formed between the first ridge of said bellows and said larger ring portion, wherein the external diameter of said valley is smaller than the internal diameter of said larger ring portion, and wherein the distance between the crests of the first and second ridges is so short as to bring them into mutual contact during angular deflections of the output shaft; and

(b) wherein the crest of said first ridge has its inner circumference located outside of the imaginary circumference of the frustum of a cone formed by joining the outer periphery of said larger ring portion at the side to be connected to said bellows and the crest of said second ridge.

4,693,485

VEHICLE HEIGHT CONTROL APPARATUS

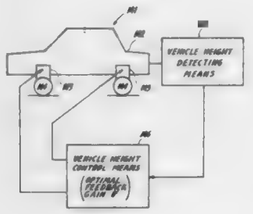
Eiichi Kamei, Nagoya; Hideaki Namba, Oobu, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 4, 1986, Ser. No. 826,012

Claims priority, application Japan, Feb. 4, 1985, 60-20673

Int. Cl.[4] B60G *17/00*

U.S. Cl. 280—6 R **8 Claims**



1. A vehicle height control apparatus, comprising:

(a) a plurality of vehicle height adjusting members for controlling the height of a vehicle at front and rear positions of said vehicle in accordance with various control signals;

(b) vehicle height detecting means for producing vehicle

height detection signals by detecting the height of said vehicle at front and rear positions of said vehicle;

(c) first means for obtaining differences between predetermined target adjustment values and vehicle heights respectively represented by said vehicle height detection signals from said vehicle height detecting means; and

(d) second means for obtaining a state variable by estimating an internal state of each of said vehicle height adjusting members, on the basis of said control signals and said respective vehicle height detection signals, which internal state varies momentarily after the application of said control signal; and

for producing said respective control signals for the momental vehicle height adjustment on the basis of said state variable, an integrated value obtained by integrating said differences, and a predetermined optimal feedback gain.

4,693,486

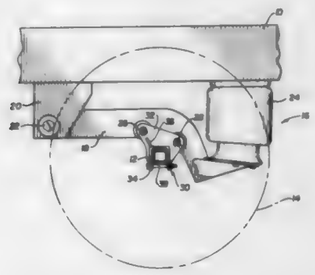
TRAILING ARM SUSPENSION WITH WRAPPER COMPRESSION AXLE MOUNTING

William C. Pierce, Muskegon, and John P. Smith, Grand Rapids, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 9, 1986, Ser. No. 849,762

Int. Cl.⁴ B60B *35/00*

U.S. Cl. 280—80 R **18 Claims**



1. A vehicle suspension system for mounting ground-engaging wheels to a vehicle frame, the suspension system comprising at least two substantially rigid arms secured to opposite sides of the frame through substantially aligned pivot mounts; at least one wheel-carrying axle mounted to said arms; and an axle support means securing said at least one axle to each of said arms; the improvement in each of said axle support means comprising:

a wrapper plate having an elongated planar complementary surface wrapping at least 180° around said axle and depending opposite sides extending beyond said axle;

compressing means for diametrically compressing said axle by drawing said opposite sides of said wrapper plate toward each other;

whereby said wrapper plate supports and strengthens said wheel carrying axle at the point at which said axle is connected to said rigid arms.

4,693,487

STEERING KNUCKLE AND SPINDLE ASSEMBLY

Randy G. Cooper, 7405 Refugee Rd., Pickerington, Ohio 43147

Filed Nov. 1, 1985, Ser. No. 794,074

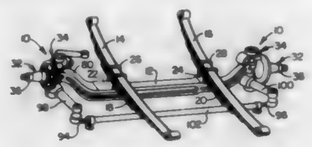
Int. Cl.⁴ B62D *7/18*

U.S. Cl. 280—96.1 **12 Claims**

1. In a non-powered, rigid beam, steering axle pivotally attached to a unitary spindle means having an integral steering knuckle which is attached to said axle by a king pin, the improvement for facilely adjusting the camber angle of said spindle means which comprises:

said spindle means being formed in two sections, a spindle section having a stub shaft adapted to mount a wheel and having a lateral support surface which is non-perpendicular to the axis of said stub shaft;

a steering knuckle section which is adapted to receive said king pin and which has a lateral support surface which conformingly engages said spindle support surface; and



attaching means for rigidly attaching said spindle section to said steering knuckle section at a plurality of discrete locations, said attaching means being removable so that said spindle section is rotatable with respect to said steering knuckle section to adjust the camber angle of said stub shaft.

4,693,488

ELECTRICALLY CONTROLLED MOTORCYCLE STAND

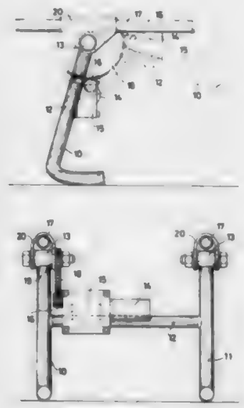
Giovanni Bernocco, Cherasco, Italy, assignor to TEMSIR S.r.l., Cherasco, Italy

Filed Sep. 11, 1985, Ser. No. 775,121

Claims priority, application Italy, Sep. 17, 1984, 67929 A/84

Int. Cl.⁴ B62H *1/02*

U.S. Cl. 280—293 **1 Claim**



1. An electrically controlled motorcycle stand comprising: an electric motor having a shaft; a switch which operates said motor; a pinion connected to said shaft and rotatable by said motor and which meshes with and is rotatable on a sector gear; and a hinge through which the stand is connected to a motorcycle, wherein said sector gear is secured to the frame of the motorcycle and has a center which coincides with the hinge such that through the action of the motor and the pinion and the sector gear and the hinge, the stand is made to rotate between two positions which are the lowered operative and the raised rest positions of the stand respectively.

4,693,489

HEELPIECE FOR SAFETY SKI BINDING

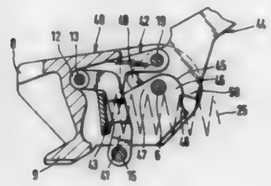
Premek Stepanek, Garmisch-Partenkirchen; Ludwig Wagner, Farchant, and Walter Knabel, Murnau, all of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

Filed Feb. 20, 1985, Ser. No. 703,270

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322634

Int. Cl.⁴ A63C *9/08*

U.S. Cl. 280—634 **7 Claims**



1. A heelpiece for a safety ski binding, said heelpiece comprising:

a base for attachment to a ski;

a support member mounted on said base;

a soleholder mounted on said support member for pivotal movement about a first axis transverse to said support member between closed and open positions for holding and releasing a ski boot, respectively, said soleholder having a forwardly extending ski boot engaging member and including a rearward facing flange surface on the rear end thereof;

a bearing lever mounted on said support member for pivotal movement about a second axis, said second axis being fixedly located near said base and parallel to said first axis;

opening lever means having a surface in operative engagement with the flange surface of said soleholder for movement therealong to effect arcuate movement of said opening lever means about an imaginary third axis, said third axis being parallel to and offset from said first axis;

connecting means connected to said opening lever means and to said bearing lever, said connecting means being attached to said opening lever means for rotation about a fourth axis parallel to said first, second and third axes;

said soleholder having first cam means and said bearing lever having second cam means, said first cam means having a first portion, a second portion and a critical portion between said first and second portions, and said second cam means being engageable with the respective portions of said first cam means; and,

adjustable spring means for biasing said second cam means against said first cam means;

said second cam means engaging the first portion of said first cam means and said spring means biasing said soleholder to the closed position when said second cam means proceeds from said critical portion towards said first portion, and said second cam means engaging the second portion of said first cam means and said spring means biasing said soleholder to the open position when said second cam means proceeds from said critical portion towards said second portion.

4,693,490

COLLAPSIBLE WHEEL-CHAIR

Jan A. T. Loodberg, Nyhamnslöge, and Olle L. Siwersson, Helsingborg, both of Sweden, assignors to AB Scaniainventor, Helsingborg, Sweden

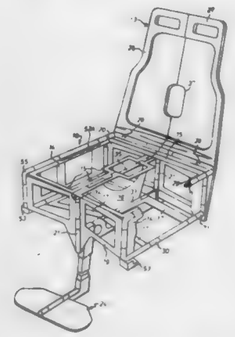
PCT No. PCT/SE86/00023, § 371 Date Oct. 15, 1986, § 102(e) Date Oct. 15, 1986, PCT Pub. No. WO86/04230, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 23, 1986, Ser. No. 923,149

Claims priority, application Sweden, Jan. 24, 1985, 8500317

Int. Cl.⁴ B62B *11/00*

U.S. Cl. 280—650 **15 Claims**



1. A collapsible wheel-chair having a foldable frame structure (**10**) which can be locked in the unfolded state and which supports the wheels (**11**, **12**) and the back (**13**) of the wheel-chair and which comprises a box-shaped seat having side wall members (**14**) connected to foldable seat and bottom members (**15**, **16**; **17**) and to foldable front and rear wall members (**19**; **20**), characterized in that the seat and bottom members (**15**, **16**; **17**) are foldable upwards and each consist each of two rigid, hingedly interconnected seat and bottom portions, respectively, (**15**, **16**; **17**) and are mechanically interconnected for common folding movements, that the front and rear wall members (**19**; **20**) are foldable rearwards and each consist of two rigid, hingedly interconnected front and rear wall portions, respectively, (**19**; **20**) and are mechanically interconnected by means of a rigid member (**22**) extending underneath the bottom portion (**17**), and that the back (**13**) can be raised and consists of two back portions (**26**, **27**) which are pivotally connected to the rear edge of a respective part (**15**) of the foldable seat member (**15**, **16**) and which in the unfolded state of the wheel-chair extend downwards behind the rear wall member (**20**) for releasably engaging a locking device (**37**) provided on the frame structure.

4,693,491

SUSPENSION SYSTEM

Yousuke Akatsu, Yokohama; Hirotsugu Yamaguchi, Chigasaki; Naoto Fukushima, Kamakura; Sunao Hano, Yokosuka; Masaru Sugino, Fujisawa; Shin Takehara, Higashi Hiroshima, and Shinichi Matsui, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 21, 1986, Ser. No. 820,369

Claims priority, application Japan, Jan. 22, 1985, 60-10633; Feb. 5, 1985, 60-15156[U]; May 20, 1985, 60-75530[U]

Int. Cl.⁴ B60G *13/00*

U.S. Cl. 280—688 **45 Claims**

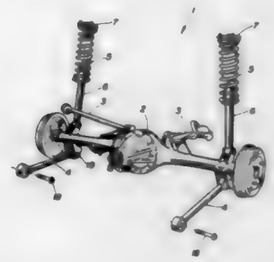
1. A suspension system of a vehicle, comprising:

a first member supported by a vehicle body of said vehicle;

a second member supported by a wheel support structure of said vehicle;

an elongate structure interposed between said first and second members to connect them, said structure including:

a first rigid member connected to said first member,
a second rigid member connected to said second member,
a first elastomeric member secured to said first rigid member and defining a first fluid chamber which is variable in volume,
a second elastomeric member secured to said second rigid member and defining a second fluid chamber which is variable in volume,
means defining a fluid communication passage through which said first and second fluid chambers are fluidly connected with each other, said means defining a fluid



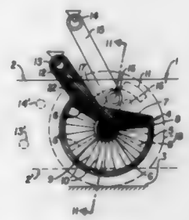
communication passage including a third rigid member securely connecting said first and second rigid members, said third rigid member having a constant axial length so that the distance between said first and second elastomeric members is substantially constant,
a fluid filling said first and second fluid chambers and said fluid communication passage, and
means for forming a fluid dynamic damper with said fluid and said first and second elastomeric members, said fluid dynamic damper having a resonance frequency approximately coincident with a resonance frequency of a vibration system including said elongate structure.

4,693,492

WHEEL SUSPENSION USING AN ARC SPRING

Manfred Schindler, Markt Schwaben, and Walter Vilsmeier, Grosshelfendorf, both of Fed. Rep. of Germany, assignors to FICHT GmbH, Kirchseeon, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,687
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1985, 3512051
Int. Cl.⁴ B60G *11/28*; F16F *9/04*
U.S. Cl. 280—705 **14 Claims**



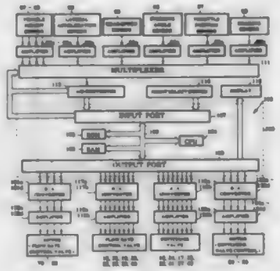
1. A hydropneumatic suspension for a vehicle having a chassis comprising:
(a) a housing being in cross-section a sector of a circle, bearing a shaft at the origin of a circular portion and having fitted therein a circular-arc suspension member and an abutment member pivotally mounted about said shaft;
(b) first and second pivot points mounted upon said chassis;
(c) a suspension arm integral with or securely attached to said housing and pivotally mounted upon said chassis at said first pivot point;
(d) a hinging lever having an inner end securely connected to said abutment member;
(e) a control arm pivotally mounted upon said chassis at said second pivot point and pivotally connected to the outer end of said hinging lever by a hinge joint;
(f) a gas spring; and
(g) means for hydraulically connecting said gas spring to said circular-arc suspension member;
wherein, when the suspension is in the extended position, said suspension arm and said control arm are essentially parallel and the hinge joint pivotally connecting said control arm and said hinging lever is located on the side of an imaginary line connecting said second pivot point and said shaft in said housing which is away from said suspension arm.

4,693,493

SYSTEM FOR VEHICLE BODY ROLL CONTROL UTILIZING STEERING ANGLE DETECTION

Hiroyuki Ikemoto; Nobutaka Oowa, both of Toyota; Yasutaka Hayashi, and Shunichi Doi, both of Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyota Central Research & Development Laboratories, Inc., both of Aichi, Japan

Filed Oct. 21, 1986, Ser. No. 921,251
Claims priority, application Japan, Oct. 22, 1985, 60-235659; Oct. 22, 1985, 60-235660; Oct. 22, 1985, 60-235661
Int. Cl.⁴ B60G *11/26*
U.S. Cl. 280—707 **31 Claims**



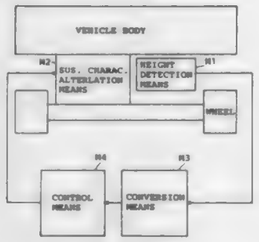
1. For a vehicle comprising a body and a plurality of wheels upon which it runs, a vehicle roll control system of vehicle height adjustment type, comprising:
a plurality of actuator assemblies, one provided corresponding to each one of said vehicle wheels and resiliently suspending said one of said vehicle wheels from the vehicle body, said actuator assemblies comprising pressure chambers and each being adapted to increase or decrease vehicle height at a location corresponding to its corresponding vehicle wheel as respective results of supplying or discharging of working fluid to or from its said pressure chamber;
a plurality of working fluid supplying and discharing means which are provided corresponding to said actuator assemblies and which serve to supply working fluid to said working fluid chambers and to discharge working fluid from said working fluid chambers;
a vehicle speed detecting means for sensing the road speed of the vehicle;
a steering angle detecting means for sensing the steering angle of the vehicle; and:
a means for computing and control, which computes a steady state roll angle ϕ_{ss} of the vehicle body from the vehicle speed sensed by said vehicle speed detecting means and the steering angle sensed by said steering angle detecting means, and computes a difference value ϕ based thereon, said computing control means being adapted to control said working fluid supplying and discharging means according to said difference value ϕ when the absolute value of said difference value ϕ is larger than a determined value.

4,693,494

SUSPENSION CONTROLLER

Shunichi Buma, Toyota; Toshio Ouuma, Susono; Kaoru Ohashi, Okazaki, and Masami Itou, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 1, 1986, Ser. No. 914,736
Claims priority, application Japan, Oct. 1, 1985, 60-219687
Int. Cl.⁴ B60G *9/00*
U.S. Cl. 280—707 **10 Claims**



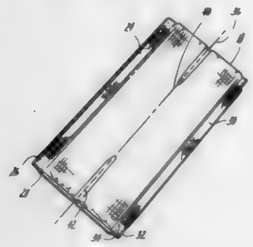
1. A suspension controller of a vehicle comprising:
vehicle height detection means for detecting a vehicle height at a front wheel and for generating a vehicle height signal according to the distance;
conversion means for converting the vehicle height signal into a corresponding converted height signal, wherein the converted height signal increases more sharply than the vehicle height signal when the vehicle height signal is greater than a preset value and decreases sharply when the vehicle height signal is less than another preset value;
control means for generating a suspension characteristic alteration signal depending on the converted height signal; and
suspension characteristic alteration means for altering characteristics of suspensioning of the vehicle in response to the suspension characteristic alteration signal.

4,693,495

SHOULDER BELT CUSHION

Virginia L. LaPointe, 21825 Superior, Taylor, Mich. 48180

Filed Jan. 13, 1986, Ser. No. 817,979
Int. Cl.⁴ B60R *22/00*
U.S. Cl. 280—808 **3 Claims**



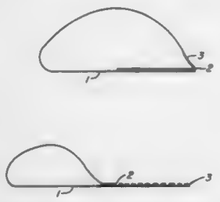
1. A cushion for a shoulder belt, comprising:
and elongated resilient pad;
a flexible cover enclosing the pad so that a portion of said cover extends laterally outwardly from each side of said pad, the cover having a pair of spaced parallel side edges;
the pad and the cover having a longitudinal fold line disposed parallel to the side edges and between the side edges, said fold line being equidistantly spaced from said side edges, the fold line having a first end adjacent one end of the pad, and a second end adjacent the opposite end of the pad;
releasable fastener means connected to the outwardly extending portion along the pair of spaced side edges;
first stitching along one end of the fold line having a length substantially less than the length of the fold line;
second stitching along the second end of the fold line having a length such that the midsection of the fold line, between the first stitching and the second stitching, is unstitched;
whereby the pad and the cover may be folded along the fold line and the opposite side edges releasably fastened together about a shoulder belt so as to be slidable along the shoulder belt to a position in which the unstitched midsection of the fold line is disposed adjacent a user in a selected position along the shoulder belt.

4,693,496

ELASTOMERIC COATING REMOVAL PROCESS

Fred L. Leonetti; Richard L. Leonetti, and Frank A. Leonetti, all of P.O. Box 6622, Concord, Calif. 94524

Continuation of Ser. No. 843,870, Mar. 25, 1986, Pat. No. 4,627,643, which is a continuation-in-part of Ser. No. 803,002, Nov. 29, 1985, abandoned. This application Aug. 7, 1986, Ser. No. 894,169
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.⁴ B42D *15/00*
U.S. Cl. 283—102 **4 Claims**



1. In a card whose surface contains printed information concealed by a removable opaque coating, the improvement comprising a pitted region on said card for abrading said removable opaque coating to expose said printed information, and a perforated line separating said pitted region from the remainder of said card to facilitate detachment thereof.

4,693,497

COLLET CONNECTOR

Ronald G. Pettus, Houston, and Thomas R. Schmitz, Katy, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

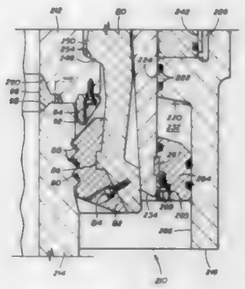
Filed Jun. 19, 1986, Ser. No. 876,086
Int. Cl.⁴ F16L *25/00*
U.S. Cl. 285—12 **8 Claims**

1. A remotely actuated connector for connecting a first and second tubular member together comprising
a plurality of latching fingers,
an actuator ring surrounding said fingers,
pressure responsive means for moving said actuator ring,
means for selectively delivering fluid pressure to opposite sides of said pressure responsive means to move said actuating ring,
each of said latching fingers having an engaging projection at one end and a locating means at the other end with both

of said projecting facing inwardly and means for securing an adapter to said other end, and

a plurality of adapters,

one of said adapters being connected to said other end of each one of said latching fingers on said projection and secured thereto by said securing means,



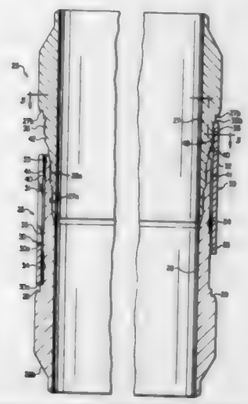
said adapters each providing at least one of a first projection and a second replaceable projection on said inner ends of said latching fingers which engage and secure the end profiles of adjacent tubular members together.

4,693,498

ANTI-ROTATION TUBULAR CONNECTION FOR FLOWLINES OR THE LIKE

Benton F. Baugh, Houston, and Narayana N. Panicker, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,308
Int. Cl.⁴ F16L *21/08*
U.S. Cl. 285—39 **5 Claims**



1. An anti-rotational, tubular joint for connecting sections of conduits together, said joint comprising:

a pin member having male threads thereon adapted to be affixed to an end of a section of conduit;

a box member having female threads thereon adapted to be affixed to an end of another section of conduit, said female threads cooperate with said male threads to form a connection therebetween when said pin member is rotated in a first direction with respect to said box member;

a lock sleeve slidably positioned on said box member and movable longitudinally thereon between a unlocked position and a locked position when said pin member is threaded in said box member; said sleeve having longitudinal grooves extending along an upper portion thereof thereby defining a plurality of resilient fingers;

ratchet teeth on each of said plurality of said fingers; and

ratchet teeth on said pin member adapted to cooperate with said ratchet teeth on said fingers when said sleeve is in said locked position to allow rotational movement between said lock sleeve and said pin member in a first direction while preventing rotational movement between said lock sleeve and said pin member in an opposite direction; and

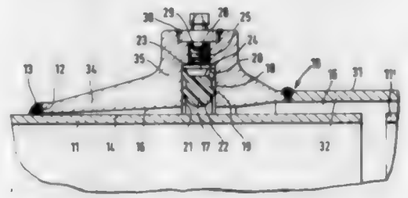
means on said lock sleeve and said box member for allowing longitudinal movement while preventing rotational movement therebetween.

4,693,499

PIPELINE FOR GASEOUS FLUIDS AND METHOD OF ASSEMBLING ITS COMPONENTS

Klaus Servè, Radevormwald, Fed. Rep. of Germany, assignor to Manibs. R. Mannesmann GmbH. & ibs Nagel GmbH. & Co. KG, Remscheid-Bliedinghausen, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,957
Int. Cl.⁴ F16L *13/02*
U.S. Cl. 285—96 **20 Claims**



4. In a pipeline, particularly for compressed gaseous fluids, the combination of a first tubular member including a first end portion having an external surface; a second tubular member including a second end portion having an internal surface surrounding said external surface, a free end, and a ring-shaped groove extending radially outwardly from said internal surface, said groove having axially spaced apart side walls; means for bonding said free end to said first end portion; a deformable ring between the side walls of said groove; and means for deforming said ring radially inwardly into sealing engagement with the external surface of said first end portion and axially into sealing engagement with said side walls independently of the fluid in the pipeline so as to allow for the application of said bonding means, particularly an annular weld, while the pressure in said tubular members deviates from the pressure of the surrounding atmosphere.

4,693,500

SWIVEL JOINT

David Anderson, P.O. Box 550, Sand Springs, Okla. 74063

Continuation of Ser. No. 742,405, Jun. 7, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,965
Int. Cl.⁴ F16L *27/08*
U.S. Cl. 285—94 **4 Claims**

1. A swivel joint for connecting two fluids carrying conduits comprising:

an inner conduit section for connecting to a first conduit;

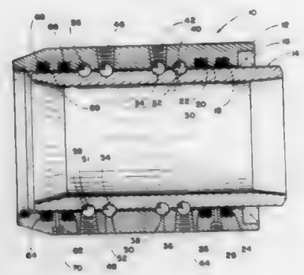
an outer conduit section adapted to fit over said inner conduit section for connecting to a second conduit, said outer conduit section having an inner end;

said outer conduit section having a first internal circumferential groove near its inner end and a second internal circumferential groove spaced from said first groove;

a first O-ring seal in said first internal circumferential groove;

a second O-ring seal within said second internal circumferential groove;

a pressure chamber in the annulus between said inner conduit section and said outer conduit section between said first internal circumferential groove and said second internal circumferential groove;



a grease confined in said pressure chamber under pressure without dependency on pressure of fluid within said inner conduit section;

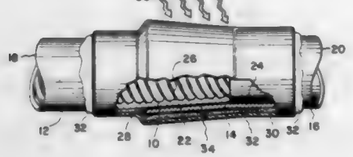
bearing means between said inner conduit and said outer conduit section at a location exterior of the space between said first and second O-ring.

4,693,501

REFRIGERATION TUBING JOINT

Terance B. Logsdon, Jr., Whitehouse, and Donald L. Fisher, Tyler, both of Tex., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 23, 1986, Ser. No. 888,593
Int. Cl.⁴ F16L *13/00, 58/00*
U.S. Cl. 285—173 **6 Claims**



1. A tube assembly comprising a first tube made mostly of copper that is bonded to an outer surface of a second tube made mostly of aluminum to form a joint said second tube having a roughened inner surface and said joint having an outer surface that is covered by a heat shrinkable tube having a thermosetting adhesive inner coating whose adherence to said joint is initiated by heating said shrinkable tube, said shrinkable tube being impermeable to moisture and thus inhibiting galvanic corrosion around said joint.

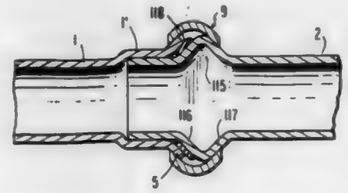
4,693,502

PIPE CONNECTION

Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

Division of Ser. No. 815,371, Jul. 13, 1977, which is a continuation-in-part of Ser. No. 531,793, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 387,446, Aug. 10, 1973, abandoned. This application May 7, 1986, Ser. No. 860,422
Claims priority, application Switzerland, Aug. 10, 1972, 11836/72
Int. Cl.⁴ F16L *25/00*
U.S. Cl. 285—334.5 **26 Claims**

1. A pipe connection between a first and a second part, of which at least one part is a tubing means having an axis provided with an inclined wall portion formed by a flared lip extending at an angle to its axis, and of which the other part having an axis and including means near one end thereof providing at least one wall portion inclined at an angle to its axis which is at least approximately similar to said first angle, a short externally cylindrically shaped means internally bridging the connection and extending into said first-mentioned tubing means, and clamping ring means having an annular portion operable to be tightened by contraction in the radially inward direction, said clamping ring means having a ring axis and internal flanks at least partially defining an approximately U-shaped profile at its internal surface thereof in a cross-sectional plane containing the axis of said clamping ring means and substantially parallel thereof, the internal flanks of said clamping ring means being at least approximately complementary to and operable in the contracted condition of the ring means to engage with the inclined wall portions of said first



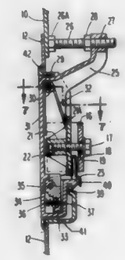
and second part, so that, in the contracted condition of the clamping ring means, the inclined wall portions and therewith the first and second part are urged toward each other, and at least one substantially plastically deformbale lug-shaped ear means in the annular portion of the clamping ring means, said ear means being capable of plastic deformation to thereby tighten the clamping ring means by reducing its diametric dimension and to thereby securely urge the inclined wall portions of said first and second part toward each other to establish a permanent pipe connection safe against unintentional opening and capable of withstanding relatively high pressures and vibrations as well as temperature fluctuations which can be opened again only by destruction of the clamping ring means or its ear means, said U-shaped profile extending over at least the circumference of the annular portion of said clamping ring means, and said short externally cylindrically shaped means being constituted by said second part.

4,693,503

LEVER LATCH

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Mar. 6, 1986, Ser. No. 837,095
Int. Cl.⁴ E05C *3/08*
U.S. Cl. 292—210 **12 Claims**



1. A combination latch and handle device comprising a housing, a handle pivotally attached to said housing, a latch

having a button component and a keeper-engagable nose component, said latch being pivotally mounted on said handle and having its button component forming an extension thereof, a keeper on said housing adapted to receive said latch when said handle is moved to its closed position, and a mounting bracket engaging said housing;

said device further characterized by biasing means mounted on said housing and constructed and arranged to contact and restrain said latch in its latched position; said device further comprising a first additional biasing means engaging said housing and said handle whereby the handle and the latch are urged to the open position when the latch is disengaged from the keeper, and a second additional biasing means engaging said handle and said latch whereby the latch is urged to a position in which its handle-extended outer surface is contiguous with the outer surface of said handle.

4,693,504

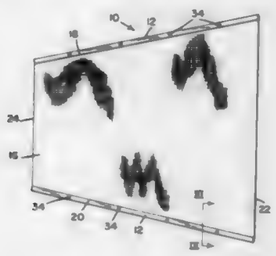
PICK-UP DEVICE FOR LAWN DEBRIS

Anna M. Baker, Lunenburg, Mass., assignor to Kenneth R. Baker, Lunenburg and Paul G. Derouier, Westminster, both of, Mass.

Continuation of Ser. No. 759,405, Jul. 26, 1985, abandoned. This application Jan. 7, 1987, Ser. No. 1,170

Int. Cl.[4] B65D *75/00;* **B65F** *1/12*

U.S. Cl. 294—1.1 **4 Claims**



1. A pick-up and carrier device for particulate material, comprising:

(a) a first elongated rigid bar having a first end and a second end,

(b) a second elongated rigid bar having a first end and a second end, and

(c) a sheet of planar flexible material having a first side edge which is attached to said first bar, a second side edge which is attached to said second bar, a first end edge which extends between the first ends of said first and second bars, and a second end edge which extends between the second ends of said first and second bars, said second end edge being substantially shorter than said first end edge so that when said sheet is fully extended and said first and second bars and said sheet lie in the same plane, said first and second bars taper toward each other from said first ends to said second ends at an angle of between 7° and 17° to define a trapezoid, so that when said bars are brought together to enclose a quantity of particulate material, said device assumes a frusto-conical shape having an open large diameter end and an open small diameter end, whereby said device is utilized for picking up a quantity of particulate material by placing said device in the fully extended state on a quantity of particulate material and bringing said rigid bars toward each other to enclose said material, whereby said device is utilized for carrying said particulate material by holding said device so that said small diameter end is down while continuing to urge said rigid bars toward each other and, whereby said device is utilized for disposing of said paritculate material by holding said device over a disposal site so that said small diameter end is down and moving said bars away from each other to allow said particulate material to funnel down to said disposal site.

4,693,505

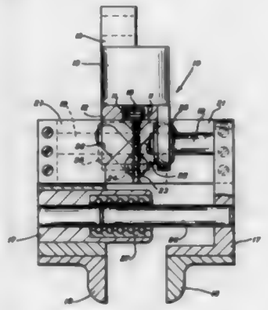
ROBOT GRIPPER

Frank N. DiMeo, Drexel Hill, Pa., assignor to Litton Systems, Inc., Clifton Heights, Pa.

Filed Apr. 14, 1986, Ser. No. 851,468

Int. Cl.[4] B25J *15/02*

U.S. Cl. 294—119.1 **7 Claims**



1. A gripper mechanism having opposed parallel fingers which open and close while remaining parallel to one another, the gripper mechanism comprising:

a body member;

a bidirectional rotary motor mounted on the body member;

a drive screw coupled to said rotary motor for rotation therewith;

a pair of arms rigidly supporting a pair of opposed parallel fingers; and

engagement means between the drive screw and the pair of arms, the engagement means comprising:

(a) a pair of plates rigidly mounted one each on the pair of arms;

(b) a pair of straight elongated inclined drive slots formed on each in the pair of plates, wherein one of the drive slots has an inclination relative to the drive screw which is opposite to the inclination of the other drive slot relative to the drive screw;

(c) a roller element engaging each of the drive slots and coupled to the drive screw, whereby rotation of the drive screw causes the roller element to be displaced along the length of the drive screw, and the engagement of the roller element with the inclined drive slots translates the displacement of the roller element along the drive screw into lateral motion of the plates and the pair of arms and fingers, whereby rotation of the screw in one direction causes the arms and the fingers to open, and rotation of the screw in the opposite direction causes the arms and fingers to close.

4,693,506

COMBINATION AIR FAIRING AND AUXILIARY AIR BRAKING DEVICE

Arnold R. Massengill, Rte. 2, Box 194A, New Tazewell, Tenn. 37825

Filed May 6, 1986, Ser. No. 860,078

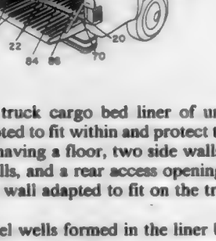
Int. Cl.[4] B62D *35/00*

U.S. Cl. 296—1 S **20 Claims**

1. A combination air fairing and auxiliary air braking device for use in connection with trucks, vans, trailers or like vehicles having a cab and an upstanding surface to the rear of said cab extending above said cab, said device comprising:

an air fairing structure positioned upon the top of said cab which serves to produce a preselected outline and reduce aerodynamic drag upon said upstanding surface resulting from air resistance to movement of said vehicle, said air fairing structure provided with a plurality of openings in a frontal portion thereof, said openings positioned between a front edge and a rear edge of said air fairing structure;

a plurality of relief doors carried by said air fairing structure,



each relief door associated with one of said openings for selectable operation between closed and opened positions such said drag is reduced when said relief doors are closed and said drag is increased when said relief doors are opened due to impingement of air flow upon said upstanding surface; and

means for selectively and rapidly opening and closing said relief doors.

4,693,507

TRUCK CARGO BED LINER WITH ANTI-SLIP SURFACE

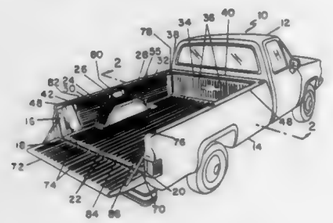
William L. Dresen, Baraboo; William F. Price, Portage; Phillip L. Emery, Portage; Harlan W. Breezer, Portage, and Robert R. Holmes, Portage, all of Wis., assignors to Penda Corporation, Portage, Wis.

Continuation-in-part of Ser. No. 608,341, May 8, 1984, Pat. No. 4,592,583. This application Jun. 2, 1986, Ser. No. 869,425

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—39 R **10 Claims**



1. A protective truck cargo bed liner of unitary vacuum formed plastic adapted to fit within and protect the contours of a truck cargo bed having a floor, two side walls, a front wall, two rear wheel wells, and a rear access opening, comprising:

a. a liner bottom wall adapted to fit on the truck cargo bed floor;

b. two liner wheel wells formed in the liner bottom wall at opposite sides thereof and adapted to accommodate the truck cargo bed rear wheel wells;

c. a liner front wall connected to and extending upwardly from the liner bottom wall;

d. two liner side walls connected to the liner bottom wall and wheel wells and the liner front wall at opposite sides thereof, each liner side wall projecting upwardly from the liner bottom wall and adjacent wheel well; and

e. a selected elastomeric material having an effectively high co-efficient of friction co-formed with and integrally adhered to the upper surface of the plastic forming the liner to provide an anti-slip film thereon for restraining movement of cargo on the liner.

4,693,508

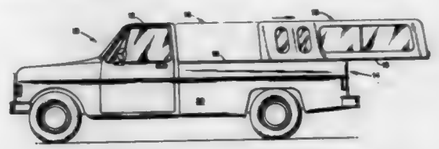
TRACK ASSEMBLIES FOR MOUNTING COVERS AND CANOPIES ON PICKUP TRUCK BEDS

Dorothy E. Pettit, 18219 46th Pl. South, Seattle, Wash. 98188

Filed Sep. 26, 1986, Ser. No. 912,056

Int. Cl.[4] B60P *7/00*

U.S. Cl. 296—100 **24 Claims**



1. For use in combination with a pickup truck having a cab and an open top truck body bed, the bed having upstanding, opposed, longitudinal side walls, each side wall terminating in an upper, elongated generally horizontal surface and a cover structure means dimensioned to substantially close the truck body bed, the cover structure means having lower opposed side edges generally coterminous with the side wall upper surfaces; the improvement comprising track means for slidably interengaging the side wall upper surfaces with the cover opposed side edges comprising: first elongate male track means rigidly associated with one of the truck bed side wall upper surfaces or the cover opposed side edges; second, elongate female track means rigidly associated with the other of the truck bed side wall upper surfaces or the cover opposed side edges, said male and female track means being slidably interfitted with one another whereby the cover structure means may be slid on and off the track body bed; means defining a first, generally horizontal, flat face on said male track means; means defining a second, generally horizontal flat face on an interior portion of said female track means which, with the female and male rail means in assembly, slidably engage one another as the cover structure means is slid onto and off the truck body bed; and elongate channel means formed in at least that flat face means of the elongate track means associated with truck body bed side wall upper surfaces whereby otherwise conventional headed fasteners may be employed to secure the rail means to the side wall upper surfaces, the channel means being dimensioned so that the heads of the headed fasteners are entirely received within the channel means whereby any interference fit between the sliding, cooperating male and female track means is prevented.

4,693,509

CONVERTIBLE TOP

Howard Moy, Rochester; James R. Thomas, Sterling Heights, and Donald J. Droske, Mt. Clemens, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1986, Ser. No. 845,260

Int. Cl.[4] B60J *1/18, 7/12*

U.S. Cl. 296—201 **18 Claims**

1. An arrangement for supporting a convertible top nonflexible back window in a raised position in a vehicle body comprising in combination:

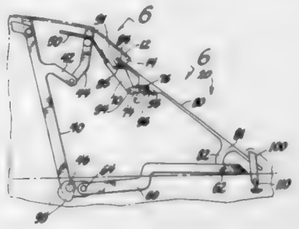
means for pivotally attaching said window to said body;

means for angularly biasing said window away from said body;

an upper window link pivotally attached to said window opposite said body;

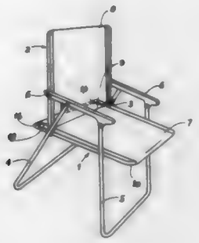
a support link pivotally attached to said upper window link, said support link also having a surface in contact with said window whereby most of said window and said pivotal

attachment of said window with said upper window link are on the same side of a line intersecting said surface of said support link in contact with said window and said pivotal attachment of said support link with said upper window link; and



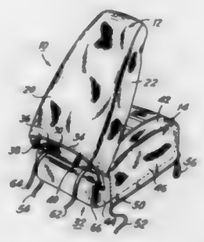
tensioning means independent of said angular biasing means operatively connecting said support link with a portion of said vehicle top forward of said window.

4,693,510
FOLDING CHAIR
Sisto Marchesini, Montecchio Maggiore Vicenza, Italy, assignor to ICU Intercommerz Union S.A., Riva San Vitale, Switzerland
Continuation of Ser. No. 594,668, Mar. 28, 1984, abandoned. This application Oct. 14, 1986, Ser. No. 918,688
Claims priority, application Italy, Mar. 28, 1983, 21298/83[U]
Int. Cl.[4] A47C *4/30, 4/44*
U.S. Cl. 297—39 **10 Claims**



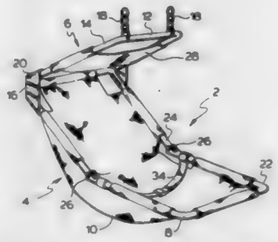
1. In a folding chair including a first metal frame defining the seat and a second metal frame defining the backrest, said frames being hinged together and to supporting legs to permit the opening and closing of the chair, and seat and backrest portions of fabric or the like having outer ends connected to ends of the aforesaid frames, wherein the improvement comprises a transverse retaining element positioned rearwardly of said seat and having ends received in said seat frame, said seat and backrest fabric portions each having inner ends connected together at a common junction intermediate the outer ends thereof, and a unitary elongated elastic strip having a width substantially equal to the width of the seat and backrest fabric and extending across said fabric portions adjacent said common junction and having a first end secured directly to said seat fabric portion and a second end secured directly to said backrest fabric portion, said strip passing over a portion of the surface of and around said transverse retaining element and being under tension between said first and second ends thereof to keep the seat and backrest fabric portions taut to define substantially planar seat and backrest portions when the chair is unfolded to an open position, said strip positioned to extend at an obtuse angle with the planes of each of said seat and backrest fabric portions when the chair is unfolded to an open position to maintain each of the seat and backrest fabric portions in a taut condition.

4,693,511
AUTO SEAT COVER
Samuel M. Seltzer; Saul Denaison, both of Livingston, and Frank Dolan, Sr., Essex Fells, all of N.J., assignors to Allison Corporation, Livingston, N.J.
Filed Sep. 8, 1986, Ser. No. 904,417
Int. Cl.[4] A47C *27/00*
U.S. Cl. 297—219 **10 Claims**



1. A one piece auto seat cover comprising an open mouthed tubular back cover terminating in a lower free edge, the back cover enveloping the back rest of an auto seat, and a seat portion intergrally joined to said back cover at an interconnected common junction for fitting onto the seat cushion of the auto seat, strap means extending from the common junction of the back cover with the seat portion for feeding through a crevice of the auto seat between its back rest and its seat cushion, and loop means depending from the lower free edge of the back cover for securing to said strap means thereby snugly retaining the seat cover in place on the auto seat with the free edge of the back portion pulled down over the rear of the back rest.

4,693,512
SWING SEATING UNIT
J. David Hobson, 34 Eagle Street East, Newmarket, Ontario, Canada L3Y 1J1
Filed Oct. 3, 1986, Ser. No. 915,052
Int. Cl.[4] A47D *13/10*
U.S. Cl. 297—277 **19 Claims**



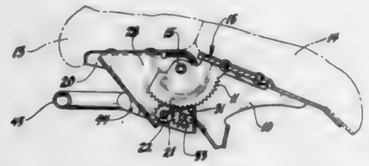
1. A collapsible swing seating unit comprising a seating section and a suspension section, said seating section including a generally elongate frame arrangement having a sunken seating portion therewithin,

said suspension section being connected to one end of said frame arrangement and being adapted to in one position be upwardly angled such that a free end thereof is above the mid point of the frame arrangement,

said suspension section being movable relative to said frame arrangement to a collapsed storage position, and means for suspending said seating unit from said suspension section adjacent the free end thereof,

said suspension section cooperating with said frame adjacent said one end to provide the sole structural connections therebetween, said structural connections being limited to said one end, leaving the remaining area intermediate said suspension section and said frame clear of obstruction.

4,693,513
THIGH SUPPORT FOR VEHICLE SEAT
Peter W. Heath, Billericay, England, assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 27, 1987, Ser. No. 6,775
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **8 Claims**



1. A vehicle seat adjustable thigh support pivotal joint, said joint in combination comprising:

a first link providing a first support;

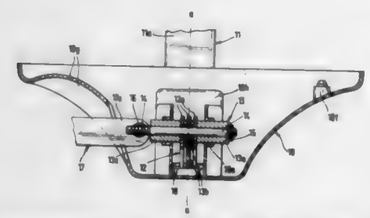
a second link pivotally attached with said first link providing a second support;

a first gear fixably attached to said first link;

a second gear meshed with said first gear and rotatively attached to said second link; and

a third gear rotatively attached to a lever, said lever being attached to one of said links whereby said third gear has a first selective position meshed with said first and second gears to lock the position of said thigh support and said third gear having a second selective position meshed with not more than one of said first and second gears to allow adjustment of said thigh support.

4,693,514
CHAIR HAVING A CLAMPING DEVICE FOR ADJUSTING THE INCLINATION OF THE BACK AND/OR SEAT
Rolf Völkle, Siemensstrasse 2, D-7298 Lossburg, Fed. Rep. of Germany
PCT No. PCT/DE85/00235, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00508, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 8, 1985, Ser. No. 857,749
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1984, 3425387
Int. Cl.[4] A47C *1/024*
U.S. Cl. 297—374 **12 Claims**



1. Chair, particularly a roatable office chair, having a foot rest which includes a central supporting spindle, seat means (**10**, **23**) carried by the support spindle and having vertical ribs (**10***c*;**10***c*';**10***c*'') formed to define support bearings (**10***a*;**10***a*') which are located at least approximately symmetrically to the plane of symmetry of the chair, a back rest carried by the seat means, and a clamping device supported in the bearings and connected to at least one of the seat means and back rest for adjusting the inclination of at least one of the seat means and back rest by laminar friction,

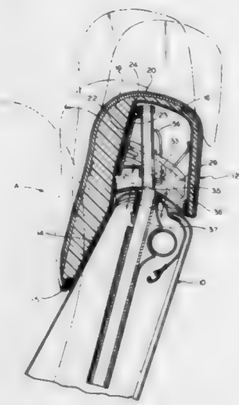
said clamping device being composed of: a packet (**12**,**12**') of laminae (**12***a*;**12***a*') which are provided with elongated holes and are articulated to at least one of the seat means and back rest; a friction lock disc packet (**13**;**13**') of annular, coaxial friction lock discs (**13***a*;**13***b*;**13***a*';**13***b*') having friction locking faces which lie against the laminae (**12***a*;**12***a*'); a clamping bolt (**14**;**14**') which passes through the laminae and discs; and a manually actuable lever operatively associated with the clamping bolt for effecting relative displacement between the clamp bolt and the laminae and discs in order to control the clamping of the laminae between the discs; characterized in that;

said friction lock discs are movably mounted in said support bearings, so that said clamping device is movable in the direction of the axis of said clamping bolt;

the plane of symmetry of the chair passes throgh said packet of laminae and said friction lock disc packet; and

said lever constitutes a self-inhibiting eccentric having a pivot axis fixed to said clamping bolt and bears against one end of said friction lock disc packet such that pivotal movement of said lever about its pivot axis causes axial displacement of said clamping bolt and causes the parts of said packet of laminae and friction lock disc packet which are respectively opposite sides of the plane of symmetry of the chair to move in respectively opposite directions.

4,693,515
HEADREST FOR AN AUTOMOTIVE VEHICLE SEAT
Vincent Russo, Cary, N.C., and Max O. Heesch, Brooklyn, Mich., assignors to ITT Corporation, New York, N.Y.
Filed Oct. 27, 1986, Ser. No. 923,335
Int. Cl.[4] A47C *1/10*
U.S. Cl. 297—391 **14 Claims**



1. A headrest for an automotive vehicle seatback comprising:

first frame means having a generally hollow interior defining a headrest configuration;

second frame means in said hollow interior of said first frame means including means for mounting said second frame means to said seatback;

first track means connecting said first frame means to said second frame means providing for movement of said first frame means relative to said second frame means over a first path of movement defined by said first track means in a generally forward and a generally rearward direction relative to said seatback between a fully rearward position and a fully forward position; and

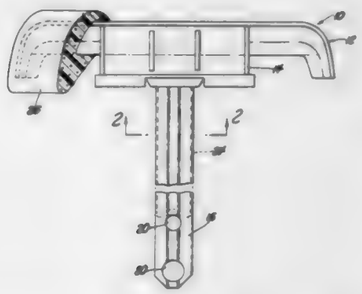
expansible-contractable means mounted between said first frame means and said second frame means for selectively causing said first frame means to move to any of an infinite number of intermediate positions between said fully rearward position and said fully forward position said first frame means being movable in said forward direction upon expansion of said expansible-contractable means and in said rearward direction upon contraction of said expansible-contractable means.

4,693,516

HEADREST ASSEMBLY AND METHOD FOR MAKING SAME

Hillery G. Knecht, 1720 Tiverton, Bloomfield Hills, Mich. 48013

Filed Aug. 14, 1986, Ser. No. 896,430
Int. Cl.⁴ A47C *7/36*
U.S. Cl. 297—391 **1 Claim**



1. A protective headrest (10, 110) for mounting on the seat back of an automotive vehicle comprising; a frame member (12, 112) including a head (14, 117) and a support (16, 116), said head (14, 117) and said support (16, 116) being integral and homogeneous and made of an organic polymeric material to define said frame member (12, 112), said head extending transversely across one end of said support (16, 116) to define a T-shape, said support (16, 116) having a preformed metal support bar (24) completely embedded therein and extending from said head (14, 117) a shorter distance than said support (16, 116), said support (16, 116) and said metal support bar (24) having a substantially rectangular cross-section, and a protective covering (26) comprising foam disposed over said head (14, 117).

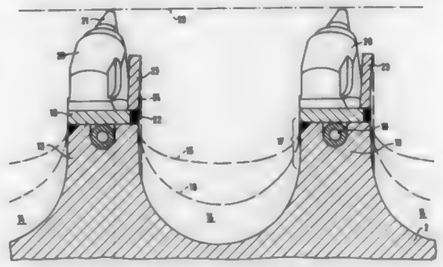
4,693,517

CUTTER FOR GOUGING ORE OR ROCK FROM MINE FACES

Martin Eisenbeis, Neunkirchen; Walter Hemmer, Wiebelskirchen, and Hans Krummenauer, Spiesen, all of Fed. Rep. of Germany, assignors to Hans Krummenauer GmbH & Co. KG, Neunkirchen, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 838,527
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508881
Int. Cl.⁴ E21B *10/00*
U.S. Cl. 299—87 **8 Claims**

1. A cutter for gouging out ore or rock, comprising a hollow rotary support arranged to penetrate into a mine face or the like and comprising a wall with helical external threads and helical grooves alternating with said threads and being devoid of dead corners wherein the fragments could accumulate and stagnate; and a plurality of bits provided on said threads to remove frgments from the ore or rock into which the bits penetrate in response to rotation of the support whereby the removed fragments enter into and flow in the grooves in the axial direction of the support, said support having bottom surfaces which bound said grooves and at least a portion of



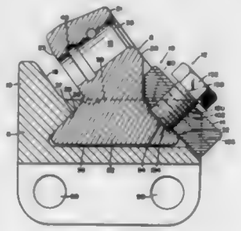
each such surface having a concave outline to thus promote the flow of fragments in the respective grooves.

4,693,518

MEANS FOR HOLDING CUTTER BITS

William P. Sulosky, Winber, and Raymond D. Evans, Jr., Everett, both of Pa., assignors to Kennametal, Inc., Latrobe, Pa.

Continuation of Ser. No. 223,257, Jan. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 141,775, Apr. 21, 1980, abandoned. This application Nov. 14, 1986, Ser. No. 931,922
Int. Cl.⁴ F21C *25/12, 35/18*
U.S. Cl. 299—93 **46 Claims**



1. A cutter bit support block adapted to be driven in a forward direction comprising: a lower body portion having a forward face slanting rearwardly upward and a rear abutment face slanting forwardly upward, said lower body portion being a polyhedron approximating the outline of a truncated right triangular prism whose largest base forms the bottom face of said lower body portion; an upper body portion having downward facing longitudinal shoulders ending at the juncture of said upper and lower body portions; and a perforation for receiving the shank of a cutter bit, said perforation communicating between an upper body portion forward face and an upper body portion rearward face.

4,693,519

FILAMENT STOCK BOX

John C. Lewis, Jr., Salisbury, Utah, assignor to Tucel Industries Inc., Forest Dale, Vt.

Filed Feb. 4, 1986, Ser. No. 825,870
Int. Cl.⁴ A46D *1/08*
U.S. Cl. 300—7 **15 Claims**

1. A filament stock box for dispensing cut-to-length filaments in predetermined tufts comprising:

a box, including front, back and side walls and a base, the lower portion of said front wall having at least one aperture therethrough having a predetermined configuration;

vibrating means coupled to said back wall for causing at least the lower portion thereof to vibrate toward and away from said front wall whereby filaments are contained within said box oriented parallel to the planes containing the and side walls, and said back wall vibrates against the adjacent ends thereof while a tuft thereof is withdrawn through the aperture;



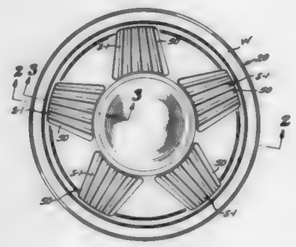
choke means disposed within said box above the aperture defining a filament picking zone therebelow and a filament reservoir above for regulating the flow of filament from the reservoir into the picking zone whereby the density of filament in the picking zone will be less than the density in the reservoir.

4,693,520

AUTOMOTIVE VEHICLE WHEEL WITH NON-SUPPORTING SPOKES

Raymond C. Brown, Tarzana, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Filed Feb. 21, 1986, Ser. No. 831,503
Int. Cl.⁴ B60B *7/04*
U.S. Cl. 301—37 SS **19 Claims**



1. In an automotive vehicle wheel having a body that includes a hub portion and a radially extending bolt-on flange portion which extends radially outwardly and rearwardly from the hub portion to merge into a tire-receiving rim portion, the combination of;

a plurality of pockets formed in the bolt-on flange portion, said pockets projecting rearwardly from the frontal surfaces of said flange portion;

a single set of generally radially extending and rearwardly straight spoke elements disposed solely within the front portion of some or all of said pockets; and

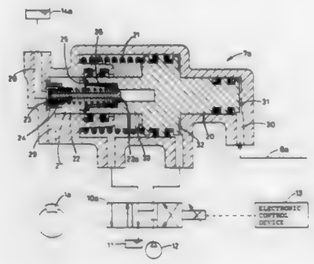
attachment means securing the radially outer end of each of said spoke elements to said rim portion and the radially inner end of said spoke elements to said hub portion.

4,693,521

AUTOMOBILE BRAKING FORCE CONTROL APPARATUS

Koji Takata, and Yukinori Nishiyama, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 22, 1985, Ser. No. 801,139
Claims priority, application Japan, Dec. 12, 1984, 59-261969
Int. Cl.⁴ B60T *8/00*
U.S. Cl. 303—103 **8 Claims**



1. An automobile braking force control apparatus for controlling the braking forces applied to any one of a number of wheel brakes individually and in groups, comprising an operator operable means such as, a brake pedal (2) for providing a first brake operating force, a master cylinder (3) connected to said brake pedal for converting said first brake operating force from said brake pedal (2) into a first hydraulic pressure, actuator means including actuator pistons for operating a respective wheel brake of said wheel brakes, operating channels (6a, 6b, 6c, 6d) leading from said master cylinder to said wheel brakes for supplying said first hydraulic pressure to said actuator pistons, an auxiliary pressure source for supplying a second auxiliary hydraulic pressure, auxiliary power circuits connecting said auxiliary pressure source to said actuator pistons of actuator means, control valves disposed in said auxiliary power circuits and controlled by an electronic control device, for limiting said second, auxiliary pressure to suitable pressure magnitudes which are effective on said actuator pistons in combination with the first hydraulic pressure from said master cylinder (3) in both positive and negative directions for said braking force control.

4,693,522

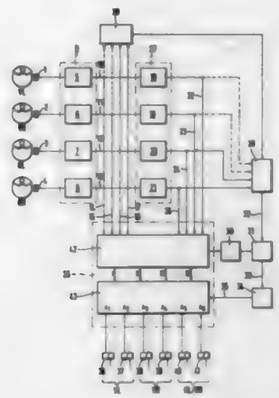
PROCESS AND CIRCUIT ARRANGEMENT FOR ADAPTING SLIP CONTROL TO THE MOMENTARY FRICTION VALUE

Hans Wupper, Friedrichsdorf, and Gunther Buschmann, Idstein, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,614
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3500745
Int. Cl.⁴ B60T *8/70*
U.S. Cl. 303—105 **6 Claims**

1. A circuit arrangement for adapting slip control of an anti-skid brake system of an automotive vehicle to the momentary friction value between a road surface and the vehicle tires comprising, sensors for the detection of the rotational behavior of the wheels, circuits for the handling and differentiation of the sensor signals as well as for the generation of braking pressure control signals by means of which electromagnetically operable multi-directional valves in the pressure medium paths of the brake system are controllable, and including circuits (28, 29) for the identification of the velocity (v_R) and of the deceleration (v_R) of the momentarily fastest wheel and a

friction coefficient identification circuit (31) by means of which, upon the instabilization of a wheel, the braking pressure



control signals are variable as a function of the deceleration (v_R) of the momentarily fastest wheel.

4,693,523

SLIP CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

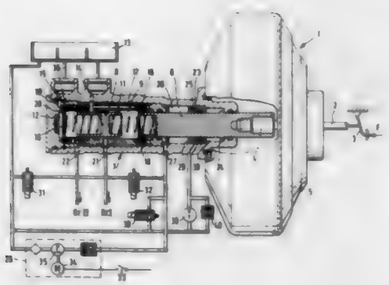
Helmut Steffes, Eschborn, Fed. Rep. of Germany, assignor to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 665,749, Oct. 29, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 939,233

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342908

Int. Cl.[4] B60T *8/44*

U.S. Cl. 303—114 **4 Claims**



1. A slip-controlled brake system for an automotive vehicle having vehicle wheels, said system comprising, in combination:

a pedal-operated brake booster;

a tandem master cylinder connected to said brake booster by a push-rod of a push-rod piston operating adjacent a first pressure chamber in said tandem master cylinder and said tandem master cylinder having an intermediate piston coupled to said push-rod piston and operating adjacent a second pressure chamber in said tandem master cylinder;

first and second hydraulic brake circuits respectively connected between said first and second chambers and said vehicle wheels;

an annular chamber surrounding said push-rod piston in said master cylinder;

said push-rod piston including radial expansion means intermediate its extremities thereby limiting movement of said push-rod piston within said chamber;

an auxiliary pressure source connected to said annular chamber in said master cylinder;

means for activating said auxiliary pressure source during slip control;

a resetting sleeve means mounted on said push-rod piston and sealably axially moveable within said annular chamber in a substantially unencumbered fashion relative to said push-rod piston, and means for increasing and directing auxiliary pressure into said annular chamber from said auxiliary pressure source whereby said sleeve means contacts said radial expansion means and moves said push-rod piston toward said brake booster;

an ambient pressure compensation reservoir;

a plurality of sensors respectively coupled to said vehicle for providing electrical signals indicative of the rotational behavior of said wheels;

means coupled to said sensors for providing output signals indicative of said rotational behavior;

a first valve connected in a fluid line extending between said auxiliary pressure source and said reservoir, said first valve being normally open to permit free passage of said increased auxiliary pressure from said auxiliary pressure source directly to said reservoir in the absence of output from said sensors, but, said first valve being responsive to said output signals to close during slip control;

a second valve connected in a fluid line extending between said reservoir and said first chamber, said second valve being normally closed and being responsive to said output signals to open during slip control after closure of said first valve, said first valve providing direct access of said auxiliary pressure to reset the push-rod and to further provide dynamic control for slip control by means of

a third valve connected in a fluid line extending between said auxiliary pressure source and said first chamber, said third valve being normally closed and being responsive to said output signals to open after said second valve reverts to its normally closed state;

whereby, said output signals and said three valves dynamically control said first hydraulic brake circuit during slip control and overide the static braking effect of said booster.

4,693,524

COMPONENT ELEMENTS FOR BUILDING FURNITURE

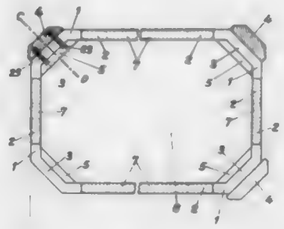
Vicente N. Navarro, Pl. Eduardo Marquina, 18-26[a], 46014, Valencia, Spain

Filed Dec. 27, 1984, Ser. No. 686,746

Claims priority, application Spain, Dec. 27, 1983, 276,569

Int. Cl.[4] A47B *47/00*

U.S. Cl. 312—140 **11 Claims**



1. Component elements for building furniture comprising:

a vertical column having a plurality of column orifices adapted to receive a fastening member;

a horizontal support member connected to said vertical column, said horizontal support member including:

a support body portion,

a plurality of body orifices disposed in said support body portion and positioned to align with said column orifices,

support end portion means projecting from said support body portion,

a rib means projecting from said horizontal support member in a direction generally perpendicular to said vertical column;

wherein said horizontal support member has first and second support body portions adapted to be connected to first and second vertical columns, respectively, said first and second support body portions being spaced at an angle relative to each other and connected to each other by a common support end, both of said body portions having a plurality of said body orifices defined therein.

4,693,525

CASING FOR ELECTRONIC APPARATUS

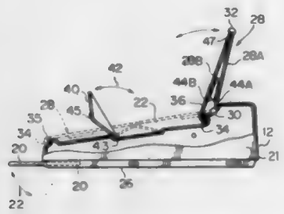
Yoshinori Shinoto, Tokyo, Japan, assignor to Linguatron Limited, Hamilton, Bermuda

Filed Feb. 21, 1986, Ser. No. 831,986

Claims priority, application Japan, May 28, 1985, 60-114659

Int. Cl.[4] A47B *81/00*

U.S. Cl. 312—208 **5 Claims**



1. A casing (12) for an electronic apparatus comprising a box-like casing body (21) and a lid (28);

said casing body (21) including an upper surface having an open portion (22) therein, a front portion positioned forwardly of said open portion, a rear portion positioned rearwardly of said open portion and a pivot portion (30) proximate to said rear portion,

said lied (28) including a first rectangular platelike member (28A) having first front and rear edges, said first rear edge being attached pivotally to said pivot portion (30) and a second rectangular platelike merber (38B) having second front and rear edges, said second rear edge being attached pivotally to said first front edge of said first platelike member, said platelike members being dimensioned to cover said open portion when said lid is extended to a generally planar closed position and to expose said open portion when said lid is folded to an open position,

a first fixing means (34, 35) for causing the second front edge of said second platelike member to be fixed to said front portion of the casing body in said closed position,

a second fixing means (34, 36) for causing the second front edge of said second platelike member to be fixed to said rear portion of the casing body in said open position,

said first fixing means (34, 35) comprising a protrusion member (34) integrally formed on the second front edge of the second platelike member and a first convex portion (35) integrally formed on the front portion of the casing body such that said protrusion member (34) may engage said first convex portion (35), whereby said lid (28) may be firmly positioned in the closed position so as to cover said open portion (22) by extending said two platelike members (28A, 28B),

and said second fixing means (34, 36) comprising said protrusion merber (34) and a second convex portion (36) integrally formed on the rear portion of the casing body such that said protrusion member (34) may engage said second convex portion (36), wherein said lid (28) may be firmly positioned in the open position so as to expose said open portion (22) by folding said two platelike members (28A, 28B), said first front edge of the first platelike members (28A) being positioned rearwardly of said pivot portion (30) and said second front edge of the second platelike members (28B) being positioned forwardly of said pivot portion (30) when said lid is positioned in said open position.

4,693,526

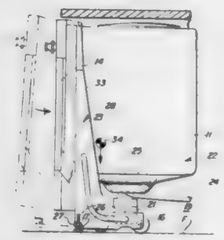
APPLIANCE SUPPORT

Raymond W. Spiegel, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 4, 1982, Ser. No. 336,770

Int. Cl.[4] A47B *91/00*

U.S. Cl. 312—250 **2 Claims**



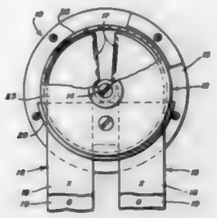
1. In an appliance having a housing defining a bottom portion including a front, a rearmost, and an intermediate portion, and an operating mechanism having a portion projecting downwardly from said housing bottom intermediate portion to define a bottom portion of the mechanism, improved means for adjustably supporting the appliance for facilitated rearward movement of the appliance with the front being raised, said means comprising:

downwardly extending vertically adjustable levelers mounted one each to opposite sides of said housing bottom front portion;

a pair of rollers mounted one each to opposite sides of said housing substantially forwardly of said housing rearmost portion more closely to the center vertical plane of the appliance than to said rearmost portion to be disposed laterally rearwardly and adjacent the downwardly projecting portion of the operating mechanism whereby said front portion of the housing may be readily lifted to permit rolling movement of the housing on said rollers free of engagement of said mechanism bottom portion with the surface on which the housing is being moved, said appliance defining a center of gravity acting downwardly a short distance forwardly of said rollers; and

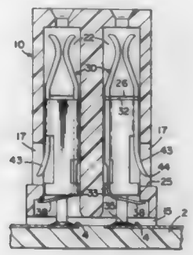
a pair of side supports disposed one each at opposite sides of the housing, each of said side supports defining a front mounting portion and a rearward mounting portion, said levelers being mounted one each to the front mounting portions of the side supports, and said rollers being mounted one each to the rearward mounting portions of the side supports, said rearward support portion defining a plurality of mounting holes for selectively mounting the roller in different positions thereon.

4,693,527
ROLLING LOOP TWIST CAPSULE
Kenneth E. Bonenberger, Blacksburg, Va., assignor to Litton Systems, Inc., Blacksburg, Va.
Filed Apr. 28, 1986, Ser. No. 856,247
Int. Cl.[4] H01R *39/02*
U.S. Cl. 439—13 **10 Claims**



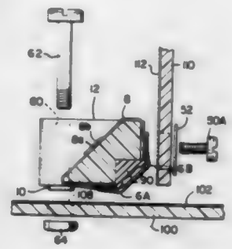
1. A twist capsule for conducting signals between an input and an output which are rotatable relative to one another, the twist capsule comprising:
a stator disk;
a rotor disk which is spaced from the stator disk;
an axis of rotation for the twist capsule which is perpendicular to both the stator disk and the rotor disk; and
a flat signal carrier having a first portion which is fixed relative to the stator disk and a second portion which is fixed relative to the rotor disk, wherein the axis of rotation of the twist capsule is perpendicular to the plane of the first portion of the flat signal carrier and to the plane of the second portion of the flat signal carrier, and wherein said flat signal carrier is formed from a U-shaped flat signal carrier comprising an arcuate portion and two side-by-side straight portions extending therefrom, said U-shaped flat signal carrier being loosely folded in the region of the arcuate portion to form a rolling loop between said first portion and said second portion, the rolling loop allowing at least 350 degrees of rotation between the stator disk and the rotor disk.

4,693,528
SURFACE MOUNT CONNECTOR WITH FLOATING TERMINALS
John C. Asick, Harrisburg; George H. Douty, Mifflintown, and James S. Staron, Millersburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation of Ser. No. 740,111, May 31, 1985, abandoned. This application Jun. 6, 1986, Ser. No. 873,138
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—83 **12 Claims**



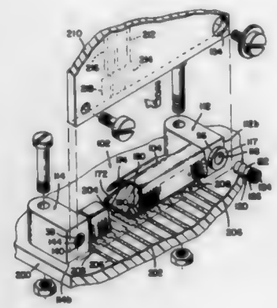
1. An electrical connector of the type for mounting onto a circuit board for electrical connection with conductive areas thereof comprising a dielectric housing having terminal-receiving passages extending therethrough and including retaining shoulders therein, electrical terminals respectively positioned within the terminal-receiving passages and having contact sections and conductor-engaging sections, and retaining members on the terminals for engagement with the retaining shoulders thereby retaining the terminals in position in the terminal-receiving passages, characterized in that said terminals are axially moveable along said passages between limiting positions defined by engagement of a pair of retaining members with respective retaining shoulders and
one of said retaining members springably engages one of the retaining shoulders when the connector is mounted on the circuit board thereby urging and maintaining the conductor-engaging sections in electrical engagement with respective conductive areas on the circuit board.

4,693,529
ELASTOMERIC MOTHER-DAUGHTER BOARD ELECTRICAL CONNECTOR
Donald G. Stillie, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 31, 1986, Ser. No. 846,325
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **15 Claims**



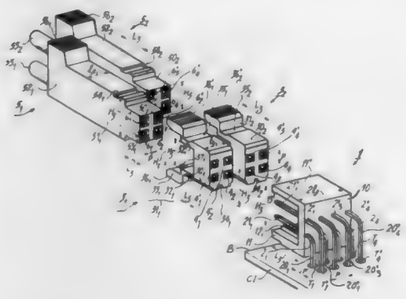
1. An electrical connector for interconnecting circuitry on a first substrate to corresponding circuitry on a perpendicularlly mounted second substrate, each substrate having conductive elements disposed on one surface thereof as part of the circuitry on the substrate, the connector comprising:
a body of cylindrical lengthwise configuration having a first mounting surface for mounting said first substrate thereto, and a second mounting surface perpendicular to said first mounting surface for mounting said second substrate thereto, said body further including a recess formed in the corner of the intersection of the first and second surfaces;
means for mounting the first substrate to the connector;
means for mounting the second substrate to the connector,
an elastomeric insert disposed in said recess, said insert having a first node extending beyond and normal to said first mounting surface, and a second node extending beyond and normal to said second mounting surface,
a flexible insulating film surrounding the elastomeric insert and at least a portion of the cylindrical body, said film having conductive traces disposed thereon,
whereby, when the first substrate is mounted adjacent the first mounting surface and the second surface is moujted adjacent the second mounting surface, the first and second nodes are each resiliently deformed inwardly to a point planer with the respective first and second mounting surfaces, normally biasing the conductive traces on the film against the circuitry disposed on the substrates.

4,693,530
SHIELDED ELASTOMERIC ELECTRIC CONNECTOR
Donald G. Stillie, and Paul D. Zakary, both of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 29, 1986, Ser. No. 912,707
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—67 **20 Claims**



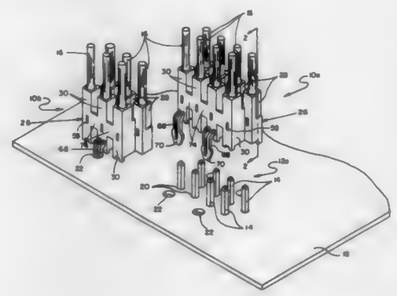
1. An electrical connector for interconnecting circuitry on a first substrate to circuitry on a second substrate, the connector comprising a body portion and a film assembly, the body portion including means to mount the substrates to the connector; the film assembly including an insulative film having an inside and an outside surface, the film having a plurality of conductive signal traces and at least one ground trace disposed on the outside surface of the the film, said signal and ground traces on said film being profiled to interconnect signal and ground traces of said first and second substrate, and a grounding means disposed on the inside surface of the film thereof, a first end of the film being placed against the body portion with the inside surface facing the body portion, the film being wrapped around the body portion until at least a portion of a second end of the film overlaps the first end, thereby commoning the grounding means with the grounding trace.

4,693,531
CONNECTING DEVICE FOR TESTING PRINTED CIRCUIT
Francis Raphal, and Jean-Paul Roy, both of 41, rue Cantagrel, 75624 Paris Cedex 13, France
Filed Oct. 12, 1984, Ser. No. 660,276
Claims priority, application France, Oct. 14, 1983, 83 16366
Int. Cl.[4] H01R *31/08*
U.S. Cl. 439—512 **9 Claims**



1. Apparatus for electrically testing a printed circuit board (CI), comprising
(a) a generally U-shaped base member (1) having a transverse portion (10) and a pair of parallel spaced leg portions (11, 11');
(b) at least one intermediate member (3_1, 3_2) removably mounted within the space defined between said leg portions, said intermediate member comprising a generally U-shaped block having a transverse portion (30_1, 30_2) and a pair of parallel spaced leg portions (32_1, 32_1'), said intermediate member being arranged with the same orientation as said base member and with its transverse portion adjacent the transverse portion of said base member;
(c) at lease one plug member (5_1, 5_2) arranged on the opposite side of said intermediate member from said base member;
(d) the transverse portion of said intermediate member containing a plurality of parallel through openings extending longitudinally in the direction between said base and plug members;
(e) a plurality of open-ended first female contacts (4_1, 4_1') mounted in the through openings contained in said intermediate member, respectively, said plug member having at one end an end portion extending within the space defined between said intermediate member leg portions, said one end portion containing a plurality of second female contacts (6_1, 6_1') arranged colinearly opposite said first female contacts, respectively;
(f) a plurality of parallel male contacts (21_1, 21_1') mounted on said base member, said male contacts extending at one end completely through said first female contacts and into the corresponding second female contacts, respectively, said male contacts being adapted for connection at their other ends with conductors on the printed circuit board; and
(g) short circuit means (S) contained in said intermediate member for establishing a short circuit between at least one pair of said first female contacts, thereby to short circuit the associated pair of male contacts and the printed circuit conductors associated therewith, said second female contacts being operable to directly receive said male contacts upon removal of said intermediate member from said base member and upon insertion of said plug member one end within the space defined between said base member leg portions.

4,693,532
MODULAR STAGGERED MULTI-ROW ELECTRICAL CONNECTOR
Stephen A. Colleran, Plainfield, and William R. Lenz, Crestwood, both of Ill., assignors to Molex Incorporated, Lisle, Ill.
Continuation of Ser. No. 698,504, Feb. 4, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 887,968
Int. Cl.[4] H01R *11/22*
U.S. Cl. 439—594 **5 Claims**



1. A dual row, modular, mass terminatable electrical connector for connecting a dual row array of pins to insulated wire conductors, said connector including

a housing made of insulative material having parallel top and bottom rows of elongated terminal receiving cavities, each cavity generally defined between two spaced-apart sidewalls, a top wall and a bottom wall, each cavity having a forward pin receiving opening and a rear wire receiving opening, and

a plurality of identical terminals, one mounted with the same orientation in each cavity, and each terminal having a forward pin engaging portion and a rear insulation displacement slot for receiving an insulated conductor therein, displacing the insulation and electrically contacting the conductor,

the improvement comprising:

the cavities of the top row being staggered with respect to the cavities of the bottom row;

the sidewalls of adjacent cavities of the top and bottom rows being spaced-apart;

a slot formed in each of the top walls of the cavities of the top and bottom rows, each slot extending from the wire receiving opening toward the forward end to expose the insulation displacement slot, whereby the insulation displacement slots of the terminals received in the bottom row cavities are accessible between the sidewalls of adjacent top row cavities so that all of the terminals of both rows can be mass terminated from one direction; and

said housing having a plurality of modules, each module including at least one top row cavity and at least one bottom row cavity and selectively removable module connecting members joining predetermined adjacent cavity sidewalls for connecting a plurality of modules together, whereby a desired number of modules may be removed from the housing leaving a connector having the same number of pin receiving opeings as there are pins in a given pin array.

4,693,533

RIBBON CABLE CONNECTOR WITH IMPROVED COVER LATCH

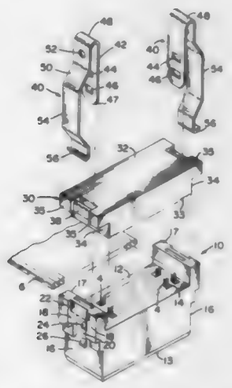
David S. Szczesny, Harrisburg, and John A. Root, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 778,095, Sep. 20, 1985, Pat. No. 4,621,885. This application Jun. 26, 1986, Ser. No. 878,766

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] H01R *4/24, 13/627*

U.S. Cl. 439—350 **15 Claims**



1. A ribbon cable connector of the type comprising a housing with insulation displacing contacts projecting from a top surface thereof, a cover having aperture means therein for receiving the contacts, and latch means at opposite ends of the connector effective to fix the cover in first and second latched positions relative to the housing, the cover being spaced from the top surface in the first position to permit alignment of the cable for termination, the cover being movable from the first position toward the top surface to terminate the cable, the cover securing the cable in terminated condition at the second position, the latch means comprises a pair of latch members fixed to the cover at respective opposite ends thereof, each latch member having a first latch arm cooperable with respective ends of the housing to effect latching at the first and second positions, each latch member further comprising a second latch arm adjacent the first latch arm and spaced from the housing, the second latch arms being cooperable with a complementary connector to retain the ribbon cable connector thereto, the connector being characterized in that:

first means are provided by the cover and the latch members securing the cover and latch members together, and as the cover is moved between the first position and the second position, the latch members move accordingly, the cover and the latch members being secured together by the first means; and

second means are provided by the first latch arms and the housing such that as the cover is moved between the first position and the second position, the latch member is permitted to move accordingly, as the second position is reached the second means secures the cover in the second position.

4,693,534

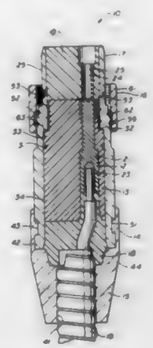
ELECTRIC FED-THRU CONNECTOR ASSEMBLY

Bill W. Clark, Houston, Tex., assignor to Seaboard Wellhead Control, Inc., Houston, Tex.

Continuation of Ser. No. 651,170, Sep. 17, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 821,037

Int. Cl.[4] H01R *4/00*

U.S. Cl. 439—276 **40 Claims**



1. Integral electrical connection apparatus for feeding electricity between a very high fluid pressure zone and a low fluid pressure zone, comprising:

(a) an elongated mandrel sleeve having an internal sleeve shoulder formed therein and facing the high pressure end of said mandrel sleeve, said mandrel sleeve being externally adapted for sealed mechanical connection into high pressure equipment;

(b) an elongated pre-formed rigid high mechanical strength dielectric insulator support means having an external insulator shoulder installed within said mandrel sleeve with said insulator shoulder in abutment with said internal shoulder of said sleeve;

(c) said insulator support means being mounted in sealed and physically bonded relation within the interior of said mandrel sleeve by means of a dielectric potting material disposed as a insulator film in the surface areas between said insulator support means and said mandrel sleeve;

(d) said insulator support means having a plurality of holes axially extending in parallel and laterally spaced apart relation through said insulator means with each hole of said holes having an internal hole shoulder formed therein and facing the high pressure end of said sleeve;

(e) an elongated rigid electrical conductor member having an external conductor shoulder and with electrical connectors on each end installed within each said hole with said conductor shoulder in abutment with said hole shoulder;

(f) said each electrical conductor member being mounted in sealed and physically bonded relation with the interior of said hole by means of a dielectric potting material disposed as a conductor film in the surface areas between said conductor member and the side of said hole;

(g) said insulator support means and said conductor members as specified being provided within said mandrel sleeve to seal off fluids from flow through said mandrel sleeve limited only by a fluid pressure level sufficiently high to cause physical failure of the material of said insulator support means.

4,693,535

TERMINAL CONNECTOR FOR AN ELECTROCHEMICAL ACCUMULATOR BATTERY

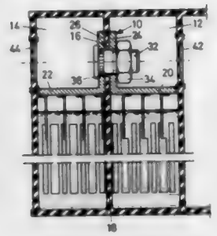
Per E. Frode, Mockebo, Sweden, assignor to SAB Nife AB, Landskrona, Sweden

Filed Oct. 9, 1985, Ser. No. 785,791

Claims priority, application Sweden, Oct. 29, 1984, 8405403

Int. Cl.[4] H01R *4/00*

U.S. Cl. 439—277 **6 Claims**



1. A connection in an electrochemical accumulator battery for sealed lead-through of a screw-joint providing an electrical connection between two adjacent cells through an opening in a cell wall said connection comprising: a cell wall made of plastic material and having an opening, a pair of plate group busses each connecting a plurality of electrode plates, each plate group bus having a leg parallel with the cell wall and positioned on opposite sides of the wall, and each said leg having an opening aligned with the wall opening, and a screw having a threaded body portion and a head portion and extending through the openings in the wall and in the plate group busses to define a screw-joint, a nut engageable with the threaded body of the screw for holding the joint together, an annular spacer having an external diameter greater than those of the openings in the plate group bus legs and smaller than the diameter of the cell wall opening and having a thickness smaller than the thickness of the cell wall and made of a harder material than the cell wall material, said spacer carried around the body portion of the screw and positioned in the opening in the cell wall, wherein each leg of the plate group bus is arranged tightly against a side of the cell wall and is forced by the screw-joint against the spacer, an interjacent part of the cell wall between the plate group bus legs being deformable and acting as a sealing gasket between the two legs.

4,693,536

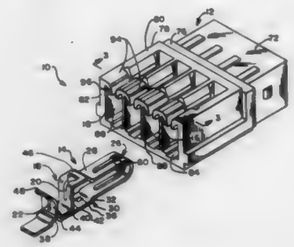
INSULATION DISPLACEMENT TERMINAL

Stephen A. Colleran, Lisle, and Connie Doles, La Grange Park, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 12, 1986, Ser. No. 873,574

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—404 **6 Claims**



1. A unitary, integrally-formed electrical terminal adapted to be mounted in a connector housing cavity for interconnecting an insulated conductor and a contact member, said terminal being a continuous strip of metal having an insulation displacement contact portion adapted to receive the insulated conductor, a second contact portion adapted to make electrical contact with the contact member, and a connecting portion extending between said insulation displacement contact portion and said second contact portion, and the improvement characterized by:

said insulation displacement contact portion being generally upwardly directed U-shaped with a lower base and spaced first and second upstanding legs;

said connecting portion extending from an upper end of said first leg;

a first insulation displacement slot in said first leg extending into said connecting portion and downwardly from the upper end of the first leg toward the base; and

a second insulation displacement slot in said second leg extending downwardly from an open upper end of said second leg toward the base;

whereby an electrical terminal including an in-line insulation displacement contact portion having small space requirements is provided.

4,693,537

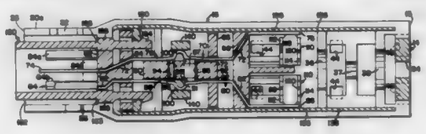
ELECTRICAL CONNECTOR

Jeffrey P. Dinsmore, and George B. Pfeffer, both of Minnetonka, Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Jul. 7, 1986, Ser. No. 882,530

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—399 **13 Claims**



1. An electrical connector apparatus for electrically connecting a twisted pair cable (**300**) and a terminal end (**200**) of a jack where the end (**200**) has a first exposed electrical contact (**206**) and a second exposed electrical contact (**208**) and said twisted pair cable (**300**) includes a first conductor (**301**) and a second conductor (**302**), said apparatus comprising:

a housing having a first end (**12**) for releasably receiving said terminal end (**200**) and a second end (**14**) for receiving said

first and second conductors (301, 302) of said twisted pair cable (300);

connecting means (20) for releasably connecting said terminal end (200) to said housing first end (12) with said terminal end (200) and said housing first end (12) maintained in predetermined alignment;

a first intermediate electrical connector (70) carried by said housing and having a first end (74) disposed to contact said first exposed electrical contact (206) in electrical connection when said terminal end (200) is connected to said housing by said connecting means (20), means (110) for connecting said first twisted pair cable conductor (301) to said first intermediate electrical connector (70) in electrical connection; and

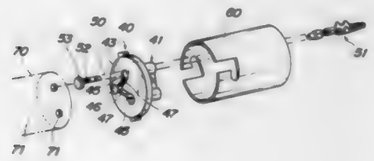
a second intermediate electrical connector (80) carried by said housing and having a first end (84) disposed to contact said second exposed contact (208) in electrical connection when said terminal end (200) is connected to said housing first end (12) by said connecting means (20), means (110) for connecting said second twisted pair cable conductor (302) to said second intermediate electrical connector (80) in electrical connection.

4,693,538

INSULATOR FOR ELECTRIC TERMINAL ATTACHED TO ELECTRIC WIRE

Hiroyoshi Matsuo, Chigasaki, Japan, assignor to Shiba Seisakusho Limited Responsibility Company, Ebina, Japan

Filed May 2, 1986, Ser. No. 859,157
Int. Cl.[4] H01R *13/422, 13/58, 17/04*
U.S. Cl. 439—460 **10 Claims**





1. An insulator for an electric terminal attached to an electric wire, comprising:

at least one cylindrical member having a first hole adapted to receive the electric wire therein, and a first slit to allow the electric wire to pass therethrough for placing the electric wire in the first hole through the first slit, and

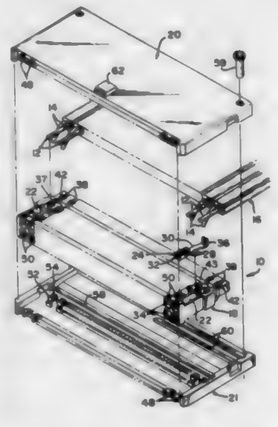
a flange integrally formed with and surrounding the cylindrical member and having at least one second hole aligned with the first hole of the cylindrical member, the diameter of the second hole being slightly larger than that of the first hole so that the electric terminal can be located in the second hole, a third hole having a diameter larger than that of the electric terminal to allow the electric terminal with the electric wire to pass longitudinally therethrough, and at least one second slit formed between the second and third holes and aligned with the first slit to allow the electric wire to pass laterally through said first and second slits so that the electric terminal is located in the second hole and the electric wire is located in the first hole.

4,693,539

RIBBON COAX CABLE CONNECTOR

Charles I. Tighe, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 789,915, Oct. 17, 1985, abandoned, which is a continuation of Ser. No. 565,510, Dec. 27, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 6,269
Int. Cl.[4] H01R *13/58*
U.S. Cl. 439—465 **9 Claims**



1. An electrical connector for a transmission cable comprising;

a body of insulative material,

conductor receiving passageways having a bottom wall and sidewalls extending along the body for snugly receiving corresponding electrical conductors of the transmission cable therealong,

terminal receiving passageways extending along the body and aligned with corresponding conductor receiving passageways,

conductive electrical terminals in the terminal receiving passageways having conductor terminating section means for electrical connection with corresponding electrical conductors of the transmission cable,

cover means for securing onto said body and covering the terminal receiving passageways and the conductor receiving passageways,

conductor strain relief means on said cover means for maintaining said conductor terminating section means connected with corresponding electrical conductors of the transmission cable,

cable strain relief means for engaging the transmission cable, and

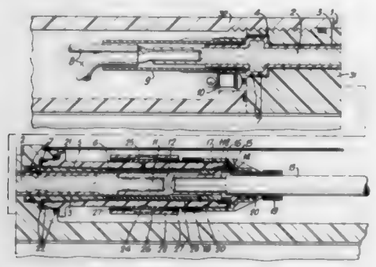
conductor receiving recess means in the sidewalls of the conductor receiving passageways between said conductor strain relief means and said cable strain relief means to accommodate movement of conductors received in said conductor receiving passageways because of temperature variation or twisting of the transmission cable that includes said conductors received in said conductor receiving passageways.

4,693,540

PRESSURE REGULATING DEVICES

Michael R. Cane, Prescot, England, assignor to BICC Public Limited Company, London, England

Filed Mar. 12, 1984, Ser. No. 588,807
Claims priority, application United Kingdom, Mar. 31, 1983, 8308977
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—198 **8 Claims**



5. An electric connector for service in an ambient medium under predetermined conditions of elevated temperature and elevated pressure, said elevated pressure being many times greater than atmospheric pressure, said connector comprising electrical connecting means and a fluid-tight housing which encloses said electrical connecting means and is fitted with at least one pressure-regulating device for substantially avoiding pressure difference between the inside of the connector and the surrounding ambient medium, said pressure-regulating device comprising:

a solid body with a shallow recess in a surface thereof;

a diaphragm sealed peripherally to said recess to partition it from ambient medium; and

a passage connecting said recess to the interior of said housing;

wherein said diaphragm is flexible such that on application of an elevated ambient pressure it will enter the recess and reduce its volume by a substantial amount, and further wherein said housing is filled with a major volume of fluid and a minor volume of gas, the relation of said major volume to said minor volume being such that said fluid will expand on heating from ordinary atmospheric temperature to said predetermined condition of elevated temperature by a volume increment substantially equal to said minor volume so as to return said diaphragm to a position where it does not enter the recess;

whereby said diaphragm is substantially free of stress under both said predetermined conditions of elevated temperature and elevated pressure and under ordinary atmospheric conditions of temperature and pressure.

4,693,541

ELECTRICAL ORNAMENTATION SYSTEM

Robert E. Sanders, Lenexa, Kans.; Jerry L. Knipp, Grandview, and Charles J. Flynn, Kansas City, both of Mo., assignors to Hallmark Cards, Inc., Kansas City, Mo.

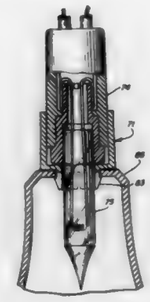
Continuation-in-part of Ser. No. 508,522, Jun. 27, 1983, Pat. No. 4,544,218. This application Jun. 21, 1985, Ser. No. 747,647
Int. Cl.[4] H01R *13/60*
U.S. Cl. 439—541 **14 Claims**

1. In combination:

a decorative ornament with an aperture therein for receiving an electrical lamp;

a connector cable assembly for electrical connection of said decorative ornament to a string of conventional sockets for miniature Christmas lights or the like, the connector cable assembly having means at one end adapted for electrically mating with a selected one of said sockets and having an electrical socket at an opposite end adapted to receive a miniature light; and

coupling means for coupling said socket of said assembly to said ornament aperture comprising a hollow cylindrical outer portion for receiving and holding the connector



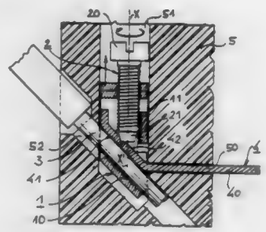
socket and a hollow cylindrical inner portion for extending axially beyond one end of said outer portion and receiving said miniature light, said inner portion being adapted to mate with said ornament aperture and to hold said miniature light secured in said aperture, said coupling means being constructed of a heat conductive material.

4,693,542

ELECTRICAL SCREW CONNECTION

Jean-Paul Heng, Lyons; André Marmonier, Bron; Ariel Ruiz, Villeurbanne, and Henri Guernet, Lyons, all of France, assignors to Cgee Alsthom, Levallois-Perret, France

Filed Dec. 12, 1985, Ser. No. 808,698
Claims priority, application France, Dec. 12, 1984, 84 18998
Int. Cl.[4] H01R *4/36*
U.S. Cl. 439—626 **5 Claims**



1. A screw connection which places a conductor wire into electrical connection with a conductor strip of an electrical apparatus at least partially contained in a housing made of insulating material, said housing including a first duct and an oblique second duct, said oblique second duct intersecting said first duct at an acute angle at one end to close off said one end of said first duct, said screw connection comprising:

a cage including an inside wire-gripping surface,

a clamping screw screwably mounted to said cage,

said conductor strip having a screw-engaging surface on one side thereof and a wire-gripping surface on an opposite side thereof facing said cage wire-gripping surface,

said screw having a shank end and a leading end, said screw leading end being screwed into said cage, and thrust against said screw-engaging surface of said conductor strip in order to electrically connect said conductor wire to said conductor strip by gripping said wire between said wire-gripping surface of said conductor strip and said inside, wire-gripping surface of said cage which extends

generally parallel to said wire-gripping surface of said conductor strip,

said clamping screw having a screw axis which extends at an acute angle relative to said generally parallel wire-gripping surfaces,

said cage including at least one lateral screw-backing element for engaging said clamping screw at least in the vicinity of its leading end to oppose the traverse component of the reaction between said screw and said connector strip tending to urge the leading end of the screw sideways while said screw is being tightened by virtue of said angle between and screw and said screw-engaging surface of said strip, said cage being made of a cut and folded metal sheet comprising a pair of parallel webs interconnected at one end by an obliquely disposed web forming said wire-gripping surface of said cage, and being interconnected at an opposite end by at least one web which extends perpendicularly to said pair of parallel webs and which includes a tapped hole holding and positioning said clamping screw so that said clamping screw extends parallel to said pair of parallel webs, each of said parallel webs including a lateral projection folded against the shank of the screw at least in the vicinity of its leading end pressed against said conductor strip and constituting said at least one lateral screw backing element to avoid setting up a rotary couple between said screw shank and said conductor strip, said cage being placed in said first duct and said cage and said first duct being configured and sized so as to enable limited axial displacement of said cage relative to said strip along said screw axis between positions which correspond to extreme positions for a gap existing between said wire-gripping surfaces of said cage and said strip, and said first duct provides access to turn the screw, said wire-gripping surfaces of said strip and of the cage being disposed opposite an opening of said second duct, said second duct constituting a wire-access duct passing obliquely through said housing in a direction which is parallel to said wire-gripping surfaces, and said conductor strip being carried by a third duct within said insulating material housing intersecting said first and second ducts, and said conductor strip having a portion projecting into said first duct at the intersection of said first and second ducts, and said conductor strip portion extending obliquely parallel to said obliquely disposed web and to said second duct.

4,693,543

OPTICAL INTEGRATED CIRCUIT

Hiroyoshi Matsumura, Saitama, and Koji Ishida, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

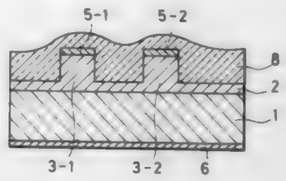
PCT No. PCT/JP84/00311, § 371 Date Mar. 7, 1985, § 102(e) Date Mar. 7, 1985, PCT Pub. No. WO85/00431, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 15, 1984, Ser. No. 711,507

Claims priority, application Japan, Jul. 8, 1983, 58-123239

Int. Cl.⁴ G02B *6/12*

U.S. Cl. 350—96.11 **2 Claims**



1. In an optical integrated circuit including a substrate, a ridge and an optical waveguide layer, the improvement comprising a hardened film of a heat-resistant, high-molecular weight resin formed over said ridge and said optical waveguide layer.

4,693,544

OPTICAL BRANCHING DEVICE WITH INTERNAL WAVEGUIDE

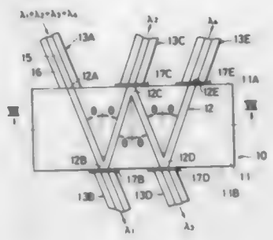
Tetsuya Yamasaki, Amagasaki, and Eiji Okuda, Itami, both of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 6, 1983, Ser. No. 558,507

Claims priority, application Japan, Dec. 14, 1982, 57-218902; Jan. 19, 1983, 58-6775

Int. Cl.⁴ G02B *6/28*

U.S. Cl. 350—96.16 **12 Claims**



3. An optical waveguide device comprising a region formed in a transparent substrate, the region having a refractive index higher than a refractive index of the transparent substrate and defining an optical waveguide within the transparent substrate, said optical waveguide having first and second optical waveguide elements, each of the waveguide elements having one end connected to the one end of the other optical waveguide element in a substantially V-shape in the vicinity of a first surface of said transparent substrate, a connecting portion of the connected ends of the two optical waveguide elements being exposed to the first surface of said transparent substrate; and

wherein an axis of each of said optical waveguide elements lies within an imaginary plane perpendicular to the first surface of said transparent substrate and is inclined at the same angle with respect to a line normal to the first surface of said transparent substrate, and the axes of the first and second optical waveguide elements also intersecting one another at the surface of the transparent substrate where the connecting portion is exposed;

wherein an optical filter is arranged on each surface portion of said transparent substrate where the connecting portion is exposed; and

wherein the optical filter transmits light of predetermined wavelengths and reflects light of other wavelengths, respectively.

4,693,545

APPARATUS FOR THE CONTROLLED TRANSMISSION OF LIGHT

Tom Henningsen, Monroeville Boro, and Theresa A. Gould, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 4, 1984, Ser. No. 646,723

Int. Cl.⁴ G02B *6/12*

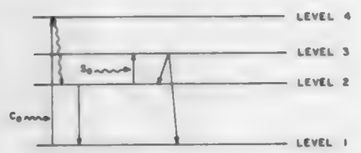
U.S. Cl. 350—96.12 **45 Claims**

1. Apparatus for controlling the transmission of radiant energy comprising:

a light transmissive medium in communication with a means for introducing a first flux of photons, or the evanescent field thereof, into said medium, said photons having energy E, and said medium having energy level characteristics such that the energy, E, of said first flux of photons matches an energy gap between an energy level designated as energy level 2 and another energy level designated as energy level 3 of said medium, and said first flux is substantially unattenuated as said first flux of photons, or the evanescent field thereof, passes through said medium; and

means in communication with said medium for selectively introducing a second flux of photons, or the evanescent field thereof, into said medium to attenuate said first flux of photons, said second flux of photons causing the population of energy level 2 of said medium, wherein a portion of said first flux is absorbed, inducing a population in level 3, a portion of which population in level 3 returns to level 2 and is available for further attenuation of said first flux, whereby the control of the transmission of said first flux of photons by said second flux of photons is more efficient than if the return of excited states from level 3 to level 2 did not occur;

and furthermore, the introduction of n_1 photons of said second flux, or the evanescent field thereof, causes the absorption of n_2 photons of said first flux, wherein n_2 is



greater than n_1, when $\tau_p^{-1} >> \tau_2^{-1}$, $k \geqq 0.90$, $\tau_{31}^{-1}/\tau_3^{-1} \geqq 0.80$, and $\tau_2^{-1}/(\gamma\sigma_{23}S_f) \leqq 0.01$, where τ_p^{-1} is the pulse rate of said second flux, τ_2^{-1} is the spontaneous decay rate from level 2, k is the fraction of said second flux which is absorbed in populating level two of said medium, τ_{31}^{-1} is the decay rate for direct transistions from level 3 to level 1, $\tau_3^{31\ 1}$ is the overall spontaneous decay rate from level 3, $\gamma\sigma_{23}$ is the effective cross section for absorption of said first flux in inducing transitions from level 2 to level 3, where $\gamma = 1$ if said first flux is introduced directly into said medium, and $\gamma < 1$ if the evanescent field of said first flux is introduced into said medium, and S_f is the final number of photons per square centimeter per second in said first flux after said first flux, or the evanescent field thereof, has passed through said medium;

and wherein the introduction of said second flux, or the evanescent field thereof, causes the absorption of n_2 photons of said first flux, wherein n_2 is greater than n_1, when $\tau_p^{-1} >> \tau_2^{-1}$, $k \geqq 0.90$, $\tau_{31}^{-1}/\tau_3^{-1} \geqq 0.80$, and $\tau_p^{-1}/(\gamma\sigma_{23}S_f) \leqq 0.01$.

4,693,546

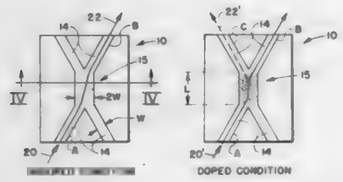
GUIDED-WAVE OPTICAL POWER DIVIDER

Joseph P. Lorenzo, Stow, and Richard A. Soref, Newton Centre, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,902

Int. Cl.⁴ G02B *6/10*

U.S. Cl. 350—96.13 **16 Claims**



1. A guided-wave optical power divider, comprising:

a body made up entirely of crystalline silicon;

an intersecting channel waveguide structure having a first leg and at least two other legs formed within said silicon body, said legs intersecting to form an intersection crossover region of predetermined size; and

said crossover region being doped with a predetermined amount of impurities, said predetermined amount of impurities being sufficient to change the cross-coupling of light between said first leg and said two other legs.

4,693,547

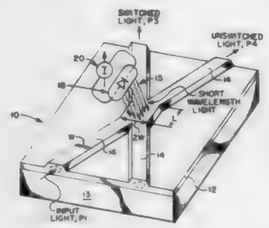
OPTICALLY CONTROLLED INTEGRATED OPTICAL SWITCH

Richard A. Soref, Newton Centre, and Joseph P. Lorenzo, Stow, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,910

Int. Cl.⁴ G02B *6/10*

U.S. Cl. 350—96.13 **19 Claims**



1. An optically-controlled integrated optical switch, comprising:

a body made up entirely of crystalline silicon:

an X like channel waveguide structure having a first leg and a second leg formed within said silicon body, said first and said second legs intersecting to form an intersection crossover region of predetermined size; and

means for providing a beam of light impinging on said intersection crossover region in order to alter the index of refraction of said silicon body and therefore changing the cross-coupling of light between said first leg and said second leg of said X-like channel waveguide structure.

4,693,548

DEVICE FOR RECORDING INFORMATION ON A PHOTOSENSITIVE MEDIUM FOR ELECTROPHOTOGRAPHY

Haruo Tsunoi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,062, Feb. 18, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 694,905

Claims priority, application Japan, Feb. 27, 1981, 56-27762

Int. Cl.⁴ G02B *6/10;* **G03G** *15/00;* **G01D** *9/04*

U.S. Cl. 350—96.13 **4 Claims**

1. A device for recording information on a photosensitive member, comprising:

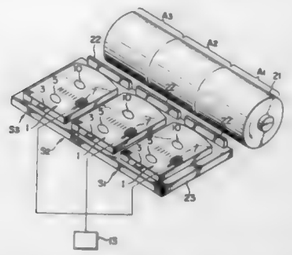
a plurality of independently controlled light sources;

a plurality of waveguides, each having a length and a width and being adapted to propagate a light beam from an associated said light source along the lengthwise direction, said waveguides being arranged with their widths extending in a predetermined direction such that the widths of said waveguides lie along a line;

deflecting means for deflecting, in the predetermined direction, the light beams propagated by said respective waveguides;

a plurality of internal lens systems, one said internal lens system being provided in each of said waveguides; and

an external lens system for condensing deflected light beams emerging from said waveguides, in cooperation with said internal lens systems, on the photosensitive member such



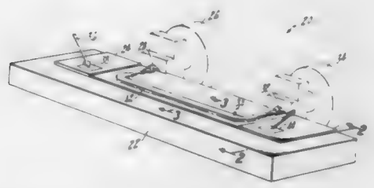
that areas on the photosensitive member exposed by the deflected light beams emerging from said waveguides are larger than the width of any one of said waveguides and are cotinuously arranged in the predetermined direction.

4,693,549

OPTICALLY BUFFERED WAVEGUIDE MODULATOR

Peter K. Cheo, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 4, 1985, Ser. No. 720,196
Int. Cl.[4] G02B *6/14*; G02F *1/00*
U.S. Cl. 350—96.14 **12 Claims**



1. An infrared electro-optic modulator comprising:

an optical waveguide slab having substantially parallel top and bottom surfaces, a predetermined waveguide index of refraction in a predetermined optical wavelength range that determines a waveguide phase velocity of light in said wavelength range, a predetermined waveguide dielectric constant, and a predetermined waveguide thickness along an axis perpendicular to said top and bottom surfaces;

a top optical buffer layer adjacent said top surface, having a buffer index of refraction in said predetermined optical wavelength range that is less than said waveguide index of refraction, a predetermined buffer layer dielectric constant, and a predetermined buffer thickness;

a top electrode, having a predetermined electrode width along a transverse direction perpendicular to said axis and a predetermined electrode length along a longitudinal direction perpendicular to both said axis and said transverse direction, disposed on said top optical buffer layer; and

a bottom electrode disposed below said optical waveguide slab, characterized in that;

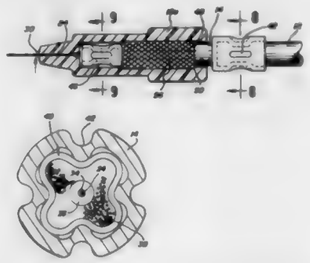
a bottom optical buffer layer is formed adjacent said bottom surface and disposed above said bottom electrode, also having said buffer index of refraction, said buffer layer dielectric constant and said buffer thickness; and said waveguide thickness and said buffer thickness of said top and bottom optical buffer layers combine with said top and bottom electrodes to form a microwave transmission line having a predetermined phase velocity for traveling wave microwave signals that is substantially equal to said predetermined waveguide phase velocity of light.

4,693,550

CRIMP TYPE FIBER OPTIC CONNECTOR

Vincent B. Brown, Prospect Heights, and Sherman W. McGrew, Chicago, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Mar. 11, 1985, Ser. No. 710,317
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **11 Claims**



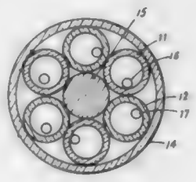
8. A fiber optic connector terminating a length of fiber optic cable having a central fiber optic core covered by cladding, a buffer outside of the cladding, and additional layers of material covering the buffer, said connector comprising, in combination, a fiber optic cable end having a first, outermost end portion stripped of all material outside of said cladding, a second, intermediate end portion stripped of all material outside of said buffer, and a third cable end portion which includes additional layers of material outside of said buffer, ductile metal sleeve means extending over said first, second, and third cable end portions, a resilient tubular insert positioned within the outer end of said ductile metal sleeve means to surround at least a portion of said first, outermost end portion of said cable which is within said sleeve means, said ductile metal sleeve means being crimped at the location of said resilient tubular insert to hold said sleeve means, said insert, and said first outermost end portion in immovable relation, and said ductile metal sleeve means being also crimped at the location of said third cable end portion, whereby said first, outermost cable end portion can abut the end of another optic cable for optical connection.

4,693,551

DIELECTRIC STRENGTH ELEMENTS FOR LOOSE TUBE OPTICAL FIBER CABLE

Carlos Blanco, Roanoke; Adolf R. Asam, Botetourt, and John C. Smith, Roanoke, all of Va., assignors to U.S. Holding Company, Inc., New York, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,344
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **17 Claims**



1. In a dielectric loose tube optical fiber cable having a tubular outer covering and containing a central strength member of a dielectric material, with a plurality of peripheral hollow fiber containing tubes surrounding said central member and positioned between said central member and said outer covering the improvement therewith comprising:

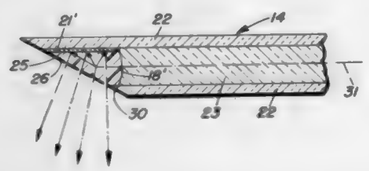
each of said plurality of said hollow fiber containing tubes being fabricated in a single layer of plastic having embedded therein a plurality of glass fibers substantially oriented in the longitudinal direction along said tube, said hollow fiber containing tubes contributing to the strength of said cable allowing said central strength member to have a reduced cross sectional area.

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OPTICAL APPARATUS

Richard V. Jeskey, Fiskdale, Mass., assignor to Incom, Inc., Southbridge, Mass.

Continuation-in-part of Ser. No. 442,512, Nov. 18, 1982, which is a continuation of Ser. No. 427,789, Sep. 29, 1982, abandoned.
This application Aug. 4, 1983, Ser. No. 520,152
Int. Cl.[4] G02B *6/06*
U.S. Cl. 350—96.24 **8 Claims**



1. An optical apparatus for receiving an optical image at a first end and for producing an expanded form of the optical image at a second end, comprising:

a plurality of optical fibers of uniform cross-section extending from said first end to said second end, each fiber having a core and cladding and an axis in the neighborhood of the second end, each fiber adapted to transmit light from the first end to the second end,

the fibers formed into a plurality of rows, the fibers in a given row being held in a uniformly adjacent configuration,

the several rows being held in close proximity at the first end and separated by spacers at the second end,

all the rows of the fibers together being cut at the second end at a narrow angle to their axes to provide a broad emission surface at the end of each fiber, the surfaces being co-planar with each other to form an expanded image plane, each surface having a center, the widths of the spacers being such as to make the center-to-center distance between the adjacent rows at the second end the same as the distance between the centers of the faces of the adjacent fibers on the same row, so that the image at the second end is and undistorted form of the image at the first end, each of the fibers at its second end being provided with light diffusing element integrally formed at the fiber end to disperse light from the second end and providing a non-directional field of view for the expanded image.

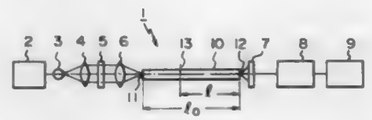
4,693,553

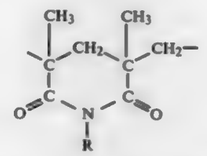
LIGHT-TRANSMITTING FIBER

Isao Sasaki, Hiroshima; Kozi Nishida; Masaru Morimoto, both of Otake, and Takashi Yamamoto, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,634
Claims priority, application Japan, Mar. 2, 1984, 59-40077; Mar. 5, 1984, 59-41825
Int. Cl.[4] D02G *3/00*
U.S. Cl. 350—96.34 **9 Claims**

1. A light-transmitting fiber comprising a core component and a sheath component covering the core component, the core component consisting essentially of a polymer comprising 2% to 100% by weight of ring structure units represented by the following general formula (I):





(I)

wherein R stands for a hydrogen atom or an aliphatic, alicyclic, or aromatic hydrocarbon group having 1 to 20 carbon atoms,

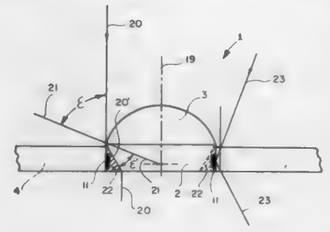
and 0% to 98% by weight of monomer units composed mainly of methyl methacrylate, and the sheath component being composed of a polymer having a refractive index smaller by at least 1% than that of the polymer of the core component.

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SENSOR MAGNIFYING GLASS APPARATUS

Werner Cordes, Hamburg, Fed. Rep. of Germany, assignor to Aristo Graphic SySteme GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 871,986
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520293
Int. Cl.[4] G02B *7/02*; G08C *21/00*
U.S. Cl. 350—244 **6 Claims**



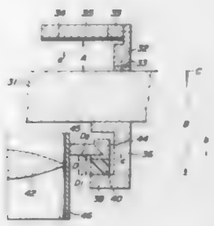
1. A sensor magnifying glass comprising a magnifying glass element held in a holder element, said magnifying glass element having a cylindrical portion and a convexly curved lens portion superposed thereon which is rotationally symmetrical with respect to the cylinder axis, said sensor magnifying glass further having a plotter coil disposed coaxially with the cylindrical portion, characterized in that the plotter coil (**11**) is secured on the cylindrical portion (**2**) in the region between the circumferential face of the cylindrical portion (**2**) and the course of a peripheral light ray (**20'**) entering an outer edge of the lens portion (**3**) as it passes through the cylindrical portion (**2**).

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DEVICE FOR HOLDING AN IMAGING LENS

Noboru Arai, and Takekazu Yanagimoto, both of Ashigara-Kami, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1985, Ser. No. 789,291
Claims priority, application Japan, Oct. 19, 1984, 59-218289
Int. Cl.⁴ G02B *7/02*
U.S. Cl. 350—253 **9 Claims**



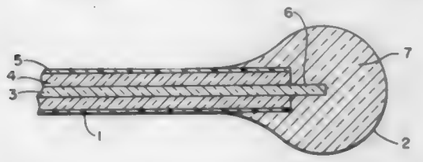
1. An imaging lens holder device comprising:
a substrate (**31**) having upper and lower surfaces and an optical window (**43**) therethrough;
holding means (**35**) for supporting a member (**34**) to be scanned;
leg members (**32**) extending from the upper surface of said substrate and attached to the holding means for supporting the holding means a predetermined distance from said substrate;
supporting legs (**36, 37**) having first and second ends and being attached to the lower surface of the substrate by said first ends;
ledges (**38, 39**) having upper and lower surfaces and integrally attached to the second end of said supporting legs;
an imaging lens holding means having an imaging lens (**42**) disposed therein in such a manner that a projection image formed by the imaging lens is formed on a surface of the member to be scanned through the optical window of the substrate; and
focus adjusting members (**40,41**) secured on the upper surfaces of said ledges and supporting the imaging lens holding means for correcting defocusing of the imaging lens resulting from dimensional change of the leg members, substrate and supporting legs due to changes in temperature.

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APPARATUS FOR PRODUCING A SPHERICAL PATTERN OF LIGHT AND METHOD OF MANUFACTURE

James S. McCaughan, Jr., Galena, Ohio, assignor to Laser Therapeutics, Inc., Worthington, Ohio

Filed Jun. 4, 1985, Ser. No. 741,144
Int. Cl.⁴ G02B *6/00*; A61B *17/36*; F21V *7/04*; B32B *31/00*
U.S. Cl. 350—320 **1 Claim**



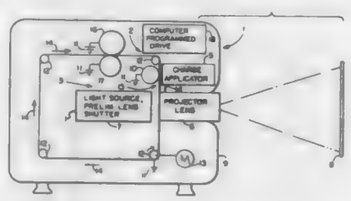
1. A process for manufacturing an apparatus for radiating light of sufficient intensity to cause photodynamic effects in an approximately uniform spherical pattern of approximately 4π steradians comprising the steps of:
(a) removing the cladding and sheathing from a region at one end of an optical fiber;
(b) polishing the smooth, exposed end of the core of said optical fiber exposed by said removal of said cladding and sheathing, making a reasonably smooth, flat surface thereon;
(c) coating said exposed core and said cladding and sheathing adjacent thereto with a light-scattering medium comprising an approximately equal mixture of powdered quartz and an optical adhesive curable by exposure to ultraviolet radiation, said light-scattering medium applied so as to have uniform scattering power in a spherical pattern around said exposed core and approximately centered thereon by means of the sub-steps;
(c-i) launching laser light into said optical fiber at the end opposite that end being coated, said light being of sufficient intensity to produce visible rays emanating from the region being coated;
(c-ii) coating said exposed core region with said light-scattering medium in an approximately spherical light scattering density as determined by an observed uniform intensity in said laser light in a spherical pattern surrounding said core;
(c-iii) curing said applied coating by exposure to ultraviolet radiation;
(c-iv) applying a plurality of additional layers of said light-scattering medium by repeating sub-steps (c-ii) and (c-iii).

4,693,557

LIQUID CRYSTAL MOTION PICTURE PROJECTOR

James L. Ferguson, Atherton, Calif., assignor to Manchester R & D Partnership, Pepper Pike, Ohio

Continuation-in-part of Ser. No. 585,884, Mar. 2, 1984, Pat. No. 4,603,945, and Ser. No. 608,135, May 8, 1984, Pat. No. 4,613,207. This application Aug. 1, 1986, Ser. No. 892,497
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—331 R **29 Claims**



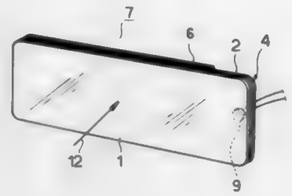
1. A liquid crystal moving picture projector comprising
liquid crystal imager means for creating characteristics of an image, and
projection optics means for projecting images sequentially created by the imager
said imager means including a continuous strip of liquid crystal material capable of temporarily sorting charge to create characteristics of an image capable of being projected by said projection optics means.
25. A method of projecting plural images in sequence, comprising:
creating an image or characteristics of an image in a liquid crystal material
storing such image by storing charge on a surface of such liquid crystal material,
directing light at such liquid crystal material,
projecting such image as a function of light transmitted through or scattered by such liquid crystal material, and
creating a further image on such liquid crystal material for subsequent projection.

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GLARE PREVENTIVE REAR VIEW MIRROR

Junichi Nakabo; Shigeru Kato, and Makoto Shibahara, all of Ooguchi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Niwa, Japan

Filed Mar. 20, 1985, Ser. No. 713,684
Claims priority, application Japan, Mar. 28, 1984, 59-44794[U]
Int. Cl.⁴ H01J *39/12*
U.S. Cl. 350—332 **2 Claims**



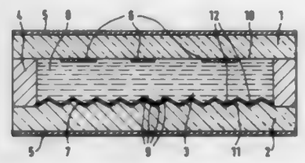
1. A glare preventive rear view mirror comprising:
a liquid crystal cell of the guest-host type including a pair of parallel transparent plates each having a transparent electrode on the inwardly desposed surface thereof and a mixture of nematic liquid crystal and dichroic dyestuff encapsulated between said transparent plates;
a mirror assembly including a quarter wave phase difference filter and a flat mirror each disposed on the side of said liquid crystal cell opposite a light receiving side thereof;
an optical polarization filter mounted on a side of said liquid crystal cell;
a photo-sensitive means for receiving light passing through at least said liquid crystal cell and said optical polarization filter, said photo-sensitive means being adapted to produce a photo-receptor signal in accordance with a quantity of received light; and
a control circuit means for controlling voltage applied to the electrodes of said liquid crystal cell so as to adjust the quantity of light passing through said liquid crystal cell and so that the magnitude of the photo-receptor signal can correspond with a predetermined level.

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LIQUID-CRYSTAL CELL WITH DEPRESSIONS FOR WIDER VIEWING ANGLE

Holm Baeger, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 805,083
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1984, 3444525
Int. Cl.⁴ G02F *1/133*
U.S. Cl. 350—334 **9 Claims**



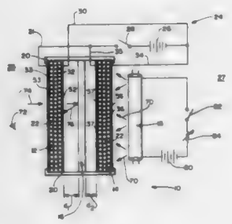
1. In a liquid-crystal cell, particularly a TN-cell, having two transparent substrates arranged spaced from each other and forming between each other a cell space filled with liquid-crystal substance, polarizers positioned on sides of said substrates facing away from each other, and electrodes located on the sides facing each other, the improvement wherein
a substrate-side boundary layer of the cell space contiguous the liquid-crystal substance is formed with a plurality of depressions adjoining each other, said depressions covering substantially the entire boundary surface and having different depths at different places distributed over the extent of the surface of each depression, said depths constituting means for producing light colors correspopding to the total thicknesses of the layer of liquid-crystal present respectively in each of said places, and wherein the light colors include substantially the entire color spectrum within the region of the extent of the surface of each depression.

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DOUBLE LAYER DISPLAY

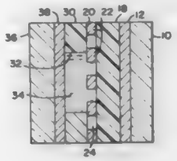
Richard Wiley, Los Altos, Calif., assignor to Taliq Corporation, Sunnyvale, Calif.

Filed Sep. 25, 1986, Ser. No. 911,980
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—335 **20 Claims**



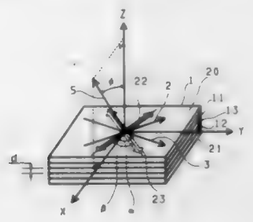
1. A display apparatus comprising:
a first liquid crystal means;
a second liquid crystal means spaced from said first liquid crystal means;
means disposed between said first and second liquid crystal means for both transmitting and reflecting light; and
said first and second liquid crystal means comprising liquid crystal material containing a dye that conforms to the structure of the liquid material and a containment medium means for inducing a distorted alignment of said liquid crystal material which in response to such alignment scatters and absorbs light and which in response to a prescribed input reduces the amount of such scattering and absorption.
10. A display apparatus comprising:
a first liquid crystal means disposed at a viewing side of the apparatus;
a second liquid crystal means spaced from said first liquid crystal means;
said first and second liquid crystal means comprising high birefringence operationally nematic liquid crystal containing a pleochroic dye and a containment medium means for containing plural volumes of the liquid crystal and dye, said containment medium means having surface means for distorting the natural structure of the liquid crystal to cause the dye to increase light absorption, and the liquid crystal being responsive to a prescribed input to reduce the amount of such light absorption;
transflector means partially reflective and partially transmissive for transmitting and reflecting light incident thereon, said transflector means disposed between said first and second liquid crystal means; and
a source of backlight disposed at a non-viewing side of the apparatus.

4,693,561
AMORPHOUS SILICON SPATIAL LIGHT MODULATOR
Paul R. Ashley, Toney, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 23, 1985, Ser. No. 812,603
Int. Cl.[4] G02F *1/135*; G02B *5/18*
U.S. Cl. 350—336 4 Claims



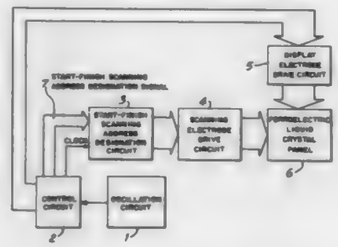
1. An amorphous silicon spatial light modulator comprising input and output end windows of light transparent material and a three electrode structure sandwiched between said windows and including a tin oxide sandwich layer on a surface of said input window, a photoconductor sandwich layer over a surface of said tin oxide layer, an aluminum grating structure mounted over a surface of said photoconductor layer, a liquid crystal layer with one surface of the layer in contact with the grating structure, and an Indium Tin Oxide layer mounted on a surface of said output window and having a surface that contacts an opposite surface of said liquid crystal.

4,693,562
LIQUID CRYSTAL DISPLAY DEVICE
Shinji Hasegawa; Yasuhiko Kando, and Tamihito Nakagomi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 6, 1985, Ser. No. 805,787
Claims priority, application Japan, Dec. 7, 1984, 59-257547
Int. Cl.[4] G02F *1/137*
U.S. Cl. 350—337 4 Claims



1. A liquid crystal display device wherein a nematic liquid crystal having a positive dielectric anisotropy and added with a chiral material is sealed between a pair of upper and lower substrates with electrodes thereon and orienting layers on the electrodes and exposed surfaces thereof so as to constitute a helical structure twisted within a range between 96° and 108° along a direction of thickness thereof, absorption axes of a pair of polarizing plates disposed on said upper and lower substrates constitute an angle between 63° and 73°, and a product Δn-d of a thickness d (μm) and an optical anisotropy Δn of a liquid crystal layer falls within a range from 0.69 μm to 0.79 μm.

4,693,563
FERRO-ELECTRIC LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE
Takamasa Harada, and Masaaki Taguchi, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan
Filed Jun. 28, 1985, Ser. No. 750,093
Claims priority, application Japan, Jul. 5, 1984, 59-139285
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S 20 Claims



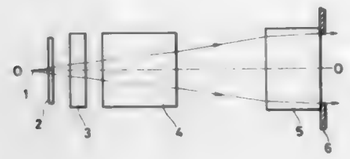
1. A ferro-electric liquid crystal electro-optical device driven in a time-sharing mode comprising: a panel having a plurality of scanning electrodes, a plurality of display electrodes and a ferro-electric liquid crystal material disposed between the scanning electrodes and the display electrodes; drive means for scanning the scanning electrodes and for feeding display data signals to the display electrodes so as to produce a picture on the panel; and control means for controlling said drive means to enable the same to scan only a part of the scanning electrodes for partially rewriting the picture produced by the panel.

4,693,564
ELECTROCHROMIC DISPLAY DEVICE
Hiroshi Mori, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 30, 1985, Ser. No. 793,127
Claims priority, application Japan, Oct. 31, 1984, 59-229714
Int. Cl.[4] G02F *1/17*
U.S. Cl. 350—357 8 Claims



1. An electrochromic display device which comprises a cell having facing electrodes, at least one of which is a display electrode and which are spaced from each other, and an electrochromic solution filled between and in contact with the paired electrodes in a sealed manner, said electrochromic solution comprising an aqueous solution of an N,N'-di(p-cyanophenyl)-4,4'-bipyridinium dihalide as an active substance, an alkali ferrocyanide as an auxiliary redox material, and an electrolyte consisting of a hypophosphite ion and a salt corresponding to the salt obtained from the anion of the active substance and the alkali ion of the auxiliary redox material, said active substance being used in an amount of 0.005 to 0.035 M, said hypophosphite being used in an amount not less than 0.5M, said salt being used in an amount not less than 0.25M.

4,693,565
COLLIMATOR LENS
Hiroyuki Ichikawa, and Minoru Toyama, both of Takarazuka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan
Filed Apr. 28, 1986, Ser. No. 856,822
Claims priority, application Japan, May 7, 1985, 60-96424
Int. Cl.[4] G02B *3/00*
U.S. Cl. 350—413 1 Claim



1. A collimator lens of refractive index distribution type for an optical recording/reproducing apparatus, wherein the collimator lens is made of cylindrical transparent medium with an incident surface and an outgoing surface being in parallel with each other and having the refractive index n(r) at position of distance r from the center axis expressed by:

$$n^2(r)=n_o^2\{1-(g\cdot r)^2+h_4(g\cdot r)^4+h_6(g\cdot r)^6+h_8(g\cdot r)^8+\cdots\}$$

and further satisfies conditions that

$$R_1=R_2=\infty \quad (1)$$

$$1.40/\sqrt{1-(g\cdot r)^2}\leqq n_o\leqq 2.1 \quad (2)$$

$$1/\sqrt{f^2-23.43}\leqq n_{eff}\leqq 1/(f\sin g)\ (\mathrm{mm}^{-1}) \quad (3)$$

$$0.23\leqq h_4\leqq 0.36 \quad (4)$$

$$1.5\leqq r_o\leqq 3.0\ (\mathrm{mm}) \quad (5)$$

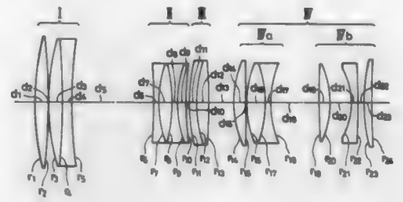
$$0.13\leqq \mathrm{NA}\leqq 0.17 \quad (6)$$

$$|\theta|\leqq 50\ (\mathrm{minute}) \quad (7)$$

(where
n_o: refractive index on the center axis
g, h_4, h_6, h_8: refractive index distribution constants
R_1, R_2: curvature radii of incident surface and outgoing surface
f: focal length
r_o: lens radius
NA: numerical aperture at light source side
θ: angle of normal of incident and outgoing surfaces with respect to optical axis).

4,693,566
ZOOM LENS SYSTEM
Masaki Imaizumi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 29, 1984, Ser. No. 645,394
Claims priority, application Japan, Sep. 8, 1983, 58-164197
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 5 Claims

1. A zoom lens system comprising a vari-focal system and a relay lens system, comprising a first lens group having positive refractive power and comprising a cemented doublet, a second lens group having negative refractive power and comprising a cemented doublet, and a third lens group having positive refractive power, and said relay lens system comprising a front lens group having positive refractive power, and a rear lens group having positive refractive power comprising a plural number of lenses including at least one positive lens, said zoom lens system fulfilling the conditions (1), (2), (3) are (4) shown below:



$$\frac{n_I'-n_I}{r_I}f_I<-0.05 \quad (1)$$

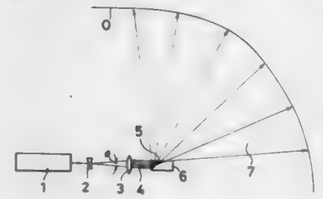
$$1.0<\frac{f_{IVb}}{f_I}<2.0 \quad (2)$$

$$1.75<\frac{f_{IVb3}}{f_{IV}}<2.00 \quad (3)$$

$$0.2<\frac{D}{f_{IV}}<0.3 \quad (4)$$

where, reference symbol f_I represents the focal length of the first lens group, reference symbol r_I represents the radius of curvature of the cemented surfaces of the cemented doublet in the first lens group, reference symbols n_I and n_I' respectively represent refractive indices of respective lens elements constituting the cemented doublet in the first lens group, reference f_{IV} represents the focal length of the relay lens system, reference symbol f_{IVb} represents the focal length of the rear lens group in the relay lens system, reference symbol f_{IVb3} represents the focal length of the positive lens arranged on the image side in the rear lens group in the relay lens system, and reference symbol D represents the airspace between the front and rear lens groups in the relay lens system.

4,693,567
APPARATUS FOR PROJECTING LUMINOUS LINES ON AN OBJECT BY A LASER BEAM
Yasuto Ozaki, 22-2, Horen-cho, Nara, Japan
Filed Aug. 17, 1983, Ser. No. 524,036
Claims priority, application Japan, Aug. 21, 1982, 57-144912; Apr. 22, 1983, 58-71746; Apr. 22, 1983, 58-71747
Int. Cl.[4] G02B *3/04*
U.S. Cl. 350—433 2 Claims



1. An apparatus for projecting luminous lines on an object by use of a laser beam, said apparatus comprising:
means for producing a laser beam;
means, located at a position subsequent to said producing means, for expanding said laser beam, said expanding means comprising concave lens means for diverging said laser beam, and convex lens means, positioned subsequent

to said concave lens means, for converging said laser beam to be of a maximum desired width;

a reflector having a central plane, said reflector being located at a position subsequent to said convex lens means with the optical axis of said laser beam extending in said central plane;

said reflector having a pair of curved side reflecting surfaces intersecting along an edge of said reflector, said edge lying in said central plane, said pair of side reflecting surfaces diverging symmetrically from opposite sides of said central plane in directions away from said convex lens means;

said pair of side reflecting surfaces thereby forming means for reflecting said laser beam at different angles with respect to said central plane, at respective different positions along said pair of said reflecting surfaces, and thus for reflecting a pair of sector-shaped luminous lines on an object, said sector-shaped luminous lines expanding symmetrically from said side reflecting surfaces;

said reflector having a curved top reflecting surface extending transverse to and intersecting said pair of side reflecting surfaces and extending perpendicular to said central plane, said central plane symmetrically bisecting said top reflecting surface; and

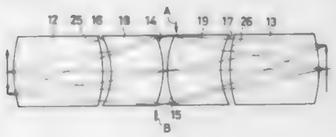
said top reflecting surface thereby forming means for reflecting said laser beam at different angles at respective different portions along said top reflecting surface, and thus for reflecting further sector-shaped luminous lines on the object, said further luminous lines expanding symmetrically from said top reflecting surface in directions perpendicular to said pair of sector-shaped luminous lines.

4,693,568

IMAGE TRANSMISSION OPTICAL SYSTEM FOR AN ENDOSCOPE

Susumu Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,679
Claims priority, application Japan, Sep. 25, 1984, 59-200140
Int. Cl.⁴ G02B *9/34, 23/00*
U.S. Cl. 350—469 **11 Claims**



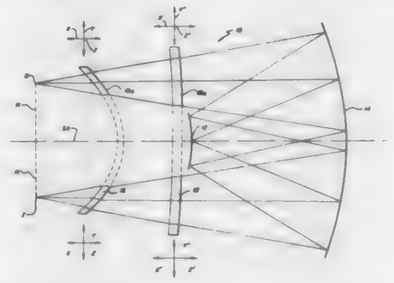
1. An image transmission optical system for an endoscope comprising two rod-like biconvex lenses, and two thick meniscus lenses disposed between said two rod-like biconvex lenses so that the convex surfaces of said two thick meniscus lenses face each other, said biconvex lens disposed on the object side of said two thick meniscus lenses being arranged at a position such that the peripheral rays of the offaxial rays transmitted by said system are limited by said convex surface of the one of said thick meniscus lenses located on the object side, said other of said two rod-like biconvex lenses being disposed on said image side of said two thick meniscus lenses and being disposed at a position such that radially inwardly located offaxial rays transmitted by said system are limited by said convex surface of said two thick mensicus lenses disposed on said image side.

4,693,569

METHOD AND APPARATUS FOR OPTICAL SYSTEM ADJUSTMENTS

Abe Offner, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 106,415, Dec. 21, 1979, Pat. No. 4,293,189, which is a continuation-in-part of Ser. No. 938,569, Aug. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 767,906, Feb. 11, 1977, abandoned. This application Oct. 5, 1981, Ser. No. 308,647
Int. Cl.⁴ G02B *17/08, 7/02*
U.S. Cl. 350—505 **13 Claims**



1. An annular field optical system having a broad spectral range and including at least one pair of refractive elements, said optical system comprising:

a first half and a second half, each half including an optical system having an optical axis and defining conjugate image and object planes substantially normal to said axis, the first half and second half being coaxially disposed in back-to-back relationship so that the conjugate planes are superposed on at least one side of the optical system, and means for providing spaced object and final image locations on the other side of the optical system, said optical system being constructed and arranged so that the Petzval sum is substantially zero, said pair of refractive elements being disposed in optical symmetry about an image plane or conjugate image planes and mounted for translational displacement along and/or rotational displacement about one or more of three orthogonal axes, said orthogonal axes consisting of said optical axis and axes parallel or orthogonal thereto, said pair of refractive elements being identical, nearly concentric menisci, the convex radii of which are longer than the concave and axial thickness of which is greater than the difference between the convex and concave radii and so shaped that their contributions to longitudinal aberrations are small while their contributions to lateral aberrations are either zero or equal and of opposite sense, the displacement being such in character, direction and extent as to enable correction of the system for deviations from theoretical design performance resulting from manufacturing errors in the optical components of the system and in their assembly and/or alignment.

4,693,570

SPORTS TRAINING APPARATUS

Ralph W. Kryder, 4481 S. Buffalo Rd., Orchard Park, N.Y. 14127

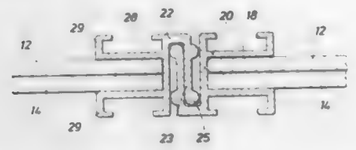
Continuation of Ser. No. 532,841, Sep. 16, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 857,733
Int. Cl.⁴ G02B *5/08, 5/10*
U.S. Cl. 350—616 **7 Claims**

1. A sports training apparatus comprising:

(a) a mirror assembly including a sheet of clear acrylic material and a sheet of mirrored acrylic material in facing contact;

(b) a frame extending about the edges of the acrylic sheets, said frame including interlocking channels extending about said frame and integral therewith, said interlocking channels cooperating together for joining at least two mirror assemblies end to end;

(c) means for mounting said assembly for use in various sports, and



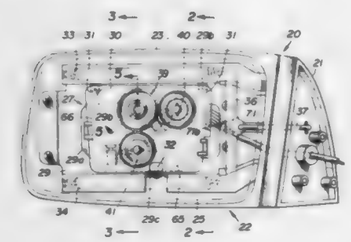
(d) wherein said interlocking channels are formed by a leg member extending outwardly from and substantially perpendicular to a base member of said frame and a clamp member extending from said leg member spaced from and substantially parallel to said base member.

4,693,571

SUPPORT AND DRIVE UNIT FOR MIRROR DEVICES

Sakae Kimura, Saitama, and Yasuhiro Tanaka, Miyazaki, both of Japan, assignors to Kabushiki Kaisha Matsuyama Seisakusho, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,865
Claims priority, application Japan, Jan. 24, 1984, 59-11155; Jan. 24, 1984, 59-11156
Int. Cl.⁴ G02B *5/08, 5/10*
U.S. Cl. 350—634 **11 Claims**



1. A support and drive unit for a mirror device having a housing and a mirror holder provided with a mirror, comprising:

(a) a casing adapted to be disposed in said housing;

(b) a support structure adapted to pivotally support said mirror holder; and

(c) means for adjusting said mirror holder;

said adjusting means comprising first and second actuating rods axially movably mounted in said casing, and a pair of motors disposed in said casing and operatively cooperating with said actuating rods so as to move said actuating rods, respectively, through coupling means;

said actuating rods having front ends adapted to be pivotally coupled to said mirror holder, and are spaced substantially right-angularly from each other around a center of said support structure; and

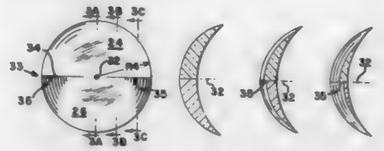
one of said motor being disposed in an area defined between a side of a plane extending through the center of said support structure and a central axis of said first actuating rod and facing said second actuating rod, and a side of a plane extending through the center of said support structure and a central axis of said second actuating rod and facing said first actuating rod, said one of said motors having a shaft, an extension of a central axis of said shaft substantially passing through said support structure.

4,693,572

MONOCENTRIC BIFOCAL CORNEAL CONTACT LENS

George F. Tsuetaki, and Shiro Sato, both of Chicago, Ill., assignors to Fused Kontacts of Chicago, Inc., Chicago, Ill.

Filed Jun. 3, 1985, Ser. No. 740,407
Int. Cl.⁴ G02C *7/04, 7/06*
U.S. Cl. 351—161 **8 Claims**



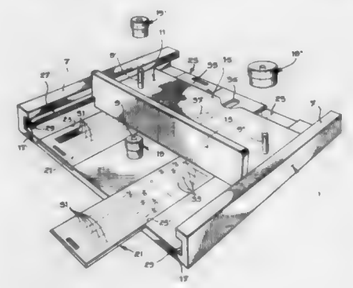
1. A bifocal contact lens blank having a front surface portion which is subdivided into distant and near vision front surface segments, said distant vision segment surface being defined, at least in part, by a front surface portion in the form of a segment of a sphere having a first, given radius of curvature, said near vision segment surface being defined at least in part by a front surface portion in the form of a segment of a sphere having a second, given radius of curvature which is smaller than the said first given radius of curvature, said distant vision segment lying in approximately the upper half of said lens blank and said near vision segment lying in the lower half of said lens blank, said surfaces meeting each other along a locus of tangent points lying generally centrally of the lens and being joined to each other on either side of said locus of tangent points by a pair of offsetting front surfaces extending between the lowermost edges of said distant vision segment surface and the uppermost edges of said near vision segment, said offsetting surfaces extending generally perpendicular to at least one of said near and distant vision front surfaces of said lens, and substantially along a meridian of said lens front surface, said offsetting surfaces, being adopted, in use, to face toward the lower lid of the wearer.

4,693,573

UNIVERSAL FRAME CENTERING, HOLDING AND MEASURING DEVICE

Georges Zoueki, 4812 Verdun, Verdun, Quebec, Canada H4G 1N1

Filed Mar. 10, 1986, Ser. No. 838,111
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—204 **14 Claims**

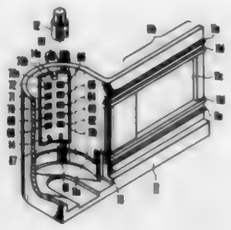


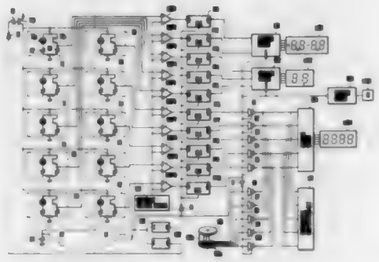
1. An universal frame centering, holding and measuring device for use by an optician to transcribe and check a distance interpupillary distance (distance P.D.), a reading interpupillary distance (reading P.D.), a segment height measured onto a customer, directly and precisely on a set of lenses mounted on a frame, said device comprising:

a base having a longitudinal axis, on which said frame may be positioned in flat position;
a central pin vertically projecting from the base;
at least one vertical cylinder mounted onto the central pin, said vertical cylinder having such a diameter as to fit within the bridge of the frame positioned onto the base;
a frame holder slidably mounted onto the base, said frame holder being movable along the longitudinal axis of the base and comprising a vertical front wall extending perpendicularly to the longitudinal axis of said base;
means for pressing the frame holder toward the central pin in such a manner as to hold the frame in substantially rigid position between the vertical front wall of the frame holder and the vertical cylinder mounted onto the central pin, with said vertical cylinder inserted into the bridge portion of the frame;
a pair of rulers slidably mounted on the base, said rulers extending parallel to the longitudinal axis of said base and being symmetrically positioned with respect to the central pin in such a manner as to extend under the two lenses mounted on the frame held by the frame holder, respectively;
a set of vertical graduations provided on each ruler, each vertical graduation indicating the distance separating it from the central pin and being useful for transcribing onto the lenses and checking the distance P.D. or reading P.D. of the customer; and
a set of horizontal graduations provided on each ruler, said horizontal graduations being useful for transcribing on the lenses the segment heights or progresive horizontal cross line of said customer.

4,693,574
FILM INFORMATION READING DEVICE
Ichiro Ohnuki, Tokyo; Yoshihiko Aihara, Kanagawa; Yoichi Tosaka, and Masaharu Eguchi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1985, Ser. No. 757,136
Claims priority, application Japan, Jul. 27, 1984, 59-156552; Jul. 27, 1984, 59-156555
Int. Cl.[4] G03B *7/24*
U.S. Cl. 354—21 **28 Claims**

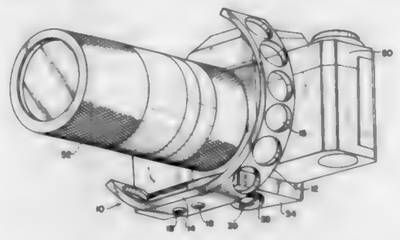
1. A reading device for reading information on the surface of a film cartridge, comprising:
first film information code detecting means for determining a condition of a first detecting surface of the film cartridge;
second film information code detecting means for detecting the reflection factor of a second detecting surface of said cartridge, the information on the surface of the film cartridge including at least information concerning the number of frames of the film and the film sensitivity, said detecting surfaces having a plurality of trains of information codes, and said information codes being formed in plurality trains of patterns in the axial direction of the cartridge,
the second film information code detecting means being arranged in a plurality of trains corresponding to the plurality of trains of information codes; and
said first detecting means including detection contact pins which are arranged to come into contact with said first detecting surface of the film cartridge, said contact pins contacting an area about two times the information code





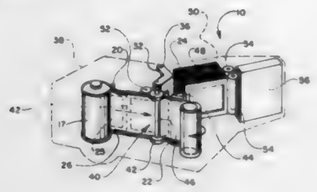
area of said second detecting surface, and detecting conductivity and con-conductivity between the contact pins.

4,693,575
CAMERA SUPPORT
James H. Keller, 254 Knoll Dr., Park Ridge, N.J. 07656
Filed Apr. 22, 1986, Ser. No. 855,175
Int. Cl.[4] G03B *17/56*
U.S. Cl. 354—82 **7 Claims**



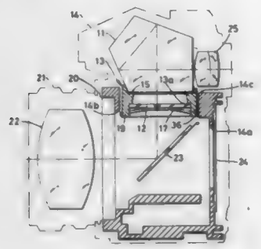
1. A portable camera support comprising, in combination: a generally arcuate member shaped to extend below and along at least one side of the lens barrel of the camera and having a portion for reception by the palm of a user, an adjustable assembly comprising a bracket secured to the arcuate member; and an adjustable clamp for connection to said bracket and for engagement with the camera; and means for securing said bracket to said camera; and wherein the spacing between said member and lens barrel is sufficiently small as th allow the fingers of a user of said support to manipulate the lens barrel while the the palm of the hand rests on any externally facing portion of the arcuate member.

4,693,576
CAMERA FOR PRODUCING FULLY MOUNTED TRANSPARENCIES
Richard J. Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 29, 1986, Ser. No. 947,358
Int. Cl.[4] G03B *17/50*
U.S. Cl. 354—86 **16 Claims**



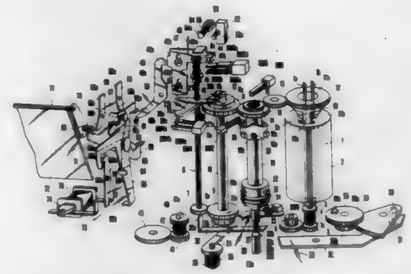
1. A photographic apparatus for a self-developing or instant type medium for recording an image upon exposure to light, said apparatus comprising:
means for developing an exposed image recording medium in said photographic apparatus;
means for retaining an exposed and undeveloped image recording medium in said photographic apparatus; and
selectable directing means for selectively directing a recorded image medium exposure to said developing means for immediate processing of its latent image or to said retention means for subsequent processing exteriorly of said apparatus.

4,693,577
FOCUSING SCREEN MOUNTING DEVICE IN A CAMERA
Nobuaki Sasagaki, Kawasaki, and Hidekatsu Fujii, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Feb. 21, 1986, Ser. No. 831,633
Claims priority, application Japan, Feb. 28, 1985, 60-28396[U]
Int. Cl.[4] G03B *13/00, 19/12*
U.S. Cl. 354—155 **8 Claims**



1. A single lens reflex camera in which a movable mirror for reflecting a light beam from a photo-taking lens toward a finder optical system having a penta roof prism is provided between the photo-taking lens and a focal plane, said camera comprising:
a housing structure having between said movable mirror and said finder optical system an opening for forming the optical path of the light beam from said photo-taking lens travelling from said movable mirror toward said finder optical system;
a focusing screen member disposed between said movable mirror and said penta roof prism to enable the image of an object to be photographed formed by said photo-taking lens to be observed and having a lower surface adjacent to said movable mirror and an upper surface adjacent to said penta roof prism;
a substantially rectangular frame member provided in said opening of said housing structure for supporting the periphery of said upper surface of said focusing screen member, said rectangular frame member including means for positioning said focusing screen member in said opening; and
a resilient single wire member having, near a pair of opposed edges of said focusing screen member, first and second side portions contacting said lower surface of said focusing screen member, a third side portion linking one end of said first side portion and one end of said second side portion, a fourth side portion extending from the other end of said first side portion along a line parallel to said third side portion, and a fifth side portion extending from the other end of said second side portion along said line, said third side portion being releasably coupled to said rectangular frame member and said fourth and fifth side portions being rotatably supported on said rectangular frame member.

4,693,578
MOTORIZED WINDING AND REWINDING CAMERA
Tatsuo Kouno, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 576,857, Feb. 3, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 839,468
Claims priority, application Japan, Feb. 5, 1983, 58-17766
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.1 **10 Claims**



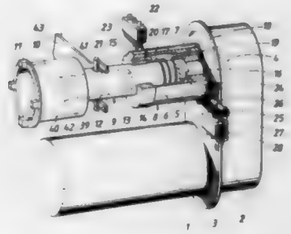
1. A motirized winding and rewinding camera comprising:
(a) winding means having a driving torque transmission for winding a film;
(b) rewinding means having a driving torque transmission for rewinding the film;
(c) an electric motor operating as a torque source for said winding means and said rewinding means;
(d) a changeover member for selectively connecting the output of said motor to the driving torque transmission of said winding means or said rewinding means;
(e) a lock member for locking said changeover member in the winding position;
(f) a first rewind control actuating member for operating said lock member to release;
(g) a second rewind control actuating member for operating said changeover member to change over;
(h) detecting means for detecting when film rewinding by said rewinding means is completed;
(i) controlling means responsive to the output of said detecting means which represents the fact that the film rewinding has been completed for changing over the driving torque transmission to the film winding state; and
(j) lock returning means for performing a locking operation on said changeover member by said lock member as said resetting means operates.

4,693,379

ARRANGEMENT FOR WINDING CAMERAS

Alf I. Alfredsson, Sävedalen, and Kjell A. Persson, Skene, both of Sweden, assignors to Victor Hasselblad AB, Gothenburg, Sweden

Filed Oct. 4, 1985, Ser. No. 784,554
Claims priority, application Sweden, Oct. 8, 1984, 8405019
Int. Cl.⁴ G03B *1/12*
U.S. Cl. 354—173.1 **3 Claims**



1. A winding device for tensioning a camera, said camera having a winding shaft and a locking device for arresting the shaft when a tensioning motion of the same is finished until an exposure sequence of the camera is completed said winding device comprising an electric motor, a transmission device comprising a primary driving shaft in driving connection with the motor, a secondary drive shaft in driving connection with said winding shaft of the camera, a spung means connecting the primary drive shaft and the secondary drive shaft, said sprung means having a tightened position in which the secondary drive shaft is biased by the sprung means, a power supply, a first switch having a closed position to connect the motor with said power supply and an open position to interrupt the power supply, switch actuating means connected to the secondary drive shaft for opening the first switch when the secondary drive shaft is in a certain angular position corresponding to a position of the winding shaft of the camera in which the camera is tensioned and the shaft arrested, at least one locking notch on the primary drive shaft, a locking means for interacting with the locking notch to arrest the primary drive shaft in at least one certain angular position against motion under the influence of a reactive turning movement from the sprung means when biasing the secondary drive shaft, and said sprung means being dimensioned to store energy sufficient for the tensioning of the winding shaft of the camera with a sufficient turning movement when the secondary drive shaft is in its certain angular position and the primary drive shaft is in its certain angular position with the sprung means being tightened, so that the sprung means by releasing the winding shaft by means of the locking device tensions the camera by rotating the secondary drive shaft bringing it out of its certain angular position, thereby closing the first switch and actuating the motor to tighten the sprung means once again.

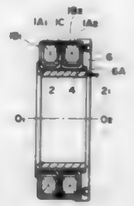
4,693,580

MOTOR

Ryoichi Hanamori, Yokohama; Shigeo Nakashima, Kawasaki, and Hiroshi Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,010
Int. Cl.⁴ G03B *9/06*; **H02K** *5/10*; **E01D** *19/06*
U.S. Cl. 354—271.1 **7 Claims**

1. A diaphragm mechanism of a camera comprising:
a ring-shaped stator having an excitation coil;
a ring-shaped magnet rotor arranged inside of said stator;
a ring-shaped lubrication member made of a resin material interposed between said stator and said rotor to serve as a lubrication member;
a ring-shaped hold member for holding said stator, said rotor and said lubrication member in union;
diaphragm means; and



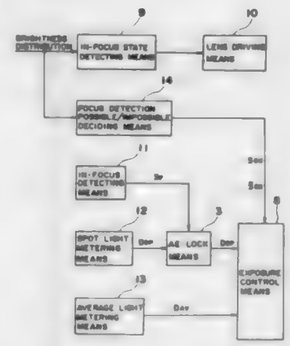
coupling means for coupling said diaphragm means to said rotor.

4,693,581

CAMERA WITH AN AUTOMATIC FOCUS ADJUSTING APPARATUS

Toshio Yamaki, Osaka; Hiromu Mukai, Kawachinagano; Akihiko Fujino; Shuji Izumi, both of Sakai; Masaaki Nakai, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1986, Ser. No. 901,652
Claims priority, application Japan, Sep. 2, 1985, 60-134687[U]; Sep. 4, 1985, 60-135373[U]
Int. Cl.⁴ G03B *3/00, 7/091*
U.S. Cl. 354—400 **2 Claims**



1. A camera provided with an automatic focus adjusting apparatus comprising:
a first detection means for detecting a focusing condition of an objective lens;
a focusing means for driving the objective lens according to the detected focusing condition and outputting an in-focus signal when the objective lens has moved to the in-focus position;
a second detection means for detecting whether or not it is possible for the detection means to detect the focusing condition;
a first light metering means for metering the brightness of a portion of an object according to the detection region of the detecting means and outputting a first light metering signal according to the metered result;
a second light metering means for metering an average brightness corresponding to an entire object to be photographed outputting a second light metering signal in accordance with the metered result;
a lock means for locking the first light metering signal when the in-focus signal is outputted; and
a means for controlling exposure amount according to the first light metering signal locked by the lock means when it is detected by the second detection means that a detection of the focusing condition is possible and controlling exposure amount in response to the second light metering signal when it is detected by the second detection means that a detection of the focusing condition is impossible.

4,693,582

AUXILIARY LIGHT SOURCE FOR CAMERA HAVING AUTOMATIC FOCUSING DEVICE

Masaharu Kawamura, and Akira Hiramatsu, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,674, Jan. 20, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,544
Claims priority, application Japan, Feb. 2, 1982, 57-15143; Feb. 2, 1982, 57-15148
Int. Cl.⁴ G03B *3/00, 7/00*
U.S. Cl. 354—403 **34 Claims**



1. A lighting device to be used in combination with a camera having an automatic focusing device for adjusting the focus on an object to be photographed, said automatic focusing device working prior to an exposure control operation of the camera, and said lighting device comprising:
(a) a mount part which is attachable to a shoe part of said camera, wherein said shoe part of the camera is provided at a position above a pentagonal part of the camera and said mount part has a signal terminal which can be connected to a signal pin provided at the shoe part of the camera, further said signal pin is connected to a starting signal forming circuit which produces a starting signal prior to the exposure control operation of the camera; and
(b) an emitting source for projecting light to an object in response to said starting signal received through said signal pin and said signal terminal; and
wherein said automatic focusing device is of the accumulation type in which the operation of accumulating image signals is recycled, and said starting signal forming circuit produces said starting signal in such a way as to be in synchronism with the accumulating operation so that light is emitted from said emitting source at least during the image signal accumulating operation of said focusing device.

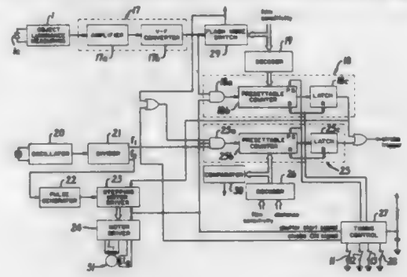
4,693,583

PROGRAMMABLE SHUTTER

Masuo Ogihara; Hajime Oda; Yoichi Seki, and Hiroshi Yamazaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 766,032
Claims priority, application Japan, Aug. 15, 1984, 59-170277
Int. Cl.⁴ G03B *7/097*
U.S. Cl. 354—439 **10 Claims**

1. A programmable shutter comprising: a shutter mechanism including a set of sectors defining an aperture for a lens and a stepping motor rotatable in forward and reverse directions in response to forward and reverse driving pulses applied thereto for opening and closing the set of sectors; and a control section including object liminance measuring means for outputting a signal corresponding to the luminance of an object, circuit means responsive to the signal output by the object luminance measuring means for outputting a control signal after the lapse of a time which is in reverse proportion to the luminance of the object, means for generating a series of reference pulse signals



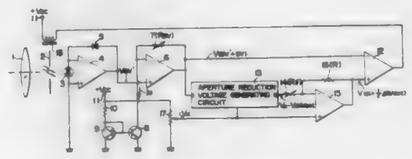
of constant frequency, and stepping motor driver means for outputting driving pulses of constant frequency to the stepping motor in synchronism with said series of reference pulse signals and operative to apply forward driving pulses to effect opening of the set of sectors and operative in coincidence with the control signal from said circuit means to forcibly reverse the phase of the driving pulses even during the application of a driving pulse to the stepping motor to thereby apply reverse driving pulses to effect closing of the set of sectors.

4,693,584

DIAPHRAGM CONTROLLER FOR CAMERAS IN WHICH THE DIAPHRAGM OPENING IS SELECTED IN ACCORDANCE WITH A PREPROGRAMMED CHARACTERISTIC

Tetsuo Miyasaka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Continuation of Ser. No. 588,348, Mar. 12, 1984, abandoned. This application Jun. 19, 1986, Ser. No. 877,092
Claims priority, application Japan, May 12, 1983, 58-83682
Int. Cl.⁴ G03B *7/08*
U.S. Cl. 354—446 **14 Claims**



1. A diaphragm controller of a camera of the program type, comprising:
diaphragm driving means for gradually reducing a diaphragm from its maximum to its minimum aperture;
a photometry circuit including a photoelectric transducer element which receives light from an object being photographed passing through a taking leans and the diaphragm for producing an output corresponding to a photoelectric variation of said transducer element as the diaphragm aperture is reduced;
a reduced number of steps of diaphragm detecting means responsive to the photometry circuit output for generating a signal proporational to a reduced number of steps of diaphragm while the diaphragm aperture is reduced by

said diaphragm driving means based on an output of said photometry circuit, said detecting means producing said signal by inverting the output of said photometry circuit;

a calculation circuit for altering the output of said reduced number of steps of diaphragm detecting means by multiplying said signal by a factor which satisfies a predetermined program characteristic; and

a comparison circuit for producing a stop signal to stop an aperture reducing operation of said diaphragm driving means whenever the difference between outputs of said calculation circuit and said photometry circuit reaches a predetermined value.

4,693,585

CONTACT FIXING DEVICE WITH AN IMPROVED CLEANING ROLLER

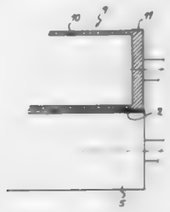
Wilhelmus H. M. Orbons, Grubbenvorst, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Jun. 9, 1986, Ser. No. 872,217

Claims priority, application Netherlands, Jun. 14, 1985, 8501717

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 FU **3 Claims**



1. A contact fixing device comprising a fixing surface made from a somewhat resilient material, a means for driving the fixing surface, a means for heating the fixing surface, a pressure surface which presses against the fixing surface forming a fixing zone through which copy material can be fed for fixing a toner image thereon, a means for driving the pressure surface and a hollow perforated cleaning roller which while rotating in contact with the fixing surface takes up toner from the fixing surface and has a narrow circular thickening near each end.

4,693,586

ELECTROSTATIC COPYING APPARATUS

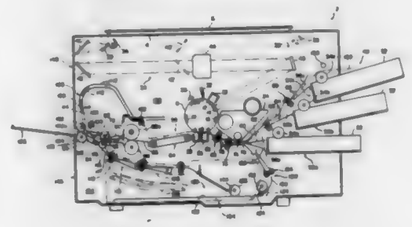
Yasuji Sumida, Kitakatsuragi; Hiroshi Kajita, Kobe, and Tadashi Fujioka, Toyonaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 793,094, Oct. 30, 1985. This application Aug. 20, 1986, Ser. No. 900,163

Claims priority, application Japan, Oct. 30, 1984, 59-226719; Nov. 30, 1984, 59-251565; Nov. 30, 1984, 59-251567; Mar. 30, 1985, 60-64982; Jul. 9, 1985, 60-149176

Int. Cl.⁴ G03G *15/00;* **B65H** *29/58*

U.S. Cl. 355—3 SH **26 Claims**



1. An electrostatic copying apparatus of the type comprising a copying paper conveying passage, a copying paper feeding means for feeding a copying paper sheet to the paper conveying passage, a conveyance controlling means disposed adjacent to the downstream end of the paper conveying passage, said conveyance controlling means having upstream and downstream ends, a copying paper discharging passage extending from its upstream end adjacent to the downstream end of the conveyance controlling means, a copying paper reversing passage extending from its upstream end adjacent to the downstream end of the conveyance controlling means, and a copying paper returning passage extending from its upstream end adjacent to the upstream end of the conveyance controlling means and located beneath the downstream end of the paper conveying passage, said conveyance controlling means being adapted to be held selectively at a first position at which it permits communication between the downstream end of the paper conveying passage and the upstream end of the paper discharging passage and the upstream end of the paper discharging passage and a second position at which it permits communication between the downstream end of the paper conveying passage and the upstream end of the paper reversing passage and also communication between the upstream end of the paper reversing passage and the upstream end of the paper returning passage, and of the type being adapted to form an image on one surface of a copying paper sheet while it is conveyed through the paper conveying after being fed thereto from the paper feeding means, introduce the copying paper sheet bearing an image on one surface into the paper discharging passage through the conveyance controlling means held at the first position and thereafter discharge it through the paper discharging passage, or to introduce the copying paper sheet bearing an image on one surface into the paper reversing passage through the conveyance controlling means held at the second position, reverse the moving direction of the copying paper sheet after its trailing end has passed the downstream end of the paper conveyed passage, return it through the copying paper returning passage, re-feed it into the paper conveying passage, form an image on the other surface of the copying paper sheet while it is re-conveyed through the paper conveying passage, thereafter introduce it into the paper discharging passage through the conveyance controlling means held at the first position and then discharge it through the paper discharging passage; wherein

said apparatus further comprises a multifunctional conveying means for carrying the copying paper sheet from the downstream end of the paper conveying passage and delivering the copying paper to the paper returning passage from the upstream end of the paper returning passage, and

the multifunctional conveying means includes a lower supporting shaft and an upper supporting shaft vertically spaced from each other, a first conveying roller mounted on the lower supporting shaft, a second conveying roller mounted on the upper supporting shaft and delivering the copying paper from the downstream end of the paper conveying passage in cooperation with the first conveying roller, one end portion of the first conveying roller projecting beyond one end of the second conveying roller to an extend within the width of the copying paper passing between the conveying rollers, and a carrying means located below the first conveying roller for carrying the copying paper into the paper returning passage from the upstream end of the paper returning passage, and a forcing means for forcing downwardly the trailing end portion of the copying paper which has passed the nipping site between the first conveying roller and the second conveying roller, the forcing means comprising a protrusion formed in said one end portion of the first conveying roller.

4,693,587

IMAGE FORMING APPARATUS

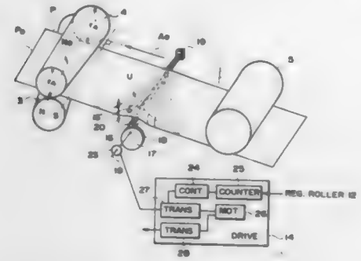
Michio Shigenoba, Tokyo, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,872

Claims priority, application Japan, Jul. 16, 1984, 59/147099; Oct. 22, 1984, 59/221455

Int. Cl.⁴ G03G *15/20, 21/00*

U.S. Cl. 355—3 FU **23 Claims**



1. An image forming apparatus, comprising:

means for forming an unfixed image on a recording material; and

means for fixing the unfixed image on the recording material;

wherein said fixing means includes first and second rollers forming a nip therebetween, said first roller having a diameter which is relatively smaller at one longitudinal end thereof and is relatively larger at the opposite longitudinal end thereof, and

wherein the distance between an image forming position of said image forming means and said nip formed between said first and second roller, measured along a path of the recording material, is shorter than a length of the recording material measured along the path, and

wherein said first and second rollers receive a leading edge of the recording material at the nip in such a manner that the leading edge is non-parallel to the nip and said first and second rollers change a direction of movement of the recording material by the difference in peripheral speed provided by the difference in the diameter of said first roller.

4,693,588

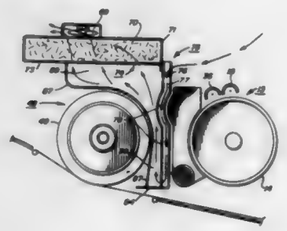
THERMAL AIR CURTAIN FOR A COPYING/PRINTING MACHINE

Joseph A. Yarbrough, Rochester; David O. Kingsland, Fairport, and Donald L. Pease, Hanecye, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1986, Ser. No. 853,819

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **2 Claims**



1. In a copying/printing machine having a xerographic section including a photoreceptor on which latent electrostatic images are formed and developed, and thereafter transferred to a copy substrate material, and a fusing section where the developed image transferred to the copy substrate material is fixed by heat, the xerographic section and the fusing section being disposed in close adjoining relation to one another to provide maximum machine compactness, the combination of:

(a) an exhaust fan for generating a flow of air internally of said machine, said fan discharging air outside said fusing section;

(b) a filter upstream of said fan for filtering said air prior to discharge by said fan;

(c) means forming an elongated chamber in the space between said xerographic section and said fusing section extending across the width of the space between said xerographic section and said fusing section;

(d) a substantially vertical wall in said chamber separating said chamber into first and second back to back air passages;

said first passage bordering said xerographic section and having air inlet means adjacent the upper end thereof opening into said xerographic section through which air is drawn from said xerographic section;

said second passage bordering said fusing section and being closed to said fusing section, said second passage having air outlet means adjacent the upper end thereof communicating with said filter through which air is discharged to said filter for discharge by said fan;

said wall having aperture means adjacent the bottom thereof connecting said first passage with said second passage, so that air drawn from said xerographic section is forced to follow a generally U-shaped path from said air inlet means downwardly through said first passage, through said aperture means to said second passage, and upwardly through said second passage to said outlet means whereby there is provided a pair of back to back curtains of moving air flowing in opposite directions to one another between said xerographic and fuser section, said pair of air curtains cooperating to inhibit transfer of heat from said fusing section to said xerographic section.

4,693,589

METHOD OF AND APPARATUS FOR FIXING UNFIXED FRAME

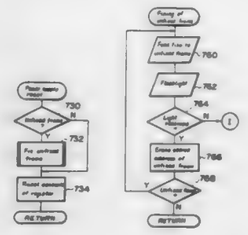
Izumi Watanabe, and Yu Tojo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 3, 1986, Ser. No. 937,635

Claims priority, application Japan, Dec. 4, 1985, 60-273011

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—5 **18 Claims**



1. An unfixed frame fixing method comprising the steps of:

making a judgement as to whether or not fixing of a frame image to a recording film has been effected;

storing, when it is judged that said fixing has not been effected accidentally, the address of the unfixed frame in a data storing medium;

reading the address of said unfixed frame from said data storing medium when processing is resumed and effecting fixing of said unfixed frame; and

erasing the address of said unfixed frame from said data storing medium after completion of the fixing operation.

4,693,590

ELECTRONIC COPIER WITH AUTOMATIC DOCUMENT FEEDER AND SORTER

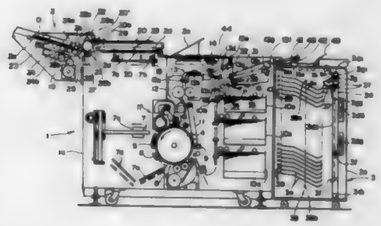
Shin Umeda, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,821

Claims priority, application Japan, Aug. 20, 1984, 59-172615; Aug. 31, 1984, 59-182317; Sep. 1, 1984, 59-183516; Sep. 1, 1984, 59-183518; Sep. 2, 1984, 59-183158; Sep. 2, 1984, 59-183161; Sep. 3, 1984, 59-185214

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 SH **11 Claims**



1. An electronic copier equipped with an automatic document feeder and a sorter, comprising:

multi-job mode setting means for selectively activating a multi-job mode command in which a plurality of groups of documents which differ in copying conditions from each other are copied without operator intervention;

copying condition inputting means for inputting, before the copying of any document of any group, copying conditions respectively associated with each of the plurality of groups of documents;

an executed document couter for counting documents which have been copied;

an executed copy counter for counting papers, or copies, which are discharged after copying;

job data store means for storing all of the copying conditions entered in advance through the copying condition inputting means, a count of the executed document counter, and a count of the executed copy counter;

division paper sensing means for sensing a division paper which is interposed between the documents whereby to divide the documents by group; and

copy control means responsive to the state of the multi-job mode setting means, to job data for all the jobs as stored in the job data store means and to a detection signal applied from the division paper sensing means, said copy control means controlling the copier for copying, without operator intervention, the plurality of groups of documents according to the pre-set copying conditions for each group.

4,693,591

MICROFILM AND MICROFILM PRINTER

Takao Saijo, Tokyo, and Masafumi Fujita, Kanagawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

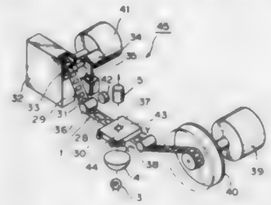
Filed Jul. 30, 1986, Ser. No. 890,479

Claims priority, application Japan, Aug. 5, 1985, 60-172099; Aug. 31, 1985, 60-192901

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—41 **8 Claims**

1. A microfilm comprising: a film base; a plurality of microimages defining film frames continuously formed on the film base; the microimages comprising at least two different sizes; the microimages being provided at peripheries thereof on the film base with size indicating means which comprises at least two different marks or a combination of no mark and at least



one kind of mark, each of which has a distinctiveness for indicating the size of the corresponding microimage.

4,693,592

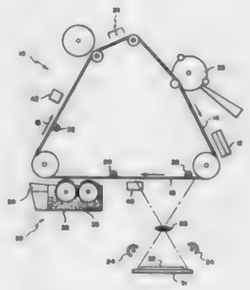
PATCH GENERATOR FOR AN ELECTROPHOTOGRAPHIC DEVICE

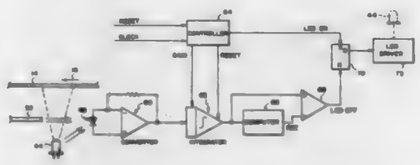
Vincent E. Kurpan, Milford, N.H., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1986, Ser. No. 867,166

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—14 E **6 Claims**





1. A patch generator for creating a test patch on a charged photoconductor member useful in controlling process parameters in electrophotographic machines having a main illumination source for exposing an original document; said patch generator comprising:

means for producing an electrical signal having a value representative of the amount of exposure of the original document;

means for modifying said signal by a selectable factor; and

means, responsive to said modified signal, for producing a test patch exposure on the photoconductive member, said test patch exposure having an exposure value determined by the value of said modified signal.

4,693,593

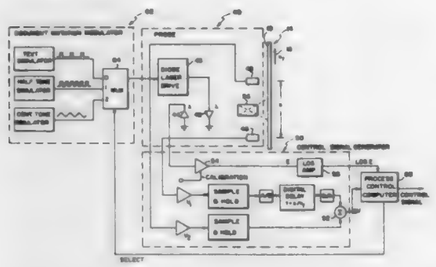
ELECTROGRAPHIC PROCESS CONTROL

Scott A. Gerger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1986, Ser. No. 877,948

Int. Cl.⁴ G03G *15/052*

U.S. Cl. 355—14 CH **5 Claims**



1. In an electrographic device that uses a chargeable image transfer member with at least one image area and has means for adjusting at least one process parameter in response to changes in the sensitometric characteristics of the image transfer member as measured in a portion of the image transfer member outside of the image area; the improvement comprising transfer member discharging means for subjecting said portion of the transfer member to a history of being charged and discharged substantially the same as the history of the image area of the transfer member.

4,693,594

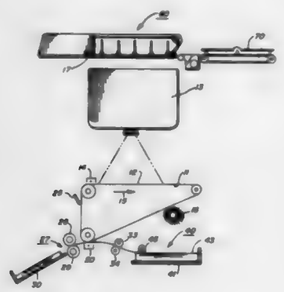
PLATEN TRANSPORT AND VACUUM PLENUM FOR BOOK COPYING

Gerald M. Garavuso, Macedon, N.Y., and Troy Shinbrat, Greenbelt, Md., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1985, Ser. No. 811,195

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—25 **24 Claims**



1. A method for copying pages from a facedown book, comprising the steps of:

(a) providing a platen surface for copying pages from the facedown book and a support member in the same plane as said platen surface for supporting the facedown book during forward and backward transport;

(b) providing belt means entrained around said support member for driving the book toward and away from said platen surface;

(c) providing a vacuum plenum positioned between and in the same plane as said platen surface and said support member, said vacuum plenum being adapted to peel a page from a first half of the facedown book as the book is transported past the vacuum plenum by said belt means;

(d) positioning a page flipping assist means immediately adjacent said vacuum plenum for contacting the page peeled from the book by said vacuum plenum and flattening the page against a second half of the facedown book;

(e) providing roller means adjacent to and downstream of said page flipping assist means for engaging the lead edge of the bottommost page of the first half of the book after the lead edge has passed the roller means by a sufficient distance, said roller means being adapted to reduce friction between the pages of the book and said platen surface; and

(f) providing a transport means for receiving the book from said belt means and transporting the book into position for copying.

4,693,595

METHOD OF CONTROLLING A STOP POSITION OF AN OPTICAL SYSTEM IN A COPYING MACHINE

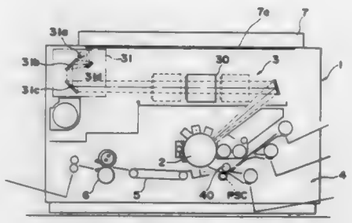
Norihide Kunikawa, Yao; Tetsuya Kondo, Shizuoka; Yasumasa Ohba, Numazu, and Michihiro Matsuoka, Susono, all of Japan, assignors to Sharp Kabushiki, Osaka, Japan

Filed Aug. 29, 1985, Ser. No. 770,585

Claims priority, application Japan, Aug. 30, 1984, 59-183179; Aug. 30, 1984, 59-183180; Aug. 30, 1984, 59-183181; Aug. 30, 1984, 59-183182; Sep. 5, 1984, 59-186209

Int. Cl.⁴ G03B *27/32*

U.S. Cl. 355—77 **6 Claims**



1. A method of controlling return speed of an optical system in a copying machine, said optical system being moved by a motor in a feed direction with a predetermined feed speed and a return direction for returning to a predetermined home position, said method comprising

returning the optical system with a first speed higher than the feed speed,

decelerating the return speed from the first speed to a second speed which is lower than the first speed to permit countercurrent braking to the motor without control disturbance,

performing a countercurrent braking of the motor after the return speed is decelerated to or lower than the second speed, and

controlling the speed of the motor after the countercurrent braking process is performed such that the optical system can be stopped at the home position.

4,693,596

METHOD OF DETERMINING EXPOSURES

Takao Shigaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 30, 1986, Ser. No. 857,627

Claims priority, application Japan, Feb. 12, 1986, 61-28554

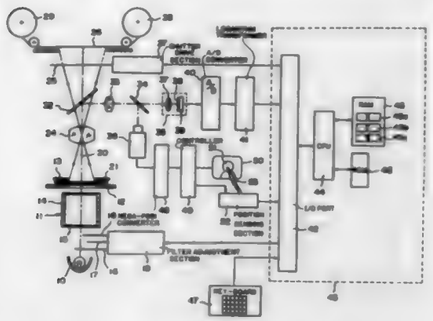
Int. Cl.⁴ G03B *27/32*

U.S. Cl. 355—77 **11 Claims**

1. A method of determining exposures when printing on a medium from an original, which comprises:

determining two image extents comprising a principal sub-

ject and a background on said original by selectively separating the original into a principal subject area and a background area;



obtaining at least one image characteristic value for each said image extent by measuring the density value of each of a plurality of points on said original; and

calculating the exposure based on said image characteristic values.

4,693,597

DISTANCE MEASURING DEVICE WITH SIGNAL PROCESSING CIRCUIT FOR POSITION SENSITIVE DETECTOR

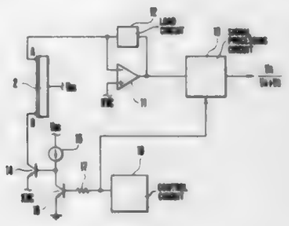
Yasuhiko Shiomi, Tokyo, and Ryoichi Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Feb. 27, 1984, Ser. No. 583,755

Claims priority, application Japan, Mar. 2, 1983, 58-34291

Int. Cl.⁴ G01C *3/24*; G01J *1/20*

U.S. Cl. 356—1 **12 Claims**



6. A signal processing circuit for light receiving means producing two output currents which oppositely vary as the position of light incident thereon varies, said signal processing circuit comprising:

(a) a signal processing circuit at a first terminal of said light receiving means;

(b) a control circuit at a second terminal of said light receiving means and including an openable switching element in series with said second terminal and capable of bring said second terminal into an open state; and

(c) control means for controlling said switching element to open said switching element.

4,693,598

OPTO-ELECTRONIC MEASURING RECEIVER AND METHOD FOR CONTROLLING THE OPTO-ELECTRONIC MEASURING RECEIVER

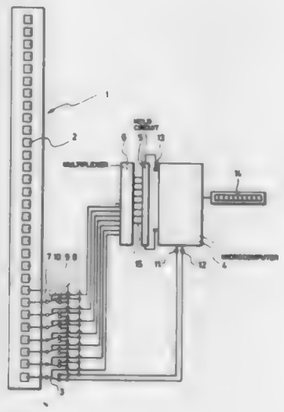
Willibald Sehr, Waldbruun-Ellar, Fed. Rep. of Germany, assignor to MOBA-Electronic Gesellschaft fur Mobil-Automation mbH, Hadamar, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,166

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506304

Int. Cl.⁴ G01C *3/08*; G01B *11/00*

U.S. Cl. 356—4 **8 Claims**



1. An opto-electronic receiver combined with switching assemblies and a control circuit for determining the relative position of the receiver with respect to a radiation plane produced by an optical transmitter, comprising:

a plurality of opto-electronic receiving units (2) disposed in a row, each opto-electronic receiving unit generating an output signal upon impingement of said radiation plane on a respective opto-electronic receiving unit;

each receiving unit being connected to a respective terminal (7) of switching assemblies, each switching assembly further having two discrete outputs (8,9), a switching element (3) and a control input (10), with each switching element (3) connected to a respective terminal (7) to receive an output signal therefrom when generated, each switching element having its own control input (10) and switchable thereby to one or the other output (8,9) to deliver the output signal thereto;

a control circuit connected to said control inputs (10) of said switching assemblies for controlling the respective switching conditions thereof;

one output of each switching assembly being connected to a first input (11) of said control circuit, the other output of each switching assembly being connected to a second input (12) of said control circuit; and

said control circuit including memory means for storing data designating one receiving unit among said plurality of receiving units.

4,693,599

APPARATUS FOR MEASURING LIGHT BEAM CHARACTERISTICS

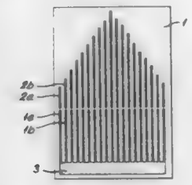
Walter Margulis, London; Wilson Sibbett, Hillingdon Heath, and William E. Sleat, Ickenham, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 554,392, Nov. 22, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,644

Claims priority, application United Kingdom, Nov. 26, 1982, 8233812

Int. Cl.⁴ G01J *1/42*; H01L *27/14*

U.S. Cl. 356—121 **9 Claims**



1. Apparatus for measuring a characteristic of a beam of light comprising:

a layer of photosensitive semiconductor or insulating material and a plurality of electrodes on the layer, the electrodes being positioned to define a linear array of gaps between pairs of electrodes, one electrode of each pair being connected to a common input terminal and the other electrode of a pair bein connected to an individual output terminal, the material in the gaps acting as an array of light detectors;

means for directing a beam, a characteristic of which is to be measured onto said array;

means for detecting changes in an electrical characteristic of each of said detectors caused by incidence of the light beam of the said array,

said detecting means comprising voltage bias means for applying a bias voltage to the common input terminal, individual resistors connected to the other electrode of each respective pair, individual pairs of back-to-back diodes connected to each resistor, a common voltage measuring means to which said pairs of diodes are connected so that the pairs of diodes block the voltages of the individual resistors from the voltage measuring means, and means for applying trigger pulses in sequence to each pair of diodes to enable any voltages across the resistors connected thereto to be measured in sequence; and

means for indicating such changes.

4,693,600

OPTICAL BEAM ANALYZER

Michael A. Cross, Severna Park, and Edward W. Nichols, Reisterstown, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 854,067, Apr. 17, 1986, abandoned, Continuation of Ser. No. 547,603, Nov. 1, 1983, abandoned. This application Oct. 23, 1986, Ser. No. 922,797

Int. Cl.⁴ G01J *1/00*

U.S. Cl. 356—121 **5 Claims**

1. A system for determining selected characteristics of a collimated optical signal directed along a predetermined optical path comprising:

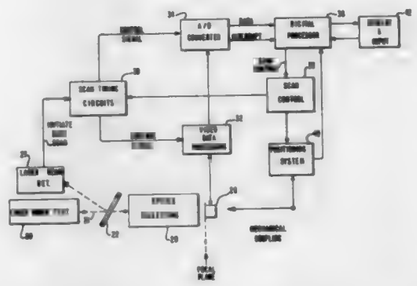
(a) means for sampling said collimated optical signal to generate a synchronizing signal;

(b) optical apparatus positioned in said predetermined optical path for focusing said collimated optical beam in a predetermined focal plane;

(c) a linear array of photodetectors;

(d) means for supporting said linear array of photodetectors in said predetermined focal plane including selective positioning means for moving or stepping the linear array in small precise increments in a direction perpendicular to the optical path to thereby mechanically step or scan the linear array over a predetermined area of the focal plane in response to said synchronizing signal;

(e) electronic scan means for collecting data from said linear array and operable at each stepped increment position of the linear array to scan the linear array at an initial predetermined fast scan rate at one end portion of the linear



array, and at a predetermined slow scan rate over a central portion of the linear array, and at the predetermined fast scan rate over the other end portion of the linear array; and

(f) data collecting and processing apparatus coupled to receive the output signals of said linear array of photodetectors and said synchronizing signal for generating signals indicative of selected characteristics of said collimated optical signal.

4,693,601

LIGHT SCANNING DEVICE FOR DETERMINING THE CONDITION OF A SURFACE WITH A LIGHT CONCENTRATOR

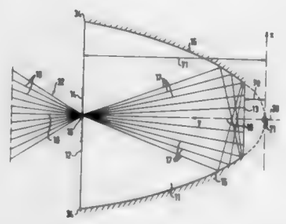
Klaus Dabelstein, Pöcking/Starnberg, and Christian Skrobol, Inning, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,017

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518832

Int. Cl.⁴ G01N *21/89, 21/47*

U.S. Cl. 356—237 **14 Claims**



1. A light scanning device for determining the condition of a surface comprising means for forming a scanning line on the surface of an article and an optical system for concentrating, at a point-like concentration zone, all the light beams which lie in a plane extending parallel to the scanning line and which leave the surface, depending on the surface condition, which in a specific direction corresponding to a normal reflection, or in a direction which deviates somewhat from this as a result of surface faults; wherein said point-like concentration zone is

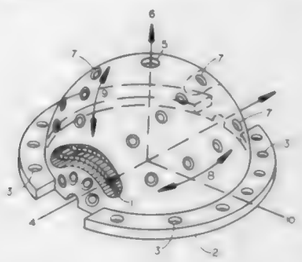
located, depending on whether the light beams have the normal direction or deviate in angle somewhat therefrom, either at a normal position on the light entry surface of a transparent light concentrator or displaced somewhat relative thereto in the direction of the light streak; wherein the light concentrator has outer mirrored side surfaces and tapers away from the concentration zone to a desired light exit surface where an areal photoconverter, in particular a photomultiplier is arranged; and wherein a dark field stop is arranged at the normal position for the light concentrator and preferably also in a small angular range about this normal position, said stop permitting only light beams which leave the surface above a predetermined angle of deviation relative to the normal direction to enter into the light concentrator, characterised in that the externally mirrored side surfaces (15) of the tapering light concentrator (11) are increasingly convexly curved in the direction away from the light entry surface in such a way that at least some (17) of the light beams which fall in the range of the dark field stop would fall, if the dark field stop were imagined to the missing, on the convexly curved side surfaces (15) at angles so steep that they would be reflected backwardly in the light concentrator without reaching the desired light exit surface (13); and in that all the light beams which enter alongside the dark field stop (14) into the light entry surface (12) of the light concentrator (11) impinge on the mirrored side surfaces (15) at such shallow angles that they all reach the desired light exit surface (13).

4,693,602

METHOD AND APPARATUS FOR MEASURING THE LIGHT SCATTERING PROPERTIES OF SMALL PARTICLES

Philip J. Wyatt, Santa Barbara, and Steven D. Phillips, Goleta, both of Calif., assignors to Wyatt Technology Corporation, Santa Barbara, Calif.

Filed Nov. 6, 1984, Ser. No. 668,711
Int. Cl.[4] G01N *15/02*
U.S. Cl. 356—336 **27 Claims**



1. An instrument for the measurement of the radiation scattered by individual particles comprised of:

(a) a scattering chamber means of essentially spherical shape containing two diametrically opposed apertures for the insertion and removal respectively, of the particle-containing stream passing through the center of said spherical chamber;

(b) an incident radiation means providing a collimated beam of radiation passing through said chamber and intersecting said particle-containing stream at the center of said spherical chamber;

(c) entrance and exit apertures for the passage of the radiation beam through the center of the said chamber means;

(d) a multiplicity of identical ports at a plurality of angular locations, each subtending a small solid angle with respect to the point of intersection of said aerosol stream and incident radiation beam at the center of said spherical chamber;

(e) a port subtending a solid angle at least 10 times larger than the solid angle subtended by the ports of (d) and located in the forward direction with respect to the direction of said incident radiation beam;

(f) a port of structure essentially identical to (e), but located in the backward direction;

(g) radiation collimation and collection means corresponding and attached to each of the small solid angle ports of (d);

(h) collimated optical fiber bundles means corresponding and attached to each large solid angle port of (e) and (f), respectively;

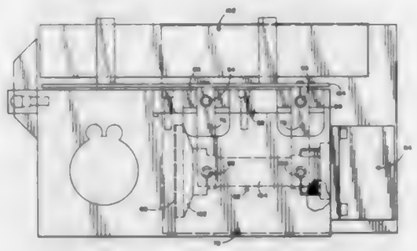
(i) individual detection means corresponding and attached to each collection means of (g) and (h) by which the scattered radiation collected thereby may be converted into an electrical signal.

4,693,603

RUGGEDIZED COMPACT INTERFEROMETER REQUIRING MINIMUM ISOLATION FROM MECHANICAL VIBRATIONS

Gerald L. Auth, Laguna Beach, Calif., assignor to MIDAC Corporation, Costa Mesa, Calif.

Filed Oct. 21, 1985, Ser. No. 789,849
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—346 **23 Claims**



1. An interferometer structure, for use in an environment in which it is subjected to ambient vibration comprising:

a movable member which provides a mirror at one end thereof, and which is so constructed as to have the highest practicable minimum mechanical resonant vibration frequency;

driving means which causes back and forth movement of the movable member, and which includes an operative interconnection with the movable member so constructed as to have the highest practicable minimum mechanical resonant vibration frequency;

supporting means for the movable member which constrains it to move along a predetermined path, and which includes an operative interconnection with the movable member so constructed as to have the highest practicable minimum mechanical resonant vibration frequency; and

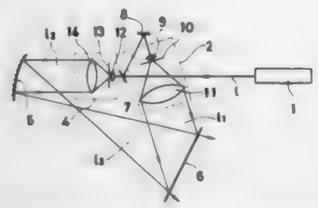
a mirror drive loop, for controlling the velocity of the movable member, which includes the above-recited mechanical elements, and also includes electronic components comprising sensing, feedback and control circuitry, whose maximum performance is limited by the minimum mechanical resonant vibration frequency in the mechanical elements of the mirror drive loop.

4,693,604

INTERFERENCE METHOD AND INTERFEROMETER FOR TESTING THE SURFACE PRECISION OF A PARABOLIC MIRROR

Koji Tenjinbayashi, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 762,944
Claims priority, application Japan, Aug. 6, 1984, 59-164661
Int. Cl.[4] G01B *9/021*
U.S. Cl. 356—348 **14 Claims**



1. An interference method of testing the surface precision of a parabolic mirror, comprising the steps of:

dividing a beam of light rays from a laser light source into two beams of light by means of a beam splitter;

producing an illuminating light beam by converting one of said two beams of light into a divergent spherical light wave by means of a microscope object lens and an associated pinhole;

producing a reference light beam from the other one of said two light beams;

illuminating a parabolic mirror to be tested with said illuminating light beam;

causing reflected light from said parabolic mirror to interfere with said reference light beam so as to thereby form interference fringes; and

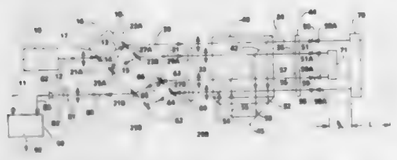
determining any shaping error of said parabolic mirror from said interference fringes.

4,693,605

DIFFERENTIAL PLANE MIRROR INTERFEROMETER

Gary E. Sommargren, Madison, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Continuation-in-part of Ser. No. 810,999, Dec. 19, 1985. This application Jun. 12, 1986, Ser. No. 873,423
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **33 Claims**



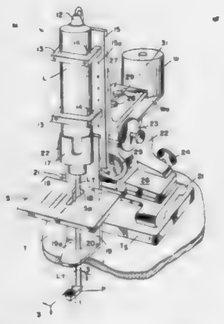
1. A differential plane mirror interferometric system comprising: a pair of plane mirrors separable by a variable optical path length; source means for emitting an input beam comprising two stabilized orthogonally polarized optical frequencies; tilted parallel plate means optically coupled to said input beam for converting said input beam into two separated parallel orthogonally polarized beams; means optically disposed in the path of one of said two separated parallel orthogonally polarized beams for converting said two separated parallel orthogonally polarized beams into two separated parallel beams having the same polarization; means optically coupled to said two separated parallel same polarized beams for causing one of said two separated parallel same polarized beams to be reflected twice by one of said pair of plane mirrors and the other of said two separated parallel same polarized beams to be reflected by the other of said pair of plane mirrors to produce two parallel output beams having the same polarization; means optically disposed in the path of one of said two separated same polarized parallel output beams for converting said two separated same polarized parallel output beams into two separated orthogonally polarized parallel output beams; means optically coupled to said two separated parallel orthogonally polarized output beams for converting said two separated parallel orthogonally polarized output beams into a single output beam having a pair of orthogonally polarized frequency components, with a phase difference therebetween being directly proportional to said variable optical path length between said pair of plane mirrors; means optically coupled to said single output beam for mixing said orthogonally polarized components thereof and producing an electrical measurement signal therefrom; and means operatively connected to said electrical measurement signal for extracting said difference in phase from said electrical measurement signal, said extracted phase difference being proportional to said variable optical path length between said pair of plane mirrors; whereby an optical configuration extremely insensitive to measurement error and misalignment is provided for said interferometric system, said tilted parallel plate means comprising a first set of regions of reflection, antireflection and polarizing coatings, said means for converting said two separated parallel orthogonally polarized output beams into said single output beams comprising said first set of regions and coatings on said tilted parallel plate means, said tilted parallel plate means further comprising a second set of regions of reflection, antireflection and polarization coatings, said second set of regions and coatings comprising said input beam converting means.

4,693,606

APPARATUS AND METHOD FOR MEASURING MUSCLE SARCOMERE LENGTH IN VIVO

Richard J. Podolsky, Washington, D.C.; Gordon R. Baker, Rockville, Md., and Bernhard Brenner, Tubingen, Fed. Rep. of Germany, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 784,258
Int. Cl.[4] A61N *5/06*
U.S. Cl. 356—355 **16 Claims**



1. A diffraction apparatus for measuring muscle sarcomere length IN VIVO, comprising:

light soruce means, having a longitudinal axis, for producing a monochromatic and collimated light beam in a direction parallel to said longitudinal axis;

transparent support means for supporting muscle tissue under examination for measurement of its sarcomere length, said support means being located so that monochromatic light passes therethrough; and

screen means for receiving light rays diffracted by the mus-

cle tissue after passage through said transparent support means and for providing a magnified measure of the muscle tissue sarcomere length;

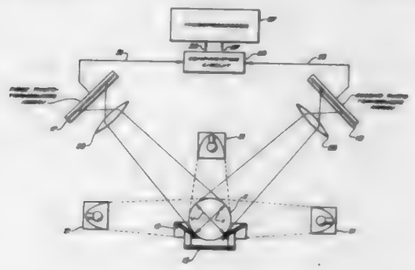
whereby the monochromatic light beam passes through said muscle tissue, diffracting the light beam towards and onto said screen means for determination of said muscle tissue's sarcomere length.

4,693,607

METHOD AND APPARATUS FOR OPTICALLY MEASURING THE VOLUME OF GENERALLY SPHERICAL FRUIT

Tim D. Conway, Stockton, Calif., assignor to Sunkist Growers Inc., Ontario, Calif.

Continuation-in-part of Ser. No. 558,312, Dec. 5, 1983, abandoned. This application May 12, 1986, Ser. No. 862,126
Int. Cl.⁴ G01B *11/28*
U.S. Cl. 356—380 **38 Claims**



1. Optical measuring apparatus for measuring the volume of a generally spherical fruit located in a receptacle and for determining if the receptacle contains more than one fruit, wherein the apparatus comprises:

width measuring means for measuring the width of a plurality of narrow, substantially parallel cross sections of the fruit in the receptacle, to produce a set of width measurements;

volume calculating means for calculating the area of each narrow cross section of the fruit based on the corresponding width measurement, and for summing together the calculated areas to produce a measure of the volume of the fruit;

selecting means for selecting the largest width measurement from the set of width measurements;

length measuring means for measuring the length of the fruit in the receptacle by counting the plurality of cross sections; and

ratio means for calculating the ratio of the largest width measurement and the length measurement and for comparing the ratio with one or more predetermined thresholds, to determine if more than one fruit is located in the receptacle.

4,693,608

METHOD AND APPARATUS FOR DETERMINING POSITION OF POINTS ON ARTICLE

Katsuichi Kitagawa, Moriyama, and Kouichi Tamura, Kudamatsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

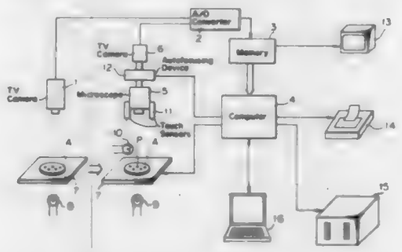
Filed Oct. 28, 1985, Ser. No. 792,315
Claims priority, application Japan, Oct. 29, 1984, 59-225793
Int. Cl.⁴ G05B *1/00*
U.S. Cl. 356—394 **4 Claims**

1. A method for locating and inspecting apertures on the surface of an article in an aperture inspecting system comprising the steps of:

detecting apparent positional information of said apertures from an image of the arrangement of said apertures;

detecting a relative difference between said apparent positional information and predetermined positional information according to design data of the arrangement of said apertures;

modifying said apparent positional information by said relative difference, which modified information is transmitted to a subsequent system for positioning said aperture in place for inspecting;



receiving a beam reflected from one surface of said article on which said aperture is opened, said beam including information of an outer edge of a periphery of said aperture;

receiving another beam projected from the opposite side of said article through said aperture, said beam including information of a cross-section of said aperture; and

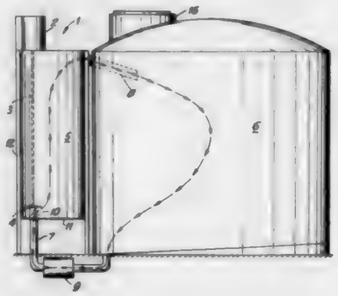
obtaining a deformation value of said edge by comparing the received information regarding said aperture.

4,693,609

MECHANISM FOR AND METHOD OF AGRICULTURAL CHEMICAL FORMULATION

Robert W. Haynes, Grand Forks, N. Dak., assignor to Terra International, Inc., Sioux City, Iowa

Filed Jan. 16, 1986, Ser. No. 819,363
Int. Cl.⁴ B01F *5/10, 7/26*
U.S. Cl. 366—136 **16 Claims**



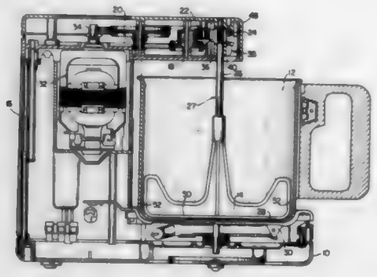
1. A mechanism for agricultural chemical formulation comprising a mixing tank, a dispersion tank, a rotatable shar blade mounted within said dispersion tank, said dispersion tank having a bottom wall and a side wall, means for transferring said formulation from the mixing tank into said dispersion tank through an opening therein, said shar blade being in close adjacency to said opening in the dispersion tank in order to permit the shar blade to strike the formulation as soon as it enters the dispersion tank, and means for returning the formulation back into said mixing tank.

4,693,610

ELECTRICAL HOUSEHOLD APPLIANCE FOR CULINARY PURPOSES

Roger Weiss, Bagnolet, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Continuation of Ser. No. 569,475, Jan. 9, 1984, Pat. No. 4,548,508
This application Dec. 5, 1985, Ser. No. 804,634
Claims priority, application France, Jan. 24, 1985, 85 00981
Int. Cl.⁴ B01F *15/06*
U.S. Cl. 366—146 **8 Claims**



1. Apparatus for food preparation comprising a base, a mixing bowl received on said base, a rotatable tool within said bowl, a column extending upwardly from said base and having a top end, an arm extending substantially horizontally above the bowl, said arm being supported by the top end of said column and having a free end and said arm further having an upper surface, a spaced lower surface and a lateral surface joining said upper and lower surfaces and defining the lateral extent of the end of the arm, an upwardly extending drive shaft of said tool being engageable with said arm, drive means for said tool contained within said arm, said drive means including a pinion for rotating the drive shaft of said tool, said pinion being fixed to said drive shaft to thereby form a drive assembly for the tool, a recess formed within the free end of said arm within which said drive assembly can be detatchably mounted, a seat for said drive assembly formed within said recess, and an opening provided in said arm by which said recess communicates with the exterior, said opening being so positioned as to enable said drive assembly to be moved into and out of said recess, said opening extending through the lower surface, the lateral surface and the upper surface of the arm, such that said opening comprises a lower zone allowing passage of the drive shaft toward the bowl and a lateral zone allowing passage of the drive shaft laterally out of and into said recess and an upper zone allowing passage of said drive assembly, said bowl being substantially cylindrical in shape, and, when the tool drive assembly is in its mounted position, the drive shaft of the tool extending along the vertical axis of said bowl, and at least one lateral edge of said tool lying in the immediate vicinity of a substantially cylindrical inner wall of said bowl.

4,693,611

FROZEN DESSERT MIXER

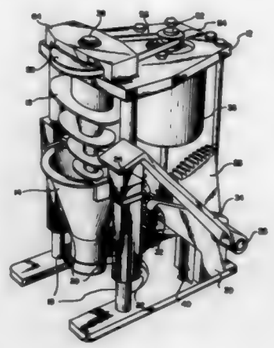
Charles E. Verkler, Peoria, Ill., assignor to International Food Equipment Inc., Peoria, Ill.

Filed Jul. 29, 1985, Ser. No. 760,121
Int. Cl.⁴ A23G *9/02*
U.S. Cl. 366—195 **6 Claims**

1. In a frozen dessert mixing machine generally having a mixing cone, a mixing auger and a drive mechanism for driving said cone and auger into operational engagement, improved means for selectively attaching said mixing cone to said drive mechanism comprising:

pivot means secured to said mixing cone; and

position locking means secured to said drive mechanism and adapted to accommodate said pivot means to lock said cone in selected positions and adapted to maintain said



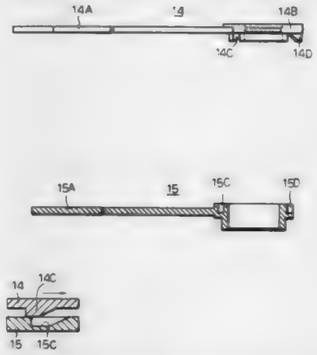
cone in alignment with said auger in at least one of said positions.

4,693,612

ALARM MECHANISM

Kelichi Yoshizawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,127
Claims priority, application Japan, Dec. 27, 1985, 60-298713
Int. Cl.⁴ G04B *23/02*
U.S. Cl. 368—74 **10 Claims**



1. An alarm mechanism having an alarm hand and an hour hand coaxially disposed with respect to each other, the hands having respective hand portions and slideably contacting hub portions, cam grooves and cam pawls respectively formed on one and the other of said respective hub portions, said cam grooves and said cam pawls having the same positional relationship with each other relative to the respective hand portions of said alarm and hour hands.

4,693,613

LOGO CLOCK

Douglas Ritchie, Stowe, Mass., assignor to By Design Corp., Cambridge, Mass.

Filed Jan. 31, 1986, Ser. No. 824,743
Int. Cl.⁴ G04B *19/04*
U.S. Cl. 368—238 **21 Claims**

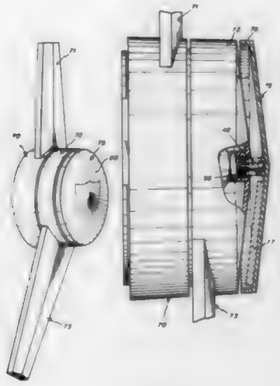
1. A clock comprising;

an hour housing supporting an hour hand integral therewith,

a minute housing supporting a minute hand integral therewith,

a timing mechanism and means supporting the timing mechanism in one of said housings at the rear of the clock,

said timing mechanism having hour driven shaft means coupled to said hour housing for rotatably driving said hour housing and in turn said hour hand, and minute driven shaft means coupled to said minute housing for rotatably driving said minute housing and in turn said minute hand,



means on one of said minute or hour housings for carrying indicia,

means for maintaining the indicia carrying means in a stationary position relative to the adjacent rotating housing, and

means for supporting the timing mechanism in a fixed position.

4,693,614

APPARATUS FOR DETECTING SLAG OUTFLOW

Akio Hatono, Suita, and Sumio Kobayashi, Yamato-Koriyama, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 622,287, Jun. 19, 1984, abandoned. This application May 6, 1986, Ser. No. 861,110

Claims priority, application Japan, Jun. 20, 1983, 58-111423; Jun. 20, 1983, 58-111424; Nov. 16, 1983, 58-214020

Int. Cl.⁴ G01J *5/00*; **B22D** *11/10*

U.S. Cl. 374—122 **3 Claims**



1. An apparatus for detecting slag outflow when a molten metal covered by molten slag is poured from one vessel to another vessel under sealed conditions by receiving the thermal radiation energy at the microwave frequencies emitted from the pouring stream of molten metal as it is poured from said one vessel to another to detect a change in thermal radiation energy caused by the difference in the emissivities of said molten metal and said molten slag, which comprises:

a microwave-focusing mechanism located at least one meter from said pouring stream composed of a plurality of microwave lenses arranged such that one focal point of one of said lenses is set at a measuring target point at said pouring stream, and a receiving antenna placed on a side of the focusing mechanism opposite to said measuring target point, said plurality of said microwave lenses being supported on a slidable arm extending toward the measuring target point wherein one end of said arm is fixed to a base on which said receiving antenna is mounted;

a waveguide means one end of which is connected to said receiving antenna and which receives the thermal radiation energy from said microwave-focusing mechanism; and

said waveguide means being provided with a purge waveguide comprising a purging mechanism having a conduit from a purge gas source; and

a radiometer connected to the other end of said waveguide means to measure the thermal radiation energy received through said waveguide means.

4,693,615

NON-CONTACT TEMPERATURE MEASUREMENT OF A STATIC OR MOVING TARGET

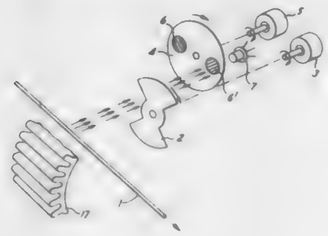
John Kyriakis, 36 Minster Court Hillcrest Road, Ealing, London, England

Filed Jun. 13, 1985, Ser. No. 744,415

Claims priority, application United Kingdom, Jun. 14, 1984, 8415164

Int. Cl.⁴ G01N *21/27*; **G01J** *5/52*

U.S. Cl. 374—129 **8 Claims**



1. Apparatus for non-contact temperature measurement of elongated elements such as wires, cables and filaments in a continuous production process for making such elements, the apparatus comprising:

chopper means to be located adjacent at least one of said elongated elements as it passes a given point at which the temperature is to be measured;

first drive means for continuously driving the chopper means to produce trains of intermittent pulses of radiant heat energy being emitted by the elongated element as it continuously moves past the chopper means;

rotary means having first and second wavelength filters mounted thereon in space peripheral relation for being interposed successively into the path of the trains of intermittent pulses of radiant energy produced by the chopper means;

a pyroelectric transducer positioned to receive the filtered trains of intermittent pulses of radiant heat energy successively from the two filters and to provide first and second electrical outputs representative of the radiant heat energy received from the first and second wavelength filters, respectively;

microprocessor means for processing said electrical outputs to form a ratio thereof indicative of the temperature of the elongated element as it passes the given point;

second drive means periodically actuated responsive to a signal from said microprocessor means for driving said rotary means to interpose said filters successively into the path of the trains of intermittent pulses of radiant heat energy produced by the chopper means; and means to prevent extraneous radiation energy from impinging upon the pyroelectric transducer.

4,693,616

BEARING FOR A FLUID FLOW ENGINE AND METHOD FOR DAMPING VIBRATIONS OF THE ENGINE

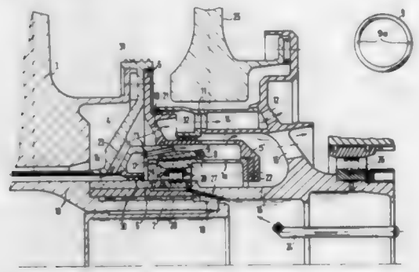
Alois Rohra, and Walter Wildner, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 9, 1986, Ser. No. 905,784

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532456

Int. Cl.⁴ F16C *39/04*

U.S. Cl. 384—99 **12 Claims**



1. An apparatus for damping vibrations in a fluid flow engine, comprising shaft means for supporting engine components, bearing means including an inner bearing race, and an outer bearing race having an outer surface, mounting means for said bearing means having an inner surface facing said outer surface, said outer surface having a smaller diameter than said inner surface for forming a damping gap between said inner and outer surfaces, said damping gap having a fluid flow gap entrance end and a fluid flow gap exit end, fluid flow entrapment chamber means formed around said gap entrance end for accumulating damping fluid in said chamber means, and means for directing a damping fluid flow through said entrapment chamber means into said damping gap, whereby rotation of said entrapment chamber means compresses damping fluid into said damping gap by centrifugal force.

4,693,617

PLAIN JOURNAL BEARING

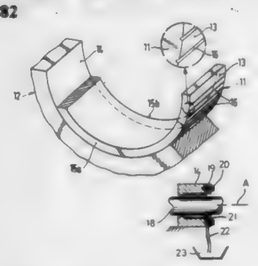
Erich Roemer; Eckhart Schopf, and Günter Cezane, all of Wiesbaden, Fed. Rep. of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 634,691, Jul. 26, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,080

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328509

Int. Cl.⁴ F16C *33/04*, *33/10*

U.S. Cl. 384—282 **10 Claims**



1. A slider bearing assembly comprising:

a bearing housing having a bore centered on an axis and having a bore surface;

a uniform composition plain bearing liner in and coaxial with the bore and having an outer surface delimited by two axially oppositely directed end faces and an axial middle region between the end faces and an inner surface, the bore and outer surfaces being in mutual surface contact in a contact area and normally directly engaging each other without the interposition of a liquid lubricant;

means for fixing the bearing liner in the housing against any movement relative thereto other than micromovements;

a movable part having a journal radially outwardly confronting and normally engaging the inner liner surface, the movable part being nonradially movable relative to the liner and housing;

drainage channels formed in at least one of the bore and outer surfaces at the contact area and extending to the axial end faces, the liner being of uniform radial thickness at least between the channels, the area occupied by the drainage channels being at the most 15% of the contact area, the radial depth of the drainage channels being 0.03 mm to 0.2 mm and 2% to 5% of the radial thickness of the plain bearing liner, this radial thickness being at least equal to 4 mm; and

means for withdrawing lubricant from the channels and thereby maintaining the contact area substantially dry.

4,693,618

DOT MATRIX PRINTER PROVIDING MULTIPLE PRINT PULSES FOR ONE ENERGIZATION OF A PRINTING HEAD STEPPING MOTOR

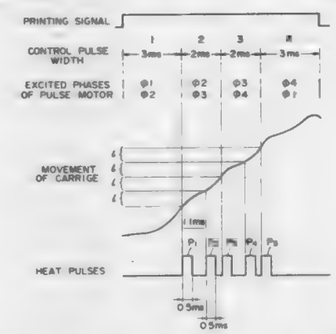
Takayoshi Hanagata, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 630,352, Jul. 16, 1984, abandoned, which is a continuation of Ser. No. 458,330, Jan. 17, 1983, abandoned, which is a continuation of Ser. No. 225,340, Jan. 15, 1981, abandoned. This application Mar. 24, 1986, Ser. No. 844,245

Claims priority, application Japan, Feb. 22, 1980, 55-20544

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—120 **2 Claims**



1. A dot matrix printer with a stepping motor for relatively moving a printing head and a printing sheet, comprising:

a printing head having at least one printing element for printing on the printing sheet in response to print pulses;

a stepping motor for relatively moving said printing head and the printing sheet once during each excited phase of said stepping motor;

motor drive signal generating means for generating a motor drive pulse;

motor drive means operable in response to the motor drive pulse for exciting each phase of said stepping motor to drive said stepping motor;

timer means having a set time perioid, said timer means being operable in response to the motor drive pulse for generating an additional pulse preceding the next motor drive pulse at the set time period; and

head drive means for generating print pulses in response to both the motor drive pulse and the additional pulse,

wherein the set time period of said timer means is selected so that the distance between dots produced in response to the print pulses is uniform.

4,693,619

STEPPING MOTOR OPERATED POSITIONING DEVICE FOR A RIBBON LIFTER IN A PRINTER

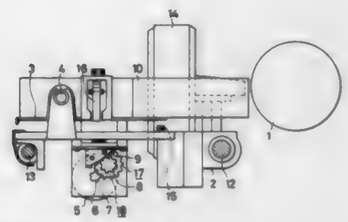
Hidekazu Ishii, and Chihiro Kosaka, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1985, Ser. No. 790,502

Claims priority, application Japan, Oct. 26, 1984, 59-225536

Int. Cl.⁴ B41J *35/14*

U.S. Cl. 400—212 **1 Claim**



1. A printer comprising:

(a) a cylindrical platen having an axis;

(b) at least one guide shaft having an axis parallel to the axis of said cylindrical platen;

(c) a carriage slidably mounted on said at least one guide shaft for movement parallel to the axis of said cylindrical platen;

(d) a ribbon base mounted on said carriage for pivotal movement about an axis parallel to the axis of said cylindrical platen;

(e) an adjustable screw stopper threadably mounted in said carriage and projecting therefrom toward said ribbon base, said adjustable screw stopper being sized and positioned so that contact between said adjustable screw stopper and said ribbon base provides a reference position for said ribbon base relative to said cylindrical platen and so that the point of contact between said adjustable screw stopper and said ribbon base is adjustable by movement of said adjustable screw stopper relative to said carriage;

(f) a stepping motor mounted on said carriage;

(g) a sector gear mounted on said ribbon base, said sector gear being concentric to the axis about which said ribbon base pivots; and

(h) a power transmitting mechanism operatively connecting said stepping motor to said sector gear, said power transmitting mechanism comprising a torque limiter designed to slip at a torque less than the maximum torque producea-ble by said stepping motor, whereby, if in use said ribbon base comes into contact with said adjustable screw stopper before said stepping motor has stepped out, said stepping motor continues to rotate, thereby preventing an out-of-phase condition of said stepping motor.

4,693,620

VARIABLE WIDTH PAPER FEEDER FOR PERFORATED AND UNPERFORATED PAPER

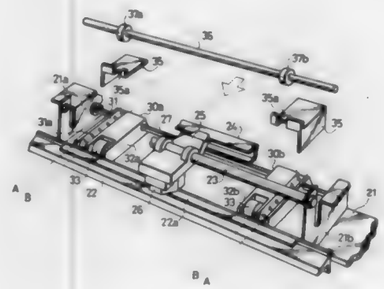
Masatoshi Harumatsu, Tamayama, Japan, assignor to Alps Electric Co.,Ltd., Japan

Filed Sep. 3, 1985, Ser. No. 771,888

Claims priority, application Japan, Aug. 31, 1984, 59-132182[U]

Int. Cl.⁴ B41J *11/30*

U.S. Cl. 400—611 **5 Claims**



1. A paper feeder capable of feeding both a paper of the type having perforated edges by engaging the perforations of the edge of the perforated paper and a paper of the type having unperforated edges by engaging the surface of the unperforated paper, comprising:

a pair of slide blocks adjustably slidable along a drive shaft extending in a first horizontally defined direction so as to vary the spacing between the slide blocks in accordance with the width and type of paper to be engaged by said slide blocks;

each slide block extending in a second horizontal direction normal to the first direction and having a pair of opposite vertical side walls extending in the second direction, wherein the paper is fed along a feed path in a horizontal paper feeding direction parallel to the second direction, a track rotating body mounted between said side walls at an outside location of said slide block on whose peripheral surface there is provided a plurality of pins for engaging the perforations of the perforated type of paper, a drive roller mounted between said side walls at an inside location of said slide block which has a frictional surface for engaging the unperforated type of paper, and drive means in said slide block for engaging said drive shaft and driving said track rotating body and drive roller in rotation so as to drive the corresponding type of paper engaged therewith in the paper feeding direction;

a pair of holder members each mounted on a respective slide block and having a portion extending over the paper feed path formed with a pinch roller holding portion which is aligned for holding a pinch roller in position for contact with the drive roller of the respective slide block; and

a pair of pinch rollers mounted adjustably slidably on a roller shaft which is movable toward said slide blocks so as to bring said pinch rollers into engagement with the holding portions of the respective holder members and into frictional contact with the respective drive rollers,

wherein said slide blocks can be adjustably moved in said first direction to vary the spacing therebetween and said pinch rollers, engaged with the respective holding portions of said holder members, can be adjustably moved with said slide blocks in said first direction so as to remain in positions of frictional contact with said drive rollers mounted in said slide blocks.

4,693,621

PAPER LOADING DEVICE OF PRINTER

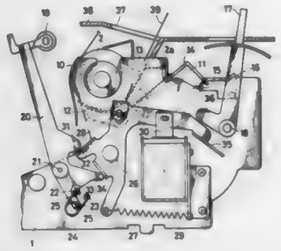
Katsuhiko Kawaguchi, Nirayama, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 695,083, Jan. 25, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 891,426

Claims priority, application Japan, Jan. 25, 1984, 59-11622; Feb. 1, 1984, 59-16870

Int. Cl.⁴ B41J *23/048, 13/20*

U.S. Cl. 400—636.1 **3 Claims**



1. An automatic loading device for a printer, comprising:

a platen connected to be rotated by a feed motor to feed paper;

a pinch roller mounted for movement toward and away from said platen;

a manipulating lever for manually positioning said pinch roller;

a pair of left and right paper bail arms mounting a paper bail roller for rotation in opposing relationship to said platen and wherein said paper bail arms include means for pivotal motion to move said paper bail roller toward and away from said platen;

a toggle spring for urging said paper bail arms toward and away from said platen on opposite sides of a neutral position of said paper bail arms;

an operating member having a pressing portion for pressing said paper bail arms away from said platen and a stopper, separate from said pressing portion, for supporting said paper bail arms at a position just on the platen side of said neutral position when said paper bail arms are pressed by said pressing portion of said operating member;

an electromagnetic actuating means for displacing said operating member to press against said paper bail arms to move said paper bail roller away from said platen whereby said device automatically feeds paper without any need for manual movement of said paper bail arm; and

said stopper serving as a means for stopping said paper bail arms at a second position on the opposite side of said neutral position from the platen side, said paper bail arms being urged toward and maintained in said second position by said toggle spring when said paper bail arms are manually operated to move said paper bail roller away from said platen.

4,693,622

COMBINED TOOTHBRUSH AND TOOTHPASTE DISPENSER

Peter A. Booth, Furtherfields, Chenies Road, Chorley Wood, Hertfordshire, WD3 5LU, United Kingdom

PCT No. PCT/GB85/00113, § 371 Date Nov. 26, 1985, § 102(e) Date Nov. 26, 1985, PCT Pub. No. WO85/04314, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 25, 1985, Ser. No. 807,896

Claims priority, application United Kingdom, Mar. 26, 1984, 8407759

Int. Cl.⁴ A46B *11/02*

U.S. Cl. 401—191 **7 Claims**

1. A combined toothbrush and toothpaste dispenser which is characterised by being collapsible into a compact unit for convenient carriage by a user, comprising.

an elongated body casing which also serves as handle means and which is defined by proximal and distal ends having elongated side wall means extending therebetween, said proximal end including proximal end wall means,

a toothbrush member located at said proximal end of said body casing and including arm means mounted in said body casing and a brush head supported at the distal end of said arm means and having bristles projecting generally perpendicularly from said brush head,

means slidably mounting said arm means adjacent said side wall means of said body casing for relative longitudinal movement substantially parallel to said side wall means between a retracted position in which said brush head is disposed adjacent and externally of said proximal end wall means of said body casing and an adjustable extended position,

articulating means adjustably supporting said brush head from said distal end of said arm means, whereby said brush head is movable between a first position in which said brush head is aligned with said arm means and a second position in which said brush head is substantially perpendicular to said arm means, said articulating means including means for resisting movement of said brush head, and said brush head generally lying within the boundaries of



said proximal end wall means when located in said second position of said brush head,

toothpaste dispensing means disposed within said body casing and including discharge nozzle means extending through said proximal end wall means of said body casing,

discharge means operable to discharge toothpaste from said dispensing means via said discharge nozzle means,

said brush head being settable in said second position thereof when said arm means is in said retracted position, whereby said bristles of said brush head are directed towards and overlie said discharge nozzle means for receiving toothpaste therefrom in response to operation of said discharge means,

manual actuating means for controlling operation of said discharge nozzle means,

indexing means associated with said manual actuating means for defining at least one indexed position of said manual actuating means, whereby to provide for dispensing of a metered quantity of toothpaste in response to operation of said discharge nozzle means by said manual actuating means, and

valve means which is adapted to operate in response to operation of said discharge nozzle means by said manual actuating means and which closes said discharge nozzle means in said at least one indexed position of said manual actuating means and opens said discharge nozzle means between successive indexed positions.

4,693,623

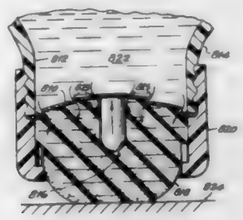
PRESSURE-RESPONSIVE VALVE FOR AN APPLICATOR

Gilbert Schwartzman, Westchester County, N.Y., assignor to Dab-O-Matic Corp., Mt. Vernon, N.Y.

Division of Ser. No. 585,754, Mar. 2, 1984, Pat. No. 4,620,648, which is a continuation-in-part of Ser. No. 395,111, Jul. 6, 1982, abandoned. This application May 28, 1986, Ser. No. 868,287

Int. Cl.[4] B05C *17/00*

U.S. Cl. 401—206 7 Claims



1. A dispensing apparatus compriaing a fluid container including a mouth, an applicator, means for holding said applicator in the mouth of said container, a normally closed pressure-responsive valve for permitting the flow of fluid from said container to said applicator upon the application of pressure to said valve, said valve including a diaphragm formed of elastically deformable fluid impermeable material with a plurality of non-intersecting arcuate slits therein, each slit having a base which is intersected by at least one other slit, each slit being out of intersecting relation with its own base, and means for disposing said valve in said container inside of said applicator.

4,693,624

BINDING MECHANISM FOR PERFORATED PAPERS

Helmut Moosmüller, Martin Luther Str. 9, D-7733 Mönchweiler, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,666

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425827

Int. Cl.[4] B42F *13/10, 13/02*

U.S. Cl. 402—22 15 Claims



1. A binding mechanism for perforated papers comprising, a flat support strip of plastic having a long dimension and a short dimension for supporting a stack of perforated paper, at least two elastically flexible tangs partly integrally formed as one piece with and on top of said flat support strip, said tangs being spaced along the long dimension and being insertable in passages of the support strip for the formation of loop-like ring arcs of different size, which passages are arranged directly below the tangs and extend across the short dimension of the support strip, the tangs being made in two parts, the tangs each comprising a tang section which is integrally formed perpendicular upright on the support strip top side at one side of said strip and an extension piece connected with the tang section and mechanically releasably locked to the tang section, said extension pieces being lockable against axial displacement at insertion-side ends of the passages by releasable fixing means, said insertion-side ends being on an opposite side of said strip from said upright tang sections, the passages being provided at their insertion-side ends with an engaging edge for engaging one of the extension pieces, the extension pieces having counter sunk in their surfaces a locked tooth system extending in a longitudinal direction thereof, the passages having at their insertion-side end an elastically flexible supporting tongue directed from a bottom thereof upwardly and offset toward and outside of the passage relative to the engaging edge.

4,693,625

BINDER ASSEMBLIES

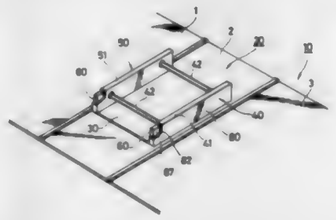
Kiyoshi Ohminato, Tokyo, Japan, assignor to King Jim Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1986, Ser. No. 830,122

Claims priority, application Japan, Jun. 27, 1985, 60-98923

Int. Cl.[4] B42F *3/04*

U.S. Cl. 402—27 7 Claims



1. A binder assembly, comprising:

a first rotatable member; and

a second rotatable member, wherein said first rotatable member comprises at least one binding rod and said second rotatable member comprises at least one binding pipe adapted to receive said at least one binding rod, and wherein said first and second rotatable members are separately and detachably provided on both sides of a bottom plate fixed to a back of a file in such a manner that said first and second rotatable members are turnable with respect to said bottom plate.

4,693,626

FOLDER FOR PAPER SHEETS, ESPECIALLY EDP PAPER SHEETS

Manuel Ferreira-Godinho, Bergiusweg 10, D-3250 Hameln 1, Fed. Rep. of Germany

Filed Oct. 16, 1986, Ser. No. 920,255

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3537026

Int. Cl.[4] B42F *3/00, 13/14, 11/00, 13/00*

U.S. Cl. 402—73 15 Claims

1. A folder for paper sheets, especially EDP paper sheets (32) having at least two spaced punched holes (34) at their lateral margins, comprising an integral carrier body or cover (21), a plurality of resilient line-up pins or sheet retainers (36) for accommodating the paper sheets (32) through the punched holes (34), retaining means (38, 40) for securely fixing the line-up pins or sheet retainers (36) and the paper sheets (32), said carrier body or cover (21) being an integral injection moulded part and including a bottom part (22) having an integral connection to a back part (24) and having an integral connection to a top part (26) to form a suitable unit, said bottom part (22) of said carrier body or cover (21) including a first and second plurality of securement holes (42) arranged along first and second lines (43, 45) which are normal to each other, said line-up pins or sheet retainers (36) being removably selectively mounted in said holes for repositioning thereof, and said retaining means (38, 40) including telescope-type clamping bars (30) having means to accommodate the protruding ends



(39) of the line-up pins or sheet retainers (36) and are separate from the top part (26).

4,693,627

DEVICE FOR FIXING THE SADDLE OF A BICYCLE TO A SADDLE PILLAR AND FOR ADJUSTING THE INCLINATION OF THE SADDLE

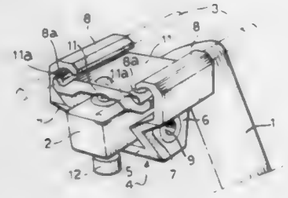
Lucio Borromeo, Turin, Italy, assignor to 3 T S.p.A., Turin, Italy

Filed Jun. 19, 1986, Ser. No. 876,155

Claims priority, application Italy, Jul. 26, 1985, 53642/85[U]

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—24 6 Claims



1. A device for fixing a saddle to a saddle pillar of a bicycle wherein said saddle is provided with a frame framing two longitudinal, parallel, spaced-apart rods, said device comprising:

an abutment member having seats for engaging the two rods of the saddle from above and which is coupled to the head of the saddle pillar so as to be rotatable about a transverse axis of rotation perpendicular to the two rods but not movable vertically,

a thrust plate which engages the two rods of the saddle from below,

a pair of screws threaded substantially vertically through the head of the saddle pillar on the opposite sides of said transverse axis of rotation with their ends engaging the lower surface of the thrust plate, to cause clamping of the rods of the saddle against the seats of the abutment member as a result of the upward thrust exerted by the screws on the thrust plate, and to allow adjustment of the inclination of the saddle by the tightening of one of the screws and the loosening of the other,

said abutment member being in the form of a bracket having a cross member, means adjacent the cross member for engaging the lower surface of the saddle pillar with a rotatable coupling, and two lateral arms which each comprise, starting from the cross member:

a first straight portion which extends into contact with a respective lateral face of the head of the saddle pillar,

a second outwardly inclined portion, and

an end portion whose end is bent inwardly and carries a seat for a respective rod of the saddle frame, the thrust plate being disposed between the end portions of the two arms of the bracket.

4,693,628

BALL JOINT, ESPECIALLY FOR MOTOR VEHICLES

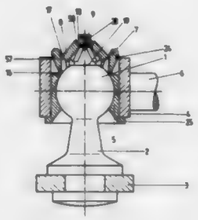
Rolf Renk, Ginsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1986, Ser. No. 848,577

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515303

Int. Cl.[4] F16D *1/12*

U.S. Cl. 403—135 6 Claims



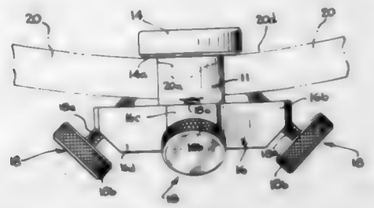
1. A ball joint, especially for motor vehicles, comprising a spherical ball having a shank, a socket having an opening on one side and axially extending slots for receiving and engaging said spherical ball, a housing comprising a metal ring surrounding said socket and having one end engaging an abutment means carried by said socket adjacent said one side thereof, and a bracing and clamping mechanism formed integral with said socket and adjacent said spherical ball at its end remote from its shank for retaining said socket within said steel ring and preventing relative axial displacement relative thereto, the improvement being that said bracing and clamping mechanism includes a plurality of annularly spaced hook-like members integrally hinged at one end to said socket via first hinges, a plurality of bracing members being integrally hinged at their outer ends with the other ends of adjacently located ones of said hook-like members via second hinges and a thrust member integrally hinged with the inner ends of said bracing members via third hinges, said bracing and clamping mechanism being movable between an unclamped position in which said third hinges have their pivot axes spaced further from said spherical ball than the axes of said second hinges and said hook-like members are disengaged from said metal ring at its other end to permit disassembly of said ball joint and a clamped position in which said hook-like members engage said other end of said steel ring and said third hinges have their axes located closer to said spherical ball than the axes of said second hinges by pushing said thurst member of said bracing and clamping mechanism toward said spherical ball whereby said bracing and clamping mechanism functions as an over-center toggle mechanism to retain said socket in place on the metal ring and to biasingly hold said socket in engagement with said spherical ball.

4,693,629

FASTENER FOR JOINING PANELS TO EACH OTHER

Robert F. Bruinsma, Northridge, Calif., assignor to Datron Systems, Inc., Simi Valley, Calif.

Filed Nov. 25, 1985, Ser. No. 801,415
Int. Cl.⁴ F16B *3/00*; F04C *1/30*
U.S. Cl. 403—170 **7 Claims**



1. A fastener for joining together a plurality of panel members at their corners, said panel members having opposite surfaces, said fastener comprising:

a central hub portion, the panel corners being shaped to matingly engage said hub portion;

an overlapping portion extending transversely from one end of the central hub portion, said overlapping portion abutting against one of the surfaces of said panels; and

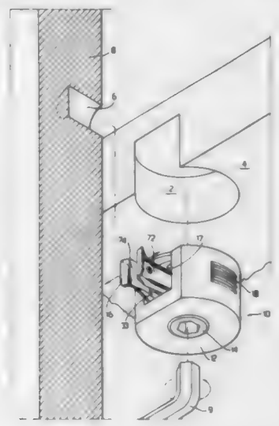
a separate clamp member for joining each of the panels to the fastener, each of said cheap members comprising an arm portion having an end, a notch being formed in the surface of said panels opposite said one of the surfaces thereof, the ends of said arm portions each being fitted into an associated one of said notches, and means for separately tightening each of said arm portions against the surfaces of said notches such that the panel corners are driven towards each other and in tight abutment against the hub portion and the overlapping portion.

4,693,630

FASTENING DEVICE FOR RELEASABLE INTERCONNECTION OF PANELS

Florello Giovannetti, Segrate, Italy, assignor to Laura Giovannetti and Antonio Giovannetti, both of Segrate, Italy, a part interest to each

Filed Oct. 16, 1984, Ser. No. 661,439
Claims priority, application Italy, Oct. 18, 1983, 23348 A/83
Int. Cl.⁴ F16B *12/02*
U.S. Cl. 403—405.1 **13 Claims**



1. A fastening device for releasable interconnection of two elements, in one of which said device is accommodated and in the other of which an engagement hole is provided, said device comprising:

a housing element;

a body rotatably mounted in said housing element;

a resilient element located between said housing element and said body;

said resilient element having a back and arms extended therefrom and extending out of the housing element, said resilient element being movable between a disengagement condition, at which said arms are positioned near one another, and an engagement condition, at which said arms are spread apart from one another to engage the walls of said engagement hole,

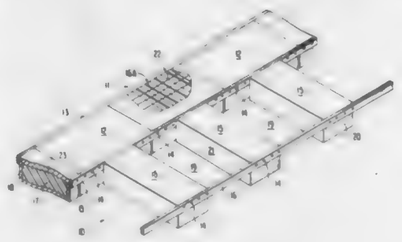
said body defining cooperating cam means to urge said arms from said disengagement condition to said engagement condition, said cam means including a first cam surface and a second cam surface which is eccentric with respect to an axis of rotation of the body and the first cam surface, and when said body is rotated to said engagement condition said first cam surface acts on said arms and said second cam surface acts on said back.

4,693,631

FLOATING BREAKWATER

Robert J. McKay, Pullenvale, Australia, assignor to Pacific Marina Developments Pty. Ltd., Australia

Continuation-in-part of Ser. No. 771,083, Aug. 30, 1985, abandoned. This application Jul. 17, 1986, Ser. No. 886,493
Claims priority, application Australia, Aug. 30, 1984, PG6847
Int. Cl.⁴ E02B *3/04*
U.S. Cl. 405—26 **3 Claims**



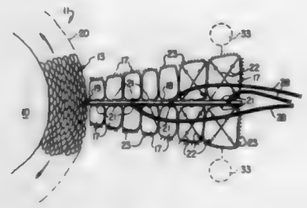
1. A breakwater comprising a rear continuous block formed by a plurality of modules in abutting relation wherein each module has an internal sheath formed from floatable material and an external core formed from concrete, a rear block interconnection strip contacting each rear surface of said module of said continuous block and a front block interconnection strip contacting each front surface of said modules of said continuous block, a first plurality of elongated fasteners extending through and interconnecting said modules and said front and rear block interconnection strips, a plurality of spaced apart fingers each having a construction similar to the construction of each module disposed in engagement with said front block interconnection strip and extending outwardly away from said rear continuous block, a continuous finger interconnection strip contacting the front surface of each of said fingers and a second plurality of elongated fasteners extending through and interconnecting said strips, said fingers, and said rear continuous block.

4,693,632

SYSTEM AND METHOD FOR CONTROLLING EROSION OF A SHORELINE

Roger W. Ingersoll, Carrollton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,566
Int. Cl.⁴ E02B *3/12*
U.S. Cl. 405—18 **2 Claims**



1. A system for controlling erosion of the slope below the waterline of a shoreline, said system comprising:

an elongated conduit;

means to pivotably secure said conduit to said shoreline approximately at said waterline;

a plurality of individual armor bags attached to said conduit; and

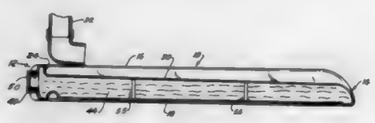
means for filling all of said individual armor bags with a grout material whereby said armor bags when filled with said grout material will be positioned as a unit onto said slope below said waterline.

4,693,633

RUN-OFF TROUGH

Louis Giordano, P.O. Box 136, Linwood, N.J. 08221

Filed Nov. 8, 1984, Ser. No. 669,636
Int. Cl.⁴ E02B *9/04*; E04D *13/08*
U.S. Cl. 405—119 **8 Claims**



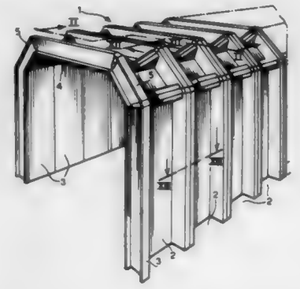
1. A light-weight splash block easily portable to the base of a down spout but unintentionally displaceable therefrom only with difficulty comprising a light-weight molded rigid plastic body means having a top surface formed in the shape of a run-off trough means for directing water away from a downspout, said body means forming a hollow chamber adapted to hold and retain a charge of a fluent material substantially greater in weight than said light-weight molded rigid plastic body, said body means having therein an opening to permit charging said hollow body with such fluent material, whereby said splash block may easily be transported while empty into proximity of a down spout, and thereupon be filled with a heavy fluent charge and rendered thereby sufficiently heavy to be unintentionally displaceable only with difficulty.

4,693,634

PREFABRICATED SUPPORT AND COVERING STRUCTURE, PARTICULARLY FOR CONSTRUCTING TUNNELS, BRIDGES AND THE LIKE

Carlo Chiaves, Turin, Italy, assignor to Tensiter S.p.A., Turin, Italy

PCT No. PCT/EP85/00259, § 371 Date Feb. 5, 1986, § 102(e) Date Feb. 5, 1986, PCT Pub. No. WO85/05653, PCT Pub. Date Dec. 19, 1985
PCT Filed May 31, 1985, Ser. No. 834,277
Claims priority, application Italy, Jun. 5, 1984, 67581 A/84
Int. Cl.⁴ E21D *5/00*
U.S. Cl. 405—126 **4 Claims**



1. A prefabricated support and covering structure particularly for making artificial tunnels, small bridges and the like, comprising a plurality of modular bodies, in the form of a polygonal section having an outer convex surface and an inner concave surface when disposed side-by-side in succession along the longitudinal axis of the structure, each modular body including a plurality of prefabricated panels of reinforced concrete having adjacent end faces, each panel being connected to the adjacent panel by articulation means comprised of a plurality of connecting reinforcement rods extending without interruption from each panel to the adjacent panel to allow relative rotation between adjacent panels from a coplanar disposition to an erect, folded postion in which portions of the end faces of adjacent panels are brought into mutual contact, the improvement comprising:

said connecting reinforcement rods having portions between each pair of adjacent panels which are inclined to each other and intersect on a common straight line substantially parallel to the longitudinal axis of the structure, the said straight line forming an articulation hinge axis,

said connecting reinforcement rods extending from each panel to the adjacent panel being disposed in proximity to the outer convex surface of the prefabricated structure,

each of said end faces of the adjacent panels being inwardly inclined and being provided, in proximity to the concave inner surface of the prefabricated structure, with a front edge which is substantially parallel to the longitudinal axis of the prefabricated structure; the two front edges of each pair of adjacent panels being substantially in longitudinal contact with each other so as to constitute a reciprocal abutment and to define, with the respective adjacent surfaces of the said end faces, a longitudinal space filled with a binding material cast on site, and

wherein said panels of each modular body have lateral faces spaced from the lateral faces adjacent modular bodies and have lateral flanges spaced apart and disposed substantially parallel to a polygonal line which defines the cross section of the prefabricated structure, said lateral flanges of one modular body being substantially in contact upon erection with the corresponding lateral flanges of the adjacent modular body so as to form a space between said lateral faces and lateral flanges extending parallel to the said polygonal line and interposed between the two adja-

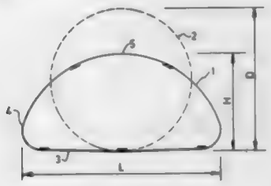
cent modular bodies, the said space being filled with binding material cast on site.

4,693,635

METHOD OF PRODUCING HOLLOW STRUCTURES AND HOLLOW STRUCTURES

Marcel Matiere, 17 Avenue Aristide Briand, 15000 Aurillac, France

PCT No. PCT/FR82/00177, § 371 Date Jul. 15, 1983, § 102(e) Date Jul. 15, 1983, PCT Pub. No. WO83/01823, PCT Pub. Date May 26, 1983
PCT Filed Oct. 29, 1982, Ser. No. 522,169
Claims priority, application France, Nov. 17, 1981, 81 21510; Jun. 11, 1982, 82 10266
Int. Cl.⁴ F16L *9/22*; E03F *3/00*; E21D *11/00*
U.S. Cl. 405—132 **7 Claims**



1. A method for producing an elongated hollow semi-cylindrical body comprising a semi-cylindrical wall and a flattened base which supports said body while lying on a groundsite, said method comprising the following steps:

determining by calculation, the individual stresses and the optimal profile of the hollow semi-cylindrical body, taking into account the totality of the known parameters relative to the site, the conditions of use and the intrinsic charactertistics of the body;

dividing said optimal profile into adjacent parts, at least some of the edges between adjacent parts being situated in the vicinity of stress nodes, where the absolute value of calculated stresses transverse to said semi-cylindrical wall of the body is at a minimum;

determining the stresses to which each of said parts will be subjected in use;

preparing longitudinal components, each corresponding to one of said parts of the cross-section, having the same transverse curvature as the corresponding part, each of said components being formed of a conventional material; and

assembling said longitudinal components for constituting at least one part of said body having a whole cross-section.

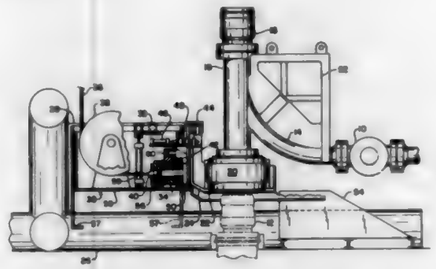
4,693,636

PIPELINE PULL-IN METHOD AND APPARATUS

Thomas A. Fraser, Jr., Ventura, Calif., and Andrew R. Macfarlane, London, England, assignors to Vetco Gray Inc., Houston, Tex.

Filed Dec. 31, 1980, Ser. No. 221,594
Int. Cl.⁴ F16L *1/04*
U.S. Cl. 405—169 **18 Claims**

1. A pipeline pull-in apparatus for pulling in and securing a pipeline to a subsea anchor pile comprising: a tool supporting receptacle; a template structure, including means for spacing said receptacle at a predetermined location with respect to the anchor pile; a pull-in tool adapted to fit within said supporting receptacle; locking means for locking said pull-in tool to said receptacle at a predetermined location; at least one alignment funnel located on said pull-in tool; means for guiding a pull-in cable through said funnel; a sled secured to and carrying the end of the pipe to be secured; a lower anchor pile connector secured to said sled; a bridle attached to said sled; means for remotely detaching said bridle from said sled; at least one alignment pin mounted on said bridle and adapted to mate with



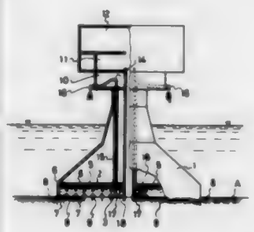
said alignment funnel; and means for attaching a pull-in cable to said bridle.

4,693,637

GRAVITY TYPE OCEANIC STRUCTURE AND ITS STABLE INSTALLATION

Yoshio Suzuki; Yoshio Suzuki; Satoshi Saitoh; Mitsuoki Yamamoto, all of Tokyo, and Hisashi Hosomi, Saitama, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,847
Claims priority, application Japan, Dec. 20, 1984, 59-270240
Int. Cl.⁴ E02B *17/00*
U.S. Cl. 405—224 **10 Claims**



1. A method of utilizing a gravity-type transferable oceanic structure of the type including a body; ballasting means within at least a portion of said body; a hollow bottom, extending from a lower end of said body, which is of larger dimension in horizontal cross-section than an upper portion of said body, said hollow bottom being formed by a circumferential wall extending downwardly from a lower periphery of said body, an upper slab covering an upper opening within the circumferential wall, and a lower slab spaced from said upper slab and covering a lower opening within the circumferential wall so as to form substantially an entire bottom surface of the structure, said lower slab having a plurality of through holes distributed throughout its surface area; and a skirt protruding downwardly from a lower periphery of said circumferential wall; said method comprising the steps of:

pouring water into said ballasting means so as to sink the oceanic structure into a body of sea water by the combined weight of the structure and the water in the ballasting means to thereby settle the structure on a sea bottom;

settling the structure on the sea bottom so as to thrust the skirt into the sea bottom and intercept the flow of sea water around the skirt and into ground under said structure; and

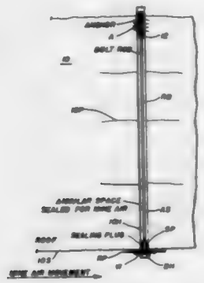
periodically pumping water from the hollow bottom to the exterior of the structure to maintain pressure within the hollow bottom equal to the atmospheric pressure, so that said lower slab is pressed to the sea bottom by a pressure difference between upward air pressure applied to the upper slab and downward water pressure applied to the exterior of the structure.

4,693,638

ROOF BOLT ASSEMBLY HAVING A SEALING PLUG FOR PREVENTING A DETERIORATION OF THE MINE ROOF

Konstanty F. Unrug, 2917 Waco Td., Lexington, Ky. 40503; Edward D. Thompson, 132 Calmes Blvd., Winchester, Ky. 40391, and Samir K. Nandy, 3489 Lansdowne Dr. Apt. 38, Lexington, Ky. 40502

Filed Apr. 22, 1986, Ser. No. 854,504
Int. Cl.⁴ E21D *21/00*
U.S. Cl. 405—259 **3 Claims**



1. In a roof bolt assembly for preserving the natural geological structure of a mine roof including an elongated bolt rod with first and second distal ends, an expandable anchor threaded on the first end for operatively engaging the walls of a roof bolt hole bored in the mine roof at points inboard of the roof surface, a bolt head on the second end of the bolt rod, and a roof plate sandwiched between the roof surface and said bolt head, the entire assembly being pre-tensioned to tightly hold said roof plate against the roof surface, said hole bored in said roof being larger in diameter than the diameter of the roof bolt rod defining an annular space around the rod, the improvement comprising:

sealing means totally disposed within said annular space adjacent the second end of said bolt but spaced from said roof plate, said sealing means further being spaced from said roof surface such that a gap is formed between the roof surface and the sealing means, said sealing means precluding the entrance of air and moisture into said hole, said annular space around the rod being generally free from material in a region between the anchor and the sealing means such that said bolt is generally out of contact with the mine roof in this region.

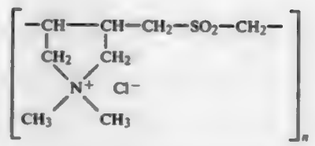
4,693,639

CLAY STABILIZING AGENT PREPARATION AND USE

Keith H. Hollenbeak, and Paul S. Brown, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 25, 1986, Ser. No. 878,160
Int. Cl.⁴ E02D *3/12*
U.S. Cl. 405—263 **7 Claims**

1. A method of preparing a water soluble clay stabilizing agent comprising polymerizing diallyldimethylammonium chloride with sulfur dioxide, said polymerization being carried out in an aqueous solution in the presence of a polymerization reaction rate retarder comprising an erythorbic acid salt to form a copolymer having the structural formula:



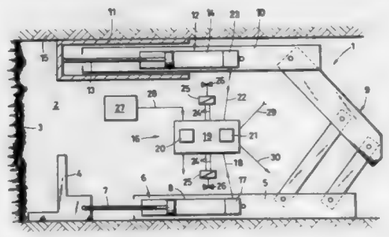
and having a nitrogen-to-sulfur mole ratio in the range of from about 1.0 to about 1.4 and n is an integer equal to the numbers of repeating units in the polymer required to give a molecular weight in the range of from about 1000 to about 100,000.

4,693,640

METHOD OF CONTROLLING HYDRAULICALLY ACTUATABLE ARRANGEMENT IN UNDERGROUND MINING

Karl-Heinz Berger, Gelsenkirchen-Resse, Fed. Rep. of Germany, assignor to Bochumer Eisenhütte Heintzmann GmbH & Co KG, Bochum, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,568
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3538251
Int. Cl.⁴ E21D *23/12*
U.S. Cl. 405—294 **5 Claims**



1. A method of controlling a plurality of hydraulically-actuated arrangements in underground excavations, comprising the steps of providing an electrical power supply; connecting a plurality of control devices with said power supply and interconnecting the control devices with one another; arranging a plurality of current-suppliable consumers to be connected with the control devices; comparing in each of the control devices a coded information about a number of consumers which have been current supplied from the power supply with a maximum possible number of consumers which can be supplied from the power supply; determining from the comparison the number of the consumers which still can be current-supplied and obtaining by the control device a release for current supplying such consumers; adding consumers which are released by the control device and current supplied with the consumers which have been indicated in the control device as current-supplied; and further transferring the result of the addition in coded form to a next control device.

4,693,641

END MILL WITH THROW-AWAY TIP

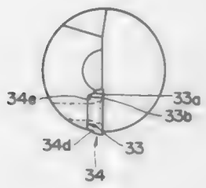
Osamu Tsujimura; Takayoshi Saito, and Tatsuo Arai, all of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,055

Claims priority, application Japan, Oct. 25, 1985, 60-163962[U]; Oct. 25, 1985, 60-163963[U]; Nov. 6, 1985, 60-170488[U]

Int. Cl.[4] B23C *5/20*

U.S. Cl. 407—42 27 Claims



1. An end mill comprising:

an end mill body having an axis of rotation therethrough and having forward and rearward ends, said forward end having a forward end face and a circumferential surface, said forward end having at least one pocket formed therein and opening to both said circumferential surface and said forward end face, said pocket including a tip receiving recess having a bottom face facing in a direction of rotation of the body, said body having a core receiving recess formed at a center of said forward end face;

a throw-away tip comprising a plate having upper and lower surfaces, said upper surface having a first cutting edge ridge, a second cutting edge ridge intersecting the first cutting edge ridge and a third cutting edge ridge intersecting the second cutting edge ridge, said tip being releasably mounted in said tip receiving recess with said lower surface held in contact with said bottom face of said tip receiving recess in such a manner that the first cutting edge ridge is located so as to protrude radially outwardly from the circumferential surface to serve an an outer peripheral cutting edge, that the second cutting edge ridge is located so as to protrude forwardly from the forward end face to serve as an end cutting edge, and that the third cutting edge ridge is located so as to protrude radially inwardly of the body into the core receiving recess to serve as an inner peripheral cutting edge, said end cutting edge being inclined toward said rearward end of the body as said end cutting edge approaches the axis of the body; and

shift preventing means for preventing said throw-away tip from being shifted during a cutting operation of the end mill, said shift preventing means comprising an engaging recess formed in one of the bottom face of the tip receiving recess and the lower surfce of the throw-away tip and extending axially of the body and a projection complementary to said engaging recess of the shift preventing means and formed on the other of the bottom face of the tip receiving recess and the lower surface of the throw-away tip so as to be brought into engagement with said engaging recess of the shift preventing means.

4,693,642

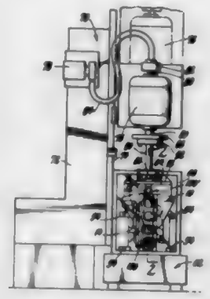
LINE BORING APPARATUS

Alexander C. Mair, Bloomfield Hills; Leonhard Allgaier, West Bloomfield, and Arnold O. DeHart, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1986, Ser. No. 881,345

Int. Cl.[4] B23B *41/12*

U.S. Cl. 408—59 4 Claims



1. Boring apparatus for workpieces which are characterized by a series of spaced walls to be bored on an axis comprising, a boring bar, a motorized spindle adapted to advance on its axis so as to present a remote one end of said boring bar serially along said workpiece axis, commencing adjacent one end of a workpiece, to each of the walls of such workpiece, a low pressure supply of boring coolant fluid, and a bar and coolant supply coupling joining the opposite end of said bar drivingly to said spindle and further to said coolant supply, said boring bar comprising at least one boring cutter element adjacent said one end thereof and a generally cylindrical hydrodynamic bearing adjacent the cutter element toward said opposite end of said bar, said bearing being sized closely to but less than the diameter of the bore cut by said cutter element whereby as said boring bar penetrates said spaced walls said bearing is adapted to utilize a cut surface of the workpiece as its outer bearing race under the dynamic pressure of coolant fluid resident at said bearing, and means for conveying fluid from said coolant fluid supply to said bearing.

4,693,643

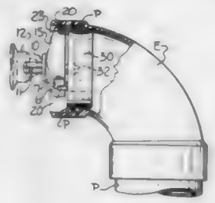
PLASTIC PIPE PLANING DEVICE

Malcolm I. Heyworth, Charlotte, N.C., assignor to E&A Heyworth Enterprises, Inc., Charlotte, N.C.

Filed May 20, 1986, Ser. No. 865,262

Int. Cl.[4] B23B *3/22, 41/00*

U.S. Cl. 406—82 9 Claims



1. A plastic pipe planing device for progressively planing or cutting the end of a plastic pipe, and for reaming out a piece of plastic pipe fixed in a plastic pipe fitting, said planing apparatus comprising

a rotatable hub,

elongate drive means having an inner end fixed to said hub, and an outer end adapted to be drivingly connected to a portable electric drill for drivingly rotating said hub,

circumferentially spaced-apart spider-like cutter arms having inner ends fixed to said hub and extending radially outwardly therefrom, and outer ends terminating slightly radially inwardly of the outer diameter of the plastic pipe to be planed,

a cutter blade attached to the radial outer end portion of each of said cutter arms and including a lower planing or cutting edge and a radial outer edge perpendicular to said cutting edge, said radial outer edge extending radially outwardly and being flush with the outer diameter of the plastic pipe to be planed, and

a cylindrical pilot removably carried by and rotatable with said hub, said pilot including an outer circumference dimensioned to provide a snug rotatable fit within the end of the plastic pipe to be planed, and for centering said hub and said cutter arms relative to the plastic pipe, said cylindrical pilot including an upper planar surface engaging said lower cutting edges of said cutter blades.

4,693,644

ANNULAR HOLE CUTTER

Shiro Takahashi, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

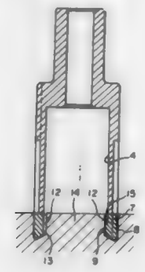
Continuation of Ser. No. 589,416, Mar. 14, 1984, abandoned.

This application Jun. 18, 1986, Ser. No. 875,456

Claims priority, application Japan, Mar. 14, 1983, 58-36494[U]

Int. Cl.[4] B23B *51/04*

U.S. Cl. 408—204 3 Claims



1. An annular hole cutter comprising:

a substantially cylindrical barrel (1) having an outer and inner circumferential surface (3, 4), and an upper end and a lower end, said outer and inner circumferential surfaces being concentric;

a shank (2) attached to the upper end of said barrel, the central axis of the outer and inner circumferential surfaces (3, 4) of the barrel being in concentric relationship with the central axis of said shank; and

a plurality of circumferentially equidistantly spaced cutting teeth (5) formed of hard material attached to said lower end of said barrel, said cutting teeth (5) including outer cutting edges (8) and inner cutting edges (9), said outer cutting edges having an outer circumference the central axis of which is in concentric axial relationship relative to the outer and inner circumferential surfaces (3, 4) of said barrel (1), said cutting teeth (5) having varying radial thickness so that a center of an imaginary circle circumscribed by the inner peripheries of the inner cutting edges (9) of said cutting teeth is offset a short radial distance from the central axis of the outer and inner circumferential surfaces (3, 4) of said barrel, the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9) of said cutting teeth where the teeth are secured to said cylindrical barrel (1) being flush with the inner circumferential surface (4) of said barrel, the inner cutting edges (9) of a plurality of relatively thick cutting teeth (5) projecting farther radially inwardly from the inner circumferential surface (4) of said barrel than inner cutting edges (9) of a plurality of relatively thin cutting teeth so that said inner cutting edges (9) of the relatively thick cutting teeth (5) are formed with steps (12*a*) between the inner peripheral surfaces of the lower portions of the inner cutting edges (9) and the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9), said steps (12*a*) having a width corresponding to said radial offset distance, whereby a gap (15) is formed between the inner peripheral surfaces (12) of the upper portions of the inner cutting edges (9) extending above said steps (12*a*) and a core (14) in a workpiece being cut by the inner cutting edges wherein the majority of chips formed by said cutting teeth are normally discharged from said annular hole cutter and a portion of the chips ascending along the inner circumference (4) enter into said gap (15) to avoid jamming of the chips.

4,693,645

THREE-DIMENSIONAL DUPLICATING MILLING MACHINE

Ingomar Kjeldsen, Conrad Holmbos veg 44, N-9000 Tromso, Norway

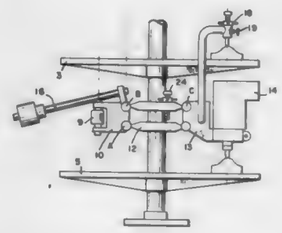
Filed Jun. 30, 1986, Ser. No. 880,274

Continuation of PCT No 85/00063 filed Oct. 7, 1985, published as WO 86/02864 on May 22, 1986.

Claims priority, application Norway, Nov. 5, 1984, 844378; PCT Int'l Appl., Oct. 7, 1985, PCT/NO85/00063

Int. Cl.[4] B23C *1/16*

U.S. Cl. 409—86 7 Claims



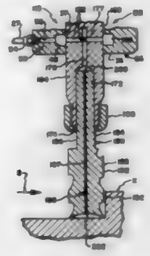
1. Centric three-dimensional duplicating milling-machine having a table (3) for the original and a cutting table (5), (4), counterweight bars (16), a milling-machine (14) with a cutter, a feeler and a coordinator arm connected between the feeler and milling machine, (17), characterized in that the table (3) for the original and the cutting table (5) are mounted on a column (1), and a combination arm (7) is mounted on the same column between the two tables and has an inner section (7^1) with a first articulation (6) and a second articulation (9), and an outer section (7^2) consisting of a cross-articulation bracket (10) where two horizontal pivots (A,B) are positioned vertically above each other and on which respectively an upper arm (11) and a lower arm (12) are pivoted in a vertical plane, and further, the other extremity of the upper arm (11) is pivoted in a vertical plane to a bracket (13) by means of a third pivot (C) while the other extremity of the lower are (12) is pivoted in a vertical plane to said bracket by means of a fourth pivot (D) while said bracket (13) comprises a clamp which holds the milling-machine (14).

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APPARATUS FOR LUBRICATING A WORKPIECE

Mark J. Andrews, Niagara Falls, N.Y., assignor to Gemcor Engineering Corp., Buffalo, N.Y.

Filed Feb. 18, 1986, Ser. No. 829,923
Int. Cl.[4] B23C *1/00*; B23B *51/06*
U.S. Cl. 409—136 **3 Claims**



1. In combination with an automatic fastening machine for installing fasteners in a workpiece clamped between an upper head assembly and a lower ram assembly of said machine, apapratus for cutting the workpiece with a rotary cutting tool comprising:

(a) spindle-supporting means in said upper head assembly and including a collar portion having a body, said collar body defining a through-opening and a flow passage extending through said body to said through-opening, said spindle-supporting means further including a bearing retainer portion extending from said collar portion and having a through opening in communication with said collar through opening;

(b) a spindle supported by said spindle-supporting means and including a spindle body having a cylindrical shank portion closely positioned within said collar body through-opening and an end portion positioned within said bearing retainer through opening for rotation within and relative to said through-opening about an axis of rotation, the surfaces of said cylindrical shank portion and said collar through-opening defining an annular cavity encircling said cylindrical shank portion, said collar through opening defining an annular groove encircling said cylindrical shank portion so that the surface of said annular groove provides a portion of the walls of said annular cavity, said spindle body defining a tool-receiving end, a tool-receiving cavity extending from said tool-receiving end, and a passageway extending between said tool-receiving cavity and said annular cavity, said spindle body being elongated and adapted to rotate about is longitudinal axis relative to said collar, one portion of said passageway extending axially along said spindle body from said tool receiving cavity and another portion of said passageway extending radially of said one portion to said annular cavity;

(c) a cutting tool including an elongated body having a cutting portion and a holding portion extending therefrom, said holding portion operatively positioned within said tool-receiving cavity for rotation with said spindle, said cutting portion defining a cutting edge adapted to effect a cut as said cutting tool is rotated and moved into engagement with a workpiece, said tool body having a central passage extending longitudinally therealong, said passage having an entrance in the surface of said holding portion and an exit in the surface of said cutting portion adjacent said cutting edge so that fluid directed into said annular cavity through said flow passage travels a continuous path through said spindle passageway and cutting tool passage and out of said cutting tool at a location adjacent said cutting edge for lubricating the workpiece during a cutting operation;

(d) bearing means retained in said through opening of said bearing retainer portion of said spindle supporting means for rotatably mounting said spindle in said spindle supporting means;

(e) first sealing means between said cylindrical shank portion of said spindle body and said collar body adjacent the side of said annular cavity facing said bearing means for preventing fluid from contacting said bearing means; and

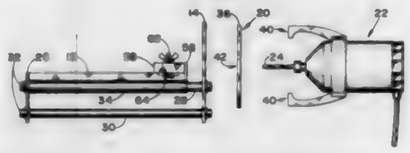
(f) second sealing means between said cylindrical shank portion of said spindle body and said collar body adjacent the opposite side of said annular cavity for preventing loss of said fluid.

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MULTI-TOOL DOWEL HOLE DRILLING MACHINE

Sherwood D. Marx, 6478 S. M St., Tacoma, Wash. 98408

Filed Nov. 6, 1985, Ser. No. 795,328
Int. Cl.[4] B23C *9/00*; B23Q *5/22*
U.S. Cl. 409—163 **3 Claims**



1. A high speed dowel hole drilling machine comprising:

a work table for supporting a workpiece;

a tool plate oriented perpendicularly to the work table, said tool plate having a tool plate drill opening extending between opposing surfaces of said plate;

a high-speed rotary machine tool having

a rotating drilling element,

a drive means for rotating said drilling element at a speed between about 5,000 RPM and 30,000 RPM,

control means for controlling the drive means so as to determine the speed of the drilling element, and

non-rotary frame means for attachment of said machine tool;

tool mounting means for removably attaching said machine tool to the tool plate such that the drilling element extends perpendicularly through the drill opening of said tool plate toward the work table, said tool mounting means including

tool adaptor means for removably attaching any one of several different high-speed rotary machine tools to the tool plate, and

plate mounting means for adjustably attaching the tool adaptor means together with the machine tool to the tool plate so that rotation of said tool adaptor means about an axis oriented perpendicularly to the plane of the tool plate and intersecting a side portion thereof raises or lowers the drilling element relative to an upper surface of the work table;

carriage means for supporting the work table while allowing said work table to be translated perpendicularly toward and away from the tool plate; and

support means for supporting the carriage means and the tool plate upon a horizontal work surface such as a workbench.

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DEPTH OF CUT ADJUSTING MECHANISM

Robert P. Cavedo, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 19, 1986, Ser. No. 876,042
Int. Cl.[4] B27C *1/10*
U.S. Cl. 409—178 **3 Claims**

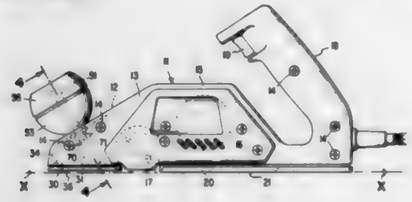
1. In a power planer having a frame including a platen having an underside defining a plane of support for said planer, a cutter supported adjacent said platen and arranged to cut in the plane defined by the underside of said platen, and a depth of cut adjusting mechanism comprising;

an infeed shoe having a planar undersurface arranged at the opposite side of said cutter from said platen;

means shiftably supporting said infeed shoe on said planer frame in said undersurface parallel to the plane defined by said platen;

spring means arranged between said planer frame and said infeed shoe biasing the undersurface of said infeed shoe upwardly toward a position above the plane defined by said platen underside;

an operator influenced knob constrained on said planer frame; and



abutment means limiting the spring biased position of said infeed shoe and including an interengaging cam and cam follower means associated one with said infeed shoe and the other with said operator influenced knob;

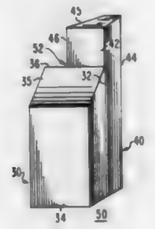
said operator influenced knob being constrained on ssid planer frame by a bearing supporting said knob for rotation about an axis inclined with respect to the plane defined by said platen underside and preventing axial movement of said knob; said infeed shoe being formed with a bore; a stud slidably accommodated in said bore and secured coaxially on said knob; said cam means comprising a spiral cam surface formed on said infeed shoe surrounding said bore; and said cam follower comprising a pin projecting laterally from said stud.

4,693,649

SHARP EDGE FORMATION ON COPPER HEATSINKS

Robert E. Harwood, Princeton, and Frank Z. Hawrylo, Trenton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 17, 1985, Ser. No. 735,163
Int. Cl.[4] B23D *1/26*
U.S. Cl. 409—293 **6 Claims**



1. A cutting apparatus for imparting a sharp, defect-free corner of a desired angle to a metal workpiece comprising:

a first cutting tool having an inclined first surface bounded by a first cutting edge which removes metal in a first cutting direction; and

a second cutting tool having an inclined second surface bounded by a second cutting edge which removes material in a second cutting direction;

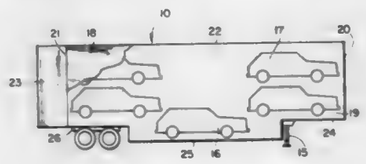
wherein said first cutting tool and said second cutting tool are held juxtaposed such that said first cutting edge and said second cutting edge contact and intersect to form an inside corner of the desired angle, thereby orienting said first cutting direction to be opposite to said second cutting direction.

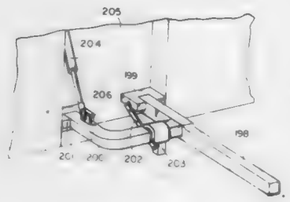
4,693,650

TRAILER APPARATUS FOR TRANSPORTING VEHICLES AND OTHER CARGO

Earl D. Smith, 2 Colonia Miramonte, Scottsdale, Ariz. 85253

Continuation of Ser. No. 519,388, Aug. 1, 1983, Pat. No. 4,597,712. This application Apr. 1, 1986, Ser. No. 846,883
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—18 **10 Claims**





1. A trailer apparatus for receiving and transporting wheeled vehicles, said wheeled vehicles having removable lifting members attached thereto and configured for engaging and supporting the wheels of said vehicles, said lifting members being attached to said wheeled vehicles prior to being received in said trailer apparatus, said trailer apparatus further being for receiving and transporting other cargo, said trailer apparatus comprising:

an enclosed body including first and second opposed side walls, a floor, a top, a front wall, and a rear wall, defining an interior storage volume, said rear wall including door means for providing access to the interior storage volume of said body;

wheel means connected with said body for carrying said body along a support surface;

vehicle support means mounted within said body for supporting several vehicles within said body, said support means including:

(a) a first plurality of support members connected with the first side wall of said body, and

(b) a second plurality of support members connected with the second side wall of said body,

each support member having means for permitting alternate disposition of the support member in:

(1) a stowed orientation in which the support member is disposed substantially without invasion of the interior storage volume of said body, and

(2) an extended orientation in which the support member extends inwardly into the interior storage volume of said body,

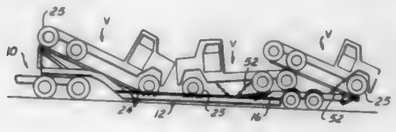
the support members, when in the extended orientation, being configured for cooperatively receiving and supporting said lifting members attached to vehicles received within said body.

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TRAILER WITH SPECIAL RAMPS

Gerald W. Stuart, Pontiac, Mich., assignor to Traffic Transport Engineering, Inc., Romulus, Mich.

Filed Sep. 2, 1986, Ser. No. 902,634
Int. Cl.[4] B60P *1/00*
U.S. Cl. 410—30 **7 Claims**



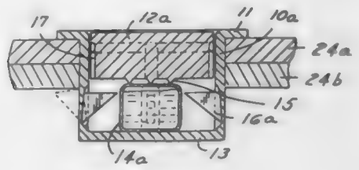
1. A transport for hauling wheeled vehicles, said transport comprising a frame, elongated ramps mounted on said frame in spaced, parallel relation for supporting the wheels of said vehicles, each ramp having a plurality of longitudinally spaced transverse pins, said pins being sufficiently close together to provide a track over which the wheels of said vehicles may travel during loading and unloading, said pins being removable so that selected pins may be removed to provide pockets to receive said wheels for transit.

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ADHESIVELY SECURABLE FASTENER

Theodore J. Sweeney, Grosse Pointe City, Mich., assignor to Theodore Sweeney & Company, Inc., Detroit, Mich.

Continuation of Ser. No. 472,084, Mar. 4, 1983, Pat. No. 4,555,206, which is a division of Ser. No. 234,777, Feb. 11, 1981, Pat. No. 4,425,065, which is a division of Ser. No. 936,331, Aug. 24, 1978, abandoned. This application Nov. 21, 1985, Ser. No. 800,555
Int. Cl.[4] F16B *13/04, 39/02*
U.S. Cl. 411—23 **13 Claims**



1.
An adhesively securable fastener for securing a first substrate having top and bottom portions to a second substrate having top and bottom portions through aligned apertures therein comprising:

a. an elongated body having an opening and a top portion and further having deflectable tabs opening adjacent to and towards the second substrate at a position juxtaposed to the opening;

the body capable of protruding through the apertures in the substrates with the body top portion capable of contacting the top portion of the first substrate and the deflectable tabs capable of contacting the bottom portion of the second substrate;

b. an adhesive positioned within said body; and

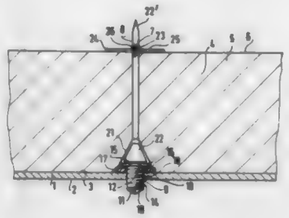
c. registering with the opening of the body a plunger means for applying pressure to said adhesive thereby adhesively securing the fastener to the substrates by movement of at least a portion of the adhesive from the body to the substrate and the deflectable tabs having the ability to lock the bottom portion of the second substrate to it so as to be able to fasten together the body and the substrate.

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MOUNTING ELEMENT FOR A FLAT INSULATING BODY WHICH CAN BE ATTACHED TO A THIN-WALLED BASE

Rainer Schubert, Liebigstrasse 38, and Otto Weber, Hubertusstrasse 144, both of D - 4620 Castrop-Rauxel, Fed. Rep. of Germany, assignors to Vereinigte Schraubenwerke GmbH, Essen; Rainer Schubert and Otto Weber, both of Castrop-Rauxel, all of, Fed. Rep. of Germany

PCT No. PCT/DE85/00153, § 371 Date Jan. 8, 1986, § 102(e) Date Jan. 8, 1986, PCT Pub. No. WO85/05165, PCT Pub. Date Nov. 21, 1985
PCT Filed May 9, 1985, Ser. No. 834,273
Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417108
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 **4 Claims**



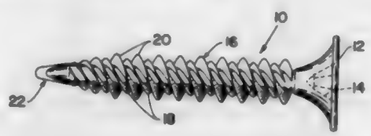
1. In a mounting element for mounting a flat insulating material on a thin-walled base, said mounting element including a pin conformed at one end for perforating the insulating material and having means connected to the other endof the pin for attaching to the base and a clamping plate for clamping to the pin, to hold the insulating material on the pin, the improvement wherein the attaching means comprises a screw having a shaft and a head fixedly connected to the shaft and the other end of the pin, with the pin and shaft in axial alignment, wherein the shaft has a self-cutting thread and a drill tip and wherein the head has key engaging faces for driving by a drill.

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SELF-DRILLING, SELF-TAPPING FASTENER

John E. Bettini, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 128,211, Mar. 7, 1980, abandoned. This application May 3, 1982, Ser. No. 374,353
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 **7 Claims**



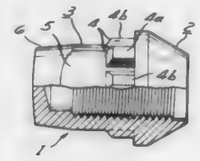
1. A self-drilling, self-tapping screw comprising a head with drive-engageable surfaces at one end; a drill point at the opposite end; and a threaded region intermediate said two ends; said drill point including a first conical segment with a flat side and a rounded tip, the edges of the flat side of said first conical segment creating a pair of cutting edges diverging from a continuously curved rounded tip at a relatively sharp acute angle, the cutting edges extending for a predetermined axial distance along the screw length, said first conical segment being at a first longitudinal position along the screw length, a second conical segment with a flat side and a rounded tip, said second conical segment being at a second longitudinal position along the screw length, said second longitudinal position being nearer the head than said first position and at least a portion of the two flat sides being coplanar, the entire surfaces of each conical segment being smooth, the flat side of the second conical segment being coplanar with the flat side of the first conical segment and defining a pair of side edges diverging from the rounded tip of said second conical segment at a relatively sharp acute angle, the side edges of said second conical segment being spaced radially inwardly from associated cutting edges on said first conical segment creating a pair of flat side segments radially inwardly of said cutting edges for a substantial portion of said predetermined axial distance, the axially transverse dimension of the drill point in a longitudinal plane intersecting the cutting edges at any given location being greater than any other axially transverse dimension in any other longitudinal plane intersecting the axis of the screw.

4,693,655

ANTI-THEFT DEVICE FOR VEHICLE WHEELS (GEARED OVAL NUT)

Shigeru Omori, Unagidani Mishinomachi, Minamiku, Osaka, Japan

Filed Aug. 20, 1985, Ser. No. 767,498
Int. Cl.[4] F16B *41/00*
U.S. Cl. 411—429 **11 Claims**



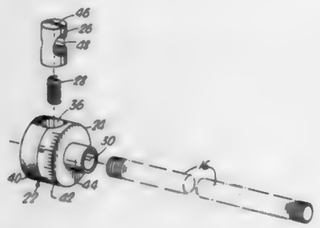
1. An anti-theft lug nut which includes:
a column section having:
(a) a plurality of protrusions on the periphery of said column section said protrusions being trapezoidal in cross-section, and at least one of said trapezoidal protrusions having a different cross-section than the remainder of said trapezoidal protrusions, at least one of said trapezoidal protrusions having side-bearing walls for torquing and untorquing of said lug nut; and
(b) a modified cylindrical section adjacent said protrusions, said modified cylindrical section, when viewed in cross-section, having at leat one portion of the cross-section of different diameter than the diameter of the remainder of said modified cylindrical section.

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QUICK ADJUSTING NUT

Gerald Guthrie, Stillwater, Minn., assignor to 5W Enterprises, Inc., Stillwater, Minn.

Filed Sep. 1, 1983, Ser. No. 528,576
Int. Cl.[4] F16B *37/08*
U.S. Cl. 411—433 **6 Claims**



1. A quickly adjustable stop nut assembly for use on a cylindrical threaded shaft of a milling machine, drill press or similar machine to provide a positive stop for relative motion between portions of the machine, which cylindrical threaded shaft has a predetermined major diameter, said stop nut assembly comprising, in combination:

a body having a generally cylindrical peripheral surface portion, having a through axial passageway including cylindrical portions slightly larger than the major diameter of the shaft to closely receive the shaft while affording free movement of the body axially along the shaft, and having a transverse cylindrical socket extending generally radially into said body, said transverse socket intersecting said axial passageway and opening through the cylindrical peripheral surface portion of said body:

a cylindrical plunger disposed in said socket, said plunger having an outer end manually accessible from the periphery of said body, an inner end portion disposed within said body, and an axis extending between said outer end and end portion, said plunger also having a transverse through aperture which has an inner portion partially defined by threads adjacent the inner end portion of said plunger adapted for engagement with the threads of the shaft, and has an outer portion adjacent the outer end of said plunger affording free transverse movement of the plunger axially along the shaft, said plunger being movable within said socket between a released position with the outer portion of said aperture aligned with said passageway to afford axial movement of said nut assembly along the shaft, to an engaged position with the threads on said plunger engaging with threads on the shaft, said outer end of said plunger being generally aligned with said peripheral surface portion of said body when the plunger is in said engaged position; and

biasing means between the said plunger and said body for biasing said plunger to said engaged position;

said aperture being elongate axially of the plunger and said threads adjacent the inner end of said plunger being adapted for about 180 degree engagement with the threads on the shaft to lock said nut assembly against longitudinal movement on the shaft without relative rotation therebetween when said plunger is moved to said engaged position under the influence of said biasing means; and

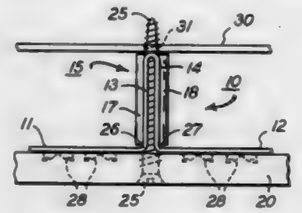
said body having a plurality of graduation marks about said generally cylindrical peripheral surface portion to facilitate fine rotational adjustment of the position of said nut assembly along the shaft when said plunger is in said engaged position.

4,693,657

AUTOMOTIVE PANEL BRACKET

Dick T. VanManen, Canandaigua, NY., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,199
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—467 **16 Claims**



1. An automotive bracket comprising:
a. a central region of a flat strip being bent back on itself at

a fold line to form a double-walled stand-off with parallel and confronting walls;

b. a groove formed in each wall of said stand-off, each of said grooves being parallel with and in between side edges of said strip to extend along the length of said stand-off, said grooves being arranged to confront each other and closely surround a generally cylindrical pilot hole for receiving a fastener extending through said stand-off;

c. base portions of said bracket extending in a plane from each of said stand-off walls, said base portions being adapted to engage and interlock with an automotive panel so that said stand-off bridges a distance between said panel and an automotive body;

d. said grooves being cut off at said fold line of said stand-off for opening a fold line end of said pilot hole between said grooves; and

e. cutouts in each of said base portions adjacent said grooves for opening a base end of said pilot hole between said grooves.

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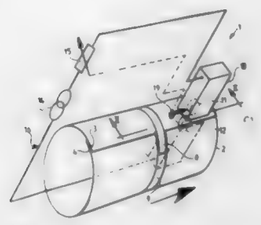
METHOD OF MANUFACTURING A CONTAINER BODY HAVING A TEAR STRIP, THE BODY PER SE, AND A METAL BLANK FROM WHICH THE BODY IS TO BE MANUFACTURED

Johannes A. Gierum, Am Deventer, and Robert C. Klunder, Aw Twello, both of Netherlands, assignors to Thomassen & Drijver-Verblifa NV, De venter, Netherlands

Filed Jun. 18, 1985, Ser. No. 746,127

Int. Cl.⁴ B21D *51/26;* **B23K** *11/06;* **B65D** *17/36*

U.S. Cl. 413—1 **7 Claims**



1. A method of forming a container body having an integral tear strip to facilitate opening of the container and wherein the container has a welded side seam, said method comprising the steps of providing a sheet metal blank formed of a base metal and having formed therein the tear strip, shaping the sheet metal blank to a tubular shape with remote edges of the blank in overlapping relation, progressively welding together said base metal in said overlapping edges from one end of the blank to the other with the welding of the base metal being interrupted at the tear strip, and sealing the side seam at the tear strip by means other than welding of said base metal, said sheet metal blank base metal being steel and having an overall coating formed of a metal having a melting temperature which is lower than the melting temperature of the base metal of the blank, the welding of the base metal being interrupted by reducing welding intensity to one wherein only melting of the coating will occur at the tear strip along the side seam, and the melted coating forming the means other than welding of said base metal which seals the side seam at the tear strip.

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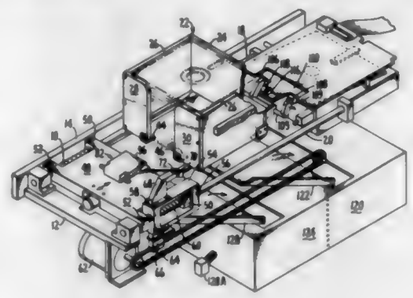
DISKETTE TRANSPORT

Ken V. Burke, Ben Lomond; Jon V. Jamieson, San Jose, and Ernie Keller, Sunnyvale, all of Calif., assignors to Mountain Computer, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 526,670, Aug. 26, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,530

Int. Cl.⁴ G11B *17/10*

U.S. Cl. 414—131 **6 Claims**



1. An apparatus for singulating and feeding diskettes one at a time from a stack and transporting each diskette to a disk drive station, said apppartus comprising:

means for supporting the plurality of diskettes in a vertical stack including a hopper,

means for pushing the bottommost diskette in the stack from beneath the stack including a pair of spaced rails disposed beneath said hopper, a carriage plate mounted for travel along said rails, means mounted to said carriage plate for separating the bottommost diskette from the stack and pushing said diskette from under the stack as the carriage plate moves beneath the stack along said rails, a chain drive extending in a direction parallel to said rails, said carriage plate being operatively connected to said chain drive, means for operating said chain drive and moving said carriage plate along said rails, and further comprising a lost motion connection including a spring operatively connected between said carriage plate and said chain drive, said spring allowing said chain drive to operate without advancing said carriage plate if carriage plate movement is obstructed.

4,693,660

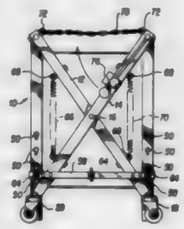
SCISSOR LIFT AND TRANSPORT

Lloyd A. LaCroix, P.O. Box 905, 313 2nd St., Lawrenceburg, Tenn. 38464

Filed Dec. 24, 1985, Ser. No. 813,092

Int. Cl.⁴ B60P *3/00*

U.S. Cl. 414—458 **5 Claims**



1. A load lifting and transporting mechanism comprising two cross frame members and having upper ends and lower ends,

a pair of wheels supporting the cross frame members,

a winch mounted on the frame members,

a cable one one end of which is attached to the winch,

the two cross frame members having a pivoted intersection forming an X-shaped configuration,

the winch being positioned in the upper end of one cross member,

a first pulley journaled in the upper end of the second cross member,

a second pulley journaled in the lower end of the second cross member,

a third pulley.

A flexible cable secured at one end to the lower end of the first cross member then trained over the third pulley, second and first pulleys in that order and affixed at another end to the winch, which when turned, draws in the cable causing the upper ends of the cross members to move toward each other and the lower ends to do likewise raising the height of the upper ends,

one support including a flange adapted to engage a load, the support being mounted on each of the upper ends of the cross frame members and the supports so defined with the load being raised with the upper ends,

a horizontal frame member having an open interior enclosing and being slidable about the lower ends of the cross frame members, and

the horizontal frame member having end portions attached at each of the end portions thereof to one of the supports to properly distance the supports.

4,693,661

CONNECTING ELEVATOR

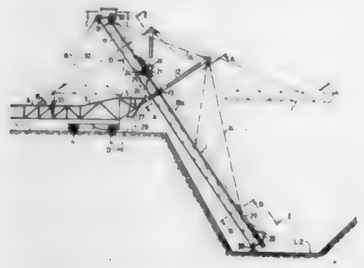
Reinhard Trümper, Ratekau, and Robert Baschant, Lübeck, both of Fed. Rep. of Germany, assignors to O & K Orenstein & Koppel AG, Fed. Rep. of Germany

Continuation of Ser. No. 570,498, Jan. 13, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,267

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303059

Int. Cl.⁴ B65G *47/58, 41/00, 17/02*

U.S. Cl. 414—595 **3 Claims**



1. A mine material elevator for operation on benches at different levels of a mine, comprising:

a crawler vehicle adapted to be positioned on a higher one of the benches;

a support frame (3) mounted on said vehicle, said support frame having a horizontal pivot support bearing (7) at one end thereof and a counterweight arm (6) on an opposite end thereof extending outwardly of said vehicle;

a swing bracket (37) pivotally mounted at said horizontal pivot support bearing to said support frame;

rollers rotatably mounted to said swing bracket;

an elongated support structure (1) mounted for rolling on said rollers of said swing bracket and parallel to a longitudinal axis of said elongated support structure for pivotally and displaceably connecting said elongated support structure to said support frame, said elongated support structure having a first end which is positionable on a lower one of the benches when said support structure is pivoted on said frame, said support structure having a second end on an opposite side thereof from said first end;

a pair of side by side rail trackways (9) extending along a top surface of said support structure from said first end toward said second end;

a back-up rail (23) extending along said trackways;

a cargo carrying vessel (19, 20) movable along said trackways, each vessel includes a hinged bottom and a back-up roller connected to each hinged bottom and engaged with said back-up rail for holding each hinged bottom closed;

a chute (26) connected to said support structure between said second end thereof and said swing bracket;

interruption means connected to each back-up rail for interrupting each back-up rail in the vicinity of said chute for opening said hinged bottom of each vessel above said chute for depositing contents of each vessel into said chute, said interruption means comprising each back-up rail having a movably mounted rail length (25) and a hydraulic mechanism (24) operatively connected to each rail length for moving each length away from a remainder of its respective back-up rail (23);

at least one first winch connected to said support structure at said second end thereof;

a hoisting rope connected to each of said vessels and operatively connected to said one first winch for raising and lowering said vessels along their trackways;

a second winch (15) connected on said counterweight arm adjacent said opposite end of said support frame;

a winch cable operatively connected between said second winch and said second end of said support structure for lowering and raising said second end of said support structure to raise and lower said first end of said support structure as said swing bracket pivots on said horizontal pivot support bearing;

a counterweight connected to said counterweight arm at said opposite ends of said support frame for counterweighting said support structure; and

a hoist mechanism (38) connected between said support structure and said swing bracket for moving said support structure parallel to its longitudinal axis and along said swing bracket.

4,693,662

COMPACT EXCAVATOR

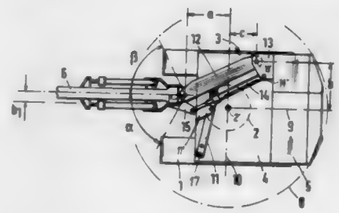
Luis Haringer, Neumarkt, Italy, assignor to Macmoter S.p.A, Modigliana, Italy

Filed Sep. 25, 1985, Ser. No. 780,968

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1984, 3435981

Int. Cl.⁴ E02F *3/38*

U.S. Cl. 414—695 **9 Claims**



1. A compact excavator, comprising a chassis (1), a superstructure (3), and swivel journal means (2) for securing said superstructure (3) to said chassis (1), said swivel journal means defining a vertical axis (2') through which a transverse axis (10) extends horizontally across the excavator and perpendicularly to a normal forward travel direction of the excavator, a boom (6) for carrying excavator means, parallel guide means for

directly securing said boom to said superstructure (3), said parallel guide means comprising a fixed length member (12) and a parallelogram link (14, 14') arranged to extend substantially in a common horizontal plane with said fixed length member (12), first vertically extending means for pivotally connecting forward ends of said fixed length member (12) and of said parallelogram link (14, 14') to said boom, and second vertically extending journal means (13' and 14'') located at a location at least as far rearwardly as said transverse axis (10) when said superstructure (3) has its front end aligned substantially in parallel with, and facing in the same direction as, a front end of said chassis, said second vertically extending journal means directly journalling rearward ends of said fixed length member (12) and of said parallelogram link (14, 14') to said superstructure at said location at least as far rearwardly as said transverse axis (10) for an increased mobility and stability of said boom (6).

4,693,663

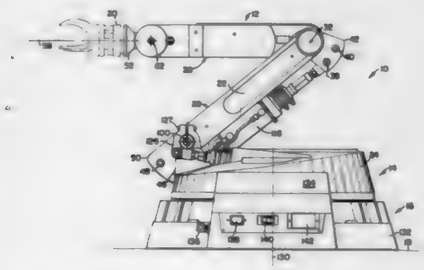
ROBOT WITH ARTICULATED ARM

David L. Brenholt; Stephen M. Crane; Paul M. Fischer, and Kenneth V. Mattson, all of Menomonie, Wis., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 5, 1984, Ser. No. 658,267

Int. Cl.[4] B25J 9/06

U.S. Cl. 414—735 **7 Claims**



1. A robot with a mechanically programmable operating envelope, which comprises:

a base plate;

a lower arm having an inner end connected to said base plate for pivotal movement about a first transverse axis, and an outer end;

an upper arm having an inner end connected to the outer end of said lower arm for pivotal movement about a second transverse axis generally parallel to the first axis, and an outer end;

a tool adaptor;

wrist means connecting said tool adaptor to the outer of said upper arm for pivotal movement about a third transverse axis and a fourth longitudinal axis, which third and fourth axes are mutually perpendicular;

a first linear actuator selectively coupled between one point in said lower arm and one of a plurality of predetermined spaced-apart points in said upper arm, depending upon the operating envelope desired, for effecting pivotal movement of said upper arm about the second axis relative to said lower arm;

a second linear actuator selectively coupled between one point in said base plate and one of a plurality of predetermined spaced-apart points in said lower arm, depending upon the operating envelope desired, for effecting pivotal movement of said lower arm about the first axis relative to said base plate;

pantograph means extending about the first, second and third transverse axes and interconnecting said lower arm, said upper arm, and said wrist means for maintaining substantially constant orientation of said adaptor upon pivotal movement of said lower and upper arms about said first and second transverse axes, respectively; and

third and fourth linear actuators connected between said base plate and said pantograph means for independently effecting pivotal movement of said adaptor about the third and fourth axes, respectively;

said pantograph means comprising:

a pair of first rollers mounted for independent rotation about the first transverse axis;

a pair of cranks, each crank adjustably secured to one of said first rollers, one crank being coupled to said third linear actuator and the other crank being coupled to the fourth linear actuator;

a pair of second rollers mounted for independent rotation about the second transverse axis;

a pair of first endless belts interconnecting corresponding first and second rollers;

a pair of third rollers mounted for independent rotation about the second transverse axis, each third roller being secured for rotation with the corresponding second roller;

a pair of fourth rollers coupled to said wrist means and mounted for independent rotation about the third transverse axis; and

a pair of second endless belts interconnecting corresponding third and fourth rollers.

4,693,664

PROGRAM-CONTROLLED INDUSTRY ROBOT IN PARTICULAR LAQUERING (OR PAINTING) ROBOT

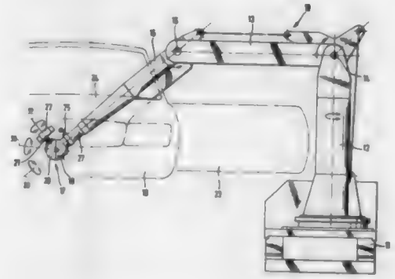
Werner Schweiker, Gemmrigheim, Fed. Rep. of Germany, assignor to Hermann Behr & Sohn GmbH & Co., Ingersheim, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 638,032

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 8322699

Int. Cl.[4] B25J 17/02, 18/04

U.S. Cl. 414—735 **2 Claims**



1. A program-controlled industry robot for the treatment of work pieces having movable parts (24) to be moved prior to the treatment, said robot comprising; a support arm (15) having a female end portion, means (12,13) supporting said arm whereby said arm is swivelable three dimensionally, a support arm end part (27) having a longitudinal axis (28) and being telescopically mounted in said female end portion and rotatably mounted about said longitudinal axis (28) and having a free end (19), a swivel head (17) mounted on the free end (19) of said support arm end part (27), said swivel head (17) having a first part (20) rotatable about a second axis (30) and a third part rotatable about a third axis (32), said second (30) and third (32) axis being nonparallel and intersetting with said first axis (28), a support member (25) movable with said support arm (15), and characterized by said support member (25) being affixed rigidly and directly on said support arm end part (27) and rotatable therewith for lifting of the movable part (24) of the work piece so that the forces acting on said support member (25) act directly on said support arm (15) and do not place any loads on said second (30) or third (32) axes of said swivel head (17).

4,693,665

LARGE FORCE MULTI-AXIS MANIPULATING ARM UNIT, ESPECIALLY FOR USE AS AN INDUSTRIAL ROBOT

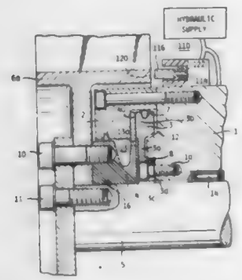
Karl-Heinz Friederichs, Kiel, and Günther Twiefel, Flintbek, both of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,519

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312862

Int. Cl.[4] B25J 9/06

U.S. Cl. 414—744 R **16 Claims**



1. A multi-axis manipulating arm unit in the form of an articulated industrial robot arm having a high force generating means for generating a high force about one axis of said multi-axis unit;

said robot arm having a plurality of arm elements, at least two adjacent arm elements being disposed along different but connected longitudinal axes, said at least two arm elements being connected at a joint;

said joint having a drive system comprising an actuator for providing movement about an axis of said joint and a braking and locking arrangement, said braking and locking arrangement comprising:

first braking means comprising a device for stopping movement at said joint;

second braking means comprising a hydraulically operated brake for hydraulically applying braking force for braking and stopping said at least two arm elements about their corresponding joint;

said second braking means for applying force being substantially free of play about said joint when actuated for locking said at least two arm elements substantially rigidly with respect to one another such that forces are transmittable through said joint, which exceed many times the forces required to lock said plurality of arm elements substantially rigidly against the force of gravity and which exceed by many times the braking forces provided by said first braking means when said first braking means is actuated;

said first braking means and said second braking means both including means for permitting said adjacent arm elements to move substantially freely relative to each other when the braking force of both said brake means is deactuated;

said first braking means having portions;

said second braking means having portions;

said first braking means being disposed at said joint;

some of said portions of said first braking means being disposed on and directly attached to one of said adjacent arm elements, and some of said portions of said first braking means being disposed on and directly attached to the other of said adjacent arm elements to act directly upon said portions of said one of said adjacent arm elements;

said second braking means being disposed at said joint and a first of said portions of said second braking means being disposed on and directly attached to one of said arm elements for rotating with one of said adjacent arm elements, and a second of said portions of said second braking means being disposed on and directly attached to the other of said adjacent arm elements to act directly upon said portions of said one of said adjacent arm elements;

said means of said second braking means for permitting said adjacent arms to move substantially freely comprising flexible means;

said second braking means having at least a first braking surface means and at least a second braking surface means;

said flexible means having said first braking surface means attached thereto, said flexible means being firmly attached to said first of said portions of said second braking means;

said second braking surface means being disposed on and firmly attached to said second of said portions of said second braking means;

said flexible means for making braking contact and withdrawing braking contact between said first braking surface means and said second braking surface means;

actuator means for actuating and deactuating said flexible means by flexing said flexible means to make braking contact and withdrawing said braking contact between said first braking surface means and said second braking surface means;

said flexible means being flexible in one direction to make said braking contact and withdrawing said braking contact and being substantially rigid in a direction other than said one direction;

said flexible means being disposed such that said rigid direction is disposed in a direction of rotation of said adjacent arm elements, whereby there is no substantial play between said first and said second of said portions of said second braking means when said second braking means is actuated and also whereby, there is no substantial play between said adjacent arm elements when said second braking means is actuated;

said flexible means of said second braking means includes a brake piston made in the form of a circular braking element, having an axially elastic but rotationally stiff portion and said first braking surface means with a friction surface disposed thereon;

said actuator means comprising a hydraulic volume adjacent said brake piston for admitting hydraulic oil under pressure to flex said elastic portion and move said friction surface means thereon; and

said second braking surface means having a friction surface and being disposed on a disc element adjacent said circular braking element;

said second braking surface means comprising an annular element having a friction surface adjacent a side of said disc element opposite said brake piston;

said annular element being connected to rotate with said brake piston;

said disc element being axially elastic but rotationally stiff so that a pressure from said brake piston urges another friction surface of said disc element against said friction surface of said annular element;

said friction surface of said brake piston being disposed to transmit a frictional torque, without substantial play, to said adjacent disc element which is freely rotatable relative to said friction surfaces when the second braking means is not actuated;

said friction surfaces of said braking surface means of said brake piston and said disc element are full circumferential ringshaped braking surfaces;

said multi-axis manipulating arm unit comprising a plurality of joints and a plurality of drive systems, at least some of said joints being rotary joints.

4,693,666

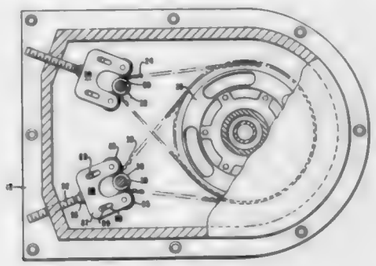
SCARA TYPE MANIPULATOR APPARATUS

John Garia, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 635,375, Jul. 27, 1984, abandoned. This application Jul. 31, 1986, Ser. No. 892,890

Int. Cl.[4] B25J *9/06*

U.S. Cl. 414—744 R 2 Claims



2. A robotic manipulator apparatus comprising:

a base supporting first and second independently operable drive means;

a primary arm rotatably supported by said base and means coupling said primary arm to said first drive means for driving said primary arm from said first drive means for rotation through one planar space;

a secondary arm having one end rotatably carried by the end of said primary arm opposite said base for rotation through another planar space, translationally displaced from said first planar space;

means coupling said second drive means to drive said secondary arm independently of said primary arm, said coupling means extending from said base through said first arm to said one end of said secondary arm;

each of said first and second independently operable drive means including a drive motor means having a first toothed gear affixed to the drive shaft, each of said means for coupling including a second toothed gear, a first endless toothed belt means operatively coupling the toothed gears for rotating said primary arm in response to the drive motor means of said first operable drive means, a second endless toothed belt means operatively coupling the toothed gears for rotating said secondary arm in response to the drive motor means of said second operable means, and

first and second adjustably positioned bidirectional belt tensioning means operatively associated with said first and second toothed belt means to control the tension of each of said belts,

each of said adjustably positioned bidirectional belt tensioning means including;

a U-shaped support member having first and second rotatable roller means affixed at either end of said U-shaped support member, said U-shaped support member being slidably positioned relative to said first toothed gear such that said first toothed gear is located within the open end of said U-shaped support member, said first and second rotatable roller means contacting the external surface of said endless toothed belt means on either side of said first tooth gear, wherein both said first and second rotatable roller means contacting the external surface of said endless tooth belt means exert simultaneously increasing or decreasing tension on said belt means, and

adjustment means coupled to said U-shaped support member to position said U-shaped support member relative to said first toothed gear for simultaneously positioning said first and second rotatable roller means to control the tension of said endless tooth belt means.

4,693,667

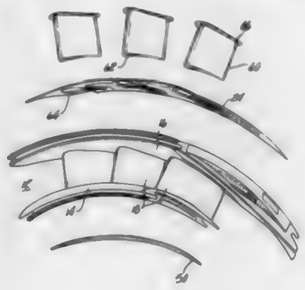
TURBINE INLET NOZZLE WITH COOLING MEANS

Herman N. Leaz, Lambertville, Mich., and Allen G. Chen, Sylvania, Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 144,909, Apr. 29, 1980, abandoned. This application Jun. 22, 1982, Ser. No. 390,872

Int. Cl.[4] F01D *5/14*

U.S. Cl. 415—115 9 Claims



1. For use in a turbine engine, a turbine nozzle assembly comprising:

a housing, said housing having an annular outer shroud having an inlet axial end and an outlet axial end, and a plurality of vanes extending radially inwardly from said outer shroud between its axial ends, said vanes being circumferentially spaced from each other and disposed in a turbine gas stream,

a tubular and cylindrical impingement plate positioned coaxially around the outer shroud so that at least a portion of the plate is spaced radially outwardly from said outer shroud thus forming a chamber therebetween, said plate having a plurality of apertures formed through it,

means for sealingly and fixedly attaching one axial end of the impingement plate to the inlet end of said outer shroud and for sealingly and fixedly attaching the other axial end of the impingement plate to the outlet end of said outer shroud,

fluid passage means formed between said chamber and the turbine gas stream,

means for communicating a pressurized cooling fluid to the outer periphery of the outer shroud, and

wherein said impingement plate includes means intermediate its ends for permitting axial differential thermal growth between said impingement plate and said outer shroud while minimizing thermal stress between said impingement plate and said outer shroud.

4,693,668

TURBINE HOUSING OF TURBOCHARGER

Takaaki Koike, Hachioji, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,358

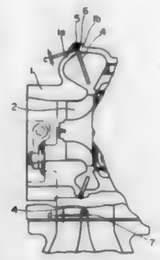
Claims priority, application Japan, May 29, 1985, 60-80233[U]

Int. Cl.[4] F28F *7/00*

U.S. Cl. 415—138 1 Claim

1. A turbine housing of a turbocharger of the type in which an interior of a turbine housing main body is partitioned into a plurality of paths, comprising: a turbine housing main body divided into a plurality of sections in axial direction of the turbine, mated engaging grooves formed in an inner circumferential direction at opposing surfaces of the divided sections of said turbine housing, a partition wall fitted into said engaging grooves, leaving a clearance in radial direction of the turbine, said partition wall having side surfaces, and a partition wall

supporting member which integrally joins opposing surfaces of said divided sections of said turbine housing main body and which is disposed in said turbine housing main body such that said partition wall supporting member is in coplanar relation-



ship with a flange surface of said turbine housing main body at a gas inlet and contacts at least one side surface of said partition wall, so as to ensure gas-tightness at said gas inlet in gas flow direction, leaving a predetermined clearance in circumferential direction of said partition wall.

4,693,669

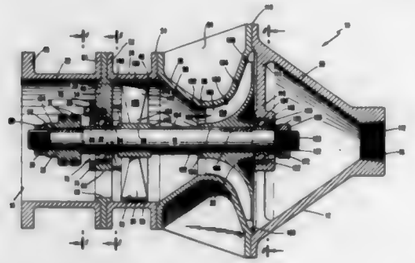
SUPERCHARGER FOR AUTOMOBILE ENGINES

Leroy K. Rogers, Sr., Rte. 13, P.O. Box 815-DD, Briarcliff Rd., Fort Myers, Fla. 33908

Filed Mar. 29, 1985, Ser. No. 717,652

Int. Cl.[4] F04D *17/02, 29/40*

U.S. Cl. 415—143 7 Claims



3. A supercharger comprising:

a housing having a longitudinal axis and being constructed from sections, which sections are connected in end-to-end relationship, said sections including a front housing section defining an axially directed inlet, an axial compressor duct section for housing an axial compressor, a rear housing section downstream of said axial compressor duct section and an exhaust section having a hollow, highly convergent, frustoconical, exhaust cone portion downstream of said rear housing section, a downstream portion of said rear housing section defining a cylindrical, axially directed inlet for a radial compressor, a casing for a radial compressor, and a substantially radially directed outlet for a radial compressor, said rear housing section further defining a highly convergent, hollow, frustoconical transition duct between a downstream end of said axial compressor duct section and said radial compressor inlet, said rear housing section having interior surfaces for defining a flow deflector, which flow deflector receives the output of said outlet for a radial compressor, which flow deflector provides a smooth surface transition from said rear housing section into said exhaust section, said exhaust cone portion defining at a downstream end a coaxial outlet, said housing further including at least two bearing supports affixable within said housing according to predetermined locations along said longitudinal axis of the housing, said bearing mounts rotatably supporting a compressor shaft, which compressor shaft is positioned along said longitudinal axis;

bearing assemblies removably implaced in said bearing supports, said bearing assemblies receiving said compressor shaft;

an axial compressor located within said axial compressor duct and secured to said shaft to be rotatable therewith, said axial compressor drawing a flow from said inlet of the front housing section and imparting an initial compression to said flow;

a radial compressor located within said casing and secured to said shaft to be rotatable therewith, said casing being in a substantially sealing relationship with said radial compressor, said radial compressor including a hub, a first set of blades extending radially from said hub and having leading edges at an intake region of said radial compressor and a second set of blades extending radially from said hub and having leading edges downstream of said intake region, said radial compressor further compressing said flow;

at least one pulley wheel secured to said compressor shaft and adapted to receive drive belts;

spacers fitted upon said compressor shaft for axially positioning said axial compressor and said radial compressor relative to each other; and

means for securing said compressor shaft against axial displacement;

wherein said transition duct favorably directs the output of the axial compressor into said inlet of the radial compressor and said exhaust cone section encloses sufficient volume to moderate the output of said radial compressor.

4,693,670

ADJUSTING DEVICE FOR AN AIRPLANE PROPULSION SYSTEM

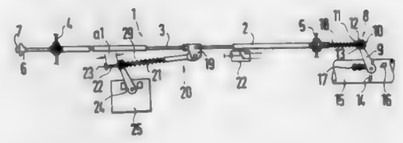
Juergen Hawener, Stuttgart, and Klaus Hain, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,281

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503951

Int. Cl.[4] B63H *3/10*

U.S. Cl. 416—25 14 Claims



1. Adjusting apparatus for an airplane propulsion system of the type having a reciprocating piston combustion engine with an adjustable intake throttle valve and with a propeller pitch regulator; the improvement comprising: a throttle valve, a propeller pitch regulator, said adjusting apparatus comprising:

movable connecting rod means linked to the throttle valve via a pivot joint means and movably guided in and with respect to a relatively fixed rod casing means,

throttle valve spring means fixed to the rod casing means and biasing the connecting rod pivot joint means toward an open throttle position,

manually releasable blocking means for selectively blocking movement of the connecting rod means with respect to the fixed rod casing means, and

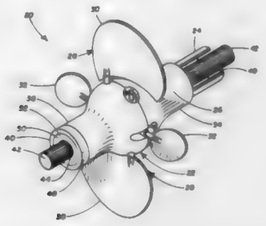
carrying rod means connected to the connecting rod means and a control member of the propeller pitch regulator via the interposition of a pitch regulator spring means therebetween.

4,693,671

REVERSIBLE SELF-ADJUSTING PROPELLER DEVICE

Harold C. Thornton, Jr., Oak Ridge, and Clifton W. Hall, Knoxville, both of Tenn., assignors to Tramtec Corporation, Oak Ridge, Tenn.

Filed Aug. 28, 1986, Ser. No. 901,891
Int. Cl.[4] B63H *3/00*
U.S. Cl. 416—43 9 Claims



1. A self-adjusting propeller device for transmitting forces to and from a fluid, comprising:

a thrust blade having a thrust blade area;

a control blade having a control blade area that is less than the blade area of said thrust blade;

a hub supporting said thrust and control blades for rotation in the fluid about a hub axis so that said thrust and control blades transmit forces to the fluid as they are rotated about the hub axis with the force transmitted being proportional to the pitch of each ;

means for interconnecting said thrust and control blades so that in response to a changing load on the device, said thrust and control blades move in relation to said hub axis with said thrust blade moving in relation to said hub axis at a changing pitch with the change in pitch of said thrust blade being proportional to the change in the load; and

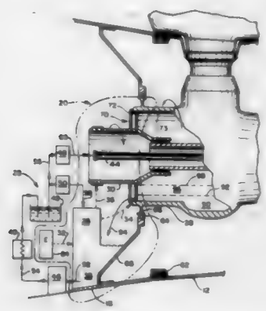
means for changing the pitch of said control blade to selected pitch settings.

4,693,672

TWO LEVEL OIL DAM

Paul A. Carvalho, Westfield, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1986, Ser. No. 925,050
Int. Cl.[4] B64C *11/30*; F01M *11/00*
U.S. Cl. 416—174 6 Claims



1. Apparatus for draining a centrifuged band of oil from a rotating propeller shaft and for damming a pool of oil if the propeller shaft is not rotating, comprising:

first means for damming said pool of oil and having disposed therein a first draining means for draining said band, said first means for damming being mounted to said propeller shaft;

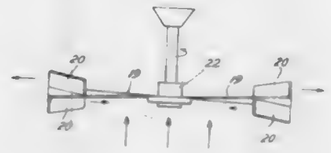
second means for damming said pool of oil and having a second draining means for draining said band disposed therein, said second means for damming being mounted to said propeller shaft such that both of said first draining means and said second draining means are not below surface of said pool if said propeller shaft is not rotating.

4,693,673

CEILING FAN

Victor W. Nee, 1624 Arcadia St., South Bend, Ind. 46635

Continuation-in-part of Ser. No. 406,123, Aug. 9, 1982, abandoned. This application Sep. 5, 1984, Ser. No. 647,393
Int. Cl.[4] F04D *29/38*
U.S. Cl. 416—199 2 Claims



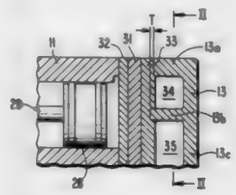
1. In combination, a ceiling fan having a plurality of radially extending blades mounted to rotate about a vertical axis, and means for rotating said fan in selected direction, said blades being shaped and positioned to discharge air upwardly from said blades when rotated in one direction and to discharge air downwardly from said blades upon rotation thereof in the opposite direction, and a vane portion projecting angularly in selected fixed relation from a face of each blade, said vane portions being spaced from the axis of rotation of the blades and positioned on said blades to provide rotative balance of the fan as it rotates, said vanes being positioned to extend similarly substantially diagonally of said blades and being shaped to generate substantially radial air flow in direction and magnitude to intercept and commingle with axial air flow generated by rotation of said blades and thereby produce a favorable pressure gradient across the blades and create air flow with moderate distribution intensity throughout a greater area than the air flow produced by a similar fan which does not have said vanes, said blades include both forwardly inclined vanes above the blades and backwardly inclined vanes below the blades when said blades are rotated in one direction.

4,693,674

CYLINDER HEAD FOR REFRIGERANT COMPRESSOR

Isamu Fukai, Fujioka, and Katsumasa Azami, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Feb. 26, 1986, Ser. No. 832,876
Claims priority, application Japan, Feb. 26, 1985, 60-25399[U]
Int. Cl.[4] F04B *39/12*
U.S. Cl. 417—269 6 Claims



1. A cylinder head for fluid compressor, said cylinder head

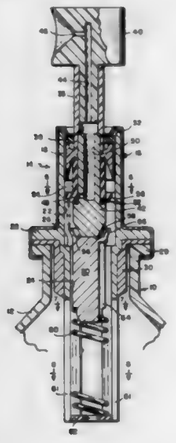
comprising an end plate portion with an outer wall portion and an inner partition wall portion extending from said end plate portion and defining a suction chamber and a discharge chamber, said wall portions including end surfaces disposed in parallel planes spaced from and opposed to said end plate portion with the plane of the end surface of said inner partition wall portion being disposed from said end plate portion approximately 0.02 mm to 0.08 mm greater than the plane of the end surface of said outer wall portion, means disposed about the perimeter of said cylinder head for fasteniing the same to a cylinder block through a valve plate adapted to close said suction chamber and said discharge chamber and having ports opening into the same and gasket means interposed between said end surfaces and said valve plate, whereby said end surfaces are in sealing engagement with said gasket.

4,693,675

NON-THROTTLING DISCHARGE PUMP

Frank Venus, Jr., Merrimack, N.H., assignor to The Pharmasol Corporation, South Easton, Mass.

Filed Jan. 16, 1986, Ser. No. 819,529
Int. Cl.[4] G01F *11/06*
U.S. Cl. 417—489 8 Claims



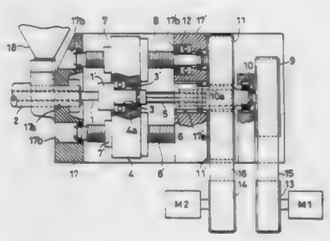
1. A discharge pump for expelling fluid from a container comprising a housing defining aligned large diameter and smaller diameter chambers wherein the adjacent ends of the chambers define an annular shoulder, first and second plungers disposed, respectively, in said large and smaller diameter chambers for reciprocal movement in unison and for movement relative to each other, spring means engaged with said second plunger in said smaller chamber yieldably holding said second plunger extended from said smaller chamber into abutting engagement with said first plunger in said larger chamber, said first plunger being of larger cross section than the second plunger, a discharge passage in said first plunger, sealing means mounted to said first plunger over said discharge passage, an intake passage in said second plunger providing communication between said container and said larger diameter chamber when said second plunger is held extended from said smaller diameter chamber into said larger diameter chamber, sealing means at the end of said second plunger engaged with said first plunger operable when said second plunger is displaced from said larger diameter chamber into said smaller diameter chamber to close the intake passage from the smaller diameter chamber into the larger diameter chamber and said first plunger and sealing means associated therewith being normally movable following movement of said sealing means mounted to said second plunger to close the intake passage to, in succession, displace said second plunger relative to said first plunger and thereafter move said first sealing means associated with the first plunger by engagement with said shoulder relative to said discharge passage to uncover the same and said spring means being operable thereafter to successively move said second plunger from said smaller chamber into said larger chamber and disengage said sealing means associated with the first plunger from said shoulder such as to allow said sealing means associated with the first plunger to cover said discharge passage.

4,693,676

SCREW-ROTATING/INJECTION MECHANISM OF INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP85/00382, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00562, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 5, 1985, Ser. No. 841,523
Claims priority, application Japan, Jul. 7, 1984, 59-139753
Int. Cl.[4] B29C *45/77*
U.S. Cl. 425—145 4 Claims



1. A screw-rotating/injection mechanism for use in an injection molding machine, comprising:

a screw shaft having a front end and a rear end, said front end having a screw formed thereon;

a drive shaft fixed to the rear end of said screw shaft and disposed in axial alignment with said screw shaft;

a pressure plate for rotatably supporting said drive shaft, said pressure plate having a central portion and a peripheral portion thereof, said drive shaft extending through the central portion of said pressure plate and being disposed rotatably but axially immovable relative to said presure plate, said drive shaft being formed with a spline shaft at a rear side of said drive shaft with respect to an axial position wherein said drive shaft is supported by said pressure plate;

a nut spline-coupled to said spline shaft;

a screw rotating motor;

a first transmission unit coupling said nut to said screw rotating motor;

a plurality of ball nuts disposed in the peripheral portion of said pressure plate in a manner unrotatable relative to said pressure plate;

a plurality of ball screws extending in parallel with said screw shaft and disposed circumferentially of said screw shaft at angular intervals, each of said ball screws having a rear end portion and arranged rotatably and threadably coupled to a corresponding one of said ball nuts, said pressure plate being supported by said ball screws in a manner axially movable relative to said ball screws;

an injection servo motor; and

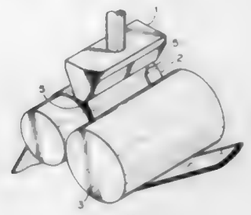
a second transmission unit coupling said injection servo motor to the rear end portion of each of said ball nuts, said ball nuts being driven simultaneously by said injection servo motor through said second transmission unit.

4,693,677

FLAT DIE NECK-IN CONTROL DEVICE

Hiromi Shigemoto; Akio Yamamoto, both of Iwakuni, and Iwatoshi Suzuki, Yamaguchi, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 854,897
Claims priority, application Japan, Apr. 24, 1985, 60-88093
Int. Cl.⁴ B29C *47/14, 47/32*
U.S. Cl. 425—376 R **5 Claims**



1. In an extrusion and roll forming apparatus including resin extruder with a flat sheet-forming die and first and second rollers, said die being disposed for delivering extruded resin to said rollers, the improvement comprising:

a control device including a pair of inducing guide members, one of said guide members being mounted to a first longitudinal end of said flat die and the other of said guide members being mounted to a second longitudinal end of said flat die, an inner surface of each of said guide members being disposed so as to provide a smooth extension of the adjacent inner surface of said flat die of said resin extruder, said guide members extending at least from said flat die to a point adjacent to at least one of said first and second rollers, whereby, neck-in of the extruded resin is minimized.

4,693,678

MALE LAYUP-FEMALE MOLDING SYSTEM FOR FABRICATING REINFORCED COMPOSITE STRUCTURES

Arthur D. Von Volkli, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 15, 1986, Ser. No. 819,039
Int. Cl.⁴ A01J *21/00*
U.S. Cl. 425—405 R **15 Claims**



1. A molding system, comprising:

a layup support fixture;

a boot securable over the support fixture to define a layup surface for a prepreg structure and;

a female mold, having a plurality of sections sealingly interconnected and disassemblable to allow easy release of the cured structure from the female mold, the mold having a smooth inner surface corresponding to the desired exterior surface configuration of the structure;

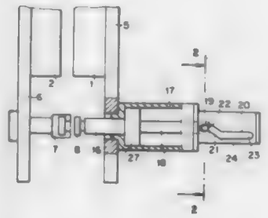
wherein the boot is sealingly securable to the female mold to define a cavity between the boot and mold for housing the structure during curing, and wherein the fixture, boot, and female mold allow layup of prepregs on the boot and curing of the prepreg structure thereafter in the female mold to yield a structure having an aerodynamically smooth outer surface formed to within close tolerance.

4,693,679

AUTOMATIC LATCH FOR MOLD CLOSING

Peter Marth, Konigswinter, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruhl, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,690
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440476
Int. Cl.⁴ B29C *39/26, 45/26*
U.S. Cl. 425—589 **6 Claims**



1. A molding apparatus with means for coupling and locking two mold halves together comprising:

(a) a first coupling member supported by a mold holder for a first mold half and movable rotationally and axially relative to said holder;

(b) a second coupling member mounted to a second mold half and axially aligned with said first coupling member;

(c) a first locking formation on said first coupling member and a mating second locking formation formed on said second coupling member such that when said first and second locking formations are engaged they lock said first and second coupling members to one another when they are rotated to a first position and unlock when rotated to a second position; and

(d) piston actuator means for rotating and axially moving said first coupling member so that said first locking formation is rotated from said second position, wherein said mold halves are separated, to said first position, wherein said mold halves are closed together, and from said first position to said second position.

4,693,680

FLAME STABILIZED POST-MIXED BURNER

William J. Snyder, White Plains, and Hisashi Kobayashi, Putnam Valley, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

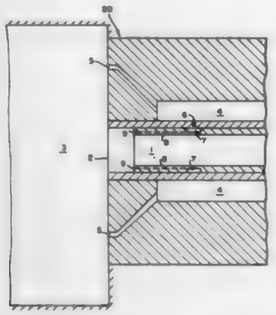
Filed Aug. 14, 1986, Ser. No. 896,211
Int. Cl.⁴ F23M *3/04*
U.S. Cl. 431—10 **18 Claims**

1. A post-mixed burner compriaing:

(a) a fuel passage having an end for injecting fuel into a combustion zone;

(b) a main oxidant passage having at least one end for injecting oxidant into the combustion zone and having a total area A_1 at the injection point(s), said end(s) being radially spaced from the fuel passage end; and

(c) a stabilizing oxidant passage communicating with both the fuel and main oxidant passages upstream of their respective ends, said stabilizing oxidant passage having a total area A_2 where it communicates with the fuel passage and a restriction having an area A_3 upstream of where it communicates with the fuel passage wherein the ratio $A_3/(A_1+A_3)$ is not more than 0.1 and the ratio A_3/A_2 is not more than 0.7.



4,693,681

CANDLE APPARATUS

Todd M. Comstock, Cotuit, Mass., assignor to Grand Royalties, Ltd., Mashpee, Mass.

Continuation-in-part of Ser. No. 604,896, Apr. 27, 1984, Pat. No. 4,608,011. This application Jul. 21, 1986, Ser. No. 887,354
Int. Cl.⁴ F23D *3/18*
U.S. Cl. 431—324 **22 Claims**



1. A candle apparatus comprising;

a base having means defining a base opening formed at least in part by a peripheral wall,

a canister for containing a liquid that is to be burned,

said canister having cap means with a passage therethrough for receiving a wick which is adapted to extend into the liquid and also extend at least partially out of the canister,

said canister having a base adapted to be received in said base opening,

and a shell which is adapted to extend over said canister and base peripheral wall and having an opening defined in the top thereof so as to leave said cap means and wick exposed,

said base including a base member and integral platform extending upwardly from said base member, said platform being of a smaller diameter than said base member,

said peripheral wall being an annular wall that extends upwardly from said platform to define said base opening,

said base having, outwardly of the platform, a substantially flat shell resting surface,

said shell, about its bottom annular edge, resting upon the base flat surface, at its top, substantially co-terminous with the top of the cap means, and covering the platform, annular wall and canister.

11. A candle apparatus comprising;

a base having means defining a base opening formed at least in part by a peripheral wall,

a canister for containing a liquid that is to be burned,

said canister having cap means with a passage therethrough for receiving a wick which is adapted to extend into the liquid and also extend at least partially out of the canister,

said canister having a base adapted to be received in said base opening,

and a shell which is adapted to extend over said canister and base peripheral wall and having an opening defined in the top thereof so as to leave said cap means and wick exposed,

said shell having an upper inwardly directed annular flange defining the shell top opening,

said cap means having a top part of smaller diameter than the shell top opening and extending at least partially into said shell top opening,

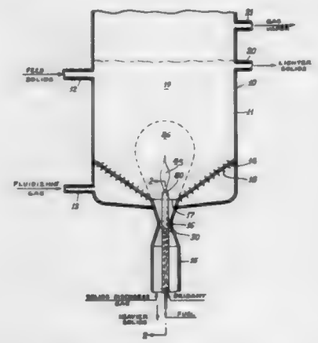
the top of the cap means being substantially co-terminous with the shell flange.

4,693,682

TREATMENT OF SOLIDS IN FLUIDIZED BED BURNER

Bernard S. Lee, Lincolnwood; Paul B. Tarman, Elmhurst, and Dharam V. Punwani, Bolingbrook, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed May 12, 1986, Ser. No. 862,325
Int. Cl.⁴ F27B *15/00;* **F23D** *19/00*
U.S. Cl. 432—15 **15 Claims**



1. A process for thermal treatment of solid particles in a fluidized bed, said solid particles characterized by thermal treatment forming a lighter weight fraction and a heavier weight fraction, relative to the total contents of the bed, said process comprising:

feeding solid particles to a fluidized bed of solid particles, said fluidized bed supported on a bed support having at least one region of opposing downwardly sloping portions converging in thier lower portions into an opening of a density/size particle classification heavier particle dis-

charge conduit, said heavier particle discharge conduit having a necked region;

maintaining said fluidized bed of solid particles in fluidized condition by pressurized fluidizing gas entering said bed through a plurality of nozzle means in said bed support and pressurized solids discharge gas entering through said heavier particle discharge conduit controlling heavier particle passage therethrough;

maintaining a discrete fluid fueled flame in said fluidzied bed in close proximity to and above said opening of said heavier particle discharge conduit by feeding fuel and oxidant through a burner extending upwardly through the central portion of said heavier particle discharge conduit and having an outlet above said opening forming a higher temperature zone in and surrounding said flame, said higher temperature one at least about 100° F. higher than the remainder bed temperature;

circulating said solid particles in said fluidized bed through said higher temperature zone heating said particles to form said heavier weight particle fraction;

maintaining flow velocity of said solids discharge gas upwardly through an annular passage between said burner and said necked region of said heavier particle discharge conduit sufficiently high to permit downward passage of said heavier wieght particles for discharge while restraining from downward passage substantially all said ligher weight fraction and recirculating said lighter weight fraction through said higher temperature zone, and withdrawing said heavier weight particles through said heavier particle discharge conduit; and

withdrawing said lighter weight fraction from the upper region of said bed.

4,693,683

DENTAL APPARATUS AND METHOD OF USE

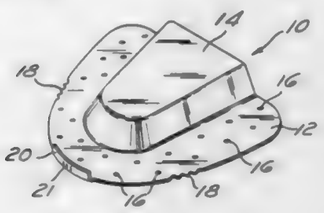
Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324

Continuation of Ser. No. 580,071, Feb. 14, 1984, Pat. No. 4,543,062. This application Aug. 12, 1985, Ser. No. 764,983

The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.[4] A61C *9/00*

U.S. Cl. 433—37 **6 Claims**



1. A dental check bite element comprising a tray shaped to fit within a person's mouth between the upper and lower teeth, the tray having a peripheral bite section to be engaged by the upper and lower teeth, said bite section being made of a thin material and having generally smooth lateral edges which curve towards the front of the tray to conform to a person's mouth, said lateral edges being interrupted to form means to facilitate gripping said edges with the thumb and a finger of one hand when inserting or withdrawing the tray from a patient's mouth.

4,693,684

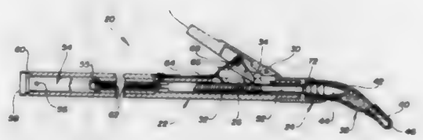
RATCHET TYPE DISPENSER FOR DENTAL MATERIALS

William J. Blatherwick, Hamilton Square; Leslie Hamilton, Trenton; Robert D. Holewinski, Lakehurst; Virginia A. Shen, East Brunswick, all of N.J.; Jeffrey Kapec, Westport, and Kazuna Tanaka, Cos Cob, both of Conn., assignors to Johnson & Johnson Dental Products Company, East Windsor, N.J.

Filed May 30, 1986, Ser. No. 868,494

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—90 **3 Claims**



1. An applicator for dispensing predetermined quantities of paste-like material or fluid, which comprises, in combination:

a. an elongated hollow housing having a longitudinal axis, a front end and a top surface, said housing including an end wall at the front end, said end wall including a plunger guiding aperture therethrough, and nozzle receiving means in front of said end wall;

b. an opening in said housing in the top of surface thereof near the front end thereof, said opening communicating with the interior of the housing;

c. ratchet anchoring means within said housing;

d. ratchet means within said housing operatively attached to said anchoring means by spring means arranged and constructed to urge said ratchet means rearwardly toward a rest position, said ratchet means being accessible through said opening, said ratchet means including a plunger drive means at the front end thereof positioned to pass through the plunger guiding aperture;

e. a lever means positioned above said opening;

a drive pawl pivotably connected to said lever means;

lever spring means for biasing said drive pawl against said lever means;

detent pawl means fixed to said housing and extending over said opening to engage said ratchet means;

a portion of said lever spring means resting on said detent pawl means; and

f. nozzle means inserted in said nozzle receiving means, said nozzle means including a front discharge tip and a rear portion comprising a tubular body portion defining a reservoir for paste-like material or fluid, said tubular body portion including an open end at the rear thereof and a piston member therein, said nozzle means being inserted in said nozzle receiving means such that the open end including the piston member is alinged with said plunger guiding aperture;

whereby when said lever is depressed, the ratchet is urged forward thereby forcing the plunger forward through the plunger guiding aperture and the plunger engages the piston and drives it forward to expel a predetermined amount of paste-like material or fluid contained therein out of said reservoir and into said discharge tip, and when said lever is elevated, the plunger withdraws from engagement with the piston and stops forcing the piston forward.

4,693,685

GEAR RATIO STEP-DOWN OR STEP-UP DEVICE FOR DENTAL HANDPIECE

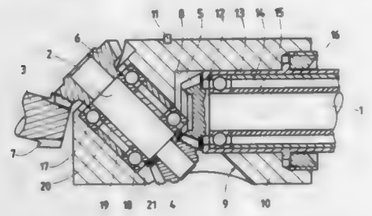
Jacques Pernot, Geneuille, France, assignor to Micro-Mega S.A., Besancon, France

Filed Nov. 7, 1985, Ser. No. 795,999

Claims priority, application France, Nov. 7, 1984, 84 17335

Int. Cl.[4] A61C *1/08*

U.S. Cl. 433—105 **12 Claims**



1. A gear-ratio adjusting device of a dental handpiece which is mounted between a tool driving shaft having a bevel wheel at one end thereof and a motor shaft, said device having a modular unit structure and comprising: a socket forcibly fitted into a handle of the dental handpiece, said socket having means defining an axial bore longitudinally extending in the socket, and means defining an oblique through-bore extending obliquely relative to the axial bore in the socket and being open at the periphery of the socket; and input shaft coaxial with and driven by said motor shaft and having a bevel wheel at one end thereof; and an oblique shaft inclined relative to said input shaft and to the tool driving shaft, said oblique shaft being provided at the ends thereof with a pair of bevel pinions meshing with the bevel wheel fixed to said input shaft and with the bevel wheel fixed to the tool driving shaft respectively, said input shaft being rotatably mounted in the axial bore of the socket, said oblique shaft being rotatably mounted in the oblique through-bore formed in said socket.

4,693,686

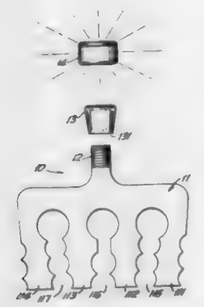
MAGNETIC DENTAL IMPLANT RETENTION SYSTEM

Victor I. Sendax, Suite 14B, 30 Central Park South, New York, N.Y. 10019

Filed Feb. 14, 1986, Ser. No. 829,725

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **5 Claims**



1. A dental prosthesis comprising:

a. an implant having an upper neck portion;

b. a ferromagnetic casted coping comprising a precious metal alloy;

c. a prosthetic member having a gum facing side;

d. a rare-earth magnet fixedly mounted in the prosthetic member at the gum facing side and coactive with the coping for retaining the prosthetic member in place;

e. a titanium abutment having a height of 2 to 4 mm, the abutment disposed between the coping and the implant, the abutment being cemented to the coping; and

f. a screw means disposed within the abutment and implant for connecting the abutment and implant to the coping.

4,693,687

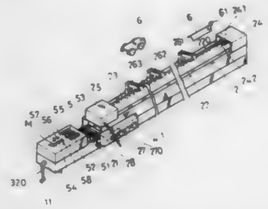
APPARATUS FOR DETERMINING THE ACCELERATION OF A MOVING OBJECT UNDER GRAVITY

Ming-Chuen Hwang, No. 1-4, Lane 240, Chung San Road, Shan Hua Chen Tainan Hsien, Taiwan

Filed Mar. 14, 1986, Ser. No. 839,734

Int. Cl.[4] G09B *23/08*

U.S. Cl. 434—302 **16 Claims**



1. An improved apparatus for determing the acceleration of a moving object under gravity comprising:

an elongated hollow base;

an angle-adjustable slope body with a top track way, pivotally connected to said base through a pivot about which said slope body turns to change its angle of inclination;

at least three sensors movably provided in an orderly manner above said top track way for sending a signal when said moving object passes therethrough;

means for driving said angle adjustable slope body to a predetermined angle relative to said elongated base for sliding said moving object down to pass said three sensors;

a display means to show said angle of inclination of said slope body, including a turnable indicator;

a gear mechanism cooperatively connected to said pivot to transmit the motion of said pivot to said indicator;

an indicating ruler provided along said top track for measuring the distance between each of said sensors; and

a timer means responsive to the signals from said sensors for measuring the time interval required by said moving object to pass from one of said sensors to another sensor, wherein the acceleration of said moving object can be computed from each said corresponding distance of said sensors and said time intervals.

4,693,688

GROUNDING CONNECTOR

Bronislau J. Cembruch, Havertown, and Walter M. Werner, Downington, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 14, 1986, Ser. No. 885,065

Int. Cl.[4] H01R *4/10*

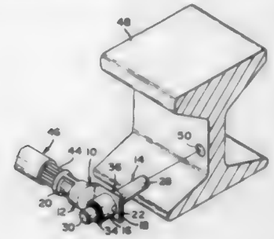
U.S. Cl. 439—877 **5 Claims**

1. A grounding connector for use in grounding a rail or other structure having a hole therein, said connector comprising:

conductive terminal means having receiving means at one end for receiving a grounding cable and apertured tongue means at another end; and

elongated conductive rod means having tapered pin means

at one end for being driven into the hole in the rail or other structure and securing means adjacent another end for securing said terminal means to said rod means, said securing means including a knurled portion thereon for



being received in said aperture in said tongue means, further including collar means for being pressed onto said knurled portion over said tongue means to lock said rod means to said terminal means.

4,693,689

CONTROLLING GEAR FOR OUTBOARD ENGINE

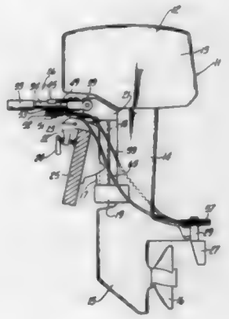
Norimichi Harada, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 671,733, Nov. 15, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,468

Claims priority, application Japan, Nov. 30, 1983, 58-224478

Int. Cl.[4] B63H *21/26*

U.S. Cl. 440—51 **5 Claims**



1. In a steering arrangement for a marine outboard drive adapted to be affixed to the transom of an associated watercraft for steering movement about a generally vertically extending steering axis and carrying driven propulsion means at its lower end, a trim tab pivotally carried by said outboard drive about an axis parallel to and rearwardly of said steering axis and adapted to be submerged in operation, and a steering lever extending forwardly from said outboard drive from said steering axis in a longitudinal direction and operably connected to said outboard drive for controlling steering movement about said steering axis, the improvement comprising means for pivoting said trim tab about its pivotal axis in a direction in response to steering movement of said steering lever in an opposite direction for generating a hydrodynamic force from said trim tab upon said outboard drive tending to steer said outboard drive in the direction of movement of said steering lever comprising a pair of flexible transmitters each affixed at one end to opposite sides of the steering lever forwardly of said steering axis and each having a portion extending from its point of operative connection longitudinally relative to the outboard drive to said steering axis, said steering lever being connected to said outboard drive by means including a lost motion connection defining a pivotal axis for said steering lever, a drum fixed relative to the outboard motor and supported for pivotal movement about a drum axis parallel to the pivotal axis of the steering lever and the axis of pivotal movement of the trim tab and means for rotating said drum about said drum axis upon relative movement of the steering lever relative to the outboard drive as afforded by the lost motion connection.

4,693,690

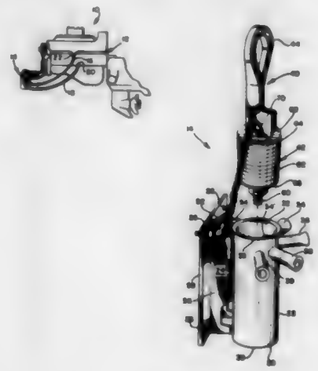
QUICK DRAIN ASSEMBLY FOR BOAT ENGINE

Elvin J. Henderson, 1407 N. Pecos, Fort Stockton, Tex. 79735

Filed Mar. 10, 1986, Ser. No. 837,958

Int. Cl.[4] B63H *21/38*

U.S. Cl. 440—88 **15 Claims**



1. A quick drain apparatus for draining water from an engine block of a boat engine, comprising:

a main cylindrical housing having an axial passageway formed therethrough; a packer device removably received within said main housing, said packer device has a packer element which is expandable into sealed relationship respective to the inner wall surface of the main housing, said packer element is retractable into a reduced diameter releasable configuration which enables the packer device to be removed from said main housing;

a plurality of lateral tubes each having a near end opposed to a far end, with the near end of each said lateral tube being affixed to the wall surface of the main housing with the far end of each said lateral tube extending away from said main housing; a passageway formed through each lateral tube and into said main housing;

said near end of each said lateral tube being located adjacent to one end of said main housing at a location which is covered by said packer element when said packer element is sealingly received within said main housing.

4,693,691

FLOAT MATTRESS

Jay DeYoe, Gold Hill, Oreg., assignor to HIS, Inc., Medford, Oreg.

Filed Jul. 26, 1985, Ser. No. 759,407

Int. Cl.[4] B63C *9/10*

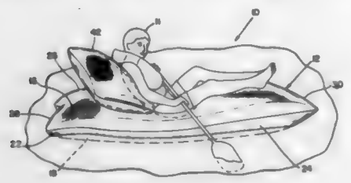
U.S. Cl. 441—129 **7 Claims**

1. A float mattress comprising:

chunks of granular, buoyant material; and

bag means comprising a meshed fabric having openings smaller in size than the size of the chunks of granular material for containing the chunks of granular material while allowing water and air to pass freely through the fabric, the bag means being substantially and loosely filled with the granular material to provide a mattress that is longitudinally and laterally flexible,

the mattress being sized and shaped to support a person resting thereon while the mattress floats in water, the



mattress being stabilized by water freely passable through the bag means to displace air within the bag means.

4,693,692

APPARATUS FOR MANUFACTURING SMALL-SIZE GAS-FILLED LAMPS

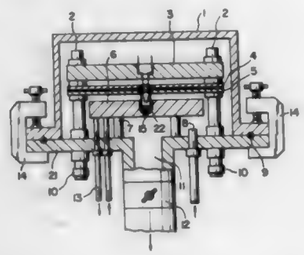
Jitsuo Hamai, Tokyo, Japan, assignor to Hamai Electric Lamp Co., Ltd., Tokyo, Japan

Division of Ser. No. 568,850, Jan. 6, 1984, Pat. No. 4,627,824. This application Aug. 20, 1986, Ser. No. 898,290

Claims priority, application Japan, Jan. 12, 1983, 58-3872; Jan. 12, 1983, 58-3874; Jan. 12, 1983, 58-3875; Jan. 12, 1983, 58-3876; Jan. 12, 1983, 58-3880

Int. Cl.[4] H01J *9/18, 9/38*

U.S. Cl. 445—66 **3 Claims**



1. An apparatus for manufacturing at least one gas-filled lamp from an assembly of a bulb having a closed head and an open end, and a bead disposed in the open end of the bulb and supporting a pair of lead wires with a filament connected thereto, said apparatus comprising:

(a) a base;

(b) a chamber mounted on said base;

(c) a bulb holder jig disposed on said base and housed in said chamber and having a recess for receiving the closed end of the bulb;

(d) a lead wire holder disposed in said chamber for supporting the lead wires;

(e) a heating carbon jig disposed in said chamber bewteen said lead wire holder and said bulb holder jig for holding the open end of the bulb with the bead positioned therein;

(f) electrodes mounted in said chamber and electrically connected to said heating carbon jig for supplying an electric current to said heating carbon jig to heat the latter;

(g) a gas supply tube mounted on said base for introducing a gas to be filled in the bulb into said chamber;

(h) an air outlet tube mounted on said base for developing a vacuum in said chamber; and

(i) coolant liquid tubes mounted on said base for supplying a coolant liquid to said bulb holder jig.

4,693,693

TOY CRASH VEHICLE

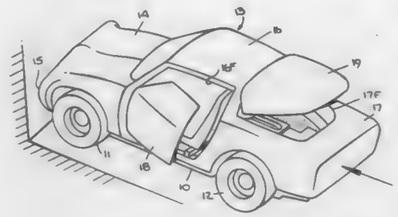
Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham A. Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Division of Ser. No. 707,567, Mar. 4, 1985, Pat. No. 4,588,386. This application Oct. 3, 1985, Ser. No. 783,357

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.[4] A63H *17/02*

U.S. Cl. 446—6 **3 Claims**



1. In a toy vehicle, a hollow body supported above a chassis, said body being constituted by a front section having a normal shape simulating that of an engine hood integral with a main body portion, said main body portion being formed of rigid plastic material and being attached to the chassis, said front section being free of the chassis and being formed of resilient synthetic plastic material which has said normal shape, said resilient material having a memory such that when the front section is subjected to frontal pressure, it is deformd to simulate the effect of a crash, and when the deforming pressure is released, it resumes its normal shape, said vehicle further including a sled joined to the front end of the front section and slidable over the chassis, said pressure being applied to said sled upon frontal impact of said vehicle.

4,693,694

TOY WITH MOVING SCREEN

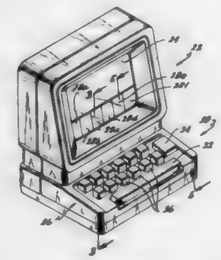
Yoshizo Seki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 665,101, Oct. 26, 1984, Pat. No. 4,573,928. This application Feb. 26, 1986, Ser. No. 833,816

Claims priority, application Japan, Dec. 10, 1983, 58-190812[U]

Int. Cl.[4] A63H *33/30;* **G09B** *3/02*

U.S. Cl. 446—197 **16 Claims**



1. A toy which comprises:

a housing;

a viewing window located in said housing;

an indicia carrier member, said indicia carrier member located in said housing, indicia located on said indicia carrier member, said indicia carrier member located in associ-

ation with said window whereby at least a portion of said indicia is viewable through said window;

a lenticular screen, said lenticular screen located in association with said window and said indicia carrier member so as to be positioned in front of said viewable portion of said indicia;

means for moving said lenticular screen with respect to said indicia carrier member, said movement of said lenticular screen with respect to said indicia carrier member changing the perceived view of said viewable portion of said indicia;

carrier means for movably supporting said indicia carrier member;

said indicia carrier member being movably located on said carrier means so as to move with respect to said window, said movement of said indicia carrier member with respect to said window positioning different portions of said indicia carrier member with respect to said window allowing viewing of said different portions of said indicia strip;

at least one operator actuator located on said housing;

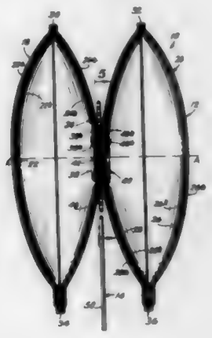
means for moving said indicia carrier member on said carrier means, said means operatively connecting between said operator actuator and said carrier means whereby movement of said operator actuator is transmitted to said carrier means to move said indicia carrier member with respect to said window.

4,693,695

ASCENDING AND DESCENDING BALLOON ACTION TOY

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Mar. 31, 1986, Ser. No. 846,055
Int. Cl.⁴ A63H *27/10*
U.S. Cl. 446—220 **9 Claims**



1. An ascending and descending balloon action toy, comprising:

(a) an air-buoyant envelope having an attached pair of mutually symmetrically arranged balloon portions, each having an interior filled with a lighter-than-air gas at about atmospheric pressure;

(b) a spool defining an axis between the balloon portions; and

(c) a tether having a fastening end region operatively connected to the spool, an opposite handle end region held by a user during play, and a tether region intermediate the end regions and repeatably coilable around, and uncoilable from, the spool during play,

(i) said tether region uncoiling from the spool about the axis when the envelope is released by the user into the air so as to enable ascent of the envelope,

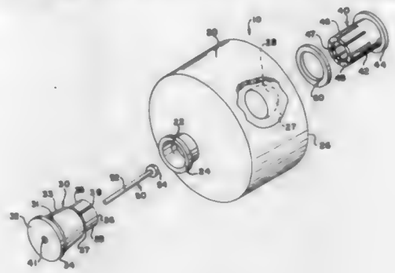
(ii) said tether region coiling around the spool about the axis when the handle end region is yanked by the user so as to cause descent of the envelope.

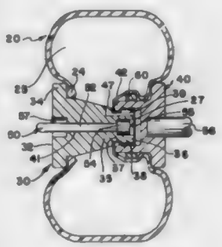
4,693,696

INFLATED BALLOON TIRE FOR TOY VEHICLES

Gordon H. Buck, 3784 Newton St., Torrance, Calif. 90505

Filed Jan. 27, 1986, Ser. No. 822,787
Int. Cl.⁴ A63H *306, 17/00;* **B60B** *9/00, 21/10*
U.S. Cl. 446—224 **24 Claims**





1. A toy tire assembly comprising:

(a) an elastomeric balloon having a single central opening at one end;

(b) a hub member having a peripheral rim about one end, with its opposite end received in said balloon and with said single central opening of said balloon seated against said peripheral rim;

(c) a cap member received over the outside surface of the opposite end of said balloon from said central opening, and cooperative engagement means between said opposite end of said hub member and said cap member, forming a hub assembly of said cap member removably interlocked to said hub member with said opposite end of said balloon engaged therebetween;

(d) a through passageway communicating from the outside of said hub, through said hub to the interior of said balloon; and

(e) valve means operatively seated in said through passageway to seal the interior of said balloon.

4,693,697

PUSH-PULL TOY

Robert J. Pagano, Mineola, N.Y., assignor to Wonderline, Inc., Bossier City, La.

Filed Dec. 4, 1985, Ser. No. 804,416
Int. Cl.⁴ A63H *5/00, 11/10*
U.S. Cl. 446—272 **14 Claims**

1. A push or pull toy comprising:

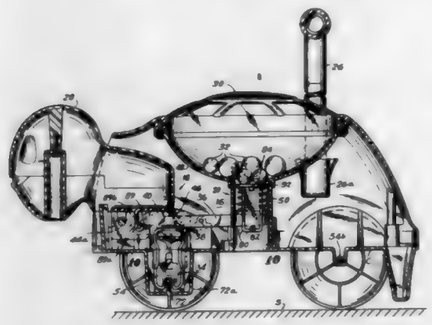
a body portion formed in the shape of an animal body and defining an internal concave surface and a transparent window overlying said internal concave surface to form a chamber;

a plurality of objects freely contained within said internal chamber;

a head portion pivotally supported by said body portion;

support and transport means, including a plurality of wheels, for supporting said body portion and enabling transport thereof over a supporting surface in response to an applied force;

dual ancillary movement means having a first branch coupled to said head portion and adapted to effect nodding movement of a first character of said head portion and a second branch adapted to effect a second ancillary movement of a popping action imparted to said objects in a



sparadic projection of two or more objects simultaneously against said transparent window;

collecting means defined in said internal concave surface causing said objects to accummulate near said second ancillary movement means;

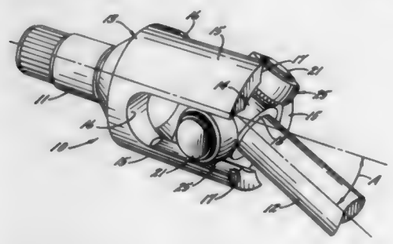
said ancillary means effecting both of said ancillary movements in response to actuation by said support and transport means.

4,693,698

COMPOSITE ROLLER FOR THE TRIPOD OF A FREE-PLUNGING CONSTANT VELOCITY UNIVERSAL JOINT

Dean A. Olson, II, Rockford, Ill., assignor to Rockford Acromatic Products Co., Rockford, Ill.

Filed Nov. 16, 1981, Ser. No. 321,450
Int. Cl.⁴ F16D *3/20*
U.S. Cl. 464—111 **3 Claims**



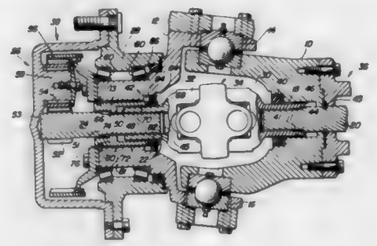
1. A free-plunging constant velocity universal joint of the tripod type for connecting a first rotatable shaft to a second rotatable shaft which is inclined at a joint angle relative to said first shaft, said joint comprising a housing member rotatable with one of said shafts and having three angularly spaced branches separated by angularly spaced slots, the sides of said branches defining tracks, a tripod rotatable with the other of said shafts, said tripod having three angularly spaced trunnions which project radially into said slots, rollers on said trunnions and each having arcuate inner and outer bearing surfaces, each of said rollers being of single-piece construction and being made of steel, needles located between each trunnion and the inner bearing surface of the associated roller and supporting the roller for rotation and for back and forth sliding on the trunnion, the outer bearing surfaces of said rollers being disposed in rolling engagement with said tracks, said universal joint being characterized in that the hardness of the outer bearing surface of each roller is less than the hardness of the inner bearing surface of such roller and is less than the hardness of said tracks.

4,693,699

SEAL ASSEMBLY FOR ROTARY AND RECIPROCATING MOTION

Stanley M. Gregerson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 24, 1985, Ser. No. 779,554
Int. Cl.⁴ F16D *3/84;* **B60K** *17/30*
U.S. Cl. 464—133 **8 Claims**



8. In the combination of a housing for a planetary assembly having a shaft opening, a drive shaft extending into said opening for axial and rotary movement relative to the housing and having an axial passage open to the interior of the housing, and a driven shaft in the housing extending into the axial passage of the first shaft and splined to the first shaft for rotation therewith and axial sliding movement relative thereto, a sealing arrangement between the first shaft and the housing comprising:

a sleeve positioned over said shafts and between said drive shaft and housing, said sleeve being splined to one of said shafts for rotation with said shafts and axial movement relative to said drive shaft;

means for preventing axial movement of the sleeve relative to the housing;

a first seal positioned between and sealingly engaging said sleeve and housing; and

a second seal positioned between and sealingly engaging said sleeve and drive shaft.

4,693,700

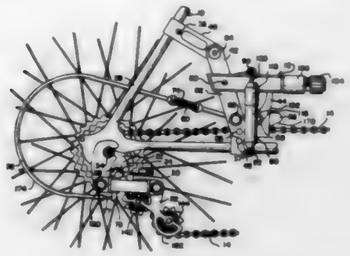
DERAILLEUR SHIFTER

Gilmore H. Chappell, 6147 Christian St., Philadelphia, Pa. 19143

Continuation-in-part of Ser. No. 707,960, Mar. 4, 1985, Pat. No. 4,599,079. This application Jul. 8, 1986, Ser. No. 883,147
Int. Cl.⁴ F16H *9/24*
U.S. Cl. 474—80 **16 Claims**

1. In an improved automatic shifter for a derailleur attached to a frame of a bicycle having a large drive gear, an endless drive chain, a rear axile and a cluster of driven gears of the type having a pivot arm means secured to the frame in spaced relation from the derailleur, a shifter arm means pivotally secured to the pivot arm means to move relative to the frame, a biasing means interconnected between the pivot arm means and the shifter arm means to continuously urge the shifter means pivotally about the pivot arm means, a stabilizing means interconnected between the pivot arm means and the shifter arm means to retard the bias of the biasing means, and a cable means interconnecting a portion of the shifter arm means and the derailleur to move the derailleur to index the chain across the cluster of driven gears in response to pivotal movement of

the shifter arm means, the improvement comprising a chain slider attached to the shifter arm means, the chain slider com-



prising a blade having a contacting surface, the contacting surface of the blade being continuously biased against the said endless drive chain.

4,693,701

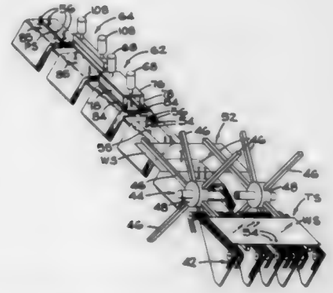
TWIN WICKETING BAG MACHINE

René F. deBin, Aalst, Belgium, assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 528,926, Sep. 2, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,692

Int. Cl.⁴ B31B *23/14*; B21B *1/98*

U.S. Cl. 493—204 **14 Claims**



1. In a bag making apparatus of the type for processing an elongated strip of thermoplastic web material being operative to divide the web into segments of equal dimension and provide each segment with at least two apertures located adjacent to and on either side of in the longitudinal median of each segment, the segments on being produced are transferred to a stacking device provided with stacking posts on which successive segments are stacked on posts projecting through the apertures,

the improvement in said apparatus comprising means operative while a stack of segments is retained on said stacking device for producing lines of perforation dividing each segment to define two bags.

4,693,702

ROTOR HAVING FRANGIBLE PROJECTIONS THEREON

David M. Carson, Newtown, and Oakley L. Weyant, Jr., Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

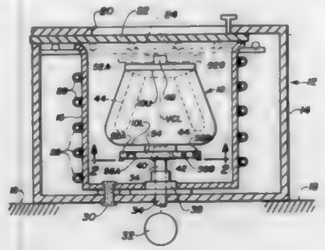
Filed Aug. 4, 1986, Ser. No. 892,262

Int. Cl.⁴ B04B *7/02, 15/02, 9/10*

U.S. Cl. 494—61 **20 Claims**

1. A centrifuge rotor for use in a centrifuge instrument of the type having an enclosable and evacuable chamber with a drive member adapted to connect the rotor to a source of motive energy projecting into the chamber, the rotor having a predetermined weight associated therewith,

the rotor having at least a first projection connected thereto through a frangible connecting region, the frangible connecting region being configured so as to fracture and thereby separate the projection from the rotor when the rotor is driven to a predetermined rotational speed,



the projection being sized and positioned on the rotor so as to exhibit an unbalance of less than the multiplication product of 0.5 gram-inches for each pound of rotor weight so that the projection may separate from the rotor without unbalancing the same to an extent sufficient to cause the rotor to leave the drive member,

the projection upon separation from the rotor forming a projectile having an energy content sufficient to puncture the chamber to admit ambient air thereinto thereby to windage limit the rotational speed of the rotor.

4,693,703

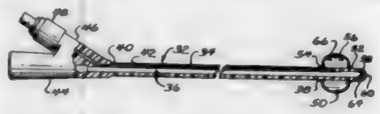
NEPHROSTOMY CATHETER WITH FORMED TIP

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 683,056, Dec. 18, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 920,811

Int. Cl.⁴ A61M *31/00*

U.S. Cl. 604—49 **2 Claims**



1. A method of performing a nephrostomy procedure, comprising the steps of:

placing a guide wire in a patient's body with a distal end of the guide wire located in the renal calyces;

advancing a catheter over the guide wire until a distal portion of the catheter is located in the renal calyces; and

inflating a balloon of the catheter in the renal calyces.

4,693,704

CERVICAL CANAL CATHETER

Sachio Ogita, 9-19, Amamihigashi-6-chome, Matsubara-shi, Osaka-fu, Japan, assignor to Sumitomo Bakelite Company Limited, Toyko and Sachio Ogita, Osaka, both of, Japan

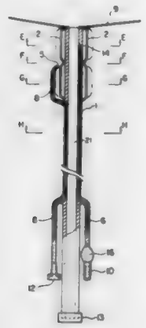
PCT No. PCT/JP83/00340, § 371 Date Jun. 5, 1984, § 102(e) Date Jun. 5, 1984, PCT Pub. No. WO84/01514, PCT Pub. Date Apr. 26, 1984

Continuation of Ser. No. 619,150, Jun. 5, 1984, abandoned. This PCT application Oct. 12, 1983, Ser. No. 824,316

Claims priority, application Japan, Oct. 12, 1982, 57-17759

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 604—55 **16 Claims**



1. A cervical canal catheter comprising:

a catheter main tube made of a soft rubber or resin and defining a main cavity therein, said main cavity haying an open end at or in contiguity to the tip of said main tube, said tip being essentially perpendicular to a central axis of said main tube;

a balloon assembly, surrounding the outer periphery of the tip, having two expandable lobes of about equal size, a narrow part being present between said two lobes, and being provided around said catheter main tube, said narrow part being adapted for receiving a strangulation ring formed by a ligature, said balloon assembly being of a size and shape adapted for the intimate adhering of said lobes to a cervical canal subjected to plication and narrowing by surgical ligature when said lobes are expanded, thereby fixing said catheter in the cervical canal;

means defining a liquid-medicine injecting hole in the narrow part;

means defining a balloon injection-hole in a part of said catheter main tube surrounded by said balloon assembly for delivering a fluid under pressure into each said lobe to cause said expansion thereof;

a balloon-injection passage for delivering said fluid to said means defining a balloon-injection hole;

a liquid-medicine injecting passage for delivering a liquid medicine to said liquid-medicine injecting hole, an end portion of said liquid medicine injecting passage at said liquid medicine injecting hole extending outside of said balloon assembly;

said balloon injection-passage and said liquid-medicine-injecting passage each having for a majority of the lengths thereof, a side thereof defined by a wall of said catheter main tube, and, at the end of said catheter main tube, branching off from said catheter main tube.

4,693,705

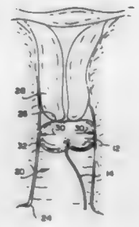
VAGINAL CONTRACEPTIVE SYSTEM

Ilona B. Gero, 300 Park Ave. South, Suite 1410, New York, N.Y. 10010

Continuation of Ser. No. 598,208, Apr. 9, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,753

Int. Cl.⁴ A61M *31/00*

U.S. Cl. 604—55 **6 Claims**



1. An intravaginal contraceptive porous sponge adapted for immediate use upon removal from a sealed packet and the sponge containing a minimal spermicidally effective amount of nonylphenoxypoly (ethyleneoxy) ethanol as the spermicide in a bacteria-free aqueous solution, pectin and at least one preservative.

4,693,706

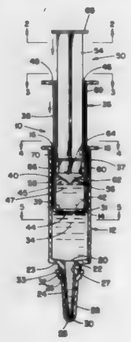
TWO COMPARTMENT MIXING SYRINGE

James F. Ennis, III, Preston, Conn., assignor to Mark L. Anderson, Elmwood, Wis.

Filed Aug. 11, 1986, Ser. No. 895,237

Int. Cl.⁴ A61M *5/00*

U.S. Cl. 604—87 **13 Claims**



1. A mixing syringe, comprising:

an inner cylindrical barrel open at one end and closed at its other end and defining an inner compartment therein for containing a quantity of a liquid;

a membrane bonded to the other end of said inner barrel closing the same thereat;

an outer cylindrical barrel open at one end thereof and defining an outer compartment therein for containing a material to be mixed with said liquid, said inner barrel being axially inserted through said one end of said outer barrel in slidable sealing contact therewith;

an elongated plunger axially movable in said inner barrel and having a head force fitted in sliding, frictional, sealing contact with said inner barrel for exerting pressure on said liquid when said plunger is advanced axially to rupture said membrane, so that said liquid enters said outer compartment and mixes with said material therein;

an open tip at the other end of said outer barrel for discharging said mixture of said liquid and said material from said outer compartment, when said plunger and said inner barrel are advanced axially in said outer barrel;

said inner cylindrical barrel having a stop means intermediate the ends thereof for preventing said elongated plunger from moving axially therefrom when subjected to an inadvertently applied force; and

said inner barrel having means extending from said stop means to said open end of said inner barrel for venting air therethrough when said elongated plunger is axially moved from said open end to said stop means.

4,693,707

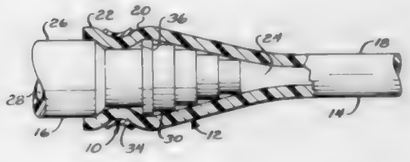
TAMPER DISCOURAGING DEVICE

John F. Dye, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 630,175, Jul. 12, 1984, abandoned. This application Mar. 4, 1986, Ser. No. 836,262

Int. Cl.⁴ A61M *27/00*

U.S. Cl. 604—111 **4 Claims**



1. A tamper discouraging device in a liquid drainage system, comprising:

an elastic catheter having an elongated shaft, a connector adjacent a proximal end of the catheter, and a drainage lumen extending through a major portion of the shaft and the connector;

a hollow drainage tube having a hollow adapter at an upstream end of the drainage tube, said adapter being received in the catheter connector; and

a circumferential endless band being heat shrunk only against the catheter over said connector and adapter, said band being spaced from the adapter and an outer end of the connector, said band being free of adhesive.

4,693,708

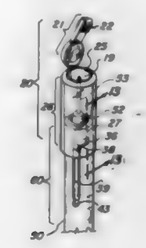
COMBINATION NEEDLE SHIELD/NEEDLE GUARD DEVICE FOR A HYPODERMIC SYRINGE WITH A PERMANENTLY ATTACHED NEEDLE

Alan A. Wanderer, 1075 E. Radcliffe, Englewood, Colo. 80110, and William E. Sagstetter, 2217 Grove, Denver, Colo. 80210

Filed Oct. 16, 1986, Ser. No. 919,373

Int. Cl.⁴ A61M *5/32*

U.S. Cl. 604—198 **9 Claims**



1. A combination needle shield/needle guard device which is positively locked onto a hypodermic syringe with a permanently attached needle;

said hypodermic syringe comprised of a syringe barrel with needle hub which is an integral part of front end of said syringe barrel;

said hypodermic needle permanently attached to said needle hub on front end of said syringe barrel;

said hypodermic syringe comprised of said syringe barrel with piston, said piston sliding inside said syringe barrel, providing means to force liquid medicament inside said syringe barrel through opening of said needle;

said needle shield/needle guard device comprising a hollow cylindrical housing which is sealed at its proximal end on weakend annular zone with an integral pull-off tab, said cylindrical housing with an internal protrusion located on distal inner wall of said cylindrical housing;

means for positive locking of said needle shield/needle guard device onto groove system on front end of said syringe barrel, said means preventing forward, backward and counterclockwise rotation of said needle shield/needle guard device in relation to front end of said syringe barrel;

means for said needle shield/needle guard device as needle shield to enclose said sterile needle which is permanently attached to said needle hub of said hypodermic syringe barrel;

means for aperture formation on proximal end of said needle shield/needle guard device;

means to prevent direct retraction of said cylindrical housing from extended lock position to retracted lock position;

means for said cylindrical housing of needle shield/needle guard device as said needle guard which can retract in relation to said syringe barrel, such that said cylindrical housing with said aperture can be moved from said extended lock position to said retracted lock position, uncovering said needle with said cylindrical housing;

means for said cylindrical housing of needle shield/needle guard device as said needle guard which can extend in relation to said syringe barrel, such that said cylindrical housing can be moved from said retracted lock position to said extended lock position, re-covering said needle with said cylindrical housing from behind the needle point of said needle;

means for said cylindrical housing as said needle guard to retract and extend ad-finitum in relation to said syringe barrel;

means for visibility of volumetric calibrations on said syringe barrel when said cylindrical housing has moved intos aid retracted lock position on said syringe barrel.

4,693,709

SYRINGE

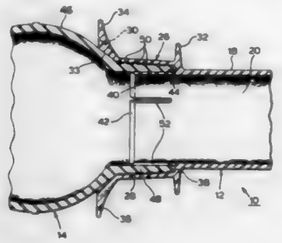
Robert D. George, Lake St. Louis, and Robert D. Banning, St. Peters, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Apr. 8, 1985, Ser. No. 720,825

Int. Cl.⁴ A61M *1/00*

U.S. Cl. 604—212 **12 Claims**

1. An irrigation syringe barrel device comprising an integral single piece barrel including a cylindrical portion having a cylindrical bore open at the proximal end thereof and capable of receiving a sryinge plunger rod having a piston thereon slidable longitudinally in sealing engagement with the walls of said bore for generating fluid pressure in said bore, an integral syringe tip at the distal end of said cylindrical portion in fluid communicaion with said bore, integral axially extending collar means at the proximal end of said cylindrical portion, and a radially inwardly extending integral wall portion integrally connecting the distal end of said collar means with said cylindrical portion at a point distally of the proximal end of said cylindrical portion and with the radially inner surface of said collar means in radial spaced relation with the radially outer surface of said cylindrical portion, said inner surface of said collar means and said outer surface of said cylindrical portion defining an axially extending substantially annular groove open at the proximal end thereof, said groove being capable of



receiving a cylindrical end portion of an elastomeric syringe bulb in tight fitting engagement with said inner surface of said collar means and said outer surface of said cylindrical portion.

4,693,710

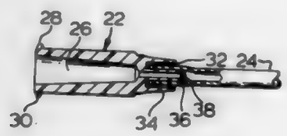
TUBE AND FITTING ASSEMBLY AND METHOD OF MAKING SAME

George W. McCool, St. Joseph, Mo., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 13, 1985, Ser. No. 711,547

Int. Cl.⁴ A61M *5/20*

U.S. Cl. 604—283 **12 Claims**



1. A medical tube and fitting assembly comprising a molded single-piece thermoplastic fitting including a luer connector having a luer tapered bore for connection with a luer tapered connector of another member, an axially extending pin adjacent one end of said fitting having a bore connected with said luer tapered bore and of smaller diameter than that of said luer tapered bore, a collar surrounding said pin and being open at the distal end thereof, said luer connector, said collar and said pin all being of the same thermoplastic material and integrally and jointlessly connected together, a plastic tube having one end portion disposed in said collar and surrounding said pin in tight, frictional engagement therewith and extending distally beyond the distal end of the said collar, said collar being heat and pressure shaped by spin forming into surrounding, tight, frictional engagement with the radially outer surface of said tube end portion with said tube end portion clamped between the radially inner surface of said collar and the radially outer surface of said pin to fixedly connect said collar, pin and tube together to form a fluid-tight mechanical connection between said fitting and said tube, said mechanical connection being established solely by said collar, pin and tube during said spin forming, the outer wall of said collar tapering distally inwardly and being of substantially minimum outer diameter at the distal end thereof.

4,693,711

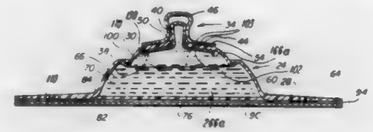
LONG-LIFE BIOMEDICAL TRANSCUTANEOUS DRUG APPLICATION DEVICE AND METHOD OF TRANSCUTANEOUS APPLICATION OF DRUGS

Roger E. Bremer, 5 Horizon Rd., Fort Lee, N.J. 07024; Charles Anthony, Jr., 53 Hickory Pl., Livingston, N.J. 07039, and Raymond M. Chappel, 21 Florie Farm Rd., Mendham, N.J. 07945

Division of Ser. No. 333,287, Dec. 22, 1981, Pat. No. 4,526,176. This application Apr. 19, 1985, Ser. No. 725,227

Int. Cl.⁴ A61M *37/00*

U.S. Cl. 604—306 **5 Claims**



1. Method of transcutaneously applying substances, such as drugs, to a body surface of a person, comprising

providing a biomedical transcutaneous application device, said transcutaneous application device comprising

a generally cup-shaped housing (**24**) of a flexible material, including a vaulted, downwardly open dish or cup-like structure forming a dome-shaped roof;

a microporous membrane sealed to and extending across the housing at a base thereof, and closing off the downwardly open housing for defining a chamber (**66**) within the housing;

a peelable, releasable, fluid-impervious protective cover film (**90**) overlying said membrane;

a liquid-compatible, pressure-sensitive adhesive means (**94**) securing said releasable cover film (**90**) to said base (**56**) of the housing, said protective film being selectively removable to expose said membrane and permit attachment of said device to a body surface;

means (**101, 102**) for subdividing said chamber into a first chamber portion (**166, 166*a***), and a second chamber portion (**266, 266*a***);

a ring-like transformation zone (**100**) circumscribing said housing at a height intermediate upper and lower limits thereof, said transformation zone extending in a plane generally parallel to said fluid-permeable membrane (**76**) and forming a mechanical discontinuity of the wall of said housing, said vaulted roof of said housing being displaceable downwardly in response to pressure applied thereto to deform said housing at said transformation zone and providing for snap-over or toggle action upon application of pressure to a top portion of the dome-shaped housing, resulting in deformation of the housing;

said subdividing means (**101, 102**) being of frangible material subject to rupture upon deformation and displacement of a wall of the housing;

at least a first body-affecting substance located in one of said chamber portions; and

a second body affecting substance, differing from said first substance located in the other chamber portion,

said substances being separated from each other during storage within said chamber portion but mixing and penetrating through the microporous membrane (**76**) to affect the skin of the user for transcutaneous application of at least one of said substances thereto,

said method comprising the steps of

stripping the peelable, releasable, fluid-impervious protective cover film from said microporous membrane;

applying the base of said housing to the body surface of a subject;

firmly pressing the housing into positive contact with the body surface of the subject and securing said membrane in contact with the body surface; and

applying pressure to a top portion of the dome-shaped housing and deforming the walls of said housing to physically transform the shape of the housing to assume a different profile with a resulting change of configuration, said pressure applying and deforming step including

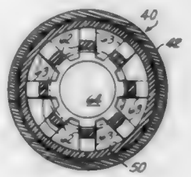
rupturing or breaking the separating means to permit mixing of the substances in said chamber portions, and apply pressure on said mixed substances to provide for penetration thereof through the microporous membrane (76) and establish transcutaneous application of said substance to the body surface of the subject.

4,693,712

BACTERICIDE VALVE ON FLUID COLLECTION BAG

David Bates, Libertyville, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 14, 1985, Ser. No. 798,209
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—323 **8 Claims**



1. A liquid collection system for collecting and discharging fluids from a patient, comprising:

a collection bag having a chamber for collection of liquid;

a tubular section in fluid communication with a lower portion of said chamber;

a valve assembly means having a valve seat and valve assembly on said tubular section having a means for opening and closing off any flow of liquid around a bactericide element in said valve means and said valve seat upstream of said bacteriacide element, downstream from said collection bag, said valve assembly also including a piston slidably disposed in a housing, said piston having a cage for enclosing said bactericide element in which fluid, when released from said collection bag, washes over said bactericide element when said valve means is opened, and stops the wash over of said bactericide element when said valve means is closed, whereby retrograde contamination to said system is minimized.

4,693,713

ABSORBENTS FOR BLOOD AND SEROUS BODY FLUIDS

Miroslav Chmelir, Grönkesdyk 36, 4150 Krefeld; Kurt Dahmen, von-Velsen.str.6, Möchengladbach; Georg Hoffman, Westwall 165, 4150 Krefeld, and Georg Werner, Dresdner Str.7, 4154 Tönisvorst 1, all of Fed. Rep. of Germany

PCT No. PCT/DE82/00146, § 371 Date Mar. 10, 1983, § 102(e) Date Mar. 10, 1983, PCT Pub. No. WO83/00289, PCT Pub. Date Feb. 3, 1983
Continuation of Ser. No. 485,128, Jun. 15, 1983, abandoned.
This PCT application Jul. 10, 1982, Ser. No. 928,573
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128100
Int. Cl.⁴ A61F *13/16*
U.S. Cl. 604—368 **19 Claims**

1. An absorbent for blood or other serous body fluids comprising a physical mixture of components A and B wherein:

component A is at least one compound selected from the group consisting of water-swellable and water-insoluble synthetic and natural polymers and copolymers; and

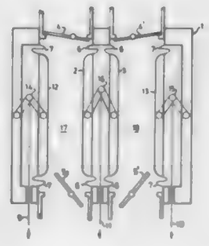
component B is at least one compound not harmful to health which is water soluble and present in the form of a pourable powder at ambient temperature selected from the group consisting of thiourea, methyl urea, ethyl urea, acrylamide, methacrylamide, monosaccharides, oligosaccharides, inorganic acids, monocarboxylic acid, polycarboxylic acid, amides of carboxylic acids, salts of monocarboxylic acids and salts of polycarboxylic acids.

4,693,714

DOUBLE PUMP ADAPTED FOR USE AS AN ARTIFICIAL HEART

Stig Lundbäck, Vaxholm, Sweden, assignor to Astra-Tech Aktiebolag, Stockholm, Sweden

Filed Mar. 8, 1985, Ser. No. 709,555
Claims priority, application Sweden, Mar. 30, 1984, 8401779
Int. Cl.⁴ A61F *2/22*
U.S. Cl. 623—3 **6 Claims**



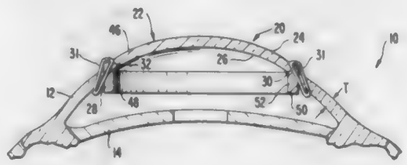
1. A double pump adapted for use as an artificial heart comprising a housing, two ventricle-simulating chambers arranged side-by-side in the housing, each chamber having a fluid inlet and a fluid outlet, and each inlet and outlet having a respective one-way valve mounted therein, a common partition wall structure separating the chambers and partly defining them and having two spaced-apart wall sections, means mounting said wall sections in the housing for movement relative to the housing in response to a difference between the respective prevailing pressures in the two chambers and for thereby changing the respective volumes and equalizing the pressures, and powered drive means for moving said wall sections away from each other intermittently and repeatedly to reduce the volumes of the chambers to expel fluid from the respective outlets.

4,693,715

ARTIFICIAL CORNEA

Robert Abel, Jr., 1100 North Grant Ave., Wilmington, Del. 19805-2695

Filed Jun. 19, 1986, Ser. No. 876,177
Int. Cl.⁴ A61F *2/14*
U.S. Cl. 623—5 **26 Claims**



1. A corneal implant adapted to be received in a substantially circular corneal aperture and sutured thereto, the cornea having a thickness T, comprising:

a substantially circular main body portion having anterior and posterior surfaces,

said main body portion having a radially outwardly facing, substantially cylindrical peripheral surface with a height H greater than T and adapted to engage the edge forming the corneal aperture, said peripheral surface having a diameter substantially equal to the diameter of said anterior surface; and

means, on said main body portion, for receiving sutures therethrough to couple said main body portion to the cornea,

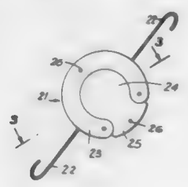
said peripheral surface extending posterior of said cornea when said implant is sutured to the cornea.

4,693,716

MULTIPARTITE INTRAOCULAR LENS

Richard J. Mackool, 31-27 41st St., Astoria, N.Y. 11103

Filed Aug. 21, 1984, Ser. No. 643,030
Int. Cl.⁴ A61F *1/16, 3/13*
U.S. Cl. 623—6 **11 Claims**



1. An intraocular lens implant, comprising:

(a) a lens body centered on a lens axis and extending along a plane normal to said lens axis, said lens body including a plurality of separate sections each of which has at least one dimension as considered along said plane which is a fraction of the diameter of said lens body to permit initial separate introduction of the respective sections into the eyeball through an incision smaller than that which would be needed for the introduction of the complete lens body, followed by subsequent assembly of said sections within the eyeball into the lens body,

(b) means for holding the assembled lens body in a predetermined position in the eyeball,

(c) one of said sections being a substantially C-shaped peripheral section and another one of said sections is a substantially circular central section at least partially circumferentially surrounded by said peripheral section in the assembled condition of said lens body,

(d) said peripheral and central sections having respective internal and external surfaces which face one another in the assembled condition of said lens body, one of said surfaces being provided with at least one projection and the other of said surfaces having at least one recess which receives said projection in the assembled condition of said lens body to hold said central section in a predetermined position relative to said peripheral section, and

(e) said projection being configured as a substantially circumferentially extending rib, and said recess being configurated as a substantially circumferentially extending groove.

4,693,717

INTRAOCULAR LENS FORMED IN SITU WITHIN THE EYE

Paul E. Michelson, 2280 Calle Tiara, La Jolla, Calif. 92037

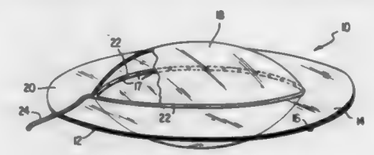
Filed Mar. 12, 1986, Ser. No. 838,692
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **4 Claims**

1. A method of implanting an intraocular lens within an eye, said method comprising:

providing a collapsible lens mold comprised of two transparent, flexible, film-like sheets which are bonded together to form a sheath which defines a cavity bounded by opposite anterior and posterior portions of the sheath, said portions each being preformed so that the cavity has a predetermined lenticular shape when the cavity is filled with a flowable material, said mold further including a tubule connected to said sheath and communicating with said cavity for providing a conduit for a flowable material to be injected into said cavity;

inserting said mold in a collapsed condition into an eye so that said tubule is accessible to a tool for injecting a flowable material into the cavity of said sheath via said tubule;

providing a lenticular material which has a first state in which the material is flowable and a second state in which



the material is shape retaining and has a desired refractive index, the material changing from the first state to the second state under conditions extant within the eye;

injecting said material, while in the first state, into the cavity of the sheath through the tubule until the cavity is filled, the material assuming the lenticular shape determined by the preformed portions of the sheath; and

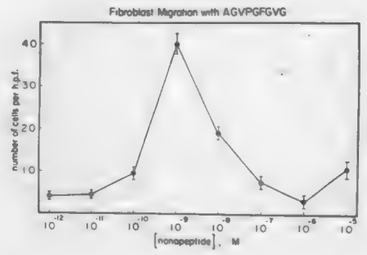
allowing the material to change from the first state to the second state, thereby retaining the lenticular shape determined by the preformed portions of the sheath and forming an optical lens within the sheath having a power determined by said lenticular shape and the refractive index of the material.

4,693,718

STIMULATION OF CHEMOTAXIS BY CHEMOTACTIC PEPTIDES

Dan W. Urry, and Marianna M. Long, both of Birmingham, Ala., assignors to University of Alabama in Birmingham, Birmingham, Ala.

Filed Oct. 31, 1985, Ser. No. 793,225
Int. Cl.⁴ A61F *2/02*; A01N *1/02*
U.S. Cl. 623—11 **10 Claims**



1. A prosthetic device wherein a surface of said device has a chemotactic peptide of the formula

$$B^1\text{-}X\text{-}(AGVPGFGVG)_n\text{-}Y\text{-}B^2$$

wherein

A is a peptide-forming residue of L-alanine:

P is a peptide-forming residue of L-proline;

G is a peptide-forming residue of glycine;

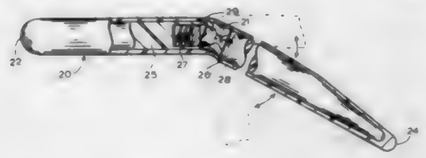
V is a peptide-forming residue of L-valine;

F is a peptide-forming residue of L-phenylalanine;

B^1 is H or a biocompatible N-terminal group;

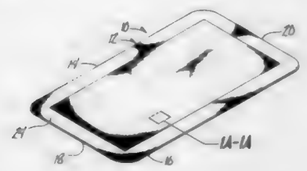
B^2 is OH, OB^3 where B^3 is a non-toxic metal ion, or a biocompatible C-terminal group:
X is GVPGFGVG, VPGFGVG, PGFGVG, GFGVG, FGVG, GVG, VG, G or a covalent bond;
Y is AGVPGFGV, AGVPGFG, AGVPGF, AGVPG, AGVP, AGV, AG, A or a covalent bond; and
n is an interger from 1 to 100; incorporated into said surface.

4,693,719
MECHANICAL PENILE PROSTHESIS
Zenon Z. Franko, Union, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.
Filed Feb. 14, 1985, Ser. No. 701,771
Int. Cl.[4] A61F *2/26, 5/00*
U.S. Cl. 623—11 **12 Claims**



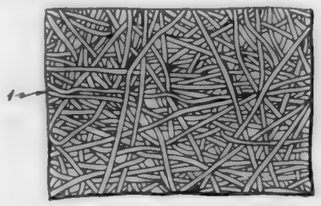
1. A penile erection prosthesis to be fully implanted in a patient having two relatively rigid cylindrically-shaped end segments at least one of the segments having a female end containing a locking mechanism for a flat surfaced connector which joins said segments in two distinct positions, said locking mechanism comprising an axially aligned biasing means located in a receiving means which extends inwardly from a ball socket of said female end, said connector comprising at least one a truncated spherical arm which mates with said ball socket and is secured for rotation within said socket, a first self-locking erect position in which said segments are axially joined and aligned wherein said connected locks into said erect position through the action of the biasing means poressing a flat rider against the flat surface of the spherical arm, and a second unlocked, dependent position in which said segments are joined and non-axially aligned.

4,693,720
DEVICE FOR SURGICALLY REPAIRING SOFT TISSUES AND METHOD FOR MAKING THE SAME
Lorne C. Scharnberg, Des Moines, Iowa, and Deva Devanathan, Warsaw, Ind., assignors to Katecho, Incorporated, Des Moines, Iowa
Filed Sep. 23, 1985, Ser. No. 779,068
Int. Cl.[4] A61F *2/02;* **A61B** *17/04;* **A01N** *1/02*
U.S. Cl. 623—11 **2 Claims**



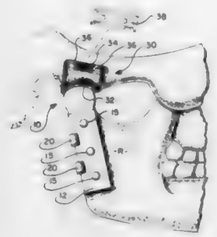
1. A device for use in surgically repairing soft tissues of a living animal, said device comprising:
a flexible planar sheet having a plurality of perimetric edges extending around the perimeter thereof, said sheet being formed by at least first and second groups of strands, each of said groups of strands comprising a plurality of filamentous carbon strands;
each of said strands in said first group of strands extending generally in a first direction, and each of said strands in said second group of strands extending generally in a second direction from said first direction and being formed into an interwoven relationship with said strands of said first group of strands whereby said interwoven first and second groups of said strands combine to form said flexible planar sheet, wherein said first group of strands are interwoven in a regular weave with said second group of strands whereby said strands of said first group pass alternatively over and under adjacent strands of said second group and wherein said strands of said second group pass alternatively over and under adjacent strands of said first group;
a first film of biodegradable polymer coating said first and second groups of strands and holding said first and second groups of strands against relative movement therebetween so as to prevent unraveling of said interwoven relationship of said first and second groups of said strands;
a second film of biodegradable polymer coating said flexible planar sheet adjacent said perimetric edges thereof to form an edging strip extending completely around said perimetric edges of said planar sheet,
said second film comprising a heavier concentration of said biodegradable polymer than said first film whereby said edging strip is sufficiently strong to support sutures when said device is surgically implanted in said animal;
said biodegradable polymer of said first and second films being substantially non-toxic to said living animal and being capable of hydrolyzing and metabolizing over an extended period of time after being surgically placed within said living animal;
said first and second films being the only material coating said flexible planar sheet,
wherein said films are coated according to the method comprising:
applying a first solution to said planar sheet, said first solution comprising said biodegradable polymer dissolved in a solvent;
permitting said solvent of said first solution to evaporate, thereby leaving said first film of said polymer on said planar sheet;
applying a second solution to the perimetric edges of said flexible sheet, said second solution comprising said biodegradable polymer dissolved in a solvent in a greater concentration than the concentration of said polymer in said solvent of said first solution;
permitting said solvent in said second solution to evaporate, thereby leaving said second film of said biodegradable polymer to form an edging strip around said perimetric edges of said planar sheet.

4,693,721
POROUS FLEXIBLE METAL FIBER MATERIAL FOR SURGICAL IMPLANTATION
Paul Ducheyne, 27 Haymarket La., Bryn Mawr, Pa. 19010
Continuation of Ser. No. 661,772, Oct. 17, 1984, abandoned. This application Apr. 22, 1986, Ser. No. 854,700
Int. Cl.[4] A61F *2/28, 2/02*
U.S. Cl. 623—16 **8 Claims**



7. A biocompatible flexible and permanently deformable porous metallic fiber mesh sheet consisting essentially of a multiplicity of interengaged and intertwined biologically inert metallic fibers, each of said fibers having a length in the range of about 2 to about 50 millimeters, and a diameter in the range of from about 40 to about 100 micrometers; said fibers being interengaged and intertwined with each other to form a porous mesh having a porosity of from about 80% to about 95%, and a thickness in the range of from about 0.5 to 30 millimeters, said mesh sheet being flexible and permanently deformable without losing its structural integrity and being characterized by an elasticity approximately the same as the elastic properties of trabecular bone, and being further characterized by having an apparent modulus of elasticity in the range of from about 80 to about 100 MPa and by a porosity such that bony tissue can penetrate into the pores of said mesh when said mesh is pressed against the surface of the skeletal structure of a living human or animal.

4,693,722
PROSTHETIC TEMPOROMANIBULAR CONDYLE UTILIZING A PROSTHETIC MENISCUS
William H. Wall, Suite 201 5139 Jimmy Carter Blvd., Atlanta, Ga. 30093
Continuation-in-part of Ser. No. 524,474, Aug. 19, 1983, Pat. No. 4,502,161, which is a continuation of Ser. No. 303,826, Sep. 21, 1981, abandoned. This application Feb. 7, 1985, Ser. No. 699,138
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.[4] A61F *2/30*
U.S. Cl. 623—18 **15 Claims**



1. A prosthetic apparatus for the temporomandibular joint, comprising:
a prosthetic condyle comprising first and second plates that are adapted to be mounted to opposite sides of the ramus of the mandible;
a prosthetic meniscus which is adapted to be inserted into the temporomandibular joint capsule between the temporal bone of the patient and the prosthetic condyle, the prosthetic meniscus comprises a resilient insert shaped to be received in the joint capsule positioned adjacent to the glenoid fossa and defining an extension thereof extending outside the joint capsule, reinforcing mesh is embedded within the resilient insert and integrally extends into the extension, and means for fixedly attaching the extending end of the extension to an outer bone surface of the temporal bone outside of the joint capsule, the extension being connected to the insert so as the permit relative movement between the insert and the extension; wherein said first plate of the prosthetic condyle is provided with a convex surface that is located directly adjacent to the prosthetic meniscus.
said second and first plates comprising a flat portion, wherein the flat portion of the first plate is adapted to be mounted to the ramus of the mandible and said first plate also comprises a curved neck portion that extends from the flat portion and on which a convex portion is provided; wherein the flat portion of the first plate further comprises at least one polygonal aperture and, the flat protion of the second plate comprises at least one tang having a polygonal tip that is adapted to mate with with polygonal aperture in the first plate.

4,693,723
SHOULDER PROSTHESIS
Jean-Jacques Gabard, Maule, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Continuation-in-part of Ser. No. 604,936, Apr. 27, 1984, abandoned. This application Mar. 7, 1985, Ser. No. 709,606
Claims priority, application France, May 2, 1983, 83 07251
Int. Cl.[4] A61F *2/40*
U.S. Cl. 623—19 **8 Claims**

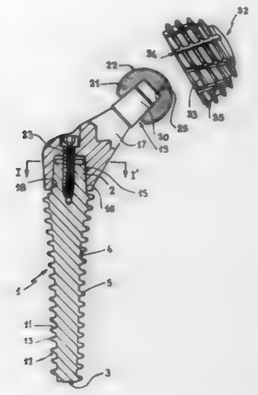


1. An implantable shoulder prosthesis for mechanical suspension on a human shoulder blade comprising:
a swivel joint system formed of an articulating sphere attached to one end of a rod and said rod having an opposite end integral with a substantially planar L-shaped blade member and wherein a short leg of said L-shaped member covers an auxiliary edge of said shoulder blade and a longer leg of said L-shaped member covering the natural socket of said shoulder blade; and
a humeral cupula member having an outer and inner substantially spherical surfaces concentric to each other, said surfaces being truncated so as to define an open face terminating in a planar surface close to that of a normal anatomical humeral head; said cupula member being fixed to the humerus by an elongated diaphyseal projection defining a longitudinal axis therethrough and supporting at one end thereof said cupula, whereupon insertion of said projection into a cavity in the humerus said axis passes through a spherical center of said cupula and subtends an angle of approximately 10° with said planar surface such that the articulating sphere is forcefitted directly into the cupula which surrounds over half of the circumference of said sphere.

4,693,724
TOTAL HIP PROSTHESIS WITH PRIMARY FIXATION
Jean L. Rhenter, 57 rue Michelet, 42000 Saint Etienne, and Jean Collomb, L'Olagnier, 26800 Portes les Valence, both of France
Filed Jan. 21, 1986, Ser. No. 820,636
Claims priority, application France, Jan. 31, 1985, 85 01528
Int. Cl.[4] A61F *2/32*
U.S. Cl. 623—23 **6 Claims**

1. An improved total hip prosthesis with primary fixation, comprising:
a threaded femoral pin for threadable insertion into a medullary cavity of a femur, said pin having a head at a proximal end and a distal end at an opposite end from said head;
a cotyloidal cupule for engagement with the acetabulum of a threaded hip; and
a prosthetic neck, the neck having a sphere for joining the head of a pin to the cupule;
the threaded femoral pin having a circular cross-section in a plane orthogonal to a sagital plane and along the entire

length of the pin an anatomical profile in a sagital plane defined by a radius of curvature which continuously non-



linearly varies from said distal end of said pin toward said head of said pin.

CHEMICAL

4,693,725

AQUEOUS LIQUID DYE COMPOSITION CONTAINING BIFUNCTIONAL REACTIVE DYE HAVING BOTH MONOHALOGENOTRIAZINYL AND VINYL SULFONYL FIBER REACTIVE GROUPS

Noriaki Yamauchi; Shinnei Ikeou, both of Hirakata, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

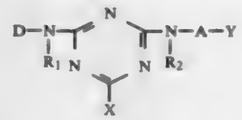
Filed Feb. 20, 1986, Ser. No. 831,300

Claims priority, application Japan, Jul. 17, 1985, 60-157337

Int. Cl.⁴ C09B *67/00, 62/00*

U.S. Cl. 8—527 **10 Claims**

1. An aqueous liquid dye composition, which comprises a bifunctional reactive dye of the following formula,



wherein D is an organic dye residue having at least one sulfonic acid group, R_1 and R_2 are independently a hydrogen atom or an unsubstituted or substituted lower alkyl group, A is an unsubstituted or substituted phenylene or naphthylene group, X is a halogen atom, and Y is $-SO_2CH{=}CH_2$ or $-SO_2CH_2CH_2Z$, in which Z is a splittable group by an alkali, in an amount of 5 to 50% by weight based on the weight of the liquid dye composition, the liquid dye composition having a pH value of from 3 to 7.

4,693,726

PROCESS FOR DYEING OR PRINTING CELLULOSE FIBERS OR CELLULOSE BLEND FIBERS WITH PYRIDINIUM-TRIAZINE REACTIVE DYE, AXABLE WITHOUT ALKALI

Fritz Meininger, Frankfurt am Main; Peter Mischke, Bad Soden am Taunus; Gerd König, Hofheim am Taunus, and Hartmut Springer, Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

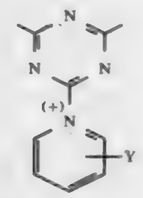
Filed Apr. 3, 1986, Ser. No. 847,722

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512630

Int. Cl.⁴ D06P *1/38, 3/66;* **C09B** *62/04*

U.S. Cl. 8—547 **18 Claims**

1. A process for dyeing cellulose fibers of cellulose blend fibers, which comprises dyeing the fibers mentioned with water-soluble reactive dyes which contain in the dye molecule, as the only fiber-reactive group or groups in the dye molecule, at least once the structural element of the formula


(1)

in which Y denotes a hydroxyl, hydroxymethyl, alkoxy C_1–C_4, aldehyde, carboxamide, monoalkyl C_1–C_4-carboxamide, dialkyl C_1–C_4-carboxamide, monophenyl carboxamide, cyano, alkyl C_1–C_4-oxycarbonyl or sulfo group or a halogen atom, in an aqueus medium within the pH range 4–11.

4,693,727

PROCESS FOR DYEING SYNTHETIC POLYAMIDE MATERIALS WITH FIBRE-REACTIVE ANTHRAQUINONE DYES

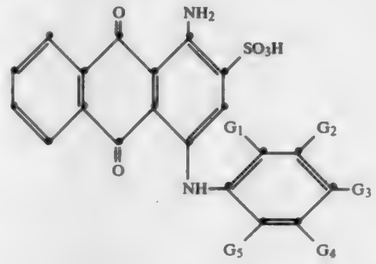
James B. Bowles, Greensboro; Marshall White, Jr., High Point, both of N.C.; Alois Puentener, Rheinfelden, Switzerland; Jean-Marie Adam, Rosenau, France, and Peter Loew, Muenchenstein, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 669,548, Nov. 8, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 841,064

Int. Cl.⁴ D06P *1/38, 3/24;* **C09B** *67/26*

U.S. Cl. 8—549 **20 Claims**

1. A continuous process for preparing ozone-fast dyeings on synthetic polyamide fiber material from aqueous liquor with anthraquinone dyes which comprises applying to said fiber material from said liquor at least one anthraquinone dye of the formula



in which G_1, G_2, G_4 and G_5 are each hydrogen and G_3 is a α,β-dibromopropionylamino, or in which G_1, G_3, G_4 and G_5 are each hydrogen and G_2 is vinylsulfonyl, chloroacetylamino, 2-methoxy-4-fluoro-s-triazinylamino or 2-ethylamino-4-fluoro-s-triazinylamino, or in which G_1 is methyl, G_2 is 2,6-difluoro-5-chloropyrimidinylamino, G_3 and G_5 are both hydrogen and G_4 is sulfo, or in which G_1 is methoxy, G_2, G_3 and G_5 are each hydrogen and G_4 is β-sulfatoethylsulfonyl, or in which G_1, G_3 and G_5 are each methyl, G_2 is hydrogen or —CH(COOH)—NH—CO—$CHBr—CH_2Br$ and G_4 is α,β-dibromopropionylaminomethyl or —CH(COOH)—NH—CO—$CHBr—CH_2Br$, or in which G_1, G_3 and G_5 are each methyl, G_2 is α,β-dibromopropionylamino and G_4 is sulfo, or in which G_1 is sulfo, G_2, G_4 and G_5 are each hydrogen and G_3 is α-dibromoacryloylamino.

4,693,728

HYDROCOLLOID BLEND FOR CONTROLLED RELEASE OF CALCIUM IONS

Kenneth Clare, San Diego, Calif., and William Gibson, Horsham, England, assignors to Kelco International Limited, London, England

Filed Aug. 27, 1985, Ser. No. 770,114

Claims priority, application United Kingdom, Aug. 30, 1984, 8421957

Int. Cl.⁴ A23L *1/04;* **C08L** *29/04;* **D06P** *1/48;* **C09D** *11/14*

U.S. Cl. 8—561 **4 Claims**

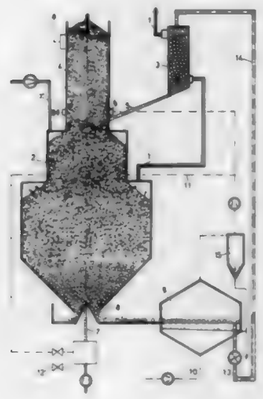
1. Blend of (2) a hydrocolloid selected from the group consisting of guar, oxidized guar, carboxymethyl guar, hydroxyalkyl guar, polyvinyl alcohol, carboxymethyl cellulose, xanthan gum, cold water soluble locust bean gum, cold water soluble starch, hydroxyethylated starch, and hydroxypropylated starch and (2) a calcium, barium, or strontium salt wherein the ratio by weight of salt to hydrocolloid ranges from 10:1 to 1:20.

4,693,729

METHOD FOR GASIFYING SOLID FUELS

Georg Beckmann, Vienna; Bruno Hillinger, Hinterbrühl, both of Austria, and Bodo Wolf, Freital, German Democratic Rep., assignors to Waagner-Biro Aktiengesellschaft, Austria

Filed Feb. 3, 1986, Ser. No. 825,628
Claims priority, application Austria, Feb. 7, 1985, 348/85
Int. Cl.[4] C10J 3/12, 3/14, 3/16
U.S. Cl. 48—203 11 Claims



1. A method of generating low-tar generator gas from a solid, bituminous fuel, comprising the the steps of

converting the solid fuel into tar-containing generator gas in two gasification zones arranged one above the other, including

introducing hot ballast bodies into the upper gasification zone so as to preheat the solid fuel therein by contact with said hot ballast bodies which are thus admixed with the solid fuel;

introducing a gasification medium which at least in part contains oxygen and water vapor from above into the upper one of said two gasification zones and from below into the lower one of said two gasification zones, whereby the gasification medium contacts the partially combusts the solid fuel under the formation of separate conflagration fronts in said gasification zones with attendant generation of additional heat that brings the solid fuel to the gasification temperature thereof;

discharging the hot tar-containing generator gas produced in said two gasification zones from a region situated between the two gasification zones;

contacting the ballast bodies in a zone separate from said gasification zones with the hot tar-containing generator gas from said gasification zones to preheat the ballast bodies prior to the mixing of the same with the solid fuel, whereby said ballast bodies capture at least a significant proportion of the tar contained in the generator gas and carries said tar with it into the upper gasification zone;

discharging the ballast bodies together with ash resulting from the gasification process from the lower gasification zone;

separating the ballast bodies from the ash; and

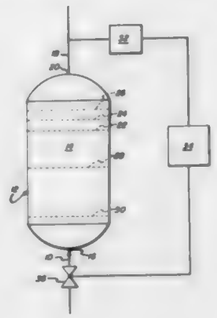
returning the separated ballast bodies into said zone separate from said gasification zones.

4,693,730

PRESSURE SWING ADSORPTION PRODUCT PURITY CONTROL METHOD AND APPARATUS

Geoffrey Q. Miller, Spring Valley, and Robert L. Gray, Jr., Mahopac, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 24, 1986, Ser. No. 889,795
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—18 20 Claims



1. A process for controlling the level of impurity in a gas product stream from a pressure swing adsorption process including a cocurrent depressurization step, comprising:

sensing a characteristic of the effluent from said cocurrent depressurization step; and

taking a corrective action responsive to the sensed characteristic, said action being effective to vary the impurity concentration in the product gas in the direction necessary to obtain desired product purity.

11. An apparatus for controlling the level of impurity in a gas product stream from a pressure swing adsorption process including a cocurrent depressurization step, comprising:

means for sensing a characteristic of the effluent from said cocurrent depressurization step; and

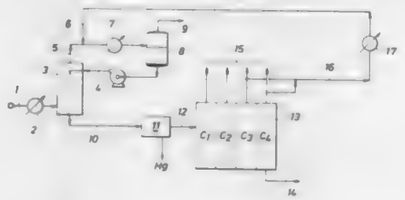
means for taking a corrective action responsive to the sensed characteristic, said action being effective to vary the impurity concentration in the product gas in the direction necessary to obtain desired product purity.

4,693,731

REMOVAL OF MERCURY FROM GASES

Ramanathan R. Tarakad, and Duffer B. Crawford, both of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Oct. 27, 1986, Ser. No. 923,462
Int. Cl.[4] B01D 19/00
U.S. Cl. 55—72 14 Claims



1. A process for removing mercury from a natural gas stream which comprises:

(a) contacting the natural gas stream in a gas/liquid contacting zone with a first mercury-free hydrocarbon liquid having a molecular weight between 20 and 130;

(b) recovering a mercury-enriched hydrocarbon liquid from the gas/liquid contacting zone; and

(c) recovering a mercury-lean methane-rich gas from the gas/liquid contacting zone;

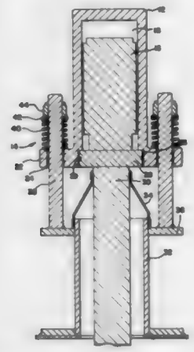
(d) recovering mercury from at least a portion of the mercury enriched hydrocarbon liquid.

4,693,732

PISTON VIBRATOR

William L. Blackford, Peoria, Ill., and Greg Zakharin, Encino, Calif., assignors to Martin Engineering Company, Neponset, Ill.

Filed Feb. 19, 1987, Ser. No. 16,229
Int. Cl.[4] B03C 3/76
U.S. Cl. 55—112 6 Claims



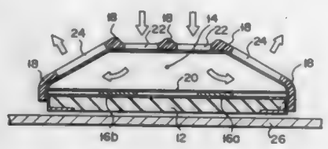
1. A piston vibrator including a housing, a cylinder defined in said housing, a piston slidably disposed in said cylinder, a strike surface associated with said housing and disposed between said piston and a member to be vibrated, means to activate said piston whereby said piston is caused to periodically impact against said strike surface, and selective adjustment means associated with said housing adjustable to selectively vary a pre-load exerted by said housing and strike surface on said member to be vibrated.

4,693,733

AIR CLEANER

Yasuyuki Fuzimura, Zushi, Japan, assignor to Kankyo Company Limited, Japan

Filed Sep. 9, 1986, Ser. No. 905,152
Int. Cl.[4] B03C 3/36
U.S. Cl. 55—129 9 Claims



1. An air cleaner comprising:

a substrate;

a pair of anodes mounted on the substrate;

a cathode mounted on the substrate and interposed between the pair of anodes, the cathode being insulated from the pair of anodes; and

a cover mounted on the substrate which covers the pair of anodes and the cathode, the cover having an inlet formed in the region of the cover, which is near from the cathode, and the cover having a pair of outlets formed in the region of the cover, which are near from the pair of anodes, respectively;

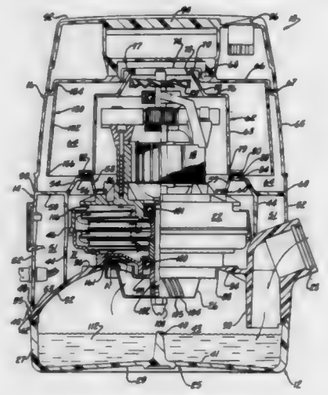
the inlet and the pair of outlets being arranged such that when a negative and positive voltage is applied to the cathode and the pair of anodes, respectively, air is inhaled into the cavity defined by the cover and the substrate from the inlet and is vented from the cavity through the pair of outlets.

4,693,734

VACUUM CLEANER CONSTRUCTION

Roy O. Erickson, Jr., Cadillac, Mich., assignor to Rexair, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 782,509, Oct. 1, 1985, Pat. No. 4,640,697. This application May 19, 1986, Ser. No. 864,820
Int. Cl.[4] B01D 47/02
U.S. Cl. 55—248 8 Claims



1. A liquid bath vacuum cleaner comprising a pan assembly adapted to contain a liquid bath including inlet means for enabling ingress of cleaning air into said vacuum cleaner and having an outer wall and a wall extending radially inwardly from said outer wall forming an opening at the top of the pan assembly, a baffle means operably associated with said outer wall and said radial wall of said pan assembly for reducing vacuum noise, a main housing operably associated with said baffle means, said baffle means operably positioned between said pan assembly and said main housing, said main housing including a main housing cavity including outlet means for enabling egress of cleaning air from said main housing cavity and said vacuum cleaner, a cap assembly operable associated with said main housing, said cap assembly including a cap assembly cavity, an inner canister positioned within said cap assembly including a motor, a motor assembly mounted within said inner canister, means for drawing cooling air into said cap assembly associated with said motor, means for enabling cooling air to egress from said inner canister into said cap assembly cavity, means for enabling cooling air to egress from said cap assembly cavity and said vacuum cleaner, means operably associated with said main housing assembly for dividing said main housing assembly from said cap assembly, said dividing means including an opening, means operably associated with said dividing means for separating said main housing cavity from said cap assembly cavity, said separating means including a support ring having an opening associated with and secured to said dividing means at said dividing means opening, and a fan housing assembly, including a fan, positioned within said main housing cavity and associated with and secured to said support ring at said support ring opening, means for establishing a seal between said fan housing assembly and said radially inwardly extending wall and a separator for drawing cleaning

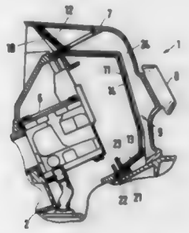
air into said pan assembly and for separating said cleaning air from liquid droplets.

4,693,735

MOTOR-DRIVEN TOOL HAVING AN AIR FILTER

Anton Wehle, Fellbach, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,793
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546028
Int. Cl.⁴ B01D *46/10*
U.S. Cl. 55—385 R **13 Claims**



1. A motor-driven tool equipped with an internal combustion engine such as a portable chain saw or the like, the tool comprising:

a housing for accommodating the engine therein;

a carburetor into which air is aspirated;

a cover mounted on the housing so as to conjointly define a path therewith for the aspirated air and a chamber through which the air passes before it enters the carburetor; and,

a single-piece double-filter unit having a prefilter section and a main filter section, said double-filter unit being mounted in said chamber to place said main filter section ahead of said carburetor in such a manner to cause said main filter section and said cover to conjointly define a compartment within said chamber and to place said prefilter section in the path of the aspirated air so as to cause the aspirated air to first pass through said prefilter section into said compartment and then through said main filter section whereupon the aspirated air passes into the carburetor.

4,693,736

OIL COOLED HERMETIC COMPRESSOR USED FOR HELIUM SERVICE

Lawrence A. Klusmier, Chelmsford, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Sep. 12, 1986, Ser. No. 906,797
Int. Cl.⁴ F25B *9/00*
U.S. Cl. 62—6 **20 Claims**

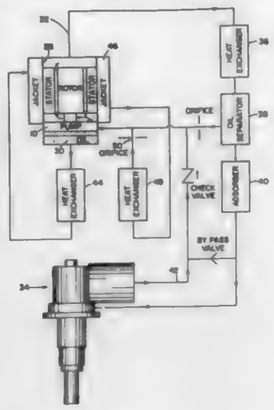
1. A cryogenic refrigeration system having an oil cooled compressor for compressing helium gas comprising:

(a) an oil sump located within the compressor;

(b) a heat exchanger for cooling oil in the sump;

(c) a heat exchange jacket surrounding the compressor for receiving oil cooled by the heat exchanger to cool the compressor;

(d) means for pumping the oil through the heat exchanger and the heat exchange jacket; and



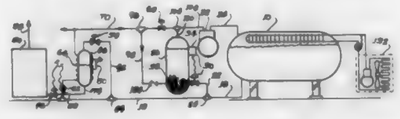
(e) means for recycling the oil from the heat exchange jacket to the oil sump.

4,693,737

REMOTE COOLING CO_2 APPLICATIONS

Lewis Tyree, Jr., Oak Brook, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Sep. 25, 1986, Ser. No. 912,048
Int. Cl.⁴ F25J *1/00*
U.S. Cl. 62—10 **14 Claims**



1. A method for providing a plurality of spaced-apart enclosures having a temperature of about −50° F. or below, which method comprises

providing a plurality of spaced-apart enclosures to be refrigerated,

providing a source of high pressure CO_2 at a temperature of about 10° F. or lower,

flowing CO_2 from said high pressure source to a plurality of tanks one of which is associated with each of said enclosures to provide high pressure liquid CO_2 therein,

creating a separate reservoir of CO_2 slush at the triple point thereof,

providing cold CO_2 vapor for absorbing heat from each of said tanks to subcool high pressure CO_2 therein and warm said vapor,

causing said warmed CO_2 vapor to flow into said CO_2 slush reservoir and condense to liquid by melting a solid portion of said slush, and

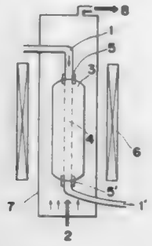
supplying subcooled liquid CO_2 to each of said enclosures from said associated tank to maintain a desired temperature within said enclosure.

4,693,738

METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Masao Hoshikawa; Michihisa Kyoto; Koji Yano, and Gotaro Tanaka, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,636
Claims priority, application Japan, Oct. 5, 1984, 59-208032
Int. Cl.⁴ C03B *37/014*
U.S. Cl. 65—3.11 **6 Claims**



1. A method for producing a glass preform for an optical fiber comprising the steps of:

maintaining, for a sufficient contact time, a hollow cylindrical porous glass preform in a first high temperature atmosphere comprising at least one gaseous fluorine-containing compound while jetting a cooling gas through the central hollow part of the porous glass preform to grade an amount of fluorine thereby added in the radial direction of the porous glass preform, said amount of fluorine added to the porous glass preform being added in sufficient quantity and under proper operating conditions to modify the refractive index of said porous glass preform, and said cooling jet being sufficient to provide for the establishment of a gradient of partial pressure of the fluorine-containing compound which increases toward the outer periphery of the porous glass preform, and then

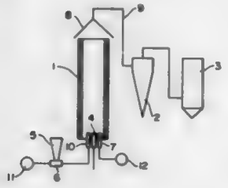
sintering the porous glass preform in a second high temperature atmosphere kept at a temperature higher than the first high temperature atmosphere to make the preform transparent.

4,693,739

METHOD FOR PRODUCING GLASS BUBBLES

Seiichiro Manabe, Itami; Tsutomu Sawano, Nishinomiya, and Takemi Saijo, Yokkaichi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jun. 18, 1985, Ser. No. 746,118
Claims priority, application Japan, Jun. 21, 1984, 59-127865
Int. Cl.⁴ C03B *19/08, 19/10*
U.S. Cl. 65—21.4 **5 Claims**



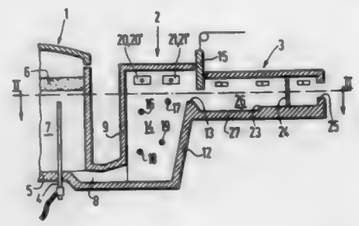
1. A method for producing glass bubbles, which comprises heating a glass powder containing a gas-blowing agent in an atmosphere containing steam having a partial steam pressure of 0.2 to 0.5 atmosphere at a temperature of about 1000° to 1600° C. to expand it.

4,693,740

PROCESS AND DEVICE FOR MELTING, FINING AND HOMOGENIZING GLASS

Robert Noiret, La Ville, and Michel Zortea, Chalon sur Saone, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 638,988, Aug. 9, 1984, abandoned. This application Oct. 30, 1985, Ser. No. 792,248
Claims priority, application France, Aug. 9, 1983, 83 13080
Int. Cl.⁴ C03B *5/225*
U.S. Cl. 65—135 **38 Claims**



3. A process for continuously producing fined glass, comprising the steps of:

melting a vitrified charge in a melting chamber to form a molten mass;

delivering said molten mass via a throat from a bottom of said melting chamber to a bottom of a fining chamber in the form of a vertically extending chute;

flowing said molten mass upward in said fining chamber, due to hydrostatic pressure; and

using heating means distributed throughout the length of said chute to homogeneously heat said upwardly flowing molten mass in said fining chamber by at least 100° C. to a fining temperature.

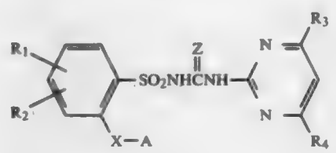
4,693,741

N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 401,583, Jul. 26, 1982, Pat. No. 4,545,811. This application Jun. 3, 1985, Ser. No. 740,937
Claims priority, application Switzerland, Aug. 6, 1981, 5075/81; Apr. 8, 1982, 2205/82
Int. Cl.⁴ C07D *239/69;* A01N *43/54*
U.S. Cl. 71—92 **24 Claims**

1. A compound of the formula:



wherein

Z is O or S;

X is O, S, SO or SO_2;

A is (i) halogenated alkyl or halogenated alkenyl of up to 6 carbon atoms or (ii) alkyl or alkenyl or up to 6 carbon atoms substituted with an unhalogenated or halogenated alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group of up to 4 carbon atoms;

R_1 is hydrogen, halo, alkyl of up to 5 carbon atoms, or R_5—Y— in which Y is O, S, SO or SO_2; and R_5 is an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_2 is hydrogen, halo, alkyl of up to 5 carbon atoms, haloalkyl of up to 5 carbon atoms, R_5—Y— in which Y and R_5

are as defined above, nitro, R_6OCO— or R_7R_8NCO—, in which R_6 is an alkyl, alkenyl, or alkynyl group of up to 5 carbon atoms; and

each of R_7 and R_8 are hydrogen or an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_3 is hydrogen, halo, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, alkylthio of up to 4 carbon atoms, haloalkyl of up to 4 carbon atoms, haloalkoxy of up to 4 carbon atoms, or alkoxyalkyl of up to 4 carbon atoms; and

R_4 is halogenated alkoxy or halogenated alkylthio of up to 4 carbon atoms.

15. A method of suppressing plant growth, which method comprises applying thereto or to the locus thereof an effective amount of a compound of claim **1**.

4,693,742

HERBICIDAL HYDROXYAMINO PHOSPHONIC ACIDS AND DERIVATIVES

Dennis R. Patterson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 20, 1983, Ser. No. 563,346

Int. Cl.⁴ A01N *57/16*

U.S. Cl. 71—86 **12 Claims**

1. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound of the formula:



wherein

R is hydrogen or lower alkyl,

R^2 is hydrogen or lower alkyl, and

A is trimethylene, 1-methylpropenylene, 2-methylpropenylene, 2-ethylpropenylene or hydroxytrimethylene, or an agronomically-acceptable salt or ester thereof, in an amount sufficient to control the growth of the weeds.

4,693,743

HERBICIDAL SULFONAMIDES

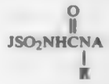
Barry A. Wexler, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 679,145, Dec. 11, 1984, Pat. No. 4,609,397, which is a continuation-in-part of Ser. No. 581,817, Feb. 21, 1984, abandoned. This application May 15, 1986, Ser. No. 863,606

Int. Cl.⁴ C07D *239/30, 239/34, 239/47;* **A01N** *43/54*

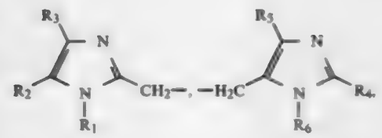
U.S. Cl. 71—92 **9 Claims**

1. A compound selected from:



wherein

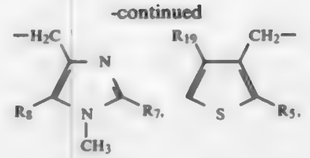
J is



J-1

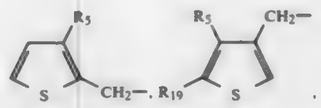
J-2

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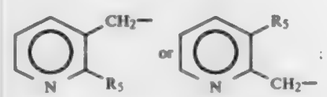
J-3

J-7



J-8

J-9



J-10

J-11

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, CO_2R_{15}, $SO_2NR_{16}R_{17}$ or SO_2R_{18};

R_2 is H or CH_3;

R_3 is H or CH_3;

R_4 is H or CH_3;

R_5 is H, CH_3, Cl, Br, CO_2R_{15}, $C(O)NR_{16}R_{17}$, $SO_2NR_{16}R_{17}$, $SO_2N(OCH_3)CH_3$, SO_2R_{18} or NO_2;

R_6 is H, C_1–C_3 alkyl, CO_2R_{15}, $SO_2NR_{16}R_{17}$ or SO_2R_{18};

R_7 is H or CH_3;

R_8 is CO_2R_{15}, $C(O)NR_{16}R_{17}$, $SO_2NR_{16}R_{17}$, $SO_2N(OCH_3)CH_3$, SO_2R_{18} or NO_2;

R_{15} is C_1–C_2 alkyl;

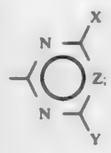
R_{16} is H or C_1–C_2 alkyl;

R_{17} is H or C_1–C_2 alkyl;

R_{18} is C_1–C_2 alkyl;

R_{19} is H, CH_3, Cl, Br, NO_2, C_1–C_2 alkylthio or C_1–C_2 alkylsulfonyl;

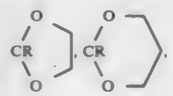
A is



A-1

X is CH_3, OCH_3, Cl, Br, OCH_2CF_3 or $OCHF_2$;;

Y is C_1–C_3 alkyl, CH_2F, cyclopropyl, C≡CH, OCH_3, OC_2H_5, CH_2OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$, OCH_2CH_2F, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CR(OCH_3)_2$,



$CR(OCH_2CH_3)_2$ or OCF_2H;

Z is CH;

provided that

(1) when X is Cl or Br, then Y is OCH_3, OC_2H_5, $NHCH_3$, $N(CH_3)_2$ OR OCF_2H;

(2) R_5 and R_6 are not simultaneously H;

(3) when R_6 is other than H or C_1–C_3 alkyl, then R_5 must be H;

(4) R_{12} and R_{13} are not simultaneously H;

(5) when R_{12} is other than H, then R_{13} must be H;

(6) R_5 and R_{19} are not simultaneously H; and

(7) when J is J-8 or J-11 then R_5 is other than H.

2. Compounds of claim **1** where R is H and A is A-1, X is CH_3 or OCH_3 and Y is C_1–C_2 alkyl or C_1–C_2 alkoxy.

3. Compounds of claim **2** wherein J is J-1.

9. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **3**.

4,693,744

HERBICIDAL ORTHO-(AZINYL)-BENZENESULFONAMIDES

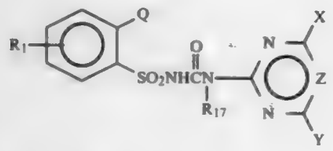
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 677,600, Dec. 3, 1984, Pat. No. 4,606,754, which is a division of Ser. No. 437,325, Oct. 28, 1982, Pat. No. 4,494,980. This application May 2, 1986, Ser. No. 858,760

Int. Cl.⁴ A01N *47/36;* **C07D** *401/12*

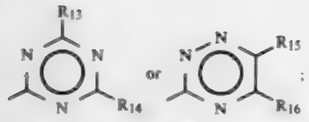
U.S. Cl. 71—93 **10 Claims**

1. A compound of the formula:



wherein

Q is



R_1 is H, F, Cl, CH_3 or OCH_3;

R_{17} is H or CH_3;

R_{13}, R_{14}, R_{15} and R_{16} are independently CH_3 or OCH_3;

X is CH_3, OCH_3 or Cl;

Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, $CH(OCH_3)_2$ NH_2, $NHCH_3$ or $N(CH_3)_2$;

Z is CH

provided that when X is Cl, then Y is OCH_3, OC_2H_5, NC_2, $NHCH_3$ or $N(CH_3)_2$ and when R_1 is CH_3, it is in the 3-, 4- or 5-position of the benzene ring;

and their agriculturally suitable salts.

8. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,693,745

CYCLOHEXANEDIONECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

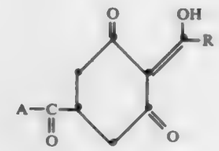
Continuation-in-part of Ser. No. 673,077, Nov. 19, 1984, Pat. No. 4,618,360, which is a continuation-in-part of Ser. No. 610,222, May 14, 1984, Pat. No. 4,584,013. This application Oct. 9, 1985, Ser. No. 785,822

Claims priority, application Switzerland, May 18, 1983, 2693/83; Dec. 19, 1983, 6747/83

Int. Cl.⁴ A01N *43/40, 37/00;* **C07D** *265/30, 211/06, 207/00;* **C07C** *121/46, 69/74, 61/08*

U.S. Cl. 71—94 **25 Claims**

1. A cyclohexanedionecarboxylic acid derivative of the formula I



(I)

wherein

A is an —OR_2 or —NR_3R_4 radical,

R is C_3–C_6cycloalkyl,

R_2, R_3 and R_4 are each independently hydrogen, C_1–C_6alkyl, C_1–C_6haloalkyl, C_1–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; C_3–C_6alkenyl which is unsubstituted or substituted by halogen, C_1–C_4alkoxy or C_1–C_4alkylthio; C_3–C_6alkynyl; phenyl or C_1–C_6aralkyl, wherein the phenyl nucleus is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, nitro or cyano; one of R_3 and R_4 is methoxy; or

R_3 and R_4, together with the nitrogen atom to which they are attached, form a 5- or 6-membered heterocyclic ring system which may contain an additional oxygen or sulfur atom in the ring; and the metal or ammonium salts thereof.

19. A composition, which contains as active ingredient a herbicidal and plant-growth regulating effective amount of a cyclohexanedionecarboxylic acid derivative according to claim **1**, together with an inert carrier and/or other inert formulation assistants.

4,693,746

CUBIC BORON NITRIDE SINTERED COMPACT FOR END MILL

Tetsuo Nakai, and Mitsuhiro Goto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 5, 1987, Ser. No. 567

Claims priority, application Japan, Jan. 6, 1986, 61-858

Int. Cl.⁴ C22C *29/04*

U.S. Cl. 75—238 **9 Claims**

1. A cBN sintered compact for an end mill obtained by sintering mixed powder containing about 35 to 50 percent by volume of cubic boron nitride powder smaller than 2 μm in average particle size and a residue of a binder under cBN-stable conditions,

said binder containing about 20 to 30 percent by weight of Al and one or more Ti compounds selected from a group of TiN_z, $Ti(C,N)_z$, TiC_z, $(Ti,M)C_z$, $(Ti,M)(C,N)_z$ and $(Ti,M)N_z$ (where M indicates a transition metal element of the group IVa, Va or VIa of the periodic table excepting Ti and z is within a range of $0.7 \leqq z \leqq 0.85$),

the atomic ratio of the content of Ti in said binder to that of said transition metal element of the group IVa, Va or VIa of the periodic table excepting Ti being about ⅓ to 97/100

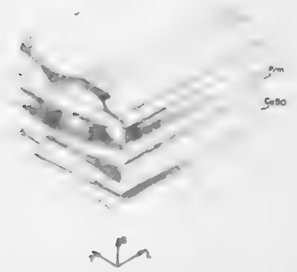
further containing tungsten in the form of at least one of said

Ti compound and WC, and the total tungsten concentration in the binder being about 5 to 20 percent by weight.

4,693,747
ALLOY HAVING IMPROVED FATIGUE CRACK GROWTH RESISTANCE

Philip E. Bretz, Plum Boro; Jocelyn I. Petit, New Kensington; Ralph R. Sawtell, Squirrel Hill, and Asuri K. Vasudevan, Plum Boro, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 18, 1985, Ser. No. 799,024
Int. Cl.[4] B22F *3/00*
U.S. Cl. 75—249 **43 Claims**



1. A method of increasing the fatigue crack growth resistance of a metal powder product comprising the steps of:
(a) providing a base metal powder alloy;
(b) admixing with said base metal alloy powder a second powder to provide a blend, the second powder capable of providing a grain size in said product greater than that resulting from the base metal powder;
(c) pressing the blend to make a green compact;
(d) hot pressing the green compact;
(e) working the hot pressed compact to a shaped product and;
(f) heat treating the shaped product to provide a final product having coarse grains in a fine grain structure having improved resistance to fatigue crack growth.

4,693,748
COMPOSITION FOR STAINING MATERIAL

Shigeyoshi Kobayashi, Kawasaki; Tsuneo Manabe, and Ichiro Yanagisawa, both of Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 912,514
Int. Cl.[4] C09K *3/00*; A61K *8/00*
U.S. Cl. 106—35 **4 Claims**

1. A composition for a calcium phosphate type staining material, which is composed of Ca and P at their atomic ratio (Ca/P) in a range of from 0.05 to 0.33; and 5 to 28 mol % of Al_2O_3.

4,693,749
CEMENT REINFORCEMENT

David M. Gale, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1985, Ser. No. 811,843
Int. Cl.[4] C04B *7/02*
U.S. Cl. 106—99 **9 Claims**

1. A coated fiber useful for cement product reinforecment comprising fiber from poly-p-phenyleneterephthalamide or copolymers thereof consisting of at least 75 mole % of p-phenyleneterephthalamide units and up to 25 mol % of p-phenylene-2,6-naphthalamide units, coated with an alkyl titanate or a titanium chelate compound.

5. A composition for reinforcement of cement products comprising a fiber from poly-p-phenyleneterephthalamide or copolymers thereof consisting of at least 75 mole % of p-phenyleneterephthalamide units and up to 25 mole % of p-phenylene-2,6-naphthalamide units, said fiber being coated with an alkyl titanate or a titanium chelate compound, and an amount of pulp of oriented polyethylene fibrids equal to from 0.01 to 100 times the amount of coated fiber on a weight basis.

4,693,750
DIRECT TABLETTING AGENT

Kurt H. Bauer, Freiburg; Bernd Pritzwald-Stegmann, and Werner Luft, both of Reitmehring, all of Fed. Rep. of Germany, assignors to Meggle Milchindustrie GmbH & Co. KG., Wasserburg, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 831,598
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506276
Int. Cl.[4] A61K *9/20*
U.S. Cl. 106—163.1 **16 Claims**

1. A direct tabletting agent, consisting essentially of a mixture of lactose and cellulose with a ratio of lactose to cellulose by weight, of from 95 to 40:5 to 60, the lactose being present partly in crystalline and partly in amorphous form and the cellulose being present as finely-divided powder and a conventional additive selected from the group consisting of a disintegration agent, an aromatising agent, a stabilizer, a filling agent, a coloring material, a lubricant and a combination thereof or said mixture of lactose and cellulose without the conventional additive.

4,693,751
TITANIUM DIOXIDE SUSPENSION FOR USE IN FILM COATING

Patrick Den Boer, Glen Rock, and Richard F. Heinze, Bridgewater, both of N.J., assignors to Crompton & Knowles Corporation, New York, N.Y.

Continuation of Ser. No. 643,550, Aug. 23, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,655
Int. Cl.[4] C08L *5/00*
U.S. Cl. 106—209 **1 Claim**

1. A composition for an aqueous pigment suspension useful in film coating, consisting essentially by weight of 50 percent titanium dioxide pigment, about 0.005 to 5 percent xanthan gum, and about 50 percent water.

4,693,752
COATING GRADE ASPHALT

Samir F. Elias, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 17, 1986, Ser. No. 853,258
Int. Cl.[4] C08L *95/00*
U.S. Cl. 106—280 **9 Claims**

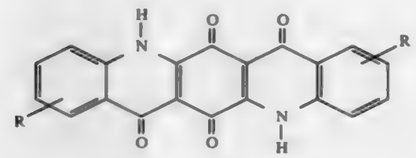
1. An asphalt-based composition suitable for use as coating grade asphalt comprising an air-blown blend of (a) 90–50% by weight of hard asphalt flux and (b) 10-50% by weight of a vacuum distilled residue by vacuum distilling the product obtained by the hydrogenation of hard asphalt flux, said residue having a flash point above 500° F., the hard asphalt flux (a) and (b) being such that cannot normally be air-blown to meet coating grade specifications for softening point and penetration whereas said composition is capable of meeting coating grade asphalt specifications for softening point and penetration and has a softening point in the range of 200–235° F. and a penetration of 14–22.

4,693,753
PIGMENTS OF THE QUINACRIDONEQUINONE SERIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Ernst Spietschka, Idstein, and Frank Prokschy, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

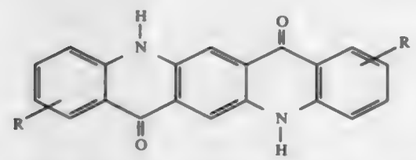
Filed Sep. 9, 1986, Ser. No. 905,672
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532343
Int. Cl.[4] C04B *14/00*
U.S. Cl. 106—288 Q **5 Claims**

1. A pigment of the quinacridonequinone series comprising 99–30 mole percent of a quinacridonequinone of the formula (1)



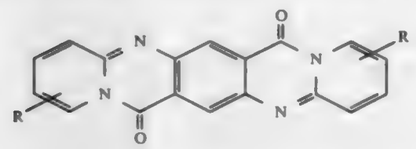
(1)

in which R denotes a hydrogen or chlorine atom or a methyl group, 0–60 mole percent of a quinacridone of the formula (2)



(2)

in which R has the abovementioned meaning, and 1–10 mole percent of a 7,15-dihydro-pyrido-(2,1-b)-(1',2'; 1,2)-pyrimido-(4,5-g)-quinazoline-7,15-dione of the formula (3)



(3)

in which R has the abovementioned meaning, the added compounds of the formulae (2) and (3) being present in the crystal lattice of the quinacridonequinone of the formula (1).

4,693,754
ALUMINUM PARTICLES RESISTANT TO REACTION WITH WATER

Tom Kondis, 842 Stevendale Dr., Pittsburgh, Pa. 15221

Continuation-in-part of Ser. No. 705,059, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 420,447, Sep. 20, 1982, abandoned. This application Mar. 7, 1985, Ser. No. 709,391
Int. Cl.[4] C04B *14/34*; C09C *1/62*
U.S. Cl. 106—290 **26 Claims**

1. A process comprising treating aluminum particles in the form of a slurry in the presence of a water-miscible organic liquid, a minor quantity of water, and an inorganic reagent capable of protecting the aluminum particles against subsequent attack by water, steam, or corrosive aqueous solutions, said inorganic reagent being one selected from the group consisting of the compounds of chromium and vanadium and being present at a concentration of about 1% to about 33% by weight on the weight of aluminum particles treated.

4,693,755
METHOD AND COMPOSITION FOR REMOVING ASBESTOS-CONTAINING MATERIALS

Bradley F. Erzinger, 6003 S. Logan St., Littleton, Colo. 80121

Filed Jun. 5, 1986, Ser. No. 871,454
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—4 **3 Claims**

1. A process for removing an asbestos-containing material from a substrate surface comprising the sequential steps of:
applying to the asbestos-containing material, a composition comprised of from about 1 to about 30 percent by weight of a cellulosic polymer and from about 99 to about 70 percent by weight of a liquid carrier;
allowing the resulting gel-like composition sufficient time to penetrate the asbestos-containing material and form a wet asbestos-containing/cellulosic polymer substance;
subjecting the wet asbestos-containing/cellulosic polymer substance to mechanical forces selected from the group consisting of scraping, chiseling, impacting, scoring, shearing and vacuuming to separate the wet asbestos-containing/cellulosic polymer substance from its substrate surface and;
collecting the resulting asbestos-containing debris for disposal.

4,693,756
METHOD AND RETORT FOR THE REMOVAL OF CARBONIZABLE COATINGS FROM THE SURFACES OF METAL OBJECTS

Horst D. Schlick, Metelen, Fed. Rep. of Germany, assignor to Schlick Roto-Jet Maschinenbau GmbH, Metelen, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 749,004
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426242
Int. Cl.[4] B08B *7/00*; B24B *1/00*; F23J *00/00*
U.S. Cl. 134—7 **9 Claims**

1. A method for the removal of carbonizable, adherent coatings from the surfaces of metal objects, in which the coatings on the metal objects are carbonized or pyrolyzed in the course of the method, comprising:
bringing one or more metal objects having one or more carbonizable, adherent coatings on one or more surfaces thereof in a substantially closed retort to the carbonizing temperature; and,
heating a blasting medium at least to a temperature so high that the temperature within the retort does not diminish below the temperature required for carbonizing within the retort;
without the one or more metal objects leaving the retort, utilizing the heated blasting medium to blast off the one or more adherent, carbonized coatings at least after the beginning of the carbonization.

4,693,757
PARTICULAR METHOD FOR TREATING ARTICLES MADE OF CORK

Modeste Sabaté, Rue Clémenceau, 66160 Le Boulou, and Joël Massé, 17 rue Aristide Maillol, 66410 Villelongue de la Salanque, both of France

Filed Feb. 19, 1985, Ser. No. 703,177
Claims priority, application France, Dec. 19, 1984, 84 19448
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—27 **13 Claims**

1. A method for treating cork plug articles comprising the steps of:
washing the cork plug articles in a first washing medium comprising a basic aqueous solution at a first concentra-

tion between 5 and 200 g/l for a time sufficient to effect degradation of lignin in said cork plug articles;

washing the basic solution treated cork plug articles in a second washing medium comprising a basic aqueous solution at a second concentration between 0.5 and 20 g/l, said second concentration being lower than said first concentration, for a time sufficient to eliminate a substantial part of the lignin degraded in the first washing medium;

treating the second washed cork plug articles in a third medium comprising a concentrated peroxide solution having a third concentration between 20 and 400 g/l, said third concentration being higher than the first concentration, for a time sufficient to achieve disinfection of the cork plug articles after drying thereof; and

drying the cork plug articles.

4,693,758

METHOD OF MAKING DEVICES IN SILICON, ON INSULATOR REGROWN BY LASER BEAM

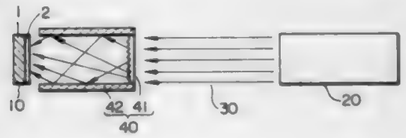
Yutaka Kobayashi, Hitachi, and Takaya Suzuki, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

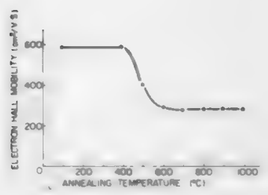
Division of Ser. No. 275,128, Jun. 18, 1981, abandoned. This application Oct. 4, 1985, Ser. No. 784,033

Claims priority, application Japan, Jun. 18, 1980, 55-81420

Int. Cl.⁴ H01L *21/263, 21/225*

U.S. Cl. 437—174 **27 Claims**





1. A method of forming a single crystalline semiconductor layer comprising the steps of:

(a) depositing a layer of semiconductor material on a main surface of an insulating substrate, said layer of semiconductor material comprising an interface sublayer adjacent said main surface of the insulating substrate and a single crystalline semiconductor sublayer formed continuously on the interface sublayer, the single crystalline semiconductor sublayer having an exposed surface not adjacent the interface sublayer, said interface sublayer being made up of an aggregate of single crystalline semiconductor grains, said single crystalline semiconductor sublayer having a predetermined orientation and

(b) irradiating a portion of said single crystalline semiconductor sublayer with an electromagnetic wave which has energy and a wavelength required to re-grow said portion substantially uniformly, from the exposed surface of said single crystalline semiconductor sublayer; said portion being all of said single crystalline semiconductor sublayer other than a seed layer part of said single crystalline semiconductor sublayer, adjacent said interface sublayer, that is necessary for serving as a seed of the re-growth.

4,693,759

METHOD OF FORMING A THIN SEMICONDUCTOR FILM

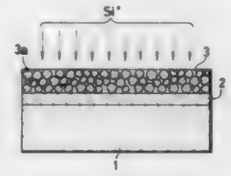
Takashi Noguchi; Hisao Hayashi, and Takefumi Ohshima, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 801,319

Claims priority, application Japan, Nov. 26, 1984, 59-249406; Nov. 30, 1984, 59-252882

Int. Cl.⁴ H01L *21/20, 21/263*

U.S. Cl. 437—24 **5 Claims**







1. A method of forming a thin semiconductor film, comprising the steps of: forming a thin semiconductor film on a predetermined substrate; implanting predetermined dopant ions in said thin semiconductor film to convert said thin semiconductor film to a thin amorphous semiconductor film; decreasing the thickness of said thin amorphous semiconductor film to a predetermined thickness; and annealing said thin amorphous semiconductor film to cause a solid-phase growth.

4,693,760

ION IMPLANATION OF TITANIUM WORKPIECES WITHOUT SURFACE DISCOLORATION

Piran Sioshansi, Bedford, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed May 12, 1986, Ser. No. 861,845

Int. Cl.⁴ C23C *11/10*

U.S. Cl. 148—4 **9 Claims**

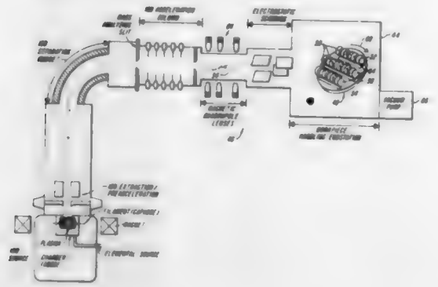
1. A process for preventing surface discoloration of workpieces formed of titanium and its alloys during their ion implantation wherein a plurality of workpieces are exposed to an ion beam in series so as to improve their wear performance comprising:

(a) exposing all titanium fixtures and shields mounted within an implant chamber prior to each ion implantation to an ion beam so as to cleanse them of surface contamination and to form a surface layer thereon having a sputtering coefficient lower than that of titanium;

(b) creating a vacuum within said implant chamber not exceeding about 5×10^{-5} torr; and

(c) introducing a workpiece formed of titanium and its alloys into said implant chamber to be secured therein by said cleansed and surface layer coated titanium fixtures and exposing said workpiece to a direct line of said ion beam while shielding areas thereof not being treated;

(d) said ion beam having an ion beam power density on the surface of said workpiece not exceeding about 1.0 watt/cm²;



(e) said ion beam incorporating one of a group of elemental species consisting of nitrogen, carbon, chromium, zirconium, oxygen, boron, tin, iron, tantalum, molbdenum, neon, argon, krypton and xenon.

4,693,761

PROCESS AND DEVICE FOR HANDLING WORKPIECES, ESPECIALLY FOR THE THERMAL SEPARATION OF PROFILES WITH A CUTTING TORCH

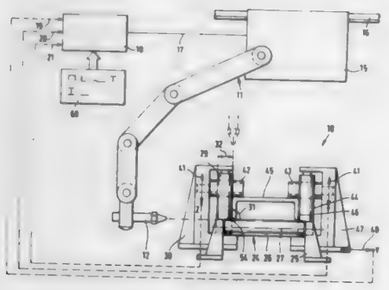
August Bohm, Kelkheim; Gerhard Lentz, Niedernhausen, and Gunter Wilkens, Kelkheim, all of Fed. Rep. of Germany, assignors to Oxytechnik, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,223

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510381

Int. Cl.⁴ B23K *7/10*

U.S. Cl. 148—9 R **15 Claims**



1. In a process for handling workpieces, such as for the thermal cutting of profiles with a cutting torch which is guided according to the contour of a workpiece by a control unit, the improvement being in storing the workpiece contour variably in the control unit, determining the absolute values of the profile to be processed by means of measuring devices in the vicinity of the profile, and transmitting the absolute values to the the control unit for determing the actual workpiece contour and for determining the control signals for the torch.

4,693,762

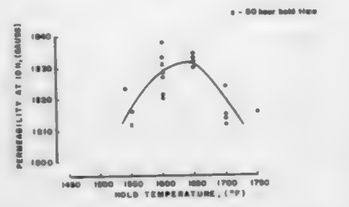
PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 510,844, Jul. 5, 1983, abandoned. This application Aug. 8, 1985, Ser. No. 763,885

Int. Cl.⁴ H01F *1/04*

U.S. Cl. 148—111 **11 Claims**



1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of preparing a steel melt containing 2.5 to 4% silicon, casting the steel, hot rolling the steel, cold rolling the steel to final gauge, decarburizing the steel, applying a refractory oxide base coating to the steel, and final texture annealing the steel by heating to and maintaining a temperature in excess of 2000° F., the improvement comprising the steps of

during final texture annealing, heating the steel to a recrystallization temperature within the range of 1600° to 1700° F.;

heating the steel at about 10° F./hour or less in the recrystallization temperature range at temperatures depending upon the thickness of the steel with higher temperatures for thinner steel for about 6 to 20 hours to substantially complete secondary recrystallization; and

heating the steel from the selected recrystallization temperature range to a temperature in excess of the 2000° F., said steel having improved magnetic permeability and core loss values.

4,693,763

WET LOADING EXPLOSIVE

Cyrus A. Ross, and Eberhard Thurow, both of Kirkland Lake, Canada, assignors to Les Explosifs Nordex Ltee/Nordex Explosives Ltd., Kirkland Lake, Canada

Filed Dec. 24, 1986, Ser. No. 945,892

Int. Cl.⁴ C06B *45/34*

U.S. Cl. 149—8 **24 Claims**

1. A water resistant explosive composition comprising:

(i) approximately 4.3% to 27% by weight of an oil/glycol emulsion including 1% to 6% by weight of an immiscible emulsifiable liquid oil, 0.3% to 5% by weight of an emulsifier and 3% to 16% by weight of a glycol, said emulsion having a density equal to or greater than water;

(ii) approximately 70% to 95% by weight of an oxidizing salt coated with said oil/glycol emusion to impart water resistance to the granules;

(iii) approximately 0.7% to 3.0% by weight of a hydratable self-complexing gelling agent; and

(iv) approximately 0% to 12% by weight of water.

4,693,764

CONTROL OF PROCESSIBILITY BY PARTICLE SIZE IN HIGH ENERGY SOLID PROPELLANTS

Donald D. Curtis, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1986, Ser. No. 909,362
Int. Cl.⁴ C06B *45/10*
U.S. Cl. 149—19.4 **1 Claim**

1. A solid propellant comprised on a weight basis of about 15.15% hydroxyl terminated polybutadiene polymer combined with isophorone diisocyanate; about 0.05% carbon black; and about 84.8% of a mixture of unground HMX having an average means diameter of about 150 microns and ground HMX, having an average mean diameter of about 8–16 microns, wherein the ratio of said ground to unground HMX is from 60:40 to 70:30 by weight and wherein the composite HMX particle size distribution is within the following limits:

Percent greater than	Nom. particle size, μ
7 ± 7	300
18 ± 12	200
47 ± 10	100
57 ± 9	70
65 ± 7	40
68 ± 6	30
71 ± 7	20
77 ± 10	10
88 ± 6	4
95 ± 5	1

4,693,765

GEL TYPE SLURRY EXPLOSIVE AND MATRIX AND METHOD FOR MAKING SAME

Donald M. Stromquist, Thirty-three C St., Salt Lake City, Utah 84103, and Boyd J. Wathen, 135 W. 740 North, American Fork, Utah 84003

Filed May 22, 1986, Ser. No. 866,455
Int. Cl.⁴ C06B *36/30*
U.S. Cl. 149—60 **24 Claims**

1. A non-explosive matrix composition to be added to an ammonium nitrate-fuel oil explosive mixture to form a slurry explosive, comprising an oxidizer solution selected from the group consisting of an aqueous sodium perchlorate solution, an aqueous ammonium perchlorate solution, an aqueous calcium nitrate solution, or a combination thereof; a thickening agent; and a fuel which serves as a dispersing agent for the thickening agent, the water and other ingredient content of the matrix being such as will make the matrix effective, when mixed with standard ammonium nitrate-fuel oil dry explosive in the range of about 14% to 40% matrix by weight, to produce a slurry explosive.

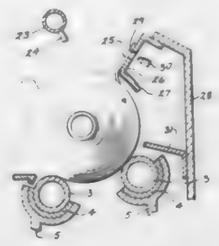
4,693,766

HIGH SPEED TAIL SEALING APPARATUS

Nelson R. Stauffer, Factoryville, Pa., assignor to Kamel Corporation, Clarks Summit, Pa.

Filed Sep. 18, 1985, Ser. No. 777,192
Int. Cl.⁴ B65H *81/00*
U.S. Cl. 156—64 **7 Claims**

1. An improved high speed apparatus for sealing the tail of a roll product, comprising a supporting structure defining a tail separating station and a wind-up station, said supporting structure including a pair of generally parallel rollers that define said tail separating station and said tail wind-up station, said stations being disposed longitudinally of said rollers, drive means for rotating the roll about its axis at the tail separating station, tail separating means disposed at the tail separating station for separating the tail from the body of the roll as the roll is rotated, tail support means disposed downstream in the direction of rotation of said roll from said tail separating means and including a supporting surface to support the separated tail, sensing means associated with said tail support means for sensing the end of the tail as the tail is drawn over said surface by continued rotation of said roll, said sensing means being connected to the drive means and operable to stop rotation of the drive means when the end of the tail is sensed by said sensing means, an apron disposed downstream in the direction of rotation from said tail support means for supporting the



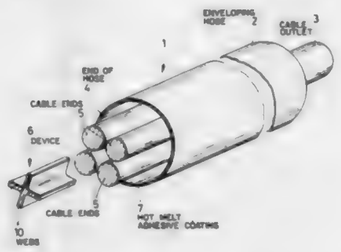
separated tail after the tail is drawn over said tail support means, conveying means for moving the roll with the separated tail from the tail separating station to the wind-up station, adhesive applying means mounted at a level above the apron for applying a strip of adhesive to the separated tail as the roll is moved to the wind-up station, and means for rotating the roll at the wind-up station to rewind the tail onto the body of the roll.

4,693,767

CABLE SLEEVE WITH A DEVICE CROSS-SHAPED IN CROSS-SECTION FOR SUPPORT OF CABLE ENDS ENTERING THE CABLE SLEEVES

Ortwin Grzanna, Essen; Manfred Koesfeld, Wetter; Rolf-Udo Weber, Muelheim; Aloysius Steuer, Essen; Horst Romswinkel, Gelsenkirchen; Dieter Fremgen, Wuelfrath, and Dieter Kastrop, Herdecke, all of Fed. Rep. of Germany, assignors to Walter Rose GmbH & Co. KG, Hagen, Fed. Rep. of Germany

Filed Jan. 13, 1986, Ser. No. 818,256
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501243; Jun. 14, 1985, 3521366
Int. Cl.⁴ H01R *43/00*; H02G *15/08*
U.S. Cl. 156—49 **9 Claims**



1. A cable sleeve for covering a cable splice formed by cables having ends, comprising an enveloping hose of heat shrinkable material, a hot melt adhesive coating covering at least some portions of the inside surface of the hose, and at least one device cross-shaped in cross-section for insertion between and support of cable ends to be entered into the cable sleeve wherein the device is a molded piece of hot melt adhesive and wherein the fusion point of the hot melt adhesive of the device is below the fusion point of the hot melt adhesive of the coating.

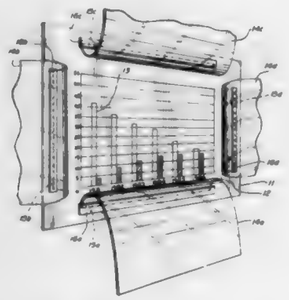
8. A process for covering a cable splice formed by cables having ends, comprising the steps of inserting a cross-shaped device of hot melt adhesive between cable ends to be spliced, placing an enveloping hose having an inside coating of hot melt adhesive over the cable ends, and fixing the device in position by applying heat to the hose, wherein the fusion point of the hot melt adhesive of the device is lower than the fusion point of the material of the inside coating of the hose, applying further heat until the fusion point of the hot melt adhesive of the coating is exceeded so that the hot melt adhesive of the coating fills the cavities existing between the cables and the hot melt adhesive of the coating is prevented by the device from exiting out from between the cables at the end of the hose.

4,693,768

ART PRODUCTION METHOD UTILIZING CAST COATED PAPER FOR PREPARATION OF CAMERA-READY ART

Wayne L. Caster, 2908 Mockingbird La., Bloomington, Ill. 61701, assignor to Wayne L. Caster, Bloomington, Ill.

Filed Aug. 14, 1985, Ser. No. 765,913
Int. Cl.⁴ B32B *31/12*
U.S. Cl. 156—62 **4 Claims**



1. In the process of producing commercial art work using an art production board with a surface to which inked indicia are applied and having one or more clear overlays juxtaposed to said board surface and to one another and with each overlay being detachably mounted on said board surface by suitable adhesive means, the improved step of employing as said board a cast-coated paper having a clay coating exhibiting a glossy surface of such hardness that chalking of the surface is not a problem and clogging of a pen used to apply inked indicia to the surface presents no difficulty, said cast-coated paper also possessing sufficient strength and durability such that errors in the application of inked indicia to said cast-coated paper surface may be readily corrected by scraping away the undesired material without marring the surface and whereby removal of said adhesive means mounting said overlays on said cast-coated paper surface also will not mar the cast-coated paper surface.

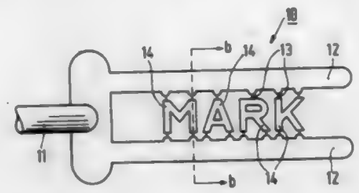
4,693,769

METHOD OF MANUFACTURING A COMBINATION OF SYNTHETIC RESIN ELEMENTS

Johannes H. Fritz, and Renaat E. Van de Leest, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,868
Claims priority, application Netherlands, May 22, 1984, 8401628
Int. Cl.⁴ B29C *37/02, 65/08*; B32B *31/14*
U.S. Cl. 156—73.1 **5 Claims**

1. A method of providing a substrate with a plurality of separate synthetic resin display elements attached thereto in a desired arrangement, each of said display elements being provided with a plane surface suitable for attaching said display element to said substrate and at least one conspicuous surface situated away from said plane surface, said method comprising forming, by molding, a unitary body consisting essentially of said plurality of synthetic resin display elements in said desired arrangement, a synthetic resin carrier and synthetic resin connecting members, each of said connecting members being



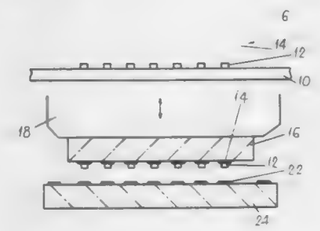
detachably joined to said synthetic resin display elements and each of said connecting elements being joined to said carrier, fully metallizing the conspicuous surfaces of said display elements, positioning said body on said substrate so that only said plane surfaces are in contact with said substrate, attaching said thus positioned body to said substrate only at said plane surfaces and detaching said connecting members and the carrier connected thereto from said synthetic resin display elements.

4,693,770

METHOD OF BONDING SEMICONDUCTOR DEVICES TOGETHER

Kenzo Hatada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1986, Ser. No. 877,967
Claims priority, application Japan, Jul. 5, 1985, 60-148908
Int. Cl.⁴ C25D *5/48*
U.S. Cl. 156—151 **16 Claims**



1. A method of fabricating a semiconductor device comprising the steps of:
conducting alignment of a metal bump and an electrode of a first semiconductor device, said metal bump being formed on a substrate;
pressing the electrode of the first semiconductor device to said metal bump on the substrate and removing the metal bump from said substrate so that said metal bump is joined to said electrode of the first semiconductor device;
conducting alignment of the metal bump joined to the first semiconductor device and an electrode of a second semiconductor device; and
pressing the metal bump to the electrode of the second semiconductor device so that the electrodes of said first and second semiconductor devices are joined together.

6. The method of fabricating a semiconductor device of claim 1, wherein resin layer is formed on said metal bump to be joined to the electrode of said first semiconductor device.

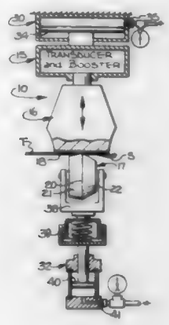
8. The method of fabricating a semiconductor device of claim 1, wherein said substrate has an opening at a position corresponding to the electrode of the semiconductor device and said bump is formed at the opening by electro-plating.

4,693,771

WOVEN TEXTILE FABRIC HAVING AN ULTRASONICALLY CUT AND SEALED EDGE AND APPARATUS AND PROCESS FOR PRODUCING SAME

George L. Payet, Fort Mill, and Stephen C. Ballard, Lancaster, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Division of Ser. No. 535,664, Nov. 28, 1983, Pat. No. 4,534,819. This application Apr. 10, 1985, Ser. No. 721,719
Int. Cl.[4] B29C *65/08*; B32B *31/18*
U.S. Cl. 156—73.3 9 Claims



1. Process for ultrasonically cutting and sealing woven textile fabric to produce a clean and sharp sealed edge of a thickness no greater than the thickness of the textile fabric and having a desired wash durability without significant raveling with an ultrasonic apparatus including a vibrating sonic horn having a flat working face and an anvil positioned for contact by the vibrating horn; said process comprising the steps of:

providing an anvil defining a peaked cutting edge, a first surface extending from the peaked cutting edge in a first direction and forming a predetermined included acute angle with the horn face of from about 3 to 20 degrees and a second surface extending from the peaked cutting edge in the opposite direction and forming an included angle with the horn face at least 2½ degrees greater than the included angle of the first surface and no more than 45 degrees for forming a desired sharpness and for reinforcing the peaked anvil cutting edge;

passing woven textile fabric having thermoplastic fibers through the ultrasonic apparatus and between the vibrating sonic horn and the anvil at a substantially constant predetermined rate of speed and in a generally linear path of travel substantially parallel to either the warp or the filling yarns of the fabric and with the peaked cutting edge of the anvil and positioned so that the edge of the fabric to be sealed is passed over the first surface of the anvil;

cutting an edge through the textile fabric substantially parallel with either a warp or a filling yarn which is parallel to the path of travel of the fabric through the ultrasonic apparatus by vibrations of the sonic horn against the peaked cutting edge of the anvil;

simultaneously sealing the cut edge of the fabric by fusing and bonding a mass of thermoplastic fibers in the fabric adjacent to and extending inwardly of the fabric from the cutting edge from about 0.01 to 0.10 inch and encompassing from about 2 to 4 of either the warp or filling yarns extending parallel to the cut edge by vibrations of the sonic horn toward the first surface of the anvil; and

applying a predetermined pressure to the anvil and to the vibrating sonic horn for exerting predetermined forces on the fabric passing therebetween for aiding in the ultrasonic cutting and sealing.

4,693,772

HOT APPLIED, EXPANDABLE SEALER

William A. Douglas, Richmond Heights, Mo., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Division of Ser. No. 787,343, Oct. 15, 1985. This application Dec. 22, 1986, Ser. No. 945,144
Int. Cl.[4] B32B *5/18*
U.S. Cl. 156—79 1 Claim

1. A method of producing a thermosetting seal between two or more surfaces comprising pumping a heated selant comprising:

about 10 percent to about 25 percent by weight of styrene-butadiene rubber, about 5 percent to about 20 percent by weight of a thermosplastic resin, about 0.5 percent to about 3 percent by weight of an accelerator activator, to about 0.2 percent by weight to about 0.75 percent by weight of a vulcanizing agent, about 25 percent by weight to about 35 percent by weight of a plasticizer, about 20 percent by weight to about 60 percent by weight of filler, about 0.5 percent by weight to about 2 percent by weight of a blowing agent, about 1 percent to about 10 percent by weight of a thickening agent about 4 percent to about 40 percent by weight of an oil or plasticizer, said composition having a sulfonamide accelerator present at concentrations of about 0.5 percent to about 3.0 percent by weight, onto at least one surface of at least one component;

cooling the heated sealant to cause it to substantially crystallize;

contacting the first component with a second component thereby causing the sealant to be positioned between the two components;

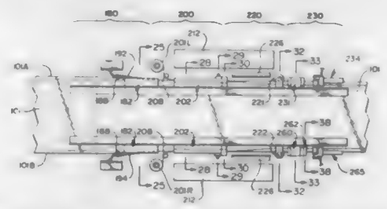
heating the entire assembly to cure and expand the sealant causing the space between the two surface to be filled by the expanding sealant.

4,693,773

METHODS FOR FORMING VISIBLE FILE POCKETS

Alan F. Davies, Vancouver, Canada, assignor to Davies Office Equipment, Ltd., Vancouver, Canada

Division of Ser. No. 461,537, Jan. 27, 1983. This application Feb. 13, 1985, Ser. No. 701,113
Int. Cl.[4] B29C *53/00*; B31F *1/00*
U.S. Cl. 156—200 28 Claims



1. The method of forming a generally rectangular visible file pocket of the type having first and second transverse parallel edges and at least two pocket tips defined by first and second turned over edges formed integrally with and respectively disposed on the front and back thereof adjacent at least one of the two edges, comprising the steps of:

(a) positioning a first rectangular ply of polymeric material adjacent a second rectangular ply of polymeric material with the first and second plies of polymeric material having heat-bondable surfaces formed thereon and disposed in face-to-face relation;

(b) applying a heat-sealing effective temperature and pressure to the first and second plies of polymeric material to form a unitary laminar central web having an unlaminated, unbonded, longitudinally extending edge portion adjacent at least one of first and second transverse parallel edges thereon and a longitudinally extending hinge pin receiving bore adjacent the other of the first and second parallel edges;

(c) heating and folding the unlaminated longitudinally extending edge portions defined by the first and second plies of polymeric material away from one another about their longitudinally extending junction with the unitary laminar central web through angles on the order of about 180°; and,

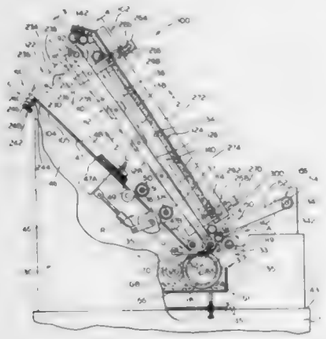
(d) cooling and setting the folded over, unlaminated, longitudinally extending edge portions in the folded over position to form first and second continuous, uninterrupted, longitudinally extending pocket tips respectively overlying and underlying the laminar central web along at least one of the first and second transverse parallel edges thereof.

4,693,774

METHOD OF LABELING USING A SEMI-AUTOMATIC LABELING MACHINE

James G. Wesley, Cicero, Ill., assignor to Labelette Company, Forest Park, Ill.

Division of Ser. No. 657,980, Oct. 5, 1984, Pat. No. 4,626,314. This application May 15, 1986, Ser. No. 863,603
Int. Cl.[4] B65C *1/20*; B32B *31/00*; B65G *47/00*
U.S. Cl. 156—215 2 Claims



1. In a method of labeling utilizing a semi-automatic labeling machine for consecutively applying discrete labels of the same predetermined size to each container of a run of round containers each of which is of the same predetermined size including external diameter, with the labeling machine including a label supply hopper having a downwardly sloping floor plate, a glue applying station, a labeling station including a pair of rotatable support rollers each having its longitudinal axis disposed normally of the path of movement of the individual labels from the supply hopper therefor through the stations, upon which machine support rollers round containers of a container run to be consecutively labeled may be manually consecutively applied on the side thereof to be supported and rotated about the longitudinal axis thereof by the machine support rollers when the latter are rotating, with the glue applying station including means for applying glue to the underside of the respective labels when received from the label supply station, and means for consecutively feeding the discrete labels londitudinally thereof along the feed path including one of said support rollers being in overlying relation to said feed path and a label feed guide mounted below the one support roller and including guide surfacing concentric with the periphery of the one support roller and disposed to direct the leading end of a label to be applied to the run container external side wall surfacing at a predetermined outfeed angle, with the one support roller being rotatable about a stationary axis and the other support roller being mounted for adjustment toward and away from the one support roller, to support and rotate containers of runs of such containers of variant diameters for label application run purposes and accommodate labeling containers of container runs made up of containers of all the same but variant container run sizes, and with the means for individually feeding the discrete labels for a run of such containers including means for individually feeding the label from the hopper through the glue applying station along the path of movement for application of glue thereto and then to label applying relation at the labeling station, and after one of the labels has been applied to consecutive of the run containers, the labeled container is manually removed from the support rollers to be manually replaced by the next run container to be labeled,

the method of operating the labeling machine to consecutively supply discrete labels from the supply hopper through the stations and consecutively apply such labels to cylindric objects of a run of such cylindrical objects each of which is of the same predetermined size including diameter, and each of wich is consecutively manually applied to the support rollers to disposed same in labeling position, and to effect automatic removal of the consecutive labeled cylindric objects from their labeling position on the support rollers by the manually placing of the next cylindric object to be labeled on the support rollers in the labeling position thereof, with the labels to be so applied to the cylindric objects of such run being each of the same predetermined size,

said method comprising:

establishing a feed path beginning at the labeling position and leading to a gravity discharge position remote from the labeling position,

rotating the machine support rollers and labelling the first run object with one of the labels in the labeling position of the object,

manually displacing the first object from the labeling position with the second object to be labeled by pressing the second object to be labeled against the said first object and thence into the labeling position and displacing the first object thereby into the feed path,

conveying the first object along the feed path while labeling the second object,

and thereafter, for the run of the cylindric objects to be labeled, consecutively manually displacing consecutively the cylindric objects that are labeled at the labeling position with the next consecutive object to be labeled by pressing the said next consecutive object to be labeled into the labeling position and thereby displacing the freshly labeled object into the feed path, and continuously conveying the consecutive freshly labeled objects along the feed path and gravity discharging same therefrom one by one while continuing to label at the labeling position the objects of the run of same to be consecutively labeled.

4,693,775

HOT MELT, SYNTHETIC, MAGNETIC SEALANT

Bruce L. Harrison, St. Louis, and Richard J. Wall, Florissant, both of Mo., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Mar. 6, 1986, Ser. No. 836,917
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—272.4 10 Claims

6. A method for sealing an irregular surface using a hot melt, magnetized adhesive comprising

applying a strip of a hot melt, magnetized adhesive of a synthetic resin containing about 60 percent to about 80 percent by weight of magnetized particles having particle

sizes greater than 150 microns to a ferrometallic substate, heating the magnetic adhesive to cause the adhesive to



become compliant and drawn onto the substrate by the magnetic field forming a substantially void free seal.

4,693,776

MACROMER REINFORCED PRESSURE SENSITIVE SKIN ADHESIVE

Stephen E. Krampe; Cheryl L. Moore, and Charles W. Taylor, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 734,907, May 16, 1985, abandoned. This application Nov. 14, 1985, Ser. No. 797,851

Int. Cl.⁴ C09J *5/00*

U.S. Cl. 156—327 **19 Claims**

1. A method of adhering a substrate to skin comprising the step of interposing between the substrate and the skin an adhesive composition comprising a copolymer of copolymerized A monomers, C macromers, and optionally B monomers, wherein:

A is a monomeric acrylate or methacrylate ester of a non-tertiary alcohol, said alcohol having from about 1 to about 14 carbon atoms with the average number of carbon atoms being from about 4 to about 12;

B, when used, is at least one ethylenically unsaturated compond copolymerizable with said A monomer, with B monomers comprising from about 0% to about 25% of the total weight of A and B monomers; and

C is a macromer having the general formula:

$$X-(Y)_n-Z$$

wherein:

X is a vinyl group copolymerizable with said A and B monomers, X having the general formula:

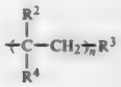


wherein

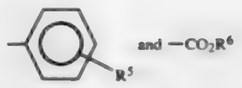
R is a hydrogen atom or a COOH group and R′ is a hydrogen atom or a methyl group;

Y is a divalent linking group with n being either 0 or 1; and

z is a monovalent polymeric moiety having a T_g greater than about 20° C. and a molecular weight in the range of about 2,000 to about 30,000 and being essentially unreactive under copolymerization conditions, Z having the general formula:



wherein R^2 is a hydrogen atom or a lower alkyl group, R^3 is a lower alkyl group, n is an integer from about 20 to about 500, and R^4 is a monovalent radical selected from the group consisting of:



wherein R^5 is a hydrogen atom or a lower alkyl group and R^6 is a lower alkyl group;

wherein the number and composition of said C macromers is such that the adhesive composition has a creep compliance of at least about 1.2×10^{-5} cm^2/dyne when measured after about 3 minutes of subjection to stress.

4,693,777

APPARATUS FOR PRODUCING SEMICONDUCTOR DEVICES

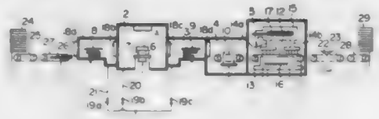
Shigeki Hazano, Yokohama, Japan; Masahiro Shibagaki, San Jose, Calif.; Hidetaka Jyo; Reiichiro Sensui, both of Sagamihara, Japan; Munesori Iwami, Yokohama, Japan, and Noboru Suzuki, Chigasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Kabushiki Kaisha Tokuda Seisakusho, Zama, both of, Japan

Filed Nov. 27, 1985, Ser. No. 802,468

Claims priority, application Japan, Nov. 30, 1984, 59-253581; Nov. 30, 1984, 59-253582; Nov. 30, 1984, 59-253585; Nov. 30, 1984, 59-253589; Nov. 30, 1984, 59-253591

Int. Cl.⁴ B44C *1/22*; C23F *1/02*; C03C *15/00*

U.S. Cl. 156—345 **49 Claims**



1. An apparatus for producing semiconductor devices comprising:

a dry etching unit for dry etching a material to be treated, said dry etching unit having an etching chamber in which said material to be treated is etched, an electrode for applying RF power to said material to be treated which is securely held in position, a gas introduction means for introducing etching gases into said etching chamber, a loading chamber communicating with said etching chamber for transferring the material to be treated into said etching chamber, and an unloading chamber communicating with said etching chamber for transferring the material to be treated from said etching chamber into said unloading chamber;

a heat-treatment unit for heat treating said material dry-etched, said heat-treatment unit having a transfer chamber communicating with said unloading chamber of said dry etching unit for transferring the material to be treated from said unloading chamber, a heat-treatment chamber communicating with said transfer chamber, and heating means disposed in said heat-treatment chamber for heating the material to be treated; and

a water cleaning unit with a chuck for cleaning said material heat-treated with water while said chuck holds in position and rotates said material.

4,693,778

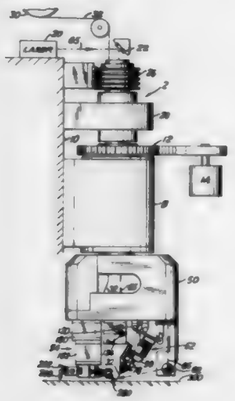
APPARATUS FOR MAKING SCRIBED CIRCUIT BOARDS AND CIRCUIT BOARD MODIFICATIONS

Brian E. Swiggett, Huntington; Ronald Morino, Sea Cliff; Raymond J. Keogh, Huntington, all of N.Y., and Jonathan C. Crowell, Lakeville, Mass., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jul. 19, 1985, Ser. No. 756,690

Int. Cl.⁴ B23K *26/02, 26/16*; B29C *65/16*

U.S. Cl. 156—361 **21 Claims**



1. An apparatus for scribing a conductor to a surface of a substrate in a predetermined pattern between two points on said surface, each of said points defining a terminal point, said conductor being coated with a coating which is non-tacky and non-blocking in its coated state but activatable to be an adhesive at the time the conductor is applied to said surface and to return to a non-tacky state after said conductor is fixed to said surface, said apparatus including means for feeding said coated conductor to the first of the pair of terminal points on said surface to be connected by said conductor, mean for supplying the end of said conductor to said first terminal point on said surface, tacking means comprising radiant heating means directed at a point on the conductor adjacent the terminal point to activate said adhesive coating to a tacky state and a tacker for fixing the supplied end of said conductor to said first terminal point prior to scribing a conductor path, means for moving said surface and said conductor feeding means relative to each other along a predetermined path from said first of said pair of terminal points to the second of said pair of terminal points, said radiant means activating said coating to an adhesive state as said conductor is applied to said surface, pressure means for urging said conductor with said activated adhesive coating into contact with said surface along said predetermined path, means for cutting the end of said conductor, means for applying said cut end of said conductor to said second of said terminal points and means for fixing said conductor end to said second terminal point.

19. An apparatus for scribing a conductor to a surface of a substrate in a predetermined pattern between two points on said surface, each of said points defining a terminal point, said conductor being coated with a coating which is non-tacky and non-blocking in its coated state but activatable to be an adhesive at the time the conductor is applied to said surface and to return to a non-tacky state after said conductor is fixed to said surface, said apparatus including means for feeding said coated conductor to the first of the pair of terminal points on said surface to be connected by said conductor, means for supplying the end of said conductor to said first terminal point on said surface, means for fixing the supplied end of said conductor to said first terminal point to scribe a conductor path, means for moving said surface and said conductor feeding means relative to each other along a predetermined path from said first of said pair of terminal points to the second of said pair of terminal points, means for activating said coating to an adhesive state as said conductor is applied to said surface, pressure means for urging said conductor with said activated adhesive coating into contact with said surface along said predetermined path, means for cutting the end of said conductor, means for applying said cut end of said conductor to said second of said terminal points and means for fixing said conductor end to said second terminal point in which said pressure means includes a wheel and means for bringing said pressure wheel into pressure contact with said conductor after said conductor has been applied comprising an indexing head and said means for fixing the applied end of said conductor to said first terminal point being mounted thereon, said indexing head including means for rotating said indexing head to a first position for engaging said fixing means with said conductor and into a second position for engaging said pressure wheel with said conductor.

4,693,779

MANUFACTURING APPARATUS FOR SEMICONDUCTOR DEVICES

Hidekazu Okuhira, Kokubunji, and Yasuo Wada, Bunkyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,113

Claims priority, application Japan, Nov. 14, 1984, 59-238570

Int. Cl.⁴ C23F *1/02*

U.S. Cl. 156—638 **8 Claims**

1. A semiconductor device manufacturing apparatus comprising:

a reaction chamber;

a first light source means having at least one first light source for radiating light to a wafer disposed in said reaction chamber to induce photo-assisted reactions for performing a plurality of processes;

a gas introducing means for introducing gaseous reactants into said reaction chamber;

a gas exhausting means for exhausting the interior of said reaction chamber; and

a second light source means for removing by light irradiation undesirable gaseous constituents which adhere to said wafer and an inner wall of said reaction chamber.

4,693,780

ELECTRICAL ISOLATION AND LEVELING OF PATTERNED SURFACES

Gerhard Beil, Erding; Alfred Pichler, Gernlinden; Horst Pschonik, Taufkirchen, and Kurt Plehnert, Pullach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 808,144

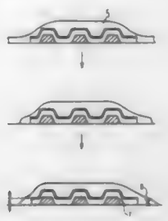
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506356

Int. Cl.⁴ H01L *21/312*

U.S. Cl. 156—643 **3 Claims**

3. A method for electrically isolating and leveling at least

one exposed surface of a substrate having patterned conductive elements thereon for providing at least one additional surface thereon, the method comprising the steps of: first covering the one exposed surface of the substrate with an insulative material comprising an organic polymer of polyimide, and second covering and leveling the polyimide with another insulative material comprising a photoresist to form a substantially planar region over an area containing the patterned conductive elements and a tapering off portion between the planar region and edges of the substrate to form a predetermined slope angle between the tapering off portion and the substrate having a range of forty to sixty degrees.

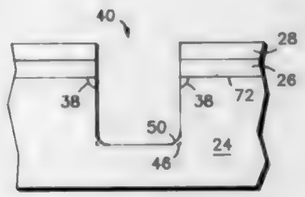


4,693,781

TRENCH FORMATION PROCESS

Howard K. H. Leung; Bich-Yen Nguyen; John R. Alvis, all of Austin, and John Schmiesing, Round Rock, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1986, Ser. No. 878,769
Int. Cl.[4] H01L *21/308*
U.S. Cl. 156—643 14 Claims



1. A process for fabricating a semiconductor device which comprises the steps of: providing a silicon substrate having a surface; forming a first oxide layer overlying said surface; patterning said first oxide to form an opening exposing a portion of said surface; implanting ions through said opening and into said surface to form a damaged surface region coincident with said opening and extending under said first oxide surrounding said opening; reactive ion etching said substrate exposed through said opening to form a trench extending into said substrate from said surface and extending below the damaged surface region; heating said substrate to grow a thermal second oxide on the walls of said trench and on said portion of said damaged surface region extending under said first oxide; and removing said thermal second oxide.

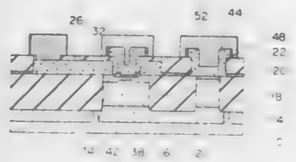
6. A process for fabricating a trench in a semiconductor substrate which comprises the steps of: providing a semiconductor substrate; forming an insulating layer overlying a surface of said substrate; patterning said insulating layer to form an opening therethrough exposing a portion of said surface; implanting ions through said opening and into said portion of said surface to form an implant damaged region, said damaged region extending laterally beneath said insulating layer around said opening; anisotropically etching said substrate exposed through said opening to form a trench extending into said substrate from said surface and through said implant damaged region and below it; oxidizing said substrate to form an oxide on the walls of said trench and on the portion of said damaged region extending laterally beneath said insulating layer; and subsequently removing said oxide.

4,693,782

FABRICATION METHOD OF SEMICONDUCTOR DEVICE

Kazuya Kikuchi, Hirakata; Tadao Komeda, Ikoma, and Tsutomu Fujita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 3, 1986, Ser. No. 903,132
Claims priority, application Japan, Sep. 6, 1985, 60-198075; Sep. 6, 1985, 60-198082
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—653 30 Claims



1. A fabrication method of a semiconductor device comprising:

a step of forming a thin film pattern on a semiconductor substrate on which an antioxidation film is formed;

a step of etching said antioxidation film by using said thin film pattern as mask;

a step of forming a first semiconductor film pattern in the other region than said thin film pattern region;

a step of etching a desired region of said thin film pattern;

a step of forming an oxide film on the surface of said first semiconductor film pattern;

a step of etching said antioxidation film; and

a step of forming a second semiconductor film pattern in a desired region.

4,693,783

METHOD OF PRODUCING INTERCONNECTIONS IN A SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURE

Paul E. Poppert, Acton, and Marvin J. Tabasky, Peabody, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 31, 1984, Ser. No. 687,705
Int. Cl.[4] B23P *15/00, 25/06*
U.S. Cl. 156—644 9 Claims

1. The method of producing electrical interconnections between contact regions in a semiconductor integrated circuit structure comprising

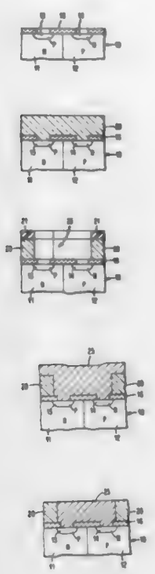
providing a body of semiconductor material having a surface covered by a coating of adherent nonconductive protective material which contact regions interspersed therein;

depositing a layer of adherent insulating material on said coating;

forming grooves in said layer of adherent insulating material in the desired pattern of electrical connections between contact regions to a depth to expose portions of said contact regions;

depositing conductive material on said body to fill said grooves and cover said layer of adherent insulating material; and

removing all the conductive material overlying the layer of adherent insulating material to expose the underlying layer of adherent insulating material leaving said conductive material only filling the grooves and providing electrical connections in said desired pattern between contact regions.

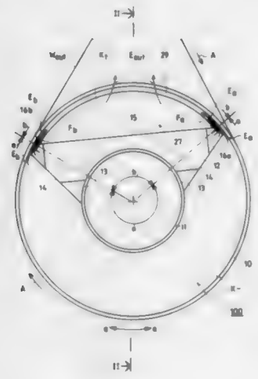


4,693,784

SUCTION ROLL AND METHOD FOR APPLYING A NEGATIVE PRESSURE OVER A SECTOR OF A ROLL

Jouko Aula, and Reima Kerttula, both of Jyväskylä , Finland, assignors to Valmet Oy, Finland

Filed Apr. 14, 1986, Ser. No. 851,480
Claims priority, application Finland, Apr. 17, 1985, 851533
Int. Cl.[4] D21F *3/10, 5/04*
U.S. Cl. 162—202 25 Claims



1. A method for applying a negative pressure over a suction sector of an air-pervious mantle of a roll, comprising the steps of:

providing a suction chamber within said pervious roll mantle to extend over said suction sector of said roll, said suction chamber having a pair of circumferentially spaced, axially extending outermost edge zones situated directly adjacent to and forming respective gaps with an inner surface of said pervious roll mantle, said outermost edge zones defining boundaries of said suction chamber;

directing air jets away from said suction chamber at said outermost edge portions of said suction chamber through said gaps, said gaps being sufficiently small so that said air jets cause air currents to be ejected from said suction chamber at said outermost edge zones thereof; and

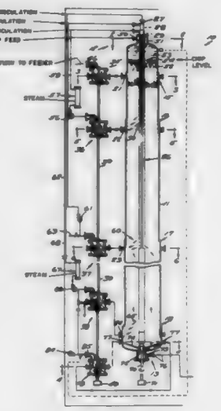
said air currents producing non-contacting air seals at said gaps at said outermost edge zones of said suction chamber and, at least partly, a negative pressure in said suction chamber.

4,693,785

DIGESTER HAVING PLURAL SCREENS AND MEANS FOR CONTROLLING THE LIQUID WITHDRAWAL

Oliver A. Laakso, Haralyn West, #2 Middle Road, Smiths Parish, Bermuda (3-18)

Division of Ser. No. 583,856, Feb. 27, 1984, Pat. No. 4,568,419. This application Sep. 24, 1985, Ser. No. 779,443
Int. Cl.[4] D21C *3/26, 7/14*
U.S. Cl. 162—242 7 Claims



1. Digester for treating comminuted cellulosic material in suspension, comprising:

(a) a vertical vessel;

(b) means for introducing material entrained in liquid at the top of the vessel;

(c) means for discharging treated material at the bottom of the vessel;

(d) a plurality of sets of annular screen systems, each set vertically spaced from the other sets;

(e) at least four circumferentially spaced outlet nozzles associated with each screen set, each outlet nozzle operatively connected to a particular radial segment of the screen set with which it is associated and for withdrawing liquid only through radial segment, and radial segments of the various screen sets being substantially vertically aligned;

(f) withdrawal means for withdrawing liquid from through each of said screen sets, said withdrawal means including:

(g) valve means operatively connected to each of said nozzles associated with each of said screen systems; and

(h) means for controlling operation of said valve means so that liquid is withdrawn through the nozzles associated with vertically aligned radial segments of all of said screen sets at the same time, while no significant amount of liquid is withdrawn through the other nozzles associated with the screen sets at that time;

(i) a vertically extending central conduit disposed in said vessel for introducing treatment liquid into said vessel adjacent central points of said vessel, said conduit being substantially concentric with said vessel;

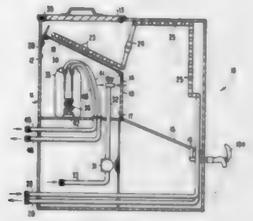
said valve means comprising, a plurality of valve members, a said valve member being associated with each screen set, each said valve member comprising a single valve body, an inlet to said valve body associated with each of said nozzles, a single rotary valve element mounted for rotation within said body, and a single outlet from said body and wherein said means for controlling operation of said valve means comprises a common operating member interconnecting each of said rotary valve elements and a drive mechanism for effecting movement of said common drive member.

4,693,786

NON-ELECTRICAL SOLVENT RECOVERY DISTILLATION APPARATUS

Dennis A. Brett, Carmel, and Clay R. Runshe, Indianapolis, both of Ind., assignors to Techserve Engineering Corp., Carmel, Ind.

Filed Jul. 2, 1985, Ser. No. 751,279
Int. Cl.[4] B01D *3/02*
U.S. Cl. 202—83 **15 Claims**



1. A portable, non-electrical solvent recovery distillation apparatus for on-site recovery of purified solvent from a batch of spent flammable solvent, comprising:

a tank having bottom and side walls and an open top;

a lid enclosing the open top of said tank and removable therefrom, said tank and lid including means for sealing in an air tight manner the interior of said tank;

a portable rigid container removably received within the interior of said tank to contain therein said batch of spent flammable solvent;

a non-electrical vacuum pump means for reducing the atmospheric pressure within said tank below ambient atmospheric pressure;

a non-electrical evaporating means, including a hot fluid conduit mounted within said tank and operable to circulate a hot fluid into indirect heat exchange relationship with the batch of spent flammable solvent contained within said rigid container, for evaporating said spent flammable solvent under reduced atmospheric conditions within said tank created by said vacuum pump means by heating said spent flammable solvent to its boiling point termperature, thereby separating purified solvent vapors from residual materials present in the spent flammable solvent; and

a non-electrical condensing means, including a cold fluid conduit operable to circulate cold fluid into indirect heat exchange relationship with said purified solvent vapors, for condensing within said tank the purified solvent vapors into a liquid form.

4,693,787

SEPARATION OF T-AMYL ALCOHOL FROM ISOBUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., and Michael J. Shanahan, 8929 Gold Dust Trail, both of Bozeman, Mont. 59715

Filed Mar. 2, 1987, Ser. No. 20,350
Int. Cl.[4] B01D *3/40*; C07C *29/84*
U.S. Cl. 203—51 **2 Claims**

1. A method for recovering t-amyl alcohol from a mixture of t-amyl alcohol and isobutanol which comprises distilling a mixture of t-amyl alcohol and isobutanol in a rectification column in the presence of about one to two parts of extractive agent per part of t-amyl alcohol-isobutanol mixture, recovering the t-amyl alcohol as overhead product and obtaining the extractive agent and isobutanol from the stillpot, the extractive agent comprises dimethylsulfoxide.

4,693,788

SEPARATION OF T-AMYL ALCOHOL FROM ISOBUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and Michael J. Shanahan, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Mar. 17, 1987, Ser. No. 26,451
Int. Cl.[4] B01D *3/40*; C07C *29/84*
U.S. Cl. 203—51 **4 Claims**

1. A method for recovering t-amyl alcohol from a mixture of t-amyl alcohol and isobutanol which comprises distilling a mixture of t-amyl alcohol and isobutanol in a rectification column in the presence of about one to two parts of extractive agent per part of t-amyl alcohol-isobutanol mixture, recovering the t-amyl alcohol as overhead product and obtaining the extractive agent and isobutanol from the stillpot, the extractive agent comprises dimethylformamide.

4,693,789

SEPARATION OF ISOPROPYL ACETATE FROM ISOPROPANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Mar. 5, 1986, Ser. No. 836,488
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] B01D *3/40*; C07C *67/48*
U.S. Cl. 203—51 **9 Claims**

1. A method for recovering isopropyl acetate from a mixture of isopropyl acetate, isopropanol and water which comprises distilling a mixture of isopropyl acetate, isopropanol and water in a rectification column in the presence of about one to two parts of an extractive agent per part of isopropyl acetate-isopropanol-water mixture, recovering isopropyl acetate and water as overhead product and obtaining the extractive agent and isopropanol from the stillpot, the extractive agent comprises at least one amino alcohol containing from two to six carbon atoms.

4,693,790

METHOD FOR MONITORING THE QUALITY OF $ZNSO_4$ ELECTROLYTE CONTAINING SB (V)

Ian H. Warren, Richmond, and Felix Mok, Vancouver, both of Canada, assignors to Cominco, Ltd., Vancouver, Canada

Filed Dec. 5, 1985, Ser. No. 805,297
Claims priority, application Canada, Sep. 12, 1985, 490589
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **16 Claims**

1. A method for controlling a process for the electrolytic recovery of zinc using a zinc sulfate electrolyte containing concentrations of impurities, including pentavalent antimony, and at least one polarization affecting agent, said method comprising the steps of:

(i) establishing a test circuit comprising in combination a test cell, a sample of electrolyte, an elongated moving cathode made of an electrolytically conductive material on which zinc is deposited, which moving cathode is immersed in and passes through said sample at a predetermined speed and has a predetermined determined area exposed to said electrolyte, an anode and a reference electrode also immersed in said sample, all three electrodes being removably positioned in the test cell in fixed relation to one another, a constant current supply and a voltage measuring means electrically connected to said electrodes;

(ii) applying a substantially constant current to the electrodes in said test cell, said current corresponding to a current density in the range of about 0.01 to 0.20 A/cm^2 based on the area of the moving cathode exposed to electrolyte in the test cell, and being sufficient to cause the exposed area of the cathode to become fully covered with deposited zinc;

(iii) moving said cathode at a predetermined speed sufficient to obtain measured values of the cathode polarization potential for zinc deposition onto zinc, under conditions such that the current density, immersed length of cathode, and the speed of the moving cathode provide a sensitivity factor having a value within the range of about 0.5 to 4.0 when calculated in accordance with the following equation:

$$\text{Sensitivity Factor} = I \times L/S$$

wherein

I represents current density, in A/cm^2;

L represents the immersed length of the moving cathode exposed to electrolyte, in cm; and

S represents the speed of the moving cathode, in cm/min;

(iv) measuring the cathode polarization potential for zinc deposition onto zinc;

(v) relating the values of the measured cathode polarization potential to the concentrations of the impurities or the polarization affecting agent or the ratio between the two in said sample; and

(vi) adjusting the concentrations of the impurities or the polarization affecting agent or the ratio between the two in the electrolyte of the process for the electrolytic recovery of zinc to obtain optimum recovery of zinc.

4,693,791

METHOD FOR PRODUCING SPINNING NOZZLE PLATES

Erwin Becker; Wolfgang Ehrfeld, both of Karlsruhe, and Peter Hagmann, Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,987
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517729
Int. Cl.[4] C25D *1/08*
U.S. Cl. 204—11 **6 Claims**

1. A method for producing a spinning nozzle plate having spinning nozzle channels, comprising the steps of:

(a) connecting a mold plate having mold channels that correspond to the spinning nozzle channels to a galvanic electrode having feed channels so that the mold channels communicate with the feed channels;

(b) producing negatives of the spinning nozzle channels by filling the mold channels and the feed channels with an electrically insulating molding material and subsequently removing the mold plate, leaving the negatives connected to the galvanic electrode;

(c) producing a galvanic layer which encloses the negatives of the spinning nozzle channels; and

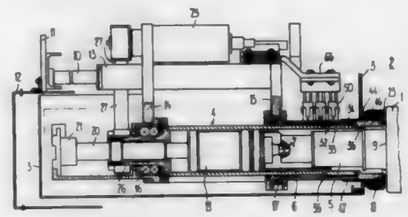
(d) removing the negatives and the remaining molding material from the galvanic layer and galvanic electrode, respectively.

4,693,792

SYSTEM FOR ELECTROLYTICAL TREATMENT OF PRINTING CYLINDERS

Max Dätwyler, Langenthal, Switzerland, assignor to MDC Max Dätwyler Bleienbach AG, Bleienbach, Switzerland

Filed Dec. 10, 1986, Ser. No. 940,010
Claims priority, application Switzerland, Dec. 16, 1985, 05356/85
Int. Cl.[4] C25D *5/00*
U.S. Cl. 204—25 **20 Claims**



1. In apparatus for electrolytic or galvanic treatment of printing cylinders, with an electrolyte trough, means including a rotatably mounted tail spindle for mounting and rotating each printing cylinder, and means for supplying electric currents to a contact ring supported by the tail spindle for contacting a front surface of each printing cylinder, the improvement comprising in combination:

carbon brushes for conducting said electric current in said supplying means; and

means for situating said carbon brushes between bearings of said tail spindle and said contact ring

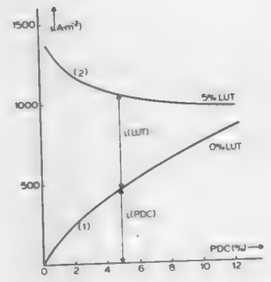
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4,693,793

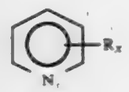
PROCESS FOR THE ELECTROCHEMICAL OXIDATION OF ALKYLPYRIDINES

Marinus Alfenaar, Schinnen; Franciscus van den Brink, Geldrop, and Rudolf van Hardeveld, Geleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 10, 1986, Ser. No. 905,398
Claims priority, application Netherlands, Sep. 11, 1985, 8502485; Sep. 11, 1985, 8502486
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—78 **7 Claims**



1. Process for the electrochemical oxidation of an alkylpyridine having the formula



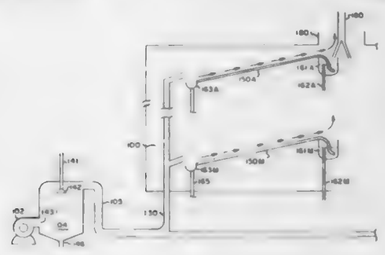
where R represents an alkyl group with 1-6 C atoms, and x is 1, 2 or 3, in an acid medium at a lead-containing anode of an electrolytic cell with anode and cathode compartments separated by an ion-exchange membrane, the process being characterized in that as ion-exchange membrane an anion-exchange membrane is used and as catholyte an aqueous solution of the same acid as used in the anolyte, which solution is dilute in respect of this anolyte, and subsequently the reaction product is recovered from the anolyte.

4,693,794

PROCESS FOR MANUFACTURING HYDROGEN PEROXIDE ELECTROLYTICALLY

John S. C. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Nov. 20, 1986, Ser. No. 932,833
Int. Cl.[4] C25B *1/30*
U.S. Cl. 204—84 **6 Claims**



1. Method for operating a cell or a plurality of cells, each cell having an electrolyte inlet, an electrolyte outlet, an anode, a porous cathode permeable to a gas, and separating means defining an anode compartment and a cathode compartment, said cathode having a first surface contacting the electrolyte and a second surface forming an exterior surface of the cell, the process comprising urging air into a container enclosing the cell or plurality of cells, removing carbon dioxide from the air, urging an alkaline electrolyte into the cell or plurality of cells, directing the carbon dioxide-free air across the second surface of the cathode of the cell or plurality of cells to provide oxygen to the second surface of the cell or cells, applying an electric potential between the anode and the cathode thereby reducing oxygen to hydrogen peroxide, exhausting air from the container, and collecting electrolyte containing hydrogen peroxide from the cell or cells.

4,693,795

PRODUCTION OF URANIUM TETRAFLUORIDE

Harry Eccles, and Stephen A. Fell, both of Preston, England, assignors to British Nuclear Fuels Plc, Warrington, England

Filed Jun. 20, 1985, Ser. No. 746,656
Claims priority, application United Kingdom, Jul. 6, 1984, 8417364
Int. Cl.[4] C25B *1/24*
U.S. Cl. 204—94 **10 Claims**

1. A process for the production of uranium tetrafluoride, including the step of electrolytically reducing a solution of uranyl fluoride-sulphate in aqueous sulphuric acid to uranous fluoride-sulphate complexes, said solution having a composition such that the uranium ions remain substantially in solution throughout said step of electrolytic reduction, and the subsequent step of adding hydrofluoric acid to precipitate hydrated uranium tetrafluoride from the uranous solution.

4,693,796

METHOD FOR MANUFACTURING CATION EXCHANGE MEMBRANE

Toru Seita; Takao Satoh, and Mitsuo Kikuchi, all of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 586,892, Mar. 12, 1984, abandoned, which is a continuation of Ser. No. 316,049, Oct. 28, 1981, abandoned. This application Oct. 25, 1985, Ser. No. 792,629
Claims priority, application Japan, Nov. 5, 1980, 55-154630; Nov. 7, 1980, 55-155762
Int. Cl.[4] C25B *1/14, 1/00, 13/00; C08D 5/20*
U.S. Cl. 204—98 **2 Claims**

1. In an electrolytic cell, the improvement consisting essentially of a cation exchange membrane means for substantially reducing alkali metal salt, said cation exchange membrane means being a cation exchange membrane prepared by providing two layers, a first layer being a film of a homogeneous blend consisting of a perfluoro carbon polymer having groups transformable into sulfonic acid groups within a range of 0.5 to 1.0 meq/g and a perfluoro carbon polymer having groups transformable into carboxylic acid groups, within a range of 0.8 to 1.5 meq/g, the blend being in a ratio by weight of 0.5 to 20, and a second layer being a film of a perfluoro carbon polymer only having groups transformable into carboxylic acid groups within a range of 0.8 to 1.5 meq/g, said films being joined together; and then transforming said groups transformable into carboxylic acid groups and said groups transformable into sulfonic acid groups respectively into carboxylic acid groups and sulfonic acid groups,

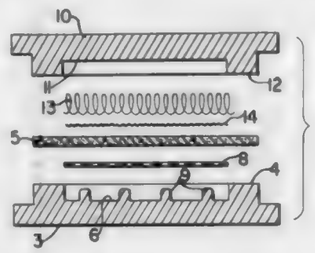
wherein said two layers are discontinuous from each other, and said first layer of said film having both the carboxylic acid and sulfonic acid groups faces the anode.

4,693,797

METHOD OF GENERATING HALOGEN AND ELECTROLYSIS CELL

Oronzio deNora, Milan, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 650,816, Sep. 13, 1984, which is a division of Ser. No. 539,522, Oct. 6, 1982, Pat. No. 4,530,743, which is a division of Ser. No. 382,690, May 27, 1982, Pat. No. 4,444,632, which is a division of Ser. No. 151,346, May 19, 1980, Pat. No. 4,310,452, which is a continuation-in-part of Ser. No. 102,629, Dec. 11, 1979, Pat. No. 4,343,690. This application Apr. 17, 1986, Ser. No. 853,000
Int. Cl.[4] C25B *1/24, 9/00, 11/03*
U.S. Cl. 204—128 **17 Claims**



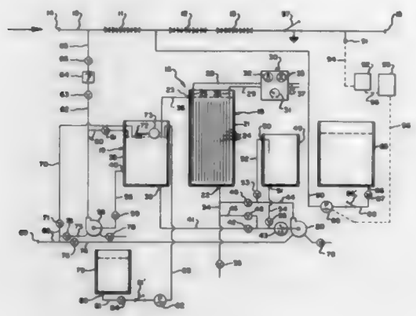
10. A method of generating halogen comprising electrolyzing an aqueous alkali metal halide solution in the anode compartment of a cell having a housing containing at least one pair of oppositely charged electrodes separated by an ion exchange diaphragm characterized in that at least one of said electrodes comprises an electrodically charged electroconductive element, screen or plate spaced from the diaphragm by a resilient compressible mat, said mat being open to gas and electrolyte flow, resistant to the cell environment and capable when compressed of distributing pressure laterally and uniformly along the diaphragm and an aqueous solution in the cathode compartment.

4,693,798

METHOD OF TREATING CONTAMINANT IONS IN AN AQUEOUS MEDIUM WITH ELECTROLYTICALLY GENERATED FERROUS IONS, AND APPARATUS THEREFOR

Stephen B. Gale, Williamsville, and Philip P. O'Donnell, Cheektowaga, both of N.Y., assignors to Niagara Environmental Associates, Inc., Cheektowaga, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,387
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 **11 Claims**



1. Method of treating contaminant ions in a contaminated aqueous medium capable of benefitting from ferrous ions, comprising the steps of:

(a) electrolytically generating ferrous ions in a separate aqueous medium having a pH of not more than 2.8, and

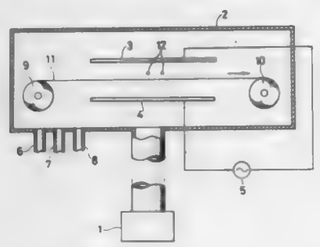
(b) introducing said separate medium containing ferrous ions into said contaminated medium at a less than 1:1 volumetric ratio of separate medium to contaminated medium.

4,693,799

PROCESS FOR PRODUCING PLASMA POLYMERIZED FILM

Kenji Yanagihara; Mituo Kimura, both of Yokohama; Masahiro Niinomi, Machida; Yasuo Nishikawa, Odawara, and Yoshito Mukaida, Kanagawa, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo and Fuji Photo Film Co., Ltd., Minamiashigara, both of, Japan

Filed Mar. 19, 1986, Ser. No. 841,183
Claims priority, application Japan, Mar. 19, 1985, 60-055549
Int. Cl.[4] C07C *3/24; C23B 13/00*
U.S. Cl. 204—165 **14 Claims**



1. A process for producing a plasma polymerized film, which comprises:

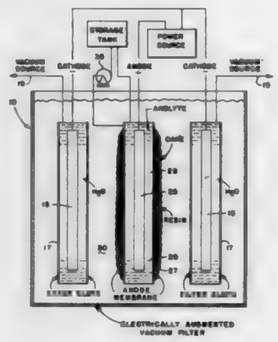
forming a plasma polymerized film on the surface of a substrate placed in a reaction zone which is not in contact with an electrode by subjecting an organic compound containing gas to plasma polymerization utilizing low temperature plasma formed by pulse discharging, in which the time of the nondischarging condition is at least 1 msec. and the voltage rise time for gas breakdown is not longer than 100 msec.

4,693,800

PROPERTY VARIATION OF DISPERSION RESINS BY ELECTROFILTRATION

Walter A. Edwards, North Ridgeville, and George R. Huddleston, Jr., Lorain, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,930
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—180.1 **23 Claims**



1. Dispersed particles having replaceable ions thereon forming a surface ion environment formed by the steps comprising:

adding the dispersed particles to an electrically augmented vacuum filter having an anode cell, adding an effective amount of an anolyte compound to said anode cell so that said anode cell has a conductivity of at least 5,000 micromhos/cm, applying a current of said anode cell, and altering the surface environment of said dispersed particles by at least partially replacing ions of said dispersed particles with said anolyte compound.

4,693,801

METHOD OF DECORATING AND INHIBITING CORROSION OF METALLIC ARTICLES

Georg Bolte, Vechelde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Brunswick, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,317
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425435
Int. Cl.[4] C25D *13/14*
U.S. Cl. 204—180.2 **2 Claims**

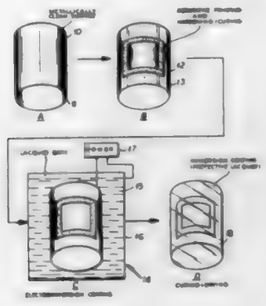
1. A method of applying a decor and protecting against corrosion, the outer curved surface of a metal can which comprises the steps of:

(a) initially printing directly on the curved outer surface of a metal can at least one decorative field of at least one color to form a decorative pattern on a metallic surface of the can;

(b) hardening the printed pattern by drying and cross-linking on said metallic surface; and

(c) thereafter completely coating the curved surface of the can and the decorative pattern imposed thereon by elec-

troimmersion lacquering and simultaneously completing a pattern to be applied to the can at least in part by a contribution to the printed pattern of the coating applied by electroimmersion lacquering.

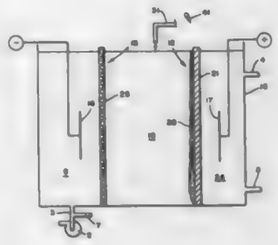


4,693,802

ELECTRICALLY AUGMENTED VACUUM FILTRATION APPARATUS FOR PRODUCING A DIALYZED CAKE PRODUCT

Joseph B. Culkin, North Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 19, 1985, Ser. No. 725,188
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 7 Claims



1. In a system for dewatering a suspension of particulate solids such as kaolin clay using a known electrically augmented vacuum filter apparatus comprising a tank adapted to receive a suspension to be filtered, and anodic and cathodic electrode assemblies adapted to be positioned in said tank in a manner such as to be submerged in suspension in said tank, said anodic electrode assembly being adapted for deposition thereon of filter cake and including an anode element and means for supplying anolyte into and out of said anode assembly, said cathodic electrode structure including a cathodic element associated with a filter medium adapted for the passage therethrough of filtrate,

the improvement which comprises employing a solid polymeric electrolyte on said anodic assembly which is substantially anion selective so that anions in said cake migrate relatively freely through said solid electrolyte into said anolyte while cations migrate from said cake toward said cathode thereby producing a cake which is substantially ion depleted.

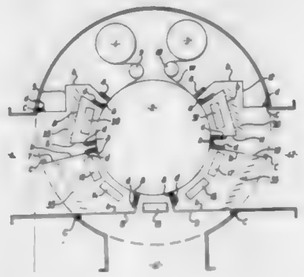
4. In a process for substantially depleting ions from a cake of solids from suspension deposited on an anode assembly, the improvement comprising using the system of claim 1.

4,693,803

VACUUM COATING APPARATUS

Frank Casey, Rochdale, and Paul A. Downing, Bury, both of England, assignors to General Engineering Radcliffe Limited, Radcliffe, England

Filed Mar. 27, 1985, Ser. No. 716,655
Claims priority, application United Kingdom, Mar. 28, 1984, 8408023
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 14 Claims



1. A vacuum coating apparatus comprising a housing defining a vacuum chamber, partition supporting means carried within the chamber, a plurality of removable and replaceable partition means engageable with the partition supporting means for dividing the chamber into at least two sub-chambers, a process station disposed in one of the sub-chambers, and means for transporting a length of material past the process station in order to process the material, wherein the removal and replacement of at least one of the partition means permits alteration of the shape and relative positions of the sub-chambers.

4,693,804

APPARATUS FOR BIDIMENSIONAL ELECTROPHORETIC SEPARATIONS

Philip Serwer, San Antonio, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Dec. 19, 1984, Ser. No. 684,275
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—182.1 18 Claims

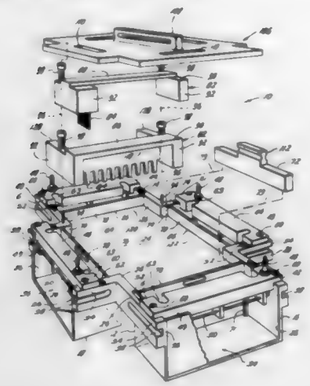
14. A process for electrophoretically separating soluble substances comprising:

forming a laterally disposed gel bed with a first gel to include a trench extending in a first direction across the gel bed;

filling a portion of the length of said trench with a second gel to define a well proximate one end of said trench;

placing the soluble substances in liquid form in said well;

electrophoretically driving said substances said first direction through said second gel; and



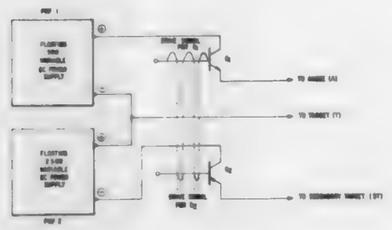
thereafter electrophoretically driving said substances from said second gel in a direction generally orthogonal to said first direction and into said first gel.

4,693,805

METHOD AND APPARATUS FOR SPUTTERING A DIELECTRIC TARGET OR FOR REACTIVE SPUTTERING

Fazle S. Quazi, Boulder, Colo., assignor to BOE Limited, San Francisco, Calif.

Filed Feb. 14, 1986, Ser. No. 829,190
Int. Cl.[4] C23C *14/34*
U.S. Cl. 204—192.22 24 Claims



1. A sputtering device comprising:

a chamber containing a plasma;

means for biasing said chamber to a reference potential;

a target disposed in said chamber, said target being electrically isolated from said reference potential;

an auxiliary electrode disposed in the chamber and spaced from said target, said auxiliary electrode being electrically isolated from said reference potential;

an anode disposed in the chamber and electrically isolated from said reference potential;

a first power supply electrically isolated from said reference potential and connected between said target and the anode for applying, during a sputtering cycle, a series of first waveforms to the target where each of the first waveforms place the target at a negative potential with respect to the plasma such that positive ions are drawn from the plasma to sputter the target during the occurrence of each first waveform, there being a predetermined interval of time between each of the first waveforms; and

a second power supply electrically isolated from said reference potential and connected between said target and the auxiliary electrode for applying, during a charge removal cycle, a series of second waveforms to the target, said series of second waveforms respectively occurring during the predetermined intervals between said first series of waveforms where each second waveform places the target at a positive potential with respect to the plasma such that electrons are removed from the plasma to neutralize any positive charge buildup which occurs during said sputtering cycle.

17. A sputtering method comprising the steps of:

confining a plasma within a chamber;

biasing said chamber to a reference potential;

disposing a target in said chamber and electrically isolating the target from said reference potential;

disposing an auxiliary electrode in the chamber and spacing it from the first target and electrically isolating the auxiliary electrode from said reference potential;

disposing an anode in the chamber and electrically isolating it from said reference potential;

applying, during a sputtering cycle, a series of first waveforms electrically isolated from said reference potential between the target and the anode where each of the first waveforms place the target at a negative potential with respect to the plasma such that positive ions are drawn from the plasma to sputter the target during the occurrence of each first waveform, there being a predetermined interval of time between each of the first waveforms; and

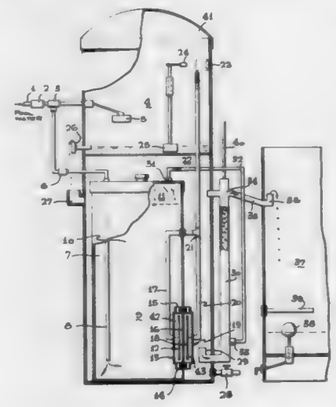
applying, during a charge removal cycle, a series of second waveforms electrically isolated from said reference potential between the target and the auxiliary electrode, said series of second waveforms respectively occurring during the predetermined intervals between said first series of waveforms where each second waveform places the target at a positive potential with respect to the plasma such that electrons are removed from the plasma to neutralize any positive charge buildup which occurs during said sputtering cycle.

4,693,806

CHLORINE GENERATOR DEVICE

Daniel M. Tucker, 1981 Chateau Ct., Walnut Creek, Calif. 94598

Filed Sep. 23, 1985, Ser. No. 778,971
Int. Cl.[4] C25B *1/26, 9/00;* B01D *21/30*
U.S. Cl. 204—252 4 Claims



1. A liquid sodium hypochlorite and/or chlorine generating device comprising:

a tank containing a saturated solution of sodium chloride with an electrolytic cell incorporated into the wall thereof;

said cell containing an ion selective membrane separating the

anode and cathode compartments such that the brine solution is present only in the anode compartment of said cell;

said tank submerged in a larger tank filled with water such that the cathode compartment of said cell communicates directly with the water in said larger tank;

said ion selective membrane to pass only hydrogen and sodium ions from said anode compartment to said cathode compartment thus converting the water in said larger tank to a sodium hydroxide solution;

a means of removing the hardness from incoming water by causing it to drip into the said sodium hydroxide solution in said larger tank;

said sodium hydroxide solution causing precipitation of the hardness minerals in said incoming water;

a source of direct current, the positive output thereof connected to the anode of said electrolytic cell, and the negative output thereof connected to the cathode of said electrolytic cell.

4,693,807

APPARATUS AND PROCESS FOR THE CATALYTIC CONVERSION OF A LIQUID, AS OR LIQUID AND GAS

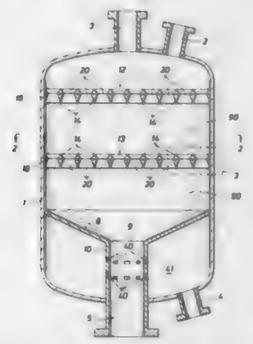
David W. B. Westerman, and Andrew M. Scott, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 11, 1986, Ser. No. 873,029

Claims priority, application United Kingdom, Jun. 18, 1985, 8515398

Int. Cl.[4] C10G *47/24*

U.S. Cl. 208—108 **12 Claims**



1. An apparatus for the catalytic conversion of a reactant fluid which comprises:

(a) an elongated vessel having a top, a bottom, and interior and exterior side walls, said vessel having means for inlet of the reactant fluid at the top of said vessel and catalytic particles at the top of said vessel, a bed of catalytic particles supported on a support means and outlet means at the bottom of said vessel for removal from said vessel of catalytic particles and reacted fluid where said reactant fluid and catalytic particles flow in a descending path through said elongated vessel;

(b) at least one row of guide elements situated intermediate said means for inlet and said catalytic particles support means and being supported on a support means communicating with said interior side walls of said vessel to form a restriction of flow of said fluid and catalytic particles through said vessel and defining, in direction of descending flow of said reactant fluid and said catalytic particles, a narrowing part, then a narrow part and then a widening part, said guide elements having a triangular fluid feed cap with two sloping side walls interconnecting a bottom member and defining a cooling fluid conduit communicating within said triangular feed cap, wherein said bottom member of said feed cap is of sufficient length to extend beyond the terminal portion of said guide element support means and includes a multiple number of guide element cooling fluid outlet means to pass cooling fluid through said cooling fluid outlet means to enter said downflow of said reactant fluid and catalytic particles.

4,693,808

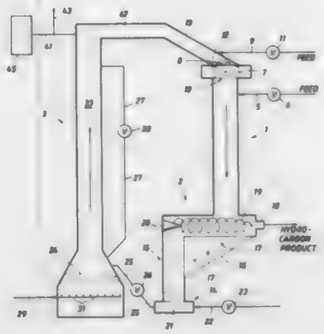
DOWNFLOW FLUIDIZED CATALYTIC CRANKING REACTOR PROCESS AND APPARATUS WITH QUICK CATALYST SEPARATION MEANS IN THE BOTTOM THEREOF

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,758

Int. Cl.[4] C10G *11/18*; B01J *8/08*

U.S. Cl. 208—113 **9 Claims**



1. A process for the continuous cracking of a hydrocarbonaceous feed material to a hydrocarbonaceous product material having smaller molecules in a downflow catalytic reactor having a top portion which comprises:

(a) passing said hydrocarbonaceous feed material into the top portion of an elongated downflow reactor in the presence of a catalytic cracking composition of matter at a temperature of from about 500° to 1500° F., a pressure of from about 1 atmosphere to about 50 atmospheres and a pressure drop of near zero to crack the molecules of said hydrocarbonaceous feed material to smaller molecules during a residence time of from about 0.5 sec to about 5 sec while said hydrocarbonaceous feed material flows in downward direction towards the outlet of said reactor;

(b) withdrawing hydrocarbonaceous product material and spent catalyst having coke deposited thereon from said outlet of said reactor after said residence time;

(c) separating by passing directly, without a change in flow direction, said hydrocarbonaceous product material from said spent catalyst, into a horizontal cyclone separator in which said passage is made at a sufficient angular velocity to cause primary separation of said spent catalyst from said product material and to form a helical flow path consisting essentially of product material and entrained spent catalyst and passing said helical flow path in a path parallel to the axis of said cyclone to cause secondary separation of said entrained spent catalyst from said helical flow path and withdrawing said hydrocarbonaceous product material from the process as product material;

(d) stripping said spent catalyst separated in step(c) in contact with steam at a temperature of from about 800° F. to about 1200° F. to strip hydrocarbonaceous material from said spent catalyst;

(e) passing said stripped catalyst and an oxygen-containing gas to a riser regenerator having a bottom and a top and raising the temperature in the bottom of said riser regenerator by a temperature elevation means to arrive at a carbon burning rate temperature and maintaining, in said riser

regenerator a relatively dense fast fluidizing bed of regenerating catalyst over the near entire length of the upflow riser regenerator to produce regenerated catalyst and a spent regeneration gas vapor phase formed from the oxidation of said coke in the presence of said oxygen-containing gas; and

(f) passing said regenerated catalyst and said spent regeneration gas vapor phase to a horizontal disengaging cyclone separation means to separate said catalyst from said vapor phase by passing said catalyst and said vapor phase to said cyclone separation means at a sufficient angular velocity and passing said catalyst therefrom in a first direction consistent with the direction of passage of hydrocarbon material in step (a) to said downflow reactor and passing said vapor phase in a second direction, opposite said first direction, to secondary catalyst disengagement.

4,693,809

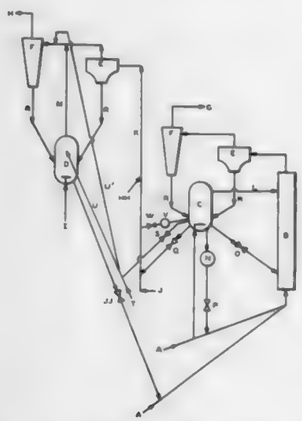
HYDROCARBON CONVERSION PROCESS

David B. Bartholic, Watchung, and Dwight F. Barger, High Bridge, both of N.J., assignors to Engelard Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 804,871, Dec. 5, 1985. This application Mar. 13, 1986, Ser. No. 839,319

Int. Cl.[4] C10G *38/38*; F27B *15/14*

U.S. Cl. 208—127 **12 Claims**



1. In a hydrocarbon conversion process wherein a hydrocarbon feed is converted to lower boiling products in a reactor by contacting the same at elevated temperatures with fluid solid contact material to form said lower boiling products and spent material containing coke from said reactor is separated from reaction products and sttripped of volatile hydrocarbons in a stripping zone, vapors from the stripping zone are separated from stripped solid contact material which is regenerated with an oxygen-containing gas in a regenerator by burning off substantially all carbon therefrom and hot freshly regenerated fluid solid contact material is returned to the reactor, the improvement which comprises: carrying out both said conversion and said regeneration in a dilute phase; passing all of the solid contact material from said reactor and said regenerator through cyclone preseparators wherein rapid disengagement of solid contact material and vapors occur and wherein the solid contact material is returned to a dense bed contained in vessel other than said regenerator or reactor; passing the gaseous effluents from each of said preseparators by a vapor discharge line to the inlet of a high efficiency cyclone having an inlet in flow communication with the outlet of a preseparator for further disengagement of solids and vapors passing therein; and charging a portion of hot freshly regenerate solid contact material from the dense bed in the vessel wherein regenerated contact material is returned into the outlet of the preseparator to which solid contact material from said reactor is passed, whereby coke formation is minimized in both the vapor discharge line between the preseparator and the high efficiency cyclone associated with said reactor and in the high efficiency cyclone associated with said reactor by superheating vapors passing from said preseparator into said high efficiency cyclone.

10. A fast fluid material transport system which comprises:

A. a reactor/contactor assembly, comprising: (1) a reactor/-contactor, having an inlet end and a discharge end; (2) a preseparator, having a vapor discharge line and a solids discharge line, which is flow connected to a said discharge end of said reactor/contactor; (3) a high efficiency cyclone, having a vapor discharge line and a solids discharge line, which is flow connected by inlet means to said gas discharge line of said preseparator; and (4) a spent solids stripper, having a vent means for equalizing pressures in said preseparator and in said stripper, said solids discharge lines of said preseparator and of said cyclone being flow connected to said stripper; and

H. a regenerator/combustor assembly, comprising: (1) a regenerator/combustor, having an inlet end and a discharge end; (2) a preseparator, having a vapor discharge line and a solids discharge line, which is flow connected to said reactor/contactor; (3) a high efficiency cyclone, having a vapor discharge line and a solids discharge line, which is flow connected to said vapor discharge line of said preseparator; and (4) a surge hopper, having a vent means for equalizing pressures in said preseparator and in said surge hopper, said solids discharge lines of said preseparator and of said cyclone being flow connected to said hopper; and (5) the discharge end of said surge hopper (4) being in flow communication with the vapor discharge line (A2) of the preseparator of said reactor/-contactor assembly.

4,693,810

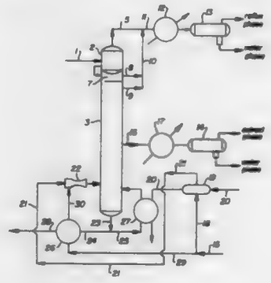
PROCESS FOR THE SEPARATION OF HYDROCARBONS FROM A MIXED FEEDSTOCK

Paulino Forte, Yonkers, and Jose A. Vidueira, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 6, 1985, Ser. No. 741,830

Int. Cl.[4] C10G *7/00*; B01D *3/38*

U.S. Cl. 208—321 **1 Claim**



1. In a solvent extraction/steam distillation process for the recovery of aromatic hydrocarbons wherein stripping water is obtained from the distillation column, the improvement comprising

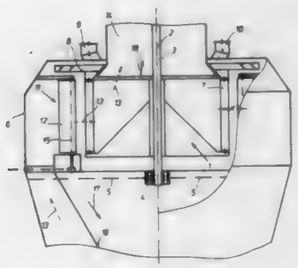
(a) dividing the stripping water into two streams;

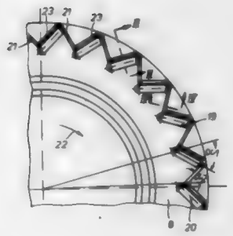
(b) passing one stream to a motive steam generator wherein the stripping water is vaporized and passed to a steam ejector;

(c) passing the other stream to a heat exchanger wherein the stripping water is vaporized by lean solvent from the

distillation column, the lean solvent is cooled, and the stripping water vapor passes to the steam ejector;
(d) passing the stripping water vapor from steps (b) and (c) to the distillation column; and
(e) passing the lean solvent from step (c) to a solvent extractor.

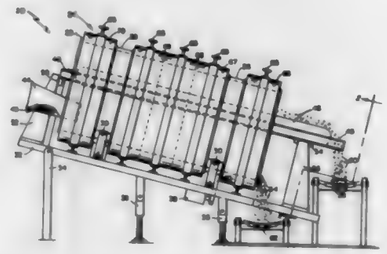
4,693,811
SIFTER
Ludger Lohnherr, Oelde-Sünninghausen, Fed. Rep. of Germany, assignor to Krupp Polysius Ag, Beckum, Fed. Rep. of Germany
Filed Sep. 22, 1986, Ser. No. 909,869
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539512
Int. Cl.[4] B07B *11/06*
U.S. Cl. 209—139.2 **13 Claims**





1. In a sifter comprising:
(a) a rotor rotatable about a vertical axis and having blades circumferentially spaced about its periphery for guiding a stream of sifting air;
(b) an annular dispersing plate rotatable with the rotor and positioned on its upper face;
(c) means for delivering material to be sifted to the dispersing plate;
(d) a distributor encircling the rotor and having guide vanes for delivering a stream of sifting air through the distributor and the rotor inwardly thereof;
(e) means above the rotor for discharging the stream of sifting air and relatively fine material entrained therein; and
(f) means below the rotor and the distributor for removal of relatively coarse material,
the improvement wherein:
(g) the dispersing plate has in its peripheral zone a plurality of openings distributed substantially evenly over the periphery, the openings are arranged so as to have radially outer and inner ends;
(h) guide elements are positioned adjacent the radially outer ends of said openings, said guide elements being positioned so as to form an angle with respect to the radius of said plate and in the direction of rotation of said plate; and
(i) distributor elements are positioned between the radially outer ends of the individual guide elements and the radially inner ends of the leading guide elements in the direction of rotation, said distributor elements being positioned so as to form an angle with respect to the radius of said plate and against the direction of rotation of said plate.

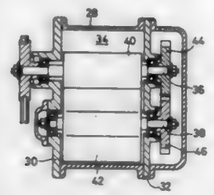
4,693,812
MAGNETIC DRUM SEPARATOR
Bruce E. Bond, Belmont, Mass., and William J. Harrold, Indian Mills, N.J., assignors to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 474,369, Mar. 11, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 741,725
Int. Cl.[4] B01D *25/00*
U.S. Cl. 209—224 **14 Claims**



1. A magnetic materials separator comprising:
material conductor means for directing along a predetermined path particles of ferromagnetic and nonferromagnetic materials; and
magnet means disposed in spaced relationship with said path for projecting into said path a magnetic field, said magnet means including a permanent magnet polarized in the direction of said path and sandwiched between two soft magnetic flux concentrators, each of the flux concentrators having in the direction of said path a thickness between five and twenty percent of one-half the thickness of the magnet in the direction of said path.

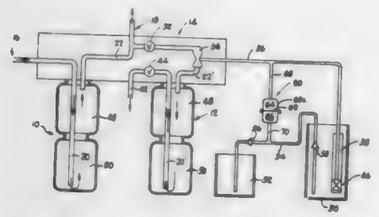
4,693,813
METHOD OF BROACHING OUTER PERIPHERY OF LOBE-TYPE ROTOR OF ROOTS-TYPE FLUID MACHINE, AND BROACHING CUTTER USED IN THE METHOD
Hajime Takeshita, Toyota; Takahiro Iwase, Aajyo; Naofumi Masuda, Nagoya; Takao Sibata, Okazaki; Hiroyuki Mochizuki, Aichi; Nobuo Kobayashi, Toyota; Seiho Kawakami, Toyota, and Yosio Kuroiwa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 30, 1986, Ser. No. 890,630
Claims priority, application Japan, Jul. 30, 1985, 60-117516; Jul. 31, 1985, 60-117547
Int. Cl.[4] B23D *15/02*
U.S. Cl. 409—244 **7 Claims**

1. A broaching method for finishing an outer peripheral surface of a resin layer of a resin-coated lobe-type rotor for a rotary fluid machine of a Roots type, comprising the steps of:
forming, with a leading preliminary cutter, at least one chip-breaker groove in the outer peripheral surface of the resin layer, such that said at least one chip-breaker groove extends in a broaching direction parallel to an axis of rotation of said rotor; and
finishing, with a trailing finish cutter, at least a portion of the outer peripheral surface of said resin layer which corresponds to a part of an entire periphery of said rotor and which has said at least one chip-breaker groove, said finish cutter having a cutting edge contour corresponding to said part of the entire periphery of said rotor, said portion



of said outer peripheral surface of said resin layer being finished by said finish cutter after said at least one chip-breaker groove is formed therein by said preliminary cutter.

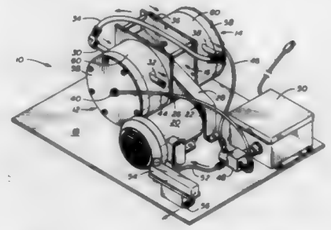
4,693,814
WATER TREATMENT APPARATUS
Keith E. Brown, Solon, Ohio, assignor to Kinetico. Inc., Newbury, Ohio
Filed Sep. 4, 1984, Ser. No. 646,953
Int. Cl.[4] C02F *1/42, 9/00*; B01J *49/00*
U.S. Cl. 210—88 **18 Claims**



1. A water treatment apparatus, comprising:
(a) tank means defining a resin compartment and a filter compartment in serial fluid communication;
(b) a reservoir including means for generating a predetermined quantity of brine solution;
(c) control valve means for controlling the communication of the tank means with the reservoir, including means for drawing solution from said reservoir during a regeneration cycle and delivering it to said tank means;
(d) means for injecting a predetermined quantity of a supplemental regenerant fluid into said reservoir, for intermixing with said brine solution to produce a composite regeneration solution, said means including:
(i) a vessel containing said supplemental regenerant fluid;
(ii) conduit means communicating with said vessel and said reservoir;
(iii) automatic pump means driven by said solution drawing means and operative to extract a predetermined quantity of said supplemental regenerant fluid and to transfer it to said reservoir to be mixed with said brine solution to produce said composite regeneration solution.

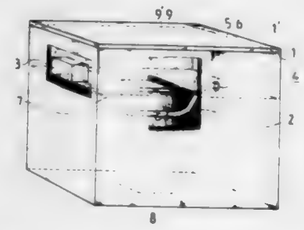
4,693,815
SELF-CLEANING FILTER SYSTEM
Henry R. Collins, Jr., 1030 W. Calhoun, Livingston, Tex. 77351
Filed Aug. 1, 1986, Ser. No. 891,601
Int. Cl.[4] B01D *35/22, 35/26*
U.S. Cl. 210—107 **8 Claims**

1. A self-cleaning filter combination, comprising:
(a) a housing having an internal cavity;
(b) a liquid agitator means rotatably mounted within said cavity and adapted to be rotated by a rotating means external of said housing;
(c) a flat filter means mounted in supported relation between said housing and a connected housing cap with a filter face openly exposed to said cavity;
(d) said housing having inlet and outlet liquid flow passages for circulating a liquid sample through said cavity around said agitator and into filterable contact with said filter face;
(e) said agitator means having means to agitate said liquid sample within said cavity and to pump a portion of said



liquid sample in a flow washing action against and across said filter face said agitator means comprises an agitator rotor having an irregular circumferential surface for agitating said liquid sample and also having a plurality of passageways inclined with respect to the axis of said rotor and disposed different radial distances away form said axis to cause a pumping action responsive to rotation of said rotor, said pumping action liquid sample in a flow washing action against and across said filter face; and
(f) said housing cap having a liquid filtrate passageway for withdrawing a filtered sample of said liquid sample through said filter means.

4,693,816
BIOLOGICAL FILTER HEATING ARRANGEMENT FOR TREATMENT OF WASTE WATER
Arto Salokangas, Lahti, Finland, assignor to Oy Ekofinn Ab, Finland
Filed Feb. 24, 1986, Ser. No. 832,585
Claims priority, application Finland, Feb. 22, 1985, 850738
Int. Cl.[4] C02F *3/06*
U.S. Cl. 210—150 **5 Claims**



1. A heating arrangement for outdoor air introduced into a biological filter intended for the treatment of waste waters, said biological filter comprising:
intake openings for the outdoor air;
a heat exchanger means mounted within the filter and connected to the intake openings for heating the outdoor air;
a blower connected to the heat exchanger means for blowing the heated air through a layer of filter material contained within the filter; and
exhaust openings for the air,
wherein said heat exchanger means includes a heat ex-

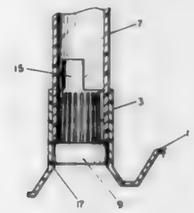
changer installed between the intake openings and the blower, the warmer side of said heat exchanger being in direct contact with the waste water flowing in the filter, whereby the outdoor air within the heat exchanger is heated directly by heat transferred thereto from the waste water.

4,693,817

GRAVEL TRAP AND COLLAR ASSEMBLY FOR AN UNDERGRAVEL AQUARIUM FILTER SYSTEM

Jerome Goldman, New York; Marvin Goldman, Great Neck, and Gerald Phillips, Glen Cove, all of N.Y., assignors to Penn Plax Plastics Inc., Garden City, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,332
Int. Cl.⁴ E04H *3/16*
U.S. Cl. 210—169 **16 Claims**



1. A gravel trap and collar assembly for an undergravel aquarium filter which comprises;

a collar, projecting from the top surface of a bottom plate of the undergravel filter, the collar being positioned over means defining an opening in the bottom plate which forms means defining a passageway through the bottom plate into a bottom cavity under the bottom plate;

a gravel trap, removeably fitted into the collar, the gravel trap having a base ring, fitting within the collar so that an interior wall surface of the collar and the outer surface of the base ring are substantially adjacent to each other, the gravel trap further having, attached to the base ring, and covering the entire central portion of the base ring, a means for preventing the passage of gravel therethrough, while allowing water and bubbles air to pass therethrough; and

the gravel trap and collar assembly further having a means for preventing the gravel trap from falling into the bottom cavity through the opening in the bottom plate.

16. In an undergravel aquarium filter wherein a bottom plate is positioned in a fish tank over the bottom surface, and covered by a layer of gravel material, and wherein uptake tubes are positioned in an opening in the bottom plate so that the opening forms a passageway between the uptake tubes and a bottom cavity under the bottom plate, the improvement comprising;

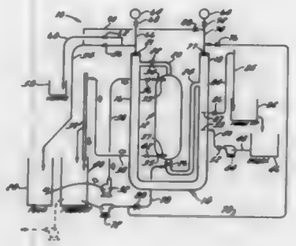
the undergravel filter being provided with a collar, projecting from the bottom plate, in an upward direction, and positioned directly over the opening in the bottom plate, and a gravel trap, removeably fitted into the collar, the gravel trap having a base ring, the outer surface of which is substantially adjacent to an inner wall surface of the collar, and a means for preventing the entry of the gravel material into and through the central portion of the base ring.

4,693,818

ION EXCHANGE APPARATUS

Conrad Terrien, Elmhurst, and Lee G. Carlson, Willow Springs, both of Ill., assignors to UIP Engineered Products Corporation, Addison, Ill.

Filed Oct. 22, 1984, Ser. No. 663,184
Int. Cl.⁴ B01J *47/10*
U.S. Cl. 210—189 **15 Claims**



1. A low pressure moving bed ion exchange apparatus comprising

a loading vessel having a feed conduit and a discharge conduit, pump means for passing a feed liquid through said feed conduit for passage through an ion exchange resin bed therewithin to said discharge conduit, said loading vessel having a resin inlet and a resin outlet,

a regeneration vessel having an ion exchange resin bed therewithin and being in resin passing communication with said resin inlet of the loading vessel through a first resin transfer means connected to one end of said regeneration vessel and in resin passing communication with said resin outlet of the loading vessel through a second resin transfer means connected to the other end of said regeneration vessel,

a first resin valve in said first resin transfer means to control the flow of resin from said one end of said regeneration vessel to said resin inlet in said loading vessel,

a second resin valve in said second transfer means to control the flow of resin from said resin outlet in said loading vessel to the other end of said one end of said regeneration vessel,

first means for passing a regenerant solution into said regeneration vessel,

second means for passing a displacement rinse liquid into said resin bed in said regeneration vessel to displace said regenerant solution,

first pressure means connected to said one end of said regeneration vessel for transferring a predetermined volume of said resin bed in said one end of said regeneration vessel through said first transfer means into said loading vessel, and

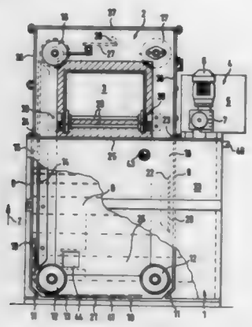
second pressure means connected to said other end of said regeneration vessel for shifting the resin bed in said regeneration vessel from said other end of said regeneration vessel to replace the volume of resin transferred from said one end of said regeneration vessel on transfer to said loading vessel.

4,693,819

TREATMENT OF EMULSIONS AND INDUSTRIAL WASTE WATERS

Ralf F. Piepho, Wennigsen, Fed. Rep. of Germany, assignor to Ralf F. Piepho Abwassertechnik GmbH, Wennigsen, Fed. Rep. of Germany

Filed Dec. 8, 1986, Ser. No. 939,171
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600935
Int. Cl.⁴ B01D *21/08*
U.S. Cl. 210—202 **20 Claims**



1. Apparatus for treating emulsions and industrial waste water and the like, said apparatus comprising:

a reaction container in which a fluid to be treated and a separating agent are mixed whereby a precipitate is formed;

a box-shaped settling container having a smooth bottom and a pair of spaced inner and outer sidewalls spaced apart from each other to define channels, said precipitate settling to the smooth bottom of said settling container;

discharge means for discharging said precipitate from said settling container, said discharge means including an endless honeycomb band of a defined cross sectional shape and drive means for driving said honeycomb band over said smooth bottom and through said sidewall channels for carrying said precipitate out of said settling container;

an opening from said settling container through which said endless band carrying said precipitate passes out of said settling container, said opening substantially corresponding in shape to the cross-sectional shape of said endless band;

storage means for storing said precipitate; and

guide means for directing said endless band over said storage means, whereby the precipitate is discharged to said storage means from said endless band.

4,693,820

MODULAR WATER CONDITIONING APPARATUS

Raymond D. Baxter, 6118 Via Nitos, Yorba Linda, Calif. 92686

Filed Jul. 1, 1985, Ser. No. 750,467
Int. Cl.⁴ B01D *27/08*
U.S. Cl. 210—232 **24 Claims**

1. A filter assembly for fluids comprising:

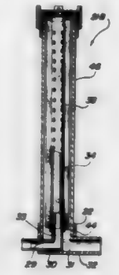
(a) an elongated hollow cylindrical casing having an open upper end,

(b) a hollow cylindrical base sealed at its lower end by a generally flat base plate and sealingly joined at its upper end to the lower end of said casing, said hollow cylindrical base being coaxial with said hollow cylindrical casing, and said hollow interior of said casing communicating with the hollow interior of said base,

(c) a hollow cylindrical boss positioned coaxially and concentrically on the upper inner surface of said base plate of said base, within the hollow interior of said base, said boss having an open upper end,

(d) a hollow outlet tube communicating with the interior of said boss, said hollow outlet tube extending radially outwards from said boss beyond the cylindrical wall of said hollow cylindrical base,

(e) a hollow inlet tube communicating with the generally annular shaped hollow interior region of said base between its interior walls and the outer surfaces of said boss and said outlet tube, said outlet tube being coaxial with



said inlet tube and extending radially outwards from the cylindrical wall of said hollow cylindrical base in a direction diametrically opposed to the extension direction of said inlet tube,

(f) an elongated hollow cylindrical filter element holder having an axial passageway adapted to couple sealingly to the hollow interior of said boss,

(g) means for sealingly connecting said passageway in said filter element holder to said interior of said boss, and

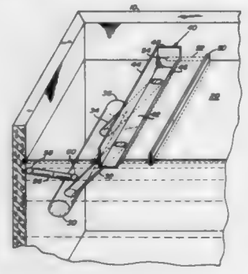
(h) means for sealing said open upper end of said elongated hollow cylindrical casing.

4,693,821

WEIR FOR WASTE WATER TREATMENT SYSTEMS

Mervyn C. Goronszy, Cremorne, and Raul Olavarria, Seven Hills, both of Australia, assignors to Transfield, Inc., Irvine, Calif.

Filed Sep. 23, 1985, Ser. No. 779,116
Int. Cl.⁴ B01D *36/04*
U.S. Cl. 210—241 **2 Claims**



1. A weir system for decanting the upper layers of wastewater from a wastewater tank to selectively lower the water level in the tank, comprising, in combination:

(a) a rotatably mounted header pipe extending horizontally across the wastewater tank adjacent an end of the wastewater tank below the water level in the tank for withdrawing wastewater from the tank, said pipe forming a plurality of openings through the wall thereof;

(b) an elongate weir extending horizontally across the wastewater tank, the weir comprising a bottom forming a plu-

rality of outlet openings therethrough, a trailing side proximate said end of the tank forming an upper trailing edge, a leading side distal of said end of the tank forming a leading edge proximate the body of wastewater in the tank, and ends closing the weir, said bottom, sides and ends defining a trough-like weir structure;

(c) a plurality of downcomer pipes extending between the weir and the header pipe and connected to said plurality of outlet openings therein providing closed fluid communication between the weir and the header pipe through said plurality of outlet openings therein, for permitting flow into the header pipe only from the weir; and

(d) positive drive means associated with the tank for selectively rotating the header pipe thereby moving the weir in an arcuate path, respectively downwardly to lower the level of wastewater in the tank and upwardly to permit the tank to fill with wastewater, the weir being so constructed and disposed that the leading edge thereof is always lower than the trailing edge thereof thus permitting wastewater to flow into the weir only over the leading edge thereof.

4,693,822

FLUIDIC CONTACTORS

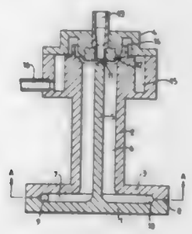
Michael J. Bowe, Newton-with-Scales; Samuel N. Oruh, Lytham St. Annes, and Jaswant Singh, Forton, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 20, 1985, Ser. No. 703,355

Claims priority, application United Kingdom, Feb. 23, 1984, 8404749

Int. Cl.⁴ B01D *17/00*

U.S. Cl. 210—255 **7 Claims**



1. A fluidic contactor including a vortex stage and a separator stage, the vortex stage comprising a closed vortex chamber having at least one tangential inlet and an axial outlet, the separator stage including a column forming an extension of said outlet and spaced apart openings at the end of the column remote from the vortex chamber whereby fluids of different densities when introduced into the chamber through said at least one tangential inlet are caused to swirl through the chamber to achieve intimate mixing thereof and substantially the entire resulting mixed flow emerging from the chamber through the axial outlet spirals along the column to cause density separation of the fluids, the separated fluids emerging through said spaced apart openings at said end of the column.

4,693,823

LIQUID FILTER

Robert W. Matchett, Dover, N.H., assignor to Fibredyne, Inc., Dover, N.H.

Filed Jun. 26, 1986, Ser. No. 879,061

Int. Cl.⁴ B01D *25/06*

U.S. Cl. 210—266 **31 Claims**

1. A liquid filter cartridge comprising:

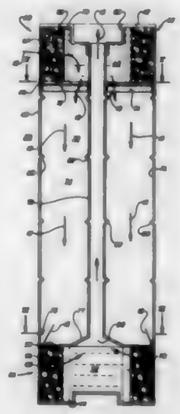
(a) a hollow cylindrical body having first and second bulkheads closing first and second ends, respectively, thereof, said body having input means for introducing a liquid to be filtered into said body adjacent said first end;

(b) a first intermediate bulkhead disposed in spaced relationship with said first bulkhead to form a first chamber therebetween, said first intermediate bulkhead having a passageway therethrough for the passage of liquid;

(c) a second intermediate bulkhead disposed in spaced relationship with said second bulkhead to form a second chamber therebetween, said first and second intermediate bulkheads being spaced from one another to form a third chamber therebetween within said body, said second intermediate bulkhead having a passageway therethrough for the passage of liquid;

(d) a quantity of granular adsorbent material disposed within said third chamber;

(e) first filter means disposed between said input means and said granular material for initially filtering liquid coming



into said body and for preventing backflow of said granular material out of said third chamber into said input means;

(f) an outlet conduit axially disposed within said body communicating with said second chamber through said second intermediate bulkhead on one end, the other end of said outlet conduit passing through said first intermediate bulkhead and said first bulkhead being the outlet for filtered liquid from the filter cartridge;

(g) second filter means disposed between said passageway of said second intermediate bulkhead and said point of communication of said outlet conduit therethrough on said one end for preventing outflow of said granular material from said third chamber into said outlet conduit; and

(h) said body includes means within said third chamber for preventing laminar flow of liquid therethrough adjacent said body and for forcing the liquid to flow through the granular material.

4,693,824

PROCESS FOR THE PRODUCTION OF POLYBENZIMIDAZOLE ULTRAFILTRATION MEMBRANES

Michael J. Sansone, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 778,994

Int. Cl.⁴ C08J *9/28*

U.S. Cl. 210—500.28 **16 Claims**

1. A process for the production of a semipermeable polybenzimidazole membrane comprising:

(a) forming a solvent solution of a polybenzimidazole polymer;

(b) depositing a film of said solution upon a support;

(c) evaporating at least a part of said solvent from said film to form a solid layer on the exposed surface of said film; and

(d) coagulating said film in a coagulation bath comprised of a solvent, selected from the group consisting of an acid, present at the 0.5 to 5 percent by weight level, N,N-dimethylacetamide, N,N-dimethylformamide, dimethyl sulfoxide and N-methyl-2-pyrrolidone, present in the range of about 5 to about 85 percent by weight based on the total weight of the coagulation bath, and a non-solvent for said polymer present in the range of about 99.5 to about a 15 percent by weight based on the total weight of the coagulation bath and thereby producing a semipermeable membrane.

4,693,825

METHOD FOR THE PREPARATION OF POLYBENZIMIDAZOLE MEMBRANES

Norman S. Trouw, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sep. 23, 1985, Ser. No. 779,017

Int. Cl.⁴ C08J *9/28*

U.S. Cl. 210—500.28 **17 Claims**

1. A process for the preparation of a semipermeable polybenzimidazole membrane comprising:

(a) forming a solvent solution of a polybenzimidazole polymer;

(b) adding benzyl alcohol to said solution;

(c) depositing a film of polybenzimidazole upon a support;

(d) removing sufficient solvent from said film to form a solid layer on the exposed surface of said film; and

(e) coagulating said film with a coagulating non-solvent for said polymer to remove residual solvent and thereby to produce a semipermeable membrane.

15. The semipermeable membrane produced in accordance with the process of claim 1.

4,693,826

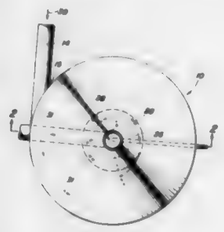
OVERFLOW FOR SLURRY TANK

Jeffrey L. Beck, Morgantown, W. Va., and David W. Campbell, Bethel Park, Pa., assignors to Conoco Inc., Ponca City, Okla.

Filed Feb. 18, 1986, Ser. No. 830,037

Int. Cl.⁴ E01D *45/12*

U.S. Cl. 210—512.1 **4 Claims**



1. A tank comprising: means for confining slurry which is comprised of fluid and particles of various sizes, said tank having a cylindrical side wall having a substantially vertical axis and an upper and lower edge, a bottom attached to said side wall at its lower edge along its periphery and an inlet tangentially mounted into said side wall between said lower and said upper edge of said cylindrical side wall; an outlet for said tank including, means enabling slurry entering tangentially into said tank to have a rotational force generated around the axis of said tank so that slurry moving toward said outlet pipe between an inner cone and said pressure confining top will have its velocity gradually increased causing particles to be deflected toward said cylindrical side wall and toward the bottom of said tank. Consisting essentially of a pressure confining top attached to said upper edge, an outlet pipe mounted near the center of said top and said inner cone, means for mounting said inner cone coaxial with said pressure confining top, said inner cone having a base diameter less than the diameter of said pressure confining top.

4,693,827

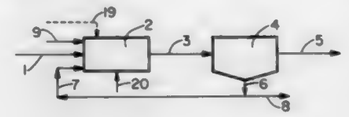
PROCESS FOR PROTECTION OF BIOLOGICAL NITRIFICATION SYSTEMS

Carol J. Mordorski, Minneapolis, Minn., assignor to Zimpro Inc., Rothschild, Wis.

Filed Mar. 20, 1986, Ser. No. 841,636

Int. Cl.⁴ C02F *3/30, 3/08*

U.S. Cl. 210—614 **7 Claims**



1. In a process for biotreating wastewater to remove carbonaceous materials and soluble ammonia therefrom to produce a biotreated wastewater, wherein said wastewater is contacted with an oxygen-containing gas and a biomass containing heterotrophic carbon-consuming organisms to oxidize carbonaceous materials and nitrifying organisms to oxidize ammonia to nitrite and nitrate, said process being subject to deterioration in degree of nitrification resulting from fluctuations in pH, temperature or dissolved oxygen, or the presence of toxic materials, including soluble ammonia in said wastewater, wherein the improvement is a method to deter said deterioration and to enhance recovery of nitrification, comprising the steps of:

(a) establishing a predetermined degree of nitrification representing an acceptable level of soluble ammonia in said biotreated wastewater;

(b) determining the concentration of soluble ammonia in said biotreated wastewater;

(c) when the determined concentration of soluble ammonia in said biotreated wastewater is greater than said acceptable level, introducing into said wastewater in said process, or into a prior carbonaceous material removal step, a rapidly-metabolized soluble or miscible organic material containing less than 5 percent nitrogen wherein the ratio of said organic material to the ammonia concentration in excess of said acceptable level in the biotreated wastewater is 10–400, to generate additional heterotrophic organisms which incorporate therein ammonia from said wastewater to reduce the ammonia concentration in said wastewater to an acceptable level and prevent toxic or inhibitory elevated levels of ammonia from forming in said process.

4,693,828

METHOD OF ION-EXCHANGING AND/OR ADSORPTION

Toshio Yoshioka, Otsu; Seiichi Yoshikawa, Koga, and Masaharu Shimamura, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP84/00431, § 371 Date May 7, 1986, § 102(e) Date May 7, 1986, PCT Pub. No. WO86/01744, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 10, 1084, Ser. No. 866,489

Int. Cl.⁴ C02F *1/42*

U.S. Cl. 210—679 **18 Claims**

1. A method of producing superpure water with an ion-exchanger, characterized in that the water is treated with a resin component containing an ion exchange resin selected from the group consisting of cation- and anion-exchange resins and mixtures thereof having an average particle diameter of 100 to 1000μ, and thereafter the water is treated with an ion-exchange

fiber component containing an ion-exchange fiber selected from the group consisting of a cation-exchange fiber, an anion-exchange fiber and a chelate fiber and mixtures thereof.

4,693,829

USE OF CARBOXYLIC ACID/SULFONIC ACID COPOLYMERS AS ALUMINUM ION STABILIZERS

Bennett P. Boffardi, Bethel Park, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1986, Ser. No. 847,995
Int. Cl.[4] C02F 5/12
U.S. Cl. 210—697 **2 Claims**

1. A method for inhibiting barium sulfate scale deposition in a recirculating water system containing aluminum ions and having a pH of about 4.5 to about 10.0 comprising adding to said system an effective amount of a composition comprising tripolyphosphate, sodium hexametaphosphate, polyacrylic acid, sodium glucoheptanate to inhibit said barium sulfate scale deposition and a water soluble polymer having an intrinsic viscosity of 0.05 to 0.5 dl/g in 1.0 M NaCl, prepared from:
   (A) 50 to 70%, by weight, of an unsaturated carboxylic compound selected from the group consisting of acrylic acid, methacrylic acid, their salts and mixtures thereof; and
   (B) 30 to 50%, by weight, of an unsaturated sulfonic compound selected from the group consisting of 2-acrylamido-2-methylpropyl sulfonic acid, 2-methacrylamido-2-methylpropyl sulfonic acid, their salts and mixtures thereof in an amount effective for solubilizing said aluminum ions and allowing said composition to effectively inhibit said barium sulfate scale deposition.

4,693,830

FLOCCULANTS FOR BRINE-CONTAINING SYSTEMS

David C. Thornton, Midland, and Mark J. McKinley, Kawkawlin, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 688,775, Jan. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 479,297, Mar. 28, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 779,345
Int. Cl.[4] C02F 1/56
U.S. Cl. 210—734 **8 Claims**

1. An improved method for flocculating suspended particulate solids from a brine containing suspension of potash ore wherein said method comprises the steps of contacting the brine with a flocculating amount of a water-soluble anionic polymer comprising, in polymerized form, from about 85 to 94 weight percent of a non-ionic, water-soluble, ethylenically unsaturated acrylamide monomer and from 5 to about 10 weight percent of a water-soluble, ethylenically unsaturated monomer containing carboxyl groups or a water-soluble, ethylenically unsaturated monomer containing groups which have been converted, during or subsequent to polymerization to carboxyl groups selected from the group consisting of acrylic acid, methacrylic acid, and alkali metal salts thereof, and from about 1 to about 5 weight percent of a N-sulfoalkylamide selected from the group consisting of 2-acrylamido-2-methylpropane sulfonic acid, 2-acrylamide propane sulfonic acid, 2-acrylamide sulfonic acid, and alkali metal salts thereof; flocculating the suspended particulate solids; and settling the flocculated particulate solids from the brine.

4,693,831

RISE-RATE CONTROL OF PULSED-BED GRANULAR MEDIUM FILTERS

Gary A. Garzonetti, Chicago, Ill., assignor to Zimpro Inc., Rothschild, Wis.

Filed Jan. 28, 1987, Ser. No. 8,020
Int. Cl.[4] B01D 37/00
U.S. Cl. 210—744 **20 Claims**

1. A method for removing solids from an influent liquid during a filtration time in a filtration cycle by passage through a down-flow granular medium filter bed in a filter tank, said filter bed having an upper surface and a lower surface and adapted for periodic backwashing and upwardly directed sub-fluidizing pulses of fluid from an array of orifices at times other than during backwash, comprising:
   (a) continuously introducing said influent liquid into said filter tank for downward solids-removing passage through said filter bed;
   (b) monitoring influent liquid level above said filter bed in said filter tank;
   (c) determining a rise rate of said influent liquid level;
   (d) activating a pulse system comprising upwardly-directed multiple sub-fluidizing pulses of a fluid through said filter bed from said array of orifices, each said pulse initated whenever said rise rate attains a predetermined value, to dislodge solids from said upper surface of said bed, store filtered solids at loci within said bed, and reduce said rise rate to extend said filtration time between backwashes; and
   (e) backwashing said filter bed at an upward fluidizing velocity after completion of two or more said pulses.

4,693,832

PREPARATION OF SAFE DRINKING WATER

Marilyn M. Hurst, Hudson, Ohio, assignor to Quantum Technologies, Inc., Twinsburg, Ohio

Filed Nov. 27, 1985, Ser. No. 802,266
Int. Cl.[4] C02F 1/76
U.S. Cl. 210—756 **12 Claims**

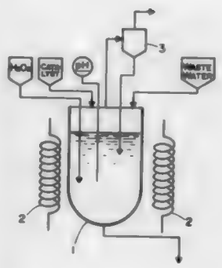
1. A disinfection process for preparing a potable water supply having a more stable and longer lasting residual germicidal activity for preserving its integrity and safety during distribution to the user comprising mixing into semi-finished water, produced by chemical pretreatment steps including primary disinfection but which lacks a significant free available chlorine residual, an aqueous solution containing between about 0.1 and about 10 grams per liter of HOCl and having a pH between about 3 and about 6 in proportions imparting a free available chlorine residual in the resultant water supply of at least about 1.0 ppm as determined about 30 to 60 minutes after said mixing.

4,693,833

METHOD OF TREATING RADIOACTIVE WASTE WATER RESULTING FROM DECONTAMINATION

Masami Toshikuni; Kazunori Suzuki, and Norie Yoshida, all of Kanagawa, Japan, assignors to JGC Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,232
Claims priority, application Japan, Oct. 26, 1984, 59-226052
Int. Cl.[4] C02F 1/58
U.S. Cl. 210—759 **3 Claims**



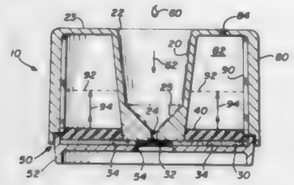
1. A method of treating readioactive waste water containing organic material resulting from decontamination, comprising decomposing said organic material by oxidation using hydrogen peroxide at a temperaure of 60°–90° C. in the presence of copper ions and iron ions as catalysts, said organic material consisting essentially of at least one organic acid, one organic inhibitor, and one surface active agent.

4,693,834

TRANSVERSE FLOW DIAGNOSTIC KIT

Miles G. Hossom, Duluth, Ga., assignor to Murex Corporation, Norcross, Ga.

Filed May 5, 1986, Ser. No. 857,914
Int. Cl.[4] B01D 29/04
U.S. Cl. 210—767 **26 Claims**



1. In a device for testing for the presence of an analyte in a liquid and having an elongated liquid input means with a receiving inlet and a discharge aperture, said receiving inlet being larger than said discharge aperture, a filter means positioned below said liquid input means and having a viewable reaction zone and at least one peripheral zone associated with said reaction zone, absorbent means associated with only said peripheral zone to draw liquid from said reaction zone to said peripheral zone and retainer means for holding such filter means in position below said liquid input means such that said reaction zone receives liquid funneled from said receiving inlet to said discharge aperture, the improvement comprising:
   a. a body portion having an opening in both the top and bottom thereof, said retaining means cooperating with said bottom opening to hold said filter means in said body portion below said liquid input means and to hold said absorbent means in association with only said peripheral zone of said filter, and
   b. a cap for removable attachment to said top opening of said cylindrical body portion, said cap having said elongated liquid input means projecting therefrom such that when said cap is attached to said body portion, said liquid input means discharge aperture is in contact with said filter means reaction zone for enabling liquid poured into said receiving inlet to be funneled for localized discharge only on said reaction zone.

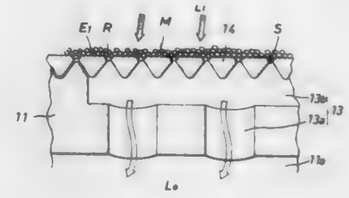
14. In a method for testing for the presence of an analyte in a liquid by providing an elongated liquid input means with a receiving inlet and a discharge inlet, said receiving inlet being larger than said discharge aperture, positioning a filter means below said liquid input means with a viewable reaction zone and at least one peripheral zone associated with said reaction zone, associating absorbent means only with said peripheral zone to draw liquid from said reaction zone to said peripheral zone and holding said filter means in position below said liquid means with a retainer means such that said reaction zone receives liquid funneled from said receiving inlet to said discharge aperture, the improvement comprising the steps of:
   a. providing a body portion having an opening in both the top and bottom thereof, said retainer means cooperating with said bottom opening to hold said filter means in said body portion below said liquid input means and to hold said absorbent means in association with only said peripheral zone, and
   b. removably attaching a cap to said top opening of said cylindrical body portion, said cap having said elongated liquid input means projecting therefrom such that when said cap is attached to said body portion, said liquid means discharge aperture is in contact with said filter means reaction zone for enabling liquid poured into said inlet to be funneled for localized discharge only on said reaction zone.

4,693,835

FILTER PROCESS AND ITS DEVICE

Koichi Arai, Kanagawa, Japan, assignor to Arai Machinery Corporation, Japan

Continuation of Ser. No. 638,660, Aug. 7, 1984, abandoned. This application Aug. 21, 1985, Ser. No. 767,746
Int. Cl.[4] B01D 29/48
U.S. Cl. 210—777 **2 Claims**



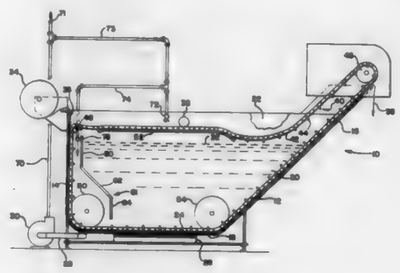
1. A filter process comprising:
forming a screw thread portion about an outer circumference of a cylinder, said cylinder having a plurality of passages longitudinally-formed about said cylinder and communication with an internal cavity in said cylinder;
wrapping an isosceles triangularly-shaped wire about said screw thread portion thereby forming an essentially flat surface comprises of base surfaces of said wire, said triangularly-shaped wire having excised corner portion on said base surface thereby forming a recess to a slit formed between adjacent wires coinciding with said longitudinally-formed passages, said slit being of a width less than a width of said recess leading to said slit;
coating a filter medium of fine particles on said wire in and about said recess to thereby form a layer of filter medium; and
carrying out a filter operation by passing a liquid through said layer of filter medium and thence through said slit from said recess of said wire.

4,693,836

FILTER APPARATUS WITH BYPASS PREVENTION

David H. Willson, Farmington Hills, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 28, 1986, Ser. No. 856,406
Int. Cl.[4] B01D 29/02, 33/38
U.S. Cl. 210—791 **9 Claims**



5. A method of filtering comprising
providing a filter tank with unfiltered liquid,
having an oulet chamber at the bottom of said filter tank,
indexing a filter media along said outlet chamber such that

such unfiltered liquid must pass through said filter media to exit said filter tank and enter said outlet chamber as filtered liquid,

providing a baffle plate within said filter tank near a rear wall of said filter tank, said baffle plate extending from above the level of the unfiltered liquid in said filter tank to near the filter media along the bottom of the filter tank and in contact with each side wall of the filter tank,

and providing a spray of filtered liquid between the rear wall of said filter tank and said baffle such that a stream of filtered liquid passes beneath said baffle into said filter tank so as to inhibit unfiltered liquid from passing beneath said baffle from said filter tank and around said filter media into said outlet chamber.

4,693,837

TERTIARY BUTYL DERIVATIVES OF TOLUENEDIAMINE AND MIXTURES AS ANTIOXIDANT FOR ORGANIC MATERIALS

Dale D. Dixon, Kutztown, and William F. Burgoyne, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 4, 1986, Ser. No. 937,769
Int. Cl.[4] C10M *133/12*
U.S. Cl. 252—50 **6 Claims**

1. In an organic material normally susceptible to gradual degradation in the presence of oxygen during use over an extended period of time and of the type in which an aromatic diamine has been added as an antioxidant, the improvement which comprises utilizing 5-tert-butyl-2,4-toluenediamine as said aromatic diamine.

4,693,838

MULTIFUNCTIONAL VISCOSITY INDEX IMPROVER

Vijaya K. Varma, Belle Mead; Esther D. Winans, Colonia; Rosemary O'Halloran, Union, all of N.J., and Phillip W. Brewster, Camlachie, Canada, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Oct. 29, 1985, Ser. No. 792,538
Int. Cl.[4] C10M *145/10*
U.S. Cl. 252—51.5 R **44 Claims**

1. A process comprising solution grafting a normally solid hydrocarbon polymer of C_2 to C_{28} olefin, said polymer having a number average molecular weight in the range of about 5,000 to 500,000 with an unsaturated material selected from the group consisting of: (A) ethylenically unsaturated C_3 to C_{10} carboxylic acid having 1 to 2 carboxylic acid groups or an anhydride group, and (B) nitrogen-containing ethylenically unsaturated monomers containing 6 to 30 carbon atoms and 1 to 4 nitrogen atoms, in a synthetic hydrocarbon oil having a number average molecular weight of about 200 to 10,000.

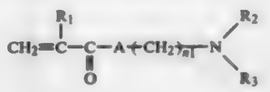
4,693,839

METAL ROLLING OIL COMPOSITION

Hiroshi Kuwamoto; Shuichi Iwadoo; Yuji Okami, all of Fukuyama; Hiroyuki Nagamori, and Yasuhiro Nakagawa, both of Wakayama, all of Japan, assignors to Kao Corporation and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,377
Claims priority, application Japan, Dec. 18, 1981, 56-204623
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.
Int. Cl.[4] C10M *145/14*
U.S. Cl. 252—51.5 A **4 Claims**

1. A metal rolling oil composition characterized by comprising essential components (a) at least one lubricating oil component selected from the group consisting of animal and plant oils, mineral oils and aliphatic acid esters, and (b) at least one water-soluble cationic or amphoteric polymer compound having at least one basic nitrogen atom or cationic nitrogen atom in one recurring unit and having an average molecular weight ranging from 1000–1,000,000, being further characterized as selected from the group consisting of homopolymers of nitrogen-containing monomers represented by general formula (I)



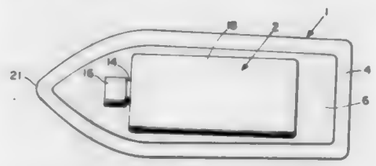
A is —O— or —NH—,
n_1 is an integer 1–3,
R_1 is H or CH_3,
R_2 and R_3 are H, CH_3 or C_2H_5, independently,
copolymers prepared from compounds of general formula (I) above and at least one vinyl monomer selected from the group consisting of α,β-unsaturated carboxylic acids, sulfonic acid group-containing vinyl compounds and aliphatic olefins having 2–20 carbon atoms, and ring-opened polymers of ethyleneimine;
said components (a) and (b) being dispersed in water form.

4,693,840

NO RINSE LIQUID CAR CLEANER WITH SOLID POLYMERS

Toan Trinh, Maineville, Ohio, and John S. Scheper, Gainesville, Fla., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 642,704, Aug. 20, 1984, abandoned, which is a continuation of Ser. No. 401,578, Jul. 26, 1982, Pat. No. 4,481,126. This application Mar. 6, 1986, Ser. No. 836,790
The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.23 **18 Claims**



1. A substantially nonabrasive liquid car cleaner composition consisting essentially of:

I. from 0.1% to 30% by weight of organic polymeric solids selected from the group consisting of:

A. polymeric particles of particle size in the range of from 1 micron to about 150 microns;

B. polymeric fibers of diameter between 1 micron and 50 microns, and length between 0.1 millimeter to 3 millimeters;

said composition having a maximum of 10% of said fibers; and wherein said composition is substantially free of particulate material having a mohs hardness of no greter than 2;

II. from 20% to about 95% of a liquid carrier for said particles, wherein said liquid carrier contains from about 10% to 90% by weight of the composition of an aliphatic hydrocarbon solvent;

III. an organic suspending agent in sufficient amount to suspend said particles in said liquid carrier; and

IV. from 0.1% to 20% by weight of silicone.

4,693,841

CARBONITRILES

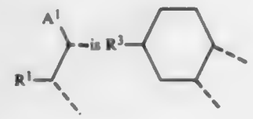
Reinhard Hittich, Modautal; Georg Weber, Erzhausen; Wolfgang Sucrow, and Peter Geschwinder, both of Paderborn, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Nov. 29, 1985, Ser. No. 802,888
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1984, 3443929
Int. Cl.[4] C09K *3/34, 19/32*; C07C *121/46, 121/48*
U.S. Cl. 252—299.62 **17 Claims**

1. A carbonitrile of the formula



wherein
each of R^1 and R^2 independently is alkyl of 1–12 C atoms, or alkyl of 1–12 C atoms wherein one or two non-adjacent CH_2 groups are replaced by —O—, —O—CO—, —CO—O— or —CH=CH—, and A^1 is H
or



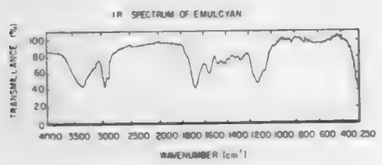
wherein
R^3 is one of the groups defined for R^1.

4,693,842

CYANOBACTERIUM-PRODUCED BIOEMULSIFIER COMPOSITION AND SOLUTION THEREOF

Moshe Shilo, Jerusalem, and Ali Fattom, Maale Hagalil, both of Israel, assignors to Solmat Systems, Ltd., Yavne and Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, both of, Israel

Continuation-in-part of Ser. No. 634,535, Jul. 26, 1984, Pat. No. 4,649,110. This application May 6, 1985, Ser. No. 731,002
Int. Cl.[4] B01F *17/30, 17/34*
U.S. Cl. 252—356 **8 Claims**



1. A treatment solution containing an extracellular substance formed by a cyanobacterium, having a molecular weight greater than 200,000 Daltons, containing sugar, fatty acid and protein moieties, and amide, carboxylic and amino groups, in an effective concentration capable of causing substantial emulsification of a liquid hydrocarbon into a second liquid.

5. A bioemulsifier composition comprising a substance formed from a cyanobacterium having a molecular weight greater than 200,000 Daltons, containing sugar, fatty acid and protein moieties, and amide, carboxylic and amino groups capable of causing substantial emulsification of a liquid hydrocarbon into a seocnd liquid.

4,693,843

RESISTANCE PASTE

Toru Kasanami, Kyoto; Hiroji Tani, Nagaokakyo; Shizuharu Watanabe, Kyoto, and Toshiaki Ikeda, Ishikawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 838,250
Claims priority, application Japan, Mar. 12, 1985, 60-50184
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—518 **4 Claims**

1. Resistance paste consisting essentially of conducting powder, glass frit and organic varnish, characterized in that said conducting powder consists essentially of iron oxide, ruthenium oxide and lead oxide, the molar ratio of said three components of the conducting powder being substantially 1:0.6–3:0.2–1 when expressed in terms of Fe_3O_4, RuO_2 and Pb_2O_4, respectively.

4,693,844

VINYLNORBORNYL ALCOHOL AND PERFUME COMPOSITION CONTAINING THE SAME

Yoshiharu Inoue, Osaka; Fumio Tanimoto, Kyoto, and Hisao Kitano, Osaka, all of Japan, assignors to Nippon Petrochemicals Company Limited, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 801,098
Claims priority, application Japan, Nov. 27, 1984, 59-250311
Int. Cl.[4] A61K *7/46*; C11B *9/00*; C07C *35/22*
U.S. Cl. 512—14 **2 Claims**

1. A vinylnorbornyl alcohol of 5- or 6-vinyl-2-hydroxymethylbicyclo[2.2.1]heptane which is represented by the following structural formula (I):

(I)



4,693,845

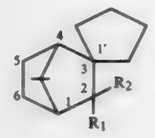
BORNANA-3-SPIRO-1'-CYCLOPENTANES AND PERFUME COMPOSITIONS COMPRISING THE SAME

Yoshiaki Fujikura, Utsunomiya; Akira Yamamuro, Tochigi, and Motoki Nakajima, Saitama, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,682
Claims priority, application Japan, Jul. 12, 1985, 60-153641
Int. Cl.[4] A61K *7/46*; C11B *9/00*; C07C *35/23, 49/417*
U.S. Cl. 512—9 **5 Claims**

1. A bornane-3-spiro-1'-cyclopentane derivative of formula (I):

(I)



wherein R_1 and R_2 are such that when R_1 is a hydrogen atom, R_2 is a hydroxyl group, or R_1 and R_2 together form a ketone group.

4,693,846

URETHANE-MODIFIED ROSIN ESTERS

Robert M. Piccirilli; Roger M. Christenson, both of Gibsonia; Frederick A. Falk, Pittsburgh, and Joseph M. Makhlouf, Mars, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 9, 1986, Ser. No. 861,171
Int. Cl.⁴ C09L *93/04*
U.S. Cl. 260—97 **11 Claims**

1. A urethane-modified rosin ester comprising a reaction product of:
   (a) a hydroxyl-functional rosin esterification product of:
      (i) a rosin polyacid comprising a dimerized rosin,
      (ii) a polyfunctional alcohol;
   (b) an isocyanate.

4,693,847

METHOD OF PREPARING HOT-MELT STABLE ROSIN ESTER WITH ORGANIC ESTER OF HYPOPHOSPHOROUS ACID CATALYST

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 14, 1986, Ser. No. 931,552
Int. Cl.⁴ C09F *7/00*
U.S. Cl. 260—104 **9 Claims**

1. A method of preparing a polyol ester of rosin, which comprises; esterifying the rosin with the polyol in the presence of a catalytic proportion of an organic ester of hypophosphorous acid.

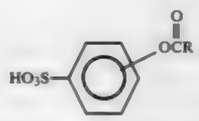
4,693,848

PREPARATION OF ALKALI METAL AND ALKALINE EARTH METAL SALTS OF ACYLOXYBENZENESULFONIC ACIDS

Wolf-Dieter Balzer, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch; Karl-Heinz Beyer, Frankenthal; Rolf Fikentscher, Ludwigshafen; Johannes Perner, Neustadt; Rudi Widder, Leimen, and Helmut Wolf, Hassloch, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 662,048, Oct. 18, 1984, Pat. No. 4,588,531. This application Apr. 2, 1986, Ser. No. 847,196
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337921
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.⁴ C07C *143/90, 79/46, 69/76*
U.S. Cl. 260—402 **6 Claims**

1. A process for the preparation of an alkali metal or alkaline earth metal salt of an acyloxybenzenesulfonic acid of formula I:



wherein R is a saturated or unsaturated alkyl radical of 1 to 17 carbon atoms, phenyl or phenyl monosubstituted or disubstituted by an alkyl radical of 1 to 3 carbon atoms, halogen, methoxy or nitro, comprising:

simultaneously adding liquid acyloxybenzenesulfonic acid and a 5–50% strength by weight aqueous solution of an alkali metal or alkaline earth metal hydroxide, carbonate or bicarbonate into water at a temperature of from 0° to 60° C.; and mixing the added ingredients during the addition process such that the acyloxybenzenesulfonic acid is neutralized with the pH of the water medium being maintained from 3.0 to 5.5, thereby forming an aqueous solution having an acyloxybenzenesulfonate salt concentration of 20–60% by weight.

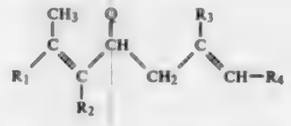
4,693,849

PREPARATION OF UNSATURATED COMPOUNDS

Gerard Mignani, Lyons, and Didier Morel, Villiers sur Orge, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Division of Ser. No. 671,963, Nov. 16, 1984, Pat. No. 4,615,838. This application Sep. 13, 1985, Ser. No. 775,835
Claims priority, application France, Nov. 18, 1983, 83 18392
Int. Cl.⁴ C09F *5/00*; C07C *67/00, 51/353, 120/00*
U.S. Cl. 260—404 **7 Claims**

1. A process for preparing an unsaturated compound of the formula:



in which Q denotes alkyloxycarbonyl in which the alkyl has 1 to 4 carbon atoms as a straight or branched chain, carboxy, cyano or formyl;

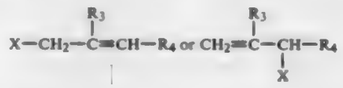
R_1 denotes a saturated aliphatic radical of 1 to 11 carbon atoms or unsaturated aliphatic radical of 2 to 11 carbon atoms and one or more double bonds;

R_2 denotes hydrogen or an alkyl radical of 1 to 4 carbon atoms;

R_3 denoted hydrogen or a saturated aliphatic radical of 1 to 11 carbon atoms; and

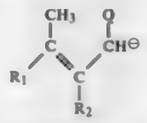
R_4 denotes hydrogen, a saturated aliphatic radical of 1 to 11 carbon atoms which is unsubstituted or substituted by acetyl, formyl which may be in the form of an acetal radical, hydroxy which may be in the form of an ether or ester, or an unsaturated aliphatic radical of 2 to 11 carbon atoms and one or more double bonds, which is unsubstituted or substituted by acetyl, formyl wich may be in the form of an acetal radical, or hydroxy which may be in the form of an ether or ester;

which comprises reacting a compound of the formula:



in which R_3 and R_4 are as defined above and X denotes halogen, methanesulphonyloxy, phenylsulphonyloxy, p-toluenesulphonyloxy or acetoxy,

with a carbanion of the formula:



in which Q, R_1 and R_2 are defined above in the presence of a catalyst based on palladium combined with a ligand in a non-polar aprotic solvent at a temperature of between −70° and +100° C.

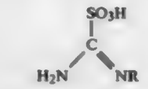
4,693,850

METHANE SULFONIC ACID DERIVATIVES

Cynthia A. Maryanoff, Solebury Township, Bucks County; James N. Plampin, Roslyn, and Robin C. Stanzione, West Chester, all of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 711,948, Mar. 15, 1985, Pat. No. 4,656,270. This application Nov. 26, 1986, Ser. No. 935,667
Int. Cl.⁴ C07C *143/56*
U.S. Cl. 260—506 **5 Claims**

1. A N-arylformamidinesulfonic acid of the following formula (I):



(I)

wherein R is phenyl, methylenedioxyphenyl, phenyl substituted with from 1 to 3 halo substituents or phenyl substituted with a member selected from the group consisting of dimethylamino, methylethylamino, diethylamino, loweralkanoylamino, loweralkylthio, trifluoromethyl, hydroxy, benzyloxy, loweralkanoyloxy, loweralkanoyl and nitro.

4,693,851

PURIFICATION OF ACID HALIDES

Mark A. Bannick, San Jose; George A. Divers, III, San Francisco, and Viktors Jansons, Los Gatos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 721,525, Apr. 9, 1985. This application Feb. 28, 1986, Ser. No. 834,703
Int. Cl.⁴ C07C *51/64*
U.S. Cl. 260—544 D **11 Claims**

1. A method of purifying an aromatic carboxylic acid halide comprising the steps of
   (a) adding a acidic molecular sieve catalyst which is a crystalline aluminosilicate, silicoaluminophosphate, or aluminophosphate in acid form or a salt with a group IA or group IIA element, or a silica polymorph, in an amount between about 0.001 to about 10% by weight to said aromatic carboxylic acid halide;
   (b) heating the resulting mixture of said acidic catalyst and said acid halide to a temperature of about 180° C. to about 250° C. for a period of at least of 0.5 hrs;
   (c) distilling the mixture to obtain acid halide substantially free of aldehyde and the halo derivative thereof.

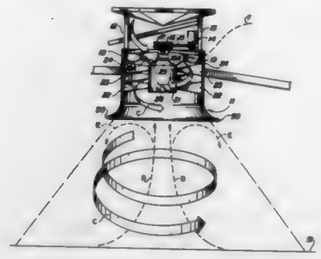
4,693,852

DROPLET INJECTION SYSTEM FOR EVAPORATIVE COOLING OF ANIMALS

Larry R. Gordon, 1612 E. First St., Mesa, Ariz. 85203

Filed Nov. 4, 1986, Ser. No. 926,524
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—30 **2 Claims**

1. Apparatus for directing a flow of air toward and over an animal to cool the animal, said apparatus comprising
   a. a frame;
   b. a hollow housing attached to said frame;
   c. a hollow member positioned inside and connected to said housing;
   d. means attached to said frame for directing an inner flow of air through said hollow member and an outer flow of air through said housing toward said animal;
   e. means for injecting water droplets into air directed into said apparatus by said air flow means;
   f. a plurality of spaced apart radially extending members intermediate said housing and said hollow member for causing said outer flow of air to have an angular velocity and to move through said housing in a rotary direction of travel about an axis, said outer flow of air generally circulating about and defining an inner area;
   g. a plurality of spaced apart radially extending members inside said hollow member for causing said inner flow of air to have an angular velocity and move through said hollow member in a rotary direction of travel generally



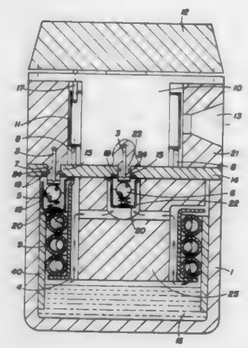
corresponding to said rotary direction of travel of said outer flow of air; and,
   h. said inner air flow generally preventing air from being drawn into said inner area away from said animal.

4,693,853

ANESTHETIC VAPORIZER

Wolfgang Falb, Krummesee; Martin Ryschka, Stockelsdorf, and Carl-Friedrich Wallroth, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,326
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523947
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—39.1 **5 Claims**



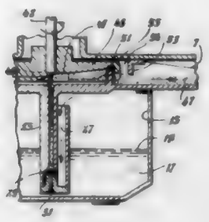
1. An anesthetic vaporizer, comprising a vaporizer housing having an interior liquid anesthetic reservoir, an intermediate plate closing said housing having a plurality of receiving openings, a proportioning unit having fluid transmitting projections of corresponding numbers as the openings, said fluid transmitting projections being positionedd to engage into the openings upon joining of the proportioning unit to the vaporizer housing, a flow passage being defined from a gas inlet to said reservoir through said fluid transmitting projection to a flow passage extending back into said proportioning unit, and a gas setting unit in said proportioning unit adapted to the release of the respective anesthetic used, marking means engaging into the proportioning unit for adaption of the setting means in said unit, said marking means being in the form of a marking pin and said gas setting means including a scale means for providing an indication of the anesthetic, operatively connected in said proportioning unit so as to be displaceable in an axial direction.

4,693,854

GENERATOR FOR HAIR STYLING MOUSSE

Yuk M. Yau, Shatin, Hong Kong, assignor to Conair Corporation, Edison, N.J.

Filed Oct. 6, 1986, Ser. No. 915,695
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—84 **10 Claims**



1. A styling mousse generator adapted to foam a liquid and deliver foamed mousse for use in hair treatment and the like, said mousse generator including

a housing including a liquid reservoir in the lower portion thereof, means for filling said reservoir, a foam outlet leading from said housing,

a fan and motor positioned within said housing and above said reservoir, said fan having a fan inlet and a fan outlet, and a foam delivery tube leading from the lower portion of said reservoir to said fan inlet, said foam delivery tube including a liquid inlet duct proximate to the lower end thereof for receiving liquid from said reservoir,

an air inlet tube associated with said foam delivery tube and having its air inlet end above the expected liquid levels of said reservoir, at least one air inlet duct leading from said air inlet tube into said foam delivery tube proximate to said liquid inlet duct, and

a passageway leading from said fan outlet to said foam outlet,

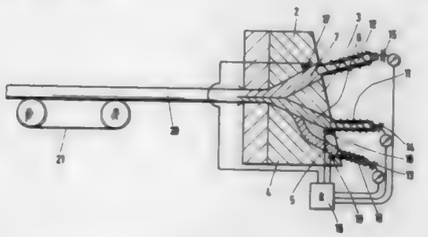
whereby actuation of said fan will cause air and liquid to be intermixed in said foam delivery tube, to be drawn through said fan, and to be discharged through said foam outlet.

4,693,855

METHOD FOR REDUCING WASTAGE IN A MULTIPLE-HEAD EXTRUSION DEVICE

Adolf Herbert, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,289
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534770
Int. Cl.⁴ B29C *47/92*
U.S. Cl. 264—40.7 **2 Claims**



1. A method of reducing the wastage during the start-up phase of an extrusion device used to produce extruded profiles from a plurality of mixtures, said extrusion device comprising a plurality of extruders, each said extruder extruding a different one of said mixtures and comprising an inlet end region and an outlet end region disposed remote from said inlet end region, separate drive means driving each said extruder, pressure sensor means disposed in said outlet end region of each said extruder for measuring the pressure of said mixture emerging from said extruder, a template member defining flow channels for receiving the individual outputs from said extruders, a common extrusion port fed by said flow channels and control mens operatively connected to each said pressure sensor means and to each said drive means, said control means including comparator means for comparing said measured pressures with pre-determined desired pressures, and means for actuating and de-actuating each said drive means in dependence upon said measured pressures, said method comprising the steps of

(a) actuating all of said drive means simultaneously to cause each said extruder to commence extruding a different one of said mixtures,

(b) monitoring the pressure of each mixture being extruded utilising said pressure sensor means,

(c) comparing each said measured pressure with said predetermined desired pressures utilising said comparator means, said control device causing de-actuation of said drive means for each said extruder when the pressure of material extruded by said extruder is equal to said predetermined desired pressure, and

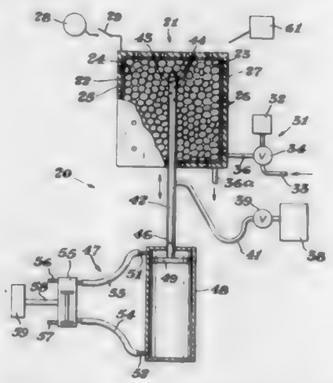
(d) re-actuating all said drive means when all of said predetermined desired pressures have been attained.

4,693,856

METHOD AND APPARATUS FOR THE PREPARATION OF FOAMED THERMOPLASTIC ARTICLES

Louis C. Rubens; Willard E. Alexander, both of Midland, and Carl A. Raeck, Essexville, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1985, Ser. No. 725,952
Int. Cl.⁴ C08J *9/22*
U.S. Cl. 264—45.4 **15 Claims**



1. A method for the molding of expanded synthetic resinous thermoplastic articles from a plurality of synthetic resinous particles, the steps of the method comprising providing a plurality of foamed synthetic resinous particles, introducing into the said foamed particles an expanding agent in a quantity sufficient that on heating said particles to a foaming temperature their volume will increase by a factor of at least 1.7;

disposing said particles within a mold having an inner molding surface;

introducing a heated gas substantially devoid of steam, which is a nonsolvent for the particles at at least one location generally remote from the inner surface of the mold, the heated gas being at a temperature sufficient to cause the particles to expand and adhere to one another,

permitting said heated gas to escape from the mold; heating at least a major portion of an internal surface of the mold to a temperature to cause expandable particles adjacent thereto to expand and thereby provide a unitary synthetic resinous foam article.

4,693,857

METHOD FOR PRODUCTION OF SINTERED ARTICLE OF SILICON NITRIDE

Katsutoshi Komeya, Ohiso, and Michiyasu Komatsu, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 26, 1985, Ser. No. 716,212
Claims priority, application Japan, Mar. 29, 1984, 59-61821
Int. Cl.⁴ C04B *33/32*
U.S. Cl. 264—56 **3 Claims**

1. An aqueous slurry method for the production of a sintered article of silicon nitride (Si_3N_4) comprising the steps of:

mixing silicon nitride powder with from 0.5 to 10% by weight, based on the powdered mixture, of a powdered spinel type compound having oxygen dissolved in aluminum nitride to form a solid solution having the formula

$$(AlN)_x(Al_2O_3)y$$

wherein x and y each has a value in the range of 0.8 to 1.2;

converting the resultant powdered mixture into an aqueous slurry mixture; molding said aqueous slurry mixture into a prescribed shape; and

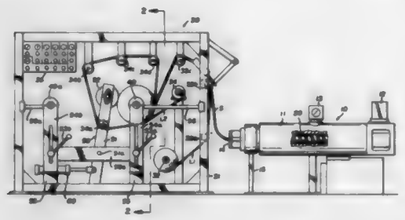
sintering the resultant shaped mixture.

4,693,858

METHOD OF PROCESSING HYDROCOLLOID DRESSINGS

Robert W. Volke, Garrettsville, Ohio, assignor to Variseal Manufacturing Corp., Parkman, Ohio

Filed Apr. 25, 1986, Ser. No. 855,716
Int. Cl.⁴ B29C *47/88*
U.S. Cl. 264—101 **7 Claims**



1. A method of processing hydrocolloid adhesive material, comprising the steps of:

(A) extruding a sheet of the adhesive material having an initial uneven surface topography from a vacuum extruder;

(B) applying a liner of release material, under constant pressure, to at least one side of said sheet while the adhesive is at an elevated temperature to thus laminate said liner and said sheet under said pressure to compress said sheet and smooth the initial uneven surface topography thereof;

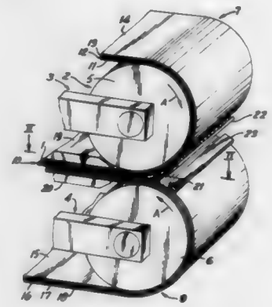
(C) maintaining said liner and said adhesive sheet under tension during cooling thereof.

4,693,859

METHOD FOR CONTINUOUS HEATED PRESSING OF MATERIAL IN SHEET FORM

Kurt Held, Alte Strasse 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,328
Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416985
Int. Cl.⁴ B30B *5/06*
U.S. Cl. 264—112 **1 Claim**



1. In a method for the continuous pressing of material sheeting in a double band press including a pair of deflecting drums, each rotating about parallel axes and defining therebetween a reaction zone within which said material sheeting is pressed, each of said drums having an outer circumference and a pair of endless press belt packs, each extending, respectively, about one of said drums, each of said packs being composed of a plurality of individual press belts, said press belt packs each having an internal side engaging against one of said drums and an external side brought into engagement with material sheeting during pressing thereof in said reaction zone, the improvement comprising that said press belt packs are continuously heated by application of heat to said internal sides thereof before reaching said reaction zone and that said external sides thereof are continuously maintained at a temperature higher than the temperature of said internal sides by continuous heating thereof at a location shortly before reaching said reaction zone, with heat flow through each of said press belt packs continuously occurring with a high heat resistance from the external side thereof to the internal side as a result of continuous maintenance of a temperature gradient thereacross.

4,693,860

METHOD OF CONVEYING PARTICULATE MATS

Werner Thelen, Kempen, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Division of Ser. No. 767,956, Aug. 21, 1985. This application Aug. 19, 1986, Ser. No. 898,036
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431126
Int. Cl.⁴ B29C *59/04*; B65G *47/64*
U.S. Cl. 264—320 **2 Claims**



1. A method of conveying particulate mats from the downstream end of an upstream conveyor normally moving continuously in a longitudinal transport direction at a predetermined relatively slow speed to a press downstream in the direction

from the upstream conveyor that receives the mats and presses them into hard panels, the method comprising the steps of:

supporting the mats between the upstream conveyor and the press on a downstream conveyor having an upstream end spaced downstream from the downstream end and a downstream end at the press and an intermediate conveyor extending between the upstream end of the downstream conveyor and the downstream end of the upstream conveyor and having a length in the direction at least equal to that of each of the mats in the direction;

reciprocating a carriage supporting the downstream end of the upstream conveyor, the intermediate conveyor, and the upstream end of the downstream conveyor in the direction at a frequency related to mat size and speed;

operating the upstream conveyor generally only at a first relatively slow transport speed in the direction;

operating the downstream conveyor generally always at a substantially higher transport speed in the direction; and

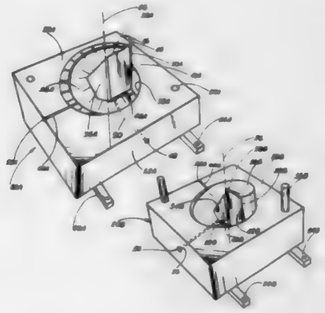
operating the intermediate conveyor at the slow speed when a mat is bridging it and the upstream conveyor and for operating it at the higher speed when a mat is bridging it and the downstream conveyor.

4,693,861

MOLD AND PROCESS FOR MANUFACTURING HELICAL SHAPED ITEMS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, Harahan, La.

Filed Apr. 9, 1984, Ser. No. 598,374
Int. Cl.[4] B29C *45/36*
U.S. Cl. 264—328.1 **32 Claims**



1. A reusable mold for forming, from a selected material, a helical shaped device enclosed in a cylinder which includes an axial member having a first and second end integrally joined with a helical shaped flight member extending a selected distance radially from a center line of said axial member and having front and back surfaces, said flight member further extending an axial distance substantially equal to the length of said axial member and up to 360 degrees coaxially around said axial member, said mold having a center axis and comprising:

a first section partially defining an elongated cavity portion extending along and around said center axis for forming a portion of said axial member, said first section further defining a helical surface extending an axial distance substantially equal to the length of said axial member, said helical surface being disposed coaxially around and along said center axis and extending said selected distance radially therefrom for a selected amount of rotation no greater than 360 degrees for forming one of said front and back surfaces of said helical shaped flight member;

a second section adapted for reciprocating movement along said center axis between an open and closed position with respect to said first section, said second section partially defining said elongated cavity portion extending along and around said center axis for forming another portion of said axial member, said second section further defining a helical surface extending an axial distance which is substantially equal to the length of said enlongated cavity portion and disposed coaxially around and along said center axis and extending said selected distance radially therefrom for said selected amount of rotation for forming the other one of said front and back surfaces of said helical shaped flight member;

said first and second sections cooperating such that when in said closed position, said helical surfaces of each section are substantially parallel to each other, and are maintained at a selected and constant spacing, so that said sections define an enclosed cavity having an elongated axial portion and a helical shaped flight portion, said helical shaped flight portion extending an axial distance which is substantially equal to said elongated axial portion and having a selected cross-section extending radially a selected distance from said center axis and coaxially therewith for said selected amount of rotation, said first and second section further defining an annular shaped aperture located coaxially with said center axis, and said annular aperture having an inside radius equal to said selected distance;

at least one of said first and second sections defining a passageway extending from said enclosed cavity to the outside of said mold such that said selected material may be transferred from outside of said mold to fill said cavity and integrally form said helical shaped flight member, said enclosing cylinder, and said axial member; and

said mold sections further cooperating such that said helical shaped device formed in said cavity may be removed by moving said second section along said center axis to said open position without twisting.

22. A method for producing a helical shaped device enclosed in a cylinder including an axial member having a first and second end integrally joined with a helical shaped flight member extending a selected radial distance from said axial member and having front and back surfaces, said flight member extending an axial distance which is substantially equal to the length of said axial member and up to 360 degrees coaxially around said axial member, said method comprising the steps of:

providing a reusable mold having first and second sections wherein each of said sections include a center axis, such that when said center axis of each of said first and second sections are coaxial with each other, said two sections are adapted for reciprocating movement with respect to each other between an open and closed position, along said center axis, each of said first and second sections partially defining an elongated cavity portion extending along and around a center axis for forming a portion of said axial member, and each section further defining a helical surface extending an axial distance which is substantially equal to the length of said elongated cavity portion, said helical surface being disposed coaxially around and along said center axis, and extending radially said selected distance therefrom for a selected amount of rotation no greater than 360 degrees, one each of said surfaces of said section for forming one each of said front and back surfaces of said helical shaped flight member, said first and second sections further defining an annular shaped aperture located coaxially with said center axis, and said annular aperture having an inside radius equal to said selected radial distance;

supporting said first and second sections such that said center axis of each section are parallel and in register;

moving at least one of said first and second sections with respect to the other section along said coaxially aligned center axis to said closed position without twisting such that said helical surfaces of each section are parallel to each other and are maintained at a selected and constant spacing so that said sections define an enclosed cavity having an elongated axial portion and a helical shaped flight portion extending an axial distance which is substantially equal to the length of said elongated axial portion, and a selected cross-section extending radially said selected distance therefrom and coaxially with said axial portion for said selected amount of rotation;

injecting an amount of selected material at a selected temperature and pressure into said enclosed cavity through a gate extending from a source outside of said cavity sufficent to fill said enclosed cavity;

subjecting said first and second section to a selected amount of force parallel to said aligned center axis to maintain said sections in said closed position during said injection of said selected material;

curing said injected material to form a helical shaped device conforming to said cavities;

moving at least one of said sections along said center axis to said open position without twisting; and

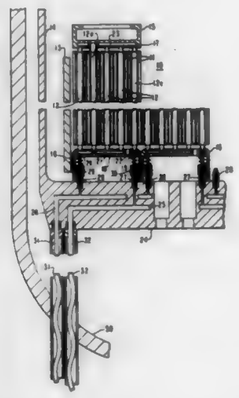
removing said formed helical shaped device from said mold.

4,693,862

GAS DISPLACEMENT SPECTRAL SHIFT REACTOR AND CONTROL METHOD

Stephen N. Tower, Washington Township, Westmoreland County; Howard E. Braun, Pittsburgh; David E. Boyle, Kiski Township, Armstrong County, and Robert B. Salton, Plum Boro, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 626,846
Int. Cl.[4] G21C *1/00, 3/32*
U.S. Cl. 376—209 **7 Claims**



1. In a liquid moderated, pressurized water nuclear reactor having initial excess reactivity, said reactor having a core formed from a plurality of fuel assemblies, each fuel assembly having fuel rods structurally supported between top and bottom nozzles, with said core being positioned within a pressure vessel between upper and lower core support plates, a method of extending core life by spectral shift comprising the steps of:

displacing a portion of the liquid moderator in the core by a gas having a low neutron absorption cross-section, from a gas supply outside said pressure vessel, during the initial stage of the life of the core by introducing said gas, from inlet flow channels in one of said core support plates, into a plurality of hollow, moderator displacement elements comprising hollow rods, sealed from reactor primary coolant flow, disposed among and arranged coextensively with fuel rods within the core, where the gas is introduced from said inlet flow channels through a first seal connector into a lower end of a first of said hollow, moderator displacement elements, and displacing said liquid moderator through the upper end of said first element;

forming a gas liquid interface at the upper end of said plurality of hollow, moderator displacement elements;

displacing the liquid moderator from within the remainder of said hollow, moderator displacement elements by said gas, from the upper end of said first element, by displacing the liquid moderator from the upper end through the lower end of said remainder of said hollow, moderator displacement elements, with said gas exiting from said remainder of said hollow, moderator displacement elements through a second seal connector, and through outlet flow channels in said one of said core support plates, with both of said seal connectors being located at the same horizontal core level, the upper ends of said hollow, moderator displacement elements being flow connected, thereby trapping said gas within said moderator displacement elements; and

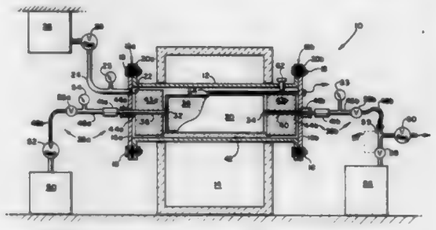
replacing said gas with liquid moderator, from a liquid moderator supply outside said pressure vessel, during the latter part of the life of the core.

4,693,863

PROCESS AND APPARATUS TO SIMULTANEOUSLY CONSOLIDATE AND REDUCE METAL POWDERS

Gregory J. Del Corso, Sinking Spring; Robert E. Carnes, and David Esposito, both of Reading, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Apr. 9, 1986, Ser. No. 849,809
Int. Cl.[4] B22F *3/14*; C22C *29/02, 29/16*
U.S. Cl. 419—13 **39 Claims**



1. In a process for making an integral, mechanically hot workable metal body from powder, the steps of

providing a porous charge of metal powder particles having a predetermined composition and volume;

forcing a reactive fluid to flow into an inlet portion of the charge while confining the reactive fluid to the volume of the charge, such that it substantially completely permeates the pores of said charge and flows out of an outlet portion thereof;

heating said charge to a consolidation temperature at which solid state sintering of the metal powder particles occurs but below the incipient melting point of the metal powder while said reactive fluid is in contact with said metal powder and thereby modifying the chemistry of at least the surfaces of the metal powder particles in a predetermined manner;

applying an external force to said charge as it is heated, so as to partially compact it while leaving it porous to the reactive fluid flowing therethrough said external force being distinct from any force caused by the flow of the reactive fluid through said charge

thereafter removing said reactive fluid from said metal powder charge; and then

further compacting the metal powder to a density greater than about 90% of the full theoretical density of said predetermined composition.

33. Apparatus for producing an integral, mechanically hot workable metal body from powder, comprising

a muffle for receiving a porous charge of metal powder of a predetermined composition and volume;

means for sealing said muffle gastight with said metal powder charge therein;

first conduit means for providing communication between

an inlet portion of said metal powder charge and a source of reactive fluid;

second conduit means for providing communication between an outlet portion of said metal powder charge and a vacuum system;

said first and second conduit means communicating with each other through said metal powder charge so that the reactive fluid is forced to flow through said metal powder charge, such that it substantially completely permeates the pores of said charge;

means for confining the reactive fluid flow to the volume of the metal powder;

means for heating said metal powder charge in said muffle to a preselected consolidating temperature while the reactive fluid is flowing through the metal powder charge; and

means for compacting said metal powder while heating it and while maintaining the flow of reactive fluid therethrough.

4,693,864

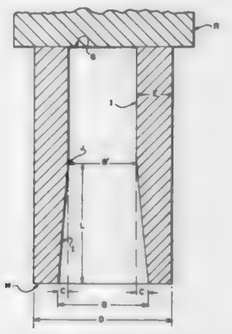
POWDER METALLURGY PROCESS FOR PRODUCING STEEL ARTICLES

Donald W. Lloyd, Dunedin Beach, Fla., assignor to Donald W. Lloyd Realty, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 748,167, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 578,533, Feb. 9, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 804,874

Int. Cl.⁴ B22F *1/00*

U.S. Cl. 419—23 **17 Claims**



1. A process for producing a powder metallurgy article substantially free of non-metallic stringers, which process consists essentially of the steps

(A) grinding mill scale into a finely divided particulate,

(B) completely reducing the particulate mill scale to form substantially pure iron in a single step,

(C) forming a particulate admixture consisting essentially of the substantially pure iron, manganese, and carbon,

(D) admixing a binder with said particulate admixture to form a bonded particulate admixture,

(E) compressing saidi bonded particulate admixture into a coherent mass having a density of from about 6.67 g/cm^3 to about 7.83 g/cm^3,

(F) heating said coherent mass in a non-oxidizing atmosphere at elevated temperature to sinter said coherent mass, thereby forming a sintered mass having structural integrity,

(G) heating said sintered mass in a non-oxidizing atmosphere to a temperature just below the fusion temperature of iron, thus forming an alloyed article, and

(H) working said alloyed article at elevated temperature to decrease its grain size.

4,693,865

SUPERCONDUCTIVE ALLOY FILAMENT

Tomoko Goto, Nagoya, Japan, assignor to Nagoya Institute of Technology, Nagoya, Japan

Filed Mar. 5, 1986, Ser. No. 836,443

Claims priority, application Japan, Apr. 2, 1985, 60-68568

Int. Cl.⁴ C22C *11/08*

U.S. Cl. 420—572 **7 Claims**



1. A superconductive alloy continuous filament with a high superconducting transition temperature (T_c) and high strength and ductility, which comprises a ternary alloy with a composition represented by the general formual:

$$Pb_x.Bi_y.M_z \qquad (I)$$

where, M represents a metallic element selected from Te and Sb; x is an atomic % from 30 to 80; y, from 15 to 55 when M is Te, or from 20 to 50 when Sb; z, from 2 to 25 when M is Te, or from 5 to 30 when Sb; and $x+y+z=100$.

4,693,866

METHOD OF SCAVENGING OXYGEN FROM AQUEOUS MEDIUMS

Nancy A. Feldman, Philadelphia, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 673,693, Nov. 21, 1984, Pat. No. 4,657,740. This application Jan. 9, 1987, Ser. No. 1,617

Int. Cl.⁴ C23F *11/06*

U.S. Cl. 422—13 **7 Claims**

1. A method for reducing the amount of oxygen in an oxygen containing aqueous medium comprising adding to said aqueous medium, as the sole oxygen scavenger, an effective amount for the purpose of a solution comprising pentaethylenehexamine or water soluble salt thereof.

4,693,867

MINERALIZATION APPARATUS FOR THE INDIVIDUAL, AUTOMATIC, TREATMENT OF SAMPLES OF PRODUCTS PLACED IN RECIPIENTS

Roger Commarmot, Lyons; Dominique Didenot, Meyzieu, and Jean-Francois Gardais, Chuzelles, all of France, assignors to Societe Prolabo (Societe Anonyme), France

Filed Feb. 27, 1985, Ser. No. 706,338

Claims priority, application France, Mar. 5, 1984, 84 03571

Int. Cl.⁴ G01N *31/12*; H05B *6/64*

U.S. Cl. 422—64 **15 Claims**

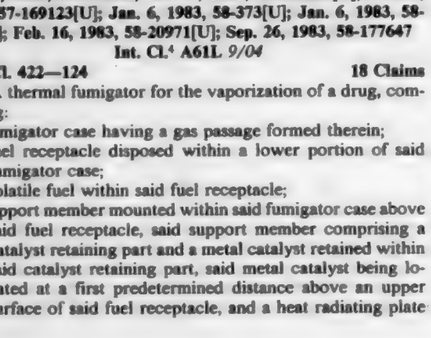
1. A mineralization apparatus for the individual, automatic, treatment of samples comprising:

a micro-wave generator for emitting micro-waves into a micro-wave heating chamber,

a plurality of sample container means each having an enlarged sample containing portion at a lower end thereof and an upwardly extending neck portion connected thereto,

a micro-wave heating chamber adapted to receive the sample containing portion of one of said plurality of sample container means said micro-wave heating chamber comprising a housing having an upper wall and defining in said upper wall an opening through which said sample containing portion of said sample container means can be placed in and removed from said chamber,

a stack bordering said opening in said upper wall of said micro-wave heating chamber adapted to surround the upwardly extending neck portion of said sample container means when the sample containing portion is placed in said micro-wave heating chamber,



a transport station for receiving said sample container means,

means for randomly supplying sample container means in individual housings, in random succession and individual presentation to said transport station,

means for detecting at least one characteristic of treatment specific to each sample transported to the transport station in sample container means,

means at said transport station for individual transfer of sample container means between said container supply means and the micro-wave heating chamber, and

means for controlling the automatic operation of the apparatus in a cycle specific to each sample based upon the at least one characteristic of treatment specific to each sample detected.

4,693,868

THERMAL FUMIGATOR FOR DRUGS

Yoshio Katsuda, Nishinomiya; Sadao Yoshinaga, Ichikawa, and Hiroyoshi Mashine, Souka, all of Japan, assignors to Dainihon Jochugiku Co., Ltd., Japan

PCT No. PCT/JP83/00323, § 371 Date May 9, 1984, § 102(e) Date May 9, 1984, PCT Pub. No. WO84/01264, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1983, Ser. No. 611,037

Claims priority, application Japan, Sep. 30, 1982, 57-148579[U]; Sep. 30, 1982, 57-148580[U]; Sep. 30, 1982, 57-148581[U]; Oct. 4, 1982, 57-174295; Oct. 8, 1982, 57-153100[U]; Oct. 8, 1982, 57-177050; Nov. 8, 1982, 57-169122[U]; Nov. 8, 1982, 57-169123[U]; Jan. 6, 1983, 58-373[U]; Jan. 6, 1983, 58-374[U]; Feb. 16, 1983, 58-20971[U]; Sep. 26, 1983, 58-177647

Int. Cl.⁴ A61L *9/04*

U.S. Cl. 422—124 **18 Claims**

1. A thermal fumigator for the vaporization of a drug, comprising:

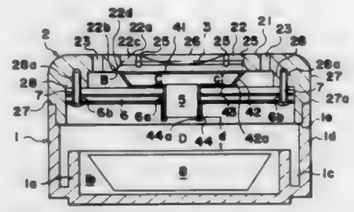
a fumigator case having a gas passage formed therein;

a fuel receptacle disposed within a lower portion of said fumigator case;

a volatile fuel within said fuel receptacle;

a support member mounted within said fumigator case above said fuel receptacle, said support member comprising a catalyst retaining part and a metal catalyst retained within said catalyst retaining part, said metal catalyst being located at a first predetermined distance above an upper surface of said fuel receptacle, and a heat radiating plate located at a second predetermined distance above said metal catalyst; and

a mat supported by said heat radiating plate, said mat being impregnated with a vaporizable drug;



wherein vapors rising from said volatile fuel contact said metal catalyst and generate a heat of reaction which is transferred to said heat radiating plate, whereby said mat is heated and said drug is vaporized.

4,693,869

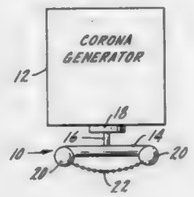
ELECTRODE ARRANGEMENT FOR CREATING CORONA

Ernest H. Pfaff, 1549 Woodvale Ave., Deerfield, Ill. 60015

Filed Mar. 20, 1986, Ser. No. 841,847

Int. Cl.⁴ B01J *19/08, 19/12*; H01J *1/88, 19/42*

U.S. Cl. 422—186.04 **19 Claims**



1. An electrode arrangement for creation of a corona, the electrode arrangement being configured for attachment to a high frequency electrical corona generator generating frequencies on the order of 2 MHz and being made of an electrically conductive material, the electrode arrangement comprising:

a. a stem for attachment to the corona generator,

b. a corona driving element secured to said stem, and

c. a corona emitting element in electrical contact with said corona driving element,

d. said corona driving element being greater in size than said corona emitting element such that corona from the electrode arrangement is emitted essentially from said corona emitting element in a direction away from said corona driving element.

4,693,870

TUBULAR OZONIZER WITH COOLED INNER ELECTRODE

Urs Gloor, Baden; Michael Hirth, Unterentfelden, and Ulrich Kogelschatz, Hausen, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 18, 1985, Ser. No. 746,122

Claims priority, application Switzerland, Jun. 27, 1984, 3106/84

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 422—186.19 **21 Claims**

1. A tubular ozoniser comprising:

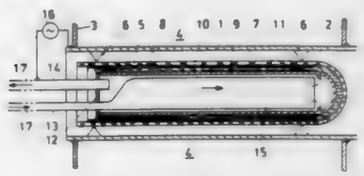
(a) an outer, electrically conductive tube;

(b) an inner, dielectric tube disposed within but spaced from said outer, electrically conductive tube, the space between

the outside of said inner, dielectric tube and the inside of said outer, electrically conductive tube comprising a discharge gap;

(c) a cooling tube disposed within but spaced from said inner, dielectric tube;

(d) a plurality of contact springs disposed between said cooling tube and said inner, dielectric tube, said plurality of contact springs serving to space said cooling tube from said inner, dielectric tube;



(e) a coating of a thermally conductive material formed on the outside of said cooling tube and extending outwardly to within a few 10 μm of the inside of said inner, dielectric tube, the space between the outside of said coating of thermally conductive material and the inside of said inner, dielectric tube comprising a thermal expansion gap; and

(f) first means for conducting a cooling fluid through said cooling tube.

4,693,871

DISPOSABLE ASEPTIC SHEATH FOR DENTAL HANDPIECES

Paul Geller, 4 Holland Ave., Elmont, N.Y. 11003

Filed Apr. 9, 1986, Ser. No. 849,808
Int. Cl.⁴ A61C *1/16*
U.S. Cl. 433—116 **6 Claims**



1. A disposable aseptic sheath for a dental handpiece having a head, neck and handle, said sheath adapted for substantially completely enclosing the handpiece therewithin during use to prevent the handpiece from becoming contaminated, comprising:

a forward substantially cylindrical and rigid head portion for receiving the head of the handpiece;

an intermediate substantially cylindrical and rigid neck portion integral with said head portion for receiving the neck of the handpiece, said neck portion having two ends and being joined to said head portion at one of said ends;

a rearward substantially cylindrical and rigid handle portion integral with said neck and head portions for receiving the handle of the handpiece, said handle portion being joined to the other of said ends of said neck portion;

said head, neck and handle portions being formed from a unitary, elastically deformable sheet of resilient thermoplastic material having a thickness in the range of between about 0.002 to 0.060 inches; and

said sheath including a pair of edge regions extending substantially longitudinally over said neck and handle portions in normally mutual overlapping relationship over at least a portion of their lengths, said overlapping edge regions being forceably separable out of overlapping relationship to form a space between them extending longitudinally over said neck and handle portions providing access for substantially lateral insertion of the handpiece into:the interior of said sheath,

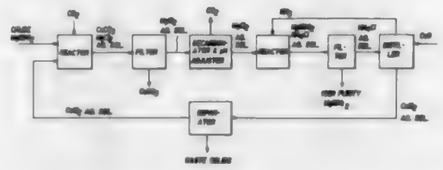
whereby upon insertion of the handpiece, said edge regions return into said mutual overlapping relationship due to the resilience of said sheet material of which said sheath is formed.

4,693,872

PROCESS FOR PRODUCING HIGHLY PURE MAGNESIUM HYDROXIDE

Keiichi Nakaya, Chiba, and Kunio Tanaka, Ichihara, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,159
Claims priority, application Japan, Jan. 20, 1984, 59-7049
Int. Cl.⁴ C01F *11/04*
U.S. Cl. 423—164 **12 Claims**



1. A process for producing highly pure magnesium hydroxide, which comprises the steps of:

reacting magnesium hydroxide starting material containing impurities, with an aqueous solution containing a water-soluble calcium salt and carbon dioxide to form an aqueous solution containing a magnesium salt and calcium carbonate precipitates whereby said impurities are transferred to the precipitates,

filtering off said precipitates,

decarbonating said filtered aqueous solution at a pH of from 1–5,

reacting said decarbonated aqueous solution containing said magnesium salt, with ammonia to form a slurry comprising magnesium hydroxide solid and an aqueous solution containing an ammonium salt, and

filtering the slurry to obtain highly pure magnesium hydroxide solid and an aqueous solution containing said ammonium salt.

4,693,873

HCN AND IRON CYANIDE COMPLEX REMOVAL

Daniel C. Baker, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1985, Ser. No. 814,708
Int. Cl.⁴ B01D *45/00, 47/00*; C01C *3/00*
U.S. Cl. 423—215.5 **2 Claims**

2. A process for scrubbing a synthesis gas stream containing residual amounts of iron containing particulate solids and minor amounts of HCN comprising

(a) contacting said synthesis gas stream in a scrubbing zone with an aqueous solution containing a reactant having the formula

$$R_1—\underset{\underset{O}{\|}}{C}—R_2$$

wherein R_1 and R_2 are hydrogen or alkyl containing 1 through 3 carbon atoms, provided that R_1 and R_2 are never simultaneously alkyl, precursors thereof, and mixtures of said compounds, precursors, and compounds and

precursors; in an amount sufficient to remove at least the bulk of HCN, under conditions to convert HCN, and producing a partially-purified synthesis gas stream having reduced HCN content and a first aqueous mixture containing solids, reaction products of HCN and said reactant, and iron cyanide complex or complexes;

(b) contacting said partially-purified gas stream in said scrubbing zone with an effective amount of an aqueous solution containing a second reactant selected from ammonium polysulfide, sodium polysulfide, and a mixture of ammonium polysulfide and sodium polysulfide, under conditions to convert HCN, the reactant being present in solution in an amount in excess of that required to react stoichiometrically with the HCN; producing a purified gas stream with a further reduced HCN content; a second aqueous mixture containing reaction products of HCN and said second reactant, and iron cyanide complex or complexes;

(c) removing and combining the first and second aqueous mixtures from the scrubbing zone, and continuing contact of the second reactant with the combined mixture in a conversion zone, the conversion zone being at a temperature of from about 110° C. to about 180° C., and converting iron cyanide complex or complexes in said mixture and producing a mixture having a reduced iron cyanide complex or complexes content.

4,693,874

METHOD FOR REDUCING GAS TURBINE NO_x EMISSIONS

Boyd E. Hurst, 21 Wherli Rd., Long Valley, N.J. 07853

Filed Mar. 22, 1985, Ser. No. 715,168
Int. Cl.⁴ C01B *21/00*; B01J *8/00*
U.S. Cl. 423—235 **16 Claims**

1. A process for reducing NO_x concentration in a combustion effluent containing at least 0.1 volume percent O_2 comprising the step of contacting said effluent with ammonia at a temperature in the range of about 1100° K. to about 1500° K. and at a pressure in the range of above 1 to 100 atmospheres, said contacting being carried out at a residence time of above 2 to about 75 milliseconds such that a reduction of NO_x in the combustion effluent is realized which is greater than that achieved by carrying out the process under substantially similar conditions but at atmospheric pressure.

4,693,875

PROCESS FOR RECOVERY OF HYDROGEN AND ABSTRACTION OF SULFUR

Brian R. James; Chung Li-Lee, both of Vancouver, Canada; Michael A. Lilga, and David A. Nelson, both of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Aug. 27, 1986, Ser. No. 900,863
Int. Cl.⁴ C01B *17/05*
U.S. Cl. 423—243 **6 Claims**

1. A process for abstracting sulfur and forming hydrogen comprising:

dissolving in a solvent a palladium complex of the formula, $Pd_2X_2(\mu\text{-dppm})_2$,

wherein dppm = bis(diphenylphosphino)methane,

wherein X is selected from Cl, Br, or I,

introducing H_2S to the palladium complex in solution whereby sulfur is abstracted by the complex from the H_2S to form $Pd_2X_2(\mu\text{-S})(\mu\text{-dppm})_2$ and hydrogen.

4,693,876

PROCESS FOR THE PREPARATION OF LINEAR POLYCHLOROPHOSPHAZENE

Roger DeJaeger, Chereng; Guy Pagniez, Lescar, and Philippe Potin, Billere, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

PCT No. PCT/FR85/00294, § 371 Date Aug. 14, 1986, § 102(e) Date Aug. 14, 1986, PCT Pub. No. WO86/02344, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 15, 1985, Ser. No. 882,958
Claims priority, application France, Oct. 17, 1984, 84 15892
Int. Cl.⁴ C01B *25/10*
U.S. Cl. 423—300 **14 Claims**

1. A process for the preparation of linear polychlorophosphazenes having a terminal group $—PXCl_2$, wherein X is oxygen or sulfur, wherein a monomer of the formula P_2NXCl_5 is polycondensed to form a polycondensation mixture by heating to release $PXCl_3$ and said heating is continued after the release of $PXCl_3$ has ceased, wherein at least the heating, following the release of $PXCl_3$, is carried out in solution in a medium which is a solvent of the monomer and the polychlorophosphazene, said solvent being inert to the constituents of the polycondensation reaction.

4,693,877

CLEAVAGE OF FORMAMIDE TO GIVE HYDROCYANIC ACID AND WATER

Ubbo v. Oehsen, Frankenthal; Karlheinz Stecher, Ludwigshafen; Waldemar Koehler, Frankenthal; Berthold Mueller, Bensheim; Fritz Brunnmueller, Limburgerhof, and Rolf Schneider, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,317
Int. Cl.⁴ C01C *3/04*
U.S. Cl. 423—373 **2 Claims**

1. A process for the cleavage of formamide to give hydrocyanic acid and water, wherein gaseous, superheated formamide together with from 0.1 to 10% by volume of air is introduced into a tube bundle reactor at from 300° to 480° C., under reduced pressure of from 1 to 350 mbar and passed over moldings subjected to final sintering and consisting of from 50 to 100% by weight of alumina and from 50 to 0% by weight of silica, or over high temperature corrosion-resistant chromium-nickel stainless steel moldings; at from 450° to 590° C., the mean residence time being from 0.01 to 0.25 seconds.

2. A process for the cleavage of formamide to give hydrocyanic acid and water, wherein gaseous, superheated formamide together with from 1.0 to 3.0% by volume of air is introduced into a tube bundle reactor at from 300°–400° C., under reduced pressure of from 50–150 mbar and passed over moldings subjected to final sintering and consisting of from 85–95% by weight of alumina and from 15–5% by weight of silica or over chromium-nickel stainless steel moldings comprising from 18–21% by weight of chromium, from 9–13% by weight of nickel and from 0–3% by weight of silicon, the remainder to 100% by weight being iron; at from 500°–540° C., the mean residence time being from 0.01 to 0.05 seconds.

4,693,878

PROCESS FOR THE PRODUCTION OF SOLUBLE ALKALI SILICATES

Arankathu Skaria, Stäfa, and Heinrich Goeldi, Neuhausen, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 15, 1986, Ser. No. 919,017
Claims priority, application Switzerland, Jun. 11, 1986, 2365/86
Int. Cl.⁴ C01B *33/32*
U.S. Cl. 423—334 **14 Claims**

1. Process for the production of soluble alkali silicates by removal of the fluorine from a finely divided waste silicic acid

reacted with an alkali-containing compound, said silicic acid containing free water and having a BET-surface of less than 20 m^2/g, with a fluorine content of less than 10% in the dry substance, which process comprises:

providing said waste silicic acid occurring by reaction of hexafluorosilicic acid with aluminum hydroxide;

treating said waste silicic acid with agitation with hexafluorosilicic acid heated to 60°–100° C. to form a mixture;

filtering the mixture;

washing the filter cake with water to free the filter cake from remaining hexafluorosilicic acid;

calcined in the range of 600°–1300° C.; and,

reacting with an alkali-containing compound.

7. Process according to claim 1 wherein the purified silicic acid in an above-stoichiometric quantity of 20–25% wt. is brought to reaction at a temperature of 90°–100° C. during 45–60 minutes with a 10–20% wt. alkali hydroxide solution and the hot suspension is filtered off.

4,693,879

ULTRASONIC VIBRATION SIEVING APPARATUS AND PROCESS FOR PURIFYING CARBON BLACK BY USING THE APPARATUS

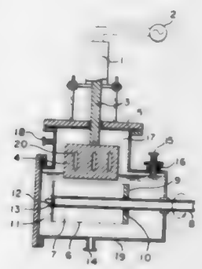
Shushichi Yoshimura; Yasunori Hiwatashi; Hiromu Kobayashi; Hozo Yamazaki, all of Kitakyushu; Nobu Nishino, Iwaki; Teruji Tahara, Yokohama, and Hidenobu Kobayashi, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,680

Claims priority, application Japan, Oct. 9, 1984, 59-212147; Dec. 26, 1984, 59-280578; Dec. 26, 1984, 59-280579

Int. Cl.⁴ C09C *1/56*

U.S. Cl. 423—461 **15 Claims**



1. A process for purifying carbon black which contains solid impurities by removing the solid impurities therefrom, which process comprises suspending said carbon black uniformly in water to obtain a carbon black aqueous slurry and subjecting the slurry to a sieving treatment with an ultrasonic vibration sieving apparatus, and wherein said ultrasonic vibration sieving apparatus comprises:

(a) a sieving maching body provided with a supply pipe and a discharge pipe for the carbon black aqueous slurry,

(b) a sieving chamber provided within the sieving machine body and provided with a withdrawal pipe for a sieved carbon black aqueous slurry,

(c) a filter layer constituting a part of the surface of the sieving chamber,

(d) an ultrasonic oscillation tip facing the filter layer surface and being dipped in the carbon black aqueous slurry to be sieved, and

(e) a tip chamber provided above the sieving machine body to permit the ultrasonic oscillation tip to enter into the sieving machine body; and wherein the the tip chamber is a gas chamber filled with a gas except for the lower portion of the ultrasonic oscillation tip.

4,693,880

PROCESS FOR PRODUCING DITHIONITES

Satoshi Arakawa, Chiba, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,830

Claims priority, application Japan, Mar. 6, 1980, 55-28432

The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.

Int. Cl.⁴ C01B *17/66*

U.S. Cl. 423—515 **1 Claim**

1. A process for producing an anhydrous dithionite which comprises reacting at least one formic compound selected from the group consisting of formic acid, formates and mixtures thereof, at least one alkaline compound, and sulfur dioxide in the presence of water and at least one organic solvent, filtering the resulting dithionite crystal from the mother liquor to form a crystal layer, washing the dithionite crystal layer with an organic solvent by adding all of organic solvent used in the washing step in one step and drying the dithionite crystal, the washings from the washing step being discharged in two sequential stages as a first discharge and a subsequent discharge, separately collecting the washings first discharged from the washing step and the washings discharged subsequently, the amount of the washings first discharged is in the range of 20 to 60% by weight based on the weight of the dithionite crystal, distilling the washings first discharged and recovering the organic solvent, and using the washings discharged subsequently without distillation as the reaction solvent.

4,693,881

SIMULTANEOUS SEPARATION AND CONVERSION TO SULFUR OF H_2S

Ralph Miller, Pleasantville, N.Y., assignor to T-Thermal, Inc., Conshohocken, Pa.

Filed Jul. 17, 1985, Ser. No. 755,840

Int. Cl.⁴ C01B *17/02*

U.S. Cl. 423—573 R **9 Claims**

1. In a regenerable process for the removal and conversion to sulfur of the hydrogen sulfide contained in a gas in which the gas is contacted with a regenerated, acidic, ferric sulfate-containing reaction medium to react the bulk of the hydrogen sulfide with ferric sulfate to form a slurry of sulfur dispersed in the reaction medium, a mole of ferrous sulfate and a half mole of sulfuric acid being formed in the reaction medium for each half mole of hydrogen sulfide converted to sulfur; the sulfur separated from the reaction medium; the acidic, ferric sulfate-containing reaction medium being regenerated from the ferrous sulfate-containing reaction medium and the regenerated reaction medium recycled to the hydrogen sulfide contacting operation; the improvement which comprises the steps of:

(a) at a low temperature, which temperature is above that sufficient to maintain ferrous sulfate within the medium, continuously contacting the ferrous sulfate-containing reaction medium with a gas containing oxygen and nitric oxide, the ratio of moles of oxygen to moles of nitric oxide in said gas being less than about sixty-one (61) to one (1) to form a regenerated, acidic, ferric sulfate-containing reaction medium and a gas mixture, said gas mixture containing all of the nitric oxide and a diminished oxygen content;

(b) continuously separating said regenerated, acidic ferric sulfate-containing reaction medium from said gas mixture; and

(c) recycling said regenerated, acidic ferric-sulfate-containing reaction medium to the hydrogen sulfide contacting operation;

4,693,882

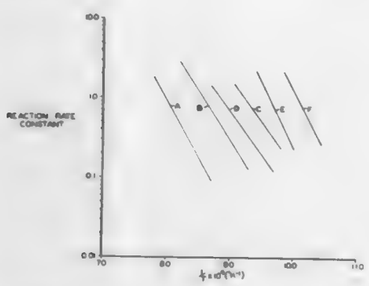
STEAM REFORMING UTILIZING SULFUR TOLERANT CATALYST

Herbert J. Setzer, Ellington; Sam Karavolis, East Hampton, and John A. S. Bett, Hamden, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Division of Ser. No. 857,688, Apr. 30, 1986. This application Dec. 24, 1986, Ser. No. 946,333

Int. Cl.⁴ C01B *1/02*

U.S. Cl. 423—652 **18 Claims**



1. In a steam reforming process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures, wherein the improvement comprises utilizing as a catalyst material high activity, sulfur tolerant catalyst of platinum supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

7. In a steam process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures wherein the improvement comprises utilizing as a catalyst material high activity, sulfur tolerant catalysts consisting essentially of iridium supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

13. In a steam reforming process for converting hydrocarbon material to hydrogen gas in the presence of sulfur comprising adding steam to the hydrocarbon material and passing the steam and hydrocarbon material over catalyst material at elevated temperatures wherein the improvement comprises utilizing as a catalyst material high activity sulfur tolerant catalysts consisting essentially of palladium supported on lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina.

4,693,883

AMMONIA UTILIZATION PROCESS

Donald K. Fleming, Park Ridge, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

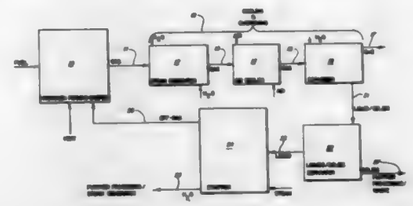
Filed Dec. 27, 1985, Ser. No. 813,919

Int. Cl.⁴ C01C *1/02*

U.S. Cl. 423—648 R **18 Claims**

1. In a process for gasification of organic carbonaceous materials in a hydrogen forming gasifier, the improvement comprising:

separating ammonia from product gas of said gasifier by dissolving in an aqueous liquid forming sour water; separating said sour water from said gasifier product gas; separating gaseous ammonia from said sour water; and recycling said gaseous ammonia to said hydrogen forming gasifier operated under organic carbonaceous material



gasifying conditions forming a substantial amount of hydrogen and nitrogen from said ammonia.

4,693,884

TECHNETIUM-99M TRIPHOSPHONATES AND TETRAPHOSPHONATES FOR THE SCINTIGRAPHIC VISUALIZATION OF RES-CONTAINING ORGANS AND LYMPH VESSELS, AND A PROCESS FOR THEIR PREPARATION

Hans-Jerg Kleiner, Kronberg/Taunus; Gerhard Kloss, Kelkheim; Michael Molter, Schwalbach; Alexander Schwarz, Flörsheim am Main, and Horst-Dieter Thamm, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,173

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 32375735

Int. Cl.⁴ A61K *43/00, 49/00, 49/02*

U.S. Cl. 424—1.1 **2 Claims**

1. A diagnostic agent for the visualization of RES-containing organs and the lymph vessels, which contains one or more compounds labeled with technetium-99m selected from the group consisting of 2,4,4-triphosphonobutyric acid (TPB), ethane-1,1,2,2-tetraphosphonic acid (ETP), propane-1,1,3,3-tetraphosphonic acid (PTP) and butane-1,1,4,4-tetraphosphonic acid (BTP) or a suitable salt thereof in physiologic saline.

4,693,885

TETRAPYRROLE THERAPEUTIC AGENTS

Jerry C. Bommer, Ogden, and Bruce F. Burnham, Logan, both of Utah, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

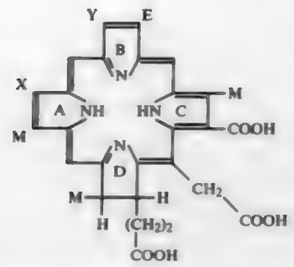
Continuation-in-part of Ser. No. 631,925, Jul. 18, 1984. This application Apr. 30, 1985, Ser. No. 728,784

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.⁴ A61K *31/40*; C07D *487/22*

U.S. Cl. 424—2 **13 Claims**

1. A fluorescent mono, di- or polyamide of an amino acid containing two carboxylic acid groups and a tetrapyrrole compound of the formula:



said amide linkages being formed between the amino group of the amino acid and the carboxyl group of the tetrapyrrole, wherein;

X=H, vinyl, ethyl, acetyl or formyl;

Y=methyl or formyl;

M=methyl; and

E=ethyl

and pharmaceutically-acceptable salts thereof.

12. A method for the detection of mammalian tumors which comprises administering to a mammalian host an effective amount of a compound according to claim 1; and applying light of sufficient wavelength to the area of the mammalian host to be examined, whereby fluorescence is observed in the tumor-affected area.

13. A method of treatment of mammalian tumors which comprises administering to a mammalian host with a tumor an effective amount of a fluorescent compound according to claim 1; and applying light of sufficient wavelength and intensity to activate said compound, whereby said activated compound exerts a cell-killing effect on said tumor.

4,693,886

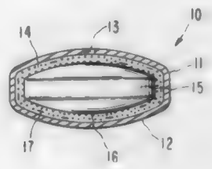
OSMOTIC DEVICE WITH INERT CORE

Atul D. Ayer, Mt. View, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 22, 1985, Ser. No. 725,840

Int. Cl.[4] A61K *9/22, 9/24, 9/44*

U.S. Cl. 424—15 **11 Claims**



1. An osmotic dispensing device for delivering a beneficial medicine formulation to an environment of use, comprising:

(a) a wall comprising in at least a part a semipermeable composition permeable to the passage of an exterior fluid present in the environment of use and substantially impermeable to the passage of the beneficial medicine formulation, the wall surrounding and forming;

(b) a compartment;

(c) means in the compartment for carrying a beneficial medicine formulation, said means comprising a member selected from the group consisting of a nontoxic, physiologically and pharmacologically inert hydrophobic composition and a nontoxic, physiologically and pharmacologically inert hydrophobic polymer, which means comprises a preshape that corresponds to the interior shape of the osmotic dispensing device thereby providing support for a medicinal formulation;

(d) a dosage unit amount of a medicine formulation carried on the means; and,

(e) at least one passageway in the wall communicating with the compartment for delivering the beneficial medicine formulation from the osmotic device.

4,693,887

MICROPHASE SEPARATED HYDROGELS FOR CONTROLLED RELEASE OF BIOACTIVE MATERIALS

Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 532,643, Sep. 15, 1983, abandoned. This application May 3, 1984, Ser. No. 606,794

Int. Cl.[4] A61K *9/22, 9/52, 31/78, 31/79*

U.S. Cl. 424—19 **9 Claims**

1. A composition for the controlled and consistent release of a water-soluble drug comprising a blend of:

10 to 30% by weight of a non-crosslinked water-soluble homopolymer of N-vinyl lactam having the structure



in which X represents an alkylene bridge having three to five carbon atoms, or a water-soluble copolymer thereof with 1 to 90 mole percent of copolymerizable monomer containing a polumerizable ethylenic unsaturation;

90 to 70% by weight of a non-crosslinked water-insoluble copolymer comprising from about 50 to 90 percent by weight, based on the total weight of the copolymer, of a hydrophobic water-insoluble ethylenically unsaturated monomer, 2 to 12 percent by weight of an ethylenically unsaturated monomer containing an acid group, and 0 to 50 percent by weight of a hydrophilic ethylenically unsaturated monomer, free from acid groups;

and less than 30% by weight, based on the weight of said blend, of a water-soluble drug dispersed throughout said blend.

4,693,888

CARIES-PREVENTIVE COMPOSITION

Tsuneo Miyahara; Yoshihiro Harada, both of Kanagawa; Katsuyuki Futakami, Chigasaki; Yasukuni Nishida, Kanagawa, and Ryoko Konishi, Ito, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Aug. 7, 1984, Ser. No. 638,553

Claims priority, application Japan, Aug. 11, 1983, 58-146859; Aug. 11, 1983, 58-146858

Int. Cl.[4] A61K *7/16, 7/18, 7/28*

U.S. Cl. 424—49 **27 Claims**

1. A caries-preventive composition, comprising:

an effective amount of antibody obtained by immunizing a mammal with at least one antigen selected from the group consisting of Streptococcus mutans, its cell-wall fraction, it's fibrous substance fraction, it's glucosyltransferase fraction and it's protein antigen fraction; and

an effective amount of at least one synergist selected from the group consisting of fluorine compounds, chlorhexidene and salts thereof, lytic enzymes, bacteriocins, glucosyltransferase inhibitors, proteases and dextranases.

4,693,889

BIRD REPELLENT COMPOSITION

Michael T. Chirchirillo, and Terrance Cannan, both of Chicago, Ill., assignors to Velsicol Chemical Corporation, Rosemont, Ill.

Filed Dec. 9, 1985, Ser. No. 806,877

Int. Cl.[4] A61K *31/745*

U.S. Cl. 424—83 **7 Claims**

1. A bird repellent composition comprising 15–35 weight percent polyisobutylene having a Staudinger molecular weight of about 8,000 to 15,000, 20–50 weight percent paraffin oil, 0–15 weight percent isoparaffin oil, 0–6 weight percent organic modified montomorillonite and 15–45 weight percent kaolin clay.

4,693,890

USE OF 1-NONEN-3-OL FOR REPELLING INSECTS

Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ira Katz, West Long Branch, N.J., and Kenneth R. Schrankel, Tinton Falls, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Filed Jun. 27, 1986, Ser. No. 879,426

Int. Cl.[4] A61K *31/74, 31/745;* **A01N** *31/00*

U.S. Cl. 424—78 **2 Claims**

1. A process for repelling house flies, *Musca domestica*, comprising the step of treating an environment infested or imminently capable of being infested with said house flies with a house fly repelling concentration of 1-nonen-3-ol.

4,693,891

VACCINE FOR *PSEUDOMONAS AERUGINOSA*

Michael S. Collins, Richmond; Grace C. Tsay, Walnut Creek, and Richard L. Seng, San Francisco, all of Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 9, 1985, Ser. No. 773,915

Int. Cl.[4] A61K *39/02*

U.S. Cl. 424—92 **17 Claims**

1. An immunizing composition effective against gram negative bacteria selected from the group consisting of *Pseudomonas aeruginosa, Escherichia coli,* Proteus sp, Serratia sp, and Klebsiella sp, and free from toxicity and endotoxin activity comprising (a) a non-toxic protein having reactive carboxylic acid groups isolated from the gram-positive bacterium, *Micrococcus luteus;* and (b) a member selected from a non-toxic polysaccharide and a non-toxic lipopolysaccharide isolated from said gram negative bacteria, said non-toxic polysaccharide or non-toxic lipopolysaccharide having been selectively oxidized to provide reactive aldehyde groups thereon, wherein the non-toxic protein and the non-toxic polysaccharide or non-toxic lipopolysaccharide are covalently coupled by means of a polyfunctional compound having a 4–12 carbon atoms and containing at least two functional groups, one of which is reactive to the aldehyde groups on the selectively oxidized non-toxic polysaccharide or non-toxic lipopolysaccharide and the other of which is reactive to the carboxylic acid groups on the non-toxic protein.

4,693,892

GELATIN CONTAINING β-CAROTENE

Ahmed Hegazy, Leverkusen, and Manfred Winter, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,733

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1985, 3532129

Int. Cl.[4] A61K *9/48;* **C09B** *61/00*

U.S. Cl. 424—456 **8 Claims**

1. A light-fast opaque coloring composition comprising by weight a mixture of about 1 to 25 parts of β-carotene and about 1 to 25 parts of iron oxide.

4,693,893

VACCINES FOR EQUINE INFLUENZA

David A. Campbell, Palo Alto, Calif., assignor to Burroughs Wellcome, N.C.

Continuation-in-part of Ser. No. 565,648, Dec. 27, 1983, abandoned. This application Apr. 3, 1984, Ser. No. 596,447

Claims priority, application United Kingdom, Jan. 8, 1983, 8300467

Int. Cl.[4] A61K *39/155, 39/295*

U.S. Cl. 424—89 **4 Claims**

1. A vaccine for either or both of Eq 1 and Eq 2 equine influenza comprising an effective vaccination amount of inactivated genetically reassorted virus grown in cell culture and derived from either or both of an equine Eq 1 and Eq 2 influenza virus and the human influenza virus A/Puerto Rico/8/34 which reassorted virus comprises RNA derived from either or both of Eq 1 and Eq 2 equine influenza virus coding for at least one neuraminidase or haemagglutinin surface antigen and an RNA segment derived from A/Puerto Rico/8/34 which codes for matrix protein in association with a veterinary acceptable carrier which can contain an adjuvant suitable for use as a vehicle to introduce the inactivated virus by parenteral administration into the animal.

4,693,894

HALOPHOR COMPOSITION

Robert H. Juda, Akron; Roger A. Crawford, Wadsworth, both of Ohio, and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 16, 1986, Ser. No. 819,440

Int. Cl.[4] A61K *33/18*

U.S. Cl. 424—150 **34 Claims**

1. A halophor comprising a complex of (a) elemental halogen selected from the group consisting of bromine and iodine, (b) dihalide of poly(ethylene glycol), and (c) added halide represented by the formula MX, wherein M is hydrogen, alkali metal or alkaline earth metal, and X is bromine, chlorine or iodine, the mole ratio of added halide to halogen being from about 1:1 to 1:12, and the amount of elemental halogen in the halophor complex being between about 10 and about 50 weight percent.

4,693,895

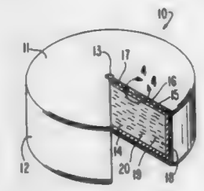
COLON DELIVERY SYSTEM

Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Oct. 26, 1984, Ser. No. 665,279

Int. Cl.[4] A61K *27/12, 9/24, 9/36;* **A61M** *31/00*

U.S. Cl. 424—473 **19 Claims**



1. An osmotic device for delivering a drug to a biological environment of use, said device comprising:

(a) a shaped laminated wall comprising: (1) a first lamina comprising a semipermeable composition permeable to the passage of fluid and substantially impermeable to the passage of drug; (2) second lamina comprising a composition comprising a polymer and an osmotic solute, which polymer is permeable to the passage of fluid and impermeable to the passage of the osmotic solute; and (3) a third lamina comprising an enteric composition, said first, sec-

ond and third lamina comprising different compositions with the laminated wall surrounding and defining:

(b) a compartment containing a dosage unit amount of a beneficial drug formulation; and,

(c) at least one passageway through the laminated wall communicating with the compartment and the exterior of the osmotic device for dispensing the drug formulation from the device to the environment of use.

4,693,896

ETHYLCELLULOSE-COATED, GASTRIC-DISINTEGRABLE ASPIRIN TABLET

Thomas A. Wheatley, Richboro, Pa., and Rashminkumar S. Shah, East Windsor, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 7, 1985, Ser. No. 785,317

Int. Cl.[4] A61K *9/36*

U.S. Cl. 424—480 **10 Claims**

1. A coated, rapidly-disintegrable analgesic tablet comprising an aspirin tablet core coated with a thin film coating consisting essentially of the dried residue of an aqueous ethylcellulose dispersion that provides a thin film of ethylcellulose polymer containing 10–40 wt % plasticizer based on the film polymer solids, the thin film constituting less than about 2 wt % of the coated tablet weight and consisting essentially of ethylcellulose as the primary coating polymer.

4,693,897

STIMULATION AND ENHANCEMENT OF FEEDING IN HERBIVOROUS FISH

Peter B. Johnsen, Havertown, Pa., and Michael A. Adams, Haddonfield, N.J., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Continuation of Ser. No. 641,569, Aug. 16, 1984, abandoned. This application Apr. 1, 1986, Ser. No. 846,834

Int. Cl.[4] A23K *1/00*

U.S. Cl. 426—2 **2 Claims**

1. A method of production of herbivorous Tilapia or herbivorous grass carp consisting essentially of feeding said Tilapia or said grass carp edible foodstuff admixed with a stimulating or enhancing amount of at least one of glutamic, aspartic or citric acids.

4,693,898

NOVEL BAKER'S YEAST AND PROCESS FOR MAKING BREAD

Yasuo Nakatomi, Chiba; Katsuhiko Hara; Fumio Umeda, both of Saitama; Toshiaki Kono, Kanagawa, and Hisashi Niimoto, Tokyo, all of Japan, assignors to Oriental Yeast Co., Ltd. and Meiji Seika Kaisha, Ltd., both of Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,854

Claims priority, application Japan, Apr. 9, 1985, 60-73580

Int. Cl.[4] C12N *1/18*; A21D *2/00*

U.S. Cl. 426—19 **6 Claims**

1. A process for making bread, which comprises the steps of mixing flour, water, fructooligosaccharide, a strain of yeast called *Saccharomyces cerevisiae* IL-1, FERM P-8056 and a hexose fermentable by said yeast strain, in proportions effective for making bread; leavening said mixture; then baking said leavened mixture to thereby obtain bread in which the fructooligosaccharide has not been decomposed.

6. An essentially pure culture of *Saccharomyces cerevisiae* IL-1, FERM P-8056.

4,693,899

METHOD FOR PREPARING FILLED COOKED DOUGH PRODUCT

Leon Hong, 81 Coalpit Rd., Danbury, Conn. 06810, and John J. Balboni, Nash Rd., Purdys, N.Y. 10578

Filed May 22, 1985, Ser. No. 736,800

Int. Cl.[4] A21D *13/08, 15/02*

U.S. Cl. 426—94 **7 Claims**

1. A method for preparing a filled cooked dough product having a high-moisture filling and an outer casing of bread having a bread-like crust and soft internal crumb, comprising the steps of:

(a) providing a leavened uncooked dough capable of being cooked to a bread-like product having a firm crust and a tender interior crumb;

(b) providing an edible filling comprising a viscous freeze-thaw stable mixture of particulate food ingredients and a water-containing sauce therefor containing a water-binding carbohydrate;

(c) completely enveloping said filling within said uncooked dough;

(d) cooking said enveloped product to an extent sufficient to bring about development in said dough of a firm crust exterior and a tender interior crumb structure;

(e) freezing said cooked product; and

(f) reheating said frozen cooked product to achieve a firm outer crust and a tender non-soggy bread-like crumb in the cooked dough and to achieve a defrosted filling within said cooked dough, both being at a temperature desired for consumption by a method selected from either (1) first subjecting said frozen product to microwave heating and thereafter subjecting said product to non-microwave oven heating or (2) subjecting said frozen product simultaneously to microwave heat and non-microwave oven heating, whereby the microwave heating is sufficient to thaw the filling portion of said product without effecting substantial dehydration thereof and the non-microwave oven heating is sufficient to bring about a crust and crumb structure in said reheated product closely resembling that existing after the cooking of step (d).

4,693,900

SHAPED PASTA PRODUCTS

Claudio Molinari, Collecchio, Italy, assignor to UNIMAC S.r.l., Collecchio, Italy

Filed Aug. 14, 1985, Ser. No. 765,865

Claims priority, application Italy, Sep. 28, 1984, 46866 A/84

Int. Cl.[4] A23L *1/16, 3/10*

U.S. Cl. 426—128 **6 Claims**

1. A shaped pasta product produced by cooking said pasta with water to obtain cooked pasta, placing said cooked pasta in a mold, deaerating under vacuum said cooked pasta in said mold to obtain deaerated cooked pasta, compressing said deaerated cooked pasta under vacuum to obtain compressed cooked pasta, cooling said compressed pasta to obtain a product consisting essentially of cooled compressed cooked pasta, cutting said product into portions, packaging said portions to obtain packaged portions, sterilizing said packaged portions, storing said sterilized packaged portions under vacuum condition to prevent oxidation.

4,693,901

SHELF STABLE DAIRYLIKE PRODUCTS

William Hullah, Don Mills, Canada, assignor to Cardinal Biological, Ltd., Ontario, Canada

Filed Dec. 10, 1985, Ser. No. 807,524

Int. Cl.[4] A23D *5/04*

U.S. Cl. 426—330.6 **3 Claims**

1. A shelf-stable, dairylike product having a dairylike taste and a texture similar to that of sour cream, cream cheese, or fresh cream, comprising from about 5.0 to about 25.0 parts by weight of milk solids, from about 4.0 to about 50.0 parts by weight of oil, from about 0.2 to about 4.0 parts by weight of emulsifiers, from about 0.003 to about 0.7 parts by weight of a phosphate, and sufficient food grade acid to lower the pH to from about 2.5 to about 4.6, and a stabilizer comprising a combination of from about 0.20 to about 1.5 parts by weight of microcrystalline cellulose and from about 0.01 to about 1.0 parts by weight of carboxylmethyl cellulose, wherein the amount of stabilizer is adjusted to impart the desired texture to the product.

4,693,902

PASTEURIZATION PROCESS

Donald W. Richmond; Carl W. Clyne, and Tod M. Holben, all of St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Continuation-in-part of Ser. No. 620,471, Jun. 14, 1984, abandoned. This application May 28, 1985, Ser. No. 737,871

Int. Cl.[4] A23L *3/02*; C12H *1/00*

U.S. Cl. 426—407 **16 Claims**

1. An improved method for tunnel pasteurization of beer in packages wherein water spray is applied at a rate of more than about 6 gal./min./ft.^{2} to the tops of the packages of beer from spray nozzles staggered transversely across the width of the tunnel and positioned above the packages to control P.U. input and wherein the P.U. input to each beer package is at a predetermined level between about 5.6 to about 20 comprising,

(a) controlling P.U. input to all packages of beer at a standard deviation of less than about 2 P.U. for each package while providing the P.U. input to each package at a predetermined minimum level above about 5.6,

(b) maintaining cold spot beer temperature in any package between about 140° F. and about 143° F., and

(c) maintaining beer out temperature between about 70° F. and about 85° F.

4,693,903

SESAME SEEDS HUSKING METHOD

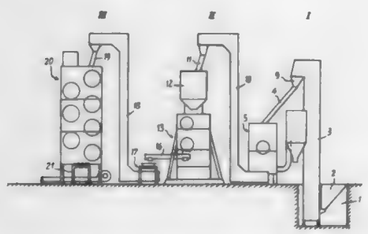
Mohammed Halwani, 90, Av. des Champs-Elysées, 75008 Paris, France

Filed Mar. 9, 1984, Ser. No. 588,127

Claims priority, application France, Oct. 5, 1983, 83 15864

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—456 **3 Claims**



1. A method for husking sesame seeds and preparing them for the production of oil and consumption, wherein the husking is carried out in two stages wherein:

first, the seeds are introduced to an attrition apparatus while injecting water and a water steam mixture until the water content of said seeds is about 15% and then sieving said seeds at the outlet of said attrition apparatus; and

then, during a second stage, the seeds are introduced into a drying assembly, where at the inlet of said drying assembly they receive a complementary water steam injection bringing their water content between 16% and 18%, the seeds are then dried in an attrition apparatus, thereby loosening the husk debris sticking to the sesame seeds.

4,693,904

PROCESS FOR STERILIZING A COCOA PASTE

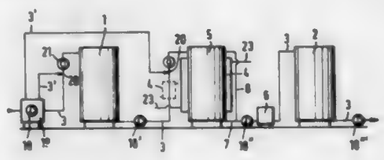
Armin Schmitt, Heusenstamm, Fed. Rep. of Germany, assignor to Luwa AG, Zurich, Fed. Rep. of Germany

Division of Ser. No. 359,783, Mar. 19, 1982, Pat. No. 4,446,781. This application Feb. 2, 1984, Ser. No. 576,175

Claims priority, application European Pat. Off., Mar. 21, 1981, 81102148

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—521 **4 Claims**



1. In a process for sterilizing a cocoa paste, initially forming the paste into a thin layer, continuously deacidifying said thin-layered paste, partially dehumidifying and degassing said thin-layered paste at a temperature less than 100° C. and, after a hold-up stage during which the paste is subjected to sterilization heat, continuously subjecting said paste in a thin layer to residual demoisturizing, and residual degassing and then discharging said paste for further processing at a rate corresponding to a feed rate at which said paste is initially formed into said thin layer, the improvement comprising, during the hold-up stage, continuously conveying the paste onward, holding up said paste, generating heat in the held-up paste by mechanical mixing to develop a sterilization temperature, maintaining said heat at a mean value by application of external heat, continuously removing a portion of said held-up paste, cooling said removed paste to a temperature below 100° C., with recondensing of a vapor phase, and continuing the treatment of the remaining portion of said held-up paste retained in the hold-up stage.

4,693,905

ORANGE FLAVOR AND AROMA COMPOSITIONS MADE BY DENSE GAS EXTRACTION OF ORGANIC ORGANCE FLAVOR AND AROMA COMPOUNDS

Cornelis H. Japikse; Lester P. Van Brocklin, both of Wyoming; Johnny A. Hembree; Ralph R. Kitts, both of Fairfield, and Donald R. Meece, Norwood, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 19, 1985, Ser. No. 746,608

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] A23L *2/02*

U.S. Cl. 426—599 **8 Claims**

1. A concentrated orange flavor and aroma composition comprising a natural orange essence oil extract containing organic flavor and aroma compounds, wherein at least three of said compounds are selected from the group consisting of ethyl butyrate, decanal, limonene, and valencene, and wherein at least about 0.50% of the composition is ethyl butyrate, less than about 0.35% of the composition is decanal, at least about 5% of the composition is valencene, and wherein the composition has an ethyl butyrate to limonene ratio of from about 1:10 to about 1:100, and wherein the extract is prepared by a process comprising the steps of:

(a) contacting natural orange essence oil with a solvent gas having a temperature between its critical temperature and about 100° C., and having a reduced pressure between about 0.56 and about 1.31 (where reduced pressure is defined as the extraction pressure of the solvent gas divided by its critical pressure), to extract flavor and aroma

compounds the majority of which have a molecular weight less than or equal to that of limonene;
(b) separating the solvent gas and dissolved compounds from the remaining undissolved compounds; and
(c) separating the dissolved compounds from the solvent gas.

4,693,906

DIELECTRIC FOR ELECTROLUMINESCENT DEVICES, AND METHODS FOR MAKING

Joseph Lindmayer, Rockville, Md., assignor to Quantex Corporation, Rockville, Md.

Filed Dec. 27, 1985, Ser. No. 813,928
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—69 **7 Claims**

1. A method of forming a dielectric layer in a electroluminescent device of the type including an electroluminescent layer sandwiched between a pair of electrodes and separated from the electrodes by respective dielectric layers, said method comprising: vapor depositing a layer of tantalum sub-oxide of the form Ta_2O_m, where $4.5 < m < 5.0$; and
exposing the layer of tantalum sub-oxide to OH radicals for completing a stable oxide network of the form $Ta_2O_mOH_{5-m}$.

4,693,907

PROCESS OR NON-ELECTROLYTIC COPPER PLATING FOR PRINTED CIRCUIT BOARD

Takakazu Ishikawa, Oogaki, Japan, assignor to Ibiden Kabushiki Kaisha, Oogaki, Japan

Continuation of Ser. No. 776,083, Sep. 13, 1985, which is a continuation of Ser. No. 562,099, Dec. 16, 1983. This application Jan. 27, 1987, Ser. No. 9,645
Claims priority, application Japan, Dec. 27, 1982, 57-226758
Int. Cl.[4] C23C *18/40*
U.S. Cl. 427—97 **7 Claims**

1. A process of non-electrolytic copper plating of a printed circuit board with through-holes obtaining a non-electrolytic copper plating film on said board, having mechanical characteristics similar to those of copper electroplating film, said process comprising at least one sequence of the following steps (a)–(f) before desired thickness of copper film deposits on said board:
(a) immersing said printed circuit board to be plated in a single non-electrolytic copper plating bath,
(b) drawing out said printed circuit board from the plating bath,
(c) immersing said printed circuit board in a 1.0–10N of inorganic acid aqueous solution of 20°–40° C. for 1–10 minutes,
(d) drawing out said printed circuit board from the acid aqueous solution,
(e) washing said printed circuit board with water, and
(f) immediately after the washing, immersing said printed circuit board again in the non-electrolytic copper plating bath.

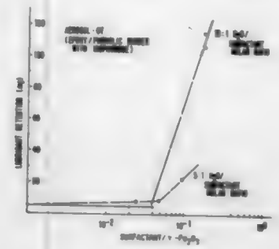
4,693,908

MAGNETIC RECORDING DISK WITH IMPROVED LUBRICANT RETENTION

Eva-Maria Rossi, Menlo Park, and Armin R. Tietze, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,623
Int. Cl.[4] G11B *5/708*
U.S. Cl. 427—130 **2 Claims**

1. In a process for making a magnetic recording disk which includes the steps of providing a suitable disk substrate, preparing an organic-based binder, the binder including a solvent and having magnetic particles dispersed therein, coating the binder onto the substrate, orienting the magnetic particles in alignment with a magnetic field, curing the coating on the substrate and applying a lubricant to the cured coating, an improvement comprising the steps of, before coating on the substrate, adding an inverse micelle forming surfactant to the binder in an amount such that the concentration of surfactant in the binder is sufficient to permit inverse micelles to be formed, and adding water to the surfactant and binder in a predetermined molar



ratio of water to surfactant, whereby during curing on the substrate the water evaporates from the attached inverse micelle forming surfactant and forms micropores in the cured coating for retention of the lubricant.

4,693,909

AQUEOUS WAX DISPERSIONS AS PRESERVATIVES FOR METAL SURFACES AND SURFACES OF COATINGS, THEIR USE AND A PROCESS FOR PRESERVING METAL SURFACES AND SURFACES OF COATINGS

Walter Ziegler, Edingen-Neckarhausen; Wolfram Dietsche, Frankenthal; Stefan Weiss, Neckargemuend; Richard Mueller, Bad Durkheim; Albert Hettche, Hesshelm; Klaus Glaser, Mutterstadt, and Christos Vamvakaris, Kallstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,306
Int. Cl.[4] B65B *33/00;* **B05D** *3/02*
U.S. Cl. 427—156 **9 Claims**

1. A liquid preservative for metal surfaces and surfaces of coatings, in the form of an aqueous wax dispersion, wherein the said dispersion contains from 10 to 30% by weight of an ethylene/acrylic acid copolymer wax, consisting of from 8 to 25% by weight of acrylic acid units and from 92 to 75% by weight of ethylene units, the percentages being based on the acid form of the wax, and water to make up to 100% by weight, the ethylene/acrylic acid copolymer wax in the acid form having a melt viscosity of not less than 1000 mm2/s, measured at 120° C., as a lower limit and an MFI of not less than 1, measured at 125° C. and 325 g, as an upper limit, and from 50 to 100 mol % of the carboxyl groups of the ethylene/acrylic acid copolymer wax are neutralized.

4,693,910

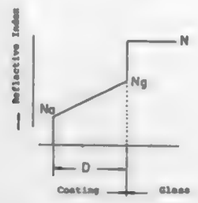
PROCESS FOR PRODUCING POROUS ANTIREFLECTIVE COATINGS

Sadahiro Nakajima, and Hisayoshi Toratani, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Apr. 17, 1985, Ser. No. 724,319
Claims priority, application Japan, May 7, 1984, 59-89483
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—168 **3 Claims**

1. A process for producing optical glass having a porous antireflective coating comprising:
treating an optical glass with an aqueous solution containing:
(i) 0.01 to 1 mol/l of an acidic salt having weak basicity, said acidic salt selected from the group consisting of an

Na_2HAsO_4, Na_2HCO_3, Na_2HPO_4 and NaC_2H_3O and (ii) 0 to 0.01 mol./l of Al^{3+}; and
8.0×10^{-4} to 1×10^{-3} mol./l of Si^{4+}



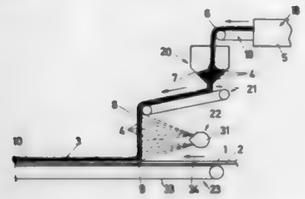
whereby a porous antireflective coating is obtained on said optical glass, said antireflective coating being substantially scratch-proof at loads in excess of 8.84 grams/cm^2.

4,693,911

METHOD FOR LINING A BASE WITH A CONTINUOUS GRANULATE LAYER AND EQUIPMENT FOR THE WORKING OF THIS METHOD

Jean-Frédéric Moreau, Carces, France, assignor to Revetements De Couvin, Couvin, Belgium

Filed Apr. 1, 1986, Ser. No. 846,739
Claims priority, application Belgium, Apr. 3, 1985, PV 0/214780
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—196 **27 Claims**



1. Method for lining a substantially plane quadrilateral-shaped surface of a base, with a continuous granulate layer, which comprises:
relieving the granulates from foreign materials,
bringing said granulates to a higher level than the base,
adjusting the granulate flow rate,
spreading the granulates to form said layer,
moving said layer by gravity towards the base such that the layer is received by the base and thereby defines a layer fall location,
coating during the layer fall, those granulates forming said layer with a material which causes said granulates to adhere to the base,
charging the granulates and the coating material oppositely,
moving the layer fall location relative to the base along a direction in parallel relationship with one base side,
adjusting the relative movement speed of said location, and
letting said material coating the granulates laid on the base, harden.

4,693,912

LYOPHILIZATION OF REAGENT-COATED PARTICLES

Anthony M. Spadaro, Mahopac; Thomas J. McLoughlin, Ossining, and Phillip V. Engler, Tarrytown, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,495
Int. Cl.[4] B01J *13/02;* **G01N** *31/00, 33/546*
U.S. Cl. 427—213.3 **32 Claims**

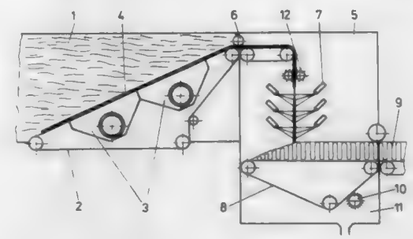
1. A method of lyophilizing reagent-coated particles, which comprises:
(a) combining a suspension of reagent-coated particles with a cryoprotective agent, said cryoprotective agent forming, during lyophilization of said combined suspension, an inert network encapsulating said particles in spaced-apart non-contacting relationship and also a zwitterionic buffer in an amount sufficient to substantially satisfy any reactive exposed sites on said particles; and
(b) lyophilizing the combined suspension to provide a lyophilized product comprising said encapsulating network and which, upon reconstitution of said lyophilized product and dissolution of the encapsulating network, has a same degree of dispersity as the pre-lyophilized product.

4,693,913

METHOD AND APPARATUS FOR THE LOSS-FREE INTRODUCTION OF BINDING AGENTS INTO MINERAL WOOL FLEECES

Dieter Gessner, and Rainer Steckert, both of Bad Berka, German Democratic Rep., assignors to VEB Zementkombinat, Dessau, German Democratic Rep.

Filed Apr. 8, 1986, Ser. No. 849,315
Claims priority, application German Democratic Rep., May 6, 1986, 2759904
Int. Cl.[4] B05D *7/00;* **C03B** *37/04*
U.S. Cl. 427—215 **15 Claims**



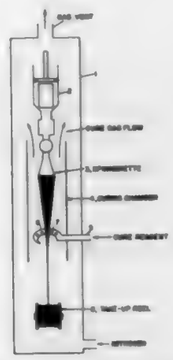
1. A method for the loss-free introduction of binding agents into mineral fiber fleeces comprising,
forming a thin fiber-fleece of mineral fibers not containing any binding agent on a suction belt in a suction chamber;
subsequently conveying the thin fiber fleece into a spraying and collecting chamber completely separated from the suction chamber;
disassociating the thin fiber fleece into individual fibers and fiber agglomerates by means of gravitational force in a free-fall area of the spraying and collecting chamber;
evenly spraying a binding agent onto free-falling individual fibers and fiber agglomerates in the spraying and collecting chamber; and
collecting the sprayed, free-falling individual fibers and fiber agglomerates on a collecting belt travelling at a speed necessary to form a crude fiber fleece having a thickness required for further processing.

4,693,914

CURING OF PRECERAMIC ARTICLES WITH GASEOUS THIONYL CHLORIDE

Paul Foley, Oldwick, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 5, 1986, Ser. No. 859,952
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—255 4 Claims



1. A process for producing a ceramic material which comprises:

(a) contacting a shaped article made from an organosilicon preceramic polymer with a gaseous thionyl chloride for a period of time sufficient to cure the same; and

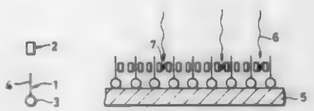
(b) thereafter pyrolyzing said shaped preceramic article by heating the same in an inert atmosphere at elevated temperatures.

4,693,915

FILM FORMING METHOD, RECORDING MEDIUM FORMED THEREBY AND RECORDING METHOD THEREWITH

Hiroshi Matsuda, Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, Tokyo; Yukuo Nishimura, Sagamihara; Ken Eguchi, Yokohama, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,544
Claims priority, application Japan, Apr. 20, 1984, 59-78636; May 15, 1984, 59-95572; May 15, 1984, 59-95575; May 15, 1984, 59-95576; May 15, 1984, 59-95583; May 15, 1984, 59-95584
Int. Cl.[4] B41M *5/26*
U.S. Cl. 427—256 20 Claims



16. A recording method, which comprises selective heating of a recording layer formed of a monomolecular film or a monomolecular-layer built-up film of a clathrate complex compound composed of a host molecule having a hydrophilic portion, a hydrophobic portion and a portion to enclose a guest molecule, and a sublimable guest molecule on a substrate, thereby subliming the guest molecules selectively to make a record.

4,693,916

METHOD OF DEPOSITING A SILICON DIOXIDE FILM

Hirotsugu Nagayama, Nishinomiya; Hisao Honda, Itami, and Hideo Kawahara, Toyonaka, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jul. 7, 1986, Ser. No. 882,428
Claims priority, application Japan, Jul. 19, 1985, 60-159457
Int. Cl.[4] B05D *1/18*
U.S. Cl. 427—397.7 7 Claims

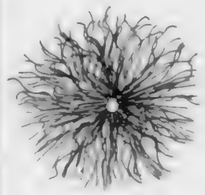
1. A method of depositing a silicon dioxide film on a substrate comprising the steps of adding a metal-containing material to a hydrosilicofluoric acid solution to supersaturate the solution with silicon dioxide, then immersing the substrate in the solution to deposit a silicon dioxide film on the substrate.

4,693,917

PROCESS AND APPARATUS FOR PREPARING A FILLING MATERIAL, PARTICULARLY FOR AN ARTICLE GIVING BODY PROTECTION

Roland A. E. Geloen, 21 rue de Lorraine, 59100 Roubaix, France

Filed Nov. 8, 1985, Ser. No. 796,221
Claims priority, application France, Nov. 9, 1984, 84 17110
Int. Cl.[4] G21C *3/06*; D01B *1/48, 3/00*
U.S. Cl. 428—6 11 Claims



1. Process for the treatment of insulating materials in ths supple, fluffy state, such as down, and intended for filling body-protecting structures, said process comprising the step of subjecting the fluff of the down to a physical treatment adapted to take the filament of the fluff into a substantially radial position, giving the fluff its maximum volume, wherein said treatment includes a suspension of the down fluff in a dry gaseous atmosphere at a temperature of the order of 100° C.

4,693,918

TOOL FOR FIRING CERAMICS

Masashi Fujimoto, and Yoshihisa Kato, both of Kariya, Japan, assignors to Toshiba Ceramics, Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,563
Claims priority, application Japan, Aug. 9, 1985, 60-174043
Int. Cl.[4] B32B *1/02*; F27B *14/08*
U.S. Cl. 428—35 15 Claims



1. A tool for firing ceramics, comprising a ceramic foam body having a three-dimensionally reticulated structure comprising plural interconnected ceramic strands, and a ceramic setting layer formed on at least one part of the surface of the ceramic foam body, wherein each of said ceramic strands comprises plural ceramic layers.

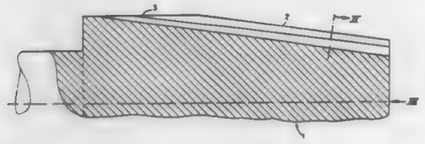
15. A crucible for firing ceramics comprising (a) a ceramic foam body having a three-dimensionally reticulated structure comprising plural interconnected ceramic strands and (b) a ceramic setting layer formed on at least one surface of the ceramic foam body.

4,693,919

PROTECTIVE DEVICE AND METHOD FOR FORMING PROTECTIVE DEVICE AND USE OF PROTECTIVE DEVICE AS A PACKAGE AND APPARATUS FOR FORMING PROTECTIVE DEVICE

Jean-Paul Languillat, Thorigny-sur-Oreuse; Jean-Michel Morel, Sens, and Jacques Queyrat, Pont sur Yonne, all of France, assignors to Lhomme S.A., Point sur Yonne, France

Filed May 31, 1985, Ser. No. 739,928
Int. Cl.[4] B32B *3/30*; B65B *11/00*; A45C *1/12*; B65D *81/02*
U.S. Cl. 428—36 27 Claims



1. A protective device comprising:

A hollow cardboard body fabricated from a cylindrical cardboard tube to have a surface defining a frustoconical area and a cylindrical area wherein said surface is provided with a series of corrugations including a plurality of ridges and adjacent valleys extending longitudinally along essentially the entire length of surface defining said frustoconical area and coverging towards a point on the longitudinal axis of said body, said corrugations having a depth which increases in the direction of the convergence of said corrugations, so as to provide said frustoconical area of said body with an average diameter which decreases in a substantially progressive manner along the longitudinal axis of said frustoconical area of said body beginning adjacent said cylindrical area.

4,693,920

PRESSURE SENSITIVE COMPOSITE MATERIAL

Arun K. Agarwal, Woodbridge, and Charles Balian, Guilford, both of Conn., assignors to CHR Industries, Inc., New Haven, Conn.

Filed Sep. 3, 1986, Ser. No. 903,300
Int. Cl.[4] A61F *13/02*
U.S. Cl. 428—40 8 Claims



1. A composite material comprising,

a non-woven substrate chosen from the group consisting of polyamide and fiberglass mat,

an adhesive coating applied to the surface of one side of said substrate, said adhesive coating chosen from the group of pressure sensitive adhesives consisting of polyacrylates, polysiloxanes, polyurethanes and resin modified natural and synthetic rubbers such as styrene-butadiene polymers, polyisoprene, polychloroprene, butadiene-acrylonitrile polymers, and

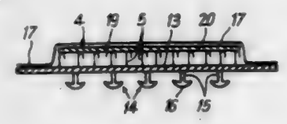
a resin coating applied to the surface of the other side of the substrate, said resin coating chosen from the group consisting of polyacrylates, polyesters, polyurethanes, butadiene-acrylonitrile polymers, and solvent resistant resins such as polychloroprene and chlorosulfonated-polyethylenes.

4,693,921

FASTENING TAPE DESIGNED TO BE ATTACHED TO A MOLDED ARTICLE DURING MOLDING, AND ITS ATTACHING METHOD

Patrick J. Billarant, 7213 Baltusrol La., Charlotte, N.C., and Bruno Queval, 839 Scaleybark Rd., Charlotte, N.C., assignors to Aplix., France

Filed Nov. 30, 1984, Ser. No. 676,951
Claims priority, application France, Dec. 13, 1983, 83 19926; Jun. 26, 1984, 84 10033
Int. Cl.[4] A44B *21/00*
U.S. Cl. 428—100 14 Claims



1. In a fastening member of the type characterized by having a base carrying on one side numerous rows of hook-like projections for mating, releasable engagement with a loose, fibrous non-woven patch to form a fastener assembly, the improvement which comprises a temporary thin protective film covering and sealingly enclosing the hook-like projections around the entire periphery of the fastening member against leakage of molding liquid past the film onto the hook-like projections to protect the hook-like projections from clogging by a molding liquid when molding the fastening member into a molded article and being removable from covering relation to the hook-like projections after the molding liquid has solidified, whereby the hook-like projections are substantially clear of clogging by solidified foam material at the end of the molding process and ready to receive the non-woven patch without an intermediate step of cleaning solidified foam material from the hook-like projections.

4,693,922

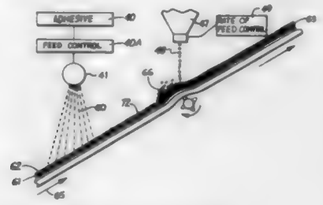
LIGHT WEIGHT ENTANGLED NON-WOVEN FABRIC HAVING EXCELLENT MACHINE DIRECTION AND CROSS DIRECTION STRENGTH AND PROCESS FOR MAKING THE SAME

Conrad C. Buyofsky, South River, and John W. Kennette, Somerville, both of N.J., assignors to Chicopee, New Brunswick, N.J.

Filed Sep. 26, 1985, Ser. No. 780,461
Int. Cl.[4] B32B *3/10*; D06C *1/46, 1/74*
U.S. Cl. 428—134 5 Claims

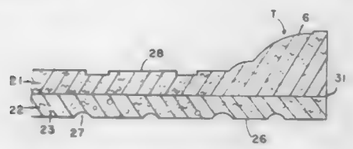
1. An entangled non-woven fabric comprising at least about 75% polyester staple fibers, said fibers being arranged in a repeating pattern of spaced parallel lines of raised entangled regions interconnected by partially entangled fiber arrays, said lines extending in one fabric direction, and spaced bundles of straight substantially parallel fiber segments interconnecting the entangled regions of adjacent lines, said bundles being substantially parallel to one another and substantially perpendicular to said line, adjacent bundle and said lines defining aperatures therebetween.

4,693,923
WATER BARRIER
Bryan M. McGroarty, 10233 Chicago Cir., and Patrick J. McGroarty, 9101 Fifth Ave. South, both of Bloomington, Minn. 55420
Filed Nov. 22, 1983, Ser. No. 801,007
Int. Cl.[4] D06N *7/04;* **E04B** *1/64;* **E04C** *2/26;* **E02D** *19/00*
U.S. Cl. 428—148 **17 Claims**



1. A waterproofing sheet comprising:
a membrane of water impermeable material; and
a plurality of layers of particles capable of swelling when in contact with water adhered with adhesive membranes to the and to adjacent layers, the layers being formed to a desired thickness.

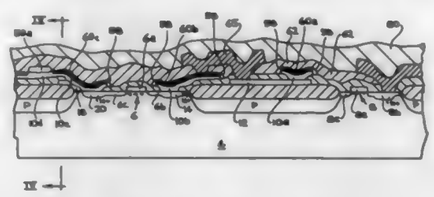
4,693,924
DECORATIVE TILE
Nina M. Kuper, 2520 N. Gordon Ct., Milwaukee, Wis. 53212, and Janis I. Kalnajs, 724 E. Wells, Milwaukee, Wis. 53202
Continuation-in-part of Ser. No. 701,073, Feb. 13, 1985. This application Aug. 14, 1986, Ser. No. 896,672
Int. Cl.[4] B32B *3/20, 13/02;* **C04B** *31/06, 31/26*
U.S. Cl. 428—170 **18 Claims**



1. A tile comprising a binder having fiber strands and a bulk enhancing agent distributed therein, said tile having a design across a front face thereof and having a density which decreases substantially gradually from front to rear in the direction of the thickness of said tile.

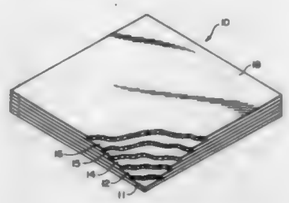
4,693,925
INTEGRATED CIRCUIT STRUCTURE HAVING INTERMEDIATE METAL SILICIDE LAYER
Robin W. Cheung, Cupertino, and Hugo W. K. Chan, Fremont, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Division of Ser. No. 585,340, Mar. 1, 1984, Pat. No. 4,581,815. This application Jan. 24, 1986, Ser. No. 822,352
Int. Cl.[4] B32B *3/22, 15/04*
U.S. Cl. 428—189 **10 Claims**

1. An improved integrated circuit structure having enhanced step coverage comprising a base layer of silicon, a first oxide layer on said substrate, a layer of polysilicon thereon doped with a dopant to provide a predetermined resistivity and patterned to provide one or more doped polysilicon strips having selected portions thereof reacted with a metal capable of forming a metal silicide in situ in said polysilicon strips, a further oxide layer over said metal silicide, and a metal layer providing electrical contact to selected portions of said structure, said enhanced step coverage being provided by the elimi-



nation of an intermediate metal layer by the formation of said metal silicide in said polysilicon strips.

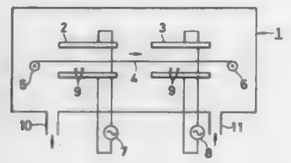
4,693,926
FLEXIBLE, FIRE-RESISTANT, DECORATIVE LAMINATES AND METHODS OF MANUFACTURE THEREOF
Joseph C. Kowalski, Snohomish; Donald A. Mottaz, Issaquah, and Berton A. Cole, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Continuation of Ser. No. 646,570, Aug. 31, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 936,461
Int. Cl.[4] B32B *3/18, 7/02, 15/08, 31/00*
U.S. Cl. 428—204 **48 Claims**



1. A flexible, fire-resistant, decorative laminate comprising, in combination:
a. a flexible panel-like base lamination;
b. a laminar fire-resistant lamination comprising: (i) a first sheet of polyvinyl fluoride adapted to be positioned in face-to-face overlying relation to said flexible panel-like base lamination; and (ii), an aluminum foil sheet overlying said first sheet and bonded thereto;
c. means adhesively bonding said first sheet to said flexible panel-like base lamination;
d. a resinous embossing film overlying and in face-to-face bonded relation to said aluminum foil sheet; and,
e. a laminar decorative sheet overlying and in face-to-face bonded relation to said resinous embossing film, said laminar decorative sheet comprising: (iii) sheet defining means having an outer decorative surface and in face-to-face bonded engagement with said resinous embossing film; and (iv), an outer transparent sheet of clear polyvinyl fluoride overlying and in bonded face-to-face relation with said sheet defining means and forming the outer exposed surface of said flexible, fire-resistant, decorative laminate, said sheet defining means having an outer decorative surace comprising a third sheet of polyvinyl fluoride with an image defining layer and wherein said second sheet of clear polyvinyl fluoride is bonded to, and in face-to-face overlying relation with, said third sheet of polyvinyl fluoride with said image defining layer sandwiched therebetween.

25. The method of forming a composite, flexible, fire-resistant, decorative laminate comprising the steps of:
a. forming a laminar fire-resistant laminate by bonding an aluminum foil sheet in face-to-face overlying relation to a first sheet of polyvinyl fluoride;
b. adhesively bonding the first sheet of polyvinyl fluoride to a flexible panel-like base lamination;
c. bonding a resinous embossing film to, and in face-to-face overlying relation with, the aluminum foil sheet;
d. bonding sheet defining means having an outer decorative surface to, and in face-to-face overlying relation with, the resinous embossing film; and,
e. bonding an outer transparent second sheet of clear polyvinyl fluoride to, and in face-to-face overlying relation with, the outer decorative surface of the sheet defining means so as to form a transparent, protective, outer exposed surface on the composite, flexible, fire-resistant, decorative laminate; and,
f. said method being further characterized in that the sheet defining means having an outer decorative surface comprises a third sheet of polyvinyl fluoride with an image defining layer and wherein the second sheet of clear polyvinyl fluoride is bonded to, and in face-to-face overlying relation with, the image defining layer sandwiched therebetween.

4,693,927
MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME
Yasuo Nishikawa; Tsutomu Okita, both of Odawara; Yoshito Mukaida, Ninomiya; Kenji Yanagihara; Mituo Kimura, both of Yokohama, and Masahiro Niinomi, Machida, all of Japan, assignors to Fuji Photo Film Company Limited, Minami-ashigara, Japan
Filed Mar. 15, 1985, Ser. No. 712,095
Claims priority, application Japan, Mar. 19, 1984, 59-53047; Mar. 19, 1984, 59-53048
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—216 **15 Claims**



1. A magnetic recording medium of improved scratch and weathering resistance, comprising:
a non-magnetic support;
a thin magnetic metal film provided on said support; and
a protective film having high abrasion resistance and an extremely small spacing loss formed on said thin magnetic metal film, said protective film having a thickness which does not exceed 500 Å comprising a plurality of layers formed by plasma polymerization and constituted at least of a base layer of a thickness of from 10–450 Å and having a density of from 0.7 to 1.5 g/cm^3 formed directly on said thin magnetic metal film and a surface layer of a thickness of from 3–450 Å and having a density of not less than 1.2 g/cm^3.

9. A process for producing a magnetic recording medium of improved scratch and weathering resistance comprising a non-magnetic support, a thin magnetic metal film provided on said support and a protective film of a thickness which does not exceed 500 Å which has high abrasion resistance and an extremely small spacing loss formed on said thin magnetic metal film and which consists of a plurality of layers formed by plasma polymerization, which comprises the steps of:
forming a first layer of a thickness of from 10–450 Å on said thin magnetic metal film or on a previously formed layer, by plasma polymerization of a first monomer gas such that the layer has a density of from 0.7 to 1.5 g/cm^3; and
forming a second layer of a thickness of from 3–450 Å on said first layer by plasma polymerization of a second monomer gas, which layer has a density of not less than 1.2 g/cm^3, which second layer is distinguishable from said first layer.

4,693,928
POROUS, FIBROUS STRUCTURES WITH THERMOPLASTIC FLUOROCARBON COATING AND METHOD OF MAKING
Warren M. Foss, Glen Cove, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Feb. 10, 1986, Ser. No. 827,529
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—236 **21 Claims**

1. A process for making a porous, fibrous structure coated with a fluorocarbon polymer which comprises:
(1) preparing an aqueous slurry of inorganic fibers and thermoplastic fluorocarbon polymer;
(2) precipitating the thermoplastic fluorocarbon polymer onto the inorganic fibers by lowering the pH of the slurry to an acidic value and adding a cationic flocculant;
(3) forming a porous, fibrous structure from the inorganic fibers onto which the fluorocarbon polymer has been precipitated;
(4) drying; and
(5) heating to the melt flow temperature of the thermoplastic fluorocarbon polymer, thereby causing said thermoplastic fluorocarbon polymer to flow and substantially completely coat the inorganic fibers.

4,693,929
MAGNETIC RECORDING MEDIUM
Katsumi Ryoke; Masatoshi Takahashi; Takashi Yoneyama; Yasuo Nishikawa, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 4, 1985, Ser. No. 784,425
Claims priority, application Japan, Oct. 4, 1984, 59-208483
Int. Cl.[4] G11B *5/70, 5/71*
U.S. Cl. 428—323 **23 Claims**

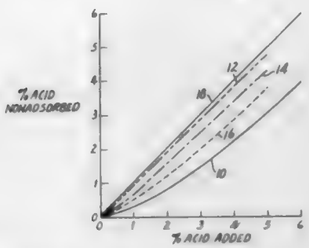
1. A magnetic recording medium comprising a magnetic layer coated on one side of a non-magnetic support, the magnetic layer comprising ferromagnetic particles dispersed in a binder, with a backing layer coated on the opposite side of the non-magnetic support, wherein the backing layer comprises non-magnetic particles, a binder and silicone which has:
(i) a viscosity of from 1 to 50 CS (centisokes) at 25° C.;
(ii) a refractive index of 1.403 or less at 25° C. and a specific gravity of 0.965 or less at 25° C.; and
which is used in an amount of from 0.01 to 3 wt.% based on the non-magnetic particles;
wherein the non-magnetic particles contain carbon black in an amount of at least 50 wt.% based on the total amount of the non-magnetic particles, and wherein 25 wt.% or more of the carbon black has an average particle size of from 150 to 1,000 mμ and wherein the dry thickness of the backing layer is from 1.0 to 5.0 ξm, wherein the amount of said silicone is 3.33 wt.% or less based on the total solid content of the backing layer.

4,693,930

SMOOTH, LOW-FRICTION MAGNETIC RECORDING MEDIUM

Richard J. Kuo, St. Paul; John W. Mackay, Afton, and Rick L. Van Buren, Eagan, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 3, 1985, Ser. No. 730,272
Int. Cl.[4] G11B *5/68, 5/706, 5/71*
U.S. Cl. 428—323 **16 Claims**



1. Flexible magnetic recording medium comprising a magnetic recording layer having an RMS surface roughness not exceeding 9 nanometers (nm) and comprising a binder in which are dispersed ferromagnetic oxide particles having a surface area of at least 40 m^2/g, said binder containing free monobasic fatty acid in an amount exceeding 1.5 percent by weight of the ferromagnetic oxide particles, but less than an amount that would exude from the recording layer, which fatty acid has a straight chain of at least 12 carbon atoms and provides a coefficient of friction not exceeding 0.3.

4,693,931

MAGNETIC RECORDING MEDIUM AND MAGNETIC PARTICLES THEREFOR

Haruo Andoh, Suita, and Seiji Matsumoto, Sakai, both of Japan, assignors to Hitachi Maxell, Ltd. and Sakai Chemical Industry Co., Ltd., both of Osaka, Japan

Filed Aug. 17, 1984, Ser. No. 641,733
Claims priority, application Japan, Aug. 18, 1983, 58-151116
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—328 **20 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic layer provided thereon, said magnetic layer comprising a binder and a magnetic recording element which comprises acicular gamma-Fe_2O_3 particles having an average porosity of not more than 5% by volume, a specific surface area of 24 to 30 m^2/g and an intensity at the face (210) to that at the face (311) in X ray diffraction of not more than 5%.

4,693,932

ORIENTED POLYESTER FILM

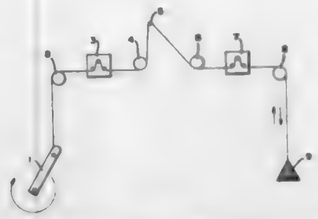
Katsuaki Kuze, Ohtsu; Yasuhiro Nishino, Tsuruga; Yujiro Matsuyama, Ohtsu; Kozo Maeda, Takatsuki; Masahiro Kobayashi, Kyoto; Tadashi Okudaira, Tsuruga; Tsuyoshi Hongo, Ohtsu, and Osamu Makimura, Ogaki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 699,298, Feb. 7, 1985, abandoned. This application May 2, 1986, Ser. No. 858,878
Claims priority, application Japan, Feb. 9, 1984, 59-023567
Int. Cl.[4] G11B *5/708*
U.S. Cl. 428—323 **17 Claims**

1. An oriented polyester film for manufacturing a magnetic recording tape which comprises a polyester composed of ethylene terephthalate as the major repeating units, and

(I) 0.01 to 1.0% by weight of particles selected from the group consisting of silica particles and titanium dioxide particles having each an average particle size of 0.01 to 0.5μ, and

(II) 0.005 to 1.0% by weight of calcium carbonate particles having an average particle size of 0.01 to 0.5μ, provided



that an amount of particles which have a particle size of not less than 5μ is not more than 0.5% by weight based on the total weight of said particles of (I) and (II) when they are incorporated in a slurry state.

4,693,933

X-RAY DISPERSIVE AND REFLECTIVE STRUCTURES AND METHOD OF MAKING THE STRUCTURES

John E. Keem; Stanford R. Ovshinsky, both of Bloomfield Hills; Steven A. Flessa, Southfield; James L. Wood, Westland; Keith L. Hart, Flat Rock, and Leonard Sztaba, Hamtramck, all of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 501,659, Jun. 6, 1983, abandoned. This application Oct. 31, 1983, Ser. No. 547,338
Int. Cl.[4] B32B *7/02*; G21K *1/06*; G02B *1/00*
U.S. Cl. 428—333 **20 Claims**



1. An improved X-ray dispersive structure comprising: a plurality of layer pairs formed on one another, said layer pairs having X-ray dispersive properties over a predetermined range of interest, one layer of each of said layer pairs is a non-metallic material chosen from the group consisting of Si, C, B, and B_4C and the second layer of each of said layer pairs is a metallic material, and a buffer layer formed of a material different from the materials forming the first and second layers, chosen from the group consisting of Si, Ge, and SiGe, and having a thickness of 1.3 Angstroms to 5 Angstroms between each metallic and non-metallic layer to provide control of interdiffusion or chemical interaction between said metallic and non-metallic layers.

4,693,934

MAGNETIC RECORDING MEDIUM FOR IMAGE RECORDING

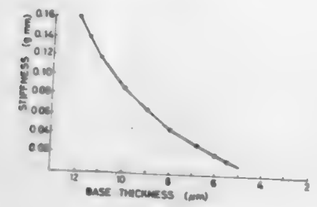
Masaharu Nishimatsu; Hiroyuki Arioka, and Hideki Ishizaki, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,780
Claims priority, application Japan, Jun. 8, 1984, 59-116595
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—336 **2 Claims**

1. A ferromagnetic thin-film for image recording having a

magnetic layer consisting of a ferromagnetic thin film formed on a base film and a backcoat layer formed on an opposite side thereof, said base film having a Young's modulus in the range of from about 280 to 800 kg/cm^2 and a thickness in the range of from 5 to 12 μm, said tape having a stiffness of

$$0.149 \times w a^3/d \times b = 0.02 \text{ to } 0.12 \text{ g-mm}$$



wherein
w: load (g)
a: radius of tape ring (mm)
b: tape width (mm)
d: deformation of tape ring (mm).

4,693,935

POLYSILOXANE-GRAFTED COPOLYMER PRESSURE SENSITIVE ADHESIVE COMPOSITION AND SHEET MATERIALS COATED THEREWITH

Mieczyslaw H. Mazurek, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1986, Ser. No. 864,517
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—352 **21 Claims**

1. A pressure sensitive adhesive composition comprising:

(a) a copolymer which has a vinyl polymeric backbone having grafted to it monovalent siloxane polymeric moieties, said copolymer comprising A, C, and, optionally, B monomers wherein:

A is at least one free radically polymerizable vinyl monomer;

B, when used, is at least one reinforcing monomer copolymerizable with A, the amount by weight of B monomer being up to about 20% of the total weight of all monomers in said copolymer, said B monomer being selected from the group consisting of polar monomers and macromers having a T_g or a T_m above about 20° C.; and

C is a polymeric monomer having the general formula

$$X(Y)_nSi(R)_{3-m}Z_m$$

wherein:

The amount and composition of C monomer in the copolymer is such as to provide said pressure sensitive adhesive composition with a decrease in initial peel adhesion value relative to that of an adhesive composition comprising a polymer of A and B, if used, without C and in the same relative amounts of A and B, if used, and of substantially the same molecular weight;

X is a vinyl group copolymerizable with the A and B monomers;

Y is a divalent linking group;

R is a hydrogen, lower alkyl, aryl, or alkoxy;

Z is a monovalent siloxane polymeric moiety having a number average molecular weight of at least about 500 and is essentially unreactive under copolymerization conditions and is pendant from said vinyl polymeric backbone;

n is zero or one;

m is an integer of from one to three

(b) up to about 150 parts by weight compatible tackifying resin per 100 parts copolymer; and

(c) up to about 50 parts by weight of compatible plasticizer per 100 parts copolymer,

said adhesive composition having a peel adhesion value which is lower initially when an exposed surface of said adhesive composition is first applied to a substrate but which builds with time once applied to approach the peel adhesion value of the adhesive composition without C.

4,693,936

LOW COEFFICIENT OF FRICTION MAGNET WIRE ENAMELS

Charles W. McGregor, and Melody L. Sutto, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 606,425, May 2, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,831
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—383 **5 Claims**

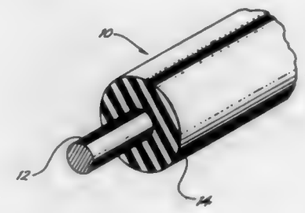
1. An electrical conductor coated with an insulating layer of magnet wire enamel comprising a polyamideimide consisting essentially of the reaction product of a tri-basic anhydride, a diisocyanate and polyfunctional organosiloxane, the polyfunctional organosiloxane being reacted into the polymer backbone prior to application to the electrical conductor, said polyorganosiloxane being present in an amount of about 0.5% to about 5% by weight based on the weight of the enamel, the enamel having a coefficient of friction, after application to magnet wire, of less than 0.10 and the polyfunctional organosiloxane component being substantially non-solvent extractable after application to the wire.

4,693,937

FLAME RETARDANT WIRE WITH HIGH INSULATION RESISTANCE

Alexander F. Wu, Bridgeport, Conn., and Robert B. Walters, Morrison, Colo., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 578,729, Feb. 9, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 703,065
Int. Cl.[4] B32B *15/04*; H01B *3/00*
U.S. Cl. 428—389 **5 Claims**



1. The method of forming a cable which comprises; preparing a blend of flame retardant ingredients by weight as follows:

INGREDIENTS	RANGE
Decabromodiphenyl oxide	100
Antimony oxide	10–70
Fumed silica	5–30
Reactive silicone fluid	0.1–10

overnizing the flame retardant ingredient blend; adding the ovenized blend to additional ingredients by weight as follows:

INGREDIENTS	RANGE
Polyolefin	100
Bromine containing treated flame retardant	5–80
Dibasic lead phthalate	0–20
Silicone gum	0–20
Lead stearate	0–3
Octamethyltetracyclosiloxane	0–5
Triallyl cyanurate	0–5
Zinc salt of a mercaptoimidazole	0.5–15
Sterically hindered di-tertiary butyl phenol	0.5–15

and disposing the resultant composition in an insulating layer on a wire.

4,693,938

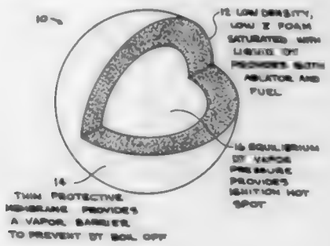
FOAM SHELL CRYOGENIC ICF TARGET

Dale H. Darling, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1986, Ser. No. 927,995

Int. Cl.[4] G21B *1/00*; A61N *5/12*; B32B *5/18, 9/00*

U.S. Cl. 428—403 **10 Claims**



1. An inertial confinement fusion target comprising a hollow spherical shell of low density, low Z, open cell, rigid foam saturated with liquid DT.

4,693,939

ARTICLE COATED WITH COPOLYMER OF POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 731,915, May 8, 1985, Pat. No. 4,618,649, which is a continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Sep. 3, 1986, Ser. No. 891,852

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—421 **12 Claims**

1. An article having a coating comprising a non-crosslinked poly(vinyl alcohol) copolymer which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000 which is the reaction product of:

1. 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

2. 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) copolymer and its poly(vinyl alcohol) copolymer solvolysis product are insoluble therein.

4,693,940

LAMINATE AND METHOD OF PREPARING SAME

Christine E. Vogdes, Albany, and Yutaka Kawazoye, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 466,266, Feb. 14, 1983, abandoned. This application Mar. 30, 1984, Ser. No. 595,072

Int. Cl.[4] B32B *27/16*

U.S. Cl. 428—422 **16 Claims**

1. A method of preparing a laminate comprising a first layer composed of a first polymeric composition and an adherent second layer composed of a second polymeric composition, which method comprises

(1) preparing a laminate comprising a layer of a first radiation cross-linkable polymeric composition and an adjacent layer of a second radiation cross-linkable polymeric composition which is incompatible with the first composition, the laminate being prepared by a process in which the interface between the layers is heated to a temperature which is higher than the melting point of at least one of the polymers in at least one of the compositions; and

(2) irradiating the laminate prepared in step (1) to effect cross-linking of said first and second compositions.

4,693,941

REINFORCED POLY(ETHYLENE TEREPHTHALATE) COMPOSITIONS

George J. Ostapchenko, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 390,684, Jun. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 223,024, Jan. 6, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 762,874

Int. Cl.[4] B32B *27/06*; B29C *43/02*; C08L *67/02*; C08K *7/14*

U.S. Cl. 428—480 **16 Claims**

1. A process for thermoforming an article from a sheet of a composition having a crystallinity of 0–5% and consisting essentially of the following components in stated approximate weight proportions:

(a) 60–77% of poly(ethylene terephthalate) having an inherent viscosity of more than 0.55 dL/g;

(b) 3–10% of at least one terpolymer of ethylene selected from the class consisting of ethylene/methacrylic acid-/isobutyl acrylate terpolymer, ethylene/methacrylic acid/n-butyl acrylate terpolymer, and ethylene/vinyl acetate/methacrylic acid terpolymer, the respective proportions of methacrylic acid and of isobutyl acrylate, n-butyl acrylate, or vinyl acetate in the terpolymer being about 1 to 30 weight percent of each;

said terpolymer having 0–100% of its carboxylic groups converted to their salt form, the cation being a divalent metal ion;

with the first proviso that up to about 20% of the recited component (a) can be replaced by a polymer compatible with poly(ethylene terephthalate) and selected from the class consisting of polyesters, polyamides, and polycarbonates; and

(c) 20–30% of a reinforcing material having an aspect ratio of at least 10%;

with a second proviso that the composition does not contain nucleating agents;

the process comprising the following steps:

(A) placing the sheet in a single mold maintained at a temperature of about 140°–150° C.,

(B) applying a vacuum of about 8 kPa to one side of the sheet, while a pressure of about 690–5520 kPa is applied to the other side of the sheet, to cause the sheet to deform and collapse onto the mold, thus conforming its shape to that of the mold,

(C) releasing the vacuum and the pressure, and

(D) removing the resulting molded article from the mold.

4,693,942

APEX SEAL FOR ROTARY PISTON ENGINES

Tsutomu Shimizu, Higashi-Hiroshima; Jun Miyata, and Koji Yagii, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 7, 1986, Ser. No. 816,834

Claims priority, application Japan, Jan. 14, 1985, 60-4610

Int. Cl.[4] B32B *15/00*; F01C *21/08*

U.S. Cl. 428—614 **2 Claims**



1. An apex seal for rotary piston engines comprising a substrate of an iron-based material having a sliding surface portion having a thickness of 1.5 to 3.5 mm, said sliding surface portion being formed by dispersing a Co-Mo-Si intermetallic compound into an iron-based material to produce a matrix of Co-Mo-Si-Fe alloy formed by Fe content in the iron-based material which is molten when the Co-Mo-Si intermetallic compound is dispersed in the iron-based material and the Co-Mo-Si intermetallic compound dispersed in the matrix in an amount of 25 to 60 vol. %, said matrix containing less than 25 weight % of Fe.

4,693,943

MAGNETOOPTICAL RECORDING MEDIUM

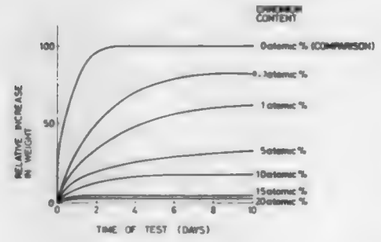
Hiroyoshi Kishi, Tokyo, and Masaaki Matsushima, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 491,300, May 1, 1983, abandoned, and Ser. No. 492,634, May 9, 1983, abandoned. This application Nov. 16, 1984, Ser. No. 671,978

Claims priority, application Japan, May 10, 1982, 57-77677; May 17, 1982, 57-82653; Mar. 16, 1983, 58-45035

Int. Cl.[4] G11B *7/24*

U.S. Cl. 428—678 **5 Claims**



1. A magnetooptical recording medium which comprises an amorphous magnetic alloy film having an axis of easy magnetization in a direction perpendicular to the film surface, said alloy having a composition represented by the general formula IV as follows:

$$[(Gd_{1-z}Tb_z)_{1-y}(Fe_{1-x}Co_x)_y]_{1-p}Cr_p \quad \text{(IV)}$$

wherein $0<z<1$; $0.005 \leqq x<1$; $0.5 \leqq y \leqq 0.9$ and $0.001 \leqq p \leqq 0.3$.

4,693,944

SURFACE-COATED WEAR-RESISTANT MEMBER OF CERMET AND PROCESS FOR PRODUCING SAME

Taijiro Sugisawa, and Akio Nishiyama, both of Yokohama, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 661,193, Oct. 15, 1984, abandoned. This application Sep. 23, 1986, Ser. No. 910,834

Claims priority, application Japan, Oct. 21, 1983, 58-197217

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—698 **7 Claims**

1. A surface-coated wear-resistant member of cermet comprising:

(a) a substrate of cermet; and

(b) a hard coating vapor-deposited on a surface of said substrate, said coating composed of at least one titanium compound selected from the group consisting of titanium carbide, titanium nitride, carbo-nitride of titanium, oxy-carbide of titanium, oxy-nitride of titanium and oxy-carbo-nitride of titanium, the atomic ratio of one of carbon, nitrogen, carbon plus nitrogen, carbon plus oxygen, nitrogen plus oxygen and carbon plus nitrogen plus oxygen to titanium (Ti) in said titanium compound being in the range of between 0.3 and 0.8, said titanium compound comprising TiX and Ti_2X wherein X is one of carbon and nitrogen or at least two of carbon, nitrogen and oxygen,

said TiX having a cubic structure, said Ti_2X having a tetragonal structure and

said titanium compound having an average thickness of 1 to 10 μm.

4,693,945

POWER GENERATOR CONTAINING FUEL CELL

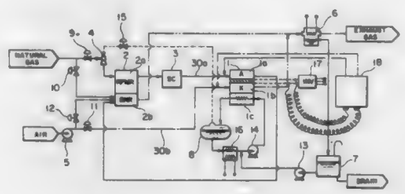
Hideo Ohyauchi; Yoshiaki Amano, both of Ibaraki, and Eiji Yokoyama, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1986, Ser. No. 854,503

Claims priority, application Japan, Apr. 22, 1985, 60-84487

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—21 **7 Claims**



1. A fuel-cell power generator comprising hydrogen and oxygen feed lines, a fuel cell which generates DC power as the cell receives hydrogen gas and oxygen gas from said feed lines, and fuel supply means which supplies hydrogen gas to said hydrogen feed line and oxygen gas to said oxygen feed line in response to a sharp rise of power load connected to said fuel cell; said fuel supply means including means for producing hydrogen gas and oxygen gas by electrolyzing an electrolyte by DC power generated by said fuel cell and for supplying the produced gases to said hydrogen and oxygen feed lines connected to said fuel cell; said means for producing hydrogen gas and oxygen gas comprising a tank containing pressurized electrolyte, hydrogen and oxygen electrodes disposed in said tank and connected to the DC power source of said fuel cell, cylindrical gas reservoirs for storing the gases produced from said oxygen electrode and said hydrogen electrode, respectively, and piping means for connecting said cylindrical gas reservoir to said hydrogen and oxygen feed lines via valves.

4,693,946

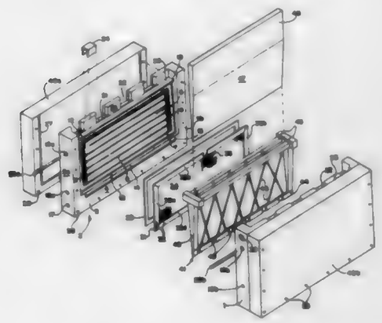
BATTERY WITH MODULAR AIR CATHODE AND ANODE CAGE

Marilyn J. Nikas, Painesville; Gerald R. Pohto; Leslie K. Lakatos, both of Mentor; Douglas J. Wheeler, Cleveland Heights, all of Ohio; Andrew J. Nikas, Painesville; Thomas J. Schue, Huntsburg, both of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Mar. 11, 1986, Ser. No. 838,484

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—27 **6 Claims**



1. A battery of the consumable metal anode type adapted for ready assembly as well as disassembly, said battery comprising:

a non-conductive cell container resistant to cell electrolyte;

a unitized framed gas-diffusion cathode with porous sheet cathode member, foraminous metal conductor member impressed against said sheet cathode member, and conductive metal frame positioned around the peripheral edges of said sheet cathode member and conductor member,

an anode cage in the cell container and having cage frame members at least in part compressed against the frame of said cathode,

with said anode cage and unitized frame cathode being independently removable upon compression release and reinsertable in said non-conductive cell container.

4,693,947

SYSTEM FOR AGITATING THE ACID IN A LEAD-ACID BATTERY

Alvin Weintraub, Schenectady, and Robert S. MacCormack, Glenville, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 21, 1986, Ser. No. 854,363

Int. Cl.[4] H01M *2/38*

U.S. Cl. 429—51 **5 Claims**

1. The method of agitating acid in a lead-acid battery which comprises the steps of passing compressed air through a humidifier, delivering said compressed humidified air to an air-lift



in a battery cell containing acid and bubbling said air up through said air-lift to agitate said acid.

4,693,948

ELECTRIC STORAGE BATTERY

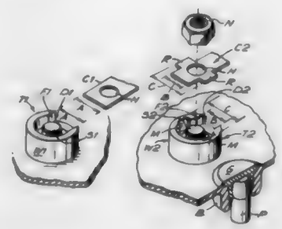
Keith J. B. McEwan, Solihull, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 20, 1985, Ser. No. 811,438

Claims priority, application United Kingdom, Dec. 20, 1984, 8432260

Int. Cl.[4] H01M *2/26, 2/00*

U.S. Cl. 429—121 **22 Claims**



1. An electric storage battery comprising a casing having a pair of terminals extending therefrom for connection to respective connectors, the terminals each having a free end and being located on a wall of the battery and spaced apart, each terminal being surrounded by an insulating wall, one of the connectors being shaped and dimensioned differently from the other, each of the connectors including an aperture for surrounding its respective terminal, each insulating wall having an aperture extending therethrough and leading to a respective passageway within the wall, each passageway being shaped to receive the respective connector only, the wall extending beyond the free end of the respective terminal to prevent an element e.g. a tool, bridging the terminals.

4,693,949

STORAGE BATTERY HOUSING

James H. Kellett; Raymond W. Gaddis, both of Winston-Salem; Robert W. Fritts, Thomasville, all of N.C., and David L. Schoenecker, Anaheim, Calif., assignors to Douglas Battery Manufacturing Co., Winston-Salem, N.C.

Filed Aug. 12, 1985, Ser. No. 764,385

Int. Cl.[4] H01M *2/02, 2/04*

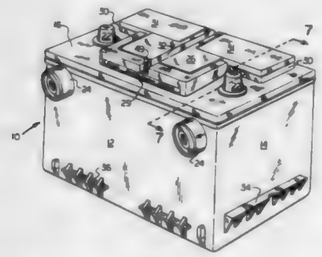
U.S. Cl. 429—178 **7 Claims**

1. A universal battery container or housing for storage batteries of the type used in automobiles, boats, and the like, and in which a plurality of horizontally spaced, lead plates are contained and electrically connected through the battery container to exterior terminals, said container comprising:

(a) side walls, end walls, a top wall, and a bottom wall forming said container and in which said plates are arranged;

(b) a first set of positive and negative exterior terminal posts on said top wall and a second set of positive and negative exterior terminal posts on one of said side walls so arranged that said first and second sets are selectively electrically connected to said plates;

(c) said top wall including, in addition to said terminal posts, a handle support pad raised or upstanding from the surface thereof in the area of said top wall intermediate said terminal posts, said handle support pad including means associated therewith for pivotally attaching a handle thereto,



the marginal area of said top surface being free of any upstanding structure around the periphery thereof, thereby adapting the battery container to be clamped down by a peripheral frametype clamp;

(d) said handle support pad including a recessed groove therethrough for the receipt of a looped securing member therethrough which extends up alongside said side walls and across said top wall from side wall to side wall;

(e) each of said side walls and each of said end walls include an outwardly protruding ledge member adjacent the bottom wall, said ledge being of such size and configuration as to be selectively securely engaged by lower hold down clips or brackets which engage in some cases the ledges of the lower end walls and in some cases the ledges of the lower side walls and are provided as the battery securing device by some automobiles and boats.

4,693,950

SECONDARY LITHIUM CELL

Rafail V. Moshtev; Vesselin G. Manev, and Bogdana L. Puresheva, all of Sofia, Bulgaria, assignors to Zlehit pri Ban, Sofia, Bulgaria

Filed Oct. 30, 1985, Ser. No. 792,901

Claims priority, application United Kingdom, Oct. 30, 1984, 67349

Int. Cl.[4] H01M *10/40*

U.S. Cl. 429—194 **4 Claims**

1. A secondary lithium cell comprising an anode of lithium or its alloys, an electrolyte solution containing an ionizable lithium salt in a non-aqueous solvent in the liquid, solid or molten state, and a cathode of an alkali thiochromite, wherein part of the chromium of said thiochromite is substituted with another transition metal, vanadium, said substituted alkali thiochromate having the following general formula

$$Na_yCr_{1-x}V_xS_2,$$

with

x being a numerical value from 0.1 to 0.2, and

y being equal to 1 for a stoichiometric compound, and a value from 0.1 to 0.3 for a non-stoichiometric compound.

4,693,951

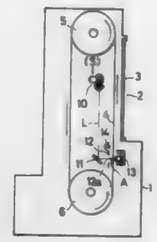
IMAGE FORMING METHOD AND IMAGE BEARING MEMBER

Yoshio Takasu, Tama; Yoshihiro Oguchi, and Kazuharu Katagiri, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,279

Int. Cl.[4] G03G *13/22, 13/24*

U.S. Cl. 430—31 **7 Claims**



1. An image forming method using an image bearing member having a photoconductive layer and having a maximum surface roughness of 20 μm or less and an average surface roughness satisfying a relation of $r \leqq 2d$; wherein r is an average surface roughness of the surface, and d is a mean particle size of the toner particle, and having (i) a contact angle with water of at least 70 degrees, and (ii) a pencil hardness of at least F as measured according to the JIS test method K-5400, which comprises a repetitive cycle of steps comprising exposing an optical image on an image bearing member from the side of the substrate, and forming a toner image on the front surface of the image bearing member corresponding to the portion where said optical image exposure is applied.

4,693,952

TONER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Fumio Koizumi, Hachioji; Takahiro Kasuya, Hino, and Jiro Takahashi, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo

Filed May 22, 1985, Ser. No. 736,705

Claims priority, application Japan, May 22, 1984, 59-101815; May 22, 1984, 59-101817; May 22, 1984, 59-101818

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **13 Claims**

1. A dry powder toner for developing an electrostatic latent image comprising a binder resin which comprises

(a) a polyester resin obtained by polymerizing a composition containing an alcohol and a carboxylic acid, at least one of said alcohol and said carboxylic acid being a multifunctional component having at least three valence bonds and (b) an epoxy resin in an amount of from 40% to 80% by weight relative to the whole binder resin.

4,693,953

METHOD FOR PRODUCTION OF MOISTURE SENSITIVE ELEMENT

Eiichi Torikai, Yao, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,510

Claims priority, application Japan, May 17, 1985, 60-106729

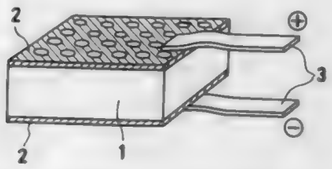
Int. Cl.[4] G03C *1/52, 5/00;* **B01D** *59/40*

U.S. Cl. 430—165 **8 Claims**

1. A method for the production of a moisture sensitive element possessing on the surface thereof an electrode layer and a moisture-adsorbing portion, comprising the steps of:

(a) applying on a portion of a surface of a perfluorosulfonate

cation-exchange membrane a resist ink which comprises a prepolymer resin selected from the group consisting of epoxy acrylate, alkyd acrylate, polyester acrylate, polyol acrylate, polyether acrylate, oligoacrylate and polyurethane acrylate or a cut monomer selected from the group consisting of monoacrylates, diacrylates and a triacrylate selected from the group consisting of 1,6-hexanediol monoacrylate, cyclohexyl acrylate, 1,6-hexanediol acrylate, neopentyl glycol diacrylate, trimethylol propane triacrylate and pentaerythritol triacrylate, a photoinitiator and at least one extender, said resist ink being curable by ultraviolet light thereby forming a cured surface material which is soluble in an alkali and which is incapable of having any metal deposited thereon when metal is chemically plated on said cation-exchange membrane;



(b) irradiating the surface of said cation-exchange membrane coated with said resist ink with ultraviolet light in a patterned fashion thereby selectively curing the applied layer of said resist ink;

(c) chemically plating the surface of said cation-exchange membrane which has been irradiated thereby forming an electrode layer on the portion of said surface which does not have cured resist ink thereon; and

(d) treating the surface of said cation-exchange membrane with an aqueous alkali solution thereby removing said cured resist ink therefrom and exposing the underlying surface of the cation-exchange membrane which forms the moisture adsorbing portion of said membrane.

4,693,954

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIALS WITH HIGH BOILING POINT SOLVENTS AND BASE OR BASE PRECURSORS

Hideki Naito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1985, Ser. No. 781,077
Claims priority, application Japan, Sep. 27, 1984, 59-202265
Int. Cl.⁴ G03C *5/54, 1/40, 7/26*
U.S. Cl. 430—203 **11 Claims**

PC
BL (Y)
I L
GL (M)
I L
RL(C)
S

1. A heat-developable light-sensitive material comprising a support having thereon (1) a light-sensitive element containing at least one light-sensitive silver halide emulsion layer and at least one image forming substance capable of forming a diffusible dye, and (2) a dye fixing element, provided on the same side of said support, wherein said dye fixing element contains at least one of a base or base precursor plus a dispersion of a high boiling point solvent, wherein said dye fixing element comprises at least one light-reflective layer and at least one dye fixing layer, said white reflective layer containing at least one of said base or said base precursor and said dispersion of high boiling point solvent.

4,693,955

NEGATIVE TYPE LITHOGRAPHIC PRINTING PLATE

Koichi Torizuka, and Kiyoshi Futaki, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 18, 1985, Ser. No. 712,731
Claims priority, application Japan, Mar. 19, 1984, 59-54089; Jan. 28, 1985, 60-15039
Int. Cl.⁴ G03C *5/54, 1/06*
U.S. Cl. 430—204 **19 Claims**

1. A light-sensitive photographic element for negative lithographic printing plates which comprises a support having thereon (1) a light-sensitive silver halide, (2) a metal salt particle having substantially no light-sensitivity, (3) a compound which reacts with an oxidized developing agent produced by development to release a compound which acts as a solvent or a solution physical development accelerator for said metal salt particle (2) and (4) physical development nuclei, which compound (3) has the formula:

A—B [I]

wherein A represents a redox release carrier moiety which is oxidized by cross-oxidation with the oxidized developing agent and releases residue B by the subsequent hydrolysis under alkaline condition and B represents a substituent which produces a compound having dissolving action or solution physical development acceleration action for the metal salt particle upon being released from A.

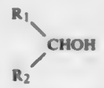
4,693,956

PROCESS FOR HIGH CONTRAST DEVELOPMENT OF PHOTOGRAPHIC ELEMENTS

Carlo Marchesano, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1985, Ser. No. 798,751
Claims priority, application Italy, Nov. 16, 1984, 23619 A/84
Int. Cl.⁴ G03C *5/24, 1/06, 1/00, 5/30*
U.S. Cl. 430—264 **41 Claims**

1. A process for forming a high-contrast photographic image by developing a silver halide photographic element, including at least a silver halide emulsion layer, with an aqueous alkaline developing solution containing a dihydroxybenzene developing agent, a superadditive developing agent and an antioxidant at a pH of less than 12 in the presence of a hydrazine compound, an organic antifogging and contrast promoting agent selected within the class including a benzotriazole compound and a benzimidazole compound and a hydroxymethylidyne group containing compound of the formula:



wherein R_1 and R_2 each independently represent a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, or R_1 and R_2 together complete a non aromatic cyclic group.

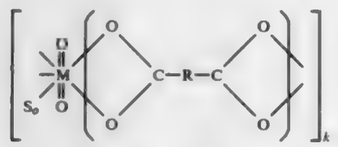
4,693,957

TRANSITION AND INNER TRANSITION METAL CHELATE POLYMERS FOR HIGH ENERGY RESIST LITHOGRAPHY

Ronald D. Archer, Amherst; Christopher J. Hardiman, Belchertown; Ryszard Grybos, and James C. W. Chien, both of Amherst, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 14, 1985, Ser. No. 711,786
Int. Cl.⁴ G03C *5/00;* **C08G** *79/00*
U.S. Cl. 430—269 **9 Claims**

1. Transition and inner transition chelate polymer resists for lithographic procedures having the formula:



where k is a positive integer so as to have the number average molecular weight of said chelate polymer to be at least 5,000, M is the transition or inner transition metal ion, S_p represents one molecule of a polar coordinating solvent, R is a member of a functionalized organic group to provide scission or cross linking upon irradiation of said chelate polymer, and each dashed line represents half a bond.

4,693,958

LITHOGRAPHIC PLATES AND PRODUCTION PROCESS THEREFOR

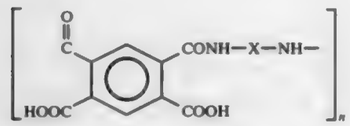
Anthony M. Schwartz, Rockville, Md.; Norimichi Kawashima, Yokohama, Japan, and Albert C. Zettlemoyer, Bethlehem, Pa., assignors to Lehigh University, Bethlehem, Pa.

Filed Jan. 28, 1985, Ser. No. 695,259
Int. Cl.⁴ G03F *7/02;* **G03C** *5/16*
U.S. Cl. 430—302 **4 Claims**

1. A process for the production of lithographic plates comprising the steps of:

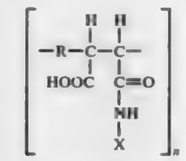
(a) spreading over a rigid substrate a layer of a coating polymer selected from the group consisting of:

(i)



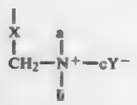
wherein X is aliphatic, aromatic, or aralkyl of a type which permits the polyimide resulting from ring-closure to be preferentially ink-receptive, and the polymer before ring-closure to be water or dilute aqueous alkaline-soluble;

(ii)



wherein X is aliphatic, aromatic, alkyl substituted aromatic, chlorine substituted aromatic, alkoxy substituted aromatic, alicyclic, or aralykyl hydrocarbon residue from 1 to 20 C atoms wherein R is the residue of a comonomer selected from the group of 2 to 12 C atom olefins, 4 to 6 atom 1–4 dienes, styrene, or hydrocarbon or halogen substituted styrenes, vinyl ethers, or vinyl halides;

(iii) polymers or copolymers of the vinyl or acrylic type containing mer units bearing a pendant group



wherein
X is alkyl or aryl
Y is an anion,
a, b, c are alkyl, aralkyl or a and
b form a morpholine ring with the nitrogen
in sufficient proportion to make the polymer water soluble or highly water-swellable and non-adherent to said substrate when in the water-swollen state;

(iv) copolymers of a vinyl or acrylic monomer, whose homopolymer is water-insoluble and ink preferring, with vinylpyrrolidone in such proportion that the copolymer contains sufficient pyrrolidone residues to make it water-swellable and non-adherent to said substrate when water-swollen;

said coating polymer being hydrophilic and being curable to a hydrophobic state,

(b) exposing said coated substrate to a source of infrared radiation in a predetermined pattern to cause said polymer coating to convert said polymer coating to a hydrophobic, ink-receptive state, in which its aqueous contact angle is greater than 55 degrees, and

(c) Removing unexposed portions of said polymer coating by washing said plate with water or a neutral or alkaline aqueous solution.

4,693,959

ADHESION PROMOTION IN PHOTORESIST LAMINATION AND PROCESSING

Robert W. Ashcraft, Towanda, Pa., assignor to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1986, Ser. No. 837,389
Int. Cl.⁴ G03C *5/00*
U.S. Cl. 430—323 **11 Claims**

1. In a process for forming a photoresist on a substrate comprising the steps of:

(a) laminating to the substrate a supported solid photosensitive film layer which is photopolymerizable of photocrosslinkable,

(b) imagewise exposing the layer to actinic radiation,

(c) removing unexposed areas of the layer to form resist areas,

(d) permanently modifying areas of the substrate which are unprotected by the resist areas by etching the substrate or by depositing a material onto the substrate, and

(e) removing the resist areas from the substrate,

the photosensitive layer comprising:

(1) polymerizable or crosslinkable ethylenically unsaturated compound, and

(2) radiation sensitive, free radical generating photoinitiator or photoinitiator system,

wherein the improvement comrprises the photosensitive layer containing an additive to increase adhesion to a substrate which is a condensation polymer formed from a triazine, formaldehyde and toluene sulfonamide or hydantoin, formaldehyde and toluene sulfonamide.

4,693,960

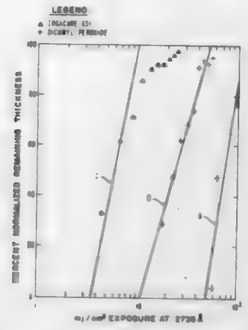
PHOTOLITHOGRAPHIC ETCHING PROCESS USING ORGANOSILICON POLYMER COMPOSITION

Edward D. Babich, Ridgefield, Conn.; Michael Hatzakis, Chappaqua, N.Y.; John J. Liutkis, Yorktown Heights, N.Y.; Juri R. Paraszczak, Pleasantville, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 717,987, Mar. 29, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,680

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—323 **10 Claims**



1. A process for producing an image which comprises providing on a substrate a layer of an ultraviolet light-sensitive negative resist composition consisting essentially of:

(a) polysiloxane having polymerizable ethylenically unsaturated groups wherein said polysiloxane contains about 0.1% to about 20% by weight of ethylenically unsaturated groups per molecule and wherein said polysiloxane also contains phenyl or substituted phenyl groups, and

(b) 2,2-dimethoxy-2-phenyl acetophenone in an amount sufficient to improve the sensitivity to ultraviolet light radiation, and being at least about 0.1% by weight based upon the polysiloxane.

imagewise exposing the layer of light-sensitive composition to imaging ultraviolet radiation in a desired pattern and developing the exposed layer, thereby leaving the desired pattern of the layer of light-sensitive negative resist composition remaining on the substrate, and then etching the substrate by a dry etching process using the pattern of the layer of light-sensitive negative resist composition as the mask.

4,693,961

PHOTOPOLYMERIZABLE COATING AGENT, A PHOTOPOLYMERIZABLE MATERIAL AND ITS USE

Sigrid Bauer, Pandex, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 691,713, Jan. 14, 1985, Pat. No. 4,601,973, which is a continuation-in-part of Ser. No. 503,445, Jun. 13, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 849,994

Claims priority, application Switzerland, Jun. 24, 1982, 3885-82

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—325 **11 Claims**

1. A process for preparing a relief image on a support material which comprises

exposing a material which has been coated with a layer of a photopolymerizable coating agent which comprises

(a) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an epoxide value of 0.2 to 0.5 equivalents per kg of resin and an average molecular weight of 1,000 to 10,000,

(b) at least one uncured epoxy resin based on a bisphenol or a novolac and epichlorohydrin, and having an average molecular weight of 20,000 to 60,000, the weight ratio of a:b being from 8:1 to 3:1,

(c) at least one light-sensitive, polyethylenically unsaturated monomer having terminal ethylene groups, and

(d) at least one photoinitiator or at least one sensitizer or a mixture of at least one photoinitiator and at least one sensitizer, through a photomask, and then

removing the unexposed areas by means of a developer.

7. A process according to claim **1** wherein the coating agent additionally contains a hardener for the epoxy resins selected from the group consisting of dicyandiamide, polybasic carboxylic acids, anhydrides of polybasic carboxylic acids and mixtures of the said hardeners with mono-, di- or triethanolamine, alone or together with a hardening accelerator.

10. A process according to claim **1** wherein the relief image obtained is hardened by means of a post-heat treatment before development.

11. A process according to claim **1**, wherein the relief image obtained is hardened by means of a post-heat treatment after development.

4,693,962

PHOTOCHROMIC PHOTOSENSITIVE COMPOSITIONS

Shinichiro Tamura, and Junetsu Seto, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

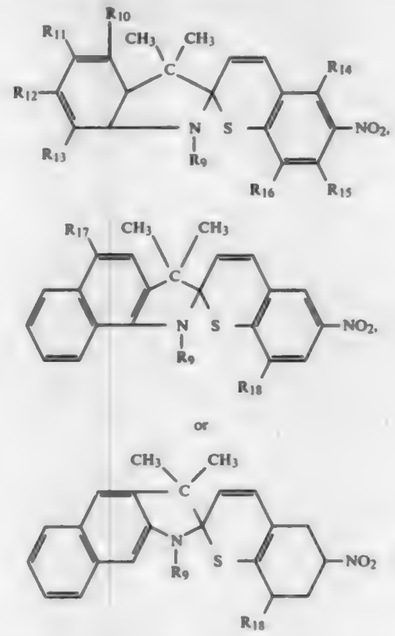
Filed Dec. 9, 1985, Ser. No. 807,017

Claims priority, application Japan, Dec. 10, 1984, 59-260411

Int. Cl.⁴ G03C *1/733*

U.S. Cl. 430—345 **6 Claims**

1. A photochromic photosensitive composition comprising a photochromic spiropyran compound, a high molecular weight, optically transparent film forming a polymer, and a compound for stablizing said spiropyran compound in its colored state, said photochromic spirochromic compound being represented by one of the following general formulas:



wherein R_9 represents an alkyl group containing 1 to 20 carbon atoms, R_{10}, R_{11}, R_{12}, and R_{13} each represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, an alkoxy group containing 1 to 5 carbon atoms, a halogen atom, a nitro group or dimethyl amino group, R_{14}, R_{15}, and R_{16} each represents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms or a halogen atom, R_{17} and R_{18} each repesents a hydrogen atom, an alkyl group containing 1 to 5 carbon atoms, an alkoxy group containing 1 to 5 carbon atoms, an alkoxyalkyl group containing 2 to 10 carbon atoms, a halogen atom, a nitro group or a cyano group, and said compound for stabilizing is selected from the group consisting of: 3,3'-dihydroxyphenyl amine and 4,4'-bis(4-hydroxy-phenyl)sulfone.

4,693,963

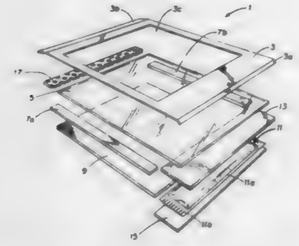
SELF-DEVELOPING INTEGRAL FILM UNIT

Thomas P. McCole, South Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 1, 1986, Ser. No. 846,614

Int. Cl.⁴ G03C *3/00*

U.S. Cl. 430—499 **5 Claims**



1. A photographic film unit adapted to be exposed and then processed to form a visible image in an area thereof by moving said film unit relative to and between pressure applying members to distribute a processing composition within said film unit toward the trailing end thereof, said film unit comprising first and second sheets of substantially equal widths, at least one of said sheets comprising photosensitive constituents; a rupturable pod releasably containing a processing composition and positioned at the leading end of said film unit so as to discharge said processing composition for distribution between said first and second sheets; a trap for receiving excess processing composition, said trap being positioned at the opposite, trailing end of said film unit from said pod; a mask adhered to the outer surface of said first sheet, said mask having an aperture therein defining an image area, said mask extending over and around the leading edge of said film unit adjacent said pod and over and around the trailing edge of said film unit adjacent said trap; a spacer element slightly wider than said pod and positioned over but not bonded to said pod and extending beyond the rupturable edge of said pod, said spacer element being laminated to the inner surface of said mask, or to the inner surface of said first sheet if said first sheet is laminated to said mask in the area over said pod, said pod being attached to said mask only by the leading edge of said pod, whereby said pod is free to move toward or away from said spacer element; rails extending along the lateral edges of said film unit to determine the thickness of the distributed processing fluid, said rails being positioned between said sheets and laminated to said sheets and to said spacer element.

4,693,964

MULTICOLOR PHOTOGRAPHIC ELEMENT WITH A TABULAR GRAIN EMULSION LAYER OVERLYING A MINUS BLUE RECORDING EMULSION LAYER

Richard L. Daubendiek, Rochester; Gary L. House, Victor, and Timothy R. Gersey, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 790,692, Oct. 23, 1985, abandoned. This application Aug. 1, 1986, Ser. No. 891,803

Int. Cl.⁴ G03C *1/40, 7/26*

U.S. Cl. 430—505 **10 Claims**



1. A photographic element for producing multicolor dye images comprised of

a support, and, coated on said support,

superimposed dye image providing layer units comprised of

at least one blue recording yellow dye image providing layer unit and

at least two minus blue recording layer units including a green recording magenta dye image providing layer unit and a red recording cyan dye image providing layer unit,

one of said layer units being positioned to receive imagewise exposing radiation prior to at least one of said minus blue recording layer units and containing a tabular grain emulsion comprised of a dispersing medium and silver bromide or bromoiodide grains having a mean diameter in the range of from 0.4 to 0.55 μm including tabular grains having an average aspect ratio of greater than 8:1 accounting for at least 50 percent of the total projected area of said grains in said emulsion layer.

4,693,965

METHOD FOR MANUFACTURING A SILVER HALIDE EMULSION

Mikio Ihama, and Tadaaki Tani, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1985, Ser. No. 802,285

Claims priority, application Japan, Dec. 3, 1984, 59-255477

Int. Cl.⁴ G03C *1/18, 1/08*

U.S. Cl. 430—569 **30 Claims**

1. A method for manufacturing a chemically and spectrally sensitized silver halide emulsion, which comprises carrying out chemical ripening of the emulsion in the presence of an iridium salt and 0.01 to 10 mmol per mol of the silver halide of a photographic carbocyanine spectral sensitizing dye which forms J-aggregates.

4,693,966

HUMAN MONOCLONAL ANTIBODIES FROM LYMPHOCYTES OF PATIENTS WITH MALIGNANT MELANOMA

Alan N. Houghton; Hannah Brooks; Richard J. Cote, all of New York; Herbert F. Oettgen, New Canaan, Conn., and Lloyd J. Old, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,618

Int. Cl.⁴ G01N *33/577;* **C12N** *5/00;* **C07K** *15/04*

U.S. Cl. 435—7 **7 Claims**

1. Human monoclonal antibody Ma4 (HB8222), wherein said monoclonal antibody is IgM and specifically binds to an epitope of a glycolipid antigen, said antigen found on the cell surface of human renal, lung, and breast cancer cells.

3. Human monoclonal antibody M307 (HB 8235), wherein said monoclonal antibody is IgM and specifically binds to an intracellular cytoskeletal antigen of human cells.

4,693,967

MONITORING THERAPY RESULTS IN BODY SAMPLES OF RECEPTOR CELLS

Bobby J. Gormus, Covington, La., assignor to Research Corporation, New York, N.Y.

Filed Feb. 18, 1981, Ser. No. 235,510

Int. Cl.⁴ G01N *33/533, 33/534, 33/554*

U.S. Cl. 435—7 **5 Claims**

1. A method for differentially diagnosing between human leukemia and lymphoma disorders involving leucocytes that possess at least three membrane receptors per leucocyte for one or more molecules selected from the group consisting of an activated third component of complement (C3), immunoglobulin G, and immunoglobulin M, which comprises:

(a) reacting a sample of a patient's blood containing leucocytes with particles coated with said molecules to form a complex;

(b) incubating the complex under receptor cap forming conditions;

(c) enumerating the percentage of leucocytes in said sample capable of forming receptor caps and

(d) comparing said percentages to normals.

4,693,968

AGENT FOR QUANTITATIVE DETERMINATION OF MICROORGANISMS

Tsunehiro Kitagawa, Nagasaki, Japan, assignor to Dainippon Pharmaceutical Co., Ltd., Japan

Filed Aug. 22, 1984, Ser. No. 643,281

Claims priority, application Japan, Aug. 24, 1983, 58-155602

Int. Cl.⁴ G01N *53/00, 33/541;* **C12Q** *1/02, 1/04*

U.S. Cl. 435—7 **3 Claims**

3. A method for the quantitative determination of a group of strains belonging to same species of microorganism based on non-competitive antigen-antibody reaction, which comprises the following six steps:

step (i) adding a first antibody raised against a first strain which belongs to the species of the microorganism to be determined, the antibody having affinity for more than one strain of the species, to a test sample suspected of containing the microorganism to be determined, in order to subject them to non-competitive antigen-antibody reaction, wherein the amount of the first antibody added is predetermined and excessive as compared to the amount of the microorganism to be determined, and allowing the first antibody to react with microorganisms in the test sample;

step (ii) adding insolubilized cell walls of a second strain belonging to the species of microorganism to be determined, the second strain having a low affinity to to the first antibody in step (i) in comparison with the first strain, to the reaction mixture of step (i), an allowing the cell walls to react with the remaining free first antibody which has not been bound with the microorganisms to be determined, to form a cell walls-antibody precipitate;

step (iii) separating the precipitated cell walls-antibody complex formed in step (ii);

step (iv) adding a labelled second antibody having affinity for the first antibody to the complex in order to form cell walls-antibody-labelled second antibody complex;

step (v) washing the complex formed in step (iv); and then,

step (vi) measuring the activity of labelling substance in the complex.

4,693,969

REAGENT FOR USE IN A SANDWICH SOLID-PHASE ENZYME-IMMUNOASSAY AND PROCESS FOR EMPLOYING SAME

Brij B. Saxena, Englewood, and Premila Rathnam, Englewood Cliffs, both of N.J., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 4, 1984, Ser. No. 607,025

Int. Cl.⁴ G01N *33/535, 33/545, 33/74;* **C12N** *9/96*

U.S. Cl. 435—7 **9 Claims**

1. A "sandwich" enzyme-immunoassay for measuring hormone concentration in a sample, comprising the steps of:

(1) immobilizing on a substrate, an antibody specific to a hormone to be assayed;

(2) incubating the immobilized hormone specific antibody with the sample to be assayed;

(3) adding a reagent comprising a purified polymer of a purified γ-globulin fraction of hormone-specific antibody: enzyme conjugate to the product of step (2), wherein said γ-globulin fraction is conjugated to said enzyme by means of a heterobifuntional cross-linking agent;

(4) removing the unbound polymer of purified γ-globulin fraction of hormone-specific antibody: enzyme conjugate, from the product of step (3); and

(5) assaying the enzyme in the resulting conjugate of step (4) and using the assay to measure concentration of the hormone in the sample.

4,693,970

IMMUNOASSAY USING COMPLEMENT

James P. O'Connell, Chapel Hill; Randal A. Hoke, Carrboro, and Patrick D. Mize, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 21, 1985, Ser. No. 747,497

Int. Cl.⁴ G01N *33/53, 33/536, 33/543;* **C12Q** *1/44*

U.S. Cl. 435—7 **15 Claims**

1. A method for determining the concentration of an analyte in a fluid comprising:

(a) contacting an analyte in a fluid with an antianalyte, a substrate selected from the group consisting of a chromogen and a fluorogen and the first component of complement;

(b) causing said analyte to bind to said antianalyte whereby said first component is activated to modulate said substrate and provide a detectable signal;

(c) measuring said detectable signal; and

(d) determining the concentration of said analyte in said fluid by comparing the magnitude of said signal with the magnitude of a signal established for a known quantity of said analyte.

4,693,971

HIGHLY SENSITIVE ENZYME ASSAY METHOD

Hideo Misaki, Shizuoka, Japan, assignor to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

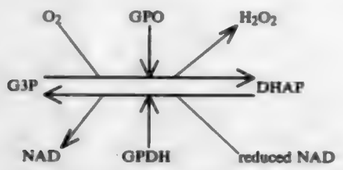
Filed Jan. 30, 1984, Ser. No. 575,292

Claims priority, application Japan, Jan. 28, 1983, 58-13057

Int. Cl.⁴ C12Q *1/50, 1/44, 1/26, 1/32*

U.S. Cl. 435—17 **12 Claims**

1. A quantitative assay method for a component selected from the group consisting of L-glycero-3-phosphate (G3P), dihydroxyacetone-3-phosphate (DHAP), nicotinamide adenine dinucleotide (NAD) and reduced NAD, in a specimen to be assayed, comprising causing a component in the specimen to take part in the reaction



wherein GPO is glycerophosphate oxidase and GPDH is glycerophosphate dehydrogenase, and measuring a detectable change in the amount of a consumed or generated component of the reaction system.

4,693,972

COMPOSITION AND METHOD FOR RAPID DETECTION OF MICROORGANISMS IN CLINICAL SAMPLES

James D. Mansour, Raleigh; Thomas H. Schulte, Cary, and Vernon R. Neece, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 16, 1984, Ser. No. 571,001

Int. Cl.⁴ C12Q *1/04, 1/44, 1/02, 1/06;* **G07K** *3/00;* **G01N** *21/64*

U.S. Cl. 435—34 **18 Claims**

1. A method for the detection of microorganisms in a body fluid sample comprising mixing said body fluid sample with an enzyme in a buffer whereby components of said body fluid but substantially none of the microorganisms in said sample are lysed, staining said microorganisms with ethidium bromide and determining the presence of said microorganisms by detecting the fluorescence emitted by said ethidium bromide.

18. A method for the detection of microorganisms in a body fluid sample comprising the steps of:

(a) mixing the body fluid sample with 5XLA lysing agent to provide a mixture wherein components of said body fluid but substantially none of the microorganisms are lysed;

(b) incubating said mixture;

(c) adding a staining buffer and ethidium bromide to said mixture; and

(d) flowing said mixture through a fluorescence activated flow cytometer and detecting the fluorescence associated with the microorganisms in said mixture.

4,693,973

DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESSES FOR PRODUCING BOVINE GROWTH HORMONE-LIKE POLYPEPTIDES IN HIGH YIELD

Gary N. Buell, Geneva, Switzerland, assignor to Biogen N.V., Curacao, Netherlands Antilles

Filed Aug. 11, 1983, Ser. No. 522,357

Claims priority, application United Kingdom, Aug. 17, 1982, 8223695

Int. Cl.⁴ C12P *21/00;* **C12N** *15/00*

U.S. Cl. 435—68 **6 Claims**

1. A process for increasing the yield of a bovine growth hormone-like polypeptide to at least 100 times that of a bovine growth hormone-like polypeptide encoded by a DNA sequence of the formula:

```
ATGGCCTTCCCAGCCATGTCCTTGTCCGGC
        CTGTTTGCCAACGCTGTGCTCCGGG
     CTCAGCACCTGCACCAGCTGGCTGCTGAC
   ACCTTCAAAGAGTTTGAGCGCACCTACATC
 CCGGAGGGACAGAGATACTCCATCCAGAACA
    CCCAGGTTGCCTTCTGCTTCTCTGAAAC
  CATCCCGGCCCCCACGGGCAAGAATGAGG
   CCCAGCAGAAATCAGACTTGGAGCTGCTTC
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-continued

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GCATCTCACTGCTCCTCATCCAGTCGTGG
CTTGGGCCCCTGCAGTTTCTCAGCAGAGTC
 TTCACCAACAGCTTGGTGTTTGGCACCTC
GGACCGTGTCTATGAGAAGCTGAAGGACCT
GGAGGAAGGCATCTTGGCCCTGATGCGGGA
 GGTGGAAGATGGCACCCCCCGGGCTGGGC
AGATCCTCAAGCAGACCTATGACAAATTTG
 ACACAAACATGCGCAGTGACGACGCGCTG
 CTCAAGAACTACGGTCTGCTCTCCTGCTTC
 CGGAAGGACCTGCATAAGACGGAGACGTA
CCTGAGGGTCATGAAGTGCCGCCGCTTCGG
          GGAGGCCAGCTGTGCCTTC
```

in the same vector-host expression system, said process comprising the step of culturing a host transformed with a recombinant DNA molecule comprising DNA sequence encoding a Met Δ or Δ bovine growth hormone-like polypeptide operatively linked to an expression control sequence, said Δ being an amino terminal deletion from the amino acid sequence of mature bovine growth hormone.

4,693,974

PROCESSES FOR PRODUCING LEUCROSE

Dieter Schwengers, Dormagen, and Herta Benecke, Frechen-Grefrath, both of Fed. Rep. of Germany, assignors to Pfeifer & Langen, Cologne, Fed. Rep. of Germany

Division of Ser. No. 809,714, Dec. 17, 1985. This application Sep. 29, 1986, Ser. No. 913,268

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 3446380

Int. Cl.⁴ C12P *19/18;* **A23G** *3/00;* **A23L** *1/236*

U.S. Cl. 435—97 **2 Claims**

1. A process for producing leucrose having a purity of at least 50% by weight, characterized in that saccharose is reacted with α-(1–6)-glucosyl transferase in the presence of at least 100 mmoles of fructose per 1,000 I.U. of enzyme, and the dextrans and iso-malto-oligosaccharides are at least partially separated.

4,693,975

HUMAN HYBRIDROMA FUSION PARTNER FOR PRODUCTION OF HUMAN MONOCLONAL ANTIBODIES

Danuta Kozbor, and Carlo M. Croce, both of Philadelphia, Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 20, 1984, Ser. No. 673,370

Int. Cl.⁴ C12N *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—172.2 **12 Claims**

1. A stable, continuous human somatic cell hybrid cell line produced by fusing a mutant cell obtained from one of either the human plasmacytoma cell line RPMI 8226 or the human lymphoblastoid cell line GM 1500 with a cell obtained from the other of either the RPMI 8226 cell line or the GM-1500 cell line, to produce a first hybrid cell line, said mutant cell exhibiting a first selectable phenotype capable of being complemented and a second selectable phenotype capable of being transmitted upon fusion with said other cell, and then mutating a cell of said first hybrid cell line to obtain said human somatic cell hybrid cell line exhibiting a selectable phenotype that can be complemented upon fusion with an antibody producing cell and having the ability to form a stable continuous cell line upon fusion with an antibody producing cell.

4,693,976

PROCESS FOR THE INCORPORATION OF FOREIGN DNA INTO THE GENOME OF DICOTYLEDONOUS PLANTS USING STABLE COINTEGRATE PLASMIDS

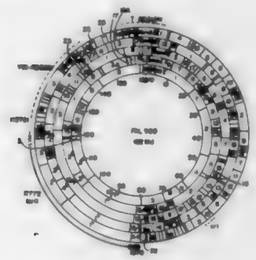
Robbert A. Schilperoort, Anthonie Duycklaan 10c, 2334 CD Leiden, and Jacques Hille, Reymerweg 76, 6871 HG Renkum, both of Netherlands

Filed Feb. 23, 1984, Ser. No. 583,024

Claims priority, application Netherlands, Feb. 24, 1983, 8300699

Int. Cl.⁴ C12P *21/00, 21/02;* **C12N** *1/22, 1/00*

U.S. Cl. 435—172.3 **3 Claims**



1. A process for the incorporation of foreign DNA into the genome of dicotyledonous plants comprising infecting the plants or incubating plant protoplasts with *Agrobacterium tumefaciens* bacteria, which contain one or more Ti (tumour inducing) plasmids, characterized in that as Ti plasmid a stable cointegrate plasmid composed of the plasmid R772 and the plasmid pTiB6 with foreign DNA incorporated in the T-region of the Ti component of the cointegrate plasmid is applied.

4,693,977

ENZYME IMMOBILIZATION FOR PRODUCING CEPHALOSPORIN ANTIBIOTICS

Saul Wolfe, Kingston; Donald Westlake, and Susan Jensen, both of Edmonton, all of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation-in-part of Ser. No. 698,842, Feb. 6, 1985, abandoned, which is a continuation of Ser. No. 507,852, Jun. 27, 1983, Pat. No. 4,536,476, which is a continuation-in-part of Ser. No. 410,302, Aug. 23, 1983, abandoned. This application Jan. 23, 1986, Ser. No. 820,930

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.⁴ C12N *11/08, 11/02;* **C12P** *37/00;* **C12R** *1/465*

U.S. Cl. 435—180 **5 Claims**

1. An immobilized enzyme reagent capable of continuously cyclizing, epimerizing and ring expanding L-α-aminoadipyl-L-cysteinyl-D-valine and analogs thereof to desacetoxycephalosporin and the respective analogs thereof, comprising an epimerase having a molecular weight of about 60,000, a cyclase having a molecular weight of about 36,500 and a ring expansion enzyme having a molecular weight of about 29,000, derived from a prokaryotic β-lactam producing organism selected from the group consisting of *S. clavuligerus, S. cattleya* and *S. lipmanii;* immobilized on a diethylaminoethyl ion exchange chromatographic resin.

4,693,978

TYPE II RESTRICTION ENDONUCLEASE MAEI, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg, and Rüdiger Schmitt, Niedergebraching, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,468

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401617

Int. Cl.⁴ C12N *9/22, 9/16, 15/00;* **C12R** *1/01*

U.S. Cl. 435—199 **6 Claims**

1. A restriction endonuclease capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows:



4,693,979

TYPE II RESTRICTION ENDONUCLEASE MAE II, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg, and Rüdiger Schmitt, Niedergebraching/Pentling, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,469

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401619

Int. Cl.⁴ C12N *9/22, 9/16, 15/00;* **C12R** *1/01*

U.S. Cl. 435—199 **6 Claims**

1. A restriction endonuclease which capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows



4,693,980

NEW TYPE II RESTRICTION ENDONUCLEASE MAE III, A PROCESS FOR OBTAINING IT AND THE USE THEREOF

Karl O. Stetter, Regensburg; Rüdiger Schmitt, Niedergebraching/Pentling, and Frank Laue, Pähl, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Sep. 28, 1984, Ser. No. 655,470

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401620

Int. Cl.⁴ C12N *9/22, 9/16, 15/00;* **C12R** *1/01*

U.S. Cl. 435—199 **6 Claims**

1. A restriction endonuclease capable of recognizing and cleaving a DNA sequence at a position indicated by the arrows



4,693,981

PREPARATION OF INACTIVATED VIRAL VACCINES

Gary P. Wiesehahn, Alameda; Richard P. Creagan, Alta Loma; David R. Stevens, Fremont, and Richard Giles, Alameda, all of Calif., assignors to Advanced Genetics Research Institute, Oakland, Calif.

Continuation-in-part of Ser. No. 563,939, Dec. 20, 1983, Pat. No. 4,545,987, and a continuation-in-part of Ser. No. 592,661, Mar. 23, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,354

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.⁴ A61K *39/12*

U.S. Cl. 435—238 **9 Claims**

1. A method for inactivating a live virus without substantially degrading their antigenic characteristics, said method comprising:

exposing the virus to a preselected intensity of long wavelength ultraviolet radiation and a preselected concentration of an inactivating furocoumarin for a time period sufficiently long to render the virus non-infectious but less than that which would result in degradation of its antigenic characteristics, wherein said exposure is performed in the substantial absence of oxygen and other oxidizing species.

4,693,982

ENZYMATICALLY-TREATED GUAR GUMS

Walter H. Carter, and Vinai K. Srivastava, both of Dalton, Ga., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed May 22, 1985, Ser. No. 736,667

Int. Cl.⁴ C09K *7/00*

U.S. Cl. 435—274 **7 Claims**

1. A method of treating solid guar gum particles to reduce insoluble residues comprising impregnating said particles, while in the solid state, with a hydrolytic enzyme solution to produce hydrated solid free flowing particles, the concentration of said enzyme in said solution being sufficient to reduce insoluble residues when said particles are mixed with water.

4,693,983

REACTOR FOR CULTIVATING BIOLOGICAL MATERIAL SUCH AS IMMOBILIZED CELLS

Graham A. Davies, Macclesfield, and Ferda Mavituna, Stockport, both of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB86/00192, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05802, PCT Pub. Date Oct. 9, 1986

PCT Filed Apr. 3, 1986, Ser. No. 937,063

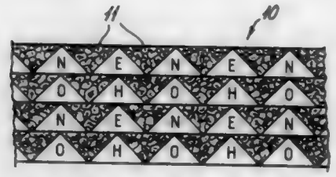
Claims priority, application United Kingdom, Apr. 4, 1985, 8508976

Int. Cl.⁴ C12M *3/00*

U.S. Cl. 435—284 **29 Claims**

1. A reactor for cultivating biological material colonized therein, comprising a support matrix having a plurality of first channels for being colonized with biological material and defined by bounding walls across which the biological material cannot pass, each said first channel adjoining a second channel and a third channel and a fourth channel, the part of said boundary wall adjoining the second channel and the part of said boundary wall adjoining the fourth channel being respectively permeable to different materials.

23. A method of cultivating biological material, comprising colonizing the first channels of a reactor according to claim 1



with the biological material, applying nutrient to the second channels, applying extractant fluid to the third channels, applying one of a heat-transfer fluid of a gas to the fourth channels and applying the other of a heat-transfer fluid or a gas to the fifth channels if present.

4,693,984

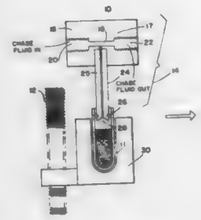
METHOD AND APPARATUS FOR SEQUENTIAL FRACTIONATION

Allen P. Minton, Bethesda, Md.; Arun K. Attri, New Delhi, India, and James V. Sullivan, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 724,033, Apr. 16, 1985, abandoned. This application Oct. 31, 1986, Ser. No. 925,452

Int. Cl.⁴ G01N *1/18*

U.S. Cl. 436—180 **13 Claims**



1. An apparatus for removing fractions of a predetermined volume from a holding tube containing a liquid, with a concentration gradient of solute therein, comprising:

a capillary tube, for removing a fraction of a predetermined volume from a holding tube containing a liquid with a concentration gradient of solute therein, said concentration gradient including a plurality of said fractions of said predetermined volume;

said capillary tube having a bottom internal end flared outwardly at an angle of between 30 and 60° and having sealing means, for slidably sealing a bottom external end of said capillary tube within the interior of said holding tube, located above the flared end of said capillary tube;

means for mounting said capillary tube along a vertical axis with said outwardly flared internal end facing downward;

means for mounting said holding tube in an upright orientation below said capillary tube and along said vertical axis, and for placing said capillary tube into said holding tube so as to sealingly engage said sealing means with the interior surface of said holding tube;

means defining a chamber connected to an end of said capillary tube opposite to said outwardly flared internal end, said chamber having a cross-sectional area at least about

ten times larger than an internal cross-sectional area of said capillary tube, so as to essentially prevent mixing of the gradient in said holding tube when fractions are removed from said holding tube;

means for providing relative incremental movement of said capillary tube and said holding tube to force a layer of liquid from said holding tube into said capillary tube, and eventually into said chamber means; and

means for exerting fluid pressure within said chamber in a horizontal direction, wherein said fluid pressure forces any liquid within said chamber horizontally through an exit port in said chamber.

9. A method of removing fractions from a centrifuge tube having a concentration gradient of solute therein, comprising the steps of:

(a) selecting a fraction volume;

(b) selecting a capillary tube having a volume of no more than about twice the volume of said selected fraction volume said capillary tube having one internal end flared outwardly at an angle of between 30° to 60° and having an O-ring having an outer diameter slightly smaller than the inner diameter of said centrifuge tube, said O-ring being fitted externally about said capillary tube above the flared end thereof;

(c) maintaining said capillary tube, flared side down, along a vertical axis;

(d) positioning a centrifuge tube having liquid therein in an upright orientation below said capillary tube and along said vertical axis;

(e) inserting said capillary tube into said centrifuge tube so as to sealingly engage said O-ring with the interior surface of said centrifuge tube;

(f) increasing the depth at which said flared end of said inserted capillary tube rests within said centrifuge tube so as to cause a first fraction of said selected volume of said liquid to enter said capillary tube;

(g) further increasing the depth at which said flared end of said capillary tube rests within said centrifuge tube so as to cause at least one additional fraction of said selected volume of said liquid and to force at least a portion of said first fraction into a chamber connected to said capillary tube, said chamber having a cross-sectional area sufficiently larger than an internal cross-sectional area of said capillary tube so as to essentially prevent mixing of the gradient in said centrifuge tube;

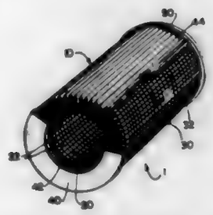
(h) exerting fluid pressure horizontally across said chamber to force said portion out of said chamber through an exit port in said chamber.

4,693,985

METHODS OF CONCENTRATING LIGANDS AND ACTIVE MEMBRANES USED THEREFOR

Peter J. Degen, Huntington; Jerold Martin, Plainview; Judy Schriefer, Commack, all of N.Y., and Brenda Shirley, Athens, Ga., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Aug. 21, 1984, Ser. No. 642,899
Int. Cl.⁴ B01D *15/08, 39/00;* **G01N** *33/545*
U.S. Cl. 436—531 **61 Claims**



1. A method of preparing a biologically active membrane having a large surface area comprising the steps of:

reacting a hydrophilic, microporous, skinless polyamide membrane with an activating agent to form a chemically activated membrane, and

reacting said chemically activated membrane with an acceptor molecule to form a biologically active membrane, said acceptor molecule being a member selected from the group consisting of a monoclonal antibody, a polyclonal antibody, an antigenic substance, a glycoprotein, Protein A, a lectin, a carbohydrate, an enzyme substrate, a cofactor, an inhibitor, a hormone, an IgG class of immunoglobulin, a carrier protein, a receptor, heparin, a coagulation factor, and a histone.

28. A method for recovering a ligand from a solution including passing a ligand solution through a biologically active membrane comprising an acceptor molecule selected from the group consisting of a monoclonal antibody, a polyclonal anitbody, an antigenic substance, a glycoprotein, Protein A, a lectin, a carbohydrate, an enzyme substrate, a cofactor, an inhibitor, a hormone, an IgG class of immunoglobulins, a carrier protein, a receptor, heparin, a coagulation factor, and a histone covalently bound to a hydrophilic, microporous, skinless polyamide membrane and binding said ligand to said biologically active membrane.

4,693,986

CERAMIC PROCESS AND PRODUCTS

Jaroslav Vit, Union, N.J.; Ronald L. Salsbury, Dublin, and Don J. Henderson, Danville, both of Calif., assignors to Orthomatrix, Inc., Dublin, Calif.

Continuation of Ser. No. 748,547, Jun. 25, 1985. This application Jan. 21, 1987, Ser. No. 9,612
Int. Cl.⁴ C04B *35/00;* **C07C** *61/06*
U.S. Cl. 501—1 **16 Claims**

1. Ceramic particles of a calcium phosphate material suitable as an implant or prosthesis material, characterized by a bulk density between about 80% and about 95% of the theoretical bulk density of the calcium phosphate material, a size range of between 10 and 80 mesh, and a network of micropores in the individual particles sufficient to permit tissue attachment when the particles are employed as an implant or prosthesis material wherein said micropores have a medium pore size of about 1.5 microns as determined by mercury porosimetry.

4,693,987

MOLYBDENUM SEALING GLASSES

Paul S. Danielson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 8, 1986, Ser. No. 904,285
Int. Cl.⁴ C03C *3/587*
U.S. Cl. 501—70 **3 Claims**

1. A glass exhibiting a strain point between 718°–725° C., a linear coefficient of thermal expansion (0°–300° C.) between $46.2–50.1\times10^{-7}$/°C., a liquidus temperature between 1145°–1180° C., a viscosity at the liquidus temperature of at least 50,000 poises, and essentially zero tensile axial stress at room temperature when sealed to molybdenum metal, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 9.1–13.1% BaO, 10.7–11.9% CaO, 14.6–15.1% Al_2O_3, and 60.5–62.4% SiO_2.

4,693,988

SINGLE PHASE SILICON CARBIDE REFRACTORY

Wolfgang D. G. Boecker, and Tadeusz M. Korzekwa, both of Lewiston, N.Y., assignors to Kennecott Corporation, Cleveland, Ohio

Filed Jul. 1, 1986, Ser. No. 880,708
Int. Cl.⁴ C04B *35/56*
U.S. Cl. 501—89 **13 Claims**

1. The method of producing a single phase silicon carbide article comprising the steps of:

(a) forming a particulate silicon carbide mixture made up of the following size fractions:

(i) particles ranging from about 0.21 mm to about 3.4 mm,

(ii) particles ranging from less than about 0.21 mm to about 0.003 mm, and

(iii) particles less than 0.003 mm in size, having an average particle size of less than one micron each of said fractions being present in the mixture in amounts of from about 5 to about 75% by weight, the sum of said fractions equaling 100%,

(b) adding up to about 3.0% by weight based upon the weight of the smallest size fraction of a sintering aid,

(c) adding carbon in excess of the stoichiometric amount required to combine with any silica or other oxygen source that may be present,

(d) shaping the mixture to form a green body, and

(e) firing said shaped body for such time, at such temperature and in such environment as to produce a pressureless sintered silicon carbide article.

4,693,989

PREPARATION AND SINTERING OF REFRACTORY METAL BORIDES, CARBIDES AND NITRIDES OF HIGH PURITY

Ajit Y. Sane, Willoughby, Ohio, assignor to Eltech Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 625,599, Jun. 28, 1984, abandoned. This application May 29, 1985, Ser. No. 737,930
Int. Cl.⁴ C04B *35/58*
U.S. Cl. 501—96 **6 Claims**

1. The method of preparing a consolidated and purified Group IVb, Vb or VIb refractory metal boride, carbide, nitride, or mixture, combination or cermet thereof by means of aided, reduced pressure and elevated temperature conditions, which method comprises:

(a) establishing a composition for a second stage reaction step of reaction sintering and adapted for enhanced production of desired product;

(b) providing sintering aid at least in part together with said composition and resting said composition upon said sintering aid, which aid is solid at normal pressure and temperatures and aids via the vapor phase at the pressure and temperature conditions of the second stage reaction step;

(c) reducing the pressure around said composition;

(d) heating said composition at a temperature for sintering; while

(e) establishing sintering aid atmosphere in contact with said composition; and

(f) maintaining the heating for a time sufficient to consolidate said composition, and thereby prepare a consolidate and purified product.

4,693,990

PRODUCTION OF CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Furuhashi Hiroyuki; Tadashi Yamamoto; Masafumi Imai, and Hiroshi Ueno, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Jul. 3, 1986, Ser. No. 882,042
Claims priority, application Japan, Jul. 5, 1985, 60-146805
Int. Cl.⁴ C80F *4/64*
U.S. Cl. 502—116 **19 Claims**

1. A titanium containing supported catalyst component comprising the product obtained by contacting:

(1) the reaction product obtained by contacting together

(a) a metal oxide or a composite of metal oxides of Group IIA, IIB, IIIA, IIIB, IVA or IVB of the Periodic Table,

(b) a dihydrocarbyl magnesium compound represented by the formula $RMgR'$, mixtures thereof or a complex with an organic compound of aluminum, boron, beryllium or zinc, and

(c) a hydrocarbyloxy. group-containing compound represented by the formula $R''_qMm(OR''')_n$,

(2)

(d) a halogen-containing alcohol,

(3)

(e) an electron-donating compound, and

(4)

(f) a di-, tri-, or tetravalent titanium compound,

wherein R and R′ are the same or different and are selected from alkyl, cycloalkyl, aryl and aralkyl groups having from 1 to 20 carbon atoms, R″ is a hydrogen atom or a hydrocarbyl group selected from alkyl, alkenyl, aryl or aralkyl groups having from 1 to 20 carbon atoms, R‴ is a hydrocarbyl group having from 1 to 20 carbon atoms and selected from alkyl, alkenyl, aryl, or aralkyl groups, M is selected from silicon, carbon, phosphorous, boron or aluminum, m is the valence of M and $m>q\geq0$, $m\geq n>0$ and $n+q$ equal m.

4,693,991

HYDROTREATING CATALYST COMPOSITION

Geir Bjornson; Douglas D. Klendworth; Lloyd E. Gardner, and Floyd E. Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 858,772, May 2, 1986, Pat. No. 4,655,906. This application Oct. 16, 1986, Ser. No. 919,360
Int. Cl.⁴ B01J *27/51, 23/28*
U.S. Cl. 502—220 **16 Claims**

1. A composition of matter, suitable as a catalyst composition for hydrotreatment of liquid polyaromatics-containing feed streams, comprising:

(a) alumina,

(b) zinc titanate,

(c) at least one compound of molybdenum,

(d) at least one compound of nickel, and

(e) at least one compound of rhenium;

wherein said composition of matter comprises from about 1 to about 20 weight-% Mo, from about 0.5 to about 8 weight-% Ni and from about 0.2 to about 4 weight-% Re.

8. A composition of matter in accordance with claim 1, having been prepared by a process comprising the steps of:

(i) mixing alumina and zinc titanate;

(ii) impregnating the mixture of alumina and zinc titanate obtained in step (i) with at least one aqueous solution containing compounds of Mo, of Ni and of Re;

(iii) drying the thus impregnated mixture obtained in step (ii);

(iv) calcining the dried mixture obtained in step (iii) under such conditions and at a temperature high enough to convert the compounds of Mo, of Ni and of Re to oxides of Mo, of Ni and of Re.

13. A composition of matter in accordance with claim 8, comprising the additional step of (v) contacting the material obtained in step (iv) with a sulfur compound under such conditions as to at least partially convert oxides of Mo, Ni and Re to sulfides of Mo, Ni and Re.

4,693,992

BACITRACIN-METAL-POLYETHER ANTIBIOTIC COMPLEXES

Vernon V. Young, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Aug. 26, 1985, Ser. No. 769,066
Int. Cl.⁴ A61K *37/02, 31/70*
U.S. Cl. 514—11 **17 Claims**

1. A complex of bacitracin, a polyether antibiotic ionophore and a non-toxic complex-forming metal ion, said complex being crystalline.

4,693,993

BRADYKININ ANTAGONIST PEPTIDES

John M. Stewart, 3690 E. Dartmouth Ave., Denver, Colo. 80210, and Raymond J. Vavrek, 1250 Poplar St., Denver, Colo. 80220

Filed Jun. 13, 1985, Ser. No. 744,207
Int. Cl.⁴ C07K *37/42, 7/18, 7/06, 7/08*
U.S. Cl. 514—14 **21 Claims**

1. A modified bradykinin type peptide having the formula

A - Arg - B - C - D - W - X - Y - Z - Arg

and the pharmaceutically acceptable salts thereof wherein

a. A is selected from the group comprising
(i) hydrogen
(ii) Arg
(iii) Lys-Lys
(iv) Phe
(v) Thi
(vi) Lys
(vii) Met-Lys
(viii) Gly-Arg-Met-Lys

b. B is selected from the group comprising
(i) Azetidine-2-Carboxylic Acid (Azt)
(ii) Thiazolidine-2-Carboxylic acid (THz)
(iii) Isonipecotic acid (Inip)
(iv) Pro
(v) 2, 3-Dehydroproline (ΔPro)
(vi) 4-Hydroxyproline (Hyp)
(vii) Hydroxyproline
(viii) Aib
(ix) Dehydroproline
(x) Lys-Lys-Hyp
(xi) Ala
(xii) Sar
(vii) beta-(2-Naphthyl)-Alanine (Nal)
(viii) Leu
(ix) Lys-Lys-Thi
(x) Serine (Ser)
(xi) Tyr

f. X is selected from the group comprising
(i) Ser
(ii) Gly
(iii) Phe
(iv) Para-Chloro-D-phenylalanine (CDF)
(v) Nal
(vi) Pal
(vii) Thi
(viii) pCl-Phe

g. Y is selected from the group comprising
(i) DNal
(ii) DPNF
(iii) DPhe
(iv) DTyr
(v) DPal
(vi) DOMT
(vii) DThi
(viii) DAla
(ix) DTrp
(x) pNO2 - DPhe (PNF)
(xi) DPro
(xii) DHis
(xiii) D-Homo-Phe (DhPhe)
(xiv) pCl-DPhe(CDF)
(xv) DPhg
(xvi) D-Val
(xvii) Lys-Lys-Dtrp
(xviii) Lys-Lys-DHis
(xix) DIle

h. Z is selected from the group comprising
(i) Phe
(ii) beta-(2-thienyl) alanine (Thi)
(iii) 0-methyltyrosine (OMT)
(iv) beta-(2-pyridyl) alanine (Pal)
(v) para-chloro-L-phenylalanine (CLF)
(vi) para-nitrophenylalanine (PNF)
(vii) beta-(2-naphthyl) - alanine (Nal)
(viii) Leu
(ix) Lys-Lys-Thi
(x) Tyr

4,693,994

PROTECTIVE SYNTHETIC PEPTIDE AGAINST MALARIA AND ENCODING GENE

Thomas F. McCutchan, Silver Spring, and Richard Wistar, Jr., Bethesda, both of Md., assignors to The Government of the United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Nov. 19, 1985, Ser. No. 799,464
Int. Cl.[4] A61K *37/02;* **C07K** *7/06*
U.S. Cl. 514—15 **4 Claims**

1. A synthetic peptide having an amino acid sequence: Gly-Asp-Arg-Ala-Asp-Gly-Gln-Pro-Ala.

4,693,995

PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF ACUTE MYOCARDIAL ISCHEMIA

Giuseppe Prino, Milan; Marisa Mantovani, Villa Guardia Como, and Riccardo Niada, Varese, all of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Como, Italy

Filed Feb. 14, 1985, Ser. No. 701,695
Claims priority, application Italy, Feb. 16, 1984, 19645 A/84
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—44 **5 Claims**

1. A method of testing acute myocardial ischemia in a patient in need of such treatment, comprising administering to said patent a therapeutically effective amount of defibrotide in a pharmaceutically acceptable, inert carrier.

4,693,996

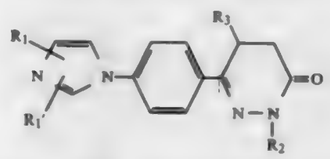
METHOD OF TREATING HEART FAILURE AND MEDICAMENTS THEREFOR

Robert P. Steffen, Saline, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 23, 1985, Ser. No. 812,876
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—46 **5 Claims**

1. A pharmaceutical composition for increasing myocardial contractility and cardiac output comprising

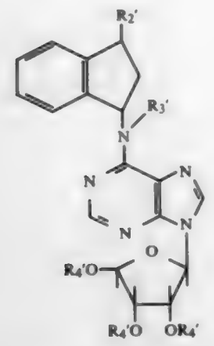
(a) an effective amount of a compound of the formula



I

wherein R_1 and R_1' are independently hydrogen or alkyl of one to three carbon atoms; R_2 is hydrogen, alkyl of one to three carbon atoms or 2-hydroxyethyl; and R_3 is hydrogen or alkyl of one to three carbon atoms, or a pharmaceutically acceptable acid addition salt thereof, with

(b) an effective amount of a compound of the formula



II

wherein R_2' and R_3' are independently hydrogen or alkyl of one to three carbon atoms; and R_4' is hydrogen, acetyl or benzoyl; its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier.

4,693,997

NOVEL PHARMACEUTICAL COMPOSITION

Carl-Aage Bergwitz-Larsen, Vällingby, and Rolf G. L. Österlund, Vallentuna, both of Sweden, assignors to KabiVitrum AB, Stockholm, Sweden

Division of Ser. No. 472,295, Mar. 4, 1983, Pat. No. 4,536,495. This application Jun. 7, 1985, Ser. No. 742,668
Claims priority, application Sweden, Mar. 12, 1982, 8201556
Int. Cl.[4] A61K *31/715, 31/65*
U.S. Cl. 514—54 **14 Claims**

1. A complex of carrageenan and 10–70% by weight of said complex of doxycycline, calculated as doxycycline hydrochloride.

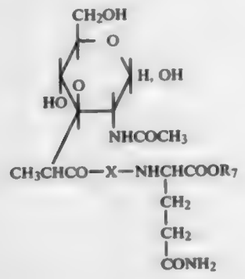
4,693,998

NOVEL COMPOUNDS OF THE MURAMYL PEPTIDE

Pierre Lefrancier, Bures Sur Yvette; Monique Parant, Paris; Francoise Audibert, Neuilly Sur Seine; Louis Chedid; Jean Choay, both of Paris, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche, France

Continuation of Ser. No. 391,140, Jun. 23, 1982, , Continuation of Ser. No. 131,138, Mar. 17, 1980, , Continuation of Ser. No. 045,401, Jun. 14, 1979. This application Nov. 7, 1985, Ser. No. 797,771
Claims priority, application France, Jun. 5, 1978, 79 16793
Int. Cl.[4] A61K *31/70;* **C07H** *5/04*
U.S. Cl. 514—62 **20 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of L-alanyl, L-seryl and L-valyl;

and R_7 is selected from the group consisting of CH_3, C_2H_5, C_3H_7, C_4H_9, C_5H_{11}, C_6H_{13} and $C_{10}H_{21}$.

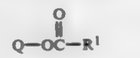
4,693,999

LIPOSOMES CONTAINING STEROID ESTERS

Bengt I. Axelsson, Genarp; Ralph L. Brattsand; Carl M. O. Dahlbäck, both of Lund; Leif A. Källström, Södra Sandby, and Jan W. Trofast, Lund, all of Sweden, assignors to Aktiebolaget Draco, Sweden

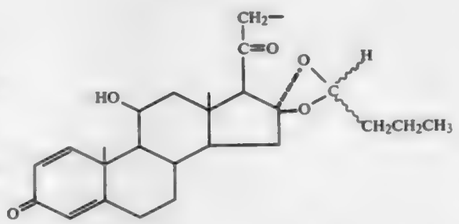
Filed Jul. 3, 1985, Ser. No. 752,257
Claims priority, application Sweden, Jul. 30, 1984, 8403905
Int. Cl.[4] A61K *31/56, 31/58;* **C07J** *00/00*
U.S. Cl. 514—174 **7 Claims**

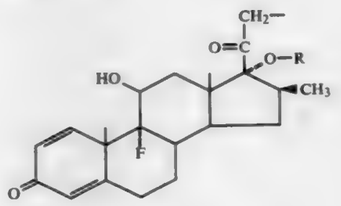
1. A pharmaceutical composition for administration primarily to the respiratory tract comprising liposomes in combination with an antiinflammatory and antiallergic effective amount of a compound of the formula

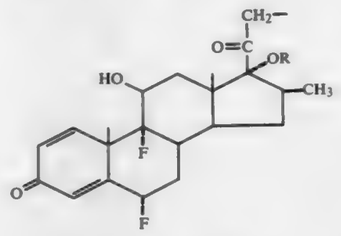


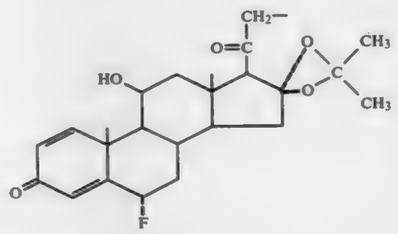
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wherein Q is

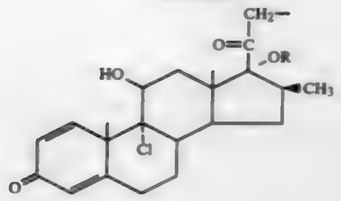




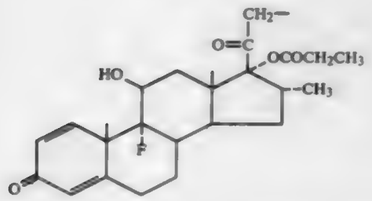




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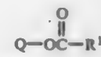


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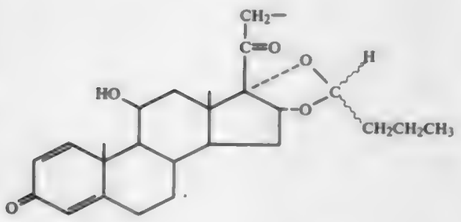


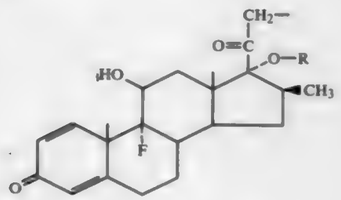
and R^1 is a saturated or unsaturated, straight or branched alkyl group with 11–19 carbon atoms and R is H, $—COCH_3$, $—COC_2H_5$, $—CO(CH_2)_2CH_3$ or $—CO(CH_2)_3CH_3$.

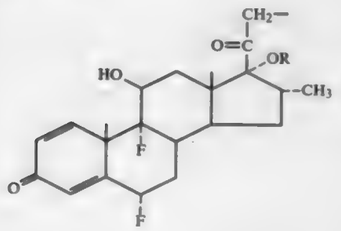
5. A compound of the formula



wherein Q is

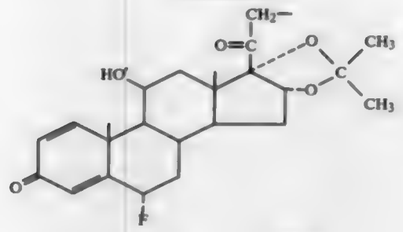




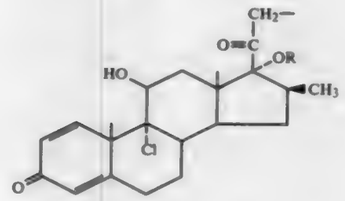


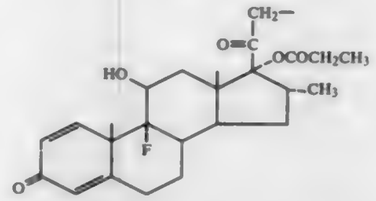
and R^1 is a saturated or unsaturated straight or branched alkyl group with 11–19 carbon atoms and R is H, $—COCH_3$, $—COC_2H_5$, $—CO(CH_2)_2CH_3$ or $—CO(CH_2)_3CH_3$.

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or





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4,694,000

QUINAZOLINE AND ISOQUINOLINE DERIVATIVES

Hendrik Timmerman, Voorschoten, and Henderikus Van der Goot, Goofddorp, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands PCT No. PCT/EP84/00312, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO 85/01501 PCT Pub. Date Apr. 11, 1985

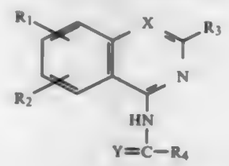
PCT Filed Sep. 28, 1984, Ser. No. 679,000

Claims priority, application Netherlands, Sep. 29, 1983, 83.03328

Int. Cl.[4] A61K *31/47, 31/505;* **C07D** *401/04*

U.S. Cl. 514—187 **33 Claims**

1. Compound of the formula:



and pharmaceutically acceptable acid addition salts and copper complexes thereof, wherein

X represents nitrogen or a CH group,

Y represents oxygen or an NH group,

R_1 and R_2 represent hydrogen, alkyl(1–6C), alkoxy(1–6C), halogen or trifluoromethyl,

R_3 represents a 2-pyridyl group which is unsubstituted or substituted by alkyl(1–6C), alkoxy(1–6C) or halogen,

R_4 represents hydrogen, an alkyl(1–6C) group which is unsubstituted or substituted by halogen, alkoxy(1–6C) or

phenyl groups, a cyclic alkyl group (3–8C) or an aromatic group selected from phenyl, naphthyl, pyridyl, pyrimidyl, pyrazinyl, furyl, thienyl, oxazolyl and thiazolyl, which aromatic group is unsubstituted or substituted by alkyl(1–6C), alkoxy(1–6C) or halogen.

13. Feed mixture, characterised in that it contains a biocidally effective amount of a biocide compound according to claim 1.

4,694,001

β-LACTAM COMPOUND AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Tadashi Hirata, Yokohama; Kenichi Mochida, Hiratsuka; Chihiro Shiraki, Machida, and Kiyoshi Sato, Mishima, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

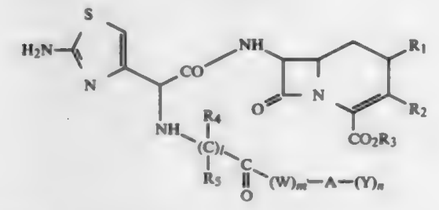
Continuation of Ser. No. 591,254, Mar. 20, 1984, abandoned, which is a continuation of Ser. No. 424,633, Sep. 27, 1982, abandoned. This application Nov. 26, 1984, Ser. No. 674,710

Claims priority, application Japan, Oct. 1, 1981, 56-156752

Int. Cl.[4] C07D *205/12;* **A61K** *31/395*

U.S. Cl. 514—210 **5 Claims**

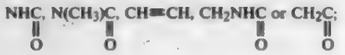
1. A β-lactam compund of the formula:



wherein

Y is a hydroxyl group, a lower alkanoyloxy group or a lower alkoxycarbonyloxy group;

W is a group represented by CH_2, NH,



A is a phenyl group, a naphthyl group, or a chromonyl group, respectively substituted by $(Y)_n$;

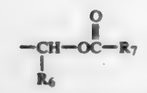
R_1 is a hydrogen atom, a hydroxyl group, a methoxy group or a lower alkyl group;

R_2 is a hydrogen atom, a halogen atom, a methoxy group or a group represented by

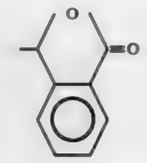
CH_2R_2' wherein R_2' is a hydrogen atom, an azido group, a lower alkanoyloxy group, a carbamoyloxy group, a pyridinium group, a substituted pyridinium group wherein the substitutuent is $—(CH_2)_p—R_A$ wherein R_A is a carbamoyl group, carboxyl group, cyano group or lower alkoxycarbonyl group having 2 to 5 carbon atoms, and p is 0, 1, 2 or 3; or $—R_B—SO_3—R_C$ wherein R_B is a lower alkylene group having 1 to 3 carbon atoms, and R_C has the same meaning as R_3, or

a substituted or unsubstituted heterocyclic thio group wherein the heterocyclic group is a tetrazolyl group, thiadiazolyl group, triazolyl group, triazinyl group or thiazolyl group and wherein the substituent is a lower alkyl group having 1 to 5 carbon atoms, hydroxyl group, oxo group, amino group, nitro group, $(CH_2)_qCO_2H$, $(CH_2)_qCO_2—$(alkyl group having 1–4 carbon atoms), $(CH_2)_qSO_3H$, $(CH_2)_q—N$ (alkyl group having 1–4 carbon atoms)$_2$, and q represents an integer of 1 to 3;

R_3 is a hydrogen atom, an alkali metal, an alkaline earth metal, an ammonium group of a basic amino acid or an ester residue represented by the formula:



wherein R_6 represents a hydrogen atom or a lower alkyl group having 1 to 6 carbon atoms, and R_7 represents a lower alkyl group having 1 to 6 carbon atoms, or a phenyl group, or the formula



R_4 and R_5 each are hydrogen atom, a lower alkyl group or a cycloalkylidene group with a carbon atom combined therewith; l is 0 or an integer of 1, 2 or 3; m is 0 or 1; and n is an integer of 1, 2, 3, 4 or 5.

4,694,002

BENZOTHIAZEPINE DERIVATIVES

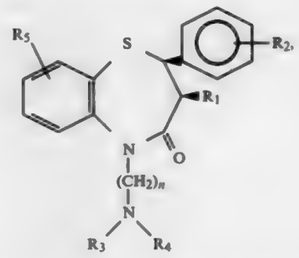
David Floyd, Pennington, and Karnail Atwal, Cranbury, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 21, 1986, Ser. No. 898,570

Int. Cl.[4] A61K *31/55;* **C07D** *281/10*

U.S. Cl. 514—211 **15 Claims**

1. A compound having the formula



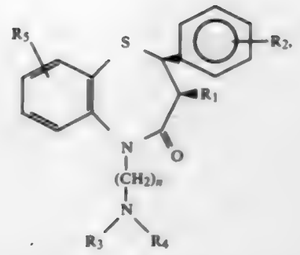
or a pharmaceutically acceptable salt thereof, wherein the stereochemistry at the chiral centers in the 2 and 3-positions of the benzothiazepine nucleus is cis, and wherein

R_1 is alkyl, aryl, arylalkyl, alkenyl or alkynyl;

R_2 and R_5 are each independently hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl; and

R_3 and R_4 are each independently alkyl or cycloalkyl or R_3 and R_4 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl.

15. A method of controlling blood pressure in a mammalian host in need thereof, which comprises administering to said host an effective amount of a compound having the formula



or a pharmaceutically accpetable salt thereof, wherein the stereochemistry at the chiral centers in the 2 and 3-position of the benzothiazepine nucleus is cis, and wherein

R_1 is alkyl, aryl, arylalkyl, alkenyl or alkynyl;

R_2 and R_5 are each independently hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl; and

R_3 and R_4 are each independently alkyl or cycloalkyl or R_3 and R_4 together with the nitrogen atom to which they are attached are pyrrolidinyl, piperidinyl or morpholinyl.

4,694,003

METHOD OF TREATING DEPRESSION WITH 5-(AMINOALKYL)-11-PHENYL-5H-DIBENZO(B,E)(1,4) DIAZEPINES

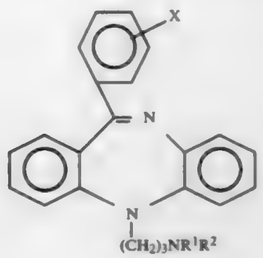
Chandler R. Taylor, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 305,076, Sep. 24, 1981, abandoned. This application Jul. 30, 1982, Ser. No. 403,757

Int. Cl.⁴ A61K *31/55*

U.S. Cl. 514—220 **6 Claims**

1. A method of treating depression which comprises administering an effective amount of a compound having the formula:



wherein

R^1 and R^2 are selected from the group consisting of hydrogen or methyl,

X is selected from the group consisting of hydrogen, chlorine, bromine or fluorine, and the pharmaceutically acceptable acid addition salts thereof.

4,694,004

SEMICARBAZIDE DERIVATIVES, PROCESSES FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Osamu Nakaguti; Noriniko Shimazaki, both of Toyonaka; Yoshio Kawai, Tokyo; Masashi Hashimoto, Takarazuka, and Michie Nakatuka, Yokohama, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

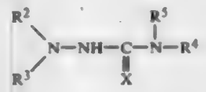
Filed Jun. 19, 1985, Ser. No. 746,510

Claims priority, application United Kingdom, Jul. 9, 1984, 8417453; May 7, 1985, 8511553

Int. Cl.⁴ A61K *31/44*; C07D *401/12, 413/12, 211/68*

U.S. Cl. 514—228 **13 Claims**

1. A compound of the formula:



wherein

R^2 and R^3 are taken together with the attached nitrogen atom to form tetrahydropyridyl optionally substituted with lower alkyl,

R^4 is lower alkyl optionally substituted with di(lower)alkylamino or pyridyl, pyrazolyl, pyridyl optionally substituted with halogen, lower alkyl or lower alkoxy, tetrahydropyridyl, pyrimidinyl, pyrazinyl, pyrrolidinyl, morpholinyl, thiazolyl, thiazolinyl, benzothiazolyl, or tetrahydrofuryl substituted with oxo,

R^5 is hydrogen or lower alkyl, and

X is O or S,

and a pharmaceutically acceptable salt thereof.

10. An antiinflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of a compound of claim 1, as an active ingredient, in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

4,694,005

5-PHENYL-3H,6H-1,3,4-OXADIAZINE-2-ONES IN TREATMENT OF HEART FAILURE AND HYPERTENSION

David Brown, Macclesfield; Rodney B. Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

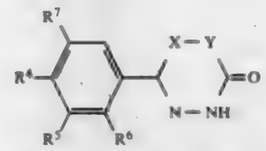
Division of Ser. No. 660,135, Oct. 12, 1984, Pat. No. 4,584,298, which is a division of Ser. No. 436,801, Oct. 26, 1982, Pat. No. 4,495,185. This application Apr. 22, 1986, Ser. No. 854,479

Claims priority, application United Kingdom, Nov. 12, 1981, 8134175

Int. Cl.⁴ A61K *31/535*

U.S. Cl. 514—234 **2 Claims**

1. A method for the treatment of hypertension, in a warm blooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound of the formula:



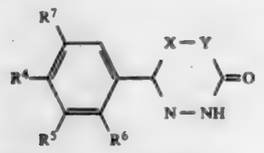
wherein X is $—CR^1R^2$ and Y is —O—, wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;

wherein either R^4 is hydrogen, fluoro or chloro, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, and R^5, R^6 and R^7, which may be the same or different, each is hydrogen, fluoro, chloro, bromo or iodo, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, provided that R^4, R^5, R^6 and R^7 are not all hydrogen;

or R^4 is bromo and R^5, R^6 and R^7 have the meanings stated above, provided that R^5, R^6 and R^7 are not all hydrogen;

or R^4 and R^5 together, or R^5 and R^6 together, or R^4 and R^7 together, form the —CH=CH—CH=CH— group and the other two of R^4, R^5, R^6 and R^7 have the meanings stated above.

2. A method of the treatment of acute or chronic heart failure in a warm blooded animal in need of such treatment, which comprises administering to said animal an effective amount of heterocyclic compound of the formula:



wherein X is $—CR^1R^2$ and Y is —O—, wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms;

wherein either R^4 is hydrogen, fluoro or chloro, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, and R^5, R^6 and R^7, which may be the same or different, each is hydrogen, fluoro, chloro, bromo or iodo, or alkyl, alkenyl, halogenoalkyl, aminoalkyl, hydroxyalkyl, alkoxyalkyl or alkoxy each of up to 6 carbon atoms, provided that R^4, R^5, R^6 and R^7 are not all hydrogen;

or R^4 is bromo and R^5, R^6 and R^7 have the meanings stated above, provided that R^5, R^6 and R^7 are not all hydrogen;

or R^4 and R^5 together, or R^5 and R^6 together, or R^4 and R^7 together, form the —CH=CH—CH=CH— group and the other two of R^4, R^5, R^6 and R^7 have the meanings stated above.

4,694,006

ACYL- OR ACYLOXYMETHYL-ALLOPURINOL PRODRUGS

Hans Bundgaard, Horsholm, and Erik Falch, Vedbaek, both of Denmark, assignors to A/S GEA, Copenhagen, Denmark

PCT No. PCT/DK84/00057, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00368, PCT Pub. Date Jan. 31, 1985

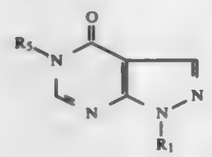
PCT Filed Jun. 19, 1984, Ser. No. 711,583

Claims priority, application Denmark, Jun. 30, 1983, 3028/83

Int. Cl.⁴ A61K *31/505*; C07D *487/04*

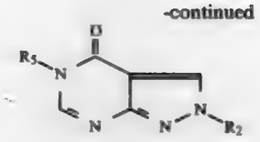
U.S. Cl. 514—258 **17 Claims**

13. A pharmaceutical composition for rectal, parenteral, or oral use in the prevention and treatment of hyperuricemic states such as gout comprising a pharmaceutically acceptable carrier or excipient in combination with a compound of the formula I'a or Ib



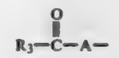
I'a

-continued



Ib

wherein R_1 is a group of the formula II



II

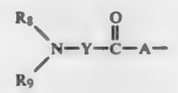
wherein R_3 is C_{1-8} alkyl; C_{1-4} alkyl monosubstituted with chloro or bromo; phenyl; phenyl substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy, or phenoxy; phenyl C_{1-4} alkyl in which the phenyl group may be substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy or phenoxy; or phenyl C_{1-4} alkenyl in which the phenyl group may be substituted with 1–3 substituents selected from chloro, bromo, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, acetoxy, or phenoxy; or R_3 is an aromatic 5- or 6-membered heterocyclic ring selected from pyridinyl, thienyl, thiazolyl, oxazolyl, imidazolyl, isoxazolyl, isothiazolyl, furanyl and pyrimidinyl; and A is a single bond or a group of the formula IIa



IIa

wherein the carbon atom is attached to the nitrogen atom of the parent ring system, and wherein R_6 and R_7 are the same or different and each represent hydrogen or have the same meaning as R_3 as defined above;

or R_1 is a group of the formula III



III

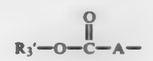
wherein R_8 and R_9 are the same or different and each represent hydrogen or have the same meaning as R_3 as defined above; or R_8 and R_9 together with the adjacent nitrogen form a 5- or 6-membered heterocyclic ring selected from piperidinyl, imidazolyl, pyrazolyl and piperazinyl; Y is a group of the formula IIIa



IIIa

wherein n is an integer from 1 to 5; and A, R_6, and R_7 are as defined above;

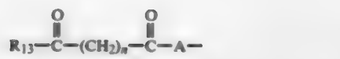
or R_1 is a group of the formula IV



IV

wherein A is as defined above and R'_3 has the same meaning as R_3 defined above;

or R_1 is a group of the formula VII



VII

wherein n and A are as defined above, and R_{13} is hydroxy or a group of the formula $—NR_8R_9$ wherein R_8 and R_9 are as defined above;
R_2 is any of the groups II, III, IV, and VII as defined above with the proviso that A solely is the group IIa as defined above; and R_5 is hydrogen or has the same meaning as R_2 as defined above; or a pharmaceutically acceptable salt thereof.

4,694,007

USE OF TRIMETREXATE AS ANTIPARASITIC AGENT

Carmen Allegra, Vienna, Va.; James C. Drake, Ijamsville, Md.; Bruce A. Chabner, Potomac, Md.; Henry Masur, and Joseph A. Kovacs, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed May 20, 1986, Ser. No. 865,055
Int. Cl.[4] A61K *31/505*
U.S. Cl. 514—260 **5 Claims**

1. A method for treating infections of Toxoplasmosis or *P. carinii* comprising administering to a mammelian host in need of said treatment an amount of trimetrexate effective to treat said Toxoplasmosis or *P. carinii.*

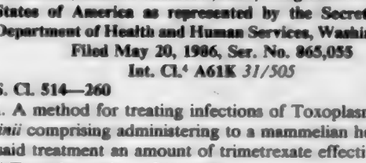
4,694,008

CHEMICAL COMPOUNDS

Thomas H. Brown, Tewin, and Graham J. Durant, Welwyn, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Aug. 15, 1985, Ser. No. 765,766
Claims priority, application United Kingdom, Aug. 23, 1984, 8421427
Int. Cl.[4] A61K *31/505*; C07D *239/24*
U.S. Cl. 514—269 **10 Claims**

1. A compound of the formula (I):



or a pharmaceutically acceptable salt thereof, wherein:
R^o is 2-guanidinothiazol-4-yl or a group $R^1R^2N(CH_2)_n—z—$ wherein:
R^1 and R^2 are independently hydrogen, C_{1-6}alkyl, phenyl(C_{1-6})alkyl, furanyl(C_{1-6})alkyl, thienyl(C_{1-6})alkyl, C_{3-10}cycloalkyl, hydroxy(C_{2-6})alkyl, or halo (C_{2-6})alkyl (wherein said hydroxy and halo groups are not substituted on the carbon atom adjacent to the nitrogen atom); or
R^1 and R^2 together represent—$(CH_2)_r$—wherein r is 4 to 7, to form together with the nitrogen atom to which they are attached a 5–8 membered saturated ring;
n is an integer from 1 to 6;
z is 2,5-thienyl, 2,4-pyridyl wherein the $R^1R^2N(CH_2)_n$ group is in the 4-position, 2,4-thiazolyl wherein the $R^1R^2N(CH^2)$n group is in the 2-position, or 1,3- or 1,4-phenylene;
m is one; or if Z is pyridyl or phenylene m may also be zero;
Y is oxygen, sulphur or methylene; or if Z is furanyl, thienyl or thiazolyl Y may also be a bond;
p is two, three or four;
R^3 is hydrogen or C_{1-6}alkyl; and
R^4 is hydrogen of C_{1-6}alkyl.

10. A method of blocking histamine H_2-receptors which comprises administering to an animal an effective amount to block said receptors of a compound of claim 1.

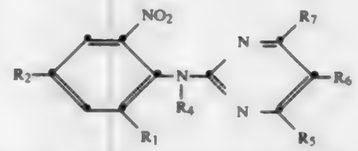
4,694,009

PESTICIDAL COMPOSITIONS

Adolf Hubele, Magden; Helmut Zondler, Bottmingen; Peter Riebli, Buckten, all of Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 19, 1985, Ser. No. 746,432
Claims priority, application Switzerland, Jun. 25, 1984, 3055/84
Int. Cl.[4] C07D *239/42, 239/47*; A61K *31/505*
U.S. Cl. 514—269 **3 Claims**

1. A compound of the formula



wherein R_1 is CF_3; R_2 is NO_2; R_4 is H; R_5 is Cl; R_6 is H, Cl or Br; and R_7 is Cl, $OCHF_2$, OCH_3, OCH_2CF_3, $OCH_2CH=CH_2$ or $OCH_2C\equiv CH$.

4,694,010

ANTICONVULSANT COMPOSITIONS AND METHOD

Jose M. Musacchio, New York, N.Y., and Frank C. Tortella, Columbia, Md., assignors to New York University, New York, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,838
Int. Cl.[4] A61K *31/44, 31/415*
U.S. Cl. 514—304 **26 Claims**

1. A method for controlling seizures in a mammal in need of such treatment comprising administering to said mammal an amount of:
(a) an antiepileptic hydantoin; and
(b) an antiepileptic hydantoin-potentiating amount of a compound selected from the group consisting of dextromethorphan, caramiphen and carbetapentane; said amounts in combination being effective for controlling seizures in said mammal.

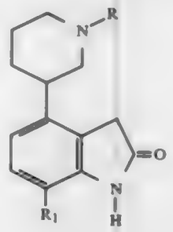
4,694,011

NOVEL 7-HYDROXY-INDOLES

Lucien Nedelec, Le Raincy; Gilles Hamon, Montrouge; Patrick Fauveau, Livry Gargan, and Claude Oberlander, Paris, all of France, assignors to Roussel Uclaf, Paris, France

Filed Mar. 10, 1986, Ser. No. 838,242
Claims priority, application France, Mar. 12, 1985, 85 03585
Int. Cl.[4] C07D *209/34*; A61K *31/40*
U.S. Cl. 514—323 **15 Claims**

1. A compound selected from the group consisting of 7-hydroxy-indoles of the formula



I

wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkylalkyl of 4 to 7 carbon atoms and aralkyl of 7 to 12 carbon atoms optionally substituted by one or more members of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, halogen and alkenyl and alkynyl of 3 to 5 carbon atoms with the multiple bond being other than between the carbons α- and β- to the nitrogen atom, R_1 is selected from the group consisting of —OH, alkoxy of 1 to 5 carbon atoms, phenoxy and phenylalkoxy of 7 to 9 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

6. A composition having peripheral cardiovascular activity comprising an amount of at least one compound of claim 1 sufficient to impart peripheral cardiovascular activity and an inert pharmaceutical carrier.

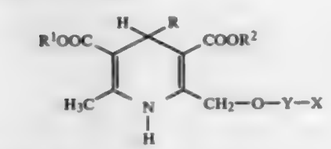
4,694,012

METHOD OF TREATING OF PREVENTING DISEASES USING 1,4-DIHYDROPYRIDINES

John L. Archibald, Faraham Royal; Terence J. Ward, and Albert Opalko, both of Maidenhead, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Jul. 30, 1985, Ser. No. 760,705
Claims priority, application United Kingdom, Aug. 17, 1984, 8421039
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—332 **11 Claims**

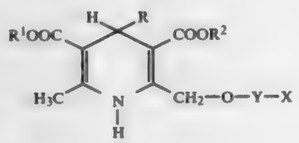
1. A method for treating or preventing diseases responsive to inhibition of blood platelet aggregation or thromboxane synthetase in a mammal in need thereof which comprises administering to said mammal an amount effective to inhibit blood platelet aggregation or thromboxane synthetase of a compound of formula I



(I)

wherein
R is phenyl or optionally substituted phenyl;
R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;
Y is $—(CH_2)_n—$, $—CH_2CH(CH_3)—$or $—CH_2C(CH_3)_2—$;
X is a 5 or 6 membered nitrogen containing aromatic heterocyclic ring optionally substituted by one or more C_1–C_4 alkyl, phenyl, benzyl, CN, $—N(R^3)_2$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2(C_1$–C_4 alkyl) or $(CH_2)_mCON(R^3)_2$ groups wherein each R^3 is independently H or C_1–C_4 alkyl and m is 0 or 1;
and
n is 1 to 3 when X is linked by a ring carbon atom or 2 or 3 when X is linked by a ring nitrogen atom; and their pharmaceutically acceptable acid addition salts.

8. A method for treating or preventing inflammatory or allergic conditions reponsive to inhibition of phosphilipase A_2 in a mammal in need thereof, which comprises adminstering to said mammal an amount effective to inhibit phosphilipase A_2 of a compound of formula Ia



(Ia)

wherein
R is 2-nitrophenyl;
R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;
Y is $—(CH_2)_n—$, $—CH_2CH(CH_3)—$or $—CH_2C(CH_3)_2—$;
X is a 5 or 6 membered nitrogen containing aromatic heterocyclic ring optionally substituted by one or more C_1–C_4 alkyl, phenyl, benzyl, CN, $—N(R^3)_2$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2H$, $(CH_2)_mCO_2(C_1$–C_4 alkyl) or $(CH_2)_mCON(R^3)_2$ groups wherein each R^3 is independently H or C_1–C_4 alkyl and m is 0 or 1;
and
n is 1 to 3 when X is linked by a ring carbon atom or 2 or 3 when X is linked by a ring nitrogen atom; or a pharmaceutically acceptable acid addition salts thereof.

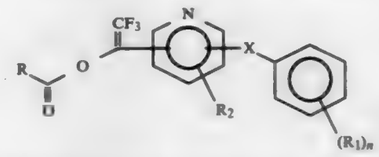
4,694,013

INSECTICIDAL AND ACARICIDAL PHENOXYPYRDINYL ESTERS AND INTERMEDIATES

George P. Lahm, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

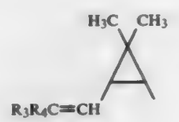
Continuation-in-part of Ser. No. 796,152, Nov. 8, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 910,942
Int. Cl.[4] A61K *31/44*; C07D *213/61, 213/62*
U.S. Cl. 514—345 **53 Claims**

1. A phenoxypyridinyl compound of the formula

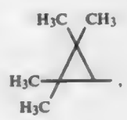


I

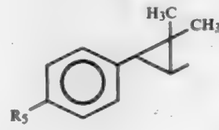
including all geometric and stereoisomers or mixtures thereof characterized by a 1,3-relationship between the ester and the ether substituents on the pyridine ring, wherein:
R is



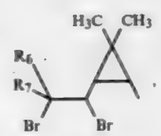
R-A



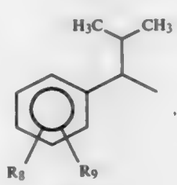
R-B



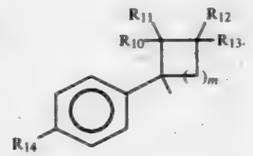
R-C



R-D



R-E



R-F

X is O or S;
n is 1 to 3;
m is 0 or 1;

R_1 is H, C_1 to C_4 alkyl, C_2 to C_5 alkenyl, C_2 to C_5 alkynyl, C_1 to C_4 haloalkyl, C_1 to C_4 alkoxy, C_1 to C_4 haloalkoxy, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, C_1 to C_4 haloalkylthio, C_1 to C_4 haloalkylsulfonyl, F, Cl, Br; when n=2, the R_1 substituents, taken together, can be 3,4-methylenedioxy;
R_2 is H, F, Cl, Br, CH_3, or CF_3;
R_3 is F, Cl, Br, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, CO_2CH_3, or $CO_2CH_2CH_3$;
R_4 is F, Cl, Br, or CH_3;
R_5 is H, F, Cl, CF_3, or C_1 to C_4 alkyl;
R_6 is Cl or Br;
R_7 is Cl or Br;
R_8 is H, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, C_1 to C_4 alkoxy, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, C_1 to C_4 haloalkylthio, C_1 to C_4 haloalkylsulfinyl, C_1 to C_4 haloalkylsulfonyl, F, Cl or Br;
R_9 is H, F, Cl, CH_3, OCH_3, or R_8 and R_9, taken together, can be 3,4-methylenedioxy;
R_{10}, R_{11}, R_{12} and R_{13} are independently H, F, or Cl; and
R_{14} is H, F, Cl, OCH_3, OCH_2CH_3, or C_1 to C_2 haloalkoxy.

40. A method for controlling acarides or insects that comprises applying to the pest or to the environment of the acaride or insect an insecticidally and acaricidally effective amount of a compound according to claim 1.

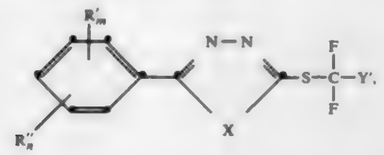
4,694,014

NEMATICIDAL COMPOSITIONS

Beriger Ernst, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 26, 1986, Ser. No. 912,904
Claims priority, application Switzerland, Sep. 30, 1985, 4214/85
Int. Cl.⁴ C07D *271/10, 285/10;* A01N *43/82*
U.S. Cl. 514—363 **16 Claims**

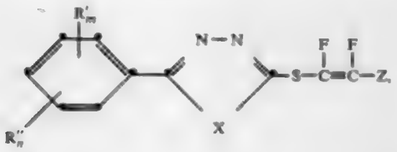
1. A compound of formula Ia



(Ia)

wherein
R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,
R″ is C_1–C_5alkyl or halogen,
m is 1 to 3 and n is 0 or 1,
X is oxygen or sulfur and
Y′ is hydrogen or the group CHF_2, or an acid addition salt thereof.

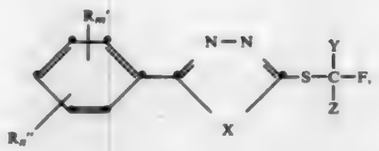
2. A compound of formula Ib



(Ib)

wherein
R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,
R″ is C_1–C_5alkyl or halogen,
m is 1 to 3 and n is 0 or 1,
X is oxygen or sulfur and
Z is fluorine or trifluoromethyl, or an acid addition salt thereof.

3. A compound of formula I•



(I•)

wherein
R′ is C_1–C_5alkyl, C_1–C_5alkoxy, halogen or trifluoromethyl,
R″ is C_1–C_5alkyl or halogen,
m is 1 to 3 and n is 0 or 1,
X is oxygen or sulfur or
Y is hydrogen, fluorine, trifluoromethyl or the group HC(F)Z and
Z is fluorine or trifluoromethyl, or an acid addition salt thereof.

4,694,015

PHARMACEUTICAL OR VETERINARY COMPOSITIONS CONTAINING THIOSULFONATE DERIVATIVES

Bernard Sebille, Clamart; Yves Beuzard, Paris, and Henri Demarne, Montpellier, all of France, assignors to Sanofi and Institut National de la Sante et de la Recherche Medicale (Inserm), both of Paris, France

Filed Nov. 13, 1985, Ser. No. 797,486
Claims priority, application France, Nov. 13, 1984, 84 17286
Int. Cl.⁴ A61K *31/42, 31/415*
U.S. Cl. 514—375 **16 Claims**

1. A pharmaceutical or veterinary composition for treating drepanocytosis, malaria or babebiosis, which comprises an effective amount for inhibiting the malformation or destruction of red blood corpuscles due to genetic modification of the haemoglobin or to parasites of a thiosulfonate derivative having a formula:

$$R—S—SO_2—R_1$$

in which R represents a 1-methyl-imidazol-2-yl, 1H-benzimidazol-2-yl or benzoxazol-2-yl radical and R_1 represents a lower alkyl, (hydroxy)lower alkyl, lower alkanoyl, phenyl, (lower alkyl)phenyl, (hydroxy lower alkyl)phenyl, (lower alkanoyl)phenyl or quinolin-8-yl radical, in association with a pharmaceutical carrier or excipient therefor, and wherein said composition is in the form of a coated or uncoated tablet, a hard- or soft-gelatin capsule, a suspension or a syrup for oral administration, a suppository for rectal administration, a sterile solution or suspension for parenteral administration.

4,694,016

PHTHALAMIDE DERIVATIVES WITH ANTHELMINTIC ACTIVITY

Jing-Jong Lu, and Herbert L. Wehrmeister, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 18, 1985, Ser. No. 788,935
Int. Cl.⁴ A61K *31/42;* C07D *261/04*
U.S. Cl. 514—380 **4 Claims**

1. An anthelmintic compound selected from the group consisting of N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(m-methylbenzyl)phthalamide, N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(p-tolylethyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(3-phenyl-1-propyl)phthalamide.

2. A method for prophylactically or therapeutically treating mammals and fowl to combat parasitic worm infestations which comprises orally administering to said mammals and fowl an effective amount of a compound selected from the group consisting of N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(m-methylbenzyl)phthalamide, N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(p-tolylethyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(3-phenyl-1-propyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(p-tolylethyl)phthalamide, and N-(3-chloro-4,5-dihydro-isoxazol-4-yl)-N′-(3-phenyl-1-propyl)phthalamide.

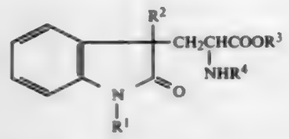
4,694,017

2-AMIDO 3(OXINDOL-3-YL)PROPIONIC ACIDS HAVING ANTIULCER ACTIVITY

Minoru Uchida, Komatsushima; Makoto Komatsu, and Kazuyuki Nakagawa, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,574
Claims priority, application Japan, May 19, 1983, 58-88948; Jan. 18, 1984, 59-7606
Int. Cl.⁴ A61K *31/405;* C07D *209/34*
U.S. Cl. 514—418 **24 Claims**

1. Oxindole compounds and pharmaceutically acceptable salts thereof represented by the formula:



wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; R^2 is a hydrogen atom or a lower alkyl group; R^3 is a hydrogen atom or a lower alkyl group; R^4 is a cycloalkylcarbonyl group, a benzoyl group which may have 1 to 3 substituents selected from the group consisting of a halogen atom, a lower alkyl group and a lower alkoxy group on the phenyl ring, or a phenyllower alkanoyl group which may have halogen atoms as the substituents on the phenyl ring.

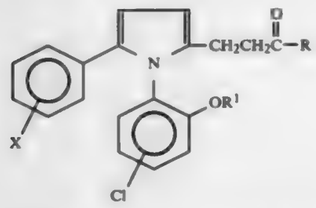
4,694,018

SUBSTITUTED 1,5-DIPHENYL-2-PYRROLEPROPIONIC ACIDS AND DERIVATIVES

Leland J. Chinn, Glenview, Ill., assignor to G. D. Serale & Co., Chicago, Ill.

Filed Nov. 29, 1985, Ser. No. 802,885
Int. Cl.⁴ C07D *207/337;* A61K *31/40*
U.S. Cl. 514—427 **12 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable base salts thereof wherein
R represents hydroxy, alkoxy of from 1 to 6 carbon atoms, inclusive, or amino:
R^1 represents hydrogen or acyl of from 2 to 7 carbon atoms, inclusive; and
X represents hydrogen, halogen, hydroxy, or alkoxy of from 1 to 6 carbon atoms, inclusive.

9. A method of eliciting an anti-inflmmatory or anti-allergic effect in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

10. A method of treating asthma in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

11. A method of treating psoriasis in a mammal in need thereof comprising administering thereto a therapeutically effective amount of a compound according to claim 1.

4,694,019

THERAPEUTICA COMPOSITIONS CONTAINING DERIVATIVES OF, ACRYLIC ACID HAVING AN OXYGEN-CONTAINING HETEROCYCLE, THERAPEUTIC TREATMENT THEREWITH AND NEW COMPOUNDS

Mario Bianchi, deceased, late of Carate Brianza (by Elsa de Carli, Silvana Bianchi and Giovanni Bianchi, Legal Representatives), and Fernando Barzaghi, Monza, all of Italy, assignors to Roussel UCLAF, Paris, France

Continuation-in-part of Ser. No. 572,458, Jan. 20, 1984, abandoned. This application Aug. 14, 1985, Ser. No. 765,539
Claims priority, application Italy, Jan. 24, 1983, 19249 A/83; Aug. 25, 1983, 22647 A/83
Int. Cl.⁴ A61K *31/44*
U.S. Cl. 514—461 **5 Claims**

1. A method for the treatment of a patient suffering from hyperchlorhydria, gastric and gastroduodenal ulcers, gastritis, hiatus hernia and gastric and gastroduedenal ailments accompanied by gastric hyperacidity, comprising administering to said patient a gastric antisecretory and cytoprotective effective amount of a compound of the formula

(I)

in which
R is a furyl radical, possibly substituted, R′ is a hydrogen atom or a linear, branched or cyclic alkyl radical, saturated or unsaturated, containing up to 18 carbon atoms, and,
either A represents a hydrogen atom and B represents a hydroxyl radical or A and B together form a carbon-carbon double bond,
or a pharmaceutically acceptable alkaline, alkaline-earth or amine salt thereof.

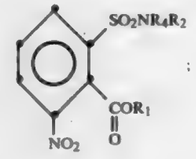
4,694,020

DERIVATIVES OF 2-(SUBSTITUTED SULFAMYL)-6-NITROBENZOIC ACIDS AND PHARMACEUTICAL COMPOSITIONS

Edward L. Engelhardt, Gwynedd Valley, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 795,569, Nov. 6, 1985, Pat. No. 4,647,588, and a continuation-in-part of Ser. No. 795,564, Nov. 6, 1985, Pat. No. 4,654,369, which is a continuation-in-part of Ser. No. 716,886, Mar. 27, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,718
Claims priority, application European Pat. Off., Mar. 20, 1986, 86103792.7; Japan, Mar. 27, 1986, 61-67425
Int. Cl.⁴ A61K *31/24;* C07C *143/78*
U.S. Cl. 514—535 **5 Claims**

1. A 2-substituted sulfamyl derivative of 6-nitrobenzamide, or physiologically acceptable salts thereof, of the formula



wherein
R_1 is lower alkyl, or lower alkyl substituted with hydroxyl;

R_2 is lower alkyl substituted with



R_3 is hydrogen, lower alkyl, or lower alkyl substituted with hydroxyl; and

R_4 is H or hydroxy lower alkyl.

5. A pharmaceutical composition for enhancing the therapeutic effect of radiation which consists of an effective amount of a compound defined in claim 1 or 2 or 3 or 4, or mixtures thereof, and a non-toxic pharmaceutically acceptable carrier.

4,694,021

METHOD FOR TOPICAL TREATMENT OF SCAR TISSUE

Raymond H. Schweiger, 363 S. Bonsal St., Baltimore, Md. 21224

Filed May 5, 1986, Ser. No. 859,816
Int. Cl.[4] A61K *31/235*
U.S. Cl. 514—544 13 Claims

1. A method for treating scar tissue, comprising the step of topically applying, to a body region where cutaneous or subcutaneous scarring or calcified bone overgrowth has occurred, a therapeutically effective amount of a first composition comprising an argillaceous absorbent, at least one ester of p-hydroxybenzoic acid, urea, and a sulfosuccinate compound.

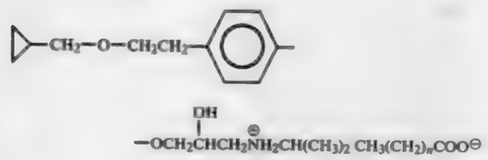
4,694,022

FATTY ACID SALTS OF BETAXOLOL USEFUL IN THE TREATMENT OF GLAUCOMA

Steven H. Gerson, and Wesley W. Han, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

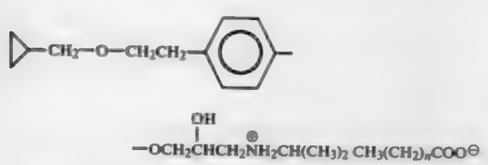
Filed Dec. 24, 1986, Ser. No. 946,345
Int. Cl.[4] C11C *3/00*; A61K *31/045, 31/085*
U.S. Cl. 514—554 6 Claims

1. A compound of formula:



herein n is a whole number of 10 or greater.

6. A topical, ophthalmic composition comprising a compound of formula:



wherein n is a whole number of 10 or greater, in an amount effective to treat glaucoma by reducing intraocular pressure; and an aqueous, pharmaceutically acceptable, ophthalmic vehicle therefor.

4,694,023

ALPHA-ALKYL POLYOLEFINIC CARBOXYLIC ACIDS AND DERIVATIVES THEREOF USEFUL IN THE TREATMENT OF PSORIASIS AND ALLERGIC RESPONSES

Bernard Loev, Scarsdale; Wan-kit Chan, Yorktown Heights, both of N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corporation, Fort Washington, Pa.

Continuation-in-part of Ser. No. 511,822, Jul. 8, 1983, Pat. No. 4,505,930, which is a continuation-in-part of Ser. No. 392,837, Jun. 28, 1982, Pat. No. 4,472,430. This application Mar. 11, 1985, Ser. No. 710,768
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/20*; C07C *57/03*
U.S. Cl. 514—559 3 Claims

1. 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

2. A therapeutic composition for the treatment of psoriasis in a human host which comprises, in combination with at least one pharmaceutically acceptable extender, an effective amount for the treatment of psoriasis of the compound 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

3. A method for treating psoriasis in a human host which comprises administering to said host a therapeutically effective amount for the treatment of psoriasis of the compound 2,5,9-trimethyl-11-(2,6,6-trimethyl-1-cyclohexen-1-yl)-2,4,6,8,10-undecapentaenoic acid.

4,694,024

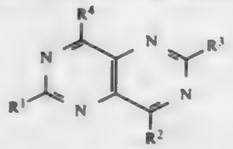
COMBINATION PRODUCT COMPOSED OF PYRIMIDO-PYRIMIDINES AND O-ACETYLSALICYLIC ACID OR ITS PHARMACOLOGICALLY TOLERATED SALTS, AND ITS USE

Klaus U. Weithmann, Hofheim am Taunus, and Dirk Seiffge, Münzenberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

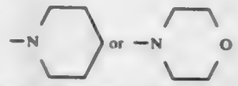
Filed Jul. 19, 1985, Ser. No. 756,674
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426961; May 3, 1985, 3515874
Int. Cl.[4] A61K *31/62*
U.S. Cl. 514—161 18 Claims

1. A pharmaceutical combination composition containing as essential ingredients:

(a) a pyrimido-pyrimidine of the Formula I



wherein at least one of the groups R^1 and R^3 represents the group $-N(CH_3-CHR^5OH)_2$ in which R^5 is hydrogen or methyl and at least one of the groups R^2 and R^4 is the group



or an effective metabolite or salt or combination thereof and

(b) O-acetylsalicylic acid or a pharmaceutically tolerable salt thereof, the weight ratio between component (a) and component (b) being higher than 0.5 and at most 30,

(c) together with or without a pharmaceutical carrier, for the consecutive application in the therapy of diseases which are caused or characterized by impaired blood functions or blood ingredients, such that component (a) is at first released.

4,694,025

ALCOHOL CONTROL OF LIGHTLY CROSSLINKED FOAMED POLYMER PRODUCTION

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 16, 1984, Ser. No. 672,010
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—88 13 Claims

1. A process for preparing lightly crosslinked olefin or styrene polymer foamed articles having a closed-cell structure, comprising the steps of:

(a) providing an olefin or styrene polymer material,

(b) admixing said olefinic or styrenic polymer material with (1) a blowing agent, (2) a crosslinking agent selected from the group consisting of silane, azido silane, titanate and amino compounds which upon reaction with said olefin or styrene polymer material reversibly releases alcohol, and (3) additionally admixing a sufficient amount of alcohol to control the degree of crosslinking of said olefin or styrene polymer material in the admixture which is thereby formed, and

(c) extruding said admixture and activating said blowing agent in such a manner to expand said olefin or styrene polymer material to a cellular structure and at the same time dissipate said alcohol, whereby foaming and crosslinking of said olefin or styrene polymer material concurrently takes place.

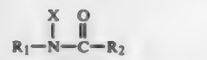
4,694,026

POLYOLEFIN FOAM COMPOSITIONS HAVING IMPROVED DIMENSIONAL STABILITY UTILIZING CERTAIN UNSATURATED NITROGEN-CONTAINING COMPOUNDS AND PROCESS FOR MAKING SAME

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 24, 1985, Ser. No. 737,598
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—94 21 Claims

1. A process for dimensionally stabilizing low density foamed polyolefins comprising expanding an olefin polymer under foaming conditions in the presence of a stabilizing amount of a nitrogen-containing compound selected from the group consisting of the compounds of formulas (I) and (II):



I

wherein: R_1 is (a) an alkyl group having 9 to 23 carbon atoms, (b) a hydrocarbon residue of a saturated fatty acid having 9 to 23 carbon atoms, (c) a saturated acyl group having 10 to 24 carbon atoms, (d) a saturated substituent organic group containing a subgroup of the formula $-(R_3O)_m-$ wherein R_3 is an alkylene group having 1 to 5 carbon atoms and m is an integer from 1 to 10, (e) an unsaturated organic group having 9 to 23 carbon atoms, (f) a hydrocarbon residue of an unsaturated fatty acid having from 9 to 23 carbon atoms, (g) an unsaturated acyl group having 10 to 24 carbon atoms, or (h) an unsaturated substituent organic group containing a subgroup of the formula $-(R_4O)_m-$ wherein R_4 is an alkylene group having 1 to 5 carbon atoms and m is an integer from 1 to 10, R_2 is a, b, c or d when R_1 is e, f, g or h and R_2 is e, f, g or h when R_1 is a, b, c, or d; and X is a hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an unsaturated organic group having from 2 to 23 carbon atoms, b, c, d, f, g, or h;



II

wherein R_5 is a, b, c or d, R_6 is e, f, g or h, and Y is an hydrogen atom, an alkyl group having from 1 to 24 carbon atoms, an unsaturated organic group having from 2 to 23 carbon atoms, b, d, f or h.

4,694,027

EXPANDABLE POLYOLEFIN COMPOSITIONS AND PREPARATION PROCESS UTILIZING ISOBUTANE BLOWING AGENT

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 24, 1985, Ser. No. 813,315
Int. Cl.[4] C08J *9/14*
U.S. Cl. 521—94 4 Claims

1. A process for preparing a substantially closed cell olefin polymer foam having dimensional stability comprising the steps of:

(a) heat plastifying an olefin polymer resin selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and a copolymerizable monomer,

(b) admixing said heat plastified resin with (1) a stability control agent selected from the group consisting of partial esters of long chain fatty acids with polyols, higher alkyl amines, fatty acid amides, olefinically unsaturated carboxylic acid copolymers, and polystyrene and (2) a blowing agent selected from the group consisting of (i) isobutane, (ii) a mixture of from 5%–95% isobutane on a molar basis with from 95%–5% of a physical blowing agent selected from the group consisting of chlorofluorocarbons and fluorocarbons having from 1 to 4 carbon atoms, boiling points between −50° and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent or less than about 1.2 times the permeation rate of air, and (iii) a mixture of at least 70% isobutane with a physical blowing agent selected from the group consisting of hydrocarbons, chlorocarbons, and chlorofluorocarbons having from 1 to 5 carbon atoms, boiling points between −50° C. and 50° C., and a permeation rate through said olefin polymer resin modified with said stability control agent of greater than about 1.2 times the permeation rate of air, and

(c) activating said blowing agent to expand said admixture to a substantially closed-cell olefin polymer foam.

4,694,028

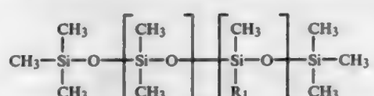
MANUFACTURING METHOD FOR PHENOL RESIN FOAM

Yukio Saeki; Naomitsu Inoue, and Yukio Tokunaga, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1986, Ser. No. 859,670
Int. Cl.[4] C08V *9/14*
U.S. Cl. 521—110 10 Claims

1. A method for the manufacturing of phenol resin foam comprising foaming and curing a resole phenolic resin having a number average molecular weight of 150–400, surface active agents, blowing agents, and curing agents, wherein surface active agents are selected from each of the general formulas A and B and may be one or more types of each represented by

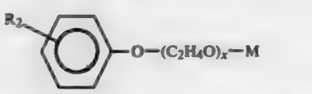
(A)



where R_1 is a saturated aliphatic hydrocarbon group of 8–14 carbon atoms and/or a 2-phenylpropyl group, m and n are integers meeting the requirement:

$$\frac{n}{n+m} = 0.2 - 0.9,$$

(B)



where R_2 is a saturated aliphatic hydrocarbon group of 4–12 carbon atoms, M is a hydrogen atom or $-SO_2Na$, X is an

integer of 4–110, and the amount of surface active agent A used is 0.1–10 parts by weight, and surface active agent B used is 0.1–10 parts by weight based on the weight of the resole phenolic resin.

4,694,029

HYBRID PHOTOCURE SYSTEM

John M. Land, Kansas City, Mo., assignor to Cook Paint and Varnish Company, Kansas City, Mo.

Filed Apr. 9, 1985, Ser. No. 721,395

Int. Cl.[4] C08F *2/50*; **C08G** *59/62, 59/68, 59/72*

U.S. Cl. 522—8 **9 Claims**

1. A photopolymerizable composition comprising

(a) a polymerizable epoxy-containing material,

(b) a polymerizable monomer or monomers selected from the group consisting of ethyienglycol diacrylate, hexane-1,6-diol diacrylate, propoxylated bisphenol A diacrylate, propoxylated bisphenol A dimethacrylate, trimethylol-propane diacrylate, pentaerythritol triacrylate, pentaerythritol trimethacrylate, trimethylolpropane triacrylate, trimethylolpropane trimethacrylate, hexane-1,6-diol dimethacrylate, 1,3-butylene glycol dimethacrylate, diethylene glycol diacrylate, neopentyl glycol diacrylate, pentaerythritol tetraacrylate and polyethylene glycol diacrylate,

(c) an effective amount of, as a cationic photoinitiator, an aromatic sulfonium compound or an aryliodonium salt,

(d) an effective amount of a carbonyl type photoinitiator which is capable of photodecomposing to free radicals in the presence of UV light and

(e) tetrahydrofurfuryl alcohol as an accelerator,

wherein the number of epoxy equivalents ranges from 14 to 1.2 per accelerator equivalent.

4,694,030

INTUMESCENT POLYSILOXANE MOLDING COMPOSITIONS

Wulf von Bonin, Leverkusen; Hans Sattlegger, Odenthal, and Harold Ebneth, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,999

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602888

Int. Cl.[4] C09K *21/14*

U.S. Cl. 523—179 **6 Claims**

1. An intumescent polysiloxane molding composition, comprising a polysiloxane molding composition and an expandable graphite compound.

4,694,031

SURFACE TREATED-GLASS FIBER-REINFORCED POLYPROPYLENE COMPOSITION

Hideyo Morita; Tomohiko Akagawa, and Yasuo Kita, all of Sakai, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Feb. 18, 1986, Ser. No. 830,655

Claims priority, application Japan, Feb. 19, 1985, 60-029356

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.[4] C08K *9/06*

U.S. Cl. 523—203 **8 Claims**

1. A glass fiber-reinforced polypropylene composition, which comprises, based on the total weight of the composition:

(A) 99 to 40% by weight of a modified ethylene/propylene block copolymer having an itaconic anhydride content of at least 0.5% by weight, which is obtained by graft-modifying at least a part of a crystalline ethylene/propylene block copolymer, in which the ethylene content is 3 to 15% by weight, the melt flow rate is 0.1 to 70 g/10 min., the intrinsic viscosity of the portion soluble in p-xylene at normal temperature is 2.5 to 6 as measured in decalin at 135°C. and the ethylene content of the portion insoluble in p-xylene at normal temperature is 1.5 to 10% by weight, with itaconic anhydride and an organic peroxide in an extruder,

(B) 0 to 20% by weight of a polyolefin rubber, and

(C) 1 to 45% by weight of a surface-treated glass fiber.

4,694,032

PROCESS FOR PREPARING THERMOPLASTIC RESIN COMPOSITION

Osamu Kakimoto, Himeji, and Fumiya Nagoshi, Kobe, both of Japan, assignors to Kanegagnchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1985, Ser. No. 795,778

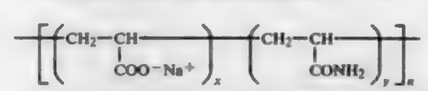
Claims priority, application Japan, Nov. 8, 1984, 59-235627

Int. Cl.[4] C08K *5/19, 5/20*

U.S. Cl. 523—334 **7 Claims**

1. A process for preparing a thermoplastic resin composition capable of giving delustered articles which comprises blending (A) 10 to 30 parts by weight of a graft-copolymer and (B) 90 to 70 parts by weight of a polymer, the total amount of the components (A) and (B) being 100 parts by weight;

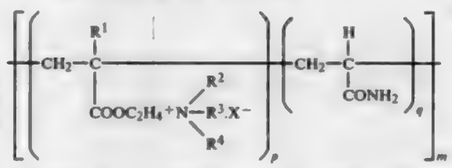
said graft-copolymer (A) being prepared by adding at least one polymer coagulant selected from the group consisting of a coagulant having the formula (I):



(I)

wherein x is 0 to 5% by mole, y is 100 to 95% by mole and n is an integer which gives a molecular weight of 1,000 to 13,000,000,

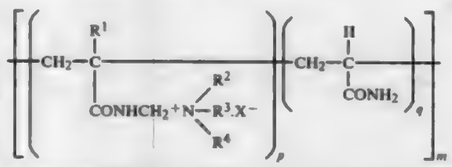
a coagulant having the formula (II):



(II)

wherein R^1 is hydrogen atom or methyl group, R^2 is hydrogen atom or a lower alkyl group having 1 or 2 carbon atoms, R^3 and R^4 are same or different and each is a lower alkyl group having 1 or 2 carbon atoms, X is a counter anion, p is 2 to 100% by mole, q is 98 to 0% by mole and m is an integer which gives a molecular weight of 200 to 6,000,000, and

a coagulant having the formula (III):



(III)

wherein R^1, R^2, R^3, R^4, X, p, q and m are as defined above, to (1) 70 to 95 parts by weight (solid content) of a latex of a diene rubber having a diene content of more than 50% by weight to give a coagulated diene rubber, and then graft-polymerizing (2) 30 to 5 parts by weight of at least one monomer selected from the group consisting of a vinyl aromatic monomer, a vinyl cyanide monomer and a methacrylic acid ester onto the coagulated diene rubber, the total amount of the components (1) and (2) being 100 parts by weight, and the amount of said polymer coagulant being from 0.01 to 0.5 part by weight per 100 parts by weight of the total amount of the components (1) and (2);

said polymer (B) being prepared by polymerizing at least one monomer selected from the group consisting of an aromatic vinyl monomer, a vinyl cyanide monomer, an acrylic acid ester and a methacrylic acid ester.

4,694,033

RESIN COMPOSITION AND PROCESS FOR THE PREPARATION OF THIS RESIN COMPOSITION

Robert van der Linde, Zwolle, Netherlands, assignor to DSM Resins B.V., Zwolle, Netherlands

Continuation-in-part of Ser. No. 762,325, Aug. 5, 1985. This application Feb. 7, 1986, Ser. No. 826,976

Claims priority, application Netherlands, Aug. 9, 1984, 8402455; Dec. 7, 1985, 8503379; Feb. 4, 1986, 8600266

Int. Cl.[4] C08G *63/54, 63/48, 59/00, 63/00*

U.S. Cl. 523—437 **23 Claims**

1. A resin composition comprising a pre-reacted mixture of at least two resins, wherein the first resin consists of the reaction product of an epoxidized fatty acid ester of a polyvalent alcohol with a carboxylic acid and the second resin consists of an aliphatic carboxylic acid-modified ester of an aliphatic polyvalent alcohol, and wherein said first and second resins have been mixed for a sufficient time and at a temperature such that a partial pre-reaction therebetween takes place.

4,694,034

SIZE COMPOSITION

David F. Lewin, Amarillo, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 29, 1986, Ser. No. 868,382

Int. Cl.[4] C08K *3/20*

U.S. Cl. 523—503 **7 Claims**

1. A substantially chrome-free aqueous sizing composition for glass fiber gun roving which comprises (A) a mixture of emulsified film-forming polymers comprising a polymer of vinyl acetate and ethylene, a polymer of vinyl acetate and an epoxy-functional vinyl monomer, and an unsaturated polyester resin; (B) titanium acetyl acetonate; (C) quaternary salt of ammonium ethosulfate; (D) a cationic lubricant; and (E) 3-methacryloxypropyltrimethoxysilane or hydrolysate thereof.

4,694,035

PROCESS FOR PREPARING LARGE-SIZED POLYMER PARTICLES

Kiyoshi Kasai, Yokkaichi; Masayuki Hattori, Aichi; Osamu Kikuchi, Yokkaichi; Hiromi Takeuchi, Yokohama; Haruhiro Hirai, Mie, and Nobuo Sakurai, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1986, Ser. No. 823,013

Claims priority, application Japan, Jan. 30, 1985, 60-14460; Jun. 10, 1985, 60-124266; Aug. 22, 1985, 60-183084

Int. Cl.[4] C08F *2/18*

U.S. Cl. 524—458 **12 Claims**

1. A process for preparing large-sized polymer particles having a particular diameter in the range of 0.1 to 500 μm by seed polymerization, comprising:

(a) preparing a dispersion of finely dispersed polymerizable monomer by dispersing a monomer in an aqueous medium so that the number average particle diameter of the resulting monomer droplets is not larger than 0.8 μm and not larger than the number average particle diameter of seed particles in a dispersion of seed particles and so that the relationship of the number average particle diameter, Dm, of said monomer droplets in a semistable condition in the monomer dispersion and the desired number average particle diameter, D, of the final polymer particles produced upon polymerization of the monomer, satisifies the expression:

$$0.5 \times D < Dm < 3.5 \times D;$$

(b) combining said monomer dispersion with said dispersion of seed particles in order to absorb or adsorb the polymerizable monomer on the seed particles; and

(c) polymerizing the polymerizable monomer in the presence of a polymerization initiator.

4,694,036

METAL DIFFUSION AND USE

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Filed Jun. 23, 1983, Ser. No. 507,174

Int. Cl.[4] C08K *5/02*

U.S. Cl. 524—473 **2 Claims**

1. A solution in which heavy metal particles are readily suspended, the solvent of said solution comprising methyl chloroform or methylene chloride, and in the solvent are dissolved from about 2 to about 8% acrylic resin binder and from about 0.1 to about 1% of an ethylene acrylic acid copolymer dispersing aid having a hydrocarbon chain of from 12 to 50 carbons.

4,694,037

COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Mar. 15, 1985, Ser. No. 712,353

Int. Cl.[4] C08L *29/04*

U.S. Cl. 524—557 **9 Claims**

1. A process for preparing a polymer hydrogel comprising the steps:

a. admixing

(1) 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

(2) 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes,

b. allowing said admixture to react so as to form a poly(vinyl trifluoroacetate) copolymer, and

c. solvolyzing said poly(vinyl trifluoroacetate) copolymer in a mild base in a non-aqueous diluent so as to produce a poly(vinyl alcohol) copolymer, said base in a non-aqueous diluent being selected so that the poly(vinyl trifluoroacetate) copolymer and the copolymeric poly(vinyl alcohol) solvolysis product are insoluble therein, and

d. hydrating said poly(vinyl alcohol) copolymer in water or normal saline to produce said polymer hydrogel.

4,694,038

LOW FRICTION, LOW WEAR COATING AND PAINT FOR RUBBER

Robert A. Burns, Seattle, and Jan W. VanWyk, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 20, 1986, Ser. No. 920,628

Int. Cl.[4] C08K *7/00, 3/04*

U.S. Cl. 524—590 **5 Claims**

1. An enamel consisting essentially of polyurethane enamel paint filled with between about 20–40 wt. % amorphous flake graphite.

4,694,039

STABILIZED LACTAM POLYMERIZATION SOLUTIONS

Edward H. Mottus, Ballwin; Ross M. Hedrick, and Bernard Silverman, both of St. Louis, all of Mo., assignors to DSM Rim Nylon V.O.F., Geleen, Netherlands

Division of Ser. No. 844,405, Mar. 26, 1986, Pat. No. 4,672,085. This application Nov. 6, 1986, Ser. No. 927,595

Int. Cl.[4] C08K *5/21*

U.S. Cl. 524—718 **16 Claims**

1. A composition comprising:

a lactam monomer; and
an unsaturated oligomer and a stabilizing amount of a trisubstituted urea, wherein the unsaturated oligomer is a polymer of an alkadiene having at least 4 carbons and has pendant thereto at least one group selected from the group consisting of hydroxy, amine, epoxy, acyllactam, and acyllactam precursor groups.

4,694,040

LIQUID COMPOSITION FOR FORMING A COATING FILM OF ORGANOPOLYSILOXANE AND METHOD FOR THE PREPARATION THEREOF

Akira Hashimoto, Yokohama; Toshihiro Nishimura, Kawasaki; Muneo Nakayama, Tokyo; Hisashi Nakane, Kawasaki, and Shozo Toda, Chigasaki, all of Japan, assignors to Tokyo Denshi Kagaku Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 756,612, Jul. 9, 1985, abandoned, which is a continuation of Ser. No. 576,617, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 420,620, Sep. 21, 1982, abandoned. This application Aug. 25, 1986, Ser. No. 902,029
Claims priority, application Japan, Dec. 7, 1981, 56-196532
Int. Cl.⁴ C08K *5/05*
U.S. Cl. 524—765 **8 Claims**

1. An organic liquid solution for forming a heat resistant organopolysiloxane film on a surface, said solution containing from about 10 to 70% by weight of an oligomer formed from a monohydrocarbylsilane triol of the formula $RSi(OH)_3$ wherein R is a substituted or unsubstituted monovalent hydrocarbon group, the degree of polymerization of said oligomer being from 2 to about 50, said solution having a viscosity of from about 2 to 200 centipoise at 25° C.

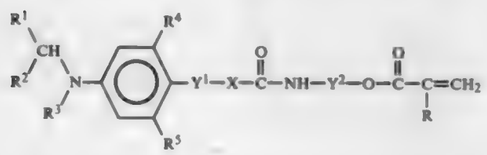
4,694,041

POLYMERIZABLE COMPOSITIONS AND THE USE OF ARYLAMINES AS HARDENING ACCELERATORS FOR THESE COMPOSITIONS

Helmut-Martin Meier, Hattingen; Rolf Dhein, Krefeld; Jens Winkel, Cologne; Gerhard Klein, Monheim, and Werner Klöker, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 676,484, Nov. 29, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 896,661
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345102
Int. Cl.⁴ C08L *67/00*
U.S. Cl. 525—25 **10 Claims**

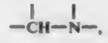
1. Unsaturated polyester resin composition containing an N,N-dialkylarylamine as the polymerization accelerator, wherein the accelerator is a compound of the formula



wherein
R is hydrogen or methyl,
Y^1 is a branched or straight chain alkyl with 1 to 6 carbon atoms,
Y^2 is a branched or straight chain alkylene with 2 to 8 carbon atoms,
X is oxygen or —NH—,
R^1 and R^2 are identical or different and each is hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkyl, cycloalkenyl, aryl, aralkyl or alkaryl group which has 1 to 11 carbon atoms and which is unsubstituted or substituted by one or more hydroxyl amino, epoxy, urethane, urea, ester or ether groups,
or R^1 and R^2 together form a 3-membered to 6-membered ring, which is carbocyclic or contains a nitrogen, oxygen or sulphur hetero-atoms,
R^3 has the meaning of R^1 or is



or R^2 and R^3, together with the adjacent



form a 5-membered or 6-membered ring, which contains only the nitrogen atom as a heterocyclic ring member or which additionally is oxygen as a further heteroatom, and
R^4 and R^5 are identical or different and each is hydrogen, halogen, alkyl or alkenyl having 1 to 10 carbon atoms which is unsubstituted or substituted by halogen.

4,694,042

ELASTOMERIC THERMOPLASTIC MOLDING MATERIALS AND THEIR PREPARATION

Graham E. McKee, Weinheim; Hilmar Ohlig, Kaiserslautern; Horst Reimann, Worms, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,790
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403576
Int. Cl.⁴ C08L *75/00, 77/00*
U.S. Cl. 525—66 **6 Claims**

1. An elastomeric thermoplastic molding material containing
(A) from 5 to 50 parts by volume of a partially or completely crystalline thermoplastic polymer comprising a nylon, a polyester or a polyacetal having a melting point of above 160° C., as a coherent phase, and
(B) from 95 to 50 parts by volume of one or more cross-linked elastomeric polymers which are prepared by emulsion polymerization, are dispersed in the component A and have a glass transistion temperature Tg of below −10° C., the sum of A and B being 100 parts by volume, wherein the elastomeric polymer B consists of esters of (meth) acrylic acid of not more than 15 carbon atoms and from 5 to 20% by weight of comonomers which possess 2 or more double bonds per molecule and can be cross-linked with free radicals, with the proviso that the mixture of A and B has a Vicat softening temperatures, measured according to DIN 53,460, which is 5°–40° C lower than that of the component A, with or without
(C) effective amounts of conventional assistants.

4,694,043

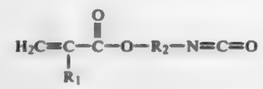
ADHESIVES WITH A HIGH LEVEL OF ADHESION ON PLASTICS MATERIALS

Wolfgang Fischer, Meerbusch; Gerhard Klein, Moaheim; Rudolph Hombach, Leverkusen, and Wilfried Kniege, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 737,232, May 23, 1985, Pat. No. 4,605,703. This application Mar. 3, 1986, Ser. No. 835,333
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 3420924
Int. Cl.⁴ C08L *75/00*
U.S. Cl. 525—127 **2 Claims**

1. Two-component adhesives comprising as a first component parts (a) to (e) as follows:
(a) from 5 to 70 parts by weight of polymer,

(b) from 20 to 80 parts by weight of reactive diluent with a polymerizable group,
(c) from 1 to 20 parts by weight of reactive diluent with several polymerizable groups,
(d) from 5 to 50 parts by weight of polymerizable isocyanate of the formula



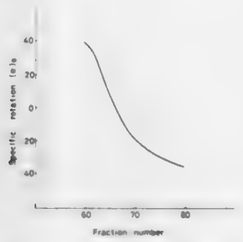
wherein
R_1 represents hydrogen or alkyl having from 1 to 5 carbon atoms and
R_2 represents straight chain or branched alkylene having from 1 to 10 carbon atoms, and
(e) from 1 to 10% by weight of peroxidic compound, based on the sum of the parts of (a) to (d)
and as a second component, an activator comprising a tertiary aromatic amine.

4,694,044

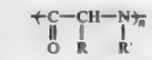
ADSORBENT

Hideaki Kiniwa, Yokohama, Japan, assignor to Research Development Corp. of Japan, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,935
Claims priority, application Japan, Mar. 9, 1984, 59-440651; Jul. 13, 1984, 59-144372
Int. Cl.⁴ C08F *8/30*
U.S. Cl. 525—178 **17 Claims**

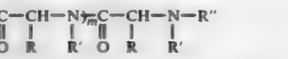


1. A cross-linked, polymeric material which has been reacted with a chemical cross-linking agent comprising a polymer carrier supporting thereon an optically active, synthetic poly(amino acid) represented by the general formula (I):



(I)

wherein R stands for an organic group, R′ stands for hydrogen or an alkyl group and n is an integer of at least 5, and a terminal amino group protected as shown by the general formula (II):



(II)

wherein R, R′ each has the same meaning as above, R″ stands for an organic group and m is an integer of at least 4.

4,694,045

BASE RESISTANT FLUOROELASTOMERS

Albert L. Moore, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 807,611, Dec. 11, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 873,165
Int. Cl.⁴ C08F *214/26, 214/18, 210/02, 259/08*
U.S. Cl. 525—276 **13 Claims**

1. A base resistant, substantially amorphous fluoroelastomer consisting essentially of (1) 10–40 mole percent ethylene units, (2) 32–60 mole percent tetrafluoroethylene units, (3) 20–40 mole percent perfluoro(alkyl vinyl ether) units wherein the alkyl group contains 1–5 carbon atoms, and (4) 0.2–3 mole percent of a cure-site monomer, said fluoroelastomer having a glass transition temperature below about −10° C.

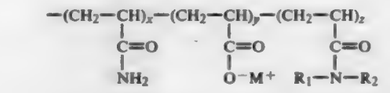
4,694,046

HYDROPHOBICALLY ASSOCIATING TERPOLYMERS OF ACRYLAMIDE, SALTS OF ACRYLIC ACID AND ALKYL ACRYLAMIDE

Jan Bock, Bridgewater; Donald B. Siano, Fanwood, both of N.J., and S. Richard Turner, Pittsford, N.Y., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 25, 1985, Ser. No. 801,226
Int. Cl.⁴ C08F *8/42*
U.S. Cl. 525—329.4 **4 Claims**

1. A terpolymer having the formula:



wherein R_1 is a straight or branched chained alkyl or cycloalkyl having about 6 to about 22 carbon atoms; R_2 is the same as R_1 or different alkyl group or hydrogen; x is about 60 to about 98 mole percent; y is about 2 to about 40 mole percent; and z is about 0.1 to about 10.0 mole percent and M^+ is an alkali metal or ammonium cation.

4,694,047

HALOGENATED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 6, 1986, Ser. No. 927,921
Int. Cl.⁴ C08F *8/22*
U.S. Cl. 525—332.3 **14 Claims**

1. Halogenated 2,3- and 6,7-poly(alloocimene).

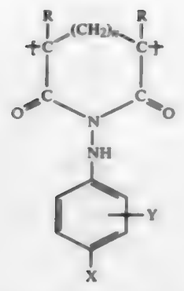
4,694,048

THERMOPLASTIC POLYMERS CONTAINING REPEATING HYDRAZIDE GROUPS

Eui W. Choe, Randolph, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,274
Int. Cl.⁴ C08F *8/30, 8/34*
U.S. Cl. 525—376 **15 Claims**

1. A thermoplastic polymer which consists of recurring structural units corresponding to the formula:



where R is a substituent selected from hydrogen or alkyl groups, n is the integer zero or one, X is a substituent selected from nitro, cyano, trifluoromethyl or tricyanoethylene groups, and Y is a substituent selected from hydrogen, alkyl, nitro or cyano groups.

4,694,049

THERMOPLASTIC ELASTOMER COMPOSITION

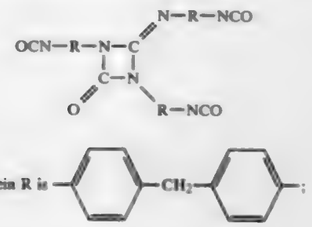
Ichiro Morita; Tadao Taika, and Hidehiro Nakamura, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd., Osaka, Japan

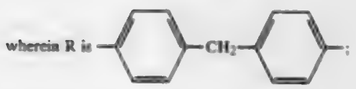
Filed Nov. 5, 1985, Ser. No. 795,289
Claims priority, application Japan, Nov. 6, 1984, 59-233694
Int. Cl.⁴ C08L *67/02, 67/04*
U.S. Cl. 525—440 **7 Claims**

1. A thermoplastic elastomer composition, which comprises:

100 parts by weight of a thermoplastic polyester block copolymer comprising a polyester segment having a high melting point and a polymer segment having a low melting point and having a molecular weight of 400 to 6,000 wherein a polymer produced from the polyester segment having a high melting point alone has a melting point of not lower than 150° C. and the polymer segment having a low melting point alone has a melting or softening point of not higher than 80° C., and

0.05 to 20 parts by weight of a liquid diphenylmethane diisocyanate comprising a mixture of pure diphenylmethane diisocyanate and a cycloadduct of the formula:



wherein R is  ;

in said mixture of the pure diphenylmethane diisocyanate and the cycloadduct, these being in the molar ratio of the cycloadduct/pure diphenylmethane diisocyanate of 0.02 to 0.5/1.

4,694,050

PROCESS FOR ABSORBING POLAR MATERIALS USING TRANSAMIDATED POLY-2-OXAZOLINE COMPOSITIONS

William J. Fairchok, Saginaw; Ralph E. Friedrich; Bruce P. Thill, both of Midland, and Mark J. McKinley, Linwood, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 635,038, Jul. 27, 1984, Pat. No. 4,582,877.
This application Oct. 15, 1985, Ser. No. 787,593
Int. Cl.⁴ B01J *20/26;* **C08L** *79/00*
U.S. Cl. 525—411 **4 Claims**

1. A process for absorbing polar materials by contacting said polar materials with a polymeric composition comprising:

(a) a poly-2-oxazoline; and

(b) a polybasic carboxylic acid; wherein said

(c) has crosslinked said poly-2-oxazline by transamidation.

4,694,051

CHIP RESISTANT COATING COMPOSITION III

Panagiotis I. Kordomenos, Mt. Clemens, and Andrew H. Dervan, Grosse Pointe Farms, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1986, Ser. No. 943,764
Int. Cl.⁴ C08G *18/06, 16/36, 71/04*
U.S. Cl. 525—437 **21 Claims**

1. An organic solvent based, thermosetting coating composition comprising:

A. hydroxy functional urethane modified polyester resin having a number average molecular weight (M_n) between about 2,000 and about 20,000, said resin being the product of polymerization of lactone monomers in the presence of hydroxy-containing urethane modified polyester precursor (i) having a number average molecular weight (M_n) between about 1,000 and about 10,000, (ii) having a hydroxyl number between about 30 and about 300, and (iii) containing between about 1 and about 10 urethane groups per molecule, wherein the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy-containing urethane modified polyester precursor and between about 90 and about 20 weight percent said lactone monomers;

B. blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in said composition in an amount sufficient upon unblocking of the blocked isocyanate groups thereof to provide between about 0.5 and about 1.6 reactive isocyanate groups per hydroxyl group on said hydroxy functional urethane modified polyester resin;

C. diol modified blocked diisocyanate being the reaction product of:

(i) diol having a number average molecular weight between about 200 and about 2,000;

(ii) diisocyanate; and

(iii) active hydrogen bearing blocking agent for said diisocyanate;

wherein said diol (i), said diisocyanate (ii) and said active hydrogen bearing blocking agent (iii) are employed in a molar ratio of about 1:2:2, respectively and wherein said diol modified blocked diisocyanate unblocks at a temperature at least 10° C. lower than the temperature at which said blocked polyisocyanate crosslinking agent unblocks; and

D. polyamine having at least two amine groups selected from primary and secondary amine groups, said polyamine being essentially non-volatile at the temperature at which said diol modified blocked diisocyanate unblocks, wherein said diol modified blocked diisocyanate and said polyamine are included in said composition in (i) a molar ratio of from about 0.9:1.1 to about 1.1:0.9, respectively and (ii) a combined amount of between 10 and about 70 weight percent based on the total weight of components (A), (B), (C) and (D) of said composition.

4,694,052

RADIATION-CURABLE COATING COMPOSITION

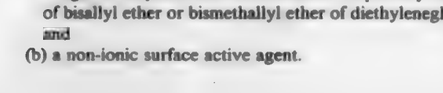
Sumio Hirose, Yokohama; Isao Naruse, Ischara, and Akio Matsuyama, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,480
Claims priority, application Japan, Jul. 2, 1984, 59-135336
Int. Cl.⁴ C08F *283/04*
U.S. Cl. 525—454 **3 Claims**

1. Radiation-curable coating composition, which comprises:

(A) a urethane-modified (meth)acrylate compound which has been prepared by reacting (a) a polyisocyanate compound containing two or more isocyanate groups per molecule, (b) a polyhydroxy compound containing two or more hydroxyl groups per molecule and (c) an unsaturated monohydroxy compound in amounts of 1.1 to 2.0 equivalents of the compound (a) and 0.1 to 1.2 equivalents of the compound (c), both per equivalent of the compound (b); and

(B) a mono(meth)acrylate of the following general formula (I):



(I)

wherein R_1 means



R_2 denotes a hydrogen atom or methyl group, X is —CH₂—CH₂— or

l stands for an integer of 1 to 6, m means an integer of 3 to 5, n is an integer of 1 to 6, and l=n is 2 to 8, the amounts of the compounds (A) and (B) being 20 to 60 weight percent and 80 to 40 weight percent, respectively.

4,694,053

METHOD FOR THE POLYMERIZATION OF VINYL CHLORIDE MONOMER IN AN AQUEOUS MEDIUM

Kenichi Itoh, Clute, Tex.; Genji Noguki, Yamaguchi, Japan; Motoaki Tanaka, and Hitoshi Ohba, both of Saitama, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,433
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.⁴ C08L *37/00*
U.S. Cl. 526—74 **4 Claims**

1. In a method for the suspension polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous medium in the presence of a monomer-soluble polymerization initiator, an improvement which comprises admixing the aqueous medium with:

(a) a water-soluble crosslinked copolymer of 100 parts by weight of acrylic acid and from 0.05 to 10 parts by weight of bisallyl ether or bismethallyl ether of diethyleneglycol; and

(b) a non-ionic surface active agent.

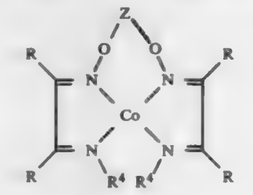
4,694,054

COBALT(II) CHELATES AS CHAIN TRANSFER AGENTS IN FREE RADICAL POLYMERIZATIONS

Andrew H. Janowicz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

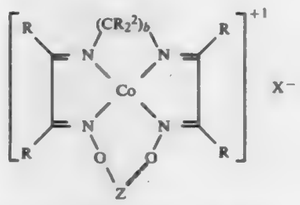
Continuation-in-part of Ser. No. 707,367, Mar. 1, 1985, abandoned. This application Jan. 27, 1986, Ser. No. 821,321
Int. Cl.⁴ C08F *2/40*
U.S. Cl. 526—93 **59 Claims**

1. In an improved free radical polymerization of monomer wherein molecular weight control is effected by means of a chain transfer agent, the improvement characterized in that the chain transfer agent is a cobalt chelate of the formula



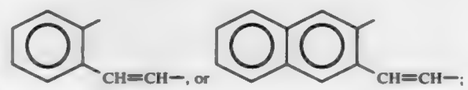
(III)

or



(IV)

wherein each R, independently, is phenyl or C_1 to C_{12} alkyl wherein each α-carbon atom contains two hydrogen atoms, or R and R on adjacent carbon atoms, taken together, is C_5 to C_8 cycloalkylene, unsubstituted in the α-positions, —CH=CH—CH=CH—,



R^2 is H or C_xH_{2x+1} wherein x is 1 to 12; each R^4, independently, is H or C_xH_{2x+1} wherein X is 1 to 12, or both R^4 groups taken together is —O—Z—O—; n is 2 or 3; Z is BF_2, BCl_2, BBr_2 or BR^2_2; and X^- is NO_3^-, Cl^-, Br^-, I^-, BF_4^-, PF_6^-, SbF_6^- or R^1COO^- wherein R^1 is C_1 to C_{12} alkyl.

4,694,055

METHOD FOR THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE MONOMER

Kenichi Itoh, Clute, Tex.; Genji Noguki, Yamaguchi, and Masanobu Nakahara, Ibaraki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,432
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.⁴ C08L *33/02*
U.S. Cl. 526—201 **4 Claims**

1. In a method for the suspension polymerization of vinyl chloride monomer or a monomer mixture mainly composed of vinyl chloride in an aqueous polymerization medium containing a non-ionic surface active agent and in the presence of a monomer-soluble polymerizatin initiator, an improvement which comprises admixing the aqueous polymerization me-

dium with a water-soluble cross-linked copolymer having carboxyl groups at a moment when the percentage of the monomer conversion is in the range from 1 to 20%, wherein the water-soluble cross-linked copolymer having carboxyl groups is a copolymer of 100 parts by weight of acrylic acid and from 0.05 to 10 parts by weight of diethyleneglycol bisallyl or bismethallyl ether.

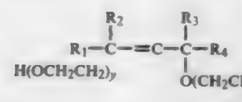
4,694,056

PRESSURE SENSITIVE ADHESIVES PREPARED BY POLYMERIZATION IN THE PRESENCE OF ETHOXYLATED ACETYLENIC TERTIARY GLYCOL

William E. Lenney, Middlesex, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 16, 1982, Ser. No. 408,363
Int. Cl.[4] C08F *2/30*
U.S. Cl. 526—202 **5 Claims**

1. A pressure sensitive adhesive polymer having excellent tack, peel and shear adhesion strength comprising by weight 34.4–40% vinyl acetate, 56.6–65% of a C_{8-12} diester of an alpha, beta-unsaturated dicarboxylic acid, 0.5 to 3.0% of unsaturated acid and 0.1 to 0.4% of a polyfunctional allylic monomer, said polymer being formed from an emulsion polymerization recipe comprising water, partially hydrolyzed polyvinyl alcohol and ethoxylated acetylenic glycol of the formula:



in which R_1 and R_4 are alkyl radicals containing from 3–10 carbon atoms, R_2 and R_3 are selected from the group consisting of methyl and ethyl, and x and y have a sum in the range of 3–60, inclusive and a catalyst, at a temperature sufficient to effect polymerization of the monomers, said polymer having a percent insolubles in toluene at reflux temperature and atmospheric pressure from 45–65% by weight.

4,694,057

PREPARATION OF POLYMERS CONTAINING PENDANT ISOCYANATE GROUPS AND DERIVATIVES THEREOF BY EMULSION COPOLYMERIZATION

Robert A. Smith, Uniontown; Dane K. Parker, Massillon; Howard A. Colvin, Akron; Arthur H. Weinstein, Hudson; Deanis B. Patterson, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 6, 1985, Ser. No. 708,840
Int. Cl.[4] C08F *2/22*
U.S. Cl. 526—206 **23 Claims**

1. A process for the emulsion copolymerization of TMI with diene monomers into TMI containing copolymers wherein said emulsion copolymerization is carried out in an aqueous medium comprising (a) at least about 1 weight percent TMI, based upon the total amount of monomers in the aqueous medium, (b) at least about 50 weight percent of at least one diene monomer, based upon the total amount of monomers in the aqueous medium, (c) an emulsifier, (d) a redox initiator system, (e) a brominated hydrocarbon chain transfer agent, and (f) water; and wherein said TMI containing copolymers have pendant isocyanate groups and a gel content of less than 5 percent by weight.

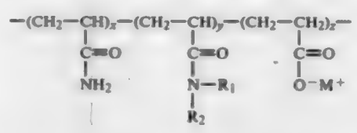
4,694,058

HIGH MOLECULAR WEIGHT TERPOLYMERS OF ACRYLAMIDE, ACRYLIC ACID SALTS AND ALKYLACHYLAMIDE

Donald B. Siano, Fanwood, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 801,331, Nov. 25, 1985. This application May 27, 1986, Ser. No. 866,724
Int. Cl.[4] C08F *220/70*
U.S. Cl. 526—307.2 **2 Claims**

1. A terpolymer characterized by the formula:



wherein R_1 is a C_6 to C_{22} straight chain or branched alkyl or cycloalkyl group; R_2 is the same or different alkyl group as R_1, or hydrogen; M^+ is an alkali metal, wherein x is about 0.50 to about 0.999; y is about 0.002 to about 0.05; and z is about 0.1 to about 0.3 and the intrinsic viscosity of the terpolymer dissolved in 2% NaCl is greater than about 12 dl/g.

4,694,059

POLYALLOOCIMENE AND METHOD FOR THE PREPARATION THEREOF

Richard L. Veazey, East Windsor, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Continuation-in-part of Ser. No. 801,899, Nov. 26, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 919,844
Int. Cl.[4] C08F *36/22*
U.S. Cl. 526—340.3 **22 Claims**

1. A polyalloocimene comprised of a mixture of polymer chain units of 2,3 alloocimene and 6,7 alloocimene.

4,694,060

PROCESS FOR THE TREATMENT OF POLYORGANOSILAZANES AND/OR OF POLYORGANO(DISILYL)SILAZANES BY MEANS OF A TREATMENT OF POLYORGANOSILAZANES WITH A CATALYST SYSTEM COMPRISING AN IONIC INORGANIC SALT AND A COMPLEXING COMPOUND

Huques Porte, Lyons, and Jean-Jacques Lebrun, Caluire, both of France, assignors to Rhone-Poulenc Specialites Chimiques, France

Filed May 6, 1986, Ser. No. 860,038
Claims priority, application France, May 6, 1985, 85 06828
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—14 **25 Claims**

1. A process for the treatment of a polysilazane comprising the step of

catalytically treating at least one polysilazane selected from the group consisting of an organopolysilazane, an organopoly(disilyl)silazane, and a mixture thereof, with a catalytically effective amount of a catalyst system, the polysilazane being free from any hydrogen atoms bonded directly to the silicon atoms and wherein the organic radicals bonded to the silicon atoms in the polysilazane are hydrocarbon radicals,

the catalyst system comprising (i) an ionic inorganic salt of a formula $M^+ A^-$ wherein M^+ is selected from the group consisting of a metal ion and a quaternary ammonium compound, and A^- is an anion compatible with M^+, and (ii) a compound capable of complexing with the M^+ cation.

4,694,061

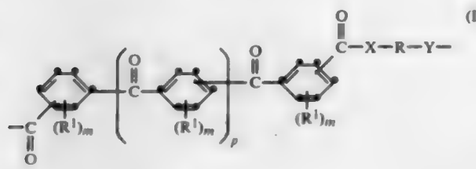
RADIATION-SENSITIVE POLYCONDENSATES, PROCESSES FOR THEIR PREPARATION COATED MATERIAL AND ITS USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

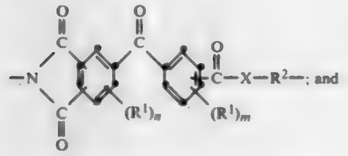
Filed Oct. 4, 1984, Ser. No. 657,870
Claims priority, application Switzerland, Oct. 12, 1983, 5570/83
Int. Cl.[4] G03C *1/01*
U.S. Cl. 528—125 **22 Claims**

1. A radiation-sensitive linear saturated homopolymer or copolymer, selected from the group consisting of the polyamides and polyamide-imides, which comprises

(a) 100 to 10 mol %, based on the total polymer, of at least one of the recurring structural units of formula I, formula II or mixtures thereof

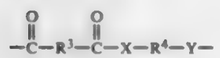


(I)

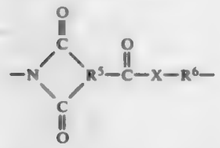


(II)

(b) 0 to 90 mol %, based on the total polymer of recurring structural units of formula III, formula IV or mixtures thereof



(III)



(IV)

in which the imide group in structural element II is bonded to two adjacent C atoms, m is 0 or a number from 1 to 4, p is 0 or a number from 1 to 5 and n is 0 or a number from 1 to 3, X is —NR^7— and Y independently has the same meaning as X, R^1 is alkyl or alkoxy having less than 6 C atoms, aryl having 6 to 10 C atoms, aralkyl having 7 to 10 C atoms or halogen, R is an unsubstituted divalent aliphatic, cycloaliphatic, araliphatic or aromatic radical; or said aliphatic radical substituted by halogen, by alkyl of 1 to 6 C atoms or by alkoxy of 1 to 6 C atoms; or said cycloaliphatic radical substituted by alkyl of 1 to 4 C atoms, or said araliphatic radical substituted on the aryl by alkyl of 1 to 6 C atoms; or said aromatic radical substituted by alkoxyalkyl, alkoxy, by alkyl of 1 to 6 C atoms, by trimethylene or tetramethylene; or R and one of the radicals R^7 together are alkylene having 5 to 7 C atoms, to which the second —NR^7— group is bonded, or R is methylene, ethylene or propylene and the two radicals R^7 of the NR^7 groups together are ethylene or propylene, R^2 is an unsubstituted divalent aliphatic or aromatic hydrocarbon radical; or said aliphatic radical substituted by halogen, by alkyl of 1 to 6 C atoms or by alkoxy of 1 to 6 C atoms; or said aromatic radical substituted by alkoxyalkyl, by alkoxy, by alkyl of 1 to 6 carbon atoms, by trimethylene or by tetramethylene; or R^2 and R^7 together are alkylene having 5 to 7 C atoms, R^4 independently has the same meaning as R, and R^6 independently has the same meaning as R^2, R^3 is a divalent saturated aliphatic or aromatic radical, R^5 is a trivalent saturated aliphatic or aromatic radical in which the imide group is bonded to two adjacent C atoms and R^7 is a hydrogen atom, alkyl, cycloalkyl, aryl, aralkyl or alkaralkyl.

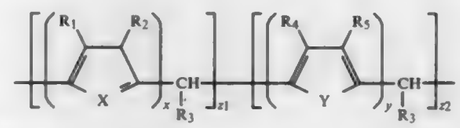
4,694,062

METHOD OF MAKING ELECTROACTIVE HETEROCYCLIC AROMATIC POLYMERS

Samson A. Jenekhe, Bloomington, and Marcia K. Hansen, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 905,084
Int. Cl.[4] C08G *12/26*
U.S. Cl. 528—232 **12 Claims**

1. A method of making electroactive polymers of the structure



wherein:

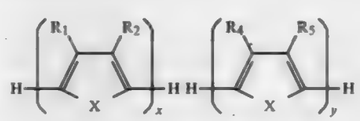
X and Y are selected from S, N—H, N-lower alkyl (C=1–7), N-phenyl, O, Se or Te;

R_1, R_2, R_4 and R_5 are selected from H and lower alkyls (C=1 to 7);

R_3 is selected from the class consisting of aliphatic, aromatic and heterocyclic groups derivable from aldehydes of the formula R_3CHO;

x and y are positive integers having a value between 1 and 5; at least one or both of Z_1 and Z_2 are positive integers having a value between 1 and 10,000;

which comprises reacting an amount of aldehyde of the formula R_3CHO, wherein R_3 is defined as above, with amounts of monomers of the structure



wherein R_1–R_4, X, Y and x and y are defined as above the presence of a compatible inert organic solvent and in the presence of a protic acid catalyst, employing a molar ratio of monomers to aldehyde within the range of from about 0.1 to 1 to 2.0 to 1 and separating the copolymer from the reaction mixture.

4,694,063

ANHYDROUS PROCESS FOR THE MANUFACTURE OF POLYAMIDE POWDER FROM LACTAM IN THE PRESENCE OF N,N'-ALKYLENE BIS AMIDE

Jean-Claude Hilaire, and Roland Guerin, both of Pau, France, assignors to Atochem, France

Filed Jan. 21, 1986, Ser. No. 820,661
Claims priority, application France, Jan. 30, 1985, 85 01274
Int. Cl.[4] C08G *69/16*
U.S. Cl. 528—315 **11 Claims**

1. A process for the manufacture of a polyamide powder comprising polymerizing in solution a reaction mixture from which any trace of water has been eliminated and comprising a monomer lactam or lactams capable of generating said polyamide in the presence of an N,N'-alkylene bisamide, an activa-

tor, a solvent, a catalyst, and a finely-divided inert material to generate crystallization nuclei.

4,694,064

ROD-SHAPED DENDRIMER

Donald A. Tomalia, and Pamela M. Kirchhoff, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 28, 1986, Ser. No. 834,993
Int. Cl.[4] C08G *69/10*
U.S. Cl. 528—332 **13 Claims**

1. A cylindrically-shaped dendrimer having at least 8 core branches emanating from an essentially linear core, each core branch extending through at least two generations and having at least two terminal groups provided that (1) the ratio of terminal groups to the branches emanating from the core is more than one, (2) the density of terminal groups in the dendrimer is at least 1.5 times that of an extended conventional star polymer having a similar linear core and monomeric moieties and a comparable molecular weight and number of core branches wherein each of such branches of the extended conventional star polymer bears only one terminal group, (3) a molecular volume that is no more than 80 percent of the molecular volume of said extended conventional star polymer, and (4) the aspect ratio of the molecules of the dendrimer is at least 2:1.

4,694,065

PROCESS FOR THE PRODUCTION OF DUROMERIC ALIPHATIC POLYCARBONATES

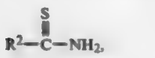
Peter Mues; Hans-Josef Buysch; Bert Brassat, all of Krefeld, and Heinrich Heine, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 2, 1986, Ser. No. 815,648
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501246
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—371 **4 Claims**

1. A process for the production of duromeric aliphatic polycarbonates by ring-opening copolymerization of monocyclic ring carbonates and difunctional ring carbonates having a cross linking action, characterised in that catalyst systems is a catalyst corresponding to formula (I)

$$X(R^1)_y \quad \text{(I)},$$

in which
X is an ion from groups IA-IIIA, IIIB or VA of the periodic system,
R^1 is a C_1–C_8-alkylalcoholate, C_7–C_{15}-aralkylalcoholate, C_4–C_{18}-thiolate, cyanide, cyanate, thiocyanate, aliphatic (C_1–C_8)carboxylate, aromatic carboxylate, carbonate, C_1–C_8-alkyl carbonate, oxide, halide or C_1–C_4-alkyl radical,
Y represents 1, 2, 3 or 4
or a catalyst corresponding to formula (II)



(II)

wherein
R^2 represents C_1–C_4 alkyl, $—NH_2$, —NH-alkyl(C_1–C_4), —N(alkyl(C_1–C_4))$_2$ or $—NHNH_2$
and a cocatalyst, selected from the group corresponding to one of formulae IIIa, aliphatic acid amides,



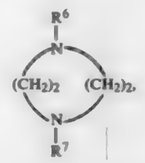
(IIIa)

in which
R^3 represents C_1–C_5-alkyl,
R^4 and R^5 represent hydrogen or C_1–C_4-alkyl,
IIIb, cyclic amides



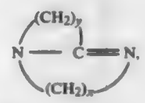
(IIIb)

in which
R^4 has the meaning given for formula IIIa and
X represents an integer of from 3 to 6,
IIIc, cyclic amines



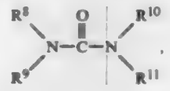
(IIIc)

in which
R^6 and R^7 represent hydrogen, $—CH_3$, $—C_2H_4OH$ or together represent a saturated methylene chain containing from 2 to 4 carbon atoms,
IIId, bicyclic amidines



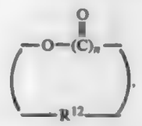
(IIId)

in which
X,Y represent an integer of from 2 to 5,
or IIIe, acyclic and cyclic ureas



(IIIe)

in which
R^8 to R^{11} represent hydrogen, C_1–C_4-alkyl, C_6–C_{10}-aryl and wherein also the nitrogen atoms be linked together to form a ring via two radicals R^8, R^{10} or R^9, R^{11} via a C_2 to C_4 chain, or general formula (IV)

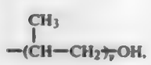


(IV)

wherein
R^{12} represents $—(CH_2)_s—$ in which s=2–5 when n=1 and $—(CH_2CH_2O—)_tCH_2CH_2—$ in which t=1–6 when n=0 and
n is 0 or 1,
or formula (V)

$$R^{13}—ZH \quad \text{(V)},$$

wherein
R^{13} represents $—CH_2CH_2OH$, $—(CH_2CH_2)_r—OH$,



C_2–C_{12}-alkyl or a phenyl ring
v represents 1–200,
Z represents O and S,
are used.

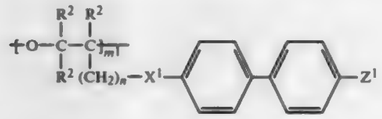
4,694,066

POLYOXYALKYLENE POLYMERS EXHIBITING NONLINEAR OPTICAL RESPONSE

Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence; James B. Stamatoff, Westfield, and Alan Buckley, Berkeley Heights, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,092
Int. Cl.[4] C08G *65/22*
U.S. Cl. 528—373 **6 Claims**

1. A polymer which is characterized by a recurring monomeric unit corresponding to the formula:



where
R^2 is hydrogen or a C_1–C_4 group;
m^1 is an integer of at least 5;
n is an integer between about 4–20;
X^1 is $—NR^1—$, —O— or —S—;
R^1 is hydrogen or methyl; and
Z^1 is $—NO_2$.

4,694,067

RUBBER COMPOSITION FOR DUST COVER BOOTS

Akio Maeda, Yokohama; Takeshi Chida, Kamakura, and Hirokatsu Seya, Kawasaki, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,586
Claims priority, application Japan, Jul. 17, 1984, 59-148090; Oct. 11, 1984, 59-213208
Int. Cl.[4] C08L *71/02*; C08G *65/12, 65/14, 65/24*
U.S. Cl. 528—393 **12 Claims**

1. An improved rubber composition having characteristics of improved heat resistance, cold resistance, dynamic ozone resistance and bending resistance rendering it suitable for use as dust cover boots comprising a copolymer rubber composed of 10 to 60 mole % of epichlorohydrin, 30 to 90 mole % of propylene oxide or both propylene oxide and ethylene oxide with the propylene oxide/ethylene oxide mole ratio being at least 1 and 0 to 15 mole % of an unsaturated epoxide, and a vulcanization agent for the copolymer rubber.

4,694,068

METHOD FOR THE PREPARATION OF A VINYLIDENE CHLORIDE INTERPOLYMER FILM

Phillip DeLassus, and William J. Raich, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1984, Ser. No. 655,794
Int. Cl.[4] C08F *6/00*
U.S. Cl. 528—502 **6 Claims**

1. An improved process for preparing a vinylidene chloride interpolymer article having enhanced barrier to atmospheric gases and water vapor, the process comprising four sequential steps, the steps being:
(a) preparing a vinylidene chloride interpolumer, the vinylidene chloride interpolymer having polymerized therein vinylidene chloride in an amount of from about 75 to about 95 percent by weight of interpolymer and from about 25 to about 5 percent by weight of interpolymer of at least one monomer copolymerized therewith, said interpolymer having a monomer copolymerized therewith, said interpolymer having a melting point;
(b) recovering the vinylidene chloride interpolymer;
(c) heat plastifying said vinylidene chloride interpolymer; and
(d) fabricating said heat plastified interpolymer into an article; wherein the improvement comprises fabricating the vinylidene chloride interpolymer into an article in a manner which allows between about 5 and about 50 percent crystallization to occur in the vinylidene chloride interpolymer article while the article is at a temperature above about 90° C. and below the melting point of the interpolymer but before the interpolymer cools below about 90° C.

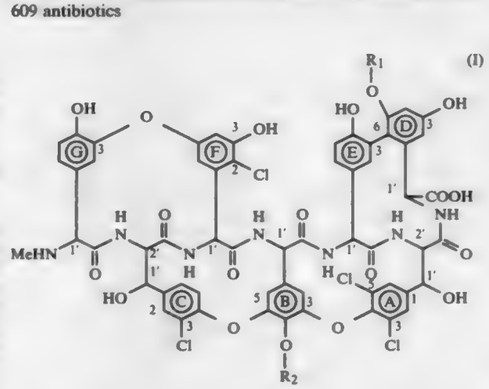
4,694,069

KIBDELOSPORANGIUM ARIDUM SK&F-AAD-609

John J. Dingerdissen, West Chester; Rajanikant Mehta, King of Prussia; Louis J. Nisbet, Rosemont; Marcia C. Shearer, Conshohocken, and Gail F. Wasserman, Devon, all of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

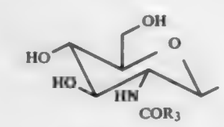
Filed Sep. 30, 1985, Ser. No. 781,422
Int. Cl.[4] A61K *35/74*; C12P *1/00, 1/04*
U.S. Cl. 530—317 **40 Claims**

1. A biologically pure culture of *Kibdelosporangium aridum largum* which has the identifying characteristics of ATCC 39922 and mutants and derivatives thereof, said microorganism and mutants and derivatives bein capable of producing AAD-609 antibiotics



(I)

wherein R_1 is mannosyl or hydrogen, and R_2 is a glycolipid radical having the structure



wherein R_3 is a C_{8-12} alkyl or alkenyl, branched or linear, optionally substituted by hydroxyl, or the desoxy analog thereof in recoverable quantity upon cultivation in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen.

4,694,070

WATER SOLUBLE XANTHYLIUM DERIVATIVES SUBSTRATES

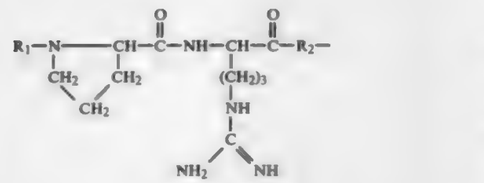
Gary A. Mitchell, Miami Lakes; Gerald E. Jaffe, Pembroke Pines, and Marilyn M. Solorzano, Sunrise, all of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

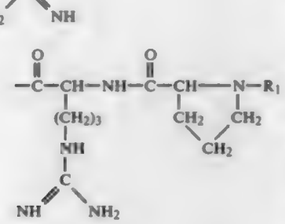
Filed May 28, 1985, Ser. No. 737,761

Int. Cl.[4] C07K *7/06;* **C12Q** *1/38*

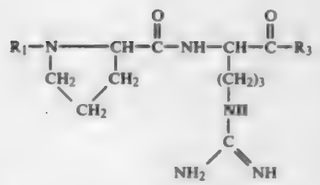
U.S. Cl. 530—329 **4 Claims**

1. A xanthylium derivative substrate selected from the group consisting of:





ami



and acid salts thereof, wherein:

R_1 is a water solubilizing radical selected from the group consisting of sarcosyl, pyroglutamyl, and glutaryl;

R_2 is xanthylium, 3', 6'-diamino-9'-(2-carboxyphenyl); and

R_3 is xanthylium, 3'-amino-6'-hydroxy-9'-(2- carboxyphenyl).

4,694,071

POLYPEPTIDES USEFUL IN VACCINATION AGAINST ENTEROVIRUSES

Jeffrey W. Almond, Leicester; Phillip D. Minor, London; David M. A. Evans, Tring, and Geoffrey C. Schild, London, all of United Kingdom, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB83/00254, § 371 Date Jun. 8, 1984, § 102(e) Date Jun. 8, 1984, PCT Pub. No. WO84/01575, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 11, 1983, Ser. No. 619,155

Claims priority, application United Kingdom, Oct. 11, 1982, 8228976; Jun. 24, 1983, 8317242

Int. Cl.[4] C07K *7/06, 7/08;* **A61K** *39/02*

U.S. Cl. 530—329 **29 Claims**

1. A synthetic polypeptide, suitable for use in vaccination against or diagnosis of a disease caused by an enterovirus, which is a hexapeptide coded for by codons 93 to 98 in the RNA sequence coding for the structural capsid protein VP1 of a poliovirus type 3 Sabin strain or by equivalent codons of another enterovirus or is an antigenic equivalent of such a hexapeptide, the antigenic equivalent being:

(i) a said hexapeptide modified by the inclusion therein of one or more changes to the amino acid sequence or

(ii) a longer peptide of up to eighteen amino acid residues incorporating a said hexapeptide or a said modified hexapeptide sequence, each said antigenic equivalent being capable of raising antibodies capable of neutralising the same strain and type of enterovirus as the said hexapeptide to which each said antigenic equivalent corresponds and the numbers of the codons being counted from the 5'-terminus of the nucleotide sequence coding for the VP1 capsid protein.

4,694,072

PEPTIDES COMPRISING AN IMMUNOGENIC SITE OF POLIOVIRUS AND DNAS CONTAINING NUCLEOTIDE SEQUENCES CODING FOR THESE PEPTIDES

Marc Girard, and Sylvie van der Werf, both of Paris, France, assignors to Institut Pasteur, Paris, France

PCT No. PCT/FR83/00241, § 371 Date Jul. 27, 1984, § 102(e) Date Jul. 27, 1984

PCT Filed Nov. 30, 1983, Ser. No. 634,881

Claims priority, application France, Nov. 30, 1982, 82 20115; Jun. 29, 1983, 83 10778

Int. Cl.[4] C07K *7/10, 7/08*

U.S. Cl. 530—350 **5 Claims**

1. Polypeptide constituted by the sequence:

Ser Arg Asp Ala Leu Pro Asn Thr GLu Ala Ser Gly Pro Thr His Ser Lys Glu Ile Pro Ala Leu Thr Ala Val Glu Thr Gly Ala Thr Asn Pro Leu Val Pro Ser Asp Thr Val Gln Thr Arg His Val Val Gin His Arg Ser Arg Ser Glu Ser Ser Ile Glu Ser Phe Phe Ala Arg Gly Ala Cys Val Thr Ile Met Thr Val Asp Asn Pro Ala Ser Thr Thr Asn Lys Asp Lys Leu Phe Ala Val Trp Lys Ile Thr Tyr Lys Asp Thr Val Gln Leu Arg Arg Lys Leu Glu Phe Phe Thr Tyr Ser.

4,694,073

METHOD OF SOMATOTROPIN SOLUBILIZATION AND NATURATION USING DIMETHYLSULFOXIDE

Larry A. Bentle, St. Charles; James W. Mitchell, St. Louis; Stephen B. Storrs, Creve Coeur, and Grant T. Shimamoto, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 704,341, Feb. 22, 1985, and a continuation-in-part of Ser. No. 704,677, Feb. 22, 1985, Pat. No. 4,652,630. This application Aug. 25, 1986, Ser. No. 900,017

Claims priority, application Spain, Feb. 20, 1986, 552233

Int. Cl.[4] C07K *15/00, 3/08*

U.S. Cl. 530—399 **19 Claims**

1. A method for naturation of somatotropin protein which comprises contacting a dimethylsulfone or urea-dimethylsulfone solution containing said protein with a mild oxidizing agent for a time sufficient to form intramolecular disulfide bonds between cysteine residues contained in said somatotropin protein.

4,694,074

PROCESS FOR THE PURIFICATION OF HBSAG

Yahiro Uemura; Takao Ohmura, both of Osaka; Akimasa Ohmizu, Hyogo; Akinori Sumi; Wataru Ohtani, both of Osaka; Yoshitaka Sakanishi, Hyogo; Hiroshi Morise; Hirofumi Arimura, both of Osaka, and Tadakazu Suyama, Kyoto, all of Japan, assignors to Green Cross Corporation, Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,081

Claims priority, application Japan, Oct. 26, 1984, 59-224116

Int. Cl.[4] A61K *39/29;* **C12P** *21/00;* **C07K** *3/18, 3/28*

U.S. Cl. 530—417 **6 Claims**

1. A process for the purification of HBsAg obtained by DNA recombination, which comprises adding an inorganic salt to a crude HBsAg solution, said HBsAg having been obtained by DNA recombination, in a concentration so that the resultant HBsAg solution has an inorganic salt concentration of five to twenty-five W/V percent, bringing the resultant solution into contact with a fixing carrier having hydrophobic groups selected from the group consisting of a phenylalanine residue, an alkyl group containing two to eight carbon atoms and a phenyl group, said carrier having been equilibrated with an inorganic salt solution of the same concentration as the resultant HBsAg solution, to adsorb thereon HBsAg with a solution of the inorganic salt to wash away contaminating free proteins and eluting the HBsAg with a buffer solution.

4,694,075

BISAZO COMPOUNDS CONTAINING ANTHRANILIC ACID AND THIAZOLE MOIETIES

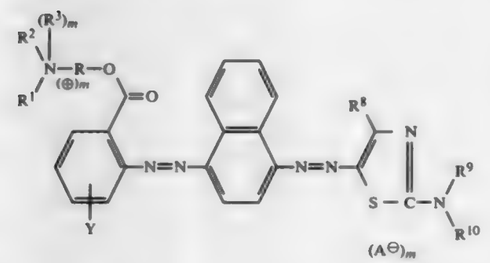
Horst Colberg, Schifferstadt, and Erwin Hahn, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Lugwighafen, Fed. Rep. of Germany

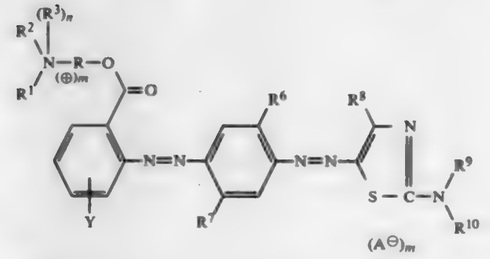
Filed Jan. 21, 1986, Ser. No. 820,018

Int. Cl.[4] C09B *31/14, 44/08;* **D06P** *1/04, 1/41*

U.S. Cl. 534—604 **13 Claims**

1. A compound of the formula:

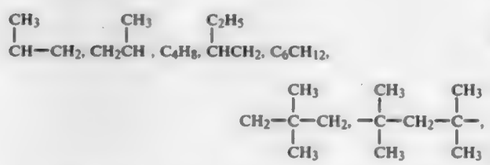




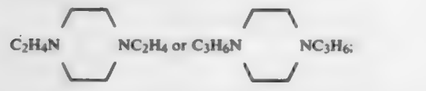
where

Y is hydrogen, chlorine, bromine or nitro;

R is C_2H_4, C_3H_6,



$C_2H_4OC_2H_4$, $C_3H_6OC_3H_6$, $C_3H_6OC_3H_6$, $C_3H_6OC_4H_8OC_3H_6$, $C_3H_6OC_2H_4OC_2H_4OC_3H_6$, $C_2H_4NHC_2H_4$, $C_2H_4NHC_3H_6$, $C_3H_6NHC_3H_6$, $C_3H_6NHC_2H_4NHC_3H_6$, $C_3H_6NHC_6H_{12}NHC_3H_6$,



m is 0 or 1;

R^1 and R^2 independently of one another are each hydrogen, allyl, methallyl, C_1–C_{14}-alkyl, C_1–C_{14}-alkenyl, C_5–C_8-cycloalkyl, C_1–C_{14}-aralkyl, or C_1–C_{14}-aryl, unsubstituted or substituted by N-cycloalkylamino, N,N-di-C_1–C_5-alkylamino, hydroxyl or C_1–C_8-alkoxy,

or R^1 and R^2 together with the nitrogen may form pyrrolidine, piperidine, morpholine, piperazine unsubstituted or substituted at the nitrogen by methyl, ethyl, n- or isopropyl, n-, iso- or sec-butyl, 2-hydroxyethyl, 2-aminoethyl, 2- or 3-hydroxypropyl or 2- or 3-aminopropyl, imidazole unsubstituted or substituted in 2- or 4-position by methyl, ethyl, propyl or butyl, or N-3-(C_1–C_{12})-alkyl or vinylimidazole unsubstituted or substituted in the 2- or 4-position by methyl, ethyl, propyl or butyl;

R^3 is hydrogen, C_1–C_{12}-alkyl, or C_2–C_4-hydroxyalkyl;

R^6 and R^7 independently of one another are each hydrogen, hydroxyl, C_1–C_4-alkoxy, methyl, $NHCOCH_3$, $NHCOC_2H_5$, $NHCOC_6H_5$, $NHCONH_2$, $NHCON(CH_3)_2$ or $NHCONHC_6H_5$;

R^8 is hydrogen, acetyl, benzoyl, C_1–C_4-alkyl which is unsubstituted or substituted by chlorine, bromine, cyano, hydroxyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylmercapto, phenoxy, sulfophenoxy, phenylmercapto, amino, N-mono- or N,N-di-C_1–C_4-alkylamino, phenylamino, sulfophenylamino, C_1–C_4-alkanoylamino sulfoethylamino, vinyl, cyclohexyl, thienyl, thiazolyl, phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkoxy, β-C_1–C_4-alkanoyloxyethoxy, β-cyanoethoxy, β-carboxyethyoxy, β-C_1–C_4-alkoxycarbonylethoxy, phenoxy, sulfophenoxy, C_1–C_4-alkylmercapto, phenylmercapto, amino, β-C_1–C_4-alkanoylamino, benzoylamino, C_1–C_4-alkylamino or dialkylamino, phenylamino, sulfophenylamino, C_1–C_4-alkylsulfonylamino or phenylsulfonylamino;

R^9 and R^{10} independently of one another are each hydrogen, C_1–C_8-alkyl which is unsubstituted or substituted by hydroxyl, carboxyl, cyano, chlorine, bromine, phenyl, C_1–C_8-alkoxy, C_1–C_4-alkanoyloxy, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkanoylamino, acetyl, C_1–C_4-alkylaminocarbonyloxy, arylaminocarbonyloxy, C_1–C_4-alkoxycarbonyloxy or phenoxycarbonyloxy, or are each, allyl, methallyl, propargyl, cyclohexyl, phenyl-C_1–C_5-alkyl, or phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, C_1–C_4-alkoxycarbonyl, nitro or C_1–C_4-alkanoylamino;

or R^9 and R^{10} together with the nitrogen form pyrrolidino, piperidino, morpholino, piperazino, α-methylpiperazino, hexamethyleneimino or thiomorpholino S-dioxide; and

A^- is an anion.

4,694,076

SIALIC ACID DERIVATIVES

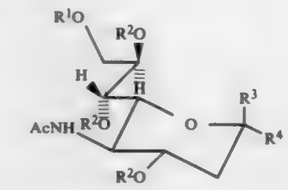
Tomoya Ogawa, Musashino; Mamoru Sugimoto, Niiza; Yoshiyasu Shitori, Musashino, and Masayoshi Ito, Kunitachi, all of Japan, assignors to Kanto Ishi Pharmaceutical Co., Ltd., Tokyo and Rikagaku Kenkyusho, Wako, both of, Japan

Filed Dec. 11, 1984, Ser. No. 680,498

Int. Cl.[4] C07H *5/06*

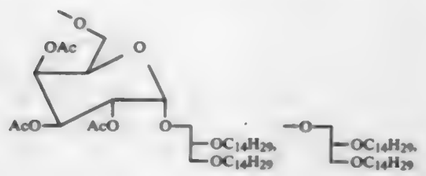
U.S. Cl. 536—17.2 **14 Claims**

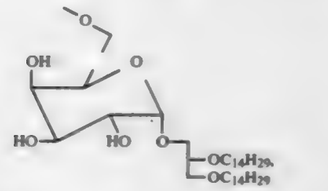
1. A sialic acid derivative of the formula:

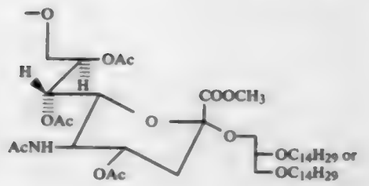


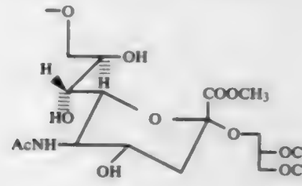
wherein R^1 is hydrogen, trityl, or acetyl, R^2 is hydrogen or

acetyl, one of R^3 and R^4 is carboxyl, methoxycarbonyl or ethoxycarbonyl, and the other of R^3 and R^4 is

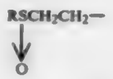








gen atom or hydroxycarbylsulfinylethyl group represented by the formula (II):



(II)

wherein R may be the same or different and represents an alkyl group having 1 to 6 carbon atoms or a phenyl group, with the average substitution degree with the hydrocarbylsulfinylethyl group of the formula (II) per glucose unit being at least 0.05, and n is an integer representing the repeating number of the glucose units.

4,694,078

PRODUCTION OF PIGMENTARY COPPER PHTHALOCYANINE

Robert Langley, Glasgow, Scotland; John D. Stewart, Kempton Park, South Africa, and Arthur S. Walls, Kilmarnock, Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 9, 1986, Ser. No. 871,932

Claims priority, application United Kingdom, Jun. 20, 1985, 8515600

Int. Cl.⁴ C09B *47/04*

U.S. Cl. 540—141 **13 Claims**

1. An improved process for converting crude copper phthalocyanine (CuPc) to pigmentary CuPc by salt milling, solvent treatment or acid pasting wherein the improvement comprises carrying out the conversion in the presence of 0.5 to 30% by weight, based on the weight of crude CuPc, of crude trichlorophenoxy CuPc, obtained together with CuPc and chlorinated CuPc by replacing from 0.5 to 25% by weight of the phthalic anhydride used to prepare CuPc or chlorinated CuPc by an equivalent amount of 3,4,6-trichloro-5-phenoxy-2-cyanobenzoic acid alkyl or phenyl ester.

4,694,079

3-PROPENYL CEPHALOSPORIN SOLVATES

Leonard B. Crast, Jr., North Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,805

Int. Cl.⁴ C07D *501/22*; A61K *31/545*

U.S. Cl. 540—215 **4 Claims**

1. The crystalline dimethylformamide solvate of 7-[(D)-2-amino-2-(4-hydroxyphenyl)acetamido]-3-((Z)-1-propen-1-yl)-3-cephem-4-carboxylic acid having the composition corresponding to the formula $C_{18}H_{19}N_3O_5S.(C_3H_7NO)_{1.5}$ and the following X-ray powder diffraction pattern.

d(Å)	I/Io
13.24	100
9.50	▮
7.82	9
7.42	10
7.14	12
6.76	15
▮.▮▮	5
5.28	10
5.06	3
4.82	10
4.72	▮
4.64	5
4.53	9
4.47	16
4.39	25
4.29	33
4.10	13
4.04	10
3.69	5
3.62	6
3.58	▮
3.56	▮

4,694,077

NOVEL CELLULOSE DERIVATIVE, PROCESS FOR PREPARING THE SAME AND SULFUR DIOXIDE GAS PERMSELECTIVE MEMBRANE COMPRISING THE SAME

Kiyokazu Imai; Tomoo Shiomi, and Yasuyuki Tezuka, all of Nagaoka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

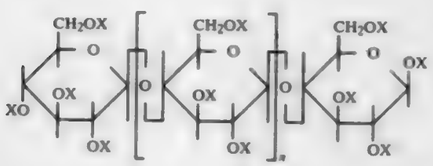
Filed Sep. 2, 1986, Ser. No. 902,625

Claims priority, application Japan, Aug. 30, 1985, 60-191088; Aug. 30, 1985, 60-191089; Apr. 25, 1986, 61-097682; Apr. 25, 1986, 61-097683

Int. Cl.⁴ C08B *11/04*

U.S. Cl. 536—92 **10 Claims**

1. A hydrocarbylsulfinylethyl cellulose represented by the formula (I):



(I)

wherein X may be the same or different and represents hydro-

-continued

d(Å)	I/Io
3.48	4
3.29	10
3.19	5
2.98	5
2.71	4.

4,694,080

2H-1,2-BENZOTHIAZINE DERIVATIVES

Susumu Nakanishi, and Isao Nagakura, both of Aichi, Japan, assignors to Pfizer Inc., New York, N.Y.

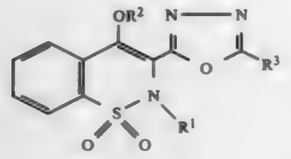
Filed Mar. 19, 1986, Ser. No. 841,509

Claims priority, application Japan, Apr. 16, 1985, 60-80666

Int. Cl.⁴ C07D *417/04*; A61K *31/38*

U.S. Cl. 544—49 **18 Claims**

1. A compound having the formula



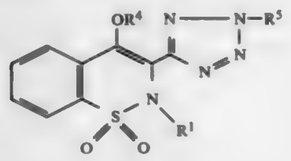
wherein

R^1 is alkyl having from 1 to 8 carbon atoms or $—(CH_2)_m—O—(CH_2)_nOR^6$ where m and n are each an integer from 1 to 4 and R^6 is alkyl having from one to six carbon atoms;

R^2 is hydrogen, alkanoyl having from 2 to 15 carbon atoms, cycloalkylcarbonyl having from 3 to 8 carbon atoms in the cycloalkyl moiety, benzoyl or benzoyl ring substituted with F, Cl, Br, I, CF_3, CH_3, NO_2 or CH_3O; and

R^3 is alkyl having from 1 to 15 carbon atoms, thienyl, furyl, cycloalkyl having from 3 to 8 carbon atoms, phenyl or phenyl substituted with F, Cl, Br, I, CF_3, CH_3 or CH_3O.

10. A compound having the formula



where

R^1 is alkyl having from 1 to 8 carbon atoms or $—(CH_2)_m—O—(CH_2)_n—OR_6$ where m and n are each an integer from 1 to 4 and R^6 is alkyl having from one to six carbon atoms;

R^4 is hydrogen, alkanoyl having from 2 to 15 carbon atoms, benzoyl or benzoyl ring substituted with F, Cl, Br, I, CF_3, CH_3, CH_3O; and

R^5 is hydrogen, alkyl having from 1 to 15 carbon atoms, alkanoyl having from 2 to 15 carbon atoms, alkenyl, aralkenyl cycloakyl of from 3 to 8 carbon atoms, phenylethyl, cycloalkylcarbonyl having from 3 to 8 carbon atoms in the cycloalkyl moiety, benzoyl, benzoyl substituted with F, Cl, Br, I, CF_3, CH_3, CH_3O or NO_2, furylmethyl, thienylmethyl, benzyl or benzyl ring substituted with F, Cl, Br, I, CF_3, CH_3, NO_2 or CH_3O.

4,694,081

PROCESS TO PREPARE 2,5-DIKETOPIPERAZINES

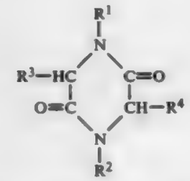
William H. Miller, Glendale, and William D. Taylor, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 23, 1985, Ser. No. 778,817

Int. Cl.⁴ C07D *241/08*

U.S. Cl. 544—385 **20 Claims**

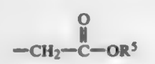
1. A process for the preparation of a substituted or unsubstituted 2,5-diketopiperazine represented by the formula:



where R^3 and R^4 are independently selected from the group consisting of hydrogen, alkyl and aryl, and R^1 and R^2 are independently selected from the group consisting of hydrogen, alkyl having between 1 and about 12 carbon atoms, arylmethyl, aryl,

$$Y—CH_2—CH_2—$$

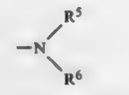
and



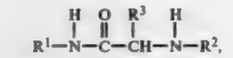
where Y is selected from the group consisting of

$—OR^5$,
$—SR^5$,

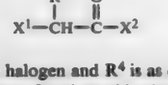
and



and R^5 and R^6 are independently selected from the group consisting of alkyl having between 1 and about 6 carbon atoms; the process comprising bringing together under reaction conditions a substituted or unsubstituted glycinamide represented by the formula:



where R^1, R^2 and R^3 are as defined above, and a haloacetyl halide represented by the formula:



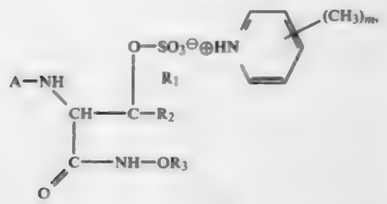
where X^1 and X^2 are halogen and R^4 is as defined above, and in the presence of a base forming said substituted or unsubstituted 2, 5-diketopiperazine.

4,694,082
COMPOUND 1,4-DIISOPROPYL-2,5-DIKETOPIPERAZINE
William H. Miller, Glendale, and William D. Taylor, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Sep. 23, 1985, Ser. No. 778,818
Int. Cl.[4] C07D *241/08*
U.S. Cl. 544—385 1 Claim

1. The compound 1,4-diisopropyl-2,5-diketopiperazine.

4,694,083
CERTAIN CARBAMATE ESTER DERIVATIVES FORMING SALTS WITH PYRIDINIUM OR PICOLINIUM CATIONS WHICH ARE USEFUL AS INTERMEDIATES
William A. Slusarchyk, Belle Mead, and Tamara Dejneka, Skillman, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Division of Ser. No. 695,775, Feb. 28, 1985, Pat. No. 4,638,061. This application Apr. 28, 1986, Ser. No. 856,527
Int. Cl.[4] C07F *7/02*; C07D *405/02, 213/02*
U.S. Cl. 546—14 1 Claim

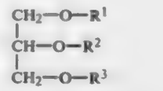
1. A compound having the formula



wherein, A is benxyloxycarbonyl, p-nitrobenzyloxycarbonyl, t-butyloxycarbonyl, o-nitrophenylsulfenyl or triphenylmethyl;
R_1 and R_2 are the same or different and each is alkyl of 1 to 4 carbons;
R_3 is benzyl, p-nitrobenzyl, benzyloxymethyl, 2-methoxy-2-propyl, 2-ethoxy-2-propyl, tetrahydropyran-2-yl, 2-trimethylsilylethyl, t-butyldimethylsilyl, or t-butyldiphenylsilyl; and
m is 0, 1, 2 or 3.

4,694,084
GLYCEROL ETHER PHOSPHATIDES
Manfred Breuninger, Freiburg, Fed. Rep. of Germany, and Dieter Schmidt, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Mar. 8, 1985, Ser. No. 709,871
Claims priority, application Switzerland, Mar. 15, 1984, 1287/84; Feb. 4, 1985, 491/85
Int. Cl.[4] C07F *9/58, 9/65, 9/10*
U.S. Cl. 546—25 7 Claims

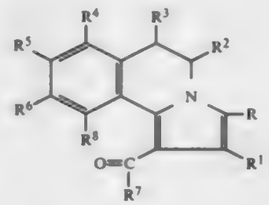
1. A compound of the formula



wherein two of the residues R^1, R^2 and R^3 represent C_{10-30}-alkyl residues with at least 8 C-atoms in a straight chain, at least one of these residues being substituted by at least 2 C_{1-3}-alkyl residues and the sum of the C-atoms in the two residues being greater than 20; and the third residue is a residue —P(O)(O⁻)OR⁴ in which R^4 is C_{5-7}-cycloalkyl residue which is substituted by a quaternary ammonium group or a C_{5-7}-cycloalkyl residue which contains a di-(lower-alkyl)-substituted nitrogen atom.

4,694,085
5,6-DIHYDRO-PYRROLO[2,1-A]ISOQUINOLINES AND THE PREPARATION THEREOF
Walter Lösel, Gau-Algesheim; Otto Roos, Schwabenheim, and Gerd Schnorrenberger, Ingelheim am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 691,444, Jan. 14, 1985, abandoned. This application Mar. 24, 1986, Ser. No. 843,084
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401018
Int. Cl.[4] C07D *491/147, 471/04, 237/28*
U.S. Cl. 546—65 4 Claims

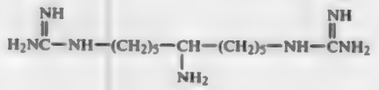
1. A compound of the formula



wherein
R, R^2, R^3, and R^7 are each independently hydrogen or alkyl of 1 to 4 carbon atoms;
R^1 is cyano, hydroxycarbonyl, (alkoxy of 1 to 4 carbon atoms) carbonyl, (hydroxy-lower alkyl)-aminocarbonyl, furfuryl-aminocarbonyl, (lower alkoxy-lower alkyl)-aminocarbonyl, (lower alkoxy-phenyl)-lower alkyl-aminocarbonyl or (di-lower alkoxy-phenyl) lower alkyl-aminocarbonyl;
R^4 and R^8 are each independently hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms, (alkyl of 1 to 4 carbon atoms)thio or —NR^9R^{10};
R^5 and R^6 are each independently hydroxyl, alkoxy of 1 to 4 carbon atoms or (alkyl of 1 to 4 carbon atoms)thio; or
R^5 and R^6, together with each other, are —O—CH_2—O—, —O—CH_2—CH_2—O— or —O—CH=CH—O—;
R^9 is hydrogen or alkyl of 1 to 4 carbon atoms; and
R^{10} is alkyl of 1 to 4 carbon atoms, hydroxy(alkyl of 1 to 4 carbon atoms), methoxy(alkyl of 1 to 4 carbon atoms) or furfuryl(alkyl of 1 to 4 carbon atoms).

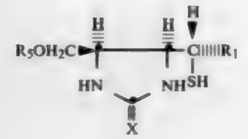
4,694,086
GUANIDINE DERIVATIVES
Hiroshi Morimoto, New York, N.Y., and Akio Ohura, Aichi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
PCT No. PCT/JP85/00151, § 371 Date Mar. 26, 1986, § 102(e) Date Mar. 26, 1986, PCT Pub. No. WO86/05782, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 28, 1985, Ser. No. 848,373
Int. Cl.[4] C07C *129/12*
U.S. Cl. 564—236 2 Claims

1. Guanidine derivatives having the following formula (I) and acid adducts thereof.



4,694,087
IMIDAZOLIDINONE PRECURSORS FOR THE PREPARATION OF BIOTIN
Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.
Division of Ser. No. 807,064, Feb. 18, 1986, Pat. No. 4,631,345, which is a division of Ser. No. 587,757, May 17, 1984, Pat. No. 4,581,459, which is a division of Ser. No. 379,247, May 17, 1982, Pat. No. 4,468,516. This application Sep. 22, 1986, Ser. No. 910,116
Int. Cl.[4] C07D *233/34*
U.S. Cl. 548—321 3 Claims

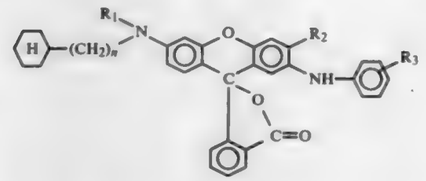
1. A compound of the formula



wherein
X is sulfur or oxygen;
R_1 is —$(CH_2)_4CH_3$, or —$(CH_2)_3OR$ or —$(CH_2)_5OR$ wherein R is alkyl, or —$(CH_2)_4CN$, or —$(CH_2)_4COOR'$ wherein R′ is alkyl or phenyl; and
R_5 is —H, —C(O)—R_6 or —SO_2R_6 wherein R_6 is alkyl, phenyl, mono- or dialkyl substituted phenyl or camphoryl, said alkyl having from 1 to 4 carbon atoms.

4,694,088
FLUORAN COMPOUNDS
Kazuo Kaneko; Susumu Suzuka; Michihiro Gonda, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan
PCT No. PCT/JP85/00121, § 371 Date Nov. 25, 1985, § 102(e) Date Nov. 25, 1985, PCT Pub. No. WO85/04414, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 12, 1985, Ser. No. 807,037
Claims priority, application Japan, Mar. 24, 1984, 59-55284
Int. Cl.[4] C07D *493/10*
U.S. Cl. 549—226 3 Claims

1. A fluoran compound represented by the general formula (I):



(I)

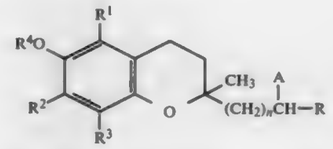
wherein R_1 represents a cyclohexyl (C_1–C_2) alkyl group; R_2 represents a hydrogen atom, a halogen atom, a lower alkyl group having 1 to 4 carbon atoms; R_3 represents a hydrogen atom, a chlorine atom, a fluorine atom or a lower alkyl group having 1 to 4 carbon atoms; and n is 2.

4,694,089
PROCESS FOR PREPARING PYROMELLITIC DIANHYDRIDE
Tsuneo Kosaka, and Yukio Sakai, both of Kurashiki, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan
Filed Sep. 2, 1986, Ser. No. 902,528
Claims priority, application Japan, Sep. 10, 1985, 60-198467
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—239 11 Claims

1. A process for preparing pyromellitic dianhydride by indirect heating of pyromellitic acid with a heating medium, which comprises heating and dehydrating the pyromellitic acid in a solid state while maintaining the temperature of the heating medium not lower than 240° C. until about 80% to about 95% of the acid is converted to the dianhydride, and heating and dehydrating the remaining pyromellitic acid while regulating the temperature of the heating medium between 200° C. and 235° C.

4,694,090
CHROMAN COMPOUNDS USEFUL AS ANALGERICS AND ANTIOXIDANTS
Manzo Shiono; Yoshiji Fujita, and Takashi Nishida, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan
Filed Dec. 7, 1984, Ser. No. 679,455
Int. Cl.[4] C07D *311/72*
U.S. Cl. 549—407 13 Claims

1. A compound of general formula



where A is an amino or hydroxyl group, R is a hydrogen atom or a hydroxymethyl or carboxyl group when A is an amino group, or a carboxyl group when A is a hydroxyl group, R^1 is a hydrogen atom or a lower alkyl group, R^2 and R^3 are the same or different and each is a hydrogen atom or a lower alkyl or alkoxy group or R^2 and R^3 combinedly represent a —CH=CH—CH=CH— group, R^4 is a hydrogen atom, a carboxylic acyl group, an alkyl group having 1 to 4 carbon atoms, a triphenylmethyl group, a benzyl group or a trimethylsilyl group, and n is an integer of 0–2, or pharmaceutically acceptable salts thereof, or when R is a carboxyl group, the pharmaceutically acceptable esters thereof.

4,694,091
METHOD FOR PREPARING A DIBUTYL TIN DIFLUORIDE POWDER FOR COATING A SUBSTRATE
Jean-Pierre Kerherve, Monthlery, and Armel Queromes, Villebon sur Yvette, both of France, assignors to Saint Gobain Vitrage, Courbevoie, France
Filed Aug. 14, 1985, Ser. No. 765,739
Claims priority, application France, Aug. 22, 1984, 84 13069
Int. Cl.[4] C07F *7/22*
U.S. Cl. 556—104 8 Claims

1. A method for preparing dibutyl tin difluoride which comprises:
reacting dibutyl tin chloride and an ammonium difluoride to form dibutyl tin difluoride;
dissolving the dibutyl tin difluoride in an appropriate solvent to form a solution;
adding a refractory powder having a predetermined particle size to the solution in an amount sufficient to act as a recrystallization initiator;

cooling the solution at a sufficient rate to recrystallize the dibutyl tin difluoride;

washing the recrystallized dibutyl tin difluoride to remove any remaining dibutyl tin chloride or solvent; and

recovering a dibutyl tin difluoride product having spherical grains averaging about 15–25 microns in size which are free of alkaline-earth and alkali impurities.

4,694,092

PARTIALLY HYDROPHILICIZED SILICA GEL AND PROCESS FOR PRODUCING THE SAME

Yasuyo Takahata, and Ryuji Miyagawa, both of Tokyo, Japan, assignors to Chemicals Inspection & Testing Institute, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,078

Claims priority, application Japan, Dec. 27, 1985, 60-299160; Dec. 27, 1985, 60-299161

Int. Cl.⁴ C07F *7/08, 7/18*

U.S. Cl. 556—400 **7 Claims**

1. Partially hydrophilicized silica gel which has hydrophobic groups on the pore inside and silanol groups on the external surface thereof.

4,694,093

POLYURETHANE RESIN COMPOSITION

Masaru Sugimori, and Koichiro Sanji, both of Takatsuki, Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

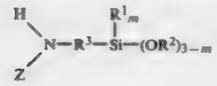
Division of Ser. No. 643,700, Aug. 24, 1984, Pat. No. 4,555,561. This application Oct. 2, 1985, Ser. No. 772,479

Claims priority, application Japan, Sep. 7, 1983, 58-165424

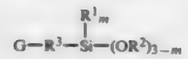
Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—413 **2 Claims**

1. An adhesion-promoting agent, which comprises a reaction product of (i) an amine compound prepared by reacting an aminoalkylalkoxysilane of the formula:



wherein R^1 and R^2 are the same or different and are each an alkyl having 1 to 4 carbon atoms, R^3 is a divalent hydrocarbon group having 1 to 4 carbon atoms, Z is hydrogen atom or an aminoalkyl having 1 to 4 carbon atoms, and m is 0, 1 or 2, and less than equimolar amount of an epoxyalkylalkoxysilene compound of the formula:



wherein R^1, R^2, R^3 and m are as defined above, and G is a glycidoxy or epoxycyclohexyl group, with an excess amount of (ii) a β-dicarbonyl compound of the formula:



wherein R^4 and R^5 are the same or different and are each an alkyl having 1 to 16 carbon atoms, an aryl having 6 to 12 carbon atoms, or an alkoxy having 1 to 4 carbon atoms.

4,694,094

CYCLIC DIPHOSPHONITES

Sylvain Juge, Puteaux, and Yvonne Legras, Paris, both of France, assignors to Societe Nationale Elf Aquitaine, France

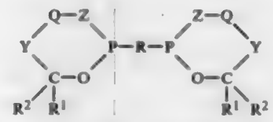
Filed May 21, 1985, Ser. No. 736,447

Claims priority, application France, May 25, 1984, 84 08215

Int. Cl.⁴ C07F *9/15*

U.S. Cl. 558—76 **5 Claims**

1. Compound of the formula



where Z is O or NR^7 in which R^7 is H or CH_3; R^1 and R^2 are independently selected from the group consisting of H, methyl, phenyl and nitrophenyl; R is $—CH_2CH_2—$; Y represents a bond or $>CHNHCOCHCl_2$ and Q is $—CH_2—$ or $>CHCH_3$.

4,694,095

PHOSPHORIC ACID DITHIOESTERS, AND INSECTICIDES CONTAINING SAID DITHIOESTERS

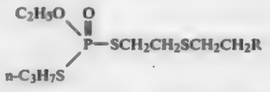
Akinori Kariya, Higashi Murayama; Shukichi Nabekawa, Tokyo; Yoshifusa Hara, Tokyo, and Junji Taguchi, Tokyo, all of Japan, assignors to Hironori Kushibiki and Nippon Chemical Industrial Co., Ltd., both of Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,646

Int. Cl.⁴ A01N *57/02*; C07F *9/165*

U.S. Cl. 558—186 **3 Claims**

1. An organo phosphoric acid dithioester represented by the general formula:



(wherein R represents a lower alkylmercapto group, a thiophenyl group or a thioebenzyl group).

4,694,096

(ACYLTHIOPROPYL)PHENOLS

Hans Lehmann, Aesch, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

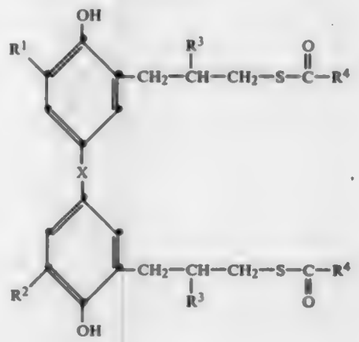
Filed Jan. 28, 1986, Ser. No. 823,230

Claims priority, application Switzerland, Feb. 1, 1985, 452/85

Int. Cl.⁴ C07C *153/023*

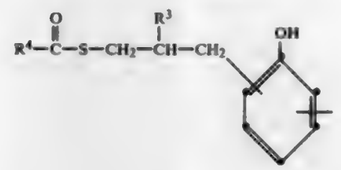
U.S. Cl. 558—251 **7 Claims**

1. A compound of formula I or II

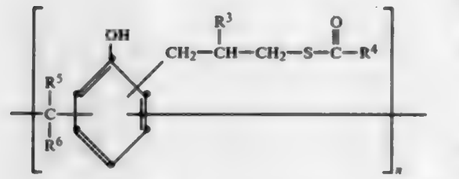


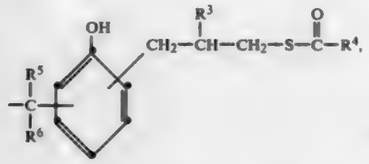
(I)

-continued



(II)





wherein R^1 and R^2 are each independently of the other hydrogen, C_1-C_8alkyl, cyclohexyl, phenyl, benzyl or tolyl, or are a $—CH_2—$ $CHR^3—CH_2—S—CO—R^4$ radical, R^3 is hydrogen or methyl, R^4 is C_1-C_{18}-alkyl, cyclohexyl, phenyl, benzyl or tolyl, X is $—CR^5R^6—$, $—S—$, $—SO—$, $—SO_2—$ or $—(CH_3)$-$C[—(CH_2)_m—COOR^7]—$, in which R^5 and R^6 are each independently of the other hydrogen or C_1-C_6alkyl, R^7 is C_1-C_1-alkyl, m is 1 or 2 and n is an integer from 1 to 10.

4,694,097

CARBAMATE ESTER PRODUCTION

Howard Alper, Ottawa, Canada, and David J. H. Smith, Camberley, England, assignors to The British Petroleum Company p.l.c., London, England

Filed Apr. 25, 1986, Ser. No. 856,665

Claims priority, application United Kingdom, May 2, 1985, 8511214

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—24 **14 Claims**

1. A process for the production of a carbamate ester which process comprises reacting at ambient temperature or elevated temperature in the range 20° to 150° C. an amine with carbon monoxide and an alcohol in the presence of a protonic acid, a dehydrating agent and a catalyst comprising (a) at least one metal selected from the group of palladium, rhodium, ruthenium, iridium and cobalt, and (b) the metal copper, the components (a) and (b) being in the form of elemental metals or compounds thereof.

4,694,098

COLORLESS LIQUID CRYSTALLINE COMPOUNDS

Yoichi Hirai; Tsunenori Fujii; Kaoru Koto; Kenji Suzuki, all of Soka; Masahiro Yoshida, Saitama; Hisashi Okawa, Kasukabe; Yoshiaki Okabe, Hitachi; Teruo Kitamura, Katsuta; Hisao Yokokura; Shintaroo Hattori, both of Hitachi; Akio Mukoh, Mito, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Kanto Chemical Co., Ltd., both of, Japan

Continuation of Ser. No. 352,019, Feb. 24, 1982, Pat. No. 4,564,694. This application Aug. 2, 1985, Ser. No. 761,885

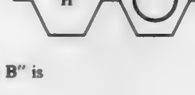
Claims priority, application Japan, Feb. 25, 1981, 56-25502; Jul. 10, 1981, 56-107074; Nov. 18, 1981, 56-183763; Nov. 18, 1981, 56-183764

Int. Cl.⁴ C07C *179/00, 69/76, 69/74*; C09K *19/32, 19/30, 19/20*

U.S. Cl. 560—59 **5 Claims**

1. A colorless liquid crystalline compound of the formula:

wherein R^1 is $—(CH_2)_nOC_mH_{2m+1}$ wherein n is an integer of 1 to 8; and m is an integer of 1 to 12; A is



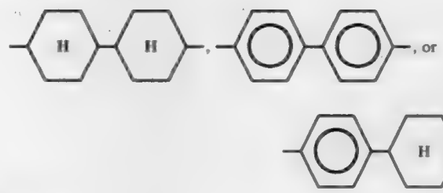
B is



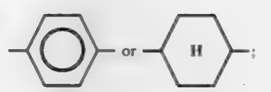
and R^2 is an alkyl group having not more than 12 carbon atoms;

4. A colorless liquid crystalline compound of the formula:

wherein R^4 and R^5 are independently a straight-chain or branched-chain alkyl group having 12 or less carbon atoms; when A″ is



then B″ is



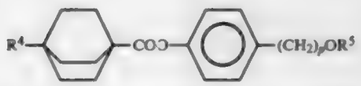
and when A″ is



then B″ is



5. A colorless liquid crystalline compound of the formula:



wherein R^4 and R^5 are independently a straight-chain or branched-chain alkyl group having 12 or less carbon atoms and p is an integer of 1 to 6.

4,694,099

PROCEDURE FOR PRODUCING STEARYL-β-(3,5-DIBUTYL-4-HYDROXYPHENYL) PROPIONATE AND BIS-(β(3,5-DIBUTYL-4-HYDROXYBENZYL)-METHYL-CARBOXYETHYL)SULPHIDE

Matts Ahlfors, Espoo; Salme Koskimies, Helsinki; Leila Lahtinen, Helsinki, and Peter Idelman, Helsinki, all of Finland, assignors to Neste Oy, Finland

PCT No. PCT/FI85/00063, § 371 Date Feb. 20, 1986, § 102(e) Date Feb. 20, 1986, PCT Pub. No. WO86/00301, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 28, 1985, Ser. No. 841,518

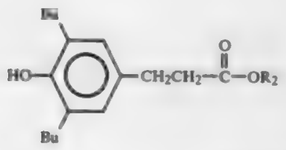
Claims priority, application Finland, Jun. 28, 1984, 842618

Int. Cl.⁴ C07C *67/03*

U.S. Cl. 560—75 **12 Claims**

1. Method for producing stearyl-β-(3,5-dibutyl-4-hydroxyphenyl)propionate or bis-(β-3,5-dibutyl-4-hydroxy-benzyl)methylcarboxethyl)sulphide,

by transesterification of a propionic acid ester of the formula



wherein Bu is an n-, secondary, iso- or tertiary butyl group and R_2 is an alkyl group containing 1 to 4 carbon atoms,

which comprises reacting said propionic acid ester with a stearyl alcohol or thiodiglycol

in the presence of a transesterification catalytic effective amount of a titanic acid ester as catalyst in the transesterification,

whereby the transesterification reaction is accelerated to form the corresponding propionate or sulphide.

4,694,100

METHOD FOR PRODUCING α-(P-ISOBUTYLPHENYL)PROPIONIC ACID OR ITS ALKYL ESTERS

Isoo Shimizu; Ryotaro Hirano; Yasuo Matsumura; Hideki Nomura; Kazumichi Uchida, all of Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,403

Claims priority, application Japan, Jul. 14, 1984, 59-146594; Jul. 14, 1984, 59-146595

Int. Cl.⁴ C07C *51/29, 51/14, 67/38*

U.S. Cl. 560—105 **33 Claims**

1. A method for producing α-(p-isobutylphenyl)-propionic acid or its alkyl esters which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis(p-isobutylphenyl) ethane under the conditions that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of said sulfuric acid and any water formed in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde;

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl) ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylstyrene and isobutylbenzene as main products; and

(III) reacting said p-isobutylstyrene with carbon monoxide and water or alcohol at temperatures in the range of 40° to 150° C. at a carbon monoxide pressure in the range of 30 to 400 kg/cm² in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylphenyl)-propionic acid or its alkyl ester.

19. A method for producing α-(p-isobutylphenyl)-propionaldehyde which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis (p-isobutylphenyl) ethane under the condition that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of sulfuric acid and any water formed in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde;

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl) ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylstyrene and isobutylbenzene as main products; and

(III) reacting said p-isobutylstyrene with carbon monoxide and hydrogen at temperatures in the range of 40° to 150° C. at a reaction pressure in the range of 5 to 500 kg/cm² in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylphenyl)-propionaldehyde.

20. A method for producing α-(p-isobutylphenyl)propionic acid which comprises the following steps of:

(I) reacting isobutylbenzene and acetaldehyde in the presence of sulfuric acid to produce 1,1-bis(p-isobutylphenyl) ethane under the conditions that the concentration of said sulfuric acid in the reaction system is not lower than 75% by weight based on the sum of the weights of said sulfuric acid and any water in the reaction system, the concentration of said acetaldehyde in the reaction system is maintained at 1% by weight or lower, and said isobutylbenzene is added in excess relative to said acetaldehyde.

(II) catalytically cracking said 1,1-bis(p-isobutylphenyl) ethane in a liquid phase at reaction temperatures in the range of 200° to 350° C. in the presence of a protonic acid catalyst or in a gaseous phase at reaction temperatures in the range of 300° to 650° C. in the presence of a solid acid catalyst or a protonic acid carrying-solid acid catalyst to produce p-isobutylsytrene and isobutylbenzene as main products;

(III) reacting said p-isobutylstyrene with carbon monoxide and hydrogen at temperatures in the range of 40° to 150° C. at a reaction pressure in the range of 5 to 500 kg/cm² in the presence of a metal complex carbonylation catalyst to produce α-(p-isobutylpheneyl)-propionaldehyde; and

(IV) oxidizing said α-(p-isobutylphenyl)propionaldehyde to produce α-(p-isobutylphenyl) propionic acid.

4,694,101

PROCESS FOR SEPARATING METHYL ISOCYANATE

George E. Heinsohn, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 639,083, Aug. 9, 1984. This application Mar. 27, 1986, Ser. No. 844,958

Int. Cl.⁴ C07C *141/00*

U.S. Cl. 560—352 **6 Claims**

1. A process for separating methyl isocyanate from a gas-phase mixture containing methyl isocyanate and water vapor comprising, in order

(a) diluting the gas-phase mixture by addition of an inert, noncondensable gas, such that the dew point of the methyl isocyanate in the mixture is lowered to about −5° C. to 5° C.;

(b) removing a portion of the water vapor by cooling the mixture to a temperature which is about 5°–10° C. above the dew point of the methyl isocyanate in the mixture, to condense the water vapor;

(c) removing essentially all the remaining water vapor from the gas-phase mixture by passing the mixture over or through a water-absorbing material; and

(d) liquefying the methyl isocyanate.

4,694,102

CALCIUM CARBOXYLATE PHENOL DERIVATIVE

Akiyoshi Oonishi; Kenji Tanaka, both of Yokkaichi; Makoto Tadeka, Ami; Kazuhiko Konno, Ami, and Masaki Saito, Ami, all of Japan, assignors to Mitsubishi Yuka Fine Chemicals Co., Ltd., Tokyo, Japan

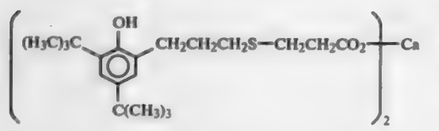
Division of Ser. No. 584,636, Feb. 29, 1984, Pat. No. 4,633,008. This application May 23, 1986, Ser. No. 866,280

Claims priority, application Japan, Mar. 15, 1983, 58-42694; Jul. 6, 1983, 58-122568

Int. Cl.⁴ C07C *149/20*

U.S. Cl. 562—426 **1 Claim**

1. A phenol derivative of the formula



4,694,103

METHOD OF PREPARING N-ACRYLOYL-α-AMINO ACIDS

Larry R. Krepski, White Bear Lake; Howell K. Smith, II, Lauderdale; Jerald K. Rasmussen, Stillwater, and Steven M. Heilmann, N. St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 19, 1986, Ser. No. 865,190

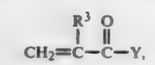
Int. Cl.⁴ C07C *99/10*

U.S. Cl. 562—450 **15 Claims**

1. A process for providing an N-acryloyl-α-amino acid comprising the steps:

(i) reacting a ketone having alkyl, aryl, or arenyl groups, or combinations of these groups, said ketone having 3 to 53 carbon and heteroatoms which can include up to 7 N, S,and O heteroatoms, an ammonium salt, and an alkali metal cyanide, in water, to provide an aminonitrile,

(ii) acryloylating the resulting aminonitrile with an acryloylating agent having the formula,



wherein R^3 is hydrogen or methyl and Y is chloride, methacryloyloxy, or acryloyloxy, in aqueous media to provide an acrylaminodonitrile, and

(iii) hydrolyzing the resulting acrylamidonitrile in aqueous acid to provide said N-acryloyl-α-amino acid.

4,694,104

PHASE TRANSFER CATALYSTS

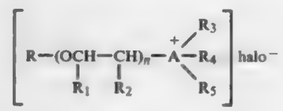
Paritosh M. Chakrabarti, Cedar Grove; Sureshchandra G. 'Desai, Wayne, and Lindley S. Wood, Jr., Montclair, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Aug. 9, 1982, Ser. No. 406,755

Int. Cl.⁴ C07C *91/26*

U.S. Cl. 564—285 **11 Claims**

1. In a liquid/liquid phase reaction process involving an organic phase and an aqueous phase, insoluble in said organic phase, said aqueous phase containing an aqueous solution of an inorganic salt having an OH^- anion the improvement which comprises contacting said inorganic salt with an effective OH^- anion exchanging amount of a quaternized phase transfer catalyst having the formula



wherein

R is alkyl having 8 to 30 carbon atoms, blends thereof or alkyl-substituted phenyl of 10 to 24 carbon atoms;

n has a value of from 2 to 14 and includes mixtures within said range;

R_1 and R_2 are hydrogen atoms or one of R_1 and R_2 is methyl;

R_3, R_4 and R_5 are independently hydrogen, alkyl radical of 1 to 6 carbon atoms or phenyl or one of R_3, R_4 and R_5 is β-ethyl-alkali metal sulfonate;

A is a phosphorous or a nitrogen atom; and halo is a chlorine or bromine ion.

4,694,105

HERBICIDAL ALKOXYAMINO- AND POLYALKOXYAMINODIPHENYL ETHERS

Dieter Dürr, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

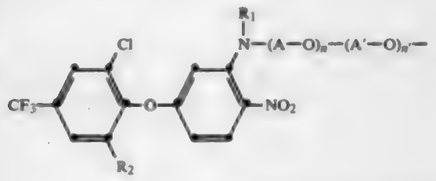
Filed Dec. 10, 1984, Ser. No. 679,860

Claims priority, application Switzerland, Dec. 20, 1983, 6758/83

Int. Cl.⁴ C07C *93/14, 149/42*

U.S. Cl. 564—430 **10 Claims**

1. A diphenyl ether of the formula



wherein:

each of A, A', A'' and A''' is an identical or different C_1–C_4-alkylene radical which may be straight-chain or branched;

n is a value of from 1 to 5;

each of n', n'' and n''' is a value of from 0 to 5;

the sum of n+n'+n''+n''' is equal to or greater than 3;

R is hydrogen or a C_1–C_4-alkyl radical unsubstituted or substituted by halogen;

R_1 is hydrogen or a C_1–C_4-alkyl, C_1–C_4-hydroxyalkyl or C_2–C_8-alkoxyalkyl; and

R_2 is hydrogen, chlorine or fluorine.

4,694,106

METHYLTHIOIONENE DERIVATIVES AND USE THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

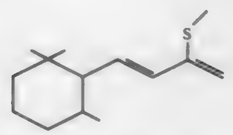
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 768,726, Aug. 23, 1985, Pat. No. 4,599,237. This application Mar. 7, 1986, Ser. No. 837,145

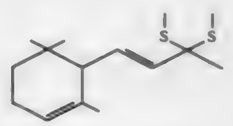
Int. Cl.⁴ C07C *149/26*

U.S. Cl. 568—38 **3 Claims**

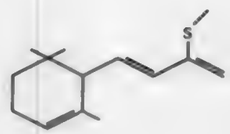
1. The methylthioionene derivative having the structure:



2. The methylthioionene derivative having the structure:



3. The methylthioionene derivative having the structure:



4,694,107

PREPARATION OF KETONES BY ISOMERIZATION OF ALDEHYDES

Wolfgang Hoelderich; Franz Merger; Wolf D. Mross, all of Frankenthal, and Rolf Fischer, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 730,676, May 3, 1985, abandoned. This application Jul. 2, 1986, Ser. No. 865,007

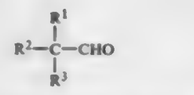
Claims priority, application Fed. Rep. of Germany, May 24, 1984, 3419378

Int. Cl.⁴ C07C *45/67*

U.S. Cl. 568—310 **13 Claims**

1. In a process for the preparation of a ketone by isomerization of an aldehyde in the presence of a zeolite catalyst, the improvement which comprises:

converting into said ketone an aldehyde of the formula



1

where R^1 is hydrogen, methyl or ethyl, R^2 is hydrogen or alkyl of 1 to 10 carbon atoms and R^3 is alkyl of 1 to 10 carbon atoms or said alkyl which is substituted by an aryl radical, or further where R^3 is an aryl, cyclopentyl, cyclohexyl or heterocyclic radical, at not more than 600° C. over a zeolite catalyst which is selected from the group consisting of a borosilicate zeolite of the pentasil type and an iron silicate zeolite of the pentasil type.

4,694,108

SYNTHESIS OF HIGHER KETONES

David J. Elliott, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 1, 1986, Ser. No. 891,838

Int. Cl.⁴ C07C *45/72*

U.S. Cl. 568—387 **29 Claims**

1. A process for preparing higher ketones comprising the step of contacting a feed comprising

(a) at least one aliphatic ketone having from 3 to 6 carbon atoms per molecule and

(b) at least one aliphatic aldehyde having from 2 to 6 carbon atoms per molecule with a catalyst composition comprising

(i) at least one of copper and copper oxide and

(ii) zinc oxide, in the substantial absence of free hydrogen in said feed, under such contacting conditions as to obtain a product comprising at least one ketone having at least one carbon atom per molecule more than said aliphatic ketone (a).

4,694,109

CHELATE LIGANDS FOR LOW PRESSURE HYDROFORMYLATION CATALYST AND PROCESS EMPLOYING SAME

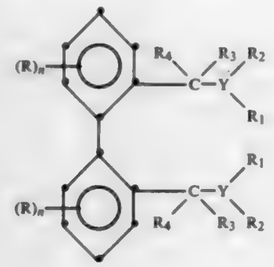
Thomas J. Devon; Gerald W. Phillips; Thomas A. Puckette; Jerome L. Stavinoha, and Jeffrey J. Vanderbilt, all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 13, 1986, Ser. No. 873,918

Int. Cl.⁴ C07C *45/50*

U.S. Cl. 568—454 **11 Claims**

1. A hydroformylation process comprising contacting at least one olefin having from 2 to 20 carbon atoms in a reaction zone at a temperature of from about 20° C. to about 250° C. and a pressure of from about 50 psig to about 800 psig with hydrogen, carbon monoxide, and a catalyst comprising rhodium in chemical complex with one or more ligands of the formula



wherein:

n is 1–4;

each R is independently selected from hydrogen, alkyl, alkoxy, aryloxy, aryl, aralkyl, alkaryl, alkoxyalkyl, cycloaliphatic, halogen, alkanoyl, alkanoyloxy, alkoxycarbonyl, carboxyl or cyano;

each R_1 and R_2 is independently selected from alkyl, aryl, aralkyl, alkaryl or cycloaliphatic;

each R_3 and R_4 is independently selected from hydrogen and the R_1 substituents;

wherein each alkyl group or moiety is straight or branched chain of 1–20 carbons, each aryl group contains 6–10 ring carbons, and each cycloaliphatic group contains from 4–6 ring carbons; and

each y is independently selected from the elements N, P, As, Sb and Bi;

for a sufficient period of time to permit reaction of said olefin with said carbon monoxide and hydrogen to form aldehyde product.

4,694,110

PROCESS FOR PRODUCTION OF M-PHENOXYBENZYL ALCOHOL

Shinji Takenaka, and Ryu Oi, both of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,414

Claims priority, application Japan, May 13, 1985, 60-99593

Int. Cl.⁴ C07C *29/00*

U.S. Cl. 568—638 **3 Claims**

1. Process for producing m-phenoxybenzyl alcohol which comprises reacting chlorobenzene with m-hydroxybenzyl alcohol in the presence of a catalytic amount of a copper complex of 8-hydroxyquinoline and a base, wherein chlorobenzene is added to a polar solvent having a higher boiling point that chlorobenzene, the amount of chlorobenzene being 0.05 to 4.0 times the weight of the polar solvent; at least one compound selected from the group consisting of alkali hydroxides, alkali carbonates and alkali bicarbonates, is used as the base in an amount of 1.0 to 2.0 gram-equivalents per mole of m-hydroxybenzyl alcohol; and the reaction is carried out at a temperature of 140° to 200° C. while removing the generated water as an azeotrope with chlorobenzene.

4,694,111

ALKOXYALKYLATION OF PHENOL

Balaram B. G. Gupta, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 9, 1986, Ser. No. 883,675

Int. Cl.⁴ C07C *41/01*

U.S. Cl. 568—662 **16 Claims**

1. A process for the production of a 1-hydroxy-2-(1'-lower alkoxyalkyl) benzene by reaction of phenol with a lower acetal or ketal comprising contacting a feed stream comprising said phenol and lower acetal or ketal at an elevated temperature with a protonated ZSM-5 zeolite as catalyst.

4,694,112

PROCESS FOR PRODUCING 2,2,2-TRIFLUOROETHANOL

Heinrich Willenberg, Garbsen; Wilhelm Pohlmeyer, and Werner Rudolph, both of Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,824

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510883

Int. Cl.⁴ C07C *31/38*

U.S. Cl. 568—842 **15 Claims**

1. A process for producing 2,2,2-trifluoroethanol by catalytic hydrogenation of 2,2,2-trifluoroethyl trifluoroacetate with elemental hydrogen in the gaseous phase at a reaction temperature of at least 100° C. and less than 210° C. in the presence of an oxide catalyst comprising oxides of zinc and copper, the sum of all oxides being set at 100 percent and the weight ratio of chromium oxide to the total of the oxide materials being from 0 to 0.05:1.

4,694,113

DUAL CATALYST SEQUENTIAL METHOD FOR PRODUCTION OF SORBITOL FROM HYDROLYZED STARCH SOLUTION

George J. Gauthier, Groton, and John D. Miceli, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,462

Int. Cl.⁴ C07C *29/132, 29/14, 31/26*

U.S. Cl. 568—863 **13 Claims**

1. A process for production of sorbitol from a 50 to 98.5 DE hydrolyzed starch solution which comprises the steps of

(a) hydrogenation of said hydrolyzed starch solution in the presence of a catalytic amount of nickel at a pH in the range of 3.0 to 7.0, at 120° to 160° C. and a pressure of from 500 to 2000 psig (35 to 140 bars), until the reducing sugar content of the mixture is below 5 percent;

(b) removal of nickel catalyst and acidification of the resulting solution to a pH in the range of 1.0 to 2.5;

(c) hydrogenation of the acidified solution in the presence of a catalystic amount of ruthenium at 100° to 180° C. and a pressure of from 500 to 2000 psig (35 to 140 bars) until hydrogen uptake is substantially complete, and removal of said ruthenium.

4,694,114

PROCESS FOR ISOMERIZING ALKYL AROMATIC HYDROCARBONS UTILIZING ZSM-23 ZEOLITE AND A HYDROGENATION/DEHYDROGENATION METAL

Yung-Feng Chu, Cherry Hill, N.J., and James C. Vartuli, West Chester, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 766,687, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 569,827, Jan. 11, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,319

Int. Cl.[4] C07C 5/22

U.S. Cl. 585—481 **6 Claims**

1. A process for producing a near equilibrium mixture of xylenes from a feed comprising ethylbenzene and mixed xylenes which comprises contacting the feed with hydrogen in the presence of a catalyst composition consisting essentially of 0.1 to 1 weight percent of a hydrogenation/dehydrogenation metal, 5 to 97 weight percent alumina and 3 to 80 weight percent ZSM-23 zeolite

wherein catalyst contact with the feed is undertaken at a weight hourly space velocity of 0.5 to 15 based on the catalyst, a pressure of from between 0 to 1000 psig and a temperature of from between 600° F. and 900° F., and

wherein ZSM-23 is steamed prior to hydrogenation/dehydrogenation metal incorporation into the catalyst composition.

4,694,115

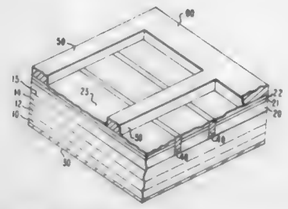
SOLAR CELL HAVING IMPROVED FRONT SURFACE METALLIZATION

David R. Lillington, Van Nuys; Nick Mardesich, Simi Valley; Hans G. Dill, Newhall, and George F. J. Garlick, Los Angeles, all of Calif., assignors to Spectrolab, Inc., Sylmar, Calif.

Filed Nov. 4, 1986, Ser. No. 927,282

Int. Cl.[4] H01L 31/06

U.S. Cl. 136—256 **7 Claims**



1. A solar cell comprising:

a first layer of gallium arsenide semiconductor material of an N+ conductivity;

a second layer of gallium arsenide semiconductor material of an N conductivity overlying said first layer;

a third layer of gallium arsenide semiconductor material of a P conductivity overlying said N conductivity layer and forming a P-N junction therebetween, said P conductivity thrid layer and said N+ conductivity first layer having front and back essentially parallel major surfaces, respectively, which are essentially parallel to said P-N junction;

a layer of aluminum gallium arsenide semiconductor material of a p conductivity overlying said front major surface of said P conductivity third layer and having an exposed surface essentially parallel to said front major surface and at least one edge;

a plurality of metallic contact lines made of a first metal alloy composition and being spaced apart by a first predetermined distance traversing said exposed surface and extending through said aluminum gallium arsenide layer to said front major surface and making electrical contact to said third layer;

a plurality of longitudinally disposed metallic grid lines made of a second metal alloy composition and being spaced apart by a second predetermined distance located on said exposed surface of said aluminum gallium arsenide layer and which cross said metallic contact lines and make electrical contact to said metallic lines;

a flat metallic strip disposed on said aluminum gallium arsenide layer exposed surface near said edge, said strip electrically coupling said metallic grid lines to one another; and

a back contact located on said back major surface.

4,694,116

THIN-FILM SOLAR CELL

Yutaka Hayashi, Ibaraki; Toshio Mishuku, Gunma; Mitsuyuki Yamanaka, Ibaraki, and Hideyo Iida, Takasaki, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry and Taiyo Yuden Co., Ltd., both of Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,210

Claims priority, application Japan, Mar. 22, 1985, 60-56165

Int. Cl.[4] H01L 31/06

U.S. Cl. 136—256 **15 Claims**

1. A thin-film solar cell, comprising:

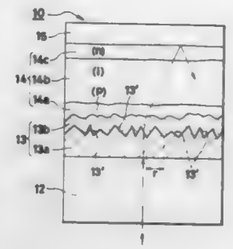
a transparent substrate;

a transparent electrode formed on the transparent substrate which is constituted of a first layer in contact with the transparent substrate and a second layer formed on said first layer;

a photoelectric conversion section formed on said second layer of said transparent electrode; and

a light-reflective back electrode formed on the photoelectric conversion section,

said first layer of the transparent electrode being formed of crystal grains having a relatively large average grain



diameter such that said first layer presents a rough upper surface having a plurality of sharply tipped points and said second layer is formed of crystal grain having a relatively smaller average grain diameter on said first layer and is of sufficient thickness such that the upper surface of said first layer is rounded by the provision thereon of said second layer.

4,694,117

SOLAR CELL

Gerda Friedrich, Unterheinriet; Klaus-Dieter Rasch, Nordheim, and Wilfried Schmidt, Talheim, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,173

Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516117

Int. Cl.[4] H01L 31/06

U.S. Cl. 136—256 **6 Claims**



1. Solar cell comprising a semiconductor body (1, 2) containing a pn-junction (6), said body being provided with a reflection-reducing layer (3) on the surface intended for incident light (7) and having a rear contact (8) on the opposite surface, wherein at least one front interconnector (5) is directly applied to the reflection-reducing layer (3) of insulating material, so that the charge carriers pass from the semiconductor body (1, 2) to the front interconnector (5) by tunnelling through the reflection-reducing layer (3).

4,694,118

AERIAL TERMINAL FOR TELECOMMUNICATION CABLES

Gunter P. Schmidt, Spring Hill, Fla., assignor to G-A-T-M Corporation, Brooksville, Fla.

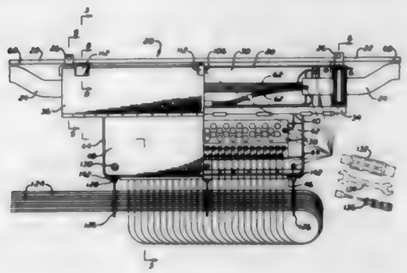
Filed Oct. 10, 1985, Ser. No. 786,461

Int. Cl.[4] H02G 15/10, 7/06

U.S. Cl. 174—41 **32 Claims**

1. An aerial terminal for telecommunication cables, said aerial terminal comprising: a splicing housing defined by an enclosure dimensioned and configured to receive a first seg-

ment of a telecommunication cable therein; a plurality of clamping means attached to the exterior of said splicing housing whereby said aerial terminal may be suspended from a second segment of the telecommunication cable; a terminal housing depending from said splicing housing, said terminal housing being defined by a box the top of which is congruent with at least a portion of said enclosure defining said splicing housing, a plurality of apertures being formed through said congruent portions whereby the interior of said splicing housing and said terminal housing are in communicating relation to each other, the interior of said terminal housing having a telecommunication terminal block mounted therein whereby pairs



of telephone wires contained within the first segment of the telecommunication cable may be operatively connected to subscriber drop wires; said aerial terminal further comprising a plurality of drop wire slots formed through said terminal housing box and a plurality of wire straps depending from said terminal housing box to receive and support subscriber drop wires; both said splicing housing and said terminal housing having hinged covers thereon whereby access to the interior of each of said housings may be obtained; said splicing housing further comprising at least a pair of sealing sleeves for surrounding the first segment of the telecommunication cable, one of said sleeves being disposed at each end of said splicing housing enclosure.

4,694,119

HEAT SHIELDED MEMORY UNIT FOR AN AIRCRAFT FLIGHT DATA RECORDER

Johannes B. Groeneweges, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 529,831, Sep. 7, 1983, abandoned. This application Dec. 31, 1984, Ser. No. 687,910

Int. Cl.⁴ H05K *5/04*

U.S. Cl. 174—52 PE **4 Claims**



1. An enclosure for thermally protecting one or more heat sensitive items from a high temperature environment, said enclosure comprising:

a metal outer housing including an interior cavity for containing said one or more heat sensitive items;

a first thermal insulator configured as a thermal liner that extends about the surface of said first interior cavity, said thermal liner defining a second interior cavity with said one or more heat sensitive items being spaced apart from the walls of said second interior cavity said first thermal insulator being a solid material and remaining solid when said enclosure is exposed to a high temperature environment; and

an amide wax, said wax occupying at least a portion of said interior cavity and encapsulating said one or more heat sensitive items said amide wax exhibiting a phase transition at a predetermined temperature, said predetermined temperature being selected to maintain said amide wax in a solid phase when said enclosure is not exposed to said high temperature environment and being selected to allow conversion of said amide wax to a liquid phase when said enclosure is exposed to said high temperature environment.

4,694,120

FRAMEWORK FOR COMPONENTS

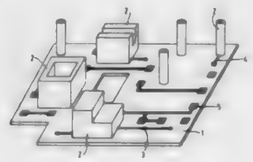
Jan F. Accou, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,872

Claims priority, application Netherlands, Nov. 27, 1984, 8403596

Int. Cl.⁴ H05K *1/00*

U.S. Cl. 174—68.5 **3 Claims**





1. A framework for components in an electrical or mechanical apparatus comprising

a mounting plate comprising a metal plate covered on opposed major surfaces with electrically insulating layers having conductor patterns superimposed thereon,

at least one synthetic resin mounting projection molded on one side of said mounting plate, said projection being secured to said mounting plate by synthetic resin molded through at least one respective hole in said plate to engage the opposite side,

synthetic resin eyelets molded in holes through said mounting plates, each eyelet having two integral flanges, one said flange molded against each major surface of said board, said eyelets being connected to at least one mounting projection by at least one runner of synthetic resin, said mounting projection and said eyelets being integrally molded.

4,694,121

PRINTED CIRCUIT BOARD

Masuaki Ota, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,396

Claims priority, application Japan, Nov. 8, 1985, 60-248710

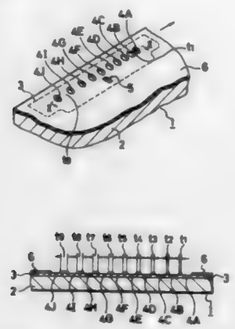
Int. Cl.⁴ H05K *3/34*

U.S. Cl. 174—68.5 **6 Claims**

1. A printed circuit board comprising:

an electrically insulative substrate;

an electroconductive layer formed on said electrically insulative substrate; and



a resist layer formed on said electroconductive layer and having a row of openings, distances between adjacent openings increasing from one end to another end of said row.

4,694,122

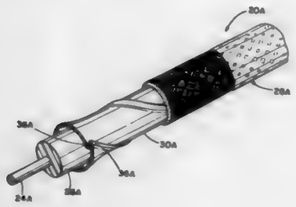
FLEXIBLE CABLE WITH MULTIPLE LAYER METALLIC SHIELD

Leonard J. Visser, Batavia, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 4, 1986, Ser. No. 835,978

Int. Cl.⁴ H01B *7/18*

U.S. Cl. 174—106 R **18 Claims**



1. A flexible shielded cable comprising:

an elongate, flexible metal conductor;

a layer of a flexible dielectric material disposed about said conductor; and

a flexible metallic shield disposed about said layer, said shield including a copper foil having overlapping edges, a copper braid about the foil, and a layer of metal which closes any opening between said overlapping edges, bonds said braid and said foil and closes the interstices of said braid whereby said shield is flexible and has no openings therein.

17. A method of forming a metallic shield about a flexible metal conductor encompassed by a layer of dielectric material to form a flexible coaxial cable, said method comprising:

wrapping a copper foil about said layer of dielectric material so that said foil has overlapping edges;

applying a copper braid over said foil; and

passing the braided cable through a bath of a molten metal which bonds to said braid and said foil so that any opening between said edges of said foil is closed and the interstices of said braid are closed.

4,694,123

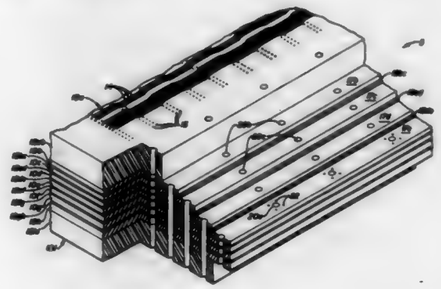
BACKPLANE POWER CONNECTOR SYSTEM

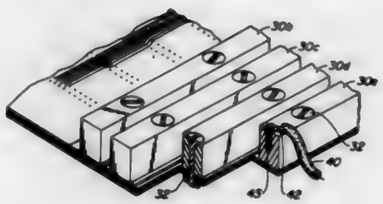
Edwin M. Massey, San Jose, Calif., assignor to ELXSI, San Jose, Calif.

Filed Jan. 13, 1982, Ser. No. 339,034

Int. Cl.⁴ H01B *7/08*

U.S. Cl. 174—117 FF **9 Claims**





1. In a backplane power distribution system having a laminated series of circuit boards comprising, in order, a first conductive layer, a first dielectric layer, a second conductive layer, and a second dielectric layer, the improvement wherein

said second conductive and dielectric layers extend transversely beyond said first conductive and dielectric layers to define a substantial extended exposed flat surface portion of said second conductive layer,

the improvement further comprising a rectangular bus bar in direct contact with said flat surface portion to facilitate electrical connection thereto.

4,694,124

DIGITIZING TABLET SYSTEM INCLUDING A TABLET HAVING A GRID STRUCTURE MADE OF TWO ORTHOGONAL SETS OF PARALLEL UNIFORMLY SIZED AND SPACED U SHAPED LOOPS OF CONDUCTIVE MATERIAL

Barry Bleaser, Raymond, N.H., assignor to Pencept, Inc., Waltham, Mass.

Continuation of Ser. No. 592,879, Mar. 23, 1984, Pat. No. 4,582,955. This application Dec. 9, 1985, Ser. No. 790,883

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ G08C *21/00*

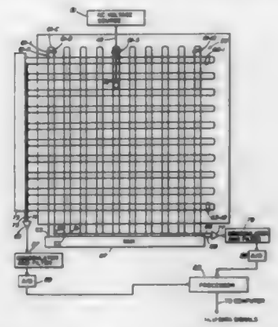
U.S. Cl. 178—19 **11 Claims**

1. A digitizing tablet system comprising:

a. a housing having a two dimensional work surface,

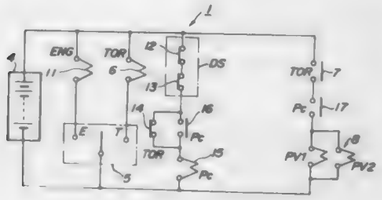
b. a grid structure in said housing, said grid structure including a first plurality of spaced parallel U-shaped conductive loop elements equal in size disposed in a plane parallel to said work surface and defining a first coordinate axis and a second plurality of spaced parallel U-shaped conductive loop elements equal in size disposed in a plane parallel to said work surface and defining a second coordinate axis,

c. a magnetizable coil indicating a position relative to said first and second coordinate axes of said grid structure,
d. means for providing an alternating voltage signal to energize said magnetizable coil so as to produce by electromagnetic induction voltage signals in the loop elements of said grid structure related to the position indicated by said coil relative to the axes of said grid structure, and



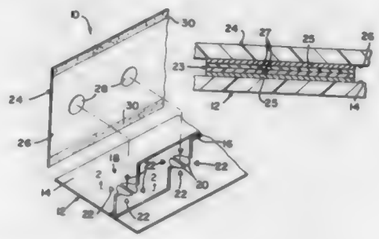
e. processing means for processing said induced voltage signals to determine the position indicated by said coil relative to an axis of said grid structure as a function of three positions defined by a U-shaped loop having the largest induced voltage and the U-shaped loops on either side thereof.

4,694,125
COLLECTOR DEVICE FOR TROLLEY-ASSISTED VEHICLES
Hidetoshi Takei, Ayase, and Teruo Minami, Kawasaki, both of Japan, assignors to Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd., Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 887,564
Claims priority, application Japan, Jul. 22, 1985, 60-160322; Jul. 22, 1985, 60-160323
Int. Cl.⁴ B60L *5/00, 5/04*
U.S. Cl. 191—87 **6 Claims**



1. Collector device for trolley-assisted vehicles comprising a pantograph operating circuit having a mode changing switch for switching trolley mode and non-trolley mode, a pantograph operating electromagnetic valve being energized in the trolley mode of the mode changing switch and deenergized in the non-trolley mode, and a battery for supplying the pantograph operating electromagnetic valve, the vehicle can be driven by a power fed from overhead contact system collected by pantographs being operated into working position to contact with the overhead contact system by energization of the pantograph operating electromagnetic valve and to leave the overhead contact system at deenergization of the valve by a pantograph controlling mechanism, characterized in that the pantograph operating circuit comprises;
a first switching circuit portion being set when a door switch corelated to doors of the vehicle is in closed condition and the mode changing switch is in non-trolley mode, and being reset when the mode changing switch is in trolley mode and the door switch is in open condition, and
a second switching circuit portion which energizes the pantograph operating electromagnetic valve when the first switching circuit portion is set condition and the trolley mode changing switch is in trolley mode, and deenergizes said pantograph operating electromagnetic valve when the first switching portion is reset condition and the trolley mode changing switch is in non-trolley mode.

4,694,126
MEMBRANE KEYBOARD SWITCH ASSEMBLY HAVING SPACER STRUCTURE AND METHOD OF MAKING
Hugh H. Aiken, Jr., Milford, and Gordon B. Langford, Amherst, both of N.H., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 29, 1986, Ser. No. 868,822
Int. Cl.⁴ H01H *13/70*
U.S. Cl. 200—5 A **20 Claims**

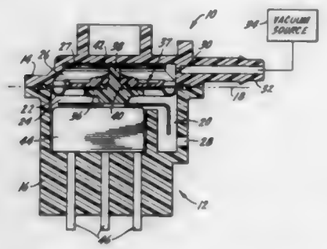


1. A membrane switch comprising:
a first dielectric layer having a plurality of first elongated electrical conductors disposed thereon, each of said first conductors being in electrical communication with but spaced from first contact pad means;
a second dielectric layer having a plurality of second elongated electrical conductors disposed thereon, each of said second conductors being in electrical communication with but spaced from second contact pad means, said first and second contact pads forming switch sites when placed in facing relationship;
spacer means as part of said first dielectric layer, said spacer means being disposed in a symmetrical discontinuous pattern around but remote from said first contact pad means, said spacer means normally maintaining said first and second contact pad means spaced from each other at said switch sites and permitting electrical engagement there between upon application of an actuation force to said switch sites;
electrical insulating means disposed between at least one of any opposed first and second conductors when said first and second dielectric layers are assembled to form said membrane switch, said insulating means being spaced from said switch site; and
means for holding said first and second dielectric layers in alignment so that corresponding first and second contact pad means overlie one another at said switch sites.

4,694,127
PRESSURE RESPONSIVE SWITCH ASSEMBLY
Suarawu O. Amuda, Decatur, Ill., assignor to Borg-Warner Automotive, Inc., Troy, Mich.
Filed Jun. 23, 1986, Ser. No. 877,062
Int. Cl.⁴ H01H *35/34*
U.S. Cl. 200—83 P **6 Claims**

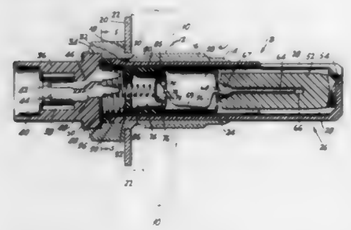
1. A pressure responsive switch assembly comprising:

a housing defining an enclosure, a vacuum port and a reference port;
diaphragm-actuator means mounted in said enclosure and cooperating with said housing to define a reference chamber and an actuation chamber;
a source of fluid at a reference pressure communicating with said reference chamber through said reference port;
a source of fluid at a variable vacuum communicating with said actuation chamber through said vacuum port;
disc-shaped means disposed in said actuation chamber separate from but adjacent to said diaphragm-actuator means for maintaining said diaphragm-actuator means at a reference position when said disc-shaped means assumes a first



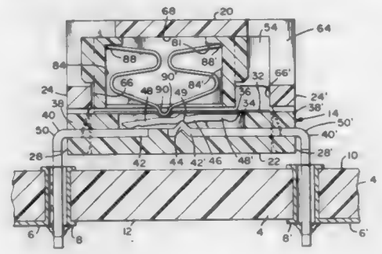
position, said disc-shaped means being deformable to a second position by said diaphragm-actuator means in response to a predeteremined first fluid differential pressure between said actuation chamber and said reference chamber and being reformable to said first position at a second fluid pressure differential less than said first fluid pressure differential; and
operative switch means disposed in said reference chamber as an assembly which is responsive to position changes of but is independently mounted from said diaphragm-actuator means and disc-shaped means and which is protected from variable vacuum fluid contamination by said diaphragm actuator means.

4,694,128
FLOAT SWITCH CONSTRUCTION FOR MONITORING LIQUID LEVELS
Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.
Filed Jul. 7, 1986, Ser. No. 882,945
Int. Cl.⁴ H05K *35/18*
U.S. Cl. 200—84 R **23 Claims**



1. A float switch construction for monitoring liquid levels, comprising in combination:
(a) an elongate float housing having an axis, and having an aperture to permit the liquid to enter the interior thereof, said housing being adapted for mounting in different rotative positions with its axis substantially horizontal,
(b) a float member comprising buoyant material, said member being held captive in said housing and being movable therein between raised and lowered positions,
(c) an asymmetric, elongate movable contact member disposed in the housing with its axis substantially horizontal,
(d) said movable contact member having a laterally offset portion constituting a gravity-responsive mass disposed at one side of its axis,
(e) electrically conductive bearing means in said housing, engaged with the contact member at a point intermediate its ends, and mounting the member for both turning movement and pivotal movement in the housing, and for conducting current to or from the contact member,
(f) said float member and movable contact member having cooperating engaged portions causing the movable contact member to pivot in response to rise or fall of the float member, said movable contact member being freely turnable with respect to the float member, and
(g) a fixed contact member having contact portions disposed in a generally circular configuration, said fixed contact member being located in said housing, adjacent to said movable contact member and adapted for engagement by the movable contact member in response to the pivotal movement thereof irrespective of the angular orientation of the float housing,
(h) said engagement of said contact members establishing a circuit from the fixed contact member to said bearing means.

4,694,129
CIRCUIT BOARD SWITCH HAVING IMPROVED SWITCH SPRING
Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed May 23, 1986, Ser. No. 868,367
Int. Cl.⁴ H01H *5/20*
U.S. Cl. 200—68.2 **10 Claims**



1. A switch which is intended for mounting on a circuit board or the like, the switch comprising a housing assembly having a mounting face, a top face which is directed oppositely with respect to the mounting face, oppositely facing first and second housing sidewalls and oppositely facing housing endwalls, first and second fixed switch conductors which extend through the switch housing sidewalls and which have contact ends which are proximate to each other in the housing assembly, a contact bar in the housing assembly which is in overlapping relationship to the contact ends, the second fixed conductor having a fulcrum on its contact end on which the contact bar is rockably supported, a slide housing which is between the first and second housing assembly sidewalls and which is movable between a first position, in which the slide housing is proximate to the first housing sidewall, and a second position, in which the slide housing is proximate to the second housing sidewall, a spring-receiving recess in the slide housing and a spring means in the recess, the spring means being in resilient engagement with the contact bar and being effective to hold the first end of the contact bar against the first fixed contact when the slide housing is in the first position and being effective to hold the contact bar disengaged from the first fixed

contact when it is in the second position, the switch being characterized in that:

the spring means comprises first and second bellows springs, each bellows spring having a fixed end, a free end, and at least two compressible bellows spring sections between its fixed end and its free end, the spring-receiving recess having a central axis which extends normally of the housing assembly sidewalls, the free ends of the bellows springs being substantially on the central axis and being connected to each other at a bearing portion which is proximate to the mounting face, the fixed ends being spaced from the central axis and being against opposed wall portions of the recess on opposite sides of the central axis, the fixed ends being proximate to the top face,

the spring means being compressed in the direction parallel to the central axis so that the bearing portion bears resiliently against the contact bar,

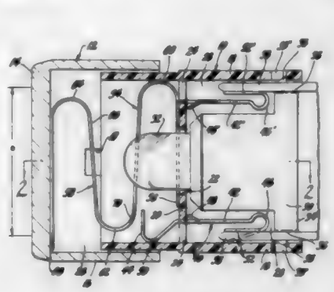
the spring means being compressed in the direction normal to the central axis so that the fixed ends of the bellows springs bear resiliently against the opposed wall portions of the recess, such that the cooperation of the fixed ends with the wall portions ensures that the spring means will be centered in the recess and resiliently maintained in that position.

4,694,130

ILLUMINATED PUSHBUTTON SWITCH WITH UNITARY SPRING AND CONTACT

Ronald A. Kitzmann, and Sarkis K. Tchejeyan, both of Santa Barbara, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1986, Ser. No. 901,944
Int. Cl.⁴ H01H *1/18, 1/36, 9/16*
U.S. Cl. 200—314 **6 Claims**



1. An illuminated pushbutton switch comprising

a base,

a pushbutton mounted for telescoping movement relative to the base between released and depressed states for switch operation,

a cap on the pushbutton spaced from the base,

a lamp on the base for illuminating the cap,

a stationary contact secured to the base and extending toward the pushbutton cap, and

a unitary movable contact and bifurcated spring means secured at one end to the base and having a pair of spaced sinuous portions each portion comprising a plurality of straight sections joined at bends and compressed between the base and the pushbutton cap and engaging the cap at the cap margins to spring load the pushbutton away from the base and to allow illumination of the caps within the margins,

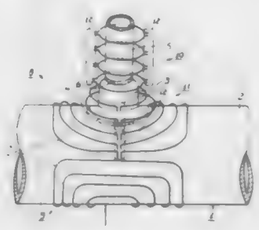
the movable contact and bifurcated spring means having an integral part adjacent and spaced from the stationary contact in one state and moving in response to pushbutton movement so that it is pressed into engagement with the stationary contact in the other state.

4,694,131

INDUCTION HEATING METHOD AND APPARATUS FOR RELIEVING RESIDUAL STRESS IN WELDED JOINT BETWEEN MAIN AND BRANCH PIPES

Toshio Ino; Tsukasa Maesosono; Kazuo Yoshida; Masanori Terasaki; Tetsuaho Kuriwaki, all of Yokohama; Tadao Koga, Kisarazu, and Miharu Hirado, Yokohama, all of Japan, assignors to Daiichi Kouatsu Kogyo Kabushiki Kaisha and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,968
Claims priority, application Japan, May 31, 1984, 59-109600
Int. Cl.⁴ H05B *6/40*
U.S. Cl. 219—10.41 **1 Claim**



1. A heating method for relieving residual stress in a welded joint between main and branch pipes of the type in which a portion of said main and branch pipes including the welded joint between said main and branch pipes is surrounded with a high-frequency induction coil and said coil is energized to heat said portion, thereby relieving residual stress in said welded joint, which comprises the steps of dividing said high-frequency induction heating coil axially of said main pipe to form upper and lower coil sections and also axially of said branch pipe to form first and second sections, mounting each of said coil sections on a corresponding portion of said main and branch pipes to cover the entire circumferential surface area of both of said main and said branch pipes adjacent to said welded joint so as to mate with the whole circumferential surface area of said main and branch pipes to be heated including the welded joint therebetween and disposing all of said coil sections on said main and branch pipes so that electric current flowing through said coil sections will flow in the same direction through all of said coil sections, connecting said coil sections together and causing current to flow through all of said coil sections, and establishing a substantially uniform magnetic flux density distribution over said whole circumferential surface area of said main and branch pipes including the welded joint therebetween whereby said whole circumferential surface area of said main and branch pipes including said welded joint therebetween is substantially uniformly heated to a desired temperature.

4,694,132

MICROWAVE OVEN TURNTABLE WITH REMOVABLE TABLE TOP

Yin C. Liu, 973 Shulman Ave., Santa Clara, Calif. 95050

Filed Oct. 22, 1986, Ser. No. 921,962
Int. Cl.⁴ H05B *6/78*
U.S. Cl. 219—10.55 F **14 Claims**

1. A portable microwave oven turntable comprising,

a base having a horizontal bottom and uprightly extending sides to form a base interior,

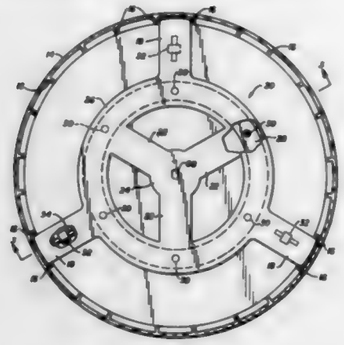
a coil spring disposed within said base interior,

a central drive shaft rotatably attached to said base to form a vertical axis of rotation, said coil spring disposed to turn said drive shaft,

means for governing the rotational speed of said central drive shaft,

a circular base cover member connected to said base, said base cover member having an inner circumference defining a center aperture, said central drive shaft having an upper portion projecting through said center aperture,

a spider drive member concentrically positioned atop said base cover member, said spider drive member mounted to said upper portion of the central drive shaft, said spider drive member having a plurality of radial spider arms, said spider arms having coplanar upper surfaces, and



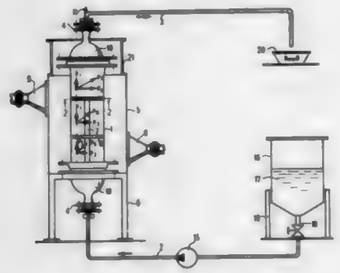
a circular table top removably rested atop said spider drive member, said table top having a substantially planar platform and a downwardly extending cylindrical side wall and having a plurality of projecting members, each projecting member extending downwardly from a surface of said planar platform adjoining said spider drive member, a plurality of said projecting members in rotational transfer engagement with said spider arms.

4,694,133

PROCESS AND DEVICE FOR HOMOGENEOUS MICROWAVE THERMAL TREATMENT OF LIQUID OR SOLUTION IN MOTION

Toai Le Viet, Vevey, Switzerland, assignor to Nestec S. A., Vevey, Switzerland

Filed Mar. 31, 1986, Ser. No. 846,291
Claims priority, application Switzerland, May 6, 1985, 1906/85
Int. Cl.⁴ H05B *6/78*
U.S. Cl. 219—10.55 M **9 Claims**



1. A process for heating liquids comprising:

delivering a liquid to an inlet end of a vertical cylindrical tube;

moving the liquid through the tube through at least one perforated plate in the tube and restricting the flow of the liquid in the central portion of the tube for at least a portion of a height of the tube from the inlet end;

exposing the liquid moving through the tube to a microwave energy field; and

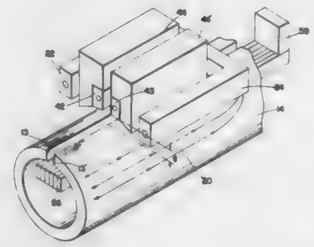
receiving the heated liquid from an outlet end of the tube.

4,694,134

APPARATUS FOR OVERHEATING EDGES OF SKELP FOR THE PRODUCTION OF COMPRESSION WELDED PIPE

Nicholas V. Ross, Youngstown, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed May 28, 1985, Ser. No. 738,361
Int. Cl.⁴ H05B *6/40*
U.S. Cl. 219—10.79 **4 Claims**



1. Induction heating apparatus for the overheating of the edges of preheated skelp which has been formed into a circular open shape, said apparatus comprising an induction heating coil assembly having a pair of electrically series-connected loops, each loop having a main conductor and a return conductor co-planar therewith, said main conductors being positioned within magnetic flux guides disposed over the outermost and uppermost sides of each of the said main conductors, which main conductors are each adapted to be positioned in spaced proximity to a different linear edge of the preheated open skelp to concentrate the currents along the said edges of the skelp and to provide uniform equal localized heating to welding temperature of both said preheated edges to weld the same, the return conductors positioned externally to the flux guides providing a distribution of return currents over a relatively greater area.

4,694,135

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING RESISTANCE SPOT WELDING

Gregory L. Nagel; David M. Sidlosky, both of Royal Oak; Balarama V. Murty, Sterling Heights; Anthony Lee, West Bloomfield, all of Mich., and Dixon Cleveland, Vienna, Va., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1986, Ser. No. 883,934
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—110 **18 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 59 Pages)

9. A method of controlling resistance spot welding comprising the steps of;

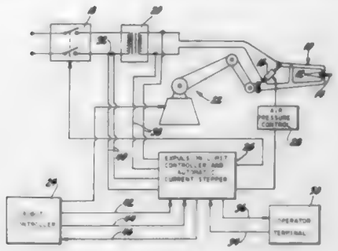
applying weld current to a workpiece,

stabilizing the weld process by applying a preheat current pulse to the workpiece immediately after initial contact of electrodes with the workpiece and then inhibiting weld current for a cooling period to establish consistent interface resistance levels,

measuring electrical welding parameters,

calculating first and second derivative resistance values from the measured parameters,

analyzing the calculated values during the welding process to detect an expulsion event and the time of the event, and



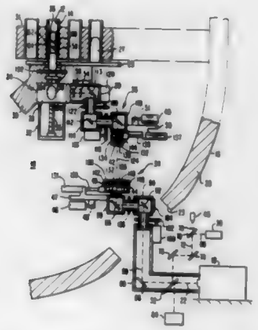
terminating weld current upon detection of an expulsion event.

4,694,136

LASER WELDING OF A SLEEVE WITHIN A TUBE

William H. Kasner, Penn Hills Twp., Allegheny County; Gerald J. Bruck, Library; Richard A. Miller, North Huntingdon, and Vincent A. Toth, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1986, Ser. No. 821,675
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD **24 Claims**



1. A method for welding a sleeve within a tube of a steam generator, the steam generator having a plurality of tubes supported by a tubesheet, the sleeve being in close-contact with the tube at the predetermined weld site, the method comprising:

positioning a welding head having a focusing lens means, a welding mirror means, and a focal distance maintaining means within the tube at the predetermined weld site;

directing a laser beam to the welding head;

focusing the laser beam with the focusing lens means within the welding head;

reflecting the laser beam focused by the focusing lens means with the welding mirror means out of the weld head and into contact with a portion of the sleeve at the predetermined weld site;

maintaining a predetermined focal distance between the welding mirror means and the inside surface of the sleeve with the focal distance maintaining means; and

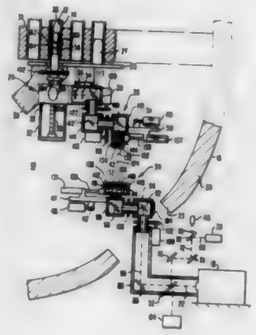
rotating the welding head at a predetermined speed to complete a weld fusion path about the inner periphery of the sleeve along which path the sleeve is fused to the tube.

4,694,137

LASER WELDING HEAD FOR SLEEVE-TO-TUBE WELDING

Phillip J. Hawkins; William H. Kasner, both of Penn Hills Township, Allegheny County, and Richard A. Miller, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1986, Ser. No. 821,674
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **24 Claims**



1. A laser welding head apparatus for welding a sleeve within a tube by fusing the interface therebetween with a laser beam, said apparatus comprising:

cylindrical housing means adapted to be inserted axialy into the sleeve and having an opening in one end thereof, discharge outlet means in a side thereof, and a hollow portion extending axially from the opening in communication with the discharge outlet means;

focusing lens means mounted within the hollow portion of said housing means between the opening and the discharge outlet means for focusing a laser beam directed through the hollow portion;

welding mirror means mounted within the hollow portion of said housing means proximate the discharge outlet means for reflecting a laser beam focused by said focusing lens means within said cylindrical housing means through the discharge outlet means and into contact with the sleeve for fusion of the sleeve to the tube;

focal distance maintaining means for maintaining said welding mirror means a predetermined distance from the inside surface of the sleeve; and

welding head rotating means for rotating said cylindrical housing means of the welding head apparatus to circumscribe a weld path about the inside wall of he sleeve with the laser beam for joining the sleeve to the tube by fusing the interface therebetween.

4,694,138

METHOD OF FORMING CONDUCTOR PATH

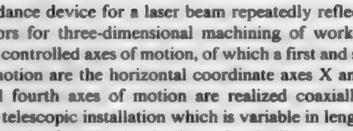
Hirosi Oodaira, Chigasaki; Haruko Suzuki; Masayuki Saito, both of Yokohama, and Masayuki Ohuchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1984, Ser. No. 677,017
Claims priority, application Japan, Feb. 10, 1984, 59-23088
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LM **13 Claims**

1. A method of forming a conductor circuit, comprising the steps of:

providing an insulating substrate having a surface region which is formed of an electrically insulating composition comprising an organic polymeric material and at least one metal source selected from the group consisting of elemental metallic powder and an organic compound containing chemically combined metal or metals, said insulating substrate having first and second electrical parts thereon which are spaced from each other; and

selectively heating said surface region between said first and second electrical parts along a predetermined pattern,



thereby decomposing and evaporating said organic polymeric material in the heated area and welding said metal of said metal source in the heated portion such that the metal forms a continuous conductive path which connects said first and second electrical parts.

4,694,139

GUIDANCE DEVICE FOR A LASER BEAM FOR THREE-DIMENSIONAL MACHINING OF WORKPIECES

Walter Röder, Frankfurt, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,762
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1984, 3444045; Feb. 1, 1985, 3503401
Int. Cl.[4] B23K *26/08*
U.S. Cl. 219—121 LU **33 Claims**

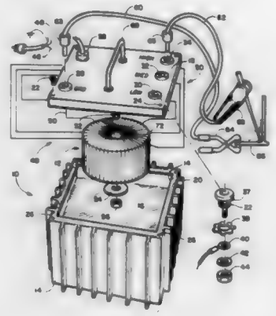
1. Guidance device for a laser beam repeatedly reflected at 45° mirrors for three-dimensional machining of workpieces, with five controlled axes of motion, of which a first and second axes of motion are the horizontal coordinate axes X and Y, a third and fourth axes of motion are realized coaxially in a rotatable telescopic installation which is variable in length and the fourth axis of motion is a horizontal swiveling axis, around which the laser head can be swiveled, whereby beginning with the third axis of motion a self-supporting design is provided, wherein the improvement comprises that an additional axis of motion (5) designed as a horizontal swiveling axis (11) is provided parallel to the laser head swiveling axis (14), the distance from the additional horizontal swiveling axis (11) to the laser head swiveling axis is larger than the length of the laser head (15), whereby the laser beam reflection at the additional swivcling axis (11) is provided in such a way that the central axes of the telescopic installation (3) and the laser head (15) are always located in a common vertical plane, and that the swiveling angles (α, β) at the additional swiveling axis (11) and the laser head swiveling axis (14) are adapted to each other in a programmable- and adjustable manner according to the position of the workpiece surface to be machined.

4,694,140

AC POWER SUPPLY

William M. Wheeler, 5938 Eton Ct., San Diego, Calif. 92122; David C. Wheeler, 7860 Dancy Rd., San Diego, Calif. 92126, and Ernest E. Wheeler, 5938 Dton Ct., San Diego, Calif. 92122

Filed Nov. 14, 1985, Ser. No. 798,123
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.1 **24 Claims**



1. An improved portable AC welding machine comprising:

a liquid tight tank with a removable lid thereon;

a power transformer positioned within said tank, said power transformer comprising, a cylinderical core with an open tubular center, perforated insulation material enclosing said core, a primary electrically winding wound over said perforated insulation material, a wrapping of porous insulation material over said primary winding and a secondary winding wound over said porous insulation material, the ends of said primary and secondary windings extend external of said tank;

an insulating medium within said tank engulfing said power transformer, said insulating medium is liquid at least when said power transformer is at operating temperature;

a pair of welding cables extending from said ends of said secondary windings; and

a power source for connecting to said ends of said primary winding.

4,694,141

AUTOMATIC WELDER'S HELMET

Lawrence R. Hahn, Pickens, S.C., assignor to The Fourth Dimension, Inc., Pickens, S.C.

Filed Oct. 31, 1986, Ser. No. 925,156
Int. Cl.[4] A23K *9/32;* **A61F** *9/06*
U.S. Cl. 219—147 **15 Claims**

1. A welding helmet for use with an electric arc welding system, comprising:

(a) an open back head shield;

(b) a head harness connected to said head shield for supporting the same on the head of an operator;

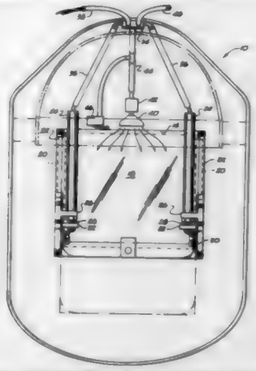
(c) a fixed clear eye lens secured in an opening in said head shield;

(d) a movable dark eye lens mounted in a frame which is slidably secured about said opening in said head shield, said dark eye lens being operable to slide over said opening between opened and closed positions;

(e) two pneumatic cylinders, each having a spring loaded piston and a piston rod, one of which is disposed on said head shield adjacent to each end of said dark eye lens frame, each piston rod being connected to said dark eye lens frame, the springs in said pistons urging said dark eye lens into the closed position; and

(f) control means operatively associable with said welding system and said helmet for operating said welding system

and said cylinders for depressurizing said cylinders and permitting said dark eye lens to close before the welding operation begins and for automatically pressurizing said



cylinders after said welding has ceased to open said dark eye lens to permit viewing through said fixed clear eye lens during periods when the welding operation is not being performed.

4,694,142

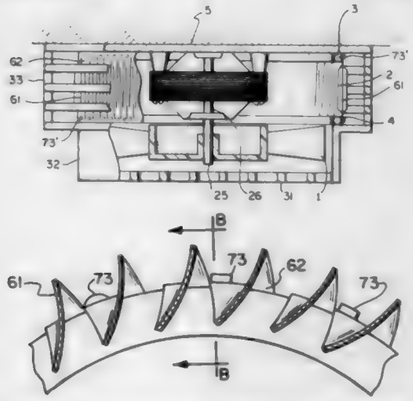
ELECTRIC AIR HEATER

Dov Z. Glucksman, 1578 Beacon St., Brookline, Mass. 02146

Filed Nov. 29, 1984, Ser. No. 676,277

Int. Cl.[4] F24H *7/00*

U.S. Cl. 219—371 **14 Claims**



1. An electric forced-convection air-heater consisting of an axial fan in the form of an electric motor and an axial fan impeller mounted on the shaft of said motor, an electric resistance heater in the shape of a cage mounted on a common base with said fan, upstream of said fan impeller in coaxial alignment therewith in a manner permitting air to be drawn by said fan impeller through said cage and to be heated by said resistance heater, the inclination of the vanes of said fan serves to create an initial vortex to the air before its entry into the impeller, and means for electrically energizing said motor and said resistance heater,

wherein said cage-shaped resistance heater consists of a plurality of spaced longitudinal strips of an electric resistance alloy, of substantially uniform width extending substantially parallel to the axis of said fan, the surface of each strip forming an angle with a tangent to the periphery of said cage, said strips being held in a predetermined angle of inclination by conductive bridging portions of the same material but of a larger cross section than said strips, said bridging portions jointing the alternate ends of each of two proximate strips so as to form a resistor circuit in a zig zag pattern, said cage being held in shape and position by two supporting frames of a heat-resistant and non-conductive material, one frame each being firmly connected to all bridging portions at one end of said cage, and holding said bridging portion in spaced-apart electrically insulating alignment.

4,694,143

ZONE MELTING APPARATUS FOR MONOCRYSTALLIZING SEMICONDUCTOR LAYER ON INSULATOR LAYER

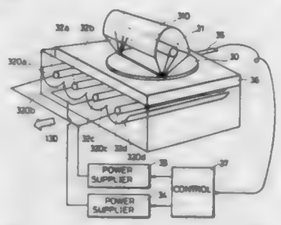
Tadashi Nishimura; Kazuyuki Sugahara; Shigeru Kusunoki, and Yasuo Inoue, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,069

Claims priority, application Japan, Feb. 26, 1985, 60-39590

Int. Cl.[4] H05B *3/64*; **F27D** *11/00*; **F27B** *5/14*

U.S. Cl. 219—388 **15 Claims**



1. A zone melting apparatus for monocrystallizing a semiconductor layer deposited on an insulator layer, comprising:

a support plate for supporting a layered substance including said semiconductor layer and said insulator layer;

an upper elongated heated for zone melting of said semiconductor layer, said upper heater being disposed above and parallel to said semiconductor layer;

a plurality of lower elongated heaters for heating the whole of said layered substance, said lower heaters being disposed in a plane below and parallel to said support plate and the axis of each of said lower heaters being substantially perpendicular to the axis of said upper heater;

a plurality of power suppliers for supplying predetermined amounts of electric power to individual heaters in said plurality of lower heaters;

a temperature sensor disposed at a predetermined position in said support plate for generating an output corresponding to the temperature of said layered substance thereat;

a controller for controlling said power suppliers in response to the output of said temperature sensor, said controller being capable of controlling said power suppliers to supply large amounts of electric power to those of said lower heaters located more remotely from the central portion to said layered substance than to those local heaters located closer to said central portion, whereby the temperature in said central portion of said layered substance is controlled to be lower than that in the outer edge portions of said layered substance; and

means for moving said upper heater relative to said layered substance in the axial direction of said lower heaters.

4,694,144

DOUBLE-GLAZED FRAME HAVING AN INTERNAL TUBULAR BLIND

Pierre Delaroche, 3, rue Granvelle, 25000 Besancon, and Paul Depondt, 3, rue des Chênes Pourpres, 95000 Cergy, both of France

Filed Jul. 17, 1985, Ser. No. 755,729

Int. Cl.[4] E06B *9/24*; **H05B** *3/06*

U.S. Cl. 219—522 **10 Claims**

1. A double-glazed window frame for erection between an outside environment and an inside environment comprising a first glass pane adjacent said outside environment, a second glass pane adjacent said inside environment, and an internal blind, wherein

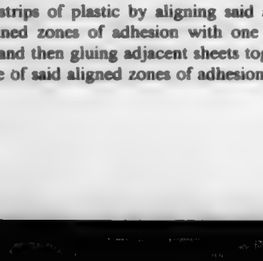
said first glass pane and said second glass pane are parallel to one another and spaced apart by a predetermined width;

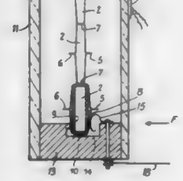
said internal blind is disposed parallel to and intermediate said first glass pane and said second glass pane;

said internal blind comprising a plurality of collapsible, elongated tubular volumes, each of said tubular volumes extending in a longitudinal direction, said tubular volumes being disposed in at least one row extending in a vertical direction, said vertical direction being transverse to said longitudinal direction, said blind being raisable and lowerable in said vertical direction;

each of said tubular volumes being bounded by longitudinally extending strips of plastic, each of said strips of plastic having a pair of opposed edges, one edge adjacent said first glass pane and the other edge adjacent said second glass pane, an upper face and a lower face;

said upper face and said lower face of each of said strips of





plastic each having a metallic layer disposed thereon, each of said metalic layers having a longitudinally extending discontinuity disposed between said pair of opposed edges.

10. A method of manufacture of an internal blind forming part of a double-glazed window frame as claimed in any one of claims **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8** or **9**, comprising

provided a sheet of plastic, having an upper face and a lower face, which has been coated by a metallic layer on each of said faces;

cutting strips of plastic from said sheet, said strips having a predetermined width and a predetermined length;

removing the metallic layer on each of said faces of each strip of plastic cut from said sheet in at least two predetermined zones of adhesion which extend lengthwise of said sheet;

joining said strips of plastic by aligning said at least two predetermined zones of adhesion with one another for each strip and then gluing adjacent sheets together along at least one of said aligned zones of adhesion.

4,694,145

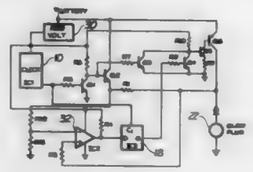
ELECTRONIC CONTROLLER FOR PREDETERMINED TEMPERATURE COEFFICIENT HEATER

Douglas J. Romstadt, Oregon, Ohio, and William R. Seitz, Birmingham, Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 15, 1985, Ser. No. 701,907

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **2 Claims**



1. In a diesel engine a system for controlling positive temperature coefficient glow plugs comprising:

at least one positive temperature coefficient glow plug in each cylinder of a diesel engine;

clock means for generating clock signals having a sample period and an activation period;

contactless means for applying activating current to each of said glow plugs;

means for sensing an amount of sensing current to only one of said glow plugs during said sample period of said clock means and generating a first electrical signal proportional to the amount of sensed current, said sensing current being less than said activating current and said sensing means not responsive to said activating current to said glow plugs;

means for generating a second electrical signal proportional to the actual temperature of the diesel engine;

means for generating a third electrical signal representing a predetermined glow plug temperature;

means for generating a fourth electrical signal representing a predetermined operating temperature of said engine;

means responsive to said first and third electrical signals during said activation period of said clock means for activating said contactless means for applying activating current to each of said glow plugs when said actual temperature is less than said predetermined operating temperature; and

means responsive to said second and fourth electrical signals for inhibiting said contactless means for applying activating current to each of said glow plugs when said temperature of said engine is equal to said predetermined operating temperature.

4,694,146

BRACKET MOUNTED TOWEL DRYING CABINET

Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed Oct. 28, 1985, Ser. No. 791,735

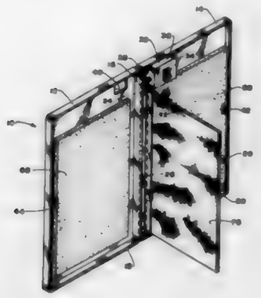
Int. Cl.[4] H05B *3/30*

U.S. Cl. 219—524 **5 Claims**

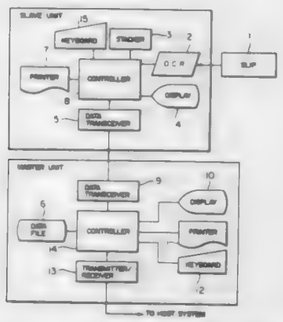
5. A bracket mounted cabinet for warming cloth material comprising:

(a) a housing comprising two opposed covers, hingedly attached by a first hinge means along one side and defining an enclosed space upon closure thereof;

(b) support and heating means for supporting and heating a towel within said enclosed space, said support means hingedly attached by a second hinge means intermediate said covers, said support and heating means comprising:
(1) an inner rigid metal plate, and
(2) a resistance heating element on at least one side of said plate;
(c) means for providing power to said heating means, comprising a switch for activation of said heating means and a thermostat for sensing a temperature and for switching said heating means on and off as required; and
(d) means for mounting said cabinet on a bracket, comprising a pair of brackets adapted to fit over a towel rack, said pair of brackets mounted near a top portion of said cabinet, and a spacer bracket mounted near a bottom portion of said cabinet below said pair of brackets and adapted to maintain said cabinet in a substantially upright position.

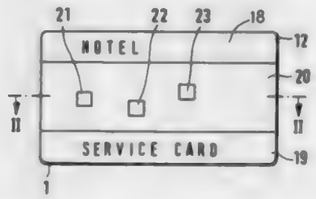


4,694,147
SLIP RECEPTION TERMINAL SYSTEM
Tsuguo Amemiya, Yokohama; Yutaka Magata, Tokyo; Satoshi Fujimatsu, and Masahiro Morita, both of Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 6, 1986, Ser. No. 826,676
Claims priority, application Japan, Mar. 20, 1985, 60-57024
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—379 **1 Claim**



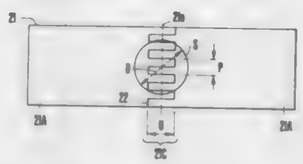
1. A slip reception terminal system comprising:
a slave unit installed on the customer's side for reading an image written on a slip by a customer and recognizing a predetermined item of said slip; and
a master unit installed on the teller's side for receiving image data and recognized data sent from said slave unit, stacking said data temporarily, displaying said data sequentially, and transmitting a predetermined part of said data to a host system after the teller has verified and corrected the displayed data.

4,694,148
ACCESS CARD
Erwin Diekemper, and Dieter Kastrup, both of Gutersloh, Fed. Rep. of Germany, assignors to MIDS Magnetische Informations-und Daten-Systeme GmbH, Fed. Rep. of Germany
Filed Jul. 5, 1985, Ser. No. 751,946
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504109; European Pat. Off., Mar. 20, 1985, 85103216.9
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—468 **11 Claims**



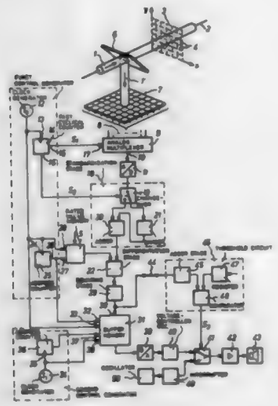
1. An access card with recorded coded data including markings which appear on a radiation receiver when exposed to radiation, comprising:
a first and a second continuous and transparent plastic foil or film blank;
a layer of material arranged between said blanks, said material being non-transparent for visible light and transparent for infrared light and disposed on at least a portion of one surface of said first blank;
a layer of photosensitive material (7) carried on at least a portion of one surface of said second blank;
said first and second blanks forming a laminate with said layer that is transparent to infrared light covering said photosensitive layer; and
the markings (21–23) appearing as negative or positive images on said photosensitive layer upon existing said blanks to a marking light.

4,694,149
FOCUS ADJUSTING DEVICE
Masamichi Toyama, and Susumu Kozuki, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Dec. 5, 1985, Ser. No. 805,986
Claims priority, application Japan, Dec. 7, 1984, 59-257496; Dec. 7, 1984, 59-257497; Dec. 7, 1984, 59-257498
Int. Cl.[4] G01J *1/20*; **G01C** *3/08*; **G03B** *3/00*
U.S. Cl. 250—201 **9 Claims**



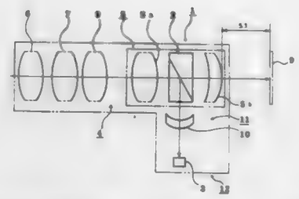
1. A distance measuring device comprising:
(a) light projecting means for projecting distance measuring light toward an object, said distance measuring light being reflected by the object and becoming reflected light;
(b) sensing means for receiving said reflected light and producing signals relating to a distance to said object, said sensing means having a plurality of sensing zones, wherein a boundary line, forming boundaries between one sensing zone and another sensing zone, forms projections and indentations; and
(c) computing means for computing a distance to said object based on said signals.

4,694,150
METHOD AND APPARATUS FOR ACOUSTIC SUPERVISION OF ADJUSTMENT OPERATIONS AT OPTICAL DEVICES
Joerg Schulz-Hennig, Heikendorf, and Horst Sievers, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany
Filed Jun. 11, 1985, Ser. No. 743,516
Claims priority, application European Pat. Off., Jun. 18, 1984, 84 106945.3
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **17 Claims**



1. A method for acoustic supervision of adjustment of a light bundle with respect to its intensity distribution in a reference plane which is at right angles to an optical axis of the light bundle, comprising the steps of:
subdividing the reference plane into surface area elements, and defining and storing a desired intensity value I_s for each surface area element so as to create a stored desired intensity distribution;
measuring each of the surface area elements in a first cyclical successsion actual intensity values I_i resulting at each of said surface area elements as a result of illumination by the light bundle;
calculating and storing for each of the surface area elements associated intensity deviations between said desired intensity values I_s and actual intensity values I_i;
successively reading out in a second cyclical succession the intensity deviations;
generating an oscillation signal and modulating at least one parameter of the oscillation signal to create a modulated oscillation signal dependent on the associated intensity deviations; and
converting the modulated oscillation signal into modulated audible measuring tones, said modulated audible measuring tones representing for the surface area elements a deviation of the intensity distribution from the desired intensity distribution.

4,694,151
AUTOFOCUSING ZOOM LENS SYSTEM WITH BEAM SPLITTER PRISM FOR SINGLE LENS REFLEX CAMERAS
Hirofumi Yoshimura, Nakano, Japan, assignor to Kabushiki Kaisha Cosina, Nakano, Japan
Filed Jun. 17, 1985, Ser. No. 745,777
Claims priority, application Japan, Jul. 6, 1984, 59-102686[U]
Int. Cl.[4] G03B *3/10*
U.S. Cl. 250—201 **5 Claims**

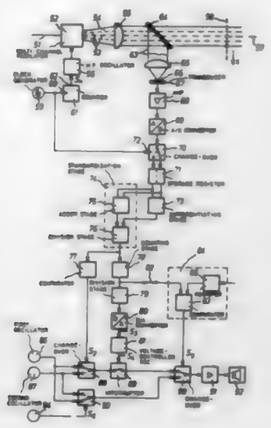


1. In an autofocusing zoom lens system for a single lens reflex camera having a beam splitter prism and comprising a focusing lens group adapted to be driven back and forth freely, a variator lens group for zooming located behind said focusing lens group, a compensator lens group located behind said variator lens group, a master lens group fixed behind said compensator lens group, said master lens group allowing the optical image of an object to form on a film in the body of the camera, a beam splitter prism, and a sensor positioned to detect image displacement formed by a beam reflected at said beam splitter prism for driving said focusing lens group to recover image displacement for autofocusing, the improvement wherein said master lens group includes a fixed front lens group and a fixed rear lens group, and said beam splitter prism is inserted between said fixed front lens group and said fixed rear lens group.

4,694,152
METHOD AND APPARATUS FOR ACOUSTIC SUPERVISION OF ADJUSTMENT OPERATIONS AT OPTICAL DEVICES
Joerg Schulz-Hennig, Heikendorf, and Horst Sievers, Preetz, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany
Filed Jun. 11, 1985, Ser. No. 743,514
Claims priority, application European Pat. Off., Jun. 18, 1984, 84106943.8
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **11 Claims**

1. A method for symmetrically adjusting an intensity distribution formed by rays of a light bundle along a given direction line lying in a reference plane which lies transverse to an optical axis of the light bundle, comprising the steps of:
measuring intensity values of first and second rays of said intensity distribution symmetrically spaced from and on opposite sides of said optical axis;
calculating a differential intensity value from said first and second rays, an amount of said differential intensity value being indicative of an amount of deviation from a desired symmetry for said intensity distribution, and a sign of said differential intensity value being indicative of a direction away from said desired symmetry of the intensity distribution; and
providing an audible oscillation, and changing a first param-

eter of said audible oscillation based on said differential intensity value amount and changing a second parameter



of said audible oscillation based on said intensity value sign.

4,694,153

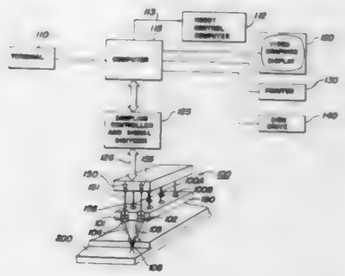
LINEAR ARRAY OPTICAL EDGE SENSOR

Antal K. Bejczy, Pasadena, and Howard C. Primus, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Oct. 29, 1985, Ser. No. 792,450

Int. Cl.[4] G05B *1/00*

U.S. Cl. 250—202 **11 Claims**



1. An optical sensing system comprising:

a plurality of pairs of, side-by-side light omitting and detecting diodes with each pair forming one element of a linear pixel array, which array is located laterally on one side of and at a predetermined distance from a surface discontinuity of an opaque workpiece to be sensed; and

means optically sequencing each pixel in said array for developing from transmitted and reflected light. discrete signal points defining a signal trace having upper and lower portions which bracket a transistor portion indicative of said discontinuity.

4,694,154

INSTRUMENTS FOR MEASURING LIGHT PULSES CLOCKED AT HIGH REPETITION RATE AND ELECTRON TUBE DEVICES THEREFOR

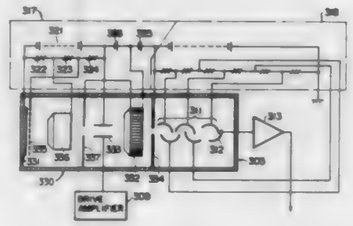
Yutaka Tsuchiya; Musubu Koishi, and Akira Takeshima, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 557,252, Dec. 1, 1983, Pat. No. 4,645,918. This application May 29, 1986, Ser. No. 868,110

Claims priority, application Japan, Dec. 7, 1982, 57-214143; Jan. 21, 1983, 58-9040; Jan. 21, 1983, 58-9041

Int. Cl.[4] H01J *31/50*

U.S. Cl. 250—213 VT **2 Claims**



1. An electron tube device for measuring light pulses generated at a high repetition rate comprising:

an electron tube including

an evacuated envelope; and

a photocathode, a focusing electrode, a pair of deflection electrodes, an electrode having a slit therein extending in a direction perpendicular to an electric field applied between said electrodes, a group of dynodes for multiplying electrons passing through said slit and a collector electrode aligned within said envelope;

a power supply device for supplying voltages to said focusing electrode, slit electrode and said dynodes, the voltage applied to said focusing electrode being higher than that applied to said photocathode and the voltages applied to said slit electrode being higher than that applied to said focusing electrode; and

a deflection voltage generator coupled to said pair of deflection electrodes for applying deflection voltages thereto, said deflection voltages successively changing in phase with respect to light pulses impinging on said photocathode, whereby different portions of said light pulses are successively sampled.

4,694,155

CIRCUIT ARRANGEMENT TO ASCERTAIN AND INDICATE THAT A LUMINOUS DENSITY LIMIT CONDITION IS EXCEEDED

Walter Bletz, Braunfels, and Rolf Magel, Ferawald, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 757,881

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427055; Jun. 22, 1985, 3447982

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 R **6 Claims**

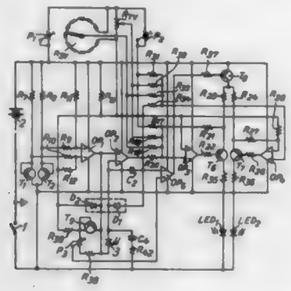
1. A circuit for determining and indicating that a luminous density limit is exceeded, comprising:

photoelectric diode means for producing a diode signal indicative of an incident luminous density;

means, arranged to receive said diode signal, for producing a logarithmic signal having an amplitude corresponding to the logarithm of the amplitude of said diode signal;

circuit means for generating a determinable limit value signal, said circuit means having an adjustable temperature dependent circuit comprising a potentiometer having a tap and also comprising a temperature-dependent dividing circuit connected to said potentiometer; and

comparator means having a first input and a second input, said first input being connected to receive said logarithm signal and said second input being adapted to receive said



limit value signal for comparing said limit value signal and said logarithm signal and for producing a control output signal when said logarithm signal and said limit value signal fail to satisfy a predetermined relationship,

said control output signal being applied to an indicator circuit and a processing stage.

4,694,156

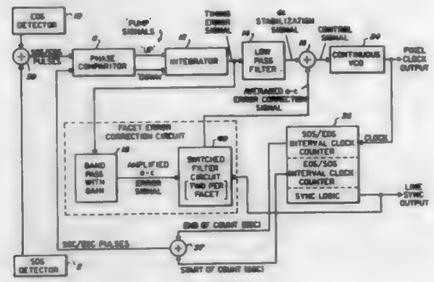
PIXEL PLACEMENT SENSING ARRANGEMENT USING SPLIT DETECTING ELEMENTS

Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 14, 1986, Ser. No. 797,355

Int. Cl.[4] H04N *1/04*

U.S. Cl. 250—214 RC **4 Claims**



1. A pixel placement sensing arrangement, comprising,

a split photodetector having photodetector halves producing current when exposed to a light spot,

a first RC integrating circuit connected to one half of said split photodetector and a second RC integrating circuit connected to the other half of said split photodetector, the RC time constant of each of said integrating circuit being long relative to the exposure time of said photodetector, whereby the current accumulated in the capacitors of said RC integrating circuits result in voltages that are proportional to the respective exposures of said halves of said split photodetector, and

a differential amplifier receiving at its inputs the respective integrated voltages of said RC circuits such that the output of said amplifier reflects any difference between the exposure time of the different halves of the split photodetector.

4,694,157

TEMPERATURE COMPENSATED ELECTRO-OPTICAL LIGHT TRANSMISSION CIRCUIT FOR USE IN A POSITION DETECTOR

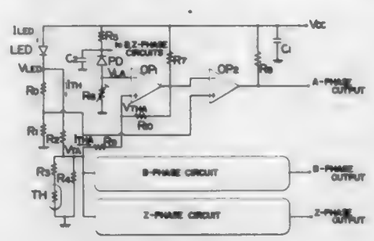
Kazuhiro Mishina, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP84/00495, § 371 Date Jun. 19, 1985, § 102(e) Date Jun. 19, 1985, PCT Pub. No. WO86/02440, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 18, 1984, Ser. No. 752,339

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 C **2 Claims**



1. A temperature compensated electro-optical light transmission circuit for use in detecting the motion of a moving object, comprising:

a light emitting diode connected in series with a first resistor across a voltage source, said light emitting diode emitting light which varies in intensity in a monotonic decreasing relationship with an increasing ambient temperature over a temperature range from a low temperature point to a high temperature point;

a photodiode connected in series with a load resistor across the voltage source and cooperating with said light emitting diode to define an optical path in which a moving object is positioned to intermittently break the light transmitted from the light emitting diode to the photodiode as said object moves for detection of the motion thereof, said photodiode having the inherent characteristic of producing an output voltage which varies in a monotonic increasing relationship with the increasing ambient temperature over the same temperature range upon receipt of light of a constant level so that said photodiode responds to receiving the light from said light emitting diode for producing an output voltage which varies in a linear relationship with the increasing ambient temperature over the same temperature range, said linear relationship reflecting the variations in the outputs of the light emitting diode and the photodiode with the varying ambient temperature;

an operational amplifier having its inverting input connected to the photodiode for receiving the output therefrom, and said operational amplifier having its non-inverting input connected through a feedback resistor to its output end so as to form a Schmitt trigger circuit;

a temperature compensating network connected across said first resistor, said temperature compensating network being in the form of a series-parallel resistor circuit comprising a series combination of a second resistor, a third resistor and a thermistor having a negative coefficient of resistivity, and a fourth resistor connected across said third resistor and said thermistor in parallel relationship therewith, the connection point between the second resistor and the third resistor being connected to the non-inverting input of the Schmitt trigger circuit so as to apply thereto the output voltage developed across the third resistor and thermistor combination as a reference voltage defining a threshold voltage for comparison with the output voltage of the photodiode indicative of the intensity of the light received; and

said temperature compensating network having values of said second, third and fourth resistors determined in con-

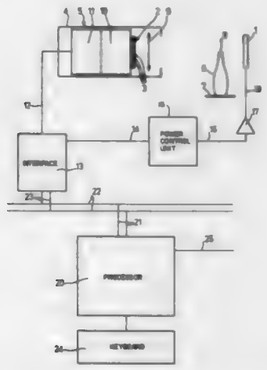
formity with the value of the thermistor, such that said threshold voltage varies in a linear proportional relationship with the increasing ambient temperature over the same temperature range for counterbalancing said linear relationship between the output voltage of the photodiode receiving light from the light emitting diode and the varying ambient temperature, thereby producing a correspondingly varying threshold voltage to compensate for both the variations in the outputs of the light emitting diode as well as the photodiode over said temperature range.

4,694,158

CONTACTLESS INSPECTION OF OBJECTS WITH FEEDBACK TO HIGH SPEED MANUFACTURING DEVICE

Jacques Leser, Lunel, France, assignor to Verrerie du Languedoc et Cie, Vergeze, France

Filed Oct. 1, 1985, Ser. No. 782,336
Claims priority, application France, Oct. 2, 1984, 84 15117
Int. Cl.[4] B07C *5/00, 5/02, 5/342*
U.S. Cl. 250—223 B **13 Claims**



1. A method of continuous contactless inspection of glassware articles and automatic control of the manufacturing process of said glassware articles comprising the following steps:

moving said glassware articles before substantive cooling and before any subsequent annealing step between an optical sensor means and a light source,

said optical sensor means comprising a linear measuring strip of a plurality of receptor photodiodes and means for thermal protection of said sensor means, said strip having its longitudinal axis perpendicular to the movement of said articles,

using said light source to illuminate one side of the entire surface of one said glassware articles while regulating said light source to avoid any flickering,

storing data issued by said sensor means for a given number of glassware articles,

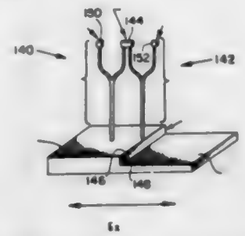
and periodically controlling the manufacturing process in accordance with the stored data.

4,694,159

OPTIC SENSOR WITH REFERENCE AND DETECTING OPTIC CIRCUITS

Larry E. Parkhurst, Boulder, and Michael R. Meadows, Nederland, both of Colo., assignors to Dieterich Standard Corporation, Boulder, Colo.

Continuation of Ser. No. 617,889, Jun. 6, 1984. This application Aug. 22, 1986, Ser. No. 899,013
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **1 Claim**



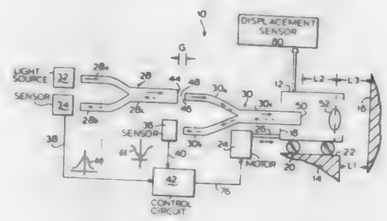
1. An optic displacement sensor comprising a light reflecting means; first and second optic circuits; and first and second optic circuits comprising bi-directional means for a light supply path to and a light return path from the said light reflecting means; wherein the first optic circuit is a reference signal circuit and the second optic circuit is a measuring signal circuit; means for directing light into the light supply paths of the said first and second optic circuits from a single light source; mounting means such that light from the light supply paths of the first and second optic circuits is received by the reflecting means and at least partially reflected into the light return paths of said first and second optic circuits; detector means for each light return path of said first and second optic circuits; and means for adjusting the measuring signal with respect to the reference signal, wherein sensing ends of the first and second optic circuits are mounted adjacent to one reflective surface of the light reflecting means; wherein the sensing end of the first optic circuit is mounted adjacent a normally immovable parallel to the light axis portion of the said reflective surface and the sensing end of the second optic circuit is mounted adjacent to a portion of the reflective surface that moves primarily parallel to the axis of light propagation at the sensing end of the second optic circuit.

4,694,160

FIBER OPTIC EXTENDER APPARATUS IN A POSITION SERVO LOOP

Leo Hoogenboom, Ballston Lake, and Curtis D. Kissinger, Gloversville, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,671
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—227 **10 Claims**



1. A proximity sensor for determining the distance between a fixed reference and a target comprising:

a light sensor;

first and second bifurcate bundles of optical fibers;

imaging means positioned between said first and second bifurcate bundles and said target;

first and second light detectors for generating first and second sensor signals corresponding to the light intensities detected by the detectors; said first and second bundles being positioned and arranged to direct light from said light source to said target through said imaging means and to transmit reflected light from said target to the first and second sensors respectively for generating two corresponding sensor signals, said sensor signals having a maximum and a minimum intensity respectively when one of said bundles is at a preselected distance from the target;

means for generating a control signal corresponding to the difference between said first and second detector signals;

movable means attached to said one bundle; and

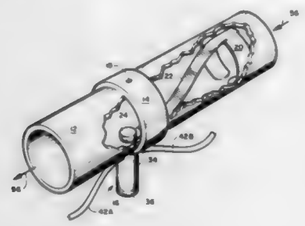
means for moving said attached movable means and thus said one bundle in accordance with said control signal for tracking said target.

4,694,161

FLUID FLOW AND LEVEL DETECTOR

Robert R. Sackett, 2282 Caminito Pescado #43, San Diego, Calif. 92107

Filed Nov. 4, 1985, Ser. No. 794,528
Int. Cl.[4] G01F *1/58*
U.S. Cl. 250—231 R **27 Claims**



1. A fluid flow detection switch comprising:

a tubular housing;

a movable member positioned within said housing and influenced by fluid flow through said housing;

a permanent magnet carried by said movable member; and

a sensing means influenced by the permanent magnet for detecting the absence of fluid flow through said tubular housing, said sensing means comprises an optical shutter positionable by influence from said permanent magnet when said magnet is in close proximate therewith and a pair of fiber optic cables, one of said cables providing a source of light to one side of said shutter and the other one receiving light therefrom when said shutter is in a certain shutter position.

4,694,162

SIGN BIT OPTICAL-ELECTRICAL GEOPHONE

Swan A. Sie, Placentia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 9, 1983, Ser. No. 560,017
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R **15 Claims**

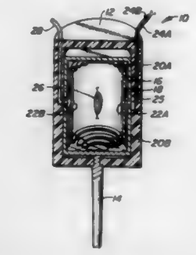
1. An optical-electrical geophone comprising:

electrical means for transmitting an electrical signal to a geophone case;

light source means connected to said means for transmitting an electrical signal in said geophone case;

light chopping means located within said case, said light chopping means containing a passage therethrough for the transmission of light from said light source means;

oscillating means connected to said chopping means, said oscillating means capable of oscillating said chopping means in response to geological movement so as to create a light/no-light binary signal; and



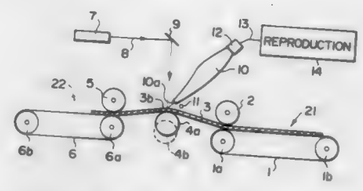
optical fiber signal return directing means for returning the light/no-light binary signal to a seismic vehicle.

4,694,163

APPARATUS FOR SCANNING SHEET-SHAPED RECORDING MEDIUM WITH A BENDING ROLLER

Makoto Ohgoda; Kaoru Tamura, and Yasuhiro Kawai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1984, Ser. No. 657,640
Claims priority, application Japan, Oct. 21, 1983, 58-197192
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—234 **6 Claims**



1. An apparatus for scanning a sheet-shaped recording medium, the apparatus comprising:

(i) a first conveyance means for conveying the sheet-shaped recording medium,

(ii) a second conveyance means for receiving and conveying said recording medium conveyed by said first conveyance means, said second conveyance means being positioned downstream of said first conveyance means in spaced relation thereto by a predetermined distance shorter than the length of said recording medium,

(iii) a roller, positioned between said first conveyance means and said second conveyance means, movable in a first direction approximately normal to a recording medium conveyance plane away from said recording medium for enabling said recording medium to be conveyed by said first conveyance means toward said second conveyance means, said roller further being movable in a second direction opposite said first direction for contacting said recording medium after said recording medium conveyed by said first conveyance means reaches said second conveyance means so as to bend said recording medium convex as viewed from the side thereof opposite to said roller, and

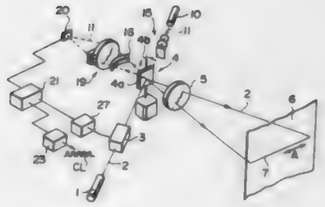
(iv) a scanning optical system positioned on the side opposite to said roller with respect to said recording medium for scanning the convex surface of said recording medium bent by said roller by a light beam in a scanning direction normal to the conveyance direction of said recording medium.

4,694,164

LIGHT BEAM SCANNING APPARATUS

Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 724,722, Apr. 18, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,939
Claims priority, application Japan, Apr. 18, 1984, 59-78230
Int. Cl.[4] H01J 5/02
U.S. Cl. 250—234 6 Claims



1. A light beam scanning apparatus for deflecting a light beam by means of a mechanical type light beam deflector comprising in combination;

a scanning light beam generating means,

a mechanical light beam deflecting means for deflecting a scanning light beam emitted by said scanning light beam generating means,

a position detecting light beam generating means for generating a position detecting light beam and causing the position detecting light beam to impinge upon said mechanical light beam deflecting means at a position substantially coincident with the position where said scanning light beam is deflected thereby,

a converging optical system for converging the position detecting light beam deflected by said deflecting means,

a light beam position detecting means provided on the plane on which said position detecting light beam is converged for detecting the position where the position detecting light beam is converged,

a signal processing circuit which processes the output signal from said light beam position detecting means and outputs an angular position signal indicative of the angular position of said mechanical light beam deflecting means and a deviation signal indicative of the deviation of the position detecting light beam in the direction perpendicular to the deflecting direction,

a correcting light beam deflector for deflecting the scanning light beam before the scanning light beam impinges upon the scanning light beam deflector in the direction perpendicular to the scanning direction at the time of scanning, and

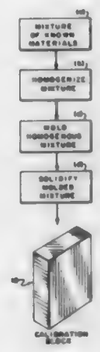
a correcting light beam deflector driving control means which receives said deviation signal and drives said correcting light beam deflector in such a manner as to correct the deviation.

4,694,165

BULK MATERIAL ANALYZER CALIBRATION BLOCK

Raymond J. Proctor, San Diego; Thomas L. Atwell, Del Mar; Clinton L. Lingren, San Diego, and James F. Miller, Solana Beach, all of Calif., assignors to Gamma-Metrics, San Diego, Calif.

Filed Sep. 30, 1985, Ser. No. 782,272
Int. Cl.[4] G01D 18/00; G01F 23/00
U.S. Cl. 250—252.1 9 Claims



1. A calibration block for use in calibrating a bulk material analyzer, comprising

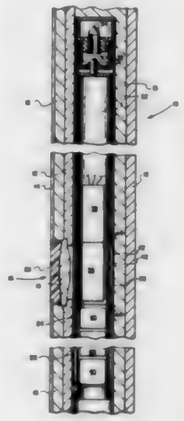
a block of a solidified homogeneous mixture of known materials in known proportions, wherein the materials do not react chemically with one another.

4,694,166

LOGGING DEVICE HAVING BIMETALLIC INSULATING FLASK

Dale A. Gearhart, Fort Worth, Tex., assignor to Gearhart Industries, Inc., Fort Worth, Tex.

Filed May 28, 1985, Ser. No. 738,419
Int. Cl.[4] G01V 5/04
U.S. Cl. 250—261 12 Claims



1. A well logging device suitable for insertion into a wellbore comprising:

a sonde suitable for insertion into a wellbore;

an insulated bimetallic storage vessel disposed within said sonde, said insulated bimetallic storage vessel comprising an inner shell including a continuous imperforate cylindrical wall and a radially spaced apart outer shell including a continuous imperforate cylindrical wall, each of the said cylindrical walls being constructed of a first metallic material and having a portion thereof constructed of a low density second metallic material having high photon transmission properties; and

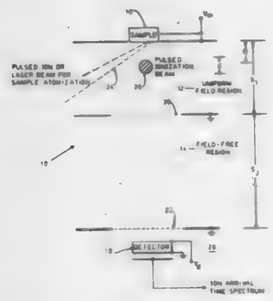
a photon detector disposed within said inner shell and surrounded by said low density second metallic material wherein photons pass through said low density second metallic material of the walls of the inner and outer shells to said photon detector.

4,694,167

DOUBLE PULSED TIME-OF-FLIGHT MASS SPECTROMETER

Marvin G. Payne; Norbert Thonnard, both of Anderson County, and George S. Hurst, Roane County, all of Tenn., assignors to Atom Sciences, Inc., Oak Ridge, Tenn.

Filed Nov. 27, 1985, Ser. No. 802,841
Int. Cl.[4] H01J 49/40
U.S. Cl. 250—282 22 Claims



1. A method for improving mass discrimination during an analysis of atoms or molecules in a time-of-flight mass spectrometer, such method conducted within an evacuated chamber, which comprises:

rapidly removing, at a first well defined time, such atoms or molecules to be analyzed from a surface containing such atoms or molecules in a region of a uniform electric field of a selected strength;

rapidly ionizing, at a second well defined time after a selected time delay, T_o, the removed atoms or molecules with an ionizing beam in a defined ionization region spaced a first defined distance, R, from said surface;

accelerating ions, produced by said ionizing beam, in said uniform field region of a second defined distance, S_1;

passing said ions into a field-free region for drifting therein for a third defined distance, S_2;

passing said ions into a relatively short, high-energy acceleration region to strike an ion detector to produce a signal corresponding to the arrival of said ions;

measuring said signal as a function of arrival time to obtain such analysis;

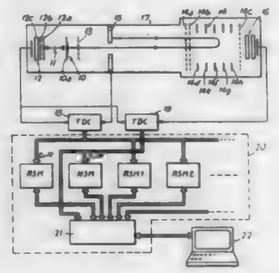
wherein said time delay, said uniform field and said defined distances are chosen to minimize spread in arrival time at said detector of a specified mass within such atoms or molecules.

4,694,168

TIME-OF-FLIGHT MASS SPECTROMETER

Yvon Le Beyec, Bures sur Yvette, and Serge D. Negra, Chilly Mazarin, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Feb. 27, 1985, Ser. No. 706,013
Claims priority, application France, Feb. 29, 1984, 84 03127
Int. Cl.[4] B01D 59/44
U.S. Cl. 250—287 6 Claims



1. A time-of-flight spectrometer comprising a source of ions, an ion mirror receiving ions issued from said source, a first detector disposed to receive ions reflected by the mirror, and a second detector disposed behind the mirror so that a spectrum of the ions reflected by the mirror and received by the first detector can be obtained, as well as a spectrum of any neutral species appearing during flight and received by the second detector,

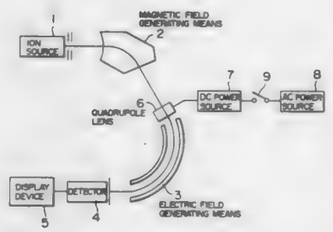
said ion mirror forming with the ion source and the first and second detectors an assembly of axial symmetry, and having a depth sufficient to allow compensation for differences of velocities of ions having the same mass.

4,694,169

MASS SPECTROMETER

Minoru Uchida, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,530
Claims priority, application Japan, Oct. 5, 1984, 59-208236
Int. Cl.[4] H01J 49/30, 49/32
U.S. Cl. 250—296 9 Claims



1. A mass spectrometer including in order along a beam path, ion source means for providing an ion beam along said beam path, magnetic field mass analyzing means, a quadrupole lens, and ion detecting means, said quadrupole lens having two pairs of electrodes, and further comprising:

means for applying variable DC voltages to each electrode of said two pairs of opposing electrodes of said quadrupole lens; and

means for superposing in-phase AC voltages on said DC voltage applied to only one of said two pairs of opposing electrodes of said quadrupole lens so that an output of said detecting means indicates the degree to which the ion

beam is centered on the beam path as it passes through said quadrupole lens.

4,694,170

INSTRUMENT FOR VERY HIGH RESOLUTION IONIC MICRO-ANALYSIS OF A SOLID SAMPLE

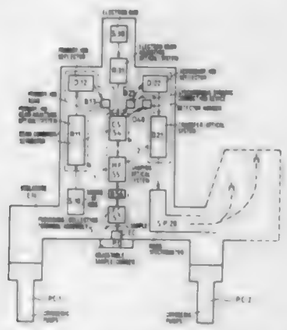
Georges Slodzian, Sceaux; Bernard Daigne, Chatenay Malabry, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales and Universite de Paris-sud, both of Paris, France

Filed Dec. 24, 1985, Ser. No. 813,145

Claims priority, application France, Dec. 28, 1984, 84 20053

Int. Cl.[4] H01J *37/256*

U.S. Cl. 250—309 **19 Claims**



1. An instrument for micro-analysis of a solid sample, comprising the following items enclosed in an evacuated chamber:

a moving sample carrier means for receiving the sample to be analyzed;

a source of primary ions;

first electrostatic optical means for causing a beam of primary ions from said source to bombard the sample, and for causing beams of secondary electrons and of secondary ions to be emitted by the sample;

an ion analyzer having inlets and including a mass spectrometer;

second electrostatic optical means for collecting the beam of secondary ions emitted by the sample, and for conveying the beam of secondary ions collected in this manner to the inlets of said ion analyzer said first and said second electrostatic optical means including a common and coaxial optical portion having ends, a first pivot center, and having an axis perpendicular to the sample carrier means and extending to the vicinity thereof in order to perform highly efficient collection of the secondary ions while simultaneously processing the primary and secondary ion beams, and further including, at one of the ends of said common and coaxial optical portion furthest from the sample, primary ion beam scanning means for causing said beam of primary ions to scan about said first pivot center located in the axis of said common and coaxial portion, said primary ion beam scanning means being associated with synchronous dynamic correction means for providing synchronous dynamic correction of the beam of secondary ions about a second pivot center located at a crossover image point provided by said second electrostatic optical means;

separator means for separating the beams of primary and secondary ions; and

autonomous electron observing means for observing the sample and comprising:

magnetic optical means incorporated coaxially with said common and coaxial optical portion, and for being adjustable in a manner which is substantially decoupled from said first and second electrostatic optical means; and

means for applying a transverse magnetic field at the end of the common and coaxial optical portion furthest from the sample causing the beams of secondary electrons and secondary ions emitted from the sample to separate, and for enabling an ion image and an electron image of the sample to be obtained simultaneously.

4,694,171

ELECTRON MICROSCOPE IMAGE FOCUSING USING INSTANTANEOUS EMISSION OF STIMULABLE PHOSPHOR SHEET

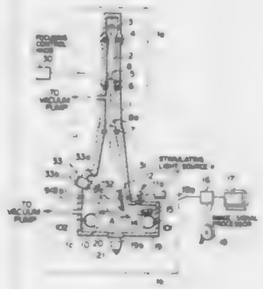
Yuichi Hosoi; Nobufumi Mori; Kenji Takahashi, and Junji Miyahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 26, 1985, Ser. No. 801,819

Claims priority, application Japan, Nov. 29, 1984, 59-252638

Int. Cl.[4] H01J *37/21, 37/22*

U.S. Cl. 250—311 **6 Claims**



1. A method of recording and reproducing an image produced by an electron microscope, comprising the steps of:

(i) exposing a two-dimensional image sensor under vacum to an electron beam having passed through a specimen;

(ii) detecting instantaneous light emitted from said two-dimensional image sensor upon exposure of the electron beam with an image intensifier to reproduce an image which can be observed by a user of the electron microscope;

(iii) focusing the electron microscope to obtain a desired focused condition using the observed image;

(iv) obtaining a desired field of view of the specimen using the observed image;

(v) thereafter exposing said two-dimensional image sensor under vacum to an electron beam having been transmitted through the specimen to store the energy of the electron beam representative of the image of the specimen on said two-dimensional image sensor;

(vi) applying stimulating energy to said two-dimensional image sensor for discharging light therefrom which represents the stored energy of the electron beam; and

(vii)photoelectrically detecting the light discharged from said two-dimensional image sensor to reproduce the transmitted electron-beam image of the specimen as a final output image thereof under said desired focused condition and/or with said desired field.

4,694,172

DETECTION OF FIRES AND EXPLOSIONS

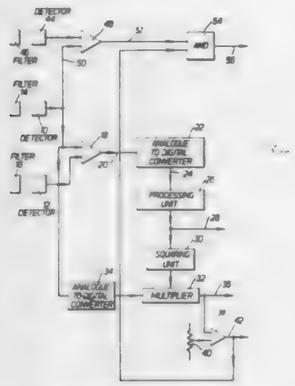
Brian D. Powell, Maidenhead, and David J. Spring, Slough, both of England, assignors to Graviner Limited, Buckinghamshire, England

Filed Oct. 11, 1985, Ser. No. 786,915

Claims priority, application United Kingdom, Oct. 13, 1984, 8425933

Int. Cl.[4] G01C *3/08*; G01J *5/26*

U.S. Cl. 250—339 **10 Claims**



1. A system for producing an output dependent on the distance to a localised source whose temperature is substantially in excess of its ambient atmosphere and which emits corresponding electromagnetic radiation, comprising

first detecting means having a wide field of view and operative to produce a first signal dependent on the electromagnetic radiation received at a first wavelength band at which the received radiation is significantly absorbed by the ambient atmosphere,

second detecting means having a wide field of view and operative to produce a second signal dependent on the electromagnetic radiation received at a second wavelength band which is a discrete emission band corresponding to a band in which the localised source emits radiation and in which there is relatively insignificant absorption by the ambient atmosphere, and

comparing means connected to compare the first and second signals so as to produce a distance-dependent output.

4,694,173

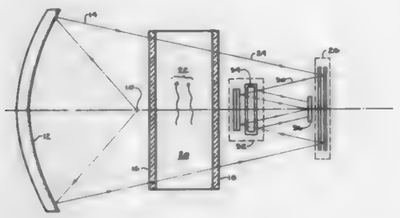
NONDISPERSIVE GAS ANALYZER HAVING NO MOVING PARTS

Jacob Y. Wong, Santa Barbara, Calif., assignor to Hibshman Corporation, San Luis Obispo, Calif.

Filed Oct. 9, 1985, Ser. No. 785,725

Int. Cl.[4] G01N *21/03*; G02F *1/29*

U.S. Cl. 250—343 **35 Claims**



1. Apparatus for use in an analyzer and characterized in having no moving parts, for, in effect, alternately including a reference cell in a beam of radiation and removing the reference cell from the beam of radiation, the reference cell having a window for permitting the beam of radiation to enter the reference cell, said apparatus comprising in combination:

a layer of a material that has selectably a highly-reflective state and a highly-transmissive state, positioned in the beam of radiation ahead of the reference cell so that the beam of radiation is reflected from said layer when said layer is in its highly-reflective state and is transmitted by said layer when said layer is in its highly-transmissive state;

means for reflecting the radiation that has been transmitted into the reference cell back out through the window, so that when said layer is in its highly-transmissive state the beam of radiation is passed back through said layer;

means for alternating the state of said layer between the highly-reflective state and the highly-transmissive state;

means for collecting the total radiation reflected from said layer and emerging from said layer; and,

means for comparing the total radiation collected when said layer is in the highly-reflective state with the total radiation collected when said layer is in the highly-transmissive state.

4,694,174

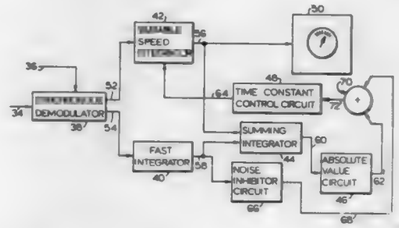
INFRARED GAS DETECTOR

Louis W. Erath, Abbeville, La., assignor to Gas Alarm Service, Inc., Abbeville, La.

Filed Oct. 1, 1985, Ser. No. 782,516

Int. Cl.[4] G01N *21/61*

U.S. Cl. 250—345 **15 Claims**



1. In a gas analyzer using a twin beam infrared absorption gas detector comprised of a reference chamber filled with a sample of a reference gas, a sample chamber partitioned into a first detection zone and a second detection zone by a flexible diaphragm, the flexible diaphragm being deformably responsive to a pressure differential between the first detection zone and the second detection zone, the first and second detection zones being filled with a sample of the reference gas, a first source of infrared energy for directing a first infrared beam through the reference chamber into the first detection zone, a second infrared source for directing a second infrared beam through the sample chamber into the second detection zone, and output circuitry adapted to produce an output signal substantially proportional to the deformation of the diaphragm, the improved signal processor comprising:

(a) a variable speed integrator having an output and adapted to produce a signal substantially proportional to the concentration of the reference gas in the sample chamber, the variable speed integrator having an adjustable time constant;

(b) circuitry adapted to adjust the time constant of the variable speed integrator responsive to the rate of change of the output signal substantially proportional to the deformation of the diaphragm; and

(c) display means adapted to display the signal produced at

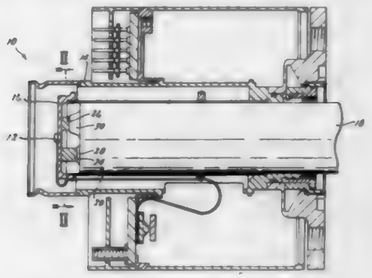
the output of the variable speed integrator as the concentration of the reference gas in the sample chamber.

4,694,175

THERMAL DAMPER FOR INFRARED DETECTOR

Joseph S. Buller, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Dec. 12, 1985, Ser. No. 807,924
Int. Cl.[4] G01J *1/04*
U.S. Cl. 250—352 **20 Claims**



1. A method for reducing temperature variation in an infrared detector, said method comprising the steps of:

providing a source of thermal energy operable to cool said detector, the temperature of said source of thermal energy varying according to a predetermined frequency;

dividing the flow of thermal energy between said source and said detector into at least two paths each having a temperature wave;

producing a phase shift in the temperature wave of the thermal energy flowing through at least one of said paths; and

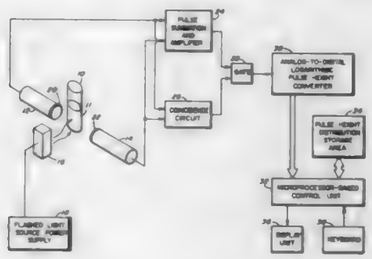
recombining the flow of thermal energy through each of said paths to reduce the temperature variation in said detector.

4,694,176

METHOD AND APPARATUS FOR INDICATING QUENCH OF A LIQUID SCINTILLATION SOLUTION

Donald L. Horrocks, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 612,180, May 21, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 818,059
Int. Cl.[4] G01T *1/204*
U.S. Cl. 250—362 **13 Claims**



1. A method for measuring a value related to quench associated with a liquid scintillation solution wherein the solution includes a sample, a solvent and a solute, the method including the steps of:

generating light flashes wherein the light includes a predetermined wavelength for exciting essentially only the solvent;

exposing the solution to the light flashes;

detecting a pulse height spectrum for scintillations produced in the solution in response to the light flashes;

determining a unique point on the pulse height spectrum; and

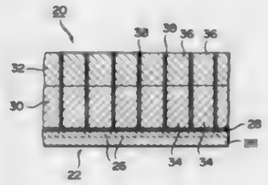
relating the unique point to a corresponding pulse height value, such pulse height value providing a value related to quench associated with the solution.

4,694,177

RADIATION DETECTOR HAVING HIGH EFFICIENCY IN CONVERSION OF ABSORBED X-RAYS INTO LIGHT

Yoshimi Akai, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 1, 1985, Ser. No. 793,860
Claims priority, application Japan, Nov. 2, 1984, 59-230260
Int. Cl.[4] G01T *1/202*
U.S. Cl. 250—368 **6 Claims**



1. A radiation detector having high efficiency in conversion of absorbed X-rays into light, comprising:

scintillator elements for receiving radiation and emitting light;

a light-transmitting member formed of a material having higher light-transmission factor than that of the scintillator elements, and capable of absorbing radiation; and

a semiconductor light-detecting member for converting the light emitted from the scintillator elements and transmitted through the light-transmitting member into an electrical signal,

said light-transmitting member being stacked contiquously on the scintillator elements by hot isostatic pressing, and disposed between the scintillator elements and the light-detecting member.

4,694,178

MULTIPLE CHANNEL ELECTRON BEAM OPTICAL COLUMN LITHOGRAPHY SYSTEM AND METHOD OF OPERATION

Kenneth J. Harte, Carlisle, Mass., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 28, 1985, Ser. No. 749,796
Int. Cl.[4] G21K *1/08*; H01J *3/14, 3/26*
U.S. Cl. 250—396 R **39 Claims**

1. An electrostatic charged particle beam optical column for use in multi-channel charged particle beam lithography/readout systems comprising:

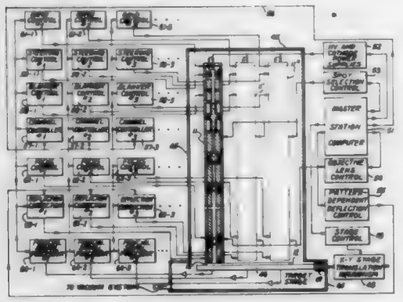
(i) a charged particle gun mounted at one end of an elongated housing having a target surface supported at the opposite end;

(ii) electrostatic charged particle beam spot shaping means mounted within said elongated housing in the direction of the target surface along the optical axis of the undeflected charged particle beam path of a charged particle beam produced by said charged particle gun;

(iii) said electrostatic charged particle beam spot shaping means including first and second spot shaping apertured plate members separated by first spot shaping electrostatic deflector means for imaging the aperture of the first spot shaping apertured plate member onto the second spot shaping apertured plate member to thereby produce a partially truncated image of the aperture of the first spot shaping apertured plate for application to the target surface, and second spot shaping electrostatic deflector means following the second spot shaping apertured plate member for restoring the partially truncated charged particle beam image of the first spot shaping aperture back to the optical axis of the undeflected charged particle beam path to thereby avoid the need to correct the charged particle beam spot position at the target surface as the charged particle beam shape is varied;

(iv) electrostatic condenser lens means positioned in said elongated housing intermediate the second spot shaping electrostatic deflector means and the target surface for demagnification of the shaped charged particle beam spot to allow for physically shortening the overall length of the electrostatic charged particle beam optical column;

(v) shaped charged particle beam spot electrostatic deflector means mounted intermediate the electrostatic condenser lens means and the target surface;



(vi) said shaped charged particle beam spot electrostatic deflector means comprising a three stage octopole deflector having first, second and third octopole deflector sections arrayed axially in the order named along the optical axis of the charged particle beam optical column and alternately supplied with deflection voltages and correction voltages; and

(vii) objective lens means positioned ahead of the third and following the first and second octopole deflector sections whereby the central rays of the shaped charged particle beam as they enter the combined three stage octopole deflector and objective lens system in the path toward the target surface are caused by the first and second octopole deflector sections to pass through the center of the objective lens means at an angle proportional to the desired deflection, and thereafter pass through the third octopole deflector section and exit at a point spaced from the center axis of the undeflected charged particle beam path by a distance proportional to the desired deflection and on a path orthogonal to the target surface.

4,694,179

SYMBIOTIC FILTER-STERILIZER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, 2858 Woody Creek Rd., Woody Creek, Colo. 81656

Filed May 27, 1986, Ser. No. 866,893
Int. Cl.[4] G01N *21/01*
U.S. Cl. 250—431 **4 Claims**

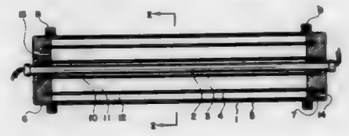
1. A symbiotic filter-sterilizer for filtering and sterilizing a fluid, comprising in combination:

(a) a cylindrical shell having a first and a second closed ends;

(b) a tubular filter having a porous cylindrical wall disposed within said cylindrical shell wherein said tubular filter extending from said one closed end to said the other closed end provides a first annular compartment intermediate said cylindrical shell and said tubular filter;

(c) a transparent tubular shield transmitting ultraviolet rays disposed within said tubular filter, wherein said transparent tubular shield extending from said one closed end to said the other closed end provides a second annular compartment intermediate said tubular filter and said transparent tubular shield;

(d) at least one elongated germicidal lamp for emiting ultraviolet rays disposed within said transparent tubular shield;



(e) at least one port open to said first annular compartment providing a flow passage for fluid; and

(f) at least one port open to said second annular compartment providing a flow passage for fluid;

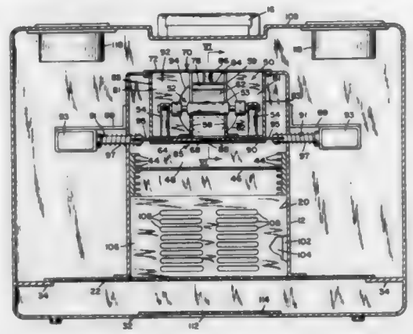
wherein the ultraviolet rays emitted by said germicidal lamp sterilizes the fluid being circulated through said first and second annular compartments and filtered by said tubular filter, and cleans said tubular filter by oxidizing particles clogging up the pores of said tubular filter, while said tubular filter enhances the sterilizing effect of said germicidal lamp by distributing the fluid flow for uniform exposure to the ultraviolet rays.

4,694,180

CURING OVEN FOR ADHESIVE

Richard Salisbury, Norfolk, and Stephen W. Wyman, N. Attleboro, both of Mass., assignors to Loctite Corporation, Newington, Conn.

Filed Sep. 20, 1985, Ser. No. 778,214
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—455.1 **22 Claims**



1. Curing oven for adhesive which is curable by ultraviolet radiation, said oven comprising:

(a) a housing having a curing chamber for containing an item which has an adhesive which is curable by ultraviolet radiation, said housing having an access opening to said chamber which enables said item to be inserted into and removed from said chamber,

(b) an openable closure member for said access opening,

(c) an ultraviolet lamp which is located above said curing chamber, said lamp being effective when energized to become heated and for generating ultraviolet radiation within a predetermined temperature range of said lamp,

(d) a primary enclosure for said lamp, said primary enclosure having a top opening which is directly above said lamp and a bottom opening which is directly below said lamp for the entire length of said lamp, said bottom opening forming an opening to said curing chamber to enable ultraviolet radiation to pass from said lamp to said curing chamber, said primary enclosure completely enclosing said lamp except for said top and bottom openings, said lamp causing air within said primary enclosure to become heated and said top and bottom openings enabling an upward convective air flow to develop from said bottom opening to said top opening across said lamp for cooling said lamp,

(e) an outer enclosure which is located outside of said primary enclosure so as to form a flow channel between said outer enclosure and said primary enclosure, said top opening forming an air flow communication between the space within said primary enclosure and said flow channel,

(f) an inlet opening at one end of said flow channel,

(g) an outlet opening at the opposite end of said channel, and

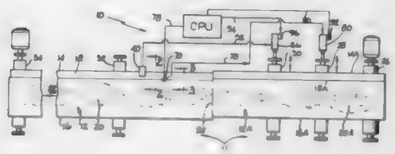
(h) a fan for creating a horizontal air flow through said flow channel from said inlet opening to said outlet opening and above said top opening for removing heated air which passes through said top opening from said convective air flow for maintaining the temperature of said lamp within said predetermined temperature range.

4,694,181

WEB LATERAL POSITION CONTROL SYSTEM USING BOTH COARSE AND FINE MODE CONTROL MEANS

Richard G. Piller, 1500 W. 92nd, Denver, Colo. 80221

Filed Jul. 7, 1986, Ser. No. 882,391
Int. Cl.⁴ G01N *21/86;* **G06K** *7/015*
U.S. Cl. 250—548 **14 Claims**



1. A control system for controlling the lateral position of a moving web of material comprising:

(a) a first sensor means having a first relatively wide scan path extending transversely of the web for sensing the relative lateral position of preselected web lateral position indicating indicia associated with the first sensor means and generating a first sensor signal indicative of the relative lateral position of the web;

(b) coarse mode control means for causing relatively rapid adjustment of the lateral position of the web in response to said first sensor signal for adjustably moving the web to a predetermined lateral position within a first set of tolerances during a coarse mode of control;

(c) a second sensor means having a second relatively narrow transversely extending scan path for sensing the relative lateral position of preselected web lateral position indicating indicia associated with the second sensor means and generating a second sensor signal indicative of the relative lateral position of the web;

(d) fine mode control means for causing adjustment of the lateral position of the web in response to said second sensor signal for maintaining the web in said predetermined lateral position within a second set of tolerances in a fine mode of control;

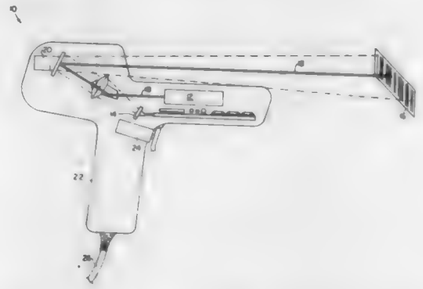
(e) control mode switching means for switching from said fine control mode to said coarse control mode whenever said web position indicating indicia associated with said second sensor are not detected thereby for a predetermined period of time and for switching from said coarse control mode to said fine control mode whenever said second sensor continuously detects the presence of said web position indicating indicia associated therewith for a predetermined period of time.

4,694,182

HAND HELD BAR CODE READER WITH MODULATED LASER DIODE AND DETECTOR

P. Guy Howard, Junction City, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Feb. 27, 1986, Ser. No. 834,286
Int. Cl.⁴ G06K *7/10*
U.S. Cl. 250—566 **3 Claims**



1. A hand held bar code reader using a laser diode as a beam generator, comprising,

a hand held bar code reader body, with external means for activating the bar code reader,

a laser diode mounted within the body in position to project a beam out of the body, in a direction in which the bar code reader body is pointed,

scanning means for scanning the beam of the laser diode,

detector means mounted within the body, for reading a reflected light signal from a bar code over which the beam from the laser diode is scanned,

power supply means for supplying power to the laser diode and the detector means,

diode modulation means for causing the laser diode to project the laser beam in intermittent pulses, at regular intervals, the intervals being sufficiently short to still assure that a shortest bar interval of the bar code can be read,

detector modulation means for causing the detector to read only intermittently, including detector readings simultaneous with pulses of the laser and including detector readings timed between pulses, and

differencing means connected to the detector means for subtracting the detector signal obtained between laser beam pulses, representing ambient light, from the detector signal read simultaneously with laser beam pulses, representing laser plus ambient light,

whereby accurate bar code readings can be obtained even in strong and fluctuating ambient light conditions.

4,694,183

OPTICAL ISOLATOR FABRICATED UPON A LEAD FRAME

Stephen P. Merrick, Sunnyvale, and Robert W. Teichner, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

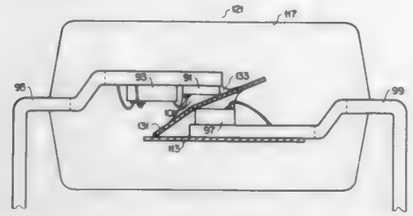
Filed Jun. 25, 1985, Ser. No. 748,520
Int. Cl.⁴ H01L *31/12*
U.S. Cl. 250—551 **10 Claims**

1. An optical isolator comprising:

an LED lead;

an LED attached to an underside of the LED lead;

a photodiode lead extending under the LED lead; a photodiode die attached to a topside of the photodiode lead in alignment with the LED die and separated from the LED die across an isolation gap;



a first dielectric sheet attached to a top side of the LED lead;

a second dielectric sheet attached to a bottom side of the photodiode lead; and,

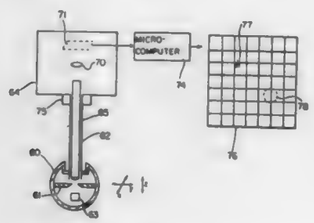
an optically transmissive material located between the first and second dielectric sheets and substantially filling the isolation gap.

4,694,184

COORDINATE MEASURING METHOD AND DEVICE USING A CONTACT MEMBER

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 592,028, Mar. 22, 1984, Pat. No. 4,583,000, which is a continuation of Ser. No. 207,081, Nov. 14, 1980, Pat. No. 4,453,082. This application Feb. 21, 1986, Ser. No. 831,724
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.⁴ G01N *21/86*
U.S. Cl. 250—561 **10 Claims**



1. Apparatus for optically sensing the presence of an object in a plane perpendicular to a reference axis, said device comprising:

a contact member disposed in said plane and movable in all directions in said plane, said contact member being a ball contact member;

means for mounting said ball contact member for movement in a direction orthogonal to said plane;

means for directing light along the reference axis; and

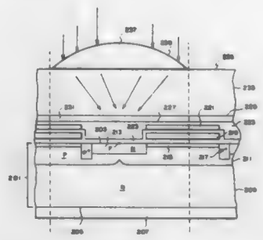
detector means for detecting a reference condition of the light when said contact member is in a rest position thereof, and for detecting a different condition of the light when the position of said contact member is changed from said rest position by contact with an object.

4,694,185

LIGHT SENSING DEVICES WITH LENTICULAR PIXELS

Armin K. Weiss, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,330
Int. Cl.⁴ H01L *27/14*
U.S. Cl. 250—578 **13 Claims**



1. A light sensing semiconductor device including an array of light sensing pixels comprised of

a semiconductive substrate, at least a portion of said substrate being of a first conductivity type, and laterally spaced regions of a second conductivity type forming within individual pixels a single light sensing portion spaced laterally inwardly from at least two opposed pixel edges and

means for transmitting incident light to said light sensing portion including

a lens presenting a convex surface capable of receiving light laterally outwardly of said light sensing portion and directing the light toward said light sensing portion, and

a light transmissive portion interposed between said lens and said light sensing portion,

characterized in that in at least one of said pixels

said light transmissive portion is comprised of a lens supporting layer having a thickness exceeding that of said lens,

said lens is laterally confined on said lens supporting layer and spaced laterally inward from at least said two opposed pixel edges, and

said lens supporting layer and said lens are formed of different polymers, said supporting layer polymer exhibiting a higher glass transition temperature than said lens polymer and said lens polymer at its glass transition temperature being resistant to wetting the laterally surrounding surface of said lens supporting layer.

4,694,186

SYSTEM FOR PHOTOELECTRIC DETECTION

Ruri Onoda, Tokyo; Yoichi Kuroki, Kawasaki, and Gen Nakamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,713
Claims priority, application Japan, Sep. 10, 1984, 59-188083; Oct. 12, 1984, 59-212605; Nov. 5, 1984, 59-231405
Int. Cl.⁴ H01J *40/14;* **G01C** *3/08*
U.S. Cl. 250—578 **17 Claims**

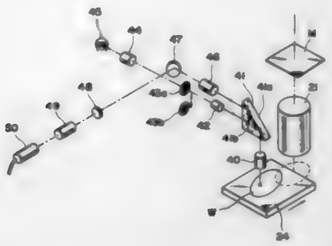
1. A system for photoelectrically detecting an object, comprising:

means for illuminating the object;

means for photoelectrically detecting the object being illuminated by said illuminating means, said detecting means producing an output in response to the detection;

means for controlling light to be directed, by way of the

object, to said detecting means from said detecting means; and



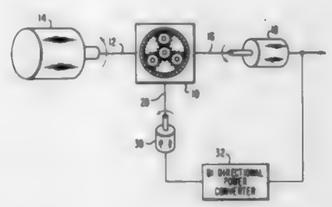
means for processing the output produced by said detecting means upon or after completion of the controlling operation performed by said controlling means.

4,694,187

ELECTROMECHANICAL CONSTANT SPEED DRIVE GENERATING SYSTEM

Donal E. Baker, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 818,466
Int. Cl.⁴ F02N *11/08*
U.S. Cl. 290—4 R **11 Claims**



1. An electromechanical constant speed drive generating system comprising:

a mechanical differential having first, second and third rotatable shafts, wherein the speed of said second shaft is equal to the speed of said first shaft multiplied by a first constant plus the speed of said third shaft multiplied by a second constant;

means for driving said first shaft at a variable speed ranging from a lower predetermined speed to an upper predetermined speed;

a constant speed generator connected in a driving relationship with said second shaft, for producing a constant frequency output;

a variable speed dynamoelectric machine connected in a driving relationship with said third shaft;

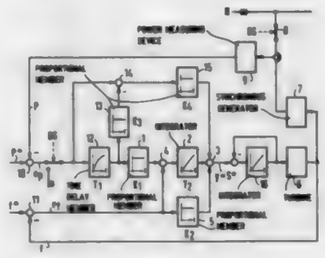
a unidirectional power converter electrically connected between the output of said constant speed generator and said variable speed dynamoelectric machine to transfer unidirectional power between the output of said constant speed generator and said variable speed dynamoelectric machine, thereby varying the speed of said variable speed dynamoelectric machine such that the speed of said second shaft remains substantially constant when the speed of said first shaft is varied between said lower and upper predetermined speeds.

4,694,188

APPARATUS FOR CONTROLLING A TURBO GENERATOR

Dieter Diegel, Rottenbach; Gerhard Plohn, Erlangen, and Manfred Schuh, deceased, late of Erlangen, all of Fed. Rep. of Germany (by Gisela Schuh, Sabine Schuh, Michael Schuh, heirs), assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,936
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529291
Int. Cl.⁴ G05B *11/06*
U.S. Cl. 290—40 B **4 Claims**



1. An apparatus for controlling a turbo generator having a speed and a power controller, each of which have integral behavior, comprising:

common integrator means for the speed and the power controller (for providing the integral behavior;

a first proportional member means having as an input a signal derived from a power deviation signal representing a difference between a preset reference power value and an actual power value and an output coupled to an input of the common integrator means, a speed deviation signal comprising the difference between a reference speed value and an actual speed value being coupled additively to said common integrator means input; and

a second proportional member means having as an input the speed deviation signal for forming a proportional amplification of the speed controller, the output signal of said second proportional member means being added to the output of the common integrator means.

4,694,189

CONTROL SYSTEM FOR VARIABLE SPEED HYDRAULIC TURBINE GENERATOR APPARATUS

Eiji Haraguchi, Ibaraki; Hiroto Nakagawa, Osaka; Akira Bando, Hitachi; Takao Kuwahara, Hitachi; Haruo Nohara, Hitachi, and Kenichi Ono, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and The Kansai Electric Power Co., Inc., Osaka, both of, Japan

Filed Sep. 24, 1986, Ser. No. 911,131
Claims priority, application Japan, Sep. 25, 1985, 60-210004; Sep. 25, 1985, 60-210005
Int. Cl.⁴ F01D *15/10*
U.S. Cl. 290—40 C **10 Claims**

1. A control system for variable speed hydraulic turbine generator apparatus comprising:

an induction generator connected at its primary side to an AC power line system;

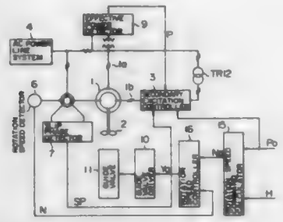
a secondary excitation controller connected to the secondary side of said induction generator and being responsive to a generator output command signal supplied externally to supply to said induction generator an excitation current which causes said induction generator to generate AC power at the same frequency as that on said AC power line system;

a hydraulic turbine for rotating said induction generator;

a guide valve for regulating the amount of water supplied to said hydraulic turbine;

a rotation speed detector for detecting a rotation speed of said induction generator;

a rotation speed command calculator for receiving a hydraulic turbine running condition signal inclusive of said external generator output command signal and calculating an optimum rotation speed command;



a rotation speed controller for comparing said optimum rotation speed command with a rotation speed signal from said rotation speed detector and producing a guide valve opening control signal in accordance with a difference between said optimum rotation speed command and said rotation speed signal: and

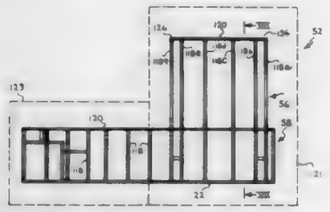
a guide valve drive responsive to said guide valve opening control signal to deliver to said guide valve a signal which controls the opening of said guide valve in accordance with said guide valve opening control signal.

4,694,190

INTEGRAL GENERATOR HOUSING AND BASE FOR A TURBINE GENERATOR

Bruce B. Lane, Westford; Douglas F. Westerkamp, Harvard, and Peter P. Clifford, Leominster, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 23, 1985, Ser. No. 811,982
Int. Cl.⁴ H02K *7/18*
U.S. Cl. 290—52 **9 Claims**



1. A turbine generator comprising:

an integral generator housing-base including a base having a bottom and a generator housing having an upper end, said integral generator housing-base being formed by a plurality of spaced-apart transverse webs and plates interconnecting said transverse webs; a first set of said transverse webs extending from said bottom to said upper end to integrally form both said base and said generator housing;

a turbine;

means for mounting said turbine on said integral generator housing-base;

a generator stator mounted within said generator housing; and

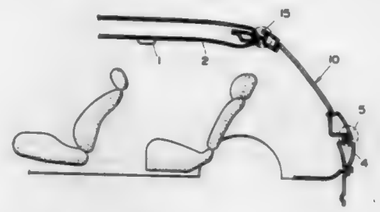
said generator housing including means for permitting installation of a generator rotor coupled to said turbine and operatively associated with said generator stator.

4,694,191

LAMP POWER SUPPLY CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Toru Segoshi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 7, 1986, Ser. No. 826,977
Claims priority, application Japan, Feb. 25, 1985, 60-34519
Int. Cl.⁴ B60Q *7/00, 3/02*
U.S. Cl. 307—10 LS **9 Claims**



1. A system for controlling a power supply to a lamp for an automotive vehicle having a body, comprising:

(a) first switch means operatively associated with at least one of the body of the vehicle and a door, said first switch means opened when the door of the vehicle is closed to seal an opening in the vehicle body and closed when the door is open;

(b) second switch means operatively associated with at least one of the body of the vehicle and the door, said second switch means opened only when the back door is detached from the vehicle body and remaining closed when the door is attached to the vehicle body;

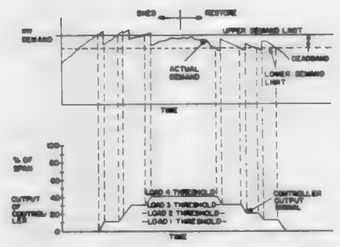
(c) a lamp connected in a series with said first and second switch means and a power source so that said lamp receives power only when said first and second switch means are closed.

4,694,192

SIMPLIFIED DEMAND LIMIT CONTROL

Peter P. Payne, Wheeling Cook, and William T. Pienta, Prospect Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 23, 1984, Ser. No. 674,447
Int. Cl.⁴ H02J *3/14*
U.S. Cl. 307—39 **9 Claims**



1. A demand control system for maintaining power consumption of loads within a building below a demand limit comprising:

power demand controller means responsive to power consumption of said loads for providing a controller output signal changing in a first direction when said power consumption is above said demand limit and changing in a second direction when said power consumption is below said demand limit;

a communication channel connected to said power demand controller means for carrying said signal; and,

at least one demand load controlling means connected to said communication channel to be responsive to a threshold of said controller output signal, said demand load controlling means having a deenergization state and an energization state, said demand load controlling means capable of having one of said states when said controller output signal is above said threshold and the other of said states when said controller output signal is below said threshold.

4,694,193

FAULT RECOGNITION CIRCUIT FOR PARALLEL POWER SUPPLY DEVICES FEEDING A USER

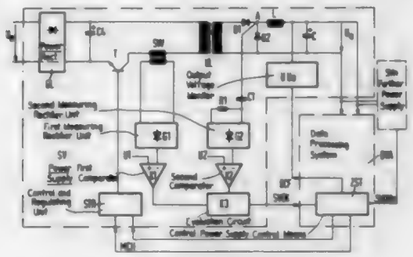
Manfred Schlenk, Bobingen, and P. N. R. Chadwick, Petzenhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 609,425, May 11, 1984, abandoned. This application Apr. 3, 1986, Ser. No. 847,108

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319306

Int. Cl.[4] G05F *1/64*; H02M *7/23*

U.S. Cl. 307—62 **8 Claims**



1. A fault recognition system, comprising:

at least two power supplies connected in parallel to a user at their outputs, each of the power supplies having at least one electronic switch, a power transformer, and a rectifier portion with a following filter;

each of the power supplies having

a control and regulating means connected to the electronic switch for controlling the same,

a current transformer connected between said electronic switch and said power transformer, a load side voltage of said current transformer being supplied to a first rectifier means,

high pass filter means for supplying an ac voltage component of an unfiltered dc voltage at the rectifier portion to a second rectifier means,

outputs of the first and second rectifier means being connected to first inputs of first and second comparators,

a second input of the first comparator being connected with a first comparison voltage that is higher than a test voltage that arises due to a magnetizing current of the power transformer so as to detect when substantially only magnetizing current is being supplied and thus a possible open circuit to the user, and a second input of the second comparator being connected with a second comparison voltage that is lower than the ac voltage component of the unfiltered dc voltage which appears given a minimum permissible line input voltage of the power supply, and

outputs of the first and second comparators being connected to respective first and second inputs of an evaluation circuit; and

an output of the evaluation circuit in the power supplies being connected to an external power supply control means for influencing the respective control and regulating means in the respective power supply.

4,694,194

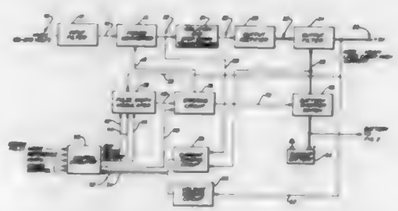
POWER SUPPLY WITH BATTERY BACKUP

Allen Hansel, Sea Bright; Ermand Centofanti, Allenwood, and Thiagarajan Natarajan, Englishtown, all of N.J., assignors to Concurrent Computer Corporation, Holmdel, N.J.

Filed Nov. 4, 1985, Ser. No. 794,920

Int. Cl.[4] H02J *9/00*

U.S. Cl. 307—66 **7 Claims**



1. A power supply system with a battery backup which is switched into the supply when the AC line fails and switched out of the supply when the AC line is available, the switching occurring with a minimum effect on the supply output, the power supply system comprising, in combination:

a high voltage direct current module responsive to the AC line to produce a high voltage direct current output;

converter means responsive to an externally generated pulse width modulated control signal to convert said high voltage direct current output into a low voltage pulsed output, said low voltage pulsed output having the same duty cycle as said pulse width modulated control signal;

a backup battery;

a reference source for producing a reference voltage;

a battery chopper switch responsive to an externally generated pulse width modulated control signal to produce a pulsed battery output having the same duty cycle as said pulse width modulated control signal;

output filter means responsive to said low voltage pulsed output or said pulsed battery output to produce a filtered direct current output;

a pulse width modulator circuit for producing said pulse width modulated control signal at a given frequency, said pulse width modulator circuit responding to said direct current output and said reference so as to produce a pulse width modulated control signal with a greater duty cycle if said direct current output falls relative to said reference voltage and to produce a pulse width modulated control signal with a smaller duty cycle if said direct current output rises relative to said reference voltage;

a steering circuit responsive to said pulse width modulated signal and an externally generated steering signal to couple said pulse width modulated signal to either said battery chopper switch or said means to convert as a function of said steering signal; and

microcomputer means, responsive to the failing of said AC line voltage, to change said steering signal so that said pulse width modulated signal is applied by said steering circuit to said battery chopper switch, said steering signal changing state at the time where said pulse width modulated signal when applied to either said battery chopper or said means to convert will produce the same filtered direct current output.

4,694,195

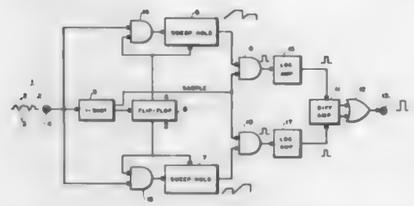
RATIO ANALYZER

Troy L. Stueck, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1965, Ser. No. 493,593

Int. Cl.[4] H03K *5/26*; H04L *15/24*

U.S. Cl. 307—234 **3 Claims**



1. A ratio analyzer for providing an output voltage that is a function of the ratio of successive mark-space intervals of a pulsed communication input signal, the said analyzer comprising: a first means including a monostable multivibrator and a bistable multivibrator for providing an output corresponding to the mark-to-mark intervals of the said input signal and providing a sampling signal output; a second means including a sweep time base generator and voltage storage, responsive to the said first means and the said input signal, providing an output voltage proportional to said mark-space interval of said input signal; a third means including an AND gate responsive to the said sampling signal of said first means and the said output voltage of said second means, providing an output voltage proportional to the mark-space interval of said input signal; a fourth means including a logarithmic amplifier responsive to said third means and providing an output voltage proportional to the logarithm of the said output voltage of said third means; and means including a difference amplifier responsive to the output voltage of said fourth means for providing an output signal that is proportional to the difference in the logarithms of said successive mark-space interval of the said input signal, said difference signal being a function of the ratio of the said intervals.

4,694,196

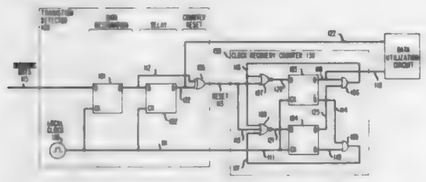
CLOCK RECOVERY CIRCUIT

Lloyd A. Hasley, Carrollton, Tex., and Jaan Raamot, Broomfield, Colo., assignors to American Telephone and Telegraph Company and AT&T Information Systems, Holmdel, N.J.

Filed Dec. 7, 1984, Ser. No. 679,458

Int. Cl.[4] H03L *7/06*; H03K *1/17*

U.S. Cl. 307—269 **2 Claims**



1. A circuit for deriving the clock of an incoming data signal, said circuit comprising:

a local clock source for generating local clock pulses having a nominal rate of 3 times the expected clock rate of said incoming signal,

an input on said detector for receiving said incoming signal,

means within said detector for delaying said received incoming signal by storing said received incoming signal in response to said received incoming signal and said local clock pulses and for producing a first delayed signal on a first output of said detector a second delayed signal,

means in said detector responsive to each transition of said delayed signal and said second delayed signal for generating a counter reset pulse on a second output of said detector,

first and second counter latches having inputs and outputs,

gating means interconnecting inputs and outputs of said counter latches for operating said counter latches as a modulo-3 counter in response to said local clock pulses,

said first and second counter latches and said gating means responsive to said local clock pulses for cyclically advancing through three counting positions,

said first and second counter latches and said gating means responsive to the generated counter reset pulse received from said second output terminal of said detector for resetting said counter to its first counting position,

said first latch further responsive for generating a derived clock pulse each time said counter advances to its third counting position,

a utilization circuit,

said means within said detector for delaying in response to said received incoming signal and said local clock pulses for transmitting said delayed signal from the first output of said detector to a first input of said utilization circuit, and

said first latch in response to each time said counter advances to its third counting position for transmitting each derived clock pulse to a second input of said utilization circuit whereby said utilization circuit registers the delayed signal extant on the first input of said utilization circuit at the time said derived clock pulse is applied to the second input of said utilization circuit.

4,694,197

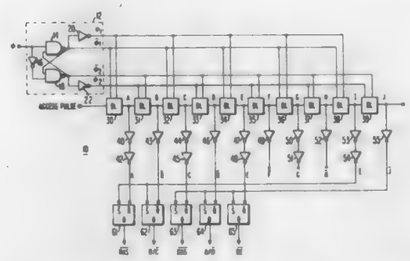
CONTROL SIGNAL GENERATOR

David L. Sprague, Hopewell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 6, 1986, Ser. No. 816,283

Int. Cl.[4] H03K *5/06*; H03L *7/00*

U.S. Cl. 307—269 **5 Claims**



1. an apparatus for generating a plurality of rectangular-wave control signals timed from a single input clock signal having a given frequency, said apparatus comprising:

a plurality of N data latches having respective input and output terminals connected to place said data latches in cascade connection, and being consecutively ordinally numbered first through N^{th} in order of their arrangement in said cascade comection;

pulse generating means for applying pulses at selected times to the input terminal of said first data latch;

means for producing first annd second non-overlapping timing timing signals from said clock signal, said first timing signal being applied only to the odd-numbered data latches and said secodn timing signal being applied only to the even-numbered data latches to clock a stream of ONEs and ZEROs through said cascade connection of said N data latches in a serial shift register operation, said

ONEs being generated by said first data latch when pulses are applied to its input terminal and said ZEROs being generated by said first data latch between pulses being applied to its input terminal; and

means responsive to digital signals from the output terminals of said data latches for generating said plurality of rectangular-wave control signals, which means comprises

a plurality of flip-flops, each having respective set and reset terminals connected to the output terminals of different ones of said data latches and having a respective output terminal to produce a respective one of said rectangular-wave control signals.

4,694,198

SCHMITT TRIGGER CIRCUIT

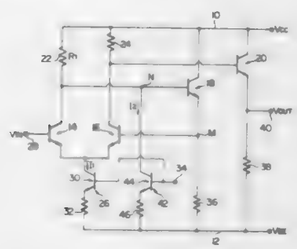
Yoshitaka Umeki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1986, Ser. No. 890,263

Claims priority, application Japan, Jul. 29, 1985, 60-167346

Int. Cl.⁴ H03K *3/295*

U.S. Cl. 307—290 **6 Claims**



1. A Schmitt trigger circuit comprising

(a) an input terminal,

(b) an output terminal,

(c) a first voltage supply line at which a first predetermined voltage is to be established,

(d) a second voltage supply line at which a second predetermined voltage is to be established,

(e) a first transistor having its base connected to the input terminal,

(f) a load resistor through which the first transistor has its collector connected to said first voltage supply line,

(g) a second transistor having its collector connected to said first voltage supply line,

(h) first constant-current source means through which said first and second transistors have their respective emitters commonly connected to said second supply voltage line,

(i) a third transistor having its collector connected to the first voltage supply line, its base connected to the first voltage supply line through the load resistor and to the collector of the first transistor and its emitter connected to the base of the second transistor, and

(j) a second constant-current source through which the third transistor has its base further connected to the second voltage supply line.

4,694,199

CIRCUIT ARRANGEMENT FOR PRODUCING A FLUCTUATION-FREE D-C VOLTAGE LEVEL OF A D-C VOLTAGE

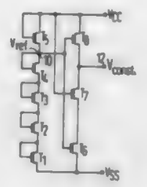
Jürgen R. Goetz, Obernenching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 422,186, Sep. 23, 1982, abandoned. This application Apr. 16, 1986, Ser. No. 853,385

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138558

Int. Cl.⁴ H03K *3/01;* **G05F** *3/16*

U.S. Cl. 307—297 **3 Claims**



1. Circuit arrangement for producing a fluctuation-free d-c voltage level from a fluctuating d-c supply voltage, comprising a first and a second circuit stage, the first circuit stage acting as a voltage divider having a first plurality of series connected MOS-transistors, each transistor therein having its gate connected to its drain, said first plurality of MOS-transistors being connected between the supply voltage and a frame reference potential and including a first part, a second part and a tap between said first and second parts, the second part including at least one of said first plurality of MOS-transistors and being disposed between the fluctuating supply voltage and the tap, the first part including the remainder of said first plurality of MOS-transistors and being disposed between the tap and the frame reference potential, the tap serving for supplying a tap reference potential; said second circuit stage including a second plurality of MOS-transistors located between the d-c supply voltage and said frame reference potential, the second plurality of MOS-transistors including at least a first MOS-transistor connected with its drain to the d-c supply voltage, a second MOS-transistor connected with its source to the frame reference potential and a middle MOS-transistor disposed between said first and second MOS-transistors, the first and second MOS-transistors being connected with their gates to said tap reference potential and said middle MOS-transistor being connected with its gate to the d-c supply voltage; said remainder of said first plurality of MOS-transistors including at least four of said MOS-transistors; the connection between said first MOS-transistor of said second circuit stage and said middle transistor forming the output of the circuit arrangement and producing the fluctuation-free d-c voltage level.

4,694,200

DEVICE FOR DETECTING A PULSE TRAIN IN NOISE AND APPLICATION TO A RADIONAVIGATION AID SYSTEM OF DME TYPE

Joseph Hetyei, Bouffemont, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 25, 1986, Ser. No. 833,734

Claims priority, application France, Mar. 5, 1985, 85 03228

Int. Cl.⁴ H03K *5/153*

U.S. Cl. 307—358 **9 Claims**

1. A device for detecting a pulse train, said train comprising a plurality of pulses, said device comprising:

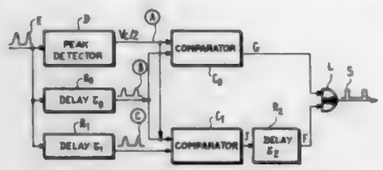
means for detecting the peak value of the first pulse of said train;

first analog delay means receiving said pulse train and conferring thereon a first delay for forming a first output signal;

a first comparator for comparing the level of said first output signal with the half of said peak value and delivering a first signal when said first output signal becomes equal to said half peak value and as long as said first output signal remains greater than said half peak value;

second analog delay means receiving said pulse train, conferring thereon a second delay, different from said first delay for forming a second output signal;

a second comparator comparing the level of said second output signal with said half peak value and with said first



output signal and delivering a second signal when said second output signal becomes equal either to said half value or to said first output signal, and delivering said second signal from the second comparator as long as said second output signal remains greater than the greatest of said half value and said first output signal;

logic means receiving said first and second signals from said first and second comparators respectively and delivering a signal when there is coincidence between said first and second signals.

4,694,201

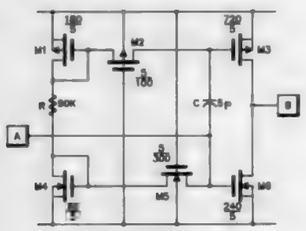
CURRENT-SAVING CMOS INPUT BUFFER

Barry L. Jason, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1985, Ser. No. 728,715

Int. Cl.⁴ H03K *19/092, 17/16;* **H03L** *5/00;* **H03F** *3/18*

U.S. Cl. 307—475 **5 Claims**



1. A current saving CMOS signal buffer comprising:

input means for receiving an input signal;

output means for providing an output signal;

at least two CMOS output transistors connected in a push-pull configuration between a supply voltage differential comprising a positive supply voltge and a negative supply voltage said CMOS output transistors having their gates connected in common to said input means and wherein a common output between said transistors connects to said output means;

means coupled to said two CMOS output transistors forming first and second current mirrors for providing a source of substantially constant current mirrored to said output transistors; and

such that current flows through said output transistors to increase substantially linearly as said supply voltage differential increases linearly.

4,694,202

BI-MOS BUFFER CIRCUIT

Masahiro Iwamura, and Ikuro Masuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,197

Claims priority, application Japan, Dec. 16, 1983, 58-238519

Int. Cl.⁴ H03K *19/092, 19/02, 19/20, 3/01*

U.S. Cl. 307—475 **24 Claims**



1. A buffer circuit having an output stage for driving a load and a driver stage for driving said outpout stage, comprising:

a first MOS transistor for constituting said output stage; and

a bipolar transistor-MOS transistor composite logic circuit for constituting said driver stage, having:

an output circuit including a bipolar transistor for driving said first MOS transistor, and

an input circuit including a second MOS transistor responsive to a predetermined input for rendering said bipolar transistor in the on or off state, wherein the effective channel size of said first MOS transistor is larger than that of said second MOS transistor,

wherein said first MOS transistor has a gate connected to the output of said driver stage, and a source-drain path connected between said load and a predetermined potential.

4,694,203

HIGH SPEED BI-COMOS SWITCHING CIRCUIT

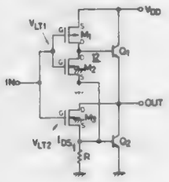
Akira Uragami, Takasaki; Yukio Suzuki, Hinode; Masahiro Iwamura, and Ikuro Masuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,151

Claims priority, application Japan, Mar. 26, 1984, 59-56033

Int. Cl.⁴ H03K *19/013, 19/017*

U.S. Cl. 307—446 **9 Claims**



1. A switching circuit comprising:

(1) first and second bipolar transistors having collector-emitter paths which are connected in series across a first operation potential point and a second operation potential point to provide an output signal for said switching circuit;

(2) a CMOS inverter circuit connected between an input terminal of said switching circuit and a base of the first bipolar transistor; and

(3) a source follower circuit connected between said input terminal and a base of said second bipolar transistor,

wherein:

said CMOS inverter circuit has a first MOSFET of the first type of conductivity and a second MOSFET of the second type of conductivity;

said source follower circuit has a third MOSFET of the second type of conductivity and resistance means;

said second MOSFET and said third MOSFET have a substantially equal logic threshold voltage V_{thNO} in the absence of substrate effect;

said resistance means has a predetermined resistance such that a turn-on and a turn-off time of said second bipolar transistor are shorter than a predetermined value;

said first MOSFET and said second MOSFET have predetermined logic threshold voltage V_{thPO}, V_{thNO} in the absence of substrate effect, and channel conductances W_P/L_P, W_N/L_N, such that said CMOS inverter will have a desired logic threshold voltage V_{LT1};

the channel conductance W_N/L_N of said third MOSFET is so set that the logic threshold voltage V_{LT2} of said source follower circuit will be substantially equal to said desired logic threshold voltage V_{LT1} of said CMOS inverter; and

wherein said output signal is provided at an output terminal coupled between the respective collector-emitter paths of said first and second bipolar transistors.

4,694,204

TRANSISTOR CIRCUIT FOR SIGNAL MULTIPLIER

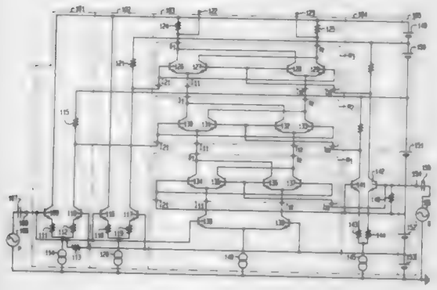
Kazunori Nishijima, and Mitsutoshi Sugawara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,597

Claims priority, application Japan, Feb. 29, 1984, 59-38010; Aug. 6, 1984, 59-164434

Int. Cl.⁴ H03B *17/00;* **G06G** *7/16*

U.S. Cl. 307—494 **10 Claims**



1. A transistor circuit comprising first, second and third multipliers, each of said multipliers including first, second, third and fourth input ends, first and second output ends, a first transistor having an emitter connected to said first input end, a base connected to said third input end and a collector connected to said first output end, a second transistor having an emitter connected to said first input end, a base connected to said fourth input end and a collector connected to said second output end, a third transistor having an emitter connected to said second input end, a base connected to said fourth input end and a collector connected to said first output end, and a fourth transistor having an emitter connected to said second input end, a base connected to said third input end and a collector connected to said second output end, said first and second output ends of said first multiplier being connected respectively to said first and second input ends of said second multiplier, said first and second output ends of said second multiplier being connected respectively to said first and second input ends of said third multiplier, a first input terminal supplied with a first signal P, a second input terminal supplied with a second signal Q, an output terminal connected to said first output end of said third multiplier, first signal-supply means coupled to said first input terminal for supplying third and fourth signals each proportional to said first signal P to said first and second input ends of said first multiplier, respectively, a phase of said third signal being opposite to a phase of said fourth signal, second signal-supply means coupled to said first input terminal for supplying fifth and sixth signals each proportional to said first signal P to the third input ends of said second and third multipliers, respectively, a phase of said fifth signal being equal to a phase of said sixth signal, third signal-supply means coupled to said second input terminal for supplying a seventh signal proportional to said second signal Q to said third input end of said first multiplier, and fourth signal-supply means coupled to said second input terminal for supplying eighth and ninth signals each proportional to said second signal Q to the fourth input ends of said second and third multipliers, respectively, a phase of said eighth signal being opposite to a phase of said ninth signal, whereby an output signal having the value of $P \times Q \times (P+Q) \times (P-Q)$ is produced from said output terminal.

4,694,205

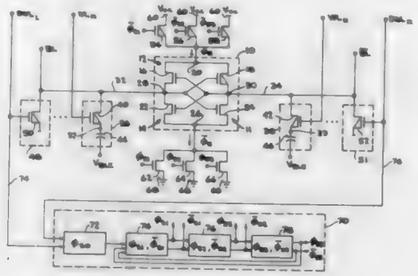
MIDPOINT SENSE AMPLIFICATION SCHEME FOR A CMOS DRAM

Lee-Lean Shu, Milpitas, and Tai-Ching Shyu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 3, 1985, Ser. No. 740,356

Int. Cl.⁴ H03K *17/04, 17/687, 3/356, 19/01*

U.S. Cl. 307—530 **17 Claims**





1. A system for controlling the amplification rate of the differential voltage signal developed at inputs of a CMOS sense amp of the type having a pull-up latch, with a first source node, and a pull-down latch, with a second source node, said system comprising:

means for determining when the amplitude of the differential voltage signal is equal to a first predetermined level;

means for establishing the amplification rate at a first selected value when the magnitude of the differential voltage signal is between the first and a second predetermined value to prevent signal loss; and

means for increasing the amplification rate to a second selected value when the amplitude of the differential signal voltage is above the second predetermined level to decrease the duration of the sense cycle.

4,694,206

DRIVE CIRCUIT FOR A POWER FIELD EFFECT TRANSISTOR

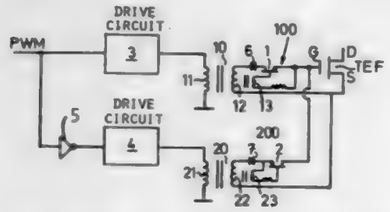
Alan H. Weinberg, Sassenheim, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Dec. 11, 1984, Ser. No. 680,952

Claims priority, application France, Dec. 14, 1983, 83 20726

Int. Cl.⁴ H03K *17/04, 17/08, 17/687*

U.S. Cl. 307—571 **9 Claims**



1. A drive circuit for a power field effect transistor, comprising:

a first switching circuit connected between the gate and source electrodes of said field effect transistor, said first switching circuit including

a first pulse transformer having a primary winding and first and second secondary windings; and

a first transistor having its drain and source connected in series with the first secondary winding of said first pulse transformer, said series-connected first transistor and first secondary winding of said first pulse transformer being connected between the gate and source electrodes of said field effect transistor, the second secondary winding of said first pulse transformer being connected between the gate and source of said first transistor;

a second switching circuit connected between the gate and source electrodes of said field effect transistor, said second switching circuit including

a second pulse transformer having a primary winding and first and second secondary windings; and

a second transistor having its drain and source connected in series with the first secondary winding of said second pulse transformer, said series-connected second transistor and first secondary winding of said second pulse transformer being connected between the gate and source electrodes of said field effect transistor, the second secondary winding of said second pulse transformer being connected between the gate and source of said second transistor;

a first pulse generator coupled to the primary winding of said first pulse transformer, said first pulse generator, in response to an input signal, producing positive voltage pulses at a predetermined rate across the first and second secondary windings of said first pulse transformer, the voltage pulses across the second secondary winding of said first pulse transformer turning said first transistor ON and OFF, and the voltage pulses across the first secondary winding of said first pulse transformer charging the gate-source capacitance of said field effect transistor to the open circuit source voltage of said first pulse transformer thereby turning said field effect transistor ON; and

a second pulse generator coupled to the primary winding of said second pulse transformer, said second pulse generator, in response to said input signal, producing negative voltage pulses at a predetermined rate across the first and second secondary windings of said second pulse transformer, the voltage pulses across the second secondary winding of said second pulse transformer turning said second transistor OFF, and the voltage pulses across the first secondary winding of said second pulse transformer charging the gate-source capacitance of said field effect transistor to a negative voltage thereby turning said field effect transistor OFF.

4,694,207

FET GATING CIRCUIT FOR SWITCHING ELECTRICAL LOADS

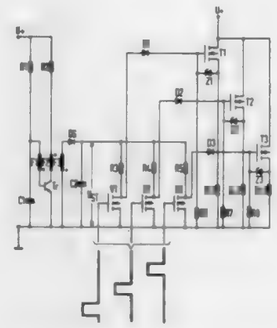
Erwin Heuwieser, Haar, and Kurt Schwaiger, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 473,869, Mar. 10, 1983, abandoned. This application Feb. 7, 1986, Ser. No. 827,653

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209070

Int. Cl.⁴ H03K *17/687, 17/56*

U.S. Cl. 307—571 **3 Claims**



1. Circuit arrangement for switching an electrical load, comprising an MOS switching transistor having its drain-source path connected between the positive terminal of a d-c voltage source and one side of the load, the other side of the load being connected to ground potential, said switching transistor having a gate to which a control voltage is applied which is at least equal to the sum of the voltage of said d-c voltage source and a voltage of a gate-source path of said switching transistor, an oscillator circuit for generating said control voltage by voltage transformation, said oscillator circuit being connected in parallel with said series connection of the load and said switching transistor between said positive and negative terminals of said d-c voltage source, and an input transistor for switching said switching transistor, said input transistor having a drain-source path connecting said gate of said switching transistor and said negative terminal of said d-c voltage source, said input transistor having a gate for receiving switching pulses.

4,694,208

CURRENT-IMPULSE CONVERTER CIRCUIT WITH VARIABLE TIME CONSTANT

Béla Szabó; Jeno Vágvölgyi, and István Fehér, all of Budapest, Hungary, assignors to MTA Kozponti Fizikai Kutato Intezete, Budapest, Hungary

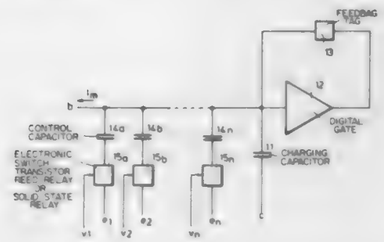
PCT No. PCT/HU84/00046, § 371 Date May 22, 1985, § 102(e) Date May 22, 1985, PCT Pub. No. WO85/01847, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 5, 1984, Ser. No. 760,724

Claims priority, application Hungary, Oct. 7, 1983, 3471-83

Int. Cl.[4] H03K *5/13;* **G06G** *7/18;* **H03F** *1/02;* **H03M** *1/00*

U.S. Cl. 307—603 **2 Claims**



1. A current-impulse converter, comprising: a digital gate for converting an input current to an output train of impulses, said gate having a limited switching speed; feedback means having an input connected to the output of said digital gate and an output connected to an input line of said digital gate; a charging capacitor having a first terminal connected to said input line of said digital gate and a second terminal connected to a stable voltage line; at least one control capacitor and at least one electronic switch; each said at least one control capacitor having a first terminal connected to said input line of said digital gate upstream of said charging capacitor, and a second terminal connected to a first terminal of a said electronic switch, each said at least one electronic switch further comprising a second terminal connected to a control input line and a third terminal connected to a stabilized voltage line.

4,694,209

MOVING ELEMENT BODY APPARATUS OF LINEAR MOTOR AND METHOD FOR PRODUCING IT

Norikazu Shindou, Kanagawa, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

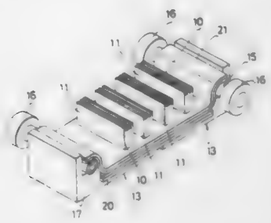
PCT No. PCT/JP84/00498, § 371 Date Jun. 6, 1985, § 102(e) Date Jun. 6, 1985, PCT Pub. No. WO85/01843, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 19, 1984, Ser. No. 743,024

Claims priority, application Japan, Oct. 19, 1983, 58-195419

Int. Cl.[4] H02K *41/00*

U.S. Cl. 310—12 **8 Claims**



1. A movable element for use in a linear electric motor, comprising:

a first pole body formed of a magnetizable material and having a base and a plurality of magnetic poles extending outwardly from said base, said magnetic poles being spaced apart by a predetermined distance and being magnetically interconnected by said base;

a second pole body formed of a magnetizable material and spaced from said first pole body, said second pole body having a base and a plurality of magnetic poles extending outwardly from said base, said magnetic poles of said second pole body being spaced apart by said predetermined distance and being magnetically interconnected by the base of said second pole body; and

holder means of a non-magnetic material for holding said first and second pole bodies in a spaced apart relationship with a first one of the magnetic poles of said first pole body spaced from a first one of the magnetic poles of the second pole body by said predetermined distance, said holder means including surface means for at least partially defining a plurality of openings spaced from each other by said predetermined distance, said first one of the magnetic poles of said first pole body extending through a first one of the openings in said holder means, said first one of the magnetic poles of said second pole body extending through a second one of the openings in said holder means, said first and second openings in said holder means being spaced apart by said predetermined distance to enable said holder means to hold said pole bodies with said first magnetic pole of said first pole body spaced from said first magnetic pole of said second pole body by said predetermined distance.

4,694,210

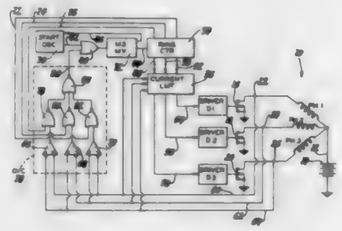
BRUSHLESS DC MOTOR AND SENSORLESS DRIVE ARRANGEMENT THEREFOR

James O. Elliott, Beavercreek, and Jack W. Savage, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 31, 1986, Ser. No. 891,108

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 R **1 Claim**



1. A brushless motor and drive arrangement comprising in combination:

a rotary output member rigidly coupled to a driven load, a magnetic rotor assembly including a plurality of permanent magnets mounted on the periphery of an annular magnetic ring, a stator assembly including at least two stator windings disposed relative to said magnetic rotor assembly such that (1) energization of an individual winding thereof with electric current develops torque for imparting rotary motion to the magnetic rotor assembly, and (2) movement of the rotor assembly relative to the stator assembly induces a voltage in the stator windings, a sensorless controller including means for initiating movement of the rotor assembly by energizing a given one of the stator windings and monitoring the voltage, whereby induced in at least one other stator winding to obtain rotor position information therefrom for synchronizing subsequenty energization of the stator windings with the rotor position, and resilient means for coupling the annular magnetic ring to the rotary output member so that when the controller energizes a given stator winding to initiate movement of the magnetic rotor assembly, the magnetic rotor assembly is able to rotate relative to the rotary output member and load at an effective velocity which induces a greater voltage in the other stator windings than would otherwise occur, thereby enabling the controller to obtain reliable rotor information for successfully starting the motor and load even though the load has relatively high inertia.

4,694,211

SYSTEM FOR SUPPLYING FUEL INCLUDING PROTECTION AGAINST ELECTROLYTIC CORROSION

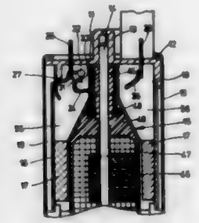
Heiner Bayha, Vaihingen; Hermann Kluge, Ingersheim, and Horst Rachner, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,100

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1985, 3522835

Int. Cl.[4] F04B *17/00;* **H02K** *11/00*

U.S. Cl. 310—71 **10 Claims**



1. A system for supplying a fuel in a motor vehicle including an electric motor driving a supply pump said motor and said pump mounted in a housing, comprising a metallic component part in said housing carrying a pair of permanent magnets, stationarily arranged metallic current leads adapted to be connected to an external electrical operating circuit, said metallic component part electrically connected to a positive side of the operating circuit of the electric motor, and means providing for a higher electric potential at said metallic component part than at one of said current leads connected to the positve side of said motor.

4,694,212

MAGNETIC PRELOADING OF ACTUATOR BEARINGS

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Mar. 21, 1986, Ser. No. 842,623

Int. Cl.[4] H02K *7/08*

U.S. Cl. 310—90 **13 Claims**

3. A limited rotation electromechanical actuator comprising

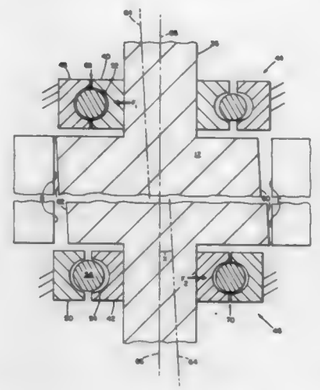
a stator assembly having a plurality of stator pole faces,

a rotor having a plurality of rotor pole faces,

two bearings for supporting said rotor for rotation about an axis relative to said stator assembly such that said rotor pole faces are juxtaposed opposite and spaced from said corresponding stator pole faces by gaps which extend along the length of said rotor, said bearings being characterized by radial free play,

means for establishing magnetic drive flux across said gaps to cause a rotational driving torque to act upon said rotor, and

means for establishing magnetic bias flux across said gaps, at least one said gap having a configuration such that said flux acting across said gap produces radial forces that act upon said rotor to reduce said radial free play in said bearings,



said gap having a varying size along its length but nowhere so great as to have effectively infinite reluctance.

4,694,213

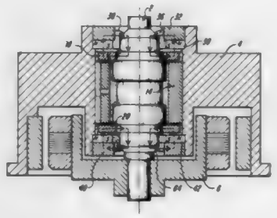
FERROFLUID SEAL FOR A STATIONARY SHAFT AND A ROTATING HUB

Hanumaiah L. Gowda, Hudson; Charles J. Cheever, Nashua, and Frank Bloom, Windham, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Nov. 21, 1986, Ser. No. 933,485

Int. Cl.[4] H02K *5/124;* **H01F** *7/02;* **F16J** *15/40;* **F16C** *32/04*

U.S. Cl. 310—90 **21 Claims**



1. In a bearing application having a stationary shaft about which a hub rotates, a ferrofluid seal for isolating said bearing from from an external environment, said seal comprising a magnet, means for forming a magnetic circuit including said magnet, said shaft and at least one annular gap between a portion of said magnetic circuit and said shaft, said gap being filled with ferrofluid, the improvement comprising,

a taper on said shaft forming a portion of said gap into a first annular wedge-shaped gap having a sloping wall which extends radially towards the axis of said shaft and in a direction towards said external environment.

4,694,214

BRUSH HOLDER FOR DYNAMOELECTRIC MACHINES

Kenneth W. Stewart, Sr., Columbus, Miss., assignor to United Technologies Electro Systems, Inc., Columbus, Miss.

Filed Mar. 7, 1986, Ser. No. 837,108

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **10 Claims**

1. A dynamoelectric machine of the type having brushes that contact a commutator positioned on an armature shaft of an armature which comprises:

a brush holder for positioning at least one brush to engage the commutator, said brush holder including an integral displaceable section defined by slots formed in the brush holder and secured to the remainder of the brush holder by tabs, said displaceable section being positioned to secure the brush in a mounting position, and said displaceable section being configured to define an opening for the receipt of the armature shaft and to be contacted by a portion of the commutator whereby contact with the commutator acts to displace the tabs securing the displaceable section and to displace the displaceable section thereby releasing the brush to engage the commutator.



4,694,215

COMPACT, SINGLE-ENDED FLUORESCENT LAMP WITH FILL VAPOR PRESSURE CONTROL

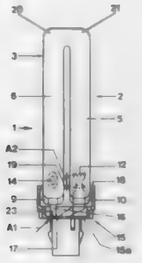
Dieter Hofmann, Augsburg, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,986

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432675

Int. Cl.[4] H01J *61/52, 17/28*

U.S. Cl. 313—44 **14 Claims**



1. A compact, single-ended, low-pressure discharge lamp (**1, 24, 33, 43**) with vapor pressure control regardless of lamp position, having

a single base (**15, 27, 34, 44**);

an internally continuous discharge vessel (**2, 35**) in form of a plurality of tube legs (**5, 6, 7, 8**) located close to each other and being closed at opposite ends,

one end portion of the tube legs extending into the base and being subjected to heating,

said end portions of the tube legs in the base being closed by a pinch or press seal, and secured and retained within the interior of the base;

electrodes (**12, 13**) press-sealed into two of the end portions of the tube legs; and

a fill of mercury and a noble gas within the discharge vessel, wherein

a base cooling zone is provided, located within the base, said base cooling zone, in operation of the lamp, and upon positioning of the lamp in "base down" position, being located in the region of the end portions of the discharge vessel, subject to heating, located in the base and comprising

a cooling tube or stub (**16, 28, 36, 48**) pinch or press-sealed in the press seal of at least one of the legs, said cooling tube or stub being open to the interior of the discharge vessel, terminating essentially flush with the pinch or press seal at the inside of the discharge vessel, and being tipped off at a position beyond the pinch or press seal of the respective tube leg to form a projecting cooling tube; and the base has a base wall (**15a, 14a**) formed with an air inlet opening (**17, 26, 39**) passing therethrough and further formed with an upper region defining an air outlet opening (**19, 42, 50**), said openings being located to provide for air flow through the base by thermal convection to place said projection cooling tube in a stream of air flow between said air flow openings when the lamp is in "base down" position.

4,694,216

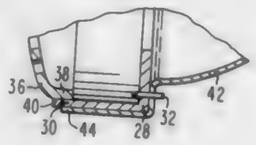
CATHODE-RAY TUBE HAVING AN INTERNAL MAGNETIC SHIELD

Albert M. Morrell, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 27, 1986, Ser. No. 867,033

Int. Cl.[4] H01J *29/06, 29/07*

U.S. Cl. 313—402 **7 Claims**



1. In a cathode-ray tube having a faceplate panel joined to a funnel thereof along a sidewall of said panel, and having an internal magnetic shield disposed therein proximate an inner surface of said funnel and connected along one end thereof to a back portion of a shadow-mask frame oriented orthogonally to a central axis of said tube and supported adjacent said sidewall, a multi-apertured shadow mask being connected along an edge thereof to a front portion of said shadow-mask frame opposite the back portion, the improvement comprising the one end of said magnetic shield overlapping, along the direction of said central axis, the corresponding edge of said shadow mask around substantially all of said shadow-mask frame.

4,694,217

CATHODE RAY TUBE INCLUDING WHITE LUMINOUS PHOSPHOR SCREEN

Yasukazu Morita, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

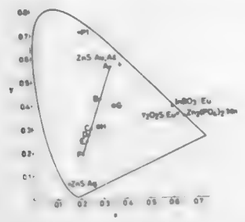
Filed Oct. 21, 1985, Ser. No. 789,777

Claims priority, application Japan, Oct. 26, 1984, 59-223903

Int. Cl.[4] H01J *29/70;* **C09K** *1/14*

U.S. Cl. 313—468 **20 Claims**

1. A cathode ray tube including a phosphor screen, wherein the phosphor being composed of a white emitting mixed phosphor consisting essentially of (i) a first phosphor having the composition expressed by a composition formula $(M_{1-x}Tb_x)_2O_2S$, wherein m corresponds to at least one element selected from the group consisting of Y and Gd and the range of x is $0<x\leq0.01$ (ii) a second phosphor being selected from a group of phosphors having the compositions expressed by composition formulas ZnS:AuAl and Zn_2SiO_4:Mn and of phosphors having the compositions expressed by composition formulas Y_2O_2S:Eu, $InBO_3$:Eu and $Zn_3(PO_4)2$:Mn and (iii) at least one other phosphor in addition to said first phosphor and said second selected phosphor included in the above group.



4,694,218

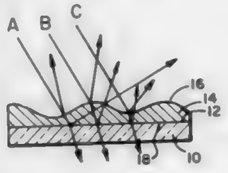
NON-GLAZE COATING FOR A CATHODE RAY TUBE

Paul Chao, Philadelphia, Pa., assignor to Cotek Company, Philadelphia, Pa.

Division of Ser. No. 607,270, May 4, 1984, Pat. No. 4,596,745. This application Jan. 13, 1986, Ser. No. 817,867

Int. Cl.[4] H01J *29/88*

U.S. Cl. 313—478 **5 Claims**



1. In a cathode ray tube having an optical glass screen, the improvement wherein said optical glass screen is coated exteriorly with a mixture of a solid of partially hydrolized metal alkoxides, the metal alkoxides having the general formula $M(OR)_4$ where M is selected form the group consisting of silicon, titanium and zirconium, wherein the metal alkoxides comprise SiO_2 and ZrO_2 and wherein the SiO_2 forms approximately 85% of the solid mixture by weight.

4,694,219

DISCHARGE LAMP ARC TUBES

Peter Hing, Birstall, England, assignor to Thorn EMI plc, London, England

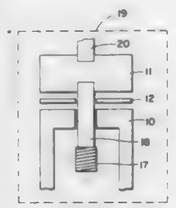
Continuation of Ser. No. 690,408, Jan. 10, 1985, Pat. No. 4,585,972, which is a continuation of Ser. No. 332,216, Dec. 18, 1981, abandoned. This application Jan. 8, 1986, Ser. No. 817,057

Claims priority, application United Kingdom, Dec. 20, 1980, 8040906

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] H01J *61/22, 61/30, 61/36;* **C03C** *8/24*

U.S. Cl. 313—636 **4 Claims**



1. An arc tube for a metal halide discharge lamp, said arc tube comprising an envelope of polycrystalline alumina, sapphire or a spinel, and one or more cermet end closures hermetically sealed thereto by a sealing composition, said sealing composition consisting of at least one of:

(I) about 2.00% to about 5% by weight of at least one nucleating agent selected from the group consisting of phosphorus pentoxide, titania, zirconia and chromia;

(II) about 1.96% to about 5% by weight of boric oxide;

(III) up to about 10% by weight of a nucleating agent selected from the group consisting of HfO_2, Y_2O_3, Yb_2O_3, La_2O_3, Dy_2O_3, and Eu_2O_3; and

the remaining part of said sealing composition consisting of a mixture of

from about 13% to about 21% by weight of the mixture of alumina;

from about 25% to about 28% by weight of the mixture of magnesia; and

the balance based on 100% of the mixture being silica.

4,694,220

HIGH-SPEED FRAME PICK-UP CAMERA

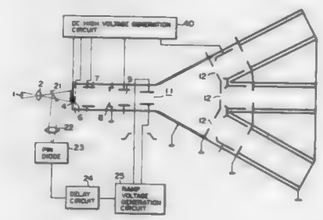
Katsuyuki Kinoshita, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 16, 1985, Ser. No. 723,642

Claims priority, application Japan, Apr. 20, 1984, 59-79794

Int. Cl.[4] H01J *31/26;* **H04N** *9/20*

U.S. Cl. 315—10 **9 Claims**



1. A high-speed frame pick-up camera for picking up the frames of a photoelectronic image formed on the photoelectric layer of an imaging tube comprising:

a first electron lens for reforming said photoelectronic image;

deflection means arranged so that the re-formed image of said photoelectronic image is located at the deflection center thereof;

a plurality of second electron lenses each having a central axis arranged to correspond with said deflection center so that the electron beam deflected by said deflection means is successively received thereby, a plurality of image frames being formed by said second electron means;

a plurality of phosphor layers respectively arranged in the locations of said image frames;

a lens drive circuit for supplying power to said first and second electron lenses; and

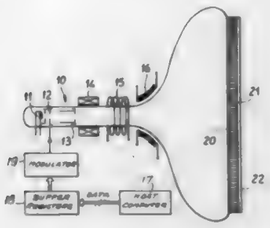
a deflection means drive circuit for supplying power to said deflection means.

4,694,221

DEVICE FOR THE RESTITUTION AND/OR ANALYZING OF COLOR IMAGES USING LINE-TYPE FIBER OPTICS CATHODE RAY TUBE

Jean-Claude Rosier, Gassy, France, assignor to Societe Europeenne de Propulsion, France

Filed Jul. 17, 1986, Ser. No. 886,385
Claims priority, application France, Jul. 23, 1985, 85 11258
Int. Cl.[4] H04N *9/24*
U.S. Cl. 315—10 **14 Claims**



1. Device for the restitution of a color image on an image carrier, comprising:

a cathode ray tube provided with a line screen;

an assembly of optical fibers fixed on the front face of said cathode tube line screen;

a color mask in film form, fixed in front of said assembly of optical fibers and provided with at least three lines of different colors;

means for scanning said line screen by the electron beam of said tube along different lines corresponding to the lines of said color mask;

means for modulating the electron beam of said tube as a function of an image singal which corresponds to the image to be restituted and which is produced from data representing a color component of a line of image;

buffer registers receiving data representing the color components of the lines of image and coupled to said modulation means, said buffer registers being so arranged as to enable sequential reading of the data in the order in which the color components of the lines of the image are formed on the image carrier; and

means providing relative displacement between said color mask and the image carrier situated in front of the mask so as to form on the carrier each line of the image to be restituted by superimposition of its color components each one being formed when the image carrier passes in front of the corresponding line of said color mask scanned by the electron beam, wherein each image line is scanned a plurality of times equal to the number of different colors provided on said color mask, each scan utilizing a unique set of data not necessarily equal to the set of data used for preceding or subsequent scans.

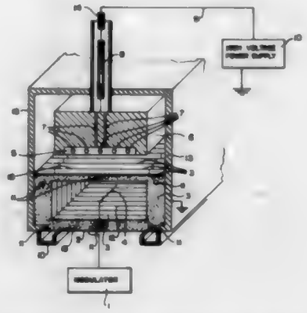
4,694,222

ION PLASMA ELECTRON GUN

George Wakalopulos, Pacific Palisades, Calif., assignor to RPC Industries, Hayward, Calif.

Filed Apr. 2, 1984, Ser. No. 596,093
Int. Cl.[4] H02K *39/00*
U.S. Cl. 315—111.21 **3 Claims**

1. An ion plasma electron gun assembly comprising: an electrically conductive evacuated housing forming first and second chambers adjacent to one another and having an opening therebetween; means for generating positive ions in said first chamber; a cathode positioned in said second chamber in spaced and insulated relationship from said housing, said cathode having a secondary electron emissive surface; means for applying a high negative voltage between said cathode and said housing to cause said cathode to draw the positive ions from said first chamber to said second chamber to impinge on said surface of said cathode and to cause said surface to emit secondary electrons; an electrically conductive electron transmissive foil extending over an opening in said housing at the end of said first chamber facing said cathode, said foil being electrically connected to the housing to constitute an anode for the secondary electrons and causing the secondary electrons to pass through the foil as an electron beam; an electrically conductive extractor grid mounted in said second chamber adjacent to the secondary electron emissive surface of said cathode and connected to said housing to create an electrostatic field at said surface to cause secondary electrons therefrom to pass



through the openings in the grid and into said first chamber; and an electrically conductive support grid mounted in said first chamber adjacent to said foil and connected to said foil and to said housing, said support grid serving to support said foil and having openings therein aligned with the openings in said extractor grid to act in conjunction with said extractor grid to accelerate the secondary electrons to the foil,

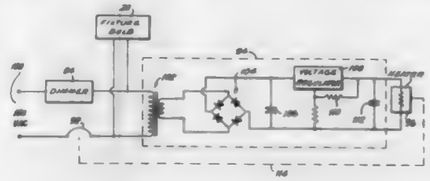
wherein said secondary electron emissive surface of said cathode has grooves formed therein at predetermined angles to increase electron emission and to direct electrons through the openings in said extraction grid.

4,694,223

THERMAL SENSOR FOR A LIGHTING FIXTURE

Steve Campolo, Valley Stream, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,394
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—118 **16 Claims**



1. Apparatus for protecting against overheating of a lamp fixture energized from a dimmer controlled voltage source, comprising:

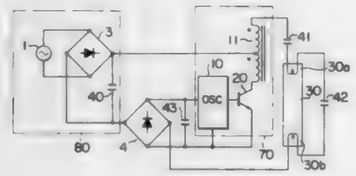
a heat flow detector for attachment at a location in the vicinity of the lamp fixture to be subject to the same heat flow environment conditions as the lamp fixture, and comprising a temperature sensitive switch electrically coupled to said lamp fixture disconnecting the lamp fixture from the dimmer controlled voltage source in response to a predetermined temperature, a biasing heater energized from said dimmer controlled voltage source and thermally coupled to the temperature sensitive switch for raising the temperature of the switch to said predetermined temperature when overheating of the lamp fixture prevents adequate dissipation into the environment of the heat from the biasing heater, and a regulator circuit for maintaining a required voltage across said biasing heater even upon reduction of the energization voltage from said dimmer controlled voltage source.

4,694,224

LIGHTING APPARATUS FOR AN ELECTRIC DISCHARGE LAMP

Hisato Nakagawa, Ryugasaki; Hideo Kuwahara, Funabashi; Atsuo Koyama, Nagareyama, and Mitsuo Akatsuka, Chiba, all of Japan, assignors to Hitachi Lighting, Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,944
Claims priority, application Japan, Oct. 19, 1983, 58-194226
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—177 **20 Claims**



1. A lighting apparatus for an electric discharge lamp comprising:

a lighting ballast element, connected in series to an electrice discharge lamp having a pair of preheating electrodes, for stabilizing a lighting current to said discharge lamp;

a preheating ballast element, connected in series with said pair of preheating electrodes of said discharge lamp, for supplying a preheating electrice power to the discharge lamp;

electric power supply means for supplying an electric power to said lighting ballast element;

a control power supply circuit connected to obtain a control electric signal from said electric power supply means through the series circuit of said lighting ballast element and discharge lamp after the lamp has been lighted or through the series circuit of said lighting ballast element, said preheating ballast element and the two preheating electrodes of said discharge lamp when said electric power is supplied to said lighting ballast element to light said lamp; and

an oscillator connected to receive said control electric signal from said control power supply circuit for controlling said electric power supply means to supply electric power to said lighting ballast element only while it receives said control electric signal from said control power supply circuit.

4,694,225

METHOD OF DRIVING A FLAT TYPE OF CATHODE RAY TUBE TO PROVIDE UNIFORMITY OF ELECTRON BEAM EMISSION CHARACTERISTICS FOR A PLURALITY OF BEAM SOURCES

Kaoru Tomii, Isehara, and Kiyoshi Hamada, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

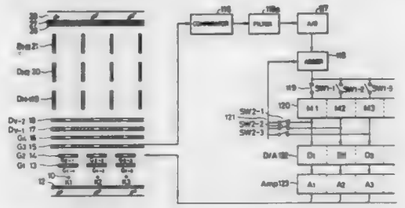
Filed Sep. 30, 1986, Ser. No. 913,593
Claims priority, application Japan, Sep. 30, 1985, 60-217060
Int. Cl.[4] H07J *29/70*
U.S. Cl. 315—366 **13 Claims**

1. A method of driving a flat type of cathode ray tube having a plurality of electron beam sources for producing respective electron beams, each of said electron beam sources comprising a cathode, a first group of electrodes comprising at least a first electrode for regulating a level of current of the corresponding electron beam and a second electrode disposed outward of said first electrode along the path of said electron beam for generating an electric field to produce said electron beam, and a second group of electrodes disposed outward of said first group of electrodes along said electron beam path, and respectively coupled to receive predetermined values of high voltage for focusing and deflecting said electron beam, the method comprising:

changing the voltage applied to one of said second group of electrodes to a fixed value which is substantially lower than said high voltage value;

successively deriving correction voltage values for each of said electron beams sources by:

enabling emission of an electron beam from said electron beam source by applying a fixed control voltage to said first electrode during a first time interval of fixed duration;



during said first time interval, sensing a current which flows from said electron beam passing into one of said second group of electrodes, and comparing the level of said sensed current with a fixed reference current value to obtain a first current difference value;

storing said first current difference value in a memory, and;

following completion of said first time interval, reading out said stored current difference value from said memory and deriving a first value of said correction voltage based on said current difference value, and;

applying said correction voltage such as to modify a potential difference between said cathode and said first group of electrodes in a direction tending to reduce the difference between said sensed current value and said reference current value, and restoring said voltage applied to said one of the second group of electrodes from said low to said high voltage level.

4,694,226

VERTICAL DEFLECTION CIRCUIT WITH SERVICE MODE OPERATION

James A. Wilber, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 29, 1986, Ser. No. 901,614
Int. Cl.[4] H01J *29/70;* **H04N** *17/02*
U.S. Cl. 315—408 **11 Claims**

1. A vertical deflection circuit for a video display apparatus having a service mode of operation, comprising:

a vertical deflection winding;

a DC blocking capacitance coupled to said deflection winding;

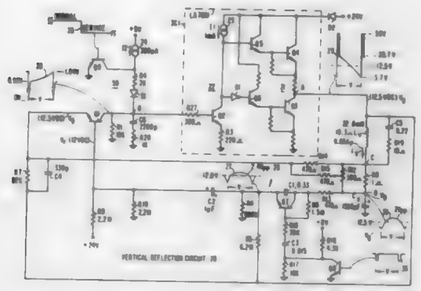
an output stage including first and second output amplifiers coupled to said vertical deflection winding in a push-pull arrangement at an output terminal, said first and second output amplifiers being respectively coupled to a source of supply voltage and to a reference potential point;

a driver stage coupled to said output stage;

a vertical sawtooth voltage generator coupled to said driver stage for applying a vertical sawtooth voltage thereto to drive said output stage at a vertical rate in a sawtooth manner to generate a sawtooth vertical deflection current in said deflection winding and establish a DC operating

voltage level at said output terminal that charges said DC blocking capacitance; and

service mode means coupled to said driver stage for asserting said service mode of operation by maintaining said



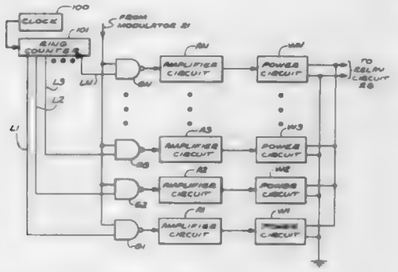
first output amplifier in cutoff and said second output amplifier in conduction to discharge said DC blocking capacitance and disable the generation of said sawtooth deflection current.

4,694,227

CURRENT SHARING CIRCUIT

Herbert M. Doman, Camarillo, Calif., assignor to Everest & Jennings, Inc., Camarillo, Calif.

Filed Apr. 14, 1986, Ser. No. 851,230
Int. Cl.[4] H03K *17/56*
U.S. Cl. 318—80 **11 Claims**



1. A controller circuit, comprising:

a source of potential;

a load;

a first power transistor having a collector-emitter circuit and including a collector, an emitter and a base;

a second power transistor having a collector, an emitter, and a base,

said source, said load and said collector-emitter circuit all being connected in series,

said second transistor collector and emitter being connected to said first transistor collector and emitter respectively: and

synchronous means connected to said transistor bases for gating said first transistor on while maintaining said second transistor at cut-off and vice versa.

6. A controller circuit, comprising:

a source of potential;

a load;

first, second . . . Nth power circuits having their outputs connected in parallel,

said power circuit outputs being connected in series with said source and said load; and

synchronous means to apply a gating pulse to each of said power circuits in digital succession,

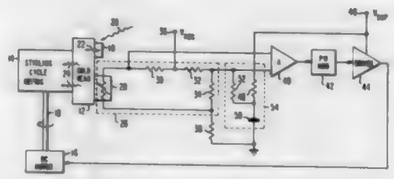
all of said gating pulses occurring over mutually exclusive periods of time.

4,694,228

COMPENSATION CIRCUIT FOR CONTROL SYSTEM PROVIDING PULSE WIDTH MODULATED DRIVE SIGNAL

Theodore D. Michaelis, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1986, Ser. No. 842,652
Int. Cl.[4] F25B *1/00;* **H02P** *5/26*
U.S. Cl. 318—341 **14 Claims**



1. In a control system including a sensing bridge circuit for producing an error voltage in response to deviations from a predetermined sensed parameter, and a modulator-driver circuit coupled to said bridge circuit, to a direct voltage power supply and to a load circuit, said modulator-driver circuit providing pulses of the voltage of said power supply to said load circuit, said modulator-driver circuit being responsive to said bridge circuit error voltage for establishing the width of said pulses, said load circuit being responsive to an average voltage level applied thereto, said average voltage level being the product of the voltage of said direct-voltage power supply multiplied by the pulse duty cycle, an apparatus for compensating for variations in said average voltage level due to variations in said power supply voltage, said apparatus comprising:

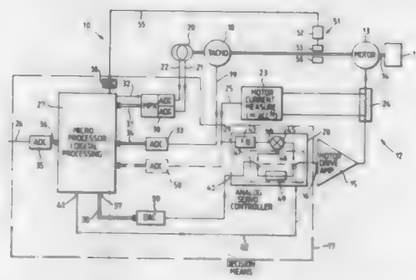
providing means coupled to said sensing bridge circuit and to said power supply for providing a signal responsive to said voltage of said direct voltage power supply, said signal affecting the balance of said sensing bridge circuit such that a change in said power supply voltage effects a change in the width of said driver circuit pulses.

4,694,229

SERVO POSITIONING SYSTEM

Robert J. Cormack, Edinburgh, Scotland, assignor to Ferranti, plc, Cheshire, England

Filed Nov. 8, 1985, Ser. No. 796,217
Claims priority, application United Kingdom, Nov. 9, 1984, 8428414
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **13 Claims**



1. A feedback servo positioning system for controlling the position of a displaceable body in accordance with received

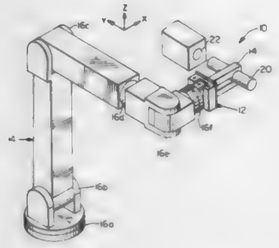
position demand signals representing the instantaneous position, velocity and acceleration of the body, drive motor means for displacing the body by current flow therein resulting from servo error signals and decision making means operable to provide said servo error signals to the drive motor in response to said position demand and transducer signals, said decision making means being responsive to a measured displacement between instantaneous and demanded positions less than a predetermined threshold value to configure the feedback servo system as a position feedback loop and derive servo error signals having values proportional to the difference between the instantaneous and demanded positions, and responsive to a displacement between instantaneous and demanded positions greater than said predetermined threshold value to configure the feedback servo system as an acceleration feedback loop, provide an acceleration demand signal representing the achievement of a predetermined acceleration by the drive motor means, determine an intermediate position as a present function of the demanded displacement, determine an acceleration error between the acceleration demand signal and transducer signal representing the instantaneous acceleration, cause the acceleration error signal to apply a drive current to the drive motor to accelerate it at said predetermined acceleration rate until it reaches the intermediate position thereafter causing the current in the drive motor to be reversed in direction to effect controlled deceleration of the drive motor and reduce the acceleration demand signal as a function of the instantaneous velocity and displacement to bring the body to rest at the demanded position.

4,694,230

MICROMANIPULATOR SYSTEM

Alexander H. Slocum, McLean, Va., and James P. Peris, Germantown, Md., assignors to USA as represented by the Secretary of Commerce, Washington, D.C.

Filed Mar. 11, 1986, Ser. No. 838,748
Int. Cl.[4] G05B *19/10*
U.S. Cl. 318—568 **8 Claims**



1. A micromanipulator system for precisely positioning an object in an xz plane and then for grossly moving the object in a y direction perpendicular to the xz plane comprising:

a base, said base defining a x axis, a y axis and a z axis;

a platform;

a mounting means for mounting said platform to said base for five different degrees of movement, the five degrees of movement being movement in the x direction, movement in the y direction, movement in the z direction, rotation about the x axis, and rotation about the z axis;

moving means for reversibly moving said platform in the five degrees of movement relative to said base, said moving means including a x position moving means for precisely positioning said platform a small distance in the x direction, a z position moving means for precisely positioning said platform a small distance in the z direction, and a y position moving means for coarsely positioning said platform a large distance in the y direction, said x position moving means and said z position moving means being linear actuators which serve as axles means about which said platform rotates about the x axis and the z axis respectively;

said base including a fixed plate and said z position moving means including a z plate such that said z position moving means pushes against said fixed plate in the z direction and said x position moving means pushes against said z plate and hence against said fixed plate in the x direction;

a rolling friction element means for providing a respective interface between a respective said actuator and one of a respective said fixed plate and said z plate, each said rolling friction element means including a concavity in the end of a respective said linear actuator, a ball located in said concavity, and a rounded trough in said fixed plate in which said ball is located such that movement along a respective x and z axis occurs as said ball rolls along the length of said trough, and movement about a respective x and z axis occurs as said ball rides up and down the sides of said rounded trough and concavity; and

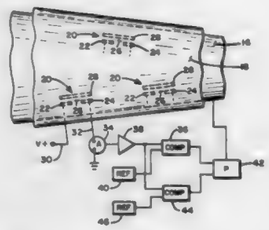
a means for holding the object, said holding means being attached to said platform and moved with said platform whereby the object held by said holding means is precisely positioned in a xz plane and subsequently coarsely moved in the y direction perpendicular to the xz plane.

4,694,231

ROBOTIC SKIN

Joseph G. Alvite', Wyoming, Minn., assignor to Mecanotron Corporation, Minneapolis, Minn.

Filed Apr. 18, 1986, Ser. No. 853,637
Int. Cl.[4] G01L *1/16;* **G05D** *15/00;* **H01C** *10/10*
U.S. Cl. 318—568 **8 Claims**



1. A tactile sensing skin for a movable member including:

a first flexible dielectric film forming a first insulative layer mounted with respect to the outside surface of a movable member, and having a first surface facing outwardly away from said member;

a second flexible and dielectric film forming a second insulative layer adjacent said first insulative layer, and having a second surface facing said first surface;

a carbon base electrically conductive compound substantially uniformly applied to one of said first and second surfaces;

an electrically conductive metallic compound selectively applied to the other of said surfaces, whereby said metallic compound and carbon base conductive compounds are contiguous over the interface between said first and second films, said metallic compound being selectively applied to form a plurality of discrete pairs of first and second electrically conductive regions and a dielectric gap between said conductive regions of each pair;

a means for establishing a substantially constant potential difference between the first conductive region and second conductive region in each pair;

a first matting of resilient fiber forming a first flexible layer attached to the outwardly facing surface of said second film;

an elastically deformable outer layer attached to the outwardly facing surface of said first flexible layer; and

a control means responsive to changes in the amount of

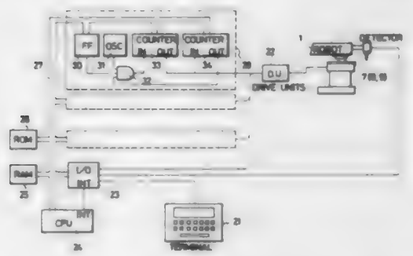
electrical current flowing between said first and second electrically conductive regions, for controlling travel of said member.

4,694,232

ROBOT CONTROLLING SYSTEM

Hayao Suzuki, and Yoshiharu Matsuoka, both of Koto, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,615
Int. Cl.⁴ G05B *19/42*
U.S. Cl. 318—568 **12 Claims**



1. In a robot controlling system having a robot hand which moves through a moving distance relative to articles stored in succession and is sequentially operated by a drive unit in response to operation data, the improvement comprising: detecting means for detecting the distance between the hand and the article and producing a corresponding detection signal during the movement of the hand toward the article; first controlling means responsive to the detection signal and connected to the drive unit for producing a control signal effective to stop the movement of the hand when the level of the detection signal reaches a predetermined level and for producing present self-taught data based on the control signal; memory means connected to the first controlling means for storing the present self-taught data representative of the stop position of the hand; and second controlling means responsive to the present self-taught data stored in the memory means and connected to the drive unit for controlling the movement of the hand based on the operation data and for calculating updated operation data representative of the next moving distance of the hand based on the present self-taught data so as to effect the movement of the hand at a higher speed toward the article through the next moving distance and thereafter effect the movement of the hand at a lower speed until the hand stops in response to the control signal produced by the first controlling means.

4,694,233

NUMERICAL CONTROL APPARATUS FOR MACHINE

Takao Yoneda, Nagoya, and Hiroshi Nakano, Toyoda, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 2, 1986, Ser. No. 902,659
Claims priority, application Japan, Aug. 31, 1985, 60-192991
Int. Cl.⁴ G05B *19/18*
U.S. Cl. 318—569 **9 Claims**

1. A numerical control apparatus for controlling a machine which has a movable element and a servomotor for moving said movable element, said numerical control apparatus comprising:

memory means for storing numerical data representing numerical characteristics of movement of said movable element, said numerical data being expressable in either one of a first system of measurement and a second system of measurement;

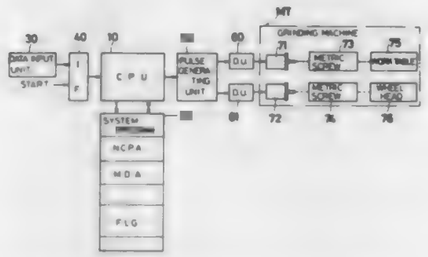
code means stored in said memory means for said numerical data expressed in said first system of measurement;

means for ascertaining when said code means is stored;

means for setting said numerical control apparatus to be operable for data expressed in one of said first system of measurement and in said second system of measurement;

means for ascertaining for which system of measurement said numerical control apparatus is set to be operable;

means responsive to said code ascertaining means and said system ascertaining means for converting said numerical data expressed in said second system of measurement into numerical data expressed in said first system of measurement when said numerical control apparatus is set to be



operable for data expressed in said second system of measurement; and

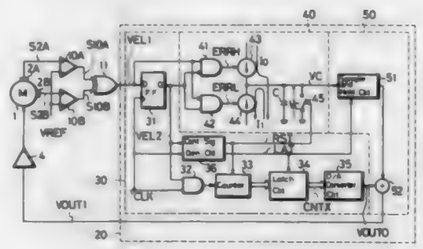
means for exciting said servomotor in accordance with said numerical data stored in said memory means when said code ascertaining means ascertains the presence of said code means, and in accordance with said numerical data converted by said converting means when said code ascertaining means ascertains the absence of said code means and said numerical control apparatus is set to be operable for data expressed in said second system of measurement.

4,694,234

APPARATUS FOR COMPENSATING A QUANTIZATION ERROR

Yasuo Nagai, Tokyo, and Fumiyoshi Abe, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,740
Claims priority, application Japan, Dec. 25, 1984, 59-279428
Int. Cl.⁴ G05B *19/29*
U.S. Cl. 318—603 **11 Claims**



1. An apparatus for detecting a pulse width of a pulse signal comprising:

means for generating reference clock pulses;

means for counting a number of said reference clock pulses occurring during said pulse signal and providing a count value indicating a pulse width of said pulse signal;

means for detecting a phase difference between said reference clock pulses and said pulse signal and including analogue means for generating an analogue signal corresponding to said phase difference; and

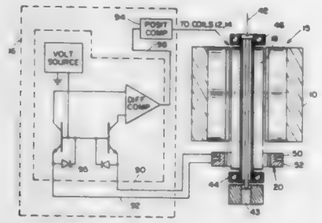
means for compensating said count value in response to said analogue signal to thereby generate pulse width data having a reduced quantization error.

4,694,235

CAPACITIVE POSITION SENSOR

Peter T. Flowers, Dorchester, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Aug. 1, 1986, Ser. No. 893,095
Int. Cl.⁴ G05B *1/06*
U.S. Cl. 318—662 **10 Claims**



1. A capacitive sensor for sensing changes in the position of a rotating element relative to a stationary element, comprising

a capacitive surface on said rotating element,

two sets of capacitive surfaces that are fixed relative to said stationary element,

said rotating surface being arranged to cooperate both with one said fixed surface of one said set, and with one said fixed surface of the other said set such that as the area of overlap of said rotating surface with said one fixed surface increases, the area of overlap with said other fixed surface decreases, and vice versa,

said surfaces of one said set forming a first integral unit,

said surfaces of the other said set forming a second integral unit,

said two units each defining spaces to receive the surfaces of the other said unit,

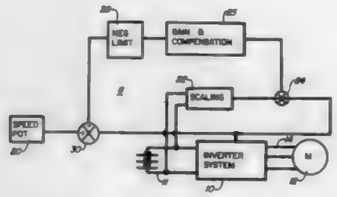
said two units being held together with the surfaces of each said set resting in the corresponding spaces in the other said unit such that all of said surfaces of both said sets intersect a common plane, and the surfaces of said one set are electrically isolated from the surfaces of said other set.

4,694,236

CONTROL FOR AC MOTOR DRIVE

Anand Upadhyay, and Lawrence W. Messenger, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 26, 1985, Ser. No. 705,665
Int. Cl.⁴ H02P *5/40*
U.S. Cl. 318—798 **9 Claims**



1. In a variable-speed AC motor drive having a variable output frequency inverter operated by a pulse width modulation (PWM) control to convert DC power developed by a battery into AC output power for energizing a motor, the battery having a finite power reserve and developing a progressively diminishing output voltage as the battery discharges, the inverter output frequency being determined in accordance with an input speed command signal, a control to maintain continued energization of the AC motor by the inverter at a constant inverter output voltage to output frequency ratio as the output voltage of the battery progressively diminishes, the control comprising:

means for deriving from the battery a signal representing the maximum motor speed which can be supported by the battery output voltage;

means for summing said maximum motor speed signal with said speed command signal to derive an error signal; and

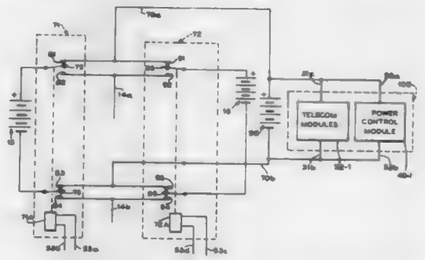
means for summing an error signal indicating a maximum supportable motor speed less than the commanded speed with the speed command signal to reduce the speed command signal to the inverter.

4,694,237

ISOLATED POWER SUPPLY SYSTEM AND METHOD

George E. Hanson, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Jul. 8, 1986, Ser. No. 883,062
Int. Cl.⁴ H02J *7/00, 9/00*
U.S. Cl. 320—6 **23 Claims**



1. In a system to be operated from an alternating current power line while providing isolation from electromagnetic interference coupled with the power line,

battery charging means having charger input means for coupling with an alternating current power line and having charger output means for supplying battery charging current,

first and second rechargeable battery means for selectively supplying electric power to a utilization circuit,

radio-frequency-isolating switching means controlling connection of said charger output means with said first and second rechargeable battery means and having a first switching condition for electrically isolating said first rechargeable battery means from the charger output means during connection of the first rechargeable battery means with the utilization circuit so as to block transmission of electromagnetic interference from the alternating current power line to the first rechargeable battery means and thus to the utilization circuit via the battery charging means, while providing for supply of battery charging current from the battery charging means to the second rechargeable battery means; and having a second switching condition for electrically isolating said second rechargeable battery means from the charger output means during connection of the second rechargeable battery means with the utilization circuit so as to block transmission of electromagnetic interference from the alternating current power line to the second rechargeable battery means and thus to the utilization circuit via said battery charging means, while providing for supply of charging current from the battery charging means to the first rechargeable battery means, and

control circuit means controlling switchover of said switching means between said first and second switching condition and comprising charge storage means for maintaining

the supply of power to the utilization circuit during switchover between the first and second switching conditions,

said charge storage means comprising a third rechargeable battery means connected with the utilization circuit and selectively connectable with the first and second rechargeable battery means under the control of said radio-frequency-isolating switching means.

4,694,238

DUAL VOLTAGE POWER SUPPLY SYSTEM FOR VEHICLES

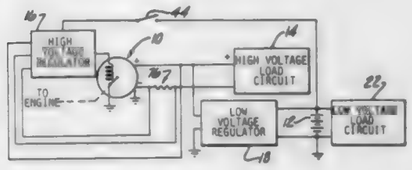
Peter Norton, 4787 Woodworth, Dearborn, Mich. 48126

Continuation of Ser. No. 569,723, Jan. 10, 1984, Pat. No. 4,604,528. This application Mar. 24, 1986, Ser. No. 843,108

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.⁴ H02J *7/14;* **H02P** *9/30*

U.S. Cl. 322—28 **21 Claims**



1. In an electrical system for a vehicle, said system being of the type including a DC generator having a DC output, a first load circuit including a battery and one or more load devices adapted to be powered by DC electricity at a voltage in a first voltage range corresponding to the rated voltage of the battery, and a second load circuit including one or more load devices designed to be powered by a DC electricity at a voltage in a second voltage range extending substantially higher than said first voltage range, the improvement comprising:

a first regulator having an input coupled with a DC output of said DC generator and having an output coupled with said first load circuit, said first regulator including means for converting power received at said input to power at a voltage in said first voltage range,

and a second regulator for controlling said generator to produce a DC voltage meeting the requirements of said second load circuit, an output of said DC generator being coupled with said second load circuit.

4,694,239

ELECTRONIC VOLTAGE REGULATING DEVICE WITH COMPENSATION FOR THERMAL DISSIPATION, PARTICULARLY FOR ALTERNATORS

Fabio Marchio', Busto Arsizio, and Pietro Menniti, Milan, both of Italy, assignors to SGS Microelettronica S.p.A., Catania

Filed Mar. 10, 1986, Ser. No. 837,892

Claims priority, application Italy, Mar. 13, 1985, 19869 A/85

Int. Cl.⁴ G05F *1/56*

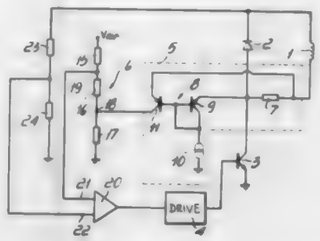
U.S. Cl. 323—285 **5 Claims**

1. An integrated electronic device for regulating the voltage of a load, in particular an alternator, with compensation of internal heat dissipation, comprising a control stage and a power stage,

said control stage comprising a control input connectable to the load for receiving therefrom a load voltage signal, temperature sensing means for generating an ambient temperature dependent reference voltage signal, comparing means connected to said control input and said sensing means for generating an output control signal,

said power stage having a power stage input receiving said output control signal and a power stage output connectable to said load, said power stage generating a drive signal to be supplied to said load and having an internal thermal dissipation,

said power stage including dissipation sensing means for detecting said drive signal and generating a thermal dissipation signal correlated thereto, and said control stage further including dissipation compensating means interposed between said temperature sensing means and said comparing means for receiving said thermal dissipation signal and said ambient temperature dependent voltage signal and for generating a compensated, ambient temperature dependent control signal fed to said comparing means.



4,694,240

SWITCHING REGULATOR

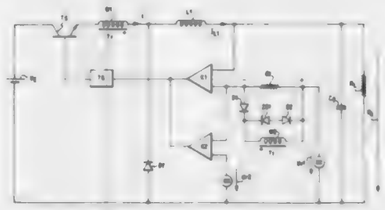
Eckhardt Grünsch, Allmersbach i.Tal, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 19, 1986, Ser. No. 875,954

Claims priority, application European Pat. Off., Jun. 20, 1985, 85 107614.1

Int. Cl.⁴ G05F *1/56*

U.S. Cl. 323—285 **5 Claims**



1. In a switching regulator for controlling the delivery of current to a load in order to establish a selected voltage across the load, which regulator includes energy supply means constituting a source of current, current storage means connected to be supplied with current by the energy supply means for supplying the load with current, controllable switch means connected to the energy supply means and the current storage means for controlling the supply of energy from the energy supply means to the current storage means and switchable between a first state in which energy is supplied by the energy supply means to the current storage means for charging the current storage means, and a second state in which energy is not supplied to the current storage means and the current storage means discharges, and regulating means connected to the switch means for switching the switch means between the first and second states in cycles, with each cycle being composed of a first period during which the switch means are in the first switching state and a second period during which the switch means are in the second switching state, the improvement wherein said regulating means comprise means for monitoring the peak current supplied by the energy supply means during each first period and for controlling the peak current supplied by the energy supply means in dependence on the load voltage, and timing control means connected to said means for monitoring and controlling for causing the second periods to all have the same duration and, for causing the first periods to have durations which vary in a manner to maintain the voltage across the load constant.

4,694,241

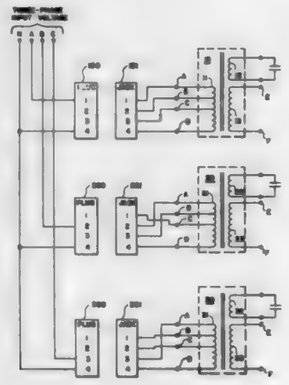
TRANSFORMER TAP CHANGER

Luther L. Genuit, Scottsdale, Ariz., assignor to Honeywell Bull Inc., Phoenix, Ariz.

Filed Jun. 6, 1986, Ser. No. 871,344

Int. Cl.⁴ H01F *21/12, 33/00*

U.S. Cl. 323—340 **5 Claims**



1. A transformer apparatus selecting one of a plurality of taps of at least two transformers, said transformer taps being taps of a winding of each of said transformers, one of said transformer taps of each of said transformers being a starting tap of said winding and the remaining taps being the selectable taps, said apparatus comprising:

(a) a plurality of jack means each jack means being associated with one of the transformers, each jack means having a plurality of pins corresponding to the plurality of taps, each of said jack means for providing a contact point for each tap of the corresponding transformer, each pin of a respective jack means operatively connected to a predetrmined selectable transformer tap of a corresponding transformer, such that the corresponding selectable taps of each of the transformers is operatively connected to a different corresponding pin for each of the corresponding jack means, and further wherein the starting tap of each transformer is operatively connected to the same corresponding pin of the jack means corresponding to the transformer; and

(b) a plurality of plug means, the number of plug means corresponding to one less than the number of pins of said jack means, each plug means having a plurality of mating pin positions corresponding to the pins of said jack means, the mating pin of each plug means that corresponds with the pin of the starting tap being operatively connected to a first supply terminal, and each plug means having a different mating pin from all the other plug means operatively connected to a second supply terminal, for mating with said jack means, such that when a predetermined plug means mates with a predetermined jack means, a predetermined tap is selected.

4,694,242

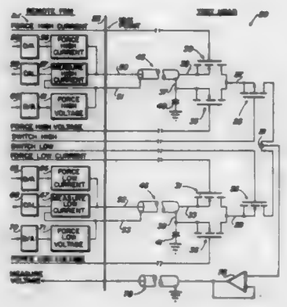
INTEGRATED CIRCUIT TESTER AND REMOTE PIN ELECTRONICS THEREFOR

John L. Peterson, and Mavin Swapp, both of Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 656,810, Oct. 1, 1984, abandoned. This application Jun. 20, 1986, Ser. No. 876,661

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 324—73 R **11 Claims**



1. In an apparatus for providing an interface between an integrated circuit tester, comprising a current between an integrated circuit tester and a pin of a device under test, said apparatus comprising means for forcing current, means for forcing voltage, means for measuring current and means for measuring voltage, the improvement comprising;

first switch means for selectively coupling and decoupling said integrated circuit tester to said pin;

second switch means for selectively coupling and decoupling said means for forcing current of said integrated circuit tester to said first switch means; and

third switch means for selectively coupling and decoupling said means for forcing voltage of said integrated circuit tester to said first switch means.

4,694,243

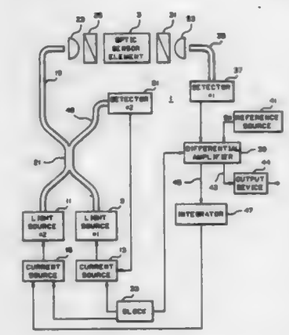
OPTICAL MEASUREMENT USING POLARIZED AND UNPOLARIZED LIGHT

Robert C. Miller, Salem Township, Westmoreland County, and Juris A. Asars, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 28, 1986, Ser. No. 868,224

Int. Cl.⁴ G01R *19/00, 15/07;* **G01B** *11/00*

U.S. Cl. 324—96 **12 Claims**



1. A method of measuring the magnitude of a physical quantity comprising the steps of:

alternately passing polarized light and unpolarized light through an optical sensor which alters the polarization of the poiarized light as a function of the magnitude of the selected physical quantity, but passes the unpolarized light unaffected by the magnitude of the physical quantity;

converting light emerging from the optical sensor into an electrical signal having in response to the polarized light a component proportional to the magnitude of the selected physical quantity;

maintaining the effective intensities of the polarized and unpolarized light in proportion such that the electrical signal generated in response to the unpolarized light and in response to the polarized light with a zero magnitude of the physical quantity, are substantially equal; and

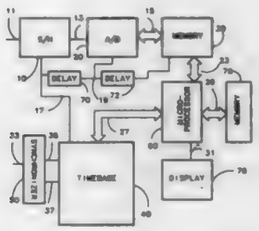
subtracting the electrical signal alternately generated in response to the unpolarized light from the electrical signal generated in response to the polarized light to generate an output signal proportional to the magnitude of the physical quantity.

4,694,244

APPARATUS FOR RANDOM REPETITIVE SAMPLING

Laura Whiteside, and Thomas K. Bohley, both of Colorado Springs, Colo., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1986, Ser. No. 832,107
Int. Cl.⁴ G01R *13/20*; H03M *1/06*
U.S. Cl. 324—121 R **1 Claim**



1. Apparatus for acquiring data using random repetitive sampling in a digital oscilloscope comprising:

sampling means having a clock input, a signal input having an analog value, and an output for setting the output to the analog value of the signal input on rising edges occuring on the clock input;

converter means connected to the sampling means for converting the sampled analog values to digital values,

first memory means connected to converter means for storing digital values,

timebase means connected to sampling means for creating clock signals, counting minimum pretrigger delays, randomizing trigger event searches with respect to rising edges occuring on the clock input of the sampling means, counting post-trigger delays and controlling sampling,

microprocessor means connected to said first memory means for controlling said timebase means, said first memory means, second memory means, and display means,

said second memory means connected to said microprocessor means for storing compilations of digital values stored in said first memory means,

said display means connected to said microprocessor means for displaying digital values stored in said second memory means,

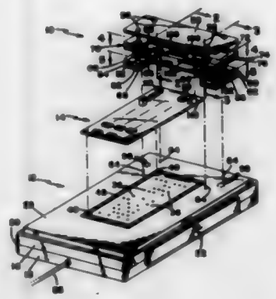
synchronizer means connected to said timebase means for locating user-determined trigger events.

4,694,245

VACUUM-ACTUATED TOP ACCESS TEST PROBE FIXTURE

T. Michael Frommes, Minnetonka, Minn., assignor to Precision Drilling, Inc., Minnetonka, Minn.

Filed Sep. 7, 1984, Ser. No. 648,786
Int. Cl.⁴ G01R *1/04*
U.S. Cl. 324—158 F **13 Claims**



1. Top access test probe apparatus for use with a vacuum-actuated test fixture having a movable top platen and a vacuum chamber defined below the platen, which comprises:

a contact board mounted adjacent to a circuit board under test on the platen of the test fixture for movement therewith;

a plurality of pairs of electrically interconnected contact pads provided on opposite sides of said contact board;

a probe block;

means for supporting said probe block on said contact board for linear reciprocal movement relative to the circuit board under test;

a plurality of pairs of electrically interconnected depending test probes mounted on said probe block for movement therewith, one test probe of each pair being positioned for engagement with a contact pad on said contact board and the other test probe of each pair being positioned for engagement with a predetermined point on the top of the circuit board under test;

a pair of laterally spaced apart bellows sealingly engaged between said probe block and said contact board, said probe block being normally biased upwardly away from the circuit board by said bellows; and

means extending between said bellows and said vacuum chamber for fluidly interconnecting said bellows and the vacuum chamber of the test fixture so that said probe block and said test probes thereon are vacuum-actuated downwardly into engagement with the top of the circuit board simultaneously upon acutation of the test

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4,694,246

MOVABLE CORE TRANSDUCER

Jean-Bernard Aviaue, Castelnaau de Medoc, France, assignor to Societe Anonyme: Societe Europeenne de Propulsion, Puteaux, France

Filed Sep. 19, 1986, Ser. No. 909,306
Claims priority, application France, Sep. 20, 1985, 85 13970
Int. Cl.⁴ G01B *7/14*; H01F *21/06*
U.S. Cl. 324—207 **5 Claims**

1. A movable core transducer of the differential transformer type, comprising:

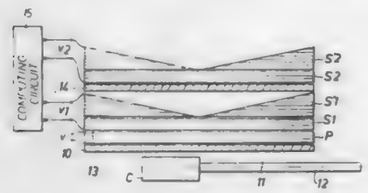
an axisymmetrical passage for a movable core connectable with a member of which the displacement or position is to be measured;

a primary winding wound around said passage and having input terminals to be energized with an input current;

a first secondary winding wound around said primary winding and including a first portion and a second portion arranged in a first phase relationship, said first secondary winding having first output terminals to deliver a first output signal when the primary winding is energized;

a rigid cylindrical support member surrounding said first secondary winding;

a second secondary winding wound around said cylindrical support member and including a first portion and a second portion respectively similar to the first portion and the second portion of the first secondary winding, but arranged in a second phase relationship opposite to said first phase relationship, said second secondary winding having



second output terminals separate from said first output terminals to deliver a second output signal when the primary winding is energized; and

circuit means connected to said first and second output terminals for delivering a differential output signal representative of the ratio between the sum and the difference of said first and second output signals;

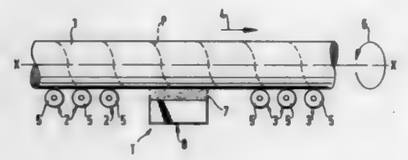
said rigid cylindrical support member completely separating said first and second secondary windings one from the other and allowing the axial position of the second secondary winding with respect to that of the first secondary winding to be varied at the end of the manufacturing process of the transducer to adjust response characteristics thereof.

4,694,247

METHOD AND APPARATUS INCLUDING A CUSHION OF PULVERULENT MAGNETIC MATERIAL FOR STRAY FIELD MAGNETIC TESTING OF FERROMAGNETIC PARTS

Ernst Melli, Uster, and Karl Rimmele, Schmerikon, both of Switzerland, assignors to MECAPEC S.A., St. Gallen, Switzerland

Filed Jun. 6, 1985, Ser. No. 741,812
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421404; Jun. 25, 1984, 3423368
Int. Cl.⁴ G01N *27/84*; G01R *33/12*
U.S. Cl. 324—216 **24 Claims**



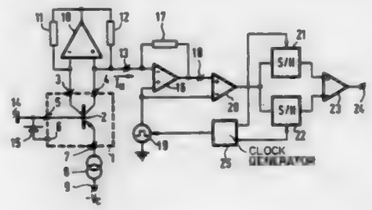
9. Apparatus for stray flux magnetic testing of an elongated ferromagnetic part for defects, comprising magnet means for establishing and maintaining a magnetic field; drive means for rotating the part to be tested in said magnetic field about an axis which extends in the longitudinal direction of the part whereby a stray magnetic flux develops at the locations of defects in the rotating part, said drive means including means for advancing the part longitudinally along a predetermined path; and marking means for establishing and maintaining a stationary cushion of dry pulverulent magnetic material at a fixed location and in contact with the rotating part so that the stray flux or fluxes, if any, attract such pulverulent material which thereby pinpoints the locations of defects.

4,694,248

MAGNETIC FIELD SENSOR COMPENSATED FOR OFFSET ERROR

Srdjan Kordi, Delft; Victor Zieren, Eindhoven, and Simon Middelhoek, Rijswijk, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1984, Ser. No. 574,773
Claims priority, application Netherlands, Feb. 15, 1983, 8300557
Int. Cl.⁴ G01R *33/02*; H03K *17/90, 19/18*
U.S. Cl. 324—252 **20 Claims**



1. A magnetic field sensor comprising, a magnetic field-sensitive element having an output for supplying a signal which is a measure of a magnetic field detected by said element, and a circuit for setting the sensitivity of said element to the magnetic field comprising, a modulator operatively coupled to said element for varying the sensitivity setting of the magnetic field-sensitive element between first and second different values so as to derive first and second different sensitivity curves, respectively, for said element, and a detection circuit coupled to said element for detecting a difference in signals at the output of the field-sensitive element as a function of the difference of said first and second sensitivity curves thereby to produce an output signal in which the influence of an offset error component in said signals is reduced, said error component being formed by a signal present at the output in the absence of a magnetic field.

4,694,249

METHOD FOR RECORDING THE NUCLEAR MAGNETIC RESONANCE FOR USE IN VNMR TOMOGRAPHY

Hans Post, Schriesheim; Dieter Ratzel, Rheinstetten; Peter Brunner, Ettlingen, and Bertold Knittel, Rheinstetten-Moersch, all of Fed. Rep. of Germany, assignors to Bruker Medizintechnik G.m.b.H., Fed. Rep. of Germany

Continuation of Ser. No. 474,698, Mar. 11, 1983, abandoned.
This application Dec. 27, 1985, Ser. No. 815,118
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209810
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **15 Claims**

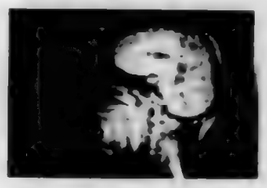
1. A nuclear-magnetic-resonance tomographic method for producing a sequence of images derived from an ensemble of nuclear spins within a preselected cross-sectional plane passing through a body, each image being associated with a particular time and representing a two-dimensional distribution of nuclear-spin polarization of the ensemble of nuclear spins in the plane, different images representing different two-dimensional distributions of nuclear-spin polarization from the same ensemble of nuclear spins as a result of different degrees of spin relaxation of the polarization at different locations within the

cross-sectional plane at the diffferent times of the images, the method comprising the steps of:

(a) subjecting at least a portion of the body which includes the preselected cross-sectional plane to a polarizing magnetic field to polarize the nuclear spins in the plane, the polarizing magnetic field being essentially static and effectively homogeneous in the cross-sectional plane;

(b) superimposing upon said polarizing magnetic field in the cross-sectional plane at least one magnetic-resonance-tomographic-imaging magnetic gradient field produced in accordance with a magnetic-resonance-tomographic-image generation process, each magnetic gradient field having a field component directed essentially parallel to the polarizing magnetic field, the magnetic-resonance-tomographic-imaging magnetic gradient fields varying in magnitude along directions relative to the preselected cross-sectional plane effective to permit nuclear-magnetic-resonance signals to be tomographically detected from nuclear spins located in the plane in accordance with the magnetic-resonance-tomographic-image generation process;

(c) exciting nuclear spins in the cross-sectional plane with a spin-echo-inducing pulse sequence of radio-frequency pulses, the pulse sequence having a first pulse and causing the excited nuclear spins to produce a sequence of spin-echo nuclear-magnetic-resonance signals in a timed relation relative to pulses in the pulse sequence, each spin-echo signal occurring at a time after the first pulse of the pulse sequence which defines a spin-echo-occurance time characteristic of the particular spin-echo signal, each spin-echo signal being representative of a distribution of



nuclear-spin polarization resulting from the ensemble of nuclear spins in the cross-sectional plane under the influence of the polarizing magnetic field and the magnetic gradient fields with the nuclear spins at each different location within the plane at the degree of spin relaxation characteristic of the location at the spin-echo-occurance time of the spin-echo signal;

(d) repeating steps (b) and (c) a tomographic-image-generation number of times less one, at least one magnetic-resonance-tomographic-imaging magnetic gradient field being altered with each repetition of step (b) in accordance with the magnetic-resonance-tomographic-image generation process, each repetition of steps (b) and (c) producing a sequence of spin-echo nuclear magnetic-resonance signals, each spin-echo signal in the sequence being characterized by one of the spin-echo occurance times;

(e) digitizing at least a portion of each spin-echo signal; and

(f) for each spin-echo occurance time, combining the digitized spin-echo signals associated with the particular spin-echo occurance time produced by the tomographic-image generation number of spin-echo-inducing pulse sequences to form a magnetic-resonance-tomographic-image in accordance with the magnetic-resonance-tomographic-image generation process, each image being characterized by the spin-echo occurance time of the digitized spin-echo signals combined to form the image and representing the two-dimensional distribution of nuclear-spin polarization resulting from the ensemble of nuclear spins in the cross-sectional plane and reflecting the different degrees of spin relaxation at different locations of the nuclear spins within the plane at the spin-echo occurance time.

4,694,250

NUCLEAR MAGNETIC RESONANCE IMAGING DEVICE

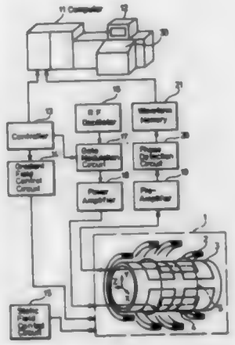
Hideto Iwaoka; Tadashi Sugiyama; Hiroyuki Matsuura, and Takaaki Hirata, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 833,224

Claims priority, application Japan, Feb. 27, 1985, 60-38235; Feb. 27, 1985, 60-38236; Mar. 6, 1985, 60-44158; Aug. 30, 1985, 60-191528; Aug. 30, 1985, 60-191529; Sep. 5, 1985, 60-196661

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **29 Claims**



1. A nuclear magnetic resonance imaging device comprising control and computation means, wherein radio frequency pulses and magnetic fields are applied to an object in time relationships designated by said control and computation means to generate nuclear magnetic resonance signals and an image of said object is obtained by using said nuclear magnetic resonance signals; wherein said device further comprises an operation console having input means for setting input information desired for said device; said control and computation means being adapted to store relaxation times T1, T2, nuclei density ρ, pulse sequences suitable for obtaining a calculated image, and scan conditions, including scan parameters; said scan conditions being determined externally or internally by the following procedure and being used as scan conditions; said scan conditions being read out from said control and computation means under designation from said operation console and said image being taken in accordance with said scan conditions;

wherein said procedure comprises

selecting and determining a pulse sequence to be used;

determining a theoretical equation of signal intensity in accordance with said pulse sequence selected in a manner as described above and with values for T1, T2, ρ, at one or more points, as representative points within a range of values T1, T2, ρ, to be noted, and determining a variance or standard deviation of a calculated image for T1, T2, ρ, as a function of scan parameters from said theoretical equation and variance in values for T1, T2, ρ

and original image; and

determining scan parameters with which a total sum of said variance or standard deviation of desired calculated image, or a total sum of weighted variance or standard deviation of said desired calculated image, among said calculated images for T1, T2, ρ, takes a local minimum value, and using said scan parameters as optimum scan conditions.

4,694,251

METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE IMAGING

Eiji Yoshitome, and Kazuya Hoshino, both of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

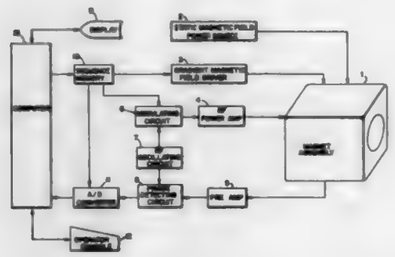
PCT No. PCT/JP85/00370, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO86/00706, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 2, 1985, Ser. No. 840,570

Claims priority, application Japan, Jul. 3, 1984, 59-137004

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **12 Claims**



1. A method of nuclear magnetic resonance imaging employing the Fourier transform imaging, comprising the steps of:

measuring the view data G(k,t) for the body which is under diagnosis, under the condition that there is a specific value of twist of spin phase within said body, in a specific direction;

measuring the view data G(−k,t) for the body which is under diagnosis, under the condition that the value of twist of the spin phase within said body is equal in amount and of opposite direction to the aforementioned value of twist of spin phase, with the time which elapses between said measurements of G(k,t) and G(−k,t) being sufficiently short that any change in the static magnetic field occurring therein can be ignored;

deriving from said view data G(k,t) and G(−k,t) the data $G(k,t_O)$ and $G(-k,-t_O)$, for the respective time points t_O and $-t_O$ which are mutually symmetrically disposed with respect to the time origin of said view data G(k,t) and G(−k,t);

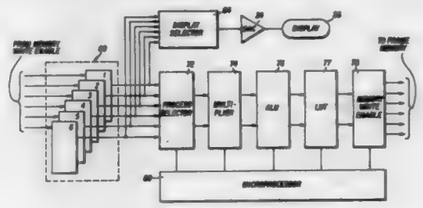
deriving the complex conjugate $\overline{G(-k,-t_O)}$ of the data $G(-k,-t_O)$;

deriving a value A which is the ratio $G(k,t_O)/\overline{G(-k,-t_O)}$, and;

correcting measured data by a signal which is proportional to the argument arg(A) of the ratio A.

time equal to a first pulse repetition time TR1, and then flipping the longitudinal magnetization MZ by 90° into the x-y plane wherein the value of x-y plane magnetization immediately after the step of flipping is said first signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior to the step of flipping and wherein said first signal S(TR1) is expressed by a first equation $S(TR1)=M_0[1-\exp(-TR1/T1)]$ where M_0 is a constant representing the net magnetization;

measuring a second signal at a second one (TR2) of said two repetition times including a step of setting a longitudinal magnetization to zero, waiting a second period of time equal to said second pulse repetition time TR2, and then flipping the longitudinal magnetization by 90° into the x-y plane, wherein the value of the x-y plane magnetization immediately after the step of flipping is said second signal, called the transverse magnetization, which is equal to the value of the longitudinal magnetization immediately prior



to the step of flipping and wherein said measured second signal S(TR2) is expressed by a second equation $S(TR2)=M_0[1-\exp(-TR2/T1)]$;

storing the value of said measured first signal in a first memory frame and the value of said measured second signal in a second memory frame;

inverting, through the use of a look-up table the value of said measured second signal stored in said second memory frame and storing said inverted value in said second frame memory;

multiplying the value of the contents of said first memory frame by the value of the contents of said second memory frame through the use of a microprocessor controlled multiplier in order to form a product R and storing said product R in said first memory frame;

mapping the value of R stored in said first memory frame to T1 in a microprocessor controlled look-up table using the transformation $R=[1-\exp(-TR1/T1)]/[1-\exp(-TR2/T1)]$;

the value T1 obtained from said transformation.

4,694,252

AUTOMATED ESTIMATION OF T1 AND T2 RELAXATION TIMES

Stephen J. Riederer; Ronald C. Wright, and James N. Lee, all of Durham, N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 734,101, May 15, 1985, Pat. No. 4,641,095. This application Jan. 31, 1986, Ser. No. 824,784

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **9 Claims**

1. A method for determining the spin-lattice relaxation time T1 of an image during a Nuclear Magnetic Resonance (NMR) measurement technique on a human body comprising the steps of:

subjecting said body to magnetic fields in accordance with a NMR technique at two different predetermined stored pulse repetition times TR1 and TR2;

measuring a first signal S(TR1) at a first one (TR1) of said two repetition times including the steps of setting a longitudinal magnetization to zero, waiting a first period of

4,694,253

PROCESS FOR THE MODULATION OF THE SPEED EFFECT OF MOVING PARTS OF A BODY IN A NUCLEAR MAGNETIC RESONANCE DENSITY MEASUREMENT AND PERFORMANCE OF THE PROCESS IN ORDER TO DEDUCE THEREFROM THE SPEED OF THE MOVING PARTS IN QUESTION

Patrick Le Roux, Paris, France, assignor to Thomson-CGR, Paris, France

Filed Dec. 12, 1985, Ser. No. 808,049

Claims priority, application France, Aug. 13, 1985, 85 12352

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **14 Claims**

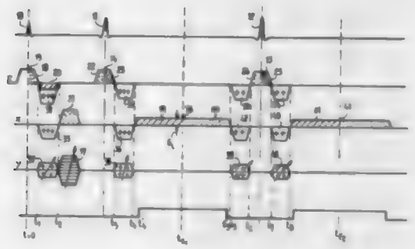
1. A process for the modulation of the speed effect of the moving parts of a body in a density measurement by nuclear magnetic resonance, comprising the steps of;

exposing said body to an orienting, constant magnetic field for orienting in a single direction the magnetic spin moments of the body;

subjecting said body to a radio frequency magnetic excitation in the presence of and/or followed by the application of a sequence of an interfering magnetic field; and

detecting a magnetic resonance signal emitted in response by the body;

wherein the effect of the speed of the moving parts of the body created by the sequence of the interfering field is modulated by the application, prior to the step of detecting, of a sequence of a compensating magnetic field, an integral of said compensating magnetic field calculated on



its duration being zero, and whose history and value are a function of the history and value of the interfering field wherein the sequence of the interfering magnetic field has magnetic field pulses along three orthogonal axes and wherein the sequence of the compensating magnetic field has magnetic field pulses along these three same axes, in order to individually modify the effects of the speed of the moving parts of the body along said three axes wherein the compensating magnetic field pulses are determined a priori by position and duration Γ; and,

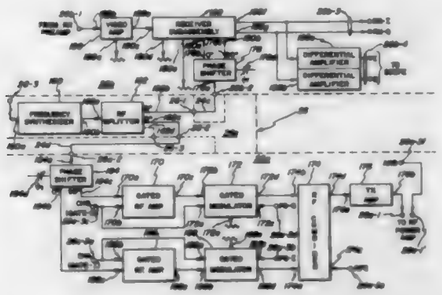
wherein amplitude λ is evaluated to obtain the modulation.

4,694,254

RADIO-FREQUENCY SPECTROMETER SUBSYSTEM FOR A MAGNETIC RESONANCE IMAGING SYSTEM

Dimitrios Vatis, and Lowell S. Smith, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 10, 1985, Ser. No. 743,121
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **20 Claims**



1. A radio-frequency (RF) spectrometer subsystem, for a nuclear magnetic resonance system for the production of images and localized chemical-shift spectra from a non-ferromagnetic sample, said system having antenna means for providing an RF magnetic field within a magnet means bore and in the sample when contained therein, responsive to a modulated radio-frequency excitation signal, and also for receiving radio-frequency energy re-radiated from the sample for forming a response signal, said subsystem comprising:

transmitter means for providing a first signal with at least a desired amplitude characteristic and a desired frequency characteristic responsive to at least one control signal from said system;

means for amplifying said first signal to the amplitude required of said excitation signal;

linearizing means coupled to said amplifying means for minimizing any change in the relative characteristics of any portion, with respect to any other portion, of the excitation signal, to the relative characteristics of the same portions of a selected one of said at least one control signal and said first signal;

means for providing at least one reference signal for obtaining at least one of phase information from, noise reduction in and/or coherent detection of, the received response signal; and

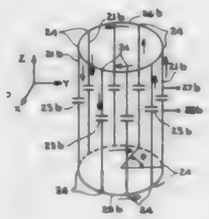
means for then converting the received response signal to at least one video signal for analysis.

4,694,255

RADIO FREQUENCY FIELD COIL FOR NMR

Cecil E. Hayes, Wauwatosa, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Nov. 4, 1983, Ser. No. 548,745
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—318 **57 Claims**



1. An NMR radio-frequency (RF) coil comprising:

a pair of conductive loop elements disposed in a spaced apart relation along a common longitudinal axis; and

a plurality of conductive segments each having at least one reactive element in series therewith, said segments electrically interconnecting said loop elements at points spaced along the periphery of each of said loops, said segments being disposed substantially parallel to said longitudinal axis such that the resulting configuration has four-fold symmetry, wherein in operation said RF coil is capable of producing an RF field useful for performing NMR studies.

4,694,256

COMPENSATION CIRCUIT FOR PULSE SIGNALS

Keiichi Kawamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 7, 1985, Ser. No. 699,176
Claims priority, application Japan, Feb. 8, 1984, 59-19886
Int. Cl.⁴ H03K *5/153, 5/19, 3/013*
U.S. Cl. 328—120 **8 Claims**

1. A compensation circuit for pulse signals comprising a noise-pulse cutting circuit and a compensation-pulse generating circuit coupled to an output terminal of the cutting circuit, there being a first, a second and a third monostable multivibrator, said first multivibrator being operative in a stable state and in a quasi-stable state; and wherein

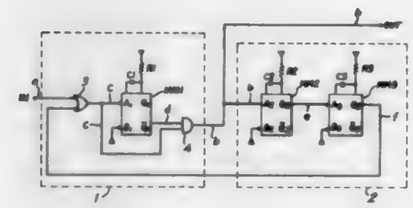
said cutting circuit comprises:

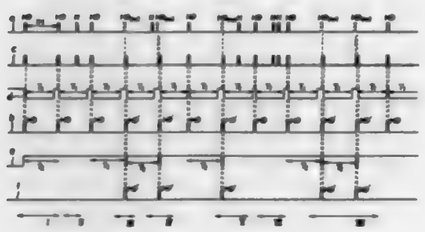
said first multivibrator, said first multivibrator being responsive to an input pulse signal applied to said cutting circuit periodically at a predermined period for assuming the quasi-stable state in response to each pulse of the input signal, the duration of quasi-stable state being slightly

shorter than said period, said first multivibrator reverting to the stable state at the conclusion of a quasi-stable state; and

a gate circuit providing an output pulse of said cutting circuit at said output terminal of said cutting circuit, said gate circuit being operatively connected to an output terminal of said first multivibrator to allow passage of a pulse of said input pulse signal via said output terminal of said cutting circuit to said generating circuit during each stable state and to block passage of a pulse of said input pulse signal to said generating circuit during each quasi-stable state, thereby implementing a pulse-cutting mode of said cutting circuit for blocking a noise pulse occurring during a quasi-stable state of said first multivibrator; and wherein

said generating circuit comprises:





said second multivibrator, said second multivibrator assuming a quasi-stable state in response to a pulse outputted by said gate circuit for an interval of time slightly longer than said period, said second multivibrator reverting to a stable state at the conclusion of quasi-stable state; and

said third multivibrator, said third multivibrator being triggered by said second multivibrator upon a transistion in said second multivibrator from a quasi-stable state to a stable state generate a compensation pulse at an output terminal of said generating circuit; and wherein

said compensation circuit further comprises means for outputting: an output pulse of said cutting circuit during the presence of a pulse of said input pulse signal, and said compensation pulse of said generating circuit upon an absence of a pulse of said input pulse signal.

4,694,257

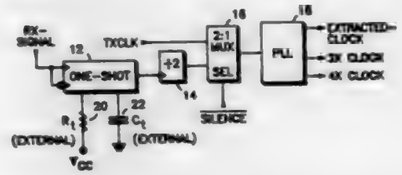
PHASE-COHERENT DEMODULATION CLOCK AND DATA RECOVERY

Michael T. Klein, Ann Arbor, Mich., and Donald J. Voss, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1986, Ser. No. 875,038
Int. Cl.⁴ H03D *3/18*
U.S. Cl. 329—50 **7 Claims**

1. A phase-coherent demodulator for use with a transmitted signal having at least two phase-coherent frequencies comprising:

clock recovery means for generating from said transmitted signal a clock signal which has the same frequency as the lowest of said phase-coherent frequencies; and



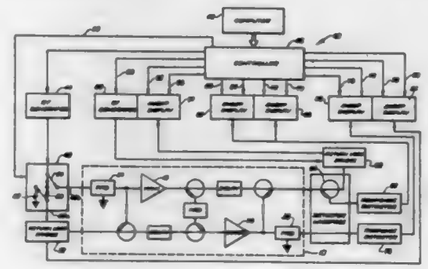
data recovery means coupled to said clock recovery means for generating separate signals corresponding to said at least two phase-coherent frequencies.

4,694,258

METHOD AND SYSTEM OF ENHANCING PERFORMANCE OF FEEDFORWARD AMPLIFIERS

Robert M. Blumenkranz, Brea, and Mark A. Gibbons, Anaheim, both of Calif., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 14, 1986, Ser. No. 840,428
Int. Cl.⁴ H03F *1/32*
U.S. Cl. 330—2 **17 Claims**



1. A method of enhancing the performance of a feed forward amplifier which includes operational characteristics of frequency response, input return loss, output return loss, input loop null response and output loop null reponse, comprising the steps of:

monitoring each of said operational characteristics on a repeating and alternating basis;

independently displaying each monitored characteristic on a real-time basis such that all of said characteristics may be viewed together; and

adjusting components of the amplifier while viewing the displayed characteristics to achieve a desired combination of the displayed characteristics.

4,694,259

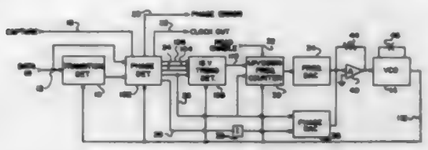
DATA TRACKING CLOCK RECOVERY SYSTEM HAVING MEDIA SPEED VARIATION COMPENSATION

Richard C. Carickhoff, Lansdale; Hakan O. Hemdal, West Chester, and Alvin L. Schultz, East Greenville, all of Pa., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Sep. 29, 1986, Ser. No. 912,879
Int. Cl.⁴ H03L *7/08*
U.S. Cl. 331—1 A **5 Claims**

1. In a clock recovery system for generating an output clock signal locked to the phase and frequency of an input data rate, said input data rate comprising a sequence of data signals, said system comprising data detection means for detecting said data signals, oscillator means responsive to an analog signal for

generating a first clock signal having a frequency representative of the value of said analog signal, phase detector means responsive to said first clock signal for cyclicly counting the oscillations of the first clock signal to generate said output clock signal and being responsive to the count of oscillations and to the output of said data detection means to determine the relative phase relationship between each data signal and the output clock signal, counter means responsive to said phase



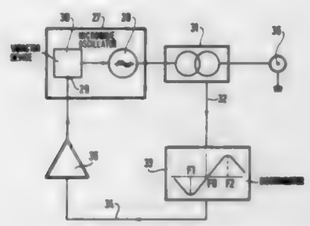
detector means for containing a count representative of the frequency of said first clock signal and being responsive to the phase relationship determined by said phase detector means to selectively increment or decrement the count therein, and converter means responsive to the count in the counter means to generate said analog signal which drives the oscillator means, the improvement comprising: a media speed variation detector means responsive to said phase detector means for accelerating the change in count in said counter means.

4,694,260

MICROWAVE DISCRIMINATOR AND DEVICES USING SAID DISCRIMINATOR

Lazare Argintaru, Le Pre Saint Gervais, and Denis Hebrard, Levallois Perret, both of France, assignors to Alcatel Thomson Faisceaux Hertziens, France

Filed Jan. 29, 1986, Ser. No. 823,862
Claims priority, application France, Jan. 29, 1985, 85 01207
Int. Cl.[4] H03D *3/26*; H03L *1/04, 7/04*
U.S. Cl. 331—9 **7 Claims**



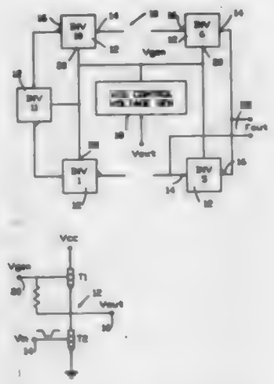
1. A microwave frequency discriminator, comprising:
a microwave inlet circuit for a microwave to be discriminated;
a pair of microwave dielectric resonators having resonant frequencies F_1 and F_2 situated on either side of the frequency F_0 of the microwave to be discriminated, said resonators being made of respective materials such that the resonant frequencies of said resonators tend to vary in opposite direction with changing temperature;
a first microwave coupling device extending between said inlet circuit and each of said resonators;
a pair of detector circuits;
respective microwave coupling devices extending between each of said resonators and a corresponding respective one of said pair of detector circuits, said detector circuits having output terminals which are connected in series-opposition in the manner of a Travis discriminator; and
a discriminated outlet being taken from said output terminals of said pair of detector circuits.

4,694,261

INTEGRATED HIGH GAIN VOLTAGE CONTROLLED OSCILLATOR

John F. Ewen, Yorktown Heights, N.Y., and Joseph M. Mosley, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,701
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—57 **10 Claims**



1. A voltage controlled oscillator comprising:
a plurality of inverter stages connected in a ring configuration, each said inverter stage having an input terminal and an output terminal with the input terminal of each said stage being connected to the output terminal of the next preceding stage, each said inverter stage comprising:
first and second transistors each having an emitter, a base and a collector, wherein the base of said first transistor is the inverter stage input terminal and the collector of said first transistor is the inverter stage output terminal, the emitter of said second transistor being connected to the collector of said first transistor, the collector of said second transistor being connected to a first power supply terminal and the emitter of said first transistor being connected to a second power supply terminal, and
a resistor connected between the base and the emitter of said second transistor;
generator means connected to the base of said second transistor is each of said inverter stages for providing a control voltage thereto; and
oscillator output terminals connected between the input and output terminals of one of said plurality of inverter stages.

4,694,262

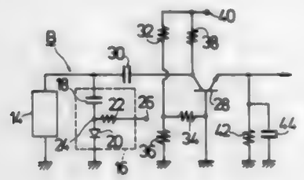
OSCILLATOR WITH RESONATOR HAVING A SWITCHED CAPACITOR FOR FREQUENCY CHANGING

Atsushi Inoue, 51-15, Oneo, Hirono-cho, Uji-shi, Kyoto; Yuji Kuroda, 653-6, Namazu-cho, Fushimi-ku, Kyoto-shi, Kyoto, and Sadahiro Tamura, 3-1-72, Kitafukunishi-cho, Ohe, Nishikyo-ku, Kyoto-shi, Kyoto, all of Japan

Filed Jul. 18, 1984, Ser. No. 632,104
Claims priority, application Japan, Jul. 23, 1983, 58-134885
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **5 Claims**

1. An oscillation circuit comprising:
a dielectric resonator of a coaxial Transverse Electromagnetic (TEM) wave type having an oscillation frequency and developing an oscillation voltage signal at said oscillation frequency thereacross; and
frequency switching means connected across said resonator for switching the oscillation frequency of said resonator, said frequency switching means including a capacitor and

a diode connected in series, said diode having a small capacitance as compared to that of said capacitor and forward and reverse conductive voltage values with abso-



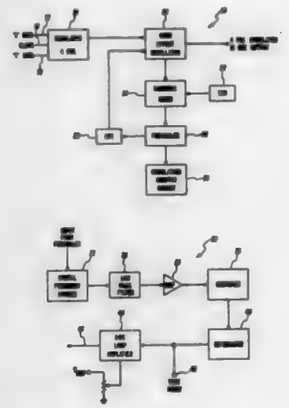
lute values larger than an absolute value of a portion of said oscillation voltage signal that is developed across said diode.

4,694,263

FREQUENCY MODULATION MONITOR CIRCUIT AND METHOD

Richard A. Cross, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 9, 1986, Ser. No. 872,074
Int. Cl.[4] G01R *23/15*
U.S. Cl. 332—20 **10 Claims**



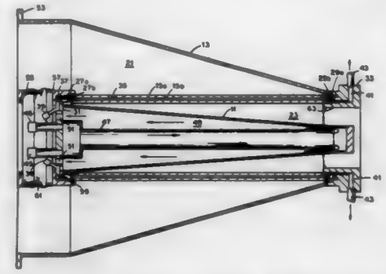
1. A method for monitoring frequency deviation of a frequency modulated signal from a system having a modulation oscillator and an automatic frequency control feedback loop, the loop including a harmonic mixer which provides a difference frequency from the signal to a prescaler which provides a divided difference frequency, the method including in combination the steps of:
further dividing the divided difference frequency of the prescaler;
filtering out the carrier frequency from the further divided signal;
rectifying the carrier filtered singal; integrating the rectified signal; and testing the integrated signal.

4,694,264

RADIO FREQUENCY COAXIAL FEEDTHROUGH DEVICE

Thomas L. Owens, Kingston; Frederick W. Baity, Oak Ridge; Daniel J. Hoffman, Oak Ridge, and John H. Whealton, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 5, 1986, Ser. No. 836,776
Int. Cl.[4] H01P *5/02*
U.S. Cl. 333—34 **7 Claims**



1. A high voltage radio frequency coaxial feedthrough device for transmitting high voltage radio frequency energy between first and second coaxial transmission lines of different dielectric mediums and pressures, comprising:
a tapered inner coaxial conductor including means for electrical connection at an upstream end thereof to an inner coaxial conductor of said first coaxial line and at a downstream end thereof to an inner coaxial conductor of said second coaxial line;
a tapered outer coaxial conductor including means for electrical connection at the upstream end thereof to an outer coaxial conductor of said first coaxial line and at the downstream end thereof to an outer coaxial conductor of said second coaxial line;
a coaxially disposed cylindrical insulator formed of a rigid, impermeable, electrically insulating material including first and second conductive metal mounting rings sealably brazed to the upstream and downstream ends respectively of said cylindrical insulator, said first ring having an axially extending portion forming a first guard ring which extends axially over a portion of the outer surface of said cylindrical insulator to form a corona shield about the upstream end of said cylindrical insulator, said second ring having an axially extending portion forming a second guard ring which extends over a portion of the inner surface of said cylindrical insulator to form a corona shield about the downstream end of said cylindrical insulator; and
means for removably connecting said cylindrical insulator in a leak-tight sealing arrangement between said first mounting ring of said cylindrical insulator and said inner conductor at the upstream end of said cylindrical insulator and said second mounting ring of said cylindrical insulator and said outer conductor at the downstream end of said cylindrical insulator so that a leak-tight seal is provided between the different pressurized dielectric mediums of said first and second coaxial transmission lines, said inner and outer coaxial conductors being spaced apart and separately tapered uniformly along the outer and inner surfaces respectively inwardly from said upstream end of said cylindrical insulator toward the central axis of said coaxial feedthrough device and said inner surface of said upstream end of said outer conductor being formed of an enlarged diameter axial segment axially aligned with said first mounting ring of said cylindrical insulator so that a constant characteristic impedance is provided along the

entire length of said feedthrough device while minimizing the insertion-voltage standing wave ratio of said feedthrough device.

4,694,265

DEVICE FOR FILTERING A HIGH-FREQUENCY CONDUCTOR SUSCEPTIBLE TO ELECTROMAGNETIC INTERFERENCE OF A HIGH-FREQUENCY SPACE

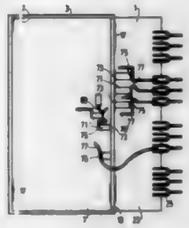
Karl H. Kupper, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,021

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325357

Int. Cl.⁴ H03H 9/64, 7/01

U.S. Cl. 333—185 **1 Claim**



1. A device for leading a high-frequency conductor out of a shielded high-frequency space, comprising a filtering capacitor that is arranged in the area where the conductor passes through a grounded wall, and that is electrically coupled to said grounded wall, wherein the conductor to be led out of the shielded high-frequency space is a planar conductor carried by a circuit board, and said filtering capacitor comprises a chip film capacitor mounted on a side of said circuit board preselected for immersion in a soldering bath to the exclusion of the other side, said chip film capacitor for filtering the high-frequency conductor from electromagnetic interference, wherein a first contact surface of said chip film capacitor is coupled to said grounded wall of the shielded high-frequency space and a second contact surface of said chip film capacitor is electrically coupled to said high-frequency conductor.

4,694,266

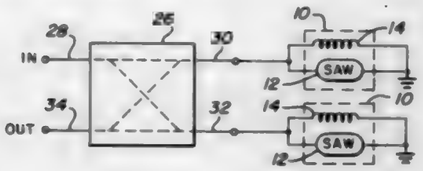
NOTCH FILTER

Peter V. Wright, Dallas, Tex., assignor to R. F. Monolithic, Inc., Dallas, Tex.

Filed Jul. 29, 1986, Ser. No. 891,238

Int. Cl.⁴ H03H 9/64, 7/09

U.S. Cl. 333—196 **12 Claims**



1. An improved notch filter for rejecting a predetermined band of signal frequencies from an input signal comprising:

a. a quadrature coupler having first, second, third, and fourth terminals, said first terminal being a signal input terminal and said fourth terminal being an output terminal,

b. a first tuned surface acoustic wave device coupled to said second one of said terminals for receiving said input signal with 0° phase shift, said first tuned device having primarily reactive characteristics at signal frequencies higher or lower than the notch region and primarily resistive characteristics across said notch region, and

c. a second tuned surface acoustic wave device coupled to a third one of said terminals for receiving said input signal with a 90° phase shift, said second tuned device having primarily reactive characteristics at signal frequencies higher or lower than the notch region and primarily resistive characteristics across said notch region, such that no output signal is present on said fourth terminal across said notch region but is present in the band pass region.

4,694,267

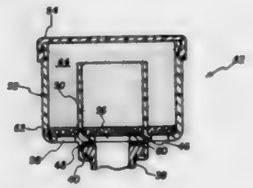
WAVEGUIDE DEHYDRATOR APPARATUS

Dennis J. Guill, Richardson; Larry D. McPherson, Allen, and John H. Steelan, Eastland, all of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 8, 1986, Ser. No. 894,424

Int. Cl.⁴ H01P 1/30

U.S. Cl. 333—248 **3 Claims**



1. Waveguide apparatus comprising, in combination:

a radio;

an antenna;

waveguide means connected between said radio and said antenna for passing signals between said radio and said antenna, said waveguide means including a further port; and

desiccant vessel means directly attached to said further port and otherwise open to the environment for removing moisture from air drawn into the waveguide means by a pumping phenomena created by changes in temperature.

4,694,268

SUPERCONDUCTING SOLENOID HAVING ALUMINA FIBER INSULATOR

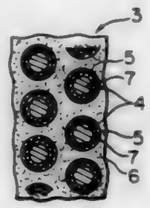
Toshimi Kawamura, Kobe; Tadatoshi Yamada, Amagasaki; Kiyoshi Hani, Amagasaki, and Kiyoshi Yoshizaki, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 30, 1986, Ser. No. 868,554

Claims priority, application Japan, May 31, 1985, 60-119123

Int. Cl.⁴ H01F 7/22

U.S. Cl. 335—216 **6 Claims**



1. A superconducting solenoid comprising a winding frame, wires formed of filamentary conductors having superconductivity and wound around said winding frame, an insulator formed of alumina fiber material and covering each of said wires for providing electrical insulation, and a resinous material impregnated in between turns of said wires so as to provide a supporting structure.

4,694,269

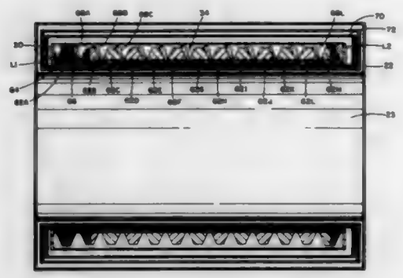
MAGNET SYSTEM AND METHOD OF ITS MANUFACTURE

Sibley C. Burnett; John R. Purcell, both of San Diego, and M. Harlan Horner, Del Mar, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Aug. 8, 1984, Ser. No. 638,876

Int. Cl.⁴ H01F 7/22

U.S. Cl. 335—216 **17 Claims**



1. A magnet system for providing a localized, substantially homogeneous magnetic field for use in nuclear magnetic resonance imaging, said magnet system comprising:

a vacuum vessel defining a bore for receiving the subject of the imaging;

a cryogenic containment vessel supported within said vacuum vessel; and

a single coil disposed within said containment vessel for providing said magnetic field, said coil comprising a winding made up of thousands of turns of small superconductive wire, said winding having a modular geometry including a plurality of axially serially disposed modules with space provided between adjacent modules, said coil further comprising an insulative substance, having a different coefficient of thermal contraction than that of said wire, distributed in said winding whereby as the temperature of said coil is reduced from room temperature to its cryogenic operating temperature, the development of localized stress concentrations sufficient to structurally damage the coil, are avoided.

4,694,270

ELECTROMAGNETIC PROPORTIONAL ACTUATOR

Koji Ichihashi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co. Ltd., Tokyo, Japan

Filed Apr. 1, 1986, Ser. No. 846,878

Claims priority, application Japan, Apr. 9, 1985, 60-051657[U]

Int. Cl.⁴ H01F 7/08

U.S. Cl. 335—260 **11 Claims**

1. An electromagnetic proportional actuator comprising:

a housing;

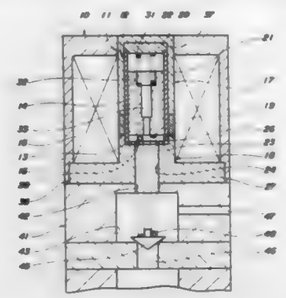
a plunger received in said housing and being movable axially thereof;

an actuating member having one end thereof associated with one axial end face of said plunger, said actuating member comprising a coil spring having one end thereof abutting against said one axial end face of said plunger;

a solenoid wound around an outer peripheral surface of said housing;

said plunger being axially displaceable in response to electric current passing through said solenoid to drive said actuating member; and

a tubular member formed of a non-magnetic material and disposed between an outer peripheral surface of said plunger and an inner peripheral surface of said housing such that said plunger is axially slidable within said tubular member, whereby said plunger is prevented from being attracted to the inner peripheral surface of said housing.



4,694,271

DEVICE FOR STABILIZING MAGNETIC ZONES

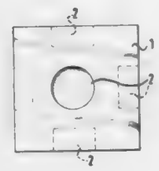
Bruno Rohde, Blindenhaselbach 6, 8267 Neumarkt-St. Veit, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 850,675

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513281

Int. Cl.⁴ H01F 7/02

U.S. Cl. 335—302 **4 Claims**



1. A device for stabilizing magnetic zones by means of magnets, comprising a cube of non-magnetic material, a separate magnet connected in the middle of each side of said cube whereby the magnets on each side of the cube are separated from each other, the magnets being in the form of plates having flat surfaces positioned perpendicular to the direction of a magnetic zone, each of said magnets having a single polarity on each side and all outwardly facing flat surfaces of all of the magnets being of the same polarity, and the magnets on opposite sides of said cube being spaced from each other a distance such that the magnetic influence on each other is just avoided.

4,694,272

ELECTRIC POTENTIOMETER

Wolfgang Maisch, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,436

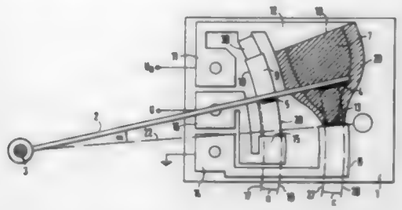
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341236

Int. Cl.⁴ H01R 13/46

U.S. Cl. 338—138 **3 Claims**

1. An electric potentiometer having an electrically nonconductive carrier plate, a first wiper and a first electrically conductive layer which is to be swept over by said first wiper, said first conductive layer comprises paste material having embedded carbon particles therein, characterized in that a sliding layer of electrically nonconductive paste material is applied to said carrier plate in a region of said first electrically conductive

layer, and said first electrically conductive layer is applied on at least a portion of said sliding layer, and said first electrically



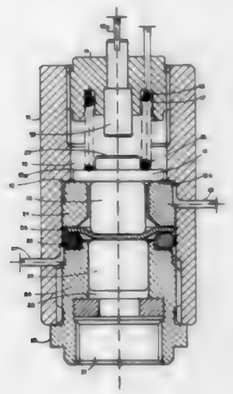
conductive layer and said first wiper are narrower than a narrowest region of said sliding layer.

4,694,273

DEVICE FOR INDICATING ABNORMAL PRESSURE CONDITIONS IN A TIRE ON A MOTOR VEHICLE IN MOTION

Domenico Franchino, Via Chisola 19/A, Cumiano (Turin), Italy

Filed Oct. 24, 1985, Ser. No. 790,827
Claims priority, application Italy, Nov. 5, 1984, 68098 A/84
Int. Cl.⁴ B60C *23/02*
U.S. Cl. 340—58 **9 Claims**



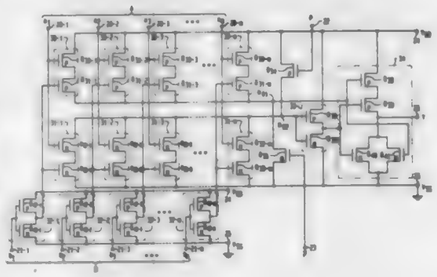
1. Device for indicating abnormal pressure conditions in a tire on a motor vehicle in motion, consisting of: a pressure sensor having a movable element and opposing spring which closes a transmitter circuit when it reaches one of two limit positions correspolnding to an upper and lower limit in a range of normal pressure values, and a receiver that picks up the transmitter signals and activates a visual and/or acoustic alarm, characterized in that the aforesaid sensor is composed of a substantially cylindrical case with its internal cavity divided into two parts, the first of which houses the movable element, in permanent electrical contact with one of the transmitter's terminals, and is closed by a first adjustable ring nut that determines one of the limit positions, while the other part is divided into two chambers, that communicate with the first part and the inside of the tire respectively, by means of a flexible membrane whose edges are held with a seal ring between a bush made of conductive material, that determines the second limit position, and a second ring nut screwed into a fixed position in the cavity in the case; in that both the bush and the second ring nut have axial cavities that house a first and a second piston, of which the first piston is held between the membrane and the movable element, and the second piston rests one end against the membrane and has the other end free and exposed to the tire pressure, these pistons keeping the movable element half way between the two limit positons as long as the pressure remains within a range of values that has been defined normal; and in that the aforesaid receiver has logic outputs for connection with a tachograph and/or on-board computer.

4,694,274

DATA COMPARISON CIRCUIT CONSTRUCTED WITH SMALLER NUMBER OF TRANSISTORS

Jiroh Shimada, and Hiroshi Morito, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,149
Claims priority, application Japan, Dec. 23, 1983, 58-243319
Int. Cl.⁴ G05B *1/00*; G06F *7/04*
U.S. Cl. 340—146.2 **9 Claims**



1. A transistor circuit comprising first and second potential terminals, first and second output nodes, at least one first series circuit connected between said first potential terminal and said first output node and including first and second transistors connected in series, at least one second series circuit connected between said second potential terminal and said second output node and including third and fourth transistors connected in series, first means for supplying a first digital signal to control electrodes of said first and third transistors, second means for supplying a second digital signal to control electrodes of said second and fourth transistors, said first and third transistors being of different conductivity types from each other, said second and fourth transistors being of different conductivity types from each other, third means for precharging said first and second output nodes to different logic levels from each other, and fourth means for detecting a change in the level at at least one of said first and second output nodes.

4,694,275

DIGITAL CAPACITANCE INCREMENTAL ENCODER

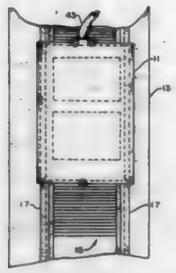
Karmen D. Cox, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 1, 1986, Ser. No. 858,345
Int. Cl.⁴ H03M *1/22*
U.S. Cl. 340—347 P **9 Claims**

1. A digital capacitance encoder for encoding position information of first and second mechanical parts movable with respect to each other comprising:

a grid of evenly spaced, parallel conductive lines fixed with respect to one of the mechanical parts, said grid being disposed along the line of movement of one mechanical part with respect to the other;

means for capacitively sensing the conductive lines of the grid, said sensing means including a first pair of interdigitated electrodes fixedly disposed on the other mechanical part along the line of movement with the fingers thereof substantially parallel to the lines of the grid, means for sensing which electrode of the pair has the greatest capacitance to the grid, drive means for applying a square waveform to each electrode, a latch or the like having its set input connected to one of the electrodes and the reset input connected to the other of the electrodes so that the output of the latch is a function of which electrode has the greatest capacitance to the grid, and a second pair of interdigitated electrodes fixedly disposed on the same mechanical part as the first pair along the lines of movement, said second pair being disposed from the first pair



such that its output differs from that of the first pair as the mechanical parts move with respect to each other; and

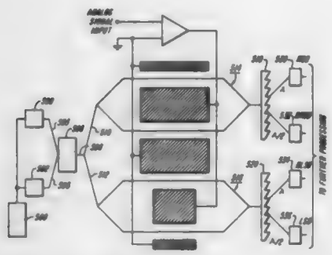
means for forcing the sensing means into close proximity with the grid as the mechanical parts are moved with respect to each other, said forcing means being stationary with respect to the sensing means.

4,694,276

INTERFEROMETRIC ANALOG-TO-DIGITAL CONVERTER AND METHOD FOR OPERATION

Ali Rastegar, Wellesley, Mass., assignor to Analog Devices, Inc., Wilmington, Mass.

Filed Aug. 13, 1986, Ser. No. 896,652
Int. Cl.⁴ H03M *1/00*
U.S. Cl. 340—347 AD **26 Claims**



1. An electrooptic analog-to-digital converter for converting an analog signal to a digital representation comprising:

an optical source for producing a pulsed multiple wavelength sampling beam, wherein the wavelengths are integer multiples of each other,

modulating means responsive to said multiple wavelength optical beam and to said analog signal for generating a multiple wavelength output beam which is a periodic function with a period that is dependent on the sampling beam wavelength and the magnitude of said analog voltage to be converted, and

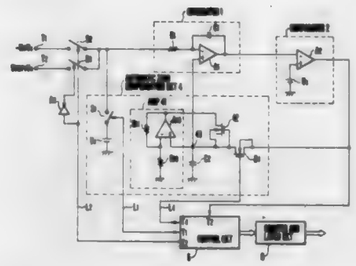
means responsive to each individual wavelength in said output beam for generating a digital signal representing a single digital bit in a digital representation of said analog signal.

4,694,277

A/D CONVERTER

Akinori Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,636
Claims priority, application Japan, Feb. 22, 1985, 60-33807
Int. Cl.⁴ H03M *1/52, 1/82*
U.S. Cl. 340—347 NT **7 Claims**



1. An A/D converter with an automatic zero compensation circuit, comprising: a predetermined voltage; an integrator for receiving as input signals the predetermined voltage in a first step of A/D conversion, a difference between the predetermined voltage and an analog voltage to be A/D converted in a second step, a sum of the predetermined voltage and a reference voltage in a third step, the input signals being supplied to an inverting input terminal of an operational amplifier constituting said integrator, a noninverting input terminal of said operational amplifier being connected to one terminal of a capacitor, and the other terminal of said capacitor being grounded; a comparator for comparing the predetermined voltage with an output voltage from said integrator and for generating a coincidence signal representing a coincidence between the two signals; and an automatic zero compensation circuit connected to an output terminal of said comparator only for a duration of the first step,

said automatic zero compensation circuit including: a first MOS transistor coupled between said output terminal of said comparator and said one terminal of said capacitor; an amplifier for substantially doubling a voltage at said one terminal of said capacitor; and a second MOS transistor which has the same physical configuration as said first MOS transistor and is coupled between said noninverting input terminal of said operational amplifier and an output terminal of said amplifier.

4,694,278

INTEGRABLE DECODING CIRCUIT

Hans P. Fuchs, Munich, and Jürgen R. Goetz, Oberneuching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 18, 1986, Ser. No. 908,829
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533606
Int. Cl.⁴ H03M *7/00*
U.S. Cl. 340—347 DD **7 Claims**

1. Decoding circuit in CMOS technology for decoding information represented by input signals, comprising:

(a) first (VCC) and second (VSS) supply potential sources, an input for an individual input signal (A0), four further inputs for first and second input signals (A1, An) and input signals (A1, An) complementary thereto in pairs but not complementary to said individual input signal (A0), four decoder outputs (DA1 to DA4), two first connecting points (C,$\overline{C}$), and a last connecting point (A);

(b) first, second, third and fourth CMOS inverters (I1 to I4) each having: an output connected to a respective one of said decoder outputs (DA1 to DA4), a transistor of one

channel type having a source, a drain and a gate, and a transistor of the other channel type having a source, a drain and a gate;

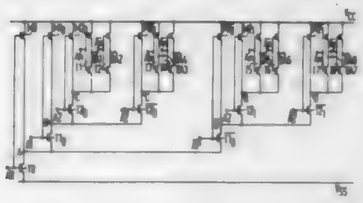
(c) the sources of said transistors of the one channel type in each CMOS inverter (I1 to I4) being connected to said first supply potential source (VCC);

(d) the sources of the transistors of the other channel type in said first and second CMOS inverters (I1,I2) being connected to each other and to one of said first connecting points (C) and the sources of the transistors of the other channel type in said third and fourth CMOS inverters (I3,I4) being connected to each other and to the other of said first connecting points ($\overline{C}$);

(e) two first switching transistors (T1, T1) of the other channel type each having a drain connected to a respective one of said first connecting points (C, $\overline{C}$), a source connected to each other and to said last connecting point (A), and a gate;

(f) the gate of one (T1) of said two first switching transistors (T1, T1) being connected to said input for said second input signal (A1) of said four further input signals (A1, An, A1, An) complementary to each other in pairs and the gate of the other (T1) of said two first switching transistors (T1, T1) being connected to said input for said input signal (A1) complementary to said second input signal (A1) of said four further input signals (A1, An, A1, An) complementary to each other in pairs;

(g) a last switching transistor (T0) of the other channel type having a drain connected to said last connecting point (A), a source connected to said second supply potential source



(VSS) and a gate connected to said input for said individual input signal (A0);

(h) the gates of both transistors of said first and third CMOS inverters (I1, I3) being connected to said input for said first input signal (An) of said four further input signals (A1, An, A1, An) mutually complementary in pairs and the gates of both transistors of said second and fourth CMOS inverters (I2, I4) being connected to said input for said input signal (An) complementary to said first input signal (An) of said four further input signals (A1, An, A1, An) mutually complementary in pairs: and

(i) further complementary transistors (M0, M1, M1) of the one channel type each having a drain connected to a respective one of said connecting points (A, C, $\overline{C}$), a source connected to said first supply potential source (VCC) and a gate connected to the gate of said switching transistor (T0, T1, T1) having the drain thereof connected to said respective connecting point (A, C, $\overline{C}$) to which the drain of said respective complementary transistor (M0, M1, M1) is connected.

2. Decoding circuit according to claim 1, wherein n is greater than 2, including:

(a) 2(n−2) further inputs for further input signals (A2) and input signals (A2) complementary thereto in pairs, 2^{n-1} further decoder outputs (DA5 to DA8); further first connecting points making a total of 2^{n-1} first connecting points (C, D, $\overline{C}$, $\overline{D}$), 2^{n-1} second connecting points (B, $\overline{B}$), and 2^{n-3} further connecting points including a last further connecting point;

(b) 2^{n-1} further CMOS Inverters (I5 to I8) each having an output connected to a respective one of said further decoder outputs (DA5 to DA8), a transistor of one channel type having a source, a drain and a gate, and a transistor of the other channel type having a source, a drain and a gate;

(c) the source terminals of the transistors of the other channel type of two (I5, I6) of said further CMOS inverters (I5 to I8) being connected to each other and to one (D) of said further first connection points (C, D, $\overline{C}$, $\overline{D}$), the source terminals of the transistors of the other channel type of two others (I7, I8) of said further CMOS inverters (I5 to I8) being connected to each other and to another ($\overline{D}$) of said further first connection points (D): and said further CMOS inverters (I5 to I8) being otherwise connected like said first four CMOS inverters (I1 to I4);

(d) further first switching transistors ($T2_0$, $T2_1$, $T2_0$, $T2_1$) of the other channel type each having a drain connected to a respective one of said first connecting points (C, D, $\overline{C}$, $\overline{D}$) and a source connected together with the source of another of said further first switching transistors to one of said second connecting points (B, $\overline{B}$);

(e) second switching transistors ($T1_0$, $T1_0$) of the other channel type each having a drain connected to a respective one of said second connecting points (B, $\overline{B}$) and a source connected to the source of another of said second switching transistors ($T1_0$, $T1_0$) and to one of said further connecting points;

(f) said switching transistors forming an alignment with said sources of each two of said switching transistors being interconnected n−1 times, at the end of said alignment said last connecting point (A) being connected to said last of said further connecting points, and between said first connecting points (C, D, $\overline{C}$, $\overline{D}$) a total of n−1 switching stages being formed through said second connecting points (B, $\overline{B}$) and said further connecting points up to said last connecting point (A);

(g) the gate of one ($T2_0$; $T2_1$) of said two first switching transistors ($T2_0$, $T2_1$; $T2_0$, $T2_1$) being connected to said input for said first signal (A2) of said 2^{n-2} further input signals (A2, A2) complementary to each other in pairs, and the gate of the other ($T2_0$, $T2_1$) of said two first switching transistors ($T2_0$, $T2_0$; $T2_1$, $T2_1$) being connected to said input for said input signal (A2) complementary to said first signal of said 2(n−2) further input signals (A2, A2) complementary to each other in pairs;

(h) in each switching stage with said further switching transistors, with the exception of said switching stage with said last switching transistor (T0), the gate of one of said two further switching transistors being connected to a further one of said inputs for said 2(n−2) further input signals (A2, A2) complementary to each other in pairs, and the gate of the other of said two further switching transistors being connected to an input for an input signal further to said further 2(n−2) input signals (A2,A2) complementary to each other in pairs: and

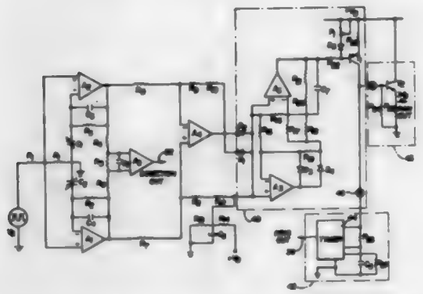
(i) additional complementary transistor ($M2_0$, $M2_1$, $M2_0$, $M2_1$, $M1_0$, $M1_1$, of the one channel type each having a drain connected to a respective one of said first connecting points (C, D, $\overline{C}$, $\overline{D}$), said second connecting points (B, $\overline{B}$) and said further connecting points, a source connected to said first supply potential source (VCC) and a gate connected to the gate of said switching transistor ($T2_0$, $T2_1$, $T2_0$, $T2_1$, $T1_0$, $T1_0$) having the drain thereof connected with said respective connecting point (C, D, /, $\overline{D}$, B, $\overline{B}$) to which the drain of said complementary transistor ($M2_0$, $M2_1$, $M2_0$, $M2_1$, $M1_0$, $M1_0$) is connected.

4,694,279

VECTOR ELECTRONIC CONTROL DEVICE

Frank Mans, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Oct. 17, 1986, Ser. No. 920,123
Int. Cl.[4] H03M 1/00
U.S. Cl. 340—347 P 12 Claims



1. In an electronic device for generating at least two interrelated electrical outputs, comprising:

at least two capacitive sensing means each for establishing a capacitor with a grounded electrical conductor positionable to conduct a capacitance when said conductor contacts said sensing means, and said sensing means having a configuration such that its capacitance changes as the position of said grounded conductor changes;

a first generating means for generating a first electrical output of selected characteristics and strength in response to said change in capacitance imposed upon one or both of said sensing means including a difference determining means for deriving the difference in capacitance between said two sensing means, and said first electrical output representing this difference and defining the direction of the displacement of said grounded conductor on one or both of said sensing means; and

a second generating means for generating a second electrical output of selected characteristics and strength in a response to said change in capacitance imposed upon one or both of said sensing means, including a deriving and amplifying means for deriving and amplifying the difference in capacitance between said two sensing means; and

rectifying means for receiving said second electrical output and for generating a third electrical output defining the magnitude of said displacement of said grounded conductor on said one or both sensing means, whereby upon relative positioning and movement of said grounded member, the direction and magnitude of said output signals may be established.

4,694,280

KEYBOARD ENTRY SYSTEM

Philip E. Rollhaus, Chicago, Ill., and Yukio Endo, Thornton, N.H., assignors to Quixote Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 574,894, Jan. 30, 1984, Pat. No. 4,638,306. This application Apr. 25, 1986, Ser. No. 856,644
Int. Cl.[4] G06F 3/02; G08C 9/00
U.S. Cl. 340—365 R 22 Claims

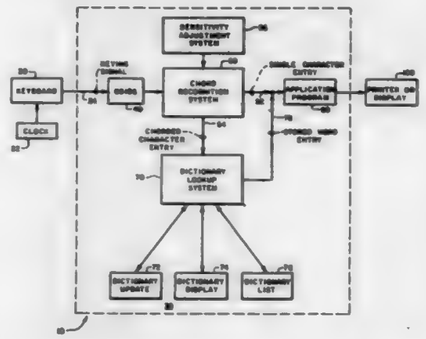
1. A keyboard entry system for a selected language, said system comprising:

a keyboard comprising a plurality of keys, said plurality of keys comprising a set of letter keys comprising a respective key for each letter of said selected language;

first means, responsive to the plurality of letter keys, for generating keying signals in response to activation of the letter keys, each keying signal characterized by a respective depression time when the keying signal is generated in response to depression of the respective letter key, and a respective release time when the keying signal is generated in response to release of the respective letter key;

second means, responsive to the first means, for generating output signals in response to the keying signals, said second means comprising:

means for classifying a plurality of keying signals as a key chord in the event the respective depression and release times satisfy predetermined criteria, said criteria comprising the component criterion that the elapsed time between a first one of the release times and an immediately preceding one of the depression times is greater than a preselected time interval;



means for storing a list of stored texts, each corresponding to a respective chord;

means, responsive to the key chord, for utilizing the key chord to select the one of the stored texts in the list of stored texts which corresponds to the key chord;

means for setting the output signal to correspond to the selected one of the stored texts; and

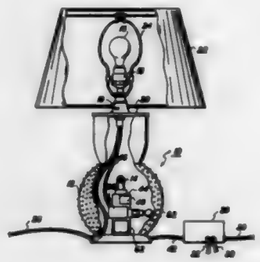
means for setting the output signal to correspond to the letters corresponding to the activated letter keys in the event the respective depression and release times fail to satisfy said criteria.

4,694,281

VISUAL ALARM APPARATUS

Julian A. McDermott, 1639 Stephen St., Ridgewood, N.Y. 11385; Jewel Verde, 2137 Hallmark Dr., Gambrille, Md. 21054, and Wayne McDermott, 2324 A E. 43 St., Apt. 5, Erie, Pa. 16510

Continuation of Ser. No. 418,932, Sep. 16, 1982, abandoned. This application Oct. 21, 1985, Ser. No. 789,754
Int. Cl.[4] G08B 19/00, 3/00
U.S. Cl. 340—521 13 Claims



1. An electrical lighting device, comprising:

(a) a first apparatus, responsive to switching control by an

attending person within a room, for general illumination of the space therein;

(b) a second apparatus, having means responsive to alert and alarm controls, for alerting and communication information to persons, should any be within said space, comprising:

a strobe lamp for producing high intensity flashes of light exceeding the level of intensity of said general illumination for said alerting and communicating information to persons, should any then be within said space; and

an enclosure for said strobe lamp comprising a partially globular shell of substantially transparent light transmitting material having a multiplicity of crystalline formations on a surface thereof for enhancement of said flashing strobe lamp; and

(c) means for integrating said first and second apparatus in an unitary assembly.

4,694,282

SECURITY MONITORING SYSTEM

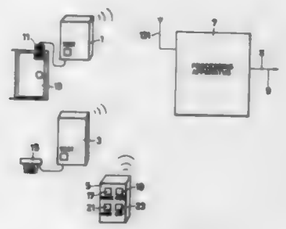
Hiroshi Tamura, and Yutaka Nakaie, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 11, 1985, Ser. No. 786,694

Claims priority, application Japan, Jan. 31, 1985, 60-017414

Int. Cl.⁴ G08B *1/08*

U.S. Cl. 340—539 **20 Claims**



1. A security monitoring system, comprising:

(a) at least one radio transmitter which includes an alarm information transmission apparatus for transmitting alarm information as a radio signal;

(b) said radio transmitter further including

(1) a test signal transmitting means for transmitting test signals at one of a first amplitude level and a second lower amplitude level, and

(2) a manually operable setting means for setting a transmission level for transmitting said test signals at said second amplitude level;

(c) a processing apparatus having an alarm unit for receiving the alarm information transmitted from said radio transmitter to carry out alarm processing in accordance with the contents of the alarm information; and

(d) said processing apparatus including a first detecting means for detecting whether or not the system operates reliably by receiving the test signals having the second amplitude level.

4,694,283

IDENTIFICATION DEVICE IN THE FORM OF A TAG-LIKE STRIP AFFIXABLE TO AN ARTICLE

Max E. Reeb, Heifensteinstasse 7, D-7336 Uhingen, Fed. Rep. of Germany

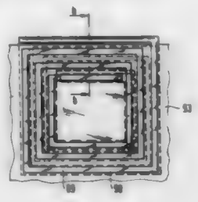
PCT No. PCT/DE82/00210, § 371 Date Jun. 29, 1983, § 102(e) Date Jun. 29, 1983, PCT Pub. No. WO83/01697, PCT Pub. Date May 11, 1983

PCT Filed Oct. 29, 1982, Ser. No. 513,970

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1981, 3143208

Int. Cl.⁴ G08B *13/24*

U.S. Cl. 340—572 **30 Claims**



1. For use in electronic security systems, an identification device in the form of a tag-like strip containing a substantially planar resonant circuit comprising:

an inductive member and a capacitive member,

said inductive member and said capacitive member consisting of at least a first both inductively and capacitively reacting element and a second both inductively and capacitively reacting element being arranged in at least a first and a second plane, respectively,

said at least first both inductively and capacitively reacting element consisting of at least a first arrangement of flat conductor strips in said at least first plane,

said at least second both inductively and capacitively reacting element consisting of at least a second arrangement of flat conductor strips in said at least second plane,

said at least first and second both inductively and capacitively reacting elements being arranged in an aligned opposition, spaced one from another by at least one dielectric layer,

said at least first and second both inductively and capacitively reacting elements being arranged in an aligned opposition, spaced one from another by at least one dielectric layer,

said at least one dielectric layer extending at least on mutually opposing surfaces of said at least first and second arrangements of flat conductor strips forming said at least first and second both inductively and capacitively reacting element, respectively,

said aligned opposition of said at least first and second both inductively and capacitively reacting elements providing an aligned overlay of said at least first and second arrangements of flat conductor strips such that any mutually opposing segments of at least first and second flat conductor path portions of said at least first and second arrangements of flat conductor strips

capacitively interact to a maximum extent with one another,

said at least first and second arrangements of flat conductor strips cooperating to form a coil having continuous turns of substantially uniform winding direction when viewed from one side of said planes,

said opposing segments of at least first and second flat conductor path portions spaced one from another by said at least one dielectric layer thus cooperating to form an individual LC stripline portion having a distributed line capacitance and a distributed line inductance,

said aligned overlay of said at least first and second arrangements of flat conductor strips thus representing the summed totality of all said individual LC stripline portions cooperating to form an LC circuit,

said cooperation of said individual LC stripline portions to form an LC circuit thus being realized by said at least first and second flat conductor strips being arranged in said at least first and second respective planes and being spaced by said at least one dielectric layer forming a plurality of individual LC stripline loop portions,

said individual LC stripline loop portions being cascadingly stacked to form an LC stripline circuit construction exhibiting distributed line capacitances integrally summing to an overall effective capacitance owing to the surface areas of said mutually opposing at least first and second flat conductor strips and properties of said at least one dielectric layer spacing them one from another,

and exhibiting distributed line inductances integrally summing to an overall effective inductance owing to distributed mutual magnetic coupling factors between said at least first and second flat conductor path portion arranged in an aligned overlay,

said overall effective capacitance and said overall effective inductance and said distributed mutual magnetic coupling factors causing the capability of such said LC stripline circuit construction to resonate,

said LC stripline circuit construction formed by a plurality of individual LC stripline loop portions being cascadingly stacked thus forming a substantially planar resonant circuit,

said substantially planar resonant circuit being provided with a suitable cover to form said tag-like strip.

4,694,284

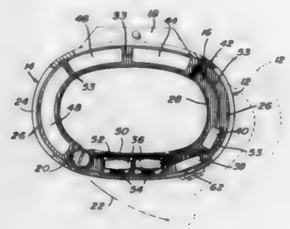
ABDUCTION-PREVENTING COLLAR

Serge Leveille; Jacqueline Cormier, both of 5001-H rue des Bocages, St-Augustin, Canada G3A 1G4; Ginette Cormier, and Pierre Brassard, both of 723 Mohawk Rd. East, Hamilton, Canada (L8T 2P9)

Filed Apr. 14, 1986, Ser. No. 851,830

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—574 **8 Claims**



1. An abduction-preventing device comprising a collar adapted to surround a human body portion, said collar consisting of two legs pivoted one to the other at one end by a hinge member and releasably locked one to the other at the other end by a lock member, said legs being made of a shear-resistant material; a radio signal-transmitting circuit, an autonomous power supply for said circuit, and switching means to activate said circuit, all housed within said collar, and a switching means manual actuator accessible at the external face of said collar, said circuit further including means to prevent deactivation of said circuit once activated by said manual actuator, short of complete discharge of said power supply, while said lock member locks said legs around said body portion.

4,694,285

COMBINATION ELECTRICAL LIGHT, SMOKE AND/OR HEAT DETECTOR

Keith A. Scripps, 4301 Massachusetts Ave., NW., Washington, D.C. 20016

Filed Nov. 12, 1985, Ser. No. 797,008

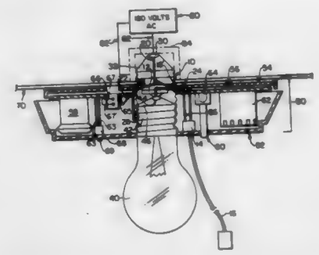
Int. Cl.⁴ G08B *23/00*

U.S. Cl. 340—693 **2 Claims**

1. A combined and alternately selectible heat, smoke detector and electric light source for removable installation to an electric fixture comprising;

(A) electrically operable, combined smoke and heat sensor and alarm therefor, each being interconnected to the other;

(B) at least one illumination receptacle switchedly electrically interconnected to the smoke and heat sensor and alarm said illumination receptacle being recessed within the detector;



(C) connector electrically interconnected to said combined smoke and heat sensor and alarm therefor and to said receptacle in extension thereof; said connector being affixed to the smoke and heat sensor and alarm adjacently and in opposite orientation thereto in an integrated structure;

(D) a light source contained by the receptacle;

(E) an electrical power source for the elements aforesaid and wherein switching means is incorporated to energize and de-energize the power source.

4,694,286

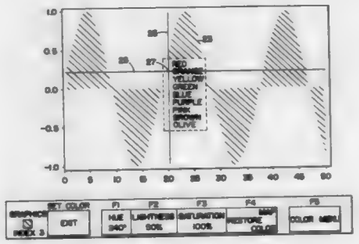
APPARATUS AND METHOD FOR MODIFYING DISPLAYED COLOR IMAGES

Gar A. Bergstedt, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 8, 1983, Ser. No. 483,354

Int. Cl.⁴ G09G *1/16*

U.S. Cl. 340—703 **7 Claims**



1. An apparatus for modifying color characteristics of a displayed color image formed by a plurality of pixels, the apparatus comprising:

means for storing pixel color data, including index values and sets of hue (H), lightness (L) and saturation (S) color values, each index value associating one color, represented by one set of H, L, S color values, with at least one pixel;

means for selecting a color of the image for modification by positioning a cursor at a specified pixel having that selected color; and

means for modifying at least one of the set of H, L, S color values associated with the specified pixel in response to input of new color data, said modifying means including a

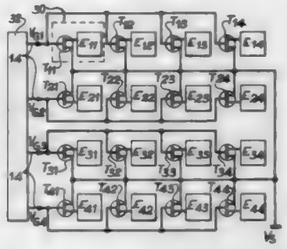
means for inputting new color data for at least one of said set and a processor means responsive to the new color data for changing said at least one of the set of stored H, L, S color values to the new color data, enabling color modification, according to the modified set, of all pixels of the image having the same index value as the specified pixel.

4,694,287

ACTIVE MATRIX DISPLAY SCREEN WITHOUT INTERSECTION OF THE ADDRESSING COLUMNS AND ROWS

André Chesevrus-Paule, Grenoble, and Jean-Frédéric Clerc, Meylan, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 5, 1984, Ser. No. 658,049
Claims priority, application France, Oct. 7, 1983, 83 15996
Int. Cl.⁴ G09G *3/34*
U.S. Cl. 340—719 **6 Claims**



1. An active matrix display screen incorporating a material whose optical characteristic can be modified, said material being inserted between a first wall and a second transparent wall, the screen comprising a plurality of image points arranged in a matrix of p rows and q columns, in which $1<p$ and $1<q$, each image point comprising a switching element and a first electrode on the first wall, said switching element being a thin film transistor whose drain is connected to said first electrode, and a second electrode on the second wall, wherein said screen comprising a first group of p row addressing conductors, each conductor being associated with a row of the matrix of image points and being connected to the gates of all the transistors of the image points of said row, a group of other conductors, parallel to the conductors of said first group and connecting the sources of the transistors of all the image points of the matrix to a reference potential, said first group of conductors and said other group of conductors being on the first wall, and said screen comprising a second group of q column addressing conductors, each conductor being associated with a column of the matrix of image points and being connected to the second electrodes of all the image points of said column, said second group of conductors being on the second wall.

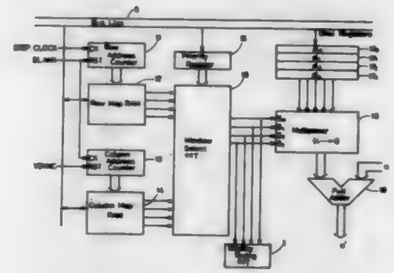
4,694,288

MULTIWINDOW DISPLAY CIRCUIT

Munenori Harada, Sakai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 5, 1984, Ser. No. 647,527
Claims priority, application Japan, Sep. 14, 1983, 58-170973
Int. Cl.⁴ G09G *1/16*
U.S. Cl. 340—721 **4 Claims**

1. A multiwindow display circuit comprising:
display means for displaying a plurality of display windows;
horizontal frame memory means for storing horizontal boundary data for each one of said plurality of display windows;
vertical frame memory means for storing vertical boundary data for each one of said plurality of display windows;
display address means for sequentially producing an initial address for each one of said plurality of display windows;
picture information memory means for storing picture information corresponding to each said initial address;
window selection means, responsive to said horizontal frame memory means and said vertical frame memory means, for selecting a particular display window from said plurality of display windows, said particular display window being selected when said initial address data is determined by said window selection means to be in said horizontal and vertical boundary data for said particular display window;
bias value memory means for storing a plurality of bias values for each one of said plurality of display windows, each one of said bias values representing the boundary data defined by said horizontal frame memory means and said vertical frame memory means of said window selection means;



address converter means for adding a selected one of said bias values corresponding to the selected display window to said initial address produced by said display address means to obtain a desired display address, said desired display address then being provided to said picture information memory means to access corresponding picture information; and
display timing control means, responsive to said window selection means, for providing a code representative of the selected display window to said display means for directing the display of said selected window, and controlling the supply of accessed picture information to said display means;
said display means being responsive to said code provided by said display timing means and said supplied picture information, whereby any portion of said picture information stored in said picture information memory means can be displayed on any display window of said display means.

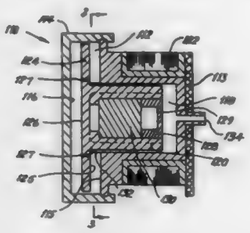
4,694,289

DISPLAY MEMBER

Roger S. Kent, Duncraig, Australia, assignor to E.R.G. Management Services Pty., Ltd., Subiaco, Australia

PCT No. PCT/AU83/00177, § 371 Date Jul. 24, 1984, § 102(e) Date Jul. 24, 1984, PCT Pub. No. WO84/02414, PCT Pub. Date Jun. 21, 1984
PCT Filed Dec. 2, 1983, Ser. No. 634,156
Claims priority, application Australia, Dec. 8, 1982, PF7176; May 24, 1983, PF9513
Int. Cl.⁴ G09G *3/34*
U.S. Cl. 340—815.05 **42 Claims**

1. A display member comprising a housing having a chamber filled with a fluid and having a viewing face, a reference member, means for mounting said reference member within said chamber for movement between a first position in which a front face of the reference member is in face to face contact with said viewing face and a second position in which said front face of the reference member is out of contact with the viewing face, said means for mounting further providing for effecting retention of said reference member in either of said positions in the absence of the exertion of an external force, and drive means comprising a first magnetic device fixed relative to said housing and a second magnetic device fixed relative to said reference member, at least one of said magnetic devices being capable of being actuated to produce a driving force



between the said devices to selectively move said reference member between said first and said second positions, the respective densities of said fluid and said reference member cooperating to limit the retention provided by said means for mounting.

4,694,290

READINESS INDICATOR FOR LASER MEDICAL INSTRUMENTS

Jürgen Schwarz, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,022
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405308
Int. Cl.⁴ G08B *21/00*
U.S. Cl. 340—815.21 **6 Claims**



1. A device for indicating the readiness for operation of a laser medical instrument, said device comprising an audiogenerator and amplifier unit having an input and an output, an earphone operatively connected to said output, and an operative connection from an existing indicating device to said input of said unit, whereby a signal given by said existing indicating device will cause a signal to be delivered to said earphone.

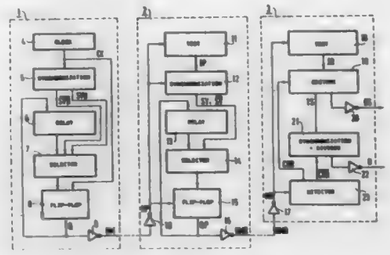
4,694,291

DEVICE FOR TRANSMITTING A CLOCK SIGNAL ACCOMPANIED BY A SYNCHRONIZATION SIGNAL

Alain Denhez, Velizy-Villacoublay; Francis Hargoaa, Paris, and Jean Aubrée, Bougival, all of France, assignors to Alcatel, Paris, France

Filed Feb. 6, 1986, Ser. No. 826,648
Claims priority, application France, Feb. 7, 1985, 85 01723
Int. Cl.⁴ H04Q *1/00*
U.S. Cl. 340—825.2 **6 Claims**

1. Device for transmitting a clock signal accompanied by a synchronization signal, comprising a transmitter, a receiver adapted to deliver a clock signal and a synchronization signal to circuits connected to an output of said receiver, a link between said transmitter and said receiver and at least one repeater in said link, wherein said transmitter comprises a clock, a synchronization circuit, a flip-flop, a selector circuit, a delay circuit and an output inverter, said synchronization circuit has an input connected to said clock and first and second outputs connected to said selector circuit, said selector circuit has an input connected to a direct output of said flip-flop by said delay circuit and an output connected to a reset input of said flip-flop, and said flip-flop has a clock input connected to said



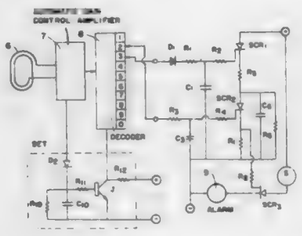
clock, a data input adapted to be connected to a positive potential and a direct output connected to said output inverter which delivers a clock and synchronization signal to an output of said transmitter.

4,694,292

DIGITIZED DECODER-RECEIVER FOR RECEIVING CALL SIGNAL

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Dec. 19, 1984, Ser. No. 683,476
Claims priority, application Japan, Jan. 12, 1984, 59-4081
Int. Cl.⁴ H04B *7/00*
U.S. Cl. 340—825.44 **4 Claims**



1. A portable device for receiving a transmitted call signal containing a first digit and a second digit, said call signal being an electromagnetic wave that carries a specific sequence of pulses having a first pulse and a last pulse, and having been preassigned as a decimal number to a particular person(s), comprising:
(a) a dc source for supplying power to said device;
(b) antenna means for picking up said call signal once it has been transmitted;
(c) an automatic gain control amplifier having an input terminal connected to said antenna means and at least one output terminal, said amplifier including means for converting said call signal, picked up by said antenna means, into a sequence of pulses;
(d) decoder means for counting the number of pulses in said sequence of pulses and activating a specific output in accordance with said number of pulses, said decoder means having a set/reset terminal and a first input terminal connected to said output terminal of said automatic gain control amplifier;
(e) a grounded-emitter transistor, having a base and a collector, for controlling said decoder means, said base of said transistor being connected to said output terminal of said automatic gain control amplifier and a first capacitor that cuts off said transistor at the end of said sequence of

pulses, and said collector of said transistor being connected to said set/reset terminal of said decoder means for initializing said decoder means when said first pulse of said sequence of pulses reaches said input terminal of said decoder means;

(f) a second capacitor which is charged when said first digit of said call signal is received and discharged when said second digit of said call signal is received;

(g) an RC-integrating circuit having a time constant sufficiently longer than the time duration of said sequence of pulses that charge said second capacitor;

(h) a controlled rectifier having a main current path and a second current path through a gate to said second capacitor, said output terminal of said decoder means charging said second capacitor through said main current path when said first digit of said call signal is received and discharging said second capacitor through said RCintegrating circuit when said second digit of said called signal is received; and

(i) means for alarming said particular person(s), said means for alarming being connected in series with said second capacitor so that when said second capacitor discharges, said means for alarming is activated.

4,694,293

DATA TRANSMISSION SYSTEM

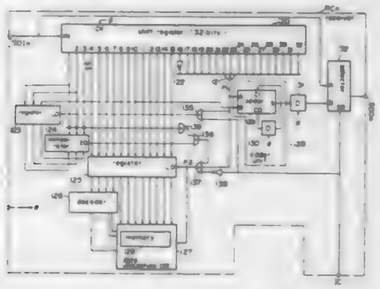
Jun Sugiyama; Kiyoshi Hagino, and Akira Usui, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 16, 1985, Ser. No. 776,689

Claims priority, application Japan, Sep. 18, 1984, 59-195573; Sep. 26, 1984, 59-200963

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 340—825.68 **14 Claims**



1. A data transmission system comprising:

(a) initialization signal generating means responsive to an application of power to said transmission system for producing an initialization signal;

(b) transmitter means connected to said initialization signal generating means and including initialization data generating means responsive to said initialization signal for generating initialization data of a predetermined value and a data output terminal for transmitting said initialization data via said output terminal; and

(c) first to Nth (N: integer greater than or equal to 2) receiver means which are connected in a cascade format in the ordinal number order and connected to said initialization signal generating means wherein said nth ($1 \leqq n \leqq N$) **receiver means comprises a nth input terminal, nth register means, nth modifying means and a nth output terminal;**

in said first receiver means, in response to said initialization signal, said first modifying means receiving said initialization data via said first input terminal, modifying said initialization data and delivering the modified initialization data as first output data via said first output terminal, and said first register means storing first identification data corresponding to said initialization data and identifying said first receiver means, and

in said kth ($2 \leqq k \leqq N$) **receiver means, in response to said initialization signal, said kth modifying means receiving a** $(k-1)$th output data via said kth input terminal, modifying said $(k-1)$th output data and delivering the modified $(k-1)$th output data as kth output data via said kth output terminal and said kth register means storing kth identification data corresponding to said $(k-1)$th output data and identifying said kth receiver means.

4,694,294

SYNCHRONIZED NETWORK SYSTEM

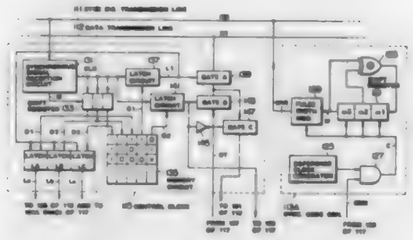
Tadashi Suzuki, Yokohama; Toru Futami, and Atsushi Sakagami, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jul. 10, 1985, Ser. No. 753,595

Claims priority, application Japan, Jul. 12, 1984, 59-144812

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.14 **11 Claims**



1. A network system including a data transmission line through which a serial data is transmitted, a synchronous signals transmission line through which a synchronous signal for controlling a transfer of the serial data is transmitted, and a plurality of data stations connected to both data transmission line and synchronous signal transmission line, each one of the data stations transferring the serial data to any of the other data stations in accordance with the synchronous signal, comprising:

(a) first means for generating and outputting the synchronous signal to the synchronous signal transmission line, the synchronous signals having information bits of a constant period for selecting any of the data stations between which the serial data is transferred via the data transmission line and with which the transfer of the serial data is synchronized;

(b) second means for cyclically generating said information bits of the synchronous signal;

(c) third means for operatively inhibiting the transmission of said information bits to the synchronous signal transmission line; and

(d) fourth means responsive to the selection of any of the stations to transmit the serial data to the data transmission line by means of said information bits for actuating said third means to inhibit the transmission of said information bits to the synchronous signal transmission line over a period which is varied according to a length of the serial data transmitted to the data transmission line.

4,694,295

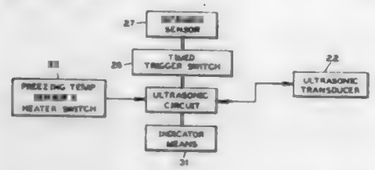
VEHICLE BLIND SPOT DETECTOR

Brett A. Miller, 2210 N. King Rd., Marion, Ind. 46952, and Daniel Pitton, 2046 NW. 43rd Ter., Apt. 1, Lauderhill, Fla. 33313

Filed May 15, 1986, Ser. No. 863,573

Int. Cl.⁴ G08G *1/00*

U.S. Cl. 340—903 **9 Claims**



1. A vehicle blind spot detector for indicating to the driver of a first vehicle impending contact with another vehicle, the first vehicle comprising:

at least one infrared ranging circuit having an infrared light emitter and an infrared light detector for extended range sensing of reflected infrared light from said other vehicle converging from one side of said first vehicle, the detector being disposed externally on a corresponding side of the first vehicle, facing said other vehicle;

a timed trigger switch responsive to the infrared light detector for generating a delayed detector response after a given delay;

a short range ultrasonic ranging circuit responsive to the delayed detector response for ultrasonically measuring the distance to the other vehicle, disposed externally on a corresponding side of the first vehicle, facing said other vehicle;

an alarm operatively responsive to the ultrasonic ranging circuit for indicating potential contact with a converging vehicle to the driver of the first vehicle when said other vehicle is within a given range from the first vehicle.

4,694,296

VEHICLE APPROACH SENSING APPARATUS

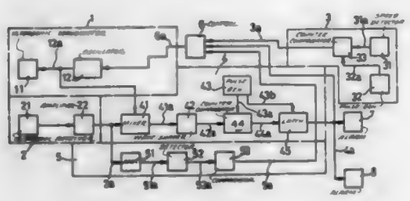
Kunihiko Sasaki, Nukata; Masao Kodera, Okazaki, and Akira Kuno, Obu, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 12, 1985, Ser. No. 711,046

Claims priority, application Japan, Mar. 13, 1984, 59-47661

Int. Cl.⁴ G08G *1/00*; G01S *13/00, 15/93*

U.S. Cl. 340—904 **10 Claims**



1. A vehicle approach sensing apparatus installed in a first of two vehicles for detecting a condition wherein one vehicle is getting closer to another vehicle at an approach speed higher than a predetermined speed threshold, comprising:

ultrasonic transmission-reception means disposed in the one vehicle and which can be selectably started and stopped, for transmitting ultrasonic waves to the another vehicle in response to a drive signal fed thereto, and for then receiving the ultrasonic waves reflected from the another vehicle, and generating a reception signal which is varied in proportion with a strength of the received ultrasonic waves;

running speed detection means for detecting a running speed of the one vehicle and for starting said transmissionreception means when the detected running speed is decreased across a first threshold value and for stopping said transmission-reception means when said running speed detection means is increased across a second threshold value;

approach speed detection means for detecting an approach speed between the one and the another vehicles from the reception signal and for producing an alarm signal and simultaneously stopping said ultrasonic transmission-reception means when the detected approach speed is higher than the predetermined speed threshold; and

approach distance detection means for detecting an approach distance between the one and the another vehicles from the reception signal and stopping said ultrasonic transmissionreception means when the detected approach distance is shorter than a predetermined value.

4,694,297

REMOTE IDENTIFICATION DEVICE

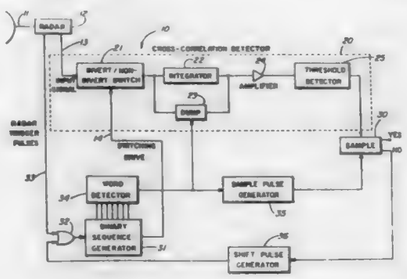
Alan Sewards, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 19, 1985, Ser. No. 703,236

Claims priority, application Canada, Feb. 27, 1984, 448362

Int. Cl.⁴ G01S *13/78*

U.S. Cl. 342—45 **7 Claims**



1. An apparatus for distinguishing a moveable subject from a group of moveable subjects, comprising:

transmitting means for transmitting electromagnetic signals towards a remote area where the moveable subject to be identified is located, said transmitting means including a local receiving means;

remote receiving means for receiving said electromagnetic signals at said moveable subject to be identified, said moveable subject including an antenna;

impedance varying means including means for generating a remote predetermined binary sequence code for varying the terminating impedance of said antenna on said moveable subject wherein the scattering cross-section of said antenna to an incoming signal is a function of the match of the antenna to that signal such that a scattered reflected signal is produced, said reflected signal being modulated by variations of said impedance, said local receiving means receiving said reflected signal;

means for generating a local binary sequence code identical with said remote binary sequence code;

detecting means for detecting said reflected modulating signal at said local receiving means, said detecting means including means for cross-correlating said reflected signal modulated by said remote binary sequence code with said local binary sequence code, said cross-correlating means including an invert-noninvert switch receiving an input signal from said transmitting means and from said local binary sequence code generator, an integrator coupled to

said switch, an amplifier coupled to said integrator, and a threshold detector coupled to said amplifier;

a sample circuit coupled to said threshold detector providing an indication of the presence or non-presence of said remote binary sequence code; and

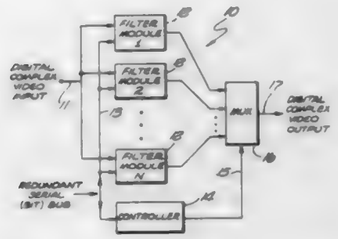
means for synchronizing said reflected and local coded signals.

4,694,298

ADAPTIVE, FAULT-TOLERANT NARROWBAND FILTERBANK

John M. Milan, Canoga Park, Calif., assignor to ITT Gilfillan, Van Nuys, Calif.

Filed Nov. 4, 1983, Ser. No. 548,607
Int. Cl.⁴ G01S 7/40
U.S. Cl. 342—89 **15 Claims**



1. An adaptive filterbank responsive to received Doppler-modulated digitized video signals, comprising:

a plurality of narrowband filter modules each having an I and Q section and each having a Doppler frequency response controllable by application of a set of digital weighting values, said modules including means for multiplying said video signals by said weighting values;

first means for storing a plurality of said weighting values each corresponding to a discrete Doppler response and for selecting and discretely applying said weighting values within corresponding ones of said filter modules;

second means for generating a plurality of simulated digitized video test signals each Doppler-modulated at a set of discrete frequencies corresponding to the intended response of one of said modules;

third means for alternating the input signal of each of said modules between said received video signals and the corresponding one of said second means simulated video test signals; and

fourth means responsive to the output of each of said modules for continuously monitoring the Doppler frequency response thereof and for controlling the selection and application of corresponding ones of said weighting values to each of said modules.

4,694,299

PORTABLE RADAR SIMULATOR WITH ADJUSTABLE SIDE LOBE GENERATOR

William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

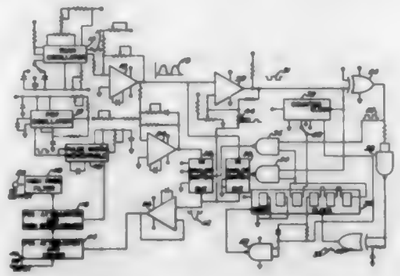
Filed Apr. 12, 1985, Ser. No. 722,542
Int. Cl.⁴ G01S 7/40
U.S. Cl. 342—170 **3 Claims**

1. A portable radar simulator for generating a pulsed RF signal adapted to be provided to a directional microwave antenna comprising:

a scan oscillator for providing a sine wave signal;

shaping means for receiving said sine wave signal and for providing a plurality of electrical signals that simulate a main lobe and a side lobe on each side of said main lobe, said shaping means further comprises main lobe generation means connected to said scan oscillator for receiving said sine wave signals and for providing a main lobe at predetermined intervals, and side lobe generator means connected to said scan oscillator for receiving said sine wave signal and for providing a side lobe immediately prior to and immediately following said main lobe;

variable pulse width generator means for providing pulse signals;



modulating means for receiving said plurality of electrical signals simulating main lobe and side lobe on each side of said main lobe from said shaping means and an RF input signal and for providing a modulated RF signal; and

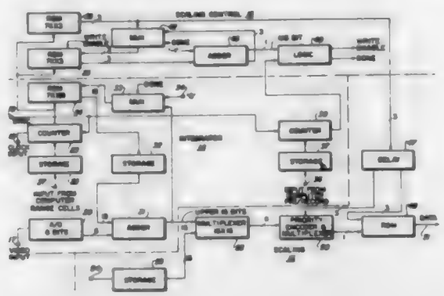
high speed driver means connected to receive said modulated RF signal and said pulse signals for providing a pulsed RF output.

4,694,300

APPARATUS FOR PROVIDING CONSTANT AZIMUTH CELLS IN AN AIRBORNE RADAR

Louis A. McRoberts, Scottsdale, and Arthur Felix, Jr., Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1983, Ser. No. 561,419
Int. Cl.⁴ G01S 13/90
U.S. Cl. 342—195 **6 Claims**



1. Apparatus for providing azimuth cells having a relatively constant size in a radar beam, said apparatus comprising:

an airborne radar having a transmission beam of fixed width, said radar providing synchronizing pulses and video data;

integrating means coupled to said radar for dividing the radar beam into range bins and integrating the video data in each range bin in reasonse to the synchronizing pulses, said integrating means including an analog to digital converter coupled to receive the video data from the radar and convert it to digital data signals, a random access memory for storing digital data signals and digital adder connected to add new and stored digital data signals and to supply the sum to the random acces memory for storage;

timing means coupled to said integrating means for dividing the range bins into azimuth cells in accordance with the number of synchronizing pulses provided per unit distance of travel and controlling said integrating means to integrate the video data in each range bin over an entire azimuth cell; and

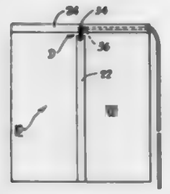
dividing means coupled to said integrating means for receiving summation signals representative of the sum of all of the digital data signals in each range bin for an entire azimuth cell and dividing the summation signals by the number of synchronizing pulses provided during the azimuth cell.

4,694,301

ANTENNA PARTICULARLY SUITED FOR USE WITH A MOBILE COMMUNICATIONS SYSTEM

Raymond E. Wassum, Chagrin Falls, Ohio, assignor to Antenna Incorporated - Div. of Celwave, Cleveland, Ohio

Filed Dec. 23, 1985, Ser. No. 812,528
Int. Cl.⁴ H01Q 1/00, 1/38
U.S. Cl. 343—720 **11 Claims**



1. An antenna suitable for mounting to a non-conductive flat surface comprising:

a planar substrate of electrically nonconducting material;

a first elongated rectangular conductor mounted to one side of the planar substrate and having a length for radiating electromagnetic energy of a predetermined frequency range in response to a radio signal and for receiving electromagnetic energy of said predetermined frequency range for conversion to a radio signal;

a second elongated ground plane conductor mounted to said one side of the planar substrate, oriented at a right angle to said first conductor, and having a mid-portion spaced from one end of the first elongated conductor; and

cable means having a radio signal carrying conductor coupled to the first elongated conductor and a ground conductor coupled to the second elongated conductor;

said ground plane mid-portion spaced from the one end of said first conductor for impedance matching the cable means to said antenna.

4,694,302

REACTIVE INK-JET PRINTING

David E. Hackleman, Monmouth, and Norman E. Pawlowski, Corvallis, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 6, 1986, Ser. No. 871,346
Int. Cl.⁴ G01D 15/16
U.S. Cl. 346—1.1 **30 Claims**

1. A method of improving the water fastness of an ink on a substrate employing ink-jet printing comprising:

(a) providing said substrate;

(b) providing an ink-jet print head having at least a first set of nozzles connected to a first reservoir;

(c) providing an ink composition comprising a coloring agent and a vehicle and at least one reactive species capable of reacting with a second species to form a polymer on said substrate, said polymer binding said coloring thereto, said second species comprising either a component in said substrate or a component maintained in a second reservoir, separate from said first reservoir and associated with a second set of nozzles indexed with said first set of nozzles; and

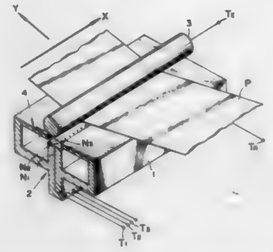
(d) applying either said ink or said ink and said second component separately to said substrate to form said polymer thereon.

4,694,303

METHOD AND APPARATUS FOR PRINTING IMAGE

Tetsuro Morino, and Shigeki Yamashita, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 611,364, May 16, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,925
Claims priority, application Japan, May 24, 1983, 58-91130
Int. Cl.⁴ G01D 15/16
U.S. Cl. 346—1.1 **6 Claims**



1. A method for use in a printing apparatus for image printing, comprising the steps of:

submerging in ink a continuous uniform block of insulation material containing printing electrodes which are formed by linearly arranging and closely and uniformly spacing a plurality of styli in a line so that the end portions of said styli, which terminate substantially coplanarly with the top of said insulation block, are slightly below an ink surface, said block having no coplanar electric field producing electrodes; said submerging step further including the step of placing on said ink surface a covering containing an elongated opening, said ink surface forming a meniscus at said opening, said opening traversing the entire line of said printing electrodes;

confronting said printing electrodes by an auxiliary electrode opposite to said printing electrodes and slightly above said ink surface; and

raising the level of desired portions of said ink surface, without the use of electroosmotic force, by applying a voltage across said printing electrodes and said auxiliary electrode in accordance with information of an image to be printed so as to print onto a printing medium disposed slightly above said ink surface, which is sufficiently close so that upon applying said voltage said risen ink touches the paper medium, wherein said image is printed on said printing medium with said ink.

4,694,304

EARTHQUAKE DISPLACEMENT RECORDER

Paul D. Engdahl, 2930-E Grace La., Costa Mesa, Calif. 92626

Filed Aug. 13, 1986, Ser. No. 896,090
Int. Cl.⁴ G01D 9/00
U.S. Cl. 346—7 **11 Claims**

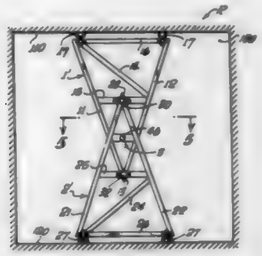
1. An instrument for recording generally lateral shear-like vibrational displacements between a first and a second structural portion of a structure, said displacements being generally perpendicular to a line joining said structural portions, comprising:

a first and a second generally flat triangular displacement-transmitting member, each having a base portion and an apex portion;

said members being disposed in adjacent parallel planes with

their base portions spaced and parallel and facing outward, and their apex portions facing inward and overlapping each other to define an overlap area;

sliding joint means in said overlap area disposed to hold said members together but to permit relative sliding displacement in their own planes along a direction parallel to said base portions;



mounting means to fasten each said base portion to a separate one of said structural portions, and

a displacement recording device disposed in said overlap area to record said relative displacement, said displacement corresponding to said lateral shear-like displacement;

said structural portions being at least about a meter apart.

4,694,305

MULTI-COLORED STACKED CASSETTES THERMAL PRINTER

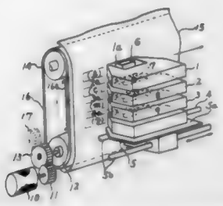
Kengo Shiomi, Tokyo; Yoshiyuki Sasaki, Chofu, and Toshiyuki Kato, Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,590

Claims priority, application Japan, Mar. 30, 1985, 60-67574; Mar. 30, 1985, 60-67575

Int. Cl.[4] G01D *15/10;* **B41J** *35/14*

U.S. Cl. 346—76 PH **7 Claims**



1. A multi-chromatic thermal printer which comprises:

recording substrate supply means for introducing a recording substrate into an image receiving position of said thermal printer;

a carriage means for laterally traversing said recording substrate;

a plurality of ribbon cassette members positioned in vertical array on said carraige means, each of said ribbon cassette members having an ink ribbon disopsed for contact with sasid recording substrate, said ribbon formed with a pigment-containing material;

a plurality of thermal head members positioned on said carriage means for selectively cooperating with a ribbon cassette member of said plurality of ribbon cassette members, each of said thermal head members being capable of being heated in image-wise pattern; and

transfer means for cooperating with said plurality of thermal head members to thereby heat said respective ribbon in said image-wise pattern and to transfer said thus heated pattern onto said recording substrate.

4,694,306

LIQUID JET RECORDING HEAD WITH A PROTECTIVE LAYER FORMED BY CONVERTING THE SURFACE OF A TRANSDUCER INTO AN INSULATING MATERIAL

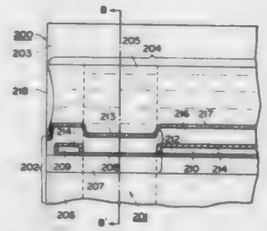
Masami Ikeda, Machida; Hiroto Matsuda, Ebina; Hiroto Takahashi, and Tatsumi Shohji, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 575,678, Jan. 31, 1984, abandoned. This application May 20, 1986, Ser. No. 867,890

Claims priority, application Japan, Feb. 5, 1983, 58-16900

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. A liquid jet recording head comprising:

a liquid discharging portion having an orifice for discharging liquid to form flying liquid droplets and a heat acting zone communicating with said orifice at which heat energy for forming said liquid droplets can act on the liquid therein, and

an electrothermal transducer including at least a pair of confronting electrodes connected electrically to a heat generating resistance layer provided on a substrate to form a heat generating portion between said electrodes and a protective layer formed by a reaction that converts material comprising said electrothermal transducer into an insulating inorganic material, wherein said reaction comprises at least one of oxidation, nitriding, boriding and carbiding of said electrothermal transducer at the surface thereof to convert said surface into at least one of an oxide, a nitride, a boride and a carbide, respectively, of the material comprising electrothermal transducer.

4,694,307

RECORDING DEVICE WITH MULTIPLE RECORDING UNITS AND A COMMON INK SOURCE

Shigeo Toganoh; Yohji Matsufuji, and Hiroo Ichihashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 752,474, Jul. 3, 1985, abandoned, which is a continuation of Ser. No. 419,515, Sep. 17, 1982, abandoned. This application Jun. 9, 1986, Ser. No. 873,837

Claims priority, application Japan, Oct. 2, 1981, 56-157296; Oct. 2, 1981, 56-157303

Int. Cl.[4] G01D *15/16;* **B41J** *3/54*

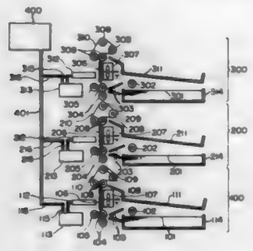
U.S. Cl. 346—140 R **1 Claim**

1. A recording device comprising:

a plurality of ink-jet recording units arranged separately from each other, each of said recording units including a plurality of multi-nozzle ink-jet recorder heads having aligned nozzles;

a plurality of ink feeders, each corresponding to one of said recording units, for supplying ink to said recorder heads of said corresponding recording unit;

a single main ink reservoir for containing ink; and



means for supplying ink from said single main ink reservoir to all of said ink feeders.

4,694,308

BARRIER LAYER AND ORIFICE PLATE FOR THERMAL INK JET PRINTHEAD ASSEMBLY

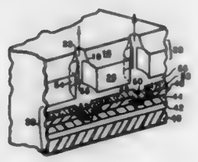
C. S. Chan, and Robert R. Hay, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 801,169, Nov. 22, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 939,284

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **17 Claims**





13. In a thermal jet printhead assembly including a plurality of resistor heater elements within a thin film resistor structure and further having a plurality of individual ink reservoirs constructed atop and aligned with respect to the plurality of resistive heater elements, respectively, for receiving thermal energy therefrom during an ink jet printing operation, the improvement comprising: a barrier layer and orifice plate structure including a barrier layer having cavities therein defining ink reservoirs, said cavities aligned with respect to said heater resistors and further having ink flow ports therein for receiving ink from an ink source, and an orifice plate layer joined to said barrier layer and having ink passageways therein aligned with respect to said cavities in said barrier layer, said ink passageways being defined by contoured and curved interior walls which converge from a point of maximum diameter adjacent said barrier layer to a point of minimum diameter at the outer surface of said orifice plate layer, whereby the convergent geometry of said passageways minimizes turbulance, air gulping, and cavitation wear caused by ink flowing through said passageways.

4,694,309

Patent Not Issued For This Number

4,694,310

METHOD AND APPARATUS OF ELECTROPHOTOGRAPHY

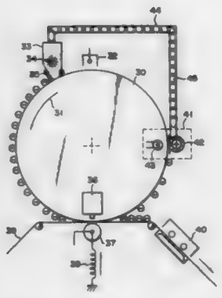
Tutomu Saito, and Hitoshi Yoneda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1984, Ser. No. 648,819

Claims priority, application Japan, Sep. 19, 1983, 58-172569; Sep. 19, 1983, 58-172570

Int. Cl.[4] G01D *15/14*

U.S. Cl. 346—153.1 **11 Claims**



1. A method of electrophotography, which comprises:

charging a photoconductive layer, in a photoreceptor consisting of a transparent, electrically conductive layer and said photoconductive layer which is sequentially formed on a transparent substrate, with a polarity;

applying a toner charged with a polarity opposite to that of

said photoconductive layer on a surface of said photoconductive layer;

exposing a portion of said photoconductive layer with said toner thereon from one side of said transparent substrate and making a charge on an exposed region of said photoconductive layer disappear through said transparent conductive layer; and

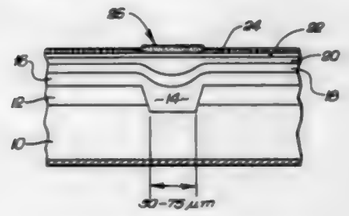
transferring toner particles on the exposed region of said photoconductive layer to toner-receiving paper held between said photoconductive layer and an electrode opposing said photoconductive layer, by applying to said electrode a voltage having a polarity opposite to that of said toner.

4,694,311

PLANAR LIGHT-EMITTING DIODE

Edward A. Rezek, Redondo Beach, and Andre Burghard, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 736,880, May 22, 1985, Pat. No. 4,647,320.
This application Sep. 11, 1986, Ser. No. 906,005
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **3 Claims**



1. A light-emitting diode of the surface emitting type, comprising:

a substrate of a selected material that is anisotropic;

a blocking layer formed over the substrate and of opposite conductivity type to that of the substrate, the blocking layer having an opening formed in it, of rectangular cross section and with the sides of the rectangle oriented at forty-five degrees to the cleavage planes of the substrate;

a first cladding layer of the same conductivity type as the substrate, formed over the blocking layer and extending into the opening and into contact with the substrate;

an active layer formed over the first cladding layer;

a second cladding layer formed over the active layer and having an opposite conductivity type to that of the substrate;

a cap layer formed over the second cladding layer;

metal layers formed on the underside of the substrate and over the cap layer except for a selected area immediately over the opening in the blocking layer; and

an anti-reflection coating formed over the device immediately over the opening in the blocking layer;

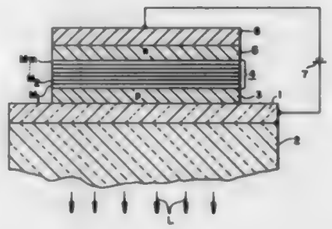
whereby the diode provides a light emission pattern that is rectangular, and the formation of the opening exposes no anisotropic crystal planes that could inhibit normal growth in subsequent fabrication steps.

4,694,312

NON-SINGLE-CRYSTAL SEMICONDUCTOR LIGHT EMITTING DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd.

Division of Ser. No. 645,773, Aug. 30, 1984, Pat. No. 4,616,244.
This application Mar. 24, 1986, Ser. No. 843,099
Claims priority, application Japan, Aug. 30, 1983, 58-160026
Int. Cl.⁴ H01L *33/00*
U.S. Cl. 357—17 **7 Claims**



1. A non-single-crystal semiconductor light emitting device comprising:

a substrate;

a first electrode formed on said substrate;

a first non-single-crystal semiconductor layer of a first conductivity type, formed on said first electrode and making ohmic contact therewith;

a non-single-crystal semiconductor intrinsic region formed in layers on said first non-single-crystal semiconductor layer;

a second non-single-crystal semiconductor layer of a second conductivity type reverse from the first conductivity type of the first non-single-crystal semiconductor layer formed on said non-single-crystal semiconductor intrinsic region; and

a second electrode formed on said second non-single-crystal semiconductor layer and making ohmic contact therewith;

wherein said non-single-crystal semiconductor intrinsic region is formed by a non-single-crystal semiconductor laminate member made up of a plurality m (where m 3) of third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m sequentially laminate in this order, and

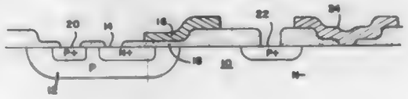
wherein the energy gaps Eg_1, Eg_2, . . . and Eg_m of said third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m bear such relationships as $Eg_1 > Eg_2 < Eg_3$, $Eg_3 > Eg_4 < Eg_5$, . . . $Eg_{(m-2)} > Eg_{(m-1)} < Eg_M$.

4,694,313

CONDUCTIVITY MODULATED SEMICONDUCTOR STRUCTURE

James D. Beason, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 19, 1985, Ser. No. 702,601
Int. Cl.⁴ H01L *29/48, 29/78, 27/02*
U.S. Cl. 357—23.4 **33 Claims**



1. An insulated gate field effect transistor comprising:

source and drain regions of a first conductivity type separated by a body region of a second conductivity type;

a gate over a portion of said body region between said source and drain regions and separated from said body by an insulation layer; and

a minority carrier diode and a majority carrier diode both formed with said drain region in series with a PN junction formed by said drain and body regions.

4,694,314

SEMICONDUCTOR DEVICE

Yasushi Tersda, and Takeshi Nakayama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,884
Claims priority, application Japan, Jan. 18, 1985, 60-7719
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.6 **6 Claims**



1. A semiconductor device forming a programming high-voltage pulse signal generator in an electrically erasable and programmable read-only memory device comprising data storage means including a plurality of memory transistors, each of said memory transistors comprising a semiconductor substrate, a control electrode, a floating gate for storing and emitting electric charge according to the voltage applied to said control electrode and a tunnel oxide film formed between said floating gate and said semiconductor substrate to serve as a path for electric charge, said high-voltage pulse signal generator comprising reference voltage generating means for generating a voltage signal serving as a reference of voltage for a high-voltage pulse generated by said high-voltage signal pulse generator, means for receiving the signal from said reference voltage generating means and providing a signal having a gentle rise to control the rise of said high-voltage pulse, and means for programming said data storage means using said high-voltage pulse signal generator, said means for receiving the signal including:

a switched-capacitor equivalent to a resistor including a first capacitor having a first grounded electrode and means for electrically switching a second electrode of said first capacitor between said reference voltage generating means and said programming means, and

a second capacitor formed of an oxide film having a thickness corresponding to the thickness of said tunnel oxide film, said capacitor connected in parallel to said programming means.

4,694,315

CMOS OVERVOLTAGE PROTECTION CIRCUIT UTILIZING THYRISTOR AND MAJORITY CARRIER INJECTING ANTI-PARALLEL DIODE

Per Svedberg, Vällingby, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

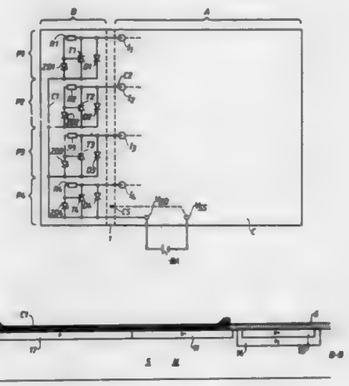
Filed Feb. 26, 1986, Ser. No. 832,786
Claims priority, application Sweden, Feb. 26, 1985, 8500924
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.13 **12 Claims**

1. A semiconductor device comprising:

a CMOS type semiconductor circuit having a substrate, a contact electrically connected to the substrate and at least two inputs;

an overvoltage protective circuit formed in the substrate, the overvoltage protective circuit providing for each input an antiparallel array of a thyristor and a diode, the array being connected between the respective input and the contact, each thyristor being turned on at a voltage level predetermined internally by the overvoltage protective circuit; each thyristor having in succession a first emitter layer, a first base layer, a second base layer and a second emitter layer, the substrate constituting one of the base layers; each diode having an anode contact and a cathode contact, one of the contacts electrically communicating with the substrate and injecting thereto charge carriers of the same type as the majority charge carriers in the substrate when current flows through the diode; the CMOS circuit and the overvoltage protective circuit being arranged adjacent to each other in the substrate; and

a zone formed in the substrate for separating the CMOS circuit and the overvoltage protective circuit, the zone having means for reducing the concentration of minority charge carriers in the substrate.



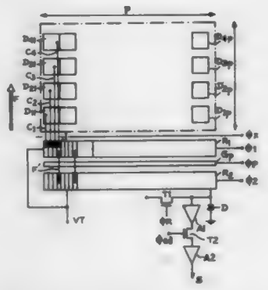


4,694,316

MULTILINEAR CHARGE TRANSFER ARRAY AND ANALYSIS PROCESS

Jean J. Chabbal, St. Egreve, France, assignor to Thomson-CSF, Paris

Filed May 7, 1985, Ser. No. 731,554
Claims priority, application France, May 18, 1984, 84 07761
Int. Cl.⁴ H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 **24 Claims**



1. An imaging system operable in a time delay integration mode comprising a multilinear array of photodetectors in N rows, each including a set of P photodetectors, means including a plurality of charge transfer shift register for in-phase summing of the N signals detected in the photodetector at the corresponding position in the row for each of the N rows,

means for transferring the signals detected to the shift registers, the plurality of shift registers including a first shift register having P separate sections one for each of the P positions in each row, each section including N stages coupled together in shift register relationships, each stage being supplied by way of the transferring means by a separate photodetector the N stages of each section being supplied by the N photodetectors of corresponding position of the array, wherein each section effects the time-delay integration of the N signals for each of the P positions of the array, and a second charge shift register of P stages coupled together in shift register relationship having P parallel inputs, one for each stage and a serial output, each separate input being supplied by a respective one of the Nth stages of the respective ones of the P sections of the first register, whereby at the serial output there results an output signal corresponding to the sum of signals collected on the photodetectors occupying the same position in the N rows.

4,694,317

SOLID STATE IMAGING DEVICE AND PROCESS FOR FABRICATING THE SAME

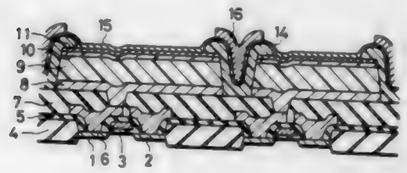
Akio Higashi; Haruji Shinada; Kazuhiro Kawajiri; Yoshihiro Ono; Mitsuo Saitou; Hiroshi Tamura, and Mitsuru Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1985, Ser. No. 790,015

Claims priority, application Japan, Oct. 22, 1984, 59-220547; Dec. 7, 1984, 59-257686

Int. Cl.[4] H01L *45/00, 27/14, 29/06, 23/48*

U.S. Cl. 357—30 **5 Claims**



1. In a solid-state imaging device that comprises stated order, a circuit for scanning a plurality of pixels, a light-sensitive film and a transparent electrode layer, said plurality of pixels being defined by a plurality of electrodes on said semiconductor substrate and said transparent electrode layer, the improvement wherein said light-sensitive layer is separated for individual pixels, a first transparent electrode layer covers, and is in substantial alignment with the light-sensitive layer corresponding to each pixel, an interlevel insulation film is disposed in grooves that isolate adjacent pixels and on the periphery of the light-sensitive layer separated for individual pixels, a second transparent electrode layer is disposed over said first transparent electrode layer and said interlevel insulation film, and a light-shielding metal layer is disposed in that area of said second transparent electrode layer which corresponds to the isolation between adjacent pixels. transparent electrode layer which corresponds to the isolation between adjacent pixels.

4,694,318

SAWTOOTH PHOTODETECTOR

Federico Capasso, Westfield, and Won-Tien Tsang, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

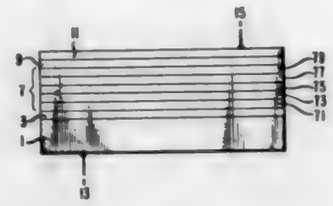
Filed Dec. 3, 1984, Ser. No. 678,226

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **11 Claims**

1. In a photodetector comprising first and second substrate-supported regions, said first and second regions having a first conductivity type,

a plurality of varying field regions between said first and second regions, said first and second regions having a



bandgap at least as great as the smallest bandgap in said varying field region, and

first and second electrical contacts to said first and second regions, respectively.

4,694,319

THYRISTOR HAVING A CONTROLLABLE GATE TRIGGER CURRENT

Teruo Kusaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,668

Claims priority, application Japan, May 19, 1983, 58-88001

Int. Cl.[4] H01L *29/74, 29/52, 29/78, 29/40*

U.S. Cl. 357—38 **9 Claims**



1. A thyristor comprising:

a semiconductor substrate of one conductivity type;

first and second regions of another conductivity type formed in said semiconductor substrate, said first and second regions being separated by an interval between 50 and 60 μm;

a third region of said one conductivity type formed in said second region;

a first conductive layer formed on but electrically isolated from a portion of said substrate positioned between said first and second regions, said first conductive layer being kept in an electrically floating condition;

a second conductive layer formed on but electrically isolated from said first conductive layer;

means for applying a voltage to said second conductive layer; and

a first electrode connected with said first region, a second electrode connected with said second region and a third electrode connected with said third region.

4,694,320

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING MULTIPLE-LAYERED CONNECTION

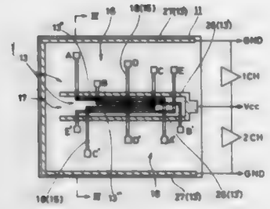
Tetsuro Asano, Gunma, Japan, assignor to Sanyo Electric Co., Japan

Continuation of Ser. No. 714,719, Mar. 21, 1985. This application Aug. 7, 1986, Ser. No. 894,381

Claims priority, application Japan, Mar. 29, 1984, 59-62494; Mar. 29, 1984, 59-62495; Mar. 29, 1984, 59-62496

Int. Cl.[4] H01L *27/02, 23/48, 29/44, 29/52*

U.S. Cl. 357—40 **14 Claims**



1. A semiconductor integrated circuit having a multiple-layered connection, comprising:

a semiconductor substrate having a main surface divided into first and second regions, said first region including first and second portions, said second region both including first and second sides and being rectangularly shaped;

said first portion being formed outside of and adjacent to said first side;

said second portion being formed outside of and adjacent to said second side,

integrated circuit elements formed in said first and second portions of said first region,

a first insulating layer covering said main surface of said semiconductor substrate,

a first electrode layer formed on said first insulating layer and including connection runs,

a first portion of said connection runs of said first electrode layer extending in said first and second portions of said first region, at least a part of said first portion of said connection runs of said first electrode layer being connected through said first insulating layer to said integrated circuit elements,

a second portion of said connection runs of said first electrode layer extending in said second region, said second portion of said connection runs being of the number necessary for cross connections being formed concentratedly in said second region,

a third portion of said connection runs of said first electrode layer constituting a voltage supply line and extending between said first region and said second region, such that said second portion of said connection runs in said second region is surrounded by said voltage supply line, while said voltage supply line extends to face said first and second portions of said first region of said main surface of said semiconductor substrate for connection to said integrated circuit elements, said voltage supply line being disposed in a U-shaped configuration including two parallel line elements, the distance between the said two line elements being selected such that any necessary ones of said connection runs may be formed in the whole of said second region, said line elements being electrically connected together at like first ends via a bridging element, at least one bonding pad being electrically connected to said bridging element, and said line elements being electrically isolated between like second ends;

a second insulating layer covering said first insulating layer and said first electrode layer, and

a second electrode layer formed on said second insulating layer and including connection runs extending between said first and second regions across and above said voltage supply line, at least a portion of said connection runs of said second electrode layer in said first regions being connected through said second insulating layer to said connection runs of said first portion of said first electrode layer in said first and second portions of said first region of said main surface of said semiconductor substrate and being connected through said second insulating layer to said connection runs of said second portion of said first electrode layer in said second region of said main surface of said semiconductor substrate;

whereby said integrated circuit elements connected through said first portion of said connection runs of said first electrode layer to said connection runs of said second electrode layer in said first and second portions of said first region are connected to each other across and above said voltage supply line and via either said second portion of said connection runs or said first electrode layer.

4,694,321

SEMICONDUCTOR DEVICE HAVING BIPOLAR TRANSISTOR AND INTEGRATED INJECTION LOGIC

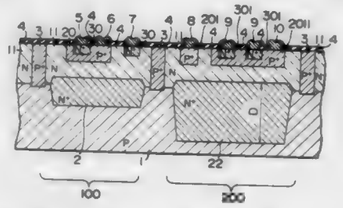
Katsuyoshi Washio; Makoto Hayashi, both of Hachioji; Tomoyuki Watanabe, Tokyo; Takahiro Okabe, and Katuhiro Norisuye, both of Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 755,912

Claims priority, application Japan, Jul. 18, 1984, 59-147535

Int. Cl.[4] H01L *27/04;* **H03K** *19/091*

U.S. Cl. 357—48 **7 Claims**



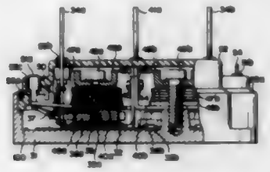
1. A semiconductor integrated circuit device incorporating an integrated injection logic (IIL) and an integrated circuit including a bipolar transistor, comprising a semiconductor substrate of a first conductivity type; a semiconductor layer of a second conductivity type formed over said substrate and defining an IIL region and a bipolar transistor region; a plurality of buried layers of the second conductivity type more heavily doped than said semiconductor layer embedded between said substrate and said semiconductor layer, wherein the top surface of a buried layer for said IIL region has substantially the same level as the top surface of a buried layer for said bipolar transistor region, the top surface of each buried layer being defined as the location where the concentration of doping of second conductivity type has decreased to substantially the concentration of said layer; and said buried layer for the IIL region having a thickness larger than that of said buried layer for the bipolar transistor region to such an extent that carriers of the first conductivity type do not reach said substrate.

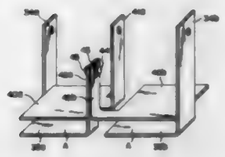
4,694,322

PRESS-PACKED SEMICONDUCTOR DEVICE

Hiroshi Sakurai, Kawasaki, and Masami Iwasaki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 13, 1984, Ser. No. 650,107
Claims priority, application Japan, Sep. 29, 1983, 58-181284; Sep. 29, 1983, 58-181286
Int. Cl.⁴ H01L *23/02, 23/44, 25/04, 21/447*
U.S. Cl. 357—74 **15 Claims**





1. A press-packed semiconductor device, comprising:

a. a heat-discharging support member having a mounting surface;

b. a lid disposed on said support member and defining a cavity therebetween;

c. a press-packed semiconductor element disposed in said cavity and having first and second sides, a first electrode contact positioned on said first side, and second and third electrode contacts positioned on said second side, said semiconductor element being spaced-apart from said mounting surface of said support member with one of said sides facing said mounting surface;

d. a first electrode plate including a first pressing portion disposed in said cavity and contacting said first side of said semiconductor element to form an electrical connection with said first electrode contact of said semiconductor element, said first electrode plate further including a lead portion extending from said first pressing portion through said lid and having an end positioned outside said cavity;

e. a second electrode plate including a second pressing portion disposed in said cavity and spaced apart from said second side of said semiconductor element, said second electrode plate further including a lead portion extending from said second pressing portion through said lid and having an end positioned outside said cavity;

f. a conducting plate disposed between said second side of said semiconductor element and said second pressing portion of said second electrode plate to form an electrical connection between said second electrode contact of said semiconductor element and said second electrode plate, said conducting plate including a through hole positioned at said third electrical contact of said semiconductor element;

g. a lead wire extending through said through hole of said conducting plate and having an end portion contacting said third electrical contact of said semiconductor element to form an electrical connection between said lead wire and said third electrode contact;

h. first pressing means for elastically pressing together said pressing portions of said first and second electrode plates to maintain said electrical connections between said first electrode contact of said semiconductor element and said first electrode plate and between said second electrode contact of said semiconductor element and said second electrode plate; and

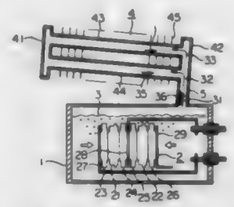
i. second pressing means for elastically pressing said end portion of said lead wire toward said third electrode contact of said semiconductor element to maintain said electrical connection between said lead wire and said third electrode contact.

4,694,323

APPARATUS FOR VAPOR-COOLING A SEMICONDUCTOR

Hiroshi Itahana, and Yoshinori Usui, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,834
Claims priority, application Japan, Apr. 10, 1985, 60-74283
Int. Cl.⁴ H01L *25/04*
U.S. Cl. 357—82 **9 Claims**



1. An apparatus for vapor-cooling a semiconductor, comprising a semiconductor stack including an approximately flat board-like semiconductor element, a cooling member and a wiring conductor, a cooling vessel for containing said stack together within a liquid refrigerant to define upper and lower refrigerant regions above and below, respectively, the semiconductor stack to permit cooling of said semiconductor element resulting from the boiling of said liquid refrigerant, wherein said cooling member has a surface facing said wiring conductor and is provided with small apertures opened on the surface thereof facing the wiring conductor, and said conductor is provided with passages for the liquid refrigerant between the upper and the lower refrigerant regions, said passages having a greater width than said small apertures and being vertically disposed in relation to a horizontal defined by an axial disposition of the semiconductor element, the cooling member and the wiring conductor.

4,694,324

MEASUREMENT OF SC/H PHASE USING A POLAR DISPLAY

Earl G. Matney, Newberg, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

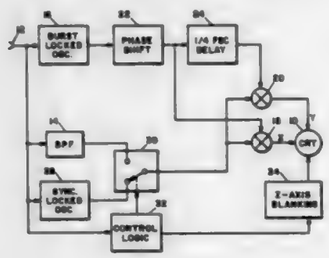
Filed Apr. 23, 1984, Ser. No. 602,859
Int. Cl.⁴ H04N *17/02*
U.S. Cl. 358—10 **3 Claims**

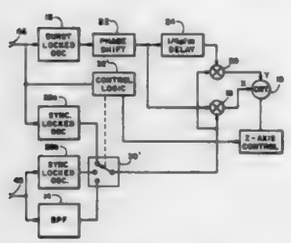
1. A circuit for use with a vectorscope to indicate SC/H phase of a composite video signal, comprising oscillator means for generating a continuous wave signal at subcarrier frequency and having its phase locked to the horizontal sync point of the video signal, and switch means for connection between the output terminal of the filter of the vectorscope and the second inputs of the demodulators of the vectorscope and for connection also to the oscillator means, for alternately connecting the subcarrier burst from the filter of the vectorscope and the sync locked continuous wave from the oscillator means to the demodulators, so that when the subcarrier burst is connected to the demodulators the vectorscope provides an indication at a predetermined angle of the polar display of the vectorscope, whereas when the sync locked continuous wave signal is connected to the demodulators the vectorscope provides an indication at a position of the polar display that is angularly spaced from a predetermined axis of the polar display by an angle that depends on the difference in phase, within the subcarrier sycle, between the sync locked continuous wave signal and the subcarrier burst.

3. An instrument for use in indicating SC/H phase of first and second video signals, comprising

first and second input terminals for receiving the first and second video signals respectively;

a display device for providing a polar display, said display device having a display surface, means for generating a visible dot on the display surface, X and Y deflection means for deflecting the position of the visible dot in mutually perpendicular rectilinear directions, a subcarrier regenerator connected to the first input terminal for generating a continuous wave signal at subcarrier frequency from, and phase-locked to, the subcarrier burst of the first video signal, first and second demodulators having their outputs connected to the X and Y deflection means respectively and each having first and second inputs, means connecting the output of the subcarrier regenerator to the first inputs of the first and second demodulators with a quarter-period relative phase difference, and a filter which is connected to the second input terminal for passing the subcarrier burst of the second video signal;





first means connected to the first input terminal for generating a first continuous wave signal at subcarrier frequency and having its phase locked to the sync point of the first video signal;

second means connected to the second input terminal for generating a second continuous wave signal at subcarrier frequency and having its phase locked to the sync point of the second video signal; and

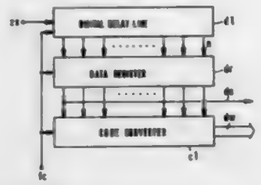
a switch for successively connecting the first and second sync locked continuous waves and the subcarrier burst of the second video signal to said second inputs of the demodulators, so that when the subcarrier burst is connected to the second inputs of the demodulators the display device displays an indication at a predetermined angular position of the polar display, whereas when one of the sync locked continuous waves is connected to the second inputs of the demodulators the display device displays an indication at a position of the angular display that is angularly spaced from a predetermined axis of the polar display by an angle that depends on the phase difference, in the subcarrier cycle, between the reference subcarrier wave and said one sync locked continuous wave.

4,694,325

INTERFACE CIRCUIT CONTAINED IN A COLOR-TELEVISION RECEIVER AND SERVING TO CONNECT A HOME COMPUTER

Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,660
Claims priority, application European Pat. Off., Nov. 16, 1984, 84113893.6
Int. Cl.⁴ H04N *11/22*
U.S. Cl. 358—11 **4 Claims**



1. An interface circuit in a color television receiver which reproduces a video signal containing interlaced fields after analog-to-digital conversion by means of a sampling signal, after digital signal processing in a digital circuit system controlled by said sampling signal which is used as a clock signal, and after digital-to-analog conversion at twice the horizontal frequency, said interface circuit providing the coupling between said receiver and a home computer which provides at least onebit digital color character signals each having a minimum pulse duration approximately equal to but different than the period of said clock signal, said interface circuit comprising:

a first input circuit, a first line memory and a first output circuit for character signals of a first color;

a second input circuit, a second line memory and a second output circuit for character signals of a second color;

a third input circuit, a third line memory and a third output circuit for character signals of a third color;

each of said first, second and third input circuits comprising:

a first digital delay line including a plurality of cascaded delay stages each having a delay equal to the period of said clock signal, said delay line receiving the character signals of the respective color at its input;

a data register having a plurality of cells, each cell having a data input coupled to the output of a corresponding one of said delay stages, said data register having a dynamic write-enable input to which said clock signal is applied, the output of a first one of said plurality of cells providing a data signal output; and

a code converter having a plurality of inputs connected to the outputs of said data register, said code converter being clocked by said clock signal and providing a nonredundantly coded output data word;

said first, second and third line memories each receiving and storing at the frequency of said clock signal the data signal output and the output data word of the respective one of said first, second and third inputs circuits, the data signal outputs and the output data words stored in said first, second and third line memories being read at twice the frequency of said clock signal;

each of said first, second and third output circuits comprising:

a second digital delay line comprising a plurality of like cascaded second delay stages each having a delay equal to one half the period of said clock signal, said second digital delay line receiving at its input the data signal output read from the respective line memory; and

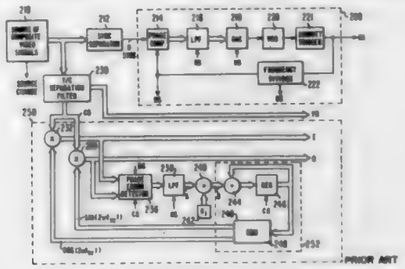
selection means responsive to the output data word read from the respective line memory for electively coupling the output of one of said plurality of second delay stages to an output terminal.

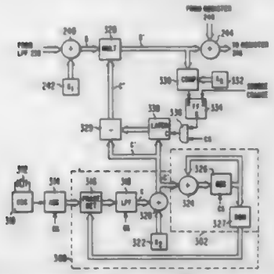
4,694,326

DIGITAL PHASE LOCKED LOOP STABILIZATION CIRCUITRY INCLUDING A SECONDARY DIGITAL PHASE LOCKED LOOP WHICH MAY BE LOCKED AT AN INDETERMINATE FREQUENCY

Walter H. Demmer, Plainsboro Township, Middlesex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,698
Int. Cl.[4] H04N 9/45
U.S. Cl. 358—19 **13 Claims**





1. In circuitry including a source of clock signal, the instantaneous frequency of which varies about a nominal clock frequency, and a first digital oscillator responsive to said clock signal and to a first frequency control signal for developing an output signal having a predetermined frequency wherein the variations in the frequency of said clock signal tend to cause corresponding variations in the frequency of said output signal, circuitry for substantially removing the variations in the frequency of said output signal comprising:

means for developing a further reference signal having a substantially invariant frequency;

a phase locked loop including:

a second digital oscillator responsive to said clock signal and to a second frequency control signal for providing an oscillatory signal having substantially the same frequency as said reference signal wherein the variations in the frequency of said clock signal tend to cause corresponding variations in the frequency of said oscillatory signal; and

means coupled to said source of reference signal for developing said second frequency control signal being proportional to the difference in phase between said reference signal and said oscillatory signal and tending to compensate said phase locked loop for the variations in the frequency of said oscillatory signal that are related to said clock signal;

means responsive to said second frequency control signal for developing a standard frequency control value representing the value of said second frequency control signal when the frequency of said clock signal is substantially equal to said nominal clock frequency;

means for combining said standard frequency control value and said second frequency control signal to generate a correction signal representing the variations in the frequency of said clock signal with respect to said nominal clock frequency and being substantially independent of said further reference signal; and

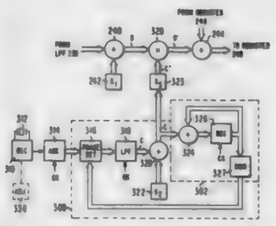
means coupled to said correction signal developing means for modifying said first frequency control signal by said correction signal to substantially remove frequency instabilites in said output signal corresponding to frequency instabilites in said clock signal.

4,694,327

DIGITAL PHASE LOCKED LOOP STABILIZATION CIRCUITRY USING A SECONDARY DIGITAL PHASE LOCKED LOOP

Walter H. Demmer, Plainsboro Township, Middlesex County; Leopold A. Harwood, Bridgewater; Chandrakant B. Patel, Hopewell, and Alvin R. Balsbaa, Lebanon, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,850
Int. Cl.[4] H04N 9/45
U.S. Cl. 358—19 **9 Claims**



1. Apparatus comprising:

a terminal for applying a clock signal which exhibits frequency instabilities;

a source of first reference signal having a predetermined frequency;

a digital oscillator responsive to said clock signal and to a first frequency control signal for developing an output signal having substantially the same frequency as said first reference signal, wherein the frequency instabilities in said clock signal tend to induce corresponding frequency instabilities in said output signal;

a source of second reference signal having a frequency substantially equal to a further predetermined frequency;

a digital phase locked loop, responsive to said clock signal for developing an oscillatory signal having substantially the same frequency as said second reference signal, including circuitry for developing a second frequency control signal which substantially compensates said phase locked loop for frequency instabilities in said oscillatory signal related to frequency instabilities in said clock signal; and

means, coupled to said digital phase locked loop for generating a stabilizing control signal proportional to said second frequency control signal;

means coupled to said digital oscillator for multiplying the first frequency control signal by the stabilizing control signal to develop a modified first frequency control signal for application to said digital oscillator to substantially stabilize the frequency of said output signal.

4,694,328

RECOMBINATION OF LOW- AND HIGH-RESOLUTION SEGMENTS OF AN EXTENDED ASPECT RATIO PICTURE

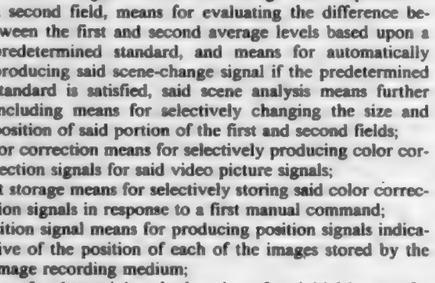
Joseph L. LoCicero, Riverside; Melih Pazarci, Chicago, and Theodore S. Rzeszewski, Lombard, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1984, Ser. No. 684,488
Int. Cl.[4] H04N 9/64, 7/08, 11/20, 5/208
U.S. Cl. 358—21 V **14 Claims**

4. A system for compensating a received video signal having edge and center portions and a vertical retrace interval and a received test pattern signal transmitted during said vertical retrace interval of the received video signal, said system comprises:

means responsive to the reception of said test pattern signal for calculating compensation parameters;

means responsive to the calculated compensation parameters for storing said compensation parameters; and



means responsive to said edge and center portions of said received video signal for correcting the transition between said edge and center portions by utilizing the stored compensation parameters.

4,694,329

COLOR CORRECTION SYSTEM AND METHOD WITH SCENE-CHANGE DETECTION

Armand Belmares-Sarabia, Deer Park, N.Y., and Stanley J. Chayka, Parsippany, N.J., assignors to Corporate Communications Consultants, Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 598,468, Apr. 9, 1984. This application Apr. 12, 1985, Ser. No. 722,801
Int. Cl.[4] H04N 9/64, 9/11
U.S. Cl. 358—22 **8 Claims**

1. A color correction system for color correcting video picture signals representative of images stored by an image recording medium, comprising:

means for moving the image recording medium and producing video picture signals representative of each of the images stored by the image recording medium;

display means responsive to said video picture signals for displaying pictures corresponding to each of the images stored by the image recording medium;

scene analysis means for analyzing at least one of the video picture signals in each of a plurality of pictures to detect a scene change, said scene analysis means automatically producing a scene-change signal in response to a scene change, said scene analysis means including means for determining a first average level of a video signal corresponding to a color component of the video picture signals in a portion of a first field, means for determining a second average level of said video signal in said portion of a second field, means for evaluating the difference between the first and second average levels based upon a predetermined standard, and means for automatically producing said scene-change signal if the predetermined standard is satisfied, said scene analysis means further including means for selectively changing the size and position of said portion of the first and second fields;

color correction means for selectively producing color correction signals for said video picture signals;

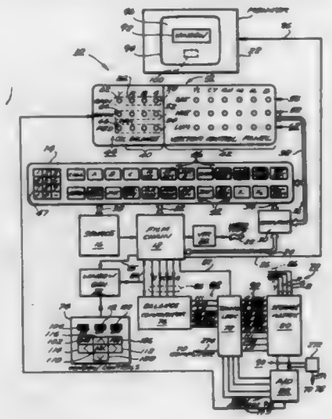
first storage means for selectively storing said color correction signals in response to a first manual command;

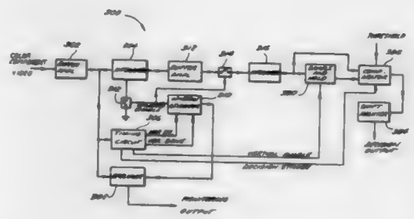
position signal means for producing position signals indicative of the position of each of the images stored by the image recording medium;

means for determining the location of an initial image of a new scene from the scene-change signal and from the position signals, said location determining means producing a location signal representative of the location of the initial image of the new scene;

second storage means for selectively storing said signal representative of the location of the initial image of the new scene in response to a second manual command;

readout means for reading from said first and second storage





means said color correction signals and said location signals, respectively; and

combining means for selectively combining color correction signals read from said first storage means with said video picture signals, said combining means being responsive to the location signals read from said second storage means and to the position signals from said position signal means.

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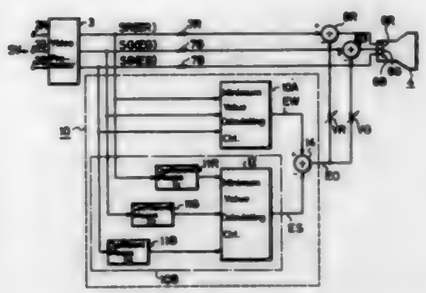
COLOR CORRECTION CIRCUIT

Yutaka Tanaka, Kanagawa, and Shunji Umemura, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,802
Claims priority, application Japan, Aug. 21, 1984, 59-173599; Aug. 28, 1984, 59-178835
Int. Cl.[4] H04N 9/68
U.S. Cl. 358—27 **8 Claims**

1. A color correction circuit comprising: three video signal lines for supplying red, green and blue signals, respectively; first means for generating a white color component from means for said red, green and blue signals which are supplied thereto by said three video signal lines; second means for generating a predetermined color component from at least two signals of said red, green and blue signals which are supplied thereto by at least two of said three video signal lines; means for producing a difference signal which is the difference be-

tween the output signals of said first and second detecting means; and means for controlling at least one of said red, green



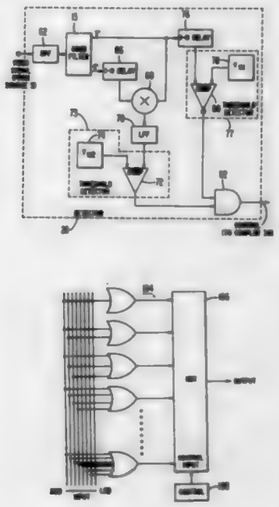
and blue signals according to said difference signal receiving the output of said means producing a difference signal.

4,694,331

VERTICAL TRANSITION PROCESSOR FOR A COMB FILTER

Kirk A. Law, East Windsor, and Leopold A. Harwood, Bridgewater, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 1, 1985, Ser. No. 782,576
Int. Cl.⁴ H04N *9/64*
U.S. Cl. 358—31 **17 Claims**



1. In a video signal processing system, including a source of composite video signals including a subcarrier on which color-representative information is modulated in such a manner that the phase of the subcarrier represents the hue and the amplitude of the subcarrier represents the staturation, a comb filter responsive to said source for producing comb filtered luminance and chrominance signals, a luminance processing channel, and a chrominance processing channel; a vertical transition processor, comprising:

means, coupled to said source, for detecting when the subcarrier on adjacent lines has the same phase and the same amplitude, indicating a complementary-color vertical transition; and

means, responsive to said detecting means, for coupling said comb filtered luminance signal to said luminance processing channel including means for altering the frequency content of said comb filtered luminance signal in the presence of a complementary-color vertical transition.

17. In a video signal processing system, an adaptive threshold detector for a multibit digital signal, comprising:

a plurality of OR gates having respective first input terminals responsive to a mutually differeat bit of said multibit digital signal, each OR gate having further input terminals responsive to a plurality of bits each more significant than that to which its first input terminal is responsive; and

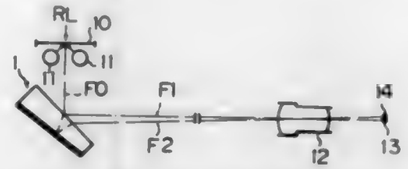
a multiplexer having a plurality of signal inputs coupled to respective OR gates, a control input and a signal output, for coupling one of said signal inputs to said signal output responsive to the signal at said control input.

4,694,332

COLOR IMAGE READER

Satoru Uchida, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 7, 1986, Ser. No. 827,267
Claims priority, application Japan, Feb. 15, 1985, 60-26372
Int. Cl.⁴ H04N *1/46*
U.S. Cl. 358—75 **5 Claims**



5. A color-separating mirror having a transparent elongate member which decomposes image light consisting of a plurality of color components, compriaing two major surfaces which intersect each other at a predetermined angle, a multi-layer interference filter provided on one of said major surfaces for reflecting a predetermined color component and transmitting the other color components, wherein said filter is produced by alternately depositing by evaporation a non-absorbing material having a high refractive index and a non-absorbing material having a low refractive index, while selecting a predetermined thickness for each of layers and a total number of the layers, and a reflection surface provided on the other major surface for reflecting said other color components, image light representive of color images of a document being incident to said filter at a predetermined angle so that first reflected image light containing only said predetermined color component is reflected by the filter and second reflected image light containing the other color component is reflected by the reflection surface.

4,694,333

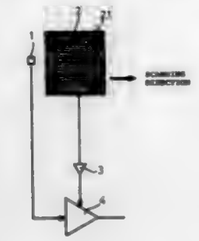
PHOTOELECTRIC RECEIVER WITH LOCAL BRIGHTNESS ADAPTATION

Roderich Rüger, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1985, Ser. No. 777,840
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435064
Int. Cl.⁴ H01J *31/49*
U.S. Cl. 358—113 **6 Claims**

1. A photoelectric receiver for camera picture pickup equipment, particularly for thermal-image equipment having local brightness adaptation, comprising at least first detector means

for providing point-by-point scanning of the picture generated by one optical receiving system, and at least one second detector means associated with said first detector means having a larger radiation-sensitive area for picking up at least part of the surroundings of a picture point picked up by the first detector



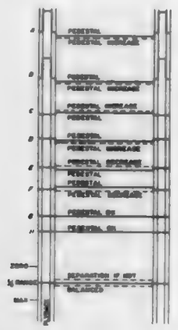
means, said second detector means being arranged adjacent said first detector means, and further comprising amplifier means coupled to an output of said first detector means for providing gain to an output signal from the first detector means, an output signal of said second detector means controlling the gain of said amplifier means.

4,694,334

PYROELECTRIC CAMERA SIGNAL PROCESSING HAVING PEDESTAL SIGNAL LEVEL COMPENSATION

Hans R. Bucher, Boulder, and Donald E. Hodd, Niwot, both of Colo., assignors to Xedar Corporation, Boulder, Colo.

Filed Dec. 24, 1985, Ser. No. 813,011
Int. Cl.⁴ H04N *5/33*
U.S. Cl. 358—113 **18 Claims**



1. A signal processing system for a pyroelectric camera having a pyroelectric videcon tube, said system comprising:

input means for receiving the output signal from said pyroelectric videcon tube, which output signal includes a pedestal component; and

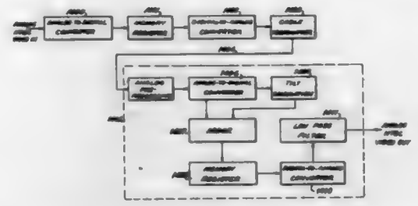
processing means including signal path establishing means having amplifying means connected with said input means to receive said output signal therefrom and analog-to-digital converter means connected with said amplifying means, said signal processing means also including DC restorer means connected with said amplifying means and feedback means the input of which is connected with said analog-to-digital converter means to receive digital outputs therefrom and the output of which is connected with said DC restorer means to thereby automatically compensate for variations in the level of said pedestal components.

4,694,335

VIDEO SCRAMBLING SYSTEM WITH LINE TILT CORRECTION

Gregory A. Baxes, Denver, Colo., assignor to American Television & Communications Corporation, Englewood, Colo.

Filed Apr. 10, 1985, Ser. No. 721,585
Int. Cl.⁴ H04N *7/167, 7/16*; H04K *1/00*
U.S. Cl. 380—14 **34 Claims**



1. A method for correcting line tilt in a video signal, said method comprising the steps of:

adding first and second amplitude reference levels of predetermined amplitudes to time-spaced portions of said video signal;

transmitting said video signal;

receiving said video signal;

sampling said first and second amplitude reference levels in said received signal;

calculating the rate of line tilt based on the difference between the sampled amplitudes of said first and second amplitude reference levels; and

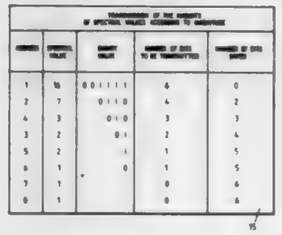
correcting said received signal by deriving from said rate of line tilt a continuous time-varying correction signal and adding said correction signal to said received signal.

4,694,336

DIGITAL DATA TRANSMISSION METHOD

Heinz-Werner Keesen, Hanover; Günter Oberjatzas, Barsinghausen, and Hartmut Peters, Hanover, all of Fed. Rep. of Germany, assignors to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,531
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513074
Int. Cl.⁴ H04N *7/133*
U.S. Cl. 358—133 **20 Claims**



1. In a method of transmitting digital data, particularly for digital video signals, including converting an analog signal to a digital signal, processing the digital signal as groups of values in a source coder, feeding the encoded groups of values to a channel coder and then to a transmission channel, and finally feeding the groups of values from the transmission channel through a channel decoder to a source decoder, the improvement comprising: in the source coder, assigning an address to each value of a group, sorting the values of a group according to magnitude, and transmitting said addresses and said values

sorted according to magnitude, with the word length of said sorted spectral values decreasing with decreasing magnitude.

4,694,337

VIDEO LINE RATE CONVERTER

David J. Lyons, Trenton, N.J., assignor to Princeton Electronics Products, Inc., North Brunswick, N.J.

Filed Jan. 23, 1986, Ser. No. 821,850
Int. Cl.[4] H04N 7/01
U.S. Cl. 358—140 **31 Claims**

$$Fq(1) = 3/5\left[Fp(1) + 2/3\ Fp(2)\right]$$
$$Fq(2) = 3/5\left[1/3\ Fp(2) + Fp(3) + 1/3\ Fp(4)\right]$$
$$Fq(3) = 3/5\left[2/3\ Fp(4) + Fp(5)\right]$$
$$Fq(4) = 3/5\left[Fp(6) + 2/3\ Fp(7)\right]$$
$$Fq(5) = 3/5\left[1/3\ Fp(7) + Fp(8) + 1/3\ Fp(9)\right]$$
$$Fq(6) = 3/5\left[2/3\ Fp(9) + Fp(10)\right]$$

1. A method for converting an input video signal comprising a plurality of input frames, each said input frame including an odd field and an even field, each input frame having P input lines, P being an integer much greater than one, into an input video signal comprising a plurality of output frames, each said output frame including an odd field and an even field, each output frame having Q output lines, Q being an integer much greater than one but different than P, said method comprising the steps of:

receiving said input video signal; and

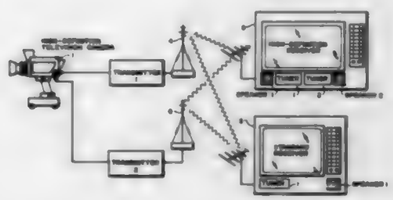
generating said output video signal utilizing substantially all of the video information contained in said video input signal, said generating step generating each said output field as a function of an associated set of first and second input fields, and initiating the generation of each said output field after all of said first, but before all of said second, input field of said associated set of input fields has been received.

4,694,338

HIGH-DEFINITION TELEVISION TRANSMISSION SYSTEM

Mikhail Tsinberg, Riverdale, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 25, 1986, Ser. No. 856,622
Int. Cl.[4] H04N 7/01, 7/04
U.S. Cl. 358—141 **14 Claims**



4. A television transmission and reception system comprising a television transmitter and receiver, said transmitter transmitting a high-definition television signal containing picture information which, on display, forms first picture frames at a rate of 2n frames per second, where n is a standard number of picture frames per second formed by the picture information in a standard television signal, and having a width which is wider than that of a standard aspect ratio picture frame, said high-definition television signal having a bandwidth greater than that of a standard television signal, each of said first picture frames including a single field having m sequentially scanned scanning lines, where m is a standard number of scanning lines in each picture frame formed by the picture information in said standard television signal in which said scanning lines of said standard television signal are arranged in two interlaced fields; characterized in that said television transmitter comprises:

first means for converting said high-definition television signal into a first transmission signal compatible with standard television receivers and containing first picture information derived from the picture information in said high-definition television signal forming substantially a first half of the scanning lines in said first picture frames, said first picture information forming, on display, second picture frames each of which having m interlaced scanning lines in two fields and corresponding to a selected portion of said first picture frames having a standard aspect ration;

second means for converting said high-definition television signal into a second transmission signal containing second picture information derived from the picture information in said high-definition television signal forming substantially a second half of the scanning lines in said first picture frames and forming a portion of said first picture frames not included in said selected portion in said second picture frames, said second picture information forming, on display, third picture frames each of which having m scanning lines in two fields, whereby said first and second picture information collectively include substantially all of the picture information in said high-definition television signal;

means for modulating said first and said second transmission signals onto a first and second carrier, respectively; and

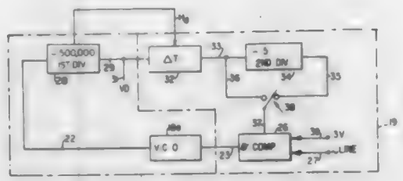
means for simultaneously transmitting said first and said second modulated carriers.

4,694,339

POWER LINE LOCKED IMAGE PROCESSING SYSTEMS

Paul Fenster, Petach Tikvah, and Zeev Ganor, Herzelia, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed May 29, 1984, Ser. No. 614,805
Int. Cl.[4] H04N 5/04; H03L 7/00
U.S. Cl. 358—148 **14 Claims**



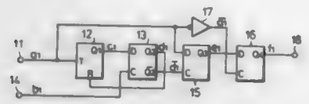
1. An imaging system for processing acquired data to convert said acquired data to images on video display devices, said system obtaining power from a power line, said system comprising: system oscillator means for providing frequency signals, locking means for locking the frequency of the system oscillator means to the frequency of the power line, and said locking means including means for enabling said locking even when the system oscillator means frequency is other than an integer multiple of the power line frequency.

4,694,340

VERTICAL SYNCHRONIZING SIGNAL SEPARATING CIRCUIT

Hidenori Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 19, 1986, Ser. No. 864,783
Claims priority, application Japan, May 20, 1985, 60-74494[U]
Int. Cl.[4] H04N 5/10
U.S. Cl. 358—154 **12 Claims**



1. A vertical synchronizing signal separating circuit comprising:

a first input terminal supplied with a composite synchronizing signal;

a second input terminal supplied with clock pulses having a predetermined repetition frequency;

a series circuit comprising a pair of flip-flops coupled in series and supplied with the composite synchronizing signal and the clock pulses for generating a first pulse signal in phase synchronism with leading edges of the composite synchronizing signal, said first pulse signal having a pulse width corresponding to one period of the clock pulses;

a first latch circuit supplied with the composite synchronizing signal and the first pulse signal for latching the composite synchronizing signal by trailing edges of the first pulse signal so as to produce a second pulse signal having a predetermined level when the composite synchronizing signal has a pulse width greater than that of a horizontal synchronizing signal thereof; and

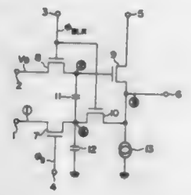
a second latch circuit supplied with the composite synchronizing signal and the second pulse signal for latching the second pulse signal by trailing edges of the composite synchronizing signal and for producing an output pulse signal thereof as a vertical synchronizing signal separated from the composite synchronizing signal.

4,694,341

SAMPLE-AND-HOLD CIRCUIT

Mitsuo Soneda, and Yoshikazu Hazama, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,019
Claims priority, application Japan, Feb. 4, 1985, 60-14467[U]; Feb. 9, 1985, 60-17310[U]
Int. Cl.[4] H04N 5/44; G11C 27/02
U.S. Cl. 358—160 **4 Claims**



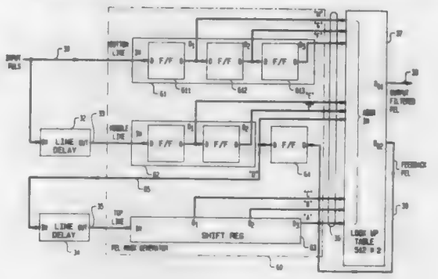
1. A buffer circuit for translating a periodic input signal comprising; an input terminal supplied with the input signal, first gate means connected to said input terminal and being turned on during a first portion of a period of the input signal, first capacitive means connected to said first gate means; second capacitive means connected to the connection point of said first capacitive means and said first gate means, a source (emitter) follower transistor having a gate (base) connected to said second capacitive means, a source (emitter) and a drain (collector), second gate means connected between the source (emitter) of said source (emitter) follower transistor and said connection point of said first gate means and said first capacitive means, said second gate means being turned on during a second portion of a period of the input signal, third gate means connected to the gate (base) of said source (emitter) follower transistor and being turned on during the second portion of a period of the input signal whereby a the gate-source (base-emitter) offset voltage of said source (emitter) follower transistor is stored across said second capacitive means during the second portion of a period of the input signal, an output terminal led out from the source (emitter) of said source (emitter) follower transistor, said first portion is a trace duration of a horizontal scanning period of the video signal and said second portion is a blanking duration of a horizontal scanning period of the video signal, and wherein said third gate means is connected between the gate (base) of said source (emitter) follower transistor and a voltage source with an average voltage level of said video signal.

4,694,342

SPATIAL FILTER USEFUL FOR REMOVING NOISE FROM VIDEO IMAGES AND FOR PRESERVING DETAIL THEREIN

Kevin J. Klees, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1986, Ser. No. 858,337
Int. Cl.[4] H04N 5/21, 1/40
U.S. Cl. 358—167 **14 Claims**



1. Apparatus for a spatial filter which provides an output filtered pel value for a corresponding input pel in an incoming video image, said apparatus comprising:

means, responsive to pel values that form the incoming image, for producing a pel mask associated with said input pel, said pel mask defining an array of pels including said input pel wherein each of said pels in said mask has a corresponding pel value;

means, responsive to the values of said pels that form said pel mask, for determining whether said input pel is a noise pel or an image pel and, in response thereto, for producing one of a pre-defined plurality of filtered pel values and a corresponding one of a pre-defined plurality of feedback pel values;

means for applying said produced filtered pel value as said output filtered pel value;

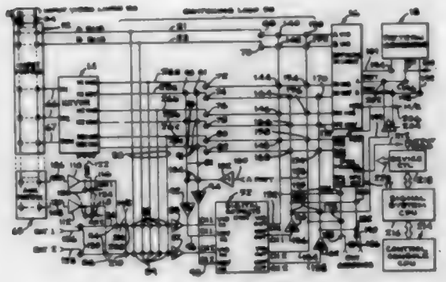
means for applying said produced feedback pel value from said determining means to said pel mask producing means such that said produced feedback pel value becomes one of the pel values for the pels that form the pel mask for a subsequently occurring input pel and wherein the value of said produced feedback pel determines whether said filter operates recursively or non-recursively.

4,694,343

DIGITAL EFFECTS DEVICE INTEGRALLY COMBINED WITHIN A VIDEO SWITCHER

Jay L. Flora, Boulder, Colo., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 28, 1986, Ser. No. 845,901
Int. Cl.⁴ H04N *5/265*
U.S. Cl. 358—183 **12 Claims**



1. A system for generating digital effects via a video switcher having selectable signal sources, a keyer, a first mixer for supplying a mix effects signal, and a pattern generator for supplying a pattern signal to the first mixer, comprising:

a second mixer coupled electrically downstream of the first mixer;

digital effects generating means having digital effects video and key inputs and outputs and disposed to digitally manipulate video and key signals in accordance with the digital effect being generated; and

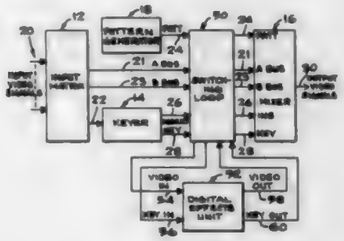
switching means selectively coupled between the signal sources and the keyer and mixers, for re-routing a selected signal from the first mixer or the signal sources to the digital effects video input, and for supplying the digitally manipulated video and key signals to the second mixer via the digital effects video and key outputs of the digital effects generating means.

4,694,344

DIGITAL EFFECTS LOOP FOR VIDEO SWITCHERS

Jay L. Flora, Boulder, Colo., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 28, 1986, Ser. No. 845,902
Int. Cl.⁴ H04N *5/265*
U.S. Cl. 358—183 **27 Claims**



1. A system for generating digital effects via a video switcher having a video source for supplying video source signals, a keyer coupled to the video source for supplying insert video and key signals, a pattern generator for supplying a pattern signal, and a mixer for providing an output video signal and having inputs coupled to the video source, the keyer and the pattern generator, comprising:

digital effects generating means operatively inserted between the video source and said mixer, and between the keyer and the mixer, for receiving a selected signal of the signals supplied within the switcher by the video source and the keyer and for supplying a selected manipulated digital effects output output signal; and

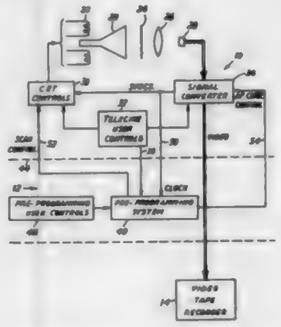
control means integral with the switcher and coupled to the digital effects generating means for selectively re-routing the selected signal to the digital effects generating means and then re-routing the selected manipulated digital effects output signal back to the inputs of the mixer.

4,694,345

VIDEO SIGNALS SPECIAL EFFECTS GENERATOR WITH VARIABLE PIXEL SIZE

Jeremy A. Rodgers, Welwyn Garden City, England, assignor to Rank Cintel Limited, Great Britain

Filed Apr. 11, 1985, Ser. No. 722,153
Int. Cl.⁴ H04N *3/36*
U.S. Cl. 358—216 **24 Claims**



1. Apparatus for producing special effects in video signals comprising a telecine and telecine programming means, wherein:

(1) said telecine comprises:

(a) a light source;

(b) a light-sensitive detector;

(c) scanning means for scanning said source of said detector with a scanning raster to provide a raw video signal;

(d) means for locating a stationary transparent film portion containing a stationary image between said source and said detector; and

(e) signal conversion means for receiving said raw video signal and providing an output video signal in standard format as a function of said stationary image, said output video signal including video timing signals; and

(2) said telecine programming means comprises:

(a) store means for storing control functions; and

(b) raster control means for controlling said scanning raster of said telecine scanning means in response to both said stored control functions and said video timing signals.

4,694,346

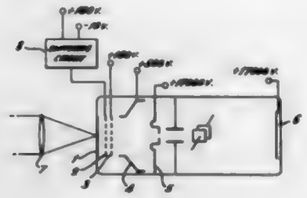
METHOD AND APPARATUS FOR GATING IMAGE TUBES

Alexander E Huston, Berkshire, England, assignor to Hadland Photonics Limited, Hertfordshire, England

Filed Jul. 29, 1985, Ser. No. 759,700
Claims priority, application United Kingdom, Feb. 27, 1985, 8505012
Int. Cl.⁴ H04N *5/228;* **H01J** *31/02*
U.S. Cl. 358—218 **2 Claims**

1. A method of gating an image tube including a cathode, screen, an electrode assembly for forming a focussed image on said screen and first and second electrodes disposed successively along said image tube between said photo cathode and said electrode assembly, said first electrode being disposed nearer to said cathode than is said second electrode, said method comprising:

gating said first electrode by raising for a short interval of time the potential of said first electrode relative to said cathode, said raised potential allowing passage of electrons beyond said first electrode for said short interval of time; and



maintaining a constant level of potential on said second electrode at least during said time interval, said constant level being less than said raised potential applied to said first electrode,

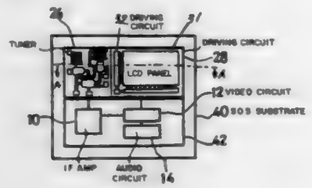
irregularity or variation in said potential of said first electrode during said interval not disturbing electric field conditions produced by said electrode assembly in said image tube.

4,694,347

TELEVISION RECEIVER HAVING A LIQUID CRYSTAL DISPLAY DEVICE

Katsu Ito, Tokorozawa, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed May 30, 1986, Ser. No. 868,715
Claims priority, application Japan, May 31, 1985, 60-118064
Int. Cl.⁴ H04N *7/00*
U.S. Cl. 358—236 **2 Claims**



1. A television receiver comprising:

a transparent SOS substrate;

a liquid crystal display panel provided on a sapphire portion of the SOS substrate;

receiving means, including an intermediate-frequency amplifier, video signal circuit and audio signal circuit, for producing audio signals and video signals;

driving means responsive to the video signals for driving the liquid crystal display panel to display images represented by said video signals;

said intermediate-frequency amplifier, video signal circuit and audio signal circuit of the receiving means and active elements of the driving means being monolithically mounted on the SOS substrate at a portion lateral of the liquid crystal display panel;

said receiving means including a gallium arsenide transistor mounted on said SOS substrate as an element of a high frequency amplifier;

said receiving means further including a surface acoustic wave device as an intermediate-frequency filter, the surface acoustic wave device being mounted on said SOS substrate.

4,694,348

METHOD OF DRIVING LIQUID CRYSTAL DISPLAY PANEL OF TV RECEIVER

Kiyoshi Kamiya; Atsushi Shiraishi, both of Tokorozawa, and Fuminori Suzuki, Tanashi, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,333
Claims priority, application Japan, Jun. 14, 1985, 60-129689; Aug. 30, 1985, 60-191755
Int. Cl.⁴ H04N *3/14*
U.S. Cl. 358—236 **4 Claims**



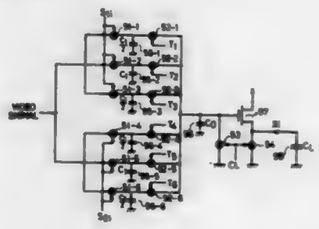
1. A method of driving a liquid crystal display panel of a television receiver having a plurality of scanning electrodes, for displaying data of a composite video signal with increased resolution by displaying six scanning lines of the video signal by two rows of liquid crystal display elements, whereby of a set of six scanning lines comprising 3 successive scanning lines of a first field of said composite video signal and 3 successive scanning lines of a second field of said composite video signal which coincide with or are displaced by one scanning line pitch from said 3 successive scanning lines of the first field in one frame of said composite video signal, 3 lines of said six set of scanning lines are displayed by liquid crystal display elements driven by a first one of said scanning electrodes and the remaining three lines of said set of six scanning lines are displayed by liquid crystal display elements driven by a second one of said scanning electrodes.

4,694,349

LIQUID CRYSTAL MATRIX DISPLAY PANEL DRIVER CIRCUIT

Makoto Takeda, Tenri; Kunihiko Yamamoto, Nara; Nobuaki Matsubayashi, Tenri, and Hiroshi Take, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1985, Ser. No. 739,849
Claims priority, application Japan, Jun. 1, 1984, 59-113744
Int. Cl.⁴ H04N *3/14, 5/66*
U.S. Cl. 358—241 **3 Claims**



1. A TV picture display unit comprising:

a liquid crystal matrix display panel for displaying a picture from a plurality of television video signals corresponding to successive scan lines of a television picture frame; and

driver circuit means for driving said matrix display panel

with signals corresponding to said video signals, including,

means for sampling video signals corresponding to alternate scan lines of said frame to provide successfully sampled signals,

means for storing at least first and second successively sampled signals,

means for forming a signal defining the mean value of said stored first and second successively sampled signals, and

means for sequentially applying said stored first sampled signal, said mean value signal, and said stored second sampled signal to said matrix display panel corresponding to said successive scan lines of said television picture frame,

said means for storing substituting each successively sampled signal for the oldest signal stored therein,

said mean value signal corresponding to a scan line between successively sampled signals.

4,694,350

AUTOMATIC BIAS CONTROL OF AN IMAGE DISPLAY DEVICE IN A VIDEO MONITOR

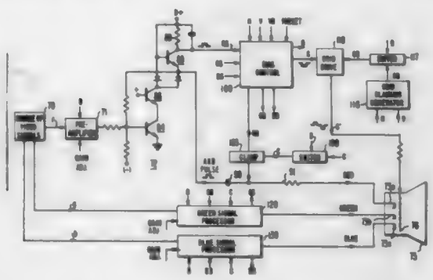
Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 15, 1986, Ser. No. 896,503

Claims priority, application United Kingdom, Oct. 1, 1985, 8524197

Int. Cl.[4] H04N *5/68, 9/20*

U.S. Cl. 358—242 **5 Claims**



1. A data display video monitor system comprising:

an image display device for displaying data on a display screen thereof in response to a video data signal, said display screen including a visible area along an edge of said display screen which is normally devoid of displayed data;

means for exciting said display device during an excitation interval within a sensing interval to produce, at an electrode thereof, a signal having a magnitude representative of the condition of an operating parameter of said display device, said excitation of said display device causing a visible artifact to appear in said visible area along an edge of said display screen; and

control means responsive to said magnitude of said representative signal for providing an output control signal to said display device to maintain a desired condition of said operating parameter; wherein

each sensing interval is preceded by and followed by a holding interval;

each sensing interval encompasses a first plurality of vertical field intervals during which said visible artifacts appear; and

each holding interval encompasses a second plurality of vertical field intervals substantially greater than said first plurality of vertical field intervals, said visible artifacts being absent during said holding interval.

4,694,351

PICTURE SIGNAL PROCESSING APPARATUS

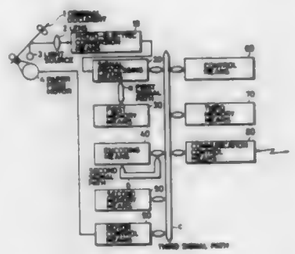
Koozoo Nakamura, Hitachiohta; Nagaharu Hamada; Masaharu Tadauchi; Yasuyuki Kozima, all of Hitachi; Noboru Suemori, and Takamitu Kouno, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,243

Claims priority, application Japan, May 15, 1985, 60-101301

Int. Cl.[4] H04M *1/00*

U.S. Cl. 358—256 **6 Claims**



1. A picture signal processing apparatus wherein digital picture signals are encoded in redundancy reduction encoding system, said apparatus comprising:

a signal processing means for performing signal processing at least picture element density conversion of picture signals;

an encoding means for inputting the digital picture signals processed by the signal processing means and performing encoding processing at least conversion of the signals into redundancy reduction code;

a first memory means for storing temporarily the digital picture signals so that the signal processing means performs the picture element density conversion;

a first signal path through which signals are received or transmitted between the signal processing means and the first memory means;

a second memory means for storing temporarily the digital picture signals so that the encoding means performs the encoding processing;

a second signal path through which signals are received or transmitted between the encoding means and the second memory means;

a third memory means for storing temporarily the code encoded by the encoding means;

a third signal path through which signals are received or transmitted between the encoding means and the third memory means; and

a control means connected to the third signal path for controlling processing of at least the signal processing means and the encoding means through at least the third signal path.

4,694,352

IMAGE INFORMATION PROCESSING SYSTEM

Kenzoh Ina; Masatoshi Otani, and Kenichi Mishima, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 776,007

Claims priority, application Japan, Sep. 21, 1984, 59-196576; Sep. 28, 1984, 59-202013; Sep. 28, 1984, 59-203149

Int. Cl.[4] H04N *1/32, 1/41*

U.S. Cl. 358—257 **16 Claims**

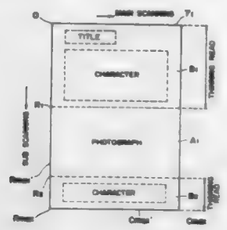
1. An image information system comprising:

reading means for photoelectrically reading an image of an original and producing image data;

means for designating arbitrary area of the image of the original; and

means for transmitting the image data produced by said reading means, said transmitting means including means for compressing the image data produced by said means,

said transmitting means being operable to transmit image



data of either a first area designated by said designating means or a second area other than said first area upon compression of the image data of said either area by said compressing means, and to transmit image data of another area on a non-compression basis.

4,694,353

DIGITAL SCANNER

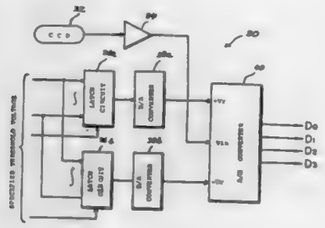
Tsutomu Sato, Yokohama; Noboru Murayama, Tokyo, and Key Sato, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,541

Claims priority, application Japan, Dec. 6, 1984, 59-258249

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—283 **3 Claims**



1. A scanner for reading and quantizing images on a document in multiple tones, comprising:

a photoelectric transducer for reading the images and photoelectrically converting the images to produce an electrical signal;

means for producing two digital signals for specifying an upper threshold voltage level and a lower threshold voltage level;

a first latch means and a second latch means connected to said means for producing two digital signals for receiving said two digital signals and for storing said signals therein;

two digital-to-analog converters, each connected to a respective latch means for receiving said digital signals and for converting said digital signals to an upper threshold voltage level signal and a lower threshold voltage level signal;

an analog-to-digital converter connected to said digital-to-analog converters and to said photoelectric transducer for receiving said electrical signal at a signal input terminal, said upper threshold voltage level signal at an upper threshold input terminal and said lower threshold voltage level signal at a lower threshold input terminal;

wherein the means for producing two digital signals is constructed to determine a regular upper and a regular lower threshold voltage level for reading the image next time, based on data produced by reading a single line or a plurality of lines of the images with respect to a particular upper and a particular lower threshold voltage level.

4,694,354

METHOD AND APPARATUS FOR PRINTING TRIMMING INSTRUCTIONS FOR DEVELOPER OF PHOTOGRAPHS

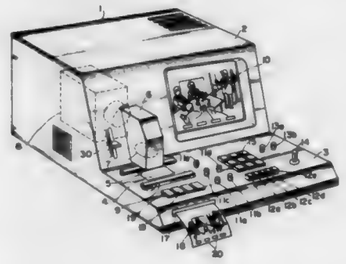
Hiroshi Tanaka, Tokyo, and Shinsuke Fukehara, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 841,610

Claims priority, application Japan, Mar. 29, 1985, 60-65881

Int. Cl.[4] H04N *1/21, 7/18;* **G03F** *3/10;* **G01D** *9/00*

U.S. Cl. 358—296 **14 Claims**



1. An apparatus for printing trimming instructions for use in trimming a photograph, comprising:

first means for picking up images from photofilm and generating a video signal based thereon;

second means for displaying a video image on a display creen, which video image corresponds to the image on said photofilm;

third means for drawing a frame delimiting a section of the image to be trimmed on said display screen; and

fourth means for printing a copy of the image on said display screen.

4,694,355

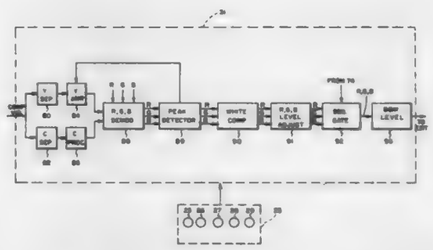
BLACK AND WHITE LEVEL ADJUSTMENT AND NORMALIZATION CIRCUIT FOR A COLOR VIDEO PRINTER

Douglas W. Constable, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,231

Int. Cl.[4] H04N *5/84, 9/81*

U.S. Cl. 358—332 **3 Claims**



1. In a color video printer apparatus for producing a color photographic copy from a color video signal, said apparatus including a monochrome electronic display means for displaying an image of a video signal; an exposure station located along an optical path from said display means at which is located a color photographic element; and a continuously

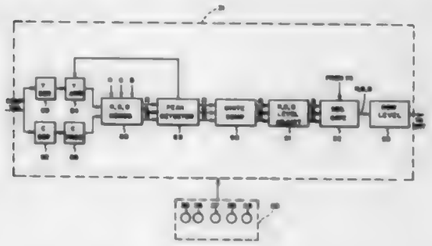
moving color filter having first, second and third primary color filters sequentially movable into said optical path in synchronism with a field frequency of said color video signal;
video signal processing apparatus comprising:
means for providing a color video signal having a separated chrominance signal and a luminance only signal;
variable gain amplifying means for amplifying said luminance signal;
demodulating means for demodulating said amplified luminance signal and said chrominance signal into concurrent first, second and third primary color component signals;
means for reducing the gain of said amplifier means in response to detection of a value of any one of said color component signals exceeding a predetermined limit so as to reduce a value of said luminance signal and reduce the value of the color component signals by an equal amount;
gate means for selectively applying to said display means only one of said color component signals from each field of three concurrent color component signals;
operator adjustable control means for adjusting black and white levels of a color component signal applied by said gate means to said display means; and
means for actuating said gate means, in response to movement of said first primary color filter into said optical path, to apply to said display means a consecutive sequence of six color component video signals consituting odd and even fields of each of said first, second and third primary colors, said sequence starting with said first primary color component signal, as respective corresponding color filters are moved into said optical path, such that said display means produces a sequence of six monochrome images which are filtered by said respective corresponding color filters to expoae a color photographic element at said exposure station to a sequence of six consecutive color field images constituting a full frame of a color video image, wherein each of said sequential fields has been normalized to have similar levels of black and white and wherein the black and white levels in an exposed photographic element may be adjusted to the tastes of a printer operator through adjustment of the black and white levels of said color component signals.

4,694,356

MODIFICATION OF COLOR COMPONENT VIDEO SIGNALS TO COMPENSATE FOR DECREASING WHITE SENSITIVITY OF PHOTOGRAPHIC ELEMENT

Douglas W. Constable, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,236
Int. Cl.⁴ H04N *5/84, 9/81*
U.S. Cl. 358—332 **3 Claims**



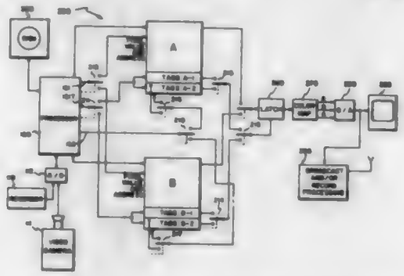
1. Color video printer apparatus for producing a white compensated color photographic copy from a color video signal comprising:
monochrome electronic display means for displaying a monochrome image of a video signal;
an exposure station which is located along an optical path from said display means, and at which is located a color photographic element having an exposure characteristic which is proportional over a major portion of its exposure range and which has decreasing sensitivity over its near white range;
video signal means for providing a color video signal constituting frames of interlaced odd and even fields repeated at broadcast field frequency wherein each field includes three concurrent color component video signals respectively representing first, second and third primary color of a color field image, wherein each of said signals has a signal characteristic which varies linearly between a black and a white level;
white compensating means connected to said video signal means for modifying the signal chracteristic of each of said color component video signals to compensate for the decreased sensitivity in the near white region of said photographic element;
a color filter having first, second and third primary color filters continuously movable into said optical path in synchronism with said field frequency of said color video signal;
selectively actuatable gate means electrically connected between said white compensating means and said display means for applying to said display means one of the three white compensated color component signals; and
means for actuating said gate means in response to detection of said first primary color filter being moved into said optical path, to apply to said monochrome display means a sequence of six consecutive compensated color component video field signals constituting odd and even fields of each of said primary colors as respective corresponding filters are sequentially moved into said optical path such that said display means produces a sequence of six consecutive monochrome images which are filtered by respective corresponding color filters to expoa said photographic element to a sequence of six color field images constituting a full frame of a color video image, wherein said exposed image is white compensated in its near white exposure region.

4,694,357

APPARATUS AND METHOD FOR VIDEO SIGNAL PROCESSING

Altaf Rahman, Stamford, and Vincent J. Navikas, Milford, both of Conn., assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Apr. 24, 1985, Ser. No. 726,409
Int. Cl.⁴ H04N *5/92*
U.S. Cl. 360—9.1 **16 Claims**



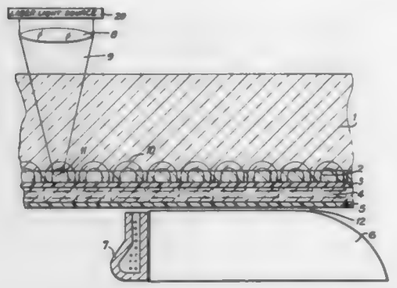
1. Apparatus for encoding, storing, reading out, and decoding frames of video signal, comprising:
a memory block, said memory block being capable of storing a frame of video pixel values at respective pixel addresses and a pair of tag bits associated with each pixel address;
a storage medium;
means for encoding a frame of video signal and storing the encoded information in said storage medium, the encoded information including a pixel position indication and an associated pixel value for positions in a frame where said pixel value changes from the pixel value at the adjacent pixel position;
means for writing an encoded frame from said storage medium into said memory block the pixel values associated with respective pixel positions of the encoded frame being written into corresponding pixel addresses of said memory block;
means for setting one of the tag bits associated with each pixel address at which a pixel value is being stored in said memory block;
means for subsequently reading out sequentially the encoded information in said memory block, and for simultaneously resetting the other of the tag bits associated with each pixel address;
means responsive to said ones of said tag bits for decoding the pixel values read out of said memory to provide a decoded output frame having a decoded pixel value at each pixel position of said decoded output frame; and
means for reversing the roles of said ones of said tag bits and said other tag bits during the writing of the next encoded frame into said memory block, the reading of said next frame out of said memory block and said decoding; whereby said others of said tag bits are used for said writing, reading and decoding, and said ones of said tag bits are reset.

4,694,358

MAGNETO-OPTIC RECORDING STRUCTURE AND METHOD

Boris J. Muchnik, and Fred W. Spong, both of Boulder, Colo., assignors to Kerdix, Inc., Boulder, Colo.

Filed Oct. 28, 1985, Ser. No. 792,148
Int. Cl.⁴ G11B *5/02, 5/06, 11/00, 13/00*
U.S. Cl. 360—59 **15 Claims**



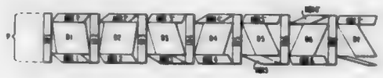
1. An integral recording structure comprising a magneto-optic layer and an opposed magnetic recording layer, data when magnetically recorded on said magnetic recording layer produces fringing magnetic fields, the magneto-optic layer being positioned to fall within the fringing magnetic field of data magnetically recorded on said magnetic recording layer, said magneto-optic layer being subject to local magnetization in alignment with said fringing field by reduction of the coercivity of the magneto-optic layer, said reduction being effected by application of a laser beam to said magneto-optic layer.

4,694,359

DIAGNOSTIC DISK FOR CHECKING THE HEAD ALIGNMENT OF MAGNETIC DISK DRIVES

Takeo Oya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,689
Claims priority, application Japan, Feb. 8, 1985, 60-22889; Feb. 14, 1985, 60-27088
Int. Cl.⁴ G11B *5/56*
U.S. Cl. 360—76 **7 Claims**



1. In a diagnostic disk for checking an azimuthal alignment of a magnetic head of magnetic disk drive with respect to the standard head alignment, said diagnostic disk being driven by said magnetic disk drive with a radially central portion of said diagnostic disk as the center of rotation whereby a concentric ideal head read path is provided on a surface of said diagnostic disk by said standard head alignment, said diagnostic disk comprising a concentric checking track provided on said ideal head read path and divided in a plurality of sectors, each of said sectors including:
an identification field for recording a sector number identifying said sector, said identification field having substantially the same width as said ideal head read path in the radial direction of said diagnostic disk and said sector number being recorded at an angle perpendicular to said radial direction;
a data field for recording a predetermined data pattern, said data pattern being recorded at an first azimuthal angle with respect to said radial direction; and
noise areas for recording a predetermined noise pattern different from said data pattern, said noise areas being located at both sides of said data field in said radial direction, said noise pattern of one of said noise area being recorded at a second azimuthal angle inclining in the clockwise direction with respect to the perpendicular line to the recording direction of said data pattern, and said noise pattern of the other of said noise areas being recorded at a third azimuthal angle inclining in the counterclockwise direction with respect to said perpendicular line.

4,694,360

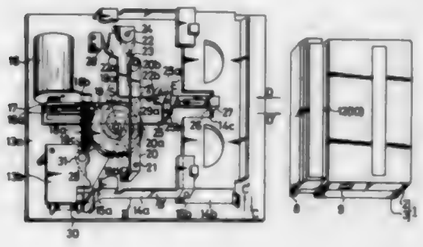
TAPE CASSETTE WITH CONCAVE ENGAGEMENT PORTION AND PLAYER WITH HOOK ENGAGEABLE THEREWITH

Masao Ohyama, Tokyo; Yoshinori Yamamoto, Kanagawa; Kenichi Horikawa, Tokyo, and Kenji Kawakami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,432
Claims priority, application Japan, Apr. 3, 1984, 59-48693[U]; Jun. 5, 1984, 59-83087[U]
Int. Cl.⁴ G11B *15/675, 15/60, 23/087*
U.S. Cl. 360—96.5 **5 Claims**

1. Apparatus for recording signals on or reproducing signals from a tape cassette that has an upper surface formed with a concave engagement portion; said apparatus comprising:
a cassette holder for receiving said tape cassette;
hook means engageable with said engagement portion;
means for moving said hook means between an ejection position wherein said tape cassette can be manually inserted partway into or removed from said holder and a loaded position wherein said cassette is fully drawn into said holder;
tape drive means; and
means for moving said holder between a load/eject position

wherein said cassette can be loaded into or ejected from said holder and a tape drive position wherein said cassette



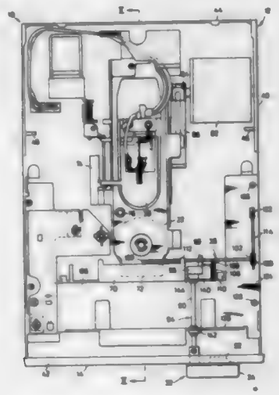
engages said tape drive means, whereby a recording and/or reproducing operation can be performed.

4,694,361

DATA TRANSFER APPARATUS HAVING A SIMPLIFIED CLAMP MECHANISM FOR HOLDING A DISKLIKE RECORD MEDIUM IN PLACE

Isamu Tsuchiya, Oume; Tsutomu Kawasaki, Iruma, and Yoshiaki Sakai, Higashikurume, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Apr. 1, 1986, Ser. No. 846,921
Claims priority, application Japan, Apr. 3, 1985, 60-49763[U]
Int. Cl.[4] G11B *17/022*
U.S. Cl. 360—97 **7 Claims**



1. A data transfer apparatus having at least one transducer head for data transfer with interchangeable disklike record media, comprising:

(a) frame means providing a space for the loading and unloading of a record medium to and from a preassigned data transfer position for data transfer with the transducer head;

(b) a drive assembly disposed on one side of, and in a concentric relation with, the record medium when the latter is in the data transfer position;

(c) a clamp assembly disposed on the other side of the record medium;

(d) a clamp arm having the clamp assembly rotatably mounted thereto and movable with respect to the frame means between an unclamping position, where the clamp assembly is away from the drive assembly to allow the loading and unloading of the record medium to and from the data transfer position, and a clamping position where the clamp assembly engages between itself and the drive assembly the record medium being held in the data transfer position;

(e) resilient means biasing the clamp arm from the clamping toward the unclamping position;

(f) a clamp lever operatively engaged at a first end thereof with the clamp arm for moving the same from the unclamping to the clamping position against the bias of the resilient means, the clamp lever being made of sheet metal and formed to include a support portion bent right angularly from a second end thereof;

(g) a flat lever mount rigidly attached to the frame means and having an aperture defined therein;

(h) the support portion of the clamp lever being adapted to undetachably engage in the aperture in the lever mount so as to allow the pivotal motion of the clamp lever about the second end thereof; and

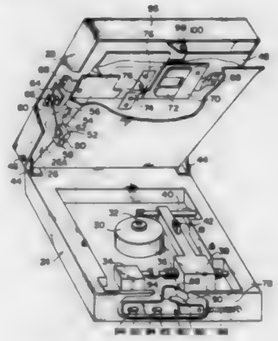
(i) a clamp actuating mechanism for acting on the clamp lever so as to cause the same to move the clamp arm from the unclamping to the clamping position against the bias of the resilient means.

4,694,362

DEVICE FOR LOADING OR UNLOADING MAGNETIC DISC PACK

Shigesori Oosaka, Kanagawa, and Shinichi Matsuda, Oomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 7, 1984, Ser. No. 648,227
Int. Cl.[4] G11B *5/012, 23/03*
U.S. Cl. 360—97 **2 Claims**



1. A device for loading or unloading a magnetic disc pack, said device comprising a lid, means for pivotally mounting said lid on one end of a main body of a magnetic recorder and/or a reproducer, and a disc pack holder, pivotally supported on said lid for opening away from said lid and being of U shape in cross section along a line parallel to the direction of cartridge insertion, said disc pack holder being capable of receiving therein said magnetic disc pack, said magnetic disc pack incorporating a magnetic disc therein, and wherein said device further comprises:

an opening formed at one side face of said U shaped disc pack holder; and

an engaging member,

means for mounting said engaging member on said disc pack holder side face in juxtaposition to said opening formed in said one side face,

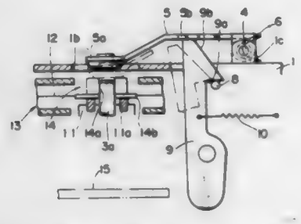
said engaging member having a portion projectable into said opening or retractable therefrom and engageable with said disc pack, and means operatively engaging both said lid and said engaging member and responsive to lid opening for causing said engaging member portion to project into said opening to engage said disc pack to restrain said magnetic disc pack in said disc pack holder when said lid is opened, and responsive to lid closing to retract said engaging member portion from said opening in said one side face of said U shaped disc pack holder to release the restraint of said magnetic disc pack when the lid is closed and wherein said engaging member is rockably supported on said one side face of said U shaped disc pack holder; and a push member is mounted to said lid and has an end remote from said lid including means in contact with said engaging member for pushing one side of said engaging member to rock said engaging member in a first direction to cause said engaging member portion to be inserted into said opening of the disc pack holder when said lid is opened, and for pushing the other side of said engaging member to rock said engaging member in a second direction upon closing of said lid, so that said engaging member portion is retracted from said opening within the one side face of said U shaped disc pack holder to release the restraint of said magnetic disc pack.

4,694,363

MAGNETIC DISC COUPLING MECHANISM FOR DISC DRIVE UNIT

Masao Nakamori, Kawaguchi, and Harunobu Ichinose, Tokyo, both of Japan, assignors to Copal Company Limited, Japan

Filed Nov. 7, 1985, Ser. No. 795,770
Claims priority, application Japan, Nov. 12, 1984, 59-238063
Int. Cl.[4] G11B *17/04*
U.S. Cl. 360—99 **8 Claims**



1. A magnetic disc coupling mechanism for use in a disc drive unit for driving a flexible magnetic disc rotatably accommodated by a disc cassette and having a center core exposed through a window formed in a wall of said disc cassette, said center core being provided with a hole for forcibly fitting around a spindle shaft and also with a magnetic member, said magnetic disc coupling mechanism comprising:

(a) a spindle means adapted for rotatively driving said magnetic disc and including said spindle shaft for forcibly fitting in said hole in said center core of said magnetic disc, and a permanent magnet for attracting said magnetic member of said center core;

(b) a housing for accommodating said disc cassette and movable towards and away from said spindle means, said housing being biased by a first spring away from said spindle means;

(c) a locking member for locking said housing at a drive position where said housing is near said spindle means; and

(d) a forcible pressing member adapted to press said center core of said magnetic disc in said disc cassette accommodated by said housing, said forcible pressing member being biased by a second spring in such a direction as to press said center core towards said spindle member;

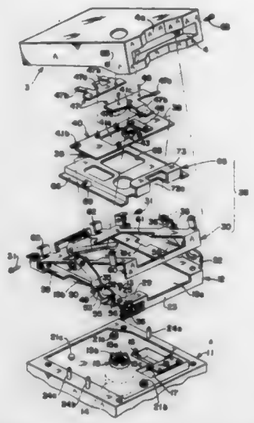
wherein said forcible pressing member presses said center core of said magnetic disc such that said spindle shaft is forcibly fitted in said hole in said center core in the final region of the stroking of said housing to said drive position and, thereafter, said locking member causes said forcible pressing member to be moved away from said center core during locking of said housing in said drive position.

4,694,364

INTEGRAL DOOR AND MAGNETIC SHEET PACK HOLDER FOR USE IN A MAGNETIC RECORDING/REPRODUCING APPARATUS

Shinichi Matsuda, Saitama, and Shigenori Oosaka, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 4, 1985, Ser. No. 719,998
Claims priority, application Japan, Apr. 11, 1984, 59-70752; Apr. 11, 1984, 59-70753; Apr. 16, 1984, 59-54778[U]
Int. Cl.[4] G11B *17/032, 17/32*
U.S. Cl. 360—99 **8 Claims**



1. A magnetic recording/reproducing apparatus comprising: a body; a door which swings so as to open and close with respect to the body of the apparatus; a spindle which engages an opening of a magnetic sheet placed in the apparatus so as to rotate said magnetic sheet; a magnetic head and a head feeding means, such that said magnetic head is moved in a radial direction with respect to said magnetic sheet by said head feeding means; a pack receiving portion with an opening to receive a magnetic sheet pack rotatably containing said magnetic sheet therein, said door and said pack receiving portion being integrally formed and rotatable around a shaft, such that said door and said pack receiving portion may be swung to an open position away from said body of said apparatus and may be swung back to a closed position flush with said body, wherein the door is locked in a closed position with said body of the apparatus by a locking means after insertion of a magnetic sheet pack so that said magnetic sheet is mounted on said spindle and simultaneously said magnetic sheet is in contact with said magnetic head; said apparatus further comprising:

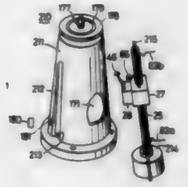
an oscillating member rotatably supported on a second shaft extending through a hole in said pack receiving portion;

wherein when said pack receiving portion and said door integrally move toward said closed position said oscillating member oscillates toward a use position wherein said magnetic sheet is in contact with said magnetic head, said oscillating member oscillating toward a non-use position when said door is in an open position wherein said magnetic head is out of contact with said magnetic sheet; and

a control plate mounted on a control plate holder, said holder including a holder shaft disposed in a hole in an upper end of said oscillating member such that when said oscillating member oscillates towards a use position, said control plate holder is brought downward to cause said control plate to enter into said magnetic pack receiving portion to give access to the magnetic sheet from a side opposite the magnetic head with respect to said magnetic head such that said magnetic sheet is disposed therebetween when said oscillating member is oscillated towards

said closed use position, the head control plate moving away from said pack receiving portion when said oscillating member is moved toward said open non-use position.

4,694,365
RECORDING MEDIUM FOR RECORDING AND/OR REPRODUCING APPARATUS
Hisao Kinjo, Yokohama, Japan, assignor to Victor Company of Japan, Tokyo, Japan
Filed Dec. 9, 1985, Ser. No. 806,671
Claims priority, application Japan, Oct. 27, 1981, 56-171868; Aug. 2, 1982, 57-134930
Int. Cl.[4] G11B *5/004*
U.S. Cl. 360—100 **15 Claims**

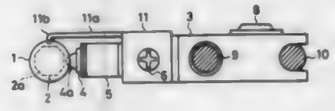


1. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording and/or reproducing means including a recording and/or reproducing transducer, said recording medium being accommodated within an accommodating case which constitutes a cartridge together with said recording medium and being loaded into said recording and/or reproducing apparatus together with said accommodating case, said accommodating case comprising a window into which said recording and/or reproducing transducer enters, said window having an elongated shape extending in a moving direction of said recording and/or reproducing transducer, said recording medium comprising:
- a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said tapered part having a peripheral surface with a recording surface thereon; and
- magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

7. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording medium comprising:
- a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said main body including an end part closing said hollow part at said other end, said end part being provided with shaft receiving means at a center thereof which engages with a tip end part of the rotary shaft of said motor, said tapered part having a peripheral surface with a recording surface thereon; and
- magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

14. A recording medium which is user-replaceable for a recording and/or reproducing apparatus which comprises a rotational motor and recording and/or reproducing means, said motor having a rotary shaft, said recording medium comprising:
- a solid main body molded from a synthetic resin, said main body having opposite ends and including a hollow tapered part having a central axis, said tapered part being open at one of said ends of said main body, said main body having a diameter at said one open end which is greater than the diameter of said main body at the other end, said tapered part having a truncated conical shaped having an angle of taper 1° to 4° so as to be substantially cylindrical, said tapered part having a peripheral surface with a recording surface thereon; and
- magnetic coupling means on said other end of said main body for user-replaceably magnetically coupling said recording medium to the rotary shaft of said motor.

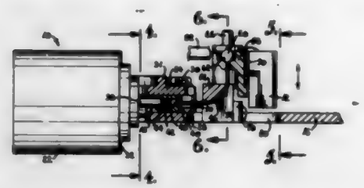
4,694,366
DEVICE FOR SHIFTING CARRIAGE
Takamichi Fuke, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Feb. 10, 1986, Ser. No. 828,204
Claims priority, application Japan, Feb. 8, 1985, 60-16646[U]
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **4 Claims**



1. A device for shifting a carriage on which a magnetic head is carried, comprising:
- a mating element mounted to the carriage;
- a threaded shaft having a helical groove extending around the periphery of the shaft provided with discrete groove portions angularly spaced one after the other in steps which are incrementally offset along an axial direction of the shaft, wherein the mating element engages in resilient contact in the helical groove against a wall defining the groove portions, the carriage being moved in incremental steps in the axial direction by rotating the shaft; and
- a retaining member mounted on the carriage and having a retaining portion extending immediately adjacent to but not in contact with the wall defining the groove portions of the helical groove,
- whereby in the event of an external shock acting to dislodge the mating element away from the helical groove, the masting element is prevented from disengaging from the groove because the retaining member bears against the wall of the groove.

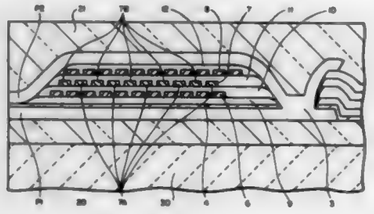
4,694,367
MECHANISM FOR MOVING RECORDING HEADS ACROSS COMPUTER TAPES
George I. Brent, Boulder, Colo., assignor to Tallgrass Technologies, Inc., Overland Park, Kans.
Filed Nov. 15, 1985, Ser. No. 798,795
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—106 **20 Claims**

1. A mechanism for moving a magnetic recording head across a tape storage medium, said mechanism comprising:
- a fixed base;
- an actuator on said base having an extensible and retractable output shaft;
- an elongate flexible cable having opposite first and second ends;
- means for coupling said first end of the cable with said shaft;
- cable guide means on said base for guiding said cable through a bend of substantially 90° between said first and second ends;
- a bracket carrying the recording head thereon, said bracket being coupled with said second end of the cable;
- means for mounting said bracket on said base in a manner restricting the bracket to linear movement in a direction



generally transverse to the tape and perpendicular to the direction of movement of said actuator shaft; and
- means for maintaining said cable in a tense condition to effect movement of said bracket and recording head across the tape in opposite directions when said actuator extends and retracts said shaft.

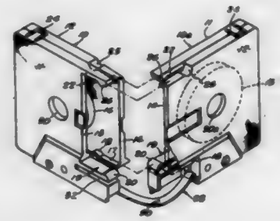
4,694,368
THIN FILM MAGNETIC HEAD WITH THREE SUPERIMPOSED COILS
Peter G. Bischoff, Cupertino; David J. Rasch, Milpitas; Vincent D. Retort, Cupertino, and John R. Osborne, Saratoga, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.
Filed Jan. 10, 1986, Ser. No. 817,621
Int. Cl.[4] G11B *5/31, 5/17*
U.S. Cl. 360—126 **8 Claims**



1. A thin film magnetic head assembly comprising:
- a nonmagnetic substrate;
- first and second magnetic pole piece layers deposited over said substrate;
- nonmagnetic insulating material disposed between said pole piece layers, said material forming a transducing gap;
- said pole pieces being connected to form a back gap closure; and
- an electrically conductive coil assembly including upper and lower layers of coil turns, and a central layer of coil turns disposed between said upper and lower layers of coil turns, said central layer being bifilar, said coil assembly being disposed in said nonmagnetic insulating material and between said pole piece layers.

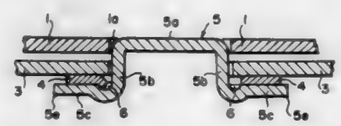
4,694,369
SEPARABLE WEB CONTAINER
Donald L. Ramsey, 6881 Hazard, Westminster, Calif. 92683
Filed Mar. 14, 1985, Ser. No. 711,742
Int. Cl.[4] G11B *23/02*; G03B *1/04*
U.S. Cl. 360—132 **4 Claims**

1. A thin film web container assembled from two identical halves separable along a central vertical line, each of said halves comprising:
- a front section on which there is a flexible extension at the top thereof, said top extension having a downward projecting semicircular tab at the end thereof, said front section also having a bottom flexible extension with an upwardly projecting semicircular tab thereon;
- a rear section attached to said front section, said rear section extending beyond said front section and including in the top and bottom thereof semicircular indentations matching said upwardly and said downwardly projecting semicircular tabs, so that when an identical pair of halves are assembled together, said downwardly and said upwardly extending semicircular tabs on said front section of said



front half engage said semicircular indentations of said rear section of the other half to hold the identical halves together in mirror image fashion; and
- each of said halves including between their front and back sections a reel rotatably disposed therein to hold a thin film web rolled up thereon,
- said identical halves being easily separable by pulling the halves apart against the flexible extensions engaged in the indentations, so that said web may be accessed to insert or delete portions thereof as desired.

4,694,370
MAGNETIC DISK CARTRIDGE
Shozo Ommori, and Kengo Oishi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan
Filed Jun. 20, 1985, Ser. No. 746,962
Claims priority, application Japan, Jun. 22, 1984, 59-93387[U]
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **5 Claims**



1. A rotatable magnetic disk assembly comprising:
- a magnetic disk having a centrally disposed opening therethrough,
- an adhesive member and
- a center core; said center core comprising a cylindrical member having an outer periphery which is receivable into said central opening in said magnetic disk and a flange radially extending from near an axial end of said cylindrical member, which flange has a face which is proximate to said magnetic disk and which is affixed to said magnetic disk by means of said adhesive member, said face having a circumferential groove therein substantially adjacent to said outer periphery of said cylindrical member so that if said adhesive member is misaligned with respect to said cylindrical member within a tolerance, a portion of said adhesive member can enter said groove to reduce deformation of the magnetic disk.

4,694,371

PROTECTION CIRCUIT FOR STALLING PROTECTION IN COMMUTATORLESS DIRECT CURRENT MOTORS

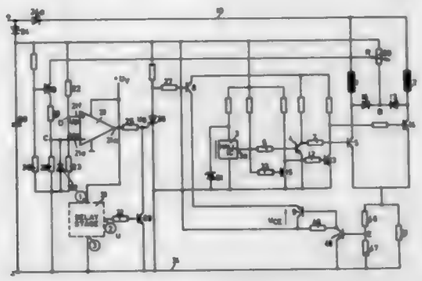
Wilhelm Reinhardt, Schrozberg-Guetbach, and Helmut Lipp, Hohebach, both of Fed. Rep. of Germany, assignors to ebm Elektrobau Mulfingen GmbH & Co., Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,199

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418276

Int. Cl.⁴ H02H *7/09*

U.S. Cl. 361—23 **11 Claims**



1. A protection circuit which protects against stalling in a commutatorless direct current motor having a plurality of stator windings receiving an operating voltage and being selectively energized, comprising:

respective semiconductor circuit elements disposed in series with each stator winding and operative to be turned on or off in response to a control voltage induced in said stator windings, said control voltage being the sum of the operating voltage in the unenergized stator windings and the counter-e.m.f. induced in said unenergized windings;

means responsive to said control voltage to turn on the respective semiconductor circuit element connected to the energized stator winding if said control voltage is greater than said operating voltage, and to turn off said respective semiconductor circuit element if said counter-e.m.f. falls below a predetermined cutoff value; and

a start-up bridging circuit operative in response to initial application of the operating voltage to the motor to override said means and maintain said respective semiconductor circuit elements turned on for a time interval sufficient for the counter-e.m.f. to build up to said predetermined cutoff value,

whereby the protective circuit does not prevent normal start-up of the motor.

4,694,372

CIRCUIT DIAGNOSIS AND CONTROL DEVICE

Jean-Paul Sibeud, Chaponnay (rhone), France

Continuation of Ser. No. 444,568, Nov. 26, 1982, abandoned. This application Jun. 13, 1985, Ser. No. 744,297

Claims priority, application France, Nov. 25, 1981, 81 22454

Int. Cl.⁴ H02H *3/24*

U.S. Cl. 361—86 **14 Claims**

1. A control, inspection and safety device in an electrical circuit receiving electrical power from a direct current source, comprising:

a MOS power transistor having a source and a drain connected in series between said current source and said electrical circuit, and a gate, said MOS power transistor being selected such that the drain to source saturation current I_{SAT} is higher than the current corresponding to the nominal current of said electrical circuit; and

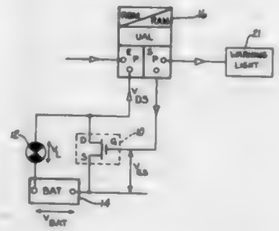
a microprocessor having means for applying a gate to source voltage V_{GS} to said gate to render said MOS transistor conductive in response to an external command and to periodically test a first logical relation:

$V_{GS} \neq 0$

and

$V_{DS} > V_{BAT}$

to generate a first signal indicative of a short circuit condition in said electrical circuit when said first logical relation is satisfied where V_{DS} is the voltage between said drain and said source of said MOS transistor and V_{BAT} is the nominal voltage at the terminals of said current source, said microprocessor further having means for terminating the application of said gate to source voltage V_{GS} to said gate for a first predetermined period of time in response to each time the test of said first logical relationship is satisfied and means responsive to the expiration of said first predetermined period of time for reapplying said voltage V_{GS} to said gate and to retest said first logical relationship.



4,694,373

CIRCUIT BREAKER WITH DIGITAL SOLID-STATE TRIP UNIT WITH OPTIONAL FUNCTIONS

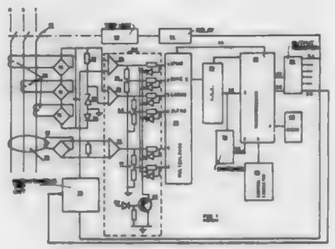
Pierre Demeyer, Uriage, France, assignor to Merlin Gerin, France

Filed Feb. 10, 1986, Ser. No. 827,440

Claims priority, application France, Feb. 25, 1985, 85 03162

Int. Cl.⁴ H02H *3/08*

U.S. Cl. 361—96 **5 Claims**



1. A digital solid-state trip unit for an electrical circuit breaker comprising:

current sensor means for generating analog signals proportional to currents flowing through conductors protected by the circuit breaker,

rectifier circuit means for rectifying said signals and for providing a continuous analog signal representative of a maximum value of said currents,

an analog-to-digital converter means having an input receiving said analog signal and an output for producing a corresponding sampled digitized signal,

microprocessor-based digital processing unit means, to which the digitized signal is applied for providing a long delay trip function and a short delay trip function and for generating a circuit breaker tripping order, when present pick-ups are exceeded by said digitized signal, said order being time delayed in terms of the value of the digitized signal, said digitized processing unit also selectively providing a ground fault protection optional function and a load shedding and restoring optional function, said ground fault or load shedding optional functions being performed by selecting a respective execution program stored in non-volitile memory,

a circuit breaker trip means activated by said tripping order,

a plurality of switches for providing the digital processing unit means with execution parameters of the tripping functions, and optional function switches for providing the digital processing unit means with execution parameters of a selected optional function.

4,694,374

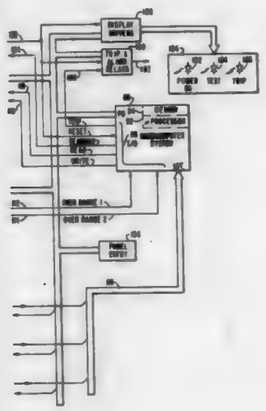
PROGRAMMED OVEREXCITATION PROTECTIVE RELAY AND METHOD OF OPERATING THE SAME

William R. Verbanets, Jr., Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 26, 1985, Ser. No. 727,697

Int. Cl.⁴ H02H *7/09*

U.S. Cl. 361—96 **17 Claims**



1. A programmed protective relay for protecting power equipment, supplied with energy from at least one power line, against overexcitation by deriving an overexcitation time-to-trip based on a selectable relationship of the ratio of voltage/-frequency of an energy supplying power line, said protective relay comprising:

a programmed digital signal processor;

memory means, coupled to said programmed processor, for storing a plurality of digitally coded signals representative of predetermined derivation constants;

means for setting a plurality of derivation parameters;

means for measuring the voltge of an energy suplying power line and generating at least one signal representative thereof;

means governed by said programmed processor to sample said voltage measurement signal at first predetermined times and to digitize said sampled voltage measurement signals, a frequency cycle of a power line voltage including a plurality of first predetermined times;

means for generating interrupts to said programmed processor based on the voltage frequency cycles of said voltage measurement signal;

said programmed processor responsive to said generated interrupts to derive first digital signals, representative of the voltage/frequency ratio of said voltage measurement signal, corresponding to each interrupt, from the sampled voltage measurement signals digitized over the corresponding inter-interrupt periods;

said programmed processor operative over predetermined time intervals, each including a plurality of inter-interrupt periods, to derive for each predetermined time interval a second digital signal, representative of an overall voltage/frequency ratio value X_1, from the first digital signals derived over the corresponding predetermined time interval i;

said programmed processor operative at times corresponding to said predetermined time intervals to read said parameter settings;

said programmed processor operative to select, at other times, certain of said digitally coded derivation constants from said memory means corresponding to said read parameter settings associated with said other times;

said programmed processor operative to detect an overexcitation condition from said derived second digital signals;

said programmed processor operative, in response to the detection of an overexcitation condition, to derive an overexcitation time-to-trip based on the following relationship:

$$\sum_{i=1}^{N} \exp\left[\frac{1}{C}(X_i - 1)\right] \geq L$$

where i from 1 to N represent the predetermined time intervals during which said detected overexcitation condition persists;

where 1/C and L represent digitally coded derivation constants based on said read parameter settings for each corresponding predetermined time interval i;

where N represents the number of predetermined time intervals which may elapse for the time-to-trip beyond a minimum number of predetermined time intervals for the time-to-trip;

where X_1 represents the second digital signal derived from the corresponding predetermined time interval i; and

means for governing the interruption of energy to said power equipment if said overexcitation condition persists for the duration of said time-to-trip derivation.

4,694,375

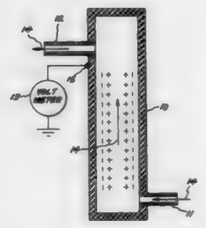
ADDITIVES TO PREVENT ELECTROSTATIC CHARGE BUILDUP IN FLUIDS IN HIGH VOLTAGE SYSTEMS

John C. Devins, Burnt Hills, N.Y.; Matthew A. Dranchak, Mt. Laurel, N.J., and Stefan J. Rzad, Rexford, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 140,244, Apr. 14, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,264

Int. Cl.⁴ H01G *1/08*

U.S. Cl. 361—212 **16 Claims**



1. A fluid mixture for use in coolant flow conduits of high voltage electrical equipment coolant systems, said mixture comprising a nonflammable insulating halocarbon liquid coolant in combination with at least one ionic additive in an amount effective to increase the electrical conductivity of said mixture,

but insufficient to impair its electrical insulating function, said additive being soluble in said coolant.

4,694,376

CIRCUIT FOR THE PULSED OPERATION OF ONE OR MORE HIGH-FREQUENCY OZONIZERS

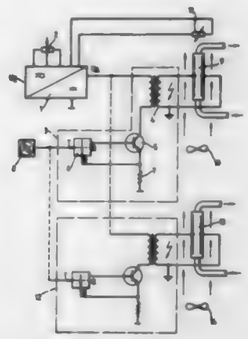
Rudolf Gesslauer, Waldstr. 6, 3501 Schauenburg, Fed. Rep. of Germany

Continuation of Ser. No. 471,358, Mar. 2, 1983, abandoned. This application Sep. 26, 1985, Ser. No. 781,201

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208895

Int. Cl.⁴ B03C *3/01*

U.S. Cl. 361—235 **11 Claims**



1. A circuit arrangement for the pulsed operation of a plurality of high frequency ozonizers of a given type but each of which may have different characteristics due to manufacturing differences caused by manufacturing tolerences, comprising; a DC voltage supply means having at least one output for delivering a DC voltage and an adjusting means for adjusting said DC voltage; a frequency control means connected to all of said ozonizers for producing current pulses of a defined frequency to all of said ozonizers; a plurality of high voltage transformers, each transformer having a primary winding coupled to an output of said DC voltage supply means and a secondary winding coupled to a respective one of said ozonizers; and a plurality of pulse width control circuits, each circuit associated with one of said ozonizers for controlling the transformer of each ozonizer to operate at a preselected repetition frequency and at a preselected duty ratio adjusted a predetermined amount and causing each ozonizer to operate at an optimum energy output efficiency, said plurality of ozonizers each having its high voltage transformer primary winding connected to said power supply and its pulse width control circuit connected to said frequency control means so that said ozonizer connections to said power supply and to said frequency control means are parallel with each other to be operated by said frequency control means and said power supply, each pulse width control circuit deriving electrical current pulses of a preselected repetition frequency from said DC voltage supply means and delivering said current pulses through a respective one of said primary windings, and each pulse width control circuit including said respective primary winding and an individual pulse width control means for each circuit having an electronic switch for deriving said electrical current pulses by blocking or releasing a flow of a DC current from its output through said respective primary winding and each circuit further having means coupled to said electronic switch for alternately switching said switch into a blocking or a releasing condition at said pre-selected repetition frequency and at a pre-selectable duty ratio such that said current pulses may be delivered through each of said primary windings at pre-selectable duty ratios, wherein said adjusting means serve to adjust a desired overall amount of production of ozone per time unit from all of said ozonizers by adjusting the same DC voltage for all of said primary windings, whereby said pulse width control means serve to individually control the amount of energy expended for each of said ozonizers.

4,694,377

SEGMENTED CAPACITOR

Frederick W. MacDougall, Marion, and Thomas A. Murphy, New Bedford, both of Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

Filed May 28, 1986, Ser. No. 868,295

Int. Cl.⁴ H01G *1/11*

U.S. Cl. 361—275 **13 Claims**



1. A capacitor comprising:

a dielectric strip,

first and second metal layers insulated from one another by said dielectric strip,

each of said layers being interrupted along its length by a plurality of transverse non-conductive gaps extending partway across said layer,

said gaps dividing each said layer into a series of conductive sections, each section being connected to an adjacent section by a narrow metallized region extending from the associated said gap to one edge of said layer, said narrow metallized region being adapted to act as a first fuse for said section during periods of excessive current flow to said section and wherein

the sections of each said layer are all electrically connected in common along one edge of said layer.

4,694,378

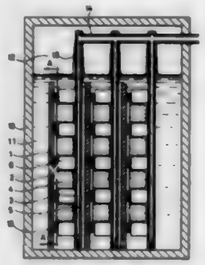
APPARATUS FOR COOLING INTEGRATED CIRCUIT CHIPS

Wataru Nakayama, Kashiwa; Shigeki Hirasawa, and Tadakatsu Nakajima, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 684,790, Dec. 21, 1984, abandoned. This application Jan. 2, 1987, Ser. No. 128

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—385 **4 Claims**



1. In a cooling apparatus cooling, by a boiling action of a dielectric liquid, integrated circuit chips mounted on printed circuit cards, each printed circuit card being submerged longitudinally in the dielectric liquid with a space provided therebetween, the cooling apparatus comprising stud means formed of a heat conductive material attached to a surface of respective integrated circuit chips promoting a boiling action to enhance a heat transfer efficiency to the dielectric liquid; cooling plate means arranged adjacent printed circuit cards in the cooling apparatus, the cooling plate means being cooled by a circulating cooling medium; a plurality of fin means attached to the cooling plate are formed of heat conductive material, and surround the circumference of each of the respective stud means; and a plurality of resilient members surrounding the respective stud means whereby vapor bubbles produced at lower integrated circuit chips or the stud means are trapped between the fin means and condensed such that vapor bubbles will not enter an area of another integrated circuit chips or stud means.

4,694,379

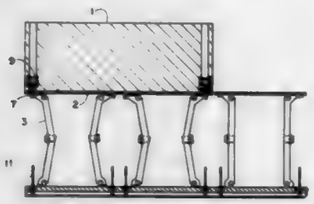
CONTROL PANEL FOR ELECTRONIC INSTRUMENTS

Peter J. Unger, Beaverton, and Jon C. Mutton, Milwaukie, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 4, 1985, Ser. No. 698,211

Int. Cl.⁴ H02B *1/04*

U.S. Cl. 367—419 **5 Claims**



1. A control panel system, comprising,

a subunit electronic device,

at least one planar cover plate,

a base plate,

a plurality of hinged support members supporting said at least one planar cover plate from said base plate,

said hinged support members having an extended position wherein said support members are substantially locked in an over center configuration, and

means provided on said subunit electronic device for unlocking said support members when said subunit electronic device is urged toward said cover plate, and wherein said unlocking means comprises means protruding from said subunit electronic device, and wherein said support members are provided with arm portions engageable by said unlocking means for rotating said support members out of said over center configuration, and, further wherein said at least one planar cover plate is perforated with holes through which said unlocking means are received to engage said support members.

4,694,380

CARRIER TRAY FOR CIRCUIT BOARD

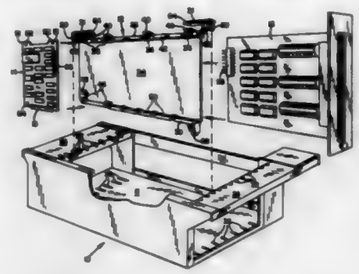
Robert L. Mallory, Portland; Alfred H. Schamel, West Linn, both of Oreg., and Stephen M. Sekel, Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 11, 1986, Ser. No. 873,000

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 361—424 **5 Claims**

1. A carrier tray carrying and shielding a circuit board assembly used in electrical equipment comprising; a metal plate, an upper plastic molded rail affixed to the metal plate along the top edge thereof and a lower plastic molded rail affixed to the metal plate along the bottom edge thereof, fastening means molded into the upper and lower rails, a circuit board assembly having top and bottom edges, and said fastening means fastening said top and bottom edges of the circuit board assembly to the rails in spaced relation to the metal plate.



4,694,381

LIGHT PROJECTOR FOR MOVABLE OPTICAL EFFECTS

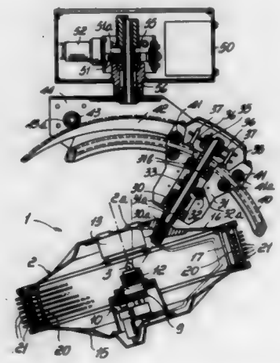
Bruno Dedoro, Castel Goffredo, Italy, assignor to Coemar S.p.A., Castel Goffredo MN, Italy

Filed Mar. 3, 1986, Ser. No. 835,382

Claims priority, application Italy, Mar. 21, 1985, 19988 A/85

Int. Cl.⁴ F21V *7/00*

U.S. Cl. 362—307 **17 Claims**



1. A light projector for movable optical effects comprising:

a light source,

a rotating shutter of substantially tubular shape surrounding said light source for partially passing light coming from said light source and emitting light beams,

a hollow body enclosing said light source and said rotating shutter, said hollow body including first and second substantially disk-like shaped support shells extending opposed to and at a distance from each other, and a lateral wall of substantially tubular shape extending between said first and second support shells coaxially to said rotating shutter, said lateral wall including a focusing lens extending all around said rotating shutter for receiving and focusing said light beams emitted by said rotating shutter,

support means in said enclosing body, rigidly connected to said first support shell and said light source and rotatively connected to said rotating shutter,

motor drive means in said enclosing body resting on said first support shell, said motor drive means being connected to and rotatively driving said rotating shutter, and

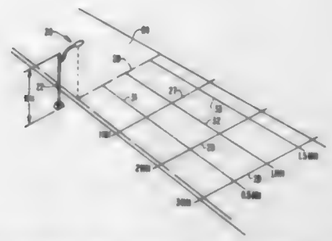
a hanging arm connected to and extending from said hollow body for hangingly supporting said hollow body.

4,694,382

REFLECTOR FOR ROADWAY LIGHTING LUMINAIRE

Kenneth B. Sales, Radford, Va., assignor to Hubbell Incorporated, Orange, Conn.

Filed Dec. 23, 1986, Ser. No. 945,528
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—346 **4 Claims**



1. A luminaire for providing a predetermined pattern of illumination of an area such as a portion of a roadway with the luminaire supported above and adjacent to one side edge of the roadway comprising

a reflector having an edge defining an elongated bottom opening and a generally concave interior reflective surface, said reflector having a street end oriented toward the roadway to be illuminated and a house end opposite the street end;

means for supporting said reflector with said edge defining said bottom opening lying in a generally horizontal plane at a preselected mounting height MH above the surface of said roadway;

a lamp; and

means for supporting said lamp within said reflector with the center of illumination thereof closer to said house end than said street end and lying in a longitudinal, central, vertical plane bisecting the interior of said reflector;

said interior surface of said reflector including

means defining a plurality of reflective facets arranged in an orderly sequence of bands, the surface of each said facet substantially lying in a plane forming a predetermined angle relative to said central plane to reflect light from said lamp toward a predetermined location on said roadway surface,

said bands forming first and second groups of bands, each group including a plurality of bands and each band including a plurality of facets, said groups of bands being disposed on opposite sides of a transverse plane perpendicular to said central vertical plane,

each band in said first group of bands lying toward said street end from said transverse plane extending arcuately from one side of said bottom edge to the other, the facets of each said band being set at angles to reflect light from said lamp primarily downwardly and generally laterally of the reflector along said roadway,

each band in said second group being toward the house end of said reflector from said transverse plane and lying between planes making angles of about 45° with the plane containing said bottom edge, and

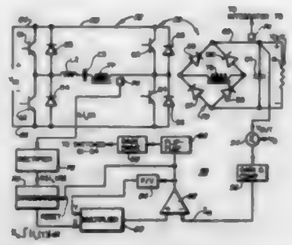
substantially all of said facets of said bands in said second group being set at angles to reflect light from said lamp downwardly and laterally of said reflector and away from the edge of said roadway adjacent said luminaire.

4,694,383

CONTROLLER FOR A RESONANT CONVERTER

Vietson M. Nguyen, and P. John Dhyanchand, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 15, 1986, Ser. No. 907,581
Int. Cl.[4] H02M *3/337*
U.S. Cl. 363—17 **18 Claims**



1. A controller for a resonant DC/DC converter having at least one power switch which is controlled to develop intermediate AC power in a resonant circuit, comprising:

first means for developing a signal representing a parameter of the intermediate AC power;

an integrator having an input coupled to the first developing means for integrating the signal developed thereby;

a combining circuit having a first input coupled to an output of the integrator, a second input and an output at which is developed a combined signal;

a comparator coupled to the output of the combining circuit for comparing the combined signal against a reference signal; and

second developing means coupled between the output of the comparator and a second input of the combining circuit for developing a feedback signal which represents the frequency of the comparator output and which is combined by the combining circuit with the output of the integrator to derive the combined signal;

whereby the comparator develops signals which are used to control the switch in the resonant converter.

4,694,384

HVIC POWER SUPPLY CONTROLLER WITH PRIMARY-SIDE EDGE DETECTOR

Robert L. Steigerwald, Scotia, N.Y.; Kevin C. Routh, Durham, N.C.; Glenn S. Claydon, Wynantskill, and William H. Bicknell, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,089
Int. Cl.[4] G05F *1/56;* **H02M** *3/335*
U.S. Cl. 363—17 **21 Claims**

1. A power supply for converting a first DC potential to a second DC potential of predetermined amplitude, comprising:

primary side means for receiving the first DC potential with respect to a primary side common potential;

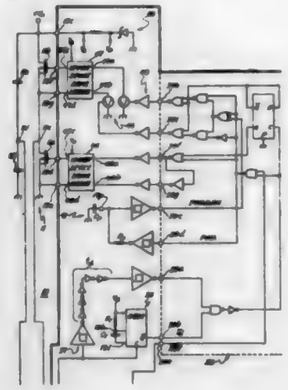
chopper means for converting the first DC potential at the primary side receiving means to a chopped signal with a periodically varying amplitude;

a potential transformer having a primary winding, receiving from the chopper means the chopped signal with respect to said primary side common potential, and a secondary winding providing on a secondary side a secondary signal, with respect to a secondary side common potential which is isolated from said primary side common potential, with said secondary signal having an amplitude responsive to at least one characteristic of the chopped signal received by the primary winding;

means for converting the secondary signal to at least the second potential;

means for providing a sequential digital data signal indicative of the magnitude and polarity of the error of the actual second potential with respect to the predetermined second potential amplitude;

means for isolatively coupling the digital data signal from the secondary side to the primary side of the power supply; and



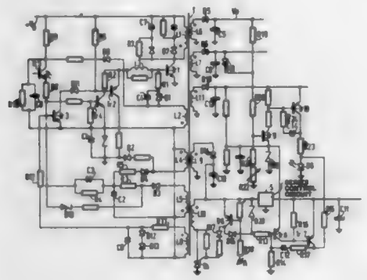
means, including a digital data edge detector for recovering each data bit of the digital data signal, on the primary side, responsive substantially only to each edge transition thereof, for controlling the operational characteristics of said chopper means to vary the chopped signal in manner to reduce the error of said second DC potential.

4,694,385

SWITCHED-MODE POWER SUPPLY WITH DELAY NETWORK TO REDUCE SWITCHING LOSSES

Antonius A. Marinus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 30, 1986, Ser. No. 890,593
Claims priority, application Netherlands, Aug. 26, 1985, 8502339
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—19 **12 Claims**



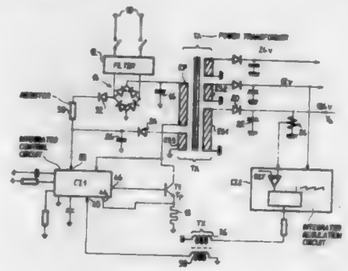
1. A switched-mode power supply circuit for converting a d.c. input voltage into a d.c. output voltage comprising: a controllable power switch connected in a series arrangement with a primary winding of a transformer, means coupling the series arrangement to input voltage terminals, said transformer having a secondary winding to which a rectifier is coupled for providing the output voltage, the primary winding forming part of a resonant circuit when the switch and rectifier pass no current, a drive circuit including a delay network connected to a control electrode of the switch for each time initiating turn-off of the switch, whereafter the voltage across the switch increases to a given value and substantially maintains said value, whereafter the said voltage decreases in accordance with an oscillation at a resonance frequency, and for each time initiating turn-on of the switch, whereafter the voltage across the switch is substantially zero, characterized in that the delay network is coupled to the control electrode of the power switch for each time adjusting the turn-on of said switch at an instant which is substantially half a cycle of the resonance frequency later than the initial instant of the decrease of the voltage across the switch during its previous cut-off time.

4,694,386

CHOPPED POWER SUPPLY CONTROL CIRCUIT WITH AUTOMATIC START-UP

Jean de Sartre, Meylan, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 7, 1986, Ser. No. 827,147
Claims priority, application France, Feb. 8, 1985, 85 01823
Int. Cl.[4] H02P *13/22*
U.S. Cl. 363—49 **7 Claims**



1. A chopped power supply control circuit intended to receive periodic regulation control signals and to produce periodic square waves enabling a main switch of the power supply, the square waves having a variable width as a function of their regulation control signals, which circuit comprises:

means for detecting the presence of regulation control signals,

a very low frequency oscillator controlled by the detection means, this oscillator producing, in the absence of regulation signals, a succession of very low frequency periodic cycles, the oscillator being inhibited by the regulation control signal detection means,

a high frequency oscillator producing chopping signals palliating the absence of regulation signals for producing enabling square waves,

an inhibition means for allowing transmission of the chopping siganls to the switch only during a first phase of each very low frequency periodic cycle and for preventing such transmission during the rest of the cycle, the first phase of each cycle having a duration which is long compared with the period of the high frequency oscillator and short compared with the period of the very low frequency oscillator.

4,694,387

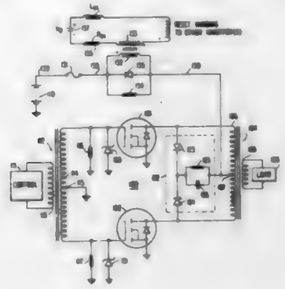
INDUCTIVE DEVICES

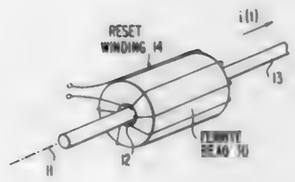
Charles S. Walker, King County, Wash., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 8, 1987, Ser. No. 1,610
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 **5 Claims**

1. An inductive device for protecting one or more transistors in a power supply composed of a bead of magnetic material, said bead being formed with an axial aperture through which an electrical conductor electrically connected to electrodes of

the transistors is adapted to pass, and a reset winding wound on said bead and connected to a source of constant current for resetting said inductive device so that the maximum volt-





second absorbtion capability of said inductive device is available for preventing destructively high current spikes from flowing through said electrical conductor.

4,694,388

SYNCHRONIZER FOR COMMONLY CLOCKED CONVERTERS

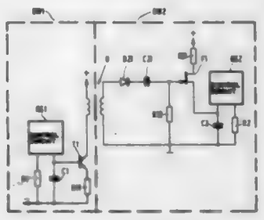
Walter Lösel, Fürth, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,602

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1985, 3528766

Int. Cl.⁴ H02M *11/00*

U.S. Cl. 363—72 **7 Claims**



1. An arrangement for synchronizing the oscillators of several clocked direct voltage converters each having a control circuit with the oscillator included as an integrated element, each control circuit having a connection for a capacitor and a connection for a resistor with the capacitor and resistor defining the frequency of its oscillator, characterized in that the frequency of the oscillator of a first direct voltage converter is adjusted to be higher than the frequency of the oscillators of all other direct voltage converters, means for transmitting a pulse sequence, whose impulse frequency is proportional to the frequency of the oscillator of the first direct voltage converter, from the first direct voltage converter through an element providing voltage isolation to all of the other direct voltage converters, wherein the pulses of the pulse sequence adjust a predetermined charging state for the capacitors of the control circuits of all the other direct voltage converters, and wherein the adjustment is repeated at the frequency of the oscillator of the first direct voltage converter.

4,694,389

PROPORTIONAL TRANSISTOR BASE DRIVE CIRCUIT FOR USE IN POWER CONVERTERS AND COMPONENTS THEREOF

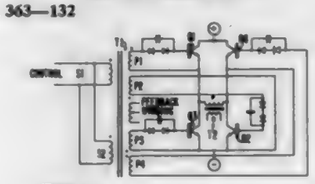
Kenneth T. Small, Cupertino, Calif., assigner to Boschert, Incorporated, Milpitas, Calif.

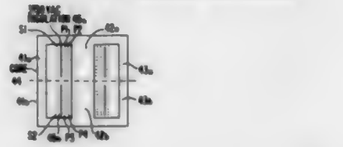
Division of Ser. No. 615,009, May 29, 1984, Pat. No. 4,628,432.

This application Jun. 26, 1986, Ser. No. 878,938

Int. Cl.⁴ H02M *7/5387*

U.S. Cl. 363—132 **13 Claims**







1. A transformer comprising:

a core containing a center leg, a first outer leg, a second outer leg, a first cross piece joining a first end of said center leg to a first end of said first outer leg and a first end of said second outer leg, and a second cross piece joining a second end of said center leg with a second end of said first outer leg and a second end of said second outer leg;

a first primary winding wound around a first portion of said center leg but not a second portion of said center leg;

a second primary winding wound around said first primary winding;

first insulation wound around said first primary winding and said second primary winding;

a first secondary winding wound around said first insulation;

a third primary winding wound around said second portion of said center leg but not said first portion;

a fourth primary winding wound around said third primary winding;

second insulation wound around said third and fourth primary windings; and

a second secondary winding wound around said second insulation,

wherein said first and second insulation isolates said primary windings from said secondary windings so as to insure that said transformer meets international safety standards.

4,694,390

MICROPROCESSOR-BASED CONTROL AND DIAGNOSTIC SYSTEM FOR MOTOR OPERATED VALVES

Robert A. S. Lee, Tewksbury, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 28, 1985, Ser. No. 750,617

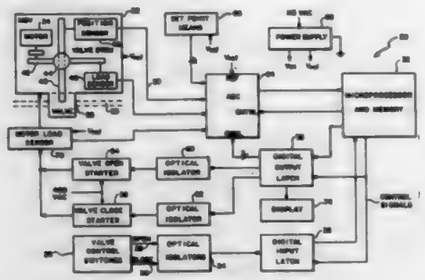
Int. Cl.⁴ G05B *13/02;* **F16K** *31/02*

U.S. Cl. 364—165 **22 Claims**

20. A method of controlling a motor operated valve having a valve stem for opening and closing said valve, and motor means for driving said valve stem so as to controllably open and close said valve; the steps of the method comprising:

measuring the position of said valve stem and producing a valve stem position signal;

measuring the load on said valve stem and producing a valve stem load signal;



periodically, when said valve is being opened, determining the rate of change of the position of said valve stem, and predicting the position of said valve stem at a predefined time in the future in accordance with said rate of change of valve stem position; and

turning off said motor if said predicted valve stem position is beyond a preselected open valve position.

4,694,391

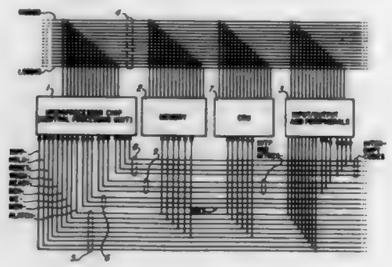
COMPRESSED CONTROL DECODER FOR MICROPROCESSOR SYSTEM

Karl M. Guttag, and Kevin C. McDonough, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 24, 1980, Ser. No. 210,108

Int. Cl.⁴ G06F *9/00*

U.S. Cl. 364—200 **20 Claims**



1. A microprocessor formed in a face of a semiconductor body comprising:

(a) a rectangular pattern in said face containing an arithmetic logic unit, a plurality of data and address registers, and a plurality of parallel busses, the rectangular pattern having a length and width;

(b) a control ROM in said face having a length and a width, the length of said control ROM being much greater than its width, the length of said control ROM extending alongside the length of said rectangular pattern and being spaced from the rectangular pattern by much less than the width of the rectangular pattern;

(c) said arithmetic logic unit containing N parallel bits with each bit having two inputs and an output, the bits of the arithmetic logic unit extending along said face of the semiconductor body in a line parallel to said width of said rectangular pattern;

(d) said plurality of data and address registers, each containing N parallel bits, each bit having an input and an output, the bits of each of the separate registers being formed in said face, in a line parallel to said width of the rectangular pattern aligned with and corresponding one-to-one with the bits of the arithmetic logic unit,

(e) said plurality of parallel busses, each having N parallel conductor lines, each bus formed at said face and extending in the direction of said length of the rectangular pattern and generally perpendicular to said line of the bits of the arithmetic logic unit and said lines of bits of the registers, each of the parallel conductor lines of a plurality of said busses crossing over a bit of the arithmetic logic unit and at least one of said registers,

(f) a plurality of control lines at said face within said rectangular pattern running generally perpendicular to said busses and parallel to said lines of bits the arithmetic logic unit and registers, the control lines being connected to logic means in the arithmetic logic unit and registers to define connections to and from the busses for the inputs and outputs of the registers and inputs and outputs of the arithmetic logic unit,

(g) said control ROM generating a plurality of control signals for coupling to said control lines and comprising:

(i) a plurality of row lines and means for selecting one of said row lines for activation in response to an address,

(ii) a plurality of column lines intercepting said row lines to provide an array, the column lines divided into a plurality of separate groups with one group for each of said control signals, and means for selecting no more than one column line in each group for activation in response to an address, the number of column lines per group differing among the groups.

4,694,392

VIDEO DISPLAY CONTROL

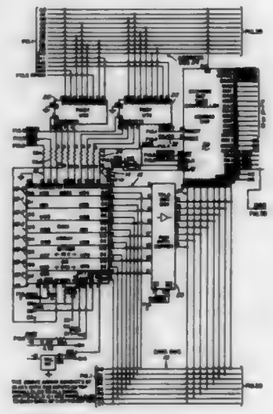
Jerry L. Ballard, 3341 Edith La., Haltom City, Tex. 76117; Dale Chatham, 2202 Dennis Rd., Weatherford, Tex. 76084, and Gerald E. Gaulke, 1308 Timber Valley, Lewisville, Tex. 75028

Continuation of Ser. No. 489,262, Apr. 27, 1983, abandoned.

This application Sep. 25, 1985, Ser. No. 779,819

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—200 **46 Claims**



1. In a microcomputer system, a video controller comprising;

a video memory means for storing video character codes and including means for controlling writing into and

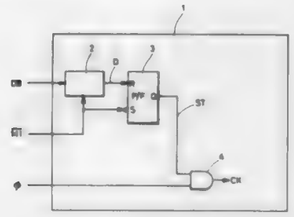
reading therefrom and means defining a memory address and memory data,
a video data bus coupled to said video memory means,
a central processing unit address bus,
a cathode ray tube controller means having address lines,
multiplexer means having first and second input sets and an output set,
means coupling the central processing unit address bus to the first input set,
means coupling the cathode ray tube controller means address lines to the second input set,
means coupling the output set to the video memory means address input,
buffer means coupling said video data bus to a central processing unit data bus for transfer of data between said central processing unit and said video memory means,
and control means for controlling the multiplexer means whereby in one state the video memory means is addressed from the cathode ray tube controller means and in the other state the video memory means is addressed from the central processing unit.

4,694,393

PERIPHERAL UNIT FOR A MICROPROCESSOR SYSTEM

Takaaki Hirano, Nara; Setsufumi Kamuro, Yamatokoriyama; Akira Yamaguchi, Nara; Junichi Tanimoto, Tenri, and Mikiro Okada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1984, Ser. No. 619,302
Claims priority, application Japan, Jun. 14, 1983, 58-107215; Jun. 15, 1983, 58-108279
Int. Cl.⁴ G06F *1/04*
U.S. Cl. 364—200 **7 Claims**



1. A peripheral unit for a microprocessor system including a microprocessor, comprising:
means, responsive to a halt-operation instruction from the microprocessor, for outputting a halt-operation signal;
means, responsive to an activation signal from the microprocessor, for producing an internal clock signal for activating said peripheral unit; and
means, responsive to said halt-operation signal, for inhibiting the production of said internal clock signal.

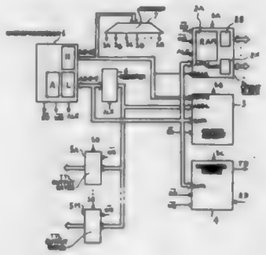
4,694,394

MICROPROCESSOR SYSTEM HAVING A MULTIPLEXED ADDRESS/DATA BUS WHICH COMMUNICATES WITH A PLURALITY OF MEMORY AND INPUT/OUTPUT DEVICES INCLUDING TTL OUTPUT GATES

Giorgio Costantini, Milan, Italy, assignor to Honeywell Information Systems Italia, Milan, Italy

Filed Oct. 10, 1985, Ser. No. 786,376
Claims priority, application Italy, Dec. 12, 1984, 24021 A/84
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. A microprocessor system comprising:
a microprocessor having a first group of address lines internally connected to the output of a first address register H,
a second group of multiplexed address/data lines internally and selectively connected to the output of a second address register L or of an accumulator and a plurality of control lines;
a demultiplexing register having inputs connected to said second group or multiplexed address/data lines and one of said control lines;
a control memory having address inputs connected to the outputs of said demultiplexing register and to at least one line of said first group, having information outputs connected to said second group of lines, and a selection input;



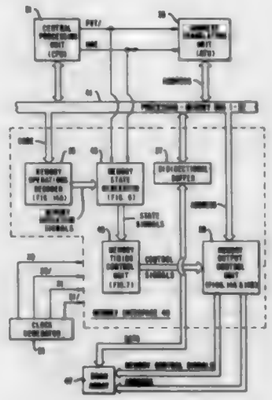
a plurality of TTL output gates provided with data inputs, one enabling input and control input connected to another one of said control lines;
a decoder having inputs connected to a subset of lines of said first group and a plurality of outputs, each of them respectively connected to the selection input of said control memory and enabling input of said TTL output gates; and
a direct connection between the outputs of said demuliplexing register and the data inputs of said TTL output gates.

4,694,395

SYSTEM FOR PERFORMING VIRTUAL LOOK-AHEAD MEMORY OPERATIONS

Rocky M. Young, Escondido, and Tri T. Vo, San Diego, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 25, 1985, Ser. No. 801,361
Int. Cl.⁴ G06F *12/10*
U.S. Cl. 364—200 **7 Claims**



1. A data processing system comprising:
a memory bus;
processing means coupled to said memory bus for providing during a first cycle either a real address for a real memory operation or a first virtual address for a virtual memory

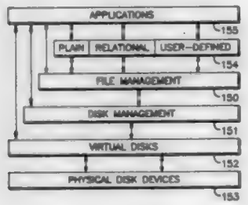
operation, said real address including first, second and third real address portion, said first virtual address including said first real address portion and a second virtual address portion, said processing means further selectively providing first and second processor signals as a function of a desired one of a plurality of real and virtual memory operations to be performed by the data processing system;
address translation means coupled to said processing means and said memory bus being responsive to said first processor signal and virtual address from the processing means via said memory bus for translating said second virtual address portion into said second and third real address portions during a first cycle, for, generating said second processor signal to a memory state generator and for forwarding said second and third real address portions to said memory bus during at least a second cycle;
decoding means coupled to said memory bus for converting said third real address portion into memory operation signals that determine which one of said plurality of memory operations is to be performed by the data processing system;
said memory state generator selectively responsive to said first and second processor signals and to said memory operation signals for selectively generating an associated predetermined set of state signals that determine the number of cycles required to perform a desired one of said plurality of real and virtual memory operations;
memory timing control means responsive to said set of state signals for selectively generating a set of timing control signals;
memory output control means selectively responsive to addresses said real address portions on said memory bus and to said set of control signals from said memory timing control means for buffering and selectively gating memory control signals and said first and second real address portions to initiate the selected one of said plurality of real and virtual memory operations;
an addressable memory being selectively responsive to said set of memory control signals and said first and second real address portions for accessing desired data during the cycle time of the memory operation that is determined by said set of timing control signals; and
output means coupled to said addressable memory and to said memory bus for passing accessed data therebetween.

4,694,396

METHOD OF INTER-PROCESS COMMUNICATION IN A DISTRIBUTED DATA PROCESSING SYSTEM

Bernhard P. Weisshaar, Toronto; Frank C. Kolnick; Andrew I. Kun, both of Willowdale, all of Canada, and Bruce M. Mansfield, Kent, Wash., assignors to Computer X, Inc., Schaumburg, Ill.

Filed May 6, 1985, Ser. No. 730,892
Int. Cl.⁴ G06F *1/00*
U.S. Cl. 364—300 **13 Claims**



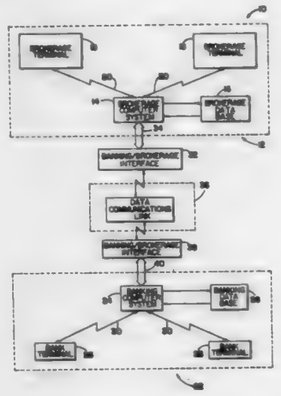
1. A method of communicating between processes in a distributed data processing system, said system comprising a plurality of individual cells and at least two processes resident on different ones of said cells, said method comprising the steps of:
(a) generating a request by a first process located in a first one of said cells to transmit a message to a second process identified only by name, and
(b) transmitting said message to said second process.

4,694,397

BANKING/BROKERAGE COMPUTER INTERFACE SYSTEM

David J. Grant, Marlborough, and Andrew M. Vignola, Sr., Cheshire, both of Conn., assignors to The Advest Group, Inc., Hartford, Conn.

Filed Dec. 27, 1984, Ser. No. 686,976
Int. Cl.⁴ G06F *15/30*
U.S. Cl. 364—408 **3 Claims**



1. Apparatus for interfacing a banking system and a brokerage system to automatically create transaction processing within and between said banking and said brokerage systems, said brokerage system having a number of brokerage offices, said apparatus comprising:
a banking system having a plurality of client bank accounts;
bank account data file means for storing information characterizing each client bank account;
a brokerage system having a plurality of client brokerage accounts, at least one of said brokerage account clients having a bank account in said banking system;
brokerage account data file means for storing information characterizing each client brokerage account;
means for entering data at a brokerage office into said brokerage system for a client having bank and brokerage accounts, said data being representative of a plurality of client desired transaction activities, at least one of said plurality of activities characterized by a first activity wherein a bank account deposit transaction is initiated at said brokerage system, a second of said plurality of activities characterized by a bank account withdrawal transaction initiated at said brokerage system and a third of said plurality of activities characterized by a purchase or sale of investment instruments at said brokerage system;
first means responsive to said entry means activity data and said brokerage data file means for updating said client brokerage account characterizing information and for automatically generating data representative of a monies transfer transaction between said brokerage system and said banking system for said client banking and brokerage accounts;
receiving and verification means at said banking system for receiving and verifying said monies transfer transaction data;
second means responsive to said transfer transaction data and said banking data file means for updating said client bank account characterizing information to reflect said

client desired transaction activity entered at said brokerage system office;

wherein monies deposited at said brokerage system by said client and identified for repository at said banking system in a bank account associated with said client making the deposit at said brokerage system are deposited in said client bank account in response to monies transfer transaction data generated by said brokerage and banking systems for said client banking and brokerage accounts in accordance with an investment strategy associated with said client, said client brokerage account deposited monies being available for withdrawal from said client bank account by said client at said banking system;

wherein monies deposited at said banking system by said client and identified for repository at said brokerage system in a brokerage account associated with said client making the deposit at said banking system are deposited in said client bank account in response to monies transfer transaction data generated by said brokerage and banking systems for said client banking and brokerage accounts in accordance with an investment strategy associated with said client, said client banking account deposited monies being available in said client brokerage account to satisfy brokerage transactions by said client brokerage account, and

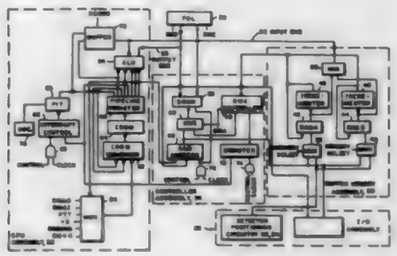
wherein monies withdrawn from said client bank account by said client at said banking system are satisfied from monies reposing in said client bank account to the extent such withdrawal monies do not exceed the monies available in said client bank account, additional monies representative of the difference in monies between the desired withdrawal and available bank account monies being automatically transferred from said client brokerage account to said client bank account in response to monies transfer transaction data generated by said brokerage and banking system for said client banking and brokerage accounts in accordance with an investment strategy associated with said client.

4,694,398

DIGITAL IMAGE FRAME PROCESSOR

Francis R. Croteau, Burlington, Mass., assignor to Baird Corporation, Bedford, Mass.

Filed Sep. 25, 1984, Ser. No. 654,323
Int. Cl.[4] G01T *1/29*; G06F *15/52*
U.S. Cl. 364—414 **11 Claims**



1. A frame processor for images produced by a digital camera system characterized by an array of digital detecting means and an array of digital transducing means, said frame processor comprising:

(a) buffer means including at least a buffer random access memory characterized by firmware arrays of buffer record means for operative connection to said array of digital detecting means and said array of digital transducing means;

(b) controller means including a dynamic random access memory characterized by firmware arrays of dynamic record means operatively connected to said buffer means for association with said firmware arrays of buffer record means;

(c) logic means including an arithmetic logic unit incorporating a bit slice arrangement of microprocessors operatively connected to said controller means for association with said firmware arrays of dynamic record means;

(d) said buffer record means being responsive to signals corresponding to software arrays of data representations and software arrays of correction representations from said digital detecting means and said digital transducing means in order to produce software arrays of initial buffer data;

(e) said dynamic record means being responsive to signals corresponding to said software arrays of initial buffer data to produce software arrays of initial dynamic data;

(f) said arithmetic logic unit being responsive to signals corresponding to said software arrays of initial dynamic data to produce software arrays of functionally transformed data;

(g) said dynamic record means being responsive to signals corresponding to said software arrays of functionally transformed data to produce software arrays of output dynamic data; and

(h) said arithmetic logic unit and said dynamic random access memory of the controller means being responsive to signals corresponding to software arrays of output dynamic data to present software arrays of final image representations;

(i) said buffer means including a first random access memory means and a second random access memory means;

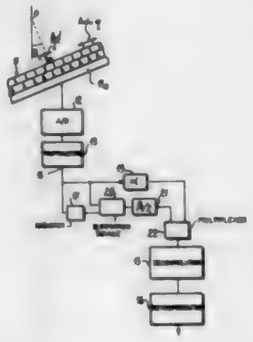
(j) wherein during a single given time interval said first random access memory means and said second random access memory means respond to signals corresponding to first software arrays of data representations and second software arrays of data representations from said digital detecting means and said digital transducing means.

4,694,399

PROCESS OF IMAGE RECONSTRUCTION BY TOMODENSITOMETRY WITH IMPROVED SPATIAL RESOLUTION

Siv C. Tan, Paris; Tri H. Nguyen, Le Pre St. Gervais, and Claude D. Benchimol, Paris, all of France, assignors to Thomson-CGR, Paris, France

Filed Mar. 14, 1985, Ser. No. 711,609
Claims priority, application France, Mar. 16, 1984, 84 04113
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **2 Claims**



1. A process of tomodensitometric image reconstruction, which comprises rotating a measuring assembly including an X-ray source and detection means in the plane of a section to be imaged, said detection means operating within a certain zone so as to detect the non-absorbed X-rays, taking a predetermined number of views which comprise each constant pitch samples of N values representing the linear attenuation values produced by said detection means for a given angular position of said measuring assembly, said views being taken at a constant angular pitch, and subjecting said views to deconvolution and retroprojection, said process further comprising the steps of:

setting off the centre of the detection zone by a quarter of said sampling pitch with respect to the centre of rotation of said measuring assembly;

gathering the views of an image over one complete revolution of said measuring assembly;

weighing said attenuation values for each view, by applying a first selected coefficient;

producing for each view a number of intermediary values, equivalent to the number of attenuation values, each intermediary value being obtained by adding two attenuation values corresponding to measured sampled adjacent values of said detection means and by weighing the thus obtained sum with a second selected coefficient; and

applying said deconvolution and retroprojection to each group of weighed attenuation values and intermediary values corresponding to each view.

4,694,400

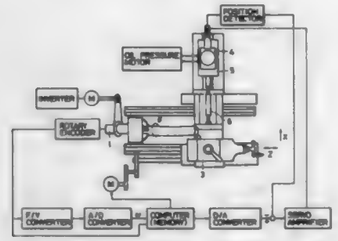
Patent Not Issued For This Number

4,694,401

APPARATUS FOR FORMING DIVERSE SHAPES USING A LOOK-UP TABLE AND AN INVERSE TRANSFER FUNCTION

Toshiro Higuchi, Yokohama, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,825
Claims priority, application Japan, Mar. 31, 1983, 58-53905
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—475 **3 Claims**



2. In an apparatus having a rotatable article and a movable part wherein the distance from the center of rotation of said article is controlled to form a pre-designated closed curve on said article, an apparatus for forming diverse shapes, said apparatus comprising:

means for detecting a rotational angle of said rotatable article;

a memory means for storing a function value representative of said pre-designated closed curve shape corresponding to each rotational angle and a pre-calculated derivative value;

arithmetic operational means responsive to an output representative of a rotational angle from said detecting means for reading a function value and a derivative value from said memory means corresponding thereto, arithmetically generating a modified signal value so as to obtain a transmission characteristic reverse to a transmission function of a servo-mechanism, used in controlling the position of the movable part, from said read-out values, and outputting said modified signal for designating a position of said movable part forming said designated closed curve; and

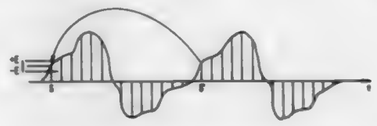
a control mechanism including said servo-mechanism for controlling the position of said movable part according to the output from said arithmetic operational means.

4,694,402

WAVEFORM DISTURBANCE DETECTION APPARATUS AND METHOD

Alexander McEachern, Oakland, and Frederic Nitz, Boulder Creek, both of Calif., assignors to Basic Measuring Instruments, Foster City, Calif.

Filed May 28, 1985, Ser. No. 738,566
Int. Cl.[4] G01R *19/65, 29/04*
U.S. Cl. 364—487 **49 Claims**



49. A waveform disturbance detection apparatus for detecting disturbances in an alternating waveform having periodic, normally similar cycles, comprising

means for obtaining consecutive samples from a current cycle of the waveform;

means for storing consecutive reference samples from a reference cycle, wherein the reference cycle is the cycle which immediately preceded the current cycle of the waveform;

means for comparing each of the consecutive samples from the current cycle, as each consecutive sample is obtained, to a corresponding one of the reference samples stored in the storing means to detect whether a disturbance is present in the waveform; and

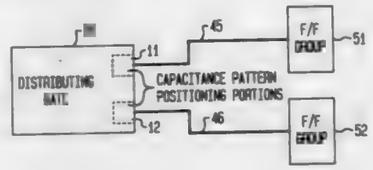
means for replacing each of the reference samples stored in the storing means with the corresponding sample from the current cycle against which it was compared, so that the reference samples in the storing means are updated each time a sample from the current cycle is evaluated.

4,694,403

EQUALIZED CAPACITANCE WIRING METHOD FOR LSI CIRCUITS

Minoru Nomura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,512
Claims priority, application Japan, Aug. 25, 1983, 58-155583
Int. Cl.[4] H01L *27/02, 27/10*; H03H *21/00*; H04B *3/00*
U.S. Cl. 364—488 **9 Claims**



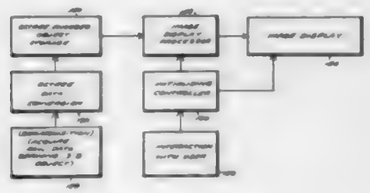
7. A method for compensating a signal transmission delay time in a LSI circuit which includes a plurality of individual circuits and at least one block having input and output terminals and a predefined area in which electric wiring is placed, comprising the step of applying a capacitance pattern having a predetermined capacitance value onto said predetermined area of said block, thereby to insert an equalizing capacitance in said individual circuits to provide said signal transmission delay time compensation.

4,694,404

HIGH-SPEED IMAGE GENERATION OF COMPLEX SOLID OBJECTS USING OCTREE ENCODING

Donald J. R. Meagher, Loudonville, N.Y., assignor to Key Bank N.A., Albany, N.Y.

Filed Jan. 12, 1984, Ser. No. 570,287
Int. Cl.[4] G06F *15/62*; G09G *1/14*
U.S. Cl. 364—518 **110 Claims**



52. A system for generating a two-dimensional image of a three-dimensional scene including at least one object, said system comprising:

data acquisition means for acquiring input data volumetrically defining an object to be displayed;

data conversion means, responsive to said input data acquired by said data acquisition means, for generating electrical signals defining said object within a three-dimensional universe subdivided into a hierarchy of a plurality of levels of subdivided volumes, each of said levels comprising at least one discrete volume, said volumes being characterized by the degree to which they are occupied by said object, any subdivided volume in said universe being a subdivision of a volume in the level above said any volume;

interactive means for selecting a point of view for viewing said object in response to interaction therewith by a user and for producing signals indicating said selected point of view;

image processing means, connected to said data conversion means and said interactive means, for generating electrical signals specifying an image of said object as viewed from said selected view point, including:

(1) image window processing means for establishing a two-dimesional view plane, including means for subdividing said view plane into a plurality of discrete areas;

(2) object node processing means, responsive to said electrical signals produced said conversion means and also connected to receive said selected point of view signals for determining a traversal sequence in response to said selected point of view signals and for visiting the volumes of said three-dimensional universe in said hierarchy in the order of said sequence until a volume occupied by said object to a predetermined degree which is not visually obstructed from said selected point of view by any other volume in said hierarchy occupied said object to said predetermined degree is encountered, and for so visiting, in the order of said sequence, each of the volumes of said universe occupied by said object to object to said predetermined degree and not visually obstructed from said selected point of view by any volume in said hierarchy occupied by said object to said predetermined degree and also not projected onto said view plane earlier in said sequence until all of the volumes in said hierarchy occupied by said object to said predetermined degree and not visually obstructed from said selected point of view by any other volume in said hierarchy occupied by said object to said predetermined degree have been visited;

(3) geometric processing and projecting means, connected to receive said point of view signal and operatively coupled to said object node processing means, for projecting each of said unobstructed volumes onto said view plane at a location and orientation determined by said selected point of view and the location of said volumes in said three-dimensional universe;

(4) geometric comparing means, operatively coupled to said image window processing means and said geometric processing and projecting means, for determining, for each of said projections, which of said discrete view plane areas are enclosed by said projections and which of said view plane areas intersect but are not enclosed by said projections, said view plane subdividing means including recursive means for further subdividing view plane areas determined by said geometric comparing means to intersect but not to be enclosed by said projections; and

(5) window writer means, connected to said geometric comparing means for painting said areas of said view plane determined to be both enclosed by a projection and not already painted because of enclosure by the projection of a volume visited earlier in said sequence; and

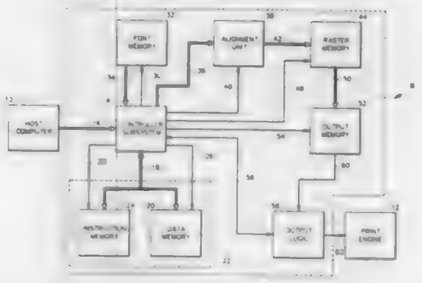
image display means, connected to said window writer means, for displaying the painted view plane areas.

4,694,405

LASER PRINTER CONTROLLER DATA ALIGNMENT DEVICE

Colin Bradbury, and George H. Douglas, both of San Diego, Calif., assignors to Office Automation Systems, Inc., San Diego, Calif.

Filed Jul. 9, 1985, Ser. No. 753,669
Int. Cl.[4] G01D *15/06*
U.S. Cl. 364—518 **16 Claims**



1. A laser printer controller for interfacing a host computer system with a laser print engine comprising:

processor means responsive to user inputs, controller program instructions and system control signals for providing data calculations, memory storage addressing and operational control signals;

control memory means for storing a display list of certain character representations selected from a predetermined set of character representations and their respective locations for a page of data to be printed;

font memory means for storing a dot-by-dot character pattern corresponding to each character representation of said predetermined set of character representations;

output memory and logic means for holding a dot line of data to be printed and for controlling the serial transmission of the data in each dot line to a laser print engine for printing thereby;

raster memory means for receiving and storing a partial page bit map of the page of data to be printed, said partial page bit map providing sequential dot lines of data for transfer to the output memory and logic means, said raster memory means having means for clearing the dot line just transferred to the output memory means and logic means, and scroll means for appending the just cleared dot line to the bottom of the partial page bit map; and

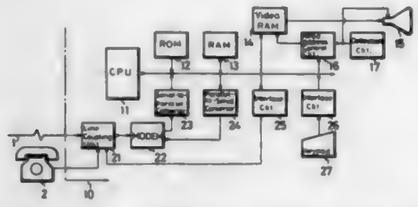
alignment device means responsive to said processor means for accepting data words containing the dot-by-dot character patterns in a first word orientation associated with said certain character representations from the control memory means, and for generating and storing data words in a second orientation having bit representations of print data in the partial page bit map for transfer to said raster memory means, said alignment device means including means for aligning the data words of the first word orientation with the data words of a second orientation as required by fixed storage boundaries of the partial page bit map in the raster memory means and means for inclusively ORing the aligned second word orientation in the partial page bit map of the raster memory.

4,694,406

APPARATUS FOR DISPLAYING SCROLLING IMAGES

Michiro Shibui, Tokyo; Yoshihiro Hanamoto, Hyogo; Yoshio Ishigaki, Tokyo; Hiroshi Sahara, Kanagawa; Satoru Maeda, Kanagawa, and Yasushi Noguchi, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone and Sony Corporation, both of Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,448
Claims priority, application Japan, Apr. 13, 1984, 59-74367
Int. Cl.[4] G06F *3/14*
U.S. Cl. 364—518 **8 Claims**



1. Apparatus for scrolling display images derived from a data signal formed as a plurality of packets that include pattern signals formed of a plurality of horizontal lines and a corresponding color signal, said apparatus comprising:

display means for producing a visual display of an input signal as a plurality of horizontal lines;

first memory means connected for receiving and storing said pattern signals and having a plurality of first addresses corresponding respectively to said plurality of horiozontal display lines and having a first buffer area for temporarily storing received pattern signals;

second memory means connected for storing said color signal and having a plurality of second addresses corresponding respectively to said plurality of packets and having a second buffer area for temporarily storing received color signals;

means for storing said pattern signals and a corresponding color signal in said first and second buffer areas, respectively;

means for reading out said first memory means and said first buffer area by accessing aid first addresses in a firt predetermined order and for reading out said second memory means including said second buffer area by accessing said second addresses in a second predetermined order;

means for incrementing the number of an initial accessing address of said first memory means every hroizontal period and means for incrementing the number of an initial accessing address of said second memory means every plurality of horizontal periods, whereby said first and second buffer memory areas are read out respectively, after said first and second memory means; and

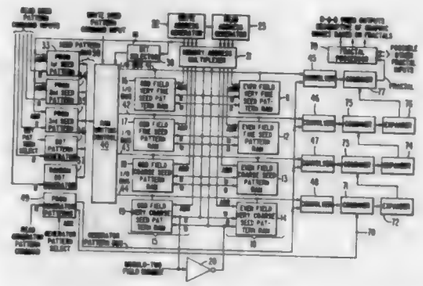
means for transferring a pattern signal of a horizontal line stored in said first buffer area to a corresponding address of said first memory means and for transferring a corresponding color signal stored in said second buffer area to a corresponding address of said second memory means, whereby said pattern signals and said corresponding color signal are fed to said display means.

4,694,407

FRACTAL GENERATION, AS FOR VIDEO GRAPHIC DISPLAYS

Joan M. Ogden, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 11, 1985, Ser. No. 743,623
Int. Cl.[4] G06F *15/336, 15/66*
U.S. Cl. 364—518 **55 Claims**



1. A method of generating fractals comprising the steps of:

convolving generator patterns with seed patterns of dots to generate convolution results for each of a plurality of sample spaces, such spaces being consecutively ordinally numbered in order of their successively more sparse sampling;

expanding the convolution results in each of the higher numbered sample spaces through interpolation to a sampling density comparable to that in a lower numbered sample space;

combining samples of the convolution results and the expanded convolution results of similar sampling density on a corresponding sample-by-sample basis; and

carrying out said steps of expanding through interpolation and said steps of combining so as to result in the expanded convolution results of each of the higher numbered sample spaces ultimately being combined with the convolution results in said first sample space, thereby generating said fractals.

4,694,408

APPARATUS FOR TESTING AUTO ELECTRONICS SYSTEMS

James V. Zaleski, 1631 Paterna Rd., Santa Barbara, Calif. 93103

Filed Jan. 15, 1986, Ser. No. 819,252
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—551 **13 Claims**

1. A diagnostic test unit for automobile electronics systems, comprising:

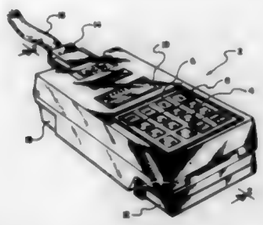
an off-vehicle microprocessor,

means for selecting and providing operational controls to the microprocessor during a test sequence,

a selectable program means providing a selectable one of a plurality of diagnostic test sequences to the microprocessor for exercising and altering the operation of particular electrical systems in the automobile,

a transceiver which is connectable to provide an interface between the microprocessor and the automobile electronics system, the transceiver providing an interactive path for transmitting test signals from the microprocessor to

exercise and alter the operation of said systems in the automobile, and a receiver path enabling the microproces-



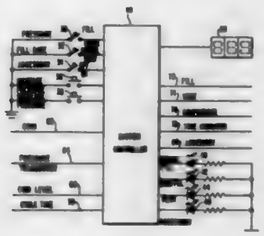
sor to monitor the condition of associated automobile systems while a first system is being exercised, and a power supply for the test unit.

4,694,409

MICROPROCESSOR BASED AIR INFLATION CONTROL SYSTEM

Michael E. Lehman, York, Pa., assignor to Monorail, Inc., Auburn, N.Y.

Filed Jun. 25, 1984, Ser. No. 623,871
Int. Cl.[4] B60C *23/00*; G05D *7/00*; G06F *15/21*
U.S. Cl. 364—558 **11 Claims**



2. A system for adjusting the air pressure in automobile tires and other inflatable devices comprising:

a source of pressurized air;

normally closed inflation valve means having an inlet connected to said source of pressurized air and an outlet connectable to an inflatable device for inflation thereof;

normally closed vent valve means having an inlet connectable to the inflatable device and an outlet for venting the inflatable device;

pressure selector means manually operable by a user of said system for selecting a desired air pressure for the inflatable device;

pressure sensing means for sensing the actual air pressure in the inflatable device;

comparison means for determining the pressure difference between the desired air pressure and the actual air pressure;

first valve control means responsive to said comparison means determining that the desired air pressure exceeds the actual air pressure by at least a first predetermined amount for opening said inflation valve means for an inflation time interval having a duration which varies in response to the magnitude by which the desired air pressure exceeds the actual air pressure, to cause air to pass from said source to an inflatable device connected to said inflation valve means and responsive to said comparison means determining that the desired air pressure exceeds the actual air pressure by at least a second predetermined amount, greater than the first predetermined amount, for opening said inflation valve means for a time interval substantially less than that required to increase the measured actual air pressure to the desired air pressure to avoid inadvertent overfilling of the inflatable device in the event initial connection of the inflation valve means to the inflatable device has resulted in an erroneously low reading of actual air pressure;

second valve control means responsive to said comparison means determining that the actual air pressure exceeds the desired air pressure by at least a third predetermined amount for opening said vent valve means for a vent time interval, to vent air from an inflatable device connected to said valve means inlet; and

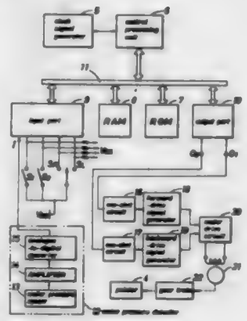
means for operating said sensing means and said comparison means upon closure of said inflation valve means or said vent valve means at the end of an inflation time interval or a vent time interval.

4,694,410

PHYSICAL QUANTITY INDICATING DEVICE BY A POINTER

Mitsuhiro Murata, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 759,014
Claims priority, application Japan, Jul. 26, 1984, 59-113778; May 24, 1985, 60-111491
Int. Cl.[4] G01L *13/06*; G06F *15/20*
U.S. Cl. 364—558 **4 Claims**



1. A device for indicating a physical quantity comprising:

a pointer for indicating a physical quantity; a reversible type pulse motor for driving said pointer;

a detector for detecting said physical quantity at predetermined sampling intervals;

converting means for converting a sampled value of said physical quantity to an indicating data representing the position of said pointer for indicating said sampled value;

a first memory for storing said indicating data till next sampling time;

judging means for judging in which direction said pulse motor is to be driven to provide a data representing the direction of rotation of said pulse motor by comparing the present indicating data with the previous or last indicating data stored in said first memory;

determining means for determining the amount of rotation of said pulse motor on the basis of the difference between the present indicating data and the previous indicating data to provide a data representing the amount of rotation of said pulse motor;

a second memory for storing a motor driving information based on said data of direction and amount of rotation of said pulse motor;

drive-signal producing means for providing a pulse motor-driving signal to drive said motor by the such number of steps in such direction as based on said motor driving information stored in said second memory; and

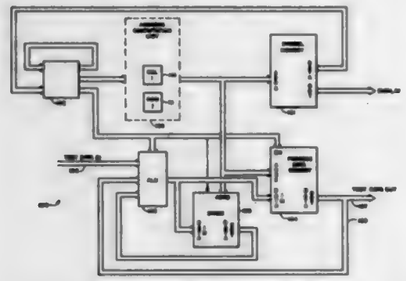
a pulse motor driving circuit for amplifying and directing said pulse motor-driving signal to said pulse motor.

4,694,411

SIMULATION APPARATUS AND METHOD

James L. Barrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 4, 1985, Ser. No. 698,286
Int. Cl.[4] G06F *15/20, 9/44*
U.S. Cl. 364—578 **18 Claims**



9. Apparatus for simulating a network of processing elements arranged in an array pattern, the processing elements comprising the network being of predetermined types each having selected characteristics and being identified by a unique representation, said apparatus comprising:

a. memory means comprising:

(i) network storage means having a plurality of storage locations arranged in an array pattern corresponding to the array pattern of the network, each storage location storing the representation of the processing element at the corresponding location in the network; and

(ii) data storage means for storing process data representative of processing by the processing elements in the network;

b. address computation means connected to said memory means for computing an address for transmission to said memory to identify a storage location in said memory;

c. processing means connected to said data storage means for receiving process data from said data storage means; and

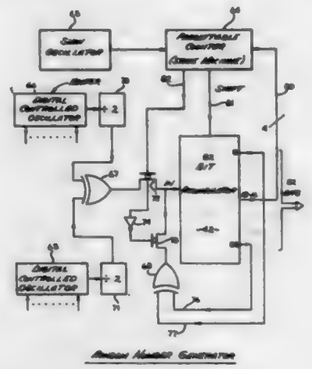
d. control means connected to said address computation means, said processing means and said memory for iteratively generating control signals for (i) enabling the retrieval of the representation of the processing element from the memory at the location identified by said address computation means and generating an address control signal in response to the retrieved representation, said address control signal being coupled to said address computation means to control the generation of an updated address for a succeeding iteration, and (ii) enabling the processing by said processing means of process data from said data storage means and said address computation means including counter means responsive to an address control signal from said control means.

4,694,412

RANDOM NUMBER GENERATOR FOR USE IN AN AUTHENTICATED READ-ONLY MEMORY

Stephen L. Domenik, Santa Cruz; Alan C. Folmsbee; Tai Nguyen, both of Santa Clara, and David A. Shirgley, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 421,513, Sep. 22, 1982. This application Sep. 30, 1985, Ser. No. 782,078
Int. Cl.[4] G06F *1/02*
U.S. Cl. 364—717 **3 Claims**



1. A random number generator for generating a random digital number comprising:

a first, second and third oscillators, said first oscillator oscillating at a relatively lower frequency when compared to said second and third oscillators;

first gating means coupled to receive the output of said second and third oscillators;

a counter coupled to receive an output of said first oscillator, wherein said first oscillator frequency determines a counting rate of said counter;

second gating means operating under control of said counter for gating signals from said first gating means;

an accumulator means for accumulating a digital number coupled to receive signals from said second gating means, said accumulator being coupled to said second and third oscillators for varying the frequency of oscillations of said second and third oscillators;

said accumulator also coupled to said counter, wherein a portion of an output of said accumulator determines a preset value of said counter;

third gating means also operating under control of said counter for gating selected output lines of said accumulator as feedback to input of said accumulator, wherein said accumulator is shifted a predetermined number of times to further accumulate said digital number when said second gating means is inactive;

whereby a random number is generated within said accumulator.

4,694,413

COMPACT-STRUCTURE INPUT-WEIGHTED MULTITAP DIGITAL FILTERS

James H. Arbelter, Hopewell, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 19, 1984, Ser. No. 632,467
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—724 **11 Claims**

1. In an m-tap input-weighted digital filter (where m is a first integer of three or more) responsive to an input stream of successive digital samples for deriving a filtered output stream of successive digital samples; wherein;

(a) each of said input and output digital samples is defined by

Q-bits (where Q is a second given integer of three or more);

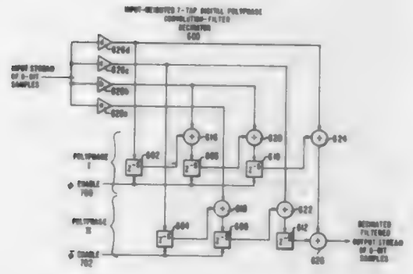
(b) each of said input digital samples is applied to a first of the m taps of said filter, and the relative weight of the first of the m taps of said filter is no greater than one-fourth, thereby deriving a stream of weighted input digital samples for the first of the m taps;

(c) at least each of a subset of the m taps that include the first of the m taps has individually associated therewith a delay means for storing each of S successive digital samples for a given time interval (where S is a third given integer), the delay means individually associated with the first of the m taps having each of said stream of weighted input digital samples applied as an input thereto; and

(d) at least the delay means individually associated with the first of the m taps for storing digital samples defined by no more than Q'-bits (where Q' is any integer having a value that is smaller than that of the second given integer Q and yet is large enough to store all the significant bits of each weighted input digital sample);

the improvement wherein said filter is comprised of:

a first component polyphase input-weighted filter responsive to at least a first portion of said input stream, said first



component filter having respective taps which comprises solely all the odd ones of said m-taps of said filter, the sum of the weights of all said odd ones of said m-taps having a value substantially equal to one-half and an individual one of said S-sample delay means associated with at least each but the last of said odd ones of said m-taps;

a second component polyphase input-weighted filter responsive to at least a second portion of said input stream, said second component filter having respective taps which comprises solely all the even ones of said m-taps of said filter, the sum of the weights of all said even ones of said m-taps having a value substantially equal to one-half an individual one of said S-sample delay means associated with at least each but the last of said even ones of said m-taps, and at least the delay means individually associated with the first of said even ones of said m-taps for storing digital samples defined by no more than Q'-bits; and

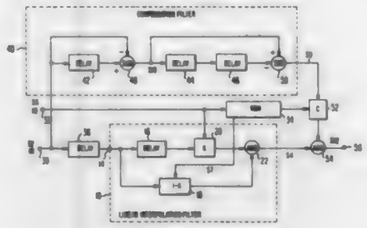
combining means coupled to both the last of said odd ones of said m-taps of said first component polyphase filter and the last of said even ones of said m-taps of said second component polyphase filter for deriving said filtered output stream of successive digital samples of said input-weighted digital filter.

4,694,414

DIGITAL DELAY INTERPOLATION FILTER WITH AMPLITUDE AND PHASE COMPENSATION

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 19, 1984, Ser. No. 683,678
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—724 **8 Claims**



1. Delay apparatus, comprising;

a first source for providing a digital input signal having a given sampling period;

a second source for providing a delay control signal;

first filter means coupled to said sources for delaying said digital input signal as a function of said delay control signal in fractional increments of said sampling period by linear interpolation of adjacent samples of said digital input signal to provide a delayed digital output signal;

second filter means coupled to said first source for providing a compensating signal, said second filter means being of a type having a response zero at zero frequency and a delay equal to an odd multiple of one-half of said sampling period;

output means for combining said compensating and delayed signals to provide a resultant digital output signal; and

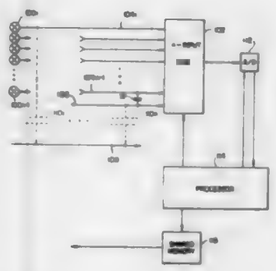
amplitude control means connected in cascade with said second filter means for controlling the amplitude of said compensating signal as a predetermined function of said delay control signal for minimizing variations in both the amplitude and the delay with frequency of said resultant signal.

4,694,415

ADAPTIVE DIGITAL FILTER FOR ANALOG INPUT SIGNALS

Joel E. Hasenkopf, Allison Park, and James F. Sutherland, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1985, Ser. No. 729,397
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724 **13 Claims**



1. A filter for an input signal subjected to noise having a frequency, said filter comprising:

reference input means for supplying a reference signal indicating the frequency of the noise;

sampling means for receiving and sampling the input and reference signals at a sampling rate and for generating input and reference samples; and

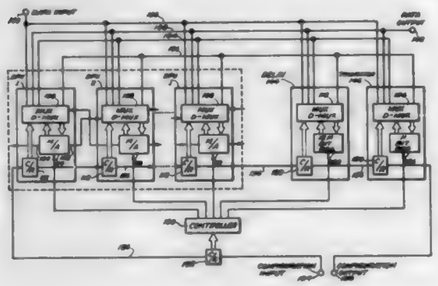
processor means for producing sums of the input and reference samples, respectively, generated during at least one cycle of the noise and for adjusting the sampling rate of said sampling means when the sum of the reference samples is not equal to zero.

4,694,416

VLSI PROGRAMMABLE DIGITAL SIGNAL PROCESSOR

James E. Wheeler, Schenectady; Robert M. Hardy, Scotia; Robert J. Dunki-Jacobs, Saratoga, and William J. Premerlani, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,290
Int. Cl.[4] G06F *7/38, 15/00*
U.S. Cl. 364—736 **7 Claims**



1. A circuit for performing different signal processing functions on digital input data, said data being in the form of binary data words, each word being presented in a bit by bit serial manner to said circuit, each of said different functions being provided by uniquely combining a series of substantially identical algebraic subfunctions performed concurrently on said input data and partially processed input data comprising:

a plurality of substantially identical algebraic digital operating units for receiving and operating on said input data to generate output data or partially processed input data, each said digital operating unit being adapted to perform said identical subfunction, and

signal directing means coupled intermediate said units for moving said input data and partially processed data into and through said units concurrently in a plurality of unique patterns, each unique pattern being associated with one of said different signal processing functions, said signal directing means being responsive to preselected user input to direct data through said plurality of units in one of said unique patterns such that said input data is operated on to generate the associated one of said plurality of functions;

said signal directing means including a plurality of data paths, configuration register means for receiving user provided configuration control signals, and multiplexer means responsive to said configuration register means for selectively coupling said data paths to said operating units to thereby direct data through said operating units in one of said patterns as determined by said user provided configuration control signals;

said multiplexer means including a plurality of multiplexer units, one of said units being associated with each of said operating units, said multiplexer units coupled to each of said data paths, each said multiplexer unit being operated to couple its associated operating unit with each of said remaining multiplexer untis via said data paths in response to said configuration control signals;

said operating units further including means for multiplying a first data word by a second data word to provide an intermediate output; and

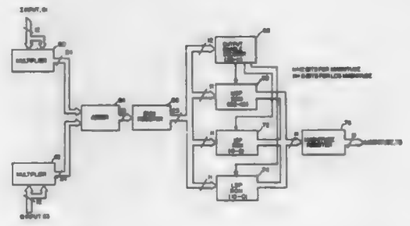
means for adding said intermediate output to a third data word to provide a first operating unit output coupled to an associated multiplexer unit, each said operating unit further including first and second registers, said registers each having an input and an output, said inputs coupled to receive and temporarily store said first and second data words, said outputs coupled to said associated multiplexer unit to enable a delayed replica of said first and second data words to be selectively coupled to others of said operating units in accordance with said configuration control signals.

4,694,417

METHOD AND APPARATUS FOR DETERMINING THE MAGNITUDE OF A SQUARE ROOT OF A SUM OF SQUARED VALUE USING VERNIER ADDRESSING

Robert H. Cantwell, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 400,330, Jul. 21, 1982, Pat. No. 4,636,973.
This application May 21, 1986, Ser. No. 865,322
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—752 **32 Claims**



1. In combination:

first multiplier means for obtaining the square of a first input data word;

second multiplier means for obtaining the square of a second input data word;

means for adding together the outputs from said first multiplier and said second multiplier;

register means for storing the output from said adder means, said output comprising a plurality of vernier address scales for reducing memory storage requirements;

ROM means coupled to said register means and responsive to said vernier address scales for storing numerical values with increased accuracy, the quantization of said numerical values being determined by the bit length of a digital word stored in said ROM means, said ROM means having a first portion coupled to a first portion of said plurality of vernier address scales, a second portion coupled to a second portion of said plurality of vernier address scales and a third portion coupled to a third portion of said vernier address scales; and

ROM decoding means for selecting an output from a portion of said ROM means said portion being addressed by one of said vernier address scales.

4,694,418

FUZZY LOGIC BASIC CIRCUIT AND FUZZY LOGIC INTEGRATED CIRCUIT OPERABLE IN CURRENT MODE

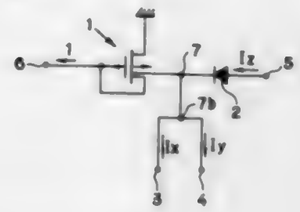
Fumio Ueno; Takeshi Yamakawa, both of Nishigoshi, and Yuji Shirai, Yatsushiro, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 22, 1985, Ser. No. 714,809

Claims priority, application Japan, Mar. 23, 1984, 59-57121; Mar. 23, 1984, 59-57122; Mar. 23, 1984, 59-57123; Mar. 23, 1984, 59-57124; Mar. 23, 1984, 59-57125

Int. Cl.⁴ G06G *7/00, 7/12*

U.S. Cl. 364—807 **6 Claims**



1. A fuzzy logic circuit comprising:

a current mirror comprising an FET,

a first input current source connected to the input side of the current mirror,

a second input current source,

a wired OR connected at its input side to the output side of the current mirror and to the second input current source, and

an output terminal connected to the output side of the wired OR.

4,694,419

PROGRAMMABLE CONTROLLER WITH DIRECT TO PLANT ADDRESSING

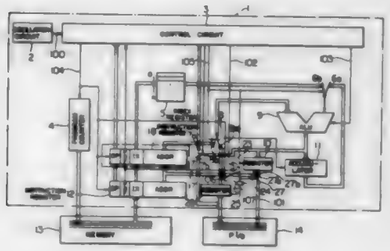
Tadashi Okamoto, Hitachi; Kazuhiko Shimoyama, Katsuta; Hiromasa Yamaoka, Hitachi, and Mitsuro Takakura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,025

Claims priority, application Japan, Oct. 6, 1983, 58-185832

Int. Cl.⁴ G05B *11/01*; G06F *9/34*

U.S. Cl. 364—900 **5 Claims**



1. A programmable controller for controlling the operations of a plant on the basis of a stored program, comprising:

memory means for storing therein a program, said program containing an instruction taking a register-modified addressing mode as an addressing mode of an operand and an instruction taking a direct addressing mode as the addressing mode of an operand, each of said instructions being read out from said memory means in response to receipt of a corresponding memory address;

a processing unit provided with operating means for supplying an address to said memory means to read out an instruction from said memory means and for performing an arithmetic operation in accordance with said read-out instruction to control a process, including an instruction register for storing an instruction read out from said memory means, means for determining by the contents of the instruction stored in said instruction register whether said instruction is an instruction taking the register-modified addressing mode or an instruction taking the direct addressing mode, a plurality of index registers, an arithmetic circuit, switching means for delivering an address as address information for controlling a plant in such a manner that, when the instruction stored in said instruction register is of the register-modified addressing mode, the contents of an index register specified by an index part of said instruction are added to an address indicated by the address part of said instruction by said arithmetic circuit and the result of addition is delivered as address information for controlling a plant, and when said instruction is of the direct addressing mode, an address indicated by an address part of said instruction is directly delivered as address information to said plant, and control circuit means for controlling said switching means in accordance with said determining means and for controlling said arithmetic circuit to operate on state information received from the plant in response to an address supplied to the plant via said switching means to produce control information to perform control operations in accordance with a command from an operation code part of the instruction read out from said memory means and stored in said instruction register; and

a process input/output unit disposed between said processing unit and said plant and responsive to said plant control address information from said processing unit for sending control information which is outputted from said processing unit to a plant specified by said address information and for sending state information which is inputted from said plant to said processing unit.

4,694,420

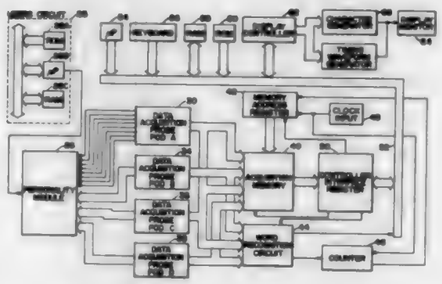
INVERSE ASSEMBLY METHOD AND APPARATUS

Mark E. Pettet, Hillsboro, and Gerd H. Hoeren, Lake Oswego, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 417,014, Sep. 13, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 814,152

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—900 **3 Claims**



1. An inverse assembler capable of converting the code associated with a stored program stored in a memory of a user's circuit, the code being generated from a microprocessor disposed in the user's circuit and having instructions and data information, into a corresponding set of mnemonics for interpretation by a user comprising:

means for entering conversion information into said inverse assembler, said conversion information being a list of code corresponding to said code associated with said stored program and a list of said mnemonics corresponding thereto;

means for receiving said conversion information and for storing said conversion information, said conversion information being stored in said receiving and storing means in the form of a set of decision tree tables, each decision tree table including entries for portions of code and mnemonic information corresponding thereto and being in a format corresponding to the format associated with a set of user documentation describing the characteristics of said microprocessor;

means responsive to said code associated with the stored program for distinguishing between said instructions and said data information and for assigning a first identifier to said instructions and a second identifier to said data information;

means for acquiring and storing said code associated with said stored program and said first and second identifiers associated therewith, said receiving and storing means correlating said code stored in said acquiring and storing means with a corresponding set of said conversion information stored in said receiving and storing means by providing a combination of mnemonic information from said tables in response to portions of code as stored in said acquiring and storing means; and

means for acquiring said corresponding set of said conversion information from the receiving and storing means and for presenting said corresponding set of said conversion information to said user for interpretation thereof.

4,694,421

INTERFACE SYSTEM WHICH SELECTIVELY PROVIDES IMPEDANCE MATCHING BETWEEN A HOST COMPUTER AND A CONTROL CIRCUIT

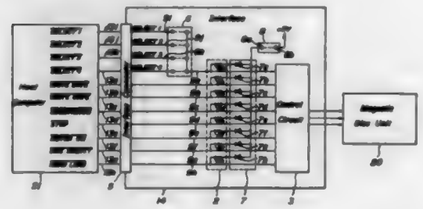
Tetsu Ogawa, Hanazono, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Jun. 5, 1984, Ser. No. 617,823

Claims priority, application Japan, Jun. 29, 1983, 58-101250

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—900 **4 Claims**



1. An interface system for connecting a control circuit to a host computer wherein said control circuit is provided with input terminals and said host computer is provided with output terminals, said interface system comprising

a plurality of signal lines, each of said signal lines connecting one of the input terminals of said control circuit to a corresponding one of the output terminals of said computer;

a plurality of resistor elements each having first and second ends, the first end of each of said resistor elements being connected to a corresponding one of said plurality of signal lines;

a connector having first and second terminals, said first terminal being connected to a power source;

a plurality of diode elements each having first and second ends, the first end of each of said diode elements being connected to the second end of a corresponding one of said plurality of resistor elements and the second ends of said diode elements being connected to each other and to the second terminal of said connector, the polarity of each of said diode elements being such that a signal on the signal line to which it is connected through an associated resistor element is not transmitted to said second terminal; and

means for selectively connecting together said first and second terminals whereby, when said first and second terminals are connected together said plurality of resistor elements are connected to said power source to provide impedance matching for the output of said host computer, and when said first and second terminals are not connected said resistor elements are electrically disconnected from the system.

4,694,422

PROTOCOL VALIDATION SYSTEM

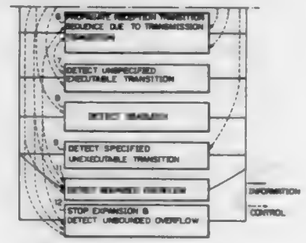
Yoshiaki Kakuda, Tokyo; Yasushi Wakahara, Kanagawa, and Masamitsu Norigoe, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

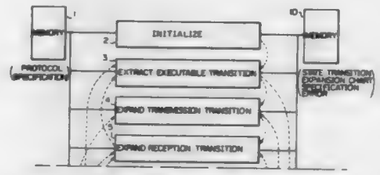
Filed Jun. 24, 1985, Ser. No. 749,591

Claims priority, application Japan, Dec. 25, 1984, 59-271930; Feb. 20, 1985, 60-30208

Int. Cl.⁴ G06F *1/00*

U.S. Cl. 364—900 **4 Claims**





1. A protocol validation system which receives a protocol specification having a plurality of processes, in a form of an electrical signal, and tests said protocol specification by expanding a state transition in each process in accordance with transition information of said protocol specification to find errors of said protocol specification, and delivers indication of said errors in the form of an electrical signal, said protocol validation system comprising:

(a) first memory means (1) for storing a protocol which is subject to validation, including an initial state;

(b) first operating means (3, 4, 5, 6) connected to said first memory means for receiving information stored therein and expanding a transmission transition and a corresponding reception transition for each said process, and for monitoring a system state composed of a state in each process and a signal state on a channel between processes;

(c) second memory means (10) connected to said first operating means for storing a state transmission expansion chart for each said process and L value of expanded states for each process;

(d) second operating means (7, 8) connected to said first and second memory means and controlled by said first operating means for detecting an unspecified executable transi-

tion and a deadlock state, in accordance with a predetermined condition, during expansion of a transition;

(e) third operating means (11) connected to said first and second memory means and controlled by said first operating means for detecting a bounded overflow, which is a system state such that the number of signals on a channel between processes exceeds a given channel capacity;

(f) fourth operating means (9) connected to said first and second memory means and controlled by said first operating means for detecting a specified unexecutable transition after completion of expansion; and

(g) fifth operating means (12) connected to said second memory means and controlled by said first operating means for providing an electrical signal to said first operating means to stop said expansion in accordance with detection of a predetermined condition.

4,694,423

MAGNETIC BUBBLE MEMORY MODULE

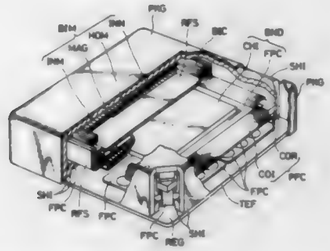
Yutaka Akiba, Fujisawa; Kazuo Hirota, Chigasaki; Nobuo Kishiro, Mobara; Toshio Futami, Mobara, and Tatsuo Hamamoto, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,647

Claims priority, application Japan, Jan. 31, 1985, 60-15341; Feb. 1, 1985, 60-16540; Apr. 1, 1985, 60-66456

Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—2 **9 Claims**



1. A magnetic bubble memory module comprising:

a rectangular core shaped like a picture frame providing windings on respective two pairs of opposite sides;

at least one magnetic bubble memory chip disposed in the area surrounded by said core;

a flexible substrate having chip-loading section means disposed for loading said at least one magnetic bubble memory chip thereon, said chip-loading section means having four corners and including means for providing electrical connections for said at least one chip, said flexible substrate including lead wire section means extending from the four corners of said chip-loading section means and arranged for bending, and connecting section means for providing connections with said lead wire section means and for disposing external connection terminals on an outside surface of said module, said means for providing electrical connections of said chip-loading section means of said flexible substrate consisting of a three-layered structure of a first insulating layer, an intermediate wiring layer, and a second insulating layer;

a revolving magnetic field-confining case for accommodating said core, said at least one chip and said flexible substrate, said revolving magnetic field-confining case including means for enabling drawing out of said lead wire section means of said flexible substrate at the corners of said chip-loading section means.

4,694,424

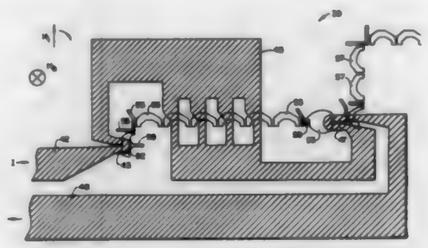
COMBINED NUCLEATE-REPLICATE SINGLE WALL DOMAIN GENERATE STRUCTURE

Guido Galli, Saratoga; Alexander A. Grillo, Cupertino, and Barry R. Lieberman, Los Altos, all of Calif., assignors to Magnesys, San Jose, Calif.

Filed Oct. 1, 1985, Ser. No. 782,743

Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—12 **13 Claims**



1. A magnetic bubble memory comprising:

a thin film of magnetic material capable of supporting single wall magnetic domains, called bubbles, under the influence of a magnetic bias field perpendicular to said thin film, which bubbles may be used to represent bits of digital information;

a patterned layer of high permeability material extending generally parallel to the path of said thin film for providing a propagation path for said bubbles to move under the influence of a rotating magnetic field in the plane of said thin film; and

a patterned layer of electrically conductive material formed to define a conduction path generally parallel to the plane of said thin film and including a first U-shaped portion disposed at a first site and a second U-shaped portion disposed at a second site such that an injection of current in a predetermined sense into said layer of electrically conductive material results in a magnetic field at said first site that is attractive for said bubbles and a magnetic field at said second site that is repulsive for said bubbles;

whereupon said injection of current in a predetermined sense is effective to cause bubble nucleation at said first site and bubble replication at said second site, depending on the magnitude of the injected current and the timing of the injected current relative to the phase of the rotating magnetic field.

4,694,425

SEVEN TRANSISTOR CONTENT ADDRESSABLE MEMORY (CAM) CELL

Michael T. Imel, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 10, 1986, Ser. No. 884,025

Int. Cl.⁴ G11C *15/04*

U.S. Cl. 365—49 **8 Claims**

1. A content addressable memory including a pair of column lines (54, 56) upon which information to be matched with the contents of said memory is placed, said memory being driven by a clock such that during particular clock phase a ROW line (50) and a MATCH line (52) are precharged and both column lines are discharged, a memory cell characterized by:

a supply voltage (Vcc);

a first transistor (M1);

a second transistor (M2);

a third transistor (M3);

a fourth transistor (M4);

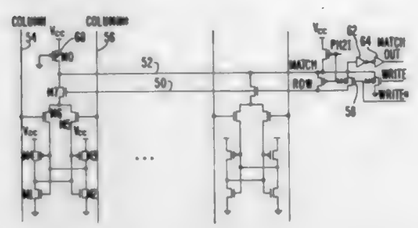
said first, second, third and fourth transistors being connected to each other and to said supply voltage (Vcc) to thereby form a cross-coupled inverter storage device;

a fifth transistor (M5);

a sixth transistor (M6); and,

a seventh transistor (M7) that acts as a "reversible diode";

said fifth and a sixth transistors being connected to said "diode" transistor (M7) and between said cross-coupled inverter (M1, M2, M3, M4) and said column lines (54, 56) to thereby form an XOR gate on said column lines (54, 56) and said "diode" transistor (M7);



said diode transistor being connected between said fifth and sixth transistors, said ROW line (50) and said MATCH line (52), such that during CAM matches said diode transistor allows charge to be siphoned from said MATCH line (62) and during a write to said CAM cell allows charge to build up.

4,694,426

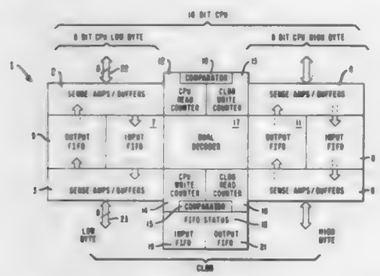
ASYNCHRONOUS FIFO STATUS CIRCUIT

Kent L. Mason, Beaverton, Oreg., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1985, Ser. No. 811,851

Int. Cl.⁴ G11C *19/00*

U.S. Cl. 365—78 **15 Claims**



1. A status circuit for determining which of two asynchronously operable counters were last incremented following the detection of correspondence in the count status, comprising;

means for generating a set signal upon the conclusion of an incrementing signal to the first counter;

means for generating a reset signal upon the conclusion of an incrementing signal to the second counter;

means for detecting a correspondence of the numerical counts in the first and second counters and generating a correspondence signal thereupon;

a bistable multivibrator switching to a first state to provide a first signal following the receipt of the set signal, and switching to a second state to provide a second signal following the receipt of the reset signal; and

signal masking means for receiving the correspondence signal and for multiplexing the first and second state signals responsive thereto to identify the last incremented counter.

4,694,427

PROGRAMMABLE SEMICONDUCTOR MEMORY DEVICE WITH COMBINED SENSE AMPLIFICATION AND PROGRAMMING CAPABILITY

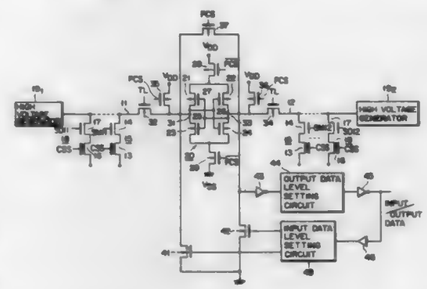
Junichi Miyamoto, and Jun-ichi Tsujimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 26, 1985, Ser. No. 759,433

Claims priority, application Japan, Sep. 21, 1984, 59-197925

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—185 **6 Claims**



1. A programmable semiconductor memory device for storing input data comprising:

a first bit line connected to first memory cells, each comprising a nonvolatile transistor for storing data, and a first dummy cell also comprising a nonvolatile transistor;

a second bit line connected to second memory cells, each comprising a nonvolatile transistor for storing data, and a second dummy cell also comprising a nonvolatile transistor;

high voltage generation means, connected to said first and second bit lines, for providing high voltage programming data for storage of said input data into said first and second memory cells and for erasing data from said first and second memory cells;

data detecting and storing means for amplifying a potential difference between said first and second bit lines caused when one of said or first memory cells is selected and for temporarily holding data prior to storage into said first and second memory cells, the amplified potential difference between said first and second bit lines reflecting data stored in said selected one of said first or second memory cells, and said data detecting and storing means including a flip-flop having two input/output nodes;

first switching means, connected between said first bit line and said first input/output node of said data detecting and storing means flip-flop for connecting said flip-flop to said first bit line in response to an enable signal;

second switching means, connected between said second bit line and said second input/output node of said data detecting and storing means flip-flop, for connecting said flip-flop to said second bit line in response to said enable signal;

signal compensation means for selectively inverting the level of said amplified potential difference according to whether said selected memory cell is connected to said first bit line or said second bit line; and

data storage controlling means for controlling the storage of said input data into said first and second memory cells, said data storage controlling means comprising

a first switching transistor having a gate receiving a first storage signal and having a current path connected between a predetermined potential and said first input-/output node of said data detecting and storage means flip-flop,

a second switching transistor having a gate receiving a

second storage signal and having a current path connected between said predetermined potential and said input/output node of said data detecting and storing means flip-flop, and

input data decoding means, coupled to the gates of said first and second transistors, for decoding said input data into said first storage signal having the same level as said input data and said second storage signal having a complementary level to said first storage signal.

4,694,428

SEMICONDUCTOR MEMORY

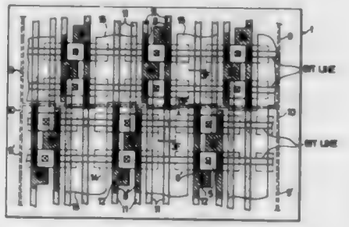
Tsuneo Matsumura, Yokohama; Tsuneo Mano, Isehara; Junzo Yamada, Ebina, and Junichi Inoue, Zama, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,846

Claims priority, application Japan, Nov. 2, 1984, 59-232083

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **10 Claims**



1. A semiconductor memory, comprising:

main word lines and sub word lines;

bit lines intersecting the sub word lines;

a memory cell array divided into a plurality of unit cell arrays and divided into a plurality of sub arrays in a direction perpendicular to said word lines, each unit cell array comprising two different sub arrays, said memory cell array including memory cells disposed at all intersections of the sub word lines and the bit lines and having cell transistors, the sub word lines connected to the cell transistors in a first one of the sub arrays forming one of the unit cell arrays being connected to a first one of the main word lines, the sub word lines connected to cell transistors in a second one of the sub arrays forming the one of the unit cells being connected to a second one of the main word lines, the first main word line passing through the second sub array and the second main word line passing through the first sub array.

4,694,429

SEMICONDUCTOR MEMORY DEVICE

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Nobuaki Ohtsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1985, Ser. No. 802,376

Claims priority, application Japan, Nov. 29, 1984, 59-252313; Oct. 8, 1985, 60-224060

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **12 Claims**

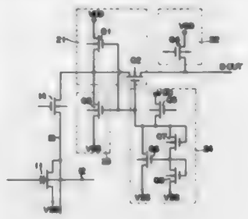
1. A semiconductor memory device comprising:

a bit line;

a memory cell connected to said bit line;

clamp circuit means connected between a power source voltage and said bit line, for clamping said power source voltage and for applying the clamped voltage to said bit line, said clamp circuit means comprising a load MOS transistor whose output current path is connected between said power source voltage and said bit line;

bypass circuit means connected between said bit line and a reference voltage, for bypassing from said bit line to said reference voltage an electric current the amount of which is substantially equal to that of a weak inversion current of said load transistor flowing into said bit line, said bypass circuit means comprising a bypass MOS transistor whose



output current path is connected between said bit line and said reference voltage; and

bias circuit means connected to said load MOS transistor and said bypass MOS transistor, for biasing said load and bypass MOS tansistors.

4,694,430

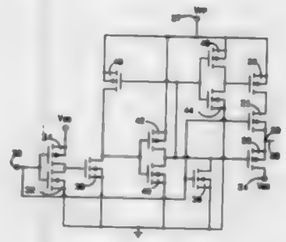
LOGIC CONTROLLED SWITCH TO ALTERNATE VOLTAGE SOURCES

Brian K. Rosier, Jenkintown, Pa., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 21, 1985, Ser. No. 714,288

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—189 **7 Claims**



5. A semiconductor integrated switching circuit, for connecting an output thereof to a high positive voltage source when the input of said switching circuit is at one logic voltage level and for connecting said output to a relatively low positive voltage source when the input of said circuit is at another logic level, comprising a plurality of P-channel enhancement MOS transistors (P-FET's), a plurality of N-channel enhancement MOS transistors (N-FET's), an input conductor, an output conductor, a high-voltage-source node, a low-voltage-source node and a ground node all being interconnected as follows:

(a) a first of said P-FET's being connected between said output conductor and said low-voltage-source node;

(b) a second and third of said P-FET's forming one series circuit branch that is connected from said output conductor to said high-voltage-source terminal, in that order;

(c) all of said P-FET's having N-type channel body regions, said N-type regions being ohmically connected to said high-voltage-source terminal except that the N-type channel body regions of said first and second P-FET's are connected to said output conductor; all of said N-FET's having P-type channel body regions and sources being connected to said ground node;

(d) the gate of said second P-FET being connected to said input conductor;

(e) one and another CMOS pairs of said transistors each being connected between said ground node and said high-voltage-source node, the output of said one-CMOS-pair being connected to the gate of said third P-FET, and the another-CMOS-pair output being connected to the gate of said first P-FET and to the input of said one CMOS pair;

(f) a third of said N-FET's connected in series with a sixth of said P-FET's between said ground and high-voltage-source nodes, the drains of said third N-FET and sixth P-FET being connected to each other and the input of said another CMOS pair;

(g) yet another CMOS pair of said transistors being connected from said ground node to said low-voltage-source node and having an input connected to said input conductor and an output connected to the gate of said third N-FET; and

(h) a fifth of said N-FET's having a gate connected to said input conductor and having a drain connected to the output of said another CMOS pair, the input of said one CMOS pair and the gate of said sixth P-FET.

4,694,431

SEMICONDUCTOR MEMORY DEVICE WITH INCREASED ADAPTABILITY

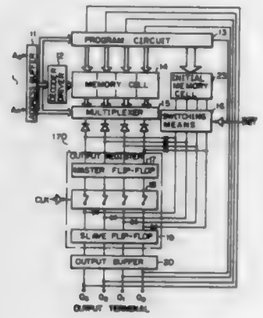
Tamio Miyamura, and Takashi Ohkawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 23, 1985, Ser. No. 779,013

Claims priority, application Japan, Sep. 25, 1984, 59-198607

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **6 Claims**



1. A semiconductor memory device comprising:

a memory cell array having a plurality of memory cells;

multiplexer means for selecting the outputs of said memory cell array;

an output register means for receiving said outputs selected by said multiplexer and storing the received data;

an initial data memory cell enabling write-in of data;

an initialization input terminal for providing a control signal to set the data written into said initial data memory cell to said output register means; and

an initial data switching circuit means for supplying to said output register means an output signal having a predetermined potential in accordance with the data written in said initial data memory cell, when said control signal is supplied to said initialization input terminal;

said predetermined potential of said output signal of said initial data switching circuit means being different from the potential of the output signal supplied through said multiplexer means from said memory cell array; and

said output register being adapted to be set by the output signal of said initial data switching circuit means, regardless of the output signal from said memory cell array, when said control signal is supplied to said initialization input terminal.

4,694,432

SEMICONDUCTOR MEMORY DEVICE

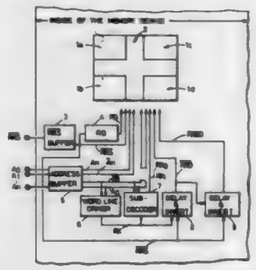
Hideshi Miyatake; Kazuyasu Fujishima, and Kazuhiro Shimotori, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 709,409

Claims priority, application Japan, Mar. 16, 1984, 59-51861

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—203 **6 Claims**



1. A semiconductor memory cell comprising:

a plurality of memory cells for storing binary signals,

a plurality of decoders connected to said memory cells for selecting said connected memory cells, said decoders including normal decoders and a spare decoder,

precharge signal providing means connected respectively to said plurality of decoders for providing a precharge signal to each of said decoders, whereby said decoders are brought into a selective state,

address signal providing means connected respectively to said decoders by a plurality of address signal lines for providing address signals for selecting specifically said decoders,

link elements inserted between said respective decoders and said respective precharge signal providing means and interposed in said plurality of address signal lines for connecting said spare decoders and said address signal providing means, said link elements being caused to be melted so that an electrically insulated state is established to bring an associated circuit line into an electrically disconnected state.

4,694,433

SEMICONDUCTOR MEMORY HAVING SUBARRAYS AND PARTIAL WORD LINES

Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,945

Claims priority, application European Pat. Off., May 14, 1984, 84105426.5

Int. Cl.[4] G11C *8/00*

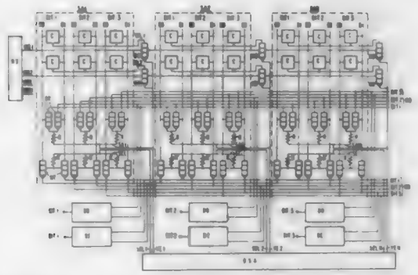
U.S. Cl. 365—230 **5 Claims**

1. A semiconductor array memory comprising a plurality of selectable subarrays arranged on a chip having a common decoder, common read lines and common write lines, data input and output circuits and word lines,

said word lines being divided into several partial word lines, each partial word line line being connected to a word switch,

all word switches of a word line being selected and controlled via at least one word control line, each subarray comprising a matrix of memory cells arranged in word line rows and bit line columns, characterized in that said bit line columns of the same bit value of all subarrays in the semiconductor memory are coupled via read transistors to said common read lines and via write transistors to said common write lines, said common read lines and

common write lines also being directly connected to said data input and output circuits, said read transistors isolat-



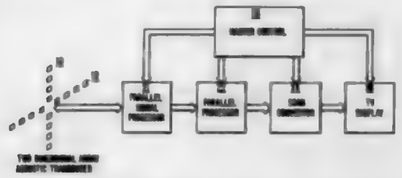
ing said common read lines from said bit line columns of unselected subarrays.

4,694,434

THREE-DIMENSIONAL IMAGING SYSTEM

Olaf T. von Ramm, 3433 Dover Rd., Durham, N.C. 27707, and Stephen W. Smith, 742 Owens St., Rockville, Md. 20850

Filed Jun. 12, 1984, Ser. No. 619,899
Int. Cl.[4] G01N *29/04*; A61B *10/00*
U.S. Cl. 367—7 **10 Claims**



1. A radiated energy pulse-echo imaging system with transducers for transmitting pulse for producing an image of a three-dimensional object in a display having at least two dimensions maintaining perspective, in which, at all ranges, the angular relationships of all targets on the object relative to the origin of the transducers are reproduced in the display, comprising:

an array of transducers for transmitting pulses toward the three-dimensional object and receiving corresponding echo data,

means for steering said array in elevation and azimuthal directions to assume predetermined transmit and receive orientations relative to an initial array position, said array assuming a predetermined angular transmit orientation for each transmitted pulse and a plurality of predetermined angular receive orientations for each transmitted pulse, said array receive orientations being defined by angles formed in the elevation and azimuthal directions between said array in said initial position and said array in said receive orientations, processing means for receiving the echo data for each transmitted pulse from said array of transducers and for producing therefrom output signals indicating a plurality of image points having predetermined locations in the image to be displayed corresponding to the relative locations of those image points on the three-dimensional object,

means for storing values of said echo data to produce a brightness control signal for each said image point,

display means,

and means for communicating said image point output signals and said brightness control signals to said display means and for locating said image point in said display means at a location directly related to said angles defining said array receive orientations,

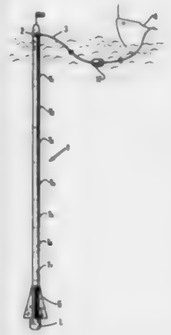
amplitude weighting means for varying the amplitudes of said image point output signals in relation to the distance from which said echo data are received, said weighted image point output signals being applied to z-axis drive means of said display means.

4,694,435

VERTICAL MARINE STREAMER

Pierre Magneville, Vernouillet, France, assignor to Institut Francais Du Petrole, Rueil-Malmaison, France

Filed Dec. 30, 1985, Ser. No. 814,766
Claims priority, application France, Dec. 28, 1984, 84 20060
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—17 **2 Claims**



1. A device for receiving acoustic waves in water at a plurality of different depth levels, the device comprising a hollow tubular member having a great length with respect to an amplitude of a swell and a smooth outer surface transparent to acoustic waves, said tubular member including near one end thereof a closed compartment containing buoyancy means and a plurality of sensor means disposed along and in fixed relationship with respect to said tubular member for receiving acoustic waves through said outer surface, cable means for connecting said tubular member to a vehicle, said cable means comprising transmission lines for connecting said sensor means to recording means on the vehicle, a weight means and profiled stabilizer fins fixed close to an opposite end of said tubular member, a distribution of masses of the hollow tubular member, the buoyancy elements and an arrangement and area of said stabilizer fins is such that the tubular member floats vertically in water in a static stable position and lies in a substantially horizontal position when towed by a vehicle under an effect of hydrodynamic forces on said stabilizer fins, and wherein means are provided for measuring an immersion depth of the cable and connected therethrough to a piloting means whereby said vehicle is prevented from applying any towing force when said tubular member is vertically oriented in water.

4,694,436

NOISE-ATTENUATING STREAMER-CABLE BULKHEAD

Valery A. Gelfand, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

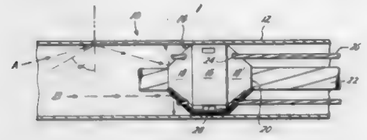
Filed May 29, 1984, Ser. No. 615,086
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—20 **7 Claims**

1. A noise-scattering structure for use with a streamer-cable section, said section including a flexible plastic jacket, connecting means at each end of said jacket for making electrical and mechanical connections with other sections, stress members within said jacket interconnecting said end coupling means,

and electrical components inside said jacket for receiving and transmitting seismic signals to a signal processor, comprising:

a plurality of bulkheads coupled to cascade to said stress members at regular intervals;

said plurality of bulkheads having means for radially scattering tube-wave noise from said streamer cable section,



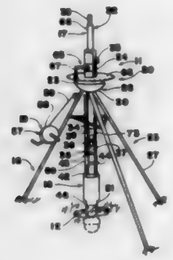
comprising: a cylindrical body; multi-faceted surfaces converging at a desired angle of substantially 45°, extending outwards from both ends of said cylindrical body; said bulkhead having an axial hole truncating the vertices of said multi-faceted surfaces for receiving electrical components therethrough; and means for anchoring said stress member to said bulkhead.

4,694,437

SUBTERRANEAN SURVEYING APPARATUS

Lowell C. Hanson, P.O. Box 299, Helena, Mont. 59624

Continuation-in-part of Ser. No. 527,100, Aug. 29, 1983, Pat. No. 4,532,545. This application Jul. 26, 1985, Ser. No. 759,261
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—27 **18 Claims**



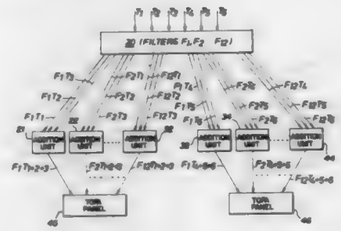
1. Subterranean surveying apparatus including a support portion, a connector portion, a housing portion, a positioning portion, a monitoring portion and a control portion; said support portion including a horizontal reference surface, a base section extending downwardly from said reference surface, means for leveling said reference surface; said connector portion including a torsionally rigid mast assembly, said mast assembly being suspended from said reference surface and extending downwardly therefrom, means for selectively fixing the position of said mast assembly with respect to said reference surface, said mast assembly including a plurality of elongated members disposed in an end to end relationship, said elongated members including end sections securable to adjoining ends of other elongated members; said housing portion including an elongated hollow section, the upper end of said hollow section being affixed to the lower end of said mast assembly, at least one opening in said hollow section intermediate the ends thereof, a signal emitting device disposed within said hollow section adjacent said opening; said positioning portion including lifting means mounted on said support portion base section, said lifting means being connected to said housing portion; said monitoring portion including signal display means located adjacent to said support portion, indexing means disposed adjacent to said reference surface, said indexing means being connected to the upper end of said mast assembly for determining the orientation of said signal emitting device; said control portion including control means for said signal emitting device, and a power source for said apparatus; whereby said support portion can be set up over a ground borehole, said housing portion lowered into said borehole and an operator can survey the bottom of said borehole while positioned on the surface adjacent to said apparatus.

4,694,438

TIME-OFFSET-FREQUENCY-AMPLITUDE PANELS FOR SEISMIC IDENTIFICATION OF HYDROCARBONS

Mrinal K. Sengupta, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 2, 1985, Ser. No. 729,508
Int. Cl.[4] G01V *1/00*; G06F *15/58*
U.S. Cl. 367—70 **18 Claims**



1. A method for producing a display of seismic data, including the steps of:

(a) generating a number of seismic traces, each trace representing an acoustic signal received at a receiver of a receiver array after propagating away from an acoustic source of a source array, and each trace being associated with a common reflecting point and with an offset value equal to the distance between the associated source and receiver;

(b) filtering each trace through a bank of band-pass filters to produce a set of filtered traces, each associated with a common reflecting point, an offset value, and a frequency band; and

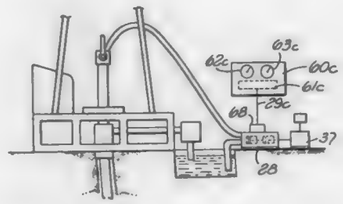
(c) displaying at least two of the filtered traces in order of progressively changing offset value, where the displayed filtered traces are associated with a common frequency band.

4,694,439

WELL INFORMATION TELEMETRY BY VARIATION OF MUD FLOW RATE

Helmut Moll, Irvine, Calif., assignor to Scientific Drilling International, Houston, Tex.

Continuation of Ser. No. 757,182, Jul. 18, 1985. This application Aug. 11, 1986, Ser. No. 895,135
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—83 **16 Claims**



1. Apparatus for conveying information from a downhole

location within a well in which circulating fluid flows in a line extending from the well surface downwardly to said location and then returns to the well surface, comprising:

means for varying the rate of flow of said circulating fluid in said line by controllably operating valving at said downhole location and in correspondence with said information to be conveyed to the surface of the earth;

means for sensing variations in the rate of flow of said fluid near the well surface as an indication of said information; and

motor driven pump means operating to pump the fluid to flow in said line, the motor set to cause the rate of flow from the pump to increase and decrease in correspondence to opening and closing of said valving;

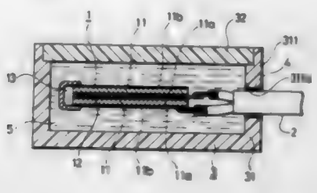
said flow rate sensing means including means for acoustically sensing variations in the speed of operation of the pump means, and including readout means responsive to the sensing means and operable to produce an output representative of or dependent upon the downhole information.

4,694,440

UNDERWATER ACOUSTIC WAVE TRANSMITTING AND RECEIVING UNIT

Koji Ogura, and Hideo Sobue, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Apr. 12, 1985, Ser. No. 722,473
Claims priority, application Japan, May 4, 1984, 59-89916
Int. Cl.⁴ H04R *1/17*
U.S. Cl. 367—152 **2 Claims**



1. An underwater acoustic wave transmitting and receiving unit comprising: a plate-shaped polarized piezoelectric resonator comprising at least one plate made of a complex of fluorosilicon rubber and lead titanate; and a rubber casing sealed around said resonator, said casing being filled with an insulating liquid matching water around said casing in acoustic impedance, wherein said plate made of a complex of fluorosilicon rubber and lead titanate is manufactured by the process comprising the steps of: rolling a mixture of lead titanate powder and fluorosilicon rubber in a volume ratio of 40 to 80% of lead titanate to fluorosilicon rubber to form a sheet; blanking said sheet to obtain a smaller sheet; vulcanizing the smaller sheet under pressure; vulcanizing the smaller sheet under atmospheric pressure for a longer period of time than under pressure; forming silver electrode layers on opposite sides of th sheet thus treated; and polarizing the sheet.

4,694,441

POSITION CONTROL DEVICE FOR AN OPTICAL REPRODUCTION SYSTEM IN AN OPTICAL TYPE DISC REPRODUCTION DEVICE

Norio Tomisawa; Shingo Kamiya, and Shinji Aoshima, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

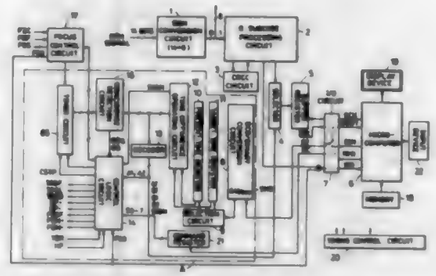
Filed Oct. 11, 1984, Ser. No. 660,432
Claims priority, application Japan, Oct. 14, 1983, 57-190909; Oct. 14, 1983, 57-190910
Int. Cl.⁴ G11B *21/10*
U.S. Cl. 369—32 **8 Claims**

1. A position control device for an optical reproduction system in an optical type disc reproduction device comprising:

means for rotating an optical disc on which a sequence of information is recorded;

an optical reproduction system picking up the recorded sequence of data optically from the rotating optical disc;

a BCD/binary conversion circuit for converting time data of a Q subcode contained in the data picked up by the optical reproduction system from a BCD code into a binary code, said BCD/binary conversion circuit comprising a series/-parallel converter for converting serial BCD code time



data to parallel data, a BCD/binary converter including means for converting the time data of the Q subcode, structured as frame data according to the rate of 75 frames/sec., into time data structured according to a different rate, and a parallel/series converter for converting parallel binary code time data to serial data; and

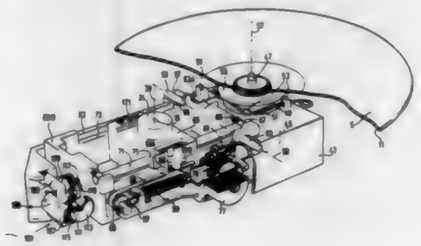
relative position change means for changing a relative position of said optical reproduction system with respect to said optical disc in accordance with the time data of the Q subcode which has been converted into a binary code.

4,694,442

DISC READER WITH OBLIQUITY CORRECTION

Wilhelmus A. H. Gijzen, and Gerard E. van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 26, 1985, Ser. No. 749,149
Claims priority, application Netherlands, Mar. 4, 1985, 8500592
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—44 **17 Claims**



1. An electro-optical device for recording and/or reading recording tracks in a recording surface of an optically readable disk by means of a radiation beam, the recording surface of the disk being provided with a transparent coating having a plane surface, which electro-optical device comprises:

a frame;

a turntable supporting means for a turntable which is rotatable about an axis of rotation;

an objective supporting means for an objective having an optical axis, which objective comprises a lens system for concentrating the radiation beam to form a radiation spot,

a focussing actuator for moving the objective along the optical axis,

mechanical guide means for at least one of the supporting means, for moving the objective and the turntable relative to one another in a radial direction between a first position, in which the optical axis and the axis of rotation are situated nearer each other, and a second position, in which said axes are situated more remote from each other, and

correction means for reducing the angle between the optical axis of the objective and the normal to the disk surface at the location of the intersection of the optical axis and the disk surface during the recording and/or reading the recording tracks, whereby an oblique position of said disc surface relative to said optical axis may be corrected,

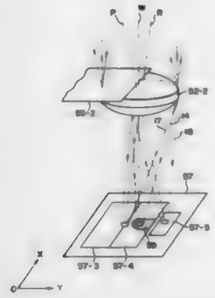
characterized in that the correction means comprise a tilting device for tilting during the recording and/or reading of the recording tracks at least one of the two supporting means relative to a neutral position about a pivotal axis, which axis extends at least substantially transversely of a plane which is defined by the optical axis and the axis of rotation and which at least in the second position of the objective and the turntable is situated between the axis of rotation and the optical axis, through a tilting angle which is determined by the direction of said normal to said surface of the optical disk.

4,694,443

OPTICAL SYSTEM FOR TRACKING AN INFORMATION RECORDING MEDIUM

Hideo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 19, 1985, Ser. No. 713,598
Claims priority, application Japan, Mar. 22, 1984, 59-53524
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—46 **19 Claims**



1. An optical system for tracking an information recording medium having a light reflecting surface, comprising:

means for generating first and second light beams;

an objective lens for converging said first and second light beams onto said light reflecting surface and for converging first and second divergent light beams reflected by said light reflecting surface, a beam spot corresponding to a beam waist of said first light beam being formed on said light reflecting surface when said objective lens is in a just-in-focus state, and a beam spot larger than that of the beam spot corresponding to the beam waist of said first light beam being formed on said light reflecting surface when said objective lens is in an out-of-focus state;

means for directing the reflected first and second light beams from said objective lens, said first reflected light beam being deflected in accordance with the distance between said objective lens and said light reflecting surface; and

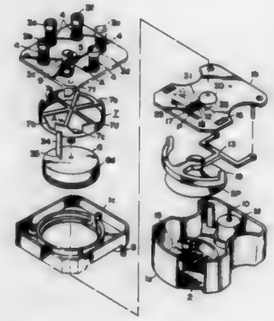
a first photodetector with a light receiving surface substantially located on an image forming plane on which an image of the beam spot corresponding to the beam waist of the first light beam is formed, said light receiving surface including first and second photosensitive regions and a photoinsensitive region, the reflected first light beam being directed between said first and second photosensitive regions when said objective lens is in the just-in-focus state and directed to one of said first and second photosensitive regions when said objective lens is in the out-of-focus state, and the second light beam being directed toward said photoinsensitive region when said objective lens is in the just-in-focus state.

4,694,444

RECORD DISC REPLACING MEANS

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Aug. 13, 1986, Ser. No. 895,958
Claims priority, application Japan, Aug. 31, 1985, 60-192330
Int. Cl.⁴ A63H *3/33*; G11B *3/00*
U.S. Cl. 369—65 **3 Claims**



1. A record disc replacing means for use in a selective reproduction type of sound reproduction device, comprising:

a casing;

a turn table disposed inside the casing capable of changeably carrying a record disc on a face thereof, said record disc having a plurality of recorded grooves thereof and a centering hole at the center thereof; said plurality of recorded grooves each having a starting and stopping point of sound reproduction;

a pickup normally biased toward the starting point of sound reproduction;

a sound transmitting member which carries a speaker diaphragm and resiliently contacts said pickup to impart stylus force thereto;

a plurality of selection poles corresponding in number to that of said recorded grooves, said plurality being disposed around the outer periphery of said turn table;

a stopper radially and outwardly projecting from the outer periphery;

a motor; whereby depression of any one of said plurality of selection poles raises said sound transmitting member and releases the stylus force imparted to said pickup and allows it to revert back to the staring point of sound reproduction, while at the same time said depressed selection pole strikes the stopper to temporarily stop said record disc under rotation whereby the starting point of the corresponding groove can stop at a position where said pickup can engage said starting point, and whereby the pickup will engage the switch at the stopping point to turn off the motor;

a power source;

said motor connected to the power source, said motor further comprising an output shaft;

means of coupling the output shaft to the turntable to rotate the turntable and a record disc carried thereon;

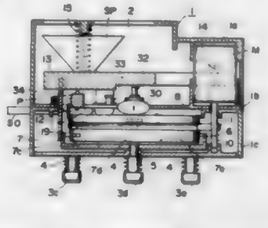
a switch engageable with the pickup at the stopping point of sound reproduction to turn off the power source;
a slit for inserting a record disc formed through the casing therein defining two openings on opposite sides thereof parallel with said record carrying face of said turn table;
at least one stylus force releasing projection carried by the sound transmitting member and disposed near one of the two openings of the slit and projecting thereinto;
a centering projection resiliently supported in said casing, and disposed adjacent the center of said slit and projecting thereinto;
a resiliently protruding record disc locking projection carried by the record disc carrying face of said turn table; and
a notch engageable with said record disc locking projection disposed on said record disc to lock the record disc to the record disk carrying face.

4,694,445

RECORD DISC REPLACING MEANS FOR A SELECTIVE PLAYING TYPE SOUND REPRODUCING DEVICE

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,218
Claims priority, application Japan, Nov. 20, 1985, 60-260947
Int. Cl.[4] G11B *3/08, 3/40, 3/78, 19/20*
U.S. Cl. 369—65 3 Claims



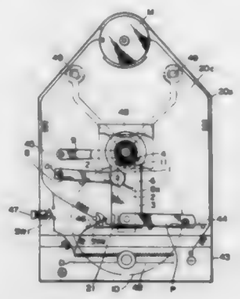
1. A simplified sound reproducing device having means for selectively reproducing sound recordings and means for replacing a record disc, the record disc having a centering hole at the center thereof, a plurality of recorded grooves and at least one starting point of sound reproduction, the simplified sound reproducing device comprising:
a casing;
a turn table having an outer periphery, a stopper projecting radially and outwardly from the outer periphery, and a record carrying face, the turn table capable of carrying the chosen record disc rotatably mounted within the casing;
a tone arm pivotally mounted to the casing, the tone arm located parallel to the record carrying face of the turn table and pivotal between the starting point and an ending point of sound reproduction;
means for biasing the tone arm toward the starting point of sound reproduction;
a pickup located on the tone arm;
a sound transmitting member attached to the casing and resiliently contacting said pickup to impart a stylus force. the sound transmitting member having at least one stylus force releasing projection;
a speaker diaphragm mounted on the sound transmitting member;
a plurality of selection poles corresponding in number to that of said recorded grooves, the selection poles extending through the casing and movable thereto, the selection poles disposed to surround the outer periphery of the turn table, the selection poles positioned such that depression on any one of said selection poles raises said sound transmitting member and releases the stylus force imparted to said pickup and allows its reverting back to the starting point of sound reproduction, and at the same time, said selection pole in depressed position strikes the stopper to temporarily stop said record disc under rotation so that an introductory part of the selected groove can stop at the position where said pickup can engage the introduction part:
a power source;
a motor powered by the power source capable of rotating the turn table;
an electric circuit located between the power source and the motor capable of supplying power to the motor to operate the turn table upon arrival of the pickup at the starting point of sound reproduction;
a record disc insertion slit formed within said casing such that a communication through the casing is established, the record disc insertion slit oriented in parallel with the record carrying face of said turn table, wherein the stylus force releasing projection is located at an inlet for the record disc insertion slit;
a centering projection resiliently supported in the casing located at an inner part of the record disc insertion slit such that both the stylus force releasing projection and the centering projection are positioned to intersect the record disc insertion slit;
a depressible ejector lever extending outside the casing and along the record disc insertion slit and able to eject, when depressed, both the stylus force releasing projection and the record disc under engagement with the centering projection;
a resiliently protruding record disc locking projection located on the record disc carrying face of the turn table; and
a notch engageable with the record disc locking projection is disposed on the record disc.

4,694,446

SIMPLIFIED SOUND REPRODUCING DEVICE OF RANDOM SELECTING TYPE

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 833,918
Claims priority, application Japan, Feb. 28, 1985, 60-39040
Int. Cl.[4] G11B *17/06*
U.S. Cl. 369—67 11 Claims



1. A simplified sound reproducing device of random selection type comprising:
a casing;
a speaker diaphragm having a top and bottom portion;
a sound transmitting member attached to the bottom of said speaker diaphragm;
a record disc having a starting point and end point of sound reproduction for each of a plurality of record grooves;
a motor for driving said record disc;
a pickup interposed between the sound transmitting member and the record disc, the pickup normally urged resiliently toward the starting point of sound reproduction and away from the recorded face of said record disc;

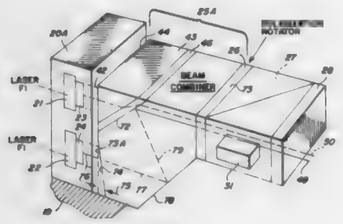
a stylus force spring imparting resilient stylus force to said pickup;
a center gear having a plurality of teeth disposed at the central part of said record disc rotatable together with said record disc;
a swing arm for releasing stylus force swingably disposed near the end point of sound reproduction so as to be extended to the path of rotation of said pickup, the swing arm normally urged toward the starting point of sound reproduction;
a free gear carried by the swing arm and rotatable by the driving force transmitted from the record disc through the center gear when the swing arm has been urged by the pickup and has moved toward the center gear, thereby carrying the free gear into engagement with the center gear, the free gear having a plurality of teeth, at least one of which has a tooth crest in the direction of rotation longer than the other teeth such that said longer tooth crest can contact any tooth crest of the teeth of the mating center gear, and stop rotation of both the free gear and the center gear; and
a stylus force releasing mechanism interposed between the sound transmitting member and the record disc, the stylus force releasing mechanism having a cam member including an upper cam piece and a lower cam piece axially stacked one on another, the upper cam piece being releasably coupled to the center gear, the cam member initiating cam action for releasing the stylus force applied to the pickup by widening a space located between said sound transmitting member and said record disc when the free gear has advanced to the position where it engages the center gear and stops rotation of the free gear against the driving force imparted by the center gear, thereby causing the cam member to elongate due to twisting and cam action.

4,694,447

OPTICAL SIGNAL RECORDERS EMPLOYING TWO LASERS AND METHODS THEREFOR

Donald K. Cohen, and Raymond Yardy, both of Tucson, Ariz., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,456
Int. Cl.[4] G11B *7/00;* G02B *27/14, 5/04*
U.S. Cl. 369—110 33 Claims



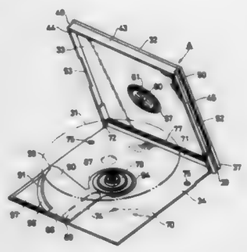
1. In an optical head for an optical disk recorder, the improvement comprising:
first and second lasers for emitting first and second light beams of substantially the same frequency and light beam intensity;
circuit means connected to said first and second lasers for operating both said lasers at a same power level;
thermal mounting means mounting said first and second lasers in high thermal conductive relationship such that the temperature of operations of the first and second lasers tend to be similar;
a polarization-insensitive beam combiner having amorphous optical materials and being optically coupled to the lasers for transferring both the beams along a single light path without altering the polarization of the two light beams and in a slightly diverging relationship, means in said combiner for attenuating the light beam intensity of said first light beam sufficiently to enable the attenuated light beam to read recorded information on an optical disk without altering the recording thereon; and
optical means in said single light path for introducing identical polarization changes to both said beams and a polarization-sensitive beam splitter optically interposed between said combiner and optical means for directing reflected light beams derived from said first and second light beams into two diverging light paths for enabling detection of one of said two reflected light beams and wherein said beam combiner has a first optical element consisting of a predetermined amorphous optical material and having a first surface (36) angled with respect to said emitted first and refract said emitted first light beam and being a part of said attenuator means and having a second input surface (37) disposed to receive said second light beam such that said first surface intercepts the second light beam and internally reflects the second light beam but not as a part of said attenuator means, said refraction and reflection directing the light beams along a given light path having a major axis and said refracted and reflected light beams having a predetermined small angle of divergence and wherein said first optical element further includes an internal reflection surface optically interposed between said first angled srface and said second laser such that said second light beam is internally reflected a plurality of times within said first optical element; and
said first and second lasers being disposed with respect to each other to emit substantially parallel beams of light.

4,694,448

DISC CASE

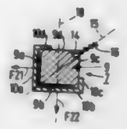
Takuya Tamaru, and Mikio Oguru, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 8, 1985, Ser. No. 731,909
Claims priority, application Japan, May 15, 1984, 59-070479; Jun. 1, 1984, 59-081526; Jun. 1, 1984, 59-081527
Int. Cl.[4] G11B *17/24, 23/04;* B65D *85/54*
U.S. Cl. 369—291 11 Claims



1. A disc case for removably housing a disc on which data has been recorded and for supporting the disc rotatably in said case so that said case can be disposed in reproducing apparatus of the type having means for reproducing the data stored on the disc whereby the reproducing apparatus can reproduce the data while the disc is housed in said case, the case comprising a first plate having sides and depending side walls with one of said side walls having a groove formed therein with said groove having a bottom surface and a rack formed on said bottom surface for cooperating with a loading mechanism of the reproducing apparatus, a second plate having sides one of which is hingedly connected to said first plate along one of the sides thereof so that said plates are movable between open and closed positions.

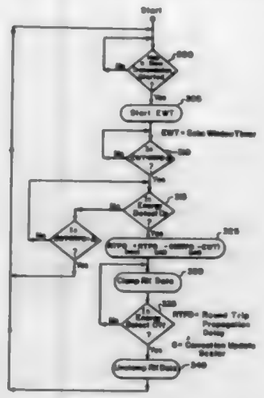
4,694,449
RECORD PLAYER WITH A SQUARE, VISCOUSLY DAMPED PICK-UP ARM LIFT ROD
Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 2, 1985, Ser. No. 751,418
Claims priority, application Netherlands, Jul. 6, 1984, 8402144
Int. Cl.[4] G11B *3/08, 17/06, 21/12*
U.S. Cl. 369—246 9 Claims



1. A record player comprising:
a deck plate,
a turntable and a pick-up arm carried on said deck plate, and
a lifting device which can be moved upwards and downwards to lift and lower the pick-up arm relative to the upper side of the turntable, said lifting device comprising an arm support, a lift rod, damping means, a guide element connected to the deck plate, and an actuating member,
said lift rod forming an integral unit with said support and being guided by said guide element, and cooperating with said actuating member for moving the lifting device upwards and downwards, and
said damping means comprising a highly viscous substance for damping at least the downward movement of the lifting device,
characterized in that the lift rod comprises a pair of longitudinal peripheral walls defining planes which are arranged at an angle with each other so as to define a line of intersection, and engage a corresponding pair of guide walls of the guide element,
the guide element forms an integral unit with the deck plate,
the highly viscous substance is retained between said walls of the lift rod and said guide walls, and
a spring element is arranged between the deck plate and the lift rod, such that said element exerts a force on the lift rod, said force being directed downwardly and towards said line of intersection of the planes of said walls of the lift rod to urge these walls against said guide walls.

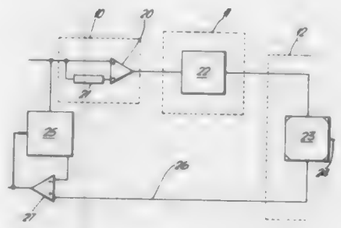
4,694,450
METHOD AND APPARATUS FOR ADAPTIVE RECEIVER SQUELCH ECHO CONTROL
Hans P. Staab, 281 Ridge Rd., New Milford, Conn. 06776
Filed May 31, 1984, Ser. No. 616,017
Int. Cl.[4] H04J *15/00;* H04L *5/14;* H04B *3/20*
U.S. Cl. 370—32.1 4 Claims

1. A method of minimizing echo problems in communication between an originate modem and an answer modem interconnected by a communication line compriaing the steps of:
measuring at the originate modem, the answer modem, or both, the round trip propagation delay of the communication line interconnecting the modems,
using said round trip propagation delay during subsequent data transmission over said communication line to determine when to expect an echo on said communication line from a data message transmitted by one of said modems, monitoring the communication line at the time when the echo is expected at the transmitting modem, and



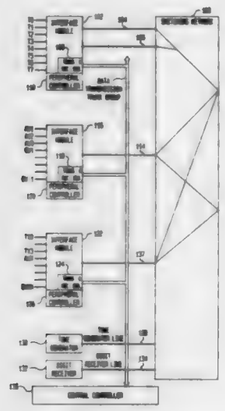
squelching a receiver at said transmitting modem while the echo is detected.

4,694,451
ADAPTIVE DIGITAL FILTER
Peter F. Adams, Ipswich, England, and Colin F. N. Cowan, Edinburgh, Scotland, assignors to British Telecommunications public limited company, Great Britain
Filed Jan. 10, 1985, Ser. No. 690,193
Claims priority, application United Kingdom, Jan. 12, 1984, 8400791
Int. Cl.[4] H04J *15/00;* H03H *7/30;* G06F *7/38*
U.S. Cl. 370—32.1 6 Claims



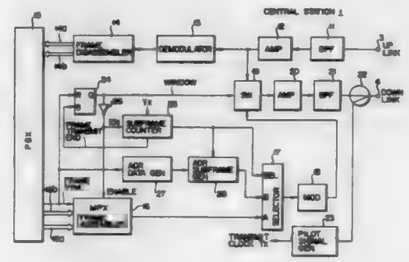
1. A digital filter comprising:
a plurality of delay stages for receiving, delaying and then outputting an input digital signal,
a plurality of individually addressable random access memory devices for storing respective data values therein,
means for addressing and accessing stored data values in each of said memory devices, said means for addressing and accessing each said memory device being connected to receive the output from at least two of said delay stages,
means for combining the thus addressed outputs read from said memory devices to provide a filter output signal, and
means for processing the filter output signal to provide an error signal which may be used to adapt the data values stored within said memory devices so as to minimize said error signal.

4,694,452
SWITCHING CONFIGURATION FOR A TELECOMMUNICATIONS SYSTEM IN PARTICULAR A PBX SYSTEM WITH SUBSCRIBER LINES, TRUNK GROUPS, AND INTERFACE MODULES
Günther Beckinger, Unterpfaffenhofen; Gerhard Egler, and Thomas Rambold, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 562,509, Dec. 16, 1983, abandoned. This application May 14, 1986, Ser. No. 865,922
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247598; Jan. 21, 1983, 33011979; Jan. 21, 1983, 3301996; Jan. 21, 1983, 3301966; Jan. 28, 1983, 3302920
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 6 Claims



1. A switching configuration for a telecommunications system, with subscriber lines and trunk groups, in which respective groups and combined subscriber line/trunk groups are each connected via a common interface module for such groups, both to a speech path switching network and, via a data transmission trunk group, to a central controller provided to establish paths for seized incoming and outgoing subscriber lines and trunks, and in which information is transmitted via the speech path switching network using pulse code modulation, information being transmitted via said data transmission trunk group in a message format using a variable data length, and wherein an interface circuit is assigned to each interface module for the purpose of transmitting information to or receiving information from the subscriber lines and/or trunk circuits, buffering this speech and signal data, and for status monitoring, said switching configuration comprising:
an internal data transmission trunk group and a peripheral controller assigned to the interface module connected to the interface circuit, the speech path switching network and the data transmission trunk group via said internal data transmission trunk group such that the transmission of speech and signal information is based upon control commands of said central controller and said peripheral controller; timer and control switching means assigned to said interface module and being coupled to said internal data transmission trunk group for transmitting and receiving speech information in pulse-code form;
a transmitting and receiving device assigned to said data transmission trunk group and being adapted to receive and transmit information between said central controller and said peripheral controller using a message format with variable data length, said transmitting and receiving device being further assigned to said interface module, and being coupled to said internal data transmission trunk group; and
a memory linked to said internal data transmission trunk group, being capable of receiving information in a message format with variable data length and being assigned to said interface module, for buffering said information and sending it to said transmitting and receiving device based upon said peripheral controller, said information being made available based upon said timer and control switching equipment assigned to said interface module for one of (a) transmitting signals via the speech path switching network in pulse-coded form and (b) converting pulse-coded signals received via said speech path switching network.

4,694,453
SYSTEM FOR ADJUSTING SIGNAL TRANSMISSION TIMING IN TIME-DIVISION MULTIPLEXING SIGNAL TRANSMISSION
Hiroshi Kobayashi, Tokyo; Hideaki Haruyama, Yokohama, and Tsuguhiro Hirose, Nakamachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 18, 1985, Ser. No. 810,092
Claims priority, application Japan, Dec. 20, 1984, 59-268824
Int. Cl.[4] H04J *3/02, 1/16*
U.S. Cl. 370—85 5 Claims



1. A communication network system comprising:
a central station;
a plurality of local stations coupled to different positions on a signal transmission path one end of which is coupled to said central station, wherein subframe information signals addressed to the respective local stations are transmitted over said signal transmission path from said central station to said local stations during a data period of one frame transmission interval including the data period and a window period following the data period, and subframe information signals are transmitted from said local stations to said central station over said signal transmission path during a data period of one frame transmission interval including the data period and a window period following the data period;
said central station comprising,
information signal transmission means for transmitting over said signal transmission path, on a time division multiplexing basis, subframe information signals addressed to the respective local stations during the data period of one transmission frame interval,
test-signal transmission-request means for transmitting over said signal transmission path a test-signal transmission-request signal, addressed to one of said local stations, subsequent to the last subframe information signal transmitted during the data period of one frame transmission interval,
test signal sendback means for sending a test signal back to a local station which transmitted the test signal over said signal transmission path;
each of said local stations comprising,
information signal detecting means for detecting a subframe

information signal transmitted from said central station and addressed to itself,

test signal transmission means responsive to a test-signal transmission-request signal transmitted from said central station and addressed to itself for transmitting a test signal to said central station during the window period of one transmission frame interval,

test signal detecting means for detecting the test signal sent back from said central station,

transmission delay time measuring means responsive to said test signal transmission means and said test signal detection means for measuring a transmission delay time required from the transmission of the test signal to the reception of the test signal sent back from said central station, and

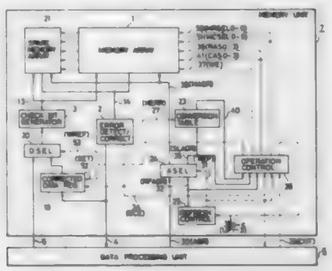
information signal transmission means responsive to said transmission delay time measuring means and said information signal detection means for transmitting a subframe information signal to said central station over said signal transmission path after a waiting time, depending on a time duration of one transmission frame interval and the transmission delay time measured by said transmission delay time measuring means, from a time of the reception of the subframe information signal addressed to itself.

4,694,454

DYNAMIC MEMORY DIAGNOSIS AND ERROR CORRECTION APPARATUS

Yasuhiko Matsuura, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,954
Claims priority, application Japan, Jul. 27, 1984, 59-155536
Int. Cl.[4] G11C *7/00*
U.S. Cl. 371—13 **7 Claims**



1. A diagnosis and error correction apparatus for a dynamic memory which has a plurality of locations identified by respective addresses and which requires periodic refresh operations to prevent its stored data from gradually degenerating, comprising:

an error detect/correct circuit connected to receive data read out of said memory for detecting errors and correcting correctable errors in said data;

a data register operatively connected to said error detect-/correct circuit for storing output data from said error detect/correct circuit;

a refresh control circuit including refresh signal generating means for generating refresh actuating signals at predetermined intervals, and refresh address generating means responsive to said refresh actuating signals for generating in synchronism with said refresh actuating signals successive memory addresses as refresh addresses which are sent to said memory to address the locations of said memory for refreshing; and

an operation control circuit connected to said error detect-/correct circuit, said data register and said refresh circuit, and including:

(a) control signal generating means for generating control signals to be supplied to said memory for controlling memory operations,

(b) an address register operatively connected to said refresh address generating means and said error detect-/correct circuit for storing the refresh address generated by said refresh address generating means at the time when a correctable error is detected by said error detect/correct circuit during refreshing of said memory,

(c) comparator means for comparing the content of said address register with said successive refresh addresses generated by said refresh address generating means to detect a coincidence between the content of said address register and any one of said refresh addresses,

(d) a coincidence counter operatively connected to said comparator means for counting the number of times coincidence is detected by said comparator means during refreshing of said memory, and

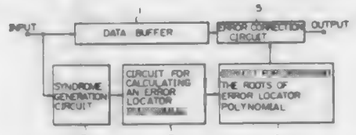
(e) refresh operation directing means operatively connected to said refresh signal generating means, said comparator means, said coincidence counter and said control signal generating means for controlling the refresh operation of said memory in response to each of said refresh actuating signals by actuating a read operation of said memory while no coincidence is detected by said comparator means and by actuating a write operation for writing the content of said data register into said memory when a first coincidence is detected by said comparator means as indicated by said coincidence counter.

4,694,455

DECODING METHOD FOR MULTIPLE BIT ERROR CORRECTION BCH CODES

Keiichiro Koga, Saitama, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,504
Claims priority, application Japan, Sep. 4, 1984, 59-183755
Int. Cl.[4] G06F *11/12*
U.S. Cl. 371—37 **5 Claims**



1. An error correcting code decoding method wherein a received code word $Y=(Y_1, Y_2, \cdots, Y_n)$ is corrected, said method comprising the steps of:

calculating the syndrome vector $(S_1, S_2, \cdots, S_{2t})=YH^t$ where H is the parity check matrix;

calculating Q_0, a symmetry determinant of order t whose elements are chosen systematically from amont syndromes, and determinants derived from Q_t by means of first specifying some diagonal elements of Q_t and then removing all the pairs of a row and a column of Q_t sharing one of the specified diagonal elements from Q_t (these derived determinants, together with Q_t, are generally termed "Q determinants");

determining the coefficients of an error locator polynomial from said Q determinants; and

locating the error bit positions of said received code word Y by calculating the roots of the error locator polynomial and correcting them;

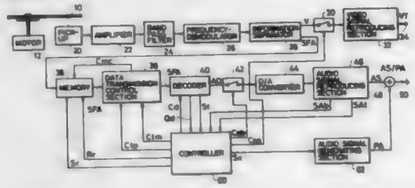
wherein said Q determinants are obtained by holding the values of Q determinants already calculated in a storage facility, and calculating, in a calculating facility, the product of a Q determinant stored in said storage facility with the square of syndrome one by one for a predetermined Q determinant-syndrome combination set, adding them up, and storing the result in said storage facility as a new Q determinant.

4,694,456

INFORMATION SIGNAL REPRODUCING APPARATUS

Kazuyuki Morita, and Toru Otsuka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,822
Claims priority, application Japan, Dec. 28, 1984, 59-277554
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **7 Claims**



1. An information signal reproducing apparatus comprising:

memory means for storing encoded digital data and error correcting data;

decoding means responsive to said memory means for decoding said digital data, producing decoded digital data organized in blocks, and delivering the decoded digital data one block at a time,

data transmission control means for controlling transmission of the digital data from said memory means to said decoding means;

analog information signal procesing means responsive to said decoding means for forming a reproduced analog information signal in accordance with each of the blocks of the decoded digital data supplied thereto,

data supply control means for controlling supply of each block of the decoded digital data from said decoder means to said analog information signal processing means, and

operation control means including first control means for controlling said data transmission control means to transmit the digital data read from said memory means successively to said decoding means and inactivating said data supply control means, so as to cause said decoding means to perform trial decoding of the digital data, and second control means for controlling said data transmission control means to transmit the digital data read from said memory means intermittently to said decoding means and activating the data supply control means, so as to cause said decoding means to perform actual decoding of the digital data after said trial decoding is completed.

4,694,457

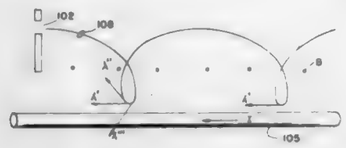
METHODS OF STEERING AND FOCUSING ION AND ELECTRON BEAMS

John C. Kelly, Turramurra, and Glenn W. Keatwell, Waverley, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Continuation of Ser. No. 515,242, Jul. 19, 1983. This application Dec. 26, 1985, Ser. No. 813,452
Claims priority, application Australia, Jul. 20, 1982, PF4955
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—2 **21 Claims**

1. A method for steering or focussing beams such as ion or electron beams with a magnetic field, the method comprising:

generating a large electric current in a straight conducting wire;



projecting charged particles in proximity with the conducting wire;

deflecting the charged particles by generating in proximity with the wire a circular magnetic field;

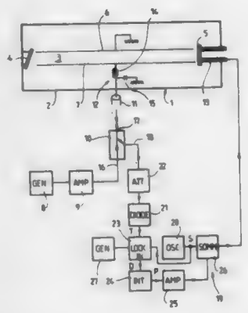
confining each of the charged particles to a path which extends in a direction substantially coplanar with the conducting wire wherein a deflecting force generated by the coaxial magnetic field is exerted on each particle in the plane defined by the conducting wire and the path of the particle.

4,694,458

DEVICE FOR FREQUENCY STABILIZING AN RF EXCITATION LASER

Thierry, R. Midavaine, and Michel M. Ouhayoun, both of Paris, France, assignors to S.A.T. (Societe Anonyme de Telecommunications), Paris, France

Filed Jun. 12, 1985, Ser. No. 743,746
Claims priority, application France, Jun. 19, 1984, 84 09593
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—32 **10 Claims**



1. A device for stabilizing the frequency of an RF excitation laser comprising:

a resonant cavity having at least two mirrors filled with the laser gas and having an impedance;

an RF radio-frequency alternating power generator for generating an excitation signal having an output impedance;

electrodes for exciting the laser gas connected to the generator;

means for causing the frequency of the laser to vary;

means, connecting said generator and said electrodes, for matching the impedance of the laser cavity to the output impedance of said generator; and

means responsive to an impedance mismatch signal reflected by the cavity, for controlling said causing means to vary said frequency through a servo-control circuit.

4,694,459

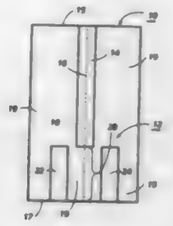
HYBRID GAIN/INDEX GUIDED SEMICONDUCTOR LASERS AND ARRAY LASERS

Robert D. Burnham, Palo Alto; Thomas L. Paoli; Donald R. Scifres, both of Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1985, Ser. No. 739,805
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **31 Claims**

1. A hybrid index/gain guided semiconductor laser comprising a plurality of contiguous semiconductor layers deposited on a substrate, one or more of said layers forming an active region having a lower bandgap and higher index of refraction relative to at least cladding layers immediately adjacent thereto, said active region approximate to a p-n junction when, upon forward biasing via primary current confinement means,

permitting carrier recombination in at least one portion thereof and supporting radiation propagation under lasing conditions in an optical cavity established between transverse end facets of the laser beneath said primary current confinement means, said laser having at least two regions of current confinement means, the first of said regions containing said primary current confinement means and comprising a single current confinement stripe and extending from one laser facet toward the



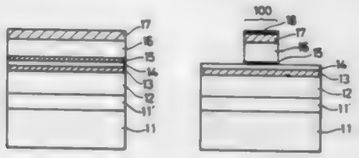
second of said regions, said second region having a pair of current confinement stripes parallel but axially offset relative to the axis of said primary current confinement stripe and extending from the other laser facet toward said first region, said axially offset current confinement stripes providing regions of lower refractive index in said laser compared to the region of said optical cavity established therebetween and functioning as an index optical waveguide for said laser.

4,694,460

STRIPE GEOMETRY SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa; Takahiro Suyama, and Saburo Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 18, 1985, Ser. No. 725,094
Claims priority, application Japan, Apr. 26, 1984, 59-86700
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **17 Claims**



1. In a stripe geometry semiconductor laser: a multi-layered crystal structure having a substrate and an active layer for laser oscillation; an etching blocking layer on said multi-layered crystal structure; and a striped mesa-type multi-layered crystal, including a cladding layer, which serves as an electroconductive region and is disposed on said etching blocking layer, resulting in a difference in the distribution of the refractive index of light with regard to the active layer between the inside and the outside of said striped mesa-type multi-layered crystal.

4,694,461

SEMICONDUCTOR LASER ARRAY

Seiki Yano, Kashihara; Saburo Yamamoto, Nara; Sadayuki Matsui, Tenri, and Motoaka Taneya, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1985, Ser. No. 700,018
Claims priority, application Japan, Feb. 28, 1984, 59-39144
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—50 **7 Claims**



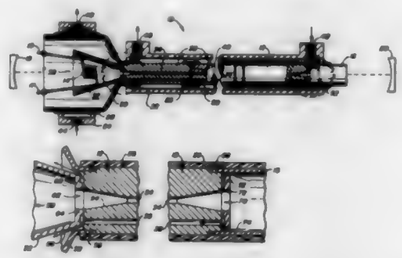
1. A semiconductor laser array having a stable operation and a high power output comprising:
a substrate;
a clad layer formed on said substrate;
an active layer formed on said substrate;
an optical guide layer formed on said active layer;
a plurality of mesa stripes formed on said optical guide layer, each mesa stripe being separated from the next mesa stripe by a groove extending into said optical guide layer, an optical coupling region having a high a mole fraction in each said groove; and
current injection means for injecting current into said active layer through said plurality of mese stripes, wherein each laser emitting region defined by said mesa stripes is optically, phase connected to the next laser emitting region with a phase difference of zero degrees.

4,694,462

LASER WITH BYPASS GAS DEFLECTOR

Ronald E. Jones, Cupertino, Calif., and Royal D. Peterson, Alpharetta, Ga., assignors to Continental Laser Corporation, Mountain View, Calif.

Filed Dec. 13, 1985, Ser. No. 808,863
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **15 Claims**



1. A gas laser comprising,
a laser tube having a longitudinal discharge bore therethrough, said tube containing a gas capable of lasing action,
cathode and anode means at opposite ends of said tube for sustaining a gas discharge in said discharge bore,
a resonant optical cavity aligned with said tube,
a gas reservoir joined in sealing relation to an end of said tube, said cathode means being within said gas reservoir, said laser tube having at least one bypass bore with an opening into said gas reservoir and

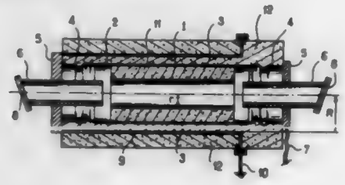
a first bypass gas deflector mounted in said reservoir and having a deflector interior region, said first deflector having an open end and an opposite aperture end, said first deflector surrounding at least a portion of said cathode means, said aperture end having an aperture, said first deflector being connected to said tube with said aperture aligned with said discharge bore, said bypass bore opening into said reservoir outside of said deflector interior region, said bypass bore being in fluid communication with said discharge bore via said open end of the first detector.

4,694,463

METAL VAPOR LASER TUBE

Antoine Hirth, Hegenheim, France, and Klaus-Herbert Schetter, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Institut Franco-Allemand de Recherches de Saint-Louis, St. Louis, France

Filed Jun. 4, 1986, Ser. No. 870,384
Claims priority, application France, Jun. 5, 1985, 85 08457
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—61 **4 Claims**



1. A metal vapor laser tube comprising a cylindrical plasma tube (**1**), which is located in a leak-proof container (**2**), said plasma tube being surrounded by a thermal insulating material, electrodes (**6**) disposed at each end of the plasma tube supplying a current pulse to a plasma located within said plasma tube and a cylindrical return conductor (**9**) which is located coaxial to the plasma tube (**1**) and which is connected with one of the electrodes, characterized in that the conductor (**9**) has a radius R of about:

$$\frac{107}{e^{4\pi r^2}} \cdot \frac{dE}{dV}\left(\frac{ro}{U}\right)^2$$

where:
e=exponential function,
r=radius of the plasma tube, expressed in centimeters,
dE/dV=energy density of the plasma, expressed in millijoules per cubic centimeter,
ro=specific resistance of the plasma, expressed in Ohms×centimeter,
U=electrical field, expressed in volts per centimeter; thereby producing impedence matching of said laser tube so as to obtain an electric discharge without oscillation of said current supply pulse.

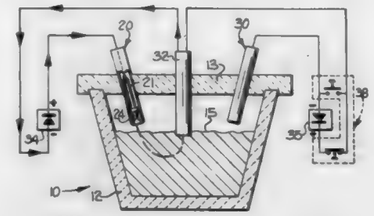
4,694,464

PLASMA ARC HEATING APPARATUS AND METHOD

Salvador L. Camacho, Raleigh, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Jul. 30, 1986, Ser. No. 892,081
Int. Cl.[4] H05H *1/00*; H05B *7/00*
U.S. Cl. 373—22 **8 Claims**

1. An apparatus for heating a metallic melt which is adaptable to efficient starting and operation and comprising:
a furnace chamber having a hearth for receiving a metallic melt and the like;
a pair of plasma torches mounted to said furnace chamber for initiating and sustaining a plasma arc, each plasma torch including a rear electrode;
an external electrode mounted to said furnace chamber so as to be adapted to contact the metallic melt in the hearth;
a first direct current power supply means mounted externally of said furnace chamber and having an anode connected to said rear electrode of one of said plasma torches and a cathode connected to said external electrode, and such that a first circuit may be established between said first power supply means, said one plasma torch, the metallic melt, and said external electrode; and
a second direct current power supply means mounted externally of said furnace chamber and having a cathode connected to said rear electrode of the other of said plasma



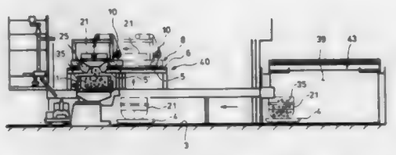
torches and an anode connected to said external electrode, and such that a second circuit may be established between said second power supply means, said other plasma torch, the metallic melt, and said external electrode, and with the second circuit having a polarity opposite to that of said first circuit;
means for selectively removing said external electrode from each of said first and second circuits and establishing a single operating circuit which includes in series said first and second power supply means, said pair of torches, and the metallic melt which serves to conduct current between said pair of torches.

4,694,465

APPARATUS FOR AUTOMATICALLY CHARGING SCRAP INTO AN ARC FURNACE

Toshio Nanjo, Itabashi, and Fumio Tomizawa, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 626,243, Jun. 29, 1984. This application Feb. 27, 1986, Ser. No. 833,599
Claims priority, application Japan, Nov. 16, 1983, 58-215791
Int. Cl.[4] F27D *3/06*
U.S. Cl. 373—81 **3 Claims**



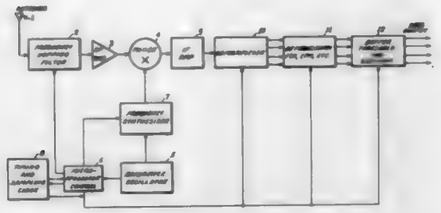
1. An apparatus for automatically charging scrap into a shroudless arc furnace, comprising: a scrap bucket open at the top, a bucket carriage on which said scrap bucket is loaded, said bucket carriage being normally positioned at a stand-by position which is adjacent to the arc furnace and which is at a height or level just sufficient for travel of the bucket to above the furnace for directly charging the scrap into the furnace, a structure including beams extended between said stand-by position and said arc furnace, said bucket carriage riding on said beams, and a mechanism for traversing said scrap bucket between said stand-by position and said are furnace.

4,694,466

TIME SHARING FREQUENCY SYNTHESIZER

Joseph Kadin, Morris, N.J., assignor to ITT Defense Communications, a Division of ITT Corporation, Nutley, N.J.

Filed Jun. 3, 1985, Ser. No. 740,603
Int. Cl.[4] H04L *27/26*
U.S. Cl. 375—1 **7 Claims**



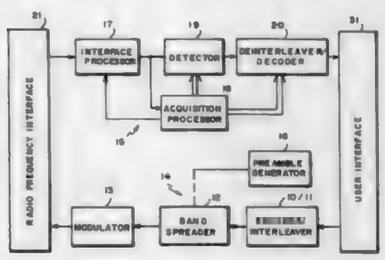
1. A time sharing frequency synthesizer circuit, comprising:
means for syntheszing a plurality of desired frequencies one at a time for predetermined intervals in a desired sequence, said means comprising a reference oscillator, a microprocessor containing values corresponding to a table of desired output frequencies for a frequency synthesizing device, said microprocessor being connected to an output of said reference oscillator, and a frequency synthesizer which is connected to an output of said reference oscillator and an output of said microprocessor and which contains circuitry for converting the output of said reference oscillator into any desired frequency,
means for heterodyning each of said desired frequencies with one or more signals with frequencies within a desired bandwidth to generate intermediate frequencies at a sample rate consistent with the Nyquist criteria of sampling at a frequency at least twice the effective bandwidth; and
means for discriminating among said intermediate frequencies.

4,694,467

MODEM FOR USE IN MULTIPATH COMMUNICATION SYSTEMS

Shou Y. Mui, Cherry Hill, N.J., assignor to Signatron, Inc., Lexington, Mass.

Filed Jul. 3, 1986, Ser. No. 881,611
Int. Cl.[4] H04B *7/00*
U.S. Cl. 375—1 **12 Claims**



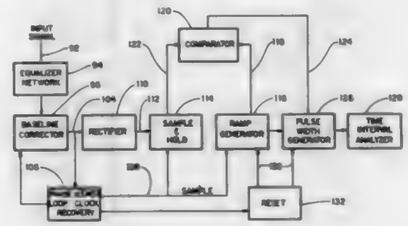
1. A modem for use in communication systems used for transmitting and receiving information bits, said modem comprising
a transmitter including
spectrum spreading means responsive to a plurality of sequentially supplied input information bits for providing a plurality of spread spectrum information bits, a first group thereof having spread spectrum characteristics in accordance with a first spread spectrum sequence and a second group thereof having spread spectrum characteristics in accordance with a second spread spectrum sequence which differs from said first spread spectrum sequence;
modulation means for modulating said plurality of spread spectrum information bits to provide a modulated transmitter signal;
means for generating a preamble signal;
means for sequentially transmitting said preamble signal and said modulated transmitter signal;
a receiver including
means for receiving said preamble signal and said modulated transmitter signal;
processing means including
means responsive to said preamble signal for processing said preamble signal to provide estimates of the frequency offsets of said received preamble signal;
means responsive to said modulated receiver signal for generating complex baseband signal samples; and
means responsive to said frequency offset estimates and to said complex baseband signal samples for shifting the frequencies of said baseband signal samples by said frequency offset estimates to reduce the frequency offsets of said baseband signal samples to a minimum;
detector means comprising
means responsive to sid frequency shifted complex baseband signal samples for providing a plurality of signal samples which are time delayed relative to each other;
means responsive to a selected number of said time delayed signal samples for de-spreading and for demodulating each of said selected signal samples to provide a selected number of de-spread and demodulated signal samples; and
means for combining said selected number of de-spread and demodulated signal samples to provide a demodulated received output signal.

4,694,468

APPARATUS USEFUL IN CHANNEL EQUALIZATION ADJUSTMENT

Dennis F. Cullum, Leucadia, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1986, Ser. No. 855,562
Int. Cl.[4] H04B *17/00*
U.S. Cl. 375—10 **6 Claims**



1. Apparatus for the measurement of the intersymbol interference of a digital output signal after transmission through a channel, wherein said intersymbol interference is related to the quality of equalization of said channel; said apparatus comprising:
a. means for applying an input digital signal to said channel at the approximate Nyquist rate of said channel,
b. means for receiving the output signal of said channel responsive to said input digital signal,
c. means for generating phased sampling signals relative to said output signal,

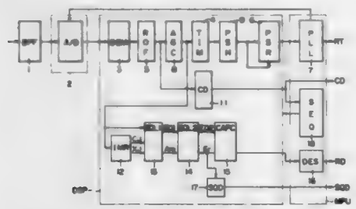
d. means for obtaining amplitude samples of said output signal by means of said sampling signals,
e. conversion means for producing corresponding pulse width samples from said amplitude samples, and
f. measurement means for determining the quantities of said pulse width samples having predetermined magnitudes of pulse widths,
whereby said quality of equalization of said channel is related to the dispersion of said samples over the range of said pulse width samples.

4,694,469

METHOD AND DEVICE FOR TIMING PULL-IN OF RECEIVING EQUIPMENT

Takashi Kaku, Tama, and Yasuhiro Arai, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 4, 1986, Ser. No. 870,546
Claims priority, application Japan, Jun. 4, 1985, 60-120839; Jun. 7, 1985, 60-123772
Int. Cl.[4] H04B *3/06, 3/10*
U.S. Cl. 375—13 **14 Claims**



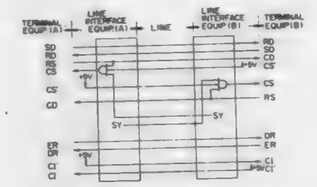
1. A timing pull-in device of a receiving equipment comprising:
means for sampling a received signal from a transmission line by a certain sampling timing and demodulating the received signal;
means for extracting a timing signal from the demodulated signal;
means for phase-rotating the extracted timing signal by an amount of rotation phase previously set;
means for adjusting the sampling timing of the received signal by carrying out a phase-locked loop control on the basis of the phase-rotated timing signal;
means for recovering an impulse from the demodulated signal;
a first equalizing means for fix-equalizing the demodulated signal by using a tap coefficient previously set; and
a second equalizing means for automaticequalizing the equalized output of the first equalizing means to obtain an output signal;
wherein, at the time of an initial training of the receiving equipment, a training signal containing an impulse component is received from the transmitting line, the impulse is recovered from the training signal by the impulse recovering means, a complex conjugate of the recovered impulse is set to the first equalizing means as the tap coefficient for the fix-equalization, the tap coefficient for the automaticequalization is calculated from the recovered impulse to be initial-set to the second equalizing means, and the amount of the phase rotation is set to the phase rotating means so that the phase of the timing signal extracted by the extracting means coincides with the phase of an internal clock of the equipment.

4,694,470

DATA TRANSMISSION CIRCUIT

Toshimichi Shimatani, Fuchu, and Yoshihiro Kawata, Tokorozawa, both of Japan, assignors to Iwatsu Electric Co. Ltd., Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,554
Claims priority, application Japan, Nov. 14, 1984, 59-239696
Int. Cl.[4] H04L *23/00*
U.S. Cl. 375—37 **2 Claims**



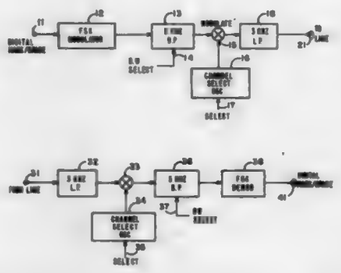
1. In a data transmission circuit accommodated in a transmission line of 64 Kbps channels through a multi-frame arrangement for transmitting data and control signals of a terminal equipment, the improvement in which a predetermined small number of frames of said multi-frame arrangement have assigned thereto a required number of bits, corresponding to data being transmitted, at least one synchronization flag bit and various control signals are assigned to the remaining bits but a request-to-send signal in the control signals is assigned to one of the remaining bits according to a logice OR of succeeding sampled values of the request to send signal, so that data of different transmission speeds can be transmitted by the same circuit, sampling means for effecting sampling of said succeeding sampled values of the request-to-send signal, and means for determining the value of the succeeding request-to-send signals prior to the sampling thereof.

4,694,471

DIGITAL DATA COMMUNICATING

Barry A. Blesser, RFD 2, Box 335, Raymond, N.H. 03077

Filed May 5, 1986, Ser. No. 859,318
Int. Cl.[4] H04L *27/10*
U.S. Cl. 375—45 **35 Claims**



1. Digital data communicating apparatus comprising,
a plurality of transmitting means for providing digital data signals each comprising,
modulating means for selectively providing first and second binary signals representative of first and second binary values, respectively,
bandpass filtering means for selectively transmitting signals within a predetermined bandwidth,
said bandpass filtering means including a bandwidth select terminal for receiving a bandwidth select signal for controlling said bandwidth,
a source of a local oscillator signal,

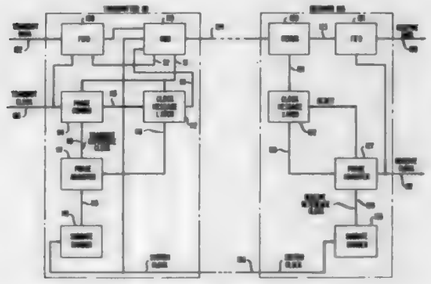
means for controlling the frequency of said local oscillator signal to select a desired audiofrequency channel,
output mixing means for combining the output of said bandpass filtering means with said local oscillator signal to provide a difference frequency signal modulated with said binary signals,
an output terminal,
and low-pass filtering means for coupling only said difference frequency signal to said output terminal for delivery to a communication channel.

4,694,472

CLOCK ADJUSTMENT METHOD AND APPARATUS FOR SYNCHRONOUS DATA COMMUNICATIONS

Gabor P. Torok, Holmdel, N.J., and Andrew B. White, Urbana, Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 371,661, Apr. 26, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,456
Int. Cl.⁴ H04L *7/00*
U.S. Cl. 375—107 **18 Claims**



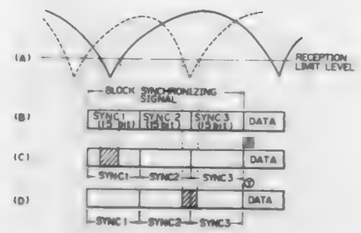
1. In a synchronous data communication system comprising a transmitter, a receiver and a common reference clock, said transmitter controlled by a first clock and said receiver controlled by a second clock derived from the common reference clock and having the same nominal frequency as said first clock, apparatus at said transmitter and said receiver for adjusting the phase between said second clock and said first clock,
said transmitter apparatus comprising:
means for periodically comparing the phase of said first clock with a transmit reference clock derived from the common reference clock;
means responsive to said comparing means for periodically generating a phase adjusting signal independent of said second clock indicating a predetermined fixed increment phase adjustment of a fraction of one clock pulse of the common reference clock to be made between said common reference clock and said second clock at said receiver, said predetermined fixed increment phase adjustment being independent of the magnitude of the phase difference between said first clock and said transmit reference clock;
means for periodically transmitting said phase adjusting signal to said receiver; and
means for adjusting the phase between said first clock and said transmit reference clock by an amount equal to said predetermined fixed increment phase adjustment.

4,694,473

DATA COMMUNICATION SYSTEM WITH BLOCK SYNCHRONIZATION DATA IN MOBILE RADIO

Hiroshi Etoh, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,716
Claims priority, application Japan, Mar. 8, 1985, 60-44741
Int. Cl.⁴ H04L *7/00*
U.S. Cl. 375—116 **2 Claims**



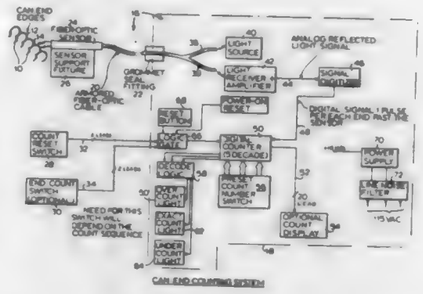
1. A block synchronization data communication method in mobile radio comprising the steps of:
(1) a step of encoding data to be transmitted and blocking the encoded data,
(2) a step of adding a block synchronization signal having a plurality of different successive patterns positioned in a prescribed order to the head of said blocked data,
(3) a step of transmitting the blocked data added with said block synchronization signal,
(4) a step of receiving said transmitted data and recognizing one of said patterns constituting the block synchronization signal,
(5) a step of estimating the data position based on a block synchronization signal constitution position of the recognized pattern, and
(6) a step of decoding the blocked data beginning from said estimated position as received data.

4,694,474

HIGH SPEED COUNTER FOR THIN OBJECTS

Richard A. Dorman, Troy, and Robert E. Johnson, Ballston Spa, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 18, 1986, Ser. No. 875,554
Int. Cl.⁴ H03K *21/40*; **G06M** *7/00*
U.S. Cl. 377—6 **2 Claims**



1. A device for counting objects arranged in a stack which are differentiable by light reflectance, comprising:
a bifurcated fiber optic bundle having a transmitter arm and a receiver arm terminating in a bundle face for directing light toward said stack and for receiving corresponding reflected light from the stack;

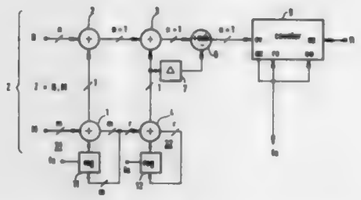
a light source coupled to said transmitter arm;
a light sensor coupled to said receiver arm for generating an electrical signal corresponding to light reflected by said stack; and
counting means for receiving said electrical signal and generating a count corresponding to the number of objects in the stock;
where said counting means comprises a digitizer circuit for generating a pulse corresponding to a peak value of said electrical signal and a digital counter for totalizing said pulse and wherein said electrical signal is characterized by alternating peaks and valleys corresponding to said objects, and said digitizer comprises peak detecting means and valley detecting means, said peak detecting means being disabled after a pulse is emitted until a valley is detected by the valley detecting means such that false counts are prevented.

4,694,475

FREQUENCY DIVIDER CIRCUIT

Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,152
Claims priority, application European Pat. Off., May 18, 1985, 85106137
Int. Cl.⁴ H03K *21/02*
U.S. Cl. 377—48 **7 Claims**



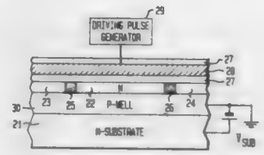
1. Frequency divider circuit for divisors consisting of an integral part and a fractional part which is designed in the manner of a rate multiplier and comprises:
a digital first accumulator including a clocked data register and an m-bit first adder having a first input presented with an m-bit first digital word corresponding to the fractional part of the divisor, and having a second input fed from the output of said data register, the input of said data register being connected to the output of said first adder said first accumulator having a sum output;
an n-bit second having a first input receiving an n-bit second digital word corresponding to the integral part of said divisor and having a second input connected to the carry output of said first adder;
an n+1 bit third adder having a first input coupled to the output of said second adder, said third adder having a second input and an output;
a subtracter having its minuend input coupled to the output of said third adder output, said subtracter having a subtrahend input and an output;
a presettable counter having its preset input coupled to the output of said subtracter output, and having a count input receiving a signal to be frequency divided;
said counter having a counter output at which a pulse occurs after a number of pulses equal to the value applied to said preset input, output pulses at said counter output being the frequency-divided signal;
said frequency divided signal clocking said data register, and;
an r-bit second accumulator, wherein $1 \leq r \leq m$, having an input receiving the r most significant output bits of said first accumulator sum output, and having a carry output coupled to a second input of said third adder and coupled to the subtrahend input of said subtracter; and
a delay means disposed between said second accumulator carry output and said subtracter subtrahend input, said delay means having a delay equal to the period of said frequency divided signal.

4,694,476

BURIED CHANNEL CHARGE COUPLED DEVICE

Eiji Oda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 741,942, Jun. 6, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 910,343
Claims priority, application Japan, Jun. 6, 1984, 59-116073
Int. Cl.⁴ G11C *19/28*; **H01L** *29/78, 27/14, 31/00*
U.S. Cl. 377—58 **7 Claims**



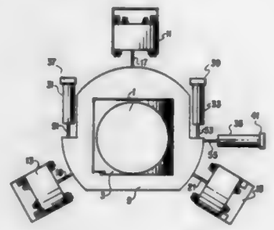
1. A buried channel charge coupled device (CCD) wherein buried CCD elements are disposed on a semiconductor substrate having one conductivity and disposed in a semiconductor area having a conductivity reverse to that of said semiconductor substrate; transfer electrodes disposed in said CCD for receiving three-level driving pulses wherein the pulses are applied to each of said electrodes, each pulse has, at different time points, first, second and third voltage levels, and the first voltage level is applied to selected ones of the transfer electrodes with the second voltage level applied to selected other ones of the transfer electrodes during at least one part of a time period in a charge transfer period and a charge integration period so that part of signal charges in the buried channel are drained through said semiconductor area into said semiconductor substrate, and said second and third voltage levels are alternately applied to said transfer electrodes during the charge transfer period.

4,694,477

FLEXURE STAGE ALIGNMENT APPARATUS

Graham J. Siddall, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 21, 1983, Ser. No. 564,434
Int. Cl.⁴ G05G *11/00*
U.S. Cl. 378—34 **21 Claims**



12. An alignement apparatus for movably supporting an X-ray lithography mask, the apparatus comprising:
a stage plate for holding the mask in an X-Y plane;
first displacement means, attached to the stage plate and disposed along a radial axis of the stage plate in an X-Y

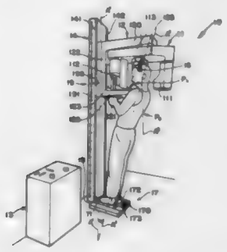
plane, the first displacement means being operative for linearly translating the stage plate along the radial axis;
second and third displacement means, attached to the stage plate and disposed in the X-Y plane orthogonally to the radial axis, for displacing the stage plate;
first, second and third flexure assemblies, attached to the stage plate at first, second and third points distributed equiangularly about the perimeter of the stage plate, the flexure assemblies each being operative for supporting the stage plate and for displacing the stage plate along a Z-axis orthogonal to the X-Y plane;
said displacement means each including an elastic element attached to the stage plate, each elastic element being stiff in a longitudinal axis and flexible orthogonally to the longitudinal axis and a piezoelectric transducer;
said first, second and third displacement means each being anchored to first, second and third fixed blocks;
said first flexure assembly including;
a pedestal,
a horizontal arm,
attachment means, connecting an end of the horizontal arm to a top of the pedestal, for allowing smooth rotation of the horizontal arm about a rotational axis,
vertical displacement means, connected to an underside of the horizontal arm, for supporting the horizontal arm and for selectably displacing the horizontal arm in the Z-axis,
a rigid bar,
vertical flexure means, connected between the rigid bar and another end of the horizontal arm, for allowing movement of the rigid bar in an X-axis.

4,694,478

APPARATUS FOR ORTHORADIAL PANORAMIC TOMOGRAPHY

Hanspeter Delnon, Seestrasse 24, 8712 Stäfa, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,286
Claims priority, application Switzerland, Jan. 25, 1985, 347/85
Int. Cl.⁴ H05G *1/60*; G03B *23/04*; A61B *6/04*
U.S. Cl. 378—39 **16 Claims**



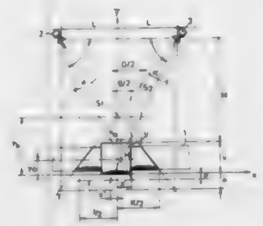
1. An apparatus for orthoradial panoramic tomography of a head region of a human patient in an erect position defined essentially by a longitudinal body axis, said patient having feet including heels and toes; said apparatus comprising:
(a) a radiation source arranged for predetermined motion relative to a point of reference;
(b) a cassette means for selective exposure of an X-ray sensitive film to radiation from said source, said cassette means also being arranged for predetermined motion relative to said point of reference;
(c) a support means for movably holding said radiation source and said cassette means relative to said point of reference;
(d) a head positioning means including an intraoral device and an extraoral device for positioning said patient's head relative to said point of reference;
(e) a carriage means connected with said support means and including a grip means;
(f) a substantially vertical column means for slidingly holding said carriage means in a vertically defined position and having a vertical axis distracted from said point of reference;
(g) a foot positioning means having a substantially horizontal reference face for defining a vertical distance from said horizontal reference face to said point of reference, and a substantially vertical reference face for maintaining toe and/or heel portions of said patient's feet in a predetermined position;
(h) a distancing means for maintaining said at least one vertical reference face at a reproducible horizontal distance from said vertical axis of said column means;
(i) a means for determining and reproducibly setting a vertical distance between said horizontal reference face and said point of reference;
said positioning means being arranged relative to said point of reference and to said vertical column axis for maintaining said patient, when standing on said foot positioning means and engaging said grip means, in a reproducible and inclined position in which his or her longitudinal body axis relative to said vertical column axis is at an angle (α) sufficient to cause an isotonic strain of brachial and dorsal muscles.

4,694,479

VIDEO-RADIOGRAPHIC PROCESS AND EQUIPMENT FOR A QUALITY CONTROLLED WELD SEAM

Endre Bácskai; Ferenc Rétfalvi, and András Sásdi, all of Budapest, Hungary, assignors to Kohaszati Cyaropito Vallalat Gepipari Technologiai Intezet, Budapest, Hungary

Filed Apr. 29, 1985, Ser. No. 728,499
Int. Cl.⁴ G01N *23/02*
U.S. Cl. 378—58 **3 Claims**



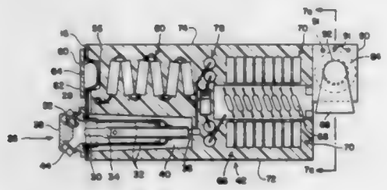
1. Video-radiographic process for the quality control of welds, wherein a weld seam is transilluminated, successively point by point, with X-ray or gamma ray, to produce electrical signals which represent a radiographic image of the weld and its environment; the image being stored for the display and used in the evaluation of a weld, wherein there are included the following improved steps:
(a) providing at least a pair of radiation sources of identical intensity, each directed toward the same portion of a new weld seam (V) at an angle, to transilluminate a portion of the weld area;
(b) positioning sources in a plane on the one side of the surface of weld seam (V), the plane being perpendicular with respect to a vertical axis (Y) and parallel with respect to both a transverse axis (X) and a longitudinal axis (Z), the (Z) axis extending along the length of the weld (V), the sources symmetrically disposed about the vertical axis (Y);
(c) positioning a target plate of a video camera in a plane disposed perpendicular to the vertical axis (Y), parallel to both the longitudinal axis (Z) and the transverse axis (X) on the other side of the surface of the weld seam to be irradiated, so that both radiation sources lie in a common plane spaced from and parallel to the plane of the target plate and separated by the weld seam (V);
(d) transilluminating the portion of the weld seam with the first radiation source operating in a pulsed mode to form a first radiographic still picture;
(e) converting the first radiographic still picture into electrical signals, noting the first picture's position along the seam, and storing the first picture and its position as a first image;
(f) transilluminating the same portion of the weld seam with the second radiation source operating in a pulsed mode to form a second radiographic still picture, noting the second picture's position along the seam, and storing the second picture and its position as a second image;
(g) repeating steps (a) through (f) along the entire length of the weld;
(h) forming a reference standard image using the above-mentioned steps (a) through (f) on a known flawless weld seam having the same characteristics and environment as the new weld; and
(i) comparing each of the first and second images of the new weld with corresponding images of the previously obtained reference standard, obtained from the flawless weld having the same characteristics, to grade and determine the quality of the weld by comparison with the reference standard and to determine the position of any defects.

4,694,480

HAND HELD PRECISION X-RAY SOURCE

Brian Skillicorn, Sunnyvale, Calif., assignor to Kevex Corporation, Foster City, Calif.

Filed Jul. 30, 1985, Ser. No. 760,684
Int. Cl.⁴ H05G *1/06*
U.S. Cl. 378—119 **19 Claims**



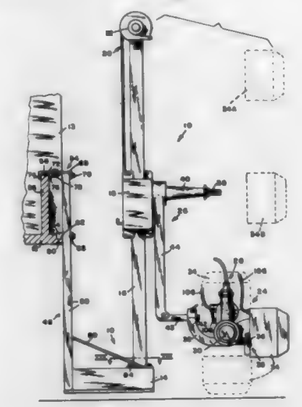
18. An elongated molded block including an x-ray source and integral generator, the block having a cross-sectional geometry which provides for two enlarged cylindrical portions aligned with the longitudinal axis of the block and joined by a thinned, flat central portion, the block having three longitudinal regions aligned in tandem, a first region at one end of the block defining a first heat conduction fluid fillable longitudinally extending cavity opening at a first end wall of the block for receiving an elongated x-ray tube and for providing a high voltage connection to an anode target connection of the x-ray tube adjacent to an interior end enclosed by the block the block having a second region adjacent the first region for encapsulating the capacitors and diodes of a single high voltage multiplier stack wherein voltage multiplying capacitors are embedded in the cylindrical portions of the second region of the block and voltage multiplying diodes are embedded in the thinned flat central portion lying between the cylindrical portions, and the block having a third region adjacent the second region containing and encapsulating primary and secondary windings of a single high voltage switching transformer means including a ferrite magnetic core for generating a high voltage and having internal connections of the secondary to the voltage multiplier stack and external primary leads.

4,694,481

TRANSPORTABLE X-RAY APPARATUS

Robert J. Tashjian, West Boylston, and Charles E. Moreland, Wakefield, both of Mass., assignors to New England Institute of Comparative Medicine, West Boylston, Mass.

Filed Aug. 15, 1985, Ser. No. 766,132
Int. Cl.⁴ H05G *1/02*
U.S. Cl. 378—198 **13 Claims**



1. Transportable X-ray apparatus which is adapted to be transported in a motor vehicle and to be mounted externally on the transport vehicle, said transportable X-ray apparatus comprising:
(a) a support assembly which includes a horizontal support base and an elongated vertical mast,
(b) a carriage which is mounted on the mast for sliding vertical movement,
(c) a radiation assembly which includes a collimator and a tube unit assembly which is operatively connected to the collimator,
(d) first mounting means for supporting said radiation assembly on said carriage for vertical movement with the carriage, and
(e) second mounting means for supporting said support assembly on the transport vehicle so that the transportable X-ray apparatus extends externally of the transport vehicle, said second mounting means comprising:
(1) a vertical bracket which is fixed to said horizontal support base and which has a free top end,
(2) an anchoring fixture at one end of the vehicle, and
(3) an attaching fixture which is fixed to said vertical bracket for operatively engaging said anchoring fixture so that the entire transportable X-ray apparatus is suspended from said anchoring fixture.

4,694,482

DIGITAL TONE DETECTOR

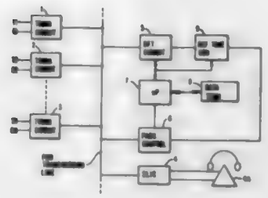
Gordon J. Reesor, Nepean; Patrick R. Beirne, and Zbigniew B. Styrna, both of Kanata, all of Canada, assignors to Mitel Corporation, Ontario, Canada

Division of Ser. No. 705,679, Feb. 26, 1985. This application Oct. 22, 1986, Ser. No. 921,526
Claims priority, application Canada, Nov. 9, 1984, 467548
Int. Cl.⁴ H04M *1/24*
U.S. Cl. 379—27 **2 Claims**

1. A method for performing line circuit diagnostics on one or more line circuits, comprising the steps of:
(a) generating and transmitting a digital sample sequence of a test tone signal having predetermined frequency to a line circuit of a PABX,
(b) receiving a modified version of said sample sequence from said line circuit,

(c) generating one or more further digital sample sequences of tone signals having frequencies harmonically related to said predetermined frequency, and

(d) performing a discrete Fourier transforms on said received sample sequence with respect to said further digital sample sequences and generating one or more digital cross



correlation signals for transmission to the PABX having magnitude parameters which are proportional to the amounts of energy in the received signal at said harmonically related frequencies,

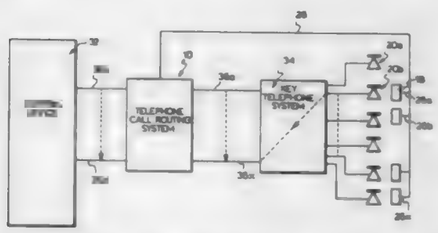
whereby said magnitudes of the correlation signals provide an indication of the status of internal circuitry of said one or more line circuits.

4,694,483

COMPUTERIZED SYSTEM FOR ROUTING INCOMING TELEPHONE CALLS TO A PLURALITY OF AGENT POSITIONS

Edward H. Cheung, Mississauga, Canada, assignor to Innings Telecom Inc., Ontario, Canada

Filed Jun. 2, 1986, Ser. No. 869,408
Int. Cl.[4] H04M *3/22*
U.S. Cl. 379—34 **13 Claims**



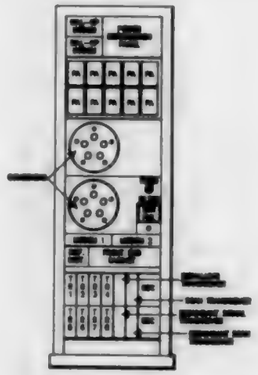
1. A telephone call routing system for routing incoming telephone calls by assigning each such incoming call to a selected one of a plurality of agent display modules, said system comprising means for receiving said incoming telephone call, means for assigning said incoming telephone call to one or more of said agent display modules, each of said agent display modules being in electronic communication with said incoming call assigning means, said agent display module having a visual output indicating which of a plurality of telephone lines carrying said incoming call is assigned thereto, a plurality of agents' telephones, each telephone being associated with a corresponding one of said agents' modules, means for connecting each of said telephones to said line carrying said incoming call, said telephone having means for generating and transmitting a coded signal along said telephone line carrying said incoming call when any one of said telephones is actuated to answer said incoming call, said signal being uniquely coded to identify said agent's module which is associated with said telephone which answers said incoming call, signal detection means to detect said transmitted coded signal and to decode said coded signal and determine which telephone associated with an agent's module answered said incoming call, means for monitoring agent telephone activity by determining and storing a characteristic representative of activity of each agent's telephone, means for accessing said monitor means and determining activity of each telephone answering incoming calls, said accessing means being in communication with said assigning means, said assigning means assigning the next incoming call to the selected agent's module associated with the least actively used telephone providing there are at least two inactive telephones at the time of assigning the next incoming call.

4,694,484

CELLULAR RADIOTELEPHONE LAND STATION

Frederick G. Atkinson, Winfield; Anthony Kobrinetz, Hoffman Estates, and Barry J. Menich, Chicago, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 18, 1986, Ser. No. 830,145
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—59 **19 Claims**



1. A modular multichannel fixed site station for radiotelephone communications, comprising:

a common equipment housing having a plurality of apertures wherein electrical equipment modules may be disposed, each aperture having electrical connections to a fixed site station controller and providing an electrical interconnection having one of at least two characteristics with a module disposed therein;

a plurality of radio transceiver modules, having variable receive and transmit parameters, removably disposed in first and second electrical interconnection characteristic apertures;

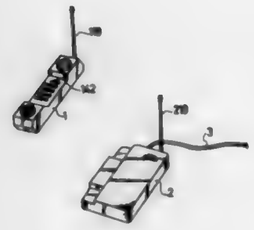
means, disposed in said fixed site station controller, for programming said variable receive and transmit parameters of each said plurality of radio transceiver modules to predetermined parameters unique to each said transceiver module and dependent, inter alia, upon whether each transceiver module is disposed in said first or second electrical interconnection characteristic aperture.

4,694,485

CORDLESS TELEPHONE

Sumio Iwase, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 596,947, Apr. 5, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 912,185
Claims priority, application Japan, Apr. 7, 1983, 58-61301
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—62 **19 Claims**



1. A cordless telephone system, comprising:

a base unit having a transmitter-receiver unit including a plurality of different communication channels and being connected to a telephone network;

a handset having a receiver-transmitter unit including said plurality of different communication channels, whereby communication with said base unit is carried out by transmitting and receiving radio waves over a first selected one of said plurality of communication channels;

detecting means provided in one of said base unit and handset for detecting whether said first selected one of said plurality of communication channels is occupied and, in response to occupation of said first selected channel, producing a channel-occupied signal and switching to a vacant channel;

selecting means provided in the other of said base unit and handset for selecting said vacant channel in response to said channel-occupied signal, so that said vacant channel is seized;

said selecting means including first channel selector means connected in said base unit and second channel selector means connected in said handset;

said detecting means including a first signal detector connected to said base unit and means for producing a channel identification signal fed to said first channel selector means for selecting a channel in response thereto, and said base unit including means for transmitting said channel identification signal to said second channel selector means for selecting said channel in said handset in response thereto;

said selecting means further including computing means for computing said vacant channel based on the next sequential one of said plurality, and

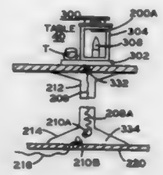
further including a phase-locked-loop circuit having a variable frequency dividing circuit in which the frequency dividing ratio is responsive to said computing means for changing said first and second channel selector means to said vacant channel.

4,694,486

COMBINED TELEPHONE-TABLE SYSTEM

Seymour C. Yuter, 407 Cedar Drive West, Briarcliff Manor, N.Y. 10510

Division of Ser. No. 332,477, Dec. 21, 1981, which is a division of Ser. No. 173,037, Jul. 28, 1980, which is a continuation of Ser. No. 13,568, Feb. 21, 1979. This application Apr. 10, 1984, Ser. No. 580,827
Int. Cl.[4] H04M *1/15*
U.S. Cl. 379—110 **6 Claims**



1. A combined telephone-table system comprising:

(A) a table having a table top, pedestal and base, said base comprising a wall enclosing a space of substantially the same shape as said base;

(B) an opening in said table top above said pedestal;

(C) a single telephone unit solely positioned above the upper surface of said table top;

(D) a first cable having a movable socket;

(E) a second cable passing from said telephone unit through said opening and pedestal and terminating in said space enclosed by said wall of said base;

(F) a movable plug attached to the end of said second cable;

(G) retracting means associated with said second cable whereby said second cable when stretched will retract to substantially its original length when released;

(H) said second cable and movable plug having a combined length which is sufficient when stretched for said movable plug to extend past the periphery of said base, and when released for said movable plug to retract past the periphery of said base into said space enclosed by said wall of said base;

(I) whereby when said movable plug of said second cable is stretched past the periphery of said base and plugged into said movable socket of said first cable, said connected movable plug and movable socket will retract past the periphery of said base into said space enclosed by said wall of said base when said second cable is released.

4,694,487

CONTROLLING MULTI-FORT HUNT GROUPS IN A DISTRIBUTED CONTROL SWITCHING SYSTEM

Shih-Jeh Chang, Naperville; Richard T. Emery, Montgomery; Shafik J. Hakim, and Douglas S. Sand, both of Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 7, 1985, Ser. No. 699,462
Int. Cl.[4] H04Q *3/42*
U.S. Cl. 379—269 **21 Claims**

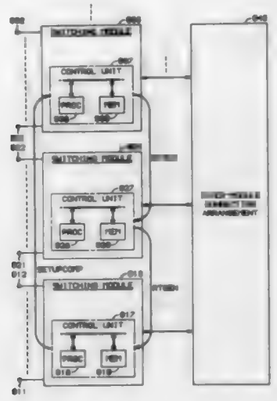
1. In a distributed call processing system for use in a switching system interconnecting a plurality of ports including a plurality of multi-port hunt groups, said call processing system comprising a plurality of control units each associated with a subset of said plurality of ports and each storing reference data defining, for each of said hunt groups, one of said control units that is designated as the controller for said each hunt group, and storing hunt data defining the busy/idle status of the ports of each of said hunt groups for which said each control unit is designated as the controller,

a method of processing a call to a given one of said hunt groups comprising

a first one of said control units accessing its reference data in

response to said call and determining that a second one of said control units is designated as the controller for said given hunt group,

said first control unit transmitting a message to said second control unit defining said given hunt group and



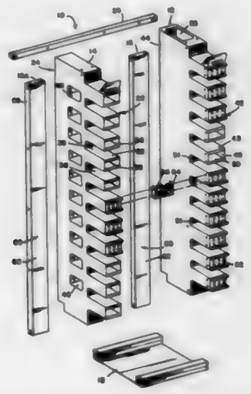
said second control unit accessing its hunt data and assigning to receive said call, one port of said given hunt group that is idle.

4,694,488

DISTRIBUTING FRAME FOR TELECOMMUNICATIONS CIRCUITS

Nils P. Mickelson, Gorham, Me., and Jerauld C. MacFarlane, Hurst, Tex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 15, 1986, Ser. No. 906,878
Int. Cl.[4] H05K *7/18*
U.S. Cl. 379—327 **9 Claims**



9. A modular distributing frame assembly for distributing telephone circuits comprising:

a central office bay member comprising a generally vertical hollow member having generally forward and rear surfaces, said forward surface having a plurality of alternating openings and interstices, each said opening communicating with said rear surface and having a terminal block mounted therein to provide appearances for office cables; said rear surface defining a vertical opening communicating with said forward openings and adapted to receive said office cables;

an outside plant bay member comprising a generally vertical hollow member having generally forward and rear surfaces, said forward surface having a plurality of openings communicating with said rear surface, each of said openings having a terminal block mounted therein to provide appearances for subscriber cables, said rear surface defining a vertical of opening, having connector blocks mounted therein, each said connector block being electrically associated with an adjacent terminal block; said interstices of said central office and outside plant bay member forming a horizontal pathway whereby jumper connections may be formed; and

a vertical trough member comprising a generally vertical partition member having generally forward and rear surfaces, said rear surface providing a vertical channel for cables to enter and fan out to the connector blocks of adjacent bay members, said forward vertical surface providing a pathway whereby vertical jumper connections may be routed.

4,694,489

VIDEO TRANSMISSION SYSTEM

Jeffrey E. Frederiksen, 603 W. Haven Dr., Arlington Heights, Ill. 60005

Division of Ser. No. 564,405, Dec. 22, 1983. This application Jul. 10, 1986, Ser. No. 884,213
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—10 **2 Claims**



1. In a video transmission system providing secure transmission of a video signal over a communications channel for reception by designated customers, synchronization information indicating the starting positions of video lines and customer data for designating individual customers permitted to receive the video signal,

a decoder having means for detecting the synchronization information and thereupon generating horizontal sync pulses indicating the starting positions of the video lines, wherein the improvement comprises,

at least a portion of the customer data for a particular customer is transmitted in a preassigned time slot in a video line including a record number preassigned to the particular customer, and

the decoder has a customer memory programmed with a customer identification number including a programmed customer record number and a programmed customer time slot identifier, and means for latching the customer data from a video line having a record number matching the programmed customer record number, the customer data being latched from the video line at a time slot indicated by the programmed customer time slot identifier.

4,694,490

SIGNAL PROCESSING APPARATUS AND METHODS

John C. Harvey, 333 E. 57th St., New York, N.Y. 10022, and James W. Cuddihy, 523 E. 14th St., New York, N.Y. 10009

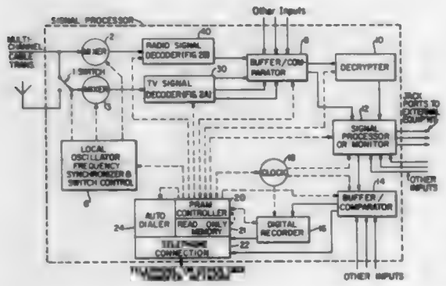
Filed Nov. 3, 1981, Ser. No. 317,510
Int. Cl.[4] H04K *9/00*; **H04N** *7/08*
U.S. Cl. 380—20 **13 Claims**

1. A method of communicating television program material to a multiplicity of receiver stations each of which includes a television receiver and computer, the computers being adapted to generate and transmit overlay signals to their associated television receivers, said overlay signals causing the display of user specific information related to said program material, and with at least some of said computers being programmed to process overlay modification control signals so as to modify the overlay signals transmitted to their associated receivers, each of said computers being programmed to accommodate a specific user application, comprising the steps of:

transmitting a video signal containing a television program signal to said receivers,

transmitting an instruct-to-overlay signal to said receiver stations at a time when the corresponding overlay is not being displayed,

receiving said video signal at a plurality of receiver stations and displaying said program material on the video receivers of selected ones of said plurality of receiver stations,



detecting the presence of said instruct-to-overlay signal at said selected receiver stations and coupling said instruct-to-overlay signal to the computers associated with the video receivers of said selected stations, and

causing said last named computers to generate and transmit their overlay signals to their associated television receivers in response to said instruct-to-overlay signal, thereby to present a display at the selected receiver stations including the television program material and the related computer generated overlay, the overlays displayed at a multiplicity of said receiver stations being different, with each display specific to a specific user.

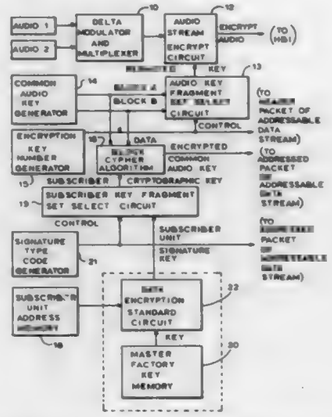
4,694,491

CRYPTOGRAPHIC SYSTEM USING INTERCHANGEABLE KEY BLOCKS AND SELECTABLE KEY FRAGMENTS

Donald R. Horne, Don Mills, and John M. Jeffers, Downsview, both of Canada, assignors to General Instrument Corp., New York, N.Y.

Filed Mar. 11, 1985, Ser. No. 710,385
Int. Cl.[4] H04N *7/167, 7/00, 7/10*
U.S. Cl. 380—20 **31 Claims**

1. A cryptographic system for the secured transmission of information between first and second nodes, comprising, at the first node; means for generating a key comprising more than one key fragment; means for selecting a set of one or more of the key fragments; means for generating data indicative of the selected key fragments; means for encrypting the information using the selected key fragment set; means for encrypting the key, said key encrypting means comprising means for generating a second key comprising more than one second key fragment; means for selecting a set of one or more of the second key fragments; means for encrytping said key with said selected set of second key fragments, means for generating second data indicative of the set of second key fragments selected; and means for transferring the encrypted information, encrypted key, select data and second data from the first node to the second node; and at the second node, means for decrypting the encrypted key, means for obtaining the selected key fragments set from the decrypted key in accordance with the



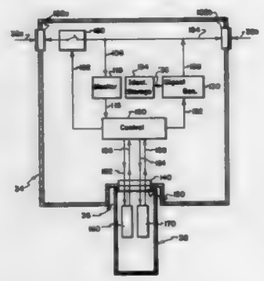
transferred select data and means for decrypting the encrypted information using the obtained key fragments set.

4,694,492

COMPUTER COMMUNICATIONS SECURITY CONTROL SYSTEM

Peter Wirstrom, Pepper Pike, Ohio, and William H. Cork, Lake Bluff, Ill., assignors to Pirmasafe, Inc., Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 670,471
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—23 **28 Claims**



1. Apparatus for verifying the authorization of a user of a terminal for accessing a host computer through a communications link, the apparatus comprising:

(a) encryption means for being carried by an "authorized user," namely a person who is authorized to use terminal to access a host computer through a communications link that connects the terminal to the host computer, the encryption means including a first encryption that has a value which has been assigned to the authorized user as an indicator of the authorized user's authority to access the host computer and also including a second variable encryption representative of the time of a prior successful authorized access with the host computer;

(b) security means interposed in series between portions of the communications link for monitoring signals as they are transmitted along the communications link, the security means defining port means for receiving the encryption means and for cooperating with the encryption means (1) to detect a predetermined authentication query signal

sequence of monitored signals as the authetication query signal sequence is transmitted along the communications link from the host computer and, (2) in response to such detection, to effect transmission of a predetermined authenticating signal sequence along the communications link to the host computer, with the value of the authenticating signal sequence being determined at least in part by the value of the first encryption and of a further encryption resident in said security means and representative of the identity of a predetermined terminal associated therewith so that the predetermined authenticating signal sequence constitutes an indicator of the user's and terminal's authority to access the host computer; and,

(c) authorization check means associated with the host computer (1) for generating an authentication query signal sequence that, when detected by the security means, will cause the security means to transmit the autheticating signal sequnce along the communications link to indicate to the authorization check means whether the autorized user's encryption means is received by the port means for cooperating with the security means to cause the authenticating signal sequence to constitute an indication of the user's authority and the particular connected terminal's authority to access the host computer, (2) for permitting host computer access upon receiving said predetermined autheticating signal sequence, and (3) for preventing host computer access upon receiving an autheticating signal sequence that is other than said predetermined autheticating signal sequence.

4,694,493

SPEAKER VERIFICATION SYSTEM

Hiroaki Sakoe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

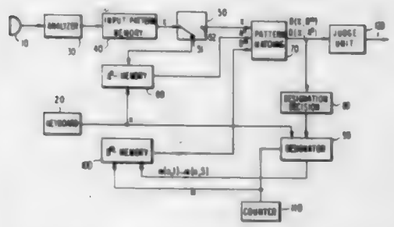
Filed Mar. 20, 1984, Ser. No. 591,652

Claims priority, application Japan, Mar. 30, 1983, 58-54132

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—42 **9 Claims**



1. A speaker verification system comprising:

a first memory for storing, as control reference patterns, patterns which are obtained by speaking a predetermined password under a plurality of predetermined conditions;

a second memory for storing, as a verification reference pattern corresponding to a registered speaker, a pattern which is obtained by said registered speaker speaking said password;

first means operating in response to outputs of said first and second memories for selecting control reference patterns from said first memory consecutively, said selected patterns being those that are the most similar to the verification reference pattern corresponding to said registered speaker;

second means operating in response to outputs of said first memory, said second memory, and said first means for determining, during verification, a first dissimilarity between the input pattern obtained by the speech of a person being verified and the verification reference pattern corresponding to said registered speaker, and second dissimilarities between said input pattern and the selected control reference patterns; and

third means operating in response to an output of said second means for outputting a confirmation signal when said first dissimilarity is less than all said second dissimilarities and a predetermined threshold value.

4,694,494

ELECTRONIC MEMORY DEVICES FOR THE BLIND

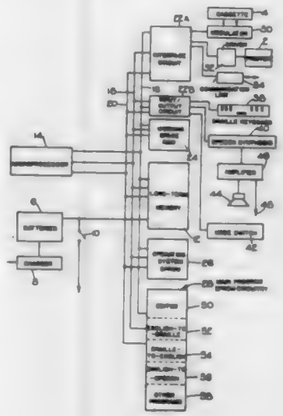
Louis A. Woolfson, Bartestree, England, assignor to Pathway Communications Limited, Hereford, England

Filed May 15, 1984, Ser. No. 610,565

Claims priority, application United Kingdom, Jun. 7, 1983, 8315630

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—51 **12 Claims**



1. An electronic memory device for a blind person or person having impaired vision, said device comprising: a Braille keyboard having a respective key for inputting each dot of a Braille character; memory means for storing in coded form text which has been entered on the keyboard in Braille notation; text transfer means for transferring text from the keyboard to the memory means; text editing means controllable by way of the keyboard to enable text which has been entered on the keyboard and stored in the memory means to be edited by searching for a specified portion of text, by deleting characters from the text and by inserting characters into the text and to enable the edited text to be restored in the memory means; a speech synthesizer for outputting speech in response to receipt of speech codes, and speech control means controllable by way of the keyboard for translating text from the memory means into speech codes and supplying said speech codes to the speech synthesizer, whereby text which has been entered on the keyboard and stored in the memory means may be interactively edited by a user by means of the text editing means in response to reproduction by the speech synthesizer of the text selected for editing by the text editing means.

4,694,495

INTEGRABLE CIRCUIT FOR IDENTIFYING A PILOT TONE

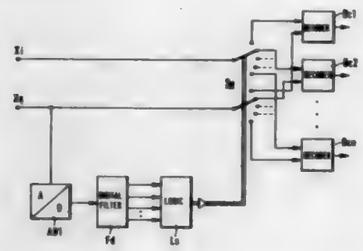
Bernhard Schroeer, Emmendingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Feb. 20, 1986, Ser. No. 831,974

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505950

Int. Cl.⁴ H04H *5/00*

U.S. Cl. 381—15 **11 Claims**



1. A circuit for identifying a pilot from a limited number of pilot tones contained in an audio frequency signal and wherein each said pilot tone corresponds to preassigned functions, said circuit comprising:

an analog-to-digital converter receiving said audio frequency signal;

a subsampling digital averager;

a digital-tone-range filter coupling the output of said analog-to-digital converter to the input of said subsampling digital averager;

a plurality of digital pilot tone filters each having its input coupled to the output of said averager and each providing an output when a corresponding one of said pilot tones occurs;

a plurality of absolute value stages each having its input coupled to the output of a corresponding one of said digital pilot tone filters;

a plurality of low pass filters each having its input coupled to the output of a corresponding one of said absolute value stages; and

circuit means responsive to the outputs of said plurality of low pass filters for selectively enabling the performance of the functions assigned to said pilot tones.

4,694,496

CIRCUIT FOR ELECTRONIC SPEECH SYNTHESIS

Hans Brandl, and Werner Liegl, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 4, 1983, Ser. No. 491,581

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218755

Int. Cl.⁴ G10L *5/00*

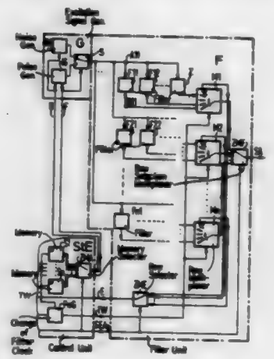
U.S. Cl. 381—51 **13 Claims**

1. In a circuit for electronic speech synthesis having a means for sampling speech elements and representing said speech elements by a plurality of significant parameters, an excitation signal generating means for generating a pulse excitation signal based on a portion of said significant parameters for representing voiced sounds and for generating a noise signal for representing voiceless sounds, a means for combining a plurality of speech elements into longer speech segments, and an electroacoustical transducer, the improvement comprising:

a filter unit connected to said excitation signal generating means and to said transducer having a plurality of individual filters each having a fixed filter coefficient, said filter unit generating an electrical speech signal which is supplied to said transducer for conversion into an audio speech signal, said individual filters being arranged in a matrix having rows and columns and each row of said individual filters constituting a filter group; and

control means connected to said excitation signal generating means and to said filter unit for selectively driving only those individual filters in said filter unit needed for representing a remainder of said plurality of significant parameters of said speech elements, the individual filters in a selected matrix row being supplied in parallel with said excitation signals from said excitation signal generating means to a matrix output; and

means for sequentially connecting the outputs of the individual filters in said selected matrix row to said matrix output.



4,694,497

AUTOMOTIVE MULTI-SPEAKER AUDIO SYSTEM WITH AUTOMATIC ECHO-CONTROL FEATURE

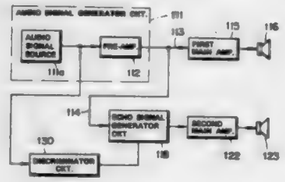
Junichi Kassi, Yokohama; Hiroshi Imai, Yokosuka, and Hiroshi Tsuda, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 796,974, Nov. 12, 1985. This application Mar. 27, 1986, Ser. No. 844,680

Claims priority, application Japan, Apr. 20, 1985, 60-85222

Int. Cl.⁴ H03G *3/00*

U.S. Cl. 381—63 **10 Claims**



1. An automotive audio system comprising:

an audio signal source adapted to generate audio signals for reproduction;

a first audio signal path for feeding said audio signals from said audio source to a first speaker adapted to generate a first audio sound by reproducing said audio signals;

a second audio signal path for feeding said audio signals from said audio signal source to a second speaker independent of said first speaker and adapted to generate a second audio sound;

a sound discriminator receiving said audio signal and discriminating between non-musical sound and musical sound for producing a discriminator signal indicative thereof; and

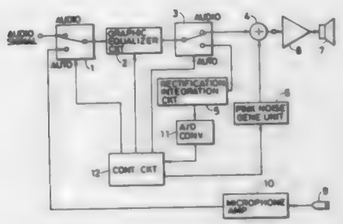
an echo signal generator interposed within said second audio signal path for receiving said audio signals from said audio signal source and generating echo signals to be reproduced through said second speaker, said echo signal generator being associated with said sound discriminator and adjusting its operating level between a predetermined minimum level and a predetermined maximum level in response to said discriminator signal, said echo signal generator being adapted to generate said echo signals by inducing a delay in said audio signals from said audio signal source, and adjusting said delay in said audio signals between a first longer delay time and a second shorter delay time depending on said discriminator signal.

4,694,498

AUTOMATIC SOUND FIELD CORRECTING SYSTEM

Shinichi Suzuki; Akio Tokumo; Yoshiro Kanagi, and Masayuki Kato, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,417
Claims priority, application Japan, Oct. 31, 1984, 59-229987
Int. Cl.⁴ H04R *3/04*
U.S. Cl. 381—103 **5 Claims**



1. A circuit for adjusting the frequency characteristics of a graphic equalizer that is adjustable in amplitude for each of a plurality of frequency bands, said circuit comprising:
test signal generating means adapted to provide an input to said equalizer,
detector means adapted to detect the output of said equalizer, and
control means adapted to adjust the amplitude of a plurality of combinations of said equalizer frequency bands to generate a composite frequency characteristic;
wherein said control means is responsive to the output of said detector means to maximize the amplitude of at least one of said frequency bands, whereby said circuit is adapted to provide the response of a band-pass filter having a center frequency equal to the center frequency of said maximized frequency band; and
wherein said control means is adapted to operate sequentially, for each step in the sequence at least one frequency band amplitude is maximized and the remaining frequency band amplitudes are minimized, and said control means stores the output from the output from the detector means and generates a composite control signal that optimally adjusts the amplitude of each equalizer frequency band whereby said circuit is adapted to provide the response of a series of band-pass filters, each having a center frequency which is equal to the center frequency of a respective frequency band.

3. An automatic sound field correction system for connection between a source of audio signal at an input and audio speaker means at an output, said system comprising:
equalizer means having a plurality of adjustable frequency bands;
test signal generation means;
transducer means adapted to receive the sound from said audio speaker means;
digital conversion means, said means adapted to convert an output of said equalizer means into a digital signal;
switch means adapted in a first mode to connect said equalizer means between said source and said audio speaker means and in a second mode to disconnect said equalizer means from said source and said audio speaker means and to connect said equalizer means between said transducer means and said digital conversion means; and
control means connected to said equalizer means and adapted to selectively adjust the amplitude of the frequency bands of said equalizer means in a sequence of steps whereby a composite control signal is generated.

4,694,499

DIRECTIONAL MICROPHONE WITH ACOUSTIC WASHER

Bruce Bartlett, Elkhart, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Feb. 13, 1985, Ser. No. 701,387
Int. Cl.⁴ H04R *1/20, 1/34, 1/38*
U.S. Cl. 381—155 **3 Claims**



1. In a directional microphone including a head portion defining a sound chamber, a directional microphone cartridge positioned within said sound chamber, said cartridge including a front sound entry and a rear sound entry, the improvement comprising a washer formed of acoustic damping material and having front and rear sides positioned about said cartridge, with said washer front side adjacent said cartridge rear sound entry, said washer constituting means for reducing reflection of sounds approaching the front sound entry and absorbing high frequency sounds approaching said cartridge rear sound entry from said washer rear side.

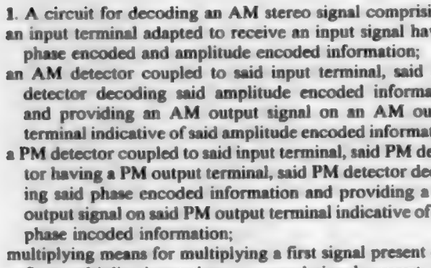
4,694,500

CONTROL VOLTAGE GENERATING CIRCUIT FOR ACTIVATING A NOISE REDUCTION CIRCUIT IN AN FM STEREO RECEIVER

Satoru Tazaki; Yasuhiro Yoshioka, and Kiyoshi Amazawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,980
Claims priority, application Japan, Mar. 6, 1985, 60-42822
Int. Cl.⁴ H04H *5/00*
U.S. Cl. 381—10 **5 Claims**

1. A control voltage generating circuit for activating a noise reduction circuit in an FM stereo receiver which generates an S meter output voltage, comprising:
an in-phase amplifier in which negative ripple components in the S meter output voltage are entered;
a first fixed voltage source fixing a first current value;
a comparator for comparing said first current value with a second current value which is produced by said in-phase amplifier and which corresponds to said negative ripple components, and for supplying an output current when said second current value exceeds said first current value;
a charging and discharging circuit to which a capacitor is connected;
a charging and discharging control circuit which produces a control voltage responsive to said output current from



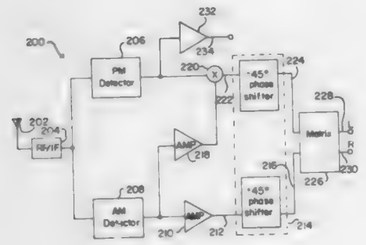
said comparator and controls a discharge from said capacitor via said charging and discharging circuit in response to said control voltage; and
a level shifting circuit which controls the level of d.c. components from the S meter output voltage in response to the discharge of said capacitor and produces a high-cut and high-blend control voltage corresponding to said d.c. components.

4,694,501

NONSYNCHRONOUS INDEPENDENT SIDE BAND AM STEREO DECODER

Fred T. Cheng, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 10, 1984, Ser. No. 680,026
Int. Cl.⁴ H04H *5/00*
U.S. Cl. 381—15 **7 Claims**



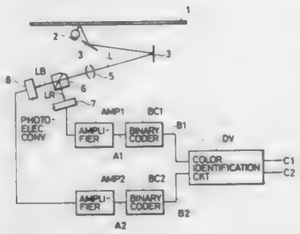
1. A circuit for decoding an AM stereo signal comprising:
an input terminal adapted to receive an input signal having phase encoded and amplitude encoded information;
an AM detector coupled to said input terminal, said AM detector decoding said amplitude encoded information and providing an AM output signal on an AM output terminal indicative of said amplitude encoded information;
a PM detector coupled to said input terminal, said PM detector having a PM output terminal, said PM detector decoding said phase encoded information and providing a PM output signal on said PM output terminal indicative of said phase incoded information;
multiplying means for multiplying a first signal present on a first multiplier input times a second signal present on a second multiplier input, said first multiplier input being coupled to said PM output signal, said second multiplier input being coupled to said AM output terminal, said multiplying means placing the product of said first and second signals on a multiplier output terminal; and
phase shifting means for shifting phases, said phase shifting means having a first phase input, a second phase input, a first phase output and a second phase output, said first phase input being coupled to said multiplier output terminal, said second phase input being coupled to said AM detector, said phase shifting means shifting the phase of the signal on said first phase input and providing the result on said first phase output, said phase shifting means shifting the phase of the signal on said second phase input and placing the result on said second phase output.

4,694,502

COLOR IMAGE READING APPARATUS

Kunitaka Ozawa, Tokyo; Naoki Ayata, Machida; Hidetoshi Suzuki, Tokyo; Seiji Saito, Yokosuka, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 380,461, May 20, 1982, abandoned.
This application Mar. 21, 1986, Ser. No. 842,763
Claims priority, application Japan, Jun. 1, 1981, 56-84714; Jul. 17, 1981, 56-112660; Oct. 8, 1981, 56-159387; Oct. 8, 1981, 56-159388; Oct. 9, 1981, 56-160151; Oct. 9, 1981, 56-160152; Oct. 9, 1981, 56-160153; Oct. 9, 1981, 56-160154
Int. Cl.⁴ G06K *9/20*
U.S. Cl. 382—17 **7 Claims**



1. A multi-color image reading apparatus comprising:
photoelectric converting means for providing plural color separation signals corresponding to plural color-separated light beams from a multi-color image;
color identifying means for forming plural color signals, corresponding to colors of said multi-color image, from said plural color separation signals;
correcting means for correcting at least one of said color signals, said correcting means being adapted to utilize a color signal of a determined color for correcting other color signals; and
expanding means for expanding the color signal of said determined color, wherein the expanded color signal of said determined color is utilized for correcting other color signals.

4,694,503

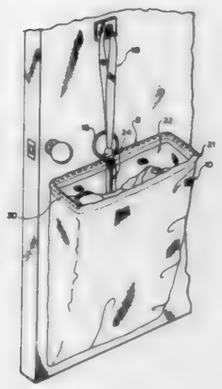
CONTROL TOP BAG

Dennis Hydorn, 1260 Caledonia Road, Toronto, Ontario, Canada M6A 2X5

Filed Mar. 20, 1986, Ser. No. 841,812
Int. Cl.⁴ B65D *33/06*
U.S. Cl. 383—12 **2 Claims**

1. An improved laundry bag and support therefor comprising: (a) a single piece support having a pair of parallel arms spaced from each other by a connector, the connector carrying a hanger incorporating a loop formed by bending the center of the connector for hanging the laundry bag, the plane of the hanger and the plane in which the pair of parallel arms are disposed creating an angle of slightly less than 90° whereby when the hanger is carried by a carrier the spaced arms are

oriented in a predetermined substantially horizontal plane thereby presenting the mouth of the laundry in a substantially horizontal plane; (b) a laundry bag carrying a pair of sleeves proximate the mouth of the bag, the pair of sleeves providing two adjacent openings each opening for receiving one of the two parallel spaced arms; (c) the laundry bag having a zipper opening proximate the pair of sleeves of (b) to permit the two



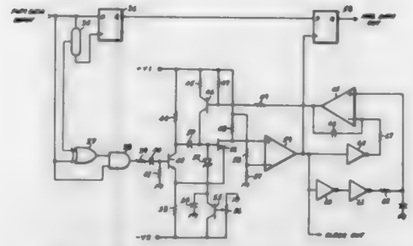
adjacent openings of the pair of sleeves to be spaced apart to permit entry of the two parallel spaced arms into the two openings of the pair of sleeves, whereby the laundry bag may be securely mounted on the support or removed from the support; (d) the pair of sleeves carrying a cinching cord whereby when the zipper is open the laundry bag may be removed from the support and the mouth of the laundry bag cinched closed.

4,694,504

SYNCHRONOUS, ASYNCHRONOUS, AND DATA RATE TRANSPARENT FIBER OPTIC COMMUNICATIONS LINK

David R. Porter, Roanoke; James H. Bowen, Salem, and John M. Holland, Shawsville, all of Va., assignors to ITT Electro Optical Products, a Division of ITT Corporation, Roanoke, VI.

Filed Jun. 3, 1985, Ser. No. 740,149
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—608 **10 Claims**



1. A circuit for restoring symmetry to an unsymmetrical clock waveform derived from a pulse width modulated optical signal in an optic fiber communications system comprising:

means for receiving a pulse width modulated input signal;

means for delaying said pulse width modulated input signal to form a delayed pulse width modulated input;

means for combining said pulse width modulated input signal with said delayed pulse width modulated input to generate a waveform having one signal value only when one of but not both of said pulse width modulated input signal and said delayed pulse width modulated input are of a first signal value;

means for gating said pulse width modulated input signal with said waveform to generate another waveform having said one signal value only when both said pulse width modulated input signal and said waveform exhibit said one signal value; and

a voltage-controlled monostable multivibrator connected to an output of said means for gating and functioning to stretch said output of said means for gating into a 50% duty cycle clock waveform.

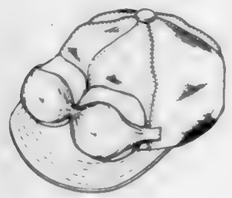
DESIGN PATENTS

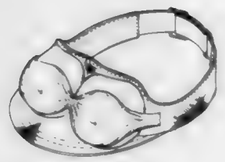
GRANTED SEP. 15, 1987

ERRATA

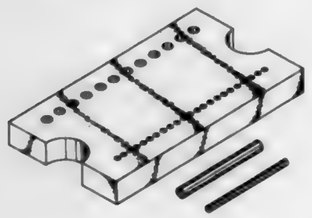
For CLASS	See PATENT NO.
D22-107	291,903
D22-107	291,904
D22-146	291,905

291,840
NOVELTY CAP OR SIMILAR ARTICLE
Lonny R. Cameron, Rte. 1, Box 113AAA, Burton, Tex. 77835
Filed Feb. 7, 1986, Ser. No. 827,061
Term of patent 14 years
U.S. Cl. D2—248

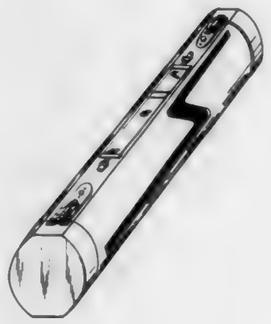




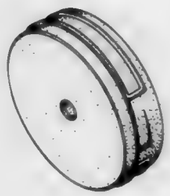
291,841
COMBINATION ADJUSTABLE BOW TIE PEG BOARD AND PEGS
Betty Owens, 3867 Gum Tree Rd., Winston-Salem, N.C. 27107
Filed Feb. 26, 1985, Ser. No. 705,810
Term of patent 14 years
U.S. Cl. D3—26



291,842
PROTECTIVE TRANSPORT CONTAINER FOR SPORTS EQUIPMENT
Edward W. Baumgardner, 4088 Sells Mill Rd., P.O. Box 1, Taneytown, Md. 21787
Filed Oct. 2, 1984, Ser. No. 657,067
Term of patent 14 years
U.S. Cl. D3—36

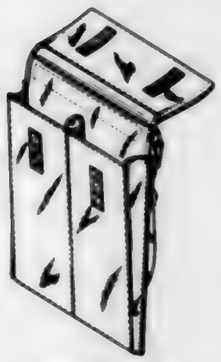


291,843
STACKABLE LEADER SPOOL CONTAINER
Robert Searle, 66 Broadway, San Francisco, Calif. 94111
Filed Oct. 19, 1984, Ser. No. 662,876
Term of patent 14 years
U.S. Cl. D3—38

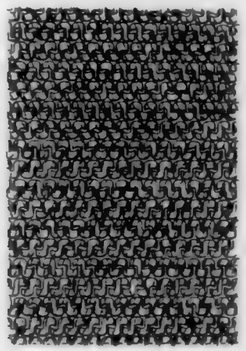


291,844
PORTABLE FOOTWEAR TOTE BAG
Julie Gerver, and Howard Gerver, both of 345 E. 93rd St., New York, N.Y. 10128
Filed Jan. 21, 1986, Ser. No. 820,938
Term of patent 14 years
U.S. Cl. D3—42





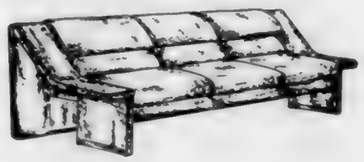
291,845
TEXTILE FABRIC
Tonino Lamborghini, via Calori 10, Bologna, Italy
Filed May 23, 1984, Ser. No. 613,599
Claims priority, application Italy, Nov. 23, 1983, 5086/83[U]
Term of patent 14 years
U.S. Cl. D5—56



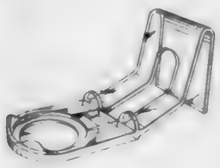
291,846
FRAME FOR A SWIVEL ROCKER
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,186
Term of patent 14 years
U.S. Cl. D6—344



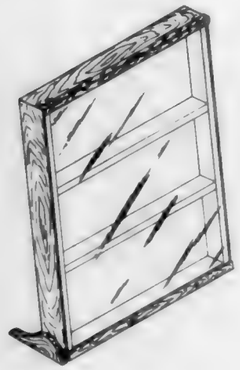
291,847
SOFA
Alberto Salvati, Milan, Italy, assignor to Saporiti Italia, S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,361
Claims priority, application Italy, Sep. 18, 1984, 23172/84[U]
Term of patent 14 years
U.S. Cl. D6—381



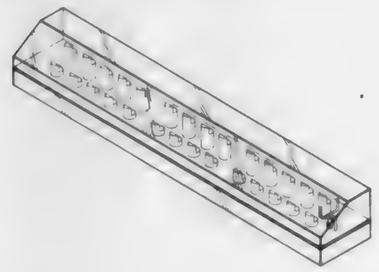
291,848
CUP AND SAUCER STAND
Christian B. Cadman, 309 East 24th Avenue, Vancouver, British Columbia, Canada V5V 1Z8
Filed Mar. 6, 1985, Ser. No. 708,598
Claims priority, application Canada, Sep. 21, 1984, 21-09-84-7
Term of patent 14 years
U.S. Cl. D6—466

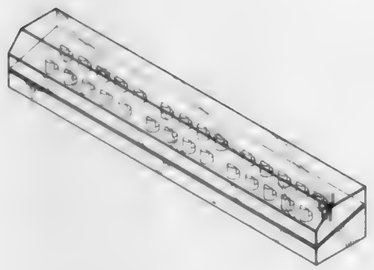


291,849
SPINNER BAIT DISPLAY CASE
Raymond H. Yates, P.O. Box 56, Rineyville, Ky. 40162
Filed Jan. 7, 1985, Ser. No. 689,403
Term of patent 14 years
U.S. Cl. D6—471



291,850
DISPLAY CASE FOR MINIATURE SPORTS HEADGEAR
Leonard L. Perkins, and Anthony Perkins, both of 4944 Twelfth St., NE., Washington, D.C. 20017
Filed Jan. 22, 1985, Ser. No. 693,243
Term of patent 14 years
U.S. Cl. D6—471

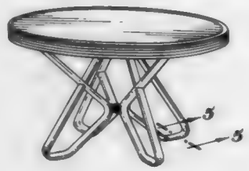




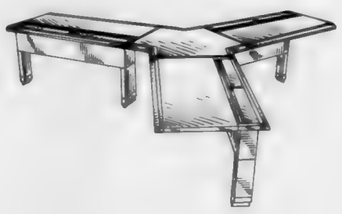
291,851
TABLE
Maurizio Salvato, Gallarate, Italy, assignor to Saporiti Italia S.p.A., Italy
Filed Mar. 15, 1985, Ser. No. 712,279
Claims priority, application Italy, Sep. 18, 1984, 23175/84[U]
Term of patent 14 years
U.S. Cl. D6—482



291,852
TABLE OR THE LIKE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,185
Term of patent 14 years
U.S. Cl. D6—487



291,853
MULTIPLE DESK TOP UNIT
William R. Worrell, Hopkins, Minn., and Robert N. Laroche, Montreal, Canada, assignors to All-Steel Canada Ltd., Montreal, Canada
Filed Nov. 13, 1984, Ser. No. 670,037
The portion of the term of this patent subsequent to May 26, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—511



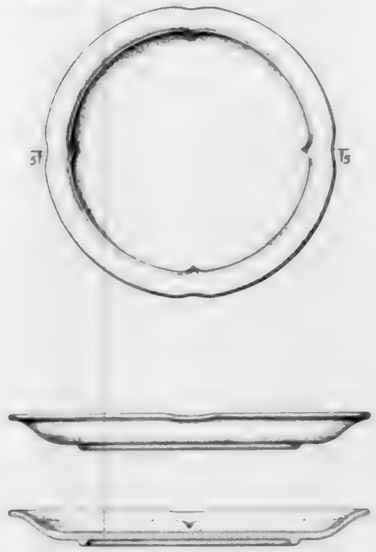
291,854
TURNTABLE FOR USE IN MICROWAVE OVENS
James F. Pomroy, St. Paul, and Allen M. Danley, Eagan, both of Minn., assignors to Plastics, Inc., St. Paul, Minn.
Filed Mar. 22, 1985, Ser. No. 715,109
Term of patent 14 years
U.S. Cl. D7—402



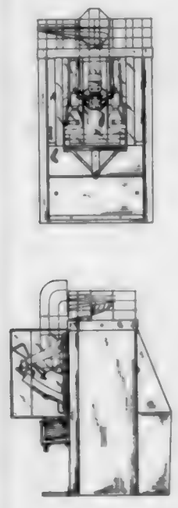
291,855
WIRE COOKING RACK
Arthur R. Erbach, Des Plaines, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Continuation-in-part of Ser. No. 501,090, Jun. 6, 1983. This application Dec. 4, 1984, Ser. No. 677,824
Term of patent 14 years
U.S. Cl. D7—404



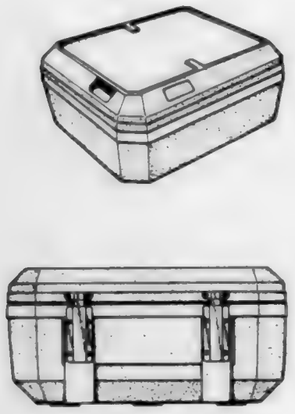
291,856
DINNER PLATE
Walter Everhan, Cologne, Fed. Rep. of Germany, assignor to American Commercial Inc., Secaucus, N.J.
Filed Feb. 3, 1984, Ser. No. 576,968
Term of patent 14 years
U.S. Cl. D7—30



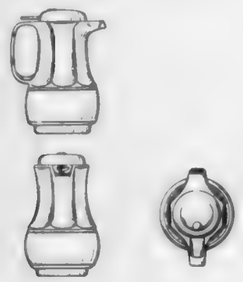
291,857
AUTOMATIC JUICING MACHINE
Stewart C. Nelson, 215 Burns St., Forest Hills, N.Y. 11375
Filed Aug. 13, 1984, Ser. No. 639,742
Term of patent 14 years
U.S. Cl. D7—49



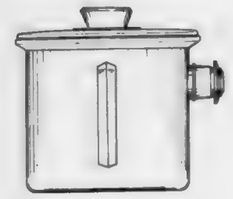
291,858
PORTABLE COOLER FOR ALLERGENIC EXTRACTS
John F. Baker, 45 Deerhaven Pl., Pleasant Hill, Calif. 94523, and Barry Dep, Castro Valley, Calif., assignors to John F. Baker, Concord, Calif.
Filed May 8, 1985, Ser. No. 732,350
Term of patent 14 years
U.S. Cl. D7—77



291,859
INSULATED JUG OR THE LIKE
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Limited Partnership Industriestrasse, Niederaula, Fed. Rep. of Germany
Filed Jul. 17, 1984, Ser. No. 631,822
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 8AR23/84
Term of patent 14 years
U.S. Cl. D7—321



291,860
DOUBLE BOILER COOKING UTENSIL
Robert Wallace, Bryanston, and Dragan Miskowic, Florida, both of South Africa, assignors to Danro Engineering (Proprietary) Limited, Maraisburg, South Africa
Filed Jan. 30, 1984, Ser. No. 575,067
Claims priority, application South Africa, Aug. 4, 1983, 83/0666
Term of patent 14 years
U.S. Cl. D7—360



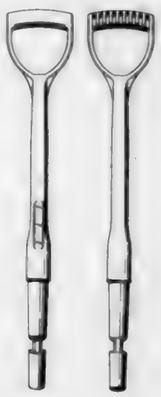
291,861
COMBINATION PRYING TOOL FOR CAN COVERS AND TOOL HOLDER
Samuel C. Smith, 210 Hartman Rd., Newton, Mass. 02159
Filed Apr. 20, 1984, Ser. No. 602,411
Term of patent 14 years
U.S. Cl. D8—37



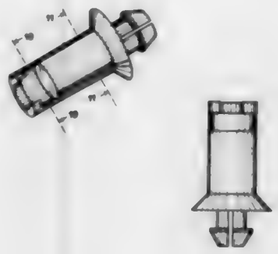
291,862
TOOL HANDLE
Robert A. Kolouia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848
Filed May 16, 1985, Ser. No. 734,531
Term of patent 14 years
U.S. Cl. D8—107



291,863
TOOL HANDLE
Robert A. Kolouia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848
Filed May 16, 1985, Ser. No. 734,532
Term of patent 14 years
U.S. Cl. D8—107



291,864
PRINTED CIRCUIT BOARD STAND-OFF
Royce W. Hill, Flippin, Ark., assignor to Micro Plastics, Inc., Flippin, Ark.
Filed Mar. 11, 1985, Ser. No. 710,418
Term of patent 14 years
U.S. Cl. D8—354



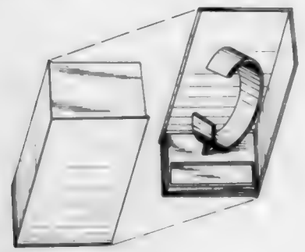
291,865
BOTTLE
Michele A. Carville, Wooster, Ohio, assignor to Kraft, Inc., Glenview, Ill.
Filed Apr. 10, 1985, Ser. No. 721,549
Term of patent 14 years
U.S. Cl. D9—322



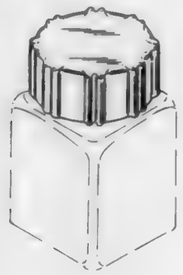
291,866
COMBINED PACKAGING CONTAINER AND BREWING DEVICE FOR COFFEE OR THE LIKE
Michael F. Brice, Syosset, N.Y., assignor to Brice Ilotan Research Corporation, Syosset, N.Y.
Filed Dec. 6, 1984, Ser. No. 679,074
Term of patent 14 years
U.S. Cl. D9—337



291,867
PACKAGING CONTAINER FOR A WRISTWATCH
Barry D. Berger, Brooklyn, N.Y., assignor to Timex Corporation, Waterbury, Conn.
Filed Feb. 6, 1985, Ser. No. 698,948
Term of patent 14 years
U.S. Cl. D9—430



291,868
CAP FOR CONTAINER
Brian R. Hindle, Frimley, England, assignor to Beecham Group p.l.c., England
Filed Nov. 2, 1984, Ser. No. 667,589
Claims priority, application United Kingdom, May 4, 1984, 8410194449
Term of patent 14 years
U.S. Cl. D9—453



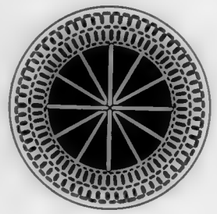
291,869
COMBINED WATCH AND BRACELET
Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Filed Apr. 17, 1985, Ser. No. 724,241
Claims priority, application Italy, Oct. 25, 1984, 36.174B/84
Term of patent 14 years
U.S. Cl. D10—32



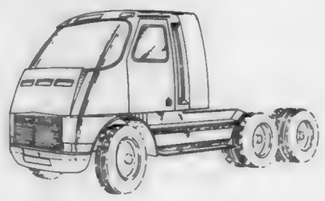
291,870
COMBINED LIGHT AND SPEAKER HOUSING FOR AN EMERGENCY VEHICLE
Sigmund S. Urbanski, Alsip; Richard W. Condon, Frankfort, and Edward S. Stanuch, Oak Forest, all of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.
Filed May 6, 1985, Ser. No. 730,451
Term of patent 14 years
U.S. Cl. D10—114



291,871
TIME DISPLAY
Warren L. Harvey, 134 Woodport Rd., Sparta, N.J. 07871
Filed Feb. 8, 1985, Ser. No. 699,579
Term of patent 14 years
U.S. Cl. D10—126



291,872
CAB-OVER-ENGINE TRUCK CAB
Wayne K. Simons; Roy L. Meryman; Larry W. Orr, and Donald A. Richardson, all of Kings County, Wash., assignors to Paccar Inc., Bellevue, Wash.
Filed Dec. 10, 1984, Ser. No. 680,141
Term of patent 14 years
U.S. Cl. D12—96



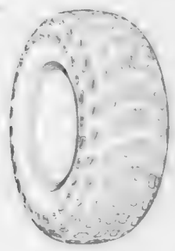
291,873
BICYCLE
Yoshio Koyama, 5-25-9 Kawabe-cho, Ohme-shi, Tokyo, Japan
Filed Jun. 11, 1985, Ser. No. 743,645
Term of patent 14 years
U.S. Cl. D12—111



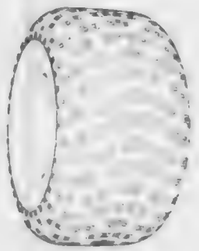
291,874
MOTORCYCLE TIRE
Toshio Hayakawa, and Shinichiro Ohkuni, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 10, 1985, Ser. No. 743,187
Claims priority, application Japan, Dec. 14, 1984, 59-51174
Term of patent 14 years
U.S. Cl. D12—147



291,875
AUTOMOBILE TIRE
Toshio Hayakawa, Tokyo, and Toru Osawa, Saitama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,775
Claims priority, application Japan, Sep. 18, 1984, 59-38394
Term of patent 14 years
U.S. Cl. D12—147



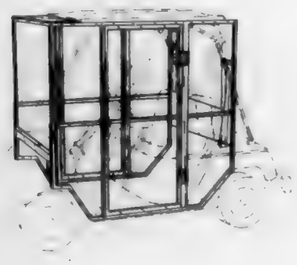
291,876
AUTOMOBILE TIRE
Toshio Hayakawa; Yasuo Himuro, both of Tokyo, and Toru Osawa, Saitama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,558
Claims priority, application Japan, Sep. 18, 1984, 59-38392
Term of patent 14 years
U.S. Cl. D12—149



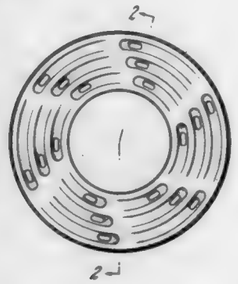
291,877
AUTOMOBILE TIRE
Hideaki Nishio, Saitama, and Kiyoshi Takase, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 14, 1985, Ser. No. 711,798
Claims priority, application Japan, Sep. 18, 1984, 59-38393
Term of patent 14 years
U.S. Cl. D12—151



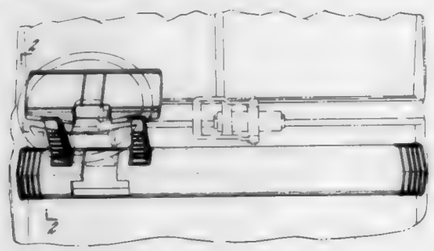
291,878
DETACHABLE PASSENGER COMPARTMENT FOR A GOLF CART
Gregory D. Cook, Duncan, Okla., assignor to Cook Manufacturing Corporation, Duncan, Okla.
Filed Jan. 14, 1985, Ser. No. 691,051
Term of patent 14 years
U.S. Cl. D12—156



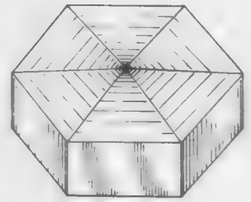
291,879
WHEEL COVER
William F. Boyle, Sterling Heights, and Maurice P. Chandler, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 15, 1985, Ser. No. 712,087
Term of patent 14 years
U.S. Cl. D12—209



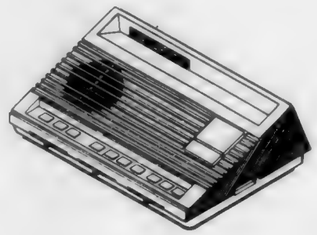
291,880
INSTRUMENT PANEL
Stuart B. Shuster, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 21, 1985, Ser. No. 703,756
Term of patent 14 years
U.S. Cl. D12—192



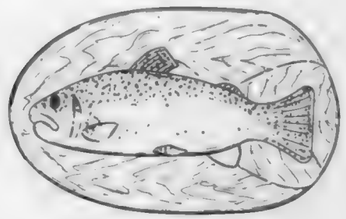
291,881
BOAT
Nicholas J. Koushiafes, Highland, Ind., assignor to Investment Associates, Inc., Highland, Ind.
Continuation-in-part of Ser. No. 212,108, Dec. 2, 1980. This application Aug. 12, 1983, Ser. No. 522,591
Term of patent 14 years
U.S. Cl. D12—300



291,882
DICTATING MACHINE
John W. Hoover, Huntington; Richard G. Rutkowski, Milford, and Rocco Luppino, South Norwalk, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.
Filed Dec. 3, 1984, Ser. No. 677,418
Term of patent 14 years
U.S. Cl. D14—3

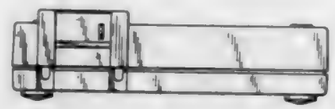


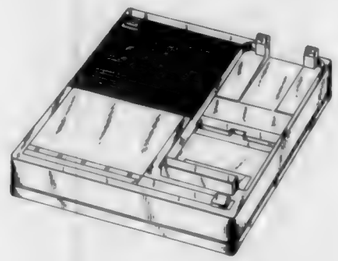
291,883
HANDSET TELEPHONE AND BASE COMBINATION
Robert Snyder, Tallmage, Ohio, assignor to Outdoor Horizons, Inc., Akron, Ohio
Filed Oct. 2, 1986, Ser. No. 914,745
Term of patent 14 years
U.S. Cl. D14—53





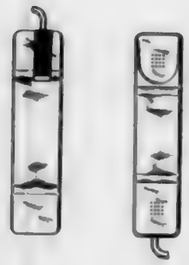
291,884
BASE STATION FOR A CORDLESS TELEPHONE OR THE LIKE
Wolfgang Muenscher, Munich, and Siegfried Schoen, Starnberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Nov. 23, 1984, Ser. No. 674,186
Claims priority, application Fed. Rep. of Germany, May 22, 1984, MRBD.10NR13903
Term of patent 14 years
U.S. Cl. D14—60





291,885
TELEPHONE HANDSET OR SIMILAR ARTICLE
Harry Hentschel, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 9, 1985, Ser. No. 785,658
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, MR BD10NR16135
Term of patent 14 years
U.S. Cl. D14—63





291,886
RADIO PAGER OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, and Robert Kurchart, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 27, 1985, Ser. No. 802,504
Term of patent 14 years
U.S. Cl. D14—68



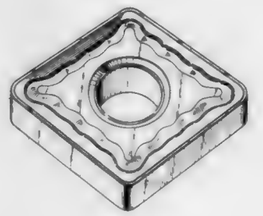
291,887
COMBINED TELEVISION RECEIVER AND VIDEO TAPE RECORDER
Henry F. Oscar, Stamford, Conn., assignor to Oscarvision Systems, Inc., Old Greenwich, Conn.
Filed May 31, 1985, Ser. No. 739,796
Term of patent 14 years
U.S. Cl. D14—79



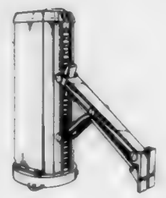
291,888
TRANSMITTER OR SIMILAR ARTICLE
Peter Fong, Los Angeles, Calif., and Tsang H. T. Henry, Kowloon, Hong Kong, assignors to Tradebest International Corporation, Whittier, Calif.
Filed Jan. 3, 1985, Ser. No. 688,595
Term of patent 14 years
U.S. Cl. D14—95



291,889
CUTTING INSERT
Lars T. Pettersson, Gävle, and Jörgen V. Wiman, Sandviken, both of Sweden, assignors to Santrade Limited, Switzerland
Filed Apr. 18, 1985, Ser. No. 724,573
Claims priority, application Sweden, Oct. 18, 1984, 84-2783
Term of patent 14 years
U.S. Cl. D15—139



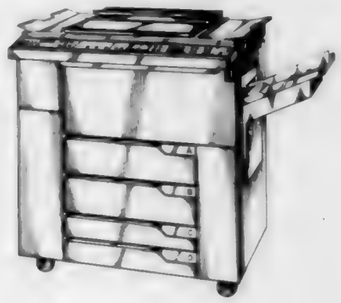
291,890
INDUSTRIAL ROBOT
Akifumi Inoue, and Koshiro Takeda, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed May 8, 1985, Ser. No. 731,796
Claims priority, application Japan, Nov. 16, 1984, 59-47217
Term of patent 14 years
U.S. Cl. D15—199



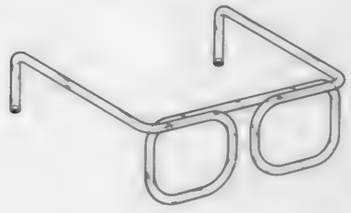
291,891
PROJECTION ENCLOSURE
James W. Clifford, St. Paul, and Rodney I. Eston, Minneapolis, both of Minn., assignors to Associated Images, Inc., Minneapolis, Minn.
Filed Mar. 21, 1985, Ser. No. 714,689
Term of patent 14 years
U.S. Cl. D16—14



291,892
COPYING MACHINE
Donald W. Carr, Binghamton, and Andrew T. Serbinski, Brooklyn, both of N.Y., assignors to Savin Corporation, Stamford, Conn.
Filed Jun. 24, 1985, Ser. No. 748,041
Term of patent 14 years
U.S. Cl. D16—30



291,893
TUBULAR EYEGLASS FRAME
Eric Lipson, 213 S. Bonsal St., Philadelphia, Pa. 19103
Filed Jan. 3, 1985, Ser. No. 688,463
Term of patent 14 years
U.S. Cl. D16—102



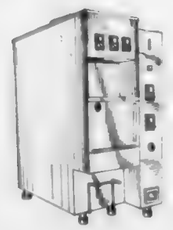
291,894
EYEGLASS RETAINING CORD WITH ADJUSTABLE SLIDE
George Weisenfeld, and David Halpern, both of Studio City, Calif., assignors to International Tropic-Cal, Inc., Los Angeles, Calif.
Filed Sep. 4, 1984, Ser. No. 647,018
Term of patent 14 years
U.S. Cl. D16—123



291,895
THERMOSTAT MAGNIFIER
Gerald R. Steiner, 2033 Virginia Ave. South, St. Louis Park, Minn. 55426
Division of Ser. No. 616,571, Jun. 4, 1984, Pat. No. Des. 288,670. This application Aug. 25, 1986, Ser. No. 899,673
Term of patent 14 years
U.S. Cl. D16—134



291,896
COIN OPERATED COFFEE BREWER
Kenneth W. Stover, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Nov. 9, 1984, Ser. No. 669,863
Term of patent 14 years
U.S. Cl. D20—5



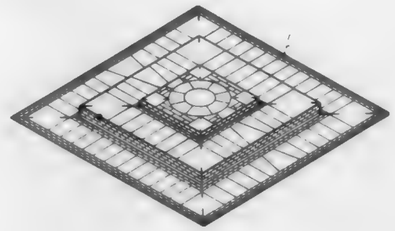
291,897
IDENTIFICATION TAG
William P. Flies, Burnsville, Minn., assignor to Datakey, Inc., Burnsville, Minn.
Filed Feb. 15, 1985, Ser. No. 702,145
Term of patent 14 years
U.S. Cl. D20—22



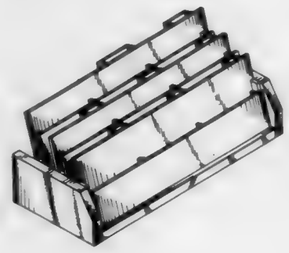
291,898
IDENTIFICATION TAG
Susan Smith, San Francisco County, Calif., assignor to Tagums, Inc., Wilmette, Ill.
Filed Nov. 19, 1984, Ser. No. 672,826
Term of patent 14 years
U.S. Cl. D20—24



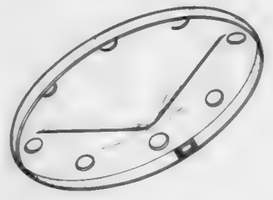
291,899
THREE-DIMENSIONAL GAME BOARD
Douglas M. Hanson; Jeff D. Hanson, and Brian E. Hanson, all of Nashua, N.H., assignors to JMBL Corporation, Nashua, N.H.
Filed Dec. 18, 1984, Ser. No. 683,207
Term of patent 14 years
U.S. Cl. D21—23



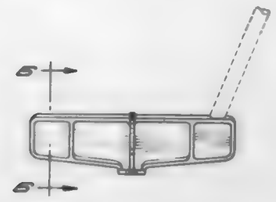
291,900
RACK FOR HOLDING CARDS USED IN TEACHING MATHEMATICS
Vernon J. Mortensen, Coeur d'Alene, Id., assignor to Mortensen Educational Products, Inc., Chatsworth, Calif.
Filed Apr. 1, 1985, Ser. No. 718,639
Term of patent 14 years
U.S. Cl. D21—54



291,901
AERIAL TOY
Doug Chapman, 13771 Hovey, Warren, Mich. 48089
Filed Apr. 25, 1985, Ser. No. 727,076
Term of patent 14 years
U.S. Cl. D21—86



291,902
GOLF CLUB HEAD
Frank D. Werner, Box SR9, Jackson, Wyo. 83001
Filed Mar. 1, 1985, Ser. No. 707,415
Term of patent 14 years
U.S. Cl. D21—219



291,903
COMPOUND BOW WITH A CABLE TENSION ADJUSTMENT
Donald E. Smith, 1882 E. Larch, Simi Valley, Calif.
Filed Apr. 29, 1985, Ser. No. 728,173
Term of patent 14 years
U.S. Cl. D22—107



291,904
BOW SIGHT
George C. Lott, Rte. 3, Box 463, Scottsboro, Ala. 35768
Filed May 28, 1985, Ser. No. 737,936
Term of patent 14 years
U.S. Cl. D22—107



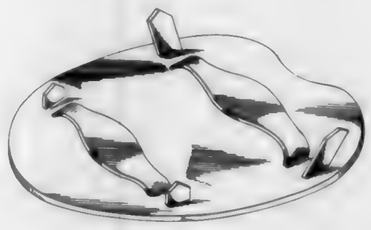
291,905
FISHING JUG
Howard Brachear, 12 Sunset Acres, Farmersville, Ill. 62533
Filed Apr. 8, 1985, Ser. No. 720,865
Term of patent 14 years
U.S. Cl. D22—146



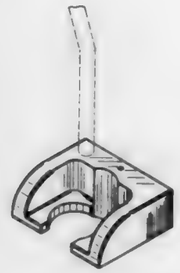
291,906
STUFFED DOG
Barbara B. Riddle, 525 Erna, Converse, Tex. 78209
Filed Feb. 27, 1985, Ser. No. 706,427
Term of patent 14 years
U.S. Cl. D21—161



291,907
HAND BAT
Elmer George, 195 Armour Dr., Washington, Pa. 15301
Filed Feb. 14, 1985, Ser. No. 701,693
Term of patent 14 years
U.S. Cl. D21—213



291,908
GOLF CLUB PUTTER HEAD
Wayne P. Glennon, 12029 Linkcrest Dr., South, Fort Worth, and Mack E. Taylor, 4020 Link Meadow Dr., Aledo, both of Tex. 76008
Filed Mar. 1, 1985, Ser. No. 707,416
Term of patent 14 years
U.S. Cl. D21—217



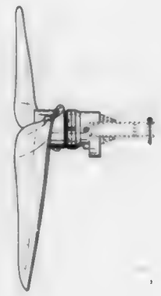
291,909
SKI POLE HANDLE
Thomas Z. Lajos, 2454 W. Oakfield Rd., Grand Island, N.Y. 14072
Filed Mar. 26, 1985, Ser. No. 716,162
Term of patent 14 years
U.S. Cl. D21—230



291,910
FLOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 18, 1985, Ser. No. 789,136
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—237



291,911
SUBMERSIBLE UNIT FOR MIXING AND AERATION OF INDUSTRIAL EFFLUENT OR THE LIKE
Hjalmar Fries, Spanga, Sweden, assignor to ITT Industries, Inc., New York, N.Y.
Filed Sep. 7, 1984, Ser. No. 648,903
Claims priority, application Sweden, Mar. 7, 1984, 840780
Term of patent 14 years
U.S. Cl. D23—1



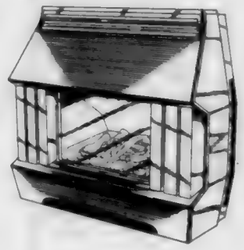


291,912
COMBINED HAND SHOWER, ADJUSTABLE HOLDER AND ARTICLE HOLDER
Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Filed Sep. 18, 1985, Ser. No. 777,476
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 20 MR 0250
Term of patent 14 years
U.S. Cl. D23—35

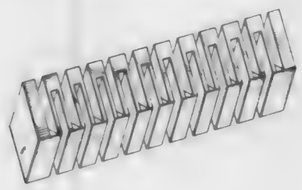




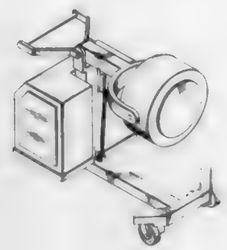
291,913
GAS FIRE
Roger Tucker, Kidderminster; Paul A. Gillam, Great Barr; Peter Wright, Sutt on Coldfield; Donald Whitehouse, Castle Bromwich; Michael C. Broadbent, West Heath, and Charles Moran, Willenhall, all of England, assignors to Valor Heating Limited, London, England
Filed Mar. 20, 1985, Ser. No. 713,859
Claims priority, application United Kingdom, Oct. 3, 1984, 1022430; Nov. 7, 1984, 1023152
The portion of the term of this patent subsequent to Jul. 7, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—97



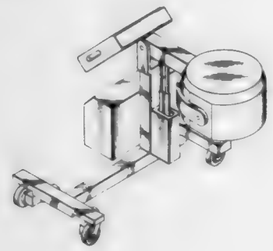
291,914
CHANNEL BODY FOR AN AIR SUPPLY REGISTER
Knut E. Bergdahl, Kvartsgränd 4, S-852 52 Sundsvall, Sweden
Continuation of Ser. No. 577,259, Feb. 6, 1984. This application Feb. 12, 1986, Ser. No. 812,716
Term of patent 14 years
U.S. Cl. D23—112



291,915
COMBINED MOBILE IMAGING AND SCANNING MACHINE FOR RADIATION DETECTION
James R. Davis, 7122 Tiara La., La Palma, Calif. 90623
Filed Mar. 19, 1985, Ser. No. 713,443
Term of patent 14 years
U.S. Cl. D24—2



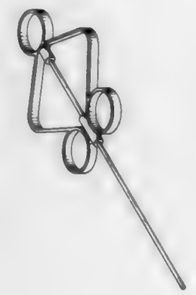
291,916
COMBINED MOBILE IMAGING AND SCANNING MACHINE FOR RADIATION DETECTION
James R. Davis, 7122 Tiara La., La Palma, Calif. 90623
Filed Mar. 19, 1985, Ser. No. 713,456
Term of patent 14 years
U.S. Cl. D24—2



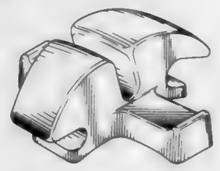
291,917
DISPOSABLE CUSHION PAD FOR INTRA-ORAL X-RAY FILMS
Donald C. Simpson, 5555 Shawnee Dr., Sierra Vista, Ariz. 85635
Filed Nov. 15, 1985, Ser. No. 805,229
Term of patent 14 years
U.S. Cl. D24—2

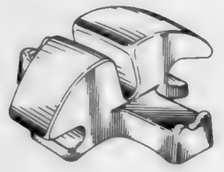


291,918
INSERTER FOR FEMALE CONTRACEPTIVES
Marc Spits, Hamont-Achel, Belgium, assignor to Homestoel Achel P.V.B.A., Belgium
Filed Dec. 4, 1984, Ser. No. 678,054
Claims priority, application Int'l Pat. Institute, Jun. 4, 1984, DM/003.813
Term of patent 14 years
U.S. Cl. D24—8



291,919
ORTHODONTIC BRACKET
James M. Reynolds, Lubbock, Tex., assignor to Zulauf, Lubbock, Tex.
Filed Dec. 30, 1985, Ser. No. 814,779
Term of patent 14 years
U.S. Cl. D24—10





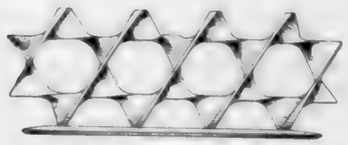
291,920
CARDIOTOMY RESERVOIR
Takashi Mouzen, Tama, and Masaru Wada, Tokyo, both of Japan, assignors to Terumo Corporation, Tokyo, Japan
Filed Apr. 23, 1985, Ser. No. 726,063
Claims priority, application Japan, Oct. 25, 1984, 59-43879
Term of patent 14 years
U.S. Cl. D24—56



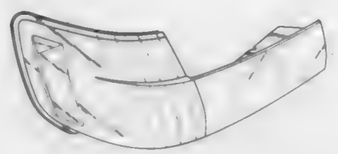
291,921
LAMP
Ronald G. Blaisdell, Saugus, and Peter R. Gagnon, Georgetown, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Feb. 25, 1983, Ser. No. 469,846
Term of patent 14 years
U.S. Cl. D26—2



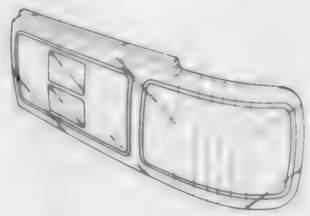
291,922
CANDELABRA
Craig R. Schaffer, 191 Mill St., Pataskala, Ohio 43062
Filed Apr. 10, 1985, Ser. No. 721,787
Term of patent 14 years
U.S. Cl. D26—14



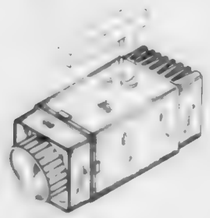
291,923
FRONT COMBINATION LAMP FOR AN AUTOMOBILE
Tsutomu Kawaguchi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,971
Term of patent 14 years
U.S. Cl. D26—28



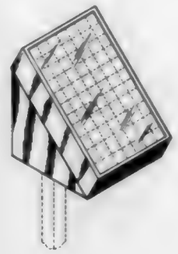
291,924
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Mitsunori Miyazaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 31, 1985, Ser. No. 760,972
Term of patent 14 years
U.S. Cl. D26—28



291,925
FRAMING PROJECTOR FOR TRACK LIGHTING SYSTEM
Romeo A. Dacanay, Schaumburg, Ill., assignor to Cooper Industries, Houston, Tex.
Filed Dec. 31, 1984, Ser. No. 687,839
Term of patent 14 years
U.S. Cl. D26—61



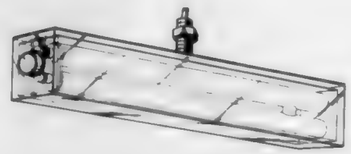
291,926
SOLAR POWERED LIGHT HOUSING
Dennis R. Schlepp, Golden, Colo., assignor to Texas HiTech, Oklahoma City, Okla.
Filed Jan. 22, 1984, Ser. No. 623,378
Term of patent 14 years
U.S. Cl. D26—67



291,927
WALL LAMP
Daniel E. Priddy, Rte. #1, Box 429, Summerfield, N.C. 27358
Filed Jul. 13, 1984, Ser. No. 630,418
Term of patent 14 years
U.S. Cl. D26—73



291,928
FLUORESCENT LIGHTING FIXTURE
John F. Morten, P.O. Box 326, Dover, Mass. 02030
Filed Jun. 3, 1985, Ser. No. 740,330
Term of patent 14 years
U.S. Cl. D26—76



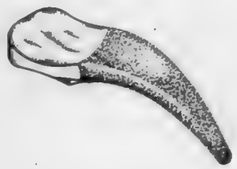
291,929
TRACK LIGHT EXTENSION ARM
Raymond J. Kusmer, Elgin, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 12, 1984, Ser. No. 588,521
Term of patent 14 years
U.S. Cl. D26—138



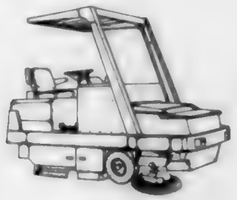
291,930
APPLIANCE FOR SMOOTHING FIBER APPLIED TO FINGERNAILS
Brenda J. Kilman, 420 W. 41st St., San Bernardino, Calif. 92407, and Betty J. Cowart, 751 S. Sycamore, Rialto, Calif. 92376
Filed Mar. 11, 1985, Ser. No. 710,507
Term of patent 14 years
U.S. Cl. D28—59



291,931
ARTIFICIAL FINGERNAIL FILE
Linda D. Thompson-Cash, 624 Oakshire Ave., Modesto, Calif. 95355
Filed Nov. 18, 1985, Ser. No. 805,172
Term of patent 14 years
U.S. Cl. D28—59



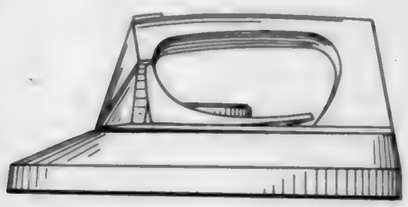
291,932
MACHINE FOR FLOOR SWEEPING AND SCRUBBING
Christopher M. Knowlton, and Robert J. O'Hara, both of Moore County, N.C., assignors to AAR Brooks & Perkins Corp., Aberdeen, N.C.
Continuation-in-part of Ser. No. 642,192, Aug. 20, 1984. This application Nov. 23, 1984, Ser. No. 674,151
Term of patent 14 years
U.S. Cl. D32—4



291,933
PLUMBING TRAP CLEANING TOOL
Charles Weiss, 121 Hillcrest Park Rd., Cos Cob, Conn. 06807
Filed Mar. 14, 1984, Ser. No. 589,529
Term of patent 14 years
U.S. Cl. D32—14



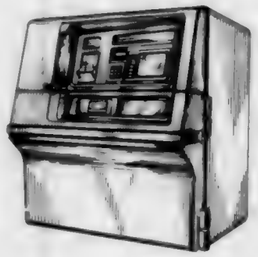
291,934
IRON
Carlo Bertani, Montechiarugolo, Italy, assignor to B e B S.r.l., Parma, Italy
Filed Dec. 13, 1985, Ser. No. 808,641
Claims priority, application Italy, Sep. 9, 1985, 22949/85[U]
Term of patent 14 years
U.S. Cl. D32—70



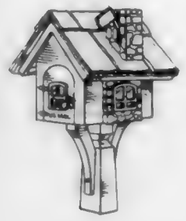
291,935
LOADING PALLET
Claes Nordström, John Lundvallsgatan 66, S-230 44 Vintrie, Sweden
Filed Nov. 8, 1984, Ser. No. 669,574
Claims priority, application Sweden, May 9, 1984, 84-1479
Term of patent 14 years
U.S. Cl. D34—38

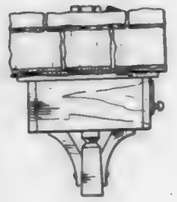


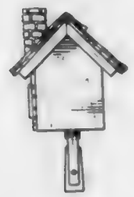
291,936
AUTOMATED TELLER MACHINE OR SIMILAR ARTICLE
Douglas G. Long, North Canton, Ohio, assignor to Diebold Incorporated, Canton, Ohio
Filed Dec. 14, 1984, Ser. No. 681,982
Term of patent 14 years
U.S. Cl. D99—28



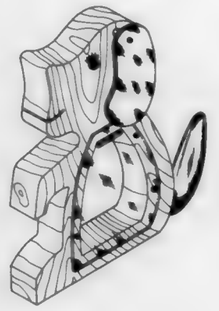
291,937
MAIL BOX
Kenneth G. Fisher, 40379 Road 96, Dinuba, Calif. 93618
Filed Apr. 8, 1985, Ser. No. 720,959
Term of patent 14 years
U.S. Cl. D99—30

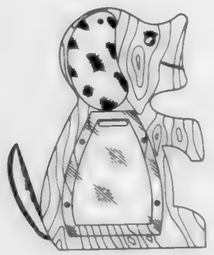






291,938
DOG BANK
Levi Kauffman, R.R. 2, Box 29-D, Topeka, Ind. 46571
Filed Jan. 23, 1985, Ser. No. 693,809
Term of patent 14 years
U.S. Cl. D99—40





291,939
COIN BANK OR THE LIKE
Charles Bennett, 48 Osborne Ave., Mt. Sinai, N.Y. 11766
Filed Feb. 26, 1985, Ser. No. 705,653
Term of patent 14 years
U.S. Cl. D99—40







LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See*—
Taylor, Chandler R., Jr., 4,694,003, Cl. 514-220.000.

A. Monforts GmbH & Co.: *See*—
Pabst, Manfred; and Mevissen, Peter, 4,693,013, Cl. 34-4.000.

A/S GEA: *See*—
Bundgaard, Hans; and Falch, Erik, 4,694,006, Cl. 514-258.000.

AB Scaniainventor: *See*—
Loodberg, Jan A. T.; and Siwersson, Olle L., 4,693,490, Cl. 180-650.000.

AB Volvo: *See*—
Nilson, Hans-Ove, 4,693,306, Cl. 165-104.210.

AB Wedalco Centerless: *See*—
Gustavsson, Harry, 4,693,145, Cl. 76-112.000.

Abe, Fumiyoshi: *See*—
Nagai, Yasuo; and Abe, Fumiyoshi, 4,694,234, Cl. 318-603.000.

Abe, Norio: *See*—
Hoizumi, Shinichi; Abe, Norio; Ueno, Takeshi; Arakawa Tadao; and Hodozuka, Kunio, 4,693,086, Cl. 60-663.000.

Abe, Shunichi: *See*—
Shimoda, Kazuho; and Abe, Shunichi, 4,693,459, Cl. 271-9.000.

Abe, Yoshio; Okano, Tetsuo; Omori, Tomohiro; and Kawamoto, Minoru, to Mazda Motor Corporation. Exhaust gas recirculation system for automatic transmission vehicle. 4,693,225, Cl. 123-568.000.

Abel, Robert, Jr. Artificial cornea. 4,693,715, Cl. 623-5.000.

Accou, Jan F., to U.S. Philips Corporation. Framework for components. 4,694,120, Cl. 174-68.500.

Acec Power Systems Limited: *See*—
McLean, George S.; Grimes, Paul J.; and van Gucht, Albert, 4,693,072, Cl. 60-39.020.

Aceti, John G., to RCA Corporation. Pallet. 4,693,370, Cl. 206-488.000.

Aciers et Outillage Peugeot: *See*—
Tourret, Alain P., 4,693,432, Cl. 242-74.000.

Adachi, Hideo, to Nippon Flute, Co. Method and apparatus for sprinklerless snow control. 4,693,300, Cl. 165-1.000.

Adam, Jean-Marie: *See*—
Bowles, James B.; White, Marshall, Jr.; Puentener, Alois; Adam, Jean-Marie; and Loew, Peter, 4,693,727, Cl. 8-549.000.

Adams, Michael A.: *See*—
Johnsen, Peter B.; and Adams, Michael A., 4,693,897, Cl. 426-2.000.

Adams, Peter F.; and Cowan, Colin F. N., to British Telecommunications public limited company. Adaptive digital filter. 4,694,451, Cl. 370-32.100.

Adams, Theodore, to Medtronic, Inc. Automatic implantable defibrillator and pacer. 4,693,253, Cl. 128-419.00D.

Adamson, Fletcher D.; and Caldwell, James M., to Russell Corporation. Automatic garment portion loader. 4,693,460, Cl. 271-10.000.

ADC Telecommunications, Inc.: *See*—
Dinsmore, Jeffrey P.; and Pfeffer, George B., 4,693,537, Cl. 439-399.000.

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Adolph Coors Company: *See*—
Hudec, Gordon D., 4,693,178, Cl. 101-40.000.

Advanced Genetics Research Institute: *See*—
Wieschahn, Gary P.; Creagan, Richard P.; Stevens, David R.; and Giles, Richard, 4,693,981, Cl. 435-238.000.

Advanced Micro Devices, Inc.: *See*—
Cheung, Robin W.; and Chan, Hugo W. K., 4,693,925, Cl. 428-189.000.
Shu, Lee-Lean; and Shyu, Tai-Ching, 4,694,205, Cl. 307-530.000.

Advest Group, Inc., The: *See*—
Grant, David J.; and Vignola, Andrew M., Sr., 4,694,397, Cl. 364-408.000.

Aerovox Incorporated: *See*—
MacDougall, Frederick W.; and Murphy, Thomas A., 4,694,377, Cl. 361-275.000.

Aesculap-Werke AG: *See*—
Bleier, Waldemar; Lutze, Theodor; and Stallforth, Harald, 4,693,251, Cl. 128-346.000.

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Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Agence Spatiale Europeenne: *See*—
Weinberg, Alan H., 4,694,206, Cl. 307-571.000.

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Tenjinbayashi, Koji, 4,693,604, Cl. 356-348.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, 4,694,116, Cl. 136-256.000.
Torikai, Eiichi, 4,693,953, Cl. 430-165.000.

Ahlfors, Matts; Koskimies, Salme; Lahtinen, Leila; and Idelman, Peter, to Neste Oy. Procedure for producing stearyl-β-(3,5-dibutyl-4-hydroxyphenyl) propionate and bis-(β(3,5-dibutyl-4-hydroxybenzyl)-methylcarboxyethyl)sulphide. 4,694,099, Cl. 560-75.000.

Ahrens, William K., to General Motors Corporation. Charge cooler angle duct. 4,693,084, Cl. 60-599.000.

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Ohnuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, 4,693,574, Cl. 354-21.000.

Aiken, Hugh H., Jr.; and Langford, Gordon B., to AMP Incorporated. Membrane keyboard switch assembly having spacer structure and method of making. 4,694,126, Cl. 200-5.00A.

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Dixon, Dale D.; and Burgoyne, William F., 4,693,837, Cl. 252-50.000.
Lenney, William E., 4,694,056, Cl. 526-202.000.

Aisin-Warner Kabushiki Kaisha: *See*—
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,693,143, Cl. 74-866.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watsnabe, Kazuaki; and Taga, Yutaka, 4,693,348, Cl. 192-3.290.

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Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.

Ajax Magnethermic Corporation: *See*—
Ross, Nicholas V., 4,694,134, Cl. 219-10.790.

Akagawa, Tomohiko: *See*—
Morita, Hideyo; Akagawa, Tomohiko; and Kita, Yasuo, 4,694,031, Cl. 523-203.000.

Akai, Yoshimi, to Kabushiki Kaisha Toshiba. Radiation detector having high efficiency in conversion of absorbed X-rays into light. 4,694,177, Cl. 250-368.000.

Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, to Nissan Motor Co., Ltd. Suspension system. 4,693,491, Cl. 280-6EE.000.

Akatsuka, Mitsuo: *See*—
Nakagawa, Hisato; Kuwahara, Hideo; Koyama, Atsuo; and Akatsuka, Mitsuo, 4,694,224, Cl. 315-177.000.

Akiba, Masaru: *See*—
Yamamoto, Shigeru; and Akiba, Masaru, 4,693,029, Cl. 43-22.000.

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Winblad, Nils, 4,693,182, Cl. 102-476.000.

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Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.

Akzo N.V.: *See*—
Timmerman, Hendrik; and Van der Goot, Henderikus, 4,694,000, Cl. 514-187.000.

Albrecht, Karl-Hans; Luhr, Hartmut; and Pieck, Gunter, to Halbergerhutte GmbH. Apparatus for producing by the casting technique a cooling means for webs between adjacent cylinders of a cylinder block and a cylinder block produced accordingly. 4,693,294, Cl. 164-312.000.

Alcantara, Miguel A.: *See*—
Lazcano-Navarro, Arturo; Alcantara, Miguel A.; and Hernandez-Ruiz, Jose E., 4,693,274, Cl. 137-625.400.

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Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,694,291, Cl. 340-825.200.

Alcatel Thomson Faisceaux Hertziens: *See*—
Argintaru, Lazare; and Hebrard, Denis, 4,694,260, Cl. 331-9.000.

Alcon Laboratories, Inc.: *See*—
Gerson, Steven H.; and Han, Wesley W., 4,694,022, Cl. 514-554.000.

Alexander, Willard E.: *See*—
Rubens, Louis C.; Alexander, Willard E.; and Raeck, Carl A., 4,693,856, Cl. 264-45.400.

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Alfred Teves GmbH: *See*—
Drott, Peter, 4,693,341, Cl. 188-72.700.

Wupper, Hans; and Buschmann, Gunther, 4,693,522, Cl. 303-105.000.

Alfredsson, Alf I.; and Persson, Kjell A., to Victor Hasselblad AB. Arrangement for winding cameras. 4,693,579, Cl. 354-173.100.

Allegheny Ludlum Corporation: *See*—
Malagari, Frank A., Jr., 4,693,762, Cl. 148-111.000.

Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., to United States of America, Health and Human Services. Use of trimetrexate as antiparasitic agent. 4,694,007, Cl. 514-260.000.

Allen, Louis. Container closure device. 4,693,414, Cl. 229-125.020.

Allen-Morrison, Inc.: *See*—
Callahan, David T.; and Dobyns, David W., 4,693,026, Cl. 40-576.000.

Allgaier, Leonhard: *See*—
Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., 4,693,642, Cl. 408-59.000.

Allied Corporation: *See*—
DeCarlo, Frank S.; and Rosen, Frank L., 4,693,114, Cl. 73-178.00R.
Fulmer, Keith H., 4,693,276, Cl. 138-31.000.
Romstadt, Douglas J.; and Seitz, William R., 4,694,145, Cl. 219-497.000.

Allison Corporation: *See*—
Seltzer, Samuel M.; Dennison, Saul; and Dolan, Frank, Sr., 4,693,511, Cl. 297-219.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,694,036, Cl. 524-473.000.

Almon, Harold A. Multi channel borehole seismic surveying tool. 4,693,335, Cl. 181-102.000.

Almond, Jeffrey W.; Minor, Phillip D.; Evans, David M. A.; and Schild, Geoffrey C., to National Research Development Corporation. Polypeptides useful in vaccination against enteroviruses. 4,694,071, Cl. 530-329.000.

Alper, Howard; and Smith, David J. H., to British Petroleum Company p.l.c., The. Carbamate ester production. 4,694,097, Cl. 560-24.000.

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Mazzarolo, Sante, 4,693,021, Cl. 36-131.000.

Alps Electric Co., Ltd.: *See*—
Fuke, Takamichi, 4,694,366, Cl. 360-106.000.
Harumatsu, Masatoshi, 4,693,620, Cl. 400-611.000.

Alty, Mark C., to General Motors Corporation. Dual cam window regulator apparatus and method. 4,693,127, Cl. 74-25.000.

Aluminum Company of America: *See*—
Bretz, Philip E.; Petit, Jocelyn I.; Sawtell, Ralph R.; and Vasudevan, Asuri K., 4,693,747, Cl. 75-249.000.

Alvis, John R.: *See*—
Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, 4,693,781, Cl. 156-643.000.

Alvite', Joseph G., to Mecanotron Corporation. Robotic skin. 4,694,231, Cl. 318-568.000.

Alza Corporation: *See*—
Ayer, Atul D., 4,693,886, Cl. 424-15.000.
Wong, Patrick S. L.; and Theeuwes, Felix, 4,693,895, Cl. 424-473.000.

Amano, Yoshiaki: *See*—
Ohyauchi, Hideo; Amano, Yoshiaki; and Yokoyama, Eiji, 4,693,945, Cl. 429-21.000.

Amazawa, Kiyoshi: *See*—
Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, 4,694,500, Cl. 381-10.000.

Amburn, James M.: *See*—
Raterman, Donald E.; and Amburn, James M., 4,693,428, Cl. 241-167.000.

Amemiya, Shinichi, to Fujitsu Limited. Correlation detection type ultrasound blood flowmeter. 4,693,319, Cl. 128-663.000.

Amemiya, Tsuguo; Magata, Yutaka; Fujimatsu, Satoshi; and Morita, Masahiro, to Hitachi, Ltd. Slip reception terminal system. 4,694,147, Cl. 235-379.000.

American Standard Inc.: *See*—
Logadon, Terance B., Jr.; and Fisher, Donald L., 4,693,501, Cl. 285-173.000.

American Telephone and Telegraph Company: *See*—
Torok, Gabor P.; and White, Andrew B., 4,694,472, Cl. 375-107.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Capasso, Federico; and Tsang, Won-Tien, 4,694,318, Cl. 357-30.000.
Chang, Shih-Jeh; Emery, Richard T.; Hakim, Shafik J.; and Sand, Douglas S., 4,694,487, Cl. 379-269.000.
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,694,328, Cl. 358-21.00V.

American Telephone and Telegraph Company and AT&T Information Systems: *See*—
Hasley, Lloyd A.; and Raamot, Jaan, 4,694,196, Cl. 307-269.000.

American Telephone and Telegraph, Company AT&T Technologies, Inc.: *See*—
Dines, David R.; and Webb, Vertis C., 4,693,408, Cl. 228-47.000.

American Television & Communications Corporation: *See*—
Baxes, Gregory A., 4,694,335, Cl. 380-14.000.

American Woodwork Specialty Co., Inc.: *See*—
Knapp, Michael E., 4,693,043, Cl. 52-211.000.

Amerock Corporation: *See*—
DeBruyn, William, 4,692,964, Cl. 16-367.000.

AMP Incorporated: *See*—
Aiken, Hugh H., Jr.; and Langford, Gordon B., 4,694,126, Cl. 200-5.00A.
Asick, John C.; Douty, George H.; and Staron, James S., 4,693,528, Cl. 439-83.000.
Cembruch, Bronislau J.; and Werner, Walter M., 4,693,688, Cl. 439-877.000.
Olsson, Billy E., 4,694,129, Cl. 200-68.200.
Stillie, Donald G., 4,693,529, Cl. 439-67.000.
Stillie, Donald G.; and Zakary, Paul D., 4,693,530, Cl. 439-67.000.
Szczesny, David S.; and Root, John A., 4,693,533, Cl. 439-350.000.
Tighe, Charles I., Jr., 4,693,539, Cl. 439-465.000.

Ampex Corporation: *See*—
Flora, Jay L., 4,694,343, Cl. 358-183.000.
Flora, Jay L., 4,694,344, Cl. 358-183.000.

Ampferer, Herbert; and Groger, Klaus, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Crankshaft bearings for internal-combustion engines. 4,693,216, Cl. 123-195.00R.

AMSTED Industries Incorporated: *See*—
Willson, David H., 4,693,836, Cl. 210-791.000.

Amuda, Suarawu O., to Borg-Warner Automotive, Inc. Pressure responsive switch assembly. 4,694,127, Cl. 200-83.00P.

Amy, A. Andre ; and Babineaux, Jules, to Metal Improvement Co., Inc. Shot-peening method. 4,693,102, Cl. 72-53.000.

Analog Devices, Inc.: *See*—
Rastegar, Ali, 4,694,276, Cl. 340-347.0AD.

Anderson, C. Lawrence: *See*—
Clark, Marion D.; and Anderson, C. Lawrence, 4,692,993, Cl. 437-53.000.

Anderson, David. Swivel joint. 4,693,500, Cl. 285-94.000.

Anderson, Mark L.: *See*—
Ennis, James F., III, 4,693,706, Cl. 604-87.000.

Anderson, Philip K. Air deflecting means for use with air outlets defined in dropped ceiling constructions. 4,693,174, Cl. 98-40.050.

Ando, Hideo, to Kabushiki Kaisha Toshiba. Optical system for tracking an information recording medium. 4,694,443, Cl. 369-46.000.

Andoh, Haruo; and Matsumoto, Seiji, to Hitachi Maxell, Ltd.; and Sakai Chemical Industry Co., Ltd. Magnetic recording medium and magnetic particles therefor. 4,693,931, Cl. 428-328.000.

Andra, Rainer, to Metzeler Kautschuk GmbH. Two-chamber motor support with hydraulic damping. 4,693,455, Cl. 267-140.100.

Andreas Stihl: *See*—
Wehle, Anton, 4,693,006, Cl. 30-383.000.

Andrews, Linda S. Curtain-hook assembly. 4,693,291, Cl. 160-388.000.

Andrews, Mark J., to Gemcor Engineering Corp. Apparatus for lubricating a workpiece. 4,693,646, Cl. 409-136.000.

Andrews, Robert P., to Westinghouse Electric Corp. Method of making scalable side entry turbine blade roots. 4,692,976, Cl. 29-156.80B.

Angell, Thomas M. Electrical box retainer. 4,693,438, Cl. 248-27.300.

Anheuser-Busch, Incorporated: *See*—
Richmond, Donald W.; Clyne, Carl W.; and Holben, Tod M., 4,693,902, Cl. 426-407.000.
Spargo, William G., 4,693,054, Cl. 53-432.000.

ANT Nachrichtentechnik GmbH: *See*—
Grunsch, Eckhardt, 4,694,240, Cl. 323-285.000.

Antenna Incorporated - Div. of Celwave: *See*—
Wassum, Raymond E., 4,694,301, Cl. 343-720.000.

Anthony, Charles, Jr.: *See*—
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., 4,693,711, Cl. 604-306.000.

Anthony, James R.; and Wiseman, Michael A., to Indiana Mills & Manufacturing, Inc. Belt buckle with eject means. 4,692,970, Cl. 24-642.000.

Antikainen, Jorma; Olaoni, Yrjo ; and Valimaki, Pentti, to Kone Oy. Continuous operation bulk goods unloader. 4,693,360, Cl. 198-509.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; Sakurai, Yoshimi; Aoki, Takashi; and Sato, Yoichi, 4,693,347, Cl. 192-3.300.

Aoshima, Shinji: *See*—
Tomisawa, Norio; Kamiya, Shingo; and Aoshima, Shinji, 4,694,441, Cl. 369-32.000.

Apfel, Norbert; Stehle, Hans-Peter; and Noll, Wilfried, to Stihl, Andreas. Guide bar for a chain saw. 4,693,007, Cl. 30-387.000.

Arad, Abraham A.: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,693,693, Cl. 446-6.000.

Arai, Kenji: *See*—
Kurihara, Kazumasa; and Arai, Kenji, 4,693,142, Cl. 74-861.000.

Arai, Koichi, to Arai Machinery Corporation. Filter process and its device. 4,693,835, Cl. 210-777.000.

Arai Machinery Corporation: *See*—
Arai, Koichi, 4,693,835, Cl. 210-777.000.

Arai, Noboru; and Yanagimoto, Takekazu, to Fuji Photo Film Co., Ltd. Device for holding an imaging lens. 4,693,555, Cl. 350-253.000.

Arai, Tatsuo: *See*—
Tsujimura, Osamu; Saito, Takayoshi; and Arai, Tatsuo, 4,693,641, Cl. 407-42.000.

Arai, Yasuhiro: *See*—
Kaku, Takashi; and Arai, Yasuhiro, 4,694,469, Cl. 375-13.000.

Arakawa, Satoshi, to Mitsubishi Gas Chemical Company, Inc. Process for producing dithionites. 4,693,880, Cl. 423-515.000.

Arakawa Tadao: *See*—
Hoizumi, Shinichi; Abe, Norio; Ueno, Takeshi; Arakawa Tadao; and Hodozuka, Kunio, 4,693,086, Cl. 60-663.000.

Arbeiter, James H., to RCA Corporation. Compact-structure input-weighted multitap digital filters. 4,694,413, Cl. 364-724.000.

Archer, Ronald D.; Hardiman, Christopher J.; Grybos, Ryszard; and Chien, James C. W., to United States of America, Navy. Transition and inner transition metal chelate polymers for high energy resist lithography. 4,693,957, Cl. 430-269.000.

Archibald, John L.; Ward, Terence J.; and Opalko, Albert, to John Wyeth & Brother Limited. Method of treating of preventing diseases using 1,4-dihydropyridines. 4,694,012, Cl. 514-332.000.

Argintaru, Lazare; and Hebrard, Denis, to Alcatel Thomson Faisceaux Hertziens. Microwave discriminator and devices using said discriminator. 4,694,260, Cl. 331-9.000.

Arimura, Hirofumi: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Moriae, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.

Arioka, Hiroyuki: *See*—
Nishimatsu, Masaharu; Arioka, Hiroyuki; and Ishizaki, Hideki, 4,693,934, Cl. 428-336.000.

Aristo Graphic SySteme GmbH & Co. KG: *See*—
Cordes, Werner, 4,693,554, Cl. 350-244.000.

Armstrong, Albert L.; and Goodrich, Joel L., to M/A-COM, Inc. Process for fabricating semiconductor components. 4,692,998, Cl. 437-225.000.

Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, to Robert Bosch GmbH. Position sensor for a movable part in a motor vehicle. 4,693,111, Cl. 73-118.100.

Arold, Klaus; Koukal, Heinz; Grimm, Hermann, deceased (by Grimm, Christel, executrix); and Trube, Hans, to Daimler-Benz Aktiengesellschaft. Heating or air-conditioning system for vehicles. 4,693,417, Cl. 237-12.30B.

Aron, Jerome; and Engel, Alfred, to Kuhn S.A. Farm machines having flexible skirts for moving agricultural products on the ground. 4,693,065, Cl. 56-377.000.

Art Metal U.S.A., Inc.: *See*—
Wetz, Leonard R., Jr., 4,693,100, Cl. 70-333.00A.

Asahi Glass Company Ltd.: *See*—
Kobayashi, Shigeyoshi; Manabe, Tsuneo; and Yanagisawa, Ichiro, 4,693,748, Cl. 106-35.000.
Nakaya, Keiichi; and Tanaka, Kunio, 4,693,872, Cl. 423-164.000.

Assi, Shojiro: *See*—
Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Assi, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, 4,693,173, Cl. 98-31.500.

Asakura, Masahiko: *See*—
Hasebe, Hiroshi; Asakura, Masahiko; Sakaino, Michio; and Miyashita, Yukio, 4,693,220, Cl. 123-339.000.

Asam, Adolf R.: *See*—
Blanco, Carlos; Asam, Adolf R.; and Smith, John C., 4,693,551, Cl. 350-96.200.

Asami, Kinichiro: *See*—
Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Assi, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, 4,693,173, Cl. 98-31.500.

Asano, Tetsuro, to Sanyo Electric Co. Semiconductor integrated circuit having multiple-layered connection. 4,694,320, Cl. 357-40.000.

Asars, Juris A.: *See*—
Miller, Robert C.; and Asars, Juris A., 4,694,243, Cl. 324-96.000.

Aschenbeck, Weldon J.; and Medley, Frank W., III, to Kaspar Wire Works, Inc. Multiple chute coin mechanism. 4,693,357, Cl. 194-202.000.

ASEA AB: *See*—
Hellgren, Keijo, 4,693,103, Cl. 72-63.000.

ASEA Aktiebolag: *See*—
Kristola, Osvald; and Korpela, Paavo, 4,692,983, Cl. 29-432.000.
Svedberg, Per, 4,694,315, Cl. 357-23.130.

Ashcraft, Robert W., to E.I. Du Pont de Nemours and Company. Adhesion promotion in photoresist lamination and processing. 4,693,959, Cl. 430-323.000.

Ashley, Paul R., to United States of America, Army. Amorphous silicon spatial light modulator. 4,693,561, Cl. 350-336.000.

Asick, John C.; Douty, George H.; and Staron, James S., to AMP Incorporated. Surface mount connector with floating terminals. 4,693,528, Cl. 439-83.000.

Astra-Tech Aktiebolag: *See*—
Lundback, Stig, 4,693,714, Cl. 623-3.000.

Atchisson, Maxwell G. Firing mechanism for firearm. 4,693,170, Cl. 89-149.000.

Atkinson, Frederick G.; Kobrinetz, Anthony; and Menich, Barry J., to Motorola, Inc. Cellular radiotelephone land station. 4,694,484, Cl. 379-59.000.

Atochem: *See*—
Hilaire, Jean-Claude; and Guerin, Roland, 4,694,063, Cl. 528-315.000.

Atom Sciences, Inc.: *See*—
Payne, Marvin G.; Thonnard, Norbert; and Hurst, George S., 4,694,167, Cl. 250-282.000.

Atsumi, Shigeru: *See*—
Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, 4,694,429, Cl. 365-189.000.

Attri, Arun K.: *See*—
Minton, Allen P.; Attri, Arun K.; and Sullivan, James V., 4,693,984, Cl. 436-180.000.

Atwal, Karnail: *See*—
Floyd, David; and Atwal, Karnail, 4,694,002, Cl. 514-211.000.

Atwell, Thomas L.: *See*—
Proctor, Raymond J.; Atwell, Thomas L.; Lingren, Clinton L.; and Miller, James F., 4,694,165, Cl. 250-252.100.

Aubert, Gilles, to Commissariat a l'Energie Atomique. Device for removably fixing an internal structure to a circular wall inside an envelope. 4,693,279, Cl. 138-108.000.

Aubree, Jean: *See*—
Denhez, Alain; Hargoss, Francis; and Aubree, Jean, 4,694,291, Cl. 340-825.200.

Audibert, Francoise: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Aula, Jouko; and Kerttula, Reima, to Valmet Oy. Suction roll and method for applying a negative pressure over a sector of a roll. 4,693,784, Cl. 162-202.000.

Auth, Gerald L., to MIDAC Corporation. Ruggedized compact interferometer requiring minimum isolation from mechanical vibrations. 4,693,603, Cl. 356-346.000.

Automation Industries, Inc.: *See*—
Choiniere, Alcide W.; and Dunn, George T., Jr., 4,693,324, Cl. 174-47.000.

Avisse, Jean-Bernard, to Societe Anonyme: Societe Europeenne de Propulsion. Movable core transducer. 4,694,246, Cl. 324-207.000.

Avny, Sam. Concealed mounted push bars and grills. 4,692,962, Cl. 16-111.00R.

Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., to Aktiebolaget Draco. Liposomes containing steroid esters. 4,693,999, Cl. 514-174.000.

Ayata, Naoki: *See*—
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.

Ayer, Atul D., to Alza Corporation. Osmotic device with inert core. 4,693,886, Cl. 424-15.000.

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Fukai, Isamu; and Azami, Katsumasa, 4,693,674, Cl. 417-269.000.

Azegami, Osamu; and Miyake, Toshifumi, to Kabushiki Kaisha Ishida Koki; and Yac Co., Limited. Method and apparatus for sorting articles. 4,693,378, Cl. 209-586.000.

B & D Autolines AB: *See*—
Karlsson, Gosta, 4,693,154, Cl. 83-161.000.

B. F. Goodrich Company, The: *See*—
Edwards, Walter A.; and Huddleston, George R., Jr., 4,693,800, Cl. 204-180.100.

Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Transfer press. 4,693,361, Cl. 198-621.000.

Babcock & Wilcox Company, The: *See*—
Kalen, David D., 4,693,389, Cl. 220-236.000.

Babich, Edward D.; Hatzakis, Michael; Liutkis, John J.; Paraszczak, Juri R.; and Shaw, Jane M., to International Business Machines Corporation. Photolithographic etching process using organosilicon polymer composition. 4,693,960, Cl. 430-323.000.

Babineaux, Jules: *See*—
Amy, A. Andre ; and Babineaux, Jules, 4,693,102, Cl. 72-53.000.

Bacardit, Juan S., to Bendiberica S.A. Electro-optical torque sensing device for an actuating mechanism. 4,693,123, Cl. 73-862.330.

Bacskai, Endre; Retfalvi, Ferenc; and Sasdi, Andras, to Kohaszati Cyaropito Vallalat Gepipari Technologiai Intezet. Video-radiographic process and equipment for a quality controlled weld seam. 4,694,479, Cl. 378-58.000.

Baeger, Holm, to VDO Adolf Schindling AG. Liquid-crystal cell with depressions for wider viewing angle. 4,693,559, Cl. 350-334.000.

Baehrle, Friedrich; Wulf, Helmut; and Kreeb, Helmut, to Daimler-Benz Aktiengesellschaft. Method for heating a road by means of geothermally fed heating installation as well as a road-heating installation for carrying out the method. 4,693,301, Cl. 165-45.000.

Bagwell, Charles, Jr., to Howden Coloney, Inc. Strap for linked container article carrier. 4,693,167, Cl. 89-35.010.

Baird Corporation: *See*—
Croteau, Francis R., 4,694,398, Cl. 364-414.000.

Baity, Frederick W.: *See*—
Owens, Thomas L.; Baity, Frederick W.; Hoffman, Daniel J.; and Whealton, John H., 4,694,264, Cl. 333-34.000.

Baker, Anna M., to Baker, Kenneth R.; and Derosier, Paul G. Pick-up device for lawn debris. 4,693,504, Cl. 294-1.100.

Baker, Daniel C., to Shell Oil Company. HCN and iron cyanide complex removal. 4,693,873, Cl. 423-215.500.

Baker, Donal E., to Westinghouse Electric Corp. Electromechanical constant speed drive generating system. 4,694,187, Cl. 290-4.00R.

Baker, Gordon R.: *See*—
Podolsky, Richard J.; Baker, Gordon R.; and Brenner, Bernhard, 4,693,606, Cl. 356-355.000.

Baker, Kenneth R.: *See*—
Baker, Anna M., 4,693,504, Cl. 294-1.100.

Balaban, Alvin R.: *See*—
Demmer, Walter H.; Harwood, Leopold A.; Patel, Chandrakant B.; and Balaban, Alvin R., 4,694,327, Cl. 358-19.000.

Balboni, John J.: *See*—
Hong, Leon; and Balboni, John J., 4,693,899, Cl. 426-94.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Metal diffusion and use. 4,694,036, Cl. 524-473.000.

Balian, Charles: *See*—
Agarwal, Arun K.; and Balian, Charles, 4,693,920, Cl. 428-40.000.

Ballard, Jerry L.; Chatham, Dale; and Gaulke, Gerald E. Video display control. 4,694,392, Cl. 364-200.000.

Ballard, Stephen C.: *See*—
Payet, George L.; and Ballard, Stephen C., 4,693,771, Cl. 156-73.300.

Ballestrazzi, Aris; and Tassi, Lamberto, to SITMA Societa Italiana Macchine Automatiche S.p.A. Device for controlling the unwinding of a plastics film in a packaging machine. 4,693,053, Cl. 53-389.000.

Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, to Basf Aktiengesellschaft. Preparation of alkali metal and alkaline earth metal salts of acyloxybenzenesulfonic acids. 4,693,848, Cl. 260-402.000.

Bando, Akira: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Bankel, Adolf: *See*—
Weber, Adolf; Strauss, Hans; and Bankel, Adolf, 4,693,180, Cl. 102-374.000.

Bannick, Mark A.; Divers, George A., III; and Janosa, Viktors, to Raychem Corporation. Purification of acid halides. 4,693,851, Cl. 260-544.000.

Banning, Robert D.: *See*—
George, Robert D.; and Banning, Robert D., 4,693,709, Cl. 604-212.000.

Barclay, William; and Stanis, Alexander C., to Barclay, William. Paper cutting attachment. 4,693,150, Cl. 82-93.000.

Barger, Dwight F.: *See*—
Bartholic, David B.; and Barger, Dwight F., 4,693,809, Cl. 208-127.000.

Barker, James M.: *See*—
Luke, Robert R.; and Barker, James M., 4,693,308, Cl. 166-55.100.

Barnabe, Jean-Pierre: *See*—
Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, 4,693,136, Cl. 74-492.000.

Barroero, Louis F. Self-closing hinge and isolation door installation. 4,692,963, Cl. 16-275.000.

Bartholic, David B.; and Barger, Dwight F., to Engelard Corporation. Hydrocarbon conversion process. 4,693,809, Cl. 208-127.000.

Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, to Center Industries Corporation. Rivet tool having reversible anvil. 4,693,406, Cl. 227-63.000.

Bartlett, Bruce, to Crown International, Inc. Directional microphone with acoustic washer. 4,694,499, Cl. 381-155.000.

Barzaghi, Fernando: *See*—
Bianchi, Mario, deceased; and Barzaghi, Fernando, 4,694,019, Cl. 514-461.000.

Baschant, Robert: *See*—
Trumper, Reinhard; and Baschant, Robert, 4,693,661, Cl. 414-595.000.

Basf Aktiengesellschaft: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.
Colberg, Horst; and Hahn, Erwin, 4,694,075, Cl. 534-604.000.
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fischer, Rolf, 4,694,107, Cl. 568-310.000.
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.
Oelsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.
Ziegler, Walter; Dietsche, Wolfram; Weiss, Stefan; Mueller, Richard; Hetsche, Albert; Glaser, Klaus; and Vamvakaris, Christos, 4,693,909, Cl. 427-156.000.

Basic Measuring Instruments: *See*—
McEachern, Alexander; and Nitz, Frederic, 4,694,402, Cl. 364-487.000.

Bates, David, to Kendall Company, The. Bactericide valve on fluid collection bag. 4,693,712, Cl. 604-323.000.

Battelle Memorial Institute: *See*—
James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., 4,693,875, Cl. 423-243.000.

Bauer, Harold: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

Bauer, Kurt H.; Pritzwald-Stegmann, Bernd; and Luft, Werner, to Meggle Milchindustrie GmbH & Co. KG. Direct tabletting agent. 4,693,730, Cl. 106-163.100.

Bauer, Sigrid, to Ciba-Geigy Corporation. Photopolymerizable coating agent, a photopolymerizable material and its use. 4,693,961, Cl. 430-325.000.

Baugh, Benton F.; and Panicker, Narayana N., to Mobil Oil Corporation. Anti-rotation tubular connection for flowlines or the like. 4,693,498, Cl. 285-39.000.

Baxes, Gregory A., to American Television & Communications Corporation. Video scrambling system with line tilt correction. 4,694,335, Cl. 380-14.000.

Baxter, Raymond D. Modular water conditioning apparatus. 4,693,820, Cl. 210-232.000.

Bayer Aktiengesellschaft: *See*—
Fischer, Wolfgang; Klein, Gerhard; Hombach, Rudolph; and Kniege, Wilfried, 4,694,043, Cl. 525-127.000.
Hegazy, Ahmed; and Winter, Manfred, 4,693,892, Cl. 424-456.000.
Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
Mues, Peter; Buysch, Hans-Josef; Brunat, Bert; and Heine, Heinrich, 4,694,065, Cl. 528-371.000.
von Bonin, Wulf; Sattlegger, Hans; and Ebneth, Harold, 4,694,030, Cl. 523-179.000.

Bayha, Heiner; Kluge, Hermann; and Rachner, Horst, to SWF Auto Electric GmbH. System for supplying fuel including protection against electrolytic corrosion. 4,694,211, Cl. 310-71.000.

BBC Brown, Boveri & Company Limited: *See*—
Gloor, Urs; Hirth, Michael; and Kogelschatz, Ulrich, 4,693,870, Cl. 422-186.190.

Beale, Michael C.; and Kashy, David H., to Newport News Shipbuilding and Dry Dock Company. Muffler for gas inducting machinery generating low frequency noise. 4,693,339, Cl. 181-255.000.

Beall, Harry C. Medical apparatus method for assessing the severity of certain skin traumas. 4,693,255, Cl. 128-654.000.

Beardsley, Robert A., to Viskase Corporation. End closure for shirred casing sticks. 4,693,280, Cl. 138-118.100.

Beasom, James D., to Harris Corporation. Conductivity modulated semiconductor structure. 4,694,313, Cl. 357-23.400.

Bechtolsheimer, Hans-Heinrich: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.

Beck, Harold K.: *See*—
Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., 4,693,316, Cl. 166-355.000.

Beck, Jeffrey L.; and Campbell, David W., to Conoco Inc. Overflow for slurry tank. 4,693,826, Cl. 210-512.100.

Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, to Kernforschungszentrum Karlsruhe GmbH. Method for producing spinning nozzle plates. 4,693,791, Cl. 204-11.000.

Becker, Roland: *See*—
Newman, Vernon H.; and Becker, Roland, 4,693,472, Cl. 273-29.00A.

Becker, Wilfried: *See*—
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, 4,693,434, Cl. 244-328.000.

Beckinger, Gunther; Egler, Gerhard; and Rambold, Thomas, to Siemens Aktiengesellschaft. Switching configuration for a telecommunications system in particular a PBX system with subscriber lines, trunk groups, and interface modules. 4,694,452, Cl. 370-58.000.

Beckman Instruments, Inc.: *See*—
Horrocks, Donald L., 4,694,176, Cl. 250-362.000.

Beckmann, Georg; Hillinger, Bruno; and Wolf, Bodo, to Waagner-Biro Aktiengesellschaft. Method for gasifying solid fuels. 4,693,729, Cl. 48-203.000.

Becton, Dickinson and Company: *See*—
Mansour, James D.; Schulte, Thomas H.; and Neece, Vernon R., 4,693,972, Cl. 435-34.000.
O'Connell, James P.; Hoke, Randal A.; and Mize, Patrick D., 4,693,970, Cl. 435-7.000.

Beer, Wilhelm, to General Motors Corporation. Arrangement for mounting an engine on the chassis of a motor vehicle. 4,693,217, Cl. 123-195.00A.

Beesley, Lawrence R.: *See*—
Wainwright, Ronald C.; and Beesley, Lawrence R., 4,693,153, Cl. 83-53.000.

Beil, Gerhard; Pichler, Alfred; Pachonik, Horst; and Plehnert, Kurt, to Siemens Aktiengesellschaft. Electrical isolation and leveling of patterned surfaces. 4,693,780, Cl. 156-643.000.

Beirne, Patrick R.: *See*—
Reesor, Gordon J.; Beirne, Patrick R.; and Styrna, Zbigniew B., 4,694,482, Cl. 379-27.000.

Bejczy, Antal K.; and Primus, Howard C., to California Institute of Technology. Linear array optical edge sensor. 4,694,153, Cl. 250-202.000.

Bell & Howell Company: *See*—
Svyatsky, Eduard; and Rabindran, K. George, 4,693,465, Cl. 271-274.000.

Bell Telephone Laboratories, Incorporated: *See*—
Torok, Gabor P.; and White, Andrew B., 4,694,472, Cl. 375-107.000.

Belmares-Sarabia, Armand; and Chayka, Stanley J., to Corporate Communications Consultants, Inc. Color correction system and method with scene-change detection. 4,694,329, Cl. 358-22.000.

Benchimol, Claude D.: *See*—
Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., 4,694,399, Cl. 364-414.000.

Bendiberica S.A.: *See*—
Becardit, Juan S., 4,693,123, Cl. 73-862.330.

Benecke, Herta: *See*—
Schwengers, Dieter; and Benecke, Herta, 4,693,974, Cl. 435-97.000.

Bentle, Larry A.; Mitchell, James W.; Storrs, Stephen B.; and Shimamoto, Grant T., to Monsanto Company. Method of somatotropin solubilization and naturation using dimethylsulfoxide. 4,694,073, Cl. 530-399.000.

Beretta, Pier G., to Fabrica D'Armi P. Beretta S.p.A. Control device for rapid firing particularly automatic weapons. 4,693,169, Cl. 89-129.020.

Berg, Lloyd; and Shanahan, Michael J. Separation of t-Amyl alcohol from isobutanol by extractive distillation. 4,693,787, Cl. 203-51.000.

Berg, Lloyd; and Shanahan, Michael J. Separation of t-amyl alcohol from isobutanol by extractive distillation. 4,693,788, Cl. 203-51.000.

Berg, Lloyd; and Yeh, An-I. Separation of isopropyl acetate from isopropanol by extractive distillation. 4,693,789, Cl. 203-51.000.

Berger, Karl-Heinz, to Bochumer Eisenhutte Heintzmann GmbH & Co KG. Method of controlling hydraulically actuatable arrangement in underground mining. 4,693,640, Cl. 405-294.000.

Bergstedt, Gar A., to Tektronix, Inc. Apparatus and method for modifying displayed color images. 4,694,286, Cl. 340-703.000.

Bergwitz-Larsen, Carl-Aage; and Osterlund, Rolf G. L., to KabiVitrum AB. Novel pharmaceutical composition. 4,693,997, Cl. 514-54.000.

Beriger Ernst, to Ciba-Geigy Corporation. Nematicidal compositions. 4,694,014, Cl. 514-363.000.

Berlex Laboratories, Inc.: *See*—
Malpass, Jack W., 4,693,371, Cl. 206-538.000.

Bernier, Donald R.: *See*—
Weintraub, Marvin H.; Bernier, Donald R.; and Cameron, Larry, 4,693,419, Cl. 239-63.000.

Bernocco, Giovanni, to TEMSIR S.r.l. Electrically controlled motorcycle stand. 4,693,488, Cl. 280-293.000.

Berry, Loren E.: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

Bessho, Hironori: *See*—
Chujo, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.

Bett, John A. S.: *See*—
Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., 4,693,882, Cl. 423-652.000.

Bettini, John E., to Illinois Tool Works Inc. Self-drilling, self-tapping fastener. 4,693,654, Cl. 411-387.000.

Betz Laboratories, Inc.: *See*—
Feldman, Nancy A., 4,693,866, Cl. 422-13.000.

Beuzard, Yves: *See*—
Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,694,015, Cl. 514-375.000.

Beyer, Karl-Heinz: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.

Beyer, Otto: *See*—
Kirst, Bertold; Beyer, Otto; and Lipp, Wolfgang, 4,693,168, Cl. 89-41.110.

Bianchi, Mario, deceased (by de Carli, Elsa, Silvana Bianchi and Giovanni Bianchi, Legal Representatives); and Barzaghi, Fernando, to Roussel UCLAF. Therapeutica compositions containing derivatives of, acrylic acid having an oxygen-containing heterocycle, therapeutic treatment therewith and new compounds. 4,694,019, Cl. 514-461.000.

Biard, Jacques, to Fenzy S.A. Coupling connectors for respirator masks. 4,693,242, Cl. 128-204.260.

BICC Public Limited Company: *See*—
Cane, Michael R., 4,693,540, Cl. 439-198.000.

Bicknell, William H.: *See*—
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.

Bieber, Oswald; Haas, Erich; Henglein, Rudolf; and Richter, Bernd, to Kraftwerk Union Aktiengesellschaft. Remotely operable tool for setting plugs into heat exchanger tubes. 4,693,277, Cl. 138-89.000.

Bilimoria, Bomi M.; Lewis, Herbert L; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., to E.C.C. America Inc. Method for improving handleability of calcined kaolin clay products. 4,693,427, Cl. 241-23.000.

Billarant, Patrick J.; and Queval, Bruno. Fastening tape designed to be attached to a molded article during molding, and its attaching method. 4,693,921, Cl. 428-100.000.

Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, to Vetrotex Saint Gobain. Device and process for simultaneously winding several separate fibers on a rotating support. 4,693,429, Cl. 242-18.00G.

Biogen N.V.: *See*—
Buell, Gary N., 4,693,973, Cl. 435-68.000.

Bisbing, Robert H., to Southco, Inc. Latch and hinge assembly. 4,693,187, Cl. 108-69.000.

Bisbing, Robert H., to Southco, Inc. Lever latch. 4,693,503, Cl. 292-210.000.

Bischoff, Peter G.; Rauch, David J.; Retort, Vincent D.; and Osborne, John R., to Read-Rite Corporation. Thin film magnetic head with three superimposed coils. 4,694,368, Cl. 360-126.000.

Bjornson, Geir; Klendworth, Douglas D.; Gardner, Lloyd E.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Hydrotreating catalyst composition. 4,693,991, Cl. 502-220.000.

Black & Decker Inc.: *See*—
Bone, Daniel, 4,693,009, Cl. 30-392.000.

Black, Kenneth R. Animal restraint apparatus and method. 4,693,212, Cl. 119-103.000.

Black, Randy D.; and Tomczak, Walter F. Protective helmet, chin cup, and face guard. 4,692,947, Cl. 2-421.000.

Blackburn, Ronald, to Sundstrand Corporation. Method and apparatus for starting a gas turbine engine. 4,693,073, Cl. 60-39.020.

Blackford, William L.; and Zakharin, Greg, to Martin Engineering Company. Piston vibrator. 4,693,732, Cl. 55-112.000.

Blackman, Peter M. Thermally powered engine utilizing thermally powered valves. 4,693,090, Cl. 62-116.000.

Blanchard, Francoise: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.

Blanchard, Pierre, to Thomson-CSF. Method of obtaining a diode whose contact tapping is self aligned with a gate. 4,692,995, Cl. 437-41.000.

Blanco, Carlos; Asam, Adolf R.; and Smith, John C., to U.S. Holding Company, Inc. Dielectric strength elements for loose tube optical fiber cable. 4,693,551, Cl. 350-96.230.

Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, to Johnson & Johnson Dental Products Company. Ratchet type dispenser for dental materials. 4,693,684, Cl. 433-90.000.

Bleier, Waldemar; Lutze, Theodor; and Stallforth, Harald, to Aesculap-Werke AG. Clip for the occlusion of an oviduct or vas deferens. 4,693,251, Cl. 128-346.000.

Blesser, Barry, to Pencept, Inc. Digitizing tablet system including a tablet having a grid structure made of two orthogonal sets of parallel uniformly sized and spaced U shaped loops of conductive material. 4,694,124, Cl. 178-19.000.

Blesser, Barry A. Digital data communicating. 4,694,471, Cl. 375-45.000.

Bletz, Walter; and Magel, Rolf, to Ernst Leitz Wetzlar GmbH. Circuit arrangement to ascertain and indicate that a luminous density limit condition is exceeded. 4,694,155, Cl. 250-214.00R.

Blohm & Voss AG: *See*—
Friedericha, Karl-Heinz; and Twiefel, Gunther, 4,693,665, Cl. 418-744.00R.

Bloom, Frank: *See*—
Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, 4,694,213, Cl. 310-90.000.

Blum, Dietmar, to Julius Blum Gesellschaft m.b.H. Drilling and mounting machine for furniture production. 4,692,973, Cl. 29-33.00K.

Blumenkranz, Robert M.; and Gibbons, Mark A., to General Instrument Corporation. Method and system of enhancing performance of feed-forward amplifiers. 4,694,258, Cl. 330-2.000.

Board of Regents, The University of Texas System: *See*—
Serwer, Philip, 4,693,804, Cl. 204-182.100.

Bochi, Hiroshi; Ueda, Kenji; and Konishi, Satoshi, to Ishida Scales Mfg. Co., Ltd. Automatic combinatorial weighting apparatus. 4,693,355, Cl. 193-2.00R.

Bochumer Eisenhutte Heintzmann GmbH & Co KG: *See*—
Berger, Karl-Heinz, 4,693,640, Cl. 405-294.000.

Bock, Jan; Siano, Donald B.; and Turner, S. Richard, to Exxon Research and Engineering Company. Hydrophobically associating terpolymers of acrylamide, salts of acrylic acid and alkyl acrylamide. 4,694,046, Cl. 525-329.400.

Bock, Jan: *See*—
Siano, Donald B.; and Bock, Jan, 4,694,058, Cl. 526-307.200.

Bodine, Albert G. Sonic drill employing orbiting crank mechanism. 4,693,325, Cl. 175-55.000.

Bodine, Albert G. Cycloidal earth cutting system with rocker-type nutating action. 4,693,326, Cl. 175-55.000.

BOE Limited: *See*—
Quazi, Fazle S., 4,693,805, Cl. 204-192.220.,

Boecker, Wolfgang D. G.; and Korzekwa, Tadeusz M., to Kennecott Corporation. Single phase silicon carbide refractory. 4,693,988, Cl. 501-89.000.

Boehringer Ingelheim KG: *See*—
Losel, Walter; Roos, Otto; and Schmorrenberger, Gerd, 4,694,085, Cl. 546-65.000.

Boehringer Mannheim GmbH: *See*—
Stetter, Karl O.; and Schmitt, Rudiger, 4,693,978, Cl. 435-199.000.
Stetter, Karl O.; and Schmitt, Rudiger, 4,693,979, Cl. 435-199.000.
Stetter, Karl O.; Schmitt, Rudiger; and Laue, Frank, 4,693,980, Cl. 435-199.000.

Boeing Company, The: *See*—
Burns, Robert A.; and VanWyk, Jan W., 4,694,038, Cl. 524-590.000.
Cross, Dan A., 4,692,974, Cl. 29-33.00M.
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., 4,693,926, Cl. 428-204.000.
VonVolkli, Arthur D., 4,693,678, Cl. 425-405.00R.

Boffardi, Bennett P., to Calgon Corporation. Use of carboxylic acid/-sulfonic acid copolymers as aluminum ion stabilizers. 4,693,829, Cl. 210-697.000.

Bohley, Thomas K.: *See*—
Whiteside, Laura; and Bohley, Thomas K., 4,694,244, Cl. 324-121.00R.

Bohm, August; Lentz, Gerhard; and Wilkens, Gunter, to Oxytechnik. Process and device for handling workpieces, especially for the thermal separation of profiles with a cutting torch. 4,693,761, Cl. 148-9.00R.

Boix-Vives, Laurent: *See*—
Salas, Joseph; and Boix-Vives, Laurent, 4,693,020, Cl. 36-117.000.

Bolte, Georg, to Schmalbach-Lubeca AG. Method of decorating and inhibiting corrosion of metallic articles. 4,693,801, Cl. 204-180.200.

Bom, Cornelis J. G.: *See*—
van der Lely, Ir E.; and Bom, Cornelis J. G., 4,693,062, Cl. 56-13.600.

Bommer, Jerry C.; and Burnham, Bruce F., to Nippon Petrochemicals Co., Ltd. Tetrapyrrole therapeutic agents. 4,693,885, Cl. 424-2.000.

Bonar Rosedale Plastics Ltd.: *See*—
Hughes, Larry R.; Dorsey, Michael L.; and Wensley, David, 4,693,386, Cl. 220-1.500.

Bond, Bruce E.; and Harrold, William J., to Raytheon Company. Magnetic drum separator. 4,693,812, Cl. 209-224.000.

Bone, Daniel, to Black & Decker Inc. Scroller jig saw. 4,693,009, Cl. 30-392.000.

Bonenberger, Kenneth E., to Litton Systems, Inc. Rolling loop twist capsule. 4,693,527, Cl. 439-13.000.

Booth, Peter A. Combined toothbrush and toothpaste dispenser. 4,693,622, Cl. 401-191.000.

Borg-Warner Automotive, Inc.: *See*—
Amuda, Suarawu O., 4,694,127, Cl. 200-83.00P.

Bora, Peter. Apparatus for wrapping stacked goods. 4,693,060, Cl. 53-388.000.

Borromeo, Lucio, to 3 T S.p.A. Device for fixing the saddle of a bicycle to a saddle pillar and for adjusting the inclination of the saddle. 4,693,627, Cl. 403-24.000.

Bos, Willem: *See*—
Bourne, Richard C.; Fanciullo, Martin; and Bos, Willem, 4,693,089, Cl. 62-79.000.

Bosch, Walter: *See*—
Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, 4,693,111, Cl. 73-118.100.

Boschert, Incorporated: *See*—
Small, Kenneth T., 4,694,389, Cl. 363-132.000.

Bottas, Michael J.: *See*—
Burk, Jeffrey L.; Bottas, Michael J.; Pielemeier, John W.; and Mueller, Dale E., 4,693,095, Cl. 68-134.000.

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Bowe, Michael J.; Orub, Samuel N.; and Singh, Jaswant, to United Kingdom Atomic Energy Authority. Fluidic contactors. 4,693,822, Cl. 210-255.000.

Bowen, James H.: *See*—
Porter, David R.; Bowen, James H.; and Holland, John M., 4,694,504, Cl. 455-608.000.

Bowles, James B.; White, Marshall, Jr.; Puentener, Alois; Adam, Jean-Marie; and Loew, Peter, to Ciba-Geigy Corporation. Process for dyeing synthetic polyamide materials with fibre-reactive anthraquinone dyes. 4,693,727, Cl. 8-549.000.

Boyd, Richard M., to Quadion Corporation. Multi-lobed rectangular sealing ring. 4,693,343, Cl. 188-322.170.

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Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., 4,693,862, Cl. 376-209.000.

Bradbury, Colin; and Douglas, George H., to Office Automation Systems, Inc. Laser printer controller data alignment device. 4,694,405, Cl. 364-518.000.

Brandl, Hans; and Liegl, Werner, to Siemens Aktiengesellschaft. Circuit for electronic speech synthesis. 4,694,496, Cl. 381-51.000.

Brassard, Pierre: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.

Brassat, Bert: *See*—
Mues, Peter; Buysch, Hans-Josef; Brassat, Bert; and Heine, Heinrich, 4,694,065, Cl. 528-371.000.

Brattsand, Ralph L.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.

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Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., 4,693,862, Cl. 376-209.000.

Breckwoldt, Robert G., to Tripar Incorporated. Smoking material. 4,693,266, Cl. 131-359.000.

Breezer, Harlan W.: *See*—
Dresen, William L.; Price, William F.; Emery, Phillip L.; Breezer, Harlan W.; and Holmes, Robert R., 4,693,507, Cl. 296-39.00R.

Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M. Long-life biomedical transcutaneous drug application device and method of transcutaneous application of drugs. 4,693,711, Cl. 604-306.000.

Brenholt, David L.; Crane, Stephen M.; Fischer, Paul M.; and Mattson, Kenneth V., to Donaldson Company, Inc. Robot with articulated arm. 4,693,663, Cl. 414-735.000.

Brenner, Bernhard: *See*—
Podolsky, Richard J.; Baker, Gordon R.; and Brenner, Bernhard, 4,693,606, Cl. 356-355.000.

Brent, George I., to Tallgrass Technologies, Inc. Mechanism for moving recording heads across computer tapes. 4,694,367, Cl. 360-106.000.

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Bretz, Philip E.; Petit, Jocelyn I.; Sawtell, Ralph R.; and Vasudevan, Asuri K., to Aluminum Company of America. Alloy having improved fatigue crack growth resistance. 4,693,747, Cl. 75-249.000.

Breuninger, Manfred; and Schmidt, Dieter, to Hoffmann-La Roche Inc. Glycerol ether phosphatides. 4,694,084, Cl. 546-25.000.

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Varma, Vijaya K.; Winans, Esther D.; O'Halloran, Rosemary; and Brewster, Phillip W., 4,693,838, Cl. 252-51.50R.

Brieger, Emmet F.: *See*—
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Brtish Telecommunications public limited company: *See*—
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Brisson, Glenn R.: *See*—
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Crast, Leonard B., Jr., 4,694,079, Cl. 540-215.000.

British Aerospace PLC: *See*—
Harvey, Charles P., 4,693,172, Cl. 98-2.010.

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British Gas Corporation: *See*—
Wayman, Malcolm; and Mood, Geoffrey I., 4,693,404, Cl. 223-101.000.

British Nuclear Fuels Plc: *See*—
Eccles, Harry; and Fell, Stephen A., 4,693,795, Cl. 204-94.000.

British Petroleum Company p.l.c., The: *See*—
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Gerrard, Donald L.; Preedy, John E.; and Williams, Kenneth P. J., 4,693,377, Cl. 209-579.000.

Brooks, Hannah: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.

Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., to Imperial Chemical Industries PLC. 5-phenyl-3H,6H-1,3,4-oxadiazine-2-ones in treatment of heart failure and hypertension. 4,694,005, Cl. 514-234.000.

Brown, Jerry W. Removable water guard for sliding patio doors. 4,692,961, Cl. 16-95.00R.

Brown, Keith E., to Kinetico. Inc. Water treatment apparatus. 4,693,814, Cl. 210-88.000.

Brown, Paul S., Jr.: *See*—
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Brown, Raymond C., to Superior Industries International, Inc. Automotive vehicle wheel with non-supporting spokes. 4,693,520, Cl. 301-37.0SS.

Brown, Thomas H.; and Durant, Graham J., to Smith Kline & French Laboratories Limited. Chemical compounds. 4,694,008, Cl. 514-269.000.

Brown, Vincent B.; and McGrew, Sherman W., to Methode Electronics, Inc. Crimp type fiber optic connector. 4,693,550, Cl. 350-96.200.

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Bruinsma, Robert F., to Datron Systems, Inc. Fastener for joining panels to each other. 4,693,629, Cl. 403-170.000.

Bruker Medizintechnik G.m.b.H.: *See*—
Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, 4,694,249, Cl. 324-309.000.

Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexanedionecarboxylic acid derivatives with herbicidal and plant growth regulating properties. 4,693,745, Cl. 71-94.000.

Brunner, Peter: *See*—
Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, 4,694,249, Cl. 324-309.000.

Brunnmueller, Fritz: *See*—
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.

Bucher, Hans R.; and Hodd, Donald E., to Xedar Corporation. Pyroelectric camera signal processing having pedestal signal level compensation. 4,694,334, Cl. 358-113.000.

Buck, Gordon H. Inflated balloon tire for toy vehicles. 4,693,696, Cl. 446-124.000.

Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, to Robert Bosch GmbH. Power impact device, particularly for fasteners. 4,693,407, Cl. 227-109.000.

Buckley, Alan: *See*—
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Buddy L Corporation: *See*—
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,693,693, Cl. 446-6.000.

Buechele, Juergen W.; and Fisher, Guenter, to G & F Precision, Inc. Universal joint maker. 4,693,288, Cl. 144-87.000.

Buehler Ltd.: *See*—
Doyle, Ralph R., 4,693,035, Cl. 51-125.000.

Buell, Gary N., to Biogen N.V. DNA sequences, recombinant DNA molecules and processes for producing bovine growth hormone-like polypeptides in high yield. 4,693,973, Cl. 435-68.000.

Buller, Joseph S., to Santa Barbara Research Center. Thermal damper for infrared detector. 4,694,175, Cl. 250-352.000.

Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, to Toyota Jidosha Kabushiki Kaisha. Suspension controller. 4,693,494, Cl. 280-707.000.

Bundgaard, Hans; and Falch, Erik, to A/S GEA. Acyl- or acyloxymethyl-allopurinol prodrugs. 4,694,006, Cl. 514-258.000.

Buras, Sharon Y. Conduit system for directly administering topical anaesthesia to blocked laryngeal-tracheal areas. 4,693,243, Cl. 128-207.150.

Burghard, Andre: *See*—
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Burgio, Antonio, to Fiat Auto S.P.A. Internal combustion engine with direct fuel injection. 4,693,219, Cl. 123-276.000.

Burgoyne, William F.: *See*—
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Burk, Jeffrey L.; Bottas, Michael J.; Pielemeier, John W.; and Mueller, Dale E., to Whirlpool Corporation. Clothes mover agitator for automatic washer. 4,693,095, Cl. 68-134.000.

Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, to Mountain Computer, Inc. Diskette transport. 4,693,659, Cl. 414-131.000.

Burlington Industries, Inc.: *See*—
Morrison, Elbert F., 4,693,071, Cl. 57-289.000.

Burnett, Sibley C.; Purcell, John R.; and Horner, M. Harlan, to GA Technologies Inc. Magnet system and method of its manufacture. 4,694,269, Cl. 335-216.000.

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Bommer, Jerry C.; and Burnham, Bruce F., 4,693,885, Cl. 424-2.000.

Burnham, Robert D.; Paoli, Thomas L.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Hybrid gain/index guided semiconductor lasers and array lasers. 4,694,459, Cl. 372-45.000.

Burns, Robert A.; and VanWyk, Jan W., to Boeing Company, The. Low friction, low wear coating and paint for rubber. 4,694,038, Cl. 524-590.000.

Burroughs Wellcome: *See*—
Campbell, David A., 4,693,893, Cl. 424-89.000.

Burrows, James L., to Sanders Associates, Inc. Simulation apparatus and method. 4,694,411, Cl. 364-578.000.

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Buschmeier, Dieter, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Gearlike, abrasive precision working tool, a method for dressing of such a tool and a dressing tool for dressing the tool. 4,693,231, Cl. 125-116.00D.

Butler, Jerry F.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

Butler Newall Machine Tool Company Limited: *See*—
Shackleton, Raymond T., 4,693,147, Cl. 82-40.00A.

Buxton, Clifford A.; Higgins, David C.; and Volesky, Gary A., to Square D. Company. Drive mechanism for drawout high amperage multi-pole circuit breaker. 4,693,132, Cl. 74-425.000.

Buyofsky, Conrad C.; and Kennette, John W., to Chicopee. Light weight entangled non-woven fabric having excellent machine direction and cross direction strength and process for making the same. 4,693,922, Cl. 428-134.000.

Buysch, Hans-Josef: *See*—
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Buzzi, Riccardo, to Matalplast S.r.l. Mechanism for actuating the hook and claw and for stitch setting in portable sewing machine. 4,693,194, Cl. 112-199.000.

C. R. Bard, Inc.: *See*—
Franko, Zenon Z., 4,693,719, Cl. 623-11.000.

C. Van der Lely N.V.: *See*—
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Caflisch, Jerry A.; and Ockuly, John D., to Pako Corporation. Photosensitive sheet dryer. 4,693,014, Cl. 34-23.000.

Caldwell, James M.: *See*—
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Calgon Corporation: *See*—
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California Institute of Technology: *See*—
Bejczy, Antal K.; and Primus, Howard C., 4,694,153, Cl. 250-202.000.

Callahan, David T.; and Dobyns, David W., to Allen-Morrison, Inc. Changeable message outdoor advertising sign. 4,693,026, Cl. 40-576.000.

Calviello, Joseph A., to Eaton Corporation. Method for fabricating MOMOM tunnel emission transistor. 4,692,997, Cl. 437-238.000.

Camacho Salvador L., to Plasma Energy Corporation. Plasma arc heating apparatus and method. 4,694,464, Cl. 373-22.000.

Cameron, Allan, Sr. Apparatus for conducting hot gases from an exhaust pipe. 4,693,421, Cl. 239-129.000.

Cameron Iron Works, Inc.: *See*—
Pettus, Ronald G.; and Schmitz, Thomas R., 4,693,497, Cl. 285-12.000.

Cameron, Larry: *See*—
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Camp, Ronnie W.: *See*—
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Campbell, Bonnie J.: *See*—
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Campbell, David A., to Burroughs Wellcome. Vaccines for equine influenza. 4,693,893, Cl. 424-89.000.

Campbell, David W.: *See*—
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Campbell, John, to Cosworth Research and Development Limited. Casting of metal articles. 4,693,292, Cl. 164-34.000.

Campbell, Leonard. Lubricating system for a weaving machine. 4,693,282, Cl. 139-1.00R.

Campolo, Steve, to Leviton Manufacturing Company, Inc. Thermal sensor for a lighting fixture. 4,694,223, Cl. 315-118.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Sewards, Alan, 4,694,297, Cl. 342-45.000.

Cane, Michael R., to BICC Public Limited Company. Pressure regulating devices. 4,693,540, Cl. 439-198.000.

Cannan, Terrance: *See*—
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Canon Denshi Kabushiki Kaisha: *See*—
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Hanagata, Takayoshi, 4,693,618, Cl. 400-120.000.
Hanamori, Ryoichi; Nakashima, Shigeo; and Yamamoto, Hiroshi, 4,693,580, Cl. 354-271.100.
Ikeda, Masami; Matsuda, Hiroto; Takahashi, Hiroto; and Shohji, Tatsumi, 4,694,306, Cl. 346-140.00R.
Ina, Kenzoh; Otani, Masatoshi; and Mishima, Kenichi, 4,694,352, Cl. 358-257.000.
Kawamura, Masaharu; and Hiramatsu, Akira, 4,693,582, Cl. 354-401.000.
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Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; Eguchi, Ken; and Nakagiri, Takashi, 4,693,915, Cl. 427-256.000.
Ohnuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, 4,693,574, Cl. 354-21.000.
Onoda, Ruri; Kuroki, Yoichi; and Nakamura, Gen, 4,694,186, Cl. 250-578.000.
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.
Shigenobu, Michio; and Saito, Takashi, 4,693,587, Cl. 355-3.0FU.
Shiomi, Yasuhiko; and Suzuki, Ryoichi, 4,693,597, Cl. 356-1.000.
Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.
Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, 4,694,307, Cl. 346-140.00R.
Toyama, Masamichi; and Kozuki, Susumu, 4,694,149, Cl. 250-201.000.
Tsunoi, Haruo, 4,693,548, Cl. 350-96.130.

Cantwell, Robert H., to Raytheon Company. Method and apparatus for determining the magnitude of a square root of a sum of squared value using vernier addressing. 4,694,417, Cl. 364-752.000.

Capasso, Federico; and Tsang, Won-Tien, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Sawtooth photodetector. 4,694,318, Cl. 357-30.000.

Card, Joseph L.; and Card, Roy T. Knife holder for tufting machine. 4,693,191, Cl. 112-80.600.

Card, Roy T.: *See*—
Card, Joseph L.; and Card, Roy T., 4,693,191, Cl. 112-80.600.

Cardinal Biological, Ltd.: *See*—
Hullah, William, 4,693,901, Cl. 426-330.600.

Carickhoff, Richard C.; Hemdal, Hakan O.; and Schultz, Alvin L., to Laser Magnetic Storage International Company. Data tracking clock recovery system having media speed variation compensation. 4,694,259, Cl. 331-1.00A.

Carl Hamel Spinn-& Zwirnmaschine AG: *See*—
Imhof, Christian; and Kempf, Gerhard, 4,693,069, Cl. 57-59.000.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
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Carl-Zeiss-Stiftung: *See*—
Schwarz, Jurgen, 4,694,290, Cl. 340-815.210.

Carlqvist, Stig G., to Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag. Method for supplying heat to an engine for external heat supply by intermittent combustion, and engine for carrying out the method. 4,693,082, Cl. 60-517.000.

Carlson, Lee G.: *See*—
Terrien, Conrad; and Carlson, Lee G., 4,693,818, Cl. 210-189.000.

Carnes, Gerald L.: *See*—
Shanks, Ernest R.; and Carnes, Gerald L., 4,693,340, Cl. 187-52.00R.

Carnes, Robert E.: *See*—
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Carpenter, Clayton A.: *See*—
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Carpenter Technology Corporation: *See*—
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Carrier Corporation: *See*—
O'Mara, Raymond D.; and Shapiro, Ian M., 4,693,091, Cl. 62-272.000.

Carroll, David L.: *See*—
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Carroll, Davis L.: *See*—
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

Carroll, Michael W.; and Harwood, Michael E., to North American Agricultural, Inc. Method and apparatus for forming an arcuate sheet metal seam. 4,692,980, Cl. 29-243.520.

Carson, David M.; and Weyant, Oakley L., Jr., to Du Pont de Nemours, E. I., and Company. Rotor having frangible projections thereon. 4,693,702, Cl. 494-61.000.

Carter, Walter H.; and Srivastava, Vinai K., to Millmaster Onyx Group, Inc. Enzymatically-treated guar gums. 4,693,982, Cl. 435-274.000.

Carvalho, Paul A., to United Technologies Corporation. Two level oil dam. 4,693,672, Cl. 416-174.000.

Casco Products Corporation: *See*—
Lupoli, Peter J.; and Mattis, Donald J., 4,694,128, Cl. 200-84.00R.

Casey, Frank; and Downing, Paul A., to General Engineering Radcliffe Limited. Vacuum coating apparatus. 4,693,803, Cl. 204-298.000.

Caskey, Kenneth D., to Halliburton Company. Wireline set/tubing retrievable bridge plug. 4,693,309, Cl. 166-123.000.

Caster, Wayne L., to Caster, Wayne L. Art production method utilizing cast coated paper for preparation of camera-ready art. 4,693,768, Cl. 156-62.000.

Cavedo, Robert P., to Singer Company, The. Depth of cut adjusting mechanism. 4,693,648, Cl. 409-178.000.

Cedar, Larry. Aerobic exercise device. 4,693,469, Cl. 272-74.000.

Celanese Corporation: *See*—
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DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.
Foley, Paul, 4,693,914, Cl. 427-255.000.
Gupta, Balaram B. G., 4,694,111, Cl. 568-662.000.
Sansone, Michael J., 4,693,824, Cl. 210-500.280.
Trouw, Norman S., 4,693,825, Cl. 210-500.280.

Cembruch, Bronislan J.; and Werner, Walter M., to AMP Incorporated. Grounding connector. 4,693,688, Cl. 439-877.000.

Center Industries Corporation: *See*—
Bartholomew, Alan; Bauer, Harold; Berry, Loren E.; and Ediger, Glen, 4,693,406, Cl. 227-63.000.

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Hansel, Allen; Centofanti, Ermand; and Natarajan, Thiagarajan, 4,694,194, Cl. 307-66.000.

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Cesna, Joseph V., to Speedfam Corporation. Measuring bar for free abrasive machines. 4,693,012, Cl. 33-533.000.

Cezanne, Gunter: *See*—
Roemer, Erich; Schopf, Eckhart; and Cezanne, Gunter, 4,693,617, Cl. 384-282.000.

Cgee Alsthom: *See*—
Heng, Jean-Paul; Marmonier, Andre ; Ruiz, Ariel; and Guernet, Henri, 4,693,542, Cl. 439-626.000.

Chabbal, Jean J., to Thomson-CSF. Multilinear charge transfer array and analysis process. 4,694,316, Cl. 357-24.000.

Chabner, Bruce A.: *See*—
Allegra, Carmen; Drake, James C.; Chabner, Bruce A.; Masur, Henry; and Kovacs, Joseph A., 4,694,007, Cl. 514-260.000.

Chadwick, P. N. R.: *See*—
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Chakrabarti, Paritosh M.: *See*—
Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., 4,693,894, Cl. 424-150.000.

Chambersburg Engineering Company: *See*—
Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., 4,693,101, Cl. 72-20.000.

Chan, C. S.; and Hay, Robert R., to Hewlett-Packard Company. Barrier layer and orifice plate for thermal ink jet printhead assembly. 4,694,308, Cl. 346-140.00R.

Chan, Hugo W. K.: *See*—
Cheung, Robin W.; and Chan, Hugo W. K., 4,693,925, Cl. 428-189.000.

Chan, Wan-kit: *See*—
Loev, Bernard; Chan, Wan-kit; and Jones, Howard, 4,694,023, Cl. 514-359.000.

Chang, Hong-Tsuan. Automatic container-filling apparatus. 4,693,285, Cl. 141-71.000.

Chang, Shih-Jeh; Emery, Richard T.; Hakim, Shafik J.; and Sand, Douglas S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Controlling multi-fort hunt groups in a distributed control switching system. 4,694,487, Cl. 379-269.000.

Chao, Paul, to Cotek Company. Non-glaze coating for a cathode ray tube. 4,694,218, Cl. 313-478.000.

Chappel, Raymond M.: *See*—
Bremer, Roger E.; Anthony, Charles, Jr.; and Chappel, Raymond M., 4,693,711, Cl. 604-306.000.

Chappell, Gilmore H. Derailleur shifter. 4,693,700, Cl. 474-80.000.

Charbonneau, Arthur G.: *See*—
McNennamy, John A.; Nafziger, Steven; Charbonneau, Arthur G.; and Godfrey, Dwaine A., 4,693,113, Cl. 73-168.000.

Charbonneau and Godfrey Associates: *See*—
McNennamy, John A.; Nafziger, Steven; Charbonneau, Arthur G.; and Godfrey, Dwaine A., 4,693,113, Cl. 73-168.000.

Chatham, Dale: *See*—
Ballard, Jerry L.; Chatham, Dale; and Gaulke, Gerald E., 4,694,392, Cl. 364-200.000.

Chayka, Stanley J.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,694,329, Cl. 358-22.000.

Chedid, Louis: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Cheever, Charles J.: *See*—
Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, 4,694,213, Cl. 310-90.000.

Chemicals Inspection & Testing Institute: *See*—
Takabata, Yasuyo; and Miyagawa, Ryuji, 4,694,092, Cl. 556-400.000.

Chen, Allen G.: *See*—
Lenz, Herman N.; and Chen, Allen G., 4,693,667, Cl. 415-115.000.

Chen, Richard J., to Polaroid Corporation. Camera for producing fully mounted transparencies. 4,693,576, Cl. 354-86.000.

Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, to Commissariat A L'Energie Atomique. Active matrix display screen without intersection of the addressing columns and rowscu4,694,283,a, Cl. 340-719.000.

Cheng, Fred T., to National Semiconductor Corporation. Nonsynchronous independent side band AM stereo decodercu4,694,501, Cl. 381-15.000.

Cheng, Peter S. C. Ascending and descending balloon action toycu4,693,695, Cl. 446-220.000.

Cheo, Peter K., to United Technologies Corporation. Optically buffered waveguide modulatorcu4,693,549, Cl. 350-96.140.

Cheung, Edward H., to Innings Telecom Inc. Computerized system for routing incoming telephone calls to a plurality of agent positioncu4,694,483, Cl. 379-34.000.

Cheung, Robin W.; and Chan, Hugo W. K., to Advanced Micro Devices, Inc. Integrated circuit structure having intermediate metal silicide layercu4,693,925, Cl. 428-189.000.

Chevron Research Company: *See*—
Sie, Swan A., 4,694,162, Cl. 250-231.00R.

Chiang, John S. C., to FMC Corporation. Process for manufacturing hydrogen peroxide electrolyticallycu4,693,794, Cl. 204-84.000.

Chiaves, Carlo, to Tensiter S.p.A. Prefabricated support and covering structure, particularly for constructing tunnels, bridges and the likecu4,693,634, Cl. 405-126.000.

Chicopee: *See*—
Buyofsky, Conrad C.; and Kennette, John W., 4,693,922, Cl. 428-134.000.

Chida, Takeshi: *See*—
Maeda, Akio; Chida, Takeshi; and Seya, Hirokatsu, 4,694,067, Cl. 528-393.000.

Chien, James C. W.: *See*—
Archer, Ronald D.; Hardiman, Christopher J.; Grybos, Ryszard; and Chien, James C. W., 4,693,957, Cl. 430-269.000.

Chiua, Leland J., to G. D. Serale & Co. Substituted 1,5-diphenyl-2-pyrrolepropionic acids and derivativescu4,694,018, Cl. 514-427.000.

Chirchirillo, Michael T.; and Cannan, Terrance, to Velsicol Chemical Corporation. Bird repellent compositionscu4,693,889, Cl. 424-83.000.

Chmelir, Miroslav; Dahmen, Kurt; Hoffman, Georg; and Werner, Georg. Absorbents for blood and serous body fluidscu4,693,713, Cl. 604-368.000.

Choay, Jean: *See*—
Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, 4,693,998, Cl. 514-62.000.

Choe, Eui W., to Celanese Corporation. Thermoplastic polymers containing repeating hydrazide groupscu4,694,048, Cl. 525-376.000.

Choiniere, Alcide W.; and Dunn, George T., Jr., to Automation Industries, Inc. Current-carrying flexible hosecu4,693,324, Cl. 174-47.000.

Choma, Michael A., to Ford Motor Company. EGR control systemcu4,693,226, Cl. 123-568.000.

CHR Industries, Inc.: *See*—
Agarwal, Arun K.; and Balian, Charles, 4,693,920, Cl. 428-40.000.

Christenson, Roger M.: *See*—
Piccirilli, Robert M.; Christenson, Roger M.; Falk, Frederick A.; and Makhlouf, Joseph M., 4,693,846, Cl. 260-97.000.

Christopher, Todd J., to RCA Corporation. Digital delay interpolation filter with amplitude and phase compensationcu4,694,414, Cl. 364-724.000.

Chu, Yung-Feng; and Vartuli, James C., to Mobil Oil Corporation. Process for isomerizing alkyl aromatic hydrocarbons utilizing ZSM-23 zeolite and a hydrogenation/dehydrogenation metalcu4,694,114, Cl. 585-481.000.

Chuio, Yoshiki; Kayasuna, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved response characteristicscu4,693,076, Cl. 60-274.000.

Churvis, Michael A.: *See*—
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., 4,693,413, Cl. 229-48.00R.

Ciba-Geigy Corporation: *See*—
Bauer, Sigrid, 4,693,961, Cl. 430-325.000.
Beriger Ernst, 4,694,014, Cl. 514-363.000.
Bowles, James B.; White, Marshall, Jr.; Puentener, Alois; Adam, Jean-Marie; and Loew, Peter, 4,693,727, Cl. 8-549.000.
Brunner, Hans-Georg, 4,693,745, Cl. 71-94.000.
Durr, Dieter, 4,694,105, Cl. 564-430.000.
Hubele, Adolf; Zondler, Helmut; Riebli, Peter; and Eckhardt, Wolfgang, 4,694,009, Cl. 514-269.000.

Langley, Robert; Stewart, John D.; and Walls, Arthur S., 4,694,078, Cl. 540-141.000.
Lehmann, Hans; and Zahir, Abdul-Cader, 4,694,096, Cl. 558-251.000.
Meyer, Willy; and Fory, Werner, 4,693,741, Cl. 71-92.000.
Pfeifer, Josef, 4,694,061, Cl. 528-125.000.

Citizen Watch Co. Ltd.: *See*—
Ito, Katsu, 4,694,347, Cl. 358-236.000.
Kasuya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, 4,694,348, Cl. 358-236.000.
Murata, Mitsuhiro, 4,694,410, Cl. 364-558.000.

Class OHG: *See*—
Freye, Theodor; and Heidjann, Franz, 4,693,259, Cl. 130-27.00R.

Clairan International: *See*—
Muth, William, 4,693,380, Cl. 211-35.000.

Clare, Kenneth; and Gibson, William, to Kelco International Limited. Hydrocolloid blend for controlled release of calcium ionscu4,693,728, Cl. 8-561.000.

Clarion Co., Ltd.: *See*—
Tazaki, Setoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, 4,694,500, Cl. 381-10.000.

Clark, Bill W., to Seaboard Wellhead Control, Inc. Electric fod-thru connector assemblycu4,693,534, Cl. 439-276.000.

Clark, Marion D.; and Anderson, C. Lawrence. Schottky barrier charge coupled device (CCD) manufacturecu4,692,993, Cl. 437-53.000.

Claydon, Glenn S.: *See*—
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.

Clerc, Jean-Frederic: *See*—
Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, 4,694,283,a, Cl. 340-719.000.

Clerc, Michel, to Cycles Peugeot. Exhaust muffler for a motor vehicle or the likecu4,693,338, Cl. 181-231.000.

Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, to Cycles Peugeot. Telescopic sub-assembly for a steering columncu4,693,136, Cl. 74-492.000.

Cleveland, Dixon: *See*—
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.

Cleveland, Richard S.: *See*—
Connor, Mark J.; Reinemuth, George H.; and Cleveland, Richard S., 4,693,109, Cl. 72-456.000.

Clifford, Peter P.: *See*—
Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., 4,694,190, Cl. 290-52.000.

Clover, William M., Jr., to Orthomedics, Inc. Orthoiscu4,693,239, Cl. 128-80.00F.

Clyne, Carl W.: *See*—
Richmond, Donald W.; Clyne, Carl W.; and Holben, Tod M., 4,693,902, Cl. 426-407.000.

Codman & Shurtleff, Inc.: *See*—
Mickiewicz, Stanley P.; and Coombes, Alan, 4,693,254, Cl. 128-421.000.

Coemar S.p.A.: *See*—
Dedoro, Bruno, 4,694,381, Cl. 362-307.000.

Cohen, Donald K.; and Yardy, Raymond, to International Business Machines Corp. Optical signal recorders employing two lasers and methods thereforcu4,694,447, Cl. 369-110.000.

Colberg, Horst; and Hahn, Erwin, to BASF Aktiengesellschaft. Biazo compounds containing anthranilic acid and thiazole moietiescu4,694,075, Cl. 534-604.000.

Cole, Berton A.: *See*—
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., 4,693,926, Cl. 428-204.000.

Colgate-Palmolive Company: *See*—
Tavss, Edward A.; Santalucia, John; and Carroll, David L., 4,693,395, Cl. 222-107.000.
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

Colleran, Stephen A.; and Lenz, William R., to Molex Incorporated. Modular staggered multi-row electrical connectorcu4,693,532, Cl. 439-594.000.

Colleran, Stephen A.; and Doles, Connie, to Molex Incorporated. Insulation displacement terminalcu4,693,536, Cl. 439-404.000.

Collins, Henry R., Jr. Self-cleaning filter systemcu4,693,815, Cl. 210-107.000.

Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., to Miles Laboratories, Inc. Vaccine for *Pseudomonas aeruginosa*cu4,693,891, Cl. 424-92.000.

Collomb, Jean: *See*—
Rhenter, Jean L.; and Collomb, Jean, 4,693,724, Cl. 623-23.000.

Colvin, Howard A.: *See*—
Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.

Combet, Roger: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.

Comess, Perry. Sports peckcu4,693,402, Cl. 224-215.000.

Cominco, Ltd.: *See*—
Warren, Ian H.; and Mok, Felix, 4,693,790, Cl. 204-1.00T.

Commarmot, Roger; Didenot, Dominique; and Gardais, Jean-Francois, to Societe Prolabo (Societe Anonyme). Mineralization apparatus for the individual, automatic, treatment of samples of products placed in recipientscu4,693,867, Cl. 422-64.000.

Commissariat a l'Energie Atomique: *See*—
Aubert, Gilles, 4,693,279, Cl. 138-108.000.
Chenevas-Paule, Andr' ; and Clerc, Jean-Frederic, 4,694,283,a, Cl. 340-719.000.
Gabard, Jean-Jacques, 4,693,723, Cl. 623-19.000.
Latge, Christian, 4,693,088, Cl. 62-55.500.

Commonwealth of Australia, The: *See*—
Robinson, David E., 4,693,120, Cl. 73-618.000.

Community of Jesus, Inc.: *See*—
Taylor, Cynthia L.; and Nash, Judith E. M., 4,693,289, Cl. 150-52.00R.

Computer X, Inc.: *See*—
Weisshaar, Bernhard P.; Kolnick, Frank C.; Kun, Andrew I.; and Mansfield, Bruce M., 4,694,396, Cl. 364-300.000.

Comstock, Todd M., to Grand Royalties, Ltd. Candle apparatuscu4,693,681, Cl. 431-324.000.

Conair Corporation: *See*—
Yau, Yuk M., 4,693,854, Cl. 261-84.000.

Concept Engineering and Design Corporation: *See*—
Hahn, Jerome S., 4,693,439, Cl. 248-37.600.

Concurrent Computer Corporation: *See*—
Hansel, Allen; Centofanti, Ermand; and Natarajan, Thiagarajan, 4,694,194, Cl. 307-66.000.

Conforto, Peter M.: *See*—
Olsen, Peter C., Jr.; Conforto, Peter M.; Wolf, David L.; and Hudson, Donald R., 4,693,055, Cl. 53-443.000.

Connor, Mark J.; Reinemuth, George H.; and Cleveland, Richard S., to Wickes Manufacturing Company. Self-aligning tool assembly for die shaping workpiececu4,693,109, Cl. 72-456.000.

Conoco Inc.: *See*—
Beck, Jeffrey L.; and Campbell, David W., 4,693,826, Cl. 210-512.100.
Royer, D. Jack, 4,693,321, Cl. 137-13.000.

Constable, Douglas W., to Eastman Kodak Company. Black and white level adjustment and normalization circuit for a color video printercu4,694,355, Cl. 358-332.000.

Constable, Douglas W., to Eastman Kodak Company. Modification of color component video signals to compensate for decreasing white sensitivity of photographic elementscu4,694,356, Cl. 358-332.000.

Continental Can Company, Inc.: *See*—
Hekal, Ihab M., 4,693,390, Cl. 220-359.000.
Roth, Donald J., 4,693,391, Cl. 220-359.000.

Continental Laser Corporation: *See*—
Jones, Ronald E.; and Peterson, Royal D., 4,694,462, Cl. 372-61.000.

Contreras, Joseph P., Sr. Hinge, and boss assembly for closure membercu4,693,392, Cl. 220-343.000.

Control Data Corporation: *See*—
Harte, Kenneth J., 4,694,178, Cl. 250-396.00R.

Conway, Gerald A. Pad holder and displaycu4,693,441, Cl. 248-225.100.

Conway, Tim D., to Sunkist Growers Inc. Method and apparatus for optically measuring the volume of generally spherical fruitcu4,693,607, Cl. 356-380.000.

Cook, Incorporated: *See*—
Coons, Harold G., 4,693,250, Cl. 128-345.000.

Cook, Jerry A.: *See*—
Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., 4,693,427, Cl. 241-23.000.

Cook Paint and Varnish Company: *See*—
Land, John M., 4,694,029, Cl. 522-8.000.

Coombes, Alan: *See*—
Mickiewicz, Stanley P.; and Coombes, Alan, 4,693,254, Cl. 128-421.000.

Coons, Harold G., to Cook, Incorporated. Method for dilating puncture site in the renal pelviscu4,693,250, Cl. 128-345.000.

Cooper Industries, Inc.: *See*—
Visser, Leonard J., 4,694,122, Cl. 174-106.00R.

Cooper, Randy G. Steering knuckle and spindle assemblycu4,693,487, Cl. 280-96.100.

Copal Company Limited: *See*—
Nakamori, Masao; and Ichinose, Harunobu, 4,694,363, Cl. 360-99.000.

Cordes, Werner, to Aristo Graphic SySteme GmbH & Co. KG. Sensor magnifying glass apparatuscu4,693,554, Cl. 350-244.000.

Corella, Arthur P. Package, instrumentation, system and method for packaging flaccid items, filaments and the likecu4,693,365, Cl. 206-63.300.

Cork, William H.: *See*—
Wirstrom, Peter; and Cork, William H., 4,694,492, Cl. 380-23.000.

Cormack, Robert J., to Ferranti, plc. Servo positioning systemcu4,694,229, Cl. 318-561.000.

Cormier, Ginette: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.

Cormier, Jacqueline: *See*—
Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre, 4,694,284, Cl. 340-574.000.

Cornell Research Foundation, Inc.: *See*—
Saxena, Brij B.; and Rathnam, Premila, 4,693,969, Cl. 435-7.000.

Corning Glass Works: *See*—
Danielson, Paul S., 4,693,987, Cl. 501-70.000.

Corporate Communications Consultants, Inc.: *See*—
Belmares-Sarabia, Armand; and Chayka, Stanley J., 4,694,329, Cl. 358-22.000.

Costantini, Giorgio, to Honeywell Information Systems Italia. Microprocessor system having a multiplexed address/data bus which communicates with a plurality of memory and input/output devices including TTL output gatescu4,694,394, Cl. 364-200.000.
Cosworth Research and Development Limited: *See*—
Campbell, John, 4,693,292, Cl. 164-34.000.
Cote, Richard J.: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.
Cotek Company: *See*—
Chao, Paul, 4,694,218, Cl. 313-478.000.
Cottman, Kirkwood S.: *See*—
Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.
Coulter Electronics, Inc.: *See*—
Mitchell, Gary A.; Jaffe, Gerald E.; and Solorzano, Marilyn M., 4,694,070, Cl. 530-329.000.
Cowan, Colin F. N.: *See*—
Adams, Peter F.; and Cowan, Colin F. N., 4,694,451, Cl. 370-32.100.
Cox, Karmen D., to Emerson Electric Co. Digital capacitance incremental encodercu4,694,275, Cl. 340-347.00P.
Crane, Stephen M.: *See*—
Breaholt, David L.; Crane, Stephen M.; Fischer, Paul M.; and Mattson, Kenneth V., 4,693,663, Cl. 414-735.000.
Crast, Leonard B., Jr., to Bristol-Myers Company. 3-propenyl cephalosporin solvatescu4,694,079, Cl. 540-215.000.
Crawford, Duffer B.: *See*—
Tarakad, Ramanathan R.; and Crawford, Duffer B., 4,693,731, Cl. 55-72.000.
Crawford, Roger A.: *See*—
Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., 4,693,894, Cl. 424-150.000.
Creagan, Richard P.: *See*—
Wiesehahn, Gary P.; Creagan, Richard P.; Stevens, David R.; and Giles, Richard, 4,693,981, Cl. 435-238.000.
Creedon, Richard L., to GA Technologies Inc. Variable modulus filament wound pressure tubecu4,693,281, Cl. 138-174.000.
Crinos Industria Farmacobiologica S.p.A.: *See*—
Prino, Giuseppe; Mantovani, Marisa; and Niada, Riccardo, 4,693,995, Cl. 514-44.000.
Croce, Carlo M.: *See*—
Kozbor, Danuta; and Croce, Carlo M., 4,693,975, Cl. 435-172.200.
Crompton & Knowles Corporation: *See*—
Den Boer, Patrick; and Heinze, Richard F., 4,693,751, Cl. 106-209.000.
Cross, Dan A., to Boeing Company, The. Connector block for use with a robotic wire harness assembly systemcu4,692,974, Cl. 29-33.00M.
Cross, Michael A.; and Nichols, Edward W., to Westinghouse Electric Corp. Optical beam analyzercu4,693,600, Cl. 356-121.000.
Cross, Richard A., to Rockwell International Corporation. Frequency modulation monitor circuit and methodcu4,694,263, Cl. 332-20.000.
Croteau, Francis R., to Baird Corporation. Digital image frame processorcu4,694,398, Cl. 364-414.000.
Crout, Charles J.; Frame, Charles W.; and Harris, Ronald N., to Chambersburg Engineering Company. Adaptive, self-regulating forging hammer control methodcu4,693,101, Cl. 72-20.000.
Crowell Corporation, The: *See*—
Raszewski. Lewis R., 4,693,056, Cl. 53-450.000.
Crowell, Jonathan C.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., 4,693,778, Cl. 156-361.000.
Crown International, Inc.: *See*—
Bartlett, Bruce, 4,694,499, Cl. 381-155.000.
Cuddihy, James W.: *See*—
Harvey, John C.; and Cuddihy, James W., 4,694,490, Cl. 180-20.000.
Culkin, Joseph B., to Dorr-Oliver Incorporated. Electrically augmented vacuum filtration apparatus for producing a dialyzed cake productcu4,693,802, Cl. 204-182.400.
Cullum, Dennis F., to Eastman Kodak Company. Apparatus useful in channel equalization adjustmentcu4,694,468, Cl. 375-10.000.
Cummins Allison Corporation: *See*—
Raterman, Donald E.; and Amburn, James M., 4,693,428, Cl. 241-167.000.
Cunningham, Arthur L. Beam form and slab form adjustment structurecu4,693,449, Cl. 249-210.000.
Cunningham, James L.; and Campbell, Bonnie J., to Wolverine Tube, Inc. Method for making heat exchange tubescu4,692,978, Cl. 29-157.30A.
Curtis, Donald D., to United States of America, Navy. Control of processibility by particle size in high energy solid propellantscu4,693,764, Cl. 149-19.400.
Curtiss, Walter W.; and Lyach, John E., to Goodyear & Rubber Company, The. Bias ply snow tire compatible with radial ply tirescu4,693,290, Cl. 152-450.000.
Cuthbert, Victor W.; and Saider, Joel M., to Whirlpool Corporation. Method of constructing a cabinet for an automatic washercu4,692,987, Cl. 29-455.00R.
Cycles Peugeot: *See*—
Clerc, Michel, 4,693,338, Cl. 181-231.000.
Clerc, Michel M.; Mouhot, Frederic M.; and Barnabe, Jean-Pierre, 4,693,136, Cl. 74-492.000.
Cykman, Josef. Locking arrangement for the gearshift stick of vehiclescu4,693,099, Cl. 70-247.000.
D. L. West Manufacturing, Inc.: *See*—
Drain, James M., 4,693,443, Cl. 248-447.100.
Dab-O-Matic Corp.: *See*—
Schwartzman, Gilbert, 4,693,623, Cl. 401-206.000.
Dabelstein, Klaus; and Skrobol, Christian, to Erwin Sick GmbH Optik-Elektronik. Light scanning device for determining the condition of a surface with a light concentratorcu4,693,601, Cl. 356-237.000.
Dadley, David A.; and Haskins, Peter J., to Royal Ordnance plc. Linear cutting chargecu4,693,181, Cl. 102-307.000.
Dahlback, Carl M. O.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.
Dahmen, Kurt: *See*—
Chmelir, Miroslav; Dahmen, Kurt; Hoffman, Georg; and Werner, Georg, 4,693,713, Cl. 604-368.000.
Daigle, Clement; and Gonthier, Emile, to Les Industries Fortier Ltee. Molded elastomeric circular gasketcu4,693,482, Cl. 277-207.00A.
Daigne, Bernard: *See*—
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Daiichi Koshuha Kogyo Kabushiki Kaisha: *See*—
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Daikuzono, Norio, to Surgical Laser Technologies, Inc. Medical and surgical laser probe Icu4,693,244, Cl. 128-303.100.
Daimler-Benz Aktiengesellschaft: *See*—
Arold, Klaus; Koukal, Heinz; Grimm, Hermann, deceased; and Trube, Hans, 4,693,417, Cl. 237-12.30B.
Baehrle, Friedrich; Wulf, Helmut; and Kreeb, Helmut, 4,693,301, Cl. 165-45.000.
Sumser, Siegfried, 4,693,085, Cl. 60-611.000.
Dainihon Jochugiku Co., Ltd.: *See*—
Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, 4,693,868, Cl. 422-124.000.
Dainippon Pharmaceutical Co., Ltd.: *See*—
Kitagawa, Tsunehiro, 4,693,968, Cl. 435-7.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Ogami, Nobutoshi; and Kitagawa, Masaru, 4,693,211, Cl. 118-725.000.
Sakai, Takamasa, 4,693,208, Cl. 118-724.000.
Daiwa Seiko Inc.: *See*—
Yamamoto, Shigeru; and Akiba, Masaru, 4,693,029, Cl. 43-22.000.
Dall'Oso, Gastone, to G.D. Societa per Azioni. Device for feeding cigarettes to the wrapping line of a packeting machinecu4,693,374, Cl. 209-535.000.
Dall'Oso, Gastone: *See*—
Mattei, Riccardo; and Dall'Oso, Gastone, 4,693,359, Cl. 198-474.100.
Danielson, Paul S., to Corning Glass Works. Molybdenum sealing glasseacu4,693,987, Cl. 501-70.000.
Darling, Dale H., to United States of America, Energy. Foam shell cryogenic ICF targetcu4,693,938, Cl. 428-403.000.
Datron Systems, Inc.: *See*—
Bruinsma, Robert F., 4,693,629, Cl. 403-170.000.
Datwyler, Max, to MDC Max Datwyler Bleienbach AG. System for electrolytical treatment of printing cylinderscu4,693,792, Cl. 204-25.000.
Daubendiek, Richard L.; House, Gary L.; and Gersey, Timothy R., to Eastman Kodak Company. Multicolor photographic element with a tabular grain emulsion layer overlying a minus blue recording emulsion layercu4,693,964, Cl. 430-505.000.
Davies, Alan F., to Davies Office Equipment, Ltd. Methods for forming visible file pocketscu4,693,773, Cl. 156-200.000.
Davies, Graham A.; and Mavituna, Ferda, to National Research Development Corporation. Reactor for cultivating biological material such as immobilized cellscu4,693,983, Cl. 435-284.000.
Davies Office Equipment, Ltd.: *See*—
Davies, Alan F., 4,693,773, Cl. 156-200.000.
Davis, Jeffrey L.; Evans, Daniel S.; and Hall, Lawrence P. Non-key locking cable lockcu4,693,098, Cl. 70-233.000.
Day, Gene F., to Precision Image Corporation. Self-seating toning shoe for electrostatic drum printercu4,693,206, Cl. 118-631.000.
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Dolan, John J.; and Dye, Charles, 4,692,967, Cl. 19-244.000.
deBin, Rene F., to FMC Corporation. Twin wicketing bag machinecu4,693,701, Cl. 493-204.000.
DeBruyn, William, to Amerock Corporation. Concealed self-closing hingecu4,692,964, Cl. 16-367.000.
de Carli, Elsa, Silvana Bianchi and Giovanni Bianchi, Legal Representatives: *See*—
Bianchi, Mario, deceased; and Barzaghi, Fernando, 4,694,019, Cl. 514-461.000.
DeCarlo, Frank S.; and Rosen, Frank L., to Allied Corporation. Gyrocompass navigation system for land vehiclecu4,693,114, Cl. 73-178.00R.
Dedoro, Bruno, to Coemar S.p.A. Light projector for movable optical effectscu4,694,381, Cl. 362-307.000.
Deeg, Helmut; and Imhof, Christian, to Sulzer Brothers Limited. Air outlet for room conditioning systemcu4,693,176, Cl. 98-40.120.
Deere & Company: *See*—
Gregerson, Stanley M., 4,693,699, Cl. 464-133.000.
Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, to Pall Corporation. Methods of concentrating ligands and active membranes used thereforcu4,693,985, Cl. 436-531.000.

DeHart, Arnold O.: *See*—
Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., 4,693,642, Cl. 408-59.000.
DeJaeger, Roger; Pagniez, Guy; and Potin, Philippe, to Societe Nationale Elf Aquitaine. Process for the preparation of linear polychlorophosphazenecu4,693,876, Cl. 423-300.000.
Dejneka, Tamara: *See*—
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Delaroche, Pierre; and Depondt, Paul. Double-glazed frame having an internal tubular blindcu4,694,144, Cl. 219-522.000.
DeLassus, Phillip; and Raich, William J., to Dow Chemical Company, The. Method for the preparation of a vinylidene chloride interpolymer filmcu4,694,068, Cl. 528-502.000.
Del Corso, Gregory J.; Carnes, Robert B.; and Esposito, David, to Carpenter Technology Corporation. Process and apparatus to simultaneously consolidate and reduce metal powdercu4,693,863, Cl. 419-13.000.
Deligny, Jean, to Societe des Cables du Mans. Mechanical control by cable with automatic adjustmentcu4,693,137, Cl. 74-501.50R.
Delnon, Hanspeter. Apparatus for orthoradial panoramic tomographycu4,694,478, Cl. 378-39.000.
Demarne, Henri: *See*—
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DeMars, Robert A. Bracket mounted towel drying cabinetcu4,694,146, Cl. 219-524.000.
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamstoff, James B.; and Buckley, Alan, to Celanese Corporation. Polyoxyalkylene polymers exhibiting nonlinear optical responsecu4,694,066, Cl. 528-373.000.
Demeyer, Pierre, to Merlin Gerin. Circuit breaker with digital solid-state trip unit with optional functionscu4,694,373, Cl. 361-96.000.
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., to General Motors Corporation. Fuel vapor storage canister having tortuous vent passagecu4,693,393, Cl. 220-374.000.
Demmer, Walter H., to RCA Corporation. Digital phase locked loop stabilization circuitry including a secondary digital phase locked loop which may be locked at an indeterminate frequencycu4,694,326, Cl. 358-19.000.
Demmer, Walter H.; Harwood, Leopold A.; Patel, Chandrakant B.; and Balaban, Alvin R., to RCA Corporation. Digital phase locked loop stabilization circuitry using a secondary digital phase locked loopcu4,694,327, Cl. 358-19.000.
De Moura, David N.: *See*—
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Den Boer, Patrick; and Heinze, Richard F., to Crompton & Knowles Corporation. Titanium dioxide suspension for use in film coatingcu4,693,751, Cl. 106-209.000.
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Dennison, Saul: *See*—
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deNora, Oronzio, to Oronzio deNora Impianti Elettrochimici S.p.A. Method of generating halogen and electrolysis cellcu4,693,797, Cl. 204-128.000.
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Baker, Anna M., 4,693,504, Cl. 294-1.100.
Dervan, Andrew H.: *See*—
Kordomenos, Panagiotis I.; and Dervan, Andrew H., 4,694,051, Cl. 525-437.000.
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Chakrabarti, Paritosh M.; Desai, Sureshchandra G.; and Wood, Lindley S., Jr., 4,694,104, Cl. 564-285.000.
de Sartre, Jean, to Thomson-CSF. Chopped power supply control circuit with automatic start-upcu4,694,386, Cl. 363-49.000.
Design Corp.: *See*—
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Dettling, Hubert; Haag, Gottlob; Hagele, Karl-Heinz; Leonhard, Rolf; and Polach, Wilhelm, to Robert Bosch GmbH. Soot afterburner for motor-vehicle exhaust systemcu4,693,078, Cl. 60-295.000.
Deutsche ITT Industries GmbH: *See*—
Mehrgardt, Soenke, 4,694,325, Cl. 358-11.000.
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Schroeer, Bernhard, 4,694,495, Cl. 381-15.000.
Devanathan, Deva: *See*—
Scharnberg, Lorne C.; and Devanathan, Deva, 4,693,720, Cl. 623-11.000.
Devins, John C.; Dranchak, Matthew A.; and Rzad, Stefan J., to General Electric Company. Additives to prevent electrostatic charge buildup in fluids in high voltage systemscu4,694,375, Cl. 361-212.000.
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., to Eastman Kodak Company. Chelate ligands for low pressure hydroformylation catalyst and process employing samecu4,694,109, Cl. 568-454.000.
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Dewitz, Thomas S., to Shell Oil Company. Downflow fluidized catalytic cranking reactor process and apparatus with quick catalyst separation means in the bottom thereofcu4,693,808, Cl. 208-113.000.
DeYoe, Jay, to HIS, Inc. Float mattrescu4,693,691, Cl. 441-129.000.
Dhein, Rolf: *See*—
Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
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Dickinson, Ben Wade Oaks: *See*—
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Dickinson, Peter D.; and Luciano, Robert A. Amusement machinecu4,693,477, Cl. 273-143.00R.
Dickinson, Robert W.; Mackey, Charles S.; and Odgers, Irving L., to Dickinson, Ben Wade Oaks; and Dickinson, Robert W. Mechanically actuated whipstock assemblycu4,693,327, Cl. 175-61.000.
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Dickson, Wayne E., to Dickson Industries, Inc. Surface blasting apparatuscu4,693,041, Cl. 51-424.000.
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Diegel, Dieter; Plohn, Gerhard; and Schuh, Manfred, deceased (by Schuh, Gisela, Sabine Schuh, Michael Schuh, heirs), to Siemens Aktiengesellschaft. Apparatus for controlling a turbo generatorcu4,694,188, Cl. 290-40.00B.
Diehl GmbH & Co.: *See*—
Weber, Adolf; Strauss, Hans; and Bankel, Adolf, 4,693,180, Cl. 102-274.000.
Diekemper, Erwin; and Kastrup, Dieter, to MIDS Magnetische Informations-und Daten-Systeme GmbH. Access cardcu4,694,148, Cl. 235-468.000.
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Dieterich Standard Corporation: *See*—
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DiFrank, Frank J., to Owens-Illinois, Inc. Quick change fountaincu4,693,210, Cl. 118-259.000.
Dill, Hans G.: *See*—
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Dines, David R.; and Webb, Vertis C., to American Telephone and Telegraph, Company AT&T Technologies, Inc. Apparatus for bonding connector terminals to circuit boardcu4,693,408, Cl. 228-47.000.
Dingerdissen, John J.; Mehta, Rajanikant; Nisbet, Louis J.; Shearer, Marcia C.; and Wasserman, Gail F., to SmithKline Beckman Corporation. *Kibdelosporangium aridum* SK&F-AAD-609cu4,694,069, Cl. 530-317.000.
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Mori, Toshiyuki, 4,693,036, Cl. 51-131.300.
Divers, George A., III: *See*—
Bannick, Mark A.; Divers, George A., III; and Jansons, Viktors, 4,693,851, Cl. 260-544.00D.
Dixon, Dale D.; and Burgoyne, William F., to Air Products and Chemicals, Inc. Tertiary butyl derivatives of toluenediamine and mixtures as antioxidant for organic materialscu4,693,837, Cl. 252-50.000.
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Dobyns, David W.: *See*—
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Dr. h.c.F. Porsche Aktiengesellschaft: *See*—
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Ampferer, Herbert; and Groger, Klaus, 4,693,216, Cl. 123-195.00R.
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Dr. Ing. Rudolf Hell GmbH: *See*—
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Schulz-Hennig, Joerg; and Sievers, Horst, 4,694,152, Cl. 250-201.000.
Dodds, Diego E. F., to Oboler, Leonard. Heat exchanging apparatus for cooling and condensing by evaporationcu4,693,302, Cl. 165-46.000.
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Dolan, Frank, Sr.: *See—*
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Dolan, John J.; and Dye, Charles, to Dey International Corporation. Textile fiber drafting apron and methodcu4,692,967, Cl. 19-244.000.

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Doman, Herbert M., to Everest & Jennings, Inc. Current sharing circuitcu4,694,227, Cl. 318-80.000.

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Domenik, Stephen L.; Folmsbee, Alan C.; Nguyen, Tai; and Shirgley, David A., to Intel Corporation. Random number generator for use in an authenticated read-only memorycu4,694,412, Cl. 364-717.000.

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Dorsey, Michael L.: *See—*
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Dougher, Christine A.; and Rath, Mary L. Slatted sofa-bed constructioncu4,692,952, Cl. 5-37.00R.

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Fairchok, William J.; Friedrich, Ralph E.; Thill, Bruce P.; and McKinley, Mark J., 4,694,050, Cl. 525-411.000.
Park, Chung P., 4,694,025, Cl. 521-88.000.
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Park, Chung P., 4,694,027, Cl. 521-94.000.
Rubens, Louis C.; Alexander, Willard E.; and Raeck, Carl A., 4,693,856, Cl. 264-45.400.
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Dragerwerk Aktiengesellschaft: *See—*
Falb, Wolfgang; Ryschka, Martin; and Wallroth, Carl-Friedrich, 4,693,853, Cl. 261-39.100.

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Dranchak, Matthew A.: *See—*
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Dresen, William L.; Price, William F.; Emery, Phillip L.; Breezer, Harlan W.; and Holmes, Robert R., to Penda Corporation. Truck cargo bed liner with anti-slip surfacecu4,693,507, Cl. 296-39.00R.

Droske, Donald J.: *See—*
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.

Drott, Peter, to Alfred Teves GmbH. Disc brake for automotive vehiclecu4,693,341, Cl. 188-72.700.

DSM Resins B.V.: *See—*
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DSM Rim Nylon V.O.F.: *See—*
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Ducheyne, Paul. Porous flexible metal fiber material for surgical implantationcu4,693,721, Cl. 623-16.000.

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Du Pont de Nemours, E. I., and Company: *See—*
Carson, David M.; and Weyant, Oakley L., Jr., 4,693,702, Cl. 494-61.000.
Gale, David M., 4,693,749, Cl. 106-99.000.
Heinsohn, George E., 4,694,101, Cl. 560-352.000.
Janowicz, Andrew H., 4,694,054, Cl. 526-93.000.
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Dye, Charles: *See—*
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E.C.C. America Inc.: *See—*
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Ashcraft, Robert W., 4,693,959, Cl. 430-323.000.

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E. R. Squibb & Sons, Inc.: *See—*
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Constable, Douglas W., 4,694,356, Cl. 358-332.000.
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Klees, Kevin J., 4,694,342, Cl. 358-167.000.
Karpen, Vincent E., 4,693,592, Cl. 355-14.00E.
Weiss, Armin K., 4,694,185, Cl. 250-578.000.

Easton, Trevor A.; and Gainer, John A., to Dofasco Inc. Control systems for vehicle fluid suspension systemscu4,693,185, Cl. 105-199.200.

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ebm Elektrobau Mulfingen GmbH & Co.: *See—*
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Edwards, A. Glen; Wesson, David S.; and Brieger, Emmet F., to Halliburton Company. Method and apparatus for absorbing shockcu4,693,317, Cl. 166-378.000.

Edwards, Walter A.; and Huddleston, George R., Jr., to B. F. Goodrich Company, The. Property variation of dispersion resins by electrofiltrationcu4,693,800, Cl. 204-180.100.

Eggert, Ulrich, to Ford Motor Company. Control valve system for a continuously variable belt drivecu4,693,144, Cl. 74-868.000.

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Matsuda, Hiroshi; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; Eguchi, Ken; and Nakagiri, Takashi, 4,693,915, Cl. 427-256.000.

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Ehrfeld, Wolfgang: *See—*
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,693,791, Cl. 204-11.000.

Einhaus, Hermanus F., to U.S. Philips Corporation. Record player with a square, viscously damped pick-up arm lift rodcu4,694,449, Cl. 369-246.000.

Eisenbeis, Martin; Hemmer, Walter; and Krummenauer, Hans, to Hans Krummenauer GmbH & Co. KG. Cutter for gouging ore or rock from mine facescu4,693,517, Cl. 299-87.000.

Eisenblaetter, Norbert: *See—*
Wuensche, Dieter; and Eisenblaetter, Norbert, 4,693,079, Cl. 60-320.000.

Electric Power Research Institute, Inc.: *See—*
Lee, Robert A. S., 4,694,390, Cl. 364-165.000.

Elias, Samir F., to Owens-Corning Fiberglas Corporation. Coating grade asphaltcu4,693,752, Cl. 106-280.000.

Elliott, David J., to Phillips Petroleum Company. Synthesis of higher ketonescu4,694,108, Cl. 568-387.000.

Elliott, James O.; and Savage, Jack W., to General Motors Corporation. Brushless DC motor and sensorless drive arrangement therefor-cu4,694,210, Cl. 310-68.00R.

Elscint Ltd.: *See—*
Fenster, Paul; and Ganor, Zeev, 4,694,339, Cl. 358-148.000.

ELTECH Systems Corporation: *See—*
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Nikse, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.
Sane, Ajit Y., 4,693,989, Cl. 501-96.000.

ELXSI: *See—*
Massey, Edwin M., 4,694,123, Cl. 174-117.0FF.

Emerson Electric Co.: *See—*
Cox, Karmen D., 4,694,275, Cl. 340-347.00P.

Emery, Phillip L.: *See—*
Dresen, William L.; Price, William F.; Emery, Phillip L.; Breezer, Harlan W.; and Holmes, Robert R., 4,693,507, Cl. 296-39.00R.

Emery, Richard T.: *See—*
Chang, Shih-Jeh; Emery, Richard T.; Hakim, Shafik J.; and Sand, Douglas S., 4,694,487, Cl. 379-269.000.

Endo, Yukio: *See—*
Rollhaus, Philip E.; and Endo, Yukio, 4,694,280, Cl. 340-365.00R.

Energy Technology, Inc.: *See—*
Meith, Hugo C.; and McHugh, Stanley A., 4,693,233, Cl. 126-117.000.

Engdahl, Paul D. Earthquake displacement recordercu4,694,304, Cl. 346-7.000.

Engel, Alfred: *See—*
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Engelard Corporation: *See—*
Bartholic, David B.; and Barger, Dwight F., 4,693,809, Cl. 208-127.000.

Engelhardt, Dietmar; and Grecksch, Hans, to W. Schlafhorst & Co. Winding station of an automatic winding machinecu4,693,430, Cl. 242-18.00R.

Engelhardt, Edward L.; and Saari, Walfred S., to Merck & Co., Inc. Derivatives of 2-(substituted sulfamyl)-6-nitrobenzoic acids and pharmaceutical compositionscu4,694,020, Cl. 514-535.000.

Engler, Phillip V.: *See—*
Spadaro, Anthony M.; McLoughlin, Thomas J.; and Engler, Phillip V., 4,693,912, Cl. 427-213.300.

Ennis, James F., III, to Anderson, Mark L. Two compartment mixing syringecu4,693,706, Cl. 604-87.000.

Erath, Louis W., to Gas Alarm Service, Inc. Infrared gas detectorcu4,694,174, Cl. 250-345.000.

Erickson, Roy O., Jr., to Rexair, Inc. Vacuum cleaner constructioncu4,693,734, Cl. 55-248.000.

Ernst Leitz Wetzlar GmbH: *See—*
Bletz, Walter; and Magel, Rolf, 4,694,155, Cl. 250-214.00R.

Erwin Sick GmbH Optik-Elektronik: *See—*
Dabelstein, Klaus; and Skrobol, Christian, 4,693,601, Cl. 356-237.000.

Erzinger, Bradley F. Method and composition for removing asbestos-containing materialscu4,693,755, Cl. 134-4.000.

Eshleman, Edgar S.; Field, Martin J.; and Penwright, James L., to General Motors Corporation. Fuel injection valve connectioncu4,693,223, Cl. 123-468.000.

Eskam, Armin: *See—*
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, 4,693,434, Cl. 244-328.000.

Esposito, David: *See—*
Del Corso, Gregory J.; Carnes, Robert E.; and Esposito, David, 4,693,863, Cl. 419-13.000.

Essex Group, Inc.: *See—*
McGregor, Charles W.; and Sutto, Melody L., 4,693,936, Cl. 428-383.000.

Ethicon, Inc.: *See—*
Failla, Stephen J., 4,693,248, Cl. 128-334.00C.

Etoh, Hiroshi, to Oki Electric Industry Co., Ltd. Data communication system with block synchronization data in mobile radiocu4,694,473, Cl. 375-116.000.

Evans, Daniel S.: *See—*
Davis, Jeffrey L.; Evans, Daniel S.; and Hall, Lawrence P., 4,693,098, Cl. 70-233.000.

Evans, David M. A.: *See—*
Almond, Jeffrey W.; Minor, Phillip D.; Evans, David M. A.; and Schild, Geoffrey C., 4,694,071, Cl. 530-329.000.

Evans, Mervyn, to National Research Development Corporation. Orthopaedic fracture fixation apparatuscu4,693,240, Cl. 128-92.00Z.

Evans, Raymond D., Jr.: *See—*
Sulosky, William P.; and Evans, Raymond D., Jr., 4,693,518, Cl. 299-93.000.

Everest & Jennings, Inc.: *See—*
Doman, Herbert M., 4,694,227, Cl. 318-80.000.

Eversdijk, Aarnoud W. Case with hollow framecu4,693,346, Cl. 190-111.000.

Ewen, John F.; and Mosley, Joseph M., to International Business Machines Corporation. Integrated high gain voltage controlled oscillatorcu4,694,261, Cl. 331-57.000.

Ex-Cell-O Corporation: *See—*
Millay, Lawrence I., 4,692,990, Cl. 29-568.000.

Excelermatic Inc.: *See—*
Kraus, Charles E., 4,693,134, Cl. 74-690.000.

Exxon Chemical Patents Inc.: *See—*
Varma, Vijaya K.; Winans, Esther D.; O'Halloran, Rosemary; and Brewster, Phillip W., 4,693,838, Cl. 252-51.50R.

Exxon Production Research Company: *See—*
Sengupta, Mrinal K., 4,694,438, Cl. 367-70.000.

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Bock, Jan; Siano, Donald B.; and Turner, S. Richard, 4,694,046, Cl. 525-329.400.
Siano, Donald B.; and Bock, Jan, 4,694,058, Cl. 526-307.200.

Fabrica D'Armi P. Beretta S.p.A.: *See—*
Beretta, Pier G., 4,693,169, Cl. 89-129.020.

Fahl, Richard L., to Dover Corporation. Poppet valve assembly and method of making samecu4,693,268, Cl. 137-219.000.

Failla, Stephen J., to Ethicon, Inc. Two-piece tissue fastener with deformable retaining receivercu4,693,248, Cl. 128-334.00C.

Fairchok, William J.; Friedrich, Ralph E.; Thill, Bruce P.; and McKinley, Mark J., to Dow Chemical Company, The. Process for absorbing polar materials using transamidated poly-2-oxazoline compositionscu4,694,050, Cl. 525-411.000.

Falb, Wolfgang; Ryschka, Martin; and Wallroth, Carl-Friedrich, to Dragerwerk Aktiengesellschaft. Anesthetic vaporizercu4,693,853, Cl. 261-39.100.

Falch, Erik: *See—*
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Falk, Frederick A.: *See—*
Piccirilli, Robert M.; Christenson, Roger M.; Falk, Frederick A.; and Makhlouf, Joseph M., 4,693,846, Cl. 260-97.000.

Fanciullo, Martin: *See—*
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Fanuc Ltd: *See—*
Inaba, Yoshiharu, 4,693,676, Cl. 425-145.000.

Farha, Floyd E., Jr.: *See—*
Bjornson, Geir; Klendworth, Douglas D.; Gardner, Lloyd E.; and Farha, Floyd E., Jr., 4,693,991, Cl. 502-220.000.

Fast, Jacob. Product information tags with improved mounting arrangementscu4,693,024, Cl. 40-20.00R.

Fattom, Ali: *See—*
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Fauveau, Patrick: *See—*
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Feher, Istvan: *See—*
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Fehrle, Siegfried: *See—*
Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, 4,693,407, Cl. 227-109.000.

Feldman, Nancy A., to Betz Laboratories, Inc. Method of scavenging oxygen from aqueous mediumscu4,693,866, Cl. 422-13.000.

Felix, Arthur, Jr.: *See—*
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Fell, Stephen A.: *See—*
Eccles, Harry; and Fell, Stephen A., 4,693,795, Cl. 204-94.000.
Fenster, Paul; and Ganor, Zeev, to Elscint Ltd. Power line locked image processing systemscu4,694,339, Cl. 358-148.000.
Fenwick, Jay G., to Joyce International, Inc. Merchandising rackcu4,693,383, Cl. 211-192.000.
Fenzy S.A.: *See—*
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Ferguson, James L., to Manchester R & D Partnership. Liquid crystal motion picture projectorcu4,693,557, Cl. 350-331.00R.
Ferranti, plc: *See—*
Cormack, Robert J., 4,694,229, Cl. 318-561.000.
Ferraro, Frank A., to Warner Lambert Company. Pivotable razor cartridge with circular camcu4,693,003, Cl. 30-50.000.
Ferraro, Frank A.: *See—*
Motta, Vincent C.; and Ferraro, Frank A., 4,692,986, Cl. 29-451.000.
Ferreira-Godinho, Manuel. Folder for paper sheets, especially EDP paper sheetscu4,693,626, Cl. 402-73.000.
Ferris, James E. Air conditioner refrigerant check gauge insert convertible to a tire check gaugecu4,693,112, Cl. 73-146.800.
Ferrofluidics Corporation: *See—*
Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, 4,694,213, Cl. 310-90.000.
Fetters, G. David. Portable collapsible baby cribcu4,692,953, Cl. 5-99.000.
Fiat Auto S.P.A.: *See—*
Burgio, Antonio, 4,693,219, Cl. 123-276.000.
Titolo, Andrea, 4,693,214, Cl. 123-90.180.
Fibredyne, Inc.: *See—*
Matchett, Robert W., 4,693,823, Cl. 210-266.000.
FICHT GmbH: *See—*
Schindler, Manfred; and Vilsmeier, Walter, 4,693,492, Cl. 280-705.000.
Field, Martin J.: *See—*
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., 4,693,393, Cl. 220-374.000.
Eshleman, Edgar S.; Field, Martin J.; and Penwright, James L., 4,693,223, Cl. 123-468.000.
Fikentscher, Rolf: *See—*
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,693,848, Cl. 260-402.000.
Filippini, Gualtiero: *See—*
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Fiorucci, Elio, to Fiorucci S.p.A. Sewing seam, particularly for jean fabriccu4,693,195, Cl. 112-262.100.
Fiorucci S.p.A.: *See—*
Fiorucci, Elio, 4,693,195, Cl. 112-262.100.
Fischer Gesellschaft M.B.H.: *See—*
Stephan, Walter A.; and Knauseder, Josef, 4,693,140, Cl. 74-579.000.
Fischer, Paul M.: *See—*
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Fischer, Rolf: *See—*
Hoelderich, Wolfgang; Merger, Franz; Mross, Wolf D.; and Fischer, Rolf, 4,694,107, Cl. 568-310.000.
Fischer, Wolfgang; Klein, Gerhard; Hombach, Rudolph; and Kniege, Wilfried, to Bayer Aktiengesellschaft. Adhesives with a high level of adhesion on plastics materialscu4,694,043, Cl. 525-127.000.
Fisher, Donald L.: *See—*
Logadon, Terance B., Jr.; and Fisher, Donald L., 4,693,501, Cl. 285-173.000.
Fisher, Guenter: *See—*
Buechele, Juergen W.; and Fisher, Guenter, 4,693,288, Cl. 144-87.000.
fisher, Stephen A.: *See—*
Skarvan, Charles A.; and fisher, Stephen A., 4,693,077, Cl. 60-39.282.
Fleming, Donald K., to Institute of Gas Technology. Ammonia utilization processcu4,693,883, Cl. 423-648.00R.
Flessa, Steven A.: *See—*
Keen, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.
Flo-Con Systems, Inc.: *See—*
King, Patrick D., 4,693,296, Cl. 164-440.000.
Flora, Jay L., to Ampex Corporation. Digital effects device integrally combined within a video switchercu4,694,343, Cl. 358-183.000.
Flora, Jay L., to Ampex Corporation. Digital effects loop for video switcherscu4,694,344, Cl. 358-183.000.
Flowers, Peter T., to General Scanning, Inc. Capacitive position sensorcu4,694,235, Cl. 318-662.000.
Flowers, Ronald C., to Signetics Corporation. Method of controlling forward voltage across Schottky diodecu4,692,991, Cl. 437-175.000.
Floyd, David; and Atwal, Karnail, to E. R. Squibb & Sons, Inc. Benzothiazepine derivativescu4,694,002, Cl. 514-211.000.
Flynn, Charles J.: *See—*
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FMC Corporation: *See—*
Chiang, John S. C., 4,693,794, Cl. 204-84.000.
deBin, Rene F., 4,693,701, Cl. 493-204.000.
Wheatley, Thomas A.; and Shah, Rashminkumar S., 4,693,896, Cl. 424-480.000.
Foley, Paul, to Celanese Corporation. Curing of preceramic articles with gaseous thionyl chloridecu4,693,914, Cl. 427-255.000.
Folmsbee, Alan C.: *See—*
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Ford Motor Company: *See—*
Choma, Michael A., 4,693,226, Cl. 123-568.000.
Eggert, Ulrich, 4,693,144, Cl. 74-868.000.
Pierce, Stanley L., 4,693,129, Cl. 74-333.000.
Forte, Paulino; and Vidueira, Jose A., to Union Carbide Corporation. Process for the separation of hydrocarbons from a mixed feedstockcu4,693,810, Cl. 208-321.000.
Fory, Werner: *See—*
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Foss, Warren M., to Pall Corporation. Porous, fibrous structures with thermoplastic fluorocarbon coating and method of makingcu4,693,928, Cl. 428-236.000.
Fourth Dimension, Inc., The: *See—*
Hahn, Lawrence R., 4,694,141, Cl. 219-147.000.
Foxboro Company, The: *See—*
Nudd, Howard W., Jr.; and De Moura, David N., 4,693,121, Cl. 73-706.000.
Frahm, Carl E.; and Rokus, B. Joseph. Extendable-nestable dispensing apparatuscu4,693,400, Cl. 222-518.000.
Frame, Charles W.: *See—*
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Franchino, Domenico. Device for indicating abnormal pressure conditions in a tire on a motor vehicle in motioncu4,694,273, Cl. 340-58.000.
Frandsen, Jorgen, to Unisys Corp. Method of making a multi-coil/multi-magnet actuatorcu4,692,999, Cl. 29-596.000.
Franko, Zenon Z., to C. R. Bard, Inc. Mechanical penile prosthesiscu4,693,719, Cl. 623-11.000.
Fraser, Thomas A., Jr.; and Macfarlane, Andrew R., to Vetco Gray Inc. Pipelise pull-in method and apparatuscu4,693,636, Cl. 405-169.000.
Frederiksen, Jeffrey E. Video transmission systemcu4,694,489, Cl. 380-10.000.
Fremgen, Dieter: *See—*
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French Joint Stock Company "L'Oreal" The: *See—*
Goncalves, Antonin, 4,693,366, Cl. 206-222.000.
Freye, Theodor; and Heidjann, Franz, to Claas OHG. Self-propelled harvester thresbercu4,693,259, Cl. 130-27.00R.
Freysinet International (Stup): *See—*
Jartoux, Pierre, 4,693,044, Cl. 52-230.000.
Friedericha, Karl-Heinz; and Twiefel, Gunther, to Blohm & Voss AG. Large force multi-axis manipulating arm unit, especially for use as an industrial robotcu4,693,665, Cl. 414-744.00R.
Friedrich, Gerda; Rasch, Klaus-Dieter; and Schmidt, Wilfried, to Telefunken Electronic GmbH. Solar cellcu4,694,117, Cl. 136-256.000.
Friedrich, Ralph E.: *See—*
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Fritts, Robert W.: *See—*
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Fritz, Johannes H.; and Van de Leest, Renaat E., to U.S. Philips Corporation. Method of manufacturing a combination of synthetic resin elementscu4,693,769, Cl. 156-73.100.
Frode, Per E., to SAB Nife AB. Terminal connector for an electrochemical accumulator batterycu4,693,535, Cl. 439-277.000.
Frommes, T. Michael, to Precision Drilling, Inc. Vacuum-actuated top access test probe fixturecu4,694,245, Cl. 324-158.00F.
Froach, Hans, to SMS Schleomann-Siemag Aktiengesellschaft. Apparatus for axially shifting rolls in a roll standcu4,693,106, Cl. 72-247.000.
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Fuchs, Hans P.; and Goetz, Jurgen R., to Siemens Aktiengesellschaft. Integrable decoding circuitcu4,694,278, Cl. 340-347.0DD.
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Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.
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Ihama, Mikio; and Tani, Tadaaki, 4,693,965, Cl. 430-569.000.
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Matsuda, Shinichi; and Oosaka, Shigenori, 4,694,364, Cl. 360-99.000.
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Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,693,927, Cl. 428-216.000.
Noguchi, Masaru, 4,694,164, Cl. 250-234.000.

Ohgoda, Makoto; Tamura, Kaoru; and Kawai, Yasuhiro, 4,694,163, Cl. 250-234.000.
Ommori, Shozo; and Oishi, Kengo, 4,694,370, Cl. 360-133.000.
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Yamazaki, Seiichi; Uchiyama, Kaoru; and Tahara, Toshiro, 4,693,016, Cl. 34-52.000.
Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, 4,693,799, Cl. 204-165.000.
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Fujikura, Yoshiaki; Yamamuro, Akira; and Nakajima, Motoki, to KAO Corporation. Bornane-3-spiro-1'-cyclopentanes and perfume compositions comprising the samecu4,693,845, Cl. 512-9.000.
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Fujimoto, Masakazu; and Kogaito, Kikuo, to Ebara Corporation. System for controlling fluid flow in a tube of a heat exchangercu4,693,305, Cl. 165-95.000.
Fujimoto, Masashi; and Kato, Yoshihisa, to Toshiba Ceramics, Ltd. Tool for firing ceramicscu4,693,918, Cl. 428-35.000.
Fujino, Akihiko: *See—*
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Fujioka, Tadashi: *See—*
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Fujisawa Pharmaceutical Co., Ltd.: *See—*
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Fujishima, Kazuyasu: *See—*
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Fujita, Masafumi: *See—*
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Fujita, Yoshiji: *See—*
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Kaku, Takashi; and Arai, Yasuhiro, 4,694,469, Cl. 375-13.000.
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Fukai, Isamu; and Azami, Katsumasa, to Sanden Corporation. Cylinder head for refrigerant compressorcu4,693,674, Cl. 417-269.000.
Fuke, Takamichi, to Alps Electric Co., Ltd. Device for shifting carriagecu4,694,366, Cl. 360-106.000.
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Fulmer, Keith H., to Allied Corporation. Pressure-balanced seals for vented accumulatorscu4,693,276, Cl. 138-31.000.
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Miyahara, Tsuneo; Harada, Yoshihiro; Futakami, Katsuyuki; Nishida, Yasukuni; and Konishi, Ryoko, 4,693,888, Cl. 424-49.000.
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Akiba, Yutaka; Hirota, Kazuo; Kishiro, Nobuo; Futami, Toshio; and Hamamoto, Tatsuo, 4,694,423, Cl. 365-2.000.
Fuzimura, Yasuyuki, to Kankyo Company Limited. Air cleanercu4,693,733, Cl. 55-129.000.
G-A-T-M Corporation: *See—*
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G. D. Serale & Co.: *See—*
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Mattei, Riccardo; Gorrieri, Giordano; and Filippini, Gualtiero, 4,693,051, Cl. 53-148.000.
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G & F Precision, Inc.: *See—*
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Thelen, Werner, 4,693,860, Cl. 264-320.000.
GA Technologies Inc.: *See—*
Burnett, Sibley C.; Purcell, John R.; and Horner, M. Harlan, 4,694,269, Cl. 335-216.000.
Creedon, Richard L., 4,693,281, Cl. 138-174.000.
Gabard, Jean-Jacques, to Commissariat a l'Energie Atomique. Shoulder prosthesiscu4,693,723, Cl. 623-19.000.
Gaddis, Raymond W.: *See—*
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Gaiser, John A.: *See—*
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Gale, Stephen B.; and O'Donnell, Philip P., to Niagara Environmental Associates, Inc. Method of treating contaminant ions in an aqueous medium with electrolytically generated ferrous ions, and apparatus thereforcu4,693,798, Cl. 204-149.000.
Galen, Neal. Sorter for automotive glove compartmentscu4,693,382, Cl. 211-189.000.
Galli, Guido; Grillo, Alexander A.; and Lieberman, Barry R., to Magnesys. Combined nucleate-replicate single wall domain generate structurecu4,694,424, Cl. 365-12.000.
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Gandy, Russell E.: *See—*
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Garavuso, Gerald M., to Xerox Corporation. Platen transport and vacuum plenum for book copyingcu4,693,594, Cl. 355-25.000.
Garcia, Jaime A. Paint rollercu4,692,975, Cl. 29-120.000.
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Garzonetti, Gary A., to Zimpro Inc. Rise-rate control of pulsed-bed granular medium filterscu4,693,831, Cl. 210-744.000.
Gas Alarm Service, Inc.: *See—*
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Gauthier, George J.; and Miceli, John D., to Pfizer Inc. Dual catalyst sequential method for production of sorbitol from hydrolyzed starch solutioncu4,694,113, Cl. 568-863.000.
Gearhart, Dale A., to Gearhart Industries, Inc. Logging device having bimetallic insulating flaskcu4,694,166, Cl. 250-261.000.
Gearhart Industries, Inc.: *See—*
Gearhart, Dale A., 4,694,166, Cl. 250-261.000.
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Geller, Paul. Disposable aseptic sheath for dental handpiecescu4,693,871, Cl. 433-116.000.

Geloen, Roland A. E. Process and apparatus for preparing a filling material, particularly for an article giving body protectioncu4,693,917, Cl. 428-6.000.

Gemcor Engineering Corp.: *See*—
Andrews, Mark J., 4,693,646, Cl. 409-136.000.

General Electric Company: *See*—
Devins, John C.; Dranchak, Matthew A.; and Rzad, Stefan J., 4,694,375, Cl. 361-212.000.
Hayes, Cecil E., 4,694,255, Cl. 324-318.000.
Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., 4,694,190, Cl. 290-52.000.
Magoon, Inder K.; and Mayer, Robert E., 4,693,165, Cl. 89-7.000.
Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., 4,694,384, Cl. 363-17.000.
Vatis, Dimitrios; and Smith, Lowell S., 4,694,254, Cl. 324-309.000.
Wheeler, James E.; Hardy, Robert M.; Dunki-Jacobs, Robert J.; and Premerlani, William J., 4,694,416, Cl. 364-736.000.
Wu, Alexander F.; and Walters, Robert B., 4,693,937, Cl. 428-349.000.

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Casey, Frank; and Downing, Paul A., 4,693,803, Cl. 204-298.000.

General Instrument Corporation: *See*—
Blumenkranz, Robert M.; and Gibbons, Mark A., 4,694,258, Cl. 330-2.000.
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General Motors Corporation: *See*—
Ahrens, William K., 4,693,084, Cl. 60-599.000.
Alty, Mark C., 4,693,127, Cl. 74-25.000.
Beer, Wilhelm, 4,693,217, Cl. 123-195.00A.
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., 4,693,393, Cl. 220-374.000.
Elliott, James O.; and Savage, Jack W., 4,694,210, Cl. 310-68.00R.
Eshleman, Edgar S.; Field, Martin J.; and Penwright, James L., 4,693,223, Cl. 123-468.000.
Heath, Peter W., 4,693,513, Cl. 297-284.000.
Jozefczak, Thadius F., 4,692,960, Cl. 16-86.00A.
Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., 4,694,130, Cl. 200-314.000.
Klomp, Edward D., 4,693,420, Cl. 239-87.000.
Mair, Alexander C.; Allgaier, Leonhard; and DeHart, Arnold O., 4,693,642, Cl. 408-59.000.
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.
Renk, Rolf, 4,693,628, Cl. 403-135.000.
Scarselletta, Louis, 4,693,307, Cl. 165-152.000.
Szromak, David P., 4,693,424, Cl. 239-453.000.
Skarvan, Charles A.; and fisher, Stephen A., 4,693,077, Cl. 60-39.282.
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General Scanning, Inc.: *See*—
Flowers, Peter T., 4,694,235, Cl. 318-662.000.
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Gensheimer, Valentin: *See*—
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Genuit, Luther L., to Honeywell Bull Inc. Transformer tap changercu4,694,241, Cl. 323-340.000.

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George, Robert D.; and Banning, Robert D., to Sherwood Medical Company. Syringecu4,693,709, Cl. 604-212.000.

Gerger, Scott A., to Eastman Kodak Company. Electrographic process controlcu4,693,593, Cl. 355-14.0CH.

Gero, Ilona B. Vaginal contraceptive systemcu4,693,705, Cl. 604-55.000.

Gerrard, Donald L.; Preedy, John E.; and Williams, Kenneth P. J., to British Petroleum Company p.l.c., The. Diamond separation using raman scatteringcu4,693,377, Cl. 209-579.000.

Gersey, Timothy R.: *See*—
Daubendiek, Richard L.; House, Gary L.; and Gersey, Timothy R., 4,693,964, Cl. 430-505.000.

Gerson, Steven H.; and Han, Wesley W., to Alcon Laboratories, Inc. Fatty acid salts of betaxolol useful in the treatment of glaucomacu4,694,022, Cl. 514-554.000.

Gerstmann, Hans: *See*—
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Gertitschke, Detlev H.: *See*—
Rittinger, Herbert; Gertitschke, Detlev H.; Rapp, Karlheinz; and Eberle, Bernd, 4,693,057, Cl. 53-539.000.

Geschwinder, Peter: *See*—
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Geslauer, Rudolf. Circuit for the pulsed operation of one or more high-frequency ozonizerscu4,694,376, Cl. 361-235.000.

Gessner, Dieter; and Steckert, Rainer, to VEB Zementkombinat. Method and apparatus for the loss-free introduction of binding agents into mineral wool fleecescu4,693,913, Cl. 427-215.000.

Gibbons, David L., to Marathon Oil Company. Conformance correction to improve hydrocarbon recovery from a subterranean formationcu4,693,310, Cl. 166-270.000.

Gibbons, Mark A.: *See*—
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Gibson, William: *See*—
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Giles, Richard: *See*—
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Giordano, Louis. Run-off troughcu4,693,633, Cl. 405-119.000.

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Girard, Leon E., to Iowa State University Research Foundation Inc. Method and means for securing plastic covered equipment to a support surfacecu4,692,968, Cl. 24-145.000.

Girard, Marc; and van der Werf, Sylvie, to Institut Pasteur. Peptides comprising an immunogenic site of poliovirus and DNAS containing nucleotide sequences coding for these peptidescu4,694,072, Cl. 530-350.000.

Glacier GmbH—Sollinger Hutte: *See*—
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Glaesmgen, Herbert; and Kleinheinz, Wolfgang, to Dunlop Limited a British Company. Games racketcu4,693,474, Cl. 273-73.00C.

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Glerum, Johannes A.; and Klunder, Robert C., to Thomassen & Drijver-Verblifa NV. Method of manufacturing a container body having a tear strip, the body per se, and a metal blank from which the body is to be manufacturedcu4,693,658, Cl. 413-1.000.

Gloor, Urs; Hirth, Michael; and Kogelschatz, Ulrich, to BBC Brown, Boveri & Company Limited. Tubular ozonizer with cooled inner electrodecu4,693,870, Cl. 422-186.190.

Glucksman, Dov Z. Electric air heatercu4,694,142, Cl. 219-371.000.

Glyco-Metall-Werke Daelen & Loos GmbH: *See*—
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Godfrey, Dwaine A.: *See*—
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Goeldi, Heinrich: *See*—
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Goetz, Jurgen R., to Siemens Aktiengesellschaft. Circuit arrangement for producing a fluctuation-free d-c voltage level of a d-c voltagecu4,694,199, Cl. 307-297.000.

Goetz, Jurgen R.: *See*—
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Gold, David, deceased; and Gold, Sara, executrix, to United States of America, Navy. Parachute fly-away deployment aidcu4,693,436, Cl. 244-149.000.

Gold, Sara, executrix: *See*—
Gold, David, deceased; and Gold, Sara, executrix, 4,693,436, Cl. 244-149.000.

Goldbach, Manfred; Marquardt, Siegfrid; and Myohl, Jochim, to Hauni-Werke Korber & Co. KG. Apparatus for forming batches of tobacco and the likecu4,693,262, Cl. 131-84.300.

Goldman, Jerome; Goldman, Marvin; and Phillips, Gerald, to Penn Plax Plastics Inc. Gravel trap and collar assembly for an undergravel aquarium filter systemcu4,693,817, Cl. 210-169.000.

Goldman, Marvin: *See*—
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Goncalves, Antonin, to French Joint Stock Company "L'Oreal"The. Packaging means in two partscu4,693,366, Cl. 206-222.000.

Gonda, Michihiro: *See*—
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Goodyear Tire & Rubber Company, The: *See*—
Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.

Gordon, Larry R. Droplet injection system for evaporative cooling of animalscu4,693,852, Cl. 261-30.000.

Gorman, Bobby J., to Research Corporation. Monitoring therapy results in body samples of receptor cellscu4,693,967, Cl. 435-7.000.

Goronszy, Mervyn C.; and Olavarria, Raul, to Transfield, Inc. Weir for waste water treatment systemscu4,693,821, Cl. 210-241.000.

Gorrieri, Giordano: *See*—
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Goto, Mitsuhiro: *See*—
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Goto, Tomoko, to Nagoya Institute of Technology. Superconductive alloy filamentscu4,693,865, Cl. 420-572.000.

Goubeaux, Donald E.; and Miller, Richard A., to Monarch Marking Systems, Inc. Cutting method and apparatus for stackercu4,693,151, Cl. 83-23.000.

Gould, Theresa A.: *See*—
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Gourmel, Yves; and Pierrel, Michel, to Pont A Mousson S.A. Installation for the step by step vertical extraction of a continuous cast productcu4,693,297, Cl. 164-447.000.

Gowda, Hanumaiah L.; Cheever, Charles J.; and Bloom, Frank, to Ferrofluidics Corporation. Ferrofluid seal for a stationary shaft and a rotating hubcu4,694,213, Cl. 310-90.000.

Grand Royalties, Ltd.: *See*—
Comstock, Todd M., 4,693,681, Cl. 431-324.000.

Grant, David J.; and Vignola, Andrew M., Sr., to Advest Group, Inc., The. Banking/brokerage computer interface systemcu4,694,397, Cl. 364-408.000.

Graviner Limited: *See*—
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Gray, Robert L., Jr.: *See*—
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Grecksch, Hans: *See*—
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Uemura, Yahiro; Ohmura, Takao; Ohmiya, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.

Gregerson, Stanley M., to Deere & Company. Seal assembly for rotary and reciprocating motioncu4,693,699, Cl. 464-133.000.

Griffith Charles A. Method and apparatus for calibrating a material-spreading applicatorcu4,693,122, Cl. 73-861.000.

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Grillo, Alexander A.: *See*—
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Grimes, Paul J.: *See*—
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Grimm, Christel, executrix: *See*—
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Grimm, Hermann, deceased: *See*—
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Grinwald, Israel M., to United States of America, Army. Mine roller attachment to tankcu4,693,164, Cl. 89-1.130.

Groenewegen, Johannes B., to Sundstrand Data Control, Inc. Heat shielded memory unit for an aircraft flight data recordercu4,694,119, Cl. 174-52.0PE.

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Grosz, Edward G.; and Herrington, Fox J., to Mobil Oil Corporation. Rotary tube punching arrangement with tumbling punch and method for punching holes into a film webcu4,693,152, Cl. 83-24.000.

Grunsch, Eckhardt, to ANT Nachrichtentechnik GmbH. Switching regulatorcu4,694,240, Cl. 323-285.000.

Grussel, Klaus; and Neuer, Andreas, to VEB Kombinat Textima. Cam system for knitting machinescu4,693,093, Cl. 66-75.100.

Grybos, Ryszard: *See*—
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Grzanna, Ortwin; Koesfeld, Manfred; Weber, Rolf-Udo; Steuer, Aloysius; Romswinkel, Horst; Fremgen, Dieter; and Kastrop, Dieter, to Walter Rose GmbH & Co. KG. Cable sleeve with a device cross-shaped in cross-section for support of cable ends entering the cable sleevescu4,693,767, Cl. 156-49.000.

GTE Laboratories Incorporated: *See*—
Poppert, Paul E.; and Tabesky, Marvin J., 4,693,783, Cl. 156-644.000.

GTE Products Corporation: *See*—
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GTE Valeron Corporation: *See*—
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Guetersloh, Timothy L., to Research Products Corporation. Media support module for paint spray booths and the likecu4,693,048, Cl. 52-664.000.

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Gupta, Balaram B. G., to Celanese Corporation. Alkoxyalkylation of phenolcu4,694,111, Cl. 568-662.000.

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Guthrie, Gerald, to 5W Eaterprises, Inc. Quick adjusting nutcu4,693,656, Cl. 411-433.000.

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Haas, Erich: *See*—
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Hackleman, David E.; and Pawlowski, Norman E., to Hewlett-Packard Company. Reactive ink-jet printingcu4,694,302, Cl. 346-1.100.

Hadland Photonics Limited: *See*—
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Hagele, Karl-Heinz: *See*—
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Hager, Walter, to Pfaff Industriemaschinen GmbH. Apparatus for monitoring shuttle thread supply of a sewing machinecu4,693,196, Cl. 112-273.000.

Hagino, Kiyoshi: *See*—
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Hahn, Erwin: *See*—
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Hahn, Jerome S., to Concept Engineering and Design Corporation. Cap cardcu4,693,439, Cl. 248-37.600.

Hahn, Lawrence R., to Fourth Dimension, Inc., The. Automatic welder's helmetcu4,694,141, Cl. 219-147.000.

Hain, Klaus: *See*—
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Hakim, Shafik J.: *See*—
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Halbergerhutte GmbH: *See*—
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Hales, John H.: *See*—
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Hall, Clifton W.: *See*—
Thornton, Harold C., Jr.; and Hall, Clifton W., 4,693,671, Cl. 416-43.000.

Hall, Lawrence P.: *See*—
Davis, Jeffrey L.; Evans, Daniel S.; and Hall, Lawrence P., 4,693,098, Cl. 70-233.000.

Halliburton Company: *See*—
Caskey, Kenneth D., 4,693,309, Cl. 166-123.000.
Edwards, A. Glen; Wesson, David S.; and Brieger, Emmet F., 4,693,317, Cl. 166-378.000.
Hollenbeak, Keith H.; and Brown, Paul S., Jr., 4,693,639, Cl. 405-263.000.
Luke, Robert R.; and Barker, James M., 4,693,308, Cl. 166-55.100.
Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., 4,693,316, Cl. 166-355.000.
Wesson, David S.; Wall, Stanley J.; and Hales, John H., 4,693,314, Cl. 166-317.000.

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Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., 4,693,541, Cl. 439-541.000.

Halvani, Mohammed. Sesame seeds husking methodcu4,693,903, Cl. 426-456.000.

Hamada, Kiyoshi: *See*—
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Nakamura, Kooroo; Hamada, Nagaharu; Tadauchi, Masaharu; Kozima, Yasuyuki; Suemori, Noboru; and Kouno, Takamitu, 4,694,351, Cl. 358-256.000.

Hamai Electric Lamp Co., Ltd.: *See*—
Hamai, Jitsuo, 4,693,692, Cl. 445-66.000.

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Hamamatsu Photonics Kabushiki Kaisha: *See*—
Kinoshita, Katsuyuki, 4,694,220, Cl. 315-10.000.
Tsuchiya, Yutaka; Koishi, Musubu; and Takeshima, Akira, 4,694,154, Cl. 250-213.0VT.

Hamamoto, Tatsuo: *See*—
Akiba, Yutaka; Hirota, Kazuo; Kishiro, Nobuo; Futami, Toshio; and Hamamoto, Tatsuo, 4,694,423, Cl. 365-2.000.

Hamilton, Leslie: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Hamon, Gilles: *See*—
Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, 4,694,011, Cl. 514-323.000.

Han, Wesley W.: *See*—
Gerson, Steven H.; and Han, Wesley W., 4,694,022, Cl. 514-554.000.

Hanagata, Takayoshi, to Canon Kabushiki Kaisha. Dot matrix printer providing multiple print pulses for one energization of a printing head stepping motorcu4,693,618, Cl. 400-120.000.

Hanamori, Ryoichi; Nakashima, Shigeo; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Motorcu4,693,580, Cl. 354-271.100.

Hanamoto, Yoshihiro: *See*—
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Hank, Dietrich; and Hauer, Kerstin, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Feed roll for material web transporting and measuring web tensioncu4,693,126, Cl. 73-862.480.

Hano, Sunao: *See*—
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Hans Krummenauer GmbH & Co. KG: *See*—
Eisenbeis, Martin; Hemmer, Walter; and Krummenauer, Hans, 4,693,517, Cl. 299-87.000.

Hansel, Alles; Centofanti, Ermand; and Natarajan, Thiagarajan, to Concurrent Computer Corporation. Power supply with battery backupcu4,694,194, Cl. 307-66.000.

Hansen, Marcia K.: *See*—
Jenekhe, Samson A.; and Hansen, Marcia K., 4,694,062, Cl. 528-232.000.

Hanson, George E., to Norand Corporation. Isolated power supply system and methodcu4,694,237, Cl. 320-6.000.

Hanson, Lowell C. Subterranean surveying apparatuscu4,694,437, Cl. 367-27.000.

Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Device of guiding drawing-out of a lower thread from a horizontal bobbin carrier of a sewing machinecu4,693,193, Cl. 112-121.110.

Hanyu, Susumu, to Janome Sewing Machine Co. Ltd. Adjusting device of slack amount of lower thread in zigzag sewing machinecu4,693,198, Cl. 112-443.000.

Hara, Katsuhiko: *See*—
Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, 4,693,898, Cl. 426-19.000.

Hara, Kazumasa: *See*—
Hanyu, Susumu; Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,693,193, Cl. 112-121.110.

Hara, Yoshifusa: *See*—
Kariya, Akinori; Nabekawa, Shukichi; Hara, Yoshifusa; and Taguchi, Junji, 4,694,095, Cl. 558-186.000.

Harada, Munenori, to Sharp Kabushiki Kaisha. Multiwindow display circuitcu4,694,288, Cl. 340-721.000.

Harada, Norimichi, to Sanshin Kogyo Kabushiki Kaisha. Controlling gear for outboard enginecu4,693,689, Cl. 440-51.000.

Harada, Takamasa; and Taguchi, Masaaki, to Seiko Instruments & Electronics Ltd. Ferro-electric liquid crystal electro-optical devicecu4,693,563, Cl. 350-350.00S.

Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, to Toyota Jidosha Kabushiki Kaisha; and Aisin-Warner Kabushiki Kaisha. Control device for an automatic transmission systemcu4,693,143, Cl. 74-866.000.

Harada, Yoshihiro: *See*—
Miyahara, Tsuneo; Harada, Yoshihiro; Futakami, Katsuyuki; Nishida, Yasukuni; and Konishi, Ryoko, 4,693,888, Cl. 424-49.000.

Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, to Hitachi, Ltd.; and Kansai Electric Power Co., Inc., The. Control system for variable speed hydraulic turbine generator apparatuscu4,694,189, Cl. 290-40.00C.

Hardiman, Christopher J.: *See*—
Archer, Ronald D.; Hardiman, Christopher J.; Grybos, Ryszard; and Chien, James C. W., 4,693,957, Cl. 430-269.000.

Hardy, Robert M.: *See*—
Wheeler, James E.; Hardy, Robert M.; Dunki-Jacobs, Robert J.; and Premeriani, William J., 4,694,416, Cl. 364-736.000.

Hargoaa, Francis: *See*—
Denhez, Alain; Hargoaa, Francis; and Aubree, Jean, 4,694,291, Cl. 340-825.200.

Hargreaves, Rodney B.: *See*—
Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,694,005, Cl. 514-234.000.

Hargrove, Benjamin F.; and Kvaternik, Billy J. Horizontally mounted submersible pump assemblycu4,693,271, Cl. 137-565.000.

Haringer, Luis, to Macmoter S.p.A. Compact excavatorcu4,693,662, Cl. 414-695.000.

Harris Corporation: *See*—
Beason, James D., 4,694,313, Cl. 357-23.400.

Harris, Ronald N.: *See*—
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Harrison, Bruce L.; and Wall, Richard J., to United Technologies Automotive, Inc. Hot melt, synthetic, magnetic sealantcu4,693,775, Cl. 156-272.400.

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Hart, Keith L.: *See*—
Keem, John E.; Ovshinsky, Stanford R.; Flesea, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.

Harte, Kenneth J., to Control Data Corporation. Multiple channel electron beam optical column lithography system and method of operationcu4,694,178, Cl. 250-396.00R.

Harumatsu, Masatoshi, to Alps Electric Co.,Ltd. Variable width paper feeder for perforated and unperforated papercu4,693,620, Cl. 400-611.000.

Haruta, Masahiro: *See*—
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Haruyama, Hideaki: *See*—
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Harvey, Charles P., to British Aerospace PLC. Automatic mist preventing system for vehicle transparenciescu4,693,172, Cl. 98-2.010.

Harvey, John C.; and Cuddihy, James W. Signal processing apparatus and methodscu4,694,490, Cl. 380-20.000.

Harwood, Leopold A.: *See*—
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Law, Kirk A.; and Harwood, Leopold A., 4,694,331, Cl. 358-31.000.

Harwood, Michael E.: *See*—
Carroll, Michael W.; and Harwood, Michael E., 4,692,980, Cl. 29-243.520.

Harwood, Robert E.; and Hawrylo, Frank Z., to RCA Corporation. Sharp edge formation on copper heatsinkscu4,693,649, Cl. 409-293.000.

Hasebe, Hiroshi; Asakura, Masahiko; Sakaino, Michio; and Miyashita, Yukio, to Honda Giken Kogyo K.K. Idling speed control system for internal combustion enginescu4,693,220, Cl. 123-339.000.

Hasegawa, Shinji; Kando, Yasuhiko; and Nakagomi, Tamihito, to Hitachi, Ltd. Liquid crystal display devicecu4,693,562, Cl. 350-337.000.

Haenkopf, Joel E.; and Sutherland, James F., to Westinghouse Electric Corp. Adaptive digital filter for analog input signalscu4,694,415, Cl. 364-724.000.

Hashimoto, Akira; Nishimura, Toshihiro; Nakayama, Museo; Nakane, Hisashi; and Toda, Shozo, to Tokyo Denshi Kagaku Kabushiki Kaisha. Liquid composition for forming a coating film of organopolysiloxane and method for the preparation thereofcu4,694,040, Cl. 524-765.000.

Hashimoto, Masashi: *See*—
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Hashimoto, Takayoshi, to Takasago Thermal Engineering Co., Ltd. Clean room systemcu4,693,175, Cl. 98-31.600.

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Hasley, Lloyd A.; and Raamot, Jaan, to American Telephone and Telegraph Company and AT&T Information Systems. Clock recovery circuitcu4,694,196, Cl. 307-269.000.

Hatada, Kenzo, to Matsushita Electric Industrial Co., Ltd. Method of bonding semiconductor devices togethercu4,693,770, Cl. 156-151.000.

by Hatono, Akio; and Kobayashi, Sumio, to Sumitomo Metal Industries, Ltd. Apparatus for detecting slag outflowcu4,693,614, Cl. 374-122.000.

Hattori, Masayuki: *See*—
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Hattori, Shintaroo: *See*—
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Hattori, Tadashi: *See*—
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Hauer, Kerstin: *See*—
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Hauni-Werke Korber & Co. KG: *See*—
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Wahle, Gunter; and Ludszeweit, Dieter, 4,693,263, Cl. 131-84.400.

Hawener, Juergen; and Hain, Klaus, to Dr. h.c.F. Porsche Aktiengesellschaft. Adjusting device for an airplane propulsion systemcu4,693,670, Cl. 416-25.000.

Hawkins, Phillip J.; Kasner, William H.; and Miller, Richard A., to Westinghouse Electric Corp. Laser welding head for sleeve-to-tube weldingcu4,694,137, Cl. 219-121.0LC.

Haworth, Inc.: *See*—
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Hawrylo, Frank Z.: *See*—
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Hay, Robert R.: *See*—
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Hayakawa, Toshihiro, to Toyota Jidosha Kabushiki Kaisha. Defroster structure for vehiclecu4,693,416, Cl. 98-2.090.

Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Apparatus for the growth of semiconductor crystalscu4,693,207, Cl. 118-715.000.

Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Stripe geometry semiconductor laser devicecu4,694,460, Cl. 372-45.000.

Hayakawa, Yoichi: *See*—
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Hayashi, Hisao: *See*—
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Hayashi, Makoto: *See*—
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Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry; and Taiyo Yuden Co., Ltd. Thin-film solar cellcu4,694,116, Cl. 136-256.000.

Hayashibara, Ken: *See*—
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Hayes, Cecil E., to General Electric Company. Radio frequency field coil for NMRcu4,694,255, Cl. 324-318.000.

Hayes, Kathryn S.: *See*—
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Haynes, Robert W., to Terra International, Inc. Mechanism for and method of agricultural chemical formulationcu4,693,609, Cl. 366-136.000.

Hayssen Manufacturing Company: *See*—
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Hazama, Yoshikazu: *See*—
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Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, to Kabushiki Kaisha Toshiba; and Kabushiki Kaisha Tokuda Seisakusho. Apparatus for producing semiconductor devicescu4,693,777, Cl. 156-345.000.

Heath, Peter W., to General Motors Corporation. Thigh support for vehicle seatcu4,693,513, Cl. 297-284.000.

Hebrard, Denis: *See*—
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Heidelberger Druckmaschinen AG: *See*—
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Heidjann, Franz: *See*—
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Heilmann, Steven M.: *See*—
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Heine, Heinrich: *See*—
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Hekal, Ihab M., to Continental Can Company, Inc. Lid for a plastic containercu4,693,390, Cl. 220-359.000.

Held, Kurt. Method for continuous heated pressing of material in sheet formcu4,693,859, Cl. 264-112.000.

Helix Technology Corporation: *See*—
Klusmier, Lawrence A., 4,693,736, Cl. 62-6.000.

Hellgren, Keijo, to ASEA AB. Forming press of the pressure cell type and a process for changing diaphrams in such a presscu4,693,103, Cl. 72-63.000.

Helpio, Pentti K., to Rauma-Repola OY. Freeze resistant bottom wellcu4,693,202, Cl. 114-74.00A.

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Hemdal, Hakan O.: *See*—
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Hemmer, Walter: *See*—
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Hemsath, Klaus H.; and Fu, Being-I, to Hercules Incorporated. Direct fired cylinder dryercu4,693,015, Cl. 34-41.000.

Henders, Siegfried, to Korf Engineering GmbH. Device for continuous castingcu4,693,295, Cl. 164-433.000.

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Henderson, Elvin J. Quick drain assembly for boat enginecu4,693,690, Cl. 440-88.000.

Heng, Jean-Paul; Marmonier, Andre ; Ruiz, Ariel; and Guernet, Henri, to Cgee Alsthom. Electrical screw connectioncu4,693,542, Cl. 439-626.000.

Henglein, Rudolf: *See*—
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Henkin, Melvyn L.; and Laby, Jordan M. Hydrotherapy massage method and apparatuscu4,692,950, Cl. 4-542.000.

Hennig, Kurt, to Gebr. Hennig GmbH. Cover arrangementcu4,693,388, Cl. 220-8.000.

Henningsen, Tom; and Gould, Theresa A., to Westinghouse Electric Corp. Apparatus for the controlled transmission of lightcu4,693,545, Cl. 350-96.120.

Henry, Richard T.: *See*—
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Herbert, Adolf, to Hermann Berstorff Maschinenbau GmbH. Method for reducing wastage in a multiple-bead extrusion devicecu4,693,855, Cl. 264-40.700.

Hercules Incorporated: *See*—
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Schweiker, Werner, 4,693,664, Cl. 414-735.000.

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Herrington, Fox J.: *See*—
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Herrmann, Herbert: *See*—
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Hetyei, Joseph, to Thomson-CSF. Device for detecting a pulse train in noise and application to a radionavigation aid system of DME typecu4,694,200, Cl. 307-358.000.

Heuwieser, Erwin; and Schwaiger, Kurt, to Siemens Aktiengesellschaft. FET gating circuit for switching electrical loadscu4,694,207, Cl. 307-571.000.

Hewlett-Packard Company: *See*—
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Hackleman, David E.; and Pawlowski, Norman E., 4,694,302, Cl. 346-1.100.
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Siddall, Graham J., 4,694,477, Cl. 378-34.000.
Whiteside, Laura; and Bohley, Thomas K., 4,694,244, Cl. 324-121.00R.

Heyworth, Malcolm I., to E&A Heyworth Enterprises, Inc. Plastic pipe planing devicecu4,693,643, Cl. 408-82.000.

Hibehman Corporation: *See*—
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Hickman, John R.; and Weidman, Craig C., to Weatherchem Corporation. Two-flap closurecu4,693,399, Cl. 222-480.000.

Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, to Fuji Photo Film Co., Ltd. Solid state imaging device and process for fabricating the samecu4,694,317, Cl. 357-30.000.
Higgins, David C.: *See*—
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Higuchi, Toshiro, to Research Development Corporation of Japan. Apparatus for forming diverse shapes using a look-up table and an inverse transfer functioncu4,694,401, Cl. 364-475.000.
Hikita, Michiyasu, to Kabushiki Kaisha Ishida Koki Seisakusho. Electonic scale with label character size change capabilitycu4,693,329, Cl. 177-4.000.
Hilaire, Jean-Claude; and Guerin, Roland, to Atochem. Anhydrous process for the manufacture of polyamide powder from lactam in the presence of N,N'-alkylene bis amidecu4,694,063, Cl. 528-315.000.
Hill, Loren G. Method and apparatus for selecting fishing lure colorcu4,693,028, Cl. 43-4.500.
Hille, Jacques: *See*—
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Hillinger, Bruno: *See*—
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Hing, Peter, to Thorn EMI plc. Discharge lamp arc tubescu4,694,219, Cl. 313-636.000.
Hiniker Company: *See*—
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Newman, Paul, 4,693,336, Cl. 181-111.000.
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Howard, P. Guy, to Spectra-Physics, Inc. Hand held bar code reader with modulated laser diode and detectorcu4,694,182, Cl. 250-566.000.
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Hwang, Ming-Chuen. Apparatus for determining the acceleration of a moving object under gravitycu4,693,687, Cl. 434-302.000.
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Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, to Toyota Jidosha Kabushiki Kaisha; and Toyota Central Research & Development Laboratories, Inc. System for vehicle body roll control utilizing steering angle detectioncu4,693,493, Cl. 280-707.000.

Ikenaga, Takao: *See*—
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Imel, Michael T., to Intel Corporation. Seven transistor content addressable memory (CAM) cellcu4,694,425, Cl. 365-49.000.

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Brown, David; Hargreaves, Rodney B.; McLoughlin, Bernard J.; and Mills, Stuart D., 4,694,005, Cl. 514-234.000.

Ina, Kenzoh; Otani, Masatoshi; and Mishima, Kenichi, to Canon Kabushiki Kaisha. Image information processing systemcu4,694,352, Cl. 358-257.000.

Inaba, Yoshiharu, to Fanuc Ltd. Screw-rotating/injection mechanism of injection molding machinecu4,693,676, Cl. 425-145.000.

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Jeskey, Richard V., 4,693,552, Cl. 350-96.240.

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Anthony, James R.; and Wiseman, Michael A., 4,692,970, Cl. 24-642.000.

Ingersoll, Roger W., to Mobil Oil Corporation. System and method for controlling erosion of a shorelinecu4,693,632, Cl. 405-18.000.

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Cheung, Edward H., 4,694,483, Cl. 379-34.000.

Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, to Daiichi Koshuha Kogyo Kabushiki Kaisha; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Induction heating method and apparatus for relieving residual stress in welded joint between main and branch pipescu4,694,131, Cl. 219-10.410.

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Magneville, Pierre, 4,694,435, Cl. 367-17.000.

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Hirth, Antoine; and Schetter, Klaus-Herbert, 4,694,463, Cl. 372-61.000.

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Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,694,015, Cl. 514-375.000.

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Girard, Marc; and van der Werf, Sylvie, 4,694,072, Cl. 530-350.000.

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Fleming, Donald K., 4,693,883, Cl. 423-648.00R.
Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., 4,693,682, Cl. 432-15.000.

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Lazcano-Navarro, Arturo; Alcantara, Miguel A.; and Hernandez-Ruiz, Jose E., 4,693,274, Cl. 137-625.400.

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Domenik, Stephen L.; Folmsbee, Alan C.; Nguyen, Tai; and Shirgley, David A., 4,694,412, Cl. 364-717.000.
Imel, Michael T., 4,694,425, Cl. 365-49.000.

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Williams, Glenn T.; and Thomas, Michael D., 4,693,444, Cl. 248-553.000.

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Babich, Edward D.; Hatzakis, Michael; Liutkis, John J.; Parasczak, Juri R.; and Shaw, Jane M., 4,693,960, Cl. 430-323.000.
Cohen, Donald K.; and Yardy, Raymond, 4,694,447, Cl. 369-110.000.
Ewen, John F.; and Mosley, Joseph M., 4,694,261, Cl. 331-57.000.
Rossi, Eva-Maria; and Tietze, Armin R., 4,693,908, Cl. 427-130.000.
Wiedmann, Siegfried K., 4,694,433, Cl. 365-230.000.

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Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,694,106, Cl. 568-34.000.
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

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Verkler, Charles E., 4,693,611, Cl. 366-195.000.

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Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., 4,693,882, Cl. 423-652.000.

International Minerals & Chemical Corp.: *See*—
Lu, Jing-Jong; and Wehrmeister, Herbert L., 4,694,016, Cl. 514-380.000.
Young, Vernon V., 4,693,992, Cl. 514-11.000.

International Packaging Machines, Inc.: *See*—
Humphrey, John R., 4,693,049, Cl. 53-64.000.

International Paper Company: *See*—
McFarland, William W.; Gandy, Russell E.; and Churvis, Michael A., 4,693,413, Cl. 229-48.00R.

Iowa State University Research Foundation Inc.: *See*—
Girard, Leon E., 4,692,968, Cl. 24-145.000.

Ishida, Koji: *See*—
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Bochi, Hiroshi; Ueda, Kenji; and Kosishi, Satoshi, 4,693,355, Cl. 193-2.00R.

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Ishii, Hidekazu; and Kosaka, Chihiro, to Tokyo Electric Co., Ltd. Stepping motor operated positioning device for a ribbon lifter in a printercu4,693,619, Cl. 400-212.000.

Ishikawa, Takakazu, to Ibiden Kabushiki Kaisha. Process or non-electrolytic copper plating for printed circuit boardcu4,693,907, Cl. 427-97.000.

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Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.
Koike, Takaaki, 4,693,668, Cl. 415-138.000.
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Ishizaki, Hideki: *See*—
Nishimatsu, Masaharu; Arioka, Hiroyuki; and Ishizaki, Hideki, 4,693,934, Cl. 428-336.000.

Itahana, Hiroshi; and Usui, Yoshinori, to Hitachi, Ltd. Apparatus for vapor-cooling a semiconductorcu4,694,323, Cl. 357-82.000.

Ito, Katsu, to Citizen Watch Co. Ltd. Television receiver having a liquid crystal display devicecu4,694,347, Cl. 358-236.000.

Ito, Masayoshi: *See*—
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Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, to Shin-Etsu Chemical Co., Ltd. Method for the polymerization of vinyl chloride monomer in an aqueous mediumcu4,694,053, Cl. 526-74.000.

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Itou, Hiroshi; Okane, Yukihiro; and Kuramoto, Akio, to Toyota Jidosha Kabushiki Kaisha. Intake air control device for an internal combustion enginecu4,693,222, Cl. 123-432.000.

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ITT Corporation: *See*—
Russo, Vincent; and Heesch, Max O., 4,693,515, Cl. 297-391.000.
Steffes, Helmut, 4,693,523, Cl. 303-114.000.

ITT Defense Communications, a Division of ITT Corporation: *See*—
Kadin, Joseph, 4,694,466, Cl. 375-1.000.

ITT Electro Optical Products, a Division of ITT Corporation: *See*—
Porter, David R.; Bowen, James H.; and Holland, John M., 4,694,504, Cl. 455-608.000.

ITT Gilfillan: *See*—
Milan, John M., 4,694,298, Cl. 342-89.000.

ITT Industries Incorporated: *See*—
Reinartz, Hans D., 4,693,083, Cl. 60-547.100.

Ivan, Steve D., to Wickes Manufacturing Company. Cable drum latching and unlatching mechanismcu4,693,453, Cl. 254-323.000.

Iwadoo, Shuichi: *See*—
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Iwamura, Masahiro; and Masuda, Ikuro, to Hitachi, Ltd. Bi-MOS buffer circuitcu4,694,202, Cl. 307-475.000.

Iwamura, Masahiro: *See*—
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Iwanaga, Kazuyoshi, to Nissan Motor Co., Ltd. Automatic transmission casecu4,693,141, Cl. 74-606.00R.

Iwaoka, Hideto; Sugiyama, Tadashi; Matsuura, Hiroyuki; and Hirata, Takaaki, to Yokogawa Electric Corporation. Nuclear magnetic resonance imaging devicecu4,694,250, Cl. 324-309.000.

Iwasaki, Masami: *See*—
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Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, 4,693,116, Cl. 73-204.000.

Iwase, Sumio, to Sony Corporation. Cordless telephonecu4,694,485, Cl. 379-62.000.

Iwase, Takahiro: *See*—
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Iwatsu Electric Co. Ltd.: *See*—
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Izumi, Shuji: *See*—
Yamaki, Toshio; Mukai, Hiromu; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,693,581, Cl. 354-400.000.

Jaffe, Gerald E.: *See*—
Mitchell, Gary A.; Jaffe, Gerald E.; and Solorzano, Marilyn M., 4,694,070, Cl. 530-329.000.

Jagemberg AG: *See*—
Hoveler, Egon, 4,693,050, Cl. 53-137.000.

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Vance, David F.; and Jakubowicz, Michael, 4,693,034, Cl. 51-101.0LG.

James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., to Battelle Memorial Institute. Process for recovery of hydrogen and abstraction of sulfurcu4,693,875, Cl. 423-243.000.

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Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, 4,693,659, Cl. 414-131.000.

Jandrasi Frank J., to Triten Corporation. Valvecu4,693,452, Cl. 251-329.000.

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Hanyu, Susumu, Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,693,193, Cl. 112-121.110.
Hanyu, Susumu, 4,693,198, Cl. 112-443.000.

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Janson, Stephen: *See*—
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Jansons, Viktors: *See*—
Bannick, Mark A.; Divers, George A., III; and Jansons, Viktors, 4,693,851, Cl. 260-544.00D.

Japan Synthetic Rubber Co., Ltd.: *See*—
Kasai, Kiyoshi; Hattori, Masayuki; Kikuchi, Osamu; Takeuchi, Hiromi; Hirai, Haruhiro; and Sakurai, Nobuo, 4,694,035, Cl. 524-458.000.
Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, 4,693,799, Cl. 204-165.000.

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Okumoto, Yutaka, 4,693,260, Cl. 131-84.100.
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Japikse, Cornelis H.; Van Brocklin, Lester P.; Hembree, Johnny A.; Kitts, Ralph R.; and Meece, Donald R., to Procter & Gamble Company, The. Orange flavor and aroma compositions made by dense gas extraction of organic organce flavor and aroma compoundscu4,693,905, Cl. 426-599.000.

Jartoux, Pierre, to Freyssinet International (Stup). Devices for prestressing concrete having stretched sinuous cables and the methods for implementing samecu4,693,044, Cl. 52-230.000.

Jason, Barry L., to Motorola, Inc. Current-saving CMOS input buffercu4,694,201, Cl. 307-475.000.

Jeffers, John M.: *See*—
Horne, Donald R.; and Jeffers, John M., 4,694,491, Cl. 380-20.000.

Jenekhe, Samson A.; and Hansen, Marcia K., to Honeywell Inc. Method of making electroactive heterocyclic aromatic polymerscu4,694,062, Cl. 528-232.000.

Jennings, Thomas P.: *See*—
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Jensen, Susan: *See*—
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,693,977, Cl. 435-180.000.

Jerabek, Jiri, to TELSA, koncernovy podnik. Magnetotherapeutic impulse devicecu4,693,238, Cl. 128-1.500.

Jeskey, Richard V., to Incom, Inc. Optical apparatuscu4,693,552, Cl. 350-96.240.

JGC Corporation: *See*—
Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, 4,693,833, Cl. 210-759.000.

John Wyeth & Brother Limited: *See*—
Archibald, John L.; Ward, Terence J.; and Opalko, Albert, 4,694,012, Cl. 514-332.000.

Johnsen, Peter B.; and Adams, Michael A., to Monell Chemical Senses Center. Stimulation and enhancement of feeding in herbivorous fishcu4,693,897, Cl. 426-2.000.

Johnson, James A.; Schulz, Richard; and Tomlonovic, Vincent J., to Hiniker Company. Tractor boomcu4,693,331, Cl. 180-135.000.

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Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Johnson, Leopold J., to United States of America, Navy. Lithium battery energy monitorcu4,693,119, Cl. 73-579.000.

Johnson, Robert E.: *See*—
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Johnson, Robert W., Jr., to Union Camp Corporation. Method of preparing hot-melt stable rosin ester with organic ester of hypophosphorous acid catalystcu4,693,847, Cl. 260-104.000.

Johnson, Roy S. Windshield attachment clipcu4,692,969, Cl. 24-573.000.

Jomar International, Ltd.: *See*—
Martin, Joseph R., 4,692,948, Cl. 4-286.000.

Jones, Howard: *See*—
Loev, Bernard; Chan, Wan-kit; and Jones, Howard, 4,694,023, Cl. 514-559.000.

Jones, Ronald E.; and Peterson, Royal D., to Continental Laser Corporation. Laser with bypass gas deflectorcu4,694,462, Cl. 372-61.000.

Josef Uhlmann Maschinenfabrik GmbH & Co. KG: *See*—
Rittinger, Herbert; Gertitschke, Detlev H.; Rapp, Karlheinz; and Eberle, Bernd, 4,693,057, Cl. 53-539.000.

Joyce International, Inc.: *See*—
Fenwick, Jay G., 4,693,383, Cl. 211-192.000.

Jozefczak, Thadius F., to General Motors Corporation. Check and control for a sliding doorcu4,692,960, Cl. 16-86.00A.

Juda, Robert H.; Crawford, Roger A.; and Chakrabarti, Paritosh M., to PPG Industries, Inc. Halophor compositioncu4,693,894, Cl. 424-150.000.

Judd, Richard K.: *See*—
DeMinco, Chris M.; Field, Martin J.; and Judd, Richard K., 4,693,393, Cl. 220-374.000.

Juengel, Richard O., to GTE Valeron Corporation. Method and apparatus for testing the operability of a probecu4,693,110, Cl. 73-1.00R.

Juge, Sylvain; and Legras, Yvonne, to Societe Nationale Elf Aquitaine. Cyclic diphosphonitescu4,694,094, Cl. 558-76.000.

Julius Blum Gesellschaft m.b.H.: *See*—
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Jurga, Stanley M., to George Frost Company. Baseball catcher's leg guardcu4,692,946, Cl. 2-22.000.

Jyo, Hidetaka: *See*—
Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, 4,693,777, Cl. 156-345.000.

Kabetnik, Wilfried: *See*—
Back, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, 4,693,407, Cl. 227-109.000.

Kabi/Vitrum AB: *See*—
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Kabushiki Kaisha Cosina: *See*—
Yoshimura, Hirofumi, 4,694,151, Cl. 250-201.000.

Kabushiki Kaisha Ishida Koki: *See*—
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Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kabushiki Kaisha Matsuyama Seisakusho: *See*—
Kimura, Sakae; and Tanaka, Yasuhiro, 4,693,571, Cl. 350-634.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Nakabo, Junichi; Kato, Shigeru; and Shibahara, Makoto, 4,693,558, Cl. 350-332.000.

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Kabushiki Kaisha Toshiba: *See*—
Akai, Yoshimi, 4,694,177, Cl. 250-368.000.
Ando, Hideo, 4,694,443, Cl. 369-46.000.
Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, 4,693,777, Cl. 156-345.000.
Kobayashi, Hiroshi; Haruyama, Hideaki; and Hirose, Tsugahiro, 4,694,453, Cl. 370-85.000.
Komeya, Katsutoshi; and Komatsu, Michiyasu, 4,693,857, Cl. 264-56.000.
Miyamoto, Junichi; and Tsujimoto, Jun-ichi, 4,694,427, Cl. 365-185.000.
Oodaira, Hiroshi; Suzuki, Haruko; Saito, Masayuki; and Ohuchi, Masayuki, 4,694,138, Cl. 219-121.0LM.
Saito, Tutomu; and Yoneda, Hitoshi, 4,694,310, Cl. 346-153.100.
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Tamura, Hiroshi; and Nakaie, Yutaka, 4,694,282, Cl. 340-539.000.
Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, 4,694,429, Cl. 365-189.000.

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Kahn, Jan E., to Newell Co. Circular knitting needle assemblycu4,693,094, Cl. 66-117.000.

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Kajita, Hiroshi: *See*—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,693,586, Cl. 355-3.0SH.

Kakimoto, Osamu; and Nagoshi, Fumiya, to Kanegaguchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing thermoplastic resin compositionscu4,694,032, Cl. 523-334.000.

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Kakuda, Yoshiaki; Wakahara, Yasushi; and Norigoe, Masamitsu, to Kokusai Denshin Deawa Co., Ltd. Protocol validation systemcu4,694,422, Cl. 364-900.000.

Kalen, David D., to Babcock & Wilcox Company, The. Reactor internals core barrel hole plugcu4,693,389, Cl. 220-236.000.

Kali-Chemie Aktiengesellschaft: *See*—
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Kallstrom, Leif A.: *See*—
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Kamata, Yoshikiyo, to Kioritz Corporation. Vibration dampercu4,693,457, Cl. 267-153.000.

Kamei, Eiichi; Namba, Hideaki; and Ohba, Masahiro, to Nippondenso Co., Ltd. Vehicle height control apparatuscu4,693,485, Cl. 280-6.009.

Kametaka, Kenichi: *See*—
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Kamiya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, to Citizen Watch Co., Ltd. Method of driving liquid crystal display panel of TV receivercu4,694,348, Cl. 358-236.000.

Kamiya, Shingo: *See*—
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Kamuro, Setsufumi: *See*—
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Kanasugi, Mikiko: *See*—
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Kanda, Ryouji, to Tokai Rubber Industries, Ltd. Fluid-filled resilient bushing with circumferential orificecu4,693,456, Cl. 267-140.100.

Kando, Yasuhiko: *See*—
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Kakimoto, Osamu; and Nagoshi, Fumiya, 4,694,032, Cl. 523-334.000.

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Kankyo Company Limited: *See*—
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Kansai Electric Power Co., Inc., The: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Kanto Chemical Co., Ltd.: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hiroo; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Kanto Ishi Pharmaceutical Co., Ltd.: *See*—
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,694,076, Cl. 536-17.200.

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Fujikura, Yoshiaki; Yamamuro, Akira; and Nakajima, Motoki, 4,693,845, Cl. 512-9.000.
Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,693,839, Cl. 252-51.50A.

Kapec, Jeffrey: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Karavolis, Sam: *See*—
Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., 4,693,882, Cl. 423-652.000.

Kariya, Akinori; Nabekawa, Shukichi; Hara, Yoshifusa; and Taguchi, Junji, to Hironori Kushibiki; and Nippon Chemical Industrial Co., Ltd. Phosphoric acid dithioesters, and insecticides containing said dithioesterscu4,694,095, Cl. 558-186.000.

Karlsson, Gosta, to B & D Autolines AB. Method and apparatus for dividing and further treatment of units of goodscu4,693,154, Cl. 83-161.000.

Karnel Corporation: *See*—
Stauffer, Nelson R., 4,693,766, Cl. 156-64.000.

Karth, Beat: *See*—
Lamping, Alfons; and Karth, Beat, 4,693,385, Cl. 215-232.000.

Kasai, Junichi; Imai, Hiroshi; and Tsuda, Hiroshi, to Nissan Motor Company, Limited. Automotive multi-speaker audio system with automatic echo-control featurecu4,694,497, Cl. 381-63.000.

Kasai, Kiyoshi; Hattori, Masayuki; Kikuchi, Osamu; Takeuchi, Hiromi; Hirai, Haruhiro; and Sakurai, Nobuo, to Japan Synthetic Rubber Co., Ltd. Process for preparing large-sized polymer particlescu4,694,035, Cl. 524-458.000.

Kasanami, Toru; Tani, Hiroji; Watanabe, Shizuharu; and Ikeda, Toshiaki, to Murata Manufacturing Co., Ltd. Resistance pastecu4,693,843, Cl. 252-518.000.

Kashy, David H.: *See*—
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Kasner, William H.; Bruck, Gerald J.; Miller, Richard A.; and Toth, Vincent A., to Westinghouse Electric Corp. Laser welding of a sleeve within a tubecu4,694,136, Cl. 219-121.0LD.

Kasner, William H.: *See*—
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Kasper Wire Works, Inc.: *See*—
Aschenbeck, Weldon J.; and Medley, Frank W., III, 4,693,357, Cl. 194-202.000.

Kassis, Amin I. Pool vacuumcu4,692,956, Cl. 15-1.700.

Kastrop, Dieter: *See*—
Grzanna, Ortwin; Koesfeld, Manfred; Weber, Rolf-Udo; Steuer, Aloysius; Romswinkel, Horst; Fremgen, Dieter; and Kastrop, Dieter, 4,693,767, Cl. 156-49.000.

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Kasuya, Takahira: *See*—
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Katagiri, Kazuharu: *See*—
Takase, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.

Kataoka, Hiroshi. Winding shaft for sheet rewindercu4,693,431, Cl. 242-72.00B.

Katayama, Takao, to Kubota, Ltd. Grass collection bag for lawn mowercu4,693,064, Cl. 56-202.000.

Katecho, Incorporated: *See*—
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Kato, Masayuki: *See*—
Suzuki, Shinichi; Tokuno, Akio; Kusugi, Yoshiro; and Kato, Masayuki, 4,694,498, Cl. 381-103.000.

Kato, Shigeru: *See*—
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Kato, Toshiyuki: *See*—
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Katoh, Shinji: *See*—
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Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, to Dainihon Jochugiku Co., Ltd. Thermal fumigator for drugscu4,693,868, Cl. 422-124.000.

Katsuno, Toshiyasu: *See*—
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Katz, Ira: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

Kawaguchi, Katsuhiko, to Tokyo Electric Co., Ltd. Paper loading device of printercu4,693,621, Cl. 400-636.100.

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Kawai, Masao: *See*—
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Kawakami, Kenji: *See*—
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Kawakami, Seiho: *See*—
Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, 4,693,813, Cl. 409-244.000.

Kawamoto, Minoru: *See*—
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Kawamura, Keiichi, to Fuji Photo Film Co., Ltd. Compensation circuit for pulse signalscu4,694,256, Cl. 328-120.000.

Kawamura, Masaharu; and Hiramatsu, Akira, to Canon Kabushiki Kaisha. Auxiliary light source for camera having automatic focusing devicecu4,693,582, Cl. 354-403.000.

Kawamura, Seijiro: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.

Kawamura, Toshimi; Yamada, Tadatoshi; Hani, Kiyoshi; and Yoshizaki, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Superconducting solenoid having alumina fiber insulatorcu4,694,268, Cl. 335-216.000.

Kawasaki Thermal Systems, Inc.: *See*—
Stephenson, Edgar O.; and Howe, Raymond C., 4,693,313, Cl. 165-102.000.

Kawasaki, Tsutomu: *See*—
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Kawazoe, Hiromitsu: *See*—
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Kawazoye, Yutaka: *See*—
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Kaysnuma, Nobuaki: *See*—
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Keem, John E.; Ovshinsky, Stanford R.; Flesas, Steven A.; Wood, James L.; Hart, Keith L.; and Sztabe, Lennard, to Ovonic Synthetic Materials Company, Inc. X-ray dispersive and reflective structures and method of making the structurescu4,693,933, Cl. 428-333.000.

Keesen, Heinz-Werner; Oberjatzas, Gunter; and Peters, Hartmut, to Telefunken Fernseh und Rundfunk GmbH. Digital data transmission methodcu4,694,336, Cl. 358-133.000.

Keijzer, Paulus P. M.: *See*—
Muijs, Herman M.; and Keijzer, Paulus P. M., 4,693,311, Cl. 166-272.000.

Keilhau, Karl F. Racket having rotatably adjustable handlecu4,693,475, Cl. 273-73.00J.

Kelco International Limited: *See*—
Clare, Kenneth; and Gibson, William, 4,693,728, Cl. 8-561.000.

Keller, Ernie: *See*—
Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, 4,693,659, Cl. 414-131.000.

Keller, James H. Camera supportcu4,693,575, Cl. 354-82.000.

Kellett, James H.; Gaddis, Raymond W.; Fritts, Robert W.; and Schoenecker, David L., to Douglas Battery Manufacturing Co. Storage battery housingcu4,693,949, Cl. 429-178.000.

Kelly, John C.; and Kentwell, Glenn W., to Unisearch Limited. Methods of steering and focusing ion and electron beamscu4,694,457, Cl. 372-2.000.

Kemmerer, Klemens; Gensheimer, Valentin; and Melzer, Rudolf, to M. A. N. Roland Druckmaschinen Aktiengesellschaft. Chain conveyor for the delivery device of printing presscu4,693,362, Cl. 198-803.700.

Kempf, Gerhard: *See*—
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Kenco Engineering Company: *See*—
Mills, Stephen K., 4,693,117, Cl. 73-326.000.

Kendall Company, The: *See*—
Bates, David, 4,693,712, Cl. 604-323.000.
Dye, John F., 4,693,707, Cl. 604-111.000.
Rosenberg, Helmut W. G., 4,693,703, Cl. 604-49.000.
Shah, Kishore R., 4,693,887, Cl. 424-19.000.

Kennametal, Inc.: *See*—
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Kennecott Corporation: *See*—
Boecker, Wolfgang D. G.; and Korzekwa, Tadeusz M., 4,693,988, Cl. 501-89.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., to Buddy L Corporation. Toy crash vehiclecu4,693,693, Cl. 446-6.000.

Kennette, John W.: *See*—
Buyofsky, Conrad C.; and Kennette, John W., 4,693,922, Cl. 428-134.000.

Kent, Roger S., to E.R.G. Management Services Pty., Ltd. Display membercu4,694,289, Cl. 340-815.050.

Kentwell, Glenn W.: *See*—
Kelly, John C.; and Kentwell, Glenn W., 4,694,457, Cl. 372-2.000.

Keogh, Raymond J.: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., 4,693,778, Cl. 156-361.000.

Kerdix, Inc.: *See*—
Muchnik, Boris J.; and Spong, Fred W., 4,694,358, Cl. 360-59.000.

Kerherve, Jean-Pierre; and Queromes, Armel, to Saint Gobain Vitrage. Method for preparing a dibutyl tin difluoride powder for coating a substratecu4,694,091, Cl. 556-104.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
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Kerttula, Reima: *See*—
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Key Bank N.A.: *See*—
Meagher, Donald J. R., 4,694,404, Cl. 364-518.000.

Khachikian, Harry. Spoileron control mechanismcu4,693,437, Cl. 244-225.000.

Kidde Recreation Products, Inc.: *See*—
Simonds, Gary; Jennings, Thomas P.; and Gallops, Henry, 4,693,228, Cl. 124-25.000.

Kikuchi, Kazuya; Komeda, Tadao; and Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Fabrication method of semiconductor devicecu4,693,782, Cl. 156-653.000.

Kikuchi, Mitsuo: *See*—
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Kikuchi, Osamu: *See*—
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Killip, Graham R.; Camp, Ronnie W.; and Orr, Clyde, Jr., to Micromeritics Instrument Co. Temperature controlling apparatus for use with pore volume and surface area analyzerscu4,693,124, Cl. 73-863.110.

Kim, Sun K. Sports shoe protectorcu4,693,019, Cl. 36-7.300.

Kimura, Mituo: *See*—
Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,693,927, Cl. 428-216.000.
Yanagihara, Kenji; Kimura, Mituo; Niinomi, Masahiro; Nishikawa, Yasuo; and Mukaida, Yoshito, 4,693,799, Cl. 204-165.000.

Kimura, Sakae; and Tanaka, Yasuhiro, to Kabushiki Kaisha Matsuyama Seisakusho. Support and drive unit for mirror devicescu4,693,571, Cl. 350-634.000.

Kinetico, Inc.: *See*—
Brown, Keith E., 4,693,814, Cl. 210-88.000.

King Jim Co., Ltd.: *See*—
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King, Patrick D., to Flo-Con Systems, Inc. Composite break ring for continuous castingcu4,693,296, Cl. 164-440.000.
King, William L.; and Weisbart, Charles K., to Samsonite Corporation. Combination garment bag and packing case luggage articlecu4,693,368, Cl. 206-287.100.
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Kiniwa, Hideaki, to Research Development Corp. of Japan. Adsorbentcu4,694,044, Cl. 525-178.000.
Kinjo, Hisao, to Victor Company of Japan. Recording medium for recording and/or reproducing apparatuscu4,694,365, Cl. 360-100.000.
Kinkel, Horst. Method for erecting a bridge superstructure of prestressed concrete and launching girder for performing the samecu4,692,955, Cl. 14-17.000.
Kinoshita, Katsuyuki, to Hamamatsu Photonics Kabushiki Kaisha. High-speed frame pick-up cameracu4,694,220, Cl. 315-10.000.
Kinoshita, Masaru: *See*—
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Kirst, Bertold; Beyer, Otto; and Lipp, Wolfgang, to Litef GmbH. Method and apparatus for aiming indirectly aimable weaponscu4,693,168, Cl. 89-41.110.
Kishi, Hiroyoshi; and Matsushima, Masaaki, to Canon Kabushiki Kaisha. Magnetooptical recording mediumcu4,693,943, Cl. 428-678.000.
Kishiro, Nobuo: *See*—
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Kitagawa, Katsuichi; and Tamura, Kouichi, to Toray Industries, Inc. Method and apparatus for determining position of points on articlecu4,693,608, Cl. 356-394.000.
Kitagawa, Masaru: *See*—
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Kitamura, Teruo: *See*—
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Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., to General Motors Corporation. Illuminated pushbutton switch with unitary spring and contactcu4,694,130, Cl. 200-314.000.
Kjeldsen, Ingomar. Three-dimensional duplicating milling machinecu4,693,645, Cl. 409-86.000.
Klees, Kevin J., to Eastman Kodak Company. Spatial filter useful for removing noise from video images and for preserving detail therein-cu4,694,342, Cl. 358-167.000.
Klein, Gerhard: *See*—
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Meier, Helmut-Martin; Dhein, Rolf; Winkel, Jens; Klein, Gerhard; and Kloker, Werner, 4,694,041, Cl. 525-25.000.
Klein, Michael T.; and Voss, Donald J., to Motorola, Inc. Phase-coherent demodulation clock and data recoverycu4,694,257, Cl. 329-50.000.
Klein, Robert A. Side facing backrest for boatscu4,693,204, Cl. 114-363.000.
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Klomp, Edward D., to General Motors Corporation. Air-assist fuel injection nozzlecu4,693,420, Cl. 239-87.000.
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Klusmier, Lawrence A., to Helix Technology Corporation. Oil cooled hermetic compressor used for helium servicecu4,693,736, Cl. 62-6.000.
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Knapp, Michael E., to American Woodwork Specialty Co., Inc. Decorative window assemblycu4,693,043, Cl. 52-211.000.
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Kobayashi, Hiroshi; Haruyama, Hideaki; and Hirose, Tsuguhiro, to Kabushiki Kaisha Toshiba. System for adjusting signal transmission timing in time-division multiplexing signal transmissioncu4,694,453, Cl. 370-85.000.
Kobayashi, Hisashi: *See*—
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Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Support for transmission shaft and hydraulic servo drumcu4,693,353, Cl. 192-85.0AA.
Kobayashi, Masahiro: *See*—
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Kobayashi, Shigeyoshi; Manabe, Tsuneo; and Yanagisawa, Ichiro, to Asahi Glass Company Ltd. Composition for staining materialcu4,693,748, Cl. 106-35.000.
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Kobayashi, Yutaka; and Suzuki, Takaya, to Hitachi, Ltd. Method of making devices in silicon, on insulator regrown by laser beamcu4,693,758, Cl. 437-174.000.
Kobrinetz, Anthony: *See*—
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Koetje, John R. Line connectorcu4,693,031, Cl. 43-44.910.
Koga, Keiichiro, to Kokusai Denshin Denwa Co., Ltd. Decoding method for multiple bit error correction BCH codecu4,694,455, Cl. 371-37.000.
Koga, Tadao: *See*—
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Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, to Oils Industry Co., Ltd. Method of manufacturing wound bush bearing with notch-free flange and mold assembly for manufacturing the samecu4,693,107, Cl. 72-354.000.
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Koichi, Komatsu: *See*—
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Koike, Eishi, to Ozen Corporation. Record disc replacing meanscu4,694,444, Cl. 369-65.000.
Koike, Eishi, to Ozen Corporation. Record disc replacing means for a selective playing type sound reproducing devicecu4,694,445, Cl. 369-65.000.
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Koike, Takaaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Turbine housing of turbochargercu4,693,668, Cl. 415-138.000.
Koishi, Musubu: *See*—
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Kondis, Tom. Aluminum particles resistant to reaction with watercu4,693,754, Cl. 106-290.000.
Kondo, Tetsuro; and Ueda, Tsuyoshi, to Mazda Motor Corporation. Vehicle body conveyance in assembly linecu4,693,358, Cl. 198-339.100.
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Konno, Kazuhiko: *See*—
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Kono, Toshiaki: *See*—
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Kordomenos, Panagiotis I.; and Dervan, Andrew H., to Du Pont de Nemours, E. I., and Company. Chip resistant coating composition IIIcu4,694,051, Cl. 525-437.000.
Korf Engineering GmbH: *See*—
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Korzekwa, Tadeusz M.: *See*—
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Koskimies, Salme: *See*—
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Kotzar, Joachim, to M.A.N.Maschinenfabrik Augsburg-Nurnberg AG. Magnetic bearing support gear traincu4,693,130, Cl. 74-397.000.
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Kovacs, Julius S. Bend following plumbers snakecu4,692,957, Cl. 15-104.3SN.
Kovacs, Lloyd, to Hayssen Manufacturing Company. Bag sealing barcu4,693,058, Cl. 53-552.000.
Kowalski, Joseph C.; Mottaz, Donald A.; and Cole, Berton A., to Boeing Company, The. Flexible, fire-resistant, decorative laminates and methods of manufacture thereofcu4,693,926, Cl. 428-204.000.
Koyama, Atsuo: *See*—
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Kozbor, Danuta; and Croce, Carlo M., to Wistar Institute, The. Human hybridroma fusion partner for production of human monoclonal antibodiescu4,693,975, Cl. 435-172.200.
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Krampe, Stephen E.; Moore, Cheryl L.; and Taylor, Charles W., to Minnesota Mining and Manufacturing Company. Macromer reinforced pressure sensitive skin adhesivecu4,693,776, Cl. 156-327.000.
Kraus, Charles E., to Excelermatic Inc. High-powered vehicle drive traincu4,693,134, Cl. 74-690.000.
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Krepski, Larry R.; Smith, Howell K., II; Rasmussen, Jerald K.; and Heilmann, Steven M., to Minnesota Mining and Manufacturing Company. Method of preparing N-acryloyl-α-amino acidscu4,694,103, Cl. 562-450.000.

Kristola, Osvald; and Korpela, Paavo, to ASEA Aktiebolag. Method and installation for fitting nuts to a workpiececu4,692,983, Cl. 29-432.000.

Krummenauer, Hans: *See*—
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Krutz, Gary W.; and Kruse, James W., to Outdoor Electronics, Ltd. Force detecting and indicating apparatus for fishing rodscu4,693,125, Cl. 73-862.390.

Kryder, Ralph W. Sports training apparatuscu4,693,570, Cl. 350-616.000.

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Kubota, Ltd.: *See*—
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Kuelnert, Egbert, to Hoechst Aktiengesellschaft. Control device and process for aligning an endless belt utilizing the control devicecu4,693,363, Cl. 198-807.000.

Kuhn S.A.: *See*—
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Kun, Andrew I.: *See*—
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Kunikawa, Norihide; Kondo, Tetsuya; Obba, Yasumasa; and Matsuoka, Michihiro, to Sharp Kabushiki. Method of controlling a stop position of an optical system in a copying machinecu4,693,595, Cl. 355-77.000.

Kuno, Akira: *See*—
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Kunugi, Yoshiro: *See*—
Suzuki, Shinichi; Tokuno, Akio; Kunugi, Yoshiro; and Kato, Masayuki, 4,694,498, Cl. 381-103.000.

Kuo, Richard J.; Mackay, John W.; and Van Buren, Rick L., to Minnesota Mining and Manufacturing Company. Smooth, low-friction magnetic recording mediumcu4,693,930, Cl. 428-323.000.

Kuper, Nina M.; and Kalnaja, Janis I. Decorative tilecu4,693,924, Cl. 428-170.000.

Kupper, Karl H., to U.S. Philips Corporation. Device for filtering a high-frequency conductor susceptible to electromagnetic interference of a high-frequency spacecu4,694,265, Cl. 333-185.000.

Kuramoto, Akio: *See*—
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Kuraray Co., Ltd.: *See*—
Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, 4,694,090, Cl. 548-407.000.

Kuribayashi, Tetsuzo: *See*—
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Kurihara, Kazumasa; and Arai, Kenji, to Diesel Kiki Co., Ltd. Automatic transmission system for vehiclescu4,693,142, Cl. 74-861.000.

Kuriwaki, Tetsuzo: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsuzo; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.

Kurlytis, Paul C.; and Carpenter, Clayton A. Exercise machine having pedals which extend radially against resistive meanscu4,693,468, Cl. 272-73.000.

Kuroda Precision Industries Ltd.: *See*—
Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, 4,693,454, Cl. 267-226.000.

Kuroda, Yuji: *See*—
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Kuroiwa, Yoso: *See*—
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Kuroki, Yoichi: *See*—
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Kurosaki Refractories Co., Ltd.: *See*—
Nishimura, Takahiro; and Ohsuna, Masao, 4,693,401, Cl. 222-607.000.

Kurpan, Vincent E., to Eastman Kodak Company. Patch generator for an electrophotographic devicecu4,693,592, Cl. 355-14.00E.

Kusaka, Teruo, to NEC Corporation. Thyristor having a controllable gate trigger currentcu4,694,319, Cl. 357-38.000.

Kusumoto, Akio: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.

Kusunoki, Shigeru: *See*—
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Kuwahara, Hideo: *See*—
Nakagawa, Hisato; Kuwahara, Hideo; Koyama, Atsuo; and Akatsuka, Mitsuo, 4,694,224, Cl. 315-177.000.

Kuwahara, Takao: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.

Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, to Kao Corporation; and Nippon Kokan Kabushiki Kaisha. Metal rolling oil compositionscu4,693,839, Cl. 252-51.50A.

Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, to Toyo Boseki Kabushiki Kaisha. Oriented polyester filmcu4,693,932, Cl. 428-323.000.

Kuznetsov, Stephen B.; and Nathenson, Richard D., to Westinghouse Electric Corp. Continuous metal casting apparatuscu4,693,299, Cl. 164-502.000.

Kvaternik, Billy J.: *See*—
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Kyoto, Machihisa: *See*—
Hoshikawa, Masao; Kyoto, Michihisa; Yano, Koji; and Tanaka, Gotaro, 4,693,738, Cl. 65-3.110.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Hirata, Tadashi; Mochida, Kenichi; Shiraki, Chihiro; and Sato, Kiyoshi, 4,694,001, Cl. 514-210.000.

Kyriakis, John. Non-contact temperature measurement of a static or moving targetcu4,693,615, Cl. 374-129.000.

Laakso, Oliver A. Digester having plural screens and means for controlling the liquid withdrawalcu4,693,785, Cl. 162-242.000.

Labelette Company: *See*—
Wesley, James G., 4,693,774, Cl. 156-215.000.

Laby, Jordan M.: *See*—
Henkin, Melvyn L.; and Laby, Jordan M., 4,692,950, Cl. 4-542.000.

LaCroix, Lloyd A. Scissor lift and transportcu4,693,660, Cl. 414-458.000.

Lagin, Herbert. Clothes hanging system and theft-proof shipping systemcu4,693,369, Cl. 206-290.000.

Lagow, Ralph J., to Thermal Engine Technology, Inc. Method of generating power from a vaporcu4,693,087, Cl. 60-670.000.

Lahm, George P., to Du Pont de Nemours, E. I., and Company. Insecticidal and acaricidal phenoxypyridinyl esters and intermediatescu4,694,013, Cl. 514-345.000.

Lahtinen, Leila: *See*—
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Laitram Corporation, The: *See*—
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Nikas, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Nikas, Andrew J.; Schue, Thomas J.; Gesodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.

Laloude, Albert. Refreshment cup holdercu4,693,440, Cl. 248-154.000.

Lamb, Owen L.; and Maclay, William R., to Slide Management Systems, Inc. Slide archival storage and retrieval systemcu4,693,373, Cl. 209-3.300.

Lamping, Alfons; and Karth, Beat, to Nyffeler Corti. Sterilization-resistant glass container sealed with an aluminum composite filmcu4,693,385, Cl. 215-232.000.

Land, John M., to Cook Paint and Varnish Company. Hybrid photocure systemcu4,694,029, Cl. 522-8.000.

Landin, Pedro: *See*—
Malloy, John C.; and Landin, Pedro, 4,693,025, Cl. 40-326.000.

Lane, Bruce B.; Westerkamp, Douglas F.; and Clifford, Peter P., to General Electric Company. Integral generator housing and base for a turbine generatorcu4,694,190, Cl. 290-52.000.

Lang, David J.; Layer, John C.; and Durtschi, William G., to Sundstrand Corporation. Clutch mechanismcu4,693,352, Cl. 192-70.270.

Lang, Hans-Jorg, to Ludwig Schwerdtel GmbH. Dosing devices for viscous materials particularly highly viscous materialscu4,693,397, Cl. 222-137.000.

Lang, Jack: *See*—
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Lange International S.A.: *See*—
Salas, Joseph; and Boix-Vives, Laurent, 4,693,020, Cl. 36-117.000.

Langford, Gordon B.: *See*—
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Langley, Robert; Stewart, John D.; and Walls, Arthur S., to Ciba-Geigy Corporation. Production of pigmentary copper phthalocyaninecu4,694,078, Cl. 540-141.000.

Languillat, Jean-Paul; Morel, Jean-Michel; and Queyrat, Jacques, to Lhomme S.A. Protective device and method for forming protective device and use of protective device as a package and apparatus for forming protective devicecu4,693,919, Cl. 428-36.000.

Lapeyre, James M., to Laitram Corporation, The. Mold and process for manufacturing helical shaped itemscu4,693,861, Cl. 264-328.100.

LaPointe, Virginia L. Shoulder belt cushioncu4,693,495, Cl. 280-804.000.

LaRocca, William J.; and Trush, David M., to Wickes Manufacturing Company. Manually operable gearshift mechanismcu4,693,135, Cl. 74-473.00R.

Laser Magnetic Storage International Company: *See*—
Carickhoff, Richard C.; Hemdal, Hakan O.; and Schultz, Alvin L., 4,694,259, Cl. 331-1.00A.

Laser Therapeutics, Inc.: *See*—
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Latge, Christian, to Commissariat a l'Energie Atomique. Cold trap for eliminating impurities from a polluted liquid metalcu4,693,088, Cl. 62-55.500.

Lane, Frank: *See*—
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Laurel Bank Machines Co., Ltd.: *See*—
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Lavely, Daniel, to Rockwell International Corporation. Rod actuator for automatic slack adjusting mechanismcu4,693,342, Cl. 188-79.50K.

Law, Kirk A.; and Harwood, Leopold A., to RCA Corporation. Vertical transition processor for a comb filtercu4,694,331, Cl. 358-31.000.

Layer, John C.: *See*—
Lang, David J.; Layer, John C.; and Durtschi, William G., 4,693,352, Cl. 192-70.270.

Lazcano-Navarro, Arturo; Alcantara, Miguel A.; and Hernandez-Ruiz, Jose E., to Instituto Mexicano De Investigaciones Siderurgicas. Device for the selective injection of an oxidizing gas or a carrier gas with or without carbonaceous material to a liquid metal bathcu4,693,274, Cl. 137-625.400.

Lear Siegler, Inc.: *See*—
Pierce, William C.; and Smith, John P., 4,693,486, Cl. 280-80.00R.

Le Beyec, Yvon; and Negra, Serge D., to Centre National de la Recherche Scientifique. Time-of-flight mass spectrometercu4,694,168, Cl. 250-287.000.

Lebrun, Jean-Jacques: *See*—
Porte, Huques; and Lebrun, Jean-Jacques, 4,694,060, Cl. 528-14.000.

Lederer, Edgar: *See*—
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Ledford, Hazen, Jr. Table saw attachment for cutting circlescu4,693,155, Cl. 83-410.000.

Lee, Anthony: *See*—
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.

Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., to Institute of Gas Technology. Treatment of solids in fluidized bed burnercu4,693,682, Cl. 432-15.000.

Lee, Cheng F. Wind-bellscu4,693,162, Cl. 84-404.000.

Lee, James N.: *See*—
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Lee, Robert A. S., to Electric Power Research Institute, Inc. Microprocessor-based control and diagnostic system for motor operated valvescu4,694,390, Cl. 364-165.000.

Lee, Robert L. Dental apparatus and method of usecu4,693,683, Cl. 433-37.000.

Lee, Roy, Jr. Method of and apparatus for straightening, swaging, and threading a pipecu4,693,105, Cl. 72-84.000.

Lefrancier, Pierre; Parant, Monique; Audibert, Francoise; Chedid, Louis; Choay, Jean; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche. Novel compounds of the muramyl peptidecu4,693,998, Cl. 514-62.000.

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Lehman, Michael E., to Monorail, Inc. Microprocessor based air inflation control systemcu4,694,409, Cl. 364-558.000.

Lehmann, Hans; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. (Acylthiopropyl)phenolscu4,694,096, Cl. 558-251.000.

Lecht, John L., to Motorola, Inc. Apparatus for dispensing solder pastecu4,693,209, Cl. 118-213.000.

Leistikow, Keith A.: *See*—
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Lenderman, Gary L., to Nalco Chemical Company. Method of utilizing paraffin inhibitorscu4,693,312, Cl. 166-279.000.

Lenney, William E., to Air Products and Chemicals, Inc. Pressure sensitive adhesives prepared by polymerization in the presence of ethoxylated acetylenic tertiary glycolcu4,694,056, Cl. 526-202.000.

Lentz, Gerhard: *See*—
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Lenz, Herman N.; and Chen, Allen G., to Teledyne Industries, Inc. Turbine inlet nozzle with cooling meanscu4,693,667, Cl. 415-115.000.

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Leonetti, Fred L.; Leonetti, Richard L.; and Leonetti, Frank A. Elastomeric coating removal processcu4,693,496, Cl. 283-102.000.

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Leonhard, Rolf: *See*—
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Leprevost, Leonardo. Closure appliance for use in connection with surgical ostomycu4,693,236, Cl. 128-1.00R.

Le Roux, Patrick, to Thomson-CGR. Process for the modulation of the speed effect of moving parts of a body in a nuclear magnetic resonance density measurement and performance of the process in order to deduce therefrom the speed of the moving parts in questioncu4,694,253, Cl. 324-309.000.

Les Explosifs Nordex Ltee/Nordex Explosives Ltd.: *See*—
Ross, Cyrus A.; and Thurow, Eberhard, 4,693,763, Cl. 149-8.000.

Les Industries Fortier Ltee: *See*—
Daigle, Clement; and Gonthier, Emile, 4,693,482, Cl. 277-207.00A.

Lescoe, Paul J.; and Scheffler, Charles E., to United States of America, Army. Fire suppression test apparatuscu4,693,320, Cl. 169-61.000.

Leser, Jacques, to Verrerie du Languedoc et Cie. Contactless inspection of objects with feedback to high speed manufacturing devicecu4,694,158, Cl. 250-223.00B.

Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, to Motorola, Inc. Trench formation processcu4,693,781, Cl. 156-643.000.

Leveille, Serge; Cormier, Jacqueline; Cormier, Ginette; and Brassard, Pierre. Abduction-preventing collarcu4,694,284, Cl. 340-574.000.

Le Viet, Toai, to Nestec S. A. Process and device for homogeneous microwave thermal treatment of liquid or solution in motioncu4,694,133, Cl. 219-10.55M.

Levitop Manufacturing Company, Inc.: *See*—
Campolo, Steve, 4,694,223, Cl. 315-118.000.

Lew, Hyok S.; and Stranahan, Michael. Symbiotic filter-sterilizercu4,694,179, Cl. 250-431.000.

Lewecke, Ernst; and Riesenberg, Manfred, to Lewecke Maschinenbau GmbH. Clamping arrangement for lumber elementscu4,693,458, Cl. 269-21.000.

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Lewis, Marvin C. Segmented boatcu4,693,203, Cl. 114-353.000.

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Liegl, Werner: *See*—
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Lillington, David R.; Mardesich, Nick; Dill, Hans G.; and Garlick, George F. J., to Spectrolab, Inc. Solar cell having improved front surface metallizationcu4,694,115, Cl. 136-256.000.

Lindmayer, Joseph, to Quantex Corporation. Dielectric for electroluminescent devices, and methods for makingcu4,693,906, Cl. 427-69.000.

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Lion Corporation: *See*—
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Litef GmbH: *See*—
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DiMeo, Frank N., 4,693,505, Cl. 294-119.100.

Liu, Yiu C. Microwave oven turntable with removable table topcu4,694,132, Cl. 219-10.55F.

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Lobley, David M., to Wargo, Andrew J. Glassworking scroll chuck with interchangeable jawscu4,693,148, Cl. 82-40.00R.

Locatelli, Lorenzo, to Meadan S.p.A. Mixing head for equipment for joining textile threads with the aid of compressed aircu4,693,067, Cl. 57-22.000.

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Lock, Brian E.; and Wojnar, Jeffrey S., to RCA Corporation. Fluid filling apparatuscu4,693,286, Cl. 141-61.000.
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Lodge, Edith M., to Gates Rubber Company, The. Floating hanger merchandise rack and methodcu4,693,381, Cl. 211-94.000.
Loev, Bernard; Chan, Wan-kit; and Jones, Howard, to USV Pharmaceutical Corporation. Alpha-alkyl polyolefinic carboxylic acids and derivatives thereof useful in the treatment of psoriasis and allergic responsescu4,694,023, Cl. 514-559.000.
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Lohnherr, Ludger, to Krupp Polysius Ag. Siftercu4,693,811, Cl. 209-139.200.
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Looser, Gottlieb. Cutting devicecu4,693,157, Cl. 83-431.000.
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Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Float switch construction for monitoring liquid levelscu4,694,128, Cl. 200-84.00R.
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Matchett, Robert W., to Fibredyne, Inc. Liquid filtercu4,693,823, Cl. 210-266.000.
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Matiere, Marcel. Method of producing hollow structures and hollow structurescu4,693,635, Cl. 405-132.000.
Matney, Earl G., to Tektronix, Inc. Measurement of SC/H phase using a polar displaycu4,694,324, Cl. 358-10.000.
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Mattison, Robert N. Illuminated fishing lurecu4,693,032, Cl. 43-17.600.

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McCaughan, James S., Jr., to Laser Therapeutics, Inc. Apparatus for producing a spherical pattern of light and method of manufacturecu4,693,556, Cl. 350-320.000.

McCole, Thomas P., to Polaroid Corporation. Self-developing integral film unitcu4,693,963, Cl. 430-499.000.

McCool, George W., to Sherwood Medical Company. Tube and fitting assembly and method of making samecu4,693,710, Cl. 604-283.000.

McCutchan, Thomas F.; and Wistar, Richard, Jr., to United States of America, Health and Human Services. Protective synthetic peptide against malaria and encoding genecu4,693,994, Cl. 514-15.000.

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McKernan, Thomas J.; and Wilcockson, Brian, to Haworth, Inc. Method of forming housing for free-standing cabinetcu4,692,984, Cl. 29-445.000.

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McNeil, Gary L., to Roto-Finish Company, Inc. Multistage finishing device and methodcu4,693,037, Cl. 51-163.200.

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Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, 4,693,898, Cl. 426-19.000.

Meili, Ernst; and Rimmele, Karl, to MECAPEC S.A. Method and apparatus including a cushion of pulverulent magnetic material for stray field magnetic testing of ferromagnetic partscu4,694,247, Cl. 324-216.000.

Meininger, Fritz; Mischke, Peter; Konig, Gerd; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Process for dyeing or printing cellulose fibers or cellulose blend fibers with pyridinium-triazine reactive dye, exable without alkalicu4,693,726, Cl. 8-547.000.

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Meith, Hugo C.; and McHugh, Stanley A., to Energy Technology, Inc. Air preheater systemcu4,693,233, Cl. 126-117.000.

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Meno, Frank, to University of Pittsburgh. Vector electrosic control devicecu4,694,279, Cl. 340-347.00P.

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Mercer, Sarah P. Brake line coupler lockcu4,693,096, Cl. 70-14.000.

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Amy, A. Andre ; and Babineaux, Jules, 4,693,102, Cl. 72-53.000.

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Brown, Vincent B.; and McGrew, Sherman W., 4,693,550, Cl. 350-96.200.

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Andra, Rainer, 4,693,455, Cl. 267-140.100.

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Michelson, Paul E. Intraocular lens formed in situ within the eyecu4,693,717, Cl. 623-6.000.

Mickelson, Nils P.; and MacFarlane, Jerauld C., to GTE Products Corporation. Distributing frame for telecommunications circuitscu4,694,488, Cl. 379-327.000.

Mickiewicz, Stanley P.; and Coombes, Alan, to Codman & Shurtleff, Inc. Transcutaneous nerve stimulation device using a common controller for pulse production and parameter displaycu4,693,254, Cl. 128-421.000.

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Auth, Gerald L., 4,693,603, Cl. 356-346.000.

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Diekemper, Erwin; and Kastrup, Dieter, 4,694,148, Cl. 235-468.000.

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Miles Laboratories, Inc.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.

Millay, Lawrence L., to Ex-Cell-O Corporation. Hollow tool exchanging mechanism for a machine toolcu4,692,990, Cl. 29-568.000.

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Yamaki, Toshio; Mukai, Hiromu; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,693,581, Cl. 354-400.000.

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Mishina, Kazuhiro, to Matsushita Electric Works, Ltd. Temperature compensated electro-optical light transmission circuit for use in a position detectorcu4,694,157, Cl. 250-214.00C.

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Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, 4,694,116, Cl. 136-256.000.

Misselbrook, John: *See*—
Shulver, Roderick L.; Misselbrook, John; and Standen, Robert, 4,692,988, Cl. 29-458.000.

Mita Industrial Co., Ltd.: *See*—
Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, 4,693,586, Cl. 355-3.0SH.

Mitchell, Gary A.; Jaffe, Gerald E.; and Solorzano, Marilyn M., to Coulter Electronics, Inc. Water soluble xanthylium derivatives substratescu4,694,070, Cl. 530-329.000.

Mitchell, James W.: *See*—
Bentle, Larry A.; Mitchell, James W.; Storrs, Stephen B.; and Shimamoto, Grant T., 4,694,073, Cl. 530-399.000.

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Reesor, Gordon J.; Beirne, Patrick R.; and Styrna, Zbigniew B., 4,694,482, Cl. 379-27.000.

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Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, 4,693,879, Cl. 423-461.000.

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Kawamura, Toshimi; Yamada, Tadatoshi; Hani, Kiyoshi; and Yoshizaki, Kiyoshi, 4,694,268, Cl. 335-216.000.
Miyatake, Hideshi; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, 4,694,432, Cl. 365-203.000.
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Terada, Yasushi; and Nakayama, Takeshi, 4,694,314, Cl. 357-23.600.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Arakawa, Satoshi, 4,693,880, Cl. 423-515.000.
Kosaka, Tsuneo; and Sakai, Yukio, 4,694,089, Cl. 549-239.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Sugisawa, Taijiro; and Nishiyama, Akio, 4,693,944, Cl. 428-698.000.
Tsujimura, Osamu; Saito, Takayoshi; and Arai, Tatsuo, 4,693,641, Cl. 407-42.000.

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Mitsubishi Rayon Company Ltd.: *See*—
Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; and Yamamoto, Takashi, 4,693,553, Cl. 350-96.340.

Mitsubishi Yuka Fine Chemicals Co., Ltd.: *See*—
Ooninhi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,694,102, Cl. 562-426.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Shigemoto, Hiromi; Yamamoto, Akio; and Suzuki, Iwatoshi, 4,693,677, Cl. 425-376.00R.

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Hirose, Sumio; Naruse, Isao; and Matsuyama, Akio, 4,694,052, Cl. 525-454.000.
Takenaka, Shinji; and Oi, Ryu, 4,694,110, Cl. 568-638.000.

Mittelmann, Gerhard, to Swiss Aluminium Ltd. Rectangular parallelpiped arrangement of two cases for air travelcu4,693,345, Cl. 190-108.000.

Miura, Kazuhiko; Hattori, Tadashi; Iwasaki, Yukio; Kohama, Tokio; and Kanehara, Kenji, to Nippon Soken, Inc. Semiconductor-chip gas-flow measuring apparatuscu4,693,116, Cl. 73-204.000.

Miyagawa, Ryuji: *See*—
Takahata, Yasuyo; and Miyagawa, Ryuji, 4,694,092, Cl. 556-400.000.

Miyahara, Junji: *See*—
Hosoi, Yuichi; Mori, Nobufumi; Takahashi, Kenji; and Miyahara, Junji, 4,694,171, Cl. 250-311.000.

Miyahara, Tsuneo; Harada, Yoshihiro; Futakami, Katsuyuki; Nishida, Yasukuni; and Konishi, Ryoko, to Lion Corporation. Caries-preventive compositioncu4,693,888, Cl. 424-49.000.

Miyake, Toshifumi: *See*—
Azegami, Osamu; and Miyake, Toshifumi, 4,693,378, Cl. 209-144.000.

Miyamoto, Junichi; and Tsujimoto, Jun-ichi, to Kabushiki Kaisha Toshiba. Programmable semiconductor memory device with combined sense amplification and programming capabilitycu4,694,427, Cl. 365-185.000.

Miyamura, Tamio; and Ohkawa, Takashi, to Fujitsu Limited. Semiconductor memory device with increased adaptabilitycu4,694,431, Cl. 365-189.000.

Miyasaka, Tetsuo, to Olympuis Optical Co., Ltd. Diaphragm controller for cameras in which the diaphragm opening is selected in accordance with a preprogrammed characteristiccu4,693,584, Cl. 354-446.000.

Miyashita, Yukio: *See*—
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Miyata, Hiroshi; and Katoh, Shinji, to Toyota Jidosha Kabushiki Kaisha. Electric control apparatus for power steering systemcu4,693,332, Cl. 180-142.000.

Miyata, Jun: *See*—
Shimizu, Tsutomu; Miyata, Jun; and Yagii, Koji, 4,693,942, Cl. 428-614.000.

Miyatake, Hideshi; Fujishima, Kazuyasu; and Shimotori, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory devicecu4,694,432, Cl. 365-203.000.

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O'Connell, James P.; Hoke, Randal A.; and Mize, Patrick D., 4,693,970, Cl. 435-7.000.

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Sehr, Willibald, 4,693,598, Cl. 356-4.000.

Mobil Oil Corporation: *See*—
Baugh, Benton F.; and Panicker, Narayana N., 4,693,498, Cl. 285-39.000.
Chu, Yung-Feng; and Vartuli, James C., 4,694,114, Cl. 585-481.000.
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Mochizuki, Hiroyuki: *See*—
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Molex Incorporated: *See*—
Colleran, Stephen A.; and Lenz, William R., 4,693,532, Cl. 439-594.000.
Colleran, Stephen A.; and Doles, Connie, 4,693,536, Cl. 439-404.000.

Molinari, Claudio, to UNIMAC S.r.l. Shaped pasta productscu4,693,900, Cl. 426-128.000.

Moll, Helmut, to Scientific Drilling International. Well information telemetry by variation of mud flow ratecu4,694,439, Cl. 367-83.000.

Molter, Michael: *See*—
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Monarch Marking Systems, Inc.: *See*—
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Monell Chemical Senses Center: *See*—
Johnsen, Peter B.; and Adams, Michael A., 4,693,897, Cl. 426-2.000.

Moniwa, Masahiro; Warabisako, Terunori; and Sunami, Hideo, to Hitachi, Ltd. Process for manufacturing semiconductor devices containing microbridgescu4,692,994, Cl. 437-40.000.

Monorail, Inc.: *See*—
Lehman, Michael E., 4,694,409, Cl. 364-558.000.

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Miller, William H.; and Taylor, William D., 4,694,081, Cl. 544-384.000.
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Monson, Clifford L. Rotary cleaner/scrubber mechanismcu4,692,959, Cl. 15-320.000.

Montagu, Jean I., to General Scanning, Inc. Magnetic preloading of actuator bearingscu4,694,212, Cl. 310-90.000.

Mood, Geoffrey I.: *See*—
Wayman, Malcolm; and Mood, Geoffrey I., 4,693,404, Cl. 225-103.000.

Mookherjee, Braja D.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

Moore, Albert L., to Du Pont de Nemours, E. I., and Company. Base resistant fluoroelastomerscu4,694,045, Cl. 525-276.000.

Moore, C. Gregg: *See*—
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Moore, Cheryl L.: *See*—
Krampe, Stephen E.; Moore, Cheryl L.; and Taylor, Charles W., 4,693,776, Cl. 156-327.000.

Moosmuller, Helmut. Binding mechanism for perforated paperscu4,693,624, Cl. 402-22.000.

Mordorski, Carol J., to Zimpro Inc. Process for protection of biological nitrification systemscu4,693,827, Cl. 210-614.000.

Moreau, Jean-Frederic, to Revetements De Couvin. Method for lining a base with a continuous granulate layer and equipment for the working of this methodcu4,693,911, Cl. 427-196.000.

Morel, Didier: *See*—
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Morel, Jean-Michel: *See*—
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Moreland, Charles E.: *See*—
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Mori, Hiroshi. Process for manufacturing a single piece aluminum alloy wheel rim for vehicle tirescu4,693,104, Cl. 72-68.000.

Mori, Hiroshi, to Sony Corporation. Electrochromic display devicecu4,693,564, Cl. 350-357.000.

Mori, Nobufumi: *See*—
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Mori, Toshiyuki, to Disco Abrasive Systems, Ltd. Semiconductor wafer surface grinding apparatuscu4,693,036, Cl. 51-131.300.

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Morino, Ronald: *See*—
Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., 4,693,778, Cl. 156-361.000.

Morino, Tetsuro; and Yamashita, Shigeki, to Fuji Xerox Co., Ltd. Method and apparatus for printing imagecu4,694,303, Cl. 346-1.100.

Morise, Hiroshi: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmiza, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.

Morita, Hideyo; Akagawa, Tomohiko; and Kita, Yasuo, to Ube Industries, Ltd. Surface treated-glass fiber-reinforced polypropylene compositioncu4,694,031, Cl. 523-203.000.

Morita, Ichiro; Taika, Tadao; and Nakamura, Hidehiro, to Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd. Thermoplastic elastomer compositioncu4,694,049, Cl. 525-440.000.

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Morita, Koji: *See*—
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Morita, Masahiro: *See*—
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Morita, Yasukazu, to Hitachi, Ltd. Cathode ray tube including white luminous phosphor screencu4,694,217, Cl. 313-468.000.

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Moritugu, Mitiyasu: *See*—
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Morrell, Albert M., to RCA Corporation. Cathode-ray tube having an internal magnetic shieldcu4,694,216, Cl. 313-402.000.

Morrison, Elbert F., to Burlington Industries, Inc. Vacuum texturizing processcu4,693,071, Cl. 57-289.000.

Moshtev, Rafail V.; Manev, Veselin G.; and Puresheva, Bogdana L., to Zlehit pri Ban. Secondary lithium cellcu4,693,950, Cl. 429-194.000.

Mosley, Joseph M.: *See*—
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Atkinson, Frederick G.; Kobrinetz, Anthony; and Menich, Barry J., 4,694,484, Cl. 379-59.000.
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Klein, Michael T.; and Voss, Donald J., 4,694,257, Cl. 329-50.000.
Leicht, John L., 4,693,209, Cl. 118-213.000.
Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, 4,693,781, Cl. 156-643.000.
McRoberts, Louis A.; and Felix, Arthur, Jr., 4,694,300, Cl. 342-195.000.
Peterson, John L.; and Swapp, Mavin, 4,694,242, Cl. 324-73.00R.

Motta, Vincent C.; and Ferraro, Frank A., to Warner Lambert Company. Razor cartridge with shaving aidcu4,692,986, Cl. 29-451.000.

Mottaz, Donald A.: *See*—
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Mottus, Edward H.; Hedrick, Ross M.; and Silverman, Bernard, to DSM Rim Nylon V.O.F. Stabilized lactam polymerization solutioncu4,694,039, Cl. 524-718.000.

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Mountain Computer, Inc.: *See*—
Burke, Ken V.; Jamieson, Jon V.; and Keller, Ernie, 4,693,659, Cl. 414-131.000.

Moy, Howard; Thomas, James R.; and Droske, Donald J., to General Motors Corporation. Convertible topcu4,693,509, Cl. 296-201.000.

Mross, Wolf D.: *See*—
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MTA Kozponti Fizikai Kutato Intezete: *See*—
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MTU-Motoren und Turbinen-Union Friedrichshafen GmbH: *See*—
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MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
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Muchnik, Boris J.; and Spong, Fred W., to Kerdix, Inc. Magneto-optic recording structure and methodcu4,694,358, Cl. 360-59.000.

Mueller, Berthold: *See*—
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Mues, Peter; Buysch, Hans-Josef; Brassat, Bert; and Heine, Heinrich, to Bayer Aktiengesellschaft. Process for the production of duromeric aliphatic polycarbonatescu4,694,065, Cl. 528-371.000.

Mui, Shou Y., to Signatron, Inc. Modem for use in multipath communication systemscu4,694,467, Cl. 375-1.000.

Muijs, Herman M.; and Keijzer, Paulus P. M., to Shell Internationale Maatschappij, B.V. Steam foam processcu4,693,311, Cl. 166-272.000.

Mukai, Hiromu: *See*—
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Musacchio, Jose M.; and Tortella, Frank C., to New York University. Anticonvulsant compositions and methodcu4,694,010, Cl. 514-304.000.

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Myohl, Jochim: *See*—
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Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, to General Motors Corporation. Method and apparatus for monitoring and controlling resistance spot weldingcu4,694,135, Cl. 219-110.000.

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Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, to Fujisawa Pharmaceutical Co., Ltd. Semicarbazide derivatives, processes for preparation thereof and pharmaceutical composition comprising the samecu4,694,004, Cl. 514-228.000.

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Nakajima, Sadahiro; and Toratani, Hisayoshi, to Hoya Corporation. Process for producing porous antireflective coatingcu4,693,910, Cl. 427-168.000.

Nakajima, Tadakatsu: *See*—
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Nakajima, Yuji; and Yamamoto, Akito, to Nissan Motor Company, Limited. Engine control systemcu4,693,221, Cl. 123-425.000.

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Nakane, Hisashi: *See*—
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Nakanishi, Susumu; and Nagakura, Isao, to Pfizer Inc. 2H-1,2-benzothiazine derivativescu4,694,080, Cl. 544-49.000.

Nakano, Hiroshi: *See*—
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Nakashima, Shigeo: *See*—
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Nakatomi, Yasuo; Hara, Katsuhiko; Umeda, Fumio; Kono, Toshiaki; and Niimoto, Hisashi, to Oriental Yeast Co., Ltd.; and Meiji Seika Kaisha, Ltd. Novel baker's yeast and process for making breadcu4,693,898, Cl. 426-19.000.

Nakatuka, Michie: *See*—
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Nakaya, Keiichi; and Tanaka, Kunio, to Asahi Glass Company Ltd. Process for producing highly pure magnesium hydroxidecu4,693,872, Cl. 423-164.000.

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Nakayama, Takeshi: *See*—
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Nakayama, Wataru; Hirasawa, Shigeki; and Nakajima, Tadakatsu, to Hitachi, Ltd. Apparatus for cooling integrated circuit chipscu4,694,378, Cl. 361-385.000.

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Nandy, Samir K.: *See*—
Uarug, Konstanty F.; Thompson, Edward D.; and Nandy, Samir K., 4,693,638, Cl. 405-259.000.

Nanjo, Toshio; and Tomizawa, Fumio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for automatically charging scrap into an arc furnacecu4,694,465, Cl. 373-81.000.

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Nash, Judith E. M.: *See*—
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National Can Corporation: *See*—
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Traczyk, Edward S.; and Shulski, Michael M., 4,693,108, Cl. 72-370.000.

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Almond, Jeffrey W.; Minor, Phillip D.; Evans, David M. A.; and Schild, Geoffrey C., 4,694,071, Cl. 530-329.000.
Davies, Graham A.; and Mavituna, Ferda, 4,693,983, Cl. 435-284.000.
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Margulis, Walter; Sibbett, Wilson; and Sleat, William E., 4,693,599, Cl. 356-121.000.

National Semiconductor Corporation: *See*—
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Navarro, Vicente N. Component elements for building furniturecu4,693,524, Cl. 312-140.000.

Navikas, Vincent J.: *See*—
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NCR Corporation: *See*—
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NEC Corporation: *See*—
Kuzaka, Terao, 4,694,319, Cl. 357-38.000.
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Nishijima, Kazunori; and Sugawara, Mitsutoshi, 4,694,204, Cl. 307-494.000.
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Takahashi, Akinori, 4,694,277, Cl. 340-347.0NT.
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Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, to Roussel Uclaf. Novel 7-hydroxy-indolescu4,694,011, Cl. 514-323.000.

Nee, Victor W. Ceiling fancu4,693,673, Cl. 416-199.000.

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Nelson, David A.: *See*—
James, Brian R.; Li-Lee, Chung; Lilga, Michael A.; and Nelson, David A., 4,693,875, Cl. 423-243.000.

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Neubauer, Walter, to Linsinger Machinenbau Gesellschaft mbH. Process and apparatus for profiling rod-like workpiecescu4,692,989, Cl. 29-558.000.

Neuer, Andreas: *See*—
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Neumann, Gerhard; and Ramisch, Hans, to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate. Method of manufacturing contact spring procedurecu4,693,002, Cl. 29-882.000.

New England Institute of Comparative Medicine: *See*—
Tashjian, Robert J.; and Moreland, Charles E., 4,694,481, Cl. 178-198.000.

New Holland Inc.: *See*—
Koch, Earl E.; and Voler, Franja F., 4,693,061, Cl. 56-13.600.

New York University: *See*—
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Newell Co.: *See*—
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Newman, Daniel A.: *See*—
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Newman, Paul, to Horizon Exploration Limited. Underwater seismic testingcu4,693,336, Cl. 181-111.000.

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Niada, Riccardo: *See*—
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Nikas, Marilyn J.; Polito, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Nikas, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., to EL-TECH Systems Corporation. Battery with modular air cathode and anode cagecu4,693,946, Cl. 429-27.000.

Nilson, Hans-Ove, to AB Volvo. Regulator means for use in heat pipescu4,693,306, Cl. 165-104.210.

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Nippon Chemical Industrial Co., Ltd.: *See*—
Kariya, Akinori; Nabekawa, Shukichi; Hara, Yoshifuse; and Taguchi, Junji, 4,694,095, Cl. 558-186.000.

Nippon Flute, Co.: *See*—
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Kokan Kabushiki Kaisha: *See*—
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Nippondenso Co., Ltd.: *See*—
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Nishida, Kozi: *See*—
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Nishijima, Kazunori; and Sugawara, Mitsutoshi, to NEC Corporation. Transistor circuit for signal multipliercu4,694,204, Cl. 307-494.000.

Nishikawa, Masao; Sakurai, Yoshimi; Aoki, Takashi; and Sato, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Lock-up control device for torque converter in automatic transmission for vehiclecu4,693,347, Cl. 192-3.300.

Nishikawa, Yasuo; Okita, Tsutomu; Mukaida, Yoshito; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, to Fuji Photo Film Company Limited. Magnetic recording medium and process for producing the samecu4,693,927, Cl. 428-216.000.

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Nishimatsu, Masaharu; Arioka, Hiroyuki; and Ishizaki, Hideki, to TDK Corporation. Magnetic recording medium for image recordingcu4,693,934, Cl. 428-336.000.

Nishimura, Tadashi; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Inoue, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Zone melting apparatus for monocrystallizing semiconductor layer on insulator layercu4,694,143, Cl. 219-388.000.

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Nishiyama, Yukinori: *See*—
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Kasai, Junichi; Imai, Hiroshi; and Tsuda, Hiroshi, 4,694,497, Cl. 381-63.000.
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Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam scanning apparatuscu4,694,164, Cl. 250-234.000.

Noguchi, Takashi; Hayashi, Hisao; and Ohshima, Takefumi, to Sony Corporation. Method of forming a thin semiconductor filmcu4,693,759, Cl. 437-24.000.

Noguchi, Yasushi: *See*—
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North American Agricultural, Inc.: *See*—
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North American Philips Corporation: *See*—
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Orbons, Wilhelmus H. M., 4,693,585, Cl. 355-3.0FU.
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O'Connell, James P.; Hoke, Randal A.; and Mize, Patrick D., to Becton, Dickinson and Company. Immunoassay using complementcu4,693,970, Cl. 435-7.000.
Oda, Eiji, to NEC Corporation. Buried channel charge coupled devicecu4,694,476, Cl. 377-58.000.
Oda, Hajime: *See*—
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Odgers, Irving L.: *See*—
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O'Donnell, John B., to Rorer Pharmaceutical Corporation. Mandrel for opening a tube of flexible materialcu4,693,059, Cl. 53-567.000.
O'Donnell, Philip P.: *See*—
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Oehler, Henry; Peth, Norbert; Holpp, Hans W.; and Sass, Wolfgang, to Gebr. Steimel. Centrifuging installationcu4,693,017, Cl. 34-58.000.
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brummueller, Fritz; and Schneider, Rolf, to BASF Aktiengesellschaft. Cleavage of formamide to give hydrocyanic acid and watercu4,693,877, Cl. 423-373.000.
Oellers, Dieter, to W. Schlafhorst & Co. Compressed air thread splicing devicecu4,693,066, Cl. 57-22.000.
Oetiker, Hans. Pipe connectioncu4,693,502, Cl. 285-334.500.
Oettgen, Herbert F.: *See*—
Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.
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Bradbury, Colin; and Douglas, George H., 4,694,405, Cl. 364-518.000.
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Slodzian, Georges; Daigne, Bernard; and Girard, Francois, 4,694,170, Cl. 250-309.000.
Offner, Abe, to Perkin-Elmer Corporation, The. Method and apparatus for optical system adjustmentscu4,693,569, Cl. 350-505.000.
Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Article coated with copolymer of poly(vinyl alcohol)cu4,693,939, Cl. 428-421.000.
Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol)-cu4,694,037, Cl. 524-557.000.
Ogami, Nobutoshi; and Kitagawa, Masaru, to Dainippon Screen Mfg. Co., Ltd. Surface treatment apparatuscu4,693,211, Cl. 118-725.000.
Ogawa, Takashi. Auxiliary instrument for stretching and softening exercisescu4,693,470, Cl. 272-96.000.
Ogawa, Tetsu, to Canon Denshi Kabushiki Kaisha. Interface system which selectively provides impedance matching between a host computer and a control circuitcu4,694,421, Cl. 364-900.000.
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, to Kanto Ishi Pharmaceutical Co., Ltd.; and Rikagaku Kenkyusho. Sialic acid derivativescu4,694,076, Cl. 536-17.200.
Ogden, Joan M., to RCA Corporation. Fractal generation, as for video graphic displayscu4,694,407, Cl. 364-518.000.
Ogihara, Masao; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, to Seikosha Co., Ltd. Programmable shuttercu4,693,583, Cl. 354-439.000.
Ogita, Sachio, to Sumitomo Bakelite Company Limited; and Ogita, Sachio. Cervical canal cathetercu4,693,704, Cl. 604-55.000.
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Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, 4,693,951, Cl. 430-31.000.
Ogura, Koji; and Sobue, Hideo, to NGK Spark Plug Co., Ltd. Underwater acoustic wave transmitting and receiving unitcu4,694,440, Cl. 367-152.000.
Ogusu, Mikio: *See*—
Tamaru, Takuya; and Ogusu, Mikio, 4,694,448, Cl. 369-291.000.
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Varma, Vijaya K.; Winans, Esther D.; O'Halloran, Rosemary; and Brewster, Phillip W., 4,693,838, Cl. 252-51.50R.
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Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, 4,694,053, Cl. 526-74.000.
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Kamei, Eiichi; Namba, Hideaki; and Ohba, Masahiro, 4,693,485, Cl. 280-6.000.
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Miyamura, Tamio; and Ohkawa, Takashi, 4,694,431, Cl. 365-189.000.
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McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.
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Ohmizu, Akimasa: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.
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Ohnuma, Masao: *See*—
Nishimura, Takahiro; and Ohnuma, Masao, 4,693,401, Cl. 222-607.000.
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Morimoto, Hiroshi; and Ohura, Akio, 4,694,086, Cl. 564-236.000.
Ohyama, Masao; Yamamoto, Yoshinori; Horikawa, Kenichi; and Kawakami, Kenji, to Sony Corporation. Tape cassette with concave engagement portion and player with hook engageable therewithcu4,694,360, Cl. 360-96.500.
Ohyauchi, Hideo; Amano, Yoshiaki; and Yokoyama, Eiji, to Hitachi, Ltd. Power generator containing fuel cellcu4,693,945, Cl. 429-21.000.
OI Forest Products STS Inc.: *See*—
Snyder, Teddy R., 4,693,411, Cl. 229-23.00R.
Oi, Ryu: *See*—
Takenaka, Shinji; and Oi, Ryu, 4,694,110, Cl. 568-638.000.
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Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,693,107, Cl. 72-354.000.
Oishi, Kengo: *See*—
Ommori, Shozo; and Oishi, Kengo, 4,694,370, Cl. 360-133.000.
Oka, Yosio, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission apparatus for vehiclescu4,693,333, Cl. 180-233.000.
Okabe, Takahiro: *See*—
Washio, Katsuyoshi; Hayashi, Makoto; Watanabe, Tomoyuki; Okabe, Takahiro; and Norisuye, Katuhiro, 4,694,321, Cl. 357-48.000.
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Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.
Okada, Yoshikatsu, to NEC Corporation. Liquid cooling module with springy contact elements and an aperture plate slidable thereovercu4,693,303, Cl. 165-80.400.
Okami, Yuji: *See*—
Kuwamoto, Hiroshi; Iwadoo, Shuichi; Okami, Yuji; Nagamori, Hiroyuki; and Nakagawa, Yasuhiro, 4,693,839, Cl. 252-51.50A.
Okamoto, Tadashi; Shimoyama, Kazuhiko; Yamaoka, Hiromasa; and Takakura, Mitsuro, to Hitachi, Ltd. Programmable controller with direct to plant addressingcu4,694,419, Cl. 364-900.000.
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Itou, Hiroshi; Okane, Yukihiro; and Kuramoto, Akio, 4,693,222, Cl. 123-432.000.
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Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.
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Etoh, Hiroshi, 4,694,473, Cl. 375-116.000.
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Yamasaki, Tetsuya; and Okuda, Eiji, 4,693,544, Cl. 350-96.160.
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Ukai, Mikio; and Okumoto, Ryouji, 4,693,484, Cl. 277-212.0FB.
Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Continuous cigarette rod cutting apparatus for a cigarette making machinecu4,693,260, Cl. 131-84.100.
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Goronszy, Mervyn C.; and Olavarria, Raul, 4,693,821, Cl. 210-241.000.
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Houghton, Alan N.; Brooks, Hannah; Cote, Richard J.; Oettgen, Herbert F.; and Old, Lloyd J., 4,693,966, Cl. 435-7.000.
Olsen, Peter C., Jr.; Conforto, Peter M.; Wolf, David L.; and Hudson, Donald R., to Manville Corporation. Method and apparatus for feeding containers to a carrier sleevecu4,693,055, Cl. 53-443.000.
Olson, Dean A., II, to Rockford Acromatic Products Co. Composite roller for the tripod of a free-plunging constant velocity universal jointcu4,693,698, Cl. 464-111.000.
Olsoni, Yrjo : *See*—
Antikainen, Jorma; Olsoni, Yrjo ; and Valimaki, Pentti, 4,693,360, Cl. 198-509.000.
Olson, Billy E., to AMP Incorporated. Circuit board switch having improved switch springcu4,694,129, Cl. 200-68.200.
Olvera, Armando C. Table saw accessorycu4,693,156, Cl. 83-422.000.
Olympus Optical Co., Ltd.: *See*—
Imaizumi, Masaki, 4,693,566, Cl. 350-427.000.
Takahashi, Susumu, 4,693,568, Cl. 350-469.000.
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Miyasaka, Tetsuo, 4,693,584, Cl. 354-446.000.
Omachen, Ludwig; and Janson, Stephen. Release means for sailboard footstrapscu4,693,199, Cl. 114-39.000.
O'Mara, Raymond D.; and Shapiro, Ian M., to Carrier Corporation. Condensate disposal systemcu4,693,091, Cl. 62-272.000.
Ommori, Shozo; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic disk cartridgecu4,694,370, Cl. 360-133.000.
Omori, Shigeru. Anti-theft device for vehicle wheels (geared oval nut)cu4,693,655, Cl. 411-429.000.
Omori, Tomohiro: *See*—
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Omron Tateisi Electronics Co.: *See*—
Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, 4,694,418, Cl. 364-807.000.
O'Neill, Ronan R., to W. R. Grace & Co., Cryovac Div. Taped bag chain with cassettecu4,693,372, Cl. 206-554.000.
Ono, Kenichi: *See*—
Haraguchi, Eiji; Nakagawa, Hiroto; Bando, Akira; Kuwahara, Takao; Nohara, Haruo; and Ono, Kenichi, 4,694,189, Cl. 290-40.00C.
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Onoda, Ruri; Kuroki, Yoichi; and Nakamura, Gen, to Canon Kabushiki Kaisha. System for photoelectric detectioncu4,694,186, Cl. 250-578.000.
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Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, to Mitsubishi Yuka Fine Chemicals Co., Ltd. Calcium carboxylate phenol derivativecu4,694,102, Cl. 562-426.000.
Oosaka, Shigenori; and Matsuda, Shinichi, to Fuji Photo Film Co., Ltd. Device for loading or unloading magnetic disc packcu4,694,362, Cl. 360-97.000.
Oosaka, Shigenori: *See*—
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McKay, Michael L., 4,693,224, Cl. 123-531.000.
Orbons, Wilhelmus H. M., to Oce-Nederland B.V. Contact fixing device with an improved cleaning rollercu4,693,585, Cl. 355-3.0FU.
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Orlosky, Henry, to Techna Vision, Inc. Gasket for molding plastic lensescu4,693,446, Cl. 249-53.00R.
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deNora, Oronzio, 4,693,797, Cl. 204-128.000.
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Vit, Jaroslav; Salsbury, Ronald L.; and Henderson, Don J., 4,693,986, Cl. 501-1.000.
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Clover, William M., Jr., 4,693,239, Cl. 128-80.00F.
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Osterlund, Rolf G. L.: *See*—
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Osypka, Peter; and Gerstmann, Hans, to Dr. Ing. P. Osypka GmbH Medizinelektronik. Surgical electrode for cardiac pacing and monitoringcu4,693,258, Cl. 128-783.000.

Ota, Masuaki, to Sony Corporation. Printed circuit boardcu4,694,121, Cl. 174-68.500.

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Dollison, William W., 4,693,171, Cl. 91-216.00B.
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Neumann, Gerhard; and Ramisch, Hans, 4,693,002, Cl. 29-882.000.

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Krutz, Gary W.; and Kruse, James W., 4,693,125, Cl. 73-862.390.

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Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Lennard, 4,693,933, Cl. 428-333.000.

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Elias, Samir F., 4,693,752, Cl. 106-280.000.
Lewin, David F., 4,694,034, Cl. 523-503.000.

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DiFrank, Frank J., 4,693,210, Cl. 118-259.000.

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Bohm, August; Lentz, Gerhard; and Wilkens, Gunter, 4,693,761, Cl. 148-9.00R.

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Koike, Eishi, 4,694,444, Cl. 369-65.000.
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McKay, Robert J., 4,693,631, Cl. 405-26.000.

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Caflisch, Jerry A.; and Ockuly, John D., 4,693,014, Cl. 34-23.000.

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Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, 4,693,985, Cl. 436-531.000.
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Woolfson, Louis A., 4,694,494, Cl. 381-51.000.

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Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., 4,694,057, Cl. 526-206.000.

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Payne, Marvin G.; Thonnard, Norbert; and Hurst, George S., to Atom Sciences, Inc. Double pulsed time-of-flight mass spectrometercu4,694,167, Cl. 250-282.000.

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Percival, William A.; and Stoltze, Leon, to United Technologies Corporation. High speed aircraft control surfacecu4,693,435, Cl. 244-91.000.

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Pernot, Jacques, to Micro-Mega S.A. Gear ratio step-down or step-up device for dental handpiececu4,693,685, Cl. 433-105.000.

Persson, Karl-Gustav, to IKO Kabel AB. Device for fire fightingcu4,693,422, Cl. 239-195.000.

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Pettit, Dorothy E. Track assemblies for mounting covers and canopies on pickup truck bedscu4,693,508, Cl. 296-100.000.

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Phenix Heat Pump Systems, Inc.: *See*—
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Pierce, Stanley L., to Ford Motor Company. Countershaft automatic transmissioncu4,693,129, Cl. 74-333.000.

Pierce, William C.; and Smith, John P., to Lear Siegler, Inc. Trailing arm suspension with wrapper compression axle mountingcu4,693,486, Cl. 280-80.00R.

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Plohn, Gerhard: *See*—
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Poppert, Paul E.; and Tabasky, Marvin J., to GTE Laboratories Incorporated. Method of producing interconnections in a semiconductor integrated circuit structurecu4,693,783, Cl. 156-644.000.

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Porter, David R.; Bowen, James H.; and Holland, John M., to ITT Electro Optical Products, a Division of ITT Corporation. Synchronous, asynchronous, and data rate transparent fiber optic communications linkcu4,694,504, Cl. 455-608.000.

Post, Hans; Ratzel, Dieter; Brunner, Peter; and Knuttel, Bertold, to Bruker Medizintechnik G.m.b.H. Method for recording the nuclear magnetic resonance for use in VNMR tomographycu4,694,249, Cl. 324-309.000.

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Powers, Richard M. Fluidized bed feedercu4,693,189, Cl. 110-347.000.

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Price, T. David. Fence system with a stop mechanismcu4,693,158, Cl. 81-461.000.
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Reinhardt, Wilhelm; and Lipp, Helmut, to ebm Elektrobau Mulfingen GmbH & Co. Protection circuit for stalling protection in commutatorless direct current motorscu4,694,371, Cl. 361-23.000.
Renk, Rolf, to General Motors Corporation. Ball joint, especially for motor vehiclescu4,693,628, Cl. 403-135.000.
Research Corporation: *See*—
Gormus, Bobby J., 4,693,967, Cl. 435-7.000.
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Higuchi, Toshiro, 4,694,401, Cl. 364-475.000.
Kiniwa, Hideaki, 4,694,044, Cl. 525-178.000.
Research Products Corporation: *See*—
Guetersloh, Timothy L., 4,693,048, Cl. 52-664.000.
Retfalvi, Ferenc: *See*—
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Retort, Vincent D.: *See*—
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Revetements De Couvin: *See*—
Moreau, Jean-Frederic, 4,693,911, Cl. 427-196.000.
Rexair, Inc.: *See*—
Erickson, Roy O., Jr., 4,693,734, Cl. 55-248.000.
Reynolds, Desmond H. J.; and Taft, Phillip A., to Lucas Industries Public Limited Company. Control valvecu4,693,273, Cl. 137-596.130.
Rezek, Edward A.; and Burghard, Andre, to TRW Inc. Planar light-emitting diodecu4,694,311, Cl. 357-17.000.
Rheinmetall GmbH: *See*—
Pehker, Manfred; Pahlke, Edelgard; and Metz, Josef, 4,693,166, Cl. 89-34.000.
Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, 4,693,434, Cl. 244-328.000.
Rhenter, Jean L.; and Collomb, Jean. Total hip prosthesis with primary fixationcu4,693,724, Cl. 623-23.000.
Rhone-Poulenc Sante: *See*—
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Rice, Norman B. Lining removal processcu4,692,982, Cl. 29-402.090.
Richard, Daniel: *See*—
Billard, Georges; Blanchard, Francoise; Klemenz, Willy; Combet, Roger; and Richard, Daniel, 4,693,429, Cl. 242-18.00G.
Richmond, Donald W.; Clyne, Carl W.; and Holben, Tod M., to Anheuser-Busch, Incorporated. Pasteurization processcu4,693,902, Cl. 426-407.000.
Richter, Bernd: *See*—
Bieber, Oswald; Haas, Erich; Henglein, Rudolf; and Richter, Bernd, 4,693,277, Cl. 138-89.000.
Ricoh Company, Ltd.: *See*—
Sato, Tsutomu; Murayama, Noboru; and Sato, Key, 4,694,353, Cl. 358-283.000.
Uchida, Satoru, 4,694,332, Cl. 358-75.000.
Umeda, Shin, 4,693,590, Cl. 355-14.0SH.
Riebli, Peter: *See*—
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Riederer, Stephen J.; Wright, Ronald C.; and Lee, James N., to Duke University. Automated estimation of T1 and T2 relaxation timescu4,694,252, Cl. 324-309.000.
Riesenberg, Manfred: *See*—
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Rikagaku Kenkyusho: *See*—
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Rimmele, Karl: *See*—
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Ringgenberg, Paul D.; Newman, Daniel A.; and Beck, Harold K., to Halliburton Company. Round mandrel slip jointcu4,693,316, Cl. 166-355.000.
Ritchie, Douglas, to Design Corp. Logo clockcu4,693,613, Cl. 368-238.000.
Rittinger, Herbert; Gertitschke, Detlev H.; Rapp, Karlheinz; and Eberle, Bernd, to Josef Uhlmann Maschinenfabrik GmbH & Co. KG. Apparatus for ordering and feeding a small item like a tablet, capsule, pill or dragee in a packaging machinecu4,693,057, Cl. 53-539.000.
Rivera, Charles A. Portable chain lockcu4,693,097, Cl. 70-18.000.
Robert Bosch GmbH: *See*—
Arnold, Herbert; Bosch, Walter; Horbelt, Michael; Maisch, Wolfgang; Nusser, Hermann; Peters, Klaus-Jurgen; Werner, Peter; and Willke, Clemens, 4,693,111, Cl. 73-118.100.
Buck, Manfred; Fehrle, Siegfried; Holzel, Martin; Kabatnik, Wilfried; Schmid, Wolfgang; and Wanner, Karl, 4,693,407, Cl. 227-109.000.
Dettling, Hubert; Haag, Gottlob; Hagele, Karl-Heinz; Leonhard, Rolf; and Polach, Wilhelm, 4,693,078, Cl. 60-295.000.
Maisch, Wolfgang, 4,694,272, Cl. 338-138.000.
Rebmann, Manfred; Rothermel, Otto; and Stirnkorb, Willi, 4,693,052, Cl. 53-167.000.
Roberts, Simon. Pneumatic tire leak detectorcu4,693,118, Cl. 73-40.700.
Robinson, David E., to Commonwealth of Australia, The. Real time ultrasonic scanning method and apparatuscu4,693,120, Cl. 73-618.000.
Rockford Acromatic Products Co.: *See*—
Olson, Dean A., II, 4,693,698, Cl. 464-111.000.
Rockwell International Corporation: *See*—
Cross, Richard A., 4,694,263, Cl. 332-20.000.
Guill, Dennis J.; McPherson, Larry D.; and Sizelan, John H., 4,694,267, Cl. 333-248.000.
Lavely, Daniel, 4,693,342, Cl. 188-79.50K.
Roder, Walter, to Messer Griesheim GmbH. Guidance device for a laser beam for three-dimensional machining of workpiecescu4,694,139, Cl. 219-121.0LU.
Rodgers, Jeremy A., to Rank Cintel Limited. Video signals special effects generator with variable pixel sizecu4,694,345, Cl. 358-216.000.
Roe, Elverton O.; and Moore, C. Gregg, to Wooster Brush Company, The. Power paint sprayercu4,693,423, Cl. 239-332.000.
Roemer, Erich; Schopf, Eckhart; and Cezanne, Gunter, to Glyco-Metall-Werke Daelen & Loos GmbH. Plain journal bearingcu4,693,617, Cl. 384-282.000.
Rogers, Leroy K., Sr. Supercharger for automobile enginescu4,693,669, Cl. 415-143.000.
Rohde, Bruno. Device for stabilizing magnetic zonescu4,694,271, Cl. 335-302.000.
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Patterson, Dennis R., 4,693,742, Cl. 71-86.000.
Rohra, Alois; and Wildner, Walter, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Bearing for a fluid flow engine and method for damping vibrations of the enginecu4,693,616, Cl. 384-99.000.
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Rokus, B. Joseph: *See*—
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Pidcock, Anthony; and Wray, Andrew P., 4,693,074, Cl. 60-39.320.
Williams, John E. F.; and Lang, Jack, 4,693,201, Cl. 114-67.00R.
Romstadt, Douglas J.; and Seitz, William R., to Allied Corporation. Electronic controller for predetermined temperature coefficient heatercu4,694,145, Cl. 219-497.000.
Romswinkel, Horst: *See*—
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Rorer Pharmaceutical Corporation: *See*—
O'Donnell, John B., 4,693,059, Cl. 53-567.000.
Rosen, Frank L.: *See*—
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Rosenberg, Helmut W. G., to Kendall Company, The. Nephrostomy catheter with formed tipcu4,693,703, Cl. 604-49.000.
Rosier, Brian K., to Sprague Electric Company. Logic controlled switch to alternate voltage sourcescu4,694,430, Cl. 365-189.000.
Rosier, Jean-Claude, to Societe Europeenne de Propulsion. Device for the restitution and/or analyzing of color images using line-type fiber optics cathode ray tubecu4,694,221, Cl. 315-10.000.
Ross, Cyrus A.; and Thurow, Eberhard, to Les Explosifs Nordex Ltee/Nordex Explosives Ltd. Wet loading explosivecu4,693,763, Cl. 149-8.000.
Ross, Nicholas V., to Ajax Magnethermic Corporation. Apparatus for overheating edges of skelp for the production of compression welded pipecu4,694,134, Cl. 219-10.790.
Ross Pulp and Paper Inc.: *See*—
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Roth, Donald J., to Continental Can Company, Inc. Closure having a pull tab and a controlled seal width at the pull tabcu4,693,391, Cl. 220-359.000.
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Roto-Finish Company, Inc.: *See*—
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Bianchi, Mario, deceased; and Barzaghi, Fernando, 4,694,019, Cl. 514-461.000.
Nedelec, Lucien; Hamon, Gilles; Fauveau, Patrick; and Oberlander, Claude, 4,694,011, Cl. 514-323.000.
Routh, Kevin C.: *See*—
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Roy, Jean-Paul: *See*—
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Rubens, Louis C.; Alexander, Willard E.; and Raeck, Carl A., to Dow Chemical Company, The. Method and apparatus for the preparation of foamed thermoplastic articlesecu4,693,856, Cl. 264-45.400.

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Rumbe, Clay R.: *See*—
Brett, Dennis A.; and Rumbe, Clay R., 4,693,786, Cl. 202-83.000.

Russell Corporation: *See*—
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Russo, Vincent; and Heesch, Max O., to ITT Corporation. Headrest for an automotive vehicle seatcu4,693,515, Cl. 297-391.000.

Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, to Fuji Photo Film Co., Ltd. Magnetic recording mediumcu4,693,929, Cl. 428-323.000.

Ryschka, Martin: *See*—
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Rzad, Stefan J.: *See*—
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Rzeszewski, Theodore S.: *See*—
LoCicero, Joseph L.; Pazarci, Melih; and Rzeszewski, Theodore S., 4,694,328, Cl. 358-21.00V.

S.A.T. (Societe Anonyme de Telecommunications): *See*—
Midavaine, Thierry, R.; and Ouhayoun, Michel M., 4,694,458, Cl. 372-32.000.

Saari, Walfred S.: *See*—
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Sabate, Modeste; and Masse, Joel. Particular method for treating articles made of corkcu4,693,757, Cl. 134-27.000.

Sabatiuk, Andrew. Gas turbine engines employing fixed volume combustioncu4,693,075, Cl. 60-39.390.

Sackett, Robert R. Fluid flow and level detectorcu4,694,161, Cl. 250-231.00R.

Sacki, Yukio; Inoue, Naomitsu; and Tokunaga, Yukio, to Sumitomo Durez Company, Ltd. Manufacturing method for phenol resin foamcu4,694,028, Cl. 521-110.000.

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Saijo, Takemi: *See*—
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Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Asai, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, to Hitachi Plant Engineering & Construction Co., Ltd.; and Hitachi, Ltd. Clean roomcu4,693,173, Cl. 98-31.500.

Saint Gobain Vitrage: *See*—
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Noiret, Robert; and Zortea, Michel, 4,693,740, Cl. 65-135.000.

Saito, Masaki: *See*—
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Saito, Takashi: *See*—
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Saito, Tutomu; and Yoneda, Hitoshi, to Kabushiki Kaisha Toshiba. Method and apparatus of electrophotographycu4,694,310, Cl. 346-153.100.

Saitoh, Satoshi: *See*—
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Sakai Chemical Industry Co., Ltd.: *See*—
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Sakai, Yoshiaki: *See*—
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Sakai, Yukio: *See*—
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Sakaino, Michio: *See*—
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Sakoe, Hiroaki, to NEC Corporation. Speaker verification systemcu4,694,493, Cl. 381-42.000.

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Sakurai, Hiroshi; and Iwasaki, Masami, to Kabushiki Kaisha Toshiba. Press-packed semiconductor devicecu4,694,322, Cl. 357-74.000.

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Salas, Joseph; and Boix-Vives, Laurent, to Lange International S.A. Flexion control for ski bootcu4,693,020, Cl. 36-117.000.

Sales, Kenneth B., to Hubbell Incorporated. Reflector for roadway lighting luminairecu4,694,382, Cl. 362-346.000.

Salisbury, Richard; and Wyman, Stephen W., to Loctite Corporation. Curing oven for adhesivecu4,694,180, Cl. 250-455.100.

Salokangas, Arto, to Oy Ekofinn Ab. Biological filter heating arrangement for treatment of waste watercu4,693,816, Cl. 210-150.000.

Salsbury, Ronald L.: *See*—
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Salton, Robert B.: *See*—
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Samsonite Corporation: *See*—
King, William L.; and Weisbart, Charles K., 4,693,368, Cl. 206-287.100.

Sand, Douglas S.: *See*—
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Sanden Corporation: *See*—
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Sanders Associates, Inc.: *See*—
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Sanders, Robert E.; Knipp, Jerry L.; and Flynn, Charles J., to Hallmark Cards, Inc. Electrical ornamentation systemcu4,693,541, Cl. 439-541.000.

Sane, Ajit Y., to Eltech Systems Corporation. Preparation and sintering of refractory metal borides, carbides and nitrides of high purity-cu4,693,989, Cl. 501-96.000.

Sanji, Koichiro: *See*—
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Sanshin Kogyo Kabushiki Kaisha: *See*—
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Sansone, Michael J., to Celanese Corporation. Process for the production of polybenzimidazole ultrafiltration membranecu4,693,824, Cl. 210-500.280.

Santa Barbara Research Center: *See*—
Buller, Joseph S., 4,694,175, Cl. 250-352.000.

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Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, David L., 4,693,396, Cl. 222-107.000.

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Sasagaki, Nobuaki; and Fujii, Hidekatsu, to Nippon Kogaku K.K. Focusing screen mounting device in a cameracu4,693,577, Cl. 354-155.000.

Sasaki, Isao; Nishida, Kozi; Morimoto, Masaru; and Yamamoto, Takashi, to Mitsubishi Rayon Company Ltd. Light-transmitting fibercu4,693,553, Cl. 350-96.340.

Sasaki, Kunihiko; Kodera, Masao; and Kuno, Akira, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Vehicle approach sensing apparatuscu4,694,296, Cl. 340-904.000.

Sasaki, Yoshiyuki: *See*—
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Sasano, Akiyoshi: *See*—
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Sass, Wolfgang: *See*—
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Satou, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Multi-fuel injection system for an internal combustion enginecu4,693,227, Cl. 123-575.000.

Sattlegger, Hans: *See*—
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Savage, Jack W.: *See*—
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Sawada, Ichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Wooden frame for a grand pianocu4,693,159, Cl. 84-186.00R.

Sawano, Tsutomu: *See*—
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Saxena, Brij B.; and Rathnam, Premila, to Cornell Research Foundation, Inc. Reagent for use in a sandwich solid-phase enzyme-immunoassay and process for employing samecu4,693,969, Cl. 435-7.000.

Scarselletta, Louis, to General Motors Corporation. Tube and fin heat exchanger with hybrid heat transfer fin arrangementcu4,693,307, Cl. 165-152.000.

Schamel, Alfred H.: *See*—
Mallory, Robert L.; Schamel, Alfred H.; and Sekel, Stephen M., 4,694,380, Cl. 361-424.000.

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Vetter, Ulrich, 4,693,038, Cl. 51-165.720.

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Schilperoort, Robbert A.; and Hille, Jacques. Process for the incorporation of foreign DNA into the genome of dicotyledonous plants using stable cointegrate plasmidscu4,693,976, Cl. 435-172.300.

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Schlenk, Manfred; and Chadwick, P. N. R., to Siemens Aktiengesellschaft. Fault recognition circuit for parallel power supply devices feeding a usercu4,694,193, Cl. 307-62.000.

Schlick, Horst D., to Schlick Roto-Jet Maschinenbau GmbH. Method and retort for the removal of carbonizable coatings from the surfaces of metal objectscu4,693,756, Cl. 134-7.000.

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Bolte, Georg, 4,693,801, Cl. 204-180.200.

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Breuninger, Manfred; and Schmidt, Dieter, 4,694,084, Cl. 546-25.000.

Schmidt, Gunter P., to G-A-T-M Corporation. Aerial terminal for telecommunication cablescu4,694,118, Cl. 174-41.000.

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Leung, Howard K. H.; Nguyen, Bich-Yen; Alvis, John R.; and Schmiesing, John, 4,693,781, Cl. 156-643.000.

Schmitt, Armin, to Lawa AG. Process for sterilizing a cocoa pastecu4,693,904, Cl. 426-521.000.

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Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,693,890, Cl. 424-78.000.

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Schubert, Rainer; and Weber, Otto, to Vereinigte Schraubenwerke GmbH; Schubert, Rainer; and Weber, Otto. Mounting element for a flat insulating body which can be attached to a thin-walled basecu4,693,653, Cl. 411-387.000.

Schue, Thomas J.: *See*—
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.

Schuh, Gisela, Sabine Schuh, Michael Schuh, heirs: *See*—
Diegel, Dieter; Plohn, Gerhard; and Schuh, Manfred, deceased, 4,694,188, Cl. 290-40.00B.

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Schultes, Otto, to Statomat-Globe Maschinenfabrik GmbH. Device for the lining of slots of stator or rotor lamination packs for electrical machines with slot linerscu4,692,972, Cl. 29-33.00L.

Schultz, Alvin L.: *See*—
Carickhoff, Richard C.; Hemdal, Hakan O.; and Schultz, Alvin L., 4,694,259, Cl. 331-1.00A.

Schulz-Hennig, Joerg; and Sievers, Horst, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for acoustic supervision of adjustment operations at optical devicescu4,694,150, Cl. 250-201.000.

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Schulz, Richard: *See*—
Johnson, James A.; Schulz, Richard; and Tomlonovic, Vincent J., 4,693,331, Cl. 180-135.000.

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Schwartz, Anthony M.; Kawashima, Norimichi; and Zettlemoyer, Albert C., to Lehigh University. Lithographic plates and production process thereforcu4,693,958, Cl. 430-302.000.

Schwartzman, Gilbert, to Dab-O-Matic Corp. Pressure-responsive valve for an applicatorcu4,693,623, Cl. 401-206.000.

Schwarz, Alexander: *See*—
Kleiner, Hans-Jerg; Klose, Gerhard; Molter, Michael; Schwarz, Alexander; and Thamm, Horst-Dieter, 4,693,884, Cl. 424-1.100.

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Schweers, Karl D. Preform handling apparatuscu4,693,375, Cl. 209-544.000.

Schweiger, Raymond H. Method for topical treatment of scar tissuecu4,694,021, Cl. 514-544.000.

Schweiker, Werner, to Hermann Behr & Sohn GmbH & Co. Program-controlled industry robot in particular laquering (or painting) robotcu4,693,664, Cl. 414-735.000.

Schweagers, Dieter; and Benecke, Herta, to Pfeifer & Langen. Processes for producing leucrosecu4,693,974, Cl. 435-97.000.

Schwenzer, Michael; Eskam, Armin; Simon, Walter; and Becker, Wilfried, to Rheinmetall GmbH. Self-deploying stabilizing-vane assembly for projectilecu4,693,434, Cl. 244-328.000.

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Moll, Helmut, 4,694,439, Cl. 367-83.000.

Scifres, Donald R.: *See*—
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Scott, Andrew M.: *See*—
Westerman, David W. B.; and Scott, Andrew M., 4,693,807, Cl. 208-108.000.

Scott, Eugene E., Sr. Legrest and footrest for bedscu4,692,954, Cl. 5-443.000.

Scripps, Keith A. Combination electrical light, smoke and/or heat detectorcu4,694,285, Cl. 340-693.000.

Sczomak, David P., to General Motors Corporation. Poppet covered orifice fuel injection nozzlecu4,693,424, Cl. 239-453.000.

Seaboard Wellhead Control, Inc.: *See*—
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Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, to Sanofi; and Institut National de la Sante et de la Recherche Medicale (Inserm). Pharmaceutical or veterinary compositions containing thiosulfonate derivativescu4,694,015, Cl. 514-375.000.

Segoshi, Toru, to Nissan Motor Company, Limited. Lamp power supply control system for an automotive vehiclecu4,694,191, Cl. 307-10.0LS.

Sehr, Willibald, to MOBA-Electronic Gesellschaft fur Mobil-Automation mbH. Opto-electronic measuring receiver and method for controlling the opto-electronic measuring receivercu4,693,598, Cl. 356-4.000.

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Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, to Toyo Soda Manufacturing Co., Ltd. Method for manufacturing cation exchange membranecu4,693,796, Cl. 204-98.000.

Seitz, William R.: *See*—
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Seki, Yoshizo, to Tomy Kogyo Co., Inc. Toy with moving screencu4,693,694, Cl. 446-197.000.

Seltzer, Samuel M.; Dennison, Saul; and Dolan, Frank, Sr., to Allison Corporation. Auto seat covercu4,693,511, Cl. 297-219.000.

Selz, Aloiz, to Surculus AG. Drinking cup with closure for open bottles and/or canscu4,693,410, Cl. 229-1.50B.

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Sendax, Victor I. Magnetic dental implant retention systemcu4,693,686, Cl. 433-173.000.

Seng, Richard L.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.

Sengupta, Mrinal K., to Exxon Production Research Company. Time-offset-frequency-amplitude panels for seismic identification of hydrocarbonscu4,694,438, Cl. 367-70.000.

Sensui, Reiichiro: *See*—
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Serve, Klaus, to Maniba. R. Mannesmann GmbH. & ibs Nagel GmbH. & Co. KG. Pipeline for gaseous fluids and method of assembling its componentacu4,693,499, Cl. 285-96.000.

Serwer, Philip, to Board of Regents, The University of Texas System. Apparatus for bidimensional electrophoretic separationscu4,693,804, Cl. 204-182.100.

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Setzer, Herbert J.; Karavolis, Sam; and Bett, John A. S., to International Fuel Cells Corporation. Steam reforming utilizing sulfur tolerant catalystcu4,693,882, Cl. 423-652.000.

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Maeda, Akio; Chida, Takeshi; and Seya, Hirokatsu, 4,694,067, Cl. 528-393.000.

SGS Microelettronica S.p.A.: *See*—
Marchio', Fabio; and Menniti, Pietro, 4,694,239, Cl. 323-285.000.

Shackleton, Raymond T., to Butler Newall Machine Tool Company Limited. Drive mechanisms for rotating crankshafts for use in machine toolscu4,693,147, Cl. 82-40.00A.

Shah, Kishore R., to Kendall Company, The. Microphase separated hydrogels for controlled release of bioactive materialscu4,693,887, Cl. 424-19.000.

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Shanks, Ernest R.; and Carnes, Gerald L. Bumper guide assembly for elevator doorscu4,693,340, Cl. 187-52.00R.

Shapiro, Ian M.: *See*—
O'Mara, Raymond D.; and Shapiro, Ian M., 4,693,091, Cl. 62-272.000.

Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Herbicidal ortho-(azinyl)-benzenesulfonamidescu4,693,744, Cl. 71-93.000.

Sharp Kabushiki: *See*—
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Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,693,207, Cl. 118-715.000.
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Shaw, Jane M.: *See*—
Babich, Edward D.; Hatzakis, Michael; Liutkis, John J.; Paraszczak, Juri R.; and Shaw, Jane M., 4,693,960, Cl. 430-323.000.

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Shell Internationale Maatschappij, B.V.: *See*—
Muijs, Herman M.; and Keijzer, Paulus P. M., 4,693,311, Cl. 166-272.000.

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Baker, Daniel C., 4,693,873, Cl. 423-215.500.
Dewitz, Thomas S., 4,693,808, Cl. 208-113.000.
Westerman, David W. B.; and Scott, Andrew M., 4,693,807, Cl. 208-108.000.

Shen, Virginia A.: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

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George, Robert D.; and Banning, Robert D., 4,693,709, Cl. 604-212.000.
McCool, George W., 4,693,710, Cl. 604-283.000.
Talonn, Daniel A., 4,693,256, Cl. 128-725.000.

Shiba Seisakusho Limited Responsibility Company: *See*—
Matsuo, Hiroyoshi, 4,693,538, Cl. 439-460.000.

Shibagaki, Masahiro: *See*—
Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, 4,693,777, Cl. 156-345.000.

Shibahara, Makoto: *See*—
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Shibui, Michiro; Hanamoto, Yoshihiro; Ishigaki, Yoshio; Sahara, Hiroshi; Maeda, Satoru; and Noguchi, Yasushi, to Nippon Telegraph & Telephone; and Sony Corporation. Apparatus for displaying scrolling imagescu4,694,406, Cl. 364-518.000.

Shigaki, Takao, to Fuji Photo Film Co., Ltd. Method of determining exposurescu4,693,596, Cl. 355-77.000.

Shigematsu, Toshifumi: *See*—
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Shigemoto, Hiromi; Yamamoto, Akio; and Suzuki, Iwatoshi, to Mitsui Petrochemical Industries, Ltd. Flat die neck-in control devicecu4,693,677, Cl. 425-376.00R.

Shigenobu, Michio; and Saito, Takashi, to Canon Kabushiki Kaisha. Image forming apparatuscu4,693,587, Cl. 355-3.0FU.

Shilo, Moshe; and Fattoon, Ali, to Solmat Systems, Ltd.; and Yissum Research Development Company of the Hebrew University of Jerusalem. Cyanobacterium-produced bioemulsifier composition and solution thereofcu4,693,842, Cl. 252-356.000.

Shimada, Jiroh; and Morito, Hiroshi, to NEC Corporation. Data comparison circuit constructed with smaller number of transistorscu4,694,274, Cl. 340-146.200.

Shimamoto, Grant T.: *See*—
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Shimamura, Masaharu: *See*—
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Shimatani, Toshimichi; and Kawata, Yoshihiro, to Iwatsu Electric Co. Ltd. Data transmission circuitcu4,694,470, Cl. 375-37.000.

Shimazaki, Norihiko: *See*—
Nakaguti, Osamu; Shimazaki, Norihiko; Kawai, Yoshio; Hashimoto, Masashi; and Nakatuka, Michie, 4,694,004, Cl. 514-228.000.

Shimizu, Isoo; Hirano, Ryotaro; Matsumura, Yasuo; Nomura, Hideki; Uchida, Kazumichi; and Sato, Atsushi, to Nippon Petrochemicals Company, Ltd. Method for producing α-(p-isobutylphenyl)propionic acid or its alkyl esterscu4,694,100, Cl. 560-105.000.

Shimizu, Tsutomu; Miyata, Jun; and Yagii, Koji, to Mazda Motor Corporation. Apex seal for rotary piston enginescu4,693,942, Cl. 428-614.000.

Shimoda, Kazuho; and Abe, Shunichi, to Konishiroku Photo Industry Co., Ltd. Sheet feeding system in recording apparatuscu4,693,459, Cl. 271-9.000.

Shimotori, Kazuhiro: *See*—
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Shin-Etsu Chemical Co., Ltd.: *See*—
Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, 4,694,053, Cl. 526-74.000.
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Shindou, Norikazu, to Tokyo Juki Industrial Co., Ltd. Moving element body apparatus of linear motor and method for producing itcu4,694,209, Cl. 310-12.000.

Shinoto, Yoshinori, to Linguatron Limited. Casing for electronic apparatuscu4,693,525, Cl. 312-208.000.

Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, to Tokyo Juki Industrial Co., Ltd. Multi-colored stacked cassettes thermal printercu4,694,305, Cl. 346-76.0PH.

Shiomi, Tomoo: *See*—
Imai, Kiyokazu; Shiomi, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.

Shiomi, Yasuhiko; and Suzuki, Ryoichi, to Canon Kabushiki Kaisha. Distance measuring device with signal processing circuit for position sensitive detectorcu4,693,597, Cl. 356-1.000.

Shiono, Manzo; Fujita, Yoshiji; and Nishida, Takashi, to Kuraray Co., Ltd. Chroman compounds useful as analgerics and antioxidantscu4,694,090, Cl. 549-407.000.

Shirai, Yuji: *See*—
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Shirgley, David A.: *See*—
Domenik, Stephen L.; Folmsbee, Alan C.; Nguyen, Tai; and Shirgley, David A., 4,694,412, Cl. 364-717.000.

Shirley, Brenda: *See*—
Degen, Peter J.; Martin, Jerold; Schriefer, Judy; and Shirley, Brenda, 4,693,985, Cl. 436-531.000.

Shitori, Yoshiyasu: *See*—
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,694,076, Cl. 536-17.200.

Shohji, Tatsumi: *See*—
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Shu, Lee-Lean; and Shyu, Tai-Ching, to Advanced Micro Devices, Inc. Midpoint sense amplification scheme for a CMOS DRAMcu4,694,205, Cl. 307-530.000.

Shuler, Steven L. Collapsible carry bag with four discrete rigid end piecescu4,693,344, Cl. 190-107.000.

Shulski, Michael M.: *See*—
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Shulver, Roderick L.; Misselbrook, John; and Standen, Robert, to Nowsco Well Service (U.K.) Limited. Screw thread protectioncu4,692,988, Cl. 29-458.000.

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Siano, Donald B.; and Bock, Jan, to Exxon Research and Engineering Company. High molecular weight terpolymers of acrylamide, acrylic acid salts and alkylacrylamidecu4,694,058, Cl. 526-307.200.

Siano, Donald B.: *See*—
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Sibbett, Wilson: *See*—
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Sibeud, Jean-Paul. Circuit diagnosis and control devicecu4,694,372, Cl. 361-86.000.

Siddall, Graham J., to Hewlett-Packard Company. Flexure stage alignment apparatuscu4,694,477, Cl. 378-34.000.

Sidlosky, David M.: *See*—
Nagel, Gregory L.; Sidlosky, David M.; Murty, Balarama V.; Lee, Anthony; and Cleveland, Dixon, 4,694,135, Cl. 219-110.000.

Sie, Swan A., to Chevron Research Company. Sign bit optical-electrical geophonecu4,694,162, Cl. 250-231.00R.

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Beil, Gerhard; Pichler, Alfred; Pachonik, Horst; and Plehnert, Kurt, 4,693,780, Cl. 156-643.000.
Brandl, Hans; and Liegl, Werner, 4,694,496, Cl. 381-51.000.
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Heuwieser, Erwin; and Schwaiger, Kurt, 4,694,207, Cl. 307-571.000.
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Tauzin, Francis, 4,693,033, Cl. 49-122.000.

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Mui, Shou Y., 4,694,467, Cl. 375-1.000.

Signetics Corporation: *See*—
Flowers, Ronald C., 4,692,991, Cl. 437-175.000.

Sills, Allan W. Measuring equipmentcu4,693,010, Cl. 33-147.00L.

Sills, James R., to DMI Fabrications Limited. Variable length columnscu4,693,442, Cl. 248-406.200.

Silverman, Bernard: *See*—
Mottus, Edward H.; Hedrick, Ross M.; and Silverman, Bernard, 4,694,039, Cl. 524-718.000.

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Simonds, Gary; Jennings, Thomas P.; and Gallops, Henry, to Kidde Recreation Products, Inc. Crossbow trigger mechanismcu4,693,228, Cl. 124-25.000.

Singer Company, The: *See*—
Cavedo, Robert P., 4,693,648, Cl. 409-178.000.

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Bowe, Michael J.; Oruh, Samuel N.; and Singh, Jaswant, 4,693,822, Cl. 210-255.000.

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Plath, Ernst-Dieter, 4,693,092, Cl. 66-55.000.

Sireix, Georges. Device for the automatic cutting of cardboard and other tubescu4,693,149, Cl. 82-53.100.

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Skillicorn, Brian, to Kevex Corporation. Hand held precision X-ray sourcecu4,694,480, Cl. 378-119.000.

Skrobol, Christian: *See*—
Dabelstein, Klaus; and Skrobol, Christian, 4,693,601, Cl. 356-237.000.

Slattery, Ian, to Spencer Wright Industries, Inc. Tufting machine for overtuftingcu4,693,190, Cl. 112-80.300.

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Margulis, Walter; Sibbett, Wilson; and Sleat, William E., 4,693,599, Cl. 356-121.000.

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Lamb, Owen L.; and Maclay, William R., 4,693,373, Cl. 209-3.300.

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Slusarchyk, William A.; and Dejneka, Tamara, to E. R. Squibb & Sons, Inc. Certain carbamate ester derivatives forming salts with pyridinium or picolinium cations which are useful as intermediatescu4,694,083, Cl. 546-14.000.

Small, Kenneth T., to Boschert, Incorporated. Proportional transistor base drive circuit for use in power converters and components thereofcu4,694,389, Cl. 363-132.000.

Smith, David J. H.: *See*—
Alper, Howard; and Smith, David J. H., 4,694,097, Cl. 560-24.000.

Smith, Earl D. Trailer apparatus for transporting vehicles and other cargocu4,693,650, Cl. 410-18.000.

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Krepaki, Larry R.; Smith, Howell K., II; Rasmussen, Jerald K.; and Heilmann, Steven M., 4,694,103, Cl. 562-450.000.

Smith International, Inc.: *See*—
Furse, John H.; Dessi, Praful C.; and Dewey, Charles H., 4,693,328, Cl. 175-273.000.

Smith, John C.: *See*—
Blanco, Carlos; Asam, Adolf R.; and Smith, John C., 4,693,551, Cl. 350-96.230.

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Pierce, William C.; and Smith, John P., 4,693,486, Cl. 280-80.00R.

Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; and Durant, Graham J., 4,694,008, Cl. 514-369.000.

Smith, Lowell S.: *See*—
Vatis, Dimitrios; and Smith, Lowell S., 4,694,254, Cl. 324-309.000.

Smith, Randolph. Color-coded card gamecu4,693,480, Cl. 273-296.000.

Smith, Robert A.; Parker, Dane K.; Colvin, Howard A.; Weinstein, Arthur H.; Patterson, Dennis B.; and Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Preparation of polymers containing pendant isocyanate groups and derivatives thereof by emulsion copolymerizationcu4,694,057, Cl. 526-206.000.

Smith, Stephen W.: *See*—
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SmithKline Beckman Corporation: *See*—
Dingerdissen, John J.; Mehta, Rajanikant; Nisbet, Louis J.; Shearer, Marcia C.; and Wasserman, Gail F., 4,694,069, Cl. 530-317.000.

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Froech, Hans, 4,693,106, Cl. 72-247.000.

Snider, Joel M.: *See*—
Cuthbert, Victor W.; and Snider, Joel M., 4,692,987, Cl. 29-455.00R.

Snyder, Teddy R., to Ol Forest Products STS Inc. Collapsible bulk shipping containercu4,693,411, Cl. 229-23.00R.

Snyder, William J.; and Kobayashi, Hisashi, to Union Carbide Corporation. Flame stabilized post-mixed burnercu4,693,680, Cl. 431-10.000.

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Avisse, Jean-Bernard, 4,694,246, Cl. 324-207.000.

Societe des Cables du Mans: *See*—
Deligny, Jean, 4,693,137, Cl. 74-501.50R.

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Rosier, Jean-Claude, 4,694,221, Cl. 315-10.000.

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DeJaeger, Roger; Pagaiez, Guy; and Potin, Philippe, 4,693,876, Cl. 423-300.000.
Juge, Sylvain; and Legras, Yvonne, 4,694,094, Cl. 558-76.000.

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Commarmot, Roger; Didesot, Dominique; and Gardais, Jean-Francois, 4,693,867, Cl. 422-64.000.

Solmat Systems, Ltd.: *See*—
Shilo, Moshe; and Fattom, Ali, 4,693,842, Cl. 252-356.000.

Solomon, Frank: *See*—
Nikas, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Nikas, Andrew J.; Schue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.

Solorzano, Marilyn M.: *See*—
Mitchell, Gary A.; Jaffe, Gerald E.; and Solorzano, Marilyn M., 4,694,070, Cl. 530-329.000.

Sommargren, Gary E., to Zygo Corporation. Differential plane mirror interferometercu4,693,605, Cl. 356-349.000.

Sommer Co.: *See*—
Sommer, Gordon M., 4,693,350, Cl. 192-18.00A.

Sommer, Gordon M., to Sommer Co. Clutch-brake unitcu4,693,350, Cl. 192-18.00A.

Soneda, Mitsuo; and Hazama, Yoshikazu, to Sony Corporation. Sample-and-bold circuitcu4,694,341, Cl. 358-160.000.

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Iwase, Sumio, 4,694,485, Cl. 379-62.000.
Mori, Hiroshi, 4,693,564, Cl. 350-357.000.
Morita, Kazuyuki; and Otsuka, Toru, 4,694,456, Cl. 371-38.000.
Nagai, Yasuo; and Abe, Fumiyoshi, 4,694,234, Cl. 318-603.000.
Noguchi, Takashi; Hayashi, Hisao; and Ohshima, Takefumi, 4,693,759, Cl. 437-24.000.
Ohyama, Masao; Yamamoto, Yoshinori; Horikawa, Kenichi; and Kawakami, Kenji, 4,694,360, Cl. 360-96.500.
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Tamura, Shinichiro; and Seto, Junetsu, 4,693,962, Cl. 430-345.000.
Tanaka, Hiroshi; and Fukehara, Shinsuke, 4,694,354, Cl. 358-296.000.
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Soref, Richard A.; and Lorenzo, Joseph P., to United States of America, Air Force. Optically controlled integrated optical switchcu4,693,547, Cl. 350-96.130.

Soref, Richard A.: *See*—
Lorenzo, Joseph P.; and Soref, Richard A., 4,693,546, Cl. 350-96.130.

Southco, Inc.: *See*—
Bisbing, Robert H., 4,693,187, Cl. 108-69.000.
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Spacesaver Corporation: *See*—
Peterman, Robert J., 4,693,184, Cl. 104-295.000.
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Spadaro, Anthony M.; McLoughlin, Thomas J.; and Eagler, Phillip V., to Technicon Instruments Corporation. Lyophilization of reagent-coated particlescu4,693,912, Cl. 427-213.300.

Spargo, William G., to Anheuser-Busch, Incorporated. Process for filling beer into containerscu4,693,054, Cl. 53-432.000.

Spearhead Industries, Inc.: *See*—
Thill, Gerald D., 4,693,205, Cl. 118-13.000.

Spectra-Physics, Inc.: *See*—
Howard, P. Guy, 4,694,182, Cl. 250-566.000.

Spectrolab, Inc.: *See*—
Lillington, David R.; Mardesich, Nick; Dill, Hans G.; and Garlick, George F. J., 4,694,115, Cl. 136-256.000.

Speedfam Corporation: *See*—
Cesna, Joseph V., 4,693,012, Cl. 33-533.000.

Spencer-Johnson Company: *See*—
Ginter, James F., 4,692,971, Cl. 26-103.000.

Spencer Wright Industries, Inc.: *See*—
Slattery, Ian, 4,693,190, Cl. 112-80.300.

Spiegel, Raymond W., to Whirlpool Corporation. Appliance support-cu4,693,526, Cl. 312-250.000.

Spietschka, Ernst; and Prokschy, Frank, to Hoechst Aktiengesellschaft. Pigments of the quinacridonequinone series, process for their preparation and their usecu4,693,753, Cl. 106-288.00Q.

Spire Corporation: *See*—
Sioahansi, Piran, 4,693,760, Cl. 148-4.000.

Spong, Fred W.: *See*—
Muchnik, Boris J.; and Spong, Fred W., 4,694,358, Cl. 360-59.000.

Sprague, David L., to RCA Corporation. Control signal generator-cu4,694,197, Cl. 307-269.000.

Sprague Electric Company: *See*—
Rosier, Brian K., 4,694,430, Cl. 365-189.000.

Sprecace-Pantoli, Enio. Concrete and construction system and modular plank element for the concrete formwork thereofcu4,693,445, Cl. 249-19.000.

Spring, David J.: *See*—
Powell, Brian D.; and Spring, David J., 4,694,172, Cl. 250-339.000.

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Meininger, Fritz; Mischke, Peter; Konig, Gerd; and Springer, Hartmut, 4,693,726, Cl. 8-547.000.

Springs Industries, Inc.: *See*—
Payet, George L.; and Ballard, Stephen C., 4,693,771, Cl. 156-73.300.

Sprouse, Michael L. Glass breaking toolcu4,693,403, Cl. 225-2.000.

Square D. Company: *See*—
Buxton, Clifford A.; Higgins, David C.; and Volesky, Gary A., 4,693,132, Cl. 74-425.000.

Srivastava, Vinai K.: *See*—
Carter, Walter H.; and Srivastava, Vinai K., 4,693,982, Cl. 435-274.000.

Staab, Hans P. Method and apparatus for adaptive receiver squelch echo controlcu4,694,450, Cl. 370-32.100.

Stallforth, Harald: *See*—
Bleier, Waldemar; Lutze, Theodor; and Stallforth, Harald, 4,693,251, Cl. 128-346.000.

Stamatoff, James B.: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.

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Alfenaar, Marinus; van den Brink, Franciscus; and van Hardeveld, Rudolf, 4,693,793, Cl. 204-78.000.

Standen, Robert: *See*—
Shulver, Roderick L.; Misselbrook, John; and Standen, Robert, 4,692,988, Cl. 29-458.000.

Stanis, Alexander C.: *See*—
Barclay, William; and Stanis, Alexander C., 4,693,150, Cl. 87-91.000.

Stanzione, Robin C.: *See*—
Maryanoff, Cynthia A.; Plampin, James N.; and Stanzione, Robin C., 4,693,850, Cl. 260-506.000.

Staron, James S.: *See*—
Asick, John C.; Douty, George H.; and Staron, James S., 4,693,528, Cl. 439-83.000.

Statomat-Globe Maschinenfabrik GmbH: *See*—
Schultes, Otto, 4,692,972, Cl. 29-33.00L.

Stauffer, Nelson R., to Kamel Corporation. High speed tail sealing apparatuscu4,693,766, Cl. 156-64.000.

Stavinoha, Jerome L.: *See*—
Devon, Thomas J.; Phillips, Gerald W.; Puckette, Thomas A.; Stavinoha, Jerome L.; and Vanderbilt, Jeffrey J., 4,694,109, Cl. 568-454.000.

Stecher, Karlheinz: *See*—
Oehsen, Ubbo v.; Stecher, Karlheinz; Koehler, Waldemar; Mueller, Berthold; Brunnmueller, Fritz; and Schneider, Rolf, 4,693,877, Cl. 423-373.000.

Steckert, Rainer: *See*—
Gessner, Dieter; and Steckert, Rainer, 4,693,913, Cl. 427-215.000.

Steffen, Robert P., to Warner-Lambert Company. Method of treating heart failure and medicaments thereforcu4,693,996, Cl. 514-46.000.

Steffes, Helmut, to ITT Corporation. Slip controlled brake system for automotive vehiclescu4,693,523, Cl. 303-114.000.

Stehle, Hans-Peter: *See*—
Apfel, Norbert; Stehle, Hans-Peter; and Noll, Wilfried, 4,693,007, Cl. 30-387.000.

Stehle, Wolfgang, to Maschinenfabrik Bezner GmbH & Co. KG. Screening apparatuscu4,693,379, Cl. 209-674.000.

Steigerwald, Robert L.; Routh, Kevin C.; Claydon, Glenn S.; and Bicknell, William H., to General Electric Company. HVIC power supply controller with primary-side edge detectorcu4,694,384, Cl. 363-17.000.

Stepanek, Premek; Wagner, Ludwig; and Knabel, Walter, to Marker International Company. Heelpiece for safety ski bindingcu4,693,489, Cl. 280-634.000.

Stephan, Walter A.; and Knauseder, Josef, to Fischer Gesellschaft M.B.H. Hollow tubular members and a method of making such memberscu4,693,140, Cl. 74-579.00R.

Stephenson, Edgar O.; and Howe, Raymond C., to Kawasaki Thermal Systems, Inc. Insulated wellbore casingcu4,693,313, Cl. 166-302.000.

Stephenson, Fred W. Shrimp processing method and devicecu4,692,965, Cl. 17-48.000.

Sterzel, Hans-Josef: *See*—
McKee, Graham E.; Ohlig, Hilmar; Reimann, Horst; and Sterzel, Hans-Josef, 4,694,042, Cl. 525-66.000.

Stetter, Karl O.; and Schmitt, Rudiger, to Boehringer Mannheim GmbH. Type II restriction endonuclease MseI, a process for obtaining it and the use thereofcu4,693,978, Cl. 435-199.000.

Stetter, Karl O.; and Schmitt, Rudiger, to Boehringer Mannheim GmbH. Type II restriction endonuclease Mae II, a process for obtaining it and the use thereofcu4,693,979, Cl. 435-199.000.

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Steuer, Aloysius: *See*—
Grzanna, Ortwin; Koesfeld, Manfred; Weber, Rolf-Udo; Steuer, Aloysius; Romswinkel, Horst; Fremgen, Dieter; and Kastrop, Dieter, 4,693,767, Cl. 156-49.000.

Stevens, David R.: *See*—
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Stewart, John D.: *See*—
Langley, Robert; Stewart, John D.; and Walls, Arthur S., 4,694,078, Cl. 540-141.000.

Stewart, John M.; and Vavrek, Raymond J. Bradykinin antagonist peptidescu4,693,993, Cl. 514-14.000.

Stewart, Kenneth W., Sr., to United Technologies Electro Systems, Inc. Brush holder for dynamoelectric machinescu4,694,214, Cl. 310-239.000.

Stig G. Carlqvist Motor Consultant, (C.M.C.) Aktiebolag: *See*—
Carlqvist, Stig G., 4,693,082, Cl. 60-517.000.

Stihl, Andreas: *See*—
Apfel, Norbert; Stehle, Hans-Peter; and Noll, Wilfried, 4,693,007, Cl. 30-387.000.
Wehle, Anton; Unrath, Dieter; and Zimmermann, Gunther, 4,693,005, Cl. 30-383.000.
Wehle, Anton, 4,693,735, Cl. 55-385.00R.

Stillie, Donald G., to AMP Incorporated. Elastomeric mother-daughter board electrical connectorcu4,693,529, Cl. 439-67.000.

Stillie, Donald G.; and Zakary, Paul D., to AMP Incorporated. Shielded elastomeric electric connectorcu4,693,530, Cl. 439-67.000.

Stirnkorb, Willi: *See*—
Rebmann, Manfred; Rothermel, Otto; and Stirnkorb, Willi, 4,693,052, Cl. 53-167.000.

Stoltman, Donald D., to General Motors Corporation. Electro-hydraulic pressure regulating valvecu4,693,275, Cl. 137-625.650.

Stoltze, Leon: *See*—
Percival, William A.; and Stoltze, Leon, 4,693,435, Cl. 244-91.000.

Stonier, Russ W. Foldable box for hanging filescu4,693,387, Cl. 220-6.000.

Storrs, Stephen B.: *See*—
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Stranahan, Michael: *See*—
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Strauss, Hans: *See*—
Weber, Adolf; Strauss, Hans; and Bankel, Adolf, 4,693,180, Cl. 102-274.000.

Strayham, Stephen G. Apparatus for establishing angles of object-scu4,693,011, Cl. 33-451.000.

Streifer, William: *See*—
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Stromquist, Donald M.; and Wathen, Boyd J. Gel type slurry explosive and matrix and method for making samecu4,693,765, Cl. 149-60.000.

Stuart, Gerald W., to Traffic Transport Engineering, Inc. Trailer with special rampcu4,693,651, Cl. 410-30.000.

Stubinen Utveckling AB: *See*—
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Stueck, Troy L., to United States of America, Air Force. Ratio analyzercu4,694,195, Cl. 307-234.000.

Sturm, Hans-Josef, to Knebel & Rottger GmbH & Co. Method and circuitry for control of a sanitary mixer for cold and hot watercu4,693,415, Cl. 236-12.120.

Styrna, Zbigniew B.: *See*—
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Sucrow, Wolfgang: *See*—
Hittich, Reinhard; Weber, Georg; Sucrow, Wolfgang; and Geschwinder, Peter, 4,693,841, Cl. 252-299.620.

Suemori, Noboru: *See*—
Nakamura, Kozoo; Hamada, Nagaharu; Tadauchi, Masaharu; Kozima, Yasuyuki; Suemori, Noboru; and Kouno, Takamitu, 4,694,351, Cl. 358-256.000.

Sugahara, Kazuyuki: *See*—
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Sugawara, Mitsutoshi: *See*—
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Sugimori, Masaru; and Sanji, Koichiro, to Sunstar Giken Kabushiki Kaisha. Polyurethane resin compositioncu4,694,093, Cl. 556-413.000.

Sugimoto, Mamoru: *See*—
Ogawa, Tomoya; Sugimoto, Mamoru; Shitori, Yoshiyasu; and Ito, Masayoshi, 4,694,076, Cl. 536-17.200.

Sugino, Masaru: *See*—
Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, 4,693,491, Cl. 280-688.000.

Sugisawa, Taijiro; and Nishiyama, Akio, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface-coated wear-resistant member of cermet and process for producing samecu4,693,944, Cl. 428-698.000.

Sugiura, Yasuyuki: *See*—
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Sugiyama, Jun; Hagino, Kiyoshi; and Usui, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Data transmission systemcu4,694,293, Cl. 340-825.680.

Sugiyama, Katsuhiko; Kawazoe, Hiromitsu; and Idota, Yoshinori, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Inlet port for internal combustion enginecu4,693,215, Cl. 123-188.00M.

Sugiyama, Tadashi: *See*—
Iwaoka, Hideto; Sugiyama, Tadashi; Matsuura, Hiroyuki; and Hirata, Takaaki, 4,694,250, Cl. 324-309.000.

Sugouchi, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Archery bow handle risercu4,693,230, Cl. 124-88.000.

Sullivan, James V.: *See*—
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Sulosky, William P.; and Evans, Raymond D., Jr., to Kennametal, Inc. Means for holding cutter bitscu4,693,518, Cl. 299-93.000.

Sulzbach, Hans-Michael: *See*—
Proksa, Ferdinand; Sulzbach, Hans-Michael; Rohrig, Lothar; and Fuhrbach, Hans-Wilhelm, 4,693,448, Cl. 249-162.000.

Sulzer Brothers Limited: *See*—
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Imhof, Christian; and Kempf, Gerhard, 4,693,069, Cl. 57-59.000.

Sumi, Akinori: *See*—
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Sumida, Yasuji; Kajita, Hiroshi; and Fujioka, Tadashi, to Mita Industrial Co., Ltd. Electrostatic copying apparatuscu4,693,586, Cl. 355-1.05H.

Sumitomo Bakelite Company Limited: *See*—
Ogita, Sachio, 4,693,704, Cl. 604-55.000.

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Sumitomo Durez Company, Ltd.: *See*—
Saeki, Yukio; Inoue, Naomitsu; and Tokunaga, Yukio, 4,694,028, Cl. 521-110.000.

Sumitomo Electric Industries, Ltd.: *See*—
Hoshikawa, Masao; Kyoto, Michihisa; Yano, Koji; and Tanaka, Gotaro, 4,693,738, Cl. 65-3.110.
Nakai, Tetsuo; and Goto, Mitsuhiro, 4,693,746, Cl. 75-238.000.
Takata, Koji; and Nishiyama, Yukinori, 4,693,521, Cl. 303-103.000.

Sumitomo Metal Industries, Ltd.: *See*—
Hatono, Akio; and Kobayashi, Sumio, 4,693,614, Cl. 374-122.000.

Sumiya, Koji: *See*—
Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.

Sumser, Siegfried, to Daimler-Benz Aktiengesellschaft. Device for increasing the rotational speed of an exhaust gas turbo-charger on an internal combustion enginecu4,693,085, Cl. 60-611.000.

Sunami, Hideo: *See*—
Moniwa, Masahiro; Warabinako, Terunori; and Sunami, Hideo, 4,692,994, Cl. 437-40.000.
Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Asai, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, 4,693,173, Cl. 98-31.500.

Sundstrand Corporation: *See*—
Blackburn, Ronald, 4,693,073, Cl. 60-39.020.
Lang, David J.; Layer, John C.; and Durtschi, William G., 4,693,352, Cl. 192-70.270.
Nguyen, Vietson M.; and Dhyanchand, P. John, 4,694,383, Cl. 363-17.000.
Tysver, John, 4,693,349, Cl. 192-7.000.
Upadhyay, Anand; and Messenger, Lawrence W., 4,694,236, Cl. 318-798.000.

Sundstrand Data Control, Inc.: *See*—
Groenewegen, Johannes B., 4,694,119, Cl. 174-52.0PE.

Sunkist Growers Inc.: *See*—
Conway, Tim D., 4,693,607, Cl. 356-380.000.

Sunstar Giken Kabushiki Kaisha: *See*—
Suginori, Masaru; and Sanji, Koichiro, 4,694,093, Cl. 556-413.000.

Supafit Gymnasium Equipment Pty, Limited: *See*—
Dofel, Andrew W. R., 4,693,471, Cl. 272-136.000.

Superior Industries International, Inc.: *See*—
Brown, Raymond C., 4,693,520, Cl. 301-37.0SS.

Surculus AG: *See*—
Selz, Aloiz, 4,693,410, Cl. 229-1.50B.

Surgical Laser Technologies, Inc.: *See*—
Daikuzono, Norio, 4,693,244, Cl. 128-303.100.

Sutherland, James F.: *See*—
Hasenkopf, Joel E.; and Sutherland, James F., 4,694,415, Cl. 364-724.000.

Sutto, Melody L.: *See*—
McGregor, Charles W.; and Sutto, Melody L., 4,693,936, Cl. 428-181.000.

Suyama, Tadakazu: *See*—
Uemura, Yahiro; Ohmura, Takao; Ohmiza, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, 4,694,074, Cl. 530-417.000.

Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; and Yamamoto, Saburo, 4,693,207, Cl. 118-715.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,694,460, Cl. 372-45.000.

Suzuka, Susumu: *See*—
Kaneko, Kazuo; Suzuka, Susumu; Gonda, Michihiro; and Kanasugi, Mikiko, 4,694,088, Cl. 549-226.000.

Suzuki, Fuminori: *See*—
Kamiya, Kiyoshi; Shiraishi, Atsushi; and Suzuki, Fuminori, 4,694,348, Cl. 358-236.000.

Suzuki, Haruko: *See*—
Oodaira, Hiroshi; Suzuki, Haruko; Saito, Masayuki; and Ohuchi, Masayuki, 4,694,138, Cl. 219-121.0LM.

Suzuki, Hayao; and Matsuoka, Yoshiharu, to Seiko Instruments & Electronics Ltd. Robot controlling systemcu4,694,232, Cl. 318-568.000.

Suzuki, Hidetoshi: *See*—
Ozawa, Kunitaka; Ayata, Naoki; Suzuki, Hidetoshi; Saito, Seiji; and Koumura, Noboru, 4,694,502, Cl. 382-17.000.

Suzuki, Iwatoshi: *See*—
Shigemoto, Hiromi; Yamamoto, Akio; and Suzuki, Iwatoshi, 4,693,677, Cl. 425-376.00R.

Suzuki, Kazunori: *See*—
Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, 4,693,833, Cl. 210-759.000.

Suzuki, Kenji: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Suzuki, Michio: *See*—
Saiki, Atsushi; Suzuki, Michio; Sunami, Hideo; Asai, Shojiro; Maki, Michiyoshi; and Asami, Kinichiro, 4,693,173, Cl. 98-31.500.

Suzuki, Noboru: *See*—
Hazano, Shigeki; Shibagaki, Masahiro; Jyo, Hidetaka; Sensui, Reiichiro; Iwami, Munenori; and Suzuki, Noboru, 4,693,777, Cl. 156-345.000.

Suzuki, Ryoichi: *See*—
Shiomi, Yasuhiko; and Suzuki, Ryoichi, 4,693,597, Cl. 356-1.000.

Suzuki, Shinichi; Tokumo, Akio; Kunugi, Yoshiro; and Kato, Masayuki, to Pioneer Electronic Corporation. Automatic sound field correcting systemcu4,694,498, Cl. 381-103.000.

Suzuki, Tadashi; Futami, Toru; and Sakagami, Atsushi, to Nissan Motor Company, Limited. Synchronized network systemcu4,694,294, Cl. 340-825.140.

Suzuki, Takaya: *See*—
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Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, to Takenaka Komuten Co., Ltd. Gravity type oceanic structure and its stable installationcu4,693,637, Cl. 405-224.000.

Suzuki, Yoshio: *See*—
Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, 4,693,637, Cl. 405-224.000.

Suzuki, Yukio: *See*—
Uragami, Akira; Suzuki, Yukio; Iwamura, Masahiro; and Masuda, Ikuro, 4,694,203, Cl. 307-446.000.

Svedberg, Per, to ASEA-Aktiebolag. CMOS overvoltage protection circuit utilizing thyristor and majority carrier injecting anti-parallel diodecu4,694,315, Cl. 357-23.130.

Svyatsky, Eduard; and Rabindran, K. George, to Bell & Howell Company. Rotatable print mechanism for printing on front or back of mediacu4,693,465, Cl. 271-274.000.

Swanberg, Melvin E., to Xerox Corporation. Pixel placement sensing arrangement using split detecting elementscu4,694,156, Cl. 250-214.0RC.

Swapp, Mavin: *See*—
Peterson, John L.; and Swapp, Mavin, 4,694,242, Cl. 324-73.00R.

Sweeney, Theodore J., to Theodore Sweeney & Company, Inc. Adhesively securable fastenercu4,693,652, Cl. 411-23.000.

Swengel, Robert C., Sr., to Doneco Inc. Oscillating device having improved support legs and demountable basecu4,693,466, Cl. 272-52.000.

SWF Auto-Electric GmbH: *See*—
Bayha, Heiner; Kluge, Hermann; and Rachner, Horst, 4,694,211, Cl. 310-71.000.

Swiggett, Brian E.; Morino, Ronald; Keogh, Raymond J.; and Crowell, Jonathan C., to Kollmorgen Technologies Corporation. Apparatus for making scribed circuit boards and circuit board modificationscu4,693,778, Cl. 156-361.000.

Swiss Aluminium Ltd.: *See*—
Mittelmann, Gerhard, 4,693,345, Cl. 190-108.000.
Skaria, Arankathu; and Goeldi, Heinrich, 4,693,878, Cl. 423-334.000.

Szabo, Bela; Vagvolgyi, Jeno; and Feher, Istvan, to MTA Kozponti Fizikai Kutato Intezete. Current-impulse converter circuit with variable time constantcu4,694,208, Cl. 307-603.000.

Szczesny, David S.; and Root, John A., to AMP Incorporated. Ribbon cable connector with improved cover latchcu4,693,533, Cl. 439-350.000.

Sztaba, Leonard: *See*—
Keem, John E.; Ovshinsky, Stanford R.; Flessa, Steven A.; Wood, James L.; Hart, Keith L.; and Sztaba, Leonard, 4,693,933, Cl. 428-333.000.

T. D. Williamson, Inc.: *See*—
Wilson, Buddy A.; and Osborn, Coy D., 4,693,278, Cl. 138-89.000.

T. Entrepreneur, Inc.: *See*—
Terhune, John J., 4,693,022, Cl. 36-132.000.

T K Valve & Manufacturing, Inc.: *See*—
Plow, Arthur E., 4,693,128, Cl. 74-104.000.

T-Thermal, Inc.: *See*—
Miller, Ralph, 4,693,881, Cl. 423-573.00R.

Tabasky, Marvin J.: *See*—
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Tadauchi, Masaharu: *See*—
Nakamura, Koozoo; Hamada, Nagaharu; Tadauchi, Masaharu; Kozima, Yasuyuki; Suemori, Noboru; and Kouno, Takamitu, 4,694,351, Cl. 358-256.000.

Tadeka, Makoto: *See*—
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Tadokoro, Eiichi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, 4,693,929, Cl. 428-323.000.

Taft, Phillip A.: *See*—
Reynolds, Desmond H. J.; and Taft, Phillip A., 4,693,273, Cl. 137-596.130.

Taga, Yutaka: *See*—
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Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.
Nakamura, Shinya; Kubo, Seitoku; and Taga, Yutaka, 4,693,081, Cl. 29-448.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,693,348, Cl. 192-3.290.

Taguchi, Junji: *See*—
Kariya, Akinori; Nabekawa, Shukichi; Hara, Yoshifusa; and Taguchi, Junji, 4,694,095, Cl. 558-186.000.

Taguchi, Masaaki: *See*—
Harada, Takamasa; and Taguchi, Masaaki, 4,693,563, Cl. 350-150.00S.

Tahara, Teruji: *See*—
Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, 4,693,879, Cl. 423-461.000.

Tahara, Toshiro: *See*—
Yamazaki, Seiichi; Uchiyama, Kaoru; and Tahara, Toshiro, 4,693,016, Cl. 34-52.000.

Taika, Tadao: *See*—
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Taiyo Yuden Co., Ltd.: *See*—
Hayashi, Yutaka; Mishuku, Toshio; Yamanaka, Mitsuyuki; and Iida, Hideyo, 4,694,116, Cl. 136-256.000.

Takahashi, Akinori, to NEC Corporation. A/D convertercu4,694,277, Cl. 340-347.0NT.

Takahashi, Hiroto: *See*—
Ikeda, Masami; Matsuda, Hiroto; Takahashi, Hiroto; and Shohji, Tatsumi, 4,694,306, Cl. 346-140.00R.

Takahashi, Jiro: *See*—
Koizumi, Fumio; Kasuya, Takahira; and Takahashi, Jiro, 4,693,952, Cl. 430-109.000.

Takahashi, Kenji: *See*—
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Takahashi, Kohsei: *See*—
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Takahashi, Kozo, to Sharp Kabushiki Kaisha. Paper speed control in automatic document feedercu4,693,461, Cl. 271-176.000.

Takahashi, Masatoshi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, 4,693,929, Cl. 428-323.000.

Takahashi, Shiro, to Man Design Co., Ltd. Annular hole cuttercu4,693,644, Cl. 408-204.000.

Takahashi, Susumu, to Olympus Optical Co., Ltd. Image transmission optical system for an endoscopecu4,693,568, Cl. 350-469.000.

Takahata, Yasuyo; and Miyagawa, Ryuji, to Chemicals Inspection & Testing Institute. Partially hydrophilicized silica gel and process for producing the samecu4,694,092, Cl. 556-400.000.

Takakura, Mitsuro: *See*—
Okamoto, Tadashi; Shimoyama, Kazuhiko; Yamaoka, Hiromasa; and Takakura, Mitsuro, 4,694,419, Cl. 364-900.000.

Takasago Thermal Engineering Co., Ltd.: *See*—
Hashimoto, Takayoshi, 4,693,175, Cl. 98-31.600.

Takasu, Yoshio; Oguchi, Yoshihiro; and Katagiri, Kazuharu, to Canon Kabushiki Kaisha. Image forming method and image bearing membercu4,693,951, Cl. 430-31.000.

Takata, Koji; and Nishiyama, Yukinori, to Sumitomo Electric Industries, Ltd. Automobile braking force control apparatuscu4,693,521, Cl. 303-103.000.

Take, Hiroshi: *See*—
Takeda, Makoto; Yamamoto, Kunihiko; Matsubayashi, Nobuaki; and Take, Hiroshi, 4,694,349, Cl. 358-241.000.

Takeda, Makoto; Yamamoto, Kunihiko; Matsubayashi, Nobuaki; and Take, Hiroshi, to Sharp Kabushiki Kaisha. Liquid crystal matrix display panel driver circuitcu4,694,349, Cl. 358-241.000.

Takehara, Shin: *See*—
Akatsu, Yousuke; Yamaguchi, Hirotsugu; Fukushima, Naoto; Hano, Sunao; Sugino, Masaru; Takehara, Shin; and Matsui, Shinichi, 4,693,491, Cl. 280-688.000.

Takei, Hidetoshi; and Minami, Teruo, to Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd. Collector device for trolley-assisted vehiclescu4,694,125, Cl. 191-87.000.

Takenaka Komuten Co., Ltd.: *See*—
Suzuki, Yoshio; Suzuki, Yoshio; Saitoh, Satoshi; Yamamoto, Mituoki; and Hosomi, Hisashi, 4,693,637, Cl. 405-224.000.

Takenaka, Shinji; and Oi, Ryu, to Mitsui Toatsu Chemicals, Inc. Process for production of m-phenoxybenzyl alcoholcu4,694,110, Cl. 568-631.000.

Takeshima, Akira: *See*—
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Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, to Toyota Jidosha Kabushiki Kaisha. Method of broaching outer periphery of lobe-type rotor of roots-type fluid machine, and broaching cutter used in the methodcu4,693,813, Cl. 409-244.000.

Takeuchi, Hiromi: *See*—
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Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, to Toto Ltd. Sanitary facility room for clean roomcu4,692,951, Cl. 4-664.000.

Talamantez, Rudolph, Sr. Ball-and-target game with tiltable playing surface thereforcu4,693,476, Cl. 273-110.000.

Talas, Eva E., to Pennwalt Corporation. Process for continuously dispensing liquid microbicides into metalworking fluidscu4,693,283, Cl. 141-1.000.

Taliq Corporation: *See*—
Wiley, Richard, 4,693,560, Cl. 350-335.000.

Tallgrass Technologies, Inc.: *See*—
Brent, George I., 4,694,367, Cl. 360-106.000.

Talonn, Daniel A., to Sherwood Medical Company. Respiratory devicecu4,693,256, Cl. 128-725.000.

Tamaru, Takuya; and Ogusu, Mikio, to Nippon Gakki Seizo Kabushiki Kaisha. Disc casecu4,694,448, Cl. 369-291.000.

Tami, Kazuya, to Tokyo Juki Industrial Co., Ltd. Sewing machine apparatus with improved shaft speed measuring and indicating meanscu4,693,197, Cl. 112-277.000.

Tamura, Hiroshi; and Nakaie, Yutaka, to Kabushiki Kaisha Toshiba. Security monitoring systemcu4,694,282, Cl. 340-539.000.

Tamura, Hiroshi: *See*—
Higashi, Akio; Shinada, Haruji; Kawajiri, Kazuhiro; Ono, Yoshihiro; Saitou, Mitsuo; Tamura, Hiroshi; and Ikeda, Mitsuru, 4,694,317, Cl. 357-30.000.

Tamura, Kaoru: *See*—
Ohgoda, Makoto; Tamura, Kaoru; and Kawai, Yasuhiro, 4,694,163, Cl. 250-234.000.

Tamura, Kouichi: *See*—
Kitagawa, Katsuichi; and Tamura, Kouichi, 4,693,608, Cl. 356-394.000.

Tamura, Sadahiro: *See*—
Inoue, Atsushi; Kuroda, Yuji; and Tamura, Sadahiro, 4,694,262, Cl. 331-96.000.

Tamura, Shinichiro; and Seto, Junetsu, to Sony Corporation. Photochromic photosensitive compositionscu4,693,962, Cl. 430-345.000.

Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., to Thomson-CGR. Process of image reconstruction by tomodensitometry with improved spatial resolutioncu4,694,399, Cl. 364-414.000.

Tanahashi, Toshio: *See*—
Chujo, Yoshiki; Kayanuma, Nobuaki; Bessho, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.

Tanaka, Gotaro: *See*—
Hoshikawa, Masao; Kyoto, Michihisa; Yano, Koji; and Tanaka, Gotaro, 4,693,738, Cl. 65-3.110.

Tanaka, Hidenori, to Victor Company of Japan, Ltd. Vertical synchronizing signal separating circuitcu4,694,340, Cl. 358-154.000.

Tanaka, Hiroshi; and Fukehara, Shinsuke, to Sony Corporation. Method and apparatus for printing trimming instructions for developer of photographscu4,694,354, Cl. 358-296.000.

Tanaka, Kazuna: *See*—
Blatherwick, William J.; Hamilton, Leslie; Holewinski, Robert D.; Shen, Virginia A.; Kapec, Jeffrey; and Tanaka, Kazuna, 4,693,684, Cl. 433-90.000.

Tanaka, Kenji: *See*—
Oonishi, Akiyoshi; Tanaka, Kenji; Tadeka, Makoto; Konno, Kazuhiko; and Saito, Masaki, 4,694,102, Cl. 562-426.000.

Tanaka, Kunio: *See*—
Nakaya, Keiichi; and Tanaka, Kunio, 4,693,872, Cl. 423-164.000.

Tanaka, Motoaki: *See*—
Itoh, Kenichi; Noguki, Genji; Tanaka, Motoaki; and Ohba, Hitoshi, 4,694,053, Cl. 526-74.000.

Tanaka, Sumio; Saito, Shinji; Atsumi, Shigeru; and Ohtsuka, Nobuaki, to Kabushiki Kaisha Toshiba. Semiconductor memory devicecu4,694,429, Cl. 365-189.000.

Tanaka, Yasuhiro: *See*—
Kimura, Sakae; and Tanaka, Yasuhiro, 4,693,571, Cl. 350-634.000.

Tanaka, Yutaka; and Umemura, Shunji, to Sony Corporation. Color correction circuitcu4,694,330, Cl. 358-27.000.

Taneya, Mototaka: *See*—
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Tani, Hiroji: *See*—
Kasanami, Toru; Tani, Hiroji; Watanabe, Shizuharu; and Ikeda, Toshiaki, 4,693,843, Cl. 252-518.000.

Tani, Tadaaki: *See*—
Ihama, Mikio; and Tani, Tadaaki, 4,693,965, Cl. 430-569.000.

Taniguchi, Nobuyuki: *See*—
Yamaki, Toshio; Mukai, Hiromu; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,693,581, Cl. 354-400.000.

Tanimoto, Fumio: *See*—
Inoue, Yoshiharu; Tanimoto, Fumio; and Kitano, Hisao, 4,693,844, Cl. 512-14.000.

Tanimoto, Junichi: *See*—
Hirano, Takaaki; Kamuro, Setsufumi; Yamaguchi, Akira; Tanimoto, Junichi; and Okada, Mikiro, 4,694,393, Cl. 364-200.000.

Tarakad, Ramanathan R.; and Crawford, Duffer B., to M. W. Kellogg Company, The. Removal of mercury from gasescu4,693,731, Cl. 55-72.000.

Tarman, Paul B.: *See*—
Lee, Bernard S.; Tarman, Paul B.; and Punwani, Dharam V., 4,693,682, Cl. 432-15.000.

Tashjian, Robert J.; and Moreland, Charles E., to New England Institute of Comparative Medicine. Transportable X-ray apparatuscu4,694,481, Cl. 378-198.000.

Tassi, Lamberto: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,693,053, Cl. 53-389.000.

Tauzin, Francis, to Sigma Plastique; and Pomagalski S.A. Mechanism for opening, closing and locking two leaved doors for cable carscu4,693,033, Cl. 49-122.000.

Tavas, Edward A.; Santalucia, John; and Carroll, David L., to Colgate-Palmolive Company. Ethylene propylene copolymer in a substrate and collapsible dispensing container made therefromcu4,693,395, Cl. 222-107.000.

Tavas, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., to Colgate-Palmolive Company. Laminate substrate and article therefrom incorporating fluorinated polyethylenecu4,693,396, Cl. 222-107.000.

Taylor, Chandler R., Jr., to A. H. Robins Company, Incorporated. Method of treating depression with 5-(aminoalkyl)-11-phenyl-5H-dibenzo(b,e)(1,4) diazepinescu4,694,003, Cl. 514-220.000.

Taylor, Charles W.: *See*—
Krampe, Stephen E.; Moore, Cheryl L.; and Taylor, Charles W., 4,693,776, Cl. 156-327.000.

Taylor, Cynthia L.; and Nash, Judith E. M., to Community of Jesus, Inc. Wheelchair cover and method of using samecu4,693,289, Cl. 150-52.00R.

Taylor, Frank H., to Otis Engineering Corporation. Bleedoff tool for well test systemscu4,693,315, Cl. 166-336.000.

Taylor, William D.: *See*—
Miller, William H.; and Taylor, William D., 4,694,081, Cl. 544-385.000.
Miller, William H.; and Taylor, William D., 4,694,082, Cl. 544-385.000.

Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, to Clarion Co., Ltd. Control voltage generating circuit for activating a noise reduction circuit in an FM stereo receivercu4,694,500, Cl. 381-10.000.

Tchejeyan, Sarkis K.: *See*—
Kitzmann, Ronald A.; and Tchejeyan, Sarkis K., 4,694,130, Cl. 200-114.000.

TDK Corporation: *See*—
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Tesc Corporation: *See*—
Tauchiya, Isamu; Kawasaki, Tsutomu; and Sakai, Yoshiaki, 4,694,361, Cl. 360-97.000.

Techna Vision, Inc.: *See*—
Orlosky, Henry, 4,693,446, Cl. 249-53.00R.

Technicon Instruments Corporation: *See*—
Spadaro, Anthony M.; McLoughlin, Thomas J.; and Engler, Phillip V., 4,693,912, Cl. 427-213.300.

Techserve Engineering Corp.: *See*—
Brett, Dennis A.; and Rumshe, Clay R., 4,693,786, Cl. 202-83.000.

Teichner, Robert W.: *See*—
Merrick, Stephen P.; and Teichner, Robert W., 4,694,183, Cl. 250-551.000.

Tektronix, Inc.: *See*—
Bergstedt, Gar A., 4,694,286, Cl. 340-703.000.
Mallory, Robert L.; Schamel, Alfred H.; and Sekel, Stephen M., 4,694,380, Cl. 361-424.000.
Matney, Earl G., 4,694,324, Cl. 358-10.000.
Pettet, Mark E.; and Hoeren, Gerd H., 4,694,420, Cl. 364-900.000.
Unger, Peter J.; and Mutton, Jon C., 4,694,379, Cl. 367-419.000.

Teledyne Industries, Inc.: *See*—
Lenz, Herman N.; and Chen, Allen G., 4,693,667, Cl. 415-115.000.

Telefunken Electronic GmbH: *See*—
Friedrich, Gerda; Rasch, Klaus-Dieter; and Schmidt, Wilfried, 4,694,117, Cl. 136-256.000.

Telefunken Fernseh und Rundfunk GmbH: *See*—
Keesen, Heinz-Werner; Oberjatzas, Gunter; and Peters, Hartmut, 4,694,336, Cl. 358-133.000.

TELSA, koncernovy podnik: *See*—
Jerabek, Jiri, 4,693,238, Cl. 128-1.500.

Temin, Samuel: *See*—
Tavss, Edward A.; Temin, Samuel; Santalucia, John; and Carroll, Davis L., 4,693,396, Cl. 222-107.000.

TEMSIR S.r.l.: *See*—
Bernocco, Giovanni, 4,693,488, Cl. 280-293.000.

Tenjinbayashi, Koji, to Agency of Industrial Science & Technology; and Ministry of International Trade and Industry. Interference method and interferometer for testing the surface precision of a parabolic mirrorcu4,693,604, Cl. 356-348.000.

Tensiter S.p.A.: *See*—
Chiaves, Carlo, 4,693,634, Cl. 405-126.000.

Terada, Yasushi; and Nakayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor devicecu4,694,314, Cl. 357-23.600.

Teramachi, Hiroshi. Simultaneously ground type bearing body and unlimited sliding bearing unit employing the samecu4,693,040, Cl. 51-291.000.

Teramachi, Hiroshi. Feeding apparatus employing ball screwcu4,693,131, Cl. 74-424.80B.

Terasaki, Masanori: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.

Terhune, John J., to T. Entrepreneur, Inc. Garden toolcu4,693,022, Cl. 36-132.000.

Terra International, Inc.: *See*—
Haynes, Robert W., 4,693,609, Cl. 366-136.000.

Terrien, Conrad; and Carlson, Lee G., to UIP Engineered Products Corporation. Ion exchange apparatuscu4,693,818, Cl. 210-189.000.

Tescom Corporation: *See*—
Patterson, Daryll D., 4,693,267, Cl. 137-116.500.

Texas Instruments Incorporated: *See*—
Guttag, Karl M.; and McDonough, Kevin C., 4,694,391, Cl. 164-200.000.

Tezuka, Yasuyuki: *See*—
Imai, Kiyokazu; Shioni, Tomoo; and Tezuka, Yasuyuki, 4,694,077, Cl. 536-92.000.

Thamm, Horst-Dieter: *See*—
Kleiner, Hans-Jerg; Kloss, Gerhard; Molter, Michael; Schwarz, Alexander; and Thamm, Horst-Dieter, 4,693,884, Cl. 424-1.100.

Theeuwes, Felix: *See*—
Wong, Patrick S. L.; and Theeuwes, Felix, 4,693,895, Cl. 424-473.000.

Thelen, Werner, to G. Siempelkamp GmbH & Co. Method of conveying particulate matscu4,693,860, Cl. 264-320.000.

Theodor Hymmen, Firma: *See*—
Pankoke, Werner, 4,693,177, Cl. 100-154.000.

Theodore Sweeney & Company, Inc.: *See*—
Sweeney, Theodore J., 4,693,652, Cl. 411-23.000.

Thermal Engine Technology, Inc.: *See*—
Lagow, Ralph J., 4,693,087, Cl. 60-670.000.

Thill, Bruce P.: *See*—
Fairchok, William J.; Friedrich, Ralph E.; Thill, Bruce P.; and McKinley, Mark J., 4,694,050, Cl. 525-411.000.

Thill, Gerald D., to Spearhead Industries, Inc. Egg decorating kitcu4,693,205, Cl. 118-13.000.

Thoma, Klemens; and Volker, Wolfgang, to Messer Griesheim GmbH. Device for generating dry, cold gas flowcu4,693,252, Cl. 128-400.000.

Thomas, James R.: *See*—
Moy, Howard; Thomas, James R.; and Droske, Donald J., 4,693,509, Cl. 296-201.000.

Thomas, Michael D.: *See*—
Williams, Glenn T.; and Thomas, Michael D., 4,693,444, Cl. 148-653.000.

Thomassen & Drijver-Verblifa NV: *See*—
Glerum, Johannes A.; and Klunder, Robert C., 4,693,658, Cl. 413-1.000.

Thompson, Edward D.: *See*—
Unrug, Konstanty F.; Thompson, Edward D.; and Nandy, Samir K., 4,693,638, Cl. 405-259.000.

Thomson-CGR: *See*—
Le Roux, Patrick, 4,694,253, Cl. 324-309.000.
Tan, Siv C.; Nguyen, Tri H.; and Benchimol, Claude D., 4,694,399, Cl. 364-414.000.

Thomson-CSF: *See*—
Blanchard, Pierre, 4,692,995, Cl. 437-41.000.
Chabbal, Jean J., 4,694,316, Cl. 357-24.000.
de Sartre, Jean, 4,694,386, Cl. 363-49.000.
Hetyei, Joseph, 4,694,200, Cl. 307-358.000.

Thomson-CSF Broadcast, Inc.: *See*—
Rahman, Altaf; and Navikas, Vincent J., 4,694,357, Cl. 360-9.100.

Thonnard, Norbert: *See*—
Payne, Marvin G.; Thonnard, Norbert; and Hurst, George S., 4,694,167, Cl. 250-282.000.

Thorn EMI plc: *See*—
Hing, Peter, 4,694,219, Cl. 313-636.000.

Thornton, David C.; and McKinley, Mark J., to Dow Chemical Company, The. Flocculants for brine-containing systemscu4,693,830, Cl. 210-734.000.

Thornton, Harold C., Jr.; and Hall, Clifton W., to Tramtec Corporation. Reversible self-adjusting propeller devicecu4,693,671, Cl. 416-43.000.

3 T S.p.A.: *See*—
Borromeo, Lucio, 4,693,627, Cl. 403-24.000.

Thurow, Eberhard: *See*—
Ross, Cyrus A.; and Thurow, Eberhard, 4,693,763, Cl. 149-8.000.

Tietze, Armin R.: *See*—
Rossi, Eva-Maria; and Tietze, Armin R., 4,693,908, Cl. 427-130.000.

Tighe, Charles L., Jr., to AMP Incorporated. Ribbon coax cable connectorcu4,693,539, Cl. 439-465.000.

Timmerman, Hendrik; and Van der Goot, Henderikus, to Akzo N.V. Quinazoline and isoquinoline derivativescu4,694,000, Cl. 514-187.000.

Timmermeister, Dieter M., to Tri-D-Automotive Industries, Ltd. Compact catalytic convertercu4,693,337, Cl. 181-231.000.

Titolo, Andrea, to Fiat Auto S.p.A. Tappet system for internal combustion engines having shafts with variable-profile camscu4,693,214, Cl. 123-90.180.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Hiroyuki, Furuhashi; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,693,990, Cl. 502-116.000.

Toda, Shozo: *See*—
Hashimoto, Akira; Nishimura, Toshihiro; Nakayama, Muneo; Nakane, Hisashi; and Toda, Shozo, 4,694,040, Cl. 524-765.000.

Toganoh, Shigeo; Matsufuji, Yohji; and Ichihashi, Hiroo, to Canon Kabushiki Kaisha. Recording device with multiple recording units and a common ink sourcecu4,694,307, Cl. 346-140.00R.

Tojo, Yu: *See*—
Watanabe, Izumi; and Tojo, Yu, 4,693,589, Cl. 355-5.000.

Tokai Rubber Industries, Ltd.: *See*—
Kanda, Ryouji, 4,693,456, Cl. 267-140.100.

Tokumo, Akio: *See*—
Suzuki, Shinichi; Tokumo, Akio; Kunugi, Yoshiro; and Kato, Masayuki, 4,694,498, Cl. 381-103.000.

Tokunaga, Yukio: *See*—
Saeki, Yukio; Inoue, Naomitsu; and Tokunaga, Yukio, 4,694,028, Cl. 521-110.000.

Tokura, Norihito; Moritugu, Mitiyasu; and Kawai, Hisasi, to Nippon Sokeu, Inc. Device for measuring flow rate of aircu4,693,115, Cl. 73-204.000.

Tokyo Denshi Kagaku Kabushiki Kaisha: *See*—
Hashimoto, Akira; Nishimura, Toshihiro; Nakayama, Muneo; Nakane, Hisashi; and Toda, Shozo, 4,694,040, Cl. 524-765.000.

Tokyo Electric Co., Ltd.: *See*—
Ishii, Hidekazu; and Kosaka, Chihiro, 4,693,619, Cl. 400-212.000.
Kawaguchi, Katsuhiko, 4,693,621, Cl. 400-636.100.
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,693,330, Cl. 177-25.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Shindou, Norikazu, 4,694,209, Cl. 310-12.000.
Shiomi, Kengo; Sasaki, Yoshiyuki; and Kato, Toshiyuki, 4,694,305, Cl. 346-76.0PH.
Tami, Kazuya, 4,693,197, Cl. 112-277.000.
Yasui, Hideo, 4,693,192, Cl. 112-121.110.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Mizunoya, Nobuyuki; Kohama, Hajime; and Sugiura, Yasuyuki, 4,693,409, Cl. 228-122.000.

Tomalia, Donald A.; and Kirchhoff, Pamela M., to Dow Chemical Company, The. Rod-shaped dendrimercu4,694,064, Cl. 528-332.000.

Tomczak, Walter F.: *See*—
Black, Randy D.; and Tomczak, Walter F., 4,692,947, Cl. 2-421.000.

Tomii, Kaoru; and Hamada, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Method of driving a flat type of cathode ray tube to provide uniformity of electron beam emission characteristics for a plurality of beam sourcescu4,694,225, Cl. 315-366.000.

Tomisawa, Norio; Kamiya, Shingo; and Aoshima, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Position control device for an optical reproduction system in an optical type disc reproduction devicecu4,694,441, Cl. 369-32.000.

Tomita, Takao; and Kawai, Noriaki, to Honda Giken Kogyo Kabushiki Kaisha. Noise reduction in gear transmissionscu4,693,133, Cl. 74-467.000.

Tomizawa, Fumio: *See*—
Naajo, Toshio; and Tomizawa, Fumio, 4,694,465, Cl. 373-81.000.

Tomlonovic, Vincent J.: *See*—
Johnson, James A.; Schulz, Richard; and Tomlonovic, Vincent J., 4,693,331, Cl. 180-135.000.

Tomy Kogyo Co., Inc.: *See*—
Seki, Yoshizo, 4,693,694, Cl. 446-197.000.

Toratani, Hisayoshi: *See*—
Nakajima, Sadahiro; and Toratani, Hisayoshi, 4,693,910, Cl. 427-168.000.

Toray Industries, Inc.: *See*—
Kitagawa, Katsuichi; and Tamura, Kouichi, 4,693,608, Cl. 356-394.000.
Morimoto, Hiroshi; and Ohura, Akio, 4,694,086, Cl. 564-236.000.
Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, 4,693,828, Cl. 210-679.000.

Torikai, Eiichi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for production of moisture sensitive elementcu4,693,953, Cl. 430-165.000.

Torizuka, Koichi; and Futaki, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Negative type lithographic printing platecu4,693,955, Cl. 430-204.000.

Torok, Gabor P.; and White, Andrew B., to American Telephone and Telegraph Company; and Bell Telephone Laboratories, Incorporated. Clock adjustment method and apparatus for synchronous data communicationscu4,694,472, Cl. 375-107.000.

Tortella, Frank C.: *See*—
Musacchio, Jose M.; and Tortella, Frank C., 4,694,010, Cl. 514-304.000.

Tosaka, Yoichi: *See*—
Ohnuki, Ichiro; Aihara, Yoshihiko; Tosaka, Yoichi; and Eguchi, Masaharu, 4,693,574, Cl. 354-21.000.

Toshiba Ceramics, Ltd.: *See*—
Fujimoto, Masashi; and Kato, Yoshihisa, 4,693,918, Cl. 428-35.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Yamamoto, Harutoshi; and Sakomoto, Sadaue, 4,693,293, Cl. 164-99.000.

Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, to JGC Corporation. Method of treating radioactive waste water resulting from decontaminationcu4,693,833, Cl. 210-759.000.

Toth, Vincent A.: *See*—
Kasner, William H.; Bruck, Gerald J.; Miller, Richard A.; and Toth, Vincent A., 4,694,136, Cl. 219-121.0LD.

Toto Ltd.: *See*—
Taki, Masaru; Okada, Hiroshi; Kawamura, Seijiro; Kusumoto, Akio; Morita, Koji; Ikenaga, Takao; Shigematsu, Toshifumi; and Iida, Masami, 4,692,951, Cl. 4-664.000.

Tourret, Alain P., to Aciers et Outillage Peugeot. Winding mandrel especially for a safety strapcu4,693,432, Cl. 242-74.000.

Tower, Stephen N.; Braun, Howard E.; Boyle, David E.; and Salton, Robert B., to Westinghouse Electric Corp. Gas displacement spectral shift reactor and control methodcu4,693,862, Cl. 376-209.000.

Toyama, Masamichi; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Focus adjusting devicecu4,694,149, Cl. 250-201.000.

Toyama, Minoru: *See*—
Ichikawa, Hiroyuki; and Toyama, Minoru, 4,693,565, Cl. 350-413.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Kuze, Katsuaki; Nishino, Yasuhiro; Matsuyama, Yujiro; Maeda, Kozo; Kobayashi, Masahiro; Okudaira, Tadashi; Hongo, Tsuyoshi; and Makimura, Osamu, 4,693,932, Cl. 428-323.000.

Toyo Boseki Kabushiki Kaisha T/A Toyobo Co., Ltd.: *See*—
Morita, Ichiro; Taika, Tadao; and Nakamura, Hidehiro, 4,694,049, Cl. 525-440.000.

Toyo Denki Seizo Kabushiki Kaisha and Komatsu Ltd.: *See*—
Takei, Hidetoshi; and Minami, Teruo, 4,694,125, Cl. 191-87.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Misaki, Hideo, 4,693,971, Cl. 435-17.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Seita, Toru; Satoh, Takao; and Kikuchi, Mitsuo, 4,693,796, Cl. 204-98.000.

Toyoda Gosei Co., Ltd.: *See*—
Ukai, Mikio; and Okumoto, Ryouji, 4,693,484, Cl. 277-212.0FB.

Toyoda Koki Kabushiki Kaisha: *See*—
Yoneda, Takao; and Nakano, Hiroshi, 4,694,233, Cl. 318-569.000.

Toyota Central Research & Development Laboratories, Inc.: *See*—
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,693,493, Cl. 280-707.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Buma, Shuuichi; Onuma, Toshio; Ohashi, Kaoru; and Itou, Masami, 4,693,494, Cl. 280-707.000.
Chajo, Yoshiki; Kayanuma, Nobuaki; Benzbo, Hironori; Masui, Takatoshi; Nagai, Toshinari; Katsuno, Toshiyasu; and Tanahashi, Toshio, 4,693,076, Cl. 60-274.000.
Harada, Yoshiharu; Taga, Yutaka; Fukumura, Kagenori; Hayakawa, Yoichi; and Kawai, Masao, 4,693,143, Cl. 74-866.000.
Hayakawa, Toshihiro, 4,693,416, Cl. 98-2.090.
Ikemoto, Hiroyuki; Oowa, Nobutaka; Hayashi, Yasutaka; and Doi, Shunichi, 4,693,493, Cl. 280-707.000.
Itou, Hiroshi; Okane, Yukihiro; and Kuramoto, Akio, 4,693,222, Cl. 123-432.000.
Kobayashi, Koji; Sumiya, Koji; Taga, Yutaka; and Watanabe, Kazuaki, 4,693,353, Cl. 192-85.0AA.
Miyata, Hiroshi; and Katoh, Shinji, 4,693,332, Cl. 180-142.000.
Nakamura, Shinya; Kubo, Seitoku; and Taga, Yutaka, 4,693,081, Cl. 60-448.000.
Satou, Yasuo, 4,693,227, Cl. 123-575.000.
Takeshita, Hajime; Iwase, Takahiro; Masuda, Naofumi; Sibata, Takuo; Mochizuki, Hiroyuki; Kobayashi, Nobuo; Kawakami, Seiho; and Kuroiwa, Yosio, 4,693,813, Cl. 409-244.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, 4,693,348, Cl. 192-3.290.
Ukai, Mikio; and Okumoto, Ryouji, 4,693,484, Cl. 277-212.0FB.

Toyota Jidosha Kabushikikaisha: *See*—
Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, 4,693,354, Cl. 192-106.100.

Traczyk, Edward S.; and Shulski, Michael M., to National Can Corporation. Method and apparatus for necking and flanging containerscu4,693,108, Cl. 72-370.000.

Traffic Transport Engineering, Inc.: *See*—
Stuart, Gerald W., 4,693,651, Cl. 410-30.000.

Tramtec Corporation: *See*—
Thornton, Harold C., Jr.; and Hall, Clifton W., 4,693,671, Cl. 416-43.000.

Transfield, Inc.: *See*—
Goronszy, Mervyn C.; and Olavarria, Raul, 4,693,821, Cl. 210-241.000.

Trenque, Pierre: *See*—
Vigneau, Jean L.; and Trenque, Pierre, 4,693,235, Cl. 126-263.000.

Tri-D-Automotive Industries, Ltd.: *See*—
Timmermeister, Dieter M., 4,693,337, Cl. 181-231.000.

Tricini, John D., to Valve Systems, Inc. Valve structurescu4,693,451, Cl. 251-163.000.

Trinh, Toan; and Scheper, John S., to Procter & Gamble Company, The. No rinse liquid car cleaner with solid polymercu4,693,840, Cl. 252-174.230.

Tripar Incorporated: *See*—
Breckwoldt, Robert G., 4,693,266, Cl. 131-359.000.

Triten Corporation: *See*—
Jandrasi Frank J., 4,693,452, Cl. 251-329.000.

Trofast, Jan W.: *See*—
Axelsson, Bengt I.; Brattsand, Ralph L.; Dahlback, Carl M. O.; Kallstrom, Leif A.; and Trofast, Jan W., 4,693,999, Cl. 514-174.000.

Trouw, Norman S., to Celanese Corporation. Method for the preparation of polybenzimidazole membranescu4,693,825, Cl. 210-500.280.

Trube, Hans: *See*—
Arold, Klaus; Koukal, Heinz; Grimm, Hermann, deceased; and Trube, Hans, 4,693,417, Cl. 237-12.30B.

Trumper, Reinhard; and Baschant, Robert, to O & K Orenstein & Koppel AG. Connecting elevatorcu4,693,661, Cl. 414-595.000.

Trush, David M.: *See*—
LaRocca, William J.; and Trush, David M., 4,693,135, Cl. 74-473.00R.

Trutek Research, Inc.: *See*—
Brisson, Alfred G.; and Nowacki, Christopher, 4,693,247, Cl. 128-328.000.

TRW Inc.: *See*—
Rezek, Edward A.; and Burghard, Andre, 4,694,311, Cl. 357-17.000.

Trznadel, Amalia. Elastic bandage knee supportcu4,693,241, Cl. 128-157.000.

Tsang, Won-Tien: *See*—
Capasso, Federico; and Tsang, Won-Tien, 4,694,318, Cl. 357-30.000.

Tsay, Grace C.: *See*—
Collins, Michael S.; Tsay, Grace C.; and Seng, Richard L., 4,693,891, Cl. 424-92.000.

Tsinberg, Mikhail, to North American Philips Corporation. High-definition television transmission systemcu4,694,338, Cl. 358-141.000.

Tsuchiya, Isamu; Kawasaki, Tsutomu; and Sakai, Yoshiaki, to Teac Corporation. Data transfer apparatus having a simplified clamp mechanism for holding a disklike record medium in placecu4,694,361, Cl. 360-97.000.

Tsuchiya, Tatsuo; and Hozumi, Kazuhiro, to Matsushita Electric Industrial Co., Ltd.; and Kuroda Precision Industries Ltd. Air pressure shock absorbercu4,693,454, Cl. 267-226.000.

Tsuchiya, Yutaka; Koishi, Musubu; and Takeshima, Akira, to Hamamatsu Photonics Kabushiki Kaisha. Instruments for measuring light pulses clocked at high repetition rate and electron tube devices thereforcu4,694,154, Cl. 250-213.0VT.

Tsuda, Hiroshi: *See*—
Kasai, Jumichi; Imai, Hiroshi; and Tsuda, Hiroshi, 4,694,497, Cl. 381-63.000.

Tsuetaki, George F.; and Sato, Shiro, to Fused Kontacts of Chicago, Inc. Monocentric bifocal corneal contact lenscu4,693,572, Cl. 351-161.000.

Tsujimoto, Jun-ichi: *See*—
Miyamoto, Junichi; and Tsujimoto, Jun-ichi, 4,694,427, Cl. 165.181.000.

Tsujimura, Osamu; Saito, Takayoshi; and Arai, Tatsuo, to Mitsubishi Kinzoku Kabushiki Kaisha. End mill with throw-away tipcu4,693,641, Cl. 407-42.000.

Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Maeda, Koji; Watanabe, Kazuaki; and Taga, Yutaka, to Aisin Warner Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Direct coupling clutch with an integral damper device for a fluid couplingcu4,693,348, Cl. 192-3.290.

Tsunoda, Kouichi: *See*—
Kohama, Masayuki; Wakabayashi, Tatsuro; and Tsunoda, Kouichi, 4,693,107, Cl. 72-354.000.

Tsunoi, Haruo, to Canon Kabushiki Kaisha. Device for recording information on a photosensitive medium for electrophotographycu4,693,548, Cl. 350-96.130.

Tucel Industries Inc.: *See*—
Lewis, John C., Jr., 4,693,519, Cl. 300-7.000.

Tucker, Daniel M. Chlorine generator devicecu4,693,806, Cl. 204-252.000.

Tunstromer, Nils, to Stubinen Utveckling AB. Apparatus for and method of burning and/or thermally decomposing fuel, especially solid fuelscu4,693,234, Cl. 126-155.000.

Turk, Thomas R.: *See*—
Niksa, Marilyn J.; Pohto, Gerald R.; Lakatos, Leslie K.; Wheeler, Douglas J.; Solomon, Frank; Niksa, Andrew J.; Scnue, Thomas J.; Genodman, Yury; Turk, Thomas R.; and Hagel, Daniel P., 4,693,946, Cl. 429-27.000.

Turner, Ralph E.: *See*—
Bilimoria, Bomi M.; Lewis, Herbert I.; Cook, Jerry A.; Turner, Ralph E.; and Garner, Robert H., 4,693,427, Cl. 241-23.000.

Turner, S. Richard: *See*—
Bock, Jan; Siano, Donald B.; and Turner, S. Richard, 4,694,046, Cl. 525-329.400.

Twellmann, Guenter, to Ninkaplast GmbH. Rotatable shelf insert for corner cupboardscu4,693,188, Cl. 108-139.000.

Twiefel, Gunther: *See*—
Friederichs, Karl-Heinz; and Twiefel, Gunther, 4,693,665, Cl. 414-744.00R.

Tyree, Lewis, Jr., to Liquid Carbonic Corporation. Remote cooling CO_2 applicationscu4,693,737, Cl. 62-10.000.

Tysver, John, to Sundstrand Corporation. Torque limiting apparatuscu4,693,349, Cl. 192-7.000.

Ube Industries, Ltd.: *See*—
Morita, Hideyo; Akagawa, Tomohiko; and Kita, Yasuo, 4,694,031, Cl. 523-203.000.

Uchida, Kazumichi: *See*—
Shimizu, Isoo; Hirano, Ryotaro; Matsumura, Yasuo; Nomura, Hideki; Uchida, Kazumichi; and Sato, Atsushi, 4,694,100, Cl. 560-105.000.

Uchida, Minoru; Komatsu, Makoto; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. 2-amido 3(oxindol-3-yl)propionic acids having antiulcer activitycu4,694,017, Cl. 514-418.000.

Uchida, Minoru, to Hitachi, Ltd. Mass spectrometercu4,694,169, Cl. 250-296.000.

Uchida, Satoru, to Ricoh Company, Ltd. Color image readercu4,694,332, Cl. 358-75.000.

Uchimura, Mitsuo; and Masuyama, Tsutomu, to Tokyo Electric Co., Ltd. Load cell scalescu4,693,330, Cl. 177-25.000.

Uchiyama, Kaoru: *See*—
Yamazaki, Seiichi; Uchiyama, Kaoru; and Tahara, Toshiro, 4,693,016, Cl. 34-52.000.

Ueda, Kenji: *See*—
Bochi, Hiroshi; Ueda, Kenji; and Konishi, Satoshi, 4,693,355, Cl. 193-2.00R.

Ueda, Tsuyoshi: *See*—
Kondo, Tetsuro; and Ueda, Tsuyoshi, 4,593,358, Cl. 198-339.100.

Uemura, Yahiro; Ohmura, Takao; Ohmizu, Akimasa; Sumi, Akinori; Ohtani, Wataru; Sakanishi, Yoshitaka; Morise, Hiroshi; Arimura, Hirofumi; and Suyama, Tadakazu, to Green Cross Corporation. Process for the purification of HBsAgcu4,694,074, Cl. 530-417.000.

Ueno, Fumio; Yamakawa, Takeshi; and Shirai, Yuji, to Omron Tateisi Electronics Co. Fuzzy logic basic circuit and fuzzy logic integrated circuit operable in current modecu4,694,418, Cl. 364-807.000.

Ueno, Hiroshi: *See*—
Hiroyuki, Furuhashi; Yamamoto, Tadashi; Imai, Masafumi; and Ueno, Hiroshi, 4,693,990, Cl. 502-116.000.

Ueno, Takeshi: *See*—
Hoizumi, Shinichi; Abe, Norio; Ueno, Takeshi; Arakawa Tadao; and Hodozuka, Kunio, 4,693,086, Cl. 60-663.000.

Uhrig, Ira J. Apparatus for supporting a musical instrumentcu4,693,161, Cl. 84-327.000.

UIP Engineered Products Corporation: *See*—
Terrien, Conrad; and Carlson, Lee G., 4,693,818, Cl. 210-189.000.

Ukai, Mikio; and Okumoto, Ryouji, to Toyoda Gosei Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Boot for universal jointcu4,693,484, Cl. 277-212.0FB.

Umeda, Fumio: *See*—
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Umeyama, Mitsuhiro; Wakahara, Kaoru; Ohtani, Kisao; Kametaka, Kenichi; Kinoshita, Masaru; and Kobayashi, Nobuyuki, to Toyota Jidosha Kabushikikaisha; and Nok-Megulastik Co., Ltd. Clutch dampercu4,693,354, Cl. 192-106.100.

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Miller, Geoffrey Q.; and Gray, Robert L., Jr., 4,693,730, Cl. 55-18.000.
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McMakin, Bruce L., 4,692,958, Cl. 15-230.120.

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Air Force: *See*—
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Gold, David, deceased; and Gold, Sara, executrix, 4,693,436, Cl. 244-149.000.
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Upadhyay, Anand; and Messenger, Lawrence W., to Sundstrand Corporation. Control for AC motor drivecu4,694,236, Cl. 318-798.000.

Uragami, Akira; Suzuki, Yukio; Iwamura, Masahiro; and Masuda, Ikuro, to Hitachi, Ltd. High speed bi-comos switching circuitcu4,694,203, Cl. 307-446.000.

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Yanai, Eiji; and Kuribayashi, Tetsuzo, to Hitachi, Ltd. Waste heat recovery boilercu4,693,213, Cl. 122-7.00R.

Yanmar Diesel Engine Co., Ltd.: *See*—
Nagakura, Katsuhiko, 4,693,218, Cl. 123-260.000.

Yano, Koji: *See*—
Hoshikawa, Masao; Kyoto, Michihisa; Yano, Koji; and Tanaka, Gotaro, 4,693,738, Cl. 65-3.110.

Yano, Seiki; Yamamoto, Saburo; Matsui, Sadayoshi; and Taneya, Mototaka, to Sharp Kabushiki Kaisha. Semiconductor laser arraycu4,694,461, Cl. 372-50.000.

Yarbrough, Joseph A.; Kingsland, David O.; and Pease, Donald L., to Xerox Corporation. Thermal air curtain for a copying/printing machinecu4,693,588, Cl. 355-3.00R.

Yardy, Raymond: *See*—
Cohen, Donald K.; and Yardy, Raymond, 4,694,447, Cl. 369-110.000.

Yasuga, Masaki. Tile-cutting machinecu4,693,232, Cl. 125-23.00T.

Yasui, Hideo, to Tokyo Juki Industrial Co., Ltd. Control device for sewing machinecu4,693,192, Cl. 112-121.110.

Yau, Yuk M., to Conair Corporation. Generator for hair styling mousecu4,693,854, Cl. 261-84.000.

Yeaman Packaging Group, Inc.: *See*—
Yeaman, William E., Sr., 4,693,412, Cl. 229-40.000.

Yeaman, William E., Sr., to Yeaman Packaging Group, Inc. Sleeve package having locking tabs for holding multiple aceptic cartonscu4,693,412, Cl. 229-40.000.

Yeh, An-I: *See*—
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Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Shilo, Moshe; and Fattom, Ali, 4,693,842, Cl. 252-356.000.

Yokogawa Electric Corporation: *See*—
Iwaoka, Hideto; Sugiyama, Tadashi; Matsuura, Hiroyuki; and Hirata, Takaaki, 4,694,250, Cl. 324-309.000.

Yokogawa Medical Systems, Limited: *See*—
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Yokokura, Hisao: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Yokoyama, Eiji: *See*—
Ohyauchi, Hideo; Amano, Yoshiaki; and Yokoyama, Eiji, 4,693,945, Cl. 429-21.000.

Yoneda, Hitoshi: *See*—
Saito, Tutomu; and Yoneda, Hitoshi, 4,694,310, Cl. 346-153.100.

Yoneda, Takao; and Nakano, Hiroshi, to Toyoda Koki Kabushiki Kaisha. Numerical control apparatus for machinecu4,694,233, Cl. 318-569.000.

Yoneyama, Takashi: *See*—
Ryoke, Katsumi; Takahashi, Masatoshi; Yoneyama, Takashi; Nishikawa, Yasuo; and Tadokoro, Eiichi, 4,693,929, Cl. 428-323.000.

Yoon, Hyun-Nam: *See*—
DeMartino, Ronald N.; Yoon, Hyun-Nam; Stamatoff, James B.; and Buckley, Alan, 4,694,066, Cl. 528-373.000.

Yoshida, Kazuo: *See*—
Ino, Toshio; Maenosono, Tsukasa; Yoshida, Kazuo; Terasaki, Masanori; Kuriwaki, Tetsusho; Koga, Tadao; and Hirado, Miharu, 4,694,131, Cl. 219-10.410.

Yoshida, Masahiro: *See*—
Hirai, Yoichi; Fujii, Tsunenori; Koto, Kaoru; Suzuki, Kenji; Yoshida, Masahiro; Okawa, Hisashi; Okabe, Yoshiaki; Kitamura, Teruo; Yokokura, Hisao; Hattori, Shintaroo; Mukoh, Akio; and Sato, Mikio, 4,694,098, Cl. 560-59.000.

Yoshida, Norie: *See*—
Toshikuni, Masami; Suzuki, Kazunori; and Yoshida, Norie, 4,693,833, Cl. 210-759.000.

Yoshikawa, Seiichi: *See*—
Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, 4,693,828, Cl. 210-679.000.

Yoshimura, Hirofumi, to Kabushiki Kaisha Cosina. Autofocusing zoom lens system with beam splitter prism for single lens reflex camerascu4,694,151, Cl. 250-201.000.

Yoshimura, Shushichi; Hiwatashi, Yasunori; Kobayashi, Hiromu; Yamazaki, Hozo; Nishino, Nobu; Tahara, Teruji; and Kobayashi, Hidenobu, to Mitsubishi Chemical Industries Ltd. Ultrasoaic vibration sieving apparatus and process for purifying carbon black by using the apparatuscu4,693,879, Cl. 423-461.000.

Yoshinaga, Sadao: *See*—
Katsuda, Yoshio; Yoshinaga, Sadao; and Mashine, Hiroyoshi, 4,693,868, Cl. 422-124.000.

Yoshioka, Toshio; Yoshikawa, Seiichi; and Shimamura, Masaharu, to Toray Industries, Inc. Method of ion-exchanging and/or adsorptioncu4,693,828, Cl. 210-679.000.

Yoshioka, Yasuhiro: *See*—
Tazaki, Satoru; Yoshioka, Yasuhiro; and Amazawa, Kiyoshi, 4,694,500, Cl. 381-10.000.

Yoshitome, Eiji; and Hoshino, Kazuya, to Yokogawa Medical Systems, Limited. Method and apparatus for nuclear magnetic resonance imagingcu4,694,251, Cl. 324-309.000.

Yoshizaki, Kiyoshi: *See*—
Kawamura, Toshimi; Yamada, Tadatoshi; Hani, Kiyoshi; and Yoshizaki, Kiyoshi, 4,694,268, Cl. 335-216.000.

Yoshizawa, Keiichi, to Seikosha Co., Ltd. Alarm mechanismcu4,693,612, Cl. 368-74.000.

Young, Rocky M.; and Vo, Tri T., to NCR Corporation. System for performing virtual look-ahead memory operationscu4,694,395, Cl. 364-200.000.

Young, Vernon V., to International Minerals & Chemical Corp. Bacitracin-metal-polyether antibiotic complexescu4,693,992, Cl. 514-11.000.

Yutaka Yamada: *See*—
Yamada, Yutaka, 4,693,269, Cl. 137-512.100.

Yuter, Seymour C. Combined telephone-table systemcu4,694,480, Cl. 379-110.000.

Zahir, Abdul-Cader: *See*—
Lehmann, Hans; and Zahir, Abdul-Cader, 4,694,096, Cl. 558-251.000.

Zakary, Paul D.: *See*—
Stillie, Donald G.; and Zakary, Paul D., 4,693,530, Cl. 439-67.000.

Zakharin, Greg: *See*—
Blackford, William L.; and Zakharin, Greg, 4,693,732, Cl. 55-112.000.

Zaleski, James V. Apparatus for testing auto electronics systemscu4,694,408, Cl. 364-551.000.

Zettlemoyer, Albert C.: *See*—
Schwartz, Anthony M.; Kawashima, Norimichi; and Zettlemoyer, Albert C., 4,693,958, Cl. 430-302.000.

Ziegler, Walter; Dietsche, Wolfram; Weiss, Stefan; Mueller, Richard; Hettche, Albert; Glaser, Klaus; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Aqueous wax dispersions as preservatives for metal surfaces and surfaces of coatings, their use and a process for preserving metal surfaces and surfaces of coatingscu4,693,909, Cl. 427-156.000.

Zieren, Victor: *See*—
Kordi, Srdjan; Zieren, Victor; and Middelhoek, Simon, 4,694,248, Cl. 324-252.000.

Zimmermann, Gunther: *See*—
Wehle, Anton; Unrath, Dieter; and Zimmermann, Gunther, 4,693,005, Cl. 30-383.000.

Zimpro Inc.: *See*—
Garzonetti, Gary A., 4,693,831, Cl. 210-744.000.
Mordorski, Carol J., 4,693,827, Cl. 210-614.000.

Zlehit pri Ban: *See*—
Moshtev, Rafail V.; Manev, Vesselin G.; and Puresheva, Bogdana L., 4,693,950, Cl. 429-194.000.

Zondler, Helmut: *See*—
Hubele, Adolf; Zondler, Helmut; Riebli, Peter; and Eckhardt, Wolfgang, 4,694,009, Cl. 514-269.000.

Zortea, Michel: *See*—
Noiret, Robert; and Zortea, Michel, 4,693,740, Cl. 65-135.000.

Zoueki, Georges. Universal frame centering, holding and measuring devicecu4,693,573, Cl. 351-204.000.

Zygo Corporation: *See*—
Sommargren, Gary E., 4,693,605, Cl. 356-349.000.

5W Enterprises, Inc.: *See*—
Guthrie, Gerald, 4,693,656, Cl. 411-433.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzona Incorporated: *See*—
Steenken, Gerhard, Re. 32,503, Cl. 423-339.000.
AMP Incorporated: *See*—
Kumar, Vijay, Re. 32,502, Cl. 439-92.000.
Hensley, George H.; and Hensley, Raymond E. Combustion initiation systemcuRe. 32,505, Cl. 361-257.000.
Hensley, Raymond E.: *See*—
Hensley, George H.; and Hensley, Raymond E., Re. 32,505, Cl. 361-257.000.
Kumar, Vijay, to AMP Incorporated. Grounding mating hard-warecuRe. 32,502, Cl. 439-92.000.
Michel, Ulrich; and Radecker, Josef, to Wacker-Chemie GmbH. Room temperature stable organopolysiloxane compositionscuRe. 32,504, Cl. 528-15.000.
Okada Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio, Re. 32,501, Cl. 30-292.000.
Okada, Yoshio, to Okada Kogyo Kabushiki Kaisha. Rotary cutter-cuRe. 32,501, Cl. 30-292.000.
Radecker, Josef: *See*—
Michel, Ulrich; and Radecker, Josef, Re. 32,504, Cl. 528-15.000.
Scovill Japan Kabushiki Kaisha: *See*—
Takata, Akihiko, Re. 32,500, Cl. 24-113.0MP.
Steenken, Gerhard, to Akzona Incorporated. Silicic acid for the filtration of beverages particularly beercuRe. 32,503, Cl. 423-339.000.
Takata, Akihiko, to Scovill Japan Kabushiki Kaisha. Button having plastic resin headcuRe. 32,500, Cl. 24-113.0MP.
Wacker-Chemie GmbH: *See*—
Michel, Ulrich; and Radecker, Josef, Re. 32,504, Cl. 528-15.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adee, James M.; and MacPherson, John A., to Form Physics Corp. Process for forming metal parts with less than 1 percent carbon contentcuB1 4,225,345, 9-15-87, Cl. 419-36.000.
Bayer Aktiengesellschaft: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Form Physics Corp.: *See*—
Adee, James M.; and MacPherson, John A., B1 4,225,345, Cl. 419-36.000.
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 7-amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxo-quinoline-3-carboxylic acids and antibacterial agents containing these compoundscuB1 4,556,658, 9-15-87, Cl. 514-254.000.
Hamilton, James C. Shoe repair devicecuB1 4,166,328, 9-15-87, Cl. 36-72.000.
MacPherson, John A.: *See*—
Adee, James M.; and MacPherson, John A., B1 4,225,345, Cl. 419-36.000.
Metzger, Karl G.: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Petersen, Uwe: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.
Zeiler, Hans-Joachim: *See*—
Grohe, Klaus; Petersen, Uwe; Zeiler, Hans-Joachim; and Metzger, Karl G., B1 4,556,658, Cl. 514-254.000.

LIST OF DESIGN PATENTEES

AAR Brooks & Perkins Corp.: *See*—
Knowlton, Christopher M.; and O'Hara, Robert J., 291,932, Cl. D32-4.000.
All-Steel Canada Ltd.: *See*—
Worrell, William R.; and Laroche, Robert N., 291,853, Cl. D6-511.000.
American Commercial Inc.: *See*—
Everhan, Walter, 291,856, Cl. D7-30.000.
American Standard Inc.: *See*—
Fabian, Wolfgang, 291,912, Cl. D23-35.000.
Associated Images, Inc.: *See*—
Clifford, James W.; and Eaton, Rodney L, 291,891, Cl. D16-14.000.
B e B S.r.l.: *See*—
Bertani, Carlo, 291,934, Cl. D32-70.000.
Baker, John F.; and Dep, Barry, to Baker, John F. Portable cooler for allergenic extractscu291,858, 9-15-87, Cl. D7-77.000.
Baumgardner, Edward W. Protective transport container for sports equipmentcu291,842, 9-15-87, Cl. D3-36.000.
Beecham Group p.l.c.: *See*—
Hindle, Brian R., 291,868, Cl. D9-453.000.
Bennett, Charles. Coin bank or the likecu291,939, 9-15-87, Cl. D99-40.000.
Bergdahl, Knut E. Channel body for an air supply registercu291,914, 9-15-87, Cl. D23-112.000.
Berger, Barry D., to Timex Corporation. Packaging container for a wristwatchcu291,867, 9-15-87, Cl. D9-430.000.
Bertani, Carlo, to B e B S.r.l. Ironcu291,934, 9-15-87, Cl. D32-70.000.
Blaisdell, Ronald G.; and Gagnon, Peter R., to GTE Products Corporation. Lampcu291,921, 9-15-87, Cl. D26-2.000.
Boyle, William F.; and Chandler, Maurice P., to General Motors Corporation. Wheel covercu291,879, 9-15-87, Cl. D12-209.000.
Brachear, Howard. Fishing jugcu291,905, 9-15-87, Cl. D22-146.000.
Brice Ilotan Research Corporation: *See*—
Brice, Michael F., 291,866, Cl. D9-337.000.
Brice, Michael F., to Brice Ilotan Research Corporation. Combined packaging container and brewing device for coffee or the likecu291,866, 9-15-87, Cl. D9-337.000.
Bridgestone Corporation: *See*—
Hayakawa, Toshio; and Ohkuni, Shinichiro, 291,874, Cl. D12-147.000.
Hayakawa, Toshio; and Osawa, Toru, 291,875, Cl. D12-147.000.
Hayakawa, Toshio; Himuro, Yasuo; and Osawa, Toru, 291,876, Cl. D12-149.000.
Nishio, Hideaki; and Takase, Kiyoshi, 291,877, Cl. D12-151.000.
Broadbent, Michael C.: *See*—
Tucker, Roger; Gillam, Paul A.; Wright, Peter; Whitehouse, Donald; Broadbent, Michael C.; and Moran, Charles, 291,913, Cl. D23-97.000.
Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Combined watch and braceletcu291,869, 9-15-87, Cl. D10-32.000.
Bunn-O-Matic Corporation: *See*—
Stover, Kenneth W., 291,896, Cl. D20-5.000.
Cadman, Christian B. Cup and saucer standcu291,848, 9-15-87, Cl. D6-466.000.
Cameron, Lonny R. Novelty cap or similar articlecu291,840, 9-15-87, Cl. D2-248.000.
Carr, Donald W.; and Serbinski, Andrew T., to Savin Corporation. Copying machinecu291,892, 9-15-87, Cl. D16-30.000.

Carville, Michele A., to Kraft, Inc. Bottlecu291,865, 9-15-87, Cl. D9-322.000.
Chandler, Maurice P.: *See*—
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Chapman, Doug. Aerial toycu291,901, 9-15-87, Cl. D21-86.000.
Clifford, James W.; and Eaton, Rodney L, to Associated Images, Inc. Projection enclosurecu291,891, 9-15-87, Cl. D16-14.000.
Condon, Richard W.: *See*—
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Conn, Marks M., to Mallin Company. Frame for a swivel rockercu291,846, 9-15-87, Cl. D6-344.000.
Conn, Marks M., to Mallin Company. Table or the likecu291,852, 9-15-87, Cl. D6-487.000.
Cook, Gregory D., to Cook Manufacturing Corporation. Detachable passenger compartment for a golf cartcu291,878, 9-15-87, Cl. D12-156.000.
Cook Manufacturing Corporation: *See*—
Cook, Gregory D., 291,878, Cl. D12-156.000.
Cooper Industries: *See*—
Decanay, Romeo A., 291,925, Cl. D26-61.000.
Cooper Industries, Inc.: *See*—
Kusmer, Raymond J., 291,929, Cl. D26-138.000.
Cowart, Betty J.: *See*—
Kilman, Brenda J.; and Cowart, Betty J., 291,930, Cl. D28-59.000.
Decanay, Romeo A., to Cooper Industries. Framing projector for track lighting systemcu291,925, 9-15-87, Cl. D26-61.000.
Danley, Allen M.: *See*—
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Danro Engineering (Proprietary) Limited: *See*—
Wallace, Robert; and Miskowic, Dragan, 291,860, Cl. D7-360.000.
Datakey, Inc.: *See*—
Flies, William P., 291,897, Cl. D20-22.000.
Davis, James R. Combined mobile imaging and scanning machine for radiation detectioncu291,915, 9-15-87, Cl. D24-2.000.
Davis, James R. Combined mobile imaging and scanning machine for radiation detectioncu291,916, 9-15-87, Cl. D24-2.000.
Dep, Barry: *See*—
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Hoover, John W.; Rutkowski, Richard G.; and Luppino, Rocco, 291,882, Cl. D14-3.000.
Diebold Incorporated: *See*—
Long, Douglas G., 291,936, Cl. D99-28.000.
Eaton, Rodney L: *See*—
Clifford, James W.; and Eaton, Rodney L, 291,891, Cl. D16-14.000.
Erbach, Arthur R.; and Stephen, James C., to Weber-Stephen Products Co. Wire cooking rackcu291,855, 9-15-87, Cl. D7-404.000.
Everhan, Walter, to American Commercial Inc. Dinner platecu291,856, 9-15-87, Cl. D7-30.000.
Fabian, Wolfgang, to American Standard Inc. Combined hand shower, adjustable holder and article holdercu291,912, 9-15-87, Cl. D23-35.000.
Federal Signal Corporation: *See*—
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Fisher, Kenneth G. Mail boxcu291,937, 9-15-87, Cl. D99-30.000.
Flies, William P., to Datakey, Inc. Identification tagcu291,897, 9-15-87, Cl. D20-22.000.
Fong, Peter; and Henry, Tsang H. T., to Tradebest International Corporation. Transmitter or similar articlecu291,888, 9-15-87, Cl. D14-95.000.
Fries, Hjalmar, to ITT Industries, Inc. Submersible unit for mixing and aeration of industrial effluent or the likecu291,911, 9-15-87, Cl. D23-1.000.
Gagnon, Peter R.: *See*—
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General Motors Corporation: *See*—
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George, Elmer. Hand batcu291,907, 9-15-87, Cl. D21-213.000.
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Glennon, Wayne P.; and Taylor, Mack E. Golf club putter headcu291,908, 9-15-87, Cl. D21-217.000.
GTE Products Corporation: *See*—
Blaisdell, Ronald G.; and Gagnon, Peter R., 291,921, Cl. D26-2.000.
Halpern, David: *See*—
Weisenfeld, George; and Halpern, David, 291,894, Cl. D16-123.000.
Hanson, Brian E.: *See*—
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Hanson, Douglas M.; Hanson, Jeff D.; and Hanson, Brian E., to JMBL Corporation. Three-dimensional game boardcu291,899, 9-15-87, Cl. D21-23.000.
Hanson, Jeff D.: *See*—
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Harvey, Warren L. Time displaycu291,871, 9-15-87, Cl. D10-126.000.
Hayakawa, Toshio; and Ohkuni, Shinichiro, to Bridgestone Corporation. Motorcycle tirecu291,874, 9-15-87, Cl. D12-147.000.
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Henry, Tsang H. T.: *See*—
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Hentschel, Harry, to Siemens Aktiengesellschaft. Telephone handset or similar articlecu291,885, 9-15-87, Cl. D14-63.000.
Hill, Royce W., to Micro Plastics, Inc. Printed circuit board stand-offcu291,864, 9-15-87, Cl. D8-354.000.
Himuro, Yasuo: *See*—
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Hindle, Brian R., to Beecham Group p.l.c. Cap for containercu291,868, 9-15-87, Cl. D9-453.000.
Homesteel Achel P.V.B.A.: *See*—
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Hoover, John W.; Rutkowski, Richard G.; and Luppino, Rocco, to Dictaphone Corporation. Dictating machinecu291,882, 9-15-87, Cl. D14-3.000.
Inoue, Akifumi; and Takeda, Koshiro, to Nippon Gakki Seizo Kabushiki Kaisha. Industrial robotcu291,890, 9-15-87, Cl. D15-199.000.
International Tropic-Cal, Inc.: *See*—
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Investment Associates, Inc.: *See*—
Koushiafes, Nicholas J., 291,881, Cl. D12-300.000.
ITT Industries, Inc.: *See*—
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Kawaguchi, Tsutomu, to Toyota Jidosha Kabushiki Kaisha. Front combination lamp for an automobilecu291,923, 9-15-87, Cl. D26-28.000.
Kilman, Brenda J.; and Cowart, Betty J. Appliance for smoothing fiber applied to fingernailscu291,930, 9-15-87, Cl. D28-59.000.
Knowlton, Christopher M.; and O'Hara, Robert J., to AAR Brooks & Perkins Corp. Machine for floor sweeping and scrubbingcu291,932, 9-15-87, Cl. D32-4.000.
Kolonia, Robert A. Tool handlecu291,862, 9-15-87, Cl. D8-107.000.
Kolonia, Robert A. Tool handlecu291,863, 9-15-87, Cl. D8-107.000.
Koushiafes, Nicholas J., to Investment Associates, Inc. Boatcu291,881, 9-15-87, Cl. D12-300.000.
Koyama, Yoshio. Bicyclecu291,873, 9-15-87, Cl. D12-111.000.
Kraft, Inc.: *See*—
Carville, Michele A., 291,865, Cl. D9-322.000.
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Kusmer, Raymond J., to Cooper Industries, Inc. Track light extension armcu291,929, 9-15-87, Cl. D26-138.000.
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Lamborghini, Tonino. Textile fabriccu291,845, 9-15-87, Cl. D5-56.000.
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Long, Douglas G., to Diebold Incorporated. Automated teller machine or similar articlecu291,936, 9-15-87, Cl. D99-28.000.
Lott, George C. Bow sightcu291,904, 9-15-87, Cl. D22-107.000.
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73.1 4,693,769
73.3 4,693,771
79 4,693,772
151 4,693,770
200 4,693,773
215 4,693,774
272.4 4,693,775
327 4,693,776
345 4,693,777
361 4,693,778
[illegible] 4,693,779
[illegible] 4,693,780
4,693,781
644 4,693,783
[illegible] 4,693,782

CLASS 160

388 4,693,291

CLASS 163

202 4,693,784
242 4,693,785

CLASS 164

34 4,693,292

[illegible] 4,693,293
312 4,693,294
433 4,693,295
[illegible] 4,693,296
447 4,693,297
[illegible] 4,693,298
[illegible] 4,693,299

CLASS 165

1 4,693,300
45 4,693,301
[illegible] 4,693,302
[illegible] 4,693,303
[illegible] 4,693,304
[illegible] 4,693,305
104.21 4,693,306
152 4,693,307

CLASS 166

55.1 [illegible] 4,693,308
123 4,693,309
[illegible] 4,693,310
272 4,693,311
279 4,693,312
[illegible] 4,693,313
317 4,693,314
336 4,693,315
355 4,693,316
378 4,693,317
[illegible] 4,693,318

CLASS 169

61 4,693,320

CLASS 173

116 4,693,322

CLASS 174

35 C 4,693,323
41 4,694,118
47 4,693,324
52 PE 4,694,119
[illegible] 4,694,120
4,694,121
[illegible] 4,694,122
117 FF 4,694,123

CLASS 175

[illegible] 4,693,325
4,693,326
[illegible] 4,693,327
273 4,693,328

CLASS 177

4 4,693,329
25 4,693,330

CLASS 178

19 4,694,124

CLASS 180

135 4,693,331
142 4,693,332
233 4,693,333
249 4,693,334

CLASS 181

102 4,693,335
111 4,693,336
231 4,693,337
4,693,338
255 4,693,339

CLASS 187

52 R 4,693,340

CLASS 188

72.7 4,693,341
79.5 K 4,693,342
322.17 4,693,343

CLASS 190

107 4,693,344
108 4,693,345
111 4,693,346

CLASS 191

[illegible] 4,694,125

CLASS 192

3.29 4,693,348
3.3 4,693,347
7 4,693,349
18 A 4,693,350
[illegible] 4,693,351
70.27 4,693,352
85 AA 4,693,353
106.1 4,693,354

CLASS 193

2 R 4,693,355
35 TE 4,693,356

CLASS 194

202 4,693,357

CLASS 198

339.1 4,693,358
474.1 4,693,359

[illegible] 4,693,360
[illegible] 4,693,361
[illegible].7 4,693,362
[illegible] 4,693,363

CLASS 200

5 A 4,694,126
68.2 4,694,129
83 P 4,694,127
84 R 4,694,128
314 4,694,130

CLASS 202

83 4,693,786

CLASS 203

51 4,693,787
4,693,788
4,693,789

CLASS 206

1 T 4,693,790
11 4,693,791
25 4,693,792
78 4,693,793
84 4,693,794
[illegible] 4,693,795
98 4,693,796
[illegible] 4,693,797
149 4,693,798
163 4,693,799
[illegible].1 4,693,800
180.2 4,693,801
182.1 4,693,804
182.4 4,693,802
192.22 4,693,805
252 4,693,806
[illegible] 4,693,803

CLASS 209

45.18 4,693,364
63.3 4,693,365
222 4,693,366
287.1 4,693,368
[illegible] 4,693,367
290 4,693,369
488 4,693,370
538 4,693,371
[illegible] 4,693,372

CLASS 210

[illegible] 4,693,807
113 4,693,808
127 4,693,809
321 4,693,810

CLASS 209

3.3 4,693,373
139.2 4,693,811
224 4,693,812
535 4,693,374
[illegible] 4,693,375
552 4,693,376
579 4,693,377
[illegible] 4,693,378
674 4,693,379

CLASS 210

88 4,693,814
107 4,693,815
150 4,693,816
[illegible] 4,693,817
[illegible] 4,693,818
202 4,693,819
232 4,693,820
241 4,693,821
255 4,693,822
266 4,693,823
[illegible] 4,693,824
4,693,825
512.1 4,693,826
614 4,693,827
679 4,693,828
697 4,693,829
[illegible] 4,693,830
[illegible] 4,693,831
756 4,693,832
759 4,693,833
767 4,693,834
777 4,693,835
791 4,693,836

CLASS 211

35 4,693,380
94 4,693,381
189 4,693,382
192 4,693,383

CLASS 212

257 4,693,384

CLASS 215

232 4,693,385

CLASS 219

10.41 4,694,131
10.55 F 4,694,132
10.55 M 4,694,133
10.79 4,694,134
110 4,694,135
121 LC 4,694,137
121 LD 4,694,136
121 LM 4,694,138
121 LU 4,694,139
130.1 4,694,140
147 4,694,141
371 4,694,142
[illegible] 4,694,143
[illegible] 4,694,145
522 4,694,144
524 4,694,146

CLASS 220

1.5 4,693,386
[illegible] 4,693,387
[illegible] 4,693,388
[illegible] 4,693,389
343 4,693,392
359 4,693,390
4,693,391
374 4,693,393

CLASS 223

1 4,693,394
107 4,693,395
4,693,396
137 4,693,397
327 4,693,398
480 4,693,399
518 4,693,400
607 4,693,401

CLASS 224

215 4,693,402

CLASS 228

2 4,693,403
103 4,693,404

CLASS 229

91 4,693,405

CLASS 227

63 4,693,406
109 4,693,407

CLASS 228

47 4,693,408
122 4,693,409

CLASS 229

1.5 B 4,693,410
23 R 4,693,411
40 4,693,412
48 R 4,693,413
125.02 4,693,414

CLASS 235

379 4,694,147
468 4,694,148

CLASS 236

12.12 4,693,415

CLASS 237

12.3 B 4,693,417

CLASS 238

10 R 4,693,418

CLASS 239

63 4,693,419
87 4,693,420
[illegible] 4,693,421
195 4,693,422
332 4,693,423
453 4,693,424
735 4,693,425

CLASS 241

18 4,693,426
23 4,693,427
167 4,693,428

CLASS 242

18 G 4,693,429
18 R 4,693,430
58.6 4,693,433
72 B 4,693,431
74 4,693,432

CLASS 244

91 4,693,435
149 4,693,436
225 4,693,437
[illegible] 4,693,434

CLASS 248

27.3 4,693,438
37.6 4,693,439
154 4,693,440
225.1 4,693,441
406.2 4,693,442
447.1 4,693,443
653 4,693,444

CLASS 249

19 4,693,445
53 R 4,693,446
[illegible] 4,693,448
210 4,693,449

CLASS 250

201 4,694,149
4,694,150
4,694,151
4,694,152
202 4,694,153
213 VT 4,694,154
214 C 4,694,157
214 R 4,694,155
214 RC 4,694,156
223 B 4,694,158
227 4,694,159
4,694,160
231 R 4,694,161
4,694,162
234 4,694,163
4,694,164
252.1 4,694,165
261 4,694,166
282 4,694,167
287 4,694,168
296 4,694,169
309 4,694,170
311 4,694,171
339 4,694,172
343 4,694,173
345 4,694,174
352 4,694,175
362 4,694,176
368 4,694,177
396 R 4,694,178
431 4,694,179
455.1 4,694,180
548 4,694,181
551 4,694,183
561 4,694,184
566 4,694,182
578 4,694,185
4,694,186

CLASS 251

121 4,693,450
129.12 4,693,447
163 4,693,451
329 4,693,452

CLASS 252

50 4,693,837
51.5 A 4,693,839
51.5 R 4,693,838
174.23 4,693,840
[illegible] 4,693,841
356 4,693,842
518 4,693,843

CLASS 254

323 4,693,453

CLASS 260

97 4,693,846
104 4,693,847
402 4,693,848
404 4,693,849
506 4,693,850
544 D 4,693,851

CLASS 261

30 4,693,852
39.1 4,693,853
84 4,693,854

CLASS 264

40.7 4,693,855
45.4 4,693,856
56 4,693,857
101 4,693,858
112 4,693,859
320 4,693,860
328.1 4,693,861

CLASS 267

140.1 4,693,455
4,693,456
153 4,693,457
226 4,693,454

CLASS 269

21 4,693,458

CLASS 271

[illegible] 4,693,459
[illegible] 4,693,460
176 4,693,461
[illegible] 4,693,462
236 4,693,463
[illegible] 4,693,464
274 4,693,465

CLASS 272

52 4,693,466
4,693,467
73 4,693,468
74 4,693,469
96 4,693,470
[illegible] 4,693,471

CLASS 273

29 A 4,693,472
32 F 4,693,473
73 C 4,693,474
73 J 4,693,475
[illegible] 4,693,476
143 R 4,693,477
164 4,693,478
186 A 4,693,479
296 4,693,480

CLASS 277

96.2 4,693,481
207 A 4,693,482
212 FB 4,693,484

CLASS 280

[illegible] 4,693,485
[illegible] 4,693,486
[illegible].1 4,693,487
[illegible] 4,693,488
634 4,693,489
[illegible] 4,693,490
[illegible] 4,693,491
[illegible] 4,693,492
[illegible] 4,693,493
4,693,494
[illegible] 4,693,495

CLASS 283

102 4,693,496

CLASS 284

12 4,693,497
[illegible] 4,693,498
94 4,693,500
[illegible] 4,693,499
173 4,693,501
334.5 4,693,502

CLASS 290

4 R 4,694,187
40 B 4,694,188
40 C 4,694,189
52 4,694,190

CLASS 292

210 4,693,503

CLASS 294

1.1 4,693,504
119.1 4,693,505

CLASS 296

1 S 4,693,506
39 R 4,693,507
100 4,693,508
201 4,693,509

CLASS 297

39 4,693,510
219 4,693,511
277 4,693,512
284 4,693,513
374 4,693,514
391 4,693,515
4,693,516

CLASS 299

87 4,693,517
93 4,693,518

CLASS 300

7 4,693,519

CLASS 301

37 SS 4,693,520

CLASS 303

103 4,693,521
105 4,693,522
116 4,693,523

CLASS 307

[illegible] 4,694,191
[illegible] 4,694,192
62 4,694,193
[illegible] 4,694,194
234 4,694,195
[illegible] 4,694,196
[illegible] 4,694,197
[illegible] 4,694,198
297 4,694,199
358 4,694,200
[illegible] 4,694,203
475 4,694,201
4,694,202
[illegible] 4,694,204
[illegible] 4,694,205
571 4,694,206
4,694,207
[illegible] 4,694,208

CLASS 310

12 4,694,209
[illegible] R 4,694,210
71 4,694,211
[illegible] 4,694,212
4,694,213
239 4,694,214

CLASS 312

[illegible] 4,693,524
[illegible] 4,693,525
250 4,693,526

CLASS 313

44 4,694,215
402 4,694,216
468 4,694,217
478 4,694,218
636 4,694,219

CLASS 315

10 4,694,220
4,694,221
111.21 4,694,222
[illegible] 4,694,223
177 4,694,224
[illegible] 4,694,225
[illegible] 4,694,226

CLASS 318

[illegible] 4,694,227
341 4,694,228
561 4,694,229
568 4,694,230
4,694,231
[illegible] 4,694,232
[illegible] 4,694,233
603 4,694,234
[illegible] 4,694,235
[illegible] 4,694,236

CLASS 320

6 4,694,237

CLASS 323

28 4,694,238

CLASS 324

285 4,694,239
4,694,240
340 4,694,241

CLASS 324

73 R 4,694,242
96 4,694,243
121 R 4,694,244
158 F 4,694,245
207 4,694,246
216 4,694,247
252 4,694,248
309 4,694,249
4,694,250
4,694,251
4,694,252
4,694,253
4,694,254
318 4,694,255

CLASS 128

120 4,694,256

CLASS 329

50 4,694,257

CLASS 330

2 4,694,258

CLASS 331

1 A 4,694,259
[illegible] 4,694,260
57 4,694,261
[illegible] 4,694,262

CLASS 332

20 4,694,263

CLASS 333

34 4,694,264
185 4,694,265
[illegible] 4,694,266
248 4,694,267

CLASS 335

216 4,694,268
4,694,269
260 4,694,270
302 4,694,271

CLASS 338

138 4,694,272

CLASS 340

[illegible] 4,694,273
146.2 4,694,274
347 AD 4,694,276
347 DD 4,694,278
347 NT 4,694,277
347 P 4,694,275
4,694,279
365 R 4,694,280

521 4,694,281
539 4,694,282
572 4,694,283
574 4,694,284
693 4,694,285
703 4,694,286
719 4,694,287
721 4,694,288
815.05 4,694,289
815.21 4,694,290
825.14 4,694,294
825.2 4,694,291
825.44 4,694,292
825.68 4,694,293
903 4,694,295
904 4,694,296

CLASS 342

45 4,694,297
89 4,694,298
170 4,694,299
195 4,694,300

CLASS 343

720 4,694,301

CLASS 346

1.1 4,694,302
4,694,303
7 4,694,304
76 PH 4,694,305
140 R 4,694,306
4,694,307
4,694,308
153.1 4,694,310

CLASS 350

96.11 4,693,543
96.12 4,693,545
96.13 4,693,546
4,693,547
4,693,548
96.14 4,693,549
96.16 4,693,544
96.20 4,693,550
96.23 4,693,551
96.24 4,693,552
96.34 4,693,553
244 4,693,554
253 4,693,555
320 4,693,556
331 R 4,693,557
332 4,693,558
334 4,693,559
335 4,693,560
336 4,693,561
337 4,693,562
350 S 4,693,563
357 4,693,564
413 4,693,565
427 4,693,566
433 4,693,567
469 4,693,568
505 4,693,569
616 4,693,570
634 4,693,571

CLASS 351

161 4,693,572
204 4,693,573

CLASS 354

21 4,693,574
82 4,693,575
86 4,693,576
155 4,693,577
173.1 4,693,578
4,693,579
271.1 4,693,580
400 4,693,581
403 4,693,582
439 4,693,583
446 4,693,584

CLASS 355

3 FU 4,693,585
4,693,587
3 R 4,693,588
3 SH 4,693,586
5 4,693,589
14 CH 4,693,593
14 E 4,693,592
14 SH 4,693,590
25 4,693,594
41 4,693,591
77 4,693,595
4,693,596

CLASS 356

1 4,693,597
4 4,693,598
121 4,693,599
4,693,600
237 4,693,601
336 4,693,602
346 4,693,603
348 4,693,604
349 4,693,605
355 4,693,606
380 4,693,607
394 4,693,608

CLASS 357

17 4,694,311
4,694,312
23.13 4,694,315
23.4 4,694,313
23.6 4,694,314
24 4,694,316
30 4,694,317
4,694,318
31 4,694,319
40 4,694,320
48 4,694,321
74 4,694,322
82 4,694,323

CLASS 358

111 4,694,324
11 4,694,325
19 4,694,326
4,694,327
21 V 4,694,328
22 4,694,329
27 4,694,330
31 4,694,331
75 4,694,332
113 4,694,333
4,694,334
133 4,694,336
140 4,694,337
141 4,694,338
148 4,694,339
154 4,694,340
160 4,694,341
167 4,694,342
183 4,694,343
4,694,344
216 4,694,345
218 4,694,346
236 4,694,347
4,694,348
241 4,694,349
242 4,694,350
256 4,694,351
257 4,694,352
283 4,694,353
296 4,694,354
332 4,694,355
4,694,356

CLASS 360

9.1 4,694,357
59 4,694,358
76 4,694,359
96.5 4,694,360
97 4,694,361
4,694,362
99 4,694,363
100 4,694,365
[illegible] 4,694,366
4,694,367
[illegible] 4,694,368
132 4,694,369
133 4,694,370

CLASS 361

23 4,694,371
86 4,694,372
96 4,694,373
4,694,374
212 4,694,375
235 4,694,376
257 Re.32,505
275 4,694,377
385 4,694,378
424 4,694,380

CLASS 362

[illegible] 4,694,381
346 4,694,382

CLASS 363

17 4,694,383
4,694,384
19 4,694,385
49 4,694,386
56 4,694,387
72 4,694,388
132 4,694,389

CLASS 364

165 4,694,390
[illegible] 4,694,391
4,694,392
4,694,393
4,694,394
4,694,395
300 4,694,396
[illegible] 4,694,397
414 4,694,398
4,694,399
475 4,694,401
[illegible] 4,694,402
488 4,694,403
518 4,694,404
[illegible] 4,694,405
4,694,406
551 4,694,407
558 4,694,409
576 4,694,410
717 4,694,411
724 4,694,412
4,694,413
4,694,414
4,694,415
736 4,694,416
752 4,694,417
807 4,694,418
900 4,694,419
4,694,420
4,694,421
4,694,422

CLASS 365

[illegible] 4,694,423
12 4,694,424
49 4,694,425
78 4,694,426
[illegible] 4,694,427
[illegible] 4,694,428
4,694,429
4,694,430
4,694,431
203 4,694,432
230 4,694,433

CLASS 366

136 4,693,609
146 4,693,610
195 4,693,611

CLASS 367

7 4,694,434
17 4,694,435
[illegible] 4,694,436
27 4,694,437
70 4,694,438
[illegible] 4,694,439
152 4,694,440
419 4,694,379

CLASS 368

74 4,693,612
238 4,693,613

CLASS 369

32 4,694,441
[illegible] 4,694,442
[illegible] 4,694,443
65 4,694,444
4,694,445
67 4,694,446
110 4,694,447
[illegible] 4,694,449
291 4,694,448

CLASS 370

32.1 4,694,450
4,694,451
[illegible] 4,694,452
85 4,694,453

CLASS 371

13 4,694,454
37 4,694,455
[illegible] 4,694,456

CLASS 372

[illegible] 4,694,457
32 4,694,458
45 4,694,459
4,694,460
[illegible] 4,694,461
61 4,694,462
4,694,463

CLASS 373

22 4,694,464
[illegible] 4,694,465

CLASS 374

122 4,693,614
129 4,693,615

CLASS 375

1 4,694,466
4,694,467
[illegible] 4,694,468
13 4,694,469
37 4,694,470
45 4,694,471
107 4,694,472
116 4,694,473

CLASS 376

209 4,693,862

CLASS 377

[illegible] 4,694,474
48 4,694,475
58 4,694,476

CLASS 378

[illegible] 4,694,477
[illegible] 4,694,478
[illegible] 4,694,479
[illegible] 4,694,480
198 4,694,481

CLASS 379

27 4,694,482
[illegible] 4,694,483
[illegible] 4,694,484
[illegible] 4,694,485
110 4,694,486
269 4,694,487
327 4,694,488

CLASS 380

[illegible] 4,694,489
[illegible] 4,694,335
[illegible] 4,694,490
4,694,491
23 4,694,492

CLASS 381

[illegible] 4,694,500
15 4,694,495
4,694,501
42 4,694,493
51 4,694,494
4,694,496
63 4,694,497
103 4,694,498
155 4,694,499

CLASS 382

17 4,694,502

CLASS 383

12 4,694,503

CLASS 384

[illegible] 4,693,616
[illegible] 4,693,617

CLASS 400

120 4,693,618
212 4,693,619
611 4,693,620
636.1 4,693,621

CLASS 401

191 4,693,622
206 4,693,623

CLASS 402

22 4,693,624
27 4,693,625
73 4,693,626

CLASS 403

24 4,693,627
135 4,693,628
170 4,693,629
405.1 4,693,630

CLASS 405

18 4,693,632
26 4,693,631
119 4,693,633
126 4,693,634
132 4,693,635
[illegible] 4,693,636
224 4,693,637
259 4,693,638
263 4,693,639
294 4,693,640

CLASS 407

42 4,693,641

CLASS 408

59 4,693,642
82 4,693,643
[illegible] 4,693,644

CLASS 409

[illegible] 4,693,645
136 4,693,646
163 4,693,647
178 4,693,648
244 4,693,813
293 4,693,649

CLASS 410

[illegible] 4,693,650
[illegible] 4,693,651

CLASS 411

23 4,693,652
[illegible] 4,693,653
4,693,654
429 4,693,655
433 4,693,656
467 4,693,657

CLASS 413

1 4,693,658

CLASS 414

131 4,693,659
458 4,693,660
595 4,693,661
695 4,693,662
735 4,693,663
4,693,664
744 R 4,693,665
4,693,666

CLASS 415

115 4,693,667
138 4,693,668
143 4,693,669

CLASS 416

25 4,693,670
43 4,693,671
174 4,693,672
199 4,693,673

CLASS 417

269 4,693,674
489 4,693,675

CLASS 419

13 4,693,863
23 4,693,864
36 B1 4,225,345

CLASS 420

572 4,693,865

CLASS 422

13 4,693,866
64 4,693,867
124 4,693,868
186.04 4,693,869
186.19 4,693,870

CLASS 423

164 4,693,872
215.5 4,693,873
235 4,693,874
243 4,693,875
300 4,693,876
334 4,693,878
339 Re.32,503
373 4,693,877
461 4,693,879
515 4,693,880
573 R 4,693,881
648 R 4,693,883
652 4,693,882

CLASS 424

1.1 4,693,884
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19 4,693,887
49 4,693,888
78 4,693,890
83 4,693,889
89 4,693,893
92 4,693,891
150 4,693,894
456 4,693,892
473 4,693,895
480 4,693,896

CLASS 425

145 4,693,676
376 R 4,693,677
405 R 4,693,678
589 4,693,679

CLASS 426

2 4,693,897
19 4,693,898
94 4,693,899
128 4,693,900
330.6 4,693,901
407 4,693,902
456 4,693,903
521 4,693,904
599 4,693,905

CLASS 427

69 4,693,906
97 4,693,907
130 4,693,908
156 4,693,909
168 4,693,910
196 4,693,911
213.3 4,693,912
215 4,693,913
255 4,693,914
256 4,693,915
397.7 4,693,916

CLASS 428

6 4,693,917
35 4,693,918
36 4,693,920
100 4,693,921
134 4,693,922
148 4,693,923
170 4,693,924
189 4,693,925
204 4,693,926
216 4,693,927
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323 4,693,929
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383 4,693,936
389 4,693,937
403 4,693,938
421 4,693,939
422 4,693,940
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614 4,693,942
678 4,693,943
698 4,693,944

CLASS 429

[illegible] 4,693,945
27 4,693,946
51 4,693,947
121 4,693,948
178 4,693,949
194 4,693,950

CLASS 430

31 4,693,951
109 4,693,952
168 4,693,953
203 4,693,954
204 4,693,955
264 4,693,956
269 4,693,957
302 4,693,958
323 4,693,959
4,693,960
325 4,693,961
345 4,693,962
[illegible] 4,693,963
505 4,693,964
549 4,693,965

CLASS 431

[illegible] 4,693,680
324 4,693,681

CLASS 432

15 4,693,682

CLASS 433

37 4,693,683
[illegible] 4,693,684
105 4,693,685
116 4,693,871
173 4,693,686

CLASS 434

302 4,693,687

CLASS 435

7 4,693,966
4,693,967
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17 4,693,971
34 4,693,972
68 4,693,973
[illegible] 4,693,974
172.2 4,693,975
172.3 4,693,976
180 4,693,977
199 4,693,978
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238 4,693,981
274 4,693,982
284 4,693,983

CLASS 436

[illegible] 4,693,984
531 4,693,985

CLASS 437

24 4,693,759
[illegible] 4,692,994
41 4,692,995
53 4,692,993
57 4,692,992
73 4,692,996
174 4,693,758
175 4,692,991
225 4,692,998
238 4,692,997

CLASS 439

13 4,693,527
67 4,693,529
4,693,530

CLASSIFICATION OF PATENTS

83	4,693,528			332	4,694,012	329.4	4,694,046	92	4,694,077	850	4,694,103
92	Re.32,501		CLASS 483	345	4,694,013	332.3	4,694,047		CLASS 540		CLASS 564
198	4,693,540	204	4,693,701	363	4,694,014	376	4,694,048	141	4,694,078	236	4,694,086
276	4,693,534		CLASS 494	375	4,694,015	411	4,694,050	215	4,694,079	285	4,694,104
277	4,693,535	61	4,693,702	380	4,694,016	437	4,694,051		CLASS 544	430	4,694,105
350	4,693,533		CLASS 501	418	4,694,017	440	4,694,049	49	4,694,080		CLASS 568
399	4,693,537	1	4,693,986	427	4,694,018	454	4,694,052	385	4,694,081	38	4,694,106
404	4,693,536	70	4,693,987	461	4,694,019		CLASS 536		4,694,082	110	4,694,107
460	4,693,538	89	4,693,988	535	4,694,020	74	4,694,053		CLASS 546	387	4,694,108
465	4,693,539	96	4,693,989	544	4,694,021	93	4,694,054	14	4,694,083	454	4,694,109
512	4,693,531		CLASS 502	554	4,694,022	201	4,694,055	25	4,694,084	638	4,694,110
541	4,693,541	116	4,693,990	559	4,694,023	202	4,694,056	65	4,694,085	662	4,694,111
594	4,693,532	220	4,693,991		CLASS 521	206	4,694,057		CLASS 548	842	4,694,112
626	4,693,542		CLASS 513	88	4,694,025	307.2	4,694,058	321	4,694,087	863	4,694,113
877	4,693,688	9	4,693,845	96	4,694,026	340.3	4,694,059		CLASS 549		CLASS 585
	CLASS 440	14	4,693,844	110	4,694,027		CLASS 528	226	4,694,088	481	4,694,114
31	4,693,689		CLASS 514		4,694,028	14	4,694,060	239	4,694,089		CLASS 604
88	4,693,690	11	4,693,992		CLASS 522	11	Re.32,504	827	4,694,090	49	4,693,703
	CLASS 441	14	4,693,993	8	4,694,029	125	4,694,061		CLASS 554	55	4,693,704
129	4,693,691	15	4,693,994		CLASS 523	232	4,694,062	104	4,694,091		4,693,705
	CLASS 443	84	4,693,995	179	4,694,030	315	4,694,063	400	4,694,092	87	4,693,706
66	4,693,692	86	4,693,996	203	4,694,031	332	4,694,064	413	4,694,093	111	4,693,707
	CLASS 446	94	4,693,997	334	4,694,032	371	4,694,065		CLASS 558	198	4,693,708
6	4,693,693	162	4,693,998	437	4,694,033	373	4,694,066	76	4,694,094	212	4,693,709
197	4,693,694	174	4,693,999	503	4,694,034	393	4,694,067	186	4,694,095	283	4,693,710
220	4,693,695	187	4,694,000		CLASS 526	502	4,694,068	251	4,694,096	306	4,693,711
224	4,693,696	110	4,694,001	458	4,694,035		CLASS 530		CLASS 560	323	4,693,712
272	4,693,697	211	4,694,002	473	4,694,036	317	4,694,069	24	4,694,097	368	4,693,713
	CLASS 488	220	4,694,003	557	4,694,037	329	4,694,070	59	4,694,098		CLASS 623
608	4,694,504	228	4,694,004	590	4,694,038		4,694,071	75	4,694,099	3	4,693,714
	CLASS 464	234	4,694,005	718	4,694,039	350	4,694,072	105	4,694,100	5	4,693,715
111	4,693,698	254	B1 4,556,658	765	4,694,040	399	4,694,073	352	4,694,101	6	4,693,716
133	4,693,699	258	4,694,006		CLASS 525	417	4,694,074		CLASS 562	11	4,693,717
	CLASS 474	260	4,694,007	25	4,694,041		CLASS 534	426	4,694,102		4,693,718
80	4,693,700	269	4,694,008	66	4,694,042	604	4,694,075			16	4,693,719
		304	4,694,009	127	4,694,043		CLASS 536			18	4,693,720
		323	4,694,010	178	4,694,044	17.2	4,694,076			19	4,693,721
			4,694,011	276	4,694,045					23	4,693,722
											4,693,723
											4,693,724

CLASSIFICATION OF DESIGNS

D2—	348	291,840	321	291,859	147	291,874	D16—	14	291,891	D22—	107	291,903			291,924
D3—	20	291,841	360	291,860		291,875		30	291,892			291,904	81	291,925
	36	291,842	402	291,854	149	291,876		102	291,893		146	291,905	87	291,926
	38	291,843	404	291,855	151	291,877		123	291,894	D23—	1	291,911	73	291,927
	42	291,844	D8—	37	156	291,878		134	291,895		35	291,912	76	291,928
D5—	36	291,845		1107	192	291,880	D20—	5	291,896		97	291,913	138	291,929
D6—	344	291,846		291,863	209	291,879		22	291,897		112	291,914	D28—	59	291,930
	381	291,847		354	291,866	300	291,881		24	291,898	D24—	2	291,915			291,931
	466	291,848	D9—	322	291,865	D14—	3	291,882	D21—	23	291,899			291,916	D32—	4	291,932
	471	291,849		337	291,866		53	291,883		54	291,900			291,917		14	291,933
		291,850		380	291,867		60	291,884		86	291,901		8	291,918		70	291,934
	482	291,851		453	291,868		63	291,885		161	291,906		10	291,919	D34—	38	291,935
	487	291,852	D10—	32	291,869		68	291,886		213	291,907		56	291,920	D99—	18	291,936
	511	291,853		114	291,870		79	291,887		217	291,908		2	291,921		30	291,937
D7—	30	291,856		126	291,871		95	291,888		219	291,902	D26—	14	291,922		40	291,938
	49	291,857	D12—	96	291,872	D15—	139	291,889		230	291,909		28	291,923			291,939
	77	291,858		111	291,873		199	291,890		237	291,910						

CLASSIFICATION OF PLANTS

P—	9	6,011	PP	6,012		6,013		6,014		6,015	88	6,016
	22	6,010										

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

[illegible] :	4,692,978		4,693,557		4,694,405		4,694,299		4,693,035		4,693,786
	4,693,444		4,693,560		4,694,408		4,694,357		4,693,073		4,693,936
	4,693,460		4,693,602		4,694,412		4,694,397		4,693,094		4,693,992
	4,693,561		4,693,603		4,694,424		4,694,450		4,693,108		4,694,016
	4,693,718		4,693,607		4,694,439	10 :	4,693,045		4,693,200		4,694,226
04 :	4,693,022		4,693,629		4,694,459		4,693,109		4,693,209		4,694,414
	4,693,090		4,693,636		4,694,462		4,693,715		4,693,247		4,694,499
	4,693,189		4,693,659		4,694,468		4,693,743		4,693,249	19 :	4,692,968
	4,693,382		4,693,683		4,694,477		4,693,744		4,693,296		4,693,132
	4,693,443		4,693,696		4,694,480		4,693,749		4,693,349		4,693,438
	4,693,650		4,693,717		4,694,501		4,693,941		4,693,352		4,693,699
	4,693,852		4,693,728		4,225,345		4,694,013		4,693,376		4,693,720
	4,694,241		4,693,764	[illegible] :	4,693,014		4,694,045		4,693,387		4,694,237
	4,694,242		4,693,806		4,693,178		4,694,054		4,693,412	20 :	4,693,402
	4,694,300		4,693,820		4,693,310	11 :	4,693,299		4,693,428		4,693,406
	4,694,447		4,693,851		4,693,340		4,693,606		4,693,465		4,693,426
05 :	4,693,280		4,693,886		4,693,368		4,694,285		4,693,532		4,693,541
	4,693,384		4,693,891		4,693,381	12 :	4,692,948		4,693,536	21 :	4,693,034
[illegible] :	4,692,949		4,693,893		4,693,708		4,692,965		4,693,550		4,693,638
	4,692,950		4,693,895		4,693,755		4,692,971		4,693,572	22 :	4,692,954
	4,692,963		4,693,908		4,693,805		4,693,024		4,693,611		4,693,055
	4,692,976		4,693,925		4,693,993		4,693,025		4,693,654		4,693,102
	4,692,993		4,693,938		4,694,159		4,693,049		4,693,682		4,693,128
	4,693,001		4,693,940		4,694,179		4,693,075		4,693,698		4,693,243
	4,693,008		4,693,981		4,694,181		4,693,167		4,693,703		4,693,271
	4,693,072		4,694,115		4,694,244		4,693,228		4,693,707		4,693,861
	4,693,086		4,694,123		4,694,334		4,693,257		4,693,712		4,693,967
	4,693,089		4,694,130		4,694,335		4,693,350		4,693,732		4,694,174
	4,693,097		4,694,132		4,694,343		4,693,380		4,693,737	23 :	4,694,488
	4,693,104		4,694,140		4,694,344		4,693,439		4,693,768	24 :	4,693,056
	4,693,119		4,694,146		4,694,358		4,693,669		4,693,774		4,693,403
	4,693,206		4,694,153		4,694,367		4,693,864		4,693,818		4,693,476
	4,693,237		4,694,156	[illegible] :	4,692,957		4,694,070		4,693,831		4,693,600
	4,693,239		4,694,161		4,692,986		4,694,118		4,693,869		4,693,906
	4,693,250		4,694,162		4,693,003		4,694,295		4,693,883		4,693,958
	4,693,281		4,694,165		4,693,179		4,694,313		4,693,889		4,693,984
	4,693,323		4,694,173		4,693,390	13 :	4,693,113		4,694,018		4,693,994
	4,693,325		4,694,175		4,693,391		4,693,124		4,694,122		4,694,021
	4,693,326		4,694,176		4,693,435		4,693,170		4,694,127		4,694,101
	4,693,327		4,694,183		4,693,549		4,693,427		4,694,192		4,694,195
	4,693,344		4,694,205		4,693,569		4,693,478		4,694,236		4,166,328
	4,693,365		4,694,222		4,693,605		4,693,480		4,694,280	25 :	4,692,946
	4,693,373		4,694,227		4,693,702		4,693,722		4,694,328		4,692,956
	4,693,400		4,694,258		4,693,706		4,693,834		4,694,383		4,693,121
	4,693,433		4,694,269		4,693,802		4,693,847		4,694,484		4,693,165
	4,693,436		4,694,298		4,693,882		4,693,982		4,694,487		4,693,241
	4,693,437		4,694,304		4,693,899	15 :	4,692,959		4,694,489		4,693,246
	4,693,446		4,694,311		4,693,920	16 :	4,694,308	18 :	4,692,953		4,693,254
	4,693,447		4,694,368		4,693,937	17 :	4,692,964		4,692,970		4,693,289
	4,693,449		4,694,369		4,693,960		4,692,966		4,693,077		4,693,504
	4,693,479		4,694,389		4,694,087		4,692,980		4,693,125		4,693,546
	4,693,496		4,694,395		4,694,113		4,693,012		4,693,276		4,693,547
	4,693,520		4,694,402		4,694,128		4,693,030		4,693,673		4,693,552

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UNITED STATES PATENT AND TRADEMARK OFFICE
September 22, 1987 Volume 1082 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 18, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,471,495 through 4,472,834
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 5, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,390,995	06/354,169	7/5/83
4,390,998	06/269,227	7/5/83
4,391,003	06/351,666	7/5/83
4,391,008	06/243,844	7/5/83
4,391,019	06/239,147	7/5/83
4,391,021	06/313,318	7/5/83
4,391,030	06/278,041	7/5/83
4,391,042	06/274,748	7/5/83
4,391,043	06/314,589	7/5/83
4,391,050	06/259,347	7/5/83
4,391,058	06/224,183	7/5/83
4,391,059	06/253,065	7/5/83
4,391,061	06/333,580	7/5/83
4,391,063	06/275,858	7/5/83
4,391,064	06/220,463	7/5/83
4,391,068	06/257,394	7/5/83
4,391,070	06/239,116	7/5/83
4,391,087	06/254,764	7/5/83
4,391,088	06/339,082	7/5/83
4,391,090	06/308,969	7/5/83
4,391,094	06/225,607	7/5/83
4,391,105	06/244,472	7/5/83
4,391,107	06/265,936	7/5/83
4,391,109	06/235,478	7/5/83
4,391,113	06/289,507	7/5/83
4,391,121	06/263,380	7/5/83
4,391,129	06/246,774	7/5/83
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4,391,194	06/259,181	7/5/83
4,391,196	06/255,906	7/5/83
4,391,201	06/302,703	7/5/83
4,391,203	06/243,910	7/5/83
4,391,205	06/231,947	7/5/83
4,391,223	06/400,345	7/5/83
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4,391,291	06/237,757	7/5/83
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4,391,296	06/261,458	7/5/83
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4,391,337	06/248,322	7/5/83
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4,391,368	06/252,301	7/5/83
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4,391,378	06/310,218	7/5/83
4,391,380	06/233,879	7/5/83
4,391,400	06/259,642	7/5/83
4,391,405	06/314,262	7/5/83
4,391,406	06/337,701	7/5/83
4,391,407	06/265,843	7/5/83
4,391,411	06/217,679	7/5/83
4,391,416	06/243,602	7/5/83
4,391,421	06/242,535	7/5/83
4,391,422	06/251,257	7/5/83
4,391,429	06/299,799	7/5/83
4,391,432	06/259,521	7/5/83
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4,391,448	06/226,431	7/5/83
4,391,449	06/271,626	7/5/83
4,391,457	06/289,470	7/5/83

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			4,391,805	06/311,184	7/5/83
4,391,463	06/269,948	7/5/83	4,391,810	06/335,936	7/5/83
4,391,479	06/252,429	7/5/83	4,391,820	06/269,735	7/5/83
4,391,481	06/249,198	7/5/83	4,391,821	06/284,573	7/5/83
4,391,501	06/299,455	7/5/83	4,391,822	06/403,788	7/5/83
4,391,503	06/247,309	7/5/83	4,391,834	06/355,166	7/5/83
4,391,508	06/329,980	7/5/83	4,391,840	06/266,693	7/5/83
4,391,515	06/261,341	7/5/83	4,391,844	06/277,920	7/5/83
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4,391,546	06/223,004	7/5/83	4,391,858	06/323,367	7/5/83
4,391,561	06/343,688	7/5/83	4,391,863	06/314,120	7/5/83
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4,391,582	06/248,909	7/5/83	4,391,951	06/336,712	7/5/83
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4,391,662	06/328,507	7/5/83	4,392,033	06/251,430	7/5/83
4,391,675	06/337,324	7/5/83	4,392,046	06/247,867	7/5/83
4,391,678	06/322,503	7/5/83	4,392,058	06/289,151	7/5/83
4,391,681	06/377,606	7/5/83	4,392,071	06/282,390	7/5/83
4,391,694	06/347,864	7/5/83	4,392,074	06/252,298	7/5/83
4,391,696	06/296,225	7/5/83	4,392,081	06/288,855	7/5/83
4,391,703	06/365,889	7/5/83	4,392,090	06/322,062	7/5/83
4,391,708	06/351,633	7/5/83	4,392,092	06/219,384	7/5/83
4,391,709	06/257,895	7/5/83	4,392,096	06/311,687	7/5/83
4,391,716	06/333,300	7/5/83	4,392,103	06/271,217	7/5/83
4,391,731	06/289,676	7/5/83	4,392,112	06/300,121	7/5/83
4,391,738	06/343,570	7/5/83	4,392,123	06/265,114	7/5/83
4,391,744	06/357,157	7/5/83	4,392,132	06/273,374	7/5/83
4,391,758	06/369,549	7/5/83	4,392,155	06/216,009	7/5/83
4,391,762	06/339,684	7/5/83	4,392,186	06/216,443	7/5/83
4,391,763	06/223,947	7/5/83	4,392,241	06/258,987	7/5/83
4,391,792	06/292,054	7/5/83	4,392,248	06/308,611	7/5/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c);37 CFR 1.378)

The patent listed below is considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,353,243	06/230,817	10/12/82	2/2/81	8/26/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicatedExamining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,421,122, Re. S.N. 083,848, Filed Aug. 7, 1987, Cl. 128/731, BRAIN ELECTRICAL ACTIVITY MAPPING, Frank H. Duffy, Owner of Record: *Children's Hospital Medical Center, Boston, Mass.*, Attorney or Agent: David E. Brook, et al., Ex. Gp.: 335

4,495,897, Re. S.N. 007,454, Filed Jan. 27, 1987, Cl. 119/148, CATTLE STANCHION APPARATUS, Teo Albers, Sr., Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

4,500,513, Re. S.N. 015,827, Filed Feb. 18, 1987, Cl. 424/89, INFLUENZA VACCINE PRODUCTION IN LIQUID CELL CULTURE, Karen K. Brown, et al., Owner of Record: *Mobay Corp., Pittsburgh, Pa.*, Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 123

4,510,411, Re. S.N. 083,443, Filed Aug. 10, 1987, Cl. 310/316, DRIVE CIRCUIT FOR SURFACE-WAVE DRIVEN MOTOR UTILIZING ULTRASONIC VIBRATION, Kazuo Hakamata, et al., Owner of Record: *Nippon Kogaku, Tokyo, Japan,* Attorney or Agent: Nelson H. Shapiro, et al., Ex. Gp.: 212

4,536,026, Re. S.N. 083,726, Filed Aug. 10, 1987, Cl. 297/39, FOLDING CHAIR, Howell N. Cornell, Owner of Record: *Keller Industries, Inc., Miami, Fla.*, Attorney or Agent: J. Rodman Steele, Jr., et al., Ex. Gp.: 357

4,568,234, Re. S.N. 080,437, Filed July 31, 1987, Cl. 414/404, WAFER TRANSFER APPARATUS, Steven N. Lee, et al., Owner of Record: *A.S.Q. Boats, Inc., Tustin, Calif.*, Attorney or Agent: Louis J. Knobbe, et al., Ex. Gp.: 317

4,670,178, Re. S.N. 082,860, Filed Aug. 4, 1987, Cl. 252/95, METHOD FOR THE SIMULTANEOUS CLEANING AND DISINFECTING OF CONTACT LENSES, Stanley W. Huth, et al., Owner of Record: *Allergan Pharmaceuticals, Inc., Irvine, Calif.*, Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 115

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Aubrey McDonald Creations, Inc., Akron, Ohio, Reg. No. 1,241,099, for the mark "AUBREY CREATIONS AND DESIGN", Canc. No. 16,169.

Willoughby's Restaurant, Inc., Deerfield Beach, Fla., Reg. No. 945,393, for the mark "WILLOUGHBY'S AND DESIGN", Canc.No. 16,359.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identifed below having been filed, and the notice of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Pixel Computer, Inc., assignee of Instrumentation Laboratory Inc., Andover, Mass., Reg. No. 1,249,713, for the mark "PIXEL 100/AP", Canc. No. 15,975.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 22, 1987

4,338,179	4,633,622	4,650,773	4,665,251
4,476,057	4,633,732	4,651,009	4,665,362
4,540,048	4,633,812	4,652,853	4,666,055
4,541,974	4,634,036	4,653,502	4,666,205
4,553,901	4,634,875	4,654,717	4,666,548
4,567,286	4,636,038	4,654,952	4,666,687
4,573,303	4,637,481	4,655,130	4,666,842
4,576,644	4,637,623	4,655,824	4,666,913
4,588,656	4,638,009	4,656,328	4,667,150
4,591,897	4,638,058	4,656,623	4,667,191
4,600,574	4,638,611	4,656,625	4,667,329
4,601,083	4,639,622	4,656,943	4,667,365
4,609,224	4,640,893	4,657,237	4,667,874
4,609,539	4,641,257	4,657,406	4,668,771
4,610,385	4,641,557	4,657,510	4,668,772
4,613,386	4,642,193	4,657,631	4,668,854
4,613,661	4,642,438	4,657,966	4,668,947
4,615,277	4,642,477	4,658,300	4,669,388
4,615,672	4,642,544	4,658,405	4,669,394
4,618,456	4,643,253	4,659,101	4,669,466
4,621,159	4,643,904	4,659,136	4,669,840
4,623,448	4,645,684	4,659,190	4,669,885
4,623,905	4,646,233	4,659,284	4,670,006
4,624,558	4,646,942	4,659,396	4,670,225
4,625,811	4,647,292	4,659,663	4,670,573
4,626,412	4,648,011	4,661,331	4,670,691
4,626,970	4,648,154	4,661,355	4,671,333
4,628,021	4,648,178	4,661,650	4,672,129
4,628,233	4,649,090	4,661,882	4,672,169
4,628,743	4,649,122	4,662,371	4,672,203
4,629,484	4,649,791	4,662,750	4,672,301
4,629,636	4,650,000	4,663,425	4,673,136
4,630,034	4,650,551	4,664,235	4,676,796
4,631,051	4,650,604	4,664,596	4,677,631
4,631,425	4,650,626	4,664,992	4,678,984
4,631,489	4,650,671	4,665,043	
4,632,363	4,650,711	4,665,248	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 15, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-13-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-16-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-25-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,522,401 to 3,526,003, inclusive
Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 22, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,439,311 (760th)

REREFINING USED LUBRICATING OIL WITH HYDRIDE REDUCING AGENTS

Richard H. O'Blasny, Natchitoches, La., assignor to Delta Central Refining, Inc., Natchitoches, La.

Reexamination Request No. 90/001,110, Oct. 6, 1986.

Reexamination Certificate for Patent No. 4,439,311, issued Mar. 27, 1984, Ser. No. 336,900, Jan. 4, 1982.

Int. Cl.[4] **C10G** *7/10, 7/00;* **C10M** *11/00*

U.S. Cl. 208—179

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-17 are cancelled.

[1. A method of rerefining used lubricating oil comprising contacting the used lubricating oil with at least one hydride reducing agent selected from the group consisting of sodium borohydride, potassium borohydride, zinc borohydride, sodium cyanoborohydride, sodium sulfurated borohydride, sodium trioxyacetal borohydride, sodium trialkoxy borohydride, sodium hydroxyl borohydride, sodium borohydride, anilide, tetrahydrofuran borohydride, di-methyl-butyl borohydride, lithium-aluminum hydride, lithium-aluminum tri-oxymethyl hydride, sodium-aluminum-2-methoxyethoxy hydride, and aluminum hydride.]

B1 4,504,383 (761st)

REREFINING USED OIL WITH BOROHYDRIDE REDUCING AGENTS

Richard H. O'Blasny, Natchitoches, La., assignor to Delta Central Refining, Inc., Natchitoches, La.

Reexamination Request No. 90/001,111, Oct. 6, 1986.

Reexamination Certificate for Patent No. 4,504,383, issued Mar. 12, 1985, Ser. No. 578,357, Feb. 8, 1984.

Continuation-in-part of Ser. No. 336,900, Jan. 4, 1982, Pat. No. 4,439,311.

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[4] **C10G** *7/10, 7/00;* **C10M** *11/00*

U.S. Cl. 208—179

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-13 are cancelled.

[1. A method of rerefining used oil comprising contacting the used oil with at least one borohydride reducing agent.]

B1 4,558,179 (762nd)

MESSAGE PLAYBACK CONTROL SYSTEM FOR TELEPHONE ANSWERING MACHINE

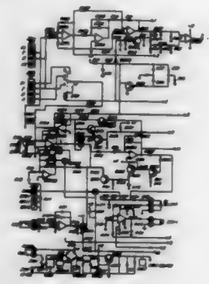
Raymond G. Bond, Long Beach, Calif., assignor to Fortel Inc., Compton, Calif.

Reexamination Request No. 90/001,105, Sep. 30, 1986.

Reexamination Certificate for Patent No. 4,558,179, issued Dec. 10, 1985, Ser. No. 527,978, Aug. 31, 1983.

Int. Cl.[4] **H04M** *1/65;* **G11B** *15/00*

U.S. Cl. 379—70



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-5 are now disclaimed.

[1. In a telephone answering system which responds to telephone messages received over a telephone line and which includes a magnetic tape mechanism for recording messages received over the telephone line on a magnetic tape, the combination of: a microcomputer; manually operated local switch means connected to the microcomputer; circuit means connecting the microcomputer to the magnetic tape mechanism to cause the magnetic tape mechanism to rewind the magnetic tape in a reverse direction to a predetermined origin position when the switch means is manually operated; further circuit means connecting the microcomputer to the magnetic tape mechanism to cause the magnetic tape mechanism to move the magnetic tape in the forward direction after it has reached said predetermined origin position; control circuitry connected to the microcomputer for enabling the microcomputer to stop the forward motion of the magnetic tape mechanism after it has returned to the position at which the switch means was manually operated; a sound transducer; and circuit means connecting the magnetic tape mechanism to the sound transducer to cause the sound transducer to reproduce the message recorded on the magnetic tape during the forward motion thereof.]

REISSUES

SEPTEMBER 22, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

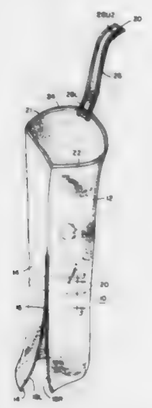
Re. 32,506
SNAKE PROOF CHAPS

George H. Hightower, Jr., Thomaston, Ga., assignor to Thomaston Mills, Inc., Thomaston, Ga.

Original No. 4,382,301, dated May 10, 1983, Ser. No. 273,067, Jun. 12, 1981. Application for reissue Jan. 30, 1984, Ser. No. 575,296

Int. Cl.[4] A41D *13/06;* F41H *1/02*

U.S. Cl. 2—22 27 Claims



11. A protective article of clothing adapted to prevent snake fangs from biting into the leg of a wearer, said protective article comprising:

(a) a generally tubular leg enclosing portion made of a woven fabric of nylon resistant to snake bites and having an upper part and a lower part, said lower part including a fastener for connecting two side edges of the lower part, and

(b) a securing means attached to said upper part for holding the leg enclosing portion up on a wearer's leg, and

wherein said leg enclosing portion comprises nylon fiber in the form of continuous filament yarn, said woven fabric is made of threads between 900 and 1100 denier and wherein said leg enclosing portion prevents penetration by snake fangs even when the snake fangs are longer than the thickness of the leg enclosing portion, and said leg enclosing portion is less than ¼" in thickness.

Re. 32,507
OPENING ROLLER UNIT FOR OPEN-END SPINNING INSTALLATIONS

Friedbert Schmid, Ueberkingen, and Hans Raasch, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Original No. 4,435,953, dated Mar. 13, 1984, Ser. No. 388,219, Jun. 14, 1982. Application for reissue Mar. 10, 1986, Ser. No. 837,727

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123480

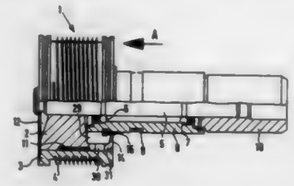
Int. Cl.[4] D01H *7/895, 7/892;* D01G *15/28*

U.S. Cl. 57—408 33 Claims

19. Opening roller ring assembly for an opening roller unit for open-end spinning installations of the type having a shaft supported in a bearing box, and an opening roller base member unit arranged on an end of the shaft which projects from the bearing box for rotation with said shaft with the opening roller base member unit extending over the bearing box in a manner forming a cavity with an annular sealing gap, said opening roller ring assembly comprising:

a ring member, and

fitting means projecting outwardly from the outer circumference of the ring member, said ring member being detachably connectable to the opening roller base member unit for accommodating interchangeability of the roller ring assembly, wherein said ring member is configured to block access from the outside to an annular sealing gap in said base member unit when in an assembled in use position on the opening roller base member unit and to permit access to the annular sealing gap when displaced from said assembled in use position.



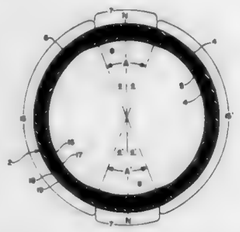
Re. 32,508
HOSE STRUCTURE

Robert H. Feucht, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Original No. 3,856,052, dated Dec. 24, 1974, Ser. No. 276,629, Jul. 31, 1972. Continuation of Ser. No. 016,680, Apr. 25, 1979, abandoned. Application for reissue Jun. 29, 1981, Ser. No. 278,019

Int. Cl.[4] F16L *11/12*

U.S. Cl. 138—119 17 Claims



18. A material transporting hose of integral construction comprising a body of flexible resilient elastomeric material having a generally circular cross-sectional configuration, said body including:

an inner tube and an outer cover; reinforcing material of a balanced symmetrical construction extending generally circumferentially about said tube and surrounded by said cover to provide reinforcement against radial forces within the hose; and

a pair of circumferentially spaced longitudinally reinforced portions having in cross section a total combined perimeter which is substantially less than the perimeter of the cross section of the body, said portions extending substantially the entire length of the hose thereby providing primary resistance to elongation of the hose and constriction of the hose opening

caused by excessive end loads, said portions being surrounded by said cover so as to be disposed completely within said body on opposite sides of the cross section thereof between said cover and said tube, said cover having a substantially uniform thickness with no substantial protuberances therein, said portions each including a plurality of elongated stress-resisting reinforcing members with substantially an equal number of said members in each portion to provide a balanced symmetrical hose construction, each said member extending generally parallel to the longitudinal axis of the hose for substantially the entire length of said hose, and being capable of withstanding substantial longitudinal stresses applied to the end of the hose to provide the hose with longitudinal strength; and

remaining portions free of said reinforcing members disposed adjacent to said longitudinally reinforced portions on each side thereof with said longitudinally reinforced portions having a total combined perimeter equal to or less than the total combined perimeter of the remaining portions of the cross-section of said body therebetween to provide a hose construction in which at least one-half of the hose remains flexible in a longitudinal direction for enabling the hose to be more easily reeled upon itself and less likely to develop kinks.

PLANT PATENTS

GRANTED SEPTEMBER 22, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,017

GERANIUM PLANT NAMED GYPSY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,675

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Gypsy, as described and illustrated, and particularly characterized by its light pink flower color, variegated with deep purple; compact self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and ease of propagation and good rooting habit.

6,018

GERANIUM PLANT NAMED ROSY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,742

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Rosy, as described and illustrated, and particularly characterized by its pale pink flower color, variegated with dark red-purple; floriferous, compact self-branching growth habit; early flowering response; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; good resistance against parasites; and ease of propagation and good rooting habit.

6,019

GERANIUM PLANT NAMED JOSY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,116

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Josy, as described and illustrated, and particularly characterized by its rose-pink flower color with very dark red variegation on upper petals; dark green foliage; very early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; compact, self-branching growth habit; and by its ease of propagation and good rooting habit.

6,020

GERANIUM PLANT NAMED PEGGY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,117

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Peggy, as described and illustrated, and particularly characterized by its light red-purple flower color, variegated with dark red-purple; very early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; compact, self-branching growth habit; very floriferous habit; and by its ease of propagation and good rooting habit.

6,021

GERANIUM PLANT NAMED SALLY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,154

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Sally, as described and illustrated, and particularly characterized by its bright red-purple flower color with small, dark red-purple variegation on upper two petals; compact, floriferous, self-branching growth habit; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; medium green foliage; and by its ease of propagation and good rooting habit.

6,022

GERANIUM PLANT NAMED LILLY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,704

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Lilly, as described and illustrated, and particularly characterized by its violet-red flower color, variegated with dark purple; early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; ease of propagation and good rooting habit; compact growth habit; and good resistance against parasites.

6,023

GERANIUM PLANT NAMED CANDY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mikro Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 810,705

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Candy, as described and illustrated, and particularly characterized by its floriferous habit, very compact and self-branching growth habit, light red-purple flower color with a much deeper red-purple variegation in the upper two petals, medium early flowering, good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period, and by its ease of propagation and good rooting habit.

PATENTS

GRANTED SEP. 22, 1987

ERRATA

For CLASS	See PATENT NO.
437-052	4,694,561
437-057	4,694,562
437-040	4,694,563
437-040	4,694,564
437-034	4,694,565
437-048	4,694,566
453-059	4,694,845
166-377	4,694,878
164-432	4,694,899
237-008	4,695,052
439-095	4,695,105
439-083	4,695,106
439-083	4,695,107
439-059	4,695,108
439-155	4,695,109
439-289	4,695,110
439-266	4,695,111
439-350	4,695,112
439-404	4,695,113
439-573	4,695,114
439-076	4,695,115
439-188	4,695,116
439-188	4,695,117
439-726	4,695,118
437-031	4,695,328
437-126	4,695,331
437-126	4,695,332
209-211	4,695,371
361-018	4,695,413
436-064	4,695,471
437-225	4,695,480
568-310	4,695,673
346-140	4,695,824
380-005	4,695,901
364-506	4,695,982
364-709	4,695,983
375-046	4,696,023

PATENTS

GRANTED SEPTEMBER 22, 1987

GENERAL AND MECHANICAL

4,694,505

UPPER BODY PROTECTOR FOR OFF-ROAD RIDERS

Corrado Flosi, Via Rosselli 8, S. Romano (Ri); Alberto Gobbi, Vie Anadeo 24, Milano; Roberto Maccioni, Via Vittor Pisani 37, Vi Reggio, and Guerrieri Simonetta, Via Rosselli 8, S. Romano, all of Italy

Filed Mar. 30, 1984, Ser. No. 595,404

Int. Cl.[4] A41D *13/00*

U.S. Cl. 2—2 **6 Claims**



1. An upper body protector comprising:

(a) a unitary, at least semi-rigid shoulder cover extending completely over the shoulder from the dorsal side of the body to the ventral side thereof and defining a neck opening;

(b) a ventral shield extending down from the front of said cover to shield the chest;

(c) means for holding the ventral shield against the body;

(d) a pair of epaulets arching dorsally-to-ventrally over the shoulder articulations and being mounted to said shoulder cover;

(e) said epaulets being pivotally mounted at their dorsal and ventral extremes to said cover to pivot toward and away from the neck opening of said shoulder; and,

(f) including a raised rib on each side of said neck opening on said shoulder cover positioned and dimensioned to act as a stop to prevent inward motion of said epaulets toward the neck beyond a predetermined point.

4,694,506

FOLDABLE EYESHADE

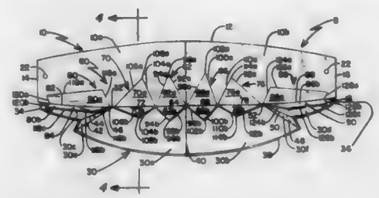
Fred P. Perna, 1417 West Park, Anaconda, Mont. 59711

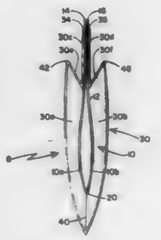
Filed Feb. 26, 1987, Ser. No. 19,249

Int. Cl.[4] A61F *9/04*

U.S. Cl. 2—12 **15 Claims**

1. An eyeshade comprising a headband of sheet material having a first edge and having a central fold line intersecting its said first edge, a visor of sheet material having a second edge complementing the first edge on said headband and having a central fold line intersecting its said second edge, said visor also having a first pair of acutely angled fold lines having their apex spaced to one side of the central fold line on said visor and a second pair of acutely angled fold lines having their apex spaced to the other side of the central fold line on said visor, both of said apices being adjacent the second edge of said visor, and tape means overlying segments of said first and second edges with first portions thereof being secured to portions of said headband and with second portions thereof being secured to portions of said visor to maintain said central fold lines in





alignment with each other and to also maintain said apices in a proximal relationship with the first edge of said headband.

4,694,507

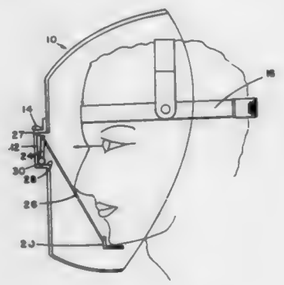
WELDER'S HOOD HAVING A CHIN OPERATED WINDOW CLOSURE

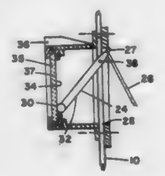
Steven M. Owen, R.R. 1, Box 136, Henry, S. Dak. 57243

Filed Sep. 10, 1986, Ser. No. 905,548

Int. Cl.[4] A61F *9/06*

U.S. Cl. 2—8 **6 Claims**





1. In a hood having an opening therein and a closure member having inner and outer surfaces, said closure member being pivotally secured to said hood over said opening, a chin oper-

ated mechanism for opening and closing said opening comprising:

a. a chin engaging member pivotally mounted in said hood for pivotal movement between first and second positions;
b. an arm pivotally secured to said hood adjacent said opening;
c. a rod having one end pivotally secured to said chin engaging member and a second end pivotally secured to a first end of said arm;
d. a roller pivotally secured to a second end of said arm, said roller being disposed in engagement with the inner surface of said closure member, said closure member disposed for pivotal movement to an open position responsive to movement of said roller thereacross in response to pivotal movement of said arm responsive to downward movement of said chin engaging member to said second position; and,
e. a spring secured to said hood and to said chin engaging member for biasing said chin engaging member toward said first position.

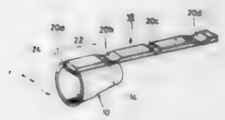
4,694,508

FINGERTIP PROTECTORS FOR WORK GLOVES

Shozo Iriyama, Kuwana, and Mitsuo Abe, Chita, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Sep. 9, 1986, Ser. No. 905,745
Claims priority, application Japan, Oct. 16, 1985, 60-230442
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—21 1 Claim





1. A fingertip protector for use with a work glove comprising a cap adapted to be detachably fitted on a fingertip of a user for covering and protecting said fingertip, said cap having an opening which faces the finger cushion of the user's finger when said cap is in use and a cushion member to be secured to both the inner and the outer surfaces of said cap, wherein:

said cushion member is made from a sheet of foamed plastic material having a predeterimined width, said sheet having thereon a series of parallel spaced transverse tapered notches for being cut at and folded about the tapered notches to form said cushion member, such that said cushion member extends from the outer surface of said cap to the inner surface thereof so that a tapered end of said cushion member is disposed on the inner surface of said cap.

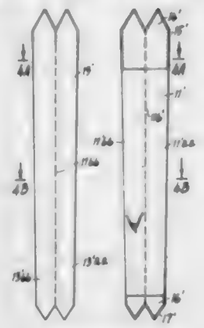
4,694,509

NON-PUCKER NECKTIE

Moe M. Grubman, 99-32/66 Road, Rego Park, N.Y. 11374

Filed Sep. 19, 1985, Ser. No. 777,767
Int. Cl.[4] A41D *25/06*
U.S. Cl. 2—144 10 Claims

1. A necktie comprising in combination, a necktie outer ornamental material of predetermined width and length dimensions prior to a folding and rearward overlapping of opposite edges thereof, a woolen-type continuous lining material of shape with width and length dimensions substantially identical to said necktie outer ornamental material of predetermined width and length dimensions, and said lining material beng



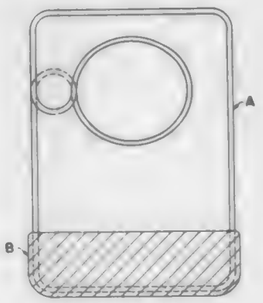
superimposed flushly upon a rearward face of necktie outer ornamental material positioned thereon such that corresponding width and length shapes substantially correspond, and opposite edges of the outer ornamental material and the lining material being at side edges thereof folded rearwardly and overlapped and slip-stitched together with stitches.

4,694,510

BIB WITH TEETHING SURFACE

Theresa K. Kamrath, Rt. 5, Box 35, Rice Lake, Wis. 54868

Filed Jan. 30, 1986, Ser. No. 734,862
Int. Cl.[4] A61J *17/00*; A41D *13/10*
U.S. Cl. 2—49 R 1 Claim



1. A teething bib for babies comprising a thickness of non-toxic rubber attached at the bottom of the bib on both front and back sides.

4,694,511

COMBINATION GARMENT AND PROTECTIVE SEAT COVER

Donna L. Estes, 8430 Franklyn Ave., Los Angeles, Calif. 90069, and Carol A. Hilson, 464 Thirty Fourth St., Manhattan Beach, Calif. 90266

Filed Jun. 13, 1986, Ser. No. 873,967
Int. Cl.[4] A41D *23/00*; A47C *27/00*
U.S. Cl. 2—69 27 Claims

1. An article of manufacture for selective use either as a temporary protective cover for a head-rest equipped vehicle seat or as a garment for use by swimsuit clad persons while in transit to and from the beach, the article comprising:

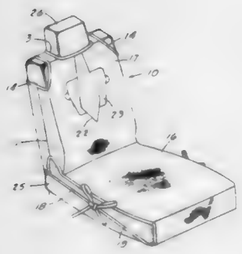
a unitary piece of a flexible sheet-like fabric material having (a) an elongated tubular upper portion of substantially uniform diameter, and (b) an attached essentially rectangularly shaped lower panel depending from approximately one-half the girth of one end of the tubular upper portion,

the other end of the tubular upper portion being closed except for a central opening and a pair of corner openings, the central opening being large enough for assembly over the head-rest of the vehicle seat,

the pair of corner openings being adapted to fit about the upper corners of the seat back of the vehicle seat,

the tubular upper portion being sized to substantially embrace and enclose the seat back of the vehicle seat,





the lower panel being sufficiently long and wide to substantially cover the entire seating surface of said vehicle seat when outstretched over the seating surface, and

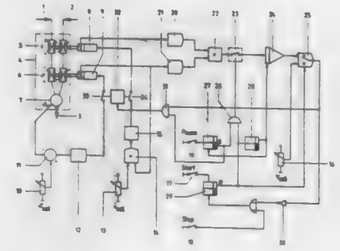
fastener means on the lower panel for securing said article to the vehicle seat to protect the seat from staining and to prevent direct contact between the seat and persons seated thereon in swimsuit wearing apparel enroute to and from the beach, the article also being adapted for being selectively worn as a garment when removed from the vehicle seat, the large central opening and the corner openings providing head and arm-receiving openings when the tubular upper portion is worn on the person's upper torso, and in which the lower panel is large enough to be wrapped around the front and rear sides of the lower torso and secured thereto by the fastener means.

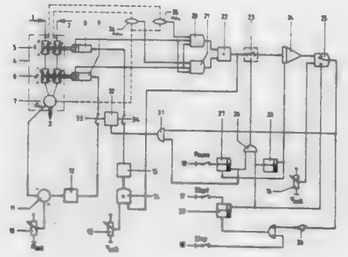
4,694,512

PLUMBING MIXING CIRCUIT CONTROL APPARATUS FOR A COMBINATION SET

Werner Knebel, Iserlohn, and Günter Sieberhagen, Hagen, both of Fed. Rep. of Germany, assignors to Knebel & Rottger GmbH & Co., Fed. Rep. of Germany

Filed Jan. 5, 1986, Ser. No. 870,818
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3531294
Int. Cl.[4] E03C *1/04*
U.S. Cl. 4—192 19 Claims

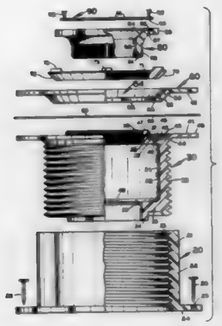




1. Plumbing mixing circuit control apparatus for controlling a plumbing combination set comprising a multi-disc mixing valve for two streams of hot and cold water or other fluids, to make a temperature adjustment by a comparison between a measurement figure for the mixture such as the actual temperature of the mixing water or fluids, and a preselected target figure which is the target temperature of the mixing water, wherein the actual value for the mixture is continuously measured and a factor for the regulator of the appropriate mixing valve adjustment disc is derived from the target/actual divergence, and at the same time the preselected flow quantity of the mixture can be maintained at a constant level without measurement of the flow quantities, such correction figure being derived from the said adjustment disc for flow control of the disc regulator, said plumbing mixing circuit control apparatus further comprising at least one mixture adjustment disc and at least one temperature adjustment disc; each at least one said disc having a regulator engaged therewith, substractor means for an adjustment algorithm;

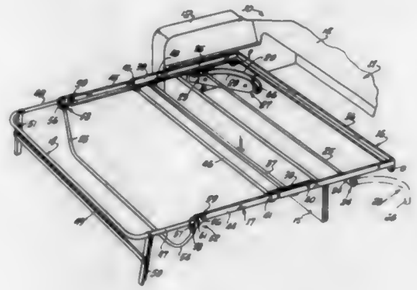
adjustment circuit means for maintaining liquid flow at a steady level, said circuit constituting a factor that the regulator which engages the flow adjustment disc, said factor being derived from the target flow by a signal transformer in communication therewith and a function generator communicating with said regulator for computing a regulated corrective factor.

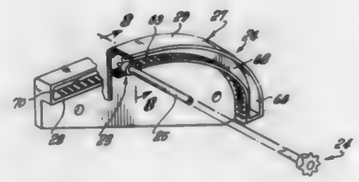
4,694,513
DRAIN
Floyd G. Kiziah, 501 N. 44th Ave., Hollywood, Fla. 33021
Filed Jan. 22, 1987, Ser. No. 6,019
Int. Cl.[4] E03C *1/26*
U.S. Cl. 4—288 9 Claims



1. A floor drain for use in a floor of solidified poured material overlying a temporary sub form base comprising:
a base member having a tubular, upstanding, internally screw-threaded tubular segment and a horizontal bottom flange extending laterally outward from said tubular segment for attachment to the form base;
a body member having an externally screw-threaded annular wall which threadedly engages said internally screw-threaded tubular segment of said base member, a smooth-walled cylindrical lower projection extending down below said annular wall at the lower end of said body member, said lower projection having a smaller inside and outside diameter than the inside diameter of said annular wall, an annular upper projection extending up above said annular wall, said upper projection having internal and external screw threads and having a smaller inside and outside diameter than said annular wall, and an annular top flange extending horizontally outward past the upper end of said annular wall;
a deformable annular membrane overlying said top flange and the upper end of said body member laterally outward from said upper projection;
an annular membrane retainer overlying said membrane across and beyond its entire extent;
a ring overlying said membrane retainer for part of its lateral extent, said ring having internal screw threads which threadedly engage said external screw threads on said upper projection of said body member and holding said membrane retainer down to clamp said membrane against the top of said body member;
and an annular strainer holder having an externally screw-threaded lower end segment threadedly engaging said internal screw threads on said upper projection of said body member, said strainer holder having an annular flange on its upper end extending laterally outward beyond its screw-threaded lower end segment and across the top of said ring, said flange on the strainer holder presenting an upwardly-facing annular seat for receiving a perforated strainer.

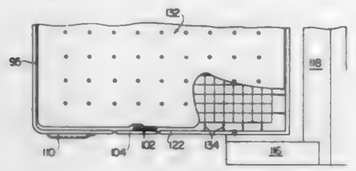
4,694,514
CONVERTIBLE SOFA MECHANISM
Edward H. Crossett, 23333 Ridge Rte., #175, El Toro, Calif. 92630
Continuation-in-part of Ser. No. 773,982, Sep. 9, 1985, Pat. No. 4,612,677. This application Aug. 13, 1986, Ser. No. 896,012
Int. Cl.[4] A47C *17/14*
U.S. Cl. 5—12 R 13 Claims





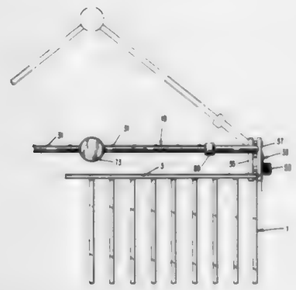
1. A three-section convertible sofa mechanism installed in a convertible sofa and which may be forwardly extended to a full length bed having a head section, a middle section and a foot section, said convertible sofa comprising:
a convertible sofa exterior member having two arms, a back and a front support beam;
right and left curved channels affixed to the inner surfaces of the arms of the convertible sofa exterior member, each of said curved channels beginning at a lowermost point near the back of said sofa exterior member to its highest point nearer the front of the sofa exterior member;
a head section including a frame having two sides and an inner edge and an outer edge, said head section frame being supportable near its outer edge by a pair of bearing means affixed to the two sides of the frame and said bearing means being supported by said right and left curved channels and being movable therealong from its inner position where the head section is in its lowermost position to its outer position when the head section is in its uppermost position and said uppermost point of said curved channel in about a horizontal position;
synchronizing means comprising a rotatable shaft including gear means at each end thereof, said gear means intermeshing with rack means held by said right and left curved channels;
a middle section hingedly affixed to said frame of said head section near its outer edge so that said middle section may be pivoted back over said head section;
a foot section hingedly affixed to said middle section near the outer edge thereof so that the foot section is movable so that the bottom of the foot section is movable to be adjacent to the bottom of the middle section; and
a pair of legs near the intersection of the middle section and the foot section.

4,694,515
SELF-INFLATABLE AIR MATTRESS IN A FOLDABLE SUPPORT
Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.
Continuation-in-part of Ser. No. 678,965, Dec. 6, 1984, abandoned. This application Jun. 26, 1986, Ser. No. 878,587
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—13 12 Claims



1. An air mattress comprising in combination a foldable body including opposite upper and lower walls and side walls defining an air chamber, resilient means in said chamber urging said upper and lower walls apart from each other while being yieldable to permit said upper and lower walls to be moved relative to each other to deflate the body, valve means on the body to admit air into and to expel air from said chamber, and actuating means connected to said valve means for closing and opening said valve means in response to unfolding and folding of the body, and wherein said valve means is located in at least one of the walls of the mattress and said actuating means includes means connected to a foldable frame for actuating the valve in response to folding movement of the frame.

4,694,516
PLAYPEN SUN COVER
Patrick Overman, Sr., 9704 Southeast 7th St., and Elldon Baird, 10010 N.E. 6 Circle, both of Vancouver, Wash. 98664
Filed Jan. 24, 1986, Ser. No. 822,154
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—93 R 11 Claims



1. An improved sun cover comprising:
(a) a frame removably attachable to an enclosure;
(b) covering means removably and adjustably attached over said frame;
(c) said frame including side rods pivotably connected to one another to enable said cover to be adjusted to different configurations;
(d) said side rods pivoting about a main rod centrally located in said frame and disposed substantially perpendicular to said side rods, said side rods including first and second substantially parallel side rods to one side of said main rod and third and fourth substantially parallel rods to another side of said main rod, said first and third rods being pivotable with respect to one another and said second and fourth rods being pivotable with respect to one another;
(e) a first end rod substantially parallel to said main rod and mounted on ends of said first and third side rods remote from said main rod, and a second end rod substantially parallel to said main rod and mounted on ends of said second and fourth side rods remote from said main rod;
(f) said frame being removably attachable to said enclosure by fastening means connected to said end rods, said fastening means comprising at least one fastener on each end rod and comprising:
(1) two facing clamping halves including interengaging structure enabling the halves to be moved toward and away from one another;
(2) a first recess between said halves and adapted to surround one of said end rods;
(3) a second recess between said halves and adapted to surround a top portion of said enclosure; and
(4) adjusting means for controllably tightening said halves about said one of said end rods and said top portion substantially simultaneously.

4,694,517
UNIVERSAL COUCH
Yui-Chen Lin, 237, Syh Te Rd., Wu Fong Hsiang, Taichung Hsien, Taiwan
Filed Feb. 4, 1987, Ser. No. 10,668
Int. Cl.[4] A47C *19/16*
U.S. Cl. 5—114 3 Claims



1. An improved universal couch, especially one characterized by comprising:
three sets of base frames, of which each set consists of two base elements, cover plates, supporting rods and elastic elements which are movably attached at two ends of the base elements; and the said three sets of base frames can be installed respectively at the front, middle and rear three special positions of the couch surface, in order to assemble and support the couch surface;
two couch frames, of which, each frame is arranged at one of the two sides of the couch surface, and of which each frame consists of two round tubes of the same size, said two tubes being connected together along the same direction, one in front of the another, by a connecting frame and said two tubes being able to be folded up for storing, furthermore, at two ends of the front tube and at underside of one end of the rear tube, a bushing and a fixed ear having been provided so that they can be used to connect supporting rods and elastic elements of the three sets of the base frame, in addition, two pivot-jointed pieces, leaving a proper distance between them, having been provided at the front end of the rear tube;
one couch surface made up from a whole sheet of tough material, each side of which having been provided with a long, looped sheath so that the two couch frames can be inserted into the said two sheaths respectively, further-

more, at the mouth of the sheath, indentation having been provided, in order to expose the mouth of couch frame and the fixed ear, in addition, at two sides of the rear couch surface a sling being sewed on:

one positioning rod and supporting rod, being movably attached to the pivot-jointed pieces of the rear tubes, and on the positioning rod, several positioning holes having been provided, so that by selecting the positioning holes for the supporting rod, the best angle of elevation of the rear couch surface can be obtained;

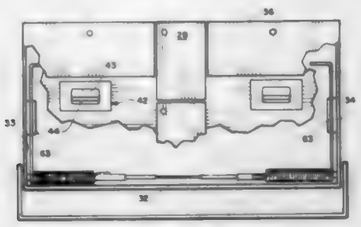
an improved universal couch being able to be assembled by means of the above elements such that the couch frame can be inserted into the looped sheaths at two sides of the couch surface, which is to be connected with three sets of the base frame in order to be constructed into a whole couch body, and the rear couch surface of which can be elevated the required angle by means of its positioning rod and supporting rod.

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CABINET HAVING A RETRACTABLE BED

James L. Lukich, 9252-2 Mast Blvd., Santee, Calif. 92071, and John Zarkovacki, 558 E. El Norte Pkwy., Escondido, Calif. 92025

Filed Jun. 26, 1986, Ser. No. 878,812
Int. Cl.[4] A47C *19/06*
U.S. Cl. 5—136 **7 Claims**



1. A cabinet having a retractable bed comprising:

a cabinet frame having a pair of laterally spaced upstanding side walls being of a predetermined height and having a top end and a bottom end, a bottom wall having opposites ends that are connected to said side walls adjacent their bottom ends, a top wall having opposite ends that are connected to said side walls at a predetermined height, said walls forming a chamber for receiving a bed frame, the walls of said cabinet frame each having a front edge;

a bed frame having laterally spaced side walls, a front wall and a rear wall; and

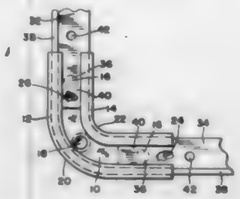
torsion spring means for pivotally mounting said bed frame in said cabinet frame so that said bed frame can be pivoted from a vertical stored position to a horizontal position, said torsion spring means comprises a square rod member having opposite ends that are rigidly supported in square apertures formed in two plates that are attached to opposing inside surfaces of the side walls of said cabinet frame, a square tubular sleeve telescoped over said tubular rod and secured thereto by a set screw, a snug fitting round tubular sleeve telescopically slid over said square tubular sleeve and frictionally held so that the two members cannot rotate with respect to each other, said round tubular member passing through aligned apertures in the side walls of said bed frame so that said bed frame can be pivoted thereabout, at least one coiled torsion spring mounted on said round tubular member, said torsion spring having a laterally extending leg member that is detachably captured by a stop on said bed frame, said coiled torsion spring having a second leg that is structurally secured to said round tubular member to prevent it from pivoting with respect to said round tubular member.

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CORNER BRACKET

Roland A. Benoit, Danielson, Conn., assignor to Gem Industries, Inc., Gardner, Mass.

Filed Sep. 8, 1986, Ser. No. 904,708
Int. Cl.[4] A47C *19/00*
U.S. Cl. 5—200 C **11 Claims**



11. A corner bracket for joining two angle irons at angles to each other to form a corner, the bracket comprising a metallic channel in arc form, the channel including a plane bottom and a flange at each side of the bottom, the flanges extending in the same direction and being generally spaced and parallel,

a dimple and dimpler receiving means on and between each angle iron and the bracket, said dimple and its receiving means locating the angle irons relative to the bracket,

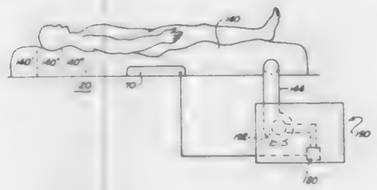
the angle irons having flanges of less width than the heights of the bracket flanges, the latter being crimped over onto the angle iron flanges and together with the dimples securing the angle irons and bracket together.

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PATIENT SUPPORT APPARATUS

Patrick R. D. Paul, Johns Island, and James H. Price, Mt. Pleasant, both of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Filed Jan. 15, 1986, Ser. No. 819,119
Int. Cl.[4] A47C *27/10*; G08B *21/00*
U.S. Cl. 5—453 **8 Claims**



1. An improved fluid support system comprising:

(a) a support frame;

(b) an inflatable patient support means support by said frame;

(c) means for supplying fluid to said inflatable support means for support of a patient in a supine position thereon;

(d) detector means associated with said support means for determining inadequate inflation of said support means when a patient is residing thereon;

(e) timer means operatively associated with said detector means whereby said timer means is actuated simultaneously with said detector means and is deactuated upon cessation of operation of said fluid supply means; and

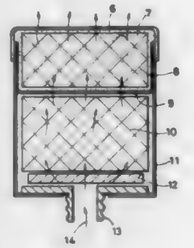
(f) control means operatively associated with said fluid supply means and said detector means for receiving input from said detector means that said support means is inadequately inflated and admitting fluid supply to said support means responsive to said input.

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HUMAN BODY SUPPORTING DEVICE

Hiroshi Tominaga, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd, Kanagawa, Japan

Filed Jun. 19, 1986, Ser. No. 876,111
Claims priority, application Japan, Jun. 19, 1985, 60-133739
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] A61G *7/00*; A47C *27/08*
U.S. Cl. 5—453 **6 Claims**



1. A human body supporting device comprising:

a mat for receiving the body, the mat including an upper layer of porous elastic material having fine particles mixed therein and a lower layer of porous elastic material; and

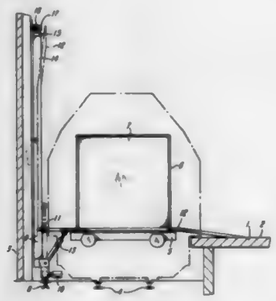
means for blowing air through said mat from said lower layer to said upper layer such that the blowing air suspends said particles in said upper layer.

4,694,522

TRANSFER BRIDGE

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,900
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506723
Int. Cl.[4] B65G *11/12, 11/18*
U.S. Cl. 14—71.1 **4 Claims**



1. A transfer bridge for bridging across railroad tracks; said transfer bridge including a bridge plate that has a free end and that is pivotably mounted on one side of the tracks in such a way that it can be pivoted about a horizontal pivot axis between an approximately vertical rest position, and an approximately horizontal operative position in which the free end of the bridge plate rests on a platform located on the opposite side of the tracks remote from that one side of the tracks where said bridge plate is pivotally mounted; said transfer bridge further comprising:

a first guide rail means disposed on that side of said tracks remote from said platform, with said first guide rail means extending parallel to said tracks;

a travel mechanism movably disposed on said first guide rail means in such a way that it is movable parallel to said tracks; the pivotable mounting of said bridge plate being effected by pivotably mounting the latter on said travel mechanism;

boom means connected to said travel mechanism and extending upwardly therefrom away from said first guide rail means;

second guide rail means disposed above said horizontal pivot axis for holding said boom means in such a way that the latter cannot tilt;

said boom means including a separate boom on each side of said bridge plate, when viewed from said platform, and a horizontal crosspiece for connecting said booms;

said crosspiece being disposed at a height corresponding approximately to the height of that end of said bridge plate remote from said horizontal pivot axis when said bridge plate is in its vertical rest position;

said travel mechanism, said two separate booms, and said crosspiece rigid frame defining a plane;

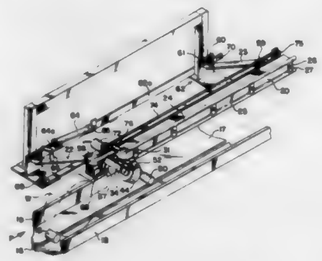
said bridge plate, when in its vertical rest position, being essentially disposed with said frame, i.e. within the plane defined by said frame.

4,694,523

TIRE SCRUBBING MACHINE FOR AUTOMATIC CAR WASHERS

Russel A. Van Brakel, Oneida County, Wis., assignor to Haverberg Auto Laundry Equipment Company, Chicago, Ill.

Filed Feb. 14, 1986, Ser. No. 830,054
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—53 B **13 Claims**



1. Scrubbing apparatus for scrubbing the outer sidewalls of the tires on the wheels located on one side of a motor vehicle being pulled by a conveyor through a washing facility along a vehicle path having an entry and an exit, said apparatus comprising:

an elongated frame providing a track generally parallel to said vehicle path;

a carriage movable along the track between a start position and a finish position, which is closer to the vehicle path exit than is the start position;

mounting means for the frame making it movable forwardly toward and rearwardly away from the vehicle path between a retracted position and an active position, whereat the start position of the carriage is closer than the finish position thereof is to the entry of the vehicle;

a brush rotatably mounted on the carriage and projecting forwardly toward the vehicle path;

a brush contact limiting device carried by the carriage and projecting forwardly toward the vehicle path less than the brush projects;

a pickup arm device on the carriage projecting further than the brush projects so as to be engaged by the tread of a tire on a wheel of a vehicle moving along the vehicle path and

position the brush and brush contact limiting device opposite the outer sidewall of the tire;

a stop arranged to be engaged by the carriage when the carriage is at its start position and the frame is in an intermediate position between its retracted and active positions, said stop being located such as to permit the carriage to advance along the track while preventing the frame from moving from its intermediate position forwardly toward its active position until the carriage is advanced toward its finish position from its start position by way of being pushed by action of a wheel on a vehicle advancing along the vehicle path and engaging the pickup arm device with the tread face of its tire, said intermediate position being far enough from the vehicle path to prevent the control device and brush from being engaged by such tread face when the frame occupies the intermediate position;

frame moving means urging the frame forwardly toward its active position when the carriage occupies its start position and urging the frame to move rearwardly toward its retracted position when the carriage occupies its finish position;

motor means on the carriage for rotating the brush as the carriage travels from its start position to its finish position; and

carriage return means on the frame for moving the carriage from its finish position to its start position when the frame is in its retracted position.

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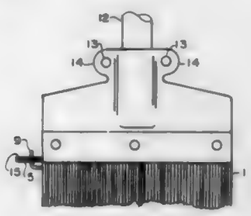
CLAMPING HEAD FOR REPLACEABLE STRING MOP

Kwan C. Kim, P.O. Box 48 (133 Mauna Kea St.), Hilo, HI. 96721

Continuation-in-part of Ser. No. 696,442, Jan. 30, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 854,659

Int. Cl.⁴ A47L *13/258*

U.S. Cl. 15—150 **3 Claims**



1. A clamping head for replaceable string mop elements comprising:

a. a mop handle;

b. a mop base operably attached to one end of said mop handle;

c. a longitudinal T-slot socket member disposed transverse to the mop handle, said socket member operably attached to said mop base;

d. a clamped mop assembly comprised of a string mop, the strings of which are bound together midway of their lengths and a clamp means comprised of a pair of parallel, opposed clamping members the bound portion of said string mop being clamped between and by said parrallel opposed clamping members;

e. said clamp means defining a longitudinal T-slot engaging flange member selectively attached to said mop base member by engagement with said longitudinal T-slot socket member;

f. a catch operably attached to said mop base releasably locking said longitudinal T-slot engaging flange member in said longitudinal T-slot socket member whereby a worn out and dirty clamped mop assembly may be readily removed by hand from the socket in the mop base by first releasing said catch, holding onto the clamp with one hand and the mop handle of base with the other hand without touching the dirty mop, the old clamped mop assembly discarded, and a new clamped mop assembly inserted and locked into the mop base all without getting the hands dirty.

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HAIRBRUSH

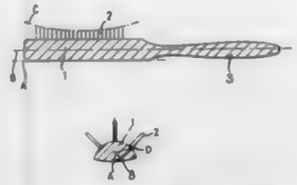
Hiromi Yamamoto, Sakura; Miho Imai, Ichikawa, and Noboru Suzuki, Tokyo, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,248

Claims priority, application Japan, Oct. 3, 1984, 59-152133[U]

Int. Cl.⁴ A46B *9/02*

U.S. Cl. 15—160 **7 Claims**



1. A hairbrush, comprising a base and a plurality of bristles, said base including an implantation portion on which said bristles are supported and an elongate grip portion projecting outwardly from said implantation portion; wherein said bristles extend generally radially outwardly with respect to a center axis and, viewed in a cross-sectional plane of said implantation portion perpendicular to said center axis, have tips at outer ends thereof which define an arcuate curve substantially concentric to said center axis; wherein said tips of said bristles, viewed in a cross-sectional plane of said implantation portion containing said center axis, define an arcuate curve having a centerpoint on a side of said bristle tips remote from said base; and wherein said grip portion has an axis of rotation which extends centrally longitudinally therethrough, which is parallel to said center axis, and which is spaced by a distance in the range of 5 to 15 mm from said center axis, said center axis being on a side of said axis of rotation remote from said bristles.

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APPARATUS FOR HEAT TREATMENT OF A TEXTILE WEB

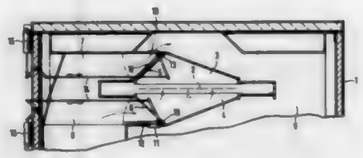
Karl Grafen, and Theo Schiffers, both of Würselen, Fed. Rep. of Germany, assignors to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Sep. 23, 1986, Ser. No. 910,486

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535421

Int. Cl.⁴ F26B *13/02*

U.S. Cl. 15—306 A **8 Claims**



1. In an apparatus for the treatment of a textile web supported on a tenter with a heated treatment medium, said apparatus including ventilator means having a suction and compression side, a distribution space connected to said compression side, a collection space connected to said suction side, and a nozzle box vented to said collection space, said nozzle box including treatment openings directed toward said web, the improvement which comprises a first inlet opening leading from said distribution space into said nozzle box, a by-pass opening leading from said distribution space into said collection space, the cross sectional area of said by-pass opening being substantially equal to the combined cross sectional areas of said treatment openings, said inlet opening being disposed adjacent said by-pass opening, and a common register member movably mounted adjacent said inlet and by-pass openings and adapted to be shifted alternatively into closing position of one or the other of said openings.

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MASK WASHING APPARATUS FOR PRODUCTION OF INTEGRATED CIRCUIT

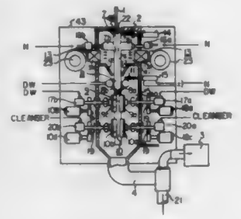
Takeshi Yoshizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 3, 1984, Ser. No. 627,578

Claims priority, application Japan, Jul. 6, 1983, 58-122706

Int. Cl.⁴ B08B *1/04*

U.S. Cl. 15—308 **6 Claims**



1. A mask washing apparatus for fabricating semiconductor devices comprising:

a vertical, airtight chamber comprising a washing space for washing the mask and a drying space for drying said mask, wherein said drying space is positioned at an upper part of said chamber, and said washing space is positioned at a lower part of said chamber;

a first shutter means located on the top of said chamber, wherein said first shutter means is closed during the washing process and the drying process and is opened during the loading or unloading of said mask;

a second shutter means located between said drying space and said washing space, wherein said second shutter means is closed during said washing process, and is opened during said drying process;

a drain and exhaust duct means, positioned at the bottom of said chamber, for exhausting gas and water from said chamber;

a gas jet type drying means for drying said mask, said drying means being positioned below said first shutter means, and emitting a flat jet flow of gas downward on both sides of the substrate to be dried, wherein said gas jet type drying means includes at least two flat nozzles positioned on either side of the substrate to be dried, wherein the upper sides of said flat nozzles are provided with cover plates extending downward close to the surface of said substrate, and is inclined to the surface of said substrate at an angle of 50° to 60°, the lower sides of said flat nozzles and said cover plates providing an orifice therebetween to provide the flat gas flow;

air flow means positioned underneath said gas jet type drying means for providing clean air flow beneath said drying means and towards the surface of the substrate to be dried, said air flow means including an air inlet means for taking in air into said airtight chamber, filter means for filterining the intake air, and a fan means for forming a stream of clean air, wherein said air flow means prevents dust or water mist from being dragged into said gas jet type dryer means; and

washing means, positioned in said washing space for washing the mask,

wherein an air stream flowing from the top to the bottom of said chamber is produced during the washing process and the drying process, said air stream flow preventing washed out dust or water mist from the cleaned surface of the washed substrate from being recycled.

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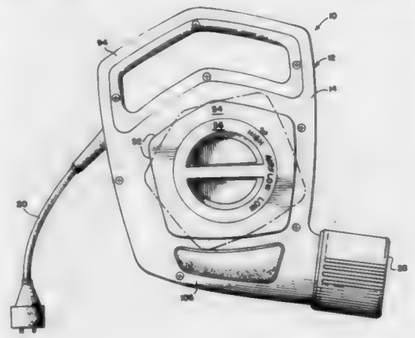
CONVERTIBLE VACUUM-BLOWER

Robert C. Comer, Hopkins; Wilbur J. Hampel, Spring Park, and Edward A. Rogers, Minneapolis, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Jul. 18, 1986, Ser. No. 886,815

Int. Cl.⁴ B02C *18/06*

U.S. Cl. 15—330 **17 Claims**



1. A convertible vacuum-blower comprising:

a housing having an air inlet and an air outlet;

a motor supported in said housing;

an impeller supported for rotary motion in said housing, in fluid communication with said air inlet and said air outlet, and rotatably driven by said motor;

a removable air inlet cover for covering said air inlet, said air inlet cover having apertures for passage of air through the cover;

attachment means for removably securing said air inlet cover to said housing;

switch means carried by said housing for allowing said motor to operate when said air inlet is covered but not when said air inlet is uncovered; and

first switch actuator means carried by said air inlet cover for actuating said switch means when said cover is secured to said housing covering said air inlet.

4,694,529

SUCTION DEVICE

Rémi Cholaiere, 464 Rachel Street, Granby, Canada (J2G 1B6)

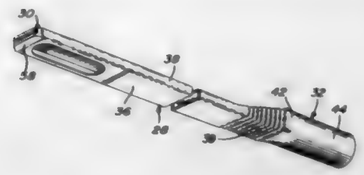
Filed May 6, 1986, Ser. No. 860,215

Int. Cl.⁴ A47L *9/02*

U.S. Cl. 15—393 **6 Claims**

1. A suction device made of a tubular semi-rigid material and consisting of a main elongated, thin hollow, longitudinally-flexible blade and an enlarged open socket freely communicating with the rear end of said blade: the blade having a front wall provided with a slit and cross-sectionally rectangular to define top, bottom and side walls: the socket having a cross-sectionally quadrangular portion adjacent said blade and a cross-sectionally circular portion at its rear end portion, so as to be adapted to be removably engaged by the cylindrical

suction tube of a vacuum cleaner, the longitudinal axes of said blade and socket being substantially parallel said socket being longitudinally-upwardly-offset relative to said blade with said enlarged socket cross-sectionally quadrangular portion defines a bottom wall coplanar with both the plane tangent to the bottom edge of said socket cross-sectionally circular portion



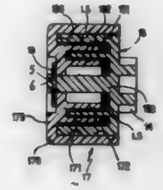
and with said blade bottom wall; a front end portion of the blade bottom wall having an elongated aperture and members at both ends of said aperture downwardly protruding from said blade bottom wall, wherein said blade is adapted to operatively extend under kitchen appliances and the like pieces of furniture having a small ground clearance, to suck up dust particles and the like on the floor.

4,694,530

DEVICE FOR CONTROLLING OPENING AND CLOSING OF MOVABLE OBJECTS, IN PARTICULAR DOORS AND DRAWERS IN MOTOR VEHICLES, HAVING MUTUALLY COOPERATING STATOR AND ROTOR

Paolo Foggini, Revigliasco Torinese, Italy, assignor to Foggini Progetti S.r.l., Beinasco To, Italy

Filed Apr. 14, 1986, Ser. No. 851,575
Claims priority, application Italy, Apr. 24, 1985, 53304/85[U]
Int. Cl.[4] E05F *5/02*
U.S. Cl. 16—82 **4 Claims**



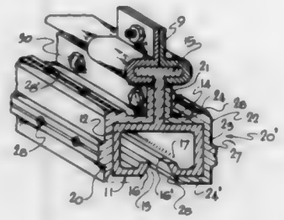
1. A device for controlling opening and closing of movable objects, in particular doors and drawers in motor vehicles, comprising a stator; a rotor rotatable and effecting angular displacements relatively to said stator, said stator being a bell-like stator with stator concentric cylinders and said rotor having rotor concentric cylinders interposed between said stator concentric cylinders; a straight groove formed on one of said stator concentric cylinders; a profiled groove formed on one of said rotor concentric cylinders and partially facing said straight groove, said profiled groove forming at least first and second groove portions arranged in parallel to each other and having first and second common ends; a cam formed on said one of said rotor concentric cylinders between said first and second groove portions; a high density fluid defining solid lubricant interposed between said stator and rotor concentric cylinders; locking and releasing means for controlling relative motion of said stator and rotor and being engageable and disengageable through said angular displacements of said rotor relatively to said stator, said locking and releasing means including a ball engaged in said straight groove of said stator and being biased by said profiled groove in said rotor, said first and second groove portion respectively defining a forward and a return path for said ball.

4,694,531

SUSPENDED OVERHEAD HOLLOW TRACK SUPPORT SYSTEM

Peter S. Foy, 4345 Topaz St., Las Vegas, Nev. 89121

Filed Sep. 30, 1985, Ser. No. 781,335
Int. Cl.[4] A47H *1/04*
U.S. Cl. 16—87.4 R **1 Claim**



1. An overhead track support system comprising a plurality of one-piece elongate track members of uniform cross-section and a plurality of splice plates of configured uniform cross-section which fit closely about an outer profile of a track member, each said track member comprising an open ended hollow section having at a lower side a central open slot extending lengthwise and from end-to-end of the member, and at an upper side a centrally located and upwardly extending upright flange extending lengthwise and from end-to-end of the member and having an upper free end, said upright flange being formed with an upper transverse flange element on the free end, wherein the upper transverse flange element and said upright flange together form the shape of a T;

a suspended hanger for mounting the track member comprising a clamping device for engaging with and coupling to the upper transverse flange element;

each said splice plate being a one-piece identically shaped profiled member of uniform cross section throughout its length;

said profiled member having a U-shaped channel section including an upright web separating a pair of transverse flanges arranged in parallel spaced apart relationship one above the other to define an upper transverse flange and a lower transverse flange in fixed spaced apart relationship to define a cavity conformal with the hollow section of the track member;

an upwardly extending connection flange carried on the end of said upper transverse flange extending parallel to and laterally of said upright web;

said lower transverse flange terminating at its free edge with an upwardly directed chamfer;

said lower transverse flange extends from said web in a lesser dimensioned distance than said upper flange;

thickening ribs of trapezoidal cross section integrally carried externally of said U-shaped channel along said upper flange adjacent said web and along said web at its mid-section between said upper and said lower transverse flanges;

attachment holes provided in said connection flange and said web rib;

fasteners insertably received in said attachment holes for bearing against the upright flange and the hollow section of the track member in releasable securement therewith;

each said splice plate comprising a high strength-to-weight ratio material;

each said splice plate being of shorter length than the track member and overlapping abutting opposing ends of the tack members;

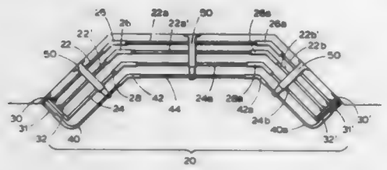
each said splice plate fits in close relationship about the track member with the connection flange abutting the upright flange of the track member and the channel section closely fitting about the holow section of the track member, whereby a pair of said track members may be secured in end-to-end relationship by securing a pair of said splice plates in overlapping relationship with respect to abutted ends of the track member and at opposite sides thereof.

4,694,532

ROD SUPPORT SYSTEM HAVING END BRACKETS AND AUXILIARY SUPPORT BRACKETS

Alce R. Black, 403 N. 24th St., East St. Louis, Ill. 62205

Filed Oct. 28, 1985, Ser. No. 792,217
Int. Cl.[4] A47H *1/142*
U.S. Cl. 16—94 D **4 Claims**



1. A combination drapery, curtain and, valance suspension system consisting of two end brackets each having a wall mounted segment, a valance rod support segment, and a slidably mated two-piece rod support segment comprised of a support arm and an extender arm which has a plurality of rod support sockets affixed thereto, wherein said valence rod support segment and said slidably mated two-piece rod support segment extend outwardly from said wall mounted segment, a traverse rod assembly consisting of a plurality of straight and elbowed traverse rods mounted in a corresponding number of said rod support sockets, a plurality of curtain rod assemblies consisting of a plurality of straight and elbowed curtain rods mounted in the remaining rod support sockets, a valance rod assembly consisting of a plurality of curved, elbowed, and straight valance rods mounted on said valance rod support segment, and a plurality of two-piece slidably mated auxiliary support brackets each having a wall mounted segment and a mating rod support segment having a plurality of rod support stirrups on a bottom side thereof and a valence rod support stirrup on a top side thereof, said auxiliary support brackets positioned at intermediate points and supporting said traverse, curtain, and valance rods at said intermediate points.

4,694,533

HINGE AND SECTIONAL PANELS ON A FRAME ENABLING ASSEMBLY AND DISASSEMBLY THEREOF

Gérard Doyen, Beuvrages, France, assignor to Alsthom, Paris, France

Filed Sep. 15, 1986, Ser. No. 907,343
Claims priority, application France, Sep. 23, 1985, 85 14069
Int. Cl.[4] E05D *7/10*
U.S. Cl. 16—257 **1 Claim**



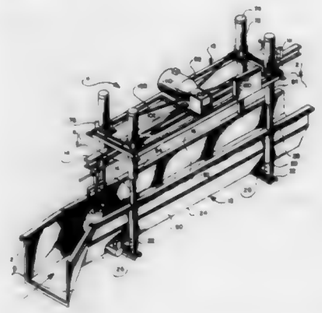
1. A hinge comprising, in combination, a sectional panel, a frame, said frame including a projecting lip of semicircular cross section forming a swivel pin and an integral projecting part extending generally in the same direction as the lip and being spaced therefrom, a sectional panel terminating at one end in a semicircular trough engaging said lip and forming a hinge connection therewith, and at least one retaining member installed on said projecting part, said projecting part including a groove on a face thereof proximate to said lip, said retaining member including a C-shaped lug, enveloping the end of said projecting part, said retaining member including a body having a concave rounded edge abutting said semicircular trough and further including an integral flexible blade extending along a face of said part proximate to said lip and including a catch facing said groove and being snap fitted into said groove by deflection of said flexible blade during engagement of the C-shaped lug with the end of the projecting part of said frame, wherein said flexible blade extends beyond the C-shaped lug, to define a hand releasing tab for forceably deflecting said flexible blade to release said catch from said groove, and wherein said retaining member body is cut out at its center and said flexible blade projects through said cutout from the rounded concave edge of said retaining member body to beyond said C-shaped lug.

4,694,534

APPARATUS FOR ELECTRICALLY STUNNING POULTRY

Lacy Simmons, P.O. Box 546, Dallas, Ga. 30132

Filed Jan. 23, 1986, Ser. No. 821,912
Int. Cl.[4] A22B *3/06*; A22C *21/00*
U.S. Cl. 17—1 E **8 Claims**



1. A stunner for poultry and the like comprising an elongate trough; the trough having a bottom, outwardly and upwardly flaring side walls and an end wall and an entrance, all defined to contain a relatively small quantity of an electrolytic solution, said wall terminating with a lip means adapted to overlie said electrolytic solution, said entrance including an upwardly and inwardly sloping floor, said entrance also including inwardly and outwardly flared side walls, said end wall defining a small height thereby permitting egress from said trough between said side outwardly and upwardly flaring walls, said trough having an elongated horizontal grid spaced from the bottom thereof and sloping upwardly in the direction of said end wall whereby in use the portion of said grid which slopes upwardly is not immersed in said electrolytic solution, said trough mounted to a plurality of upwardly extending means, said means terminating in upwardly extending threaded means, a carriage means displaced vertically over said trough, means mounted on said carriage means adapted and constructed to operatively act on said threaded means, said means mounted on said carriage means adapted and constructed to selectively rotate on said upwardly extending threaded means whereby said carriage means when said carriage means operates to increase or decrease the distance between said trough and said carriage means.

4,694,535

POST STUNNER FOR POULTRY

Lacy Simmons, P.O. Box 546, Dallas, Ga. 30132

Filed Jan. 2, 1986, Ser. No. 869,322
Int. Cl.[4] A22C *21/00, 3/06*
U.S. Cl. 17—1 E 12 Claims



1. A post stunner for delivering a plurality of electric shocks to poultry, after the poultry has passed through a killer station wherein the throat of the poultry is cut for bleeding the poultry comprising:

an electrically conductive conveyor means to which poultry can be secured and along which poultry is conveyed to various processing stations;

a plurality of electrically spaced conductive cross bars arranged perpendicular to the direction of the conveyor means defining a contactor ladder configuration positioned parallely beneath and adjustably supported by the conductive conveyor means, the contactor ladder is positioned to come into contact with poultry being transported by the electrically conductive conveyor means;

a source of about fifty volts alternating electric energy which is connected to the electrically conductive conveyor means and the contactor ladder; and

a vertical positioning means for raising and lowering the contactor ladder so that it can be adjusted for different sized poultry being transported along the electrically conductive conveyor means,

whereby the vertical positioning means is actuated to change the relative vertical position of the contactor ladder so that poultry being transported along the conveyor means come into successive contact with each of the cross bars of the contactor ladder completing an electric circuit between each said cross bar and the conveyor means, thereby providing the poultry with a plurality of spaced electric shocks, immobilizing the poultry and promoting increased blood flow.

4,694,536

COMPOUND PUMP MECHANISM FOR MEAT ENCASING MACHINES AND THE LIKE

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Dec. 15, 1986, Ser. No. 941,376
Int. Cl.[4] A22C *11/08*
U.S. Cl. 17—37 24 Claims

1. A compound pump mechanism, comprising,

a first pump housing,

a first pump mechanism in said first pump housing,

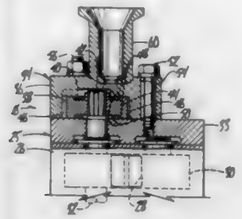
inlet and outlet ports in said first pump housing in communication with said first pump mechanism for delivering to and from said first pump housing the material to be pumped,

a drive shaft in said first pump housing and connected to a source of rotational power and to said first pump mechanism to cause said first pump mechanism to pump material delivered to said inlet port through said first pump mechanism and out said outlet port,

a second pump housing mounted on said first pump housing,

a second pump mechanism in said second pump housing,

inlet and outlet ports in said second pump housing in communication with said second pump mechanism for delivering to and from said second pump housing the material to be pumped,



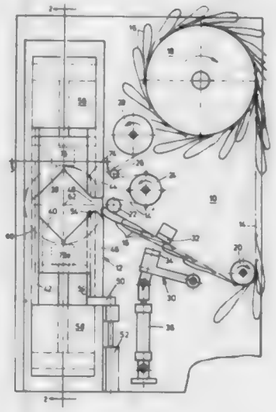
said drive shaft in said first pump housing extending into said second pump housing and connected to said second pump mechanism, whereby rotation of said drive shaft will operate both said first and second pump mechanisms.

4,694,537

PROCESS AND DEVICE FOR THE FIXTURE OF SUSPENSION ELEMENTS TO SAUSAGES

Günter Kollross, Am Wallerstädter weg 20, D-6080 Gross Gerau-Dornheim, Fed. Rep. of Germany

Filed Jul. 26, 1985, Ser. No. 759,137
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1984, 3430030923
Int. Cl.[4] A22C *11/12*
U.S. Cl. 17—49 15 Claims



1. A method for attaching suspension elements to sausages by attaching them to a clamp, which is applied to the end of a sausage after the filing thereof, by a sausage constricting tool having relatively movable shear arms for constricting the sausage sheath, comprising the steps of:

delivering a suspension element to the sausage constricting tool and grasping the suspension element by the sausage constricting tool at a grasped position before the filling of the sausage to which that suspension element is to be attached,

and then guiding the suspension element from the grasped position to the longitudinal axis of the sausage, as the sausage constricting tool operates to constrict the sausage,

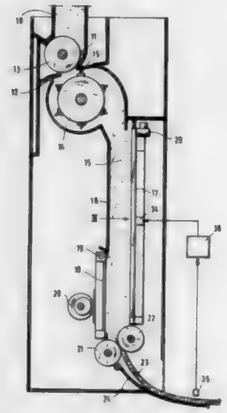
and enclosing the suspension element together with the sausage sheath with the clamp.

4,694,538

FEED APPARATUS FOR CARDS, CARDING ENGINES, AND THE LIKE

Akiva Pinto, Gastonia, N.C., and Guenter Lucassen, Haltern, Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Continuation of Ser. No. 657,844, Oct. 4, 1984, abandoned. This application May 2, 1986, Ser. No. 858,626
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336654
Int. Cl.[4] D01G *15/40*
U.S. Cl. 19—105 9 Claims



1. Feed apparatus for cards, carding engines and the like, including a substantially vertical shaftway defined at least in part by two side walls and two end wall flanges, the improvement comprising:

one of said side walls being formed of a resilient deformable member which is deformable in the widthwise direction of said vertical shaftway thereby enabling the distance between the two side walls to vary along the widthwise direction of said vertical shaftway, wherein said one side wall is fastened to a carrying part by holding means by which said deformable member is displaceable transversely of said shaftway; and edge seal means carried by opposing edges of said deformable member contacting with said end wall flanges in a manner that said opposing edges may move in sliding contact with said wall flanges when said deformable member is displaced transversely.

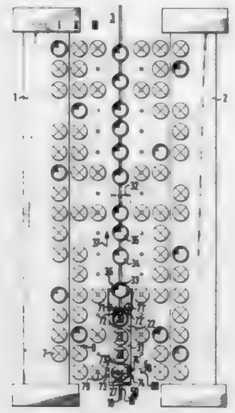
4,694,539

METHOD AND DEVICE FOR EXCHANGING EMPTY CANS WITH CANS FILLED WITH SLIVER

Manfred Langen, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,534
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505494
Int. Cl.[4] B65H *67/02*
U.S. Cl. 19—159 A 14 Claims

1. Method of exchanging empty cans with cans filled with sliver at a spinning machine having set locations for the cans wherein a mobile transport device is automatically driven along a floorlike travel path at the spinning machine, which comprises placing empty cans on the travel path, successively placing filled cans entrained with the transport device automatically at set locations of the machine which are unoccupied, picking up the empty cans on the travel path automatically with the transport device, and driving the transport device automatically back to a loading station, when the transport device is too full to pick up any more cans, so as to surrender the empty cans and pick up filled cans at the loading station preparatory to driving the transport device back to the spinning machine.

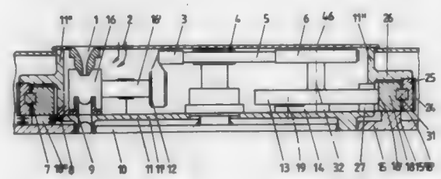


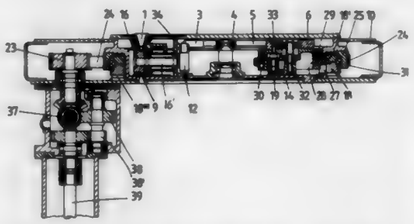
4,694,540

CAN COILER

Albert Rosink, deceased, late of Nordhorn, Fed. Rep. of Germany by Lieselotte Rosink, heiress, assignor to Albert Rosink Maschinenbau, Nordhorn, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,944
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 3434228
Int. Cl.[4] B65H *54/80*
U.S. Cl. 19—159 R 13 Claims





1. In a can coiler with sliver inlet opening on a head side thereof, said opening being in a rotating plate and being flanked by calender rolls, the latter being driven by rotary movement of the rotating plate in a head of the can coiler, the improvement comprising

gearless means for driving the calender rolls by said rotary movement of the rotating plate,
said means comprises a belt drive and a friction wheel drivably connected to the belt drive,
said friction wheel being shiftably mounted so as to be shiftable into a position of rolling frictional engagement against an annular surface of said head of the can coiler by the rotary movement of the rotating plate.

4,694,541
ELASTIC TIE-DOWN WITH ROPE ADJUSTMENT MEANS
Helmut K. Skyba, Rte. 2, Box 330, Wild Rose, Wis. 54984
Filed Jul. 23, 1986, Ser. No. 888,337
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—301 **10 Claims**



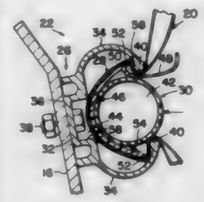
1. A tie-down comprising:
a. a flexible rope having first and second ends and a pair of spaced abutment means on the rope between the two ends; and
b. an elastic sleeve placed over the rope intermediate the rope ends, and encapsulating and concealing said abutment means enlargements, the sleeve length being less than the spacing between the rope abutment means to create a rope slack inside the sleeve, the sleeve being crimped tightly at the ends thereof over the rope to grip the rope and capture said abutment means and rope slack between the sleeve ends and to create rope first and second ends extending oppositely from the ends of the sleeve and having sufficient length to afford connection of said rope ends for rope usage,
so that applying tension to the rope ends causes said abutment means to cause tension on said elastic sleeve to stretch and thereby impart elastic qualities to the tie-down.

4,694,542
FOLDABLE CLOSURE FOR FLEXIBLE BAGS COMPRISING FLAT SHEET WITH INTEGRAL AXIAL HINGE GROOVE, LEAD IN NOTCH, AND GRIPPING APERTURE
Lon W. Koppe, P.O. Box 567, Athabasca, Alberta T0G 0B0, Canada
Filed Feb. 14, 1986, Ser. No. 829,711
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—30.5 S **9 Claims**



1. A bag closure comprising:
a flat sheet of material,
said sheet having a lead-in notch extending into said sheet from one edge thereof,
said sheet having only a single aperture extending therethrough adjacent to and communicating with said notch via a passageway which is narrower than said aperture,
said passageway being shaped so that said notch extends into said aperture with the material of said sheet forming a base of said notch and also forming a pair of points projecting into said aperture,
said sheet having an integral hinge along an axis which intersects said notch and said aperture, said hinge comprising a groove along said axis extending partially through said sheet from one side thereof along a straight line from an edge of said aperture opposite said passageway to an edge of said sheet opposite said one edge thereof,
said sheet of material being wide enough, in a direction perpendicular to said axis and parallel to said sheet, to be graspable with the fingers os that it can be bent along said axis, and
said sheet being made of a non-frangible material and having properties such that:
(a) said sheet can be repeatedly bent along said axis and straightened without fracture,
(b) said sheet is sufficiently rigid such that when bent along said axis, said sheet will assume a V-shaped configuration when seen from an end thereof in a direction parallel to said axis, with said axis at the base of said V-shaped configuration and the rest of said sheet forming two flat hinge leaves extending up from said axis, and
(c) when bent along said axis, said sheet will assume and remain by itself indefinitely in said V-shaped configuration and when bent back to a flat configuration, it will remain flat indefinitely by itself.

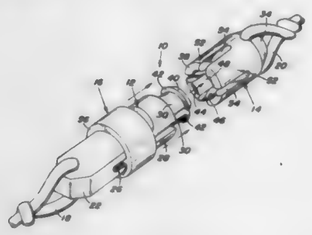
4,694,543
SHEET GRIPPING ASSEMBLY
John L. Conley, 3870 Chino Ave., Chino, Calif. 91710
Filed May 28, 1985, Ser. No. 738,276
Int. Cl.[4] A44B *21/00*
U.S. Cl. 24—461 **2 Claims**



1. A sheet gripping assembly for thin pliable sheet material, such as plastic film, comprising:
a relatively rigid base channel including laterally curved longitudinal side walls having longitudinal edge portions which curve toward one another and a longitudinal cavity opening laterally through a side opening between and bounded by longitudinal sheet gripping edges on said side wall edge portions, said gripping edges defining a plane
an elongate innerlock member including a laterally flexible channel portion having an open side between longitudinal edges of the channel portion, and a lip joined to the inner side of said channel portion adjacent but spaced from one longitudinal edge thereof and extending outwardly through and well beyond the plane of said open side of said channel portion,
an elongate cylindrical gripping bar having a diameter greater than the width of said base channel side opening and sized to fit within said innerlock channel portion with the bar protruding through the open side of the channel portion between and bearing against said lip and the opposite side of said channel portion to resist lateral deflection of said innerlock edges toward one another,

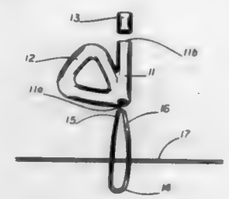
said gripping bar and innerlock member being resilient, whereby said innerlock member and gripping bar are laterally insertable into said base channel cavity through said side opening thereof along with the sheet material to be secured and to assembled positions within said base channel cavity wherein said innerlock channel portion opens toward said base channel side opening, said longitudinal edges of said innerlock channel portion abut the inner side of said base channel side wall edge portions adjacent said gripping edges thereof, said innerlock lip projects through said base channel side opening adjacent one base channel gripping edge and then well beyond the plane of said base channel side opening, said gripping bar is positioned within and protrudes from said innerlock channel portion toward said base channel side opening to resist lateral deflection of said channel portion edges toward one another, and the sheet material enters said base channel between said innerlock lip and the adjacent base channel gripping edge and then passes around the innermost side of said innerlock member between the latter and said base channel and finally emerges from said base channel between said gripping bar and the other base channel gripping edge for gripping of the sheet material between said lip and the adjacent base channel gripping edge on the one hand and between said gripping bar and the other base channel gripping edge on the other hand, and
the outer extremity of said innerlock lip being well spaced from sheet material gripped by said sheet gripping assembly so as to be readily accessible to receive finger pressure for laterally contracting said innerlock channel portion to facilitate insertion and removal of the innerlock member into and from said base channel and for shielding the adjacent portion of said sheet material against direct contact with said gripping bar during insertion and removal of the latter into and from the base channel.

4,694,544
RELEASABLE CONNECTOR
Jon Chapman, 5968 Via Lemora, Goleta, Calif. 93117
Filed Aug. 22, 1986, Ser. No. 899,150
Int. Cl.[4] A41F *1/00*; **A43C** *11/00*
U.S. Cl. 24—625 **9 Claims**



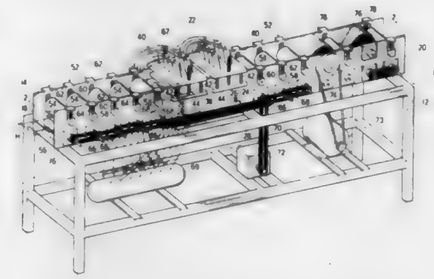
1. A releasable connector comprising:
a male member having two prongs terminating in normally spaced apart prong ends;
a tubular female member having an open end dimensioned for axially receiving said prong ends, said tubular member being divided at said open end into at least three legs by axially extending slots;
said prong ends being resiliently compressible towards each other for insertion into said female member, said prong ends returning to said normal position within and interlocking with said female member to prevent separation of said male and female members, said prong ends being disengagable from said female member upon squeezing together of said prongs; and
unitary locking means removably interposable between said interlocked prong ends for securing said male and female members in mating engagement, and with an annular coextensive portion thereof for bridging the joint interface between the interlocked male and female members.

4,694,545
ATTACHMENT OF RINGS WITHOUT SEWING
David Dernis, 13321 SW. 80th St., Miami, Fla. 33183
Filed Dec. 10, 1985, Ser. No. 807,449
Int. Cl.[4] B21D *37/04*
U.S. Cl. 29—1 R **2 Claims**



1. A device which when attached to a sheet provides a closed loop depending from the sheet, comprising: the combination of a U-shaped filament, a tubular member and filament holding means; said tubular member having a closed loop portion attached thereto; the legs of said filament being adapted to pass through the sheet and into said tubular member; said holding means being adapted to hold the filament legs in position on said tubular member.

4,694,546
APPARATUS FOR STRIPPING PAINT
Kirk A. Rawlings, Wausau, Wis., assignor to Wausau Metals Corporation, Wausau, Wis.
Filed Dec. 5, 1985, Ser. No. 804,781
Int. Cl.[4] B21C *43/00*
U.S. Cl. 29—81 D **10 Claims**



2. Apparatus for stripping paint from articles comprising, in combination:
(a) an elongated frame (**12**),
(b) means (**56**) for supporting and conveying a plurality of articles (H) longitudinally along said frame in an upstream-to-downstream direction,
(c) a horizontal platen (**32**) mounted to said frame and disposed so that conveyed articles pass thereover and are supported thereby,
(d) a plurality of reciprocating needle chisels (**48**) disposed above said platen for striking articles as they pass over said platen to thereby remove paint therefrom,
(e) means (**26, 28, 30**) adjustably mounting said platen (**32**) to said frame,
(f) damper means (**34**) supporting said platen,
(g) and downwardly canted end means on said platen to

cause an article approaching the latter to ride up thereonto.

4,694,547

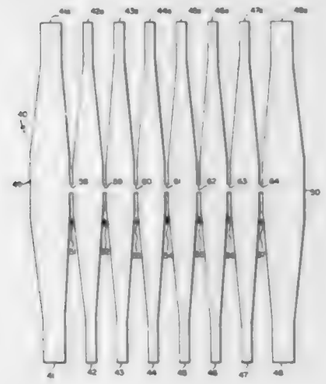
ONE-PIECE METAL COVERING FOR INSULATED PIPE BENDS

Edison L. Broussard, 13327 Virgil Jackson, Baton Rouge, La. 70818-2050

Continuation-in-part of Ser. No. 583,603, Feb. 27, 1984, abandoned. This application Feb. 6, 1986, Ser. No. 828,443

Int. Cl.[4] **B21D** *53/00*; **F22B** *7/18*; **F16L** *43/00*

U.S. Cl. 29—157 R **34 Claims**



1. A one-piece metal jacket for insulated pipe bends comprising:

(a) a curved metal spine for longitudinally covering the curved portion of the insulated pipe bend having the larger radius,

(b) a plurality of opposed paired fingers, spaced apart along and extending from said spine, having sufficient length to overlap longitudinally and transversely around the insulated pipe,

(c) a plurality of connecting links formed along said spine and between the spaced apart fingers, separating one pair of said opposed paired fingers from another pair, and

(d) fastener means to hold said fingers in fixed position, whereby the portion of said spine between adjacent, spaced apart opposed pairs of fingers and forming said connecting link, in use, folds back upon said spine overlapping the next adjacent pair of opposed fingers along their sides in weatherproofing fashion.

22. A method of covering an insulated pipe bend which comprises applying the one-piece metal jacket of claim **1** to said bend, temporarily fastening the first opposed pair of metal fingers at one end and then bending the connecting link back upon the metal spine and folding the next adjacent pair of metal fingers about said insulated pipe bend in overlapping and weatherproofing fashion continuing until the last pair of metal fingers is folded and secured temporarily and thereafter securely fastening each of said metal fingers.

4,694,548

METHOD FOR PRODUCING A SPINNING NOZZLE PLATE

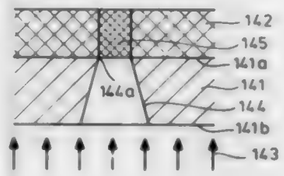
Wolfgang Ehrfeld, Karlsruhe, and Peter Hagmann, Leopoldshafen, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 9, 1986, Ser. No. 883,633

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524411

Int. Cl.[4] **B21D** *53/00*; **G03C** *5/00*; **C25D** *1/08*

U.S. Cl. 29—157 C **21 Claims**



1. A method for producing a spinning nozzle plate having funnel-shaped preliminary channels in flow communication with nozzle capillaries, the method comprising the steps of:

a. providing a metal plate having opposing first and second surfaces and having a plurality of spaced-apart preliminary channels defined therethrough, each preliminary channel having a funnel-shape including a tapered end which opens at the first surface of the metal plate;

b. providing a resist layer on the first surface of the metal plate, which resist layer comprises a radiation-sensitive material;

c. subjecting first portions of the resist layer to high energy radiation by irradiating the second surface of the metal plate whereby radiation is directed through the preliminary channels of the metal plate onto the resist layer, the metal plate thereby functioning as a self-aligning mask;

d. providing negatives of a plurality of nozzle capillaries on the first surface of the metal plate by removing portions of the resist layer to expose portions of the first surface of the metal plate and filling at least the preliminary channels with a removable filler material,

e. electrodepositing a galvanic layer on the exposed portions of the first surface of the metal plate using the metal plate as an electrode, the galvanic layer thereby defining a plurality of nozzle capillaries;

f. planing the galvanic layer; and

g. removing the removable filler material and the negatives of the plurality of nozzle capillaries.

4,694,549

METHOD FOR REMOTELY REPLACING TUBE ENDS IN A HEAT EXCHANGER

George B. Rabe, Sparta, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 24, 1986, Ser. No. 831,889

Int. Cl.[4] **B21D** *53/00*; **F28F** *7/00*; **F16L** *55/18*

U.S. Cl. 29—157.3 C **10 Claims**

1. A method for remotely removing and replacing a tube end portion attached to a tubesheet of a heat exchanger, comprising:

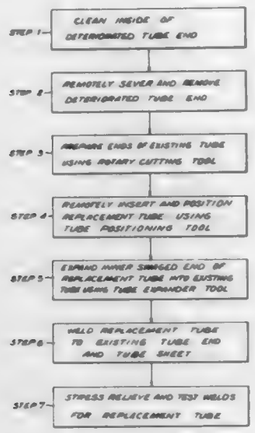
(a) inserting a rotary cutting tool into a tube end portion and circumferentially severing the tube wall at a selected location near the tubesheet;

(b) removing a weld joint located between the tube end portion and the tube sheet;

(c) withdrawing the tube end portion out through the surrounding opening in the tubesheet;

(d) inserting a new replacement tube into the tubesheet opening and axially positioning the new tube in axial alignment and interfitting engagement with the existing tube end;

(e) expanding the outer end of the new tube firmly into the surrounding tubesheet opening, so as to hold the new tube in position;



(f) expanding the inner end of the replacement tube into the existing tube end;

(g) welding the new tube inner end to the existing tube end to provide a pressure-tight joint therebetween; and

(h) welding the new tube outer end to the tubesheet to provide a pressure-tight joint therebetween.

4,694,550

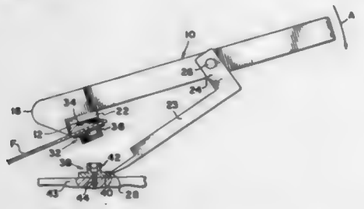
SNAP FASTENER TOOL

Jerry E. Grove, 3700 3-Mile Rd., Bay City, Mich. 48706

Filed Jun. 23, 1986, Ser. No. 877,170

Int. Cl.[4] **B23P** *19/04*

U.S. Cl. 29—267 **9 Claims**



1. A snap fastener tool for joining together a pair of mating fastener members secured respectively to a flexible cover and a fixed base, said tool comprising a handle having forward and rearward ends and being undercut at one end to form a shoulder facing the rearward end; a pad on said handle adjacent said shoulder which is adapted to overlie and bear on the fastener member secured to said cover; and a jack arm free at one end and pivoted at its other end to said handle between the ends of the latter for rocking movements of said one end toward and away from said handle, said jack arm being of such length that in one position thereof its one end confronts and is spaced rearwardly of said shoulder, said one end of said jack arm being adapted to seat against the fastener member secured to said base and said shoulder being adapted to seat against the fastener member secured to said cover with that portion of said handle rearward and adjacent said shoulder overlying the fastener member secured to said cover, whereby rocking movement of said handle about an arc having its center at said one end of said jack arm causes said fastener members to be drawn into overlying, axial alignment.

4,694,551

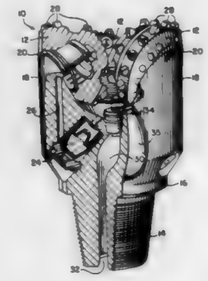
METHOD OF REMANUFACTURING A ROCK DRILL BIT

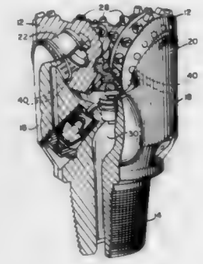
Will W. Mathews, Germantown, Tenn., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 30, 1985, Ser. No. 814,330

Int. Cl.[4] **B23P** *6/00*

U.S. Cl. 29—402.08 **15 Claims**





1. A method for remanufacturing a used rotary rock drill bit having a bit body with leg extensions supporting journals on which are rotatably mounted at least two cones including cutting elements, including the steps of:

(a) separating all the leg extensions, journals and cones simultaneously from the bit body along a line perpendicular to the central axis of rotation of the drill bit to form a substantially planar bit body attachment surface and discarding said leg extensions, journals and cones;

(b) forming at least two cone support assemblies, including leg extensions, journals and cones, from new materials;

(c) attaching the cutting element-containing cone assemblies to the bit body to form a remanufactured drill bit;

(d) removing the reusable cutting elements from the cones; and

(e) attaching the reusable cutting elements recoverd in step (a) to the cones formed in step (b), adding new cutting elements as required to provide each cone with a full complement of cutting elements.

4,694,552

METHOD FOR FABRICATING A COMPOUND PORTAL FRAME EXTRUSION PROFILE

Warren S. Ecker, Delray Beach, Fla.; Howard J. Ecker, Hartsdale; Robert S. Ecker, New York, both of N.Y., and Maurice E. Sterner, Jr., Spring Grove, Pa., assignors to Ecker Mfg. Corp., New York, N.Y. and Product Design & Development, Inc., York, Pa.

Filed Aug. 28, 1986, Ser. No. 901,415
Int. Cl.[4] E04G *21/00;* E04C *2/26*
U.S. Cl. 29—418 6 Claims





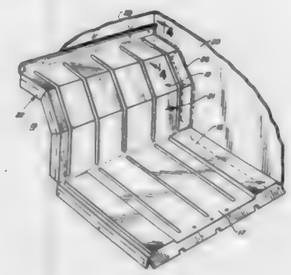
1. A method of fabricating a compound portal frame extrusion profile, comprising the steps of lineally aligning a first separate portal frame extrusion profile component in a detached and spaced relationship with respect to a second separate portal frame extrusion portal frame extrusion profile component, pivotally inserting a connection flange nose of a connection flange member of said first extrusion profile component within a connection flange nose receiving recess of a cooperative connection flange recess of said second extrusion profile component so that said connection flange member is pivotally received in lineal alignment within said cooperative connection flange recess in an insertable male-female mechanically cooperative positioning placement and thereby lineally positions a crimp lug protrusion of said first extrusion profile component adjacent a flex-extended crimp retention recess of said second extrusion profile component, accomplishing progressive lineal roll crimp conformed pivotal deflection engagement of said crimp retention recess from a flex-extended open position disposition to receivably engage said crimp lug protrusion in a closed crimp retention position to thereby effect an interim connecting means between said first and second extrusion profile components and form a lineally disposed intercommunicating U-shaped resin-receiving trough structure therebetween, injection depositing a resin-bonding insulating material within said lineally disposed intercommunicating U-shaped resin receiving trough structure from end-to-end longitudinally thereof, and thereafter cuttably removing a strip from a sidewall of said U-shaped resin-receiving trough down to the resin-bonding insulating contained therewithin to thereby provide a lineally extending thermal cavity barrier gap from end-to-end longitudinally of the compound portal frame extrusion profile thus formed.

4,694,553

METHOD OF MANUFACTURING REFRIGERATION APPARATUS CABINET CONSTRUCTION UTILIZING PREPAINTED STEEL PANELS

Ralph Tate, Jr., Center Township, Vanderburgh County, and John T. Woods, Scott Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 633,214, Jul. 19, 1984, Pat. No. 4,640,432.
This application Nov. 13, 1986, Ser. No. 931,391
Int. Cl.[4] B23P *9/00*
U.S. Cl. 29—445 4 Claims



1. A method of assembling a plurality of sheet metal walls into an outer shell of a refrigeration apparatus cabinet to have a preselected width, comprising the steps of:

forming a U-shaped cabinet member having opposite, outwardly diverging planar sidewalls;

forming a deck member having a width greater than said preselected width;

forming obtusely angled flanges extending outwardly from opposite side edges of said deck member, said opposite side edges being spaced apart a distance less than said preselected width and said flanges having outer end portions spaced apart a distance greater than said preselected width;

wrapping said cabinet member about said deck member with said angled flanges extending into engagement with said sidewalls;

positioning said sidewalls in parallel relationship, whereby each of said sidewalls deflects the confronting flange and forms a tapered cavity therewith without substantial deflection of the sidewalls by-said flanges; and

flowing a substantially moisture-impermeable sealing material into said cavity.

4,694,554

METHOD OF CLAMPING OFF A TUBULAR MEMBER SUCH AS THE NECK OF A BALLOON

John E. McGrath, 17743 April Ct., Castro Valley, Calif. 94546

Division of Ser. No. 799,127, Nov. 18, 1985, Pat. No. 4,648,178.
This application Oct. 14, 1986, Ser. No. 918,544
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 1 Claim

1. A method for clamping off a tubular member such as the neck of a balloon with a clip having clamping arms joined by a hinge, with a device comprising a base member having a surface for receiving a clip, means forming a notch in said surface and a stop on one side of said notch, comprising the steps of:

placing a clip on said surface with one arm thereof resting against said stop and the hinge overlying said notch, inserting the neck of a tubular member into the hinge portion of said clip and pulling said neck and clip down through said notch to urge the clamping arms of the clip into a locked position, thereby clamping off said tubular member.

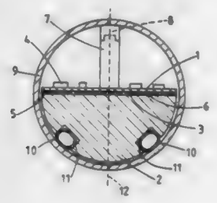


4,694,555

ASSEMBLIES FOR SUPPORTING ELECTRICAL CIRCUIT BOARDS WITHIN TUBES AND METHOD OF USING SAME

Michael K. Russell, Prestbury; Donald L. Wesenberg, Northleach, and Peter A. Leaney, Cheltenham, all of England, assignors to NL Industries, Inc., New York, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,367
Claims priority, application United Kingdom, Feb. 7, 1986, 8603122
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—451 9 Claims



1. An assembly for supporting an electrical circuit board within a tube, the assembly comprising the circuit board, an elongated support spine supporting the circuit board, and shock-absorbing means for holding the assembly within the tube, wherein the shock-absorbing means includes longitudinally along said spine exterior at least one elongated tubular member the outside diameter of which can be changed, by varying the internal pressure of the tubular member, between a relatively contracted state in which the assembly can be inserted into the tube from one end and a relatively expanded state in which the assembly is subsequently held firmly within the tube.

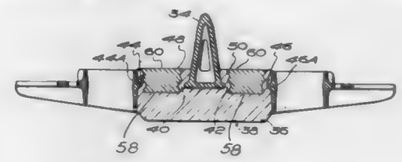
9. A method of inserting an electrical circuit board support assembly into a tube, wherein the assembly comprises an elongated circuit board and a support spine supporting the circuit board, which method comprises providing shock-absorbing means in a position on the spine to engage the inside wall of the tube, the shock-absorbing means includes longitudinally along said spine exterior at least one elongated tubular member the outside diameter of which can be changed by varying the internal pressure of the tubular member, inserting the assembly into the tube with the or each tubular member in a relatively contracted state corresponding to a first internal pressure, and holding the assembly firmly within the tube with the or each tubular member in a relatively expanded state corresponding to a second internal pressure.

4,694,556

TRACK TREAD

Paul Hewitt, Hexham, England, assignor to George Blair P.L.C., Forth, Great Britain

Continuation of Ser. No. 461,206, Nov. 1, 1982, abandoned. This application Dec. 17, 1985, Ser. No. 811,311
Claims priority, application United Kingdom, Oct. 31, 1981, 8132904
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—451 3 Claims



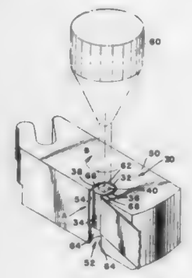
1. A method of applying a wear surface pad to a link body of an endless track of a tracked vehicle, said link body having at least one aperture where the aperture wall is provided with a circumferential locking rib defining a neck in the aperture which is smaller in diameter than the remainder of the aperture and is intermediate the ends thereof, the wear surface pad being of resilient plastic and which has at least one projection integral with the pad and of the same resilient plastic, said projection having a circumferential groove to receive said circumferential locking rib, the projection comprising a wall defining a hollow interior to allow deforming of the projection, said method comprising resiliently deforming the projection and passing it so deformed into the aperture to engage said locking rib with said circumferential groove, releasing the deforming force on the projection, inserting a plug into the hollow interior of the projection to force the projection wall against the aperture wall and lock the pad to the link body, the plug being of a size and shape corresponding to the hollow interior of the projection.

4,694,557

LEADER TAPE STAKING ROD AND RELATED METHOD OF ASSEMBLY

Anthony L. Gelardi, Cape Porpoise, Me., assignor to Shape Inc., Biddeford, Me.

Filed Mar. 25, 1986, Ser. No. 843,688
Int. Cl.[4] B23P *19/02;* G11B *23/107*
U.S. Cl. 29—525 8 Claims



1. A method for forming a leader block assembly for a tape cartridge, comprising the steps of:

(a) forming a leader block having a sustantially cylindrical shaped opening with a mouth;

(b) forming a staking rod including an elongated member

having a substantially cylindrical shape with first and second ends, two opposing, substantialy curved, longitudinal sides, two opposing, substantially flat, longitudinal sides and an opening having a first configuration in the first end;

(c) positioning a leader tape in the opening formed in the leader block;

(d) inserting a tool having a tip with the first configuration into the corresponding opening formed in the staking rod;

(e) transferring the staking rod via the tool to the vicinity of the opening formed in the leader block;

(f) inserting the staking rod via the tool into the opening formed in the leader block, such that the substantially flat, opposing sides are adjacent to the mouth of the opening formed in the leader block;

(g) turning the tool such that the opposing, substantially curved, longitudinal sides create an interference fit with the opening formed in the leader block; and

(h) withdrawing the tool from the staking rod.

4,694,558

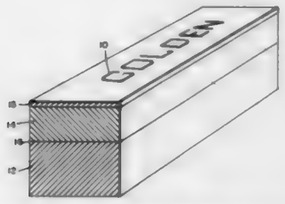
BIMETAL THERMOSTATS AND METHOD OF MANUFACTURE

Ron J. DeNuccio, Greensboro, N.C.; Han J. Kim, Concord, Mass., and Chi H. Leung, Greensboro, N.C., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 6, 1986, Ser. No. 816,496

Int. Cl.[4] B23P *17/00;* **C23C** *16/40*

U.S. Cl. 29—527.2 **9 Claims**



1. In a process for manufacturing golden-hued indicia bearing thermostatic bimetals having two sections of metal joined to each other and adapted to move in response to changes in temperature, said bimetals having a section of low thermal expansion and another of high thermal expansion, at least one of said sections having a predominantly ferrous composition and having an oxide film disposed thereon, the steps which comprise:

forming a bimetal with at least one section having a predominantly ferrous composition; and

immersing said bimetal in an acid bath; and

forming a grey ferrous oxide film on the external surface of the section having the predominantly ferrous composition; and

washing said bimetal whereby said grey film is removed, and marking an indicia on said washed bimetal; and

heating said bimetal in an oxidizing atmosphere to temper it and to form a transparent ferrous oxide film on at least said section having a predominantly ferrous composition, said ferrous oxide film having a controlled thickness in the interferance color range and said indicia being visible thereon.

7. A bimetal having at least one section formed of a ferrous metal, said bimetal having a thin ferrous oxide film on the surface of the section formed of the ferrous metal, said thin ferrous oxide coating having a thickness between about 440 and 480 Angstroms such that it has a golden hue, said bimetal further having indicia marked on said section having a thin ferrous oxide film.

4,694,559

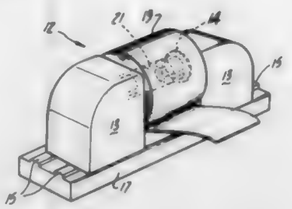
EXPANDING ARBOR

Allen W. Lundy, Highland, and Leonard Kasle, Franklin, both of Mich., assignors to Kasle Steel Corporation, Dearborn, Mich.

Filed Jan. 27, 1986, Ser. No. 822,818

Int. Cl.[4] B65H *75/24*

U.S. Cl. 29—559 **13 Claims**



1. An expandable arbor adapted for mounting to a standard decoiler mechanism and movable by the decoiler mechanism into the axial bore of a coil of material to rotatably support the coil and allow material to be unwound therefrom, the decoiler mechanism having a coil support means attached thereto with the support means having a forward end, a rearward end and a body which increases in diameter in the direction from the forward end to the rearward end, said expandable arbor comprising:

a mounting member adapted to be mounted to the forward end of the coil support means, the mounting member having at least two circumferentially spaced first guides about the perimeter thereof;

at least two opposed sections, each of the sections having an elongated, transversely curved outer surface with the surfaces being longitudinally positionable within the bore, the sections having second guides substantially complementary to and slidably interconnected with the first guides of the mounting member;

expansion means interconnecting each of the sections, the expansion means permitting movement of the support means with respect to the sections converting lateral movement of the support means into radial expansion of the sections;

whereby the sections are adapted to be laterally moved into the bore by the decoiler mechanism with the sections thereafter expanding radially outwardly into engagement with the bore.

4,694,560

APPARATUS FOR TREATING STATOR WINDING LEADS

Giorgio Barrera, Leumann, Italy, assignor to Officine Meccaniche Pavesi & C. S.p.A., Turin, Italy

Filed May 14, 1986, Ser. No. 863,216

Claims priority, application Italy, Jul. 23, 1985, 67674 A/84

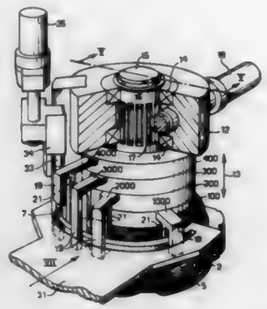
Int. Cl.[4] H02K *15/00*

U.S. Cl. 29—564.1 **9 Claims**

1. A device usable in the manufacture of stators for dynamoelectric machines for fixing end portions of the stator coils to a support member carried by the stator, wherein the device includes:

means for disposing the end portions of the stator coils in directions parallel to a plane substantially perpendicular to the axis of the stator and facing an end surface of the stator so as to make the end portions project outwardly from the stator,

means for moving the end portions in the said plane substantially perpendicular to the axis of the stator until they are brought into a zone of the end surface of the stator in which the support member is disposed, and



means for thrusting the end portions into corresponding grooves provided in the support member.

4,694,561

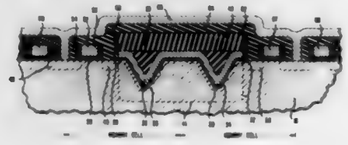
METHOD OF MAKING HIGH-PERFORMANCE TRENCH CAPACITORS FOR DRAM CELLS

Joseph Lebowitz, Watchung; William T. Lynch, Summit, both of N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1984, Ser. No. 676,677

Int. Cl.[4] H01L *21/72, 21/385*

U.S. Cl. 437—52 **1 Claim**



1. A method of making a VLSI DRAM device in a semiconductive member, said method comprising the steps of

forming trenches in a portion of said member that exhibits a specified conductivity type, said trenches each including walls that extend into the member from a main planar surface thereof, whereby edges are defined where the trench walls meet the main planar surface,

masking the entire main planar surface of said member except for limited surface portions that extend a prescribed distance away from said edges,

simultaneously introducing dopants of the opposite conductivity type into shallow regions below said surface portions and below said trench wall to form in and adjacent to each trench in said semiconductor member a continuous conductive layer that comprises a conductive trench layer and a conductive laterally extending surface extension thereof,

and forming an associated MOS transistor, including source and drain regions, in said same semiconductive member adjacent each trench to establish one region of each such adjacent transistor in electrical contact with a portion of the laterally extending extension of the adjacent trench layer,

wherein said masking step comprises

forming a relatively thick layer on the entire main planar surface of said member and a relatively thin layer on the walls of said trenches,

and then etching said layers to remove said relatively thin layer from the walls of said trenches and to pattern said relatively thick layer to form a relatively thin masking layer that covers the entire main planar surface of said member except for said limited surface portions.

4,694,562

METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED DEVICE INCLUDING BIPOLAR AND CMOS TRANSISTORS

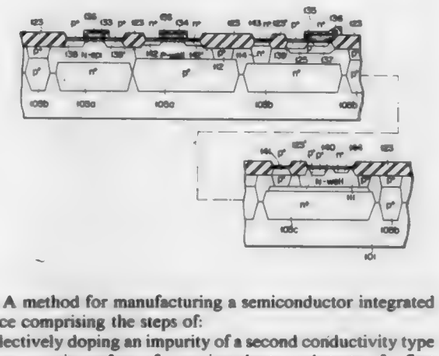
Hiroshi Iwasaki, Chigasaki, and Shintaro Ito, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 847,150, Apr. 3, 1986, Pat. No. 4,637,125, which is a continuation of Ser. No. 652,087, Sep. 19, 1984, abandoned. This application Oct. 31, 1986, Ser. No. 925,266

Claims priority, application Japan, Sep. 22, 1983, 58-175363; Sep. 28, 1983, 58-179558

Int. Cl.[4] H01L *21/38*

U.S. Cl. 437—57 **2 Claims**



1. A method for manufacturing a semiconductor integrated device comprising the steps of:

selectively doping an impurity of a second conductivity type on a main surface of a semiconductor substrate of a first conductivity type to form a first high concentration buried region of the second conductivity type for bipolar transistors and a second high concentration buried region of the second conductivity type for a MOS transistor;

selectively doping an impurity of the first conductivity type in said semiconductor substrate to form a third high concentration buried region of the first conductivity type surrounding said first high concentration buried region for the bipolar transistors and a fourth high concentration buried region of the first conductivity type for the MOS transistor;

epitaxially growing a semiconductor layer of the second conductivity type on a surface of said semiconductor substrate in which high concentration buried regions are formed;

selectively diffusing an impurity of the first conductivity type from a main surface of said semiconductor layer to form a well region of the first conductivity type reaching said fourth high concentration buried region;

selectively performing high-concentration diffusion of an impurity of the first conductivity type in the main surface of said semiconductor layer, or selectively converting said semiconductor layer into an insulating layer, to form an electrical isolation region reaching said third high concentration buried region formed to surround said first high concentration buried region; and

forming a vertical bipolar transistor and MOS transistors of a first and second conductivity type channel, said bipolar transistor being formed in the semiconductor region of the second conductivity type surrounded by said electrical isolation region, which includes said semiconductor region as the collector region, the MOS transistor of the second conductivity type channel being formed in said well region of the first conductivity type, and the MOS transistor of the first conductivity type channel being

formed on the semiconductor region of the second conductivity type positioned above said second high concentration buried region.

4,694,563

PROCESS FOR MAKING SCHOTTKY-BARRIER GATE FET

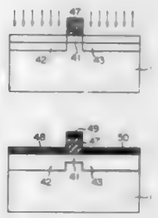
Kenichi Kikuchi, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 26, 1982, Ser. No. 342,912

Claims priority, application Japan, Jan. 29, 1981, 56-11812; Apr. 24, 1981, 56-62999

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—40 **9 Claims**



1. A process for the production of a Schottky-barrier gate field effect transistor, which comprises forming a first active layer of one electrically conductive type semiconductor crystal with a thickness and carrier concentration chosen so as to give a predetermined pinch-off voltage, forming a pattern thereon, introducing an impurity for giving the same electrically conductive type as the first active layer into the first active layer by ion implantation or thermal diffusion selectively through the pattern as a mask to form a second deeper active layer at both sides of the first active layer such that the second active layer has a surface carrier concentration substantially equal to that of the first active layer, and then forming electrodes.

4,694,564

METHOD FOR THE MANUFACTURE OF A SCHOTTKY GATE FIELD EFFECT TRANSISTOR

Takatomo Enoki, Soubudai-Ryo, 2-183, Soubudai, Zama-shi, Kanagawa 228; Kimiyoshi Yamasaki, Desden 5-101, 861-1, Ishida, Isehara-shi, Kanagawa 259-11, and Kuniki Ohwada, 1074-47, Katakura-cho, Hachioji-shi, Tokyo 192, all of Japan

Filed Jul. 21, 1986, Ser. No. 887,211

Claims priority, application Japan, Jul. 29, 1985, 60-167304

Int. Cl.⁴ H01L *21/467*

U.S. Cl. 437—40 **6 Claims**

1. A method for the manufacture of a field effect transistor, comprising:

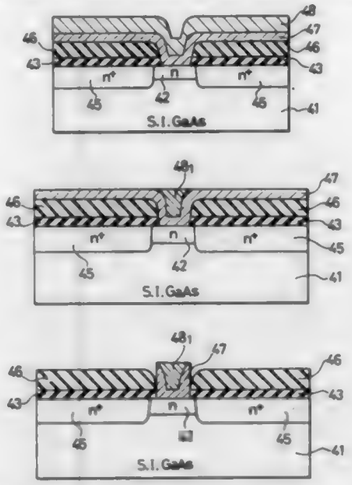
a step wherein a source region, a drain region, and an active region sandwiched therebetween are formed in the body of a semiconductor substrate near its one main surface and an insulating film of at least one layer deposited all over the main surface of the substrate is selectively removed, exposing a part of the active region formed in the semiconductor substrate;

a step wherein an underlying metal which forms a Schottky junction between it and the semiconductor of the active region and can be removed by anisotropic etching and an overlying metal of at least one layer which is capable of serving as a mask for the etching of the underlying metal are deposited in layers on the insulating film and the substrate surface exposed through the aperture made in the insulating film, filling the aperture with the underlying and the overlying metal;

a step wherein the surface of the overlying metal layer is planarized so that the overlying metal layer selectively remains in the aperture of the insulating film;

a step wherein the underlying metal layer is selectively removed by anisotropic etching through the remaining the overlying metal, forming a gate electrode of the overlying and underlying metal layers on the active region exposed through the aperture of the insulating film; and

a step wherein the insulating film is partly removed and source and drain electrodes are formed on the source drain regions, respectively.



4,694,565

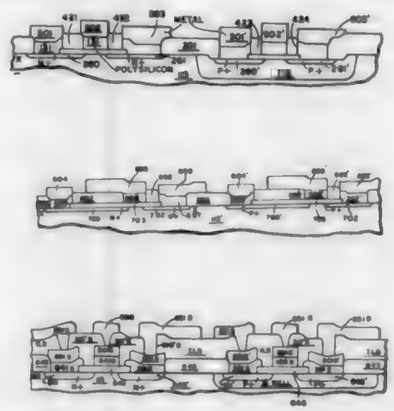
METHOD OF MAKING HARDENED CMOS SUB-MICRON FIELD EFFECT TRANSISTORS

Frank Z. Custode, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 28, 1986, Ser. No. 856,304

Int. Cl.⁴ H01L *21/385, 21/425*

U.S. Cl. 437—34 **8 Claims**



1. A process for providing CMOS sub-micron n-channel and p-channel devices on a p-doped silicon wafer, comprising the steps of:

growing a layer of oxide on the wafer;

applying a layer of photoresist over the oxide;

using a well mask to open a region for the p-channel device to bare silicon;

implanting phosphorus ions in the p-channel region to initiate the formation of n-doped well;

driving in the ions to complete the well, while growing a layer of oxide in the p-channel region;

stripping the oxide;

growing gate oxide;

applying a layer of photoresist over the wafer;

using a source and drain contact mask to open source and drain openings through the photoresist and oxide to bare silicon for both channels;

depositing a layer of polysilicon over the wafer including the bare silicon and the opened oxide;

depositing a layer of nitride over the polysilicon;

depositing a layer of low temperature oxide over the nitride;

depositing photoresist over the low temperature oxide;

using a double active region mask to protect the channel and open field oxide regions elsewhere;

etching the photoresist, low temperature oxide, nitride, and a portion of the polysilicon outside the active regions;

depositing photoresist;

using an active region mask to protect the p-channel region with a layer of photoresist;

field implanting boron ions into the field oxide region around the n-channel region while protecting the p-channel region from the implant;

stripping the photoresist layer, low temperature oxide and growing field oxide using the nitride as masks for the active regions;

depositing photoresist;

using a p-channel region source and drain mask to open source and drain regions in the p-channel region;

implanting boron ions into said source and drain regions to dope them P+;

implanting a low dose of boron ions into the n and p channels to adjust threshold voltages;

using an opaque source and drain mask and photoresist to cover the source and drain regions for the p-channel;

implanting phosphorus ions into the polysilicon layer;

stripping the photoresist;

activating all implants including:

boron implant of the source and drain for the p-channel,

the low dose boron for both channels for threshold adjustment, and

the phosphorus implant into polysilicon;

applying photoresist;

using gate-contact mask to delineate gaps in the nitride adjacent both sides of channel electrode regions being formed; and etch away the delineated nitride and part of the polysilicon;

applying photoresist over the n and p-channels and opening the p-channel regions;

implanting the source and drain of the p-channel region to extend the P+ source and drains of the p-channel by boron ion implant;

stripping the photoresist;

applying photoresist and opening the n-channel regions;

implanting phosphorus ions to extend the N+ source and drain regions;

stripping the photoresist;

growing cross-over oxide in the gap regions, and activating all implants not previously activated;

etching away the nitride layer;

depositing metal;

applying a layer of photoresist over the metal and using a metal mask to etch the photoresist and metal except for the interconnects to the source for each n and p channel, gate for each n and p channel and drain for each n and p channel;

stripping the photoresist; and,

sintering the structure as now completed.

4,694,566

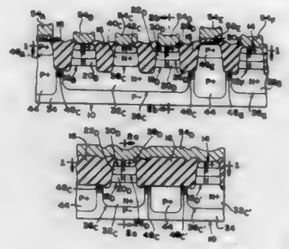
METHOD FOR MANUFACTURING PROGRAMMABLE READ-ONLY MEMORY CONTAINING CELLS FORMED WITH OPPOSING DIODES

George W. Conner, Ben Lomond; Raymond G. Donald, San Jose, and Ronald L. Cline, Los Gatos, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 367,492, Apr. 12, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 757,185

Int. Cl.⁴ H01L *21/265, 29/72, 21/225*

U.S. Cl. 437—48 **14 Claims**



1. A method for manufacturing a programmable read-only memory (PROM) in which a semiconductor body is provided with a recessed electrically insulating region that fully adjoins the entire lateral boundary of each of at least two monocrystalline portions of a doped semiconducting region of a first conductivity type spaced laterally apart from one another along a top surface of the doped semiconducting region, a semiconductor dopant of a second conductivity type opposite to the first conductivity type is introduced through the top surface into part of each monocrystalline portion to define therein a substantially horizontal first PN junction that fully adjoins the insulating region and to leave therein a lower region of the first conductivity type, and a substantially horizontal second PN junction that fully adjoins the insulating region is defined in each monocrystalline portion above its first PN junction, characterized in that the step of introducing comprises ion implanting the dopant into the monocrystalline portions with energy sufficient to cause the maximum concentration of the dopant to occur below the second PN junctions at a vertical distance from the mid-point between the pair of first and second PN junctions in each monocrystalline portion that is no more than 20 percent of the distance between that pair of PN junctions.

4,694,567

METHOD FOR MAKING A SUPERCONDUCTING GRADIOMETER HAVING A THREE-DIMENSIONAL STRUCTURE AND ASSOCIATED CONNECTING LINES FOR A DEVICE FOR MEASURING WEAK MAGNETIC FIELDS

Gabriel M. Daalmans, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,370

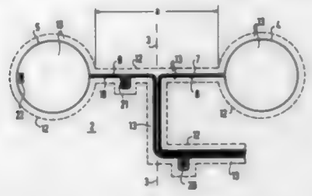
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442269

Int. Cl.⁴ H01L *39/24*

U.S. Cl. 29—599 **18 Claims**

1. A method for manufacturing a gradiometer having a three-dimensional structure for a device for the single-or multi-channel measurement of magnetic fields with field intensities down to less than 10^{-10}T and in particular, below 10^{-12}T, wherein at least one superconducting gradiometer coil of predetermined dimensions is arranged a support body and connected by means of superconducting connecting lines and a coupling coil to a superconducting quantum interference element (SQUID) in a magnetically coupling manner, wherein the gradiometer coil and at least the connecting lines associated with the coil are applied as thick or thin films together and

simultaneously to a common three-dimensional support body in which at least one coating operation is preceded for the



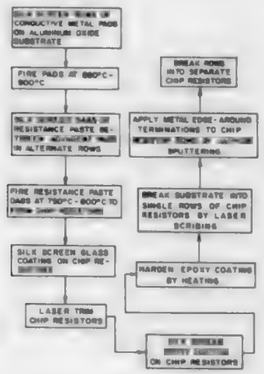
position-wise fixation of the corresponding conductor runs by a lithographic process.

4,694,568

METHOD OF MANUFACTURING CHIP RESISTORS WITH EDGE AROUND TERMINATIONS

Amedeo J. Morelli, Randolph, N.J., and Francis L. Gaylord, Painted Post, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jan. 7, 1982, Ser. No. 337,644
Int. Cl.⁴ H01C *17/06*
U.S. Cl. 29—620 **14 Claims**



1. A method of manufacturing chip resistors comprising:

(a) depositing an even series of electrically separated, essentially parallel rows of electrically conductive metal pads on a major surface of a thin electrically insulating ceramic substrate, each of said metal pads facing an opposing pad in an opposing row of other said pads, one row of said metal pads being adjacent to a first edge of said substrate and a second row of said metal pads being adjacent to a second edge of said substrate essentially parallel to said first edge,

(b) firing said metal pads at a temperature sufficient to fix said metal pads to said substrate,

(c) depositing resistor paste dabs extending between, and in electrical contact with, opposing metal pads in opposing rows of said metal pads, and in a manner such that each of said metal pads is electrically connected with only one other of said metal pads thereby forming at least one row of at least two electrically separated resistors on said surface of said substrate,

(d) firing said resistor paste dabs at a temperature sufficient to fix said resistor paste dabs to said substrate,

(e) trimming each of said resultant resistors to a desired value,

(f) scribing fragmentation lines in said surface of said substrate between each of said resistors,

(g) breaking said substrate along fragmentation lines separating the rows of resistors into strips each strip containing a single row of resistors,

(h) depositing by vapor deposition, narrow electrically conductive metal bands over each of said rows of metal pads adjacent to an edge of said substrate, and extending over said adjacent edge thereby forming edge-around terminations on said resistors and

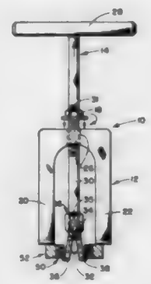
(i) separating said resistors, one from another, along said fragmentation lines.

4,694,569

BEARING EXTRACTOR

William F. Colvell, 4375 Weber River Dr., and Dean M. Baker, 548 W. 4900 S., both of Ogden, Utah 84405

Filed Apr. 2, 1986, Ser. No. 847,354
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—724 **2 Claims**



1. A bearing extractor, comprising:

U-shaped support having a flat top portion and a pair of legs capable of impacting a case surrounding a bearing to be extracted;

a bearing grasping assembly, said assembly including a nut-shaped support having internal threads and a pair of expandable prongs extending from said nut-shaped support, each of said prongs having internal threads and a ledge formed at the bottom thereof for engaging the bottom of said bearing;

a rod, said rod being slidable and rotatable within said top portion of said U-shaped support and rotatable within said bearing grasping assembly, said rod having threads for engaging said threads of said nut-shaped support and said prongs, and said prongs having a preselected internal configuration for engaging an end of said rod in order to expand said prongs against the interior surface of said bearing when said rod is rotated into said nut-shaped support, and said rod having a handle at another end thereof; and

means for encompassing said rod for adjustably supporting said rod with respect to said U-shaped support;

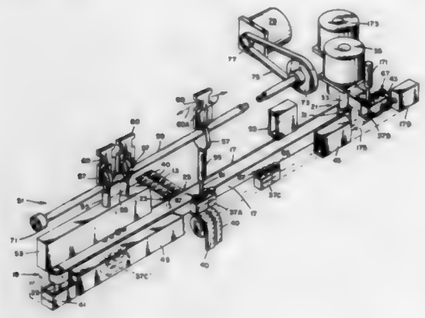
whereby after said prongs of said bearing grasping assembly are expanded against the interior surface of said bearing, outward movement of said rod draws said bearing case into contact with said legs of said U-shaped support, and further outward movement of said rod removes said bearing from said bearing case.

4,694,570

SURFACE MOUNTED COMPONENT TRANSPORT MECHANISM

John M. Rudolph, Carlsbad, and George M. Wohlhieter, Santa Maria, both of Calif., assignors to AMISTAR Corporation, Torrance, Calif.

Filed Nov. 21, 1985, Ser. No. 800,217
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—740 **9 Claims**



1. A random access surface mounted component transport system used in the population of surface mounted components (SMC) in printed circuit board (PCB) fabrication, including:

an elongated movement mechanism including a multiple SMC carrier, said mechanism having a plurality of adjacent loading points and a downstream off-loading station, said movement mechanism including an overhead cam assembly including a bus-carried SMC-holding mechanism actuator, a different one of said actuators being disposed at each of said loading points;

a plurality of adjacent SMC carrier media disposed adjacent said movement mechanism, each SMC carrier media associated with a different one of said loading points;

loading means positioned adjacent said loading points and said SMC carrier media for moving selected SMC from said carrier media to said multiple SMC carrier of said movement mechanism for transportation of SMC to said off-loading station;

unloading means position adjacent said off-loading station for moving SMC from said multiple SMC carrier to an appropriate position on a PCB in a predetermined sequence; and

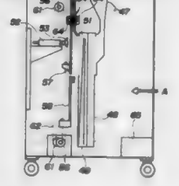
bus means for transporting said SMC, said bus means including a plurality of bus members temporarily attachable to said time belt upstream of said loading points and temporarily detachable from said time belt adjacent said off-loading station.

4,694,571

APPARATUS FOR AUTOMATICALLY CHANGING X-RAY FILMS

Hideo Kanai, Gunma; Toshinori Komba, Tokyo, and Eiji Mogi, Kanagawa, all of Japan, assignors to Nagase Medical Supply Co., Ltd., Osaka, Japan

Filed Mar. 31, 1986, Ser. No. 846,049
Claims priority, application Japan, Apr. 2, 1985, 60-49080[U]
Int. Cl.⁴ B23P *19/00, 21/00*
U.S. Cl. 29—806 **4 Claims**



1. An apparatus for changing X-ray films of cassettes each of which has two halves hinged together at respective ends thereof, each of the cassettes being open after one of the two halves is moved away from the other of the two halves about the hinged respective ends thereof, each of the cassettes being closed to contain an X-ray film therein when said one of the two halves covers the other of said two halves, and each of the cassettes having securing means for securing an X-ray film therein when the cassette is in a state that is not completely closed, said apparatus comprising:

a housing having a slot extending therethrough at the top thereof through which one of the cassettes is inserted when changing an X-ray film contained therein, and a shutter mounted within the housing adjacent said slot, the shutter being movable relative to said housing for opening and closing said slot;

a cassette supporting means within said housing for supporting the cassette in a vertical orientation with said hinged ends thereof up after the cassette is inserted through said slot into said housing, said cassette supporting means pivotally mounted to said housing for pivoting between a first position at which the cassette remains disposed in a generally vertical orientation and at which an exposed X-ray film within the cassette is discharged therefrom by falling out of the cassette when the cassette is open and a second position at which an unexposed X-ray film is loaded into the cassette, said cassette supporting means having a cassette opening and closing means for engaging both of said halves of said cassette to open and close the cassette;

an exposed film chamber within said housing and below said cassette supporting means for containing exposed X-ray films that have respectively fallen from ones of the cassettes;

a film chute within said housing between said cassette supporting means and said exposed film chamber for guiding an exposed X-ray film falling from the open cassette supported by said cassette supporting means at said first position to the exposed film chamber;

an unexposed film chamber within said housing and below said cassette supporting means for containing unexposed X-ray films to be fed to the cassette supported by said cassette supporting mans at said second position;

vertical guide rail means movably mounted within said housing and extending between said unexposed film chamber and said cassette supporting means, and transporting means for moving said guide rail means between a first position adjacent said unexposed film chamber and a second position at which the guide rail means extends into the open cassette supported by said cassette supporting means at said second position thereof;

film transporting means within said housing having a suction pad for transferring an unexposed X-ray film from said unexposed film chamber to said guide rail means when said guide rail means is at said first position thereof;

a lifter movably mounted within said housing for raising an unexposed X-ray film along and relative to said guide rail means until an upper portion of the unexposed X-ray film extends beyond the top of the guide rail means; and

control means for controlling said cassette supporting means to pivot to said first position thereof after a cassette is

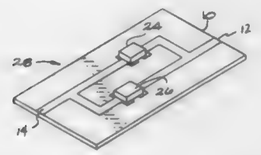
supported thereby and for causing said cassette opening and closing means to open said cassette so that an unexposed X-ray film contained therein falls into said film chute and is guided thereby into said exposed film chamber, for subsequently controlling the cassette supporting means to pivot to said second position, for controlling the film transporting means to transfer an unexposed X-ray film from said unexposed film chamber to said guide rail means, for subsequently controlling said transporting means to raise said guide rail means to said second position thereof to move the guide rail means into the cassette, for controlling said lifter to move an unexposed X-ray film into said cassette, for controlling said cassette opening and closing means to close the cassette thereby securing the unexposed X-ray film to and within the cassette with the securing means as the cassette is closed, and for controlling said transporting means to lower the guide rail means after said unexposec X-ray film is secured to the cassette before the cassette is completely closed.

4,694,572

PRINTED POLYMER CIRCUIT BOARD METHOD

David C. Leber, and Timothy L. Falk, both of Vancouver, Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 13, 1986, Ser. No. 874,265
Int. Cl.⁴ H05K *3/34*
U.S. Cl. 29—840 **3 Claims**



1. A method of manufacturing a printed circuit board having electrical circuit elements secured thereto comprising the steps of:

(a) forming a polymer component, at least a portion of said component comprising a substrate for a printed electrical circuit;

(b) forming electrical circuit runs and electrical contact pads on said substrate with an electrically conductive, adhesive ink;

(c) mounting said electrical circuit elements to said electrical contact pads; and

(d) curing said electrically conductive, adhesive ink with said electrical circuit elements secured thereto.

4,694,573

METHOD OF FORMING ELECTRICALLY CONDUCTIVE CIRCUIT

Atsuhi Nishino, Neyagawa; Masaki Ikeda, Hirakata; Yoshihiro Watanabe, Moriguchi, and Masahiro Hiraka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

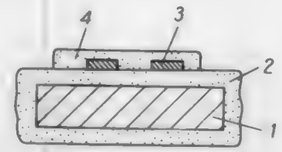
PCT No. PCT/JP85/00327, § 371 Date Feb. 10, 1986, § 102(e) Date Feb. 10, 1986, PCT Pub. No. WO86/00190, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 12, 1985, Ser. No. 832,716
Claims priority, application Japan, Jun. 14, 1984, 59-120648
Int. Cl.⁴ H05K *3/20*
U.S. Cl. 29—846 **10 Claims**

1. A method of forming an electrically conductive circuit comprising the steps of:

preparing a transferring paper in which an assembly of electrically conductive foil carrying a predetermined pattern and an insulating layer containing glass frit and an overcoat layer consisting of a resin film having good burning property are provided on a transferring mount paper covered with soluble paste layer;

removing an integral structure of said assembly of said conductive foil, said insulating layer, and said overcoat layer from said transferring paper;

setting the removed integral structure onto a substrate;



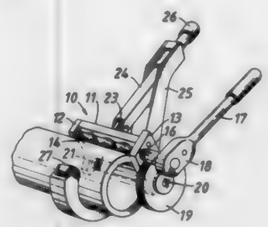
firing said substrate with said integral structure set thereon to burn out said resin film and simultaneously soften the glass in said insulating layer, to form a vitreous enamel insulating layer to thereby fix said conductive foil to said substrate.

4,694,574

PIPE SCRAPER

Alan J. Dickinson, Cramlington, England, assignor to British Gas Corporation, England

Filed Jun. 5, 1985, Ser. No. 741,530
Claims priority, application United Kingdom, Jun. 7, 1984, 8414545
Int. Cl.⁴ B23D *21/06*
U.S. Cl. 30—94 **6 Claims**



1. A scraper comprising:

a helically bladed rotary scraping member, and means for applying said scraping member to a cylindrical surface of an object while rotating past said surface such that said scraping member forms a low angle helix scrape which approximates a longitudinal scrape on said surface, said means comprising:

a support structure,

operating means,

drive means,

and step down gearing,

said scraping member and said drive means being mounted on said structure,

said operating means being operatively connected to said scraping member to rotate the same,

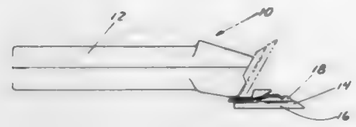
and also being operatively connected by said gearing to said drive means to rotate the same in rolling drive engagement with said object, thus relatively to rotate said structure and said object.

4,694,575

CLIPPER ATTACHMENT DEVICE

Daniel A. Boerger, 5132 Norman St., Racine, Wis. 53406

Filed Aug. 25, 1986, Ser. No. 900,009
Int. Cl.⁴ B26B *19/04*
U.S. Cl. 30—221 **14 Claims**



1. A clipper of the type having a main body and a pivotably-mounted cutter head with a fixed blade and a reciprocating blade, comprising:

male and female connecting members including one on the main body and the other on the cutter head;

the female connecting member being a slot formed of first and second substantially planar principal wall members spaced apart by a fixed distance;

the male connecting member being a substantially planar member of principal thickness less than said fixed distance for easy insertion into said slot; and

one of the substantially planar members having a resilient portion offset from the plane thereof by a distance greater than the fixed distance less the principal thickness, and biased therefrom in a direction normal to said plane,

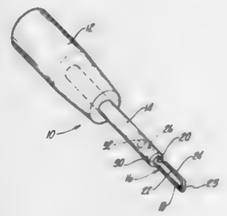
whereby looseness between said planar members is eliminated.

4,694,576

TOOL FOR REMOVING WINDSHIELD SEALANT

Jeffrey R. Cothery, Livonia, Mich., assignor to Reid Manufacturing Co., Inc., Southfield, Mich.

Continuation of Ser. No. 799,560, Nov. 20, 1985, abandoned, which is a continuation of Ser. No. 630,949, Jul. 16, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 898,721
Int. Cl.⁴ B26B *3/00*
U.S. Cl. 30—280 **6 Claims**



1. A tool for forming a groove of fixed width in a urethane sealant disposed about the periphery of an automobile windshield, the groove so formed being dimensioned to receive a windshield-retaining molding thereon, said tool comprising:

an elongated member defining a longitudinal axis of said tool, said member comprising a first end portion, and a secone end portion opposite said first end portion;

a handle affixed to said first end portion of said elongated member; and

a blade comprising a mounting sleeve and a cutting member affixed to said mounting sleeve;

wherein said second end portion of said elongated member defines a longitudinal bore extending partway through said elongated member, said bore being closely dimensioned to said mounting sleeve so that said second end portion detachably frictionally engages said sleeve when said mounting sleeve is inserted in said bore;

wherein said cutting member is substantially U-shaped in cross section transverse to said longitudinal axis of said tool defined by said elongated member; and

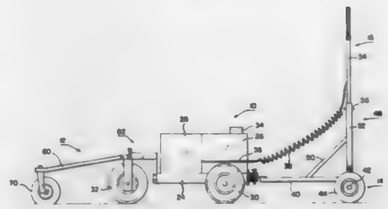
wherein said cutting member comprises a pair of longitudinally extending, radially opposed edges, and a pair of laterally extending, radially opposed second edges disposed perpendicularly to said longitudinally extending edges, opposite said mounting sleeve.

4,694,577

SELF-PROPELLED, SELF-STEERED VEHICLE FOR POWER DRIVEN PLANT TRIMMING TOOLS

Jacobus C. van der Merwe, and Lucas C. van der Merwe, both of 801 Beechwood Dr., Kingsport, Tenn. 37663

Filed Jul. 18, 1986, Ser. No. 886,801
Int. Cl.⁴ B23D *45/20*
U.S. Cl. 30—379.5 **11 Claims**



1. A self-propelled, self-steered vehicle for supplying power to a plurality of power driven plant trimming tools, comprising:

(a) a wheeled vehicle having a pair of driving wheels, a steered wheel rotatably mounted on a steered wheel carrier, said steering wheel carrier mounted at one end of the vehicle and pivotal about a vertical axis, an engine supported by the vehicle and drivingly connected with the driving wheels for propelling the vehicle along the ground, speed control means for controlling the speed of the vehicle, and a tool power source driven by the engine for providing power to a plurality of plant trimming tools;

(b) steering means connected to the steered wheel, said steering means including a pilot wheel adapted to be received in and to travel along a pre-formed furrow in a field, said pilot wheel rotatably mounted on a pilot wheel carrier, and lever means extending between and interconnecting the steered wheel carrier and the pilot wheel carrier, said pilot wheel carrier being pivotally connected to said lever means to pivot about a vertical axis, said steered wheel carrier secured to said lever means at a predetermined spacing from said pilot wheel carrier, wherein lateral movement of said pilot wheel causes pivotal movement of said lever about a vertical axis passing through said steered wheel carrier to turn said steered wheel in the direction of said lateral pilot wheel movement; and

(c) carrier means connected with said vehicle for carrying a plurality of conduits communicating with said tool power source to supply power to a plurality of individual plant trimming tools connected to the conduits, the carrier means including a supporting structure, and conduit means carried by the supporting structure and in communication with the tool power source, the conduit means terminating in a plurality of connectors to which plant trimming tools are adapted to be connected, the supporting structure including a central, upstanding boom, the boom carrying a pair of outwardly extending arms each supporting at least one branch conduit and connector.

4,694,578

MOTOR-DRIVEN CHAIN SAW

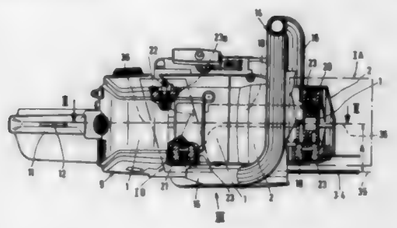
Ralf-Rainer Kemmler, Grossbottwar, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,905

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1985, 3525593

Int. Cl.⁴ B27B *17/00*

U.S. Cl. 30—383 **9 Claims**



8. A motor-driven chain saw comprising:

a housing having a front wall, a rear wall, two longitudinal side walls extending rearwardly from said front wall to said rear wall, and a base wall extending between said side walls;

a first handle on said rear wall of said housing for holding and operating the chain saw;

a saw chain;

a guide bar defining a guide-bar plane and being mounted on said housing for accommodating said saw chain for movement thereon;

an elongated extension arm defining a longitudinal axis and being mounted on said housing in the region of said base wall so as to extend in the direction toward the front of said chain saw, said extension arm having a top surface and including three mutually parallel rectangularly-shaped flat segments defining respective planes substantially perpendicular to said guide-bar plane, said flat segments being arranged one atop the other; and,

said extension arm further including first and second segments respectively interconnecting the top flat segment and the middle flat segment and said middle flat segment and the bottom flat segment, said first and second segments being located on opposite sides of said longitudinal axis;

a drive unit for driving said saw chain, said drive unit being supported on said extension arm above said top surface for driving said saw chain; and,

an elongated second handle mounted forward of said rear handle and having one end attached to said extension arm.

4,694,579

DEVICE FOR GUIDING A TOOL ALONG A CURVE

Björn Källberg, Box 6040, S-191 06 Sollentuna, Sweden

PCT No. PCT/SE85/00214, § 371 Date Jan. 22, 1986, § 102(e) Date Jan. 22, 1986, PCT Pub. No. WO85/05310, PCT Pub. Date Dec. 5, 1985

PCT Filed May 22, 1985, Ser. No. 834,243

Claims priority, application Sweden, May 23, 1984, 8402796

Int. Cl.⁴ B43L *13/10*

U.S. Cl. 33—23.08 **4 Claims**

1. A device for guiding a tool (**17**) along a curve (**24**), said device comprising a holder (**16**) for the tool to be movable in one plane, and being so connected to a curve follower, which is adapted to follow a predetermined guide curve (**5**) in the same or another plane, that the holder (**16**) and the tool (**17**) follow a path corresponding to the path of the curve follower, said curve follower including a driven rotatable means (**44**) rigidly jointed to the holder (**16**) for the tool, and a freely rotatable means (**43**), both said rotatable means (**43, 44**) being movable towards each other so as to contact said guide curve (**5**) from either side thereof, a first arm (**38**) being mounted to be freely rotatable about the driven rotatable means (**43**) and carrying a second arm (**40**) journalled for swinging motion relative to said first arm (**38**), said second arm (**40**) carrying



said freely rotatable means (**43**), and spring means (**45**) acting between said first arm (**38**) and said second arm (**40**) to urge said freely rotatable means (**43**) towards said driven rotatable means (**44**).

4,694,580

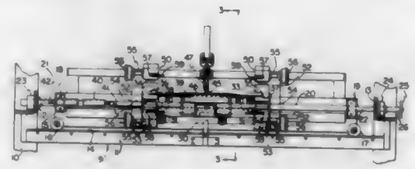
MACHINE FOR GUIDING AND MARKING PLYSTOCK

Robert W. Street, Kent, Ohio, assignor to General Tire, Inc., Akron, Ohio

Filed Jul. 24, 1986, Ser. No. 888,679

Int. Cl.⁴ B43L *13/00;* **B65H** *25/26*

U.S. Cl. 33—32.6 **7 Claims**



1. A machine for monitoring the travel of a continuous piece of material used in the construction of a tire, comprising:

(a) a pair of horizontally spaced sensors when the machine is in operation for sensing opposing marginal edges of the piece of material;

(b) at least one support roll adjacent to the sensors for supporting the piece of material between the sensors as the piece of material travels past the sensors;

(c) means coacting with one of the sensors for simultaneously moving the sensors toward and away from each other when said one of the sensors senses lateral movement of the adjacent marginal edge of the piece of material relative thereto; and

(d) means coacting with the other of the sensors for simultaneously moving the sensors and support roll in the same lateral direction relative to the direction of travel of the piece of material, when the other sensor similarly senses lateral movement of the adjacent marginal edge of the piece of material.

4,694,581

HEIGHT-MEASURING DEVICE

William P. Heinrich, McHenry, and Norbert Leopoldi, Chicago, both of Ill., assignors to Genentech, Inc., San Francisco, Calif.

Filed Dec. 22, 1986, Ser. No. 944,006

Int. Cl.⁴ G01B *5/02*

U.S. Cl. 33—169 R **11 Claims**

1. A height-measuring device for measuring the height of a person, comprising:

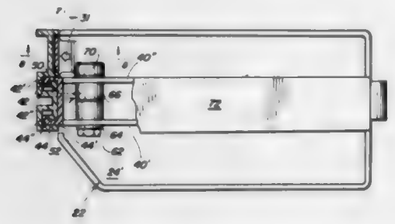
a ruler element having indices thereon, said ruler element being elongated and having a central longitudinal axis;

slide-mounting means integrally formed with said ruler element and coplanar therewith, said slide-mounting means being positioned at one longitudinal side of said ruler element such that said ruler element and said slide-mounting means form substantially one coherent unit;

said slide-mounting means having at least one longitudinally extending channel;

slide means having at least one slide-runner for sliding engagement and movement in said at least one channel;

height-measuring plate means having a lower, flat surface that may be placed upon the top of a persons's head who is being measured;



means for selectively locking and unlocking said slide means in said channel;

said slide means fixedly mounting said height-measuring plate means such that said plate means extends therebelow;

said channel being a substantially U-shaped channel having a first open face through which projects said slide-runner, and a second closed face, said slide-mounting means having a central rib about which is defined said U-shaped channel; said slide-runner being substantially L-shaped a portion of which is disposed adjacent to said central rib, so that said central prevents the outward removal of said slide-runner from engagement in said channel.

4,694,582

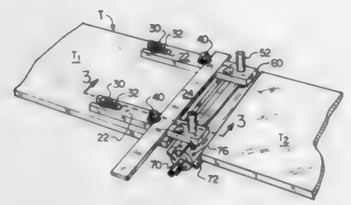
BLADE SETTING TOOL FOR WOOD JOINTER/PLANER MACHINES

Donald R. Walston, Jr., 402 E. Vandalia Rd., Greensboro, N.C. 27406

Filed Nov. 5, 1986, Ser. No. 927,129

Int. Cl.⁴ B27G *23/00*

U.S. Cl. 33—635 **9 Claims**



1. A blade setting tool for wood jointer/planer machines of the type having a horizontal worksupporting/feeding table, a slot-type opening across the width of the table and through which rotatable knife blades are exposed for cutting the workpiece as the workpiece passes over the table; said blade setting tool comprising:

(a) a jig member having:

(i) means for adjusting the width of said jig to accomodate worktables of various width;

(ii) means for adjusting said jig along the longitudinal axis of said worktable and for securing said jig in a position wherein a portion of said jig overlies said slot opening in said table;

(iii) the said portion of said jig overlying said slot-type opening having an undersurface constituting a gauging surface for balancing said knife blades;

(b) a pair of spaced apart, vertically displaceable blade stops for stopping and retaining said knife blades at a prescribed point in the path of rotation; said blade stops being supported by said jig and being vertically displaceable from a first position in contact with said knife blades to a second position outside the path of rotation of said knife blades;

whereby a selected one of said knife blades is balanced against said gauging surface and said blade stops, and after balancing, said blade stops are displaced to said second position to allow the balanced blade to rotate past said blade stops, thereby moving subsequent blades into position for balancing while said jig member remains as originally positioned on said worktable.

4,694,583

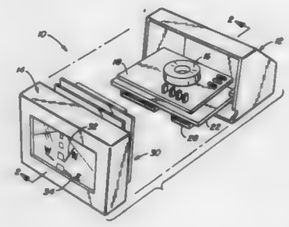
ELECTRONIC AUTOMOTIVE COMPASS AND DISPLAY

Peter G. Blaney, Walnut Creek, Calif., assignor to Zemco Group, Inc., San Ramon, Calif.

Filed Mar. 26, 1986, Ser. No. 844,175

Int. Cl.⁴ G01C *17/30*

U.S. Cl. 33—361 **15 Claims**



1. An electronic compass adapted for installation on a vehicle having a frontal display means for indicating vehicle direction relative to the major compass points and comprising:

dynamic indicia means including an array of reference bar means angularly spaced apart and extending radially from a common center point and associated letter legend means for indicating the four major compass points adjacent said reference bar means said letter legend means being located between said reference bar means so that each letter legend means can be activated in combination with one adjacent reference bar means on either side thereof;

fixed indicia means superimposed on said dynamic indicia means including means indicating the actual direction of travel of the vehicle;

flux gate compass means providing digital outputs proportional to the actual orientation of the vehicle with respect to the earth's magnetic North;

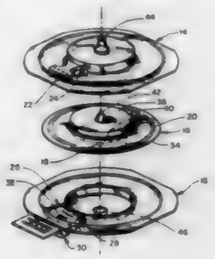
microprocessor means connected to said compass means for converting said digital compass outputs to directional control signals to activate computed combinations of said reference bar means and associated letter legend means of said dynamic indicia means, thereby making said computed combinations visible and indicating the present orientation of the vehicle relative to the major compass points.

4,694,584

REDUCED VOLUME DIGITAL INCLINOMETER

Floyd J. Mills, 815 Alpine #4, Boulder, Colo. 80302

Filed May 30, 1986, Ser. No. 869,198
Int. Cl.[4] G01C *9/06, 9/12*
U.S. Cl. 33—366 **6 Claims**



6. An inclinometer for generating information indicative of inclination angles comprising:

disk encoder means,

means for aligning said disk encoder means with gravitational field forces,

said disk encoder means having a plurality of encoding marks for providing high resolution positional data indicative of a rotational position of said disk encoder means resulting from alignment of said disk encoder means with gravitational field forces;

fluid means surrounding said disk encoder means for providing a supporting medium for said disk encoder means;

shell means for encapsulating said fluid means around said disk encoder means, said shell means having a shape which substantially conforms to the shape of said disk encoder means to minimize volume of said fluid means and, thereby minimize the total amount of expansion and contraction of said fluid means within said shell means so as to minimize mechanical distortions of the shell means;

buoyancy means for maintaining said disk encoder means in substantial equilibrium in said fluid means to substantially eliminate frictional forces on said disk encoder means;

said aligning means comprising counterweight means for displacing the center of gravity of said disk encoder means by creating a righting arm which aligns said disk encoder means with gravitational field forces; and

detector means for sensing said high resolution positional data to produce data signals indicative of inclination angles.

4,694,585

DEVICE FOR MEASURING CLEARANCE AROUND A PIN FOR CENTERING THE UPPER INTERNAL EQUIPMENT OF A PRESSURIZED WATER NUCLEAR

Alain Frizot, Moatcenis; Gerard Cadauretlle, Saint Bonnet de Mure; Jean-Christophe Lalére, Lyons, and Jean-Yves Machuron, Le Creusot, all of France, assignors to Framatome, Courbevoie, France

Filed Aug. 14, 1986, Ser. No. 895,984
Claims priority, application France, Aug. 14, 1985, 85 12398
Int. Cl.[4] G21C *17/00*
U.S. Cl. 33—502 **4 Claims**

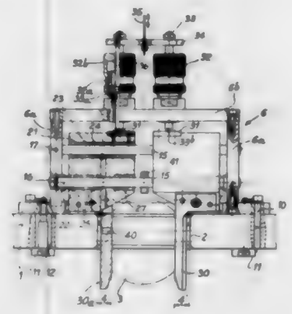
1. Device for measuring clearance around a pin (3) for centering the upper internal equipment of a pressurized water nuclear reactor on the lower internal equipment, placed in the reactor vessel which is open and filled with water, the lower internal equipment comprising the reactor core enclosure to which centering pins (3) are fixed, and the upper internal equipment comprising the upper core plate (1) in which slots (2) corresponding to the centering pins (3) are machined, characterized in that is comprises:

a carrier (6) integrally fixed to a pedestal (7) equipped with means (10, 11) intended to cooperate with holes (12) in the upper core plate (1) for fixing the carrier (6) on the upper core plate (1),

at least two travellers (15) mounted in the carrier (6) and parallel to the bearing surface of the pedestal (7) which is placed on the upper face of the upper core plate (1),

two movable slides mounted on the two travellers (15), each carrying a planar marking plate (31) parallel to the direction of movement of the slides (20) and each equipped with a sensing finger (30) projecting downwards relative to the bearing face of the pedestal (7),

resilient means (25) for returning the slides to bring them



back towards each other, in the direction of the travellers (15) and mounted within the carrier (6),

and a marking assembly carried by the carrier (6) and comprising two styli (33) mounted in guiding carriers (32) directed at right angles to the marking plates (31), each placed facing a marking plate (31) and pushed towards the plate (31) by a resilient means (36), and a control equipment (34) conected to the styli (33) and to a control cable (35) whose end away from the control equipment (34) enables a pull to be applied to separate the styli (33) from the marking plates (31), by compressing each of the pushing means (36), the styli moving to mark the plates (31) when the cable (35) is released.

4,694,586

APPARATUS AND METHOD FOR DRYING AND CURING COATED SUBSTRATES

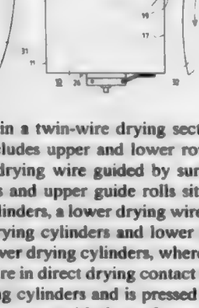
David Reznik, 2151 Barbara Dr., Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 735,366, May 17, 1985. This application Aug. 13, 1986, Ser. No. 895,929
Int. Cl.[4] F26B *23/08*
U.S. Cl. 34—1 **21 Claims**

1. Apparatus for drying or curing a coating on a metal substrate comprising:

means for inductively heating said coated substrate in a highly confined space; and

means for condensing evaporated liquids released as the result of said heating, said means for inductively heating and means for condensing being operative for maintaining



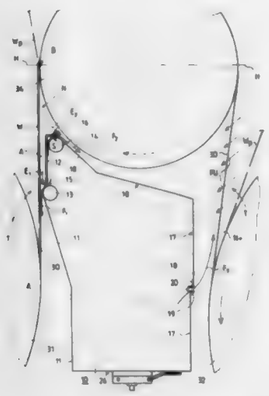
an atmosphere of evaporated liquids in said confined space, substantially to the exclusion of atmospheric gases.

4,694,587

METHOD AND APPARATUS IN A TWIN-WIRE CYLINDER DRYING SECTION OF A PAPER MACHINE

Pekka Eskelinen, Turku, Finland, assignor to Valmet Oy, Finland

Filed Sep. 9, 1986, Ser. No. 905,180
Claims priority, application Finland, Sep. 13, 1985, 853525
Int. Cl.[4] F26B *3/24, 13/08*
U.S. Cl. 34—23 **14 Claims**



1. A method in a twin-wire drying section of a paper machine which includes upper and lower rows of drying cylinders, an upper drying wire guided by surfaces of said upper drying cylinders and upper guide rolls situated between said upper drying cylinders, a lower drying wire guided by surfaces of said lower drying cylinders and lower guide rolls situated between said lower drying cylinders, wherein a web in pressed by said upper wire in direct drying contact with the surfaces of said upper drying cylinders and is pressed by said lower wire in direct drying contact with the surfaces of said lower drying cylinders, said web having a free draw of a certain length between the drying cylinder of one row and a drying cylinder of another row, comprising the steps of

in a space bounded by a first drying wire run leaving a first drying cylinder and going to a next guide roll, a free sector of said next guide roll, and a second drying wire run returning from said next guide roll and going to a second drying cylinder,

directing a first air jet proximate to said first drying wire run in a direction opposite to the running direction thereof;

at the same time directing a second air jet proximate to said free sector of said next guide roll in a direction opposite to the direction of rotation thereof;

said first and second air jets ejecting air from spaces behind them thereby creating a vacuum zone acting on at least a section of said first drying wire run;

said vacuum zone causing said web to be suctioned against said drying wire so that said certain length of said free web draw between a cylinder of one row and a cylinder of another row is substantially shortened;

directing a third air jet on said second run of said drying wire returning from said next guide roll and going to said second drying cylinder in a direction opposite to the running direction of said second drying wire for preventing air from being pumped through said second drying wire run from pockets defined within said drying section; and

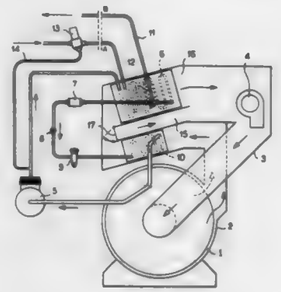
regulating the distribution of said third air jet in the transverse direction of said drying wire to control the transverse moisture profile of the web.

4,694,588

DRY CLEANING MACHINE

Alain Bagolin, Dijon, and Joël Gay, Saulon La Chapelle, both of France, assignors to Frimair S.A., Longvic, France

Filed May 28, 1986, Ser. No. 869,015
Claims priority, application France, Jun. 5, 1985, 85 08458
Int. Cl.[4] F26B *21/10*
U.S. Cl. 34—77 **10 Claims**



1. A dry cleaning machine comprising: a rotating drum (1) disposed in an enclosed chamber (2); an air flow duct (3) in a closed-loop relationship with the chamber (2); means (4) for impelling air through the air flow duct (3) toward the chamber (2) and a cooling circuit having an evaporator (10) disposed in the air flow duct (3) and a single condenser (6) disposed therein downstream of the evaporator (10) as considered in the direction of air flow in the air flow duct (3), wherein a temperature control circuit (11) having an internal heat exchanger (12) is interlaced at least to some extent with the condenser (6) in the air flow duct (3); and means (13) to control the flow of a fluid in the control circuit (11) and to operate in dependence upon the pressure in the cooling circuit.

4,694,589

ELASTOMERIC SHOE INNERSOLE

James B. Sullivan, and Richard B. Box, both of Perseverance Way, Hyannis, Mass. 02601

Continuation of Ser. No. 777,459, Sep. 18, 1985, Pat. No. 4,627,178, which is a division of Ser. No. 470,638, Feb. 28, 1983, Pat. No. 4,581,187. This application Dec. 9, 1986, Ser. No. 939,746

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] A43B *13/40*

U.S. Cl. 36—44 **15 Claims**



1. A molded shoe innersole for employment in footwear to provide support and cushioning to the foot, which innersole comprises a contoured heel and arch section having a generally flat, lower surface and a heel and arch, contoured top surface, the heel and arch sections contoured to provide a contoured arch section and a heel cup section composed of a molded, resilient, elastomeric, open-cell, polyurethane foam material of low compression set, and a top flexible sheet material bonded to the upper surface of the heel section said lower surface of the heel and arch section tapering into the plane of the bottom surface of the said sheet material.

4,694,590

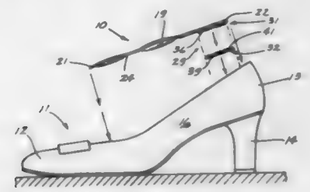
ARCH SUPPORT UNIT AND METHOD OF FORMATION

Kent S. Greenawalt, 1100 Mela Dr., Dubuque, Iowa 52001

Filed Apr. 3, 1986, Ser. No. 847,679

Int. Cl.[4] A43B *7/22*

U.S. Cl. 36—91 **1 Claim**





1. A separable fastener device adapted for use in securing a removable arch support to an internal portion of a shoe comprising:

first and second pads, said first pad comprising a circular, rigid planar element, with a second pad comprising a circular planar second element;

means applied to one side of said first element for attaching said first element to said removable arch support;

surface bearing pressure responsive adhesive means applied to one side of said second element for attaching said second element to said internal portion of said shoe; and

means attached to each of the other sides of said first and second elements providing releasable interengagable mating surfaces on said other sides wherein said mating surfaces engage upon pressing together said surfaces and release upon pulling said surfaces apart;

and further wherein a portion of the arch support is cut away and with an outer edge of said first element inserted within said cut away area such that the periphery of the arch support about said cut away area overlaps said first element outer edge.

4,694,591

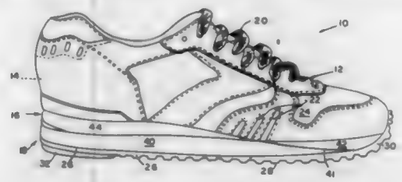
TOE OFF ATHLETIC SHOE

Howard P. Banich, Grand Rapids, and Daniel E. Norton, Rockford, both of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Filed Apr. 15, 1985, Ser. No. 723,197

Int. Cl.[4] A43B *5/00, 13/18, 23/08, 13/12*

U.S. Cl. 36—102 **5 Claims**



1. An athletic shoe having an outsole, an upper, and a midsole subassembly therebetween, said midsole subassembly comprising:

a compressible layer having a rear portion extending forwardly from the rear of the shoe toward the toe of the shoe but terminating short of the front end of the shoe in a tapered front zone;

said layer also having a highly compressible toe off pad with a tapered rear zone overlapping and bonded integrally with said tapered front zone;

said toe off pad underlying the toe area of the shoe and having a density substantially less than that of said rear portion, and sufficiently low to allow the user's metatarsals to sink into said toe off pad during toe off action;

said athletic shoe including a lower layer and an upper compressible layer bonded to said lower layer and extending forwardly from the rear of the shoe but terminating short of said toe off pad and wherein said upper layer is formed of overlying, laterally tapered wedge portions of different density, the wedge portion having a thicker edge on the medial side being of substantially greater density than that of the wedge portion having a thicker edge on the lateral side; and

said upper layer having an integral, upstanding stability heel cup, the medial side of which is of said greater density material and the lateral side of which is of the lesser density material.

4,694,592

CLOSURE DEVICE PARTICULARLY FOR REAR ENTRANCE SKI BOOTS

Giorgio Baggio, San Martino Di Lupari, and Renzo Balbinot, Vittorio Veneto, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 3, 1986, Ser. No. 815,858

Claims priority, application Italy, Jan. 11, 1985, 20468/84 [U]

Int. Cl.[4] A43B *5/04*

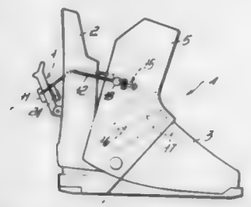
U.S. Cl. 36—117 **6 Claims**

1. In a ski boot with a longitudinal extension a widthwise extension and an upwards extension and having a shell with a front quarter formation and a rear quarter formation hinged thereon to oscillate about an axis extending in said widthwise direction,

a closure device for closing said rear quarter formation relative to said front quarter formation, comprising

a lever articulated to the rear portion of said rear quarter formation about an axis extending in said widthwise direction to assume a first angular position when said closure device performs its closing function and a second angular position when said closure device leaves open said front quarter formation and said rear quarter formation relative to each other, said lever having guide means formations thereon, said lever having a first side facing towards said rear quarter formation when said lever is in said first angular position and a second side opposite to said first side and facing away from said rear quarter formation when said lever is in said first angular position thereof, said second side facing towards said rear quarter when said lever is in said second angular position thereof and said first side facing away from said rear quarter formation when said lever is in said second angular position thereof,

a block member slidable on said lever at said first side



thereof along said guide means formations thereof, said block member having locking means thereon for selectively locking at said first side of said lever said block member in a selected position along said guide means formations,

control means for selectively controlling the locking action of said locking means, said control means being arranged at said second side of said lever,

cable means associated with said block member and having at least one portion thereof secured to said front quarter formation, and

further guide means in said rear quarter formation and in said front quarter formation for guiding therein said cable under operation,

thereby to allow an adjustable closing and opening degree of said rear quarter formation with respect to said front quarter formation when said lever assumes said first and said second angular position depending on the locking position of said block member on said lever member.

4,694,593

SKI BOOT WITH SPRING ACTION FLEX CONTROL

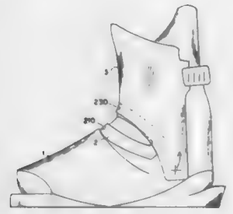
Roland Petrini, Chambéry, and Joseph Morell, Annecy-Le-Vieux, both of France, assignors to Salomon S.A., Annecy, France

Filed Jan. 13, 1984, Ser. No. 570,643

Claims priority, application France, Jan. 14, 1983, 83.00796

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—120 **37 Claims**



2. A ski boot comprising a rigid shell base on which a cuff is journalled to pivot around a transverse axis, and flexion means for affecting the flexional characteristics of the cuff, said flexion means comprising a dihedral shaped spring member positioned between said cuff and said shell base, said spring member being a unitary element distinct from said cuff and/or shell base, whereby said spring member may be removed and replaced as desired, said spring member being positioned to at least partially extend around the instep of the boot and being adapted to work in tension as well as compression.

4,694,594

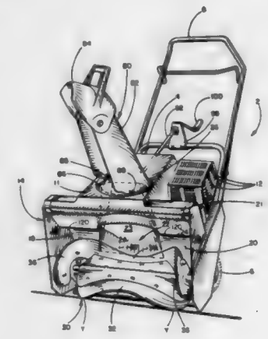
SINGLE STAGE SNOWTHROWER

Richard A. Thorud, Bloomington, and Donald M. White, III, Chanhassen, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Sep. 12, 1985, Ser. No. 775,288

Int. Cl.[4] E01H *5/09*

U.S. Cl. 37—244 **35 Claims**



1. An improved single stage snowthrower of the type having a housing that includes a generally open front portion defined by spaced side walls connected together by a rear wall; a rotatable snowthrowing impeller extending between the side walls and located in front of the rear wall; and engine means carried by the housing for rotating the impeller: and wherein the improvement comprises:

an impeller having at least one outwardly extending paddle for picking up and throwing snow, wherein the paddle comprises:

(a) a central snowthrowing section which extends over at least the middle one-half of the entire paddle's length, wherein the central section is curved forwardly from the midpoint to each side thereof to be generally concave such that snow is thrown in a stream that tapers inwardly as it rises from the central section;

(b) two end sections located on each side of the central section which fill out the remaining length of the paddel, wherein each end section comprises a relatively small portion of one turn of a helical auger having a relatively small pitch in relation to the paddle's length; and

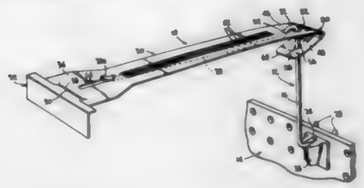
(c) wherein the central snowthrowing section faces forwardly with respect to a radial line extending from the axis of rotation of the central section, wherein the amount of the forward facing is from 5° to 20° at the midpoint of the central section and is approximately 0° at each side of the central section.

4,694,595

PRODUCT INFORMATION DISPLAY TAG

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Filed Jan. 19, 1986, Ser. No. 876,166
Int. Cl.[4] A47F *7/00*
U.S. Cl. 40—19.5 **11 Claims**



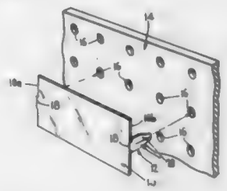
1. An elongate product information and display tag blank of plastic sheet comprising an elongate portion and an adjacent mounting portion particularly adapted for securing the blank on a skyhook structure having vertical and horizontal limbs joining at a hump-like bend between the vertical and the horizontal limbs of the structure, the mounting portion having an inboard section adjacent the elongate portion, an outboard section connected to the inboard section by a transverse bend line and a proximal end, the outboard section extending from the bend line to the proximal end of the blank, a pair of axially located longitudinally spaced apertures formed in the inboard section, a first axial slit connecting the apertures, a further axially located aperture in the outboard section, and a second axial slit extending from the proximal end into said further aperture.

4,694,596

MERCHANDISE INFORMATION TAG WITH IMPROVED MOUNTING PORTION

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 422,010, Sep. 23, 1982, Pat. No. 4,539,766, which is a continuation-in-part of Ser. No. 358,925, Mar. 17, 1982. This application Apr. 23, 1985, Ser. No. 726,357
Int. Cl.[4] G09F *3/08*
U.S. Cl. 40—20 R **3 Claims**



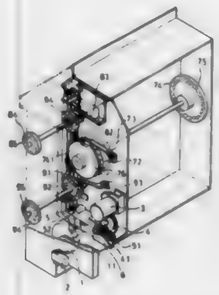
1. A merchandise information tag comprising a body member of plastic sheet material including a substantially planar sheet material body portion and sheet material projections integral with the body portion extending respectively in the same plane as said body portion from opposite sides of the body portion, neck portions connecting said projections to said body portion so that said projections can be folded substantially at right angles to said body portion for insertion in spaced holes of a perforated board structure or the like for mounting the body portion substantially face-to-face with a surface of the perforated board structure when the projections are extended behind the body portion, wherein each projection has a base portion with parallel sides adjacent the neck portion, and an end portion with tapered converging sides, and wherein each projection is slit longitudinally into a pair of fingers to be squeezed together when inserted in the respective opening for holding the projection in the opening by friction.

4,694,597

ELECTRIC PERPETUAL CALENDAR

Shou Kuei-Wen, No. 160, Chin Chou St., Taipei City, Taiwan

Filed Oct. 15, 1985, Ser. No. 788,204
Int. Cl.[4] G09D *3/10*
U.S. Cl. 40—117 **4 Claims**



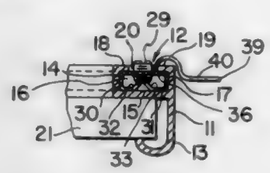
1. An electric perpetual calendar, comprising:
(a) a calendar housing;
(b) a drive wheel rotatably journalled in said housing and adapted to be rotated by a respective gear through one cycle per 24 hours, and said drive wheel having on its peripheral edge a cam formation for actuation of a respective micro-switch;
(c) a gear mounted in said housing for rotating said drive wheel through a respective cycle;
(d) a micro-switch mounted in said housing and arranged in an electric circuit including at least one motor, whereby said micro-switch can be actuated by rotation of said drive wheel and contact of its cam formation;
(e) an eccentric wheel journalled in said housing and including a pin, said eccentric wheel being driven to rotate by said at least one motor;
(f) a retractable rod having a first, front end and a second, rear end remote from said front end, said front end having a slot formation for operatively receiving therein said pin of said eccentric wheel; and said rear end of said retractable rod being connected to respective pulling rods for control of the date and week-day indication in said calendar; and said retractable rod including a fulcrum about which said retractable rod is pivoted to swing up and down due to the respective movements imparted to it by said eccentric wheel and said pin in said slot formation;
(g) a first pulling rod for setting a date, said first pulling rod having a first, top end and a second, lower end remote from said top end, said top end being biased by a respective spring, and said lower end being operatively connected to said retractable rod, and said lower end having a notch formation and a formation for securing a respective string;
(h) a spring operatively connected in said calendar housing and at said top end of said first pulling rod;
(i) a first positioning piece mounted laterally at said first pulling rod, said first position piece being adapted to operatively engage a respective ratchet wheel upon the changing of a date being completed;
(j) a ratchet wheel rotatably mounted on a respective shaft in said housing for cooperation with said first positioning piece;
(k) a second pulling rod for setting a month in said calendar, said second pulling rod having a first, top end biased by a respective spring, and said second pulling rod also having a notch formation;
(l) a spring operatively connected in said calendar housing and at said top end of said second pulling rod;
(m) a second positioning piece mounted laterally at said second pulling rod, said second positioning piece being adapted to operatively contact a respective ratchet wheel;
(n) a ratchet wheel rotatably mounted on a respective shaft in said housing for cooperation with said second positioning piece so as to be fixed in position on rotation;
(o) a control lever operatively mounted a said second pulling rod, said control lever having a first, front arm and a second, rear arm remote from said first arm, said front arm adapted to operatively contact a notch formation on a respective cam wheel, and said rear arm being adapted to engage said notch formation in said first and second pulling rods, whereby said first pulling rod for setting the date in said calendar and said second pulling rod for setting the month in said calendar are jointly moved so as to change the month;
(p) a cam wheel having at least one notch formation, said cam wheel mounted on a respective shaft in said housing;
(q) a third pulling rod for setting a week-day in said calendar, said third pulling rod having a first, top end and a second, lower end remote from said top end, said top end biased by a respective spring, and said lower end being operatively connected to said retractable rod;
(r) a spring operatively connected in said calendar housing and at said top end of said third pulling rod;
(s) a positioning piece laterally secured at said third pulling rod and adapted to operatively contact a respective ratchet wheel;
(t) a ratchet wheel operatively mounted on a respective shaft in said calendar housing for cooperation with said positioning piece of said third pulling rod for being engaged and fixed thereby upon a week-day being changed; and
(u) for each pulling rod at least one shaft operatively journalled in said housing;
(v) for each pulling rod at least one pair of loose-leaf mounting wheels, with each pair being mounted on the respective shaft of the associated ratchet wheel, and about the rim of said wheels a plurality of holes is furnished for mounting respective loose-leaf date indicators; and
(w) a plurality of loose leaves indicative of date, week-day, and month in said calendar, respectively arranged on corresponding pairs of wheels;
wherein upon said first and second, date pulling rods and said third, week-day pulling rod being pulled downwards, the respective ratchet wheels wll drive respective loose-leaf mounting wheels to rotate respectively to change the date and the week-day; and
wherein said first, date pulling rod can, by way of said control lever, drive said second, month pulling rod downwards to cause the respective ratchet wheel to rotate the respective pair of loose-leaf mounting wheels for changing the loose-leaf indicative of the month.

4,694,598

COMPRESSION CLAMP FOR A PICTURE FRAME

Helmut Eisenloeffel, North Royalton, Ohio, assignor to Valco/-Valley Tool & Die, Inc., North Royalton, Ohio

Filed Aug. 21, 1986, Ser. No. 898,636
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—155 **3 Claims**



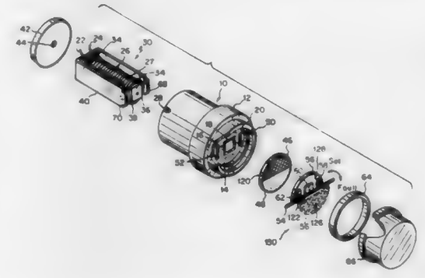
1. A clamping device for attaching a first member to a second member which has a longtudinally extending channel with a rectangular cross-section which is defined by a flat bottom wall, a pair of sidewalls extending from the bottom wall in parallel relation, and a pair of flanges which extend from the sidewalls in aligned parallel relation with the bottom wall and which terminate in spaced relation to form an opening between them, the device comprising:
(a) at least one flat plate which is designed to rest in close proximity to the flanges, the plate having at least one opening therein, the opening being located between the flanges;
(b) a screw threadably received in the opening and rotatable therein to and from the bottom wall of the channel, the screw having a flat distal end within the channel closest the bottom wall, the screw having a diameter which is at least as large as the diameter of the opening;
(c) a pair of resilient arms extending from opposing marginal edges of the plate on opposite sides of the opening, the arms extending along the adjacent sidewalls and then towards each other partially along the bottom wall and then terminating at distal ends which converge towards each other in the direction of the opening and terminate in closely spaced relation to engage the flat end of the screw, the spacing between the distal ends of the arms being less than the diameter of the screw to prevent the screw from passing between them;
the screw, when rotated towards the bottom wall, designed to engage the distal ends of the arms and force them apart and towards the bottom wall to move the arms and attached plate into compressive engagement with at least the bottom wall and flanges of the channel.

4,694,599

ELECTROMAGNETIC FLIP-TYPE VISUAL INDICATOR

Robert D. Hart, Collinsville, and John J. Ambrozaitis, Waterbury, both of Conn., assignors to Mineico, Inc., Thomaston, Conn.

Filed Nov. 27, 1985, Ser. No. 802,647
Int. Cl.[4] G09F *9/00*
U.S. Cl. 40—449 **26 Claims**



1. An electromagnetic indicator for providing binary indication of first and second conditions comprising:
a housing;
a flag assembly rotatably mounted in said housing so that said flag assembly is rotatable between a first and a second position, said first position indicating said first condition and said second position indicating said second condition, said flag assembly being permanently magnetized in at least one portion;
magnetic latching means comprising bracket means having a first end and a second end, and a core bar means, said bracket and core bar means being mounted within said housing so that said ends of said bracket and core bar means are near said flag assembly;
electromagnetic means mounted within said housing, said electromagnetic means comprising at least one electromagnet having a core and a winding therearound, said electromagnetic means having first and second ends, said bracket means being magnetically connected to said first

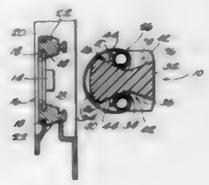
end of said electromagnetic means, said second end of said electromagnetic means being magnetically connected to said core bar means and being near said flag assembly, said winding being connectable to an electrical power source so that when said electromagnetic means is connected to said electrical power source said electromagnetic means is able to generate a magnetic field whereupon said bracket means, said ends of said bracket means and said core bar means become magnetized to produce a magnetic field, the magnetic field of said ends of said bracket means and said core bar means interacting with the magnetic field of said magnetized portion of said flag assembly to cause said flag assembly to rotate from said first position to said second position and become magnetically latched in said second position by the magnetic attraction between said ends of said bracket means and said core bar means and said magnetized portion of said flag assembly, or to cause said flag assembly to rotate from said second position to said first position and become magnetically latched in said first position by the magnetic attraction between said ends of said bracket means and said core bar means and said magnetized portion of said flag assembly, said magnetic latching to continue after said electromagnetic means is disconnected from said electrical power source.

4,694,600

INDICIA DISPLAY MODULE USING LIGHT PIPE

Ledell L. Murray, Noblesville, Ind., assignor to General Indicator Corporation, Pardeeville, Wis.

Filed Sep. 27, 1982, Ser. No. 423,692
Int. Cl.[4] G09F *11/18*
U.S. Cl. 40—518 **3 Claims**



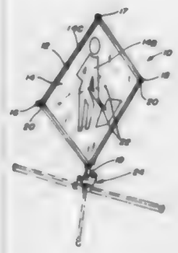
1. A display module comprising,
a bezel having an aperture therein,
a clear plastic light pipe mounted on the back of the bezel and having a rearwardly facing surface which accepts light,
said light pipe having opposed sides which converge and then diverge going from the rear to the front of the module,
said light pipe having a generally flat front surface through which light is emitted, the light entering the rear surface being internally reflected forward to the front surface,
a coiled generally opaque indicia strip having translucent or transparent indicia thereon, the coiled ends of the strip being supported in the cavities on opposing sides of the light pipe which cavities are formed by the converging and diverging sides whereby the strip extends across the front of the module between the light pipe and the bezel and selected indicia on the strip are displayed at the aperture.

4,694,601

PORTABLE COLLAPSIBLE HIGHWAY SIGN

Grant D. Dicke, Downers Grove, and Jeffrey A. Williams, Bolingbrook, both of Ill., assignors to Dicke Tool Company, Downers Grove, Ill.

Filed Nov. 18, 1985, Ser. No. 799,302
Int. Cl.[4] G09F *10/00*
U.S. Cl. 40—610 **11 Claims**



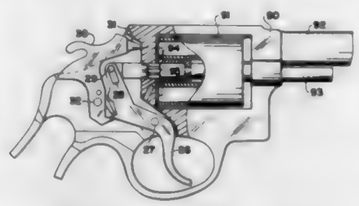
10. An improved portable collapsible sign comprising:
a flexible panel,
a frame comprising four (4) rigid arms attached to a rigid central web, wherein said central web is composed of four (4) channel sections firmly secured to a rigid plate enabling each of said arms to be pivotally mounted through one of said channels of said central web,
fastening means attaching said message panel to said arms and said central web,
releasably securing means attached to each of said arms and to protrude through a hole in each of said channel sections for locking said arms in an extended position in the form of a cross and firmly holding said message panel in position,
pivot means connecting said arms to said central web to enable said arms and, said sign panel to be folded down in a single direction of fold and form a compact bundle whereby the panel is fastened to the inward side of each arm so as to be within the arms when folded and having large area fastening means.

4,694,602

REVOLVER HANDGUN

Klaus O. M. Pust, 935 Ashton St., Jacksonville, Fla. 32208

Filed Jun. 17, 1986, Ser. No. 875,069
Int. Cl.[4] F41C *1/00, 1/02*
U.S. Cl. 42—59 **8 Claims**



1. A revolver handgun having a revolving cylinder, a trigger and hammer mechanism that causes the cylinder to rotate when the hammer or trigger is moved, and an extractor assembly with a star shaped head, a central bore, and a shaft; said mechanism including a transfer rod having a transverse pin therein and being slidably mounted in said bore to move linearly therein when said trigger is pulled or said hammer is moved; said trigger having an upwardly extending member with a slot therein which engages said pin and is adapted to cause said rod to slide in said bore when said trigger or said hammer is moved; one of said rod and said bore having a

network of grooves on its surface to mate with a plurality of radially directed protrusions on the surface of the other of said rod and said bore whereby linear movement of said rod causes progressive radial rotation of said extractor assembly, said shaft of said extractor assembly being mounted in a central bore in said cylinder by means permitting relative linear movement but no relative rotational movement, said network of grooves providing a pathway of repeating cam sections each having a first location where said trigger and hammer are in their normal positions after firing, and a second location where said cartridge primer and said hammer are aligned and said trigger and hammer are in firing position.

4,694,603

FISHING DEVICE

Laurel L. Anderson, 6721 23rd Ave., Kenosha, Wis. 53140

Filed Jan. 9, 1986, Ser. No. 817,453
Int. Cl.[4] A01K *97/10*
U.S. Cl. 43—21.2 **17 Claims**



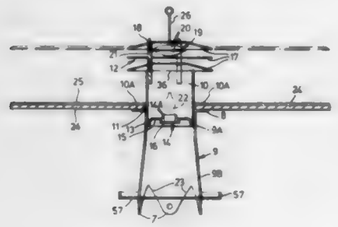
1. A fishing device particularly useful for ice fishing comprising a supporting stand, a fishing pole having a rod and a handle, a reel mounted on said handle, means pivotally mounting the fishing pole to the supporting stand at a pivot point intermediate the reel and the forward end of the rod, and means for adjusting the mounting of the reel to the handle lengthwise of the handle to achieve a balance of the fishing pole about said pivot point.

4,694,604

GAS OR VAPOR DISPERSING APPARATUS

Arthur W. Mitchell, Sandyacre, 18 Ballyardle Road, Kilkeel, County Down, Ireland

PCT No. PCT/GB81/00133, § 371 Date Mar. 9, 1982, § 102(e) Date Mar. 9, 1982, PCT Pub. No. WO82/00079, PCT Pub. Date Jan. 21, 1982
Continuation-in-part of Ser. No. 843,878, Mar. 26, 1986, abandoned, which is a continuation of Ser. No. 783,065, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 359,652, Mar. 9, 1984, abandoned. This PCT application Jul. 7, 1981, Ser. No. 901,999
Claims priority, application United Kingdom, Jul. 8, 1980, 8022349; Mar. 6, 1981, 8117035
Int. Cl.[4] A01M *1/02, 1/14, 5/06, 13/00*
U.S. Cl. 43—114 **18 Claims**



1. Apparatus for dispersing a gaseous or vaporized pheromone into the atmosphere, comprising a first housing within which at least one pheromone-releasing source holding means is located, the housing having at its top and outlet, upward-draft creating means provided on said first housing which has adjacent to or below the, or each holding means, air introducing means, wherein the upward-draft creating means is mounted over the outlet, and comprises a series of annular vanes, the uppermost and lowermost of which are parallel and of frusto-conical shape or substantially of frusto-conical shape, a central aperture in each said vane, a common axis about which the vanes are centered and arranged in predetermined vertical spaced relationship, a plurality of supports parallel to and radially spaced from said axis, the lowermost of said vanes converging inwardly toward the next upper vane which is usually horizontal and planar in a diameter towards the common axis but may have a frusto-conical profile of shallower angle than the uppermost and lowermost vane forming a venturi, a device of aerodynamic shape mounted co-axially with the vanes and located between the upper two vanes, the device masking but not closing the central apertures in said vanes, and having upper and lower cone-like or dish-shaped air-deflecting walls arranged base-to-base about said common axis, the upper wall of the device being parallel or substantially parallel to the uppermost and lowermost vanes.

4,694,605

MOSQUITO ELIMINATOR

Armando Garcia, 4821 Cheryl St., Corpus Christi, Tex. 78415, and David V. Nesmith, 3805 Reynosa St., Corpus Christi, Tex. 78416

Filed Jul. 31, 1986, Ser. No. 891,373
Int. Cl.[4] A01M *3/02*
U.S. Cl. 43—137 **6 Claims**



1. An adjustable switch device which can be used selectively in swatting insects and the like or as a brush, the device comprising a plurality of strand elements formed into a switch, a tubular handle and an adjustable securing means attaching the switch into the handle for adjustable and selective movement of the switch therein to expose different lengths of the strands from one end of the handle as required, said securing means comprising a length of cord securing a rear end of the switch to the part of the handle remote from said one end for movement of the switch between a fully retracted position within the handle and a fully extended position in which at least a major length of the switch is exposed from said one end, said handle having a cap on the end opposite said one end and said cord being trapped between the handle and the cap.

4,694,606

SEEDING PROCESS AND APPARATUS

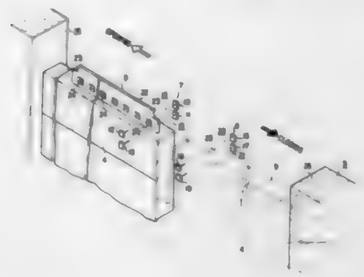
Donald C. Wood, and James D. Wood, both of 2810 Camino Tassajara, Danville, Calif. 94526

Filed Mar. 5, 1985, Ser. No. 708,444
Int. Cl.[4] A01C *1/04*
U.S. Cl. 47—56 **16 Claims**

1. A device for planting seed tape in soil comprising:
a. a support structure;
b. means for moving said support structure along the surface of the soil;
c. means for advancing the seed tape relative to the movement of said support structure by said moving means, said seed tape advancing means and seed tape being mounted on said support structure;
d. a cutter, means driving said cutter to cause repeated severing of sections from the seed tape in timed relation

with the advancement of the seed tape by said means for advancing the seed tape; and,

e. means for folding each severed seed tape section and forcing a severed seed tape section from the support structure into the soil to a selected soil depth, said means for



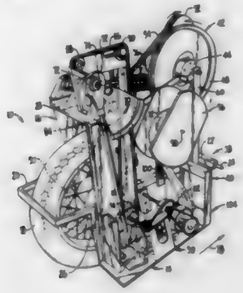
folding and forcing including means for maintaining each said seed tape section in a unitary form at said selected soil depth and means reciprocatingly mounting said folding and forcing means on said support structure for pendular, swinging movement.

4,694,607

APPARATUS FOR DETECTING DOOR MOVEMENT DATA IN AN AUTOMATIC DOOR SYSTEM

Takao Ishida, Kurobe; Yukio Yoshida, Namerikawa, and Kenzo Ohno, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,540
Claims priority, application Japan, Jun. 24, 1985, 60-135933
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—25 **9 Claims**



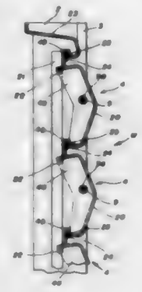
1. An apparatus for detecting door movement data in an automatic door system, comprising a door frame in which a slide door is provided so as to be freely moved in the opening and closing directions, an opening-direction sensor and a closing-direction sensor mounted on a horizontal member of said door frame, a dog having a predetermined horizontal length and mounted on said door, said dog having a plurality of actuating portions adapted to turn ON or OFF said opening-direction and closing-direction sensors and disposed on said dog at a predetermined space interval in the longitudinal direction thereof.

4,694,608

SECURITY BAR SYSTEM FOR LOUVERED WINDOW UNITS

Earl B. Lambert, 9-1 Peppertree Ter., Christiansted, St. Croix, V.I. 00820

Filed Jun. 2, 1983, Ser. No. 501,636
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—50 **14 Claims**



1. A security bar system for windows and window openings in which each has a defined open or openable area surrounded by a solid structure comprising:

a. at least one cylindrical cut resistant bar member having a sufficient length to extend across the open area;

b. apertures in each end of said bar member;

c. a pair of stub shafts rotatably mounted in said apertures where said bar member and stub shafts freely rotate;

d. a pair of mounting apertures in the solid structure surrounding the open area for receiving one end of the stub shaft; and

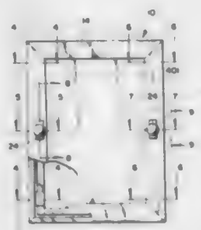
e. a cylindrical, cut resistant sleeve rotatably mounted on said bar member and covering the bar and the exposed area of said stub shafts.

4,694,609

DOUBLE-HUNG CLOSURE FOR ACCESS OPENINGS

Mohammad T. Torabi, 6657 S. Pearose Ct., Littleton, Colo. 80121

Filed Dec. 15, 1986, Ser. No. 941,760
Int. Cl.[4] E05D *15/50*
U.S. Cl. 49—193 **8 Claims**



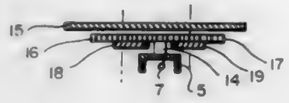
1. For use in combination with an access opening bordered by a fixed frame and a cover therefor, the improved assembly for hinging the cover to open from either side of the frame which comprises: an outer movable frame and an inner movable frame, the inner movable frame being positioned inside the outer movable frame and each being movable independently relative to the other; a first hinged connection hingedly attaching the inner movable frame to the fixed frame on one side of the fixed frame; a second hinged connection having a hinge axis paralleling said first hinged connection hingedly attaching the inner movable frame to the access opening cover on the other side of said access opening; a third hinged connection with a hinge axis in common with said second hinged connection hingedly attaching the outer movable frame to the fixed frame on said other side of the access opening; and, a fourth hinged connection with a hinge axis in common with said first hinged connection hingedly attaching the outer movable frame to the access opening cover on said one side of the access opening, said inner movable frame and access opening cover cooperating with one another and with the first and fourth hinged connections to define a first unitary subassembly operative to cover and uncover the access opening by hinging the cover therefor on said one side of the latter, and said outer movable frame and access opening cover cooperating with one another and with the second and third hinged connections to define a second unitary subassembly operative to cover and uncover the access opening by hinging the cover therefor on said other side of the latter.

4,694,610

CABLE WINDOW LIFT FOR VEHICLES

Lothar Horuivius, Ehringshausen, Fed. Rep. of Germany, assignor to Kuster & Co. GmbH, Ehringhausen, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,703
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—351 **4 Claims**



1. A cable window lift mounted in a vehicle for adjusting a one piece window pane with a plane having a shortened lateral groove guidance on one side of said pane, comprising:

(a) a vertical U-shaped guide rail;

(b) a continuous cable mounted for vertical movement in said guide rail;

(c) a drive roller connecting said cable for actuating said vertical movement;

(d) a brace joined to the lower edge of said window pane and having guidance groove means extending perpendicularly to said vertical U-shaped guide rail;

(e) means connecting said brace to said cable and for sliding on said guide rail; and

(f) a first support arm having a first end engaging said guidance groove means and a second end rigidly joined to a first gear, a second support arm having a first end engaging said guidance groove means and a second end rigidly joined to a second gear, said first and second gears mutually meshing and mounted for rotation on a plate which, in turn, is mounted on said guide rail,

whereby said support arms prevent tilting of said window pane in the direction of said plane of said window pane.

4,694,611

CONSTRUCTION OF DOOR FRAME IN MOTOR VEHICLE

Katsuhiro Okumura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Aug. 15, 1985, Ser. No. 765,932
Claims priority, application Japan, Aug. 24, 1984, 59-128069[U]
Int. Cl.[4] E05D *15/16;* **E06B** *7/16*
U.S. Cl. 49—441 **6 Claims**

1. A construction of a vehicle door, comprising:

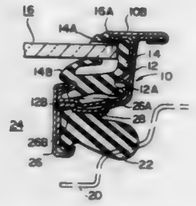
a door frame mounted on the vehicle door for slidably supporting a door glass;

a guide portion formed on said door frame for receiving an end edge of said door glass, said guide portion being substantially vertically disposed along said door frame;

a seal member connected to said guide portion for sealingly engaging said end edge and for guiding said door glass being slidably positioned along said guide portion;

a door weather strip;

a channel formed on said door frame for supporting said door weather strip and for positioning said door weather strip in contact with a vehicle body when the door is closed, said guide portion and said channel being formed of a plate having a substantially two-ply configuration for



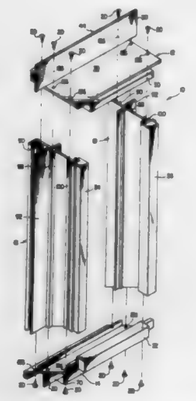
reinforcing said channel and said guide portion, the two-ply configuration of said plate defining wall members for said channel and said guide portion, said plate also defining an enclosed section formed between said wall members for providing engagement between said wall members to increase the rigidity of said door frame, wherein said enclosed section has a generally elongated triangular shape, so that said wall member of said guide portion engages said wall member of said channel to brace said wall members and thereby control the deformation of said enclosed section.

4,694,612

WOOD-CLAD ALUMINUM WINDOW FRAME AND ASSOCIATED WINDOW ASSEMBLY

Charles W. Pruden; Alfred P. McEvoy, and Charles S. McEvoy, all of Dallas, Tex., assignors to Western Extrusions Corporation, Carrollton, Tex.

Filed Oct. 9, 1986, Ser. No. 916,839
Int. Cl.[4] E05F *1/00*
U.S. Cl. 49—445 **31 Claims**



1. A wood-clad metal window frame comprising:

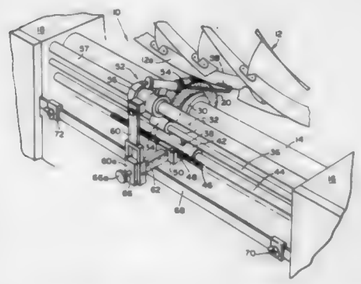
(a) an elongated metal head section having an interior side edge portion, a wood facing member secured to and extending along said interior side edge portion, an exterior side edge portion, and lip and flange means extending along its length;

(b) an elongated metal sill section having an interior side edge portion, a wood facing member secured to and extending along said interior side edge portion of said sill section, an exterior side edge portion, and lip and flange means extending along its length;
(c) a pair of elongated metal jamb sections each having an interior side edge portion, a wood facing member secured to and extending along said interior side edge portion of said jamb section, an exterior side edge portion, and lip and flange means extending along its length; and
(d) means for intersecting said head, sill and jamb sections to thereby form an assembled essentially all- metal window frame insertable into a preformed window opening in a wall having an interior surface and an exterior surface, said assembled frame being dimensioned to extend essentially entirely through said preformed window opening when inserted thereinto and having an interior side and an exterior side, said lip and flange means defining in said assembled window frame;
(1) an integral J-channel extending completely around the exterior side periphery of said frame and adapted to peripherally inwardly receive and conceal a portion of an exterior siding material defining said exterior surface of said wall,
(2) an integral, outwardly projecting nailing and flashing flange extending around the exterior side periphery of said frame inwardly adjacent said integral J-channel, and
(3) an integral pair of jamb channels each defined by a spaced pair of vertically extending, peripherally inwardly projecting jamb flanges, each pair of said jamb flanges being adapted to releasably engage and retain a side edge portion of an elongated sash-supporting balance member capable of movably supporting a pair of wooden window sashes,
said wood facing members collectively defining in said essentially all-metal assembled window frame an interior wood border which provides said frame with an all-wood interior appearance, and inhibits inward and outward heat flow through said frame.

4,694,613
RELIEF GRINDING OF LAWN MOWER CYLINDRICAL BLADES

Stephen Bernhard, Rugby, England, assignaor to Atterton and Ellis Limited, England

Filed Feb. 6, 1986, Ser. No. 826,606
Claims priority, application United Kingdom, Feb. 7, 1985, 8503151
Int. Cl.[4] B24B *7/00*
U.S. Cl. 51—34 C **4 Claims**



1. A grinding machine for relief grinding the blades of a lawn mower blade cylinder comprising:
housing means for supporting parts of the grinding machine;
a drive shaft rotatably supported by said housing means;
a grinding wheel mounted on said drive shaft for rotation therewith and for axial movement therealong;
separate first, second and third fixed shafts supported by said housing means;
a fork assembly comprising at least one fork arm for coupling said fork assembly to said grinding wheel and a first sleeve for carrying said fork assembly on said first fixed shaft, said first sleeve being axially movable along said first shaft;
traverse means for causing the axial traverse of said fork assembly and said grinding wheel coupled thereto, and for automatically reversing the direction of travel of said fork assembly so that said grinding wheel reciprocates along said drive shaft during rotation thereof;
a blade guide assembly compriting a guide finger, a guide element and, a second sleeve carrying said guide finger and guide element, said second sleeve being axially slidable along said second fixed shaft, and said guide finger being engagable with that face of a blade to be ground which is remote from said grinding wheel;
a third sleeve mounted for axial slidable movement on said third fixed shaft and being connected to said fork assembly for transmitting axial movement to said fork assembly from said traverse means; and
connecting means including locking means for releasably coupling both said blade guide assembly and said fork assembly with said traverse means so that said traverse means, said fork assembly and said blade guide assembly can traverse together whereby the back face of the blade to be ground is maintained in constant engagement with the grinding wheel.

4,694,614
MULTIPURPOSE POLISHER

Yang C. Shyang, P.O. Box Taichung 2103, Taichung, Taiwan

Filed Aug. 21, 1986, Ser. No. 898,580
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—141 **3 Claims**



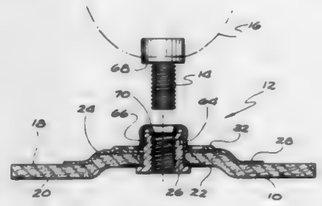
1. A multi-purpose polisher comprising:
a base having a stand and an openable cover,
a column vertically mounted on the base and having a fixing recess in an appropriate place and a fixing pin at the top end,
a pulley support fixed to the column with said fixing pin and having a wheel axle,
an upper pulley fitted on the said wheel axle,
an abrasive belt fitted in the column and on the upper pulley,
a work stand being in L shape and having a long slot in the vertical piece and a short slot in the horizontal piece,
a work table fixed to the said work stand and being adjustable in height with the slot,
a support plate fixed to the back of the column and having a magnet in the plate as high as the work stand, and an upper knuckle and a lower knuckle,

a swivelling shaft having a vertical pivot pin for connecting with the upper and lower knuckles of the support plate by means of ball and socket joints, and a stop block for making the shaft stop in an appropriate place,
a radial frame having a stub fitted in the swivelling shaft, and a plurality of arm supports extending radially from the hub,
a plurality of support arms having slots at one end for fixing with the arm supports, and axles perpendicular to an arm axis, mounting a plurality of supporting wheels having rims in different shapes or widths;
said swivelling shaft being so arranged that any one of the supporting wheels can be selectively placed behind the abrasive belt and changed to another one of said supporting wheels to meet various requirements of polishing.

4,694,615
DISPOSABLE DEPRESSED CENTER GRINDING WHEEL HAVING AN INTEGRAL MOUNTING HUB

Joseph H. MacKay, Jr., 17551 Cabela Dr., San Diego, Calif. 92127

Filed Apr. 3, 1986, Ser. No. 847,793
Int. Cl.[4] B24B *45/00;* **B24D** *13/20*
U.S. Cl. 51—168 **16 Claims**



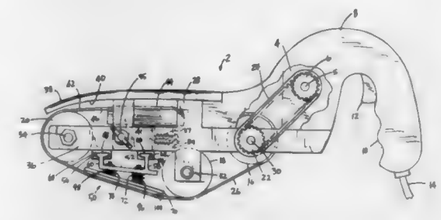
1. A depressed center grinding wheel having a disposable drive member backing flange non-removably affixed thereto for mounting on a rotatable shaft of a power tool comprising:
a grinding wheel having a face and a back with a depressed center, said depressed center extending from said face toward said back, said depressed center having a first centrally disposed aperture therethrough;
a backing flange having a diameter smaller than the diameter of said grinding wheel and defining a second centrally disposed aperture therethrough, said backing flange seated on said back of said grinding wheel over said depressed center with said first and second apertures aligned;
a retaining nut having a hollow internally threaded body having first and second ends, a first radially outwardly extending flange extending from said first end of said body, said body extending through said first aperture from said face toward said back with said flange seated against said face; and
means including said second end of said body for non-removably securing said retaining nut and said backing flange to said wheel without the use of adhesives while permitting relative axial movement between said retaining nut and said backing flange toward each other to thereby compress said wheel between said backing flange and said flange on said nut as grinding loads are applied to said wheel during use thereof.

4,694,616
REMOVABLE BELT-BACKING MECHANISM FOR A BELT SANDER

Robert C. Lindberg, Rte. 2, Box 306R, Dorchester, Wis. 54425

Filed Jun. 25, 1986, Ser. No. 878,415
Int. Cl.[4] B24B *23/06*
U.S. Cl. 51—170 EB **21 Claims**

1. A removable belt-backing mechanism for attachment to a belt sander having at least two rollers and an endless loop sanding belt therearound for forming a sanding span therebetween, said belt having an outer sanding surface and an inner surface engaged by said rollers, said belt sander being provided with belt tensioning means for performing the dual function of maintaining tension in said belt both when said belt-backing mechanism is attached to said sander and when said belt-backing mechanism is removed from said sander, so that the same belt can be used on said sander for sanding flat surfaces when said belt-backing mechanism is in place on said sander and for sanding curved surfaces when said belt-backing mechanism is removed from said sander, said removable belt-backing mechanism comprising:
attachment means for removable mounting of said belt-backing mechanism on said sander within said loop of said belt,



said attachment means including a bearing surface spaced away from the connection of said attachment means to said sander and toward said belt, said attachment means being adapted for removable interconnection with a receiving means provided on said sander;
plate means having a substantially flat surface movably connected to said attachment means; and
biasing means bearing between said bearing surface of said attachment means and said plate means for biasing said plate means away from said attachment means and toward the inner surface of said belt, so that a substantially flat sanding area is maintained along the portion of said sanding span-backed by said plate means when pressure is applied to said sanding span.

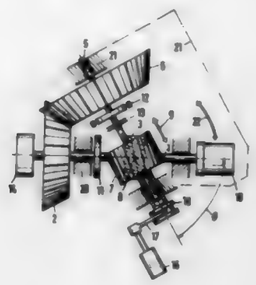
4,694,617
METHOD FOR THE PRECISION WORKING OF THE TOOTH SYSTEM OF BEVEL GEARS

Herbert Loos, Dorfen Stadt, and Manfred Erhardt, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,100
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506499
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—287 **3 Claims**

1. In a method for the precision working of the tooth system of a bevel gear workpiece by moving during rolling contact with a bevel-gear-shaped tool with axes which are spaced and crossed at a defined location, said tool having abrasive flank surfaces free of any uniformly directed cutting edges and a sufficient axial dimension so that engagement with said workpiece occurs from one axially facing side of said workpiece tooth system to the other, the improvement comprising wherein a guidegear pair is provided, orienting the crossed axes for said workpiece and said tool so that the common normal to the axes, extending a direction parallel to a plunge feed direction, is oriented externally of the confines of said workpiece and said tool, orienting and connecting each guide gear coaxially to a respective one of said workpiece and tool, each guide gear being selected so as to have the same speed ratio as said workpiece-tool pair, bringing both said workpiece-tool pair and also said guide-gear pair into a rolling

meshing engagement with normal backlash provided therebetween, controlling said engagement so that in one pair in each case only the right or the left tooth sides contact, while in the other pair the other tooth sides contact, and sequentially working said right flanks and said left flanks on said workpiece one after the other through means for effecting a flank change.



4,694,618

SANDING TOOL

Edward Eberhart, Northville, Mich., and Arlen E. Ingram, 32606 Barkley, Livonia, Mich. 48154, assignors to Arlen E. Ingram, Livonia, Mich.

Filed Mar. 31, 1986, Ser. No. 846,013
Int. Cl.[4] B24D *15/04*
U.S. Cl. 51—392 **3 Claims**



1. A manually operated sanding tool which comprises a support frame comprising a handle having embedded therein two proximal ends of a double run rod connected at the distal end by a bight portion, said runs being parallel and spaced apart in a plane, U-shaped loop supports having one leg provided with a right angle threaded extension to insert between and be clamped on said parallel runs, a threaded nut on each extension to clamp the supports to said parallel runs of said frame, and the other leg lying in spaced relation to said plane to provide longitudinally spaced loop supports, and a flat closed loop of abrasive material having each end of the loop respectively looped over said loop supports and retained in tension.

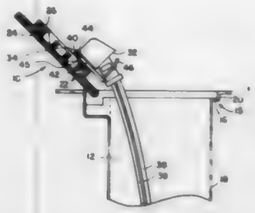
4,694,619

PIT COVER ASSEMBLY WITH FLOOD PROTECTION

Kathyleen A. Dabich, 7212 Patterson Dr., Garden Grove, Calif. 92640

Filed Apr. 8, 1986, Ser. No. 849,543
Int. Cl.[4] F16L *5/00*; E02D *29/14*
U.S. Cl. 52—20 **9 Claims**

1. In a sub-surface pit having a cover support, a cover having a top side and an underside hingedly mounted on said support above a hollow chamber and hingedly rotatable between raised and seated positions, the improvement comprising a hollow, concave cup formed of a rigid, water impervious material and having an open mouth and secured to said underside of said cover by means of a hinge mechanism and disposed so that said mouth faces downwardly when said cover is seated, whereby said cup is adapted to receive water sensitive equipment and to define an air pocket to protect said water sensitive equipment when water rises in said chamber to mouth of said cup, and said cup moves in rotation about said above the level of said hinge connection when said cover is moved between said raised and seated positions.

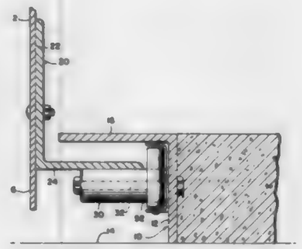


4,694,620

ROTATABLE BUILDING

Ralph E. Pope, 3680 Ryan Bluff Dr., Cumming, Ga. 30130

Filed Oct. 29, 1986, Ser. No. 924,269
Int. Cl.[4] E04B *1/346*
U.S. Cl. 52—65 **3 Claims**



1. A rotatable building comprising an annular vertical wall positioned above a fixed generally horizontal ground surface, and means for supporting the building for rotary movement and for prevention of binding when relative horizontal movement of the building and the ground surface occurs, comprising:

(a) a fixed annular member of right-angular cross sectional shape positioned within the lower part of the building wall and having a vertical flange with its free edge supported on the ground surface and a horizontal flange spaced above the ground surface and extending radially outwardly from the vertical flange with its free edge positioned inwardly of the inner surface of the building wall,

(b) a plurality of horizontal cylindrical rollers supported in an annular series and connected to the vertical flange of the annular member and extending radially outwardly therefrom toward and spaced from the inner surface of the building wall, and

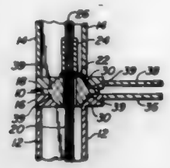
(c) an annular flat horizontal member extending radially inwardly from the building wall with its lower surface resting on and supported by the cylindrical surfaces of the rollers, with its inner edge spaced outwardly of the vertical flange of the fixed annular member.

4,694,621

MODULAR BUILDING CONNECTING MEANS

Reginald A. J. Locke, 184 Hooper St., San Francisco, Calif. 94107

Filed Nov. 7, 1984, Ser. No. 669,154
Int. Cl.[4] E04B *1/41*
U.S. Cl. 52—79.13 **15 Claims**



1. A steel building construction for fastening structural members of a steel building together comprising:

a plurality of rigid, solid connectors, circular in section, each with an axial bore, a flat top surface and bottom surface perpendicular to the bore, a ring-shaped flange midway between the top surface and the bottom surface, a first sloping surface extending from the top surface toward the flange, a second sloping surface extending from the bottom surface toward the flange, wherein the circumference of the connector as defined by the sloping surfaces increases as the flange is approached, a first vertical surface extending from said first sloping surface to said flange and a second vertical surface extending from said second sloping surface to said flange, said flange having an axial dimension less than a distance from said top surface to said flange;

a plurality of rods with a threaded first end and a threaded second end, the first end of each rod passing through the bore in a connector;

a plurality of coupler nuts, each located proximate to a connector and having a threaded through bore for receiving the first end of one rod and the second end of another rod; and

a plurality of spaced structural members of a building, each structural member having a mating portion defining a recess within each of its ends shaped to couple with the portion of the connector extending outward from one of the surfaces of the flange, each said mating portion of said structural member having a sloped surface complementary to one of said connector sloped surfaces and a vertical surface joined to said mating portion sloped surface and complementary to one of said connector vertical surfaces and offset from said connector vertical surface such that a gap is defined so that said structural member sloped surface may slide along said connector sloped surface when subjected to a horizontal force, the structural members being aligned with each other, with a string of the rods extending through the structural members, coupler nuts and connectors.

4,694,622

CONCRETE STRUCTURAL ELEMENTS, PROCESS AND DEVICE FOR MANUFACTURING THESE ELEMENTS

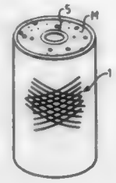
Pierre Richard, Neuilly Sur Seine, France, assignor to Bouygues, Clamart, France

Filed Jul. 26, 1985, Ser. No. 759,446
Claims priority, application France, Jul. 27, 1984, 84 11988; Jul. 27, 1984, 84 11987
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—223 R **14 Claims**

1. A block of uniformly compressed concrete formed by the steps of:

surrounding an area of liquid concrete with a hoop of resiliently stretchable wires crossing each other and passing between each other,

compressing the liquid concrete to stretch the hoop, and



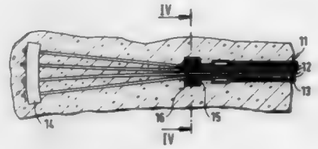
allowing the liquid concrete to harden while under compression to thereby produce a block of concrete uniformly compresses by the force of the hoop returning to its prestretched condition.

4,694,623

CLOSED RING-SHAPED REINFORCING MEMBER FOR A CONCRETE STRUCTURE

Gero Herrmann, Karlsfeld, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,867
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1984, 8437161
Int. Cl.[4] E04C *3/10, 5/12*
U.S. Cl. 52—223 L **12 Claims**



1. A closed axially extending ring-shaped reinforcing member to be embedded in and included within a concrete structure for laterally encircling at least one prestressing member, said reinforcing member being stressable by annular tension forces and preventing the transfer of such forces from said ring-shaped reinforcing member into the concrete in which said reinforcing member is embedded, said ring-shaped member is formed of steel and has a radially inner surface and a radially outer surface each extending in the general direction of the axis thereof and completely encircling the axis, and a coating of a material deformable under compression located on and completely covering the radially outer surface of said steel ring-shaped member whereby with said coating in surface contact with the concrete embedding the ring-shaped reinforcing member said coating deforms and prevents the transfer of annular tension forces to the concrete.

4,694,624

MODULAR PRE-INSULATED, PRE-FINISHED BUILDING BLOCK

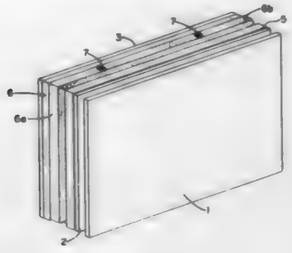
William M. Juhas, 2604 Ninth St., Cuyahoga Falls, Ohio 44221

Filed Jan. 21, 1986, Ser. No. 820,141
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—228 **14 Claims**

1. A pre-insulated and pre-finished modular building block for a modular building system, said building block comprising:

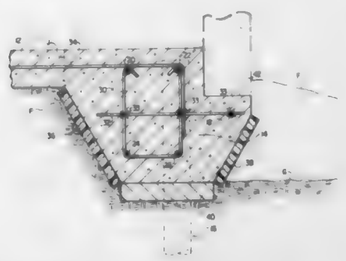
(a) a pair of spaced parallel structural elements;

(b) a one-piece rigid foam insulating element disposed between said structural elements;
(c) a vapor barrier between one of said structural elements and said insulating element;
(d) structural element retainer means attached to said structural elements for securing said structural elements in predetermined spaced relationship;



(e) at least one tubular conduit for a fastening rod, said conduit being secured to said retainer means and extending through said insulating element extending thereof from one edge to the opposite edge thereof; and
(f) a fastening rod extending through said conduit from one edge to the opposite edge of said building block.

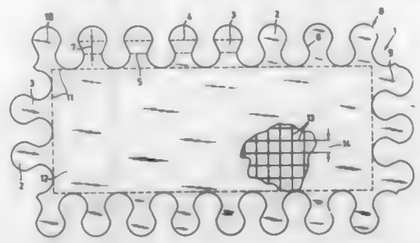
4,694,625
FOUNDATION FILING SYSTEM
Steven D. Gregory, 2400 S. Monte Viste, Adz, Okla. 74820
Filed Apr. 2, 1986, Ser. No. 847,278
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—294 **9 Claims**



1. A foundation system for a building, comprising a concrete slab constructed and arranged to form a foundation of said building, a concrete grade beam formed around said slab, a plurality of pipes extending along said grade beam, each pipe having a first portion extending into the ground and a second portion projecting from the ground and into said grade beam, and at least one horizontally extending bar member extending continuously around said grade beam and through an opening formed in each projecting portion of said pipes.

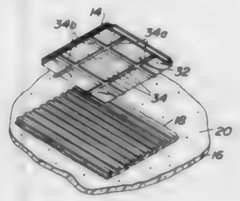
4,694,626
INSULATING BOARD
Hans Nicklas, Darmstadt, and Christoph Pruzina, Walluf, both of Fed. Rep. of Germany, assignors to ISPO Gmbh, Kritel, Fed. Rep. of Germany
Filed Jul. 18, 1986, Ser. No. 888,549
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1985, 3526715
Int. Cl.[4] E04C *2/10, 2/26*
U.S. Cl. 52—309.12 **15 Claims**

1. An insulating board of plastic foam provided on at least one edge with beaver-tail-shaped tabs that completely complement similar tabs of another board when the boards are placed alongside one another, each beaver-tail-shaped tab being geometrically in the form of a trapezoidal area with, adjacent its



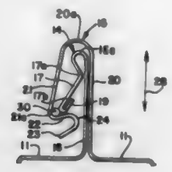
longer parallel side, an area demarcated by an axially symmetrical curve of the second order about 1.1 times as that side, the height of the trapezoidal area equalling at least ½ the thickness of the board.

4,694,627
RESILIENTLY-CUSHIONED ADHESIVELY-APPLIED FLOOR SYSTEM AND METHOD OF MAKING THE SAME
Ray E. Omholt, 1027 Valley Forge Rd. (#414), Devon, Pa. 19333
Filed May 28, 1985, Ser. No. 738,611
Int. Cl.[4] E04F *13/08*
U.S. Cl. 52—390 **45 Claims**



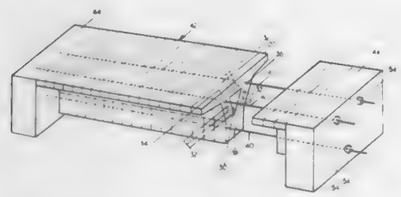
1. A resiliently-cushioned adhesively-applied floor system comprised of a plurality of floor panels secured to a support base by an elastomeric adhesive of trowelable consistency, the adhesive being spread on at leat one of the floor panels or the support base in spaced ridges of a generally uniform thickness, the floor panels being forced toward the support base so that the adhesive ridges form an intimate bond between the floor panels and the support base, the improvement comprising:
a plurality of spaced elongated support member means fabricated of a pre-cured elastomeric material, the support member means having a thickness less than the initial thickness of the uncured adhesive ridges, the support member means being positioned between the floor panels and the support base and being spaced from each other for providing both initial and permanent resilient cushioned support to the floor panels, the support member means engaging the floor panels, the support base and the adhesive when the floor panels are forced toward the support base, the spaces between the adhesive ridges, the adhesive and the support member means cooperating to provide cushioned resilient support for the floor panels.

4,694,628
METAL BUILDING PANEL WITH STANDING SEAM EDGE FORMATIONS
G. Earl Vondergoltz, Fulshear, and Milton E. Hammack, Houston, both of Tex., assignors to ECI Building Components, Inc., Stafford, Tex.
Filed Apr. 21, 1986, Ser. No. 854,097
Int. Cl.[4] E04D *1/18*
U.S. Cl. 52—528 **11 Claims**



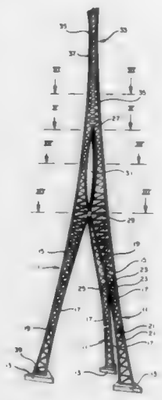
1. A metal building panel of the type adapted to form a standing seam joint between an adjoining pair of said panels, said panel having longitudinal edges shaped to define integral male and female edge formations, each of said edge formations having an upstanding flange extending generally perpendicular to the plane of the panel member, each of said upstanding flanges being joined by an intermediate arcuate portion with a return flange disposed adjacent common sides of the respective upstanding flanges, the return flange of said female edge formation being joined with a reentrant rib which extends toward said intermediate arcuate portions obliquely to said upstanding flanges, and into the space defined between the distal portion of the return flange of the male edge formation and the upstanding flange of the male edge formation, whereby the reentrant rib of the female edge formation will snap under the distal portion of the return flange of the male edge formation and into said space when male and female edge formations of an adjoining pair of said panels are interengaged by relative movement along a line generally perpendicular to the planar body portions of the such pair of panels, and a return lip joined with the reentrant rib of the female edge formation and adapted to engage and slide along the upstanding flange of the male edge formation upon the application of a squeezing force thereby to extend farther into said space for forming a locking interengagement between an adjoining pair of said panels.

4,694,629
MODULAR BLOCK AND MODULAR STRUCTURAL ELEMENTS CONSTRUCTED THEREFROM
Hossein Azimi, Box 1690, Rolla, Mo. 65401
Filed Aug. 16, 1985, Ser. No. 766,777
Int. Cl.[4] E04B *5/04*
U.S. Cl. 52—611 **10 Claims**



1. A horizontally extending modular structural element constructed from a plurality of modular blocks, the element comprising:
a plurality of modular blocks, each block having a generally hollow T-shaped cross-section, the block comprising a base section having opposite ends and comprising two oppositely extending colinear legs terminating respectively at said opposite ends and defining a flat generally horizontal top surface extending between said opposite ends; a stem section having outer sides spaced inwardly from said opposite ends and extending downwardly from the center of the bottom of the base section, the stem section having a compound configuration comprising a first portion having inner sides and upper sections of said outer sides tapering downwardly and inwardly from the base section, the stem section having a second portion below the first portion having generally vertical parallel lower sections of said outer sides; an axial hole defined at least in part by the inner sides extending through the first portion of the stem section; and, at least three axial passages for receiving tension members, the three passages being arranged in a triangular pattern around the axial hole, a side of this triangular pattern being parallel to the flat top surface of the block; the plurality of blocks being arranged in a line parallel to the three passages and of uniform cross section, the line of blocks having first and second ends with their axial passages aligned to define three triangularly oriented compound passages through the blocks extending from the first end to the second end for receiving tension members; a tension member extending through each compound passage in the blocks; and means for engaging the tension member to the block at each end of the line, the tension member exerting a compressive force on the blocks, holding the blocks together and putting the blocks under a compressive pre-stress.

4,694,630
TOWER AND METHOD OF CONSTRUCTING A TOWER
Henry J. McGinnis, 7241 Martha La., Fort Worth, Tex. 76111
Filed Feb. 3, 1986, Ser. No. 825,206
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—649 **6 Claims**



1. A tower, comprising:
a base section and a window section extending upward from the top of the base section;
each section having a plurality of columns, each column having an outside leg and two inside legs, laced together in a triangular cross-section throughout the length of each section;
the width of each column in the window section varying along the length of the window section, from larger widths at the top and bottom of the window section to a minimum width area between the top and bottom of the window section;
the columns being spaced apart at the bottom of the base section, converging upward and joining each other at the top of the base section; and
the columns in the window section joining each other at the

bottom of the window section, separating from each other between the top and bottom of the window section, and joining again at the top of the window section, defining an open window between the columns in the window section.

4,694,631

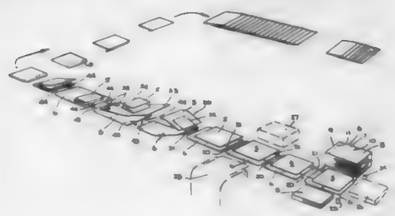
MECHANISM FOR FOLDING AN ENVELOPE AROUND AN INSERT

William H. Gunther, Jr., Mystic, Conn., assignor to Gunther International, Ltd., Mystic, Conn.

Continuation of Ser. No. 747,704, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 423,665, Sep. 27, 1982, abandoned. This application Jul. 31, 1986, Ser. No. 874,043

Int. Cl.⁴ B65B *11/48, 57/00*

U.S. Cl. 53—55 **19 Claims**



1. A mechanism for forming an envelope comprising a stack of pre-cut single predetermined individual envelope assemblies and a stack of pre-cut single predetermined individual letter insert assemblies, first means for moving each individual envelope assembly along a first path, second means for moving each individual letter insert assembly along a second path, said first and second moving means comprising a pair of conveyor mechanisms superimposed over and in spaced relationship to each other, each conveyor mechanism being adapted to receive an assembly, each of said assemblies being individually fed to their respective conveyor mechanism from stacks of assemblies, code data on said letter insert assembly and said envelope assembly, reading means adjacent the stacks for sensing said code data to determine whether an insert assembly matches an envelope assembly before said assemblies are fed to their respective conveyor mechanisms and before the assemblies are fed from the stacks, means for comparing the code data sensed by the reading means to determine whether a predetermined letter insert assembly is matched with a predetermined envelope assembly whereby feeding from said stacks is interrupted if the code data on the predetermined letter insert assembly does not match with a predetermined envelope assembly, third and fourth means in line with said first and second moving means for receiving said assemblies from said first and second moving means and for causing said assemblies to move along superimposed third and fourth paths, said third means includes means for folding each letter insert assembly and for positioning each predetermined letter insert assembly in superimposed relationship to each predetermined envelope assembly, said fourth means includes means for causing said folded letter insert assembly to be deposited on top of said moving envelope assembly means for folding said envelope assembly around said letter insert assembly and means for sealing the edges of said envelope assembly.

4,694,632

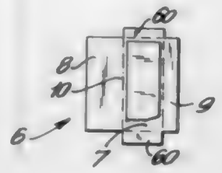
MECHANISM FOR FOLDING AN ENVELOPE AROUND AN INSERT

William H. Gunther, Jr., Mystic, Conn., assignor to Gunther International, Ltd., Mystic, Conn.

Continuation-in-part of Ser. No. 747,704, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 423,665, Sep. 27, 1982, abandoned. This application Aug. 25, 1986, Ser. No. 899,645

Int. Cl.⁴ B65B *11/48*

U.S. Cl. 53—55 **6 Claims**



1. A mechanism for forming an envelope comprising a stack of pre-cut single predetermined individual envelope assemblies having a rear edge and a stack of pre-cut single predetermined individual letter insert assemblies having a rear edge, first means for moving each individual envelope assembly along a first path, second means for moving each individual letter insert assembly along a second path, said first and second moving means comprising a two-tiered conveyor mechanism with each tier superimposed over and in spaced relationship to each other, each tier of said conveyor mechanism being adapted to receive an assembly, means operatively associated with said first and second means to move both assemblies with their rear edges in vertical alignment with each other, each of said assemblies being individually fed to their respective conveyor mechanism tiers from stacks of assemblies 1 code data on said letter insert assembly and said envelope assembly, reading means adjacent the stacks for sensing said code data to determine whether an insert assembly matches an envelope assembly before said assemblies are fed to their respective conveyor mechanism tiers and before the assemblies are fed from the stacks, means for comparing the code data sensed by the reading means to determine whether a predetermined letter insert assembly is matched with a predetermined envelope assembly whereby feeding from said stacks is interrupted if the code data on the predetermined letter insert assembly does not match with a predetermined envelope assembly, third and fourth means in line with said first and second moving means for receiving said assemblies from said first and second moving means and for causing said assemblies to move along superimposed third and fourth paths, said third and fourth means comprising a two-tiered conveyor mechanism, said third means includes means for folding each letter insert assembly and for positioning each predetermined letter insert assembly in superimposed relationship to each predetermined envelope assembly, said fourth means includes means for causing said folded letter insert assembly to be deposited on top of said moving envelope assembly, means for folding the envelope assembly around said letter insert assembly, means for sealing the edges of said envelope assembly, said envelope assembly comprising a front panel, a rear panel, end flaps and a seal flap, said means for depositing deposits the folded letter insert assembly onto said front panel, and means operatively associated with said two-tiered conveyor mechanism for maintaining said folded letter insert assembly on said front panel during movement of both said assemblies.

4,694,633

FILM WRAPPING MACHINE

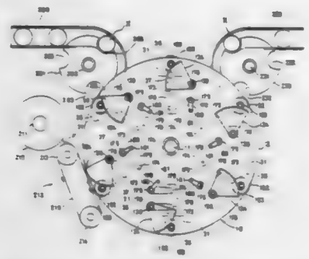
Masaaki Fujio, Suita, and Tetsuhiro Yamamoto, Hirakata, both of Japan, assignors to Fuji Seal Industry Co., Ltd., Osaka, Japan

Filed Nov. 10, 1986, Ser. No. 929,500

Claims priority, application Japan, May 21, 1985, 60-109982; May 20, 1986, 61-116565; May 20, 1986, 61-116566

Int. Cl.⁴ B65B *21/26, 11/56*

U.S. Cl. 53—49 **5 Claims**



1. A film wrapping machine for successively turning films around articles so as to form a film tube encircling each article, which machine comprises:

a rotary turntable assembly supported for rotation in one direction about a support shaft, said rotary turntable assembly being, during one complete rotation, movable from and back to an article supply station past a film supply station and an article delivery station, all of said stations being disposed in the vicinity of the periphery of of the rotary turntable assembly;

a plurality of article supports provided in the rotary turntable assembly at a peripheral portion thereof for rotation together with said rotary turntable assembly about the support shaft, said article supports being spaced an equal distance from each other in a direction circumferentially of the rotary turntable assembly, each of said article support being operable to carry the respective article during the rotation of the rotary turntable assembly;

an article supply unit disposed at the article supply station for supplying the articles successively onto the respective article supports in the rotary turntable assembly as the rotary turntable assembly during the rotation thereof arrives at the article supply station;

a film retaining member provided for each article support and supported in the vicinity of the respective article support for rotation about an axis parallel to the support shaft between inoperative and operative positions and also for movement in a direction parallel to the support shaft between raised and lowered positions, said film retaining member having suction openings defined therein in at least two leading and trailing rows, the leading and trailing rows of the suction openings being spaced a predetermined distance from each other in a direction conforming to the direction of rotation of the film retaining member, said leading row of the suction openings being adapted to retain a leading end of the associated film by the effect of a suction force whereas the trailing row of the suction openings is adapted to retain a trailing end of such associated film by the effect of a suction force, said film retaining member being rotatable about the associated article on the article support from the inoperative position towards the operative position only when and after it has been moved from the lowered position towards the raised position;

a film supply unit disposed at the film supply station for supplying the film onto the respective film retaining member each time the rotary turntable assembly is brought to the film supply station, said film retaining member being moved from the lowered position to the raised position upon the arrival of the rotary turntable assembly at the film supply station such that the leading end of the film can be sucked by the leading row of the suction openings by the effect of the suction force, the film with its leading end sucked by the leading row of the suction openings being exteriorly turned around the associated article as the film retaining member is rotated from the inoperative position towards the operative position, said film being completely turned around the associated article with a portion of the film adjacent the trailing end sucked by the trailing row of the suction openings permitting the trailing end to overlap the leading end;

a heater unit provided for each article support and carried by the rotary turntable assembly for movement between projected and retracted positions in a direction close towards and away from the associated article on the article support, said respective heater unit being moved from the retracted position to the projected position in unison with the movement of the associated film retaining member from the inoperative position to the operative position, said heater unit when moved to the projected position being pressed against the associated film retaining member with the overlapping ends of the film around the article consequently fusion-bonded together to complete a film tube; and

an article delivery unit disposed at the article delivery station for removing the articles with the respective film tube successively out from the associated article supports as the rotary turntable assembly during its continued rotation is brought to the article delivery station.

4,694,634

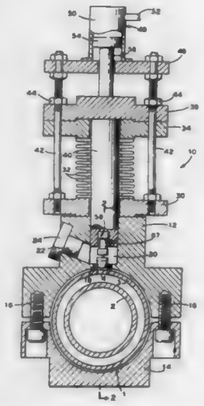
VACUUM SEALING DEVICE FOR INSULATED STEAM INJECTION TUBING

Paul T. Anderson; Lawrence Irwin; John C. Matthews, all of Lancaster, and Charles E. Paugh, Canal Winchester, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 16, 1985, Ser. No. 776,254

Int. Cl.⁴ B65B *1/00*

U.S. Cl. 53—88 **8 Claims**



1. A vacuum sealing device for plugging a port in a tube comprising:

clamping means adapted to engage around a tube and over a port to be plugged in the tube, said clamping means having a space with an opening;

a vacuum connector connected to said clamping means and communicating with said space for drawing a vacuum from said space;

a sealing pin movable in said space between a first position

spaced away from said opening and a second position extending into said opening, said sealing pin having a plug portion and a shank portion with a breakable tab connected between said plug portion and shank portion; and

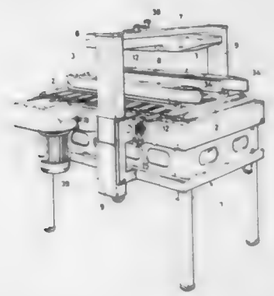
drive means for driving said sealing pin from its first position to its second position whereby said plug portion can be sealed into a port of a tube engaged by said clamping means, and for breaking said tab to separate said plug portion from said shank portion.

4,694,635

MACHINE FOR SEALING CARDBOARD BOXES OF CONSTANT WIDTH

Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Dec. 9, 1985, Ser. No. 807,018
Claims priority, application Italy, Dec. 17, 1984, 24084 A/84
Int. Cl.⁴ B65B *7/16*
U.S. Cl. 53—137 **4 Claims**



1. A machine for sealing cardboard boxes of constant width, comprising:

a support table for the boxes;

a pair of belt pulling units placed at an adjustable distance along opposite sides of the support table to achieve a pulling engagement with the sides of the boxes, said pulling units having inlet ends and outlet ends;

first sliding supports and adjustment means, fitted at the inlet ends of the pulling units, for adjusting the distance between the pulling units along opposite sides of the support table, said first sliding supports including a plurality of sliding bushings fixed thereto;

a first transverse guide bar fixed to the support table and arranged near the outlet ends of the pulling units;

second sliding supports and motorization means, fitted at the outlet ends of the pulling units, for operating the belt pulling units; and

forked plates being secured at one end to the second sliding supports and having shoe means, formed at an opposite end, for embracing in a sliding manner with the first transverse guide bar.

4,694,636

HORIZONTAL BUNDLING WITH VARIABLE ENTRY AND EXIT CONVEYORS

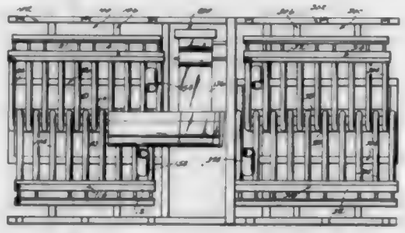
Everett Griffin, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 23, 1981, Ser. No. 246,437
Int. Cl.⁴ B65B *13/12*
U.S. Cl. 53—399 **16 Claims**

1. An apparatus for wrapping articles comprising:

(a) an infeed conveyor having an infeed support frame and first and second sets of rotatably driven infeed rollers which intersect to form a conveyor having a "V" shaped cross-section which defines an angle A that is measured between the first and second sets of infeed rollers, the infeed conveyor having a longitudinal axis which is parallel to the direction of motion of aritcles along the infeed conveyor, the angle A having a bisecting plane which intersects the longitudinal axis, the first set of infeed rollers being retained in a first infeed support frame and the second set of infeed rollers being retained in a second infeed roller frame which has a side that is pivoted in the infeed support frame at a pivot point;

(b) an outfeed conveyor having an outfeed support frame and first and second sets of rotatably driven outfeed rollers which intersect to form a conveyor having a "V" shaped cross-section which defines an angle B that is measured between the first and second sets of outfeed rollers, the outfeed conveyor having a longitudinal axis which is parallel to the direction of motion of articles



along the outfeed conveyor, the angle B having a bisecting plane which intersects the longitudinal axis of the outfeed conveyor, the first set of infeed rollers being retained in a first outfeed roller frame which has a side that is pivoted in the outfeed support frame and a second outfeed roller frame which has a side that is pivoted in the outfeed support frame at a pivot point;

(c) means disposed between the infeed and outfeed conveyors for wrapping articles with a sheet of material to form a package having a plurality of sides while the articles are conveyed between the infeed and outfeed conveyors; and

(d) means for varying the angular orientation of the bisector plane of the angle A with respect to the bisector plane of the angle B so that the package is oriented on a predicted side when it leaves the outfeed conveyor.

4,694,637

METHOD AND APPARATUS FOR GROUPING, ORIENTING, AND PACKING ARTICLES

Marcus C. Bech, Hillerod, and Ole Koster, Roskilde, both of Denmark, assignors to Stormax International A/S, Herley, Denmark

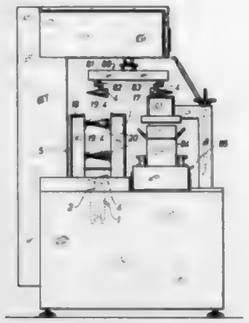
Filed Oct. 17, 1985, Ser. No. 788,311
Claims priority, application Denmark, Oct. 17, 1984, 4965/84
Int. Cl.⁴ B65B *5/08, 35/38, 35/56*
U.S. Cl. 53—448 **11 Claims**

1. A method of grouping, orienting and packing articles having a cross section perpendicular to a longitudinal direction, the area of said cross section substantially decreasing towards one end of the article, seen in the longitudinal direction, and whereby the articles are advanced in rows on conveyor means, and subsequently grouped and oriented so as finally to be grouped in groups by a gripping device positioning the articles in an open packing box by means of gripping means gripping their respective articles, comprising the steps of

(a) advancing said articles (**4**) in a first advancing direction (**3**) while they are lying directly on a first endless and continuously operating conveyor (**1**);

(b) receiving said articles (**4**) in groups on a second endless and continuously operating conveyor (**5**); and

(c) moving said articles (**4**) in a second advancing direction (**45**) extending substantially parallel to the moving direction of said gripping means (**82, 83**) of said gripping device (**80**) during a gripping phase of their working cycle, said second conveyor (**5**) adjusting the mutual spacing of said



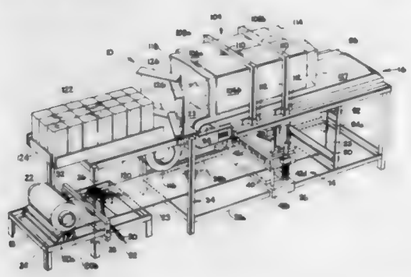
articles to the mutual spacing of said gripping means before the latter grip the articles (**4**) from said second conveyor (**5**).

4,694,638

APPARATUS AND METHOD OF LOADING ARTICLES INTO AN INFLATED BAG FROM A WEB

Forrest E. Maddux, Jr.; Paul A. Eagle, both of Cincinnati, and Robert L. Robbins, Covington, all of Ohio, assignors to The Ultra Bagger Co. of Cincinnati, Cincinnati, Ohio

Filed Aug. 28, 1986, Ser. No. 900,993
Int. Cl.⁴ B65B *43/26*
U.S. Cl. 53—459 **13 Claims**



1. An apparatus for loading articles into an inflated bag from a web having at least two perforated sheets comprising:

(a) web supply means for receiving the web, the web supply means having sensor means for detecting perforations in the web;

(b) sheet separating means for separating an upper sheet of the web along a perforation, the sheet separating means being actuated by the sensor means, the sheet separating means comprising:

(i) a plurality of finger assemblies pivotally mounted on a support plate and biased away from the web;

(ii) cylinder means connected to the support plate for forcing the support plate in the direction of the web; and

(iii) control means connected to the sensor for actuating the cylinder means so that the finger assemblies contact the web at desired intervals to separate the first sheet along a perforation; and

(c) conveyor means for driving the web along its feed path, the conveyor means comprising a blower means for inflating a bag on the web after its first sheet has been separated by the sheet separating means and enclosure means for stabilizing the inflated bag on the conveyor means. assemblies contact the web at desired intervals to separate the first sheet along a perforation.

10. A method for loading articles into a bag formed from a web delineated by perforations, the web having at least first and second perforated sheets, comprising:

(a) detecting perforations on the web by a sensor means;

(b) providing a sheet separating means comprising:

(i) a plurality of finger assemblies pivotally mounted on a support plate and biased away from the web;

(ii) cylinder means connected to the support plate for forcing the support plate in the direction of the web; and

(iii) control means connected to the sensor for actuating the cylinder means so that the finger assemblies contact the web at desired intervals to separate the first sheet along a perforation;

(c) separating the first sheet along the perforation by actuating the cylinder means to force the plurality of finger assemblies against the web;

(d) advancing the web to a platform;

(e) blowing an air stream at the separating first sheet of the web so that a bag is inflated;

(f) stabilizing the inflated bag on the platform; and

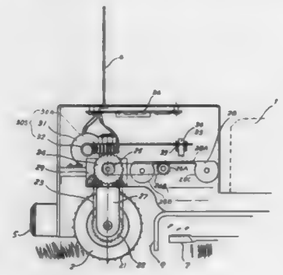
(g) advancing the articles into the inflated bag.

4,694,639

ROBOTIC LAWN MOWER

Sheng K. Chen; Shi Y. Horng, and I-Ting Chen, all of No. 17, Lane 32, Ta Chyuan Street, Taichung, Taiwan

Filed Dec. 30, 1985, Ser. No. 814,480
Int. Cl.⁴ A01D *35/00, 53/08;* **G05B** *1/00*
U.S. Cl. 56—10.2 **9 Claims**



1. A lawnmower, comprising:

a power unit;

a drive wheel operatively coupled to said power unit for propelling said lawn mower;

a lead wheel for guiding said lawnmower to move along a route of travel, said lead wheel being rotatably mounted on a fork member which is rotatably attached to said lawnmower;

a control unit including a memory unit for storing said route of travel, said memory unit including a paper tape to be advanced in proportion with the rotation of said lead wheel and a writing device for recording said route of travel on said paper tape, said writing device having an arm member operatively connected to said fork member, said control unit also including a reading unit for reading said route of travel recorded in said memory unit and producing control signals according to said route of travel, and a control circuit for producing operation signals; and

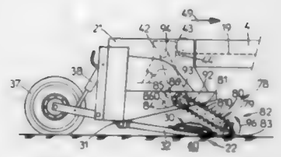
a steering unit operable by said operational signals for steering said lead wheel to guide said lawnmower to travel along said route of travel.

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MOWING MACHINE FOR CUTTING HAY AND CEREAL GRASS

Riso Ermacora, Ottersthal, and Patrice Jehl, Imbsheim, both of France, assignors to Kuhn S.A., Saverne, France

Continuation of Ser. No. 716,178, Mar. 26, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 15,561
Claims priority, application France, Nov. 12, 1984, 84 17351
Int. Cl.[4] A01D *34/66*
U.S. Cl. 56—16.4 **84 Claims**



1. A mowing machine comprising in combination:
a chassis,
cutting means supported by said chassis,
an intermediate structure on said chassis, said intermediate structure at least partially supporting said cutting means, said cutting means extending on both sides of said intermediate structure,
supporting wheels on said chassis for supporting said chassis on the ground, said supporting wheels being mounted on said chassis in a pivotable manner, and maneuvering means able to modify the position of said supporting wheels in relation to said chassis,
a beam fixed on said chassis by means of an upwardly directed axis to connect said mowing machine to a pulling vehicle, said beam being pivotable about said upwardly directed axis, so as to occupy different positions in relation to said chassis,
driving means to drive the cutting means, and
means associated with said intermediate structure for preventing attachment of crop to said intermediate structure.

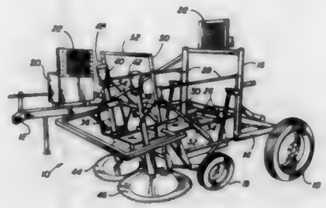
43. A mowing machine comprising in combination:
a chassis,
cutting means supported by said chassis,
supplementary working member supported by said chassis,
an intermediary structure on said chassis, said intermediate structure at least partially supporting said cutting means and/or said supplementary working members, said cutting means and/or said supplementary working members extending on both sides of said intermediate structure,
supporting wheels on said chassis for supporting said chassis on the ground, said supporting wheels being mounted on said chassis in a pivotable manner, and maneuvering means able to modify the position of said supporting wheels in relation to said chassis,
a beam fixed on said chassis by means of an upwardly directed axis to connect said mowing machine to a pulling vehicle, said beam being pivotable about said upwardly directed axis, so as to occupy different positions in relation to said chassis,
driving means to drive the cutting means and/or the supplementary working members, and
means associated with said intermediate structure for preventing attachment of crop to said intermediate structure.

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CROP HARVESTING AND SOIL TILLING APPARATUS

John R. Porter, 1255 Dublin Rd., Waterloo, N.Y. 13165

Filed Jul. 29, 1985, Ser. No. 759,958
Int. Cl.[4] A01D *46/00*
U.S. Cl. 56—328 R **10 Claims**



1. In an agricultural implement of the type having forward and rear ends, a rigid frame mounted upon wheels for movement through a field and a pair of circular disks mounted upon power-driven drive shafts at the forward end for rotation about parallel, substantially vertical axes which are evenly spaced on opposite sides of the longitudinal centerline of the implement, the improvement comprising:
(a) at least two elongated, substantially horizontal guide members rigidly affixed to the forward end of the implement frame and extending forwardly and outwardly therefrom at equal, acute angles to the longitudinal centerline of the implement, said guide members being equally spaced from and on opposite sides of said centerline;
(b) means for mounting the disk drive shafts upon the respective guide members for movement thereon between first and second positions wherein the distance between said rotational axes is changed between first and second values, respectively; and
(c) means for releasably fixing said drive shafts in said first and second positions.

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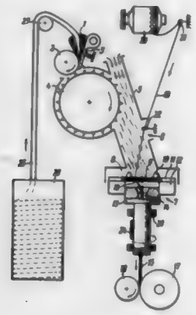
METHOD AND APPARATUS FOR PRODUCING REINFORCED THREAD

Gennady V. Zhigalov; Abdurakhim Abduganiev; Sergei Y. Kim, and Robert R. Mosheev, all of Tashkent, U.S.S.R., assignors to Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin, Tashkent, U.S.S.R.

Filed Dec. 12, 1986, Ser. No. 940,809
Int. Cl.[4] D01H *7/882*; D02G *3/36*
U.S. Cl. 57—5 **2 Claims**

1. A method of producing reinforced thread by winding fibres around a core thread in a ringless open-end spinning process, using a twisting member, including:
supplying a stream of loose fibres onto the flat surface of the disc of a rotating twisting member, said twisting member having an axis of rotation;
guiding a core thread through said disc of said twisting member eccentrically with respect of said axis of rotation of said twisting member, to form by rotation of said twisting member two balloons of said core thread with their respective apexes disposed to the opposite sides of said disc;
aligning said respective apexes of said balloons with said axis of rotation of said twisting member;
rotating said twisting member to wind said fibres around said core thread, for forming the reinforced thread.

2. An apparatus for producing reinforced thread by winding fibres around a core thread in an open-end ringless spinning process, comprising:
a guide for the core thread;
fibre-separating means;
a twisting member having an axis of rotation; a body of said twisting member; and blades radially arranged on said body of said twisting member;
a fibre-guiding duct;
said twisting member communicating through said fibre-guiding duct with said fibre-separating means;
said guide for the core thread having a geometric centre, said centre being aligned with said axis of rotation;



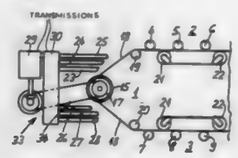
a flat disc of said twisting member; an axial bore in said flat disc; means on said flat disc for retaining fibres thereon; radially extending slits made through said discs for the passage of a stream of air created by said blades radially arranged on the surface of said flat disc, facing said body of said twisting member;
an opening for the passage of the core thread made in said disc eccentrically with respect to said axis of rotation of said twisting member;
a holder for a bobbin with the supply of said core thread; a unit for winding the reinforced thread;
said guide of said core thread overlying the plane of said flat disc.

4,694,643

SPINNING OR TWISTING MACHINE

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 819,541
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3901530
Int. Cl.[4] D01H *1/20, 1/24, 1/241, 1/28*
U.S. Cl. 57—100 **16 Claims**



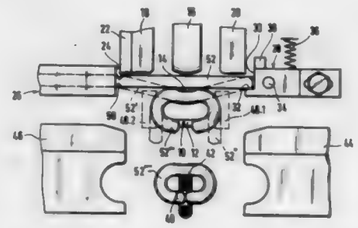
1. In a machine for spinning or twisting yarn with at least two kinds of working units, each of which is connected with a drive mechanism having at least one motor, wherein on interruption of the energy supply the rotational speed of each of said drive mechanisms run down together with said rotational speed of the remaining ones of said drive mechanisms from a normal operational value of said rotational speed, the improvement wherein said drive mechanisms have a common synchronizing means, and are connected with each other operably by at least one torque transfer device independent of said synchronizing means.

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METHOD AND APPARATUS FOR PRODUCING OVAL CHAIN LINKS FROM ROUND WIRE

Willi Rudy, Iserlohn, and Gerhard Lange, Reutlingen, both of Fed. Rep. of Germany, assignors to Waflos Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,214
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440907
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] B21L *1/02*
U.S. Cl. 59—27 **7 Claims**



1. In a method for the manufacture of oval chain links out of round wire, in which a straight wire length which perpendicularly crosses the longitudinal axis of a cylindrical bending mandrel having an annular groove surroundin this axis in a vertical plane to receive the wire length, is fed toward the mandrel in line with the groove but laterally spaced therefrom; in which the center of the length which forms the back of the link is moved into a recess in the mandrel on the feed side thereof and in line with the groove therein; in which the recess forms two points which are adjacent the groove base and which most closely approach the longitudinal axis of the feed of the wire length and in which the wire length separated from the wire is bent into the groove outside of the mandrel recess until the longitudinal axis of the wire length follows the course of the groove, the improvement comprising the steps of initially bending the wire length against the mandrel groove in a first bending station into the shape of an obtuse V; preventing the trailing end of the wire length and its leading free end from significantly moving perpendicularly relative to the longitudinal and feed direction of the straight wire length during the initial bending of the wire length and the simultaneous moving of the center thereof into the mandrel recess; maintaining during a prebending including the initial bending of a straight wire length, into a C-shaped wire piece which is closed in a second bending station for the final bending of the wire piece into an O-shape, in the first bending station a perpendicular spacing of the straight wire length from the two adjacent points of the groove base amounting to at least the diameter of the wire; and transporting, at the latest the next wire length during the transport of the preceding wire length to the second bending station to the position adjacent the mandrel of the first bending station after the prebending of the preceding wire piece into the C-shape.

4,694,645

PROPELLER ASSEMBLY

Nils O. Flyborg, and Orvar Björheden, both of Kristinehamn, Sweden, assignors to Kamewa AB, Kristinehamn, Sweden

Filed May 21, 1985, Ser. No. 736,533
Claims priority, application Sweden, May 23, 1984, 8402792
Int. Cl.[4] B63H *11/00*; F04D *7/00*; B03H *1/16*
U.S. Cl. 60—221 6 Claims





1. A propulsion and steering apparatus which controls the direction of a propeller jet for mounting underneath the bottom part of a hull of a watercraft, comprising:

a propeller and a fixed propeller shroud embracing the propeller;

a propeller shaft on which said propeller is mounted;

a gear housing in which said propeller shaft is journalled and which accommodates a bevel gearing through which the propeller shaft is connected to a drive shaft extending perpendicular to said propeller shaft;

a tubular support strut surrounding said drive shaft and having a lower end connected to said gear housing for supporting said gear housing and an upper end adapted to be rotatably mounted in an opening in said bottom part of the hull of the watercraft with the axis of rotation of the support strut extending vertically and the propeller shaft extending in a substantially horizontal direction;

said propeller shroud being provided at its outlet end with stationary, substantially horizontally extending guide vanes positioned obliquely in relation to the direction of the propeller shaft so as to deflect a propeller jet generated and exiting from the propeller shroud upon rotation of the propeller obliquely downwardly in relation to the direction of the propeller shaft;

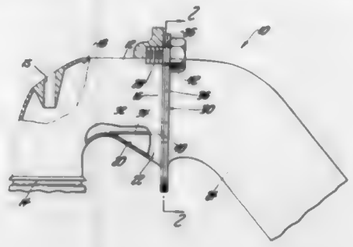
wherein the propeller shroud is provided at its outlet end also with stationary, substantially radial guide vanes for eliminating rotational movement in the propeller jet.

4,694,646

EXHAUST PORT EQUALIZER DEVICE

Robert P. Holmstrom, 30427 Nye, Livonia, Mich. 48484

Filed Jan. 9, 1986, Ser. No. 871,787
Int. Cl.[4] F01N *3/00*
U.S. Cl. 60—272 9 Claims



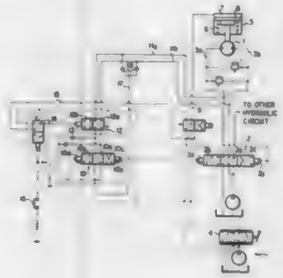
1. An exhaust port equalizer device (30) for insertion into an exhaust port-passage (12) of an internal combustion engine having an exhaust header (24) connected to the exhaust port-passage (12), said device (30) comprising: an integral sheet metal body of substantially uniform thickness having a flow control portion (32) for extending into and defining one side portion (18) of the port-passage (12), and a support portion (36) connected to said flow control portion (32) for removable attachment between the exhaust header (24) and the port-passage (12) to smooth the gas flow between the exhaust port-passage (12) and the exhaust header (24), said flow control portion (32) being substantially flat and projecting at an angle from said support portion (36).

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HYDRAULIC CIRCUIT SYSTEM FOR USE IN HYDRAULICALLY OPERATED VEHICLES

Kazuhiro Yoshida, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,294
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—442 4 Claims



1. A hydraulic circuit system for use in hydraulically operated vehicles, comprising:

(a) a forwardly and reversely rotatable slewing motor having a brake unit associated therewith and hydraulic fluid circuits for rotating said slewing motor forwardly and reversely;

(b) a directional control valve for connecting and disconnecting said fluid circuits with and from a pressurized fluid supply source, said control valve having an OFF position and forward and reverse rotating positions and being remotely controlled by a pilot fluid pressure;

(c) bypass circuits, one ends of which are respectively connected to said fluid circuits;

(d) a shadow valve having a communicating position for allowing said bypass circuits to communicate with each other at their respective other ends and disconnecting positions for disconnecting said bypass circuits from each other, said shadow valve being interlocked with said directional control valve to enable interlocked control to be achieved in such a manner that it may assume its communicating position when said directional control valve is located at its OFF position, while it may assume its disconnecting positions when said directional control valve is located at either forward or reverse rotating position, and

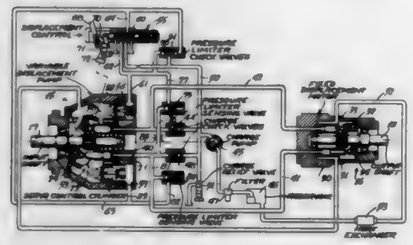
(e) an ON-OFF changeover valve provided in said bypass circuits for allowing said bypass circuits to communicate with and disconnect from said shadow valve.

4,694,648

ANTI-PLUG CONTROL

Richard Beck, Jr., Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 449,407, Dec. 13, 1982, abandoned.
This application Mar. 20, 1985, Ser. No. 714,091
Int. Cl.[4] F16D *31/02*
U.S. Cl. 60—452 9 Claims



1. An anti-plug control in combination with a drive for a driven working element to prevent jamming of the driven working element in response to an overload wherein said drive includes a fluid motor and a variable displacement fluid pump for supplying fluid to the motor comprising, servo means including a servo control cylinder for controlling displacement of the pump, means for sensing the pressure of the fluid delivered by the pump to the motor, means responsive to an increase of said pressure beyond a predetermined value for modifying the displacement of said pump to increase the speed of said drive, and means operable in response to an increase in the fluid pressure a predetermined amount beyond said predetermined value for modifying the displacement of the pump to decrease the speed of the drive.

4,694,649

PRESSURE LIMITING ACCELERATION CONTROL SYSTEM AND VALVE FOR HYDRAULIC MOTORS

David F. Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation of Ser. No. 463,739, Feb. 4, 1983, abandoned. This application May 2, 1986, Ser. No. 861,646
Int. Cl.[4] F16D *31/02*; F16K *31/12*
U.S. Cl. 60—468 15 Claims

1. In a hydraulic system including a pump and hydraulic motor means adapted to be supplied with pressure fluid by said pump through a flow circuit interconnecting said pump and said motor means, means for limiting the peak pressure imposed on said motor means in response to introducing full load fluid flow through said circuit to drive said motor means, said pressure limiting means comprising:

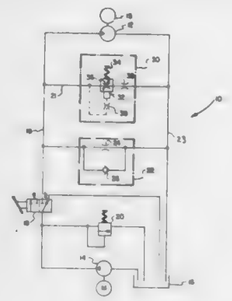
a self-closing valve adapted for progressive throttling of fluid flow through said circuit between said pump and said motor means in response to a predetermined pressure condition of fluid flowing through said valve, said valve comprising:

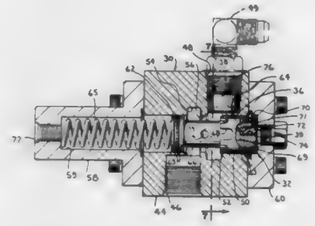
a body including a bore for receiving a closure member and a surface defining valve seat means, a fluid inlet port and a fluid discharge port opening into said bore;

a cylindrical closure member disposed in said bore including a portion cooperable with said seat means for throttling fluid flow through said valve, said closure member having an end surface;

biasing means for urging said closure member toward a valve open position;

means in said valve for predetermining a pressure condition in said valve resulting from introduction of full load fluid





flow to said motor means for urging said valve to close against said biasing means;

a pilot pressure fluid actuator including passage means extending through said end surface of said closure member and in communication with fluid flowing through said valve at a point upstream of said seat means for conducting pressure fluid to said pilot actuator, said pilot pressure fluid actuator further including a pilot pressure fluid chamber, defined in part by said end surface of said closure member, for receiving pressure fluid from said passage means; and

orifice means in said passage means for limiting the rate of fluid flow to said pilot actuator to cause said closure member to progressively throttle the flow of fluid through said valve.

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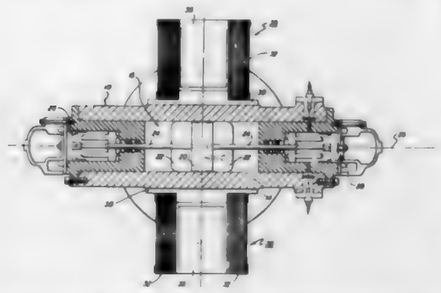
EXTERNALLY TUNED VIBRATION ABSORBER

Ronald J. Vincent, Latham, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 28, 1986, Ser. No. 889,697
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—520 21 Claims

1. In a hydraulic apparatus of the type having a housing

filled with a relatively incompressible fluid, said housing being secured to a prime mover and containing diaphragm means for converting vibratory energy transmitted from the prime mover into pressure waves within the fluid for oscillating a movable element along a linear path of motion, the improvement comprising at least one vibratory absorber unit attached to the outside of the housing for absorbing vibrational energy resulting from the oscillation of the movable element that includes a spring means and an absorber mass affixed to the spring means for reciprocal movement parallel with the path of travel of said movable element, and means to adjust the resonant frequency of the absorber means whereby the resonant frequency of the absorber means can be matched to the frequency range of the pressure waves.



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BRAKE MASTER CYLINDER

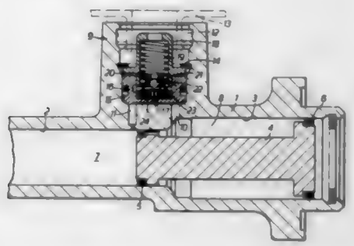
Alfred Yardley, Kidderminster, and John F. Pickering, Warwickshire, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 25, 1981, Ser. No. 247,619

Claims priority, application United Kingdom, Apr. 29, 1980, 8014024; Jun. 24, 1980, 8020621

Int. Cl.⁴ B60T *11/08*

U.S. Cl. 60—578 **7 Claims**



1. A master cylinder of the quick-fill type comprising a body, a bore in the body stepped to define respective bore portions, a piston received in the bore and having opposite ends slidable in said respective portions of the bore, the piston defining in the bore a low volume pressure chamber and a larger volume quick-fill chamber, a port in the body open to the quick-fill chamber and a compensation port in the body for communication with the pressure chamber, a reservoir, means connecting the reservoir to said ports and including valve means for controlling communication between the reservoir and the ports, said valve means including a pressure responsive valve arranged to open when the pressure in the quick-fill chamber reaches a predetermined level and a one-way valve permitting free flow of fluid in the direction from the reservoir to the quick-fill chamber, and wherein the pressure responsive valve comprises a valve member and seat having annular, co-operating confronting substantially parallel surfaces, the seat having an opening at the center of the annular surface thereof communicating with said ports, and said confronting surfaces moving apart when the valve opens to allow fluid to flow therebetween in a direction substantially parallel to the said surfaces, and a groove is provided in one of said confronting surfaces and extends along a substantially spiral path, said groove defining a flow restricting by-pass passage between said confronting surfaces when said pressure responsive valve is closed.

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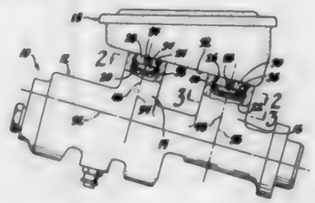
MASTER CYLINDER WITH RESERVOIR MOUNTING ARRANGEMENT

John R. Coleman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 16, 1986, Ser. No. 852,826

Int. Cl.⁴ B60T *11/26;* **F15B** *7/08, 7/10*

U.S. Cl. 60—585 **7 Claims**



7. In a master cylinder assembly having a cylinder body and a reservoir body, said cylinder body having first and second reservoir mounting bores formed therein in axially parallel spaced relation with the axes thereof located in a first plane passing through said cylinder body, and said reservoir body having first and second mounting bayonet members extending therefrom in axially parallel spaced relation and respectively received in said cylinder body mounting bores in mounted sealing relation to deliver brake fluid between the interior of said reservoir body and the interior of said cylinder body, said bayonet members having basic diameters established by worst case tolerancing in said first plane involving both of said reservoir mounting bores and said mounting bayonet members, the improvement comprising:

said first and second mounting bayonet members each having a pair of diametrically opposed axially extending ribs formed thereon with rib axes respectively parallel to the axes of said first and second mounting bayonet members and respectively located in second and third planes respectively passing through the axes of said first and second mounting bayonet members and substantially perpendicular to said first plane, the diameter of said first mounting bayonet member in said second plane through and including said ribs on said first mounting bayonet member being greater than the basic diameter of said first mounting bayonet member and being established by worst case tolerancing in said second plane involving only said first reservoir mounting bore and said first mounting bayonet member, and the diameter of said second mounting bayonet member in said third plane through and including said ribs on said second mounting bayonet member being greater than the basic diameter of said second mounting bayonet member and being established by worst case tolerancing in said third plane involving only said second reservoir mounting bore and said second mounting bayonet member.

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ENGINE ENERGY RECOVERY APPARATUS

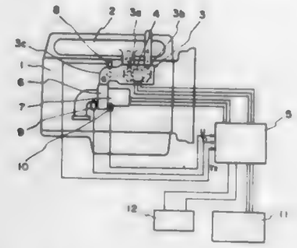
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,760

Claims priority, application Japan, Oct. 29, 1985, 60-241871

Int. Cl.⁴ F01D *15/10;* **F02G** *5/00*

U.S. Cl. 60—597 **4 Claims**



1. A apparatus for recovering exhaust energy from an exhaust turbine rotated by exhaust gas produced in an engine, comprising:

(a) an exhaust turbine provided at an exhaust port of the engine;

(b) a generator rotated by said exhaust turbine;

(c) a first temperature sensor for sensing exhaust temperature at an inlet of said exhaust turbine;

(d) a second temperature sensor for sensing exhaust temperature at an outlet of said exhaust turbine;

(e) a speed sensor for sensing rotational speed of said exhaust turbine;

(f) first means for determining exhaust turbine efficiency based on signals from said first and second temperature sensors and said speed sensor; and

(g) second means for adjusting a load on said generator so as to maximize the exhaust turbine efficiency determined by said first means.

4,694,654

EXHAUST ENERGY RECOVERY AND GENERATOR FOR USE WITH AN ENGINE

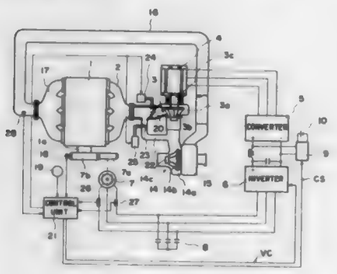
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,058

Claims priority, application Japan, Oct. 29, 1983, 58-203238; Oct. 31, 1983, 58-204569; Mar. 17, 1984, 59-51558

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—605 **8 Claims**



1. An exhaust energy recovery and generator device for a thermally insulative engine having an exhaust passage and an output shaft, the device comprising:

(a) a first exhaust turbine disposed in the exhaust passage of the thermally insulative engine and rotatable by the energy of an exhaust gas discharged from the thermally insulative engine, said first exhaust turbine having a wheel and a wheel shaft;

(b) a generator having a rotor shaft coupled coaxially with the wheel shaft of said first exhaust turbine;

(c) a converter operatively connected to said generator for converting alternating current into direct current;

(d) an inverter operatively connected to said converter for converting direct current into alternating current;

(e) a motor having a rotatable shaft and drivable by said generator via said converter and said inverter;

(f) means connecting the rotatable shaft of said motor to the output shaft of the thermally insulative engine, whereby the energy of the exhaust gas recovered by said first exhaust turbine can be fed back to the output shaft of the thermally insulative engine through said generator, said converter, said inverter and said motor;

(g) a body of silicon steel fitted over the rotor shaft of the generator; and

(h) a stator coil, having a winding, for passing an armature current which is 90° advanced in phase through the winding to generate a no-load induced electromotive force, said generator thereby serving as a reluctance generator.

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CONTROLLABLE HELIUM-II PHASE SEPARATOR

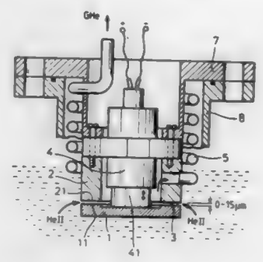
Albert Seidel, Siegertsbrunn, and Werner Malburg, Neubiberg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 895,802

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3530168

Int. Cl.⁴ F17C *13/02*

U.S. Cl. 62—51 **5 Claims**



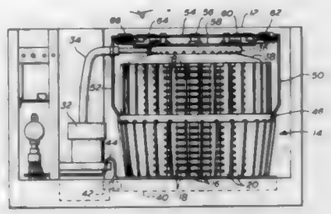
1. A controllable helium-II phase separator comprising suport means, control means coupled to said support means and at least one capillary gap-shaped canal in communication with a source of superfluid helium-II, said superfluid helium-II flowing in said at least one capillary gap-shaped canal utilizing the cut-off action of the thermomechanical effect, the geometry of said capillary gap-shaped canal being varied by said control means, whereby the gap width of said at least one canal can be changed by varying the distance between two opposite canal walls at least in the range between 0 and 15 μm, said opposite canal walls being formed by surfaces facing each other of at least one cylindrical ring element and at least one disc element, said control means coupled to at least one of the disc element or the ring element in an axial direction of the disc element and ring element.

4,694,656

ROTARY RELEASE ICE MACHINE AND METHOD

Robert C. Lane, and Joseph M. Lee, both of 2030 Richmond, Houston, Tex. 77098

Filed Feb. 7, 1986, Ser. No. 827,083
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] F25C *1/12*
U.S. Cl. 62—72 **22 Claims**



18. An article of manufacture suitable for making ice blocks including a vertically disposed plurality of ice freezing pockets with each pocket of said freezing pockets comprising in combination:

(a) a directly refrigeratable freezing member forming the base of each pocket;

(b) at least two vertically disposed apart and horizontally extending fins attached with each freezing member and forming the sides of said pocket;

(c) at least two horizontally pivotable and vertically disposed plates mounted contiguously with said freezing member and said extending fins to form the ends of each said pocket of said plurality of pockets;

(d) said freezing member being of cylindrical shape with said fins extending around said freezing member and with said vertically disposed plates being pivotally mounted in spaced apart relation around said freezer for pivoted horizontal movement; and

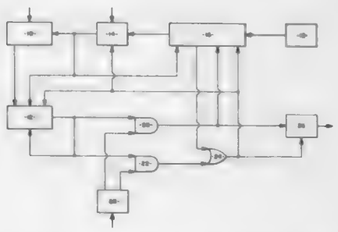
(e) each of said vertically disposed plates being pivoted on centers located away from its inner edge.

4,694,657

ADAPTIVE DEFROST CONTROL AND METHOD

Eldon D. Vaughn, Brea, Calif., assignor to Spectrol Electronics Corporation, City of Industry, Calif.

Division of Ser. No. 50,352, Jun. 20, 1979, Pat. No. 4,680,940. This application Apr. 24, 1986, Ser. No. 855,267
Int. Cl.[4] F25D *21/00*
U.S. Cl. 62—80 **6 Claims**



1. A method of determining the appropriate time-to-initiate a defrost cycle for effecting a change in operation of a refrigeration circuit to remove frost from a heat exchanger forming a part of the refrigeration circuit comprising the steps of

detecting the period of elapsed time during the previous defrost cycle,

selecting a time period for which the refrigeration circuit should be operated between defrost cycles based upon the elapsed time during the previous defrost cycle,

monitoring the cumulative operating time of the refrigeration circuit between defrost cycles,

comparing the cumulative operating time of the refrigeration circuit with the time period formulated by the step of selecting to ascertain the appropriate time-to-initiate the next defrost cycle, said appropriate time occuring when the cumulative operating time equals the preselected time,

wherein the step of monitoring the cumulative operating time includes energizing a time-to-initiate clock which emits periodic pulses when the refrigeration circuit is operating and further includes counting the pulses emitted by the clock; and

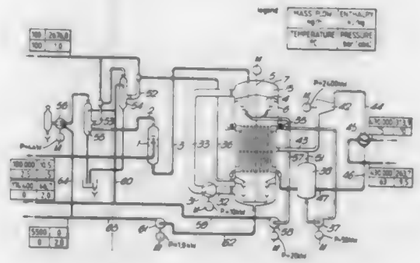
wherein the time-to-initiate clock has a variable pulse emission rate and wherein the step of selecting a time period includes controlling the rate at which pulses are emitted from the time-to-initiate clock.

4,694,658

METHOD AND EQUIPMENT FOR UTILIZATION OF THE FREEZING HEAT OF WATER AS A SOURCE OF HEAT OF A HEAT PUMP

Pentti Juhola, Espoo, Finland, assignor to Rintekno Oy, Espoo, Finland

PCT No. PCT/FI84/00086, § 371 Date Jul. 19, 1985, § 102(e) Date Jul. 19, 1985, PCT Pub. No. WO85/02458, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 26, 1984, Ser. No. 762,192
Claims priority, application Finland, Nov. 25, 1983, 834335
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—100 **17 Claims**



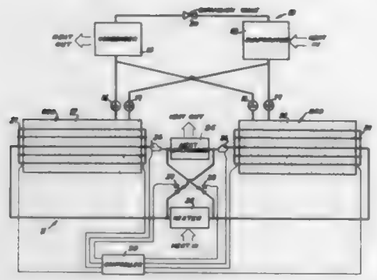
1. Method for using the heat released by freezing water as a source of heat in a heat pump wherein the water flow to be utilized as the source of heat is evaporated in a first stage at a sufficiently low pressure that freezing of part of the water occurs as a concomitant to vaporization of another part of yield water vapour, and said water vapour is condensed in a heat exchanging condenser stage that functions as the evaporator of the heat pump, wherein a heat exchanging condenser stage of plural compartments is utilized, and said water vapour is caused to condense, freeze and deposit a layer of ice in at least one but not all of said compartments of said condenser stage while delivering heat of solidification to a heat transfer medium for the heat pump, and concurrently in at least some of the condenser stage compartments in which ice is not then being deposited melting ice previously formed therein, and alternating the use of said compartments.

4,694,659

DUAL BED HEAT PUMP

Samuel V. Shelton, 1183 Burnt Creek Ct., Decatur, Ga. 30033

Continuation-in-part of Ser. No. 729,921, May 3, 1985, Pat. No. 4,610,148. This application Sep. 8, 1986, Ser. No. 904,673
Int. Cl.[4] F25B *17/00, 17/08*
U.S. Cl. 62—106 **17 Claims**



1. A method of operating a heat pump system including a heat pump loop and a heating loop where the heat pump loop includes a pair of solid adsorbent beds connected to a condenser and an evaporator with an expansion device therebetween so that refrigerant flows from the bed being heated to the condenser while the refrigerant can flow from the evaporator to the bed being cooled, and where the heating loop includes a heat exchanger associated with each bed design so that when a heat transfer fluid is flowing therethrough, a thermal temperature gradient or wave will be generated along the bed together with a cooling heat exchanger between one of the ends of the beds and a heating means between the other ends of the beds comprising the steps of:

circulating the heat transfer fluid around the heating loop until the exit temperature of the heat transfer fluid passing out of either of the beds shifts from the initial temperature of that bed by at least about twenty percent (20%) of the difference between the initial bed temperature and inlet fluid temperature; and

then reversing the flow of the heat transfer fluid around the heating loop each time the exit temperature of the heat transfer fluid passing out of either of the beds shifts from the initial temperature of that bed by at least about twenty percent (20%) of the difference between the initial bed temperature and inlet fluid temperature.

4,694,660

REFRIGERATION SYSTEM INCLUDING CAPACITY MODULATION

Edwin L. Ganaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 27, 1986, Ser. No. 867,802
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—196.4 **26 Claims**

1. A refrigeration system including capacity modulation comprising:

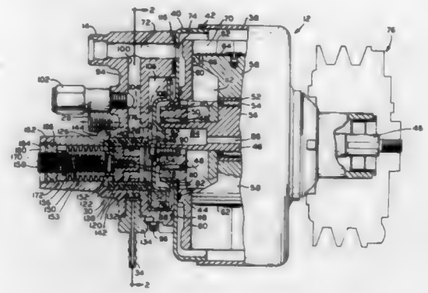
a compressor having a suction chamber and a discharge side,

a condenser having an inlet side connected to the discharge side of the compressor and an outlet side,

an evaporator connected between the outlet side of the condenser and the suction side of the compressor,

a liquid bypass conduit means connected between the outlet side of the condenser and the suction chamber of the compressor for bypassing a portion of the liquid refrigerant from the condenser around the evaporator to the compressor suction chamber, and

pressure responsive valve means on said compressor having an inlet connected to said bypass conduit means and an outlet opening into said suction chamber, said valve means opening and closing in response to the pressure in said suction chamber for metering bypassed liquid refrigerant into said suction chamber to thereby vary the cooling capacity of the compressor, wherein said valve means outlet opens directly into said suction chamber whereby the bypassed liquid refrigerant can expand immediately upon discharge from said valve means.

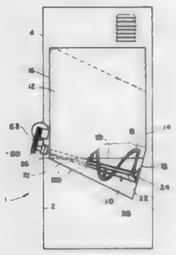


4,694,661

ICE DISPENSER WITH AN UPWARDLY INCLINED CHANNELED RAMP AND TWO PART AUGER

Jerry L. Landers, Sellersburg, Ind., assignor to Servend International, Inc., Jeffersonville, Ind.

Filed Jan. 23, 1986, Ser. No. 823,925
Int. Cl.[4] F25C *5/18*
U.S. Cl. 62—344 **25 Claims**



5. An ice storage bin in an ice dispenser has a rear wall, a front wall, and side walls which are connected to the rear and front walls and a cover means which rests atop the rear, front and side walls and a bottom wall extending between the rear wall, front wall and side walls, the bottom wall curving downward from relatively high positions on the side walls to relatively low positions intermediate the side walls and sloping upwardly from the rear wall to the front wall and a dispensing opening in the bin for dispensing ice stored within the bin, wherein the bottom wall has a central section with a relatively large radius of curvature near the rear wall and a relatively small radius of curvature near the front wall, and wherein the bottom wall has lateral portions with generally uniform radii of curvature which extend from the central section to the side walls and which slope upward from the rear wall to the front wall.

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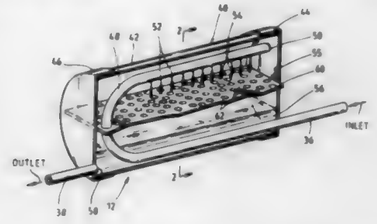
CONDENSING SUB-COOLER FOR REFRIGERATION SYSTEMS

Robert W. Adams, P.O. Box 68, Norway, Mich. 49870

Continuation of Ser. No. 665,916, Oct. 29, 1984, abandoned. This application Aug. 26, 1986, Ser. No. 901,962

Int. Cl.[4] F25B *39/04*

U.S. Cl. 62—509 12 Claims



1. A closed circuit, liquid refrigeration system comprising:
a liquid metering device for reducing the pressure of a liquid refrigerant;
an evaporator;
a compressor;
a condenser; and
a mechanical sub-cooler adjacent said metering device for condensing any vapor in said liquid refrigerant prior to said liquid refrigerant entering into said metering device, said sub-cooler consisting essentially of:
a shell defining a chamber having an inlet and an outlet; and
pressure reducing means connected to said inlet within said shell for receiving high pressure liquid refrigerant and reducing the pressure of liquid refrigerant passing therethrough.

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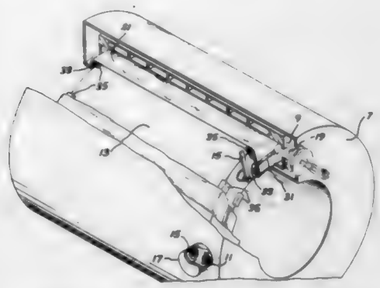
LOW COST INTERMEDIATE RADIATION SHIELD FOR A MAGNET CRYOSTAT

Russell S. Miller, Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1986, Ser. No. 816,086

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—514 R 4 Claims



1. A radiation shield assembly for a cryostat having an inner helium vessel, said cryostat defining a penetration for cooling the helium vessel, said radiation shield assembly comprising:
a flexible shield including means for conducting heat toward the cryostat penetration and providing an isothermal surface, the shield surrounding said helium vessel;
spacer means situated between said shield and said helium vessel; and
clamping means for holding said flexible shield under tension around said spacer means to prevent said flexible shield from sagging.

4,694,664

EAR ORNAMENTATION

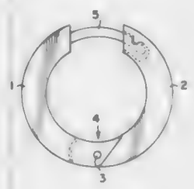
Carl Elsener, Uetlibergstrasse 60, CH-8902 Urdorf, Switzerland

Filed May 9, 1985, Ser. No. 732,514

Claims priority, application Switzerland, May 10, 1984, 2291/84

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—12 9 Claims



1. An ear ornamentation for wearing on and removable from a perforated ear lobe comprising two ornamental components (1, 2), (11, 12) of substantially the same size and configuration linked by means of a hinge (4) at one end and having engageable fastening means (5, 6, 7 and 8) at the other end of each said ornamental component (1, 2), (11, 12), and opposite each other relative to the direction of rotation about said hinge (4), said engageable fastening means comprising a spring pin (5) mounted in one said ornamental component (1, 11) with a transverse recess (6) near a terminal end of said spring pin (5), and a receiving aperture (7) with a projection (8) therein in the other said ornamental component, said projection (8) providing a snap catch for engagement with said transverse recess (6) in said spring pin (5), whereby said two ornamental components (1, 2), (11, 12) are positively and integrally locked by engagement of said fastening means upon rotation of said ornamental components in one direction, and said two ornamental components are opened and said fastening means disengaged by rotation of said ornamental components in an opposite direction, and said engageable fastening means are invisible when said ear ornamentation is engaged on said perforated ear lobe.

4,694,665

COUNTERFLOW WASHING MACHINE

Karl-Heinz Stoll, Wiesbaden, Fed. Rep. of Germany, assignor to Senkingwerk GmbH, Hildesheim, Fed. Rep. of Germany

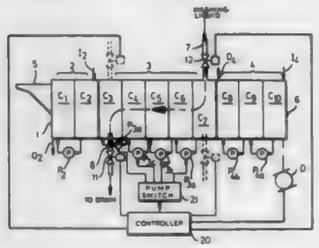
Continuation-in-part of Ser. No. 819,135, Jan. 15, 1986, Pat. No. 4,616,372, which is a division of Ser. No. 672,582, Nov. 16, 1984, Pat. No. 4,607,509. This application Jul. 1, 1986, Ser. No. 880,891

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341504

Int. Cl.[4] D06F *31/00*

U.S. Cl. 68—27 5 Claims

1. A washing machine, comprising:
a washing drum axially subdivided into a plurality of washing zones, each divided into a plurality of washing compartments, said drum being provided with means for transferring batches of wash through said zones and said compartments in one direction and in succession, and for agitating said batches in said compartments;
first flow-control means communicating with said drum for introducing a first washing liquid to a relatively upstream compartment of at least one of said zones and for draining said first washing liquid from said drum at a relatively downstream compartment of said one of said zones, whereby said first washing liquid flows from said relatively upstream compartment to said relatively downstream compartment in said direction and contacts said batches in said relatively upstream compartment, said relatively downstream compartment and compartments of said one of said zones between said relatively upstream compartment and said relatively downstream compartment;
second flow-control means communicating with said drum for introducing a second washing liquid to said relatively downstream compartment of said one of said zones and for draining said second washing liquid from said drum at



said relatively upstream compartment of said one of said zones, whereby said second washing liquid flows from said relatively downstream compartment to said relatively upstream compartment in counterflow to said direction and contacts said batches in said relatively upstream compartment, said relatively downstream compartment and compartments of said one of said zones between said relatively upstream compartment and said relatively downstream compartment; and
means for contacting said batches with other liquids in others of said zones and said compartments.

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SHACKLE MECHANISMS

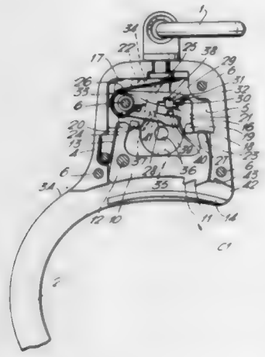
Ronald S. Bellingham, Bilston, and Malcolm J. White, Lichfield, both of England, assignors to Chubb & Son's Lock and Safe Company Limited, Feltham, England

Filed Nov. 21, 1985, Ser. No. 800,622

Claims priority, application United Kingdom, Dec. 13, 1984, 8431516

Int. Cl.[4] E05B *75/00*

U.S. Cl. 70—16 2 Claims



1. The combination of a shackle device an a correct key therefor, the shackle device comprising a pair of arms pivoted together at one of their respective ends and interengageable at their other respective ends so as collectively to encircle part of a subject's body; a first said arm being formed with a series of ratchet teeth on its convex side at its end remote from the aforesaid pivot and the second said arm extending from a casing which houses a resiliently-biased pawl for engagement with said teeth; the aforesaid ratchet teeth and pawl being so arranged as to permit continuous 360° rotation of the first arm relative to the second arm in the direction which closes the aperture defined by said arms but to prevent rotation of the first arm relative to the second arm in the opposite direction when the ratchet teeth and pawl are in contact; a key-engageable runner slidably borne in said casing and adapted to lift said pawl out of contact with said ratchet teeth against the action of said resilient bias when said runner is slid from a predetermined first position to a predetermined second position by the rotation of the correct key within said casing in a predetermined direction; the runner further having a manually-engageable portion extending outside of said casing for actuation by the finger or thumb of a person applying the shackle device for manually sliding the runner from its said first position to a predetermined third position, in the direction opposite to the direction of its movement from its first to its second position, in which third position a portion of the runner overlies a portion of the pawl to block the pawl from lifting out of contact with the ratchet teeth; a plurality of pivoted, key-engageable locking levers housed in said casing and biased to respective locking positions; each said lever having a first formation with which an abutment portion of the runner engages when the runner is in its said first position and the levers are in their locking positions, so as to block the movement of the runner from its said first position to its said second position, but said levers being pivotable to respective unlocking positions in which each said formation disengages from said abutment portion so as to permit such movement of the runner, by the rotation of the correct key within said casing in its said direction; each said lever having a second formation with which said abutment portion of the runner engages when the runner is in its said third position and the levers are in their locking positions, so as to block movement of the runner from its third to its first position, but each said second formation being arranged to disengage from said abutment portion so as to permit such movement of the runner when the levers are pivoted to their unlocking positions by the rotation of the correct key within said casing in its said direction; and at least one of said first formation of each lever and said abutment portion of the runner having a face inclined to the direction of movement of the runner from its first to its third position whereby movement of the runner in that direction by manipulation of said manually-engageable portion cams the levers away from their locking positions until the runner reaches its third position, whence the levers return to their locking positions under their aforesaid bias to engage their aforesaid second formations with the abutment portion.

4,694,667

PERMANENT PADLOCK-CHAIN ASSEMBLY

Allan M. Hodge, 5852 Lomond Dr., San Diego, Calif. 92120

Filed Jul. 26, 1985, Ser. No. 759,408

Int. Cl.[4] E05B *67/06;* A43C *11/08;* A44B *13/00;* F16G *15/00*

U.S. Cl. 70—49 8 Claims

1. An assembly for securing a chain to a padlock and for precluding separation of the chain and padlock, comprising:
a pair of sheet metal brackets each being bent to provide a pair of upstanding ears and a pair outwardly extending arms, with the two outwardly extending arms overlying one-another;
said outwardly extending arms having opposite facing notches defining a means for receiving and securing a link of a chain in said notches;
means for rigidly securing and locking said two brackets together in the area where the arms overlap one-another to permanently secure the chain to said brackets; and
said ears having aligned spaced hole means extending through said ears for receiving the pivot shank portion of

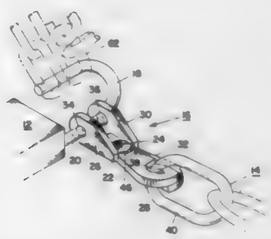
the padlock, said holes in said brackets being of a relatively small diameter to closely fit around the pivot shank of a padlock and being fixedly spaced apart by said locking means by a sufficiently great distance to preclude removal over the bent portion of said shank;

whereby, when said brackets are first assembled with the pivot shank portion of said padlock and a link of said chain located in said notches, and the brackets are then locked together, a permanent assembly is formed with the chain secured to said padlock even when the padlock is unlocked.

7. A permanent padlock and chain assembly, comprising:

a conventional padlock having a shackle having a curved portion and a straight pivot shank;

a chain;



first and second heavy sheet metal members each having an apertured first portion mounted with the aperture closely fitting over said straight pivot shank, and having a second portion displaced in orientation relative to said first portion, with the second portion of both of said sheet metal members overlying one-another;

means for permanently and rigidly locking the overlapping portions of said first and second members together with said apertured first portions being fixedly spaced apart from one-another to prevent removal of said two members from said shackle even when said padlock is open; and

means including opposite facing notches in said overlapping portions defining a means for locking onto one link of said chain when said two members are secured together.

4,694,668

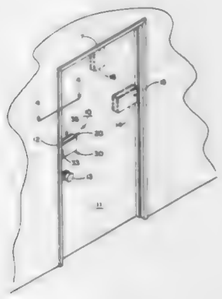
SECURITY BOX

Guy D. Ciletti, and Michael J. Trudeau, both of 7 Princeton, Irvine, Calif. 92720

Filed Oct. 24, 1986, Ser. No. 920,393

Int. Cl.⁴ E05B *65/52*

U.S. Cl. 70—63 **11 Claims**



1. A device in which to place an article to be retrieved later by an intended recipient, comprising:

a container having a first portion defining a first opening through which to insert an article into the container, a second portion defining a second opening through which to retrieve the article from the container, and a size and shape enabling the container to be mounted on a conventional door;

a first cover member adapted to be locked in place on the container in a position disposed over the first opening, to limit access through the first opening;

support means, including a bracket member having a first end, a second end, and a generally flat midportion disposed intermediate the first and second ends that is shaped and dimensioned to fit between the door and a door frame on which the door is mounted, for providing a support structure with which to mount the container on the door by closing the door with the midportion disposed between the door and the door frame;

mounting means for attaching the first end of the bracket to the container so that with the midportion of the bracket disposed between the door and the door frame, the first opening of the container is disposed in a position enabling placement of an article through the first opening by unlocking the first cover member, and the second opening of the container is disposed closely adjacent to and facing the door in a position inhibiting retrieval of the article through the second opening; and

door engaging means, including a lip portion of the bracket member disposed intermediate the midportion of the bracket and the second end, for engaging the door to inhibit removal of the container when the door is closed while enabling removal when the door is open, to thereby enable an intended recipient to retrieve an article by opening the door and moving the container to a position providing access through the second opening.

4,694,669

DOOR LOCK STRUCTURE

Horst Schwalb, Ontario, Canada, assignor to Dynaflair Corporation Canada Inc., Pointe Claire, Canada

Filed Jul. 14, 1986, Ser. No. 885,546

Int. Cl.⁴ E05B *65/08;* **E05C** *1/02*

U.S. Cl. 70—100 **12 Claims**



1. A door lock structure for securement in a longitudinal cavity in a door vertical free edge portion or folding door edge post, said door lock structure comprising an elongated locking rod supportingly guided in said longitudinal cavity, said rod having a locking free end movable above an open end of said bore above a horizontal edge of said door, said rod being normally biased in a retracted position in said cavity with said rod locking free end disposed inwardly of said horizontal door edge, external rod displacement means on an outside face of said door vertical free edge portion and secured to said rod for displacing said rod and said locking free end outwardly of said horizontal door edge to a locking position, bolt engaging means disposed inwardly of said door edge adjacent said rod for engaging said rod when placed in its locking position, key operated cam means accessible from an outside face of said door vertical free edge portion for disengaging said rod engaging means from engagement with rod, there being two of said longitudinal cavities axially aligned in said door edge, a locking rod associated with each said cavity and each biased with their respective locking free end inwardly of a top and bottom horizontal edge of said door, said bolt engaging means engaging both said bolts simultaneously in their locking position and permitting either of said bolts to be independently displaced to their locking position, each said bolt being provided with at least one retention notch therein, said bolt engaging means being an elongated lock arm having an arresting finger at opposed ends thereof, said lock arm being spring biased in the direction of said bolts with said arresting fingers contacting an associated one of said bolts whereby said fingers will enter said retention notch when displaced thereagainst.

4,694,670

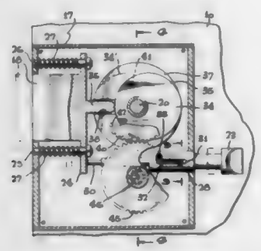
COMBINED KEY AND COMBINATION LOCK

Young H. Jang, San Francisco Calle 72, Casa 38, Panama City, Panama

Filed Dec. 31, 1984, Ser. No. 687,938

Int. Cl.⁴ E05B *37/08*

U.S. Cl. 70—303 R **1 Claim**



1. A combined key and combination lock comprising:

a key lock mechanism;

a combination rotary lock mechanism coaxially disposed with respect to said key lock mechanism;

a door mounted action bolt operable between a locked position and an unlocked position;

latch mechanism operated by cooperation of both said key lock mechanism and said combination rotary lock mechanism;

means interconnecting said key lock mechanism and said combination rotary lock mechanism whereby coded and selective operation of said key lock and combination rotary lock mechanisms operate said action bolt between said locked and unlocked positions via said latch mechanism;

means included in said interconnecting means for selectively disengaging said key lock mechanism and said combination rotary lock mechanism from one another so that said rotary lock mechanism operates to the exclusion of said key lock mechanism for unlocking said action bolt from said locked position;

overriding means operably coupled to said key lock mechanism and said combination rotary lock mechanism to maintain said action bolt in said locked position until released manually by a user;

said overriding means, including a manually operated push rod yieldably biased against said action bolt and further including retention means carried on said push rod in said locked position;

said interconnecting means includes a plurality of spaced apart discs, each disc having a cutout adapted to be linearly aligned to insertably receive said action bolt establishing said unlocked position and adapted to be non-linearly aligned establishing said locked position;

said interconnecting means further includes an eccentric drive cam adjacent said plurality of discs and said action bolt resiliently bearing against said drive cam to constitute a cam follower so as to move said action bolt out of said linearly aligned cutouts of said plurality of discs in response to rotation of said drive cam;

resilient means coupled to said action bolt for returning or normal biasing said action bolt into said disc aligned linear cutouts.

4,694,671

PRESS INCORPORATING SAFTEY SYSTEM

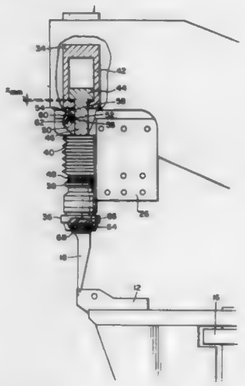
David Downham, Flitwick, England, assignor to Leslie Hartridge Limited, Buckingham, England

Continuation of Ser. No. 728,949, Apr. 30, 1985, abandoned. This application Oct. 17, 1986, Ser. No. 922,839

Claims priority, application United Kingdom, May 3, 1984, 8411336

Int. Cl.⁴ B23Q *11/00*

U.S. Cl. 72—26 **10 Claims**



1. A press comprising:

(a) a frame;

(b) two press parts which are mounted on said frame in such a manner that one of the two parts is moveable towards the other part;

(c) drive means mounted on said frame and connected to said one of the two parts to effect such movement;

(d) a detector switch positioned on one of said two press parts, or a member connected thereto, and arranged to be operated by a resistance to such movement;

(e) a limit switch connected to said drive means and arranged to be operated by means of the motion of said one of the two press parts, or a member connected thereto, when the remaining available travel of said one of the two press parts in a direction towards said other press part is less than the thickness of an operator's finger

(f) control means connected to said drive means and having a first electrical input which, when an electrical signal is applied thereto, stops such movement, and a second electrical input which, when an electrical signal is applied thereto, enables a working force to be applied to said one of the two parts by the drive means;

(g) a first switch means connected to said limit switch, which is normally in a conductive state but which is switched to a non-conductive state upon operation of said limit switch;

(h) a second switch means connected to said limit switch,

which is normally in a non-conductive state but which is switched to a conductive state upon operation of said limit switch;

(i) a first switch means connnected to said detector switch, which is normally in a non-conductive state but which is switched to a conductive state upon operation of said detector switch; and

(j) a second switch means connected to said detector switch, which is normally in a non-conductive state but which is switched to a conductive state upon operation of said detector switch;

in which the respective said first switch means connected to said limit switch and said detector switch are connected in series with one another to said first input of said control means, and in which the respective said second switch means connected to said limit switch and said detector switch respectively are connected in series with one another to said second input of said control means;

whereby said drive means acts on said one of the two press parts with a working force in said direction when both said limit switch and said detector switch have been operated, and movement of said one of the two press parts in said direction is stopped when said detector switch is operated, during a given approach of that press part towards said other press part, in the event that said limit switch has not yet been operated for that given approach, and such movement is also prevented in the event that said detector switch fails in its operated condition prior to operation of said limit switch.

4,694,672

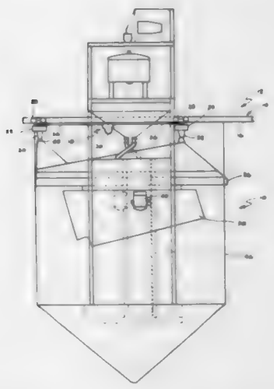
METHOD AND APPARATUS FOR IMPARTING A SIMPLE CONTOUR TO A WORKPIECE

Davis L. Baughman, Rte. 10, Box 105, Hagerstown, Md. 21740

Continuation of Ser. No. 568,403, Jan. 5, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,206

Int. Cl.[4] B21J *5/00*

U.S. Cl. 72—53 **15 Claims**



1. Apparatus for imparting a simple contour to a flat workpiece so as to form a wing skin, comprising:

a treatment chamber;

a conveying means extending through said chamber for moving the workpiece through the chamber, the conveying means including a rail means, a transport means, and a workpiece affixing means having an adjusting means for positioning said workpiece in relation to the rail means;

a shot throwing means carried by the treatment chamber capable of discharging shot in a pattern into the treatment chamber and onto a selected side of the workpiece; and

a control system for the shot throwing means to regulate the flow and direction of the shot discharged therefrom, the control system further connected to the adjusting means to direct and position the workpiece to receive the discharge pattern of shot on the selected side in spaced narrow spanwise strips.

4,694,673

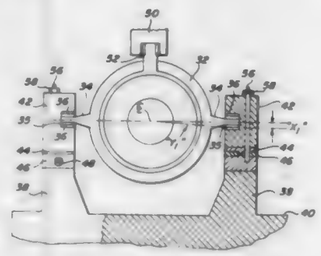
CONTAINER GUIDANCE SYSTEM FOR EXTRUSION PRESS

Raymond F. Bockold, Springfield, Pa., assignor to Wean Industries, Inc., Youngstown, Ohio

Filed Dec. 3, 1985, Ser. No. 804,033

Int. Cl.[4] B21C *27/00*

U.S. Cl. 72—272 **8 Claims**



1. In an extrusion press having a frame, an extrusion die carried by the frame defining an operating centerline axis centrally thereof, a pair of longitudinally extending guideways carried by said frame on either side of said axis and parallel thereto, an extrusion container, a generally annular container holder concentrically of said axis, a single pair of fins extending outwardly from said container holder and having slide faces thereon for slide cooperation with said guideways, means for horizontally adjusting said container with respect to said centerline axis, and, means for vertically adjusting said guideways thereby to vertically adjust said container holder carried thereby to a desired alignment with said centerline axis;

the improvement therein to minimize shifting of said container holder from said predetermined axis alignment during press operation, comprising,

said single pair of fin means having respective planar upper and lower slide faces thereon,

said guideways respectively having a substantially C-shaped cross-section defing upper, lower, and side internal surfaces and having a lateral opening directed toward said holder,

said frame having means positioning said guideways carried coplanar relation on either side of said container holder in substantially thereby in substantially diametric relation thereto, and,

said container holder having the fins thereof extending substantially diametrically of said holder for respective reception within said guideways,

whereby subsequent to vertical adjustment of said guideways to centerline axis alignment, vertical shifting of said guideways and said press frame and radial expansion of said container holder in response to press forces and thermal expansion during press operation is ineffective to materially after container centerline axis alignment.

4,694,674

BENCH SYSTEM FOR REPAIRING AUTOMOBILES

David R. Lawrence, 28102 S. Salo Rd., Mulino, Oreg. 97042

Filed Feb. 24, 1986, Ser. No. 832,531

Int. Cl.[4] B21D *1/12*

U.S. Cl. 72—305 **12 Claims**

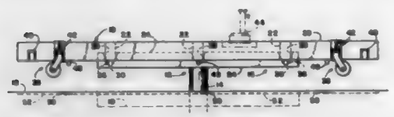
1. An apparatus for repairing the body of a vehicle comprising:

(a) lift means having a pedestal and a generally horizontal bed at the top of said pedestal for selectively raising or lowering said bed;

(b) bench means having a frame for supporting a vehicle thereon;

(c) means for structurally attaching said frame rigidly to the vehicle for movement in unison therewith;

(d) mating means on said bed and frame, respectively, for



releasably attaching said frame supportably atop said bed in a position generally symmetrical with respect to said pedestal and for selectively detaching said frame from said bed with said vehicle attached to said frame for movement of said frame and said vehicle in unison to a location which is remote from said lift means; and

(e) means structurally interlocking said bed and said frame for transferring vertical and horizontal stresses from said frame to said bed so as to strengthen said frame.

4,694,675

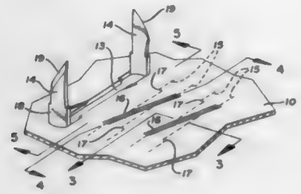
METHOD OF MAKING A CONNECTOR PLATE

Edgar A. Mort, Poland, Ohio, assignor to Inter-Lock Steel Company, Inc., East Palestine, Ohio

Filed Aug. 8, 1986, Ser. No. 894,875

Int. Cl.[4] B21D *31/02*

U.S. Cl. 72—325 **4 Claims**



1. A method of fabricating a connector plate with a plurality of sharp ended teeth from sheet steel of a known thickness having first and second substantially parallel surfaces comprising the steps of: forming in a first punching operation, elongated cross sectionally V-shaped grooves in said sheet steel inwardly of said first surface to a depth of at least half the known thickness of said sheet steel, forming, in a second punching operation a plurality of attached teeth in said sheet steel so that one end of each of said teeth is shaped by one inclined side surface of each of said plurality of elongated cross sectionally V-shaped grooves, and moving said punched teeth to positions at right angles to the surfaces of said sheet steel.

4,694,676

METHOD OF MANUFACTURING TRI-POT UNIVERSAL JOINT HOUSINGS

Gerald A. O'Brien, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1982, Ser. No. 402,829

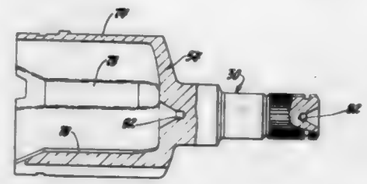
Int. Cl.[4] B21K *1/26*

U.S. Cl. 72—348 **12 Claims**

1. A method of manufacturing a one-piece tri-pot universal joint housing, comprising the steps of:

providing a part having a shank at one end and an enlarged cylindrical head at the opposite end,

backward extruding the enlarged cylindrical head to form a triangularly shaped cup which has an annular triangularly shaped side wall and a triangularly shaped bottom wall,



and draw-ironing the triangularly shaped cup to form a tri-lobal housing portion which has a tri-lobal side wall defining three internal, circumferentially spaced ball tracks and a tri-lobal bottom wall.

4,694,677

ELONGATED TUBE EXPANDER TOOL

George B. Rabe, Sparta, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 24, 1986, Ser. No. 831,888

Int. Cl.[4] B21D *41/02*

U.S. Cl. 72—393 **9 Claims**



1. An elongated tube expander tool for expanding a tube end at a remote location, said tool comprising:

(a) an elongated central shaft adapted for being inserted into a tube, said shaft being attached at its forward end to a cylinder containing a front piston axially movable in the cylinder forward end portion;

(b) a collet attached to the forward end of said cylinder, said collet having multiple radially expandable fingers at its forward end;

(c) a cylindrical-shaped mandrel having an inwardly tapered front end and a rear end rigidly attached to the forward end of said piston and adapted to be slidably received in said collet fingers;

(d) a retractor piston threadably attached to the rear end of said central shaft, said retractor piston being slidable within a retractor housing; and

(e) an elongated tube centrally disposed within said shaft and said retractor piston, the tube being adapted for supplying fluid pressure from said housing to the rear end of said front piston, whereby said mandrel can be forced forward into said collet fingers so as to radially expand the fingers and thereby radially expand the tube end.

4,694,678

TIE-RODS FABRICATED OF COMPOSITE MATERIALS FOR FORGING PRESSES

Alexander Zeitlin, White Plains, and Adam Zandel, Forest Hills, both of N.Y., assignors to Press Technology Corporation, White Plains, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,019

Int. Cl.[4] B21J *13/04;* **B21D** *37/12*

U.S. Cl. 72—455 **7 Claims**

1. An improved tie-rod plate in combination with a frame for a large forging press, comprising:

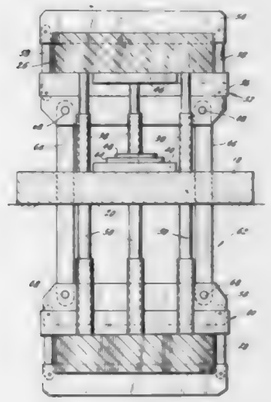
the frame for the large forging press which includes:

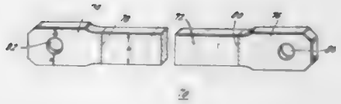
a load opposing, horizontally extending, elongated upper

crosshead assembly having first and second longitudinally opposed end regions;

a load opposing lower crosshead assembly having its respective first and second end regions which are located on opposite longitudinal ends of said assembly, said lower crosshead assembly being spaced from, parallel to, and coextensive with said upper crosshead assembly, said crosshead assemblies being comprised of pluralities of superposed plates;

first and second tie-rod assemblies for completing said frame, said first tie-rod assembly including a plurality of superposed plates which extend generally vertically between said first end regions of said upper and lower crosshead assemblies and said second tie-rod assembly including a plurality of superposed plates which extend between the second end regions of said upper and lower crosshead





assemblies, the respective ends of the plates of said tie-rod assemblies being interleaved with plates which comprise said upper and lower crossheads, a respective link pin through each one of said end regions connecting the tie-rod plates and the crosshead plates to one another;

each plate of said tie-rod assemblies being constituted of the improved tie-rod plate which comprises:

an elongate, single piece, generally flat steel bar which includes a middle section constructed of metal having a predetermined yield strength and first and second end sections welded to longitudinally opposite ends of the middle section and constructed of an alloy steel having a yield strength which is greater than said yield strength of said middle section, each one of said end sections having at least one respective pin hole formed therein for connecting said tie-rod plate in said frame.

4,694,679

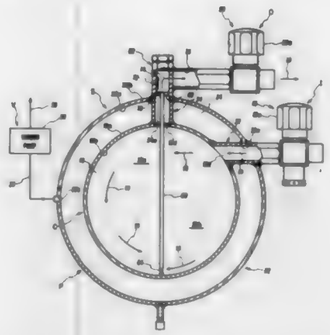
GRAVITOMETER PROVER

James A. Woods, Houston, Tex., assignor to Harold R. Lauterbach, Houston, Tex.

Continuation-in-part of Ser. No. 636,836, Aug. 10, 1984, abandoned. This application Apr. 2, 1986, Ser. No. 847,440

Int. Cl.⁴ G01N *9/04*

U.S. Cl. 73—1 R **4 Claims**



1. A gravitometer prover for measuring the density of a fluid in communication with and for proving the accuracy of a gravitometer, comprising:

a shell member having an outer surface and an inner surface defining an inner chamber for receiving fluid therein;

a fluid inlet formed in said shell member in communication with said inner chamber for receiving fluid to be directed into said inner chamber;

a fluid outlet formed in said shell member in communication with said inner chamber for directing fluid from said inner chamber; and,

flow restricting means interposed between said inner chamber and said fluid outlet, said flow restricting means comprising an elongated tube projecting into said inner chamber, said elongated tube having an inlet port in communication with said inner chamber for admitting fluid and having an outlet port connected in communication with said fluid outlet.

4,694,680

ULTRASOUND DIAGNOSTIC EQUIPMENT

Yasuhito Takeuchi; Yuichi Hirota; Shinichi Sano, and Shinichi Ishiguro, all of Tokyo, Japan, assignors to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP84/00615, § 371 Date Jul. 26, 1985, § 102(e) Date Jul. 26, 1985, PCT Pub. No. WO85/02761, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 26, 1984, Ser. No. 765,435

Claims priority, application Japan, Dec. 27, 1983, 58-247382

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—1 DV **5 Claims**

1. An ultrasound diagnostic equipment comprising

an ultrasound applying probe means for applying ultrasound signals to a body to be examined;

control means;

means, under the control of said control means, for receiving diagnostic signals from said body and for outputting in response thereto transmitted diagnostic signals;

testing means for testing faults in the internal components of said equipment, comprising means for providing test signals indicating presence or absence of faults in said internal components of said equipment;

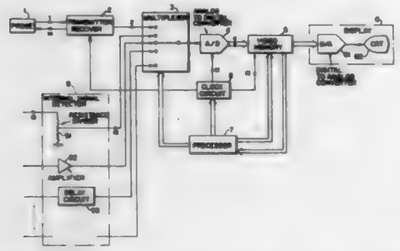
switching means for selectively inputting test signals from said testing means and diagnostic signals from said means

for receiving and selectively outputting said test signals and said diagnostic signals;

converting means, under the control of said control means, for inputting signals from said switching means and for converting said test signals and said diagnostic signals into digital signals;

memory means, under control of said control means, for storing digital signals from said converting means; and

display means for inputting signals stored in said memory means and displaying said signals; wherein



said testing means comprises dividing means, amplifier means and delay means, and means for testing the internal components of said equipment for faults and applying test signals through said switching means to said converting means concurrently with the continued operation of said ultrasound applying probe means; and wherein

said dividing means and said amplifier means of said testing means causes the voltage of the test signals to be within the voltage range of the converting means and said delay means cause the test signals to be within the operating cycle of the converting means.

4,694,681

MEASURING TURBINE

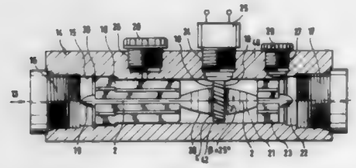
Helmuth Hoffmann, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Hydrotechnik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 602,758, Apr. 23, 1984, abandoned, which is a continuation of Ser. No. 364,480, Apr. 1, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 748,033

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113112

Int. Cl.⁴ G01F *1/12*

U.S. Cl. 73—3 **8 Claims**



8. A process for adjusting the rotation of a turbine rotor in a measuring turbine wherein said turbine rotor is arranged in a flow channel with its axis in the direction of flow, comprising:

providing an irregular configuration of an annular gap defined by the circumference of the turbine rotor and a flow channel wall to produce braking forces on a circumferential flow component around said turbine rotor;

varying the irregular configuration of said flow channel wall to adjust said braking to an optimum desired level.

4,694,682

ANALYSIS OF ORGANIC ADDITIVES IN PLATING BATHS USING NOVEL CHROMATOGRAPHIC METHODS IN A MASS BALANCE APPROACH

Kurt E. Heikkila, Shoreview; Rodney K. Williams, St. Paul, and Russell J. Pylkki, Minneapolis, all of Minn., assignors to ETD Technology, Inc., Shoreview, Minn.

Continuation of Ser. No. 594,558, Mar. 29, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 842,356

Int. Cl.⁴ G01N *30/04*; B01D *15/08*

U.S. Cl. 73—61.1 C **36 Claims**



1. An analytical method of determining the concentration of an organic analyte or mixtures thereof in an acidic or basic metal plating bath medium using an HPLC apparatus having components that maintain the stability, precision and accuracy of the analytical method which comprises:

(1) obtaining an HPLC apparatus having:

(a) a chromatographic column, containing a stationary phase and a support phase composition sufficient to resolve each organic analyte, having an inlet and an outlet;

(b) a detector means for measuring the relative concentration of each organic analyte having an inlet and an outlet wherein the chromatographic column outlet is attached in liquid communication to the detector inlet;

(c) a second column, having a packing comprising at least a support phase composition, and having an inlet and an outlet wherein the second column outlet is connected in liquid communication with the chromatographic column inlet, wherein the second column support phase composition can substantially reduce the effect of the acidic or basic components of the sample on the reproducibility, precision or accuracy of the analysis;

(d) a sample introduction means having an inlet, an outlet and a sample introduction port, wherein the sample introduction means outlet is attached in liquid communication to the second column inlet;

(e) a source of solvent under pressure; and

(f) a third column, having an inlet and an outlet, having sufficient support phase to saturate the solvent with dissolved support phase, the third column inlet in liquid communication with the source of solvent, and the third column outlet in liquid communication with the sample introduction means inlet;

(2) passing a stream of solvent under pressure through the HPLC apparatus;

(3) applying a sample of a bath medium to be analyzed into the stream of solvent under pressure at the sample introduction port;

(4) passing the bath medium sample in the solvent through the second column wherein the column packing substantially reduces the effect of the acid or basic components of the sample forming an innocuous analyte;

(5) passing the innocuous analyte in the stream of solvent into the chromatographic column, resolving the analyte components into detactable segments utilizing the interaction between the analyte and the stationary phase; and

(6) passing the detectable segments in the solvent into a detector that can produce a signal which as a result of the cooperation of the elements of the HPLC apparatus and the sample obtains a substantially linear relationship between the analyte concentration in the sample and the integration units produced from the signal.

24. An HPLC apparatus that can determine the concentration of an organic analyte or mixtures thereof in an acidic or basic metal plating bath medium, which comprises:

(a) a chromatographic column, containing a stationary phase

and a support phase composition sufficient to resolve each organic analyte, having an inlet and an outlet;

(b) a detector means, for measuring the relative concentration of each organic analyte, having an inlet and an outlet wherein the chromatographic column outlet is attached in liquid communication to the detector inlet;

(c) A second column, having a packing comprising at least a support phase composition, and having an inlet and an outlet wherein the outlet is connected in liquid communication with the chromatographic column inlet, wherein the second column support phase composition can substantially reduce the effect of the acidic or basic components of the sample on the reproducibility, precision or accuracy of the analysis;

(d) a sample introduction means having an inlet, an outlet and a sample introduction port, wherein the sample introduction means outlet is attached in liquid communication to the second column inlet;

(e) a source of solvent under pressure; and

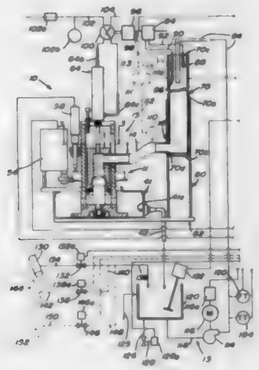
(f) a third column, having an inlet and an outlet, having sufficient support phase to saturate the solvent with dissolved support phase, the third column inlet in liquid communication with the source of solvent, and the third column outlet in liquid comuunication with the sample introduction means inlet.

4,694,683

METHOD TO AUTOMATICALLY DETERMINE THE SIZE DISTRIBUTION OF SHIVE AND ANALYZER THEREFOR

Wladmir Janssen, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Feb. 11, 1986, Ser. No. 828,344
Int. Cl.[4] G01N *15/06*
U.S. Cl. 73—63 **10 Claims**



1. An apparatus to automatically determine, on-line, the shive content and shive size distribution of a wood pulp containing shives, said apparatus comprising:

a line having an inlet for receiving a flow of wood pulp containing shives and an outlet whereby said flow of pulp is leaving said line,

a plugging means for closing said line,

a means to automatically actuate said plugging means, as to define a gradually increasing or decreasing gap in said plugging means,

and responsive to said means automatically actuating said pluggins means, a means translating and recording the size of said gap, said gap allowing during operating conditions the passage of the flow of wood pulp and the portion of shives having less than the size of said gap at a given moment, while temporarily preventing the passage of shives exceeding the size of said gap and thereby interfering with the flow of wood pulp through the gap and thereby through said line, thereby causing impedance in said line,

a means for sensing the impedance in said line over a predetermined impedance threshold level,

and responsive to said means of sensing impedance over said threshold level a means for rapidly releasing said plugging means whereby upon each occurence of said impedance over said predetermined threshold level, said impedance sensing means actuates said rapidly releasing means and thereby instantaneously enlarge said gap from said operating conditions as to permit the passage threthrough of said shives exceeding the size of the gap, and a short period of time thereafter, rapidly returning said plugging means and said gap to said operating conditions, and responsive to said rapidly releasing means,

a means for registering said occurrence of said impendance over said threshold level for said gradually increasing or decreasing gap during a predetermined period of time,

a means responsive to said registering means and said means for translating and recording the gap size, to correlate the count of said occurrence to the size of said gap to automatically determined on-line the size distribution of said shive, and

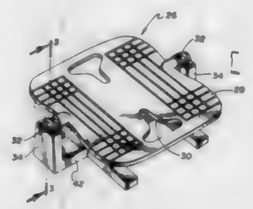
a means to deliver a constant flow of wood pulp in said inlet of said line, said means to deliver a constant flow being selected from the group comprising pressure measuring means, volume measuring means, pressure regulating means, volume regulating means.

4,694,684

DYNAMIC BALANCING FOR SKIS

Harry J. Campbell, III, 667 Mill St., Excelsior, Minn. 55331

Filed Feb. 13, 1986, Ser. No. 829,415
Int. Cl.[4] G01M *1/12;* **A63C** *11/26*
U.S. Cl. 73—65 **8 Claims**



2. A fixture for accomplishing the optimum dynamic balancing of a pair of skis while being stood upon by the skier, the fixture comprising, in combinations:

a. a frame; and

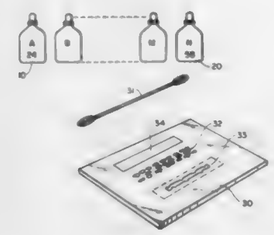
b. platform having a pivot axis on a top surface thereof and mounted on the frame for deflection about the pivot axis by a skier standing on the platform with ski boots on a ski having the midpoint of the running surface thereof aligned with the pivot axis of the platform, the platform constructed and arranged for allowing the tips of the skis when the skier flexes to be deflected upwardly and downwardly by the skier with equal ease when the skier's boot is positioned at a dynamically neutral balance point on the surface of the ski.

4,694,685

APPARATUS AND METHODS FOR DETERMINING THE WETTABILITY OF VARIOUS SUBSTRATES

Franklin A. Dick, Princeton, N.J., assignor to Marbetech Corporation, Princeton, N.J.

Continuation of Ser. No. 619,549, Jun. 11, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,443
Int. Cl.[4] G01N *13/00*
U.S. Cl. 73—104 **13 Claims**



1. In a process for use in testing the wettability of various substrates by wiping the substrate with a solution and viewing the wiped substrate to determine whether the solution properly wets the substrate or retracts on the substrate the improvement therewith of using a solution, comprising:

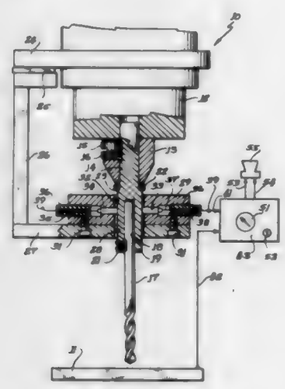
a main blend consisting of a dihydric alcohol and purified water in amounts to provide a surface tension of 56 dynes per centimeter.

4,694,686

CUTTING TOOL WEAR MONITOR

John M. Flides, Hanover Park, and Robert H. Krueger, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 621,834, Jun. 18, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,616
Int. Cl.[4] G01N *3/58, 3/56*
U.S. Cl. 73—104 **12 Claims**



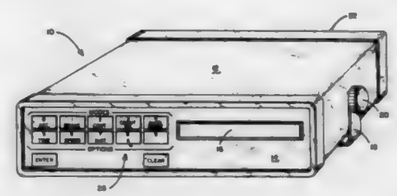
1. A method of detecting tool wear failure for a metal removal operation comprising the steps of monitoring the direct current generated by a cutting tool acting on a metal workpiece during the cutting operation and determining a sharp change in the slope of the current generated plotted against the number of articles cut in comparison with earlier changes in slope thereof as an indication of tool failure.

4,694,687

VEHICLE PERFORMANCE ANALYZER

Wayne A. Bonin, Cedar; Roger D. McCumber, Minnetonka, and Rein S. Teder, Minneapolis, all of Minn., assignors to Vericom Corporation, Minnetonka, Minn.

Filed Apr. 17, 1986, Ser. No. 853,236
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **8 Claims**



1. A vehicle performance analyzer, comprising:

(a) electrical transducer means for sensing acceleration and deceleration forces and producing electrical signals proportional to said forces;

(b) pulse producing means coupled to said transducer means for converting said electrical signals into a pulse whose width is proportional to said acceleration and deceleration forces;

(c) microprocessor means, including counting means, coupled in controlling relation to said pulse producing means for converting the pulse from said pulse producing means into a digital quantity;

(d) manually operable switch means coupled to said microprocessor means for entering commands into said microprocessor means for directing the nature of the computations to be performed using said digital quantity as an operand; and

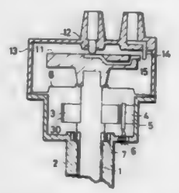
(e) display means for visually indicating results of said computations.

4,694,688

CRANK ANGLE SENSOR

Tadashi Takahashi; Kunio Miyashita, and Syoichi Kawamata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,975
Claims priority, application Japan, Feb. 8, 1985, 60-23305
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **20 Claims**



1. A crank angle sensor for generating signals representative of the rotation of the crankshaft of an internal combustion engine comprising:

a magnetic recording medium coupled to said crankshaft so as to rotate in synchronism therewith, and containing a plurality of recording tracks including at least a first and a second track and wherein on respective ones of said recording tracks data is magnetically recorded in the form of unitary magnetic poles, the magnetic poles of said first of said tracks having a pitch P between the poles thereof and being representative of the angle of rotation of said crankshaft, and each of the magnetic poles of said second

track having said pitch P between the poles thereof and being distributed at prescribed locations along said second track with the magnetic polarities thereof being oriented in the same manner as the polarities of the respective magnetic poles of said first track;

a magnetic sensor spaced apart from said magnetic recording medium and containing respective pairs of magnetoresistive elements arranged to be magnetically coupled with each of the respective recording tracks of said recording medium, the magnetoresistive elements of a respective pair of elements being spaced apart from one another by effectively one-half said pitch P in the direction of relative motion between said sensor and said recording medium; and

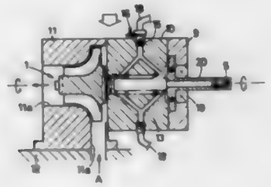
wherein the magnetic poles of said second recording track are distributed at predetermined locations along said second track in respective pluralities corresponding to the number of cylinders of said engine.

4,694,689

METHOD AND DEVICE FOR SPIN-TESTING OF TURBOCHARGER ROTOR

Keiji Kawasaki, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Mar. 18, 1986, Ser. No. 840,754
Claims priority, application Japan, Mar. 23, 1985, 60-59072
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—118.1 **8 Claims**



1. A method for spin-testing a turbocharger rotor, said rotor including a shaft portion which is fixed to an assembly of component parts which include a thrust bearing, a spacer, at least one of a sleeve portion and compressor rotor portion, and a lock nut, wherein the improvement comprises the steps of:

preparing an integral composite member consisting of at least two of said component parts;

dynamically balancing said turbocharger rotor, without said shaft portion fixed to said assembly;

placing said turbocharger rotor and said integral composite member in a testing device, such that said shaft portion and said assembly are fixed to each other by said lock nut, and are rotatable as a unit; and

rotating said turbocharger rotor and said assembly in said testing device, to effect said spin-testing.

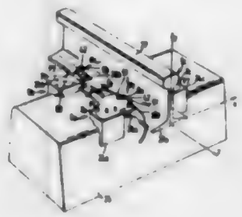
4,694,690

MEASURING DISPLACEMENT BETWEEN TWO RELATIVELY MOVABLE STRUCTURES

Robert Jones, Cambridge; Keith W. Jones, Histon, and William R. S. Baxter, Cambridge, all of England, assignors to Pandrol Limited, London, England

Filed Jul. 30, 1986, Ser. No. 891,652
Claims priority, application United Kingdom, Aug. 2, 1985, 8519473; Jul. 3, 1986, 8616298
Int. Cl.⁴ G01M *19/00*
U.S. Cl. 73—146 **16 Claims**

1. A method of measuring movement of a railway rail with respect to an underlying structure, wherein a first device is fixed with respect to the rail and a second device is fixed with respect to the underlying structure, one of these devices including a split field filter and the other including first means for directing light at the filter and second means for transmitting light which has passed through the filter, and wherein there is supplied to the first means light of two wavelengths and the light which has passed through the filter, which is affected by



the position of the filter with respect to the first and second means, is used to provide a measure of the movement of the rail with respect to the underlying structure.

4,694,691

AIR PRESSURE GAUGE TOOL

John G. Johnston, Oak View, Calif., assignor to M. O. Enterprises, Inc., Walnut Grove, Calif.

Filed May 19, 1986, Ser. No. 864,455
Int. Cl.⁴ B60C *23/02*; G01L *7/00*
U.S. Cl. 73—146.8 **4 Claims**



1. An air pressure gauge tool comprising:

a housing having a fore end and an aft end, an operating head attached to said fore end, a graspable handle section attached to said aft end;

an air pressure gauge assembly mounted within said housing, visual indicating means connected to said air pressure gauge, said visual indicating means comprises an elongated member extendable outward from said aft end and spaced from said operating head;

a valve assembly mounted within said operating head, said valve assembly connecting with a source of pressurized air, an air passage arrangment formed within said housing, said valve assembly connected to said air pressure gauge, whereby upon said valve assembly being connected to the source of pressurized air the air pressure is conducted to said valve assembly and a numerical value corresponding to the amount of air pressure is readable by said visual indicating means;

accessory tool engaging means formed within said operating head of said housing, whereby an accessory tool is to be removably connected to said accessory tool engaging means to permit said tool to be usable in a manner other than to determined air pressure; and

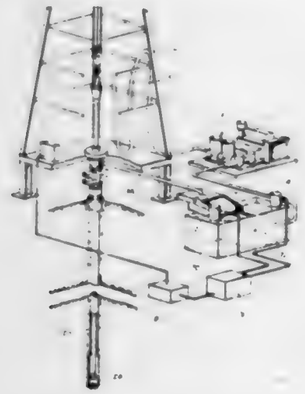
a locking pin connectable with said operating head, whereby said locking pin is to connect with the accessory tool to retain such in a fixed position on said operating head.

4,694,692

DRILLING FLUID DENSITY MEASUREMENT SYSTEM

Gregory D. Brown; Darrel E. Clark, and Rodger W. Schuermann, all of Norman, Okla., assignors to Technical Oil Tools Corporation, Norman, Okla.

Filed Jun. 4, 1986, Ser. No. 870,343
Int. Cl.⁴ G01N *9/28*; E21B *47/00*
U.S. Cl. 73—155 **15 Claims**



1. An apparatus for measuring the density of a drilling fluid within a reservoir at the surface of a well, the drilling fluid being circulated through the subterranean well bore during drilling thereof, the circulation path of the drilling fluid including the reservoir; the apparatus comprising: first and second tubular means continuously disposed in the reservoir, each for introducing a gas at different depths within the drilling fluid in the reservoir; flow-regulating means for delivering the gas to the first and second tubular means at selected flow rates; a differential pressure transmitter; pneumatic means for communicating the pressure-opposing introduction of the gas into the drilling fluid from the first and second tubular means to the differential pressure transmitter, the differential pressure transmitter comprising means for emitting an output signal related to the difference in pressure opposing introduction of the gas at the first and second tubular means; zeroing means for intermittently determining a value of the differential pressure transmitter output signal corresponding to zero differential pressure; level check means for intermittently determining if the level of the drilling fluid in the reservoir is above the first and second tubular means; and microprocessor means for regulating the zeroing means and the level check means and for correlating the differential pressure transmitter output signal to the density of the drilling fluid in the reservoir.

4,694,693

CHECK VALVE TEST METHOD USING TRUNCATED ACCUMULATOR BLOWDOWN

Thomas J. Gerlowski, Crafton Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 734,373, May 15, 1985, abandoned.
This application Nov. 6, 1986, Ser. No. 928,640
Int. Cl.⁴ G01M *19/00*
U.S. Cl. 73—168 **21 Claims**

17. A method for testing a normally closed check valve connected in series with an isolation valve at an outlet of an accumulator tank in a passive injection system for supplying liquid to a reactor cooling system in a pressurized light water nuclear power system, the passive injection system being connected to a low pressure system and supplying liquid to the reactor cooling system only during abnormally low pressure in the reactor cooling system, the accumulator tank having at least two upper taps and at least two lower taps with at least two standpipes each connected to a corresponding pair of upper and lower taps via valves and each of the standpipes having lower ends with drain valves connected thereto, said method comprising the steps of:

(a) establishing a range for acceptance criteria applicable to test data provided by a test procedure comprising the steps of:

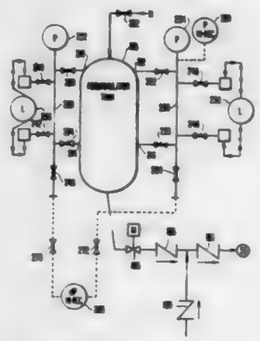
(ai) connecting a high accuracy differential pressure measuring device to the drain valves connected to the at least two standpipes;

(aii) connecting a high accuracy pressure measuring device to one of the at least two standpipes;

(aiii) closing one of the valves connected between one of the standpipes and one of the upper taps and another of the valves connected between the other standpipes and the lower tap connected thereto;

(aiv) isolating the passive injection system from the low pressure system;

(av) adjusting upstream pressure in the accumulator tank upstream of the check and isolation valves as necessary to attain a first pressure level;



(avi) adjusting downstream pressure in the reactor cooling system downstream of the check and isolation valves as necessary to attain a second pressure level lower than the first pressure level;

(avii) opening the isolation valve completely and then immediately closing the isolation valve;

(aviii) recording differential pressure versus time measured by the differential pressure measuring device during step (avii) as indicating a change in level in the accumulator tank;

(aix) recording pressure versus time measured by the high accuracy pressure measuring device; and

(ax) recording downstream pressure versus time in the reactor cooling system during step (avii);

(b) performing a preoperational test including the test procedure of step (a);

(c) performing a subsequent test after operation of the pressurized light water nuclear power system has begun, the subsequent test being performed according to the test procedure in step (a);

(d) determining any differences between the pressures versus time recorded in steps (aviii), (aix) and (ax) during the preoperational test and the subsequent test, respectively; and

(e) comparing the differences determined in step (d) to deter-

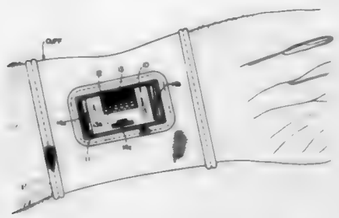
mine whether the differences are within the acceptance cirteria to verify operability of the check valves.

4,694,694

SOLID STATE ACCUMULATING ALTIMETER

Connor G. Vlakancic, San Jose; Ruy J. Pereira, Lafayette, and Larry R. Goodman, Laguna Niguel, all of Calif., assignors to Vertical Instruments, Inc., Lafayette, Calif.

Filed Jan. 6, 1986, Ser. No. 816,552
Int. Cl.⁴ G01L *7/12*
U.S. Cl. 73—386 **10 Claims**



1. A solid state altimeter device, comprising:
an integrated circuit solid state pressure sensor including a deformable silicon diaphragm with a semiconductor strain gauge in the diaphragm;
a vacuum chamber operatively attached to the diaphragm such that the vacuum of the vacuum chamber is applied to one side of the diaphragm, with the opposite side of the diaphragm exposed to atmospheric pressure;
electrical means connected to the semiconductor strain gauge for conducting an analog signal from the strain gauge representing pressure difference between atmospheric and the vacuum chamber;
a housing containing the pressure sensor and the vacuum chamber;
microprocessor means in the housing for receiving the signal from the electrical means and for converting the signal into an altitude value;
display means mounted in the housing and connected to the microprocessor means for displaying values as controlled by the microprocessor means, to a user;
calibration means connected to the microprocessor means for enabling the user to manually calibrate the altimeter device to a reference value; and
accumulator means included in the microprocessor means for accumulating altitude change in one direction, disregarding altitude changes in the opposite direction, for a selected interval, and including an accumulation display associated with the display means for displaying said altitude change in one direction.

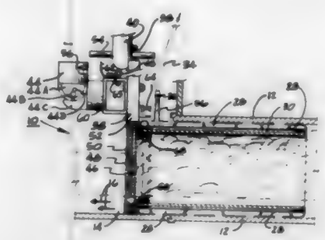
4,694,695

SEWER PIPE SMOKE BLOCKING DEVICE

Rickey E. Sewell, 1100 Hilltop Rd., and Glenwood H. Sewell, 1259 N. Buckner, Apt. 103, both of Derby, Kans. 67037

Filed Sep. 24, 1986, Ser. No. 911,076
Int. Cl.⁴ G01M *3/28*
U.S. Cl. 73—40.5 R **9 Claims**

1. A sewer pipe smoke blocking device for lowering into a manhole and inserting in a sewer pipe, the device preventing smoke introduced upstream in the pipe from passing therepast while allowing sewer water to pass therethrough, the device comprising:
a hollow cylindrical housing having a diameter less than the diameter of the sewer pipe and adapted for receipt therein;
an inflatable bladder surrounding the outer circumference of the housing, the bladder when inflated securing the housing to the inner circumference of the sewer pipe; and



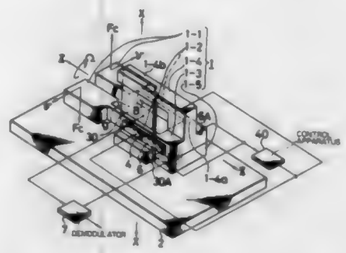
a gate assembly mounted on the housing, the assembly when lowered, engaging the top of the sewer water flowing through the hollow housing.

4,694,696

VIBRATION-TYPE GYRO APPARATUS

Takeshi Hojo; Shin-Ichi Kawada, both of Kuroiso; Michio Fukano, Ohtahara; Kanshi Yamamoto, Kuroiso; Youji Okamura, Nasumachi; Kazuteru Sato, Kuroiso; Masahiko Saito, Yokosuka, and Fuyuki Hane, Nasumachi, all of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Filed Oct. 23, 1985, Ser. No. 790,527
Claims priority, application Japan, Oct. 25, 1984, 59-224755; Oct. 25, 1984, 59-224756; Oct. 25, 1984, 59-224759; Oct. 25, 1984, 59-224760
Int. Cl.⁴ G01P *9/04*
U.S. Cl. 73—497 **3 Claims**



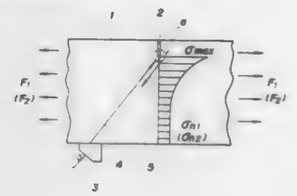
1. A vibration-type gyro apparatus comprising: a vibrating tuning fork-type vibrator having at least a vibration mass portion and a pair of leg portions; a drive apparatus for continuously vibrating said vibrator; a displacement detector formed of a first piezo-electric element for detecting a vibration of said vibrator; a first pre-amplifier having a first input resistance R1 and supplied with an output from said first piezo-electric element; a control apparatus connected to said first pre-amplifier for controlling said drive apparatus so as to continuously and stably vibrate said vibrator; a second piezo-electric element for detecting an angular vibration of said vibrator around an input axis passing through the center of said vibrator and in parallel to said leg portions of said vibrator; a second pre-amplifier having a second input resistance R2 and supplied with an output from said second piezo-electric element; and a demodulator for synchronously rectifying an output from said second piezo-electric element with respect to the output from said first piezoelectric element; wherein said input resistance R1 of first pre-amplifier is selected to be a value substantially expressed as $R1 \simeq 1/C1\omega$ where C1 is an electrostatic capacitance of said first piezo-electric element and ω is an angular frequency of said vibrator, and said second input resistance R2 is selected to be a value substantially expressed as $R2 \simeq 1/C2\omega$ where C2 is an electrostatic capacity of said second piezo-electric element.

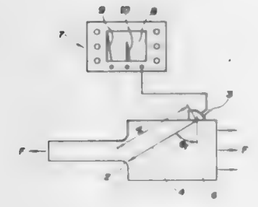
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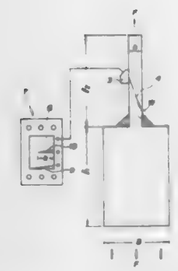
METHOD OF MEASURING FACTOR OF STRESS CONCENTRATION BY UTILIZING ULTRASOUND

Takeshi Miyajima, Makabemachi, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00013, § 371 Date Apr. 22, 1986, § 102(e) Date Apr. 22, 1986
PCT Filed Jan. 16, 1985, Ser. No. 855,665
Int. Cl.⁴ G01N *29/00*; G01L *1/00*
U.S. Cl. 73—570 **6 Claims**







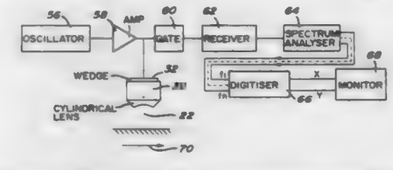
1. A method of measuring the stress concentration factor at a stress-concentrated portion of a mechanical member having an undercut located at a portion where the cross-section of the member varies abruptly, said undercut extending into the member and having a bottom, said method comprising:
causing an ultrasonic wave to impinge on said stress-concentrated portion of said member in a first stressed state;
detecting the acoustic pressure of the ultrasonic wave reflected from the bottom of the undercut while said member is in said first stressed state;
gradually increasing or decreasing the stress on said member to cause an increased or decreased stressed state and in a direction for causing a variation of the shape of the bottom of the undercut;
continuing to cause said ultrasonic wave to impinge on said stress-concentrated portion of said member;
detecting the acoustic pressure of the ultrasonic wave reflected from said bottom of the undercut while said undercut is in the increased or decreased stressed state;
comparing the acoustic pressure of the ultrasonic wave reflected from the bottom of the undercut in said first stressed state with the acoustic pressure when said stress concentrated portion is in the increased or decreased stressed state; and
determining the stress concentration factor at the stress-concentrated portion using as an evaluation index the change ratio of the compared values of the acoustic pressure.

4,694,699

ACOUSTIC MICROSCOPY

John D. N. Cheeke, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Sherbrooke, Canada

Filed Jun. 30, 1986, Ser. No. 880,664
Int. Cl.⁴ G01N *29/30*
U.S. Cl. 73—606 **36 Claims**



1. A method for obtaining information at a microscopic scale of a specimen by scanning said specimen with acoustic waves, said method comprising the steps of:
propagating acoustic waves of a plurality of frequencies toward said specimen, said specimen reflecting said acoustic waves, the position of a propagated acoustic wave in a reference plane which is generally perpendicular to the direction of propagation of said acoustic waves toward said specimen being a function of the frequency of the acoustic wave;
controlling the frequency of the acoustic waves in order to control the position of the propagated acoustic waves in said reference plane; and
detecting and analyzing said reflected acoustic waves to obtain said information.

4,694,700

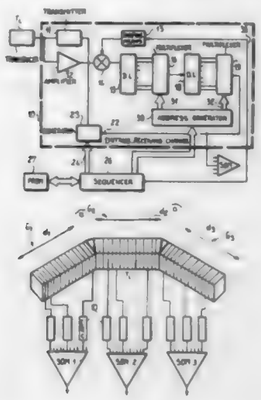
ULTRASONIC SENSOR FOR ELECTRONIC SECTORIAL SCANNING AND ECHOGRAPH INCORPORATING SUCH A SENSOR

Charles Maerfeld, Antibes, France, assignor to CGR Ultrasonic, Paris, France

Filed Sep. 25, 1985, Ser. No. 779,855
Claims priority, application France, Sep. 25, 1984, 84 14708
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 75—628 **17 Claims**

1. An ultrasonic sensor for electronic sectorial scanning, comprising: a plurality of groups of transducer elements formed into consecutive portions which are respectively

aligned to present a convex outline to an object of scanning, each portion being distinguished from its adjacent portion by



at least one of a discontinuity and a different radius of curvature.

4,694,701

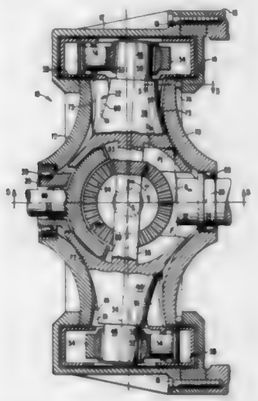
RADIALLY ORIENTED NUTATIONAL TRACTION DRIVE TRANSMISSION WITH LARGE RANGE OF SPEED RATIOS

Yves J. Kemper, Birmingham, Mich., assignor to Tractiontec Corporation, Bloomfield Hills, Mich.

Continuation-in-part of Ser. No. 797,481, Nov. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 746,230, Jun. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 739,414, May 30, 1985, abandoned. This application Jan. 31, 1986, Ser. No. 824,664

Int. Cl.⁴ F16H *15/44, 15/16*

U.S. Cl. 74—191 **19 Claims**



1. In a continuously variable traction drive transmission having a frame, an alpha body supported by said frame for rotation about a first axis, a beta body supported by said alpha body on a second axis intersecting said first axis at a point of axes intersection, said beta body having a pair of members on opposite sides of said point of axis intersection for defining beta rolling surfaces of revolution about said second axis, omega body means for defining a pair of omega rolling surfaces of revolution about said first axis, said beta and omega surfaces being in rolling friction engagement at two points of contact in a plane containing said first and second axes, said two points of contact lying in diagonally opposite quadrants defined by said first axis and a line perpendicular to said first axes at said point of axes intersection, and means for varying the radius ratio of said beta and omega surfaces at said points of contact, the improvement comprising:

means for shifting said points of contact between adjacent diagonal quadrants as defined by said first axes and said line so as to reverse the rotational direction of said beta body on said second axis.

4,694,702

VORTEX SHEDDING FLOWMETER

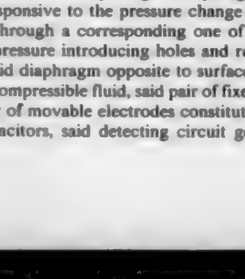
Hiroyuki Amemori, Kawasaki; Shigeru Nishiyama, Hiratsuka, and Tetsuo Iwamoto, Yokohama, all of Japan, assignors to Tokico Ltd., Japan

Filed Sep. 11, 1985, Ser. No. 774,804

Claims priority, application Japan, Sep. 12, 1984, 59-138477[U]; Jun. 20, 1985, 60-134895

Int. Cl.⁴ G01F *1/32*

U.S. Cl. 73—861.24 **7 Claims**



1. A vortex shedding flowmeter for measuring a flow rate of a fluid which flows through a flow passage, said vortex shedding flowmeter comprising: a bluff body arranged in said flow passage for generating

Karman vortices of said fluid, said bluff body being provided with a pair of differential pressure introducing holes for introducing a pressure change caused by the generation of the Karman vortices of said fluid, said differential pressure change holes opening to respective side surfaces of said bluff body and penetrating through said bluff body to open to one end of said bluff body; and

a main detecting part which is independent of said bluff body,

said main detecting part comprising a mounting member which is mounted on said one end of said bluff body, a pair of detecting means provided in said mounting member and a detecting circuit, said pair of detecting means being arranged separated from each other in a longitudinal direction of said flow passage and comprising a pair of first recesses provided on said mounting member, a pair of fixed electrodes mounted in said pair of first recesses, a pair of movable electrodes provided in said pair of first recesses with a predetermined distance from the respective pair of fixed electrodes, a channel provided in said mounting member for communicating a pair of spaces formed between said pair of fixed electrodes and said pair of movable electrodes, and an incompressible fluid filled up in said pair of spaces and said channel, each of said movable electrodes comprising a diaphragm which is displaced responsive to the pressure change in said fluid introduced through a corresponding one of said pair of differential pressure introducing holes and received by a surface of said diaphragm opposite to surfaces in contact with said incompressible fluid, said pair of fixed electrodes and said pair of movable electrodes constituting a pair of variable capacitors, said detecting circuit generating an electrical output responsive to changes in capacitances of said variable capacitors of said pair of detecting parts.

4,694,703

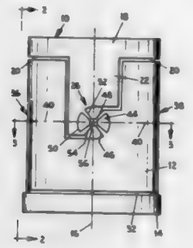
CIRCUMFERENTIALLY ORIENTED FLEXURE SUSPENSION

Gregory S. Routson, Kentwood, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Jun. 28, 1984, Ser. No. 625,518

Int. Cl.⁴ G01C *19/02*

U.S. Cl. 74—5 F **10 Claims**



1. In a two-axis, monolithic flexure, hinge suspension system for inertially sensitive devices wherein first, second and third cylindrical portions are slightly axially spaced from each other along a common axis and connected by pairs of flexure hinges therebetween, one pair of flexure hinges defining a first flexure axis which is perpendicular to the common axis, another pair of said flexure hinges defining a second flexure axis which is perpendicular to said common axis and to said first flexure axis, whereby said first flexure axis and said common axis lie in a first plane and said second flexure axis and said common axis lie in a second plane perpendicular to said first plane; each flexure hinge having a pair of flexure leaves extending between adjacent cylindrical portions, the improvement which comprises:

each said pair of flexure leaves being circumferentially mounted to adjacent cylindrical portions such that each flexure leaf in a pair of said flexure leaves has one end mounted to one cylindrical portion at one side of an associated one of said first and second planes, and an opposite end mounted to another cylindrical portion at another side of said one associated plane such that one of said leaves is in tension and one of said leaves is in compression when axial forces are applied to said cylindrical portions, whereby G-sensitivity drift resulting from resonant-frequency sensitivity changes of the flexure hinges is minimized.

4,694,704

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

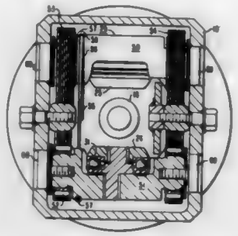
Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Aug. 4, 1986, Ser. No. 892,373

Int. Cl.⁴ F16H *15/08, 15/10*

U.S. Cl. 74—200 **4 Claims**

1. An infinitely variable traction roller transmission comprising: coaxial input and output shafts; oppositely disposed toric elements, one being supported by each of said shafts for rotation therewith; at least two motion transmitting rollers disposed between said toric elements in radial symmetry with respect to the axis of the input and output shafts; and means for forcing said toric elements toward each other to cause frictional engagement of the motion transmitting rollers with the opposed surfaces of the toric elements; a support structure for each of said rollers, each of said support structures including a pivot shaft having a pivot axis normal to a plane which includes the axis of the input and output shafts, said pivot shafts having flanges arranged opposite one another, each provided with a circumferential groove and an endless cable loop extending around said flanges of the opposite pivot shafts with a cross-over therebetween, said cable having tube sections of a given length firmly mounted thereon and said grooves having



areas of increased width and of a circumferential length corresponding to the given length of said tube sections, said tube sections being fittingly received in said groove areas of increased width for operative engagement of said cable loop with said pivot shafts.

4,694,705

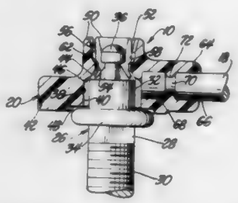
MOLDED TERMINAL FOR REMOTE CONTROL ASSEMBLY (LOLLIPOP)

Thomas J. Frankhouse, Southfield, and Arthur L. Spease, Livonia, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.

Continuation of Ser. No. 742,363, Jun. 7, 1985, abandoned, which is a continuation of Ser. No. 392,515, Jun. 28, 1982, abandoned. This application Jan. 12, 1987, Ser. No. 6,252

Int. Cl.⁴ F16C *1/14*

U.S. Cl. 74—501 R **13 Claims**



1. A motion transmitting remote control assembly (**10**) of the type for transmitting motion in a curved path, said assembly (**10**) comprising: a guide means (**12**); core means (**18**) movably supported by said guide means (**12**) and extending therefrom to provide a variable extending length of said core means (**18**) between said guide means (**12**) and one end (**68**) of said core means (**18**), said extending length defining a line of force; and an integral terminal member (**20**) for operatively interconnecting said extending length of said core means (**18**) and a control member (**22**) of the type having a body portion (**32**) and a smaller ball pin (**36**) extending therefrom, and characterized by said terminal member (**20**) including an enlarged base portion (**42**) having a neck portion (**64**) extending along said extending length of said core means (**18**) for retaining a portion of said extending length therein on said line of force, an opening (**38**) extending completely through said terminal member (**20**) on an axis perpendicular to said line of force and having a containing portion (**40**) on said line of force for containing the body portion (**32**) of the control member (**22**) therein and for absorbing the applied forces as said terminal member (**20**) is moved along the line of force, said containing portion (**40**) being disposed in said enlarged base portion (**42**) on one side thereof, said opening (**38**) of said terminal member (**20**) further including a plurality of flexible fingers (**50**) extending laterally from the side of

said enlarged base portion (42) opposite said one side, about said containing portion (40) and offset axially with respect to said opening from said line of force and arranged about said axis of said opening (38), said fingers (50) defining lips (60,62) extending into said opening and defining a smaller diameter portion of said opening (38) than said containing portion (40) thereof, said fingers (50) extending from said base portion (42) to free distal ends for flexing radially of said axis of said opening (38) during insertion of the ball pin (36) through the smaller diameter portion of said opening (38) to retain the ball pin (36) disposed within said opening (38) independently of actuating engagement between the body portion (32) and said opening in said enlarged base portion (42) whereby the relatively smaller ball pin (36) of a control member (22) may be freely passed through the larger containing portion (40) of said opening (38) and into engagement with the smaller diameter presented by said fingers (50) to flex said fingers (50) outwardly until the ball pin (36) is therepast as the larger body portion (32) of the control member (22) which trails the ball pin (36) is inserted into said larger containing portion (40) for transmitting said applied forces therebetween while held therein by said fingers (50) engaging the ball pin (36) at a position between the body portion (32) and the ball pin (36).

4,694,706

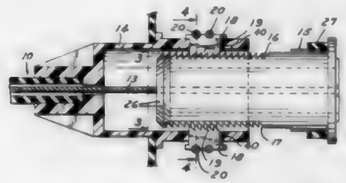
CONTROL CABLE CONDUIT LENGTH ADJUSTMENT DEVICE

Norman B. Lichtenberg, Tecumseh, and Adam W. Chaczyk, Allen Park, both of Mich., assignors to Acco Babcock Inc., Fairfield, Conn.

Continuation of Ser. No. 829,762, Feb. 14, 1986, abandoned. This application Mar. 12, 1987, Ser. No. 23,895

Int. Cl.[4] **F16C** *1/10*

U.S. Cl. 74—501.5 R **6 Claims**



1. A self-adjusting control cable conduit length adjustment device comprising

a tubular outer detent member defining an opening,

an inner adjuster member extending into said opening of said detent member and guided thereby for longitudinal movement,

a conduit connected to one end of said detent member, and

a control cable extending through the detent and adjuster member,

said adjuster member having opposed sets of longitudinally spaced ratcheting teeth,

said detent member having opposed radial openings,

a set of opposed detent pawls mounted in said openings,

said openings guiding said pawls for radial movement only with respect to said outer detent member,

each pawl having an outer radial end and an inner radial end,

a plurality of teeth on the inner end of each pawl complementary to and engaging a respective set of teeth on the adjuster member,

said teeth on said detent member and said adjuster member being unsymmetrical in cross section so that a one-way ratcheting action is permitted of the adjuster member axially inwardly relative to the detent member,

spring means engaging the outer ends of said pawls exteriorly of the detent member and yieldingly urging said pawls radially inwardly,

such that when a predetermined force is applied on the inner adjuster member tending to force the adjuster member axially inwardly relative to the detent member, the pawls are caused to move radially outwardly and ratchet automatically so that the force moves the adjuster member axially inwardly relative to the detent member thereby shortening the effective length of the conduit, thus lengthening the inner member,

said spring means yieldingly urging said pawls radially inwardly comprising at least one circumferentially extending arcuate spring surrounding the detent member and engaging the radially outer ends of said pawls,

said spring being C-shaped with ends positioned circumferentially between said pawls, said detent member having means thereon for preventing said spring from rotating such that the engagement with the pawls is maintained and that substantially equal spring force is applied to each said pawl,

said means on said detent member comprising a radial projection extending between the ends of said spring.

2. A self-adjusting control cable conduit length adjustment device comprising

a tubular outer detent member defining an opening,

an inner adjuster member extending into said opening of said detent member and guided thereby for longitudinal movement,

a conduit connected to one end of said detent member, and

a control cable extending through the detent and adjuster member,

said adjuster member having opposed sets of longitudinally spaced ratcheting teeth,

said detent member having opposed radial openings,

a set of opposed detent pawls mounted in said openings,

said openings guiding said pawls for radial movement only with respect to said outer detent member,

each pawl having an outer radial end and an inner radial end,

a plurality of teeth on the inner end of each pawl complementary to and engaging a respective set of teeth on the adjuster member,

said teeth on said detent member and said adjuster member being unsymmetrical in cross section so that a one-way ratcheting action is permitted of the adjuster member axially inwardly relative to the detent member,

spring means engaging the outer ends of said pawls exteriorly of the detent member and yieldingly urging said pawls radially inwardly,

such that when a predetermined force is applied on the inner adjuster member tending to force the adjuster member axially inwardly relative to the detent member, the pawls are caused to move radially outwardly and ratchet automatically so that the force moves the adjuster member axially inwardly relative to the detent member thereby shortening the effective length of the conduit and lengthening the effective length of the inner member,

said adjuster member being rotatable relative to said detent member, circumferential portions of said adjuster member circumferentially between said sets of ratcheting teeth are smooth such that resetting of the device may be achieved by manually rotating the detent member relative to the adjuster member to cause the pawls to be moved radially outwardly and thereby disengage the teeth on the pawls from the teeth on the adjuster member and cause the teeth on the pawls to contact said smooth circumferential portions so that the detent and adjuster member can be moved longitudinally relative to one another after which the detent member and adjuster member may be rotated relative to one another to re-engage the teeth of the pawls and adjuster member,

said adjustment member including radial tooth portions aligned circumferentially with said smooth portions for engaging said pawls to prevent inadvertent disassembly of the device when the adjustment member is moved axially outwardly relative to said detent member.

3. A self-adjusting control cable conduit length adjustment device comprising

a tubular outer detent member defining an opening,

an inner adjuster member extending into said opening of said detent member and guided thereby for longitudinal movement,

a conduit connected to one end of said detent member, and

a control cable extending through the detent and adjuster member,

said adjuster member having opposed sets of longitudinally spaced ratcheting teeth,

said detent member having opposed radial openings,

a set of opposed detent pawls mounted in said openings,

said openings guiding said pawls for radial movement only with respect to said outer detent member,

each pawl having an outer radial end and an inner radial end,

a plurality of teeth on the inner end of each pawl complementary to and engaging a respective set of teeth on the adjuster member,

said teeth on said detent member and said adjuster member being unsymmetrical in cross section so that a one-way ratcheting action is permitted of the adjuster member axially inwardly relative to the detent member,

at least one circumferentially extending arcuate C-shaped spring having spaced ends surrounding the detent member and engaging the outer ends of said pawls exteriorly of the detent member and yieldingly urging said pawls radially inwardly into engagement with the respective set of teeth on the adjuster member,

means between said C-shaped spring and said detent member for preventing rotation of said C-shaped spring relative to said detent member such that engagement is maintained between the spring and the pawls and substantially equal spring force is applied to each said pawl,

such that when a predetermined force is applied on the inner adjuster member tending to force the adjuster member axially inwardly relative to the detent member, the pawls are caused to move radially outwardly and ratchet automatically so that the force moves the adjuster member axially inwardly relative to the detent member thereby shortening the effective length of the conduit and lengthening the effective length of the inner member.

4,694,707

ROD SEAL DEVICE FOR STIRLING ENGINES

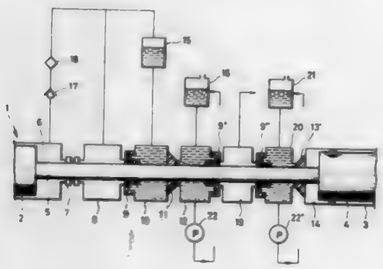
Daisaku Kobayashi; Tunesaku Itaba, Kashiwazaki, and Yutaka Momose, Anjyo, all of Japan, assignors to Kabushiki Kaisha Riken, Tokyo and Aisin Seiki Kabushiki Kaisha, Aichi, both of, Japan

Filed Feb. 12, 1986, Ser. No. 828,664

Claims priority, application Japan, Feb. 20, 1985, 60-23261[U]

Int. Cl.[4] **F16H** *57/02;* **B01D** *19/00*

U.S. Cl. 74—606 A **3 Claims**



1. A rod seal device for a Stirling engine, comprising:

a piston rod having a first end connected to an operating piston for the engine and a second end connected to a guide piston disposed in a crank case;

a compression chamber defined by said operating piston and a cylinder of the engine and including therein a working gas for the engine;

a first intermediate chamber surrounding an outer periphery of said piston rod and being connected to said compression chamber and kept to maintain a minimum level of pressure of said working gas;

a high pressure oil chamber disposed next to said first intermediate chamber and surrounding the outer periphery of said piston rod, said high pressure oil chamber being connected to said compression chamber via a check valve to recirculate the working gas leaked thereinto to said compression chamber;

a first low pressure oil chamber disposed next to said high pressure oil chamber via an oil seal member and surrounding the outer periphery of said piston rod, said first low pressure oil chamber being connected to a first low pressure oil reservoir which is exposed to the atmospheric pressure to discharge any gas introduced into said first low pressure oil chamber to the atmosphere;

a first scraper seal disposed next to said first low pressure oil chamber and surrounding the outer periphery of said piston rod;

a second intermediate chamber disposed next to said first low pressure oil chamber via said first scraper seal and surrounding the outer periphery of said piston rod, said second intermediate chamber being exposed to the atmosphere for allowing any gas introduced thereinto to be discharged to the atmosphere;

a second scraper seal disposed next to said second intermediate chamber and surrounding the outer periphery of said piston rod;

a second low pressure oil chamber disposed next to said second intermediate chamber via said second scraper seal and surrounding the outer periphery of said piston rod, said second low pressure oil chamber being connected to a second low pressure oil reservoir which is open to the atmospheric pressure to discharge any gas introduced into said second low pressure oil chamber to the atmosphere;

a second oil pump disposed between said second low pressure oil chamber and said second low pressure oil reservoir to positively discharge any gas introduced into said second low pressure oil chamber to he atmosphere; and

a further oil seal disposed between said second low pressure oil chamber and a working gas chamber in said crank case for a power take-off device.

4,694,708

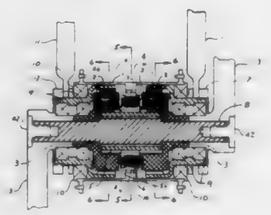
SINGLE SPEED TRANSMISSION FOR PEDAL-PROPELLED VEHICLE

Dirck T. Hartmann, 4121 Morningstar Dr., Huntington Beach, Calif. 92649

Filed May 15, 1986, Ser. No. 845,960

Int. Cl.[4] **F16H** *1/28;* **B62M** *1/02*

U.S. Cl. 74—750 B **2 Claims**



1. In a pedal-propelled vehicle including a frame, a driving wheel having a hub, and a pedal drive shaft on the axis of said hub for concentric rotation therewith, an improved single speed transmission located within said hub and comprising:

a pair of internally toothed, axially spaced ring gears with an

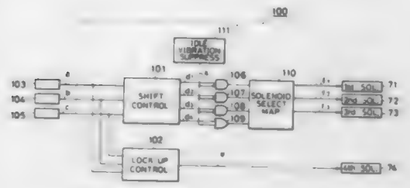
integral cylindrical extension of each of said ring gears fixed to said frame;
a ball bearing seated on each of said integral cylindrical extensions and supporting opposite ends of said hub;
a pair of axially spaced bearings seated inside each of said integral cylindrical extensions for the support of said pedal drive shaft;
a pair of axially spaced planetary gear carriers mounted on said pedal drive shaft for rotation therewith;
three externally toothed planetary gears rotatably mounted 120 degrees apart on each of said planetary gear carriers and meshed with said internally toothed ring gears;
an externally toothed sun gear located between said pair of axially spaced planetary gear carriers and meshed with said planetary gears for support and concentric rotation about said pedal drive shaft; and
a conventional free-wheel ratchet means located between said pair of axially spaced ring gears for driving said hub from said sun gear.

4,694,709

CONTROL OF A VEHICLE AUTOMATIC TRANSMISSION

Toshiyuki Kikuchi, Higashi-Hiroshima, and Koichi Yamamoto, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 4, 1985, Ser. No. 772,427
Claims priority, application Japan, Sep. 8, 1984, 59-188666; Sep. 8, 1984, 59-188667
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **2 Claims**



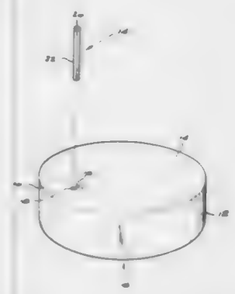
1. A vehicle having vehicle brake means, an engine provided with engine output control means having an idle position, an automatic transmission comprising a torque converter having a turbine, a multiple-stage transmission gear mechanism connected with the turbine of the torque converter and having a neutral gear stage, a first gear stage and at least one higher gear stage, gear stage selecting means for selecting one of the gear stages, and a shift lever having a neutral range and at least one running range for operating the gear stage selecting means so that the neutral gear stage is selected when the shift lever is in the neutral range and one of the first and higher gear stages is selected when the shift lever is in the running range, the improvement comprising shift position detecting means for detecting that the shift lever is in the running range, engine idle detecting means for detecting that the engine output control means is in the idle position, vehicle stop detecting means for detecting that the vehicle is substantially stopped, vehicle brake detecting means for detecting that the vehicle brake means is engaged, control means responsive to output signals from said detecting means to operate the gear stage selecting means when the shift lever is in the running range and the vehicle is stopped so that the gear mechanism is shifted to the higher gear stage in an instance wherein the engine output control means is in the idle position and the vehicle brake means is engaged, which vehicle further includes idle up detecting means for detecting that the engine is operated with an increased idle speed, said control means including means for prohibiting a shift up to the higher gear stage when the engine is operated with the increased idle speed under a condition wherein the shift lever is in the running range, the vehicle is stopped, the engine output control means is in the idle position and the vehicle brake means is engaged.

4,694,710

METHOD OF MAKING A BLANK OF A DRILL BIT

Cornelius Phaal, 34 Rutland Avenue, Craighall Park, Johannesburg, Transvaal, South Africa

Filed Jun. 2, 1986, Ser. No. 869,974
Claims priority, application South Africa, Jun. 13, 1985, 85/4462
Int. Cl.[4] B23P *15/32*
U.S. Cl. 76—108 R **6 Claims**



1. A method of producing a blank for a drill bit comprising providing a cylindrically-shaped composite abrasive compact having a diamond or cubic boron nitride compact bonded to a cemented carbide backing and having major flat end surfaces in which one flat end surface is the diamond or cubic boron nitride compact and the other is the cemented carbide backing, severing the composite abrasive compact along plane perpendicular to the flat surfaces and from one flat end surface to the other flat end surface to produce a plurality of sticks polygonally-shaped end-on, each sever plane defining side surfaces of adjacent sticks, and longitudinally rounding each stick to produce from it a blank for a drill bit which is round end-on, comprises a diamond or cubic boron nitride compact bonded to an elongated cemented carbide rod, and has a diameter in the range 0.5 to 5 mm and a diameter to length ratio in the range 1:3 to 1:20.

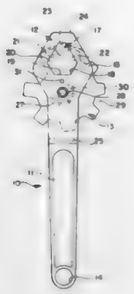
4,694,711

ADJUSTABLE WRENCH

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Sep. 10, 1986, Ser. No. 905,533
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—57.5 **15 Claims**

1. A wrench for tightening and loosening a workpiece having a polygonal-shaped body, said wrench comprising:
a handle having a rearward gripping portion and a forward wrench portion integral therewith;
said forward wrench portion having a slot formed therethrough, said forward wrench portion further having an aperture including a gripping portion being formed therethrough;
a wrench plate being removeably received in the slot;
said wrench plate including a periphery having a plurality of notches formed therein, such that each of said notches may be selectively positioned in communication with the aperture, whereby the workpiece may be disposed between the gripping portion of the aperture and received within a selective notch of the wrench plate where it is gripped for the tightening and removal thereof.

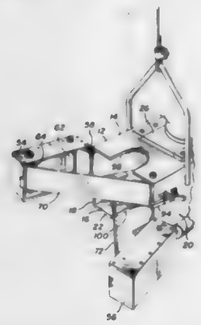


4,694,712

WELL STRING SECTION SPINNING TOOL

Hubert M. Doss, 803 N. Madison St., Magnolia, Ark. 71753

Filed Sep. 26, 1985, Ser. No. 780,674
Int. Cl.[4] B25B *21/00*
U.S. Cl. 81—57.17 **10 Claims**



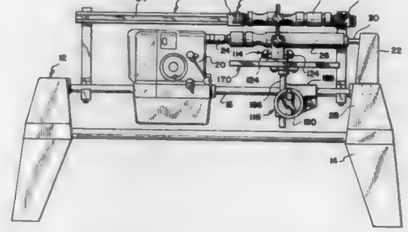
1. A turning tool for laterally engaging an elongated member intermediate its opposite ends and turning said elongated member about its longitudinal axis, said tool including a main body having a first end and a second end remote from said first end, said body being adapted to be shifted among a path extending between said ends toward and away from said elongated member with said second end facing away from said elongated member, said body also defining a pair of opposite sides extending between said ends, said first end including at least one elongated door including base and free ends, said base end being pivotally mounted from one side of said first end for swinging about a first axis between a closed position extending across said first end an open position extending outwardly from said first end, said first end defining a notch therein paralleling said first axis and opening endwise outwardly of said first end, driven drum means journalled from the second end of said body about a second axis paralleling said first axis, said body and door including strategically located rollers journalled therefrom about axes generally paralleling the said first axis and aligned with said drum means, an endless flexible drive member trained about said rollers and drum with said drive member including a positive bight extending about each of said rollers and said drum means, said drive member including a reach thereof extending between one of said rollers journalled from said body and a closely adjacent roller journalled from the free end of said door and deflectable inwardly of said notch into a negative bight for passing about said elongated member in friction driving engagement therewith, said negative bight opening in a direction inclined at least generally 45° relative to the direction in which said notch opens, and means operatively connected between said body and door to releasably retain said door in the closed position thereof, said body including a pair of said doors staggered relative to each other along the longitudinal extent of said notch and with the base ends of said doors pivotally mounted from opposite sides of said body, each of said doors including a pair of rollers journalled therefrom and the opposite sides of said first end of said housing each including a roller journalled therefrom, said drum means including axially spaced circumferential zones thereof registered with said doors and said tool including a pair of endless flexible drive members each trained about a corresponding drum circumferential zone and a corresponding pair of door rollers as well as one of the housing rollers, said drive members each including a negative bight of at least 270° and less than 360° in angular extent for frictionally drivingly engaging an equal angular extent of the outer periphery of said elongated member with said drive members engaged with axially circumferential zones of said elongated member.

4,694,713

DUPLICATING SYSTEM FOR A LATHE

Steven A. Snyder, Spring Valley; Jack Smith, Huber Heights; David D. Flora, Arcanum, and Robert L. Bartlett, Dayton, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Filed Jun. 17, 1986, Ser. No. 875,433
Int. Cl.[4] B23B *3/28*
U.S. Cl. 82—14 R **17 Claims**



1. For use with a multipurpose woodworking machine capable of performing lathe operations and including a pair of way tubes, a motorized headstock, and a tailstock, a lathe duplicating system comprising:
means releasably attachable to said woodworking machine for holding a pattern to be duplicated above the headstock and tailstock thereof, said holding means including means for supporting a pattern to extend alternately substantially parallel to or substantially perpendicular to a rotational axis of a workpiece on said woodworking machine;
platform means adjustably mountable on said woodworking machine and including a substantially flat table top, a carriage and means for mounting said carriage on the way tubes, and means for raising and lowering said top relative to said carriage; and
a tool stand positioned on said table top and having means enabling slidable movement thereon, said tool stand including upper follower means for contacting a pattern in said holding means, and lower cutting tool means, extending below said upper follower means, for engaging a workpiece mounted on said woodworking machine, whereby said platform means is adjustable to position said cutting tool means at a predetermined elevation relative to a workpiece.

4,694,714

PROCESS AND APPARATUS FOR CHANGING REELS IN CONNECTION WITH PACKAGING MACHINES

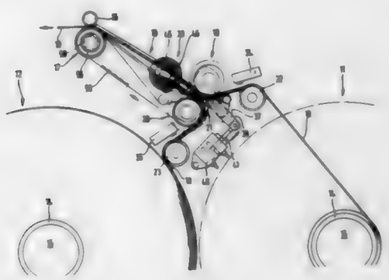
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Aug. 27, 1985, Ser. No. 769,904

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 3436217

Int. Cl.⁴ B65B *41/10*; **B65H** *19/10*

U.S. Cl. 83—13 **26 Claims**



22. A method for replacing a first material sheet (10) which wound around a first reel (11) with a second material sheet (13) which is wound around a second reel (12), the first and second material sheets being made of a relatively stiff packaging material, particularly thin cardboard, for removal of rim pieces of a cigarette flip-top pack, the method being for use in connection with a packaging machine, particularly a cigarette packaging machine, the method comprising the steps of:

(a) passing the first material sheet along a conveyor track (18), in a feeding direction, to at least one of a separation and a packaging system;

(b) delivering the front end (29) of the second material sheet to a first point along the conveyor track;

(c) cutting a trailing end portion of the first material sheet at a second point on the conveyor track, the second point being at substantially the same point as the first point with respect to the feeding direction; and

(d) passing the second material sheet along the conveyor track in the feeding direction at substantially the same time as the step of cutting is performed.

4,694,715

SLICING DEVICE FOR BREAD OR THE LIKE

Sebastiaan C. E. Jongerius, Renswoude, Netherlands, assignor to Jongerius B.V., Soesterberg, Netherlands

Filed Sep. 8, 1986, Ser. No. 904,872

Claims priority, application Netherlands, Sep. 17, 1985, 8502547

Int. Cl.⁴ B26D *1/48*

U.S. Cl. 83—72 **16 Claims**

1. A machine for slicing bread of the like, comprising

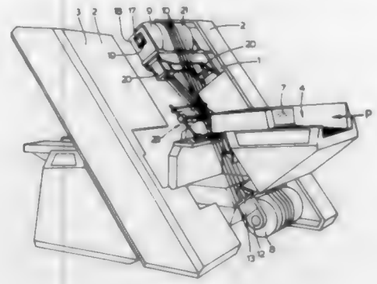
(1) a stationary frame;

(2) first and second drums rotatably mounted on the stationary frame in spaced apart opposed relation;

(3) a plurality of endless slicer bands trained over the first and second drums, the plurality of slicer bands extending substantially parallel to each other;

(4) tensioning means for tensioning the slicer bands by displacement of one of the drums toward or away from the other drum, the tensioning means including cylinder-plunger mechanisms disposed at opposite ends of the displaceable drum;

(5) the stationary frame being disposed adjacent one end of the drums and having support arms extending laterally from the stationary frame between the loops of the slicer bands to the opposite end of the drums, the cylinder-plunger mechanisms supporting the displaceable drum being carried by one of the laterally extending arms and the other drum being mounted on supports secured to the



other of the laterally extending arms whereby the drums are accessible from the open side opposite the stationary frame and thereby facilitate mounting and dismounting of the slicer bands on and from the drums.

4,694,716

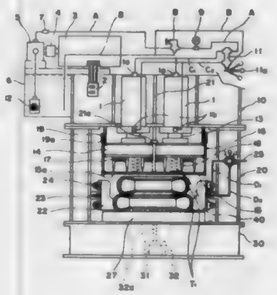
MACHINE FOR CUTTING SOLID BODIES

Tsutomu Sakamoto, Hirakata, Japan, assignor to Kansai Environmental Development Co., Ltd., Japan

Filed Feb. 28, 1986, Ser. No. 834,537

Int. Cl.⁴ B26D *1/09*

U.S. Cl. 83—112 **5 Claims**



1. A machine for cutting solid bodies comprising: at least one pressing cylinder means having a vertically movable piston rod; a blade base fixed to the lower end of said piston rod; said blade base having an underside on which a plurality of downwardly directed cutting blades are mounted; a presser plate disposed below said blade base and having a corresponding number of slits through which said blades are allowed to retractably project downward; said presser plate having a center to which a vertical sliding rod is fixed at the lower end thereof; said blade base having a center through which said sliding rod slidably extends; said sliding rod being provided at an intermediate portion thereof with a flange; said blade base having an upper face engagable with said flange and capable of lifting said presser plate; a receiver arranged below said presser plate for placing thereon a solid body or bodies to be cut; rotary drive means for rotating said receiver a predetermined small angle after a predetermined number of cutting operations; and discharge means for horizontally moving cut solids.

4,694,717

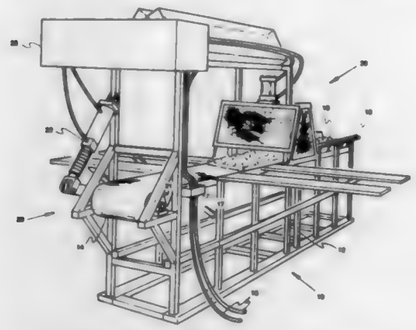
SINGLE PASS SOD CUTTING MACHINE FOR PRODUCING HEXAGONALLY SHAPED PLUGS

Gordon C. Boots, Orlando, Fla., assignor to A. Duda & Sons, Inc., Oviedo, Fla.

Filed Aug. 5, 1985, Ser. No. 762,296

Int. Cl.⁴ B26D *3/20, 5/20*

U.S. Cl. 83—222 **12 Claims**



1. A machine for automatically cutting large sections of coarse grasses into relatively small, hexagonally shaped pieces for ready packaging and subsequent transplanting, comprising sod advancing means in combination with sod cutting means, said sod advancing means being intermittently operative and serving to advance the sections of sod toward said sod cutting means, said sod cutting means involving the use of a plurality of closely grouped blade means arrayed in an open, non-linear configuration and designed to move periodically in unison downwardly into forceful cutting contact with sod to be cut, each blade of said blade means being elongate, with its cutting edge disposed at its lowermost portion, and with the cutting edges of said blades being located in a common plane, at least one side edge of each blade being in touching contact with the side edge of an adjacent blade, with said blades being disposed in such an array that adjacent cutting edges reside at approximately 120° angles to each other, such that together said cutting edges create an incomplete hexagonal pattern in which no closed areas are defined, such downward cutting movements being accomplished while said sod is momentarily stationary, such downward cutting movements being closely followed in each instance by an upward movement of said blade means, thereafter to permit the sod to advance for several inches preparatory for the next cutting cycle, means for coordinating the movements of said sod cutting means with the operation of said sod advancing means, such that forward movement of a section of sod is in each instance prevented until said blade means have accomplished the cut and are again clear of the section of sod being cut, whereby each time the cutting edges of said blade means contact a section of sod during a cutting movement, a plurality of relatively small, generally hexagonally-shaped pieces of sod are created.

4,694,718

TUBE CUT OFF APPARATUS

Robert J. Kinsley, Elmhurst, Ill., assignor to Vogel Tool & Die Corporation, Stone Park, Ill.

Continuation of Ser. No. 648,612, Sep. 7, 1984, Pat. No. 4,563,927, which is a continuation of Ser. No. 427,715, Sep. 29, 1982, abandoned. This application Sep. 30, 1985, Ser. No. 782,203

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.⁴ B23D *21/00, 25/04*

U.S. Cl. 83—319 **16 Claims**

1. In a tube cut-off apparatus being provided with upper and lower die plates, and a tube cut-off means extending from the upper die plate, and a tube clamping assembly being mounted on said lower die plate and the upper die plate having a downward extending cam means for actuating the tube clamping assembly,

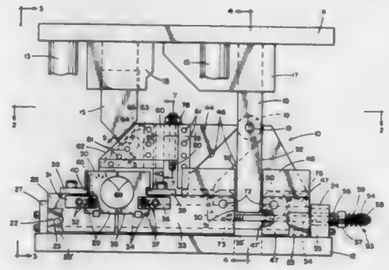
the tube clamping assembly comprising:

a jaw supporting guide member supported on said lower die plate,

a first jaw structure carried on said guide member,

a second jaw structure carried on said guide member adjacent said first jaw structure and opposing said first jaw structure for clamping and supporting a tube to be cut,

said first and second jaw structures having first and second engaging means respectively, said first and second engaging means engaging the guide member and supporting said first and second jaw structures for movement thereon,



a retaining carriage means being operatively associated with and entrapping each jaw structure,

a reaction member carried on said guide member and operatively associated with and engaging with said retaining carriage means,

the reaction member and the second jaw structure being adapted to be moved apart responsive to movement of the associated cam means, thereby moving the first and second jaw structures together to clamp the tube; and

blade support means on the second jaw structure, said blade support means supporting a scarfing blade structure for reciprocal movement thereon the scarf the tube attendant to the cutting thereof.

4,694,719

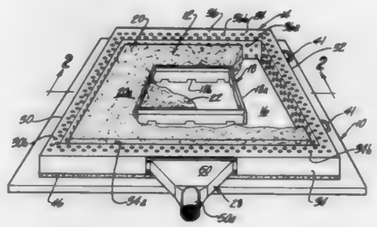
VACUUM DIE CUTTING APPARATUS

Martin M. Levene, and William W. Lessard, both of Kitchener, Canada, assignors to Ontario Die Company Limited, Waterloo, Canada

Filed Jul. 10, 1985, Ser. No. 753,380

Int. Cl.⁴ B26D *7/02*

U.S. Cl. 83—451 **13 Claims**



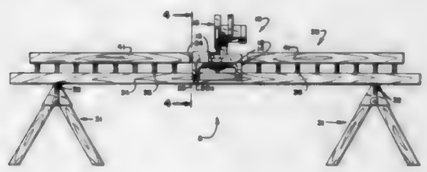
1. A steel rule die assembly comprising:

(a) a plate;

(b) a steel rule die adapted to be removably positioned on said plate and including a base member and a steel rule

upstanding from said base member and having a sharpened upper edge;
(c) a frame member of closed loop configuration and having a size to fit on said plate in surrounding relation to said base member of said steel rule die;
(d) resilient sealing means positioned on the underside of said frame member and extending in a closed loop totally around the underside of said frame member for sealing coaction with said plate; and
(e) means mounting said frame member for movement between
(1) an operative position in which it is positioned on said plate in surrounding relation to said steel rule die with said resilient sealing means sealingly coacting with said plate and
(2) a die change position in which it is removed from said plate to allow removal and replacement of said steel rule die.

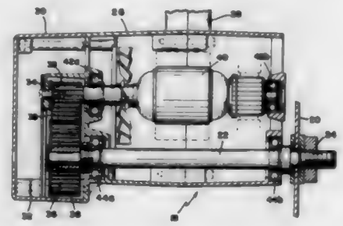
4,694,720
MITER BOX CONSTRUCTION
Louis C. Brickner, Jr., Pittsburgh, Pa., and Jerry D. Skipworth, Burkesville, Ky., assignors to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Apr. 8, 1986, Ser. No. 848,591
Int. Cl.[4] B27B *5/24*
U.S. Cl. 83—471.3 **24 Claims**



1. A portable power tool suitable for use in combination with horizontal support rails; said power tool comprising:
(a) a motor unit;
(b) base means operatively engaging the motor unit; and
(c) slots means in operative contact with the base means and including a plurality of downwardly projecting legs and a plurality of downwardly projecting studs;
(i) said legs being oriented to selectively support said base means upon a surface, if desired, and
(ii) said legs and studs forming a plurality of rail slots, each slot being formed between a leg and an associated stud, said slots being oriented and arranged for engaging selected horizontal support rails;
(d) whereby the portable power tool may selectively be raised a comfortable height above a ground plane.

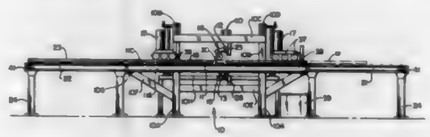
4,694,721
MOTOR PACK FOR CIRCULAR SAW
Louis C. Brickner, Jr., Pittsburgh, Pa., assignor to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Apr. 8, 1986, Ser. No. 848,592
Int. Cl.[4] B27B *5/24*
U.S. Cl. 83—471.3 **24 Claims**

1. A power saw arrangement comprising:
(a) a base;
(b) a table pivotably connected to said base for pivoting about a substantially vertical axis;
(c) a circular saw blade having a first radius, and a central axis;
(d) a motor unit pivotably connected to said table, said motor unit including: a casing; a motor armature having a longitudinal axis; an arbor shaft; a speed reducer arrangement; and, a casing extension;
(i) said casing having a first sidewall and a second sidewall;
(ii) said motor unit including a pair of armature bearings operatively mounted in said casing and arranged to rotatably support said armature in extension substantially between said first and second casing sidewalls;
(iii) said motor unit including a pair of arbor bearings operatively mounted in said casing and arranged to rotatably support said arbor shaft in extension substantially between said first and second casing sidewalls;
(iv) said arbor shaft being mounted in said arbor bearings and said armature being mounted in said armature bearings, said arbor shaft and said armature being spaced apart and extending substantially parallel to one another;



(v) said speed reducer arrangement being mounted substantially adjacent said casing first sidewall and including means operatively coupling said armature to said arbor shaft; said casing extension being arranged to enclose said speed reducer arrangement;
(vi) said circular saw blade being mounted on said arbor shaft substantially adjacent said casing second sidewall, and exterior to said casing;
(vii) said saw blade being mounted relative to said armature such that a line coaxial with said armature longitudinal axis intersects said saw blade within a distance of said first radius from said saw blade central axis;
(e) a distance between said arbor bearings being at least about one-third a distance between said armature bearings.

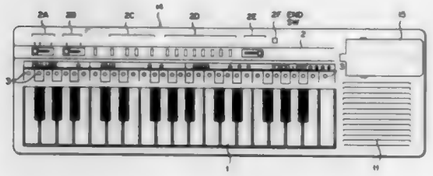
4,694,722
APPARATUS FOR SCORING AND CUTTING WALLBOARD AND THE LIKE
Ronald T. Collier, Columbus, and Robert E. Thompson, Hebron, both of Ohio, assignors to Cardinal Industries, Inc., Columbus, Ohio
Filed Aug. 6, 1985, Ser. No. 763,044
Int. Cl.[4] B26D *3/08, 1/24*
U.S. Cl. 83—885 **1 Claim**



1. Apparatus for cutting a workpiece of sheet material such as wallboard, plasterboard or the like, said apparatus comprising:
(a) a floor mounted support frame;
(b) a table disposed on the frame for carrying the workpiece in a generally horizontal plane;
(c) drive means mounted on the frame and disposed above the table for holding the workpiece against said table and for moving said workpiece in a selected direction of travel;

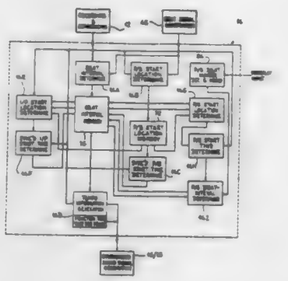
(d) a pair of relatively elongated spaced apart, parallel, vertically aligned, stationary tool guides extending from the support frame generally transversely to the direction of travel of the workpiece and disposed, respectively, above and below the table, each of said tool guides having at least one free end;
(e) at least one tool assembly slidably mounted on and readily removable from the free end of each of the tool guides and provided with means for releasably locking said tool assembly in any of a plurality of selected positions on said tool guide; and
(f) a generally circular blade freely rotatable one each tool assembly and disposed thereon for penetrating the workpiece as said workpiece is moved along the table, said blade being formed with a plurality of circumferentially aligned teeth projecting radially outwardly from a tapered, peripheral edge portion of said blade.

4,694,723
TRAINING TYPE ELECTRONIC MUSICAL INSTRUMENT WITH KEYBOARD INDICATORS
Isao Shinohara, Tokorozawa, and Itsuro Yoshimoto, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 25, 1986, Ser. No. 856,697
Claims priority, application Japan, May 7, 1985, 60-96236
Int. Cl.[4] G09B *15/04;* **G10H** *1/36, 7/00*
U.S. Cl. 84—1.03 **15 Claims**



1. A keyboard type electronic musical instrument, comprising:
keyboard means including a plurality of keys with respective allotted musical notes, and display elements each provided for a different one of said keys;
memory means for storing note data and duration data forming a musical piece in accordance with a progression of the musical piece;
musical tone signal generating means for generating a musical note signal with a tone determined by an operated key of said keyboard means;
indicating means connected to receive the note data and duration data from said memory means for lighting, in response to the note data, a corresponding display element in said keyboard means to indicate a key to be operated;
comparing means for comparing the note data successively read out from said memory means and key code signals generated by said keyboard means and representing notes of keys successively operated;
counting means coupled to said comparing means for counting instances of non-coincidence between a key specified by the note data and a key operated on said keyboard means; and
display means for displaying a number result of the instances of the non-coincidence between the note data and the operated keys.

4,694,724
SYNCHRONIZING SIGNAL GENERATOR FOR MUSICAL INSTRUMENT
Tadao Kikumoto, and Isato Murakami, both of Osaka, Japan, assignors to Roland Kabushiki Kaisha, Osaka, Japan
Filed Jun. 21, 1985, Ser. No. 747,555
Claims priority, application Japan, Jun. 22, 1984, 59-129745
Int. Cl.[4] G10H *1/42*
U.S. Cl. 84—1.03 **6 Claims**



1. A synchronized sound recording and reproducing system including
(a) sound information recording and reproducing means for recording base sound information and time code information on a recording medium and reproducing the base sound information therefrom, said recording medium being movable with respect to said sound information recording and reproducing means, said time code information being representative of different physical locations on said recording medium, said locations being arranged in the direction of movement of the recording medium, said sound information recording and reproducing means being operative to reproduce said time code information substantially in synchronism with said base sound information,
(b) base sound generating means for generating base sounds on the basis of the base sound information reproduced by said sound information recording and reproducing means,
(c) beat signal generating means for generating a beat signal each time the beat signal generating means is actuated,
(d) synthesized-sound signal generating means operative to have additional sound information memorized therein and to reproduce the stored additional sound information in accordance with a time base expressed by synchronizing signals providing tempo information, and
(e) additional-sound synthesizing means for synthesizing and generating additional sounds on the basis of the additional sound information reproduced by said synthesized-sound signal generating means,
comprising in combination
(A) beat interval determining means for determining beat intervals on the basis of the time code information reproduced by said sound information recording and reproducing means and the beat signals generated by said beat signal generating means
(B) beat interval memorizing means for storing values respectively representative of the beat intervals determined by said beat interval determining means and allowing the stored values to be successively read out therefrom when required,
(C) playback start location determining means for determining a particular physical location on said recording medium as the location at which playback operation is to be started by said sound information recording and reproducing means, said particular physical location corresponding to the first one of the best signals produced by said beat signal generating means, said playback start location de-

termining means determining said particular physical location in response to said first one of the beat signals and to said time code information reproduced by said sound information recording and reproducing means,

(D) playback start location memorizing means for memorizing a value representative of said particular physical location of said recording medium,

(E) synchronized playback start time determining means for determining the point of time at which synchronized playback operation is to be started simultaneously by said sound information recording and reproducing means and said synthesized-sound signal generating said additional-sound synthesizing means, said synchronized playback start time determining means determining said point of time when a value representative of a physical location on said recording medium indicated by said time code information reproduced by said sound information recording and reproducing means is substantially equalized with said value representative of said particular physical location memorized by said playback start location memorizing means, and

(F) tempo information generating means which is to become active at said point of time for generating tempo information on the basis of the values successively read out from said beat interval memorizing means and supplying the tempo information as synchronizing signals to said synthesized-sound signal generating means to enable the synthesized-sound signal generating means to reproduce said additional sound information and said additional-sound synthesizing means to generate said additional sounds in synchronism with the base sounds generated by said base sound generating means.

4,694,725

SOUND GENERATING SYSTEM FOR A KEYBOARD

Daniel B. Seevers, and John J. Rohulich, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 3, 1985, Ser. No. 772,224
Int. Cl.[4] G01H *1/46*
U.S. Cl. 84—1.27 **10 Claims**

1. In a data terminal device having a keyboard including a plurality of key members for generating data when operated, a system for generating an audio signal in response to the operation of a key member in the keyboard comprising:

means mounted in said keyboard for generating an audio output signal;

means coupled to said signal generating means for outputting a plurality of electrical signals at a first predetermined frequency for operating said signal generating means to output an audio signal at a first decibel level in accordance with the frequency of the electrical signals outputted by said outputting means;

means coupled to said outputting means for varying the frequency of the electrical signals outputted by said outputting means including counting means for counting a predetermined count, said varying means outputting a control signal to said outputting means upon said counting means reaching said predetermined count whereby said outputting means will vary the frequency of the electrical signal in accordance with the time the control signal is generated; and

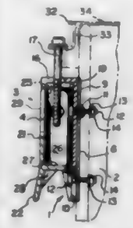
encoding means coupled to said counting means and each of the key members for outputting a different predetermined count to said counting means in response to the operation of each of said key members whereby said varying means will control the frequency of the electrical signals outputted by said outputting means in accordance with the key member operated enabling the signal generating means to output an audio output signal at a decibel level which varies with the operation of each of the key members.

4,694,726

DRUM SKIN TIGHTENING ARRANGEMENT

Frank Silvestri, Calgary, Canada, assignor to Greg Taylor, Calgary, Canada

Filed Jul. 31, 1984, Ser. No. 636,219
Claims priority, application Canada, Aug. 19, 1983, 435013
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—413 **3 Claims**



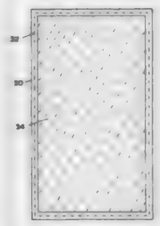
1. A drum skin tightener comprising one-piece bracket means including a base plate permitting mounting of the bracket means on the body of the drum near one open end thereof, and socket means integral with said base plate, said socket means being substantially closed but open in a direction facing away from the open drum end; lever means including lug means for releasable and pivotal insertion into said socket means, whereby said lever means can be releasably and pivotally engaged in said socket means with said bracket means; and pin means in said lever means for receiving a threaded end of a bolt to pivotally connect the lever means to a retaining rim on the drum, whereby said lever means can be rotated between a locked position in which the lug means seat firmly in said socket means and the retaining rim tensions the drum skin, and a releasable position in which the retaining rim can be removed from the drum body to release the drum skin.

4,694,727

SITU DISPOSABLE GEL CANISTER

Lloyd G. Jones, Dallas, and Lawrence R. Stowe, Plano, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,929
Int. Cl.[4] F42B *3/00*
U.S. Cl. 86—20.15 **14 Claims**



1. A method for making a disposable propellant device for use in controlled pulse fracturing which device is suspended in a wellbore comprising:

(a) forming a disposable outer liner comprised of a flexible porous material consumable upon ignition of a propellant;

(b) impregnating said porous material with a combustible solidifiable gel mixture in an amount sufficient to form a solid enclosure of a thickness capable of containing said propellant;

(c) solidifying said gel to form a solid enclosure in combination with said liner sufficient to contain said propellant while said enclosure is suspended in said wellbore; and

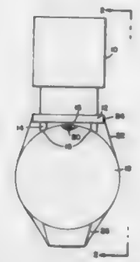
(d) enclosing within said liner a propellant means and means for igniting said propellant.

4,694,728

FIBER OPTIC GUIDED MISSILE AIMER

Steven G. McDaniel, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1985, Ser. No. 718,034
Int. Cl.[4] B64D *3/02*
U.S. Cl. 89—1.11 **3 Claims**



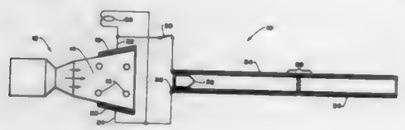
1. A missile aimer for use in accurately aiming a missile comprising a gyrocompassing north finding module mounted in a housing structure, a base member secured to said housing structure on one side of said housing structure, a pair of rails mounted on the opposite side of said base member, an alignment pin mounted in said opposite side of said base member and being spaced an equal distance from each rail, and straps mounted on opposite edges of said base member for clamping said aimer to a missile, whereby when said housing and base member are mounted on a missile with the pin projecting into an alignment opening of the missile and with the rails contacting the skin of the missile and clamped relative thereto by the straps, the gyrocompassing north finding module then being adapted for allowing one to accurately aim the missile relative to a target.

4,694,729

ELECTROMAGNETIC LAUNCHER ASSEMBLY

James R. Hall, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 4, 1986, Ser. No. 835,926
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **4 Claims**



1. A method for producing and directing current for activation of an electromagnetic launcher assembly comprising:

producing pulsed, ionized, conductive hot gases having a velocity of about 2000 meters/second with a magnetohydrodynamic power generator;

channeling and directing the conductive hot gases produced by the generator into a generator channel having a magnetic field associated therewith to produce electric power;

conducting the electric power from the generator channel to an energy storage means to store electric power energy;

selectively routing the electric power from the energy storage means through assembly circuitry;

causing the generator to function as a non-mechanical opening switch by interrupting current flow through assembly circuitry;

increasing electrical resistance in the channel;

causing the collapse of the magnetic field associated with the generator field to generate a flyback voltage; and

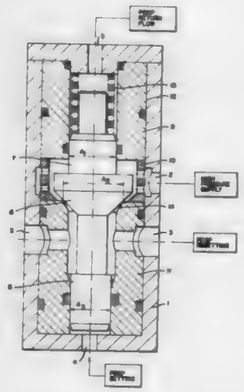
directing the flyback voltage to the launcher assembly to activate same.

4,694,730

PROP CONTROL VALVE

Karl Krieger, Wuppertal, and Werner Reinelt, Bochum, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Continuation of Ser. No. 765,232, Aug. 13, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 920,926
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430526
Int. Cl.[4] F01B *1/00*
U.S. Cl. 91—170 MP **1 Claim**



1. In combination, a control valve and prop conduits associated with the pressure chambers of the hydraulic props of a walking mine roof support assembly comprising:

a generally cylindrical valve housing, an elongate valve closure body arranged for longitudinal movement in the valve housing, a valve cone on an intermediate portion of the valve closure body, an annular valve seating arranged in the valve housing to be sealingly engaged by the valve cone with the valve closure body extending through the valve seating, a high pressure supply connected to said housing to communicate with valve cone, a valve closure spring in the valve housing arranged to act on one end portion of the valve closure body to press the valve cone into the valve setting, a first journal portion on the valve closure body on that side of the valve cone nearer the spring forming a first piston, a first cylinder in the valve housing slidingly and sealingly receiving the first piston for longitudinal movement therein, said first cylinder and said first journal portion forming a first chamber connected to the return flow conduit of a mine-roof prop, a second journal portion of the valve closure body on the side of the valve cone remote from the spring forming a second piston, and a second cylinder in the valve housing

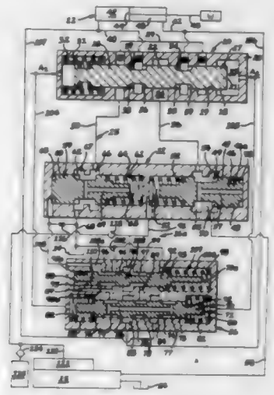
slidingly and sealingly receiving the second piston for longitudinal movement therein, said second cylinder and second journal portion forming a second chamber connected to a prop-setting conduit, the pistons having actuation areas of different sizes which are loadable by a pressure medium for the actuation of the closure body in dependence upon a predetermined minimum setting pressure in the pressure chambers of the props, the seal between the valve cone and the valve seating providing a sealing area of larger dimension than the actuation area on the first piston, the actuation area of the second piston having a smaller dimension than an annular area formed by the sealing area of the-sealing cone and than the actuation area of the first piston, and the valve closure body with the valve cone and two pistons thereon being of one-piece construction.

4,694,731

LOAD COMPENSATED VALVE

Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 22, 1986, Ser. No. 944,917
Int. Cl.[4] F15B *13/02*
U.S. Cl. 91—421 **18 Claims**



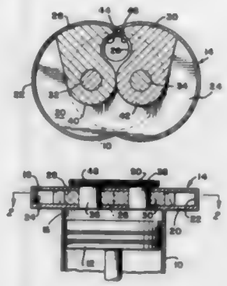
1. A load responsive valve assembly supplied with pressure fluid by a pump and operable to control fluid flow to and from a fluid actuator subjected to positive or negative load pressure said load responsive valve assembly comprising sensing means operable to determine whether said fluid actuator is subjected to positive or negative load pressure, first valve means having first and second fluid metering orifice means operably connected to said fluid actuator, inlet fluid control means interposed between said pump and said first fluid metering orifice means selectively operable to maintain a relatively constant pressure differential across said first metering orifice means, while the pressure upstream of said first metering orifice means is permitted to vary with said positive load pressure, and first deactivating means of said inlet fluid control means having means responsive to said negative load pressure above a certain predetermined negative load pressure level whereby said inlet fluid control means can selectively maintain fluid upstream of said first fluid metering orifice means at a relatively constant preselected pressure level when said negative load pressure exceeds said predetermined pressure level.

4,694,732

CLEARANCE POCKET ASSEMBLY

James V. Kurzar, Horseheads, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 31, 1986, Ser. No. 846,065
Int. Cl.[4] F01B *31/14*
U.S. Cl. 92—60.5 **8 Claims**



1. A clearance pocket assembly, for altering the effective volume of the cylinder of an air compressor or the like, comprising:

first means defining a shallow chamber having a center which is bounded by (a) a peripheral wall, and (b) a pair of parallel walls normal to, and joined by, said peripheral wall; wherein

one of said parallel walls has an aperture formed therein, said aperture being offset from said chamber center; and further including

second means within said chamber and movable, therewithin, between a first disposition for sealing off, from fluid communication with said aperture, at least a substantial portion of said chamber, and a second disposition for opening a substantial portion of said chamber to said aperture for fluid communication therewith; wherein

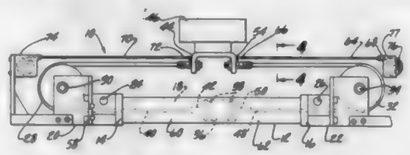
said second means comprises a rotor, journalled in said chamber, and haivng surfaces which form a constant, fluid-sealing interface with (a) said peripheral wall, and (b) both said parallel walls.

4,694,733

CABLE SHIELD FOR A RODLESS CYLINDER

Joseph H. Green, Dearborn, Mich., assignor to Greenco Corporation, Dearborn, Mich.

Filed Nov. 8, 1985, Ser. No. 796,416
Int. Cl.[4] F01B *29/00, 9/00*
U.S. Cl. 92—88 **18 Claims**



1. For use with a rodless cylinder of the type having an elongated cylinder, a fluid actuated piston longitudinally reciprocally mounted in said cylinder, an actuator, a movable member extending between one end of the actuator and one end of the piston, the improvement comprising:

an elongated flexible strip having a width greater than the width of said movable member,

means for attaching one end of said elongated strip to one end of said actuator, and

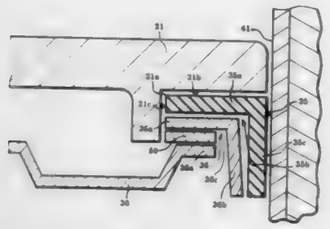
means longitudinally spaced from one end of said actuator for longitudinally slidably receiving the other end of said strip, said longitudinal receiving means comprising means for winding said strip into a coil and being positioned so that said strip overlies said movable member.

4,694,734

SEALING CONSTRUCTION FOR SLIDE TYPE VACUUM PUMP WITH FINGER PORTIONS OF SPRING ELEMENT PRESSING CYLINDRICAL PORTION OF SEAL ELEMENT AGAINST CYLINDER BORE

Yoshihisa Nomura, Toyota; Koichi Suda, and Tadashi Kozawa, both of Oobu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Kogyo Kabushiki Kaisha, both of, Japan

Filed Aug. 4, 1986, Ser. No. 892,282
Claims priority, application Japan, Aug. 9, 1985, 60-176493
Int. Cl.[4] F16J *9/06*
U.S. Cl. 92—130 R **6 Claims**



1. For a slide type vacuum pump, comprising:

(a) a cylinder bore; and

(b) a generally cylindrical piston member reciprocatingly slidably fitted in said cylinder bore;

(c) with a vacuum pumping chamber being defined on a one side of said piston member:

a sealing construction, comprising:

(d) a seal element housed in an annular groove shape formed around an axial end remote from said vacuum pumping chamber of said generally cylindrical piston member, said annular groove shape being defined by a generally flat annular first surface extending generally radially to said piston member and a generally cylindrical second surface extending generally axially to said piston member, said seal element comprising:

(d1) a generally flat annular first portion extending generally radially to said piston member, and axially abutted against said generally flat annular first defining surface of said annular groove shape; and:

(d2) a generally cylindrical second portion extending from the outer peripheral portion of said generally flat annular first portion of said seal element generally axially to said piston member in the same axial direction thereof as said generally cylindrical second defining surface of said annular groove shape and away from said vacuum pumping chamber, the outer cylindrical surface of said generally cylindrical second portion sliding against the inner cylindrical surface of said cylinder bore and sealing thereagainst;

(e) a first spring member, comprising:

(e1) a generally flat annular first portion extending generally radially to said piston member, and axially abutted against said generally flat annular first portion of said seal element and holding it against said generally flat annular first defining surface of said annular groove shape; and:

(e2) a plurality of resilient finger portions, each extending from the outer peripheral portion of said generally flat annular first portion of said first spring member generally axially to said piston member in the same axial direction thereof as said generally cylindrical second portion of said seal element and angled outwards somewhat when said first spring member is in the unstressed condition, and each said resilient finger portion springingly pressing against a portion of the inner cylindrical surface of said generally cylindrical second portion of said seal element and pressing said generally cylindrical second portion of said seal element in the radially outward direction against the inner cylindrical surface of said cylinder bore to effect sealing therebetween;

and:

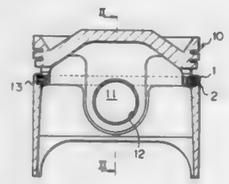
(f) a second generally disk shaped spring member the outer peripheral portion of which resiliently presses in the axial direction on said generally flat annular first portion of said first spring member and axially biasing it against said generally flat annular first portion of said seal element and holding the two of them against said generally flat annular first defining surface of said annular groove shape.

4,694,735

PISTON FOR INTERNAL COMBUSTION ENGINE

Yoshiaki Tatematsu, and Atsuo Tanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 10, 1985, Ser. No. 774,432
Claims priority, application Japan, Oct. 22, 1984, 59-220443
Int. Cl.[4] F16J *1/04*
U.S. Cl. 92—208 **6 Claims**



1. A piston for an internal-combustion engine, comprising a piston body made of aluminum or aluminum alloy, including a piston head portion, a piston skirt portion and a piston boss portion, provided with a composite fiber reinforcement consisting of a first layer of inorganic long filament, and a second layer or layers of inorganic staple short fibers substantially enclosing said first layer, said composite fiber reinforcement being arranged within the piston body, at least in either said piston boss or a shoulder portion of the piston skirt.

4,694,736

CLEAN ROOM

Taizo Yamagata; Takaaki Uchikawa; Shinichi Yamamoto; Shinichiro Tomikawa; Yoshio Ogasshara, and Masaru Sukagawa, all of Chuo, Japan, assignors to Shimizu Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,308
Claims priority, application Japan, Oct. 23, 1984, 59-221320; Feb. 26, 1985, 60-35286
Int. Cl.[4] F24F *1/02*
U.S. Cl. 98—31.6 **4 Claims**

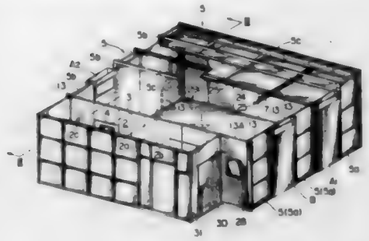
1. A clean room for keeping clean interior air of an airtight main room by circulating the interior air through a circulation path and an air conditioner and filters disposed in the circulation path, which clean room comprises:

a plurality of gate-shaped frames disposed in prescribed directions and regularly spaced on a floor surface;

an air-conditioning unit built in at least one of the spaces between the adjacent vertical members of the gate-shaped frames

a control unit built in one of the spaces between the adjacent vertical members other than the space occupied by the air-conditioning unit and adapted for controlling the air-conditioning unit, the air-conditioning unit being provided

with an external casing of low thickness, the external casing having at the lower interior wall thereof an air inlet and at the upper interior wall thereof an air outlet fitted with a high-performance filter, the casing having therein an air blower, the air-blower being so adapted as to deliver forced air flow to the air outlet, and the control unit being disposed in a thin external casing for accommodating mechanical control items;



wall panels covering the spaces between the adjacent vertical members of the gate-shaped frames other than those occupied by the air-conditioning unit and the spaces between the vertical members of the gate-shaped frames and wall panels covering the exterior of the gate-shaped frames positioned outside the room;

a ceiling panel covering the upper open end of the room enclosed by the wall panels; and

means for tightly sealing the clean room.

4,694,737

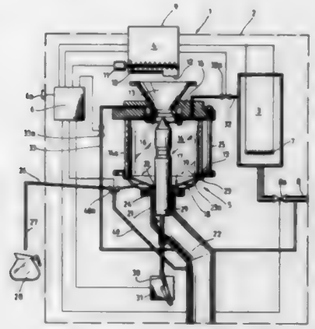
COFFEE PERCOLATOR

Gerhard Wittlinger, Geislingen/Steige, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik AG, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,832

Int. Cl.[4] A47J *31/06*

U.S. Cl. 99—279 **7 Claims**



1. A coffee percolator comprising a scalding chamber and a coffee filter including a wall substantially closing said scalding chamber at its lower portion and extending from an upper peripheral rim in a conical configuration with an angle of about 8° to 35° to the horizontal towards a substantially centrally located outlet, said wall comprising a support sieve and a sheet of stainless steel disposed on the upper surface of said support sieve facing towards said scalding chamber, said sheet having a thickness of about 20 to 80 μm and being provided with a pattern of etched micro-perforations having a diameter of about 30 to 100 μm at the surface facing towards said scalding chamber and wherein the diameter of substantially all of said micro-perforations of said sheet increases from the upper side thereof facing towards said scalding chamber in the direction of the lower side facing towards said support sieve, said support sieve having a thickness of about 0.5 to 3 mm and being provided with a pattern of holes having a diameter of about 1 to 5 mm.

4,694,738

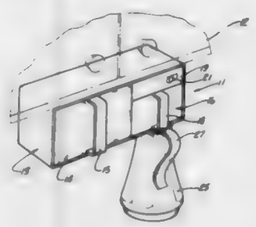
AUTOMATIC DRIP COFFEE MAKER

Richard A. Tarozzi, Gales Ferry, Conn., assignor to King-Seeley Thermos Co., Del.

Filed Jan. 14, 1986, Ser. No. 818,771

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—279 **12 Claims**



1. An automatic coffee maker adapted to be supported by means other than standing upon a counter top for delivery into a removable brewed coffee container having a neck defining a fill and pouring opening and a base for supporting said serving container on a table or the like comprising a main housing, a water compartment carried by said main housing and adapted to hold an amount of water, heating means for heating the water from said water compartment, a filter compartment carried by said main housing and adapted to contain coffee, means for communicating heated water from said heating means to said filter compartment, said filter compartment having a brewed coffee outlet for discharging liquid brewed coffee, and container supporting means carried by said housing and adapted to detachably support a brewed coffee container other than by its base and with its mouth adapted to receive the brewed coffee from said filter compartment.

4,694,739

APPARATUS FOR BEVERAGE BREWING

Joseph W. Daintrey, Royston, and Peter Thomson, Cambridge, both of England, assignors to Sankey Vending Limited, Bilston, England

PCT No. PCT/GB85/00375, § 371 Date Apr. 3, 1986, § 102(e) Date Apr. 3, 1986, PCT Pub. No. WO86/01388, PCT Pub. Date Mar. 13, 1986

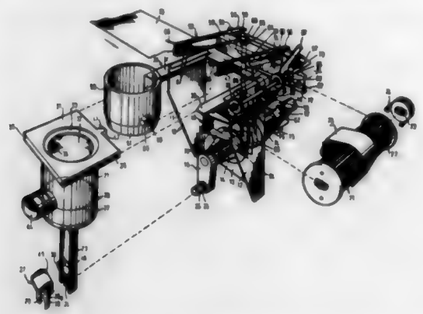
PCT Filed Aug. 21, 1985, Ser. No. 852,249

Claims priority, application United Kingdom, Aug. 25, 1984, 8421674

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—289 R **4 Claims**

1. Apparatus for producing, during a cycle, an infusion from a liquid and an infusible ingredient, and comprising: a container for receiving the ingredient and liquid; a base of the container which is permeable to air and liquid but substantially impermeable to the ingredient; means to move the container between an operative position in which it is sealed to the base and an inoperative positon in which it is spaced from the base; a piston and cylinder assembly under the container; the cyliner having an open top which communicates with the base; a support; a pair of arms on the support to receive the cylinder therebetween; a flange on the cylinder; mutually interengageable surfaces on each arm and the flange, such surfaces extending generally perpendicular to the longitudinal axis of the cylinder; means for reciprocating the pistoa in the cylinder when the container is in its operative position; said reciprocating means comprising: a connecting rod between the piston, a rotatable crank and a detachable connection between said rod and the crank; the piston and cylinder assembly being mountable on and demountable from the support when said connection is



detached by sliding the flange between the arms with said surfaces engaged; an outlet in the cylinder through which the infusion entering the cylinder via the base can be delivered; and operating means to cycle the apparatus by reciprocating the piston and moving the container between its operative and inoperative positions.

4,694,740

DOMESTIC APPLIANCE USING A HYDROPHILIC POWDER

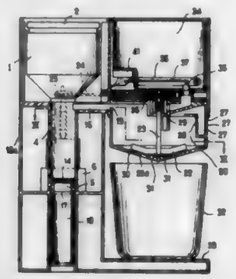
Joanny Dalox, Is Sur Tille, France, assignor to SEB S.A., Selongey, France

Filed Mar. 27, 1986, Ser. No. 844,782

Claims priority, application France, Apr. 3, 1985, 85 05084

Int. Cl.[4] A23F *3/00*; A47J *31/00*

U.S. Cl. 99—323.3 **10 Claims**



1. A domestic appliance for preparing a drink from a soluble powder and a liquid, comprising a chamber (**4**) for dispensing said powder in a quantity according to the volume of drink required to be prepared, a chamber (**20**) for mixing said powder with the liquid, said chambers communicating with one another via a duct (**16**) connecting the top parts of said chambers, a turbine (**7**) driven by a motor (**9**) to create a current of air between the base of the dispensing chamber (**4**) and an opening (**15**) leading into said duct (**16**), the base of said chamber having means (**14**) to prevent the passage of powder while being permeable to the current of air.

4,694,741

APPARATUS FOR MAKING ROLLED WAFER CONES

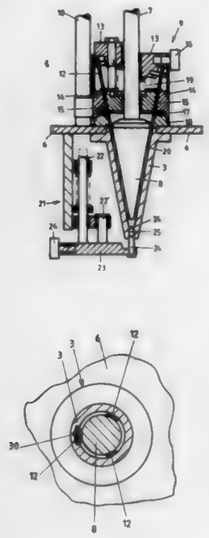
Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschines Industriegesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 727,006, Apr. 25, 1985, Pat. No. 4,624,885. This application Sep. 8, 1986, Ser. No. 904,898

Claims priority, application Austria, May 4, 1984, 1491/84

Int. Cl.[4] A21C *15/02*; A21D *13/00*

U.S. Cl. 99—354 **48 Claims**



1. Apparatus for making a rolled wafer cone having an annular cone rim and a closed cone tip, which comprises

(a) wafer-baking oven for baking a plastically deformable, flat wafer blank of a sugar-containing dough, the blank having a circumferentially extending rim and the oven having a delivery station for the baked flat wafer blank, and

(b) a rolling apparatus having a blank-receiving station facing the oven delivery station for receiving the baked flat wafer blank to be rolled into the wafer cone and a rolling apparatus delivery station for delivering the rolled wafer cone, the rolling apparatus comprising:

(1) a rotary frame rotatable about an axis and having a circumference surrounding the axis, and

(2) a plurality of winding devices spaced from each other along the circumference of the frame and mounted thereon for rotation therewith between the blank-receiving and delivery stations of the rolling apparatus, each winding device comprising:

(i) a winding mold having a conical inside surface defining a conical cavity having a longitudinal axis, a wide open end and a narrow end opposite thereto, the winding mold having a slot for introducing the baked flat wafer blank into the conical cavity,

(ii) a rotatable winding shaft extending coaxially with the longitudinal winding mold cavity axis and parallel to the rotary frame axis, the winding shaft being axially displaceable and having an end facing the winding mold,

(iii) a conical winding core secured to the winding shaft end for rotation therwith and movable into the conical winding mold cavity upon axial displacement of

the winding shaft whereby the conical inside surfaces of the winding mold and the conical winding core define a gap receiving the plastically deformable, flat baked wafer blank through the slot in the winding mold for rolling the wafer blank into the wafer cone upon rotation of the winding shaft and winding core secured thereto while the rim of the blank remains unrestrained and a portion of the unrestrained blank rim forms the cone rim, and

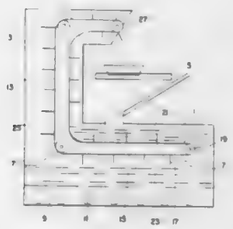
(iv) a sizing device for plastically deforming the cone rim of the rolled wafer cone until it has an accurately defined annular rim and an accurately defined length extending between the cone rim and cone tip.

4,694,742

DEEP FAT FRYER

Jerome J. Dover, Blackfoot, Id., assignor to Basic American Foods, San Francisco, Calif.

Filed Jan. 3, 1986, Ser. No. 815,913
Int. Cl.⁴ A47J *37/12*
U.S. Cl. 99—404 **4 Claims**



1. An apparatus for deep fat frying comestibles comprising:
(a) a reservoir for containing a quantity of cooking medium;
(b) means for heating said cooking medium;
(c) means for conveying comestibles through said cooking medium, said means for conveying having:
(i) a first section horizontally disposed for receiving said comestibles and conveying said comestibles horizontally for a prescribed distance in order to permit a second batch of comestibles to be supplied to said apparatus;
(ii) a second section adjacent said first section, said second section being curved for conveying comestibles downwardly to submerge said comestibles in said cooking medium;
(iii) a third section horizontally disposed adjacent said second section and located directly below said first section for transporting said submerged comestibles through the cooking medium for a prescribed period of time;
(iv) a fourth section vertically disposed adjacent said second section for removing the comestibles from the cooking medium and permitting the comestibles to drain free of excess cooking medium; and
(v) a fifth section adjacent said fourth section and horizontally disposed above said first section for conveying the cooked and drained comestibles to a discharge area located above and adjacent to the area of introduction of food product into said first section.

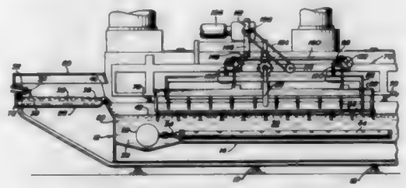
4,694,743

METHOD AND APPARATUS FOR FRYING PRODUCT

Horace E. Groff, Box 176, School Rd., Bowmansville, Pa. 17507

Filed Nov. 25, 1985, Ser. No. 802,164
Int. Cl.⁴ A47J *37/12*
U.S. Cl. 99—405 **11 Claims**

1. An apparatus for frying a food product, said apparatus including an elongated cooking vat, heated cooking liquid disposed within said vat to a predetermined level and upon which said product will float, heating means in good heat transfer relation with said liquid for supplying heat energy thereto at a controlled rate, food product supply means for applying food product to one end of said vat at a controlled rate, product discharge means operatively associated with the other end of said vat for discharging cooked product therefrom, and combined cooking food product agitating, propelling and turning unit means including at least one set of dependingly supported fingers, said unit means being mounted from said vat for cyclic movement relative thereto consisting of sequential downward displacement from a starting position with said fingers spaced above said level to a position with said fingers extending through said level, longitudinal displacement along said vat, with said fingers extending through said level, toward the other end of said vat, upward displacement to a position with said fingers spaced above said level and longitudinal displacement along said vat toward said one end back to said starting position, said heating means including a plurality



of laterally spaced longitudinally extending cylindrical heat tubes disposed within said vat below said predetermined level, each of said heat tubes including burner means in an end thereof adjacent said other end of said vat and combustion exhaust manifold means in said one end of said vat into which the adjacent ends of said tubes open, said vat including cooking liquid circulating means including pumping means for pumping a portion of said cooking liquid from said other end of said vat and discharging the pumped cooking liquid into said one end of said vat, an initial product receiving tank disposed adjacent said one end of said vat and including one marginal portion of said tank defining a weir-type outlet for discharging liquid from said tank into said one end of said vat, said tank including a second marginal portion opposite said one marginal portion into which said pumping means discharges the pumped liquid, the pumped liquid being movable through said tank from said second marginal portion to said one marginal portion and over said weir-type outlet into said one end of said vat.

4,694,744

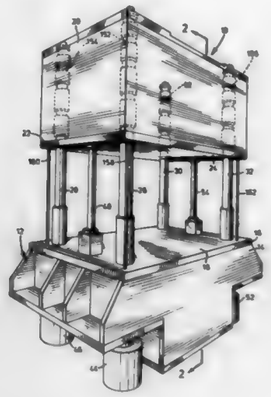
HYDRAULIC PRESS WITHOUT CONVENTIONAL SIDE SLABS AND CROSS-HEAD

James Hepburn, and Leon Malashenko, both of Toronto, Canada, assignors to John T. Hepburn, Limited, Mississauga, Canada

Filed Oct. 30, 1986, Ser. No. 924,927
Claims priority, application Canada, Dec. 30, 1985, 498799
Int. Cl.⁴ B30B *7/02*
U.S. Cl. 100—214 **9 Claims**

1. A press comprising:
a base structure which includes a lower platen;
a multiplicity of vertical posts;
guide means attached to the base structure and continually engaged with the posts for rigidly guiding the posts to move vertically relative to the base structure;
hydraulic cylinder means attached to the base structure for raising and lowering the posts;
an upper platen guided solely on the posts for vertical movement relative to the lower platen;

upper platen displacement means for moving the upper platen relative to the posts; and,



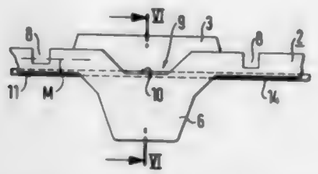
controllable locking means for releasably locking the upper platen to the vertical posts.

4,694,745

PRINTED BAND, IN PARTICULAR FOR PRICE MARKING DEVICES

Heinrich Volk, Beerfelden-Gammelsbach; Karl Harter, and Fritz Dotter, both of Furtwangen, all of Fed. Rep. of Germany, assignors to Esselte Meto International GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,229
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422456
Int. Cl.⁴ B41J *1/60*
U.S. Cl. 101—111 **13 Claims**



1. In a printing band, in particular for price marking devices, which is endless and has one run (2) which on its outer side comprises visually readable characters (3) or digits and which on the opposite run (4) has printable characters (5) or digits disposed laterally inverted relative to the visually readable characters, and respective inwardly projecting cams causing an increase in thickness of belt in the location of the cams disposed beneath the readable characters (3), said cams being used to advance the printing band (1), the inner side (11) of the run of the printing band which carries the printable characters (5) being smooth and a first recess (8) between each adjacent printable and readable character, said first recesses (8) extending from the outside inwardly to provide for selective band weakening areas,

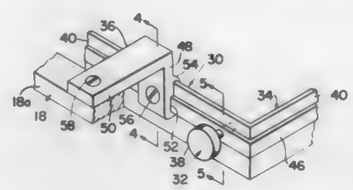
the improvement comprising means for increasing the flexibility of the printing band at the location of the cams, said means for increasing the flexibility including a second recess (9) aligned with each of the inwardly projecting cams (6) on the outer side of the run (2) which is remote from the cams (6).

4,694,746

SILKSCREEN FRAME MOUNTING ASSEMBLY FOR PRESS

Kaino J. Hamu, 25142 Wandering La., El Toro, Calif. 92630

Continuation of Ser. No. 657,832, Oct. 5, 1984, abandoned. This application Jul. 22, 1986, Ser. No. 889,582
Int. Cl.⁴ B41F *15/36*
U.S. Cl. 101—124 **7 Claims**



1. A mounting assembly for removably mounting a stencil screen frame on the screen frame support of a stencil screen printing press between spaced members of the frame support, comprising:

an open rectangular carrier frame to be positioned between said support members of said printing press for receiving said screen frame through one side of the carrier frame, said carrier frame having sidewalls along the edges of the carrier frame substantially normal to the plane of the carrier frame and flanges projecting inwardly from said sidewalls along the sidewall edges at the opposite side of said carrier frame and disposed in a common plane generally parallel to said plane of the carrier frame, said opposite side of said carrier frame having an opening bounded circumferentially by said flanges,

said carrier frame being adapted to receive said screen frame in a position wherein said screen frame rests on said flanges,

screws threaded in said carrier frame sidewalls with their axes substantially parallel to said plane of the carrier frame for engaging the edges of a screen frame positioned in the carrier frame to releasibly secure the screen frame in the carrier frame, and

mounting brackets rigidly joined to two opposite side walls of said carrier frame for mounting said carrier frame on said screen frame support of the printing press, said mounting brackets including arms extending outwardly from said opposite sidewalls in opposite edgewise directions of said carrier frame and in a common plane substantially parallel to said plane of said carrier frame flanges and offset from the latter plane toward said one side of said carrier frame for engagement over said screen frame support members of said printing press.

4,694,747

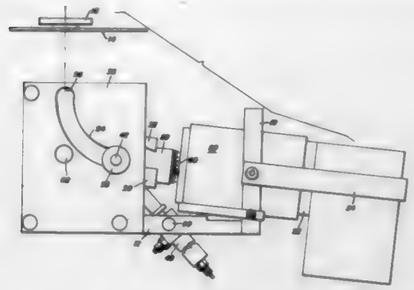
PRINT HEAD OPERATING MECHANISM

Alfred A. Marozzi, 3 Cheryl Rd., Pine Brook, N.J. 07058

Filed Apr. 15, 1981, Ser. No. 254,396
Int. Cl.⁴ B41F *1/04*
U.S. Cl. 101—301 **11 Claims**

10. In an apparatus for intermittently marking a substantially planar surface, including a frame, an elongated ink storage cartridge having an inclined longitudinal axis, an ink transferring end portion and an ink pad at said end portion with a surface substantially perpendicular to the axis, a print head mounted on the frame for movement independently of the cartridge, and a power operated device pivotally connected to the print head at a movable pivot for displacement thereof between marking and inking positions respectively engaging the planar surface and the surface of the ink pad in the end portion of the cartridge, the improvement comprising means mounting the cartridge on the frame for fixing said inclined axis thereof to the frame, means for guiding movement of the

movable pivot along an arcuate path having a substantially constant radius of curvature and opposite terminal ends, and orienting means engageable with the print head at a second pivot fixed to the frame for angularly displacing the print head about said movable pivot in response to said movement along



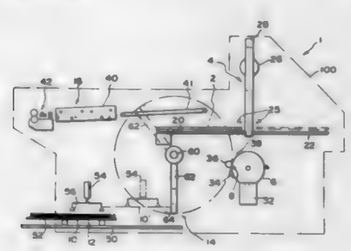
the arcuate path between said inking and marking positions, said opposite terminal ends of the arcuate path lying on tangents thereto which intersect at the fixed pivot, one of the said tangents being coincident with the fixed inclined longitudinal axis of the cartridge.

4,694,748

DEVICE FOR MOVING OFFSET PLATES

Kunio Fujisawa, Saitama; Toyoji Tanaka, Tokyo; Toshio Mochizuki, Saitama; Norio Nakamura, Saitama, and Seiji Kaya, Saitama, all of Japan, assignors to Fujirex Company, Limited, Japan

Filed Nov. 14, 1985, Ser. No. 798,179
Int. Cl.[4] B41C *1/02*
U.S. Cl. 101—401.1 **8 Claims**



1. Printing and fixing apparatus for forming an image on offset plates comprising a support for a stack of said offset plates, a photo-printing device and a photo-fixing device; said offset plates initially having no discernible image when in said stack;

said apparatus being operable in connection with offset plates having a plurality of holes adjacent one edge thereof; said offset plates forming said stack and being arranged with the holes in said plates aligned with each other;

operating means for moving said plates in a cycle of operation individually and successively from said stack to said photo-printing device and then to said photo-fixing device;

said operating means comprising a transport member; one end of said transport member being translatable in a rotary path from said stack to said photo printing device to said photo-fixing device; said photo-printing device and said photo-fixing device forming a discernible image on each plate;

additional means for engaging and raising the top offset plate of said stack towards said transport member;

a pin fixing plate carried tangentially at the one end of said transport member and having a plurality of pins registrable with the holes in the plate which has been raised by said additional means; and

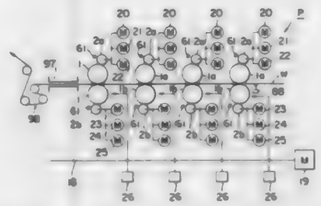
means for disengaging the plate from the pins and the transport member on completion of a cycle of operation.

4,694,749

METHOD OF PRESETTING PLATE CYLINDERS FOR REGISTERING IN AN OFFSET PRINTING PRESS

Hideo Takeuchi, Shiroi; Michiaki Kobayashi, Kitamoto; Osamu Yoritsune, and Takemasa Matsumoto, both of Mihara, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation-in-part of Ser. No. 653,840, Sep. 24, 1984, abandoned. This application Nov. 1, 1985, Ser. No. 793,790
Claims priority, application Japan, Sep. 30, 1983, 58-182315
Int. Cl.[4] B41F *5/06, 13/12*
U.S. Cl. 101—426 **3 Claims**



1. A method of presetting plate cylinders for registering before the start of a printing operation in an offset printing press in which a web runs between surfaces of opposed rotating blanket cylinders for the plate cylinders, the method comprising the steps of:

(a) correcting rotation phase, lateral and twist errors of each plate cylinder without considering a delamination error defined by a rotational phase error caused by the web being drawn in a rotational direction of a blanket cylinder due to adherence of the web onto an inked surface of the blanket cylinder, while detecting register marks on a printing plate mounted on each plate cylinder;

(b) calculating tension of a web on the basis of a functional expression with respect to at least one of width and weight per unit length of the web and operating tension adjusting means on the basis of a calculated value of web tension;

(c) calculating the delamination error of each plate cylinder corresponding to each printing color on the basis of at least one functional expression with respect to at least one of the calculated tension, width, weight per unit length and rates of pattern area and operating delamination error correcting means on the basis of a calculated value of a delamination error with respect to each plate cylinder corresponding to each printing color; and

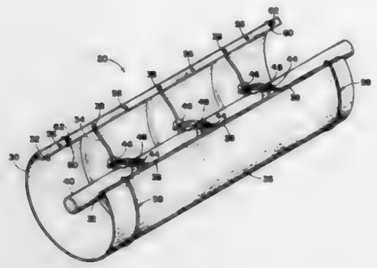
(d) carrying out self-learning in which an operator manually adjusts the delamination error correcting means until delamination errors are eliminated while viewing shear of colors on printed articles to determine a suitable web tension and delamination error when shear of colors is eliminated, the suitable web tension and delamination error being used when coefficients of the functional expressions with respect to web tensions and delimination errors are calculated for subsequent printing operations.

4,694,750

PRINTING PRESS CYLINDER WITH AXIALLY ADJUSTABLE CORD ANTI-SMEAR DEVICES

Joe A. Greene, 3176 South 76 East Ave., Tulsa, Okla. 74145

Continuation of Ser. No. 800,560, Nov. 21, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 5,323
Int. Cl.[4] B41F *21/00*
U.S. Cl. 101—426 **16 Claims**



1. A method for preventing the smearing on ink of a freshly inked sheet of paper as it moves through a printing press, comprising the steps of:

providing a printing press having a blanket cylinder, an impression cylinder, and a transfer cylinder,

providing the transfer cylinder with a cylindrical portion,

providing the cylindrical portion of the transfer cylinder with an axially oriented flange at each axial end thereof,

providing a pair of elastic members, each elastic member having a hook each end there of,

attaching each elastic member to the cylindrical portion by securing each hook cooperably with each flange and stretching each elastic member around the circumferential surface of the circular portion,

examining properties of material to be printed so as to choose a position along the flange members for the elastic members to provide an efficient antismearing capacity for the transfer cylinder, and

adjusting the elastic members axially along the flange members to chosen positions for the elastic members around the cylindrical portion so as to provide a minimum area of contact of the elastic members with printed areas of the freshly inked sheet.

4,694,751

EXPLOSIVE SYSTEM FOR GUIDED MISSILES AND ROCKET PROJECTILES

Horst Moosmann, Schramberg, Fed. Rep. of Germany, assignor to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,489
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441385
Int. Cl.[4] F42C *19/08*
U.S. Cl. 102—202 **2 Claims**

1. An explosive system for use in projectiles such as guided missiles and rocket projectiles, comprising:

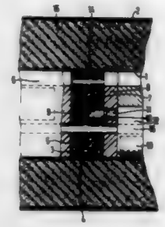
an explosive charge,

an ignition booster for igniting said charge, said booster arranged within said charge such that an outer circumference of said booster is encompassed by said explosive charge, said booster defining a longitudinal axis,

a detonator spaced longitudinally from said booster for igniting said booster,

a layer of material disposed between said booster and said detonator, and

an ignition transfer device arranged between said detonator and said booster for being ignited by said detonator and igniting said booster, said ignition transfer device including a first portion embedded longitudinally within said booster, a second portion extending through said layer of



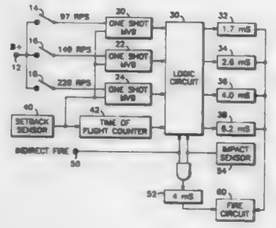
material, and an enlarged collar located at a junction of said first and second portions and engaging said booster and said layer of material.

4,694,752

FUZE ACTUATING METHOD HAVING AN ADAPTIVE TIME DELAY

John D. Titus, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1986, Ser. No. 914,405
Int. Cl.[4] F42C *11/06, 15/40*
U.S. Cl. 102—215 **3 Claims**



1. A method of adaptive delay after impact of projectile comprising the steps of:

determining a spin rate of a projectile;

setting a time delay corresponding with said spin rate;

updating said time delay; and

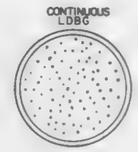
starting said time delay after impact.

4,694,753

CONTINUOUS PRODUCTION OF LOW DENSITY BASE GRAIN WITH A SALT-FREE LIQUOR

Karen A. Thomas, Leon, Fla., assignor to Olin Corporation, Stamford, Conn.

Filed Feb. 26, 1986, Ser. No. 834,182
Int. Cl.[4] C06D *5/06*
U.S. Cl. 102—289 **3 Claims**



1. In the art of making spherical, single-base low density powder grains from discrete particles of a lacquer of a single

smokeless powder base and a solvent therefore, the method comprising the steps of

(a) continuously forming a single-base lacquer into substantially spherical particles while entrained in a salt-free liquor suspending medium which is a non-solvent for the powder base and substantially immiscible with said solvent,

(b) coating the formed spherical particles with a deterrent; and

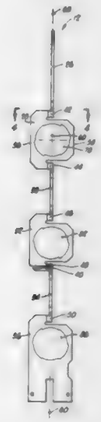
(c) rolling the particles to produce an oblate spheroidal grain of a specific gravity within the range of from about 1.15 to about 1.275.

4,694,754

MULTI-PHASE CHARGE HOLDER

Jack E. Dines, and Ernest L. Gillingham, both of Fort Worth, Tex., assignors to Jet Research Inc., Arlington, Tex.

Filed Apr. 21, 1986, Ser. No. 854,277
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—310 **18 Claims**



1. A shaped charge carrier assembly apparatus, comprising:

a carrier including:

a plurality of carrier segments integrally formed from a single substantially flat elongated sheet of structural material; an interconnecting portion located between and integrally connected with each two adjacent carrier segments;

said interconnecting portion being defined at least partially by first and second transverse slot extending from opposite edges of said elongated carrier toward a longitudinal central axis of said elongated carrier; and

said adjacent carrier segments being angularly offset from each other about said longitudinal axis by permanent deformation of said interconnecting portion located therebetween; and

a plurality of shaped charges connected to said plurality of carrier segments.

4,694,755

SHELL FOR FIRING PRACTICE

Inigo A. Ibarra, Vizcaya, Spain, assignor to Esperanza y Cia, S.A., Spain

Filed Apr. 9, 1986, Ser. No. 849,751
Int. Cl.[4] F42B *13/22*
U.S. Cl. 102—445 **10 Claims**

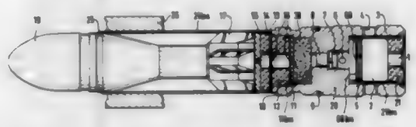
1. A shell for firing practice comprising:

(a) a master projectile in the shape of a conventional shell, said master projectile having a bore along the longitudinal axis of said master projectile;

(b) a subcaliber training projectile, said subcaliber trainign projectile comprised of a sleeve and a plurality of components that are housed in said sleeve, said subcaliber training projectile capable of fitting inside said master projection bore;

(b_1)said sleeve housing said components such that said components are concentrically placed in axial continuity inside said sleeve in the following order from one end of said sleeve to the other;

(b_{1-1}) a cartridge positioned at one end of the sleeve said cartridge having a first explosive charge that is activated by a mortar firing pin, and said cartridge having a wad



with at least one hole therethrough, said first explosive charge capable of producing a first explosion;

(b_{1-2}) a second firing pin positioned next to said cartridge inside said sleeve, said second firing pin capable of being acted upon by said first explosion by means of said hole in said wad;

(b_{1-3}) a second explosive charge which is capable of being activated by said second firing pin, said second explosive charge capable of producing a second explosion;

(b_{1-4}) means for transmitting the second explosion;

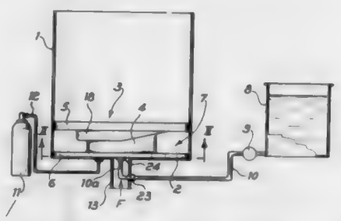
(b_{1-5}) a carried projectile positioned at the other end of said sleeve, said second explosion acting on said carried projectile by means to transmit the second explosion thereby igniting a third explosive charge in said carried projectile.

4,694,756

FURNACE FOR THE COMPLETE, SMOKELESS COMBUSTION OF LIQUID OR PARTIALLY LIQUID MATERIALS

Giuseppe Carrara, Via Cavour, 125, Cernusco Sul Naviglio, Italy

Filed Jul. 21, 1986, Ser. No. 887,221
Claims priority, application Italy, Jul. 31, 1985, 21784 A/85
Int. Cl.[4] F23G *7/04*
U.S. Cl. 110—238 **7 Claims**



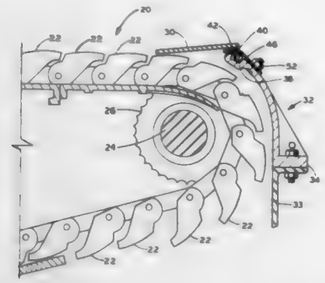
1. A furnace for complete smokeless combustion of liquid or partially liquid materials, wherein it includes, at the lower end of a hollow cylindrical body open at the top thereof, a cylindrical body provided, at the opposite ends thereof, with expanded portions, said expanded portions together with the side surface of cylindrical body and the opposite internal surface of hollow cylindrical body, enclosing a combustion chamber wherein there is injected the materials to be burnt, a fuel gas and a combustion sustaining gas, by means of suitable passages provided inside cylindrical body, said passages being connected for that purpose to sources of supply of said products.

4,694,757

TUYERE CONSTRUCTION FOR REFUSE BURNING BOILER SYSTEMS

Richard A. Hawkins, Columbus, and Merle D. Hunter, Orient, both of Ohio, assignors to The City of Columbus, Ohio, Columbus, Ohio

Filed Apr. 30, 1986, Ser. No. 857,492
Int. Cl.[4] F23H *11/10*
U.S. Cl. 110—271 **3 Claims**



1. An improved tuyere assembly for a refuse burning boiler of the kind having a conventional continuously moving stoker grate defining a path of travel for refuse from a rear wall to a forward wall of said boiler comprising, in combination, a tuyere support wall disposed adjacent to said rear wall of said boiler and spaced near to the rear of said stoker grate, said support wall having an arcuate upper portion extending above a portion of the path of travel and laterally across said stoker grate generally at a right angle to said path of travel; a plurality of tuyere plates horizontally disposed in closely adjacent relationship to one another and extending laterally across a portion of the path of travel of said stoker grate, said plates being independently mounted at their rearwardly disposed edge to said support wall for vertical pivoting movement about a substantially constant horizontal axis with their forwardly disposed edge freely engaging the moving upper surface of said stoker grate and means fixed to said support wall to limit the angle of the vertically upward pivoting movement of any one of said plates independent from another to an angle less than ninety degrees, whereby vertically raised foreign obstructions which adhere upon the surface of said stoker grate during combustion may pass under said tuyere plates by forcing said plates to pivot vertically away from said stoker grate.

4,694,758

SEGMENTED FLUIDIZED BED COMBUSTION METHOD

Walter P. Gorzegno, Morristown, and Iqbal F. Abdulally, Randolph, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 16, 1986, Ser. No. 942,126
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **4 Claims**

1. A method of generating heat comprising the steps of:

forming a plurality of chambers in an enclosure,

introducing a particulate fuel material into one of said chambers,

introducing air into said one chamber to form a fluidized bed of said particulate material in said one chamber,

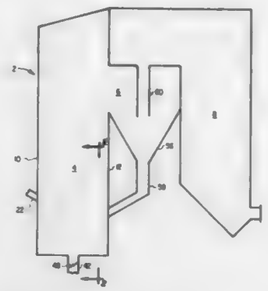
controlling the velocity of said air so that it is substantially equal to the minimum velocity required to fluidize said bed,

introducing a particulate fuel material into another of said chambers,

introducing air into said other chamber to form a fluidized bed of said particulate material in said other chamber,

controlling the velocity of said air introduced to said other chamber so that it is substantially equal to the minimum velocity required to fluidized said bed in said other chamber,

then increasing the velocity of air introduced to at least one of said chambers to a value above said minimum velocity and so that it combines with the gaseous products of



combustion and entrains a portion of said particulate material,

separating the entrained particulate material from said mixture of air and gaseous products of combustion, and

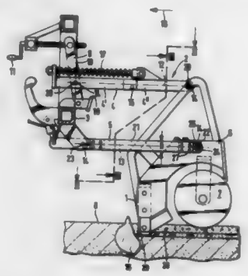
passing said separated particulate material into one of said chambers.

4,694,759

SEED DRILL

Heinz Dreyer; Bernd Scheufler, both of Hasbergen; Benno Wiemeyer, Lotte-Halen, and Johannes Lührmann, Wallenhorst, all of Fed. Rep. of Germany, assignors to Amazonen Werke H. Dreyer GmbH & Co. KG, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Aug. 15, 1985, Ser. No. 766,000
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431327
Int. Cl.[4] A01C *7/20*; A01B *49/06*
U.S. Cl. 111—85 **17 Claims**



1. In a seed drill movable in a direction of travel for applying at least one of seed and fertilizer, having a frame, reservoir, sowing shares, and means attaching each sowing share to the frame to enable the sowing share to move in an upright plane parallel to the direction of travel including a parallelogram mount with superimposed and at least approximately parallel upper and lower struts, the improvement wherein the attaching means further comprises: the upper strut having a longitudinal axis parallel to the direction of travel when in the horizontal working position, the lower strut having a narrow side and being inherently elastic and comprising spaced apart leaf springs, wherein the lower strut has connection means mounting a sowing share, the connection means including an axis

extending transverse to the direction of travel and including an intermediary fastened to the leaf spring and to a bushing mounted on the intermediary and which is wider by a multiple of the narrow side of the lower strut and means including said elastic lower strut enabling the sowing share to deflect laterally about the longitudinal axis of the upper strut.

4,694,760

STANDING SEED PLANTER

Joan A. Camp, 1798 Belmar Blvd., Wall, N.J. 07719

Filed Nov. 1, 1985, Ser. No. 793,751
Int. Cl.[4] A01C *5/02*
U.S. Cl. 111—92 **3 Claims**



1. A seed planter for gardening from an upright position comprising an elongated, hollow, tubular body having an open upper end and a lower end; means for closing said lower end; said means for closing said lower end being pointed for insertion into the ground; said means for closing said lower end having at least one movable portion controlled by a lever rigidly mounted on said portion, said portion being hinged to open said lower end when said lever is moved; a handle means having a rigid part secured around the opening, and including a grasping portion extending to one side of said opening and not obstructing said opening, at said upper end; said handle having a movable part pivoted on said rigid part, extending to said one side from the opposite side beneath said rigid part and not obstructing said opening, to be squeezed by hand; means connecting said movable handle part to said lever on said movable portion of said means for closing said lower end to maintain said means for closing in a normally closed portion and for opening said lower end of said tubular body when said movable handle is squeezed, to spread open said ground pierced by said pointed end to permit the dropping of a given seed through said opening at said upper end and through said hollow tubular body, for planting, along with water to start germination, and other materials to nourish said seed.

4,694,761

YARN CUTTING HEAD

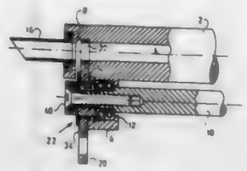
Yackob Golda, 5 Noga Street, Herzlia, Israel

Filed Dec. 23, 1986, Ser. No. 945,787
Claims priority, application Israel, Jan. 6, 1986, 77530
Int. Cl.[4] D05C *15/06*
U.S. Cl. 112—80.71 **6 Claims**

1. A yarn cutting head for a tufting machine, comprising:

a discoid, rigid cutting plate having a central bore for the free passage therethrough of a first element of said machine, means for rigid attachment of said plate to a second element of said machine, and at least one cutting hole eccentrically located relative to said bore and substantially concentric, in the attached state of said cutting plate, with a yarn-feeding duct provided in said second member of the machine;

a revolving cutting knife made of a relatively thin, elastically flexible material, drivable by a motor of said tufting machine via a drive shaft and consisting of a hub portion provided with a hole for connection to said drive shaft, and an elongated cutting portion extending beyond said hub portion, said cutting portion being provided with a



cutting edge outwardly extending with respect to said hole, means being provided, in assembly for pressing at least part of said cutting portion against said cutting plate,

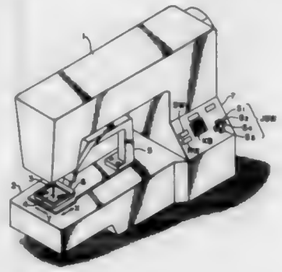
wherein said elastically flexible cutting knife is prebent in such a way that when upon assembly, the rear face of said hub portion is pressed against said cutting plate said elongated cutting portion is pressed against said plate along a relatively narrow strip only, said strip including said cutting edge.

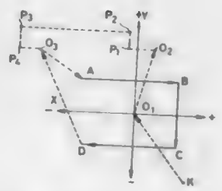
4,694,762

SEWING MACHINE CONTROL APPARATUS

Kunio Takano, Tokyo, and Masanori Nukushina, Kanagawa, both of Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00543, § 371 Date Aug. 7, 1985, § 102(e) Date Aug. 7, 1985, PCT Pub. No. WO85/02871, PCT Pub. Date Jul. 4, 1985
PCT Filed Nov. 13, 1984, Ser. No. 767,292
Claims priority, application Japan, Dec. 26, 1983, 58-246833
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **1 Claim**





1. In a sewing machine including a needle rod having a needle secured to a lower end thereof and movable up and down directions in operative association with a main shaft, a moving body having a fabric holding body to and from which a fabric is capable of being attached and detached, said moving body being freely supported on an upper surface of a bed for movement in a plane perpendicular to said direction in which the needle rod moves, drive means coupled to said moving body in such a manner that said moving body is moved under electrical control in said plane along perpendicularly intersecting X and Y axes individually or along a resultant direction, memory means for successively storing needle descent position data for each stitching pattern as movement data in the X and Y directions from a stitching starting position to a stitching end position and for storing a fixed position in the X and Y directions as a first origin, means for reading said movement data out of said memory means, and first control means for driving said drive means in relation to the read movement data, the improvement comprising:

starting means for generating a start signal by a manual operation to start a driving source of the sewing machine;

manual operating means for generating a position signal in the X and Y directions before generation of said start signal;

second control means for controlling said drive means to move said moving body in response to said position signal;

third control means for storing a position in the X and Y direction corresponding to said position signal as a second origin; and

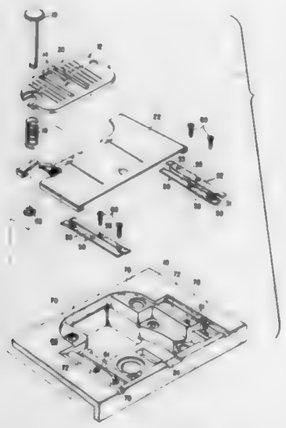
fourth control means for controlling said drive means to move said moving body to a stitching starting position of said second origin in response to said start signal and to return said moving body to said second origin after completion of the stitching pattern.

4,694,763

SEWING MACHINE BED SLIDE RETENTION

Kenneth D. Adams, Madison, N.J., assignor to SSMC Inc., Stamford, Conn.

Continuation of Ser. No. 179,861, Aug. 20, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,208
Int. Cl.[4] D05B *73/12*
U.S. Cl. 112—184 **2 Claims**



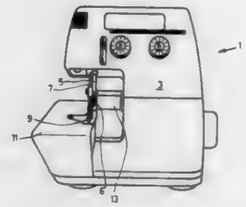
1. A sewing machine comprising a frame including a head and a work supporting bed, said head supporting therein an endwise reciprocating sewing needle, said work supporting bed being fashioned of molded synthetic resin material and having a cavity therein for a sewing machine loop taker for cooperation with said sewing needle in the formation of stitches, a throat plate spanning said cavity, said throat plate having an orifice for passage of said sewing needle to said loop taker, a bed slide adjacent said throat plate, said, bed slide spanning said cavity and extending beyond said throat plate on both sides of said throat plate, and means adjacent said cavity on opposite sides thereof for slidably holding said bed slide to said bed for selective movement from a position abutting said throat plate to a position spaced from said throat plate to expose said sewing machine loop taker, said means including at least a pair of apertures in said work supporting bed, one each of said apertures on opposite sides of and spaced from said cavity a distance amenable to good molding practice for the synthetic resin material, said bed slide further comprising ends beyond both sides of said throat plate doubled back under said slide and spaced therefrom so that the ends thereof lie beyond both sides of said throat plate aligned with and directed towards each other, said holding means comprising a pair of first steps in said work supporting bed one each beyond both sides of said throat plate for slidably receiving said bed slide for selective positioning abutting said throat plate and spaced thereform, a pair of second steps on both sides of said cavity one adjacent each of said first steps and spaced from said bed slide a pair of sheet metal Z shaped members, each having a lower bar, an upper bar, and a leg joining said lower and said upper bars, said lower bars thereof supported one on each of said second steps and said upper bars thereof adapted to extend one on each end of said bed slide between said bed slide and said doubled back ends, and means for retaining said lower bars on said second steps.

4,694,764

LATERALLY SWINGABLE SEWING MACHINE PRESSER DEVICE

Heinz Janouschek, Steckborn, Switzerland, assignor to F. Gegauf AG Bernina Nähmaschinenfabrik, Steckborn, Switzerland

Filed Jan. 21, 1986, Ser. No. 820,681
Claims priority, application Switzerland, Jan. 31, 1985, 420/85
Int. Cl.[4] D05B *29/00*
U.S. Cl. 112—237 **14 Claims**



1. A fabric presser device for sewing machines possessing a needle bar carrying a needle, comprising:

a spring-loaded presser-bar possessing a predetermined end;

said presser-bar possessing a longitudinal axis;

said presser-bar being arranged substantially parallel to said needle bar;

a presser-bar guide;

a connecting element;

said presser-bar guide being attached to said presser-bar by means of said connecting element;

guide means extending substantially parallel to said longitudinal axis of said presser-bar and guiding said presser-bar guide;

said guide means containing a guide groove defining one side and an open upper end on said one side of said guide groove;

lifting means engaging said presser-bar guide for lifting said presser-bar;

a presser-foot mounted at said predetermined end of said presser-bar;

said presser-bar, when lifted into a raised position under the action of said lifting means upon said presser-bar guide, rendering pivotable said presser-foot about said longitudinal axis of said presser-bar such that said presser-foot is rendered laterally pivotable below said needle bar and away from a stitching region defined by said needle;

a housing of said sewing machine;

said presser-bar being mounted in said housing; and

said presser-foot being pivotable conjointly with said presser-bar.

4,694,765

ADJUSTABLE APPARATUS FOR SEWING MACHINE THREAD TENSIONING DEVICE

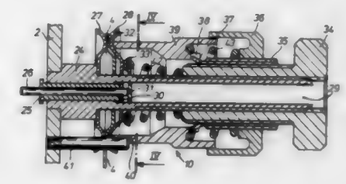
Konrad Diehl, Bexbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 892,481

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529369

Int. Cl.⁴ D05B *47/02*

U.S. Cl. 112—254 **10 Claims**



1. A sewing machine tensioning device for a needle thread, comprising a mounting pin having a threaded section, first and second cooperative gripping discs mounted on said pin for tensioning a needle thread, first and second adjusting members, a release disc for each adjusting member, said first and second adjusting members being mounted on said pin on the same axis and being capable of movement with respect to one another, at least one of said adjusting members being mounted on said threaded section of said pin, a spring mechanism for adjusting the tension between said adjusting members and said release discs including a separate spring for each of said first and second adjusting members, a mechanism for occasionally suspending the effect of said spring mechanism, said second adjusting member comprising an inner part, a stationary support fitting onto said inner part, said first adjusting member comprising an outer part, said outer part fitting onto said stationary support, each of said first and second adjusting members being associated with a respective spring, said mechanism for occasionally suspending the effect of said spring mechanism including two release members mounted for movement with respect to each other and engageable with said release discs for the purpose of occasional suspension of the effect of each of said springs for a graduated release of the tensioning of the thread.

4,694,766

METHOD AND APPARATUS FOR REGISTERING AND CLAMPING LARGE WORKPIECES

Francis A. Wickers, Beverly, and Max Raines, Salem, both of Mass., assignors to USM Corp., Flemington, N.J.

Filed Dec. 29, 1986, Ser. No. 947,015

Int. Cl.⁴ D05B *21/00*

U.S. Cl. 112—262.1 **12 Claims**

1. Apparatus for registering and clamping large pieces of work within a pallet that is to be attached to the movable carriage of an automatic sewing machine, said apparatus comprising:

means for registering and clamping a first flat piece of work within the pallet;

means for registering only the central portion of a second piece of work relative to the first flat piece of work;

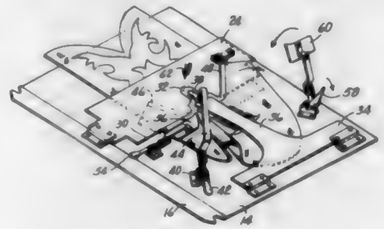
means for registering one side of the second piece of work relative to the first piece of work after folding the one side of the second piece of work;

means for clamping the one folded side of the second piece of work adjacent to the fold;

means for registering the other side of the second piece of work relative to the first piece of work by folding the other side of the second piece of work; and

means for clamping the other folded side of the second piece of work adjacent to the fold therein.

7. A method for registering and clamping large pieces of work within a flat pallet that is to be attached to the movable



carriage of an automatic sewing machine, said method comprising the steps of:

registering and clamping a first flat piece of work within the pallet;

registering only the central portion of a second piece of work relative to the registered and clamped first flat piece of work;

folding one side of the second piece of work so as to thereby register the folded side relative to the first piece of work;

clamping the one folded side of the second piece of work adjacent the fold;

folding the other side of the second piece of work so as to thereby register the other folded side relative to the first piece of work; and

clamping the other folded side of the second piece of work adjacent the fold therein.

4,694,767

DEVICE FOR TRANSFERRING A FABRIC STRIP FROM A DEPOSIT STATION

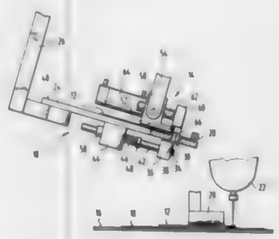
Alfons Beisler, Goldbach, Fed. Rep. of Germany, assignor to Beisler GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,744

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539551

Int. Cl.⁴ D05B *27/00*

U.S. Cl. 112—303 **11 Claims**



1. In a device for transferring a fabric strip from a deposit station to a support base including a transfer clamp for carrying the fabric strip from the deposit station to the support base, the improvement comprising:

a plate **24** having a major surface **40** onto which the fabric strip **12** is placed, an end of the plate **24** having a ledge **28** abutting one end of the fabric strip **12**, the plate **24** having an opening **30** therein spaced from the ledge **28**;

a folding bar **34** extending upwardly through the opening **30** to raise a portion of the fabric strip **12** above the surface **40**;

said transfer clamp **14** having a pair of opposing members **52** and **60** positioned on opposite sides of said folding bar when the transfer clamp is in a receiving position adjacent plate **24**; and

means for pivoting the transfer clamp about an axis **58** parallel to said members.

8. Apparatus for folding and transferring a fabric strip in a folded condition from a deposit station to another piece of fabric lying on a sewing machine table, said apparatus comprising:

a plate **24** having a major surface **40** on which the fabric strip initially rests, the plate **24** having a ledge **28** on an end thereof against which an edge of fabric strip **12** abuts, the plate **24** having an opening **30** therein spaced a given distance from the ledge **28**;

a folding bar **34** projecting through the opening **30** for raising the fabric strip **24** from the surface **40**; and

transfer clamp means **14** for grasping the raised fabric strip **12** and carrying the fabric to the sewing machine table in a folded condition.

4,694,768

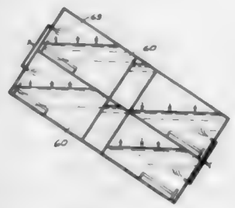
EMERGENCY AIR SYSTEM FOR PARTIALLY SUBMERGED VESSELS

Leonard Aloisio, P.O. Box 276, Patterson, La. 70392

Filed Dec. 23, 1985, Ser. No. 812,731

Int. Cl.⁴ B63J *2/04*

U.S. Cl. 114—71 **9 Claims**



1. A system for providing pressurized air to quarters within a ship in the event the ship capsizes or sinks, the system comprising:

a. a first quantity of breathable air contained under pressure on board ship;

b. a line extending between the first quantity of pressurized breathable air from a plurality of pressure tanks to the various rooms contained within the ship for supplying the breathable air thereinto upon a given impulse, a first portion of the tanks providing a high flow of air into the various rooms, and the second portion of tanks providing a metering of the pressurized air over a longer length of time;

c. sensing means, provided in the system, for sensing the position of the ship in the water, and upon the ship reaching a certain degree of listing, signaling the release of pressurized breathable air in the system;

d. valving means contained in the line for regulating the quantity of air being transported between the pressurized breathable air and the individuals rooms; and

e. means for allowing the high flow of air to be first transported to the various rooms and following the use of this quantity of air, subsequently allowing the metered breathable air to begin flowing to be transported into the various rooms.

4,694,769

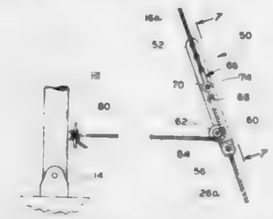
METHOD AND APPARATUS FOR STEPPING A SAILBOAT MAST

J. James Sowers, 3 Makanna Dr., Huntington, N.Y. 11743

Filed Jan. 9, 1987, Ser. No. 1,911

Int. Cl.⁴ B63B *15/02*

U.S. Cl. 114—90 **3 Claims**



1. Apparatus for connecting a mast stay of a sailboat to the hull to enable the holding erect and tensioning of the mast by a single individual comprising a clevis coupling attached at one end to said hull and having a pair of parallel legs, each provided with a plurality of mutually paired holes, a retaining pin adapted to enter into a selected one of said pairs of holes, a pulley located at the bight of said coupling adjacent the connecting web of the legs, and a pull cable entrained over said pulley adapted to be releasably attached at one end to said stay whereby said line may be pulled over said pulley to cause said stay to hold said mast erect whereby said retaining pin may be located through the end of said stay and a selected pair of said holes.

4,694,770

WATERCRAFT STABILIZING FLOTATION STRUCTURE

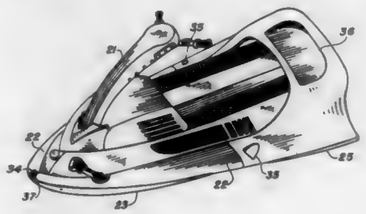
William M. Kitner, 3515 W. 118 Pl., Inglewood, Calif. 90303, and James B. Hart, 227 E. 52nd St., Long Beach, Calif. 90805

PCT No. PCT/US84/01221, § 371 Date May 10, 1985, § 102(e) Date May 10, 1985, PCT Pub. No. WO85/01486, PCT Pub. Date Apr. 11, 1985

PCT Filed Jul. 30, 1984, Ser. No. 740,850

Int. Cl.⁴ B63B *35/84*

U.S. Cl. 114—123 **20 Claims**



1. A watercraft stabilizing floatation structure attached to a self-propelled watercraft comprising:

(a) a forward hull having a front, rear, sides and a floatation chamber therein, said rear having a female recess,

(b) an aft hull having a front, rear, sides with a floatation chamber therein, said front having a raised male boss in alignment with said female recess and said rear having an integral seat connecting the sides in bridge fashion,

(c) side attaching means disposed upon each side of said forward and aft hull in such a manner as to compressibly couple them together when mating male boss and corresponding female recesses are aligned, and,

(d) a recessed channel integral with said hulls on a horizontal plane contiguous to and of a shape conforming to a outwardly extending separation rail on said watercraft for retention of said hulls on said sides, said hulls adapted to be retained to said watercraft along each side and front for increasing stability to said watercraft when stationary within the water by extending the lateral floatation surface.

4,694,771

MOORING DEVICE

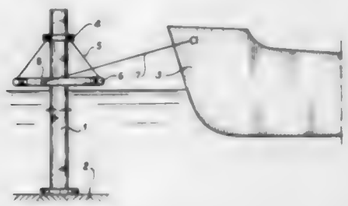
Leendert Poldervaart, La Turbie, and Jean C. M. Personnat, Nice, both of France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Dec. 20, 1985, Ser. No. 811,400

Claims priority, application Netherlands, Dec. 31, 1984, 8403978

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **9 Claims**



1. In a mooring device comprising a body (1) having a portion located at a distance above the bottom (2) of the body of water, which body is attached to said bottom (2) and has a support (4) which can rotate about a vertical axis and by means of downwardly extending elements (5) carries swingably about a horizontal axis a weight-loaded construction (6), which under the influence of its own weight has its center of gravity below its virtual point of suspension from the support (4), and a connecting member (7) between a vessel (3) and a point (8) of connection on said construction (6); the improvement in which said point (8) of connection on the construction (6) and the vessel (3) are located on opposite sides of a first imaginary vertical plane which includes the center of gravity of said construction (6) and is perpendicular to a second imaginary vertical plane which includes said center of gravity and bisects the vessel (3).

4,694,772

DIVER'S BUOYANCY COMPENSATOR BELT

Mark Faulconer, Costa Mesa, and Scott E. Greatrake, Fountain Valley, both of Calif., assignors to U.S.D. Corp, Santa Ana, Calif.

Filed Jun. 17, 1985, Ser. No. 745,492

Int. Cl.[4] B63C *9/24*

U.S. Cl. 114—315 **6 Claims**

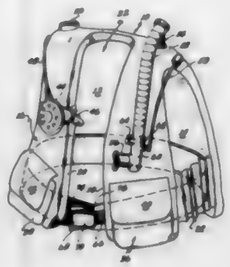
5. A buoyancy compensator belt for use with a buoyancy compensator comprising:

a belt for circumscribing a user's waist formed of an elastomeric material substantially similar to wetsuit material for a diver;

said belt having at the ends thereof a looped pile material on one end thereof and a multiplicity of hooks at the other end for being received on said looped pile material for detachably connecting the ends of said belt to each other in order to circumscribe a user's waist;

strap means connected to said belt;

a plurality of looped keepers connected to said buoyancy compensator for receiving said strap on said buoyancy compensator for connecting said belt to said buoyancy compensator;



means for connecting the ends of said strap means that interconnect said belt to said buoyancy compensator in the form of a buckle and handle means.

4,694,773

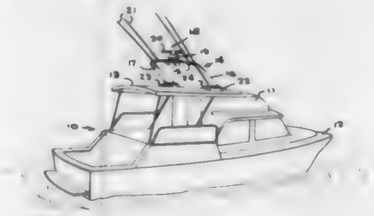
REMOTE CONTROL TILTING SYSTEM FOR RAISING AND LOWERING RADAR AND RADIO ARCH FOR BOATS

Laurie R. Sparkes, and Joseph G. Baker, both of Richmond, Va., assignors to JGB Industries, Inc., Richmond, Va.

Filed Mar. 7, 1986, Ser. No. 837,281

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 114—354 **15 Claims**



1. A tiltable upwardly extending supporting arch assembly for supporting a radar antenna above the roof of a cabin or control bridge superstructure of a boat comprising a unitary rigid arch member of inverted substantially U-shaped configuration including a generally horizontal top portion transversely spanning a major portion of the width of the roof and a pair of depending leg portions extending downwardly from opposite ends of the top portion having feet at their lower ends for attachment to mounting assemblies, a pair of tilting base mounting assemblies at the lower ends of said leg portions each having a box-like base housing component in the shape of an elongated box shaped housing to be fixed to the roof and having side members and a tiltalbe top plate member for attachment to the arch member feet pivotally coupled to said side walls of said box-shaped housing by a pivot pin for angular movement about the pivot pin from a first position disposing the arch member in a raised normal operating position to a second position disposing the arch member in a lowered position wherein the leg portions lie substantially parallel to confronting surface portions of the roof, powered actuator means contained in said box-shaped housing having a movable drive member coupled to said top plate member eccentrically of said pivot pin for drawing the top plate member and arch member attached thereto between said first and second position, and remote control means including a three-position toggle switch coupled to said actuator means to condition the actuator means at first and second position of said switch for movement of the top plae member of each mounting assembly to said first and second positions and to deactivate the actuator means at a third position of said switch.

4,694,774

SHAPE ADAPTABLE PROTECTIVE CUSHION DEVICE AND METHOD OF MAKING AND USING SAME

Howard W. Keithley, Jr., Adelphi, Md., assignor to Marie E. Keithley; Steven W. Keithley and Gwenn M. Kelly, all of Adelphi, Md., part interest to each

Filed Mar. 29, 1985, Ser. No. 717,793

Int. Cl.[4] B63B *17/00*

U.S. Cl. 114—361 **14 Claims**



1. A protective device for covers for boats comprising:

a base member;

said base member being made of material which is bendable and has a shaped form retention characteristic;

retaining means which can be shaped about a boat element to fasten the device thereto including laterally projecting arms connected to and made of the same material as said base member for retaining the shaped form after being bent about said boat element;

cushioning means permanently affixed to said base member; and

resilient friction retention means affixed to at least the tips of said projecting arms.

4,694,775

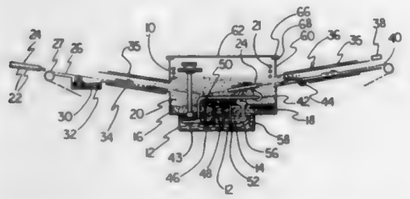
VAPOR PHASE PROCESSING MACHINE

Gerard G. Derrico, Maynard, Mass., assignor to Dynapert-HTC Corporation, Concord, Mass.

Filed Jun. 23, 1986, Ser. No. 877,577

Int. Cl.[4] B05C *15/00, 5/02*

U.S. Cl. 118—64 **3 Claims**



1. A vapor phase processing machine comprising

a tank open at its top for containing an electronic liquid,

means for vaporizing the electronic liquid to form a saturated vapor zone,

inlet and outlet throats communicating with the sides of said tank,

means for conveying product through said inlet throat into said tank and for conveying processed product from said tank through said outlet throat,

means for closing the top opening of said tank, including a lid assembly having universal joint means,

an arm hingedly secured to one side of said tank,

means for connecting said arm and said universal joint means so that said lid assembly can move universally relative to said arm, and

means for constraining said universal movement of said lid assembly relative to said arm to within selected limits.

4,694,776

STEP AND REPEAT APPARATUS

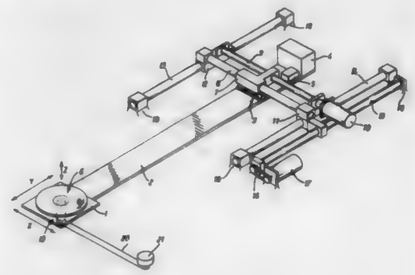
Rex H. Sandbach, Stockport, and Alan Poole, Macclesfield, both of United Kingdom, assignors to Co-Ordinate Technology Ltd., Lancaster, England

Filed Jun. 21, 1985, Ser. No. 747,662

Claims priority, application United Kingdom, Jun. 21, 1984, 8415912; May 20, 1985, 8512679

Int. Cl.[4] B05C *13/02*

U.S. Cl. 118—500 **2 Claims**



1. Step and repeat apparatus comprising a support for a workpiece and an arm, said support being attached by means of said arm to a movement control mechanism adapted to move said support in two dimensions, said arm having a pivot end and a movement end opposite said pivot end, said pivot end of said arm being secured to allow said arm to rotate about a horizontal pivotal axis at said pivot end, with said movement end of said arm secured to said movement control mechanism at a location remote from said support, said apparatus further comprising lifting means arranged to move the support about the pivot in a plane perpendicular to said two dimensions, said lifting means positioned substantially at said movement end of said arm.

4,694,777

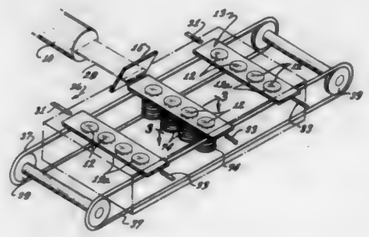
APPARATUS FOR, AND METHODS OF, DEPOSITING A SUBSTANCE ON A SUBSTRATE

Gregory A. Roche, 4287 Drybed Ct., Santa Clara, Calif. 95054

Filed Jul. 3, 1985, Ser. No. 751,682

Int. Cl.[4] B05D *3/06;* **C23C** *14/00*

U.S. Cl. 118—725 **38 Claims**



1. In combination for providing for the direction of a sub-

stance to a surface of a substrate to affect the surface of the substrate,

means for holding the substrate in a planar disposition,

means for directing a beam of substantially coherent light in a first direction substantially parallel to, and contiguous with, the substrate,

means for introducing to the substrate gases having properties of combining chemically to produce the substance when energized by the beam to provide for a direction of the substance to the substrate, and

means for reflecting the beam of substantially coherent light after movement of the beam past the substrate to obtain a movement of the beam of substantially coherent light in a second direction substantially parallel to, and contiguous with, the substrate.

4,694,778

CHEMICAL VAPOR DEPOSITION WAFER BOAT

Arthur J. Learn, Cupertino, and Dale R. DuBois, Los Gatos, both of Calif., assignors to Anicon, Inc., San Jose, Calif.

Continuation of Ser. No. 607,065, May 4, 1984, Pat. No. 4,582,020. This application Feb. 10, 1986, Ser. No. 828,625

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.⁴ C23C *16/44*; B05C *13/02*

U.S. Cl. 118—728 **11 Claims**



1. A chemical vapor deposition wafer boat means for supporting a plurality of wafers in an evenly spaced, upright orientation perpendicular to the axis of the boat, the boat comprising a cylinder having closed ends and comprised of mutually engaging upper and lower hemicylinders, the upper hemicylinder having diffusion zones with gas flow passageways therein in the ends and in zones within from 0° to 75° from a horizontal plane through the cylinder axis and from 0° to 15° from a vertical plane through the cylinder axis, the remainder of the hemicylinder wall being baffle areas without gas flow passageways, the ends and sidewall of the lower hemicylinder comprising gas diffusion zones, the gas flow passageways comprising from 0.5 to 80 percent of the surface area of the respective gas diffusion zones.

6. A chemical vapor deposition apparatus comprising a vapor deposition chamber having a gas inlet means positioned in the upper portion of the chamber for introducing gases into the chamber and a gas outlet means positioned in the lower portion of the chamber for removing gases from the chamber, a cylindrical wafer boat means positioned between the gas inlet means and the gas outlet means for supporting a plurality of wafers in an evenly spaced, upright orientation, the boat means comprising a cylinder having closed ends and comprised of mutually engaging upper and lower hemicylinders, the upper hemicylinders having diffusion zones with gas flow passageways therein in the ends and in zones within from 0° to 75° from a horizontal plane through the cylindrical axis and from 0° to 15° from a vertical plane through the cylinder axis, the remainder of the hemicylinder wall being baffle areas without gas flow passageways positioned between the gas inlet means and interior of the boat means, the ends and sidewall of the lower hemicylinder comprising a gas diffusion zones with gas flow passageways therein, the gas flow passageways comprising from 0.5 to 80 percent of the surface area of the respective gas diffusion zones.

4,694,779

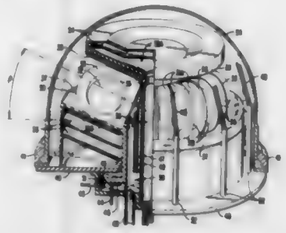
REACTOR APPARATUS FOR SEMICONDUCTOR WAFER PROCESSING

Martin L. Hammond, Cupertino, and Charles L. Ramiller, Santa Clara, both of Calif., assignors to Tetron, Inc., Fremont, Calif.

Filed Oct. 19, 1984, Ser. No. 662,879

Int. Cl.⁴ C23C *13/08*

U.S. Cl. 118—730 **24 Claims**



1. A chemical vapor deposition reactor comprising

a carrier having a plurality of cells arranged in a circle around a center, each cell having a pair of opposing flat surfaces with means for mounting substrates thereto, said surfaces oriented in two non-parallel planes intersecting in a line so as to form a first angle α with each other at said intersecting line, said intersecting line forming a second angle β with respect to the vertical;

a pair of gas flow directors, a first director located below said carrier and a second director located above said carrier to maintain any gas flow through said carrier;

an inlet means for introducing gas around the periphery of said carrier; and

an exhaust means for removing gas from said center of said plurality of carrier cells;

whereby gas flows through each cell in a direction substantially perpendicular to said intersecting line.

4,694,780

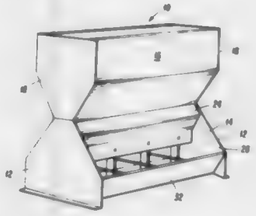
ANIMAL ACTUATED FEEDER

Dale H. Keuter, 1026 Sherman Ave., and Karl A. Keuter, R. R. #1, P.O. Box 257B, both of Manchester, Iowa 52057

Filed Feb. 14, 1986, Ser. No. 829,207

Int. Cl.⁴ A01K *1/10*

U.S. Cl. 119—53.5 **6 Claims**



2. An animal-actuated feeder comprising means defining a feeder area accessible to the animal; feed storage means having a feed discharge opening disposed over the feeding area; feed dispensing means located between the feeding area and the feed storage means to receive feed from the storage means and dispense the feed into the feeding area; the feed dispensing means including a cradle positioned beneath the discharge opening of the feed storage means to normally prevent the gravity-flow of feed from the storage means into the feeding area, the cradle being pivotally mounted on a horizontal axis for limited pivotal movement; the feed dispensing means also including a wiper positioned inside of the cradle in a fixed position so as to move the feed out of the cradle as the cradle pivots; a member extending within the feeding area so as to be moveable by an animal to produce pivotal movement of the cradle whenever the member is moved by an animal; and actuating means operatively connecting the cradle with the animal-actuated member.

4,694,781

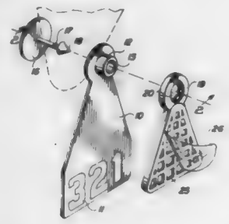
CONTAINER FOR ATTACHMENT TO ANIMAL EAR TAGS

Steve R. Howe, 27 University Dr., Longmont, Colo. 80501; William B. Warner, 2338 W. Rockwell Ct., Chandler, Ariz. 85224, and J. Wallace Shores, 10202 N. 51st Dr., Glendale, Ariz. 85302

Filed Nov. 29, 1985, Ser. No. 802,961

Int. Cl.⁴ G09F *3/00*; A01K *13/00*

U.S. Cl. 119—156 **12 Claims**



1. For use with an animal ear identification tag having at least two parts comprising a backing portion with an elongated spike for passing through the ear of the animal and a tag portion with a hollow hoss for receiving and holding said spike after passage of the same through the ear of the animal, a container including in combination:

attachment means made of frangible material for press fit frictional engagement with the boss of said tag portion to permit relatively easy placement over said boss whereby said attachment means is secured to said boss and said attachment means being structured to break upon removal from said boss; and

hollow housing means coupled to said attachment means.

4,694,782

PROCESS AND APPARATUS FOR PRODUCING HIGH-PRESSURE AND SUPERHEATED STEAM

Ulrich Premel; Rolf Dorling, and Manfred Schultze, all of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,497

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447265

Int. Cl.⁴ F22D *1/00*

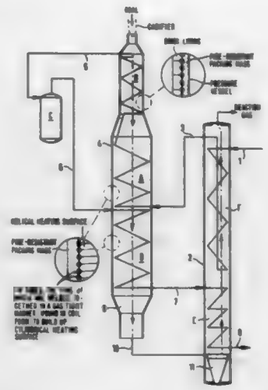
U.S. Cl. 122—7 R **42 Claims**

1. A process for producing high-pressure and superheated steam by means of hot reaction gas from a gas generator in which coal or carbon-containing materials are gasified; said process includes the steps of:

producing said high-pressure, superheated steam in said gas generator and in a waste heat system;

said producing step comprises producing said steam in at least two successive stages, including, in a first stage, producing said steam in a radiation vaporizer, and in a subsequent second stage, conveying said steam through a radiation superheater;

providing a further superheating stage, in the form of an end stage, at the outlet side of said radiation superheater in said gas generator; and



providing a convection superheater as said further superheating stage, and disposing said convection superheater in a vessel separate from said gas generator.

4,694,783

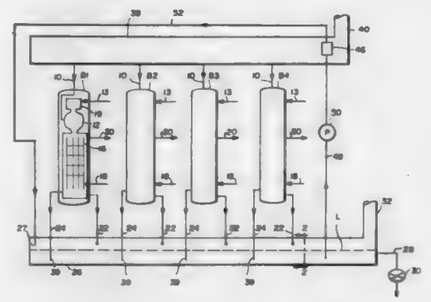
MULTIPLE BOILER HEATING SYSTEM WITH IMPROVED VENTING AND HEAT RECLAMATION

Clarence W. Cleer, Jr., 98 Fraley St., Kane, Pa. 16735-9524

Filed Jan. 9, 1987, Ser. No. 1,747

Int. Cl.⁴ F22B *37/42*; F22D *5/00*

U.S. Cl. 122—448 B **12 Claims**



1. A heating system comprising:

a plurality of boilers of the condensing type each having a combustion chamber, an air inlet for providing air into said combustion chamber, a heat exchanger having a fluid inlet and a fluid outlet and disposed in heat exchange relation with hot combustion gases flowing from said combustion chamber, and an exhaust gas outlet;

means for reclaiming heat from the exhaust gases comprising a first manifold common to said boilers, means for directing the hot exhaust gases and condensate from each boiler into said first manifold wherein the exhaust gases and condensate are placed in heat exchange relation, a second manifold for receiving air external to said heating system, said air inlet for each said boiler lying in communication with said second manifold for flowing air into the corresponding combustion chamber, a heat exchanger in said second manifold, means for flowing heated condensate from said first manifold to said heat exchanger in said second manifold for placing the condensate in heat ex-

change relation with the inlet air, thereby preheating the air flowing into the combustion chambers of the boilers; and

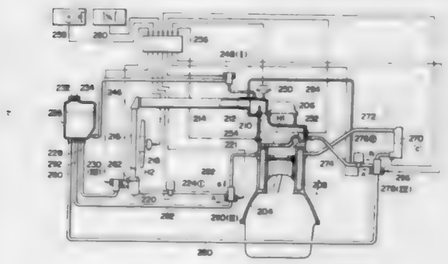
means for recirculating the condensate from said heat exchanger in said second manifold to said first manifold.

4,694,784

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

Yoshinori Hirano, Yokohama, and Takao Kubozuka, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1986, Ser. No. 849,115
Claims priority, application Japan, Apr. 24, 1985, 60-88266
Int. Cl.⁴ F01P *3/22*
U.S. Cl. 123—41.12 **22 Claims**



1. In an internal combustion engine having a structure subject to high heat flux;

a cooling system for removing heat from said engine comprising:

a cooling circuit including:

a coolant jacket disposed about said structure and into which coolant is introduced in liquid form, permitted to boil and discharged in gaseous form;

a temperature sensor disposed in said coolant jacket for sensing the temperature of the coolant therein;

a radiator in fluid communication with said coolant jacket and in which coolant vapor produced in said coolant jacket is condensed to its liquid form, said radiator having heat exchanging surfaces exposed to a cooling medium;

means for returning liquid coolant from said radiator to said coolant jacket in a manner which maintains the level of coolant in said coolant jacket at a first predetermined level, said first predetermined level being selected to immerse said structure in a predetermined depth of liquid coolant;

a first level sensor disposed in said radiator for sensing the level of liquid coolant being above a second predetermined level;

a device for varying the amount of cooling medium which flows over the heat exchanging surfaces of said radiator;

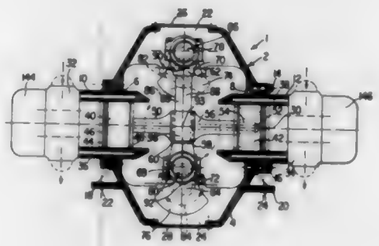
a control circuit responsive to said temperature sensor and said first level sensor, said control circuit being arranged to energize said device (a) at a first level in response to said temperature sensor indicating that the temperature of the coolant in said coolant jacket is above a desired target value and said level sensor indicating that the level of coolant in said radiator is above said second predetermined level and (b) at a second level in response to said temperature sensor indicating that the temperature of the coolant in said coolant jacket is above a desired target value and the said level sensor indicating that the level of coolant in said radiator is below said second predetermined level.

4,694,785

PISTON APPARATUS

Tom Timmerman, 207-145 West 18th Street, North Vancouver, British Columbia, Canada V7L 2V6, and Norman V. Chapman, 20481-92A Avenue, Langley, Canada V1M 1B7

Filed Jan. 23, 1986, Ser. No. 821,823
Int. Cl.⁴ F02B *75/32*
U.S. Cl. 123—52 A **6 Claims**



1. A piston apparatus comprising:

(a) a first pair of spaced-apart cylinders aligned along a cylinder axis;

(b) a pair of pistons, each piston being slidably received in one of the cylinders for reciprocation along the axis;

(c) a pair of spaced-apart crank members on opposite sides of the cylinder axis, the crank members having parallel axes of rotation;

(d) a first gear wheel, a second gear wheel and a third gear wheel, the first and second gear wheels being operatively connected to the crank members, the third gear wheel meshing with and being located between the first and second gear wheels, the third gear wheel being rotatable about an axis midway between the axes of rotation of the crank members and parallel thereto, the gear wheels being adapted to couple the crank members together for rotation at the same rotational speed and in the same direction;

(e) a crank connecting member having a longitudinal axis which is perpendicular to the cylinder axis and having opposite ends, each said end only being rotatably connected to one of the crank members a distance from the axis of rotation thereof, the crank connecting member being connected at a distance equal at each end from the axis of rotation of the crank member connected thereto, the longitudinal axis of the crank connecting member and the cylinder axis extending along a common plane, the axes of rotation of the crank members being perpendicular to the plane; and

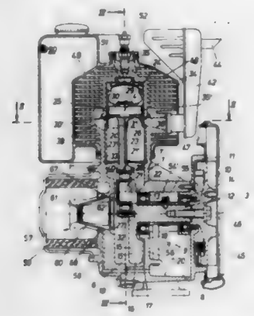
(f) a piston connecting member interconnecting the pair of pistons and having an aperture extending therethrough in a direction perpendicular to the cylinder axis, the crank connecting member being slidably received in the aperture to permit relative movement between the piston connecting member and the crank connecting member along the longitudinal axis of the crank connecting member, the piston connecting member and the crank connecting member being carried together for movement parallel to the cylinder axis.

4,694,786

ONE-CYLINDER, TWO-STROKE INTERNAL COMBUSTION ENGINE WITH CRANKCASE SCAVENGING

Andreas Bilek, and Peter Wünsche, both of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H., Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Jun. 27, 1986, Ser. No. 879,309
Claims priority, application Austria, Jul. 25, 1985, 2215/85
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—73 AD **10 Claims**



1. A crankcase-scavenging internal combustion engine which comprises

a crankcase which defines an opening for a mixture of air and lubricant,

a crankshaft rotatably mounted in said crankcase,

a lubricant reservoir containing lubricant,

a part positioned over said opening of said crankcase for providing a mixture of air and lubricant thereto when a vacuum is created in said crankcase, said part including a bottom end having a cross-rib, a side wall and a top end and defining a chamber therein which has a first diameter adjacent said bottom end and an increasing diameter between said bottom end and said top end, said part also defining a nozzle located in said cross-rib and communicating with said chamber, at least one lubricant feed line extending in said side wall and in said cross-rib to communicate with said nozzle, and air intake openings at said bottom end, and

a lubricant supply line extending from said lubricant reservoir to said part to supply lubricant to each lubricant feed line in said part.

4,694,787

AUTOMATIC FLUID DISTRIBUTING VALVE TIMING DEVICE

Gary E. Rhoads, 8565 Boulder Dr., La Mesa, Calif. 92041

Filed Feb. 27, 1984, Ser. No. 583,998
Int. Cl.⁴ F01L *9/02*
U.S. Cl. 123—90.13 **11 Claims**

1. In an internal combustion engine having a plurality of combustion chambers each of which has an intake valve and an exhaust valve, the invention comprising:

a fluid reservoir;

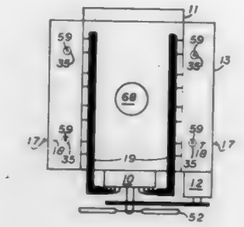
a high pressure fluid pump connected to said fluid reservoir;

a high pressure fluid distributor assembly connected to said high pressure fluid pump, said distributor assembly having a rotor fixedly mounted on a shaft so that they rotate as one, said rotor being in the form of a disc having a front face and a rear face, said rotor having a radially extending fluid passage within its interior, said fluid passage having an inner end and an outer end, means connecting said inner end to said high pressure fluid pump;

said rotor having at least a first outlet port on its front face that is in communication with the fluid passage within said rotor;

each of the valves of the engine having an actuation unit connected to the top of said valve for opening said valve at a predetermined time;

manifold means periodically connecting said fluid passage to each of said individual actuation units in a predetermined sequence, said manifold means having at least a primary



annular shaped disc that is positioned flush against the front face of said rotor, said primary disc having a predetermined number of aperatures spaced circumferentially about a radius on said primary disc equal to that of the radius of said first outlet port, said individual apertures each being connected to its own separate valve actuation unit; and

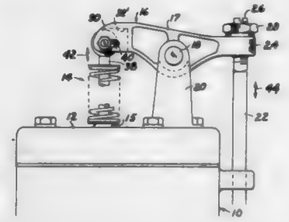
means for rotating said rotor.

4,694,788

INTERNAL COMBUSTION ENGINE ROCKER ARM

John A. Craig, P.O. Box 5772, Enid, Okla. 73702

Filed Mar. 28, 1986, Ser. No. 845,308
Int. Cl.⁴ F01L *1/18*
U.S. Cl. 123—90.16 **3 Claims**



1. In an internal combustion engine cylinder head exhaust valve operating elongated rocker arm having a friction reducing valve stem end contacting roller journalled by a bolt extending through a transverse bore in one end portion of the rocker arm normal to the axis of the valve stem, the improvement comprising:

means for adjusting the position of the roller longitudinally of the rocker arm and relative to the axis of the exhaust valve stem.

4,694,789

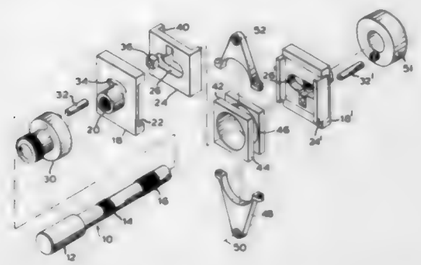
VARIABLE VALVE TIMING

Derek Frost, Leigh-On-Sea, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1985, Ser. No. 796,661
Claims priority, application United Kingdom, Nov. 9, 1984, 8428430
Int. Cl.⁴ F01L *1/34;* **F16F** *15/26*
U.S. Cl. 123—90.17 **6 Claims**

1. A drive mechanism for connecting an input shaft to an

output shaft for rotation at the same speed while superimposing on the output shaft a variable oscillatory motion determined by the position of a reaction member, the drive mechanism comprising means fast in rotation with one of the input and output shafts defining a slideway transverse to the axis of said one of the shafts, a sliding member slidable along said driveway, means for sliding the sliding member along the slideway in synchronism with the rotation of the input shaft,



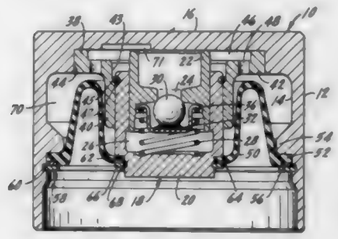
the amplitude of the sliding movement varing as a function of the position of the reaction member, the oscillation of the sliding member being symmetrical about a central position, and a crank pin fixed to the other of said input and output shafts and connected slidably to the said sliding member whereby as the sliding member slides along the slideway, the phase of the output shaft is varied with respect to the phase of the input shaft.

4,694,790

INVERTED BUCKET TAPPET WITH COLLAPSING DIAPHRAGM SEAL

Steven J. Kowal, Prospect Heights, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 730,195, May 3, 1985, Pat. No. 4,624,225. This application Aug. 25, 1986, Ser. No. 900,169
Int. Cl.[4] F01L *1/24*
U.S. Cl. 123—90.58 **6 Claims**



1. A self-contained lash adjuster including a generally cylindrical cup-shaped follower having a closed end, a lash adjuster cartridge assembly, a spacer mounting said cartridge assembly within said follower,

said cartridge assembly including a reciprocally movable body and a plunger within said body, a high pressure chamber defined between said plunger and body, a plunger passage opening into said high pressure chamber, a check valve controlling flow through said plunger passage,

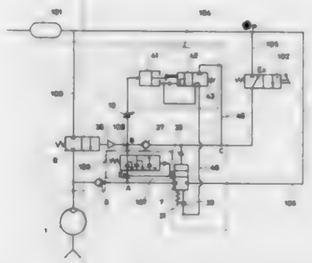
and a diaphragm-type seal attached at its outer periphery to an interior wall of said follower and attached at its inner periphery to the movable body, said seal cooperating with the interior wall of said follower and said body to define a fluid reservoir, said spacer being positioned within said reservoir and having openings therein to connect said reservoir with the plunger passage.

4,694,791

STARTING DEVICE WITH AIR MOTOR FOR INTERNAL COMBUSTION ENGINES

Masami Tanaka, Osaka, Japan, assignor to Showa Precision Machinery Co., Ltd., Amagasaki, Japan

Filed Mar. 25, 1986, Ser. No. 845,760
Claims priority, application Japan, Nov. 15, 1985, 60-257139
Int. Cl.[4] F02N *7/08*
U.S. Cl. 123—179 F **4 Claims**



1. In a pneumatically operated starter for internal combustion engines comprising a pneumatic motor, a driving shaft operatively connected to said pneumatic motor, said driving shaft having at one end a pinion or spline and being movable axially for selectively engaging and disengaging said pinion or spline with gear means of the engine to be started, air piston means for moving axially said driving shaft, main valve means positioned in a main passage of compressed air for controlling flow of compressed air from a supply thereof into said pneumatic motor, sub-valve means positioned in a sub-passage of compressed air communicating with said main passage for controlling flow of compressed air from said main passage into said air piston means, said main valve means and said sub-valve means being actuatable pneumatically by means of their respective air pistons and biassed normally into their closed positions, a first passage branched from said main passage for introducing compressed air to one side of said sub-valve air piston to open said sub-valve, said first passage including a start command valve therein, the improvement comprising, in combination:

a second passage of compressed air for establishing flow communication between said sub-passage and said air piston means in response to the opening of said sub-valve means to advance said driving shaft into the engagement with said engine gear by said pinion or spline, and at the same time for diverting part flow of compressed air to drive said pneumatic motor at low speed;

a third passage of compressed air for establishing flow communication between said air piston means and said main valve air piston in response to the advancement of said air piston means to actuate said main valve air piston to open the main valve for driving said pneumatic motor;

a fourth passage of compressed air for establishing flow communication between said first passage and the other side of said sub-valve air piston opposite to said one side to close said sub-valve means;

third valve means associated with said fourth passage for normally closing the fourth passage, said third valve means having associated therewith an air piston; and

a fifth passage of compressed air for establishing flow communication between said third passage and said third valve air piston to open said third valve means with some time delay relative to the opening of said main valve so that compressed air is introduced to said opposite side of said sub-valve air piston whereby said sub-valve means are

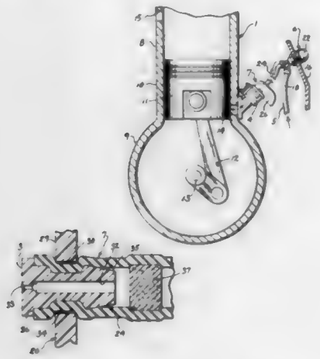
placed in closed position while said start command valve remains open.

4,694,792

WET PRIMING MECHANISM FOR AN INTERNAL COMBUSTION ENGINE

Arvo F. Uuskallio, Hartland, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed May 3, 1985, Ser. No. 729,913
Int. Cl.[4] F02M *1/16*
U.S. Cl. 123—187.5 R **2 Claims**



1. A wet priming mechanism for an internal combustion engine, comprising an engine block defining a combustion chamber and having an opening therein communicating with said chamber, a fuel tank to contain a liquid fuel, a main fuel line connecting the fuel tank with the combustion chamber for supplying fuel to the chamber, a priming conduit providing a connection between said fuel tank and said chamber and having an inlet end communicating with said fuel tank and a discharge end communicating with said chamber, manual pumping means disposed in said priming conduit for pumping fuel in a direction toward said discharge end, said restrictor means comprising a housing having an opening, an adaptor containing said orifice, said priming conduit including a flexible resilient tube disposed around said adaptor, said adaptor having a central waist portion of reduced cross sectional area, said waist portion being in registry with said opening, the diameter of said opening being less than the combined external diameter of said tube and the portion of the adaptor located on either side of said waist portion, said tube being sufficiently resilient to enable said waist portion to be press fitted into registry with said opening.

4,694,793

ENGINE LUBRICANT TYPE AND CONDITION MONITORING SYSTEM

Tsunehiro Kawakita, Yokosuka, and Minoru Imajo, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 12, 1986, Ser. No. 929,373
Claims priority, application Japan, Nov. 15, 1985, 60-255109
Int. Cl.[4] F01M *1/00*
U.S. Cl. 123—196 S **9 Claims**

1. In an engine having a lubricating system, a lubricant monitoring system comprising:

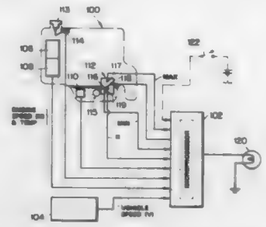
a first sensor for sensing the type of oil contained in the lubricating system;

a second sensor for sensing the level of oil in the lubricating system;

a third sensor for sensing a first system operation parameter which varies with the rate of degradation of the oil in the lubricating system;

control means responsive to said first, second and third sensors for:

(a) determining when an oil change is required;



(b) determining when the oil is drained from the system;

(c) determining the type of oil which is introduced following the draining; and

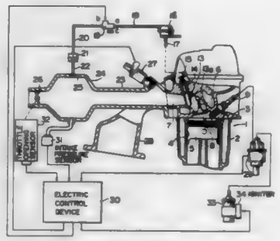
(d) setting values which are used to determine when an oil change is required.

4,694,794

METHOD AND DEVICE FOR CONTROL OF INTERNAL COMBUSTION ENGINE VARIABLE SWIRL AIR FUEL INTAKE SYSTEM WITH DIRECT HELICAL INTAKE PASSAGE

Kenji Kato; Soichi Matsushita, and Kiyoshi Nakanishi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 681,681, Dec. 14, 1984, abandoned. This application May 16, 1986, Ser. No. 865,655
Claims priority, application Japan, Aug. 20, 1984, 59-173008
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—306 **1 Claim**



1. For an air-fuel mixture intake system, incorporated in an internal combustion engine having a cylinder head which defines a combustion chamber, comprising an intake port, a downstream end of which opens to said combustion chamber and which includes a helical passage which extends helically around and toward said downstream end and straight passage which extends substantially straight toward said downstream end, and an intake passage switchover control valve which is convertible between a first position wherein the proportion of intake flow which passes through said straight passage relative to intake flow which passes through said helical passage is minimized, and a second position wherein said proportion is maximized,

a control device comprising:

a valve drive system including diaphragm means adapted to be actuated by intake vacuum present in an intake manifold of the engine so as to drive said intake passage switchover control valve to said first position when supplied with a certain determinate or greater level of

intake vacuum and to drive said intake passage switch-over control valve to said second position when supplied with atmospheric pressure, a vacuum switching valve for selectively either connecting said diaphragm means to said intake manifold or releasing said diaphragm means to the atmosphere, and a one way valve provided between said vacuum switching valve and said intake manifold so as to hold vacuum on one side thereof toward said diaphragm means;

first means for detecting throttle opening;

second means for detecting vacuum level present in the intake manifold of the engine;

third means for, when said throttle opening detected by said first means increases from below a certain determinate opening value to or above said certain determinate opening value, issuing a first command for said valve drive system to switchover said vacuum switching valve so as to release said diaphragm means to the atmosphere; and

fourth means for, when said vacuum level present in the intake manifold of the engine detected by said second means rises from below said certain determinate vacuum level to or above said certain determinate vacuum level, issuing a second command for said valve drive system to switchover said vacuum switching valve so as to connect said diaphragm means to the intake manifold of the engine; and

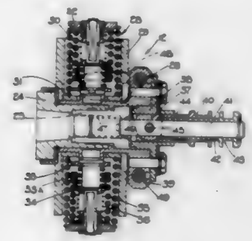
further comprising an electronic control routine system which includes means for detecting first and second values of a flag, a first subrouting system which operates said third means for issuing said first command as long as said flag has said first value, and a second subroutine system which operates said fourth means for issuing said second command as long as said flag has said second value, said third means setting said flag to said second value upon issuance of said first command, and said fourth means setting said flag to said first value upon issuance of said second command.

4,694,795

GOVERNOR MECHANISM

Domingo C. Pruneda, Barcelona, Spain, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Feb. 3, 1986, Ser. No. 825,654
Claims priority, application Spain, Feb. 6, 1985, 540.158
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—373 **8 Claims**



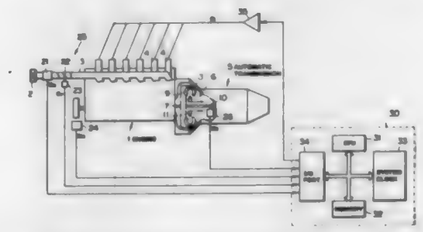
1. A governor mechanism for attachment to a fuel injection pump for an internal combustion engine, the governor mechanism being of the two speed type and comprising a centrifugal weight mechanism, a pivotal lever coupled to the weight mechanism and to an output member which in use is connected to a fuel control rod of the pump, the mechanism including a manually operable member connected to an adjustable pivot for the lever, and the governor mechanism including resilient means opposing movement of the centrifugal weight mechanism, the arrangement being such that the governor mechanism will control the idling speed and the maximum speed of the associated engine, the rate of fuel supply intermediate these speeds being controlled by the position of said manually operable member, the mechanism further including a maximum fuel stop to limit the maximum rate at which fuel can be supplied to the associated engine, said weight mechanism including a further output member which moves in accordance with the speed at which the mechanism is driven, a fluid pressure operable servo responsive to the movement of said further output member, a cam the position of which is varied by said servo and a lever mechanism including a follower engaging said cam, said lever mechanism acting to determine the setting of said maximum fuel stop, wherein the servo includes a piston coupled to said cam, and a servo valve member slidable within said piston for controlling the application of fluid under pressure to said piston, said piston and said valve member forming a follow up servo mechanism.

4,694,796

SYSTEM AND METHOD FOR CONTROLLING FUEL SUPPLY TO A VEHICULAR INTERNAL COMBUSTION ENGINE WITH FUEL SUPPLY CUTOFF FUNCTION

Yasushi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 8, 1986, Ser. No. 861,008
Claims priority, application Japan, May 10, 1985, 60-99268
Int. Cl.⁴ F02D *41/12*
U.S. Cl. 123—325 **19 Claims**



1. A system for a vehicular internal combustion engine, comprising:

(a) first means for detecting whether the engine has entered a predetermined deceleration state;

(b) second means for measuring a magnitude of the engine deceleration when the engine has entered the predetermined deceleration state;

(c) third means for varying a first predetermined threshold value defining a cutoff zone of fuel supplied to the engine and at which the cutoff of fuel supply to the engine is initiated so as to provide an optimum range of the cutoff zone according to the measured magnitude of engine deceleration; and

(d) fourth means for learning the variation of the first predetermined threshold value and storing the first predetermined threshold value varied in said third means, the learned and stored first predetermined threshold value thereby being used as the first predetermined threshold value in said third means.

16. A method for a vehicular internal combustion engine, comprising the steps of:

(a) detecting whether the engine has entered a predetermined deceleration state;

(b) measuring a magnitude of the engine deceleration when detecting that the engine has entered the predetermined deceleration state in said step (a);

(c) varying a first predetermined threshold value defining a cutoff zone of fuel supplied to the engine and at which the cutoff of fuel supply to the engine is initiated so as to provide an optimum range of the cutoff zone according to the measured magnitude of engine deceleration in said step (b); and

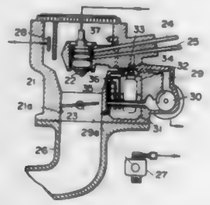
(d) learning the variation of the first predetermined threshold value and storing the first predetermined threshold value varied in said step (c), the learned and stored first predetermined threshold value being used as the first predetermined threshold value in said step (c).

4,694,797

FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kyugo Hamai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Oct. 22, 1986, Ser. No. 921,769
Claims priority, application Japan, Oct. 23, 1985, 60-235427
Int. Cl.⁴ F02M *3/07, 3/12*
U.S. Cl. 123—339 **7 Claims**



1. A fuel supply system for an internal combustion engine, comprising:

a throttle body having a throttle bore;

a throttle valve disposed in said throttle bore;

a fuel injector disposed upstream of said throttle valve for injection of fuel into said throttle bore;

auxiliary air passage means formed in said throttle body for providing communication between portions of said throttle bore upstream and downstream of said throttle valve;

an idle speed control valve disposed in said auxiliary air passage means for controlling the flow rate of auxiliary air passing therethrough and thereby achieving a predetermined idle speed;

fuel storage chamber means formed in said throttle body for storing therewithin a predetermined quantity of fuel; and

idle fuel pickup passage means having an end projecting into the fuel within said fuel storage chamber means and the other end communicated with said auxiliary air passage means for drawing fuel thereinto from said fuel storage chamber means and supplying it into said auxiliary air passage means.

4,694,798

AUTOMOTIVE ENGINE IDLING SPEED CONTROL SYSTEM WITH VARIABLE IDLING SPEED DEPENDING UPON COOLING AIR TEMPERATURE IN AUTOMOTIVE AIR CONDITIONING SYSTEM

Masaki Kato, Tokyo, and Tsutomu Yamazaki, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 12, 1986, Ser. No. 838,817
Claims priority, application Japan, Mar. 15, 1985, 60-50610
Int. Cl.⁴ F02M *3/00;* **B60H** *1/32*
U.S. Cl. 123—339 **7 Claims**

1. An idling speed control system for an automotive internal combustion engine associated with an air conditioning system, comprising:

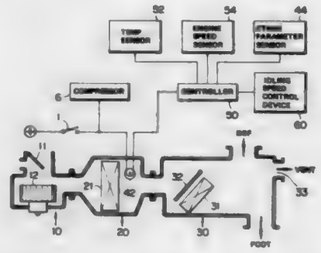
a cool air source in said air conditioning system, said cool air source being driven by said internal combustion engine for producing cool output air;

an engine idling control means including an electrically operated actuator for adjusting an idling speed of the engine;

a first sensor monitoring a basic engine idling control parameter and producing a first sensor signal indicative of the basic engine idling control parameter;

a second sensor associated with said cool air source in said air conditioning system for monitoring the output air temperature of said cool air source and producing a second sensor signal indicative of the air cool source output temperature; and

a controller deriving a basic engine idling speed based on said first sensor signal and deriving a basic control signal indicative of the basic engine idling speed, and said controller being responsive to an air conditioning mode selector for deriving a correction value for said basic engine



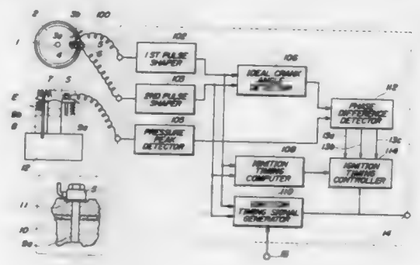
idling speed based on said second sensor signal when air conditioning is selected on said air conditioning mode selector so as to adjust said output air temperature to a given value, which correction value varies with said second sensor signal value from a maximum value when air conditioning is initially selected on said mode selector through a decreasing range to a lower final value as said output air temperature of said cool air source decreases, and modifying said basic control signal by said correction value to derive a modified control signal for controlling said actuator so as to adjust the engine idling speed to a speed corresponding to the basic idling speed modified by said correction value.

4,694,799

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Shizuo Yagi, Asaka; Yoshiaki Hirosawa, Shiki; Makoto Kawai, Tokorozawa, and Isao Fujii, Hasuda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,750
Claims priority, application Japan, Oct. 16, 1984, 59-215204
Int. Cl.⁴ F02P *5/14, 41/22*
U.S. Cl. 123—425 **5 Claims**



1. An ignition timing control system for an internal combustion engine having a crankshaft, at least one cylinder, and a starter, said system comprising:

crank angle detecting means for producing a first pulse signal indicative of a reference crank angle position of the

crankshaft and a second pulse signal indicative of a crank angle position that changes constantly with rotation of the crankshaft;

ideal crank angle detecting means receiving the first and second pulse signals from said crank angle detecting means for producing an output signal indicative of an ideal crank angle position at which pressure internal of the cylinder of the engine attains a peak value;

pressure sensing means for sensing the peak value of pressure internal of the cylinder which exceeds a predetermined value and for producing an output signal indicative of the sensed peak value of pressure;

phase difference detecting means receiving the output signals from said ideal crank angle detecting means and from said pressure sensing means for detecting a phase difference between said output signals and for producing an output signal indicative of the detected phase difference;

first ignition timing control means receiving the output signal from said phase difference detecting means for producing an output signal indicative of optimum ignition timing which is in accordance with the detected phase difference; and

second ignition timing control means receiving the first and second pulse signals from said crank angle detecting means and an input signal from the starter of the engine for controlling ignition timing to a fixed value only for a period of time during which said input signal indicates actuation of the starter.

4,694,800

SYSTEM AND METHOD FOR CONTROLLING IGNITION TIMING FOR AN INTERNAL COMBUSTION ENGINE

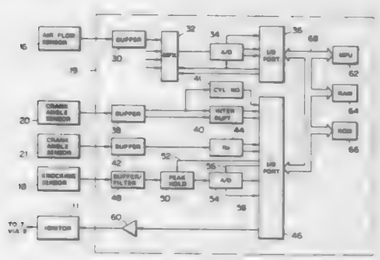
Tatsuo Morita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 22, 1986, Ser. No. 921,490

Claims priority, application Japan, Oct. 22, 1985, 60-235815

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—425 **11 Claims**



1. a system for controlling ignition timing for a vehicular internal combustion engine, comprising:

(a) first means for detecting an engine operating condition;

(b) second means for calculating a change rate of an engine revolution speed on the basis of the engine operating condition detected by the first means;

(c) third means for determining whether the engine operating condition is trnasferred to an engine load region such that an occurance of engine knocking can be predicted on the basis of the change rate of the engine revolution speed calculated by the second means;

(d) fourth means for deriving a basic ignition timing angle on the basis of the engine operating condition detected by the first means;

(e) fifth means for setting a first correction coefficient on the basis of which the basic ignition timing angle derived by the fourth means is corrected when the third means determines that the engine operating condition is transferred to the engine load region;

(f) sixth means for detecting whether a knocking is generated in the engine;

(g) seventh means for calculating an ignition timing angle correction amount for correcting the basic ignition timing angle drived by the fourth means on the basis of the first correction coefficient set by the fifth means when the sixth means detects the engine knocking so that the ignition timing is immediately corrected toward a retardation angle side;

(h) eighth means for correcting the basic ignition timing angle derived by the fourth means according to the ignition timing angle correction amount calculated by the seventh means; and

(i) ninth means for igniting air-fuel mixture supplied to each engine cylinder at an ignition timing angle corrected by the eighth means.

11. A method for controlling ignition timing for a vehicular internal combustion engine, comprising the steps of:

(a) detecting an engine operating condition;

(b) calculating a change rate of an engine revolution speed on the basis of the engine operating condition detected in the step (a);

(c) determining whether the engine operating conditon is transferred to an engine load region such that the occurence of engine knocking can be predicted on the basis of the change rate of the engine revolution speed calculated in the step (b);

(d) deriving a basic ignition timing angle on the basis of the engine operating conditon detected in the step (a);

(e) setting a correction coefficient on the basis of which the basic ignition timing angle derived in the step (d) is corrected when determining that the engine operating condition is transferred to the engine load region;

(f) detecting whether a knocking is generated in the engine;

(g) calculating an ignition timing angle correction amount for correcting the basic ignition timing angle derived in the step (d) on the basis of the correction coefficient;

(h) correcting the basic timing angle derived in the step (d) according to the ignition timing angle correction amount calculated in the step (g); and

(i) igniting air-fuel mixture supplied to each engine cylinder at an ignition timing corrected in the step (h).

4,694,801

SYSTEM FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Masaaki Nagai, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,431

Claims priority, application Japan, Dec. 28, 1984, 59-280552

Int. Cl.⁴ F02P *5/14*

U.S. Cl. 123—425 **7 Claims**

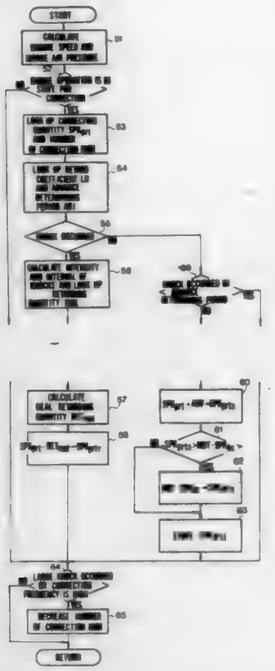
2. A system for controlling the ignition timing of an internal combustion engine having a microprocessor and an ignition timing control device comprising:

sensing means for sensing operating conditions of the engine and for producing an engine operating condition signal;

a knock sensor for sensing engine knock and for producing a knock signal;

first means responsive to the engine operating condition signal and knock signal for producing an ignition timing correcting signal representing an ignition timing correcting quantity at a time for deciding the ignition timing;

second means for detecting frequency of ignition timing correction higher than a predetermined value and producing a correction signal; and



third means responsive to the correction signal for increasing the ignition timing correcting quantity.

4,694,802

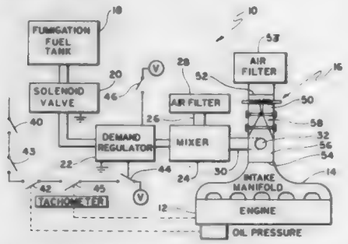
COMPRESSION IGNITION ENGINE FUMIGATION SYSTEM

Alvin Lowi, Jr., 2146 Toscanini Dr., San Pedro, Calif. 90732

Filed Sep. 21, 1984, Ser. No. 652,937

Int. Cl.⁴ F22B *37/18, 9/08;* **F22D** *1/00*

U.S. Cl. 123—431 **23 Claims**



1. A variable area venturi apparatus for variably metering a constant proportion fumigation fuel/air mixture into a main air flow supplied to a compression ignition engine having an intake manifold, comprising:

a housing defining an inner surface and having an air intake port, an output port for being coupled to the intake manifold, a main passageway between the air intake port and the output port through which the main air flow to the engine occurs, and a branch port coupled for enabling the constant proportion fumigation fuel/air mixture to be drawn into the main passageway to be variably mixed with the main air flow;

a variable restrictor means in the main passageway defining a variable area throat, the restrictor mean variably opening and closing to open and close the throat in response to air flow drawn through the main passageway by the engine for creating a variable pressure drop downstream of the throat, the branch port being positioned between the throat of the restrictor means and the intake manifold, the amount of constant proportion fumigation fuel/air mixture being drawn into the main passageway varying in response to the variable pressure drop to vary the proportion of fumigation fuel mixed with air supplied to the intake manifold.

4,694,803

AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AN ATMOSPHERIC PRESSURE RESPONSIVE CORRECTION OPERATION

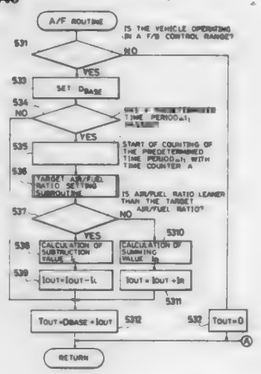
Masahiko Asakura, Tokorozawa; Tomohiko Kawanabe, Utsunomiya; Masahiro Ueda, Asaka; Shinichi Kubota, Nagareyama; Noritaka Kushida, Tokyo, and Yukihiro Matsumoto, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 819,454

Claims priority, application Japan, Apr. 16, 1985, 60-081178; Apr. 16, 1985, 60-081179

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—440 **5 Claims**



1. An air-fuel ratio control system for an internal combustion engine mounted on a vehicle, comprising:

an oxygen concentration sensor disposed in the exhaust passage of said interal combustion engine and producing an output signal whose level increases and decreases generally in proportion to an oxygen concentration of the exhaust gas flowing through said exhaust passage;

atmospheric pressure detecting means for detecting the atmospheric pressure exerted on said vehicle;

target air-fuel ratio determining means for determining a target air-fuel ratio in accordance with preselected operational parameters of said engine, and for correcting the target air-fuel ratio in accordance with the detected atmospheric pressure;

comparing means for comparing the level of the output signal of said oxygen concentration sensor with said corrected target air-fuel ratio; and

feedback means for controlling the air-fuel ratio of an air-fuel mixture to be supplied to said engine in response to the result of the comparison by said comparing means toward the corrected target air-fuel ratio.

4,694,804

FUEL INJECTION APPARATUS FOR AUTOMOBILE

Torey W. DeGrazia, Jr., 1014 S. Greenwood, Park Ridge, Ill. 60068

Filed May 28, 1985, Ser. No. 738,422
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—462 4 Claims



1. A fuel injection adapter for use on a vehicle including a carburetor having a throat, a fuel pump, a throttle and a throttle control lever, comprising:

chamber means adapted for mounting adjacent said carburetor;

metering jet means, including an orifice with different size internal diameters and a longitudinal needle movable within said orifice for varying the volume of fuel delivered therethrough, coupled to said chamber means and including nozzle means extending into said throat of said carburetor and above said throttle;

fuel inlet means on said chamber means adapted for connection to said fuel pump;

adjustment means mechanically coupled to said throttle lever and responsive to movement thereof to control movement of said metering jet means to vary the amount of fuel delivered by said nozzle means, said adjustment including an operating lever coupled to said throttle lever, a needle plate coupled to said operating lever and means on said needle plate for engaging said needle; and

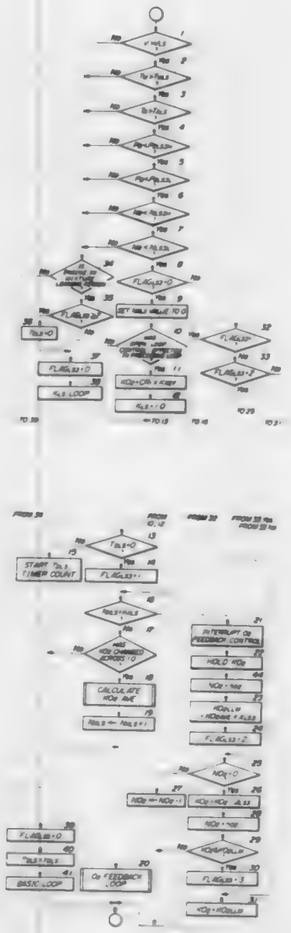
fuel shutoff means coupled in series with said fuel inlet means for cutting off fuel to said chamber means when said operating lever is moved to a position corresponding to a throttle wide-open position.

4,694,805

AIR-FUEL RATIO CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Fumio Yatabe, and Yoshio Wazaki, both of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Sep. 17, 1986, Ser. No. 908,310
Claims priority, application Japan, Sep. 19, 1985, 60-207292; Sep. 19, 1985, 60-207293
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—489 9 Claims



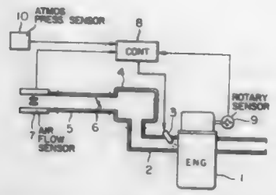
1. A method of effecting feedback control of the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust passage and means arranged in said exhaust passage for detecting the concentration of an exhaust gas ingredient, by correcting a basic fuel supply quantity by the use of a correction coefficient variable in value in response to an output from said means for detecting the exhaust gas ingredient concentration, when said engine is operating in a feedback control region, the method comprising the steps of: (1) providing a low-load operating region of said engine lying outside said feedback control region and defined by at least one parameter representing load on said engine; (2) determining, when the engine enters said low-load operating region, a value of said correction coefficient in response to the output from said means for detecting the exhaust gas ingredient concentration and also calculating an average value of values of said correction coefficient thus determined, for a predetermined period of time after the engine enters said low-load operating region; (3) calculating a target value of said correction coefficient on the basis of the average value obtained in said step (2), said target value yielding a predetermined air-fuel ratio leaner than a stoichiometric mixture ratio; (4) varying the value of said correction coefficient after the lapse of said predetermined period of time and until it becomes equal to said target value while the engine remains in said low-load operating region; and (5) correcting said basic fuel supply quantity by the use of the value of said correction coefficient thus varied.

4,694,806

FUEL CONTROL APPARATUS FOR ENGINE

Seiji Wataya; Setsuhiro Shimomura, and Yukinobu Nishimura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 18, 1986, Ser. No. 897,334
Claims priority, application Japan, Aug. 20, 1985, 60-182701
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—494 5 Claims



1. A fuel control apparatus for an engine comprising:

an air flow sensor for detecting and producing an output representing the intake air amount of the engine,

a sensor for detecting and producing an output representing the operating state of the engine,

a controller for calculating and producing an output representing the fuel supply amount in accordance with the output signals of said sensors to determine the optimum value,

fuel injecting means controlled by the output signal of the controller for injecting fuel to the intake passage of the engine, and

an atmospheric pressure sensor for detecting the atmospheric pressure,

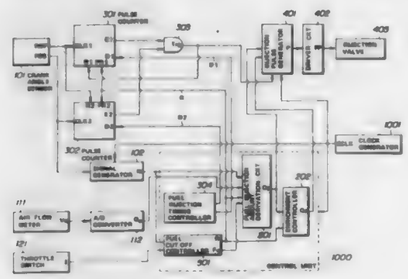
wherein said controller in the operating range of the engine where the detected output of said air flow sensor does not exhibit the true value of the intake air amount due to the reverse-flow of the intake air of the engine, sets at least one upper limit value Qn of the intake air amount in response to the operating state of the engine, and wherein said upper limit value is corrected by the atmospheric pressure detected by said atmospheric pressure sensor.

4,694,807

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH ASYNCHRONOUS FUEL INJECTION FOR FUEL SUPPLY RESUMPTION FOLLOWING TEMPORARY FUEL CUT-OFF

Yasushi Mori, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 28, 1985, Ser. No. 737,940
Claims priority, application Japan, May 29, 1984, 59-107588
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—501 25 Claims



1. A fuel injection control system for an internal combustion engine comprising:

a first sensor producing a first sensor signal representative of the angular position of the crank shaft;

a second sensor producing a second sensor signal representative of preselected engine operating parameters;

a third sensor detecting whether engine operating conditions satisfy a predetermined fuel cut-off condition and if so, producing a third sensor signal;

fourth means for deriving a fuel injection amount on the basis of a value of said second sensor signal and producing a fuel injection control signal having a value indicative of the derived fuel injection amount;

fifth means for disabling said fourth means in the presence of said third sensor signal and for resumption operation of said fourth means after said third sensor signal ends, said fifth means modifying said fuel injection signal value to a given degree for the first fuel injection upon resumption of the operation of said fourth means;

sixth means for deriving fuel injection timing and producing an injection timing control signal, said sixth means normally deriving said fuel injection timing on the basis of said first sensor signal so as to perform fuel injection at a predetermined angular position of said crank shaft, and producing said injection timing signal independently of the crank shaft angular position upon termination of said third sensor signal, and

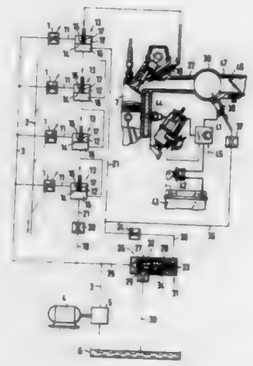
wherein said first sensor signal includes a first pulse train representative of predetermined angular positions of said crank shaft and a second pulse train representative of predetermined units of rotation of the crank shaft, and said sixth means counts the pulses of said first and second pulse trains, produces said injection timing signal when a first counter value of said first pulses reaches a given value and a second counter value of said second pulses reaches a second given value, and presets said first and second counter values to said first and second value in response to said third sensor signal.

4,694,808

METHOD AND FUEL INJECTION SYSTEM FOR FUEL SUPPLY TO A MIXTURE-COMPRESSING INTERNAL COMBUSTION ENGINE HAVING EXTERNALLY SUPPLIED IGNITION

Klaus-Jürgen Peters, Affalterbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 410,099
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140948
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—453 9 Claims



1. A method for supplying fuel to a mixture-compressing internal combustion engine having an air intake tube and exter-

nally supplied ignition by means of a fuel injection system having metering valve means disposed in a fuel supply line for metering a quantity of fuel at a specific proportion to the quantity of air aspirated by said engine, a control pressure line communicating with said fuel supply line, and having individual injection valve means, comprising the steps of:

injecting the metered fuel ahead of each cylinder of said engine; and

further injecting fuel into the air-intake tube of said engine by means of a supplementary injection valve means in accordance with engine operating characteristics, whereby the pressure in said control pressure line is reduced by means of said supplementary injection valve means, and the pressure difference at said metering valve means is increased to thereby increases the metered fuel quantity transmitted by means of said individual injection valve means.

4,694,809

METHOD AND SYSTEM FOR INTERNAL COMBUSTION ENGINE OXYGEN SENSOR HEATING CONTROL WITH TIME SMOOTHING

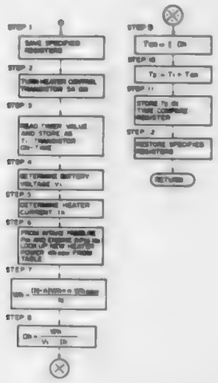
Jiro Nakano; Takao Ishibashi; Takao Akatsuka, and Masao Kawaguchi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 666,466, Oct. 30, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 898,783

Claims priority, application Japan, May 7, 1984, 59-90881

Int. Cl.[4] F02M *51/00, 7/00;* **G01V** *27/26;* **C25B** *1/24*

U.S. Cl. 123—489 **5 Claims**



1. In an internal combustion engine having an exhaust system and an oxygen sensor fitted to the exhaust system, the oxygen sensor including a sensor element and an electrically-powered heater for heating same, a method for controlling the electrical supply to the heater, comprising the steps of:

storing the existing value of the power supplied to the heater;

determining a target value for power to be supplied to the heater at a future time when the temperature of the engine exhaust gases reflects values consistent with engine operating parameters;

delaying the application of the full value of said target value until said future time; and

recycling to said storing step.

4,694,810

FUEL COCK FOR AN INTERNAL COMBUSTION ENGINE

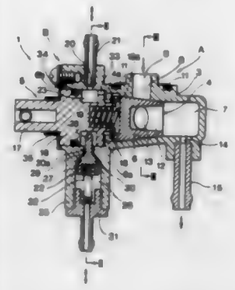
Yasuhiko Miyamoto, Okmiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,106

Claims priority, application Japan, Dec. 28, 1984, 59-278473

Int. Cl.[4] F02M *37/02;* **F16K** *5/02*

U.S. Cl. 123—516 **7 Claims**



1. A fuel cock for an internal combustion engine comprising:

a valve body having a tapered bore portion and a cylindrical bore portion, said tapered bore portion having a fuel inlet port and a fuel outlet port, said cylindrical bore portion having an air inlet port and an air outlet port;

said fuel inlet port and fuel outlet port being communicated with a bottom of a fuel tank and a carburetor, respectively, said air inlet port being communicated with a vent passage of the fuel tank;

an air outlet passage provided in said valve body being communicated with the atmosphere and said air inlet port;

a fuel plug, having a large diameter portion at one end thereof and a small diameter portion at an opposite end thereof and a tapered periphery between said ends, rotatably engaged in the tapered bore portion of the valve body so as to selectively close and open a fuel passage between the fuel inlet port and the fuel outlet port and axially displaceable in the tapered bore portion so as to serve as a piston;

an air plug having a cam portion and said air plug being positioned adjacent the large diameter portion of the fuel plug defining a chamber therebetween and rotatably engaged in the cylindrical bore portion;

said air plug forming a passage so as to apply fluid pressure at the air inlet port to the chamber to urge the fuel plug towards the small diameter end of said fuel plug;

valve means mounted in said air outlet passage including a projection slidably engaged with said cam portion to selectively close and open said air outlet passage dependent on rotatary position of said air plug; and

the fuel plug and air plug being so arranged as to open both the fuel passage and the air outlet passage at the same time so as to discharge vapor in the fuel tank to the atmosphere and to supply fuel to the carburetor from the fuel tank at the same time and respectively so as to close both the fuel passage and the air outlet passage at the same time.

4,694,811

AIR-GAS MIXING DEVICE WITH DUAL-CONTROL FUEL VALVE

David E. Bennett, Hermosa Beach, Calif., assignor to Impco Carburetion, Inc., Cerritos, Calif.

Filed Sep. 20, 1985, Ser. No. 778,482

Int. Cl.[4] F02B *43/00*

U.S. Cl. 123—527 **19 Claims**

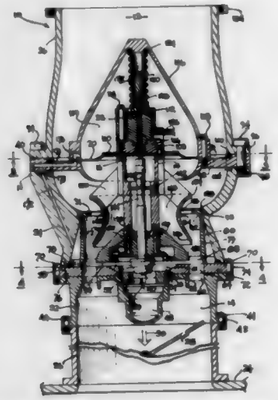
1. An air gas mixing device of the type used to mix gaseous fuel with air as an air/fuel mixture for discharge into an air intake conduit means of an internal combustion engine, comprising:

a housing having an air duct extending through the housing, the air duct having an air inlet and an air-fuel mixture discharge outlet downstream of the air inlet in the direction of fluid flow, the housing arranged to be connected to the air intake conduit means of the engine so that the discharge outlet of the air duct is in communication with said intake conduit means;

an air valve for controlling the rate of air flow through said air duct;

a primary fuel inlet in communication with said air duct for delivery of gaseous fuel for mixture with air flowing through said air duct;

a fuel valve for controlling the rate of fuel flow through said fuel inlet, the fuel valve having open and closed positions,



and the rate of fuel being delivered through said fuel inlet being dependent on the degree to which said fuel valve is opened;

a first fuel valve actuator means automatically operated by a remote first fuel valve control signal for moving the fuel valve in an open position to a predetermined degree in response to the first fuel valve control signal; and

a second fuel valve actuator means automatically operated by a remote second fuel valve control signal for adjusting the opening of the fuel valve independently of and relative to the first fuel valve actuator means in response to the second control signal whereby the fuel valve is opened to a predetermined degree by said first actuating means in response to said first control signal and the opening thereafter adjusted by said second actuating means in response to said second control signal to provide an optimum fuel delivery rate.

4,694,812

EXHAUST GAS RECIRCULATION VALVE HAVING INTEGRAL ELECTRONIC CONTROL

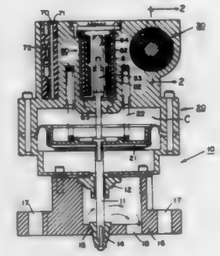
David L. Wendt, Janesville, Wis., assignor to SSI Technologies, Inc., Janesville, Wis.

Filed Apr. 21, 1986, Ser. No. 853,964

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **9 Claims**

1. Exhaust gas recirculating apparatus for delivering a variable quantity of exhaust gas from an engine exhaust to its air intake, said apparatus comprising a casing having therein a subatmospheric pressure chamber in communication with a source of relatively low air pressure; passage means through which exhaust gas may flow; valve means movable between positions in which the flow of said exhaust gas through said passage is enabled and disabled; adjusting means coupled to said valve means for adjusting the position of the latter in response to pressure changes in said chamber; constant restriction means interposes between said chamber and said source and in communication with each for permitting a continual leak of air from said chamber to said source; pilot valve means interposed between said chamber and a source of ambient air at



atmospheric pressure; adjustable flow control means in said pilot valve means for varying the quantity of air that may pass through said pilot valve; and operating means coupled to said flow control means and responsive to electrical control signals to adjust said flow control means.

4,694,813

PISTON FOR INTERNAL COMBUSTION ENGINES

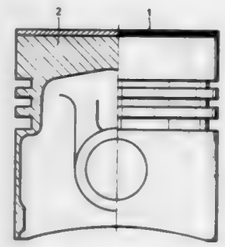
Siegfried Mielke, Neckarsulm, Fed. Rep. of Germany, assignor to Kolbenschmidt AG, Neckarsulm, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 698,289

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404284

Int. Cl.[4] F02F *3/12*

U.S. Cl. 123—668 **6 Claims**



1. In a piston for an internal combustion engine, comprising a cover layer which has been applied to the piston head by plasma spraying or flame spraying and consists of a material having a relatively low thermal conductivity, the improvement wherein said cover layer comprises a material of thermal conductivity of $\lambda \leqq 2$ W/mK., and has a thickness of 0.5 to 2 mm and a peak-to-valley height of only 5 to 30 μm.

4,694,814

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH A MAGNET GENERATOR

Lothar Gademann, Rottenburg; Adam Hirt, Ammerndorf; Hartmut Michel, Reutlingen; Hans-Dieter Schmid, Nuremberg, and Michael Schneider, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

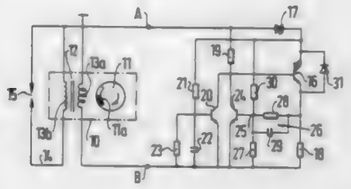
PCT No. PCT/DE85/00258, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO86/03259, PCT Pub. Date Jun. 5, 1986

PCT Filed Jul. 31, 1985, Ser. No. 852,806

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443739

Int. Cl.⁴ F02P *3/12*

U.S. Cl. 123—644 **7 Claims**



1. Ignition system for internal combustion engines comprising a magnet generator provided with an ignition armature cooperating with a rotary magnet system driven by an internal combustion engine to generate voltage half waves of opposite polarity, the ignition armature including a secondary winding connectable to an ignition plug and a primary winding connected to a primary current circuit, the primary current circuit comprising an electronic ignition switching element responsive to voltage half waves of one polarity and having a control electrode, a control circuit coupled to said control electrode for switching-over at an ignition time point said ignition switching element from a conductive state to a blocking state whereby an ignition voltage is induced in said secondary winding, said control circuit including a first control subcircuit provided with first timing means for triggering the switch-over of said ignition switching element at a first ignition time point, said first timing means being responsive to a frequency of said voltage half waves corresponding to a predetermined lower speed range, and a second control subcircuit provided with second timing means for triggering the switch-over of said ignition switching element at a second ignition time point which is advanced relative to said first ignition time point, said second timing means being responsive to a frequency of current half waves passing through said ignition switching element and corresponding to a predetermined upper speed range.

4,694,815

TOY GUNS FOR FIRING PELLETS

Lam H. Hung, Hong Kong, Hong Kong, assignor to Longreen Limited, Hong Kong, Hong Kong

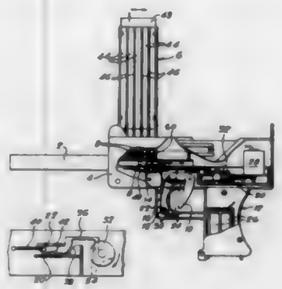
Filed Aug. 23, 1985, Ser. No. 768,797

Claims priority, application United Kingdom, Jul. 29, 1985, 8519051

Int. Cl.⁴ F41B *7/08, 11/02*

U.S. Cl. 124—27 **12 Claims**

8. A toy gun for firing pellets having a barrel extending forwardly from a gun body; an hand grip attached to the body adjacent a trigger for activating a firing mechanism; and means for delivering pellets seriatim to substantially the same point in the barrel for firing, the firing mechanism comprising a motor coupled through a gear train to drive a pinion bearing two posts eccentrically mounted on a common diameter thereof; an arm mounted for reciprocal motion parallel to the axis of the barrel; means continuously biasing the arm forwardly towards the distal end of the barrel, the arm having a portion extending perpendicularly to said barrel axis for alternate engagement with the posts as the pinion rotates, a post engaging said portion at the end of each forward stroke of the arm and releasing it at the end of each rearward stroke; a cam follower pivotally mounted on the forward end of the arm for selective coupling



to a firing hammer to withdraw same in the rearward stroke of the arm, the gun body including a cam surface which pivots the follower at the end of the rearward stroke of the arm to release the hammer, and resilient means for urging the hammer upon such release along the barrel and through said point therein to engage and discharge a pellet thereat forwardly from the barrel.

4,694,816

GRILLE APPARATUS

Miguel Fabbro, Miami, Fla., assignor to Bifa Corporation, Miami Beach, Fla.

Filed Oct. 8, 1985, Ser. No. 785,531

Int. Cl.⁴ A47J *37/00*

U.S. Cl. 126—41 R **5 Claims**



1. A grille apparatus for cooking food with electric or gas stove burners, comprising:

A. a base member having substantially the shape of a plate with a central opening of sufficiently large dimensions to house said burners and further having an inner upwardly extending flange around the periphery of said central opening and an outer upwardly extending flange around the outer periphery of said plate so that a channel is defined outside the heating range of said burners and further including sufficient water to substantially fill said channel;

B. a grille assembly having substantially the shape of a plate including a center hole having substantially the same dimensions as said central opening and said grille assembly includes a plurality of orifices scattered throughout so that the grease of said food resting on said grille assembly may drip down to said water filled channel and further including a plurality of spacer members mounted to the underside of said grille assembly so that a space apart relationship is kept between said assembly and said base member; and

C. a cover member being of slightly smaller dimensions than said grille assembly and which interfits with said grill assembly so that it can tightly cover said food thereby allowing the heated air entering the central opening of the base member to cook food placed upon the grill assembly and retain the heat in the apparatus.

4,694,817

HEATING STOVE AND METHOD FOR THE COMBUSTION OF FUELS IN HEATING STOVES

Sture Nilsson, Blå Grind, S-599 00 Ödeshög, Sweden

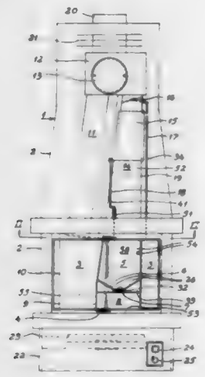
PCT No. PCT/SE85/00149, § 371 Date Dec. 10, 1985, § 102(e) Date Dec. 10, 1985, PCT Pub. No. WO85/04464, PCT Pub. Date Oct. 10, 1985

PCT Filed Apr. 1, 1985, Ser. No. 828,323

Claims priority, application Sweden, Mar. 30, 1984, 8401770

Int. Cl.⁴ F24B *5/00*

U.S. Cl. 126—76 **18 Claims**



1. A heating stove comprising a fireplace (**5**) having front and rear walls and a pair of opposed lateral walls (**54**, **55**) and a hearth (**6**) located at an intermediate height within the fireplace and dividing the fireplace into an upper chamber above the hearth, and a space (**8**) below the hearth, said hearth having grate means (**7**) for supporting fuel while allowing combustion products to pass through the hearth; a flue (**20**); a first duct (**11**) having one end connected to the flue; means comprising aperture means (**9**) in one of said walls providing communication between said space (**8**) below the hearth and the first duct (**11**) for the passage of combustion products from said space (**8**) to the flue (**20**); a second duct (**14**) having one end connected to said flue (**20**) and having its other end in communication with the upper chamber; a damper (**16**) in the second duct; a firepalce opening in the front wall of the fireplace leading to the upper chamber above the hearth; hatch means (**3**) for closing the fireplace opening; linkage means (**17**), connected to the damper and operable by the hatch means for closing the damper when the hatch means is closed and opening the damper when the hatch means is open; and means for substantially limiting the draft through the grate to flow in the downward direction when the damper and hatch means are closed, whereby the combustion products flow from the space (**8**) below the grate outwardly through said aperture (**9**) and through the first duct (**11**) to the flue (**20**).

4,694,818

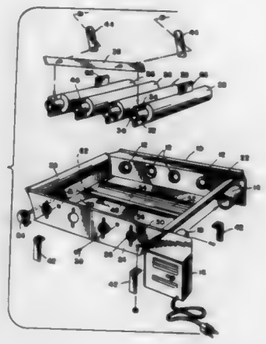
FIREPLACE GRATE FOR GAS FIRED FIREPLACE INCLUDING FORCED AIR HEAT EXCHANGER

Jon Bridgwater, Morton, Ill., assignor to Morton Metalcraft Company, Morton, Ill.

Filed Aug. 7, 1986, Ser. No. 893,965

Int. Cl.⁴ F24B *7/00*

U.S. Cl. 126—121 **6 Claims**



1. An improved fireplace heat transfer unit for placement in a fireplace of the type having a floor, a back wall, and a front opening, said unit comprising, in combination:

a forced air fed distribution manifold adapted to extend across the rear of a fireplace substantially parallel to the back wall thereof;

a series of heat transfer conduits each defining a respective heat transfer chamber connected with said manifold extending therefrom toward the fireplace opening and including an emission orifice for jetting air directly into a room;

a generally rectangular frame having a rear member defined by the manifold, opposite side members and a front member for supporting the heat transfer conduits;

means for supporting the frame above the floor;

an air supply tube connected to the manifold;

blower means for forcing air through said tube into the manifold, then through the conduits and from the emission orifices, said blower means being positioned within the fireplace front opening when the unit is operating;

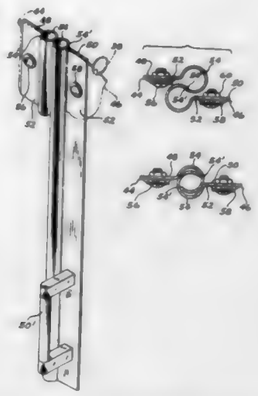
a plurality of synthetic, non-flammable, model combustibles supported on the heat transfer conduits generally above the frame;

a pan supported by the frame at the bottom of the frame and beneath the heat transfer conduits to define an enclosure which has the frame forming the sides thereof and the pan generally forming the bottom thereof with the top being generally open, said heat transfer conduits extending through the enclosure from the manifold;

gas supply means including a gas burner tube, said burner tube generally transverse to the heat transfer conduits and supported by the pan intermediate the rear and front members of the frame and below the conduits comprising means for providing a gas supply for ignition and burning of gas in the region of the transfer conduits and the model combustibles; and

a layer of sand covering the gas burner tube for dispersal of gas discharged from the tube to within the enclosure defined by the frame for combustion within the enclosure around the tubes and also around the model combustibles.

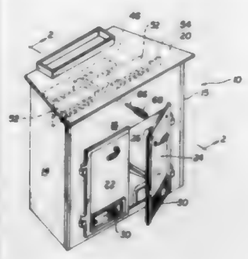
4,694,819
LOCKING MEANS FOR FIREPLACE SCREEN
Donald L. Shaffer, R.R. 2, Box 399, Scottsburg, Ind. 47170
Filed Aug. 27, 1986, Ser. No. 900,682
Int. Cl.[4] F24C *15/10*
U.S. Cl. 126—140 **6 Claims**

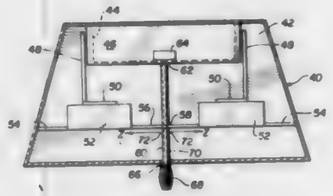


1. A fireplace screen fixture for assembly to the front face of a fireplace opening, said fixture comprising:
   a. a frame capable of outlining a fireplace opening, and having a supporting rod suspended transversely across the upper portion of the frame from one side to the other, and a plurality of ring members threaded onto the supporting rod and capable of sliding along the length thereof; and
   b. a pair of wire screen curtains suspended at their upper portions from the said ring members, and movable away from each other to a folded-away open position, as well as being movable toward each other to a stretched closed position capable of stretching across the fireplace opening;
   c. the invention comprising a sheet metal locking strip attached to the vertical mating side edge of each screen curtain, so that when the two screen curtains are overlapped and stretched closed these two locking strips are interlocked with each other to form a bond that will prevent these two screen curtains from being opened inadvertently until these two interlocking strips are purposely disengaged from each other by human intervention.

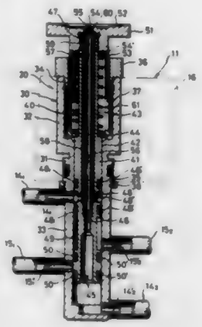
4,694,820
STOVE WITH CATALYTIC CONVERTER
Carrol E. Buckner, 5 Piney Dr., Fletcher, N.C. 28732
Filed Dec. 15, 1986, Ser. No. 941,358
Int. Cl.[4] F23V *15/00;* **F23L** *11/00*
U.S. Cl. 126—289 **8 Claims**

1. A solid fuel burning stove having a combustion chamber defined by a top wall, a bottom wall, a front wall, a rear wall and a pair of side walls, a flue in communication with said combustion chamber for removing exhaust gases and a catalytic converter apparatus within said combustion chamber; said catalytic converter apparatus comprising:
   support means for supporting catalytic elements and having first and second inlet means, each in communication with the combustion chamber and flue;
   a damper means slideably mounted on said support means for movement between open and closed positions with said first inlet means for opening and closing the same, and
   elongated conduit means partially in said combustion chamber having one end coupled to the damper means and a second end remote from said one end extending outside the combustion chamber and having a handle means affixed thereon, said conduit means having an air inlet means outside the combustion chamber and an air outlet means inside thereof, and an intermediate flow channel connecting said air inlet mean to said air outlet mean for allowing the passage of outside air therethrough, said conduit means operative when activated by the user on said handle means for moving said damper means between the respective open and closed positions and for communicating outside air into the combustion chamber proximate the catalytic elements when the damper is in the closed position, whereby the catalytic elements receive outside air for enhanced combustion of the exhaust gases passing therethrough when said damper means is in the closed position.



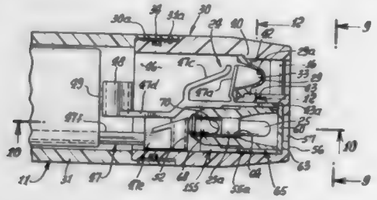


4,694,821
AIR FEED CONTROL DEVICE FOR AN ENDOSCOPE
Mitsuo Kondo, Saitama, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama, Japan
Filed Oct. 23, 1985, Ser. No. 790,481
Claims priority, application Japan, Oct. 24, 1984, 59-159793[U]
Int. Cl.[4] A61B *1/12*
U.S. Cl. 128—4 **11 Claims**



1. In an air feed control device of an endoscope comprising regulating means mounted in an operating section of the endoscope, which means is provided with a vent hole opening to the atmosphere for regulating the quantity of air escaping therethrough into the atmosphere and by which means an intake air pipe having one end adapted to be connected to an air supply separate from the endoscope and an outlet air pipe having one end connected to an air feed nozzle at the distal end of an insertion section of the endoscope are connected in communication with each other; the improvement in which said regulating means includes therein an inflow air channel for connecting said vent hole with said intake air pipe and an outflow air channel for connecting said vent hole with said outlet air pipe, and inflow and outflow air channels being in communication with each other only in the vicinity of the point at which said vent hole opens to the atmosphere said regulating means comprising a hollow body having a cylindrical axial bore and a partition wall for dividing said cylindrical bore into two air channels for inflow and outflow.

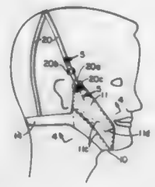
4,694,822
SUBMERGIBLE LARYNGOSCOPE BATTERY HOUSING
Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272
Filed Apr. 1, 1986, Ser. No. 846,913
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—11 **28 Claims**



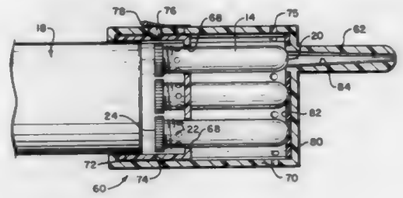
1. In a laryngoscope, having a blade and hollow body means including a handle and a cap, the combination comprising
   (a) the handle adapted to receive dry cell means, the handle having an open end,
   (b) the cap telescopically and removably interfitting the handle to close said open end, and means sealing off between the cap and handle,
   (c) means carried by the cap to pass light from a light source within said body means to a predetermined zone at the cap exterior, whereby said light may be transmitted along the blade removably attached to the cap,
   (d) a flexible barrier carried by the cap to be deflected by the blade upon its attachment to the cap, the barrier sealing off between the cap interior and exterior,
   (e) and circuit means including a motion transmitting element to be deflected within the hollow body means in response to said barrier deflection to establish an ON condition of the circuit means for transmitting current from said dry cell means to said light source.

4,694,823
NECK AND FACIAL LIFT BAND ASSEMBLY
Marilyn M. Young, 430 57th Pl. NE., Minneapolis, Minn. 55432
Filed Feb. 24, 1986, Ser. No. 832,382
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—76 B **8 Claims**

1. A neck and facial lift band comprising,
   a chin and jaw engaging yoke assembly which includes: a central stretchable chin engaging segment with a pair of non-stretchable lateral jaw engaging segments extending upwardly from the central stretchable chin engaging segment and contoured to engage the lateral jaw and face portions,
   a lower anchoring neck strap directly connected with an intermediate portion of each lateral jaw engaging segment to surround the rear portion of the upper neck of the wearer and securely anchor the assembly in a horizontal direction,
   a pair of criss cross head engaging straps oriented to pass upwardly over the head of the wearer with the ends thereof respectively anchored to the rear portions of the neck strap and the front ends respectively connected to the upper portions of the jaw engaging segments to provide an upwardly and rearwardly directed lifting action on the engaged jaw and face portions, one end of each of the head engaging straps being provided with a removable connection.



4,694,824
NASAL INHALATION SYSTEM
Max J. Ruderian, 545 Hanley Ave., Los Angeles, Calif. 90049
Division of Ser. No. 811,279, Dec. 20, 1985. This application Jun. 2, 1986, Ser. No. 869,363
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—203.22 **5 Claims**



1. A nasal inhalation system, comprising:
   an air flow source;
   a plurality of inhaler tubes each having at least one entry port and at least one exit port generally at opposite ends thereof;
   a support nozzle including means for removably supporting each of said inhaler tubes at a position between said entry and exit ports of said inhaler tubes without obstructing said entry and exit ports; and
   means for mounting said support nozzle onto said air flow source with said inhaler tubes supported by said nozzle in a position for flow-through passage of air from said air flow source into said entry ports and through said inhaler tubes for discharge via said exit ports;
   said support means further including means for selectively opening and closing said inhaler tubes to flow-through passage of air from said air flow source, said means for selectively opening and closing comprising means for permitting air passage through a selected one of said inhaler tubes and for preventing air passage through the remaining ones of said inhaler tubes.

4,694,825

CONTROL FOR RESPIRATORS

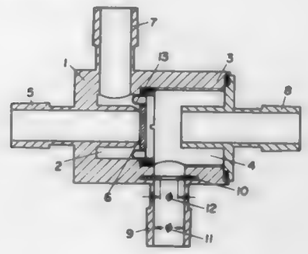
Janos Slemmer, Gross Grönau, and Gottfried Schröter, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,275

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1983, 3341711

Int. Cl.⁴ A61M *16/00*

U.S. Cl. 128—205.24 **3 Claims**



1. A control for use by a patient with a respirator, comprising a valve housing (1) having an interior valve chamber (2), an exhaled gas inlet (5) extending into said interior valve chamber and terminating in an annular valve seat (6), said valve chamber extending around said valve seat, a diaphragm (13) means having one side engagable with and disengagable from said annular valve seat to open and close said exhaled gas inlet to said valve chamber, an exhaled gas outlet (7) connected to said valve chamber for receiving exhaled gas from said exhaled gas inlet when said diaphragm means is disengaged from said valve seat, said housing having a control chamber 4 bounded by an opposite side of said diaphragm means which is opposite from said valve seat, said diaphragm means separating said control chamber from said valve chamber, a first connection (8) to an anesthetic ventilator and bellows connected to said control chamber for supplying anesthetic gas to said control chamber and for receiving fresh mixed gas from said control chamber, a second connection (9) connected to said control chamber for supplying fresh mixed gas to said control chamber and for receiving gas from said control chamber, said second connection being adapted for connection to a patient for receiving the anesthetic gas, said second connection having an orifice plate (10) therein defining a reduced area passage in said second connection so that, during an inhalation phase, the patient receives anesthetic gas from the first connection and from the control chamber to produce a higher pressure in said control chamber than in said valve chamber to cause said diaphragm means to engage against said annular seat to close said exhaled gas inlet from said exhaled gas outlet, and during an exhalation phase, fresh mixed gas is supplied through said second connection and through said orifice plate into said control chamber and through said first connection to fill the bellows, said orifice plate causing pressure in said control chamber to be less than pressure in said valve chamber to disengage said diaphragm means from said annular valve seat to open said exhaled gas inlet with respect to said exhaled gas outlet.

4,694,826

ENDOTRACHEAL TUBE GUIDE

Martin H. Chester, Carmel, Calif., assignor to Carmel Medical Devices, Carmel, Calif.

Filed Nov. 13, 1984, Ser. No. 670,850

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—303 R **7 Claims**

1. An endotracheal tube guide for easily guiding an endotracheal tube in the posterior, anterior, lateral and medial directions during intubation, said guide comprising:

lower blade portion means having a generally semicircular configuration for engagement with an endotracheal tube during intubation and having an upper and a lower curved lip portion which defines said semicircular configuration;

an elongated middle portion connected to said blade portion means at an upper end of said blade portion means; and

handle portion means connected at a lower end thereof to an upper end of said middle portion and being oriented at an acute angle with respect to the longitudinal axis of said middle portion, said handle portion means and said semicircular blade portion means extending away from said



longitudinal axis of said middle portion in opposite directions;

said handle portion means being of sufficient length to form a gripping portion engageable between the thumb and index finger of one hand such that, when gripped, neither the hand nor the fingers of the hand extend substantially beyond a plane defined by a front face of said middle portion, and such that the index finger extends along a lower surface of said handle portion means and the thumb presses against a top surface of said handle portion means.

4,694,827

INFLATABLE GASTRIC DEVICE FOR TREATING OBESITY AND METHOD OF USING THE SAME

Brian C. Weiner, and Sarah H. Weiner, both of 24 Bowling Green Pl., Staten Island, N.Y. 10314

Filed Jan. 14, 1986, Ser. No. 818,736

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—303 R **10 Claims**



1. A flexible-walled, imperforate, air-inflatable balloon insertable and inflatable within the stomach of a human or animal to deter ingestion of food by occupying a substantial portion of the stomach volume, wherein the improvement comprises:

(a) said balloon having a plurality of wall portions that form smooth-surfaced convex outward protrusions when inflated,

(b) said protrusions being distributed around the balloon and cooperatively defining a plurality of outwardly open channels for passage of fluent material between the balloon outer surface and the stomach wall, and

(c) said protrusions being shaped and disposed to permit engagement of the stomach wall by the balloon only at spaced localities so as to maintain a substantial portion of the stomach wall away from contact with the balloon, for minimizing complications due to mechanical trauma of the balloon against the stomach wall.

4,694,828

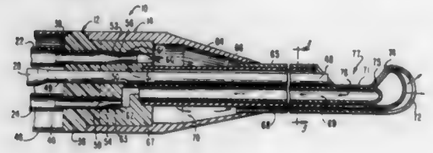
LASER SYSTEM FOR INTRAOCULAR TISSUE REMOVAL

Daniel M. Eichenbaum, 5258 Linton Blvd., Suite 302, Delray Beach, Fla. 33445

Filed Apr. 21, 1986, Ser. No. 854,134

Int. Cl.⁴ A61B *17/36*

U.S. Cl. 128—303.1 **20 Claims**



1. A needle probe for removing tissue comprising:

an outer housing having first and second ends and inner and outer surfaces, said outer housing having means defining a first aperture on a first side of said housing adjacent said second end, and means defining a second aperture substantially at said second end;

an inner housing located inside said outer housing, said inner housing having first and second ends, first and second opposite sides, and inner and outer surfaces, said inner housing having means defining an inner housing aperture positioned substantially coaxially with said means defining said first aperture in said outer housing, and on said first side of said inner housing, which side is laterally adjacent to said first side of said outer housing;

the volume bounded by said means defining said coaxial first and inner housing apertures in said outer and inner housings defining a photovaporization zone;

said inner surface of said outer housing and said outer surface of said inner housing defining an irrigation passageway for irrigating liquid, which liquid flows through said passageway from said first ends of said outer and inner housings and exits the probe through said second aperture in said outer housing, said irrigation passageway being connectable to an irrigation generator;

a laser tube positioned inside said inner housing and laterally adjacent to said first side of said inner housing, said laser tube having first and second ends, said first end being connectable to a laser generator and said second end being located adjacent said photovaporization zone to deliver laser energy into said zone; and

an aspiration tube having first and second ends, and first and second opposite sides, said aspiration tube being positioned inside said inner housing with said second side of said aspiration tube being laterally adjacent to said second side of said inner housing, said aspiration tube having means defining an aspiration aperture on said first side of said aspiration tube adjacent said second end, said means defining said aspiration aperture being positioned substantially coaxially with said means defining said first aperture of said outer housing and said means defining said inner housing aperture of said inner housing, said first end of said aspiration tube being connectable to an aspiration generator.

4,694,829

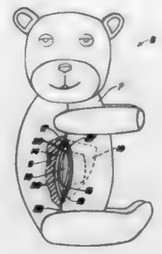
THERAPEUTIC STUFFED TOY

Ruth E. Frye, 505 S. Main, Lindsay, Okla. 73052

Filed Jan. 9, 1986, Ser. No. 817,901

Int. Cl.⁴ A61F *7/08, 7/10*

U.S. Cl. 128—399 **13 Claims**



12. A therapeutic toy positionable in heat exchange relation to the human body comprising: an outer body member having an outer configuration of an animal-like figure and having an inner cavity; a container in said inner cavity; non-toxic particulate material dampened with liquid having a freezing point below that for water and a boiling point above that for water in said container, said material and said container being substantially inert with respect to each other, and said container being substantially impervious to said material, said container being hermetically sealed to allow heating or cooling of material in said container to form a heat sink; and insulation material around said container to control the rate of heat transfer to and from said material.

4,694,830

HEART PACEMAKER WITH RESPIRATORY SIGNAL GENERATION CAPABILITY

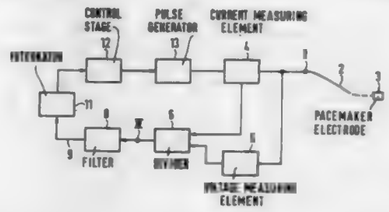
Anders Lekholm, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich

Filed Sep. 24, 1986, Ser. No. 911,057

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535534

Int. Cl.⁴ A61N *1/00*; H05G *0/00*

U.S. Cl. 128—419 PG **3 Claims**



1. In a heart pacemaker for supplying stimulation pulses to a heart via a pacemaker electrode, the improvement comprising:

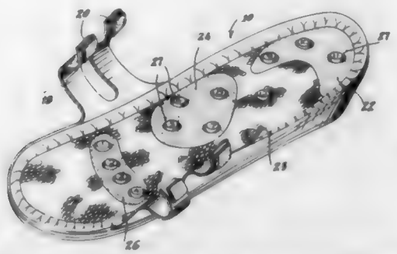
means connected to said pacemaker electrode for measuring the stimulation current;

means connected to said pacemaker electrode for measuring the stimulation voltage;

a divider connected to said means for measuring the stimulation current and means for measuring the stimulation voltage for forming an impedance signal corresponding to the electrode impedance;

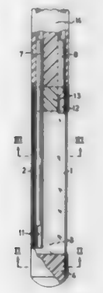
means for generating a signal corresponding to the respiration rate of said pacemaker user from said impedance signal and for controlling the pulse rate of said pacemaker dependent thereon.

4,694,831
MASSAGE FOOTWEAR
Charles J. Seltzer, 17 Autumn Dr., Danbury, Conn. 06810
Continuation of Ser. No. 568,039, Jan. 4, 1984, abandoned. This application Jul. 25, 1986, Ser. No. 887,982
Int. Cl.⁴ A61F *5/14*
U.S. Cl. 128—582 **5 Claims**



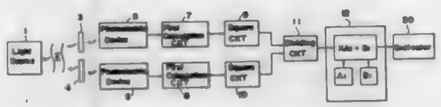
1. A footwear article having an outer sole provided with an inner surface normally facing the underside of a human foot and an upper closure means for said footwear article and attached to opposite marginal edges thereof, at least three raised flat foot support platforms on said inner surface, said inner surface other than the portion supporting said platforms being provided with a plurality of non-specific rounded projections located on substantially all the areas of said inner surface not occupied by said platforms, said platforms having a plurality of spaced, foot stimulating, dome-shaped massage bumps, each of said bumps having a greater diameter than height, and said platforms having a flat, lightly stippled surface on each of said platforms in the areas not occupied by said massage bumps for preventing slippage of the foot when said footwear article is worn, said platforms with massage bumps thereon supporting the ball, mid-sole, arch and heel of the wearer's foot, the locations of said massage bumps being selected to engage the underside of the wearer's foot either directly or indirectly to cause continuous stimulations of the sole of the foot thereby providing an improvement in circulation and in the overall health of the wearer.

4,694,832
DIALYSIS PROBE
Carl U. Ungerstedt, Mjölnarstigen 11, S-18146 Lidingö, Sweden
Continuation of Ser. No. 554,116, Nov. 21, 1983, abandoned. This application Nov. 22, 1985, Ser. No. 800,374
Claims priority, application Sweden, Dec. 1, 1982, 8206863
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—632 **1 Claim**



1. A dialysis probe for insertion into biological tissues, comprising a hollow fibre dialysis membrane of uniform cross-sectional configuration throughout its length, an elongated mounting that surrounds and supports and includes means for partially exposing the outer surface of the membrane so that the outer exposed surface of the membrane is free to contact biological tissue in which the probe is inserted, the mounting having an exposed outer surface and being substantially more rigid than the membrane and having an internal diameter greater than the greatest external diameter of the membrane, and ducts for supplying and removing perfusion liquid to and from the interior of the membrane, one of said ducts extending to the distal end of the hollow fibre membrane and being open to the distal end of the membrane, said one duct being disposed inside the hollow fibre membrane and having an external diameter substantially less than the internal diameter of the hollow fibre membrane, the other duct communicating with the proximal end of the hollow fibre membrane, substantially all the inner surface of the membrane opposite said outer exposed surface of the membrane being exposed to the flow of liquid between said ducts.

4,694,833
NONINVASIVE DEVICE FOR PHOTOELECTRICALLY MEASURING THE PROPERTY OF ARTERIAL BLOOD
Kenji Hamaguri, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 467,431, Feb. 17, 1983, Pat. No. 4,586,513. This application Mar. 13, 1986, Ser. No. 839,433
Claims priority, application Japan, Feb. 19, 1982, 57-26639
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.⁴ A61B *5/00, 6/00*
U.S. Cl. 128—633 **20 Claims**



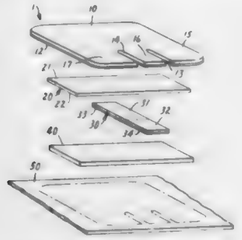
1. A noninvasive device for photoelectrically measuring a property of arterial blood in living tissue comprising:
means for generating a source light and causing said light to enter into living tissue, such that the light generating means remains outside the living tissue and only the generated light passes into the living tissue;
means for photoelectrically measuring the intensity of the source light emerging from the living tissue after contact with the arterial blood therein, at a pair of separate wavelengths, to produce a pair of electrical signals, respectively, each signal including an alternating-current component and a direct-current component;
means for calculating information from said pair of electric signals representative of the relative amplitude of the alternating-current component compared to the direct-current component for each of the measured wavelengths and for producing first and second calculated outputs, respectively, each output representing a respective said relative amplitude;
means for obtaining a final output signal according to a function containing the square of a ratio between the first and second calculated outputs and containing no terms of first order in said ratio; and
means for indicating the property of the arterial blood in response to the final output.

4,694,834
GAS SENSOR
Mark E. Meyerhoff, Ann Arbor, Mich.; Eric J. Fogt, Maple Grove, and Darrel F. Untereker, Cedar, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Mar. 31, 1986, Ser. No. 846,388
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—635 **11 Claims**



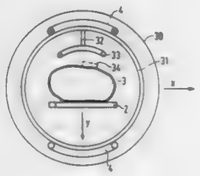
1. A gas sensor comprising:
a pH-sensitive FET transducer having a gate-insulated field-effect transistor structure;
a reference electrode;
an insulating tube having an opening which provides connecting lead wires to the FET transducer and which houses said transducer, said gate region of said FET transducer being located in the opening provided in said insulating tube, and said lead wires extending along said insulating tube;
electrical insulation resin placed between the inner wall of said tube and lead-wire-FET connecting points to stop said opening of the tube; and
a gas permeable membrane overlying and in direct contact with the gate region of the FET transducer whereby the existence of any discernible layer between the gas permeable membrane and the FET transducer is precluded.

4,694,835
BIOMEDICAL ELECTRODE
Jerome E. Strand, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 21, 1986, Ser. No. 865,521
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—640 **6 Claims**



1. A biomedical electrode comprising
(a) a backing;
(b) a biocompatible pressure-sensitive adhesive coating one surface of the backing;
(c) a bonding sheet having first and second faces and being smaller in surface area than the backing wherein the first face is adhered to the biocompatible pressure-sensitive adhesive;
(d) an electrical conductor having top face divided into first and second surfaces and a bottom face divided into third and fourth surfaces wherein the first surface is opposed to the third surface, the second surface is opposed to the fourth surface, the first surface spans a portion of the second face of the bonding sheet and the second surface adheres to a portion of the biocompatible pressure-sensitive adhesive, and
(e) an electrolyte composition, having a surface area smaller than that of the backing sheet which electrolyte composition is:
(i) in electrical contact with the third surface of electrical conductor, and
(ii) adhered to at least a portion of the second face of the bonding sheet which is not spanned by the electrical conductor.

4,694,836
MRI TOMOGRAPHY APPARATUS FOR GENERATING A MOTION SIGNAL
Dirk Bulkman; Thomas Helzel, and Peter Röschman, all of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 16, 1985, Ser. No. 809,635
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446717; Mar. 21, 1985, 3510195
Int. Cl.⁴ A61B *5/05*
U.S. Cl. 128—653 **14 Claims**



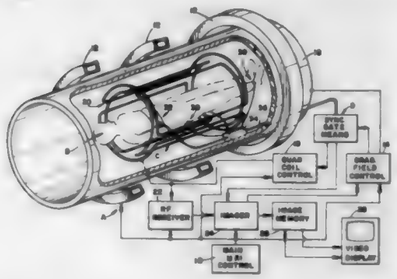
1. A MRI tomography apparatus for generating a motion signal comprising
first high frequency coil means, surrounding a body to be examined, for generating a high frequency magnetic field at the Larmor frequency, said first high frequency coil means receiving spin resonance signals from said body to be examined,
second high frequency coil means, positioned adjacent to said body and within said first high frequency coil means, for generating a motion signal, and
impedance measuring means for measuring impedance of said second high frequency coil means to determine said motion signal.

4,694,837
CARDIAC AND RESPIRATORY GATED MAGNETIC RESONANCE IMAGING
Douglas M. Blakeley, Euclid; Carolyn A. Kershaw, Mentor, and Raymond E. Gangarosa, Euclid, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio
Filed Aug. 9, 1985, Ser. No. 764,440
Int. Cl.⁴ A61B *5/05*
U.S. Cl. 128—653 **20 Claims**

1. An anatomical condition gating apparatus for a magnetic resonance imager, the apparatus comprising:
a first anatomical condition detector means for monitoring at a first anatomical site within an imaging magnetic field of the imager a first anatomical condition of a patient to be imaged;
a second anatomical condition detector means for monitoring at a second anatomical site within the imaging magnetic field a second anatomical condition of the patient to be imaged;
a light source means for transmitting a light signal from within the imaging magnetic field to a light signal receiver disposed out of the imaging magnetic field;
an encoding means for encoding the light signal within the imaging magnetic field in accordance with both the first and second anatomical conditions monitored by the first

and second anatomical condition detector means, the encoding means being operatively connected with the first and second anatomical condition detector means and the light source means, whereby information about the first and second monitored anatomical conditions is transmitted through the imaging magnetic field without altering the imaging magnetic field;

a light signal decoding means operatively connected with the light signal receiver for recovering first and second anatomical condition encodings from the encoded light signal;



a scan triggering means for initiating imaging scans in accordance with the first anatomical condition encoding of the received light signal, the scan triggering means being operatively connected with the light signal decoding means; and,

a scan blocking means for preventing processing of imaging data in accordance with the second anatomical condition encoding of the received light signal, the scan blocking means being operatively connected with the light signal decoding means.

4,694,838

LOOP CORONARY CATHETER

Bandula Wijayarthna, Friendswood, Tex., and Glenn E. Newman, Durham, N.C., assignors to Mallinckrodt, Inc., St. Louis, Mo. and Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 575,276, Jan. 30, 1984, abandoned. This application Jan. 23, 1985, Ser. No. 693,974

Int. Cl.⁴ A61M *25/00*

U.S. Cl. 128—658 **25 Claims**



1. A catheter for coronary angiography comprising

a tubular flexible body portion,

a tubular flexible tip portion on one end of the body portion communicating therewith,

said tip portion having a loop formed therein with the plane of the loop being transverse to the axis of the body portion,

said loop having at least one arcuate portion with outwardly directed peripheral opening means formed therein,

said peripheral opening meansextending longitudinally in the peripheral wall of the one arcuate portion for a distance at leat two times the width of the opening means for directing a fan-like flow of contrast medium toward a selected sector of an aorta wall, and

said loop having adjacent arcuate portions devoid of peripheral openings on both sides of the one arcuate portion and extending for angular distances each greater than the angular distance of the one arcuate portion.

4,694,839

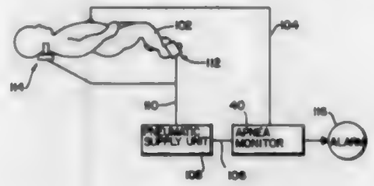
AUXILIARY STIMULATION APPARATUS FOR APNEA DISTRESS

William F. Timme, 891 Amaryllis Ave., Oradell, N.J. 07649

Filed Mar. 24, 1986, Ser. No. 842,831

Int. Cl.⁴ A61B *5/08*

U.S. Cl. 128—721 **19 Claims**



1. An apnea monitor-assist apparatus which provides physical stimulation of a patient in response to the monitor's reaction to a reduced respiratory action by the patient, said respiratory action of sufficient magnitude to actuate said monitor-assist and, in response to an electronic signal or signals from said monitor-assist, the assist apparatus is also actuated, said assist apparatus including:

(a) means for receiving a signal from an actuated monitor and electronically converting said received signal into an electrical flow of current to an electrical motor;

(b) a shoe removably attachable to a foot of a patient, said shoe characterized as having:

(b1) a selectable tightening means;

(b2) a sole member;

(b3) an upper portion attached to said sole member and, with said upper portion attached to the sole member, said selectable tightening means may be manipulated to cause the shoe to be attached to the foot of the patient, and

(b4) an enclosure removably attached to the sole member of the shoe;

(bb1) an electric motor arrayed within this enclosure and fixedly secured in spaced array from said sole;

(bb2) a shaft within said motor and extending therefrom;

(bb3) a disc eccentrically and securely mounted on said shaft and, when said motor is actuated so that the shaft is rotated, the eccentrically mounted disc is also rotated to cause vibration forces to be transmitted to the shoe and patient;

(c) a converter adapted to change electronic signals from said actuated monitor to electric current, and

(d) wire conducting means for transmitting electrical current from said converter to said motor in the enclosure portion of the shoe.

4,694,840

ELECTRO-THERAPEUTIC DEVICE

Alexandre Kairis, and Ronnie H. Colsen, both of Tokyo, Japan, assignors to 501 Waco Trading Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 601,167, Apr. 17, 1984, abandoned. This application Feb. 4, 1986, Ser. No. 825,919

Claims priority, application Japan, Oct. 25, 1983, 58-164090[U]; Nov. 16, 1983, 58-176085[U]

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—735 **10 Claims**

1. A probing and stimulating device for use with a sensitive point on the skin comprising:

a housing comprising a long and flat tube of insulating material;

a pair of electrodes disposed coaxially at one end of said housing, one of said electrodes forming a first center electrode having an axle shape surrounded by an insulating zone made from insulating materials, said insulating zone being thicker in the direction of radius than the diameter of a skin sensitive point, and the other of said electrodes forming a second annular electrode immediately surrounding the insulating zone in a coaxial arrangement with respect to said first center electrode;

electronic circuit means for locating and stimulating the sensitive point, said electronic circuit means including a locating circuit for locating a skin sensitive point, a stimulator circuit for stimulating the skin sensitive point, and a selector switch having a first position for selecting operation of the locating circuit and a second position for selecting operation of the stimulating circuit,

said locating circuit having a first lead for connecting the locating circuit to the selector switch, a second lead for connecting the locating switch to the first center electrode, and a third lead for connecting the locating circuit to the second annular electrode and to an electrical ground,

said stimulating circuit having a first lead for connecting the stimulating circuit to the selector switch, a second lead for connecting the stimulating circuit to the first center electrode and a third lead for connecting the stimulating circuit to the second annular electrode and to an electrical ground,



said locating circuit comprising a first lamp for indicating when the locating circuit is selected, whether the pair of electrodes are in contact with electrically low resistant skin, a second lamp for indicating, when the locating circuit is selected, alignment of the pair of electrodes with a skin sensitive point, a converter circuit connected to said second and third leads of the locating circuit and connected to said first lead through said first lamp and connected again to said first lead through said second lamp, said converter circuit comprising a first comparator for driving the first lamp when the electrodes are in contact with electrically low resistant skin, a second comparator driving the second lamp when the resistance across the electrodes drops, thereby indicating alignment with a skin sensitive point, said stimulating circuit comprising an electrically high potential pulse generator for developing a high potential peaked pulse, and a discriminating circuit for cutting off the lower level of said peaked pulse below a predetermined value, thus generating a pulse with a peaked crown of high potential for supplying to said electrodes.

4,694,841

SYSTEM FOR THE SELF-LIGHTING OF CIGARETTES

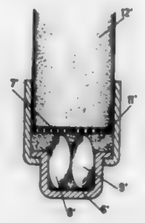
Natividad G. Esparza, C/ Bolivia 15, 28016-Madrid, Spain

Filed Jun. 21, 1985, Ser. No. 747,562

Claims priority, application Spain, Jul. 17, 1984, 534.390; Jan. 11, 1985, 539.495

Int. Cl.⁴ A24D *1/08*

U.S. Cl. 131—351 **28 Claims**



1. A cigarette lighting cap, comprising:

a housing having an upper section and a lower section divided by a grid, said upper section adapted to receive the front end of a cigarette;

a container located in said lower section of said housing and containing a substance which reacts, upon direct contact with air, to produce a sufficient amount of heat to ignite said front end of said cigarette when a cigarette is located in said upper section of said housing; and

means for breaking said container in response to a predetermined actuation by the user of said cap.

4,694,842

TEA-CONTAINING TOBACCO

Kouzou Kobayashi, 239-3 Miyanogicho, Chiga-shi, Japan (281)

Filed Sep. 21, 1983, Ser. No. 534,151

Int. Cl.⁴ A24B *15/18*; A24D *1/18*

U.S. Cl. 131—359 **1 Claim**

1. A tobacco composition consisting of tobacco leaves, green tea leaves, dry chrysanthemum flower and Cnidii Rhizoma.

4,694,843

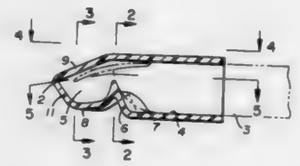
FINGERTIP COVER

Elaine J. Casenhiser, 379 Lindenwood Ave., Akron, Ohio 44301

Filed Oct. 7, 1986, Ser. No. 916,116

Int. Cl.⁴ A45D *29/00*; D05B *91/04*

U.S. Cl. 132—73 **8 Claims**



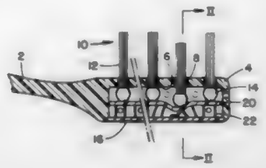
1. A finger-end cover comprising an elongate, flexible sheath having a closed front end and an open rear end, with a continuous tubular cavity extending therebetween, a stop barrier dividing said cavity into a front protector portion and a rear finger-gripping portion, said protector portion including stiffening means to resist collapse of the walls of said sheath, said gripping portion adapted to receive and retain a finger-end inserted therein no further than to said barrier, at which finger end location the said protector portion is adapted to surround and protect a nail on the finger end.

4,694,844

TOOTHBRUSH

Marta N. Berl, 15 Usha Street, Kiryat Bialik, and Esther Turner, 4 Harakafot Street, Haifa, both of Israel

Filed Feb. 22, 1985, Ser. No. 704,632
Claims priority, application Israel, Feb. 27, 1984, 71065
Int. Cl.[4] A46B *3/00*
U.S. Cl. 132—84 R **9 Claims**



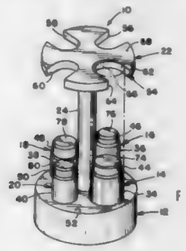
1. A toothbrush comprising:
a handle;
a hollow head contiguous with said handle and having a bottom provided with a plurality of holes passing through said bottom;
a plurality of tufts, each tuft consisting of a bundle of bristles fixedly joined together at one end portion thereof, said end portions forming joints, at least some of said tufts being slidingly mounted in said holes, with said joints located inside the hollow of said head, and the major portion of each of said tufts projecting from said head;
a cover plate for said head, to cover the hollow thereof, and
at least one element, elastically deformable in bending, being located inside said hollow head, said elastically deformable element being made of an elastomer and comprising a relatively thin plate, movably disposed in said hollow, one side of which plate is in contact with said tuft joints, and from the other side of which plate protrudes a plurality of flexible members abutting against the inner surface of said cover plate, which elastically deformable element, in the state of rest of said toothbrush, urges at least one of said tufts towards a limit position, wherein pressure applied to at least one tuft during use of said toothbrush will cause the collective tips of said tufts to conform to the contours of a given group of teeth as a result of at least one of said tufts being pushed into said head to varying degrees against the restoring force of said elastically deformable element, and wherein said holes directly support said tufts slidingly mounted therein.

4,694,845

COIN COUNTER AND WRAPPER AND METHOD OF COUNTING AND WRAPPING COINS

John Zay, 23623 Emmons Rd., Columbia Station, Ohio 44028

Filed May 5, 1986, Ser. No. 859,703
Int. Cl.[4] G07D *9/06*
U.S. Cl. 453—59 **12 Claims**



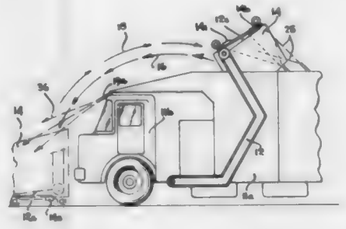
1. A coin counter and wrapper holder for use with a coin wrapper intended to contain a stack consisting of a predetermined number of coins, said coin counter and wrapper holder comprising
a base,
first wrapper support means connected with said base for positioning a first end portion of a coin wrapper,
end stop means connected with one of said base and first wrapper support means for abutting a first end of the coin wrapper to limit axial movement of the coin wrapper in one direction,
second wrapper support means connected with said base for positioning a second end portion of the coin wrapper, said second wrapper support means having a surface flush with a second end of the coin wrapper opposite the first end thereof and surface means defining a side opening in said second wrapper support means proportioned for receiving and embracing the coin wrapper, said second wrapper support means including a post connected with said base and a bracket including a plate which includes said surface, said bracket being mounted to said post, and
coin stack positioning means for supporting a stack of coins consisting of the predetermining number of coins with one end of the stack flush with said surface of said second support means
wherein said first wrapper support means comprises an upstanding member proportioned to fit inside the coin wrapper and said coin stack positioning means comprises an end face of said upstanding member.

4,694,846

GARBAGE TRUCK WITH TRASH BIN CLEANING SYSTEM

Roland D. Bouchard, 15419 Doty Ave., Lawndale, Calif. 90260

Filed Sep. 9, 1986, Ser. No. 905,197
Int. Cl.[4] B08B *3/02, 9/08;* **A61L** *11/00*
U.S. Cl. 134—78 **6 Claims**



1. In a garbage truck for removing garbage contained in a trash bin, said truck including a compartment for receiving garbage from said bin, a cab for the operator of the truck and conveyor arm means for lifting the bin from a first upright position on the ground to a second inverted position above said compartment whereat the garbage is emptied into the compartment and then returned back to its initial upright position on the ground, the improvement being means for washing and deodorizing said trash bin comprising:
a first set of spray nozzles mounted on said truck behind the compartment,
means for feeding a washing liquid to said first set of nozzles when the bin is on its inverted position and after the bin has been emptied,
said first set of nozzles being positioned to direct sprays of said washing liquid against the interior and exterior walls of said bin,
a second set of spray nozzles mounted on the cab of the truck, and
means for feeding deodorizing liquid to said second set of nozzles after the bin has been sprayed from first set of nozzles and has been returned to its upright position on the ground,

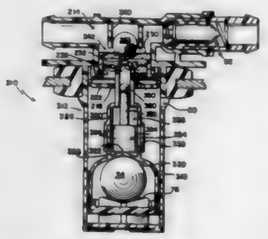
said second set of nozzles being positioned to direct sprays of said deodorizing liquid against the interior and exterior walls of said bin.

4,694,847

ROLL-OVER VALVE WITH SEALING BALL

Emil Szlaga, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 911,243, Sep. 24, 1986, which is a continuation-in-part of Ser. No. 837,152, Mar. 7, 1986, Pat. No. 4,655,238. This application Oct. 9, 1986, Ser. No. 916,879
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—39 **20 Claims**



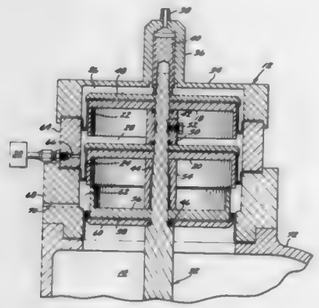
1. A roll-over valve for use in a vehicle fuel system having an outlet for discharging fuel vapor, the roll-over valve comprising
a hollow valve member terminating in a distal tip formed to include a top aperture and having a side wall formed to include at least one side aperture,
roll-over means for moving the distal tip from an outlet-opening position to an outlet-closing position in response to tilting the hollow valve member during vehicle roll-over conditions, and
closing means in the hollow valve member for closing the top aperture in response to predetermined tilting movements of the hollow valve member so that passage of fuel through the outlet is blocked.

4,694,848

FLOW CONTROL VALVE

Walter E. Jorgensen, 815 Columbia St., So., Pasadena, Calif. 91030, and Robert L. Linquist, 11851 Melody Park Dr., Garden Grove, Calif. 92640

Filed Oct. 24, 1985, Ser. No. 790,956
Int. Cl.[4] F16K *31/126*
U.S. Cl. 137—114 **4 Claims**



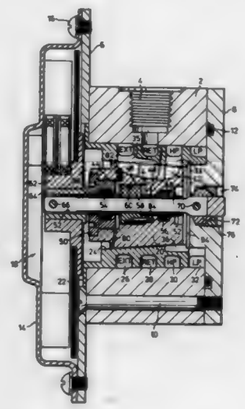
1. A direct acting flow control valve comprising:
a valve body;
valve means movable in said valve body for throttling a flow of fluid through said valve body;
bias means operative upon said valve means for biasing said valve means in a first direction;
first actuator means coupled to said valve means and including first rolling diaphragm means fixed to said valve body for defining an actuator chamber, and for operating said valve means in a direction opposite said first direction in response to an operating fluid pressure developed in said actuator chamber;
means for admitting fluid to said actuator chamber for developing said operating fluid pressure;
second actuator means coupled to said valve means and including second rolling diaphragm means fixed to said valve body in spaced relation to said first rolling diaphragm means for defining a leakage chamber for retaining any fluid leaking past said first rolling diaphragm means as a consequence of a failure of said first rolling diaphragm means, said second rolling diaphragm means having the same dimensions and configuration as said first rolling diaphragm means whereby, upon any failure of said first rolling diaphragm means, said second rolling diaphragm means is adapted for operating said valve means in a manner identical to that of said first rolling diaphragm means;
response means for sensing the development of said operating fluid pressure in said leakage chamber upon leakage of fluid past said first rolling diaphragm means and into said leakage chamber;
third actuator means coupled to said valve means in spaced relation to said second actuator means for movement in said first direction in response to a pressure head developed in said valve body by said flow of fluid through said valve body, and for isolating said second actuator means from said flow of fluid; and
vent means for venting to atmosphere the space between said second actuator means and said third actuator means.

4,694,849

HYDRAULIC CONTROL VALVES

William H. S. Rampen, R.R. No. 1, Oakville, Ontario, Canada L6J 4Z2

Continuation-in-part of Ser. No. 633,504, Jul. 23, 1984, abandoned. This application May 5, 1986, Ser. No. 859,787
Int. Cl.[4] F16K *11/083;* **F15B** *9/08*
U.S. Cl. 137—312 **16 Claims**



1. In a balanced hydraulic valve structure of the type comprising a stationary member and a rotatable plug received in a bore defined in the stationary member, wherein valving is achieved by establishing selective communication between

valve ports opening into the bore defined by the stationary member through cavities formed in the plug, the ports and cavities being arranged so that there is substantial cancellation of radially acting hydrostatic forces acting on the plug, and the plug and the bore being provided with complementary tapers; the improvement wherein a variable leakage path is defined between the plug and the bore of a magnitude determined by their relative axial position; linear actuator means is provided to sustain unbalanced axial hydrostatic forces acting on the tapered plug; and means are provided to sense movement of the plug and to establish a negative feedback loop to said linear actuator means whereby to cause the latter to oppose movements of the plug tending to alter the leakage path from a nominal value corresponding to an equilibrium position of the plug relative to the bore.

4,694,850

GAS SUPPLY MECHANISM

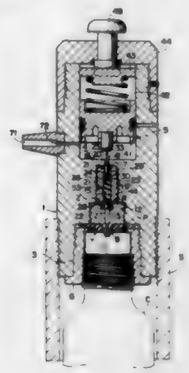
Ichiro Fumino, Tokyo, Japan, assignor to Nippon Tansan Gas Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,233

Claims priority, application Japan, Oct. 11, 1985, 60-154352 [U]; Nov. 19, 1985, 60-176841[U]; Mar. 27, 1986, 61-67193

Int. Cl.⁴ F16K *51/00*; B67B *7/24*

U.S. Cl. 137—318 **5 Claims**



1. A gas supply mechanism comprising a main body which has a hole therethrough on the axial line thereof containing a socket for a pressure cartridge on one end thereof and a second pressure chamber with a pressure modulating mechanism on the other end thereof, a nut screwed into said socket and around a top portion of said pressure cartridge to settle a packing disposed between the main body and said cartridge top portion, said packing having an O-ring part and a flat ringlike flange part on the periphery thereof, a piercing body having a needle projecting downwardly and into engagement with said packing at said cartridge top portion, said needle having a gas passage therethrough on the axial line thereof, a valve housing having a gas passage therethrough on the axial line thereof and having a cavity in which a sealing member is settled and an outer periphery on which communicates with said gas passage through a bypass at one end of and around said gas passage; said hole in said body comprising midway therethrough a first portion which communicates with the second pressure chamber and through which a valve pin moves, a second portion which communicates with said first portion and which receives said valve housing, and a third portion which communicates with said second portion and into which said piercing body screws; said valve pin co-operating with said sealing member to make and cut off connections between said gas passage and said second pressure chamber, said packing being settled in said main body by said nut with its flange part on said piercing body and with its O-ring part being deformed around said needle and into engagement with said cartridge top portion when said needle pierces said cartridge top portion, to thereby provide an effective seal between said needle and said cartridge top portion.

4,694,851

FLOW REGULATOR AND ITS USE

Erkki Aalto, and Veikko Ylä-Hemmilä, both of Kausala, Finland, assignors to Halton Oy, Finland

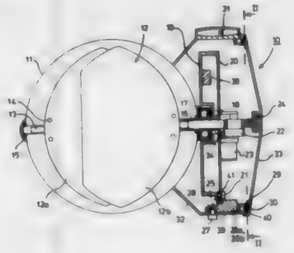
PCT No. PCT/FI84/00038, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04804, PCT Pub. Date Dec. 6, 1984

PCT Filed May 17, 1984, Ser. No. 694,393

Claims priority, application Finland, May 20, 1983, 831802

Int. Cl.⁴ F16K *17/34*; F24F *11/04*

U.S. Cl. 137—499 **13 Claims**



1. A flow regulator intended for gaseous substances, in particular for air in air-conditioning and ventilation installations for maintaining the volumetric flow of a gaseous substance at desired magnitude with sufficient accuracy at differential pressure across the flow regulator varying within given limits, said flow regulator comprising an envelope and a regulating member disposed in a flow passage confined by the envelope, characterized in that the flow regulator is provided with limiting members constituting means for restricting the differential pressure range of the flow regulator, said limiting members being disposed to limit the movement of the regulating member, wherein minimum and maximum breadth of the differential pressure are arbitrarily determined by said limiting members.

4,694,852

FLOW REGULATING VALVE FOR CONTROLLING THE FLOW OF CORROSIVE FLUIDS

Robert W. Grant, Pleasanton, Calif., assignor to FSI Corporation, Chaska, Minn.

Continuation-in-part of Ser. No. 693,127, Jan. 22, 1985, abandoned. This application May 30, 1986, Ser. No. 868,568

Int. Cl.⁴ G05D *7/01*

U.S. Cl. 137—501 **7 Claims**

1. A fluid flow regulating valve for controlling the flow of a corrosive fluid, comprising:

a solid valve body having an inlet, an outlet, and a plurality of intersecting bores in said body forming a passage for flow between said inlet and said outlet;

a flow controlling orifice in said passage said element comprising a cylindrical wall with at least one fluid control orifice in said wall;

a fluid-tight chamber having an interior wall surface;

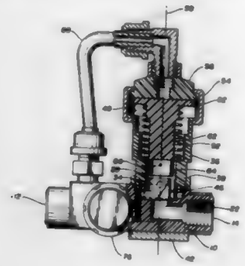
a movable piston disposed in said chamber, said piston having an integrally formed radially resilient sealing ring around its periphery engaging the interior wall surface of said chamber;

means for generating a first and second fluid pressure whose difference is proportional to said fluid flow;

means for coupling said first pressure to said chamber on one said piston;

means for coupling said second pressure to said chamber on the other side of said piston;

a valve stem connected to said piston; and



a cylindrical recess in said stem forming a control surface in sliding engagment with said cylindrical wall whereby movement of said piston causes said control surface to move across said fluid control orifice.

4,694,853

WAFER CHECK VALVES

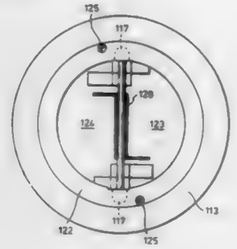
Richard S. Goodwin, Stoke-On-Trent, England, assignor to R. Goodwin International Ltd., Hanley-Stoke-On-Trent, England

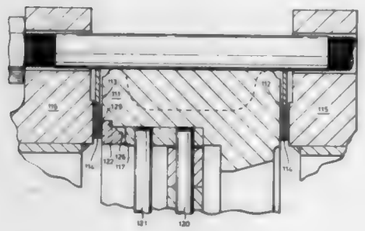
Filed May 2, 1985, Ser. No. 729,741

Claims priority, application United Kingdom, May 2, 1984, 8411255; Feb. 6, 1985, 8503035

Int. Cl.⁴ F16K *15/03*

U.S. Cl. 137—512.1 **2 Claims**





1. A wafer check valve comprising an annular housing having two end faces, a passage through said housing, said passage comprising, at one section of the housing, two generally semicircular opening, sealing surfaces formed on the housing within said passage around said openings, two closing flaps effective to close respective ones of said openings, spring means to urge said flaps to a passage closing position in contact with said sealing surfaces, diametrically opposed axially extending slots formed in asaid housing and opening into said passage towards one end face of said housing, an insert received in each of said slots, a radial bore in each insert, said bores opening in said passage, a hinge pin on which said flaps are both pivotally mounted, end portions of said hinge pin being received in each of said bores to mount said hinge pin diametrically in said housing, said hinge pin end portions and said bores being dimensioned to allow limited axial play between said hinge pin and said inserts to facilitate opening and closing of said flaps without any wear on the housing or sealing surfaces, retaining means fixedly securing said inserts in said slots and effective to preclude any axial movement between said inserts and said housing, said retaining means comprising an annular groove formed in said housing, said groove opening into said passage and into said one end face and said slots opening into said annular groove, a retaining ring located in said annular groove and abutting said inserts, means securing said retaining ring against movement to thereby prevent said inserts from moving in said housing, the ring having a smaller outer radius than said one end face whereby the junction between said ring and said one end face is radially inwards of the outer edge of said one end face, whereby upon location of the valve in a pipe system with a flange abutting said one end face a gasket can be located to cover said junction without being subject to localised increased degradation forces.

4,694,854

DEVICE FOR REGULATING THE DISCHARGE OF FLUID FROM A CONTAINER

Klaus U. Giehl, Heimborn, Fed. Rep. of Germany, assignor to Lothar Steinhardt, Fed. Rep. of Germany

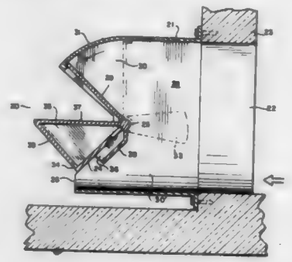
PCT No. PCT/DE84/00221, § 371 Date Jun. 6, 1985, § 102(e) Date Jun. 6, 1985, PCT Pub. No. WO85/01974, PCT Pub. Date May 9, 1985

PCT Filed Oct. 25, 1984, Ser. No. 744,068

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338793; Sep. 27, 1984, 3435450

Int. Cl.⁴ F16K *17/12*

U.S. Cl. 137—519 **15 Claims**



1. A regulating device for controlling the flow of a fluid from a container through an outlet opening provided in the container, the regulating device comprising

a throttling unit which is seated to pivot on an axis and can close in a manner that regulates the cross-sectional area of closure of the outlet opening,

counterweight means situated outside of the container for normally retaining the throttling unit in an inactive position away from the outlet opening to maximize the cross-sectional area of the outlet opening, the counterweight means acting to pivot the throttling unit in a first direction toward its inactive position, and

hydrostatic pressure detector means connected to the counterweight means for pivoting the throttling unit in an opposite second direction to a throttling position at least partially closing the outlet opening in response to an increase in head pressure of fluid in the container in excess

of a predetermined threshold level so that the cross-sectional area of the outlet opening is functionally related to head pressure of fluid in the container.

4,694,855

DRILL PIPE INSIDE BLOWOUT PREVENTER

Robert A. Cunningham, Bellaire, Tex., assignor to Hughes Tool Company - USA, Houston, Tex.

Continuation of Ser. No. 655,282, Sep. 28, 1984, abandoned. This application May 23, 1986, Ser. No. 869,833
Int. Cl.⁴ F16K *15/04*
U.S. Cl. 137—519.5 **10 Claims**



10. An inside blowout preventer for use in a drill string comprising in combination:

a valve body having upper and lower ends for connection to the drill string;

a longitudinal passage extending through the body with an upper inlet and a lower outlet for the passage of fluid, having an upper section tapering gradually to a central section with a larger flow area and a lower section tapering gradually downwardly from the central section to a smaller flow area portion;

a ball seat located in the upper section and facing toward the outlet, the length of the upper section being substantially greater than the diameter of the seat;

a ball storage member having an upper end containing a concave socket facing the inlet for snugly receiving the ball and located in the central section of the longitudinal passage;

in case of upward flow from the outlet to the inlet of sufficient velocity, the ball being movable from the socket to the seat; and

a generally tooth-shaped guide member projecting upwardly from an edge of the socket for guiding the ball into the socket.

4,694,856

FLUID CONTROL DEVICE PARTICULARLY USEFUL IN LIQUID TRANSFUSION APPARATUS

Saul Leibinsohn, 11 Olei Hagardom Street, Rishon Lezion, Israel

Filed Nov. 7, 1985, Ser. No. 795,861
Claims priority, application Israel, Nov. 23, 1984, 73598
Int. Cl.⁴ F16K *7/06;* **A61M** *5/16*
U.S. Cl. 137—555 **3 Claims**

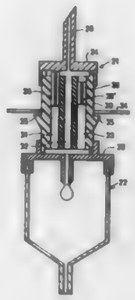
1. A fluid flow control device connectable in a line for controlling the flow of fluid therethrough, comprising:

an inlet connector and an outer connector;

a flexible conduit defining at least three passageways in side-by-side relation extending in parallel between said inlet and outlet connectors to provide at least three parallel paths for the flow of the fluid therebetween;

one of said passageways having a full, unrestricted flow rate;

a restrictor in each of the other two passageways for restricting the flow therethrough according to fixed predetermined rates lower than that of said one passageway;



a pivotable clamp receiving said flexible conduit and having a cam member shaped such as to close the center passageway and one end passageway in one pivoted position, the center passageway and other end passageway in another pivoted position, and to open all said passageways in a third pivoted position;

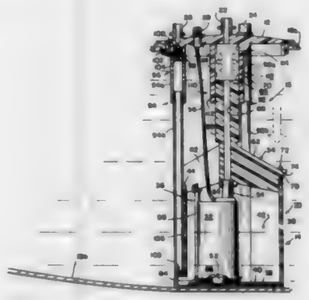
said pivotable clamp having a lower arm carrying indicia markings identifying the flow rate of the device according to the pivoted position of the lever arm.

4,694,857

FUEL SENDER UNIT

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Mar. 31, 1986, Ser. No. 846,080
Int. Cl.⁴ F04B *39/12*
U.S. Cl. 137—565 **37 Claims**



1. A fuel sender unit for delivering fuel from a fual tank having a bottom wall, the fuel sender unit comprising

a support fixtures mounted on the fuel tank,

sending means for pumping fuel in the fuel tank toward a point of use outside the fuel tank, the sending means being situated within the fuel tank, and

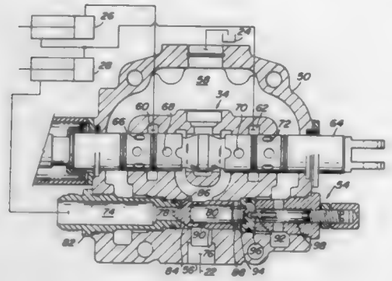
extensible means for coupling the sending means to the support fixture so that said sending means is movable within the fuel tank in relation to the support fixture in response to fuel pressure generated during operation of the sending means to reach and pump fuel accumulating along the bottom wall of the fuel tank.

4,694,858

HYDRAULIC CONTROL VALVE

Gary Sutton, Augusta, Ga., assignor to General Signal Corporation, Stamford, Conn. and Dempster Systems, Inc., Knoxville, Tenn.

Division of Ser. No. 683,823, Dec. 19, 1984, Pat. No. 4,642,019. This application Aug. 29, 1986, Ser. No. 901,684
Int. Cl.⁴ F15B *13/06*
U.S. Cl. 137—596 **5 Claims**



1. In a control valve including a housing having an inlet passageway, an exhaust passageway, two motor passageways and a moveable valve element having a first position in which one motor passageway is placed in fluid communication with the inlet passageway and the other motor passageway is placed in fluid communication with the exhaust passageway, an opposite second position in which the other motor passageway is placed in fluid communication with the inlet passageway and said one motor passageway is placed in fluid communication with the exhaust passageway, and a third position in which each motor passageway is isolated from the other three passageways, the improvement comprising:

a third motor passageway in said housing and a combination sequence and regeneration valve in fluid communication with said third motor passageway and said inlet passageway for preventing fluid communication between said third motor passageway and said inlet passageway when the pressure in said inlet passageway is below the first predetermined amount and for permitting bidirectional fluid communication between said third motor passageway and said inlet passageway when the pressure in said inlet passageway exceeds said first predetermined amount.

4,694,859

UNDERSEA HYDRAULIC COUPLING AND METAL SEAL

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Company, Inc., Stafford, Tex.

Filed Nov. 25, 1985, Ser. No. 801,477
Int. Cl.⁴ F16L *29/00*
U.S. Cl. 137—614.04 **21 Claims**

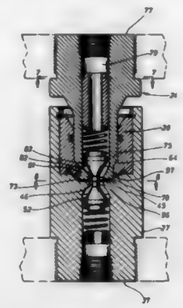
1. A coupling, comprising:

(a) a body having a first longitudinal bore, said first bore having a circumferential shoulder therein;

(b) a retainer adapted to be inserted into a first end of said first longitudinal bore and to seat on said shoulder, said retainer having a second longitudinal bore;

(c) a probe adapted to be inserted through said second longitudinal bore ane into said first longitudinal bore; and

(d) a reusable annular metal seal insertable into said first longitudinal bore to be interposed between said shoulder and said retainer upon insertion of asid retainer into said first longitudinal bore, said seal being configured to engage said first bore and the circumference of said probe as



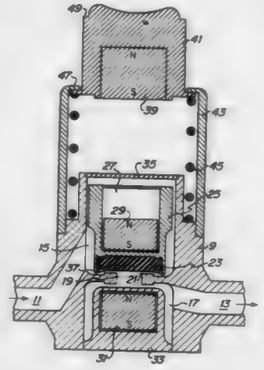
said probe is inserted through said second bore and into said first bore.

4,694,860

FLUID-FLOW ISOLATION AND CONTROL APPARATUS AND METHOD

Paul G. Eldsmore, 2 Blue Hill Ct., Scotts Valley, Calif. 95066

Continuation-in-part of Ser. No. 675,825, Nov. 28, 1984, Pat. No. 4,624,443, which is a continuation-in-part of Ser. No. 398,845, Jul. 16, 1982, abandoned. This application Feb. 4, 1986, Ser. No. 826,022
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 137—614.21 **16 Claims**



1. Apparatus for controlling the flow of fluid under pressure, comprising:

a body having first and second fluid channels therein and an aperture communicating between the first and second fluid channels;

an element mounted within the first fluid channel for selective movement into and away from engagement with the aperture for selectively forming a fluid-tight seal therewith, said element including an elongated chamber having a first dimension therewithin substantially aligned with the direction of movement of the element;

a first magnet having a second dimension substantially less than said chamber first dimension, said first magnet being slidably disposed in said chamber for movement between a first position adjacent the aperture and a second position remote from said aperture;

a second magnet positioned within the second fluid channel to magnetically urge the first magnet into said first posi-

tion and to urge the element into engagement with said aperture; and,

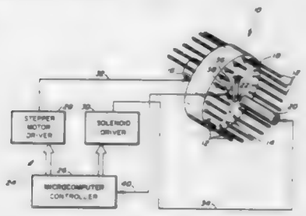
magnet means disposed external to the first and second fluid channels for selectively magnetically actuating said first magnet to slide within said chamber to said second position and urge the element away from engagement with said aperture.

4,694,861

ROTARY PINCH VALVE

David L. Goodale, Anaheim, and Nick Darden, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 22, 1986, Ser. No. 944,363
Int. Cl.[4] F16K *7/06*; F16L *55/14*
U.S. Cl. 137—624.19 **10 Claims**



1. A random-access pinch valve adapted to selectively pinch and release a plurality of fluid conduits, comprising:

a valve body adapted to retain the fluid conduits;

an actuator arm;

a plurality of toggle mechanisms associated with respective flexible conduits retained by the valve body, each toggle mechanism including latching means responsive to actuation by the actuator arm for positioning the toggle mechanisms in latched or unlatched states, and means for pinching the flexible conduit associated with the toggle mechanism when the toggle mechanism is in one of the latched or unlatched states and for releasing the flexible conduit associated with the toggle mechanism when the mechanism is in the other of the latched or unlatched states;

means for positioning the actuator arm with respect to the toggle mechanism; and

means for actuating the arm to change the state of the toggle mechanism actuated by the arm.

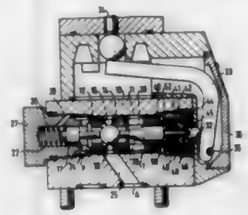
4,694,862

VALVE FOR ATTACHMENT TO AN ACTUATING MEANS

Horst Rott, Mühlbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,413
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509479
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.5 **9 Claims**

1. Valve for attachment to an actuating means comprising a housing defining a bore, a plurality of separate valve seat components arranged axially adjacent each other in said housing bore and clamped between a closure screw screwed to an internal thread of said housing bore and a stop, and valve elements consisting at least of a valve body cooperable with oppositely facing valve seats formed on certain of said valve seat components and an actuating pin displaceable axially with respect to said valve seat components, said actuating pin extending outwardly through said housing bore and being sealed by means of at least one seal with respect to the housing bore, said actuating pin cooperating with an external actuator, characterized in that said stop for the valve seat components is formed by a second closure screw screwed into an internal thread at the other end of said housing bore and freely adjustable in an axial direction for adjusting the spacing between a



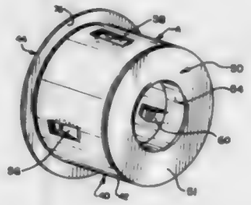
reference plane of said valve housing, said actuating pin and said valve seat components by turning the two closure screws.

4,694,863

PROTECTIVE CAP

James L. Klopp, Stow, Ohio, assignor to Cajon Company, Macedonia, Ohio

Filed Jan. 15, 1986, Ser. No. 819,237
Int. Cl.[4] F16L *57/00*
U.S. Cl. 138—96 R **22 Claims**



1. A protector for the end of a fluid conduit, said conduit including a cylindrical end portion with an inwardly extending flow passage having a generally transverse sealing face located circumferentially about the outer end thereof and a flange positioned about the exterior of the cylindrical end portion at a location spaced inwardly from the sealing face; said protector comprising:

an annular body portion having first and second ends, said first end having an inner diameter for closely receiving the cylindrical end portion of the conduit;

an end wall on said second end of said annular body portion, said end wall extending radially and axially inwardly of the annular body portion to a centrally disposed aperture opening to the interior of said annular body portion, said aperture located to be in general alignment with the flow passage of the conduit when the annular body portion receives the cylindrical end portion of the conduit, wherein said aperture has a diameter at least approximately two thirds as large as a diameter of said annular body portion; and,

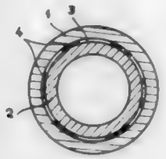
fastener means integral with said body portion for selectively holding the protector on an associated fluid conduit, said fastener means comprising a plurality of spaced resilient V-shaped tangs each having a smooth contact face means for slidingly engaging a cylindrical outer periphery of the associated fluid conduit.

4,694,864

DOUBLE-WALL TUBE FOR A HEAT EXCHANGER

Bernard Libin, Marly Le Roi, France, assignor to Novatome, Le Plessis Robinson, France

Filed Apr. 29, 1985, Ser. No. 728,420
Claims priority, application France, May 4, 1984, 84 06940
Int. Cl.[4] F16L *9/18*
U.S. Cl. 138—113 **8 Claims**



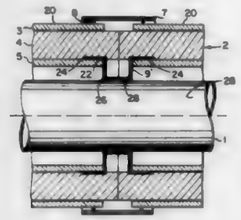
1. A double-wall tube for a heat exchanger having two fluids, the tube comprising an inner tubular wall and outer tubular wall, the inner wall being disposed coaxially inside the outer wall with a very small clearance therebetween,with a subsequent tight fit therebetween, the inner wall having a smaller diameter being adapted to come into contact with one of said fluids by an inner surface and the outer wall having a larger diameter being adapted to come into contact with the other fluid by an outer surface, and a layer of brazing metal having a thickness between 10 and 30 microns interconnecting the outer surface of the inner wall and the inner surface of the outer wall in regions which are discontinuous both in a circumferential direction and in a longitudinal direction of the tube and together represent between 5 and 15% of confronting surfaces of the inner and outer walls of the tube.

4,694,865

CONDUIT

Otto Tauschmann, Ostmarkgasse 23/9, Wien, Austria

PCT No. PCT/AT84/00038, § 371 Date Jun. 25, 1985, § 102(e) Date Jun. 25, 1985, PCT Pub. No. WO85/02003, PCT Pub. Date May 9, 1985
PCT Filed Oct. 31, 1984, Ser. No. 752,336
Claims priority, application Austria, Oct. 31, 1983, 3846/83
Int. Cl.[4] F16L *59/06*
U.S. Cl. 138—148 **11 Claims**



1. A conduit for transporting a liquid or a gas comprising:

a media pipe providing a conduit for the gas or liquid to be transported;

an envelope coaxially enclosing said media pipe for insulating said pipe, said envelope including a plurality of segments connected together for enclosing and insulating said media pipe; and

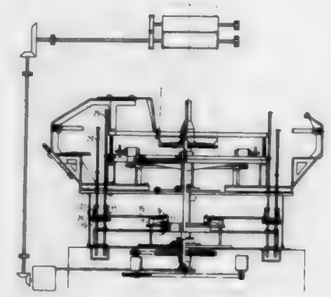
at least one sliding member coaxially disposed between the inner walls of said envelope and the outer walls of said media pipe, said sliding member being held in abutment between two of said segments and providing an insulating air gap between said inner walls and said outer walls, said at least one sliding member including a cylindrical sleeve having two opposing end sections connected by a middle section, said end sections contacting two of said segments in concentric arrangement therewith, said middle section having a plurality of inwardly extending portions for coaxially engaging said outer walls of said media pipe, each of said inwardly extending portions having inclining portions connected by an arcuate bridge portion, said bridge portion contacting said outer walls of said media pipe.

4,694,866

SHEDDING DEVICE FOR A CIRCULAR WEAVING MACHINE

Huang Kuo-Ching, No. 43, Bao An Village, Ren Der, Shiang, and Lin Yong-Hung, No. 5, Lane 140, Jong Jeng Rd. Gong How Villiage, Shin Gang Shiang, Jia Yih, both of Taiwan

Filed May 5, 1986, Ser. No. 859,828
Int. Cl.[4] D03D *37/00*
U.S. Cl. 139—13 R **6 Claims**



1. A shedding device for moving shedding rods of a circular weaving machine having a rest base, the shedding rods being for moving vertical yarns and being mounted for vertical movement to the rest base, the shedding device comprising:

a drive shaft mounted for rotation about a vertical axis;

a cam fixed to said drive shaft for rotation therewith and carrying a cam path lying in a horizontal plane;

a cam follower support;

a cam follower means connected to said follower support and engaged in said cam path for moving said cam follower support in a horizontal plane when said drive shaft is rotated;

a cantilever arm mounted to the rest base for rotation about a vertical axis for rocking in a horizontal plane, said cantilever arm having an outer end pivotally connected to said cam follower support for holding said support at a fixed rotational position with respect to said cam;

a pair of control rods each having one end connected to said support and each having an opposite end; a pair of cranks pivotally connected to the rest base, each crank having a first arm connected to said opposite end of one control rod, each crank having a pair of second arms;

a clamp connected to each shedding rod;

a link pivotally connected to each second arm of each crank; each link being pivotally connected to one of said clamps so that, with rotation of said cam, said support and control rods move horizontally to pivot said cranks and move the shedding rods up and down; and

wherein said follower means comprise a first cam follower at one end of said support and a second cam follower at an opposite end of said support, each cam follower comprising a roller engaged with said cam path, one control rod being pivotally connected to said support adjacent one of said followers and the other control rod being pivotally connected to said support adjacent the other of said fol-

lowers, said free end of said cantilever arm being pivotally mounted to said support between said cam followers whereby said support rotates about the pivotal connection between said cantilever arm and said support and moves horizontally with vertical swinging of said cantilever arm as said cam rotates.

4,694,867

LOOM REED

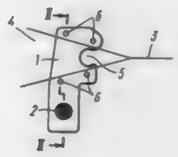
Mikhail A. Gendelman; Anatoly F. Borodulin; Diana F. Golubeva, and Sergei V. Bychkov, all of Klimovsk Moskovskoi, U.S.S.R., assignors to Klimovskoe Spetsialnoe Konstruktorskoe Bjuro Po Proektirovaniju Tkatskogo Oborudovania, Klimovsk, U.S.S.R.

Filed Oct. 7, 1986, Ser. No. 916,224

Claims priority, application U.S.S.R., Oct. 8, 1985, 3975056

Int. Cl.⁴ D03D *49/62*

U.S. Cl. 139—192 **4 Claims**



1. A reed for a loom comprising a plurality of plates each having a central portion to be accommodated in a shed area of the loom and having upper and lower portions to be situated above the shed area and below the shed area respectively, means interconnecting the lower portions of the plates to align the plates in a successive row, aligned recesses in the central portions of the respective plates to be accommodated in the shed area, said recesses jointly defining an open guiding channel for accommodating the motion of an inserter through the shed of the loom and for leading out a weft thread inserted by the inserter, and projections provided on said upper and lower portions of at least some of the plates, the projections facing adjacent ones of the plates and each having a thickness which is smaller than a space between the plates.

4,694,868

APPARATUS FOR MANUFACTURING A DISC-SHAPED CURVED MAGNET COIL

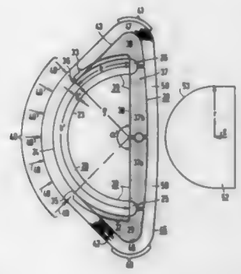
Andreas Jahnke, Forchheim; Günter Ries, and Konrad Meier, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 5, 1985, Ser. No. 805,331

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444983; Aug. 19, 1985, 3529607

Int. Cl.⁴ H01F *41/00*

U.S. Cl. 140—92.1 **15 Claims**



1. Apparatus for manufacturing a disc-shaped curved magnet coil, for a system for at least one of accelerating and storing electrically charged particles, wherein the conductors of the coil to be made are arranged about a winding core which is curved along a central arc length (b) with at least approximately constant spacing (2D) between long sides thereof having a curvature and wherein said conductors are fixed in position about the winding core, comprising an approximately lens-shaped fitting piece as a coil form added to the concave inside of the winding core so as to form a provisional winding body with only positive radii of curvature on outsides thereof, the conductors being wound under tension about said provisional winding body and subsequently fastened only to the winding core of the winding body, said coil form being removable whereby the exposed conductor portions facing the region of the concave inside of the winding core may be pressed against the concave inside and the conductor portions fixed in position against the concave inside of the winding core.

4,694,869

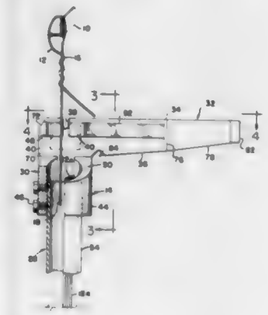
TOOL FOR WRAPPING DROP WIRES FOR SUSPENDED GRID CEILING

Otis Wolford, Jr., 1105 N. Meadow La., Mt. Prospect, Ill. 60056, and Richard P. Wolford, 55 Payson Ct., Hoffman Estates, Ill. 60194

Filed May 12, 1986, Ser. No. 862,469

Int. Cl.⁴ B21F *7/00*

U.S. Cl. 140—119 **18 Claims**



1. A tool for positioning and wrapping a hanger wire, having tension and wrap sections connected together across a bend section, onto and to an overhead support member, initially with the bend section overlying the support member and the tension and wrap sections then being on opposite sides of the support member and spaced apart and each extended below the support member, and then with a wrap configuration underlying the support member, the combination comprising

an elongated member;

means extending axially upward beyond one end of the elongated member, along one side thereof;

a slot open downwardly from an upper edge of the axially extending means and extended radially of the elongated member,

said slot having a width sized to loosely receive the bend section on one hanger wire, and having a length extended radially of the elongated member, a distance less than the separation between the tension and wrap sections but sufficient to restrict wobble of the hanger wire as supported therein;

a finger supported off the axially extended means and projected laterally of the elongated member and the radial direction of the slot, said finger being extended from the elongated member a distance greater than the separation between the tension and wrap sections,

the tension section of a first hanger wire being received in the elongated member and the bend section than being received in the slot, to stably support the wrap section spaced from the tool in a position to be hooked over the support member, upon downward movement of the tool,

whereby upon rotation of the tool about the elongated member, the finger catches the wrap section under the support member and bends it over and wraps it around the tension section, to define the wrap configuration, and the tension section of the first hanger wire then being withdrawn from the elongated member from the upper end thereof.

4,694,870

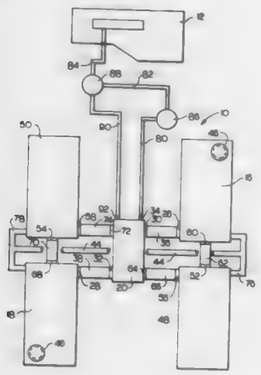
VENTED FUEL SYSTEM FOR A VEHICLE

Robert M. Vize, Bettendorf, Iowa, assignor to Caterpillar Inc., Peoria, Ill.

Filed Jun. 13, 1986, Ser. No. 873,977

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—326 **14 Claims**



1. A vented fuel system for supplying fuel to the engine of a vehicle, comprising:

a first fuel storage tank having a filler spout and an outlet opening and being positioned on a first side of said vehicle;

a second fuel storage tank having a filler spout and an outlet opening and being positioned on a second opposite side of said vehicle;

a fuel sump tank having first and second fuel inlet openings and a fuel outlet opening and being positioned intermediate said first and second fuel storage tanks;

a first air transfer line connecting said first fuel storage tank to said second fuel storage tank;

first and second fuel lines connecting said first and second fuel storage tank outlet openings respectively to said first and second fuel inlet openings of said fuel sump tank; and

a vented fuel cap assembly removably secured to one of the filler spouts of said first and second fuel storage tanks.

4,694,871

PROCESS FOR THE MANUFACTURE OF PANEL-TYPE WORKPIECES WITH ASSEMBLY BORES, MORE PARTICULARLY, MADE OF WOOD OR WOOD-LIKE MATERIAL AND APPARATUS FOR PERFORMING THE PROCESS

Erwin Jenkner, Lindenstrasse 13, Gechingen, Fed. Rep. of Germany D-7261

Filed Dec. 6, 1985, Ser. No. 806,274

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444929; Jun. 21, 1985, 3522278

Int. Cl.⁴ B27M *1/08*

U.S. Cl. 144—35 R **12 Claims**

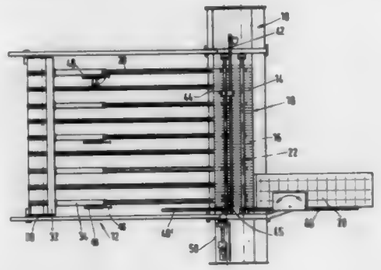
1. An apparatus for cutting panel-type workpieces and for making bores on the flat face and/or at the end faces thereof, having a frame comprising a workpiece receiving device equipped with a workpiece clamping device, a saw carriage displaceable along a straight guide relative to the workpiece receiving device and a boring device arranged in movable and settable manner on the frame, said apparatus comprising:

said saw carriage being guided beneath a workpiece support table having a saw slit formed therein;

a side stop extending substantially perpendicularly to said saw slit and being arranged on said workpiece support table proximate a first end of said saw slit;

said workpiece advancing device being further provided with a programmable workpiece slide which is transversely and horizontally adjustable in relation to said saw slit to enable splitting up of said workpieces into a plurality of panel-type sections of desired dimensions;

said workpiece advancing device further being capable of carrying a workpiece in both directions of travel of said workpiece;



said workpiece advancing device further being fixable in predetermined positions relative to said saw slit;

said boring device comprising a programmed boring device being positioned especially beneath said workpiece support table so as to automatically provide a desired preselected configuration of bores into said flat face and/or end faces of said workpieces;

said boring device being variably adjustable and lockable along a line parallel to said saw slit and further being movable in a direction of advance;

said boring device comprising at least one vertical boring head for said flat face boring and an additional boring head for end face boring which is vertically adjustable and lockable; and

said boring device being further provided with two oppositely arranged and oppositely movable boring spindles extending in a horizontal plane transversely to said saw slit.

4,694,872

HIGH PERFORMANCE DRIVE TIRE ARRANGEMENT FOR AGRICULTURAL TRACTORS

Thorvald G. Granryd, 1260 N. Western Ave., Lake Forest, Ill. 60045

Filed Aug. 5, 1985, Ser. No. 757,342

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.⁴ B60C *27/20*; A01B *33/00*

U.S. Cl. 152—216 **13 Claims**

1. Traction intensifying means for a rubber tired vehicle having a power driven wheel, including a tire, a rim and a hub, said traction intensifying means comprising

a structural member secured to the rim of the tire,

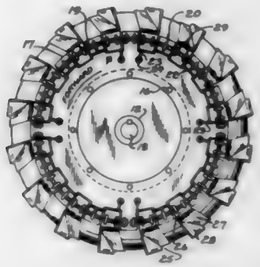
frame means secured to said structural member for forming an attachment base,

a series of ground engaging spades operatively connected to the tire in a position to be movable between ground engaging and ground avoiding positions,

each of said ground engaging spades having a base portion, a sole portion and a lug portion,

a plurality of anchor means operatively connected to said ground engaging spades to facilitate movement thereof between said ground engaging and ground avoiding positions,

each one of said anchor means being secured to said frame,



at least two lengths of wire rope, each one of said lengths being supported by said series of anchor means for rotational movement relative thereto, and

coupling means for fixedly securing said base portion of each of said ground engaging spades onto said lengths of wire rope, such that rotational movement of said wire rope will move said ground engaging spades between said ground engaging and ground avoiding positions.

4,694,873

VEHICLE WHEEL WITH RUN-FLAT SUPPORT

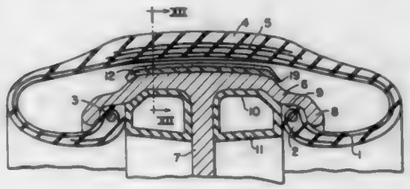
Klaus Gerloff, Isernhagen; Dieter Ehlert, Gehrden, and Klaus von der Wall, Wölpinghausen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 10, 1986, Ser. No. 818,536

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501116

Int. Cl.[4] B60C *17/04;* **B60B** *21/12*

U.S. Cl. 152—380 **15 Claims**



1. A vehicle wheel on which can be mounted a pneumatic tire having a tread as well as a belt below said tread, with the wheel being suitable for use during emergency operation of the tire; the tire is essentially comprised of rubber or rubber-like synthetic material, and has a carcass that is anchored in beads of the tire by being looped around bead cores; the inside of the tire is provided with an air-impermeable layer; the wheel is provided with a rigid rim that includes an emergency-operation element upon which the inner surface of the tire is supported during emergency operation of the tire; said wheel further comprises:

at least one friction strip disposed on the radially outer side of said emergency-operation element; said friction strip extending further radially outwardly than do any parts of said rim and emergency-operation element, so that during emergency operation of said tire, the latter is supported by said friction strip; said friction strip being rotatably supported on said emergency-operation element; and

lateral guide elements integral with said friction strip and extending in circumferential direction of said rim as well as extending over sides of said emergency-operation element in a direction angularly inwardly and away from said tread and said belt.

4,694,874

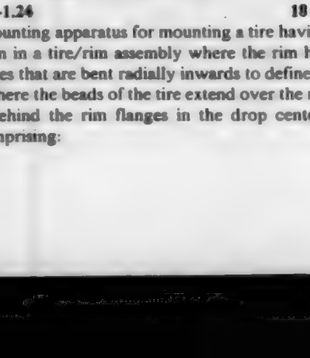
WHEEL WELL OBSTRUCTOR FOR A WHEEL RIM

Basil D. White, Lauder Hill, Fla., assignor to Tyron, Inc., Fla.

Filed Nov. 22, 1985, Ser. No. 801,061

Int. Cl.[4] B60B *21/00, 21/12*

U.S. Cl. 152—381.5 **20 Claims**



1. A removable annular well obstructor for obstructing the interior of an annular well of a hub of a wheel rim, wherein said well has a predetermined radial depth, said obstructor comprising:

an annular band of inextensible material of a predetermined axial width having an opening through its circumference, said band having a thickness substantially less than the depth of said well and being adapted to circumferentially surround said well;

said band further having a plurality of radially and inwardly projecting hollow protrusions of a predetermined height spaced apart around the circumference of said band and adapted to be received into said well, each of said hollow protrusions having curved walls arranged about a central opening, said curved walls being being connected to one another edgewise to form a continuous perimeter about said central opening;

and means for tensionably retaining said well obstructor on said hub.

4,694,875

TIRE-MOUNTING APPARATUS

Eickhart Goebel, Pfungstadt, Fed. Rep. of Germany, assignor to Gebr. Hofmann GmbH & Co. Kg Maschinenfabrik, Pfungstadt, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,425

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401476

Int. Cl.[4] B60C *25/10*

U.S. Cl. 157—1.24 **10 Claims**

1. A tire-mounting apparatus for mounting a tire having two beads on a rim in a tire/rim assembly where the rim has two opposed flanges that are bent radially inwards to define a drop center, and where the beads of the tire extend over the rim and are located behind the rim flanges in the drop center, said apparatus comprising:

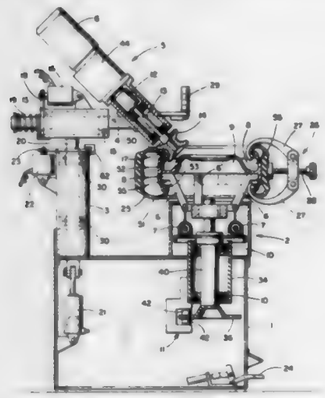
a base;

rim-mounting means for rotatably mounting the rim to said base;

clamping means for retaining the beads of the tire on a radially inner side of the rim flanges;

mounting means having a mounting tool for forcing one of the tire beads over one of the rim flanges, into the drop center and radially outwards onto said radially inner side of the rim flanges while the beads of the tire are retained by the clamping means;

moving means for moving the tire and rim when the tire is in



contact with the mounting tool and the beads are retained on said radially inner side of the rim flanges by said clamping means so that said one tire bead is rolled over said one rim flange, into the drop center of said rim and forced radially outwards onto said radially inner side of said one rim flange, said moving means including a drive unit for rotating said mounting tool against said tire to move said tire and rim; and

braking means for counteracting the movement of said tire and rim by said moving means, said braking means including an assembly secured to said rim-mounting means.

4,694,876

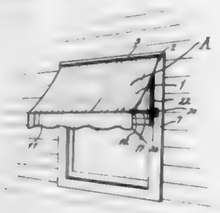
KNOCK-DOWN ADJUSTABLE AWNING CONSTRUCTION

Michael T. Bottom, Crawford County, Mo., assignor to T. J. Bottom Industries, Inc., Cuba, Mo.

Filed Jun. 14, 1985, Ser. No. 744,632

Int. Cl.[4] E04F *10/00*

U.S. Cl. 160—45 **2 Claims**



1. A knock-down awning construction for treatment of a wall opening comprising a flexible curtain, an upper mounting strip, means securing said strip upon said wall upwardly of the opening to be treated, a lower transverse arm axially parallel to said mounting strip for disposition normally downwardly and outwardly thereof, means for engaging said wall for supporting said arm, means for retainingly securing the upper end portion of said curtain with said mounting strip, a tubular member integrally provided with said lower transverse arm and being axially parallel thereto, said tubular member having a downwardly directed co-extensive, slot-like opening, a rigid rod freely received within said tubular member and being axially parallel therewith, said rod being substantially co-extensive with said tubular member, said rod being normally urged gravitationally downwardly toward said slot-like opening, said rod further having a cross-section less than the inside cross-section of said tubular member for normally developing a void therebetween, the lower end portion of said curtain being directed upwardly through said slot-like opening into the said void within said tubular member and extending coveringly about said rod, and then being directed returningly downwardly and outwardly through said slot-like opening whereby the extremity of said lower end portion depends downwardly of said opening in exposed state, said curtain being relatively adjustably movable with respect to said rod to permit exposure of a preselected extent of said extremity, the combined cross-section of said rod and the thickness of the curtain portions trained about said rod within said tubular member is greater than the width of the slot-like opening in said tubular member but slightly less than the inside cross-section of said tubular member whereby said rod is upwardly shiftable but normally, through gravity, causes the lower surrounding portions of said curtain to be frictionally maintained against the slot-like opening adjacent inner portions of the tubular member in preselected condition.

4,694,877

MANUALLY OPERATED SHADE LOWERING AND RAISING MECHANISM FOR ATRIUM WALLS

Doan D. Dunbar, Columbus, Ohio, assignor to Inside Outfitters, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 752,284, Jul. 5, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 887,485

Int. Cl.[4] E06B *9/204, 9/322*

U.S. Cl. 160—273 R **6 Claims**



1. A device for manually raising and lowering a shade on a wall having a vertical portion connected to a concave portion which in turn is connected to a portion approaching the horizontal, said wall being provided with at least one window extending from the vertical portion through the concave portion and into the portions approaching the horizontal, said window being provided with mullions extending throughout the length of said window on either side thereof, at least a portion of said shade being positioned adjacent both said concave portion of said wall and said portion of said wall approaching the horizontal, said device comprising:

at least one oppositely disposed, vertically extending pair of compartmentalized parallel tracks comprising a first and second track attached to said wall, the side of said mullions adjacent said window and of a shape to conform to the contour of said wall,

said compartmentalized track having a U-shaped cord guiding portion, the opening of which extends toward said windows and a U-shaped shade supporting portion, the opening of which faces the edge of said shade, and a

common wall forming the base of said cord guiding portion and a side of said shade supporting portion,

a plurality of shade supports positioned in said shade supporting portion of each of said tracks,

a shade positioned between said pair of tracks and connected to said shade supports,

said cord guiding portion of each said tracks being provided with means to prevent said cords from touching said shade and from sagging when said cords are in the concave position or in the position approaching the horizontal of said cord guiding portion of each of said tracks,

a first pulley and a second pulley positioned at the upper end of each of said tracks,

a third pulley positioned at the lower end of each of said tracks,

an endless cord positioned in the cord guiding portion of each of said tracks, said cord being positioned on said pulleys so that it engages said third pulley on said first track, then said second pulley on said first track, then said second pulley on said second track, then said third pulley on said second track in a reverse direction, then said first pulley on said second track, then said first pulley on said first track, then returning to said third pulley on said first track,

first means for securing one side of the lower portion of said shade to be raised or lowered by said device to said cord between said third pulley and said first pulley on said first track, wherein said means comprises a base portion permanently secured to a lower portion of the shade and an extension to which the cords are secured and which rides in the cord guiding portion of said track wherein said shade may be raised or lowered by manual movement of said first and a second means,

said second means for fixedly securing the other side of said lower portion of said shade to be raised or lowered by said device to said cord between said third pulley and said second pulley on said second track, wherein said means comprises a base portion permanently secured to a lower portion of the shade and an extension to which the cords are secured and which rides in the cord guiding portion of said track wherein said shade may be raised or lowered by manual movement of said first and second means.

4,694,878

DISCONNECT SUB FOR A TUBING CONVEYED PERFORATING GUN

Louis M. Gambertoglio, The Woodlands, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jul. 15, 1986, Ser. No. 886,273

Int. Cl.[4] E21B *23/00, 43/11*

U.S. Cl. 166—377 **7 Claims**

1. A disconnect sub for a tubing conveyed perforating gun of the type used to perforate a cased well bore, comprising:

a tubular member having a generally cylindrical exterior and an interior bore, said tubular member having an upper connecting end for connection in a tubing string extending to the well surface and a lower end;

a sliding mandrel telescopingly received within the interior bore of said tubular member, said sliding mandrel having a lower end with connecting means for engaging and supporting said perforating gun and an upper colleted end with a plurality of collet fingers which terminate in collet lugs, said fingers being expandible radially inwardly and outwardly, and wherein said interior bore is provided with an internal profile for engaging said collet lugs when said fingers are expanded radially outwardly;

a retaining sleeve received within the interior bore of said tubular member, said sleeve having a lower cylindrical extent which initially underlies said collet lugs and biases said lugs radially outwardly to engage said internal profile and define a running-in position, said retaining sleeve being movable to a release position upon upward sliding movement of said mandrel in which said fingers are disengaged to release said sliding mandrel;

lock means within said interior bore for engaging said retaining sleeve in said release position upon upward travel of said mandrel and retaining sleeve over a predetermined distance; and

wherein said retaining sleeve is a generally cylindrical body, said body having an external surface which increases in diameter at an upper extent thereof to form a lip, said lip being received upon a ledge formed within said interior bore when said sleeve is in said running-in position.

7. A method of disconnecting a tubing conveyed perforating gun of the type having a percussion detonator used to perforate a cased well bore, comprising the steps of:

connecting a tubular member having an interior bore within an internal profile in a well tubing string and positioning a sliding mandrel within the interior bore in telescoping fashion, the sliding mandrel having a lower end connected to the perforating gun for supporting the gun, the mandrel being provided with a colleted upper end having a plurality of collet fingers expandible radially inwardly and outwardly for engaging the internal profile;

retaining the mandrel within the tubular member by installing a retaining sleeve above the sliding mandrel within the



tubular member, the sleeve being provided with a lower cylindrical extent which initially underlies said collet fingers and biases said fingers radially outwardly to engage said internal profile and define a running-in position, said retaining sleeve being movable to a release position upon upward sliding movement of said mandrel in which said fingers are disengaged to release said sliding mandrel;

providing locking means within said interior bore for engaging said retaining sleeve in said release position upon upward travel of said mandrel and retaining sleeve over a predetermined distance;

providing a region of reduced external diameter which forms an annular chamber between the exterior of said mandrel and said interior bore, and filling said chamber with a substantially incompressible fluid;

providing drain means initially containing said fluid within said chamber, said drain means including a frangible portion which extends within the internal bore of said mandrel; and

passing a weight through said tubing string from the well surface through said internal bore to sever said frangible pin and drain said chamber, said weight being allowed to continue down said internal bore to contact said percussion detonator and fire said perforating gun.

4,694,879

PROCESS FOR PRODUCING CASTINGS

Kurt Feuring, Solms-Niederbiel, Fed. Rep. of Germany, assignor to Buderus Aktiengesellschaft, Wetzlar, Fed. Rep. of Germany

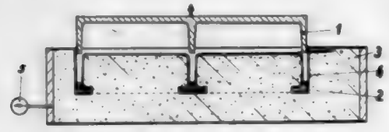
PCT No. PCT/DE85/00121, § 371 Date Oct. 1, 1985, § 102(e) Date Oct. 1, 1985, PCT Pub. No. WO85/04826, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 17, 1985, Ser. No. 787,801

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415232

Int. Cl.[4] B22C *7/02, 9/04*

U.S. Cl. 164—7.2 **2 Claims**



1. A method for producing a casting having at least one vertical rib when a cross-sectional shape selected from L-, T- and combination shapes thereof, said method comprising:

providing a pattern for said casting said pattern being a combination of reusable and gasifiable parts, said reusable parts comprising a base element, and at least one vertical rib web attached thereto which is substantially perpendicular to said base element, said gasifiable parts comprising at least one horizontal rib flange connected to said rib web, a portion of said rib flange formed at an angle to said rib web;

molding a binder free molding material around said pattern to form a mold;

removing said reusable parts of said pattern from said mold; and

destroying said gasifiable parts of said pattern during introduction of casting material into said mold.

4,694,880

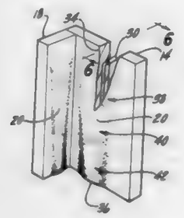
METHOD OF CONTINUOUSLY CASTING METAL SLABS

Kirk M. Gladwin, c/o Gladwin Corporation, 20401 Gladwin Ave., Taylor, Mich. 48180

Filed Sep. 16, 1982, Ser. No. 418,888

Int. Cl.[4] B22D *11/04*

U.S. Cl. 164—459 **3 Claims**



1. In a method of continuously casting metal including the steps of providing a continuous casting mold having a pair of opposed, spaced apart side plates and a pair of opposed, spaced apart end plates, said mold plates each having a facing, said side plate facings and said end plate facings defining a mold cavity therebetween, said mold cavity having open upper and lower ends, and continuously casting metal into the continuous casting mold by pouring molten metal into the open upper end of the cavity for cooling within said mold and for exiting from the open lower end of said mold cavity with a partially solidified skin, the improvement comprising:

said step of providing a continuous casting mold further including providing each facing of at least one pair of said opposed mold wall plates witha progressively increasing thickness between the open upper end of said cavity and the open lower end of said cavity with the rate of increase of said progressively increasing thickness being non-linear; and

providing said facings with progressively increasing thicknesses of inwardly convex configuration.

4,694,881

METHOD FOR MAKING THIXOTROPIC MATERIALS

Robert S. Busk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1981, Ser. No. 326,304

Int. Cl.[4] B22D *17/00, 25/00*

U.S. Cl. 164—113 **10 Claims**

1. A process for the production of liquid-solid material comprising (a) feeding a solid material having a dendritic structure into a screw extruder; (b) passing said material through a feeding zone in the extruder; (c) heating said material to a temperature greater than its liquidus temperature as it passes through a heating zone in the extruder; (d) cooling said material to within a temperature range of greater than the solidus and less than the liquidus temperature of the material; (e) shearing said cooled material in the extruder with the screw at a force sufficient to break at least a portion of the dendritic structures as they form; and (f) removing said material from said extruder.

4,694,882

METHOD FOR MAKING THIXOTROPIC MATERIALS

Robert S. Busk, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1981, Ser. No. 326,305

Int. Cl.[4] B22D *17/00, 25/00*

U.S. Cl. 164—113 **11 Claims**

1. A process for producing a liquid-solid metal alloy comprising:

(a) feeding a metal alloy having a dendritic structure into the barrel of a screw extruder;

(b) heating the metal alloy to a temperature above the alloy's solidus temperature and below the alloy's liquidus temperature; and

(c) subjecting the heated metal to a shearing action provided primarily by rotating the screw, said shearing action being sufficient to break at least a portion of the dendritic structures of the metal alloy to form a liquid-solid metal alloy composition.

4,694,883

HOLLOW CORE MOLDING APPARATUS

Klaus Haiduk, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 456,279, Jan. 6, 1983, abandoned. This application Dec. 18, 1985, Ser. No. 810,551

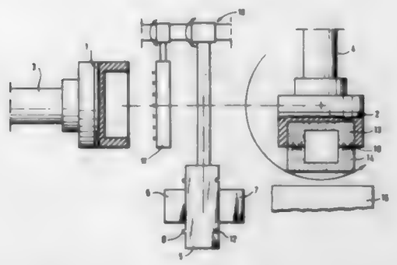
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1982, 3200193

Int. Cl.[4] B22C *9/10, 9/12, 13/12*

U.S. Cl. 164—186 **1 Claim**

1. An apparatus for molding core halves out of mold sands comprising two core-box halves, each core half being molded on a center plate having inner hollow-mold parts and a respective outer core-box half employed therewith, and the core-box halves are fastened in alignment with spacing from each other in a horizontal plane on actuator cylinder means, and the center plate having the inner hollow-mold parts is fastened on a tool carrier, and a spray device and the center plate are arranged movably on the same tool carrier, said spray device

being pivotable between the core-box halves held with spacing from each other collectively with the core-halves therein, said spray device serving for application of a hardening adhesive directly on faces of the core halves, said center plate on the two face sides thereof having recesses and projections in alignment and located opposite to each other and which serve for molding of clamp connections on the core halves out of mold material, said core halves being cured or hardened-out in the



core-box halves before the core-box halves are moved apart and said center plate is removed, and said spray device after application of the hardening adhesive on faces of the core halves then being pivotable away from between the core-box halves which are then brought together into engagement with each other along with the core halves still located in the core-box halves so that the core halves thereupon adhered to each other are kept from deformation, and dimensioning thereof is maintained to the utmost in the finished unit.

4,694,854

MOLTEN METAL CASTING AND FEEDER SLEEVES FOR USE THEREIN

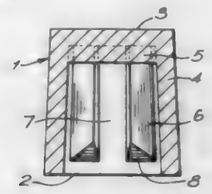
David R. Butler, Lichfield, and Clifford F. Corbett, Walsall, both of England, assignors to Foseco International Limited, Birmingham, England

Filed Mar. 28, 1986, Ser. No. 845,532

Claims priority, application United Kingdom, May 17, 1985, 8512514

Int. Cl.⁴ B22C *9/08*

U.S. Cl. 164—359 **34 Claims**



1. A feeder sleeve for use in casting molten metal in which metal is cast into a mould and having a feeder cavity defined by the feeder sleeve, the feeder sleeve having an inner surface and a plurality of discrete ribs extending inwardly from said surface and spaced one from the other around its perimeter to define a feeder cavity with an open center portion, said ribs extending substantially the full length of the inner surface and terminating at their lower ends in faces which taper to meet the inner surface, and the number and dimensions of said ribs being such that the volume of the feeder cavity is reduced by at least 20% compared to the volume of the feeder cavity of a sleeve of generally the same internal size and shape but having no ribs.

4,694,885

APPARATUS FOR CONTINUOUS CASTING OF THIN METALLIC PLATE

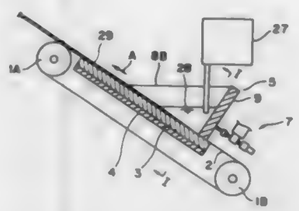
Haruo Sakaguchi; Teruyoshi Suehiro; Kunio Nagai, all of Osaka; Toshie Hashimoto, Izumi; Hisaki Nishiyama, Toyonaka, and Masakazu Mohri, Takatsuki, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Apr. 30, 1986, Ser. No. 857,921

Claims priority, application Japan, Jun. 6, 1985, 60-123197; Jun. 6, 1985, 60-123198; Jul. 17, 1985, 60-157272; Sep. 4, 1985, 60-195191

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—416 **10 Claims**



1. An apparatus for continuous casting of a thin metallic plate which includes a movable mold arranged for movement in a specified direction, and melt receiving wall means disposed on the movable mold for storing molten metal in cooperation therewith, whereby molten metal within the wall means, through its contact with the surface of the movable mold, will be cooled and formed into a casting shell, said casting shell being drawn by the movable mold in the form of a thin metallic plate, said apparatus being characterized in that at least the lower end portion of said melt receiving wall means is movable along the moving direction of the movable mold, and in that vibrating means are provided for oscillating the lower end portion of the melt receiving wall means along the moving direction of the movable mold.

4,694,886

HORIZONTAL CONTINUOUS CASTING APPARATUS

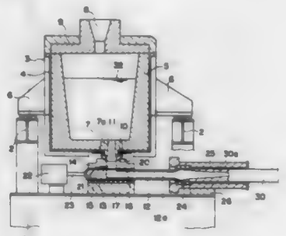
Haruo Sakaguchi, Osaka, Japan, assignor to Hitachi Zosen Corporation, Osaka, Japan

Filed Apr. 28, 1986, Ser. No. 856,820

Claims priority, application Japan, May 28, 1985, 60-114861

Int. Cl.⁴ B22D *11/04*

U.S. Cl. 164—416 **12 Claims**



12. A horizontal continuous casting apparatus comprising:
a tundish for receiving molten metal and having a discharge opening;
oscillatable nozzle means having an interior molten metal passage, said passage having an inlet end communicating with said discharge opening and having a discharge end;
guide means mounted below the tundish for slidably supporting the nozzle means for horizontal reciprocating movement;
mold means slidably receiving the discharge end portion of said nozzle means; and,
vibrator means for horizontally oscillating said nozzle means relative to said tundish and to said mold means.

4,694,887

DUAL ROLL TYPE CONTINUOUS CASTING MACHINE

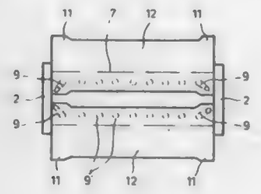
Kunio Matsui, Yokohama; Hisahiko Fukase, Tokyo, and Akihiro Nomura, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed May 29, 1986, Ser. No. 868,068

Claims priority, application Japan, Aug. 23, 1985, 60-185085

Int. Cl.⁴ B22D *11/06*

U.S. Cl. 164—428 **6 Claims**



1. A dual roll type continuous casting machine in which a molten bath is defined at least by a pair of parallel cooling rolls and side seal plates disposed at both axial ends of said pair of cooling rolls, a core being inserted into and disposed in said molten bath, comprising nozzles located on opposite sides of the core, each nozzle including at least one molten-metal-pouring passage formed through said core, said nozzles opening between a respective side of the core and a corresponding cooling roll, and said molten-metal-pouring passages are disposed so that molten metal is fed toward said side seal plates in directions tangential to said corresponding cooling rolls.

4,694,888

ELECTROMAGNETIC LEVITATION CASTING

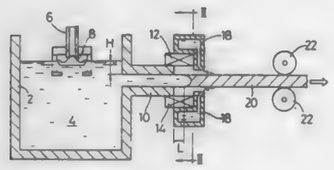
Masahiro Yoshida, Aichi, and Susumu Inamura, Nagoya, both of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Japan

Filed Jan. 30, 1986, Ser. No. 824,272

Claims priority, application Japan, Feb. 13, 1985, 60-25495

Int. Cl.⁴ B22D *27/02, 11/10*

U.S. Cl. 164—467 **3 Claims**



1. An electromagnetic levitation casting process for continuously casting a flat ingot in a horizontal direction, comprising the steps of:
transferring a mass of molten metal having a composition selected from the group consisting of aluminum and aluminum alloys through a nozzle having an opening which has a rectangular cross sectional shape substantially corresponding to a transverse cross sectional shape of said flat ingot, the rectangular cross sectiontal shape of said opening having long sides extending in the horizontal direction.
causing said mass of molten metal to continuously emerge in said horizontal direction from an exit end of said nozzle;
subject the mass of molten metal which has emerged from said nozzle, to electromagnetic forces created by an upper and a lower electromagnetic coil disposed in a mutually vertically spaced-apart relationship adjacent to said exit end of said nozzle, and thereby levitating the mass of molten metal in the horizontal direction between said upper and lower electromagnetic coils for a horizontal distance of 5–20 mm from said exit end of said nozzle;
controlling a transverse width of said flat ingot with at least a pair of dam blocks, said dam blocks being located at said exit end of said nozzle such that said dam blocks extend horizontally away from the nozzle and parallel to short sides of the rectangular transverse cross sectional shape of the nozzle and said dam blocks maintain a vertical separation between said upper and lower electromagnetic coils;
solidifying the levitated mass of molten metal into said flat ingot, by direct contact of the molten mass with a cooling fluid, said cooling fluid being delivered by at least an upper water jacket and a lower water jacket, said upper and lower water jackets being located adjacent to and downstream from said upper and lower electromagnetic coils and walls defining said upper and lower water jackets being spaced apart from said mass of molten metal;
withdrawing the solidified flat ingot continuously in the horizontal direction.

4,694,889

COOLING OF MATERIALS

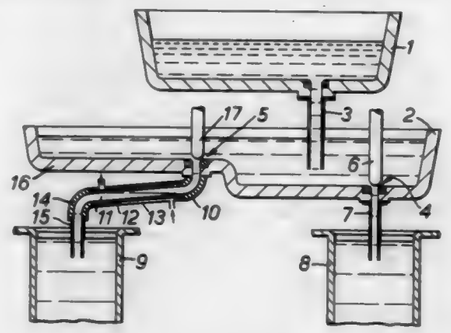
Gene D. Spenceley, Stokesley, and STeven Henderson, Middlesbrough, both of England, assignors to British Steel Corporation, Great Britain

Continuation-in-part of Ser. No. 471,847, Mar. 3, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 723,508

Claims priority, application United Kingdom, Mar. 11, 1982, 8207155

Int. Cl.⁴ B22D *11/10, 1/00*

U.S. Cl. 164—488 **6 Claims**



1. A method of shaping steel having a final structure of substantially globular nature including the steps of transferring liquid steel from a containing vessel and/or delivery system to a shaping station through a hollow carrier; extracting heat from the steel as it passes through the hollow carrier; subjecting the steel to turbulent flow conditions as it passes through the hollow carrier and sustaining sufficient shear rate within the steel to maintain the fluidity and globular nature of the steel emergent therefrom; and passing the fluid steel directly from the hollow carrier to the shaping station.

4,694,890

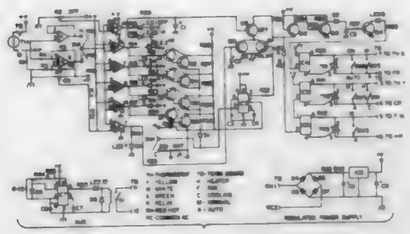
ANALOG COMPUTER VARIABLE DUTY MODULATOR

Humberto T. Zarate, Houston, Tex., assignor to Dianalog Systems, Inc., Houston, Tex.

Filed Apr. 15, 1985, Ser. No. 723,433

Int. Cl.[4] F28F *27/00*; G05D *23/00*

U.S. Cl. 165—12 **5 Claims**



1. An environmental temperature control system for air conditioning and heating equipment having a heating and a cooling mode, including a fan for blowing air through the equipment, a refrigeration system including a compressor and a heating system including heating means comprising a temperature sensing means for sensing temperature in a controlled space to be conditioned, signal conditioner means coupled to said temperature sensing means to buffer the signal and to provide at least two outputs, a first of said outputs being proportional to the temperature difference between the said sensed temperature and a set-point temperature of the controlled space, and a second of said outputs indicating a sensed temperature outside of a range of comfort zone temperatures, variable ON timer means for providing different ON times to said air conditioning and heating equipment responsive to said first output, said variable ON timer means also including a predetermined FIXED OFF time for said cooling mode and a different predetermined FIXED OFF time for said heating mode, a timer override means responsive to a second of said outputs of said signal conditioner means for overriding the variable timer means when said sensed temperature is outside of said comfort zone temperatures and causing the said air conditioning or heating equipment to operate continuously, fan delay timer means for operating the fan beyond the ON time, and heating, cooling and fan relay control means coupled to said signal conditioner means and override means for providing output signals to respectively control heating means, the compressor and the fan.

4,694,891

BOILER APPARATUS UTILIZING EXHAUST GAS HEAT

Shinichi Okumura, 9, Yakumonishimachi 4-chome, Moriguchi-shi, Osaka, and Yasushi Okumura, Moriguchi, both of Japan, assignors to Shinichi Okumura, Osaka, Japan

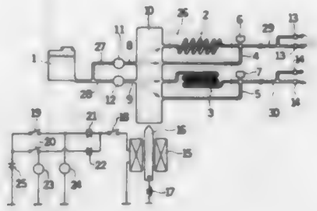
Filed Dec. 18, 1986, Ser. No. 944,334

Claims priority, application Japan, Jan. 31, 1986, 61-19718; Feb. 17, 1986, 61-32274

Int. Cl.[4] B60H *1/06*

U.S. Cl. 165—41 **14 Claims**

1. A boiler apparatus for removing a deposit of frost, snow, ice, or the like by melting same by discharging hot water, comprising a tank for storing water, a nozzle for spraying water, a two-way switchable valve provided in passage connecting between said tank and the nozzle, a pump provided in passage connecting between the tank and a supply port of said valve, at least one pair of heater tube and by-pass tube which are respectively connected at one end to said nozzle, said heater tube being adapted to be heated by respective output ports of the valve and at the other end to hot exhaust gas so that heated water is discharged from said nozzle when flow



passages within the valve are in communication with said heater tube.

4,694,892

APPARATUS FOR RETRIEVING SPHERICALLY SHAPED CLEANSING BODIES

Werner Borchert, Mulheim, Fed. Rep. of Germany, assignor to GEA Energiesystemtechnik GmbH & Co., Bochum, Fed. Rep. of Germany

PCT No. PCT/EP86/00137, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06823, PCT Pub. Date Nov. 20, 1986

PCT Filed Mar. 13, 1986, Ser. No. 2,598

Claims priority, application European Pat. Off., May 3, 1985, 85200701.2

Int. Cl.[4] F28G *1/12*

U.S. Cl. 165—95 **8 Claims**

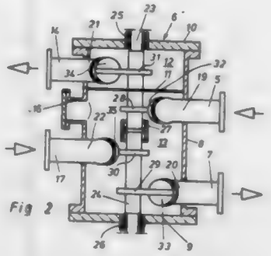


Fig 2

6. Apparatus for retrieving generally spherically shaped cleansing bodies circulating with cooling water in a flow circuit including a tubular heat exchanger, the apparatus comprising a tubular housing having a longitudinal axis, a sieve plate disposed transversely to the housing axis and spaced from axial ends of the housing so as to form a relatively smaller chamber and a relatively larger chamber in the housing, a drain tube extending generally radially into the smaller chamber and defining a sealing surface at an end thereof, a feed tube, a discharge tube, and a flushing tube each extending generally radially into the larger chamber, each defining a sealing surface at an inner end of the respective tube, first and second, independently rotatable shaft means axially extending into the housing, valve plates mounted to the first shaft means for rotation therewith and positioned to sealingly engage the sealing surfaces of the drain tube and the feed tube when positioned thereagainst, valve plates mounted to the second shaft means for rotation therewith and positioned to sealingly engage the sealing surfaces of the discharge tube and the flushing tube when positioned there against, and means for independently rotating the first and second shaft means from an exterior of the housing.

4,694,893

UNIT FOR GUIDING THE FLOW OF COLD GAS IN STEAM GENERATORS OF HIGH-TEMPERATURE REACTORS

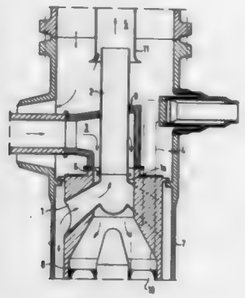
Gerd Pollak, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 868,242

Claims priority, application Fed. Rep. of Germany, May 28, 1985, 3519038

Int. Cl.[4] F28F *9/22*

U.S. Cl. 165—104.34 **6 Claims**



1. A unit for guiding the flow of cold gas from the annular chamber that is disposed between the pressure tank wall and the steam generator wall to the circulation fan of a steam generator of a high-temperature reactor, with hot gas being adapted to be supplied to said steam generator wall via a hot gas guide mechanism; said unit further comprising:

compensating tube bundles associated with said steam generator wall, with said compensating tube bundles having an upper end when viewed in the direction that gases rise;

a plurality of cold gas channels that pass through said upper end of said tube bundles and are adapted to receive cold gas from said annular chamber between said pressure tank wall and said steam generator wall; and

a riser for receiving cold gas from said cold gas channels and conveying said cold gas to said circulation fan, with said pressure tank having a central axis and said hot gas guide mechanism having a portion that extends parallel to said central axis of said pressure tank, and with said riser being disposed in said portion of said guide mechanism that extends parallel to said central axis of said pressure tank.

4,694,894

HEAT EXCHANGERS

Masahiro Kito, Brighton, and Katsuhiro Mori, Hove, both of England, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 16, 1985, Ser. No. 776,669

Claims priority, application United Kingdom, Sep. 14, 1984, 8423320

Int. Cl.[4] F28F *13/00*

U.S. Cl. 165—135 **8 Claims**

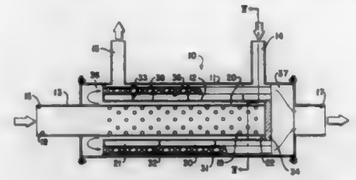
1. A heat exchanger, comprising:

a casing having a hollow cylindrical shape and provided with inlet and outlet ports;

at least one outer tube fixedly connected to and positioned within said casing;

at least one inner tube fixedly inserted into said outer tube so as to form a space therebetween and provided with a plurality of holes formed on a substantially entire circumferential surface thereof for directly spraying a first heated fluid to an inner wall of said outer tube and therethrough wherein an outer wall of said outer tube further comprises a first heat transfer surface for directly facing a second fluid to be heated passing through said casing;

passage means for said first heated fluid, said passage means being positioned between said casing and said outer tube and communicating with a first open end of said space formed between said outer tube and said inner tube and



having a second heat transfer surface for directly facing said second fluid at an outer circumferential surface of said second heat transfer surface; and

sealing means positioned in said outer tube for closing one end of said inner tube and for closing a second end of said space opposite said first open end.

4,694,895

APPARATUS FOR SECURING A COMPONENT EXPOSED TO ELEVATED TEMPERATURE TO A THERMALLY INSULATED WALL

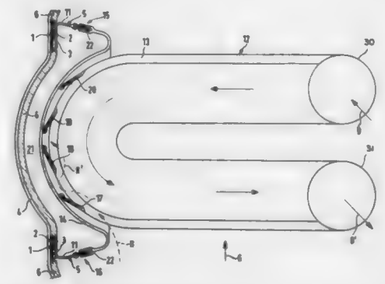
Bernhard Wöhrl, Gauting, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,473

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514378

Int. Cl.[4] F28F *13/00*

U.S. Cl. 165—136 **14 Claims**



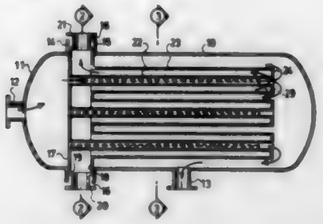
1. Apparatus for securing a component exposed to the relatively high temperature of a medium on a casing wall having thermal insulation to protect said wall from said medium, said casing wall comprising a section devoid of thermal insulation, a separate thermoelastic flexible insulating element dimensioned to fit into the section of casing wall devoid of thermal insulation, said insulating element having opposite surfaces, plates on both surfaces of said insulating element sandwiching said insulating element between said plates, means attaching one of said plates directly to the casing wall, the other plate facing inwardly of said wall and means attaching the component to said other plate.

4,694,896

HEAT EXCHANGER

Frank Navratil, 14-90 Langside Street, Winnipeg, Manitoba, Canada R3C 1Z2

Filed Oct. 22, 1986, Ser. No. 921,483
Claims priority, application Canada, Nov. 5, 1985, 494582
Int. Cl.[4] F28D 7/12
U.S. Cl. 165—142 **9 Claims**



1. A heat exchanger for exchanging heat between a first fluid and a second fluid, comprising a housing, means defining in said housing a first inlet and a first outlet for the first fluid and a second fluid inlet and a second outlet for the second fluid, an heat exchange core through which said fluids are arranged to pass in heat exchanging, fluid impervious relationship, said core comprising a plurality of first tubes, a plurality of second tubes, means mounting each of the first tubes inside a respective one of the second tubes and arranged so as to define for each first and second tube a first channel through said first tube having as an outer surface the inner surface of said first tube, a second channel having as an outer surface the inner surface of the second tube and as an inner surface the outer surface of the first tube and a third channel having as an inner surface the outer surface of the second tube, first manifold means for communicating said first fluid from said first inlet through said first and third channels to said first outlet and second manifold means for communicating said second fluid from said second inlet through said second channel to said second outlet, end closure means for closing said second channel at one end of said first and second tubes and baffel means dividing said second channel longitudinally, said baffle means being spaced from said end closure means whereby said second fluid travels along said second channel toward said end closure means on one side of said baffle means and returns along said second channel from said end closure means along an opposed side of said baffle means.

4,694,897

HEAT EXCHANGER FOR HEAT EXCHANGE BETWEEN HOT GAS AND MEDIUM FLOWING THROUGH TUBE BUNDLES

Gustav Thönes, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,379
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1985, 3529634
Int. Cl.[4] F28F 9/22
U.S. Cl. 165—160 **4 Claims**

1. A heat exchanger for the heat exchange between a hot gas and a flowing medium that is conveyed in tube bundle heat transfer surfaces, comprising:

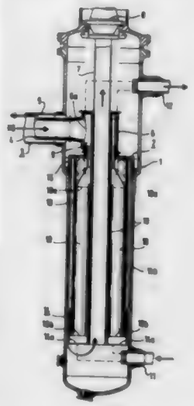
a pressure tank having a wall and connecting means for gas circulation;

a heat exchanger vessel disposed in said pressure tank, with said heat exchanger vessel having a wall, gas inlet means, and gas outlet means;

tube bundles disposed within said wall of said heat exchanger vessel and having said heat transfer surfaces for receiving hot gas from said gas inlet means of said heat exchanger vessel and said pressure tank, with said tube bundles also having inlet and outlet means for said flowing medium and gas outlet means for gas leaving said tube bundles;

hot gas conduit means that communicate with said gas inlet means of said heat exchanger vessel, with said hot gas conduit means opening into said heat exchanger vessel wall from the side, with an annular chamber being disposed within said vessel wall between said gas inlet means of said vessel and said tube bundles;

gas deflection means disposed downstream from said gas outlet means of said tube bundles for deflecting the direction of flow of gas in such a way that gas leaving said tube bundles via said gas outlet means thereof first flows along the outer surface of said wall of said heat exchanger vessel in the direction toward said gas inlet means of said vessel,



and then flows in the opposite direction along the inner surface of said wall of said pressure tank in the direction toward said gas outlet means of said tube bundles;

a riser disposed in said heat exchanger vessel, concentric to said walls of said pressure tank and said vessel, to provide communication by being twofold deflected by said gas deflection means and via said gas circulation connecting means, with said riser providing an inward delimitation for said annular chamber, and with said riser extending from said gas circulation connecting means, in the direction of said tube bundles, to the vicinity of said gas outlet means of of said tube bundles; and

said gas deflection means essentially provide for a 180° deflection of gas between said gas outlet means of said tube bundles and said riser.

4,694,898

HEAT EXCHANGER ELEMENT COMPRISING A SINGLE AND INTEGRALLY EXTRUDED MEMBER INCLUDING AT LEAST TWO HOLLOW TUBES INTEGRALLY JOINED BY AT LEAST TWO WEBS

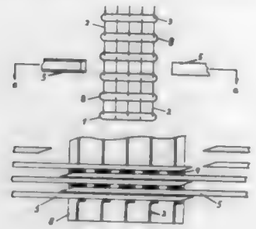
Edvin L. Clausen, Tonder, Denmark, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Oct. 3, 1985, Ser. No. 783,636
Claims priority, application Norway, Oct. 17, 1984, 844137
Int. Cl.[4] F28F 1/42
U.S. Cl. 165—171 **19 Claims**

1. A heat exchanger element for use in forming a heat exchanger unit, said element comprising a single and integrally extruded member including:

at least two hollow tubes having parallel longitudinal axes; and

each two adjacent said hollow tubes being connected by at least two webs which extend parallel to said longitudinal



axes and which are formed integrally with each of said two adjacent hollow tubes.

4,694,899

EDGE DAM SYNCHRONIZATION AND TENSIONING CONTROL METHOD AND SYSTEM FOR THE SHAPING AND PROFILING OF CONTINUOUSLY CAST METAL SECTIONS BY MEANS OF A CONTINUOUS CASTING MACHINE

John F. B. Wood, Burlington; Timothy D. Kaiser; Jerome B. Allyn, both of Colchester; Charles D. Dykes, Milton; Frank E. Kalaskie; Robert J. Carmichael, both of Colchester, and Charles R. Simon, Williston, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed Dec. 3, 1986, Ser. No. 937,319
Int. Cl.[4] B22D 11/06, 11/16
U.S. Cl. 164—452 **20 Claims**

1. The improved method of synchronizing the motion and position of the edge dams of a continuous metal casting machine in which integral, recurring contoured shapes, which may include projections, lobes, profiles, depressions, cavities and identations, are continuously cast into opposite, generally parallel edges of said product being cast, which method utilizes a twin-belt casting machine wherein a pair of moving edge dams comprising many blocks strung upon opposed parallel flexible unifying closed loops of high strength material travel along the opposed parallel edges of a casting region from its entrance to its outputs end between a pair of revolving casting belts to define a moving mold, wherein said casting belts travel downstream in the machine for carrying molten metal downstream from said entrance to become solidified and wherein said edge dams each include a plurality of identically recurring contoured shapes, which may include depressions, cavities, indentations, projections, and lobes, in order advantageously to shape the aforesaid integral, identically recurring contoured shapes being continuously cast, the method comprising:

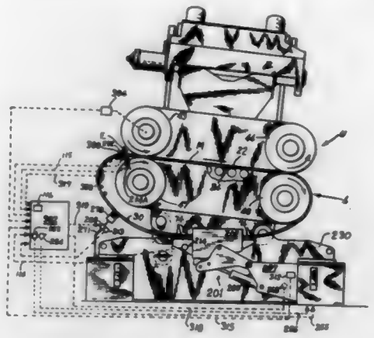
sensing the relative progress through said casting region of said continuously cast contoured shapes in said opposed pair of edge dams, by comparison between said edge dams,

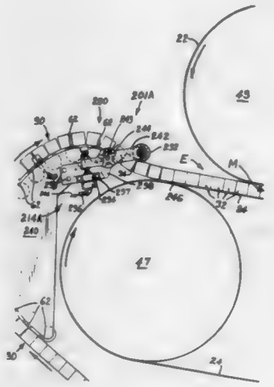
deriving a control parameter when the error in the position of said depressions or cavities between the two said edge dams departs from a range of pre-established limits,

adjustably imposing a roller tensing device against the sagging return reach of at least one of said moving edge dams, which roller tensing device contains a plurality of rollers which exert rolling contact against said moving edge dam,

adjusting, with respect to a section of at least one of said moving edge dams, the elevation of at least one aforesaid roller tensing device in response to said control parameter, thereby resulting in

synchronizing the progressive movement and position of said pair of edge dams in relation to each other, with the final result that the aforesaid integral repetitive projections or lobes of the aforesaid metal being continuously





cast will be disposed in a predetermined, consistently repetitive relationship with respect to each other.

4,694,900

DRY PELLET DISPENSING DEVICE FOR WELLS

Kelly D. Behrens, Albert City, Iowa, assignor to B & B Chlorination, Albert City, Iowa

Filed Aug. 5, 1985, Ser. No. 763,038
Int. Cl.[4] E21B 43/25
U.S. Cl. 166—75.1 **10 Claims**

1. Apparatus for dispensing dry pellets, comprising:

(a) a pellet reservoir having a pair of oppositely inclined floor portions and a lower chamber;

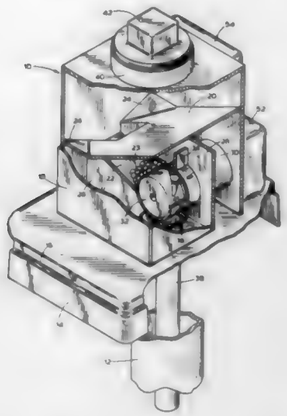
(b) tube means downwardly communicating between said lower chamber and the outside of the pellet dispensing apparatus;

(c) a metering drum mounted for rotation inside a cylindrical sleeve near an outlet end of the lower of said floor portions, and separating the upper side of said lower floor portion from said lower chamber;

(d) one or more indentations, substantially circular in cross section, in the periphery of said drum for receiving a single pellet;

(e) drive means for rotating said metering drum from a first position wherein one of said indentations receives a pellet

from said pellet reservoir to a second position wherein said pellet is delivered into said tube means; and



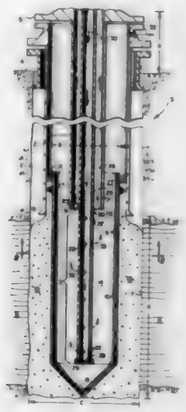
(f) responsive control means for selectively operating said drive means to deliver pellets at a predetermined adjustable rate.

4,694,901

APPARATUS FOR REMOVAL OF WELLBORE PARTICLES

James L. Skinner, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 29, 1985, Ser. No. 759,806
Int. Cl.⁴ E21B *37/08*
U.S. Cl. 166—77 **10 Claims**



1. In wellbore apparatus wherein a deep wellbore passes through at least one hydrocarbon fluid producing subterranean formation and an apertured liner is carried in said wellbore adjacent said hydrocarbon fluid producing formation, said liner defining an enclosed inner chamber within said liner and an external zone which extends from the outer wall of said liner to the wall of said wellbore, the improvement comprising:

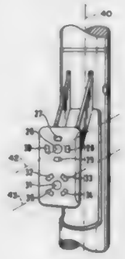
an elongated coilable tubing insertable into said wellbore, said coilable tubing being configured to include first conduit means having inner and outer walls and which is in communication with the surface of the earth and extends into said inner chamber, said first conduit means extending for a substantial portion of the length of said inner chamber, said first conduit means having a plurality of spaced apart nozzle means carried on a portion thereof extending over substantially the entire length of said first conduit means in said inner chamber and adapted to direct flow of fluid radially outwardly into said inner chamber, and said nozzle means being arranged such as to induce substantially vortex flow of fluid emitting from said nozzle means within said inner chamber, at least second conduit means having inner and outer walls and which is in fluid communication with the surface of the earth separately from said first conduit means, said second conduit means extending around said first conduit means and forming a generally annular zone between the inner wall of said second conduit means and the outer wall of said first conduit means to provide a path by which fluid and entrained solids are removed from said inner chamber by way of said second conduit means, said annular zone having a cross-sectional flow area approximately the same as the cross-sectional flow area of said first conduit means so as to maintain a flow velocity of said fluid which will substantially prevent settling out of said solid particles in said inner chamber or said annular zone, said second conduit means terminating near the top of said inner chamber close to but spaced from the point where said nozzle means first appear on said first conduit means so that said second conduit means does not overlap said nozzle means, said improvement providing for circulating fluid through the interior of said first conduit means and out through said nozzle means into said inner chamber to entrain solid particles in said circulated fluid, said fluid then being removed from said inner chamber by way of said second conduit means whereby said solid particles that pass from said external zone through said liner and collect in said inner chamber are swept out of said inner chamber by said circulated fluid as it passes from said nozzle means through said inner chamber into said second conduit means.

4,694,902

PROCEDURE AND DEVICE FOR DETERMINING THE JAMMING POINT OF A PIPE LINE IN A DRILL HOLE

Gerd Hörmansdörfer, Kastanieneck 6 A, 3167 Burgdorf-Beinhorn, Fed. Rep. of Germany

Filed Apr. 10, 1986, Ser. No. 850,266
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512767; Feb. 18, 1986, 3605036
Int. Cl.⁴ E21B *47/00*
U.S. Cl. 166—250 **18 Claims**



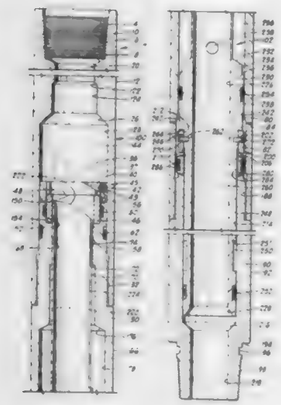
1. A procedure for determining the jamming point of a pipe line in a drill hole comprising passing a probe unit through said pipe line at essentially constant speed, said probe unit having a long axis, a magnetostrictive analyzer and a spring biasing said magnetostrictive analyzer against the inner surface of said pipe line with the axis of said magnetostrictive analyzer perpendicular to said long axis, imposing mechanical stress on said pipe line and transmitting the mechanical stresses sensed by said magnetostrictive analyzer in different areas of said pipe line to a data processing means.

4,694,903

FLAPPER TYPE ANNULUS PRESSURE RESPONSIVE TUBING TESTER VALVE

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 20, 1986, Ser. No. 876,967
Int. Cl.⁴ E21B *47/10, 34/10*
U.S. Cl. 166—250 **2 Claims**



1. A method of pressure testing a pipe string in a well bore, comprising:

providing a pipe string having a tubing tester valve at the lower end thereof;

running said pipe string into said well bore;

filling the interior of said pipe string from below with well bore fluid through said tubing tester valve;

testing the integrity of said pipe string by applying pressure to the interior of said pipe string above said tubing tester valve thereagainst;

sealing across the annulus between said pipe string and the wall of said well bore below said tubing tester valve with a packer;

trapping hydrostatic pressure on the interior of said tubing tester valve in response to said sealing;

increasing the pressure in the well bore above said packer to open said tubing tester valve;

opposing said pressure increase with said trapped hydrostatic pressure; and

opening said tubing tester valve only when the force resulting from said increased pressure exceeds the force resulting from said trapped hydrostatic pressure, to flow in said pipe string from above to below said tubing tester valve.

4,694,904

CYCLIC FLOODING OF A NATURALLY-FRACTURED FORMATION

M. Marc Sengul, and Steven B. Hinchman, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

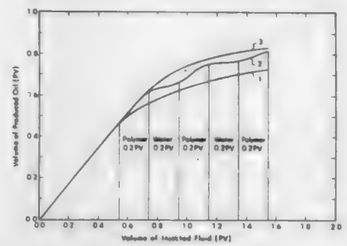
Filed Jul. 31, 1986, Ser. No. 892,524
Int. Cl.⁴ E21B *43/22, 47/00*
U.S. Cl. 166—252 **15 Claims**

1. A process for recovering oil from a subterranean formation having an oil-bearing connective natural fracture network and oil-bearing matrix blocks, both in fluid communication with an injection well and a production well, the process comprising:

(a) adjusting the mobility of a fluid such that said mobility adjusted fluid substantially flows in said natural fracture network, but does not substantially flow into said matrix blocks upon injection into said natural fracture network;

(b) injecting said mobility adjusted fluid into said natural fracture network via said injection well to displace the oil in said natural fracture network toward said production well;

(c) thereafter sequentially injecting a second fluid having a



substantially higher mobility than said mobility adjusted fluid into said natural fracture network via said injection well to displace said mobility adjusted fluid toward said production well;

(d) conveying said second fluid into said matrix blocks to displace the oil therein into said natural fracture network; and

(e) recovering the displaced oil from said formation via said production well.

4,694,905

PRECURED COATED PARTICULATE MATERIAL

David R. Armbruster, Forest Park, Ill., assignor to Acme Resin Corporation, Westchester, Ill.

Filed May 23, 1986, Ser. No. 866,523
Int. Cl.⁴ B05D *7/00;* **B32B** *27/14, 27/42;* **E21B** *43/267*
U.S. Cl. 166—280 **36 Claims**

1. Coated particulate material consisting essentially of particles resistant to melting at temperatures below about 450° F., said particles individually coated with one or more layers of a cured resin selected from the group consisting of:

(a) the combination of a phenolic resin and a furan resin; or

(b) the terpolymer of a phenol, furfuryl alcohol and an aldehyde.

4,694,906

METHOD FOR EMPLACEMENT OF A GELATINOUS FOAM IN GAS FLOODING ENHANCED RECOVERY

Richard D. Hutchins, Placentia, and Hoai T. Dovan, Fullerton, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 30, 1985, Ser. No. 771,283
Int. Cl.⁴ E21B *33/13*
U.S. Cl. 166—294 **43 Claims**

1. A method for reducing the permeability of the higher permeability zones of a subterranean reservoir having heterogeneous permeability and being penetrated by at least one well, said method comprising:

(I) injecting through a well and into a subterranean reservoir:

(a) an aqueous liquid solution comprising:

(1) a water-soluble or water-dispersible polymer;

(2) a crosslinking agent for the polymer capable of reacting with the polymer to produce a gel;

(3) a source of hydroxyl ions in an amount sufficient to retard the reaction of the polymer with the crosslinking agent;

(4) a water soluble surface active agent;

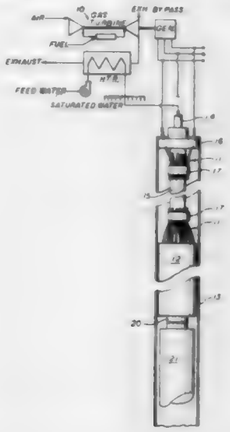
(b) a foam enplacement gas comprising an acid gas; and
(c) allowing a gelatinous stable foam having stiffened foam films of crosslinked polymer to form in the higher permeability zones.

4,694,907

THERMALLY-ENHANCED OIL RECOVERY METHOD AND APPARATUS

Charles R. Stahl, Scotia, N.Y.; Michael A. Gibson, and Christian W. Knudsen, both of Houston, Tex., assignors to Carbotek, Inc., Houston, Tex.

Filed Feb. 21, 1986, Ser. No. 832,267
Int. Cl.[4] E21B *36/04, 43/24*
U.S. Cl. 166—303 **24 Claims**



1. A method of stimulating the flow of oil from a reservoir formation traversed by a bore hole, comprising
providing an above-ground hydrocarbon powered turbine-driven electric generator to produce electrical power,
supplying water in heat exchange relation to the exhaust from said turbine to produce pressurized hot water simultaneously with said power generation,
positioning electric heating means in said bore hole between the surface and the point of discharge to said formation and energizing the same by power from said generator,
positioning an injection tube in said bore hole adjacent to said heating means,
said electric heating means comprising a plurality of electric resistance heaters, completely insulated electrically from injected water and formation fluids positioned circumferentially about said hot water injection tube,
said injection tube comprising a small-diameter insulated tube enclosed at the bottom and having orifices in the side wall adjacent to said electric heating means,
injecting said pressurized hot water from the surface down the bore hole through said injection tube to expand said water to reservoir pressure, while maintaining a high hydrostatic pressure thereon, and in heat exchange with said electric resistance heaters to convert said water into high pressure steam, said electric resistance heaters being the sole source of heat for vaporizing said pressurized hot water, and
directing said high pressure steam from said electric resistance heaters into said oil reservoir to heat the same and stimulate the flow of hydrocarbons therefrom.

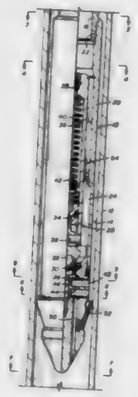
19. An injection-heater for injecting high-pressure steam into a well formation comprising
an elongated axially extending tubular member adapted to be secured on the lower end of a conduit supported in a well bore,
said tubular member being enclosed at its bottom end and having a series of apertures in its side wall adjacent thereto,
heating means comprising a plurality of elongated electric heating elements circumferentially disposed about said tubular member bottom end adjacent to said apertures,
said electric heating means comprising a plurality of electric resistance heaters, completely insulated electrically from injected water and formation fluids positioned circumferentially about said tubular member,
(said tubular member being adapted to receive water conducted from the surface through said conduit and to expand said water to well formation pressure and inject same into contact with said heating means to convert the water into high pressure steam, and)
said tubular member being adjacent to said electric resistance heaters and adapted to receive water conducted from the surface through said conduit and to expand said water to reservoir pressure and inject same into contact with said electric resistance heaters to convert the water into high pressure steam, said electric resistance heaters being the sole source of heat for vaporizing said pressurized hot water, and
means to direct said high pressure steam from said (heating means) electric resistance heaters into said well formation to heat the same to stimulate the flow of hydrocarbons therefrom.

4,694,908

METHOD AND APPARATUS OF INJECTING FLUID INTO A WELL CONDUIT BY COIL TUBING

Arthur J. Morris, Magnolia, Tex., and Donald E. Newton, Marrero, La., assignors to Camco, Incorporated, Houston, Tex.

Filed Oct. 27, 1986, Ser. No. 923,452
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—310 **10 Claims**



6. An injector valve for use on coil tubing for injecting fluid into a well conduit comprising,
a body having connecting means for connection to a coil tubing,
said body including a fluid passageway for receiving injecting fluid, and has a fluid outlet connected to the fluid passageway,
a piston actuated valve positioned in the fluid passageway upstream of the fluid outlet,
biasing means acting on the valve in a direction to close the valve,
said piston subject to fluid pressure in the fluid passageway acting in a direction to open the valve, and
said fluid outlet directed outwardly from the body around the body circumference for circumferentially spraying the interior circumference of a well conduit.

10. The method of injecting fluid into a well conduit by coil tubing comprising,
inserting a coil tubing having a fluid outlet and a valve positioned in the coil tubing above the outlet into the well conduit, said valve including a piston actuator,
inserting a fluid to be injected downwardly into the coil tubing,
biasing the valve to the closed position with a sufficient force to at least balance the hydrostatic force of injection fluid in the tubing,
pressuring the fluid in the coil tubing for opening the valve by the pressure of the injecting fluid acting on the piston actuator overcoming the biasing force, and ejecting the fluid through the fluid outlet, and
vertically moving the fluid outlet relative to the well conduit while injecting the fluid into the conduit.

4,694,909

RISER SUPPORT SYSTEM

Graham W. Stephenson, Loughton, and Richard C. Toft, London, both of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 573,311, Jan. 24, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,876
Claims priority, application United Kingdom, Jan. 27, 1983, 8302292
Int. Cl.[4] E21B *7/12*
U.S. Cl. 166—359 **6 Claims**



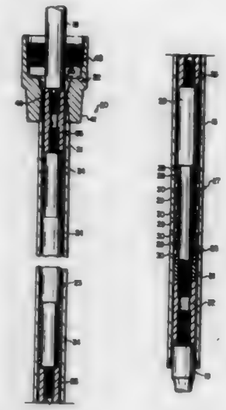
1. An oil production system comprising:
(a) a floating vessel having a moonpool,
(b) a support system for supporting a riser running through the moonpool, and
(c) a riser adapted to be supported by (b); the support system (b) comprising;
(d) guides in the moonpool,
(e) a carriage adapted to run on the guides, the guides being fixed to the vessel so as to prevent relative rotation between the carriage and the vessel, and
(f) means for supporting the carriage the carriage (e) comprising:
(g) a pivoted support for the riser, capable of pivoting about more than one axis; the oil production system also comprising:
(h) means for permitting relative rotation about a vertical axis between at least a section of the riser and the carriage.

4,694,910

PACKING TUBE ASSEMBLY FOR PUMPING WELLS

Geoffrey F. Towner, and Charles A. Carter, both of Dallas, Tex., assignors to Texaust Australia Limited, Canberra, Australia

Filed Jun. 16, 1986, Ser. No. 874,657
Int. Cl.[4] E21B *33/03, 19/16*
U.S. Cl. 166—379 **6 Claims**



1. In a pumping well having a conventional production tubing string, a downhole pump, a sucker rod string for operating said downhole pump, a polished rod forming the upper end of said sucker rod string, and a pumping tee forming part of a wellhead; a packing tube assembly for replacing a conventional stuffing box, said packing tube assembly comprising:
a packing tube;
a rod adaptor adapted to be coupled between said polished rod and said sucker rod string and adapted to extend throughout said packing tube when positioned therein;
compressible packing means on said rod adaptor adapted to provide a seal between said rod adaptor and said packing tube when said rod adaptor is in position within said packing tube;
stabilizing means on said rod adaptor adapted to engage said packing tube to stabilize said rod adaptor within said packing tube during operation; and
a mounting bushing connected to the top of said packing tube and adapted to be threaded into said pumping tee to secure said packing tube position within said production tubing string; said bushing having a bore therethrough, said bore having a smoothly tapered interval therein which tapers downwardly and inwardly from a diameter which is greater than the diameter of the packing means in its uncompressed state to a diameter of the packing means in its compressed state which is equal to the inside diameter of said packing tube whereby said rod adaptor with said packing means thereon can be inserted into said packing tube through the upper and thereof without damaging said packing means.

5. A method of converting a conventional stuffing box-equipped pumping well to a packing tube-equipped well comprising:
disconnecting the polished rod of the pumping well from the sucker rod string while suspending said sucker rod string within the well by the use of slips;
unthreading the conventional stuffing box from the pumping tee of the well and removing the stuffing box;
attaching the polished rod to the upper end of a rod adaptor of a packing tube assembly, said rod adaptor having packing elements thereon;
inserting said rod adaptor with said polished rod attached into the packing tube of said packing tube assembly;

aligning said packing tube assembly with said sucker rod string;
connecting the lower end of said rod adaptor to said sucker rod string;
removing said slips and lowering said packer tube assembly through said pumping tee; and
connecting the upper end of said packing tube to said pumping tee.

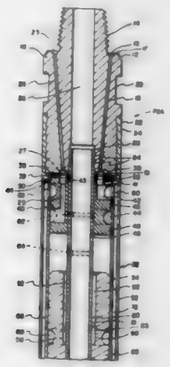
6. In a pumping well having a packing tube assembly in lieu of a conventional stuffing box, said packing tube assembly having a packing tube connected to the pumping tee of the well and a rod adaptor connected into the pump string and slidability positioned in said packing tube, said adaptor having packing elements thereon which seal with said tube during pumping operations, a method of servicing said packing tube assembly comprising: raising the pump string through said packing tube until said packing elements on said rod adaptor are positioned out of and above said packing tube while said packing tube remains in place within the well;
replacing said packing elements on said rod adaptor; and
lowering said pump string until said rod adaptor has reentered said packing tube from the upper end thereof.

4,694,911

DRILLING ASSEMBLY FOR PERCUSSION DRILLING OF DEEP WELLS

James D. Kennedy, P.O. Box 140, Wentworth, Mo. 64873

Continuation-in-part of Ser. No. 630,670, Jul. 13, 1984. This application Feb. 25, 1985, Ser. No. 705,222
Int. Cl.[4] B25D *17/14*
U.S. Cl. 173—62 12 Claims



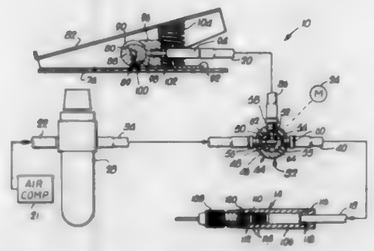
1. A percussion drill assembly for down hole drilling, comprising:
an elongated chamber defining a barrel assembly;
a top sub assembly connected to one end of said barrel assembly and having passage means therein including a flushing passage and separate intake and fluid exhaust passages sealed from the flushing passage;
a driver sub assembly connected to the other end of said barrel assembly;
a hammer assembly disposed within said chamber and having an axially extending flushing passage therein and fluid intake and fluid exhaust passages, said hammer assembly being disposed within said barrel assembly for reciprocal motion therein;
an anvil and bit shank assembly disposed within said chamber and having an axial flushing passage disposed within said driver sub assembly; said anvil and bit shank assembly adapted to be impacted upon by said hammer assembly;
a fluid distributing means disposed within said barrel assembly to receive an operating fluid for causing reciprocal movement of said hammer assembly; said barrel assembly having passage means for interconnecting the fluid intake passages of the top assembly and the hammer assembly through the fluid intake passages of the distributing means and the fluid exhaust passages of the top sub assembly and the hammer assembly through the exhaust passages of the distributing means, and
a tube extending through the flushing passage of said distributing means and said hammer assembly for passing a flushing fluid therethrough separate from said operating fluid.

4,694,912

CONTROLLED IMPACT POWER TOOL

Donald A. Glaser, Emporia, Kans., assignor to Glendo Corporation, Emporia, Kans.

Continuation of Ser. No. 667,074, Nov. 1, 1984, abandoned, which is a continuation of Ser. No. 413,541, Aug. 13, 1982, abandoned. This application Feb. 28, 1986, Ser. No. 836,224
Int. Cl.[4] B25D *9/26*
U.S. Cl. 173—115 6 Claims



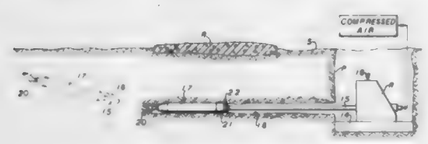
1. An impact power tool for use in delicate handworking operations including:
a hand-held device having
a tubular body presenting a bore and having a first tool mounting end and a second closure end, said body being provided with a member adjacent said first end for supporting an impact transmitting work tool projecting from the body,
a piston received within said bore shiftable along a stroke length between an impact position engaging said member and any one of a number of extended positions between said member and said second end,
said bore defining a first portion between said piston and said first end of the bore and a second variable length portion between said piston and said second end of said bore, the length of said second portion of the bore varying as a function of the disposition of the piston in the extended positions therein;
spring means within said first bore portion of the body for biasing said piston toward said second end of the bore;
a source of motive fluid pressurized to a certain, maximum positive value;
means coupling said source of motive fluid to said body for communication with said second bore portion thereof for maintaining a positive pressure condition at all times within said second portion of the bore during use of said device and for direct impingement of said motive fluid on said piston,
said body being provided with port means therein operable to maintain fluid communication of said first portion of said bore with the atmosphere during operation of the device,
said certain, positive pressure value of the fluid of said source being sufficient to cause the pressurized fluid to overcome the bias of said spring means and effect shifting of said piston toward and into said impact position thereof engaging said member; and
means for intermittently, cyclically, lowering the pressure of said motive fluid in said second portion of said bore to any one of a number of reduced, preselected levels each of which is below said maximum value and above atmospheric and each of which allows the spring means to return the piston from said impact position to an extended position which is determined by the magnitude of the reduced pressure level, each of said reduced pressures being sufficient to overcome the bias of said spring means as said piston moves toward said end of the body to interrupt such movement and restrict the piston to an extended position preventing said piston from shifting fully to said second end, said pressure lowering means including selectively positionable means being movable by the tool user into selected positions each of which causes the pressure of said motive fluid in said second portion of the bore to be reduced to a different, reduced level which is above atmospheric pressure, thus allowing selective variation of the distance of said extended position from said impact position depending on the position of the selectively positionable means in order to vary the amount of impact energy imparted to said impact member by said piston during travel thereof into said impact position.

4,694,913

GUIDED EARTH BORING TOOL

William J. McDonald; Gerard T. Pittard; William C. Maurer; Michael R. Wasson, and William C. Herben, all of Houston, Tex., assignors to Gas Research Institute, Chicago, Ill.

Filed May 16, 1986, Ser. No. 863,957
Int. Cl.[4] E21B *4/14, 4/20, 7/08*
U.S. Cl. 175—61 26 Claims



1. A controllable tool for drilling holes in the earth comprising
a hollow elongated rigid supporting drill pipe having a forward end for entering the earth,
means supporting said drill pipe for earth boring or piercing movement, including
means for moving said drill pipe longitudinally for penetrating the earth,
said drill pipe moving means being constructed to permit addition and removal of supporting drill pipe during earth penetrating operation,
a boring mole supported on the forward end of said hollow low drill pipe comprising
a cylindrical housing supported on and open to the forward end of said drill pipe,
a first means on said front end for applying a boring force to the soil comprising an anvil having a striking surface inside said housing and a boring surface outside said housing,
a second means comprising a reciprocally movable hammer positioned in said housing to apply a percussive force to said anvil striking surface for transmitting a percussive force to said boring force applying means, and
means permitting introduction of air pressure supplied through said hollow pipe into said housing for operating said hammer and for discharging spent air from said housing to the hole being bored, and
said tool being operable to penetrate the earth upon longitudinal movement of said drill rod by said longitudinal rod moving means and operation of said mole by reciprocal movement of said hammer.

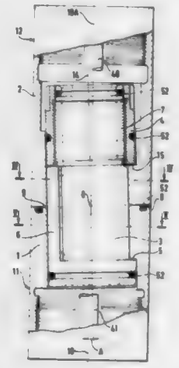
4,694,914

DRILLING STRING FOR DRILLING A BENT BORE, A METHOD OF USING SAID STRING, AND A BENDING DEVICE USED IN SAID STRING

Georges Obrecht, Seyssins, France, assignor to Alsthom, Paris, France

Filed Jul. 23, 1986, Ser. No. 888,664
Claims priority, application France, Jul. 30, 1985, 85 11608
Int. Cl.[4] E21B *7/08*
U.S. Cl. 175—61 4 Claims





1. In a drilling string assembly for drilling a bent bore, said string assembly having an axis at all points along its length and comprising:
a rotary drilling tool mounted via a tool shaft to the bottom of the string, said tool having a tool axis which locally constitutes the string assembly axis;
a down-hole motor assembly including a driving element driving said tool in rapid rotation relative to said string assembly;
a pivot element placed between said driving element and said tool and carrying said tool shaft for transmitting axial thrust to said tool while enabling said tool rotation;
a controllable bending device above said tool capable of taking up a bent configuration for locally bending the string in order to provide a curved length of bore, and capable of taking up a rectilinear configuration for re-establishing string rectilinearity in order to provide a straight length of bore; and
a succession of drilling tubes for transmitting axial thrust to said pivot element, and for enabling the string assembly to be slowly rotated from the surface of the ground;

said bending device comprising:
a lower sleeve having an axis which is locally the axis of said string assembly and which is fixed to said tool axis;
an upper sleeve above said lower sleeve and having an axis which is locally the axis of said string assembly; and
pivot means interconnecting said upper and lower sleeves, said pivot means having a pivot axis which slopes by the same small pivot slope angle (A) relative to the respective axes of said sleeves and holding said sleeves relative to each other and a pivot sector enabling the lower sleeve to rotate through a limited pivot sector angle (R) relative to the upper sleeve about said pivot axis, between an aligned position of said lower sleeve in which the axes of said sleeves are aligned in order to bring said device to its rectilinear configuration, and a bent position of said sleeve creating a bend angle D where; $D=2A \sin R/2$ between the axes of said two sleeves bringing the device its bent configuration, said pivot means allowing a free passage inside the string assembly at least for a drilling mud;
the improvement wherein said column includes, beneath said bending device and above said tool, a member which rubs against the wall of the bore so that rotating said drilling string assembly in a normal direction causes a friction couple to be set up bringing said lower sleeve into abutment at said alignment end of the pivot sector, and so that rotation of said drilling string assembly in the opposite direction causes a friction couple to be set up bringing said lower sleeve into abutment at said bending end, and said bending device is placed between said driving element and the pivot element and has a coupling passing axially therethrough for transmitting motor drive to said tool shaft, said driving element driving said coupling to cause it to rotate in said "normal" direction so that friction of said shaft in said pivot element tends to drive and hold said lower sleeve in abutment at said bending end in the absence of rotation of the drilling string assembly.

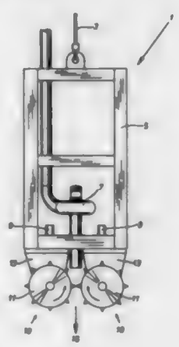
3. A method of drilling a well with bends using a drilling string, said string having an access of all points along its length and comprising:
a rotary tool mounted via a tool shaft to the bottom of the string, said tool having a tool axis which locally constitutes the string assembly axis;
a down-hole motor assembly including a driving element driving said tool in rapid rotation relative to said string assembly;
a pivot element placed between said driving element and said tool and carrying said tool shaft for transmitting axial thrust to said tool while enabling said tool rotation;
a controllable bending device above said tool capable of taking up a bent configuration for locally bending the string in order to provide a curved length of bore, and capable of taking up a rectilinear configuration for re-establishing string rectilinearity in order to provide a straight length of bore; and
a succession of drilling tubes for transmitting axial thrust to said pivot element, and for enabling the string assembly to be slowly rotated from the surface of the ground;
said bending device comprising:
a lower sleeve having an axis which is locally the axis of said string assembly and which is fixed to said tool axis;
an upper sleeve above said lower sleeve and having an axis which is locally the axis of said string assembly; and
pivot means interconnecting said upper and lower sleeves, said pivot means having a pivot axis which slopes by the same small pivot slope angle (A) relative to the respective axes of said sleeves and holding said sleeves relative to each other and a pivot sector enabling the lower sleeve to rotate through a limited pivot sector angle (R) relative to the upper sleeve about said pivot axis, between an alignment end position of said lower sleeve in which the axes of said sleeves are aligned in order to bring said device to its rectilinear configuration, and a bending end position of said sleeve creating a bend angle D where; $D=2A \sin R/2$ between the axes of said two sleeves bringing the device its bent configuration, said pivot means allowing a free passage inside the string assembly at least for a drilling mud;
and wherein said column includes, beneath said bending device and above said tool, a member which rubs against the wall of the bore, said method comprising the steps:
continuously rotating said drilling string in a "normal" direction from the surface of the ground during rectinlinear drilling stages in order to maintain said slower sleeve in abutment against said alignment of said pivot sector; and
effecting a change over from a rectilinear drilling stage to a curved drilling stage by temporarily rotating the drilling string in said opposite direction from the surface of the ground in order to bring the lower sleeve into abutment against said bending end of said pivot sector;
measuring the angular position of the bottom end of the drilling string about its axis and continuing to rotate said string in the opposite direction until said axis arrives in a predetermined plane of curvature in which a curved length of well is to be drilled;
performing said curved drilling stage without the string being rotated; and
effecting a changeover from a curved drilling stage to a rectilinear drilling stage by returning the rotation of the drilling string to rotation in the normal direction.

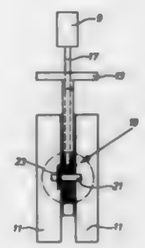
4,694,915

SLOTTED WALL MILLING CUTTER

Karlheinz Bauer, Schrobenhausen, and Maximilian Arzberger, Igenhausen, both of Fed. Rep. of Germany, assignors to Karl Bauer Spezialtiefbau GmbH & Co KG, Schrobenhausen, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 849,449
Int. Cl.[4] E21B *4/16*
U.S. Cl. 175—91 13 Claims





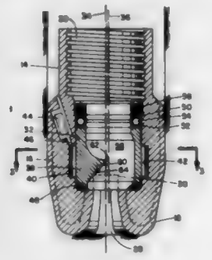
1. A slotted wall milling cutter for producing a slotted wall in the ground, said slotted wall milling cutter comprising:
a cutter frame,
a bearing bracket fixed to said cutter frame,
two roller-like cutting wheels rotatably mounted on said bearing bracket, one of said two roller-like cutting wheels being located on each side of said bearing bracket,
at least one drive motor for rotating said two roller-like cutting wheels,
a cutting wheel gear arranged in said two roller-like cutting wheels to drive said two roller-like cutting wheels, and
gear means including transmission means for interconnecting and transmitting a driving force between said at least one drive motor and said cutting wheel gear, said gear means being mounted within said bracket means to protect said gear means while the slotted milling cutter produces a slotted wall in the ground.

4,694,916

CONTINUOUS CORING DRILL BIT

George A. Ford, Houston, Tex., assignor to R. C. Ltd., Houston, Tex.

Filed Sep. 22, 1986, Ser. No. 910,389
Int. Cl.[4] E21B *10/02*
U.S. Cl. 175—249 13 Claims



1. A continuous coring drill bit comprising:
(a) body means defining a vertical axis and adapted for connection to drill pipe and forming an internal body cavity disposed in eccentric relation with said vertical axis and a generally circular throat in communcation with said body cavity for conducting drilling fluid, said throat defining a throat axis coincident with said vertical axis and being of a configuration permitting passage of a formation core into said body cavity;
(b) a generally cylindrical tubular core breaker being rotatably mounted within said body cavity and defining a vertical axis of rotation of generally parallel and offset relation with said vertical axis of said body means; and
(c) a buttress element extending inwardly from said core breaker and adapted to contact said formation core, upon each rotation of said drill bit said buttress element applying transverse force to said core for fracturing of said core into sections sufficiently small for transport by said drilling fluid.

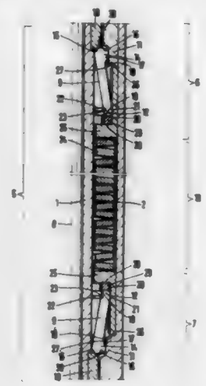
4,694,917

MECHANICAL JARRING DEVICES FOR USE IN DRILLING

Gerhard Heidemann, Witten-Stockum, and Johannes Witte, Brunswick, both of Fed. Rep. of Germany, assignors to Eastman Christensen Co., Salt Lake City, Utah

Filed Mar. 31, 1986, Ser. No. 846,585
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1985, 3513123
Int. Cl.[4] E21B *4/06, 31/107*
U.S. Cl. 175—299 11 Claims

1. In a jarring device for use in drilling which jar device comprises first and second members longitudinally relatively movable between a locked position and a released position the improvement which comprises:
providing control means including first and second locking devices arranged between and slidable relative to both said first and second members;
said first locking device having a release position and a locking position to prevent relative movement between said members until a predetermined force is applied to one of said movable members in one longitudinal direction;
said second locking device having a release position and a



locking position to prevent relative movement between said members until a predetermined force is applied to one of said movable members in the opposite longitudinal direction;
spring means longitudinally interposed between said first and second locking devices for normally maintaining said locking devices in said locking position, said predetermined force being sufficient to longitudinally displace one of said locking devices against the urging of said spring means out of said locking position and into said release position.

4,694,918

ROCK BIT WITH DIAMOND TIP INSERTS

David R. Hall, Provo, Utah, assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 728,177, Apr. 29, 1985, Pat. No. 4,604,106, which is a continuation-in-part of Ser. No. 600,399, Apr. 16, 1984, Pat. No. 4,525,178. This application Feb. 13, 1986, Ser. No. 829,022
The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.
Int. Cl.[4] E21B *10/52*
U.S. Cl. 175—329 54 Claims

1. A percussion rock bit, comprising:
a steel body;
means at one end of the steel body for connecting the bit to a drill string;
a plurality of inserts embedded in the other end of the steel body, at least a portion of the inserts comprising:
a cemented tungsten carbide body having a grip portion embedded in the steel body and a converging end portion protruding from the surface of the steel body;
a polycrystalline diamond layer on the converging end of the carbide body;
at least one transition layer between the polycrystalline diamond layer and the carbide body, such a transition layer comprising a composite containing diamond crystals and precemented tungsten carbide particles, where the diamond crystal content is greater adjacent the

polycrystalline diamond layer and lower adjacent the cemented tungsten carbide body.

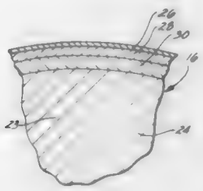
32. A rock bit comprising:

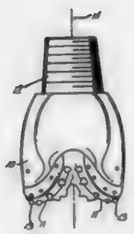
a steel body;

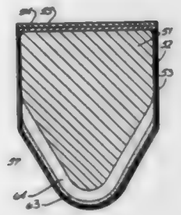
means at one end of the body for connecting the bit to a drill string;

means at the opposite end of the body for mounting at least one roller cone on the body for rotation around an axis transverse to the axis of the bit;

at least one roller cone so mounted on the body for rolling on the bottom of a bore hole being drilled;







a plurality of inserts in such a cone for crushing rock at the bottom of such a bore hole, at least a portion of such inserts comprising:

a cemented tungsten carbide body having a grip length embedded in the cone and a converging end portion protruding from the surface of the cone;

a polycrystalline diamond layer on the converging end of the carbide body; and

at least one transition layer between the polycrystalline diamond layer and the carbide body, the transition layer comprising a composite containing diamond crystals and precemented tungsten carbide particles.

4,694,919

ROTARY DRILL BITS WITH NOZZLE FORMER AND METHOD OF MANUFACTURING

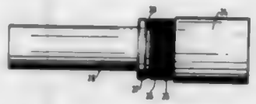
John D. Barr, Cheltenham, England, assignor to NL Petroleum Products Limited, Gloucestershire, England

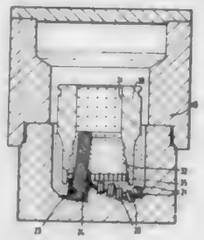
Filed Jan. 22, 1986, Ser. No. 821,303

Claims priority, application United Kingdom, Jan. 23, 1985, 8501702

Int. Cl.⁴ E21B *10/60*

U.S. Cl. 175—393 **9 Claims**





1. A method of manufacturing by a powder metallurgy process a rotary drill bit including a bit body having an external surface on which are mounted a plurality of cutting elements, and an inner passage for supplying drilling fluid to at least one nozzle located in a socket at the external surface of the bit, the method including the steps of forming a hollow mould for moulding at least a portion of the bit body, positioning on the interior surface of the mould at least one former which projects into the interior of the mould space at the desired location for a nozzle socket, the former having an external screw thread, packing around at least the externally threaded portion of the former a first matrix-forming material, packing around the former and first material a second matrix-forming material, the second matrix-forming material being a powdered material filling at least part of the mould, and infiltrating the matrix-forming materials with a metal alloy in a furnace to form a matrix, whereby the first matrix-forming material packed around the former becomes shaped with a corresponding internal screw thread, the former being so constructed that it may be removed from the bit body after formation thereof to leave in the matrix an internally threaded socket adapted to receive a separately formed, externally threaded nozzle, the internal threads in the socket being formed from the first matrix-forming material, the first matrix-forming material having characteristics enabling it to form an internal screw thread of the required fineness and the second outer matrix-forming material having different characteristics such as are normally required for a bit body.

4,694,920

COMBINATION WEIGHING SYSTEM AND METHOD

Kazufumi Naito, Ohtsu; Setsuo Haze, Shiga; Hideo Nobutugu, Kyoto; Yukio Nakagawa, Kyoto; Seiji Yamada, Kyoto, and Shuji Murata, Shiga, all of Japan, assignors to Ishida Scales Manufacturing Company, Ltd., Shiga, Japan

Filed Sep. 3, 1985, Ser. No. 772,244

Int. Cl.⁴ G01G *19/22, 19/52, 23/14*

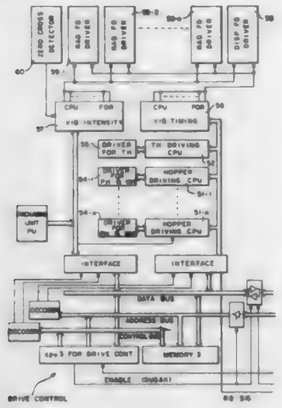
U.S. Cl. 177—25 **8 Claims**

1. An automatic combinational weighing system comprising

a plurality of separate article batch handling means adapted to receive individual article batches, to measure weights of said received article batches, to output analog weight signals indicative of said measured weights and to selectively discharge said measured article batches in response to a discharge signal, and

a control unit substantially consisting of a weight-monitoring section, a drive-control section and a main section,

said weight-monitoring section including means to input said analog weight signals from said article batch handling means and a weight-monitoring central processing unit (CPU) which serves to constantly read digital signals



corresponding to said analog weight signals and to detect stability of said article batch handling means by analyzing fluctuations in said weight signals.

said drive-control section including driving means for driving said article batch handling means and a drive-control CPU which serves to control said driving means, and

said main section including a main CPU for performing combinational calculations from said digital signals to select a combination of said article batch handling means.

4,694,921

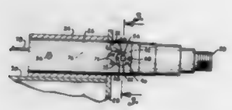
SHEAR BEAM WEIGH AXLE TRANSDUCER

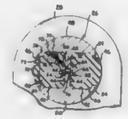
Bruce L. Johnston, Jefferson County, Wis., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Oct. 20, 1986, Ser. No. 920,966

Int. Cl.⁴ G01G *19/08, 3/14;* **G01L** *1/22*

U.S. Cl. 177—136 **12 Claims**





1. A shear beam transducer comprising:

a beam presenting opposite sides thereon, said beam being deflectable upon the application of loads thereto;

a pair of blind openings extending into the respective sides of said beam in alignment with one another, said openings terminating in end surfaces at blind ends of the openings and cooperating to provide the beam with a generally I-shaped cross sectional configuration having upper and lower flanges interconnected by a substantially vertical web presenting said end surfaces on opposite sides thereof;

each opening being undercut to present a relatively large cavity adjacent the blind end thereof and a smaller passage extending into the side of the beam;

a pair of strain gauges on each of said end surfaces, each strain gauge exhibiting a resistance which varies in proportion to the shear strain of said web; and

a bridge circuit having four arms and four corner terminals which define a pair of input terminals for receiving an input voltage and a pair of output terminals for providing an output voltage, said gauges being connected in the arms of the bridge circuit in a manner to provide an output voltage between said output terminals which is proportional to the shear strain of said web.

4,694,922

INSTRUMENT FOR MEASURING AND RECORDING FORCES

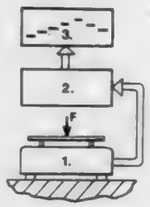
Guy Mairot, Vétraz-Monthoux, France, assignor to S.c.a.i.m.e., Annemasse, France

Filed Dec. 27, 1985, Ser. No. 814,200

Claims priority, application Switzerland, Jan. 17, 1985, 244/85

Int. Cl.⁴ G01G *23/32*

U.S. Cl. 177—178 **4 Claims**



1. An instrument for measuring, registering and displaying forces, comprising

force measuring means, a transducer for converting measured forces into electric signals, calculating means controlled by said transducer, a plurality of memories for registering successive values of the measured forces, graphic display means,

said calculating means comprises an arrangement for calculating mean values of the measured forces within successive periods of time of different periodicities, the memories being provided for registering several series of successive values of force as a function of time, at least one of said series being formed by successive daily measured values of force, remaining series being formed each of successive mean values of measured forces calculated by said calculating means for a predetermined periodicity, controlling means being provided for actuating said display means for selectively displaying memorized values of forces of the n last measured values of the measured forces, and of the n last mean values of force calculated by said calculating means for each of said various periodicities.

4,694,923

HEAVY DUTY DISPLAY CART

Lawrence B. Grenzicki, 24780 Adlai, East Detroit, Mich. 48021

Filed Oct. 17, 1986, Ser. No. 920,244

Int. Cl.⁴ B62D *1/28*

U.S. Cl. 180—6.5 **13 Claims**

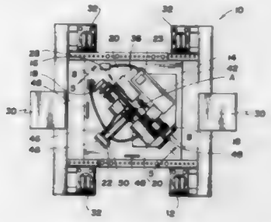
1. A heavy duty display cart comprising:

a carriage for supporting an object to be displayed, such as a vehicle;

a reversible drive mechanism supported below the carriage for rotation with respect thereto about a vertical axis, said drive mechanism including a pair of drive wheels and a pair of reversible drive motors respectively coupled to the pair of drive wheels to provide rotation of the drive mechanism about the vertical axis or movement of the cart;

a magnetic latch mechanism on the carriage and drive mech-

anism for fixing the rotational location of the drive mechanism with respect to the carriage in first second, third, and fourth positions spaced at 45 degree intervals about the vertical axis to thereby provide ten directions of movement of the cart upon reverse driving of the drive mechanism;



a radio receiver for operating the drive mechanism and the magnetic latch mechanism; and

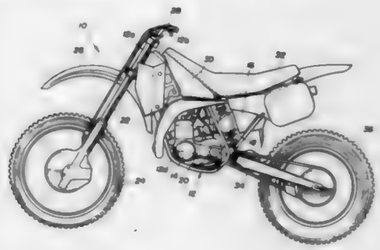
a radio transmitter for operating the receiver to control operation of the cart from a remote location.

4,694,924

MOTORCYCLE

Toshimitsu Asakura, Wako, and Tomoyuki Tagami, Soka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Dec. 24, 1985, Ser. No. 813,254
Int. Cl.[4] B62K *5/04*
U.S. Cl. 180—68.3 **11 Claims**



1. A motorcycle comprising:

(a) an elongated frame having front and rear ends;

(b) an engine mounted on said frame;

(c) a fuel tank mounted on said frame above said engine and having an upper surface extending along a length of the frame;

(d) an elongated seat mounted on said frame above said fuel tank along the length of said frame, said seat having a bottom having a portion extending along the length thereof and disposed in spaced opposed relation to said upper surface of said fuel tank to define an air intake passageway therebetween, said passageway having an open front end opening toward the front end of said frame and having a rear open end, said seat having a front end disposed near to a front end of said fuel tank so that said seat covers said upper surface of said fuel tank generally entirely; and

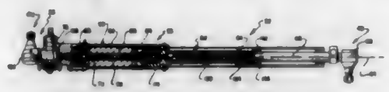
(e) an air cleaner operatively connected to said engine and disposed rearwardly of said fuel tank, the rear open end of said passageway being in communication with said air cleaner whereby the ambient air can be fed to said air cleaner through said air intake passageway.

4,694,925

STEERING APPARATUS

Maurice P. Roberts, Lafayette, Ind., assignor to TRW Inc., Lyndhurst, Ohio

Filed May 30, 1986, Ser. No. 868,602
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **12 Claims**



1. An apparatus for use in turning steerable vehicle wheels, said apparatus comprising:

an electric motor having a central axis, said electric motor including a motor output member rotatable about said central axis;

a planetary gear set drivingly connected with said motor output member;

a transmission output member coaxial with said central axis of said electric motor and connected with said planetary gear set and rotatable by said planetary gear set upon rotation of said motor output member;

a ball nut attached to said transmission output member for rotation therewith about said central axis upon rotation of said motor output member;

an externally threaded member disposed in engagement with and circumscribed by said ball nut and coaxial with said central axis and movable axially by said ball nut upon rotation of said motor output member for effecting turning of the steerable vehicle wheels; and

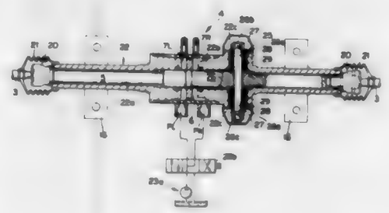
a manually rotatable drive shaft extending axially through said electric motor and said planetary gear set, said drive shaft having an input end portion drivingly connected with the steering wheel and an output end portion drivingly connected with said transmission output member.

4,694,926

VEHICLE STEERING SYSTEM

Masatoshi Kikkawa, Zama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Sep. 5, 1986, Ser. No. 903,966
Claims priority, application Japan, Sep. 6, 1985, 60-197173
Int. Cl.[4] B62D *5/10*
U.S. Cl. 180—132 **7 Claims**



1. A hydraulic actuator for a vehicle steering system, comprising:

a housing having a cylinder;

a piston positioned to move in said cylinder and define on the opposite sides thereof a pair of hydraulic chambers for selective communication with a source of hydraulic fluid under pressure;

an actuator rod connected to said piston to move together therewith and extending externally of said housing; and

biasing means for holding said actuator rod in a predetermined position when hydraulic fluid pressures in said chambers are substantially equal to each other;

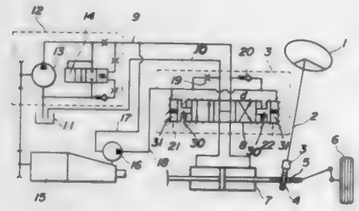
said biasing means including a cylindrical pushing pin secured to one of said actuator rod and said housing and an annular resilient bushing surrounding a longitudinal portion of said pin and secured to the other of said actuator rod and said housing in such a manner that displacement of said actuator rod out of said predetermined position causes said pushing pin to compress a longitudinally separated half of said bushing while stretching the remaining longitudinally separated half of said bushing.

4,694,927

VEHICULAR SPEED RESPONSIVE POWER STEERING DEVICE

Kiyoshi Nagae, Aichi, Japan, assignor to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Apr. 16, 1986, Ser. No. 852,795
Claims priority, application Japan, Apr. 19, 1985, 60/84344
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—132 **2 Claims**



1. A power assisted steering apparatus for a vehicle comprising:

an actuator for providing power assist;

a main pump for supplying fluid flow to said actuator;

control valve means for controlling fluid flow from said main pump to said actuator;

first passage means for communicating fluid flow from said main pump to said control valve; and

means for varying the power assist in accordance with a vehicle speed, said means comprising a vehicle speed responsive pump having an inlet port and an outlet port, second passage means for connecting said inlet port of said vehicle speed responsive pump with said first passage means, third passage means for connecting said outlet port of said vehicle speed responsive pump with a reservoir, a reactive pressure orifice located in said third passage means, and a reactive pressure check valve which is located between said third and first passage means, opens in response to a fluid pressure to direct flow from the third passage means to the first passage means, and communicates with said third passage upstream of said reactive pressure orifice.

4,694,928

OPERATOR RESTRAINT SYSTEM

James C. Barton, Peoria; Robert E. Hefner, Morton, both of Ill.; Paul A. Reid, Mentor, and Frank R. Sable, Wickliffe, both of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Jun. 9, 1986, Ser. No. 872,346
Int. Cl.[4] B60R *21/10*
U.S. Cl. 180—268 **23 Claims**

1. A work vehicle comprising:

first and second spaced apart vehicle sides;

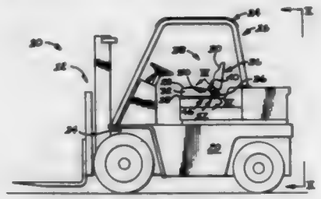
an operator station having a seat, said seat having first and second spaced apart side portions and being mounted on said operator station;

a lap belt having first and second spaced apart end portions;

means for connecting said lap belt first end portion to said operator station at a first location adjacent the seat first side;

means for connecting the lap belt second end portion to said operator station at a second location adjacent the seat second side; and

means for automatically releasing one of the first and second lap belt end portions from connection with said operator's station in response to and simultaneously with a vehicle side over turn generated impact being applied to one of



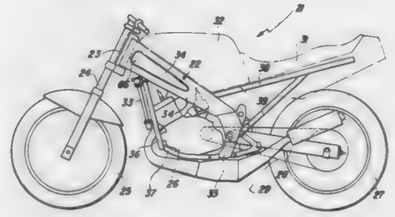
the first and second vehicle sides in a direction transverse to one of the first and second seat side portions, said automatic releasing means being maintained from releasing said one of the first and second end portions in response to an impact with the vehicle in directions longitudinal of the first and second sides and being free from external contact.

4,694,929

FRAME BODY OF MOTORCYCLES

Makoto Sugimoto, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jan. 17, 1986, Ser. No. 820,546
Claims priority, application Japan, Jan. 18, 1985, 60-6746; Mar. 14, 1985, 60-51097
Int. Cl.[4] B62K *11/04*
U.S. Cl. 180—311 **13 Claims**



1. A frame construction for a vehicle having only a single dirigible front wheel comprising a head pipe adapted to dirigibly support said front wheel and a main frame member affixed at its forward end to said head pipe and extending rearwardly therefrom, said main frame member comprising a box section member, made up of a pair of generally C-shaped pieces having overlapping flanges affixed to each other, said C-shaped pieces tapering in height from said head pipe to the rear in a decreasing manner.

4,694,930

LIFTING APPARATUS

Mitsuihiro Kishi, Ashikaga, Japan, assignor to Kabushiki Kaisha Hikoma Seisakusho, Tochigi, Japan

Filed Apr. 1, 1986, Ser. No. 846,813
Claims priority, application Japan, Apr. 3, 1985, 60-70459; Apr. 13, 1985, 60-79041; Jun. 11, 1985, 60-126830; Jun. 17, 1985, 60-132593
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 **11 Claims**

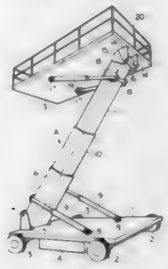
1. A lifting apparatus comprising:

(a) a chassis;

(b) a platform;

(c) a telescopic boom assembly connecting said chassis and said platform together, said telescopic boom assembly being composed of a plurality of telescopically movable booms which are axially aligned with each other;

(d) a cover member mounted on an upper one of said booms closest to said platform and having an end extending towards one of said booms other than said upper boom closest to said platform, said cover member overlying said upper boom closest to said platform and said booms other than said upper boom, said cover member being engageable with an upper surface of each of said booms other than said upper boom when said telescopic boom assembly is expanded and contracted;



(e) at least one first hydraulic cylinder disposed in said telescopic boom assembly for extending and contracting said telescopic boom assembly;

(f) at least one second hydraulic cylinder operatively coupled between said telescopic boom assembly and said chassis for tilting said telescopic boom assembly with respect to said chassis;

(g) at least one third hydraulic cylinder operatively coupled between said cover member and said platform for keeping said platform substantially parallel to said chassis; and

(h) a hydraulic control system for operating said first, second and third hydraulic cylinders in synchronism to move said platform toward and away from said chassis in a direction which is substantially perpendicular to said chassis.

4,694,931

AUTOMATIC TRIPPING RESCUE SYSTEM

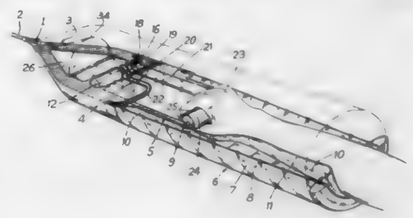
Jean-Baptiste Sibertin-Blanc, and Yves Tellier, both of Paris, France, assignors to Ecole Nationale Superieure de Creation Industrielle, Paris, France

Filed Oct. 10, 1986, Ser. No. 917,496

Claims priority, application France, Oct. 11, 1985, 85 15142

Int. Cl.[4] A62B *35/00*

U.S. Cl. 182—3 **5 Claims**



1. An automatic rescue system of the type comprising a physical, generally supple, link (2), said link being controlled at one of its extremities by a rescuer, the other extremity of said link being linked to a fastening system able to be made integral with a rescued person, characterized in that said fastening system is comprised of a mobile and inflatable sleeve (6), in that said system is fitted with a visible and easily sizable manual prehension element (23), said element being provided with tripping means (25) which are actuated by a mere hand grasping of this tripping element (25) and intended to firstly automatically and rapidly displace the sleeve (6) to place it around the forearm of the rescued person, and secondly to inflate said sleeve (6) to enclose the wrist and the forearm of the rescued person under a non-traumatising pressure.

4,694,932

STRUCTURAL SUPPORT SHOE AND METHOD OF MANUFACTURING THE SAME

Thomas J. Schmitt, Louisville, Ky., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 12, 1986, Ser. No. 895,696

Int. Cl.[4] E06C *7/46*

U.S. Cl. 182—109 **13 Claims**



1. A shoe for a structural support comprising:

a pair of rigid angular parts, each including a base member and a side member extending integrally therefrom at an angle thereto;

the base member of one part being positioned in cooperative relation with respect to the base member of the other part with the side members of each part extending in opposed facing spaced relation to each other; and,

means to join said base members in fast reinforcing relation to form said shoe.

4,694,933

SELF-PROPELLED SCAFFOLD FOR BUILDINGS AND ROPE TENSIONING MEANS, AS WELL AS PROCESS FOR THE CONSTRUCTION AND/OR FOR THE SERVICING OF HIGH BUILDINGS

Tibor Sinkó, Budapest, Hungary, assignor to Kisuzemi Innovacios Iroda, Budapest, Hungary

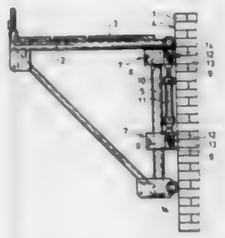
PCT No. PCT/HU84/00027, § 371 Date Dec. 18, 1984, § 102(e) Date Dec. 18, 1984, PCT Pub. No. WO84/04127, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 19, 1984, Ser. No. 690,499

Claims priority, application Hungary, Apr. 19, 1983, 1343/83; Apr. 19, 1983, 1344/83

Int. Cl.[4] E04G *3/10*

U.S. Cl. 182—128 **17 Claims**



1. In a self-propelled scaffold for buildings exhibiting a continuous outline, wherein the scaffold comprises a framework

having a vertical beam, a working platform formed on a horizontal bracket of the framework and tensionable elements extended around the building and providing a detachable connection between the building and the framework; the improvement in which, at each of at least two levels of height, the framework is associated with at least one set of jaws, through which the tensionable elements are passed for holding them away from an outer surface of the building and each set of jaws is connected respectively with a mutually independent, detachable connection to the outer surface of the building, one set of said jaws being fixedly attached to the to said beam and another set of said jaws having a sleeve which slidingly accomodates the beam and being joined to said one set of jaws by a length-variable element.

4,694,934

PORTABLE ELEVATING DEVICE

Curtis W. Erickson, Rte. 6, Box 202, Buffalo, Minn. 55313

Filed Dec. 20, 1983, Ser. No. 563,688

Int. Cl.[4] E04G *3/10*

U.S. Cl. 182—142 **10 Claims**



1. In a portable elevating device including a member for releasably grabbing a pole, a tree, or the like at an elevated vertical position, a telescoping pole for removeable interconnection to the releasably grabbing member for positioning the releasably grabbing member at the elevated vertical position, a winch for rolling and unrolling a length of cable thereon, with the free end of the cable being secured to the releasably grabbing member; a winch frame, with the winch being mounted to the winch frame, and a member secured to the winch frame for supporting an operator, with the improvement comprising an improved releasably grabbing member comprising, in combination: a generally C-shaped member including: a first member having a first end and a second end; a second member having a first end and a second end; with the first end of the second member being interconnected to the second end of the first member at an angle equal to 90 degrees; a third member having a first end and a second end, with the first end of the third member being interconnected to the second end of the second member at an angle equal to 135 degrees; a fourth member having a first end and a second end, with the first end of the fourth member being interconnected to the second end of the third member at an angle equal to 90 degrees, wherein said fourth member extends upward from the plane of the second member and the third member at an angle equal to 25 degrees, with the C-shaped member being positionable around the pole, tree, or the like by passing the pole, tree, or the like between the opening of the C-shaped member defined by the first end of the first member and the second end of the fourth member with the first member and the third and fourth members abutting with the outside surface of the pole, tree, or the like for releasably gripping the pole, tree, or the like within the C-shaped member.

4,694,935

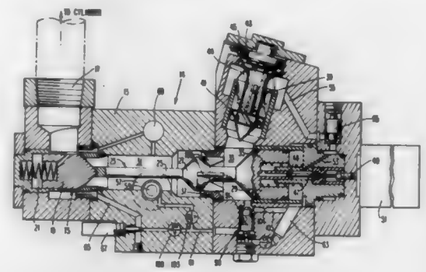
SELF-ADJUSTING CONTROL VALVE FOR ELEVATORS

William A. P. Lawrence, Simi Valley, Calif., assignor to Cemco, Inc., Plumsteadville, Pa.

Filed Oct. 17, 1986, Ser. No. 920,213

Int. Cl.[4] B66B *1/04;* **F15B** *13/043*

U.S. Cl. 187—111 **26 Claims**



1. A self-adjusting control valve for a hydraulically-operated elevator propulsion system, the system having a cylinder within which a piston is moved by the pressure of a hydraulic medium, the valve comprising:

(a) means defining a housing, the housing defining an interior chamber,

(b) means for fluidly connecting the cylinder to the chamber,

(c) a bypass piston assembly, the bypass piston assembly comprising means for dividing the chamber into three regions, the first region being nearest to the connecting means, the third region being farthest from the connecting means,

(d) a check valve, positioned between the connecting means and the first region, wherein the opening of the check valve means enables fluid to flow between the cylinder and the first region, wherein the bypass piston assembly includes a valve element which opens and closes a path between the first and second regions, wherein the filling of the first region, when the valve element is closed, causes sufficient pressure buildup in the first region to cause the check valve means to open and to force hydraulic fluid into the cylinder,

(e) means for directing hydraulic fluid from a reservoir into the first region, and a pilot line for directing fluid from the reservoir into the third region,

(f) means for conveying hydraulic fluid out of the second and third regions, and back to the reservoir,

(g) means for measuring the rate of flow of fluid out of the second region,

(h) means for measuring the pressures in the first region and in the cylinder,

(i) needle valve means for varying the rate of fluid flow out of the third region, the needle valve means being capable of being moved by a motor means,

(j) means for monitoring the linear position of the needle valve means,

(k) a microprocessor, the microprocessor being connected to receive inputs from the flow measuring means, the pressure measuring means, and the monitoring means, the microprocessor being programmed to control the motor means, so as to move the needle valve means, wherein movement of the needle valve means changes the pressure difference between the first and third regions, whereby movement of the needle valve means causes movement of the bypass piston assembly, and

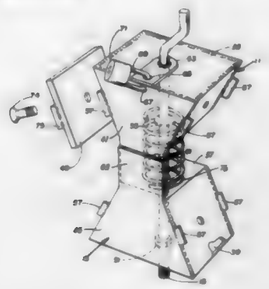
(l) a solenoid valve, fluidly connected to the cylinder, and fluidly connected to the third region, the solenoid valve, when actuated, completing a path for fluid out of the cylinder and into the reservoir, the solenoid valve being connected for actuation by the microprocessor, whereby the elevator can be lowered by allowing fluid to exit the cylinder.

4,694,936

EXTERIOR BRAKE FOR TANDEM TIRES

Carl E. Jackson, 1019 6th St., Perry, Okla. 73077

Filed Feb. 28, 1986, Ser. No. 834,575
Int. Cl.⁴ B60T *1/04*
U.S. Cl. 188—2 R **20 Claims**



1. An exterior brake device for braking tires against movement on a vehicle having a pair of tires which are radially closely spaced, said brake device comprising:

upper and lower opposing wedges which are sized for wedging engagement with upper and lower, respectively, tread surfaces of said spaced tires for preventing rotation of the tires;

a threaded bar joining said upper and lower wedges and connected thereto so that rotation of the bar moves the wedges toward and away from each other;

handle means connected to said bar for rotating said bar for moving said wedges toward and away from each other;

lock means for locking said bar against rotation; and

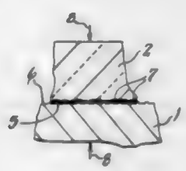
expansion pads adapted to be removably connected to said upper and lower wedges for changing the size of said wedges to fit different tire configurations and for engaging tread surfaces of said different tire configurations.

4,694,937

FRICTION ELEMENTS, ESPECIALLY FOR DRUM BRAKES

Siegfried Jonas, Gummersbach, Fed. Rep. of Germany, assignor to Beral Bremsbelag GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1986, Ser. No. 834,395
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508109
Int. Cl.⁴ F16D *69/00*
U.S. Cl. 188—73.1 **11 Claims**



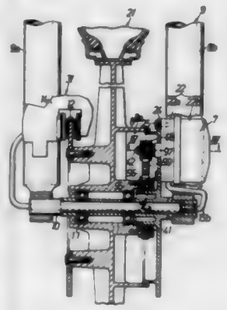
1. A friction element comprising a lining carrier and a friction lining rivated thereon, wherein between the mating surfaces of the friction lining and the lining carrier a multiplicity of particles are provided which particles are harder than the surface of the lining carrier, said particles being adhered to only one of said mating surfaces by means of a binder.

4,694,938

BRAKING DEVICE FOR VEHICLE

Tsutomu Hayashi, Tokyo; Takeshi Kawaguchi, and Tetsuo Tsuchida, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1985, Ser. No. 738,675
Claims priority, application Japan, May 30, 1984, 59-109835
Int. Cl.⁴ B60T *8/34*
U.S. Cl. 188—181 A **8 Claims**



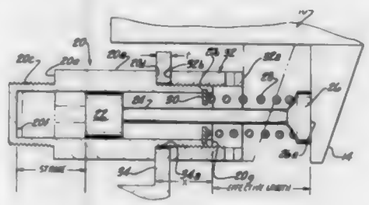
1. A braking device for motorcycles, comprising: a brake actuated by hydraulic pressure from a master cylinder for applying brake power to a motorcycle wheel; and an antilock control unit having an inertia type wheel angular deceleration sensor bulit therein which is driven by said wheel, said antilock control unit controlling a brake hydraulic pressure for said brake in accordance with an output of said sensor, wherein said brake and said antilock control unit are disposed in such a manner that they are located opposite each other on right and left sides of said wheel, and wherein a hydraulic conduit is provided to extend between said antilock control unit and said brake for feeding said brake hydraulic pressure having been controlled by said antilock control unit to said brake, said hydraulic conduit penetrating through a hollow portion formed inside an axle of said wheel.

4,694,939

SHOCK ABSORBER WITH STOP COLLAR

Robert J. Heideman, Westland, and Richard T. Mitera, Canton, both of Mich., assignors to Enertrols, Inc., Westland, Mich.

Filed May 3, 1985, Ser. No. 730,334
Int. Cl.⁴ F16F *9/48*
U.S. Cl. 188—287 **17 Claims**



1. An elongated shock absorber comprising:

(A) a main body portion;

(B) a reduced diameter front end portion forming an annular shoulder with said main body portion;

(C) a piston assembly including a piston slideably mounted in said shock absorber for axial movement between a rest position and a working position proximate but spaced from the rear end wall of said shock absorber, a piston rod secured to said piston and extending axially forwardly out of the front end of said reduced diameter portion, and an impact pad on the front end of said piston rod;

(D) an elongated annular stop collar sized to fit telescopically over said reduced diameter portion; and

(E) means mounting said collar telescopically over said reduced diameter portion in a predetermined position relative to said shoulder, with the front annular end of said collar spaced forwardly from the front end of said reduced diameter portion and the rear annular end of said collar proximate said shoulder, and operative in response to an object impacting said pad and striking the free annular end of said collar to transmit the impact loading at the rear annular edge of said collar in a straight axial line into said shoulder for absorption by said main body portion.

17. A method of mounting a shock absorber in a manner to simultaneously secure the shock absorber to a support structure, prevent bottoming of the piston of the shock absorber against the rear end wall of the shock absorber, and provide a precise predetermined end limit position for an object impacting the impact pad secured to the free end of the piston rod of the shock absorber, said method comprising the steps of:

(A) forming a threaded reduced diameter portion at the front end of the shock absorber forming an annular shoulder with the main body portion of the shock absorber;

(B) providing a bracket of predetermined thickness and having an aperture having a diameter larger than the diameter of said reduced diameter portion and smaller than the diameter of said body portion;

(C) securing said bracket to the support structure;

(D) passing said reduced diameter portion through said aperture to position the rear face of said bracket against said shoulder;

(E) providing an annular internally threaded stop collar of circular cross-section adapted to be threaded onto said reduced diameter portion and having a predetermined length slightly greater than the length of said reduced diameter portion plus the rest distance, or effective length, from the impact surface of said impact pad to the front end of said reduced diameter portion minus said predetermined bracket thickness and minus the rest distance, or stroke, of said piston from said rear end wall; and

(F) threading said collar onto said reduced diameter portion and into abutting engagement at its rear annular edge with the front face of said bracket to rigidly mount said shock absorber on said bracket and simultaneously position the front annular edge of said collar forwardly of the front end of said reduced diameter portion by a precisely determined distance such that the impacting object will engage said front annular edge just prior to bottoming of said piston against said end wall and the impacting object will be stopped at its precise predetermined end limit position.

4,694,940

CARRYING CASE WITH A HINGED LID AND CLOSURE MEMBER

Yutaka Horiuchi, Apt. 910, 100-8th Avenue, Kitchener, Ontario, Canada N2C 1S3

Filed Mar. 6, 1986, Ser. No. 837,071
Int. Cl.⁴ A45C *3/02, 13/10, 15/02*
U.S. Cl. 190—109 **5 Claims**

1. A carrying case, which comprises a body (1) and a closure member (3);

where the body includes a well-shaped compartment (14) in the body;

characterized in that:

the closure member (3) includes a main-portion (7) and a flap-portion (8), the portions being connected by a connecting means (10) which permits relative movement therebetween;

the flap-portion (8) is smaller than the main-portion (7); the main-portion (7) is rigid;

and the closure member (3) can be set selectably to all these positions relative to the body:

(a) a closed position, in which the said two portions (7, 8) of the closure member (3) lie over respective parts of the well-shaped compartment (14), the closure member (3) being so shaped and dimensioned as to substantially close at least a major part of the well-shaped compartment (14) when set in the closed position;

(b) a wide-open position, in which both portions (7, 8) are displaced away from the well-shaped compartment (14), leaving the well-shaped compartment wide open;

(c) and a partially-open position where the main-portion (7) lies over, and substantially closes, a part of the well-shaped compartment (14), and where, simultaneously, the flap-portion (8) lies open enough relative to the body (1) to permit access into the wall-shaped compartment;



where the case is provided with a lid (2), where the lid is separate from the closure member (3), and where the lid is attached to a back wall (12) of the body (1) and is pivotable relative to the back wall (12);

where the lid (2) includes a lid-flap-portion (21) and a lid-main-portion (24) the portions (21, 24) being connected by a lid-flap-connecting-means (25) which permits relative movement therebetween;

where the lid (2) can be set selectably to all these positions relative to the body (1):

(a) a closed position, in which the said two portions (21,24) of the lid (2) lie over the corresponding portions (8,7) of the closure member (3);

(b) a wide-open position, in which both portions (21, 24) of the lid are displaced away from the closure member (3), leaving the closure member, in substance, wide open;

(c) and a partially-open position, where the lid-mainportion (24) lies over, and substantially closes, the main-portion (7) of the closure member (3), and where simultaneously the lid-flap-portion (21) lies open enough relative to the closure-member (3) to permit access into the lid-flap-portion (21).

4,694,941

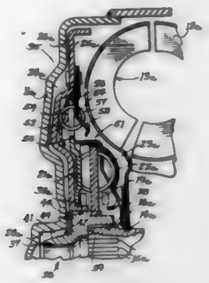
DRIVE HUB FOR TORQUE CONVERTER CLUTCH

David A. Hall, Clawson, and Kenneth C. Yuergens, Farmington Hills, both of Mich., assignors to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Jul. 16, 1986, Ser. No. 886,146
Int. Cl.⁴ F16D *3/12*
U.S. Cl. 192—3.28 **4 Claims**

1. A one-piece drive hub and spacer for a lock-up clutch in a torque converter, comprising an elongated hub barrel having a counterbored internal passage defining a shoulder acting to engage the end of a turbine hub of the torque converter having external splines; a plurality of internal splines in the counterbored portion adapted to receive the externally splined turbine

hub, a cylindrical external surface receiving the inner periphery of a clutch piston plate, sealing means in said external



surface engaging the plate periphery, and external splines formed adjacent one end of said surface adapted to receive a hub plate for said lock-up clutch.

4,694,942

INTERLINKING CONTROL DEVICE FOR BRAKE AND CLUTCH IN TRACTOR-MOUNTED WORKING MACHINES

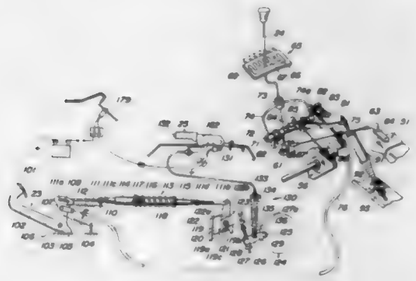
Takeo Ogano; Takeshi Komatsuzaki; Ryoichi Shigenari, all of Saitama, and Naomoto Uesugi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Toyko, Japan

Filed Feb. 15, 1985, Ser. No. 702,208

Claims priority, application Japan, Feb. 17, 1984, 59-29210; Feb. 17, 1984, 59-29213

Int. Cl.⁴ F16D *41/24*; G05G *9/08*

U.S. Cl. 192—13 A **4 Claims**



1. An interlinking control device in a tractor-mounted working machine having an engine with a governor, wheels, a braking mechanism for braking the wheels, and a clutch for selectively transmitting power from the engine to the wheels, said interlinking control device comprising:

(a) a first control system for operating said braking mechanism;

(b) a second control system for operating said clutch;

(c) a single manually operated swingable member coupled to ends of said first and second control systems, the arrangement being such that said clutch starts being disengaged when said swingable member starts swinging and is completely disengaged when said swingable member is positioned intermediately on a path of swinging movement thereof, and said braking mechinism produces a maximum braking force when said swingable member reaches a terminal end of said path of swinging movement thereof; and

(d) a third control system for operating said braking mechanism to produce a braking force slightly greater than a force required to stop the tractor-mounted working machine on a sloping surface lying at 20° wherein said first and second control systems include first and second wire members respectively, said swingable member having an arcuate slot defined therein about a pivot thereof, the first wire member having an end engaging in said arcuate slot for movement therealong, including a resilient member connected between said swingable member and said first wire member for normally urging said first wire member toward said swingable member.

4,694,943

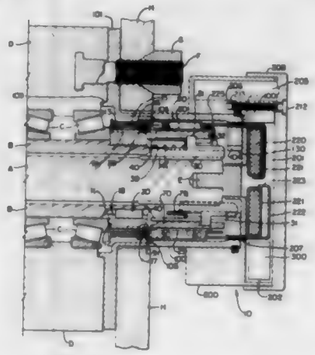
GROUND CLUTCH ASSEMBLY WITH DYNAMIC ENGAGEMENT AND DISENGAGEMENT

Harry A. Petrak, Boulder, Colo., assignor to Boulder 12 Investments, Boulder, Colo.

Filed Jan. 21, 1986, Ser. No. 820,731

Int. Cl.⁴ B60B *27/00*; B60K *23/08*; F16D *1/06, 43/20*

U.S. Cl. 192—35 **25 Claims**



1. A clutch assembly for converting a vehicle between two-wheel drive and four-wheel drive by effecting dynamic engagement and disengagement between a drive shaft and a ground engaging wheel to be driven and wherein torque applying means are provided to selectively and positively rotate the drive shaft, said clutch assembly comprising;

a fixed locking member;

a receiver gear drivingly connected to said wheel to be driven;

a drive gear keyed for rotation with said drive shaft and being axially movable with respect to said drive shaft, said drive gear interposed between said fixed locking member and the wheel to be driven and cam follower means associated with said drive gear;

an axially movable camming assembly provided with a cam surface, said cam follower means along with cam surface to impart axial movement to said drive gear along said drive shaft when said camming assembly is fixed against rotation and said drive gear is being rotated by said drive shaft; and

shift means movable into engagement with said fixed locking member whereby to temporarily lock said camming assembly against rotation, said cam follower means being responsive to positive rotation of said drive shaft when said camming assembly is locked against rotation by said fixed locking member to advance between first and second portions of said cam surface whereby said drive gear is advanced in an axial direction into and out of engagement with said receiving gear and said shift means and camming assembly are released from locking engagement with said fixed locking member so that said shift means and camming assembly are thereafter rotatable with said drive gear, and activating means for moving said shift means into engagement with said locking member independently of the application of torque to said drive shaft or the rotation of said wheel to be driven.

4,694,944

OVERLOAD CLUTCH PARTICULARLY FOR THREAD-CUTTING CHUCKS OR THE LIKE

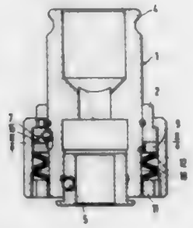
Wolfgang Schmidt, Lauf, Fed. Rep. of Germany, assignor to Emuge-Werk Richard Glimpel Fabrik fuer Praezisionswerkzeuge (vormals Moschkau & Glimpel), Lauf, Fed. Rep. of Germany

Filed Sep. 11, 1985, Ser. No. 774,832

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437269

Int. Cl.⁴ F16D *43/20, 7/06*

U.S. Cl. 192—56 R **19 Claims**



1. A safety overload clutch operable between an engaged and disengaged position comprising a drive member and a driven member, each of said members having at least a partial cylindrical configuration with one of said members being coaxially disposed relative to the other of said members, ball pockets provided in said one member, clutch balls receivable in said ball pockets when the clutch is in said engaged position, said ball pockets having a depth less than the diameter of said clutch balls, said ball pockets defining grooves extending longitudinally parallel to the axis of said members, said clutch balls being displaced from said ball pockets when the clutch is in said disengaged position, an inclined ramp means in the other of said members receiving said clutch balls when the clutch passes from said engaged to said disengaged position, said inclined ramp means being inclined at an angle other than a right angle relative to the axes of said members such that said clutch ball moves radially and axially along said inclined ramp means when passing between said engaged and desengaged positions, a pressure ring carried by said other member, biasing means between said pressure ring and said other member biasing pressure ring in an axial direction, said pressure ring engaging said clutch balls such that said biased pressure ring urges said clutch balls into said engaged position, and a release channel in said other member opening up to said inclined ramp means that upon a torque overload condition, said balls overcome the bias of said pressure ring and pass in both a radial and axial direction from said ball pockets along said inclined ramp means into said release channel, said release channel having a cross-sectional configuration which precludes said clutch balls from being subjected to the application of a radial biasing force induced by said biasing means when said clutch balls are in said release channel.

4,694,945

ELECTROMAGNETIC CLUTCH WITH AN IMPROVED MAGNETIC ROTATABLE MEMBER

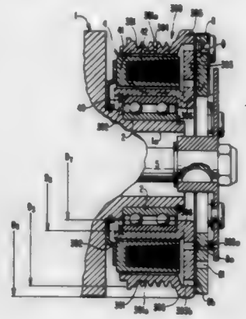
Takatoshi Koitabashi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Oct. 16, 1984, Ser. No. 661,465

Int. Cl.⁴ F16D *27/10*

U.S. Cl. 192—84 C **2 Claims**

1. An electromagnetic clutch including a first rotatable member of magnetic material rotatably supported on a bearing, an annular electromagnetic device disposed in a stationary position in a hollow portion of said first rotatable member, said annular electromagnetic device including an annular magnetic housing, an annular magnetic coil disposed therein, a second rotatable member, a hub secured on said second rotatable member, a magnetic armature plate supported on and around said hub at a predetermined radial gap, said magnetic armature plate being capable of limited axial movement and facing said first rotatable member at a predetermined axial air gap, said magnetic armature plate further being attracted to said first



rotatable member when said annular magnetic coil is energized, the improvement comprising said first rotatable member comprising an outer cylindrical member, an inner cylindrical member and an axial end plate member which has an axial end surface connecting said outer and inner cylindrical members, wherein the outer diameter of said axial end plate member is larger than the diameter of any part of the outer cylindrical member and the inner diameter of said axial end plate member is smaller than the diameter of any part of the inner cylindrical member.

4,694,946

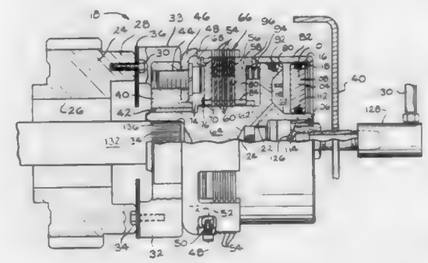
CLUTCH ASSEMBLY FOR A DIESEL ENGINE BLOWER

Dean A. Pearch, Mt. Pleasant, and Thomas F. Pung, Weidman, both of Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Sep. 19, 1985, Ser. No. 777,713

Int. Cl.⁴ F16D *25/00*

U.S. Cl. 192—85 AA **14 Claims**



1. A clutch assembly comprising:

a generally hollow cylindrical driven input member having a co-axial passageway formed therethrough;

a first plurality of radially inwardly extending clutch plates connected to said input member for rotation therewith;

a second plurality of radially outwardly extending clutch plates interleaved with said first plurality of clutch plates;

a rotatable hub connected to said second plurality of clutch plates for rotation therewith, said hub including an annular piston plate disposed thereabout which is axially im-

movable relative thereto, said hub forming an output member to said clutch assembly;

a hollow cylinder disposed about said hub and said piston plate and axially movable relative to said hub, said cylinder including a radially inwardly extending cylinder plate disposed between said first and second pluralities of clutch plates and said piston plate;

means for normally urging said cylinder plate into engagement with said first and second pluralities of clutch plates so as to cause frictional engagement thereof to couple said input member to said hub; and

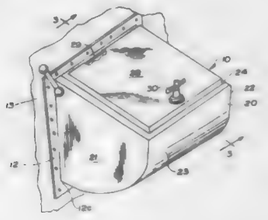
means for selectively moving said cylinder plate out of engagement with said first and second pluralities of clutch plates to uncouple said hub from said input member.

4,694,947

DUMP CHUTE ASSEMBLY

Edward Nineberg, Evanston, and Mark Mensker, Chicago, both of Ill., assignors to ML Corporation, Chicago, Ill.

Filed Sep. 23, 1985, Ser. No. 778,798
Int. Cl.⁴ B65G *11/20*; F23G *5/00*
U.S. Cl. 193—34 **14 Claims**



1. In an incinerator chimney having an opening therein for permitting refuse to be deposited therein, including in combination, a dump chute assembly comprising

a housing enclosure mounted to the incinerator chimney about the opening in the incinerator chimney,

a radially-shaped outer housing mounted to said housing enclosure and extending outwardly therefrom and having an opening at the top thereof,

a door means pivotally mounted and operable between a closed position closing said opening at the top of outer housing and an open position permitting access to the outer housing,

an inner radially-shaped chute member having an opening therethrough, said chute member being pivotally mounted within said radially-shaped outer housing and having a sealing panel mounted thereon forwardly of said opening and within the incinerator chimney, said sealing panel on said chute member being positioned for engagement with said opening in the incinerator chimney to seal the chute assembly from the incinerator chimney, and

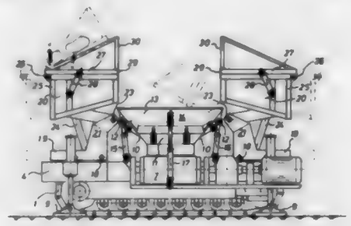
control means operatively connected to said inner radially-shaped chute member to pivotally move the same and said sealing panel thereon from a closed sealing position, wherein said outer housing prevents the flow of material through said opening in said inner chute member, to a dumping position wherein said sealing panel is moved to an open position away from the opening in the incinerator chimney and said opening in said inner chute member is positioned in the chimney and the material in said inner radially chute member is deposited into the incinerator chimney.

4,694,948

TRAVELLING HOPPER BELT CAR

Sükrü Ceylan, Labeck, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,520
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443684
Int. Cl.⁴ B65G *41/00*
U.S. Cl. 198—311 **13 Claims**



1. A travelling hopper belt car comprising a superstructure, a belt carrier mounted for pivoting in a vertical plane around a horizontal axis on said superstructure, a throw-off belt mounted for movement in a conveying direction on said belt carrier, a feed chute connected to said belt carrier adjacent said horizontal axis, said feed chute having side walls which each include a lower section fixed to said carrier and an upper side section pivotally mounted to each lower section respectively about a further horizontal axis for folding down at least to a vertical height of said further horizontal axis, said travelling superstructure being mounted for pivoting in a horizontal plane about a vertical axis, a support arm mounted on said superstructure and carrying said horizontal axis of said belt carrier, said support arm extending to a feed end of said throw-off belt under said feed chute, a feed device mounted on said superstructure at opposite sides of said feed chutes, and feed device mounting means for moving said feed device on each side of said feed chute toward and away from said feed chute in a horizontal direction, each feed device comprising a feed trough for receiving material and a bearing connected to each feed trough for pivoting each feed trough about at least one axis which is on one side of said feed end of said throw-off belt and extends in the conveying direction of said throw-off belt.

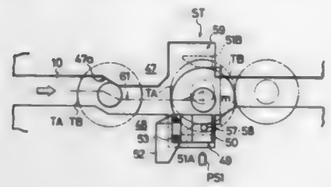
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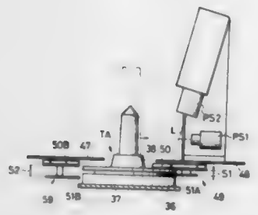
ARTICLE SELECTING SYSTEM

Osamu Nakagawa, Nagaokakyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed May 29, 1985, Ser. No. 738,943
Claims priority, application Japan, May 29, 1984, 59-108758
Int. Cl.⁴ B65G *47/22*; B65H *67/06*
U.S. Cl. 198—351 **5 Claims**

1. An article selecting system comprising a branch path and a gauge plate provided intermediately of a transport path which transports n-types ($n \geq 3$) of different articles for sorting articles of the n-types into two types of articles and $n-2$ types of articles, a second gauge plate located at a particular position on a transport path for the sorted two types of articles for displacing the articles to two positions in accordance with the two types, an article arrival detecting sensor and an article presence detecting sensor indicating whether a specific article





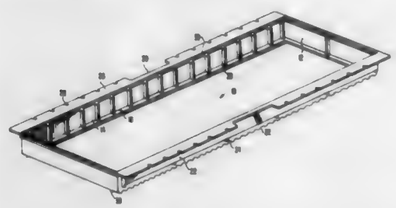
type is present on said transport path for the sorted two types of articles.

4,694,950

TAPE CASSETTE ASSEMBLY TRAY

Robert B. Macleod, Jr., Kennebunkport, Me., assignor to Shape Inc., Me.

Filed Sep. 25, 1984, Ser. No. 654,131
Int. Cl.⁴ B65G *49/00*
U.S. Cl. 198—465.3 **27 Claims**



1. An injection-molded plastic assembly tray for supporting a plurality of articles during manufacturing of the articles, the assembly tray comprising:

a single frame of shallow height and elongated length compared to width, for directly supporting therein the plurality of articles arranged along the elongated length, the frame including

ends, each of said ends having a top edge and a bottom edge, the width being measured parallel to the bottom edge of said ends;

sides, connected to said ends, each of said sides having a top edge and bottom edge, the elongated length being measured parallel to the bottom edge of said sides; and

torsion boxes, extending along substantially all of the elongated length of each of said sides at the top edge thereof, for providing rigidity of said single frame, each torsion box having a solid top, solid sides, solid ends, an open bottom and stacking spacers abutting and supporting the sides and top of each torsion box, the stacking spacers extending through the open bottom of the torsion box so that when a first assembly tray is stacked above an empty second assembly tray, the stacking spacers of the first assembly tray contact the top of the torsion box of the second assembly tray; and

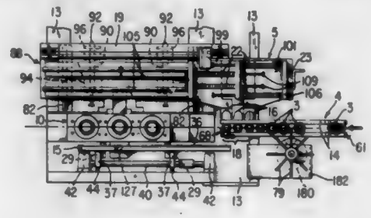
a bottom, connected to the bottom edge of each of said sides and said ends, having a continuously open area along the elongated length through which each of the plurality of articles can be directly accessed during manufacturing.

4,694,951

BOTTOM LOADER FOR A CONVEYOR MEANS

Joseph F. Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 4, 1985, Ser. No. 784,074
Int. Cl.⁴ B65G *47/08*
U.S. Cl. 198—468.3 **14 Claims**



1. A bottom loading means to load a group of like-shaped elongated vertically depending articles into a corresponding number of grippers that are part of a conveyor system for such articles which means comprises:

a feed means to present a group of said articles at a reception point with a first spacing in a substantially horizontal machine direction line one behind the other;

said grippers being located by said conveyor system during loading at a load point downstream in machine direction of said reception point and elevated above the upper ends of said articles along an extension of said line and spaced apart another and different amount than said first spacing;

a backing means and a sled assembly each movably supported on opposite sides of said group between said reception and load points;

said sled assembly being movable in a cross machine direction at said reception point to engage each article in said group whereby said articles are supported to depend from said sled assembly and for movement along said extension;

an elevator means at said load point disposed with a loading member for each article in the group to be directly underneath each of such grippers when an article depending from said sled is presented between the elevator and grippers for loading each of said group into a corresponding gripper by a vertical movement;

said backing means and sled assembly together further comprising means to engage said group at said reception point, move the group along said line to said load point, and change the spacing of articles in said group from said first to said another spacing; and

means to cause disengagement and engagement of said backing means and sled assembly from said group at said load point during said vertical movement of loading.

4,694,952

SCRAPER CLEANING APPARATUS FOR REVERSIBLE CONVEYOR BELTS

Johan B. A. Meijer, Hellevoetsluis, Netherlands, assignor to Rodiac Intercessor Ltd., Zug, Switzerland

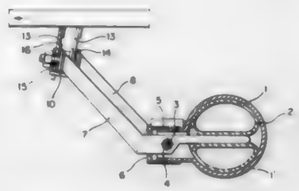
PCT No. PCT/EP84/00156, § 371 Date Dec. 3, 1984, § 102(e) Date Dec. 3, 1984, PCT Pub. No. WO84/04516, PCT Pub. Date Nov. 22, 1984

PCT Filed May 16, 1984, Ser. No. 681,999

Claims priority, application Netherlands, May 16, 1983, 8301730

Int. Cl.[4] B65G 45/00

U.S. Cl. 198—499 5 Claims



1. A conveyor belt cleaning device for a reversible conveyor belt, said cleaning device comprising:

(a) a plurality of scraper blades extending transversely of and each being narrower than the width of the conveyor belt, said blades being positioned at substantially the same angle relative to the surface of the belt, spaced from each other along a longitudinal axis of the belt, and defining overlapping contact areas on the belt;

(b) a plurality of lever arm means each having a first end on which respective scraper blades are adjustably carried, said lever arm means each having a second end spaced from said first end, and a lever pivot axis between said first and second ends, said lever pivot axes extending transversely to the longitudinal axis of the belt, successive pivot axes offset from and substantially parallel to each other;

(c) supporting means for pivotally supporting said lever arm means for pivotal movement about said pivot axes so that said blades are able to yield to obstructions in the conveyor belt;

(d) first and second flexible vessel means positioned on opposite sides of each said lever arm means adjacent said second ends to impart simultaneous pivotal movement to all of said lever arm means upon coordinated flexing of said first and said second vessel means so that the introduction of pressurized fluid into one of said vessel means causes pivotal movement of all said lever arm means to move said scraper blades into engagement with the conveyor belt and the introduction of pressurized fluid into the other of said vessel means causes pivotal movement of said lever arm means to move said scraper blades out of engagement with the conveyor belt.

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DRIVE FOR DOUBLE GRIPPER CHAIN CONVEYOR

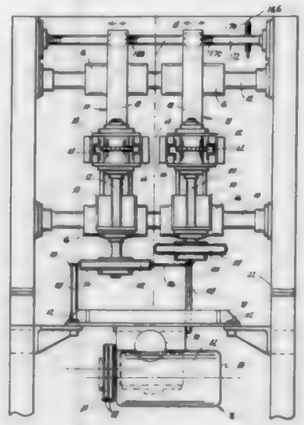
Robert E. Murphy, Utica; Gary R. Ballard, Royal Oak, and Rodney D. Kuechenmeister, Utica, all of Mich., assignors to Automation Service Equipment, Inc., Warren, Mich.

Filed Jun. 12, 1985, Ser. No. 743,736

Int. Cl.[4] B65G 15/14

U.S. Cl. 198—627 14 Claims

1. In a conveyor for conveying articles along a conveyance path which is cooperatively defined by and between confronting portions of two endless gripper chain assemblies operated in unison in opposite senses by a drive such that said confronting portions grip and convey articles along the conveyance path, the improvement which comprises said drive comprising a pair of shafts each of which constitutes an input to a corresponding one of said two gripper chain assemblies, a power output shaft, and coupling means for operatively coupling said power output shaft with said pair of shafts for causing said pair of shafts to rotate in opposite senses and thereby similarly operate said gripper chain assemblies, said coupling means comprising a non-twisted endless drive member between said power output shaft and one of said pair of shafts in an operative arrangement such that rotation of said power output shaft in one sense causes said one of said pair of shafts to rotate in the same sense and said coupling means comprising a twisted endless drive member between said power output shaft and the other of said pair of shafts in an operative arrangement such that rotation of said power output shaft in said one sense causes the other of said pair of shafts to rotate in the opposite sense, and in which the endless gripper chain assemblies of the conveyor are relatively adjustably positionable toward and away from each other and said pair of shafts are correspondingly



relatively adjustably positionable toward and away from each other in accordance with the adjustable positioning of said endless gripper chain assemblies, in which said power output shaft is adjustably positionable in correlation with the relative positioning of said pair of shafts to maintain said drive members in operative arrangement with said pair of shafts for different adjustment positions of said endless gripper chain assemblies with respect to each other, and in which the axes of said pair of shafts and of said power output shaft are parallel with each other and the axis of said power output shaft is disposed in a plane which is equidistant from the axes of said pair of shafts, and said pair of shafts are adjustably positionable toward and away from each other within a common plane which is perpendicular to said central plane, and the axis of said power output shaft is adjustably positionable within said central plane toward and away from said common plane.

4,694,954

COMPACT DISC DISPENSING AND STORAGE ASSEMBLY

Ira L. Moss, 176 Beach 146th St., Neponset, Queens, N.Y. 11694

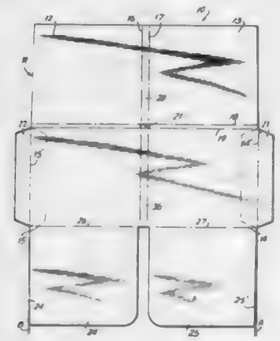
Continuation-in-part of Ser. No. 788,932, Sep. 22, 1986, Pat. No. 4,620,630. This application Sep. 22, 1986, Ser. No. 909,584

Int. Cl.[4] B65D 85/57

U.S. Cl. 206—45.26 8 Claims

1. As a new article of manufacture, a compact disc and packaging assembly convertible from a merchandising to a storage mode comprising an integral generally rectangular blank of rigid material, a cruciform fold structure formed in said blank, said structure including a proximately spaced first pair of longitudinal fold lines extending substantially medially of said blank and dividing said blank into front and rear panels

separated by a longitudinal spine portion and a proximately spaced second pair of fold lines extending substantially medially of said blank in a (transversed) transverse direction and dividing said blank into upper and lower panels separated by a transverse spine portion, a flap member including first and second margins connected to a surface of said blank along a side and bottom edge respectively of one of said panels, the longitudinal and transverse extent of said flap being less than the (distance between said edges and said foldlines) longitudinal and transverse dimensions respectively of said panels, a compact disc member at least partially encompassed int he space betwen said flap and said one of said panels, said blank being folded inwardly about said first fold lines to dispose said flap member betwen said front and rear panels, a planar stiffener member interposed between said front and rear panels in registry with said flap member, said stiffener member extending from said bottom edge to a level at least above said second





pair of fold lines, and a removable transparent film member encompassing and sealing said device and maintaining said front and rear panels and said stiffener member in substantial coplanar alignment, said blank after removal of said film and stiffener member being foldable about said first and second pairs of fold lines to define a compact storage container for said disc.

6. As a new article of manufacture, a compact disc and convertible display shiftable between merchandising and storage codes comprising front and rear rigid and congruent panel members separated by a first pair of spaced parallel hinge lines, said lines defining therebetween a vertically extending spine portion, a second spaced parallel pair of hinge lines formed medially of said panel members and extending transversely of said first pair of hinge lines, said second pair of hinge lines defining a spine portion therebetween, said second pair of hinge lines dividing said front and rear panel members into upper and lower sections, the portions of said panel member encompassing the intersection of said first and second pairs of hinge lines being removed, a flap portion formed on a first surface of a section of one said panel member, a disc member disposed between flap portion and said one section, said panel members being folded about said first pair of hinge lines such that said first surfaces of said members are justaposed in parallel spaced relation, a planar stiffener member interposed between said panel members in spanning relation of said second pair of hinge lines, and a removable film member encompassing said justaposed panel members and retaining said panel members and hence said disc and stiffener in said positions.

7. As a new article manufacture, a compact disc container comprising an integral generally rectangular blank of rigid material, a cruciform fold structure formed in said blank, said structure including a proximately spaced first pair of parallel longitudinal fold lines extending substantially medially of said blank and dividing said blank into front and rear panels separated b a longitudinal spine portions and a proximately spaced second pair of transverse parallel fold lines extending substantially medially of said blank in a transverse direction and dividing said blank into upper and lower panels separated by a transverse spine portion, the portions of said blank encompassing the intersection of said first and second pairs of fold lines being removed, an integral flap member formed on said blank, said flap member being of lesser size than said panels and including a fold line defining a first common margin with one of said lower panels, said flap being folded into parallel relation to said one lower panel and including a second margin bonded to a second outer margin of said one lower panel, said flap being tensioned in a direction away from that pair of said fold lines parallel to said second margin when bonded whereby said flap is secured in stretched condition and urged to lie substantially flatwise against said one lower panel, said container being in a folded condition wherein the same is first folded about said transverse fold lines and thereafter folded about said longitudinal fold lines.

4,694,955

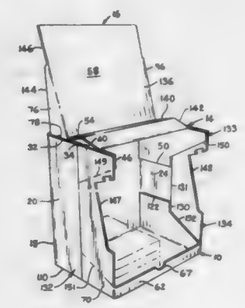
DISPLAY CARTON

Kenneth A. Rank, Jr., 409 Balsam Ct., Schaumburg, Ill. 60193

Filed Jul. 7, 1986, Ser. No. 882,409

Int. Cl.[4] B65D 51/00

U.S. Cl. 206—45.29 7 Claims



1. A display carton, comprising:

a box-like shipping container having a set of walls including a top wall, a bottom wall, a front end wall, a back end wall, and side walls,

said top wall including a substantially rectangular top panel hingeably connected to said back end wall and a substantially rectangular upper panel hingeably connected to said top panel, said top panel defining locking tab-receiving holes, said upper panel having substantially the same lateral width as said top panel and being in substantial coplanar relationship with said top panel during shipment of said carton;

said front end wall having a substantially rectangular forehead panel hingeably connected to said upper panel and a substantially rectangular display panel hingeably connected to said forehead panel, said forehead panel being substantially similar in size to said upper panel and substantially smaller than said display panel, said display panel having substantially the same lateral width as said forehead panel and being in substantially coplanar relationship with said forehead panel during shipment of said carton;

each of said side walls having an ear hingeably connected to said display panel, said ear having a locking tab;

said upper panel, forehead panel, display panel, and said ears being pivotable from a normally closed shipment position substantially blocking access into the interior of said container to an open display position with said locking tabs lockably engaging said locking tab-receiving holes of said top panel, said display panel and said forehead panel cooperating with said upper panel and ears for supporting said displaying at least some of the merchandise shipped in said container in said open display position, said front end wall in said open display position defining an access opening for viewing any remaining merchandise in said container, and

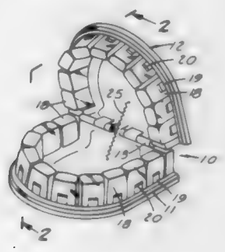
said forehead panel in said open display position comprising a ledge having substantially the same lateral width as said display panel, said ledge extending laterally across and forwardly from said display panel at an upward angle of inclination for carrying and helping to support merchandise on said display panel.

4,694,956

DISPLAY RECEPTACLE FOR DECIDUOUS TEETH

Edward H. Sims, 521 North Chandler Avenue "B", Monterey Park, Calif. 91754

Filed Nov. 7, 1986, Ser. No. 928,388
Int. Cl.[4] A61K *19/10*; B65D *85/00*
U.S. Cl. 206—83 **8 Claims**



1. A display receptacle for deciduous teeth comprising:

spaced apart upper and lower generally U-shaped members movable connected together crosswise of their generally straight transverse rear perimeters; and

an arcuate row of tooth-like receptacles connected along the facing rim edge portions of said upper and lower members each adapted to receive and store a deciduous tooth and each including hinge means connecting the same to a respective one of said upper and lower members.

4,694,957

CONTAINER FOR FLAT RECORDING MEDIA

Peter Ackeret, Allmendstr. 18, CH-8700 Kuenacht, Switzerland

Continuation of Ser. No. 645,061, Aug. 28, 1984, abandoned.
This application Dec. 18, 1986, Ser. No. 943,550
Claims priority, application European Pat. Off., Aug. 29, 1983, 83104431.9
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—309 **38 Claims**



1. Apparatus for use in the storage of disc-shaped flat recording media comprising:

housing means, said housing means defining an interior space having an access opening on one side thereof;

a plurality of media holders mounted in said housing means for individual movement relative to said housing means and through said opening, said media holders being mounted such that recording media positioned thereon may be displaced in generally parallel planes between a storage position where such recording media is located entirely within said housing means and an ejected position where the recording media is at least in part positioned outside of said housing means for removal from said holders, each of said holders including:

at least a first rigid plate member, said first plate member being provided with a surface recess commensurate in size with the recording media to be stored, said recess being deeper in the center region than in the edge region whereby a recording media positioned therein will be supported only by a portion thereof adjacent its edge;

means defining a recording media insertion slot at a first end of the holder; and

means defining a generally rectangularly shaped media holder front wall, the front wall covering the insertion slot of the holder when the holder is in the storage position, said front wall defining means being displacably connected to the holder for movement of said front wall into and out of registration with the insertion slot, the front wall being oriented substantially transversely with respect to the plane of movement of a stored recording media when the holder is in the storage position, the front wall being spaced in close proximity to the front wall of adjacent holders when the holder is in the storage position whereby said front walls cooperate to substantially entirely cover said housing means access opening when all of said holders are in the storage position; and

means for resiliently biasing each of said holders toward the ejected position.

4,694,958

SAFETY STRIP FOR WIRE HOOK FASTENERS

Edward C. Musil, Lyons, Ill., assignor to Flexible Steel Lacing Company, Downers Grove, Ill.

Filed Dec. 13, 1985, Ser. No. 808,522
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—340 **8 Claims**

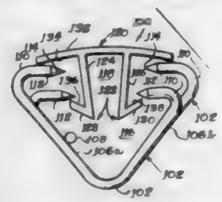
1. A safety strip for protecting and covering the pointed ends of generally triangular shaped wire fasteners held in parallel relationship in a strip, the safety strip comprising:

a body of plastic for extending longitudinally along the length of the strip of parallel wire fasteners,

an exterior cover portion on the body having a flange of a predetermined width extending outwardly of the pointed ends for covering the pointed ends of the wire fasteners,

a flexible detent means on the body and projecting from the exterior cover portion inwardly through a throat formed by the sharp hooks for detenting engagement with the wire fasteners, the detent means having a pair of depending legs attached at upper ends to a central portion of the flange, said legs being flexible and deflected inwardly by the pointed ends of the wire fasteners when being pressed through the throat and expanding outwardly after passing through the throat, and

feet on the lower free ends of the legs inclined upwardly and outwardly to be engaged by the hooked ends, said feet defining with said flange a pair of parallel channels with pointed end of the wire fasteners in the channels.

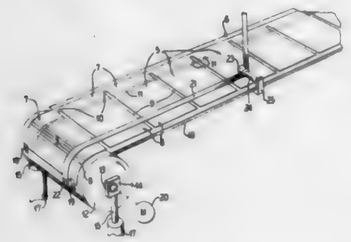


4,694,959

MAINTAINING SINGLE LINK CHAIN BAGS AGAINST SKEWING

Steven Ausult, New York, and Per Bentsen, Suffern, both of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,640
Int. Cl.[4] B65D *33/16*; B65B *27/08*
U.S. Cl. 206—390 **23 Claims**



7. A method of maintaining free from skewing a series of bags having first and second end portions and separated from one another except at single link means connecting the first end portions of the bags and thereby joining the bags into a continuous bag chain wherein said second end portions of the bags are entirely separated from one another, comprising:

reeling the bag chain upon itself into a storage roll;

and engaging against one face of said second end portion means for maintaining the bags in the reeled chain substantially free from skewing relative to one another.

4,694,960

TEAR OPEN BLISTER PACKAGE

Cornelius M. Phipps, Glen Ellyn, and William C. Pershak, Chicago, both of Ill., assignors to Plastic Specialties, Inc., Glen Ellyn, Ill.

Filed Jun. 26, 1986, Ser. No. 879,054
Int. Cl.[4] B65D *75/58*
U.S. Cl. 206—469 **20 Claims**

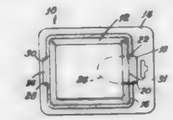
1. In a package having a generally flat backing and a blister receptacle formed of plastic material and a peripheral flange which is secured to the backing, the improvement comprising,

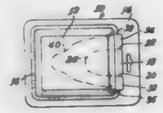
a. tab means extending from said receptacle at and intersecting said flange for grasping during opening, said tab means being unsecured to the backing,

b. a tear initiation cut through the plastic material of the receptacle at the intersection of said tab means and said flange for initiating tearing of the plastic material, and

c. a tear guide extending from said cut, said tear guide comprising a lineal bead in said receptacle of a lesser thickness than the adjacent plastic material of said receptacle.

15. In a package having a generally flat backing and a blister receptacle formed of plastic material and a peripheral flange which is secured to the backing, the improvement comprising,





a. means forming a tab extending from said receptable at and intersecting said flange for grasping during opening, said tab means being unsecured to the backing,

b. said flange being sealed to the backing, and including an area of the flange adjacent said tab which is not sealed to the backing, and

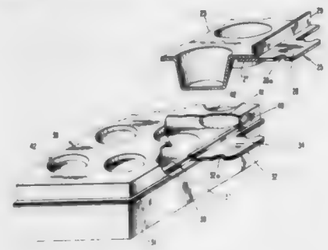
c. a tear initiation cut through the plastic material of the receptacle at the intersection of said tab means and said flange for initiating tearing of the plastic material.

4,694,961

FOOD CARRIER ASSEMBLY

Rita J. Menendez, 126 Montgomery La., Mingo Jct., Ohio 43938

Filed Sep. 17, 1985, Ser. No. 776,977
Int. Cl.[4] B65D *21/02, 25/28*; B65J *1/34*
U.S. Cl. 206—508 **8 Claims**



1. A food carrier assembly comprising:

(a) a baking pan shaped to receive a plurality of cupcakes and having an outer rim and a lid portion,

(b) a supporting ring member having an underlying rim supporting section below the outer rim to only provide support for transporting the baking pan, and

(c) handle means disposed on the supporting ring member for carrying the baking pan as a compact carrier assembly,

(d) the supporting ring member being removably disposed around the outer rim and including a gripping portion, and

(e) the handle means includes a hand gripping portion and coupling means for detachably connecting to said gripping portion on the supporting ring member,

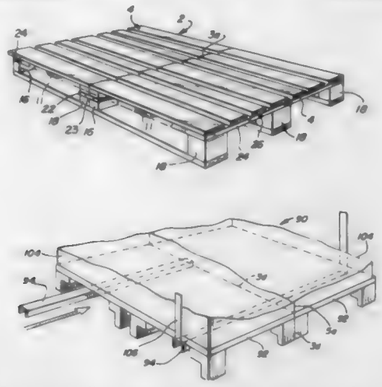
(f) the gripping portion includes tab means projecting outwardly from opposing sides of the supporting ring member with the opposed tab means being in alignment with respect to each other.

4,694,962

STANDARD DIMENSION PALLET ASSEMBLY FORMED OF SEPARATE ABUTTED SEGMENTS

Ronald H. Taub, John Hancock Bldg., 175 E. Delaware, Chicago, Ill. 60035

Filed Jun. 10, 1985, Ser. No. 742,992
Int. Cl.[4] B65D *19/26*
U.S. Cl. 206—600 **11 Claims**



1. In a product transport pallet assembly having a load bearing face of standard dimensions; an improved product support pallet comprising, in combination:

a plurality of discrete pallet segments each having an upwardly facing, load bearing surface, and an opposite downwardly facing surface, each of said pallet segments providing an aliquot portion of the pallet's load bearing face of standard dimensions;

each of said discrete pallet segments having leg means extending therebelow for providing a member-receiving space between said downwardly facing surface and a planar surface upon which said transport pallet assembly is to be supported by said leg means;

each of said segments further having at least one abutting edge portion for abutting an adjacent pallet segment to form a straight split line, that lies in a vertical plane between adjacent edges of a pair of abutting pallet segments, and an external edge portion on each pallet segments spaced from said abutting edge portion;

means for supportively engaging a pair of discrete pallet segments, said supportively engaging means including at least one elongated rigidifying member positioned beneath and against the downwardly facing surface of said load bearing faces of abutting pallet segments, and extending substantially transversely to said abutting edge portions that define said split line;

said means for supportively engaging a pair of discrete, adjacent, pallet segments providing two opposite end edges, each of which is located substantially co-terminal with an external edge portion of one of the pallet segments; and

selectively installable and removable holding means, for selectively engaging and securing each of the ends of said elongated rigidifying member to an adjacent pallet segment for maintaining said pair of adjacent pallet segments as a substantially rigid pallet assembly.

8. An improved product transport pallet assembly having a load bearing face and comprising, in combination:

a plurality of discrete pallet segments which, when assembled together, define the product transport pallet assembly;

each discrete pallet segment having an upwardly facing, load bearing surface, and an opposite and downwardly facing lower surface, each of said pallet segments constituting an aliquot portion of the pallet assembly's load bearing face;

each of said pallet segments having a plurality of edges, at least one edge being an abutting edge portion, for abutting an edge of an adjacent pallet segment to form only a continuous straight split line that lies in a vertical plane defined between said adjacent abutting edges of each of abutting pallet segments;

each pallet segment having, adjacent its edges, a plurality of supportive leg means extending downwardly from the downwardly facing surface of the pallet segment, for spacing the load bearing surface of the pallet segment above a support surface for the product transport pallet assembly, some of the support leg means for each pallet segment being located adjacent said split line that lies in a vertical plane and also being located adjacent to and abutting leg means of an adjacent pallet segment; and

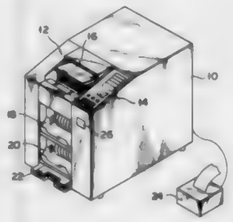
a first severable connective banding means, located below the load bearing surfaces of a pair of adjacent one of said pallet segments, said first connective banding means being wrapped only around abutting ones of said supportive leg means for holding said supportive and abutting leg means of said adjacent, abutting, pallet segments together along the straight split line therebetween, and a second, severable, connective banding means located spaced below the load bearing surfaces of each of the pair of adjacent, abutting, pallet segments, but being located in a different horizontal plane than said first connective banding means, and being wrapped around the exterior periphery of all exterior ones of said supportive leg means of the pair of adjacent, abutting, pallet segments, whereby to hold said pair of pallet segments together, but permitting selective separation of the pair of pallet segments along said split line by severing said first and second connective banding means that hold said adjacent pair of pallet segments together along the split line.

4,694,963

APPARATUS FOR SORTING SHEETS

Sumiyoshi Takesako, Yamato, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 596,148, Apr. 2, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 883,445
Claims priority, application Japan, Apr. 4, 1983, 58-59009
Int. Cl.[4] B07C *5/34*
U.S. Cl. 209—534 **6 Claims**



1. An apparatus for sorting a mixture of different kinds of bank notes into at least one of a first stacker, a second stacker and a third stacker, comprising:

means for feeding said bank notes one by one;

means for specifying a denomination of said notes;

means for judging a denomination of judgeable notes which are fed by said feeding means, and for indicating unjudgeable notes which cannot be judged by said judging means;

stacking means for stacking said judged notes in one of said stacker; and

mode setting means for setting one of: (1) a first mode in which said specifying means specifies a single denomination, said specified denomination of notes is stacked into said first stacker, an unspecified denomination of notes is stacked into said second stacker and said unjudgeable notes are stacked into said third stacker, (2) a second mode in which said specifying means specifies no denomination, judgeable notes are alternately stacked into said first and second stackers in units of a predetermined number of notes and unjudgeable notes are stacked into said third stacker, and (3) a third mode in which said specifying means specifies a first and a second denomination, said first specified denomination of notes is stacked into said first stacker, said second denomination of notes is stacked into said second stacker, and both of an unspecified senomination of notes and unjudgeable notes are stacked into said third stacker.

4,694,964

DEVICE FOR CONVEYING COMPONENTS PARTICULARLY INTEGRATED CHIPS, FROM AN INPUT MAGAZINE TO AN OUTPUT MAGAZINE

Ekkehard Ueberreiter, Karwendelstrasse 1, D-8011 Zorneding/Pöring, Fed. Rep. of Germany

Continuation of Ser. No. 820,891, Jan. 17, 1986, abandoned, which is a continuation of Ser. No. 666,826, Oct. 31, 1984, abandoned. This application Oct. 8, 1986, Ser. No. 917,292
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 3340183
Int. Cl.[4] B07C *5/34*; G01R *31/28*
U.S. Cl. 209—549 **10 Claims**



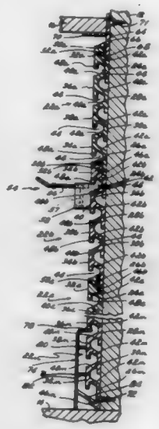
1. In a device for conveying components received in individual, separate receiving portions of an input magazine, to individual, separate receiving portions of an output magazine, with a testing device arranged between the input magazine and the output magazine, to which are supplied, one after the other, by means of a first conveyor device, the individual components, from the receiving portions of the input magazine, for testing, and which discharges the tested components to a second conveyor device, which enables the components to be discharged to a receiving portion of the output magazine established by the testing device, the combination of storage and indicating devices associated with each receiving portion of the output magazine, which devices are each capable of storing and indicating information corresponding to a component testing or measuring class, and means for moving the second conveyor device in such a manner, relative to the receiving portions of the output magazine on the basis of comparison of data from said testing device and preassigned data stored in the individual storage and indicating devices, that a component, established by the testing device as belonging to a certain component testing or measuring class, can be discharged into the receiving portions associated with this testing or measuring class, said means for moving the second conveyor device also being operative to assign to the storage and indicating device of an available receiving portion a testing or measuring class corresponding to data received from said testing device which does not correspond to preassigned data and to discharge components of such testing or measuring class into said receiving portion.

4,694,965

MODULAR PANELS FOR A DISPLAY APPARATUS

Raymond Parnell, Cincinnati, Ohio, assignor to The Tomorrow Group, Inc., Cincinnati, Ohio

Filed Sep. 16, 1986, Ser. No. 907,877
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—87 **10 Claims**



1. A display panel comprising:

a back surface;

a plurality of first and second web pairs spaced along said back surface, each pair of said first and second webs extending outwardly from said back surface at an angle relative to one another forming a channel therebetween;

a plurality of spaced front flanges extending substantially parallel to said back surface, a first front flange being connected to a first web of one of said web pairs and the remaining front flanges being connected to said first web of one web pair and said second web of an adjacent web pair, said front flanges overlying a portion of its respective underlying channel so that when viewed from said front flanges the viewer sees a series of parallel, spaced longitudinal channels;

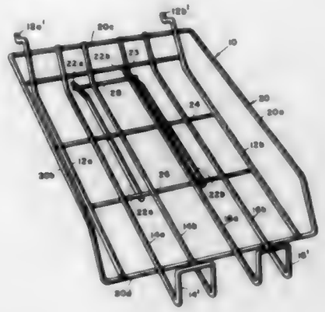
first side edge means connected to said first front flange at one end of said back surface and second opposed side edge means connected to the opposite end of said back surface, said first side edge means of one display panel being adapted to engage said second side edge means of another display panel for joining one panel to another panel, said first side edge means of one panel cooperating with an adjacent front flange of said another panel to define a channel substantially identical to said channels in said another panel thereby concealing the joinder of said panels from view.

4,694,966

MERCHANDISING TRAY

Robert E. Sorenson, Comstock Park, Mich., and John M. Scriba, Jr., Western Springs, Ill., assignors to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Filed Jul. 17, 1986, Ser. No. 886,326
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—88 5 Claims



1. A tray for attachment to a perforated vertical support panel comprising:

a plurality of article support wires arranged in spaced, generally parallel planar array to form a tray bottom in a first plane, said support wires having rear portions projecting diagonally upwardly in a second plane obtuse to said first plane;

a pair of said support wires having offset rear terminal ends to project into perforations of the support panel;

a peripheral border wire extending around the tray, with two lateral portions, a front transverse portion and a rear transverse portion, said lateral portions and said rear portion being in a third plane elevated above said first plane, said rear portion being joined by welding to said support wire rear portions;

said first mentioned support wires having front portions joined by welding to said front transverse portion of said peripheral border wire, with at least some of said support wires extending forwardly beyond said border wire, and terminating in upwardly extending hairpins;

and compression brace wires extending downwardly rearwardly with respect to said tray bottom, being joined by welding to said tray bottom, and having rearwardly protruding ends for insertion in holes in the support pannel, said brace wires having depth limiting shoulder means for limiting the depth of insertion of said brace wires into the support panel.

4,694,967

DRAFTING TABLE ACCESSORY STORAGE ATTACHMENT DEVICE

Lawrence J. Burke, P.O. Box 306, Manhattan Beach, Calif. 90266

Filed Apr. 17, 1986, Ser. No. 853,360
Int. Cl.[4] A47F 3/14
U.S. Cl. 211—126 5 Claims

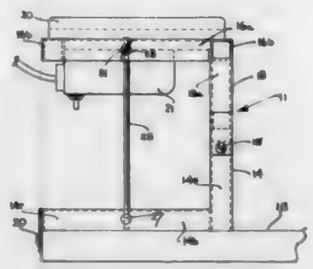
1. An accessory and storage attachment for a drafting table comprising:

an upper frame section including a rectangular top open frame structure formed by a pair of opposing longitudinal arms joined together at their opposite ends by a pair of opposing cross arms, and a pair of vertical arms extending normally from the opposite ends of one of said longitudinal arms;

a lower frame section formed by a pair of similar opposing frame members, each of such frame members including a vertical arm and a leg fixedly attached to and extending normally from said vertical arm;

means for pivotally connecting one end of each of the vertical arms of said lower frame section to one end of a respective one of the vertical arms of said upper frame section;

a tray having a plurality of slots formed therein for use in mounting drafting tools and accessories on said tray, said tray having an indented portion formed therein;



said tray being supported on said upper frame section, with the indented portion thereof nested in the top open frame structure;

means for setting the vertical arms of said upper and lower frame sections in a preselected angular position relative to each other, and

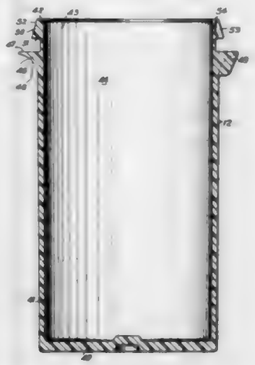
means for attaching the legs of the lower frame member to said drafting table.

4,694,968

TIGHTLY SEALING SAFETY CAP

John D. Proctor; Edward J. Towns, both of Summit, and Edward M. Brown, Livingston, all of N.J., assignors to Lerner Packaging Corp., Garwood, N.J.

Filed Jun. 20, 1986, Ser. No. 876,474
Int. Cl.[4] B65D 55/02
U.S. Cl. 215—224 1 Claim



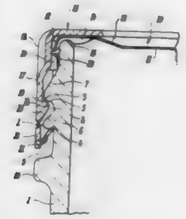
1. In a combination container and flexible safety type cap therefor, the container including an open end portion defining a mouth and having a peripheral flange thereon, at least one segment of which is discontinuous, said gap including a generally planar end wall, a cylindrical side wall, and a plurality of inwardly facing projections selectively engaging said peripheral flange when said cap is in engaged condition upon said container, improved sealing means comprising: said container having a flange thereon surrounding said mouth, said flange having a frusto-conical surface thereon, said cap having a rim member having an inner surface corresponding to said frusto-conical surface to effect a sealing action therebetween, and retaining flange means on a second inner surface of said cap selectively positionable beneath said frusto-conical surface to effect a locking action between said cap and said container, said retaining flange means having an angular length of at least one-hundred eighty degrees and substantially less than three hundred sixty degrees; and a projection in coplanar relation relative to said retaining flange means and alignable within a discontinuous segment of said peripheral flange to permit disengagement of said cap, said projection being generally opposite a midpoint on said flange retaining means; whereby upon the flexing of said container to other than circular cross-sectional configuration at the mouth thereof, said retaining flange means on said cap will flex to like cross-sectional configuration to resist other than normal manipulation to disengage said cap from said container.

4,694,969

CONTAINER CLOSURE

Rodney J. Granat, Caufield, Australia, assignor to ACI Australia Limited, Melbourne, Australia

Filed Nov. 15, 1984, Ser. No. 672,108
Claims priority, application Australia, Nov. 17, 1983, PG2423; Jul. 16, 1984, PG6014
Int. Cl.[4] B65D 41/48
U.S. Cl. 215—252 16 Claims



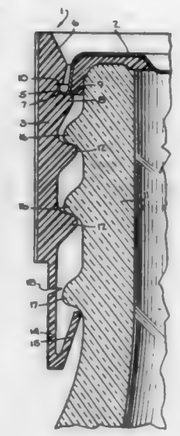
1. A closure for an open necked container of the type having a sealing rim defining a container opening and at least one external annular rib spaced from the said rim for non-threaded engagement by said closure; said closure includng a container cover member adapted to extend over and close the opening of the container, with a peripheral edge of the cover member extending marginally beyond the container sealing rim, and a resilient cover holding member integrally moulded from plastics material, said cover holding member being adapted to hold said container cover member in sealing abutment with the container rim and including a cover encapsulating portion extending radially over said peripheral edge, a depending portion entending below said peripheral edge, at least one annular retaining rib projecting radially inwardly from said depending portion and spaced from said encapsulating portion for non-threaded engagement below said annular rib of the container, and retaining means extending beneath said peripheral edge to hold said cover member within said cover holding member; said retaining means comprising a plurality of lugs spaced circumferentially around, and projecting radially inwardly from, said depending portions; said lugs each being spaced from said encapsulating portion and said cover holding member being operable such that, on rotation of said cover holding member on a container, one of said lugs engages an axially inclined ramp surface defined by the container, said cover holding member twists out of a co-axial relationship with the container opening to initiate disengagement of said at least one retaining rib from the at least one annular rib of the container and simultaneously causes said one lug to locally engage said peripheral edge and initiate lifting of said container cover member from the container rim.

4,694,970

TAMPER EVIDENT COMPOSITE CLOSURE

Thomas H. Hayes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jun. 16, 1986, Ser. No. 874,639
Int. Cl.[4] B65D 41/34
U.S. Cl. 215—252 10 Claims



1. In a composite closure for a container having a cover fitted into a molded plastic ring and having container engaging members on the radially inner surface of said ring, the improvement comprising:

said ring comprising a relatively thin cylindrical member with a cover receiving groove positioned downwardly from the ring top and engaging the outer edge of the cover portion

said container engaging members comprising continuous threads, and

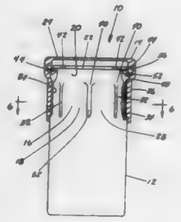
the outer diameter of said groove being greater than the inner diameter of said continuous threads facilitating the insertion of said cover through the top of said ring.

4,694,971

TAMPERPROOF PACKAGE

Thad Elsmo, 208 E. Four Mile Rd., Racine, Wis. 53402, and Ronald Horvath, 4325 Kennedy Dr., #204, Racine, Wis. 53404

Filed Dec. 4, 1986, Ser. No. 937,739
Int. Cl.[4] B65D 39/04
U.S. Cl. 215—253 19 Claims



1. In a package of the type having a container with a substantially cylindrical neck and a lip, a closure with a cover portion and a depending skirt sleeved over the neck, the neck outside and skirt inside forming a pair of facing surfaces, and tamperproof means, the improvement comprising:

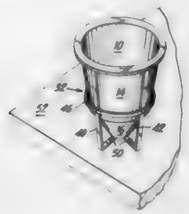
a plurality of mating sets of grooves and groove-engaging male members on the facing surfaces, each groove axially-parallel on one facing surface and its corresponding male member frangibly connected to the other facing surface;
a flange extending radially outwardly from the container to form the lip, the flange having notches therealong; and
lugs spaced around the skirt inside surface and projecting inwardly below the lip, the lugs having coplanar top surfaces engaging the lip and rotatable with the closure into alignment with the notches.

4,694,972

APPARATUS FOR REFUSE COLLECTION AND DISPOSAL

Michael Bimonte, 1863 64th St., Brooklyn, N.Y. 11204, and Dennis Cleary, 46 Barth St., Staten Island, N.Y. 10308

Filed Feb. 5, 1986, Ser. No. 826,313
Int. Cl.[4] A63B *55/04*
U.S. Cl. 220—401 **7 Claims**



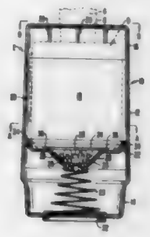
1. A refuse liner comprising a non-self-standing body having an uppermost opening, a generally cylindrical portion extending downwardly from said opening, and a frustro-conical portion extending downwardly from such cylindrical portion, a lip extending radially outwardly of said cylindrical portion adjacent said opening and a gripping detent being formed in said cylindrical portion adjacent said frustro-conical portion.

4,694,973

WARMING DEVICE FOR DISPOSABLE TOWEL DISPENSER

K. Daniel Rose, Healdsburg; Charles Yarbrough, Kenwood, and Alan F. Strachan, Santa Rosa, all of Calif., assignors to Warmwipes, Inc., Santa Rosa, Calif.

Filed Dec. 2, 1985, Ser. No. 803,465
Int. Cl.[4] A47K *10/38*; B65D *83/08*
U.S. Cl. 221—46 **23 Claims**



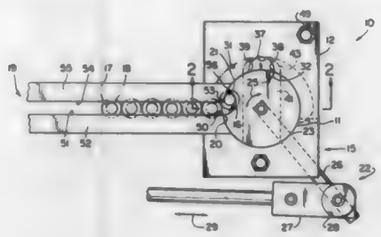
1. A dispenser for disposable pre-wetted towels prepackaged in plastic canisters, comprising:
a cup having an upper sector sized and adapted to contain a canister and a dispenser opening in said upper sector, and a lower sector below said upper sector;
securing means to secure the canister in said upper sector of said cup, said securing means further comprising uplift means for urging the canister upwardly towards said dispenser opening of said upper sector;
incandescent light bulb means disposed within said lower sector of said cup and mounted on said uplift means for heating the canister in said cup; and
a translucent window disposed in said lower sector to be illuminated by said incandescent light bulb means.

4,694,974

ESCAPEMENT APPARATUS FOR AN AUTOMATIC SCREW FEEDING MACHINE

Michael Heck, 302 NE. 36th St., Boca Raton, Fla. 33432, and Nathan Singer, 5710 NW. 54th Way, Tamarac, Fla. 33319

Filed Jun. 14, 1985, Ser. No. 744,629
Int. Cl.[4] B65G *59/06*
U.S. Cl. 221—263 **8 Claims**



1. Escapement apparatus for an automatic screw feeding machine adapted to receive a fastener from a track feed arrangement with the shank of said fastener being positioned within the space between tracks and to deliver said fastener to a conduit which transmits said fastener to a driver of an automatic screw feeding machine, comprising a housing having a first opening therein, means fitting within said first opening for receiving a fastener from said track arrangement comprising a rotor having a cutout axially oriented along the periphery of said rotor, said cutout being adapted to receive the shank of said fastener therein, with the head of said fastener resting on the upper surface of said rotor, the axis of said rotor being positioned at an angle to the vertical, and said cutout for receiving the shank of said fastener having a substantially semi-cylindrical shape with a near axial edge thereof co-extensively positioned and abutting with the inside edge of one track of said track arrangement, said inside edge being the edge perpendicular to the longitudinal axis of the track and at the end face thereof, whereby a fastener received within said cutout is caused to be urged downstream of the edge at the inside surface and the end face of the other track, means connected to said means within said first opening for delivering said fastener to a drop point comprising a substantially cylindrical opening which is substantially free of obstructions, said cylindrical opening being adapted to be connected to conduit means whereby said fastener is ducted to the driver apparatus of said screw feeding machine.

4,694,975

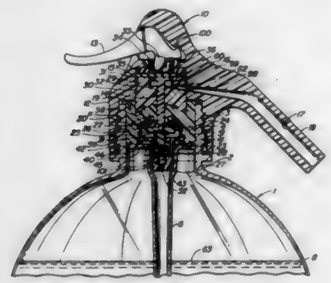
METHOD AND APPARATUS FOR STORING AND DISPENSING FLUIDS CONTAINERED UNDER GAS PRESSURE

Richard J. Hagan, San Carlos, Calif., assignor to McKesson Corporation, Los Angeles, Calif.

Continuation of Ser. No. 685,912, Dec. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 609,280, May 10, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 924,186
Int. Cl.[4] B67B *7/00*; B65D *83/00*
U.S. Cl. 222—1 **13 Claims**

1. A method for storing and dispensing fluids contained under gas pressure comprising:

(a) selecting a substantially non-frangible plastic container capable of safely withstanding in excess of three atmospheres of pressure, said container having a longitudinal axis and being formed with a neck portion having an internal annular wall having a substantial surface area generally parallel to said longitudinal axis and including an opening, said container having an attachment member formed on said neck portion adapted for removably affixing a head member to said attachment member for dispensing fluid from said container;
(b) selecting a valve means having an external annular wall dimensioned for gas sealing and structural connection to said internal annular wall of said neck portion mounted substantially within said container neck portion for maintaining gas pressure of at least three atmospheres and having a passage formed therein adapted for receiving a valve actuating member;
(c) mounting a syphon tube within said container having a distal end adjacent the bottom of said container and operatively connected to said valve means;
(d) bonding said external annular wall of said valve means to said internal wall of said neck portion;
(e) filling said container through said value means with a liquid under at least 3 atmospheres of pressure;
(f) selecting a removable sanitary sealing means covering said opening in said neck of said container, which removable sanitary sealing means is a cap member having internal threads and has sufficient structural integrity to prevent expulsion of said valve means under normal working pressures present in said container, and wherein said attachment member is external screw threads formed in said neck portion adjacent said neck opening for threadable registration with said cap threads, and



(g) selecting a head member having a manually engageable valve actuating member, a remote valve actuating member selectively operable by said valve actuating member and positioned for engagement with said valve means, said head member having a liquid and gas substantially impermeable resilient means forming a sealed top of said open ended chamber and separating said manually engageable valve actuating member and said remote valve actuating member, said sealed top resilient separating means being free to move so that downward motion of said manually engageable valve actuating member is transmitted to said remote valve actuating member, said remote valve actuating member extending below said sealed top resilient separating means to open said valve in response to the downward motion of said manually engageable valve actuating member, said head member having internal threads for registeration with said screw threads formed in said neck portion.

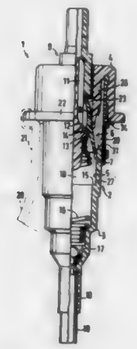
5. A container system for storing and dispensing fluids under gas pressure comprising:
(a) a substantially non-frangible container capable of safely withstanding in excess of three atmospheres of pressure, said container having a longitudinal axis and being formed with a neck portion having an internal annular wall having a substantial surface area generally parallel to said longitudinal axis and including an opening;
(b) a valve means having an external annular wall dimensioned for gas sealing and structural connection to said internal annular wall of said neck portion mounted substantially within said container neck portion for maintaining gas pressure of at least three atmospheres and having a passage formed therein adapted for receiving a valve actuating member, said external annular wall of said valve means being fixedly attached to said internal wall of said neck portion;
(c) a syphon tube mounted within said container having a distal end adjacent the bottom of said container and an end operatively connected to said valve means;
(d) a removable sanitary sealing means covering said opening in said neck of said container;
(e) an attachment means at said neck portion adapted for removably affixing a head member to said attachment means for dispensing fluid from said container; and
(f) an end tube member having an end portion formed with a flared end having a notched opening therein, being formed from a flexible material, having a bellows type mid-section and being dimensioned for connection to said syphon tube.

4,694,976

DISCHARGE APPARATUS FOR FLOWABLE MEDIA

Hans-Josef Schuetz, Donaueschingen, Fed. Rep. of Germany, assignor to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 2, 1986, Ser. No. 815,569
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1985, 3503354
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—189 **21 Claims**



1. A discharge apparatus for fluid media, comprising:
a manually-operated discharge pump, for mounting on a container defining a fluid reservoir in an assembled condition of the pump and container, said discharge pump having a pump casing projecting at least by an immersing part into the fluid reservoir in the assembled condition, the pump casing being bounded on curved outer surfaces by a casing wall, the outer surfaces being substantially curved around a pump axis, a ventilating duct for the fluid reservoir being provided in said discharge pump and issuing at a venting opening in the casing wall of said immersing part; and,
a bacteria filter provided on the pump casing, traversing a part of said ventilating duct, said bacteria filter having a ring-like sealing part surrounding an effective filter section, an air inlet side and an air outlet side and being mounted with the sealing part against one of the curved outer surfaces of the casing wall of said immersing part,

said ring-like sealing part projecting from at least the inlet side of said bacteria filter and sealing the effective filter section at a substantially constant spacing from said one of the outer surfaces of the casing wall with respect to this outer surface, the bacteria filter thereby being curved around said pump axis and bounding a part of the fluid reservoir with the discharge pump and reservoir in the assembled condition, said effective filter section being arranged free of contact on both the inlet and outlet sides, said bacteria filter and an adjacent outer surface of said casing wall defining a filter inlet chamber, said venting opening traversing said outer surface opposite to the bacteria filter and being substantially smaller than a boundary of said filter inlet chamber defined by the ring-like sealing part of the bacteria filter.

4,694,977

FLUID DISPENSER

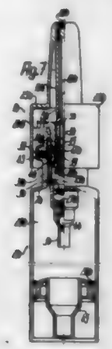
Lothar Graf, Worblingen; Leo Maerte, Sipplingen, and Thomas Skorka, Radolfzell, all of Fed. Rep. of Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,514

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339180

Int. Cl.⁴ B65D *83/00*

U.S. Cl. 222—259 **12 Claims**



1. A fluid dispenser, comprising:

a storage container defining a storage space extending between two opposite ends of the storage container;

a drag piston displaceable in the container and tightly sealing the storage space at one of its ends by means of a piston ring sealing said drag piston against the storage container;

a piston pump having a pump cylinder in a cylinder casing with an external shape arranged in the container at the end of the storage space opposite to the drag piston in said storage space, means defining a fluid discharge outlet leading from said pump cylinder to an area outside of the dispenser, a fluid inlet for said pump cylinder, said fluid inlet being connected to the storage space, and a pump piston displaceable in the pump cylinder along a pump axis between a pump stroke end and an initial end of a piston stroke by a handle, the piston pump forcing fluid from the fluid inlet to the fluid discharge outlet, the pump cylinder being substantially axially parallel to the drag piston, the drag piston having an inner side facing the piston pump and an outer side facing away from said inner side, said inner side defining a cup-like cavity with an internal cross-section for receiving a portion of the piston pump extending into the storage space, such that said portion of the piston pump fills the cavity of the drag piston when the storage space is empty, wherein the fluid inlet and the cylinder casing of the piston pump project into the storage space, defining a projecting cylinder casing portion thereof, the drag piston having an adapting cup forming the cavity, said cavity having an internal cross-section substantially precisely adapted to an external shape of the projecting cylinder casing portion, such that said cylinder casing portion fills the cavity of the drag piston when the storage space is emptied, said adapting cup being disposed radially inside the piston ring and extending axially past the outer side of the piston ring.

4,694,978

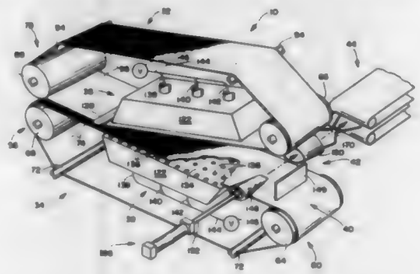
APPARATUS AND METHOD FOR SIMULTANEOUSLY INVERTING, FOLDING AND PLEATING

Dean W. Westphal, and David T. Strohbeen, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 7, 1986, Ser. No. 916,256

Int. Cl.⁴ A41C *5/00*; **D06C** *15/00*

U.S. Cl. 223—28 **15 Claims**



1. Apparatus for simultaneously folding and pleating a child's training pant or the like, comprising:

a handling station adapted for selectively positioning a pant thereat,

a plunger member at said handling station and being selectively reciprocative thereacross, and

a folding means at said handling station and having an interior surface defining an interior space for receiving therein said plunger member upon reciprocation thereof, and a pleating means disposed on said interior surface adapted for pleating a pant passed thereover, whereby said plunger member can be reciprocated against the pant to move the pant into said interior space to be simultaneously folded by said folding means and pleated by said pleating means.

4,694,979

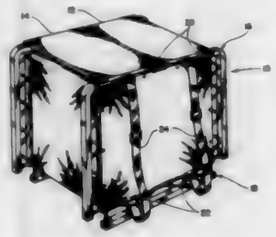
SEAT/BACKPACK/SLED COMBINATION

Lee Ables, 37858 N. Greenbay Rd., Waukegan, Ill. 60087

Filed Jan. 2, 1986, Ser. No. 869,740

Int. Cl.⁴ A45C *15/00*

U.S. Cl. 224—151 **15 Claims**



1. A multifunction wilderness seat/backpack/sled combination capable of functioning as a supporting device, a backpack or a light-weight sled, said combination comprising:

a base section having first and second ends and first and second sides connecting said first and second ends;

first and second end sections each having first and second sids and, one having a first end hingeably attached to said first end of said base section and the other having a first end hingeably attached to said second end of said base section, and each having an upwardly extending portion on a second end, said first and second sides connecting said first and second ends of each of said first and second end sections;

wherein in a closed position said upwardly extending portions on said second ends of said first and second sections meet to form a substantially box-like structure with said base section to function as a supporting device or a bakcpack and in an open position with said upwardly extending portions of said first and second ends upstanding said first and second sections lie substantially in a common plane with said base section to form a sled-like structure.

4,694,980

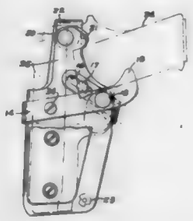
HANDGUN HOLSTER

William H. Rogers, Jacksonville, Fla., assignor to Safariland Ltd., Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 730,050, May 3, 1985, abandoned. This application Feb. 10, 1986, Ser. No. 827,816

Int. Cl.⁴ F41C *33/02*

U.S. Cl. 224—243 **15 Claims**



1. In a holster for a handgun and attachable to a belt, the holster having with respect to a front and back of a wearer of the holster inner and outer spaced substantially rigid sidewalls joined together along the forward and lower rear portions thereof to define an inner expandable cavity and an open expandable top and upper rear portions for receiving a handgun therein and for removing a handgun therefrom, the improvement comprsing a first strap portion extending upwardly from adjacent said forward portion of said outer sidewall and attached by a releasable first fastener to a second strap portion extending upwardly from adjacent said forward portion of said inner sidewall and including a thumb engaging first tab adjacent said first fastener; a third elongated strap extending laterally across and affixed to said outer and inner sidewalls adjacent said open expandable top, and upper rear portions, a releasable second fastener joining ends of said third strap adjacent a rear portion of said inner sidewall with a middle finger engaging second tab on said third strap adjacent said second fastener, slideable means attaching one end of said third strap to said inner sidewall for limited expansion of said open expandable top and upper rear portions and of said inner cavity when said second fastener is opened by a middle finger engaging said second tab and a thumb engages said first tab to open said first fastener, and means in said inner cavity to engage a portion of a handgun in the holster to resist upward withdrawing of a handgun.

4,694,981

HOLDER FOR SIDE-HANDLE BATON WITH ALLEN WRENCH

John C. Miller, Jr., 415 Claydon Way, Sacramento, Calif. 95864

Filed Nov. 28, 1986, Ser. No. 935,754

Int. Cl.⁴ A45F *5/00*

U.S. Cl. 224—251 **1 Claim**



1. A holder for carrying and detachably securing on the belt of a policeman a side-handle baton including an elongated tubular club and a short side-handle which is disposed perpendicular and rotatively coupled to the elongated tubular club with a screw for adjusting the rotational friction of the side-handle, said holder comprising:

a. a ring into which the elongated tubular club is inserted;

b. a strap which is mechanically coupled to said ring and which may be attached to the belt of the policeman;

c. a post which is disposed perpendicular and mechanically coupled to said ring and which prevents the elongated tubular club from rotating within said ring so that the side-handle remains relatively stationary;

d. screw adjusting means for adjusting the screw of the side-handle baton, said screw adjusting means being fixedly coupled to said post.

4,694,982

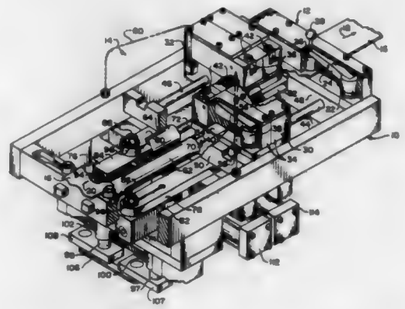
SIDE BY SIDE AIR FEEDER FOR ADVANCING STOCK TO A POWER PRESS AND THE LIKE

Edwin W. Plumb, Woodbury, Conn., assignor to Pressmate, Inc., Woodbury, Conn.

Continuation-in-part of Ser. No. 371,968, Apr. 26, 1982. This application Oct. 12, 1984, Ser. No. 660,143

Int. Cl.⁴ B65H *20/18*

U.S. Cl. 226—115 **42 Claims**



1. A feeder for advancing stock in intermittent feed strokes into a downstream work station of a machine such as a power press and the like and comprising a frame, a power operated feed slide mounted on the frame for reciprocating linear movement between starting and advanced stroke limit positions, the

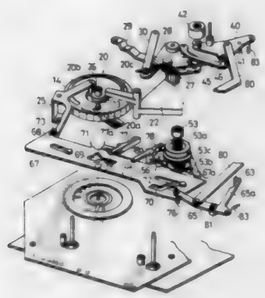
feed slide having a releasable stock clamp operable for clamping stock and thereafter advancing the clamped stock during a feed stroke in unison with movement of its feed slide from starting to advanced positions, a rotary crank mechanism mounted on the frame and drivingly connected to the feed slide, the crank mechanism being movable through a predetermined displacement in opposite angular directions precisely defining first and second crank throw limit positions terminating movement of the feed slide in opposite linear directions in said starting and advanced stroke limit positions, and a fluid operated, single acting power cylinder cooperating with the crank mechanism for driving the feed slide from its starting position to advanced stroke limit position, the power cylinder being deactivated during an idle return movement of the feed slide from advanced stroke limit position to its starting position under the driving force of its crank mechanism.

4,694,983

DEVICE FOR CONTROLLING PINCH ROLLER IN CASSETTE TAPE RECORDER

Shoji Suzuki, Iwaki, Japan, assignor to Alpine Electronics Inc., Japan

Filed Mar. 26, 1986, Ser. No. 844,174
Claims priority, application Japan, Mar. 26, 1985, 60-43753
Int. Cl.⁴ B65H *20/40, 23/18;* **G11B** *15/29;* **G03B** *1/32*
U.S. Cl. 226—181 **2 Claims**



1. In a cassette tape recorder, a pinch roller controlling device comprising:

a chassis;

a pinch roller support plate and a control lever respectively pivotally attached with a first and a second support shaft on said chassis at respective intermediate portions of said pinch roller support plate and said control lever;

a capstan shaft supported on said chassis;

a pinch roller pivotally attached on said pinch roller support plate at one end portion thereof arranged to be movable to advance to/retreat from said capstan shaft;

an elongated guide hole formed in said pinch roller support plate at a portion between said one end portion of said pinch roller support plate and said first support shaft;

a control plate slidably mounted on said chassis at the side of said second support shaft and formed with a cam hole;

a driven pin projectingly provided on said control lever at one end portion thereof and inserted into said cam hole;

a connecting plate pivotally attached at one end portion thereof on said control lever at a portion between said one end portion of said control lever and said second support shaft;

an engaging pin projectingly provided on the other end portion of said connecting plate and inserted into said elongated guide hole; and

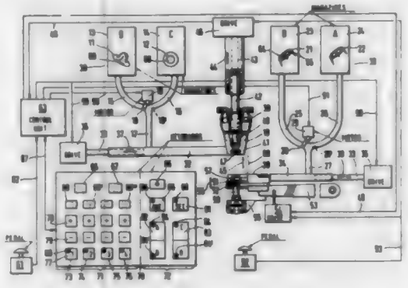
a roller urging spring stretched between the other end portion of said pinch roller support plate and the other end portion of said control lever.

4,694,984

AUTOMATIC RIVETING PRESS

Gerhard H. J. Altwicker, Eschweiler, Fed. Rep. of Germany, assignor to William Prym-Werke GmbH. & Co. KG, Stolberg, Fed. Rep. of Germany

Filed Feb. 12, 1986, Ser. No. 828,833
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508018
Int. Cl.⁴ A41H *37/02*
U.S. Cl. 227—18 **19 Claims**



1. A cyclically operated machine for assembling complementary first and second articles of hardware at a single assembling station, particularly a riveting press for affixing first and second components of fasteners to garments and the like, comprising first and second applicatior means at said single station; a plurality of first sources for supplies of different types of first articles; a plurality of corresponding second sources for supplies of different types of second articles, each type of second articles being complementary to a particular type of first articles; article feeding means operable to deliver first and complementary second articles from said first and second sources to said first and second applicator means, respectively, comprising discrete first and second conveyors for each of said first and second sources, respectively, said first and second conveyors being respectively activatable to deliver first and second articles from the corresponding first and second sources; programmable signal transmitting control means for operating said feeding means so as to select, prior to each cycle, a discrete first and a discrete second conveyor for delivery of respective articles to the corresponding applicator means; and means for programming said control means, including first signal generating means for determining the sequence in which said feeding means is operated to deliver different types of first and complementary second articles from the respectively first and second sources, and second signal generating means for selecting the total number of first and second articles of each type to be delivered seriatim from the selected first and corresponding second sources.

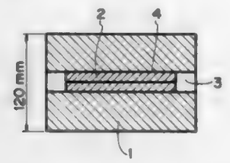
4,694,985

METHOD OF PRODUCING TITANIUM CLAD STEEL PLATE BY HOT ROLLING

Chiaki Ouchi; Masakazu Nikura, both of Kanagawa, and Hiroyoshi Suenaga, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 892,576
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—235 **5 Claims**

1. A method of producing titanium clad steel by hot rolling, comprising forming a slab assembly with ferrous base materials and titanium cladding materials, coating at least one side of the cladding surfaces of said base materials and said titanium cladding materials with oxides of Mo or V in the amount of 20 to 300 g/m², evacuating the interior of said slab assembly to a pressure of less than 10^{-1} Torr, heating at temperatures between the melting point of said oxide plus 50° C. and 1050° C.



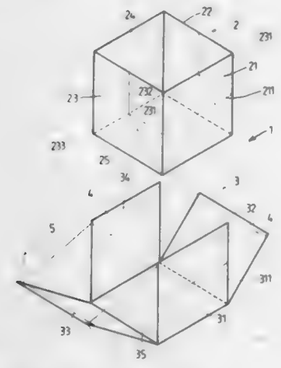
so as to reduce said oxide by the action of said titanium, and carrying out hot-rolling thereon.

4,694,986

DISPOSABLE CONTAINER

Lung-Chiao Chou, No. 1, Alley 9, Lane 250, Sec. 2, Cheng Kung Rd., Nei Hu, Taipei, Taiwan

Filed Aug. 15, 1986, Ser. No. 896,647
Int. Cl.⁴ B65D *5/36*
U.S. Cl. 229—41 R **2 Claims**



1. A disposable container comprising:

an inner cup having a vertical front wall, a vertical rear wall, two vertical side walls and a bottom, said vertical front wall having a horizontal folding line at middle thereof, each of said vertical side walls having a horizontal folding line with one end connecting to the horizontal folding line of the vertical front wall and the other end connecting to center thereof, a vertical folding line extending from the center to an upper edge thereof, and two slanting folding lines extending from the center to respective lower corners thereof;

an outer cup having a bottom plate, a front flap, a rear flap and two side flaps, the flaps being integral with respective sides of the bottom plate, said flaps having an upper edge provided with a passage, said front flap having a horizontal folding line at middle thereof which coincides with the horizontal folding line of the vertical front wall of the inner cup, the inside surface of the front flap, the rear flap and the bottom plate of the outer cup being respectively adhered to outside surface of the vertical front wall, the vertical rear wall and the bottom of the inner cup;

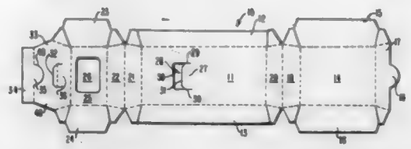
a pulling line in turn passing through the passages of one of the side flaps, the front flap, the other one of the side flaps, the rear flap, and the first one of the side flaps.

4,694,987

TWO COMPARTMENT CARRYOUT CARTON

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 19, 1986, Ser. No. 932,307
Int. Cl.⁴ B65D *5/48*
U.S. Cl. 229—114 **5 Claims**



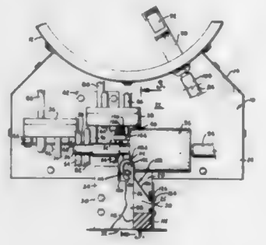
1. In a carton comprising a single tray and a pair of lid members, said tray having a bottom wall and trapezoidal shaped upstanding side walls with upper edges and said lid members having trapezoidal shaped, downwardly extending side walls, rear walls and front walls, one of said front walls being extended below the upper edges of the tray side walls into the tray to form a front wall ceiling, means for foldably attaching the rear walls of said lid members to opposed side walls of the tray, a flap element foldably connected along a fold line to the front wall extension of one of the lid members, and flap element having a free leading edge and a trailing edge defined by its foldable connection to the front wall extension, means for releasably connecting the front wall of one lid member to the front wall of the other lid member, and a locking means between the bottom wall of the tray and the flap element attached to said front wall extension, said locking means including a male locking tab integral with the flap element cut from the extended front wall material, and a female locking slot of substantially rectangular shape cut from the tray bottom wall material.

4,694,988

CONTROL INSTALLATION FOR VARIABLE VOLUME AIR DIFFUSERS

Melvin C. Carlson, Kansas City, Mo., and Raymond H. Dean, Shawnee Mission, Kans., assignors to Tempmaster Corporation, North Kansas City, Mo.

Division of Ser. No. 837,888, Mar. 10, 1986, Pat. No. 4,648,552.
This application Dec. 5, 1986, Ser. No. 938,430
Int. Cl.⁴ F24F *7/06, 13/08*
U.S. Cl. 236—49 **2 Claims**



1. In a control system for an air diffuser having a plenum for directing conditioned air to the diffuser and a diffuser slot for discharging the air to a conditioned space, the improvement comprising:

a generally transverse bulkhead on said plenum and diffuser defining a control compartment and an underlying thermostat compartment arranged as extensions of the plenum and diffuser, respectively, said thermostat compartment having opposite sides and a slot arranged as an extension of the diffuser slot;

a thermostat having a housing containing a temperature sensitive sensing element included in the control system, said thermostat housing having a tube connection arranged to be coupled to a tube of the control system and said housing having an open bottom for accommodating flow of air from the conditioned space to the sensing elements;

a spring clip in the thermostat compartment for holding said thermostat, said clip having opposite legs engaging said opposite sides of the thermostat compartment to hold the clip in a fixed position wherein said legs are located to receive the thermostat housing with said legs gripping the housing therebetween to releaseably hold same in place with said open bottom located in said slot of the thermostat compartment; and

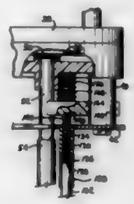
a foam insulating block in said thermostat compartment adjacent the slot thereof, said block having an opening sized to accept passage of the thermostat through said slot into and out of the thermostat compartment, said housing fitting closely in said opening of the block when the housing is inserted into said spring clip and ripped between said legs thereof.

4,694,989

CONTROL INSTALLATION FOR VARIABLE VOLUME AIR DIFFUSERS

Melvin C. Carlson, Kansas City, Mo., and Raymond H. Dean, Shawnee Mission, Kans., assignors to Tempmaster Corporation, North Kansas City, Mo.

Division of Ser. No. 837,888, Mar. 10, 1986, Pat. No. 4,648,552. This application Dec. 5, 1986, Ser. No. 938,576
Int. Cl.⁴ F24F *13/10*
U.S. Cl. 236—49 **14 Claims**



1. In an air distribution system having a duct for receiving conditioned air, an outlet for discharging air from the duct to a conditioned space, pressure responsive actuator means for controlling the discharge of air through the outlet, a pneumatic control circuit for controlling said actuator means, and an exhaust tube in the control circuit slidable axially to adjust the maximum air flow rate through the outlet, the improvement comprising:

a control compartment housing said control circuit and having a lower end;

means for mounting said exhaust tube in the control compartment for generally up and down axial sliding movement to adjust the maximum air flow rate through the outlet;

an elongate internally threaded sleeve secured in said control compartment at a fixed location offset from and generally parallel to the exhaust tube;

a bracket extending from said exhaust tube and having a seat surface aligned with said sleeve at a location above the sleeve; and

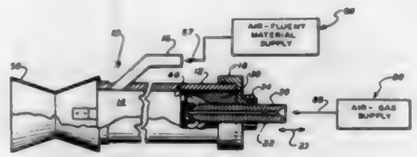
an elongate screw threaded through said sleeve and having a top end presenting a tip engaging said seat surface, said screw having a bottom end accessible through the lower end of said control compartment to effect turning of the screw to move the bracket and exhaust tube up and down for adjustment of the maximum air flow rate.

4,694,990

THERMAL SPRAY APPARATUS FOR COATING A SUBSTRATE WITH MOLTEN FLUENT MATERIAL

Axel T. Karlsson, 94 Townsend Dr., Middletown, N.J. 07748, and Mille Stand, Apt. 4A, 117 S. Highland Ave., Ossining, N.Y. 10562

Continuation-in-part of Ser. No. 648,070, Sep. 7, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,182
Int. Cl.⁴ B05B *1/24*
U.S. Cl. 239—81 **11 Claims**



1. Thermal spray apparatus for providing a stream of molten heat fusible fluent material for coating a substrate, comprising:

heat source means including a flame for producing a stream of heated gas heated to sufficiently high temperature to melt said material;

material advancing means for advancing a stream of heat fusible fluent material into said stream of heated gas to melt said material and produce said stream of molten fluent material; and

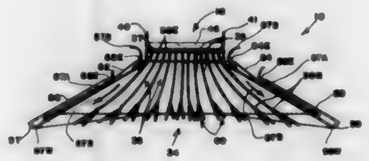
flame barrier means intermediate said flame and said stream of molten fluent material, said flame barrier means for permitting passage therethrough of said stream of heated gas and for preventing reaction between said flame and said material.

4,694,991

AGRI-CHEMICAL SPREADER

Virgil H. Breckenridge, P.O. Box 178, Beedeville, Ark. 72014

Filed Feb. 18, 1986, Ser. No. 829,915
Int. Cl.⁴ B64D *1/18, 1/00*; B05B *1/20*
U.S. Cl. 239—171 **8 Claims**



6. In an agri-chemical spreader device adapted to be coupled to agricultural spray planes or the like for uniformly widely broadcasting a agri-chemical over a selected field, the spreader being of the type comprising a generally V-shaped main body portion having a central section, a top and a spaced-apart bottom, the top and bottom originating at the mouth of an input throat of a predetermined height and width, and the top and bottom rearwardly diverging to a larger width rear output end with a reduced height wherein said mouth is defined between a pair of angled side plates, an upper sprayer mounting plate, and a lower, forward facing angularly adjustable baffle plate adapted to be selectively adjusted for varying the intake rate of air into said spreader main body portion, a plurality of internal spaced apart, acruate vanes extending between said top and bottom of said main body having fronts secured in closely spaced apart relation within said mouth and terminating in farther spaced apart ends at said output end, the improvement comprising:

a plurality of angularly adjustable swallow tails operatively associated with each of said vanes at the terminal ends thereof for distributing said agri-chemical, said swallow tails each comprising a pair of cooperating tabs pivotally coupled at the rear of each of said vanes, each of said tabs being pivotally deflectable relative to the other, whereby the tabs can be adjusted to either;

a position to the left or the right relative to said vanes to compensate for prop (P)-Factor;

a substantially open V shaped position to variably occlude the air passageways defined between adjacent vanes; or;

a substantially closed position in which both tabs are substantially coplanar with said vanes; and,

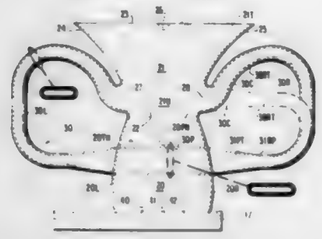
whereby said spreader is adapted to compensate for uneven wind effects caused by such factors as prop rotation, prop (P)-Factor, aircraft design, and the presence of aircraft component parts such as landing gears, wing struts, oil coolers and the like.

4,694,992

NOVEL INERTANCE LOOP CONSTRUCTION FOR AIR SWEEP FLUIDIC OSCILLATOR

Ronald D. Stouffer, Silver Spring, Md., assignor to Bowles Fluidics Corporation, Columbia, Md.

Filed Jun. 24, 1985, Ser. No. 748,065
Int. Cl.⁴ B63H *25/46*
U.S. Cl. 239—265.23 **6 Claims**



1. Continuous inertance loop connectable at its ends to a pair of control ports of a fluidic oscillator, comprising,

a pair of matching sections, each of said matching sections having gradually varying cross-sectional areas for coupling the respective ends of said loop to said control ports, said matching section being of largest cross-sectional area at said control port, and of smaller cross-sectional area at the opposite end thereof,

a pair of loop sections of uniform cross-sectional area substantially equal to the cross-sectional area of the said smaller cross-sectional area of the said opposite end of said matching section, each respective said loop section being connected at one end to said opposite end of its matching section,

a pair of transition sections each having cross-sectional area substantially equal to the cross-sectional area of said loop sections of uniform cross-sectional area, and

a common section having a substantially flat and elongated cross-sectional area and coupled between the respective ends of said transition sections.

4,694,993

CRUSHING AND WASHING PROCESSING APPARTUS FOR BALLAST AND SAND

Shigeharu Endo, and Kazuma Endo, both of 22-3, Motoshiro-cho, Fujinomiya-shi, Shizuoka-ken, Japan

Filed Sep. 30, 1985, Ser. No. 782,288
Int. Cl.⁴ B02C *19/22*
U.S. Cl. 241—46.11 **5 Claims**

1. A crushing and washing apparatus for ballast and sand comprising:

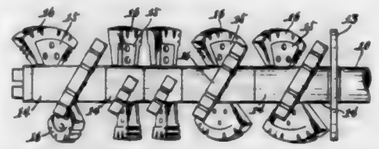
a cylindrical barrel formed at one end with a feed port for the introduction of ballast and sand, and at the other end with a discharge port;

at least one water filling port between said feed and discharge ports;

a rotary shaft within said barrel extending from said feed port to a point adjacent said discharge port;

at least a sleeve having agitating wings thereon mounted on said rotary shaft; and

back pressure control means connected with said discharge



port for selectively varying the back pressure applied to the ballast and sand to control the amount of time the ballast and sand are subjected to said agitating wings,

said back pressure control means comprising a rotary crushing bowl longitudinally movable into and out of said discharge port;

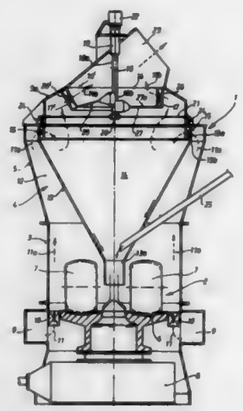
and a rotary shaft supporting said crushing bowl, a bearing slideably supporting said shaft, and pressure means adjacent the end of said shaft for applying a preselected pressure to the end of said shaft.

4,694,994

ROLLER MILL

Heinrich Henne, Ennigerloh; Gotthardt Blaszcyk; Hubert Eickholt, both of Beckum, and Ludger Lohnherr, Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 759,836
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 8425837[U]
Int. Cl.⁴ B02C *15/00, 23/32*
U.S. Cl. 241—79.1 **14 Claims**



1. A roller mill comprising a housing having air inlet means at its lower end and air exhaust means at its upper end; a grinding member within said housing; grinding rollers in rotary engagement with said grinding member for comminuting material, said air inlet means and said air exhaust means being operable to establish an upwardly flowing air stream for entraining comminuted material; a conical hopper within said housing defining with the latter an air passage for said air

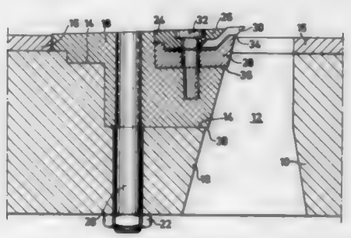
stream and material entrained therein, said hopper forming a sifting chamber inwardly of said air passage having an outlet at its lower end for discharging material to said grinding member, said sifting chamber being in communication at its upper end with said air exhaust means; a ring of guide vanes at the upper end of said sifting chamber, means for deflecting said air stream and material entrained therein from said air passage through said ring of guide vanes transversely inwardly into said sifting chamber to effect a first separation of material entrained in said air stream, said ring of vanes having a diameter corresponding substantially to that of the upper end of said sifting chamber, said housing having an upper sifter portion upwardly converging from a maximum lower transverse diameter inwardly of said ring of guide vanes to an upper air exhaust outlet; a rotor of lesser diameter than that of said ring of vanes and coaxial therewith, said rotor having a bottom and a peripheral wall extending upwardly therefrom and provided with transverse openings therethrough; means mounting said rotor at a level above that of said ring of vanes and between the upper end of said sifting chamber and said air exhaust means; the maximum outer diameter of said rotor being less than the minimum inner diameter of said ring of vanes to provide an annular space therebetween, and the converging upper sifter housing portion extending closely adjacent the upper end of the peripheral wall of said rotor about its circumference, whereby the air stream charged with fine material can be reliably delivered to the outer peripheral openings of said rotor so that all air passing from said sifting chamber flows through the openings of said rotor to effect a second separation of material entrained in said air stream; and drive means for rotating said rotor.

4,694,995

DEVICE IN CONNECTION WITH CHOPPERS

Erne L. Holmberg, Hudiksvall, and Torbjorn C. Andersson, Forsa, both of Sweden, assignors to Aktiebolaget Iggesunds Bruk, Iggesund, Sweden

Continuation of Ser. No. 717,584, Mar. 29, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 937,434
Claims priority, application Sweden, Apr. 21, 1982, 8202509
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—92 **9 Claims**



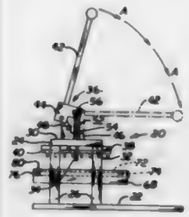
1. A device for use in choppers with a rotating chopper disk that has a top side and a bottom side, having a knife attached to a knife holder disposed radially on the chopper disk, characterized in that the knife holder includes a filler piece fitting into a recess in the chopper disk, and a knife holder cassette for the knife, the knife holder cassette having a top part and a bottom part, the top and bottom parts being shaped to clamp the knife therebetween, the top and bottom parts being selectively separable to permit knife replacement, the filler piece incorporating a mounting for the knife holder cassette, the cassette being attached to the filler piece by means of a first fastener inserted from the top side of the chopper disk, the first fastener abutting the top part of the knife holder cassette and clamping the knife in place, the filler piece being held fast in the recess in the chopper disk by means of a second fastener, the first fastener being threaded only into the filler piece and not extending through the filler piece into the chopper disk to clamp the knife in place and secure the cassette to the filler piece.

4,694,996

MULTI CAVITY MEDICATION CARD CRUSHER

Harold B. Siegel, Clearwater, Fla., assignor to Siegel Family Revocable Trust, Clearwater, Fla.

Filed Oct. 20, 1986, Ser. No. 920,678
Int. Cl.[4] B02C *1/00*
U.S. Cl. 241—100 **9 Claims**



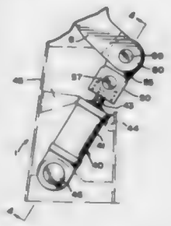
1. An apparatus for crushing multi cavity medication cards, said apparatus comprising: frame means comprising a pair of oppositely disposed base plates, a top plate, and a plurality of legs disposed in interconnecting relation between said top plate and said base plates, said top plate further comprising a top surface and a bottom surface; a crusher means mounted on said top plate, said crusher means comprising crusher platen actuator means mounted on said top surface of said top plate, a crusher platen disposed adjacent said bottom surface of said top plate and operatively attached to said actuator means for reciprocal movement in directions normal to the plane of said bottom surface, and crusher plate means removably attachable to said crusher platen, said crusher plate means comprising a planar surface adjacent said crusher platen and an opposite, exposed surface comprising a plurality of protrusions found thereon, each one of said protrusions being in registry with a medication cavity of a multi cavity medication card; and medication card support means comprising a pair of oppositely disposed guide rails, one of said pair of guide rails being attached in spaced above, substantially parallel relation to a corresponding one of said base plates, each of said guide rails comprising an upper guide track and a lower guide track formed thereon, whereby a multi cavity medication card may be inserted into said card support means and may be crushed by the action of said crusher means to render the card useless.

4,694,997

APPARATUS FOR EXERTING A DOWNWARD FORCE ON A GRINDING ROLLER

Bernard H. Schonbach, Allentown, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Dec. 12, 1985, Ser. No. 808,324
Int. Cl.[4] B02C *15/00*
U.S. Cl. 241—117 **4 Claims**



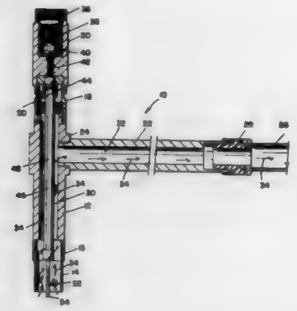
1. In a roller mill for comminuting solid material including a generally horizontal grinding table mounted for rotation about its own axis, at least one grinding roller mounted at an angle to the grinding table for rotation about its own axis for cooperation with the grinding table for comminuting material between the grinding table and the grinding roller, a rocker arm mounted for pivotal movement relative to said grinding table, said grinding roller being mounted on one end of said rocker arm, an improved apparatus for exerting a downward force on the grinding roller comprising piston-cylinder means including a piston and an upwardly extending shaft, a link element pivotally connected at its one end to said shaft and pivotally connected at its other end to the other end of said rocker arm whereby downward movement of said piston causes said rocker arm to pivot and exert downward force on the grinding roller.

4,694,998

VACUUM ASSEMBLY FOR WIRE UNWRAPPER

Donald L. McKinney, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 26, 1985, Ser. No. 780,174
Int. Cl.[4] B65H *81/00*
U.S. Cl. 242—1 **7 Claims**



5. A vacuum assembly for vacuuming around an electrical post while unwrapping wire from the electrical post with a wire wrap removal tool, the tool having two ends, a first end adapted for engaging the wire wrapped around the electrical post, the vacuum assembly comprising:

a hollow housing for receiving the removal tool therein, one end of the housing being flexible for receipt around one or more electrical posts when the first end of the removal tool engages the wire, the second end of the removal tool being rotatably attached inside the other end of the housing using a tool connecting means for rotating the removal tool therein in order to unwrap the wire from the electrical post; and

vacuum means communicating with the housing for drawing a vacuum in the housing and around the tool as the tool unwraps the wire.

4,694,999

TOROIDAL WINDING APPARATUS

Masahiro Ishida; Shunichi Kato, and Noboru Takasu, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 633,888, Jul. 24, 1984, Pat. No. 4,568,032. This application Nov. 14, 1985, Ser. No. 798,025
Claims priority, application Japan, Jul. 26, 1983, 58-135176; Aug. 23, 1983, 58-152436; Sep. 17, 1983, 58-170598; Oct. 19, 1983, 58-194032; Oct. 25, 1983, 58-199484; Oct. 31, 1983, 58-203836; May 8, 1984, 59-91224; May 8, 1984, 59-91225; May 8, 1984, 59-91226
Int. Cl.[4] H01F *41/08*
U.S. Cl. 242—4 R **24 Claims**

1. An apparatus for winding a wire on an object having a through hole by passing the wire through the through hole, comprising:

a base;

holding means, arranged on the base, for holding the object;

wire supply means for supplying the wire through the through hole from one end of the through hole of the object held by the holding means;

first wire feeding means, arranged at said one end side of the through hole of the object held by the holding means, for clamping the wire and for feeding the clamped wire through the through hole from said one end thereof;

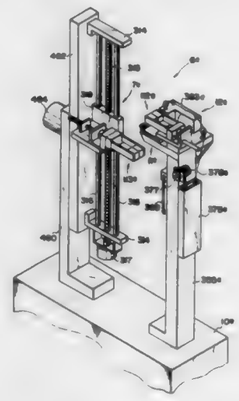
first means for moving the wire feeding means toward and away from the holding means;

second wire feeding means for clamping at the other end side of the through hole the wire supplied through the through hole from said one end thereof and for feeding the clamped wire to the through hole from said one end side thereof;

second means for moving the second feeding means between a first position at the other end side of the through hole and a second position at said one end side of the through hole and between a front position adjacent to the object and a rear position separated from the object,

means for rotating said second wire feeding means about an axis perpendicular to the axis of the through hole; and

drive means for



causing the supply means to supply the wire from said one end of the through hole, causing the second moving means to move the second wire feeding means to the first position at the other end side of the through hole and to the front position thereof, and driving the second wire feeding means to clamp a leading end of the wire supplied;

causing the second moving means to move the second wire feeding means to the rear position thereof so as to suspend the wire between the object and the second wire feeding means, causing the first moving means to move the first wire feeding means to a position in the vicinity of the object, and causing the second moving means to move the second wire feeding means to the second position thereof so as to wind the wire around the object;

causing the rotating means to pivot the second wire feeding means to direct the leading end of the wire toward the object and causing the second moving means to move the second wire feeding means to the front position thereof in the vicinity of the first wire feeding means;

causing the second wire feeding means to feed the wire and clamping the leading end of the fed wire by the first wire feeding means;

causing the second moving means to move the second wire feeding means to the first position and the front position thereof, thereafter causing the first feeding means to feed

the wire through the through hole from said one end thereof, causing the second wire feeding means to clamp the fed wire at the other end of the through hole, causing the first moving means to move the first wire feeding means away from the object, and causing the second moving means to move the second wire feeding means to the rear position thereof to wind the wire around the object; and

thereafter continuously operating the apparatus in the above sequential steps.

4,695,000

DEVICE FOR WINDING-UP A THREAD

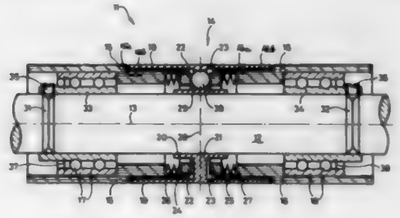
Walter Fretz, Frauenstein, and Walter Heßi, Ettenhausen, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jan. 28, 1987, Ser. No. 7,579

Claims priority, application Switzerland, Jan. 29, 1986, 00343/86

Int. Cl.⁴ B65H *54/46*

U.S. Cl. 242—18 DD **12 Claims**



1. In a device for winding-up a yarn to form a yarn package on a rotatable conical bobbin tube by means of a rotatable drive roller, comprising:

a common drive shaft;

substantially cylindrical rotational elements arranged axially adjacent one another on said common drive shaft;

said substantially cylindrical rotational elements defining a central rotational element and two lateral rotational elements;

said central rotational element having oppositely situated ends;

said central rotational element being fixedly secured to the drive shaft;

a given one of said two lateral rotational elements being arranged at each end of the central rotational element;

a rotational bearing provided for each lateral rotational element for mounting each said lateral rotational element upon said drive shaft;

said rotational elements being capable of engaging with the bobbin tube or yarn package being formed thereon along a generatrix for rolling engagement therewith during a yarn wind-up operation;

a differential transmission for operatively interconnecting said lateral rotational elements; and

said differential transmission serving for operatively interconnecting said lateral rotational elements comprises a friction coupling.

4,695,001

MEANS FOR CUTTING TO LENGTH AND WINDING WINDING MATERIAL

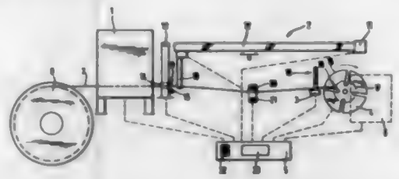
Anton Dreher, and Josef Gramer, both of Horb, Fed. Rep. of Germany, assignors to Hans Deissenberger, Horb am Neckar, Fed. Rep. of Germany

Filed Sep. 26, 1985, Ser. No. 780,444

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438212

Int. Cl.⁴ B65H *54/02*

U.S. Cl. 242—25 R **7 Claims**



1. In a winding and reeling apparatus for strand material including a measuring and cutting unit for feeding said strand material, the improvement comprising:

a strand supply reel and a take-up reel;

a threading device for grasping and for advancing a lead end of said strand material toward said take-up reel;

centering means between said cutting and measuring unit and said threading device operable to position said lead end for connection with the threading device, and;

sensing means adjacent said centering means for indicating the presence in said centering means of said lead end, said threading device being operable in response to said sensing means to grasp and to advance said lead end toward said supply reel.

4,695,002

DRIVEN THREAD STORAGE DEVICE

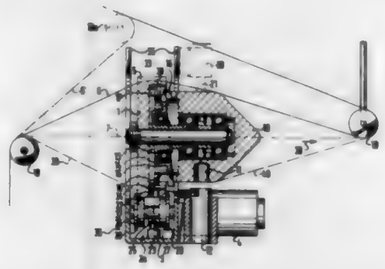
Hans Raasch, Moenchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,676

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516457

Int. Cl.⁴ B65H *51/20*

U.S. Cl. 242—47.01 **14 Claims**



1. Driven thread storage device for compensating instantaneous differences between thread feeding and withdrawal velocities in a textile machine, comprising means for axially feeding thread at a feeding locations, means for axially withdrawing thread at a withdrawal location, a stationary storage drum, a driven thread guide in the form of a rotation-symmetrical disc conducting the thread to said storage drum and producing a thread ballon at said feeding location, said disc having an edge with at least one radially open thread guide slot formed therein, a drive for said disc, means disposed outside said thread balloon for supporting said disc, said supporting means including a friction drive contacting said edge of said disc and being connected to said drive, a machine frame, means for spatially fixing the position of said storage drum with magnetic forces, said position fixing means including an element fixed at said machine frame and an element disposed at said storage drum, at least one of said elements being a magnet, a thread holding device attached to said machine frame, and means for moving said thread holding device toward said storage drum for blocking traversing motion of the thread around said storage drum at said withdrawal location whether or not said disc is operating.

4,695,003

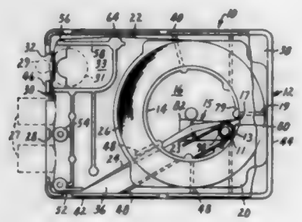
SELF ADJUSTING ENDLESS LOOP TAPE CARTRIDGE

Alfred H. Moris, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 23, 1986, Ser. No. 877,374

Int. Cl.⁴ G11B *23/07*

U.S. Cl. 242—55.19 A **1 Claim**



1. A cartridge comprising:

a housing adapted to be received in a machine and having access openings adapted to receive heads and a tape drive mechanism in said machine;

a cylindrical hub attached to said housing at a position spaced from said access openings, said hub having a central opening and a slot extending axially across the full width of the hub and communicating with said central opening; and

an endless length of tape having a major portion wrapped about said hub to form a coil and a minor portion extending from the innermost wrap of the coil through said slot into said central opening, and around the side surface of the coil to the outermost wrap of the coil;

said hub comprises a flexible cantilevered portion having a first end partially defining said slot, having a second end spaced from said first end that is fixed on said housing, and being separated from said housing between said first and second ends;

said cartridge comprises a cam rotatably mounted about an axis on said housing and having a peripheral surface contacting the inner side of said cantilevered hub portion to provide means for changing the position of said cantilevered portion radially of said hub to adjust the effective circumference of the hub and thereby the length of said minor portion; and

means on said housing for defining a tape path for and producing tension in said minor portion, comprising means for guiding said minor portion past said access openings in a predetermined position for engagement by the heads and drive mechanism of the playback machine, and a guide pin helping to guide said minor portion at a position adjacent the slot, said guide pin being fixed to said cam for pivotal movement about the axis of said cam between a first position providing a first path length for said minor portion at which said cam provides a first maximum effective circumference for said hub and a second position providing a second path length shorter than said first path length for said minor portion at which the cam provides a second minimum circumference for said hub, and means for biasing said guide pin toward said first position.

4,695,004

METHOD FOR TRANSFERRING A WEB FROM A FINISHED ROLL TO A NEW CORE, AND DRUM WINDER FOR THE APPLICATION OF THE METHOD

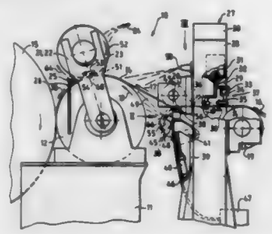
Udo Groessmann, Heidenheim; Dieter Holzinger, Herbrechtingen, and Guenter Rohde, Zang, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Oct. 23, 1985, Ser. No. 790,341

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515519

Int. Cl.⁴ B65H *19/26*

U.S. Cl. 242—56 R **11 Claims**



5. In a drum winder for the transfer of a continuously arriving web from a finished product roll onto a new core having a powered drum looped by the web, a finished product roll bearing on the powered drum and the new core rotating in the direction of web travel and positioned before the product roll, the drum winder comprising: cutting means positioned before the powered drum for cutting the web longitudinally for forming a transfer strip prior to running onto the drum but leaving the transfer strip attached to the portion of the advancing web to be wound on the finished product roll, severing means, positioned downstream of said cutting means and before the intake gap between the drum and the new core, for severing the transfer strip from said advancing web portion before the transfer strip reaches the new core, and guide means for guiding the severed transfer strip onto the new core, said cutting means including the means for completely severing the web after the severed transfer strip is guided onto the new core.

4,695,005

CORELESS WINDER FOR STRIPS OF PLIABLE MATERIAL

Peter J. Gietman, Jr., Combined Locks, Wis., assignor to Custom Machinery Design, Inc., Appleton, Wis.

Filed May 13, 1985, Ser. No. 733,045

Int. Cl.⁴ B65H *18/10, 19/26, 75/24*

U.S. Cl. 242—56 R **12 Claims**

1. A winder for winding elongate strips of pliable material, such as plastic film, cloth or paper, into coreless rolls, said winder including:

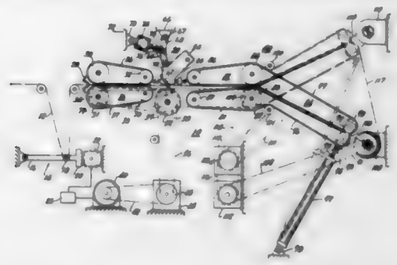
cut-off means for forming strips of pliable material of a preselected length;

conveyor means for conveying said strips of pliable material from said cut-off means;

at least two winding assembly means for winding said strips of pliable material into coreless rolls;

said conveyor means consisting of a first extended stationary portion, immediately adjacent said cut-off means and having top and bottom conveying surfaces forming a nip for accepting a leading edge of said strip of pliable material from said cut-off means, and a second movable portion

for alternately directing said stips of pliable material to different ones of said winding assembly means;
means for driving said conveyor means;
means for driving said winding assemblies
wherein said movable portion of said conveyor means comprises an outlet formed by the ends of said top and bottom conveying surfaces, said winder including a first cylinder means having an extensible piston rod means, said rod means being coupled to said conveyor outlet for moving said outlet from a first position in which said outlet is disposed adjacent a first one of said winding assemblies to



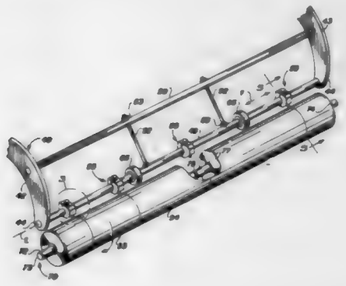
at least another position in which said outlet is located adjacent another of said winding assemblies
wherein said stationary portion and said movable portion of said conveyor means comprise a plurality of pairs of roller means spaced between said cut-off means and said outlet, said pairs of roller means including a top roller and a bottom roller, single endless means surrounding the top rollers to provide a top conveyor surface and single endless means surrounding the bottom rollers to provide a bottom conveyor surface, whereby pliable material passing into said nip and between said conveyor surfaces is conveyed through said conveyor means.

4,695,006

PAPER CONVERTING MACHINE

Daniel L. Pool, Paradise Valley, Ariz., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Aug. 12, 1985, Ser. No. 764,396
Int. Cl.[4] B65H *35/02*
U.S. Cl. 242—56.3 **37 Claims**



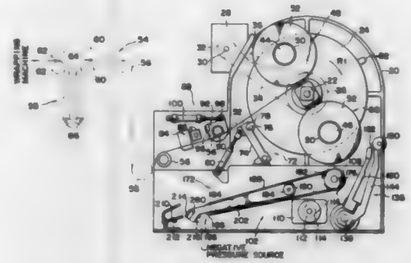
1. A slitter mechanism for use in a paper converting machine which converts a roll of bulk coiled sheet paper into a plurality of specialty rolls of paper, said machine being of the type which includes a frame, a shaft coupled to the frame and supporting said roll of bulk coiled sheet paper for rotation about a first axis, a driven roller, an idler roller, and a mandrel positioned for rotation in a cradle formed by said driven roller and said idler roller for receiving a plurality of pre-cut specialty cores positioned in end-to-end abutment relationship upon which paper cut from said roll of bulk coiled sheet paper is wound in widths corresponding to the length of each of said specialty cores, said slitter mechanism comprising:
a pair of spaced apart arms having first and second ends;
an elongate support bar coupled between said spaced apart arms, said support bar having first and second ends, the second ends of said spaced apart arms being coupled to said frame;
a plurality of slitter assemblies slideably mounted on said support bar and capable of being selectively positioned thereon at locations corresponding to the desired lengths of said specialty rolls for cutting said bulk coiled sheet paper into said widths as said bulk coiled sheet paper is rolled onto said specialty cores;
a reinforcing bar extending between and carried by said pair of spaced apart arms at a location apart from said support bar and intermediate the first and second ends of said spaced apart arms; and
a plurality of spaced apart trusses each having a selectively adjustable length extending between and threadably engaging said support bar and said reinforcing bar.

4,695,007

APPARATUS FOR CONTINUOUSLY SUPPLYING SHEETS FROM SUPPLY ROLLS

Yoshiyuki Muto, Yonago; Tadao Etani, Tokyo; Satoru Aida, Sanjo, and Shinya Kato, Tsubame, all of Japan, assignors to Sanjo Machine Works, Ltd., Maniwakanbara and Japan Tobacco, Inc., Tokyo, both of, Japan

Filed Nov. 25, 1986, Ser. No. 934,721
Claims priority, application Japan, Nov. 28, 1985, 60-268094
Int. Cl.[4] B65H *19/16*
U.S. Cl. 242—58.4 **6 Claims**



1. An apparatus for continuously supplying sheets from supply rolls, comprising:
a rotary disc vertically disposed such that a central axis thereof extends in a horizontal direction, the rotary disc being rotatable about the central axis;
a first supply roll mounted at a peripheral portion of the rotary disc and including a roll of sheet material, the first supply roll having a first axis parallel to the central axis of the rotary disc, the first supply roll being rotatable about the first axis;
means for feeding the sheet from the first supply roll, the feeding means having a sheet feeding path;
a second supply roll mounted at a peripheral portion of the rotary disc and including a roll of sheet material, the second supply roll having a second axis parallel to the central axis of the rotary disc and being rotatable about the second axis, the second supply roll being provided with an adhesive tape for partially fixing a distal end of the sheet to an outer surface of the second supply roll;
a cutting/feeding device, located near the rotary disc, for cutting the adhesive tape of the second supply roll and feeding the sheet therefrom, the cutting/feeding device including driving means for reversibly rotating the second

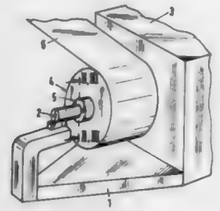
supply roll, knife means provided with a knife to come into contact with or to be separated from an outer surface of the second supply roll, and actuating means for moving the knife along a direction parallel to the second axis of the second supply roll when the knife of the knife means is inserted under the distal end of the sheet of the second supply roll, the knife being adapted to be inserted under a portion excluding a region of the distal end of the sheet of the second supply roll upon driving of the second supply roll by the driving means, the region being fixed to the outer surface of the second supply roll by means of the adhesive tape, whereby the adhesive tape of the second supply roll is cut upon cooperation of the knife and the actuating means and, thereafter, the sheet of the second supply roll is fed therefrom upon rotation of the second supply roll by the driving means;
guiding means for guiding the sheet fed from the second supply roll and hence the distal end thereof to a predetermined connection position in the feed path of the feeding means;
adhering means for adhering the sheet from the first supply roll to the distal end of the sheet from the second supply roll at the connection position; and
cutting means, disposed in the feed path between the connection position and the first supply roll, for cutting the sheet fed from the first supply roll.

4,695,008

REELING MANDREL FOR WINDING METAL STRIPS

Henry Dabrowski, In der Meer 22a, 4005 Meerbusch 1, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,499
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 3432876
Int. Cl.[4] B65H *18/04, 75/18*
U.S. Cl. 242—68.5 **16 Claims**



1. A reeling installation for winding metal strips with a drivable reeling mandrel, comprising:
an exchangeable lining of elastomer material mounted on said reeling mandrel, said lining of elastomer material being hard and flexible in the inner region as far as the inner surface of the lining, and soft and flexible in the outer region as far as the outer surface of the lining;
wherein the elastomer material of the inner region is sufficiently flexible to allow said lining to be useable on a reeling mandrel of the spreadable type.

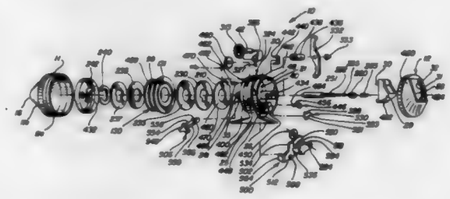
4,695,009

BAIT ALERT FOR SPIN CAST REEL

Steven L. Swisher, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 1, 1986, Ser. No. 858,031
Int. Cl.[4] A01K *89/00, 89/01*
U.S. Cl. 242—84.1 R **9 Claims**

1. In a fishing reel of the type having a spool for storing a supply of line and a crank handle operable through a drive train to direct line onto the spool, said drive train having a first member rotatable in a first direction with the crank handle operated to direct line onto the spool and rotatable oppositely to the first direction in response to the line being drawn off the spool, an improved bait alert comprising:
a clicker;
means mounting the clicker on the reel movably between a first position wherein a portion of the clicker contacts the first member and produces an audible clicking sound upon the first member being rotated and a second position wherein the portion of the clicker is spaced from the first member so that no clicking noise is generated between the portion of the clicker and first member upon the first member being rotated in the first direction; and



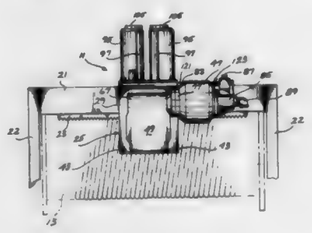
actuator means for moving the clicker to its second position upon the first member rotating in the first direction and for moving the clicker to its first position upon the first member rotating oppositely to the first direction,
whereby the user of the reel is alerted by the clicking noise to the fact that line is being drawn off of the reel as by a fish and upon the user retrieving line through operation of the crank handle the clicking noise is automatically stopped.

4,695,010

LEVELWIND MECHANISM

Glenn S. Smith, Issaquah, Wash., assignor to Beebe International, Inc., Seattle, Wash.

Filed Jun. 12, 1986, Ser. No. 873,506
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R **11 Claims**



1. A levelwind mechanism for controlling the fleet angle of a cable as the cable is spooled onto a winch drum comprising:
a winch frame having sidewalls at the ends of said winch drum for rotatably supporting the winch drum;
a rigid guide bar rigidly attached to said sidewalls of said winch frame so as to lie parallel to the axis of rotation of said winch drum;
an elongate rack mounted on said rigid guide bar;
a frame slidably mounted on said rigid guide bar for movement along the guide bar, said slidably mounted frame being entirely supported by said rigid guide bar;
a motor mounted on said slidably mounted frame, said motor being entirely supported by said slidably mounted frame and, thus, said rigid guide bar;
a gear train mounted on said slidably mounted frame for coupling said motor to said rack, said gear train being entirely supported by said slidably mounted frame and,

thus, said rigid guide bar, said gear train including: (i) a worm directly connected to the shaft of said motor; (ii) a shaft; (iii) a worm gear mounted on said shaft so as to engage said worm; and, (iv) a pinion gear mounted on said shaft and positioned to engage said rack;

cable guide rollers mounted on said slidably mounted frame through which cable passes as cable is spooled onto said winch drum, said cable guide rollers being entirely supported by said slidably mounted frame and, thus, said rigid guide bar; and,

a fleet angle sensor mounted on said slidably mounted frame on the winch drum side of said cable guide rollers for sensing the fleet angle of cable as cable is spooled onto said winch drum, said fleet angle sensor being entirely supported by said slidably mounted frame and, thus, said rigid guide bar, said fleet angle sensor connected to said motor for controlling the energization of said motor such that said motor is energized to reduce said fleet angle when said fleet angle exceeds a predetermined value by rotating said gear train in the direction that causes said slidably mounted frame to slide in the direction that reduces said fleet angle.

4,695,011

CASSETTE TAPE MACHINE

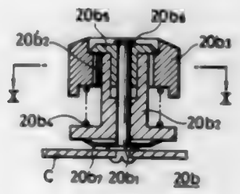
Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,510

Claims priority, application Japan, Dec. 26, 1980, 55-186647[U]; Dec. 26, 1980, 55-186648[U]; Dec. 26, 1980, 55-186649[U]; Dec. 26, 1980, 55-186651[U]

Int. Cl.⁴ G11B *15/32*

U.S. Cl. 242—199 **9 Claims**



1. A cassette tape machine of the type having at least one rotatable shaft unit, said rotatable shaft unit having an outer surface of irregular shape, and hub means rotatable with said shaft unit and having an outer periphery for engaging a tape reel in a cassette, said hub means having an inner surface of a mating irregular shape to said outer surface and surrounding said outer surface, said tape reel being rotatable in tape supply and take-up directions whereby said means rotates said shaft unit in said supply direction, the improvement comprising: resilient coupling means for resiliently coupling the rotational force of said hub to said shaft unit when said hub rotates in said supply direction, said resilient coupling means including at least one resilient member disposed between said inner and outer surfaces and biased outwardly from said shaft unit against said inner surface.

4,695,012

AERIAL LOAD-LIFTING SYSTEM

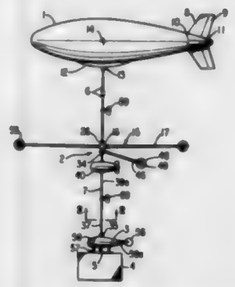
Bernard Lindenbaum, 4929 Thorain Ct., Dayton, Ohio 45416

Division of Ser. No. 502,324, Jun. 8, 1983, Pat. No. 4,601,444. This application Mar. 20, 1985, Ser. No. 714,123

Int. Cl.⁴ B64B *1/34*

U.S. Cl. 244—26 **31 Claims**

1. An aerial load-lifting system having a plurality of aircraft units, one of said units comprising a lighter-than-air aircraft for lift and another unit comprising a powered heavier-than-air aircraft for lift and maneuvering including controls using motion sensing inputs into an autopilot, a flexible tension member including an upper cable adapted for angle changes interconnecting said units, and means on said heavier-than-air aircraft connected to said tension member for allowing said heavier-than-air aircraft to bodily tilt through large angles in said azimuthal direction and to cause the tension force in said tension member to act approximately through a prescribed point with respect to said heavier-than-air aircraft for any angle between



said tension member and said heavier-than-air aircraft during operation, said lighter-than-air aircraft being located substantially above said heavier-than-air aircraft suspended therefrom and cooperating therewith to permit swinging motion damped maneuvering of said heavier-than-air aircraft with a minimum of influence by any motions of said lighter-than-air aircraft such that the autopilot is used to stabilize position of the heavier-than-air aircraft and a suspended load regardless of motions of the lighter-than-air aircraft above and the upper cable angle changes produced by such motions.

4,695,013

LANDING AID

Ulrich Trampnau, P.O. Box 167, 21211 Jeddah, Saudi Arabia

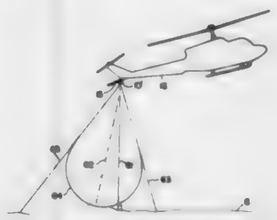
Filed Oct. 10, 1984, Ser. No. 659,358

Claims priority, application United Kingdom, Oct. 17, 1983, 8327731

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.⁴ B64C *13/16*

U.S. Cl. 244—17.13 **10 Claims**



1. A landing aid, for a helicopter with a tail rotor, for assisting a pilot to carry out a simulated or real auto-rotation landing, said landing aid comprising means for giving a height-measurement by transmitting and receiving high frequency electromagnetic wave beams, positioned at a tail of a helicopter, said high frequency electromagnetic wave beam having an axis which is directed backwardly and obliquely downward from the tail of the helicopter, means for calculating the tail height responsive to a receipt of the reflected electromagnetic wave signals; computing means for computing the tail sink rate responsive to at least one of said height measurements or reflected electromagnetic wave signal, means for providing a flare signal to tell a pilot when to start a landing flare, and means for providing a warning signal to tell a pilot when to stop the landing flare responsive to the tail sink rate relative to its instantaneous height and a corresponding value indicating a danger of a tail/ground.

4,695,014

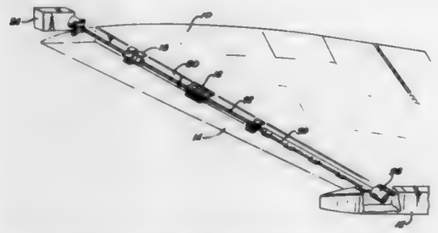
AIRCRAFT WING SECTION MOVEMENT APPARATUS

George D. Mourani, Huntington Beach, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Filed May 25, 1984, Ser. No. 614,252

Int. Cl.⁴ B64C *13/24*

U.S. Cl. 244—213 **14 Claims**



12. In an aircraft wing structure extending outwardly from a fuselage to a wing tip and having a pivotably movable wing section extending therealong, a mechanism for moving said section comprising:

motor means for producing rotary movement;

a torque shaft extending outwardly through said wing toward said tip and connected to said motor means to be rotated thereby;

rotary actuator means disposed adjacent to said tip and operatively connected to said torque shaft for driving said movable wing section at a reduced speed in response to rotation of said torque shaft; and

a return shaft concentric with said torque shaft and disposed around said torque shaft and operatively connected to said rotary actuator means to be driven at said reduced speed, said return shaft extending through said wing toward said motor means and connected to said movable wing section, thereby transmitting forces from said rotary actuator means to said movable wing section.

4,695,015

IMPROVEMENTS RELATING TO BELTS OF INTER-WOVEN SPIRAL WIRES

Ari Salminen, Suorama, Finland, assignor to Tamfelt Oy Ab, Tampere, Finland

Filed Mar. 6, 1986, Ser. No. 837,360

Claims priority, application Finland, Mar. 22, 1985, 851165

Int. Cl.⁴ B21F *27/08*

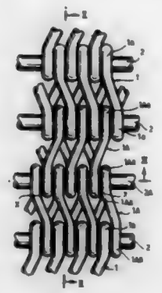
U.S. Cl. 245—6 **9 Claims**

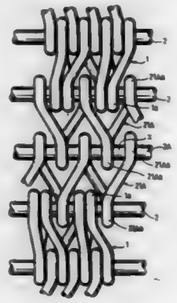
1. A spiral wire belt, comprising:

a plurality of pairs of adjacent thread-like spirals (1) formed with loops (1c) and positioned in pairs with said loops (1a) thereof interlapping and in contact with each other to form transverse rows of loops in the wire belt extending the width of the belt and

linking threads (2) inserted in said rows of loops, respectively, the loops of adjacent spirals in contact with each other being pressed against said linking threads alternately from opposite sides, said belt having opposite ends formed by the plurality of said spirals (1) and linking threads (2); and

means defining a seam portion including at least one pair of seam spirals (1A; 11A; 21A) for connecting the ends of the wire belt to form an endless wire belt, said seam spirals being formed with loops (1Aa, 11Aa, 21Aa) interlapping with each other and arranged such that a clearance (X) is provided between substantially each of the interlapping loops (1Aa; 11Aa; 21Aa) of the seam spirals (1A; 11A; 21A) forming the seam portion, and a seam thread (2A) inserted through said loops of the seam spirals to establish said endless wire belt, said clearance extending in the





direction of the seam thread (2A) which interconnects said loops of the seam spirals, said clearance (X) being provided between the interlapping loops of the seam spirals only in the seam portion with the interlapping loops of adjacent thread-like spirals (1) being in contact with each other outside the seam portion and without any appreciable clearance therebetween.

4,695,016

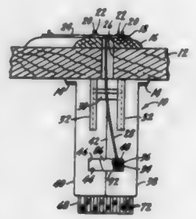
SLOW MOTION ACTUATING DEVICE

Stephen A. Worack, 361 Herrick Rd., Riverside, Ill. 60546

Filed Aug. 29, 1985, Ser. No. 770,724

Int. Cl.⁴ B61L *1/02;* **E01B** *7/00*

U.S. Cl. 246—415 A **11 Claims**



1. A switch machine for effecting a prototypical throw of model railroad switch points, comprising:

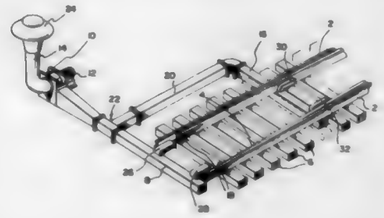
a housing having a first opening therein;
an electric motor mounted in the housing, the motor having a stall current low enough to allow the motor to be continuously stalled without damage to the motor;
circuit means providing electrical connections to the motor;
a set of reduction gears mounted in the housing and driven by the motor;
a swing arm pivotally mounted in the housing, driven by the reduction gears, and engageable with the switch points through the first opening; and
stop means in the housing, engageable with the swing arm, limiting movement of the swing arm to a point where the switch points are fully thrown but the torque of the motor is absorbed by the stop means and not by the switch points.

4,695,017

RAILROAD SWITCH SNOW DEFLECTING AIR NOZZLE APPARATUS

Thomas R. Ringer, Gloucester, and Byrne E. Bramwell, Kars, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 826,681, Feb. 6, 1986, abandoned, which is a continuation of Ser. No. 639,415, Aug. 10, 1984, abandoned. This application Dec. 23, 1986, Ser. No. 4,210
Claims priority, application Canada, Aug. 19, 1983, 435008
Int. Cl.[4] E01B 7/00
U.S. Cl. 246—428 **9 Claims**



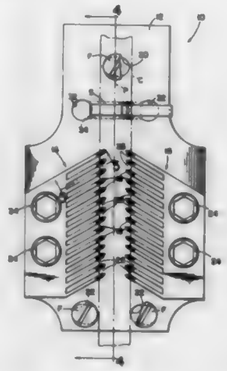
1. A railroad switch snow deflecting air nozzle apparatus, comprising:
(a) a first elongate conduit for transporting air under and transversely of stationary rails of the switch to a location ahead of switch points thereof,
(b) at least one primary nozzle extending from the first conduit and having an open nozzle end for directing air along the rails and towards the switch points to a position adjacent the apex of the switch and in a direction from the apex towards the heel of the switch,
(c) a second elongate conduit for transporting air under and transversely of the stationary rails to a location spaced from the said at least one primary nozzle and behind the switch points,
(d) at least one secondary nozzle extending from the secondary conduit and having an open nozzle end for directing air along and between movable rails of the railway switch, and in the same direction as air from the said at least one primary nozzle, each said secondary nozzle being about halfway between the apex and the heel of the switch to effectively act in series with a respective said primary nozzle,
(e) air supply means, having a snow protected air inlet, for supplying air at ambient temperatures to the first and second conduits for air to exit from the said at least one primary nozzle at a velocity of the order of 100 mph and from the said at least one secondary nozzle at a velocity of the order of 100 mph to prevent the entry of any falling snow or rain into the switch, and
(f) automatic control means associated with remotely controlled sensors to activate the apparatus at the onset of snow or freezing rain, whereby
(g) in operation, the railroad switch is maintained operationally free of snow.

4,695,018

CABLE HANGER

Joseph Carswell, Morganton, and Louis Ance, Newton, both of N.C., assignors to BRIntec Corp., Willimantic, Conn.

Filed Jan. 14, 1986, Ser. No. 818,872
Int. Cl.[4] F16L 3/08
U.S. Cl. 248—74.2 **5 Claims**



3. A cable hanger for gripping and securing in fixed position an axially elongated portion of a cable, said cable hanger comprising a mounting base having a rearwardly facing mounting surface, a pair of opposing combs supported on and projecting forwardly from said mounting base at opposite sides of an axial plane intersecting said mounting base and normal to said mounting surface, each of said combs having a finger supporting portion fixed relative to said mounting base and a multiplicity of integral flexible resilient spaced apart fingers projecting in parallel relation to each other from said finger supporting portion, said fingers of each of said combs extending forwardly from said mounting base in generally normal relation to said mounting surface annd defining forwardly extending slots therebetween, said fingers of each of said combs being inclined to said axial plane and in the direction of one end of said mounting base, said fingers being free to move relative to said supporting portion and said mounting base and relative to each other, said fingers of said opposing combs having free ends disposed in opposing spaced apart relation to each other at opposite sides of said axial plane, said free ends cooperating to define a forwardly open generally V-shaped groove converging toward said mounting base and toward an apex disposed within said axial plane, said V-shaped groove having a substantially uniform cross-section throughout its length, said free end portions defining opposing parallel rows of notches of substantially uniform size at opposite sides of said axial plane.

4,695,019

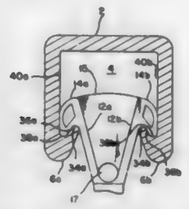
NON-METALLIC STRUT SYSTEM

Verne L. Lindberg, Everett, and Paul A. Stockinger, Tacoma, both of Wash., assignors to Aickin Development Corporation, Everett, Wash.

Continuation-in-part of Ser. No. 743,102, Jun. 10, 1985. This application Sep. 26, 1986, Ser. No. 912,963
Int. Cl.[4] F16L 3/03
U.S. Cl. 248—74.3 **1 Claim**

1. In combination:
a. a fiberglass structural support element having sides forming a longitudinal slot;

b. longitudinal flanges inwardly projecting toward the center line of said support element along the sides of said support element, each of said longitudinal flanges having an interior surface ajacent said slot, said interior surface of said longitudinal flanges having a rounded portion where said longitudinal flanges meet the sides of said support element, said longitudinal flanges having rounded edges of a predetermined radius;
c. a pair of complemental composite thermoplastic pipe supporting bands having bottom portions forming a natural curvature for cradling a pipe when the end of said bands are engaged, said supporting bands having a top portion integral with said bottom portion, said top portion having distal flanges, said distal flanges having side portions, undersides, rounded bottom edges of a pre-determined radius, and otherwise so shaped as to allow substantially full and interlocking contact between the side portion of said distal flanges and the sides of said support element and between the undersides of said distal flanges, including their rounded edges and the interior surface of said longitudinal flanges including the rounded portions of said longitudinal flanges where said longitudinal flanges meet the sides of said support element, and the rounded edges of said longitudinal flanges when the top portion of said support bands is disposed within said longitudinal slot; and
d. adjustable holding means on the bottom portion of said supporting bands for connecting and locking said support bands around a pipe.

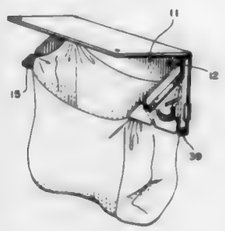


4,695,020

APPARATUS FOR HOLDING DISPOSABLE BAGS

John Collins, Bldg. A-2-Apt. #412, 7715 SW. 86th St., Miami, Fla. 33143

Filed Jun. 26, 1986, Ser. No. 878,624
Int. Cl.[4] B65B 67/04
U.S. Cl. 248—100 **10 Claims**



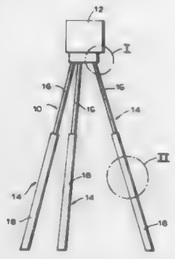
1. Bag-holding apparatus for attaching either a plastic or paper bag thereto and thereby allowing reuse of the bags, said apparatus comprising a back portion with rotatable top and side members attached thereto, brace members formed from said back member, each being hinge connected to said back portion along one edge of said brace member, said brace members each being received in slot means formed in said side members to keep said side members in a perpendicular position with respect to the back portion, said top member resting upon upper edges of said side members when said top member is rotated downward relative to said back member, and bag holding means for attaching said plastic or paper bag to said bag-holding apparatus.

4,695,021

SUPPORT STAND WITH ADJUSTABLE LEGS

Klaus Leinfelder, Oberasbach, Fed. Rep. of Germany, assignor to Cullmann Handelsgesellschaft für Verbrauchsgüter mbH, Langenzenn-Laubendorf, France

Filed Sep. 30, 1985, Ser. No. 782,426
Int. Cl.[4] B64G 1/36
U.S. Cl. 248—168 **7 Claims**



1. A suppport stand for an item of equipment, comprising: a hand portion; support legs which are connected to the head portion and which extend downwardly therefrom and each of which comprise inner and outer tube portions displaceable in telescope relationship with each other; and a respective fixing means adapted to fix the tube portions of each leg relative to each other, said fixing means comprising an actuating rod displaceable in the axial direction of the respective leg and actuable from outside the tube portions, first and second clamping cone members which taper in the same direction and which are disposed on the actuating rod in the vicinity of the lower end of the inner said tube portion, a respective expandable pressure element around each said cone member and co-operative therewith, holding members holding said pressure elements axially immovably on said lower end of the inner tube portion whereby said pressure elements are adapted top bear against the inside wall surface of the outer one of said tube portions under the action of the associated cone members, and a resilient means operable to urge said actuating rod in the direction in which said cone members taper whereby in a normal operating condition of the fixing means towards which said cone members are urged said cone members press said pressure elements against the inside wall surface of the outer tube portion, with such a force as to provide a frictional connection which can be overcome by hand between the two tube portions.

4,695,022

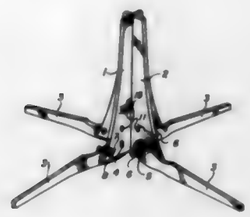
CLARINET STAND

Alvin A. Meadonsa, 2860 Ransford Ave., Monterey, Calif. 93940, and Donald D. Eshoff, 87 San Benancio Rd., Salinas, Calif. 93908

Filed May 21, 1984, Ser. No. 612,350
Int. Cl.[4] F16M 11/00
U.S. Cl. 248—176 **12 Claims**

1. A stand for supporting musical instruments which have a bell, said stand having an open configuration for supporting said instruments and a closed configuration for storing and transporting within said instruments, said stand comprising:
a support portion having an outside contour which substantially conforms to the inside contour of the bell of said instruments, and having a plurality of cavities formed within the outside contour thereof; and
a plurality of legs, movably coupled to the support portion,

having a lockably open position to form the open configuration of the stand, and a lockably closed position to form the closed configuration of the stand, said legs being formed to fit within said cavities of the support portion;



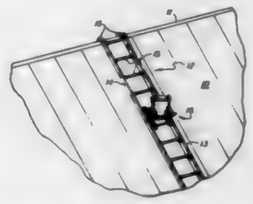
said cavities being arranged to receive said legs in said closed configuration.

4,695,023

PLATFORM ASSEMBLY FOR SLANTED LADDER

Stanley E. McCafferty, R.D. #1, McCafferty Rd., Greenville, N.Y. 12083

Filed Mar. 2, 1987, Ser. No. 20,697
Int. Cl.[4] E06C *7/14*
U.S. Cl. 248—238 **5 Claims**



1. In a platform assembly for a slanted ladder wherein a base is to be hooked to and lie against rungs of the ladder, a platform is hinged to the base, and a brace is pivoted to the platform to abut the base and hold the platform and base at an included angle which substantially levels the platform, adjustment means for varying said included angle to accomodate different ladder angles comprising

(a) a pair of parallel side flanges on the platform formed with respective arrays of holes in registry with one another and with each array describing an arc about a common axis which is also the pivot axis of the brace on the platform, and

(b) a pair of coaxial pins on the brace movable simultaneously in opposite directions away from one another into a corresponding pair of coaxial holes in the respective side flanges to fix the platform and brace at a predetermined included angle and toward one another out of said pair of holes to permit the brace to be pivoted on the platform side flanges so that the pins can register with a different selected pair of registered holes.

4,695,024

TEST SYSTEM MANIPULATOR ARM

Kenneth R. Haven, Fremont, Calif., assignor to Attain, Inc., Milpitas, Calif.

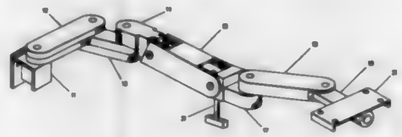
Filed May 9, 1986, Ser. No. 861,189
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—281.1 **4 Claims**

1. An adjustable arm for controlling the horizontal and vertical position of an object mounted at one end of said arm, said arm comprising:

means for rigidly mounting the end of said arm opposite said end at which said object is mounted;

a plurality of interconnected links, a first group of said plurality of links controlling the horizontal position of said arm and said object;

a counterbalancing link among said plurality of links, said counterbalancing link being disposed intermediate said first group of links, said counterbalancing link serving to



provide vertical movement of said plurality of links and said object and to counterbalance the weight of said object at said one end of said arm;

said counterbalancing link including a gas spring for supplying a counterbalancing force;

means for adjusting the counterbalancing force supplied by said gas spring; and

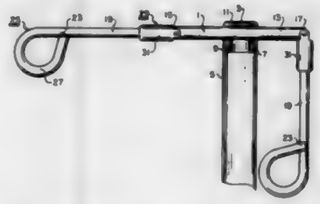
said adjusting means including a ramped surface for controlling the force supplied by said gas spring.

4,695,025

HANGER ASSEMBLY

Thomas L. Vaughan, 27272 Cool Water Ranch Rd., Valley Center, Calif. 92082

Filed Nov. 1, 1985, Ser. No. 793,963
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—293 **26 Claims**



1. A hanger assembly for an upright equipment pole, said assembly comprising:

(a) means for attaching the hanger assembly to the equipment pole;

(b) a cross-arm extending from said attaching means and terminating at a terminal end spaced apart from the pole;

(c) a hanger arm having first and second ends, said first end mating with the terminal end of said cross-arm in at least one configuration of the hanger assembly, said hanger arm comprising means for hanging equipment therefrom; and

(d) means proximate to said first end for locking said cross-arm and said hanger arm into an operational configuration such that equipment may be hung therefrom, and thereafter unlocking said arms to permit said hanger arm to be swung into a storage configuration.

4,695,026

HOLDER FOR EYE GLASSES

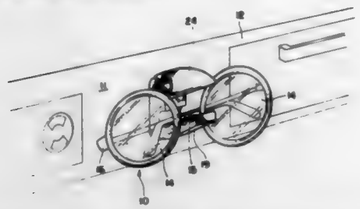
Travis D. Medley, Jr., 1551 Brenner Way, San Jose, Calif. 95118

Filed Mar. 3, 1986, Ser. No. 835,156
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—316.5 **4 Claims**

1. An eye glass holder for holding eye glasses having a pair of lenses connected by a nose piece and having attached a pair of ear pieces, said holder comprising:

a base member having first and second ends,

a support member fixed to the first end of said base member and formed to extend from said base member and receive the nose piece of the eye glasses and forming at the juncture with said base member an enlarged opening to receive the sun glass earpieces,



a clamping member pivotally attached to the second end of said base member to extend in the same direction as said support member and positioned to contact and clamp the eye glasses against said support member, and

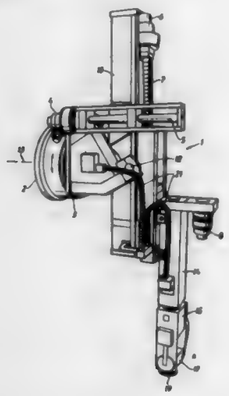
means biasing said clamping member towards said base member whereby the eye glasses can be placed with the nose piece on said support member and the earpieces in said enlarged opening and the clamping member moved into contact therewith to hold said eye glasses.

4,695,027

INDUSTRIAL ROBOT INSTALLATION

Carl-Henrik Lindholm, Vikes, and Christer Landström, Enköping, both of Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Jun. 2, 1986, Ser. No. 869,366
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—325 **9 Claims**



1. An industrial robot installation including at least one robot of pendulum type, said robot comprising

a robot stand rotatable about a first axis,

an arm system including a primary arm and a secondary arm, said primary arm being pivotably journalled in said stand about a second axis oriented transversely across the longitudinal direction of the primary arm, and said secondary arm being movably journalled on said primary arm,

a counterweight displaceably mounted on said primary arm for counterbalancing said arm system, and

a movement-transmitting mechanism interconnecting said secondary arm and said counterweight,

said secondary arm and said counterweight being simultaneously linearly displaceable towards and away from each other, respectively, on respective sides of said second axis such that, independently of the position of said secondary arm on said primary arm, the centre of gravity of said arm system is located on or in immediate proximity to said second axis.

4,695,028

DEVICE FOR HOLDING CONSTRUCTION MATERIALS

Wayne W. Hunter, 2823 Sherman Ave., NW., Apt. #2, Washington, D.C. 20036

Filed Apr. 14, 1986, Ser. No. 851,634
Int. Cl.[4] E04G *25/00*
U.S. Cl. 248—354.1 **7 Claims**



1. A device for holding a sheet of construction material in an elevated position so that the sheet may be secured to a ceiling comprising:

a first rigid member,

a second member which is elongated and which is spaced from said first member and adapted to assume an upper and lower position with respect to said first member, said second member having a support means at one end for holding said sheet,

spring means attached at opposite ends to said first and second members respectively for upwardly urging said second member to said upper position;

retaining means for releasably retaining said second member in said lower position, and activable release means for upon activation releasing said retaining means and causing said spring means to quickly propel said second member from said lower to said upper position.

4,695,029

SUPPORT DEVICE FOR SECURING A RAZOR TO A SHAVING CREAM DISPENSER

Jeffrey A. Fox, 4374 Ventura Canyon Ave., #5, Sherman Oaks, Calif. 91403, and Cheryl Fox, 3274 Ventura Canyon Ave., #5, Sherman Oaks, Calif. 91403

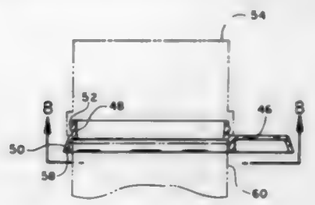
Continuation-in-part of Ser. No. 690,927, Jan. 11, 1985, abandoned. This application Jan. 8, 1986, Ser. No. 816,934
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—360 **5 Claims**

1. An adapter for attachment to a cosmetic dispensing unit having a peripheral bead for receiving a cap, said adapter comprising:

a collar member having a radially outwardly extending flange defining an opening therethrough,

first and second rims extending in opposite longitudinal directions from said collar member;

first means carried by said first rim for removably affixing



said collar member to said peripheral bead on said dispensing unit; and

second means carried by said second rim for removably securing the cap.

4,695,030

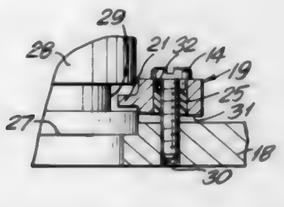
QUICK RELEASE CLAMP

Jay P. Fischer, 210 Hopkins Rd., Watertown, Conn. 06795

Filed Sep. 3, 1985, Ser. No. 772,048

Int. Cl.⁴ B25B *5/08*

U.S. Cl. 248—507 **3 Claims**



1. A clamp for securing a component having an annular flange thereon to a support, comprising:

a clamp body having a central bore therein;

said clamp body including a top and a bottom;

a clamping lip extending about a portion, and less than all of a perimeter of said clamp body;

a first cam-shaped portion on said bottom;

said first cam-shaped portion extending a substantial distance below said clamping lip;

said first cam-shaped portion and said clamping lip being joined along a generally linear stop;

a clamping screw;

a first diameter of said central bore being substantially greater than a second diameter of said clamping screw;

a plastic insert in said central bore occupying substantially all of a radial distance between said first diameter and said second diameter;

said plastic insert having a length substantially less than a length of said central bore;

a second cam-shaped portion on said top;

said second cam-shaped portion extending a substantial distance above said clamping lip, whereby a length of said central bore is increased; and

said second cam-shaped portion having a shape substantially identical to said first cam-shaped portion and aligned therewith, whereby a rotational position of said first cam-shaped portion is ascertainable by observing the same rotational position of said second cam-shaped portion.

4,695,031

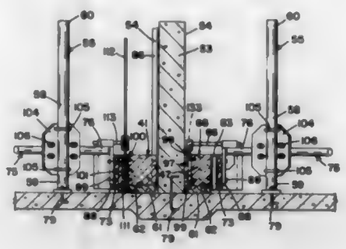
GANG FORM

Edward A. Proctor, 3417 Clareadon Rd., Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 575,288, Jan. 30, 1984, abandoned. This application Nov. 14, 1985, Ser. No. 797,843

Int. Cl.⁴ B28B *7/22*

U.S. Cl. 249—91 **12 Claims**



1. A gang form for molding a plurality of elongated concrete beams, each beam, when in use, having a pair of spaced apart, elongated, generally vertical side surfaces interconnecting a top surface and a bottom surface, said top surface having corrugations extending over the length of the beam, said beam further including embedded reinforcement adjacent to said bottom surface, said beams being molded on their sides, one beam on top of another in superimposed tiers such that the vertical side surfaces are cast in a generally horizontal position, the gang form comprising a concrete base slab having a planar upper surface; a straight vertical concrete form wall rigidly secured centrally on said planar upper surface; a starter slab adjacent to the base slab and extending transversely from at least one side of said form wall; a plurality of upright posts attached to the upper surface of the base slab and spaced from said at least one side of said form wall, said posts being aligned in a plane parallel to said at least one side of said form wall, each post having a central body portion; a plurality of horizontal support arms each having an extended end portion; means for adjustably attaching one of said arms to the central body portion of each of said posts such that the arms may be vertically and horizontally adjusted relative to said posts; an individual mold side member rigidly attached to said end portions of said arms and having a vertical height substantially less than the vertical height of said form wall, thereby enabling said mold side member to be positioned at various elevations above the base slab as well as at various distances from said at least one side of said form wall; a pair of spaced apart end wall mold members extending transversely from said at least one side of said first wall; at least one of said mold side member and said form wall having attached on a molding face thereof a plurality of corrugated sheets; said at least one side of said form wall, said individual mold side member, and said end wall mold members together defining an open top elongated trough mold compartment with a bottom molding face defined either by said starting slab for a first tier of molded beams, or by a previous tier for second and subsequent tiers of molded beams.

4,695,032

CONVERTIBLE MOULD

Lucien A. Desport, Paris, France, assignor to Engineering Management Data Processing (E.M.D.P.), Paris, France

Filed Aug. 14, 1985, Ser. No. 765,916

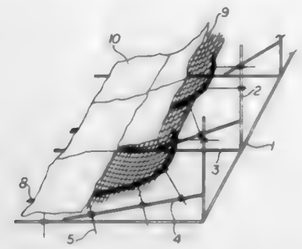
Claims priority, application France, Aug. 31, 1984, 84 13506

Int. Cl.⁴ B29C *41/38*

U.S. Cl. 249—112 **10 Claims**

1. A convertible mould for moulding an object having a surface with first principal lines which extend in first parallel planes and second principal lines which extend in second parallel planes intersecting the first planes, comprising a frame, a

plurality of rows each having a plurality of head-holders mounted on the frame, each row extending in one of said first planes, a head supported by each head-holder, primary slats having longitudinal dimensions substantially greater than their lateral dimensions, secondary slats interlaced with the primary slats and fixed thereon, each head including means for supporting said primary slats with the longitudinal dimensions thereof



extending along said first principal lines, the support means being pivotable about an axis parallel to the first principal line to allow support of a principal slat in a twisted condition that accommodates the configuration of an adjacent secondary slat thereby allowing the primary and secondary slats to locally conform to said surface, and sheets applied to the secondary slats.

4,695,033

MODULAR PANEL FOR MOLD

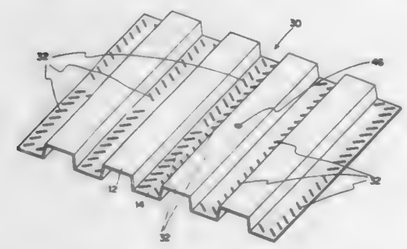
Fumihiro Imaeda, and Yoshio Imaeda, both of Nagoya, Japan, assignors to Shin Nihon Kohan Co., Ltd., Komaki, Japan

Filed Dec. 27, 1985, Ser. No. 814,197

Claims priority, application Japan, Oct. 19, 1985, 60-160651[U]; Oct. 19, 1985, 60-160650[U]

Int. Cl.⁴ E04G *9/10, 11/46*

U.S. Cl. 249—189 **11 Claims**



1. A modular panel for forming a mold, comprising:

a plurality of parallel longitudinal ridges and a plurality of parallel longitudinal troughs which extend in a predetermined direction and alternate with each other, said ridges and troughs being connected by walls forming an angle other than an acute angle with said troughs; and

a plurality of elongate openings formed through at least opposite end portions of a bottom of at least each of said troughs, not in parallel with the direction of the trough, but at an angle other than a right angle thereto, and in such a manner that said elongate openings, when aligned with openings of another modular panel define through passages for nails and enable said modular panels to mount substantially flush with one another,

wherein said elongate openings are disposed in said trough in at least one array wherein those openings of said at least one array located above a transversal centerline of the panel are disposed at angles opposite to those openings located below said centerline.

4,695,034

FLUID CONTROL DEVICE

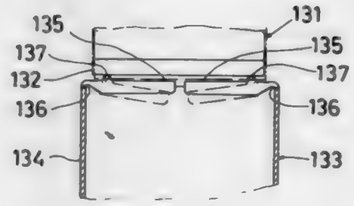
Tetsuo Shimizu; Kiyoharu Tajimura, and Michinori Iwamoto, all of Kyoto, Japan, assignors to STEC Inc., Kyoto, Japan

Filed Nov. 19, 1985, Ser. No. 799,739

Claims priority, application Japan, Nov. 27, 1984, 59-249860; Jul. 9, 1985, 60-152035

Int. Cl.⁴ F16K *31/02*

U.S. Cl. 251—129.06 **19 Claims**



1. A fluid control device, comprising:

a housing having an inlet, an outlet, and a fluid passage connecting said inlet and said outlet; and

valve means disposed in said housing for preventing fluid from passing from said inlet to said outlet, said valve means comprising a valve seat forming part of said fluid passage, a movable valve body having one end which engages said valve seat to prevent fluid from passing from said inlet to said outlet, a piezoelectric stack means disposed on said housing for moving said valve body towards said valve seat in response to electrical energy supplied to said piezoelectric stack means, elastic partition means forming another part of said fluid passage connected between said piezoelectric stack means and the other end of said valve body for providing a fluid tight seal between said passage and said piezoelectric stack means, and driving force transmission member means connected to said piezoelectric stack means for amplifying the amount of movement of said valve body towards said valve seat relative to the amount of movement produced by only said piezoelectric stack means when electrical energy is supplied to said piezoelectric stack means.

4,695,035

JACK FOR INSTALLING A MINE STOPPING

John M. Kennedy, and William R. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Oct. 25, 1985, Ser. No. 791,577

Int. Cl.⁴ B66F *3/24*

U.S. Cl. 254—93 R **17 Claims**

1. A jack for installing in a mine a plurality of elongate extensible panels adapted to extend vertically in side-by-side relation from the floor to the roof of a passageway in a mine, each panel comprising a first elongate member constituting a lower member of the panel adapted for engagement of its lower end with the floor of the passageway, and a second elongate member constituting an upper member of the panel adapted for engagement of its upper end with the roof of the passageway, each of said panel members being a sheet metal member of channel shape in cross section having a web and flanges at opposite sides of the web, each flange having an inturned portion at its outer edge extending generally parallel to the web, one of said members having a telescoping sliding fit in the other with the webs of the members in engagement, the one member constituting the inner member and the other constituting the outer member of the panel, a plurality of the panels being adapted to be installed in a passageway with the

side flanges of the outer members generally in engagement, the upper member of each panel having a head at its upper end, the lower member of each panel having a foot at its lower end, said jack comprising:

a base adapted to fit between the flanges of a lower panel member and engage the foot of said lower panel member;

an extensible member having means at its upper end adapted to fit between the flanges of an upper panel member and engage the head of said upper panel member;

guide means extending up from the base guiding said extensible member for up and down movement relative to said guide means and the base;

a hydraulic jack cylinder extending up from the base coaxially with the guide means having a lift member movable up and down for raising and lowering said extensible member;



a hydraulic pump on the base for pumping hydraulic fluid to said cylinder for moving the lift member and said extensible member upwardly; and

means for operating the pump comprising a handle pivoted on the guide means at a level convenient for an operator and a link from the handle to the pump, said means at the upper end of said extensible member comprising a crosshead contractible in length for insertion of the crosshead between the flanges of said upper panel member to a position below the head of said upper panel member, and extensible to a length greater than the distance between said flanges whereby the crosshead is adapted for engagement with the flanges to maintain the crosshead in said position below the head of the upper panel member.

4,695,036

SCREW BAR FOR A PANTOGRAPH-TYPE JACK

Kazuyoshi Yukimoto, Kariya; Kenichi Fukura, and Nobuhiro Yamauchi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Dec. 27, 1985, Ser. No. 813,975

Claims priority, application Japan, Dec. 27, 1984, 59-279054

Int. Cl.[4] B66F *3/22*

U.S. Cl. 254—126 **3 Claims**

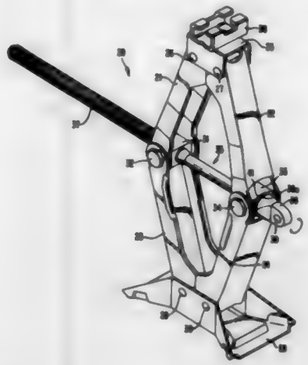
1. A screw bar for connecting a nut member and a bearing member of a pantograph-type jack, comprising:

a cylindrical-shaped bar member having a predetermined diameter, a first end, and a second end;

a joint portion integral with said bar member at said first end and including a flange portion having a preselected outer diameter;

a threaded portion formed on said bar member at said second end, said threaded portion having a maximum outside diameter greater than said predetermined diameter of said bar member, said nut member being threadably engageable with said threaded portion; and

a bearing support portion adjacent said joint portion, said bearing support portion having a desired diameter less



than said preselected outer diameter of said flange portion and greater than or equal to said maximum outside diameter of said threaded portion, said bearing member being pivotally mountable on said bearing support portion.

4,695,037

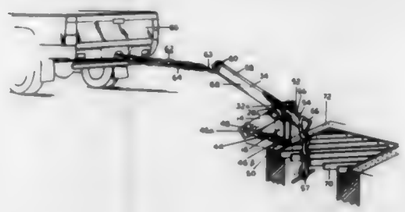
LIFTING APPARATUS

David L. Hadhavny, Box 283, Westmoreland City, Pa. 15692

Filed Mar. 6, 1987, Ser. No. 23,115

Int. Cl.[4] B66F *11/00*

U.S. Cl. 254—131 **6 Claims**



1. A lifting apparatus, said apparatus comprising fulcrum member means including an outer U-shaped support member and an inner U-shaped rim holding and support member, said outer U-shaped support member having first aperture means passing therethrough proximate the ends thereof, said inner U-shaped rim holding and support member having second aperture means passing therethrough proximate ends thereof, a lever having third aperture means passing therethrough at a predetermined pivot point, said fulcrum member means further comprising a bolt member, said bolt member passing through said first aperture means of said outer U-shaped support member, said second aperture means of said inner U-shaped rim holding and support member and said third aperture means of said lever, a nut affixed to said bolt member, a collapsible connector member affixed at one end to the bottom of said outer U-shaped support member and said collapsible connector member affixed at the other end thereof to the bottom portion of said inner U-shaped rim holding and support member, said lever at one end thereof proximate said third aperture means having a groove therein in the upper edge thereof, means for pulling said lever affixed to said lever proximate the other end thereof, grate engaging means engagable with said lever proximate said groove, whereby upon affixing said grate engaging means to a grate and applying force by said means for pulling said lever said grate will lift with little physical effort, upon completion of use of said lifting apparatus it may be folded for easy storage.

4,695,038

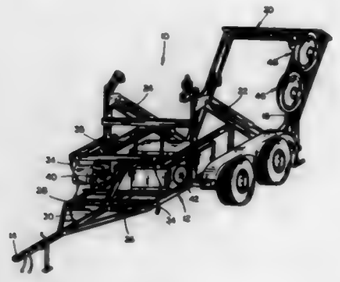
MEANS FOR PULLING FIBER OPTIC CABLE THROUGH A CONDUIT

D. William Giroux, 3 Lakewood Villa, Lake Manawa, Council Bluffs, Iowa 51501

Filed Aug. 22, 1986, Ser. No. 899,321

Int. Cl.[4] E21C *29/16*

U.S. Cl. 254—134.3 FT **6 Claims**



1. A pulling machine, comprising, a frame means, first and second puller pinch wheels rotatably mounted on

said frame means adapted to have a flexible line means extending around, a first hydraulic motor operatively connected to said first

puller pinch wheel for rotating said first puller pinch wheel in a first direction, a second hydraulic motor operatively connected to said

second puller pinch wheel for rotating said second puller pinch wheel in a second direction which is opposite to said first direction, a hydraulic pump means operatively connected to said first

and second hydraulic motors for rotating the same, and a valve means operatively connected to said pump means and said first and second hydraulic motors for selectively supplying hydraulic fluid to said first and second motors in either a series manner or in a parallel manner, said first and second motors being operated, when series connected, at a greater speed but with less pulling power than when said first and second motors are connected in parallel.

4,695,039

BRACKET AND REPAIR METHOD

Kenneth Clossen, 7601 Belmount Ave., Cheyenne, Wyo. 82009

Filed Dec. 2, 1985, Ser. No. 803,139

Int. Cl.[4] H02G *1/00*

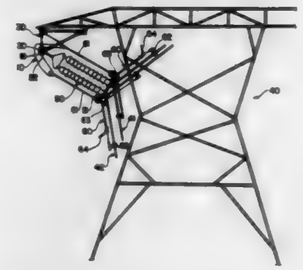
U.S. Cl. 254—134.3 R **6 Claims**

1. A method for temporarily supporting high tension electrical conductor lines which are suspended by means of a suspension system from a gate member on a tower in a manner such that repairs to, or replacement of, said suspension system may be performed, said method comprising the steps of:

(a) providing a C-shaped bracket comprising a generally planar body portion and two elongated arms carried by said body portion, wherein each said arm includes attachment means, wherein said arms are integral with said body portion; wherein each said arm has a length in the range of about 40 to 48 inches; wherein one said arm forms a 90° angle with said body portion; and wherein said bracket is adapted to withstand at least 60,000 pounds of force applied to said arms;

(b) supporting said bracket on said gate member in a manner such that said arms project toward said electrical conductor lines;

(c) connecting one of said electrical conductor lines to each said arm of said bracket by means of tensioning means having first and second ends, wherein said first end of said tensioning means is connected to one arm of said bracket by means of said attachment means, and wherein said



second end of said tensioning means is connected to one of said electrical conductor lines;

(d) pulling said electrical conductor lines toward said bracket by means of said tensioning means sufficiently to enable said suspension system to be disconnected and removed from said electrical conductor lines while said lines are retained and supported by said bracket; whereby said suspension system may be repaired or replaced.

4,695,040

ERECTING RIG FOR A WELL PUMP

Günther Hantschk, Waldkraiburg, Fed. Rep. of Germany, assignor to Netzsch-Mohnopumpen GmbH, Waldkraiburg, Fed. Rep. of Germany

Continuation of Ser. No. 658,709, Oct. 9, 1984, abandoned. This application Jun. 4, 1986, Ser. No. 873,100

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1983, 3337698

Int. Cl.[4] B66D *3/14*

U.S. Cl. 254—264 **9 Claims**



1. An erecting rig for a well pump having a string of several releasably coupled risers comprising

a hollow upright;

a head member and a foot member fixed to top and bottom ends, respectively, of the upright;

a mast supported by said upright;

guide pulley means arranged at an upper end of said mast and having a radius which corresponds substantially to the distance between the axes of said mast and said upright, the distance determined by said head member and said foot member;

a pulling element passing around said pulley means and said pulling element including connected elements extended downward from said pulley means in parallel lines to each other with said pulling element at one end having means for suspension of a riser and at the other end having a connecting means for a lifting device;

said foot member being a ground engaging member;

said mast having its bottom abutted against said foot member.

4,695,041

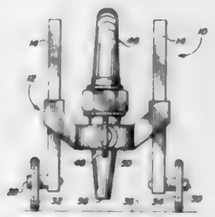
CUTTING TORCH HOLDER

James L. Clites, 10670 LaCienega, #B, Inglewood, Calif. 90304

Filed Nov. 8, 1985, Ser. No. 796,247

Int. Cl.[4] B23K 7/10

U.S. Cl. 266—66 12 Claims



1. An improved cutting torch holder, said holder comprising, in combination:

(a) a frame adapted to releasably receive and retain the nozzle of a cutting torch, said frame including:

(1) a central portion defining a vertically extending passageway adapted to receive said nozzle,

(2) said passageway being configured so as to wedge said nozzle in a predetermined position,

(3) at least one set screw carried by said central portion for securing said nozzle in said predetermined position, said set screw having a portion thereof extending along a horizontal line into said passageway,

(4) said central portion having a plurality of extensions integral with said central portion and radiating therefrom,

(i) each of said extensions having a vertically extending post-receiving opening therein,

(ii) each said opening being dimensioned so as to prevent rotation of a post therein,

(iii) at least one set screw carried by each of said extensions for securing a post within the opening in each said extension, and

(b) height adjustment means secured to said frame, comprising

(1) a plurality of posts for supporting said frame at at predetermined height,

(i) each said post having marker means thereon for effecting an alignment of said frame,

(ii) said marker means including a plurality of horizontal lines extending along the length of each post,

(iii) at least one set screw carried by each of said extensions for securing a post within the opening in each said extension, and

(c) roller means secured to at least one of said posts adjacent the lower end thereof below said frame, whereby said frame can readily be moved along a surface to effect controlled travel of a cutting torch which is carried by said frame and maintained at a predetermined distance above said surface.

4,695,042

LANCE SUPPORTING APPARATUS

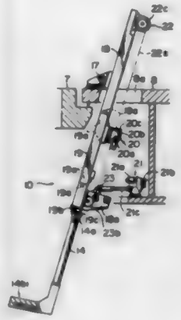
Takenori Kudou, Oita, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 17, 1986, Ser. No. 840,276

Claims priority, application Japan, Apr. 2, 1985, 60-68394

Int. Cl.[4] C21C 5/30

U.S. Cl. 266—226 1 Claim



1. A lance supporting apparatus comprising:

a rotatable doughnut-shaped turntable for supporting a plurality of vacuum degassing vessels;

a circular turntable rotatable within a plane and disposed in an area within the inner diameter portion of said doughnut-shaped turntable; and

a plurality of lance operation units mounted on said circular turntable, each of said lance operation units detachably supporting a lance for inserting a gas and/or powdered treating agent into a molten metal, said lance operation units having mechanisms for lifting, lowering, rotating and tilting said supported lance.

4,695,043

GAS SCAVENGING APPARATUS FOR METALLURGICAL VESSELS

Manfred Winkelmann, Krefeld; Hans Rothfuss, Wiesbaden; Udo Muschner, Krefeld, and Karl H. Schmitt, Meerbusch, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 27, 1986, Ser. No. 923,635

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542781

Int. Cl.[4] C21B 7/16

U.S. Cl. 266—265 15 Claims

1. In a gas scavenging apparatus for use in a metallurgical vessel containing molten metal, said apparatus including a frusto-conical refractory inner scavenging block to be inserted in a refractory lining of the vessel and to have passed therethrough a scavenging gas to be supplied to the molten metal in the vessel, said inner scavenging block having a smaller end surface facing the molten metal and a larger base end directed away from the molten metal, the improvement comprising:

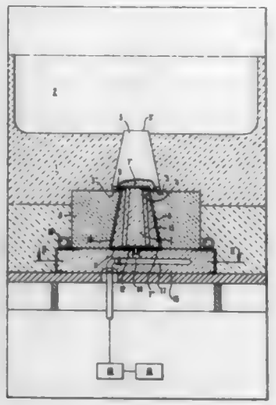
a mounting brick positioned outwardly of said inner scavenging block;

a frusto-conical refractory outer scavenging block extending through said mounting brick, said outer scavenging block having a smaller end surface smaller than and facing said larger base end of said inner scavenging block and a larger base end directed away from said inner scavenging block;

said larger base end of said inner scavenging block having an annular end surface extending outwardly away from said smaller end surface of said outer scavenging block and resting on said mounting brick; and

said inner scavenging block being formed of a refractory material porous to the scavenging gas, and said outer scavenging block having extending therethrough capillary passages;

whereby scavenging gas may be passed through said outer scavenging block and then through said inner scavenging block to be supplied to the molten metal.



4,695,044

APPARATUS FOR SECURING A PHOTOSENSITIVE SHEET

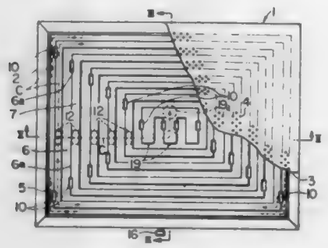
Takamichi Nishihama; Kotaro Okada, and Shigekazu Kadota, all of Shiga, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 25, 1986, Ser. No. 856,936

Claims priority, application Japan, May 10, 1985, 60-99976

Int. Cl.[4] B25B 11/00

U.S. Cl. 269—21 3 Claims



1. An apparatus for securing a sheet material under suction, the apparatus comprising: a face plate including a number of suction pores adapted to allow air to pass through, a base plate including outlet ports, corrugated plate interlocated between the face plate and the base plate, the corrugated plate including hill portions and valley portions alternately produced, each hill portion and valley portion taking the form of rectangles produced concentrically of the base plate, the corrugated plate further including inlet grooves between one hill portion and another, and outlet grooves between one valley portion and another, each outlet groove including one outlet port in the base plate, the inlet grooves and a outlet grooves being communicated with each other through a communication port produced in the partition wherein the port is located at a point distant from the outlet ports; and means for communicating the outlet grooves with a power suction means.

4,695,045

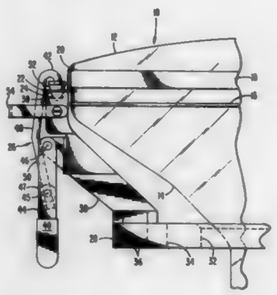
APPARATUS FOR SECURING A CATHODE-RAY TUBE DURING PROCESSING

Thomas L. Chase, and Kenneth A. Long, both of Lancaster, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 28, 1986, Ser. No. 889,625

Int. Cl.[4] B25B 1/14

U.S. Cl. 269—152 6 Claims



1. An apparatus for securing a cathode-ray tube during processing utilizing mounting lugs attached to said tube, each of said lugs having an end projecting away from said tube and containing an aperture, comprising:

a platform having a plurality of legs positioned to support, respectively, the ends of said moutning lugs, each of said legs having a receess therein aligned with the aperture in said respective end, and

means pivotally attached to each of said legs for clamping said respective lug to said leg by projecting an end portion of said clamping means through said aperture into the respective recess when pivoted, each of said clamping means comprising a handle rotatably attached to the respective leg for pivoting about a fixed axis, and also a J-shaped clamp having a substantially straight portion rotatably attached to said handle about a movable axis and a curved end portion rigidly fixed to said straight portion and positioned to project through said respective aperture, each of said straight portions being attached to said respective handle in a manner that allows each straight portion to move laterally along and rotate feely about said movable axis, whereby said curved portions securely hold said lugs to said respective legs when said handles are pivoted away from said lugs.

4,695,046

SPECIMEN HOLDER CLAMP FOR A MICROTOME

Manfred Berleth, Eppelheim, Fed. Rep. of Germany, assignor to Cambridge Instruments GmbH, Heidelberger, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 634,928

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327619

Int. Cl.[4] B25B 1/02

U.S. Cl. 269—210 7 Claims

1. A specimen holder clamp for rotary microtome, comprising

a guide member,

a fixed jaw mounted on said guide member,

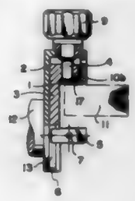
a first engagement element coacting with said guide member to permit sliding movement of said first engagement element relative to and along the length of said guide member wherein the relative movement of said first engage-

ment element is guided by said guide member along a first path, said first engagement element defining a fine-pitch threaded bore extending along a second path oriented generally parallel to said first path,

a rotatable spindle operatively joined to said guide member and coacting with said fine-pitch threaded bore in said first engagement element so that rotation of said spindle relative to said guide member moves said first engagement element relative to said guide member along said first path,

a movable jaw slidably carried by said first engagement element and positioned in general alignment with said fixed jaw so that movement of said movable jaw relative to said guide member moves said movable jaw toward and away from said fixed jaw,

a second engagement element interposed between said mov-



able jaw and said first engagement element and defining with said first engagement element complementary engagement surfaces which when in operative engagement with one another fixedly secures said movable jaw to said first engagement element for movement therewith, and

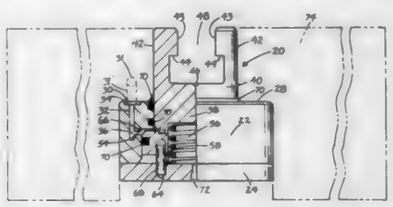
disengagement means carried by said movable jaw and cooperating with said second engagement element for disengaging said complementary engagement surfaces from one another to permit said movable jaw to be manually moved relative to said first engagement element toward and away from said fixed jaw and thereby permit coarse manual adjustment of said movable jaw and rotation of said rotatable spindle relative to said guide member moves said first engagement element, cooperatively, with said second engagement element to provide fine adjustment of said movable jaw when said first and second engagement elements are engaged.

4,695,047

T-SLOT HYDRAULIC CLAMP SYSTEM

Winfried Ehrhardt; Klaus Richter, and Adolf Lehr, all of Laubach, Fed. Rep. of Germany, assignors to Carr Lane Roemheld Manufacturing Co., Inc., St. Louis, Mo.

Filed Oct. 14, 1986, Ser. No. 918,573
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—309 **5 Claims**



1. For installation within a bore and counterbore in and through the T-slot of a conventional machine tool bed or bolster plate,

a fluid-pressure actuated clamp including

a cylinder whose diameter is adapted to fit within such counterbore, the cylinder having an annular outer end surface adapted to fit at the juncture of such bore and counterbore,

there being means adjacent to said end surface to provide for inflow of fluid under pressure, and

a piston rod whose diameter fits slidingly within such bore, and whose length is such as on installation to project into such T-slot and to the level of such bed or bolster plate,

said piston rod having an integral outward end divided by a central T-slot leaving arcuate faces outwardly of said slot, said slot including parallel slide surfaces terminating in opposite undercut faces, said surfaces and faces being sized for alignment with corresponding surfaces and faces of such T-slot,

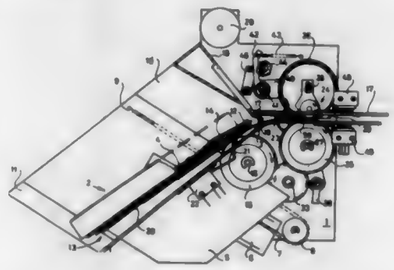
whereby on installation within such T-slotted bed or boltster plate, the said arcuate faces of the piston rod will be supported by such bore to resist forces applied sidewardly.

4,695,048

APPARATUS FOR SEPARATING DOCUMENTS

Horst Görner, St. Georgen; Walter Furstwängler, and Walter Usbeck, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Fed. Rep. of Germany

Filed Jan. 30, 1986, Ser. No. 824,153
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1985, 3503168
Int. Cl.[4] B65H *3/52*
U.S. Cl. 271—122 **6 Claims**



1. An apparatus for separating documents, comprising storage means for a stack of documents, spaced apart first and second rollers having circumferential surfaces and parallel axes, said rollers defining a gap therebetween, said second roller mounted on an axle, means for feeding the documents from said storage means into said gap, said first roller driven to rotate so as to convey the documents through said gap, said second roller driven so that said surfaces of said rollers at said gap move in opposite directions, said second roller holding back any document placed on the document conveyed by said first roller, said second roller mounted pivotable about a pivot axis, wherein the width of said gap is adjustable in accordance with the thickness of the document conveyed through said gap, a guide roller immediately downstream of said gap, and a support member for connecting said guide roller to said axle of said second roller, said guide roller mounted to project slightly beyond the periphery of said second roller so as to make contact with a document conveyed through said gap and to slightly widen said gap during the conveyance of a document through said gap.

4,695,049

EXERCISE DEVICE

Jan A. Cieniega, 1817 Beloit St., Apt. 10, Los Angeles, Calif. 90065

Filed Sep. 11, 1986, Ser. No. 906,142
Int. Cl.[4] A63B *5/00*
U.S. Cl. 272—67 **20 Claims**



1. An exercise device comprising:

first and second handles sized and shaped for manual grasp;

a threaded rod secured to said first handle;

first and second nuts threadedly engaged with said threaded rod and rotatably secured to said second handle; and

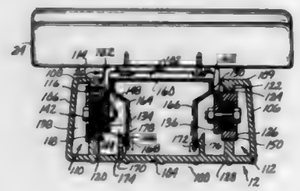
a spring engaged with both said first and second nuts so as to produce force on said first and second nuts in a direction along said threaded rod in order to produce rotative friction on said nut with respect to said threaded rod so that when said handles are manually grasped and rotated with respect to each other, said nuts rotate on said threaded rod and the friction therebetween provides resistance to relative rotation of said first and second handles.

4,695,050

EXERCISE ROWING MACHINE

David B. Smith, Mercer Island, and Randolph F. Miller, Mt. Vernon, both of Wash., assignors to Precor Incorporated, Redmond, Wash.

Filed Sep. 16, 1985, Ser. No. 776,400
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 **18 Claims**



1. An exercise apparatus, comprising:

a frame including an elongaged, generally tubular beam assembly, comprising:

(a) a first component having a bottom portion forming the bottom exterior of the beam assembly, side portions forming the exterior sides of the beam assembly and top portions extending laterally inwardly from the side portions to form exterior top flanges of the beam assembly and to define a gap therebetween extending longitudinally of the beam assembly;

(b) a second component cooperatively engageable and disengageable with the first component of the beam assembly, said second component being generally U-shaped in cross section and defined by:

(i) a top wall extending between the top portions of the first component of the beam assembly to, in conjunction with the top portion of the first component, substantially close off the top section of the beam assembly and define elongated entrance openings in the form of a pair of narrow slots disposed in spaced parallel relationship to each other and extending along the length of the beam assembly; and,

(ii) laterally spaced apart side walls extending downwardly from the lateral edge portions of the top wall; and,

(c) means for detachably engaging the lower portions of the side walls of the second component of the beam assembly to the bottom portion of the first component whereby the second component of the beam assembly and the bottom portion of the first component cooperatively form a closed, hollow structure extending longitudinally of the beam assembly;

internal track means disposed within the interior of the beam assembly, said internal track means including a pair of guide rails disposed outwardly and on opposite sides of the second component of the beam assembly and positioned in spaced parallel relationship to each other;

a seat; and,

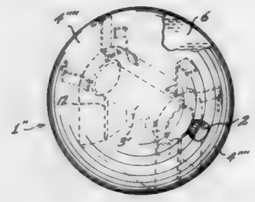
a carriage assembly having an underframe for supporting the seat, said underframe extending downwardly through said beam assembly entrance openings and into the interior of said beam assembly, and a plurality of roller means rotatably secured to said underframe and engageable with said guide rails for guiding the carriage assembly for travel along the length of the beam assembly.

4,695,051

COLLAPSIBLE DUMBBELLS

Robert E. Jenison, Rte. 1, Box 2149, Lopez, Wash. 98261

Continuation-in-part of Ser. No. 639,265, Aug. 9, 1984, abandoned. This application Jul. 3, 1985, Ser. No. 751,751
Int. Cl.[4] A63B *11/00*
U.S. Cl. 272—122 **5 Claims**



1. In combination, a hollow, flexible, collapsible, fillable hand held exercise device having two enlarged chambers at opposite ends of a centrally located axially balanced handle portion and a hollow, flexible, collapsible, fillable horseshoe cross section, elongated lengthwise of said handle portion, forming an internal passage communicating with both of said enlarged chambers and encircling at least 180 degrees of said handle portion leaving space for a hand between the inner wall of said horseshoe cross section and said handle portion.

4,695,052

HOT WATER HEATING SYSTEM USING A HEAT CONSUMPTION METER

Hendrikus Berkhof, Emmen, Netherlands, assignor to Honeywell B.V., Amsterdam, Netherlands

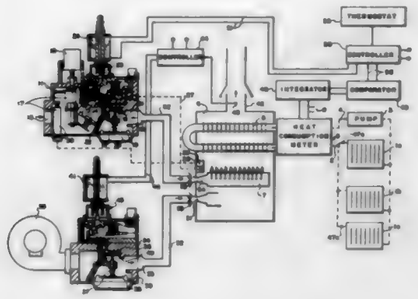
Filed Nov. 10, 1986, Ser. No. 928,944
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1985, 3544411
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—8 R **5 Claims**

1. A hot water heating system comprising

a heat consumption meter for providing an electrical output signal proportional to the amount of heat being supplied to the heating system and

a controller means which controls the heating power of a heat generator, said output signal being supplied as an input signal to said controller, wherein said controller means includes an integrator having a timer and being connected to receive the output of said heat consumption meter, said integrator measuring the amount of heat consumed during a predetermined period of time and storing a corresponding signal and

a comparator connected to said integrator, with said comparator comparing the measured amount of currently supplied heat with an amount of heat measured during a



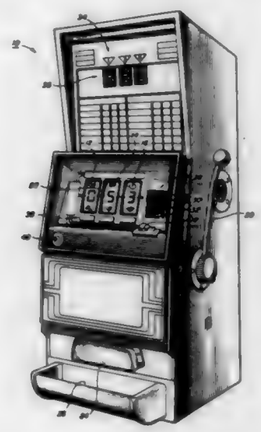
preceding period of time of equal length and from this comparison deriving a control signal for controlling the heating power of the heat generator.

4,695,053

GAMING DEVICE HAVING PLAYER SELECTABLE WINNING COMBINATIONS

Hilario Vazquez, Jr., and Paul R. Yarnold, both of Chicago, Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Mar. 7, 1986, Ser. No. 837,422
Int. Cl.[4] A63B *71/04*
U.S. Cl. 273—143 R **10 Claims**



1. In a gaming device of the type having means for generating a random combination of symbols, means defining a plurality of winning combinations of symbols and means resonsive to said random combination generating means and to said winning combination defining means for providing an indication of a win whenever the generated random combination corresponds to one of said winning combinations, the improvement comprising:

player operated means for generating a player selected winning combination;

means responsive to said player selected combination for providing an indication of a win whenever the generated random combination corresponds to said player selected winning combination; and

wherein said random combination generating means includes a plurality of rotatable reels, each reel having disposed thereon a plurality of first symbols corresponding to symbols defining said winning combination and second symbols corresponding to symbols defining said player selected said winning combinations and said second symbols being different from said first symbols.

4,695,054

GOLF CLUB

Timothy F. Tunstall, P.O. Box 434, Springfield, Mass. 01101

Filed Mar. 10, 1986, Ser. No. 837,956
Claims priority, application Ireland, Mar. 13, 1985, 643/85
Int. Cl.[4] A63B *53/06*
U.S. Cl. 273—171 **1 Claim**



1. In a golf club consisting of a shaft and a head interconnected by a hosel, the improvement in means for modifying the club to a preferred weight level comprising:

the head consisting of a cover and a contact plate and a base,

the contact plate having a front striking face and being vertically-extending and securable to the cover for defining cooperantly therewith a closed upwardly-projecting recess from the sole of the cover,

the base having a forward toe and a rearward heel relative to the longitudinal axis of the head and being nestably receivable within the recess,

an extension of the longitudinal axis of the shaft passing through the base between the toe and heel,

the base having spaced vertically-extending downwardly-projecting closed recesses in the respective toe and heel,

a screw in locked interengagement with and vertically extendable through and rotatable relative to the base between the recesses and threadedly engageable with the cover for releasably interengaging the cover and base,

a barrel and a plurality of weight discs being selectively receivable in each of the recesses for weighting the respective toe and heel,

each barrel being selectively receivable in its recess with the respective weight discs disposed upwardly thereof for the weighting of the upper region of the base or with the respective weight discs disposed downwardly thereof for the weighting of the lower region of the base,

a compressible member being receivable in each respective barrel and disposable over the respective weight discs and barrel in maintaining the respective weight discs and barrel in tight relationship as to the base,

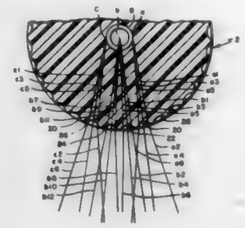
the front striking face of the contact plate forwardly of the screw defining a preferred point of initial contact of the plate with a ball.

4,695,055

ILLUMINATED TRANSLUCENT GOLF BALL

Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of Mirror Lake, N.H. 03853

Continuation-in-part of Ser. No. 794,668, Nov. 4, 1985, abandoned. This application Jan. 6, 1986, Ser. No. 816,236
Int. Cl.[4] A63B *43/06*
U.S. Cl. 273—213 **7 Claims**



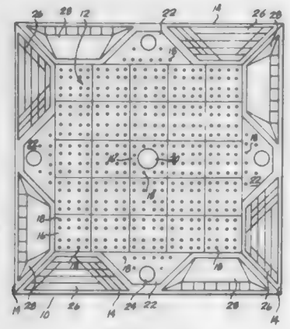
1. A solid golf ball comprising a body in the shape of a sphere and made of a translucent plastic material, the outer surface of said sphere including closely spaced apart dimples, said ball being provided with a permanent diametrical hole extending therethrough for receiving and retaining a cylindrical chemiluminescent light stick having a diameter corresponding generally to the diameter of said diametrical hold so that the visibility of said ball in the dark will be enhanced when an activated chemiluminescent light stick as aforesaid is retained therein and the light from said stick is further enhanced by the diffused light passing through said dimples.

4,695,056

VARIABLE SURFACE BOARD GAME

Donald P. Cornelson, Seattle, and Jess W. Carlson, Everett, both of Wash., assignors to C & C Concepts, Inc., Seattle, Wash.

Filed Sep. 23, 1985, Ser. No. 779,165
Int. Cl.[4] A63F *3/02, 3/00*
U.S. Cl. 273—262 **26 Claims**



1. A multiple player competing board game, comprising:

a playing board having a central portion comprising a pattern of areas, each said area including a plurality of position marks, and player start positions on each side of the board bordering said central portion; said player start positions constituting entries into the central portion;

a plurality of property identifying markers that randomly cover a plurality of position marks;

a plurality of obstacle identifying markers that randomly cover a plurality of position marks;

at least one position marker for each player; and

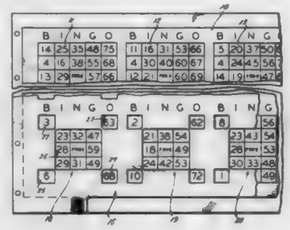
a plurality of playing surface determining cards, each having a front side and a back side, with a first group of said cards having property identifying indicia on their front sides, with a second group of said cards having obstacle identifying indicia on their front sides, and with a third group of said cards having other identifying indicia on their front sides, whereby the cards can be shuffled or otherwise mixed with their face sides concealed, and then dealt face down on the areas of the central portion of the playing board, and then turned over, and each card of the first group of cards can be replaced with a property marker corresponding to property identified on the card, and each card of the second group of cards can be replaced by an obstacle marker corresponding to an obstacle on the card, and wherein the third group of cards are merely removed from the board, so as to expose for use in the play of the game the position marks on the areas from which such cards are removed.

4,695,057

BINGO GAME MARKING TEMPLATE

Carol A. McCullen, 459 San Juan, St. Charles, Mo. 63303

Filed May 22, 1985, Ser. No. 736,269
Int. Cl.[4] A63F *3/06*
U.S. Cl. 273—269 **5 Claims**



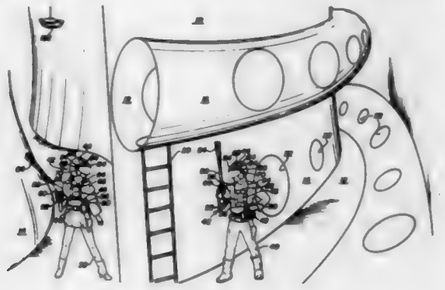
1. In combination a bingo sheet having a rectangular block of numbers thereon, each number in the block being disposed in a rectangular space defined by horizontal and vertical limits, a template for use by a player in playing bingo games, the template being adapted to overlie the rectangular block of numbers on the bingo sheet, the template being readily removable from the sheet, the template being larger than the size of the rectangular block of numbers so as to provide marginal portions outside of the block of numbers, and having, within the rectangular area corresponding in size to the size of the rectangular block of numbers, openings cut out to expose only the numbers on the bingo sheet that are required to be used in the game being played, and having uncut portions that are at least somewhat opaque to obscure the numbers that are not being played in that particular game, the openings in the template having horizontal and vertical edges corresponding to the edges of the numbers of the blocks' horizontal and vertical openings, the openings being of sufficient size to admit indicating means to be placed on the bingo sheet by the player, the template being separate from and readily removable from the sheet to leave the indicating means visible on the sheet, an edge of each opening being connected with the margin of the template so that the template can remain integral.

4,695,058

SIMULATED SHOOTING GAME WITH CONTINUOUS TRANSMISSION OF TARGET IDENTIFICATION SIGNALS

George A. Carter, III, Dallas, and James L. Dooley, Arlington, both of Tex., assignors to Photon Marketing Limited, Dallas, Tex.

Continuation of Ser. No. 575,332, Jan. 31, 1984, abandoned. This application Jan. 28, 1986, Ser. No. 822,966
Int. Cl.[4] F41J 5/00
U.S. Cl. 273—311 31 Claims



1. An amusement shooting game for play by a plurality of players, wherein players shoot at each other while being shot at on a battlefield comprising:

means carried by each player for generating and transmitting continuously in a wide-angle beam directed outwardly from each player a coded signal unique to each player;

means carried by each player for receiving said transmitted coded signal being transmitted by all of the players, said means for receiving having a reception angle substantially smaller than said wide-angle beam;

means responsive to said receiving means for detecting a transmitted coded signal; and

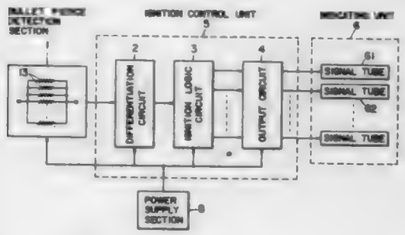
means for counting the number of detected coded signals to provide a score for each player representing the number of players he has shot.

4,695,059

HIT INDICATING SYSTEM IN TOWED TARGET FOR AERIAL FIRING PRACTICE

Masatoshi Yamashita, and Norio Tsunoda, both of Utsunomiya, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,125
Int. Cl.[4] F41J 5/04, 9/10
U.S. Cl. 273—360 1 Claim



1. In a target for firing practice to be towed by an aircraft or the like, a hit indicating system comprising:

a bullet pierce detection section installed over parts of the target where bullets are expected to hit and comprising a plurality of parallel connected resistance circuits respectively constituting bullet pierce detecting elements breakable by a piercing bullet;

a differentiation circuit responsive to variations in the combined resistance value of the bullet pierce detection section for generating pulse signals;

an indicating unit comprising a plurality of indicating elements;

a logic circuit for generating outputs for causing said indicating elements to operate sequentially on the basis of the pulse signals of the differentiation circuit;

an electric power source for supplying electric power to the bullet pierce detection section, the differentiation circuit and the logic circuit;

the bullet pierce detection section, the differentiation circuit, the indicating unit, the logic circuit and the power source being installed on board the target;

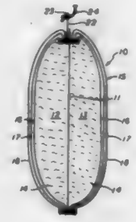
said bullet pierce detection section includes two bus conductors connecting opposite ends respectively of said resistance circuits in parallel, said bus conductors have opposite ends forming two pairs of terminals connected to said differentiation circuit, whereby bullet pierce detection of the system is unaffected by a single break at one part of the bus conductors, respectively, and bullet pierce detection of the system is affected by a double break at two parts of the bus conductors, respectively, only by failure of the resistance circuits between the double break.

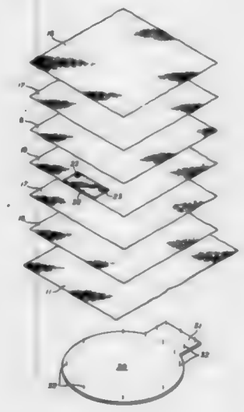
4,695,060

REVERSIBLE ARCHERY TARGET

J. Cole Pilgrim, 3706 Clear Falls Dr., Kingwood, Tex. 77339

Filed May 2, 1986, Ser. No. 858,956
Int. Cl.[4] F41J 3/00
U.S. Cl. 273—404 21 Claims





1. An archery target comprising

a first layer of burlap,

a second layer of woven polypropelyne,

a third layer of woven polypropelyne,

a fourth layer of woven polypropelyne which is a centrally disposed divider,

a fifth layer of woven polypropelyne,

a sixth layer of woven polypropelyne,

a seventh layer of burlap,

said third and fifth layers forming adjacent compartments at each side of said fourth layer, and

a mass of fibrous material disposed in said compartments between said third and fourth layer and said fourth and fifth layer,

said layers being stitched together about the margins thereof.

19. A method of manufacturing an archery target comprising the steps of;

providing an assembly jig having a generally round flat configuaration with a rectangular neck portion extending outwardly on one end and a plurality of thin rodlike pointed projections spaced about the periphery of the jig with the points facing upwardly to removably receive and maintain layers of material in a predetermined position on the jig,

precutting a plurality of sheets of material to a size slightly larger than the periphery of the jig,

precutting a sheet of material to a rectangular shape and installing grommets in two opposed corners thereof,

placing a first sheet of material on said jig in the approximate center with the outer edges extending beyond the periphery of the jig and said neck portion and pressing it down on the projections,

placing a second and third sheet of material on said jig in the approximate center overlaying said first sheet with the outer edges extending beyond the diametric periphery of the jig excluding said neck portion and pressing them down on the projections,

placing a fourth sheet of material on said jig in the approximate center overlaying said third sheet with the outer edges extending beyond the diametric periphery of the jig excluding said neck portion and pressing it down on the projections,

placing the rectangular sheet of material in a position diametrically opposed to the neck portion of said jig overlaying said second, third, and fourth sheets with the grommeted edge inward and the opposed edge extending beyond the periphery of the jig,

placing a fifth sheet of material on said jig in the approximate center overlaying said fourth sheet and the inward edge of the rectangular sheet with the outer edges extending beyond the diametric periphery of the jig excluding said neck portion and pressing it down on the projections,

placing a sixth and seventh sheet of material on said jig in the approximate center overlaying said fourth sheet with the outer edges extending beyond the diametric periphery of the jig excluding said neck portion and pressing them down on the projections,

cutting the edges of the overlayed sheets extending beyond the periphery of said jig,

sewing the overlayed sheets together just inside the outer periphery excluding said neck portion to form a generally bag-like enclosure with an open neck for receiving a filler material,

removing the bag-like enclosure from the jig by lifting it from the projections and turning the bag-like enclosure inside out, and thereafter said first sheet becoming a central divider sheet extending partially outwardly from the open neck and dividing the bag-like enclosure into two compartments on each side thereof,

stuffing a predetermined volume of filler material into each compartment of the bag-like enclosure,

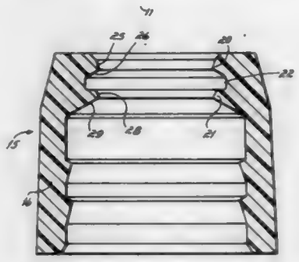
compressing the stuffed bag-like enclosure to a predetermined thickness and while under compression sewing the layers of material at the open neck together to securely close the opening and completely enclose the filler material within the bag-like enclosure.

4,695,061

VALVE STEM SEAL

Edward O. Meisner, Elkhart, Ind., and Charles F. Romine, Madison, Conn., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Aug. 29, 1985, Ser. No. 770,782
Int. Cl.[4] F01L 3/08; F16J 15/32
U.S. Cl. 277—27 3 Claims



1. For a valve stem having an oil side and a valve guide side, a valve stem seal between said oil and said guide, said seal comprising:

an elastomeric sleeve surrounding said stem and guide, said sleeve having a lower portion surrounding said guide in sealing relation thereto,

said sleeve having on the internal surface thereof at least one land tightly engaging the surface of said stem,

said land having a first frustoconical surface on the oil side thereof,

said land having a second frustoconical surface on the guide side thereof,

the angle between said second frustoconical surface and said valve stem being greater than the angle of said first frustoconical surface and said valve stem, whereby the sum of the oil flows caused by reciprocation of the valve stem results in an overall oil flow toward said guide due to said angle between said first frustoconical surface and said valve stem creating a greater hydrodynamic lift-off during the stroke of said valve stem toward said guide than the hydrodynamic lift-off created by said angle between said second frustoconical surface and said valve stem during the stroke of said valve stem away from said guide.

4,695,062

PRESSURE RELIEVING SEALING RINGS FOR ROTATING ELEMENTS

Peter Dreschmann, Dittelbrunn, and Wilhelm Walter, Reith, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 890,002
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528961
Int. Cl.[4] F16J 15/32, 15/48
U.S. Cl. 277—27 13 Claims

1. Means defining a space having first and second sealing rings at opposite sides thereof;

said means including first and second sections mounted for relative rotation therebetween, with one of said sections being disposed inside the other of said sections;

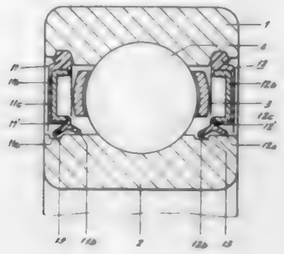
each of said sealing rings being secured to said first section and having annular resilient lip means including a sealing lip biased to engage seat means on said second section;

said sealing lips and said seat means being disposed so that in the even pressures within and without said space are unequal, at a given time the sealing lip of only one of said

sealing rings separates from said seat means to equalize pressures within and without said space;

each of said sealing rings having an interior side facing said space and being subjected to pressure existing within said space;

each of said sealing rings having an exterior side facing away from said space, with both of said exterior sides being subjected to pressures that are equal;



for each of said sealing rings, said resilient lip means at its free end being bifurcated to form first and second lips;

for each of said sealing rings, one of said first and second lips constituting said sealing lip, and the other of said first and said second lips constituting a non-sealing lip that is disposed free of engagement with said first and second sections.

4,695,063

RADIAL SHAFT SEAL RING WITH BACKFEED RIBS AND DAMMING RIBS

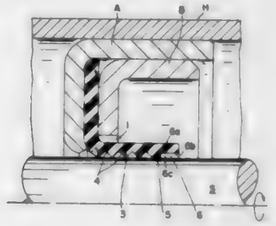
Wolfgang Schmitt, Viernheim, and Hans Forch, Birkenau, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 796,003

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440797

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—134 **6 Claims**



1. A radial shaft seal ring comprising an annular sealing lip of a polymeric material which by a peripheral sealing strip bears resiliently on the shaft, hydrodynamically acting backfeed ribs on the side of the sealing strip remote from the pressure, an internally cylindrical annular projection on the side facing the sealed medium, and a radial clearance between the interior of the annular projection and the shaft, the annular projection being united with the sealing strip in a bending-resistant manner, and damming ribs which have leading surfaces for the sealed medium and are uniformly distributed over the periphery protruding from the interior of the annular projection, characterized in that the leading surfaces, viewed at right angles to the axis of rotation of the shaft, make an acute angle with the shaft surface and extend parallel thereto.

4,695,064

PISTON RING ASSEMBLY AND EXPANDER

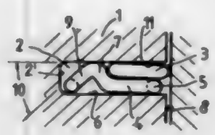
Bert Braners, and Martin Morsbach, both of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,171

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3530175

Int. Cl.⁴ F16J *9/06*

U.S. Cl. 277—139 **4 Claims**



1. A piston-and-ring assembly including a generally cylindrical piston having an axis and a circumferential groove having a bottom and two radial flanks forming opposite sides of the groove; an expander spring ring accommodated in said groove and including a plurality of generally radially extending tongues arranged in a circumferential series; each tongue having a radially inward end and a leg portion extending at an angle other than zero from a respective said tongue to one of said flanks; each said leg portion continuing in an extension provided with a free terminus; two oil scraper annular laminae situated in said groove and being supported axially by said tongues and being abutted radially by said leg portions, the improvement wherein said extension of each said leg portion is oriented thereto at an inclination; each said extension being oriented toward the other of said flanks and being of a length such that said free terminus reaches substantially to the other of said flanks.

4,695,065

KEYLESS CHUCK FOR ROTARY TOOL

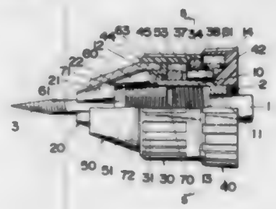
Teruaki Komatsu, Hikone; Kiyoshi Kobayashi, Nagahama; Kunihiko Tatsu, and Shoichi Shibata, both of Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Dec. 24, 1986, Ser. No. 946,067

Claims priority, application Japan, Jan. 21, 1986, 61-10834

Int. Cl.⁴ B23B *31/12*

U.S. Cl. 279—60 **9 Claims**



1. A chuck for a rotary tool comprising:

a chuck body having a longitudinal axis and adapted to be connected to a drive spindle of a drive source for being driven to rotate about the axis;

a set of gripping jaws drivingly connected to said chuck body and releasably holding a tool bit to be driven to rotate by said chuck body;

a handle ring rotatably disposed on the chuck body and operatively connected to said gripping jaws; said handle ring being relatively rotatable with respect to the chuck body for displacing the gripping jaws into tool-gripping relation with the tool bit when it is rotated relative to the chuck body in one direction and displacing the gripping jaws out of tool-gripping relation with the tool bit when rotated in the opposite direction relative to the chuck body, the rotating direction of the handle ring for displacing the gripping jaws into tool-gripping relation with the tool bit being corresponding to the reverse rotating direction of the chuck body for removing the tool bit from a workpiece;

clutch means for rotatively fixing the handle ring to the chuck body when the chuck body is driven to rotate in the reverse direction of removing the tool bit from the workpiece such that the handle ring is forced to rotate together with the chuck body in the direction of displacing the gripping jaws into tool-gripping relation with the tool bit;

control means acting on said clutch means to functionally move the same between an active position where said clutch means is capable of rotatively fixing the handle ring to the chuck body and an inactive position where said clutch means is deactivated to release the handle ring from the chuck body for permitting the handle ring to be freely rotatable in relation to the chuck body.

4,695,066

CHIP-SHEDDING HAMMER-DRILL CHUCK

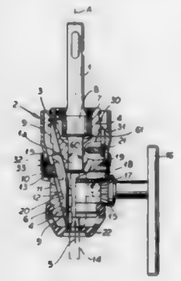
Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,891

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 8436751

Int. Cl.⁴ B23B *31/04*

U.S. Cl. 279—62 **4 Claims**



1. A chuck comprising:

a chuck body having an outer circumferential surface and formed with

a forwardly open hole defining an axis and normally receiving a drill bit projecting axially forward from the body,

a plurality of angularly generally equispaced guide bores extending at an acute angle to the axis and having inner front ends opening in the hole at the front portion thereof and outer rear ends opening on the outer surface, and

respective chip-shedding passages opening radially inward into the guide bores between the inner and outer ends thereof and radially outward on the outer surface;

respective jaws displaceable in the bores and having front ends engageable with a bit in the hole and radially outwardly directed teeth; and

an adjustment ring engaged around the body and fitting with the teeth of the jaws, whereby rotation of the ring in one direction advances the jaws in the body and rotation in the opposite direction retracts the jaws for respectively clamping and unclamping the drill bit in the front portion.

4,695,067

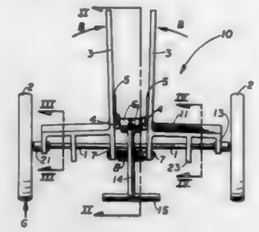
WHEELED ARTICLE CARRIER

Robert P. Willey, 8835 Phoenix Ave., Fair Oaks, Calif. 95628

Filed Apr. 3, 1986, Ser. No. 847,912

Int. Cl.⁴ B62B *1/14*

U.S. Cl. 280—47.22 **25 Claims**



17. An article carrier, comprising in combination:

an axle having wheels at extremities thereof,

frame means bearing on said axle adjacent said wheels,

said frame means including a clamp means held by a spring below said axle,

clearance slots on said clamp means through which said axle passes, and said clamp means includes a connecting member above the axle about which said clamp means pivots for grasping the article.

4,695,068

FRONT AND REAR WHEEL STEERING DEVICE

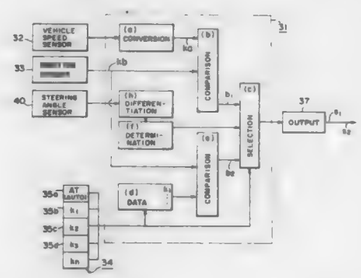
Yoshimichi Kawamoto; Yoshimi Furukawa; Tetsuro Hamada, and Mitsuya Serizawa, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,000

Claims priority, application Japan, Jan. 24, 1985, 60-011821; Jan. 24, 1985, 60-011822; Jan. 24, 1985, 60-011823; Jan. 24, 1985, 60-011824; Jan. 24, 1985, 60-011825; Jan. 24, 1985, 60-011826

Int. Cl.⁴ B62D *6/00*

U.S. Cl. 280—91 **13 Claims**



1. A front and rear wheel steering device control for a vehicle for variably controlling the steering angle rtio of rear wheels relative to front wheels according to certain conditions, comprising:

storage means for storing data of at least one fixed rear wheel steering ratio and a variable rear wheel steering angle ratio whch is a function of vehicle speed;

actuator means for achieving a rear wheel steering angle ratio selected from the data stored in the storage means;

manual switching means which selects the fixed rear wheel steering angle ratio when activated and selects the variable rear wheel steering angle ratio when deactivated; and

a limiting means for deactivating the action of the manual

switching means when the change rate of vehicle speed is greater than a certain value.

4,695,069

STEERING SYSTEM FOR REAR WHEELS

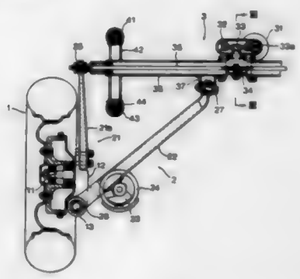
Ryogo Kurokawa; Fusami Oyama, both of Gunma, and Akira Takahashi, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,350

Claims priority, application Japan, Mar. 22, 1985, 60-58101; Mar. 22, 1985, 60-58102

Int. Cl.⁴ B62D *5/10, 7/00*

U.S. Cl. 280—91 **19 Claims**



1. A steering system for a motor vehicle having a body comprising:
- a cross-member attached to the body of the motor vehicle in the transverse direction;
- a movable member slidably disposed on the cross-member so as to be moved in the transverse direction;
- an outer control arm rotatably connected at one end thereof on an end of the movable member so as to swing in a vertical plane;
- a shaft secured to the outer control arm;
- a rear wheel of the vehicle rotatably mounted on said shaft;
- an inner control arm rotatably supported at an end thereof on the cross-member so as to swing in a vertical plane;
- a kingpin rotatably connecting other ends of both said control arms with each other so that said outer control arm is swingable in a horizontal plane;
- suspension means engaged with the inner control arm for elastically suspending the body of the motor vehicle; and
- means for moving the movable member so that the outer control arm turns about the kingpin for turning the rear wheel.

4,695,070

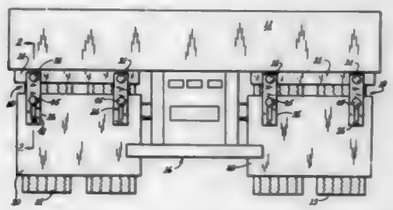
SAFETY HANGER FOR MUD FLAPS

Ronald A. Knox, 13262 Edinburgh Dr., Westminster, Calif. 92683

Filed Jun. 2, 1986, Ser. No. 869,235

Int. Cl.⁴ B62D *25/18*

U.S. Cl. 280—154.5 R **5 Claims**



1. In combination with a road vehicle which travels on wheels;
- a. at least two non-stretchable bars, each having a first end for securing to and depending from said vehicle in generally parallel relation at a position rearwardly of at least one of said wheels relative to the normal direction of travel of said vehicle;
- b. each of said non-stretchable bars having an elongated slot formed therein;
- c. at least two stretchable bars, each having first and second ends, with means on said first ends for securing to said vehicle in proximate relation to said first ends of said non-stretchable bars, each of said stretchable bars having a hole formed in the second end thereof;
- d. a mud flap having at least two holes disposed adjacent an upper edge thereof;
- e. a pin disposed and through said slot, one of said holes on said mud flap and said hole on said stretchable bar so that said pin is capable of sliding along said slot, said mud flap being supported by said stretchable bars in the normal position with each of said pins adjacent the upper end of its respective slot, said mud flap further being guided by said pins within said slots upon downward force being applied to said mud flap, and guided for return to its normal position under the return bias of said stretchable bars when said force is removed.

4,695,071

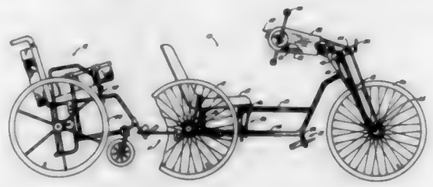
HAND POWERED TRICYCLE HAVING A WHEELCHAIR HITCH

Fred E. Johnston, R.F.D. Box 83, Cleghorn, Iowa 51014

Filed Oct. 8, 1986, Ser. No. 916,691

Int. Cl.⁴ B62K *27/00;* **B60D** *1/00*

U.S. Cl. 290—204 **5 Claims**



1. A hand operated cycle apparatus comprising:
- a cycle frame;
- a pair of spaced apart rear wheels rotatably attached along a horizontal axis to the rear of the cycle frame;
- a yoke pivotally attached to the front of the cycle frame;
- a front wheel rotatably attached to said yoke;
- drive means for selectively rotating said front wheel;
- pedal means attached to an upper portion of said yoke and to said drive means for selectively turning said drive means by hand;
- a seat operably attached to a rear portion of said cycle frame;
- brake means operably attached to said cycle frame for selectively holding each of the rear wheels form rotating with respect to the frame;
- footrest means for supporting the feet of a cycle user;
- a wheelchair having wheelchair frame and a seat, a pair of rear wheels, a pair of front wheels and footrests connected to said wheelchair frame;
- a wheelchair hitch connected to the rear of said cycle frame, said hitch comprising a somewhat horizontally disposed rod extending transverse to the direction of forward movement of said cycle frame and a pair of spaced apart locking members connected at one end to said rod and extending in the direction of forward movement of said cycle frame whereby the footrests of said wheelchair can be placed below said locking members to prevent the wheelchair from being dislodged from said hitch when said wheelchair is being towed behind said cycle frame.

4,695,072

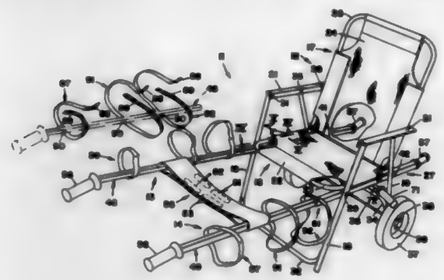
ATHLETE CARRIER

Royce L. Brooks, Benicia, Calif., assignor to Norman D. Koerner, Benicia, Calif.

Continuation-in-part of Ser. No. 750,993, Jul. 2, 1985, which is a continuation of Ser. No. 349,913, Feb. 18, 1982, abandoned. This application Nov. 15, 1985, Ser. No. 798,744

Int. Cl.⁴ A47C *4/28*

U.S. Cl. 280—650 **7 Claims**



1. Apparatus for manually transporting an injured person comprising:
- a chair having a seat, a backrest and front and rear leg members, said seat and backrest and front and rear leg members being foldable relative to each other from a chair configuration to a relatively compact storage configuration,
- first and second ground wheels mounted on said rear leg members at opposite sides of said chair,
- first and second attachment elements secured to opposite sides of said seat,
- first and second spaced apart parallel front carrier arm segments received within said attachment elements and extending forwardly therefrom and first and second spaced apart parallel rear carrier arm segments extending rearwardly therefrom, and wherein said rear carrier arm segments extend a shorter distance from said chair than said front carrier arm segments,
- means for releasably securing said front carrier arm segments and said rear carrier arm segments to said attachment elements,
- a handle secured to the end of each of said carrier arm segments,
- a disconnectable cross strap extending between said front carrier arm segments at a location spaced forwardly from said chair, and
- first and second pluralities of straps attached to said first and second front carrier arm segments respectively for securing at least one of the legs of an injured person to one of said front carrier arm segments with such leg in a extended position, at least one of said straps at each of said front carrier arm segments being situated between said chair and said cross strap and at least one of said straps at each of said front carrier arm segments being situated between said cross strap and said handle.

4,695,073

TOE AND CAMBER ADJUSTING SYSTEM

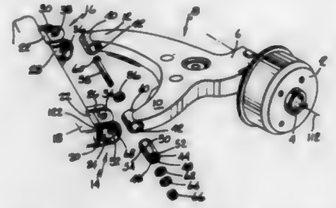
Craig R. Pettibone, Lafayette, and Jimmy D. Berry, Longmont, both of Colo., assignors to Specialty Products, Inc., Longmont, Colo.

Filed Apr. 11, 1986, Ser. No. 850,948

Int. Cl.⁴ B62D *17/00*

U.S. Cl. 280—690 **16 Claims**

1. Apparatus for adjusting the toe and camber of a normally fixed wheel of a vehicle comprising:
- a vehicle having a longitudinal axis;
- a wheel drum;
- means for mounting said wheel drum on said vehicle for rotation about an axis extending generally perpendicular to said longitudinal axis;
- a control arm having a central portion thereof operatively connected with said means for mounting said wheel drum;
- said control arm having spaced apart ends extending outwardly from said central portion;
- a first bracket mounted in a fixed position on said vehicle;
- said control arm having one of said ends thereof mounted in said first bracket so as to permit slight relative movement between said one end and said first bracket;
- a second bracket mounted in a fixed position on said vehicle;
- mounting means for mounting the other end of said control arm in said second bracket;



- rotatable means in said mounting means for moving at least a portion of said other end of said control arm through an arcuate path about a relatively fixed axis extending in a direction generally perpendicular to said longitudinal axis of said vehicle for changing the angular relationship between said longitudinal axis of said vehicle and said rotational axis of said wheel drum to adjust simultaneously the toe and camber of said wheel drum to a desired position; and
- means for locking said rotatable means to retain said wheel drum in said desired position.

4,695,074

VEHICLE SUSPENSION APPARATUS

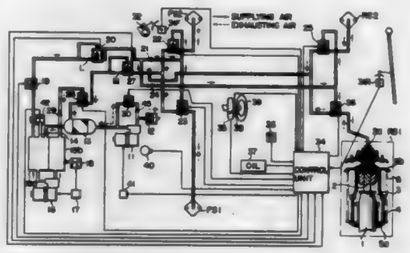
Kazuyoshi Kobayashi, Oobu; Shozo Takizawa, Okazaki; Tadao Tanaka, Okazaki; Mitsuhiko Harara, Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki, and Naotake Kumagai, Aichi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1985, Ser. No. 747,651

Claims priority, application Japan, Jun. 30, 1984, 59-98981[U]; Jul. 25, 1984, 59-112664[U]; Nov. 30, 1984, 59-182008[U]

Int. Cl.⁴ B60G *11/26*

U.S. Cl. 280—707 **17 Claims**

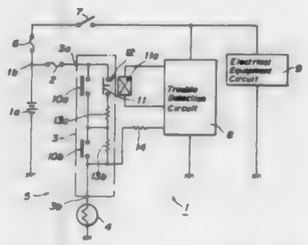


1. A vehicle suspension apparatus comprising:
- air spring chambers arranged between a vehicle body and respective wheels, said air chambers comprising left air chambers and right air chambers:
- air supply means for supplying air to said air spring chambers through supply control valve means;

air exhaust for exhausting the air from said air spring chambers through exhaust control valve means;
control means for controlling said supply and exhaust control valve means;
said air supply means comprising a high-pressure reserve tank connected to said air spring chambers through said supply control valve means and a first compressor for supplying compressed air to said high-pressure reserve tank;
said air exhaust means comprising a low-pressure reserve tank connected to said air spring chambers through said exhaust control valve means;
said first compressor of said air supply means being provided with a suction port connected to said low-pressure reserve tank;
position change detecting means for detecting a position change in the vehicle body;
position control means for supplying a position control signal to said supply and exhaust control valve means so as to control the position change such that the air is supplied to contracted air spring chambers, among said air spring chambers, along a direction of the positon change in a predetermined volume, and such that the air is exhausted from extended air spring chambers, among said air spring chambers, in a predetermined volume when said position change detecting means detects a position change signal;
communicating means for causing left air spring chambers to communicate with right air spring chambers, among said air spring chambers, through a communication control valve; and
said position control means including means for generating, in a normal vehicle position state, a communication control valve control signal to open said communication control valve so as to cause said left air spring chambers to communicate with said right air spring chambers; for generating a communication control signal to close said communication control valve when said position change detecting means detects the position change signal, and, at the same time, supplying a control signal to said supply and exhaust control valves so as to control the position change such that the air is supplied to contracted air spring chambers, among said air spring chambers, along a direction of the position change in a predetermined volume, and exhausted from extended air spring chambers, among said air spring chambers, in a predetermined volume, as well as supplying a control signal to said communication control valve to open said communication control valve when the position change of the vehicle body is detected, by said position change detecting means, to be decreased below a predetermined level after the control signal for controlling the position change is generated.

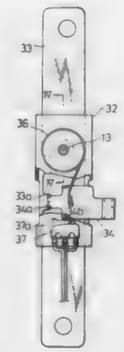
4,695,075
AIR BAG DEVICE FOR VEHICLES
Koichi Kamiji, and Toshikazu Ohya, both of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 16, 1985, Ser. No. 787,909
Claims priority, application Japan, Oct. 16, 1984, 59-156221[U]
Int. Cl.[4] B60R *21/12*
U.S. Cl. 280—735 **3 Claims**

1. In an air bag device (1) for a vehicle having an electric power source (1*a*), and an ignition switch (7) operatively connected to said power source (1*a*),
an improvement comprising:
an air bag trigger circuit (5) substantially directly connected to said power source (1*a*),
wherein:
said trigger circuit comprises an impact sensing circuit (3) and an air bag inflation squib (4) adapted for expanding to inflate an air bag and connected in series to said sensing circuit (3);
said sensing circuit (3) including an impact sensor (10*a*, 10*b*) adapted to close when the vehicle is subjected to an impact of a larger magnitude than a predetermined value and a combination of a shunt resistor (13*a*, 13*b*) and switch means (12) interconnected in series, said combination being connected in parallel to said impact sensor (10*a*, 10*b*), and said switch means being adapted to open and close in an interlocked manner with the opening and closing of said ignition switch (7),
such that when said impact sensor (10*a*, 10*b*) is closed, a short circuit current is conducted across said squib (4), thereby causing the squib to expand to inflate said air bag;



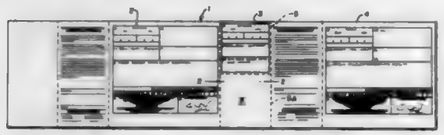
said air bag device further comprising a trouble detection circuit (8, 14) operatively connected to said sensing circuit (3), to check for a defective condition of said sensing circuit (3) by detecting variations in the quantity of an electric current running through said sensing circuit (3) under a condition that said ignition switch (7) is closed; and
said trouble detection circuit (8, 14) being operatively connected to said ignition switch (7), to operate under the condition that said ignition switch (7) is closed.

4,695,076
POSITION ADJUSTING DEVICE FOR MOVABLE ANCHOR LATCH MECHANISM
Toshiyuki Hane, Kanagawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan
Filed Dec. 17, 1986, Ser. No. 942,637
Claims priority, application Japan, Dec. 25, 1985, 60-198298
Int. Cl.[4] B60R *22/06*
U.S. Cl. 280—804 **25 Claims**



1. A position adjusting device for a movable anchor latch mechanism, comprising:
a drive means for causing a movable anchor to move between an occupant releasing position and an occupant restraining position, thereby allowing an associated webbing to take an occupant releasing state and an occupant restraining state selectively;
a latch mechanism for latching the movable anchor at the occupant restraining position when the movable anchor has reached the occupant restraining position;
an adjusting means for fixing the latch mechanism at a desired position; and
a release means for detecting that the adjusting means is about to be operated, whereby the movable anchor assuming the occupant restraining position is released from the occupant restraining position.

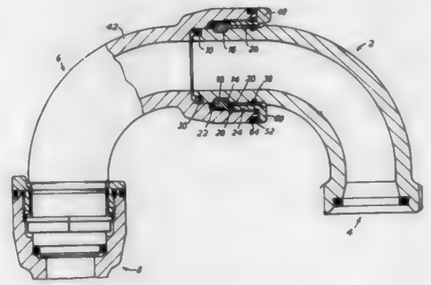
4,695,077
AUTOMOBILE INSURANCE CARD
Roger Pretre, Boulogne-Billancourt, France, assignor to Moore Business Forms, Inc., Grand Island, N.Y.
Filed Mar. 18, 1986, Ser. No. 840,864
Claims priority, application France, Oct. 3, 1985, 85 14597
Int. Cl.[4] B42D *15/00, 17/00;* **G09F** *7/18*
U.S. Cl. 283—81 **5 Claims**



1. A label mounting system for adhering an indicia-bearing label to a transparent support for viewing the indicia therethrough, said system comprising:
a substantially planar substrate having an indicia-receiving surface area and another surface area at least co-extensive in area with said first-mentioned area; and
a label mounting stack supported upon and substantially overlying said second-mentioned area, said label mounting stack including a substantially transparent film releasably adhered on a first side thereof to said second-mentioned area and having a removable protective sheet releasably adhered to the other side thereof,
whereby the protective sheet can be removed from the transparent film, the second-mentioned area placed over the first-mentioned area to adhere the other side of the transparent film over the first-mentioned area, and the substrate released from the first side of the transparent film so as to enable adhering the first side of the transparent film to a transparent support for viewing the first-mentioned area therethrough.

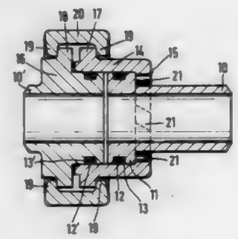
4,695,078
SWIVEL PIPE JOINT
Robert W. Anderson, Stocksfield, England, assignor to Anson Limited, Gateshead, England
Filed Aug. 28, 1986, Ser. No. 901,751
Claims priority, application United Kingdom, Sep. 5, 1985, 8522047; Jan. 28, 1986, 8601972
Int. Cl.[4] F16L *17/00*
U.S. Cl. 285—98 **7 Claims**

1. A swivel joint between two lengths of pipe, said joint including a male connecting piece on an end of one length of pipe, and a cooperating female connecting piece on an end of the other length of pipe;
said male connecting piece having an axially directed cylindrical outer wall and a circumferential groove formed in said outer wall and positioned spaced from the axial end of said male connecting piece, a substantially annular split collet located within said groove and having an axially inner radial wall projecting outwardly from said outer wall to provide an abutment surface, and having an externally threaded nut rotatably mounted on said male connecting piece, said nut having an axially outer radial face adapted to react against said abutment surface of said split collet;
said female connecting piece having a cylindrical internal surface in which said axial end of said male member is received and positionally supported for swivelling movement of said male and female members relative to each other, a screw thread formed in said internal surface and corresponding with the external thread of said nut, said internal surface being recessed to receive said split collet on said male connecting piece in bearing engagement therewith;
said male and female connecting pieces having opposed,



radially spaced and axially directed surfaces thereon between which at least one substantially annular seal reacts;
whereby, on location of the male connecting piece within the female connecting piece, and, upon threading of the nut on the male connecting piece into the female connecting piece, a radial seal is effected between the two connecting pieces, and, said pieces can swivel relative to each other about the central longitudinal axis of the joint; and
a cylindrical bearing member which is a force fit on said male connecting piece, said bearing member including an annular flange extending radially of said male connecting piece and positioned between said axially outer radial face of the nut and said abutment surface of said split collet.

4,695,079
DEVICE FOR CONNECTING THE ENDS OF TWO PIPES
Karl Weinhold, Im Jagdfeld 43, D 4040 Neuss, Fed. Rep. of Germany
Filed Oct. 30, 1985, Ser. No. 792,953
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1984, 3440259
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—278 **5 Claims**



1. A device for connecting the ends of two pipes, comprising: an insert connectable to one pipe end and a bushing slidably and rotatably received over the end of another pipe having an annular ridge and which is configured to slidably and rotatably receive the insert, the bushing having an annular

mount at a rear face at the end away from the insert and extending radially inwardly to overlap the annular ridge on said another pipe end, wherein the annular mount has at least one throughbore therein opening onto the annular ridge for removing particles of contamination on the annular ridge when the bushing is rotated relative to the annular ridge.

4,695,080

PIPE CONNECTION

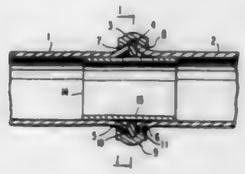
Hans Oetiker, Oberdorfstrasse 21, 8810 Horgen, Switzerland

Division of Ser. No. 815,371, Jul. 13, 1977, which is a continuation-in-part of Ser. No. 531,793, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 387,446, Aug. 10, 1973, abandoned. This application May 7, 1986, Ser. No. 858,949

Claims priority, application Switzerland, Aug. 10, 1972, 11836/72

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—334.5 **49 Claims**



1. A pipe connection in which pipe ends defining a pipe axis and forming joining edges along the free ends to be joined are provided with substantially axially symmetrical enlargement means having outer and inner surfaces and located within the area of the pipe ends, and which includes a circumferentially extending clamping ring means having an annular portion extending about said pipe ends and operble to be tightened by contraction in the radially inward direction to engage with said outer surfaces, said clamping ring means having a ring axis and having internal flanks at least partially defining an approximately U-shaped profile of the annular portion in a cross-sectional plane containing the axis of said clamping ring means and parallel thereto, at least one of the internal flanks of the clamping ring means and one of the outer surfaces of the enlargement means being inclined to the pipe axis in said cross-sectional plane in mutually opposite directions away from the joining edges so that in the contracted condition of the clamping ring means, the joining edges of the pipe ends are urged toward each other, and at least one substantially plastically deformable lug-shaped ear means in the annular portion of the clamping ring means, said ear means being capable of plastic deformation to thereby tighten the clamping ring means by reducing its diametric dimension and thereby securely urge said joining edges toward each other to establish a permanent pipe connection safe against unintenional opening and capable of withstanding relatively high pressures and vibrations as well as temperature fluctuations without danger of inadvertent reopening or loosening of the connection, said clamping ring means providing the permanent connection of the pipe ends upon contraction of the ear means, which can be reopened only by conscious destruction of the clamping ring means or its ear means.

4,695,081

VENT WINDOW SECURING DEVICE FOR VANS AND TRUCKS

Richard C. Boykin, 262 7th Ave., New York, N.Y. 10001

Filed Oct. 19, 1984, Ser. No. 663,661

Int. Cl.[4] E05C *13/02*

U.S. Cl. 292—96 **8 Claims**

1. A vent window securing device mounted on a van or truck door having a vent window frame and a vent window mounted in the frame movable between open and closed positions, a locking latch connected to the frame for holding the vent window in a closed position when in a generally horizontal position, and an interior flat vertical surface, comprising,

a flat support member secured to the interior flat surface of the door,

an elongated vertical member attached to said support member and having opposed upper and lower portions and movable between raised and lowered positions, said vertical member having vertical gear teeth formed at said lower portion,



a circular gear member having circular gear teeth engaged with said vertical gear teeth and rotatably secured to said support member,

locking means mounted at said upper portion of said elongated member for securing the vent window in the closed position, and

rotating means connected to said circular gear member for rotating said circular gear teeth so as to gear said vertical member between said raised and lowered positions,

wherein in said lowered position said locking means holds the vent window in said closed position and in said raised position said locking means releases the vent window from said closed position.

4,695,082

REVERSIBLE MORTISE LOCK

George R. Marks, 19 The Hemlocks, Roslyn Estates, N.Y. 11576

Filed Feb. 26, 1986, Ser. No. 833,026

Int. Cl.[4] E05C *1/12;* E05B *15/00*

U.S. Cl. 292—169.16 **10 Claims**

1. A reversible mortise lock comprising:

a housing having two opposed side walls and a front plate formed with a first opening,

a latch movable with respect to the housing between an extended position, in which the latch projects from the housing through the first opening in the front plate, and a retracted position, in which the latch is substantially completely withdrawn into the housing,

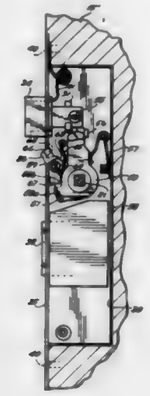
two spindle hubs within the housing independently pivotable about a fixed axis, the latch moving from said extended to said retracted position in response to pivotal movement of either spindle hub in a particular direction,

a one-piece abutment member pivotable in a first orientation between two extreme positions, the abutment member being formed so that in one extreme position the abutment member directly interferes with pivotal movement of one of the spindle hubs, but not the other, so as to prevent said one hub from causing movement of the latch to its retracted position while permitting pivotal movement of the other spindle hub, and in the other extreme position the abutment member permitting pivotal movement of both spindle hubs,

a second opening in the housing from plate through which the abutment member is exposed so that the abutment member can be swung from one extreme position to the other by finger operation, the second opening being large enough to permit the entire abutment member to pass through it,

a pin mounted in the housing upon which the abutment member is supported for pivotal movement, and

an opening in one of the housing side walls through which the pin can be removed to free the abutment member so that the latter can be removed from the housing through



the second opening in the front plate without opening the housing,

whereby the abutment member can be reversed with respect to said first orientation by rotating the abutment member 180° about a horizontal axis, and reinserted into the housing through the second opening, following which the pin can be reinserted in the housing to again pivotally support the abutment member, the abutment member said reversed orientation being capable of directly interfering with pivotal movement of the other of the two spindle hubs but not with said one of the hubs.

4,695,083

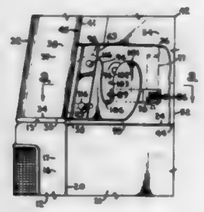
LATCH FOR PICKUP TRUCK COVER DOORS AND THE LIKE

Dennis C. Herrmeyer, Richmond, Kans., assignor to Rigid Form, Inc., Richmond, Kans.

Filed Mar. 10, 1986, Ser. No. 837,737

Int. Cl.[4] E05C *3/10*

U.S. Cl. 292—241 **1 Claim**



1. In combination with a pickup cover having: a top; opposed side walls; a rear end with a pair of coplanar side wall rear legs and a pair of flanges extending forwardly from said cover side wall rear legs, said flanges defining a cover door opening therebetween in said cover rear end; a cover door having upper, lower and opposite side edges with upper, lower and opposite side rails located thereat with said upper rail being hingedly connected to said cover rear end and said lower rail having a back surface, the improvement of a latch mechanism, which comprises:

(a) a pair of angle-section door jambs each having:

(1) a proximate leg with inside and outside faces, said proximate leg being mounted on said cover side wall flange with its outside face against said cover side wall flange; and

(2) a distal leg extending from said proximate leg at a right angle and lying in a plane parallel to a plane formed by said shell rear end, said distal leg having front and back faces;

(b) a pair of elastomeric door jamb weatherstrips each including:

(1) a proximate leg mounted on the inside face of a respective door jamb proximate leg; and

(2) a distal leg mounted on the rear face of a respective door jamb distal leg whereby said door jamb and said door jamb weatherstrip distal legs project inwardly into said cover rear opening in opposed relation;

(c) a pair of handle assemblies each mounted on said lower rail in proximity to a respective said rail and including:

(1) a handle assembly plate mounted on said lower rail back surface;

(2) a T-handle;

(3) a shaft selectively rotatably journalled in said mounting plate and said lower rail, said shaft having a rear portion projecting rearwardly from said mounting plate and mounting said handle and a front portion projecting forwardly from said lower rail;

(4) a keyed lock cylinder located in said handle and having an open position permitting said shaft to rotate with respect to said lower rail and a locked position preventing rotation of said shaft with respect to said lower rail;

(5) a lever mounted on said shaft front portion and including: an extension section with proximate and distal end; a spacer section extending from said extension section proximate end; a return section extending from said spacer section, said extension and return sections being substantially parallel and including aligned, square receivers adapted for receiving said shaft in a nonrotatable engagement; and a bight section extending rearwardly from said extension section distal end in substantially parallel, spaced relation from said spacer section, said spacer and bight sections extending at substantially right angles from said extension section proximate and distal ends and said spacer section having a threaded receiver extending therethrough parallel to said extension and return sections;

(6) a set screw threadably received in said spacer section receiver whereby said lever is fixedly mounted on said shaft; and

(d) a hook plate including:

(1) an inner leg having an upper end, a cam lobe located below and outwardly from said upper end and a substantially vertical notch edge located below said cam lobe;

(2) an outer leg integrally connected to said inner leg and having a first fastener receiver and a slotted second fastener receiver;

(3) a pair of fasteners extending through said outer leg fastener receivers and a respective door jamb distal leg whereby said hook plate outer leg is fastened on the front face of said door jamb distal leg in spaced relation from said door lower rail with said door in its closed position; and

(4) a notch defined between said inner and outer legs and having a notch lower end whereat said inner and outer legs are connected and adjacent to said notch edge, said notch being adapted to selectively receive said lever bight section with said latch in its locked position;

(e) said lever bight section being slidable along said inner leg

cam lobe and said notch edge when said handle assembly is turned to its locked position;

(f) said hook plate inner leg notch edge being located substantially level with said shaft when said door is in its closed position and said hook plate inner leg cam lobe being located further from said shaft rotational axis than said inner leg notch edge;

(g) said lever being subjected to a first tensile force with said bight section engaging said cam lobe and a second tensile force with said bight section engaging said notch edge, said first tensile force being greater than said second tensile force; and

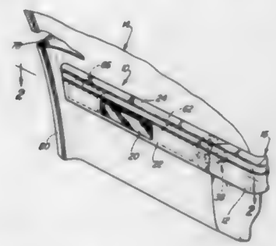
(h) said cover side wall rear leg being prevented from spreading outwardly with respect to said door by said lever tensile forces and said engagement of said lever bight sections with said hook inner leg notch edges.

4,695,084

MOVABLE MOLDING FOR A VEHICLE

Mark C. Hlavach, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 8, 1986, Ser. No. 939,194
Int. Cl.[4] B60R *19/02*
U.S. Cl. 293—126 **4 Claims**



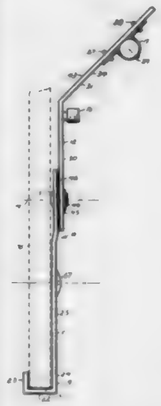
1. A movable molding for a vehicle having a body and a bumper mounted on one of the forward and rearward ends thereof, energy absorbing structure mounting the bumper to the vehicle, said energy absorbing structure biasing the bumper to a normal position but permitting movement of the bumper toward the vehicle upon impact, said bumper having an end portion extending around a side of the vehicle body, said molding comprising a relatively rigid element having an underside and an exterior side, the molding lying on the exterior of the vehicle body in alignment with, and adjacent to, said bumper end portion, fastening means securing the molding to said bumper end portion, slide element means connected to the vehicle body, the molding being, with respect to the length of the vehicle, slidably received on the slide element means, the slide element means maintaining the molding in position relative to the vehicle body while permitting the molding to slide in the direction of the bumper movement, the bumper end portion adapted to move the molding on the slide element means when the bumper is moved towards the vehicle upon impact and move the molding back to its original position upon retraction of the bumper end portion after impact, the molding having an enlarged opening in the end thereof adjacent to the bumper end portion, the bumper end portion having opening means therein, the fastening means comprising a fastening element extending through the enlarged opening in the molding and the opening means provided in the bumper end portion, a base having a pin extending vertically slidably therethrough with ends of the pin extending from the base, the fastening element being secured to said base, the molding having opening means on the underside thereof receiving said pin ends to pivotally and vertically slidably mount the base to facilitate orientation and passage of the fastening means through the opening means in the bumper end portion during assembly and permit vertical movement of the base on the pin to accommodate vertical movement of the bumper end portion upon impact, with the molding remaining vertically stationary.

4,695,085

SHEET CARRIER

Mark A. Cassels, 637 Fernandina St., Palm Bay, Fla. 32907

Filed Nov. 3, 1986, Ser. No. 926,121
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—15 **3 Claims**



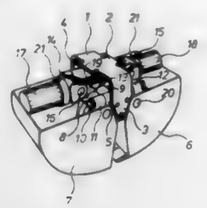
1. A hand held sheet carrier for use with plywood, wallboard and the like sheet material comprising: a first rigid component that has an upright working position, and a foot portion for supporting a sheet to be carried on the carrier, said foot portion having means defining a channel that is upwardly opening and horizontally arranged at said working position for receiving the lower edge of a sheet to be supported thereby, a second rigid component, a handle mounted on said second rigid component for grasping by a user of the carrier, and pivot means interconnecting the first and second components and establishing a pivot axis offset from said foot portion for pivotal movement of said second component with respect to said first component, said second component having a first pivotal position with respect to said first component, and foot means which is horizontally offset from the foot portion of said first component when said second component is at said first pivotal position, said foot means and said foot portion being adapted and arranged when said second component is at said first pivotal position to support said carrier on an underlying support surface through contact therewith, whereby said first component is retained in said upright working position when said carrier is thus supported on said underlying support surface and said channel is retained in an upwardly opening horizontal arrangement for receiving the lower edge of a sheet to be carried on the carrier; said carrier further comprising a device for locking the second component against pivotal movement with respect to said first component, and said locking device comprising screw means mounted on one of said first and second components, and threaded means mounted on the other of said first and second components, said screw means being arranged in working alignment with said threaded means when said second component is at said first pivotal position and thereat being threadedly engageable with said threaded means.

4,695,086

TWO-SIDED GRAB BUCKET WITH PLURAL OPERATING CYLINDERS

Alfred Kinshofer, Wendelsteinstrasse 8, 8160 Miesbach, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 773,640
Int. Cl.[4] B66C *3/02*
U.S. Cl. 294—68.23 **5 Claims**



1. A two-sided grab bucket comprising a U-shaped scoop carrier having a pair of opposite depending legs a pair of scoops each of which includes opposite side walls and a crosspiece extending between and affixed to said side walls, said crosspieces being parallel and supported by said carrier legs for rotation about parallel axes, a pair of longitudinally spaced actuating levers affixed to and projecting transversely from each of said crosspieces, a piston-cylinder unit including a pair of cylinders and pistons and a common piston rod extending between and coupled to said pistons, each of said cylinders including an end head piece having a guide slidably engaging said piston rod and a pair of longitudinally spaced coaxial pivot pins mounted on each of said cylinder head pieces on opposite sides of said guide and rockably coupling each pair of said levers to a respective cylinder head piece, said head pieces being provided with yokelike recesses on both sides of the respective guides, opposite walls defining each of said recesses and having transverse coaxial bores engaging respective pins, and the ends of said actuating levers of each pair being affixed to each crosspiece and being pivoted to said pins.

4,695,087

CONVERTIBLE TRUCK BED FOR PICKUP

J. Richard Hollrock, Simsbury, Conn., assignor to Hollrock Engineering, Inc., Granby, Conn.

Filed Dec. 30, 1985, Ser. No. 814,636
Int. Cl.[4] B60J *7/10*
U.S. Cl. 296—14 **8 Claims**



1. A truck bed for a pickup truck body having a floor and sides of height (H) such that the floor area is limited to a generally rectangular shape dicated by a lateral dimension (A) between the truck body's sides and a longitudinal dimension B equal to the length of the floor, said truck bed comprising;

(a) a removable frame having at least one lower leg portion of width (A) said lower leg end portion abutting the floor inside the truck body, said leg portion having an upper end at a height H above the lower end thereof.

(b) said frame having two longidutinally extending members supported on said leg upper end portion and spaced from one another by a dimension at least approximately (A),

(c) said frame having a forward bulkhead supported by forward ends of said longitudinally extending members, said bulkhead including laterally outwardly extending shelf support portions,

(d) said frame having longitudinally extending shelf margin portions spaced outboard of and in the same plane as said longitudinal frame members,

(e) at least two support struts extending between said longitudinal frame members and said shelf margin portions,

(f) platform defining panel means provided on said longitudinally extending members, and shelf panels provided on said shelf support portions, said shelf margin portions and said shelf support struts, said platform panel means including at least two platform panels, each of said panels pivotably mounted to one of said longitudinally extending frame members, and said panels being movable to positions inclined outwardly and upwardly to form upwardly projecting sides of the truck body fo increase the capacity of the basic truck body, and

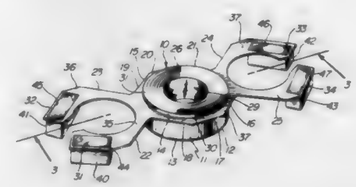
(g) side rails pivotably connected to said shelf margin portions, and means provided in part on said bulkhead for supporting said rails in upright positions perpendicular said plane.

4,695,088

OIL DROP COLLECTOR

Otto S. Jensen, 5650 Panorama Dr., Whittier, Calif. 90601

Filed Aug. 1, 1986, Ser. No. 891,552
Int. Cl.[4] B62D *25/20*
U.S. Cl. 296—38 **4 Claims**



1. An oil drop collector comprising:

an oil collection reservoir defining an oil collection recess;

an absorbent cartridge configured to be received within said oil collection recess;

wherein said absorbent cartridge extends beyond said oil collection recess by a predetermined distance;

a plurality of resilient flexible arms extending outwardly from said reservoir;

wherein said oil collection reservoir and said plurality of resilient flexible arms form a one-piece molded unit;

a plurality of magnets secured to each of said resilient flexible arms in said plurality of resilient flexible arms; and

wherein said resilient flexible arms each terminate in a recessed cavity and wherein said magnets in said plurality of magnets are received within said recessed cavities and adhesively secured therein.

4,695,089

UPPER BODY STRUCTURE OF AN OPEN-TOP VEHICLE

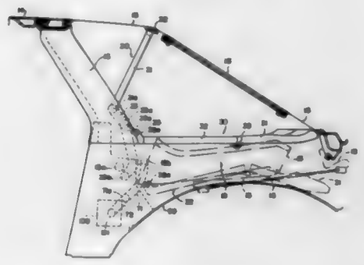
Hisao Fukutomi; Takeshi Kouishi; Koji Kurooka; Morio Umeda; Takanori Tachiya, and Yutaka Imura, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

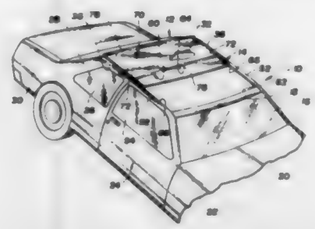
Filed Feb. 18, 1986, Ser. No. 829,925

Claims priority, application Japan, Feb. 18, 1985, 60-21398[U]; Apr. 27, 1985, 60-91431; Apr. 27, 1985, 60-91434

Int. Cl.[4] B60J *7/11, 7/12*

U.S. Cl. 296—107 **9 Claims**





1. An open-top vehicle body structure including a body section, foldable hood means adapted to cover at least a part of the body section, link means for supporting said hood means, said link means being movable between an extending position wherein the link means supports the hood means in an extended position and a retracted position wherein the link means allows the hood means to be folded, first operating means provided at one side portion of the body section for moving the link means at one side between the extending position and the retracted position, second operating means provided at the other side portion of the body section for moving the link means at the other side between the extending position and the retracted position, said link means including a swingable pillar of an inverted U-shape having opposite leg portions mounted on the body section for swinging movement about a transversely extending horizontal axis, said hood means being connected at a front edge portion to said swingable pillar and at a rear edge portion to a part of said body section located rearwardly of said swingable pillar, a rigid roof panel being removably mounted between said swingable pillar and a front windshield structure, each of said first and second operating means including reversible motor means and a linkage connecting said motor means with said leg portion of the swingable pillar for converting a rotation of said motor means into a swingable movement of said pillar means, said linkage including a first link having one end pivotably connected with said leg portion of the swingable pillar, and a second link having one end pivotably connected with the other end of the first link, the other end of the second link being connected with an output shaft of said motor means.

4,695,090

EXTERNALLY RETRACTABLE SUNROOF ASSEMBLY

David L. Draper, Whitemore Lake, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Filed May 23, 1986, Ser. No. 866,595

Int. Cl.[4] B60J *7/047*

U.S. Cl. 296—216 **7 Claims**

1. In a vehicle body including an outer roof panel having side edges and also having inner rails that cooperate with the side edges of the outer roof panel to provide a pair of hollow side rails, and side doors having upper window frames including outer frame members that continue the contour of the outer roof panel at the side edges thereof with the side doors in a closed position, an externally retractable sunroof assembly comprising: a roof opening in the outer roof panel; said roof opening having forward and rearward edges and having side edges exposing the interior of the side rails of the roof; a pair of tracks respectively mounted within the pair of side rails; and a sunroof having side edge portions extending over the side rails and being respectively mounted by the pair of tracks therein for movement between a closed position closing the roof opening and an externally retracted position above the outer roof panel to the rear of the roof opening to thereby open the roof opening, and the sunroof having the side edge portions thereof in the closed position respectively juxtaposed with respect to the upper window frames of the side doors to provide a continuous door-to-door appearance.

4,695,091

HEAT CONDUCTOR CONNECTIONS BETWEEN SEATS AND BACKRESTS OF VEHICLES

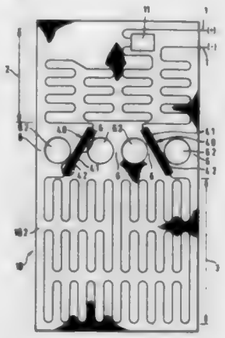
Horst-Dieter Altmann, Gründau-Lieblos, and Eberhard Haupt, Gründau-Rothenbergen, both of Fed. Rep. of Germany, assignors to I.G. Bauerhin GmbH Elektro-Technische Fabrik, Gründau-Rothenbergen, Fed. Rep. of Germany

Filed Nov. 19, 1986, Ser. No. 932,292

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544499

Int. Cl.[4] A47C *7/72*

U.S. Cl. 297—180 **4 Claims**



1. In heat conductor connections between electrical heating elements located in seat and backrest surfaces having a padded core, said surfaces separated by a bracing trough provided in said padded core, a first bracing wire bonded into said padded core beneath said bracing trough, said first bracing wire exposed in sections by window-like recesses in said bracing trough, covering materials on said surfaces having a second bracing wire, an insert loop connecting said first and second bracing wires, the improvement comprising:

connecting webs between said seat and backrest comprising woven or knitted copper bands and connecting heating conductor sections laid in a meander or wave form bearing on said copper bands and connecting said heating elements wherein said connecting webs (4.0) each consist of a two-layer copper strip (4.1) and said heating conductor sections (4.2) are freely movable between the two layers.

4,695,092

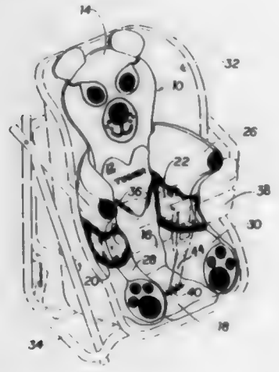
PADDED INFANT SEAT LINER

Debra A. Hittie, R.D. #1, Friedens, Pa. 15541

Filed Oct. 6, 1986, Ser. No. 915,408

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—230 **7 Claims**



1. A padded liner, for use in an infant safety automobile seat of the type having a shell-like chair with a high-back portion, attached to a support frame and adapted to be fastened in use position by the automobile lap belt retainably strapped to the frame, comprising:

a plurality of cushions sewn together to form a substantially self-supporting unit, including a vertically-elongated first backing cushion, a comparatively small and generally rectilinear second cushion having a rearward edge sewn to the lower edge of the first cushion, a pair of vertically-extending spaced-apart side cushions each having a rearward edge joined to a vertically-oriented edge of the first backing cushion;

each of the side cushions having a cross-sectional thickness substantially greater than the thickness of the first and second cushions, and the upper edge of the side cushions being on a level above the horizontal midline of the first backing cushion;

the thickness of the padding in each side cushion adjacent its jointure to the second cushion being substantially greater than the padding thickness at its upper end and of such thickness that placing a child, of sufficient size to fully cover the second cushion, in seated position on the second cushion will cause the padding in the lower ends of the side cushions to compressibly upwardly displace; and

the liner being in the form of a fanciful figure wherein the first cushion constitutes a torso and head, and each side cushion constitutes an arm and leg portion of the figure.

4,695,093

WORK CHAIR

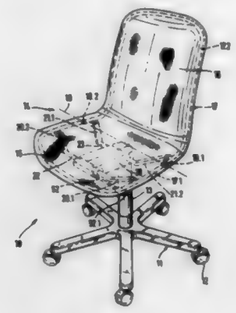
Heinz-Peter Suhr, Grossbottwar, and Bernd Weinberger, Steinheim, both of Fed. Rep. of Germany, assignors to Firma August Froscher G.m.b.H. & Co. K.G., Steinheim, Fed. Rep. of Germany

Filed Jun. 9, 1986, Ser. No. 872,279

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521458

Int. Cl.[4] A47C *3/00, 1/032*

U.S. Cl. 297—300 **23 Claims**



1. A work chair comprising a base frame adapted to be supported on a floor, a seat divided along a transverse line into a forward seat portion having a rounded forward edge and a rear seat portion, hinge means hingedly joining said forward seat portion and said rear seat portion with one another, with a hinge axis on said transverse line, a backrest structurally joined with said rear seat portion at a substantially unalterable angle, first support means supporting said rear seat portion and backrest on said base frame for movement from a first forward position to a second rearwardly inclined position of said backrest accompanied by a lowering of said rear seat portion, second support means for supporting said forward seat portion on said base frame for movement from a first approximately horizontal position to a second position in which said forward seat portion is inclined downwardly to the rear while said rounded forward edge of said forward seat portion remains at substantially the same height from the floor, and spring means resiliently opposing movement of said backrest and seat portions from said first positions to said second positions.

4,695,094

MOTOR-VEHICLE SEAT WITH BACKREST WHICH CAN BE SWUNG FORWARD OUT OF A POSITION OF USE

Helmut Siebler, Fellbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 714,209, Mar. 21, 1985, Pat. No. 4,636,003. This application Aug. 18, 1986, Ser. No. 897,344

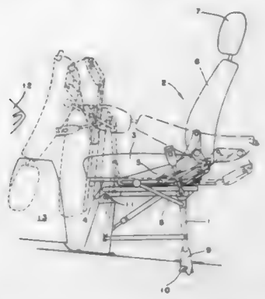
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410262

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—331 **2 Claims**

1. A motor-vehicle seat with a backrest which can be swung forward out of the position of use and which is mounted so as to be pivotable forwardly about a lateral pivot on a bracket connected to a seat-cushion frame, there being a guide device by means of which the point of pivoting of the backrest on the bracket is displaced rearwardly relative to the seat-cushion frame and in the longitudinal direction of the vehicle via a lever arrangement connected to the backrest, characterized in that the guide device is assigned to the bracket in such a way that the latter is arranged so as to be displaceable relative to the seat cushion frame, and in that, when the backrest is pivoted out of the position of use, the backrest together with the

bracket is moved to the rear via at least one supporting lever articulated on the seat frame and fixed to the backrest, and where the bracket in the position of use is locked against an unintended shifting and supports itself in a prestressed condition at a stop face of a toothed segment that is pivotable at the seat frame and that an additional toothed segment engages with the toothed segment, the pivotal movement of said additional toothed segment, via a connecting rod, being transmitted to a locking lever pivoted on the frame.



4,695,095

ARRANGEMENT FOR SECURING THE END POSITION OF A GUIDED SUPPORT ROD OF A HEADREST

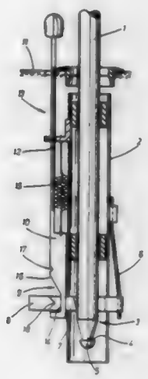
Eberhard Faust, Stuttgart; Kurt Niethammer, Jettingen, and Ludwig Hammer, Nagold, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,108

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436541

Int. Cl.⁴ A47C *7/36*

U.S. Cl. 297—410 **7 Claims**



1. An arrangement for securing the position of a support rod means for a vehicle headrest, comprising:

locking means for preventing an unintentional manual removal of said headrest by an operator,

release means for disengaging said locking means to permit manual removal of said headrest, said release means being configured such that an external manual force is unnecessary to maintain said locking means in its disengaged state whereby said headrest may be removed with both hands by the operator using a minimal force, and

a triggering means for automatically resetting the release means to its inoperative position upon reinsertion of said headrest support rod means.

4,695,096

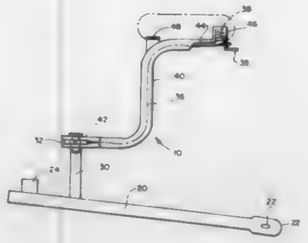
MOTORCYCLE PASSENGER ARM REST

Donald M. Kincaid, R.R. #2, Claremont, Ill. 62421

Filed Nov. 20, 1986, Ser. No. 933,579

Int. Cl.⁴ A47C *7/54*

U.S. Cl. 297—417 **2 Claims**



1. In combination with a motorcycle rear passenger seat, the improvement of an horizontally swingable armrest which comprises:

(A) an elongated mounting base which defines plural spaced-apart forward and rearward anchors, the said mounting base being set upon the motorcycle at a rearwardly ascending angle from the horizontal;

(B) an upright connector, fixed at one end to the mounting base adjacent the said rearward anchor, said connector having an inwardly offset extension adjacent a free end of the connector, a free end of the extension defining a detent plate, each said offset extension and detent plate being disposed beneath the passenger seat;

(C) a swing rest mount engaging the free end of the upright connector in horizontally moveable relation to the connector and detent plate, the swing rest mount having a spring-loaded detent pin at the lower end and a spring-loaded lock pin release handle and cable, interconnecting the upper end of the swing rest mount and detent pin, the cable being slideably moveable within the swing rest mount, whereby to provide for alternately setting and releasing the detent pin, relative to the detent plate, the swing rest mount further supporting an armrest cushion adjacent its upper end.

4,695,097

SEAT FOR USE IN MOTOR VEHICLE

Masakazu Muraishi, Isehara, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 17, 1986, Ser. No. 909,120

Claims priority, application Japan, Sep. 18, 1985, 60-207494

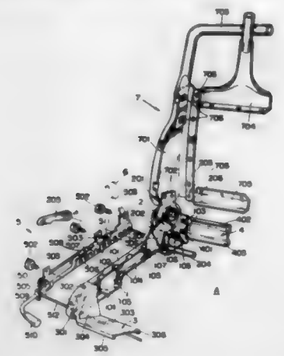
Int. Cl.⁴ A47C *7/02*

U.S. Cl. 297—452 **11 Claims**

1. A seat mounted on a floor of a motor vehicle, comprising:

a generally rectangular seat cushion frame including two spaced side frames, a front frame having axially opposed ends detachably connected to respective front portions of said side frames, and a rear frame having axially opposed ends detachably connected to respective rear portions of said side frames; and

a seat sliding mechanism including two spaced stationary rails which are detachably secured to said floor in a manner to extend along the respective side frames, and two movable rails which are slidably disposed on the respective stationary rails and detachably connected to the respective side frames; said front frame having a major flat portion which is sloped down toward the rear of said seat cushion frame, said front frame also including side walls which respectively extend upward from the longitudinallly opposed ends of said major flat portion and are detachably connected to respective upper sides of said front portions of said side frames, and wherein each side frame of said rectangular seat cushion frame is formed with an inwardly projected flange along the periphery thereof except for the rear portion thereof.



4,695,098

EXCAVATOR, PARTICULARLY FOR CONTINUOUS STRIP MINING OF MINERALS

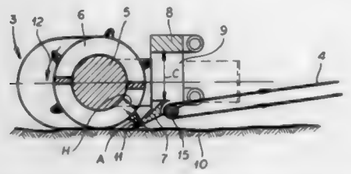
Friedrich W. Paurat, Kasselweg 29, 4230 Wesel 1, and Roland Paurat, Blumenstrasse 11, 4230 Wesel 13, both of Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,439

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518691

Int. Cl.⁴ E21C *35/20, 37/02*

U.S. Cl. 299—64 **10 Claims**



1. In an excavator for mining minerals, particularly for continuous strip mining of said minerals, comprising a track drive, a digging unit with at least one digging roller and a connected conveyor for removing raw ore, said digging roller having a roller core and at least one helical digging and delivery flight, said excavator further comprising a delivery mechanism positioned between said conveyor and said digging roller, the improvement wherein said delivery mechanism comprises a breaking wedge and a delivery frame, said frame lying in a vertical plane and having a delivery opening connected to said breaking wedge, said breaking wedge extending from the underside of said delivery frame to the ground, said wedge having

a breaking surface thereon substantially and continuously tangent to said helical digging and delivery flight when said digging unit is in operation, a gap A existing between said braking wedge and said helical digging and delivery flight of threat height H, and the sum of said gap A and said thread height H being less than the width B and the height C of said delivery opening,

wherein said conveyor is mounted on said underside of said delivery frame, said helical digging and delivery flight is a breaking tool and has a thread pitch G which is smaller than said width B and said height C of said delivery opening and said digging roller is rotatable in the working direction at said breaking wedge from below to above.

4,695,099

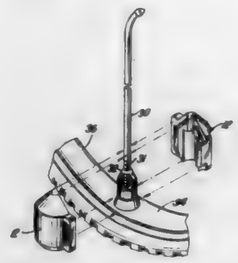
WHEEL SPOKE ADJUSTER GUARD

Mark S. Klein, 76 Dewey Ave., Totowa, N.J. 07512

Filed Apr. 15, 1986, Ser. No. 852,056

Int. Cl.⁴ B60B *7/00, 1/00*

U.S. Cl. 301—37 SA **6 Claims**



1. A wheel spoke adjuster guard for wheel spoke adjuster lugs and adjacent wheel spoke, as well as the wheel rim holes through which said wheel spoke adjuster lugs are received, each wheel spoke adjuster guard comprising:

a pair of substantially identical interlocking semi-tubular sections, each said pair of semi-tubular sections being interlockable to form a substantially unitary tubular member proportioned to surround an adjuster lug; and

identical cooperating coupling means on each said semi-tubular section for interlocking the semi-tubular sections in each said pair thereof to form the unitary tubular member, said tubular member, when assembled, providing a hollow central channel extending longitudinally therethrough, said channel being proportioned to encase and closely surround said wheel spoke adjuster lug and at least a portion of its adjacent wheel spoke, and to fixedly engage said portion of said wheel spoke so as to protectively cover said wheel spoke adjuster lug, said adjacent wheel spoke, and said wheel rim opening through which said wheel spoke adjuster lug is received.

4,695,100

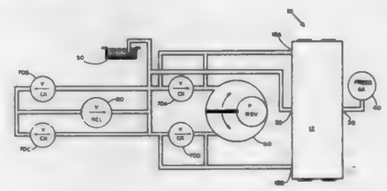
VALVE SYSTEM FOR EXERCISE APPARATUS

James E. Miles, Graham, N.C., assignor to Isotechnologies, Inc., Hillsborough, N.C.

Filed Jan. 17, 1986, Ser. No. 820,717

Int. Cl.⁴ B60T *13/18*

U.S. Cl. 303—10 **15 Claims**



1. A hydraulic valve system adapted for quick equalization of high and low pressure in the closed hydraulic circuit of an exercise apparatus when a load is removed, said hydraulic valve system comprising:

a housing defining first and second vertical fluid passageways and first and second intersecting horizontal passageways communicating therewith;

first and second hydraulic circuit connection ports in fluid communication with said first and second vertical fluid passageways, respectively;

a hydraulic pressure gauge port in fluid communication with said first horizontal passageway through an aperture defined by said horizontal passageway;

shuttle valve means operably positioned in said first horizontal passageway between said vertical passageways for opening said normally closed first horizontal passageway aperture in response to high pressure on either side thereof, said shuttle valve means also adapted to allow fluid flow therethrough from the high pressure side to the low pressure side thereof;

a hydraulic reservoir port in fluid communication with said second horizontal passageway through an aperture defined by said second horizontal passageway;

a valve seat fixedly positioned in said second horizontal passageway between said intersecting vertical passageways and in fluid communication with said hydraulic reservoir port; and

a pair of valves positioned in horizontally opposing relationship and cooperatively engaging said valve seat so as to provide fluid communication between the low pressure side of said valve seat and said fourth hydraulic port while simultaneously preventing fluid communication between the high pressure side of said valve seat and said fourth hydraulic port.

4,695,101

PRESSURE REGULATOR

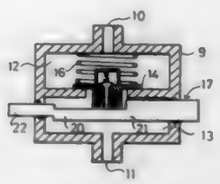
Anthony L. Woudergem, Waikowhai, New Zealand, assignor to Development Finance Corporation, Auckland, New Zealand

Filed Mar. 11, 1986, Ser. No. 838,597

Claims priority, application New Zealand, Mar. 22, 1985, 211548

Int. Cl.[4] B60T *8/36*

U.S. Cl. 303—117 **3 Claims**



1. A pressure regulator for an anti-lock hydraulic braking system, the regulator including:

a housing with an inlet chamber and an outlet chamber;

an inlet for hydraulic fluid to the inlet chamber, an outlet for hydraulic fluid from the outlet chamber and a passage for the hydraulic fluid between the inlet chamber and the outlet chamber;

valve means which can be opened and closed to control the flow of hydraulic fluid through the passage between the inlet chamber and the outlet chamber;

and a plunger locatable in the outlet chamber and capable of being moved linearly therein to vary the volume of the outlet chamber occupied by the hydraulic fluid to modulate the pressure within the outlet chamber when the flow of fluid between the inlet chamber and the outlet chamber is cut off, the plunger being also rotatable in the outlet chamber and incorporating a cam in contact with the valve means, the cam being arranged upon rotation of the plunger to open and close the valve means.

4,695,102

LUBRICATED ROLLER FOR THE TRACKS OF CRAWLER VEHICLES, IN PARTICULAR, A TOP ROLLER WITH FIXED OVERHUNG SHAFT AND ROLLING BEARINGS

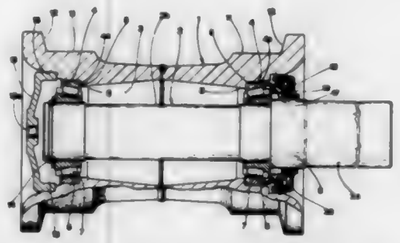
Aldo Crotti, Modena, Italy, assignor to Societa' Italtractor Meccanica Itm S.p.A., Potenza, Italy

Filed Nov. 26, 1985, Ser. No. 801,854

Claims priority, application Italy, Nov. 30, 1984, 29049/84[U]

Int. Cl.[4] B62D *4455/14*

U.S. Cl. 305—11 **14 Claims**



1. A lubricated roller for the tracks of crawler vehicles, in particular a top roller, of the type featuring a fixed overhung shaft and rolling bearings, said roller comprising:

a shaft having an overhung end and an anchored end, a groove located at its overhung end with a first snap ring therein, and external limiting means located at its anchored end;

a roller body carried by the shaft and provided with a bore cavity through which said shaft passes through, said roller body having a pair of shoulders at the ends of said bore cavity;

a pair of rolling bearings located between said shaft and said roller body, the inner ring of a first of said rolling bearings being checked by contact with said external limiting means at said anchored end of said shaft, the inner ring of the other rolling bearing being checked by said snap ring, and the outer rings of said rolling bearings being checked by said shoulders of said roller body;

a frontal-action seal in contact with the outer ring of the respective rolling bearing located at the anchored end of the shaft, to prevent egress of lubricant between said seal and said outer ring;

an annular bracket fitted around the frontal-action seal such as to remain integral with the shaft, and to provide a fluid-tight seal with said shaft and an annular part of said seal; and

an outer circular cover enclosing a lubricant chamber at the overhung end of the shaft by being fixed to the body of the roller, said outer circular cover being located in a cylindrical seat in the outer edge of said bore cavity.

4,695,103

DISKETTE HOLDER

John B. MacDonald, Dedham, Mass., and David E. McLinn, Merrimack, N.H., assignors to Continental Molding Corporation, Auburn, Me.

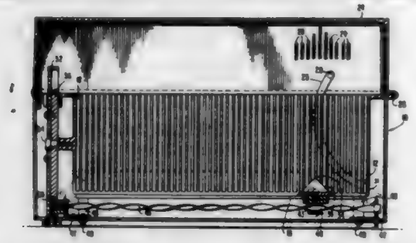
Filed Apr. 28, 1986, Ser. No. 856,285

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—18 **12 Claims**

1. A container for storing a plurality of substantially flat articles, such as word-processing diskettes, said container comprisisng an article holder having an elongated, generally rectangular interior with a plurality of slots each for receiving an article to be stored with said articles being aligned in side-by-side relation and slidable in opposite directions within said slots, indexing means for movement along said elongated interior to sequentially engage an edge portion of each article and

simultaneous with said engaging to sequentially slide each engaged article within said slot to a position out of alignment



with the remainder of said stored articles, said indexing means being in continuous article engagement during said movement along said elongated interior.

4,695,104

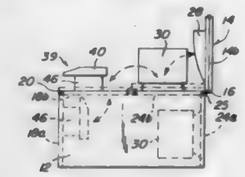
COMPUTER FURNITURE

Elsie J. Lederman, 630 Victory Blvd., Apt. 6-G, Staten Island, N.Y. 10301

Filed Jan. 13, 1986, Ser. No. 818,375

Int. Cl.[3] A47B *81/00*

U.S. Cl. 312—26 **7 Claims**



1. A piece of computer furniture convertible between a rectangular table and a computer desk which comprises:

(a) a pair of side panels spaced horizontally apart;

(b) a foldable top extending entirely across said side panels and hinged to a rear edge of said side panels, said top arranged in one instance in a flat horizontal position for use as an entire table top of the rectangular table and in another instance in a foldable vertical position as a back support for the computer desk;

(c) a front panel extending entirely across each side panels and hinged to said side panels, said front panel arranged in one instance in a vertical position as an entire front of the table and in another instance in a horizontal position as a front part of the computer desk top;

(d) a back panel extending entirely across said side panels and hinged to said side panels, said back panel arranged is one instance in a vertical position as an entire back of the table and in another instance in a horizontal position as a back part of the computer desk top; and

(e) means for locking said front panel and said back panel in said horizontal position to form together as the entire computer desk top.

4,695,105

FILTERED ELECTRICAL RECEPTACLE

Reuben E. Ney, Mount Joy; Raymond V. Pass, Camp Hill, and Patrick F. Yeager, Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

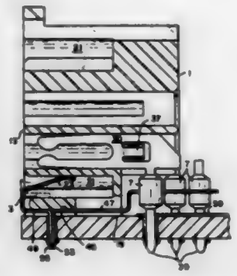
Continuation of Ser. No. 683,846, Dec. 20, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,566

Int. Cl.[4] H01R *4/66, 13/66*

U.S. Cl. 439—95 **6 Claims**

1. An electrical connector, comprising:

a dielectric housing member having a plurality of passageways extending through said housing member, said passageways extending parallel to a longitudinal axis of said housing member, said housing member having recess means extending inwardly from a front surface of said



housing member for at least part way of said housing member;

electrical contact members secured in said passageways and having contact sections in said passageways and terminal sections extending along a rear surface of said housing member as well as beyond a bottom surface of said housing member for electrical connection to conductive areas of a circuit board;

filter means on said terminal sections and having inside surfaces electrically connected to said terminal sections, most of said filter means being disposed in a recessed section located at a rear bottom portion of said housing member; and

ground plate means having a first and second section of which at least a part extends along an inner surface of said housing member spaced inwardly from said bottom surface, said first section extending rearwardly from said part and being disposed in said recessed section and having apertures in which the filter means are located and electrically connected to the ground plate means, said second section extending forwardly from said part and extending along the front surface of said housing member and including spring fingers disposed in said recess means for electrical connection with a complementary electrical connector.

4,695,106

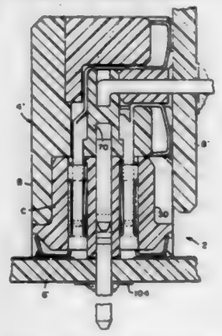
SURFACE MOUNT, MINIATURE CONNECTOR

Steven Feldman, Seminole, and Robert J. Tennant, Largo, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1985, Ser. No. 733,176

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—83 **6 Claims**



1. A surface mount electrical connector for establishing electrical continuity with solder pads on the surface of a printed circuit board comprising:

a housing having a plurality of cavities extending therein from a first surface;

electrical terminals each dimensioned for receipt in one of

said housing cavities and engagable with the housing when partially inserted therein to retain the terminal in a partially inserted position and having a surface mount solder tail extending beyond the first surface of the housing when the terminal is in the partially inserted position, each terminal comprising a resilient beam member located within the housing when the terminal is in the partially inserted position, the resilient beam being frictionally engagable with an internal wall of the corresponding cavity for retaining the terminal in the partially inserted position, and a stop surface on each terminal engagable with the housing first surface adjacent the corresponding cavity when the terminal is in the partially inserted position; and

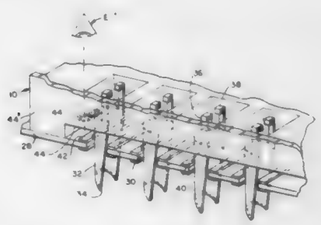
means for securing the housing to a printed circuit board disposed adjacent the first surface, each terminal being independently shiftable further into the cavity and away from the printed circuit board from the partially inserted position as its solder tail is pressed against flat surfaces of said solder pads upon securement of the housing to the printed circuit board, whereby contact is independently established between the solder tails and the solder pads on the printed circuit boards despite deformities in the printed circuit board or warpage of the housing.

4,695,107

INTEGRATED CIRCUIT SOCKETS

James B. Leppert, 903 Frankewitz Rd., Baltimore, Md. 21221

Filed Jun. 9, 1986, Ser. No. 871,848
Int. Cl.[4] H01R *13/05, 9/09*
U.S. Cl. 439—83 **3 Claims**



1. In a system of integrated circuit sockets having: a base with a bottom surface and a plurality of pins in spaced rows in said base for engaging respective holes in a printed circuit board having, adjacent said holes, upper copper tracks, and at least one side wipe **936**, **38**) associated with each of said pins, the improvement comprising: each said pin (**32**) being a half circle in cross-sectional view and being conically tapered longitudinally with a sharp chisel tip at one extreme end (**34**), said half circular cross section extending from said sharp chisel tip substantially to said at least one side wipe at the other end of said pin, and a spur (**40**) on each pin extending to a location for resting on a said upper copper track (**42**) and serving as a path for conveying solder to a said upper copper track (**42**).

4,695,106

CONNECTOR FOR FLEXIBLE PRINTED CIRCUIT BOARD

Norio Ichitsubo, Yao, Japan, assignor to Hosiden Electronics Co., Ltd., Japan

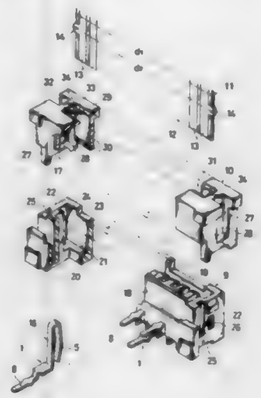
Filed Aug. 4, 1986, Ser. No. 892,988
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—99 **6 Claims**

1. A connector for flexible substrates comprising:

a flexible substrate having an expanded section formed on an end thereof,

a connector body having a cavity opened upward with movable contact points of a number of terminals arranged side by side in a row in said cavity, and

a housing mounted on said connector body so as to close an opening of said cavity and to hold an end of said flexible substrate inserted through a window on a top wall between a tongue and the movable contact points of said terminals, and in which,



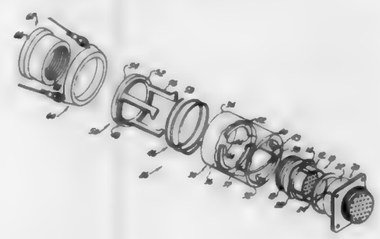
the window of said housing is formed of a wide opening to insert the expanded section of the flexible substrate, and a narrow opening communicated with said wide opening into which a non-expanded section following the expanded section of the flexible substrate is fitted when the connector body is capped so that the non-expanded section is interlocked with the housing under the window when fitted into the narrow opening.

4,695,109

QUICK RELEASE CONNECTOR

Lloyd G. Ratchford, Oneonta, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 28, 1986, Ser. No. 902,240
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—155 **7 Claims**



1. An electrical connector comprising a plug, a coupling ring surrounding the plug for coupling to a receptacle adapted to releasably mate with the plug, the coupling ring having a bayonet groove spiralling axially rearward from a front face for engaging a bayonet pin extending from the receptacle, and release means for releasing the receptacle from the coupling ring upon the occurrence of an axial force therebetween exceeding a predetermined amount, said release means including

a locking ring having a locking finger,

first bias means for biasing the locking ring axially rearward relative to the plug, and

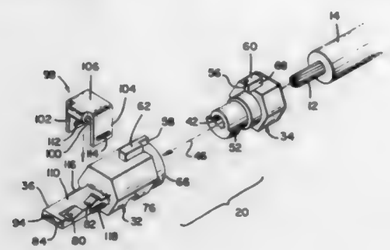
second bias means for biasing the coupling ring axially forward relative to the locking ring, said second bias means being disposed between said rings.

4,695,110

ELECTRICAL CONNECTOR APPARATUS

Henry G. Wasserlein, Seminole, Fla., assignor to Amp Incorporated, Harrisburg, Pa.

Filed Oct. 21, 1985, Ser. No. 789,592
Int. Cl.[4] H01R *25/00*
U.S. Cl. 439—289 **24 Claims**



1. For use in an electrical connector assembly, an electrically conductive terminal for attachment to an end of a length of cable comprising:

a stator member and a rotor member rotatable with respect to each other about an axis of rotation, said stator member and said rotor member each having a bore offset from the axis of rotation for receiving a cable end when said bores are in alignment along a common axis and for terminating the received cable end when said bores are out of axial alignment as a result of relative rotation between said stator member and said rotor member.

a bayonet formed on the front end of one of said members and adapted to be positioned in contact with an associated electrial element; and

resilient means attached to said bayonet for releasably latching said bayonet in contact with the associated electrical element.

4,695,111

ZERO INSERTION FORCE CONNECTOR HAVING WIPING ACTION

Dimitry Grabbe, Middletown; Iosif Korsunsky, Harrisburg; Thomas M. Klunk, Dover, and Joseph S. DiOrazio, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 10, 1986, Ser. No. 849,980
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—266 **16 Claims**

1. An electrical connector comprising:

an insulating housing having a substrate-receiving surface and a mounting surface;

an opening extending into the substrate-receiving surface for reception of a substrate having spaced-apart terminal pads;

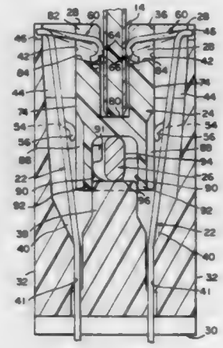
terminals positioned in the housing adjacent the opening having free ends which are proximate the substrate-receiving surface and fixed ends which are proximate the mounting surface, the terminals having thereon contact engagement cam followers and contact wipe cam followers;

contact arms extending from the free ends toward the opening, the contact arms having outer ends, each outer end comprising a contact portion of the terminal and the contact wipe cam follower;

camming block means positioned in the opening which is movable between a first position and a second position;

an actuator provided in the housing for moving the camming block means between the first position and the second position;

contact engagement cam surface means integral with the camming block means being associated with, and adjacent to, the contact engagement cam followers, the contact engagement cam surface means and the contact engagement cam followers being effective, during movement of the camming block means from the second position to the first position, to flex the terminals away from the opening so that the contact portions of the terminals are moved away from the opening allowing the substrate to be placed in the opening under zero insertion force conditions, and upon movement of the camming block means back to the second position, the terminals are moved toward the



substrate allowing the contact portions to move against the terminal pads, the contact portions are held resiliently urged against the terminal pads under normal force conditions; and

contact wipe cam surface means integral with the camming block means being associated with, and proximate to, the contact wipe cam followers, the contact wipe cam surface means being engageable with the contact wipe cam followers during a final portion of the movement of the camming block means to the second position and being effective to move the contact portions over the terminal pads under normal force conditions producing clean contact surfaces at the electrical interfaces of the contact portions and the terminal pads.

4,695,112

PRINTED CIRCUIT BOARD, EDGEBOARD CONNECTOR THEREFOR

Donald M. Maston, Livonia, and Kenneth H. Mertz, Mount Clemens, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 29, 1986, Ser. No. 947,303
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—350 **4 Claims**

1. An edgeboard connector for connecting a plurality of wires to an edge-card plug of a printed circuit board;

wherein a plurality of terminals each of which having an oval-shaped front end which imposes spring-like pressure against conductor runs terminating within the edge-card plug are positioned in a plurality of channels disposed along a bottom surface of the connector;

wherein each of the plurality of terminals has a lance depending from a base of the terminals which snaps into a slot in each of the plurality of channels for locking each terminal in each channel to prevent accidental retraction of the terminal during use;

wherein each terminal includes a pair of crimping arms at a rear end of each terminal for crimping a wire to the terminal;

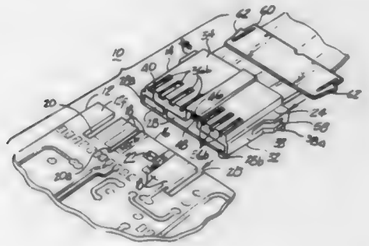
wherein the edge-card plug of the printed circuit board has at least one slot used for mating the circuit board in proper mechanical alignment and electrical polarity with the edgeboard connector; and

wherein the edge-card plug also has a lock hole near one of the three alignment slots that is near the central region of the plug for receiving a lobe on the end of a locking arm formed in one of the plurality of channels along the bottom surface of the connector, the lock arm rising from the bottom of the channel towards a top surface of the connector, the lobe and the lock hole being used for locking the plug to the connector, said connector comprising:

(a) a divided front cavity for receiving the edge-card plug of the printed circuit board, said front cavity having a vertical partition extending the length of said front cavity between the top and bottom surface of the connector, said partition being in alignment with the alignment slot near the central region of the edge-card plug;

(b) a plurality of stop blocks near the rear of said front cavity that project a chosen distance from the top surface, each of said plurality of stop blocks being equally spaced apart but offset a chosen distance above each channel so that only one of said plurality of stop blocks is above each of the channels, said stop blocks being used for ensuring that the terminals of the connector are oriented and inserted correctly within the channels;

(c) an undivided rear cavity for receiving the terminals and



the attached wires which are mated with the conductor runs terminating at the plug of the circuit board, said rear cavity having sidewalls which are the extensions of sidewalls of said front cavity, each of said rear sidewalls having an aperture in a region above the height of sidewalls of the plurality of channels disposed along the bottom surface of the connector;

(d) a right and a left sidewall of each of the terminals disposed between the oval-shaped front end and the crimping arms, said right sidewall having a height that permits a top surface of said right sidewall to slide against and in alignment with a bottom surface of said stop block in each of the channels for assuring that each terminal is oriented and inserted correctly within the channel, said left sidewall of each terminal having a rear locking ear which rises from a top surface of said left sidewall towards the top surface of the connector when the terminal is inserted into a channel in correct orientation;

(e) a lock bar including a pair of collapsible nibs, one of each of said pair of nibs being disposed at opposite ends of said lock bar, said lock bar having a front edge for contacting said ears of said left sidewall of each of the terminals inserted into the channels of the connector, said collapsible nibs of said lock bar being inserted into said apertures of said rear walls of said rear cavity for providing an additional lock for keeping the plurality of terminals in place when the connector is connected to the edge-card plug of the printed circuit board.

4,695,113

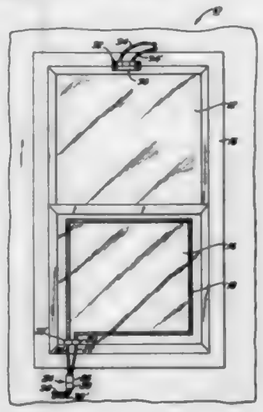
ELECTRICAL WIRE CONNECTORS FOR WIRE OF VARIED SIZES

Ira Eckhaus, 810 E. 3rd St., Brooklyn, N.Y. 11218

Continuation-in-part of Ser. No. 656,860, Oct. 2, 1984, abandoned. This application May 16, 1986, Ser. No. 864,435

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 439—404 **7 Claims**



1. An electrical terminal block, comprising a base portion having a lower receiving wall for receiving a layer of metal foil material thereon, a metal retaining member havng one wall section engaging the foil material and another wall section, at least one elongated notch formed into said another wall section from a free end thereof defining an opposing pair of cutting edges, and a substantially rectangular member having at least one wire receiving bore formed therethrough and aligned with said elongated notch, whereupon the insertion of the insulated electrical wire into said receiving bore and with the sliding of said metal retaining member onto said base portion, said wire and said elongated notch are forced into engagement to slice the insulation and contact the wire core to electrically interconnect the wire core to the foil material.

4,695,114

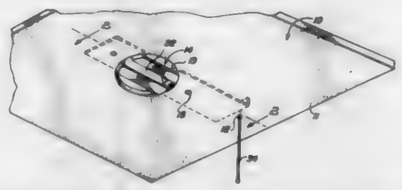
LIGHTING FIXTURE

James R. Stanton, 1117 Wald Rd., Orlando, Fla. 32806, and James R. Legg, 7314 Paprika La., Columbus, Ga. 31909

Filed Apr. 9, 1986, Ser. No. 849,803

Int. Cl.⁴ H01R *13/60*

U.S. Cl. 439—573 **6 Claims**



1. A lighting fixture hanging system comprising in combination:

a flat rectangular panel having a pair of apertures therein and shaped to fit in a suspended grid;

an elongated generally flat lighting fixture suspending bracket having pair of end portions and a circular dropped portion shaped to fit over and align with one aperture in said flat rectangular panel and having a plurality of threaded openings therein positioned to receive threaded fasteners from a lighting fixture, and said lighting fixture suspending bracket circular portion having an elongated opening therein;

an electrical receptacle support tab being fixedly attached to the lighting fixture suspending bracket and fixedly holding an electrical receptacle therein adjacent to the lighting fixture suspending bracket elongated opening; and

said elongated lighting fixtures suspending bracket also having a switch attached to one end portion thereof and having a pull-cord extending from the switch through an aperture in the panel whereby a lighting fixture can be plugged into a receptacle and attached to a lighting fixture suspending bracket and switched with a pull-cord switch.

4,695,115

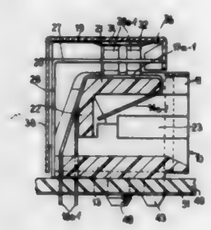
TELEPHONE CONNECTOR WITH BYPASS CAPACITOR

Donald R. Talend, Wauconda, Ill., assignor to Corcom, Inc., Libertyville, Ill.

Filed Aug. 29, 1986, Ser. No. 901,824

Int. Cl.⁴ H01R *13/66*

U.S. Cl. 439—76 **9 Claims**



1. A modular telephone jack comprising an insulating body member formed with an opening for a mating connector, a plurality of electrical contacts mounted in said body member, a plurality of surface mounted tombstone capacitors with first ends in contact, respectively, with said plurality of electrical contacts, an electrically conducting planar member mounted to said body member and formed with a plurality of flexible fingers, respectively, engaged by the second end of said plurality of tombstone capacitors, and means for grounding said electrically conducting planar member.

4,695,116

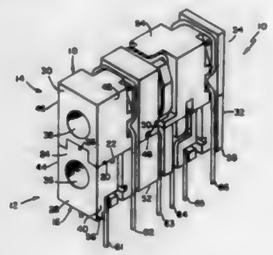
STACKED ELECTRICAL JACKS

James R. Bailey, Chicago, and Emma Basov, Des Plaines, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Continuation of Ser. No. 584,261, Feb. 27, 1984, abandoned. This application May 21, 1986, Ser. No. 870,284

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 439—188 **16 Claims**



1. An electrical jack assembly comprising:

a first electrical jack including an external surface having therein first recess means disposed for receiving electrical conductors and including a pair of first electrical conductors having contact means comprised of respective switch component end portions of the first electrical conductors disposed in electrically contactable relationship with one another in said first recess means for forming therein a first electrical switch, at least one of said switch component end portions of the first electrical conductors being engageable by a jack plug extended in a first direction relative to said first electrical switch, said switch component end portions of the first electrical conductors being electrically connected to respective terminal end portions thereof extending from a base portion of the first electrical jack in a second direction substantially orthogonal to said first direction; and

a second electrical jack including an external surface having therein second recess means disposed for receiving electrical conductors and including a pair of second electrical conductors having contact means comprised of respective switch component end portions of said second electrical conductors disposed in electrically contactable relationship with one another in said second recess means for forming therein a second electrical switch, at least one said switch component end portions of the second electrical conductors being engageable by a jack plug extended in a direction substantially parallel with said first direction, a proximal portion of the second electrical jack overlying a distal portion of the first electrical jack, said switch component end portions of the second electrical conductors being electrically connected to respective terminal end portions thereof said terminal end portions of the second electrical conductors extending from said base portion of the first electrical jack in said second direction substantially orthogonal to said first direction.

4,695,117

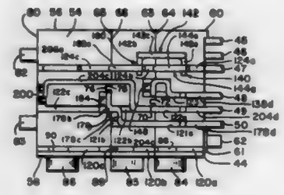
JACK MODULE AND JACKFIELD

William J. Kysiak, Brookfield, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Continuation of Ser. No. 740,442, Jun. 3, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 946,672

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 439—188 **8 Claims**



1. An electrical jack assembly comprising:

a first electrical switch having a pair of contacts, one thereof being engageable by a jack plug and electrically connected to a terminal end portion of the first electrical switch extending beyond a bottom portion of the first switch;

a second electrical switch having a bottom portion disposed over the first electrical switch and having a pair of contacts, one thereof being engageable by a jack plug and electrically connected to a terminal end portion of the second electrical switch extending beyond the bottom portion of the first electrical switch; and

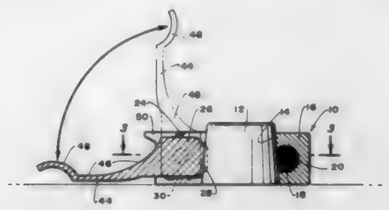
electrical shunt means integrally joined to the respective other ones of the pairs of contacts of the first and second electrical switches for electrically connecting said other ones of the pairs of contacts to one another directly in said assembly.

4,695,118

BATTERY TERMINAL POST CLAMP

Garnik Magdesyan; Stepan Magdesyan, both of 436 Wilber Pl., Apt. D, Montebello, Calif. 90640, and Leon P. Boodanian, 526 Griswold St., Glendale, Calif. 91205

Filed Jul. 2, 1985, Ser. No. 751,024
Int. Cl.[4] H01R *11/26*
U.S. Cl. 439—726 **5 Claims**



1. In combination with an electrically conductive battery terminal post, a clamp to be mounted on said post, an electrical conductor separate from said terminal post for conducting of electricity relative to said terminal post, said clamp comprising:

a housing having an enlarged internal opening, said post to be located within said internal opening in a snug fitting manner;

an open-ended slot formed within said housing said slot connecting with said enlarged internal opening;

a hole formed within said housing, said hole having a longitudinal center axis, said longitudinal center axis being tangentially disposed relative to said enlarged internal opening with said hole connecting with said enlarged internal opening, a portion of said electrical conductor to be located within said hole and physically contact said terminal post;

a cam member mounted within said slot connected by connecting means to said housing, said cam member being pivotable between a locked position and an unlocked position, when in said locked position said cam member being in tight contact with said terminal post causing deflection of a portion of said electrical conductor by said terminal post, when in said unlocked position said cam member being spaced from said terminal post permitting disengaging of said clamp from said terminal post;

said cam member being connected to a manually actuatable handle; and

said clamp including locking means, said locking means being operable to maintain said cam member in said locked position preventing movement to said unlocked position.

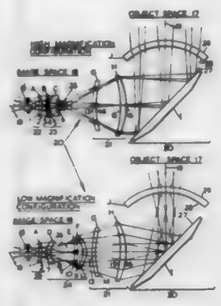
4,695,119

INFRARED OPTICAL SYSTEM

Iain A. Neil, Bearsden, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Jan. 13, 1983, Ser. No. 460,549
Claims priority, application United Kingdom, Jan. 14, 1982, 8201045
Int. Cl.[4] G02B *15/14;* **F21V** *9/06;* **B29D** *13/18*
U.S. Cl. 350—1.2 **5 Claims**

1. A forward looking infrared optical system comprising a refractor telescope having a fixed focus achromatic telephoto objective system composed of a primary objective lens element and a secondary objective lens element aligned on a common optical axis, at least one refractive surface of the primary objective element being aspheric and each of the other refractive surfaces of the objective system being substantially spherical, the secondary objective lens element being negatively powered and having a refractive index lower than that of the primary objective element which is positively powered, the degree of asphericity of said aspheric surface or surfaces being such that the telescope is neither afocal nor diffraction limited, in combination with an optically powered window the two refractive surfaces of which are substantially spherical and



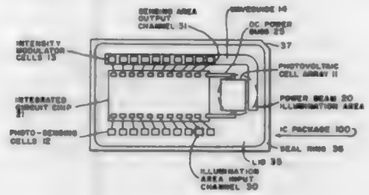
concentric and have their common centre of curvature located on said common optical axis, wherein the spherical aberration introduced to the system by the window is compensated by the spherical aberration of the telescope so that the system is substantially afocal and diffraction limited.

4,695,120

OPTIC-COUPLED INTEGRATED CIRCUITS

James D. Holder, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 26, 1985, Ser. No. 780,139
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.11 **1 Claim**



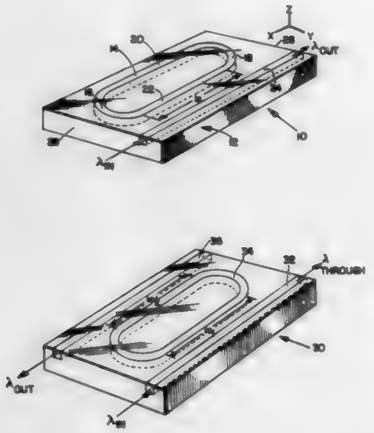
1. A system for an optic-coupled integrated circuit (IC) comprising a plurality of photon sensing devices mounted onto and connected to said IC for providing input signals in response to outside photon information to said IC without any outside electrical or magnetic energy input being involved, a plurality of photon producing devices connected to and being mounted to said IC for providing output photon data information only as outputs of the overall system, a photo-voltaic cell array mounted to and connected to said IC for providing electrical power for said IC in response to outside photon power illumination of said array; and an optical-coupling means mounted to said IC and subject to said power illumination whereby a portion of the illumination is transferred to said photon producing devices so as to provide a base illumination that said photon producing devices will modulate in accordance to outputs transmitted by the IC.

4,695,121

INTEGRATED OPTIC RESONANT STRUCTRES AND FABRICATION METHOD

Amaresh Mahapatra, Lexington; Donald H. McMahon, Carlisle; William C. Robinson, Concord, and Norman A. Sanford, Stillriver, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 28, 1985, Ser. No. 695,467
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.12 **20 Claims**



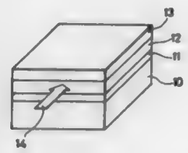
1. An optical resonator for use in controlling optical radiation, said resonator comprising a substrate made of a ferroelectric, Z-cut, crystalline material and having formed therein by the selective exchange of protons for at least one constituent of said substrate material a first optically continuous waveguiding region having predetermined resonant characteristics, said substrate further having formed therein a second waveguiding region having at least one port by which radiation can be coupled in and out of said substrate and at least one section optically coupled to said first optically continuous waveguiding region.

4,695,122

OPTICAL THIN FILM WAVEGUIDE

Koji Ishida, Musashino, and Hiroyoshi Matumura, Iruma, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,478
Claims priority, application Japan, Feb. 1, 1984, 59-15179
Int. Cl.[4] G02B *6/12*
U.S. Cl. 350—96.12 **14 Claims**



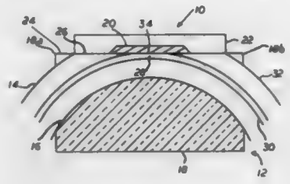
8. A thin film type optical waveguide formed on a substrate, characterized in that at least a part of a core or a clad thereof consists of a sputtered amorphous silicon film which contains such a quantity of at least one other element selected from the group consisting of hydrogen, nitrogen and oxygen that is in the range of quantities not large enough to cause the whole of the silicon to turn into a silicon compound, wherein said amorphous silicon has a refractive index between 2.3 and 3.78.

4,695,123

CUTOFF POLARIZER AND METHOD

Chin-Lung Chang, Phoenix, Ariz., and John R. Feth, Chatsworth, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 20, 1985, Ser. No. 767,553
Int. Cl.[4] G02B *5/30*
U.S. Cl. 350—96.15 **37 Claims**



1. A polarizer for propagating an optical signal of a selected polarization in a single mode optical fiber having a central core and a cladding surrounding the central core and for radiating optical signals of other polarizations from the optical fiber, comprising:

an interaction region formed in said optical fiber;

cutoff means for preventing propagation of optical waves of all polarizations in said optical fiber through said interaction region;

waveguiding means adjacent said interaction region for guiding optical waves past the interaction region;

means for coupling a wave having a particular polarization from said core to said waveguiding means at a first portion of said optical fiber; and

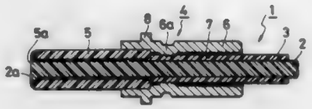
means for coupling the wave having the particular polarization back into said core at a second portion of said optical fiber.

4,695,124

PLASTIC OPTICAL FIBER CABLE WITH FERRULE

Yusaku Himono; Yoshiaki Moriya; Masato Miyahara, and Kazuhiro Suzuki, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,508
Claims priority, application Japan, Jan. 30, 1984, 59-11546[U]; Mar. 9, 1984, 59-33725[U]; Nov. 1, 1984, 59-166048[U]; Dec. 25, 1984, 59-278490
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.20 **16 Claims**



1. A terminated plastic optical fiber cable, comprising:

an optical fiber cable comprised of a plastic optical fiber core surrounded by a protective sheath, wherein at one terminal end of the optical fiber cable the protective sheath is removed to expose a predetermined length of the optical fiber core; and

a composite ferrule coaxially surrounding the terminal end of the optical fiber cable, said ferrule comprising (i) a hollow plastic cylindrical member having an axial bore, said plastic cylindrical member axially surrounding and having a length substantially equal to said predetermined

length of exposed optical fiber core, said plastic cylindrical member having at its end corresponding to the terminal end of the optical fiber cable a recess formed by an enlarged portion of said axial bore, and (ii) a hollow metallic cylindrical member having an axial bore and being joined axially to said plastic cylindrical member and axially surrounding a length of the optical fiber cable, said metallic cylindrical member including a projection in its axial bore which penetrates the protective sheath on said optical fiber cable to axially secure said optical fiber cable in said metallic cylindrical member,

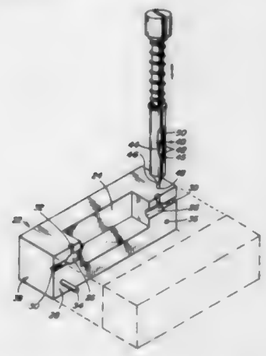
wherein the terminal end of said optical fiber core comprises an enlarged end portion which is flush with the end of said plastic cylindrical member and which extends into said recess to secure the end of said optical fiber core to the end of said plastic cylindrical member.

4,695,125

HERMETIC OPTICAL ATTENUATOR

William J. Sinclair, Kanata; Tibor F. I. Kovats, and Jozef Straus, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 11, 1981, Ser. No. 233,500
Int. Cl.[4] G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **7 Claims**



1. A hermetically packaged passive fiber optic device, the device having at least one optical fiber connected thereto, the device and an outer surface of a bared portion of said at least one fiber having molded therearound a single block of a bismuth-containing fusible alloy characterized by an expansion during solidification of at least 0.2%.

4,695,126

METHOD AND APPARATUS FOR EFFECTING LIGHT ENERGY TRANSMISSION WITH LESSENED REFLECTION

John S. Cook, Ramsen, N.J., assignor to Dorran Photonics, Incorporated, Atlantic Highlands, N.J.

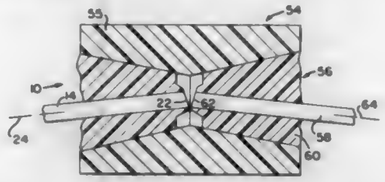
Filed Feb. 11, 1985, Ser. No. 700,458
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **19 Claims**

9. In an optical fiber connector, in combination:

(a) a first housing defining a passage therethrough for residence of an optical fiber therein and having a central axis constituting an energy output axis, at least a portion of said passage adjacent said energy output axis extending along an axis in acute first angle intersecting relation to said energy output axis;

(b) a first elongate optical fiber resident in said first housing passage and accordingly having disposition at said acute first angle to said energy output axis in said passage portion, said fiber defining an end face juxtaposed with said energy output axis, said fiber end face being at an acute second angle to the fiber longitudinal axis and being acutely inclined with respect to said energy output axis;

(c) a second housing defining a passage therethrough for residence of an optical fiber therein, said second housing having a central axis axially aligned with said first housing energy output axis; and



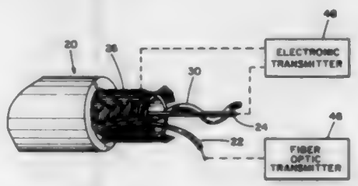
(d) a second elongate optical fiber resident in said second housing passage and defining a fiber end face juxtaposed with a said first housing energy output axis and in energy exchanging relation with said first fiber end face.

4,695,127

HYBRID COAXIAL-OPTICAL CABLE AND METHOD OF USE

Ronald L. Ohlhaber, and Thaddeus R. Uljasz, both of Geneva, Ill., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 27, 1985, Ser. No. 716,579
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **15 Claims**



1. A hybrid cable of substantially uniform cross section throughout its length for concurrently carrying an electrical signal which does not carry confidential information and an optical signal which does not carry confidential information, said cable comprising:

a metallic conductor disposed at the center of the cable for carrying said electrical signal,

a resilient buffer tube,

an optical conductor for carrying said optical signal disposed inside said tube and having an outside diameter smaller than the inside diameter of said tube, said optical conductor being movable inside said tube,

a metallic shield surrounding said metallic conductor and said tube,

centering means for maintaining said metallic conductor and said shield coaxial, and

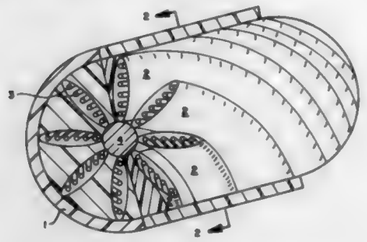
an electrically insulative resilient outer jacket whereby said cable gives the appearance of and taps as a conventional coaxial cable, but additionally can transmit an optical signal.

4,695,128

FIBER OPTIC CABLE

Bernd Zimmerman, and John Chamberlain, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Mar. 25, 1986, Ser. No. 843,984
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **6 Claims**



1. A fiber optic cable comprising:

(a) an outer jacket;

(b) a central member coaxially disposed within the outer jacket, delimiting a first space between the outer jacket and the central member;

(c) a first optical fiber disposed within said first space; and

(d) a buffer tube containing said first optical fiber wound around said central member within said first space, loosely holding said first optical fiber wherein, within any plane perpendicular to the central member, said first optical fiber is free to move within said buffer tube along the line segment containing said first optical fiber radially extending from said central member to said outer jacket, but said first optical fiber is restrained from moving more than slightly elsewhere within said plane.

4,695,129

VIEWER HAVING HEAD MOUNTED DISPLAY UNIT FOR CINERAMA PICTURES

Louis M. H. Paessen, and Giok D. Khoe, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 17, 1984, Ser. No. 611,061
Claims priority, application Netherlands, May 26, 1983, 8301864
Int. Cl.[4] G02B *6/06*
U.S. Cl. 350—96.25 **9 Claims**

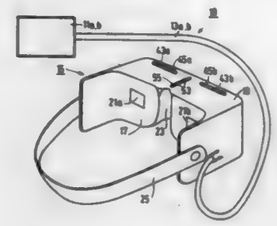
1. Viewer for displaying cinerama television pictures and the like to an individual person comprises

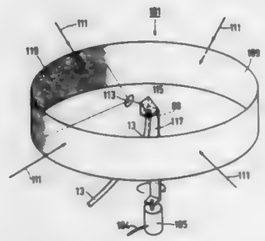
optical fiber bundle means for the transmission of pictures, said bundle having entrance face means onto which the pictures are projected and exit face means to which the pictures are transmitted;

picture generating means for projecting cinerama pictures onto the entrance face means;

a display unit comprising a box shaped holder in which said exit face means of the bundle means is secured, said holder having two viewing apertures formed therein and optical means arranged between said apertures and said exit face means for viewing transmitted pictures, said display unit further comprising a fiberoptic gyroscope for detecting the angular position of said person's head, said gyroscope being coupled to output a control signal which is a measure of the angular rotation of the display unit;

control means for selecting a sub-picture of a cinerama picture generated by said picture generating means in response to receipt of said control signal representing the angular rotation of the display unit;





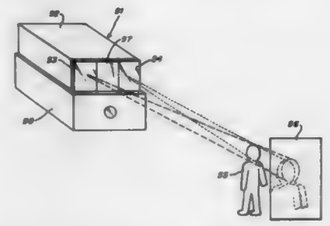
fixing means attached to the display unit for keeping the unit in position on the head of said person.

4,695,130

CAMERA FLASH ATTACHMENT FOR THREE DIMENSIONAL IMAGING SYSTEMS

Antonio Medina, One Emerson Pl., Apt. 17J, Boston, Mass. 02114, and Yehoshua Y. Zeevi, Pierre Hall, Harvard University, Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 537,514, Sep. 30, 1983. This application Aug. 5, 1985, Ser. No. 762,414
Int. Cl.[4] G02B *27/22;* **G03B** *15/02, 15/08, 11/00*
U.S. Cl. 350—132 **6 Claims**



1. A camera flash attachment comprising a light source a pair of filters for transmitting visible light in separate wavebands and means securing said filters in adjacent relation, to each other and over said camera flash attachment to simultaneously filter light from said camera flash attachment whereby light from said flash attachment passing through said pair of filters will create two sets of shadows having distinctive characteristics defined by said separate wavebands.

4,695,131

DISUBSTITUTED ETHANES AND THEIR USE IN LIQUID CRYSTAL MATERIALS AND DEVICES

Peter H. Balkwill, 45 Cressingham Road, Reading, Berkshire; David L. Bishop, 19 Freshwater Drive,, Hamworthy, Poole, Dorset; Andrew D. Pearson, Flat 5, Ettrick House, Ettrick Road, Branksome Park, Poole, Dorset; Ian C. Sage, 238 Freshwater Drive, Hamworthy, Poole, Dorset; George W. Gray, 33 Newgate Street, Cottingham, Humberside; David Lacey, 19 Killdale Close, Hull, Humberside; Kenneth J. Toyne, 25 Hall Road, Hull, Humberside, and Damien G. McDonnell, Flat 10, Eton Hurst, Upper Chase Road, Malvern, Worcester, all of England

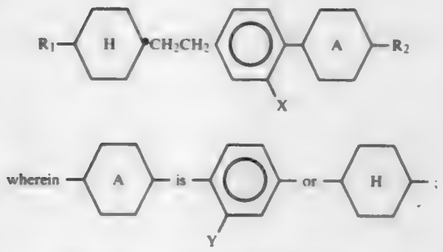
Filed Jan. 25, 1984, Ser. No. 573,819

Claims priority, application United Kingdom, Jan. 26, 1983, 8302119; Oct. 24, 1983, 8328370

Int. Cl.⁴ G02F *1/13*; C09K *19/30*; C07C *25/18, 43/19*

U.S. Cl. 350—350 R **13 Claims**

1. A compound having the formula:



wherein A is or H;

R_1 is hydrogen or non-chiral alkyl having up to 12 carbon atoms;

R_2 is hyrogen or non-chiral alkyl or non-chiral alkoxy having up to 12 carbon atoms;

each of X and Y independently represent H or F provided that at least one of X and Y is present and is F;



represents a cyclohexane ring which is in the trans configuration if 1,4-disubstituted;



represents a phenylene ring; and the total number of carbon plus oxygen atoms in R_1 and R_2 is less than 10.

9. A liquid crystal composition comprising a mixture of compounds, at least one being a compound of Formula I. as claimed in claim 1.

4,695,132

F0 SINGLE LENS

Nobuo Sakuma, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

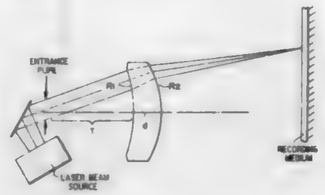
Filed Jul. 1, 1982, Ser. No. 394,148

Claims priority, application Japan, Jul. 2, 1981, 56-103665

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.⁴ G02B *3/00*

U.S. Cl. 350—409 **13 Claims**



1. An *f0* single lens having an optical axis used with a laser beam source providing a laser beam through an entrance pupil on an object side of the lens on said optical axis for focusing the laser beam, comprising a meniscus lens having a positive power with a concave first surface directed toward the object side and satisfying the following:

(i) $1.6 \leqq n \leqq 2.0$

(ii) $-5 \leqq R1/f \leqq -1.7$

(iii) $-0.21 \leqq T/nf \leqq -0.16$

wherein R1 represents the radius of curvature of the first surface, f the focal length, n the refractive index, and T the distance between the first surface of the lens and the entrance pupil to said lens along the optical axis.

4,695,133

HIGH RANGE ZOOM LENS

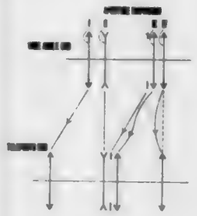
Nozomu Kitagishi; Sadatoshi Takahashi, both of Tokyo; Keiji Ikemori, Kanagawa; Kikuo Momiyama, Kanagawa, and Tsunefumi Tanaka, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,376

Claims priority, application Japan, Apr. 2, 1984, 59-65489

Int. Cl.⁴ G02B *15/16*

U.S. Cl. 350—427 **11 Claims**



1. A zoom lens comprising:

from front to rear, a first lens unit of positive power, a second lens unit of negative power, a third lens unit of positive power and a fourth lens unit,

when zooming, said second lens unit remaining stationary, said first lens unit and said third lens unit moving along an optical axis independently of each other, and said fourth lens unit moving in such a manner that the direction of advance changes on the way.

4,695,134

COMPACT PHOTOGRAPHIC LENS

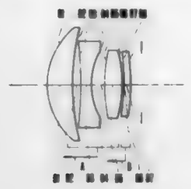
Hiroki Nakayama; Yasuhisa Sato, both of Kanagawa, and Yasuyuki Yamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1984, Ser. No. 678,222

Claims priority, application Japan, Dec. 6, 1983, 58-230268

Int. Cl.⁴ G02B *13/18, 9/34*

U.S. Cl. 350—432 **10 Claims**



1. A photographic lens comprising, from front to rear, a positive meniscus-shaped first lens unit of forward convexity, a negative second lens unit having a front surface concave toward the front, a positive bi-convex third lens unit and a negative bi-concave fourth lens unit wherein the following conditions are satisfied:

$-3.5 < r3/f < -2.0$

$-1.8 < r7/f < -0.5$

$1.4 < r8/f < 6.5$

$0 < d6/f < 0.017$

where f is the focal length of the entire system, r3 is the radius curvature of the paraxial region of the front surface of said second lens unit, r7 and r8 are the radii of curvature of the front and rear surfaces of said fourth lens unit, and d6 is the axial air space between said third and said fourth lens units when focused to infinity.

4,695,135

INFORMATION DISPLAY PANEL

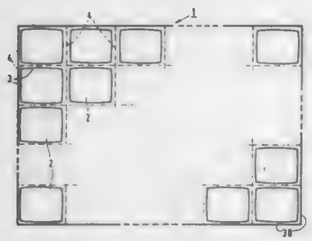
Hendrikus B. Den Exter Blokland, and Petrus J. van Raay, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,775

Claims priority, application Netherlands, May 17, 1985, 8501424

Int. Cl.⁴ G02B *3/08, 27/22*

U.S. Cl. 350—452 **14 Claims**



1. An information display panel comprising a plurality of information display units arranged in a rectangular matrix of rows and columns, each display unit comprising a picture tube having a faceplate with a curved surface and an image magnifying element secured thereto, said image magnifying element comprising a Fresnel lens spaced from said face plate, each said Fresnel lens exhibiting in two perpendicular directions a curvature which corresponds to the curvature of the respective faceplate, each said Fresnel lens being concentric with the surface of the respective face plate, said display unit being arranged so that respective Fresnel lenses form a unitary picture without discontinuities.

4,695,136

PROJECTION OBJECTIVE ASSEMBLY

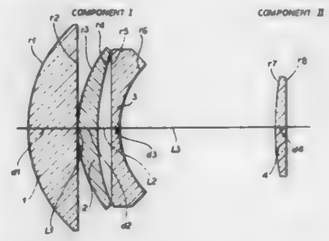
Hiltrud Schitthof, Schweppenhausen, Fed. Rep. of Germany, assignor to Jos. Schneider Optische Werke Kreuznach GmbH & Co. KG, Kreuznach, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,615

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407898

Int. Cl.⁴ G02B *9/34, 15/08*

U.S. Cl. 350—472 **12 Claims**



1. A projection objective assembly for forming a set of at least two objectives with different focal lengths, comprising:

a first component common to all objectives of said set consisting of three lenses; and

a plurality of interchangeable second components each consisting of at least one lens, spaced from said common component along a common optical axis therewith, said second components being replaceable by one another solely to select different overall focal lengths of objectives of said set.

4,695,137

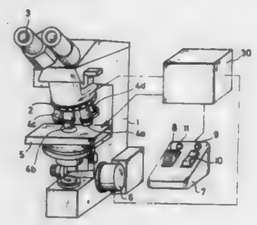
MOTORIZED FOCUS DRIVE FOR A MICROSCOPE

Reinhard Jörgens, Oberkochen; Bernd Faltermeier, and Franz Trautwein, both of Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,137

Int. Cl.⁴ G02B *21/24*; G05B *1/06*

U.S. Cl. 350—521 **11 Claims**



1. A microscope having a focus drive which can be moved by motor and having an operating means by which the focus drive can be manually controlled, characterized by the fact that the operating means is a finger wheel (8) or knob which is coupled to an electronic bit-signal generator (encoder 18) and

is located in a separate control console (7) set up next to the microscope (1).

4,695,138

PANORAMIC REAR VIEW AUTOMOBILE MIRROR

David Epstein, 54 Turning Mill Rd., Lexington, Mass. 02173

Filed Nov. 26, 1986, Ser. No. 934,948
Int. Cl.[4] B60R *1/04, 1/08;* G02B *5/10, 7/18*
U.S. Cl. 350—615 10 Claims



1. A panoramic rear-view mirror adapted to be mounted on the windshield of a motor vehicle, which mirror provides a one position, relatively continuous, panoramic rear view without distortion of distance perspective, while at the same time keeping the forward view of the highway within peripheral vision, which mirror comprises in combination:

(a) mirror housing means which comprises a first and a second wing mirror casing;

(b) a flat reflecting surface mirror centered between the first and second side mirror casings;

(c) a first reflecting mirror disposed in the first wing casing and a second reflecting mirror disposed in the second wing casing, the first and second mirrors in the same vertical plane as the center mirror, and the adjacent mirror edges closely adjacent to the respective edges of the central mirror to provide a substantially continuous reflecting mirror view;

(d) the first and second mirrors having a flat surface reflecting area and a convexly curved mirror surface area at the exterior peripheral edge, the flat surface occupying a substantial area portion of said mirror to provide minimal distortion of distance perspective;

(e) first adjustment means to secure the first and second casings to the central mirror and to move the first and second casings about a vertical axis with respect to the central mirror;

(f) second adjustment means to move the first and second mirrors within the respective casings about a horizontal axis within the respective casings; and

(g) means to connect at a defined distance the central mirror to the motor vehicle.

4,695,139

PLURAL-ZONE MIRROR FOCUSING SYSTEM

John P. Bagby, Anaheim Hills, and Richard L. Hedden, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 26, 1984, Ser. No. 686,334
Int. Cl.[4] G02B *17/06, 17/08*
U.S. Cl. 350—620 5 Claims

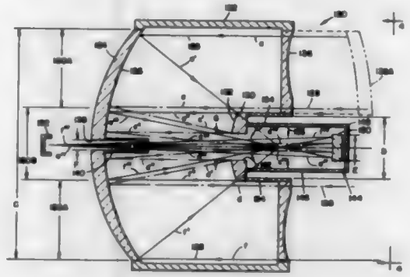
1. An optical system capable of guiding radiation from a distant source of radiation to a sensor of the radiation, said system comprising:

a primary reflector having a curved surface facing radiation from said source;

a secondary reflector having a curved surface facing the curved surface of said primary reflector;

at least one of said curved surfaces comprising a set of concentric zones for receiving radiations reflected from the other of said curved surfaces for the forming of an image of said object; wherein

said surfaces are disposed relative to each other to implement a sequence of multiple reflections of rays of radiant energy from said object to said image, said sequence of multiple reflections increasing the focal length of said optical system to provide for a reduced viewing angle and increased offaxis rejection of extraneous radiation, each of said zones being positioned for intercepting only one leg of a pass in said sequence of reflections, and each of said zones being separately formulated for adjusting the orientation of a leg of said sequence of reflections to compensate for aberrations in the forming of said image; and wherein



the curved surface of the primary reflector is concave and the curved surface of said secondary reflector is convex; said system further comprising

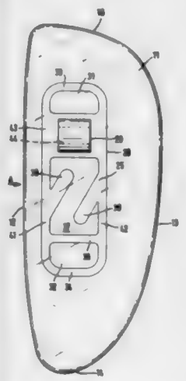
first and second apertures disposed respectively in said primary reflector and said secondary reflector, one of said apertures being positioned for receiving reflections in said series of reflections, and wherein said system further comprises means for directing radiation between said apertures for the formation of an image of said object behind one of said reflectors.

4,695,140

PAD

Walter H. Bononi, Fellbach-Schmiden, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,709
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 82366322[U]
Int. Cl.[4] G02C *1/00, 5/02*
U.S. Cl. 351—139 7 Claims



1. A pad adapted to be fastened angularly movable to pad levers of spectacle frames comprising:

(a) a kidney-shaped pad body, which has a skin contact surface merging, with circumferential radii, in a rear surface which is spaced from the skin contact surface,

(b) an anchoring plate, having a plane around which the pad body has been cast and which has an elongated contour in the longitudinal extension of the pad body and is substantially thinner than the pad body,

(c) a finger having a free end zone which projects perpendicularly from the anchoring plate and which passes through the rear surface of the pad body and in its free end zone has a cross hole which extends transversely to the longitudinal extension of the pad body, the anchoring plate and the finger being of the same material,

(d) and the improvement wherein:

(1) The pad body consists of glass-clear silicone rubber having Shore-D hardness of 10–30 according to DIN 53 305, and

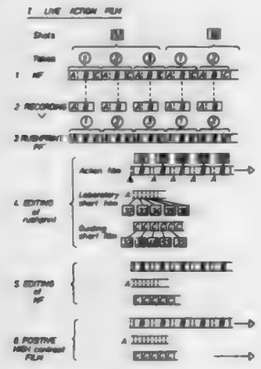
(2) The anchoring plate consists of a transparent plastic material that is harder than the pad body; the length of the anchoring plate is several times greater than its width; and the elongated contour of the anchoring plate extends perpendicularly and substantially beyond the finger and comprises a lattice-work of openings and small rods in an ajoure arrangement that facilitates flexure of the anchoring plate together with the pad body while providing a sufficient anchoring area to secure the anchoring plate substanially undetachably in the pad against forces extending longitudinally substantially over the anchoring plate in a direction substantially parallel to the finger.

4,695,141

METHOD FOR THE PRODUCTION OF A COMBINED LIVE-ACTION AND ANIMATION MOTION PICTURE FILM

Raoul Servais, Middelkerke, Belgium, assignor to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Dec. 18, 1985, Ser. No. 810,356
Claims priority, application European Pat. Off., Dec. 24, 1984, 84116294.4
Int. Cl.[4] G03B *19/18*
U.S. Cl. 352—50 9 Claims



1. In a method for the production of a motion picture film combining at least one live-action subject and animation, in which a series of successive frames of a motion picture photographic color film are exposed in an animation camera to the combination of a background image and a superposed transparent cell sheet of such live action subject, and then photographically processed, the improvement which comprises the steps of:

(a) producing photographic positive-type transparent enlargements of the images of selected frames of a black and white generally continuous tone live-action film of at least one subject, such enlargement carrying its image in a format which corresponds with the format of said background image, said image of such enlargement having a generally continuous tone grey gradation generally corresponding to the gradation of the image of the corresponding frame of said live subject film,

(b) producing subject contour images from the subject enlargements by hand-tracing onto a drawing sheet the controus of the distinct areas of the images of said subject enlargements,

(c) superimposing a transparent cell sheet upon each said subject contour image and applying to the areas of said cell sheet delineated by the underlying contour image opaque colorant of appropriate coloration to said live action frames, and

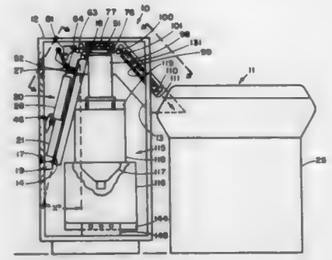
(d) forming a sandwich of each subject enlargement in registration with the corresponding cell sheet and combining said sandwich with the background image for the exposure of a frame of said motion picture film in said animation camera.

4,695,142

AUTOMATIC PHOTO IMAGING SYSTEM

David R. Holt, Rockford, Ill., assignor to Harold A. Williamson, Rockford, Ill.

Filed Jul. 25, 1985, Ser. No. 758,786
Int. Cl.[4] G03B *29/00;* G01D *9/42;* G03G *21/00*
U.S. Cl. 354—76 21 Claims



1. An automatic multi photo imaging system employing multiple single sheet film, said system comprising

a single sheet film transport means operative to receive single sheets of film and mechanically deliver said single sheet along a film sheet path to a first film image exposure row position, said image exposure row being at right angles to said film path,

said film transport means further having means to detect an arrival of said film sheet when said film sheet is adjacent said first film image exposure row position and to stop said film sheet movement along said path,

a video monitor projector means mounted for movement at right angles to said film sheet path, said projector means including a video monitor tube coupled by a projection conduit having one open end secured to said video monitor and configured to match said video monitor, said conduit having the other open end positioned immediately adjacent said film path, said other open end configured to match the boundries of an image to be projected upon said film.

said projection conduit having therein a remote, shutter controlled single lens,

said video projection means having driving means to move said projection means incrementally back and forth across said film sheet in a single degree of freedom path to thereby establish a first row of images across said film sheet upon the actuation of said remote shutter controlled single lens at each incremental movement of said video projection means,

said transport means including means to advance said film sheet along said filmsheet path to thereby present said conduit other open end to unexposed film and thereby

establish another row of possible images across said sheet of film by the use of said single lens moveable in said single degree freedom path,

said single sheet film transport means including multiple apertured image boundry defining means positioned between said video monitor projection means remote open end and said film sheet when said film sheet is at said first film image exposure row position,

said remote conduit opening configuration matching said aperatures in said image boundry defining means to thereby ensure precisely defined image formation on said film as said video monitor projector means incrementally moves from apperture to apperture in said image boundry defining means.

4,695,143

INSTANT PHOTOGRAPHIC APPARATUS

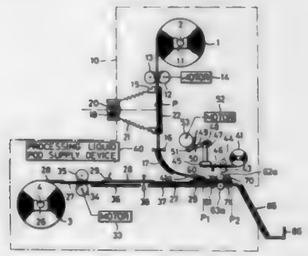
Yuji Oshikoshi, Tokyo; Masashi Kato, and Hisashi Kikuchi, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1986, Ser. No. 823,279

Claims priority, application Japan, Jan. 28, 1985, 60-12676; Jan. 28, 1985, 60-12677; Jan. 28, 1985, 60-12678

Int. Cl.[4] G03B *17/50*

U.S. Cl. 354—86 **17 Claims**



17. An instant photographic apparatus in which a processing liquid is distributed between superposed exposed photosensitive and image-receiving members so as to produce on said image-receiving member a positive image corresponding to a latent image created on said exposed photosensitive member by means of diffusion transfer processing, said apparatus comprising means for separately advancing an exposed photographic member and an image-receiving member toward a superposing position, and means within said apparatus for withdrawing a pod of the processing liquid from a supply source comprising a plurality of said pods, and depositing said pod on the exposed photosensitive member or the image-receiving member before being superposed in contact with each other.

4,695,144

DRIVE APPARATUS OF LENS AND EXPOSURE MECHANISM BY MOTOR

Tsunemi Yoshino, Nara; Katsuji Ishikawa, Higashiosaka, and Hiroshi Iwata, Ikoma, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Aug. 25, 1986, Ser. No. 899,914

Claims priority, application Japan, Aug. 4, 1985, 60-186132; Aug. 24, 1985, 60-186131

Int. Cl.[4] G03B *1/18*

U.S. Cl. 354—195.11 **14 Claims**

1. A drive apparatus of lens and exposure mechanism by a motor comprising:

a motor as a drive source which rotates both in normal direction and reverse direction,

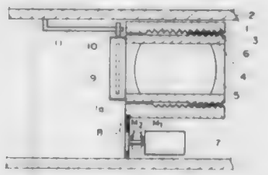
a rotary member mounted on a frame of an optical lens appratus,

transmission means for transmitting rotating force of said motor to said rotary member,

a lens barrel which holds the lens and is disposed at a specified position inside said rotary member,

force-direction conversion means for converting operating direction, being disposed between said rotary member and lens barrel to transmit the rotating motion of said rotary member to said lens barrel through a predetermined frictional force, making said lens barrel move linearly,

an exposure mechanism affixed to said lens barrel, having a drive member which causes plural blade members provided inside the main body open and close by moving thereof, and



a protruding member which projects from said frame and is engaged with said drive member in a manner to allow a linear motion of said lens barrel in the direction parallel to optical axis of said lens and to prohibit rotation of said drive member around said optical axis,

whereby said lens barrel is moved to a predetermined position, together with said exposure mechanism, by the rotation of said motor in a predetermined direction, and said drive member of said exposure mechanism is moved to a predetermined position by a rotation in the reverse direction of said motor.

4,695,145

MOTOR BUILT-IN LENS MOUNTING

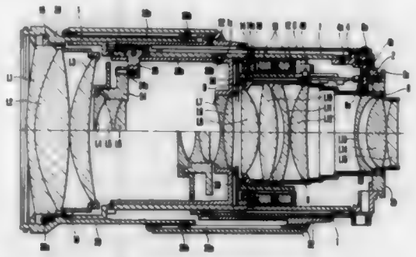
Kenichi Kawamoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Feb. 3, 1986, Ser. No. 825,191

Claims priority, application Japan, Feb. 7, 1985, 60-16216[U]; Dec. 27, 1985, 60-204709[U]

Int. Cl.[4] G03B *9/06*

U.S. Cl. 354—271.1 **6 Claims**



1. A diaphragm device comprising:

(a) a magnet rotor having an aperture through which light passes, said rotor being magnetized about an optical axis;

(b) an exciting coil and yoke arranged on an outer or inner periphery of said magnetic rotor;

(c) a diaphragm unit drivenly connected to said magnetic rotor; and

(d) bearing means for bearing said magnetic rotor, said bearing means including bearing balls, holes or a recess for said balls directly formed in one end portion of an axial length of said magnetic rotor, and a receiving member for receiving said balls, said receiving member being fixedly secured to a stationary member in a lens barrel, said magnetic rotor being supported by said receiving member rotatably around the optical axis by means of said bearing balls.

4,695,146

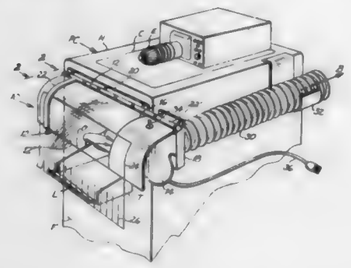
FUME EXHAUST SYSTEM FOR PHOTO PRINT PROCESSORS

Charles L. Fuller, 2340 Loma Linda St., Sarasota, Fla. 33579

Filed Oct. 10, 1986, Ser. No. 917,772

Int. Cl.[4] G03D *13/00*

U.S. Cl. 354—309 **6 Claims**



1. A fume and heat exhaust system adapted for installation in conjunction with the front panel of a photo print processor the front panel having a photo discharge opening and a photo tray below the discharge opening, said system comprising:

an air blower having an inlet and an outlet;

a rigid hood having opposing upper and lower edge margins and opposing right and left end margins, said hood contoured of a thin sheet of material for mating alignment of said hood right end margin with said blower inlet;

hood mounting means for attaching said hood along said hood upper edge margin against the front panel of the photo print processor above the photo discharge opening;

blower mounting means for positioning said blower inlet adjacent said hood right end margin;

said hood extending outwardly and downwardly from said hood upper edge margin to said hood lower edge margin, said hood lower edge margin positioned such that said hood substantially covers the photo discharge opening and tray;

said blower outlet directed away from the photo discharge opening and tray.

4,695,147

APPARATUS AND METHOD FOR PREVENTING THE FORMATION OF A DEPOSIT FROM A PROCESSING SOLUTION ON A FILM TRANSPORT MEMBER

Jean Thibault, Chalon sur Saone, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,593

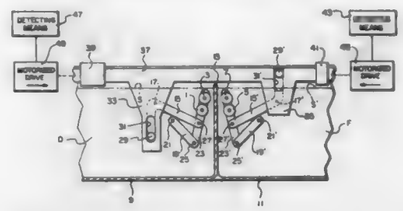
Claims priority, application France, Dec. 23, 1985, 85 19016

Int. Cl.[4] G03D *3/08*

U.S. Cl. 354—322 **12 Claims**

1. An improved photographic processing apparatus of the type wherein transport means is operated to transport a photosensitive material along a predetermined path through a free surface of a volume of processing solution, and wherein the improvement comprises:

means for moving said transport means to an operative position elevated at least partially above the free surface of the processing solution, to enable said transport means to be operated to transport the photosensitive material along the predetermined path through the free surface of the processing solution, and to a non-operative position immersed in the processing solution below its free surface, to prevent the formation of a deposit from the solution on said transport means generally during non-use of the transport means.



4,695,148

FLASH PHOTOGRAPHING SYSTEM

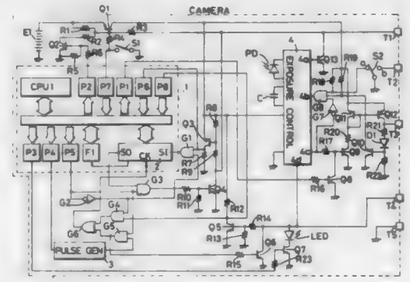
Nobuhiko Terui, Tokyo, and Hisatoshi Takahata, Sakura, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

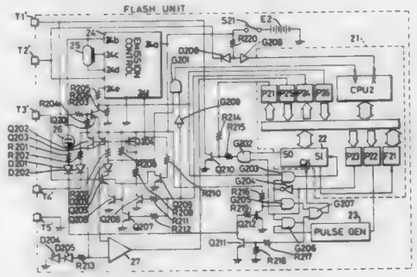
Filed May 12, 1986, Ser. No. 861,712

Claims priority, application Japan, May 15, 1985, 60-103361

Int. Cl.[4] G03B *15/03*

U.S. Cl. 354—413 **4 Claims**





1. A flash photographing system comprising:

a flash unit including flash emitting means and data control means, said flash emitting means being provided with a flash tube and circuit means for energizing said flash tube, said data control means being provided with data generating means for generating first data concerning with said flash unit, data reading means, and means for generating a control signal prior to the first data;

a camera including power source means, power source control means for enabling said power source means in response to the control signal, and data control means

driven by said power source means, and said data control means being provided with data generating means for generating second data concerning said camera, and data reading means; and

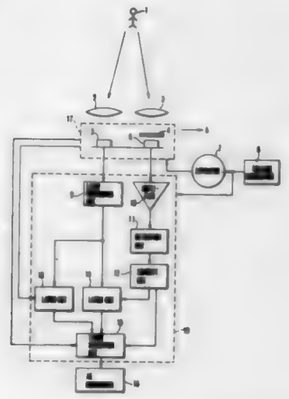
transfer means, connecting said flash unit to said camera, for transferring the control signal from said flash unit to said power source control means of said camera, the first data from said flash unit to said data control means of said camera, and the second data from said camera to said data control means in said flash unit.

4,695,149

LIGHT MEASURING DEVICE

Mazao Shikanmi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Apr. 29, 1986, Ser. No. 857,237
Claims priority, application Japan, May 9, 1985, 60-096252
Int. Cl.[4] G03B *7/08*
U.S. Cl. 354—430 **10 Claims**



1. A light measuring device comprising a sensor portion including a light measuring element and a heat source sensor arranged in positions to receive light substantially from a same optical axis; scanning means for scanning a photographic image plane by said sensor portion; and light measuring detecting means for detecting a light measurement output signal of said light measuring element when an object to be photographed is detected by said heat source sensor.

4,695,150

DIAPHRAGM-CONTROL APPARATUS FOR CAMERA

Akira Ogasawara, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,462
Claims priority, application Japan, Sep. 20, 1985, 60-208474
Int. Cl.[4] G03B *7/095*
U.S. Cl. 354—448 **3 Claims**

1. A diaphragm-control apparatus for controlling stopping-down of an aperture of a photographing lens for a camera to obtain a desired aperture value, including:

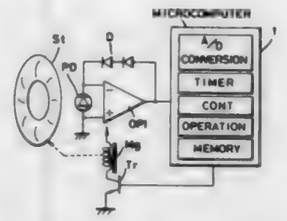
(a) light metering means for detecting an intensity of light reflected by an object to be photographed and transmitted through said aperture and sequentially generating electrical signals each corresponding to a detected light intensity;

(b) memory means for storing a predetermined number of electrical signals;

(c) storing means for sequentially storing the electrical signals in said memory means, said storing means being adapted to store the electrical signal in place of an oldest electrical signal stored in said memory means;

(d) operating means for sequentially calculating changing velocities represented by the electrical signals during stopping-down according to the predetermined number of electrical signals stored in said memory means, said operating means being adapted to sequentially calculate a predicted electrical signal to be produced by said light metering means after a lapse of a predetermined period of time from a time corresponding to a newest electrical signal stored in said memory means, according to a corresponding one of calculated changing velocities; and

(e) stopping means for detecting that a value represented by the predicted electrical signal calculated by said operating means has a predetermined relationship with the desired aperture value, and for interrupting the stopping-down.

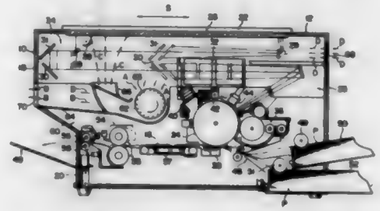


4,695,151

IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1985, Ser. No. 788,724
Claims priority, application Japan, Oct. 26, 1984, 59-225308
Int. Cl.[4] G03G *15/00, 15/12*
U.S. Cl. 355—3 R **10 Claims**



1. An image forming apparatus which illuminates an original for exposure to form an image corresponding to reflected light from the original, comprising:

an exposure table to carry the original thereon;

an optical unit for exposing the original on the exposure table, said optical unit including a light source;

ventilating means for ventilating the interior of the optical unit, said ventilating means including a first fan, first duct means for guiding air from the first fan to the outside of the optical unit, and second duct means for returning part of the air from the first fan to the optical unit; and

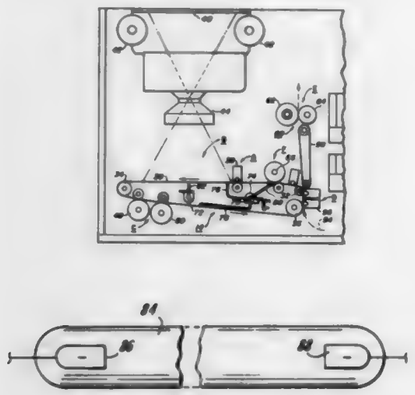
a photosensitive drum adapted to be illuminated with the reflected light from the original to form thereon a latent image corresponding to the image of the original, wherein said first fan has an axial dimension substantially equal to the longitudinal dimension of the photosensitive drum.

4,695,152

CHARGE ERASE DEVICE FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Charles J. Urso, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 676,030, Nov. 28, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,370
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **2 Claims**



1. An electrophotographic printing machine comprising: a photoconductive member; means for forming a charge on the surface of said member, means for exposing said surface so as to form a latent electrostatic image on said surface and means for reducing the charge in at least one region of said surface, said charge reduction means including at least one lamp, said lamp comprising an elongated tubular glass envelope having cold cathode electrodes sealed into its opposite ends and containing neon at a pressure range of 18–25 torr, said lamp operating over a current range of 5 to 50 ma(rms);

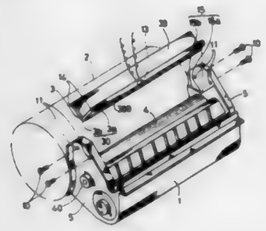
wherein said lamp operates at a current of approximately 35 ma (rms) and at a pressure range of approximately 21 torr.

4,695,153

DOCTOR BLADE POSITIONING IN ELECTROPHOTOGRAPHIC COPYING MACHINES

Mitsuo Matsushita, Higashiosaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 29, 1986, Ser. No. 823,865
Claims priority, application Japan, Jan. 30, 1985, 60-11911[U]
Int. Cl.[4] G03G *15/08, 15/09*
U.S. Cl. 355—3 DD **5 Claims**



1. In a developing apparatus of an electrophotographic copying machine which comprises a developing housing having side walls which support a developing sleeve having a cylindrical surface for transporting a developer and a doctor blade which regulates the amount of developer transported by said developing sleeve, a supporting means for supporting and positioning said doctor blade with respect to said developing sleeve comprising:

means arranged at said housing side walls for rotatably supporting said developing sleeve at ends thereof for rotation about an axis of said cylindrical surface;

said doctor blade having a leading surface edge formed thereon by a pair of control surfaces including a first planar control surface parallel to said axis and lying on a normal line with respect to said developing sleeve axis and a second planar control surface lying in a plane parallel to said axis and intersecting said first planar surface at an angle θ such that $90° > \theta > 0°$, the intersection of said planar surfaces forming a leading surface edge extending in the same direction as said axis of said sleeve; and

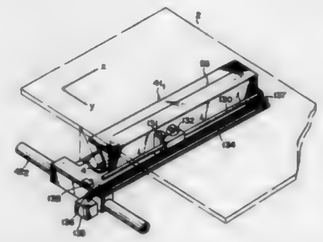
a supporting means for supporting said doctor blade at said control surfaces comprising a pair of supporting sections formed, respectively, at each of said housing side walls, said supporting sections each comprising a first planar supporting surface parallel to said first control surface and a second planar supporting surface parallel to said second control surface, and means for hold said doctor blade control surfaces firmly against said supporting section supporting surfaces such that said leading surface edge is supported at a fixed distance from said cylindrical surface of said developing sleeve to regulate the amount of developer transported thereby.

4,695,154

IMAGE FORMING APPARATUS WITH DOCUMENT SIZE DETECTION

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1985, Ser. No. 811,872
Claims priority, application Japan, Dec. 25, 1984, 59-278422; Dec. 27, 1984, 59-278228
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—8 **24 Claims**



1. An image forming apparatus with document size detection, said apparatus comprising:

a document table on which a document subjected to image formation is placed at one end side thereof;

image formation instruction means for supplying an image formation instruction;

document scanning means, movable along said document table, for scanning the document from the one end side to the other end side of said document table to obtain image data in accordance with the image formation instruction;

light emitting and receiving means provided on said document scanning means to be movable along a direction perpendicular to a moving direction of said document scanning means, and including a light emitting section for emitting light in a direction of said document table and a light receiving section for receiving a reflected component of light emitted by said light emitting section;

first control means for, in an initial state, setting said docu-

ment scanning means at a predetermined initial position of said document table and setting said light emitting and receiving means at a predetermined initial position on said document scanning means;

document size detection instruction means for supplying a document size detection instruction prior to the image formation instruction;

second control means for moving said document scanning means from the predetermined initial position in accordance with the document size detection instruction;

first detection means for detecting a change in amount of light received by said light receiving section, when said light emitting and receiving means has reached one side portion of the document, upon movement of said document scanning means by said second control means;

third control means for moving said light emitting and receiving means from the predetermined initial position in accordance with the detection signal from said first detection means;

second detection means for detecting, upon movement of said document scanning means and said light emitting and receiving means by said first and third control means, a change in amount of light received by said light receiving section when said light emitting and receiving means has reached the other side portion of the document;

document size calculation means for calculating two dimensions of the document based on the detection signals from said first and second detection means;

image forming means for transferring the image data from said document scanning means onto an image forming medium at a predetermined magnification; and

fourth control means for generating a control signal required for at least one of said document scanning means and said image forming means based on the calculation result from said document size calculation means.

4,695,155

READER-PRINTER HAVING AN IMAGE ROTATION DEVICE

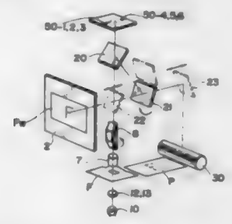
Kenjiro Ishii, Sagamihara; Yutaka Satoh, Yokohama; Fumio Fukumoto, Sagamihara; Hajime Otsuki, Yokohama; Yasuhide Kokura, Machida, and Shuichi Saito, Kawasaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1986, Ser. No. 824,083

Claims priority, application Japan, Jan. 31, 1985, 60-17826; Mar. 20, 1985, 60-57457

Int. Cl.⁴ G03B *13/28*

U.S. Cl. 355—45 **15 Claims**



1. A reader-printer comprising:

projection means for projecting an image of a microfilm to a screen and onto a photosensitive medium;

copy forming means for forming the image projected onto the photosensitive medium into copies;

feed means for feeding copy papers toward the photosensitive medium;

image rotation means disposed in a light path of said projection means for optically rotating the image;

drive means for driving said image rotation means;

direction detecting means for detecting the orientation of the projected image; and

control means for controlling said drive means so that the orientation of the projected image and the orientation of fed copy paper agree with one another in accordance with said direction detecting means.

4,695,156

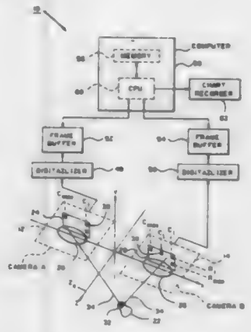
RANGE FINDING METHOD AND APPARATUS

Jeffrey D. Taft, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 3, 1986, Ser. No. 882,006

Int. Cl.⁴ G01C *3/00, 5/00*

U.S. Cl. 356—1 **20 Claims**



1. A method for finding the range of a target object, comprising the steps of:

(a) viewing the target object from a first perspective, using a camera having a sensor with light-sensitive regions that are disposed in a row having ends, to provide a signal $V_A(I_A)$ corresponding to the first perspective, where V_A is a voltage proportional to light intensity at a light-sensitive region of the row and I_A is an integer corresponding to the distance between the respective light-sensitive region and a predetermined end of the row;

(b) viewing the target object from a second perspective, using a camera having a sensor with light-sensitive regions that are disposed in a row having ends, to provide a signal $V_B(I_B)$ corresponding to the second perspective, where V_B is a voltage proportional to light intensity at a light-sensitive region of the row and I_B is an integer corresponding to the distance between the respective light-sensitive region and a predetermined end of the row;

(c) finding a disparity function $D(I_A)$ which maps $V_A(I_A)$ onto $V_B(I_B)$ for every I_A in an interval, the interval including a plurality of consecutive integers;

(d) using the disparity function $D(I_A)$ to determine the range of the target object at a plurality of points on the target object; and

(e) providing electrical signals corresponding to the range to an output device.

4,695,157

SOLDER PROCESS INSPECTION DIFFUSER ASSEMBLY

Gary L. Schoenbaum, Newtown; Lewis A. Latanzi, Roxbury; Stephen L. Hedrick, and Harold V. Johnson, both of Danbury, all of Conn., assignors to Benchmark Industries Incorporated, Manchester, N.H.

Filed Oct. 11, 1985, Ser. No. 786,609

Int. Cl.⁴ G01N *21/47*

U.S. Cl. 356—237 **12 Claims**

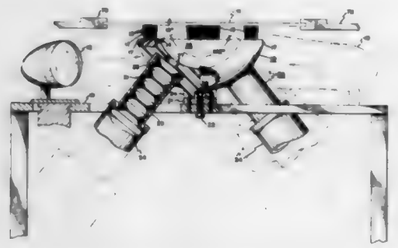
1. An optical inspection unit for inspecting an irregular surface of an object such as the solder surface of a substantially flat printed circuit board comprising

means supporting the object while exposing its surface to be inspected,

a maneuvering base adjacent to the supported object and having a mounting plate facing said surface and spaced therefrom,

X-Y maneuvering means associated with said base and said object supporting means and connected to produce successive relative repositioning movements of the plate and the surface upon command,

a thick-walled translucent concave dome having a hollow central cavity bounded by a rim, with the cavity being defined by an interior face arching internally away from said inspected surface, the dome being centrally mounted on the mounting plate with its central cavity opening toward and its rim closely juxtaposed to said surface,



substantially blocking external illumination from passing between said rim and said surface,

external illumination means aimed to direct illumination on the external face of the dome,

and inspection portal means formed in the dome each defined by a portal axis intersecting a central region of said surface to be inspected, through which optical inspection of said surface can be made,

whereby diffuse illumination of said surface substantially without bright spots, specular reflections or glare is produced within the cavity by attenuation of externally delivered illumination through absorption and internal reflection as it passes through the thick wall of the translucent concave dome, enhancing the precision of optical inspection of said surface performed through said inspection portal means.

4,695,158

FOCUS ERROR DETECTOR

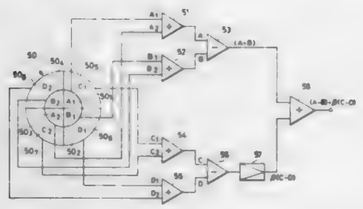
Fumitaka Kotaka, and Takanori Maeda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,553

Claims priority, application Japan, Mar. 2, 1984, 59-40633

Int. Cl.⁴ G01J *1/36*

U.S. Cl. 356—123 **12 Claims**



1. A focus error detector for generating a focus error signal having a value indicating the degree that a lens system is out of focus by processing an illumination beam emitted by the lens system, the detector comprising:

means for generating an offset of said illumination beam in response to an out of focus condition;

first means for determining the first cumulative offset of the illumination beam from a focus point for a first circular area corresponding to a first predetermined radial distance from said focus point and for generating a first signal having a magnitude proportional to said first offset;

second means for determining the second cumulative offset of the illumination beam from said focus point for a second annular-shaped area corresponding to a second predetermined radial distance from said focus point not less than said first predetermined radial distance and a third predetermined radial distance from said focus point greater than said second predetermined radial distance, and for generating a second signal having a magnitude proportional to said second offset;

means for amplifying said second signal; and

means for arithmetically combining said first and second signals to produce the focus error signal.

4,695,159

IMPROVEMENTS IN SIGHTS FOR FIREARMS AND OTHER ARTICLES

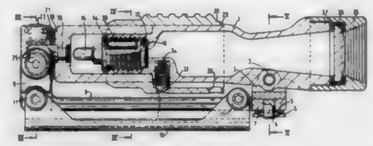
Albert W. Cannon, Poole, England, assignor to Focalpoint Armoury Limited, England

Filed Feb. 7, 1985, Ser. No. 699,140

Claims priority, application United Kingdom, Feb. 7, 1984, 8403242

Int. Cl.⁴ G01C *9/02;* **F41G** *1/32*

U.S. Cl. 356—247 **13 Claims**



1. A sight comprising a collimator having a front end and a rear end, a mount, a light unit and an adaptor for mounting the sight on a firearm or other article which is to be aimed at a target or the like, said mount being mounted on said adaptor and said collimator being mounted for universal pivotal movement on the mount, said mount having adjusting means for adjusting the angular position of the collimator relative to the mount and locking means for locking the collimator in any desired adjusted position said collimator having means at said front end which are engageable by said adjusting means and said locking means, said light unit being located at the front end of the collimator and being arranged to emit a light spot towards the rear end of the collimator and said rear end of the collimator having an opening through which the light spot can be viewed, wherein a housing projects upwards from a main body part of the mount and is located in front of the front end of the collimator, said adjustment means and locking means being incorporated in the housing and the light unit comprising a light collecting member adapted to collect, amplify and emit ambient light, said light unit being surrounded by a casing of transparent material secured to the front end of the collimator and extending between the front end of the collimator and the housing.

4,695,160

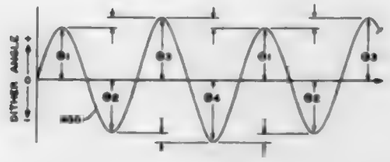
ERROR CANCELLING BIAS SYSTEM

Werner H. Egli, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 280,955, Jul. 6, 1981, abandoned. This application Jan. 15, 1982, Ser. No. 339,357

Int. Cl.⁴ G01C *19/64*

U.S. Cl. 356—350 **11 Claims**



1. A ring laser angular rate sensor comprising:

support means for supporting two counter-traveling waves of substantially monochromatic electromagnetic radiation substantially traveling about a closed-loop path, wherein the frequency of each of said waves is a function of the rate of rotation of said closed-loop path, and there being a corresponding phase relationship established between said waves also being a function of the rate of rotation of said closed-loop path;

means responsive to said waves for providing a sensor signal related to the true angle of rotation of said closed-loop path;

phase angle detector means, responsive to said waves for providing at least one output signal related to the instantaneous phase, ψ, of said phase relationship between said waves;

biasing means responsive to a bias control signal, for varying the frequency of at least one of said waves and said corresponding phase relationship between said waves, said bias control signal capable of

(i) periodically varying the frequency of at least one of said waves such that the frequency difference between said waves periodically alternates in sign, and

(ii) affecting said phase relationship such that said phase, ψ, takes on selected phase values at selected occurrences of $d\psi/dt$ being zero; and

bias control signal generating means for producing said bias control signal, said bias control signal generating means including,

means responsive to said phase angle detector means at least one output signal for determining at least a first phase value of said phase relationship at an occurrence of a first selected value of $d\psi/dt$, and

means responsive to said first phase value for determining at least one signal component of said bias control signal such that said bias control signal causes said biasing means to produce a second and a third phase value of said phase relationship at second and third subsequent occurrences of said selected value of $d\psi/dt$ such that said second phase value and said third phase value differ by a selected phase difference of substantially π radians.

4,695,161

AUTOMATIC RANGING GUN SIGHT

Larry T. Reed, Richardson, Tex., assignor to Axia Incorporated, Oak Brook, Ill.

Filed Aug. 6, 1984, Ser. No. 637,721

Int. Cl.⁴ G02B *27/36*

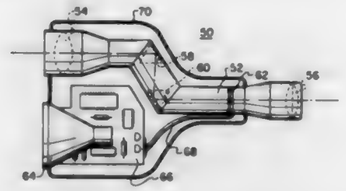
U.S. Cl. 356—254 **2 Claims**

1. An automatic ranging sight for a weapon which fires a projectile, comprising:

a housing supported on the weapon, the housing defining a plane of symmetry generally parallel the direction of projectile motion,

means for determining the distance from said weapon to a target mounted within said housing generally on a first side of said plane of symmetry,

an optical viewer mounted in said housing, said optical viewer having an optical path on the second side of the plane of symmetry at the end of the housing facing the target, the optical path being altered through a pair of prisms to lie on the plane of symmetry near the end of the housing away from the target for viewing by the weapon operator,



a reticle in said viewer, said reticle comprising a liquid crystal display having a plurality of horizontal cross-hair which are essentially transparent except for a cross-hair at a selected position over the vertical range of horizontal cross-hair positions, and

means for selecting one of said horizontal cross-hair positions as a function of the distance to said target as determined by said distance determining means whereby the selected cross-hair position provides elevation aiming to said target for said weapon while the optica path is uninterrupted by said distance determining means.

4,695,162

FILM THICKNESS MEASURING APPARATUS

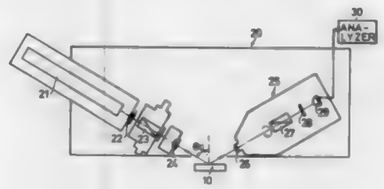
Makoto Itonaga, Yokohama, and Kanji Kayanuma, Hatano, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed May 22, 1985, Ser. No. 736,938

Claims priority, application Japan, May 24, 1984, 59-104920; Jun. 15, 1984, 59-123312

Int. Cl.⁴ G01J *4/00*

U.S. Cl. 356—369 **5 Claims**



1. A method of adjusting an incident angle θ_0 in a film thickness adjusting apparatus, said film thickness measuring apparatus comprising: a light source for impinging light on a measuring plate with the incident angle θ_0, said measuring plate comprising a transparent film on top of a transparent substrate, said transparent film having a film thickness which is to be measured by said film thickness measuring apparatus; a light receiving system for receiving and detecting light which is impinged on said measuring plate and is reflected thereby; and an analyzer system responsive to an output of said light receiving system for measuring an angle Δ of the phase difference between two polarized light components of the reflected light from said measuring plate and for calculating the film thickness of said transparent film from said angle Δ of the phase difference, said method comprising the steps of:

placing an adjusting instrument on said measuring plate so that a bottom surface of said adjusting instrument rests on said measuring plate, said adjusting instrument comprising first and second side surfaces each forming a predetermined angle θ_0 with respect to the bottom surface thereof, said predetermined angle θ_0 being equal to a polarizing angle θ_b of said transparent film of said measuring plate, said first side surface of said adjusting instrument opposing to said light source;

positioning a reflecting mirror to be parallel to said second side surface of said adjusting instrument; and

adjusting the angle of light traveling from said light source toward said measuring plate so that light emitted from said light source and reflected by the said first side surface of said adjusting instrument and/or light emitted from said light source, passed through said adjusting instrument and reflected by said measuring plate and said reflecting mirror returns to said light source.

4,695,163

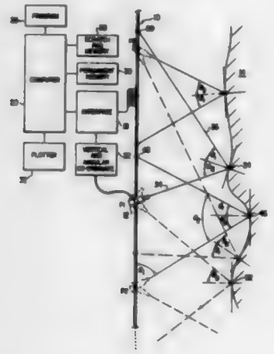
METHOD AND APPARATUS FOR DETERMINING SURFACE SHAPES USING REFLECTED LASER LIGHT

Ronald A. Schachar, 1020 N. Highway 75, Denison, Tex. 75020

Filed Jun. 17, 1985, Ser. No. 745,516

Int. Cl.⁴ G01C *3/10*; G01B *9/08*

U.S. Cl. 356—369 **24 Claims**



1. A method for determining the surface shape of an object when the index of refraction thereof is known, comprising the steps of:

illuminating a plurality of points on the surface of the object with a plurality of light beams to produce a corresponding plurality of reflections, having various degrees of polarization;

detecting the amount of polarization of the reflections of said light beams; and

calculating spatial data of surface points of said reflections using Brewster's Angle and the amount of light polarization reflected therefrom, said data collectively being representative of the surface shape of said object.

4,695,164

POSITION DETECTOR AND MOUNT THEREFOR FOR A CENTRIFUGAL ANALYZER

Maury Zivitz; Eric Ko, and Mark Estick, all of Houston, Tex., assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

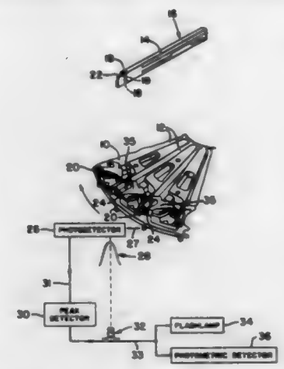
Filed Sep. 24, 1985, Ser. No. 779,520

Int. Cl.⁴ G01N *21/90, 1/10*

U.S. Cl. 356—427 **16 Claims**

1. In a centrifugal analyzer having a support, a rotatable rotor on the support, and an optical unit radially spaced from the axis of rotor rotation and having an optical path for optically analyzing a liquid in a cuvette when on the rotor and rotated thereby to the optical path of the optical unit, a position detector for detecting the rotational position of the rotor relative to the optical unit in which the cuvette will be in the optical path of the optical unit for the optical analysis, comprising:

a photodetector fixed to the support and having light emitting means for emitting light and light receiving means for



responding to the intensity of the light when reflected thereto; and

a member having a surface reflective of the light, convex to the photodetector, and movable with the rotor relative to the photodetector so as to sweep the light reflectively across the photodetector means for responding thereto for providing a continuously-curving response of the light receiving means.

4,695,165

CAVITY TRANSFER MIXING EXTRUDER

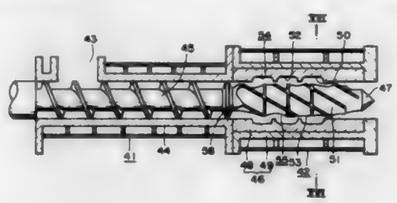
Shinnichi Fukumizu; Kimio Inoue, and Akimasa Kuriyama, all of Hyogo, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 14, 1986, Ser. No. 918,548

Claims priority, application Japan, Oct. 14, 1985, 60-229573; Feb. 24, 1986, 61-25998[U]; Mar. 7, 1986, 61-33484[U]

Int. Cl.⁴ B29B *7/40*

U.S. Cl. 366—90 **3 Claims**



1. A cavity transfer mixing extruder comprising:

an extrusion unit which comprises a barrel provided with a feed opening in the rear portion thereof; and a screw shaft coaxially and rotatably extended through the barrel; and

a mixing unit which comprises a housing; a stator fixedly fitted in the housing and provided with a first cavity group including a plurality of circumferential rows of cavities located in the inner circumference thereof excluding opposite ends thereof; and a rotor joined coaxially to a front end of the screw shaft, coaxially and rotatably extended through the stator, and provided with a second cavity group including a plurality of circumferential rows of cavities in the outer circumference thereof excluding the

opposite ends thereof, wherein the respective cavities of the first and second cavity groups, when developed on a plane, each has a parallelogram shape defined by a pair of opposite, parallel straight walls extending perpendicularly to an axial direction, and a pair of opposite, parallel straight walls inclined at an angle to the axial direction; the longitudinal axes of the cavities of the first cavity group and the longitudinal axes of the cavities of the second cavity group being inclined in opposite directions with respect to the axial direction; the cavity rows of the first cavity group and the cavity rows of the second cavity groups are the same in axial pitch; and the cavity rows of the first cavity group are shifted axially relative to the cavity rows of the second cavity group by a distance corresponding to half the axial pitch so that each cavity of each cavity row of the first cavity group overlaps the adjacent cavities of the adjacent cavity rows of the second cavity group.

4,695,166

PISTON METERING DEVICE FOR THE PRODUCTION OF PLASTIC MATERIAL FROM AT LEAST TWO FLOWABLE REACTION COMPONENTS

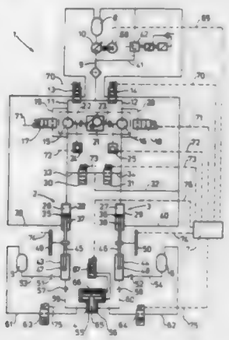
Klaus Schulte; Klaus Nadolski; Heinrich Ersfeld, all of Leverkusen; Wilfried Ebeling, Odenthal-Gloebusch; Heinrich Boden, Leverkusen, and Walter Schneider, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 872,344

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522153

Int. Cl.⁴ B01F *15/04*

U.S. Cl. 366—160 **8 Claims**



1. A piston metering device for the production of a plastic material from at least two flowable reaction components comprising:

(a) a hydraulic driving mechanism

(b) a storage container for hydraulic fluid which is connected to the driving mechanism (a)

(c) a hydraulic metering pump which is connected to storage container (b)

(d) a pressure line with a change-over valve which line is connected to metering pump (b),

(e) two lines which branch from pressure line (d)

(f) a regulating element for each of the lines (e) made up of hydraulic motors rigidly coupled to one another,

(g) two piston metering units each of which is connected to one or the other of the branch lines (e) which metering units are made up of

(1) a working cylinder with a plunger piston and

(2) a storage container to which the plunger piston of (1) is connected

(h) two mixing stroke chambers each of which is connected to one or the other piston metering units (g)

(i) two filling stroke chambers each of which is connected to one or the other of the mixing stroke chambers (h)

(j) a mixer head to which each of the filling stroke chambers (i) leads and which is connected to each of the storage container (g)(2) and

(k) two return lines each of which leads back from one or the other filling stroke chamber (i) through the change-over valve and to one of the storage containers (g)(2).

4,695,167

APPARATUS FOR MIXING AND PUMPING SLURRY

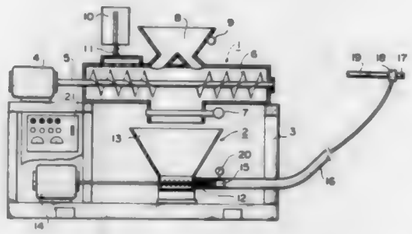
Masashi Mori; Shingo Nonaka, and Seiji Nagai, all of Okayama, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1985, Ser. No. 786,858

Claims priority, application Japan, Nov. 30, 1984, 59-180808[U]

Int. Cl.⁴ B01F *7/08, 15/02*

U.S. Cl. 366—181 **1 Claim**



1. Apparatus for mixing and pumping a binder slurry for admixture with a refractory aggregate material in a gunning nozzle comprising:

binder slurry mixing means comprising a slurry mixing vessel, means for metering a pre-determined quantity of liquid binder into said mixing vessel, means for introducing a pre-determined quantity of refractory powder into said mixing vessel for admixture with said pre-determined quantity of said liquid binder to form in said mixing vessel a refractory gunning binder slurry suitable for admixture in a gunning nozzle with a premixture of gunning refractory aggregate and solvent to form a castable refractory material suitable for application by gunning, agitating means mounted in said mixing vessel for admixing said liquid binder and refractory powder to form said binder slurry, means for discharging said binder slurry downwardly from said slurry mixing vessel, and means for actuating said binder slurry discharging means;

a frame supporting said binder slurry mixing means;

a pump comprising a rotatable member for pumping said binder slurry to a gunning nozzle for admixture with a premixture of gunning refractory aggregate and solvent to form a castable refractory material suitable for application by gunning, said pump being mounted on said frame means below said mixing vessel and having an inlet for receiving binder slurry from said mixing means and an outlet for delivering the binder slurry to a gunning nozzle;

hopper means mounted directly below said discharging means for receiving binder slurry discharged downwardly from said mixing vessel, said hopper means having an opening at the bottom thereof located directly above an opening in the upper portion of said pump whereby binder slurry received in said hopper means is able to flow directly into said pump;

means for varying the rotational speed of said rotatable pump member to vary the output thereof;

a gunning nozzle comprising means for admixing binder slurry and a premixture of gunning refractory aggregate and solvent to form a castable refractory material suitable for application by gunning and an outlet for discharging said castable refractory material; and

hose means for conveying binder slurry from said pump outlet to said gunning nozzle;

whereby the ratio of binder slurry admixed with said premixture of gunning refractory aggregate and solvent can be controlled by regulating the rotational speed of said rotatable pump member independently of variation of the pressure within said gunning nozzle.

4,695,168

ELECTRONIC WATCH HAVING TWO MOTORS AND COMPRISING MEANS FOR PERPETUALLY INDICATING THE DAY OF THE MONTH

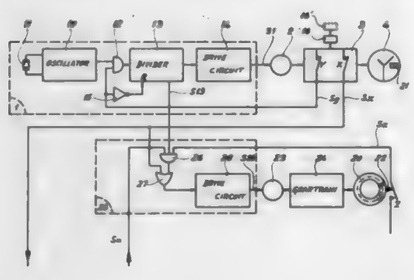
Pierre-André Meister, Bienne; Pierre Schmidli, Evilard, and Bertrand Soltermann, Diesse, all of Switzerland, assignors to ETA SA Fabriques D'Ebauches, Grenchen, Switzerland

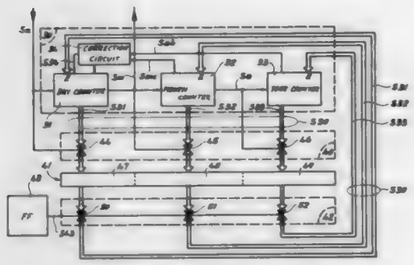
Filed Dec. 18, 1986, Ser. No. 943,013

Claims priority, application Switzerland, Dec. 18, 1985, 05437/85

Int. Cl.⁴ G04B *19/24*

U.S. Cl. 368—31 **3 Claims**





1. An electronic watch which comprises:

a time keeping circuit able to generate a time base signal;

a first motor activatable by said time base signal;

a control mechanism including a first gear-train arranged to be driven by said first motor, a contact activatable daily by said first gear-train as the watch switches from one day to the next to generate a daily signal, and a correction number;

analogue time display means arranged to be driven by said first gear-train, and alterable by said correction member;

a perpetual-calendar circuit including day, month and year counters connected in series, and a correction circuit linked to the month and year counters, for setting to 1 the contents of the day counter at the end of each short month, said calendar being also arranged to generate, in response to the daily signal applied to the input of the day counter, a calendar signal, representative of the contents of the counters, showing the date and taking into account, by virtue of the correction circuit, the number of days in each month of the year and leap years, and a monthly signal as the calendar signal switches from one month to the next;

a second motor;

a second gear-train arranged to be driven by said second motor;

analogue display means for displaying the day of the month and controlled by said second gear-train;

a control circuit, connected to the calendar circuit and arranged to receive, in addition, said daily signal and a retrieval signal having a frequency greater than that of said daily signal, for issuing a control signal to said second motor, said control signal serving to alter the day of the month display by one day in response to said daily signal, and by the required number of days at the end of a short month in response to said retrieval signal, whereby the day of the month display will agree with the contents of the day counter on the first day of each month;

a cell for supplying energy to said circuit;

a reprogrammable non-volatile memory;

a first transmission circuit for transferring, as each day, each month and each year moves on to the next, the contents of said day, month and year counters, respectively, to said perpetual memory;

a replacement cell detection circuit arranged to generate a detection signal when the voltage of said replacement cell is applied across said circuits; and

a second transmission circuit for transferring, in response to said detection signal, the contents of said non-volatile memory to the counters of said calendar circuit.

4,695,169

STRUCTURAL BEARING

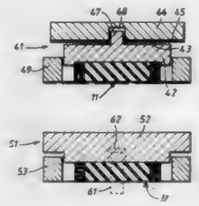
Baigent Maurice G., Somerset, England, assignor to AEPLC, Rugby, England

Filed Jan. 13, 1986, Ser. No. 818,327

Claims priority, application United Kingdom, Jan. 14, 1985, 8500822

Int. Cl.⁴ F16C *41/00, 27/06;* **E01D** *19/04*

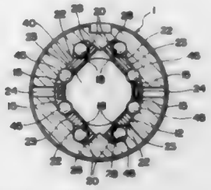
U.S. Cl. 384—36 **18 Claims**



1. A structural bearing assembly having a self-aligning support comprising: an elastomeric core support element, an annular reinforcement member surrounding said support element and integrally joined thereto; said member having a plurality of windings of tension resistant material in fibre form embedded in a matrix of an elastomeric material, said reinforcement member extending vertically from the top to the bottom of said support element and with said reinforcement member providing a free standing flexibly resilient support resistant to deformation in the form of lateral expansion.

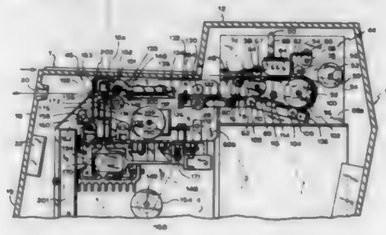
18. A structural bearing assembly including a self aligning support located between an upper plate and a lower plate, said support comprising an elastomeric core of neoprene, said core having an integral outer reinforcing layer, said outer reinforcing layer comprising a spirally wound cord of poly (p-phenyleneterephthalamide) material embedded in an elastomeric material.

4,695,170
ENDLESS BALL SPLINE
Hiroshi Teramachi, 34-8, Higashitamagawa 2-chome, Setagaya-ku, Tokyo, Japan
Filed Oct. 10, 1986, Ser. No. 917,579
Claims priority, application Japan, Oct. 15, 1985, 60-156509[U]
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 **1 Claim**



1. An endless ball spline comprising:
a spline bearing including an outer casing, a pair of cages fitted inside said outer casing and each having a ball recirculating groove, a pair of end covers respectively fitted on projections formed at both axial ends of said cages and secured to both axial ends, respectively, of said outer casing, and a multiplicity of balls disposed in ball recirculating endless tracks bores defined by said outer casing, said cages, and said end covers; and
a spline shaft supported through the multiplicity of balls in said spline bearing,
said outer casing including: grooves with a U-shaped cross-section provided in the inner peripheral surface thereof, said U-shaped grooves extending over the whole length of said outer casing in parallel with the axis thereof and in bisymmetry with each other; loaded ball guide grooves provided in both side surfaces, respectively, of the bottom of each of said U-shaped grooves; ridges with a triangular cross-section provided on the inner peripheral surface of said outer casing in such a manner that said triangular ridges extend axially over the whole length of said outer casing in parallel to each other and in symmetry with each other with respect to the plane which intersects the respective centers of said U-shaped grooves; cage securing grooves with a substantially trapezoidal cross-section provided on both sides, respectively, of each of said triangular ridges; and annullar slanted surfaces formed at both axial ends, respectively, of the inner periphery of said outer casing, each slanted surface expanding or diverging outward,
said cages having an inner peripheral surface with a substantially V-shaped cross-section, and each cage including: cage securing pieces provided at both longitudinal ends, respectively, of said cage; a plurality of annular grooves provided in the outer peripheral surface of said cage, said annular grooves including loaded ball grooves corresponding to the loaded ball guide grooves on said outer casing, said loaded ball grooves being formed in the substantially central portion of said cage and each having a slot with a diameter slightly smaller than the diameter of said balls; and non-loaded ball grooves formed on both lateral end surfaces of said cage, said non-loaded ball grooves being communicated with the corresponding loaded ball grooves through ball turning grooves which are provided at both ends, respectively, of each of said loaded ball grooves,
said end covers having a substantially U-shaped cross-section and each end cover including: a through-hole provided in its center and having a diameter slightly larger than the outer diameter of said spline shaft; ball turning grooves respectively corresponding to the ball turning grooves provided in said cages; a pair of axially extending ridges with a triangular cross-section provided on the inner peripheral surface of said end cover so that said triangular ridges can be respectively aligned with the corresponding triangular ridges formed inside said outer casing; and grooves with a substantially trapezoidal cross-section provided on both sides, respectively of each of said triangular ridges, and
said spline shaft having a substantially square cross-section and including loaded ball rolling grooves formed on both sides, respectively, of each of one pair of diagonally opposing corners thereof.

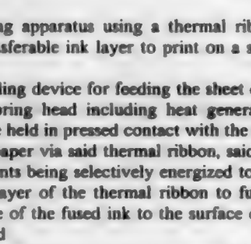
4,695,171
HORIZONTALLY OR VERTICALLY ORIENTABLE COMPACT TICKET PROCESSOR
Thomas P. Sapitowicz, Bel Air, Md., assignor to General Instrument Corp., New York, N.Y.
Filed Dec. 4, 1985, Ser. No. 804,523
Int. Cl.[4] B41J *3/516, 13/00*
U.S. Cl. 400—70 **10 Claims**



1. A ticket processing device for processing customer markable tickets, adapted for use with a substantially planar partition, comprising a housing adjacent the partition, a ticket input slot, ticket reading means, ticket printing means, a ticket output slot, the partition being situated with said input slot on one side thereof and said output slot on the other side thereof, and means for transporting a ticket through a substantially "U" shaped transport path, said path comprising three sections, said first section extending from said input slot through said reading means, said third section extending through said printing means to said output slot, said second section connecting said first and third sections, said first and third sections being relatively closely situated in substantially parallel planes, said second section comprising a substantially arcuate channel having a diameter which exceeds the distance between said parallel planes.

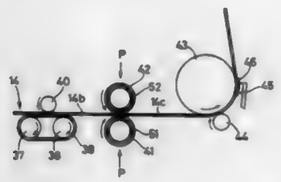
4,695,172
PRINTER WITH DISPLAY FOR DOUBLE-WIDTH CHARACTER
Hideo Ueno; Hiroshi Hattori, both of Nagoya; Kumiko Maeda, Ichinomiya, and Keiko Yamada, Ama, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Dec. 26, 1985, Ser. No. 813,563
Claims priority, application Japan, Dec. 29, 1984, 59-277667
Int. Cl.[4] B41J *3/46*
U.S. Cl. 400—83 **6 Claims**

1. A printer which can print a double-width character with a display for a double-width character comprising:
a keyboard having cursor leftward and rightward shifting keys, a group of character keys and a double-width mode selection key, said keyboard generating a cursor position control signal, a character signal and a double-width mode signal in accordance with depression of said cursor keys, each of said group of character keys and said mode selection key respectively;
a display for displaying a preset number of characters and marks;
display control means for displaying each character on said display according to said character signal from said keyboard and for displaying each character corresponding to said character signal in a position which a cursor of said display indicates together with a double-width mark in an adjacent position during said double-width mode; and



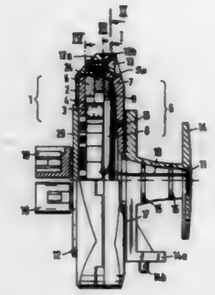
said display control means shifting said cursor leftward and rightward according to said cursor position control signal which is generated in accordance with depression of said cursor leftward and rightward shifting key respectively, and making said cursor jump the position of said double-width mark to indicate the next character.

4,695,173
PRINTING APPARATUS WITH A THERMAL PRINT HEAD
Yasutaka Tomida, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 681,682, Dec. 14, 1984, abandoned.
This application Jul. 28, 1986, Ser. No. 889,307
Claims priority, application Japan, Dec. 20, 1983, 58-240610; Dec. 20, 1983, 58-240611
Int. Cl.[4] B41J *3/00*; D21H *1/22*
U.S. Cl. 400—120 **5 Claims**



1. A printing apparatus using a thermal ribbon having a thermally transferable ink layer to print on a sheet of paper, comprising:
a paper feeding device for feeding the sheet of paper;
a thermal pring head including heat generating elements which are held in pressed contact with the surface of said sheet of paper via said thermal ribbon, said heat generating elements being selectively energized to apply heat to said ink layer of the thermal ribbon to fuse the ink for adherence of the fused ink to the surface of the sheet of paper; and
smoothness improving means, disposed upstream of said thermal print head in the direction of feed of the sheet of paper by said paper feeding device, for improving the surface smoothness of the surface of the sheet of paper, said smoothness improving means comprising a humidifying device for humidifying and swelling said sheet of paper, a pressing device located downstream of the humidifying device for applying a pinching pressure to opposite surfaces of said swollen sheet of paper, and means for applying heat to the swollen sheet of paper downstream of the humidifying device.

4,695,174
MAGNETIC CIRCUIT FOR MATRIX PRINT HEAD
Bernd Gugel, Ulm-Einsingen; Harald Niebel, Senden, and Hubert Ott, Ravensburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany
Filed Jan. 27, 1986, Ser. No. 822,874
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502469
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **6 Claims**

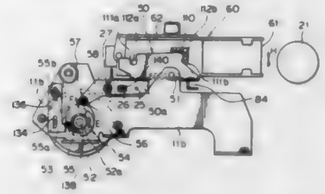


1. A matrix print head including a common magnetic yoke plate, magnetic pole defining cores annularly arranged on said yoke plate, electromagnetic coils mounted on said cores, a common permanent magnet plate arranged in magnetic conductive relationship to said yoke plate; said yoke plate, said cores, said coils, and said permanent magnet plate establishing an electromagnetic assembly, there being additionally a common annular armature assembly including an armature plate and a plurality of deflectable radially extending armature arms, said armature assembly arranged in relation to the electromagnetic assembly such that the armature arms cooperate with said electromagnetic cores, there being print elements connected to said armature arms the improvement comprising:
said armature plate being an annulus that extends around a common center, and said radially extending armature arms being physically separated from the armature plate in radial direction but being resiliently interconnected to establish a single uncritical parasitic radial air gap; and
said magnetic yoke plate and said armature plate being radially, inwardly recessed vis-a-vis said permanent magnet plate, so that the permanent magnet plate has a larger radial outward extension through said yoke plate and said armature plate.

4,695,175
COLOR PRINTER HAVING APPARATUS FOR SHIFTING INK RIBBON
Tetsuo Tsukada, Kawasaki; Hideyuki Shimobuchi, Akishima, and Takahiro Yoshikawa, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Oct. 17, 1985, Ser. No. 788,566
Claims priority, application Japan, Oct. 23, 1984, 59-222607
Int. Cl.[4] B41J *32/02*
U.S. Cl. 400—196.1 **17 Claims**

1. A color printer, comprising:
a base unit;
a cylindrical platen rotatably mounted on said base unit for supporting and guiding a printing paper;
a printing head;
a carrier reciprocally movable along said platen for supporting said printing head to reciprocally move said printing head along a printing line on the printing paper on said platen;

an ink ribbon supporting frame mounted on said base unit swingably about an axis parallel to said platen, said ink ribbon supporting frame being capable of having detachably mounted thereon a color ink ribbon cassette comprising a cassette case for accommodating therein a color ink ribbon which has a plurality of different color longitudinal stripes so that at least a part of said ink ribbon forms a loop exposed from and extending to the cassette case, which ribbon loop is positioned along said platen and between said printing head and platen, when the color ink ribbon cassette is set on said ink ribbon supporting frame;



a ribbon guide member slidably mounted on said carrier for supporting said ink ribbon at a position adjacent to said printing head;

slide shifting means for slide shifting said ribbon guide member so that a desired one of said color stripes of the ink ribbon is positioned on said printing line; and

swing shifting means for swing shifting said ink ribbon supporting frame so that the position of the cassette case substantially follows that of the shifted position of the ink ribbon, said swing shifting means being driven in accordance with said slide shifting means.

4,695,176

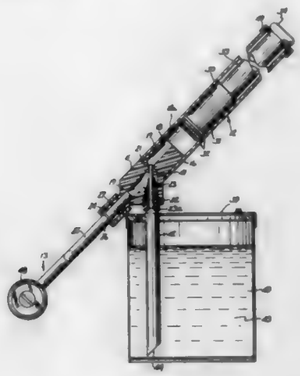
FOUNTAIN APPLICATION HANDLE WITH REFILL VALVE

Dallas W. Simonette, Stacy, and Bruce A. Wiener, Shoreview, both of Minn., assignors to Power-Flo Products Corporation, Minneapolis, Minn.

Filed Feb. 5, 1986, Ser. No. 826,197

Int. Cl.[4] B65B *3/04*; B05C *1/10*

U.S. Cl. 401—144 **20 Claims**



1. Fountain applicator for providing a continuous supply of a liquid coating including a reservoir for storing the liquid coating, a central channel having an inlet in communication with the reservoir and having an outlet, a fill channel extending angularly across and intersecting with the central channel between the inlet and outlet, and a fill tube in fluid communication with a source of liquid coating, with the improved fountain applicator comprising, in combination: first sealing means located in the fill channel spaced from the central channel for preventing flow of the liquid coating from the fill channel and for allowing insertion of the fill tube into the fill channel; and second sealing means located adjacent the intersection of the fill channel with the central channel for sealing with the fill tube when inserted in the fill channel for allowing the liquid coating to pass from the fill tube through the inlet of the central channel into the reservoir and preventing liquid coating flow from the fill tube through the outlet of the central channel and for allowing liquid coating flow in the central channel through the outlet when the fill tube is removed from the fill channel.

4,695,177

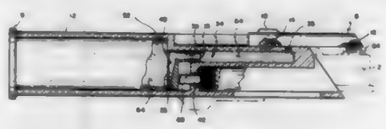
DENTIFRICE DISPENSING TOOTHBRUSH

Youti Kuo, 88 Foxbourne Rd., Penfield, N.Y. 14526

Filed Feb. 18, 1986, Ser. No. 830,467

Int. Cl.[4] A46B *11/02*

U.S. Cl. 401—150 **8 Claims**



1. A dentifrice dispensing toothbrush comprising:

a. a housing;

b. a reservoir situated within the housing for storing dentifrice material;

c. a brush which contains a head member and a set of bristles having their bottom end portions attached to the head member and their top end portions unattached so as to collectively provide a brush surface for supporting dentifrice material, said brush being releasably attached to the housing;

d. an applicator for depositing dentifrice material directly onto the brush surface, said applicator being attached to the housing and being in communication with the reservoir;

e. a valve positioned in communication with the reservoir for controlling flow of dentifrice material from the reservoir to the applicator, said valve having a stem and a head and containing an orifice which extends longitudinally through the valve stem and valve head so as to provide an opening for the passage of dentifrice material which is pumped from the reservoir; and

f. pumping means for applying pressure to cause dentifrice material to flow from the reservoir to the applicator.

4,695,178

JOINT FOR REINFORCING BAR EMPLOYED IN CONCRETE CONSTRUCTION

Yoshiyuki Era, Chiba, and Yasuo Kumagai, Saitama, both of Japan, assignors to Okabe Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 887,719

Claims priority, application Japan, Jul. 30, 1985, 60-117080[U]

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—14 **2 Claims**



1. A joint for connecting a pair of reinforcing bars together end-to-end, said joint comprising:

a joint main body having a generally U-shaped cross section defined by a pair of side walls extending parallel to and spaced from one another, and a generally outwardly curved wall extending between said pair of side walls,

each of said side walls having a plurality of wedge bores extending therethrough, said plurality of wedge bores spaced from one another respectively along each of said side walls in the direction in which said side walls extend parallel to one another along the length of the main body, each of said wedge bores extending through one of said pair of side walls being aligned with a respective one of said wedge bores extending through the other of said pair of side walls thereby defining a plurality of pairs of aligned wedge bores;

said curved wall having an inner V-shaped surface defined by a pair of substantially flat surfaces extending between the surfaces of said side walls that face each other and against which end portions of said pair of reinforcing members abut;

a respective wedge extending through each of said pairs of aligned wedge bores, each said respective wedge contacting a respective said end portion of said pairs of reinforcing bars for urging said end portion against said inner V-shaped surface whereby said end portions are clamped in two-point contact against said substantially flat surfaces of said inner V-shaped surface by said respective wedges; and

a respective rigid bar-shaped wedge guide member extending through each of said pairs of aligned wedge bores, each said wedge guide member bearing against a surface of a respective said wedge at a location thereon that is spaced from the location on said wedge at which said wedge contacts said respective end portion of a said reinforcing rod, said respective wedge guide members for guiding said wedges through said pairs of aligned wedge bores respectively.

4,695,179

FASTENING ARRANGEMENT FOR A MINIMUM OF THREE STRUTS ALONG THE SPATIAL AXES

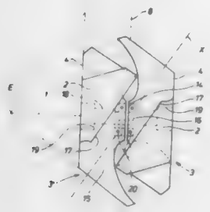
Raimund Schnell, Hans-Saxer-Str. 9, Eichberg SG, Switzerland 9451

Filed Nov. 26, 1985, Ser. No. 801,851

Claims priority, application Switzerland, Nov. 28, 1984, 05672/84

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—24 **15 Claims**



1. A retainer for use in a fastening arrangement for a minimum of three struts along the spatial axes, comprising:

a body having a shape, regardless of how formed, which is that shape which would result from cutting a three-sided pyramid-shaped corner from a cube-like body, cutting a second joint face parallel to the face made by the base of the cut-away pyramid at a distance therefrom, and drilling boreholes through the remaining body parallel to the edges of the original cube-like body.

4,695,180

LINK COUPLING DEVICE

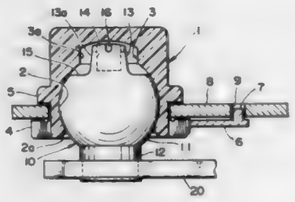
Yasuziro Saito, Fujisawa, Japan, assignor to Jidosha Denki Kogyo Kabushiki Kaisha, Japan

Filed Jun. 24, 1986, Ser. No. 877,933

Claims priority, application Japan, Jun. 28, 1985, 60-99194[U]

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—114 **3 Claims**



1. A link coupling device comprising:

a ball pin of a metallic material, said ball pin having a cylindrical fixing part, and a spherical part contiguous with said fixing part, a movement restricting projection portion contiguous with said spherical part and opposite said fixing part, said projection portion having an outer peripheral wall of a tapered cylindrical shape and a cylindrical recess therein with an oil groove being provided at an upper end of said projection portion;

a motor link arm fixed to said ball pin;

a one-piece ball retainer of a synthetic resin having a spherical recess therein and a movement restricting cylindrical recess in the bottom of the spherical recess, said ball retainer being forced over the ball pin with said cylindrical recess of the ball retainer receiving said projection portion of the ball pin and said spherical recess of the ball retainer receiving said spherical part of the ball pin; and

a link connecting rod attached to said ball retainer, whereby said motor link arm and said link connecting rod are connected through said ball pin and ball retainer for limited movement relative to each other.

4,695,181

BALL JOINT

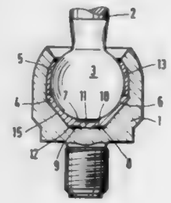
Karl-Heinz Rahmede, Düsseldorf, and Horst-Heinz Stemmer, Meerbusch, both of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 26, 1986, Ser. No. 900,386

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530633

Int. Cl.[4] F16C *11/00*

U.S. Cl. 403—135 **12 Claims**



1. A ball joint comprising:

a housing having a surface defining a chamber;

a ball stud having a shank portion extending outwardly from said housing and a ball end portion disposed in said chamber; and

a resiliently deformable bearing member disposed between said housing and said ball end portion;

said housing having a plurality of elevations thereon, each of

said elevations having radially extending side surfaces defining a plurality of recesses therebetween, and said resiliently deformable bearing member being preloaded and having portions deformed into said recesses to limit rotation of the bearing member relative to the housing.

4,695,182

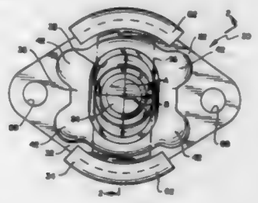
BALL JOINT WITH MECHANICAL INTERLOCK

Huey E. Wood, Jr., St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Continuation-in-part of Ser. No. 815,673, Jan. 2, 1986, which is a continuation of Ser. No. 726,135, Apr. 23, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,673

Int. Cl.[4] F16C *11/00*; F16D *1/12*

U.S. Cl. 403—140 **15 Claims**



1. A ball and socket joint for connecting load transmitting members for relative pivotal movement, said ball and socket joint comprising:

a socket for connection with one member, said socket having a surface defining a chamber and an elongate opening;

a ball stud for connection with the other member, said ball stud having a ball portion and a shank portion extending therefrom, said ball portion disposed in said chamber and said shank portion extending through said elongate opening, said shank portion being movable in a path along the longitudinal axis of the elongate opening in said socket;

a resiliently deformable elastomeric layer bonded to said ball portion and resiliently interconnecting said ball stud with said socket for urging said ball stud to an inititial position relative to said socket;

said elastomeric layer having portions which project into volumes defined by said socket to mechanically interlock said elastomeric layer and said socket and to prevent slipping of said elastomeric layer relative to said socket; and

said volumes defined by said socket comprising only volumes transversely spaced from the path of movement of said shank along the longitudinal axis.

4,695,183

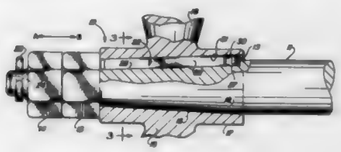
MARINE PROPELLER SHAFT/KEY ASSEMBLY

Robert Greenberg, Cocoa, Fla., assignor to Ray Industries, Inc., Knoxville, Tenn.

Filed Aug. 15, 1986, Ser. No. 896,716

Int. Cl.[4] B25G *3/28*; F16B *3/00*

U.S. Cl. 403—356 **1 Claim**



1. In a marine propeller shaft/key assembly, said assembly including

a shaft for use in driving a propeller, said shaft having an aft end portion threaded to accept propeller retaining nut means, and

a tapered portion adjacent said aft end portion,

a propeller having a tapered interior hub portion which is matable with the tapered portion of said shaft,

an axial keyway in each of said tapered portions,

said hub portion being retained on said shaft by locking nut means on said threaded aft end portion,

the improved assembly comprising:

(a) axial keyway means in said tapered portion of said shaft, including

(i) an axially extending floor,

(ii) axially extending side wall surfaces, and

(iii) an end wall perpendicular to said floor at the forward end of said keyway, said perpendicular end wall being part of an enlarged rounded extension of said side wall surfaces; and

(b) key means shaped and dimensioned to be slidably received in said axial keyways when said keyways are in angular registration, the forward end of said key being curved to matingly engage the rounded end wall of said shaft keyway, said end wall of said shaft keyway forming a stop which precludes axial movement of said key forwardly in said keyway.

4,695,184

LOCKS FOR CONSTRUCTION COMPONENTS

Alcee P. Robishaw, 9333 Memorial, #210, Houston, Tex. 77024, and Paul A. Robishaw, 10122 Meadow Lake La., Houston, Tex. 77042

Filed Aug. 17, 1984, Ser. No. 642,182

Int. Cl.[4] F16B *1/04*

U.S. Cl. 403—410 **30 Claims**



1. A male lock system selectively engageable with a female lock system for locking together two construction components, said male lock system comprising:

a pair of tandem male lock assemblies spaced apart in a first directional mode, each of said male lock assemblies including:

a body comprising socket means having front and rear faces and defining a socket opening extending therethrough in a front-rear directional mode which is transverse to said first directional mode,

a rigid pin member having first and second lock engagement regions spaced from each other along the length of said pin member, said pin member being received in said socket opening for reciprocation relative to said socket means between an advanced position and a retracted position,

lock means carried by said body and mounted for reciprocation with respect to said socket means in said first directional mode between a locking position for interengagement between said pin member and said body and a release position spaced therefrom, and

resilient biasing means cooperative between said body and said pin member to yieldably bias said pin member in the rear-to-front direction;

wherein, when said pin member is in its advanced position, said first lock engagement region is disposed forward of said front face of said socket means, and said second lock engagement region is positioned for engagement by said lock means, and said lock means, in its locking position, is cooperative between said pin member and said body to transfer rear-to-front forces exerted on said pin member to said body;

and wherein, when each of said pin members is in its retracted position, its first lock engagement region is positioned for engagement by the respective lock means, and said lock means, in its locking position, is cooperative between said pin member and said body to prevent forward movement of said pin member to its advanced position;

said pin members of said two lock assemblies being parallel;

body extension means rigidly connecting the bodies of said two lock assemblies in such spaced apart relation;

and lock extension means connecting the lock means of said two lock assemblies for joint movement between their locking and release positions.

4,695,185

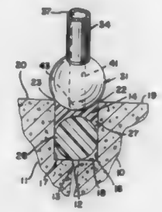
SEALANT APPLICATOR

Sherwood Spells; James R. Warren, both of Midland, and Ronald W. Wieck, Bay City, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 5, 1985, Ser. No. 708,601

Int. Cl.[4] E01C *23/02, 23/09*

U.S. Cl. 404—107 **4 Claims**



1. An applicator for placing and shaping a sealant into a groove to be sealed, comprising a member having a lower side having a convex arcuate shape for shaping said sealant, a sealant passage extending through said member and including an outlet opening in said lower side wherein no portion of said outlet opening projects beyond said arcuate lower side, said lower side of said applicator having a width substantially greater than the width of said groove to generally remain in contact with the edges thereof and a limiter attached to said member, said limiter extending laterally of said lower side of said member, whereby a portion of said arcuate surface of said lower side extends into said groove during use for shaping the upper surface of said sealant to a generally concave shape at the same time that said sealant is placed into said groove through said outlet opening.

4,695,186

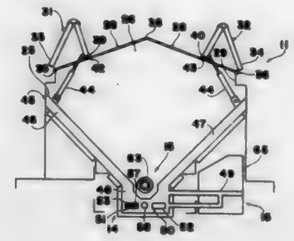
ASPHALT HANDLING APPARATUS

Timothy W. King, Box 1234, Billings, Mont. 59103

Filed Sep. 26, 1986, Ser. No. 912,385

Int. Cl.[4] E01C *19/12*

U.S. Cl. 404—111 **19 Claims**



1. Asphalt handling apparatus including a carriage portion, a hopper portion, a hopper heating portion, as asphalt dispensing portion, a liquid tack material dispensing portion and as equipment lifting portion; said carriage portion including a frame section, an axle member extending transversely of said frame section, a wheel rotatably carried at each end of said axle member; said hopper portion including an elongated trough section with a generally V-shaped cross section, said trough section including transverse end sections with peaked upper edges, said trough section including a generally rectangular open top section, a pair of bi-fold doors selectively covering said open top section, one edge of each of said bi-fold doors being pivotally connected to a longitudinal edge of said trough section adjacent said open top section, said bi-fold doors in a flat configuration contacting one another along a horizontal longitudinal centerline of said trough section located a significant distance above said longitudinal edges of said trough section, free corners of contacting edges of said bi-fold door moving from an open to a closed position closely adjacent to upper edges of transverse end sections of said trough section; said hopper heating portion including an enclosed first chamber disposed immediately below said V-shaped trough section and in direct contact therewith, said first chamber including sloping wing sections having relatively thin substantially uniform cross sections and a deeper central section along the lowest point of said trough section communicating therewith, a heat transfer medium disposed within said first chamber, a U-shaped burner channel disposed substantially horizontally within said central section of said first chamber along the length thereof; a gas burner disposed along the length of a first arm of said U-shaped burner channel, an exhaust stack extending upwardly from a free end of a second arm of said channel, a gas reservoir supplying said burner, an elongated electrical heating element disposed within said central section between said arms of said U-shaped burner channel, controls operating said burner and said heating element; said asphalt dispensing portion including a screw conveyor disposed within said trough section along the lowest point thereof, drive means for said conveyor; said liquid tack material dispensing portion including an elongated second chamber located outside said hopper portion alongside said central section of said hopper heating portion and under one sloping wing section thereof, said second chamber including tubing therein communicating with said central section of said hopper heating portion, valve means communicating with an outlet of said second chamber, delivery means including a nozzle and a length of flexible hose connected to said valve means, a cleaning fluid reservoir communicating with said valve means; said equipment lifting portion including a frame assembly disposed in a generally vertical plane and affixed adjacent a rear transverse trough section on the side of the discharge of said conveyor remote from said liquid tack material dispensing portion, said frame assembly

including a fixed section and a vertically movable section slidably engageable therewith, said movable section including an equipment engaging member, a vertically oriented fluid piston/cylinder combination having one end secured to an end of said fixed section and extending therealong, an opposite end of said piston/cylinder combination being secured to said movable section of said frame assembly; whereby asphalt is supplied to said trough section through said open bi-fold doors, heated therein with said heat transfer medium, the resulting hot asphalt discharged from said trough section by said screw conveyor into a cavity in a road that has been coated with liquid tack material, and the asphalt compacted by equipment carried by said lifting portion.

4,695,187

CONCRETE ARCH BURIED BRIDGE

Leonid Mikhailovsky, Edmonton, and Jay G. Ramotar, St. Albert, both of Canada, assignors to Bridgefill Design Ltd., Edmonton, Canada

Filed Jul. 29, 1985, Ser. No. 759,952
Claims priority, application Canada, Aug. 2, 1984, 460229
Int. Cl.[4] E21D *9/00, 11/14;* E01F *5/00*
U.S. Cl. 405—124 **13 Claims**



1. A concrete arch buried bridge, comprising,

a lower curved corrugated metal part resting on a compacted fill and having upper longitudinal margins,

an upper arched corrugated metal part having lower longitudinal margins near said upper longitudinal margins and provided with a reinforced concrete cap having a footing at each side thereof,

connecting means, connecting said upper and lower longitudinal margins to provide a conduit, to retain said upper arched corrugated metal part and said lower curved conrugated metal part against relative horizontal movement while permitting limited relative vertical movement, said connecting means being tightenable to hold said upper and lower longitudinal margins against relative movement.

4,695,188

LINED ROCK CISTERN OR TUNNEL

Jorma Pulkkinen, Porvoo, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI85/00024, § 371 Date Oct. 21, 1985, § 102(e) Date Oct. 21, 1985, PCT Pub. No. WO85/04214, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 8, 1985, Ser. No. 795,342
Claims priority, application Finland, Mar. 13, 1984, 841016
Int. Cl.[4] E21D *11/00*
U.S. Cl. 405—150 **9 Claims**

1. A rock cistern or tunnel, comprising

an inner layer of tightly sealing material, said inner layer having an inner surface facing the cistern or tunnel, and an outer surface, wherein said tightly sealing material is one of plastic, steel, or concrete fiber,

an intermediate layer formed on said outer surface of said inner layer, said intermediate layer comprising a steel-reinforced, water-tight, sprayed concrete and said intermediate layer having an outer surface,

an outer layer formed on said outer surface of said intermediate layer, said outer layer comprising water-permeable, sprayed concrete and serving as a layer for conducting ground water, wherein said water-permeable, sprayed concrete comprises a light-weight concrete mix of haydite, sand, cement, a swelling agent, or a water-conducting fiber.

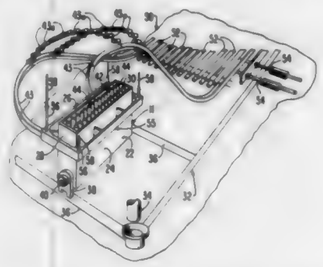


4,695,189

ROTATING CONNECTION ASSEMBLY FOR SUBSEA PIPE CONNECTION

Norman R. Wallace, Walnut Creek, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 18, 1986, Ser. No. 853,804
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—169 **21 Claims**



1. A connection assembly for interconnecting a subsea well with a platform floating on the surface of the sea comprising:

a connection box;

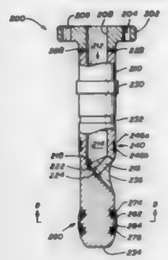
means coupled with the connection box for pivotally mounting the same on the sea bed for movement from a first position to a second position, said connector box having a flexible pipe segment coupled thereto and being structurally deformable as the connection box moves between said first and second positions, said pipe segment having an inlet end and an outlet end, said inlet end adapted to be coupled to a subsea well to direct flowable hydrocarbons from the well to the outlet end of the pipe segment, there being fitting means on the outlet end of the pipe segment for attachment of the lower end of a fluid conductor extending between the connections box and the vessel, the connection box being pivotal from the first position to the second positions as the length of the fluid conductor to form a J-shaped riser extending between the vessel and the connection box.

4,695,190

PRESSURE-BALANCED STAB CONNECTION

Michael J. A. Best, Dursley; Richard H. Jones, Stroud, both of England; Joseph H. Hynes, Houston, Tex.; Richard J. Pond, Nailsworth, and Colin R. Gordon, Stroud, both of England, assignors to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 4, 1986, Ser. No. 836,009
Int. Cl.[4] E21B *33/038, 34/04*
U.S. Cl. 405—169 **25 Claims**



1. Apparatus for sealingly connecting a flow bore of a wellhead to a flowline, comprising:

a stab member including a stab body, said stab body having a stab body bore therethrough, one end of said stab body bore exiting from said stab body and being in fluid communication with the flow bore and the other end of said stab body bore exiting from a side of said stab body through a stab body side port;

a stab receptacle mounted on the wellhead and having a stab receiving bore therethrough for receiving said stab body therewithin;

said stab receptacle having a receptacle flow bore therethrough, one end of said receptacle flow bore being in fluid communication with said stab receiving bore and the other end of said receptacle flow bore exiting said stab receptacle and being in fluid communication with the flowline;

means for establishing fluid communication between said stab body side port and said one end of said receptacle flow bore when said stab body is received within said stab receiving bore, including means disposed on said stab member for orienting said stab member with respect to said Christmas tree for ensuring the alignment of said stab body side port with said one end of said receptacle flow bore when said stab body is received within said stab receiving bore; and

first and second sealing means disposed on said stab body above and below said stab body side port, respectively, for sealing engagement with the walls of said stab receiving bore above and below said one end of said receptacle flow bore for establishing a non-blow-apart, fluid pressure sealed flow passage between said stab body bore of said stab member and said receptacle flow bore of said stab receptacle when said stab body is landed within said stab receiving bore.

4,695,191

HANDLING SYSTEM FOR EFFECTING A SUBMERGED COUPLING

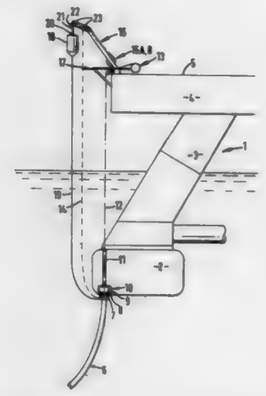
William L. Wagstaff, Tarves, Scotland, assignor to The Floating Technology Company Limited, Greenford, England

Filed Aug. 5, 1985, Ser. No. 762,302
Claims priority, application United Kingdom, Apr. 15, 1985, 8509630
Int. Cl.[4] E02D *21/00*
U.S. Cl. 405—195 **5 Claims**

1. A method of coupling the free end of a riser extending from a sea bed location to a submerged portion of a floating structure provided with a riser handling system of the type including a first coupling part attached to the free end of the riser, a second coupling part for selective releasable connection to the first coupling part, a third coupling part attached to a submerged portion of the floating structure, and control means on the floating structure for moving the second coupling part, comprising the steps:

recovering the free end of the riser and positioning it at an above-water location on said floating structure;

operating the control means to move the second coupling part to said above-water location;



coupling said second coupling part to the first coupling part at said above-water location;

operating said control means to move the second coupling part with said first coupling part and hence the riser attached thereto from said above-water location to an underwater location on the floating structure; and,

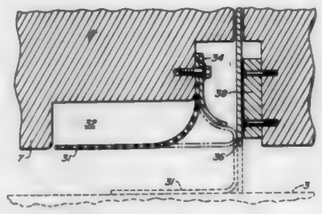
utilising said control means to couple the second coupling part to the third coupling part at said underwater location thereby effecting coupling of said riser to said floating structure.

4,695,192

FLAPPER-TYPE SEALING SYSTEM FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

Richard New, Kenmore, N.Y., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 3, 1986, Ser. No. 835,420
Int. Cl.[4] E02B *17/00;* E02D *23/16*
U.S. Cl. 405—203 **7 Claims**



1. A sealing apparatus to affix a gravity founded, movable offshore structure onto a subbase that rests on the sea floor, during the time when the movable structure is being deballasted to prepare for rapid site removal, comprising:

a movable offshore platform;

at least one load bearing member to support the platform, the member is fixedly connected to the platform, and extends in a generally downward direction;
a generally flat surface on the underside of the member;
a subbase located on the sea floor to provide support to the platform;
a generally flat upper surface on the subbase to support the member on the upper surface of the subbase;
means for creating a space between the subbase and the member;
a reinforced, elastomeric flapper-type seal fixed in a closed loop on the bottom surface of the at least one member for sealing purposes, the seal being engaged once a portion of the platform weight forces the elastomeric seal down onto the subbase to establish a barrier around the space the seal mounted at approximately 90° relative to the surface of the subbase on a metallic backing plate and kept in position during evacuation by a retaining ring placed between the seal and the evacuated space;
means for evacuating the space between the subbase, the member, and the seal to reduce the hydrostatic pressure in the space to a lower pressure than the surrounding seawater, so that when the space has been evacuated, the platform will be held onto the subbase until the hydrostatic pressure in the evacuated space has been restored to equilibrium with the outside sea environment.

4,695,193

SLENDER FLEXIBLE MARINA STRUCTURE FOR HYDROCARBON PRODUCTION AND SHIP MOORING IN DEEP SEAS

Gaetano Sebastiani, Mestre; Roberto Brandi; Francesco Di Lena, both of Padua; Silvestro Vanore, Mestre, and Roberto Carraro, Padua, all of Italy, assignors to Tecnomare S.p.A., Venice, Italy

Filed Apr. 30, 1984, Ser. No. 605,164
Claims priority, application Italy, May 9, 1983, 84116 A/83
Int. Cl.⁴ E02B *17/00*
U.S. Cl. 405—204 **9 Claims**



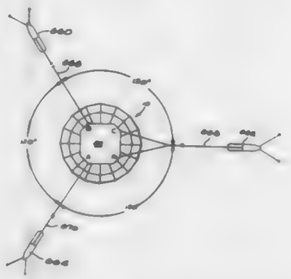
1. A deep sea marine structure for use as a hydrocarbon production platform or oil tanker mooring point positioned in proximity to the sea surface comprising:
a foundation base assembly,
a tapered bottom terminal element connected to said foundation base assembly,
a tapered top terminal element integral with an immersed buoyancy chamber which is located in proximity to the sea surface,
said bottom terminal element and said top terminal element being connected by a vertical tubular element,
said vertical tubular element is maintained under tension by said immersed buoyancy chamber,
a structure supported by said immersed buoyancy chamber located above the surface of the sea,
the rigidity of said bottom terminal element decreases in the up direction and the rigidity of said top terminal element decreases in the down direction.

4,695,194

MOBILE MARINE OPERATIONS STRUCTURE

Arun Bhalaik, Seattle, Wash.; Peter W. Braddick, Fullerton, Calif.; Darryl S. Brittin, Laguna Hills, Calif., and Gerald L. Johnson, Orange, Calif., assignors to Santa Fe International Corporation, Alhambra, Calif.

Division of Ser. No. 819,288, Jan. 16, 1986. This application Dec. 23, 1986, Ser. No. 945,514
Int. Cl.⁴ E02B *17/00*
U.S. Cl. 405—207 **10 Claims**



1. The process of installing a marine operations structure in a pre-determined sea floor location, said structure having a central core and a support base having at least two differently sloped ice wall surfaces for achieving fracturing of ice features, and having at least two series of circumferentially arranged ballast tanks, comprising the steps of:
positioning the structure over a selected sea floor location by the use of at least three tug boats connected to said structure by tension cables arranged radially with respect to said structure;
flooding a first series of lower ballast tanks in a sequential ballasting operation;
flooding a second series of ballast tanks located at a higher elevation within said structure than said first series of ballast tanks;
maintaining radial forces along said tension cables during said flooding steps; and
after said structure has become founded on the bottom of the sea, pumping sea water into fluid tanks some of which are located at an elevation above the water level.

4,695,195

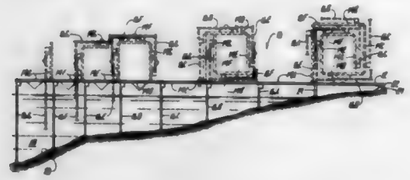
FOLDING BOAT DOCK

Bruce R. Brande, 3214 Lettie, Ames, Iowa 50010

Filed Mar. 5, 1986, Ser. No. 836,327
Int. Cl.⁴ B63C *1/00*
U.S. Cl. 405—220 **36 Claims**

1. A boat dock assembly for retrievable extension into a body of water from the shore, comprising:
a base secured to the shore;
a plurality of elongated dock sections, including a first and last dock section, each having opposite forward and rearward ends and opposite sides,
a plurality of hinge means for pivotally securing said dock sections together in an end-to-end relation, with said rearward end of said first dock section being pivotally secured to said base by one of said hinge means, each of said hinge means having a pivot axis transverse to the longitudinal axis of said dock sections,

a plurality of support means attached to each dock section for supporting said dock sections above the surface of the body of water; and
means for rolling said dock sections out of said body of water by sequentially pivoting each dock section in one direction above the respective hinge means, commencing with said last dock section, such that said dock sections roll into a spiral configuration adjacent said base, and for



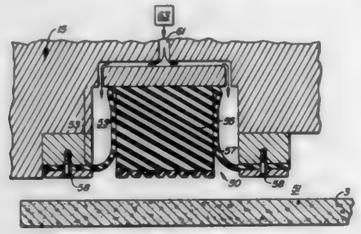
unrolling said dock sections from said spiral configuration into said body of water by sequentially pivoting each dock section in the opposite direction about the respective hinge means, commencing with said first dock section;
said means for rolling and unrolling said dock sections including a series of rail members operatively connected to said dock sections and means for extending and retracting said rail members such that said dock sections roll and unroll, respectively.

4,695,196

PAD-TYPE INFLATABLE SEAL FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

Richard New, Kenmore, N.Y., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 3, 1986, Ser. No. 835,419
Int. Cl.⁴ E02B *17/00*; E02D *5/74*
U.S. Cl. 405—224 **1 Claim**



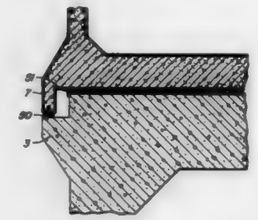
1. A sealing apparatus for affixing a gravity founded, movable offshore structure onto a sub-base that rests on the sea floor, during the time when the movable structure is being deballasted in preparation for rapid site removal, comprising:
a movable offshore platform;
at least one load bearing member for supporting the platform, the member being fixedly connected to the platform and extending in a generally downward direction from the platform, the underside of the member having a generally flat surface;
a subbase also for providing support to the platform, the subbase having a generally flat surface so that the member may rest on the upper surface of the subbase;
a recessed chamber within the member;
a flexible elastomeric seal attached to both sides of the recessed chamber to seal the recessed chamber off from the outside sea environment and make it fluid-tight;
a pad attached to the outside of the elastormeric seal, the pad arranged to undergo mechanical compression when properly mating the subbase;
a manifold line connected to the fluid-tight recessed chamber;
means for creating an internal pressure within the recessed chamber through the manifold line;
means for creating a space between the member and the subbase; and
means for evacuating the space between the member and the subbase to reduce the hydrostatic pressure within the space to a point lower than the surrounding seawater;
so that when the recessed chamber is pressurized the flexible seal will create a fluid-tight seal against the sub-base so that the hydrostatic pressure in the space may be reduced to keep the platform on the subbase until such time as the pressure in the space is equalized with the surrounding seawater.

4,695,197

ELASTOMERIC SEAL FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

Brian J. Watt, Kingwood; Dilipkumar N. Bhula, Houston, and Jal N. Birdy, Kingwood, all of Tex., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 13, 1986, Ser. No. 839,492
Int. Cl.⁴ E02B *17/02*
U.S. Cl. 405—224 **4 Claims**



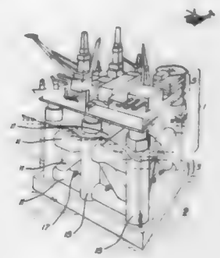
1. A sealing apparatus to affix a gravity founded, movable offshore structure onto a subbase that rests on the sea floor, during the time when the movable structure is being deballasted to prepare for rapid site removal, comprising:
a movable offshore platform;
at least one load bearing member to support the platform, the member is fixedly connected to the platform and extending in a generally downward direction from the platform;
a generally flat surface on the underside of the member;
a subbase also located on the sea floor to provide support to the platform;
a generally flat upper surface on the subbase to support the member on the upper surface of the subbase;
means for creating a space between the subbase and the member;
a passive, elastomeric seal on the bottom of the at least one load bearing member and mounted on a lip for sealing purposes, the seal being engaged once a portion of the platform weight forces the elastomeric seal down onto the subbase to establish a fluid-tight barrier around the space; and
means for evacuating the space between the subbase, the member and the elastomeric seal to reduce the hydrostatic pressure to a lower pressure than the surrounding seawater, so that when the space has been evacuated the platform remains on the subbase while it is being deballasted until such time when the hydrostatic pressure in the evacuated space has been restored to equilibrium with the outside sea environment.

4,695,198

LIP-TYPE SEALING SYSTEM FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

John H. Goodacre, Glen Ellyn, and Eric Brogren, Wheaton, both of Ill., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 23, 1986, Ser. No. 866,825
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—224 **8 Claims**



1. A sealing apparatus to affix a gravity founded, movable offshore structure onto a subbase that rests on the sea floor, during the time when the movable structure is being deballasted to prepare for rapid site removal, comprising:

a movable offshore platform;

at least one load bearing member to support the platform, the member is fixedly connected to the platform and extends in a generally downward direction from the platform;

a generally flat surface on the underside of the member;

a subbase located on the sea floor to provide support to the platform;

a generally flat upper surface on the subbase to support the member on the upper surface of the subbase;

means for creating a space between the subbase and the member;

a reinforced, elastomeric lip seal membrane fixedly connected to the bottom of at least one support member in a closed loop for primary sealing purposes, the membrane being able to contact the subbase once a portion of the platform weight forces the membrane down onto the subbase; and

means to evacuate the space between the lip seal, the subbase, and the pontoon, to reduce the hydrostatic pressure lower than the surrounding seawater so that when the space has been evacuated the platform is held onto the subbase until the hydrostatic pressure in the evacuated space is restored to equilibrium with the outside sea environment.

4,695,199

ELASTOMERIC BEARING PAD AND SEAL FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

John H. Goodacre, Glen Ellyn, Ill., and Larry J. Hall, Birmingham, Ala., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 2, 1986, Ser. No. 869,524
Int. Cl.[4] E02B *17/00*; E02D *5/74*
U.S. Cl. 405—224 **2 Claims**

1. A sealing apparatus to hold a gravity founded, movable offshore structure onto a subbase during deballasting of that structure, comprising:

a movable offshore platform;

means for ballasting and deballasting said platform;

a plurality of load bearing columns fixedly connected to said platform in a generally downward direction;

a pontoon fixedly connected to the lower surface of said columns;

a generally flat lower surface on the underside of said pontoon;

a subbase located on the sea floor to support the pontoon;

a generally flat upper surface of said subbase;

a circular channel in the subbase arranged in a closed loop;

an elastomeric bearing pad, having a specific gravity greater than seawater, placed in the circular channel, the elastomeric bearing pad extending out of the channel so that when the pontoon compresses the elastomeric bearing pad, a fluid-tight space is created between the subbase, the pontoon and the elastomeric bearing pad;



space bars to hold the elastomeric bearing pad substantially in the center of the channel; and

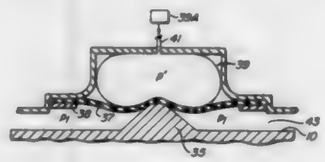
means to evacuate the water from the space.

4,695,200

MEMBRANE SEAL FOR A REMOVABLE BOTTOM FOUNDED STRUCTURE

Larry Hall, Birmingham, Ala., and John H. Goodacre, Glen Ellyn, Ill., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 2, 1986, Ser. No. 869,525
Int. Cl.[4] E02B *17/00*; E02D *21/00*
U.S. Cl. 405—224 **2 Claims**



1. A sealing apparatus to affix a gravity founded, movable offshore structure onto a subbase that rests on the sea floor, during the time when the movable structure is being deballasted to prepare for rapid site removal, comprising:

a movable offshore platform;

at least one load bearing member to support the platform, the member is fixedly connected to the platform and extending in a generally downward direction from the platform;

a generally flat surface on the underside of the member;

a subbase to provide support to the platform;

a generally flat upper surface on the subbase to support the at least one member on the upper surface of the subbase;

a raised sill located on the upper surface of the subbase on which the columns will sit, the sill being arranged in a substantially circular closed loop;

an indented portion in the member, corresponding to the sill configuration so that both the sill and the indented portion will match each other when the member is placed on the subbase;

a flexible seal attached to the sides of the indented portion so that there is a fluid-tight inside chamber in the indented portion;

an inflatable bladder within the fluid-tight inside chamber of the indented portion;

means to inflate the bladder;

means to support substantially all of the platform weight;

means to establish a space between the subbase and the member; and

means to evacuate the space between the member and the subbase to create a lower hydrostatic pressure within the space than the surrounding seawater;

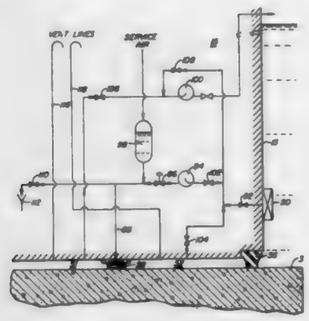
so that as the member sits on the subbase, the sill deflects the flexible membrane, and once the bladder is inflated it seals off the space between the member and the subbase from the outside sea environment, so that the structure will be held down onto the subbase once the hydrostatic pressure within the space is reduced to a pressure that is lower than the surrounding seawater.

4,695,201

REMOVABLE BOTTOM FOUNDED STRUCTURE

Robert H. Beskow, Concord; Patrick J. Dunn, Pleasant Hill, both of Calif.; John H. Goodacre, Glen Elly, Ill.; Larry J. Hall, Birmingham, Ala.; William H. Fischer, Wingdale, N.Y., and E. Ronald Carlson, New Fairfield, Conn., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 21, 1986, Ser. No. 898,989
Int. Cl.[4] F02B *17/02*
U.S. Cl. 405—224 **11 Claims**



1. A sealing apparatus to affix a normally gravity founded, movable offshore structure onto a subbase that rests on the sea floor, during the time when the movable structure is deballasted to prepare for rapid site removal, comprising:

a movable offshore platform;

at least one load bearing column to support the platform, the column is fixedly connected to the platform and extends in a generally downward direction from the platform;

a generally flat lower surface on the at least one column;

a subbase located on the sea floor to support the platform;

a generally flat upper surface on the subbase to support the at least one column on the upper surface of the subbase;

means to create a space between the subbase and the at least one column;

a passive, elastomeric seal arranged in a closed loop in the space between the underside of the at least one column and the subbase for primary sealing purposes, the seal is engaged once a portion of the platform weight compresses the elastomeric seal down onto the subbase to establish a fluid-tight barrier around the space;

an inflatable seal affixed in a closed loop to the underside of the at least one column for secondary sealing purposes once the inflatable seal is inflated and pressed against the subbase and the at least one column to establish a fluid-tight barrier in the space;

means to inflate the inflatable seal; and

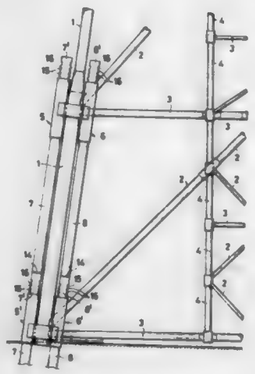
means to evacuate the space to reduce the hydrostatic pressure lower than the surrounding seawater pressure so that when the space is evacuated the platform will be held onto the subbase while it is devallasted until such time when the hydrostatic pressure in the evacuated space has been restored to equilibrium with the outside sea environment.

4,695,202

SYSTEM OF SUBMARINE LINKING BETWEEN THE LEGS OF A PLATFORM AND THE RELATING FOUNDATION PILES

Gian P. Ferrari Aggradi, Barberino di Mugello, and Cesare M. Ferrante, Florence, both of Italy, assignors to Nuovo Pignone S.p.A., Florence, Italy

Filed May 2, 1986, Ser. No. 859,008
Claims priority, application Italy, May 3, 1985, 20570 A/85
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—227 **3 Claims**



1. A system for submarine linking between anchoring cylinders affixed to a platform leg and a related foundation pile, characterized in that said anchoring cylinders are composed of two coaxial cylinders, one of which is an outer cylinder having a substantial thickness of high yield strength steel, the other of which is an inner cylinder having a thickness of low yield strength steel, said thickness being less than the thickness of said outer cylinder, wherein said outer cylinder and said inner cylinder are butt-welded to each other at their ends so as to define an annular chamber between said cylinders, said chamber being radially inwardly expansible by the application of pressure therein, and wherein said related foundation pile is composed of high yield strength steel in a zone where said submarine linking is to be accomplished said zone of said pile including an outer surface with alternating slots and toothing and an inner thickened surface.

4,695,203

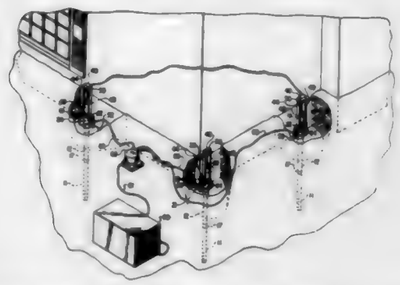
METHOD AND APPARATUS FOR SHORING AND SUPPORTING A BUILDING FOUNDATION

Steven D. Gregory, Ada, Okla., assignor to Gregory Enterprises, Inc., Ada, Okla.

Filed Apr. 11, 1985, Ser. No. 722,060
Int. Cl.[4] E02D *5/00*
U.S. Cl. 405—230 **11 Claims**

1. An apparatus for raising and supporting the foundation or slab of a building, said apparatus comprising means for engaging the lower surface of said foundation or slab, said engaging means including a tubular guide means; a pipe assembly extending through said guide means and having an upper portion

extending above said guide means and a lower portion extending into the ground; a lifting saddle connected to said engaging means and extending around said upper portion of said pipe assembly; hydraulic lifting means extending between said upper portion of said pipe assembly and said lifting saddle, said



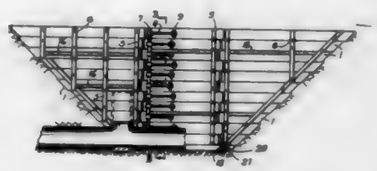
hydraulic lifting means including a piston disposed coaxially with said pipe assembly, and means for actuating said hydraulic lifting means to extend said piston, said lifting saddle being quick-detachably mounted to said engaging means so that it may be removed therefrom after said foundation or slab is raited.

4,695,204

TRAVELING TRENCH SHORE

Noel G. Bell, 52 W. Hudson Ave., Englewood, N.J. 07631

Filed Jan. 12, 1986, Ser. No. 873,709
Int. Cl.[4] E02D *17/00;* **E21D** *5/12*
U.S. Cl. 405—283 **9 Claims**



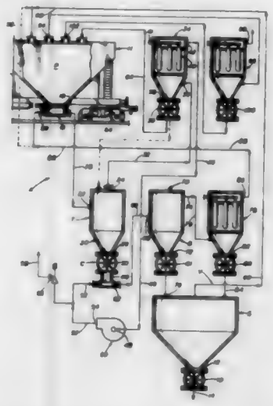
1. A traveling trench shore of the type consisting of longitudinal panels which cover the walls of the trench, the panels being supported transversely against the walls of the trench by vertical soldier beams and cross braces that form movable frames on which hydraulic jacks are mounted that are connected to the panels and move the panels forward, the reaction for the jacks being taken by the frames which are held in position by other jacks attached to other panels, which panels are held stationary by the friction between them and the walls of the trench, the panels being movable vertically and individually in succession and having plates on their lower edges and ends to cover the junction with panels below and behind them and prevent entry of earth between them; the shore comprising: a central chamber where a permanent structure is installed; a front section with walls sloping to conform to the natural slope of the ground, where excavation takes place; and a rear section with similar sloping walls to allow for installing manholes consisting of vertical segments, the vertical soldier beams of the rear section being cantilevered downwards below the lowest cross braces so that the shore can pass over each manhole segment after the segment is placed.

4,695,205

PNEUMATIC CONVEYING SYSTEM

Marc S. Levine, Houston, Tex., assignor to United DC, Houston, Tex.

Filed Dec. 20, 1985, Ser. No. 811,951
Int. Cl.[4] B65G *53/28, 53/60*
U.S. Cl. 406—38 **20 Claims**



1. A closed loop pneumatic conveying system for transferring granular and powdered particulate materials from a transport container having a discharge manifold and a vent opening thereon, to a supply bin comprising:

transfer unit means, having a first and second connection, for generating a vacuum at said first connection and pressure at said second connection;

first conduit means for connecting a discharge manifold on the transport container to said first connection of said transfer unit;

separator means mounted to the supply bin having an inlet, a particulate outlet and a fluid outlet for separating particulate material, from an incoming fluid-particulate material stream, through said particulate outlet into the supply bin;

second conduit means for connecting said second connection of said transfer unit to said inlet of said separator means for transfer of particulate material under pressure;

said transfer unit means further comprising conveying means to separate said transfer unit means into a pressure zone, connected to said second conduit, and a vacuum zone, connected to said first conduit, and to allow particulate materials to flow from said vacuum to said pressure zone;

third conduit means for connecting said fluid outlet of said separator means to the discharge manifold on the transport container thereby closing a loop, said third conduit means being devoid of flow controlling elements therein; and

means for venting the supply bin into the transport container.

18. A method for unloading a transport container into a supply bin comprising the steps of:

connecting a first cyclone separator inlet to a particulate material discharge connection of a transport container;

applying a vacuum to said first cyclone separator to pneumatically convey particulate matter from the discharge connection of the transport container into the first cyclone separator;

discharging particulate matter from the first cyclone separator through a valve into a pressure conveying line;

applying a pressure source to the pressure conveying line to pneumatically convey the particulate material in the pressure conveying line to a second cyclone separator mounted to the supply bin;

discharging particulate material from said second cyclone separator into the supply bin;

conducting fluid and particulate matter emerging from an overhead connection on said second cyclone separator into a conduit connected to said particulate matter discharge connection of the transport container;

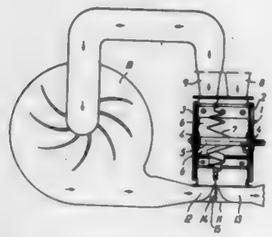
venting the conduit used in said conducting step into a vent connection on the transport container.

4,695,206

PNEUMATIC CONVEYOR FOR PARTICULATE MATERIAL

Jens O. E. Hansen, Fuglebjerg, Denmark, assignor to Kongskilde Koncerneiskab A/S, Sord, Denmark

Filed Apr. 14, 1986, Ser. No. 851,217
Claims priority, application Denmark, Apr. 15, 1985, 1697/85
Int. Cl.[4] B65G *53/46*
U.S. Cl. 406—65 **2 Claims**



1. A pneumatic conveyor for delivery of low weight particulate material comprising

a cellular rotor including

a cylindrical housing (**1**) having spaced side wall (**2** and **3**), bearing means (**4**) in each side wall (**2** and **3**),

a horizontal shaft (**5**) extending between said side walls (**2** and **3**) and being supported by said bearing means (**4**),

a plurality of radial vanes (**6**) carried by said shaft (**5**) and extending to the periphery of the housing (**1**), to define a plurality of radial cells,

a filter wall (**7**) vertically disposed in said housing (**1**) transversely to said horizontal shaft and separating said housing into an inlet side and an outlet side,

an air inlet (**8**) on top of said housing communicating with said inlet side for air carrying the particulate material into said inlet side,

an air outlet (**9**) on top of said housing communicating with said outlet side for carrying air from said outlet side,

a conveyance conduit (**11**) on the bottom of said housing (**1**) having at one end an air inlet chamber (**12**) in open communication with the outlet side of said housing (**1**) and at an opposite end a discharge chamber (**13**) in open communication with the inlet side of said housing (**1**) to receive particulate material therefrom,

a blower **10** having a suction protion communicating with said air outlet (**9**) to withdraw air from the outlet side of said housing (**1**) and having a pressure portion communicating with said air inlet chamber (**12**) to deliver pressurized air thereto,

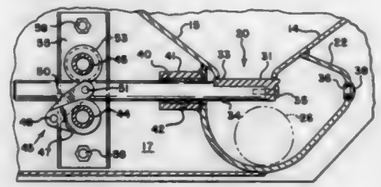
a threshold means (**14**) located at the plane of the filter wall in said conveyance conduit (**11**) to narrow an air flow path therebetween whereby part of the pressurized air proceeds from said air inlet chamber (**12**) upward into the outlet side of said housing (**1**) and whereby a second part of the pressurized air proceeds directly into said discharge chamber (**13**) for air carrying and discharging the particulate material dropped thereinto.

4,695,207

PNEUMATIC GATE OPERATOR AND OUTLET CAP

Roy W. Miller, Highland, Ind., assignor to Pullman Rail Leasing Inc., Chicago, Ill.

Filed Jul. 18, 1985, Ser. No. 756,784
Int. Cl.[4] B65G *53/46*
U.S. Cl. 406—130 **24 Claims**



11. A pneumatic hopper discharge structure comprising:

a discharge housing including a pair of transversely spaced downward sloping walls forming an opening and a pair of end walls connected to the ends of the downward sloping walls;

a control tube supported below the discharge housing and communicating with the opening;

movable valve support means supported on the discharge structure for movement with respect to the discharge housing;

valve means supported on the movable support means and positioned for movement with respect to the discharge housing to open and close the opening;

a crank arrangement being connected with the movable support means for movement of the movable support means and of the valve means;

a first valve operating shaft supported on the end walls and extending longtudinally of the discharge structure below one of the downward sloping walls, the operating shaft being connected with the crank arrangement providing rotation of the operating shaft to open and close the opening;

the crank arrangement including

a crank member being fixedly mounted on the operating shaft; and

a connector member having two end portions, one end portion having a pivotal connection with the crank member and the other end portion being pivotally connected with the movable support means providing a varying mechanical advantage being greatest during initial movement of the valve means in the opening in opening and closing thereof;

the distance on the crank member from the operating shaft to the pivotal connection being substantially equal to the vertical distance from the operating shaft to the movable support means for efficient load transfer during opening and closing of the valve means.

4,695,208

TOOL HOLDER

Gerald K. Yankoff, 8273 Copperaail Way, Westchester, Ohio 45069

Filed Nov. 14, 1985, Ser. No. 798,122
Int. Cl.[4] B23B *27/10, 27/16, 27/22*
U.S. Cl. 407—106 **4 Claims**

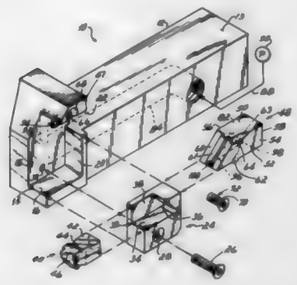
1. A tool holder for machining a workpiece with an insert having a top surface terminating with a cutting edge, comprising:

a support bar formed with a cavity defining a top wall having an outer face, said support bar being formed with a threaded bore terminating in a recessed seat at said outer face in said top wall;

a mounting block formed with a seat having a bottom wall, a side wall and a rear wall;

means for removably securing said mounting block within said cavity of said support bar, said seat of said mounting block receiving an insert so that the top surface of the insert is exposed;

a clamping block disposed within said cavity beneath said top wall of said support bar and atop the exposed, top surface of the insert, said clamping block being formed with a beveled edge terminating with a bearing surface;



a screw having a tapered head matable with said recessed seat in said outer face of said top wall of said support bar and said bearing surface of said clamping block, said screw being inserted into said threaded bore of said support bar so that said tapered head of said screw engages both said recessed seat in said support bar and said bearing surface in said clamping block to force said clamping block against the insert for clamping the insert against said bottom wall, said side wall and said rear wall of said mounting block.

4,695,209

HELICAL GUIDE APPARATUS USABLE FOR A GEAR SHAPER

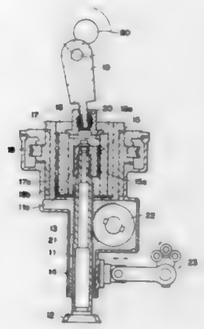
Takayo Noguchi; Yoichi Togawa; Tsuneo Nishimoto; Yoshiharu Tonohara, all of Kyoto; Tadashi Rokkaku, Hiroshima; Seigo Nakai, Kyoto; Michio Araki, Kyoto, and Kabei Kitano, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 21, 1986, Ser. No. 888,973

Claims priority, application Japan, Aug. 13, 1985, 60-176926; Oct. 21, 1985, 60-233189; Feb. 5, 1986, 61-22151

Int. Cl.[4] B23F *9/04*

U.S. Cl. 409—42 **3 Claims**



1. A helical guide apparatus usable for a gear shaper of the type comprising a main spindle adapted to reciprocably move in an axial direction and rotate in a circumferential direction, first reciprocable driving means for reciprocably driving said main spindle, a male pattern fixedly connected to the main spindle or made integral with the latter, said male pattern being formed with a first helical projection of which lead and direction are determined corresponding to a certain required helix angle, a first female pattern disposed around the male pattern and having a first helical recess on an inner wall surface into which said first helical projection on the male pattern is fitted and a second helical projection on an outer surface thereof of which lead and direction are determined same or opposite to those of the first helical projection, a second female pattern disposed around said first female pattern and having a second helical recess on an inner wall surface thereof into which said second helical projection on said first female pattern is fitted, said second female pattern being rotated in synchronization with a workpiece to be worked, and second reciprocable driving means for reciprocably driving the first female pattern in the axial direction of the main spindle in synchronization with reciprocable movement of the latter.

4,695,210

APPARATUS FOR THE MACHINING OF WORKPIECES

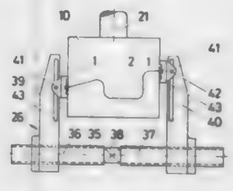
René Büchler, Sonnental, Switzerland, assignor to Büchler G-Set A.G., Flawil, Switzerland

Filed Jan. 22, 1986, Ser. No. 821,233

Claims priority, application Switzerland, Jan. 22, 1985, 279/85

Int. Cl.[4] B23Q *3/06*

U.S. Cl. 409—219 **9 Claims**



1. In an apparatus wherein a workpiece affixed for support at a supporting means of the apparatus is subjected to a machining process for separating said workpiece into a waste piece and a remaining piece, whereby when said machining is completed only said remaining piece is kept affixed for support at the supporting means, the improvement comprising at least one pair of retention means cooperating with each other for retaining said waste piece unmovably positioned with respect to said remaining piece, each retention means comprising attachment means for attaching a first portion of said retention means to said remaining piece for supporting said retention means at said remaining piece and attachment means for attaching a second portion of said retention means to said waste piece for supporting said waste piece at said retention means, wherein when said machining is completed said waste piece and said remaining piece have respective surfaces facing each other and defining between them a machining space, and each said retention means is shaped for bridging said machining space, said retention means comprising substantially the sole support for said workpiece during the machining process.

4,695,211

REFRIGERATED CARRIER FLOOR CLAMP

Willem H. P. Van Iperen, Westfield, N.J.; Henry J. Sandt, Jr., Mt. Bethel, Pa., and Eric G. Aronson, Livingston, N.J., assignors to Sea-Land Corporation, Inc., Elizabeth, N.J.

Filed Sep. 10, 1985, Ser. No. 774,318

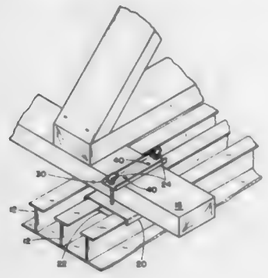
Int. Cl.[4] B60P *1/64*

U.S. Cl. 410—77 **10 Claims**

1. A clamping arrangement for clamping to a floor constructed from a plurality of parallel arranged T-shaped floor members, comprising:

a. a cargo carrier having a floor constructed from a plurality of parallel arranged T-shaped floor members which are spaced apart at regular intervals along the floor to form a cargo bearing floor formed by the tops of the regularly spaced apart T-shaped floor members, with the top of each T-shaped floor member being supported by a central vertical support member, with the spaces between the regularly spaced apart floor members providing for ventilation to allow air to circulate beneath the cargo;

b. a channel shaped top floor plate positioned across the top of two adjacent T-shaped floor members, said channel shaped top floor plate comprising an elongated member with its length extending parallel to the T-shaped floor members, and having a cross section in the shape of an inverted U with the base of the inverted U extending completely across the tops of the two adjacent T-shaped



floor members, and the legs of the U extending downwardly outside of the T tops of the two adjacent T-shaped floor members;

c. an under floor hold down plate positioned between the two adjacent T-shaped floor members and beneath the T-tops of the T-shaped floor members, said under floor hold down plate including at least one threaded aperture therein;

d. an elongated strap member, having a length substantially equal to the top floor plate, adapted to be positioned on top of a beam placed on top of the top floor plate; and

e. at least one bolt extending through said strap member, alongside the beam, through the channel shaped top floor plate, between the two adjacent T-shaped floor members, and through a said threaded aperture in the under floor hold down plate, and serving to clamp the top floor plate to the under floor hold down plate against the T tops of the T-shaped floor members positioned therebetween.

4,695,212

COMPOSITE CHANNEL AND PLATE NUT ASSEMBLY

Imre Berecz, El Toro, Calif., assignor to Microdot Inc., Darien, Conn.

Filed Apr. 25, 1986, Ser. No. 855,712

Int. Cl.[4] F16B *27/00*

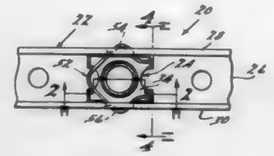
U.S. Cl. 411—85 **1 Claim**

1. A composite channel and plate nut assembly comprising

a U-shaped channel defined by a web portion and spaced side flanges,

said channel having a plurality of apertures in the web portion thereof immediately adjacent the flanges therein whereby said flanges define and are contiguous with the laterally outer walls of said apertures, respectively, and

a plate nut having a threaded portion for the acceptance of a complementary bolt and a base flange seated on the web portion of said channel, the base flange of said nut having a plurality of downwardly extending lugs thereon acceptable in the apertures of the web portion of said channel, respectively, the base flange and the lugs on said nut bearing against the side flanges of said channel whereby reaction forces upon threading of a bolt into said nut are accepted directly by said channel flanges; and



means for retaining the base flange on said nut in juxtaposed relation to the web portion of said channel.

4,695,213

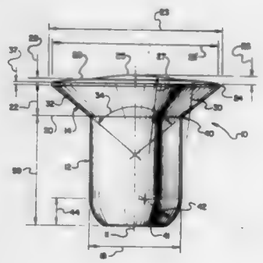
CONTROLLED EXPANSION PROTRUDING-HEAD RIVET DESIGN

Kenneth P. Sparling, Burbank; Angelo Incardona, Reseada; Garth D. Kikendall, Glendale; David G. Richardson, Burbank; Ronald E. Wood, Sepulveda, and Leon Bakow, Sherman Oaks, all of Calif., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Nov. 29, 1984, Ser. No. 676,464

Int. Cl.[4] F16B *19/06*

U.S. Cl. 411—506 **4 Claims**



1. A flush-head rivet, having a shank portion with a minimum and maximum diameter and a nominal diameter therebetween, for joining two or more structural members together, the members having a countersunk rivet hole therethrough with a countersink included angle of between 99 and 101 degrees, the rivet providing controlled expansion of the rivet hole when the hole has a minimum diameter equal to the maximum shank diameter and a maximum diameter of 1.05 times the minimum shank diameter, the rivet comprising:

a head portion comprising:

a head diameter before forming a land on the edge thereof of between 1.875 times the minimum shank diameter and 1.879 times the maximum shank diameter;

a minimum head diameter after forming the land on the edge thereof of 1.823 times the minimum shank diameter;

a land width on said head of between 0.021 times the minimum shank diameter and 0.012 times the maximum shank diameter;

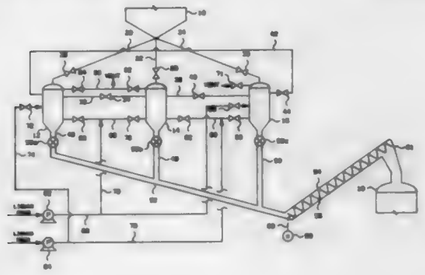
a head major crown radius between 2.974 times the minimum shank diameter and 2.690 times the maximum shank diameter; and

a major crown height of between 0.063 times the minimum shank diameter and 0.078 times the maximum shank diameter; and

a minor crown radius between 4.014 times the minimum

shank diameter and 2.880 times the maximum shank diameter;
a minor crown height of between 0.021 times the minor shank diameter and 0.031 times the maximum shank diameter;
an underhead included angle of 102 to 103 degrees.

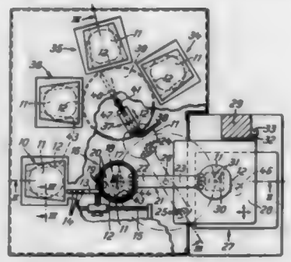
4,695,214
APPARATUS AND METHOD FOR FEEDING SOLID MATERIALS TO A HIGH PRESSURE VESSEL
James Sciata, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jul. 22, 1985, Ser. No. 757,817
Int. Cl.⁴ B65G *65/32*
U.S. Cl. 414—221 **12 Claims**



12. A method for feeding solid materials to a high pressure vessel comprising:
(a) introducing liquid to a first lock hopper so as to at least partially fill said first lock hopper with said liquid;
(b) introducing solid materials to said first lock hopper after step (a);
(c) if during step (b) the liquid level in said first lock hopper rises above a predetermined level, the volume of liquid above said predetermined level being denoted as excess liquid, the step of passing at least a portion of said excess liquid, during step (b), from said first lock hopper to another lock hopper is carried out;
(d) supplying a liquid to said first lock hopper after step (c) so as to attain a pressure in said first lock hopper which is substantially equal to the pressure of high pressure vessel; and
(e) discharging said solid materials from said first lock hopper after step (d) so as to be introduced to said high pressure vessel.

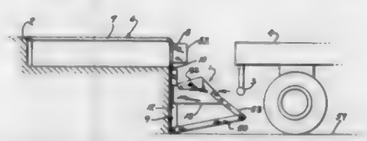
4,695,215
DEVICE FOR AUTOMATICALLY TRANSPORTING DISK SHAPED OBJECTS
Hans-Dieter Jacoby, Werdorf, and Peter Schmidt, Huettenberg, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Division of Ser. No. 494,706, May 16, 1983, Pat. No. 4,501,527.
This application Jan. 2, 1985, Ser. No. 688,419
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219502
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.⁴ B65H *5/00*
U.S. Cl. 414—225 **12 Claims**

1. A device for operating on disk shaped objects comprising a disk cassette, means for adjusting the height of said cassette, a position adjusting station, an inspection station, and means for automatically transporting said disk shaped objects along a path from said disk cassette through said position adjusting station to said inspection station and from said inspection station to a receiving cassette, said transporting means comprising:
a linearly displaceable transport arm mounted between said disk cassette and said position adjusting station and extendable into said disk cassette from the side facing said position adjusting station, said transport arm being laterally spaced from and extending parallel to a center line of said path along which said disk shaped objects are transported from said cassette to said position adjusting station;



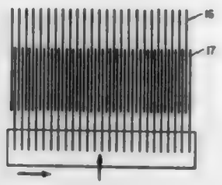
means on said linearly displaceable transport arm for eccentrically gripping one of said disk shaped objects;
means at said position adjusting station for centrally gripping the bottom of a disk shaped object;
a pivotal lever having a working range between said position adjusting station and said inspection station; and
means of said pivotal lever for eccentrically gripping one of said disk shaped objects.

4,695,216
VEHICLE RESTRAINT
Kjell I. Erlandsson, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.
Filed May 14, 1986, Ser. No. 863,054
Int. Cl.⁴ B65G *67/02*
U.S. Cl. 414—401 **24 Claims**



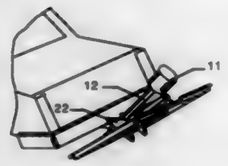
1. A vehicle restraint, comprising a frame mounted on a supporting structure, a slide mounted for vertical movement on said frame, said slide including a inclined surface extending downwardly and outwardly with respect to said supporting surface, said slide having a recess disposed inwardly in a direction toward said supporting structure from the upper end of said inclined surface, biasing means for urging the slide to an upper position relative to said supporting structure, an abutment on a vehicle backing toward said supporting structure disposed to engage said inclined surface to wedge said slide downwardly against the force of said biasing means and effect engagement of said abutment with said recess thereby preventing said vehicle from pulling away from said supporting structure, and release means for releasing said abutment from said recess to enable said vehicle to pull away from the supporting structure.

4,695,217
SEMICONDUCTOR WAFER TRANSFER APPARATUS
John J. Lau, 13350 Floyd Cir., Dallas, Tex. 75243
Filed Nov. 21, 1983, Ser. No. 553,790
Int. Cl.⁴ B65G *65/00*
U.S. Cl. 414—404 **12 Claims**



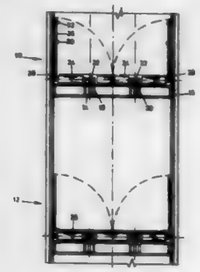
1. Apparatus for receiving and storing at least two pluralities of semiconductor wafers comprising:
a stage adapted to receive and support a container enclosing a plurality of semiconductor wafers;
storage means disposed above said stage including a first plurality of slots for receiving and storing semiconductor wafers;
elevation means disposed within said stage for elevating a plurality of semiconductor wafers from said container for insertion into said storage means; and
retention means for retaining a first plurality of semiconductor wafers within the odd numbered ones of said first plurality of slots in response to the insertion of a first plurality of semiconductor wafers while permitting insertion of a second plurality of semiconductor wafers into the even numbered ones of said first plurality of lots and for retaining said first and second plurality of semiconductor wafers in said first plurality of slots in response to the insertion of said second plurality of semiconductor wafers, said retention means including an elongate shaft disposed adjacent to the periphery of said first and said second plurality of semiconductor wafers when said semiconductor wafers are disposed within said storage means, said shaft including means for selectively engaging said first and second plurality of semiconductor wafers.

4,695,218
AMBULATORY VEHICLE CARRIER
Elton W. Boyer, 1503 Merion, No. 48J, Seal Beach, Calif. 90740
Filed Mar. 24, 1986, Ser. No. 843,209
Int. Cl.⁴ B60R *9/06*
U.S. Cl. 414—462 **6 Claims**



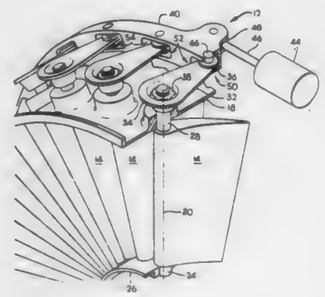
1. A carrier for attachment to the trailer hitch tail stock of a motor vehicle comprising:
a tubular segment having an upper and a lower end;
a reversible electrical motor connected to the upper end of said tubular segment and conformed for electrical excitation from said vehicle, said motor extending a rotary internally threaded sleeve into the interior of said segment;
a screw jack extending into the lower end of said tubular segment to threadably engage said sleeve;
an attachment bracket formed on the exterior of said tubular segment conformed for supported attachment on said tail stock, said attachment bracket being fixed on said segment at a dimension determined by the extension of said screw jack which is substantially equal to the height of said tail stock above ground.

4,695,219
CAGE DECK
Samuel B. McGimpsey, Klerksdorp, South Africa, assignor to Vaal Reefs Mining and Exploration Co., Ltd., South Africa
Filed Oct. 23, 1985, Ser. No. 790,324
Claims priority, application South Africa, Oct. 24, 1984, 848283
Int. Cl.⁴ B65G *65/00*
U.S. Cl. 414—787 **7 Claims**



1. A deck for a cage in a materials handling system which includes a pair of rails for a tracked vehicle, the rails extending in a first direction, a plurality of rollers located between and outside the rails, the upper surface of the rollers being at least as high as the upper surfaces of the rails, the rollers being rotatable about axes which are transverse to the first direction, drive means for rotating at least some of the rollers in a selected sense of rotation, and at least one cover which is pivotally mounted and which is movable between an upright position at which the rails, and the rollers, are exposed, and a horizontal position in which it forms a load-bearing platform which overlies at least some of the rollers.

4,695,220
ACTUATOR FOR VARIABLE VANES
John Dawson, Boxford, Mass., assignor to General Electric Company, Lynn, Mass.
Filed Sep. 13, 1985, Ser. No. 775,550
Int. Cl.⁴ F04D *29/56*
U.S. Cl. 415—9 **8 Claims**



1. An actuator for rotating a plurality of variable vanes spaced circumferentially about a centerline, each having a

spindle extending through a casing about which the vane is rotatable, comprising:

a plurality of levers, each having first and second ends, respective ones of said levers being fixedly attached to said vane spindle at said lever first end;

an arcuate unison member disposed coaxially about said centerline;

means for rotatably joining said lever second ends to said unison member to cause said levers and said vanes to rotate as said unison member is rotated;

frangible means for allowing a first one of said vanes to be rotated to an angular position different from the angular position of adjacent ones of said vanes upon impact of said first vane by a foreign object; and

limit means operatively associated with said unison member for allowing said first vane to rotate with rotation of said unison member after breakage of said frangible means for maintaining the angular position of said first vane within predetermined limits with respect to the angular position of said adjacent vanes.

4,695,221

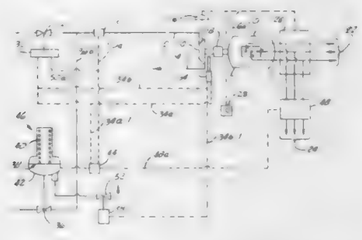
TURBINE SHUTDOWN CONTROL SYSTEM

Judson S. Swearingen, Malibu, Calif., assignor to Rotoflow Corporation, Los Angeles, Calif.

Filed Dec. 4, 1985, Ser. No. 804,677

Int. Cl.[4] F01D *17/06*

U.S. Cl. 415—36 **6 Claims**



1. A turbine shutdown control system for a turbine powered by a fluid source and driving multiple load groups comprising

a first valve disposed between the fluid source and the turbine;

a second valve disposed in parallel with said first control valve between the fluid source and the turbine;

means for sensing a turbine overspeed condition indicating loss of a selected load group and for closing said first control valve in response thereto;

means for monitoring a selected one of the remaining load groups and for controlling said second control valve to modulate fluid flow through said valve in an amount sufficient to drive said selected remaining load group, said monitoring and controlling means being continuously operable during both normal and overspeed running conditions of the turbine.

4,695,222

RECIRCULATING TOILET PUMP ASSEMBLY

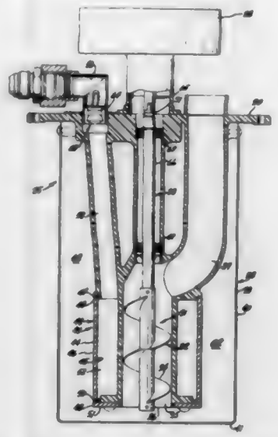
Arthur Barraza, Arleta, and Calvin T. Kearney, Glendale, both of Calif., assignors to Kidde, Inc., Saddle Brook, N.J.

Filed Oct. 8, 1985, Ser. No. 785,580

Int. Cl.[4] B01D *29/38*

U.S. Cl. 415—80 **16 Claims**

12. In a self contained recirculating sewage system including a recirculating pump assembly having a housing positioned in a holding tank and filter means surrounding the housing, a filter rinse assembly comprising a filter rinse member having means for allowing rotation about the housing, said filter rinse member having a side wall spaced adjacent the inside surface of the filter means, said sidewall formed with a plurality of



tangential rinse water spray holes, said holes providing rotation of said filter rinse member and rinsing of said filter means.

4,695,223

TURBOMOLECULAR VACUUM PUMP WITH A ROTOR AND AT LEAST ONE ANTIFRICTION BEARING

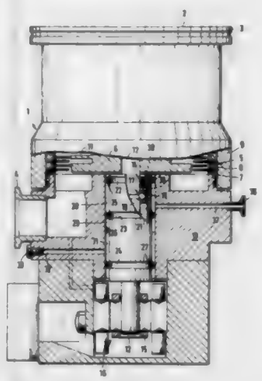
Hans-Peter Caspar, Troisdorf, and Günter Schütz, Cologne, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 26, 1986, Ser. No. 844,460

Claims priority, application European Pat. Off., Apr. 4, 1985, 85104096.4

Int. Cl.[4] F04D *29/04*

U.S. Cl. 415—90 **16 Claims**



1. A turbomolecular vacuum pump comprising a rotor and at least one antifriction bearing for said rotor wherein said rotor contains a stationary ring, and a sleeve with a wall against which said stationary ring is seated, said sleeve supported on a casing section of said pump by a plurality of O-rings which consist of elastic material, wherein said sleeve, said casing, and said O-ring form at least one annular space which is filled with a medium which promotes heat flow from the sleeve to the adjacent part of the casing.

4,695,224

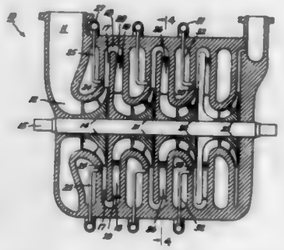
CENTRIFUGAL COMPRESSOR WITH INJECTION OF A VAPORIZABLE LIQUID

Harold Lown, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 637,925, Aug. 6, 1984, abandoned, which is a continuation of Ser. No. 336,733, Jan. 4, 1982, abandoned. This application May 16, 1985, Ser. No. 734,941

Int. Cl.[4] F04D *29/58*

U.S. Cl. 415—116 **7 Claims**



1. A compressor including a housing, a rotatable shaft journaled within said housing, and a plurality of successive compressor stages positioned along the longitudinal axis of said rotatable shaft, with at least one of said compressor stages comprising:

a multi-blade impeller rotatable with said rotatable shaft;

a diffuser adapted to receive a stream of gas from said impeller;

a cross-over channel adapted to receive the gas stream from said diffuser; and

liquid injection means for injecting vaporizable liquid into the gas stream in said diffuser at a high relative velocity with respect to said gas stream, substantially upstream of said cross-over channel adjacent to said impeller said liquid injection means being stationary relative to said impeller, so that said vaporizable liquid is shattered into droplets by said gas stream from said impeller, and so that said droplets are vaporized in said diffuser,

wherein each of said liquid jets is oriented with respect to within a tolerance of about 10 degrees of normal to the gas stream in said diffuser, wherein each of said liquid jets is spaced radially with respect to said axis at a radius in the range of about 1.05 to 1.1 times the maximum radius of said impeller.

4,695,225

AXIAL SWIRL BODY FOR GENERATING ROTARY FLOWS

Jaan Hellat, Rüthof-Baden, and Jakob Keller, Killwangen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 636,499, Aug. 1, 1984, abandoned. This application Jul. 24, 1986, Ser. No. 887,977

Claims priority, application Switzerland, Aug. 30, 1983, 4742/83

Int. Cl.[4] F01D *9/04*

U.S. Cl. 415—189 **4 Claims**

1. An axial swirl body for generating rotary flows having selectively variable peripheral speeds, said axial swirl body comprising:

(a) an outer tube having a plurality of slots extending therethrough;

(b) an inner tube coaxially mounted within said outer tube;

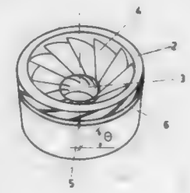
(c) a plurality of exchangeable sets of guide blades, each one of said plurality of exchangeable sets of guide blades comprising a plurality of guide blades, said guide blades and said exchangeable sets of guide blades having the following characteristics:

(i) said plurality of guide blades in each one of said plurality of exchangeable sets of guide blades are not connected to each other;

(ii) each one of the plurality of guide blades in each set of guide blades is sized and shaped to pass through a corresponding one of said plurality of slots in said outer tube and to be held in position between said outer tube and said inner tube without deformation;

(iii) each one of the guide blades in each of said plurality of exchangeable sets of guide blades has the same flow-off angle δ; and

(iv) each set of guide blades has a different flow-off angle δ; and



(d) an annular sleeve surrounding said outer tube and axially movable relative thereto, said annular sleeve being sized and shaped so that, during use of the axial swirl body, said annular sleeve prevents unintended radial movement of the set of guide blades held in position between said outer tube and said inner tube,

whereby:

(e) the peripheral speed of the rotary flow generated by the axial swirl body can be selectively varied by moving said annular sleeve axially relative to said outer tube to expose said plurality of slots and exchanging one set of guide blades for another set of guide blades and

(f) the guide blades in each one of said exchangeable sets of guide blades can be reused repeatedly.

4,695,226

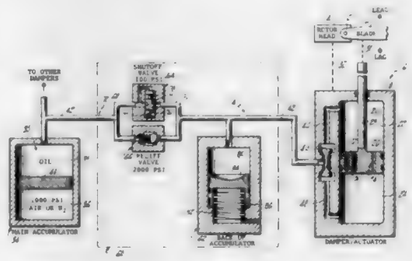
HELICOPTER ROTOR BACKUP DAMPER SYSTEM

Michael J. Marchitto, Orange, and Louis R. Bocciarelli, Branford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 549,389, Nov. 7, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,705

Int. Cl.[4] B64C *27/51*

U.S. Cl. 416—106 **6 Claims**



1. A method of providing a backup mode of operation for a hydraulic system including unequal piston-area dampers and a common main accumulator for providing positive pressure thereto, comprising:

interposing a shutoff valve between each damper and the main accumulator; and

connecting a backup accumulator to each damper on the damper side of the associated shutoff valve for providing a positive pressure thereto in the backup mode;

wherein the shutoff valves are open to permit fluid communication between the main accumulator and the dampers during normal operation, and are closed to prohibit fluid communication between the main accumulator and the dampers in the backup mode of operation.

4,695,227

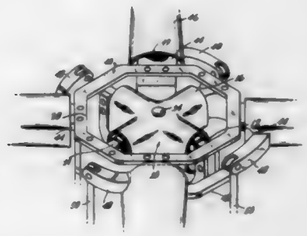
ALL COMPOSITE, CONSTANT SPEED UNIVERSAL JOINT FOR USE IN A SHAFT DRIVEN TILTABLE MAIN ROTOR FOR A HELICOPTER

Robert E. Head, Palos Verdes Estates, and Samuel S. Yao, Fountain Valley, both of Calif., assignors to Hughes Helicopters Inc., Culver City, Calif.

Filed Feb. 27, 1985, Ser. No. 706,444

Int. Cl.⁴ B64C *27/35, 27/52*

U.S. Cl. 416—134 A **9 Claims**



1. An improvement in a pitch cone rotor system in a helicopter comprising:

a plurality of rotor blades;

a driven shaft;

a rotor hub coupled to said plurality of rotor blades; universal joint means for resiliently coupling said driven shaft to said rotor hub with three degrees of rotational and three degrees of translational freedom,

whereby said plurality of pitch cone rotor blades are mechanically driven by applied torque,

wherein said means for resiliently coupling said driven shaft and pitch cone rotor blades comprises a first crossbeam rigidly coupled to said driven shaft;

a cruciform case resiliently coupled to said first crossbeam;

a second crossbeam resiliently coupled to said cruciform case, said second crossbeam being coupled to said plurality of pitch cone rotor blades.

4,695,228

TURBO-MACHINE BLADE

Bebe-Titu Purcaru, Mülheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 286,894

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029082

Int. Cl.⁴ F01D *5/14*

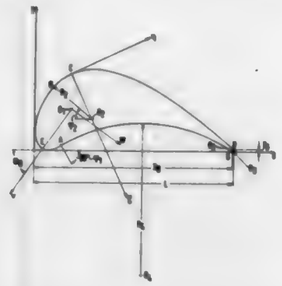
U.S. Cl. 416—223 A **6 Claims**

1. Turbo-machine blade with a profile contour having a convex leading edge region, a convex suction side region, a convex trailing edge region and a concavely curved pressure side region, comprising profile segments being blended into each other forming the profile contour and following each other in a continuous curve, said profile segments including:

(a) a first ellipse segment and a second ellipse segment adjacent to said first ellipse segment in the leading edge region,

(b) a first circle segment adjacent to said second ellipse segment and a second order parabola segment adjacent to said first circle segment in the suction side region,

(c) a second circle segment adjacent to said parabola segment in the trailing edge region, and



(d) a third circle segment adjacent to said second circle segment and said first ellipse segment in the pressure side region.

4,695,229

FRICTION REDUCTION FOR MOVING ELEMENTS IN CONTACT WITH A FLUID MEDIUM

James J. Fealing, 686 Ash, Chula Vista, Calif. 92010

Division of Ser. No. 611,128, May 17, 1984. This application Aug. 4, 1986, Ser. No. 892,374

Int. Cl.⁴ B63B *1/34*

U.S. Cl. 416—241 A **9 Claims**



1. In a mechanical device having both active working and passive non-working surfaces, said both surfaces having relative movement with a liquid, said passive surfaces only being coated with a material lyophilic to said liquid, the coated surfaces substantially eliminating boundary layer friction therebetween; wherein said device is a liquid pump having only passive non-working walls of said pumps forming said passive surfaces which are coated with said lyophilic material.

4,695,230

POWER TRANSMISSION

Lael B. Taplin, Union Lake, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 808,527, Dec. 13, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 943,823

Int. Cl.⁴ F04B *1/26*

U.S. Cl. 417—218 **2 Claims**

1. A variable displacement hydraulic pump control system comprising

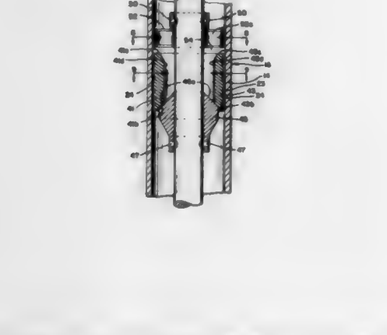
a variable displacement pump including a pump adjusting mechanism comprising a hydraulic positioning piston means and spring biased piston means yieldingly opposing said positioning piston means,

load sensing spool compensator means,

said pump having an oultet and an inlet,

first passage means connecting the outlet of the pump to one end of said load sensing spool compensator means for sensing the pressure at the outlet of the pump which is being delivered to a load,

second passage means extending between said load sensing spool compensator means and said positioning piston means for moving said pump adjusting mechanism in



response to activation of said load sensing spool compensator means,

a system valve,

third passage means between the outlet of said pump and said system valve,

fourth passage means extending between the other end of said load sensing spool compensator means and said system valve, and

fifth passage means between said fourth passage means downstream of said system valve and said spring biased piston means.

4,695,231

SONIC IMPELLER FOR SONIC WELL PUMP

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Oct. 15, 1985, Ser. No. 787,492

The portion of the term of this patent subsequent to Oct. 11, 2001, has been disclaimed.

Int. Cl.⁴ F04F *7/00;* **B01F** *11/00*

U.S. Cl. 417—241 **10 Claims**

1. A pumping system for pumping fluid out of a well comprising a tubing string for conducting said fluid, said tubing string running down said well,

a rod string fabricated of elastic material contained within said tubing string and running therealong, said rod string being spaced from the tubing string,

vibration generator means for providing vibrational energy to said rod string at a frequency such as to effect resonant standing wave vibration of said rod string, and

a plurality of sonic impeller elements fixedly mounted on said rod string at spaced intervals therealong, said impeller elements each having a cylindrical sleeve with an elongated cylindrical body portion with an outside diameter slightly less than the inside diameter of said tubing string to form a narrow annular gap therebetween, said annular gap filling with said fluid to form a fluid annulus, said fluid annulus presenting acoustic mass impedance which provides a fluid dynamic seal against leak back flow past said body portion,

the sonic energy effecting pumping action of the impeller elements to pump the well fluid up said tubing string.

4,695,232

CENTRAL BODY TO WHICH ARE CONNECTED BOTH A DRIVING MOTOR AND A PUMP

Manfred Klauck, Lebach, Fed. Rep. of Germany, assignor to Flutec Fluidtechinische Gerate GmbH, Sulzbach, Fed. Rep. of Germany

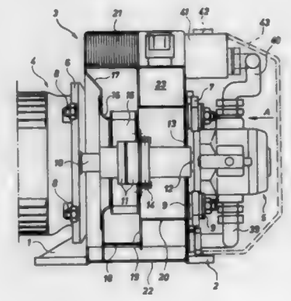
PCT No. PCT/DE84/00080, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/03915, PCT Pub. Date Oct. 11, 1984

PCT Filed Apr. 6, 1984, Ser. No. 686,260

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312490

Int. Cl.⁴ F04B *23/02*

U.S. Cl. 417—410 **12 Claims**



1. A hydraulic powered apparatus, comprising:

a driving motor;

a pump coupled to said motor by a shaft and a coupling such that said driving motor powers said pump, said pump having a suction connector;

a hollow central body having opposite ends connected to said driving motor and said pump and surrounding said coupling;

a fan mounted on said shaft inside said central body and connected with a fan inlet and a fan outlet, said fan inlet being at the end of said central body adjacent said driving motor;

a heat exchanger located within said central body adjacent and receiving air from said fan outlet;

a hydraulic pressure medium tank mounted within said central body, said tank surrounding and being spaced at a radial distance from said shaft, said tank being connected to said suction connector of said pump such that hydraulic

pressure medium from said pressure medium tank is pressurized by said pump.

4,695,233

SCREW ROTOR MECHANISM

Kiyotada Miyoshi, Kobe; Noboru Tsuboi, Kakogawa; Kunihiko Nishitani, Akashi; Kazuo Kubo, Kobe, and Shouji Yoshimura, Takasago, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 10, 1986, Ser. No. 884,078

Int. Cl.[4] F04C *18/16, 29/00*

U.S. Cl. 418—83 **1 Claim**



1. A screw rotor of a dry type compressor comprising:

a male and female rotor, said male and female rotor including in a plane perpendicular to axes of said rotors respective rotor tooth profiles which are formed from normal-temperature tooth profiles of basic male and female rotors having no clearance between a tip circle of said basic male rotor and a root circle of said basic female rotor wherein said male and female rotors include a seal coating of 35 μm–45 μm on the peripheral surfaces of said rotors and said normal-temperature tooth profiles at each profile point include a first inter-tooth gap determined by a sum of an amount of interference created by a thermal expansion at said profile point during the operation of the compressors and an amount of minimum safety clearance necessary for said operation, and further an inter-tooth gap is reformed by an amount, equal to a total thickness of seal coatings applied to said male and female rotors, at a predetermined profile point at which the determined inter-tooth gap is smaller than said total thickness of seal coatings.

4,695,234

CENTRAL MECHANISM IN A TIRE VULCANIZING PRESS

Itaru Amano, Kobe; Yasuhiko Fujieda; Katsumi Ichikawa, both of Akashi; Masahide Kanzawa, Kobe; Toshio Yanagihara, Kobe, and Shikao Misumi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 7, 1986, Ser. No. 837,169

Claims priority, application Japan, Mar. 29, 1985, 60-47150[U]; Apr. 30, 1985, 60-65624[U]

Int. Cl.[4] B29C *35/00, 33/50*

U.S. Cl. 425—23 **3 Claims**

1. A central mechanism in a tire vulcanizing press, comprising:

a shaping bladder disposed in a central position of a lower die;

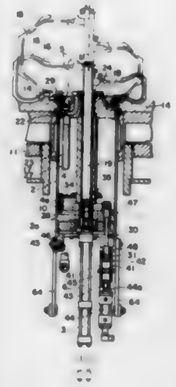
means for supplying a hot pressure medium into said bladder;

a center post for supporting an upper clamp for said bladder;

a support post for supporting a lower clamp for said bladder, wherein said center post is vertically movable and positioned within said support post;

drive means connected to said posts for vertically independently moving each of said posts;

latch means for engaging said support post to prevent descent of the support post during vulcanizing pressing for the tire and for disengaging from said support post to allow the descent of the latter;



means for driving said latch means in opening and closing directions relative to said support post, said latch driving means comprising drive means movable along a vertical axis, means for converting a vertical linear motion of said drive means into a rotational motion around the vertical axis and means for transmitting a thus-obtained rotational motion to said latch means.

4,695,235

BAG-CYLINDER CONTROL DEVICE IN A TIRE VULCANIZER

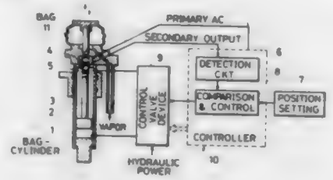
Wataru Ichikawa, Fuchu; Yuji Matsuki, Sayama; Yoshiaki Hirata, and Mikiya Ito, both of Kodaira, all of Japan, assignors to Kabushiki Kaisha SG and Bridgestone Corporation, both of Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,376

Claims priority, application Japan, Oct. 3, 1985, 60-220962

Int. Cl.[4] B29C *33/20, 35/02*

U.S. Cl. 425—29 **5 Claims**



1. A bag-cylinder control device in a tire vulcanizer comprising:

a coil section provided on the open side of a bag-cylinder main body for being excited by a primary ac signal and producing a secondary output signal;

a material provided in a predetermined pattern about a piston rod of said bag-cylinder and consisting of such substance and having such configuration that bring about reluctance change of a magnetic circuit passing through said coil section in response to displacement of said piston rod;

a detection circuit for producing position detection data representing position of said piston rod in response to the secondary output signal;

position establishing means for establishing stop position data representing a desired position at which said piston rod should stop in accordance with the diameter of a tire to be vulcanized; and

comparison and control means for controlling, in a specified step in a sequence for vulcanizing the tire, stopping of said piston rod in accordance with comparison between the established stop position data and the position detection data.

4,695,236

APPARATUS FOR CONTINUOUS EXTRUSION OF A MULTILAYER SYNTHETIC RESIN WEB

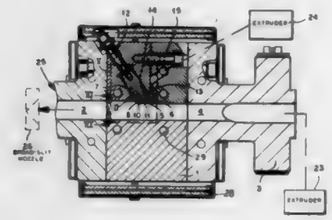
Wilhelm Predöhl, Hennef-Bröl; Heinz Beisemann, Cologne, and Paul Reitemeyer, Troisdorf, all of Fed. Rep. of Germany, assignors to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,579

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405257

Int. Cl.[4] B29C *47/04, 47/92*

U.S. Cl. 425—131.1 **8 Claims**



1. In an apparatus for continuous extrusion of a plastic laminate comprising at least two extrusion screw presses, an accumulator block, a transition unit, and an output die from which a plastic laminate is extruded, wherein the accumulator block has a combining channel, to which said extrusion screw presses are connected and which is connected to said output die by way of said transition unit, the improvement wherein said combining channel has an essentially rectangular cross section with rounded corners, said combining channel being connected at a first end coaxially to a connecting canal with one of said extrusion screw presses and at a second end opposite said first end of said combining channel to said transition unit, said combining channel having downstream of said connecting canal at least one input metering slot connected to said combining channel at a first end of said slot and at a second end of said slot to another of said extrusion screw presses, said input metering slot being positioned between an input tongue formed on a wall of said combining channel and a substantially rectangular cross section adjusting bar recess formed in said block, said adjusting bar recess having a rectangular adjusting bar therein, said input slot extending over a long side of said combining channel, said input metering slot being slanted toward said channel in a downstream direction, and said adjusting bar having a compensating beveled portion for compensating flow across the width of said combining channel and being adjustable in said adjusting bar recess perpendicularly to said slot, said beveled portion being downstream from said slot and being an extension of a surface of said combining channel wall forming said input tongue.

4,695,237

INJECTION MOLDING APPARATUS

Yoshiharu Inaba, Kawasaki, Japan, assignor to FANUC LTD, Minamitsuru, Japan

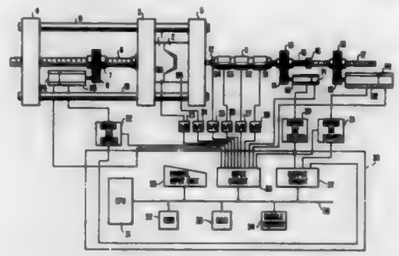
PCT No. PCT/JP84/00619, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02813, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 26, 1984, Ser. No. 752,525

Claims priority, application Japan, Dec. 28, 1983, 58-245422

Int. Cl.[4] B29C *45/77, 45/78*

U.S. Cl. 425—135 **11 Claims**



1. An automatic injection conditions setting apparatus for use in an injection molding apparatus comprising:

injection pressure detecting means for detecting an injection pressure;

injection time detecting means for detecting an injection time;

injection quantity detecting means for detecting an injection quantity;

a memory device for storing optimal values of parameters, including a cushion quantity, an injection pressure and an injection speed, for injection conditions corresponding to a time interval from a time at which injection is started to a time at which a maximum injection pressure is obtained, and an injection quantity for the corresponding time interval; and

control means, operable during trial injection, for causing said injection time detecting means and said injection quantity detecting means to detect a time and an injection quantity for which said injection pressure detecting means detects the maximum injection pressure, so long as the trial injection is being performed, and for reading out values of the parameters of the injection conditions from said memory device in accordance with the detected time and the detected injection quantity, to automatically set the readout values of the parameters of the injection conditions as optimal values of the injection conditions for production of injection molding products.

4,695,238

INJECTION MOLDER

Yoshiya Taniguchi, Hyogo, Japan, assignor to Toyo Machinary & Metal Co., Ltd., Hyogo, Japan

Filed Oct. 10, 1985, Ser. No. 786,039

Claims priority, application Japan, Jan. 21, 1985, 60-6443; Mar. 25, 1985, 60-59800[U]

Int. Cl.[4] B29C *45/02*

U.S. Cl. 425—145 **10 Claims**

1. An injection molder comprising:

a heating cylinder having forward and rearward ends and including

an injection hole in said forward end,

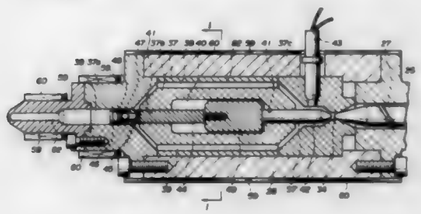
a slide chamber in a middle part of said heating cylinder,

an accumulation chamber for molten resin surrounding said slide chamber,

a piston means having a stop valve means and

a reciprocating plunger attached to said piston means, said reciprocating plunger moving within said slide chamber, said stop valve means being closed when said reciprocat-

ing plunger is moved toward said forward end of said heating cylinder such that said reciprocating plunger causes injection of molten resin into an injection cavity, said stop valve means being opened when said reciprocating plunger is moved toward said rearward end of said heating cylinder charging the molten resin in said accumulation chamber into said injection hole through said stop valve means;



an injection nozzle disposed on said forward end of said heating cylinder in front of said injection hole; and

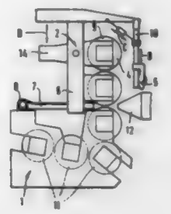
a screw disposed on said rearward end of said heating cylinder, said screw continuously revolving at a stationary position without reciprocating, said screw revolving in one direction for continuously feeding molten resin into said accumulation chamber to the forward end of said heating cylinder.

4,695,239

THERMOPLASTIC SHEET FORMING DEVICE

Wilhelm Klepsch, and Dietmar Plöbst, both of Kapfenberg, Austria, assignors to Senoplast Klepsch & Co., Austria

Filed Feb. 26, 1986, Ser. No. 833,897
Claims priority, application Austria, Nov. 14, 1985, 3316/85
Int. Cl.[4] B29C *43/46*
U.S. Cl. 425—194 **20 Claims**



9. An apparatus for processing material to material webs, comprising:

a bottom frame;

a bottom feed roll mounted in said bottom frame;

a top frame associated with said bottom frame;

a top feed roll mounted in said top frame;

a smoothing ledge device carried by said top frame in a position offset from said top feed roll;

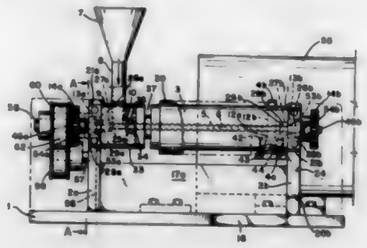
means for selectively positioning said top frame and for positioning one of said top feed roll and said smoothing ledge in an operative position with respect to said lower feed roll.

4,695,240

APPARATUS FOR EXTRUDING SMALL QUANTITIES OF MATERIAL

Hsin L. Li, Parsippany, and Dusan C. Prevorsek, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 4, 1984, Ser. No. 596,497
Int. Cl.[4] B29C *47/00*
U.S. Cl. 425—207 **17 Claims**



1. An extruder apparatus comprising:

(a) an extruder barrel for processing material to be fed to a shaping means, said extruder barrel having an axial bore defined therein, the extruder barrel including a feed portion, a heated portion, and an isolator portion arranged between the feed portion and the heated portion;

(b) feed means communicating with a feed zone of the axial bore defined in the feed portion of the extruder barrel for introducing material to said feed zone of the axial bore;

(c) heating means disposed about a heated zone of the axial bore defined in the heated portion of the extruder barrel for heating material contained therein;

(d) outlet means communicating with said heated zone of said axial bore for dispensing material received from the heated zone;

(e) at least one extruder screw disposed within the axial bore of said extruder barrel and extending from the feed portion through the heated portion of said extruder barrel for transporting material through said axial bore from the feed zone to said outlet means and for forcing material through the outlet means;

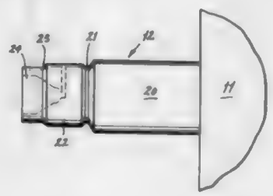
(f) the extruder barrel having surfaces defining isolater means comprising a cavity in the isolator portion of the extruder barrel for thermally isolating the feed portion of the extruder barrel from the heated portion of the extruder barrel.

4,695,241

DIP MOLD AND PROCESS

Joseph J. Ventimiglia, St. Louis, Mo., assignor to Sinclair and Rush, Inc., St. Louis, Mo.

Filed Jan. 24, 1986, Ser. No. 822,047
Int. Cl.[4] B28B *21/46*
U.S. Cl. 425—275 **4 Claims**



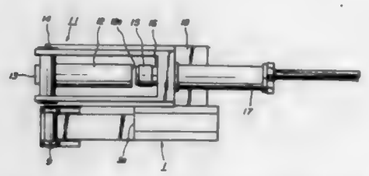
1. A one piece dip mold having a longitudinal body with an outer wall and an internal cavity open at one end and vent passage means extending laterally from the internal cavity to the outer wall of the mold.

4,695,242

PLUNGER MOLDING MACHINE HAVING BLANK LOADING DEVICE

Isao Hattori, Nagoya, and Hifuo Noiri, Hashima, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Sep. 25, 1986, Ser. No. 911,384
Claims priority, application Japan, Oct. 4, 1985, 60-151459[U]
Int. Cl.[4] B28B *3/24*; B29C *47/10*
U.S. Cl. 425—376 R **6 Claims**



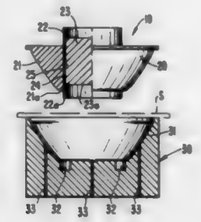
1. A plunger molding machine including a material cylinder having at one end an extending die for extruding a blank therethrough and pivotally movable about a pivotal axis provided on a side of the extending die by means of cylinder tilting means, a piston having a size enabling the piston to telescopically slide in the material cylinder, and a fluid plunger for driving the piston, comprising a blank loading device arranged in parallel with moving directions of said piston for molding, and said blank loading device comprising a blank receiving platform for receiving the blank to be molded, chuck means for preventing the blank on said blank receiving platform from being dislodged therefrom, platform tilting means for tilting said blank receiving platform, and platform traversing means for moving said blank receiving platform in translational motion onto a side of said material cylinder to bring an axis of said blank receiving platform into alignment with that of said material cylinder.

4,695,243

DEVICE FOR MOULDING CONTAINERS

Makoto Watanabe, 2-13-3 Tomihama, Ichihara-Shi, Chiba-Ken, Japan

Division of Ser. No. 813,273, Dec. 24, 1985. This application Oct. 7, 1986, Ser. No. 916,207
Int. Cl.[4] B29C *51/06, 51/20*
U.S. Cl. 425—388 **2 Claims**



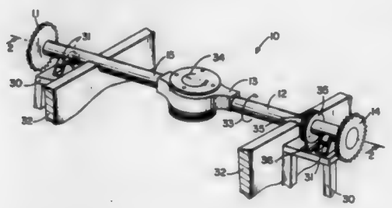
1. A device for moulding a synthetic resin container for foods, comprising a male mould including a main body of a selected shape having a lower edge, a bottom forming portion received in said main body for vertical movement therein and having a lower edge, said bottom forming portion being normally so held in the main body that the lower edge of the bottom forming portion projects downwardly beyond the lower edge of the main body by a small distance, a pressurizing portion received in said bottom forming portion for vertical movement therein and having a lower edge, said pressurizing portion being normally so held in the bottom forming portion that the lower edge of the pressurizing portion is positioned above the lower edge of said main body by a small distance; and a female mould having a mating recess for receiving said lower edge of the bottom forming portion in the male mould.

4,695,244

ROTATIONAL ARM FOR MOLDING MACHINE

Peter Friesen, R.R. 1, Box 314, Group 24, Winkler, Manitoba R0G 2X0, Canada

Filed Jan. 6, 1986, Ser. No. 816,406
Int. Cl.[4] B28B *1/20*
U.S. Cl. 425—429 **12 Claims**



1. A rotational molding machine comprising two spaced outside walls each defining an upper surface, a first and a second support, each provided exteriorly of a respective one of the outside walls adjacent said upper surface thereof, a spindle arm for detachable use and supportable mounting between said outside walls, comprising a gear housing having an input drive gear means and an output drive gear means, for orthogonally translating rotational motion of said input drive gear means to said output drive gear means; a cylindrical shaft lying along an axis and having a first end attached to said gear housing and a length greater than approximately one-half the distance between said walls, and having a second end with a rotational drive means attached thereto, for receiving a rotational drive coupling from a driving source mounted on said first support; a hollow cylindrical housing lying along said axis and having a first end attached to said gear housing and a length greater than approximately one-half the distance between said walls, said cylindrical housing being oppositely positioned from said cylindrical shaft relative to said gear housing; a driving shaft in said hollow cylindrical housing and having a first end connected to said input drive gear means and a second end projecting from said cylindrical housing and having a rotational drive means attached thereto for receiving rotational drive coupling from a driving source mounted on said second support; a driven shaft connected to said output drive gear means and projecting externally of said gear housing; first and second bearing means each mounted on a respective one of said supports for receiving and supporting respectivley said cylindrical shaft and said cylindrical housing for rotation about said axis and arranged at a height such that said cylindrical shaft and cylindrical housing extend across said upper surfaces, each of said bearing means being arranged for readily releasing said cylindrical shaft and cylindrical housing for upward movement from said supports and means mounted on one of said supports separate from said bearing means for limiting axial movement of said cylindrical shaft, said hollow cylindrical housing and said gear housing.

4,695,245

COMBUSTION PROCESS WITH IONIZATION CONTROL

Heinz Kotzmann, Buchlesweg 11, D-7142 Marbach 3, Fed. Rep. of Germany

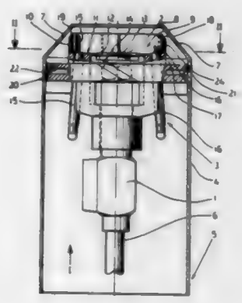
PCT No. PCT/DE85/00136, § 371 Date Jan. 3, 1986, § 102(e) Date Jan. 3, 1986, PCT Pub. No. WO85/05168, PCT Pub. Date Nov. 21, 1985

PCT Filed May 2, 1985, Ser. No. 830,586

Claims priority, application Fed. Rep. of Germany, May 5, 1984, 3416711

Int. Cl.⁴ F23M *3/00*

U.S. Cl. 431—9 **14 Claims**



1. Process for producing a sootless flame in a pressure atomizer burner having an oil nozzle for producing an oil atomizing cone, primary air supply channels for supplying a primary air whirl around and in the direction of the atomizing cone and secondary air supply channels for supplying a secondary air whirl around and transversely inwardly toward the primary air whirl, the process comprising the step of supplying at least a major portion of the primary air via primary air supply channels having outlets radially outwardly of the outlet of the oil nozzle adjacent to the transverse plane of the nozzle outlet to produce a primary air whirl around the oil atomizing cone from adjacent the plane of the nozzle outlet and further comprising the step of selecting the flow rates of air via both the primary and secondary air supply channels to provide said primary and secondary air whirls at selected strengths for controlling the length and width of the burner flame.

4. An oil burner having a jacket tube and a burner nozzle assembly mounted coaxially within the jacket tube comprising an oil nozzle for producing an oil atomizing cone, a flame bowl having a bottom with axial air supply means with outlets for supplying a primary air whirl downstream around the atomizing cone from adjacent the transverse plane of the outlet of the oil nozzle and between the nozzle outlet and atomizing cone, the flame bowl having a generally cylindrical peripheral wall, the peripheral wall and jacket tube defining an annular channel therebetween for guiding tertiary air to the burner flame downstream of the flame bowl, radial air supply means in the peripheral wall for supplying air from the annular channel to the interior of the flame bowl for supplying secondary air to the oil burner flame, and air whirling means upstream of said radial air supply means, the radial air supply means comprising axially extending slot-shaped channels provided in the peripheral wall of the flame bowl obliquely relative to a peripheral wall tangent for imparting an angular whirl to the secondary air flowing from the annular channel into the flame bowl, the axial air supply means comprising radial channels in the bottom of the flame bowl having at least sections thereof with said outlets and with a helical shape for producing said primary air whirl.

4,695,246

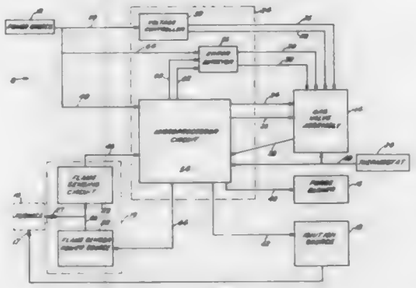
IGNITION CONTROL SYSTEM FOR A GAS APPLIANCE

Robert C. Beilfuss, Coppell; David M. Lanier, Richardson; Stanley E. Bammel, Duncanville; Terry J. Huang, Garland, and David M. Banks, Richardson, all of Tex., assignors to Lennox Industries, Inc., Carrollton, Tex.

Filed Aug. 30, 1984, Ser. No. 645,667

Int. Cl.⁴ F27N *5/00*

U.S. Cl. 431—31 **14 Claims**



1. An ignition control system for an appliance operating with a source of gas in response to a demand signal, said appliance including a combustion chamber for receiving said gas and containing a flame, comprising, in combination:

a valve for receiving an interconnect signal and responsively interconnecting said appliance with said source of gas and for receiving a lockout signal for responsively disconnecting said appliance from said source of gas;

an ignition source for receiving a ignition signal and responsively producing a ignite within said combustion chamber to ignite said gas;

a flame sensor for detecting said flame within said combustion chamber, said flame sensor responsively providing a flame signal upon detecting said flame and a blank signal before and after detecting said flame;

a blower for receiving a purge signal and responsively blowing gas out of said combustion chamber;

control means, interconnected to said valve, flame sensor, and blower, for receiving said demand signal and responsively issuing a purge signal to said blower for a first predetermined period and thereafter issuing said interconnect signal to said valve for a second predetermined period after said first predetermined period and for issuing said ignition signal to said spark generator during said second predetermined period, said control means also including

a pulse generator emitting a counting pulse upon said control means receiving a blank signal from said flame sensor after said second predetermined period and a counter for receiving said counting pulse and, after said counter has received a predetermined number of count pulses, issuing a lockout signal to said valve.

4,695,247

COMBUSTOR OF GAS TURBINE

Yoshiki Enzaki; Kazuki Kitahara, both of Kobe; Satoru Terasaka, Kakogawa; Kenji Mori, Akashi, and Takeshi Kimura, Kobe, all of Japan, assignors to Director-General of the Agency of Industrial Science & Technology, Japan

Filed Feb. 26, 1986, Ser. No. 833,268

Claims priority, application Japan, Apr. 5, 1985, 60-71055

Int. Cl.⁴ F23D *14/02*

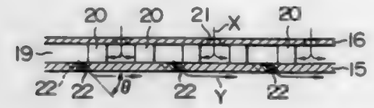
U.S. Cl. 431—352 **8 Claims**

1. A combustor of a gas turbine comprising:

wall means of double wall construction including an outer plate member and an inner plate member located at least in one part of the combustor;

connector means including a multiplicity of connector pins formed of heat conductive material for connecting together the outer plate member and inner plate member of the wall means; and

cooling air flow aperture means including a multiplicity of cooling air inlet apertures formed in the outer plate member to introduce cooling air therethrough from outside into a spaced defined between the outer and inner plate members perpendicularly to an outer surface of the inner plate, and a multiplicity of cooling air outlet apertures formed in the inner plate member to allow the cooling air to flow along an inner surface of the inner plate after being released into the interior of the combustor from the space between the outer and inner plate members, said cooling air outlet apertures formed in said inner plate member being inclined and said cooling air inlet apertures formed in said outer plate member being greater in diameter but smaller in total area than said cooling air outlet apertures.



4,695,248

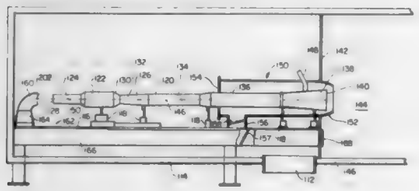
PULSE COMBUSTION DRYING APPARATUS FOR PARTICULATE MATERIALS

Robert R. Gray, 7110 Via Monte Mar Dr., Gladstone, Oreg. 97027

Filed Oct. 3, 1985, Ser. No. 783,861

Int. Cl.⁴ F27B *15/00*; **F27D** *7/00*; **F23C** *11/04*

U.S. Cl. 432—58 **6 Claims**



1. Improved pulse jet combustor apparatus for the drying of particulate material comprising:

a pulse jet combustor including

a combustion chamber, an air inlet conduit connected to one end thereof, a primary exhaust outlet conduit connected to the other end thereof, an elongate tailpipe section disposed downstream of said exhaust conduit and a frusto-conically shaped drying section connected to said tailpipe section

an augmenter duct having an upstream end positioned to receive secondary back flow exhaust gas emanating from said inlet conduit and a downstream end disposed remote therefrom,

a sleeve member having an upstream and a downstream end disposed in surrounding spaced relation with said tailpipe and drying sections and having its downstream end disposed in surrounding proximate relation with the downstream end of said drying cone,

conduit means interconnecting the downstream end portion of said augmenter duct with the upstream end of said sleeve member for effecting the introduction of secondary back flow exhaust gas therein and

means for controlling the volume of said secondary back flow exhaust gas directed from said augmenter duct into said sleeve member.

4,695,249

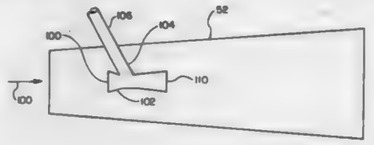
FEED SYSTEM FOR PARTICLE DRYING PULSE JET COMBUSTORS

Robert R. Gray, 7110 Via Monte Mar Dr., Gladstone, Oreg. 97027

Filed Oct. 3, 1985, Ser. No. 783,859

Int. Cl.⁴ F27B *15/00*; **F27D** *7/00*; **F23C** *11/04*

U.S. Cl. 432—58 **4 Claims**



1. In pulse jet combustor apparatus for the drying of particulate material of the type having

a combustion chamber,

an air inlet conduit connected to one end thereof,

a primary exhaust gas outlet conduit connected to the other end thereof,

an elongated transition-tailpipe section connected to said primary exhaust conduit, and

a frusto-conically shaped drying section of increasing diameter having its upstream end connected to the downstream end of said transition-tailpipe section and having means for introducing a feed stock of particulate material to be dried therein,

the improvement wherein said last mentioned means comprises an open-ended tube disposed in spaced relation with the surrounding wall of the upstream end of said frusto-conically shaped drying section and in concentric relation with the longitudinal axis thereof,

a feed stock delivery tube connected to said open-ended tube intermediate the ends thereof for introducing said feed stock into the path of exhaust gas passing through said tube.

4,695,250

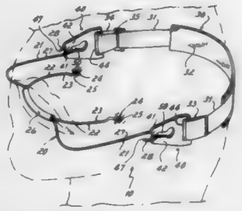
BREAKAWAY ORTHODONTIC FACE BOW APPLIANCE

James F. Mariol, Cincinnati, Ohio, assignor to Fairdale Orthodontic Company, Cincinnati, Ohio

Filed Jun. 23, 1986, Ser. No. 877,326

Int. Cl.⁴ A61C *7/00*

U.S. Cl. 433—5 **12 Claims**



1. An orthodontic appliance comprising:

a generally U-shaped wire face bow having rearwardly facing arms terminating in hooked ends integrally formed of the wire,

an elastic headband connected between the opposite ends of said face bow for applying tension to the arms of said face bow,

a pair of breakaway connectors, each connected between an opposite one of the ends of said headband and a corresponding opposite one of the ends of said face bow such that said breakaway connectors are the only elements making the connection between the headband and the hooked ends of said face bow, and

each of said connectors being formed of a single molded plastic piece and shaped so as to make a snap-fit connection around the wire of one of said hooked ends.

4,695,251

ORTHODONTIC BRACKET ADHESIVE AND ABRASIVE FOR REMOVAL THEREOF

Ronald M. Randklev, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 559,401, Dec. 8, 1983, abandoned, which is a division of Ser. No. 406,500, Aug. 9, 1982, Pat. No. 4,435,160, which is a continuation of Ser. No. 172,218, Jul. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 137,631, Apr. 7, 1980, abandoned. This application Jan. 23, 1985, Ser. No. 694,477

Int. Cl.⁴ A61C *3/00, 13/10*

U.S. Cl. 433—8 **7 Claims**

1. An article of manufacture comprising an orthodontic bracket adhesive composition consisting essentially of a finely divided, non-toxic inorganic filler admixed with a polymerizable resin, said filler being essentially insoluble in mouth fluids, having a Mohs hardness less than about 3 and a mean particle diameter between about 1 and about 100 micrometers, with said filler being at least 25% of the total weight of said composition, and with said adhesive composition being disposed adjacent to an orthodontic bracket and being substantially free of adjuvants in amounts which would damage tooth enamel upon removal of said adhesive from said tooth enamel.

4,695,252

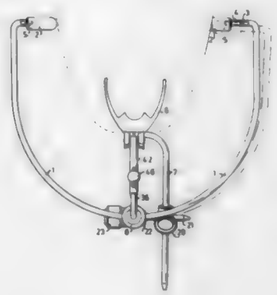
QUICK MOUNT FACE-BOW DEVICE FOR AN ARTICULATOR

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

Filed Dec. 5, 1985, Ser. No. 804,635

Int. Cl.⁴ A61C *19/04*

U.S. Cl. 433—73 **12 Claims**



1. A face-bow device for registration of a patient's face and for transferring the registration to an articulator, for use in making dentures or parts thereof, including:

a bite fork on a bite fork support;

an adjustment means, in which said bite fork support is insertable,

a bow means extending from ear to ear in front of said patient's face, on which bow means said adjustment means is mountable,

said bow means having two arms firmly connected to each other, each arm having an integral, inwardly bent free end provided with an ear piece adapted to be placed in said patient's ear meatus, said free ends being aligned, said ear pieces being adjustably mounted directly on said free ends and adjustable toward and away from each other relative to said free ends,

said arms being made of a resilient material and having sufficient resiliency to be resiliently outbendable at least to such an extent that a bow means having its free ends at a distance from each other adapted to the distance between the openings to said patient's ear meatuses in outbent condition is movable over the sides of said patient's face for placing said ear bow ends into said patient's ear meatuses, and thereafter, when removed from the patient, to return to its original shape of said bow.

4,695,253

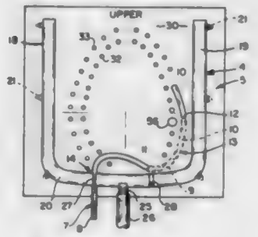
ORAL EVACUATION DEVICE AND METHOD

Thomas M. Tynes, 2415 Pebblebrook, SE., Grand Rapids, Mich. 49506

Filed Mar. 8, 1985, Ser. No. 709,891

Int. Cl.⁴ A61C *5/14*

U.S. Cl. 433—136 **42 Claims**



1. An oral evacuation device, comprising:

a frame shaped to fit over at least a portion of the mouth of a patient;

a flexible sheet stretched over said frame, having top and bottom sides, and shaped to cover at least a portion of the patient's mouth;

means for positioning said sheet over an operating area of the patient's mouth on which a selected procedure is to be performed;

means for releasably retaining said sheet in a selected position with respect to the operating area of the patient's mouth;

an evacuation tube, having a hollow body with a sidewall, and first and second ends; the first end of said evacuation tube being shaped for communication with a source of suction, and the second end of said evacuation tube having a plurality of apertures, which are spaced along the length thereof, and extend through the sidewall of said evacuation tube for aspirating materials therethrough;

first and second apertures disposed in said sheet through which the second end of said evacuation tube is threaded to form a flexible loop on the bottom side of said sheet;

said second end of said evacuation tube being resiliently flexible to permit adjusting the shape and orientation of said evacuation tube loop into an operating position that conforms with the shape and orientation of the patient's mouth by extending downwardly from said first sheet aperture into and along the tongue side of the patient's mouth to a rearward, lower portion of the patient's mouth in which saliva collects, and thence upwardly through said second sheet aperture; and

means for releasably retaining said evacuation tube loop in the operating position, whereby throughout the operating procedure, said evacuation tube automatically and continuously removes saliva, and the like directly from the lower portion of the patient's mouth for improved operating efficiency and increased patient comfort.

4,695,254

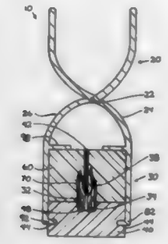
TOOTH REPLACEMENT

John M. Herrell, 106 Hazard Rd., Carpentersville, Ill. 60110

Filed Oct. 24, 1985, Ser. No. 790,868

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—213 **17 Claims**



1. A method for providing an artificial, replacement tooth for to avoid gaps caused by a pulled tooth in a mouth; wherein said artificial tooth has at least one root and a crown and wherein said method comprises:

a. reconstructing a defective tooth in place in said mouth to form a reconstructed tooth, having at least one natural root and a reconstructed portion;

b. extracting said reconstructed tooth having said at least one natural root and said reconstructed portion to form a empty socket in said mouth;

c. forming a die to shape an artificial tooth using said extracted, reconstructed tooth as a model;

d. making a mold from the die;

e. filling said mold with a pharmaceutically acceptable resin;

f. hardening said pharmaceutically acceptable resin to form an artificial tooth having said at least one root and said crown as a substantial duplicate of said reconstructed tooth;

g. removing said artificial tooth from said mold; and

h. inserting said artificial tooth into said socket to permit a jaw to grow around said at least one root of said artificial tooth and seat said artificial tooth in said jaw.

3. A mold assembly for forming an artificial tooth having roots and a crown wherein:

a. said mold assembly includes a mold form and a removable clamping means for holding said mold form together;

b. said mold form includes a root piece and a cap piece;

c. said root piece and said cap piece are secured together by said clamping means;

d. said root piece forms a root of said artificial tooth and said cap piece forms a crown of said artificial tooth;

e. said clamping means removably secures said root piece and said cap piece together;

f. a flexible spacer is inserted between said cap piece and said root piece; and

g. said clamping means compresses said flexible spacer to hold said mold tightly.

4,695,255

METHOD OF COOLING AND LUBRICATING HUMAN HARD TISSUE DURING POWER TOOL CUTTING

Thad J. Overmyer, 132 N. Second St., Danville, Ky. 40422

Filed May 27, 1986, Ser. No. 866,928

Int. Cl.⁴ A61C *5/00*

U.S. Cl. 433—215 **4 Claims**

1. A method of cooling and lubricating human hard tissue during power tool cutting thereof which comprises

(a) admixing about 25% to 70% by volume of water and about 5% to35% by volume of potable alcohol and about 10% to 45% by volume of glycerin, and

(b) directing a flow of the admixture against the hard tissue subjected to cutting.

4,695,256

METHOD FOR PRACTICING AIMING WITH THE USE OF A LASER FIRING SIMULATOR AND OF A RETROREFLECTOR ON THE TARGET SIDE, AS WELL AS FIRING SIMULATOR FOR CARRYING OUT THIS METHOD

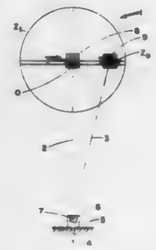
Kurt Eichweber, Hamburg, Fed. Rep. of Germany, assignor to Precitronic Gesellschaft, Hamburg, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 812,793

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1984, 3447887; Oct. 9, 1985, 3436108

Int. Cl.⁴ G09B *9/00*

U.S. Cl. 434—22 **15 Claims**



5. A firing simulator for practising aiming with the use of a taget equipped with a retroreflector which simulator comprises a laser beam emitter for emitting light in the direction of said target, a receiver for the laser light reflected by the target, a laser range finder responsive to said reflected light, means for detecting the position of light reflected by the target relative to a reference line, a trigger for triggering a simulated discharge of a projectile, an evaluating arrangement for the determination of the hit position after the elapse of projectile flight time, measurement means for measurement of the angular velocity of the target in relation to the reference line and of aiming-off allowance, said measurement means being connected with the evaluating arrangement in such a manner that their measurement results related to the time of discharge of the projectile can be coupled to the evaluating arrangement.

4,695,257

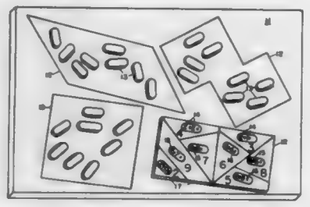
PROBLEM SOLVING GAME

James R. Vawter, 688 Coronado Dr., Sedalia, Colo. 80135

Filed Apr. 26, 1985, Ser. No. 727,667

Int. Cl.⁴ G09B *1/06*

U.S. Cl. 434—333 **18 Claims**



1. An educational game comprising tiles having answer bases and adapted to provide a view of problem bases on a game surface when the answer bases are correctly positioned on said problem bases and

a game surface having at least one of a series of predeter-

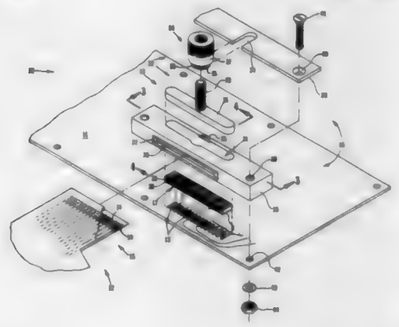
mined undivided geometric shapes thereon, each geometric shape having a plurality of problem bases each of which has (a) a problem made up of at least two numbers, at least one operand, and at least one equal symbol disposed in a format which provides at least one problem to be answered by an answer displayed on a tile; and (b) is surrounded by an undefined area of the geometric shape so that the answer base of each tile, when correctly positioned upon the problem bases, causes the tiles to duplicate the predetermined geometric shape of each of the geometric shapes of the series and displays to the player both the problems and an answer to each of the problems.

4,695,258

CONNECTOR ASSEMBLY FOR ELECTRICALLY CONNECTING FLEXIBLE AND RIGID PRINTED CIRCUITS

Daniel R. Hanson, and Ludwig D. Nesheim, both of Minneapolis, Minn., assignors to Cherne Industries, Inc., Minneapolis, Minn.

Filed Dec. 9, 1986, Ser. No. 939,715
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **13 Claims**



1. A unitary connector and alignment assembly for electrically connecting flexible circuits to rigid circuits comprising:

a. an alignment structure having horizontal and vertical support and positioning means to align the flexible circuit for electrical communication with the rigid circuit, said alignment structure having a vertical aperture in its bottom extending inwardly and a unitary horizontal aperture in its side, said horizontal aperture extending inwardly without obstruction to open at said vertical aperture for ingress and egress of the flexible circuit, said alignment structure being mounted on the rigid circuit so that said vertical aperture covers the communicative portions of the rigid circuit;

b. an elastomeric vertical conductor disposed within said vertical aperture so that said elastomeric vertical conductor is between the inserted flexible circuit and the rigid circuit; and

c. a hand operable clamping member connected to said alignment structure and moveable within said vertical aperture, above said elastomeric vertical conductor, to releasibly urge the flexible circuit and the rigid circuit into contact with said elastomeric vertical conductor.

4,695,259

WATERPROOF LAMP SOCKET CONSTRUCTION

Kihachirou Uchida, Shimizu, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1985, Ser. No. 779,642
Claims priority, application Japan, Sep. 26, 1984, 59-145359[U]
Int. Cl.[4] H01R *13/52*
U.S. Cl. 439—271 **4 Claims**

1. A waterproof lamp socket construction, comprising in combination:

a socket body having a hollow extending axially therethrough, the hollow including a large diameter portion extending rearwardly from a front end of the socket body and a smaller diameter portion adjacent a rear end of the socket body thereby to define between the larger and smaller diameter portions an annular step portion which faces toward said front end of the socket body;

a tubular ferrule of electrically conducting material received in the larger diameter portion of the hollow in the socket body, said tubular ferrule including a wedge shaped protuberance which is embedded in the inside surface of the socket body thereby to lock the tubular ferrule against displacement relative to the socket body;

an insulating plate having a foot contact thereon and mounted within the ferrule for axial displacement within limits;

a cylindrical packing of elastic material intimately plugged into the smaller diameter portion of the hollow in the socket body for watertightly sealing the rear end of the hollow, the packing including a flange on a front end thereof and a first annular rib formed on a rear surface of said flange, said first annular rib being intimately held against said annular step portion of the socket body, said packing further including second annular ribs about a major portion thereof and pressed against the wall of the smaller diameter portion of the hollow of the socket body, said first and second annular ribs being arranged to constitute a labyrinth seal;

a spring compressed between the insulating plate and the flange of the packing thereby to bias said insulating plate and said flange in opposite directions thereby pressing said annular rib against said annular step portion; and

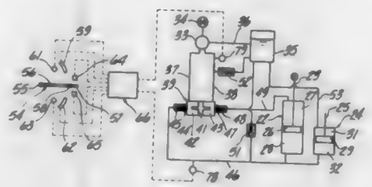
an annular gasket disposed about the socket body, said gasket having a pair of opposite ridges one of which is fast held against a flange formed about the socket body.

4,695,260

TILTING DEVICE FOR MARINE PROPULSION DEVICE

Hideo Suzuki, Shizuoka, and Kazunobu Nozue, Kosai, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Nov. 7, 1984, Ser. No. 669,317
Claims priority, application Japan, Nov. 15, 1983, 58-213196
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—61 **9 Claims**



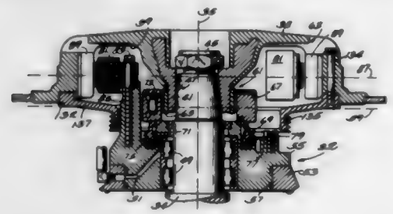
1. A tilt mechanism for a marine outboard drive supported for tilting movement about a generally horizontally extending tilt axis relative to a watercraft, power means for selectively effecting tilting movement of said outboard drive about said tilt axis, and control means for selectively activating said power means, said control means including a control element movable between a null position and an activated position and a control device for selectively energizing said power means continuously upon the activation of said control element from its null position to its activated position without necessitating an operator to maintain said control element in its activated position, said control device further being selectively operable to actuate the power means only so long as the operator activates said control element to its activated position.

4,695,261

MARINE PROPULSION ENGINE VOLTAGE GENERATOR ARRANGEMENT

George L. Broughton, and James E. Macier, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 3, 1985, Ser. No. 752,258
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—900 **16 Claims**



1. A marine propulsion device comprising a lower unit including a rotatably mounted propeller, and internal combustion engine mounted on said lower unit and drivingly connected to said propeller, said engine including an engine block, a crankshaft and flywheel assembly including a crankshaft rotatably supported by said engine block and having an end extending from said engine block, and a flywheel mounted on said end of said crankshaft for rotation therewith, and a voltage generator including a magnet mounted on one of said assembly and said engine block, and a coil mounted on the other of said assembly and said engine block, said coil being radially spaced from said magnet, and an annular power takeoff pulley mounted on said flywheel and surrounding said voltage generator in adjacent relation thereto axially of said crankshaft.

4,695,262

TOY ROTATING GEAR ACCESSORY FOR USE WITH GYROSCOPIC TOP

Michael A. Crosby, Hawthorne, and Art J. Foss, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jun. 23, 1986, Ser. No. 877,580
Int. Cl.[4] A63H *1/00*
U.S. Cl. 446—236 **5 Claims**



1. A toy rotating gear accessory for use with a gyroscopic top, comprising:

a supporting body having a plurality of apertures passing therethrough; and

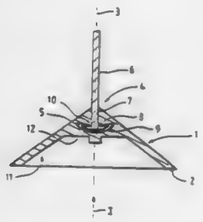
a plurality of gears removably and rotatably engaged to said supporting body, each of said gears having (a) teeth means at the outer circumference thereof for engaging at least one other of said teeth means of another of said gears, (b) upwardly-extending flexible member means attached thereto for removably enaging one of said apertures, (c) support means attached thereto for supporting said rotating gear accessory on a horizontal surface, (d) an upwardly-extending portion with an aperture therein, said aperture in said portion adapted for engaging said gyroscopic top and (e) a number of protuberances located on the top surface thereof, said protuberances adapted for supporting said body so that said body rests on top of said protuberances and clearance is provided between said top surface and said body.

4,695,263

TOY SPINNING TOP HAVING A LEG SUPPORT

Peter Balleis, Zirndorf, Fed. Rep. of Germany, assignor to Lorenz Bolz GmbH & Co., Zirndorf, Fed. Rep. of Germany

PCT No. PCT/DE85/00330, § 371 Date Jun. 12, 1986, § 102(e) Date Jun. 12, 1986, PCT Pub. No. WO86/02280, PCT Pub. Date Apr. 24, 1986
PCT Filed Sep. 24, 1985, Ser. No. 887,104
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 8430096[U]
Int. Cl.[4] A63H *27/00*
U.S. Cl. 446—256 **3 Claims**



1. Toy spinning top comprising

a top body which rotates about a stationary to shaft (**6**); and

a base (**1**) made of an injection moldable or castable plastic for holding the top shaft (**6**) in a substantially vertical orientation, with the top shaft (**6**)

being supported in a vertical aperture (**7**) of the base (**1**); and

being secured against removal from the base (**1**) by a spring ring (**5**) placed onto its lower end; and the spring ring (**5**) is provided, at the side facing the floor when the top is stood up, with a covering hood (**9**) which extends over the plane of the spring ring (**5**) and covers the lower end of the top shaft (**6**) in the manner of a hat,

characterized in that the spring ring (**5**) and its covering hood (**9**) are embedded in the plastic material of the base (**1**).

4,695,264

CONVERTIBLE STUFFED FIGURE

Marvin K. McLeod, Jr., Rte. 1, Box 201A, Valley, Wash. 99181

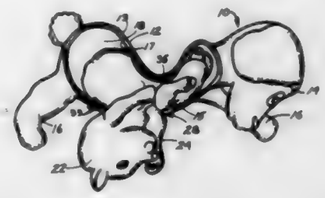
Filed Jun. 27, 1986, Ser. No. 879,570
Int. Cl.[4] A63H *3/00*
U.S. Cl. 446—321 **20 Claims**

1. A toy including interconnected eversible figures, comprising:

a first complete foldable figure having a shaped external surface and an internal surface surrounding a first internal cavity;

a second complete foldable figure having a shaped external

surface independent of the external surface of the first foldable figure and an internal surface surrounding an individual second internal cavity;
wherein the individual external surfaces of the first and second foldable figures are joined together along a common seam;
wherein the common seam defines an opening common to the individual first and second internal cavities of both figures; and



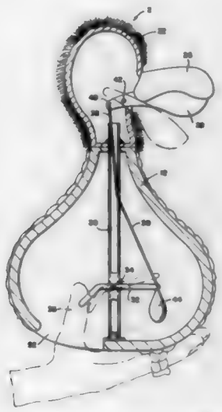
means joining the internal surfaces of the first and second figures at a common location along the internal surfaces opposite the opening and distinct from the common seam for eversing one figure into the internal cavity of the other figure as the other figure is folded outward of the one figure to expose the shaped external surface thereof and such that the one figure progressively fills the internal cavity of the other figure to function as stuffing for the other figure.

4,695,265

PUPPET APPARATUS

Maynard H. Clark, 8E Butler Ave., Chalfont, Pa. 18914

Filed Apr. 7, 1986, Ser. No. 848,656
Int. Cl.[4] A63H *3/14*
U.S. Cl. 446—329 **12 Claims**



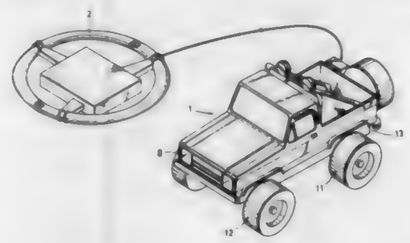
1. A puppet which is operable by one hand of a puppeteer, comprising,
a body,
a head mounted on the body, said head being mounted for pivotal movement about a first axis in order to turn with respect to the body,
said head having a face provided with a facial element which is movably mounted on the head,
an actuator member located inside said body and being movable by the puppeteer to turn the head relative to the body and to move the facial element relative to the head,
said actuator member being connected to the head and being movable in a first direction of travel to turn the head relative to the body,
said actuator member being connected to the facial element and being movable in a second direction of travel to move the facial element relative to the head, said second direction of travel being different from said first direction of travel,
said actuator having two surfaces which face toward each other and are spaced apart to provide a horizontal space for receiving therebetween a puppeteer's thumb which is parallel to said first axis, said surfaces being elongated in directions which extend away from said first axis.

4,695,266

STEERABLE ELECTRIC TOY CAR

Hsu W. Hui, No. 160, Wu Fu I Road, Kaohsiung City, Taiwan

Filed Sep. 17, 1986, Ser. No. 908,235
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—454 **8 Claims**



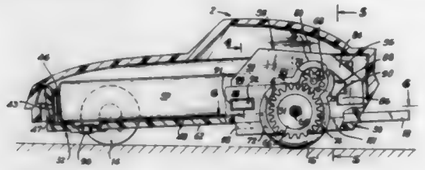
1. A steerable electric toy car comprising:
a toy body, including
a frame,
a rear shaft rotatably mounted transversely on an underside of a rear portion of said frame;
a pair of first wheels fixedly mounted at opposite ends of said rear shaft, adapted to be driven by a rear motor forwards and backwards,
a front shaft, rotatably mounted transversely on the underside of a front portion of said frame;
a pair of second wheels fixedly mounted respectively at opposite ends of said front shaft; and
means for controlling said front shaft to move with respect to a longitudinal axis of said frame, including a jointed control plate attached to said front shaft; a control rod engaged with and extending vertically with respect to said jointed plate; a gear mechanism including an output end coupled to said control rod, and a front motor having an output shaft coupled with an input end of said gear mechanism so that rotation from said output shaft can be transmitted to drive said control rod; and
a steering mechanism, including
a grip member, adapted to be controlled by a player; contact means disposed on said grip member and electrically connected to said front motor of said toy body; and
a weight body, pivotedly suspended by one end thereof on said grip member, with a weight disposed at another end of said weight body, and an activating finger disposed on said weight body near the pivoted end of the weight body in such a position that when said grip member is rotated, and said weight causes said weight body by gravity to remain vertically oriented to the ground, thereby the change of relative position of said weight body to said grip members will cause said activating finger to contact said contact means to close a circuit for driving said front motor.

4,695,267

BATTERY-POWERED SMALL-SCALE TOY VEHICLE

Thomas L. Simmel, 44 Boorne La., Milford, Conn. 06460; David W. Crossley, Pennington, and Mark N. Morehouse, Ridgefield, both of N.J., assignors to Robert S. McDarren; Barry Y. Piels, both of Ridgefield and Thomas L. Simmel, Milford, all of, Conn.

Filed Feb. 8, 1985, Ser. No. 699,700
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—462 **20 Claims**



1. A chassis for use in a toy vehicle powered by a battery, the chassis having a floor and a pair of integral side walls on the floor which support an axle carrying a pair of driven rear wheels, the axle and the wheels being driven by a main spur gear and a pair of free-turning front wheels speced apart from the driven wheels, each side wall having an upward-facing notch, the chassis further comprising:
means for releasably supporting the battery on the chassis on the forward side of the axle of the driven wheels;
electric motor means having a motor spur gear for coupling rotation to the driven wheels, the electric motor means further having a pair of outwardly and oppositely extending bosses, each boss of the pair of bosses being received in one of the notches of the side walls;
conductor means for making electrical connection between the electric motor means and the battery; and
motor mount means releasably coupled to the side walls, the motor mount means clamping the electric motor means immediately above the axle of the driven wheels so that the main spur gear is engaged by the motor spur gear and so that the electric motor means may be connected to the battery and so that there is no interposition of parts between the bottom of the electric motor means and the underlying axle.

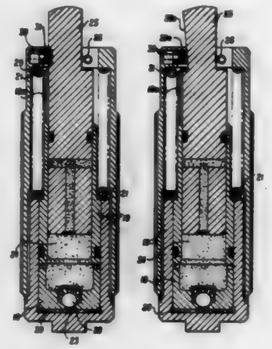
4,695,268

AUTOMATIC TENSIONER HAVING LOCKING MECHANISM

Hisashi Kodama, Nagoya, and Yoshio Okabe, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 29, 1986, Ser. No. 925,112
Claims priority, application Japan, Oct. 29, 1985, 60-166452
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—110 **3 Claims**

1. An automatic tensioner having a locking mechanism, comprising:
a large oil chamber formed at the bottom of a body of the tensioner and containing oil;
a plunger biased toward the large oil chamber by a spring and inserted in the body so as to be slidable;
a hole formed at the center of the plunger;
a rod having a head that protrudes from the body of the tensioner, the rod being slidably inserted in the hole so as to form a small oil chamber containing oil, the small oil chamber being in communication with the large oil chamber through a narrow passage, the end surface of the head of the rod being pressed against an external device or element, such as a belt; and
a piston which is received in the body of the tensioner and normally biased into contact with the plunger and which, when oil leaks from the large oil chamber to thereby



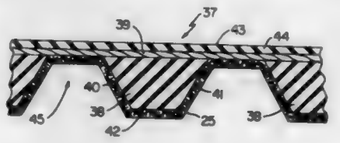
lower the plunger, is permitted to protrude into engagement with the rod, locking the rod.

4,695,269

LAYER OF REINFORCED POLYMERIC MATERIAL, METHOD AND APPARATUS FOR MAKING THE SAME AND A PRODUCT CONTAINING THE SAME

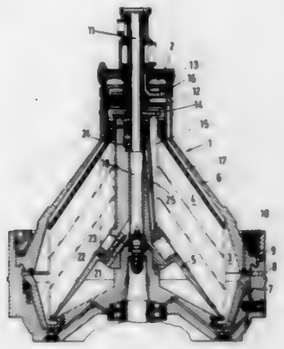
Joseph V. Tassone, Kettering, and James T. Candor, Washington Township, Montgomery County, both of Ohio, assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 465,960, Feb. 14, 1983, Pat. No. 4,559,188.
This application Sep. 20, 1985, Ser. No. 778,580
Int. Cl.[4] B32B *27/12*; F16G *1/04*
U.S. Cl. 474—268 **8 Claims**



1. In a belt construction formed from a plurality of parts of which one part thereof comprises a layer of material forming at least part of the exterior surface of said belt construction and that initially was a substantially flat layer of material having opposed substantially parallel spaced apart flat surfaces and comprising polymeric material and a fabric sheet means disposed in said polymeric material between said surfaces and being substantially coextensive therewith, the improvement wherein said layer of material has reinforcing particles therein with at least part of said particles having the long dimensions thereof oriented so as to be substantially perpendicular to said surfaces of said layer of material and to said part of said exterior surface of said belt construction and with at least some of the thus oriented particles extending through said fabric sheet means.

4,695,270
DRUM FOR CLARIFYING AND SEPARATING CENTRIFUGATES
Karl-Heinz Zettler, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany
Filed Jan. 29, 1986, Ser. No. 823,707
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503581
Int. Cl.[4] E04E *11/00*
U.S. Cl. 494—34 8 Claims



1. In a device for clarifying and separating centrifugates, having a rotatable drum, a stationary inlet pipe extending into an inlet chamber and which rotates along with the drum, at least one skimmer for diverting the clarified or separated centrifugates, through an aperture that is wider than the inlet pipe, outlets extending from the inlet chamber into an antechamber that communicates with channels ascending through a set of nested plates within the drum and an annular space upstream of the inlet chamber and that communicates with the inlet chamber through an annular channel, the improvement comprising: means for precluding an injector effect where the inlet pipe enters the inlet chamber sufficient to enable maximum tolerance to withstand greater supply fluctuations including a skimming disk with runoff apertures on the bottom thereof in the vicinity of the inlet chamber and fixed to the inlet pipe, the skimming disk positioned in the annular sapce to return centrifugate to the inlet chamber through the runoff apertures and the annular channel.

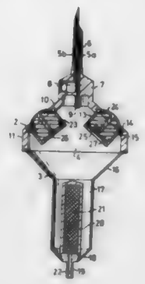
4,695,271
ANGIOGRAPHIC INJECTOR
James H. Goethel, Cincinnati, Ohio, assignor to Liebel-Flarsheim Company, Cincinnati, Ohio
Filed Feb. 3, 1986, Ser. No. 825,473
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—49 9 Claims

1. An apparatus having a powerhead for injecting a fluid into a living being comprising:
a. receptacle means mounted to said power head for receiving and holding a syringe cartridge having a movable plunger;
b. means mounted to said power head for moving said plunger along the longitudinal axis of said syringe cartridge;
c. means mounted to said power head for determining when said plunger had been fully extended; and
d. means associated with said power head for preventing operation of said power head in the injection mode until said plunger has been fully extended after said power head



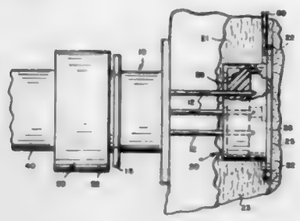
has been powered up or when a new cartridge has been placed in said receptacle means.

4,695,272
DRUG RELEASE DEVICE
Bengt G. Berglund, Göteborg; Karl-Erik L. Falk, Lindome; Dan A. Magnusson, Fjärås; Nils B. Nilson, Mjölby, and Ake S. Nilsson, Göteborg, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden
Filed Apr. 23, 1985, Ser. No. 726,059
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—84 13 Claims



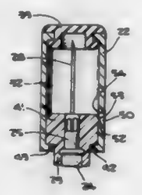
1. A drug release device for inclusion in a parenteral drug delivery system comprising a chamber having an outer wall, an inlet for a liquid administerable to a patient by a parenteral route and an outlet for liquid containing dissolved drug, the wall, inlet and outlet together defining a drug dissolution space within said chamber through which said liquid will flow during such parenteral delivery, and means for receiving and retaining within said drug dissolution space a drug preparation from which a drug is releaseable to said liquid during such parenteral delivery.
the improvement comprising providing one or more drug cells disposed on the outer wall of said chamber, each cell containing said drug preparation which is held isolated from the liquid by said cell, each of said drug cells having means for emptying its contents into said drug dissolution space.

4,695,273
MULTIPLE NEEDLE HOLDER AND SUBCUTANEOUS MULTIPLE CHANNEL INFUSION PORT
Eric W. Brown, Redondo Beach, Calif., assignor to I-Flow Corporation, Torrance, Calif.
Filed Apr. 8, 1986, Ser. No. 849,408
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—173 13 Claims



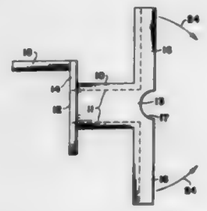
1. A multiple needle holder comprising:
a housing having a housing wall surrounding a plurality of conduits extending from a rear face on said housing to a front face;
a plurality of needles secured within said housing so that each of said needles is in communication with one of the said conduits, said needles extending outwards from the front face of said housing;
a plurality of engagement ports on the rear face of said housing each having an opening in communication with one of said conduits, said engagement ports being arranged so as to be matingly aligned with a plurality of ports on a multilumen catheter connector; and
means extending outwardly from said housing wall for engaging a locking mechanism.

4,695,274
PROTECTED HYPODERMIC NEEDLE
Richard L. Fox, 1804 Rockefeller La., Redondo Beach, Calif. 90278
Filed Jan. 31, 1986, Ser. No. 824,879
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 4 Claims



1. A disposable needle attachment for use with a syringe body assembly which has an expulsion end and a handle end, said needle attachment comprising a needle-holding member having at one end a recess of constructing configuration for releasable sealing engagement with the syringe body assembly at said expulsion end and a needle-holding end for the mounting of a hypodermic needle, a reltively closed safety jacket member having a needle-receiving pocket, a permeable closure at one end of the jacket member for alignment with a free end of the needle, the other end of the jacket member having a variable connection to the needle-holding member, said jacket member having a protective first position relative to the needle-holding member adapted to entirely contain the needle and a second position wherein said needle is adapted to be exposed through said permeable closure in a work position, said jacket member being turnable to said protective first position wherein said disposable needle attachment is removable from said body assembly for disposal.

4,695,275
MIDDLE EAR VENTILATION TUBE
Donald Bruce, 1723 Peachtree Cir. N., Jacksonville, Fla. 32207, and Richard L. Goode, 1583 Arbor, Los Altos, Calif. 94022
Continuation of Ser. No. 562,092, Dec. 16, 1983, abandoned.
This application Dec. 6, 1985, Ser. No. 806,091
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—264 19 Claims



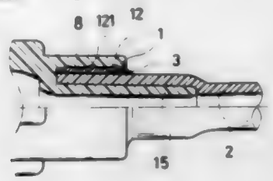
1. A myringotomy ventilation tube for insertion into an opening in a tympanic membrane to allow drainage from a middle ear to an outer ear, said tube comprising:
(a) a hollow tubular body having an outer surface and opposite end portions on opposite side walls of a tympanic membrane and a generally elongated uniform and straight passageway therethrough extending between said end portions and communicating between a middle ear and an outer ear;
(b) an outer flange secured to one of said end portions of said tubular body, said flange having an elongated substantially flat portion for contacting an outer wall of a tympanic membrane and inhibiting said tube from passing through an opening in an tympanic membrane and any contact of the other said end portion with a promotory in a back wall of as middle ear, said flange having a reduced portion substantially conforming to said outer surface of said tubular body for facilitating viewing of an opening in a tympanic membrane during insertion of said tube thereinto;
(c) a projection extending outwardly from said flange adjacent the free edge of said flange and adapted to be readily grasped by a removal instrument, said projection extending substantially parallel to and offset from the longitudinal axis of said passageway; and
(d) a pair of spaced inner flexurally resilient elongated separate arms secured to said other end portion of said tubular body spaced from said outer flange and substantially parallel thereto and extending laterally in opposite directions from said body and generally perpendicular to said longitudinal axis, said arms being adapted to be temporarily squeezed together to substantially form a longitudinal extension of said body and having substantially the same diameter thereof and extending parallel to said longitudinal axis when being inserted into an opening in a tympanic membrane and to thereafter return to their opposite directions in perpendicular relationship with respect to said longitudinal axis to contact an inner wall of a tympanic membrane and inhibit inadvertent outward removal of said tube from its placement through an opening in a tympanic membrane.

4,695,276

MEDICAL INSTRUMENT

Kouji Shiino, Yamanashi, and Hitoshi Kuboki, Kofu, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,741
Claims priority, application Japan, Nov. 6, 1984, 59-233769
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—283 **7 Claims**



1. A medical instrument for transferring liquid therethrough, comprising

a connector of a rigid resin including a generally cylindrical portion having a passage extending throughout the connector and one open end, said cylindrical portion at said one open end including an outer sleeve and an inner sleeve defining therebetween a recess extending circumferentially and axially from the open end, the inside surface of said outer sleeve being provided with at least one substantially circumferential rib, and

a tube of a flexible resin inserted into said recess and bonded thereto with an adhesive to define a continuous passage communicating said connector and said tube, characterized in that

said connector is formed of a rigid resin which is difficult to bond with a curable adhesive and having a Shore D hardness of at least 55,

said tube is formed of a flexible resin which is bondable with a curable adhesive and having a Shore D hardness of not higher than 45, and

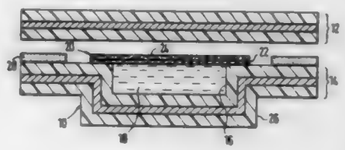
the joint portions of said connector and said tube are bonded with a ultraviolet curable adhesive which shows a Shore D hardness of at least 70 after curing.

4,695,277

PHARMACEUTICAL ADHESIVE PLASTER AND METHOD FOR MANUFACTURING IT

Willi Lauk, Schorndorf-Haubersbronn, Fed. Rep. of Germany, assignor to Allpack Industrielle Lohnverpackung GmbH & Co. KG, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,420
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430250; Apr. 2, 1985, 3511963
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—304 **1 Claim**



1. A pharmaceutical adhesive plaster comprising two parts jointed together, namely an active ingredient container comprising a composite film and having a shallow recess for containing the medicament, an innermost layer of thermoplastic synthetic resin in the form of a film, and an outer layer or adhesive which is at least one of pressure sensitive and sensitive to the heat of the skin and surrounds the recess in the form of a ring on the opening side of the recess; and a composite covering film comprising an innermost layer of thermoplastic synthetic resin in the form of a film, which is covered with the layer of adhesive and covers the recess of the active ingredient container;

wherein the recess of the active ingredient container is closed by a membrane which is permeable to the active ingredient and is firmly connected to the composite film of the active ingredient container concentrically within the outer layer of the adhesive; and in that the composite covering film is hermetically connected to the composite film of the active ingredient container along a ring extending radially between the membrane and the layer of adhesive;

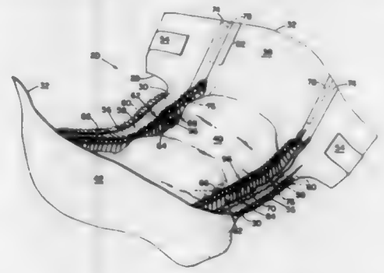
wherein the membrane is comprised of at least three layers, one of which layers is arranged as a layer of adhesive between the other two layers.

4,695,278

ABSORBENT ARTICLE HAVING DUAL CUFFS

Michael I. Lawson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 11, 1985, Ser. No. 786,926
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **28 Claims**



1. An integral disposable absorbent article comprising:

a liquid pervious topsheet; a liquid impervious backsheet associated with said topsheet;

an absorbent core disposed between said topsheet and said backsheet;

an elastically contractible gasketing cuff disposed adjacent to an edge of the absorbent article;

a barrier cuff having a proximal edge and a distal edge, said barrier cuff disposed inboard of said gasketing cuff; and

spacing means associated with said barrier cuff for spacing said distal edge away from the top surface of said topsheet.

4,695,279

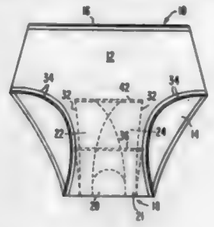
INCONTINENCE BRIEFS AND PANTS

Graham E. Stoer, Surrey, England, assignor to Craig Medical Products Limited, East Grinstead, England

Filed Apr. 18, 1986, Ser. No. 853,533
Claims priority, application United Kingdom, Apr. 29, 1985, 8510876; Jul. 16, 1985, 8517871; Aug. 22, 1985, 8521020
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—397 **6 Claims**

1. A pair of incontinence pants or briefs including a pocket located in the crotch region, the pocket defined by an outer wall of a liquid-impermeable material which is longer than it is wide and an inner wall of like material, the inner wall constructed of two pieces whose edges define a substantially oval hole, a portion of the one piece of the inner wall overlapping but not connected to a portion of the second piece of the inner wall, their edges being crossed over one another at one end of the pocket.

5. A pair of incontinence briefs or pants including a pocket located interiorly of the fabric of the crotch region, said pocket having an inner wall and an outer wall both of liquid impermeable material, the pocket having an opening which extends



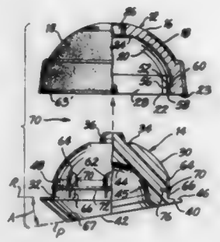
through its inner wall towards the body of the wearer when said briefs or pants are being worn, the edges of said opening being partly or wholly elasticated.

4,695,282

ACETABULAR CUP ASSEMBLY WITH SELECTIVE BEARING FACE ORIENTATION

Mark R. Forte, Pine Brook; Alex Khowaylo, Allendale, and Ewald Schloesser, Wayne, all of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Jan. 23, 1986, Ser. No. 821,772
Int. Cl.[4] A61F *2/34*
U.S. Cl. 623—22 **16 Claims**



1. An acetabular cup assembly capable of being implanted in stages so as to enable preliminary ascertainment and adjustment of position during implant and prior to commitment to a completed implanted position, said acetabular cup assembly comprising:

a shell component having an outer surface for enabling permanent implant of the shell component at an implanted position, an upper top, a lower opening and an inner cavity extending into the shell component upwardly from the lower opening;

a bearing insert for placement within the cavity of the shell component by movement of the bearing insert in an axial direction into the cavity, the bearing insert being initially movable into a preliminary axial position within the shell component and subsequently movable axially upwardly beyond the preliminary axial position into a fully-seated axial position within the shell component, the bearing insert having a bearing face extending transverse to said axial direction;

an alignment and securing arrangement for aligning and securing the bearing insert within the shell component, said alignment and securing arrangement including first alignment and securing means carried by the shell component and second alignment and securing means carried by the bearing insert, the first and second alignment and securing means being generally complementary to one another for engagement when the bearing insert is in either of the preliminary and fully-seated axial positions;

the alignment and securing means including alignment and securing elements, the number and circumferential location of the alignment and securing elements being such that the bearing insert may be placed within the cavity in any selected one of a plurality of circumferential positions relative to the shell component for selective orientation of the bearing face relative to the shell component;

the alignment and securing elements including preliminary alignment means engagable upon placement of the bearing insert at the preliminary axial position for retaining the bearing insert at a preliminary circumferential position, relative to the shell component, wherein the bearing face is located at an initial selected orientation, the preliminary alignment means enabling holding of the bearing insert at the preliminary axial position for ascertainment of the circumferential position of the bearing insert and the concomitant orientation of the bearing face, and enabling selective withdrawal of the bearing insert from the preliminary axial position for circumferential repositioning of the bearing insert and concomitant reorientation of the bearing face to a selected final orientation corresponding

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4,695,280

ARTIFICIAL VASCULAR GRAFT

Koji Watanabe, Otsu; Miyoshi Okamoto, Takatsuki; Yuichi Mori, Kamakura, and Yasuharu Noishiki, Tottori, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 617,048, Jun. 4, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 910,330
Claims priority, application Japan, Jul. 6, 1983, 58-101321
Int. Cl.[4] A61F *2/06*
U.S. Cl. 623—1 **5 Claims**



1. An artificial vascular graft fabric consisting essentially of

(a) ultra-fine fibers of less than 0.5 denier, and

(b) conventional denier fibers of more than 1.0 denier, wherein said fibers are braided, woven or knit to form said artificial vascular graft fabric, whereby said artificial vascular graft fabric has at least a first inner surface and a second outer surface, said first inner surface consisting essentially of ultra-fine fibers.

4,695,281

MEDICAL MATERIAL

Teruo Miyata, Tokyo, and Yasuharu Noishiki, Tottori, both of Japan, assignors to Kokeu Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 478,773
Int. Cl.[4] A61F *2/02, 2/06*
U.S. Cl. 623—11 **13 Claims**

1. A medical material comprising collagen, the surface of the collagen being chemically modified by succinylation of terminal $—NH_2$ groups of side chains attached to polypeptide chains of the collagen, so that the $—NH_2$ groups on the surface of the collagen are converted to —COOH groups to a degree of at least 50%, based on the entire collagen; and the interior of the collagen being modified by crosslinking $—NH_2$ groups therein with one of an aldehyde and its analogous compound.

to a predetermined appropriate orientation, final alignment means engagable upon placement of the bearing insert at the fully-seated axial position for aligning the bearing insert at a final circumferential position, wherein the bearing face is at the selected final orientation, relative to the shell component, and locking means engagable in response to placement of the bearing insert at the fully-seated axial position for locking the bearing insert at the fully-seated axial position with a capturing force great enough to capture the bearing insert at the fully-seated axial position within the shell component, with the bearing face at the selected final orientation relative to the implanted position of the shell component, for permanent service in the acetabular cup assembly.

4,695,283

ENDOPROSTHESIS

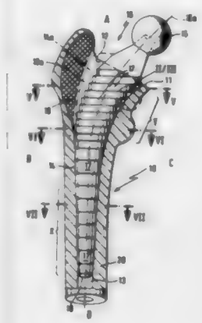
Günther Aldinger, Engelfriedshalde 13, 7400 Tuebingen, Fed. Rep. of Germany

Division of Ser. No. 484,143, Apr. 8, 1983, abandoned. This application Jun. 27, 1985, Ser. No. 749,880

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213437

Int. Cl.⁴ A61F *2/30*

U.S. Cl. 623—23 **8 Claims**



1. An endoprothesis comprising an elongated shaft dimensioned to be anchored through a bone opening in a bone cavity, said shaft being formed in one piece having a shape composed by a plurality of individual disc-like segments of different shapes forming a tapered stepped profile without undercuts from a proximal end to a distal end of said shaft; said shapes of said individual disc-like segments having outer perimeters adjusted to substantially match the corresponding cross sections of the bone cavity in order said implanted shaft to be fitted snugly to the bone cavity at least in regions of said shaft in which a support of said implanted shaft to the bone takes place when said endoprothesis is loaded.

4,695,284

COOL WATER FABRIC WASHING PROCESS USING A PARTICULATE DETERGENT CONTAINING A NONIONIC AND A FATTY ACID BUILDER SALT

Andrew T. Hight, South Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Jun. 4, 1985, Ser. No. 741,042

Claims priority, application United Kingdom, Jun. 15, 1984, 8415302

Int. Cl.⁴ C11D *1/66, 9/22, 10/4, 11/02*

U.S. Cl. 8—137 **17 Claims**

1. A method for washing fabrics at cold water temperatures comprising contacting said fabrics below 5020 C. with built detergent particles comprising:

(i) from 5 to 50% by weight of a nonionic detergent active compound;

(ii) from 15 to 90% by weight of a saturated fatty acid builder salt containing at least 16 carbon atoms, or mixtures thereof; and

(iii) from 5 to 80% by weight of a carrier material, the carrier material being chosen from water-insoluble inorganic materials, water-soluble inorganic materials, water-soluble organic materials selected from the group consisting of urea, solid polyhydric alcohols, polysaccharides, synthetic polymers, proteins, and mixtures thereof; and

wherein said particles are prepared by distributing said nonionic active, said fatty acid builder salt, and said carrier material in water to form an aqueous solution and/or dispersion, mixing said combination, and evaporating water therefrom to obtain said built particles.

14. A method for washing fabrics at cold water temperatures comprising cntacting said fabrics below 50° C. with built detergent particles comprising:

(i) from 5 to 50% by weight of nonionic detergent active compound;

(ii) from 15 to 90% by weight of a saturated fatty acid builder salt containing at least 16 carbon atoms, or mixtures thereof; and

(ii) from 5 to 80% by weight of a carrier material, the carrier being a water-insoluble inorganic material selected from the following: naturally occurring silice, precipitated silica, silica gels, alumina and aluminosilicates, clays and mixtures thereof; and

wherein said particles are prepared by distributing said nonionic active, said fatty acid builder salt, and said carrier material in water to form an aqueous solution and/or dispersion, mixing said combination, and evaporating water therefrom to obtain said built particles.

4,695,285

PROCESS FOR COLORING KERATINACEOUS MATERIALS

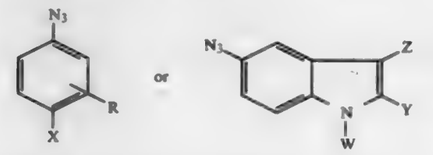
Alexander Chung-Bong-Chan, Mineola, N.Y., and Leszek J. Wolfram, Stamford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Oct. 15, 1986, Ser. No. 919,174

Int. Cl.⁴ A61K *7/13, 7/42;* **D06P** *5/20*

U.S. Cl. 8—429 **12 Claims**

1. A process for coloring keratinaceous material which comprises contacting said keratinaceous material with a coloring composition which contains an aromatic azide or azidoindole component having the formula



wherein X is hydroxyl, alkoxyl, NR'R", in which R' and R" are independently of each other hydrogen, alkyl or hydroxyalkyl, and if R' is H or alkyl, then R" can be further carbamylalkyl, mesylaminoalkyl, acylaminoalkyl, sulfoalkyl, piperidinoalkyl or morpholinoalkyl, R' and R" can also form with the nitrogen atom to which they are attached, a piperidine or morpholine ring, R is hydrogen, alkyl, hydroxyalkyl, halogen, nitro, cyano or alkoxyl, W, Y and Z are independently of each other H or R', wherein all of the aforementioned alkyl moieties can have between 1 and 8 carbon atoms, and then exposing the contacted keratinaceous material to a suitable light source for sufficient time to develop the color.

4,695,286

HIGH MOLECULAR WEIGHT POLYCARBONATE RECEIVING LAYER USED IN THERMAL DYE TRANSFER

Noel R. Vanier, Rochester, and Kin K. Lum, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,200, Dec. 24, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,551

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 8—471 **13 Claims**

5. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a polycarbonate dye image-receiving layer, the improvement wherein said polycarbonate has a number average molecular weight of at least about 25,000.

4,695,287

CYAN DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Steven Evans, Rochester, and Kin K. Lum, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,209, Dec. 24, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 911,839

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 8—471 **20 Claims**

11. In a process of forming a cyan dye transfer image comprising imagewise-heating a dye-donor element comprising a support bearing a dye layer comprising a cyan dye dispersed in a polymeric binder and transferring a cyan dye image to a dye-receiving element to form said cyan dye transfer image, the improvement wherein said cyan dye comprises a 2-carbamoyl-4-[N-(p-substituted aminoaryl)imino]-1,4-naphthoquinone.

4,695,288

SUBBING LAYER FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Gerald L. Ducharme, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 7, 1986, Ser. No. 916,138

Int. Cl.⁴ B41M *5/26*

U.S. Cl. 8—471 **18 Claims**

8. In a process of forming a dye transfer image comprising

(a) imagewise-heating a dye-donor element comprising a poly(ethylene terephthalate) support having thereon, in order, a subbing layer and a dye layer comprising a dye dispersed in a cellulosic binder, and

(b) transferring a dye image to a dye-receiving element to form said dye transfer image,

the improvement wherein said subbing layer comprises from about 5 to about 35 percent by weight of recurring units of an ethylenically unsaturated monomer, from about 0 to about 20 percent by weight of recurring units of an ethylenically unsaturated carboxylic acid, and from about 55 to about 85 percent by weight of recurring units of vinylidene chloride, said subbing layer providing increased adhesion between said support and said dye layer.

4,695,289

PROCESS FOR IMPROVING THE COLOUR YIELD AND WETFASTNESS PROPERTIES OF DYEINGS OR PRINTS PRODUCED ON CELLULOSIC FABRICS WITH ANIONIC DYES: TREATMENT WITH CATIONIC IMIDAZOLE

Rosemarie Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,935

Claims priority, application Switzerland, Nov. 5, 1984, 5285/84

Int. Cl.⁴ D06P *1/64, 3/60;* **C07D** *233/60;* **D06B** *1/14*

U.S. Cl. 8—573 **19 Claims**

1. A process for improving the colour yield and wetfastness properties of dyeings or prints produced on cellulosic materials with anionic dyes, which process comprises treating the cellulosic materials before, during or after dyeing with a cationic fiber-reactive compound which is the reaction product of an imidazole compound containing in 2-position an aliphatic radical of not less than 7 carbon atoms or phenyl, and an epihalohydrin.

4,695,290

INTEGRATED COAL CLEANING PROCESS WITH MIXED ACID REGENERATION

James K. Kindig, Boulder, and James E. Reynolds, Golden, both of Colo., assignors to Integrated Carbons Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 517,338, Jul. 26, 1983, abandoned, and a continuation-in-part of Ser. No. 517,339, Jul. 26, 1983, abandoned, and a continuation-in-part of Ser. No. 517,340, Jul. 26, 1983, abandoned, and a continuation-in-part of Ser. No. 517,362, Jul. 26, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,236

Int. Cl.⁴ C10L *9/02, 9/06*

U.S. Cl. 44—1 S R **40 Claims**

3. A method of producing a coal product from coal and coal derivatives, said coal product having a mineral matter content of less than about 5 percent by weight comprising the steps of:

(a) contacting coal of a size less than about one inch with a mixed acid leach liquor comprising less than about 70 weight percent hydrofluoric acid and less than about 38 weight percent hydrochloric acid at atmospheric pressure and at a temperature below the boiling point of the acid mixture to produce a leached coal and a spent acid liquor comprising at least one metal halide wherein said metal halide will pyrohydrolyze to its metal oxide at a temperature below about 1200° C. and at atmospheric pressure and at least one metal halide that will not pyrohydrolyze to metal oxide at said temperature and pressure, but will sulfate to form its metal sulfate at said temperature and pressure, and wherein said halide is selected from the group consisting of fluoride and chloride;

(b) separating said spent mixed acid leach liquor and said leached coal;

(c) contacting said spent mixed acid leach liquor with a hot gas comprising water vapor in the presence of SO_2 and excess oxygen at a temperature of from about 600° C. to about 1100° C. to regenerate HF and HCl from substantially all of the metal halide salts present and to form the respective metal sulfates and oxides;

(d) separating said HF and HCl as part of hot off-gas produced in step (c) from the oxide/sulfate-containing calcine formed in step (c);

(e) recycling said regenerated HF and HCl mixed acids to mixed acid leach of step (a); and

(f) removing pyrite from said leached coal to produce a coal product substantially free of pyrite.

4,695,291

POLY(OXYALKYLENE) AMINOETHER CARBAMATES AS DEPOSIT CONTROL ADDITIVES

Frank Plavac, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

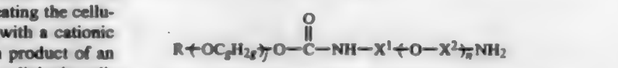
Continuation of Ser. No. 429,695, Sep. 30, 1982, Pat. No. 4,521,610. This application Feb. 15, 1985, Ser. No. 701,849

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.⁴ A01M *23/10*

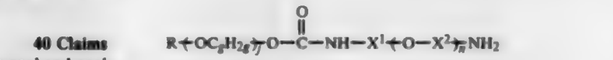
U.S. Cl. 44—62 **16 Claims**

1. A fuel composition comprising a major portion of hydrocarbon boiling in the gasoline range and from 30 to 2,000 ppm of an additive having the formula:



wherein n is an integer from 1 to 10; g is an integer from 2 to 5; j is an integer such that the molecular weight of the compound is in the range of about 500 to 10,000; R is a hydrocarbyl group of from about 1 to 30 carbon atoms; and X^1 and X^2 are the same or different substituents selected from the group consisting of (A) alkylene groups containing 1 to 6 carbon atoms; (B) arylene groups of from 6 to 12 carbon atoms; and (C) groups selected from (A) and (B) and substituted with groups selected from hydroxyl, alkoxyl, nitrile, amino, and alkyl and/or aryl groups substituted with substituents selected from hydroxyl, alkoxyl, nitrile, amino groups; and wherein X^2 can vary independently within the groups consisting of (A), (B) and (C) up to n times.

9. A fuel concentrate comprising an inert stable oleophilic organic solvent boiling in the range of from 150° to 400° F. and from 10 to 50 weight percent of a fuel additive of the formula:



wherein n is an integer from 1 to 10; g is an integer from 2 to 5; j is an integer such that the molecular weight of the compound is in the range of about 500 to 10,000; R is a hydrocarbyl group of from about 1 to 30 atoms; and X^1 and X^2 are the same or different substituents selected from the group consisting of (A) alkylene groups containing 1 to 6 carbon atoms; (B) arylene groups of from 6 to 12 carbon atoms; and (C) groups selected from (A) and (B) and substituted with groups selected from hyrdoxyl, alkoxyl, nitrile, amino, and alkyl and/or aryl groups substituted with substituents selected from hydroxyl, alkoxyl, nitrile, amino groups; and wherein X^2 can vary independently within the groups consisting of (A), (B) and (C) up to n times.

4,695,292

MOTOR FUEL COMPOSITIONS AND METHODS

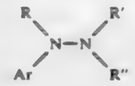
Hans Osborg, P.O. Box 152, 80 Long View Rd., Port Washington, N.Y. 11050

Continuation-in-part of Ser. No. 503,396, Jun. 10, 1983, abandoned. This application Aug. 11, 1983, Ser. No. 522,548

Int. Cl.⁴ C10L *1/22*

U.S. Cl. 44—64 **11 Claims**

1. A liquid fuel mixture comprising gasoline, at least one alcohol selected from the group consisting of methanol, ethanol, propanol, butanol, pentanol, hexanol, and isomers thereof, and a hydrazine derivative of the formula:



wherein Ar represents a radical selected from the group consisting of aryl having 6 to 15 carbon atoms or aralkyl having 7 to 15 carbon atoms, R, R' and R'' may be the same or different and represent hydrogen or a racical selected from the group consisting of alkyl having 1 to 10 carbon atoms, cycloalkyl having 3 to 8 carbon atoms or Ar, as herein defined, and at least one of said R, R', and R'' is hydrogen, said mixture being homogeneous at ambient temperatures, and the composition of said mixture comprising, by weight, from about 50% to about 95% gasoline, from about 4.75% about 49.75% alcohol and from about 0.25% to about 5.0% hydrazine derivative.

11. The mixture of claim 1, which further includes a compatible Lewis base, selected from ammonia, a mono-, di- or trialkylamine, or a mixture thereof.

4,695,293

FUEL ADDITIVE

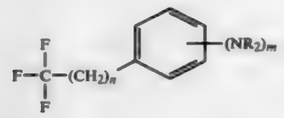
Saul Kessler, 7020 Rivol Rd., Canoga Park, Calif. 91307

Filed Sep. 20, 1985, Ser. No. 773,662

Int. Cl.⁴ C10L *1/20*

U.S. Cl. 44—68 **17 Claims**

1. An additive for a liquid hydrocarbon fuel comprising a solution in a combustible organic diluent of about 0.0001 to 10 percent by weight of a soluble compound comprising the reaction product of a halide salt selected from the group consisting of boron halides, titanium halides or aluminum halides with a haloalkyl-arylamine of the formula:



where n is an integer from 0 to 4, m is an integer from 1 to 2 and R is selected from hydrogen, lower alkyl of 1 to 9 carbon atoms, lower alkanol of 1 to 8 carbon atoms, aryl or aralkyl.

4,695,294

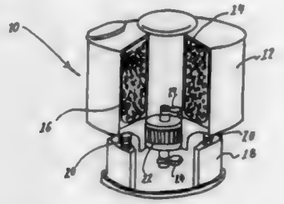
VIBRATORY GRINDING OF SILICON CARBIDE

Tadeusz M. Korzekwa, Lewiston; Carl H. McMurtry, Youngstown, and Wolfgang D. G. Boecker, Lewiston, all of N.Y., assignors to Stemcor Corporation, Cleveland, Ohio

Filed Apr. 11, 1985, Ser. No. 722,272

Int. Cl.⁴ B24D *3/02*

U.S. Cl. 51—307 **20 Claims**



1. A grinding mixture comprising silicon carbide pellets and a suspension of silicon carbide powder, having a particle size of less than 150 microns, in a fluid, said silicon carbide pellets having a maximum dimension of from about 0.5 to 5 centimeters, at least 90 percent of the pellets having a density greater than 3.05 g/cm^3.

4,695,295

GAS SEPARATION MEMBRANES FROM POLYMERS CONTAINING A HYDROCARBON BACKBONE AND PENDANT (HYDROCARBYLAMIDO)ALKYL ESTER MOIETIES

Linneaus C. Dorman; Victor E. Meyer, both of Midland, Mich., and Marinda L. Wu, San Ramon, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 24, 1986, Ser. No. 911,275

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **16 Claims**

1. A gas separation membrane comprising a semipermeable membrane fabricated from a polymer containing a hydrocarbon backbone and pendant (hydrocarbylamido)alkyl ester moieties.

7. A method of separating gases comprising the steps of

(a) contacting with a feed gas mixture under pressure one side of a semipermeable membrane comprising a membrane fabricated from a polymer containing a hydrocarbon backbone and pendant (hydrocarbylamido)alkyl ester moieties;

(b) maintaining a pressure differential across the membrane under conditions such that a component(s) of the feed gas mixture selectively permeates through the membrane from the high pressure side to the low pressure side of the membrane,

(c) removing the permeated gas which is enriched in the faster permeating component(s) from the low pressure side of the membrane; and

(d) removing the nonpermeated gas which is depleted in the faster permeating component(s) from the high pressure side of the membrane.

4,695,296

METHOD FOR THE SELECTIVE SEPARATION OF GASES

Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1985, Ser. No. 739,806

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—68 **10 Claims**

1. A method for the selective removal of an oxide of carbon from a gas stream containing the same and an elemental halogen comprising: bringing the gas stream to be treated into contact with a water-free, molecular sieve which has been prehalogenated with elemental halogen whereby the oxide of carbon is selectively retained in the molecular sieve.

9. A method for the selective removal of CO_2 from a gas stream containing the same and fluorine comprising passing the gas stream through a bed of pellets consisting of an aluminosilicate having a pore size of at least about 4 angstroms which has been prefluorinated with elemental fluorine.

4,695,297

ELECTROSTATIC PRECIPITATOR

Arthur G. Hein, 5274 Cliffridge Avenue, North Vancouver, British Columbia, Canada (V7R 3V4)

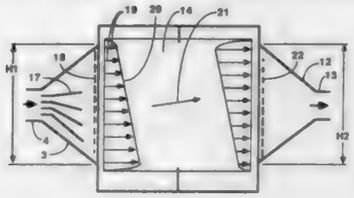
Continuation-in-part of Ser. No. 714,469, Mar. 26, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 943,855

Int. Cl.⁴ B03C *3/36*

U.S. Cl. 55—112 **2 Claims**

1. In a dry horizontal flow electrostatic precipitator for removing suspended particles from a gas stream, the precipitator having a casing, a treatment zone consisting of collecting and high voltage electrodes, rapping means to dislodge the collected dust, an inlet opening at one end of the treatment zone for admitting the untreated gas stream and an outlet opening at the other end of the treatment zone for discharging the treated gas stream, the improvement comprising gas flow

control means at or near the inlet opening designed for non-uniform gas distribution, such that more than half the gas flow



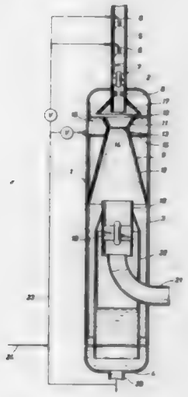
entering the treatment zone enters the lower half of the height of the opening to the treatment zone.

4,695,298

APPARATUS FOR CLEANING SOLIDS-LADEN GAS

Hubertus W. A. A. Dries, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 1, 1983, Ser. No. 547,690
Claims priority, application United Kingdom, Nov. 1, 1982, 8231168
Int. Cl.⁴ B01D *47/06, 47/10, 47/12*
U.S. Cl. 55—223 **2 Claims**



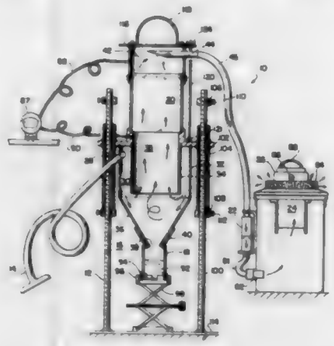
1. An apparatus for cleaning a solids-laden gas comprising a vertically-extending vessel with a solids-laden gas supply conduit communicating therewith and substantially vertically-extending into the top-portion of the vessel, said supply conduit being provided with means for introducing a fluid therein; first means in said supply conduit for imparting a rotary motion to a gas/liquid mixture in said conduit to separate liquid from gas; means for laterally discharging separated liquid from the supply conduit into the vessel; said vessel also being internally provided with a venturi-shaped gas passage member communicating at its entrance with and substantially coaxially aligned with the supply conduit; means for guiding liquid, from said means for lateral discharge of separated liquid, into a means for liquid collection; means substantially surrounding at least the upper part of the venturi-shaped gas passage member forming therewith and with the walls of the vessel said means for liquid collection, and further forming with said gas passage member means for guiding liquid from said means for liquid collection into the throat of the venturi-shaped gas passage member at or above the throat thereof; second means for imparting a rotary motion to a gas/liquid mixture to separate liquid with solids from gas, said second means being aligned with and communicating with the discharge end of said venturi-shaped passage member in said vessel; means for discharging liquid with solids from said vessel; and means for discharging gas from the vessel.

4,695,299

METHOD AND APPARATUS FOR IN-CELL VACUUMING OF RADIOLOGICALLY CONTAMINATED MATERIALS

Peter R. Spadaro; Jay E. Smith, both of Pittsburgh; Elmer L. Speer, Ruffsdale, and Arnold L. Cecconi, Clairton, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 21, 1986, Ser. No. 831,744
Int. Cl.⁴ B01D *45/12*
U.S. Cl. 55—274 **15 Claims**



5. A vacuum system having a vacuum source for collecting radiologically contaminated material for disposal, comprising:
an inlet nozzle for collecting said material;
a cyclone separator connected to said inlet nozzle to receive said material therefrom, said cyclone separator having a material discharge and an air flow discharge;
a product container positioned at said material discharge for receiving material discharged from said cyclone separator, said product container is transparent for allowing observation of a level of material collected therein;
a first prefilter downstream of said air flow discharge for filtering air from said air flow discharge;
a second prefilter connected between said vacuum source and said first prefilter for filtering air from said first prefilter, said second prefilter having means for visually observing the air flow in said second prefilter;
means for monitoring a pressure drop across said first prefilter; and
means for supporting said product container against said material discharge during operation and for facilitating removal of said product container from said material discharge for disposal of said material.

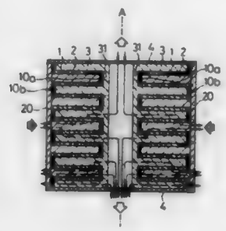
4,695,300

RADIAL FLOW TYPE DUST COLLECTING FILTER

Shigeru Takagi, Anjo, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Division of Ser. No. 605,980, Apr. 20, 1984, abandoned, continuation of Ser. No. 360,768, Mar. 22, 1982, abandoned. This application Jan. 7, 1986, Ser. No. 816,977
Claims priority, application Japan, Mar. 22, 1981, 56-41242
Int. Cl.⁴ B01D *46/52, 50/00*
U.S. Cl. 55—485 **5 Claims**

1. A radial flow type dust collecting filter provided with a cylindrical filtering wall of substantially constant radial thickness for filtering fluid flowing in the radial inward direction of said filtering wall, comprising:
a thin walled first filter member of generally cylindrical shape and having a generally zig-zag or corrugated configuration in longitudinal section to define circumferentially-extending inwardly-facing and outwardly-facing ridges separated by inwardly-facing and outwardly-facing valley-like spaces, said ridges having end portions connected to main portions of said first filter member;
a second filter member which is disposed within and completely fills the outwardly-facing spaces defined by said first filter member;
a third filter member which is disposed within and completely fills the inwardly-facing spaces defined by said first filter member, which interiorly covers said first filter member and which has a cylindrical interior surface defining an axially extending through hole in the center thereof; and
a pair of end plates which are fixed to both axial ends of said first and third filter members, respectively, for retaining said filter members therebetween,



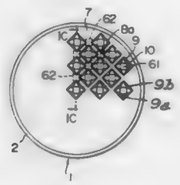
at least one of said end plates having a central hole in communication with said through hole,
at least said end portions of one of said inwardly-facing and said outwardly-facing ridges having a flowing resistance larger than that of said main portions of said first filter member, and
each of said second filter member and said third filter member having generally the same flowing resistance smaller than that of said main portions of said first filter member for collecting dust primarily by impaction.

4,695,301

POROUS CERAMIC MONOLITHS

Atushi Okajima, Kariya; Hitoshi Yoshida, Okazaki; Yukihisa Takeuchi, Aichi, and Masanori Fukutani, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 10, 1986, Ser. No. 827,718
Claims priority, application Japan, Feb. 11, 1985, 60-24994
Int. Cl.⁴ B01D *39/20;* **C04B** *21/06*
U.S. Cl. 55—523 **11 Claims**



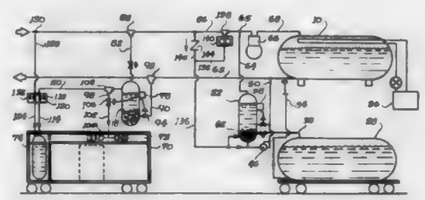
1. A porous ceramic monolith having an inlet end wall and an outlet end wall and including a plurality of bores having substantially parallel axes and separated from each other by porous partition walls, some of said bores being closed by said inlet end wall and opened in an outer end face of said outlet end wall to provide outlet bores and the other of said bores being closed by said outlet end wall of said ceramic monolith and opened in an outer end face of said inlet end wall to provide inlet bores, said inlet and outlet bores being interlaced such that a flow of fluid entering said inlet bores is allowed to pass through the pores in said partition walls into said outlet bores, wherein the open ends of at least said inlet bores are diverged outwardly and wherein each of said end walls has a first thickness measured in the axial direction of said bores and each of said partition walls has a second thickness measured in a direction perpendicular to the axes of said bores, said first thickness being greater than said second thickness.

4,695,302

PRODUCTION OF LARGE QUANTITIES OF CO_2 SNOW

Lewis Tyree, Jr., North Oak Brook, Ill., assignor to Liquid Carbonic Corporation, Chicago, Ill.

Filed Oct. 28, 1986, Ser. No. 923,908
Int. Cl.⁴ F25J *1/00*
U.S. Cl. 62—10 **18 Claims**



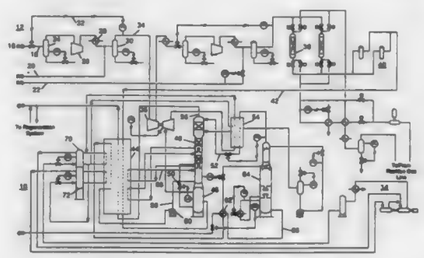
1. A method for efficiently providing large quantities of CO_2 snow, which method comprises the steps of:
maintaing a reservoir of at least about 2,000 pounds of solid CO_2 at about its triple point containing a substantial portion of solid CO_2,
connecting a source of high pressure liquid CO_2 to a first region of said reservoir,
connecting a second region of said reservoir to a receptacle for receiving a large quantity of CO_2 snow and causing the flow of high pressure liquid CO_2 through said reservoir while deterring the exit passage of solid CO_2, whereby high pressure CO_2 flows through said reservoir when it is subcooled by contact with solid CO_2 therein, and expanding said subcooled CO_2 at the receptacle to create solid CO_2 and CO_2 vapor.

4,695,303

METHOD FOR RECOVERY OF NATURAL GAS LIQUIDS

George J. Montgomery, IV, Houston, and Hafez K. Aghili, Katy, both of Tex., assignors to McDermott International, Inc., New Orleans, La.

Filed Jul. 8, 1986, Ser. No. 883,210
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—24 **6 Claims**



1. A method for recovering natural gas liquids from a fuel gas stream with high hydrogen and carbon dioxide content comprising the steps of:
dehydrating said fuel gas stream;
compressing said fuel gas stream to a pressure of generally 300 psi;
chilling said fuel gas stream in an inlet gas cooler to generally −45° F.;

separating said chilled, compressed fuel gas stream into a predominently liquid stream and a predominantly vapor stream;

separately reducing the pressure of said liquid and said vapor streams and supplying said separated streams to a demethanizer;

raising the temperature of said vapor stream prior to supplying it to said demethanizer;

removing cold demethanized residue gas from the top of said demethanizer and cross exchanging said residue gas with said fuel gas stream in said inlet gas cooler to chill said fuel gas stream;

removing cold demethanized bottoms product from the bottom of said demethanizer and cross exchanging said demethanized bottoms product with said fuel gas stream in said inlet cooler to chill said fuel gas stream;

cross exchanging said demethanized bottoms product downstream of said inlet gas cooler and supplying said cross exchanged demethanized bottoms product to a de-ethanizer;

removing a de-ethanized bottoms product from the bottom of said de-ethanizer and cross-exchanging said de-ethanized bottoms product with said demethanized bottoms product to lower the temperature of said de-ethanized bottoms product and raise the temperature of said demethanized bottoms product prior to supplying said demethanized bottoms product to said de-ethanizer;

removing a de-ethanized overhead product from the top of said de-ethanizer and cross exchanging said de-ethanized overhead product with said vapor streams to lower the temperature of said de-ethanized overhead product and raise the temperature of said vapor stream prior to supplying both to said demethanizer; and,

scrubbing said fuel gas stream prior to chilling said stream in said inlet gas cooler.

4,695,304

SEPARATION OF CO_2 FROM A GASEOUS MIXTURE

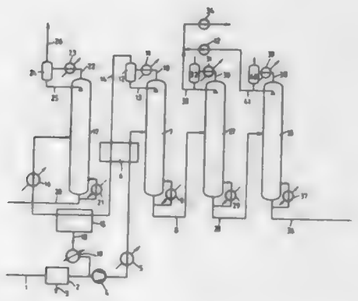
Rainer Sapper, Neuried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 743,727

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422158; May 3, 1985, 3515949

Int. Cl.⁴ F24J *3/02*

U.S. Cl. 62—27 **27 Claims**



1. A process for the separation of CO_2 from a gaseous mixture containing CO_2 and at least C_1–C_2 hydrocarbons, said process comprising separating said gaseous mixture in a first fractionating stage into an overhead fraction containing substantially all the C_1 and C_2 hydrocarbons and a minor portion of the CO_2 and into a bottoms fraction containing the major portion of the CO_2.

4,695,305

METHOD OF FOR MANUFACTURING GLASS BODIES

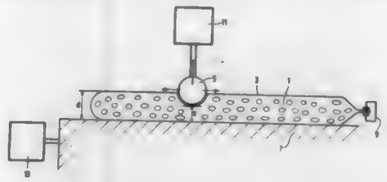
Rolf Clasen, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,407

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511454

Int. Cl.⁴ C03B *37/023*; C03C *4/00*

U.S. Cl. 65—18.3 **13 Claims**



1. In a method of manufacturing glass bodies, in which method a thixotropic suspension, the starting material for the glass body, is used to form a porous green body which is subsequently subjected to a purification step in a heated gaseous phase and then sintered to form a glass body, the improvement wherein the starting material is placed in an elastic mold, is subjected to mechanical forces applied to the external surface of said elastic mold while in the elastic mold whereby it is homogenized and liquefied in the elastic mould and is subsequently freed of the influence of said mechanical forces, as a result of which the starting material solidifies again to form a green body.

4,695,306

AUTOMATIC MACHINE FOR WELDING TWO OPTICAL FIBERS END-TO-END

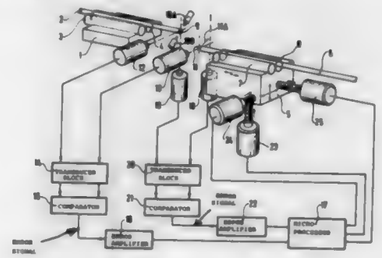
Roland Hakoun, Paris, and Michel Jurczyszyn, Ivry Sur Seine, both of France, assignors to Optiques Compagnie Lyonnaise de Transmissions, Clichy, France

Continuation of Ser. No. 664,445, Oct. 24, 1984, abandoned. This application Feb. 10, 1986, Ser. No. 828,089

Claims priority, application France, Oct. 24, 1983, 83 16889; Apr. 20, 1984, 84 06300

Int. Cl.⁴ C03B *9/42, 23/20*

U.S. Cl. 65—152 **12 Claims**



1. In an automatic machine for welding optical fibers end-to-end, said machine comprising:

first and second optical support plates respectively for supporting a first "reference" optical fiber and a second, "moving" optical fiber in end facing general axial alignment;

automatic translation means connected to said second support plate for moving said second support plate in two orthogonal directions which are perpendicular to the axes of the fibers;

automatic translation means connected to one of said support plates for moving said support plate parallel to the axes of the fibers;

manual translation means connected to the other of said support plates for moving said other support plate parallel to the axes of the fibers;

position detecting means comprising light source means for illuminating the ends of the optical fibers; optical lens means for forming magnified images thereof; and optical pick-up means for sensing the positions of said images and for generating signals responsive to sensed positions of said images;

control means responsive to said signals derived from said optical pick-up means and connected to said automatic translation means to effect control thereof; and

fiber welding means for welding together the ends of said optical fibers;

the improvement wherein said light source means comprises means illuminating the ends of said optical fibers in a plane perpendicular to the axes of said optical fibers, and said pick-up means comprises means for detecting the position of each fiber end in two orthogonal directions corresponding to said orthogonal directions perpendicular to the axes of the fibers, said pick-up means comprising at least two optical pick-ups for each fiber end and at least one optical pick-up for each of said orthogonal directions, optical transducers connected to respective optical pick-ups for converting said optical signals into respective electrical signals, and means connecting electronic comparators to said transducers so that, for each of said orthogonal directions, the electrical signals derived from the pick-ups associated with different optical fiber ends are electronically compared, and means connecting said comparators to said control means for feeding electrical signals resulting from said comparisons representing misalignment of said optical fibers in respective orthogonal directions perpendicular to said axes of said optical fibers to said control means to enable said control means to control said automatic translation means to bring said fiber ends within one-tenth of a micron degree of axial alignment, and into end-to-end contact ready to be welded together;

and wherein said light source means comprises a separate light source for each of said two orthogonal directions, each of said separate light sources is located on one side of the fiber ends, said lens means comprise separate lens means located on the other side of the fiber ends opposite said separate light sources, respectively, for forming magnified real images of the optical fiber ends and respective optical pick-ups are located at said magnified real images.

4,695,307

BAFFLE MOVING MECHANISM FOR USE IN A GLASSWARE MANUFACTURING MACHINE OF THE INDIVIDUAL SECTION TYPE

Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jul. 17, 1986, Ser. No. 887,145

Claims priority, application United Kingdom, Jul. 24, 1985, 8518717

Int. Cl.⁴ C03B *9/335*

U.S. Cl. 65—242 **2 Claims**

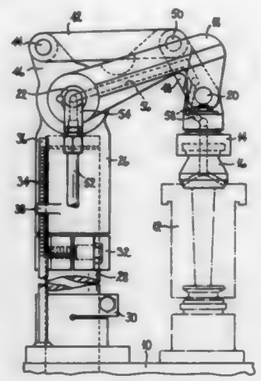
1. A glassware manufacturing machine of the individual section type comprising:

a mold,

a baffle,

parallelogram linkage means for supporting said baffle and for displacing said baffle from an operative to a remote position without changing its orientation, said parallelogram linkage means including

first conduit means for directing air under pressure to said baffle,



said baffle including second conduit means continuously communicating with said first conduit means.

4,695,308

HERBICIDAL SUBSTITUTED 5-AMINO-1-ARYL-PYRAZOLES

Reinhold Gehring, Wuppertal; Markus Lindig, Hilden; Otto Schallner, Monheim; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch Gladbach, and Jörg Stetter, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

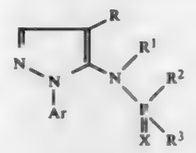
Filed Oct. 30, 1986, Ser. No. 925,845

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1985, 3539844

Int. Cl.⁴ A01N *57/32*; C07F *9/65*

U.S. Cl. 71—86 **8 Claims**

1. A substituted 5-amino-1-arylpyrazole of the formula



in which

R represents hydrogen, cyano or nitro, or represents straight-chain or branched alkoxycarbonyl with 1 to 4 carbon atoms,

R^1 represents hydrogen, or represents straight-chain or branched alkyl with 1 to 6 carbon atoms,

R^2 and R^3 independently of one another represent in each case straight-chain or branched alkyl, alkenyl or alkinyl with in each case up to 8 carbon atoms, or represent straight-chain or branched halogenoalkyl with 1 to 6 carbon atoms and 1 to 13 identical or different halogen atoms, or represent straight-chain or branched alkoxyalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts, or represent straight-chain or branched alkoxy with 1 to 6 carbon atoms, or represent cycloalkyl or cycloalkyloxy with in each case 3 to 7 carbon atoms, or represent aryl, aryloxy, aralkyl or aralkyloxy with in each case 6 to 10 carbon atoms in the individual aryl parts and, where appropriate, one to three carbon atoms in the straight-chain or branched alkyl parts, in each case optionally monosubstituted or polysubstituted in the aryl part by identical or different substituents selected from the group

consisting of halogen, cyano, nitro and in each case straight-chain or branched alkyl, alkoxy, alkylthio or halogenoalkyl with in each case 1 to 4 carbon atoms and, in the case of the halogenoalkyl, with 1 to 9 identical or different halogen atoms,

X represents oxygen or sulphur, and

Ar represents phenyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, in each case optionally monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of cyano, nitro, halogen, in each case straight-chain or branched alkyl, alkoxy and alkoxycarbonyl with in each case 1 to 4 carbon atoms in the alkyl part, in each case straight-chain or branched halogenoalkyl and halogenoalkoxy with in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms or the radical $-S(O)_n-R^4$,

wherein

R^4 represents amino, or represents in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl, with 1 to 9 identical or different halogen atoms, and

n represents the number 0, 1 or 2,

or a salt thereof.

6. A herbicidal composition comprising a herbicidally effective amount of a compound or salt according to claim **1** and a diluent.

4,695,309

COMPOSITION FOR PROLONGING THE ACTION OF HERBICIDES AND HERBICIDE COMPOSITIONS WITH A PROLONGED ACTION

Barna Bordás; Antal Gimesi; Magda Kovács, née Kálmán; Éva János; György Matolcsy, and Márton Tüske, all of Budapest, Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Division of Ser. No. 744,513, Jun. 13, 1985. This application Mar. 17, 1986, Ser. No. 840,425

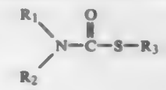
Claims priority, application Hungary, Jun. 14, 1984, 2306/84

Int. Cl.[4] A01N *25/22*

U.S. Cl. 71—88 **14 Claims**

1. A composition with prolonged herbicidal activity which comprises:

(a) a herbicidal compound of the Formula (I)

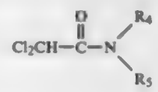


wherein

R_1, R_2 and R_3 are each C_1 to C_4 alkyl; or

R_1 and R_2 are each C_4 to C_6 cycloalkyl;

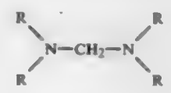
(b) an antidotal compound of the Formula (II)



wherein

R_4 and R_5 are each C_2 to C_4 alkenyl, a (C_1 to C_4 alkoxy)-(C_1 to C_4 alkoxy-(C_1 to C_4 alkyl) group, or a (C_2 to C_4 alkenyl)-aminocarbonyl-(C_1 to C_4 akyl) group; or R_4 and R_5 together with the adjacent nitrogen atom may represent a saturated ring consisting of 4 to 7 members optionally broken by an oxygen atom and optionally substituted at most by three methyl groups or C_4 to C_6 cycloalkyl groups; and

(c) an extender compound of the Formula (III)



wherein the

R substituents are each independently C_1 to C_6 alkyl or C_2 to C_4 alkenyl each unsubstituted or substituted by a C_1 to C_4 alkyl group, wherein at least two of the R substituents are each allyl and wherein the weight ratio between the herbicidal compound of the formula (I) to the extender compound of the formula (III) is 25:1 to 1:1.

4,695,310

BENZOFURAN AND BENZOTHIOPHENE SULFONAMIDES

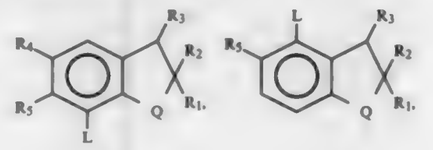
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 706,961, Mar. 6, 1985, Pat. No. 4,589,909, which is a continuation-in-part of Ser. No. 617,608, Jun. 5, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 824,368

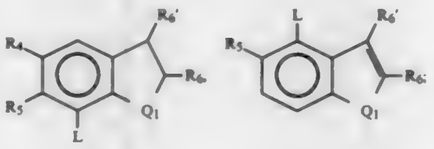
Int. Cl.[4] C07D *405/12, 409/12;* **A01N** *43/54*

U.S. Cl. 71—90 **22 Claims**

1. A compound selected from:



I I'



II II'

wherein

Q is O, S, SO or SO_2;

Q_1 is O, S or SO_2;

L is



R_1 is H or C_1–C_4 alkyl;

R_2 is H or C_1–C_4 alkyl;

R_3 is H or CH_3;

R_4 is H, Cl, CH_3, CF_3, OCH_3, Br, F, SCH_3 or OCF_2H;

R_5 is H, CH_3, OCH_3, Cl, Br, NO_2, CO_2R_7, SO_2R_8, OSO_2R_9, $SO_2NR_{10}R_{11}$, F, CF_3, SCH_3, OCF_2H or $SO_2N(OCH_3)CH_3$;

R_6 is H, Cl, Br or C_1–C_4 alkyl;

R_6' is H, CH_3, Cl or Br;

R_7 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl;

R_8 is C_1–C_3 alkyl;

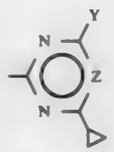
R_9 is C_1–C_3 alkyl or CF_3;

R_{10} and R_{11} are independently C_1–C_2 alkyl;

R_{12} is H or CH_3;

W is O or S;

A is



Y is C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 alkoxylmethyl, OCF_2H, SCF_2H, OCH_2CF_3, OCH_2CH_2F, CF_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $NHCH_3$, $N(CH_3)_2$ or $CH(OCH_3)_2$; and

Z is CH;

and their agriculturally suitable salts; provided that

(1) in Formulae II and II', when R_5 is NO_2, then R_6 is C_1–C_4 C_1–C_4 alkyl and R_6' is CH_3;

(2) when Q is SO, then W is O;

(3) when R_4 is other than H, then R_5 is H; and

(4) R_1 and R_2 taken together are not more than four carbon atoms.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,695,311

HERBICIDAL SULFONAMIDES

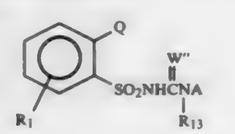
Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 685,026, Dec. 21, 1984, Pat. No. 4,606,755, which is a division of Ser. No. 436,631, Oct. 29, 1982, Pat. No. 4,511,392, which is a continuation-in-part of Ser. No. 337,934, Jan. 7, 1982, abandoned. This application May 9, 1986, Ser. No. 861,260

Int. Cl.[4] A01N *43/54;* **C07D** *403/12, 413/12, 417/12*

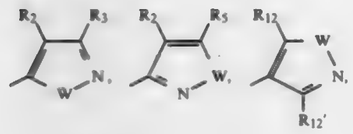
U.S. Cl. 71—92 **37 Claims**

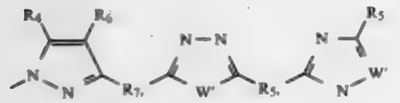
1. A compound of the formula:

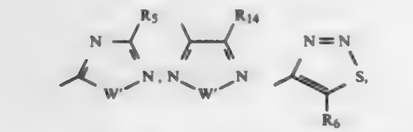


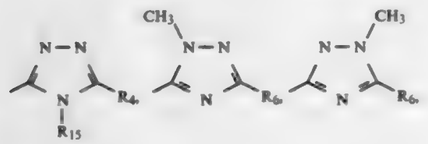
wherein

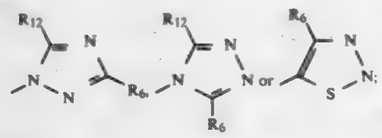
Q is











W" is O or S;

W is O, S or NR;

W' is O or S;

R is H or C_1–C_4 alkyl;

R_1 is H, F, Cl, Br, CH_3, CF_3 or OCH_3;

R_2 is H, CH_3, C_2H_5, Cl or Br;

R_3 is H, CH_3, C_2H_5, Cl, Br, OCH_3, OC_2H_5 or SCH_3;

R_4 is H or C_1–C_4 alkyl;

R_5 is H, CH_3, C_2H_5, Cl, Br, OCH_3, OC_2H_5 or SCH_3;

R_6 is H, CH_3 or C_2H_5;

R_7 is H or C_1–C_4 alkyl;

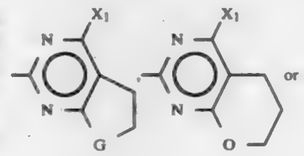
R_{12} is H or CH_3;

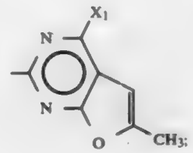
R_{12}' is H or CH_3;

R_{13} is H or CH_3;

R_{14} is H, CH_3, C_2H_5, Cl, OCH_3, OC_2H_5 or SCH_3;

R_{15} is C_1–C_3 alkyl; A is





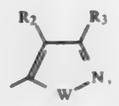
X_1 is CH_3, OCH_3 or Cl;

G is O or CH_2;

and their agriculturally suitable salts; provided that:

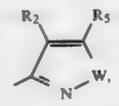
(a) when R_2 is Cl or Br, then W is O or S;

(b) when Q is



then one of R_2 or R_3 must be H, CH_3 or C_2H_5;

(c) when Q is



then one of R_2 or R_5 must be H, CH_3 or C_2H_5;

(d) the total number of carbon atoms of Q must be less than or equal to 8.

30. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

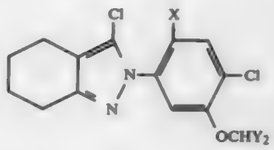
4,695,312

4,5,6,7-TETRAHYDRO-2H-INDAZOLE DERIVATIVES AND HERBICIDES CONTAINING THEM

Yoshio Hayase, Mie; Toshikazu Ohtsuka; Kinya Ide, both of Shiga, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 31, 1986, Ser. No. 846,051
Claims priority, application Japan, Apr. 3, 1985, 60-71428
Int. Cl.[4] A01N *43/56*; C07D *231/56*
U.S. Cl. 71—92 4 Claims

1. A compound of the formula:



wherein X and Y each is halogen or a phytologically acceptable acid addition salt thereof.

4. A herbicidal composition comprising a herbicidally effective amount of a compound or salt thereof according to claim 1 together with one or more carriers, diluents and/or excipients.

4,695,313

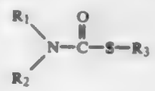
COMPOSITION FOR PROLONGING THE ACTION OF HERBICIDES AND HERBICIDE COMPOSITIONS WITH A PROLONGED ACTION

Barna Bordás; Antal Gimesi; Magda Kovács née Kálmán; Éva János; György Matolcsy, and Márton Tüske, all of Budapest, Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Jun. 13, 1985, Ser. No. 744,513
Claims priority, application Hungary, Jun. 14, 1984, 2306/84
Int. Cl.[4] A01D *25/22*
U.S. Cl. 71—100 6 Claims

1. A composition with prolonged herbicidal activity which comprises:

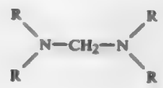
(a) a thiolcarbamate compound of the Formula (I)



wherein

R_1, R_2 and R_3 are each independently C_1 to C_4 alkyl; or R_1 and R_2 are each independently C_4 to C_6 cycloalkyl; and

(b) an extender compound of the Formula (III)



wherein the

R substituents are each independently C_1 to C_6 alkyl or C_2 to C_4 alkenyl, each unsubstituted or substituted by a C_1 to C_4 alkyl group; wherein at least two of the R substituents are each allyl and wherein the weight ratio between the herbicidal compound of the Formula (I) to the extender compound of the Formula (III) is 25:1 to 1:1.

4,695,314

S-BENZYL THIOLCARBAMATES AND THEIR USE IN CONTROLLING WEEDS IN RICE FIELDS

Lawrence L. Buren, Cupertino; Donald R. James, El Sobrante; Barney J. Randolph, San Jose; Eugene G. Teach; Harry Tillos, both of El Cerrito, and Francis H. Walker, Mill Valley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 607,106, May 3, 1984. This application Apr. 28, 1986, Ser. No. 856,270
Int. Cl.[4] A01N *37/00*; C07C *155/02*
U.S. Cl. 71—100 4 Claims

1. S-benzyl-N-ethyl-N-1,2-dimethylpropyl thiocarbamate.

3. A method of controlling undesirable vegetation in rice crops comprising applying to the locus where control is desired an herbicidal composition comprising an herbicidally effective amount of S-benzyl-n-ethyl-n-1,2-dimethylpropyl thiocarbamate and an inert diluent carrier.

4,695,315

METHOD OF MINIMIZING REDUCTION DISINTEGRATION OF IRON ORES AND IRON ORE AGGLOMERATES TO BE USED AS BLAST FURNACE BURDEN

Heinrich Kortmann, Liebenburg, and Wolfgang Bock, Langelsheim, both of Fed. Rep. of Germany, assignors to Studiengesellschaft für Eisenerzaufbereitung, Liebenburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 000,209, Oct. 13, 1983. This application Jul. 13, 1984, Ser. No. 630,593
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242086
Int. Cl.[4] C21B *5/00*; C22B *1/14*
U.S. Cl. 75—0.5 R 23 Claims

1. A method for minimizing disintegration of pieces of iron ore agglomerates during reduction of pieces of iron ore agglomerates in a blast furnace comprising

surface-treating the iron ore agglomerates directly before being fed to the blast furnace with halogenide reagents, where the surface treating is performed until the pieces of iron ore agglomerates have an analytical content of from about 0.001 to 0.1 weight percent in halogen, which surface treating with halogenides minimizes reduction disintegration of the iron ore agglomerates when exposed to temperatures in the blast furnace in the range of from about 400 to 600 degrees centigrade under reducing conditions; feeding the surface-treated iron ore agglomerates into a blast furnace; and

exposing the surface treated agglomerates in the blast furnace to temperatures in the range of from about 400 to 600 degrees centigrade under reducing conditions.

4,695,316

MULTIPLE INDUCTION FURNACE SYSTEM USING SINGLE POWER SUPPLY

Jesse M. Cartlidge, Trenton, N.J., assignor to Inductotherm Corporation, Rancocas, N.J.

Filed Jun. 27, 1986, Ser. No. 879,691
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.14 3 Claims

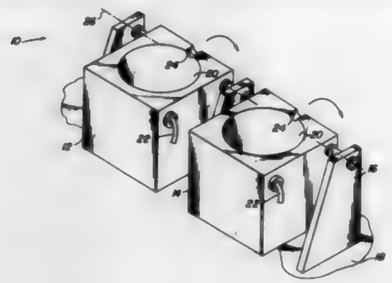
1. A system for simultaneously melting metal and holding molten metal for casting operations and the like, comprising:

(a) a plurality of coreless induction furnaces each having an induction coil having a plurality of coil turns, the induction coils of the furnaces being arranged to inductively heat metal in the furnaces and being connected in electrical series,

(b) a single power supply for supplying AC power to the series-connected induction coils,

(c) connector means on each induction coil at spaced intervals therealong for enabling electrical connections to be made to the induction coils at said intervals, each interval comprising a preselected number of coil turns, and

(d) switch means associated with each induction coil and connected to selected ones of the tap means for selectably



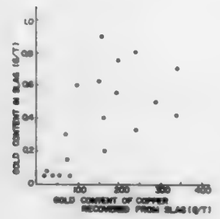
switching a preselected number of coil turns into and out of circuit with the power supply for selectively melting or holding molten metal in the induction furnace associated with a selected coil.

4,695,317

METHOD OF TREATING SILICATE ORE CONTAINING GOLD AND SILVER

Takayoshi Kimura; Seiichi Tsuyeguchi, and Yoshiaki Mori, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo

Filed Jan. 29, 1986, Ser. No. 823,629
Claims priority, application Japan, Jan. 31, 1985, 60-17516; Jan. 31, 1985, 60-17517
Int. Cl.[4] C22B *11/00*
U.S. Cl. 75—24 9 Claims



1. A method of treating a silicate ore containing gold and silver which comprises the steps of

(1) providing a molten slag from a copper converter, said molten slag containing copper and iron,

(2) providing a reducing agent,

(3) adding said silicate ore containing gold and silver to said molten slag and said reducing agent so as to produce a treated slag and a precipitate of copper with absorbed gold and silver, and

(4) recovering the precipitate of copper with absorbed gold and silver.

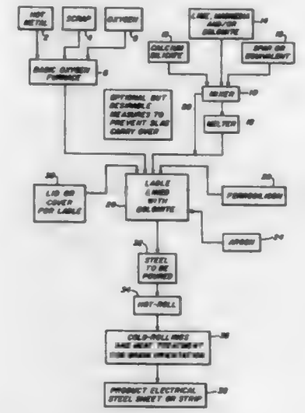
4,695,318

METHOD OF MAKING STEEL

William F. Knauss, Jr.; Uday B. Pal, both of Pittsburgh, and Balaji V. Patil, Sarver, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1986, Ser. No. 917,864
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—51.1 19 Claims

1. A composition of matter for use as a synthetic slag, said composition of matter having been made by mixing a commercially pure calcium silicate material with an approximately equal quantity of alkaline-earth flux material selected from the



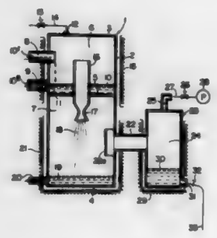
group consisting of lime, magnesia, and mixtures thereof, plus an effective amount of fluidity-promoting additive.

4,695,319

METAL DISTILLATION METHOD UTILIZING DOUBLE VAPORIZATION

Hirohisa Miura; Hiroshi Satoh; Toshio Natsume, and Hidenori Kategiri, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 26, 1985, Ser. No. 759,309
Claims priority, application Japan, Nov. 30, 1984, 59-253417
Int. Cl.[4] C22B *26/22*
U.S. Cl. 75—63 8 Claims



1. A method for separating a certain metal from a mixture of said certain metal with other elements which have lower vapor pressure values than said certain metal, comprising the steps of:

(a) heating said mixture in order to partially vaporize said certain metal and said other elements with the result that the composition of the gas mixture generated by said heating is shifted to a mixture substantially enriched in said certain metal as a result of the differences in vapor pressure values of the elements which have been vaporized;

(b) adiabatically expanding said gas mixture resulting in said gas mixture being substantially liquified;

(c) allowing the liquified gas to vaporize principally by the heat of the liquified gas, the result of which is that the composition of the gas thus generated is further enriched in the amount of said certain metal because of the differences in vapor pressure value of the components of said liquified gas and also because the composition of the liqui-

fied gas is changed from that of the mixture which is originally heated; and

(d) collecting the gas generated by the vaporization process of step (c) thereby permitting recovery of said certain metal.

4,695,320

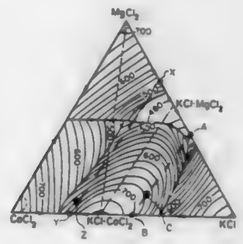
MAGNESIUM REFINING PROCESS

Roy A. Christini, Apollo, Pa., and Kenneth P. Frizzell, Chewelah, Wash., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 11, 1985, Ser. No. 786,903

Int. Cl.⁴ C22B *26/22*

U.S. Cl. 75—67 A **9 Claims**



1. A process for refining magnesium crude provided by thermally reducing a magnesium source ore, the crude containing between about 0.7 and 1.5 wt. % calcium, said process comprising:

(a) providing a molten body of said magnesium crude;

(b) mixing a flux containing from 55 to 85 wt. % magnesium chloride and 45 to 15 wt. % of at least one alkali chloride into the body, wherein during said mixing a substantial portion of the calcium reacts to remove substantially all of the calcium in the crude, said mixing producing refined magnesium and a sludge containing calcium chloride resulting from the reaction of said calcium with said magnesium chloride; and

(c) separating the refined magnesium from the sludge.

4,695,321

DYNAMIC COMPACTION OF COMPOSITE MATERIALS CONTAINING DIAMOND

Tamotsu Akashi, Socorro, N. Mex., and Akira Sawaoka, Yokohama, Japan, assignors to New Mexico Tech Research Foundation, Socorro, N. Mex.

Continuation-in-part of Ser. No. 747,558, Jun. 21, 1965, Pat. No. 4,655,830. This application May 1, 1986, Ser. No. 858,449

Int. Cl.⁴ C22C *29/00*

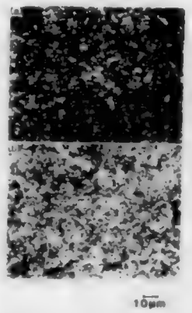
U.S. Cl. 75—243 **14 Claims**

1. A process for forming compacts of powders of ceramics, metals and cermets containing diamond powder and exothermically reactive additive powders comprising:

(a) mix high pressure phase diamond powder with non-stoichiometric exothermically reactive additive powders;

(b) compress the resulting mixture of powders into a compact; and

(c) apply a shock wave to said compact which is sufficient to compress the compact, to reduce at least a portion of the high pressure phase diamond powder into a low pressure phase at a residual temperature, and to cause exothermic



sintering of the powders, interparticle bonding, and a chemical reaction between the particles.

4,695,322

DUST-FREE ALGINATE IMPRESSION MATERIALS

Peter Schwabe, and Reiner Voigt, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 913,824

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535132

Int. Cl.⁴ A61K *6/10*; **A61C** *9/00*

U.S. Cl. 106—35 **8 Claims**

1. In an impression material comprising an alginate, a pulverulent material and a dust-reducing coating, the improvement wherein such coating comprises an iso-paraffin.

4,695,323

HIGH STRENGTH COKE-OVEN MORTAR

Roger L. Rueckl, Washington Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 677,422, Dec. 3, 1984, Pat. No. 4,596,601. This application Apr. 14, 1986, Ser. No. 851,189

Int. Cl.⁴ C04B *12/02*

U.S. Cl. 106—85 **8 Claims**

1. A mortar which consists essentially of:

a solid particulate material constituent selected from the group consisting of crystobalite, tridymite, fused silica and mixtures thereof, said constituent providing 25 to 88 percent SiO_2 of the total solid particulate materials in said mortar on a dry basis, a solid particulate material constituent providing 6 to 65 percent Al_2O_3 in said mortar on a dry basis, a constituent providing 7 to 12 percent P_2O_5 of the solid particulate materials on a dry basis, at least seventy percent of said P_2O_5 being provided in colloidal form, said mortar including not more than 4 percent of other solid particulate material constituents, not more than 45 percent by weight of the solid particulate material constituents in said mortar having a size less than 74 microns, said liquid in the mortar being limited to an amount such that the weigth loss of the mortar on heating to a temperature of 104° C. 220° F. will not exceed 13.5 percent of the total weight of the mortar, the total weight loss of the mortar on heating to a temperature of 1100° C. (2012° F.) being not in excess of 15 percent, said mortar having at least 7 percent by weight P_2O_5 after heating at said temperature of 1100° C. (2012° F.).

4,695,324

METHOD FOR PROCESSING COAL PREPARATION PLANT WASHINGS FOR ELIMINATION OF SLUDGE PONDS

Benjamin Lieberman, 901 Valley Rd., Charleston, W. Va. 25302

Filed Jan. 9, 1984, Ser. No. 569,224

Int. Cl.⁴ C04B *14/02*

U.S. Cl. 106—96 **2 Claims**

1. A method for solidifying coal waste suspensions from coal beneficiation processes, said method comprising:

(i) mixing, in a heated mixer,

(a) a coal waste suspension having a solids content of at least 50%, and

(b) 5 to 20%, based on the weight of solids in the suspension (a), of portland cement;

(ii) removing the heated mixture from the mixer after a 2 to 5 minute retention time; and

(iii) cooling the removed mixture to produce a disposable solid.

4,695,325

METHOD AND APPARATUS FOR PRODUCING CLINKER

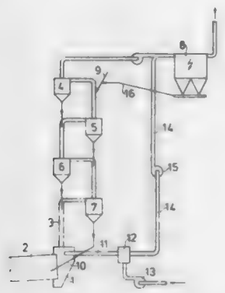
Torben Enkegaard, Copenhagen, Denmark, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark

Filed Apr. 9, 1986, Ser. No. 849,770

Claims priority, application United Kingdom, Jun. 3, 1985, 8513967

Int. Cl.⁴ C04B *7/60*

U.S. Cl. 106—100 **3 Claims**



1. A method of producing clinker from raw material with an average chloride content of 0.015–0.1 weight percent of all raw material used in a kiln plant having at least one suspension preheater, comprising the steps of:

passing kiln exit gas with a chloride content through said preheater to a primary precipitator or filter, causing a portion of said exit gas to bypass said suspension preheater;

quenching said exit gas portion; and

passing said portion of exit gas after said quenching directly to said primary precipitator or filter without first encountering a separate precipitator or filter such that condensed chloride particles formed in said exit gas portion during the quenching step pass unimpeded through the primary precipitator or filter.

4,695,326

LOW-CARIOGENIC SWEETNERS

Ichiro Takazoe; Kosei Ohta, both of Tokyo; Junichi Shimizu, Yokohama; Kazumasa Suzuki, Ayase; Tatsuya Iwakura, Yokohama, and Yoshikazu Nakajima, Yamato, all of Japan, assignors to Mitsui Sugar Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 771,769

Claims priority, application Japan, Oct. 23, 1980, 55-147553

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.⁴ C13F *3/00*; **C13K** *13/00*

U.S. Cl. 127—30 **3 Claims**

1. A low-cariogenic sweetner which consists of a mixture of sucrose and palatinose wherein the proportion of palatinose is from 20 to 400 parts by weight per 100 parts by weight of sucrose.

4,695,327

SURFACE TREATMENT TO REMOVE IMPURITIES IN MICRORECESSES

Thomas J. Grebinski, Sunnyvale, Calif., assignor to Purusar Corporation, Sunnyvale, Calif.

Filed Jun. 13, 1985, Ser. No. 745,241

Int. Cl.⁴ B08B *5/00, 30/00*

U.S. Cl. 134—11 **10 Claims**

1. A method of treating a surface of an object to remove impurities in microrecesses having minimum dimensions of 10 microns or less with a condensible solvent which has a vapor pressure, P^*, at a treating temperature, T, comprising:

(1) positioning the object, with the surface exposed, within a sealed treating chamber having therein a limited number of potential spaceborne nucleation centers at said temperature, T;

(2) introducing said solvent into said chamber until the pressure, P, of the solvent in the chamber is sufficient so that a plurality of molecular layers of the solvent is adsorbed in the microrecesses while maintaining a ratio of P/P^* in the chamber below unity and below that at which substantial spaceborne nucleation of the solvent occurs; and

(3) thereafter increasing the ratio, P/P^*, until the solvent condenses and wets the microrecesses.

4,695,328

METHOD OF MAKING A BIPOLAR TRANSISTOR

Masatoshi Moriyama, and Masaki Ohira, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 762,867

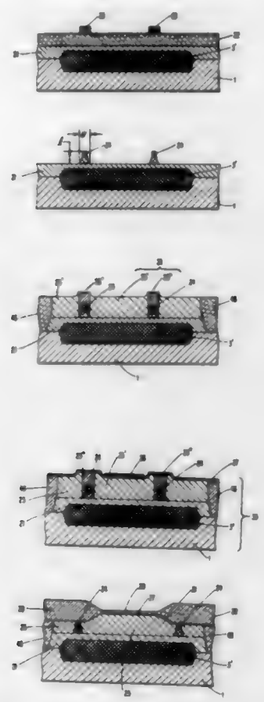
Claims priority, application Japan, Aug. 7, 1984, 59-165268

Int. Cl.⁴ H01L *21/04*

U.S. Cl. 437—31 **3 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of forming an insulating film on an upper surface of a semiconductor body, forming selectively a mask pattern on said insulating film, etching selectively said insulating film by using said mask pattern to form a protruded insulating wall on said semiconductor body, depositing a semiconductor layer on said semiconductor body and on said protruded insulating wall, forming selectively an anti-oxidized film on said semiconductor layer within said protruded insulating wall, using said anti-oxidized film as a mask during thermal oxidation to form an insulating layer, the lower surface of said insulating layer contiguous with the upper surface of said

protruded insulating wall, removing said anti-oxidized film, and introducing an impurity into said semiconductor layer



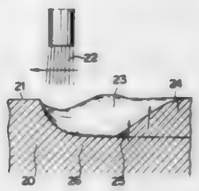
within said protruded insulating wall to form an impurity region therein.

4,695,329

METHOD FOR MANUFACTURING A CYLINDER HEAD OF CAST ALUMINUM ALLOY FOR INTERNAL COMBUSTION ENGINES BY EMPLOYING LOCAL HEAT TREATMENT

Souichi Hayashi, Nagoya; Johji Miyake, Okazaki; Mototsugu Koyama, and Kanji Sakaguchi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 20, 1986, Ser. No. 831,708
Claims priority, application Japan, Feb. 21, 1985, 60-31627
Int. Cl.[4] C21D *1/09*; B22D *25/00*; C22F *1/00*
U.S. Cl. 148—3 **7 Claims**



1. A method for manufacturing a cylinder head of cast aluminum alloy for internal combustion engines, comprising the steps of

casting a cylinder head body from an aluminum alloy,

directing a high density irradiating of at least one region of said cylinder head body where a high strength is required, thereby rapidly remelting a surface layer in said region, and

subsequently removing the irradiating energy and allowing the molten aluminum alloy of the surface layer to be rapidly cooled and solidified through heat transfer therefrom to the underlying matrix, thereby forming a remelted, solidified layer.

4,695,330

METHOD OF MANUFACTURING INTERNAL OXIDIZED AG-SNO SYSTEM ALLOY CONTACT MATERIALS

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki Kogyo K.K., Japan

Division of Ser. No. 771,341, Aug. 30, 1985, Pat. No. 4,647,322. This application Sep. 30, 1986, Ser. No. 913,196
Int. Cl.[4] C23C *8/10*
U.S. Cl. 148—6.3 **5 Claims**

1. A method of making internal oxidized Ag-SnO system alloy electrical contact materials which comprises preparing an Ag alloy layer having a thickness at least twice as thick as a desired thickness, wherein said alloy comprises 0.5–12 weight % of Sn, and a metal selected from the group consisting of In in a 0.5–15 weight percent and Bi in a 0.01 to less than 1.5 weight percent,

sandwiching said alloy layer between pure thin silver layers,

completely internally oxidizing said alloy layer to form a depleted layer which lies centrally and transversely to the axis or to the height of said alloy layer, and

cutting said alloy layer along said depleted layer thereby removing said depleted layer.

4,695,331

HETERO-AUGMENTATION OF SEMICONDUCTOR MATERIALS

K. R. Ramaprasad, Princeton, N.J., assignor to Chronar Corporation, Princeton, N.J.

Filed May 6, 1985, Ser. No. 731,072
Int. Cl.[4] H01L *21/365*
U.S. Cl. 437—126 **14 Claims**



1. The method of forming a doped semiconductor which comprises the steps of:

(a) feeding a gaseous host semiconductor precursor to a reaction chamber;

(b) introducing a gaseous compound of the host and a hetero-atom into the reaction chamber, said hetero-atom being a dopant for said semiconductor; and

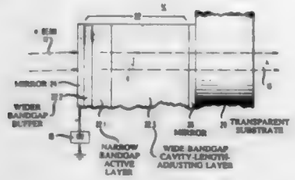
(c) reacting the mixture of the precursor and the compound in said chamber.

4,695,332

METHOD OF MAKING A SEMICONDUCTOR LASER CRT

Eugene I. Gordon, Convent Station, and Uri Levy, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 453,577, Dec. 27, 1982, Pat. No. 4,539,687. This application May 28, 1985, Ser. No. 737,787
Int. Cl.[4] H01L *21/20, 21/36*
U.S. Cl. 437—126 **3 Claims**



1. A method of fabricating a target for an electron-beam-pumped semiconductor laser, comprising the steps of:

providing a single crystal semiconductor body,

epitaxially growing on the body a plurality of layers including: a thin, buffer layer of a relatively wide bandgap semiconductor on the body; a thicker, narrower bandgap active layer on the buffer layer; and a much thicker, wider bandgap cavity-length-adjusting layer on the active layer,

forming on the cavity-length-adjusting layer a first mirror which is partially transmissive at the optical wavelength of the laser,

affixing a transparent substrate to the first mirror,

removing the single crystal substrate to expose the buffer layer, and

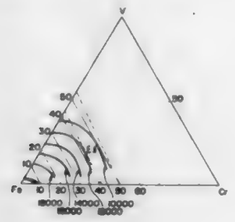
forming on the buffer layer a second mirror, including a metal layer, which is highly reflecting at the optical wavelength.

4,695,333

IRON-CHROMIUM-BASE SPINODAL DECOMPOSITION-TYPE MAGNETIC (HARD OR SEMI-HARD) ALLOY

Kiyoshi Inoue, and Hideo Kaneko, both of Tokyo, Japan, assignors to Inoue-Japax Research Incorporated, Kanagawaken, Japan

Continuation of Ser. No. 304,931, Sep. 23, 1981, abandoned. This application Dec. 22, 1986, Ser. No. 946,106
Claims priority, application Japan, Sep. 29, 1980, 55-136009
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—306 **9 Claims**



1. A hard or semihard magnet consisting of a spinodally decomposed iron-chromium base ternary alloy composition consisting of 3 to 40% by weight vanadium, 5 to 45% by weight chromium and the balance iron wherein said alloy composition contains iron in an amount of not less than 40% by weight.

4,695,334

METHOD OF MAKING WATER IMPERVIOUS MATERIALS

Alfred T. Mays, East Windsor, N.J., assignor to Chicopee, New Brunswick, N.J.

Division of Ser. No. 689,123, Jan. 7, 1985, Pat. No. 4,595,629, which is a division of Ser. No. 588,037, Mar. 9, 1984, Pat. No. 4,522,203. This application Mar. 3, 1986, Ser. No. 835,132
Int. Cl.[4] B32B *27/00*; D04H *1/04*
U.S. Cl. 156—62.2 **4 Claims**



1. A process for preparing a water impervious laminated material comprising at least one layer of conjugate fibers, said layer of conjugate fibers having a first face and an opposite face, said conjugate fibers being composed of a lower melting component and a higher melting component, wherein a substantial proportion of the surfaces of said conjugate fibers comprises said lower melting component, said lower melting component of said conjugate fibers which lie on said first face being fuse bonded to a first layer of plastic laminated film which comprises said first layer and an additional layer, said first layer of said film being thermoplastic and possessing a lower melt temperature than said additional layer of said film, said lower melting component of said fibers having been fuse bonded at a temperature below the melt temperature of said higher melting component of said fibers so that the latter component retains its initial fiber-like integrity;

said process comprising forming an assembly of said laminated film and at least one layer of said conjugate fibers placed adjacent to said first layer of said plastic film;

subjecting said assembly to a temperature sufficient to fuse said lower melting component of said conjugate fibers which lie on said first face as well as the first layer of the film in contact with said fibers without fusing the higher melting component of said conjugate fibers nor the additional layer of film, while maintaining said assembly under minimal pressure;

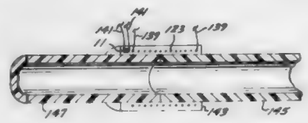
and cooling said assembly to resolidify said lower melting component of the fibers as well as said first layer of said film, whereby said fibers are firmly bonded to said film without impairing the integrity of said higher melting component of said fibers.

4,695,335

METHOD FOR DEVELOPING A PREDETERMINED FUSING TEMPERATURE IN THERMOPLASTIC ITEMS

Lucian H. Lyall, Woodland Hills, Calif., assignor to R. W. Lyall & Company, Inc., Santa Fe Springs, Calif.

Filed Nov. 8, 1985, Ser. No. 796,565
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—64 **9 Claims**



1. A method of developing a predetermined fusion welding temperature at an interface between a thermoplastic collar and abutting thermoplastic pipe sections over which such collar is telescoped, comprising:

increasing the temperature of the interface at a relatively slow preheating rate;

sensing the attainment of a predetermined preheat temperature at the interface;
increasing the temperature of the interface at a relatively fast fusion rate only upon attainment of said predetermined preheat temperature;
sensing the attainment of said predetermned fusion welding temperature at the interface; and
allowing the interface to cool when said predetermined fusion welding temperature has been attained.

4,695,336

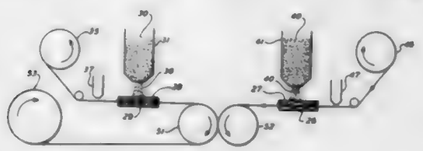
PHOSPHORESCENT MATERIAL AND PROCESS OF MANUFACTURE

Joseph W. Coburn, Jr., P.O. Box 1585, Lakewood, N.J. 08701

Division of Ser. No. 786,759, Oct. 11, 1985, Pat. No. 4,663,214, and a continuation-in-part of Ser. No. 687,502, Jan. 4, 1985, abandoned, which is a continuation of Ser. No. 581,340, Feb. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 512,034, Jul. 8, 1983, abandoned. This application Sep. 18, 1986, Ser. No. 909,035

Int. Cl.[4] B32B *31/12*; B44F *1/14*

U.S. Cl. 156—67 **4 Claims**



1. Process of making phosphorescent material decorative in visible light, comprising the steps of:
providing a first layer of substantially clear dry adhesive to a support layer of substantially opaque material;
providing a second layer of substantially clear dry adhesive to a layer of substantially clear plastic film;
applying a layer of dry phosphorescent particles to said first layer of substantially clear dry adhesive;
providing a layer of dry substantially transparent iridescent particles to said second layer of substantially clear dry adhesive; and
assembling said layers wherein said support layer of substantially opaque material and said layer of substantially clear plastic film each face outward and applying predetermined heat and pressure to said layers to bond said layers together wherein the combination of the iridescent particle layer and the phosphorescent particle layer provides an iridescent decorative effect in visible light and a substantial after-glow effect in darkness.

4,695,337

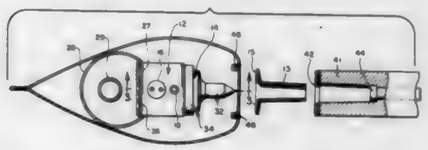
APPARATUS AND METHOD FOR ATTACHING A FITMENT TO A WEB OF FILM

William Christine, Catasauqua, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 1, 1985, Ser. No. 697,534

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—69 **32 Claims**



1. An apparatus for attaching a fitment having a flange and an aperture to a web of film in a form, fill, and seal flexible bag making machine comprising:
means for orienting the fitment on one side of the film including a movable press and ejector pin; and
means for contemporaneously piercing and sealing the film to the flange of the fitment and within the aperture of the fitment.

25. A method for attaching a fitment to a web of film utilizing a heat seal apparatus including a heated face and heated tip comprising the steps of:
heating the heat seal apparatus;
orienting the fitment on one side of the film;
moving the fitment and film towards the heat seal apparatus so that a portion of the film begins to melt;
continuing to move the fitment and film towards the heat seal apparatus so that the heated tip pierces the film and is received within an aperture in the fitment; and
continuing to move the fitment and film towards the heat seal apparatus so that the film is sealed to a flange of the fitment and within the aperture of the fitment.

4,695,338

INSULATING AND IMPERVIOUS ROOFING PANELS AND A PROCESS AND APPARATUS FOR THEIR MANUFACTURE

Stephane Cousin, Lamorlaye, and Jean-Paul Boumendil, Paris, both of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Oct. 31, 1983, Ser. No. 547,219

Claims priority, application France, Oct. 29, 1982, 82 18166

Int. Cl.[4] E04B *2/00*

U.S. Cl. 156—71 **9 Claims**



1. A process for the manufacture of a heat insulating and liquid impervious fibrous panel which may be covered with at least one hot applied bituminous coating, said process comprising the steps of:
forming a dense mat of felt consisting of mineral fibres bonded together by a first thermosetting binder finely dispersed therein,
stabilizing the mass per unit volume of said mat by a heat treatment to set said binder, and
applying to at least one main surface of said mat a pliant composite covering comprising together a fiberous reinforcing layer impregnated with a heat softened binder and a sheet of pliant separating agent, said composite covering being applied with the reinforcing layer in contact with said mat and in a quantity of said heat softened binder and at a temperature sufficient to ensure adherence of said reinforcing layer to said felt mat and said separating agent being selected so as to be capable of being bonded to said reinforcing layer by means of said second binder and capable of hot self-welding to the reinforcing layer.

4,695,339

METHOD FOR PREPARING TISSUE SECTIONS

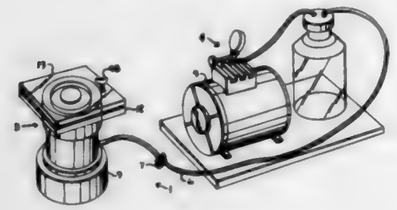
David C. Rada, 6347 Outlook, Mission, Kans. 66202

Filed Oct. 3, 1986, Ser. No. 914,814

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—80 **3 Claims**

1. A method for preparing a tissue specimen for sectioning in a microtome or the like; said method comprising:
(a) positioning said tissue specimen on a polished disc with an undersurface of said tissue specimen to be examined contacting a surface of said disc;
(b) placing said polished disc in a receptacle structure;
(c) covering said polished disc and said tissue specimen with a membrane;
(d) sealing said membrane relative to said receptacle structure and over said polished disc and said tissue specimen;
(e) drawing air from said receptacle structure in such a manner as to retract said membrane toward said receptacle structure, thereby tending to flatten an undersurface of said tissue specimen;
(f) manipulating said tissue specimen to a desired orientation on said polished disc;
(g) freezing said tissue specimen onto said polished disc;



(h) removing said membrane from a polished disc/tissue specimen complex formed by the freezing of said tissue specimen to said polished disc;
(i) applying an embedding medium to said polished disc/tissue specimen complex;
(j) mating said polished disc/tissue specimen complex with a corrugated disc having an embedding medium thereon; and
(k) disengaging said polished disc from said tissue specimen, which is retained by said embedding medium and said corrugated disc, whereby said tissue specimen undersurface presents a generally planar surface for sectioning.

4,695,340

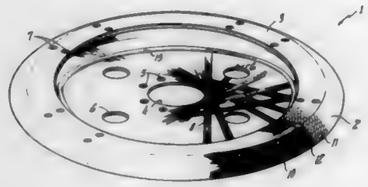
FILAMENT WOUND STRUCTURE HAVING FILAMENT WOUND REINFORCING RINGS FOR USE AS A TORQUE DRIVE

David G. Matuska, Stratford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 781,605, Sep. 30, 1985, Pat. No. 4,629,644. This application Jun. 2, 1986, Ser. No. 869,550

Int. Cl.[4] B65H *21/00*

U.S. Cl. 156—161 **17 Claims**



1. A method of forming a fiber reinforced resin composite structure, particlarly adapted for use as a torque drive diaphragm in a rotary wing aircraft hub, comprising winding fiber impregnated with resin on a mandrel with sufficient tension substantially tangentially to a central attachment-means in a multiple circuit pattern to form a diaphragm having a rim and a rim attachment means, winding reinforcing fiber impregnated with resin in an essentially circumferential manner with about 1000 to about 10,000 pounds per square inch tension to reinforce the rim of the structure, wherein the reinforcing fibers are interleaved with the tangential fibers, and winding reinforcing fibers impregnated with resin in a substantially circular manner to form at least one reinforcing ring, the ring located concentrically on the diaphragm or within the diaphragm, the structure is then cured by molding at sufficient heat and pressure thereby producing a structure such that the diaphragm remains essentially uniplanar when subjected to stresses induced by temperature changes, and the structure is resistant to buckling under torque loads.

4,695,341

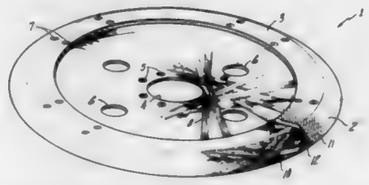
FILAMENT WOUND STRUCTURE FOR USE AS A TORQUE DRIVE

David G. Matuska, Stratford, and Evan A. Fredenburgh, Fairfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 734,982, May 16, 1985, Pat. No. 4,666,753. This application Jun. 2, 1986, Ser. No. 869,551

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—161 **16 Claims**



1. A method of forming a fiber reinforced resin composite structure, particularly adapted for use as a torque drive diaphragm in a rotary wing aircraft hub, comprising winding fiber impregnated with resin on a mandrel with sufficient tension substantially tangentially to a central hole in a multiple circuit pattern to form a diaphragm having a rim and an inward turning flange, and winding reinforcing fiber impregnated with resin in an essentially circumferential manner with about 1000 to about 10,000 pounds per square inch tension to reinforce the rim of the structure, wherein the reinforcing fibers are interleaved with the tangential fibers, the structure is then cured by molding at sufficient heat and pressure thereby producing a structure such that the diaphragm remains essentially uniplanar when subjected to stresses induced by temperature changes.

4,695,342

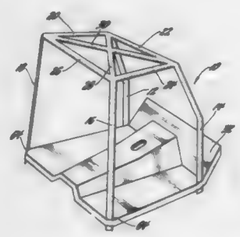
METHOD OF FORMING TRUCK CAB FRAMES

Gordon F. Belleau, Algonac; Michael J. Jelcin, Rochester, and Charles F. Verga, Holly, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1985, Ser. No. 717,313

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—173 **1 Claim**



1. The method of forming a pair of truck cab frames comprising the steps of:
providing a pair of mandrels in base-to-base relationship, each mandrel having four corner pillar channels for form-

ing four corner pillars, the corner pillar channels of one mandrel being aligned with the corner pillar channels of the other mandrel, each mandrel further having four roof rail channels for forming four roof rails, each mandrel also having two cross channels for forming two roof cross-members, the cross channels overlapping and having a flat surface in the overlapping region, the cross channels having a curvilinear surface in the remaining regions, the corner pillar channels and the roof rail channels also having a curvilinear surface, each corner pillar channel of each mandrel intersecting a cross channel and two roof rail channels of that mandrel, the intersections on one mandrel being designated LRA, RRA, RFA and LFA in a counterclockwise direction, the intersections on the other mandrel being designated RRB, LRB, LFB and RFB, RRB being aligned with LRA, LRB being aligned with RRA, LFB being aligned with RFA, and RFB being aligned with LFA,

winding filamentary material about said mandrels in the pattern RRB, LFB, RFB, LRB, LFB, RFA, LFA, RRA, LRA, RRB, RFB, LFA, LRA, RFA, RRA, LRB, RRB to form four corner pillars, four roof rails, and two roof cross-members of each frame,

and separating the corner pillars of one frame from the corner pillars of the other frame adjacent the bases of said mandrels.

4,695,343

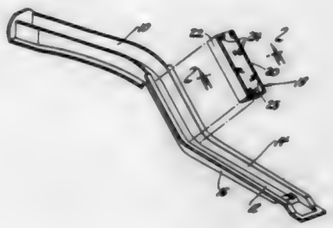
METHOD OF REINFORCING A STRUCTURAL MEMBER

Joseph S. Wycech, Grosse Pointe Farms, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 674,226, Nov. 23, 1984, Pat. No. 4,610,836, which is a continuation-in-part of Ser. No. 531,058, Sep. 12, 1983, abandoned. This application May 19, 1986, Ser. No. 864,311

Int. Cl.[4] B28B *7/30*; B29C *33/78*

U.S. Cl. 156—196 **7 Claims**



1. A method of reinforcing a selected portion of the walls of a structural member comprising the steps of:

coating macrospheres composed of bonded together hollow microspheres and having a diameter of 3 to 9 mm. with a curable adhesive in an amount effective to bond together adjacent macrospheres and yet leave voids between the macrospheres upon subsequent curing of the curable adhesive;

close-packing the adhesive coated macrospheres into the structural member at a selected portion thereof to be reinforced so that the macrospheres engage the structural member walls and engage one another; and

curing the adhesive to create adhesive bonding between the macrospheres and the structural member whereby the structural member is reinforced by the bonded together mass of macrospheres and airflow is permitted through the structural member via the voids between the closely packed adhesively bonded macrospheres.

4,695,344

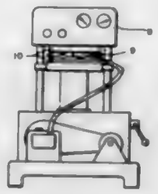
RESIN IMPREGNATION AND PROCESSING TECHNIQUE FOR RIGIDIZING NET-SHAPED FIBROUS SKELETAL COMPOSITE PREFORMS

Roger M. Crane, Baltimore, and Aleksander B. Macander, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1985, Ser. No. 717,767

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—242 **13 Claims**



1. A method for fabricating a composite material into shapes comprising:

supplying at least one impregnating resin sheet;

providing a layered apparatus by preparing a closed type mold having a depth in excess of a finished thickness of said composite material;

placing a sheet of peel ply on said closed type mold to aid in disassembly;

placing at least one of said impregnating resin sheets on said peel ply;

placing a fiber preform to be impregnated with said impregnating resin on said at least one of said impregnating resin sheets;

placing at least another impregnating resin sheet on said fiber preform;

placing the layered apparatus in a vacuum oven;

heating the layered apparatus and removing air from the layered apparatus wherein wicking action and gravitational flow result in said impregnating resin material saturating said fiber preform;

removing the layered apparatus from said vacuum oven;

placing another sheet of peel ply on the layered apparatus to aid in disassembly;

placing a spacer in said closed mold for controlling said finished thickness of said saturated fiber preform;

placing a pressure plate over said closed type mold;

vacuum bagging the assembly;

placing the vacuum bagged assembly in a means for processing the vacuum bagged assembly for a recommended time, temperature and pressure sufficient for curing or hardening said composite material shapes;

and processing the vacuum bagged assembly for a recommended time and temperature and pressure sufficient for curing or hardening said composite material shapes.

4,695,345

CONTINUOUS OR SEMI-CONTINUOUS PROCESS FOR FORMING RECONSOLIDATED WOOD PRODUCT

William G. Grace, Warragul, Australia, assignor to Repco Limited, Melbourne, Australia

PCT No. PCT/AU84/00242, § 371 Date Jul. 23, 1985, § 102(e) Date Jul. 23, 1985, PCT Pub. No. WO85/02368, PCT Pub. Date Jun. 6, 1985

PCT Filed Nov. 23, 1984, Ser. No. 765,308

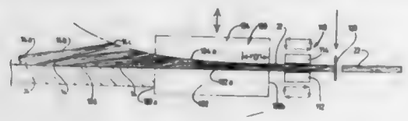
Claims priority, application Australia, Nov. 23, 1983, PG2517

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—264 **7 Claims**

1. A process for forming an extended elongate reconsolidated wood product from a plurality of flexible open lattice

work webs each of naturally interconnected wood strands, each said web being formed by partially rending natural wood so that said strands thereof are generally aligned along a common grain direction, a substantial proportion of said strands of each web being substantially discrete but incompletely separated from each other, said process comprising superposing said webs in such a fashion that the webs make an acute angle to the longitudinal direction of extent of the product and so that adjacent webs partly overlap each other in said direction and applying a bonding agent to the webs, compressing the superposed webs to consolidate the strands while maintaining them such as to substantially extend in said original grain direction and curing the bonding agent to hold the strands of said superposed webs together in juxtapositions assumed pursuant to said consolidation, said compressing step comprising passing the superposed webs longitudinally through a compression device from an inlet end to an outlet end, the compression device comprising two compression elements relatively movable towards each other from an open condition to effect said compression and consolidation, said passing step comprising relatively displacing the superposed webs through the compression device from the inlet end a distance less than one half the length of the compression device between the inlet and outlet ends when the compression elements are in their open condition and wherein the compression elements are moved towards each other to effect said compression and consolidation when the superposed webs are stationary in the longitudinal direction and said curing is effected when the superposed webs are compressed by the compression elements in portions of the superposed webs in the compression device adjacent the outlet end thereof, and said passing step, said compression and consolidation and said curing are repeated along the entire length of the superposed webs to produce said extended product.



4,695,346

APPARATUS FOR APPLYING TRANSVERSE WELD SEAMS TO AN INTERMITTENTLY MOVED PLASTIC FOIL WEB

Karl Dreckmann, Hennef-Altenbödingen; Jakob Schneider, Niederkassel-Mondorf, and Hans-Werner Theuner, Troisdorf-Müllekoven, all of Fed. Rep. of Germany, assignors to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Nov. 8, 1985, Ser. No. 796,644

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1984, 3441173; Jun. 14, 1985, 3521351

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—361 **2 Claims**

1. An apparatus for applying a transverse weld seam to a web in dependence upon a print register on said web, said apparatus comprising:

means defining a transport path for said web extending in a longitudinal direction thereof;

a welding unit extending across said path and actuatable to apply a transverse weld thereto;

conveying means engageable with said web for advancing said web along said path and including a pinion gear;

means operatively coupling said conveying means and said welding unit for synchronous operation thereof;

a drive disk rotatable about a first axis;

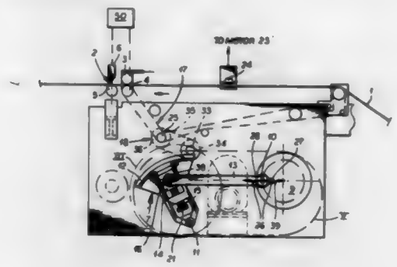
a coupling rod pivotally connected as a first pivot at one end with said drive disk eccentrically of said axis;

means for selectively positioning said first pivot on said disk at a selected distance from said first axis for coarse setting of the advance of said web in accordance with the print register thereon;

a rocker pivotally connected at a second pivot to an opposite end of said coupling rod;

a gear segment swingable about a second axis parallel to said first axis and spaced therefrom and meshing with said pinion gear, said rocker being shiftable along said gear segment generally radially of said second axis.

a threaded spindle coupled with said rocker for shifting same generally radially of said second axis upon rotation of said threaded spindle;



a toothed wheel on said threaded spindle;

a toothed belt engaging said toothed wheel;

a setting motor having another toothed wheel engaging said belt for displacing said spindle for fine adjustment of the advance of said web in accordance with said print register thereon; and

photocell upstream of said welding unit along said path for detecting the print register on said web and controlling said setting motor for fine adjustment of a location of a weld seam for each print register successively passing said photocell and said welding unit.

4,695,347

PROCESS FOR THE FORMATION OF SINGLE CRYSTALS FROM THE GAS PHASE

Klaus Fischer, Herzogstrasse, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Continuation of Ser. No. 576,026, Feb. 1, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 800,897

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1983, 3304060

Int. Cl.[4] C30B *23/06*

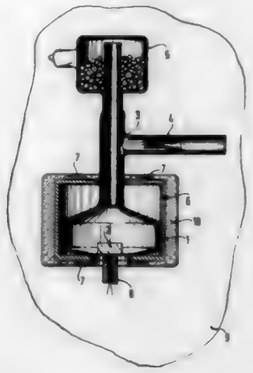
U.S. Cl. 156—610 **2 Claims**

1. In a process for the formation of single crystals from the gas phase wherein source gases are formed in a vessel from solid starting materials and the source gases are conducted to a walled growth chamber provided for the formation of a single crystal, said chamber being heated to a temperature to maintain said source gases in the gaseous phase and wherein the single crystal which is growing on a surface within said growth chamber is exposed to a static temperature gradient between the exposed crystal surface and the surroundings within the growth chamber, wherein the improvement comprises:

heating the walls of the growth chamber to a temperature required to maintain said source gases in a gaseous phase until the formation of nuclei of the single crystal is accomplished on a cooled growth surface in the growth chamber, and

subsequent to the formation of the nuclei, cooling the walls

of the growth chamber to provide a temperature gradient effective to cause the entire exposed surface of the crystal



to be warmer than its surroundings, said exposed surface being within the metastable range of supersaturation.

4,695,348

COPPER ETCHING PROCESS AND PRODUCT

James F. Battey, Los Altos; Norvell J. Nelson, Palo Alto, and Daniel J. Barnett, San Jose, all of Calif., assignors to PSI Star, Fremont, Calif.

Filed Sep. 15, 1986, Ser. No. 907,078

Int. Cl.⁴ C23F *1/02;* **B44C** *1/22*

U.S. Cl. 156—647 **33 Claims**

1. In a process utilizing a liquid etchant for manufacturing a circuit board, the steps of: selecting a copper foil having a top surface crystal structure which is etched anisotropically and with a vertical-to-lateral etching ratio of at least 10:1 by the liquid etchant, bonding the copper foil to a substrate, and exposing a portion of the copper foil to the liquid etchant to remove that portion of the foil from the substrate.

4,695,349

PROCESS AND APPARATUS FOR DISTILLATION AND/OR STRIPPING

Hans Becker, Munich, and Gerhard Linde, Grünwald, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

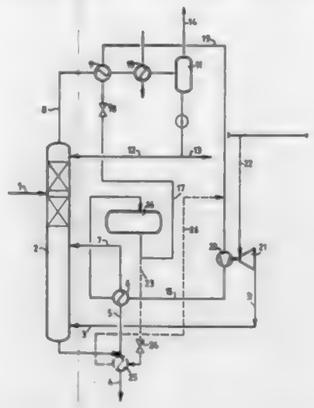
Filed Mar. 7, 1985, Ser. No. 709,247

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3436021

Int. Cl.⁴ B01D *3/14*

U.S. Cl. 203—26 **11 Claims**

1. In a process for the fractionation of liquid involving introducing a gas or vapor as stripping medium to the lower portion of a column and heating the sump of the column and cooling the head of the column, with heating and cooling being effected with a heat pump system coupling the heating and cooling operations to each other, the improvement comprising driving the heat pump system by expansion of a gas or vapor,



and after expansion of said gas or vapor, passing the expanded gas or vapor for use as said stripping medium in the column.

4,695,350

SEPARATION OF N-HEXYL ACETATE FROM N-HEXYL ALCOHOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Jan. 27, 1986, Ser. No. 822,604

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.⁴ B01D *3/40;* **C07C** *67/48*

U.S. Cl. 203—51 **2 Claims**

1. A method for recovering n-hexyl acetate from a mixture of n-hexyl acetate, n-hexyl alcohol and water which comprises distilling a mixture of n-hexyl acetate, n-hexyl alcohol and water in a rectification column in the presence of about one part of extractive agent per part of n-hexyl acetate-n-hexyl alcohol-water mixture, recovering n-hexyl acetate and water as overhead product and obtaining the n-hexyl alcohol and the extractive agent from the stillpot, the extractive agent comprises dimethylsulfoxide.

4,695,351

METHOD FOR PRODUCING MAGNETIC HEADS

Michael L. Mallary, Berlin, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 10, 1986, Ser. No. 884,013

Int. Cl.⁴ C25D *5/02*

U.S. Cl. 204—15 **6 Claims**

1. A process for fabricating a yoke member with a magnetic flux conducting path for a high frequency switching magnetic read head comprising the steps of:

(a) forming a mask means on a suitable electricity conducting base;

(b) electroplating a layer of magnetic flux permeable material through said mask means onto said electricity conducting base; and

(c) subjecting said layer of magnetic flux permeable material, during said electroplating step, to a biasing magnetic flux field having a value which is not less than $H_{demag}/4$ where H_{demag} is determined by the following equation:

$$H_{demag} = Ms(90° + \mathrm{TAN}^{-1}(T/W))/360°$$

where:

H_{demag} = The demagnetizing field at the corner in Oersteds when the structure is completely saturated in the width direction,

Ms = Average saturation flux density in gauss (10,000 gauss for permalloy with no gaps),

T = Maximun structure thickness obtained during plating (in microns),

W = The pole structure width (in microns),

TAN^{-1} = Inverse tangent function in degrees,

(d) forming said electricity conducting base with said electroplated layer of magnetic flux permeable material thereon into a yoke member to be used as part of said high frequency switching magnetic read head.

4,695,352

ELECTROCHEMICAL REDUCTION OF PYRIDINE CARBOXAMIDE BASES

Joseph E. Toomey, Jr., Indianapolis, Ind., assignor to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

Filed Dec. 31, 1984, Ser. No. 688,061

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.⁴ C25B *3/00*

U.S. Cl. 204—74 **15 Claims**

1. In an electrochemical reduction of a pyridine carboxamide base, the improvement comprising the step of conducting the electro-reduction reaction at a high hydrogen-overvoltage cathode in a flow cell having an ion-exchange membrane divider, said conducting further being in an aqueous or partly aqueous medium comprising a Lowry-Bronsted acid in at least a 1:1 equivalent ratio with the base.

4,695,353

PROCESS FOR THE PRODUCTION OF SILVER (III) OXIDE

Martin Jansen, Hanover, and Burkhard Standke, Adenstedt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,527

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442719

Int. Cl.⁴ C25B *1/00;* **C01G** *5/00*

U.S. Cl. 204—96 **21 Claims**

1. A process for the production of silver (III) oxide which is free from Ag_2O comprising anodically oxidizing an aqueous solution of a silver (III) salt with a complex ion other than the nitrate or sulfate at a current density of 40 to 2000 A/m at a temperature of −15° to +10° C., and recovering the silver (III) oxide free from Ag_2O.

4,695,354

MEDIUM FOR ELECTROPHORESIS

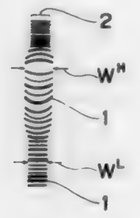
Mitsuru Sugihara, and Naohiko Sugimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 17, 1986, Ser. No. 908,376

Claims priority, application Japan, Sep. 18, 1985, 60-206090

Int. Cl.⁴ G01N *27/26;* **C08K** *5/21;* **B01K** *5/00*

U.S. Cl. 204—180.1 **3 Claims**



1. In a medium for electrophoresis comprising an aqueous polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound and a crosslinking agent in the presence of water and at least one compound having a carbamoyl group, the improvement wherein glycerol is contained in the medium in an amount ranging from 0.3 to 0.8 wt/v %.

4,695,355

ELECTRODE FOR MEMBRANE ELECTROLYSIS

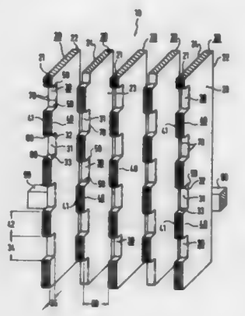
Konrad Koziol, Röthenbach a.d.Pegnitz, Fed. Rep. of Germany, assignor to Conradty GmbH & Co. Metallelektroden KG, Rothenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed May 13, 1986, Ser. No. 862,818

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519573

Int. Cl.⁴ C25B *11/02*

U.S. Cl. 204—252 **33 Claims**



28. A membrane electrolysis cell comprising: a membrane; a first electrode on one side of said membrane; and a second electrode on the other side of said membrane, said first electrode comprising an electrode body having a surface provided at least partially with an electro-catalytically active coating and being formed from a plurality of parallel, mutually spaced lamellas, each lamella having an edge surface for supporting said membrane, on which edge surface is provided a plurality of recesses separated by respective bridge portions not coated for electro-catalytic activity.

4,695,356

ELECTROCHEMICAL PROCEDURE FOR THE DIRECT FORMING OF GENERALLY THIN ELEMENTS WITH VARIOUS CONTOURS AND SURFACES OF USUAL AND TECHNICAL CERAMICS OR REFRACTORY MATERIAL

Henri Vander Poorten, Mons, Belgium, assignor to Andromaque S.A., Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 573,950, Jan. 26, 1984, abandoned. This application Mar. 19, 1986, Ser. No. 841,446

Int. Cl.⁴ B01D *57/02*

U.S. Cl. 204—180.9 **26 Claims**

1. A process for producing ceramic tiles which comprises:

providing a plurality of metallic plates, each of an area greater than that of tiles to be produced,

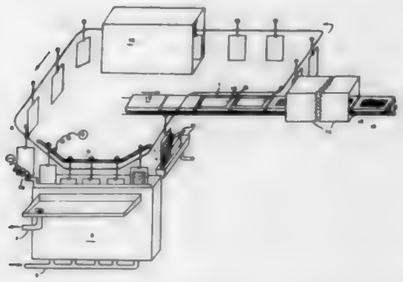
applying to a surface of each of said plates electrical insulating material defining the boundaries of at least one active area of said surface for producing at least one tile,

providing on said surface electrically conductive separating means for temporary adhesion of electrodeposited ceramic material on said active area and subsequent removal of said electrodeposited material from said plate,

transporting said plates sequentially through a bath of finely divided ceramic material suspended in an aqueous electrolyte,

applying an electrical potential of selected value between said plates while in said bath and a counter electrode to produce electrodeposition of ceramic material from said

bath onto said active area of said surface of each of said plates within the boundaries defined by said insulating material, the value and time of application of said potential being selected to build up on said active area of said surface of said plate a deposit of ceramic material having a thickness of from 1 mm to 20 mm,



removing said plates sequentially from said bath with said deposits on said plates and partially drying said deposits to constitute green tiles,

stripping said green tiles intact from said plates onto heat resistant supports,

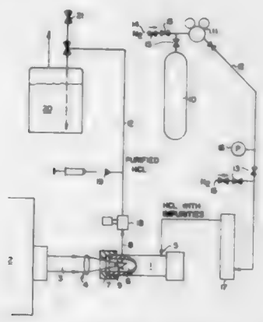
transporting said supports with said green tiles thereon into a furnace and there firing said tiles.

4,695,357

REMOVAL OF UNSATURATED HYDROCARBONS IN ANHYDROUS HYDROGEN HALIDE BY INFRARED LASER RADIATION

Anne S. Boussert, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 25, 1985, Ser. No. 801,258
Int. Cl.[4] B01J *1/10*
U.S. Cl. 204—157.41 **14 Claims**



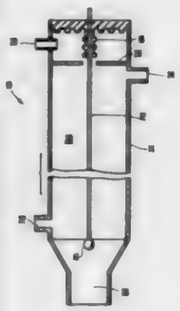
1. A process for converting ethylenically unsaturated hydrocarbons of from 2–3 carbon atoms and acetylene, in anhydrous hydrogen halide containing up to about 4,000 ppm by volume thereof, into one or more reaction products readily separable from the hydrogen halide, comprising subjecting the hydrogen halide containing the organic impurities to laser radiation having a wavelength corresponding to a wavelength at which the impurity absorbs radiation, in an amount effective to achieve dielectric breakdown.

4,695,358

METHOD OF REMOVING SO_2, NO_X AND PARTICLES FROM GAS MIXTURES USING STREAMER CORONA

Akira Mizuno, Toyohashi, Japan, and Judson S. Clements, Tallahassee, Fla., assignors to Florida State University, Tallahassee, Fla.

Filed Nov. 8, 1985, Ser. No. 796,268
Int. Cl.[4] C01B *17/60*
U.S. Cl. 204—174 **49 Claims**



1. A method for converting sulfur dioxide and/or nitrogen oxides in a mixture thereof with at least one other gas to separable forms comprising:

passing said mixture of gas through a streamer corona discharge zone defined by spaced electrodes;

periodically dissipating in said zone pulses of electrical power of sufficiently high voltage to establish therein a continuous pulsed streamer corona discharge whereby the sulfur dioxide and/or nitrogen oxides are converted to acid mist and/or particle aerosols;

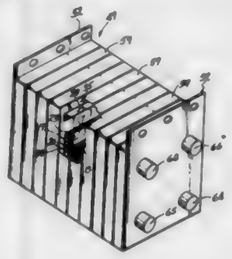
the improvement comprising establishing a streamer corona discharge by applying fast-rising narrow pulses in a zone defined by electrodes spaced in a wire-cylinder or wire-plate geometry.

4,695,359

FILTER PRESS MEMBRANE ELECTROLYTIC CELL WITH DIFFUSION BONDED ELECTRODE ELEMENTS AND ELASTOMERIC FRAMES

Kenneth E. Woodard, Jr., Cleveland, Tenn.; Robert A. Dean, Guilford, Conn.; David L. Fair, Cheshire, Conn., and Julius C. Fister, Jr., Hamden, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jan. 2, 1986, Ser. No. 815,697
Int. Cl.[4] C25B *9/00, 11/02, 11/10*; B23K *31/02*
U.S. Cl. 204—255 **22 Claims**



1. An electrolytic cell for electrolyzing electrolytes having raw materal infeed lines and product outlet lines connected to an electrical power source and having an ion selectively permeable membrane separating each adjacent pair of electrodes, comprising in combination:

(a) a plurality of electrode frames with internal surfaces in contact with the electrolytes, the raw material and the product, the electrode frames further having an unfilled central space;

(b) protective liner material lining the internal surfaces to prevent th electrolytes, raw material and product from directly contacting the elastomeric electrode frame;

(c) an electrode subunit fitted within the central space of each electrode frame containing at least one electrode surface, conducting elements and a backplate, the at least one electrode surface being formed of a corrosion resistant material metallurgically bonded by diffusion bonding to the conducting elements to form electrode surface-conducting element joints that do not abrade the adjacent membrane;

(d) a conducting plate mated to the backplate, the backplate further having a conductive coating applied thereto in line with the conducting elements to lower the electrical resistance between the conducting plate and the backplate prior to mating the conducting plate and the backplate, the conducting plate and the backplate further being mated by an adhesive applied to the backplate; and

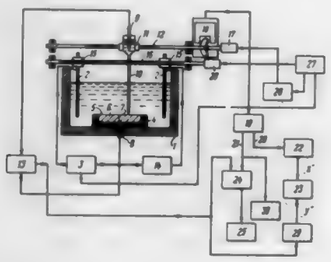
(e) a coating applied to the at least one electrode surface of each electrode subunit to promote the electrolyzing of the electrolytes.

4,695,360

DEVICE FOR ELECTROCHEMICAL-ETCHING DETERMINATION OF CORROSION RESISTANCE OF METALS

Georgy N. Asatiani; Evgeny A. Pikus; Elgudzha R. Kutelia; David M. Tsivtsivadze; Yason N. Mudzhiri, and Nikolai V. Dzhalabadze, all of Tbilisi, U.S.S.R., assignors to Gruzinsky Politekhnichesky Institute, Tbilisi, U.S.S.R.

Filed Dec. 6, 1985, Ser. No. 805,800
Claims priority, application U.S.S.R., Dec. 6, 1984, 3820850
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—404 **9 Claims**



1. A device for an electrochemical-etching determination of corrosion resistance of metals comprising:

an electrochemical cell including an electrolyte;

first and second polarization electrodes mounted spaced apart in said electrochemical cell, presenting opposing surfaces facing each other;

power supply means with its output electrically connected to said polarization electrodes;

a holder for a sample of a test metal to be tested in said cell, said holder being located between said polarization electrodes and being mounted in said electrochemical cell so that when the test sample is placed thereinto the working surface of said test sample interacting with the electrolyte lies in a position perpendicular to said opposing surfaces of the polarization electrodes;

electric contact means located in said holder for contact with a sample placed therein, and extending to the exterior of the electrochemical cell;

reference electrode means including a capillary probe mounted in said electrochemical cell with said capillary probe terminating adjacent the working surface of the test sample when placed in said holder;

movement means for said reference electrode means to move said capillary probe in a direction perpendicular to said opposing surfaces of the polarization electrodes and along the working surface of said test sample to interact therewith; and

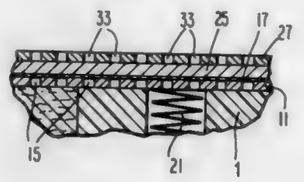
potential meter means interconnected, between said reference electrode means and said electric contact means to generate a signal indicative of the potential difference therebetween.

4,695,361

OXYGEN SENSOR

Mark P. Grady, Norristown, Pa., assignor to Seatronics, Inc., Hatboro, Pa.

Continuation-in-part of Ser. No. 794,553, Nov. 4, 1985, abandoned. This application May 19, 1986, Ser. No. 864,492
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—415 **19 Claims**



1. An oxygen sensor, comprising:

(a) means defining a housing,

(b) an anode disposed within the housing, the anode being connected to an anode terminal,

(c) a cathode disposed within the housing, the cathode comprising a perforated metallic disk, the cathode being kept apart from the anode by an insulating separator, the cathode being disposed within a gasket in a recess in the housing,

(d) an electrolyte disposed within the housing and contacting the cathode and anode,

(e) a gas-permeable liquid-impermeable membrane having a diameter substantially equal to that of the gasket, the membrane being disposed adjacent the cathode, on the side of the cathode opposite the anode,

(f) a sintered disk, having a diameter substantially equal to that of the membrane, the sintered disk being disposed adjacent the membrane,

(g) means for holding the membrane and the sintered disk against each other and against the cathode, and

(h) spring means, disposed within a cavity in the housing, the spring means being held in compression between the cathode and a cathode terminal, wherein the electrical connection between the cathode and the cathode terminal is completed by the spring means.

4,695,362

ACID OR ACID SALT WASH OF A METAL CHLORIDE LAYER OF AN ION SELECTIVE ELECTRODE

Thomas R. Kissel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,162, Dec. 24, 1985, abandoned. This application Sep. 25, 1986, Ser. No. 911,560

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—419 **6 Claims**

1. In a process for making an ion selective electrode selective for chloride, comprising the steps of

(a) forming a layer of silver on a support, and

(b) oxidizing a surface portion of the silver layer with a bath comprising a chlorochromate, to form silver chloride;

the improvement comprising a further step, after step (b), of washing said electrode in an organic acid, inorganic acid, or aqueous solution of a salt of said organic or inorganic acid, provided that

(a) said acid has a pKa <4.0 and a silver solubility product pK_{sp} <10.0, in a concentration and for a length of time effective to reduce negative biases created by purine interferences when using an electrode prepared without said further step; and

(b) said salt;

(i) is soluble in water at $\geqq 0.001M$,

(ii) yields an aqueous pH of $\leqq 7.0$, and

(iii) comprises ions that do not dissolve said silver chloride, the cations being univalent or divalent cations only.

4,695,363

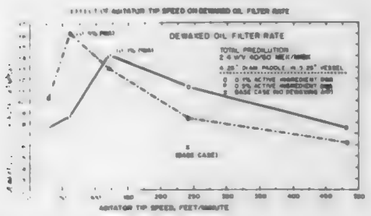
WAX CRYSTAL MODIFICATION USING DEWAXING AIDS UNDER AGITATED CONDITIONS

Theodore H. West, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 27, 1986, Ser. No. 867,141

Int. Cl.⁴ C10G *73/04*

U.S. Cl. 208—33 **5 Claims**



1. A method for dewaxing waxy hydrocarbon oils by chilling a mixture of waxy oil-dewaxing solvent and dewaxing aid in indirect chilling means to a wax filtration temperature wherein conditions of agitation are maintained in said indirect chilling means by means of paddles in the chilling means extending the length of the chilling means, which paddles do not touch the internal walls of said chilling means, resulting in a gap between the tip of said paddle and the internal wall of the chilling means, wherein said gap ranges from about 0.5 to about 20% of the internal diameter of said chilling means, the paddle being rotated so as to exhibit a tip velocity of about 25 to 400 feet/minute.

4,695,364

LUBE OR LIGHT DISTILLATE HYDRODEWAXING METHOD AND APPARATUS WITH LIGHT PRODUCT REMOVAL AND ENHANCED LUBE YIELDS

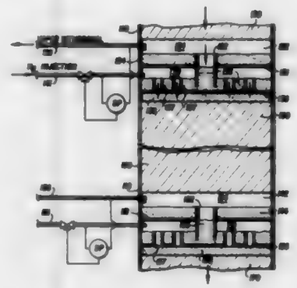
Kenneth R. Graziani, Woodbury; Chwan P. Kyan, Mantua; Stuart S. Shih, Cherry Hill, and Raymond M. Sowiak, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 685,564, Dec. 24, 1984, Pat. No. 4,648,957. This application Jan. 3, 1986, Ser. No. 816,092

The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.

Int. Cl.⁴ C10G *65/02, 65/12*

U.S. Cl. 208—59 **20 Claims**



1. A method for hydrodewaxing a hydrocarbon feedstock comprising the steps of:

(a) passing said hydrocarbon feedstock and hydrogen gas through a dewaxing reactor containing a series of adjacent dewaxing catalyst beds to produce a dewaxed feedstock and olefin-containing vapor, wherein each of said catalyst beds is separated by a collector tray and a distributor tray positioned below said collector tray;

(b) withdrawing said olefin-containing vapors above each said collector tray; and

(c) injecting non-olefinic hydrogen-rich gas between each said collector tray and each said distributor tray to produce an optimum feed to the succeeding dewaxing catalyst bed.

4,695,365

HYDROCARBON REFINING PROCESS

Donald B. Ackelson, Costa Mesa; Eric L. Moorehead, Diamond Bar; John W. Ward, Yorba Linda, and Jon D. Probst, Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 31, 1986, Ser. No. 891,735

Int. Cl.⁴ C10G *65/04*

U.S. Cl. 208—89 **116 Claims**

69. A process for reducing the pour point of a fuel oil with minimum degradation of the viscosity thereof, said process comprising:

(1) hydrotreating a sulfur, nitrogen, and hydrocarbon-containing feedstock having an initial boiling point between about 500° and 600° F. and an end point between about 850° and 950° F. in the presence of a particulate hydrotreating catalyst comprising hydrogenation components on a porous refractory oxide support under conditions of elevated temperature and pressure and the presence of hydrogen so as to decrease the sulfur and nitrogen content of said feedstock;

(2) hydrodewaxing at least a portion of the hydrotreated feedstock in the presence of a particulate hydrodewaxing catalyst under conditions of elevated temperature and pressure and the presence of hydrogen so as to produce a hydrocarbon fraction of lower pour point than said fuel oil, said hydrodewaxing catalyst comprising one or more hydrogenation components on a support comprising at least 70 weight percent of an intermediate pore molecular sieve having cracking activity, and said fraction having a viscosity within about 1.75 centistokes, as measured at 212° F., of the viscosity of the feedstock;

(3) hydrotreating the entire effluent from said hydrodewaxing in the presence of hydrogen and under conditions of elevated temperature and pressure and in the presence of a particulate hydrotreating catalyst comprising one or more hydrogenation components on a porous refractory oxide support;

(4) recovering said fraction from the product of said hydrotreating in step (3); and

(5) blending said fraction with a fuel oil of higher pour point so as to reduce the pour point thereof while not substantially changing the viscosity of the fuel oil.

4,695,366

DESULFURIZATION PROCESS

J. Wayne Miller, and John W. Ward, both of Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 680,348, Dec. 11, 1984, Pat. No. 4,582,819. This application Jan. 9, 1986, Ser. No. 817,352

Int. Cl.⁴ C10G *61/06*

U.S. Cl. 208—91 **16 Claims**

1. A process for removing sulfur from a hydrocarbon oil, said process comprising contacting said hydrocarbon oil under sulfur-removing conditions with a porous catalytic absorbent comprising copper oxide and a porous refractory oxide prepared by a method comprising admixing a synthetic basic copper carbonate having a sulfur content less than about 0.05 weight percent, calculated as S, with said porous refractory oxide or precursor thereof, forming an extrudable paste, shaping said extrudable paste, drying the shaped extrudable paste, and calcining the dried, shaped, extrudable paste to form said composition.

4,695,367

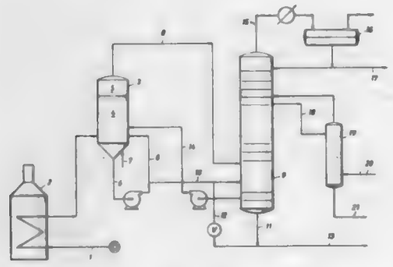
DIESEL FUEL PRODUCTION

Daniel D. Eizernack, Sugarland, and Robert B. Armstrong, Katy, both of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Mar. 24, 1986, Ser. No. 843,442

Int. Cl.⁴ C09C *1/48*

U.S. Cl. 208—106 **6 Claims**



1. A continuous process for production of diesel range fuel which comprises:

(a) heating virgin hydrocarbon oil having a Conradson carbon content below 2 weight percent and boiling predominantly above 345° C. to incipient cracking conditions and introducing the resulting heated oil to a back-mixed, soaking zone having a vapor zone and a liquid zone, a temperature between 385° C. and 440° C., and a vapor zone pressure between 1.38 and 3.84 kg/cm^2 abs.;

(b) cracking the heated oil in the liquid zone in the absence of added hydrogen to a diesel-rich, overhead vapor portion and a heavy oil liquid portion while maintaining the liquid portion in the soaking zone for an average residence time equivalent to between 1 and 4 hours based on fresh feed and maintaining the overhead vapor portion in the soaking zone for a residence time less than 1 minute;

(c) introducing all of the diesel-rich, overhead vapor portion directly to an intermediate point of a fractionation zone;

(d) recovering a diesel range fuel product from the fractionation zone; and

(e) recovering the heavy oil liquid portion from the soaking zone.

4,695,368

PROCESS FOR PRODUCING HIGH OCTANE GASOLINE

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 31, 1986, Ser. No. 892,756

Int. Cl.⁴ C10G *47/02*

U.S. Cl. 208—111 **43 Claims**

1. A hydrocracking process for producing a high octane gasoline from a hydrocarbon feedstock containing constituents boiling above about 550° F. which comprises contacting said feedstock in the presence of hydrogen and greater than about 200 ppmw ammonia, based on said feedstock, under hydrocracking conditions with a hydrocracking catalyst comprising at least one hydrogenation metal component in combination with a crystalline silicoaluminophosphate molecular sieve having pores defined by 12-membered rings of oxygen atoms.

4,695,369

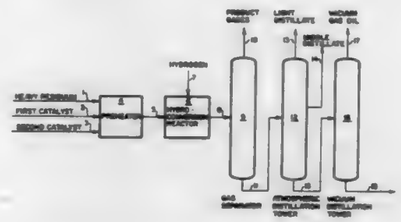
CATALYTIC HYDROCONVERSION OF HEAVY OIL USING TWO METAL CATALYST

Diwakar Garg, Macungie; Edwin N. Givens, Bethlehem, and Frank K. Schweighardt, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 11, 1986, Ser. No. 895,570

Int. Cl.⁴ C10G *45/04, 45/06, 47/02, 47/26*

U.S. Cl. 208—112 **11 Claims**



1. In a process for hydrotreating a heavy hydrocarbon oil feedstock having a boiling point greater than 950° F. and containing asphaltenes and metal contaminants to produce distillate products having a boiling pont less than 950° F., said distillate products having reduced asphaltenes and metal contaminants at low coke formation rates, the improvement comprising contacting said feedstock with a gaseous hydrogen atmosphere at about 700° to 860° F. and 400 to 4,000 psig hydrogen pressure with a nominal reactor residence time of 20 to 180 minutes in the presence of a two dispersed metal compound catalyst system consisting essentially of a first and second dispersed metal compound catalyst component, wherein the first of said dispersed metal compound catalyst component being an oil soluble hydrogenation catalyst having a metal concentration of about 10 to 1,000 ppm, with said metal selected from the group consisting essentially of molybdenum, tungsten, cobalt, nickel, and mixtures thereof, and the second of said dispersed metal compound catalyst being selected from

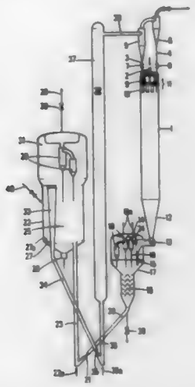
the group consisting of an oil soluble catalyst and a fine particulate catalyst of less than or equal to 350 U.S. mesh, and said second catalyst having a metal concentration of 0.05 to 1.2 wt.% (500 to 12,000 ppm), with said metal selected from the group consisting essentially of zinc, iron, copper, and mixtures thereof, said concentrations for either catalyst based upon the weight of said feedstock.

4,695,370

PROCESS AND APPARATUS FOR FLUID BED CATALYTIC CRACKING

Pierre Galtier, Vienne-Estressin, and Christian Busson, Dardilly, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 2, 1985, Ser. No. 762,073
Claims priority, application France, Aug. 2, 1984, 84 12388
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—113 **17 Claims**



1. A process for catalytically cracking a liquid hydrocarbon charge in a fluidized bed reaction zone having an upper and lower part wherein the charge and the catalyst flow co-currently in a downward direction, and for regenerating the catalyst in first and second regeneration zones, said process comprising:

injecting the liquid charge at the upper part of the reaction zone through at least one line which is subdivided into a plurality of substantially vertical first ducts with each of said first ducts being provided at its lower end with spray means for dispensing the liquid charge as droplets, introducing into an enclosure located within the upper part of the reaction zone catalyst particles having a temperature which is in a range from 600° to 950° C., the catalyst particles being introduced through at least one second duct into the enclosure so as to define a catalyst fluidized bed in said enclosure,

circulating a gas through said fluidized bed so as to downwardly drive the catalyst particles of the fluidized bed through a plurality of substantially vertical third ducts thereby introducing the catalyst particles into the reaction zone itself, each vertical first duct being coaxial with one of the third ducts, each means for spraying the liquid charge being juxtaposed with an upper end of said third duct, so as to obtain in said third duct a flow of liquid charge and entrained catalyst particles in order to completely vaporize the liquid charge and intimately admix the charge with the catalyst particles,

maintaining contact in said reaction zone between the liquid charge and the catalyst, with a residence time of the charge from 0.1 to 10 seconds and at a temperature in the range of 450°–700° C. to produce a reaction effluent stream,

increasing the velocity of the catalyst and the reaction effluent in the lower part of the reaction zone, said lower part being funnel shaped and converging

downwardly at a half apex angle ranging from about 5 to 30°,

separating 50 to 90% of the catalyst particles from the reaction effluent stream in a generated spiral within at least one first separation zone having an inlet and outlet and having a residence time lower than one second, the velocity of the gaseous portion of the reaction effluent at the inlet of said first separation zone being from 10 to 40 meters per second so as to produce a helical flow of vapor without reversal of the generated spiral, with the major part of the remaining catalyst particles being driven along with the gaseous effluent and then being separated from the reaction effluent within at least one second separation zone which includes the reversal of a spiral stream generated by the injection of the gaseous flow into said second separation zone,

removing the major part of the hydrocarbons from the catalyst particles by the introduction of a stripping gas,

conveying the catalyst particles upwardly through a fourth duct to a first fluidized bed regeneration zone by means of a first carrier gas,

performing a first catalyst regeneration step, within said first regeneration zone at a temperature T_1 ranging from about 500° to 750° C., with a fluidizing gas which comprises oxygen or a molecular oxygen-containing gas, so as to cause the combustion of at least 90% of the hydrogen and so as to oxidize 10–60% by weight of the carbon present on the catalyst,

removing the major part of the gases from the first regeneration zone,

withdrawing the partially regenerated catalyst from said first regeneration zone, feeding it upwardly through a first transfer line, by means of a second carrier gas comprising a molecular oxygen-containing gas to a lower part of a second regeneration zone, the second regeneration zone having the shape of a substantially vertical and elongate tube having a length L, and diameter ϕ, whose ratio L/O ranges from 3 to 90, the catalyst being further regenerated in the second regeneration zone by being treated with the second carrier gas at temperature T_2 from 650° to 1000° C., with T_2 being higher than T_1, in order to obtain a regenerated catalyst containing no more than 0.04% by weight of coke, the catalyst having this been driven upwardly through the second regeneration zone by means of said second carrier gas, and

withdrawing from the second regeneration zone a gas-catalyst mixture, separating the catalyst particles from the gases and feeding these regenerated particles, which have a temperature from 600° to 950° C., into said at least one second duct.

8. An apparatus for performing a catalytic cracking and catalyst regeneration process comprising:

a first substantially vertical elongate reactor having an upper and lower part, and a reservoir defined above a horizontal wall located within the upper part, at least one first inlet line for admission of a liquid charge into the upper part of said first reactor, each of said first lines being subdivided into a plurality of substantially vertical first ducts, each first duct being provided at its lower end with a first nozzle for spraying said charge,

at least two substantially vertical second inlet lines for introducing the catalyst particles into said reservoir,

at least one distributor of a gaseous fluid, located above said horizontal wall,

a plurality of catalyst particles discharge tubes connecting said reservoir to said first reactor, said discharge tubes being arranged so that each of the first ducts is coaxial with one of the discharge tubes and so that each first nozzle is located in the vicinity of the upper end of a discharge tube, with all of the first nozzles, first ducts and discharge tubes thus defining a contact and mixing zone for the liquid charge with the catalyst, with the lower part of the reactor including a bottom portion comprising at least one funnel which converges downwardly and has a half apex angle which is in the range from about 5° to 30°,

means defining at least one primary separation zone located beneath the funnel including at least one cyclone separator and at least one first outlet line for the removal of the catalyst particles from said primary separation zone,

means defining at least one secondary separation zone wherein the reaction effluent is separated from the remaining catalyst particles, including at least one second outlet line for the removal of catalyst particles from said secondary separation zone and at least one third outlet line for the removal of the reaction effluent,

means for stripping the catalyst particles by means of a gas introduced through at least one stripping gas inlet line, said means being fed with catalyst through said first and second outlet lines, and a first conduit for conveying catalyst particles discharged from said stripping means,

a first substantially vertical transfer line connected to said first conduit for lifting the catalyst particles supplied through said first conduit, by means of a lifting gas thus conveying the catalyst particles to the inside of a first regeneration vessel, the first regeneration vessel comprising means for supporting a catalyst bed, a regeneration gas feeding line, and means comprising at least one cyclone for separating the gases from the catalyst particles,

a second duct for discharging gases and a third duct for withdrawing the catalyst from the first regeneration vessel,

a second conduit communicating with said third duct for flowing the catalyst downwardly,

a second vertical ascending catalyst transfer line connected at a lower end to said second conduit and also to a lifting gas inlet,

a second substantially vertical tubular reactor for catalyst regeneration, having a length, L, and diameter, 0, whose ratio L/O ranges from 3 to 90, said second reactor including at least one second nozzle for injecting a regeneration gas, wherein said second reactor is connected to an upper end of said second transfer line,

a third conduit for discharging a gas-catalyst mixture from said second reactor and,

a first means for separating the catalyst from the gases, the first separation means comprising at least two cyclone separators, and a fourth conduit for conducting the catalyst from said first separation means into said second inlet lines.

4,695,371

NONAQUEOUS COAL CLEANING PROCESS

Arthur E. Starbuck, 1430 Kirston St., Reno, Nev. 89503

Filed Jul. 26, 1984, Ser. No. 634,751
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] B04C *5/14, 9/00*; F26B *3/00*
U.S. Cl. 209—211 **7 Claims**

1. A method of cyclone cleaning of fine particle coal containing carbonaceous material, ash and pyrites comprising the steps of:

a. demoisturizing the coal by immersing the coal in a non-aqueous drying liquid having a vaporization temperature higher than that of water, the drying liquid being maintained at a temperature exceeding the vaporization temperature of water, whereby water in the coal is vaporized from the coal and drying liquid;

b. transferring the coal to a non-aqueous, agglomerate inhibiting, carrier liquid miscible with the drying liquid, said carrier liquid is comprised of a liquid mixture of a first liquid having a first specific gravity and a second liquid having a second specific gravity different from said first specific gravity, the carrier liquid's specific gravity is adjusted by using a select amount of each of said first and second liquids to yield a carrier liquid specific gravity intermediate said first and second specific gravities, said carrier liquid specific gravity being greater than 1 less than 1.6 selected for effective separation of carbonaceous material from pyrites and ash for a particular coal and wherein the carrier liquid has the characteristic of extracting non-pyrite forms of sulfur from the coal; and,

c. cycloning the coal in the carrier liquid with a compound cyclone, wherein a first stream predominantly consisting of carbonaceous material and liquid is separated from a second stream predominantly consisting of ash, pyrites and liquid.

4,695,372

CONDITIONING OF CARBONACEOUS MATERIAL PRIOR TO PHYSICAL BENEFICIATION

Robert P. Warzinski, Venetia, and John A. Ruether, McMurray, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 15, 1986, Ser. No. 863,650
Int. Cl.[4] C10G *17/04*
U.S. Cl. 208—311 **9 Claims**

1. A method of reducing the ash content of a carbonaceous material comprising:

contacting said carbonaceous material with a supercritical fluid selected from the group consisting of methanol and cyclohexane to extract a solute into supercritical phase leaving a solid residuum;

separating the solid residuum into an ash reduced fraction and an ash-enriched fraction in a liquid of specific gravity selected to float the ash-reduced fraction and to permit the ash-enriched fraction to sink;

recovering the solute and ash-reduced fraction as product.

4,695,373

EXTRACTION OF HYDROCARBON-CONTAINING SOLIDS

Philman N. Ho, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 694,009, Jan. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 599,480, Apr. 12, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,832
Int. Cl.[4] C10G *1/00, 1/04*
U.S. Cl. 208—428 **21 Claims**

1. A process for recovering hydrocarbon liquids from oil shale solids which comprises:

(a) contacting said oil shale solids with a hot, nonoxidizing gas in the substantial absence of an added liquid organic solvent at a temperature between about 550° F. and about 900° F., wherein said solids are contacted with said hot gas at a pressure below the critical pressure of said gas and in the substantial absence of added ammonia and added amines;

(b) contacting the heated oil shale solids from step (a) with a liquid organic solvent in an extraction zone by passing said solvent downwardly through said solids in the substantial absence of an aqueous phase at a temperature between about ambient temperature and about 600° F. in the presence of an added amine under conditions such that hydrocarbons are extracted from said solids, said added amine being selected from the group consisting of (1) a primary alkylamine having the formula R_1NH_2 where R_1 is a straight or branched chain alkyl radical having from 1 to 10 carbon atoms, a substituted or unsubstituted cycloalkyl radical having from 5 to 12 carbon atoms, or a substituted or unsubstituted bicycloalkyl radical having from 9 to 18 carbon atoms, (2) a diamine having the formula $NH_2—R_2—NH_2$ where R_2 is a straight or branched chain alkyl radical having from 2 to 12 carbon atoms, (3) pyrrolidine and (4) N-methylaniline; and

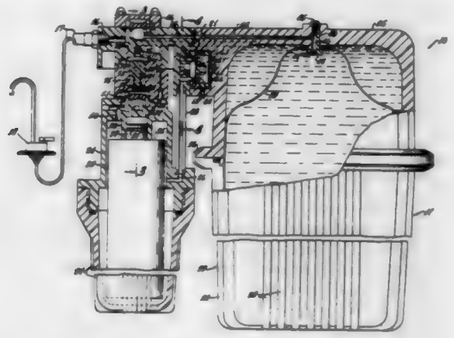
(c) recovering said extracted hydrocarbons from said organic solvent as said hydrocarbon liquids.

4,695,374
Patent Not Issued For This Number

4,695,375
SELF-CONTAINED HYDRAULICALLY OPERABLE WATER PURIFIER

Truman V. Tyler, 1440 Northwood Rd., Apt. 242A, Seal Beach, Calif. 90740

Filed May 27, 1986, Ser. No. 867,800
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—110 36 Claims

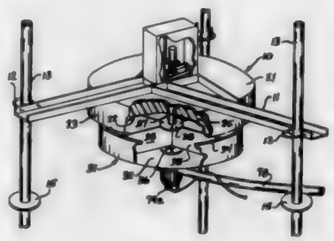


1. A water purifier comprising
a filter chamber,
a reverse-osmosis filter membrane in said filter chamber, said reverse-osmosis filter membrane having a cylindrical exterior surface, a tank,
movable means in said tank dividing said tank into two chambers of variable volume,
the first of said chambers being adapted to receive pure water,
the second of said chambers being adapted to receive unpurified water,
a water inlet adapted for connection to a source of tap water under pressure,
a first water passageway for conducting tap water from said inlet to said filter chamber so that a portion thereof can be purified by passing through said reverse-osmosis filter membrane, and another portion can remain unpurified,
a first water outlet adapted for connection to a pure water line having a valve therein for tansmission to a location of consumption,
a second water passageway for conducting pure water from said filter chamber to said first chamber of said tank, and from said first chamber of said tank to said first water outlet, a second water outlet,
a third water passageway for conducting unpurified water from said filter chamber to said second outlet,
and to said second chamber of said tank for forcing purified water out of said first chamber of said tank to said first water outlet,
control valve means for controlling the flow of tap water in said first water passageway, the flow of pure water in said second water passageway, and the flow of unpurified water in said third water passageway,
control passageway means connected to said second water passageway for transmitting the pressure in said second water passageway to said control valve means for effecting automatic operation thereof entirely in response to the pressure of said pure water,
said filter chamber including a first part fixed relative to said tank and defining one end portion of said filter chamber, and a second part rotatably coupled to said first part for permitting separation of said second part from said first part for removal and replacement of said reverse-osmosis filter membrane, one end of said reverse-osmosis filter membrane being received in said first part and the opposite end of said reverse-osmosis filter membrane being received in said second part, such that a portion of the circumference of said reverse-osmosis filter is exposed upon such separation of said second part from said first part, for facilitating removal and replacement of said reverse-osmosis filter membrane,
said reverse-osmosis filter membrane having an axially projecting outlet at said one end thereof for discharging pure water therefrom,
said first part of said filter chamber including a tubular section receiving said projecting outlet of said reverse-osmosis filter membrane, whereby pure water is discharged into said tubular section,
said second water passageway being connected to said tubular section for receiving pure water therefrom,
said third water passageway being connected to said first part of said filter chamber outside of said tubular section for receiving unpurified water,
said first water passageway being connected to said first part of said filter chamber at a location relative to said one end of said filter membrane which is axially inward of said connection of said third water passageway to said first part, and
an annular seal around said reverse-osmosis filter membrane and engaging the wall of said first part of said filter chamber,
said annular seal being between said connection of said third water passageway and said connection of said first water passageway to said first part of said filter chamber for separating the same.

4,695,376
FLOATING DECANTER

Gordon L. Astrom, Mount Morris, Ill.; Ronald J. Weis, South Beloit, Wis., and Wesley M. Shubert, Ames, Iowa, assignors to Aqua-Aerobic Systems, Inc., Rockford, Ill.

Filed Oct. 20, 1986, Ser. No. 920,760
Int. Cl.[4] B01D *17/00*
U.S. Cl. 210—122 13 Claims

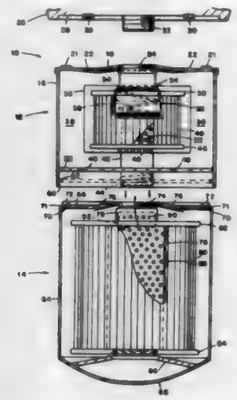


1. A floating decanter apparatus comprising, float means for buoyantly supporting the decanter apparatus in a body of liquid and having an underside, a decanter receptacle disposed below the float means and having an open top surrounded by a peripheral upper decanter rim and outlet means for decanted liquid communicating with said decanter receptacle at a level below said decanter rim, discharge means communicating with said outlet means for discharging decanted liquid from the decanter receptacle, means mounting the decanter receptacle on the float means for movement toward and away from the underside of the float means, seal means operative when the decanter receptacle is moved toward the float means to a preselected raised position for sealing the decanter rim to the underside of the float means sufficient to at least substantially prevent flow of liquid from the body of liquid into the decanter receptacle and power operated actuator means mounted on the float and operatively connecting to the decanter receptacle for selectively moving the decanter receptacle from a lower position in which the decanter rim spaced below the underside of the float means to said preselected raised position to seal the decanter rim to the underside of the float means.

4,695,377
FLUID FILTER HAVING SEPARABLE ELEMENTS

Frank W. Medley, III, 45 E. 10th St., Cookesville, Tenn. 38501

Filed Aug. 25, 1986, Ser. No. 899,924
Int. Cl.[4] B01D *27/08*
U.S. Cl. 210—132 11 Claims

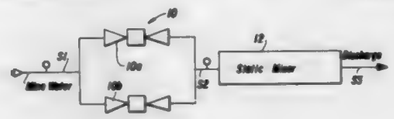


11. An oil filter for attachment to an engine oil filter base having a threaded engine nipple, an annular seal base, an engine outlet disposed between said threaded nipple and said annular seal base for transmitting oil under pressure to the filter, and an engine inlet disposed within said nipple for receiving oil from said filter, comprising:
a first can having an upper end plate;
a threaded aperture disposed in said upper end plate for receiving and sealing with said engine nipple;
seal ring means disposed on said upper end plate for sealingly engaging the annular seal base when said threaded nipple is threaded onto said engine nipple;
a first oil inlet formed in said upper end plate between said aperture and seal ring means;
said threaded aperture defining a first oil outlet;
a lower end plate formed on said first can;
a lower annular seal base formed on said lower end plate;
a lower threaded nipple extending from said lower end plate and being concentrically disposed with respect to said lower annular seal base;
a second oil outlet disposed in said lower end plate between said lower nipple and said lower annular seal base;
a second oil inlet disposed within and defined by said lower threaded nipple;
outer oil passage means for transmitting oil from said first oil inlet to said second oil outlet;
inner oil passageway means for transmitting oil from said second oil inlet to said first oil outlet;
first oil filter means disposed in one of said inner and outer oil passageway means for filtering oil as it passes therethrough;
a second can having a connection plate;
a second threaded aperture disposed in said connection plate for receiving and sealing with said lower nipple;
second annular seal ring means disposed on said connection plate for sealingly engaging said lower annular seal base when said lower nipple is threaded onto said second threaded aperture;
a third oil inlet formed in said second can;
said second threaded aperture defining a third oil outlet;
third oil passageway means for transmitting oil from said third oil inlet through said second can to said third oil outlet; and
second oil filter means disposed in said third oil passage means for filtering oil flowing therethrough.

4,695,378
ACID MINE WATER AERATION AND TREATMENT SYSTEM

Terry E. Ackman, Finleyville, and John M. Place, Bethel Park, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1984, Ser. No. 669,155
Int. Cl.[4] C02F *1/66, 1/72*
U.S. Cl. 210—198.1 5 Claims

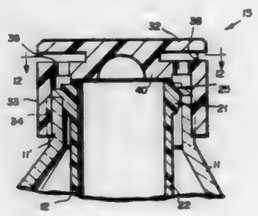


1. An in-line areation and treatment system for acid mine water having metallic components therein, said system having no moving parts and comprising:
at least one jet pump capable of entraining air having no moving parts and which utilizes Venturi action to operate, each of said at least one jet pumps having a first inlet for receiving acid mine water having metallic components, a second inlet opened to atmosphere for receiving air to be entrained with the mine water, and a diffuser outlet section for discharging aerated treated mine water in a high velocity stream;
and a static mixer fluidly connected to the outlet section of said at least one jet pump for receiving the aerated mine water, said mixer having an internal helical element therein to force the treated acid mine water from the at least one jet pump to flow through a helical path and out a discharge, thereby further assisting in the aeration thereof and the increasing of the oxidation rates for the metals present in the acid mine water.

4,695,379
WATER TREATMENT APPARATUS

John E. Nohren, Jr., St. Petersburg, and Richard T. Downes, Clearwater, both of Fla., assignors to Innova/Pure Water Inc., Clearwater, Fla.

Filed Jan. 24, 1986, Ser. No. 822,238
Int. Cl.[4] B01D *27/02*
U.S. Cl. 210—282 21 Claims



1. In combination with a bottle having a neck with an interior surface and an exterior surface:
an elongated tube having first and second ends, said first end

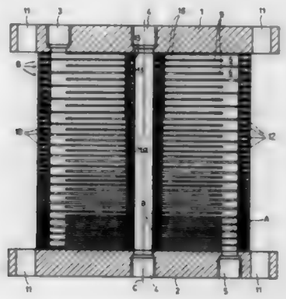
having means for operatively connecting said tube to said interior surface of said bottle neck;
water treatment means disposed within the interior of said tube for treating water passing through said tube; and
cap means for cooperating with the exterior surface of said neck and closing off said tube first end while allowing passage of liquid from within the bottle between the tube and the neck so that it may flow out of the bottle.

4,695,380

DIAPHRAGM-EQUIPPED FLUID TREATING APPARATUS

Walter Hilgendorff, Tespe; Gerhard Kahn, and Jürgen Kaschemekat, both of Geesthacht, all of Fed. Rep. of Germany, assignors to GKSS Forschungszentrum Geesthacht GmbH, Geesthact, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,210
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507908
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—347 **14 Claims**



1. In a fluid treating apparatus having a longitudinal axis; means defining a plurality of chambers arranged in a stack along said axis; a first and a second end plate bounding the stacked chambers at opposite axial ends thereof; an inlet port in said first end plate for introducing into the apparatus a fluid to be treated; an outlet port in said second end plate for withdrawing fluid from the apparatus; means defining a central channel extending along said axis for withdrawing from the apparatus a fluid extract; a plurality of fluid-impervious diaphragms situated in a spaced relationship in said chambers in an orientation generally perpendicular to said axis; the fluid being guided along said diaphragms generally radially relative to said axis; the improvement comprising

(a) a plurality of support frames arranged in a stack along said axis; each said support frame including an outer ring and an inner ring surrounded by said outer ring; said outer ring and said inner ring each having a radially inner face and a radially outer face relative to said axis; the radially inner face of said outer ring and the radially outer face of said inner ring of each said support frame together define radially outer and radially inner boundaries, respectively, of each of said chambers; the radially outer faces of said outer rings together forming an outer wall face of the apparatus, the radially inner faces of said inner rings surrounding said central channel; each of said outer ring having a radial surface portion arranged to constitute a supporting face engaging a radially outer marginal surface portion of an adjoining said diaphragm; each said support frame comprising a grid situated between said outer and inner rings thereof; each grid being preponderantly out of contact with adjoining said diaphragms; and

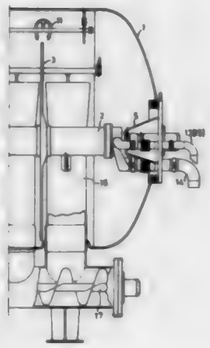
(b) each said diaphragm having a central aperture in axial alignment with each said inner ring and means for constraining the fluid under treatment to flow along said diaphragms substantially along their entire width measured transversely to said axis.

4,695,381

FILTER FOR CONTINUOUS FILTERING OF A SUSPENSION UNDER PRESSURE

Samuel Ragnegard, Hedemora, Sweden, assignor to AB Hedemora Verkstader, Hedemora, Sweden

Filed May 2, 1986, Ser. No. 858,769
Claims priority, application Sweden, May 2, 1985, 8502122
Int. Cl.⁴ B01D *33/08*
U.S. Cl. 210—403 **8 Claims**



1. Filter for contiuous filtering of a suspension under pressue, comprising:

a pressure vessel;

a rotatable filter element arranged in the pressure vessel, for each revloution said filter element passing a filtering cycle having a plurality of filtering zones in liquid phase and gaseous phase;

filtrate channels connected between the filter elements and seprate filtrate outlets from the pressure vessel for each filtering zone;

means in the gaseous phase zone for removing filter cake received during the filtering on the filter elements;

means for discharging removed filter cake from the pressure vessel;

means for effecting required difference pressure over the filter elements;

means for independently controlling the difference pressure over the filter elements in each filtering zone, said control means further being arranged to maintain a lower difference pressure in the liquid phase zone than in the gas phase zone for controlling the difference pressurs over the filter elements in the filtration zones in gas phase and liquid phase independent of each other and wherein a lower difference pressure in the liquid phase zone than in the gas phase zone is maintained.

4,695,382

COMBINED FLUID FILTER AND DELIVERY TUBING

James J. Cronin, Mission Viejo, Calif., assignor to Microgon, Inc., Laguna Hills, Calif.

Filed Nov. 18, 1985, Ser. No. 799,318
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—436 **13 Claims**

1. A combined inline final filter and tubing unit for the filtration and administration of intravenous fluids or the like comprising:

a. a nonporous intravenous tubing member;

b. microporous hollow filter fibres arranged within said tubular member parallel to the longitudinal direction thereof, said fibres being closed at one end thereof and open at the opposite ends thereof;

c. flow blocking material arranged around said fibres for blocking flow through said tubing member other than through said hollow fibres; and,



d. at least one hydrophobic fibre arranged to extend into said tubing member in proximity to said microporous hollow filter fibres, said hydrophobic fibre having an end thereof in communication with the atmosphere.

4,695,384

METHOD FOR IMPROVING THE PHOSPHORUS ELIMINATION CAPACITY OF A LAKE

Wilhelm K. Ripl, Berlin, Fed. Rep. of Germany, and Bo L. Verner, Saltsjo Boo, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 13, 1986, Ser. No. 930,307
Claims priority, application Sweden, Nov. 13, 1985, 8505383
Int. Cl.⁴ C02F *3/32*; C12N *1/12*
U.S. Cl. 210—602 **1 Claim**



1. A method of improving the phosphorus elimination capacity of a lake (11) by restricting sedimentation of algae to a minor portion of the lake which comprises; extending a flexidle wall (16) from the bottom (21) of the lake (11) a substantial distance toward the surface (23) of the lake and between the boundaries of the lake on either side of an inlet channel (12) at the beginning of the vegetation period of the lake to separate the lower parts of a minor portion of the lake from the lower parts of the rest of the lake, positioning a number of sheets (18) between the inlet channel (12) and the flexible wall (16) as growth areas for algae, feeding phosphorus containing water to said inlet channel, and lowering the flexible wall (16) around the end of the vegetation period of the lake to allow the flushing away of sedimented algae from the bottom of said minor portion.

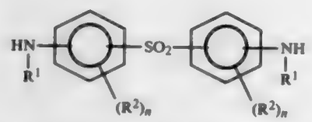
4,695,383

PERMSELECTIVE MEMBRANE

Shigeji Konagaya; Osamu Watanabe, both of Ootsu; Hideshi Kuzumoto, Shiga; Masaya Tokai, Takatsuki; Haruhiko Narusawa, Ootsu, and Yasuo Kato, Shiga, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 5, 1987, Ser. No. 22,624
Claims priority, application Japan, Mar. 12, 1986, 61-55597; Apr. 17, 1986, 61-88697; Apr. 17, 1986, 61-88698
Int. Cl.⁴ B05D *5/00*
U.S. Cl. 210—500.37 **20 Claims**

1. A permselective membrane consisting mainly of a copolyamide prepared by the reaction of an aromatic polycarboxylic acid component with a mixed diamine component comprising a diaminodiphenylsulfone compound of the general formula (I),



(I)

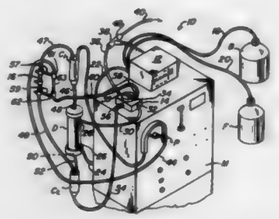
wherein R^1 represents hydrogen atom or a C_1–C_{12} hydrocarbon group, R^2s may be the same or different, each representing a monovalent organic group, and n represnets an integer of 0 or 1 to 3, and an alicyclic diamine compound containing two secondary amino groups in the same or different ring(s), the molar ratio of the diaminodiphenylsulfone compound to alicyclic diamine being 95/5 to 35/65.

4,695,385

DIALYZER REUSE SYSTEM

James T. Boag, Evergreen, Colo., assignor to Colorado Medical, Inc., Evergreen, Colo.

Filed Apr. 29, 1985, Ser. No. 728,204
Int. Cl.⁴ B01D *13/01*; B08B *3/04*
U.S. Cl. 210—636 **12 Claims**



1. A reuse device for automatically cleaning, disinfecting and testing a hemodialysis machine, dialyzer and blood tubing set when connected together as an operational dialysis system, the reuse device comprising:

(a) a power supply connected to a suitable source of electrical power;

(b) fluid tubing means having valve means for controlling fluid flow through the device;

(c) a pair of reservoirs of concentrated cleaning solution and disinfecting solution connected to the valve means in said tubing means;

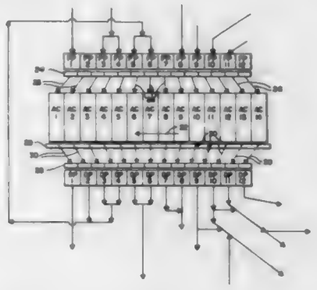
(d) a logic circuit means connected to said power supply and having a connected read only memory storage means which has been programmed to perform a desired reuse operation cycle;
(e) said logic circuit means having input means for initiating the start of the operation cycle of the reuse device and output means connected to a control means;
(f) a control means being sequentially driven by the logic circuit means to select and drive a plurality of suitable latching circuits and indicator means for operating the valve means for controlling the flow of cleaning and disinfecting fluids at the proper time during the cycle so that the concentrated solutions will be drawn from the device to provide desired fluids to the dialysis system during the sequentialy operation of the reuse device whereby the fluid can be diluted and used to clean, rinse and sterilize the entire dialysis system; and
(g) a conductivity sensing means which senses the conductivity of the fluid leaving the dialyzer system for verifying the integrity of the dialyzer and the presence of the correct fluid in the system during the respective operational cycle of the reuse device.

4,695,386

PROCESS FOR THE DECOLORIZATION OF PULP MILL PROCESS STREAMS

W. Wes Berry, Lakeland, Fla., assignor to Advanced Separation Technologies Incorporated, St. Petersburg, Fla.

Filed May 20, 1985, Ser. No. 735,762
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—665 **23 Claims**



1. A process for the decolorization of pulp mill effluent streams comprising:
(a) acidifying the effluent to below pH 4.0, thereby precipitating color bodies from the effluent;
(b) filtering the effluent;
(c) conducting the filtrate through a carbon bed to adsorb organic compounds from the effluent onto the carbon; and
(d) regenerating the carbon by passing a caustic solution through the carbon bed.

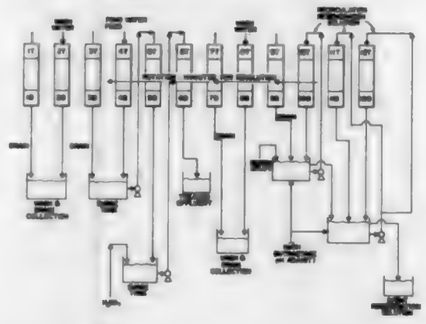
4,695,387

REMOVAL OF AMMONIA FROM WASTEWATER

W. Wes Berry, and William R. Erickson, both of Lakeland, Fla., assignors to Advanced Separation Technologies Incorporated, St. Petersburg, Fla.

Filed May 7, 1985, Ser. No. 731,281
Int. Cl.[4] C02F *1/42*
U.S. Cl. 210—676 **13 Claims**

1. A process for the continuous removal of ammonia from wastewater comprising the steps of:
(a) providing a plurality of zeolite-filled chambers moving about a circular path sequentially in periodic fluid communication with a stationary adsorption stage feed port and a stationary regeneration stage feed port as well as corresponding stationary adsorption stage and regeneration stage discharge ports at an end of said chambers opposite to said respective feed ports;
(b) adsorbing ammonium ions onto the zeolite by supplying a solution containing ammonium ions to a first stationary feed port, said solution being delivered in sequence to said plurality of zeolite-filled chambers to form an ammonium-loaded zeolite and an interaction product comprising wastewater with substantially reduced amounts of ammonium, said interaction product being discharged through a first adsorption stage discharge port for entry into a second stationary adsorption stage feed port;



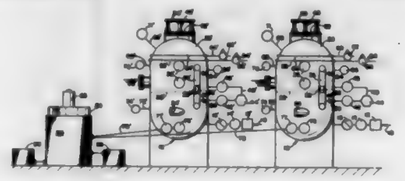
(c) regenerating ammonia from said zeolite filled chambers by supplying an alkaline regeneration fluid to said stationary regeneration stage feed port, said regeneration fluid being delivered in sequence to said plurality of chambers containing said ammonium-loaded zeolite and effecting desorption of a substantial portion of the ammonium ions from said ammonium-loaded zeolite by ion exchange conversion of the ammonium ions to ammonia;
(d) repeating said steps (b) and (c).

4,695,388

APPARATUS AND PROCESS FOR RAPID SEWAGE SLUDGE SEPARATION

Charles A. Long, Jr., Birmingham, Ala., assignor to Long Enterprises, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 650,960, Sep. 14, 1984, Pat. No. 4,582,612, which is a continuation-in-part of Ser. No. 560,058, Dec. 9, 1983, Pat. No. 4,487,699. This application Apr. 14, 1986, Ser. No. 851,600
Int. Cl.[4] C02F *1/78*
U.S. Cl. 210—760 **13 Claims**



1. An apparatus for use in a sewage sludge treatment system comprising means for enhancing the surface area of the sludge to be treated and its interaction with a pressurized oxygen-rich atmosphere to produce a treated sludge with absorbed and dissolved gas and means for rapidly removing the treated sludge from a lower portion of a vessel for subsequent rapid sludge separation releasing the absorbed and dissolved gas from the treated sludge,
the means for enhancing the surface area of the sludge and its interaction with a pressurized oxygen-rich atmosphere including a hyperbaric vessel including a sludge inlet means for conveying sludge to the vessel to be accumulated in a lower portion of the vessel, a sludge delivery means having a discharge end for delivering sludge particles from the lower portion to an upper portion of the vessel, oxygen inlet means for delivering oxygen to the upper portion of the vessel to oxygenate the sludge particles at a hyperatmospheric pressure therein to produce the treated sludge, the oxygenated treated sludge particles falling to and being collected in the lower portion of the vessel, gas outlet means for removing gas from the upper portion of the vessel,
the means for rapidly releasing absorbed and dissolved gas from the treated sludge including a treated sludge outlet means for rapidly removing the oxygenated treated sludge from the lower portion of the vessel using the pressurized oxygen as a propellant, the sludge outlet means comprising a discharge pipe connected to the lower portion of the vessel for conducting sludge to a separation apparatus maintained at a lower pressure than the pressure in the vessel, and a rapidly opening valve means controlling flow of the oxygenated sludge through the discharge pipe.

8. A process for treating sewage sludge comprising: enhancing the surface area of the sludge and its interaction with a pressurized oxygen-rich atmosphere and to rapidly remove treated sludge from a vessel for subsequent rapid sludge separation by the steps of
(a) delivering particles of the sludge to an upper portion of a hyperbaric vessel containing a pressurized oxygen-rich atmosphere where the particles interact with the oxygen to form oxygenated sludge containing absorbed and dissolved gas;
(b) collecting the oxygenated sludge particles containing absorbed and dissolved gas within a lower portion of the vessel; and
(c) rapidly releasing the absorbed and dissolved gas from the oxygenated sludge by removing the oxygenated sludge rdpidly from the vessel through a discharge pipe to a separation apparatus as a result of a pressure differential created between the hyperbaric vessel and the separation apparatus at a pressure lower than the pressure in the hyperbaric vessel.

4,695,390

REACTION PRODUCT OF POLYALRYLENE-SUBSTITUTED POLYCARBOXYLIC ACID ACYLATING AGENT, POLYAMINE AND SULFOLENE AS A DISPERSANT

Frederick W. Koch, Willoughby Hills, and Joseph W. Pialet, Euclid, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 4, 1985, Ser. No. 688,785
Int. Cl.[4] C10M *1/20, 1/32, 1/38*
U.S. Cl. 252—47.5 **40 Claims**

1. An oil soluble dispersant composition comprising:
the reaction product of (A) at least one polycarboxylic acid acylating agent having at least one polyalkene substituent having an Mn value of about 300 to about 5000 and a Mw value of about 500 to about 2000 with (B) a polyamine and (C) a sulfolene, said acylating agents having within their structure an average of at least 0.5 acylating groups for each equivalent weight of said polyalkene group, said reaction being conducted at a temperature from about 15° C. to about 300° C.

4,695,391

MODIFIED SUCCINIMIDES (IX)

Thomas F. Buckley, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 820,457, Jan. 17, 1986, abandoned. This application Sep. 4, 1986, Ser. No. 904,086
Int. Cl.[4] C10M *133/44*
U.S. Cl. 252—51.5 A **51 Claims**

1. A product produced by the process which comprises contacting at a temperature sufficient to cause reaction a polyamino alkenyl or alkyl succinimide having at least one primary or secondary amino group with a compound of the Formula V:



V

wherein R_4 is selected from the group consisting of a divalent hydrocarbyl of from 2 to 30 carbon atoms with the proviso that the hydrocarbyl carbon atom bound to one



group is not also bound to the other



group and $—R_5—OR_5—_p$ wherein R_5 is alkylene of from 2 to 5 carbon atoms and p is an integer of from 1 to 100; X is selected from the group consisting of bromo, chloro and $—OR_6$ wherein R_6 is selected from the group consisting of alkyl of from 1 to 6 carbon atoms, phenyl and phenyl substituted with 1 to 2 substituents selected from the group consisting of chloro, bromo, nitro, alkyl of from 1 to 6 carbon atoms and trifluoromethyl; and m is independently an integer of from 0 to 1 and wherein the molar charge of the compound of Formula V to the basic nitrogen of the polyamino alkenyl or alkyl succinimide is from about 0.1:1 to about 0.5:1.

4,695,389

AQUEOUS GELLING AND/OR FOAMING AGENTS FOR AQUEOUS ACIDS AND METHODS OF USING THE SAME

Gregory Kubala, Broken Arrow, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Division of Ser. No. 590,284, Mar. 16, 1984, Pat. No. 4,591,447. This application Mar. 7, 1986, Ser. No. 837,488
Int. Cl.[4] E21B *43/27*
U.S. Cl. 252—8.553 **13 Claims**

1. A buffered gelling/foaming agent for gelling aqueous inorganic acid solutions comprising:
(a) a N,N-bis(2-hydroxyethyl) fatty amine acetic acid salt;
(b) an alkali metal acetate salt; and
(c) acetic acid; and functioning as a buffer reactant;
(d) water.

4,695,392

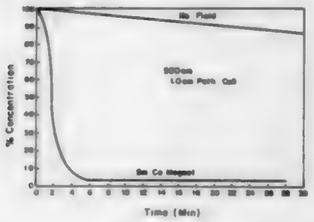
MAGNETIC PARTICLES FOR USE IN SEPARATIONS

Roy A. Whitehead, Hingham; Mark S. Chagnon, Lowell; Ernest V. Groman, Brookline and Lee Josephson, Arlington, all of Mass., assignors to Advanced Magnetics Inc., Cambridge, Mass.

Division of Ser. No. 493,991, May 12, 1983, Pat. No. 4,554,088. This application Jun. 13, 1985, Ser. No. 744,434

Int. Cl.⁴ C08F *283/12;* **H01F** *1/00;* **C09D** *5/23*

U.S. Cl. 252—62.54 **11 Claims**



1. A magnetically-responsive particle comprising a magnetic metal oxide core generally surrounded by a silane coat to which molecules can be covalently coupled, a mass of the particles being dispersable in aqueous media to form an aqueous dispersion having (a) a fifty-percent-turbidity-decrease settling time of greater than about 1.5 hours in the absence of a magnetic field, and (b) a ninetyfive-percent-turbidity-decrease separation time of less than about 10 minutes in the presence of a magnetic field, the magnetic field being applied to the aqueous dispersion by bringing a vessel containing a volume of the dispersion into contact with a pole face of a permanent magnet, the permanent magnet having a volume which is less than the volume of the aqueous dispersion in the vessel.

4,695,393

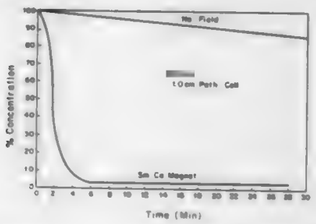
MAGNETIC PARTICLES FOR USE IN SEPARATIONS

Roy A. Whitehead, Hingham; Mark S. Chagnon, Lowell; Ernest V. Groman, Brookline and Lee Josephson, Arlington, all of Mass., assignors to Advanced Magnetics Inc., Cambridge, Mass.

Division of Ser. No. 493,991, May 12, 1983, Pat. No. 4,554,088. This application Jun. 13, 1985, Ser. No. 744,435

Int. Cl.⁴ C08F *283/12;* **G01N** *33/00*

U.S. Cl. 252—62.54 **12 Claims**



1. A process for preparing magnetically-responsive particles which comprises:

(a) precipitating divalent and trivalent transition metal salts in base to form a precipitate;

(b) washing the precipitate in water to approximate neutrality;

(c) washing the precipitate in an electrolyte;

(d) suspending the washed precipitate in an organic solvent containing about 1% (V/V) water to form a mixture;

(e) adding an acidic solution of a silane monomer to the mixture of step (d);

(f) homogenizing the resultant mixture of steps (d) and (e) at high speed;

(g) adding to the homogenized mixture of steps (d), (e), and (f) a wetting agent, which agent is miscible in the organic solvent and water;

(h) heating the resultant mixture of steps (d), (e), (f), and (g) to a temperature which is: (i) at or above the boiling point of the organic solvent and the boiling point of water, such that the organic solvent and water are evaporated; (ii) below the boiling point of the wetting agent, such that the wetting agent is not evaporated; and (iii) sufficient to polymerize the silane monomer and to cause the resultant silane polymer to become adsorptively or covalently bound to the precipitate; and

(i) washing the wetting agent from the silanized precipitate, which precipitate comprises silane-coated magnetically-responsive particles with mean diameters between about 0.1μ and 1.5μ as measured by light scattering, a mass of the particles being dispersable in aqueous media to form an aqueous dispersion having (a) a fifty-percent-turbidity-decrease settling time of greater than about 1.5 hours in the absence of a magnetic field, and (b) a ninety-five-percent-turbidity-decrease separation time of less than about 10 minutes in the presence of a magnetic field, the magnetic field being applied to the aqueous dispersion by bringing a vessel containing a volume of the dispersion into contact with a pole face of a permanent magnet, the permanent magnet having a volume which is less than the volume of the aqueous dispersion in the vessel.

4,695,394

THICKENED AQUEOUS CLEANSER

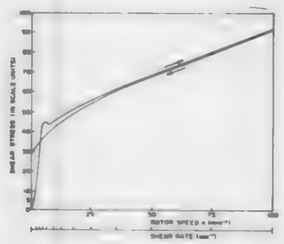
Clement K. Choy, Walnut Creek; Frederick I. Keen, Manteca; Aram Garabedian, Newark, and Colleen J. Spurgeon, Walnut Creek, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 727,702, Apr. 26, 1985, which is a continuation of Ser. No. 603,266, Apr. 20, 1984, Pat. No. 4,599,186. This application May 30, 1985, Ser. No. 739,377

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.⁴ C11D *9/20, 9/12, 3/395*

U.S. Cl. 252—97 **34 Claims**



1. An aqueous hard surface abrasive scouring cleanser characterized by compliance with environmental requirements for being substantially free of phosphate components, comprising:

(a) a colloidal alumina thickener having an average particle size, in dispersion, of no more than about one micron, the colloidal alumina thickener forming about one to fifteen percent by weight of the cleanser;

(b) a non-phospate electrolyte/buffer forming about 1 to 25 percent by weight of the cleanser;

(c) a surfactant system including two surfactant components, one surfactant component comprising a fatty acid anionic surfactant, the other surfactant component comprising a selected bleach-stable surfactant, the surfactant system forming about 0.1 to 15% by weight of the cleanser;

(d) a halogen bleach forming about 0.1 to 5 percent of the cleanser;

(e) a particulate abrasive having an average particle size of about one to as much as 400 microns to provide scouring action, the particulate abrasive forming about 5 to 70 percent by weight of the cleanser.

3. The cleanser of claim 1 wherein the electrolyte/buffer is a silicate.

4,695,395

CLEANING COMPOSITIONS WITH SKIN PROTECTION AGENTS

Michael L. Caswell, Memphis, Tenn.; James J. Corr, Huntington, N.Y.; Mark S. Dobrovolny, Edison, N.J.; Lynn H. Lander, Harrington Park, N.J.; William R. Narath, Parsippany, N.J., and Richard F. Theiler, Harrington Park, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 654,291, Sep. 25, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 886,575

Int. Cl.⁴ C11D *9/32, 17/00*

U.S. Cl. 252—121 **7 Claims**

1. A toilet bar composition consisting essentially of:

(a) from 30 to 70% alkali metal fatty acid soap;

(b) from about 2 to 15% of sodium isethionate;

(c) from 1% to 15% C_{12}–C_{18} free fatty acid; and

(d) from 5% to 45% sodium C_8–C_{18} acyl isethionate, the amount of acyl isethionate being no greater than the amount of soap present.

4,695,396

TWO-COMPONENT ALKALINE CLEANING COMPOSITIONS AND METHODS OF PREPARING AND USING SAME

Christian Roosmann, Langenfeld; Horst Fluechter, Kaarst; Gerald Schreiber, Duesseldorf, and Winfried Wichelhaus, Mettmann, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 7, 1986, Ser. No. 827,291

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504172

Int. Cl.⁴ C11D *11/00*

U.S. Cl. 252—135 **18 Claims**

1. In a method for manufacturing a two-component alkaline cleaner composition having a pH greater than 11, said composition comprising a mixture of

component (A) a strongly alkaline alkali metal hydroxide solution, and

component (B) an aqueous silicic acid dispersion concentrate containing an anionic, nonionic or amphoteric tenside, a detergent builder, and a stabilizer, the improvement comprising

forming said silicic acid in situ in said concentrate dispersion by precipitating it from an alkali metal silicate maintained at a pH of about 8 to 11, which is reacted at least one (a) mineral acid or (b) gas which reacts acidically in said silicate solution; and

mixing said components.

4,695,397

GRANULAR BLEACHING ACTIVATOR

Karl Sommer, Palzing; Robert Heinz, Mannheim; Albert Hettche, Hessheim; Johannes Perner, Neustadt; Werner Schuster, Boehl-Iggelheim, and Wolfgang Trieselt, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 772,209, Sep. 5, 1985, abandoned, which is a continuation of Ser. No. 421,098, Sep. 22, 1982, abandoned. This application Sep. 15, 1986, Ser. No. 907,161

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138551; Mar. 6, 1982, 3208216

Int. Cl.⁴ C09K *3/00;* **C11D** *3/395*

U.S. Cl. 252—182 **2 Claims**

1. A process for the preparation of a granular bleaching activator, which comprises:

(a) homogeneously mixing the powdered components of said granular bleaching activator consisting of (1) from 75 to 95 parts by weight of at least one bleaching activator selected from the group consisting of pentaacetylglucose, pentapropionylglucose, tetraacetylethylenediamine, tetracetylglycoluril, carboxylic acid anhydrides, salts of mixed anhydrides and phenol esters, (2) from 2.5 to 15 parts by weight of at least one water-swellable assistant selected from the group consisting of starch, crosslinked polyvinylpyrrolidone and starch ethers, and (3) from 2.5 to 10 parts by weight of at least one inorganic or organic builder and/or dispersant selected from the group consisting of sodium sulfate, sodium carbonate, alkali metal salts or alkaline earth metal salts of phosphoric acid, oligomeric phosphoric acids, polymeric phosphoric acids, alkali metal salts or alkaline earth metal salts of nitrilotriacetic acid, alkali metal salts or alkaline earth metal salts of ethylenediaminetetraacetic acid, alkali metal salts or alkaline earth metal salts of polyacrylic acid, the alkali metal salts or alkaline earth metal salts of copolymers of maleic acid with acrylic acid or vinyl ethers, one of said organic acids in free form, and carboxymethylcellulose without the presence of water;

(b) compacting said mixture by feeding said mixture by means of a feed screw into the gap between two counter-rotating rolls;

(c) comminuting the compactate obtained; and

(d) isolating the particles of compactate obtained having a size ranging from 0.5 to 3 mm.

4,695,398

CYCLOHEXANE DERIVATIVE

Yasuyuki Goto; Tetsuya Ogawa, both of Yokohama, and Shigeru Sugimori, Fujisawa, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 838,630

Claims priority, application Japan, Mar. 12, 1985, 60-48549

Int. Cl.⁴ C09K *19/54, 19/30;* **C07C** *25/13*

U.S. Cl. 252—299.5 **10 Claims**

1. A cyclohexane derivative having the formula



(I)

wherein R represents an alkyl group of 1 to 10 carbon atoms.

2. A liquid crystal composition having at least two components at least one of which is a compound expressed by the formula (I) set forth in claim 1.

4,695,399

METHOD OF MAKING A CONTACT LENS MATERIAL WHICH MAY BE IDENTIFIED BY COLORED FLUORESCENCE

Charles W. Neefe, 811 Scurry St., P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 857,177, Apr. 29, 1986, Pat. No. 4,632,773. This application Sep. 30, 1986, Ser. No. 913,453

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.⁴ C09K *11/02*

U.S. Cl. 252—301.35 **19 Claims**

1. A method of making a contact lens material which is identifiable from similar contact lens materials by the step of selecting a colored fluorescent dye in solid state solution in a transparent organic resin adding the selected fluorescent colored dye in the amount of from 0.0002 to 0.009 parts by weight to the lens monomer mixture, polymerizing the lens monomer mixture to form a solid contact lens blank, making a contact lens from the solid contact lens blank, placing the contact lens

convex surface on a dark surface, in the absence of visible light irradiating the lens with ultraviolet light, allowiong the colored fluorescent light emanating from within the lens to be concentrated at the lens edge by reflecting between the lens polished optical surfaces, allowing the colored fluorescent light to exit the lens at the lens edge, identifying the lens material by observing the selected color of the fluorescent colored light visible at the lens edge.

4,695,400

TERNARY ALLOY AND OIL SLURRY THEREOF

Alfred R. Globus, 26-53 210th St., Bayside, N.Y. 11360

Division of Ser. No. 753,455, Jul. 10, 1985, Pat. No. 4,581,130, which is a continuation-in-part of Ser. No. 652,898, Sep. 21, 1984, Pat. No. 4,601,817. This application Dec. 19, 1985, Ser. No. 810,790

Int. Cl.⁴ B01J *13/00; C22C 24/00*

U.S. Cl. 252—309 **2 Claims**

1. A ternary alloy consisting essentially of sodium, copper, and lead, wherein said copper is present in an amount of 1-4% and said lead is present in an equal or slightly larger amount.

2. A ternary alloy according to claim 1 in the form of a slurry in oil.

4,695,401

NONIONIC EMULSIFIER AND SUBSTITUTED SUCCINIC ANHYDRIDE COMPOSITIONS THEREWITH

W. Alan Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 449,324, Dec. 13, 1982, abandoned. This application Dec. 27, 1985, Ser. No. 814,351

Int. Cl.⁴ B01J *13/00;* **B01F** *17/36*

U.S. Cl. 252—312 **18 Claims**

8. A stable hydrocarbyl-substituted succinic anhydrid/nonionic emulsifier composition comprising:

(a) 70 to 99.5% of a normally liquid hydrocarbyl-substituted succinic anhydride having from 10 to 30 carbon atoms in the substituent; and

(b) 0.5 to 30% of a water-soluble emulsifier comprising the reaction product of a hydrocarbyl-substituted succinic anhydride having from 10 to 30 carbon atoms in the substituent and a nonionic water-soluble compounds having 1 to 3 groups reactive to anhydrides, wherein said water-soluble compund has sufficient hydrophilic strength to give a balanced oil-in-water emulsifier;

and wherein the emulsifier so produced contains a free carboxyl group and a substituted carboxyl group per each reacted anhydride molecule.

18. The composition according to claim 8, wherein the composition is in the form of an aqueous emulsion.

4,695,402

ORGANOPHILIC CLAY GELLANTS AND PROCESS FOR PREPARATION

Claude M. Finlayson, Cranbury; Charles A. Cody, Robbinsville; Steven J. Kennetz, Trenton; William W. Reichert, Freehold; Edward D. Magauran, Mount Holly, and Johnny R. Johnson, Freehold, all of N.J., assignors to NL Chemicals, Inc., New York, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,599

Int. Cl.⁴ B01J *13/00*

U.S. Cl. 252—315.2 **87 Claims**

1. A process for preparing an organophilic clay gellant comprising:

(a) subjecting a slurry of smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of clay to high shear conditions whereby clay agglomerates are separated, said smectite-type clay having been previously treated to remove non-clay impurities;

(b) reacting the smectite-type clay with organic cation in an amount ranging from about 90 to about 150% of the cation exchange capacity of the smectite-type clay whereby at least some of the cation exchange sites of the smectite-type clay are substituted with organic cation thereby forming an organiphilic clay gellant;

(c) separating the organophilic clay gellant from the slurry; and

(d) drying the organophilic clay gellant under conditions selected such that the temperature of the wet organophilic clay gellant does not exceed about 50° C.

4,695,403

THICK FILM CONDUCTOR COMPOSITION

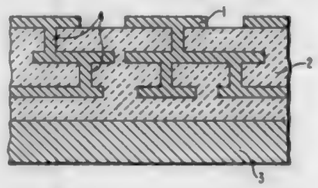
Tsutomu Nishimura, Uji; Seiichi Nakatani, Neyagawa; Satoru Yuhaku, Osaka, and Toru Ishida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 17, 1986, Ser. No. 875,083

Claims priority, application Japan, Jun. 17, 1985, 60-131104; Jun. 18, 1985, 60-132290; Jun. 20, 1985, 60-134542; Jun. 20, 1985, 60-134547

Int. Cl.⁴ H01B *1/00*

U.S. Cl. 252—513 **13 Claims**



1. A thick film conductor composition comprising an inorganic ingredient and an organic vehicle, wherein said inorganic ingredient comprises 80-98 wt% of copper oxide, and 2-20 wt% of at least one metal selected from the group consisting of Pt, Pd and Ni which metals are capable of forming a homogeneous solid solution with copper.

4,695,404

HYPERCONDUCTIVE FILLED POLYMERS

Chung T. Kwong, Pennington, N.J., assignor to Amerasia International Technology, Inc., Trenton, N.J.

Filed Apr. 7, 1986, Ser. No. 848,783

Int. Cl.⁴ H01B *1/02*

U.S. Cl. 252—514 **6 Claims**

1. A polymeric composition in the form of paste, liquid, or preformed film, comprising a polymeric binder and silver particles evenly distributed in said binder, said binder being prepared from a processable liquid polymer, said silver particles comprising at least 95% pure silver and having a volume electrical resistivity in the compressed free flow state of not more than 0.0002 ohm-cm, said composition having a stable volume electrical resistivity of 0.0001 ohm-cm or less.

4,695,405

PROCESS FOR QUENCHING FLUORESCENCE, AND NEW CATIONIC OR AMPHOTERIC AROMATIC NITRO COMPOUNDS

Horst Harnisch, Much, and Edgar Siegel, deceased, late of Leverkusen, Fed. Rep. of Germany (by Gabriele, E. Helena-Maria Siegel, heiress), assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,818

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415103.6

Int. Cl.⁴ G03C *1/00*

U.S. Cl. 252—600 **7 Claims**

1. A process for quenching the fluoresence produced by

anionic fluorescent brighteners in a substrate by adding to said substrate one or more virtually colorless, water-soluble cationic or amphoteric compounds wherein the compounds have the formula

$$(O_2N)_r\text{-}E\text{-}(K^{\oplus 1}\text{—}Z^2\text{—}Y_2\text{—}X^2\text{—}G\text{—})_t W(r-a)\text{-}An^{\ominus}$$

wherein

$K^{\oplus 1}$ stands for $E^{\oplus 1}$- or A—X^1—Y^1—Z^1—$E^{\oplus}$—,

A stands for a benzene, biphenyl, naphthalene, furan, benzofuran, thiophene, benzothiophene, thiazole, benzothiazole, benzimidazole, 1,3,4-thiadiazole or indole radical which, in addition to nitro, can also be substituted by C_1-C_4-alkyl, halogen, carbamoyl, sulphamoyl, cyano, hydroxyl, C_1-C_4-alkoxy or a sulpho group,

X^1 stands for —$(CH_2)_r$—CO—, —CH_2—Y^1—CO—, —$(CH_2)_r$—SO_2— , —O—CH_2—CO—, —O—CH_2—SO_2—, —S—CH_2—CO—, —S—CH_2—SO_2— or a single bond,

t stand for 0, 1 or 2,

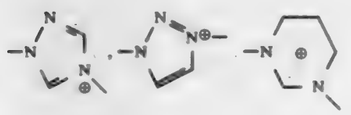
X^2 stands for —CO—, —CO—NH—CO—, —SO_2— or a single bond,

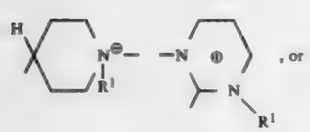
Y^1 and Y^2 each stand for —O—, —S—, —N(R)—, —N(-R)—NH— or a single bond,

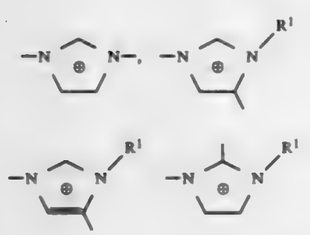
R stands for hydrogen, C_1-C_2-alkyl or cyanoethyl or, in Y^1 and Y^2, also for —CO— or —SO_2—, each of which can be bonded to the o- or periposition of A or of a benzene ring W,

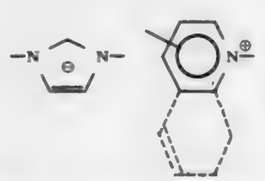
Z^1 and Z^2 each stand for C_1-C_6-alkylene, p-benzylene, p-xylylene or a single bond,

$E^{\oplus}$ stands for —$N^{\oplus}(R^1R^2)$—,





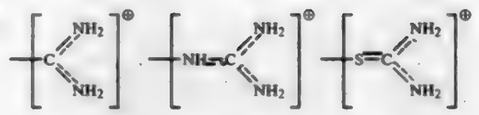


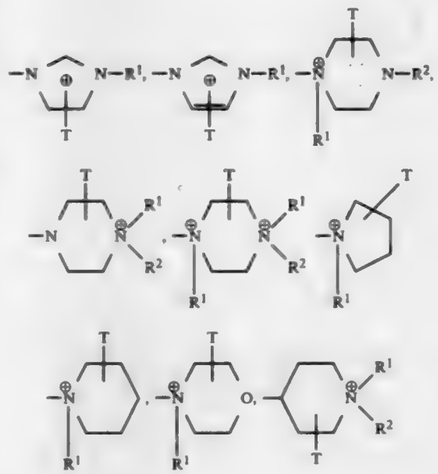


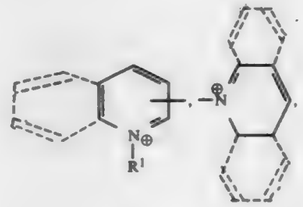
wherein

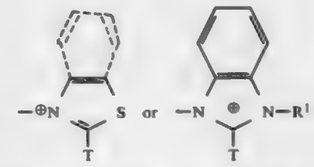
these rings can be optionally substituted by 1-4 methyl groups, and each of the two free valencies can be bonded to —X^1—Y^1—Z^1— or to —Z^2—Y^2—X^2—G—,

$E^{\oplus 1}$ stands for —$N^{\oplus}(R^1R^2R^2)$,









T stands for hydrogen or—depending on the nature of the ring—for 1-4 methyl groups,

wherein

the aromatic radicals, in addition to 1 or 2 nitro groups, can also be substituted by C_1-C_{14}-alkyl, halogen, cyano or carbamoyl and the amidinium, guanidinium and thiuronium radicals can also be substituted by 1-2 R^2 radicals,

R^1 and R^2, independently of each other, stand for hydrogen, C_1-C_4-alkyl, which can be substituted gy OH, NH_2, halogen, C_1-C_4-alkoxy, COOH, $CONH_2$, CN or C_1-C_4-alkoxycarbonyl, C_2-C_4-alkenyl, cyclohexyl, phenyl-C_1-C_3-alkyl or benzoylmethyl which, in addition to nitro, can

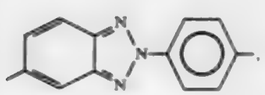
each also be ring-substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, Cl or Br,

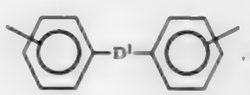
R^1 also stands for $—O]^{\ominus}$ or $A—X^1—Y^1—Z^1—$, R and R^1 can also be cyclised and then, together with $—N—Z^1—N—$ or $—N—Z^2—N—$, form a piperazine radical which is optionally substituted by 1 or 2 methyl groups, or

R^1 and R^2 can also be cyclised and then, together with the nitrogen atom to which they are bonded, form a pyrrolidine, piperidine, morpholine or piperazine ring each of which is optionally substituted by 1 to 4 methyl groups and can be substituted on the second N atom by optionally OH— or NH_2-substituted C_1- to C_3-alkyl,

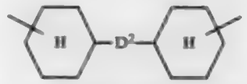
G stands for —NH—, —NH—CH_2—, —O— or a single bond,

W stands for an r-dentate radical from the group comprising benzene, naphthalene, anthracene, phenanthrene, 9,10-dihydrophenanthrene, cyclohexane, fluoren-9-one(3,6), thiophene(2,5), dibenzofuran(3,6), dibenzothiophene(3,6), dibenzothiophene-S-dioxide(2,7), 9-H-thioxanthene-S-dioxide(3,6), carbazole(3,6), 9-H-xanthene-9-one(2,7), 9-acridone(2,7), 1,3,4-oxadiazole(2,5), 1,2,4-oxadiazole(3,5), 1,3,4-thiadiazole(2,5), s-triazine(2,4,6), piperazine(1,4), 1,2-dihydro-1,2,4,5-tetrazine(3,6) or for a radical of the formula





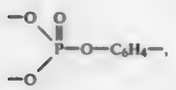
, or



or for the case where $—E^{\oplus}—$ denotes a bidentate pyridinium or quinolinium radical also for a single bond,

D^1 and D^2, independently of each other, stand for a straight-chain or branched C_1–C_7-alkylene radical which is optionally interrupted by —O—, or for $—O—C_2—C_4$-alkylene—O—, —O—, —NH—, $—N(C_1$–C_2-alkyl)—, —CO—, —CO—NH—, —NH—CO—NH—, 1,1-cyclohexylene or a direct bond,

D^1 can also stand for $—CH(C_6H_5)—$, $—CH(C_6H_4—)—$, $—N(C_6H_5)—$, —CH=CH—, —S—, $—SO_2—$, —SO—, m- or p-phenylene, thiophene(2,5), 1,3,4-oxadiazole(2,5), 1,3,4-thiadiazole(2,5), oxazole(2,5), thiazole(2,5), 1,2-dihydro-1,2,4,5-tetrazine(3,6) or



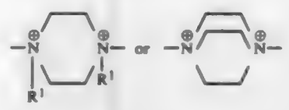
D^2 can also stand for $—CH(C_6H_{11})—$ or $—CH(C_6H_{10}—)—$, where the rings mentioned under W, D^1 and D^2, in addition to nitrogen, can also be substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen and/or a sulpho group,

n stands for an integer from 1 to 6, a stands for the number of anionic and/or $N^{\oplus}—O^{\ominus}$ groups and correspondingly for 0, 1, 2 or 3,

r stands for 2 or 3 and is $\geq a$, and An^-, if present, stands for a colourless anion,

and wherein the chains occurring r times can be identical or different,

and wherein in the case of r=2 the grouping $—E^{\oplus}—Z^2—Y^2—X^2—G—W—G—X^2—Y^2—Z^2—E^{\oplus}—$ as a whole can also stand for



4,695,406

ANTHRAQUINONE COMPOUNDS AND THE PRODUCTION AND USE THEREOF

Roger Lacroix, Huningue; Jean-Marie Adam, Saint-Louis, both of France, and Janos Vincze, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

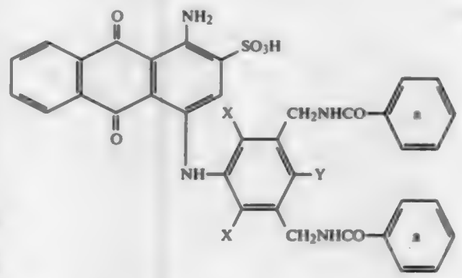
Continuation of Ser. No. 647,872, Aug. 31, 1984, abandoned, which is a continuation of Ser. No. 305,661, Sep. 25, 1981, abandoned, which is a division of Ser. No. 166,277, Jul. 7, 1980, Pat. No. 4,309,180, which is a continuation of Ser. No. 963,627, Nov. 24, 1978, abandoned. This application May 31, 1985, Ser. No. 740,295

Claims priority, application Luxembourg, Nov. 28, 1977, 78397

Int. Cl.⁴ C07C *143/665*

U.S. Cl. 260—372 **6 Claims**

1. An anthraquinone compound which, in the form of the free acid, corresponds to the formula I



(I)

wherein the X's independently of one another are each a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms, Y is hydrogen or is the same as X, and wherein the phenyl rings a can also be substituted by one or more halogen atoms.

4,695,407

METHOD FOR PURIFYING 1-AMINOANTHRAQUINONE

Norio Kotera, Amagasaki; Masatoshi Uegaki, Nara; Masakatsu Yoshimura, Sakai; Shinzaburo Masaki, Ashiya; Tatsuo Kaneoya, Toyonaka; Takashi Miyaoka, Minoo; Yuzo Maegawa, Ibaraki, and Akira Fukasawa, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 15, 1983, Ser. No. 466,568

Claims priority, application Japan, Mar. 3, 1982, 57-34169

Int. Cl.⁴ C07C *97/24*

U.S. Cl. 760—378 **7 Claims**

1. In a method for purifying crude 1-aminoanthraquinone containing inorganic impurities formed through nitration of anthraquinone with concentrated nitric acid or a mixed acid by rectification, the improvement comprising reducing said inorganic impurities to not more than 4 wt. % as converted to ash basis or reducing the iodine-consuming reductive inorganic impurities to not more than 2 wt. % as converted to consumed iodine basis prior to said rectification.

4,695,408

PREPARATION OF TRISPHENOL METHANES

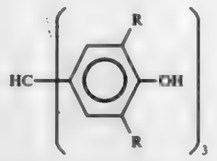
Kuo Y. Chang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1985, Ser. No. 751,342

Int. Cl.⁴ C09B *11/06*

U.S. Cl. 260—395 **17 Claims**

1. A process comprising contacting a 2,6-disubstituted phenol with salicylaldehyde under reaction conditions such that there is formed a product represented by the formula:



wherein each R independently is alkoxy, aryloxy, or alkyl of up to about 10 carbon atoms; or H or halo.

4,695,409

CONTROL OF DISALT IN α-SULFOFATTY ACID ESTER SURFACTANTS

Robert Piorr, Ratingen-Hoesel; Guenter Panthel, Haan; Karl H. Schmid, Mettmann; Dietmar Colignon, Erkrath; Hans J. Rommerskirchen, Duesseldorf-Eller; Wolfgang Schmidt, Monheim, and Horst Ritterbex, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,304

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1984, 3432324

Int. Cl.⁴ C07C *143/90*

U.S. Cl. 260—400 **11 Claims**

1. A process for the preparation of α-sulfofatty acid alkyl esters having a low disalt content which consists essentially of sulfonation of a fatty acid alkyl ester with less than about 2 moles of SO_3 per mole of fatty acid alkyl ester to obtain a crude α-sulfofatty acid alkyl ester, contacting the crude α-sulfofatty acid alkyl ester and SO_3 reaction product with about 0.8 to 1.3 mole equivalents of at least one alcohol, based on the SO_3 which is not used for α-sulfonation, at a temperature of 40° C. to 150° C. to react free alcohol and transeserify the α-sulfofatty acid alkyl ester to obtain a product consisting essentially of transesterified α-sulfofatty acid alkyl ester and alkyl sulfate, followed by working-up said product in aqueous medium to bleach said product or to neutralize said α-sulfofatty acid alkyl ester, or both, with the proviso that the alcohol is an aliphatic C_1–C_3-monoalcohol and the same alcohol present in the fatty acid alkyl ester is used for transesterification.

4,695,410

RECOVERY OF PHENOL FROM AQUEOUS SOLUTION

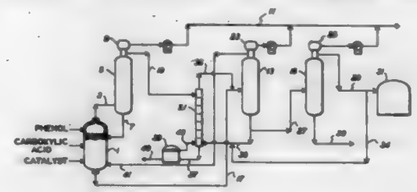
Gary J. Lynch, Bridgeton, and Chen-Hsyong Yang, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 29, 1986, Ser. No. 901,681

Int. Cl.⁴ C07F *5/8*; C07C *37/68, 69/7*

U.S. Cl. 260—410.5 **10 Claims**

1. In a process for producing a phenyl ester wherein a carboxylic acid is reacted with phenol and water is removed from the reaction product resulting in the formation of an aqueous solution of phenol, the improvement which comprises extracting phenol from the aqueous solution with recycled phenol stripped phenyl ester.



4,695,411

PROCESS FOR MANUFACTURING A COMPOSITION OF FATTY ACID ESTERS USEFUL AS GAS OIL SUBSTITUTE MOTOR FUEL WITH HYDRATED ETHYL ALCOHOL AND THE RESULTANT ESTERS COMPOSITION

Robert Stern, Paris; Gérard Hillion, Herblay; Paul Gateau, St Nom La Breteche, and Jean-Claude Guibet, St Germain En Laye, all of France, assignors to Institut Francais du Petrol, Rueil-Maimaison, France

Filed Feb. 18, 1986, Ser. No. 830,169

Claims priority, application France, Feb. 15, 1985, 85 02340

Int. Cl.⁴ C11C *3/04, 3/10*

U.S. Cl. 260—410.9 R **17 Claims**

1. A process for manufacturing a composition of fatty acid esters, useful as motor fuel substitute for gas oil, said composition comprising a major proportion of ethyl esters, by transesterification of a starting material oil or grease of vegetable or animal origin, or a mixture thereof, which starting material may contain free acids, said process comprising the following steps:

(a) in a first acid transesterification step, reacting said starting material oil or grease with ethyl alcohol containing from 1 to 60% by weight of water, in the presence of an acid catalyst, at 70°–150° C. for a time sufficient to transesterify at least 75% of said oil or grease to ethyl ester, and recovering a raw ethyl ester phase containing free fatty acids and a glycerol phase and separating said phases from each other,

(b) in a second step, reacting said separated raw ethyl ester phase at an acid pH with an alcohol selected from the group consisting of methanol, ethanol, propanol and butanol and simultaneously distilling water from the reaction mixture, so as to form additional ester from said free fatty acids present in said separated raw ethyl ester phase, while decreasing the content of said free fatty acids to at most about 2% by weight of said raw ethyl ester phase,

(c) in a third step, reacting resultant reaction product of said second step with at least one aliphatic, linear or branched monoalcohol of 1 to 5 carbon atoms in the presence of a basic catalyst, thereby further reducing the content of said free fatty acid in the product of step (b) and forming a purified composition of fatty acid esters.

4,695,412

PREPARATION OF ACYLOXYBENZENESULFONIC ACIDS AND THEIR ALKALI METAL AND ALKALINE EARTH METAL SALTS

Wolf-Dieter Balzer, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch; Karl-Heinz Beyer, Frankenthal; Rolf Fikentscher, Ludwigshafen; Johannes Perner, Neustadt; Rudi Widder, Leimen, and Helmut Wolf, Hassloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

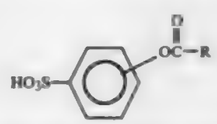
Continuation of Ser. No. 736,847, May 22, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 933,354

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419795

Int. Cl.[4] C07C *143/52*

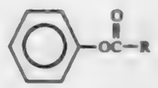
U.S. Cl. 260—507 R **9 Claims**

1. A process for the preparation of alkali metal or alkaline earth metal salts of an acyloxybenzenesulfonic acid of the formula I



(I)

where R is straight-chain or branched saturated alkyl of 5 to 11 carbon atoms, by sulfonation of a phenyl ester, wherein a phenyl ester of the formula II



(II)

where R has the meanings given for formula I, in the presence of from 0.2 to 30 mole %, based on SO_3 or chlorosulfonic acid, of a complexing agent for SO_3 or chlorosulfonic acid, is sulfonated with SO_3 or chlorosulfonic acid at from 20° to 80° C., the molar ratio of phenyl ester to SO_3 or chlorosulfonic acid being about 1:1, the resulting acyloxybenzenesulfonic acid is subsequently acylated at 40°–50° C. with an acyl chloride of the formula Cl—COR, where R has the meanings stated for formula II, said acyl chloride being in an equimolar amount based on the free phenolic OH groups present, and the acyloxybenzenesulfonic acid obtained is then neutralized to give the alkali metal or alkaline earth metal salt, said neutralization being effected by combining the resulting liquid acyloxybenzenesulfonic acid of the formula I with an aqueous solution of an alkali metal or alkaline earth metal hydroxyde, carbonate or bicarbonate in water at from 0° to 60° C., with thorough mixing, so that a pH of from 3.0 to 5.5 is maintained, and, if required, the aqueous solution of the latter is subjected to oxidative bleaching before drying.

4,695,413

PROTECTIVE CIRCUIT FOR A HACKER TYPE DC CONVERTER

Folke J. B. Ekelund, Norsborg; Per O. Lilja, Västerhaninge; Roland J. E. Wald, Skärholmen, and Matts F. Stahl, Älvsjö, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE85/00461, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/03349, PCT Pub. Date Jun. 5, 1986

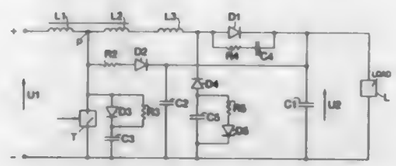
PCT Filed Nov. 18, 1985, Ser. No. 884,290

Claims priority, application Sweden, Nov. 19, 1985, 8405816

Int. Cl.[4] H02H *7/10*

U.S. Cl. 361—18 **7 Claims**

1. A hacker type D.C. converter circuit comprising a supply voltage source, a series circuit including a first coil (L1), a first diode (D1) and a first capacitor (C1), said series circuit being connected to the supply voltage source (U1), controllable switching means, a connection junction between said first coil and first diode, a further diode (D3) and capacitor (C3) coupled across said switching means, said first capacitor including a first terminal remote from said further diode and a second terminal proximate said further diode and an impedance means, said connection junction (p) between the first coil (L1) and the first diode (D1) being connected to the first terminal of the first



capacitor (C1) remote from the further diode through said impedance means across said controllable switching means (T), which periodically alternates between open and closed states, the series circuit between said connection junction (p) and the first diode (D1) further including an inductive element (L3) and a second coil (L2) which is inductively connected to the first coil (L1), and a second diode (D2) connected in a parallel circuit from the connection junction (p) and across the first diode (D1) to the first capacitor.

4,695,414

METHOD AND APPARATUS FOR PRESSING POWDER MATERIAL

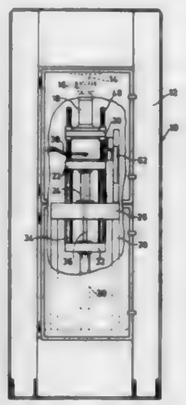
Alf Forslund, and Goran Andersson, both of Harnosand, Sweden, assignors to Convey Teknik AB, Harnosand, Sweden

Filed Jun. 29, 1984, Ser. No. 625,953

Claims priority, application Sweden, Jul. 1, 1983, 8303796

Int. Cl.[4] C06B *21/00*

U.S. Cl. 264—3.1 **4 Claims**



1. A method for pressing powder material with a press, the press including a stationary punch, a movable punch, and a movable die, the method comprising the steps of:

dosing the powder material into the die;

pressing the powder material between the stationary punch and the movable punch until a predetermined position of the movable punch is reached;

stopping the movable punch when the predetermined punch position is reached;

sensing an actual value of force on the movable punch when the predetermined punch position is reached;

after the stopping and sensing steps, comparing the actual value of punch force with a preselected criterion;

rejecting the pressed powder material if the actual value of punch force deviates from the preselected criterion by more than a predetermined amount; and

moving the die relative to the stationary punch to withdraw the pressed powder material.

4,695,415

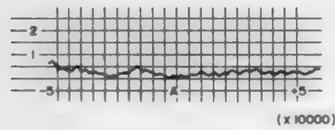
METHOD FOR PRODUCING ACRYLIC FIBER PRECURSORS

Takashi Setsuie; Takeji Otani, and Kanji Yoshida, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,302

Int. Cl.[4] D01F *9/22*

U.S. Cl. 264—29.2 **9 Claims**



2. A method for producing an acrylic fiber precursor for carbon fibers substantially free of defects from fusion bonding or agglutination, said acrylic fiber comprising an acrylonitrile polymer containing at least 90% by weight of acrylonitrile and having a surface roughness of 2.0 to 3.0, the surface roughness being measured in the following manner:

a secondary electron line scanning profile of the acrylic fiber precursor is prepared by a scanning electron microscope at a magnification of 6,600 times, which is magnified to 10,000 times to obtain a line scanning profile in which each distance of 5 cm, corresponding to 5μ in actual measurement, the left and right from the zero level of the line scanning taken as the center are divided into ten equal length and heights of respective divided profiles in the directions of the y-axis, and read, and a variance of the heights is calculated according to formula (1) and an arithmetic mean value of the variances obtained on fifty specimens is taken as the surface roughness,

$$\text{Variance} = \sqrt{\frac{1}{20}\sum_{i=1}^{20}(yi - \bar{y})^2} \quad (1)$$

wherein yi is the height of the profile at a particular division in the direction of the y-axis and $\bar{y}$ is a mean value of the heights in the direction of the y-axis; said method comprising:

(i) dry-jet wet spinning a spinning solution comprising 24 to 27.5% by weight of an acrylonitrile polymer containing at least 90% by weight of acrylonitrile and an organic solvent of dimethylformamide or dimethylacetamide into a coagulation bath consisting essentially of the said organic solvent and water at 5° C. to 25° C., and

(ii) subjecting the thus spun filaments to simultaneous washing and stretching to 1.05 to 20 times their length in hot water or boiling water of 50° C. to 100° C., applying oiling agents and subsequently dry-heat stretching.

4,695,416

METHOD AND APPARATUS FOR MOULD-FORMING EXPANDED PLASTICS FORM BLOCKS

Peter Treffner, and Charles Treffner, both of 85 Gross Street, Parramatta, New South Wales, 2150, Australia

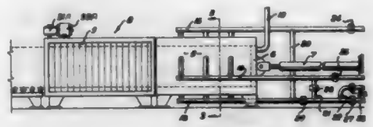
PCT No. PCT/AU85/00032, § 371 Date Oct. 1, 1985, § 102(e) Date Oct. 1, 1985, PCT Pub. No. WO85/03903, PCT Pub. Date Sep. 12, 1985

PCT Filed Oct. 1, 1985, Ser. No. 784,884

Claims priority, application Australia, Feb. 29, 1984, PG3840

Int. Cl.[4] C08J *9/22*

U.S. Cl. 264—45.4 **8 Claims**



1. In a method of making an expanded plastics foam block section and uniting it with a prior made or partly made section comprising the steps of charging a mould space of which one end is defined by a surface of the prior section with expandable plastics beads, and initiating the expansion and fusion of the beads to create a cohesive but largely unexpanded mass of beads, the improvement comprising obtruding the prior section into the mould space to compress a zone of the cohesive mass adjacent to the said end of the space, increasing the temperature and pressure in the mould space to complete the expansion and fusion process and to compress an end zone of the prior section to bring its end substantially to its unobtruded position, lowering said pressure and temperature, and then ejecting the newly made block section from the mould space.

4,695,417

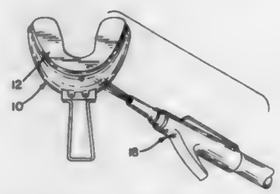
METHOD OF MAKING AN OPTICALLY CLEAR TOOTH POSITIONING AND RETAINING APPLIANCE

Arthur B. Hall, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ill.

Filed Nov. 22, 1982, Ser. No. 443,472

Int. Cl.[4] B29C *39/00, 59/08*

U.S. Cl. 264—80 **13 Claims**



1. A method of making a substantially optically clear custom tooth positioning and retaining appliance from a resilient thermoplastic material with the capability of having substantially optically clear transparentness, said appliance including air holes extending between the labial and lingual sides thereof and between the archways, wherein the appliance is molded of said material in a flask or mold having mounted therein upper and lower mold members for defining upper and lower archways in the appliance, trimmed on one or more grinding wheels, and optionally buff polished on a buffing wheel, after which the appliance has a semi-opaque or frosty appearance, said method comprising the steps of cooling the appliance to about room temperature or below, mounting an air hole insert in the air holes, and heat polishing the exterior surfaces of the appliance by applying localized heat to said surfaces at a level sufficient to cause momentary surface melting.

4,695,418

METHOD AND APPARATUS FOR MANUFACTURING ROOF TILES AND TILES MADE THEREBY

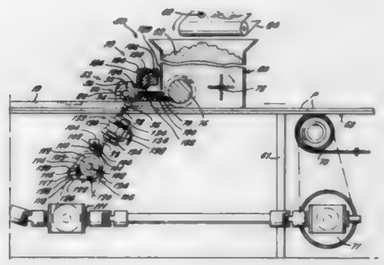
Robin M. Baker, Horsham; Paul R. Sargeant, Wisborough Green; Ernest G. Papper, Crawley; Bhusan K. Oberoi, Horley; Frank A. Smith, Godstone, and Malcolm C. Rae, Reigate, all of United Kingdom, assignors to Redland Roof Tiles Limited, Surrey, United Kingdom

Filed Sep. 12, 1985, Ser. No. 775,413

Claims priority, application United Kingdom, Sep. 12, 1984, 8423048

Int. Cl.⁴ B28B *11/12*

U.S. Cl. 264—151 **26 Claims**



1. A method of manufacturing roof tiles comprising the steps of first extruding continuous shaped ribbon of tile forming material onto a succession of moving pallets and subsequently cutting and forming the material into individual green state tiles on pallets with a recess formed in the upper surface of each tile over only part of its length, wherein the method of forming said recess includes the steps of causing a recess cutting tool to engage with the upper surface of the ribbon to penetrate the ribbon downwardly against the direction of movement of the ribbon to cut an inclined portion of the recess, causing said cutting tool to remain at a predetermined depth while moving relative to the ribbon to cut a floor portion of the recess, and moving the cutting tool to a retracted position, and removing the material cut from the recess to a position remote from the tile.

4,695,419

MANUFACTURE OF A MINIATURE ELECTRIC MOTOR

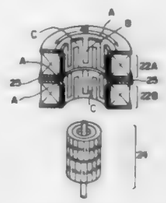
Tokuzo Inariba, 906 Kamiuma-Mansion, 2-9, Kamiuma 4-chome, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 655,665, Sep. 28, 1984, abandoned. This application Apr. 23, 1986, Ser. No. 854,701

Claims priority, application Japan, Sep. 28, 1983, 58-177889

Int. Cl.⁴ B29C *45/14*

U.S. Cl. 264—259 **10 Claims**



1. A method of manufacturing a composite toothed pole structue in a miniature electric motor, wherein said motor includes an annular fixed coil, a circular permanent magnet, a plurality of pole teeth made of a soft magnetic material, and a yoke of a soft magnetic material in operative contact with said pole teeth and forming a casing and a continuous magnetic circuit through said plurality of pole teeth, said coil magnet, pole teeth and yoke all being co-axial with one another, said magnet having N and S poles alternating circumferentially, and each pole of said magnet corresponding to one of said pole teeth to form a pair of poles, one of each of said pair of poles forming a rotor and the other of each of said pair of poles forming a stator, said method comprising the steps of:

forming said pole teeth and said connecting portion from a single plate of soft magnetic material such that said pole teeth extend axially from said connecting portion;

forming said yoke into a casing from a single plate of soft magnetic material;

positioning said plurality of pole teeth as inserts in an annular mold;

charging said annular mold ith a non-magnetic, synthetic resin to form a bobbin for receiving said core, such that said plurality of pole teeth forming a stator are embedded annularly in said synthetic resin to form a single solid unified structure such that each of said pole teeth has an exposed side facing a corresponding pole of said permanent magnet; and

joining said yoke with said connecting portion to form a continuous magnetic circuit including said yoke and said pole teeth.

6. A method of manufacturing a composite toothed pole structure in a miniature electric motor, wherein said motor includes an annular fixed coil, a circular permanent magnet, a plurality of pole teeth made of a soft magnetic material, and a yoke of a soft magnetic material in operative contact with said pole teeth and forming a casing and a continuous magnetic circuit through said plurality of pole teeth, said coil magnet, pole teeth and yoke all being co-axial with one another, said magnet having N and S poles alternating circumferentially, and each pole of said magnet corresponding to one of said pole teeth to form a pair of poles, one of each of said pair of poles forming a rotor and the other of each of said pair of poles forming the stator, said method comprising the steps of:

forming said pole teeth and said connecting portion from a single plate of soft magnetic material such that said pole teeth extend axially from said connecting portion;

forming said yoke into a casing from a single plate of soft magnetic material;

positioning said plurality of pole teeth as inserts in annular mold;

charging said annular mold with a non-magnetic, synthetic resin to form a cylinder such that said plurality of pole teeth, forming a rotor, are embedded annularly in said synthetic resin to form a single solid unified structure such that each of said pole teeth has an exposed side facing a corresponding pole of said permanent magnet; and

operatively connecting said yoke to said connecting portion.

4,695,420

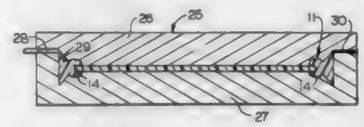
METHOD OF FORMING A WINDOWED UNITARY PANEL

Charles E. Grawey, and Scot L. Winters, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 694,492, Jun. 25, 1984, abandoned. This application Aug. 12, 1985, Ser. No. 764,525

Int. Cl.⁴ B29C *61/00*

U.S. Cl. 264—265 **7 Claims**



1. A method of forming a windowed unitary panel having a rigid frame of high modulus plastic material and a transparent windowpane having its peripheral edge integrally embedded within the rigid frame, comprising the steps of:

heating a pane of transparent glazing to a preselected temperature;

positioning the preheated pane within a mold so that the peripheral edge portion protrudes into a mold cavity; and

injecting into the mold cavity the constituent ingredients of the high modulus plastic material causing the plastic material to exothermally rise to a molding temperature for forming the rigid frame and encapsulating the peripheral edge portion within the frame while the pane is in the preheated condition allowing both the pane and plastic material to cool from said temperatures such that the pane and plastic material contract at substantially the same rate to eliminate compressive forces and cause low tensile stresses to be imparted to the pane.

4,695,421

METHOD OF MOLDING A MEMBER HAVING UNDERCUT PORTIONS

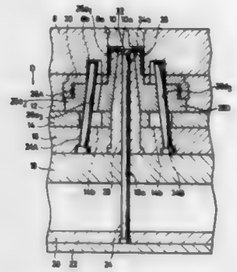
Masami Takeda, Ami, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,712

Claims priority, application Japan, Sep. 19, 1984, 59-196178

Int. Cl.⁴ B29C *33/44, 45/44*

U.S. Cl. 264—318 **2 Claims**



1. A method for forming an under-cut portion of a molded article, using a molding apparatus comprising:

a fixed mold plate having a circular hollow portion including an inner peripheral wall defining a cavity for molding the article;

a tapered pin, in the center of which a through-hole is provided, a center pin passing through said through-hole;

a plurality of movable molding plates;

a plurality of core sections supported by said movable molding plates, said core sections forming a core including an outer peripheral surface of cylindrical shape when they are combined; and

a plurality of moving pins, positioned at an inclination angle with respect to a center line of said center pin, and passing through guide holes defined by said movable molding plates and said core sections;

each core section comprising a cylindrical article molding portion projecting into said hollow portion and having an undercut portion, and a holder portion, in which a guide hole for one of said moving pins is provided, the cylindrical article molding portions of said core sections when combined forming said outer peripheral surface of cylindrical shape and having alternating wide outer peripheral arcuate surfaces and narrow outer peripheral arcuate surfaces, said guide holes of said core sections having wide outer peripheral arcuate surfaces being of greater dimension, in a radial direction with respect to an axial line of said center pin, then said guide holes of said core sections having narrow outer peripheral arcuate surfaces;

the method comprising the steps of:

(a) injecting the molding material into the cavity defined by the inner peripheral wall of the hollow portion of said fixed molding plate and the combined cylindrical article molding portions to form the molded article including undercut portions;

(b) moving said plurality of moving pins in a direction parallel to the center line of said center pin, so as to cause movement only of said core sections having narrow outer peripheral arcuate surfaces toward the center line of said center pin; and

(c) further moving said plurality of moving pins in a direction parallel to the center line of said center pin, so as to cause movement of said core sections having wide outer peripheral arcuate surfaces toward the center line of said center pin.

4,695,422

PRODUCTION OF FORMED MATERIAL BY SOLID-STATE FORMATION WITH A HIGH-PRESSURE LIQUID STREAM

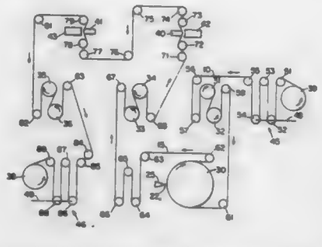
John J. Curro, Cincinnati; Alan J. Trusty, Bethel, and George M. Vernon, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 16, 1984, Ser. No. 580,911

The portion of the term of this patent subsequent to Sep. 1, 2003, has been disclaimed.

Int. Cl.⁴ B29C *59/06, 69/02*

U.S. Cl. 264—504 **33 Claims**



1. A process for permanently transforming a substantially continuous web of substantially planar, deformable material comprising a film having an indefinite length, a first surface and a second surface into a web of formed material having a substantial third dimensional structure perpendicular to the plane of said material without substantially altering the physical properties or the thermo-mechanical history of said substantially planar web, said material having a transformation temperature range, said process comprising the steps of:

(a) providing said web of material on a forming structure with said first surface of said web of material proximate a forming surface of said forming stucture, said forming surface exhibiting a three-dimensional profile, said forming surface moving in a direction of said length of said web of material and carrying said web of material in said direction;

(b) applying a substantially unconstrained liquid stream which is substantially stationary in the direction of travel of said moving web substantially uniformly to said second surface of said moving web of deformable material in those areas to be transformed, said substantially unconstrained liquid stream having sufficient force and mass flux to cause said moving web of material to be deformed toward said forming surface upon contact therebetween, such that said material acquires a substantial, permanent three-dimensional conformation in the image of said forming surface of said forming structure before passing beyond the influence of said substantially stationary liquid stream; and

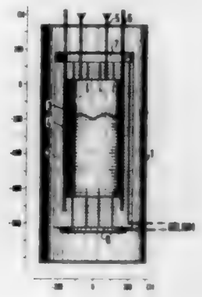
(c) controlling the temperature of said web of material such that it remains below said transformation temperature range of said material throughout said process, thereby maintaining said web of substantially planar material in a substantially solid state throughout said process.

4,695,423

METHOD FOR LOADING, OPERATING, AND UNLOADING A BALL-BED NUCLEAR REACTOR

Eberhardt Teuchert, Jülich; Klaus-Arne Haas, Düren, and Helmut Gerwin, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,353
Int. Cl.⁴ G21C *19/00*
U.S. Cl. 376—265 **9 Claims**



1. Method of operating a ball-bed nuclear reactor with fuel element balls, some of which have a fissionable material content different from that of others of said balls, comprising the steps of:

initially partly filling a reactor cavern, to produce a reactor core therein, with fuel balls of sufficient fissionable material content for establishing criticality and a desired level of power production at the completion of said partial filling and then, without any further filling of said reactor cavern, starting reactor operation;

thereafter without any removal of fuel balls from said reactor cavern, filling fuel balls continually or in groups at relatively short intervals into said reactor cavern during increasing burning up of the fuel balls already therein, for compensation of the diminishing fissionable material content of the reactor core constituted by said fuel balls until a final total quantity of filling is reached;

after said final filling quantity is reached and burning up has occurred, shutting down the reactor, cooling it off, releasing the pressure in said cavern, and

thereafter unloading all said fuel balls from said reactor cavern, unloading being begun when the reactor is shut down and being completed before said reactor is restarted.

4,695,424

CELL FOR A SPENT NUCLEAR FUEL RACK

William M. Flynn, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1985, Ser. No. 790,604
Int. Cl.⁴ G21C *19/40*
U.S. Cl. 376—272 **8 Claims**

1. A cell for a spent fuel rack, comprising:

a sheet metal element having an inside surface and an outside surface, and including

a first substantially flat wall portion,

a second substantially flat wall portion

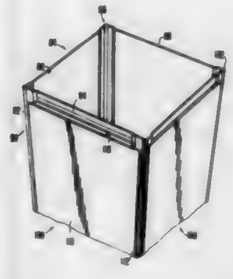
disposed substantially perpendicularly to said first wall portion,

a third substantially flat wall portion disposed substantially perpendicularly to said second wall portion and substantially parallel to said first wall portion,

a fourth substantially flat wall portion disposed substantially perpendicularly to said first and third wall portions and substantially parallel to said second wall portion,

an elongated bent region joining said first and second wall portions, said bent region having an elongated and substantially flat platform portion that is disposed substantially parallel to said first wall portion but that is not coplanar with said first wall portion, an elongated and substantially flat platform portion that is disposed substantially parallel to said second wall portion but that is not coplanar with said second wall portion, and at least one protruding portion that is intersected by planes lying on the outer surfaces of said platform portions of said bent region, the outside surface of said at least one protruding portion of said bent region having a radius of curvature that is less than about 0.65 centimeters,

an additional elongated bent region joining said second and third wall portions, said additional bent region having an elongated and substantially flat platform portion that is disposed substantially parallel to said second wall portion but that is not coplanar with said second wall portion, an elongated and substantially flat platform portion that is disposed substantially parallel to said third wall portion but that is not coplanar with said third wall portion, and at least one protruding portion that is intersected by planes lying on the outer surfaces of said platform portions of said additional bent region, the outside surface of said at least one protruding portion of said additional bent region having a radius of curvature that is less than about 0.65 centimeters,



a further elongated bent region joining said third and fourth wall portions, said further elongated bent region having an elongated and substantially flat platform portion that is disposed substantially parallel to said third wall portion but that is not coplanar with said third wall portion, an elongated and substantially flat platform portion that is disposed substantially parallel to said fourth wall portion but that is not coplanar with said fourth wall portion, and at least one protruding portion that is intersected by planes lying on the outer surfaces of said platform portions of said further bent region, the outside surface of said at least one protruding portion of said further bent region having a radius of curvature that is less than about 0.65 centimeters,

another elongated and substantially flat platform portion that is disposed substantially parallel to said fourth wall portion but that is not coplanar with said fourth wall portion, and

another elongated and substantially flat platform portion that is disposed substantially parallel to said first wall portion but that is not coplanar with said first wall portion;

means for joining said another platform portions;

four sheets of neutron poison; and

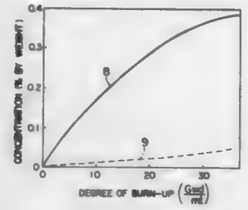
four sheet metal wrappers, each securing a respective neutron poison sheet to a respective wall portion, each wrapper having a substantially flat central portion and substantially flat border regions that lie in the same plane as the central portion and that are attached to platform portions.

4,695,425

FUEL ASSEMBLY

Motoo Aoyama, Hitachi; Hiromi Maruyama, Katsuta; Kikuo Umegaki, Hitachi, and Sadao Uchikawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,082
Claims priority, application Japan, Oct. 4, 1983, 58-185330
Int. Cl.⁴ G21C *3/32*
U.S. Cl. 376—435 **10 Claims**



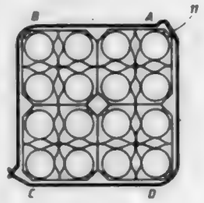
1. A fuel assembly comprising a plurality of fuel rods arranged in a lattice and being charged into a core of a BWR nuclear reactor using light water as a coolant, the fuel rods of the fuel assembly being divided into a first group of fuel rods and a second group of fuel rods, the first group of fuel rods having a first average concentration of U^{236} and the second group of fuel rods having a second average concentration of U^{236} higher than the first average concentration of the first group of fuel rods, the first group of fuel rods and the second group of fuel rods being arranged at different predetermined positions in the fuel assembly, the U^{236} being U^{236} recovered by reprocessing spent fuel, whereby a fuel assembly for a light water BWR nuclear reactor is provided which reduces the requirements for natural uranium by reutilizing uranium recovered by reprocessing spent fuel to lower the reactivity penalty due to U^{236}.

4,695,426

SPACER FOR FUEL RODS

Olov Nylund, Västerås, Sweden, assignor to Aktiebolaget ASEA-ATOM, Västerås, Sweden

Filed Jul. 7, 1986, Ser. No. 882,362
Claims priority, application Sweden, Jul. 9, 1985, 8503403
Int. Cl.⁴ G21C *3/34*
U.S. Cl. 376—441 **10 Claims**



1. A spacer for retaining and fixing elongated fuel rods into bundles insertable into a fuel assembly of a nuclear reactor, said spacer being made of a zirconium alloy having a low neutron absorption and comprising spring elements and surrounding structure elements, the spring elements being intentionally given a texture which provides a certain axial irradiation growth and the surrounding structure elements being intentionally given a texture having a smaller axial irradiation growth than that for said spring elements.

4,695,427

METHOD FOR PRODUCTION OF LANTHANIDE-CONTAINING ALLOY

Toru Degawa, Kurashiki; Kozo Fujiwara, Tamano; Akio Hashimoto, Takamatsu; Seiju Uchida, Tamano; Gen Okuyama, Tamano, and Susumu Matsui, Tamano, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1986, Ser. No. 927,790
Claims priority, application Japan, Nov. 19, 1985, 60-259385; Jun. 5, 1986, 61-130996
Int. Cl.⁴ C22B *34/00*; C21B *7/04*
U.S. Cl. 420—129 **19 Claims**

1. A method for the production of a lanthanide-containing alloy, comprising melting under non-oxidizing atmosphere the lanthanide-containing alloy by the use of a container having the inner surface thereof formed of a calcia-based refractory possessing a CaO content of not less than 90% by weight.

4,695,428

SOLDER COMPOSITION

Richard E. Ballentine, Montevallo, Ala., and Robert M. Henson, Cincinnati, Ohio, assignors to J. W. Harris Company, Cincinnati, Ohio

Filed Aug. 21, 1986, Ser. No. 898,498
Int. Cl.⁴ C22C *19/00, 18/02*
U.S. Cl. 420—561 **6 Claims**

1. A low temperature, lead-free metal solder composition comprising by weight:

0.5–4.0% antimony

0.5–4.0% zinc

0.1–3.0% silver

0.1–2.0% copper

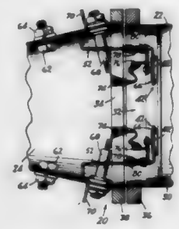
88.0–98.8% tin.

4,695,429

ENGINE EXHAUST PARTICULATE IGNITOR CONSTRUCTION

Peter J. Lapoli, Hamden, and Donald J. Mattis, Norwalk, both of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Mar. 20, 1985, Ser. No. 714,190
Int. Cl.⁴ B01D *50/00*; F01N *3/10, 3/38, 7/18*
U.S. Cl. 422—49 **22 Claims**



9. A vibration-resistant exhaust-gas purification canister for installation in an exhaust line of an internal combustion engine in a vehicle, comprising in combination:

(a) a generally tubular exhaust-gas causing having an open end,

(b) an end fitting having a wide mouth removably connected to the open end of the exhaust-gas casing, and having an inlet port for connection to an exhaust line,

(c) releasable fastening means joining the wide mouth of the fitting to the open end of the exhaust-gas casing, so as to close off said open end,

(d) a porous filter element in the path of the exhaust gas, said filter element trapping particulate matter carried in the exhaust gas,

(e) a vibration-resistant, spiral, tightly wound igniting coil

disposed between the porous filter element in the exhaust-gas casing and the inlet port of the fitting, said coil being located in a path along which the particulate-containing exhaust stream flows, for vaporizing at least some of the particulate matter in the stream whereby the resultant vaporized particulate matter can pass through the porous filter element with minimal clogging of said filter element,

(f) means comprising an enclosing electrically-conducting annular casing, mounting the igniting coil on the end fitting with a face of the coil being exposed to the said exhaust stream so as to increase the efficiency of the vaporizing that occurs, said enclosing casing being connected to an outer convolution of the coil and constituting a terminal thereof, and

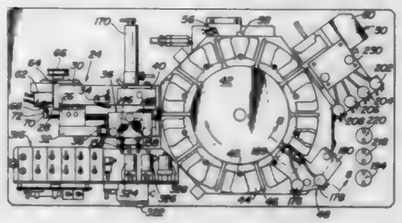
(g) electrical connection means for establishing a circuit from an electrical system of a vehicle to the inner convolution of the igniting coil.

4,695,430

ANALYTICAL APPARATUS

William E. Coville, Levittown, Pa.; Hyman Grossman, Lambertville, N.J., and Michael Sokol, Melrose Park, Pa., assignors to Bio/Data Corporation, Hatboro, Pa.

Filed Oct. 31, 1985, Ser. No. 793,376
Int. Cl.[4] G01N *35/04*
U.S. Cl. 422—65 **16 Claims**



1. Apparatus for automatically performing analytical testing of individual distinct samples of biological fluids wherein one or more test reagents are introducted into said samples and the reacted samples are tested for a change in optical characteristics, comprising:

(a) memory means for storing a plurality of different test protocols,

(b) means for enabling an operator to select one of said plurality of test protocols from said memory,

(c) a plurality of differently-configured sample cell means for receiving individual distinct samples of biological fluid to be tested,

(d) means for receiving individual sample cells

(e) sensor means for sensing the presence of an individual sample cell and generating signals representative of the configuration of the sensed sample cells,

(f) means for transporting individual sample cells to a first location,

(g) means at the first location responsive to the signals representative of the configuration of the sample cells for filtering unwanted non-fluid material from the fluid to be tested and for removing excess fluid to be tested from at least one test chamber in said sample cells to cause a precise, accurate volume of fluid to be tested to remain in the test chamber in response to a first one of said signals and for only removing excess fluid to be tested from at least one test chamber in said sample cells to cause a precise, accurate volume of fluid to be tested to remain in the test chamber in response to a second one of said signals representative of a differently configured sample cell,

(h) means for transporting individual sample cells from the first location to a second location, the means for transporting including means for heating individual sample cells to a preselected temperature,

(i) means at the second location for introducing a first reagent into the sample,

(j) means for transporting individual sample cells from the second location to a test location,

(k) means at the test location for introducing additional reagents into the sample,

(l) means at the test location for optically scanning the sample in a vertical direction relative to individual sample cells and for precluding an air-to-fluid interface in the optical scanning path,

(m) means for optically detecting a change in an optical characteristic of the sample, and

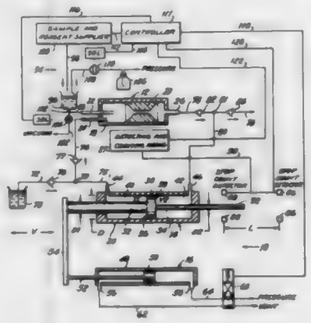
(n) means for providing an indication that a change in said optical characteristic of the sample has been detected.

4,695,431

VOLUMETRIC PUMPING APPARATUS AND METHOD FOR SUPPLYING FLUIDS TO SHEATH STREAM FLOW CELLS

Gregory A. Farrell, Teaneck, N.J., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 408,390, Aug. 16, 1982, abandoned. This application Aug. 16, 1985, Ser. No. 766,671
Int. Cl.[4] G01N *1/14, 21/01*
U.S. Cl. 422—81 **22 Claims**



1. In an apparatus for establishing a precisely controlled sheath stream flow of first and second fluids from respective sources thereof through a sheath stream flow cell having an inlet and an outlet, the improvements comprising, means for pumping a controlled volume of said first fluid from said (a) source thereof to said flow cell inlet, means integral and cooperating with said first fluid pumping means for aspirating a controlled volume of said second fluid from said (a) source thereof to said flow cell inlet, and means integral and cooperating with said first fluid pumping means and second fluid aspirating means for withdrawing by aspiration at a controlled rate from the outlet of said flow cell a volume of mixed first and second fluids equal to the sum of the volumes the first and second fluids introduced into said flow cell while said first and second fluids are being pumped and aspirated, respectively, into said flow cell inlet by said first fluid pumping means and said second fluid aspirating means.

4,695,432

NITRIDES AND OXYNITRIDES WHICH CAN BE USED AS SELECTIVE DETECTORS OF REDUCING GASES IN THE ATMOSPHERE, AND DETECTION DEVICE CONTAINING THEM

Yves Colin, Cesson-Sevigne; Gabriel Rosse, Rennes; Jean Guyader, Agine, and Yves Laurent, Cesson-Sevigne, all of France, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris and Universite de Rennes I, Rennes, both of, France

Filed Mar. 28, 1986, Ser. No. 845,465
Claims priority, application France, Apr. 2, 1985, 85 04989
Int. Cl.[4] G01N *27/12*
U.S. Cl. 422—98 **5 Claims**

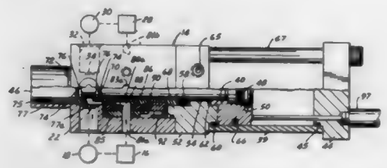
1. A device for the selective detection, in the atmosphere, of nitrogen-containing reducing gases, comprising a support provided with a heating means, said support having a layer thereon of a nitride or oxynitride of tetrahedral structure, and a means for measuring variations in the resistance of said layer in response to chemisorption of nitrogen-containing reducing gases on said layer, said measuring means producing a signal representing the concentration of gases in the vicinity of said layer.

4,695,433

VALVED MIX-HEAD FOR RIM PROCESS

Jerry V. Scrivo, and Gordon W. Breuker, both of Holland, Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Dec. 23, 1985, Ser. No. 812,049
Int. Cl.[4] G05D *16/00*; G05B *17/00*; B01F *15/02*
U.S. Cl. 422—112 **8 Claims**



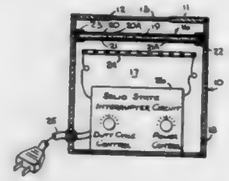
1. A mix-head assembly for combining two or more chemical streams for mixing and discharge into a mold cavity comprising: a mix-head body having a sleeve therein defining a longitudinal mixing bore of constant diameter along the length thereof, said sleeve having a plurality of inlet openings, said mix-head body having a plurality of return ports, each of said inlet openings communicating with said mixing bore to direct a chemical composition stream into said mixing bore, said mixing bore having an outlet end defining a discharge port for flow of a mixture of streams from said mixing bore to a mold cavity, said sleeve having spaced slots in its outer surface in communication with said inlet opening so as to define a return path in said sleeve, a slide plunger of constant diameter along its length in sliding fit relationship with the inside diameter of said bore, a piston valve in surrounding sliding relationship to said plunger and being positioned for opposite reciprocation thereon, said plunger being slidably positioned so as to reciprocate in opposite directions within said bore and being positioned so as to open and close said inlet openings, said piston valve being positioned so as to move in a first direction to cause material to be directed from the mix-head body through said return ports, said piston valve being positioned so as to move in a direction opposite to said first direction to block flow through said return ports so as to cause recirculation flow from each of said inlet openings through one of said slots to one of said return ports.

4,695,434

AROMA-GENERATING UNIT

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Aug. 27, 1982, Ser. No. 412,080
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.[4] A61L *9/04*
U.S. Cl. 422—116 **3 Claims**



1. An aroma generating unit comprising:

A. a hollow case whose upper wall has a vent therein and whose side wall has a cartridge-receiving slot;

B. a replaceable cartridge insertable in said slot to occupy a position in said case under said vent; said cartridge, when fully inserted, defining an air-confined chamber within the case, said cartridge having a porous mat having wicking properties impregnated with an aroma-producing liquid enclosed in a housing defined by a pair of sheets between which the mat is sandwiched, said sheets having corresponding central holes therein to form a port which exposes the central portion of the mat, the remaining unexposed portion of the mat acting as a reservoir for the liquid which as liquid is depleted from the central exposed portion, it is replenished by liquid wicked from the unexposed portion; and

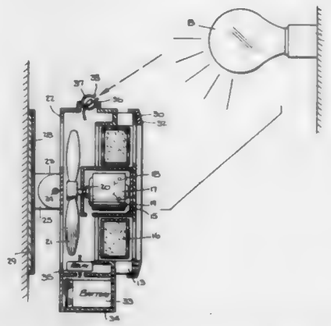
C. an electrical heater disposed in said chamber which, when energized, acts to heat and expand the confined air therein to create a positive pressure forcing the heated air through the port and the exposed portion of the impregnated mat to rapidly volatilize the liquid and to produce an aromatic vapor which is discharged into the atmosphere through said vent.

4,695,435

LIGHT-ACTIVATED AROMA GENERATOR

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 592,915, Mar. 23, 1984, Pat. No. 4,568,521. This application Aug. 13, 1985, Ser. No. 765,152
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] A61L *9/2*
U.S. Cl. 422—124 **7 Claims**



1. In combination with a switch-controlled light bulb dis-

posed at a fixed position in a room having ambient light therein, an aroma generator which is rendered operative to modify the atmosphere of the room only when the switch connected to said light bulb is turned on; said generator comprising:

A. a case having pressure-sensitive adhesive mounting means for mounting the case on a wall in the room at a position adjacent the light bulb and including a compartment for housing of a battery;

B. a low-voltage direct current motor coupled to a propeller fan and which is housed in said case;

C. an orientable light sensor mounted on said case, said sensor being orientable relative to said light bulb to intercept light rays from said light bulb to produce a signal whose magnitude depends on the intensity of the rays impinging thereon;

D. an air permeable cartridge containing an aroma supply and disposed in said case in operative relation to said fan to exude an aroma into the atmosphere at a relatively rapid rate only when an air current is forced through said cartridge by said fan; and

E. a signal-responsive electronic relay disposed in said case, said relay being coupled to said sensor and connecting said battery to said motor, said relay being actuated only when the signal applied thereto by said sensor has a magnitude which is a function of the light rays from the bulb when it is switched on and substantially exceeds the magnitude of the signal resulting from said ambient light, whereby the operation of the generator is coordinated with that of the light bulb, despite the absence of a wired connection therebetween and the generator is rendered operative only when the switch is turned on.

4,695,436

PROCESS FOR MANUFACTURING HIGH PURITY METAL CHLORIDES

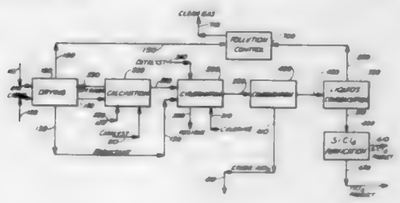
Ronald Wyndham, Thibodaux, La.; Gervaise M. Chaplin, New Delhi, India, and William M. Swanson, Tucson, Ariz., assignors to Toth Aluminum Corporation, Metairie, La.

Filed Jan. 16, 1985, Ser. No. 691,958

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.[4] C01B *9/02;* **C01F** *7/60, 7/62*

U.S. Cl. 423—135 **9 Claims**



1. A process for producing and yielding metal chlorides, comprising the steps of:

a. providing aluminous ore and a carbon source;

b. drying and calcining said aluminum ore and carbon source at a temperature not to exceed 900° C. in the presence of a sulfur containing compound;

c. combining said aluminous ore and carbon source with a chlorinating agent at a temperature range from 500° C. to 1000° C. thereby producing crude metal chlorides;

d. condensing solid crude $AlCl_3$ and separating it from crude $SiCl_4$ and $TiCl_4$ formed in said step 1c.;

f. sublimating and desublimating said $AlCl_3$ to produce substantially pure $AlCl_3$ at a temperature not to exceed 180° C. and one (1.0) atmosphere of pressure.

4,695,437

SELECTIVE CATALYTIC REDUCTION CATALYSTS

Hyun J. Jung, Wayne, Pa., assignor to Johnson Matthey, Inc., Malvern, Pa.

Filed Jun. 13, 1986, Ser. No. 874,154

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] B01J *8/00, 27/053, 27/043;* **C01B** *21/00*

U.S. Cl. 423—239 **3 Claims**

1. In a process for removing NO_x from a gas containing excess oxygen which involves adding NH_3 to the gas and passing the gas over a catalyst at a temperature of 350° to 450° C. to react the NO_x with the NH_3, the improvement which comprises using, as the catalyst, a catalyst consisting essentially of an oxysulfur compound of manganese or nickel, or mixtures thereof, carried by a mixture of ceria and alumina on a support, the ceria comprising 2–60% by weight of the mixture of ceria and alumina and the manganese, nickel or mixture thereof comprises from 0.1–25% by weight of metal based on the carrier weight.

4,695,438

SELECTIVE CATALYTIC REDUCTION CATALYSTS

E. Robert Becker, and Hyun J. Jung, both of Wayne, Pa., assignors to Johnson Matthey, Inc., Malvern, Pa.

Filed Jun. 13, 1986, Ser. No. 874,153

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] B01J *8/00, 27/053, 27/043;* **C01B** *21/00*

U.S. Cl. 423—239 **2 Claims**

1. In a process for removing NO_x from a gas containing excess oxygen which involves adding NH_3 to the gas and passing the gas over a catalyst at a temperature of 250° C. to 500° C. to react the NO_x with the NH_3, the improvement which comprises using, as the catalyst, a catalyst consisting essentially of iron sulfate carried by a mixture of ceria and alumina on a support, the ceria comprising 2–60% by weight of said mixture and the iron sulfate comprising from 0.5–50% by weight of said mixture.

4,695,439

YTTRIUM OXIDE STABILIZED ZIRCONIUM OXIDE

Joseph E. Ritsko; David L. Houck, and Howard L. R. Acla, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 25, 1986, Ser. No. 911,603

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—263 **2 Claims**

1. A process comprising:

(a) forming a solution by mixing yttrium hydroxide and a sufficient amount of an aqueous solution of acetic acid to dissolve the yttrium hydroxide, wherein said solution has a concentration of yttrium ion of about 5% to about 20% by weight of said solution,

(b) adding from about 80% to about 95% by weight of zirconium oxide having a particle size range from about 1 to about 5 microns to yield a Zr to Y weight ratio of from about 4:1 to about 19:1 and thereby forming a slurry,

(c) spray drying said slurry to form spherical agglomerates consisting essentially of zirconium oxide and a relatively uniform distribution of yttrium acetate whereby said agglomerates have a size from about 20 to about 200 micrometers,

(d) heating said agglomerates to about 600° C. to about 700° C. in a neutral or oxidizing atmosphere to convert yttrium acetate to yttrium oxide to thereby form zirconium oxide yttrium oxide agglomerates with about 5% to about 20% by weight of yttrium oxide.

4,695,440

CRYSTALLINE ALUMINOSILICATE ISI-6

Nobuyuki Morimoto; Kozo Takatsu, both of Sodegaura, and Michio Sugimoto, Ichihara, all of Japan, assignors to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Division of Ser. No. 582,529, Feb. 22, 1984, Pat. No. 4,578,259.

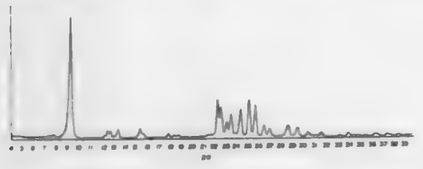
This application Jan. 9, 1986, Ser. No. 790,741

Claims priority, application Japan, Mar. 7, 1983, 58-35926; Oct. 14, 1983, 58-190977

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **3 Claims**



1. A crystalline aluminosilicate which has a composition represented by the general formula (I) after being calcined in the air at 550° C.,

$$pM_{2/n}O.Al_2O_3.qSiO_2 \quad (I)$$

wherein M represents at least one element selected from hydrogen, alkali metals, and alkaline earth metals, n represents the valence of M, and p and q are within the ranges of $0.05 \leqq p \leqq 3.0$ and $60 \leqq q \leqq 500$, and has the X-ray diffraction pattern set forth in Table 2.

4,695,441

MANUFACTURE OF SILANE

Edward J. Lahoda, Edgewood Borough; Herbert A. Burgman, Murrysville, both of Pa., and Young J. Kwon, Fruit Heights, Utah, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 2, 1987, Ser. No. 10,108

Int. Cl.[4] C01B *33/04*

U.S. Cl. 423—347 **15 Claims**

1. A method of making silane comprising reacting a compound having the general formula SiR_4 with hydrogen, where each R is independently selected from the group consisting of alkoxy to C_4, alkyl to C_4, alkylene to C_4, and alkinyl to C_4.

4,695,442

AMMONIA SYNTHESIS PROCESS

Alwyn Pinto, Middlesbrough, and John B. H. Johnson, Sedgefield, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 20, 1985, Ser. No. 703,531

Claims priority, application United Kingdom, Feb. 3, 1984, 8405591; Apr. 7, 1984, 8417016; Apr. 7, 1984, 8417017; Sep. 10, 1984, 8425508

Int. Cl.[4] C01C *1/04*

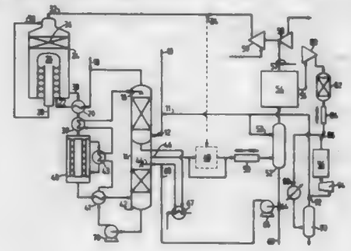
U.S. Cl. 423—359 **15 Claims**

1. A process for the production of ammonia comprising

(i) forming ammonia synthesis gas by

(a) reacting a volatile hydrocarbon feedstock with steam and a gas containing oxygen and nitrogen at a pressure in the range 25 to 50 bar abs. using process conditions and reactant proportions so as to produce a crude gas containing hydrogen,
unreacted steam, and
medium boiling gas containing
carbon monoxide, and
nitrogen in an excess of that required in the ammonia synthesis gas,
and in which the molar ratio of hydrogen plus carbon monoxide to nitrogen and other medium boiling gas, if any, is in the range 1.25 to 2.50, and the content of carbon monoxide plus carbon dioxide, if any, is in the range 10 to 25% v/v on a dry basis;

(b) converting carbon monoxide to carbon dioxide by subjecting the crude gas to a single stage of catalytic shift reaction to produce a raw gas having a carbon monoxide content of less than 0.5% v/v on a dry basis and in which at least 90% of the total medium boiling gas is nitrogen, said shift reaction being controlled at 230° to 280° C. and operated in indirect heat exchange with a coolant, thereby producing a stream of heated coolant, and at least some of



the steam employed in the step (a) being introduced by contacting the feedstock with a stream of heated water, comprising hot water or a mixture of hot water and steam, said stream of heated water comprising said heated coolant, where the coolant is water, or being obtained by indirect heat exchange with the stream of heated coolant;

(c) removing carbon dioxide and medium boiling gas, including the excess of nitrogen, from the raw gas by a pressure swing adsorption process, to give a product gas; and

(d) methanating the product gas to convert residual carbon oxides therein to methane; and

(ii) passing the ammonia synthesis gas over an ammonia synthesis catalyst to produce a reacted gas stream containing synthesised ammonia, and separating synthesised ammonia from said reacted gas stream.

4,695,443

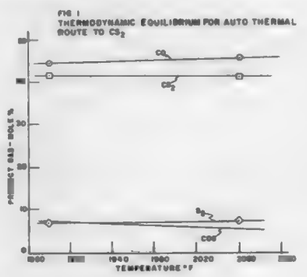
AUTOTHERMAL PROCESS FOR THE PRODUCTION OF CARBON DISULFIDE AND HYDROGEN SULFIDE

Albert M. Leon, Mamaroneck, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 14, 1985, Ser. No. 701,841

Int. Cl.[4] C01B *31/26, 17/16*

U.S. Cl. 423—443 **7 Claims**



1. An autothermal process for the production of carbon

disulfide from a carbonaceous material and elemental sulfur which comprises reacting the carbonaceous material with an oxygen-containing gas and elemental sulfur in a one-step process in a fluid bed so as to autogenously generate the temperatures necessary for the reaction of the carbonaceous material with elemental sulfur.

4,695,444

METHOD OF MANUFACTURING SULPHUR FROM SO_2 CONTAINING GASES

Horst Grochowski, Oberhausen; Dieter Zurawsky, Gladbeck; Karl Knoblauch, Essen; Klaus Goldschmidt, Essen, and Jürgen Schwarte, Essen, all of Fed. Rep. of Germany, assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation of Ser. No. 280,506, Jul. 6, 1981, abandoned, which is a continuation of Ser. No. 131,363, Mar. 18, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 432,398

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1979, 2933713

Int. Cl.⁴ C01B *17/02*

U.S. Cl. 423—569 **9 Claims**

1. A method of producing sulfur from sulfur dioxide containing feed gas comprising: dividing said feed gas into first and second streams, the volume ratio of said first stream to said second stream being 2:1; introducing said first stream into a reaction zone containing a carbon containing substance; maintaining a portion of said carbon containing substance at a temperature between 900° C. and 1000° C. by introducing air into said carbon containing substance at a point upstream of the location at which said feed gas is introduced into said carbon containing substance; contacting said feed gas with said portion of said carbon containing substance for a sufficient time to convert the sulfur dioxide to hydrogen sulfide; combining said hydrogen sulfide with said second gas stream thereby producing a gas mixture containing hydrogen sulfide and sulfur dioxide in a volume ratio of 2:1; causing the hydrogen sulfide and the sulfur dioxide in said gas mixture to react and form sulfur.

4,695,445

MAGNESIUM HYDROXIDE AND PROCESS FOR ITS PRODUCTION

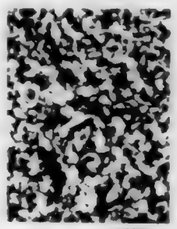
Keiichi Nakaya, Chiba, and Kunio Tanaka, Ichihara, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 11, 1986, Ser. No. 895,464

Claims priority, application Japan, Aug. 14, 1985, 60-177713

Int. Cl.⁴ C01F *5/16*

U.S. Cl. 423—635 **20 Claims**



X 10000

1. Magnesium hydroxide having a fine plate-shaped particle form with an average particle size ($\bar{d}$) of from 0.2 to 0.8 ? m as measured by a light transmission liquid phase sedimentation method, wherein the proportion of particles having a particle size of $\bar{d}+0.5$ μm or larger is not greater than 50% by weight based on the weight of the total particles, and the particle thickness distribution is such that the proportion of particles having a thickness of 0.05 μm or less is not greater than 5% by number and the proportion of particles having a thickness of 0.2 μm or more is not greater than 20% by number; and wherein said magnesium hydroxide is produced by a process which comprises:

(a) reacting an aqueous solution containing a water-soluble magnesium salt, with ammonia; and

(b) precipitating the magnesium hydroxide formed thereby from the aqueous solution, wherein the precipitation of magnesium hydroxide is initiated when the concentration of magnesium hydroxide dissolved in the aqueous solution reaches a level equal to or greater than the value of C_S, with C_S being represented by the formula:

$$C_S = 0.0293\ C_M^{1.78}$$

wherein C_S is the concentration in g mol/liter of magnesium hydroxide dissolved in the aqueous solution at the initiation of the precipitation of magnesium hydroxide, and C_M is the concentration in g mol/liter of magnesium ions in the aqueous solution containing the water-soluble magnesium salt to be reacted with ammonia.

4,695,446

METHOD OF SEPARATING AND PURIFYING HYDROGEN

Borislav Bogdanovic, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 626,819, Jul. 2, 1984, which is a continuation of Ser. No. 500,070, Jun. 1, 1983, which is a continuation of Ser. No. 499,140, May 21, 1983, abandoned, which is a continuation of Ser. No. 433,978, Oct. 6, 1982, abandoned, which is a continuation of Ser. No. 187,907, Sep. 17, 1980, abandoned, which is a continuation of Ser. No. 8,739, Feb. 2, 1979, abandoned. This application Jun. 3, 1985, Ser. No. 740,698

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247361

Int. Cl.⁴ C01B *1/32*

U.S. Cl. 423—648 R **6 Claims**

1. A method of absorbing hydrogen comprising (a) thermally dehydrogenating magnesium hydride that has been doped with a transition metal by contacting a finely divided form of magnesium hydride with a solution of a transition metal organic compound so that the elementary transition metal precipitates in an extremely finely divided form on the surface of the particles of magnesium hydride, said transition metal being of subgroups IV–VIII of the Period Table, and the removing the solution, thereby yielding active magnesium, and (b) contacting the active magensium with hydrogen, thereby selectively to absorb the hydrogen by forming magnesium hydride, heating the magnesium hydride thereby to desorb the hydrogen in purified form and regenerate active magnesium from the hydride, and recovering the desorbed hydrogen.

3. A method of absorbing hydrogen comprising (a) thermally dehydrogenating a magnesium hydride that has been doped with a transition metal by contacting a finely divided form of metallic magnesium with a solution of a transition metal organic compound, so that the elementary transistion metal precipitates in an extremely finely divided form on the surface of the particles of magnesium, said transition metal being of subgroups IV–VIII of the Periodic Table, thereby yielding active magnesium and (b) contacting the active magnesium with hydrogen, thereby selectively to absorb the hydrogen by forming magnesium hydride, heating the magnesium hydride thereby to desorb the hydrogen in pruified form and regenerate active magnesium from the hydride, and recovering the desorbed hydrogen.

5. A method of absorbing hydrogen comprising contacting the hydrogen with active magnesium wherein the active magnesiuum initially contacted with the hydrogen is metallic magnesium obtained by thermally dehydrogenating a magensium hydride that has been doped with a transition metal by reacting magnesium with hydrogen in an organic solvent in the presence of anthracene and a halide of a transition metal of the IVth to VIIIth Subgroup of the Periodic Table, thereby selectively to absorb the hydrogen by forming magnesim hydride, heating the magnesium hydride thereby to desorb the hydrogen in purified from and regenerate active magnesium from the hydride, and recovering the desorbed hydrogen.

4,695,447

DESTRUCTION OF INORGANIC HAZARDOUS WASTES

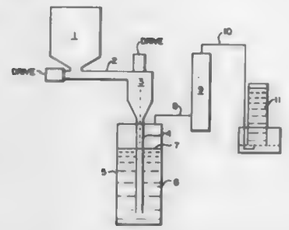
Clifford G. Shultz, Evansville, Ind., assignor to Detox International Corporation, St. Charles, Ill.

Continuation of Ser. No. 628,998, Jul. 9, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 809,976

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.⁴ C02F *11/00, 1/70*; C22B *7/00, 5/04*

U.S. Cl. 423—659 **19 Claims**



1. A process for treating non-radioactive hazardous waste comprising residues left in chemical waste dumps or aggregations of hazardous materials collected at chemical waste storage sites, said process comprising the step of contacting said waste with molten aluminum to provide reduction to lower less hazardous oxidation state.

4,695,448

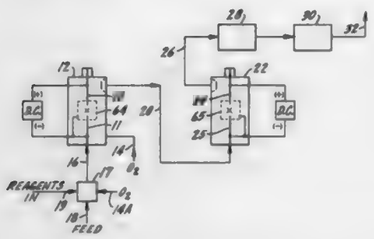
REDUCTION AND DISPOSAL OF TOXIC WASTE

Myron L. Anthony, Grand Junction, Colo., assignor to Grand Junction Reality Co., Inc., Grand Junction, Colo.

Filed Sep. 26, 1985, Ser. No. 780,274

Int. Cl.⁴ B01J *19/80*; F23G *5/10*; C01B *13/11*

U.S. Cl. 423—659 **11 Claims**



1. A method of oxidizing toxic waste compounds entrained as a stream of toxic waste and including the steps of establishing a high temperature electric arc in the gap presented by and between the opposed ends of a pair of spaced elongated consumable electrodes located within a substantially airtight chamber, the temperature within the arc being of an intensity to dissociate the toxic compound, one of the electrodes having a longitudinal bore which opens at its gap end, feeding a mixture of oxygen and the stream of toxic waste to and through said bore so that a jet of oxygen and toxic waste is emitted at said gap where the toxic compound content is dissociated in the presence of oxygen to form gaseous oxides, and establishing via oxygen introduction sufficient pressure within said chamber to force both particulate matter resulting from electrode erosion and evolved oxide gases as a stream of effluent educted from said chamber for disposal.

4,695,449

COMPOSITION AND METHOD FOR TREATMENT OF MELANOMAS

John M. Pawelek, Hamden, Conn., assignor to Yale University, New Haven, Conn.

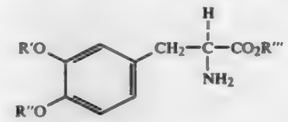
Filed Mar. 30, 1983, Ser. No. 480,402

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.⁴ A61K *49/00, 43/00*

U.S. Cl. 424—1.1 **12 Claims**

1. A composition useful in the treatment of melanomas in human beings comprising at least one O-phosphorylated derivative of DOPA of the general formula I



I

wherein R′ and R″ are each hydrogen or

$$(R'''O)_2P(O)-$$

or R′ and R″ together represent

$$(R'''O)P(O)$$

wherein R‴ and R‴′ each represent hydrogen or a pharmaceutically acceptable cation and P is ^{32}P with the provisos that R′ and R″ cannot simultaneouly be hydrogen.

4,695,450

ANHYDROUS EMULSIONS AND THE USE THEREOF

Kurt H. Bauer, Freiburg-Tiengen, and Heinrich Pins, Eberbach, both of Fed. Rep. of Germany, assignors to Warner Lambert Company, Morris Plains, N.J.

Filed Oct. 7, 1983, Ser. No. 540,082

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237814

Int. Cl.⁴ A61U *9/26, 31/00, 47/00*

U.S. Cl. 424—22 **6 Claims**

1. An anhydrous physiologically acceptable carrier comprising an emulsion of (1) a hydrophobic liquid selected from the group consisting of a vegetable oil, an animal oil, a mineral oil, a synthetic oil and mixtures thereof and (2) a hydrophilic, anhydrous liquid.

4,695,451

AEROSOL ANTIPERSPIRANT COMPOSITION

Alan Straw, Macclesfield, and Stewart Shields, Salford, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,991

Int. Cl.⁴ A61K *7/32, 7/34, 7/36, 7/38*

U.S. Cl. 424—47 **9 Claims**

1. An aerosol antiperspirant composition in the form of a substantially stable water-in-oil emulsion which does not result in reversion of said emusion when it is sprayed from a container consisting of 25% to 50% by weight of a liquefied, normally gaseous propellant and 50% to 75% of a base consisting essentially of, by weight:

A. 4% to 20% of at least one water-soluble, astringent salt having antiperspirant efficacy;

B. 0.5% to 5% of a water-in-oil emulsifier;

C. 10% to 25% of a propellant-soluble emollient-stabilizer agent consisting of (1) a water-insoluble, organic, liquid

emollient selected from the group consisting of isopropyl esters of C_{12}–C_{18} alkanoic acids, C_8–C_{12} alkanols and silicone oils and (2) a water-insoluble organic liquid hydrocarbon having a boiling point in the range of 65° C. to 130° C., the weight ratio of (1) to (2) being in the range of 0.8:1 to 3:1; and

D. 55% to 78% of water, said base being in the form of a substantially stable water-in-oil emulsion.

4,695,452

COSMETIC STICK

Peter M. Gannis, and Aphrodite Gannis, both of 50 Kensington Rd., Stamford, Conn. 06905

Continuation of Ser. No. 659,257, Oct. 10, 1984, abandoned. This application Aug. 8, 1986, Ser. No. 894,709

Int. Cl.⁴ A61K *7/42, 31/355, 31/375*

U.S. Cl. 424—59 **19 Claims**

1. A cosmetic stick composition for applying a cosmetic to human skin, and when applied to the skin has a frictional drag which produces a massaging action, the cosmetic composition consisting essentially of:

approximately between 9.5 and 57% by weight of acetylated monoglyceride having the consistency of a waxy solid; approximately between 5 and 39% by weight beeswax having a melting temperature of approximately 149 degrees F.; and

approximately between 2 and 24% by weight of isopropyl myristate in liquid form, and a cosmetic additive selected from the group consisting of pigments, fragrances, antioxidants, emollients, sunscreens, vitamins, humectants, and moisturizers whereby the cosmetic composition has a coefficient of friction which is greater than approximately 0.5.

4,695,453

THICKENED ALCOHOLIC ANTIMICROBIAL COMPOSITIONS

Francis W. Tuominen, Minneapolis; Helmut K. Maier, Golden Valley, and Warren W. Howland, Champlin, all of Minn., assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 694,538, Jan. 24, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 858,099

Int. Cl.⁴ A61K *31/78*

U.S. Cl. 424—81 **4 Claims**

1. A method of controlling the growth of bacteria comprising subjecting bacteria to a bactericidally effective amount of an alcoholic antibacterial composition composed of a mixture of about 40–50% ethanol, about 20–30% isopropanol and about 0.5–2% benzyl alcohol thickened with 0.2–2% by weight of a homopolymer selected from the group consisting of

(x) poly(2-acrylamido-2-methylpropane sulfonic acid) and

(y) poly(ammonium 2-acrylamido-2-methylpropane sulfonate) wherein said homopolymer has a molecular weight from about 50,000 to about 5,000,000.

4,695,454

PROCESS FOR PREPARING HEPATITIS B SURFACE ANTIGEN CONTAINING PARTICLES IN NOVEL FORMS WHICH ARE HIGHLY IMMUNOGENIC

Alfred M. Prince, Pound Ridge, and Kwang S. Kim, Staten Island, both of N.Y., assignors to New York Blood Center, Inc., New York, N.Y. and Eugene Tech International, Inc., Allendale, N.J.

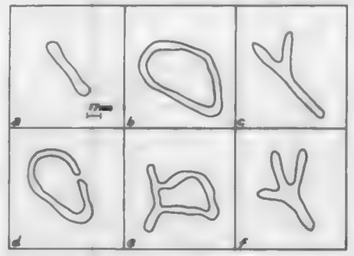
Filed Apr. 1, 1985, Ser. No. 718,248

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.⁴ A61K *35/16, 39/29*

U.S. Cl. 424—89 **18 Claims**

1. In a process for heat inactivating a virus in a concentrated mass containing the same and antigenic components thereof, the improvement wherein the concentrated mass is subjected to said heat inactivation without dilution thereof by a proteinaceous material, said heat inactivation comprising subjecting



the mass to a temperature of 101° to 104° C. for a dwell time of 1 to 15 minutes.

4,695,455

CELLULAR ENCAPSULATION OF PESTICIDES PRODUCED BY EXPRESSION OF HETEROLOGOUS GENES

Andrew C. Barnes, San Diego, and Susan G. Cummings, Chula Vista, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 693,080, Jan. 22, 1985, abandoned. This application Aug. 30, 1985, Ser. No. 771,313

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.⁴ A01N *63/00*; **C12P** *21/00*; **C12N** *15/00, 1/20*

U.S. Cl. 424—93 **19 Claims**

1. A pesticidal composition comprising pesticide-containing substantially intact microbial cells and an inert carrier wherein:

(1) the microbial cells have been stabilized with a chemical reagent selected from the group consisting of halogenating agents, aldehydes, anti-infective, alcohols and histological fixatives under conditions such that the cells have prolonged pesticidal activity when applied to the environment of a target pest; and

(2) the pesticide is a polypeptide, which remains intracellular after stabilisation, and is produced as a result of expression of a heterologous gene in the microbial cell, and which pesticide becomes accessible to a target pest upon ingestion of the cell by a pest.

4,695,456

METHOD FOR ALLEVIATING SKIN IRRITATION BY FORMULATIONS CONTAINING SUPEROXIDE DISMUTASE

Martin S. Wilder, Amherst, Mass., assignor to Centerchem, Inc., Tarrytown, N.Y. and Pentapharm AG, Basel, Switzerland

Filed Oct. 31, 1984, Ser. No. 666,677

Int. Cl.⁴ A61K *37/48*

U.S. Cl. 424—94.5 **24 Claims**

1. A method for the alleviation of dermal chemical irritation, dermal chemical inflammation or acne of the skin of a human, comprising applying at an area concentration of at least about 0.002 ml or 2 mg per square cm, a topical formulation containing a non-toxic, non-allergenic carrier and at least about 0.026 weight percent relative to the total weight of the formulation, of purified superoxide dismutase having an activity of at least about 3800 C.I.U./mg or an extract having an equivalent activity thereof, to the skin of said human having chemical irritation, inflammation or acne of the skin.

9. A method for the alleviation of dermal chemical irritation, dermal chemical inflammation or acne of the skin of a human, comprising applying at an area concentration of at least about 0.002 ml or 2 mg per square cm, a topical formulation containing a non-toxic, non-allergenic carrier and an amount of superoxide dismutase (SOD) sufficient to deliver at least abvout 1 CIU of SOD per square cm.

4,695,457

ENZYME COMPOSITION ACTING AS A DIGESTION PROMOTER ON VARIOUS LEVELS IN THE ALIMENTARY TRACT, AND A METHOD FOR FACILITATING DIGESTION

Lars G. I. Hellgren, Västra Frölunda, Sweden; Viggo Mohr, Trondheim, Norway, and Jan G. Vincent, Stockholm, Sweden, assignors to Pharmacia AB, Uppsala, Sweden

PCT No. PCT/SE85/00187, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Pub. No. WO85/04809, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 24, 1985, Ser. No. 829,642

Claims priority, application Sweden, Apr. 24, 1984, 8402238

Int. Cl.⁴ A61K *37/48*

U.S. Cl. 424—94 **6 Claims**

1. In a pharmaceutical composition formulated as a tablet, a granulated material, a capsule or a pellet and containing an amount of an enzyme preparation which is effective to promote decomposition of food containing meat or adipose tissue, or meat and adipose tissue, the improvement comprising that the enzyme preparation comprises those watersoluble proteolytic enzymes that (i) can be extracted by an aqueous solvent from an aquatic animal selected from the group consisting of the order Euphausiaceae and of the genus Mallotus, and (ii) have molecular weights, in a non-aggregated form, within the range of 15,000–80,000 daltons.

4,695,458

SOLUTION OF ALPHA-CHYMOTRYPSIN

Jorg H. Krumeich, Probst-Hellmich-Promenade 28, 4630 Bochum 6, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,337

Int. Cl.⁴ A61K *37/48*

U.S. Cl. 424—94 **6 Claims**

1. A method of performing an extracapsular operation for treatment of grey cataract, said method comprising the step of treating the posterior side of the capsule of the lens by irrigation with a composition of matter consisting essentially of alpha-chymotrypsin in a physiologically suitable solvent medium, said alpha-chymotrypsin being present in a dilution of one part by weight of said alpha-chymotrypsin to between 20,000 and 30,000 parts by weight of said solvent medium.

4,695,459

METHOD OF TREATING AUTOIMMUNE DISEASES THAT ARE MEDIATED BY LEU3/CD4 PHENOTYPE T CELLS

Lawrence Steinman; Matthew K. Waldor, both of Palo Alto, Calif.; Subramanian Sriram, Burlington, Vt.; Leonard A. Herzenberg, and Leonore A. Herzenberg, both of Stanford, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 26, 1984, Ser. No. 686,126

Int. Cl.⁴ A61K *35/56*

U.S. Cl. 424—95 **7 Claims**

1. A method of treating a patient for an autoimmune disease that is mediated by Leu3(CD4) phenotype T cells comprising parenterally administering a therapeutically effective amount of an anti-Leu3(CD4) antibody that binds to said T cells to the patient.

4,695,460

SYNTHETIC, PLASMA-FREE, TRANSFUSIBLE PLATELET STORAGE MEDIUM

Stein Holme, Virginia Beach, Va., assignor to American Red Cross, Washington, D.C.

Filed Mar. 19, 1986, Ser. No. 841,435

Int. Cl.⁴ A61K *35/14*; **A01N** *1/02*

U.S. Cl. 424—101 **20 Claims**

1. A sterile, plasma-free platelet storage medium comprising:

a physiologically compatible, aqueous electrolyte solution, one liter of said electrolyte solution having:

between about 3.0 grams and about 7.5 grams of dextrose;

between about 3.0 grams and about 6.0 grams of sodium citrate; and

between about 2.0 grams and about 4.2 grams of sodium bicarbonate;

said platelet storage medium being isotonic and having a pH in a range of between about 6.8 and about 7.4, said platelet storage medium being capable of preserving platelets for at least about 10 days at a temperature of at least about 22° C.

15. A process for preserving platelets in a sterile, plasma-free platelet storage medium comprising:

preparing a physiologically compatible, aqueous electrolyte solution, one liter of said electrolyte solution having:

between about 3.0 grams and about 7.5 grams of dextrose;

between about 3.0 grams and about 6.0 grams of sodium citrate; and

between about 2.0 grams and about 4.2 grams of sodium bicarbonate;

suspending platelets in said platelet storage medium, said platelet storage medium being isotonic and having a pH in a range of between about 6.8 and about 7.4, whereby a substantial concentration of said platelets remain viable for at least about 14 days at a temperature of at least about 22° C.

4,695,461

BONE DISORDER TREATMENT

Sebastian M. Laurent, Greenwell Springs, and Robert N. Sanders, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 741,572, Jun. 5, 1985, abandoned, which is a division of Ser. No. 475,370, Mar. 14, 1983, Pat. No. 4,556,564. This application Nov. 25, 1985, Ser. No. 801,596

Int. Cl.⁴ A61K *33/06, 33/12*

U.S. Cl. 424—154 **17 Claims**

1. A method of increasing the bone strength of an animal having a bone strength lower than desired, wherein a relatively small effective amount of a zeolite is regularly fed to the animal.

4,695,462

CELLULAR ENCAPSULATION OF BIOLOGICAL PESTICIDES

Andrew C. Barnes, San Diego, and Susan G. Cummings, Chula Vista, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed Jun. 28, 1985, Ser. No. 750,369

Int. Cl.⁴ A01N *65/00*

U.S. Cl. 424—195.1 **20 Claims**

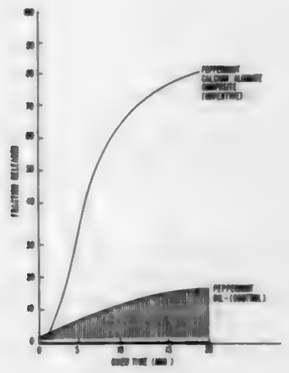
1. An improved pesticidal composition comprising a substantially intact microorganism naturally producing a pesticide, said microorganism stabilized to have prolonged pesticidal activity when applied to the environment of a target pest; and an inert carrier.

4,695,463

DELIVERY SYSTEM FOR ACTIVE INGREDIENTS AND PREPARATION THEREOF

Robert K. Yang, Randolph, and Shri C. Sharma, Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 24, 1985, Ser. No. 738,148
Int. Cl.[4] A61K *47/00*; A23G *3/30*; A01N *43/00*
U.S. Cl. 424—440 **26 Claims**



1. a process of preparing a particulate delivery system comprising:

(i) forming an aqueous suspension of an insolubilized active ingredient and a monovalent cation salt of an algin or carageenen, wherein the insolubilized active ingredient is selected from the group consisting of drugs, favors, coloring agents, sweetening agents, perfumes, bulking agents and mixtures thereof;

(ii) combining the aqueous suspension of the insolubilized active ingredient with a precipitate initiating material to form a polymeric matrix entrapping said active with the matrix interstices;

(iii) recovering the resultant product and drying to yield the delivery system.

4,695,464

SUSTAINED RELEASE DOSAGE FORM BASED ON HIGHLY PLASTICIZED CELLULOSE ETHER GELS

Daniel A. Alderman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1984, Ser. No. 658,965
Int. Cl.[4] A61K *9/02, 9/20*
U.S. Cl. 424—449 **8 Claims**

1. A transdermal pharmaceutical dosage form comprising

(1) a thermoplastic water-soluble gel matrix comprising a water-soluble cellulose ether homogeneously dispersed in an amount of a plasticizer for the cellulose ether sufficient to render the dosage form thermoformable, said gel matrix having dispersed therein a pharmaceutically active agent;

(2) a non-porous covering attached to said gel matrix such that the gel matrix is exposed only on one side, and

(3) a means for adhering the dosage form to human or animal skin such that exposed surface of the gel matrix is in contact with the skin without exposure to the air.

4,695,465

SOFT PATCH

Kazuo Kigasawa; Hideaki Ohtani; Makoto Tanaka, and Shigeru Hayashida, all of Tokyo, Japan, assignors to Takeda Chemical Industry, Ltd., Osaka, Japan

Filed Apr. 5, 1985, Ser. No. 720,401
Claims priority, application Japan, Apr. 5, 1984, 59-66710; Feb. 13, 1985, 60-24393
Int. Cl.[4] A61L *15/03*; A61F *13/00*
U.S. Cl. 424—449 **15 Claims**

1. In the art of externally applying drug preparations to the skin, which act as a barrier to the absorption of the drug, the improvement which comprises externally contacting the skin with a soft drug preparation containing a percutaneously absorbable drug, applied either topically, directly to the effected site, or in the neighborhood thereof, for the purpose of curing disease on the skin surface, or under the skin, or to systematically reach a target tissue or organ, when absorbed from the skin surface where applied, at a site which is most conductive to the percutaneous absorption of the active components of the drug preparation and where a horny layer is not well developed, said drug preparation exhibiting a stick-itself-to-the-skin property and containing the following components:

(a) a percutaneously absorbable drug;

(b) a water-soluble protein having an absorption promoting effect in an amount which ranges from 5 to 15 weight percent based on the weight of the whole composition;

(c) a polyhydric alcohol in an amount which ranges from 5 to 50 weight percent based on the weight of the whole composition;

(d) a tackifier in an amount which ranges from 0.1 to 15 weight percent based on the weight of the whole composition; and

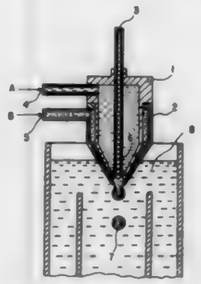
(e) an oleaginous substance in an amount which ranges from 0.1 to 25 weight percent based on the weight of the whole composition.

4,695,466

MULTIPLE SOFT CAPSULES AND PRODUCTION THEREOF

Takashi Morishita, Nishinomiya; Takehisa Hata, Muko; Mitio Mori, Higashiosaka, and Shohachi Tanoue, Toyonaka, all of Japan, assignors to Morishita Jintan Co., Ltd. and Fujisawa Pharmaceutical Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 570,289, Jan. 13, 1984, abandoned. This application Nov. 18, 1986, Ser. No. 931,940
Claims priority, application Japan, Jan. 17, 1983, 58-6287
Int. Cl.[4] A61J *3/07*; A61K *9/54*
U.S. Cl. 424—456 **4 Claims**



1. A double soft capsule wherein an inner soft capsule containing an oil therein and having a water-soluble film containing gelatin and sorbite thereon is contained with outer capsule oil in an outer soft capsule having a water-soluble film containing gelatin and sorbite thereon, said inner soft capsule having a diameter of at least 2 mm and said outer soft capsule having a diameter of at least 6 mm.

4,695,467

SUSTAINED RELEASE TABLET

Toshinobu Uemura, Kishiwada; Kiyohide Shinooka, Nishinomiya, and Tokuaki Kajiho, Kobe, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 5, 1985, Ser. No. 751,866
Claims priority, application Japan, Jul. 12, 1984, 59-145495
Int. Cl.[4] A61K *9/22, 9/16*
U.S. Cl. 424—502 **13 Claims**

1. A sustained release tablet which comprises easily disintegrable granules containing

(a) a drug,

(b) a disintegrating agent selected from the group consisting of starch derivatives, gums, cellulose derivatives and ion-exchange resins, and

(c) a water soluble polymer selected from the group consisting of cellulose derivatives, synthetic water soluble polymers and polysaccharides, the surfaces of which granules are treated solely with a wax selected from the group consisting of plant or animal wax, hydrogenated oils and paraffin.

4,695,468

PROCESS FOR PRODUCING CARBONATED BEVERAGES

Ronald P. Boston, Middle Le Havre, Lunenburg County, Canada, assignor to Fronda Limited, Bridgewater, Canada

Filed Oct. 1, 1985, Ser. No. 782,577
Claims priority, application Canada, Oct. 5, 1984, 464891
Int. Cl.[4] A23L *2/26*
U.S. Cl. 426—8 **13 Claims**

1. A method of producing a carbonated beverage which comprises:

(a) dispensing into a sealable receptacle predetermined amounts of a liquid flavour extract and sugar, an amount of water to provide suitable dilution of said flavour extract, and predetermined amounts of an acidulant and a yeast nutrient buffer to adjust the initial pH level of said diluted flavour extract within said receptacle to less than about 4.0;

(b) thereafter adding to said receptacle an amount of a yeast sufficient to produce said carbonated beverage, said yeast being operational in a pH range falling within an overall range of about 2.5 to about 4 and being operational at and below said initial pH level; and

(c) then mixing the contents of the receptacle and permitting the receptacle to stand to effect fermentation by said yeast with concomitant generation of carbon dioxide, and continuing fermentation with progressive consumption of sugar and nutrient buffer and decrease in pH level until the pH level drops to a value which is not more than about 3.0, and which is below the operational pH range of said yeast, thereby automatically terminating the fermentation process without cooling or heating and resulting in the production of a carbonated beverage in said receptacle.

4,695,469

SHORTENING REPLACING AND FRESH SLICE IMPROVING AGENTS FOR YEAST-RAISED BAKERY PRODUCTS

Curtis J. Forsythe, Raytown, Mo., assignor to Breido, Inc., Kansas City, Kans.

Continuation of Ser. No. 259,824, May 4, 1981, Pat. No. 4,399,155, which is a continuation-in-part of Ser. No. 962,011, Nov. 20, 1978, abandoned. This application Mar. 17, 1983, Ser. No. 476,059
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.[4] A21D *2/14*
U.S. Cl. 426—24 **5 Claims**

1. A method of improving fresh slicing characteristics of yeast-raised bakery products; said products being substantially free of triglyceridal shortening; said method comprising the steps of:

(a) producing a composition comprising succinylated monoglycerides and a lactylic component selected from the group consisting of sodium stearoyl-2-lactylate, calcium stearoyl-2-lactylate, lactylic stearate, and mixtures thereof; wherein

(b) said composition contains an amount of said succinylated monoglycerides in a range of about 5 to about 95 parts by weight and an amount of said lactylic component in a range of about 5 to about 95 parts by weight; and further

(c) after producing said composition incorporating said composition into the ingredients including flour and yeast of said bakery product prior to baking; wherein

(d) said composition is included in said bakery products in an amount within a range from about 0.3% to about 0.5% by weight of said flour; and

(e) baking said ingredients of said bakery products without inclusion of substantial amounts of triglyceridal shortening into said bakery products.

4,695,470

RENNIN-CONTAINING DISRUPTED YEAST CELLS USED IN CHEESE MANUFACTURE

David Botstein, Brookline; Gerald R. Fink, Wellesley, both of Mass., and Ronald W. Davis, Menlo Park, Calif., assignors to Collaborative Research, Inc., Bedford, Mass.

Filed Feb. 28, 1983, Ser. No. 471,360
Int. Cl.[4] A23C *9/12*
U.S. Cl. 426—37 **11 Claims**

1. A method of clotting milk to form cheese, said method comprising,

providing an active rennin enzyme along with disrupted transformable yeast cells which contain recombinant material from which said rennin has been obtained, in a milk based mixture to clot said milk in the preparation of cheese.

9. A cheese product comprising yeast cellular material from disrupted transformable yeast cells that contain recombinant material that expresses rennin or prorennin and a cheese product.

4,695,471

BREAST CYST FLUID SCREENING METHOD FOR CANCER RISK ASSESSMENT

Martin Fleisher, Glen Cove; H. Leon Bradlow, Holliswood, and Morton K. Schwartz, Tarrytown, all of N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,846
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—64 **2 Claims**

1. A method for screening breast cyst fluid to identify patients having a high risk of developing breast cancer, comprising the steps of measuring the chloride ion content of breast cyst fluid aspirated from the patient; and correlating the chlo-

ride ion concentration with the risk of developing breast cancer wherein said step of correlating comprises classifying a patient having breast cyst fluid with a chloride concentration above about 60 mM/liter as a low risk patient and a patient having breast cyst fluid with a chloride ion concentration of less than 30 mM/liter as a high risk patient.

4,695,472

METHODS AND APPARATUS FOR EXTENDING THE SHELF LIFE OF FLUID FOOD PRODUCTS

Joseph E. Dunn, Rancho LaCosta, and Jay S. Pearlman, San Diego, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed May 31, 1985, Ser. No. 740,004
Int. Cl.[4] A23L *3/32*
U.S. Cl. 426—237 **25 Claims**

1. A method for preserving a fluid foodstuff which is a microbiological nutrient medium comprisng the steps of

providing an edible, pumpable fluid foodstuff which is a microbiological nutrient medium having an indigenous microbiological population, said fluid foodstuff having a viscosity of less than about 1000 centipoise at a temperature about 0° C. and comprising from about 50 to about 95 percent by weight water, and from about 4 to about 50 percent by weight of solids selected from the group consisting of proteins, carbohydrates, fats and mixtures thereof, based on the total weight of the fluid foodstuff,

subjecting the fluid foodstuff to a plurality of substantially uniform high electric field and current pulses through all of the fluid foodstuff, each of said plurality of pulses having a minimum field strength of at least about 5,000 volts per centimeter and a current density of at least about 12 amperes per square centimeter, and each of said plurality of pulses having a duration in the range of rom about 1 to about 100 microseconds and heating said edible pumpable fluid foodstuff to a treatment temperature of at least 45° C. such that all of said fluid foodstuff is subjected to at least one of said high electric field pulses at said treatment temperature of at least about 45° C. to provide a pulsed high electrical field treated fluid foodstuff,

maintaining the pulsed high electric field treated fluid foodstuff under substantially sterile conditions conditions and packaging the pulsed high electric field treated fluid foodstuff to provide a packaged food product having extended shelf-life.

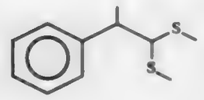
4,695,473

FLAVORING WITH GEM DITHIOETHERS OF PHENYLALKANES

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Domenick Laccarelli, Jr., Neptune; Kevin P. Miller, Middletown, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 747,448, Jun. 21, 1985, Pat. No. 4,585,663. This application Dec. 26, 1985, Ser. No. 813,675
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[4] A23L *1/226*
U.S. Cl. 426—535 **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from about 0.05 ppm up to about 250 ppm of the gem dithioether having the structure;



4,695,474

DRY, SUGAR-FREE INSTANT PUDDING MIX

Carol A. Cuneo, South Plainfield, N.J., and Charles Lambert, Decatur, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Oct. 3, 1985, Ser. No. 784,438
Int. Cl.[4] A23L *1/187*
U.S. Cl. 426—579 **6 Claims**

1. A dry, sugar-free instant pudding mix which rapidly and uniformly disperses and hydrates when mixed with cold milk comprising:

(a) at least 45% by weight of pregelatinized corn, waxy maize or tapioca starch material having a particle size distribution wherein at least 55% by weight of the material is retained on a 230 U.S. mesh screen and no more than 2% by weight of the material is retained on an 80 U.S. mesh screen;

(b) from 15 to 30% of an expanded hydrolyzed starch product having a bulk density of less than 0.2 g/cc and a particle size wherein in excess of 80% by weight will be retained on a 270 U.S. mesh screen and

(c) an intensive sweetening agent in an amount effective to impart a sweet taste to the prepared pudding.

4,695,475

IMITATION CHEESE PRODUCTS CONTAINING HIGH AMYLOSE STARCH AS TOTAL CASEINATE REPLACEMENT

Gary A. Zwiercan, Knutsford, England; Norman L. Lacourse, Plainsboro, and Julianne M. Leschin, Cranbury, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 709,946, Mar. 8, 1985, Pat. No. 4,608,265, which is a continuation-in-part of Ser. No. 480,058, Mar. 29, 1983, abandoned. This application Apr. 21, 1986, Ser. No. 854,447
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.[4] A23C *20/00*
U.S. Cl. 426—582 **8 Claims**

1. An imitation mozzarella cheese product consisting essentially of water, an edible vegetable fat or vegetable oil, cheese additives, and at least one edible caseinate, wherein the improvement comprises the replacement of all of the caseinate by an edible pregelatinized converted or converted and derivatized corn starch having an amylose content of at least about 50% by weight, the converted starch having a calcium chloride water fluidity of about 30–32 and the converted and derivatized starch having a calcium chloride water fluidity of about 30–32 and prepared by treatment of the starch with up to about 0.75% octenylsuccinic anhydride, the cheese containing the starch replacement being functionally equivalent to the cheese containing the caseinate.

4,695,476

PROCESS FOR COATING THE INTERNAL SURFACE OF ZIRCONIUM TUBES WITH NEUTRON ABSORBERS

Alexander L. Feild, Jr., Mt. Lebanon Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1985, Ser. No. 742,153
Int. Cl.[4] G21C *3/06*
U.S. Cl. 427—6 **25 Claims**

1. A process for forming (a) an integral, adherent boron coating on the internal surface of a hollow tube of a metal, selected from zirconium and a zirconium alloy for use in a nuclear reactor component comprising:

heating the internal surface of the hollow tube to be coated to an elevated temperature of between about 200°–450° C., said internal surface being in an active state; and

passing a mixture of a volatilized boron compound in a carrier gas, selected from the group consisting of helium and argon, through the heated tube, the volatilized boron compound selected from the group consisting of boron compounds which will decompose at said elevated tem-



perature, whereby the boron compound is heated by said internal surface of the tube, decomposes, and a boron coating is deposited on said internal surface.

4,695,478

GRAY BODY COLORED ZINC SULFIDE ACTIVATED WITH COPPER

Harry O. Schulze, Wyalusing, and Ronald E. Karam, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 753,099, Jul. 9, 1985. This application Jun. 6, 1986, Ser. No. 872,579
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—71 **2 Claims**

1. A process comprising:

(a) forming a first aqueous slurry consisting essentially of a cathodoluminescent copper-activated zinc sulfide phosphor and water,

(b) forming a second aqueous slurry consisting essentially of a mixture of cobalt aluminate, ferric oxide and water, said slurry having a weight ratio of cobalt aluminate to ferric oxide of from about 3.5:1 to about 4.5:1,

(c) combining said first and second slurries to form a third slurry,

(d) adjusting the pH of such slurry from about 5 to about 6,

(e) adding the collodial silica to said third slurry,

(f) adjusting the pH of said third slurry containing said silica to about 8 to about 9 and maintaining said pH for at least about 30 minutes,

(g) removing the resulting pigmented phosphor from the aqueous phase and

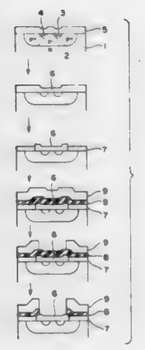
(h) drying said pigmented phosphor at about 120° C. to about 160° C.

4,695,479

MOSFET SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

Yukinori Nakakura, and Nobuyuki Kato, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 838,830
Claims priority, application Japan, Mar. 15, 1985, 60-52608
Int. Cl.[4] H01L *21/314*
U.S. Cl. 437—228 **1 Claim**



1.

A method of forming a MOSFET gate insulating film, comprising the steps of:

forming a SiO_2 film as a gate insulating film on a MOSFET surface by thermal oxidation;

removing the SiO_2 film from the surface area other than the MOSFET region by selective etching and depositing an oxygen doped semi-insulating polycrystalline silicon film; and

removing the oxygen doped semi-insulating polycrystalline silicon film from the MOSFET region by selective etching and depositing a silicon nitride film and a SiO_2 film formed by CVD method at least on the surface area other than the MOSFET region.

4,695,477

METHOD OF PRODUCING A PLANE PHOSPHOR SCREEN

Uwe Violl, Aichwald, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,169
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424714
Int. Cl.[4] B05D *5/06*
U.S. Cl. 427—68 **3 Claims**

1. A method of coating a smooth glass faceplate to produce a phosphor screen for use with flat color picture tubes comprising the steps of:

placing a basic mask on the faceplate;

applying a coating mask for a first color;

depositing a first layer of phosphor dispersed in a reactive binder;

causing said first layer to meet with an activator on said faceplate, said activator causing said binder to harden;

applying a coating mask for a second color;

depositing a second layer of phosphor dispersed in a reactive binder;

causing said second layer to meet with said activator on said faceplate;

applying a coating mask for a third color;

depositing a third layer of phosphor dispersed in a reactive binder; and

causing said third layer to meet with said activator on said faceplate;

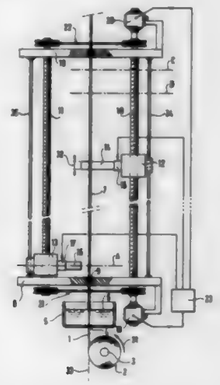
wherein said activator may either be deposited on said faceplate prior to the deposition of said basic mask, or may be sprayed upon said faceplate with each of said phosphor layers.

4,695,480

METHOD AND APPARATUS FOR DRAWING A TAPE CONSTITUTED BY A SUPPORT COATED IN A LAYER OF SEMICONDUCTOR MATERIAL, SAID TAPE BEING DRAWN FROM A LIQUID BATH OF SAID MATERIAL

Christian Belouet, Sceaux, France, assignor to Compagnie Generale d'Electricite, Cedex and Societe Nationale Elf Aquitaine, Courbevoie, both of, France

Filed Mar. 25, 1986, Ser. No. 843,546
Claims priority, application France, Mar. 25, 1985, 85 04407
Int. Cl.[4] B05D *5/12*
U.S. Cl. 437—225 **2 Claims**



1. A method of drawing a tape constituted by a support coated with a layer of semiconductor material, said tape being drawn from a liquid bath of said material, the tape being tensed in a vertical plane, said method comprising:

clamping two opposite portions of two respective edges of the tape between the two jaws of a clamp, the clamping being performed at a first level above the bath, in such a manner as to hold the tape coated with said layer in a vertical plane; and

while clamping the tape, vertically displacing the clamp from the first level to a second level higher than the first level, said displacement taking place at a predetermined constant speed, and the distance between said first and second levels being large relative to the length of said portions.

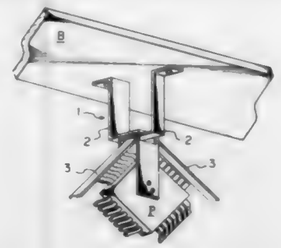
4,695,481

METHOD OF PERFORMING PLATING OF AN ITEM HAVING FINE PARTS AND A SUPPORT DEVICE THEREFOR

Yuuji Kawamata; Tomohiko Iino, both of Souka; Ryoichi Suzaki, Tokyo, and Noriyuki Haga, Saitama, all of Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 845,226
Claims priority, application Japan, Mar. 28, 1985, 60-61815
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—96 **5 Claims**

1. A method of performing plating of an item having a row of fine parts to be plated comprising immersing said item in a bath of molten solder, removing said item from said bath while maintaining said item in an attitude such that said row of fine parts is sloped with respect to the surface of said molten solder, and causing flux to exert a fluxing action on said molten solder which adheres to said fine parts, thereby decreasing the surface



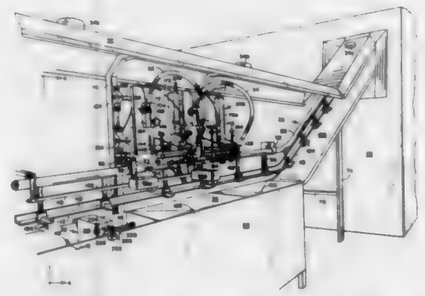
tension of the solder adhering to said fine parts and preventing bridges of solder from forming between said fine parts.

4,695,482

METHOD AND APPARATUS FOR COATING OF CIRCUIT BOARDS

Klaus D. Weiswurm, 818 E. Myrtle St., San Antonio, Tex. 78212

Filed Jan. 21, 1986, Ser. No. 821,404
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—96 **21 Claims**



1. An apparatus for coating printed circuit boards with insulating material which comprises:

a manifold having an inlet in fluid communication with a source of insulating material and a plurality of outlets;

a length of flexible tubing attached to each of said outlets, said tubing being selectively bendable to direct insulating material to a predetermined location on a printed circuit board;

means for positioning a printed circuit board in a preselected, spaced relationship to said manifold which comprises a conveyer on which the printed circuit board is mounted, means for sensing the spaced relationship between the printed circuit board mounted on said conveyer and said manifold and means for stopping the movement of said conveyer for a predetermined period of time in response to said sensing means; and

means for pumping a measured amount of insulating material through said manifold and out said lengths of flexible tubing onto the printed circuit boards.

4,695,483

METHOD FOR THE PREPARATION OF COMPOSITE MEMBRANES BASED ON INTERPENETRATING POLYMER NETWORKS

Joseph J. Zupancic, Bensenville, and Raymond J. Swedo, Mt. Prospect, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 670,187, Nov. 13, 1984, Pat. No. 4,613,440, which is a continuation-in-part of Ser. No. 485,971, Apr. 18, 1983, abandoned. This application Jul. 21, 1986, Ser. No. 887,777
Int. Cl.[4] B05D *5/00*
U.S. Cl. 427—244 **16 Claims**

1. A process for the production of a composite semipermeable interpenetrating polymer network membrane which comprises reacting a polyether with an isocyanate to form an isocyanate-capped polyether, admixing said isocyanate-capped polyether with a heterocyclic nitrogen-containing compound selected from the group consisting of polyvinylpyridine and mixtures of polyvinylpyridine and poly(N-vinylpyrrolidone) to form an interpenetrating polymer network membrane-forming composition, forming a film of said composition on a porous support backing material, curing the resultant composite in a hydrous atmosphere at curing conditions for a time sufficient to generate an amine-capped polymer by hydrolysis of a portion of said isocyanate-capped polyether with said amine-capped polymer subsequently reacting with a portion of the isocyanate groups present in said composition to form a substituted polyurea which serves to physically entwine said heterocyclic nitrogen-containing compound in said composition, and recovering the resultant composite semipermeable interpenetrating polymer membrane.

4,695,484

PROCESS FOR FORMING MOISTURE-PERMEABLE WATERPROOF COATING ON FABRICS

Teruo Tanaka; Teruya Tanaka, both of Ohmihachiman, and Masato Kitamura, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Dec. 6, 1985, Ser. No. 805,520
Claims priority, application Japan, Dec. 7, 1984, 59-259743
Int. Cl.[4] B05D *3/02, 3/10, 5/00*
U.S. Cl. 427—245 **20 Claims**

1. A method for forming a moisture-permeable water-proof coating on a fabric which comprises the steps of applying on a fabric a water-based coating composition containing a film-forming polymer which forms a water insoluble polymeric film upon drying or heat treatment and a water-soluble, enzyme degradable polymer, in a proportion of 5 to 70% by weight of the total solid content of said coating composition, drying or heat-treating said fabric to form a film thereon, treating the resulting film on the fabric with an aqueous solution of an enzyme capable of selectively degrading said water-soluble polymer, thereby enzymatically degrading said water-soluble polymer and extracting the degraded water soluble polymer from said film, whereby the film on the fabric is rendered microporous.

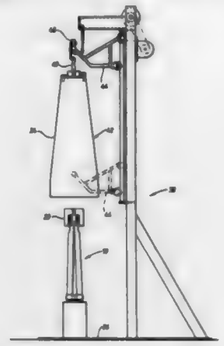
4,695,485

FLUID DISPENSING PROCESS

Jame D. M. Gibson, Ilkley, England, assignor to Wool Development International, Ltd., West Yorkshire, England

Division of Ser. No. 645,440, Aug. 29, 1984, Pat. No. 4,607,589. This application Mar. 10, 1986, Ser. No. 838,136
Claims priority, application United Kingdom, Sep. 1, 1983, 8323484; Oct. 10, 1983, 8327055
Int. Cl.[4] B05D *5/00*
U.S. Cl. 427—256 **4 Claims**

1. A process for the application of a crease setting composition for trousers having legs with crease lines thereon, comprising supporting said trousers on a conveyor, inserting into the leg of said trousers an apparatus capable of forcing outwardly the trouser leg at said crease and applying crease setting composition within said crease line at or near at least one of the points of said outward force, moving the trousers with respect to the apparatus while said outward force is maintained



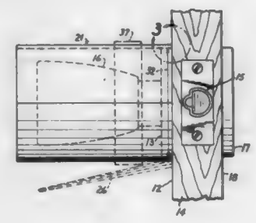
so as to deposit the crease setting composition in said crease line, removing said apparatus from said trouser legs, conveying the trousers to a subsequent work station, and repeating the process in a continuous manner.

4,695,486

PAINT SHIELDS AND PAINTING METHODS

William C. Stark, 306 S. Almansor St., Alhambra, Calif. 91801

Continuation-in-part of Ser. No. 176,390, Aug. 8, 1980. This application May 16, 1983, Ser. No. 495,300
Int. Cl.[4] B05D *1/32*
U.S. Cl. 427—282 **47 Claims**



1. In a method of applying paint to a surface surrounding a raised circular object, the improvement comprising in combination the steps of:

providing apart from said object a self-supporting paint shield;

winding at least part of said self-supporting paint shield apart from said object into a spiral shield having an inside diameter different from a diameter of said circular object and having portions overlapping each other sufficiently to remain overlapping when said spiral shield is adapted in diameter to said circular object;

leaving said overlapping portions slidable relative to each other in said spiral shield;

shielding said object with the paint shield by fitting said spiral shield having said different inside diameter onto said raised object by changing said spiral shield in inside diameter, with said overlapping portions of said spiral shield sliding relatively to each other until said spiral shield on said raised object is adapted in inside diameter to said raised object and exerts a gripping action supporting the paint shield on said raised object; and

applying paint to said surface exclusive of said shielded object.

13. In a method of applying paint to a surface surrounding a

raised circular object, the improvement comprising in combination the steps of:

providing apart from said object a self-supporting paint shield;

winding at least part of said self-supporting paint shield apart from said object into a tapered spiral having at one end thereof an inside diameter different from a diameter of said circular object and having portions overlapping each other sufficiently to remain overlapping when said tapered spiral is adapted in diameter to said circular object;

leaving said overlapping portions slidable relative to each other in said tapered spiral;

shielding said object with said tapered spiral by fitting said tapered spiral having said different inside diameter at said one end thereof onto said raised object by changing said tapered spiral in inside diameter with said overlapping portions of said tapered spiral sliding relatively to each other until said tapered spiral on said raised object is adapted in inside diameter to said raised object and by applying a force to said tapered spiral for an exertion of a gripping action on said raised object supporting the paint shield thereon; and

applying paint to said surface exclusive of said shielded object.

4,695,487

PROCESS FOR COLORING GRANITE

Cho, Yu H., 1169-23, Choryang-Dong, Dong-Gu, Busan-Shi, Rep. of Korea

Filed Jun. 17, 1986, Ser. No. 875,214

Claims priority, application Rep. of Korea, Apr. 14, 1986, 86-2808

Int. Cl.[4] **B05D** *3/02;* **C14L** *9/00*

U.S. Cl. 427—294 **5 Claims**

1. A process for coloring a granite which comprises the steps of

dissolving in a solvent a metallic salt formed by reacting a metal with a strong acid to form a solution,

introducing said solution to a vacuum container charged with the granite to permeate said solution into said granite,

developing color by heating said permeated granite in a heating furnace maintained at temperature in the range from 250° C. to 300° C. for 2 or 3 hours,

cooling down to room temperature, and

finally surface-treating the colored granite with a silicone oil.

4,695,488

SOIL RELEASE COMPOSITION AND USE THEREOF

Iwao Hisamoto, Suita; Masaru Hirai, Settsu, and Sueyoshi Ishikawa, Kishiwada, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,754

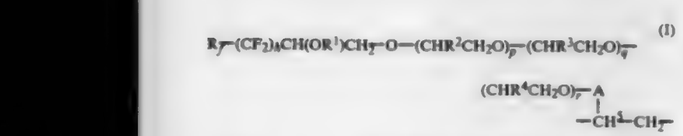
Claims priority, application Japan, Mar. 12, 1985, 60-49944

Int. Cl.[4] **B05D** *3/02;* **C08L** *75/00*

U.S. Cl. 427—385.5 **17 Claims**

1. A soil release composition comprising:

(A) a polymer containing 10 to 100% by weight of constituting unit of the formula:



(I)

$$R_f\text{—}(CF_2)_aCH(OR^1)CH_2\text{—}O\text{—}(CHR^2CH_2O)_p\text{—}(CHR^3CH_2O)_q\text{—}(CHR^4CH_2O)_r\text{—}A\text{—}CH^5\text{—}CH_2\text{—}$$

wherein R_f is a C_3–C_{21} fluoroalkyl group; R^1 is a hydrogen atom or a C_2–C_4 acyl group; R^2, R^3, R^4 and R^5 are, the same or different, each a hydrogen atom, a methyl group or an ethyl group; A is a group of the formula: $—CH_2CH(OR^1)CH_2—OCO—$ in which R^1 is the same as defined in the above, —CO—, $—(CH_2)_kN(R^2)CO—$ in which R^2 is the same as defined in the above and k is an integer of 1 to 10, or $—(CH_2)_k—$ in which k is the same as defined in the above; h is an integer of 0 to 5; p is an integer of 1 to 40; q and r are, the same or different, each an integer of 0 to 40,

(B) at least one hydrophilic resin selected from the group consisting of glyoxal resin, melamine resin, polyamide resin, urethane resin, acrylic resin and triazine resin, and

(C) a water- and oil-repellent, the weight ratio of (A):(B):(C) being 5–95:95–5:0 or 1–95:5–95:1–50.

4,695,489

ELECTROLESS NICKEL PLATING COMPOSITION AND METHOD

Kenneth P. Zarnoch, Scotia, and Charles D. Iacovangelo, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 28, 1986, Ser. No. 890,050

Int. Cl.[4] **C23C** *18/34*

U.S. Cl. 427—438 **3 Claims**

1. A method of applying nickel directly to a nonactivated tungsten surface by immersing the tungsten surface in an aqueous electroless nickel plating bath comprising a water-soluble nickel salt; ethylenediaminetetraacetic acid; hydrazine; and monoethanolamine at a temperature of about 70° C. to 100° C. for a period of time sufficient to deposit a layer of nickel on the tungsten surface.

4,695,490

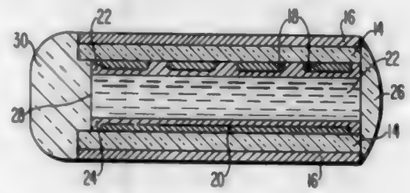
SEAL FOR LIQUID CRYSTAL DISPLAY

Sandra K. McClelland, Bordentown Township, Burlington County; Neal D. Conrad, Ewing Township, Mercer County, and Nitin V. Desai, East Windsor Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

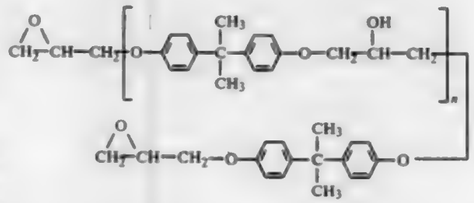
Filed Oct. 15, 1985, Ser. No. 787,679

Int. Cl.[4] **B32B** *17/10;* **C09K** *19/00*

U.S. Cl. 428—1 **6 Claims**



1. In a liquid crystal display comprising two spaced apart substrates sealed at the periphery with the exception of one or more fill ports, liquid crystal material disposed between the substrates and a sealant for the fill ports, the improvement wherein the sealant comprises a cured epoxy resin of a diglycidylether of bisphenol A precursor represented by the formula



wherein n is 0–2, a curing agent hardener therefor comprising

triethylenetetramine and, optionally, a minor amount of a suitable thixotropic agent.

4,695,491

HEAT-SHRINKABLE COMPOSITE PACKAGING FILM

Kazuo Kondo; Nobuya Ishiguro, and Teruo Tada, all of Marugame, Japan, assignors to Okura Industrial Co., Ltd, Marugame, Japan

Filed May 31, 1985, Ser. No. 739,655

Claims priority, application Japan, Jun. 6, 1984, 59-117354

Int. Cl.[4] **B65D** *85/00;* **B32B** *27/00*

U.S. Cl. 428—35 **9 Claims**

1. A heat-shrinkable, composite packaging film comprising:

(a) a core layer of saponified ethylene-vinyl acetate copolymer of 3–20 microns thickness;

(b) a first polymeric outer wall, comprising a first inner layer of a modified polyolefin based resin, directly bonded to said one side of the core layer, and a first outermost layer of a polyamide resin bonded to said inner layer on the side thereof opposite to the core layer, said inner layer and said outermost layer each having a thickness of 5–25 microns; and

(c) a second, heat-sealable polymeric outer wall, bonded to the other side of the core layer, comprising either (i) a single layer of a heat-sealable modified polyolefin based resin or (ii) a laminate comprising a second inner layer of a modified polyolefin based resin bonded to said other side of the core layer and a second outermost layer of a heat-sealable polyolefin based resin, the thickness of said second outer wall being 5–50 microns; said first and second outer wall each having a permeability to hot water having a temperature of 90° C. of less than 600 g/m^2/hour;

said composite film having a total thickness of about 20–120 microns and exhibiting excellent resistance to whitening and delamination when a package sealed in an envelope of the composite film with said first outermost layer being exposed outwardly is sterilized in hot water.

4,695,492

FORMING LUBRICANT FOR A COATED METAL CONTAINER AND METHOD OF MAKING THE SAME

Joseph L. Godar, Wauconda, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 23, 1985, Ser. No. 790,698

Int. Cl.[4] **B27N** *5/02;* **B21B** *45/00;* **B21J** *13/08;* **B65D** *90/04*

U.S. Cl. 428—35 **18 Claims**

4. In a coated metal container comprising a seamless side wall and a bottom wall integral with said sidewall, said sidewall being substantially the same thickness as or thinner than said bottom wall and the metal of said walls being selected from the group consisting of electrolytic tinplate and *precoated* tinless low-carbon steel and a hardened coating on the metal surfaces of at least the interior walls of the container, the improvement wherein said hardened coating comprises (1) a coat consisting essentially of a lubricant containing a butyl stearate, liquid lanolin and a silicone resin, said lubricant being compatible with and overcoated with (2) a synthetic resin coating.

4,695,493

PEEL-AND-STICK CARPET ASSEMBLIES, COMPONENTS THEREOF AND METHODS OF CONSTRUCTION

Randal H. Friedlander; Sheryl A. Nash, and Greg A. Komitor, all of Columbus, Ohio, assignors to Century Adhesives Corp., Columbus, Ohio

Filed Dec. 15, 1986, Ser. No. 941,752

Int. Cl.[4] **B32B** *33/00*

U.S. Cl. 428—40 **8 Claims**

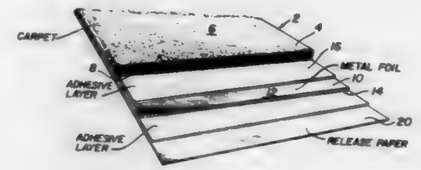
1. A new peel-and-stick carpet assembly capable of being formed and reformed mechanically or by hand without requiring application of heat thereto into a stable three-dimensional contoured shape that does not exhibit any appreciable shrinkage or stretching and will remain substantially unchanged in any of its three dimensions throughout storage prior to application to a substrate to be covered thereby and during normal life of use thereof after such application which comprises:

a carpet layer having a front surface and a rear surface,

a shape-retention web of thickness between about 1 to 100 mil having a front surface and a rear surface,

a first adhesive layer of thickness between about 1 to 30 mil sandwiched between said carpet layer rear surface and said web front surface adhering said web to said carpet layer,

a second adhesive layer of thickness between about 1 to 20 mil covering said rear surface of said web, and



a release sheet of thickness between about 1 to 10 mil releasably adhered to said second adhesive layer,

said first adhesive layer being formed from a hot melt adhesive composition comprising the following ingredients in the percentages by weight as listed:

styrene-unsaturated hydrocarbon-styrene	
block copolymer	30–50%
tackifying resin	35–50%
reinforcing resin	0–10%
plasticizer	5–20%
degradation inhibitor	0–5%,

said second adhesive layer being the same as or different from said first adhesive layer formed from hot melt adhesive having said composition, and

said web being a metallic sheet or mesh.

4,695,494

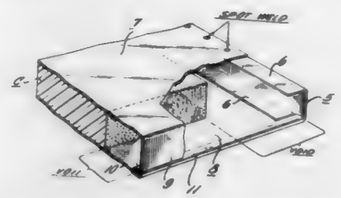
FIRE-RESISTANT ARTICLE AND METHOD OF MANUFACTURE

George F. Fowler, Jr., Norcross, and Charles W. Lehnert, Stone Mountain, both of Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Nov. 25, 1986, Ser. No. 934,726

Int. Cl.[4] **E04B** *1/74, 2/28;* **B32B** *3/26;* **B28B** *3/00*

U.S. Cl. 428—71 **18 Claims**



9. A light-weight, fire-resistant article comprising a major amount of expanded perlite in compressed form and a minor amount of an adhesive material, the major portion thereof being gelatinized starch, said article having a density of no greater than about 22 lb/cu ft.

15. An article according to claim 9, 10, 11, 12, 13, or 14 in the form of a fire door core.

16. A core according to claim 15 wherein said starch is an ethylated dent, modified corn starch comprising about 25% amylose with about 2.6–2.7% substitution of ethylene oxide.

17. A metal fire door including the core of claim 15.

18. A fire door according to claim 17 comprising metallic

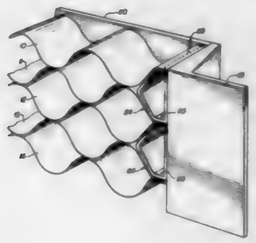
sheets at the side faces of the door, the sheets being interconnected with each other at the edges of the door and being laterally spaced from each other to provide an interior space to accommodate said core, a core in said interior space, and the metallic sheets being adhesively bonded to the side faces of the core.

4,695,495

HONEYCOMB CORE LOAD BEARING STRUCTURE

Robert M. Ault, Westminster, Calif., assignor to TRE Corporation, Los Angeles, Calif.

Filed Mar. 27, 1985, Ser. No. 716,678
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—73 **11 Claims**



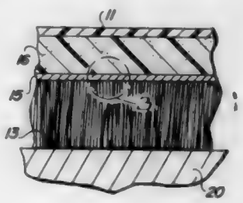
1. A honeycomb core load bearing structure comprising:
a first face member;
a second face member spaced from and parallel to the first face member;
a load bearing edge member attached to an edge of each of said first and second face members;
a plurality of corrugated ribbon core elements disposed between and attached to said first and second face members and forming a honeycomb core, each of said core ribbon elements aligned generally perpendicular to said edge member; and
a plurality of load distributing attachment elements, one each located in the space between adjacent core elements at the edge member and extending between the first and second face members, wherein each attachment element is attached to the adjacent core elements and further attached to said first and second face members.

4,695,496

SKIN PROTECTIVE PAD

William Lee, Star Rte. #1, Box 542, Cave Creek, Ariz. 85331

Filed Jul. 14, 1986, Ser. No. 885,486
Int. Cl.[4] B32B *3/02, 5/18, 5/32*
U.S. Cl. 428—95 **18 Claims**



1. A skin protection pad including in combination:
a first layer comprised of a plurality of hydrophobic fibers for wicking moisture and perspiration away from skin;
a water storage and energy dissipation cushion layer having first and second sides;
a membrane layer interconnecting said first layer and the first side of said cushion layer, said membrane layer having pores through it of sizes constructed to permit passage of water vapor and perspiration from said first layer to said cushion layer and to block passage of water droplets from said cushion layer to said first layer; and
a fourth water impervious layer connected to the second side of said cushion layer.

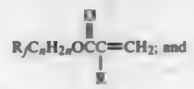
4,695,497

METHOD OF IMPARTING STAIN RESISTANCE TO COLORED SUBSTRATES WHICH INCLUDE A FILAMENTARY MATERIAL

Monte L. Nagy, Jr., Chesterfield, and Charles J. Cole, Chester, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 2, 1987, Ser. No. 263
Int. Cl.[4] B32B *3/02, 33/00*
U.S. Cl. 428—96 **19 Claims**

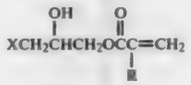
1. A method of imparting stain resistance to a colored substrate comprising a filamentary material, said method comprising:
a. applying a first dispersion of a polymer as a finish to a filamentary material during manufacture thereof;
b. forming the filamentary material into a colored substrate; and
c. applying a second dispersion of a polymer to the filamentary material; each of said dispersions being applied in an amount sufficient to achieve at least 300 ppm fluorine from each application on the filamentary material, said first and second dispersions being independently selected from the group consisting of:
i. a first polymer comprising
(a) from about 50 to about 85 parts by weight of units derived from a fluorinated monomer or mixture of fluorinated monomers having the formula



$$R_fC_nH_{2n}OCC(R)=CH_2$$

and

(b) from about 15 to about 50 parts by weight of units derived from one or more monomers having the formula



$$XCH_2CH(OH)CH_2OCC(R)=CH_2$$

wherein
R_f is straight or branched-chain perfluoroalkyl containing 4–20 carbon atoms;
R is H or CH_3;
n is an integer from 1–15; and
X is Cl or Br; and
ii. a dispersion comprising
(a) from about 10 to 50 parts by weight said first polymer;
(b) from about 5 to about 10 parts by weight an emulsifier; and
(c) from about 40 to 85 parts by weight a second polymer derived from a monomer having the formula



$$R_fC_nH_{2n}OCNH(CH_2)_6N=C=O$$

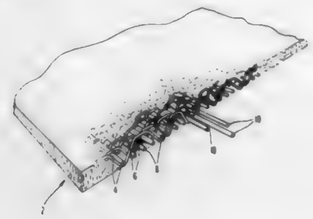
wherein
R_f is straight or branched-chain perfluoroalkyl containing 4–20 carbon atoms; and n is an integer from 1–15.

4,695,498

PAPERMAKERS FLAT WOVEN FABRIC

Yvon Sarrazin, Valleyfield, Canada, and Harry D. Smolens, Norristown, Pa., assignors to Asten Group, Inc., Charleston, S.C.

Division of Ser. No. 399,992, Jul. 20, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,987
Int. Cl.[4] B32B *3/04*
U.S. Cl. 428—121 **3 Claims**



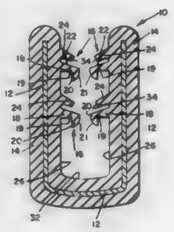
1. An improved papermakers fabric comprising:
a flat woven fabric having at least one system of continuous machine direction monofilament yarns;
each end of said fabric having a portion of said fabric material folded back upon the adjacent portion of the fabric body thereby defining a hem and hem line;
said hem including an area having loop segments of selected machine direction yarns, extending therefrom;
a first group of machine direction yarn segments distributed in the cross machine direction being drawn against said hem line; and
a second group of machine direction yarn segments interspersed among the yarn segments of the first group extending from said hem line in a defined series of loops such that the loops of the respective ends will intermesh to define a seaming channel which receives a pintle means and the yarns of said first and of said second groups are continuous throughout said fabric hem and body portions.

4,695,499

BEADING PROFILE STRIP

Gary Whitener, Paramount, Calif., assignor to Trim-Lok, Inc., Paramount, Calif.

Filed Aug. 29, 1986, Ser. No. 902,221
Int. Cl.[4] B32B *1/04*
U.S. Cl. 428—122 **12 Claims**



1. A beading profile strip comprising:
a. a semi-rigid rectilinear core formed into a U-shaped strip having a channel;
b. a yielding resilient coating disposed about and covering said core forming a coated U-shaped strip having a channel;
c. said coating U-shaped strip comprising a pair of limbs interconnected by an arcuate connecting member and an open portion opposite the arcuate connecting member;
d. at least one leg integrally formed from said resilient coating and projecting from one limb of said coated U-shaped strip inwardly into the channel of the coated U-shaped strip and downwardly at an angle to the limb in a direction extending away from the open portion of the coated U-shaped strip, the leg running continuously throughout the length of said coated U-shaped strip and parallel to the longitudinal axis of said coated U-shaped strip;
e. a foot attached to the leg at the innermost portion of the leg by a joining ankle;
f. at least one stop integrally formed from said resilient coating and projecting from the same limb to which the leg is attached, the stop projecting inwardly into the channel of the coated U-shaped strip and downwardly at an angle to the limb in a direction extending away from the open portion of the coated U-shaped strip;
g. said stop located adjacent to said leg but offset from it so that the stop is always further away from the arcuate connecting portion and closer to the open portion of the coated U-shaped strip; and
h. said stop being shorter than said leg and said ankle of said leg being vertically aligned with the inwardly projecting end of said stop;
i. whereby when a sheet is inserted into the channel through the open portion, the stop does not come in contact with the sheet and does not serve to retard entrance of the sheet and when the sheet is withdrawn from the channel, the stop acts as a fulcrum against which the ankle of the leg must pivot, allowing the foot to rotate upward, be compressed and squeezed between the sheet and stop to thereby provide a resistance force to retard the sheet from being withdrawn from the channel.

4,695,500

STABILIZED FABRIC

John Dyer, Randolph, and John W. Kennette, Somerville, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Jul. 10, 1986, Ser. No. 884,152
Int. Cl.[4] A61F *13/00;* **B32B** *3/10*
U.S. Cl. 428—134 **32 Claims**



1. A stabilized fabric comprising a loosely woven component and a staple fiber component,
said woven component comprising a plurality of substantially parallel, spaced apart warp yarns intersecting at right angles with a plurality of substantially parallel spaced apart fill yarns, said warp and fill yarns defining a plurality of openings in said woven component,
said staple fiber component comprising staple length fibers entangled about said warp and fill yarns without completely encasing said woven component, said staple fibers substantially anchoring said warp and fill yarns at the intersections thereof,
said stabilized fabric maintaining a plurality of openings defined by said warp and fill yarns.

4,695,501

THERMOFORMABLE COMPOSITE ARTICLES

Leonard W. Robinson, Trenton, Mich., assignor to Fibre Converters, Inc., Three Rivers, Mich.

Filed Apr. 10, 1984, Ser. No. 598,653
Int. Cl.⁴ B32B *5/18, 5/28, 5/32, 7/12*
U.S. Cl. 428—159 **10 Claims**



2. A thermoformable composite article, comprising:

a core layer consisting essentially of a thermoformable synthetic resin foam, said foam consisting essentially of closed cells, said core layer comprising a pair of sub-layers of said synthetic resin foam, which sub-layers are in face-to-face contact with each other but are not substantially bonded to each other in a plurality of spaced-apart areas so that said sub-layers can be separated over said areas during thermoforming to form a plurality of voids in said core layers between said sublayers;

said non-bonded areas being surrounded by continuous adhesively bonded areas so that the non-bonded areas can be shaped into closed chamber surrounded by continuous adhesively bonded areas during subsequent thermoforming;

a pair of first and second adhesive layers adhered to the opposite, upper and lower faces of said core layer, respectively; and

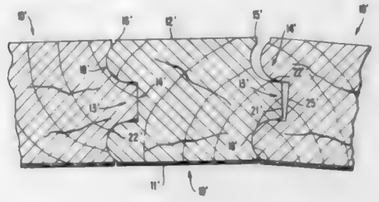
a pair of fabric layers superposed on the opposite upper and lower faces of said core layer, which fabric layers are bonded to said faces of said core layer by said adhesive layers, at least one of said fabric layers consisting essentially of a non-woven fabric impregnated with a thermoplastic or an uncrosslinked thermosetting synthetic resin.

4,695,502

INTERLOCKING LANDSCAPE PLANKING

John L. Rush, P.O. Box 548, Lexington, S.C. 29072

Continuation-in-part of Ser. No. 764,476, Aug. 12, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 886,951
Int. Cl.⁴ B32B *3/06*
U.S. Cl. 428—192 **5 Claims**



1. Interlocking landscape planking for lawn edging, furniture, retaining walls, area accents and sculpture, wherein each interlocking plank comprises:

front and rear surfaces,

a tongue along one edge of the plank, for attaching said interlocking plank to other like interlocking planks, said tongue having a flat apex which is 11/16 inch in width, the side of which flat apex taper outwardly from said flat apex and continue in a circular arc corresponding to the arc of a circle having a diameter of at least ⅞ inch toward the front and rear surfaces, respectively, of said interlocking plank, extending to a point slightly removed from said front and rear surfaces, and

a groove along an edge of the plank opposite the tongue, for attaching said interlocking plank to other like interlocking planks, said groove having a flat base which is ⅞ inch in width, the sides of which flat base extend at a 90 degree angle to the plane of said flat base and continue outwardly from said flat base in a circular arc corresponding to the arc of a circle having a diameter of at least ⅞ inch toward the front and rear surfaces, respectively, of said interlocking plank, extending to a point slightly removed from said front and rear surfaces.

4,695,503

COATED, ORIENTED, POLYMER FILM LAMINATE

Leland L. Liu, Macedon, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 7, 1986, Ser. No. 837,116
Int. Cl.⁴ B32B *3/14, 27/08*
U.S. Cl. 428—207 **23 Claims**

1. A coated, oriented polymer film laminate which comprises:

(a) an oriented core layer having an upper face and lower face, said core layer being fabricated from polypropylene homopolymer;

(b) an oriented, heat sealable layer applied to the lower face, and optionally, to the upper face, of core layer (a), said heat sealable layer being fabricated from a member of the group consisting of heat sealable copolymer or blend of copolymers, heat sealable blend of homopolymers and heat sealable blend of at least one copolymer and at least one homopolymer;

(c) a coating layer applied to the upper face of core layer (a), or, where heat sealable layer (b) has been applied thereto, to the exposed surface of said layer (b), said coating layer being derived from an interpolymer which is obtained from the interpolymerization of from about 0 to 15 parts by weight of an alpha-beta monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid and mixtures thereof with from about 85 to about 100 parts by weight of neutral monomer esters; and,

(d) an adhesively bonded substrate or a water-based coating composition applied directly to the exposed, untreated surface of heat sealable layer (b) applied to the lower face of core layer (a).

4,695,504

THICK FILM RESISTOR COMPOSITION

Hirotoshi Watanabe, Kadoma; Osamu Makino, and Toru Ishida, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 18, 1986, Ser. No. 875,872
Claims priority, application Japan, Jun. 21, 1985, 60-136411; Oct. 4, 1985, 60-222231; Mar. 10, 1986, 61-51705
Int. Cl.⁴ B32B *3/00;* **H01B** *1/06*
U.S. Cl. 428—209 **20 Claims**

1. A thick film resistor composition comprising a silicide powder and an alkaline earth borosilicate glass powder dispersed in a vehicle containing an acrylic polymer, said silicide powder being composed of 0–40 mol % of molybdenum disilicide and a 100–60 mol % of a mixture of a tantalum disilicide and a magnesium silicide, the mol ratio of said tantalum disilicide to said magnesium silicide ranging from 9.5:0.5 to 5:5, said alkaline earth borosilicate glass powder containing 8–10 wt % of niobium pentoxide.

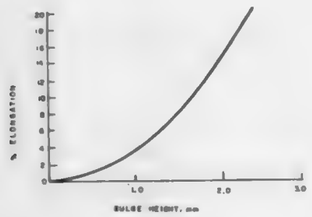
9. A thick film resistor composition comprising a silicide powder and an alkaline earth borosilicate glass powder being dispersed in a vehicle containing a acrylic polymer, said silicide powder being composed of 10–90 mol % of cobalt silicide and 90–10 mol % of nickel disilicide, said alkaline earth borosilicate glass powder containing 8–10 wt % of niobium pentoxide.

4,695,505

DUCTILE ELECTROLESS COPPER

Oleh B. Dutkewych, Harvard, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Oct. 25, 1985, Ser. No. 791,597
Int. Cl.⁴ B05D *1/00, 3/06*
U.S. Cl. 428—209 **14 Claims**



1. An electroless deposit of copper containing a minor amount of codeposited nickel and having an elongation capability of at least 10 percent wherein, said deposit is made by deposition from an electroless copper plating solution capable of depositing electroless copper having an elongation capability of at least 10 percent, said solution being characterized by the presence of nickel ions, a member selected from the group of cyanide ions, ferrocyanide ions and mixtures thereof, a source of formaldehyde, hydroxyl radicals, Quadrol, and by the absence of substances in concentrations that would reduce elongation below about 10 percent.

4,695,506

RIGID AND SEMIRIGID THERMOPLASTIC STRUCTURES WITH MULTIPLE COEXTRUDED POLYMERIC LAYERS INCORPORATING AN INNER VINYLIDENE CHLORIDE COPOLYMER LAYER AND USE OF THESE STRUCTURES FOR THE MANUFACTURE OF PACKAGES

Claude Debennau, Waterloo, and Yannick Vandendael, Braine-l'Alleud, both of Belgium, assignors to Solvay & Cie. (Societe Anonyme), Brussels, Belgium

Filed Jul. 17, 1985, Ser. No. 755,904
Claims priority, application France, Jul. 19, 1984, 84 11630
Int. Cl.⁴ B32B *7/02*
U.S. Cl. 428—212 **9 Claims**

1. A rigid or semirigid thermoplastic structure comprising multiple coextruded polymeric layers,

an inner vinylidene chloride copolymer layer,

vinyl chloride polymer layers having a gel temperature not exceeding about 190° C. and a dynamic viscosity at 180° C. and 1 sec^{-1} not exceeding about 2 10^5 Pa s, and

separate adhesive layers of vinyl chloride polymer,

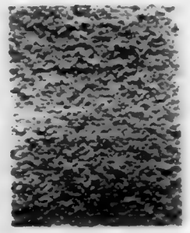
wherein each face of said inner vinylidene chloride copolymer layer is bonded to one said vinyl chloride polymer layer by means of one adhesive layer and the vinyl chloride polymer of said one adhesive layer has a gel temperature and a dynamic viscosity at 180° C. and 1 sec^{-1} lower than the gel temperature and the dynamic viscosity of the vinyl chloride polymer of its adjacent layer under the same conditions.

4,695,507

LOW TOXIC CEILING BOARD FACING

William C. Schwartz, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 731,075, May 6, 1985, abandoned. This application Sep. 10, 1985, Ser. No. 774,524
Int. Cl.⁴ B32B *17/02;* **B05D** *3/02*
U.S. Cl. 428—228 **13 Claims**



1. A process for manufacturing a coated, sculptured, nubby fabric useful as a ceiling board facing comprising:

(1) applying, to at least one face of a nubby, textured fabric substrate made of a plurality of yarns, a uniform layer of a thick, flame-retardant coating containing a pigment, a flame-retardant and a resin, the coating contacting and encapsulating substantially all of the yarns of the substrate with a tough, adherent film, the coating composition when exposed to heat or flame emitting vapors of low-toxicity and low smoke, and

(2) drying the thus-coated substrate to produce a sculptured, nubby, textured fabric having a non-cellular coating thereon.

4,695,508

ADHESIVE COMPOSITION

Kunio Kageyama, Yokohama, and Sumio Takasugi, Hiratsuka, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1985, Ser. No. 773,278
Int. Cl.⁴ C09J *7/02;* **H01B** *1/22, 1/26*
U.S. Cl. 428—261 **3 Claims**

1. A structural adhesive which is obtained by impregnating, spread-coating or laminating a strand, surface mat, cloth, woven fabric or victoria lawn, composed of glass fiber, a glass fiber/organic fiber composite, an organic fiber or a carbon fiber, with an adhesive composition comprising (1) at least one polymer having polar groups, which is selected from the group consisting of acrylonitrile/butadiene copolymers, carboxyl group-containing acrylonitrile/butadiene copolymers, acrylic rubbers, urethane rubbers, chloroprene rubber, chlorosulfonated polyethylene, ethylene/vinyl acetate copolymers, ethylene/acrylic acid copolymers, thermoplastic polyurethanes, saturated polyesters and polyamides, (2) at least one epoxy acrylate resin, (3) at least one acrylic or methacrylic monomer selected from the group consisting of acrylic or methacrylic monomers having at least two different functional groups in the molecule, and acrylic or methacrylic monomers represented by the following general formula:

$$H_2C{=}\underset{\displaystyle R_1}{\underset{|}{C}}{-}COOR_2$$

wherein R_1 is a hydrogen atom or a methyl group, and R_2 is an alkyl group having 1 to 18 carbon atoms or an organic residue containing an aromatic hydrocarbon ring or a heterocyclic ring, (4) an organic peroxide, (5) an imidazole or an amino compound containing at least one tertiary amino group, and (7)

at least one electrically conductive material selected from the group consisting of carbon black having a surface area of 125 to 260 m^2/g as determined by the N_2 adsorption method and a DBP oil absorption of 100 to 200 cc/100 g, ketjenblack, lamp black, acetylene black and graphite, and a cut carbon fiber and fine powders of aluminum, nickel, copper and zinc having a size not larger than 200 mesh.

4,695,509

POLYAMIDE FIBER REINFORCEMENT IN THERMOSET POLYURETHANE COMPOSITES

Colleen W. Cordova, Midlothian, Va., and Hugh H. Rowan, Chapel Hill, N.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 23, 1985, Ser. No. 812,581
Int. Cl.[4] B32B *27/40*
U.S. Cl. 428—267 **8 Claims**

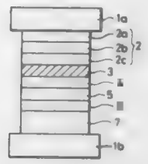
1. A fiber-reinforced thermoset polyurethane molded composite characterized by improved impact strength comprising molded thermoset polyurethane matrix reinforced with high tenacity polyamide fiber in an amount sufficient to provide said composite with said improved impact strength, said polyamide fiber characterized by a drawn denier of 4 to 8 denier per filament; a thermal shrinkage of up to about 14 percent; an elongation of less than 28 percent; and a tenacity of at least 5.5 grams per denier.

4,695,510

OPTO-MAGNETIC RECORDING MEDIUM

Mitsuharu Sawamura; Kazuoki Honguu, both of Yokohama, and Kazuhiko Kikuchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,867
Claims priority, application Japan, Aug. 28, 1984, 59-177582
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—336 **9 Claims**



1. An opto-magnetic recording medium comprising:
a plastic substrate at least substantially transparent to light;
a recording layer consisting of an amorphous magnetic material;
an under-coated layer comprising a silicon oxide film, a metal film at least substantially transparent to light and a nitride film laminated in succession from the substrate side between said substrate and said recording layer; and
a protective overcoat formed on the side of said recording layer opposite the side on which said under-coated layer is formed.

4,695,511

GRANULE FOR SEPARATING ORGANIC COMPOUNDS FROM AQUEOUS LIQUIDS

Howard Goodman, and Andrew R. Fugler, both of St. Austell, England, assignors to English Clays Lovering Pochin & Company, Cornwall, England

Filed Nov. 27, 1984, Ser. No. 675,960
Claims priority, application United Kingdom, Dec. 1, 1983, 8332174
Int. Cl.[4] B32B *5/16*; C09C *1/42*; C02F *1/42*
U.S. Cl. 428—404 **11 Claims**

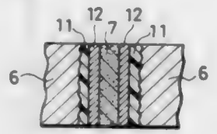
1. A granule useful for separating organic substances from an aqueous medium comprising an inner core, which is formed from a material that does not expand in the presence of organic compounds, and is selected from the group consisting of carbonaceous, siliceous and alumino-siliceous materials, and an outer shell formed from an organophilic cation-modified clay.

4,695,512

MAGNETIC HEAD FOR PERPENDICULAR MAGNETIC RECORDING

Takashi Hatanai, and Keishi Nakashima, both of Nagaoka, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 20, 1985, Ser. No. 800,056
Claims priority, application Japan, Nov. 22, 1984, 59-246162
Int. Cl.[4] G11B *5/235*
U.S. Cl. 428—408 **5 Claims**



1. A magnetic head for perpendicular magnetic recording comprising:
a pair of substrates constituted by a non-magnetic material and having their opposing surfaces respectively formed with heat-resistant polymer films for reduced surface roughness of R_{max}=0.05 microns;
a thin magnetic film retained between said substrates; and
a non-magnetic intermediate film interposed between said thin magnetic film and each of said heat-resistant polymer films and having a coefficeint of thermal expansion which is close to that of said thin magnetic film.

4,695,513

MAGNETIC RECORDING MEDIUM

Minoru Hashimoto, Kawasaki; Hajime Takeuchi, and Takeo Itoh, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Continuation of Ser. No. 647,385, Sep. 5, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 929,364
Claims priority, application Japan, Sep. 6, 1983, 58-162578
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—425.9 **10 Claims**

1. A magnetic recording medium, comprising a hexagonal system ferrite magnetic powder uniformly dispersed in a curable binder resin material comprising at least one of a vinyl chloride-vinyl acetate series resin and a polyurethane series resin, said binder having a B value in a following apparent viscosity equation:

$$\log \eta a = Bx + \log [\eta]$$

wherein ηa is an apparent viscosity in cP at a temperature of 25° C., x is a resin concentration in weight percent, is a limiting viscosity in cP at a temperature of 25° C., and B is a constant, said B value being 10 or less and measured by dissolving said binder resin material in a mixed solvent of equal weights of methyl ethyl ketone, toluene and cyclohexanone.

4,695,514

MAGNETO-OPTICAL MEMORY ELEMENT

Akira Takahashi, Nara; Yoshiteru Murakami; Junji Hirokane, both of Tenri; Hiroyuki Katayama, Nara, and Kenji Ohta, Yao, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 28, 1984, Ser. No. 675,850
Claims priority, application Japan, Nov. 29, 1983, 58-227293
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—432 **16 Claims**



1. A magneto-optical memory element comprising:
a substrate; and
a recording thin-film having a longitudinal surface formed on said substrate, said recording thin-film having an axis of easy magnetization prependicular to said surface, and said recording thin-film being made of an amorphous Nd-Gd-Fe ternary alloy thin-film.

4,695,515

METAL CORED BOARD AND METHOD FOR MANUFACTURING SAME

Hideaki Shirai; Kimio Chiba; Koji Okawa; Hiroshi Ishibashi; Akihiro Ishii; Hirotaka Itoh; Hirokazu Kuzushita; Michihiko Yoshioka, and Michio Hirose, all of Amagasaki, Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed Jul. 26, 1985, Ser. No. 759,210
Claims priority, application Japan, Jul. 30, 1984, 59-118195[U]; Jul. 30, 1984, 59-118196[U]; Dec. 22, 1984, 59-271425; Dec. 22, 1984, 59-271426
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—458 **6 Claims**



1. A metal cored board which comprises a base metal core, an easily solderable metal plating layer formed on one surface of the base metal core, an electrically insulating layer formed on the other surface of the base metal core, and an electrically conductive metal layer formed on the electrically insulating layer.

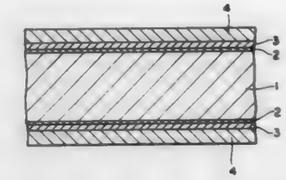
4,695,516

HEAT RESISTANT PRECOATED STEEL SHEET AND PROCESS FOR THE PRODUCTION THEREOF

Kenichi Masuhara; Kazuo Yamayoshi, and Kouji Wakabayashi, all of Chiba, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1986, Ser. No. 825,263
Claims priority, application Japan, Feb. 2, 1985, 60-18985
Int. Cl.[4] B05D *7/04, 7/16*
U.S. Cl. 428—623 **12 Claims**

4. A precoated steel sheet suitable for use in the manufacture of a muffler of an automobile exhaust gas system comprising:
a hot dip aluminized steel sheet,
a chromate pretreatment layer formed on each surface of said a hot dip aluminized steel sheet and having a chromium pick-up of 10 to 50 mg/m^2,
a primer coat formed on said pretreatment layer and comprising a cured polyamide imide resin and 8 to 52 parts by weight, based on 100 parts by weight of said resin, of strontium chromate intimately admixed with said resin,
a top coat formed on one of the primer coats and comprising a cured polyamide imide resin and 8 to 32 parts by weight, based on 100 parts by weight of said resin, of aluminum scale intimately admixed with said resin, and



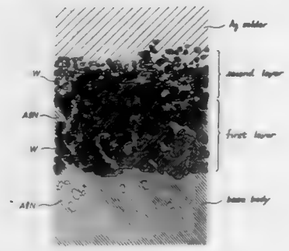
a black top coat on the other primer coat and comprising a cured polyamide imide resin having intimately admixed therewith 1.5 to 5 parts by weight of aluminum scale, 30 to 40 parts by weight of a calcined black pigment and 4 to 6 parts by weight of silica powder, based on 100 parts by weight of said resin.

4,695,517

COMPOSITE LAYER ALUMINUM NITRIDE BASE SINTERED BODY

Akiyasu Okuno, Kani; Masakazu Watanabe, Nagoya, and Kazuhiko Ikoma, Komaki, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 2, 1986, Ser. No. 869,792
Claims priority, application Japan, May 31, 1985, 60-119174; Jun. 13, 1985, 60-129023; Jun. 17, 1985, 60-131570
Int. Cl.[4] C04B *35/58*; F27D *7/06*
U.S. Cl. 428—698 **6 Claims**



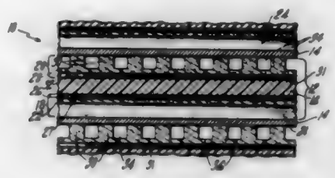
1. A composite layer aluminum nitride-base sintered body which comprises:
on at least one surface of AlN-base sintered body a first layer and a second layer in the recited order,
said first layer consisting essentially of
100 parts by weight of at least one first component selected from the group consisting of W, Mo, borides thereof and carbides thereof, and
0.1–50 parts by weight of a second component consisting essentially of AlN, and
said second layer consisting essentially of
at least one component selected from the group consisting of W, Mo, borides thereof and carbides thereof.

4,695,518

SILICON CARBIDE MATRIX FOR FUEL CELLS

John C. Trocciola, Glastonbury; Joseph Powers, Riverside, both of Conn., and Ronald G. Martin, Monson, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 516,152, Jul. 21, 1983, abandoned. This application Apr. 10, 1985, Ser. No. 722,176
Int. Cl.[4] H01M 8/14
U.S. Cl. 429—12 8 Claims



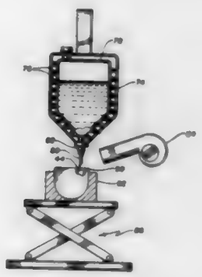
1. A fuel cell comprising:
a pair of spaced apart gas diffusion electrodes;
a porous electrolyte retaining matrix confined in the space between said electrodes, said matrix having a porosity of at least 38 percent and consisting essentially of 70 to 90 weight percent silicon carbide and a balance of hydrophilic polyethersulfone as a binder; and
phosphoric acid electolyte disposed within said matrix, wherein said matrix has the characteristic that it remains physically intact for at least 17,000 hours of fuel cell operation at 375° F.

4,695,519

ELECTROCHEMICAL CELL CONSTRUCTION AND FILL METHOD

T. V. Rao, Coon Rapids, and Robert C. Samec, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 264,789, May 18, 1981, abandoned. This application Jun. 23, 1983, Ser. No. 507,044
Int. Cl.[4] H07M 10/44; B65B 1/20
U.S. Cl. 429—52 5 Claims



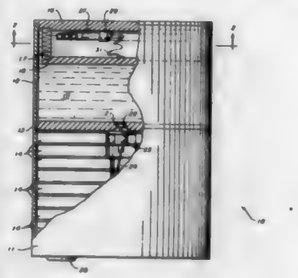
1. The method of introducing a fluid component into an electrochemical cell having a filler opening in the cell container plugged with a penetrable self-sealing septum, and in which the fluid component is of the type which is solid at ambient temperature and which must be heated to a melting point to achieve the fluid condition, comprising:
penetrating the septum with a hypodermic-like needle,
introducing the heated fluid component into the container by flow through the needle,
heating the needle to prevent uncontrolled solidification of the fluid component therein and flow stoppage, and
cooling the needle to stop fluid flow therethrough by solidification of the fluid component as desired.

4,695,520

ELECTROCHEMICAL RESERVE BATTERY

Kenneth T. Koper, Hatfield, Pa.; Sylvester L. Willard, and Larry A. Abramowski, both of Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 25, 1986, Ser. No. 911,615
Int. Cl.[4] H01M 6/32
U.S. Cl. 429—116 3 Claims



1. An electrochemical reserve battery comprising in combination:
a housing including a separating wall forming two sealed chambers;
a stack of dry cells disposed in one of said chambers;
an expandable container occupying a portion of the space within the other of said chambers;
an electrolyte completely filling the unoccupied space at a pressure sufficient to collapse said container;
a source of high pressure gas within said container;
frangible means operatively connected between said source and said container for releasing the gas into said container at a preselected expansion thereof; and
actuating means operatively connected to said separating wall for selectively establishing communication between said chambers for permitting said electrolyte to transfer to said cells.

4,695,521

CONJUGATED POLYMER AS SUBSTRATE FOR THE PLATING OF ALKALI METAL IN A NONAQUEOUS SECONDARY BATTERY

Lawrence W. Shacklette; James E. Toth, both of Maplewood, and Ronald L. Elsenbaumer, Morristown, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 27, 1985, Ser. No. 749,325
Int. Cl.[4] H01M 10/40
U.S. Cl. 429—194 15 Claims

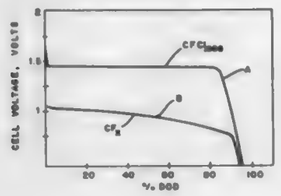
1. A battery comprising:
(a) an anode comprising a porous conjugated backbone polymer substrate, wherein said conjugated backbone polymer is reduced (n-doped) before or during the charging of said battery and, has dispersed therein elemental alkali metal;
(b) an electrolyte comprising an organic solvent containing dissolved alkali-metal salt, and
(c) a cathode;
said alkali-metal from said electrolyte being electrodeposited in and/or onto said polymer substrate as elemental alkali metal during at least a part of the charging cycle of said battery, and said elemental alkali metal being converted into alkali metal cations during the discharging of said battery.

4,695,522

AQUEOUS BATTERY WITH $(C_yF_xCl_z)_n$ CATHODE

David Nalewajek, West Seneca; Jung T. Kim, Williamsville, and Lynn E. McCurry, Hamburg, all of N.Y., assignors to Allied Corporation, Morristownship, Morris County, N.J.

Continuation of Ser. No. 756,202, Jul. 18, 1985, abandoned. This application Aug. 26, 1986, Ser. No. 900,280
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] H01M 4/58
U.S. Cl. 429—206 4 Claims



1. A novel high energy density aqueous cell comprising:
(a) a zinc anode;
(b) an aqueous electrolyte; and
(c) a $(C_yF_xCl_z)_n$ cathode wherein y has a value of greater than zero up to 2, x is greater than 0 up to 1.2, z is greater than 0 up to 0.1 and n denotes an infinitely large number for a two dimensional array of $C_yF_xCl_z$ units.

4,695,523

METHOD OF SCREENING A FLAT MASK CATHODE RAY TUBE

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Electonics Corporation, Glenview, Ill.

Filed Apr. 26, 1985, Ser. No. 727,486
Int. Cl.[4] G03C 5/00; H01J 9/20
U.S. Cl. 430—23 9 Claims

1. For use in the manufacture of a color cathode ray tube which ultimately includes a tensed mask having a pattern of apertures, a method of photographically forming a pattern related to said pattern of apertures on a faceplate of said tube which method includes utilizing said tensed mask, said mask being held on a support frame that is subject to distortion when in a free state by forces exerted thereon by said tensed mask, the method comprising:
positioning said faceplate bearing a photosensitive coating in an exposure station and in registration with said mask support frame;
thermally expanding said tensed mask to reduce tension in said tensed mask and thereby reduce distortion in said support frame; and
exposing said faceplate borne photosensitive coating through said tensed mask, to energy actinic to said coating while said support frame is in its distortion-reduced state to thereby create a substantially undistorted latent image of said aperture pattern on said coating.

4,695,524

PROCESS FOR ULTRA HIGH QUALITY IMAGES WITH MAGNETIC DEVELOPER COMPOSITION

John F. Knapp, Fairport; Robert J. Gruber, Pittsford; Lawrence Floyd, Jr.; Steven B. Bolte, both of Rochester, and Michael G. Swales, Sodus, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 21, 1986, Ser. No. 865,327
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] G03G 13/00, 9/10
U.S. Cl. 430—32 29 Claims

1. A process for generating consistent high quality images comprised of (1) providing a xerographic imaging, or printing apparatus; (2) adding thereto a stable two component developer composition comprised of a toner composition with an average particle diameter of from about 6 to about 10 microns, and comprised of resin particles, first pigment particles, second magnetite pigment particles, which are present in a greater amount than the first pigment particles, and blended flow additive particles; and carrier particles consisting of a ferrite core, or a steel core, and a coating thereover selected from the group consisting of terpolymers of styrene, methacrylate, and organosilanes; and polymethacrylate, which coating has incorporated therein conductive particles; (3) forming electrostatic latent images, or magnetic images in the apparatus; and (4) developing the images formed, wherein the developer composition retains its electrical properties for an extended number of imaging cycles.

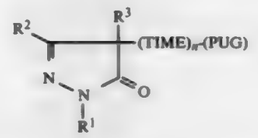
4,695,525

IMAGE FORMING PROCESS

Masaaki Tsukase; Kozo Sato; Hiroshi Kitaguchi; Masashi Takeuchi, and Masatoshi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1986, Ser. No. 828,481
Claims priority, application Japan, Feb. 12, 1985, 60-24665
Int. Cl.[4] G03C 5/18, 5/54, 1/34, 1/06
U.S. Cl. 430—151 12 Claims

1. A process of forming images by heat developing a heat developable light-sensitive material after imagewise exposure, comprising heating a heat developable light-sensitive material in the presence of a nucleophilic reagent and a compound represented by general formula (I):



(I)

wherein R^1 represents a group represented by the following groups (A) to (C)



(A)



(B)



(C)

wherein R^{11} and R^{12}, which may be the same or different in formula (C), each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic residue, a substituted or unsubstituted alkyloxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, or a substituted or unsubstituted amino group; said R^{11} and R^{12} may combine with each other to form a 5-membered or 6-membered ring in formula (C);

R^2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted heterocyclic residue, a substi-

tuted or unsubstituted alkyloxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a substituted or unsubstituted amino group, a substituted or unsubstituted carbamoyl group, a carboxy group, an acylamino group, an acyloxy group, a sulfonylamino group, a cyano group, an alkyloxycarbonyl group, or an aryloxycarbonyl group;

R^3 represents a subetituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted heterocyclic residue, or a group shown by -(TIME)$_n$-(PUG);

said R^2 and R^3 may combine with each other to form a 5-membered or 6-membered ring;

TIME represents a timing group;

PUG represents a photographically useful group; and

n represents an integer of 0 to 3.

6. A process as claimed in claim 1, wherein (PUG) is selected from the group consisting of an antifoggant, a development inhibitor, a developing agent, a developing accelerator, an electron donor, a fogging agent, a nucleating agent, a silver halide solvent, a bleach accelerator, a blix accelerator, a fix accelerator, a dye, a coloring agent for color diffusion transfer process, a coupler, a melting point depressant for light-sensitive materials and a coupling inhibitor for diazo heat photography.

4,695,526

POLY(ETHYLENE OXIDE) STRIPPING AGENTS FOR PHOTOGRAPHIC PRODUCTS

John F. Bishop, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,346

Int. Cl.[4] G03C *5/54, 1/90*

U.S. Cl. 430—215 **11 Claims**

1. A photographic product comprising

(a) A photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer;

(b) an image-receiving layer; and

(c) a stripping layer located between said photosensitive element and said image-receiving layer, wherein said stripping layer comprises a nonionic poly(ethylene oxide) homopolymeric compound having a weight average molecular weight of from about 200,000 to about 5,000,000 present in such concentration that said image-receiving layer can be cleanly separated, after processing, from the remaining layers of said product.

4,695,527

RADIATION-POLYMERIZABLE COMPOSITION AND PROCESS FOR THE APPLICATION OF MARKINGS TO A PRINTED CIRCUIT BOARD

Ulrich Geissler, Frankfurt am Main, and Heide Lampas, Hochheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 717,101, Mar. 28, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,190

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3412992

Int. Cl.[4] G03C *5/00, 11/12*

U.S. Cl. 430—256 **18 Claims**

1. A process for the application of markings to a printed circuit board, comprising the steps of:

(i) laminating under pressure a solid thermoplastic photopolymerizable layer onto a supported, imagewise-exposed and developed solder-resist layer of a printed circuit board, said photopolymerizable layer being provided on a transparent, flexible temporary support and comprising

(a) a compound which has at least two terminal ethylenically unsaturated groups and which is capable of forming a crosslinked polymer by means of addition chain polymerization initiated by free radicals,

(b) a polymeric binder,

(c) a radiation-activatable polymerization initiator which forms free radicals,

(d) a compound which is thermally crosslinked with at least one from the group consisting of a polymerization product of said compound (a), said polymeric binder (b) and said compound (d) itself, and

(e) a finely-divided pigment which is dispersible in said photopolymerizable layer and which contrasts in color with the surface of said printed circuit board;

(ii) imagewise exposing said photopolymerizable layer through a negative of said markings;

(iii) peeling said temporary support from said photopolymerizable layer; and

(iv) treating said photopolymerizable layer in a developer to dissolve unexposed areas of said photopolymerizable layer.

4,695,528

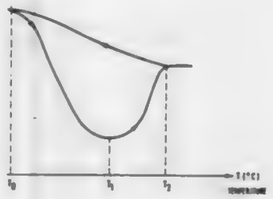
PROCESS FOR FORMING IMAGES USING BODY WITH REVERSIBLE FIXABLE AND TEMPERATURE-VARIABLE LIGHT EXTINCTIONS

Wolfgang H. Dabisch, Scharfensteinstr. 18, 6228 Eltville; Peter Kung, Kelkheim; Siegfried R. Muller, Destrich-Winkel, and Krishnamoorthy Narayanan, Eltville, all of Fed. Rep. of Germany, assignors to Wolfgang Dabisch, Fed. Rep. of Germany

Division of Ser. No. 123,582, Jul. 16, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,763

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—290 **21 Claims**



1. An imaging process which comprises:

image-wise heating a body to a temperature in excess of T_0, and allowing said body to cool to a temperature of T_0 or below,

said body comprising at least one organic polymeric or resinous matrix material (A) and at least one organic low molecular material (B);

said material (B) having 10 to 60 carbon atoms, being at least partially insoluble in said material (A) and being contained in said material (A) as a dispersed second phase, exhibiting a change in volume of at least 5% upon changing from a solid phase to a liquid phase or changing from a liquid phase to a solid phase, and in the solid state at ambient temperature, exhibiting a refractive index which closely approximates or is the same as the refractive index of the material (A) and being selected from the group consisting of an alkanol; an alkandiol; a haloalkanol or a haloalkandiol; an alkylamine; an alkane; an alkene; an alkyne; a cycloaklane; a cycloalkene; or a cycloalkyne; a saturated or unsaturated mono- or -di-carboylic acid or an ester or an amide or an ammonium salt of the same; a saturated or unsaturated halogen fatty acid or an ester, an amide; or an ammonium salt of the same; an aryl carboxylic acid or an ester, an amide, or an ammonium salt thereof; a haloaryl carboxylic acid or an ester, an amide, or an ammonium salt of the same; a thiol; a thiocarboxylic acid or an ester, an amide or an ammonium salt thereof; or a carboxylic acid ester of a thiol or mixtures thereof, wherein in the aforesaid esters the alcohol groups can be saturated or unsaturated and/or halogen-substituted,

said materials (A) and (B) being selected such that they provide said body with a variable light extinction characteristic at a temperature below a temperature T_0 in dependence upon prior heating to a temperature above T_0, said organic material (B) being present in a weight ratio to the matrix material (A) of approximately 1:3 to 1:16, said variable light extinction characteristic being such that maximum light extinction is obtained by heating said body above a temperature T_2 which lies above T_0 and cooling to a temperature below T_0; minimum light extinction is obtained by heating said body above a temperature T_1 lying between T_0 and T_2 and cooling to a temperature below T_0; and light extinctions of varying magnitude are obtained by heating said body to a temperature between T_0 and T_1, and cooling to a temperature below T_0; wherein;

images having maximum light extinction are obtained by image-wise heating said body when said body is in a state in which said body exhibits minimum light extinction at a temperature below T_0, to a temperature above a temperature T_2 and cooling to below T_0,

images having light extinction of diminishing magnitude are obtained by image-wise heating said body when said body is in a state in which said body exhibits maximum light extinction at a temperature below T_0, to a temperature T between T_0 and T_1, and cooling to below T_0, and

images of minimum light extinction are obtained by image-wise heating said body when said body is in a state in which said body exhibits maximum light extinction or extinction of diminished magnitude at a temperature below T_0, to a temperature between T_1 and T_2 and cooling to below T_0.

11. Am imaging process which comprises:

image-wise heating a body to a temperature in excess of room temperature, and allowing said body to cool from said temperature to room temperature;

said body comprising at least one organic polymeric or resinous matrix material (A) and at least one organic low molecular material (B);

said low molecular material (B) containing 10 to 60 carbon atoms, exhibiting a change in volume of at least 5% upon changing from a solid phase to a liquid phase or changing from a liquid phase to a solid phase, being at least partially insoluble in said material (A), exhibiting a solid state refractive index which closely approximates or is the same as the refractive index of said material (A), and being selected from the group consisting of:

an alkanol; an alkandiol; a haloalkanol or a haloalkandiol; an alkylamine; an alkane; an alkene; an alkyne; a cycloalkane; a cycloalkene; or a cycloalkyne; a saturated or unsaturated mono- or -di-carboxylic acid or an ester of an amide or an ammonium salt of the same; a saturated or unsaturated halogen fatty acid or an ester, an amide; or an ammonium salt of the same; an aryl carboxylic acid or an ester, an amide, or an ammonium salt thereof; a haloaryl carboxylic acid or an ester, an amide, or an ammonium salt of the same; a thiol; a thiocarboxylic acid or an ester, an amide or an ammonium salt thereof; or a carboxylic acid ester of a thiol or mixtures thereof, wherein in the aforesaid esters the alcohol groups can be saturated or unsaturated and/or halogen-substituted,

said matrix material (A) and said low molecular material (B) being present in said body in a weight ratio of said material (B) to said material (A) of approximately 1:3 to 1:16; and matrix material (A) and said low molecular material (B) being selected such that said body possesses a temperature variable light extinction at room temperature in dependence upon heating to a temperature above room temperature, said variable light extinction characteristic being such that maximum light extinction is obtained by heating said body to a temperature T_2 which lies above room temperature and cooling said body to room temperature; minimum light extinction is obtained by heating said body above a temperature T_1 which lies between room temperature and said temperature T_2 and cooling said body to room temperature; and light extinctions of varying magnitude are obtained by heating said body to a temperature between room temperature and said temperature T_1 and cooling said body to room temperature; wherein:

images of maximum light extinction are obtained by image-wise heating said body from a state in which said body exhibits minimum light extinction at room temperature, to a temperature above said temperature T_2 and cooling said body to room temperature;

images having light extinction of diminishing magnitude are obtained by image-wise heating said body from a state in which said body exhibits maximum light extinction at room temperature to a temperature T between room temperature and said temperature T_1, and cooling said body to room temperature, and

images of minimum light extinction are obtained by image-wise heating said body from a state in which said body exhibits maximum light extinction or light extinction of diminished magnitude at room temperature, to a temperature between said temperature T_1 and said temperature T_2 and cooling said body to room temperature.

4,695,529

IMAGE-FORMING PROCESS

Akira Abe; Junya Nakajima, and Toshihiro Nishikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 15, 1986, Ser. No. 919,110

Claims priority, application Japan, Oct. 17, 1985, 60-232725

Int. Cl.[4] G03C *5/38, 7/42*

U.S. Cl. 430—351 **9 Claims**

1. An image-forming process, which comprises imagewise exposing a silver halide color photographic material comprising a support having provided thereon at least one silver halide emulsion layer containing tabular silver halide grains having a diameter-to-thickness ratio of 5 or more, subjecting the exposed photographic material to color development processing, then processing the photographic material in a bath mainly having a bleaching ability and successively in a bath having a bleach-fixing ability.

9. An image-forming process as claimed in claim 1, wherein the processing solutions are used at temperatures of about 10° C. to about 50° C.

4,695,530

METHOD FOR FORMING IMAGE USING SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kotaro Nakamura, and Takatoshi Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1986, Ser. No. 854,976

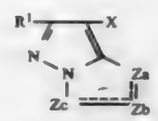
Claims priority, application Japan, Apr. 23, 1985, 60-87133

Int. Cl.[4] G03C *5/38, 5/44, 7/36, 7/42*

U.S. Cl. 430—381 **30 Claims**

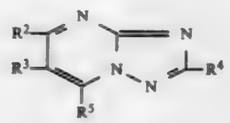
1. A method for forming an image in a silver halide color photographic light-sensitive material comprising developing an imagewise exposed silver halide color photographic light-sensitive material and then bleach fixing the silver halide color photographic light-sensitive material in a bleach fixing bath, the silver halide photographic color light sensitive material comprising a support having thereon a silver halide emulsion layer containing a yellow coupler, a silver halide emulsion layer containing a magenta coupler and a silver halide emulsion layer containing a cyan coupler, wherein the silver halide emulsion layer containing the magenta coupler contains at least

one pyrazoloazole type coupler represented by the general formula (I):

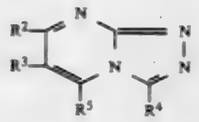


(I)

wherein R^1 represents a hydrogen atom or a substituent; X represents a hydrogen atom or a group capable of being released upon a coupling reaction with an oxidation product of an aromatic primary amine developing agent; Za, Zb and Zc each represents a methine group, a substituted methine group, —N= or —NH—, one of the Za-Zb bond and the Zb-Zc bond being a double bond and the other being a single bond; an aromatic ring may be condensed to the Zb-Zc bond; R^1 or X may form a polymer including a dimer or more; and when Za, Zb or Zc is a substituted methine group, the substituted methine group may form a polymer including a dimer or more; a photographic layer of the silver halide color photographic light-sensitive material or a processing solution contains at least 5.0×10^{-6} mol per mol of silver halide contained in the silver halide color photographic light-sensitive material of at least one compound represented by the formulae (II) or (III):



(II)



(III)

wherein R^2, R^3, R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a hydroxy group, an aliphatic residue, an alkyl group substituted with an aromatic group, an alkyl group substituted with an alkoxy group, an alkyl group substituted with a hydroxy group, a carboxy group or an alkoxy carbonyl group or an aromatic residue; or R^2 and R^3 may be bonded each other to form a 5-membered or 6-membered saturate or unsaturated ring; and a developing agent which is introduced into the bleach-fixing bath is at least 1.0×10^{-4} mol per mol of a bleaching agent thereof.

2. A method for forming an image as claimed in claim 1, wherein the polymer of the pyrazoloazole type coupler is a bis coupler or a polymer coupler.

4,695,531

LIGHT-SENSITIVE ELEMENTS FOR RADIOGRAPHIC USE IN THE FORMATION OF AN X-RAY IMAGE

Gerolamo Delfino, Savona; Simone Frasco, Ferrania, and Cesare Verdi, Carcare, all of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

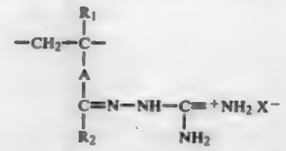
Filed Jul. 17, 1986, Ser. No. 887,121

Claims priority, application Italy, Jul. 25, 1985, 21716 A/85

Int. Cl.⁴ G03C *1/84*

U.S. Cl. 430—513 **13 Claims**

1. A light-sensitive silver halide element for use with x-ray intensifying screens said element comprising a transparent support having coated on at least one of its sides one spectrally sensitized silver halide emulsion layer, said element containing, between the base and said one silver halide emulsion layer, a hydrophilic colloid layer of from 0.05 to 2 microns containing a water-soluble acid dye capable of being decolorized in the photographic processing and having absorption in a region of the electromagnetic spectrum corresponding to the spectral sensitivity of the silver halide emulsion, said dye being associated with a basic polymeric mordant, said mordant being present as from 1 to 30% by weight of said hydrophilic colloid, said element being characterized by the fact that said mordant comprises repeating units of formula:



wherein R_1 is hydrogen or a methyl group, A is a —COO— or —COO—alkylene group, R_2 is hydrogen or a lower alkyl group and X is an anion.

4,695,532

PHOTOGRAPHIC SILVER HALIDE ELEMENT CONTAINING NEW ADHESION PROMOTING POLYMERIC MATERIALS AND POLYESTER SUPPORT

Ignazio S. Ponticello, and Edward P. Otocka, both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 768,386, Aug. 22, 1985. This application Sep. 8, 1986, Ser. No. 905,014

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—533 **6 Claims**

1. A photographic element comprising a silver halide emulsion layer and a discharge-treated polyester film support having coated directly thereon a crosslinked layer of an aqueous polymer and gelatin coating composition wherein the polymer to gelatin ratio is in the range of 95:5 to 60:40 and the polymer comprises

(a) from 1 to 60 weight percent of recurring units derived from a polymerized vinyl monomer having a primary amine addition salt component or aminostyrene addition salt component;

(b) from 0 to 50 weight percent of recurring units derived from a polymerized hydrophilic vinyl monomer; and

(c) from 20 to 98 weight percent of recurring units derived from a polymerized hydrophobic nonionic vinyl monomer.

4,695,533

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noritaka Nakayama; Satoshi Kawakatsu; Katsunori Katoh, all of Hachioji; Toshijumi Iijima, Kokubunji; Kenji Kamashiro, Hachioji; Hiroshi Kashiwagi, Hino; Koichi Hatta; Takashi Uchida, both of Hachioji; Hajime Wada, Tokyo; Fumio Ishii, Akishima; Satoshi Matsunaga, Hino; Yasuko Matsubara, Akishima, and Kaoru Shinozaki, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

PCT No. PCT/JP85/00510, § 371 Date May 28, 1986, § 102(e) Date May 28, 1986, PCT Pub. No. WO86/01915, PCT Pub. Date Mar. 27, 1986

PCT Filed Sep. 12, 1985, Ser. No. 845,881

Claims priority, application Japan, Sep. 14, 1984, 59-193609; Dec. 26, 1984, 59-281182; Apr. 3, 1985, 60-70197

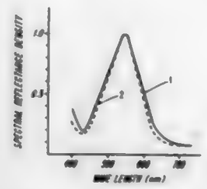
Int. Cl.⁴ G03C *1/40, 7/38, 7/32*

U.S. Cl. 430—558 **7 Claims**

1. A silver halide photographic light-sensitive material characteristica a support bearing thereon at least one of silver halide emulsion layers. wherein at least one of said silver halide emulsion layers contains an 1H-pyrazolo[3,2-C-s-triazole magenta coupler substituted in the third position thereof by a group represented by the following Formula [I];

$$—R_1—SO_2—R_2$$ Formula [I]

wherein R_1 represents an alkylene group having not less than 3 carbon atoms in the straight-chained portion thereof, which



links said $—SO_2—R_2$ the carbon atom in the third position of the nucleus of the 1H-pyrazolo[3,2-C]-s-triazole; and R_2 represents an aryl group.

4,695,534

SILVER HALIDE PHOTOSENSITIVE MATERIAL

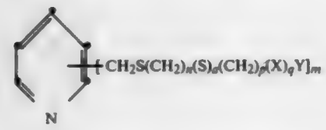
Philip S. Bryan, and Arthur H. Herz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,452

Int. Cl.⁴ G03C *1/08*

U.S. Cl. 430—569 **20 Claims**

13. In a process for the preparation of a silver halide emulsion, the improvement which comprises adding, during preparation of said emulsion or prior to coating thereof on a support, from about 0.001 to about 10 g per mol of silver halide of a compound having the structural formula:



where

X is $NHCO(CH_2)_n$;

Y is hydrogen, hydroxyl or a carboxylic group of the formula COOR′ where R′ is hydrogen or an alkyl group having from 1 to about 5 carbon atoms;

a is 0 or 1;

n is 1 or 2;

p and q are each 0, 1 or 2; and

m is from 2 to 5,

or a quaternary ammonium salt thereof.

4,695,535

SILVER HALIDE PHOTOSENSITIVE MATERIAL

Philip S. Bryan, and Arthur H. Herz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,455

Int. Cl.⁴ G03C *1/08*

U.S. Cl. 430—569 **13 Claims**

8. In a process for the preparation of a silver halide emulsion, the improvement which comprises adding, during preparation of said emulsion or prior to coating thereof on a support, from about 0.001 to about 10 g per mol of silver halide of a compound having the structural formula:

$$HO_2C(C_2H_4S)_2(CH_2)_n(CHR^1)_n(CHR^2)_n(SC_2H_4)_2CO_2H$$

wherein

R^1 is hydrogen, hydroxy or —COOH;

R^2 is hydrogen or $—(CH_2)_2COOH$; and

each n is independently 1 or 2,

or an alkali metal or ammonium salt thereof.

4,695,536

CORNEAL STORAGE SYSTEM

Richard L. Lindstrom, 20050 Lakeview Ave., Excelsior, Minn. 55391; Donald J. Doughman, 5228 W. Highwood Dr., Edina, Minn., and Debra Skelnik, P.O. Box 344, Cambridge, Minn. 55008

Filed Jan. 10, 1984, Ser. No. 569,609

Int. Cl.⁴ A01N *1/02*

U.S. Cl. 435—1 **14 Claims**

1. Corneal storage media comprising 500 ml Gibco's minimum essential media (Eagles) with Earls salts, 25 mM HEPES buffer without L-glutamine; 50 ml of decomplemented calf serum or 25 ml of decomplemented calf serum and 25 ml of decomplemented fetal calf serum or 50 ml of decomplemented fetal calf serum at a 10 percent final concentration of final media volume; 5 ml of L-glutamine (200 mM) at 1 percent final concentration of final media volume; chondroitin sulfate at 1 percent of 10 percent to final media volume; and, antibiotics of 10,000 units/ml of penicillin plus 50–100 ug/ml of garamycin (plus or minus 0.25 ug/ml of amphotericin B) whereby the solution is equilibrated to 7.2–7.6 pH through 5 percent CO_2 and 95 percent air.

4,695,537

PARTICLES SENSITIZED WITH DETERGENT-TREATED ANTIGEN FOR AGGLUTINATION IMMUNOASSAY

Preston H. Dorsett, Memphis, Tenn., assignor to The University of Tennessee Research Corp., Knoxville, Tenn.

Continuation-in-part of Ser. No. 380,537, May 21, 1982, Pat. No. 4,590,156. This application Apr. 25, 1985, Ser. No. 727,661

Int. Cl.⁴ G01N *33/546, 33/547*

U.S. Cl. 435—5 **28 Claims**

1. A composition, comprising:

a solid particulate support and a detergent-treated antigen supported on said support, said antigen being an intracellular parasite antigen, said antigen having been treated with a detergent to provide a solid support sensitized with the detergent-treated antigen which is is resistant to self-agglutination.

6. The composition of claim 1 wherein said antigen has been treated with a detergent prior to being supported on the support.

4,695,538

HUMAN MONOCLONAL ANTIBODIES TO CELL SURFACE ANTIGENS

Richard J. Cote; Timothy M. Thomson; Alan N. Houghton, all of New York, N.Y.; Herbert F. Oettgen, New Canaan, Conn.; Lloyd J. Old, and Carlos C. Cardo, both of New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Jun. 1, 1984, Ser. No. 616,397

Int. Cl.⁴ G01N *33/53, 33/577*

U.S. Cl. 435—7 **12 Claims**

1. Hybridoma cell lines which produce human monoclonal antibodies which specifically bind to cell surface antigens and intracellular components of human cells, said cell lines selected from the group consisting of HB8565, HB8572, HB8573, HB8574, HB8575, HB8576, and HB8577.

4,695,539

PROCESS FOR QUANTITATIVE DETERMINATION OF SUBSTRATE TREATED WITH OXIDASE

Yoshitsugu Sakata, Otsu; Yoshibonu Miyashita, Osaka; Tadashi Hamasaka, Kobe; Hiroyuki Koders; Yutaka Miki, both of Amagasaki; Kazuhiko Yamanishi, Tokyo, and Toshiro Hanada, Kawagoe, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 22, 1983, Ser. No. 516,241

Claims priority, application Japan, Sep. 29, 1982, 57-170639

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] C12Q *1/62, 1/60, 1/54, 1/26, 1/28*

U.S. Cl. 435—10 **9 Claims**

1. A process for quantitatively determining a substrate, which comprises treating a sample containing a substrate selected from the group consisting of glucose, glycerol, glycerol phosphate, choline, cholesterol, acyl CoA, pyruvic acid, uric acid, xanthine and lactic acid with a specific oxidase corresponding to said substrate, and measuring the generated superoxide ion by using a reagent composition comprising (a) the specific oxidase, (b) a peroxidase, (c) a phenol and/or an amine, (d) a thiol compound in an amount effective to retard the conversion of superoxide into hydrogen peroxide, and (e) a color producing reagent to be reduced.

4,695,540

QUANTITATIVE DETERMINATION OF SUBSTRATE TREATED WITH OXIDASE

Kazuhiko Yamanishi, Tokyo, and Toshiro Hanada, Kawagoe, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 22, 1983, Ser. No. 516,271

Claims priority, application Japan, Jul. 23, 1982, 57-128700; Jun. 20, 1983, 58-110423

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] C12Q *1/62, 1/60, 1/54, 1/26, 1/28*

U.S. Cl. 435—10 **6 Claims**

1. A process for quantitatively determining a substrate, which comprises treating a sample containing a substrate with a specific oxidase corresponding to said substrate and measuring the generated superoxide ion, said oxidase treatment and measuring of generated superoxide ion conducted by measuring color formation or color change being conducted by using a reagent composition comprising (a) the specific oxidase corresponding to the substrate to be determined, (b) iron complex of porphyrin or iron chelate, (c) an amine and/or a phenol, (d) a thiol compound in an amount effective to retard the conversion of superoxide into hydrogen peroxide, and (e) a color producing reagent to be reduced.

4,695,541 •

ENZYMATIC DETECTION OF BACTERIAL CAPSULAR POLYSACCHARIDE ANTIGENS

Peter W. Taylor, West Haven, Conn., assignor to Molecular Diagnostics, Inc., West Haven, Conn.

Filed Jan. 31, 1985, Ser. No. 696,827

Int. Cl.[4] C12N *9/24;* **C12Q** *1/00, 1/34*

U.S. Cl. 435—18 **16 Claims**

1. A substantially pure enzyme which hydrolyzes a polymer containing alpha 2,8-linked N-acetyl neuraminic acid, said enzyme derived from the tail structure of K-1 specific bacteriophages, said enzyme having a molecular weight of 208,000d, said enzyme characterized by not being able to release α2,3-, α2,6- and α2,9-linked sialyl residues and said enzyme having a maximal activity in the pH range of 5.2 to 5.5.

4,695,542

CDNA CLONES CODING FOR POLYPEPTIDES EXHIBITING MULTI-LINEAGE CELLULAR GROWTH FACTOR ACTIVITY

Takashi Yokota; Frank Lee, both of Palo Alto; Donna Rennick, Los Altos Hills, and Ken-ichi Arai, Palo Alto, all of Calif., assignors to DNAX Research Institute of Molecular and Cellular Biology, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 539,050, Oct. 4, 1983, abandoned. This application Mar. 19, 1984, Ser. No. 590,867

Int. Cl.[4] C12P *21/00;* **C07H** *15/12;* **C12N** *15/00, 1/00*

U.S. Cl. 435—68 **17 Claims**

1. A process for producing a polypeptide exhibiting mouse multi-lineage cellular growth factor activity, said process comprising the steps of:

providing a vector comprising a nucleotide sequence coding for said polypeptide, wherein the nucleotide sequence is capable of being expressed by a host containing the vector and wherein the nucleotide sequence is selected from the group of nucleic acids capable of encoding a polypeptide having an amino acid sequence defined by the formula:

Asp—Thr—His—Arg—Leu—Thr—Arg—Thr—
—Leu—Asn—Cys—Ser—Ser—Ile—Val—Lys—
—Glu—Ile—Ile—Gly—Lys—Leu—Pro—Glu—
—Pro—Glu—Leu—Lys—Thr—Asp—Asp—Glu—
—Gly—Pro—Ser—Leu—Arg—Asn—Lys—Ser—
—Phe—Arg—Arg—Val—Asn—Leu—Ser—Lys—
—Phe—Val—Glu—Ser—Gln—Gly—Glu—Val—
—Asp—Pro—Glu—Asp—Arg—Tyr—Val—Ile—
—Lys—Ser—Asn—Leu—Gln—Lys—Leu—Asn—
—Cys—Cys—Leu—Pro—Thr—Ser—Ala—Asn—
—Asp—Ser—Ala—Leu—Pro—Gly—Val—Phe—
—Ile—Arg—Asp—Leu—Asp—Asp—Phe—Arg—
—Lys—Lys—Leu—Arg—Phe—Tyr—Met—Val—
—His—Leu—Asn—Asp—Leu—Glu—Thr—Val—
—Leu—Ala—Ser—Arg—Pro—Pro—Gln—Pro—
—Ala—Ser—Gly—Ser—Val—Ser—Pro—Asn—
—Arg—Gly—Thr—Val—Glu—Cys

incorporating the vector into the host; and

maintaining the host containing the vector under conditions suitable for expression of the nucleotide sequence into said polypeptide.

4,695,543

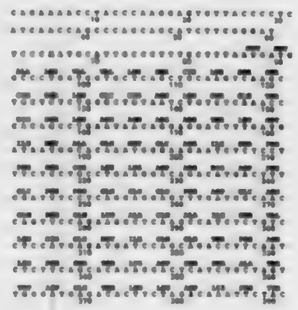
ALPHA INTERFERON GX-1

Alan Sloma, Silver Spring, Md., assignor to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 361,364, Mar. 23, 1982, abandoned. This application Apr. 24, 1984, Ser. No. 602,275

Int. Cl.[4] C12P *21/02, 21/00, 21/04, 19/34;* **C12N** *15/00, 1/00, 1/20;* **C07H** *21/04*

U.S. Cl. 435—70 **19 Claims**



1. A cloned, intact human alpha-interferon Gx-1 gene, substantially free of other DNA of human origin, comprising the

following deoxyribonucleotide sequence, along with the corresponding amino acid sequence for which said deoxyribonucleotide sequence codes:

```
    CYS  ASN  LEU  SER  GLN  THR  HIS
5' TGY AAY YTZ QRS CAM ACX CAY

    SER  LEU  ASN  ASN  ARG  ARG  THR
    QRS YTZ AAY AAY LGN LGN ACX

    LEU  MET  ILE  MET  ALA  GLN  MET
    YTZ ATG ATH ATG GCX CAM ATG

    GLY  ARG  ILE  SER  PRO  PHE  SER
    GGX LGN ATH QRS CCX TTY QRS

    CYS  LEU  LYS  ASP  ARG  HIS  ASP
    TGY YTZ AAM GAY LGN CAY GAY

    PHE  GLY  PHE  PRO  GLN  GLU  GLU
    TTY GGX TTY CCX CAM GAM GAM

    PHE  ASP  GLY  ASN  GLN  PHE  GLN
    TTY GAY GGX AAY CAM TTY CAM

    LYS  ALA  GLN  ALA  ILE  SER  VAL
    AAM GCX CAM GCX ATH QRS GTX

    LEU  HIS  GLU  MET  ILE  GLN  GLN
    YTZ CAY GAM ATG ATH CAM CAM

    THR  PHE  ASN  LEU  PHE  SER  THR
    ACX TTY AAY TYZ TTY QRS ACX

    LYS  ASP  SER  SER  ALA  THR  TRP
    AAM GAY QRS QRS GCX ACX TGG

    ASP  GLU  THR  LEU  LEU  ASP  LYS
    GAY GAM ACX YTZ YTZ GAY AAM

    PHE  TYR  THR  GLU  LEU  TYR  GLN
    TTY TAY ACX GAM YTZ TAY CAM

    GLN  LEU  ASN  ASP  LEU  GLU  ALA
    CAM YTZ AAY GAY YTZ GAM GCX

    CYS  MET  MET  GLN  GLU  VAL  GLY
    TGY ATG ATG CAM GAM GTX GGX

    VAL  GLU  ASP  THR  PRO  LEU  MET
    GTX GAM GAY ACX CCX YTZ ATG

    ASN  VAL  ASP  SER  ILE  LEU  THR
    AAY GTX GAY QRS ATH YTZ ACX

    VAL  ARG  LYS  TYR  PHE  GLN  ARG
    GTX LGN AAM TAY TTY CAM LGN

    ILE  THR  LEU  TYR  LEU  THR  GLU
    ATH ACX YTZ TAY YTZ ACX GAM

    LYS  LYS  TYR  SER  PRO  CYS  ALA
    AAM AAM TAY QRS CCX TGY GCX
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-continued

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    TRP  GLU  VAL  VAL  ARG  ALA  GLU
    TGG GAM GTX GTX LGN GCX GAM

    ILE  MET  ARG  SER  PHE  SER  LEU
    ATH ATG LGN QRS TTY QRS YTZ

    SER  ALA  ASN  LEU  GLN  GLU  ARG
    QRS GCX AAY YTZ CAM GAM LGN

    LEU  ARG  ARG  LYS  GLU
    YTZ LGN LGN AAM GAM 3'
```

wherein the 5' to 3' strand, beginning with the amino terminus and the amino acids for which each triplet codes are shown, and wherein

A is deoxyadenyl
T is thymidyl
G is deoxyguanyl
C is deoxycytosyl
X is A, T, C or G
Y is T or C
when Y is C, Z is A, T, C or G
when Y is T, Z is A or G
H is A, T or C
Q is T or A
when Q is T, R is C and S is A, T, C or G
When Q is A, R is G and S is T or C
M is A or G
L is A or C
when L is A, N is A or G
when L is C, N is A, T, C or G
GLY is glycine
ALA is alanine
VAL is valine
LEU is leucine
ILE is isoleucine
SER is serine
THR is threonine
PHE is phenylalanine
TYR is tyrosine
TRP is tryptophan
CYS is cysteine
MET is methionine
ASP is aspartic acid
GLU is glutamic acid
LYS is lysine
ARG is arginine
HIS is histidine
PRO is proline
GLN is glutamine
ASN is asparagine.

4,695,544

PROCESS FOR THE PREPARATION OF CHOLECYSTOKININ ANTAGONISTS

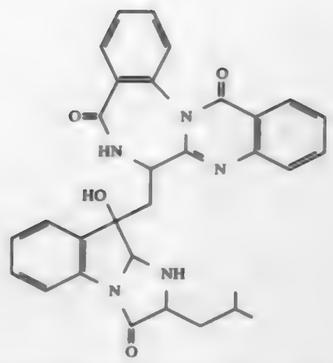
Richard L. Monaghan, Somerset; Michael A. Goetz, Fanwood, and Raymond S. Chang, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 509,883, Jul. 1, 1983, Pat. No. 4,530,790, which is a continuation-in-part of Ser. No. 453,383, Dec. 27, 1982, abandoned. This application Mar. 15, 1985, Ser. No. 712,046

Int. Cl.[4] C12N *1/14;* **C12P** *17/18;* **C12R** *1/66*

U.S. Cl. 435—119 **6 Claims**

1. A process for preparing the compund of Formula I;



and its minor related components A, B, C and D which comprises the aerobic fermentation of a strain of *Aspergillus alliaceus* Thom and Church that is capable of producing said compound and its minor related components A, B, C and D wherein said aerobic fermentation is under operating conditions and a time period that are controlled so as to produce a recoverable amount of said compound or one of its minor related components A, B, C, and D in an assimilable aqueous nutrient medium and isolating at least one of said compound and its minor related components A, B, C and D.

4,695,545

CULTURE AND PROCESS FOR PRODUCING A41030 ANTIBIOTICS

Walter M. Nakatsukasa, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 361,302, Mar. 24, 1982, abandoned. This application May 7, 1984, Ser. No. 607,907

The portion of the term of this patent subsequent to Aug. 5, 2003, has been disclaimed.

Int. Cl.[4] **C12P** *17/18, 21/04, 17/00, 17/16;* **C12N** *1/20;* **C12R** *1/465;* **A61K** *35/00;* **CO7K** *15/00*

U.S. Cl. 435—119 **4 Claims**

1. A method of producing the A41030 antibiotic complex which comprises cultivating *Streptomyces virginiae* NRRL 12525, or an A41030-producing variant or mutant thereof, in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic A41030 activity is produced by said organism in said culture medium and recovering said culture medium having said antibiotic A41030 activity.

4,695,546

TRANSFORMING *BACILLUS STEAROTHERMOPHILUS* WITH PLASMID VECTOR PTB 19

Shuichi Aiba, and Tadayuki Imanaka, both of Suita, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

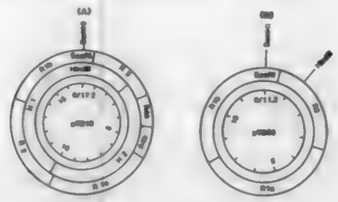
Filed Mar. 8, 1982, Ser. No. 356,150

Claims priority, application Japan, Mar. 6, 1981, 56-32809; Mar. 6, 1981, 56-32810

Int. Cl.[4] **C12N** *15/00*

U.S. Cl. 435—172.3 **1 Claim**

1. A process for the transformation of a microorganism of the species *Bacillus stearothermophilus*, which microorganism is thermophilic and is gram-positive or gram-variable, which comprises introducing into said microorganism, which is in the protoplast state at a temperature of about 40° to 70° C., a



plasmid comprising the vector pTB 19, said plasmid having been retained in *Bacillus subtilis* FERM-P5895.

4,695,547

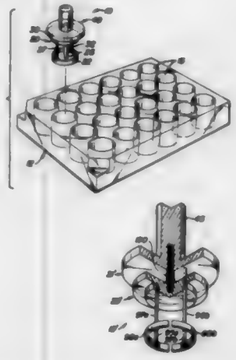
PROBE FOR ELECTROFUSION, ELECTROPORATION, OR LIKE PROCEDURE

Jeffrey L. Hilliard, 5256 El Cemonte, Davis, Calif. 95616, and Maurice M. Moloney, Davis, Calif., assignors to Jeffrey L. Hilliard, Davis, Calif.

Filed Apr. 2, 1986, Ser. No. 847,356

Int. Cl.[4] **C12N** *13/00*

U.S. Cl. 435—173 **13 Claims**



1. A probe for insertion into a cylindrical well for subjecting a sample of genetic material in the well to the action of an electric field, comprising:

a metal ring having an outer diameter slightly less than the inner diameter of the well to permit free insertion of said ring into the well coaxial with respect to the well;

a cover;

a metal rod having an outer diameter less than the inner diameter of said ring and extending through said cover such that one end of said rod defines a first electrical terminal above said cover and the other end of said rod is proximate the bottom of the well when the probe is inserted into the well; and

a metal pin extending through said cover and having a first end defining a second electrical terminal above said cover and a second end rigidly and electrically joined to said ring such that the lower edge of said ring is proximate the bottom of the well when the probe is inserted into the well;

said cover holding said rod coaxial with respect to the well when said ring is inserted into the well coaxial with respect to the well.

4,695,548

GEL INSERTS USEFUL IN ELECTROPHORESIS

Charles R. Cantor, and David C. Schwartz, both of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 442,590, Nov. 18, 1982, Pat. No. 4,473,452. This application Sep. 25, 1984, Ser. No. 654,641

Int. Cl.[4] **C12N** *11/12*

U.S. Cl. 435—179 **7 Claims**

1. A gel insert useful for electrophoretic separations which comprises a gel matrix consisting of a solidified agarose or acrylamide suitable for use in an electrophoretic method and entrapped within the gel matrix are lysed cells and macromolecules derived from the lysed cells.

5. A method of preparing a gel insert of claim 1 which comprises suspending cells in a liquid agarose or acrylamide suitable for use in an electrophoretic method, allowing the agarose or acrylamide to form a gel matrix in which the suspended cells are entrapped, diffusing a cell lysing reagent into the gel matrix containing the suspended cells so as to lyse the cells, and yield lysed cells and macromolecules derived from the lysed cells entrapped in the gel matrix.

4,695,549

METABOLICALLY ACTIVE PREPARATIONS OBTAINED FROM YEAST OF ANY TYPE

Ernst B. Grabitz, Casatenovo, Italy, assignor to Hasunor A.G., Lugano, Switzerland

Filed May 7, 1984, Ser. No. 607,563

Claims priority, application Switzerland, May 20, 1983, 2787/83

Int. Cl.[4] **C07G** *17/00;* **C12N** *1/06;* **C12R** *1/85;* **A61K** *35/78*

U.S. Cl. 435—267 **9 Claims**

1. A process for obtaining a sterile, pyrogen-, histamine- and protein-free solution containing at least 1.4 mg/ml of nitrogen, useful as a promoter of oxidative phosphorylation, which comprises the steps:

(a) plasmolyzing an aqueous dispersion of yeast at a temperature of less than 0° C.,

(b) adding a proteolytic enzyme,

(c) adding a diamine oxidase in order to remove histamine,

(d) adding a mixture of a monovalent C_2–C_6 aliphatic alcohol with two or more polyvalent alcohols containing at least 3 carbon atoms, to precipitate protein,

(e) separating liquid by filtration or centrifugation,

(f) adding a buffer solution to stabilize the separated liquid at pH 6–7, and

(g) concentrating the stabilized liquid under vacuum said liquid being a sterile, pyrogen-, histamine- and protein-free solution containing at least 1.4 mg/ml of nitrogen.

4,695,550

ATP: POLYNUCLEOTIDE ADENYLYLTRANSFERASE ENZYME AND METHOD OF PREPARATION THEREOF

Rusty J. Mans, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Jun. 5, 1984, Ser. No. 617,596

Int. Cl.[4] **C12N** *9/12*

U.S. Cl. 435—194 **31 Claims**

1. A method of preparing ATP: polynucleotide adenylyltransferase enzyme in substantially pure form comprising the sequential steps;

(a) homogenizing monocotyledonous plant tissue in an aqueous medium buffered to a mildly alkaline pH to solubilize said enzyme and separating isoluble material from said solution;

(b) dissolving in the aqueous solution obtained in step (a) the minimum amount of soluble, inert salt necessary to precipitate substantially all of said enzyme and separating said precipitated enzyme from said solution;

(c) dissolving said precipitated enzyme from step (b) in an aqueous medium buffered to a mildly alkaline pH;

(d) removing from the solution produced in step (c) any low molecular weight cellular components dissolved therein and adjusting the inert salt ionic strength thereof to from about 0.45M to about 0.75M;

(e) contacting the solution from step (d) with a weak anion exchange resin whereby nucleic acids, competing enzymic activities and proteinaceous impurities are chromatographically adsorbed thereby to the exclusion of said ATP enzyme;

(f) isolating said ATP enzyme following said chromatographic separation of step (e), dissolving said enzyme in an aqueous medium buffered to a mildly alkaline pH and adjusting the inert salt ionic strength thereof to from about 30 mM to about 75 mM;

(g) contacting the solution of step (f) with a weak anion exchange resin whereby said ATP enzyme is chromatographically adsorbed thereby to the exclusion of proteinaceous impurities;

(h) eluting the adsorbed enzyme from said resin and dialyzing the eluted fraction from step (g) against an aqueous solution buffered to a mildly acid pH and having an ionic strength of dissolved inert salt of from about 10 mM to about 30 mM;

(i) contacting said dialyzed fraction with a weak cation exchanger to chromatographically adsorb therefrom the ATP enzyme to the exclusion of proteinaceous impurities from which the adsorbed enzyme is separated after elution from said weak cation exchanger with an aqueous medium buffered to a mildly acid pH and having an inert salt ionic strength of from about 50 mM to about 200 mM;

(j) contacting said eluted fraction with a polynucleotide covalently bound to an inert matrix to chromatographically adsorb therefrom the ATP enzyme to the exclusion of proteinaceous impurities from which the adsorbed enzyme is separated after elution from said bound polynucleotide with an aqueous medium buffered to an alkaline pH and having an inert salt concentration of from about 50 mM to about 200 mM.

4,695,551

SAMPLING APPARATUS FOR A BIOLOGICAL REACTOR

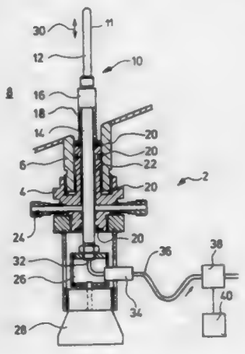
Wolfgang Samhaber, and Werner Renn, both of Allschwil, Switzerland, assignors to Proton AG, Zug, Switzerland

Filed Apr. 21, 1986, Ser. No. 854,174

Claims priority, application Fed. Rep. of Germany, May 4, 1985, 3516080

Int. Cl.[4] **C12M** *1/26*

U.S. Cl. 435—292 **13 Claims**



1. A sampling apparatus for a bioreactor having a connection port, comprising:

a probe having a head region operatively coacting with said bioreactor;

said head region comprising a semipermeable membrane defining a microfilter;
a conduit operatively coupled with said microfilter for sampling contents of the bioreactor;
said semipermeable membrane having an outer surface;
means operatively connected with said semipermeable membrane for moving said outer surface of said semipermeable membrane;
a probe housing;
said semipermeable membrane together with said probe being displaceably mounted in said probe housing;
sealing means;
said probe including a section of pipe having a first end and a second end;
said sealing means sealingly interconnecting said section of pipe and at least part of said probe housing and sealing said probe housing from the contents of said bioreactor;
a coupling housing;
said section of pipe possessing on said first end said semipermeable membrane and on said second end said coupling housing;
said coupling housing being connected with said means for moving said outer surface of said semipermeable membrane; and
said conduit being connected to said section of pipe.

4,695,552

PROCESS AND REAGENT FOR THE DETERMINATION OF THE HEMOGLOBIN-HAPTOGLOBIN COMPLEX IN THE PRESENCE OF FREE HEMOGLOBIN

Urban Schmitt, Tutzing; Rolf Deeg, Bernried, and Joachim Ziegenhorn, Starnberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,801
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314308
Int. Cl.⁴ G01N *33/72;* **C12Q** *1/28*
U.S. Cl. 436—66 **14 Claims**

1. A process for the determination of the hemoglobin-haptoglobin complex in a sample containing free hemoglobin comprising the steps of adding a detergent to the sample to be determined, in an effective amount to almost completely inactivate the peroxidase activity of the free hemoglobin without substantially changing the peroxidase activity of the hemoglobin-haptoglobin complex, and thereafter measuring the residual peroxidase activity of the reaction mixture as a measure of the amount of hemoglobin-haptoglobin complex.

4,695,553

METHOD FOR INCREASING AGGLUTINATION OF GROUPS OF CELLS TO PRODUCE IMPROVED CELL LAYER INTERFACE IN CENTRIFUGED BLOOD SAMPLE USING ANTIBODIES

Stephen C. Wardlaw, Branford; Robert A. Levine, Guilford, both of Conn.; Rodolfo R. Rodriguez, Randolph, N.J., and Michael R. Loken, Los Altos, Calif., assignors to Becton Dickinson and Co., Inc., Parsippany, N.J.

Filed Nov. 1, 1985, Ser. No. 794,127
Int. Cl.⁴ G01N *1/18*
U.S. Cl. 436—177 **13 Claims**

1. A method for producing a clear, well-defined interface between erythrocytes and leukocytes in a centrifuged sample of blood, said method comprising the step of adding to the blood sample an effective amount of a monoclonal antibody which causes all erythrocytes in the blood sample to agglutinate so as to form multi erythrocyte groups effective to impart to all of the erythrocytes a group density which substantially equals the mean erythrocyte density of the blood sample.

4,695,554

SAC OR LIPOSOME CONTAINING DYE (SULFORHODAMINE) FOR IMMUNOASSAY

James P. O'Connell, Chapel Hill, N.C.; Uri Piran, Norwood, Mass., and Daniel B. Wagner, Raleigh, N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 579,667, Feb. 14, 1984, and a continuation-in-part of Ser. No. 650,200, Sep. 13, 1984. This application Mar. 27, 1985, Ser. No. 716,533
Int. Cl.⁴ G01N *33/533;* **B01J** *13/02*
U.S. Cl. 436—528 **21 Claims**

10. A composition, comprising:
a sac, said sac including a sulforhodamine dye.

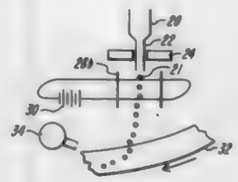
11. In an assay for an analyte in a sample wherein a sac employing a detectable marker is employed as a measure of analyte, the improvement comprising:
detecting, as a measure of analyte, a sulforhodamine dye present in a sac as defined in claim 10.

4,695,555

LIQUID CHROMATOGRAPHIC DETECTOR AND METHOD

Andrew F. O'Keeffe, 4801 Deerwood Dr., Raleigh, N.C. 27612

Continuation of Ser. No. 743,895, Jun. 12, 1985, abandoned. This application Oct. 30, 1986, Ser. No. 924,119
Int. Cl.⁴ G01N *27/00, 30/64*
U.S. Cl. 436—150 **14 Claims**



11. A method of detecting the solute burden of effluent of a liquid chromatograph column comprising the steps of:
emitting an effluent liquid stream, as uniformly sized spherical droplets, through an orifice in the liquid chromatograph column at a constant rate and over a common path, said emitted droplets being imparted with an electric charge, the amount of said electric charge acquired by each droplet being dependent upon the nature and quantity of the solute carried by said droplet:
passing each of said droplets through an electric field which causes each of said droplets to deflect off said common path by a distance dependent on the solute burden in said droplet;
providing an electrically neutral, relatively non conducting recording medium;
positioning said recording medium so that said droplets passing through the electric field will impinge on said recording medium;
processing said recording medium so as to render said impinging droplets visible.

4,695,556

CATALYST RESINS AND PROCESS FOR THEIR PREPARATION

Siegfried Oeckl, Bergisch Gladbach; Alfred Mitschker, Odenthal-Holz; Peter M. Lange, Leverkusen, and Friedrich Martinola, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 909,995
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3626581
Int. Cl.⁴ B01J *31/08, 31/10, 37/30*
U.S. Cl. 502—11 **9 Claims**

5. In the process for the preparation of a strongly acid cation exchanger loaded with a catalytically active metal by loading the cation exchanger with a solution of a salt of the catalytically active metal and reducing the cation exchanger loaded with the metal ions, the improvement which comprises carrying out the loading of the cation exchanger at a temperature of from 50° to 120° C. and using formic acid as the reducing agent.

4,695,557

CATALYST FOR POLYMERIZATION OF OLEFINS

Shigeo Suzuki; Yoshiharu Doi, and Kazuo Soga, all of Kanagawa, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1986, Ser. No. 875,145
Claims priority, application Japan, Jun. 18, 1985, 60-130885
Int. Cl.⁴ C08F *4/68*
U.S. Cl. 502—103 **7 Claims**

1. A catalyst system comprising a vanadium chelate of a beta-ketoaldehyde and an organoaluminum compound.

4,695,558

CATALYSTS FOR HOMO- AND COPOLYMERIZATION OF ETHYLENE AND THE POLYMERS OBTAINED BY USE THEREOF

Enrico Albizzati, Arona; Enrico Pettenati, Milan; Umberto Zucchini, and Illaro Cuffiani, both of Ferrara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 19, 1985, Ser. No. 713,557
Claims priority, application Italy, Mar. 20, 1984, 20139 A/84
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.⁴ C08F *4/64*
U.S. Cl. 502—123 **13 Claims**

1. Catalysts for the polymerization of ethylene and of mixtures thereof with other olefins, comprising the product of reaction between the following components:
(a) an Al-alkyl compound;
(b) an electron-donor compound containing at least a nitrogen atom and reactive towards $MgCl_2$, but not towards Al-triethyl under standard reaction conditions, compound (b) being used in a molar ratio with respect to compound (a), of 0.1 to 10;
(c) the reaction product between at least a titanium compound containing at least a Ti-halogen bond and an anhydrous magnesium dihalide.

4,695,559

CATALYST FOR THE SELECTIVE REDUCTION OF NITROGEN OXIDES IN WASTE GASES AND PROCESS FOR THE MANUFACTURE OF SUCH A CATALYST

Dietrich Wagener, Essen; Karl H. Laue, Hattingen; Egmar Wunderlich, Mülheim; Theo Sander, Essen; Claus Flockenhaus, Essen; Erich Hackler, Essen; Blagoje Levkov, Wiesbaden; Daniel Grimm, Schlangenbad-Bärstadt; Hartmut Kainer, Wiesbaden; Hermann Stein, Bad Dürkheim; Hans-Eugen Bühler, Königstein; Horst Kalfa, Idstein; Johann Jansen, Duisburg; Werner Steader, Raesfeld, and Arnold Max, Bottrop, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Didier Engineering GmbH, Essen, both of, Fed. Rep. of Germany

Filed Feb. 19, 1986, Ser. No. 831,142
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505648
Int. Cl.⁴ B01J *21/18, 27/053, 27/18*
U.S. Cl. 502—183 **17 Claims**

1. A catalyst for selective reduction of nitrogen oxides, said catalyst being a catalyst for reacting waste gases with ammonia, said catalyst comprising:
a mixture of two basic substances which are A and B, and wherein the basic substance A comprises the following components:
about 89 to about 92 percent by weight of Fe_2O_3;
about 3 to about 4 percent by weight of Fe_3O_4;
about 4 to about 5 percent by weight of SiO_2;
about 1 to about 2 percent by weight of Al_2O_3;
about 0.01 to about 0.2 percent by weight of MnO;
about 0.01 to about 0.03 percent by weight of CaO;
about 0.01 to about 0.02 percent by weight of MgO; and
about 0.7 to about 0.001 percent by weight of V_2O_5,
and the basic substance B comprises the following components:
about 30 to about 48 percent by weight of Cr_2O_3;
about 12 to about 30 percent by weight of Fe_2O_3;
about 10 to about 30 percent by weight of Al_2O_3;
about 10 to about 25 percent by weight of MgO; and
about 1 to about 5 percent by weight of SiO_2.

4,695,560

CATALYST FOR THE SELECTIVE HYDROGENATION OF DIOLEFINIC HYDROCARBONS

Mark J. Gattuso, Palatine, and Daniel L. Ellig, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 782,790, Oct. 1, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,139
Int. Cl.⁴ B01J *21/04, 27/043*
U.S. Cl. 502—222 **9 Claims**

1. A catalyst for the selective hydrogenation of diolefinic hydrocarbons to monoolefinic hydrocarbons, which consists essentially of an alumina support material, about 0.05 to 1.5 wt. % sulfur, and about 1.0 to 25.0 wt. % nickel, where the alumina support material is characterized by having a total pore volume greater than 1.4 but less than 2.5 cc/g, a surface area greater than 150 m^2/g, with less than 25 percent of the total pore volume being provided by pores having pore diameters of less than 150 angstroms and with over 60 percent of the pore volume being provided by pores having pore diameters greater than 600 angstroms.

4,695,561

CHEMICALLY IMPREGNATED IN SITU REGENERATION OF THE EFFICIENCY OF ACTIVATED CARBON FILTERS FOR TRAPPING RADIOACTIVE IODINE

Victor R. Deitz, 3310 Winnett Rd., Chevy Chase, Md. 20815

Continuation-in-part of Ser. No. 506,790, Jun. 22, 1983, Pat. No. 4,518,562. This application Mar. 7, 1985, Ser. No. 709,389

Int. Cl.⁴ B01J *20/22*

U.S. Cl. 502—401 **2 Claims**

1. An activated charcoal filter impregnated with a compound selected from Quinuclidine.CH_3I; Triethylenediamine.$2CH_3I$; and Hexamethylenetetramine.CH_3I for efficiently removing radioactive iodine from an air flow directed through said impregnated filter.

4,695,562

SYNTHETIC PEPTIDE COMPOUNDS

Edwin H. Beachey, Memphis, Tenn.; Andre Tartar, Vitry-en-Artois, France; Helene Gras-Masse, Hem, France; Michel Jolivet, Issy-les-Moulineaux, France; Francoise Audibert, Neuilly S/Seine, France, and Louis Chedid, Paris, France, assignors to Univ. of Tennessee Research Corp., Knoxville, Tenn.

Continuation of Ser. No. 597,272, Apr. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 402,355, Jul. 27, 1982, Pat. No. 4,454,121. This application Dec. 11, 1985, Ser. No. 808,214

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.⁴ A61K *37/02;* **C07K** *7/06, 7/08, 7/10*

U.S. Cl. 514—13 **20 Claims**

1. A synthetic polypeptide which comprises the amino acid sequence

X-Ala-Asp-Leu-Glu-Lys-Ala-Leu-Glu-Gly-Y

wherein X is Lys-, Arg-Lys-, Ala-Ala-Leu-Ala-Ala-Arg-Lys-, Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-, Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-, Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-, or Asn-Phe-Ser-Thr-Ala-Asp-Ser-Ala-Lys-Ile-Lys-Thr-Leu-Glu-Ala-Glu-Lys-Ala-Ala-Leu-Ala-Ala-Arg-Lys-; and Y is -Ala, -Ala-Met, or -Ala-Met-Cys.

4,695,563

ARTHROPODICIDAL PHOSPHORUS-CONTAINING HETEROCYCLES

Bernd-Wieland Krüger, Wuppertal; Wolfgang Behrenz, Overath; Benedikt Becker, Mettmann; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

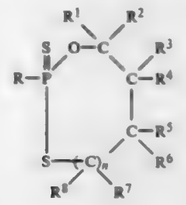
Filed Jun. 3, 1986, Ser. No. 870,043

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520388; Nov. 2, 1985, 3538894

Int. Cl.⁴ A01N *51/36;* **C07F** *9/21*

U.S. Cl. 514—105 **10 Claims**

1. A phosphorus-containing heterocycle of the formula



in which

R represents amino, C_1–C_6-alkylamino, methyl-(C_1–C_6-alkyl)-amino or optionally halogen-substituted C_1–C_6-alkylthio, C_1–C_6-alkoxy or C_1–C_6-alkylthio,

R^1 to R^8 are identical or different and represent hydrogen, halogen, NO_2, C_1–C_6-alkyl which can be halogen-substituted, C_2–C_8-alkenyl, di-(C_1–C_4-alkyl)-amino, C_1–C_4-alkoxy-C_1–C_4-alkyl, C_1-alkylthio-C_1–C_4-alkyl, benzyl or phenyl,

or in which

two of the radicals R^1 to R^8, together with the carbon atom or carbon atoms to which they are bonded, form a C_5–C_7-cycloalkyl or cycloalkenyl ring which can be substituted by methyl or ethyl and which can be bridged by a methylene or ethylene group to form a bicyclic ring, and

n represents zero or one.

9. A method of combatting arthropods which comprises applying to such arthropods or to an arthropod habitat an arthropodicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,695,564

INSECTICIDAL COMPOSITIONS COMPRISING A SYNERGISTIC MIXTURE OF TERBUFOS OR PHORATE AND A PYRETHROID

Paul J. Walgenbach, Hamilton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 709,617, Mar. 8, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 831,605

Int. Cl.⁴ A01N *37/34, 57/00*

U.S. Cl. 514—127 **7 Claims**

1. An insecticidal composition comprising a synergistic mixture of 10 to 40 parts by weight of 0,0-diethyl S-[(ethylthio)methyl]phosphorodithioate or S[[(1,1-dimethylethyl)thio]-methyl] 0,0-diethylphosphorodithioate and 1 part by weight of a pyrethroid selected from the group consisting of (±)-α-cyano-m-phenoxybenzyl (±)-2-[p-(difluoromethoxy) phenyl]-3-methylbutyrate, cyano-(3-phenoxyphenyl)-methyl-4-chloro-α-(1-methylethyl) benzeneacetate and (±)-α-cyano-3-phenoxbenzyl-(±)-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcylopropane carboxylate.

4,695,565

ANTIBACTERIAL 7β-HETEROCYCLIC-CEPHEM

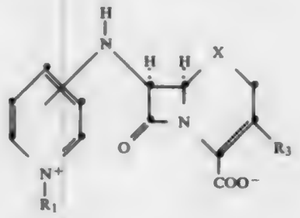
John Hannah, Matawan, and Burton G. Christensen, Cliffside, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 657,711, Oct. 4, 1984, abandoned. This application Dec. 7, 1984, Ser. No. 679,413

Int. Cl.⁴ C07D *501/18;* **A61K** *31/545*

U.S. Cl. 514—206 **4 Claims**

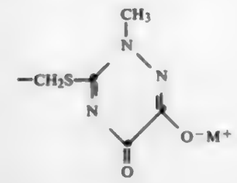
1. A compound having the structural formula:



wherein:

R_1 is a hydrogen, lower alkyl, phenyl(lower)alkyl,

R_3 is a 5- or 6-membered heterocyclic thio methyl substituent selected from:



wherein M is an alkali or alkaline earth metallic cation and pharmaceutically accepted salts thereof; and

X is sulfur.

4,695,566

3-AMINOCARBONYLMETHOXY-5-PHENYLPYRAZOLE COMPOUNDS, ANTIARRYTHMIC COMPOSITIONS CONTAINING THEM, AND INTERMEDIATES IN THEIR PREPARATION

Henning Heinemann; Wolfgang Kehrbach; Uwe Schoen; Gerd Buschmann, all of Hanover, and Ulrich Kuhl, Gehrden, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

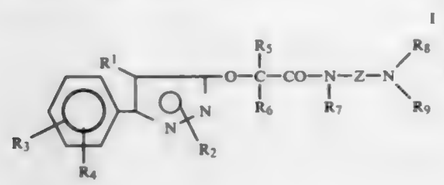
Filed Jul. 2, 1985, Ser. No. 751,045

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424586

Int. Cl.⁴ A61K *31/415, 31/535;* **C07D** *231/20, 405/12*

U.S. Cl. 514—234 **16 Claims**

1. A 3-aminocarbonylmethoxy-5-phenylpyrazole compound corresponding to the Formula I



wherein

R_1 is hydrogen or lower alkyl,

R_2 is in position 1 or 2 on the pyrazole ring and is hydrogen or lower alkyl,

R_3 is hydrogen, halogen, lower alkyl or lower alkoxy and

R_4 is hydrogen, hydrogen, lower alkyl, lower alkoxy or if R_3 is hydrogen, R_4 may also be trifluoromethyl, nitro or hydroxy or

R_3 and R_4 are linked to adjacent carbon atoms and together represent an alkylene dioxy group with 1 or 2 carbon atoms,

R_5 is hydrogen or lower alkyl and

R_6 is hydrogen or methyl or

R_5 and R_6 together from an alkylene chain with 3 to 5 carbon atoms,

R_7 is hydrogen or lower alkyl,

Z is an alkylene chain with 2 to 5 carbon atoms or the 2-hydroxypropylene chain,

R_8 is hydrogen or lower alkyl and

R_9 is hydrogen or lower alkyl or

R_8 and R_9 together with the nitrogen atom to which they are linked represent a heterocyclic group corresponding to the Formula a:



a

wherein A is an alkylene chain with 4 or 5 carbon atoms which chain may be substituted by 1 or 2 methyl groups, or A is the $—C_2H_4—O—C_2H_4—$ chain, or if Z is an alkylene chain, then

R_8 may be hydrogen or lower alkyl and

R_9 may be an alkylene chain, which together with the nitrogen atom to which it is linked and the carbon atom of the alkylene chain Z which is adjacent to this nitrogen atom, forms a 5- or 6-membered heterocycle, or a pharmaceutically acceptable acid addition salt thereof.

14. An antianythmic pharmaceutical composition containing an antianythmic effective quantity of a 3-aminocarbonylmethoxy-5-phenylpyrazole compound according to claim 1 and at least one additional substance selected from the group consisting of conventional pharmaceutical adjuvants and carriers.

4,695,567

PYRROLOBENZIMIDAZOLES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND METHOD OF USING THEM TO TREAT CERTAIN HEART AND CIRCULATORY DISEASES

Alfred Merteas, Schriesheim; Jens-Peter Hölck; Herbert Berger, both of Mannheim; Bernd Müller-Beckmann, Grünstadt; Klaus Strein, Hemsbach, and Egon Roesch, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

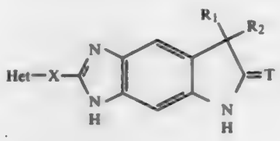
Filed Jan. 17, 1986, Ser. No. 820,259

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501497

Int. Cl.⁴ A61K *31/50, 31/505;* **C07D** *403/06, 487/04*

U.S. Cl. 514—253 **18 Claims**

1. A pyrrolobenzimidazole or tautomer thereof, of the formula:



(I)

wherein

R_1 is hydrogen, C_1–C_6 alkyl, C_2—C_6 alkenyl or C_3–C_7cycloalkyl;

R_2 is hydrogen, cyano, C_1-C_6 alkyl, C_2–C_6 alkenyl, or a carbonyl group substituted by hydroxyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, amino, C_1–C_6 alkylamino, C_2–C_{12} dialkylamino or hydrazino, or

R_2 and R_1 together with the carbon to which they are attached form a C_3–C_8 spirocycloalkyl ring, or R_1 and R_2 together form C_3–C_7 alkylidene or C_3–C_7 cycloalkylidene,

X is a valency bond, C_1–C_4 alkylene or vinylene and

T is oxygen or sulphur;

and Het is furanyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, oxazolyl, thiazolyl, triazolyl, oxadiazolyl, thiadiazolyl, pyrazinyl, pyrimidinyl or pyridazinyl wherein the heterocyclic five- and six-membered rings are unsubstituted or substituted by one or more C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, hydroxyl, oxo, nitro, amino, halo, carboxyl, C_2–C_7 alkoxycarbonyl, aminocarbonyl or cyano groups; or a physiologically acceptable salt thereof with an inorganic or organic acid.

17. A method of treating heart or circulatory diseases which respond to a change of blood pressure, an increase in cardiac output and/or a change in microcirculation comprising administering an effective amount for treating said heart or circulatory diseases, of the pyrrobenzimidazole of claim 1.

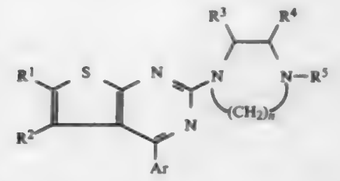
4,695,568

THIENO[2,3-D]PYRIMIDINE DERIVATIVES AND SALTS THEREOF

Kunihiro Ninomiya; Issei Nitta, both of Machida; Akihiro Tobe, Yokohama; Mitsuo Egawa, and Ryoji Kikumoto, both of Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,768
Claims priority, application Japan, Jan. 5, 1984, 59-479
Int. Cl.[4] A61K *31/38;* **C07D** *239/00*
U.S. Cl. 514—258 **18 Claims**

1. A thieno[2,3-d]pyrimidine compound represented by the formula (I):

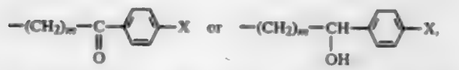


(I)

wherein R^1 and R^2 independently represent hydrogen, halogen or an alkyl group having 1–6 carbon atoms; or R^1 and R^2 together with the carbon atoms to which they are attached may form a cycloalkylene group having 5 to 6 carbon atoms; R^3 and R^4 independently represent hydrogen or an alkyl group having 1–6 carbon atoms; R^5 represents a member selected from the group consisting of:

(1) hydrogen or alkyl of 1–6 carbon atoms, and

(2)



in which m is an integer of from 1 to 3 and X represents halogen;

Ar represents 2- or 3-thienyl, phenyl or phenyl substituted by a member selected from a group consisting of halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, hydroxyl, nitro, amino, cyano and alkyl-substituted amino; and n is 2; or a salt thereof.

17. A pharmaceutical preparation for improving the depressive conditions and/or dysfunctions of the brain in a unit dosage form, which comprises an effective dosage of the thieno[2,3-d]pyrimidine compound according to claim 1 as an active ingredient.

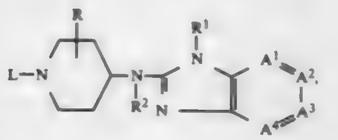
4,695,569

BICYCLIC HETEROCYCLYL CONTAINING N-(BICYCLIC HETEROCYCLYL)-4-PIPERIDINAMINES

Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef E. Hens, Nijlen, and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 556,742, Nov. 30, 1983, abandoned. This application Oct. 12, 1987, Ser. No. 660,608
Int. Cl.[4] A61K *31/415;* **C07D** *239/00*
U.S. Cl. 514—258 **15 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein: A^1=A^2—A^3=A^4 is a bivalent radical having the formula

—CH=CH—CH=CH—, (a)

—N=CH—CH=CH—, (b)

—CH=N—CH=CH—, (c)

—CH=CH—N=CH—, (d)

or

—CH=CH—CH=N—, (e)

wherein one or two hydrogen atoms in said radicals (a)–(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, lower alkyl—O—(CO)— and Ar^2—lower alkyl;

L is a member selected from the group consisting of a radical of formula



(f)

a radical of formula

Het—C_sH_{2s}—Y—Alk—; (g)

and

a radical of formula

(h)

wherein

n is 0 or the integer 1 or 2;

s is 0 or an integer of from 1 to 6 inclusive;

Alk is lower alkanediyl;

Y is O, S, NR^3 or a direct bond;

X is O, S, CH—NO_2 or NR^4;

Z is O, S, NR^5 or a direct bond; and

Het is an optionally substituted six-membered ring having two ring nitrogens which are separated by a single ring carbon and having three additional ring carbons, and being condensed with an optionally substituted five- or six-membered ring through said single ring carbon and one of said nitrogens, the remainder of the ring being carbon optionally interrupted by a sulfur or nitrogen, provided that:

(ii) when L is a radical either of formula (f), or of formula (g) wherein Y is other than a direct bond, or of formula (h) wherein Z is other than a direct bond, wherein in said radicals (f), (g) or (h) Het is connected to C_sH_{2s} on a nitrogen atom then s is not 0;

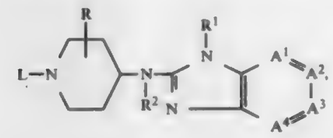
said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2—lower alkyl, lower alkyloxy, Ar^2—lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2—amino, Ar^2—lower alkylamino or Ar^2—lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2—sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2—carbonyl; and

said R^5 being hydrogen or lower alkyl;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl—CO—; thienyl, halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and imidazolyl optionally substituted by lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)—CO.

7. A method of treating allergic diseases in warm-blooded animals suffering from same which method comprises the systemic administration to warm-blooded animals of an effective anti-allergic amount of a compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

A^1=A^2—A^3=A^4 is a bivalent radical having the formula

—CH=CH—CH=CH—, (a)

—N=CH—CH=CH—, (b)

—CH=N—CH=CH—, (c)

—CH=CH—N=CH—, (d)

or

—CH=CH—CH=N—, (e)

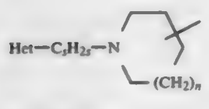
wherein one or two hydrogen atoms in said radicals (a)–(e) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, lower alkyl—O—(CO)— and Ar^2—lower alkyl;

L is a member selected from the group consisting of a radical of formula



(f)

a radical of formula

Het—C_sH_{2s}—Y—Alk—; (g)

and

a radical of formula

(h)

wherein

n is 0 or the integer 1 or 2;

s is 0 or an integer of from 1 to 6 inclusive;

Alk is lower alkanediyl;

Y is O, S, NR^3 or a direct bond;

X is O, S, CH—NO_2 or NR^4;

Z is O, S, NR^5 or a direct bond; and

Het is an optionally substituted six-membered ring having two ring nitrogens which are separated by a single ring carbon and having three additional ring carbons, and being condensed with an optionally substituted five- or six-membered ring through said single ring carbon and one of said nitrogens, the remainder of the ring being carbon optionally interrupted by a sulfur or nitrogen, provided that:

(ii) when L is a radical either of formula (f), or of formula (g) wherein Y is other than a direct bond, or of formula (h) wherein Z is other than a direct bond, wherein in said radicals (f), (g) or (h) Het is connected to C_sH_{2s} on a nitrogen atom then s is not 0;

said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2—lower alkyl, lower alkyloxy, Ar^2—lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2—amino, Ar^2—lower alkylamino or Ar^2—lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2—sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2—carbonyl; and

said R^5 being hyrogen or lower alkyl;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl—CO—; thienyl, halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and imidazolyl optionally substituted by lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)—CO.

4,695,570

ANTIVIRAL COMPOUND USE

Thomas A. Krenitsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 434,384, Oct. 14, 1982, Pat. No. 4,544,634. This application Mar. 15, 1985, Ser. No. 712,160
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/52*
U.S. Cl. 514—261 **9 Claims**

1. A method of delivering acyclovir in an effective antiviral treatment amount to a human having a viral infection which comprises orally administering to said human an amount of 6-deoxyacyclovir sufficient to produce an effective antiviral treatment amount of acyclovir in said human.

4,695,571

TRICYCLIC OXINDOLE ANTIINFLAMMATORY AGENTS

Lawrence S. Melvin, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

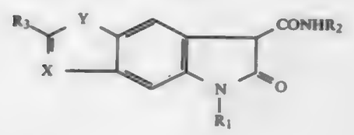
PCT No. PCT/US84/01371, § 371 Date Apr. 2, 1986, § 102(e) Date Apr. 2, 1986, PCT Pub. No. WO86/01510, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 24, 1984, Ser. No. 867,185

Int. Cl.[4] A61K *31/41*; C07D *498/04*, *491/048*, *515/04*

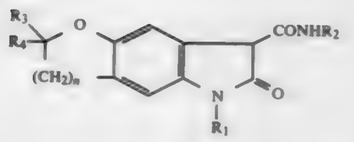
U.S. Cl. 514—275 **25 Claims**

1. Compounds of the formulae



1

and



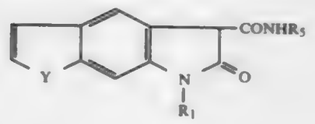
2

and the pharmaceutically acceptable base salts thereof, wherein Y is selected from the group consisting of oxygen and sulfur; X is selected from the group consisting of

N, CH and $C(CH_3)$;

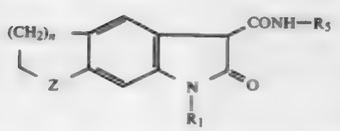
R_1 is selected from the group consisting of alkyl containing one to three carbon atoms and phenyl; R_2 is selected from the group consisting of phenyl, mono-substituted phenyl wherein said subatituent is selected from the group consisting of fluoro, chloro, trifluoromethyl, methylthio, methoxy, acetyl, ethoxycarbonyl and methylsulfinyl, disubstituted phenyl wherein said substituents are each selected from fluoro and methoxy, and heterocyclic and mono- and dimethyl substituted heterocyclic wherein said heterocyclic is selected from the group consisting of 2-thiazolyl, 2-oxazolyl, 5-isothiazolyl, 3-isoxazolyl, benzothiazolyl, 2-thiazolinyl, 2-thiadiazolyl, 2-pyrimidinyl and pyridyl; R_3 and R_4 are each selected from the group consisting of hydrogen and methyl; and n is an integer of 1 or 2.

14. Compounds of the formulae



3

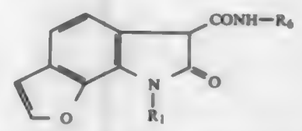
and



4

and the pharmaceutically acceptable base salts thereof, wherein Y is selected from the group consisting of oxygen and sulfur; R_1 is selected from the group consisting of alkyl containing from one to three carbon atoms and phenyl; Z is selected from the group consisting of oxygen and methylene; n is an integer of 1 or 2; and R_5 is selected from the group consisting of phenyl, fluorophenyl, difluorophenyl, chlorophenyl, pyridyl, 2-thiazolyl and monomethyl-2-thiazolyl.

22. The compound of the formula



and the pharmaceutically acceptable base salt thereof, wherein R_1 is selected from the group consisting of alkyl containing from one to three carbon atoms and phenyl; and R_6 is selected from the group consisting of fluorophenyl, difluorophenyl, pyridyl, 2-thiazolyl and 5-methyl-2-thiazolyl.

4,695,572

ISOINDOLINONE DERIVATIVES, PRODUCTION AND USE THEREOF

Giichi Goto, Toyono, and Yoshiaki Saji, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

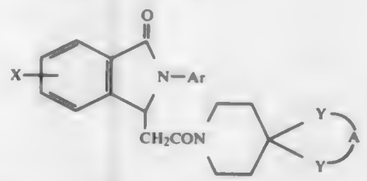
Filed Sep. 10, 1985, Ser. No. 774,470

Claims priority, application Japan, Sep. 14, 1984, 59-193073

Int. Cl.[4] A61K *31/40*; C07D *209/46*

U.S. Cl. 514—278 **14 Claims**

1. A compound of the formula



wherein X is hydrogen, halogen or nitro; Ar is phenyl, naphthyridinyl, or substituted phenyl or naphthyridinyl having one or two substituents of the class consisting of halogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, nitro, amino, methylenedioxy, phenoxy, benzyloxy, C_{2-5} alkanoyloxy, α- or ω-hydroxy-C_{1-4} alkyl, benzoyl, amido, cyano, trifluoromethyl, C_{1-4} alkylthio, C_{2-5} alkanoyloxy-C_{1-3} alkyl, C_{2-5} alkanoylamino and C_{1-4} alkoxycarbonyl; Y is oxygen or sulfur; and A is a C_{2-4} alkylene chain or a C_{2-4} alkylene chain having one or more C_{1-4} alkyl side chains; or a physiologically acceptable acid addition salt thereof.

12. A pharmaceutical composition suitable for prevention or treatment of psychosomatic diseases or anxiety neuroses that contains an amount of a compound according to claim 1 effective for prevention or treatment of said diseases or neuroses and a pharmaceutically acceptable carrier, vehicle or diluent therefor.

14. A method for prevention or treatment of psychosomatic diseases or anxiety neuroses in a mammal that comprises administering to said mammal an amount of a pharmaceutical composition according to claim 12 that is effective for prevention or treatment of said diseases or neuroses.

4,695,573

9-AMINO-1,2,3,4-TETRAHYDROACRIDIN-1-OL AND RELATED COMPOUNDS

Gregory M. Shutske, Somerset, N.J., and Frank A. Pierrat, Coventry, R.I., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

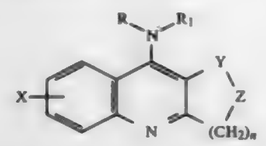
Continuation-in-part of Ser. No. 664,730, Oct. 25, 1984, Pat. No. 4,631,286. This application Oct. 1, 1985, Ser. No. 781,155

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/47*; C07D *219/10*

U.S. Cl. 514—290 **89 Claims**

1. A compound having the formula



wherein n is 1, 2 or 3; X is hydrogen, loweralkyl, loweralkoxy, halogen, hydroxy, nitro, trifluoromethyl, $NHCOR_2$ where R_2 is loweralkyl, or NR_3R_4 where R_3 and R_4 are independently hydrogen or loweralkyl; R is hydrogen or loweralkyl; R_1 is hydrogen, loweralkyl, diloweralkylaminoloweralkyl, arylloweralkyl, diarylloweralkyl, furylloweralkyl, thienylloweralkyl, oxygen-bridged arylloweralkyl, oxygen-bridged diarylloweralkyl, oxygen-bridged furylloweralkyl, oxygen-bridged thienylloweralkyl; Y is C═O or CR_5OH where R_5 is hydrogen or loweralkyl; Z is CH_2 or $C{=}CR_6R_7$ where R_6 and R_7 are independently hydrogen or loweralkyl; an optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

83. The compound as defined in claim 1, which is 9-amino-1,2,3,4-tetrahydro-cyclopenta[b]quinolin-1-ol.

87. A method of treating a patient in need of memory enhancement, wherein an effective memory enhancing amount of a compound defined in claim 1 is administered to the patient.

4,695,574

4-QUINOLINYLAMINO-N-[PYRROLIDINYL OR PIPERDINYL)ALKYL]-BENZENESULPHONAMIDES

John T. A. Boyle, Cookham, and Richard S. Todd, Near Slough, both of England, assignors to American Home Products Corporation, New York, N.Y.

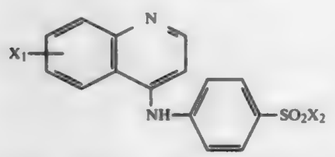
Filed Dec. 17, 1985, Ser. No. 809,996

Claims priority, application United Kingdom, Dec. 19, 1984, 8432091

Int. Cl.[4] C07D *215/44*; A61K *31/47*

U.S. Cl. 514—313 **11 Claims**

1. A compound having the formula



(I)

or a pharmaceutically acceptable salt thereof, wherein X_1 is selected from halogen and trifluoromethyl and X_2 represents a group having the formula

(II)

where Q is lower alkylene attached to a ring carbon atom of the ring illustrated in formula II; R_1 is selected from hydrogen and lower alkyl; and R_4 is lower alkyl and the ring illustrated in formula II is a piperidine or a pyrrolidine ring which is unsubstituted or substituted on one or more carbon ring members by a lower alkyl group.

4,695,575

4-[(BICYCLE HETEROCYCLYL)-METHYL AND -HETERO]-PIPERIDINES

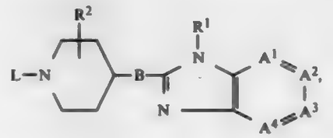
Fraas E. Janssens, Bonheiden; Ludo E. J. Kennis, Turnhout; Jozef F. Hens, Nijlen; Joseph L. G. Torremans, Beerse, and Gaston S. M. Diels, Ravels, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 671,135, Nov. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 569,369, Jan. 9, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 747,754

Int. Cl.[4] A61K *31/445*; C07D *401/12*

U.S. Cl. 514—322 **12 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein: $A^1{=}A^2{-}A^3{=}A^4$ is a bivalent radical having the formula

—CH═CH—CH═CH—, (a-1)

—N═CH—CH═CH—, (a-2)

—CH═N—CH═CH—, (a-3)

—CH═CH—N═CH—, or (a-4)

—CH═CH—CH═N—, (a-5)

wherein one or two hydrogen atoms in said radicals (a-1)–(a-5) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

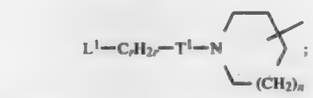
R^2 is a member selected from the group consisting of hydrogen and lower alkyl;

B is CH_2, O, S, SO or SO_2;

L is a member selected from the group consisting of a radical of formula

$L^1{-}C_rH_{2r}{-}T{-}C_sH_{2s}{-}$; and (b-1)

a radical of formula



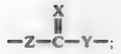
(b-2)

wherein one or two hydrogen atoms in the bivalent radical $-C_2H_{2s}-$ may, each independently from each other, be replaced by halo, hydroxy, mercapto, isothiocyanato, isocyanato, lower alkyloxy, lower alkylthio, Ar^1, Ar^1O—, Ar^1S—, Ar^1SO_2—, or NR^3R^5; and

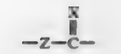
n is 0 or the integer 1 or 2;

r and s are, independently from each other, 0 or an integer of from 1 to 6 inclusive;

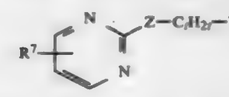
T is —Y— or



T^1 is



or a direct bond;
said Y being O, S, NR^3 or a direct bond; X being O, S, CH—NO_2 or NR^4; Z being O, S, NR^5 or a direct bond; and
said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2-lower alkyl, lower alkyloxy, Ar^2-lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2-amino, Ar^2-lower alkylamino or Ar^2-lower alkyl(lower alkyl)amino;
said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2-sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2-carbonyl; and
said R^5 being hydrogen or lower alkyl;
wherein L^1 is a member selected from the group consisting of hydrogen; halo; hydroxy; lower alkyloxy; lower alkylthio; cyano; mercapto; isocyanato; isothiocyanato; Ar^1; Ar^1-carbonyl; Ar^1-sulfonyl; lower alkylsulfonyl; cycloalkyl being optionally substituted with up to two substituents each independently selected from the group consisting of lower alkyl, cyano and Ar^2; [10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene]methyl; Het; and furan substituted with substituted lower alkyl; said substituted lower alkyl being lower alkyl substituted with a member selected from the group consisting of hydroxy, mercapto, lower alkyloxy, lower alkylthio, aminolower alkylthio, Ar^2-oxy and a radical of formula



(c)

wherein: t is 0 or an integer of from 1 to 6 inclusive; and R^7 is hydrogen or lower alkyl; provided that: when in said radical of formula (c) t is 0, then Z or Y is a direct bond; and
where r is 0, L^1 may also be lower alkenyl, Ar^1-lower alkenyl or lower alkyl substituted with two lower alkyloxy radicals; and
where r is 0 and T is NR^3, or T is —$N(R^5)$—C(=X)—Y or T^1 is —$N(R^5)$—C(=X)—, L^1 may also be amino, lower alkylamino or Ar^1-amino; and
where r is 0, and T is —$N(R^5)$—C(=X)—Y or T^1 is —$N(R^5)$—C(=X)—, L^1 may also be nitro; said Het being a five- or six-membered heterocyclic ring containing a number of heteroatoms which varies of from 1 to 4, said heteroatoms being selected from the group consisting of oxygen, sulfur and nitrogen, provided that no more than two oxygens or sulfurs are present, said five or six-membered ring being optionally condensed with a five- or six-membered carbocyclic or heterocyclic ring also containing a number of heteroatoms which varies from 1 to 4, the latter heteroatoms being selected from the group consisting of oxygen, sulfur and nitrogen, provided that no more than 2 oxygens or sulfurs are present, and wherein said Het being a bicyclic ring system may optionally be substituted with up to 6 substituents, or said Het being a monocyclic ring system may optionally be substituted with up to 3 substituents, said substituents of Het being selected from the group consisting of a bivalent radical of formula =X, said =X independently having the same meaning of the previously defined X; halo; isocyanato; isothiocyanato; nitro, cyano, trifluoromethyl; a radical of formula R—Y—, wherein R is hydrogen, Ar^1 or lower alkyl being optionally substituted with Ar^1, lower alkyloxy, Ar^1O, hydroxy, lower alkyloxycarbonyl and Y independently has the same meaning of the previously defined Y; and a radical R—Z—C(=X)—Y—, wherein R is as defined hereinabove and Z, X and Y independently have the same meanings of the previously defined Z, X and Y; provided that (i) when in the radical R—Y— R is hydrogen, then Y is other than a direct bond, or (ii) when in the radical R—Z—C(=X-)—Y—R is hydrogen and Y is NR^3, O or S, then Z is other than O or S; provided that:
(i) when L is a radical of formula (b-1) wherein L^1 is hydrogen and wherein T is —Z—C(=X)—Y— wherein y is other then a direct bond and Z and X are each independently O or S, then r is not 0; or when L is a radical of formula (b-2) wherein L^1 is hydrogen and wherein T^1 is —Z—C(=X)— wherein Z and X are each independently O or S, then r is not 0;
(ii) when L is a radical of formula (b-1) wherein L^1 is halo, hydroxy, lower alkyloxy, mercapto, lower alkylthio, isocyanato, isothiocyanato or Het connected to C_rH_{2r} on a nitrogen atom, and wherein r is 0, then T is a direct bond or a radical —C(=X)—Y—; or when L is a radical or formula (b-2) wherein L^1 is halo, hydroxy, lower alkyloxy, mercapto, lower alkylthio, isocyanato, isothiocyanato or Het connected to C_rH_{2r} on a nitrogen atom, and wherein r is 0, then T^1 is a radical —C(=X)—;
(iii) when L is a radical of formula (b-1) wherein T is Y, said Y being other than a direct bond, or when T is —Z—C(=X)—Y—, wherein Y is other than a direct bond, then s is not 0;
wherein Ar^1 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl, thienyl, halothienyl, lower alkylthienyl, pyridinyl, mono- and di(lower alkyloxy)pyridinyl, pyrrolyl, lower alkylpyrrolyl, furanyl, furanyl substituted with lower alkyl, pyrazinyl, thiazolyl, imidazolyl, lower alkylimidazolyl; said substituted phenyl, being phenyl substituted with up to 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, lower alkylsulfonyl, lower alkylsulfonyllower alkyl, phenyllower alkylsulfonyl, phenylsulfonyllower alkyl, a radical of formula R^8—C_pH_{2p}—Y—, a radical of formula R^9—Z—C(=X)—Y—, and a radical of formula $R^{10}SO_2Y$—; wherein p is an integer of from 1 to 6 inclusive and R^8 is a member selected from the group consisting of amino, cyano, phenyl aminocarbonyl, mono- and di(lower alkyl)aminocarbonyl, lower alkyloxycarbonyl, phenyllower alkyloxycarbonyl, 4-morpholinylcarbonyl, 1-piperidinylcarbonyl, 1-pyrrolidinylcarbonyl, and lower alkenyl; wherein R^9 is member selected from the group consisting of hydrogen, lower alkyl and Ar^2; provided that, when R^9 is hydrogen and Y is other than a direct bond, then Z is not O or S; and wherein R^{10} is lower alkyl or Ar^2;
wherein Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, thienyl and furanyl, said substituted phenyl being phenyl optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)-CO.

4,695,576

L-N–N-PROPYLPIPECOLIC ACID-2,6-XYLIDIDE

Bo T. af Ekenstam, Hjalteby, and Christer Bovin, Frolunda, both of Sweden, assignors to Astra Lake Medel Aktiebolag, Sodertalje, Sweden

Continuation-in-part of Ser. No. 629,738, Jul. 9, 1984, abandoned, which is a continuation of Ser. No. 377,104, May 11, 1982, abandoned. This application Oct. 9, 1985, Ser. No. 785,819
Int. Cl.[4] C07D *211/60*; A61K *31/445*
U.S. Cl. 514—330 **6 Claims**

1. A method for inducing local anesthesia comprising administration to a patient needing local anesthesia an anesthetizing amount of the substantially pure L-isomer of N-n-propylpipecolic acid-2,6-xylidide or its water soluble salts substantially devoid of the racemic and the D-isomer of N-n-propylpipecolic acid-2,6-xylidide.

3. Substantially pure L-isomer of N-n-propylpipecolic acid-2,6-xylidide, and its water soluble salts, substantially devoid of racemic and D-N-n-propylpipecolic acid-2,6-xylidide.

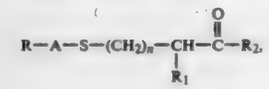
4,695,577

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Filed Aug. 14, 1979, Ser. No. 64,901
Int. Cl.[4] A61K *31/40, 31/41*; C07D *207/00, 211/72*
U.S. Cl. 514—362 **21 Claims**

1. A new compound having the formula



wherein
R is cyclopentylcarbonyl or tert-butyloxycarbonyl;
A is L-phenylalanyl, glycyl, L-alanyl, L-tryptophyl, L-tyrosyl, L-isoleucyl, L-leucyl, L-histidyl, or L-valyl whoseα-amino group is an amide linkage with R;
R_1 is hydrogen or methyl;
R_2 is L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the



and,
n is 0 or 1, such that when n=0, R_1 is methyl.

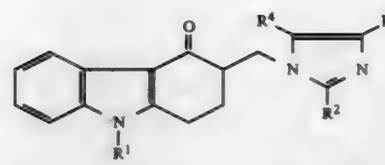
4,695,578

1,2,3,9-TETRAHYDRO-3-IMIDAZOL-1-YLMETHYL-4H-CARBAZOL-4-ONES, COMPOSITION CONTAINING THEM, AND METHOD OF USING THEM TO TREAT NEURONAL 5HT FUNCTION DISTURBANCES

Ian H. Coates, Hertfordshire; James A. Bell, Royston; David C. Humber, Ealing, and George B. Ewan, Gerrard's Cross, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 820,743, Jan. 22, 1986, abandoned, and a continuation-in-part of Ser. No. 694,790, Jan. 25, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,032
Claims priority, application United Kingdom, Jan. 25, 1984, 8401888; Oct. 15, 1984, 8425959; Jan. 23, 1985, 8501727; Jan. 23, 1985, 8501728
Int. Cl.[4] A61K *31/415*; C07D *403/06*
U.S. Cl. 514—397 **20 Claims**

1. A compound of formula (I)



(I)

wherein R^1 represents a hydrogen atom or a C_{1-10} alkyl, C_{3-7} cycloalkyl, C_{3-6} alkenyl, C_{3-7} cycloalkyl-(C_{1-4})alkyl, C_{3-10} alkynyl, phenyl or phenyl-C_{1-3} alkyl group, and one of the groups represented by R^2, R^3 and R^4 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7} cycloalkyl, C_{2-6} alkenyl or phenyl-(C_{1-3}) alkyl group and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6} alkyl group; or a physiologically acceptable salt or solvate thereof.

12. A method of treating a condition caused by disturbance of "neuronal" 5HT function which comprises administering to a patient an effective amount of a compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof to relieve said condition.

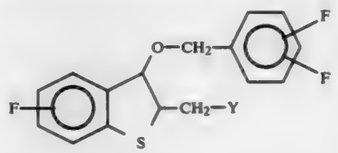
4,695,579

ANTIFUNGAL 2-AZOLYLMETHYL-3-DIFLUOROBENZYLOXY-2,3-DIHYDROFLUORO-BENZO(B) THIOPHENS

Dinanath F. Rane, Sayreville; Jagdish A. Desai, Parlin, and Russell E. Pike, Stanhope, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 21, 1984, Ser. No. 684,872
Int. Cl.[4] A61K *31/415, 31/41*; C07D *409/06*
U.S. Cl. 514—397 **17 Claims**

1. A compound represented by the following formula I:



I

or a pharmaceutically acceptable acid salt thereof,
wherein Y is imidazolyl, 1,2,4-triazolyl or lower alkyl and aryl substituted derivatives thereof, said aryl being a member selected from the group consisting of phenyl, halophenyl; and lower alkylphenyl;
in racemic or optically active form.

13. A method of treating susceptible fungal infections which comprises administering to a host in need of such treatment an antifungally effective amount of a compound of claim 1 or a pharmaceutical composition comprising such a compound and a pharmaceutically acceptable carrier or diluent.

4,695,580

PHENYLSERINE DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Naohito Ohashi, Newton, Mass.; Shoji Nagata, Takarazuka, Japan; Masashi Nakatsuka, Osaka, Japan; Kikuo Ishizumi, Toyonaka, Japan; Junki Katsube, Toyonaka, Japan; Shunji Aono, Toyonaka, Japan, and Teruo Sakurama, Toyonaka, Japan, assignors to Sumitomo Pharmaceuticals Company, Ltd., Osaka, Japan

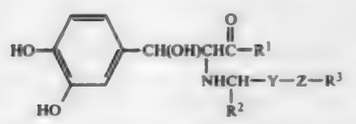
Filed Dec. 19, 1984, Ser. No. 683,430

Claims priority, application Japan, Dec. 20, 1983, 58-241601

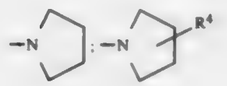
Int. Cl.[4] A61K *31/40, 31/165, 31/215;* **C07D** *209/08, 209/44, 295/18*

U.S. Cl. 514—412 **11 Claims**

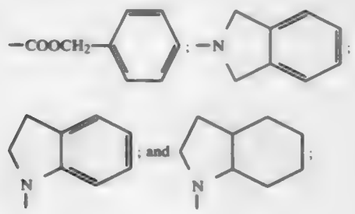
1. A phenylserine derivative of the formula:



wherein R^1 is a member selected from the group consisting of



wherein R_4 is C_1–C_4 alkyl, carboxyl, carbo(C_1–C_4)alkoxy, hydroxy(C_1–C_4)alkyl, phenyl or



wherein

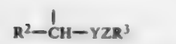
R^2 is hydrogen, a C_1–C_4 alkyl group, or phenyl;

R^3 is hydrogen; a C_1–C_4 alkyl group; a C_5–C_6 cycloalkyl group; unsubstituted pehnyl, phenyl having one or more substituents selected from the group consisting of a C_1–C_4 alkyl group, hydroxy, C_1–C_4 alkoxy, halogen, trifluoromethyl, di(C_1–C_4 alkyl)amino and methlenedioxy; naphtyl; furyl, thienyl; pyrrolyl; or indolyl;

Y is a single bond; an unsubstituted C_1–C_4 alkylene; or a C_1–C_4 alkylene substituted by a C_1–C_4 alkyl or phenyl;

Z is a single bond; oxa; thia; C_1–C_4 alkylimino; or —CONH—; or

the group Z—R^3 forms a 1,4-benzodioxyanyl group, or the group



forms a tetrahydronaphthyl group, with the proviso that when Y and Z both represent a single bond, it is the same single bond, or a pharmaceutically acceptable acid addition salt thereof.

10. A pharmaceutical composition for the treatment of allergic diseases induced by SRS-A which comprises as an essential active ingredient a therapeutically effective amount of the compound according to claim **1** in admixture with a pharmaceutically acceptable carrier or diluent.

11. A method for the treatment of allergic diseases induced by SRS-A, which comprises administering a therapeutically effective amount for the prophylaxis and treatment of allergic diseases induced by SRS-A of the compound according to claim **1** to a person suffering from said allergic diseases.

4,695,581

2-(3,5-DIALKYL-4-HYDROXYPHENYL)INDOLE DERIVATIVES

Yasushi Suzuki, Yokohama; Yukio Hasegawa, Yamato; Michitaka Sato, Kawasaki; Morinobu Saito, Kawasaki; Norio Yamamoto, Kawasaki; Katsuhiko Miyasaka, Atsugi; Takashi Mikami, Yokohama, and Katsuhiko Miyazawa, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Minato, Japan

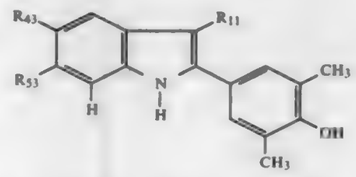
Filed Aug. 29, 1985, Ser. No. 770,773

Claims priority, application Japan, Aug. 31, 1984, 59-180656

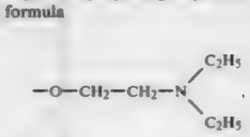
Int. Cl.[4] A61K *31/40;* **C07D** *209/12*

U.S. Cl. 514—415 **5 Claims**

1. A compound represented by the formula



Wherein R_{11} represents a methyl or ethyl group, R_{43} represents a hydrogen atom, a methyl group, a methoxy group, an n-propoxy group, an isopropoxy group, an amino group, or a group of the formula



and R_{53} represents a hydrogen atom or a methoxy group when R_{43} is a methoxy group and represents a hydrogen atom when R_{43} is other than a methoxy group, or a pharmaceutically acceptable salt thereof.

2. A pharmaceutical composition for inhibiting 5-lipoxygenase comprising a 5-lipoxygenase-inhibiting amount of a compound defined in claim **1** or its pharmaceutically acceptable salt in combination with a pharmaceutically acceptable carrier or diluent.

4,695,582

INHIBITORS OF ANGIOTENSIN CONVERTING ENZYME

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation of Ser. No. 941,289, Sep. 11, 1978. This application Jan. 30, 1980, Ser. No. 116,950

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00*

U.S. Cl. 514—423 **15 Claims**

1. New compounds selected from the group: N-[3-(benzoylphenylalanylthio)-2-D-methylpropanoyl]-L-proline, N-(2-benzoylphenylalanylthiopropanoyl)-L-proline and N-(3-benzoylphenylalanylthiopropanoyl)-L-proline.

4,695,583

METHOD FOR RELIEVING PAIN OR PRODUCING ANALGESIA

Emanuel Revici, New York, N.Y., assignor to Elena Avram, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,905

Int. Cl.[4] A61K *31/335*

U.S. Cl. 514—449 **16 Claims**

1. A method for relieving pain or producing analgesia in a host having a painful area which comprises injecting a solution of epichlorohydrin hydrolyzed in water at the painful area in a sufficient amount to relieve pain or produce analgesia therein.

4,695,584

METHOD OF SYNTHESIZING BREVICOMIN AND USING SAME IN BEETLE CONTROL

Theodore Cohen, Pittsburgh, Pa., and James Matz, Ithaca, N.Y., assignors to University of Pittsburgh, Pittsburgh, Pa.

Division of Ser. No. 312,968, Oct. 20, 1981, Pat. No. 4,426,535. This application Jan. 24, 1983, Ser. No. 460,405

Int. Cl.[4] A01N *43/16*

U.S. Cl. 514—456 **4 Claims**

1. A method of interfering with normal propagation of Dendroctonus beetles including:

providing a reactive metal reducing agent in solution form, admixing with said reducing agent an alpha-(phenylthio) ether substrate which is the Diels-Alder adduct of phenyl vinyl sulfide and methyl vinyl ketone,

effecting said admixture at about −45° C. to about −93° C., for at least about 15 minutes, adding to said reducing agent-substrate solution about 1 to 10 moles of propionaldehyde, adding an organic solvent, and washing the reaction admixture with an aqueous acid solution to produce a mixture of endo-brevicomin and exo-brevicomin and distributing said mixture in an anti-propagation effective amount in regions desired to be controlled.

4,695,585

7-OXABICYCLO(2.2.1)HEPTANE ANALOGS USEFUL AS INHIBITORS OF 5-LIPOXYGENASE AND CYCLOOXYGENASE

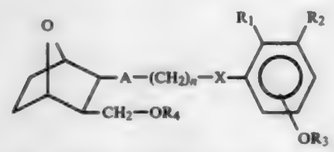
Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 23, 1986, Ser. No. 910,583

Int. Cl.[4] A61K *31/34;* **C07D** *307/00*

U.S. Cl. 514—469 **28 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, hydroxy, alkoxy or aryloxy; R_2 is hydrogen, hydroxy, alkoxy or aryloxy; or wherein R_1 and R_2 taken together is a benzene ring; R_3 is hydrogen or lower alkyl; R_4 is lower alkyl, alkenyl of 2–8 carbon atoms or alkynyl of 2–8 carbon atoms; X is amino, alkylamino, alkanoylamino, oxygen or a single bond; A is $—CH_2$ —CH=Ch— or a single bond; and n is an integer from 0 to 9, with the provisos that when A is a single bond, n is an integer from 1 to 9 and that when X and A are both single bonds, n is an integer from 6 to 9; including all stereoisomers thereof;

wherein the term alkoxy by itself or as part of another group represents both straight and branched chain radicals of up to 12 carbon atoms;

the term alkyl by itself or as part of another group represents both straight and branched chain radicals of up to 12 carbons, chain as well as such groups substituted by F, Br, Cl, I, CF_3, an alkoxy substituent, an aryl substituent, an aralkyl substituent, a haloaryl substituent, a cycloalkyl substituent, an alkylcycloalkyl substituent, hydroxy, an alkylamino substituent, an alkanoylamino substituent, an arylcarbonylamino substituent, a nitro substituent, a cyano substituent, a thiol substituent or an alkythio substituent;

the term aryloxy by itself or as part of another group represents substituted or unsubstituted phenoxy or naphthoxy;

wherein the substituent on either the phenoxy or naphthoxy is selected from the group consisting of 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, lor 2 thiol groups and/or 1 or 2 alkylthio groups.

23. A method of simultaneously inhibiting arachidonic acid cyclooxygenase and arachidonic acid 5-lipoxygenase which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1**.

4,695,586

7-OXABICYCLO(2.2.1)HEPTANE-BASED DERIVATIVES USEFUL AS ANTIINFLAMMATORY, ANTIASTHMA AND ANTIPSORATIC AGENTS

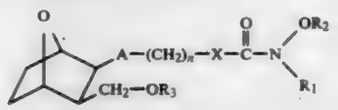
Ravi K. Varma, Belle Mead; Sam T. Chao, East Windsor, and Eric M. Gordon, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 23, 1986, Ser. No. 910,597

Int. Cl.[4] A61K *31/557;* **C07D** *307/00*

U.S. Cl. 514—469 **12 Claims**

1. A compound of the formula



wherein R_1 is hydrogen, lower alkyl, alkenyl, aryl or aralkyl; R_2 is hydrogen, lower alkyl, aralkyl, alkanoyl or aroyl; R_3 is lower alkyl, alkenyl or alkynyl; A is $—CH_2—CH=CH—$ or a single bond; X is oxygen, sulfur or NH; n is an integer from 1 to 8; and all stereoisomers thereof; wherein the term lower alkyl or alkyl refers to straight and branched chain radicals of up to 12 carbons, as well as such groups including a halo-substituent, an alkoxy substituent, an aryl substituent, an aralkyl substituent, a haloaryl substituent, a cycloalkyl substituent, an alkylcycloalkyl substituent, hydroxy, an alkylamino or dialkylamino substituent, an alkanoylamino substituent, an arylcarbonylamino substituent, a nitro substituent, a cyano substituent, a thiol substituent or an alkylthio substituent;

the term alkenyl refers to an unsaturated hydrocarbon group having from 2 to 8 carbons and a single carbon-carbon double bond;

the term alkynyl refers to an unsaturated hydrocarbon group having from 2 to 8 carbons and a single carbon-carbon triple bond;

the term aryl by itself, or as a part of aralkyl or aroyl, refers to monocyclic or bicyclic aromatic groups containing from 6 to 10 carbons in the ring portion, selected from phenyl, naphtyl, substituted phenyl or substituted naphtyl wherein the substituent on either the phenyl or naphthyl may be 1 or 2 lower alkyl groups, 1 or 2 halogens selected from CL, Br or F, 1 or 2 lower alkoxy groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino or dialkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups;

the term aralkyl or aryl-alkyl refers to said alkyl groups substituted with one of said aryl groups;

the term alkanoyl refers to a group comprising a carbonyl and one of said alkyl groups; and,

the term aroyl refers to a group comprising a carbonyl and one of said aryl groups.

9. A method of simultaneously inhibiting arachidonic acid cyclooxygenase and arachidonic acid 5-lipoxygenase which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,695,587

M-4 AND ISOM-4 DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

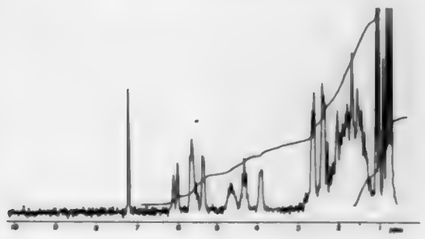
Akira Terahara, and Minoru Tanaka, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 372,696, Apr. 28, 1982, Pat. No. 4,479,965. This application Apr. 26, 1984, Ser. No. 604,056

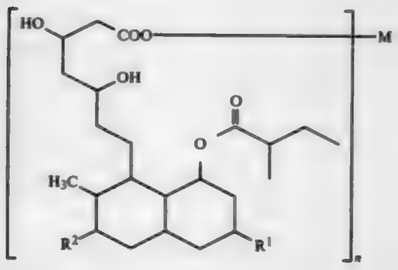
Claims priority, application Japan, May 7, 1981, 56-68646

Int. Cl.⁴ A61K *31/215, 31/22;* **C07C** *69/33, 69/675*

U.S. Cl. 514—510 **17 Claims**



1. The tetrahydro-M-4 and tetrahydro-IsoM-4 compounds of the formula (III):



(III)

wherein

one of R^1 and R^2 represents a hydrogen atom and the other represents a hydroxy group;

M represents a metal atom selected from the group consisting of alkali metals, alkaline earth metals, aluminum, iron, zinc, nickel and cobalt; and

n represents the valency of the metal atom M.

4,695,588

FLUORINATED AMINO ACIDS

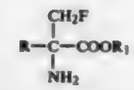
Janos Kollonitsch, Westfield, and Arthur A. Patchett, Cranford, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 802,391, Jun. 1, 1977, Pat. No. 4,325,961. This application Mar. 16, 1978, Ser. No. 886,601

Int. Cl.⁴ A61K *31/195, 31/24;* **C07C** *101/04, 101/18*

U.S. Cl. 514—538 **25 Claims**

1. A compound having the formula



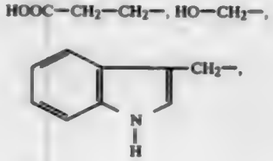
wherein R is a substituted C_1–C_4 alkyl group selected from

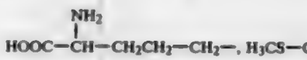


wherein R_2 is H or C_2–C_6 alkanoyl,









and R_1 is H or C_1–C_{18} alkyl.

23. A pharamecutical composition for modulating or inhibiting the biosynthesis of biologically significant amines containing a decarboxylase inhibiting amount of a compound of claim 1 or an acid addition salt thereof and a pharmaceutically acceptable diluent.

4,695,589

ALPHA-(AMINOALKYL-4-HYDROXY-3-(ALKYLTHIO)-BENZENEMETHANOLS

Richard E. Philion, Sand Lake, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

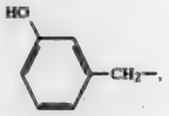
Continuation-in-part of Ser. No. 937,926, Aug. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 803,372, Jun. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,856, Jun. 25, 1976, abandoned. This application May 27, 1983, Ser. No. 499,102

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.⁴ A01N *33/02*

U.S. Cl. 514—653 **8 Claims**

1. A compound having the formula



and

wherein

R_2 and R_3 are independently hydrogen or lower alkyl;

n is the integer 1 or 2;

Ar is lower alkoxyphenyl; and

Y is hydrogen or lower alkanoyl;

or an acid addition salt thereof.

2. A compound according to claim 1 wherein Ar is 4-methoxyphenyl.

7. The method of lowering blood pressure in a mammal which comprises administering to said mammal a blood pressure lowering effective amount of a compound according to claim 2.

4,695,590

METHOD FOR RETARDING AGING

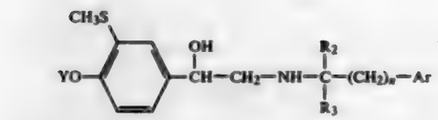
Richard D. Lippman, Scottsdale, Ariz., assignor to California Health Technologies, Los Angeles, Calif.

Filed May 5, 1986, Ser. No. 859,464

Int. Cl.⁴ A61K *31/045*

U.S. Cl. 514—724 **16 Claims**

1. A method for retarding aging in humans by administering to a human a daily dosage of from about 0.5 mg per kilogram of body weight to less than about 2 mg per kilogram of body weight of a pharmaceutically acceptable composition comprising a compound or a mixture of compounds represented by the following structural formula:



(1)

wherein

m is 0, 1 or 2;

n is 0 or 1;

R1 is hydrogen, halogen or hydroxy; and

R2 and R3 each independently represents hydrogen or methyl provided that when m is 0, n is 0 and when m is 1 or 2, n is 1 and R1 is hydroxy or halogen and that when m is 2, each R2 can be the same or different and each R3 can be the same or different or

a pharmaceutically acceptable alkali or alkaline earth metal salt thereof.

4,695,591

CONTROLLED RELEASE DOSAGE FORMS COMPRISING HYDROXYPROPYLMETHYLCELLULOSE

Gayda Hanna, Berwyn, Pa., and Winston A. Vadino, Bridgewater, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 718,036, Mar. 29, 1985. This application Nov. 22, 1985, Ser. No. 801,130

Int. Cl.⁴ A61K *31/74, 9/20, 9/22*

U.S. Cl. 514—781 **2 Claims**

1. A controlled release dosage form comprising a combination of an analgesic-effective amount of acetaminophen, an anti-histaminic-effective amount of dexbrompheniramine maleate, a decongestive-effective amount of pseudoephedrine sulfate and hydroxypropyl methylcellulose U.S.P. 2910 as the carrier base, wherein said hydroxypropyl methylcellulose constitutes 4.6 to 12 weight-% of the total dosage form.

4,695,592

HYDROPHILIZED POROUS MEMBRANE AND PRODUCTION PROCESS THEREOF

Hajime Itoh, Hiroshima, and Kazutami Mitsui, Otsuka, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1987, Ser. No. 70

Claims priority, application Japan, Jan. 7, 1986, 61-000951; Sep. 19, 1986, 61-221465

Int. Cl.⁴ C08J *9/40*

U.S. Cl. 521—54 **5 Claims**

1. A process for the production of a hydrophilized porous membrane, which comprises the steps of (A) holding at least diacetone acrylamide, a crosslinkable monomer, and a polymerization initiator on at least a part of the pore walls of a starting porous membrane of a polyolefin which has been rendered porous by a stretching technique, and (B) heating them to polymerize these monomers.

4,695,593

PREFOAMED PROPYLENE POLYMER-BASE PARTICLES, EXPANSION-MOLDED ARTICLE PRODUCED FROM SAID PARTICLES AND PRODUCTION PROCESS OF SAID ARTICLE

Hideki Kawabara, Hadano; Atsushi Kitagawa, and Yoshimi Sudo, both of Fujisawa, all of Japan, assignors to Japane Styrene Paper Corporation, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,548

Int. Cl.⁴ C08J *9/24*

U.S. Cl. 521—60 **4 Claims**

1. A process for producing an expansion-molded propylene polymer-base article, which comprises:

imparting foamability to prefoamed propylene polymer-base particles, which have a crystalline structure featuring a high-temperature peak appearing on the higher temperature side than the peak inherent to the propylene polymer-base resin on the DSC curve obtained by differential scanning calorimetry upon heating 1–3 mg of the prefoamed propylene polymer-base particles at a constant heating rate of 10° C./min to 220° C. by means of a differential scanning calorimeter and an internal pressure decreasing velocity coefficient k of 0.70 or smaller ($k \leqq 0.70$) at 25° C. and 1 atm;

filling the resultant particles in a mold; and

heating the particles so as to cause their expansion, thereby obtaining the articles which conform in shape with the mold.

4,695,594

MODIFIED FLAME RETARDANT POLYPHENYLENE ETHER RESINS HAVING IMPROVED FOAMABILITY AND MOLDED ARTICLES MADE THEREFROM

Eric Pressman, East Greenbush, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Aug. 27, 1986, Ser. No. 900,705

Int. Cl.⁴ C08J *9/08*

U.S. Cl. 521—92 **10 Claims**

1. A method of producing a foamed flame retardant thermoplastic composition substantially free of surface streaking and without odor generation, said composition comprising (a) a polyphenylene ether, alone, or in combination with a styrene resin; (b) an effective flame retarding amount of a halogenated flame retardant, alone, or in further combination with an antimony compound, said method comprising (i) adding to said composition an effective foam generating amount of (c) a foaming agent comprising citric acid and sodium bicarbonate; and (ii) foaming the composition of step (i).

4,695,595
PROCESS FOR THE PRODUCTION OF CELLULAR ORGANIC SILICATE PRODUCTS

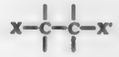
David H. Blount, 6728 Del Cerro Blvd., San Diego, Calif. 92120
Division of Ser. No. 892,834, Aug. 4, 1986, Pat. No. 4,663,363.
This application Jan. 5, 1987, Ser. No. 443
Int. Cl.[4] C08J 9/00
U.S. Cl. 521—99 10 Claims

1. The process for the production of foamed organic silicate products which consist of mixing and reacting the following components:

A. a substituted organic compound having the graphical skeleton carbon structure of



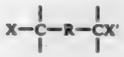
wherein X represents the substituents which split off during the reaction; the R, R' and R" are selected from the following groups: hydrogen, saturated straight-chain carbon atoms, unsaturated carbon atoms, ether linkages, ester linkages, aromatic structures, another X and mixtures thereof; the X substituents are selected from the following group, halogens, acid sulfate, nitrate, acid phosphate, bicarbonate, sulfate, formate, acetate, propionate, laurate, oleate, stearate, acid oxalate, acid malonate, acid tartrate, acid citrate and mixtures thereof, or wherein the substituted organic compound is a polysubstituted organic compound having the graphical skeleton carbonstructure of



where



represents two adjacent carbon atoms or



where X and X' represent the substituents which split off during the reaction and are selected from the group consisting of halogen, acid sulfate, nitrate, acid phosphate, bicarbonate, formate, acetate, propionate, laurate, oleate, stearate, oxalate, acid malonate, acid tartrate, acid citrate and mixtures thereof; the R between the pair of reactive carbon atoms is selected from the following groups, saturated straight-chain carbon atoms, unsaturated carbon atoms, ether linkage, ester linkages, aromatic structures and mixtures thereof, in the amount of 1 to 100 parts by weight;

B. alkali oxidated silicon compound, in the amount of 100 parts by weight;

C. free-radical initiator in the amount of 0.1 to 10 parts by weight,

D. a blowing agent.

4,695,596
STABLE, LOW VISCOSITY POLYMER/POLYISOCYANATE DISPERSION

Phillip T. Berkowitz, Woodbridge, Conn., assignor to Olin Corporation, Cheshire, Conn.
Filed Aug. 28, 1986, Ser. No. 901,505
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—137 24 Claims

1. A stable polymer/polyisocyanate dispersion comprising:

(a) a polyisocyanate and

(b) a polymer which is a reaction product of an ethylenically unsaturated macromol-ecular monomer and at least one other ethylenically unsaturated monomer.

4,695,597
ORGANOPOLYSILOXANE COMPOSITION FOR FIRE-RESISTANT FOAMED SILICONE RUBBER

Masanori Seino, Gunma, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Aug. 19, 1986, Ser. No. 898,132
Claims priority, application Japan, Aug. 20, 1985, 60-182739
Int. Cl.[4] C08G 77/00
U.S. Cl. 521—154 9 Claims

1. A foamable organopolysiloxane composition capable of being converted into a cured foamed silicone rubber which comprises:

(a) 100 parts by weight of a first diorganopolysiloxane having a hydroxy group bonded to the silicon atom at each of the molecular chain ends and represented by the general formula

$$HO—SiR_2—(O—SiR_2—O)_n—SiR_2—OH,$$

in which R is a monovalent hydrocarbon group free from aliphatic unsaturation and m is a positive integer in the range from 5 to 10,000;

(b) from 10 to 100 parts by weight of a second diorganopolysiloxane having a vinyl group bonded to the silicon atom at each of the molecular chain ends and represented by the general formula

$$CH_2=CH—SiR_2—O—(SiR_2—O)_n—SiR_2—CH=CH_2,$$

in which R has the same meaning as defined above and n is a positive integer in the range from 10 to 1000;

(c) an organohydrogenpolysiloxane having, in a molecule, at least two hydrogen atoms directly bonded to the silicon atoms in such an amount that from 2.0 to 40.0 moles of the silicon-bonded hydrogen atoms are provided per mole of the overall amount of the hydroxy groups in the first diorganopolysiloxane and the vinyl groups in the second diorganopolysiloxane;

(d) from 5 to 100 parts by weight of an inorganic filler;

(e) a platinum compound in a catalytic amount;

(f) from 5 to 100 parts by weight of aluminum hydroxide; and

(g) from 0.1 to 5 parts by weight of red phosphorus.

4,695,598
EPOXY RESIN COATING COMPOSITION

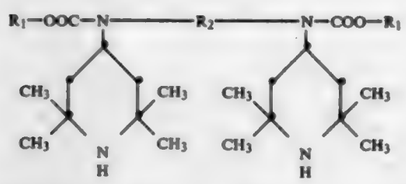
Hiraku Yamamoto; Toshimichi Suzuki; Shigeru Katayama; Isao Urutsuka, and Eishi Asoshina, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 2, 1986, Ser. No. 847,333
Claims priority, application Japan, Apr. 3, 1985, 60-70397
Int. Cl.[4] C08K 3/08
U.S. Cl. 523—400 8 Claims

1. An epoxy resin coating composition comprising a rubber-modified epoxy resin which is obtained by reacting an expoxy resin with a carboxyl group-containing butadiene-acrylonitrile rubber, a phenoxy resin, a metal powder, a curing component, and an organic solvent, wherein the amount of phenoxy resin is from 40 to 90 percent by weight based on the total weight of said phenoxy resin and rubber-modified epoxy resin and wherein the amount of said metal powder is from 25 to 75 percent by weight based on the weight of the solids content in the composition.-

4,695,599
USE OF DIPIPERIDINE-DI-CARBAMATES AS STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Bitonto, Italy, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Continuation of Ser. No. 606,456, May 2, 1984, abandoned. This application Oct. 4, 1985, Ser. No. 783,804
Claims priority, application Italy, May 3, 1983, 20900 A/83
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—103 8 Claims

1. A light-stabilised, heat-stabilised and oxidation-stabilised polymer composition, which comprises a synthetic polymer and a stabilizing amount of one or more of the stabilisers of the formula (I)



(I)

in which R_1 is C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl, C_5–C_{12}-cycloalkyl or phenyl or hydroxyphenyl which are unsubstituted or substituted by 1 to 3 C_1–C_4-alkyl groups or by benzyl or hydroxybenzyl which are unsubstituted or substituted by 1 to 3 C_1–C_4-alkyl groups, R_2 is C_1–C_{18}-alkylene, C_5–C_{18}-cycloalkylene, C_6–C_{18}-arylene, C_7–C_{18}-aralkylene or a radical of the formula (II)



(II)

in which R_3 and R_4, which can be identical or different, are C_2–C_6-alkylene, n is 1 or 2 and X is —O —or

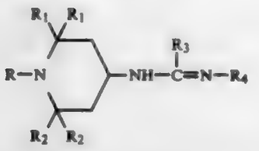


with R_5 being C_1–C_{12}-alkyl, C_5C_{12}-cycloalkyl, C_6–C_{12}-aryl, C_7–C_{12}-aralkyl, 2,2,6,6-tetramethyl-piperidin-4-yl or a radical —COOR$_1$ in which $R_1$is as defined above.

4,695,600
TETRAALKYLPIPERIDINES

Lajos Avar, Biel-Benken, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland
Filed Jun. 17, 1986, Ser. No. 875,130
Claims priority, application United Kingdom, Jun. 20, 1985, 8515672
Int. Cl.[4] C07D 417/12, 417/14; C08K 5/34
U.S. Cl. 524—103 14 Claims

1. A compound of formula I



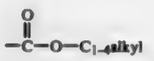
(I)

in which R is hydrogen, unsubstituted C_{1-18}alkyl, unsubstituted C_{1-21}alkylcarbonyl, unsubstituted C_{2-18}alkenylcarbonyl, C_{1-21}alkoxycarbonyl, phenylcarbonyl, phenylC_{1-4}alkylcarbonyl, C_{1-4}alkylphenylcarbonyl, oxygen or



where

R_6 is

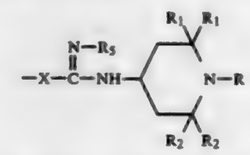


or —NR$_7$R$_8$; R_7 being hydrogen, C_{1-12}alkyl, C_{5-6}cycloalkyl, phenyl or C_{1-12}alkyl-phenyl and R_8 is hydrogen or C_{1-12}alkyl;

R_1 is —CH_2—C_{1-4}alkyl or —CH_3 or both R_1s together form —$(CH_2)_5$;

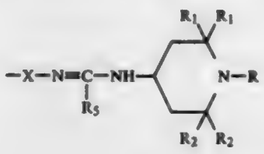
R_2 is —CH_2—C_{1-4}alkyl or —CH_3 or both R_2s together form —$(CH_2)_5$;

R_3 is unsubstituted C_{1-18}alkyl; phenyl, unsubstituted or substituted by 1, 2 or 3 groups selected from C_{1-18}alkyl, C_{1-4}alkoxy and halogen; or is a group (a)

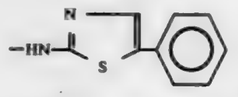


(a)

R_4 is C_{1-18}alkyl; phenyl, unsubstituted or substituted by 1 to 3 groups selected from C_{1-18}alkyl, C_{1-4}alkoxy and halogen; or is a group (b) or (c)



(b)



(c)

where X is a direct bond or a bridging group and R_5 is unsubstituted C_{1-18}alkyl or phenyl unsubstituted or substituted by 1 to 3 groups selected from C_{1-18}alkyl, C_{1-4}alkoxy and halogen;

with the proviso that when R_3 is a group (a) R_4 is not a group (b).

6. A polymeric composition comprising a polymeric material and a compound of formula I according to claim 1.

4,695,601
POLYPHENYLENE ETHER THERMOPLASTIC PROTECTED FROM DISCOLORATION DURING PROCESSING

Yuval Halpern, Skokie, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.
Filed Nov. 12, 1986, Ser. No. 929,445
Int. Cl.[4] C08K 5/07
U.S. Cl. 524—362 14 Claims

1. A thermoplastic composition comprising a polyphenylene ether and an alpha-hydroxyketone, said ketone being present in

an amount sufficient to suppress discoloration of the composition during processing.

4,695,602

FIBER REINFORCED THERMOPLASTICS CONTAINING SILICONE INTERPENETRATING POLYMER NETWORKS

Jane M. Crosby, Wilmington, Del., and MaryGail K. Hutchins, Philadelphia, Pa., assignors to LNP Corporation, Malvern, Pa.

Filed Feb. 28, 1985, Ser. No. 707,121
Int. Cl.[4] C08K *7/16, 7/14, 7/10, 7/06*
U.S. Cl. 524—439 **22 Claims**

1. A melt processable composition comprising:

a. a thermoplastic matrix material comprising a thermoplastic which has an unfilled flexural modulus greater than 90,000 psi;

b. a hydride group-containing silicone and a component which will react with said hydride group-containing silicone, said silicone and said component being selected and present in sufficient amounts to react with each other by vulcanization within said thermoplastic matrix to form a silicone semi-interpenetrating polymer network, said vulcanization of said silicone and said component being initiated during thermoplastic melt-processing of said silicone and said component with said matrix; and

c. a fibrous reinforcing agent mixed with said matrix material, said silicone and or said component.

4,695,603

ROOM TEMPERATURE CURABLE SILICONE RUBBER COMPOSITION

Yoshio Inoue; Masatoshi Arai, and Takeo Inoue, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,421
Claims priority, application Japan, Jun. 1, 1984, 59-112752
Int. Cl.[4] C08L *83/08*
U.S. Cl. 524—723 **3 Claims**

1. A room temperature curable silicone rubber composition which comprises:

(a) 100 parts by weight of a diorganopolysiloxane having a viscosity ranging from 100 to 1,000,000 centistokes, which is terminated at both molecular chain ends with a silanolic hydroxy group bonded to the terminal silicon atom;

(b) from 0.01 to 25 parts by weight of an organosilicon compound having at least two hydrolyzable groups bonded to the silicon atoms in a molecule;

(c) from 0.01 to 5.0 parts by weight of a surface active agent having at least one fluorine atom in a molecule;

(d) from 0.01 to 10 parts by weight of an organosilicon compound having, in a molecule, at least one organosilicon unit epresented by the general formula

$$R^1—CO—NR^2—(CH_2)_bSiR^3_aO_{(3-a)/2}$$

in which R^1, R^2 and R^3 may be the same or different and are elected from the group consisting of monovalent hydrocarbon having from 1 to 8 carbon atoms, monovalent hydrocarbon having 1 to 8 carbon atoms substituted with halogen or cyano and hydrogen, a is zero, 1, 2 or 3 and b is a positive integer not larger than 10; and (e) from 1 to 400 parts by weight of a filler.

4,695,604

ELECTRON BEAM CURABLE POLYUETHANE POLYMERS POR MAGNETIC TAPE APPLICATIONS

Charles J. Amirakis, Lake Geneva, Wis., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 16, 1985, Ser. No. 692,444
Int. Cl.[4] C08L *75/06, 33/08*
U.S. Cl. 525—28 **19 Claims**

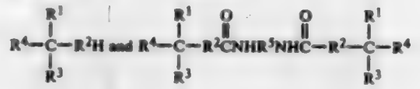
1. A substantially uncrosslinked, electron beam crosslinkable polyurethane resin which is the reaction product of:

A. from about 34% to about 75% by weight of hydroxyl terminated polyester which is a reaction product of an alpha-omega dicarboxylic acid and a lower alkyl diol;

B. from about 5% to about 22% by weight of an unsaturated compound having a structure selected from:

Structure I

Structure II



wherein

R^1 is a moiety having the structure:

$$—(CH_2)_{x_2}OH,$$

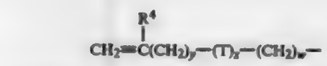
R^2 is a moiety having the structure:

$$—(CH_2)_{x_3}O—$$

wherein the oxygen atom is part of a carbamate linkage in Structure II,

x_3 can be 0, 1, or 2,

R^3 is a moiety having the structure:



T is selected from carbonyl and ether linkages,

y is 0 or 1,

z is 0 or 1,

w is 0, 1, or 2,

R^4 is selected from —H and —CH_3, or R^3 and R^4 together form a divalent ring-forming moiety having the structure



wherein

r and s are independently 0, 1, 2, or 3, and

R^5 is an aliphatic hydrocarbon moiety having from about 6 about 36 carbon atoms; and

C. from about 18% to about 44% by weight of an organic diisocyanate.

17. A polyurethane resin mixture comprising:

A. from about 50% to about 98% by weight of the resin of claim 1; and

B. from about 2% to about 50% of a urethane acrylate product obtained by reacting trimethylolpropane, toluene diisocyanate, and 2-hydroxyethyl acrylate.

4,695,605

SAG RESISTANT, HIGH PERFORMANCE EPOXY STRUCTURAL ADHESIVES

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Oct. 1, 1986, Ser. No. 913,903
Int. Cl.[4] C09G *18/30*
U.S. Cl. 525—109 **12 Claims**

1. An adhesive composition comprising a mixture of a first component comprising a polyepoxide and a polyisocyanate said polyisocyanate having been allowed to react with a primary or secondary polyamine and a second component comprising a hardener which is a mixture of primary, secondary, and tertiary amines, amido amines, and phenolics.

4,695,606

COATING BINDER ADDITIVE

William C. Floyd, Chester, and Sai H. Hui, Rock Hill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 22, 1986, Ser. No. 909,621
Int. Cl.[4] C08F *8/28;* **C08L** *61/00*
U.S. Cl. 525—160 **11 Claims**

1. An additive for binders for paper coating compositions which comprises:

a blocked glyoxal resin, which is the reaction product of a glyoxal and a blocking component, mixed with a vinyl or acrylic water soluble polymer which is reactive with free glyoxal, the amounts being within the ratio of 25:1 to 1:2 parts by dry weight of the blocked glyoxal resin to the polymer.

4,695,607

GROUP TRANSFER PROCESSES FOR ACRYLIC STAR POLYMERS

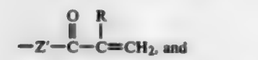
Harry J. Spinelli, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 627,919, Jul. 5, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 771,684
Int. Cl.[4] C08F *293/00, 295/00, 297/00*
U.S. Cl. 525—272 **4 Claims**

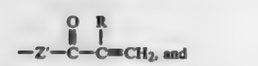
1. An arm/core process for preparing acrylic star polymers which comprise

a. a crosslinked core comprising a polymer derived from a mixture of monomers (A) comprising

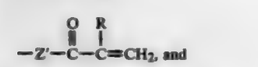
i. 1–100% by weight of one or more monomers each having at least two groups.



ii. 0–99% by weight of one or more monomers, each having one group,



b. attached to the core, at least 5 arms comprising polymer chains derived from one or more monomers (B), each having one group,



in each of which R is the same or different and is H, $CH_3C_3CH_2$, CN or CO_2R' and Z' is O or NR', wherein R'is C_{1-4} alkyl, and

c. attached to the core or to at least some of the arms, living group transfer polymerization sites which are $(R^1)_3M$ wherein; R is selected from the group consisting of C_{1-10} alkyl and C_{6-10} aryl or alkaryl; and M is Si, Sn, or Ge,

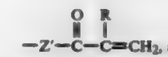
said process comprising group transfer polymerization utilizing a tetracoordinate organosilicon, organotin or organogermanium polymerization initiator having at least one initiating site, and a catalyst suitable for group transfer polymerization, involving the sequential steps of

a. preparing a living arm polymer by reacting the transfer initiator with one or more monomers (B), each having one group

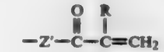


b. contacting the resulting living polymers in the presence of the catalyst with a mixture of monomers (A) comprising

i. 1–100% by weight of one or more monomers each having at least two groups,



ii. 0–99% by weight of one or more monomers, each having one group,



4,695,608

CONTINUOUS PROCESS FOR MAKING POLYMERS HAVING PENDANT AZLACTONE OR MACROMOLECULAR MOIETIES

David A. Engler, Woodbury, and Anthony R. Maistrovich, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

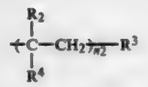
Continuation of Ser. No. 594,555, Mar. 29, 1984, abandoned. This application May 27, 1986, Ser. No. 867,519
Int. Cl.[4] C08F *265/04*
U.S. Cl. 525—308 **34 Claims**

1. A process of making a pressure sensitive adhesive composition by bulk polymerizing one or more free radical polymerizable vinyl compounds with one or more macromer represented by the general formula $X—(Y)_{n1}—Z$ wherein

X is a copolymerizable vinyl group;

Y is a divalent linking group where n_1 can be 0 or 1; and

Z is a monovalent polymer moiety having the general formula



wherein R^2 is hydrogen or a lower alkyl group, R^3 is a lower alkyl group, n_2 is an integer from 40 to 500 and R^4 is



wherein R^5 is hydrgen or a lower alkyl group; which process comprises:

(a) continously feeding to a wiped surface reactor, comprising a vessel and at least one rotor inside the vessel having

a wiping portion located close to the inside surface of the vessel and a root portion spaced substantially further from said inside surface than the wiping portion wherein the root surface is wiped continously during rotation of the rotor, raw materials which comprise unpolymerized vinyl compound without any substantial amount of polymerized vinyl compound, the macromer, and at least one initiator for free radical polymerization under the following conditions:

(i) all raw materials being fed substantially free of oxygen, and

(ii) at least one raw material being a liquid unpolymerized vinyl compound having a viscosity less than about 4,000 centipoise which is fed under a pressure at least as high as the vapor pressure of the combined raw materials at the temperature to which the exotherm of the free radical polymerization brings them in the reactor;

(b) reacting the raw materials to desired conversion; and

(c) continuously withdrawing a polymeric material from the reactor.

4,695,609

VULCANIZABLE RUBBER COMPOSITIONS CONTAINING XANTHOGEN POLYSULFIDE AND XANTHATE COMPOUNDS

Arthur Stevenson, West Midlands, United Kingdom, assignor to Robinson Brothers Limited, West Bromwich, United Kingdom

Filed Oct. 22, 1985, Ser. No. 790,136

Claims priority, application United Kingdom, Oct. 25, 1984, 8427009; May 3, 1985, 8511378

Int. Cl.⁴ C08C *19/20*

U.S. Cl. 525—352 **12 Claims**

1. A vulcanizable composition which comprises 100 parts by weight rubber; from about 1 to about 6 parts by weight dihydrocarbyl xanthogen polysulfide of the formula $R^1O—C(=S)—S_x—SC(=S)—OR^2$ wherein R^1 and R^2 are the same or different and selected from the group consisting of alkyl, cycloalkyl and N-free heterocyclic groups and x is an integer of at least 2; from about 0.01 to about 5 parts by weight of a xanthate compound selected from the group consisting of dihydrocarbyl xanthates and metal hydrocarbylxanthates of the formula $R^4O—CS—S—R^5$ wherein R^4 is selected from the group consisting of alkyl, cycloalkyl and N-free heterocyclic groups and R^5 is selected from the group consisting of a metal and R^4; and less than 0.4 parts by weight of nitrosatable materials.

4,695,610

SEMI-2-INTERPENETRATING NETWORKS OF HIGH TEMPERATURE SYSTEMS

Annamarie O. Egli, Gloucester, and Terry L. St. Clair, Poquoson, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1986, Ser. No. 840,816

Int. Cl.⁴ C08F *283/04*

U.S. Cl. 525—426 **12 Claims**

1. In the method of making a semi-2-interpenetrating polymer network wherein a linear polymer is combined with a cross-linkable oligomer, the improvement wherein the linear polymer comprises polyimidesulfone and the cross-linkable oligomer comprises acetylene-terminated polyimidesulfone.

4,695,611

LACTAM POLYMERIZATION INITIATORS

Edward H. Mottus, Ballwin, and Ross M. Hedrick, St. Louis, both of Mo., assignors to DSM Rim Nylon V.O.F., Geleen, Netherlands

Division of Ser. No. 838,643, Mar. 11, 1986. This application Nov. 28, 1986, Ser. No. 935,725

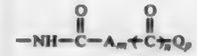
Int. Cl.⁴ C08L *77/00*

U.S. Cl. 525—432 **29 Claims**

1. The composition comprising:

a lactam monomer; and

the lactam polymerization initiator having at least two lactam terminal groups of the formula:



wherein Q is a lactam residue containing a C_3–C_{11} alkylene group and bonded to a carbonyl through the nitrogen atom of the lactam; A is an aliphatic or aromatic hydrocarbyl or hydrocarbyl ether group; m is 0 or 1; when m is 0, n is 0 or 1 and p is 1; when m is 1, n is in the range of 1 to 3 and p=n; and an elastomeric backbone derived from a telechelic polyamine containing at least two primary or secondary amine groups.

4,695,612

SECONDARY AMINE-TERMINATED OLIGOMERS AND COPOLYURETHANECARBONATES PREPARED THEREFROM

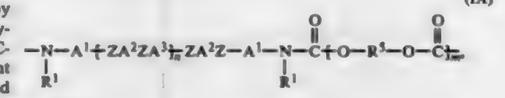
Tohru Takekoshi, Scotia, and Patricia P. Anderson, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,623

Int. Cl.⁴ C08L *79/00*

U.S. Cl. 525—433 **10 Claims**

1. A block copolyurethanecarbonate composition comprising structural units having the formula



(IX)

wherein:

R^1 is C_{1-4} alkyl or phenyl;

each of A^1, A^2 and A^3 is independently an aromatic radical, with A^1 and A^3 being divalent and A^2 being divalent or tetravalent;

Z is a bridging radical containing at least one non-carbon linking atom;

n is from 0 to about 20;

about 60% of the total number of R^5 radicals are aromatic organic radicals and the remainder are aliphatic, alicylic or aromatic organic radicals, and

m is in the range of about 10–500.

4,695,613

POWDER VARNISH COMPOSITIONS CONTAINING CARBOXY CURING AGENTS

Juergen Olbrich, Dorsten; Uwe Biethan, Marl, and Gerwold Sorge, Herne, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 778,658

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434917

Int. Cl.⁴ C08G *59/14, 59/16;* **C08L** *63/00*

U.S. Cl. 525—533 **30 Claims**

1. In a process for curing an epoxy resin composition, comprising heating a mixture comprising the resin and an effective amount of a curing agent, which curing agent is the neutralization product of a polycarboxylic acid precursor and a cyclic amidine, the improvement wherein the polycarboxylic acid precursor is an oligoester which is the product of a C_{4-10} hydrocarbon, aliphatic cycloaliphatic or aromatic-polycarboxylic or -dicarboxylic acid and a C_{4-8} hydrocarbon aliphatic or cycloaliphatic diol, said oligoester having an acid number of about 245–265, and wherein in said polycarboxylic acid product >25% to 90% of the free carboxy groups in the oligoester are neutralized by said cyclic amidine.

4,695,614

PROCESS FOR PRODUCING AN OLEFIN COPOLYMER RUBBER

Yoshihide Yamazaki; Kazumi Uchimura; Satoshi Yamashita, and Mikio Takeuchi, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 702,062, Feb. 15, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 850,067

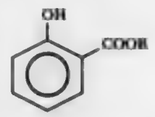
Claims priority, application Japan, Mar. 2, 1984, 59-38671

Int. Cl.⁴ C08F *4/68, 236/20*

U.S. Cl. 526—142 **18 Claims**

1. A process for producing an olefin copolymer rubber, which comprises:

copolymerizing ethylene, at least one α-olefin and at least one non-conjugated diene in a slurried state in a liquid-state α-olefin with substantially no solvent being present for the resulting copolymer in the presence of a catalyst consisting of an organocaluminum compound selected from the group consisting of a trialkylaluminum and a dialkylaluminum monohalide and a modified vanadium compound obtained by contacting a vanadium compound with at least one modifying salicylate compound of the formula:



wherein R is a C_{1-20} alkyl group.

4,695,615

INSTANT ADHESIVE COMPOSITION UTILIZING MIXED FUNCTIONALITY CALIXARENES AS ACCELERATORS

Raymond G. Leonard, Co. Kildare, and Stephen J. Harris, Dublin, both of Ireland, assignors to Loctite (Ireland) Limited, Tallaght, Ireland

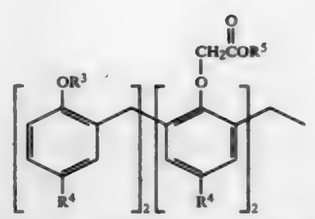
Continuation-in-part of Ser. No. 717,251, Mar. 28, 1985, Pat. No. 4,642,362, and a continuation-in-part of Ser. No. 776,536, Sep. 16, 1985, Pat. No. 4,636,539, which is a division of Ser. No. 673,621, Nov. 21, 1984, Pat. No. 4,556,700, and a continuation-in-part of Ser. No. 575,257, Jan. 30, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 825,012

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.⁴ C08F *20/34*

U.S. Cl. 526—194 **11 Claims**

1. In a cyanacrylate adhesive composition, the improvement comprising that said composition includes an accelerator in a conventional amount, the accelerator being a calixarene compound stable to cyanocrylate monomers represented by the formula:



where R^3 is H, $—CH_2C(=O)OH$, $—CH_2C(=O)OR^6$, $—C(=O)R^6$, hydrocarbyl, or trihydrocarbylsilyl or the two R^3 groups together form a divalent hydrocarbyl or oxygen interrupted hydrocarbyl group; R^4 is H or hydrocarbyl; R^5 is hydrocarbyl, hydrocarbyl interrupted by one or more oxygen atoms, or hydrocarbyl sustituted with halo, nitro, or oxo groups; R^6 is as defined for R^5 but different therefrom; and R^8 is as defined for R^5 but the same or different therefrom.

4,695,616

PROCESS FOR POLYMERIZATION OF VINYL CHLORIDE IN SUSPENSION

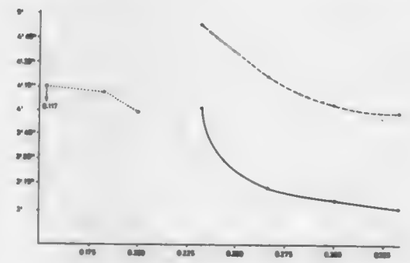
Adolfo Caporossi, Ravenna, and Leonello Del Signore, L'Aquila, both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Continuation of Ser. No. 448,265, Dec. 9, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 701,433

Claims priority, application Italy, Dec. 11, 1981, 25518 A/81

Int. Cl.⁴ C08F *2/20*

U.S. Cl. 526—202 **3 Claims**



1. A process for the polymerization of vinyl chloride monomer in suspension to prepare polymers of high porosity and a vinyl chloride monomer content of less than 2 ppm said process comprising polymerising the vinyl chloride in an aqueous medium in the presence of an adequate quantity of peroxide initiator with or without buffer agents and ionogenic or non-ionogenic wetting agents in the presence of a single component suspending agent which consists of from 0.267 to 0.33% by weight of partially saponified polyvinyl acetate with a saponification number of between about 412 and about 330, that is prepared by controlled alkaline alcoholysis in the presence of methyl acetate and thereafter stripping the unreacted vinyl chloride monomer.

4,695,617

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue; Masatoshi Arai; Shinichi Sato, and Koji Yokoo, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,588
Claims priority, application Japan, Mar. 13, 1985, 60-49546
Int. Cl.[4] C08G 77/20
U.S. Cl. 528—32 6 Claims

1. A room temperature-curable organopolysiloxane composition which comprises:

(a) 100 parts by weight of an organopolysiloxane terminated at the molecular chain ends each with a silanolic hydroxy group, of which the content of low molecular constituents having a vapor pressure of 0.01 mmHg or higher at 20° C. is not larger than 0.3% by weight;

(b) from 1 to 25 parts by weight of an alkenyloxy-containing organosilane compound represented by the general formula

$$R^1_{n-4}Si(O-CR^2{=}CH-R^3)_m$$

in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group, R^2 and R^3 are each a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group and the subscript n is a number of 3 or 4, or a partial hydrolysis-condensation product thereof having a vapor pressure of 0.3 mmHg or below at 20° C.; and

(c) from 0.01 to 10 parts by weight of an organosilane or organopolysiloxane compound having, in a molecule, at least on guanidino group represented by the general formula

$$-N{=}C(NR_2)_2,$$

in which each of the groups denoted by R is, independently from the others, a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, bonded to the silicon atom through a divalent group and having a vapor pressure of 0.3 mmHg or below at 20° C.

4,695,618

SOLVENTLESS POLYURETHANE SPRAY COMPOSITIONS AND METHOD FOR APPLYING THEM

Norman R. Mowrer, La Habra, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed May 23, 1986, Ser. No. 867,337
Int. Cl.[4] C08L 75/04
U.S. Cl. 528—55 21 Claims

1. A two-component solventless spray composition for producing polyurethane and poly(urea)urethane coatings comprised of substantially equal volumes of:

an isocyanate-containing component comprised of a liquid polyisocyanate, polyisocyanurate or isocyanate-terminated prepolymer or quasi-prepolymer; and

a curative component comprised of from about 0% to about 15% by weight of one or more polyamines or alkanolamines in an amount sufficient to react to form a thixotropic mixture about 15 seconds to about 2 minutes after being mixed with the isocyanate-containing component, from about 10% to about 20% by weight of one or more glycols having an equivalent weight in the range from about 30 to about 200, from about 40% to about 80% by weight of one or more high molecular weight polyols or polyamines having an equivalent weight in the range from about 300 to about 2000, and at least about 1% by weight of one or more additives to adsorb moisture or carbon dioxide.

4,695,619

INTUMESCENT FLAME-RESISTANT COATING COMPOSITION

Charles L. Hamermesh, Westlake Village; Paul J. Dynes, Los Angeles, and Peter A. Hogenson, Long Beach, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 17, 1985, Ser. No. 755,872
The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.
Int. Cl.[4] B32B 3/26, 27/40, 5/18; B05D 3/02
U.S. Cl. 528—73 23 Claims

1. An intumescent fire resistant coating composition comprising about 20 to about 60% of an aromatic polyisocyanate, about 10 to about 40% of an aromatic polycarboxylic compound and about 1 to about 20% furfuryl alcohol, by weight.

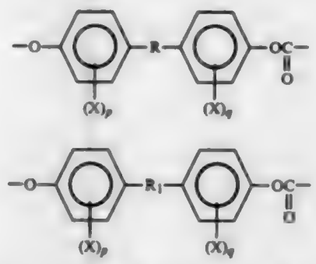
4,695,620

COPOLYCARBONATE RESIN FROM BRANCHED CHAIN ALKYLENE BIS PHENOL

Mitsuhiko Masumoto; Shigeo Yasuda, and Tadami Kinugawa, all of Osaka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,062
Claims priority, application Japan, Apr. 17, 1985, 60-81592
Int. Cl.[4] C08G 63/62
U.S. Cl. 528—204 4 Claims

1. A copolycarbonate resin having, as constituting units, units of the following formulae A and B:



(A)

(B)

wherein R represents a divalent aliphatic, alicyclic, or phenyl-substituted alkylidene group each having 1 to 15 carbon atoms, or —O—, —S—, —SO—, —SO_2—, or —CO—; R_1 is an aliphatic organic group represented by —$CH(CH_3)$—CH_2—$C(CH_3)_2$—, —$C(CH_3)$=CH—$C(CH_3)_2$—, —$C(=CH_2)$—CH_2—$C(CH_3)_2$—, —$CH(CH_3)$—CH=CH—, or $CH(CH_3)$—CH_2—CH_3—; X represents a halogen atom or a lower alkyl group, and p and q each represents an integer of 0 to 2.

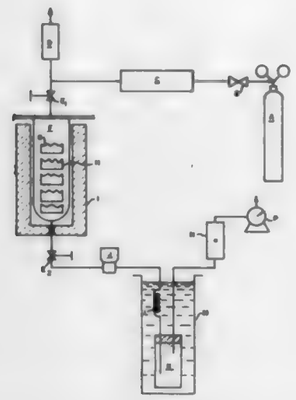
4,695,621

METHOD FOR REDUCING RESIDUAL MONOMERS FROM OVERSIZED FAT IMBIBING COPOLYMER BEADS

Sambasiva R. Allada, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1985, Ser. No. 812,486
Int. Cl.[4] C08F 6/00
U.S. Cl. 528—403 6 Claims

1. In a method for making oversized fat imbibing, fat retaining, copolymer beads from cross linked copolymers of an ethylenically unsaturated monomer selected from the group consisting of isobornyl acrylate, isobornyl methacrylate, styrene or C_6–C_{12} alkyl styrene and at least one ester of a C_8 to C_{20} fatty alcohol and acrylic or methacrylic acid, the improvement comprising purifying beads prepared from said cross-linked copolymers and having a volume average particle diameter of from about 380 to about 2,000 microns, and a residual monomer content of less than about 500 ppm by extracting at least 70% of the residual monomers with a gas under supercritical conditions of from about 42° C. to 50° C., at pressures of from about 1800 to about 3000 psi for a period of from 1 to about 2 hours;



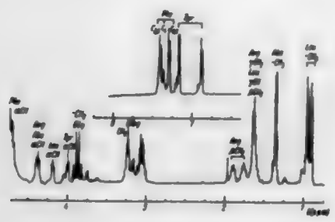
whereby the beads exhibit improved resistance to hydrolytic attacks of gastric juices and intestinal lumen and contain substantially reduced amounts of residual monomers, solvents, unreacted cross linking agents, initiators, inhibiters and catalysts.

4,695,622

HEXAPEPTIDE

Evgeny I. Chazov; Vladimir N. Smirnov; Valentin A. Vinogradov; Mikhail I. Titov; Vladimir A. Pesin; Alexandr K. Giorgadze; Galina P. Titova; Zhanna D. Bespalova; Boris L. Pekelis; Nikolai K. Pervyakov; Sergei I. Emelyanov, and Alexandr A. Dzhikia, all of Moscow, U.S.S.R., assignors to Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskikh Nauk SSSR, Moscow, U.S.S.R.

PCT No. PCT/SU85/00032, § 371 Date, Feb. 5, 1986, § 102(e) Date, Feb. 5, 1986, PCT Pub. No. WO86/00622, PCT Pub. Date Jan. 30, 1986
PCT Filed Feb. 5, 1986, Ser. No. 830,588
Claims priority, application U.S.S.R., Jul. 16, 1984, 3772995
Int. Cl.[4] C07K 7/06
U.S. Cl. 530—329 1 Claim



1. A hexapeptide of the following structure:

Tyr-Ala-Gly-Phe-Leu-Arg.

4,695,623

CONSENSUS HUMAN LEUKOCYTE INTERFERON

Yitzhak Stabinsky, Boulder, Colo., assignor to Amgen, Thousand Oaks, Calif.

Division of Ser. No. 483,451, Apr. 15, 1983, which is a continuation-in-part of Ser. No. 375,494, May 6, 1982. This application Dec. 12, 1983, Ser. No. 560,495
Int. Cl.[4] C07K 15/26, 13/00; A61K 45/02; C12P 21/00
U.S. Cl. 530—351 1 Claim

1. A consensus human leukocyte interferon of the formula, IFN-αF.

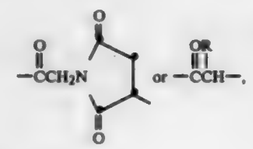
4,695,624

COVALENTLY-MODIFIED POLYANIONIC BACTERIAL POLYSACCHARIDES, STABLE COVALENT CONJUGATES OF SUCH POLYSACCHARIDES AND IMMUNOGENIC PROTEINS WITH BIGENERIC SPACERS, AND METHODS OF PREPARING SUCH POLYSACCHARIDES AND CONJUGATES AND OF CONFIRMING COVALENCY

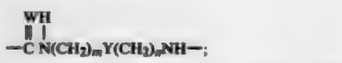
Stephen Marburg, Metuchen; Richard L. Tolman, Warren, both of N.J., and Peter J. Kniskern, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 608,738, May 10, 1984, abandoned. This application Apr. 4, 1985, Ser. No. 719,678
Int. Cl.[4] C07K 15/04; A61K 37/02, 39/02
U.S. Cl. 530—395 20 Claims

1. Stable, covalently-coupled polysaccharide-protein conjugates comprising polyanionic bacterial polysaccharides having acid groups and immunogenic proteins coupled through bigeneric spacers, containing thioether bonds, which may be represented by the formula A-E-S-B, wherein E is



where R is H or CH_3; A is



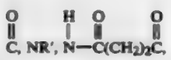
where m is 0 to 4, n is 0 to 3, W is O or NH, and Y is CH_2, O, S, NR′, or $CHCO_2H$, where R′ is H or C_1- or C_2-alkyl, such that when Y is CH_2, then both m and n are not equal to zero, and when Y is O or S, then m is 2, 3 or 4 and n is 2 or 3 and B is



where p is 1 to 3, q is 0 to 2, Z is NH_2,



CO_2H or H, and D is



where R' is as defined above.

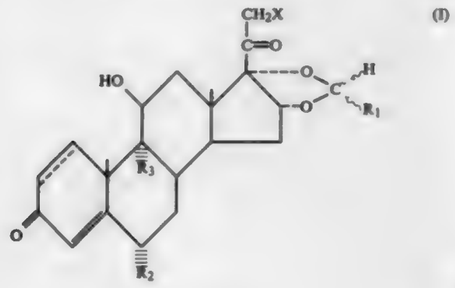
4,695,625

PROCESS FOR THE PREPARATION OF 16,17 ACETALS OF PREGNANE DERIVATIVES

Peter Macdonald, Arese, Italy, assignor to Sicor Società Italiana Corticosteroidi S.p.A., Milan, Italy

Filed May 30, 1985, Ser. No. 739,131
Claims priority, application Italy, Jan. 11, 1984, 21343 A/84
Int. Cl.⁴ C07J *71/00*
U.S. Cl. 540—63 **11 Claims**

1. A process for the preparation of 16,17-acetals of pregnane derivatives having formula I



(I)

wherein

R_1 represents a C_1–C_{12} alkyl group,

X may be OH, Cl, F or —OCOR group wherein R represents a C_1–C_{12} alkyl group;

R_2 may be hydrogen, fluorine or methyl;

R_3 may be hydrogen, fluorine or chlorine;

characterized in that the corresponding 16,17-acetonides are reacted with aldehydes having formula R_1CHO, wherein R_1 has the same meaning as in formula I, in aqueous hydrofluoric or hydrochloric acid.

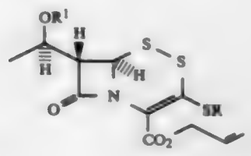
4,695,626

1-AZA-4,5-DITHIABICYCLO [4.2.0] OCT-2-EN-8-ONE-2 CARBOXYLATE ESTERS

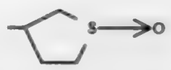
Katherine E. Brighty, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 29, 1986, Ser. No. 891,493
Int. Cl.⁴ C07B *513/02*
U.S. Cl. 540—214 **4 Claims**

1. A compound of the formula



where R is $(C_1$–$C_3)$alkyl or



and R^1 is a conventional hydroxy-protecting group.

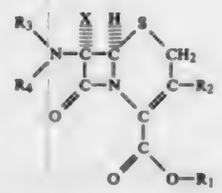
4,695,627

CEPHALOSPORIN DEOXYGENATION PROCESS

Jan Verweij, Leiden; Herman H. Grootveld, Benthuizen; Henri G. J. Hirs; Gerardus J. Van Veen, both of Zoetermeer; Jan Kalter, Hazerswoude-Dorp, and Peter W. Henniger, Leiden, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

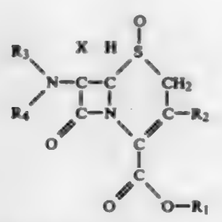
Filed Sep. 21, 1984, Ser. No. 653,866
Claims priority, application European Pat. Off., Oct. 7, 1983, 83201456
Int. Cl.⁴ C07D *501/20, 501/58*
U.S. Cl. 540—224 **37 Claims**

1. In a process for the preparation of 7 β-acylamino-3-substituted-3-cephem-4-carboxylic acid compounds of the formula



(II)

wherein X is selected from the group consisting of hydrogen, alkoxy of 1 to 4 carbon atoms and alkylthio of 1 to 4 carbon atoms, R_1 is a hydroxy protective group, R2 is selected from the group consisting of hydrogen, chlorine, methoxy, trifluoromethyl, vinyl, methyl, and methyl substituted by one member selected from the group consisting of: (a) halogen, (b) protected hydroxy, (c) alkoxy and alkylthio of 1 to 4 carbon atoms, (d) alkanoyloxy and alkanoylthio of 2 to 5 carbon atoms, (e) 1-pyridinium optionally substituted with at least one member of the group consisting of cyano, chloro, dialkylamino with alkyls of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, dialkylcarbamoyl with alkyls of 1 to 4 carbon atoms, hydroxy, carboxy, sulfo, and alkyl of 1 to 4 carbon atoms optionally substituted on the first or second carbon atom thereof with a member selected from the group consisting of dialkylamino with alkyls of 1 to 4 carbon atoms, chloro, cyano, methoxy, alkoxycarbonyl of 2 to 5 carbon atoms, N,N-dimethylcarbamoyl, hydroxy, carboxy and sulfo, and (f) heterocyclic thio optionally substituted on ring carbons with at least one member of the group consisting of cyano, chloro, dialkylamino with alkyls of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, dialkylcarbamoyl with alkyl groups of 1 to 4 carbon atoms, hydroxy, carboxy, sulfo, and alkyl of 1 to 4 carbon atoms optionally substituted on the first or second carbon atom thereof with a member selected from the group consisting of dialkylamino with alkyl of 1 to 4 carbon atoms, chloro, cyano, methoxy, alkoxycarbonyl of 2 to 5 carbon atoms, N,N-dimethylcarbamoyl, hydroxy, carboxy and sulfo, and/or on a saturated ring nitrogen atom with alkyl of 1 to 4 carbon atoms optionally substituted on the first or second carbon atom thereof with a member selected from the group consisting of dialkylamino with alkyls of 1 to 4 carbon atoms, chloro, cyano, methoxy, alkoxycarbonyl of 2 to 5 carbon atoms, N,N-dimethylcarbomoyl, hydroxy, carboxy and sulfo, R_3 is acyl of an organic carboxylic acid of 1 to 18 carbon atoms and R_4 is hydrogen or R_3 and R_4 taken together with the nitrogen atom to which they are attached form phthalimido comprising reacting at −70° C. to 0° C. in an inert organic solvent phosphorus pentachloride with a compound of the formula



(I)

wherein X, R_1, R_2, R_3 and R_4 have the above definition with any hydroxy, carboxy, sulfo and heterocyclic saturated amino groups contained in R_2 and R_3, optionally being protected by silylation or in the last case also by acylation, the improvement comprising effecting the reaction in the presence of an olefinic compound having at least one carbon-carbon double bond having not more than three hydrogen atoms attached thereto capable of removing chlorine at least in part by addition to a carbon-carbon double bond.

4,695,628

PREPARATION OF 6-AMINO-PENICILLANIC ACID-1,1-DIOXIDE

Jacobus J. Bos, Gouda; Rinze Cuperus, Pijnacker, and Rudolf Wielinga, De Lier, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Sep. 5, 1986, Ser. No. 904,190
Claims priority, application European Pat. Off., Sep. 6, 1985, 85201409.1
Int. Cl.⁴ C07D *499/02*; A61K *31/425*
U.S. Cl. 540—312 **5 Claims**

1. A process for the preparation of 6-amino-penicillanic acid-1,1-dioxide, characterized in that 6-amino-penicillanic acid or 6-amino-penicillanic acid sulfoxide is oxidized with an alkali metal permanganate in an aqueous medium.

4,695,629

PROCESS FOR THE PREPARATION OF 6-METHYL-3,4-DIHYDRO-1,2,3-OXATHIAZIN-4-ONE 2,2-DIOXIDE AND ITS NON-TOXIC SALTS

Karl Clauss, Kelkheim; Adolf Linkies, Frankfurt am Main, and Dieter Reuschling, Butzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 714,177, Mar. 20, 1985, Pat. No. 4,607,100.
This application Jun. 3, 1986, Ser. No. 870,078
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410439
Int. Cl.⁴ C07D *291/06*
U.S. Cl. 544—2 **5 Claims**

1. A process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts by ring closure of an acetoacetamide derivative, which comprises using as the acetoacetamide derivative acetoacetamide-N-sulfonic acid or its salts, and carrying out the ring closure by the action of at least the approximately equimolar amount of SO_3, where appropriate in an inert inorganic or organic solvent, and then, where appropriate, also neutralizing with a base the 6-methyl3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide which is produced in the form of the acid in this reaction.

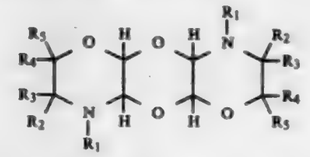
4,695,630

CYCLOACETALS

Peter Haas, Haan, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,569
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504480
Int. Cl.⁴ C07D *498/14*
U.S. Cl. 544—75 **19 Claims**

1. A polycyclic acetal of the formula



in which

R_1 is an unsubstituted alkyl or an alkyl substituted by a substituent selected from the group consisting of a halogen, a heterocyclic group, an alkoxy group and an alkylmercapto group, an unsubstituted cycloalkyl or a cycloalkyl substituted by a substituent selected from the group consisting of C_1–C_4 alkyl groups and halogen atoms, an unsubstituted aralkyl or an aralkyl substituted by a substituent selected from the group consisting of methyl, chloro, and trifluoromethyl, an unsubstituted aryl or aryl substituted by a substituent selected from the group consisting of cyano, fluoro, chloro and methyl or a heteroaryl radical and R_2, R_3, R_4 and R_5 independently of one another are hydrogen or an unsubstituted alkyl or an alkyl substituted by a substituent selected from the group consisting of a halogen, a heterocyclic group, an alkoxy group and an alkylmercapto group, an unsubstituted cycloalkyl or a cycloalkyl substituted by a substituent selected from the group consisting of C_1–C_4 alkyl groups and halogen atoms, an unsubstituted aralkyl or an aralkyl substituted by a substituent selected from the group consisting of methyl, chloro, and trifluoromethyl, an unsubstituted aryl radical or aryl radical substituted by a substituent selected from the group consisting of cyano, fluoro, chloro and methyl, or

R_3 and R_4 together form an unsubstituted C_2–C_6-alkylene radical or a C_2–C_6-alkylene radical substituted by a lower alkyl group,

R_2, R_3, R_4 and R_5 together form a fused, unsubstituted 1,2-phenylene radical or a 1,2-phenylene radical substituted by a substituent selected from the group consisting of a lower alkyl group, a halogen atom, a cyano group and a nitro group.

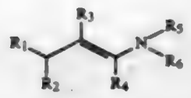
4,695,631

PROCESS FOR THE PREPARATION OF ENAMINES OR IMINES

Seinosuke Otsuka; Kazuhide Tani, both of Hyogo; Tsuneaki Yamagata, Osaka; Susumu Akutagawa, Kanagawa; Hidenori Kumobayashi, Kanagawa, and Misao Yagi, Kanagawa, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

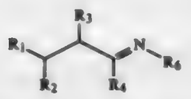
Filed Jun. 30, 1982, Ser. No. 393,982
Claims priority, application Japan, Jun. 30, 1981, 56-102039
Int. Cl.⁴ C07C *87/24*; C07D *295/02*
U.S. Cl. 544—170 **1 Claim**

1. A process for preparing an enamine represented by formula (II):



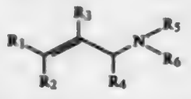
(II)

wherein R_1, R_2, R_3 and R_4 are each hydrogen, an alkyl group containing from 1 to 12 carbon atoms, an alkenyl group containing up to 12 carbon atoms, or a phenyl group, wherein R_1 may be substituted by one hydroxy group; R_5 is hydrogen, an alkyl group containing from 1 to 8 carbon atoms, or a cycloalkyl group containing from 6 to 8 carbon atoms; R_6 is an alkyl group containing from 1 to 8 carbon atoms or a cycloalkyl group containing from 6 to 8 carbon atoms; or R_5 and R_6 may combine together in combination with the adjacent nitrogen atom to form pyrrolidine, piperidine or morpholine; or an imine represented by formula (III):



(III)

wherein R_1, R_2, R_3, R_4 and R_6 are the same as for formula (II), isomerizing an allylamine derivative represented by formula (I):



(I)

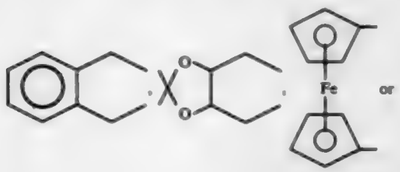
wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same as for formula (II), using as a catalyst a rhodium complex represented by formula (IV):

$$[Rh(olefin)L]^+X^- \quad (IV)$$

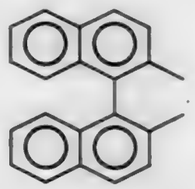
wherein olefin represents ethylene, 1,3-butadiene, norbornadiene or cycloocta-1,5-diene; X represents ClO_4, BF_4 or PF_6; and L represents two triarylphosphines wherein the aryl moiety is a phenyl, a tolyl or a naphthyl group or a tri-valent phosphorous compound derivative represented by formula (V):

$$(aryl)_2—P—Y—P—(aryl)_2 \quad (V)$$

wherein the aryl moiety is a phenyl, an ortho-tolyl or a metal-tolyl group, or $(aryl)_2$ is a 2,2'-biphenyl group and Y represents $—(CH_2)_a—$, $—(CH_2)_a—$, $—(CH_2)_a—$,



or



4,695,632

QUATERNARY REACTIVE COMPOUNDS

Walter Kalk; Karl H. Schündehütte, and Manfred Süll, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

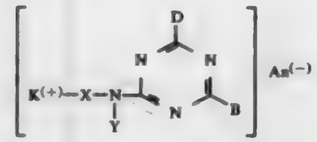
Continuation of Ser. No. 804,858, Jun. 8, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,565

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626959

Int. Cl.[4] C07D 251/46, 251/52, 251/18, 401/12

U.S. Cl. 544—194 10 Claims

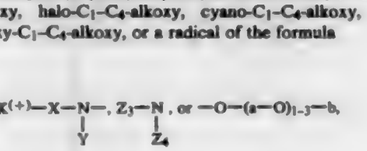
1. A compound of the formula



wherein

B is halogen, methylsulphonyl, ethylsulphonyl, or phenylsulphonyl; or also is hydrogen when D is halogen, methylsulphonyl, ethylsulphonyl, or phenylsulphonyl;

D is hydrogen, halogen, methyl, ethyl, methylsulphonyl, ethylsulphonyl, phenylsulphonyl, trifluoromethyl, C_1–C_4-alkoxy, halo-C_1–C_4-alkoxy, cyano-C_1–C_4-alkoxy, hydroxy-C_1–C_4-alkoxy, or a radical of the formula



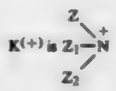
wherein

B and D are not halogen at the same time;

Z_3 and Z_4, independently of each other, are hydrogen, C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, or when joined together with N are morpholino or piperidino;

a is ethylene or propylene;

b is hydrogen, C_1–C_4-alkyl, or phenyl;



Z, Z_1 and Z_2 independently of one another are C_1–C_4-alkyl, cyclohexyl, phenyl, benzyl or phenylethyl, which are unsubstituted or substituted by 1–3 halogen, amino, hydroxy, C_1–C_4-alkoxy or C_1–C_4-alkyl;

Z and Z_1, together with N, are pyrrolidine, piperidine morpholine or piperazine, which is unsubstituted or substituted by C_1–C_4-alkyl; or Z, Z_1 and Z_2, together with N, are pyridine which is unsubstituted or substituted by C_1–C_4-alkyl,

X is C_2–C_3-alkylene, o-phenylene, m-phenylene, or p-phenylene;

Y is hydrogen or C_1–C_4-alkyl; and

$An^{(-)}$ is an anion.

4,695,633

CHROMOGENIC 4,4-DIARYL-DIHYDROQUINAZOLONES, THEIR PREPARATION AND THEIR USE

Horst Berneth, Leverkusen, and Alfred Brack, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

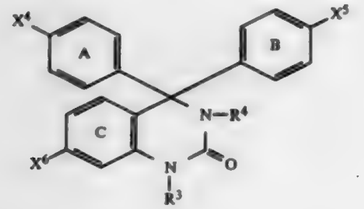
Filed May 17, 1985, Ser. No. 735,477

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420799

Int. Cl.[4] C07D 239/82

U.S. Cl. 544—286 4 Claims

1. Chromogenic 4,4-diaryldihydroquinazolones of the formula



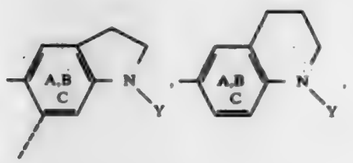
wherein

one of the radicals X^4, X^5 or X^6 represents NY^4Y^5 and the others independently of one another denote hydrogen; halogen; C_1- to C_{12}-alkyl; phenyl which is optionally substituted by chlorine and/or C_1- to C_{12}-alkyl; C_1- to C_{12}-alkanoylamino; benzoylamino which is optionally substituted by chlorine and/or C_1- to C_{12}-alkyl; NY^4Y^5, OY^6 or SY^6;

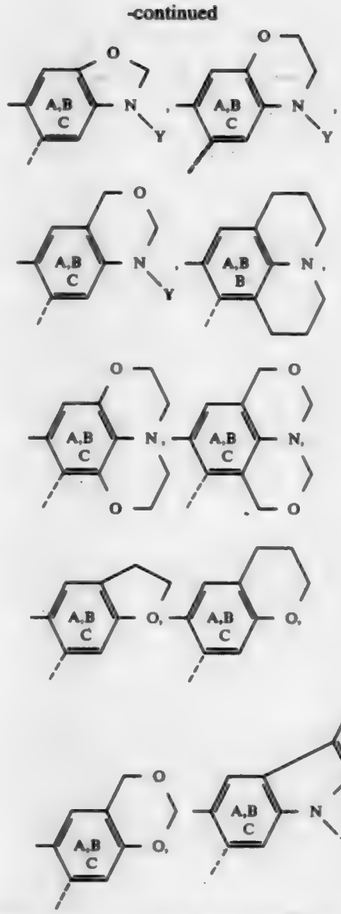
R^3 denotes hydrogen; C_1- to C_{12}-alkyl; cyclohexyl; benzyl or phenyl radicals, each of which is optionally substituted by chlorine and/or C_1–C_4-alkyl;

R^4 denotes hydrogen; C_1- to C_{30}-alkyl, which optionally carries chlorine, cyano, C_1- to C_4-alkoxycarbonyl and/or C_1- to C_4-alkoxy; cyclohexyl, which optionally carries chlorine and/or C_1- to C_4-alkyl; benzyl, which optionally carries nitro, chlorine, C_1- to C_4-alkyl and/or C_1- to C_4-alkoxy; phenyl, naphthyl, picolyl, pyridyl, pyrimidyl, pyrazinyl, triazinyl, triazolyl, thiadiazolyl, tetrazolyl, optionally benzo-fused imidazole, oxazole or thiazole radicals, each of which optionally carries chlorine, bromine, nitro, C_1- to C_4-alkyl, C_1- to C_4-alkoxy, C_1- to C_4-alkylthio, mono- or di-C_1- to C_4-dialkylamino, C_1- to C_4-alkylsulphonyl, cyano and/or C_1- to C_4-alkoxycarbonyl;

Y^4, Y^5 and Y^6 independently of one another denote C_1- to C_8-alkyl, which is optionally substituted by chlorine, cyano, C_1- to C_4-alkoxycarbonyl or C_1- to C_4-alkoxy; cyclohexyl or phenyl or benzyl, each of which is optionally substituted by chlorine, C_1- to C_4-alkyl or C_1- to C_4-alkoxy, or members which are necessary to complete together with ring A, B and C respectively to which they are attached one of the ring systems of the following formulae



-continued



wherein in the case of ring C the free bond and the broken line denote the points fused to the dihydropyrimidone ring,

Y represents hydrogen; C_1- to C_8-alkyl which is optionally substituted by chlorine, cyano, C_1- to C_4-alkoxycarbonyl or C_1- to C_4-alkoxy; cyclohexyl or phenyl or benzyl, each of which is optionally substituted by chlorine, C_1- to C_4-alkyl or C_1- to C_4-alkoxy;

the saturated ring part of the above ring systems being optionally substituted by up to 4 radicals from the group consisting of chlorine, C_1- to C_4-alkyl, C_1- to C_4-alkoxy and phenyl and the rings A, B and C are optionally substituted by chlorine, C_1- to C_4-alkyl, C_1- to C_4-alkoxy and/or C_1- to C_4-alkanoylamino; or

NY^4Y^5 denotes a pyrrolo, pyrrolidino, piperidino, pipecolino, morpholino, pyrazolo or pyrazolino radical, each of which is optionally substituted by chlorine, C_1- to C_4-alkyl or phenyl.

4,695,634

HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

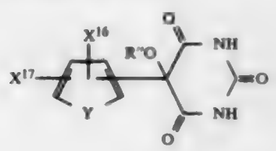
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 777,109, Sep. 17, 1985, Pat. No. 4,622,406, which is a division of Ser. No. 542,241, Oct. 14, 1983, Pat. No. 4,562,267, which is a division of Ser. No. 353,777, Mar. 1, 1982, Pat. No. 4,423,233, which is a division of Ser. No. 252,961, Apr. 23, 1981, Pat. No. 4,332,952, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 222,202, Jan., 1981, Pat. No. 4,367,234. This application Aug. 6, 1986, Ser. No. 893,743

Int. Cl.⁴ C07D *241/18, 407/04*; A61K *31/33*

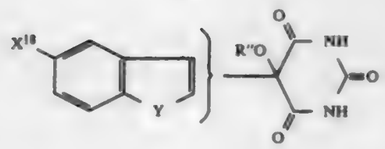
U.S. Cl. 544—300 **4 Claims**

1. A compound of the formula



(XI)

or



(XII)

wherein

R'' is hydrogen, acetyl or benzoyl;

X^{16} is hydrogen, fluoro, chloro, bromo, iodo, methyl, phenyl, or (C_1–C_3)-alkoxy;

X^{17} is hydrogen or methyl;

X^{18} is hydrogen, fluoro, chloro, bromo or iodo; and

Y is oxygen or sulfur.

4,695,635

PROCESS FOR THE PRODUCTION OF 2,3-DIHYDROERGOLINES

Gerhard Sauer, and Gregor Haffer, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

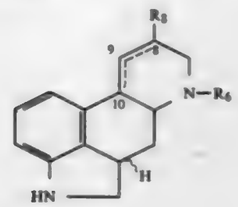
Filed Mar. 28, 1985, Ser. No. 717,064

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411981

Int. Cl.⁴ C07D *487/06*

U.S. Cl. 546—69 **17 Claims**

1. In a process for the production of a 2,3-dihydroergoline of the general formula



wherein

C_8 C_9 and C_9 C_{10} are each a C—C single or C=C double bond, but are not both a C=C double bond,

R_6 is a lower alkyl group of up to 3 carbon atoms, and

R_8 is $-CH_3$, $-NH-CO-N(C_2H_5)_2$ or $-COOCH_3$,

by reducing the corresponding 2-bromoergoline with sodium borohydride in trifluoroacetic acid, the improvement which comprises:

conducting the reduction step under cooling, whereby dimerization side reactions are essentially eliminated or lessened.

4,695,636

CHROMOGENIC DIHYDROFUROPYRIDINONES

Davor Bedekovic, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

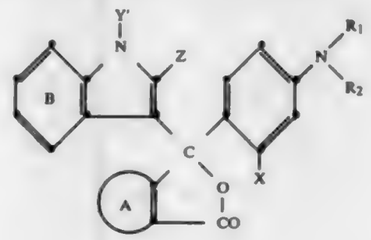
Division of Ser. No. 690,075, Jan. 9, 1985, Pat. No. 4,587,539, which is a division of Ser. No. 502,035, Jun. 7, 1983, Pat. No. 4,508,897, which is a continuation-in-part of Ser. No. 449,955, Dec. 15, 1982. This application Feb. 4, 1986, Ser. No. 826,155

Claims priority, application Switzerland, Dec. 23, 1981, 8250/81; Dec. 23, 1981, 8251/81; Apr. 7, 1983, 1868/83

Int. Cl.⁴ C07D *491/048*

U.S. Cl. 546—116 **6 Claims**

1. A chromogenic azaphthalide of the formula



wherein

R1 and R2 together with the nitrogen to which they are attached are pyrrolidinyl;

X is hydrogen, halogen, lower alkyl, lower alkoxy, benzyl, phenyl, benzyloxy, phenoxy, or benzyl or benzyloxy which are substituted by halogen, nitro, lower alkyl or lower alkoxy;

Y' is C6–C9-alkyl;

Z is hydrogen, lower alkyl or phenyl; and

the ring A is a pyridine radical and

the benzene nucleus B is unsubstituted or substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, amino, lower alkylamino or di-(lower alkyl)-amino.

4,695,637

INTERMEDIATES FOR SPIRO[2H-1,4 BENZODIOXEPIN-3(5H)4'-PIPERIDINE AND -3'-PYRROLIDINE] COMPOUNDS

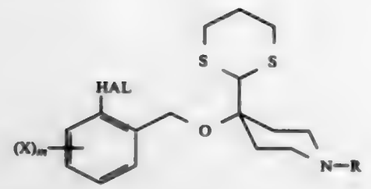
Raymond W. Kosley, Jr., Bridgewater, and Robert J. Cherill, Somerset, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Continuation of Ser. No. 630,133, Jul. 12, 1984, abandoned, which is a division of Ser. No. 516,832, Jul. 25, 1983, Pat. No. 4,472,580, which is a division of Ser. No. 410,155, Aug. 20, 1982, Pat. No. 4,405,631. This application Dec. 19, 1985, Ser. No. 811,245

Int. Cl.⁴ C07D *409/04*

U.S. Cl. 546—207 **4 Claims**

1. A compound of the formula



in which

HAL is chlorine or fluorine; X is Cl, F, or Br;

m is zero or 1; and

R is CH_3.

4,695,638

Patent Not Issued For This Number

4,695,639

THIAZOLE DERIVATIVES

Kunio Takanohashi, Kawanishi; Tsuneaki Yoshida, Osaka, and Shoichiro Fujii, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

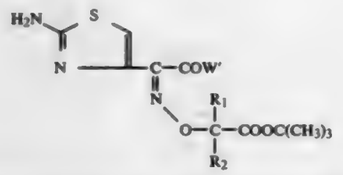
Filed Jan. 6, 1984, Ser. No. 568,921

Claims priority, application PCT Int'l Appl., Jan. 7, 1983, PCT/JP83/00003; May 2, 1983, PCT/JP83/00135

Int. Cl.⁴ C07D *277/76, 277/40*

U.S. Cl. 548—165 **6 Claims**

1. A process of producing an aminothiazoleacetic acid derivative of the formula



(I)

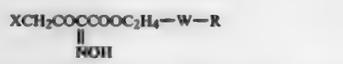
wherein R_1 and R_2 each is hydrogen or lower alkyl; and W' is hydroxyl or 2-benzothiazolylthio, or a salt thereof, which comprises reacting diketene with a halogen, reacting the resulting 4-haloacetoacetyl halide with an alcohol of the formula

$$R-W-C_2H_4OH \quad (II)$$

wherein R is lower alkyl or phenyl; and W is S or SO_2, reacting the resulting compound of the formula

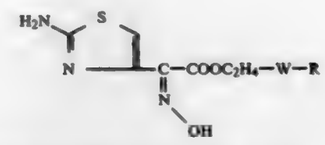
$$XCH_2COCH_2COOC_2H_4-W-R \quad (III)$$

wherein X is halogen; and R and W are as defined above, with nitrous acid, or a salt thereof, reacting the resulting compound of the formula



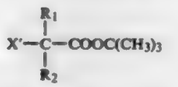
(IV)

wherein the symbols are as defined above, with thiourea or a salt thereof, reacting the resulting compound of the formula



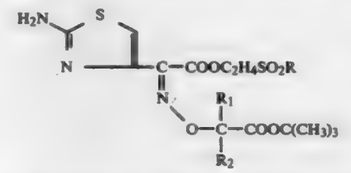
(V)

wherein the symbols are as defined above, or a salt thereof, with a compound of the formula



(VI)

wherein X' is halogen; and R_1 and R_2 are as defined above, oxidizing the reaction product when W is S, and (i) hydrolyzing the compound thus obtained of the formula



(VII)

wherein the symbols are as defined above, or a salt thereof, in the presence of a base, or (ii) hydrolyzing the compound (VII) or a salt thereof in the presence of a base, and reacting the resulting product with 2,2-dithiobis-benzothiazole.

4,695,640

ADDITION COMPOUND OF FLUORAN COMPOUNDS AND KETONE

Masakichi Yahagi, Tokyo; Tetsuo Igaki, Kawagoe; Shinji Yoshinaka, Iwatsuki; Kimiaki Kinoshita, Kitamoto; Morikuni Saito; Toshiyuki Yamashita, both of Tokyo, and Morio Nanbu, Fujimi, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

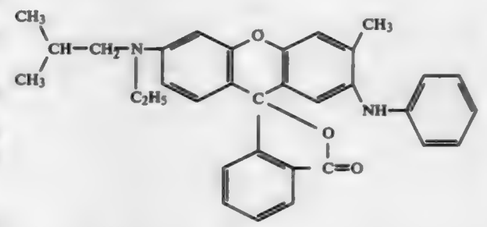
Filed Oct. 21, 1985, Ser. No. 789,950

Claims priority, application Japan, Oct. 24, 1984, 59-223460

Int. Cl.⁴ C07D *407/02*

U.S. Cl. 549—226 **1 Claim**

1. Crystals of fluoran compound consisting of 2 molecules of fluoran compound of



and 1 molecule of ketone selected from acetone and methylethyl ketone, which is obtainable by maintaining fluoran compound in the ketone at reflux temperature of the ketone for 20 minutes.

4,695,641

N-OXIRANEMETHANE N,N,N-TRIALKYLAMMONIUM COMPOUNDS

Jean Saingier, Wattrelos, and Jean-Pierre A. Joly, Golbey, both of France, assignors to Dollfus-Meig & Cie, Paris, France

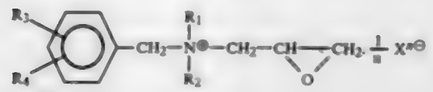
Division of Ser. No. 605,393, Apr. 30, 1984, Pat. No. 4,582,917, which is a division of Ser. No. 493,560, Apr. 11, 1983, Pat. No. 4,652,267. This application Oct. 18, 1985, Ser. No. 788,810

Claims priority, application France, Aug. 10, 1981, 81 15869; Aug. 5, 1982, 82 00131

Int. Cl.⁴ C07D *301/27*

U.S. Cl. 549—552 **2 Claims**

1. A compound of the formula:



where

R_1 is alkyl having 1 or 2 carbon atoms,

R_2 is linear alkyl having from 12 to 16, carbon atoms,

R_3 and R_4 are each chlorine or hydrogen, and

$X^{n\ominus}$ is an anion, where n is the anion valence,

with the proviso that R_3 and R_4 are not both hydrogen.

4,695,642

METHOD FOR PREPARING CRYSTALLINE ZIRCONIUM PHOSPHATES

E. G. Derouane, Namur, Belgium; R. M. Dessau, Edison, N.J.; I. J. Hellwell, Princeton, N.J., and G. T. Kerr, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 676,968, Nov. 30, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,121

Int. Cl.⁴ C07F *7/00*

U.S. Cl. 556—14 **42 Claims**

1. A method for preparing in an aqueous reaction mixture crystalline zirconium phosphate compounds having the composition:

$$xA{:}yM'_{2/m}O{:}ZrO_2{:}zP_2O_5{:}wH_2O$$

where A is an organic cation having a molecular weight of at least about 100; M' is a cation of valence m; $0<x<4$; $0<y<6$; $0<z<3$; and $0<w<20$, wherein a phosphorus source selected from the group consisting of water-soluble phosphates and phosphoric acid is combined with a salt of said organic cation, and thereafter combined with a source of zirconium under crystallization conditions.

4,695,643

SILANES, PROCESS FOR THEIR PREPARATION, AND THEIR USE

Konrad Oertle, and Hansjürg Wetter, both of Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

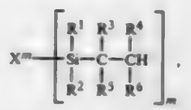
Filed Oct. 1, 1985, Ser. No. 782,349

Claims priority, application Switzerland, Oct. 4, 1984, 4765/84-0

Int. Cl.⁴ C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—428 **9 Claims**

1. A compound of formula I



(I)

in which X is an ester group of an inorganic or organic acid, m is a number from 1 to 4, R^1 and R^2 independently of one another are linear or branched C_1–C_{12}-alkyl, C_5-cycloalkyl or C_6-cycloalkyl, or R^1 and R^2 together are tetramethylene or pentamethylene, and R^3 and R^5 together and R^4 and R^6 together are tetramethylene or pentamethylene; or R^3 and R^5 together are tetramethylene or pentamethylene and R^4 and R^6 are independently linear or branched C_1–C_{12}-alkyl, C_5-cycloalkyl or C_6-cycloalkyl; or R^4 and R^6 together are tetramethylene or pentamethylene and R^3 and R^5 are indepeadently linear or branched C_1–C_{12}-alkyl, C_5-cycloalkyl or C_6-cycloalkyl; or R^3 and R^4 together and R^5 and R^6 together are trimethylene or tetramethylene; or R^3 and R^4 together are trimethylene or tetramethylene and R^5 and R^6 are independently linear or branched C_1–C_{12}-alkyl, C_5-cycloalkyl or C_6-cycloalkyl.

4,695,644

PROCESS FOR PRODUCING PHENYL CHLOROTHIOFORMATES

Kenji Tsuzuki, and Takashi Uetani, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed May 14, 1986, Ser. No. 862,923

Claims priority, application Japan, May 14, 1985, 60-100553; May 22, 1985, 60-108290

Int. Cl.⁴ C07C *68/00*

U.S. Cl. 558—249 **8 Claims**

1. A process for producing a phenyl chlorothioformate, which comprises (1) allowing sulfur dioxide to react with a mixed solution consisting of perchloromethyl mercaptan, an organic solvent and water, (2) removing the water layer from the reaction mixture and (3) adding to the remaining organic layer a phenol compound or condensed phenol and a dehydrohalogenating agent in that order.

4,695,645

PROCESS FOR THE PREPARATION OF N,O-SUBSTITUTED MONO-AND/OR POLYURETHANES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 20, 1984, Ser. No. 632,840

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1983, 3327824

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—24 **9 Claims**

1. A process for the preparation of N,o-substituted mono- and/or polyurethanes of the formula

$$R^1[\text{—NHCOOR}^2]_n$$

in which

R^1 is an aromatic radical having from 6 to 15 carbon atoms which may be substituted,

R^2 is selected from the group consisting of an alkyl radical having from 1 to 18 carbon atoms, a cycloalkyl radical having from 4 to 12 carbon atoms, an aralkyl radical having from 7 to 15 carbon atoms and an alkyl radical having from 2 to 24 carbon atoms substituted with alkoxy groups or polyoxyalkylene groups having from 1 to 4 carbon atoms, and n is a whole number from 1 to 5 wherein N-substituted allophanic acid and/or polyallophanate is reacted with alcohols in the presence or absence of catalysts at temperatures of at least 160° C.

4,695,646

AMINOACRYLIC ACID DERIVATIVES

Fritz Maurer, Wuppertal, and Klaus Grohe, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

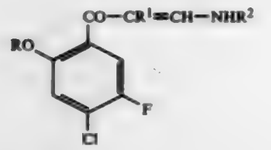
Filed Jan. 6, 1986, Ser. No. 816,544

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501247

Int. Cl.⁴ C07C *101/78, 69/738*

U.S. Cl. 560—43 **6 Claims**

1. An aminoacrylic acid derivative of the formula



in which

R is alkyl,

R^1 is alkoxycarbonyl, and

R^2 is C_3–C_6-cycloalkyl.

4. A compound of the formula



in which

Q is $—CR^1{=}CHR^3$ or $—CH_2COOR^4$,

R is alkyl,

R^1 is alkoxycarbonyl,

R^3 is alkoxy, and

R^4 is alkyl.

4,695,647

AROMATIC DERIVATIVES OF 13-AZAPROSTANOIC ACID

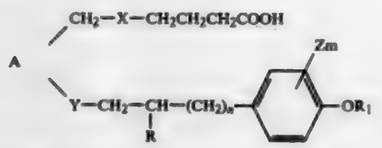
Thomas D. Eller, Mt. Pleasant; Perry V. Halushka; Daniel R. Knapp, both of Charleston, and Dale Mais, Goose Creek, all of S.C., assignors to Drug Science Foundation, Charleston, S.C.

Filed Mar. 22, 1984, Ser. No. 592,074

Int. Cl.⁴ C07C *177/00*

U.S. Cl. 560—53 **11 Claims**

1. Radioactive compounds of the formula:



and their pharmaceutically acceptable esters and salts, wherein:

R is H or OH;

R_1 is H or lower alkyl;

X is $—CH_2—CH_2—$ or cis $—CH{=}CH—$;

Y is $—CH_2—$,



$—O—$ or $—S—$;

n is 0 or 1;

m is 1 or 2;

Z is radioactive iodine; and

A is

(i) an eicosanoid nucleus;

(ii) a carbocyclic analog of an eiconsanoid nucleus; or

(iii) a heterocyclic analog of an eicosanoid nucleus wherein one of the carbons in one of said carbocycliic analogs is replaced by O, S or N.

4,695,648

NOVEL ARYLACETIC ACID DERIVATIVES

Karl H. Agback; Tamara Agback, both of Upsala, and Alf S. Nygren, Örbyhus, all of Sweden, assignors to Pharmacia AB, Upsala, Sweden

PCT No. PCT/SE85/00020, § 371 Date Aug. 29, 1985, § 102(e) Date Aug. 29, 1985, PCT Pub. No. WO85/03287, PCT Pub. Date Aug. 1, 1985

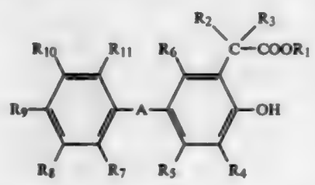
PCT Filed Jan. 18, 1985, Ser. No. 775,058

Claims priority, application Sweden, Jan. 19, 1984, 8400239

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—053 **11 Claims**

1. An arylacetic acid derivative having the structure



(I)

in which

R_1 and R_2 are hydrogen or lower alkyl, preferably R_2 is hydrogen;

R_3 is hydrogen, lower alkyl or;

R_4, R_5 and R_6 are hydrogen, halogen, lower alkyl, lower alkoxy, cyano, carboxy or nitro; at least one of the groups R_4 to R_6 being hydrogen;

R_7 to R_{11} are hydrogen, halogen, cyano, lower alkyl, trifluoromethyl, lower alkoxy, hydroxy, lower acyl, lower alkxycarbonyl, N,N,-diloweralkylaminocarbonyl or N,N-loweralkylene-aminocarbonyl; and R_8 to R_{10} may in addition be carboxy; at least two of R_7 to R_{11} always being hydrogen; preferably R_7 and R_{11} are hydrogen, halogen, cyano, lower alkyl, trifluoromethyl, lower alkoxy, hydroxy or lower acyl; and

—A— is —CO—, $—CH_2—CO—$, —CH=CH—, —CH=CH—CO— or corresponding groups in which a hydrogen atom is replaced by a lower alkyl group; or salts thereof in cases where the compound comprises at least one carboxy group; or corresponding lactones in cases where R_1 is H.

4,695,649

PHTHALATE COMPOUNDS

Masato Magami; Kazumi Saeki, both of Nakatsu; Takanori Miura, Chikujo, and Takeshi Inoue, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP85/00208, § 371 Date Jun. 12, 1985, § 102(e) Date Jun. 12, 1985, PCT Pub. No. WO85/04869, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 16, 1985, Ser. No. 748,450

Claims priority, application Japan, Apr. 19, 1984, 59-78907

Int. Cl.[4] C07C *69/80*

U.S. Cl. 560—86 1 Claim

1. Di(p-benzyloxycarbonylphenyl)isophthalate.

4,695,650

LIQUID CRYSTAL COMPOUNDS AND COMPOSITIONS CONTAINING SAME

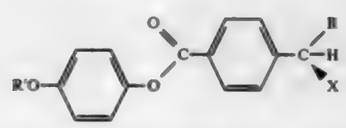
David M. Walba, and Homayoun A. Razavi, both of Boulder, Colo., assignors to University of Colorado Foundation, Boulder, Colo.

Filed Sep. 24, 1986, Ser. No. 911,096

Int. Cl.[4] C07C *69/76;* C09K *19/20*

U.S. Cl. 560—109 6 Claims

1. A compound of the formula:



wherein R is an alkyl group containing three to twelve carbon atoms, R' is an alkyl group containing five to twelve carbon atoms and X is selected from the group consisting of chlorine and fluorine.

4,695,651

BIPHENYL-BASED DIESTER COMPOUNDS AND LIQUID CRYSTAL COMPOSITIONS CONTAINING SAME

Ryoichi Higuchi, Tokyo; Takao Sakurai, Kawasaki; Naoko Mikami, Yokohama; Kiriko Akaiwa, Tokyo, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

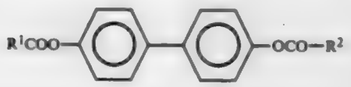
Filed Sep. 10, 1985, Ser. No. 774,484

Claims priority, application Japan, Sep. 10, 1984, 59-189232; Feb. 8, 1985, 60-22920

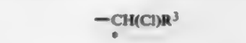
Int. Cl.[4] C09K *19/12, 19/52;* G02F *1/13;* C07C *69/353*

U.S. Cl. 560—141 4 Claims

1. A smectic liquid crystal compound of the formula



wherein R^1 represents a C_{1-18} alkyl group, R^2 represents



wherein R^3 represents a C_{1-16} alkyl group and the carbon atom marked by (*) is an asymmetric carbon atom.

4,695,652

PROCESS FOR THE PREPARATION OF β-AMINOETHYL KETONES

Floris Seng, Bergisch-Gladbach, and Josef Bremen, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,462

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436450

Int. Cl.[4] C07C *97/10, 85/18*

U.S. Cl. 564—343 6 Claims

1. In a process for the preparation of a β-aminoethyl ketone by the condensation of a methyl aryl ketone with an aldehyde and ammonia or an amine, the improvement comprising carrying out the reaction in the absence of hydrochloric acid or hydrochlorides and in the presence of an organic nitrile and a sulphonic acid or in the presence of a glycol ether sulphuric acid.

4,695,653

CATIONIC SURFACE-ACTIVE AGENTS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 111,326, Jan. 11, 1980, Pat. No. 4,436,909, which is a division of Ser. No. 891,455, Mar. 29, 1978, Pat. No. 4,220,602, which is a division of Ser. No. 742,671, Nov. 17, 1976, Pat. No. 4,096,332, which is a division of Ser. No. 547,465, Feb. 6, 1975, Pat. No. 4,009,253, which is a division of Ser. No. 187,151, Oct. 6, 1971, Pat. No. 3,879,464, which is a continuation-in-part of Ser. No. 655,336, Jul. 24, 1907, abandoned. This application Aug. 23, 1983, Ser. No. 525,705

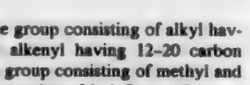
Claims priority, application Luxembourg, Jul. 26, 1966, 51645; May 12, 1967, 53667

Int. Cl.[4] C07C *91/10;* C07D *295/08*

U.S. Cl. 564—505 6 Claims

1. A cationic surface-active agent comprising a mixture of compounds having the formula





wherein R' is selected from the group consisting of alkyl having 12–20 carbon atoms and alkenyl having 12–20 carbon atoms, R'' is selected from the group consisting of methyl and ethyl, m has a statistical average value of 2–6, R_1 and R_2 each independently are selected from the group consisting of lower alkyl having 1–4 carbon atoms and hydroxy lower alkyl having 1–4 carbon atoms and n has a statistical average value of 0.5–4.

4,695,654

GEM-DIHALO-1,8-DIAMINO-4-AZA-OCTANES

Fritz Gerhart, Kehl Leutesheim, Fed. Rep. of Germany, and Pierre Mamont, Strasbourg, France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Aug. 21, 1985, Ser. No. 767,928

Int. Cl.[4] C07C *87/22*

U.S. Cl. 564—510 6 Claims

1. A gem-dihalo-1,8-diamino-4-aza-octane derivative of spermidine wherein the gem-dihalo moiety is located at one of the 2,2-, 6,6- or the 7,7-positions thereof.

4,695,655

ETHYNYLTHIOPHENOXY DERIVATIVES OF DIPHENYLHEXAFLUOROPROPANE

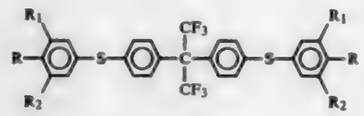
Kreisler S. Y. Lau, Alhambra, and William J. Kelleghan, Whittier, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 4, 1984, Ser. No. 647,000

Int. Cl.[4] C07C *149/34*

U.S. Cl. 568—56 2 Claims

1. A diphenylhexafluoropropane compound having the formula:



where R, R_1 and R_2 are hydrogen or ethynyl.

4,695,656

PROCESS FOR THE PREPARATION OF 2,4-DINITROPHENYL ETHERS

Kuno Reh, and Friedrich Schophoff, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

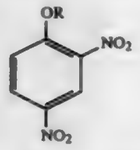
Filed Mar. 31, 1986, Ser. No. 846,011

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515339

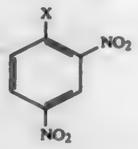
Int. Cl.[4] C07C *43/025;* C07D *307/02*

U.S. Cl. 568—587 12 Claims

1. In the improved process for the preparation of 2,4-dinitrophenyl ethers of the formula



wherein R is (C_1–C_4)alkoxy-(C_2–C_4)alkyl, phenoxy-(C_2–C_4)alkyl, (C_1–C_4)alkoxy-(C_2–C_4)alkoxy-(C_2–C_4)alkyl or tetrahydrofurfuryl, wherein 2,4-dinitrohalobenzene of the formula



is reacted with an alkali metal alcoholate of the formula

ROM

wherein X is —Cl or —Br and M is an alkali metal cation, the improvement comprises reacting the dinitrohalobenzene and alkali metal alcoholate at a temperature of −25° C. to 50° C. in a non-polar, inert solvent.

4,695,657

PROCESS FOR PREPARING COMPOUNDS CONTAINING A DIFLUOROMETHYLENE GROUP IN A POSITION α TO AN OXYGEN ATOM

Michel Desbois, Rilleux, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 17, 1985, Ser. No. 809,721

Claims priority, application France, Dec. 26, 1984, 84 19798

Int. Cl.[4] C07C *43/02, 43/18, 69/63, 69/62*

U.S. Cl. 568—656 8 Claims

1. A process for the preparation of an ether compound containing a difluoromethyleneoxy group by simultaneous esterification and fluorination, comprising the step of contacting an alcohol or a phenol with a carbonyl-containing compound selected from the group consisting of trifluoroacetic acid, halides of trifluoroacetic acid and the anhydride of trifluoroacetic acid, in anhydrous liquid hydrofluoric acid, in the presence of boron trifluoride in a quantity such that the absolute of boron trifluoride is at leats about one bar for a time sufficient to create said difluoromethyleneoxy group.

4,695,658

ARYL CARBOXYLATE PROCESS

Edward C. Taylor, Princeton; Alan H. Katz, Cranbury; Randy A. Bull, Hopewell; Lance R. Byers, Hightstown, and Richard A. Brown, Trenton, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 12, 1984, Ser. No. 589,257

Int. Cl.[4] C07C *39/10, 69/76*

U.S. Cl. 568—763 15 Claims

1. The process of replacing a carbon-thallium bond of an arylthallium compound with a carbon-oxygen bond comprising:

a. forming a nonaqueous solution containing the arylthallium compound, a nitrile, a carboxylic acid or salt thereof, and an acid in an amount sufficient to maintain an excess of free acid in the solution, and

b. adding to the nonaqueous solution a cuprous copper compound which is capable of forming a soluble carboxylate salt therein, and which serves to promote the replacement of the thallium moiety with the carboxylate moiety to form substantially only an arylcarboxylate ester of the corresponding arylthallium compound.

4,695,659

METHOD FOR DEALKYLATION OF ALKYL-ARYL ETHERS

Sven-Görsa B. Andersson, Malmö , Sweden, assignor to Chemical Dynamics Development AB, Skara, Sweden

PCT No. PCT/SE85/00399, § 371 Date Jun. 20, 1986, § 102(e) Date Jun. 20, 1986, PCT Pub. No. WO86/02634, PCT Pub. Date May 9, 1986

PCT Filed Oct. 17, 1985, Ser. No. 881,027

Claims priority, application Sweden, Oct. 22, 1984, 8405262

Int. Cl.[4] C07C *37/00, 37/055*

U.S. Cl. 568—805 9 Claims

1. In a process for the dealkylation of an alkyl aryl ether by reaction with aluminum triodide under reflux, the improvement comprising conducting said reaction in the presence of a catalytic amount of a quaternary ammonium iodide in a substantially non-aqueous organic solvent, and hydrolyzing the reaction product with water, whereby reaction time is shortened and reaction yield is increased.

4,695,660

METHOD OF PRODUCING CYCLOHEXYL COMPOUNDS

Werner Otte, Dorsten, and Rudolf Nehring, Marl, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 24, 1986, Ser. No. 888,711

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537228

Int. Cl.[4] C07C 29/132, 29/136

U.S. Cl. 568—830 6 Claims

1. A method for producing 1-cyclohexyl-ethanol by catalytic hydrogenation of acetophone, comprising:

hydrogenating said acetophenone in the presence of a catalyst consisting essentially of Ru and a support, at a hydrogen pressure of about 200–350 bar and a temperature of from about 80°–160° C. and

wherein said acetophenone is in a slurry or a tricking liquid phase.

4,695,661

CATALYTIC SYSTEM AND A PROCESS FOR PREPARING ALPHA, OMEGA-C_4 THROUGH C_{20} ALKENOLS

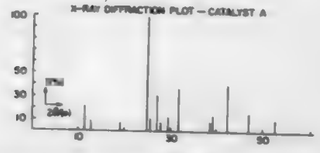
Walter K. Homann, Duelmen, and Lothar Fischer, Marl, both of Fed. Rep. of Germany, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 19, 1986, Ser. No. 841,490

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510568

Int. Cl.[4] C07C 29/60, 33/025

U.S. Cl. 568—903 14 Claims



1. A method for preparing pure alpha, omega-C_4 to C_{20} alkenols having purities in excess of 90% by the catalytic dehydration of the corresponding alpha, omega-C_4 to C_{20} diols, comprising:

(a) reacting an alkaline earth metal compound with phosphoric acid in a paste and forming an alkaline earth metal phosphate reaction product;

(b) doping said reaction product by adding 2 to 25% by weight of a diphosphate doping compound selected from the group consisting of alkali metal diphosphate and alkaline earth metal diphosphate and forming an alkaline earth metal phosphate reaction product doped with a diphosphate doping compound wherein the percent by weight of said diphosphate doping compound is calculated as metal oxide and referred to the weight of said phosphate reaction product also calculated as metal oxide;

(c) drying and extruding said phosphate reaction product doped with a diphosphate doping compound and forming a dried and extruded substance;

(d) calcining said dried and extruded substance at temperatures between 350° to 950° C. to form a catalyst free of diphosphate compound; and

(e) dehydrating said diols by passing them over said catalyst at temperatures between 300° to 500° C. to form said alkenols having purities in excess of 90% at conversions in excess of 90%.

4,695,662

LIGHT PARAFFIN DEHYDROGENATION PROCESS

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 4, 1986, Ser. No. 848,354

Int. Cl.[4] C07C 5/03, 7/11

U.S. Cl. 585—324 9 Claims

1. A hydrocarbon conversion process, which process comprises the steps of:

(a) passing a feed stream comprising a C_4 paraffin into a catalytic dehydrogenation reaction zone maintained at dehydrogenation conditions and producing a dehydrogenation reaction zone effluent stream comprising hydrogen, a C_3 and a C_4 paraffin and a C_3 and a C_4 olefin;

(b) passing the dehydrogenation reaction zone effluent stram upward through a first absorption zone countercurrent to a first process stream comprising a C_5-plus compound, and producing a lean vapor stream, which stream comprises hydrogen, the C_5-plus compound and the C_3 olefin, and a first rich liquid stream comprising the C_5-plus compound, C_3 and C_4 paraffins and C_3 and C_4 olefins;

(c) passing the lean vapor stream upward through a second absorption zone countercurrent to a second process stream which comprises a C_3–C_4 paraffin, and producing a hydrogen-rich gas stream, which stream comprises hydrogen and a C_3–C_4 paraffin, and a second rich liquid stream which comprises the C_5-plus compound and the C_3 olefins;

(d) recycling at least a portion of the hydrogen-rich gas stream to the catalytic dehydrogenation reaction zone;

(e) passing the first and the second rich liquid streams into a fractionation zone and separating the first and the second rich liquid streams into at least a first net overhead stream comprising propane, and a third process stream comprising a C_4 olefin and a C_4 paraffin; and,

(f) passing at least a portion of the third process stream into a catalytic etherification zone wherein at least a portion of the C_4 olefin is consumed by reaction with methanol in the creation of a C_5-plus ether, and producing an effluent stream comprising the C_4 paraffin and a product stream comprising the C_5-plus ether.

4,695,663

PRODUCTION OF AROMATICS FROM HYDROCARBON FEEDSTOCK

Antony H. P. Hall, Cobham, and John J. McCarroll, Camberley, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Jul. 30, 1986, Ser. No. 891,740

Claims priority, application United Kingdom, Aug. 21, 1985, 8520977

Int. Cl.[4] C07C 2/00

U.S. Cl. 585—417 10 Claims

1. A process for producing liquids rich in aromatic hydrocarbons comprising bringing into contact in the vapour phase and in the absence of oxygen at a temperature between 650° C. and 800° C. a hydrocarbon feedstock containing greater than 50% w/w of methane with a catalyst composition comprising an aluminosilicate having silica to alumina in a molar ratio of at least 5:1.

4,695,664

METHOD OF RECOVERING HEAT FROM LOW TEMPERATURE EFFLUENT

Leslie F. Whittle, Windham, N.H., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed Apr. 17, 1986, Ser. No. 853,043

Int. Cl.[4] C07C 4/02

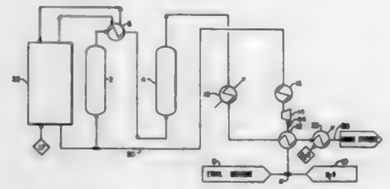
U.S. Cl. 585—440 18 Claims

1. A process for the dehydrogenation of an alkylaromatic hydrocarbon which comprises the steps of:

(a) continuously contacting a reactant vapor stream comprising an alkylaromatic hydrocarbon and steam with a dehydrogenation catalyst in a reactor under dehydrogenation conditions so as to form a vapor phase dehydrogenation reaction effluent comprising a predetermined product hydrocarbon;

(b) continuously removing said effluent as a stream from said reactor;

(c) continuously mixing an alkylaromatic hydrocarbon and water in liquid form so as to form an azeotropic feed mixture;



(d) cooling said effluent stream without any significant condensation of said predetermined product hydrocarbon by indirect heat exchange with a selected fluid cooling medium;

(e) recovering additional heat from said effluent stream by indirect heat exchange with said azeotropic feed mixture so as to cause vaporization of said alkylaromatic hydrocarbon and water; and

(f) feeding said vaporized alkylaromatic hydrocarbon and water to said reactor as said reactant vapor stream.

4,695,665

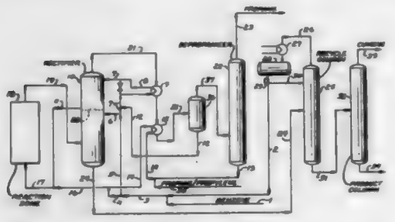
PROCESS FOR ALKYLATION OF HYDROCARBONS

Richard R. De Graff, Deerfield, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 2, 1986, Ser. No. 881,536

Int. Cl.[4] C07C 3/54, 7/04

U.S. Cl. 585—450 14 Claims



1. A fixed-bed hydrocarbon alkylation process which comprises the steps of:

(a) passing a reaction zone effluent stream comprising a volatile light hydrocarbon and less volatile feed and product hydrocarbons into a lower portion of a rectified separation zone operated at conditions effective to separate the entering hydrocarbons into an overhead vapor stream which is rich in the light hydrocarbon and a bottoms stream comprising the feed and product hydrocarbons;

(b) separating the bottoms stream in a fractionation zone into a liquid-phase recycle stream which is rich in the feed hydrocarbon and a product stream which is rich in the product hydrocarbon, and withdrawing the product stream from the process;

(c) passing a portion of the recycle stream into a contact-exchanger located in an upper portion of the rectified separation zone and which receives a rectified vapor stream comprising the volatile light hydrocarbon and the feed hydrocarbon from the lower portion of the rectified separation zone, removing heat and the feed hydrocarbon from the rectifier vapor stream by direct contact and producing said overhead vapor stream and a rectifier exchanger liquid stream which is withdrawn from the rectified separation zone at a point above the lower portion of the rectified separation zone and below the contact-exchanger; and,

(d) passing the rectifier exchanger liquid stream and a feed stream comprising the volatile light hydrocarbon into a reaction zone maintained at reaction conditions and producing the reaction zone effluent stream.

4,695,666

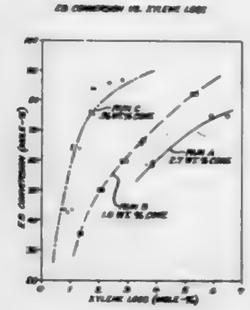
PHOSPHORUS-CONTAINING ALUMINA CATALYST FOR THE ISOMERIZATION OF AROMATICS

Tai-Hsiang Chao, Mt. Prospect, and J. W. Adriaan Sachtler, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 871,968, Jun. 9, 1986, Pat. No. 4,654,455, which is a division of Ser. No. 806,984, Dec. 9, 1985, Pat. No. 4,636,483. This application Dec. 22, 1986, Ser. No. 944,910

Int. Cl.[4] C07C 5/22

U.S. Cl. 585—481 10 Claims



1. A process for isomerizing isomerizable alkylaromatic hydrocarbons which comprises contacting the alkylaromatic hydrocarbons in a reaction zone at isomerization reaction conditions with a catalytic composition comprising phosphorus-containing alumina, a gallium component, and crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12.

4,695,667

NOVEL CRYSTALLINE ALUMINOSILICATE ZEOLITES AND PROCESS FOR PRODUCTION THEREOF

Koji Sumitani; Tokuji Sakai; Yasuo Yamasaki, and Tamio Onodera, all of Matsuyama, Japan, assignors to Teijin Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 634,449, Jul. 25, 1984, which is a division of Ser. No. 317,918, Nov. 3, 1981, abandoned. This application Feb. 26, 1985, Ser. No. 705,631

Claims priority, application Japan, Nov. 4, 1980, 55-155017; Mar. 6, 1981, 56-31182; Jun. 10, 1981, 56-88024; Jul. 20, 1981, 56-112264

Int. Cl.[4] C07C 5/27

U.S. Cl. 585—481 12 Claims

1. In a process for isomerizing xylenes and ethylbenzene which comprises contacting an aromatic hydrocarbon stock mainly containing xylene isomers and ethylbenzene, in which the concentration of at least one xylene isomer is lower than the thermodynamical equilibrium concentration with a catalyst composition at an elevated temperature in the vapor phase in the presence of hydrogen, the improvement which comprises using as the catalyst composition a catalyst composition containing as catalytically active components

(A) alumina having deposited thereon platinum or its oxide, and

(B) a crystalline aluminosilicate zeolite characterized by having a composition of the following general formula expressed in terms of the mole ratios of oxides in the anhydrous state

$$xM_{2/n}O.Al_2O_3.ySiO_2 \quad (I)$$

where M represents at least one cation having a valence of n selected from the group consisting of a hydrogen ion and metal cations of metals of Group IA, IIA and IIIB of the periodic table, x is a number between 0.5 and 4, and y is a number of at least 10, and having an X-ray diffraction pattern showing at least the following significant peaks

Interplanar spacing d(Å)	Relative intensity
11.2 ± 0.5	medium to strong
9.9 ± 0.5	medium to strong
4.67 ± 0.1	medium
4.33 ± 0.1	very strong
4.02 ± 0.05	strong to very strong
3.83 ± 0.05	medium
3.72 ± 0.05	weak to medium
3.44 ± 0.04	weak to strong
3.33 ± 0.04	weak to strong
3.28 ± 0.03	medium

4,695,668

MOLYBDENUM-TUNGSTEN-CONTAINING CATALYST AND METHANE CONVERSION PROCESS USING SAME

Louis J. Velenyi, Lyndhurst, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 24, 1986, Ser. No. 843,095
Int. Cl.⁴ C07C *2/00*
U.S. Cl. 585—500 **31 Claims**

1. A process for converting methane to at least one higher order hydrocarbon comprising contacting a gaseous reactant comprising methane and oxygen with a molybdenum-tungsten-containing catalyst under reaction conditions for an effective period of time to form said higher order hydrocarbon, said catalyst comprising a molybdenum-tungsten-containing complex represented by the formula

$$Mo_aW_bM_cA_dO_e$$

wherein M is selected from the group consisting of one or more metals selected from any of Groups IB, IIB, IVB, VB or VIII of the Periodic Table and/or one or more of Y, Cr, Mn, Re, B, In, Ge, Sn, Pb, Th or U, or a mixture of two or more of the metals in said group;

A is at least one metal selected from the group consisting of alkali metals, alkaline earth metals, Lanthanide series metals, La, Tl, or a mixture of two or more of the metals in said group;

a is a number in the range of from about 1 to about 200;

b is a number in the range of from about 1 to about 200;

with the proviso that either Mo or W is in excess of the other, the ratio of a:b being about 4:1 or greater, or about 1:4 or less;

c is a number such that the ratio of c:(a+b) is in the range of from 0:100 to about 10:100;

d is a number such that the ratio of d:(a+b) is in the range of from 0:100 to about 75:100; and

e is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,695,669

PROCESS FOR PROPYLENE DIMERIZATION

James C. Stevens, and William A. Fordyce, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 2, 1986, Ser. No. 902,740
Int. Cl.⁴ C07C *2/10, 2/26*
U.S. Cl. 585—511 **20 Claims**

1. A process for the preparation of 4-methyl-1-pentene, the process comprising contacting propylene and a catalyst comprising uranium under reaction conditions to produce 4-methyl-1-pentene with a selectivity of at least 94 mole percent with respect to other C_6 olefins.

4,695,670

PRODUCTION OF GASOLINE

Duncan Seddon, Mount Eliza, Australia, assignor to The Broken Hill Proprietary Co., Ltd., Melbourne and Commonwealth Scientific and Industrial Research Organisation, Campbell ACT, both of, Australia

Continuation of Ser. No. 715,381, Mar. 25, 1985, abandoned. This application Apr. 2, 1986, Ser. No. 847,242
Claims priority, application Australia, Mar. 27, 1984, PG4265
Int. Cl.⁴ C07C *2/02*
U.S. Cl. 585—533 **8 Claims**

1. Process for conversion of a light olefinic feed stock into gasoline by contact with a zeolite catalyst, characterized in that the catalyst has not been subjected to ion exchange, contains at least 0.5% by weight of a Group IA metal oxide, and has an X-ray powder diffraction pattern (Co radiation) exhibiting the presence of ZSM-5 zeolite and characterized by a peak in the region $2\theta = 27.0 \pm 0.2$ degrees which is greater in intensity than peaks at both $2\theta = 9.20 \pm 0.2$ and $2\theta = 10.25 \pm 0.2$ degrees.

4,695,671

TETRAMETHYLTETRAHYDRONAPHTHALENE PURIFICATION PROCESS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 2, 1986, Ser. No. 902,786
Int. Cl.⁴ C07C *15/20*
U.S. Cl. 585—858 **12 Claims**

1. A process for the removal of by-product amounts of aromatic hydrocarbon compounds from a mixture comprised of aid compounds and predominantly tetramethyltetrahydronaphthalene comprising the steps of:

contacting said mixture with a sulfuric acid solution containing in the range of from about 90% to about 100% by weight sulfuric acid in an amount sufficient to cause the dissolution of said aromatic hydrocarbon compounds; and

separating the resulting acid phase containing said aromatic hydrocarbon compounds from said mixture.

4,695,672

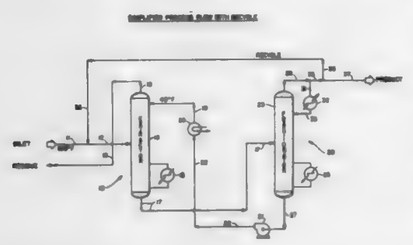
PROCESS FOR EXTRACTIVE-STRIPPING OF LEAN HYDROCARBON GAS STREAMS AT HIGH PRESSURE WITH A PREFERENTIAL PHYSICAL SOLVENT

Terry N. Bunting, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Filed Apr. 21, 1986, Ser. No. 854,384
Int. Cl.⁴ F25J *1/02*
U.S. Cl. 585—867 **18 Claims**

1. In a process for selectively extracting hydrocarbons from a hydrocarbon gas feed stream with a preferential physical solvent which provides selective capability for extremely high recoveries according to any selected degree of a selected hydrocarbon component and heavier hydrocarbons within the group consisting of ethane, propane, butane, and pentane without the need simultaneously to recover hydrocarbons lighter than said selected hydrocarbon component from said hydrocarbon gas feed stream, said recoveries being: (a) ethane in amounts within the range of 2–100%, (b) propane in amounts within the range of 2–100%, (c) butane in amounts within the range of 2–100%, or (d) pentanes and higher molecular weight hydrocarbons in amounts ranging up to 100% by the following steps:

(a) selectively extracting and stripping said hydrocarbon gas feed stream with said physical solvent to produce a residue hydrocarbon gas stream of pipeline specifications and a rich solvent stream containing ethane and heavier hydrocarbon components, whereby said rich solvent stream consists essentially of only economically desired hydrocarbons, said preferential physical solvent being selective for said ethane and heavier hydrocarbon components of the gas stream such that: (1) the relative volatility of methane over ethane is at least 5.0 and the hydrocarbon loading capacity, defined as solubility of ethane in solvent, is at least 0.25 standard cubic feet of ethane per gallon of solvent, or (2) the preferential factor determined by the multiplication of relative volatility of methane over ethane by the solubility of ethane in solvent, in standard cubic feet of ethane per gallon of solvent, is at least 1.25; and



(b) distilling said rich solvent to produce: (1) said selected hydrocarbon component and heavier hydrocarbons as overhead product, the amount of each recovered hydrocarbon component that is lower in molecular weight than said selected hydrocarbon component being less than the recovered amount of said selected hydrocarbon component, and (2) said physical solvent as bottoms for feeding to said extracting and stripping step,

wherein the need exists to avoid an excessive solvent flow rate and high reboiler temperatures when said hydrocarbon gas stream is lean and/or when said hydrocarbon gas feed stream is at a pressure above about 400 psia,

the improvement comprising the selective enrichment of said hydrocarbon gas feed stream with recycle of a selected portion of said overhead product to said extracting and stripping step, whereby said extremely high recoveries according to said any selected degree are feasible without said excessive solvent flow rates or said high reboiler temperatures.

4,695,673

PROCESS FOR THE PRODUCTION OF ACYLATED 1,3-DICARBONYL COMPOUNDS

James B. Heather, Hercules, and Pamela D. Milano, Concord, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 798,842, Nov. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,882, Dec. 20, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 872,069
Int. Cl.⁴ C07C *45/54*
U.S. Cl. 568—310 **49 Claims**

1. A process for producing an acylated cyclical 1,3-dicarbonyl compound by rearrangement of the corresponding enol ester in which the rearrangement is conducted in the presence of a cyanide source which is an alkali metal cyanide, a cyanohydrin of a methyl alkyl ketone having from 1 to 4 carbon atoms in the alkyl group, benzaldehyde cyanohydrin, cyclohexanone cyanohydrin, a cyanohydrin of a C_2–C_5 aliphatic aldehyde, lactonitrile, a lower alkyl silyl cyanide, potassium ferricyanide, or hydrogen cyanide.

4,695,674

PREFORMED, THIN-FILM FRONT CONTACT CURRENT COLLECTOR GRID FOR PHOTOVOLTAIC CELLS

Ari Bar-on, Shaker Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 30, 1985, Ser. No. 771,262
Int. Cl.[4] H01L *31/04, 31/18*
U.S. Cl. 136—256 11 Claims

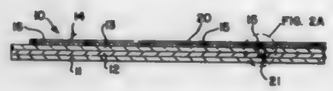


FIG. 2A

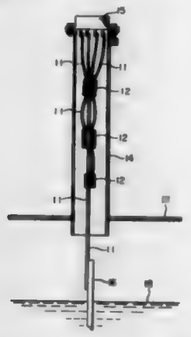
1. A photovoltaic cell comprising:
an electrically conductive substrate layer;
a semiconductor body deposited on said substrate layer;
a transparent electrically conductive layer deposited on said semiconductor body;
preformed thin-film electrically conductive grid means for collecting electrical current from said cell, said grid means having a predetermined physical configuration; and
an electrically conductive adhesive on said grid means to physically and electrically connect said grid means to said transparent electrically conductive layer, said adhesive having a bulk resistive of from about 0.5 ohms-cm to about 5 ohms-cm.

4,695,675

ELECTRIC LEAD DEVICE FOR SUPERCONDUCTING ELECTRIC APPARATUS

Yuuichi Yamamoto, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,490
Claims priority, application Japan, Oct. 17, 1985, 60-157834
Int. Cl.[4] H01F *7/24*
U.S. Cl. 174—15 CA 6 Claims



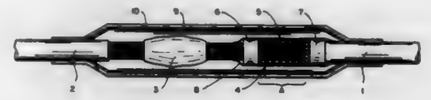
1. An electric lead device for a superconducting electric apparatus comprising:
a coolant tank for storing therein a cryogenic coolant;
a superconducting electric apparatus disposed in said coolant tank;
a lead housing secured to said coolant tank and communicating with the interior of said coolant tank for introducing therein coolant gas vaporized from said cryogenic coolant; and
conductor means received in said lead housing and extending from a normal temperature side to a cryogenic temperature side for electrically connecting said superconducting electric apparatus to the outside, said conductor means being constructed such that the total cross sectional area of said conductor means decreases from said normal temperature side toward said cryogenic temperature side, said conductor means being formed of conductor wire elements each covered with an electrically insulating layer.

4,695,676

CABLE BLOCKING AND BLOCK SPLICE PROTECTION

Alvah A. Lawrence, Los Altos, and Jason W. Neves, Campbell, both of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Filed May 30, 1985, Ser. No. 740,134
Int. Cl.[4] H02G *15/25*
U.S. Cl. 174—22 R 5 Claims



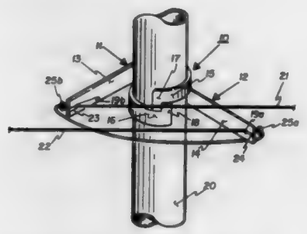
1. An assembly comprising:
a cable containing paper insulation spliced to a cable containing oil or petroleum based material;
a reservoir positioned around at least a portion of the cable containing the oil or petroleum based material wherein the reservoir covers a portion of the conductors of said cable and a portion of the jacket remaining on said cable without covering any part of the splice area;
a particulate material in the reservoir in sufficient amounts to fill the voids between the conductors and to cover the conductors and the cable jacket; and
means positioned around the reservoir to compress the reservoir whereby the particulate material prevents liquids and the oil or petroleum based material from migrating from the interior of said cable into the splice area.

4,695,677

WIRE TENSIONING SYSTEM

Dale G. Ruth, 12021 Donna Ct. NE., Albuquerque, N. Mex. 87112, and Robert J. Yuhas, 824 Omaha NE., Albuquerque, N. Mex. 87123

Filed Jun. 6, 1985, Ser. No. 742,117
Int. Cl.[4] H02G *7/02;* H01B *17/16;* A01K *3/00;* G08B *13/26*
U.S. Cl. 194—45 TD 5 Claims



1. A tensioned wire system, comprising:
a. an elongated support member;
b. a first tensioner including a first elongated tensioning arm having flexibility in a direction perpendicular to the elongated dimension thereof, means for receiving and holding wire at the distal end thereof and means for affixing said first tensioner to said elongated support member in a direction substantially perpendicular to the longitudinal axis of said support member, said first tensioner being attached to said elongated support member by said affixing means;
c. a second tensioner substantially identical to said first tensioner and having a second elongated tensioning arm, said second tensioner attached in a similar manner to said

elongated support member and placed alongside said first tensioner, said first tensioner and said second tensioner oriented to form a V-shape in a plane perpendicular to the longitudinal axis of said elongated support member;

d. means for interconnecting said first tensioner and said second tensioner, whereby said first tensioner and said second tensioner are prevented from rotating about the axis of said elongated support member when substantially equal and opposite forces are applied to the distal ends of said first and second tensioners;

e. a first wire segment connected to the distal end of said first tensioner by said first means for receiving and holding wire;

f. a second wire segment connected to the distal end of said second tensioner by a second means for receiving and holding wire;

g. means for applying force in a chosen direction to the end of said first wire segment not connected to the distal end of the first tensioner, the force being sufficient to deflect said first tensioning arm in the direction of the force, whereby the combination of the force applied to the end of the first wire segment and the restorative force of the deflected first tensioning arm provides tension to said first wire segment; and

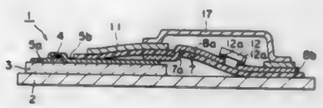
h. means for applying a second force to the end of said second wire segment not connected to the distal end of the second tensioner in a direction approximately opposite the force applied to the first wire segment, the force being sufficient to deflect said second tensioning arm in the direction of the second force whereby the combination of the force applied to the end of the second wire segment and the restorative force of the deflected second tensioning arm provides tension to said second wire segment.

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ELECTRONIC DEVICE CARRIER

Masanori Itagaki; Junichi Takahashi, both of Tokyo, and Hideyasu Endou, Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,147
Claims priority, application Japan, Oct. 8, 1983, 58-187694
Int. Cl.⁴ H01L *23/02*
U.S. Cl. 174—52 FP **5 Claims**



1. An electronic device carrier structure, comprising:

a substrate having an electrically insulating surface and comprising an electrically insulating, flexible tape;

at least one signal input line formed from an electrically conductive material and extending on said electrically insulating surface, said signal input line having a signal input end and a first connecting end at the other end;

at least one signal output line formed from an electrically conductive material and extending on said electrically insulating surface, said signal output line having a signal output end at one end and a second connecting end at the other end;

at least one electronic device carried on said substrate and connected to said first and second connecting ends;

at least a pair of guard lines each of which is formed on said electrically insulating surface and extends substantially along a corresponding side of said at least one signal input line; and

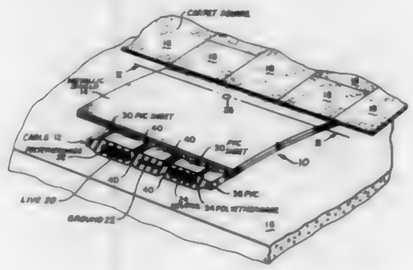
an electrically conductive support for supporting thereon said flexible tape and an electrically conductive cover which is electrically connected to and fixedly attached to said electrically conductive support for substantially covering said flexible tape from above.

4,695,679

FLAT MULTICONDUCTOR CABLE FOR UNDERCARPET WIRING SYSTEM

Richard F. Strauss, Morrisville, Pa.; Phillip Herb, Somerville, N.J.; Peter Noorily, Bridgewater, N.J., and Julio Rodrigues, Linden, N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Aug. 19, 1985, Ser. No. 767,306
Int. Cl.⁴ H01B *7/08*
U.S. Cl. 174—117 FF **19 Claims**



1. An electrical cable for use in an undercarpet wiring system wherein said cable is likely to be exposed to an alkaline environment, said cable comprising:

a plurality of elongate electrical conductors extending generally parallel to each other in side by side relation, said conductors including live, ground and neutral conductors,

a layer of insulation individually surrounding each of said live and said neutral conductors,

a casing of insulation surrounding said conductors and being in adhered relation to said respective layers of insulation surrounding said live and said neutral conductors, said casing substantially surrounding said ground conductor and being in contact therewith, said casing of insulation being substantially free from attack in an alkaline environment.

4,695,680

STYLUS FOR POSITION RESPONSIVE APPARATUS HAVING ELECTROGRAPHIC APPLICATION

Robert G. Kable, Dublin, Ohio, assignor to Scriptel Corporation, Columbus, Ohio

Filed Jun. 27, 1986, Ser. No. 879,331
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—19 **20 Claims**



1. A stylus for receiving position responsive signals from an electrographic surface for transmission by cable to a control circuit, said surface being excited by a time varying source of select frequency, comprising

an elongate, hand grippable, body having an outwardly disposed electrically conductive first wall surrounding a first cavity, a forwardly disposed nose portion and a rearwardly disposed region;

an elongate cartridge having an electrically conductive second wall extending about a second cavity to a tip receiving portion and further extending to a rearward edge, an electrically insulative tip fixed within said tip receiving portion, an electrically insulative spacer coupled with said rearward edge and supported within said second cavity, an elongate, electrically conductive signal transmission rod extending through said second cavity, spaced from said second wall and supported between said electrically insulative tip and said electrically insulative spacer, spring mounting means extending rearwardly from said insulative spacer for retaining an electrically conductive spring and effecting electrical contact between said signal rod and said spring, said cartridge second wall being supported within said first cavity and said cartridge being slideable to a retracted position exposing a predetermined length of said signal transmission rod at said electrically insulated tip selected to receive said position responsive signals outwardly from said nose portion;

spring retainer means mounted within said first cavity rearward region for providing a spring biasing support;

electrically conductive spring means mounted upon said spring mounting means and in biased relationship against said spring retainer means; and

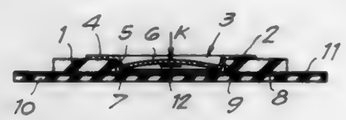
circuit means mounted within said first cavity rearwardly disposed region for receiving said position responsive signals from said electrically conductive spring means for effecting transmission of position date signals in correspondence therewith through said cable and electrically effecting ground communication between said first wall and said cable.

4,695,681

MEMBRANE FOR MEMBRANE SWITCHES AND COMPOSING ELEMENTS THEREOF

Koen Velleman, Gavere, Belgium, assignor to Velleman-Switch, naamloze vennootschap, Gent, Belgium

Filed May 15, 1986, Ser. No. 863,341
Claims priority, application Belgium, May 22, 1985, 2/60691
Int. Cl.⁴ H01H *13/70*
U.S. Cl. 200—5 A **13 Claims**



10. A membrane switch comprising:

(a) a profiled top membrane layer of resilient material;

(b) a underlying supporting layer having an upper surface, an underside and an opening therein;

(c) said top layer being positioned on said upper surface of said underlayer and having a recess fitted in said opening, said recess formed by sidewall means extending downwardly into said opening and a spherical segment extending upwardly into said opening and being suspended from an edge formed by a junction between said sidewall means and said spherical segment;

(d) an under-layer supporting said underlying layer; and

(e) cooperating electrical contact elements on said underlayer and on said spherical segment.

4,695,682

SEAT SWITCH

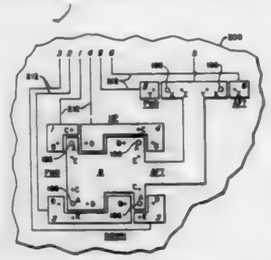
Ray F. Winogrocki, 18975 Holbrook, East Detroit, Mich. 48021

Filed Dec. 23, 1985, Ser. No. 812,426
Int. Cl.⁴ H01H *9/00*
U.S. Cl. 200—5 R **20 Claims**

4. A switch for controlling the positioning of apparatus, said switch generating an appropriate signal to cause the apparatus to be displaced in the same direction that the switch knob is displaced, and said switch knob being capable of horizontal and vertical motion as ell as one or both ends of the switch being capable of relative rotational motion, the improvement comprising:

said switch including two contacts each having two contact surfaces;

means mechanically connecting the contacts with the switch knob such that vertical and horizontal motion of the switch knob displaces all four contact surfaces vertically or horizontally, such that relative rotation of a first end of the knob without displacement of the other end of the



knob displaces one contact, and such that relative rotation of the other end of the knob without displacement of the first end of the knob displaces the other contact; and

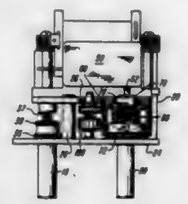
a pattern of electrical contact pads positioned to be engaged by the electrical contacts, said pattern being arranged relative to the contacts such that displacement of the knob in any direction of motion causes the contacts to engage the pads in a pattern indicative of the motion imparted to the knob whereby an appropriate signal is generated.

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ELECTRIC APPLIANCE TIMER WITH AUTOMATIC TURN OFF

William C. Wingler, Boylston, and Edward V. Pomponio, Milford, both of Mass., assignors to Telechron, Inc., Ashland, Mass.

Filed Jul. 23, 1986, Ser. No. 888,969
Int. Cl.⁴ H01H *43/00, 7/08*
U.S. Cl. 200—38 R **16 Claims**



1. In a timer assembly for control of an electrical device, said timer assembly including a motor, a clockwork gear train rotated by said motor, manually-operable means for determining a set-time, an electrical switch controlling said device, and actuator means responsive to the rotation of said gear train and cooperating with said manual set-time neans for actuating said switch at said set-time, the improvement comprising:

said actuator means including means responsive to the rotation of said gear train for deactuating said switch within a predetermined time interval,

means responsive to the actuation of said switch for engaging said deactuating means with said gear train, and

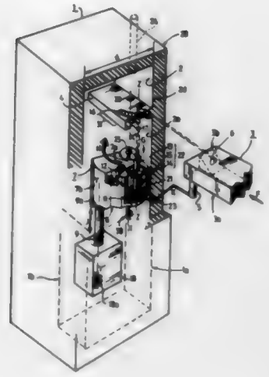
means connected to said actuator means for maintaining said switch deactuated at the end of said predetermined time interval.

4,695,684

ELECTRIC SAFETY SWITCH

Michel Bochard, Ruelle, and Michel Lafaye, Angouleme, both of France, assignors to La Telemecanique Electrique, France

Filed Mar. 18, 1986, Ser. No. 840,833
Claims priority, application France, Mar. 18, 1985, 85 03938
Int. Cl.[4] H01H *27/00*
U.S. Cl. 200—43.07 **3 Claims**



1. A safety switch comprising:

i. a case and a partition wall in said case forming first and second chambers therein and leaving a passage from the first to the second chambers; said partition wall having a slot shaped as an arc of a circle and a locking recess;

ii. A switch unit housed in the second chamber and having an elongate pusher movable along a direction at right angles with said partition wall;

iii. a rotary cam shaped as a cylindrical sector mounted for rotating in the second chamber about an axis parallel to said direction and passing through the center of said circle, from a first to a second angular position, said cam having a first end surface facing said partition wall, a second end cam-shaped surface, engaging said pusher to switch the switch unit, when the cam passes from its first to its second angular position, and a cylindrical side surface, said cam further having a radial groove defining a driving surface for the cam and opening on said first end surface and on said side surface and an elongate housing defining a guiding surface in a direction parallel to said axis;

iv. a spring-actuated retractable locking member mounted for moving along said guiding surface from a first to a second positions and having a shoulder which engages said locking recess to prevent rotation of the cam when the locking member is in its first position and an end portion which projects beyond said shoulder through said slot when the locking member is in its first position;

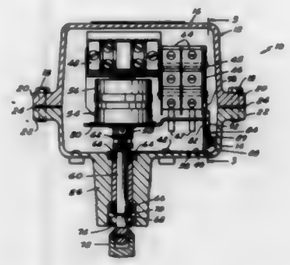
v. a key form fittingly engageable into the first chamber and having an inclined surface portion which pushes said end portion to disengage said shoulder from said locking recess and moves the locking member into its second position, said key further having a stud which passes through said passage and engages the driving surface of the radial groove for rotating said cam from its first to its second positions.

4,695,685

ROTATING PADDLE BIN LEVEL INDICATOR

Phillip P. Fleckenstein, and Norman F. Marsh, both of Port Huron, Mich., assignors to Berwind Corporation, Philadelphia, Pa.

Filed Jul. 28, 1986, Ser. No. 889,699
Int. Cl.[4] H01H *35/00*
U.S. Cl. 200—61.21 **5 Claims**



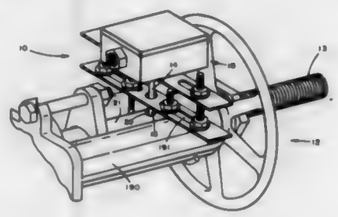
1. Apparatus for indicating level of material in a storage bin comprising a hollow enclosure including means for mounting said enclosure to a storage bin, a motor mounted for limited movement within said enclosure between first and second positions, a paddle operatively coupled to said motor and constructed to be disposed for rotation within said bin, rotation of said paddle being retarded when material stored in said bin is at a level so as to stallably engage said paddle, means mounted in fixed position within said enclosure for detecting limited movement of said motor between said first position when rotation of said paddle is not retarded by material stored in the bin and said second position when rotation of said paddle is retarded by material stored in said bin, and spring means extending between means projecting from said motor and means affixed to said enclosure for urging said motor to both said first and second positions such that said spring means must be urged over center during motion of said motor in either direction between said first and second positions.

4,695,686

VALVE SUPERVISORY SWITCH

David E. Merchant, Lincoln, Nebr., assignor to Emhart Industries Inc., Indianapolis, Ind.

Filed Sep. 15, 1986, Ser. No. 906,992
Int. Cl.[4] H01H *9/06*
U.S. Cl. 200—61.86 **8 Claims**



1. A valve supervisory switch for supervising a valve having a movable portion, said supervisory switch comprising:

a housing having a port;

a switch within said housing, said switch including a switch actuating means;

a swing actuator member;

pivot means for pivotable supporting said swing actuator member;

a linear actuator member;

means for supporting said linear actuator member while permitting it to move linearly;

coupling means for permitting coupling of said swing actuator member to said housing with said swing actuator member extending through said port and engagable with said switch actuating means for actuating said switch and for permitting coupling of said linear actuator member to said housing with said linear actuator member extending through said port and engagable with said switch actuating means for actuating said switch; and

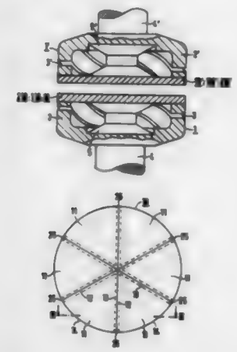
means for attaching said housing to said valve with one of said actuator members coupled to said housing by said coupling means and actuable by said movable portion of the valve.

4,695,687

CONTACT ARRANGEMENT FOR VACUUM SWITCHES WITH AXIAL MAGNETIC FIELD, AND METHOD FOR THE PRODUCTION OF THE RESPECTIVE CONTACT PIECES

Joachim Grosse, Erlangen; Ruediger Hess, Berlin; Wilfried Kuhl, Wendelstein, and Reiner Mueller, Steinbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,502
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610243
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **24 Claims**



1. A contact arrangement for vacuum switches having an axial magnetic field, the arrangement comprising: contact members including disk shaped contact bodies, contact carriers have the contact members soldered to them and including means for reducing eddy currents, the contact bodies comprising a plurality of discrete elements affixed to the contact carrier wherein their edges form joints that define conductivity jumps for suppression of the eddy currents.

4,695,688

ELECTRICAL CONTACT CONSTRUCTION

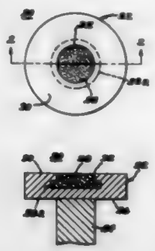
George A. Farrall, Rexford, N.Y., and Raymond K. Seymour, Plainville, Conn., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,435
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **13 Claims**

1. An electrical contact assembly for use in a circuit breaker, comprising:

a generally disc shaped metal contact having first and second major surfaces;

a metal contact support connected integrally with said first contact surface; and



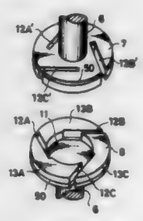
a disc shaped electrically insulating insert disposed concentrically in said second contact surface forming an insulator-metal boundary therewith at the second contact surface.

4,695,689

VACUUM CIRCUIT BREAKER

Yukio Kurosawa, and Kiyoji Iwashita, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,484
Claims priority, application Japan, Nov. 22, 1984, 59-246043
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **1 Claim**



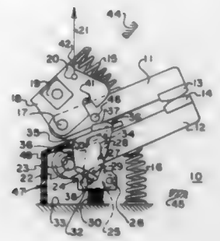
1. A vacuum circuit breaker comprising a pair of separable disc shaped electrodes facing to each other and disposed in a vacuum casing, a pair of conductive rods connected to each of said disc shaped electrodes at their non-facing surfaces and extending through the vacuum casing in an air tight manner, each disc shaped electrode including an annular circular part formed around the outer circumferential portion of the disc shaped electrode, a round recessed part formed on the inner portion thereof and surrounded by the annular contact part, and arc preventing means including at least three straight grooves extending from the outer periphery of the annular contact part to the inner periphery thereof for preventing arcing on the round recessed part during a circuit breaking operation of the vacuum circuit breaker, said disc shaped electrode further including an elastic support plate placed on the non-facing surface thereof, the elastic support plate being provided with at least three straight grooves aligned with the straight grooves formed on the respective annular parts.

4,695,690

CLOSING DELAY ARRANGEMENT FOR CURRENT LIMITING CIRCUIT BREAKER CONTACTS

Claudio Baufi, Rovello Porro, Italy, assignor to General Electric Company, New York, N.Y.

Filed Jan. 21, 1986, Ser. No. 820,051
Int. Cl.[4] H01H 33/18
U.S. Cl. 200—147 R **7 Claims**



1. A closing delay arrangement for circuit breaker contacts comprising:

a first movable contact arm having a first contact and a second movable contact arm having a second contact said first and second movable contact arms being arranged for electrodynamic repulsion upon the occurrence of short circuit current through said contacts and being biased toward each other by a pair of opposedly arranged contact springs, said first contact arm being pivotally attached to a first support means under control of a circuit breaker operating mechanism for moving said first contact arm between a closed and a fully open position, said first contact arm being moved to a partially open position by means of electrodynamic repulsion between said first and second contact arms independent of said circuit breaker operating mechanism, said second arm being pivotally attached to a second support means for movement between first and second positions; and

a pawl pivotally attached to said second support means, and being biased to a first position for holding said second contact arm in said first position for holding said second contact arm in said first position whereby a detent on said pawl captures a post on said second contact arm to hold said second contact arm in said first position, said second contact arm being moved to said second position by said circuit breaker operating mechanism when said post is released from said detent.

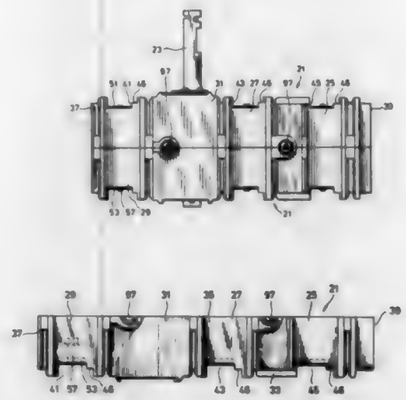
4,695,691

SWITCH HOUSING HAVING FIXED EXTERNAL NUTS FOR ATTACHMENT OF CONTACTS AND TERMINALS

Henrik Leth-Olson, Ringsted, and Lajos K. D. Marot, Virum, both of Denmark, assignors to Aktieselskabet Laur.Knudsen Nordisk Elektricitets Selskab, Copenhagen, Denmark

Filed Jan. 8, 1986, Ser. No. 817,107
Claims priority, application Denmark, Jan. 14, 1985, 161/85
Int. Cl.[4] H01H 19/04
U.S. Cl. 200—303 **6 Claims**

1. A housing having a hollow interior for receiving a complete switching mechanism for a multipole power switch of the kind including a reciprocative contact bridge supporting a plurality of movable contacts for short circuiting pairs of corresponding L-formed fixed contacts, said housing comprising two identical halves forming a bottom member and a top member and having a longitudinal dimension and a transverse dimension, the bottom member having a bottom wall and the top member having a top wall, each member also having two symmetrical end walls and two mutually symmetrical side walls, wherein the outer surface of said bottom wall and said top wall are provided with transverse grooves for receiving mounting ends of the L-formed fixed contact members and external terminals, said transverse grooves being provided with elongated holes for receiving contact ends of the L-formed fixed contact members, and wherein plate-shaped nut members are secured from the inside of the housing in each end



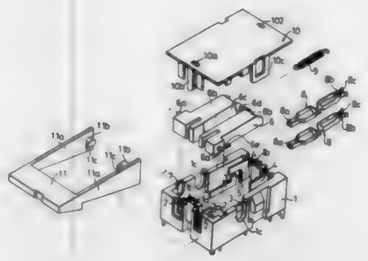
of said transverse grooves, said nut members being provided with threaded holes for receiving screws for fastening the mounting ends of L-formed fixed contacts and external terminals in one operation.

4,695,692

SWITCH WITH PIVOTING CLIP-TYPE CONTACTS

Yasuhiko Noda, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 13, 1985, Ser. No. 809,056
Claims priority, application Japan, Dec. 13, 1984, 59-189113[U]
Int. Cl.[4] H01H 21/62
U.S. Cl. 200—335 **4 Claims**



1. A switch having pivoting clip-type movable contacts, comprising:

a casing provided with a common terminal at one end and, at an opposite end of the casing, a normally-open terminal spaced apart by a gap from a normally-closed terminal, said terminals being planar in shape and arranged parallel to each other in one vertical plane;

a pivot member having one end pivotably mounted at said one end of said casing and its other end adapted to be pivotably moved along an arcuate path which includes said normally-closed terminal, said gap, and said normally-open terminal;

clip-type movable contacts having a first pair of clip contacts at a first end and a second pair of clip contacts at a second end remote from said first end, said clip-type movable contacts being held in said pivot member such that said first end thereof is disposed at said one end of said pivot member and said second end is disposed to be pivotably moved with said other end of said pivot member along said arcuate path, said first pair of clip contacts being clampingly engaged in a supporting hole bored in said common terminal so as to be in electrical contact with said common terminal and pivotally supported thereby, and said second pair of clip contacts being clampingly engageable with said normally-closed and said normally-open terminals;

a returning spring connected between said pivot member and said casing for biasing said pivot member to a return position; and

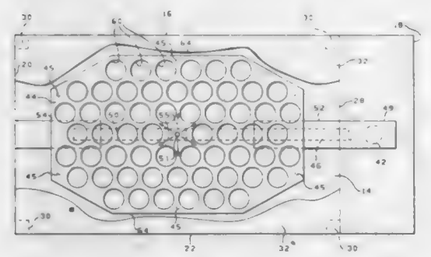
a lever pivotally mounted at one end to said casing and having a control piece which engages a portion of said pivot member so as to pivot said pivot member and move said second pair of clip contacts between said normally-closed and said normally-open terminals, said lever having an operating portion at its other end remote from said one end thereof and extending from said casing for operating the movement of said second pair of contacts between said terminals.

4,695,693

TRIANGULAR ANTENNA ARRAY FOR MICROWAVE OVEN

James E. Stuats, and Louis H. Fitzmayer, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 2, 1986, Ser. No. 915,048
Int. Cl.[4] H05B 6/72
U.S. Cl. 219—10.55 F **4 Claims**



1. A microwave cooking appliance comprising:

a cooking cavity for receiving objects to be heated, defined by a top wall, a bottom wall, a back wall, a pair of opposing side walls and a front wall defined by a front opening access door;

a microwave pervious support shelf disposed within said cavity spaced above and extending generally parallel to said bottom wall;

a source of microwave energy;

a generally planar antenna member disposed between said bottom wall and said support shelf, said antenna member being centered laterally in said cavity and extending over a substantial portion of said bottom wall, said antenna member having a peripheral edge spaced apart from said front, back and side walls thereby defining a peripheral region between said front, back, side and bottom walls and said peripheral edge of said antenna member; said member having formed therein a plurality of radiating circular apertures arranged in triangular fashion such that straight lines connecting the centers of any three closely adjacent apertures intersect to define an equilateral triangle;

means for coupling microwave energy from said microwave energy source to the center point of said antenna member comprising a microwave strip line member extending from said source beneath said antenna member and electrically connected to the center point of said antenna member;

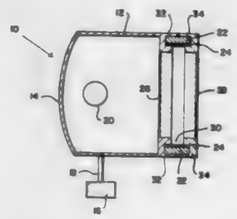
whereby microwave energy radiates from said apertures to heat items placed on said support shelf from below and energy is radiated through said peripheral region into the interior of said cavity and reflected by said front, back and top walls to heat the items on said shelf from above.

4,695,694

STRUCTURE FOR MINIMIZING MICROWAVE LEAKAGE

James D. Hill, Mount Airy, Md., and Gene R. Wooden, Sterling, Va., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Feb. 14, 1986, Ser. No. 829,343
Int. Cl.[4] H05B 6/76
U.S. Cl. 219—10.55 D **8 Claims**



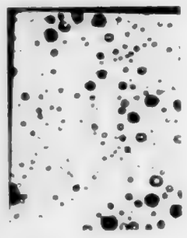
1. Apparatus for using microwave energy comprising walls defining a microwave cavity, said walls including a light window comprising an inner screen and a spaced-apart outer screen, each of said screens being substantially transparent to light and relatively opaque to microwave energy, said apparatus further including microwave absorbing material disposed between the two screens only at or near the periphery of the light window.

4,695,695

MIXTURE FOR PRODUCING FRACTURE-RESISTANT, FIBER-REINFORCED CERAMIC MATERIAL BY MICROWAVE HEATING

Thomas T. Meek, Los Alamos, and Rodger D. Blake, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 3, 1985, Ser. No. 719,654
Int. Cl.[4] H05B 6/64; C04B 35/36
U.S. Cl. 219—10.55 M **14 Claims**



1. A method for producing a fracture-resistant, fiber-reinforced ceramic material comprising the steps of:

a. preparing a ceramic precursor mixture comprisinng glass material, a coupling agent, and resilient fibers;

b. enclosing said mixture with an insulative material;

c. microwaving said mixture at a power, time, and frequency sufficient to bond ceramic material to said fibers; and
d. allowing said material to cool, thereby securing a fracture-resistant, fiber-reinforced ceramic material.

4,695,696

ELECTRIC DISCHARGE MACHINE WITH CONTROL OF THE MACHINING PULSE'S CURRENT VALUE IN ACCORDANCE WITH THE DELAY TIME

Yoshio Ozaki; Kazuo Tsurumoto; Takeshi Yatomi, and Masahiro Yamamoto, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP83/00167, § 371 Date Jan. 30, 1984, § 102(e) Date Jan. 30, 1984, PCT Pub. No. WO83/04204, PCT Pub. Date Dec. 8, 1983
PCT Filed May 27, 1983, Ser. No. 584,440
Claims priority, application Japan, May 28, 1982, 57-90799
Int. Cl.⁴ B23H *1/02, 7/04*
U.S. Cl. 219—69 P **8 Claims**



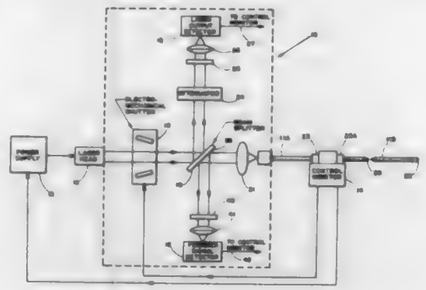
1. An electric discharge machine comprising a main switch circuit for supplying a current high in current peak value between electrodes which are made up of an electrode and a conductive workpiece and an auxiliary switching circuit for supplying a current low in current peak value between said electrodes, to intermittently cause electric discharge between said electrodes thereby to machine said workpiece; said electric discharge machine further comprising control signal forming circuit means for turning switching elements of said main switching circuit and said auxiliary switching circuit on and off, said control signal forming circuit means comprising: initial voltage applying means for applying an initial voltage across said electrodes with the aid of said auxiliary switching circuit; a decision time setting circuit for setting a time long enough to decide whether discharge occurring between said electrodes is normal; a detector circuit for detecting the occurrence at least one of the group of discharge and short-circuiting between said electrodes; an initial voltage application continuing means for causing, when said detector circuit detects the occurrence of discharge after said time set by said decision time setting circuit has passed, the application of the initial voltage across said electrodes by said auxiliary switching circuit to continue until said detector circuit detects the occurrence of discharge; means for driving, when said detector means detects the occurrence of discharge after the application of the initial voltage by said initial voltage application continuing means is continued, said main switching circuit to supply a normal current between said electrodes according to a given surface roughness; and means for driving, when said detector circuit detects at least one of the group of the occurrence of discharge within the time set by said decision time setting circuit and the occurrence of short-circuiting, at least one of said main switching circuit and said auxiliary switching circuit to immediately apply a current smaller than said normal current between said electrodes.

4,695,697

FIBER TIP MONITORING AND PROTECTION ASSEMBLY

Nadhir B. Kous, Minneapolis, Minn., assignor to GV Medical, Inc., Minneapolis, Minn.

Filed Dec. 13, 1985, Ser. No. 808,737
Int. Cl.⁴ B23K *26/02*
U.S. Cl. 219—121 LZ **14 Claims**



1. In a control system for use with a laser generated radiation system utilizing, in combination, a laser generator, a lens means, and an optical fiber for transmission of radiation in the form of laser energy from the generator to the lens, the lens means comprising a laser energy transmitting lens body with a pair of opposed surfaces, one of said surfaces being arranged for reception of an incoming beam of radiation from the distal tip end of an adjacent optical fiber and thence through said lens body; said control system comprising:
(a) a laser generator for creating and discharging an output of laser energy as a beam of such energy and being within a certain first predetermined output power level and having a certain first predetermined wavelength;
(b) a lens body transmissive to incident laser beam radiation within said first predetermined output power level and having a surface arranged for reception of an incoming beam of radiation at one end thereof and having an opposed surface arranged discharge of said beam therefrom;
(c) an optical transmitting fiber arranged to receive radiation at the proximal end thereof from said laser generator and to transmit such radiation along the length thereof, said optical fiber having a distal tip end disposed adjacent a surface of said lens body;
(d) said lens means emitting fluorescent radiation within a certain second predetermined wavelength upon excitation through exposure to said laser beam, said second predetermined wavelength being significantly different from said first predetermined wavelength; and
(e) sensing means for detecting the radiation emitted from said lens body.

4,695,698

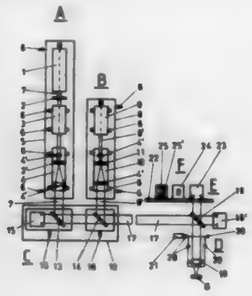
METHOD OF, AND APPARATUS FOR, GENERATING A PREDETERMINED PATTERN USING LASER RADIATION

Jean-Michel Mayor, Lausanne; Jürg Steffen, Sigriswil, and Peter Wüthrich, Frauenfeld, all of Switzerland, assignors to Lasarray Holding AG, Thundorf, Switzerland

Filed Jul. 2, 1985, Ser. No. 751,258
Claims priority, application Switzerland, Jul. 10, 1984, 3337/84; May 22, 1985, 2174/85
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 L **58 Claims**

1. A method of generating by means of a writing laser beam a predetermined pattern on a workpiece containing a three-dimensional integrated circuit and which is provided with a metalized raster, said method comprising the steps of:

displacing said workpiece and said writing laser beam relative to each other along substantially line-like paths of movement;
scanning said metalized raster using said writing laser beam during said relative displacing movement of said workpiece and said writing laser beam and thereby generating reflected light originating from said writing laser beam;
modulating said writing laser beam during said scanning step of the operation;



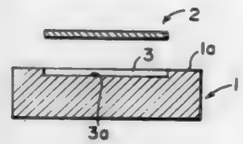
placing a radiation detector so as to receive said reflected light originating from said writing laser beam and to generate corresponding output signals; and
evaluating the output signals generated by said radiation detector in order to determine the relative positions of said workpiece and said writing laser beam and to possibly correct said relative displacing movements of said workpiece and said writing laser beam while writing said predetermined pattern.

4,695,699

METHOD OF MAKING COMPOSITE MEMBER

Koji Yagi; Jun Miyata, and Shunzo Takasuga, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Apr. 21, 1986, Ser. No. 854,382
Claims priority, application Japan, Apr. 30, 1985, 60-90967
Int. Cl.⁴ B23K *28/02, 26/00, 20/14*
U.S. Cl. 219—121 LD **5 Claims**



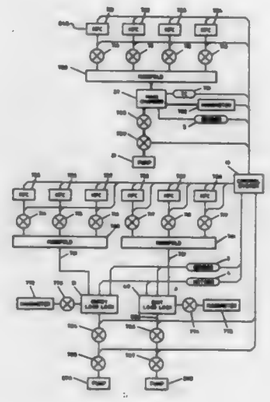
1. A method of making a composite member, which comprises the steps of:
(i) fitting a functional member constituted by an aluminum composite material capable of providing a desired target function to a recess of a base material constituted by an aluminum alloy and having said recess on a surface required to exhibit said desired target function,
(ii) beam-welding, in a non-oxidizing atmosphere, the entire peripheral section exposed at the outer surface among the joining sections of said base material with said functional member, and
(iii) subjecting said beam-welded base material and said functional member to diffusion bonding by pressing them at least in the fitting direction and heating them.

4,695,700

DUAL DETECTOR SYSTEM FOR DETERMINING ENDPOINT OF PLASMA ETCH PROCESS

John D. Provence, Mesquite; Frederick W. Brown, Colleyville, and John I. Jones, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 22, 1984, Ser. No. 663,903
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121 PD **14 Claims**



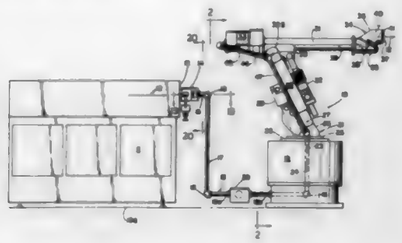
1. An apparatus for the manufacturing of semiconductor devices from semiconductor wafers having a plurality of semiconductor circuit patterns on at least a first surface of the semiconductor wafer, the apparatus comprises:
first means for providing a stream of reacting gases to react with the semiconductor wafer to create circuit elements according to the semiconductor circuit pattern thereby;
second means for handling the wafers and includes a third means for bringing the wafers into contact with the reacting gas, fourth means for degassing of the semiconductor wafers, fifth means for preventing the contamination of the third means and to provide a port for the transfer of the semiconductor wafers from the fourth means to the third means; sixth means for isolating the semiconductor wafers and the circuit elements from the third means, seventh means for providing a port for the transfer of the semiconductor wafer between the third means and the sixth means, and eighth means for transferring the semiconductor wafer from the fourth means to the third means and from the third means to the sixth means; and
twenty-fifth means for detecting when the etching performed by the reacting gases has reached a predetermined depth in the semiconductor wafer, wherein the twenty-fifth means further comprises:
twenty-seventh means for illuminating the first surface of the semiconductor wafers; and
twenty-eighth means for detecting reflected lights when reflected from trace materials in the reacting gases, said trace materials being released from the semiconductor wafer during etching by the reacting gases, wherein the twenty-eighth means comprises:
first detector means for detecting the reflected light;
second detector means for detecting the reflected light; and
twenty-ninth means for comparing the output of the first detector means to the output of the second detector means.

4,695,701

LASER WRIST

Robert C. Monteith, Milford, and Robert E. Borgmann, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 17, 1986, Ser. No. 840,361
Int. Cl.[4] B23K *26/08*
U.S. Cl. 219—121 LV **16 Claims**



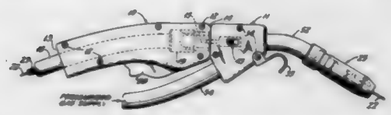
1. An improved articulatable laser wrist assembly, having:
a base housing, rotatable about
a first wrist axis:
means for mounting said base housing to a robotic arm:
a turret housing mounted to said base housing, and rotatable about
a second wrist axis, transverse to, and intersecting, said first wrist axis at a junction point; and
means for rotatably driving said base housing and said turret housing, said means for driving including drive elements concentric with said first wrist axis;
wherein the improvement comprises:
a continuous laser beam pathway through said base housing and said turret housing, said beam pathway extending collinearly with said first and second wrist axes; and
at least one mirror having a reflecting surface, said mirror mounted to said wrist assembly with said reflecting surface intercepting said junction point of said first and second wrist axes.

4,695,702

WELDING-PROCESS HANDLE FOR INTERCHANGEABLE WELDING-PROCESS HEADS

Thomas J. Gartland, Huntington Station, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Apr. 11, 1986, Ser. No. 850,628
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—137.63 **12 Claims**



1. An electric-arc torch assembly comprising an elongate tubular host-torch body of electrically insulative material extending between a supply end and a discharge end, a first tubular metal connector member retained within said host-torch body at said discharge end, a flexible hose connected to said connector member via the supply end of said host-torch body, said hose containing a tubular guide for consumable electrode material fed to and through said first connector member, and said hose having internal clearance with said guide and therefore provision for gas flow to said first connector member, said hose also containing flexible electrical-conductor material connected to said first connector member; and a welding-process head having a supply end detachably connected to the discharge end of said host-torch body via said first connector member, said welding-process head extending between said supply end and a discharge end and having a tubular casing of electrically insulative material, a second tubular metal connector member retained within said welding-head casing at the supply end thereof and having internal clearance with said tubular guide, adjacent ends of said metal connector members having coacting detachable formations for removable assembly of the welding-process head to said host-torch body; said welding-process head including a gas-constricted arc-nozzle connected to the discharge end of said head, an elastomeric seal ring for closing the internal clearance with said tubular guide and an external side-port gas-supply connection communicating with the interior of said second metal connector at a location downstream from said seal ring, for supply of substantial gas flows to said nozzle without back flow past said seal ring; whereby, upon detachment of said welding-process head from said host-torch body, a different welding process head that is dedicated to gas-shielded arc purposes may be similarly assembled to said host-torch body in unsealed internal-clearance relation with said tubular guide.

10. An electric-arc torch assembly comprising an elongate tubular host-torch body of electrically insulative material extending between a supply end and a discharge end, a first tubular metal connector member retained within said host-torch body at said discharge end, a flexible hose connected to said connector member via the supply end of said host-torch body, said hose containing a tubular guide for consumable electrode material fed to and through said first connector member, and said hose having provision for gas flow to said first connector member, said hose also containing flexible electrical-conductor material connected to said first connector member; and a welding-process head having a supply end detachably connected to the discharge end of said host-torch body via said first connector member, said welding-process head extending between said supply end and a discharge end and having a tubular casing of electrically insulative material, a second tubular metal connector member retained within said welding-head casing at the supply end thereof, adjacent ends of said metal connector members having coacting bayonet-lock formations for removable assembly of the welding-process head to said host-torch body; said adjacent ends comprising fitted coaxial male and female surfaces and said bayonet-lock formations including a radial pin extending outward of the male surface and an L-shaped groove for said pin on the female surface, said groove providing a substantially axial region of pin/groove engagement adjacent a rotational region of pin/-groove engagement, and an axially shiftable locking member carried with a connecting member having said male surface, said locking member being angularly offset from said radial pin, the extent of the angular offset being such that upon rotation into complete bayonet engagement, said locking member may shift axially into engagement with said groove, whereby the head-to-body assembly is retained against bayonet rotation unless said locking member is withdrawn from groove engagement.

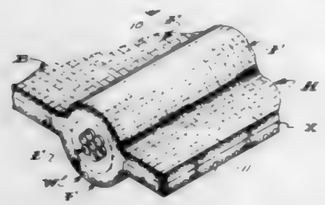
4,695,703

FLEXIBLE BLANKET HEATER

David E. Williams, and Edwin D. Hoyt, both of Hemet, Calif., assignors to Amark Industries, Inc., San Jacinto, Calif.

Filed Apr. 25, 1986, Ser. No. 855,925
Int. Cl.[4] H05B *3/36*
U.S. Cl. 219—212 **6 Claims**

1. A flexible blanket resistance heater structure comprising a thin, flexible, normally horizontal blanket structure of elastic dielectric material having a normally horizontal central plane and substantially flat top and bottom surfaces spaced above and below said central plane, an elongate flexible resistance element of metal alloy, the modulus of elasticity of which is materially less than the modulus of elasticity of said dielectric material, said element is positioned within said blanket structure on said central plane and formed to extend about and throughout said plane with all portions thereof in horizontal spaced relationship from each other, said element has terminal end portions accessible from the exterior of the blanket structure to connect with an electric power supply, the portions of the blanket structure and spaced from the element are free to bend to radii smaller than the smallest radii to which said element can bend within the limits of the modulus of elasticity of the alloy of which said element is made; and elongate top and bottom welts of said dielectric material on and projecting upwardly and downwardly from said top and bottom surfaces of the blanket structure adjacent to and coextensive with said element, said welts have outside surfaces joined with related



top and bottom surfaces, said welts establish curved, compacted, element-supporting masses of said dielectric material about the inside circumference of bends formed in the blanket structure adjacent said element and limit bending of said element beyond and modulus of elasticity of said alloy, and flexible fabric reinforcements are set within said elastic dielectric material adjacent said top, bottom and outside surfaces imparting the heater structure with planar dimensional stability and limiting elastic flow and displacement of said dielectric material about the inside circumference of bends formed in the blanket structure and to cause said supporting masses of dielectric material to compact substantially rigidly.

4,695,704

HAIR GROOMING ATTACHMENT FOR A CURLING IRON

Matthew L. Andis, 5315 Wind Point Rd., Racine, Wis. 53402

Division of Ser. No. 415,372, Sep. 7, 1982, Pat. No. 4,496,825, which is a continuation-in-part of Ser. No. 059,676, Jul., 1979, abandoned. This application Sep. 27, 1984, Ser. No. 655,320
Int. Cl.[4] A45D *1/04, 1/18;* **H05B** *3/00*
U.S. Cl. 219—222 **7 Claims**



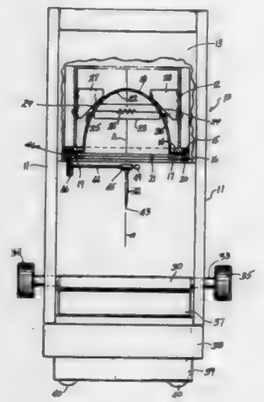
1. A hair curling iron comprising a handle, an elongated heating element attached to said handle and having an outer circular peripheral surface, a first end adjacent to said handle, and a second end spaced outwardly from said handle, means defining a plurality of generally arcuately spaced, radially open grooves extending longituidnally on said outer peripheral surface of said heating element between said first end and said second end and being axially open at said second end, a plurality of longitudinally extending bars slidingly and removably engaged in said grooves through said open ends thereof and being in thermally conductive and heat exchanging relation with said heating element, said bar supporting radially extending hair grooming means, and fastening means constituting an auxiliary handle and being attachable to said second end of said heating element for preventing removal of said bars from said grooves while permitting free, unlimited, bidirectional selative rotation between said fastening means and said heating element.

4,695,705

APPARATUS AND METHOD FOR LOCALIZED HEATING OF AN OBJECT AT PRECISE TEMPERATURES

Frank M. Kulig, Bloomfield, Conn., assignor to The J. M. Ney Company, Bloomfield, Conn.

Filed Feb. 14, 1986, Ser. No. 829,838
Int. Cl.[4] F24H *3/00;* **B23Q** *1/04*
U.S. Cl. 219—354 **6 Claims**



1. Apparatus for heating a workpiece to a predetermined temperature comprising a reflector having an axis with first and second focal points therealong; a source of radiant energy axially located substantially at first focal point within said reflector whereby said reflector reflects energy from said source to said second focal point; housing means supporting said reflector and source; a support assembly; means mounting said housing means on said support assembly in a fixed position; a platform movably supported on said support assembly below said housing for reciprocal movement along a vertical axis relative to said second focal point; means for vertically moving said platform on said support assembly relative to said housing along said vertical axis; a vertically extending probe member; an arm having one end pivotally mounted on said support assembly for pivotal movement in a plane normal to said vertical axis and carrying said probe member adjacent its other end, said probe member depending from said arm and having a free lower end locatable in a plane which essentially includes said second focal point, said arm being pivotable to move the free end of said probe member to a position in which it extends coaxially of said reflector and the free end of said probe member indicates said second focal point and to a second position wherein said arm and probe member are disposed outwardly of the radiant energy reflected from said reflector.

4,695,706

VERTICAL FURNACE FOR HEAT-TREATING SEMICONDUCTOR

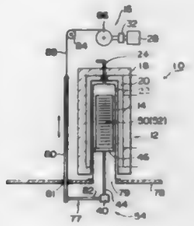
Youichi Mizushina, Kawasaki, Japan, assignor to Denkoh Co. Ltd., Oume, Japan

Division of Ser. No. 686,231, Dec. 26, 1984, Pat. No. 4,610,628. This application Jan. 9, 1986, Ser. No. 871,683

Claims priority, application Japan, Dec. 28, 1983, 58-201329; Nov. 6, 1984, 59-232397

Int. Cl.⁴ H05B *3/62*; F27B *9/06, 9/20*

U.S. Cl. 219—390 **5 Claims**



1. A vertical furnace for heat-treating a semiconductor comprising:

a furnace body formed into a cylindrical shape and substantially vertically arranged, said furnace body being closed at the upper end thereof and open at the lower end thereof and having a heater means disposed on the inner wall thereof;

a boat means adapted to support a semiconductor thereon so as to allow said semiconductor to be subjected to heat-treating in said furnace body;

a boat supporting means for supporting said boat means thereon;

a connecting means connected to said boat supporting means;

a boat driving means for vertically moving said boat supporting means through said connecting means to permit the introduction and removal of said boat means with respect to said furnace body to be carried out through the lower open end of said furnace body;

an operation space defined below said furnace body so as to allow the charging and discharge operations of said semiconductor with respect to said boat means to be carried out in said operation space;

a separating means for airtightly isolating said operation space from a space around said furnace body, said separating means being arranged below said furnace body and formed with an opening positionally corresponding to the lower open end of said furnace body, said separating means also airtighly isolating said operation space from said boat driving means;

said connecting means including a vertically movable shaft vertically arranged so as to be laterally spaced from said furnace body and vertically movably extending through said separating means in an airtight manner and a supporting member fixedly mounted on the lower end of said vertically movable shaft to support said boat supporting means thereon; and

said boat driving means including a pulley arranged above said vertically movable shaft, a take-up roller arranged to be laterally spaced from said pulley, a wire or belt means stretched between the upper end of said vertically movable shaft and said take-up roller through said pulley so as to be wound up on said take-up roller as desired, and a motor for rotating said take-up roller.

4,695,707

HEATING OVEN

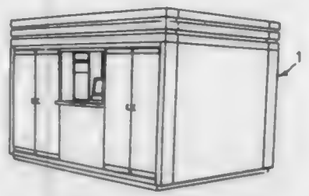
David N. Young, Glenrothes, Scotland, assignor to Kenetica Limited, Glenrothes, Scotland

Filed Aug. 12, 1985, Ser. No. 764,971

Claims priority, application United Kingdom, Oct. 6, 1984, 8425299

Int. Cl.⁴ F24D *5/00, 11/00*

U.S. Cl. 219—392 **4 Claims**



1. A heating oven for testing of semiconductors comprising:

a heating chamber for receiving a plurality of containers, said containers having a first portion for receiving semiconductors to be tested and a second portion containing test control apparatus for said semicondutors;

the chamber having a wall in the form of a heat barrier, said heat barrier defining apertures at spaced intervals to allow independent passage therethrough of each of said containers between a first position in which the portion for receiving semiconductors is fully out of the chamber and a second position in which the portion for receiving semiconductors is fully in the heating chamber;

wherein a portion of each said container intermediate said first and second portions porvides a closure which forms a heat barrier for a corresponding aperture in the second position of said container.

4,695,708

ELECTRIC COOKER

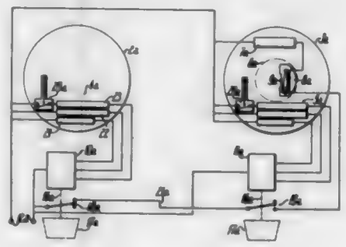
Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed May 15, 1986, Ser. No. 863,600

Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518124

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—486 **11 Claims**



1. An electric cooking unit, comprising:

at least two electric hotplates, each of said hotplates having at least one main heating resistor connected to associated leads for electrical power supply thereto;

manually-operable first and further power control devices for the electric hotplates, each of the power control devices being connected into the associated leads of said at least one main heating resistor of its respective electric hotplate and being provided to control said electric hotplate in an operating level ranging between a maximum and a minimum;

at least one of the electric hotplates having an additional heating resistor connected to the associated leads for its electrical supply, for additional heating common with the main heating resistor of this electric hotplate during an initial cooking phase, said electric hotplate thereby defining an additional supplyable hotplate;

a temperature switch responsive to said additional supplyable hotplate, said temperature switch being connected to deenergize said additional heating resistor above a predetermined temperature of said additional supplyable hotplate;

a first contact for controlling the additional heating resistor, said first contact being provided for manual operation by operating the first power control device of the additional supplyable hotplate; and,

an additional second contact for controlling the additional heating resistor, said second contact being connected for operation by operating a further power control device and being thereby connected into the lead to the additional heating resistor of the additional supplyable hotplate.

4,695,709

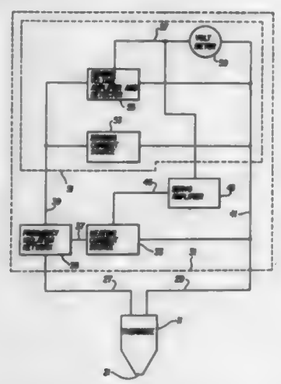
METHOD AND APPARATUS FOR HEATING AND CONTROLLING THE TEMPERATURE OF ULTRA SMALL VOLUMES

Frederick Sachs; Anthony Auerbach, both of Buffalo; Richard G. McGarrigle, Snyder, and James E. Neil, Buffalo, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed May 1, 1986, Ser. No. 858,386

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—494 **10 Claims**



1. An apparatus for heating, measuring, and controlling the temperature of an ultra small volume comprising:

a. an electrically non-conducting thin-walled microcapillary tube containing an electrically conductive material.

b. said microcapillary tube having an external coating of an electrically conductive material.

c. said electrically conductive materials meeting at one end of said microcapillary tube to form a heater-sensor portion juncture comprised of an area of electrical resistance along said juncture, said area of electrical resistance having a diameter between about 0.5 and about 5.0 microns, said heater-sensor portion having a heater portion and a heat-sensor portion.

d. means for applying an electrical current to said electrically conductive materials to heat said heater portion.

e. means for monitoring the electrical resistance of said heat-sensor portion to determine the temperature thereof, and

f. means for controlling the supply of electrical current to said heater-sensor portion.

4,695,710

ELECTRIC RICE COOKER WITH TIMER HAVING PLURAL MEMORY AREAS

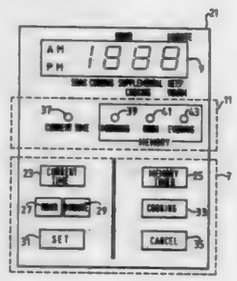
Kiyoshi Yamashita, Aichi; Terutaka Aoshima, Toyohashi; Ryuuho Narita, and Masahiro Imai, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 28, 1986, Ser. No. 856,287

Claims priority, application Japan, Oct. 4, 1985, 60-222077

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—506 **12 Claims**



1. An electric rice cooker with a timer, comprising:

memory means for storing a plurality of cooking completion time data;

selection means for selecting a desired cooking completion time data from said memory means;

setting means for altering according to a user command, a selected cooking completion time and storing the altered cooking completion time in said memory means;

cooking start time means for calculating a cooking start time data by subtracting the value of a prescribed period of time from the value of the cooking completion time data;

timing means for producing current time data;

comparison means for comparing the cooking start time data with the current time data fed from said timing means, said comparison means outputting a coincidence signal when both the cooking start time data and the current time data coincide with one another;

display means for displaying one of the selected cooking completion time data and the current time data; and

cooking control means for executing a prescribed cooking program when receiving the coincidence signal from said comparison means.

4,695,711

ELECTRICALLY OPERATED APPLIANCE CONTROLS AND METHODS OF MAKING THE SAME

Gram J. McGeorge, Spring Lake, Mich., assignor to Robershaw Controls Company, Richmond, Va.

Division of Ser. No. 685,775, Dec. 24, 1984, Pat. No. 4,636,621. This application Sep. 29, 1986, Ser. No. 912,968

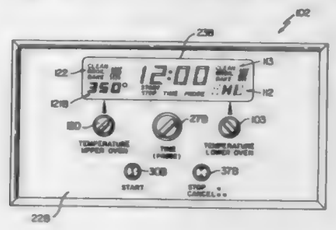
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—506 **20 Claims**

1. In an electrically operated appliance control comprising an electrically operated device for providing various modes of operation thereof, an electrically operated visual display unit, and a manually operated selector means electrically interconnected to said device and said unit for selecting a desired mode of operation of said device and for setting said device to pro-

vide that selected mode in a desired set manner thereof as being indicated on said display unit by such operation of said selector means, said selector means having a manually operated start actuator which when actuated will cause said device to begin to produce the selected mode of operation thereof and in that selected set manner thereof, the improvement wherein said selector means comprises a manually movable selector member which when moved in one direction a certain amount from an off position thereof to a first position thereof first selects one of said modes of operation and then sets said device to provide that selected mode of operation in a desired manner from a first sequence of operations thereof as being indicated on said dis-



play unit as said selector member is being further moved in said one direction between said first position thereof thru a certain distance that provides said first sequence of operations and a certain second position thereof and which when moved in said one direction to said second position thereof selects another mode of operation thereof and then sets said device to provide that other selected mode of operation in a desired manner from a second sequence of operations thereof as being indicated on said display unit as said selector member is being further moved in said one direction beyond said second position thereof thru a certain distance that provides said second sequence of operations.

4,695,712

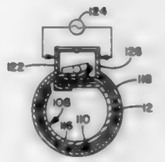
FLEXIBLE AUTOREGULATING HEATER WITH A LATCHING MECHANISM

Paul F. Busch, Los Altos Hills, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 507,919, Jun. 27, 1983, abandoned. This application Mar. 6, 1984, Ser. No. 586,712

Int. Cl.⁴ H05B *3/58*

U.S. Cl. 219—535 **26 Claims**



1. An autoregulating heater comprising

a flexible, relatively flat, elongated, autoregulating heater strap having at least a first thin elongated member of ferromagnetic material,

means for securing said heater strap in a band about a workpiece to be heated, and

means for developing an alternating current in said strap sufficient to cause its temperature to approach the Curie temperature of said ferromagnetic material.

4,695,713

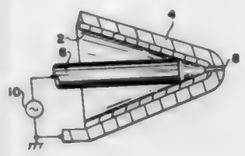
AUTOREGULATING, ELECTRICALLY SHIELDED HEATER

John F. Krumme, Woodside, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 430,317, Sep. 30, 1982, abandoned. This application Oct. 19, 1983, Ser. No. 543,443

Int. Cl.⁴ H05B *3/10*

U.S. Cl. 219—553 **16 Claims**



1. An element for an autoregulating heating device comprising:

a laminated structure having at least a first lamina and a second lamina, both being a material having a high magnetic permeability,

said first lamina being of a material having a lower Curie Temperature than said second lamina,

said laminae being in electrical contact along their adjacent surfaces.

4,695,714

LIGHT SOURCE STABILIZER WITH INTENSITY AND TEMPERATURE CONTROL

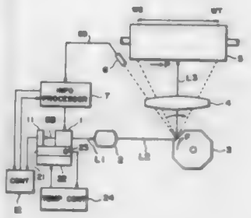
Junichi Kimizuka, Yokohama; Yukihide Ushio, Tokyo, and Kaoru Seto, Chigasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,402

Claims priority, application Japan, Feb. 8, 1983, 58-18065

Int. Cl.⁴ G01U *1/32*

U.S. Cl. 250—205 **13 Claims**



1. A light source stabilizer comprising:

light emitting means;

heating means for heating said light emitting means;

temperature sensing means for sensing a temperature of said light emitting means;

temperature control means for controlling said heating means in accordance with the output of said temperature sensing means, wherein said temperature control means sets the control temperature to be approximately equal to the highest ambient temperature of said light emitting means;

light intensity detection means for detecting light intensity of said light emitting means; and

light intensity control means for controlling the light intensity of said light emitting means in accordance with the output of said light intensity detection means, wherein said light intensity control means effects control of the light intensity of said light emitting means after the temperature sensed by said temperature sensing means reaches the control temperature.

4,695,715

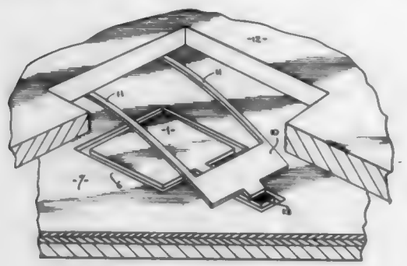
INFRARED IMAGING ARRAY EMPLOYING METAL TABS AS CONNECTING MEANS

Robert E. Maim, Pacific Palisades, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Dec. 12, 1985, Ser. No. 808,209

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 J **7 Claims**



1. An infrared imaging device comprising

a semiconductor substrate,

an insulating layer disposed on one side of said substrate,

a plurality of discrete electrodes formed and laid on said insulating layer, said electrodes being substantially transparent to infrared radiation,

a second substrate,

a plurality of integrating capacitors disposed on a second substrate mounted in alignment over the semiconductor substrate so that the electrodes and integrating capacitors are in general aligned positions to coincide with each other,

a plurality of means for connecting each electrode to a respective one of said capacitors to a charging voltage and for thereafter discharging each said electrode, the charge so accumulated on each capacitor being related to the charge collected at the insulating layer-substrate interface beneath the electrode due to interaction by radiation passing therethrough,

means for creating a depletion layer in the substrate and for floating each of the electrodes,

means for reading out each detector by measuring the amount of charge that needs to be placed on the electrode to partially discharge the electrode to a predetermined voltage,

means for adjusting the initial electrode voltage and the voltage to which the electrode is partially discharged to obtain an approximately linear relationship between the charge which is transferred to the electrode and the amount of charge which is accumulated the insulating layer-substrate interface beneath the electrode due to incident radiation.

4,695,716

IMAGE SENSOR ARRAY FOR ASSEMBLY WITH LIKE ARRAYS TO FORM A LONGER ARRAY

Jagdish C. Tandon, Fairport, and Mehdi N. Araghi, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 808,797, Dec. 13, 1985, Pat. No. 4,668,333. This application Oct. 27, 1986, Ser. No. 923,516

Int. Cl.⁴ H01V *40/14*

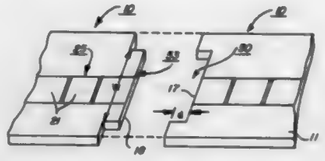
U.S. Cl. 250—211 R **1 Claim**

1. A sensor array adapted for assembly with other like arrays to provide a longer array, comprising;

(a) a (110) silicon chip;

(b) at least one row of photosites on said chip, the boundaries of said photosites being parallel to the (111) planes of said chip whereby said photosites are generally in the shape of a parallelogram;

(c) the opposing ends of said chip being uniformly smooth and parallel to said chip (111) planes whereby the ends of said chip extend at an acute angle to the axis of said row of photosites so that said chip has a generally parallelogram shape complementary to said photosites;



(d) each end of said chip being formed along a line passing along the boundary between adjoining photosites so that the photosites at the border of each end of said chip are unimpaired and the same size as the other photosites in said row of photosites whereby said chip may be assembled with other like chips by bringing said chip ends into abutting engagement with the ends of adjoining chips with the photosite row of said chip being aligned with the photosite rows of said adjoining chips.

4,695,717

SEMI-CONDUCTOR DEVICE AND ELECTRONIC APPARATUS USING THE SAME

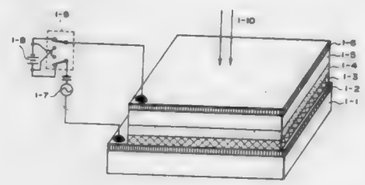
Yutaka Hirai, Tokyo; Masahiro Haruta, Funabashi; Yukuo Nishimura, Sagamihara; Hiroshi Matsuda, Yokohama, and Takashi Nakagiri, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,497

Claims priority, application Japan, Apr. 24, 1984, 59-81091; May 16, 1984, 59-96374; May 16, 1984, 59-96372

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 R **15 Claims**



1. A display device which comprises a laminated structure of a photoconductive layer, a charge-retaining layer and a display layer which are provided between two electrophotoconductive films, the charge-retaining layer being provided between the photoconductive layer and the display layer, at least one of the two electroconductive films being transparent.

4,695,718

PROTECTIVE LIGHT FILTER SYSTEM FOR IMAGE INTENSIFIER

James M. Dill, Pompano Beach, Fla., assignor to EOL_3 Company, Inc., Fort Lauderdale, Fla.

Filed Jul. 9, 1986, Ser. No. 883,636

Int. Cl.⁴ H01J *31/50*

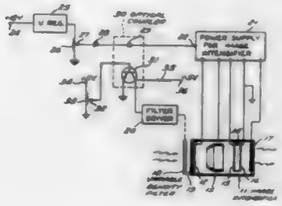
U.S. Cl. 250—213 VT **6 Claims**

1. In combination with an image intensifier having a photo-

cathode for receiving incident light and a power supply for said image intensifer,

a variable density light filter controlling the level of the incident light received by said photocathode;

a current-amplifying optical coupler having a current-conducting light emitting device operatively connected in said power supply to emit light which changes in accordance with changes in the power supply current, and a



light sensing current-producing device optically coupled to said light emitting device to produce current which changes in accordance with changes in the light output from said light emitting device;

and a filter driver operatively connected between said light sensing device and said filter to operate said filter to control the incident light input to said photocathode in inverse relation to the current produced by said light sensing device.

4,695,719

APPARATUS AND METHOD FOR OPTO-ELECTRONIC PACKAGE

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 5, 1983, Ser. No. 557,972

Int. Cl.[4] E04G *17/06*

U.S. Cl. 250—216 **19 Claims**



1. In the process of making an opto-electronic package for ranging devices having a substrate, a die with electronic components and radiation detectors thereon, a plurality of lenslets with a mask therebetween mounted adjacent the die and a transparent cover adjacent the lenslets and mask and attached to the substrate so that radiation is directed by the lenslets to the detectors and not the electronic components, the improvement comprising:

constructing the lenslets in the cover on one side.

4,695,720

OPTOELECTRONIC INCREMENTAL MEASURING SYSTEM WITH ADJUSTABLE LED POSITIONING

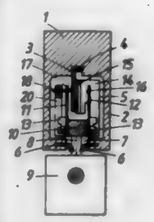
Heinz Rieder, St. Pantaleon, and Max Schwaiger, Osterniething, both of Austria, assignors to EMR Elektronische Mess- und Regelgerate Gesellschaft m.b.H., Tarsdorf, Austria

Filed Dec. 5, 1985, Ser. No. 805,850

Claims priority, application Austria, Dec. 5, 1984, 3856/84

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE **6 Claims**



1. An optoelectronic incremental measuring system, comprising:

a scale member provided with an incremental scale having a plurality of predetermined scale increments; and

a scanning unit mounted for relative movement of said unit and said scale member along said scale, said scanning unit comprising:

a plurality of scanning grids spaced apart along said scale by a distance which is an integral multiple and a fractional part of one scale increment,

a plurality of optoelectronic receivers each associated with a respective one of said grids,

a support,

a printed circuit board of a flexibly resilient material,

a plurality of light-emitting diodes mounted on said printed circuit board, each of said light-emitting diodes being positioned to cooperate with a respective one of said grids and a respective one of said receivers for emitting light which is detected by the respective receiver and is modulated by said scale and the respective grid upon said relative movement, said receivers generating relatively phase-displaced sine signals having periods which correspond in number to a number of said scale increments swept by said scanning unit upon said relative movement, and

means for individually adjusting positions of said light-emitting diodes relative to said support by deforming said printed circuit board in a region at which the respective light-emitting diode is mounted thereon for adjusting said signals relative to one another.

4,695,721

SURFACE TEXTURE RECOGNITION USING MULTI-DIRECTIONAL SCANNING

Emmet M. Fulkerson, Cincinnati; Ralph M. Somers, West Chester, both of Ohio, and Diana R. Compton, Bloomington, Ind., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 26, 1985, Ser. No. 813,360

Int. Cl.[4] G06K *9/30*

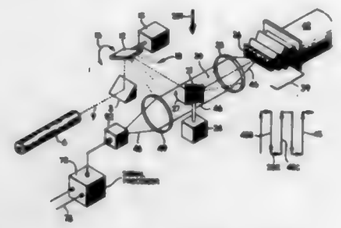
U.S. Cl. 250—234 **6 Claims**

1. Apparatus for obtaining information from a surface, comprising:

(a) means for scanning a light beam along a path on the surface;

(b) means for successively sensing reflected light at a plural-

ity of path locations within each pixel on the surface and for generating an intensity signal for each location; and



(c) means for arranging the intensity signals successively generated for each pixel into groups and for deriving a single pixel signal from each group of intensity signals.

4,695,722

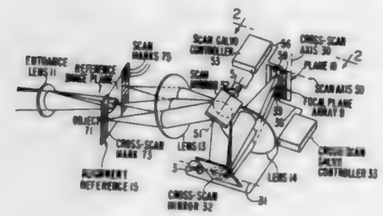
OPTICAL SCANNER ERROR COMPENSATOR

Wesley D. Motooka, Irvine, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Apr. 25, 1986, Ser. No. 855,974

Int. Cl.[4] H04N *1/04;* **G01B** *11/26*

U.S. Cl. 250—235 **10 Claims**



1. Apparatus for compensating for errors introduced into an optical scanning system, said apparatus comprising:

a reference plane comprising an object to be projected;

a detector, lying in a detector plane, for converting the object into electrical signals;

means for optically scanning the object onto the detector;

lying in the reference plane, an elongated reference mark;

lying in the detector plane, a first optical displacement sensor generating a first error compensation signal proportional to the degree of linear misalignment between said first optical displacement sensor and the projection of the reference mark thereonto, and hence the misalignment between the object and the detector, along a first axis; and

means for controlling said optical scanning means in accordance with said first error compensation signal in order to compensate for said misalignment.

4,695,723

CORONA-CHARGING APPARATUS

James C. Minor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1985, Ser. No. 744,079

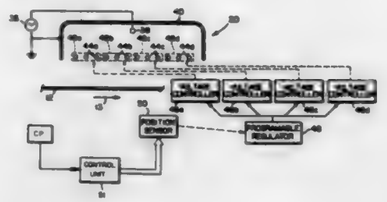
Int. Cl.[4] G03G *15/02;* **H01T** *19/00*

U.S. Cl. 250—325 **3 Claims**

1. In corona-charging apparatus having corona electrode means for charging successive image segments of a moving charge-receiving element such that the charging rate from an image segment to the next may be adjusted in the transition region between the trailing edge of one image segment and the leading edge of the next image segment, the improvement comprising:

a composite grid including a plurality of conductive control grid sets with at least one grid wire per set between the electrode means and the charge-receiving element, and extending in a direction transverse to the direction of movement of the charge-receiving element,

control means for adjusting the voltage of each of said grid sets independently of other grid sets to cause corona discharge to effect a predetermined charge on the portion of



the charge-receiving element aligned with each grid set, and

regulator means for said control means synchronized with the movement of the charge-receiving element such that the voltages of said control grid sets are adjusted respectively when the control grid set is aligned with the transition region of the charge-receiving element.

4,695,724

AC-MODULATION QUADRUPOLE MASS SPECTROMETER

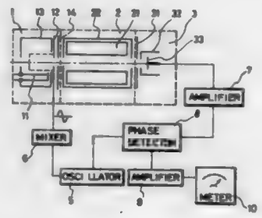
Fumio Watanabe, Fukushima; Shojiro Komaki, Tokyo; Masao Miyamoto, Tokyo, and Takao Ito, Tokyo, all of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Continuation of Ser. No. 658,481, Oct. 9, 1984, abandoned. This application Nov. 24, 1986, Ser. No. 935,097

Claims priority, application Japan, Oct. 14, 1983, 58-192112

Int. Cl.[4] B01D *59/44*

U.S. Cl. 250—292 **9 Claims**



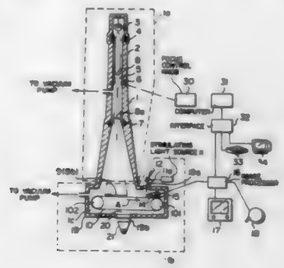
1. A quadrupole mass spectrometer comprising: ion generating means for generating an ionized particle stream; modulating means coacting with the ion generating means for modulating the ionized particle stream with an AC voltage to produce a frequency-modulated ionized particle stream, the modulating means including an oscillator for producing a frequency signal, and a mixer connected to receive the frequency signal from the oscillator for producing therefrom the AC voltage; quadrupole analyzing means for receiving and analyzing the frequency-modulated ionized particle stream; detecting means for receiving the analyzed frequency-modulated ionized particle stream and detecting therefrom a modulated ion current signal; and synchronizing means for receiving the frequency signal and the modulated ion current signal and synchronizing the frequency signal with the modulated ion current signal to produce a DC voltage output signal representative of the level of the modulated ion current signal analyzed by the quadrupole analyzing means.

4,695,725

METHOD OF DETECTING A FOCUS DEFECT OF AN ELECTRON MICROSCOPE IMAGE

Nobufumi Mori; Yuichi Hosoi; Kenji Takahashi, and Junji Miyahara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Dec. 9, 1985, Ser. No. 806,466
Claims priority, application Japan, Dec. 10, 1984, 59-260517; Apr. 12, 1985, 60-78079
Int. Cl.[4] H01J 37/21, 37/153
U.S. Cl. 250—327.2 10 Claims



1. A method of detecting a defocus value of an image produced by an electron microscope, comprising the steps of:

(i) exposing a two-dimensional image sensor under vacuum to an electron beam having passed through a specimen to enable said two-dimensional image sensor to store the energy of the electron beam;

(ii) applying stimulating energy to said two-dimensional image sensor to discharge the stored energy as light;

(iii) photoelectrically detecting the light discharged from said two-dimensional image sensor to produce an image signal; and

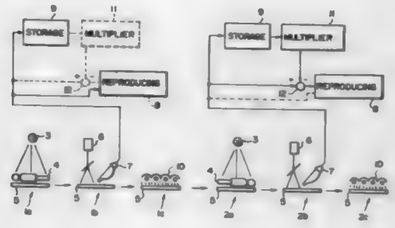
(iv) computing the defocus value of the image based on said image signal.

4,695,726

RADIATION IMAGE REPRODUCING METHOD AND APPARATUS

Hideo Watanabe, and Nobuyoshi Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1985, Ser. No. 732,210
Claims priority, application Japan, May 9, 1984, 59-92628
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—327.2 5 Claims



1. A method of reproducing a radiation image in a radiation image recording and reproducing system in which object image recording is conducted by exposing a stimulable phosphor sheet to a radiation passing through an object to have a radiation image of the object stored in the stimulable phosphor sheet, image read-out is conducted by scanning the stimulable phosphor sheet carrying the radiation image stored therein by stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the stored radiation energy and by photoelectrically detecting the emitted light to obtain an electric image signal, a visible image is reproduced by use of the electric image signal, the radiation image remaining in the stimulable phosphor sheet after the image read-out is erased, and the erased stimulable phosphor sheet is reused for the radiation image recording,

the method of reproducing a radiation image comprising the steps of:

(i) reading out a radiation image stored in said stimulable phosphor sheet after n+1'th object image recording on the same stimulable phosphor sheet, thereby obtaining an electric image signal after the n+1'th image recording,

(ii) subtracting an electric image signal corresponding to a remaining radiation image obtained after n'th image recording from said electric image signal after the n+1'th image recording, said electric image signal corresponding to said remaining radiation image being determined in accordance with recording and read-out conditions, in accordance with erasing conditions at erasing of an n'th recorded image, and further in accordance with a type of stimulable phosphor sheet employed, and

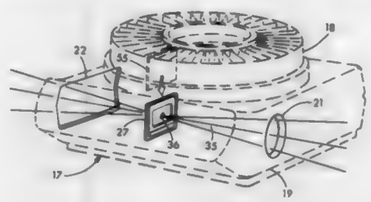
(iii) reproducing a visible image only of a radiation image recorded by the n+1'th image recording on the basis of an electric image signal obtained by said step(ii).

4,695,727

OPTICAL ANALYTICAL INSTRUMENT WITH AUTOMATIC SAMPLE CHANGING

Philip R. Brierley, and Stephen R. Lowry, both of Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Mar. 7, 1986, Ser. No. 837,608
Int. Cl.[4] G01N 21/35
U.S. Cl. 250—328 9 Claims



1. An anlaytical instrument for use in infrared spectroscopy comprising:

(a) a housing with walls therein defining a sample chamber, including a wall on one side of the chamber having an inlet opening therein and a wall on the other side of the chamber having an outlet opening therein, a beam path being defined between the inlet and outlet openings within the sample chamber;

(b) an infrared detector and optical elements within the housing arranged to receive an incoming beam of infrared radiation from a source and to direct the beam of radiation across the beam path between the inlet and outlet openings in the sample chamber walls and onto the detector;

(c) slide projector apparatus having a magazine adapted to hold a plurality of sample holders each having substantially the dimensions of a photometric transparency slide with which the slide projector apparatus is adapted to be used, and further including means therein for selectively transporting a single sample holder at a time from the magazine to a slide viewing position away from the magazine, the projector apparatus being free of obstructions in an optical path therethrough which extends from an entrance opening to an exit opening in the projector apparatus and which includes the slide viewing position; and

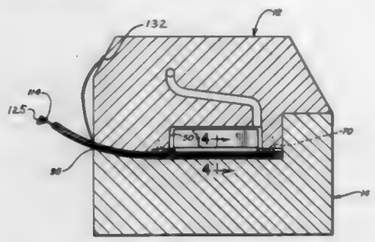
(d) means for mounting the projector apparatus within the sample chamber of the housing such that the projector apparatus is located with the slide viewing position interposed in the beam path and with the beam path passing unimpeded through the projector apparatus.

4,695,728

PORTABLE RADIATION CONTAMINATION DETECTOR

Terrence R. Gibes, 1214 Illini Dr., Lockport, Ill. 60441

Filed Feb. 26, 1986, Ser. No. 833,011
Int. Cl.[4] G01J 1/00; G01F 23/00
U.S. Cl. 250—336.1 8 Claims



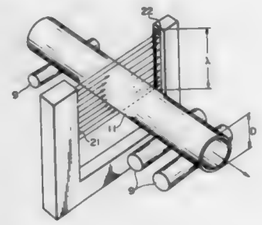
1. A radiation detecting apparatus comprising a shielded container made of radiation resisting material, said container having at least two shield components, one of said components having a protruding section, the other component having a receding section for receiving said protruding section, said protruding and receding sections having configured wall surfaces spaced from each other and defining therebetween a curvilinear slot, a chamber in one of said components communicating with said slot, a detector disposed in said chamber, a slide retainer disposed in said slot, and means connected to said detector for providing radiation detecting reading of material inserted into said slide retainer.

4,695,729

TUBULAR PART WALL THICKNESS MEASURING DEVICE

Asao Mouno, Kanagawa; Kiyoo Watanabe, and Kazuyuki Kaneko, both of Tokyo, all of Japan, assignors to Fuji Electric Co., Ltd. and Fuji Facom Corporation and Kawasaki Steel Corporation, both of, Japan

Continuation of Ser. No. 515,230, Jul. 19, 1983. This application May 27, 1986, Ser. No. 868,895
Int. Cl.[4] G01N 23/08
U.S. Cl. 250—358.1 1 Claim



1. A device for measuring the wall thickness of a tubular part, comprising:

radiation source means;

radiation detector means disposed in spaced apart aligned relation with respect to said source means, to accommodate a tubular part therebetween, the length of said detector means being at least as large as the length of said radiation source means, and a width of a radiation beam from said radiation source means being substantially larger than a diameter of said tubular part, said tubular part comprising a continuously or intermittently vibrating element, and said radiation source means and said radiation detector means providing a gap therebetween, said gap having a length in a transverse direction larger than said diameter of said tubular part in said transverse direction, and

wherein said radiation source means and said radiation detector means are each provided with collimator means having at least one opening for providing parallel radiation beams, a width of a radiation beam provided by said source means and said collimator means of said source means being sufficiently larger than said diameter of said tubular part to allow for vibration of said part, said collimator means of said source means being provided with an opening defined by a plurality of collimator holes arranged in a plurality of lines, the collimator holes of adjacent ones of said lines being formed in a staggered relationship; and

a transverse gap defined by said source means, said detector means, said collimator means of said source means, and said collimator means of said detector means having a length sufficiently larger than said diameter of said tubular part to allow for vibration in said transverse direction; the length of said detector means being at least larger than the length of said opening of said detector collimator means; and

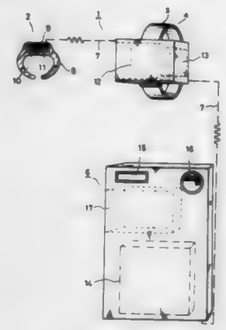
wherein said radiation detector means provides an output for determining an average wall thickness of said tubular parts.

4,695,730

LOCAL RADIATION EXPOSURE ALARM APPARATUS

Kimio Noda, Ibaraki; Kiyoshi Ozeki, Chiba; Hiroaki Furukawa, Ibaraki, and Katsunori Watai, Kanagawa, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan and Ohyo Koken Kogyo Co., Ltd., both of Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,793
Claims priority, application Japan, Sep. 17, 1984, 59-192497
Int. Cl.[4] G01T 1/24
U.S. Cl. 250—370 6 Claims



1. An exposure alarm apparatus comprising:

a detector unit having a semiconductor element sensitive to gamma radiation, a filter for improving an energy characteristic of said semiconductor element, and a cushion material for embedding therein said semiconductive element, said detector unit being formed in the shape of a finger ring having a body portion so that said detector unit can be removably adapted to a finger of an operator, said semiconductor element, filter and cushion material being embedded in said body portion;

a preamplifier unit electrically connected to said semiconductor element, said preamplifier unit having first means

for selectively encasing said detector unit, and a strap for removably engaging said amplifier unit to the operator; and

a measuring unit electrically connected to said preamplifier unit, said measuring unit having second means for selectively encasing said preamplifier unit, and a clip device for removably engaging said measuring unit to the operator.

4,695,731

IONIZATION CHAMBER

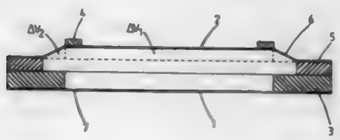
Keith J. Larkin, Uckfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 2, 1985, Ser. No. 762,008

Claims priority, application United Kingdom, Sep. 10, 1984, 8422786

Int. Cl.⁴ G01T *1/185*

U.S. Cl. 250—374 **14 Claims**



1. A device for measuring intensity of a beam of ionizing radiation comprising

a closed chamber having at least one flexible wall through which ionizing radiation is passed,

an ionizable gas completely contained in said closed chamber at an ambient pressure, said gas having a total volume of V_T, and

two opposing electrodes contained in said closed chamber, one of said two electrodes being disposed on said flexible wall, said two electrodes having an applied potential difference for producing an ionization current from said ionizing radiation,

said two electrodes defining an active region therebetween having a volume V_A, said volume V_A being less than V_T, said ionization current flowing in said active region,

wherein said volume V_T and said volume V_A both vary with changes in ambient pressure and in ambient temperature, said changes in ambient pressure and ambient temperature producing changes ΔV_T and ΔV_A in V_T and V_A respectively,

wherein a proportional change $\Delta V_A/V_A$ in said volume of said active region is substantially equal to a proportional change $\Delta V_T/V_T$ in said total volume within operating ranges of said ambient pressure and said ambient temperature, and

wherein said ionizable gas in said active region has a weight per unit area remaining substantially constant when measured in a plane normal to a line intersecting said electrodes.

4,695,732

ELECTRON LITHOGRAPHY APPARATUS

Rodney Ward, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

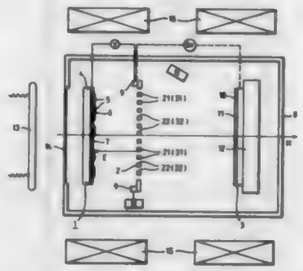
Filed May 6, 1985, Ser. No. 730,885

Claims priority, application United Kingdom, May 18, 1984, 8412698

Int. Cl.⁴ H01J *37/00, 37/30*

U.S. Cl. 250—492.2 **7 Claims**

1. An electron image projector for projecting with substantially unity magnification a beam of electrons emitted by a cathode onto a target under the action of a substantially uniform electric field wherein the beam of electrons has a predetermined spatial pattern which extends transversely to the electric field, the projector comprising an electron emissive cathode, an anode comprising a grid having a plurality of mutually parallel slats, each pair of parallel slats being spaced apart along their entire lengths by electron permeable regions, the grid being disposed intermediate and parallel to the cathode and the target and the area of slats and regions being large enough that said beam is interrupted over its entire spatial pattern only by said parallel slats, an electric field voltage



source, means on said cathode and said grid for connecting said electric field voltage source thereto whereby in operation said uniform electric field is produced between the cathode and the anode grid, the projector further comprising means for producing a substantially uniform magnetic field parallel to the electric field to focus the patterned beam of electrons onto the target.

4,695,733

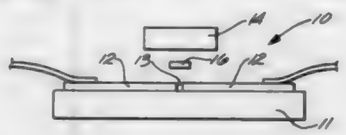
PHOTOCONDUCTIVE POWER SWITCH

Philip Pesavento, 1622 6th St., Manhattan Beach, Calif. 90266

Filed Oct. 17, 1984, Ser. No. 661,938

Int. Cl.⁴ H03K *3/42;* **H01L** *27/14*

U.S. Cl. 250—551 **7 Claims**



1. A method for producing an electrical pulse of at least about 10 amperes and about 100 volts at a switching speed of about one nanosecond or less comprising:

providing a photoconductive switch comprising:

non-cryogenically cooled wafer of high resistivity semiconductor material capable of transistion between a high resistivity state and a low resistivity state in about one nanosecond or less selected from the group consisting of compounds containing elements from Group III to Group V, carbon, silicon carbide and mixtures thereof;

a pair of electrodes mounted on the wafer, said electrodes being spaced apart to form a gap;

a high powered multiple stripe diode laser capable of emitting light having an energy at least as great as the band gap of the semiconductor material at an intensity of at least 50 picojoules; and

means for directing light emitted from the diode laser onto the gap;

applying a bias voltage of at least about 100 v across the gap; and

activating the diode laser to thereby generate an electrical pulse of at least about 10 amperes and about 100 volts.

4,695,734

PHOTOELECTRIC SMOKE SENSOR INCLUDING A PHOTOSENSING DATA CORRECTION RATIO CORRECTION CIRCUIT

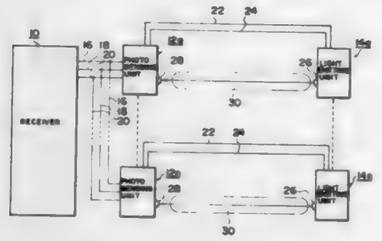
Hiroshi Hosma, Tokyo, and Junichi Narumiya, Kanagawa, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,385

Claims priority, application Japan, Mar. 5, 1984, 59-31476[U]

Int. Cl.⁴ G01N *15/06;* **G08B** *17/10*

U.S. Cl. 250—573 **5 Claims**



1. A photoelectric smoke sensor in which a light emitting unit and a photo sensing unit are arranged to face each other a predetermined distance away from each other, wherein a pulse light emitted from said light emitting unit, which has been attenuated due to smoke, is received by said photo sensing unit, thereby detecting a fire, comprising:

a storage means for storing photo sensing data when a power source is turned on as initial photo sensing data;

a correction ratio correcting means for comparing at every predetermined fouling correction period the photo sensing data at that time with said initial photo sensing data and, when a difference is noted between said data, for correcting a correction ratio in accordance with said difference;

a correction operating means for inputting the photo sensing data that is derived at every predetermined period shorter than said correction period as is and for obtaining correction photo sensing data due to a multiplication with the correction ratio at that time used as a multiplier; and

a smoke discriminating means for discriminating a fire on the basis of said correction photo sensing data

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4,695,735

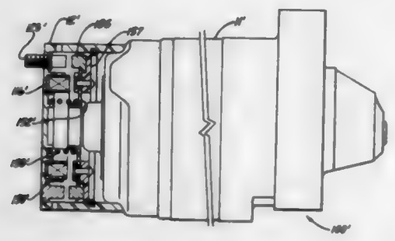
ENGINE STARTER DRIVE WITH INTEGRAL STARTER RELAY

John R. Tallis, Jr., Horseheads, and Nicholas A. Volino, Elmira, both of N.Y., assignors to Facet Enterprises, Inc., Tulsa, Okla.

Filed May 30, 1986, Ser. No. 868,448

Int. Cl.⁴ F02N *11/00;* **H02P** *9/00;* **H02K** *1/06*

U.S. Cl. 290—38 R **10 Claims**



1. A starter drive for starting an internal combustion engine, said starter drive comprising:

a starter housing having a first end and a second end;

an electric motor positioned within said starter housing;

a drive shaft that is connected to said electric motor to be driven thereby, said drive shaft carrying advancing starting means for advancing by the rotation of said drive shaft toward said second end of said starter drive into starting engagement with the internal combustion engine to be started; and

solenoid means for selectively delivering electrical power to said electric motor, said solenoid means being mounted to said starter housing at said first end thereof, said solenoid means comprising:

a housing member;

a first terminal attached to said housing member, said first terminal being adapted to be connected to a source of electric power;

a second terminal attached to said housing member and being spaced apart from said first terminal, said second terminal being electrically connected to said electric motor;

a translatable annular armature positioned within said housing member and being translatable within said housing member between a first position and a second position;

biasing means normally biasing said translatable annular armature member toward one of said first position and said second position;

a solenoid coil positioned within said housing member, said solenoid coil being electrically connected to said first terminal and being adapted to be electrically energized when said first terminal is connected to said source of electric power, said solenoid coil, when electrically energized, creating an electromagnetic force that translates said translatable annular armature toward the other of said first position and said second position; and

contact means connected to said translatable annular armature and translatable therewith, said contact means electrically connecting siad first terminal and said second terminal to one another when said translatable annular armature has been translated toward said other of said first position and said second position, said first terminal and said second terminal being electrically disconnected from one another when said translatable annular armature is in said one of said first position and said second position.

4,695,736

VARIABLE SPEED WIND TURBINE

Glidden S. Doman, Granby, Conn.; Joseph M. Kos, Holyoke, Mass.; Kermit I. Harner, Windsor, Conn.; Eugene D. DiValentin, Enfield, Conn., and Henry S. Healy, Bloomfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 18, 1985, Ser. No. 799,045

Int. Cl.⁴ F03D *9/02*

U.S. Cl. 290—44 **8 Claims**

1. A variable speed wind turbine system having an optimum power coefficient versus velocity ratio performance curve, comprising:

a turbine rotor shaft with a hub at one end with at least one blade attached to the hub;

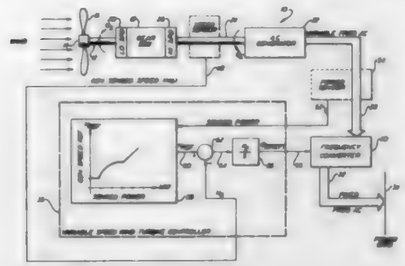
a gearbox, having a low speed side thereof attached to the other end of the turbine rotor shaft;

an AC generator, having a generator rotor shaft attached to a high speed side of the gearbox, the generator providing variable frequency AC at a power output line thereof;

sensing means, for sensing generator speed and generator electrical power output and for providing sensed signals indicative thereof;

a variable speed wind turbine controller, responsive to the sensed signals indicative of generator speed and generator electrical power output, for providing a generator torque

command signal for commanding maneuvers of the generator speed according to a function defining generator speed versus generator electrical power output which manuevers tend to cause the wind turbine to operate substantially on the wind turbine power coefficient versus velocity ratio optimum performance curve substantially at the peak thereof; and



a frequency converter, electrically connected to the generator power output line and responsive to the generator output AC for converting the variable frequency AC to constant frequency AC, the frequency converter responsive to the generator torque command signal for controlling the magnitude of power flow through the converter, thereby effecting control of the generator torque.

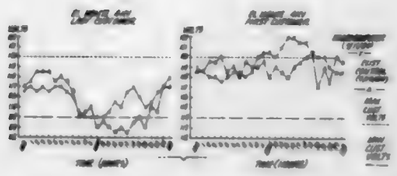
4,695,737

MICROCOMPUTER CONTROLLED POWER REGULATOR SYSTEM AND METHOD

Joe D. Rabon, Hacienda Heights, and Rudy Haro, Alta Loma, both of Calif., assignors to Southern California Edison, Rosemead, Calif.

Filed Mar. 19, 1986, Ser. No. 841,317
Int. Cl.[4] H02J 3/00
U.S. Cl. 307—31 **25 Claims**





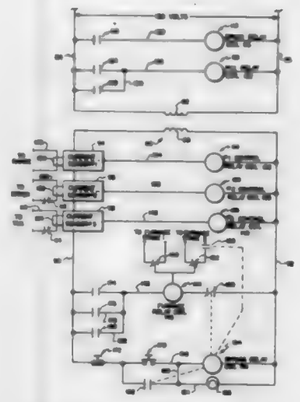
1. A method for operating an A.C. power distribution substation for centralized control of a plurality of distribution circuits, each circuit having regulator means and associated control means for connecting a common voltage to first and second sides of drive means for selectively raising and lowering
(a) regulator voltage of the circuit, the method comprising the steps of:
(b) sensing the regulator voltage;
(c) sensing an output current of the regulator means;
(d) repetitively producing digital voltage and current data corresponding to the sensed regulator voltage and output current;
(e) determining, based on the voltage and current data, and actual circuit voltage and a change in the output current;
(f) detecting whether the actual circuit voltage is within a deadband about a desired circuit voltage, the deadband being variably offset with respect to the desired circuit voltage in response to the change in the output current for selectively producing a raise command and a lower command; and
(g) selectively driving the first and second sides of the drive means to the common voltage in response to the raise command and the lower command for regulating the actual circuit voltage at approximately the desired circuit voltage.

4,695,738

ENERGY MANAGEMENT SYSTEM

Daniel Wilmot, 8005 Dennison-Ashtabula, Cortland, Ohio 44410

Filed Sep. 30, 1985, Ser. No. 781,946
Int. Cl.[4] H02J 3/00
U.S. Cl. 307—31 **16 Claims**



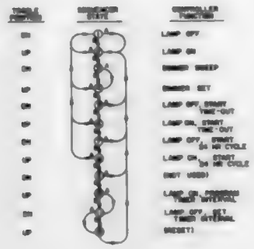
1. An energy management system for controlling a plurality of electrical loads, the electrical loads having first, second, and third priorities of use, respectively, comprising:
first sensing means for sensing currenrt flow in the first electrical load and for providing an output signal in response thereto;
second sensing means for sensing current flow in the first electrical load or the second electrical load and for providing an output signalin response thereto;
first interrupting means for interrupting current flow in the second electrical load, the first interrupting means being electrically connected to the first sensing means and being actuated upon receiving an output signal from the first sensing means;
second interrupting means for interrupting current flow in the third electrical load, the second interrupting means being electrically connected to the second sensing means and being actuated upon receiving an output signal from the second sensing means; and
a step-down transformer, the output side of the transformer being electrically connected to each of the sensing means and the interrupting means.

4,695,739

MULTI-FUNCTION SWITCH-CONTROLLED LAMP CIRCUIT

Lyle R. Pierce, P.O. Box 19387, Portland, Oreg. 97219

Filed Oct. 18, 1985, Ser. No. 788,924
Int. Cl.[4] H01H 43/00; G05B 19/10
U.S. Cl. 307—141 **14 Claims**



1. In an electrical circuit including a power source, a load and a single-pole, single-throw switch for normally controlling the application of power to the load, a function controller connected in series with said load and also connected to said switch, said function controller being actuated by a predetermined number of changes of state of said switch to provide auxiliary functions for said electrical circuit wherein each auxiliary function is implemented as a result of the number of times said switch changes state.

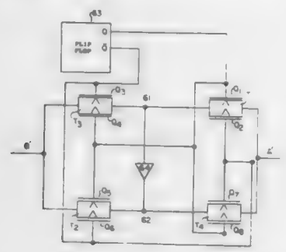
8. In an electrical circuit including a power source, a load and a single-pole, single-throw switch for normally controlling the application of power to the load, a function controller comprising:
(a) delay timer means responsive to each change of state of said switch for providing a timing signal of predetermined duration, said timing signal being initiated each time said switch changes state; and
(b) encoder means responsive to each change of state of said switch and to a delay signal from said delay timer means for providing a circuit function control signal.

4,695,740

BIDIRECTIONAL BUFFER AMPLIFIER

William S. Carter, Santa Clara, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Sep. 26, 1984, Ser. No. 655,008
Int. Cl.[4] H03K 17/56; H04B 3/38
U.S. Cl. 307—242 **6 Claims**



3. A bidirectional amplifier comprising:
an amplifier having an input lead and an output lead;
first transistor means responsive to the application of a control voltage for controllably conducting a first input signal from a first terminal to said input lead;
second transistor means responsive to the application of a control voltage for controllably conducting a second input signal from a second terminal to said input lead;
third transistor means responsive to the application of a control voltage for controllably conducting an output signal of said amplifier from said output lead to said first terminal;
fourth transistor means responsive to the application of a control voltage for controllably conducting said output signal from said output lead to said second terminal;
means for selectively programming said first, second, third and fourth transistor means such that for a first program selection said first transistor means and said fourth transistor means conduct said first input signal and said output signal, respectively, and said second and said third transistor means block said second input signal and said output signal, respectively, and for a second program selection said second and third transistor means conduct said second input signal and said output signal, respectively, and said first and fourth transistor means block said first input signal and said output signal, respectively;
said means for selectively programming having a first lead connected to said first and fourth transistor means, and having a second lead connected to said second and third transistor means, so that said means for selectively programming generates said control voltage for controllably conducting said input and output signals;
wherein each of said first, second, third and fourth transistor means comprises a CMOS transmission gate, each of said CMOS transmission gates comprising an N-channel enhancement mode transistor a P-channel enhancement mode transistor and an inverter;
each transmission gate having an input lead, an output lead, and a control lead, said gate input lead connected to the drain electrodes of both said N-channel and said P-channel transistors, said gate output lead connected to the source electrodes of both said N-channel and said P-channel transistors, said control lead connected to the gate electrode of said N-channel transistor and the input of said inverter, and the output circuit of said inverter connected to the gate electrode of said P-channel transistor;
said first CMOS transmission gate having its control lead connected to said first programming lead and to said control lead of said fourth CMOS transmission gate and its output lead connected to said output lead of said second CMOS transmission gate and to said amplifier input lead and its input lead connected to said first terminal; and
said fourth CMOS transmission gate having its input lead connected to said amplifier output lead and its output lead connected to said second terminal; and
said second CMOS transmission gate having its control lead connected to said second programming lead and to said control lead of said third CMOS transmission gate and its input lead connected to said second terminal; and
said third CMOS transmission gate having its input lead connected to said amplifier output lead and its output lead connected to said first terminal.

4,695,741

SWITCHGEAR

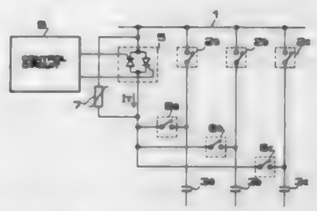
Masatoshi Takeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1985, Ser. No. 732,720
Claims priority, application Japan, May 11, 1984, 59-92914; May 14, 1984, 59-94493
Int. Cl.[4] H03K 17/72
U.S. Cl. 307—643 **3 Claims**

1. A switchgear comprising:
(a) a semiconductor switch connected to an a.c. power source and ON-OFF controlled in synchronism with the phase of said a.c. power source;
(b) a first switch connected in series with said semiconductor switch between the a.c. power source and the load, and arranged to close in advance of the turn-on operation of

said semiconductor switch when said load is to be connected to said a.c. power source and arranged to open after said load has been disconnected from said a.c. power source by the operation of said semiconductor switch when said load is to be disconnected from said a.c. power source; and

(c) a second switch connected in parallel to at least said semiconductor switch and arranged to close in advance of the turn-off operation of said semiconductor switch when said load is to be connected to said a.c. power source and arranged to open after said semiconductor switch has



turned on when said load is to be disconnected from said a.c. power source;

a nonlinear resistor element connected in parallel to said semiconductor switch;

means for controlling said semiconductor switch to turn on said semiconductor switch within one cycle of the closing of said first switch when power is to be supplied to said load and to turn off said semiconductor switch approximately one cycle before said first switch is opened when power is to be disconnected from the load whereby the time when voltage is applied to said nonlinear resistor is minimized.

4,695,742

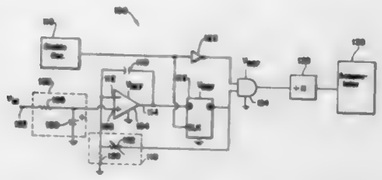
CHARGE BALANCE VOLTAGE-TO-FREQUENCY CONVERTER UTILIZING CMOS CIRCUITRY

Bruce E. Randall, Rock Hill, N.C., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation of Ser. No. 492,533, May 9, 1983, abandoned. This application Jan. 20, 1987, Ser. No. 8,102

Int. Cl.[4] H03L *7/00;* **H03K** *5/00*

U.S. Cl. 307—271 **13 Claims**



1. A highly precise charge balance voltage-to-frequency converter requiring only a single polarity voltage power supply, comprising:

(a) integrator means, having a first input for receiving an input signal and a second input for receiving a feedback signal having a high state and a low state, for producing a first output signal as a function of the integral of the difference between the input signal and the feedback signal;

(b) reference oscillator means for generating a clock signal having first and second logic states;

(c) CMOS flip-flop means having a stable internal voltage threshold level derived from said voltage power supply and an input responsive to said first output signal and having a clock input responsive to said clock signal for producing said feedback signal at an output terminal of said flip-flop means when the magnitude of said first output signal and said voltage threshold level during an occurrence of said clock signal have a predetermined relationship;

(d) logic means, having a first input responsive to said clock signal and a second input responsive to said feedback signal, for producing an output pulse each time said clock signal and said feedback signal are in a common predetermined logic state;

(e) linear circuit means interconnecting said output terminal of said CMOS flip-flop means and said second input of said integrator means to form a continuous circuit path for said feedback signal; and

(f) accumulator means for accumulating a preselected proportion of the output pulses produced by said logic means, whereby the number of such output pulses so accumulated is indicative of a parameter of said input signal.

4,695,743

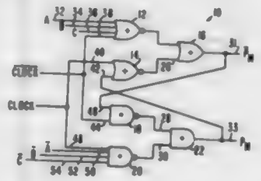
MULTIPLE INPUT DISSYMMETRIC LATCH

George S. Des Brisay, Jr., Hemet, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 23, 1985, Ser. No. 790,568

Int. Cl.[4] H03K *3/284, . 19/02, 3/26, 3/29*

U.S. Cl. 307—272.2 **7 Claims**



1. A method of providing first and second output signals, said first output signal being a logical complement of a corresponding second output signal, comprising the steps of:

receiving a first clock signal;

receiving a corresponding second clock signal, said second clock signal being a logical complement of said first clock signal;

receiving N first data signals, where N is an integer, and N>1;

receiving N second data signals, where each second data signal corresponds to a first data signal and is the logical complement of said first data signal;

the steps of receiving said first and second data signals both following the steps of receiving said first and said clock signals;

performing a first logical function characterized by an OR function of first and second logic inputs, said first logic input characterized by a NOR function of said second output signal and said second clock signal, said second logic input of said OR function characterized by a NOR function of said first data signals and said first clock signal; and

performing a second logical function characterized by an AND function of third and fourth logic inputs, said third logic input characterized by the NAND function of said first output signal and said first clock signal, said fourth logic input of said AND function characterized by the NAND function of said second data signals and said second clock signal;

the steps of performing said first and second logical functions both following the steps of receiving said first and second data signals.

4,695,744

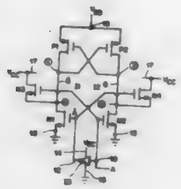
LEVEL SHIFT CIRCUIT INCLUDING SOURCE FOLLOWER OUTPUT

Raymond L. Giordano, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, Somerville, N.J.

Filed Dec. 16, 1985, Ser. No. 809,132

Int. Cl.[4] H03K *3/26, 17/687;* **G01R** *19/00*

U.S. Cl. 307—279 **9 Claims**



1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

first and second input terminals for the application thereto of complementary input signals;

first and second outputs at which are produced complementary output signals in response to said input signals;

first and second switching transistors, each having a conduction path and a control electrode;

means connecting the conduction paths of said first and second transistors between said first and second outputs, respectively, and said first power terminal;

means connecting the control electrodes of said first and second transistors to said first and second input terminals, respectively;

first and second variable impedance means connected between said first and second outputs, respectively, and said second power terminal;

third and fourth transistors of same conductivity type as said first and second switching transistors, said third and fourth transistors having source and drain electrodes defining the ends of a conduction path and a control electrode;

means connecting the source electrode of said third transistor to said first output and its control electrode to said second input terminal;

means connecting the source electrode of said fourth transistor to said second output and its control electrode to said first input terminal; and

means connecting the drain electrodes of said third and fourth transistors to a point of operating potential for operating said third and fourth transistors in the source follower mode and for passing a current between said point of operating potential and said first output, in addition to, and of same polarity as, the current flowing through said first variable impedance means, when said third transistor is rendered conductive, and for passing a current between said point of operating potential and said second output, in addition to, and of same polarity as, the current through said second variable impedance means when said fourth transistor is rendered conductive.

4,695,745

MONOLITHIC SEMICONDUCTOR INTEGRATED CIRCUIT WITH PROGRAMMABLE ELEMENTS FOR MINIMIZING DEVIATION OF THRESHOLD VALUE

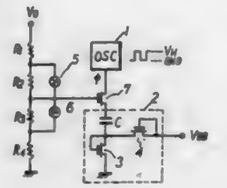
Toshio Mimoto, Nara, and Keizo Sakiyama, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1984, Ser. No. 681,588

Claims priority, application Japan, Dec. 17, 1983, 58-238407

Int. Cl.[4] G05F *3/16*

U.S. Cl. 307—297 **4 Claims**



1. A monolithic semiconductor integrated circuit comprising:

a substrate bias voltage generator circuit including, an oscillator circuit and a charge pump circuit;

MOS transistor means connecting said oscillator circuit to said charge pump circuit; and

a plurality of programmable elements for permanently storing data being provided in a gate voltage circuit of said MOS transistor means to vary the voltage applied to the charge pump circuit in response to the memory content of said programmable elements.

4,695,746

SUBSTRATE POTENTIAL GENERATING CIRCUIT

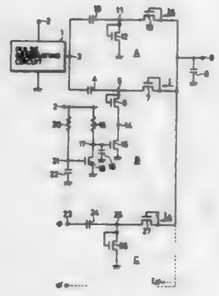
Youichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,588

Claims priority, application Japan, Oct. 19, 1984, 59-220906

Int. Cl.[4] H01L *27/10;* **H03L** *1/00;* **H03K** *3/354*

U.S. Cl. 307—297 **12 Claims**



1. A substrate potential generating circuit for a semiconductor integrated circuit employing insulated-gate field-effect transistors as fundamental elements, in which said semiconductor integrated circuit comprises:

first circuit means receiving through a first capacitive element a pulse signal from a pulse generating circuit operated from a supply voltage for supplying a first substrate bias current to an output terminal at all times after application of said supply voltage; and

second circuit means receiving through a second capacitive element said pulse signal from said pulse generating circuit for supplying a second substrate bias current to said out-

put terminal for a predetermined period of time after application of said supply voltage;

said first circuit means comprises: a first rectifying MOS transistor connected between one electrode of said first capacitive element and said output terminal; and a second rectifying MOS transistor connected between said one electrode of said first capacitive element and ground, and

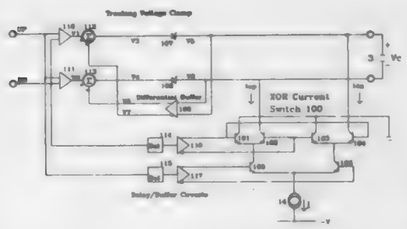
said second circuit means comprises: a third rectifying MOS transistor connected between one electrode of said second capacitive element and said output terminal; a fourth rectifying MOS transistor having one main electrode connected to said one electrode of said second capacitive element; a controlling MOS transistor connected between another main electrode of said fourth rectifying MOS transistor and ground; and an "on" signal generating circuit means for applying an "on" signal to a gate electrode of said controlling MOS transistor for a predetermined period of time after application of said supply voltage to render said controlling MOS transistor conductive.

4,695,747

APPARATUS INCREASING DIODE SWITCHING SPEEDS

Paul W. Latham, II, Marlboro, Mass., assignor to Data General Corporation, Westborough, Mass.

Filed Jun. 26, 1985, Ser. No. 749,155
Int. Cl.⁴ H03K *17/74*
U.S. Cl. 307—317 R **3 Claims**



1. Apparatus for increasing the switching speeds of a pair of diodes,

the pair of diodes consisting of a first diode and a second diode, each having an anode and a cathode, and each diode having a junction voltage being the voltage by which its anode is more positive than its cathode when it is in an ON state, the junction voltage of the first diode being substantially equal to the junction voltage of the second diode;

the apparatus being responsive to first and second voltages,

the first voltage having a value of

plus one-half the junction voltage when the first diode is to be turned ON and the second diode is to be turned OFF;

minus one-half the junction voltage when the first diode is to be turned OFF and the second diode is to be turned ON; or

zero volts when both the first and second diodes are to be turned OFF,

and the second voltage having a value of

plus one-half the junction voltage when the second diode is to be turned ON and the first diode is to be turned OFF;

minus one-half the junction voltage when the second diode is to be turned OFF and the first diode is to be turned ON; or

zero volts when both the first and second diodes are to be turned OFF,

the apparatus comprising

a differential buffer circuit having

a first input connected to the cathode of the first diode, the voltage at said cathode being a third voltage;

a second input connected to the cathode of the second diode, the voltage at said cathode being a fourth voltage;

a first output operatively derived from the first input being a fifth voltage which is greater than the third voltage by one-half the junction voltage; and

a second output operatively derived from the second input being a sixth voltage which is greater than the fourth voltage by one-half the junction voltage;

a first summer for adding the first voltage and the fifth voltage to produce a first sum, and for applying the first sum to the anode of the first diode; and

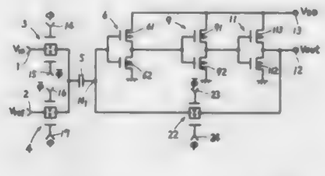
a second summer for adding the second voltage and the sixth voltage to produce a second sum, and for applying the second sum to the anode of the second diode.

4,695,748

COMPARING DEVICE

Toshio Kumamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,442
Claims priority, application Japan, Aug. 27, 1985, 60-190737
Int. Cl.⁴ H03K *5/24*
U.S. Cl. 307—355 **3 Claims**



1. A comparing device for obtaining binary outputs by comparing an input voltage and a reference voltage, comprising:

first switching means having an input terminal supplied with a voltage to be compared and an output terminal, and responsive to clock signals supplied from the exterior for turning on and off between said input terminal and said output terminal,

second switching means having an input terminal supplied with said reference voltage and an output terminal, and responsive to clock signals supplied from the exterior for turning on and off between said input terminal and said output terminal.

said first switching means and said second switching means being controlled so that they are turned on and off in a complementary manner,

a coupling capacitor having a first electrode and a second electrode, said first electrode of the coupling capacitor being connected to said output terminal of said first switching means and to said output terminal of said second switching means,

a first inverter having an input terminal and an output terminal, said input terminal of said first inverter being connected to the second electrode of said coupling capacitor, and said first inverter having a function of detecting a difference between the output voltage of said first switching means and the output voltage of said second switching means,

a second inverter having an input terminal and an output terminal, said input terminal of said second inverter being connected directly to the output terminal of said first inverter, and said second inverter having a function of amplifying the output of said first inverter,

a third inverter having an input terminal and an output terminal, said input terminal of said third inverter being connected to the output terminal of said second inverter,

and said third inverter having a function of amplifying the output of said second inverter, and

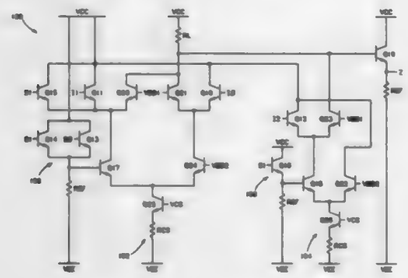
third switching means having an input terminal connected to the output terminal of said third inverter and an output terminal connected to the input terminal of said first inverter, and responsive to clock signals supplied form the exterior so as to be synchronized with the turning on and off of said second switching means for turning on and off between said input terminal and said output terminal of said third switching means.

4,695,749

EMITTER-COUPLED LOGIC MULTIPLEXER

Nim C. Lam, Sunnyvale, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed Feb. 25, 1986, Ser. No. 832,797
Int. Cl.⁴ H03K *19/086, 17/62*
U.S. Cl. 307—455 **5 Claims**



1. An ECL multiplexer comprising:

voltage means, including a high voltage source and a low voltage source, for supplying a potential differential between said high voltage source and said low voltage source, said voltage means further including reference voltage means for supplying constant voltage inputs:

current network means, including multiple paths, for providing multiple paths through which current can flow between said high voltage source and said low voltage source, said current network means being coupled to said voltage means output means, coupled to said current network means, for outputting a voltage as a function of which of said paths is carrying current;

said current network means including reference transistors, each reference transistor including an emitter, a collector and a base, the base of each said reference transistor being coupled to receive a constant voltage supplied by said reference voltage means, the collector and emitter of each reference transistor defining a reference electrical segment;

said current network means including data transistors for receiving plural data input signals, each data transistor including an emitter, a collector and a base, the base of each said data transistor being coupled to receive one of said data input signals, the collector and emitter of each reference transistor defining a data electrical segment, each said reference electrical segment and each data electrical segment constituting a segment of at least one of said paths so that current flows through such at least one path when and only when current flows through said segment, each said data transistor being in emitter-coupled relation with a respective one of said reference transistors so that, when the voltage at the base of a given data transistor is greater than the constant voltage supplied to the base of the reference transistor emitter-coupled thereto, current is prohibited through said associated emitter-coupled reference transistor, and so that, when the voltage at the base of that data transistor is less than the constant voltage supplied to the base of the reference transistor emitter-coupled thereto, current is prohibited through said given data transistor; and

first and second non-empty sets of select transistors for receiving plural select signals, each select transistor including an emitter, a collector and a base, the base of each select transistor being coupled to receive one of said select signals, each select transistor of said first set being coupled to receive a first of said plural select signals at its base, each transistor coupled so that its base can receive said first select signal being included in said first set, each transistor of said second set being coupled to receive another of said select signals at its base,

said select transistors being operatively connected to said current network means so as to collectively prohibit current flow through all but at most one of said reference transistors having a data transistor emitter-coupled thereto, the set of reference transistors through which current is prohibited being a well-defined multi-variate function of the values of said select input signals whereby the multiplexer function is realized,

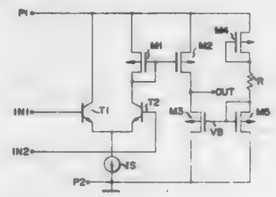
each transistor of said first set being in parallel with a transistor of said second set.

4,695,750

VOLTAGE LEVEL CONVERTING CIRCUIT

Hiroyuki Hara, Tokyo; Michinori Nakamura, and Yasuhiro Sugimoto, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Asaki, Japan

Filed Aug. 28, 1985, Ser. No. 770,090
Claims priority, application Japan, Aug. 29, 1984, 59-179644
Int. Cl.⁴ H03K *19/092, 19/086, 19/003, 17/10*
U.S. Cl. 307—475 **5 Claims**



1. A voltage level converting circuit for an input interface to a TTL circuit, comprising:

first and second potential terminals between which a power source voltage is applied;

first and second input terminals coupled for respectively receiving an input signal and an inverted input signal from an ECL circuit;

a differential amplifier for detecting a voltage difference between said input and said inverted input signals, including:

first and second bipolar transistors each having a base, collector, and emitter, with the bases respectively connected to the first and second input terminals, and with the collector of the first bipolar transistor connected only to the first potential terminal,

a first constant current source connected to the emitters of the first and second bipolar transistors and connected to the second potential terminal,

a first MOS transistor, with a source connected to the first potential terminal, and with the collector of the second bipolar transistor connected to a drain and a gate of the MOS transistor, for providing a current path from the first potential terminal to the collector of the second bipolar transistor at times when the second bipolar transistor is turned on,

wherein the first and second bipolar transistors are respectively turned on and off at times when the input signal is at a high voltage, and the first and second bipolar

transistors are respectively turned off and on at times when the input signal is at a low voltage; and

an output circuit for generating an output logic voltage in accordance with the detected voltage difference, including:

a second MOS transistor, with a source connected to the first potential terminal, with the collector of the second bipolar transistor connected only to a gate of the second MOS transistor and to the drain and gate of the first MOS transistor, and a drain,

a second constant current source connected to the drain of the second MOS transistor and to the second potential terminal, and

an output terminal at which the output logic voltage is generated connected to the drain of the second MOS transistor,

wherein a current path is provided from the first potential terminal to the output terminal and generates the output logic voltage at a high level at times when the second bipolar transistor is turned on, and a current path is not provided from the first potential terminal and generates the output logic voltage at a low level at times when the second bipolar transistor is turned off.

4,695,751

SAMPLING-DATA INTEGRATOR WITH COMMUTATED CAPACITANCE UTILIZING A UNITARY-GAIN AMPLIFIER

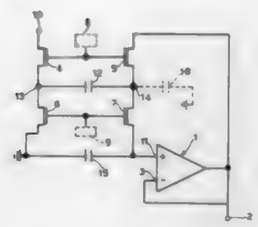
Alejandro De La Plaza, Bergamo, Italy, assignor to SGS Microelettronica S.p.A., Italy

Filed Nov. 4, 1986, Ser. No. 926,590

Claims priority, application Italy, Nov. 8, 1985, 22759 A/85

Int. Cl.⁴ H03K *5/01;* **G11C** *27/02*

U.S. Cl. 307—490 **2 Claims**



1. Sampling-data integrator with commutated capacitances comprising a sampling capacitor, an integration capacitor, a unitary-gain amplifier and four switches commutatable between a low-resistance state and a high-resistance state, a first and a second switch being controlled by a first timing signal generator and a third and a fourth switch being controlled by a second timing signal generator synchronized with the first in such a manner that the related timing signals follow in sequence without overlapping, the first and the third switches being connected in series and the second and fourth switches being also connected in series, the sampling capacitor being connected between common circuit nodes placed between said switches in series and the integration capacitor being connected between an input of the amplifier and ground, characterized in that the series of the first and third switches is inserted between an input signal source and ground and the series of the second and fourth switches is inserted between the output of the amplifier and said input of said amplifier.

4,695,752

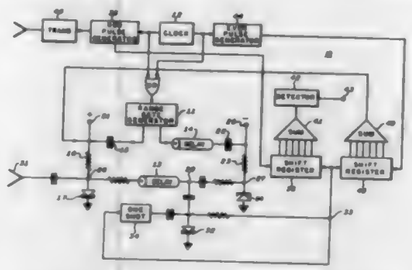
NARROW RANGE GATE BASEBAND RECEIVER

Gerald F. Ross, Lexington, and Kenneth W. Robbins, Wilmington, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 11, 1982, Ser. No. 345,310

Int. Cl.⁴ G01R *29/02;* **G01S** *7/28*

U.S. Cl. 307—518 **9 Claims**



1. An apparatus for detecting pulsed signals comprising:

means for receiving said pulse signals;

first bistable means having first and second switchable stable states for switching from said first state to said second state in response to pulse signals coupled thereto from said receiving means;

second bistable means having first and second switchable stable states coupled to said first bistable means with a node therebetween, said node having substantially a low level signal thereat when said first and second bistable means are in said first state and a detectable level signal when a pulsed signal from said receiving means causes said first bistable means to switch to said second stable state;

third bistable means having first and second switchable stable states coupled to said node and responsive to said detectable level signal for switching from said first stable state to said second stable state, thereby generating an output pulsed signal;

generator means for providing first and second pulses of substantially equal duration and opposite polarity;

first means coupled between said generator means and said first bistable means for receiving and differentiating said first pulses; and

second means coupled between said generator means and said second bistable means for receiving and differentiating said second pulses.

4,695,753

CHARGE SENSOR HAVING A PRESET FLIPFLOP

Marcellinus J. M. Pelgrom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 698,007, Feb. 4, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 910,247

Claims priority, application Netherlands, Feb. 13, 1984, 8400453

Int. Cl.⁴ H03K *3/45*

U.S. Cl. 307—530 **1 Claim**

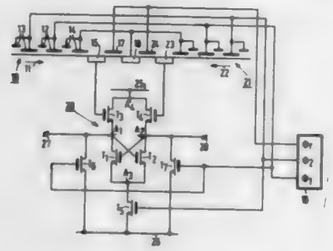
1. A charge sensor, for use with a charge transfer device comprising:

two cross-coupled MOS transistors T_1 and T_2 each having a source, a drain and a gate, the gate of T_2 and the drain of T_1 being connected to a first junction A_1 and the gate of T_1 and the drain of T_2 being connected to a second junction A_2, while the sources of T_1 and T_2 are connected to a third junction A_3;

two load MOS transistors T_3 and T_4 each having a source, a drain and a gate, the sources of T_3 and T_4 being directly and continuously connected to A_1 and A_2, respectively, and the drains of T_3 and T_4 being directly and continuously connected to a fourth junction A_4, while the gates of T_3 and T_4 are coupled to a signal supply means;

a positive and negative current supply lead for passing a current between the junctions A_3 and A_4, junction A_4 being directly and continuously connected to one of said current supply leads, and a fifth MOS transistor T_5, which acts as a switch and has a gate which is connected to a clock voltage source which also timely applies the clock voltage for the intermittent energization of the sensor, a source and a drain;

a sixth (T_6) and a seventh (T_7) MOS transistor, each having a source, a drain and a gate, the drain of T_6 being connected to A_1 and the drain of T_7 being connected to A_2, while the sources of T_6 and T_7 are connected to the other of the current supply leads and the gates are connected to



a clock voltage source for intermittently opening and closing the transistors T_6 and T_7;

the drain of T_5 being connected to the junction A_3 and the source of T_5 being directly and continuously connected to the other supply lead associated with A_3 and the gates of T_5, T_6 and T_7 being connected to said clock voltage sources which supply clock voltage in a manner such that at the beginning of each cycle the junctions A_1 and A_2 are first set to a rest voltage by closing the transistors T_6 and T_7, after which, while T_5 is opened, T_6 and T_7 are also opened and the signal charges to be read are supplied directly to the gates of T_3 and T_4, as a result of which a signal-dependent voltage difference is obtained between the junctions A_1 and A_2, whereupon the transistors T_5 is closed and said voltage difference is increased.

4,695,754

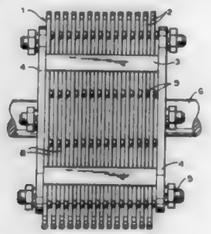
PERMANENT MAGNET ROTOR FOR AN ELECTRICAL MACHINE

Entcho N. Popov; Krestyo A. Stanilov; Rumen K. Apostolov; Pantcho G. Dundarov, all of Sofia; Peyu V. Radkov; Pentcho K. Aderski, both of Troyan, and Georgi A. Georgiev, Sofia, all of Bulgaria, assignors to DSO "Elprom", Sofia, Bulgaria

Filed May 28, 1985, Ser. No. 738,594

Int. Cl.⁴ H02K *1/22, 15/02*

U.S. Cl. 310—156 **1 Claim**



1. An inductor of a rotary electrical machine comprising a plurality of pole pieces, each pole piece representing a laminated pack of flux-conducting lamellae, and a plurality of permanent magnets, each magnet directly contacting a pole piece, gaps being provided between each of the flux-conducting lamellae: the pole pieces and the permanent magnets being covered by non-magnetic discs arranged parallel to said lamellae and clamped in a pack by studs, said non-magnetic disks being statically fixed to a shaft.

4,695,755

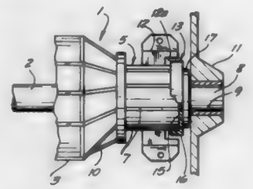
COLLAR FOR THE COMMUTATOR OF AN AUTOMOTIVE STARTER

Chester Brown, 133-20 91st Ave., Richmond Hill, N.Y. 11418

Filed Nov. 12, 1986, Ser. No. 929,612

Int. Cl.⁴ H02K *13/10;* **H01R** *39/16*

U.S. Cl. 310—236 **4 Claims**



1. A collar adapted to be bonded to a commutator of an automotive starter motor for restraining thin copper bars extending longitudinally about the periphery of the commutator from peeling at their free ends and to provide lubrication between the collar and an end frame of the housing of the motor as the collar rotates with the commutator relative to the housing, wherein the collar comprises: a body of disc form provided with an axial hole whereby the collar may be passed over a stub shaft projecting axially from a rear end face of the commutator, the body having an inner flat face adapted to lie in abutment with the rear end face of the commutator, a rim about the body projecting forwardly beyond the inner flat face of the body, the rim being adapted to overlay the free ends of the bars, and a hub of reduced diameter projecting rearwardly from the body, the hub having radially extending cavities in its rear adapted to contain grease, the hub being adapted to serve as a thrust washer relative to the end frame of the housing, and the grease being adapted to serve as a lubricant for the collar as it rotates with the commutator relative to the end frame.

4,695,756

LAMINATED TERMINAL LAYER FOR ELECTRONIC COMPONENT

Yasuhiro Tanaka, Ishikawa, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 612,598, May 21, 1984, abandoned. This application Aug. 13, 1986, Ser. No. 895,580

Claims priority, application Japan, May 21, 1983, 58-77406[U]

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—355 **9 Claims**

1. A piezoelectric resonator, comprising:

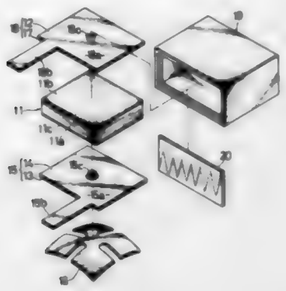
a housing having an opening for accommodating piezoelectric components, said components comprising:

a piezoelectric means having a flat piezoelectric member with electrodes formed on both sides thereof;

two terminal plates each interposed between an inner wall of said housing and one side of said piezoelectric means and being provided with a projection to contact a vibration node on each of said electrodes;

each of said terminal plates comprising a first layer of phosphor bronze and a second layer, for reducing vibration received by said piezoelectric means, having a thickness equal to 5% or more of the thickness of said first layer, of a member selected from the group consisting of Al, Ag, Pb or any alloy thereof laminated on said first layer in a

manner such that said second layer contacts each of said electrodes; and



lead means extending from each of said two terminal plates through said opening.

4,695,757

METHOD AND APPARATUS FOR COOLING ELECTRODELESS LAMPS

Michael G. Ury, Bethesda, and Charles H. Wood, Rockville, both of Md., assignors to Fusion Systems Corporation, Rockville, Md.

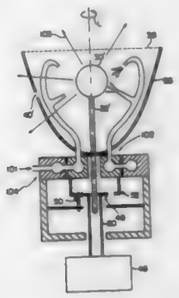
Continuation-in-part of Ser. No. 381,481, May 24, 1982, Pat. No. 4,485,332. This application Nov. 26, 1984, Ser. No. 674,631

Claims priority, application Japan, Dec. 5, 1983, 58-229730

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.[4] H01J *7/24, 61/52*

U.S. Cl. 313—44 **8 Claims**



1. A method of cooling an electrodeless lamp having a lamp envelope which gets extremely hot during operation, comprising the steps of,

providing a source which produces at least a stream of cooling gas under pressure,

directing said at least a stream of cooling gas at said lamp envelope, and

providing relative rotative motion between said lamp envelope and said source, wherein said relative rotative motion comprises rotating said source completely about said envelope.

4,695,758

SMALL-SIZED SPARK PLUG HAVING A SPARK GAP PARALLEL TO AN AXIS RUNNING THROUGH THE CENTER ELECTRODE

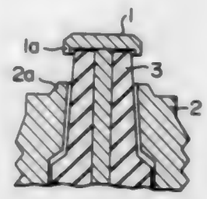
Minoru Nishida; Tadashi Hattori, both of Okazaki; Kunimasa Yoshimura, Mishima, and Tetsuzo Muraki, Hamamatsu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya; Toyota Jidosha Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, all of, Japan

Filed Jul. 24, 1985, Ser. No. 758,415

Claims priority, application Japan, Jul. 25, 1984, 59-155046; Jul. 25, 1984, 59-155047

Int. Cl.[4] H01T *13/20*

U.S. Cl. 313—130 **12 Claims**



1. A small-sized spark plug for internal combustion engines comprising:

a center electrode having a longitudinal axis extending through the center of the electrode and a shaft portion surrounded by an insulator layer and a terminal end portion adapted to act as a spark generation portion; and

an earthed electrode having a terminal end portion which is spaced in the direction of said axis apart from and is opposite to the terminal end portion of the center electrode so that the whole of a spark gap is defined along a surface of the insulator layer,

the shortest distance δ between each end portion of said two electrodes and the surface of said insulation layer and the distance l between said forward end portions of said two electrodes having the following relationship:

$$\delta \geq 0.25\ l, \text{ and } 0.8\ \text{mm} \leq l \leq 2.0\ \text{mm},$$

said plug reduces the deterioration in ignition efficiency caused by creeping discharge channelling phenomenon during operation of the plug.

4,695,759

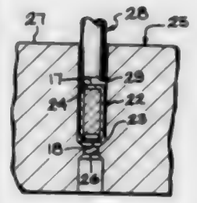
METHOD FOR PRODUCING A COMPOSITE CENTER ELECTRODE AND AN ELECTRODE

Richard S. Podiak, Maumee, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Oct. 29, 1981, Ser. No. 316,206

Int. Cl.[4] H01T *13/20*

U.S. Cl. 313—136 **9 Claims**



7. A composite electrode for a spark plug comprising a core formed from a high thermally conductive metal, a wire terminal formed from a metal different from said thermally conductive metal having a predetermined diameter and an end abutting said conductive metal, said terminal having a diameter at said end smaller than said predetermined diameter and having a constricted diameter smaller than said end diameter adjecent said end, and a sheath formed from a corrosion-resistant metal surrounding and in contact with said thermally conductive metal, said terminal end and said constricted diameter portion of said terminal whereby said thermally conductive metal is completely enclosed.

4,695,760

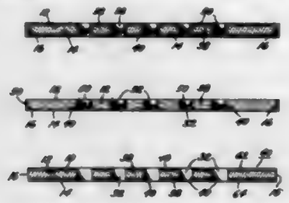
SELF-ALIGNED DOUBLE GRIDS FOR VACUUM TUBES

Thomas R. Anthony, Schenectady; Philip A. Lindner, Liverpool, both of N.Y., and Jewell G. Tucker, Owensboro, Ky., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,955

Int. Cl.[4] H01J *1/46, 1/52, 17/04, 17/12, 19/38, 19/40, 21/10*

U.S. Cl. 313—348 **50 Claims**



1. A method for making

a composite structure providing first and second electrically conducting grid members with predetermined spacing therebetween comprising the steps of:

(a) providing a body of electrically non-conducting material having first and second opposed surfaces spaced apart to the extent of said predetermined spacing;

(b) employing a laser beam to cut a plurality of openings of pre-set shape, spacing and orientation through said body with the central axes of said openings being substantially parallel;

(c) covering the inside surfaces of said openings with a removable coating material, said first and second opposed surfaces being free of said coating material;

(d) bonding a first electrically conducting grid member having a first set of open areas therein to said first opposed surface and bonding a second electrically-conducting grid member having a second set of open areas therein to said second opposed surface, the periphery of each open area of said first set being permanently aligned with the periphery of an open area of said second set, each pair of aligned open areas being of substantially identical size and configuration and having the central axis of said pair substantially coincident with the central axis of one of said openings, and

(e) removing said coating material.

4,695,761

TENSION SHADOW MASK SUPPORT STRUCTURE

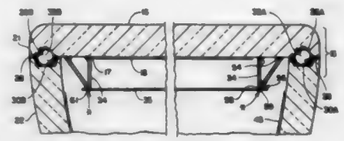
James R. Fendley, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 21, 1986, Ser. No. 832,556

Int. Cl.[4] H01J *29/07*

U.S. Cl. 313—407 **12 Claims**

1. A front assembly for a color cathode ray tube including a faceplate having on its inner surface a centrally disposed phosphor screen, said assembly including a shadow mask support structure composed of sheet metal secured directly to said inner surface and extending along opposed sides of said screen, and a foil shadow mask secured in tension on said structure, the



mechanical rigidity of said faceplate imparted to said support structure counteracting the tension in said mask.

4,695,762

ELECTRON BEAM PUMPED ROD-LIKE LIGHT EMITTERS

George W. Berkstresser, Bridgewater, and Joseph Shmulovich, Murray Hill, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1985, Ser. No. 749,928

Int. Cl.[4] H01J *29/28*

U.S. Cl. 313—474 **18 Claims**



1. Optical apparatus comprising

means for generating a scannable electron beam, and

a luminescent screen including a transparent phosphor layer on which said electron beam is made incident to generate a scannable spot of light,

characterized in that

said phosphor layer comprises an array of elongated, rod-like elements each having at one end an output face from which said light emanates primarily in a direction parallel to the length of said elements,

a reflective coating covers other surfaces of each of said elements, and

said generating means provides said electron beam with an oblong cross section which is made incident along the length of selected ones of said elements.

4,695,763

REFLECTOR TYPE FLUORESCENT LAMP FOR OPTICAL APPARATUS

Toshitaka Ogasawara; Kazumasa Nohmi, both of Takatsuki; Masao Honmoh, Bizen, and Yukito Iseki, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Oct. 17, 1985, Ser. No. 788,483

Claims priority, application Japan, Oct. 18, 1984, 59-220010

Int. Cl.[4] H01J *61/35, 61/44*

U.S. Cl. 313—487 **3 Claims**

1. A reflector type fluorescent lamp for optical apparatus comprising:

a glass tube,

a pair of electrodes sealed in said glass tube at respective ends thereof,

a specified amount of a rare gas and mercury,

a reflective layer formed on the inner wall of said glass tube in a configuration to have a main aperture at an angle of 50°–90° with respect to the axis of said glass tube and a sub-aperture at a narrower angle of 10°–40° with respect to said axis, said main aperture is for emission of light for



illumination of an object in an optical reading apparatus and said sub-aperture is for emission of light for erasing a drum of photosensitive material, and

a fluorescent layer formed on the reflective layer and on said sub-aperture.

4,695,764

DISPLAY ARRANGEMENTS

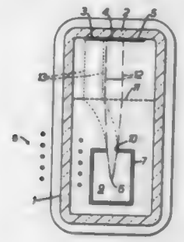
Ralph D. Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Aug. 2, 1984, Ser. No. 637,035

Claims priority, application United Kingdom, Aug. 5, 1983, 8321147

Int. Cl.⁴ H01J *1/62*

U.S. Cl. 313—497 **21 Claims**



1. A display arrangement including an evacuated envelope having a fluorescent screen and an electron gun which is capable of producing a flood beam of electrons which falls upon said screen, the screen having three distinct adjacent localized areas which emit light of three different primary colors respectively in response to incident electrons, the electron gun comprising a cathode and a field electrode positioned adjacent to the cathode and arranged to shape the flood beam which emerges from said gun, the three localized areas of the screen being such that the undeflected flood beam falls upon one of them; means for generating a predetermined magnetic field in the region of said gun, the angle at which said beam emerges from said gun being dependent upon the polarity of the magnetic field so that said beam is deflected to fall upon the other two localized areas respectively in response to a magnetic field of the same value but of opposite polarity.

4,695,765

DISPLAY ARRANGEMENTS

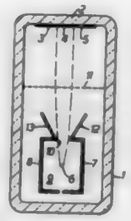
Ralph D. Nixon, Braintree, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Aug. 2, 1984, Ser. No. 637,036

Claims priority, application United Kingdom, Aug. 5, 1983, 8321146

Int. Cl.⁴ H01J *1/62*

U.S. Cl. 313—497 **20 Claims**



1. A display arrangement including an evacuated envelope having a fluorescent screen and an electron gun which is capable of producing a flood beam of electrons which falls upon said screen, the screen having three distinct adjacent localized areas which emit light of three different primary colors respectively in response to incident electrons, the electron gun comprising a cathode and two field electrodes positioned one on each side of the cathode and arranged to shape the flood beam which emerges from said gun, the three localized areas of the screen being such that the undeflected flood beam falls upon one of them, and such that the flood beam is deflected to fall upon the other two localized areas respectively in response to potentials of said field electrodes of the same value but of opposite effect.

4,695,766

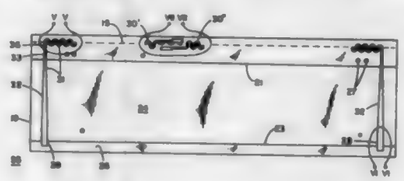
TRAVELING WAVE TUBE AND ITS METHOD OF CONSTRUCTION

John K. Waterman, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 1, 1986, Ser. No. 892,018

Int. Cl.⁴ H01J *25/34*

U.S. Cl. 315—3.5 **19 Claims**



1. A traveling wave tube comprising:

a first circuit block;

an electron beam tunnel having an axis of symmetry in said circuit block;

a folded waveguide slow-wave circuit in said first circuit block having an axis of symmetry, an input, and an output;

said folded waveguide axis being parallel to said beam tunnel axis;

an input transition section of waveguide;

an output transition section of waveguide;

an input waveguide;

an output waveguide;

said input transition section of waveguide connecting said input of said folded waveguide and said input waveguide;

said output transition section of waveguide connecting said output of said folded waveguide and said output waveguide;

said folded waveguide, input and output transitions, and input and output waveguides each being in the form of a continuous slot in said first circuit block having two opposed walls;

said slot extending between first and second planar parallel opposed surfaces near one edge of said first circuit block; and

a first and second cover plate attached to said first and second planar opposed surface of said circuit block to provide another two opposed walls of said folded waveguide, said input and output transitions, and said input and output waveguides.

4,695,767

SINGLE-ENDED FLUORESCENT LAMP-BASE COMBINATION

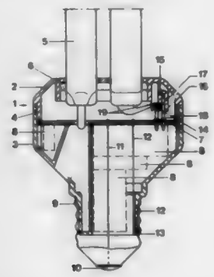
Horst Wittmann, Stadtbergen, Fed. Rep. of Germany, assignor to Patent Treuhand Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,638

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439171

Int. Cl.⁴ H01J *7/44*

U.S. Cl. 315—58 **8 Claims**



1. Single-ended low-pressure mercury vapor discharge lamp—and—base combination,

particularly compact fluorescent lamp, comprising at least one discharge vessel (5) formed by at least two parallel legs;

current leads (19) extending from said discharge vessel;

a hollow base body (1) having a first portion (2) for receiving the discharge vessel said legs of the discharge vessel (5) being secured to the receiving portion of the base body,

the base body further having an electrical connection,

an at least partly metallic screw-in terminal (9);

an accessory circuit (7, 8) secured to the base body, said accessory circuit having current leads (11, 12) extending therefrom, and including means (14, 16) for connection of the current leads (19) of the discharge vessel (5) to the accessory circuit;

wherein the electrical connection portion (3) of the base body (1) includes

an essentially cylindrical, internally hollow projecting wall portion (3a) extending to the vicinity of the bottom end of the screw-in terminal (9);

at least one (12) of the current connection leads (11, 12) extends through the hollow projecting wall portion (3a) around the hollow projecting wall portion and then adjacent the outer surface of said projecting wall portion (3a) of the base body (1),

the screw-in terminal (9) being secured over said essentially cylindrical projecting wall portion and pinching and clamping part of the at least one connection lead (12) between the screw-in terminal (9) and the outer surface of the essentially cylindrical wall portion of the base body; and

wherein the screw-in terminal (9) is secured to the outer surface of the essentially cylindrical wall portion (3a) of the base body (1) by punch deformation, while simultaneously clamping and pinching the at least one current connection lead (12) in position

to form a mechanically stable, immovable, and electrically tight connection between said at least one current connection lead (12) and the screw-in terminal (9).

4,695,768

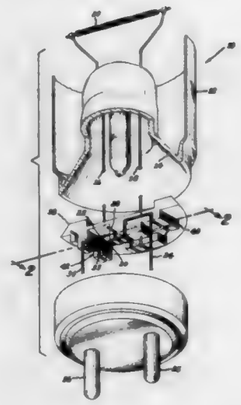
BIMETAL SWITCH FOR ELECTRODE HEAT CUTOUT WITHIN AN ELECTRICALLY INSULATING SUPPORT

Edward J. Covington, Highland Hts.; John E. Cridland, Cleveland Hts., and John P. Gorman, Mentor, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1985, Ser. No. 810,616

Int. Cl.⁴ H01J *7/44, 17/34*

U.S. Cl. 315—73 **28 Claims**



18. A fluorescent lamp electrode heat cutout device for use outside the lamp envelope which comprises a support of electrically insulating material supporting both a resistance wire heating element and a bimetal switch element disposed in predetermined heat exchange relationship with said heating element, whereby current is provided to one end of an electrode in said lamp through said bimetal switch element and whereby current is supplied to the other end of said electrode is said lamp through said heating element and wherein said heating element causes said bimetal switch element to break electrical contact with one end of said electrodes when said lamp has reached operating conditions.

4,695,769

LOGARITHMIC-TO-LINEAR PHOTOCONTROL APPARATUS FOR A LIGHTING SYSTEM

Karl Schweickardt, Cazenovia, N.Y., assignor to Wide-Lite International, San Marcos, Tex.

Filed Nov. 27, 1981, Ser. No. 325,378

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—158 **6 Claims**

1. Photocontrol apparatus for logarithmically regulating the output of a controlled light to compensate for the logarithmic change in the intensity of a sensed external light being perceived as linear to the eye, the output of said controlled light being linearly dependent on the voltage applied thereto, comprising

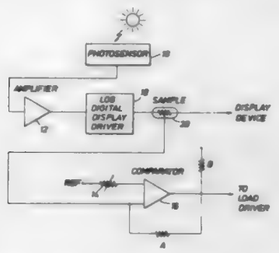
a comparator, the output voltage of which is connected to the controlled light, said comparator output being the

difference between an applied reference voltage and a sampled control voltage, and

means for producing said control voltage, including

photosensing means for sensing the external light and converting sensed light intensity therefrom to a voltage proportional thereto, and

logarithm-to-linear conversion means connected to said photosensing means for producing a linearly changing



output voltage with a logarithmically changing input voltage, a sample of said output voltage being connected as the sampled control voltage to said comparator,

the output from said comparator logarithmically varying the intensity of the controlled light to perceptually visually compensate for changes in the intensity of the sensed light.

4,695,770

CIRCUIT FOR SWITCHING CURRENT IN AN INDUCTIVE LOAD

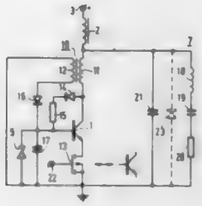
Hubert C. Raets, Nieuweahagen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1985, Ser. No. 709,014

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409423

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—207 **22 Claims**



1. A circuit arrangement for switching a current in a load which includes an inductive reactance, comprising, at least one transistor which switches through its collector-emitter path the current in the load, means connecting the transistor base to its emitter through a voltage-stabilizing element for stabilizing a voltage supplied to the base, said voltage-stabilizing element also being operative as a dissipation device for dissipating currents or voltages occurring in a sense opposite to the sense of conduction of the transistor and produced by th inductive reactance.

4,695,771

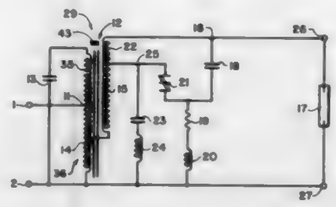
IGNITION CIRCUIT FOR HIGH PRESSURE ARC DISCHARGE LAMPS

Alexander R. Hallay, Chicago, Ill., assignor to Advance Transformer Company, Chicago, Ill.

Filed Jul. 29, 1985, Ser. No. 760,000

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—290 **27 Claims**



1. Apparatus for igniting and operating a high-pressure discharge lamp comprising:

a pair of input terminals for connection to a source of low frequency AC supply voltage,

a pair of output terminals for connection to the electrodes of the high-pressure discharge lamp,

inductance means including a step-up transformer having a secondary winding coupled to at least one of said output terminals and a primary winding,

a first capacitor,

an impedance means,

means connecting asid first capacitor and said impedance means in a first series circuit,

first means coupling said first series circuit to said input terminals via at least a part of said inductance means,

a voltage sensitive switching element coupled to said first capacitor and to said transformer primary winding and operable to at least partly discharge the first capacitor via said primary winding when the voltage across the first capacitor equals a predetermined breakdown voltage of the switching element, thereby to induce a high voltage ignition pulse in the transformer secondary winding,

and second means coupling a second capacitor to a winding of said transformer and to the other one of said output terminals, said second capacitor having a capacitance value such that the impedance of the second capacitor at the supply voltage frequency allows the second capacitor to develop a voltage that closely follows the AC supply voltage and, upon discharge of the first capacitor, the second capacitor maintains a high voltage level across said output terminals that closely approximates the level of the AC supply voltage at the time of discharge of the first capacitor.

4,695,772

DIGITAL MULTI-BEAM CRT CONTROLLER

Robert S. Lau, San Jose; Roy E. Murphy, Watsonville, and Robert G. Quick, Jr., Ben Lomond, all of Calif., assignors to Azuray Inc., Scotts Valley, Calif.

Filed Jul. 3, 1985, Ser. No. 752,266

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—370 **17 Claims**

1. A picture quality control system for use with a multi-beam raster scan display device having:

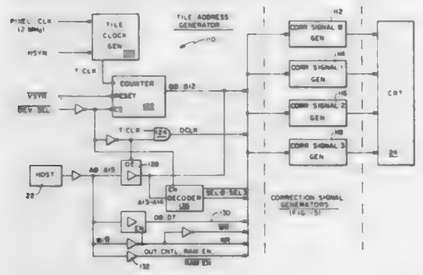
a cathode ray tube with multi-beam gun means for simultaneously generating a band of parallel electron beams, a screen, responsive to electrons impinging thereon, for displaying an image generated by said electron beams, and a neck coupling said gun means to said screen, said neck having a center axis and an acceleration region in which said beams are accelerated toward said screen; and

raster deflection means at the end of said neck for periodically deflecting said electron beams onto said screen in a predefined raster scan pattern;

said image comprising a multiplicity of parallel bands of pixels, each said band of pixels comprising a set of parallel lines of pixels generated by a separate sweep of said band of parallel electron beams across said screen;

said control system comprising:

linearity correction means, coupled to said raster deflection means, for adjusting the distance between neighboring ones of said bands of pixels in accordance with the position on said screen that said electron beams are being deflected to by said raster deflection means; and



dynamic detwist means for adjusting the relative positions of said electron beams within said band of electron beams, including

dynamic detwist coil means for generating an electromagnetic field, in a predefined portion of said neck of said cathode ray tube, which causes said band of beams to rotate with respect to the center axis of said neck; and

detwist correction signal generation means for controlling the magnitude of the electromagnetic field generated by said detwist coil means in accordance with the position on said screen that said electron beams are being deflected to by said raster deflection means.

4,695,773

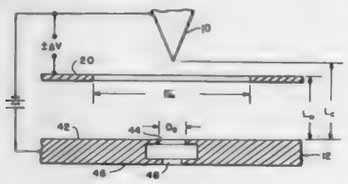
FIELD EMISSION GUN ELECTRODE GEOMETRY FOR IMPROVED FOCUS STABILITY

Lee H. Veneklasen, Castro Valley, and Guy G. Yagunoff, San Francisco, both of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 332,275, Dec. 18, 1981, abandoned, which is a continuation of Ser. No. 132,673, Mar. 21, 1980, abandoned. This application Apr. 16, 1984, Ser. No. 600,246

Int. Cl.⁴ H01J *29/58, 29/52*

U.S. Cl. 315—382 **4 Claims**



1. A field emission gun having a coaxial triode electron beam forming structure including:

an electron emission source;

an accelerating anode having a first axial aperture therethrough, said first aperture having a diameter, D_a, the spacing between said emission source and the proximate surface of said accelerating anode having the dimension, L_c; and

a Wehnelt electrode between said emission source and said accelerating anode, said Wehnelt having an axial aperture of a diameter, D_w, said Wehnelt being responsive to variable beam regulation signals for correspondingly varying the field strength of said emission source to produce a cathode lens effect, and also varying the emission from said source, said Wehnelt being parallel with and spaced from the proximate surface of said accelerating anode by a distance, L_w, and producing an electric field with an associated anode lens effect;

the dimensions for said D_a, L_c, D_w and L_w being selected in relationship to each other to provide focus stability to said field emission gun irrespective of variations in said beam regulation signals, by the placement of said Wehnelt electrode such that electric potential changes on said Wehnelt electrode produce a precise balance of each of said lens associated with said cathode emission source and said anode so that no axial shift in position of the image of said emission source results.

4,695,774

LINE OUTPUT CIRCUIT FOR GENERATING A LINE FREQUENCY SAWTOOTH CURRENT

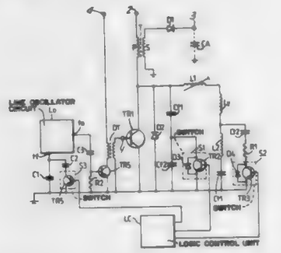
Derek J. Gent, Wallington, and Michael Bergström, Sutton, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1986, Ser. No. 873,229

Claims priority, application United Kingdom, Jun. 19, 1985, 8515483

Int. Cl.⁴ H01J *29/70, 29/76*

U.S. Cl. 315—408 **13 Claims**



1. A line output circuit for generating a sawtooth deflection current having a scan period and a flyback period selectively at a first or a second line frequency through a line deflection coil for deflecting an electron beam in a cathode ray display tube where said second frequency is higher than said first frequency, said circuit comprising the series arrangement of a line deflection coil and first or second trace capacitance selected by first switch means which series arrangement is connected across the terminals of a controlled switch, flyback capacitance also being connected across th terminals of said controlled switch, one terminal of the controlled switch being additionally connected to the primary winding of a transformer which winding is additionally arranged to receive a voltage supply from a source of direct voltage, said transformer having a secondary winding one end of which is connected to a rectifier for generating, during the flyback period, the EHT supply for the final anode of a display tube, said controlled switch being conducting during the scan period and being rendered non-conducting at the end of the scan period under the control of line pulses at said first or second frequency applied to a control input of said controlled switch to initiate the flyback period, characterised in that said first switch means additionally causes an inductor to be included in the series arrangement of the deflection coil and the appropriate trace capacitance when said circuit is set for operation at the first line frequency for main-

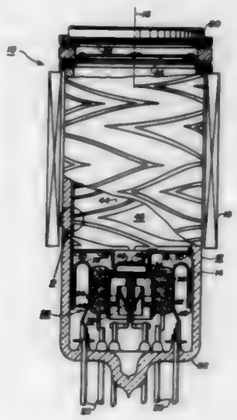
taining substantially the same scan current through said deflection coil as when set for said second line frequency with the same value for the direct supply voltage, said circuit further comprising second switch means for selecting flyback capacitance of a higher value when set for operation at said first line frequency than when set for operation at the second line frequency for maintaining substantiallyt he same ratio between the flyback and line periods at both line frequencies, the value of the EHT supply generated by said circuit being substantially the same when the circuit operates at either the first or the second line frequency.

4,695,775

IMAGING SYSTEM HAVING AN IMPROVED ELECTROSTATIC YOKE AND METHOD OF MAKING SAME

Ira G. Ritzman, Paradise Township, Lancaster County, and Joseph W. Wright, Lancaster, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 15, 1986, Ser. No. 863,430
Int. Cl.[4] H01J *29/74, 29/46*
U.S. Cl. 315—410 **11 Claims**



1. In an imaging system for focusing and deflecting an electron beam comprising:

an evacuated envelope structure having a longitudinal axis; magnetic field means for generating a substantially uniform magnetic field within the envelope and along said axis thereof;

an electrostatic yoke within said envelope for generating a variable substantially uniform electric field within said envelope to deflect said electon beam along two coordinates of said system, said electric field being orthogonal to said magnetic field;

an electron gun disposed within said envelope for generating and directing said electron beam through said magnetic and electric fields; and

a target located within said envelope opposite said electron gun, said target being disposed in a plane perpendicular to said longitudinal axis, the improvement wherein

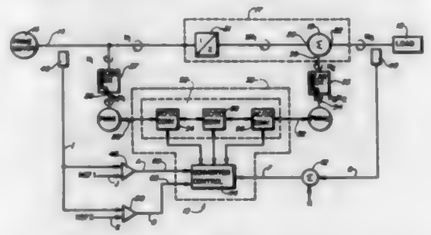
said electrostatic yoke comprising a first conductive layer bonded to said interior surface of said envelope and a second conductive layer overlying said first conductive layer and being in contact therewith, said first layer having a thickness in the range of about 500 to 1000 Å and said second layer having a thickness in the range of about 800 to 1500 Å, said first and second layers including two pairs of interleaved electrodes.

4,695,776

POWER CONVERTER FOR AN ELECTRICALLY-COMPENSATED CONSTANT SPEED DRIVE

Bryan W. Dishner, Roscoe, Ill.; Richard D. Juarros, Los Lunas, N. Mex., and P. John Dhyanchand, Rockford, Ill., assignors to Sunstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 812,396, Dec. 23, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 893,943
Int. Cl.[4] F01D *15/10*; H02P *9/00*
U.S. Cl. 318—14 **31 Claims**



1. An electrically-compensated constant speed drive (CSD) for developing constant speed motive power from variable speed motive power developed at an output shaft of a prime mover, comprising:

a speed summer having first and second input shafts and an output shaft at which the constant speed motive power is developed, the first input shaft being coupled to the prime mover output shaft;

a speed-compensating permanent magnet machine having a motive power shaft coupled to the second input shaft of the speed summer and electrical power windings;

a control permanent magnet machine having a motive power shaft coupled to either of the first and output shafts of the speed summer and also having electrical power windings;

a first bi-directional AC/DC converter coupled to the electrical power windings of one of the permanent magnet machines;

a second bi-directional AC/DC converter coupled to the electrical power windings of the other of the permanent magnet machines;

a bi-directional DC/DC converter coupled between the AC/DC converters; and

means for controlling the AC/DC converters and the DC/DC converter whereby electrical power is transferred between the permanent machines so that the speed-compensating permanent magnet machine develops compensating speed of a magnitude and direction sufficient to maintain the speed summer output shaft at the desired speed.

4,695,777

VR TYPE LINEAR STEPPER MOTOR

Masuo Asano, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 17, 1981, Ser. No. 293,311
Claims priority, application Japan, Aug. 27, 1980, 55-118193
Int. Cl.[4] H02K *41/00*
U.S. Cl. 318—135 **3 Claims**

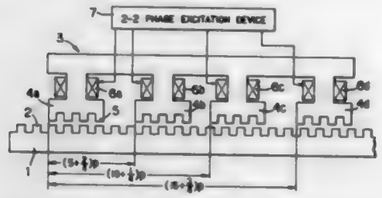
1. A linear stepper motor of the variable reluctance type comprising:

a stator having a plurality of stator teeth formed with an equal pitch p along a longitudinal direction;

a slider having four slider poles consisting of A pole, B pole, C pole, and D pole arranged in a longitudinal direction in that order, each of said slider poles being provided with a plurality of slider teeth formed oppositely to, and with identical pitch with, said stator teeth;

distances separating said B pole, C pole and D pole from said A pole being respectively (L+2/4)p, (M+1/4)p and (N+3/4)p wherein L, M and N are natural numbers;

four windings, wound about and cooperating with said four slider poles independently to form A phase, B phase, C phase and D phase, respectively; and



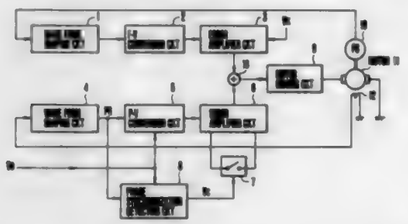
2-2 phase excitation means for repeatedly exciting two of said four windings in at least one of a first sequence of A phase-C phase, C phase-B phase, B phase-D phase and D phase-A phase, and a second sequence which is a reversal of the former, to move said slider in increments of 1/4 pitch.

4,695,778

ROTATION PHASE CONTROL DEVICE

Yasuo Chito, Saitama, and Masahiko Ogawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,501
Claims priority, application Japan, Jan. 26, 1984, 59-13156
Int. Cl.[4] H02P *5/50*
U.S. Cl. 318—314 **5 Claims**



1. A rotation phase control device for a motor having a rotor, comprising:

(a) phase detection means for detecting the rotation phase of said rotor to produce a phase detection signal;

(b) error detection means for producing a phase error signal which has a voltage corresponding to a phase difference between said phase detection signal and a predetermined reference signal;

(c) discrimination means or periodically discriminating whether the phase difference between said phase detection signal and said reference signal is within a predetermined different to produce a discrimination signal;

(d) amplifying means for amplifying said phase error signal;

(e) rotation phase control means for controlling the rotation of said rotor based on said phase error signal amplified by said means; and

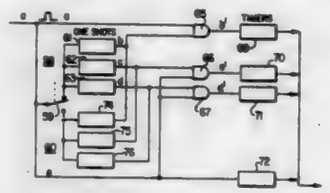
(f) frequency characteristic changing means for changing the frequency characteristic of said amplifying means in response to said discrimination signal.

4,695,779

MOTOR PROTECTION SYSTEM AND PROCESS

Kenneth H. Yates, Midland, Tex., assignor to Sargent Oil Well Equipment Company of Dover Resources, Incorporated, Tulsa, Okla.

Filed May 19, 1986, Ser. No. 864,717
Int. Cl.[4] H02P *1/04*
U.S. Cl. 318—484 **25 Claims**



1. In a protection system for a motor designed to run under conditions of varying speed and having a plurality of operating modes as determined by the connections of the leads of the windings of said motor, the combination comprising:

a. means for generating a motor speed signal representative of the speed of said motor;

b. means establishing at least two stall condition suites corresponding respectively to at least two of said motor modes and each having at least two stall speed set points, the first of said set points corresponding to an upper stall speed and the second of said stall points corresponding to a lower stall speed;

c. means for monitoring at least some of the connections of said motor winding leads to determine the existing operational motor mode and selecting the stall condition suite corresponding to the existing motor mode; and

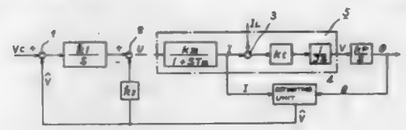
d. means for comparing said motor speed signal with the selected stall speed suite and in response to said motor speed signal having a value corresponding to said upper stall speed set point for a predetermined time period or having a second lower value corresponding to said second stall speed set point for a second time period which is shorter than said first time period generating a motor control function.

4,695,780

SERVOMOTOR VELOCITY CONTROL SYSTEM

Mitsuo Kurakake, Hino; Keiji Sakamoto, and Yukio Toyosawa, both of Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP85/00620, § 371 Date Jul. 2, 1986, § 102(e) Date Jul. 2, 1986, PCT Pub. No. WO86/03074, PCT Pub. Date May 22, 1986
PCT Filed Nov. 7, 1985, Ser. No. 885,577
Claims priority, application Japan, Nov. 9, 1985, 60-236475
Int. Cl.[4] G05B *13/00*
U.S. Cl. 318—561 **3 Claims**



1. A servometer velocity control system in which a position signal from a rotary encoder mounted on a servomotor driving a mechanical load is fed back and a torque command signal is produced for application to the servomotor, the system comprising:

an estimating unit for obtaining an estimated value of veloc-

ity of the servomotor based on the position signal from the rotary encoder, motor current of the servomotor and a load torque signal, and

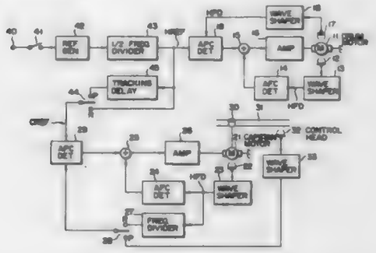
arithmetic means for calculating the torque command signal based on the estimated value of velocity outputted by said estimating unit and a velocity command signal.

4,695,781

DIGITAL TIME INTERVAL MEASURING APPARATUS

Kenji Ito, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 25, 1986, Ser. No. 911,382
Claims priority, application Japan, Sep. 30, 1985, 60-216554
Int. Cl.[4] G05B *19/21*; G11B *21/02*
U.S. Cl. 318—603 **23 Claims**



1. A digital time interval measuring apparatus comprising:

(a) main counter means, responsive to a predetermined clock signal and a gate signal, for stopping the counting of the clock signal when the gate signal is supplied, and for counting the clock signal when the gate signal is not supplied, thereby providing a main count value;

(b) gate circuit means, responsive to predetermined timing signals, for supplying the gate signal to said main counter means when any one of the timing signals is generated;

(c) count value storage means, coupled to said main counter means and said gate circuit means, for storing main count data representing the main count value obtained when said main counter means stops the counting of the clock signal in response to the gate signal;

(d) compensation means, coupled to said gate circuit means, for providing compensation data corresponding to the number of the gate signals generated; and

(e) time interval detection means for detecting time interval data, representing a signal time interval between one and another one of the predetermined timing signals, based on a difference between the main count value from said main counter means and the main count data from said count value storing means, and based on the compensation data from said compensation means.

17. A digital time interval measuring apparatus comprising:

(a) main counter means, responsive to a predetermined clock signal and a gate signal, for counting the clock signal when the gate signal does not exist, and outputting a main count value;

(b) gate circuit means, responsive to predetermined timing signals, for supplying the gate signal to said main counter means when any one of the timing signals is generated; and

(c) time interval calculation means for calculating time interval data representing a signal interval between one of the predetermined timing signals and another one thereof, based on the main count value obtained when said main counter means stops the counting of the clock signal in response to generation of the gate signal, and based on count stop data corresponding to a count stop period and the number of count stop operations of said main counter means.

18. A digital time interval measuring apparatus comprising:

(a) cyclic counter means for counting a predetermined clock signal;

(b) circuit means for generating a gate pulse to stop the counting of said cyclic counter means for a predetermined period of time, every time a predetermined timing pulse is supplied, and for stopping the generation of the gate pulse to allow said cyclic counter means to resume the counting when the predetermined period of time has elapsed;

(c) first latch means for latching a content of said cyclic counter means in a stopped state, when a first pulse of two timing pulses among the predetermined timing pulses, a pulse interval of which is to be measured, is supplied;

(d) means for counting the gate pulses which are generated upon reception of, among the two timing pulses, a second pulse following the first pulse, and weighting the obtained count to provide a correction value NX; and

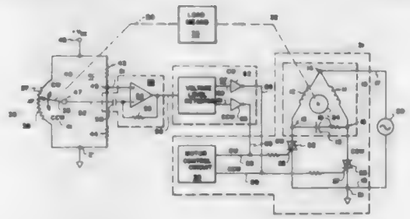
(e) second latch means, responsive to a content NA of said cyclic counter means, a content NB of said first latch means, and the correction value NX, for performing an arithmetic operation of NA−NB+NX, and latching the result of this arithmetic operation when the second pulse is supplied.

4,695,782

SYSTEM FOR INSURING ROTATIONAL DIRECTION FOR AN ALTERNATING CURRENT MOTOR

Girts U. Jatnieks, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 904,995
Int. Cl.[4] H02P *3/20*, *1/40*
U.S. Cl. 318—748 **8 Claims**



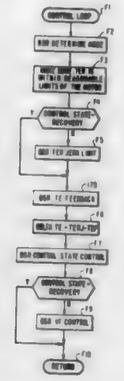
1. A system for insuring the correct direction of rotation of a bi-directional, alternating current motor, including: permanent magnet rotor means for said motor; stator means having a pair of windings and a capacitor; said capacitor and said windings being connected in a delta connection configuration and having external connection means; motor control means connected to said connection means and to a source of alternating current potential to energize said motor to cause said rotor means to rotate in either a clockwise direction or a counterclockwise direction in response to said motor control means; said motor having rotational output means to drive load means; bridge means including sensor means driven with said load means and providing a time varying voltage signal from said bridge means; said sensor means limited in movement to correspond to the movement of said load means; differentiator means having an input means and an output means with said input means connected to said sensor means to differentiate said time varying voltage signal; said output means of said differentiator means providing a resultant signal; voltage level detector means having input means connected to receive said resultant signal; said voltage level detector means having two output signals in response to operation of said sensor means; and said voltage level detector means connected to said motor control means to insure that said rotor means rotates in only the direction that said control means dictates by said two output signals from said differentiator means selectively acting with said motor control means.

4,695,783

INDUCTION MOTOR CONTROL APPARATUS AND METHOD

David J. Shero, South Park Twp., Allegheny County, Pa., and Habib Dadpey, Atlanta, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1985, Ser. No. 790,009
Int. Cl.[4] H02P *5/41*
U.S. Cl. 318—808 **11 Claims**



1. In control apparatus for a load having at least one phase and operative with an inverter including a first switch device and a second switch device for each phase of the load, said inverter being coupled with a power source and responsive to an effort request signal, the combination of

first means for determining in response to said effort request signal and in relation to each motor phase the successive first conduction times for the first switch device and the successive second conduction times for the second switch device to supply a desired output voltage having a desired frequency for energizing said phase of said load,

second means for determining the current angle between said voltage and the load current,

third means for determining in relation to said angle when the output current is positive and when the output current is negative, and

fourth means for providing a first modification to one of the first and second conduction times in response to said positive current and providing a second modification to the other of said first and second conduction times in response to said negative current, with said first and second modifications being removed in response to said desired output voltage.

4,695,784

VOLTAGE AND CURRENT LIMITING PHASE-TRIGGERED BATTERY CHARGER WITH CONTINUOUS OPTIMIZATION OF CHARGING RATE

William R. Reynolds, 63 Myrtle Ave., Madison, N.J. 07490

Continuation of Ser. No. 728,819, Apr. 30, 1985, abandoned. This application Sep. 4, 1986, Ser. No. 904,785
Int. Cl.[4] H02J *7/04*
U.S. Cl. 320—32 **5 Claims**

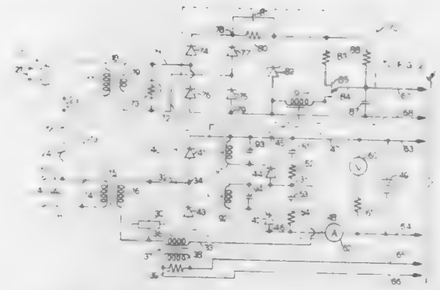
1. In a battery charging circuit for providing a battery with a charging current not greater than a predetermined current limit and a charging voltage not greater than a predetermined voltage limit, the improvement comprising:

means for sensing the amount of charging current provided to the battery by the charging circuit, said charging current sensing means generating a first signal indicative of the amount of charging current;

a first adjustable zener diode operating in its linear region as an amplifier, and having an anode, a cathode, and a reference terminal, said first signal being applied to said reference terminal of said first adjustable zener diode wherein the amount of current flow through said first adjustable zener diode from cathode to anode is generally proportional to the amount of charging current;

means for sensing the amount of charging voltage provided across the battery by the charging circuit, said charging voltage sensing means generating a second signal indicative of the level of charging voltage;

a second adjustable zener diode operating in its linear region as an amplifier and having an anode, a cathode, and a reference terminal, said second signal being applied to said



reference terminal of said second adjustable zener diode wherein the amount of current flow through said second adjustable zener diode from cathode to anode is generally proportional to the amount of charging voltage; and

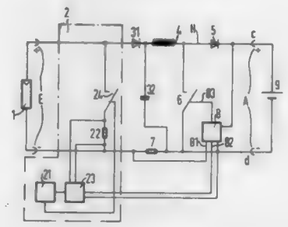
means responsive to said current flow through said first adjustable zener diode and to said current flow through said second adjustable zener diode, said responsive means regulating the charging current and charging voltage so that the charging current is provided to the battery at a level not greater than said predetermined current limit and the charging voltage is provided across the battery at a level not greater than said predetermined voltage limit, whereby the charging rate is continuously optimized.

4,695,785

CIRCUIT ARRANGEMENT FOR FEEDING AN ELECTRICAL LOAD FROM A SOLAR GENERATOR

Guenther Mieth, Munich, and Ulf Schwarz, Pullach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 876,452
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3522080
Int. Cl.[4] G05F *1/565*
U.S. Cl. 323—222 **5 Claims**



1. A circuit arrangement for feeding a load from a solar generator comprising:

an input for connection to the solar generator and an output for connection to the load;

a reference voltage generator including a first switch and a precision resistor connected across said input, and a clock connected to said first switch and operable to generate clock pulses to periodically close said first switch so that reference voltage pulses are produced across said first precision resistor representing the short-circuit current of the solar generator;

a sample and hold circuit connected to said first precision resistor and connected to and operated by said clock for sampling the reference voltage pulses;

a second switch connected across the output of said arrangement;

actual value means connected to said input for measuring the current drawn from the solar generator and producing a representative actual voltage; and

a control circuit connected to said second switch to said actual value means and to said sample and hold circuit and operable to open and close said second switch in response to the reference and actual voltages such that the current drawn from the solar generator has a prescribed ratio with respect to the short-circuit current.

4,695,786

VOLTAGE REGULATOR FOR AN ALTERNATOR HAVING AN AUXILIARY STAGE FOR STARTING THE ALTERNATOR AT A LOW ROTATIONAL SPEED

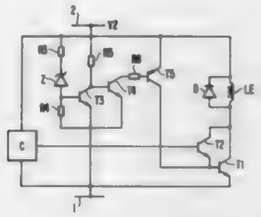
Pietro Menniti, Milan, and Fabio Marchio, Busto Arsizio, both of Italy, assignors to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed May 20, 1986, Ser. No. 865,026

Claims priority, application Italy, May 20, 1985, 20797 A/85

Int. Cl.⁴ G05F *5/00*; H02P *9/10*

U.S. Cl. 323—303 **1 Claim**



1. In a voltage regulator for an alternator having first and second supply terminals and comprising a control stage connected between said first and second supply terminals and having an output terminal connected to a base of a first transistor of a pair of transistors forming part of an actuator stage of said regulator, said pair of transistors being connected together in a Darlington configuration and having their collectors connected to an exciter winding of said alternator, the improvement comprising an auxiliary stage connected between said first and second supply terminals, and having an output terminal connected to the base of a second transistor of said pair of transistors of said actuator stage and comprising a determining circuit means for determining a reference voltage and control circuit means for causing said second transistor of said pair of transistors to conduct when a voltage between said first and second supply terminals is lower than said reference voltage, thereby reducing a voltage drop across said pair of transistors; wherein said first transistor of said pair of transistors of said actuator stage has its emitter connected to said base of the second transistor of said pair of transistors, and wherein said determining circuit means of said auxiliary stage comprises at leat one resistor and at least one Zener diode disposed in series and connected between said first supply terminal and a base of a third transistor forming part of said auxiliary stage and at least one resistor connected between said base of said third transistor and said second supply terminal, and wherein said control circuit means of said auxiliary stage comprises a fourth transistor having its base connected to said first supply terminal and to a collector of said third transistor and having its emitter and collector respectively connected between said second supply terminal and a base of a fifth transistor which is connected between said first supply terminal and an output terminal of said auxiliary stage.

4,695,787

DEVICE FOR DETECTING AND LOCATING PENETRATION OF WATER INTO A MARINE ACOUSTIC STREAMER

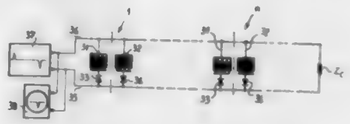
Daniel Billet, St. Paul De Vence, and Jean F. Cesarini, Nice, both of France, assignors to Thomson CSF, Paris, France

Filed Aug. 27, 1985, Ser. No. 769,735

Claims priority, application France, Aug. 31, 1984, 84 13510

Int. Cl.⁴ G01V *1/38*; G01R *31/02*

U.S. Cl. 324—557 **6 Claims**



1. A marine acoustic streamer assembly for passively detecting submarine noises comprising:

a plurality of hollow streamer elements connected to each other by sealed junctions and filled with a non-conducting oil;

a plurality of humidity sensors disposed in said streamer elements proximate said junctions;

means for monitoring said humidity sensors to determine if any of said sealed junctions has water leaking therein and for determining the location of such leakage if it exists by means of brief pulse reflectometry.

4,695,788

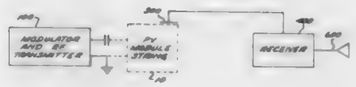
OPEN FAULT LOCATION SYSTEM FOR PHOTOVOLTAIC MODULE STRINGS

Neil A. Marshall, Rancho Palos Verdes, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 11, 1984, Ser. No. 680,451

Int. Cl.⁴ G01R *31/08*; H01L *31/00*

U.S. Cl. 324—527 **26 Claims**



1. Apparatus for detecting the location of open faults in a series-connected string of photovoltaic (PV) modules, comprising means for impressing rf test signals onto said module string at a predetermined location in the series-connected string, the frequency of said rf signals being selected in dependence on the reactive loss of said PV module string to be low enough that the string does not become an rf radiator, means for detecting the presence or absence of such rf signals, and probe means for coupling rf signals from successive positions adjacent said modules to said means for detecting such signals, said means for detecting the presence or absence of such rf signals further comprising means responsive to the absence of such detected signals for indicating the location of an open fault in the PV module string, the presence of such detected test signals indicating that continuity exists in the PV module string between said predetermined location and the position where said probe is disposed, and the absence of such detected signals indicating that the PV module string is open faulted between said probe and said predetermined location.

4,695,789

PROBE DEVICES

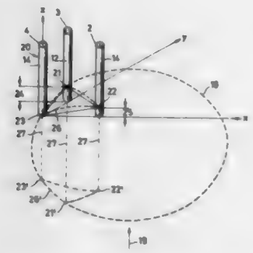
Johannes Lambertz, Kerpen, and Ingo Schumacher, Cologne, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG., Fed. Rep. of Germany

Filed Jul. 16, 1985, Ser. No. 755,405

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1984, 3426993

Int. Cl.⁴ G01F *23/28*

U.S. Cl. 324—61 P **8 Claims**



1. A probe device including a holder, a first capacitive measuring sensor carried by the holder and comprising a first hollow electrical conductor, and second and third mutually separate electrical conductors which are disposed in at least substantially parallel and approximately coaxial relationship within the first conductor and which have tips terminating outside the first conductor at an axial spacing from each other in a common ceramic casing adapted for detecting the presence and the speed of propagation of a first medium in a system comprising a plurality of media with different dielectric constants which in certain states form phases having interfaces with each other, and second and third further capacitive measuring sensors each having a respective single coaxial inner conductor, the sensors being so arranged in the holder that the three tips thereof lie in a common plane and are disposed in a triangular configuration.

4,695,790

RF FREQUENCY SPECTRUM ANALYZER SUBSYSTEM

Ronald F. Mathis, San Diego, Calif., assignor to General Dynamics Electronics Division, San Diego, Calif.

Filed Jan. 2, 1986, Ser. No. 815,630

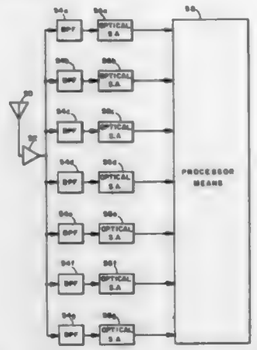
Int. Cl.⁴ G01R *23/16*

U.S. Cl. 324—77 K **12 Claims**

1. A spectrum analyzer subsystem for analyzing the frequency content of an RF signal, comprising:

optical source means responsive to an RF signal for generating a plurality of intensity modulated optical signals;

filter means responsive to each one of said intensity modulated optical signals for providing a plurality of output optical signals each corresponding to a respective one of said intensity modulated optical signals, each output optical signal corresponding in intensity to the frequency content of an RF signal within a different predetermined frequency bandwidth; and



detector means responsive to each output optical signal for converting each output optical signal into a corresponding electrical signal.

4,695,791

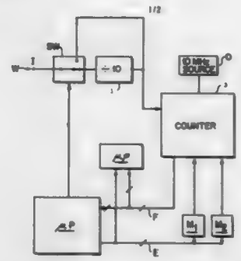
AUTO RANGING OF A FREQUENCY MEASURING INSTRUMENT

Robert V. Miller, Dover, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 4, 1985, Ser. No. 740,947

Int. Cl.⁴ G01R *23/10*

U.S. Cl. 324—78 D **6 Claims**



6. Apparatus for selecting the best mode in which to make a frequency measurement comprising:

an input gate to which a signal whose frequency is to be measured may be applied,

means for opening the gate for a trial interval,

means for counting the number of cycles of the signal that pass through the gate during the trial interval and indicating said number by a series of digits,

means for examining groups of said digits in said number to determine the range in which the frequency of the wave lies,

means responsive to the range determined by said examining means for indicating whether the frequency mode should be used or whether the period mode should be used, and

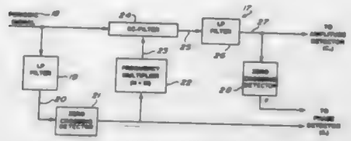
means for deriving the frequency of the signal in accordance with the indicated mode.

4,695,792

METHOD AND SYSTEM FOR MEASURING THE AMPLITUDE AND PHASE ANGLE OF HARMONICS IN A PERIODIC SIGNAL

Gilles Roy, Beloeil, Canada, assignor to Ecole Polytechnique, Montreal, Canada

Filed Dec. 16, 1985, Ser. No. 809,046
Int. Cl.[4] G01R 25/00
U.S. Cl. 324—83 D 16 Claims



1. A harmonics analyzer system for simultaneously detecting the amplitude and phase angle of harmonics in a periodic signal, said system comprising: a tunable tracking filter connected to an input of said system for receiving said periodic signal having a frequency within a predictable range; conditioning circuit means connected to said input to tune said tracking filter to a selected harmonic in said periodic signal; and a programmable frequency multiplier circuit

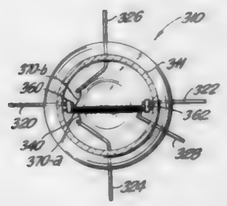
connected to said tracking filter for locking the clock frequency thereof to tune said tracking filter to said selected harmonic of said periodic signal to provide at its output an output signal having the amplitude and corresponding phase of the selected harmonic.

4,695,793

RESISTIVE SENSING THERMAL DEVICE FOR CURRENT MEASUREMENT

Fred L. Katzmann, Cedar Grove, N.Y., assignor to Ballantine Laboratories, Inc., Boonton, N.J.

Filed Feb. 15, 1984, Ser. No. 580,450
Int. Cl.[4] G01R 5/26; G08B 21/00; H01C 7/10
U.S. Cl. 324—106 15 Claims



1. In a thermal transfer device for use in the precise measurement of electrical current including an evacuated enclosure containing a first elongate electrical conductor, which conductor is heated by the electrical current being measured, and a thermal sensor that provides an electrical characteristic representative of the temperature of the first electrical conductor, the improvement comprising:

(a) the first electrical conductor being a fine wire formed of a low temperature coefficient of resistivity material;

(b) the thermal sensor being a second elongate fine wire electrical conductor formed of a relatively high temperature coefficient of resistivity material; and

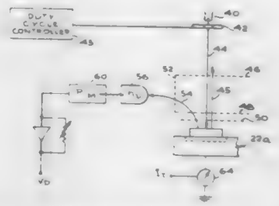
(c) the length of the thermal sensor being thermally coupled with most of the length of the first electrical conductor.

4,695,794

VOLTAGE CALIBRATION IN E-BEAM PROBE USING OPTICAL FLOODING

Charley B. Burgett, Santa Barbara; Roderic L. Osgood, Goleta; Joseph L. Davis, Santa Barbara, and Richard J. Joyce, Thousand Oaks, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 31, 1985, Ser. No. 739,832
Int. Cl.[4] G01R 31/28
U.S. Cl. 324—158 R 23 Claims



1. Photodiode testing apparatus comprising:

electron-beam source means for generating a beam of primary electrons;

beam control means for directing the beam to a selected diode in a photodiode array;

means for modulating the electron beam to develop predetermined bias voltages at the selected diode;

voltage sensing means responsive to secondary emission electrons from the selected diode for providing output signals which are proportional to the diode bias voltages;

means for directly measuring the induced bias voltages at zero diode current;

means for correlating the measured bias voltages with corresponding output signals from the voltage sensing means; and

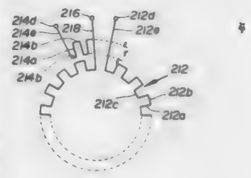
means for illuminating the selected diode on the same side of the diode as the electron-beam source means with a high background level of infrared radiation in order to sharpen the zero crossings of the I–V characteristic curves of the diode during the measurement of the bias voltages at zero diode current.

4,695,795

ROTATION SENSOR WITH CO-PLANAR VELOCITY AND POSITION RESPONSIVE ELEMENTS

Hiromitsu Nakamizo, Tokyo, and Takashi Mochida, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,590
Claims priority, application Japan, Dec. 28, 1983, 58-248923
Int. Cl.[4] G01P 3/48; G01B 7/30
U.S. Cl. 324—208 39 Claims



1. A rotation sensor comprising:

a first rotary component including a magnetic element having a plurality of first segments arranged about the periphery of said rotary component and generating magnetic fields between each adjacent pair of first segments, and one or more second segments disposed near said first segments and representing a reference angular position of a rotating object, said magnetic element being coupled with said rotating object, the angular motion of which is to be monitored, for rotation therewith; and

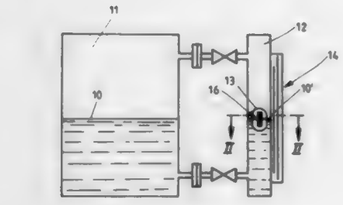
a second stationary component on which a first signal generator is cooperative with said first segments of said magnetic element to output a first signal representative of angular motion speed of said rotating object, and a second signal generator is cooperative with said second segments of said magnetic element to output a second signal indicative of the presence of said rotating component in said reference position, said first signal generator being connected to its output terminals via communication lines lying on the same plane, on which said first signal generator is arranged, said communication lines extending across the magnetic field formed by said second segments of said magnetic element and arranged to avoid electromagnetic interaction with said magnetic field formed by said second segments.

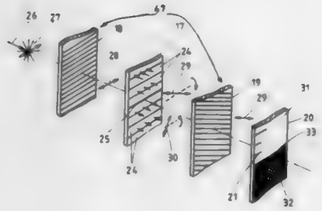
4,695,796

MAGNETO-OPTIC MEASURING DEVICE

Reinhard Omet, Babenhausen; Hans Kindsvater, Bad Homburg, and Hans J. Wall, Darmstadt, all of Fed. Rep. of Germany, assignors to Phönix Armaturen-Werke Bregel GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 670,142
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341265
Int. Cl.[4] G01B 21/00; G01N 27/72; G01R 33/00
U.S. Cl. 324—226 17 Claims





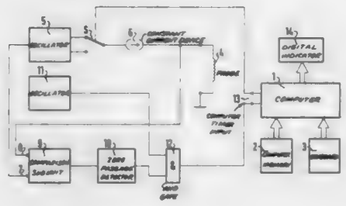
1. A device for measuring physical quantities such as length, angle, position, temperature electric current, comprising means for generating a magnetic field whose parameters are a function of a quantity under measurement; a magnetooptic element arranged for intercepting said magnetic field and for receiving light emitted from a light source, said magnetooptic element producing a Faraday rotation of light passing therethrough; polarizing means optically coupled to said magnetooptic element to detect said Faraday rotation; indicating means for intercepting light emerging from said polarizing means to indicate a value of said quantity under measurement, said polarizing means including a polarizer arranged in the path of light rays before the magnetooptical element, and an analyzer arranged after the magnetooptical element; and said magnetooptic element being assembled of a plurality of superposed rows of a magnetooptic material extending transversely to the path of incident light, said rows forming domains which are uniformly magnetizable by the intercepted magnetic field and being separated by sharp demarkation lines ones from the other, and the polarizing means covering the overall area of the superposed domains.

4,695,797

METHOD OF AND APPARATUS FOR LAYER THICKNESS MEASUREMENT

Volker K. Deutsch, Wuppertal, and Werner F. Roddeck, Velbert, both of Fed. Rep. of Germany, assignors to Karl Deutsch Prüf- und Messgerätebau GmbH+Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,667
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404720
Int. Cl.[4] G01B 7/10
U.S. Cl. 324—230 20 Claims



1. A method for measuring a thickness of a layer of non-magnetic material on a ferromagnetic base material specimen in accordance with a magnetic inductive process using a probe having a coil therein, said coil having an inductance which varies with respect to a distance between said coil and a ferromagnetic material, wherein a calibration table is stored for said probe corresponding to a curve A reflecting a non-linear relationship between the coil inductance and the distance between the coil and the magnetic material, characterized in that the method comprises the steps:

(a) placing a non-magnetic foil having a known thickness on the non-magnetic material layer on the specimen;

(b) placing the probe on top of said foil;

(c) measuring the inductance of the coil of the probe;

(d) storing said measuring coil inductance and the known foil thickness;

(e) repeating steps (a) through (d) for at least one further foil having a different thickness;

(f) determining difference values for the above measured coil inductances and the known foil thickness;

(g) comparing these difference values with the curve A of the stored calibration table;

(h) generating a curve B offset from said curve A by an amount ov in response to said comparison;

(i) displaying said offset value ov as an initial measurement for the thickness of said layer on said specimen; and

(j) storing said offset value ov for use in subsequent measurements of said specimen.

4,695,798

METHOD AND APPARATUS FOR GENERATING FREQUENCY SELECTIVE PULSES FOR NMR SPECTROSCOPY

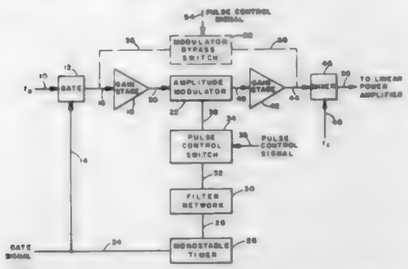
Rolf Brandes, Stockholm, Sweden, assignor to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 22, 1985, Ser. No. 725,382
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—307 29 Claims

1. An apparatus for generating a frequency selective output pulse from a carrier frequency signal pulse of a predetermined duration, comprising:

pulse means for generating at least one modulating pulse of predetermined amplitude, duration, and frequency content;

filter means responsive to said modulating pulse for removing selected frequencies from the frequency content of said modulating pulse, said filter means having a predetermined transfer function so as to provide a modulating signal varying in amplitude as a function of time as determined by a filter impulse response; and



modulator means for receiving a carrier frequency signal pulse, said carrier frequency signal pulse being of a predetermined duration and a single constant carrier frequency, and responsive to said modulating signal for modulating the amplitude of the carrier frequency signal pulse and providing a frequency selective output pulse having a predetermined frequency content centered about the carrier frequency of the carrier frequency signal pulse.

4,695,799

NMR MAGNETIZATION INVERSION BY NON-LINEAR ADIABATIC FAST PASSAGE

Christopher J. Hardy, and William A. Edelstein, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1985, Ser. No. 746,146

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **11 Claims**



1. A method for complete inversion of magnetization by adiabatic fast passage during an NMR investigation of a sample having a selected nuclear specie with a Larmor frequency ω_O, comprises the steps of:

(a) generating a radio-frequency (RF) magnetic field having an amplitude B_1 and an instantaneous frequency $\omega(t)$;

(b) controlling the frequency $\omega(t)$ to non-linearly sweep as a time function $\omega(t)=\omega_O+\alpha\gamma B_1 \tan(\arcsin(\omega_s t))$, where γ is the gyromagnetic constant of the selected nuclear specie and $\omega_s=\alpha\gamma B_1$ and $O<\alpha\leq 1$, during a preselected time interval, from a first frequency, selected from one of a minimum frequency ω_1 substantially at a maximum offset frequency $\Delta\omega$ below the Larmor frequency ω_O and a maximum frequency ω_h substantially at the maximum offset frequency $\Delta\omega$ above the Larmor frequency, through the Larmor ω_O frequency, to a second frequency which is the remaining one of the minimum and maximum frequencies; and

(c) applying the non-linearly swept RF signal to the sample-being-investigated to substantially invert the magnetization of the selected nuclear specie.

4,695,800

NON HARMONIC NMR SPIN ECHO IMAGING

David M. Kramer, Cleveland Heights; Russell A. Compton, Chesterland; Lawrence M. Strenk, Middleburg Hts., and James B. Murdoch, Solon, all of Ohio, assignors to Technicare Corporation, Cleveland, Ohio

Filed Jun. 6, 1985, Ser. No. 742,161

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **17 Claims**



1. Nuclear magnetic resonance apparatus for producing resonance information in the form of first and second spin echo signals in which an initial nuclear magnetic resonance signal is repetitively refocused by successive refocusing radio frequency signals, comprising:

means for applying a static magnetic field to a subject being examined;

means for applying a first radio frequency signal to said subject at a first predetermined time for inducing an initial nuclear magnetic resonance information signal;

means for applying a second, refocusing radio frequency signal to said subject at a second predetermined time for generating a first spin echo signal at a time following said first radio frequency signal: and

means for applying one or more additional radio frequency signals to said subject at respective predetermined times for refocusing the information of said first spin echo signal about a point in time separated from the last of said additional radio frequency signals by a given time interval to form a desired spin echo signal, said additional radio frequency signals also generating undesired signal components derived from earlier-occurring nuclear magnetic resonance signals, and said given time interval not exhibiting a harmonic relationship to the time intervals between ones of said radio frequency signals, whereby there is no substantial overlap in time of said desired spin echo signal by said undesired signal components.

4,695,801

MATCHED GUADRATURE COILS FOR MRI WITH MINIMIZED INTERCOIL COUPLING

Mitsuaki Arakawa, Hillsborough; John H. Fehn, El Sobrante, and Lawrence E. Crooks, Richmond, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 10, 1986, Ser. No. 827,609

Int. Cl.[4] G01R *33/20*

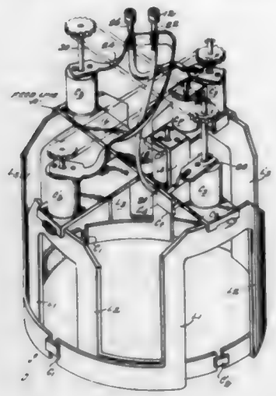
U.S. Cl. 324—318 **15 Claims**

1. Magnetic resonance imaging apparatus having a quadrature RF coil comprising:

first and second co-located RF coils extending axially and circumferentially about a volume to be imaged but being rotationally offset so as to produce a pair of RF signals from said volume which are in phase quadrature;

said first and second RF coils having a common open end through which objects to be imaged may be inserted along an axis of the apparatus and a common closed end for location of RF coupling and feeding structures;

said first and second RF coils each having respective RF feedlines which extend across respectively associated



perpendicularly disposed diameters of said common closed end.

4,695,802

NUCLEAR MAGNETIC RESONANCE APPARATUS WITH A PERMANENT MAGNET

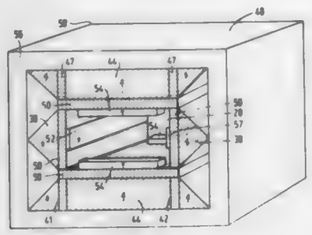
Hinne Zijlstra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 672,971, Nov. 19, 1984, abandoned. This application Jul. 9, 1985, Ser. No. 753,205

Claims priority, application Netherlands, Jul. 17, 1984, 8402250

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—319 **15 Claims**



1. A nuclear magnetic resonance apparatus comprising first means for generating homogeneous, main magnetic field in a magnetic field space, second means for generating at least one magnetic gradient field in said field space, means for generating a radio frequency field in said field space and means for detecting a nuclear magnetic resonance signal produced by said radio frequency field in an object under examination disposed in said field space, said first means comprising a plurality of bars of a permanent magnetic material, said bars being laterally magnetized and having planar side surfaces, said bars being disposed about and surrounding an axis extending centrally along said field space so as to define the periphery of said field space having a polygonal cross-section in a plane normal to said axis, with each axially extending peripheral surface of said field space being constituted by a planar surface of a respective bar.

4,695,803

HID LAMP BALLAST TESTER

Robert H. Rue, Christiansburg, Va., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Continuation of Ser. No. 523,105, Aug. 15, 1983, abandoned. This application Feb. 3, 1986, Ser. No. 825,772

Int. Cl.[4] G01R *31/00, 1/22*

U.S. Cl. 324—403 **5 Claims**



1. A testing device for use with a clamp-on ammeter to measure the short-circuit current output of a ballast circuit connected to an HID lamp socket, comprising

a body of electrically nonconductive material;

a head portion fixedly attached to said body, said head portion having means defining an opening therethrough dimensioned to receive the current-sensing arms of a clamp-on ammeter;

a base attached to said body, said base including contact portions adapted to mate and make electrical contact with the socket to be tested; and

a low resistance wire connected at opposite ends to said connector portions of said base and extending around said opening to be coupled to said ammeter and to form a short-circuit across said socket relative to the impedance of said ballast circuit.

4,695,804

APPARATUS FOR GENERATING A MULTI-FREQUENCY SIGNAL

Artur Bardl, Munich, and Manfred Lindner, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jnl. 31, 1985, Ser. No. 761,056

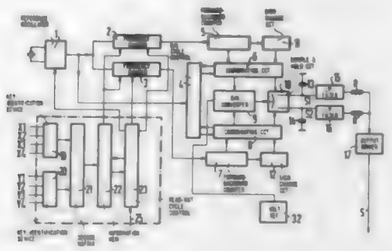
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428767

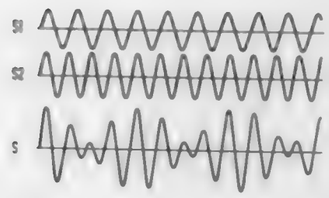
Int. Cl.[4] H03L *7/18;* **H03B** *21/00*

U.S. Cl. 328—14 **5 Claims**

1. Apparatus for generating a multi-frequency signal, comprising a digital-to-analog converter, two coordinating circuits connected to said D/A converter for providing different frequency analog-wave information to said D/A converter for determining a respective connecting instant, two forward-/backward counters driven by different frequencies each being connected for controlling a respective one of said coordinating circuits, a D/A cycle control connected to said coordinating circuits for monitoring time connecting instants of said converter circuits to said D/A converter, a sample-and-hold circuit having at least two divider capacitors and being connected

to said D/A converter controlled by said D/A cycle control, and holding capacitors connected to said sample-and-hold





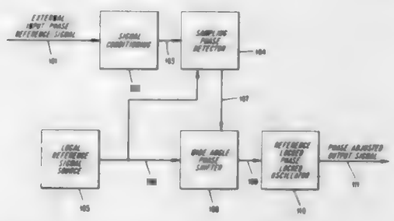
circuit, whereby at least two different frequency analog waves are generated.

4,695,805

APPARATUS FOR GENERATING SIGNALS SYNCHRONIZED TO AN UNSTABLE EXTERNAL SIGNAL

Larry W. Massingill, and Derrick O. Perkins, both of Raleigh, N.C., assignors to OnLine Computer Systems Inc., Germantown, Md.

Filed May 13, 1985, Ser. No. 733,483
Int. Cl.[4] H03K *17/00, 17/26, 5/13*
U.S. Cl. 328—72 **7 Claims**



1. Apparatus for synchronizing an internally generated local reference signal with an externally generated signal having a specific point which may occur periodically or aperiodically to generate a periodic output signal synchronized with the specific point on the externally generated signal comprising:

means for generating the local reference signal;

sampling phase detector means for comparing the externally generated signal against the local reference signal for generating and holding stable between receipt of the specific points on the externally generated signal a sampled phase difference signal, the sampled phase difference signal representing the phase angle at which the previous specific point on the externally generated signal occurs with respect to the local reference signal;

means connected to receive the sampled phase difference signal and the local reference signal for generating a phase shifted local reference clock signal, the phase shifted local reference clock signal having a cycle equal in period to the local reference signal but shifted in phase with respect to the local reference signal by an amount equal to the phase angle; and

means connected to receive the phase shifted local reference clock signal for generating the output signal synchronized and phase locked to the externally generated signal,

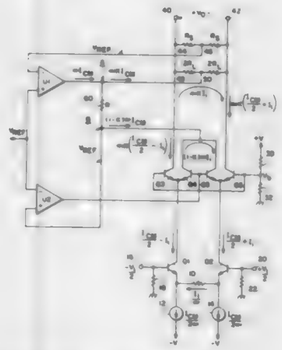
wherein the output signal is phase locked to the externally generated signal at each occurrence of a specific point of the externally generated signal and remains phase locked until the next occurrence of a specific point of the externally generated signal.

4,695,806

PRECISION REMOTELY-SWITCHED ATTENUATOR

Ronald A. Barrett, Westford, Mass., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 15, 1986, Ser. No. 852,476
Int. Cl.[4] H03G *3/30*
U.S. Cl. 330—254 **6 Claims**



1. An attenuator circuit, comprising:

means for receiving an input signal and generating a signal current therefrom;

differential amplifier means coupled to said input signal receiving means for providing a first signal current path and a second signal current path;

attenuation-ratio determining means comprising a first operational amplifier having an output coupled to a first circuit node, load impedance means coupled between said first circuit node and said first signal current path and one input of said operational amplifier to complete a feedback path therefor, and selectable impedance means coupled between said first circuit node and a second circuit node, said second circuit node being connected to said second signal current path, wherein the attenuation ratio is determined by the said load impedance means and said selectable impedance means; and

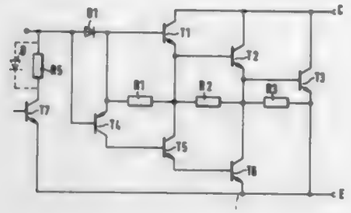
a second operational amplifier having a first input coupled to a reference potential, a second input coupled to said second circuit node to sense said attenuation ratio, and an output coupled to said differential amplifier means for controlling the proportionality of signal current between said first and second signal current paths in response to the attention ratio sensed at said second circuit node.

4,695,807

CIRCUIT ARRANGEMENT HAVING CLEARING TRANSISTORS FOR DISCHARGING A DARLINGTON STAGE

Ralph Annecker, and Joachim Dietl, both of Heilbronn, Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 838,691
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509595
Int. Cl.[4] H03F *3/04;* **H03K** *3/33*
U.S. Cl. 330—310 **4 Claims**



1. A circuit arrangement, comprising:

a Darlington stage which includes a sequence of Darlington transistors; and

means for removing charges during the circuit-breaking of the Darlington transistors, said means for removing the charges including

a plurality of clearing transistors,

means for connecting the clearing transistors in a sequence and for connecting each clearing transistor to the base of a respective Darlington transistor so that the base current of the Darlington transistors preceding the last Darlington transistor travels in each case via the switched-through collector emitter section of a clearing transistor to the base of a following clearing transistor to actuate the following clearing transistor, and

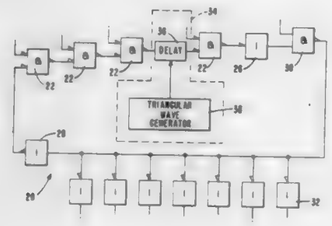
a diode connected between the base of the first transistor in the sequence of Darlington transistors and the base of the first transistor in the sequence of clearing transistors.

4,695,808

VARYING FREQUENCY OSCILLATOR FOR THE REDUCTION OF RADIATED EMISSIONS OF ELECTRONIC EQUIPMENT

Frank W. Cabaniss, Columbia, S.C., and James M. Lockwood, Mountain View, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 27, 1984, Ser. No. 584,269
Int. Cl.[4] H03B *1/00*
U.S. Cl. 331—57 **5 Claims**



1. In combination with an oscillator for outputting clock signals of a predetermined frequency, an apparatus for reducing interference caused by electromagnetic radiation from said system at said predetermined frequency including delay means for outputting a delay signal for delaying the clock output of the oscillator and signal generator means for modulating the delay signal enabling said oscillator to output clock signals of varying frequencies, said oscillator includes an inverting gate member through which the clock signals are generated and said delay means includes a resistor-capacitor network connected to the input of said inverting gate member for outputting said delay signal which delays the timing of the clock signals outputted by the oscillator.

4,695,809

MICROWAVE SWEEP FREQUENCY OSCILLATOR

Marie-Irène Rudelle, Aubervilliers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1986, Ser. No. 867,349
Claims priority, application France, May 28, 1985, 85 07951
Int. Cl.[4] H03B *5/18, 23/00*
U.S. Cl. 331—117 D **4 Claims**



1. A microwave-frequency power oscillator swept linearly over a wide frequency range around a central frequency, by means of two variable capacitance diodes, the capacitance of which may be varied depending on a control voltage, and whose cathodes are interconnected via a line element to which said control voltage is applied, said oscillator comprising a transistor whose matching impedances at its input and output electrodes are provided by lines designed to ensure the maximum gain at the central frequency wherein, the working frequency is obtained with a stable transistor operating mode in said frequency range by means of a feedback network matching its input to its output, said variable capacitance diodes being inserted in series between three line elements in a wobbulator circuit arranged in shunt to said feedback network, said line element interconnecting the cathodes, constituting one of said three elements while of the other two elements one end of each is connected to a diode anode, and the respective other ends are connected to a point on the feedback network and to earth, said line elements of the wobbulator circuit being designed to optimise the frequency modulation linearity.

4,695,810

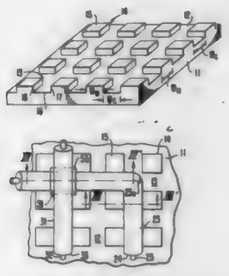
WAFFLELINE-CONFIGURED MICROWAVE TRANSMISSION LINK

Douglas E. Heckaman, Indialantic; Roger H. Higman, Palm Bay; Jeffrey A. Frisco, Palm Bay, and Edward J. Bajgrowicz, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 22, 1984, Ser. No. 664,876
Int. Cl.[4] H01P *5/00, 3/06*
U.S. Cl. 333—1 **32 Claims**

1. A transmission line structure for effecting signal transmission at microwave frequencies between spaced apart microwave signalling components comprising a plate member at least one side of which is formed with a first plurality of regularly-spaced, parallel channels extending in a first direction, and a second plurality of regularly-spaced, parallel channels

extending in a second direction transverse to said first direction, so as to form, with said first plurality of channels, a waffle-iron-like arrangement of mesa portions each of which extends from a commonly-shared floor for each of said channels to a prescribed height above said floor, the commonly-shared floor, side walls of said channels defined by side walls of said mesa portions, and top land portions of said mesas comprising conductive material and at least one microwave circuit component receiving portion for accommodating at least one microwave circuit component, so that said waffle-iron-like arrangement of mesa portions forms, with signal conductors for connection to said at least one microwave circuit component and disposed in said channels of said first and second pluralities of



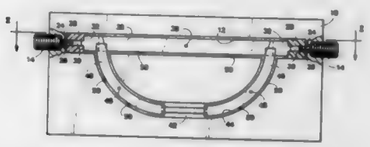
regularly-spaced parallel channels, a transmission line structure that is periodic in both of said first and second directions and provides a constant transmission line impedance irrespective of a change in channel direction of the disposition of a conductor along channels of either of said first and second pluralities of channels, said at least one microwave circuit component receiving portion comprising a pocket recessed in said commonly-shared floor so that channels of said first and second pluralities of channels are interrupted thereby, and wherein the side walls and commonly-shared floor of said channel portions are provided with a layer of insulator material thereon.

4,695,811

HIGH FREQUENCY COAXIAL SWITCH

Heinz E. Greilmann, Beaverton, and Leonard A. Roland, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 28, 1986, Ser. No. 890,044
Int. Cl.[4] H01P *1/10*
U.S. Cl. 333—105 **6 Claims**



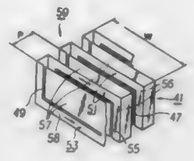
1. A high frequency coaxial switch comprising:
a housing having a cavity;
a hybrid circuit board mounted within the cavity, the hybrid circuit board having a microstrip conductor thereon;
a first coaxial connector mounted on the housing and electrically connected to the microstrip conductor to provide electrical access to the cavity;
a first contact stripline situated within the cavity so as to overlap the microstrip conductor; and
means for moving the first contact stripline to make or break electrical contact with the microstrip conductor.

4,695,812

ELECTROMAGNETIC DELAY LINE WITH INDUCTANCE ELEMENT WITH TRANSVERSELY STAGGERED STACKED CONDUCTING PORTIONS

Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Mar. 14, 1986, Ser. No. 839,578
Claims priority, application Japan, Mar. 15, 1985, 60-52670; Jul. 9, 1985, 60-151488
Int. Cl.[4] H01P *9/00;* **H03H** *7/34*
U.S. Cl. 333—156 **21 Claims**



1. A distributed constant type delay line, comprising:
(a) an inductance element comprising a plurality of essentially parallel stacked plates which are conducting and connected in series, said stacked plates being defined by a first and a second set of plates, individual plates of said first set of plates being stacked to alternate with individual plates of said second set of plates, each of said stacked plates having a longitudinal axis, the longitudinal axes of the first set of plates defining a first plane essentially perpendicular to the parallel stacked plates, the longitudinal axes of the second set of plates defining a second plane essentially perpendicular to the parallel stacked plates, said first plane being spaced from said second plane;
(b) a ground electrode interposed between adjacent parallel stacked plates; and
(c) a dielectric layer interposed between said ground electrode and said parallel stacked plates.

4,695,813

POLARIZED ELECTROMAGNETIC RELAY

Kazuhiro Nobutoki, and Kenji Ono, both of Matsusaka, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Mar. 6, 1986, Ser. No. 836,735
Claims priority, application Japan, Mar. 25, 1985, 60-60087
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—78 **7 Claims**



1. In a polarized electromagnet relay including:
a casing;

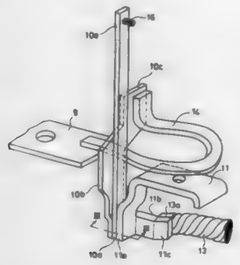
an elongate armature pivotally supported at its central portion to be movable about a center pivot axis for angular movement between two contact operating positions;
an electromagnet received in the casing, said electromagnet having a core, exciter coil means about the core, and a pair of pole members extending from the ends of the core toward the ends of the armature on either side of the pivot axis;
a bar-shaped three-pole magnetized permanent magnet disposed between the free ends of the pole members in closely adjacent relationship to the armature, said permanent magnet being magnetized to have the same poles at its lengthwise ends and to have the opposite pole intermediate its end;
a pair of movable contact springs carried by the armature to be moved into and out of contact with corresponding fixed contacts mounted on the casing; the improvement comprising:
each of said movable contact spring extending along each lateral side of the armature and fixedly connected thereto at the portion intermediate the ends thereof so as to be movable together with the armature,
each movable contact spring being formed at the intermediate portion thereof with a transversely extending pivot arm which joins fixedly with a portion of the casing,
said pivot arm being integral with the movable contact spring to define itself a resilient torsion element of limited deformability whereby the armature is permitted to pivot about the axis of the pivot arms for movement between the two contact operating positions.

4,695,814

CIRCUIT BREAKER

Matsumoto Yoshiaki; Shinji Yamagata, and Kazuyoshi Sugihara, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1986, Ser. No. 870,326
Claims priority, application Japan, Jun. 27, 1985, 60-97958[U]
Int. Cl.[4] H01H *71/16, 75/08*
U.S. Cl. 337—77 **4 Claims**



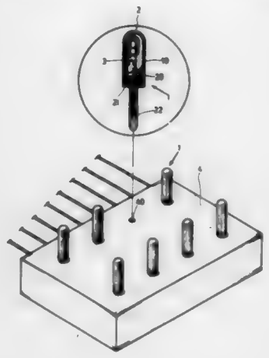
1. A circuit breaker, comprising:
a thermal tripping device having a bimetal element and a heater, said heater being juxtaposed adjacent said bimetal element to heat the same primarily by radiated heat;
a holding member for holding said bimetal element and said heater at respective first end parts thereof;
arm means, thermally and electrically connected to said holding member, for generating heat by providing electrical resistance to flowing of over-current therethrough and for thermally conducting said generated heat to said first end part of said bimetal element; and
a flexible copper wire connected to said arm for flowing current thereto.

4,695,815

AUTOMOBILE FUSE WITH DAMAGE INDICATOR

Chern Hwang, 8, Lane 158, Nan Gang Rd., Nan Gang District, Taipei, Taiwan

Filed May 7, 1985, Ser. No. 731,385
Int. Cl.[4] H01H *85/32*
U.S. Cl. 337—266 **5 Claims**



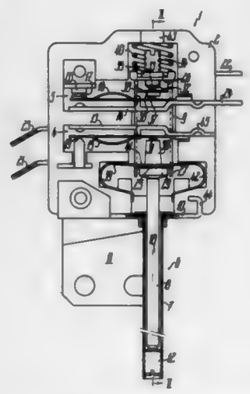
1. An automobile fuse with damage indicator means comprising
a cylindrical, transparent shell having an open end and a closed end;
a pin comprising a pair of conductors separated by an insulator, the pin having an upper end and a lower end, the upper end being inserted into the open end of the shell to form a sealed portion; and
disposed within the sealed shell portion, a fusible link and an indicator bulb in electrical connection with the pair of conductors.

4,695,816

THERMAL CUT-OUT

Willi Essig, Böblingen, and Heinz Petri, Bretten, both of Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed Nov. 13, 1986, Ser. No. 930,862
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1985, 3540414
Int. Cl.[4] H01H *37/48*
U.S. Cl. 337—394 **35 Claims**



1. A thermal cut-out (1) for a heating means, said cut-out

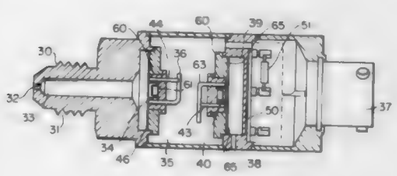
having a substantially rod-like temperature sensor (6) for operating a signal switch (4) and a power switch (5) arranged in a base (2) for switching off the heating means at a predetermined maximum temperature, said temperature sensor having an outer tube (7) and an inner rod (8) located therein, a transfer member (9) continuately arranged to a socket-side end of the inner rod (8) being provided for acting on actuating points (31, 37) of both switches (4, 5) by actuating members (30, 32), said switches (4, 5) being substantially arranged in a length extension of the inner rod (8), wherein at least one of the actuating members (32) is operatively connected to an adjusting device provided on the transfer member (9) for varying the relative spacing between the actuating members (30, 32).

4,695,817

ENVIRONMENTALLY PROTECTED PRESSURE TRANSDUCERS EMPLOYING TWO ELECTRICALLY INTERCONNECTED TRANSDUCER ARRAYS

Anthony D. Kurtz, Teaneck, and Joseph R. Mallon, Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Jun. 26, 1985, Ser. No. 748,836
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 338—4 **24 Claims**



1. A pressure transducer apparatus of the type containing first and second transducer structures each contained in a housing and each associated with a separate pressure port, the improvement in combination therewith of an environmentally protected transducer structure comprising:

a first metal diaphragm secured to a first pressure port to provide a deflectable diaphragm, with a first surface of said metal diaphragm facing said port, with said first transducer structure secured to the opposite surface of said metal diaphragm, with said first transducer surrounded by a pressure fluid accommodating assembly to provide isolation of said transducer structure from said first port,

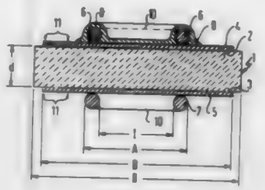
with a second metal diaphragm secured to said second port to provide a deflectable diaphragm with a first surface of said metal diaphragm facing said port, with said second transducer structure secured to the opposite surface of said metal diaphragm, with said second transducer surrounded by a pressure fluid accommodating assembly to provide isolation of said transducer from said second port and means coupling respective sensors of said first and second transducer structures together to form a compensated array where the voltage output is indicative of the pressure applied to one port as referenced to said other port.

4,695,818

ELECTRICAL RESISTOR WITH A NEGATIVE TEMPERATURE COEFFICIENT FOR INCREMENTAL RESISTANCE VALUES AND METHOD FOR MANUFACTURING SAME

Gerald Kloiber, Feldkirchen/Graz, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,622
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1985, 3508163
Int. Cl.⁴ H01C *7/10, 1/144*
U.S. Cl. 338—22 R **5 Claims**



1. An NTC resistor comprising:

a wafer consisting of densely sintered metal oxide ceramic having a diameter in the range of from about 1.5 mm through about 5.0 mm, a thickness in the range of from about 0.6 mm through about 2.5 mm, and having two opposite major faces;

solderable metal coatings respectively substantially covering and adhering to said major faces; and

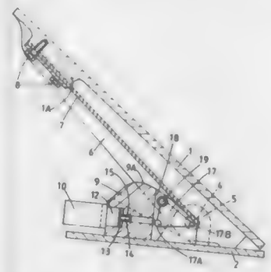
two current lead elements respectively secured to each metal coating with solder, each lead element having a closed annular eye centrally disposed on said major face adjacent said coating, said annulus eye having a diameter which is less than about 60% of the diameter which of said coating and said solder being substantially coextensive with said annulus eye leaving a solder-free edge of said coating.

4,695,819

PEDAL DEVICE

Glynne T. Bowsher, Birmingham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 14, 1986, Ser. No. 839,550
Claims priority, application United Kingdom, Mar. 21, 1985, 8507300
Int. Cl.⁴ H01C *10/00*
U.S. Cl. 338—153 **20 Claims**



1. A pedal device comprising:

a pedal pivotally mounted for rotation about a pivot axis;

a leaf spring mounted on said pedal in a cantilever manner;

a bearing means;

a bearing surface on said bearing means engageable with said leaf spring and having a configuration and location relative to said leaf spring so that the position of engagement varies during rotation of said pedal to produce a predetermined ratio between pedal movement and pedal load depending on said position of engagement; and

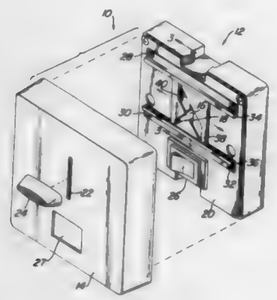
an output device mounted in a position relative to said pedal and adapted to be operated by said pedal for producing an electrical output in response to pedal rotation movement.

4,695,820

SAFETY DEVICE FOR APPARATUS HAVING RELATIVELY MOVABLE MEMBERS

Michael J. D'Aleo, Ottsville, and Mark Smaich, Allentown, both of Pa., assignors to Lutron Electronics Co. Inc., Coopersburg, Pa.

Filed Mar. 13, 1986, Ser. No. 839,303
Int. Cl.⁴ H01C *10/38*
U.S. Cl. 338—179 **16 Claims**



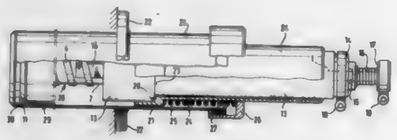
1. In electrical control apparatus having a first member disposed in an opening in a second member, the first and second members being adapted and arranged for relative movement with respect to each other, means for covering the open portions of the opening as the first member moves relative to the opening, comprising primary shield means adjacent to and overlapping the opening, the primary shield means being operatively associated with the first member for transverse movement relative to the opening in response to movement of the first member, the primary shield means having a shape adapted to permit unrestrained movement of the first member while substantially overlapping the open portions of the opening for all positions of the first member in the opening.

4,695,821

RESISTOR ELEMENT ASSEMBLY FOR A HEATING FURNACE OF GLASS SHEETS AND METHOD OF REPLACING A RESISTOR ELEMENT

Pauli T. Reunamäki, Nattari; Erkki P. J. Yli-Vakkuri, and Kauko K. Anttonen, both of Tampere, all of Finland, assignors to O/Y Kyro A/B Tamglass, Tampere, Finland

Filed Dec. 16, 1985, Ser. No. 809,341
Claims priority, application Finland, Jan. 3, 1985, 850026
Int. Cl.⁴ H01C *10/16*
U.S. Cl. 338—316 **6 Claims**



1. A resistor element assembly for a heating furnace of glass sheets, comprising:

an elongated resistor element extending in a longitudinal direction and having a first end and a second end, said resistor element including

a plurality of elongated ceramic elements positioned successively in said longitudinal direction,

a resistance wire wound into wire coils around said ceramic elements, said wire coils having a diameter, and

a plurality of ceramic spacer blocks positioned between said ceramic elements, said blocks having a diameter exceeding said diameter of said wire coils,

a support frame having a first end, a second end and a limit stop at said second end, said support frame carrying said resistor element by providing a resting surface for said spacer blocks, and

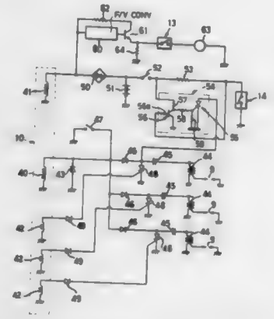
a first spring positioned between said first end of said resistor element and said first end of said support frame for compressing said resistor element at all operating temperatures against said limit stop at said second end of said support frame, said elongated resistor element further including means for urging said plurality of elongated ceramic elements and said spacer blocks toward one another in said longitudinal direction at least when said resistor element is not being carried in said support frame.

4,695,822

OVERHEAT WARNING AND PREVENTION SYSTEM FOR OUTBOARD ENGINES

Naoki Furukawa, Shizuoka, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 29, 1982, Ser. No. 343,837
Claims priority, application Japan, Feb. 6, 1981, 56-16371
Int. Cl.⁴ G08B *21/00;* **F02B** *9/00*
U.S. Cl. 340—53 **7 Claims**



1. A system for warning of and preventing overheating of an engine of the type having coolant conduits through which coolant water under pressure is circulated to cool said engine comprising;

a plurality of cylinders in said engine, each of said cylinders having a spark plug;

low pressure-responsive sensor means exposed to and sensing said coolant water pressure;

engine RPM responsive means detecting the RPM of said engine and providing an output when said engine RPM is above a predetermined amount;

warning means connected to said low pressure-responsive sensor means and said engine RPM responsive means for providing a warning when said coolant water pressure is below a predetermined amount and said engine RPM is above a predetermined amount;

a high-temperature-responsive sensor exposed to said coolant water;

engine disabling means connected to said high-temperature responsive sensor adapted to partially disable said engine when said coolant water temperature exceeds a predetermined temperature; said engine disabling means interrupt-

ing an ignition spark to one or more of said spark plugs when said coolant water temperature exceeds a predetermined level and restoring said ignition spark to said one or more spark plugs when said coolant water temperature falls below said predetermined level;

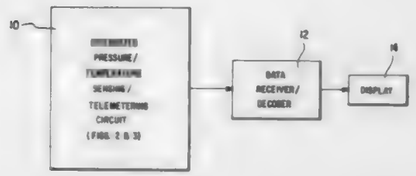
whereby a warning is given when said coolant water pressure and RPM are such that overheating can occur and said engine disabling means provides reduced power output and engine RPM should overheating occur.

4,695,823

VEHICLE TIRE MONITORING APPARATUS

Roger W. Vernon, Box 608, Georgetown, Colo. 80444

Filed Apr. 27, 1984, Ser. No. 604,934
Int. Cl.[4] B60C *23/00, 23/02*
U.S. Cl. 340—58 **6 Claims**



1. An integrated circuit monitor for telemetering data such as temperature or pressure from a vehicle tire comprising

sensing means constituting an integral part of an integrated circuit for transducing a sensed parameter to an electrical signal;

means constituting a further integral part of said integrated circuit for processing said electrical signal;

transmitting means constituting yet a further integral part of said integrated circuit for transmitting the processed, electrical signal to a remote location;

means for mounting said integrated circuit with respect to said tire; and

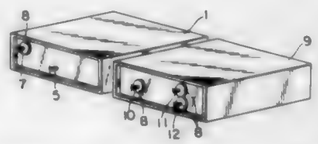
whereby said integrated circuit includes as integrated circuit elements thereof at least said sensing means, processing means and transmitting means.

4,695,824

INK STORING APPARATUS WITH A FIRST CASE HAVING PLURAL INK TANKS AND SECOND CASE HAVING ONE INK TANK AND A WASTE INK RECEPTACLE

Shigemitsu Tazaki, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 489,092, Apr. 27, 1983, abandoned. This application Oct. 10, 1985, Ser. No. 786,176
Claims priority, application Japan, May 10, 1982, 57-76617
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **10 Claims**



1. An ink storing apparatus for a printing device, the apparatus comprising:

at least one first ink storing means including a first case for storing a first ink and being detachably connectable with the printing device; and

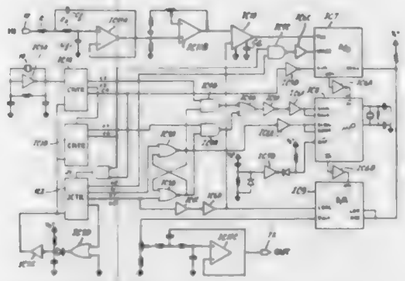
a second ink storing means including a second case integrally having a first storing portion for internally storing a second ink and a second storing portion for storing waste ink, said second ink storing means being detachably connectable with the printing device, wherein said first ink storing means and the printing device remain connected when said second ink storing means is disconnected from the printing device and wherein said second ink is preselected to be used at a faster rate than said first ink.

4,695,825

ANALOG-DIGITAL CONVERSION SYSTEM

Graham P. Bloy, St. Louis, Mo., and John L. Miramonti, County of Oakland, Mich., assignors to Metme Communications, St. Louis, Mo.

Filed Apr. 28, 1986, Ser. No. 856,832
Int. Cl.[4] H03M *1/02*
U.S. Cl. 340—347 SH **12 Claims**



1. In an analog-digital conversion system for receiving analog input signals and converting such input signals to digital form for further processing by digital processing apparatus during repetitive cycles including a sample-and-hold circuit for periodically sampling the value os such input signals and an analog-to-digital converter for converting the sampled input signals into digital format, the improvement characterized by timing circuitry for generating a plurality of control signals during each such cycle for controlling the sample-and-hold circuit, the analog-to-digital converter and the processing apparatus, said timing circuitry comprising means for selectively shortening the duration of at least one interval associated with such control signals, the timing circuitry comprising an oscillator and resettable counter means driven by the oscillator for proving counter output defining a plurality of successive timing states which together define each such repetitive cycle, the means for selectively shortening duration comprising means responsive to count signal output of the counter means for resetting of the counter means for accelerated termination of the last timing state in each such cycle, whereby to reduce average total duration of each such cycle by accelerating the beginning of each such cycle.

4,695,826

HIGH ACCURACY DIGITAL-TO-ANALOG CONVERTER HAVING SYMMETRICAL CURRENT SOURCE SWITCHING

Hideki Ando, and Takahiro Miki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,562
Claims priority, application Japan, Apr. 17, 1985, 60-82930
Int. Cl.[4] H03M *1/74*
U.S. Cl. 340—347 DA **4 Claims**

1. A digital-to-analog converter, comprising:

a plurality of constant current sources adapted to generate equal constant currents, said plurality of constant current sources being arrayed in a prescribed order;

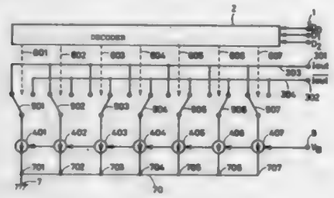
a grounding conductor haivng an internal resistance distributed along its length and connected with said constant current sources so that currents generated from respective

ones of said plurality of constant current sources flow into different positions of said grounding conductor along said array of constant current sources, an end of said grounding conductor being grounded;

a first bus including an output terminal for analog signals generated by said converter;

a second bus including an output terminal for analog signals complementary to said converted analog signals;

a plurality of switching means respectively provided in



correspondence to said constant current sources for switching said first bus and said second bus to obtain currents flowing into said constant current sources;

decoder means for decoding input digital signals thereby to output switching control signals for respective ones of said switching means; and

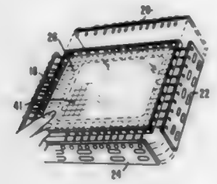
control means for controlling said switching means in response to said decoder means to switch said plurality of constant current sources symmetrically with respect to the center of said array to said first bus.

4,695,827

ELECTROMAGNETIC ENERGY INTERFERENCE SEAL FOR LIGHT BEAM TOUCH PANELS

August H. Beining, Fullerton; Larry A. Dial, Diamond Bar; William A. Smith, and Gene W. Rieck, both of Laguna Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 20, 1984, Ser. No. 673,311
Int. Cl.[4] G08C *21/00*
U.S. Cl. 340—365 P **30 Claims**



30. Electromagnetic energy interference sealing apparatus for a light beam touch panel system having a matrix of crossed light beams formed in front of the face of a display device by pairs of opposing light beam sources and light beam detectors used to establish the position of an object inserted into said matrix, the sorces and detectors being arrayed around the periphery of the display device, the sealing apparatus being used for sealing of the system including the display device, sources and detectors, the sealing apparatus comprising:

an electromagnetic interference sealing means including an embedded conductive mesh across the face of said display device;

means including a bezel enclosing said display device;

an electrically conductive strip disposed about said periphery between said bezel and said sealing means and having a plurality of spaced apart aperture means formed therethrough which are disposed in optical alignment with the light beams for passing the light beams therethrough;

the aperture means each having a cross-section size-to-length ratio selected so that each said aperture means acts as a waveguide having a cutoff frequency which is lower than the frequency of the passing light beams and is higher than the frequency of electromagnetic energy interference;

means for electrically connecting said wire mesh to said conductive strip; and

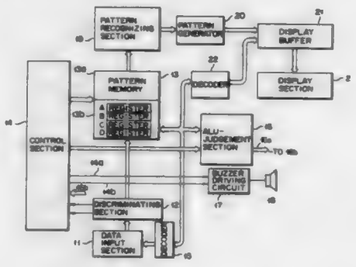
environmental sealing means disposed across each said aperture means for sealing each said aperture means for environmental contaminants.

4,695,828

ELECTRONIC APPARATUS FOR ENTERING PATTERN DATA BY FINGER ACTIVATION

Haruo Yamamoto, Sayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,312
Claims priority, application Japan, Jul. 23, 1982, 57-128614
Int. Cl.[4] G06F *3/02*
U.S. Cl. 340—365 S **7 Claims**



1. An electronic apparatus for entering a pattern data by activating a matrix array of keys with a finger comprising:

pattern data input means having matrix array keys;

means connected to said pattern data input means for detecting the "on"-"off" state of said keys;

means having an input connected to said "on"-"off" state detecting means, for measuring a time interval beginning from the release of a key in the pattern data input means and ending at the depression of a different key therein;

means connected to said time interval measuring means and having a display means driven according to the measured time interval for providing a display indicative thereof;

means for storing a reference time interval signal;

means connected to said time interval measuring means and said storing means, for comparing a signal from said time interval measuring means and said reference time interval signal from said storing means;

pattern recognition in means coupled between said time interval measuring means and said display means, for causing said display means to display input pattern data entered with a finger when said comparing means detects the coincidence of said measured time interval signal and said reference time interval signal.

4,695,829

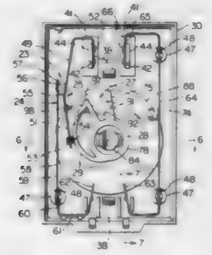
TEMPERATURE LEVEL INDICATING DEVICE AND METHOD OF MAKING THE SAME

Charles J. Everett, Clinton, and Rolf H. Ochsner, Trumbull, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 9, 1985, Ser. No. 690,034
Int. Cl.[4] G08B *17/00*
U.S. Cl. 340—586 **11 Claims**

1. In a device for indicating that a sensed temperature has reached a certain selected level, said device comprising a

housing means carrying an electrical switch means for operating an indicator means to one condition thereof when said switch means is closed and to another condition thereof when said switch means is open, said switch means comprising a first movable contact means and a second movable contact means which when in contact with each other close said switch means and when out of contact with each other open said switch means, said first contact means having means for moving the same relative to said second contact means in relation to said sensed temperature, and selector means rotatably carried by said housing means for selecting said certain level and having setting means operatively interconnected to said second contact means to position the same relative to said first contact means in relation to the selected level, the improvement wherein said selector means and said setting means comprise a one-piece selector member having a peripheral cam surface engaging said second contact means to position said



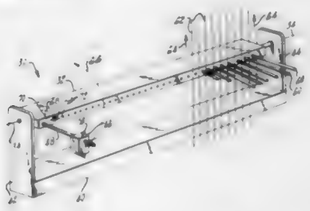
second contact means relative to said first contact means as said cam surface is rotated by the rotation of said selector member selecting said certain level, said selector member having a substantially cylindrical portion provided with opposed ends, said housing means having a cylindrical projection provided with an internal annular surface, said cylindrical projection telescopically receiving one of said ends of said cylindrical portion therein to rotatably mount said selector member to said housing means by said one end rotatably engaging said internal annular surface of said cylindrical projection, said housing means having a snapfit projection extending concentrically out of said cylindrical projection in radially inwardly spaced relation to said internal annular surface of said cylindrical projection, said cylindrical portion having an opening passing therethrough and through said ends thereof, said snap-fit projection extending into said opening and being snapfitted to the other of said ends of said cylindrical portion.

4,695,830

WIRE RUNTOGETHER SENSOR

Randall C. Graham, Nashville, Tenn., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 18, 1985, Ser. No. 788,903
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—677 **3 Claims**



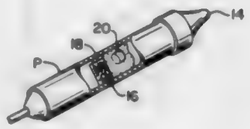
1. A runtogether sensor, comprising:
two opposed vertical support members;
a beam supported between the support members;
a plurality of parallel rigid tines extending outwardly horizontally from the beam for insertion between a plurality of vertical parallel wires in motion undergoing enamelling;
a counter-balance motion on the beam for precisely balancing the beam such that the tines are horizontal; and
a switch, responsive to movement of the beam induced by a tine forced in motion by a pair of stuck together wires moving past the tine for providing a signal indicative of a runtogether condition.

4,695,831

LIGHT PEN HAVING ACTUATING ACCELEROMETER

Alan L. Shinn, Berkeley, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed May 6, 1985, Ser. No. 731,416
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—707 **3 Claims**



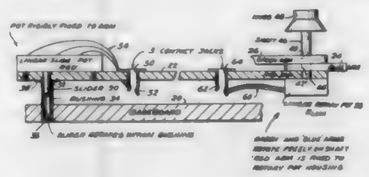
1. In the combination of a cathode ray tube display having a transparent screen, a raster for writing to said display and a light pen having a photosensor for detecting raster passage from the front of said cathode ray display and relaying raster passage to software logic interior of a computer; and a switch in combination with said light pen for gating a signal from said photosensor to circuitry for locating position of said photosensor in relation to said display, the improvement to said switch including an accelerometer mounted to said light pen actuated by the tapping of said light pen on the transparent screen of said CRT, said accelerometer including a mass movably mounted to said light pen and a transducer for detecting movement of said mass upon acceleration of said light pen upon tapping said light pen, and actuating said switch in response thereto.

4,695,832

ANALOG COLOR SELECTOR

Dov Jacobson, Staten Island, N.Y., assignor to Time Video Information Services, Inc., New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,564
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—709 **13 Claims**



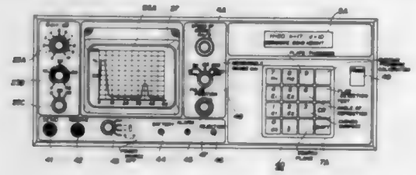
1. An analog color selector for connection to a video display for selection among colors defined by a continuum of values of each of three selected independent variables and having a capability of instantaneous on-screen color selection at any specific location on a screen of the video display, said selector comprising a control element capable of being moved throughout a predetermined region, said region having at least two geometric dimensions, and a plurality of generating means connected to said control element for generating electrical signals representative of electrical signal an instantaneous position of said control element within said region, with each electrical signal generating means being capable of varying the value of the electrical signal produced based upon movement of the control element within said region, and with each position of said control element within said region being indicative of at least a first and a second independent variable of a specific color capable of being presented at a specific location on the screen of the video display.

4,695,833

MAN-MACHINE INTERFACE TYPE PORTABLE ULTRASONIC COMPOSITE MEASURING APPARATUS

Yukio Ogura, Amimachi, and Seiji Nasu, Hitachi, both of Japan, assignors to Hitachi Construction Machinery Co., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

PCT No. PCT/JP83/00094, § 371 Date Nov. 13, 1984, § 102(e) Date Nov. 13, 1984, PCT Pub. No. WO84/03944, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 28, 1983, Ser. No. 673,704
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—722 **1 Claim**



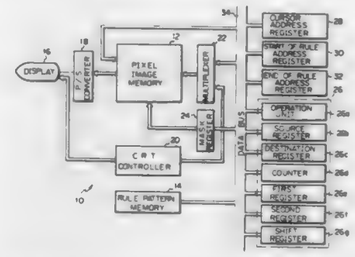
1. A man-machine interface type portable ultrasonic composite measuring apparatus comprising:
a keyboard device for designating a certain mode from among a plurality of ultrasonic composite measuring modes;
a microcomputer having a plurality of processing programs respectively corresponding to said plurality of composite measuring modes, and which reads one of said processing modes which corresponds to said mode designated by the keyboard device, and which processes specified information consisting of a measurement procedure, a measurement object and a measurement position, in accordance with the read-out processing program, and which takes in external measured information to be stored as measurement data;
a display unit for displaying said measurement procedure, said measurement object and said measurement position obtained during said processing by said microcomputer;
an oscilloscope device for directly displaying in real-time responsive observation wave signals relating to an object to be inspected, obtained in accordance with the displayed content in said display unit, from an ultrasonic probe, without storing them;
a transparent position-detecting panel which is mounted on a display surface of said oscilloscope device and which inputs coordinate signals of designated points on said responsive observation signal waveform displayed on said display surface;
and an A-D converter for converting coordinate signals inputted from said panel into digital signals and for sending said converted coordinate signals to the microcomputer as measurement information.

4,695,834

PATTERNED LINE GENERATOR FOR A DATA PROCESSING DEVICE

Tomomi Gojo, Zama; Yoshio Yagi, Hatano, and Tsunetada Izumi, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,612
Claims priority, application Japan, Feb. 14, 1984, 59-25698
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—734 **6 Claims**



1. A data processing device having input means, pixel image memory means for storing data corresponding to data to be displayed and control means for storing a particular line in the pixel image memory means in response to a command entered through the imput means, said data processing device comprising:
particular line pattern store means for storing basic patterns representative of a plurality of particular lines extending in a first direction and a plurality of particular lines extending in a second direction, the first and second directions corresponding respectively to vertical and horizontal directions of an image data store area of the pixel image memory means;
particular line pattern transfer means including pattern selecting means for selecting one of the basic patterns stored in said particular line pattern store means and including moving means for moving the selected basic pattern from said particular line pattern store means to the pixel image memory means; and
position control means for positioning said selected pattern by storing the start address of the selected pattern, storing the start address of the line to be drawn in the pixel image memory means and causing the selected pattern to be moved into the pixel image memory means at sequential memory positions contiguous with the start address in memory.

4,695,835

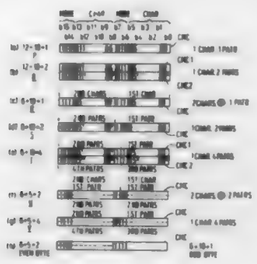
DATA DISPLAY SYSTEMS

Richard E. F. Bugg, Coulsdon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1983, Ser. No. 552,654
Claims priority, application United Kingdom, Nov. 19, 1982, 8233114
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—750 **12 Claims**

1. A data display system for displaying data represented by digital codes, the displayed data being composed of discrete characters the shapes of which are determined by selected dots of a dot matrix which constitutes a character format for the characters, said system comprising a character memory which stores character information which conforms to different character modes of the form $m \times n \times b$, where $m \times n$ is a bit matrix format which is repeated b times to provide b-bits per displayed character dot of the characters concerned, said system being characterized in that the stored character information for each character includes more bits which determine the charac-

ter mode and include (a) character shape, (b) character resolution for a given character size, and (c) character color, and logic control and addressing means are provided for reading out from a first address said mode bits along with dot information for a selected character dot row contained in one bit matrix for the mode and wherein said mode bits are used by



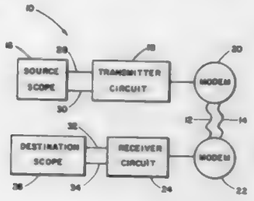
said logic control and addressing means to determine a second address for selecting further dot information for the same character dot row in the same or a second bit matrix for the mode, the addressing being organized so that the first address has the same address format irrespective of the relative sizes of the m×n×b character modes.

4,695,836

METHODS OF AND SYSTEMS FOR TRANSMITTING OSCILLOSCOPE SIGNALS

Robert W. Everhart, Columbus, and Charles T. Huck, Gahanna, both of Ohio, assignors to American Telephone and Telegraph Company AT&T-Technologies, Berkeley Heights, N.J.

Filed Mar. 7, 1985, Ser. No. 709,490
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—750 **11 Claims**



1. A real-time data acquisition and communication system, which comprises:

means for generating vertical and horizontal component signals in response to a continuous or transient analog signal;

first means for converting each of the component signals into digital equivalent signals;

first means, responsive to the first converting means, for storing words in memory at addresses identified by clock signals with each word storing the digital equivalent signals identifying both the vertical and horizontal component signals;

means for transmitting the digital equivalent signal words to a remote location;

second means for storing the digital equivalent signal words at the remote location; and

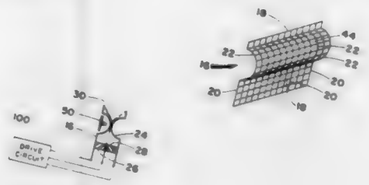
second means, responsive to the second storing means, for converting the digital equivalent signal words into an analog signal.

4,695,837

ELECTROSTATIC DISPLAY DEVICE WITH IMPROVED FIXED ELECTRODE

Charles G. Kalt, 29 Hawthorne Rd., Williamstown, Mass. 01267

Continuation-in-part of Ser. No. 299,804, Sep. 8, 1981, Pat. No. 4,468,663. This application Mar. 7, 1984, Ser. No. 587,313
Int. Cl.[4] G09G *3/16*
U.S. Cl. 340—763 **16 Claims**



1. An electrostatic display device, comprising:

(a) conductive flexible movable flapper means;

(b) first support means for supporting said movable flapper means at a bending point at one end of said flapper means and with an opposite end of said flapper means as a free end;

(c) a conductive fixed electrode element having insulation disposed over one of its faces to define an insulated face;

(d) second support means for supporting said fixed element, said fixed element being supported in a position with said insulated face facing said movable flapper means and where said movable flapper means is capable of being disposed against or spaced from said fixed element, said fixed element including a plurality of raised surfaces disposed over substantially all of its insulated faces to define together with said movable flapper means air passages which communicate between ambient atmospheric pressure and the side of said movable flapper means disposed against said fixed element when said flapper means is disposed against said fixed element; and

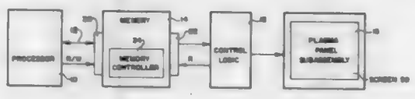
(e) electrical drive means coupled to said fixed electrode and said flapper means for moving said movable flapper means between a first position where said flapper means bears against and covers said fixed element and a second position where said flapper means exposes said fixed element.

4,695,838

PLASMA PANEL DISPLAY SELECTIVELY UPDATABLE ON PEL LINE BASIS

Joseph J. Ellis, Jr., West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1985, Ser. No. 729,013
Int. Cl.[4] G09G *3/28*
U.S. Cl. 340—771 **4 Claims**



1. A display system comprising:

a processor,

a plasma display panel assembly including generally orthogonally related conductor arrays and drive circuits for each conductor in said arrays,

control logic and a read-write memory for storing image data from said processor and delivering drive information to the said plasma panel assembly,

said control logic being adapted for time sharing said read-write memory between said processor and said plasma display panel assembly,

means for providing a plurality of data tags associated with the operation of said read-write memory to identify data changes to be displayed,

each line of said display having an associated data tag,

means for modifying said data tags to identify data lines to be updated, and

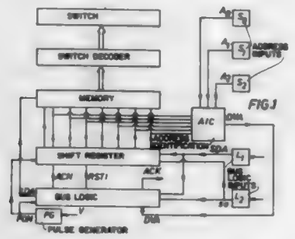
control means responsive to said modified data tags to control update, erase and write operations on said plasma display panel assembly on an individual line basis.

4,695,839

SLAVE-TYPE INTERFACE CIRCUIT OPERATING WITH A SERIES BUS

Stefan Barbu, Caen, France; Léonardus Valkestijn, and Franciscus A. M. van de Kerkhof, both of Ba Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1985, Ser. No. 741,090
Claims priority, application France, Jun. 8, 1984, 84 09064
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.06 **15 Claims**



1. A slave type interface circuit for attaching to a serial bus having a data signal line (SDA) and a clock signal line (SCL), said circuit comprising:

a plurality of addressing inputs (S_0, S_1, S_2) for receiving present address bits (A_0, A_1, A_2) for identifying the circuit in question;

a data input connectable (L1) to said data signal line;

a clock input (L_2) connectable to said clock signal line;

a shift register ($R_0 \ldots R_7$) connected to said data input and clock input for receiving data sequences and address sequences under synchronization by said clock signal line, said sequence being organized in bit cycles, each bit cycle having at least one sequence;

a memory (M) fed by parallel outputs of said shift register;

a first decoder (CDEC) fed by parallel outputs of said memory for generating decoded binary control signals for controlling user circuits (COM);

wherein said shift register has a downstream end output (QR_8) for forwarding an end-of-sequence acceptance signal (ACN) to a data input of a first control flip-flop (DC1) clocked by said clock signal (SCL) and whose output (Q) synchronizes a second control or pointer flip-flop (PNT), whose inverted output (P) is retrocoupled to its input (D), in which the presence of a logic level "1" at the output (Q) of the first flip-flop (DC1) and at the output (P) of the pointer flip-flop enables an initialization of the shift register, which corresponds to the return of a predetermined initial state;

said circuit furthermore having resetting means for resetting said first and second control flip-flops under the control of an end-of-cycle detection signal (SDA) after said initialization;

wherein said circuit furthermore comprises: a logic comparator (10, 11, 12) for comparing predetermined address bits present in said shift register ($R_0 \ldots R_7$) and said preset address bits presented by said addressing inputs and upon correspondence producing an identification logic signal (DVA);

a storage circuit (66, 67) for storing said identification signal, in the form of a stored identification signal (ADC);

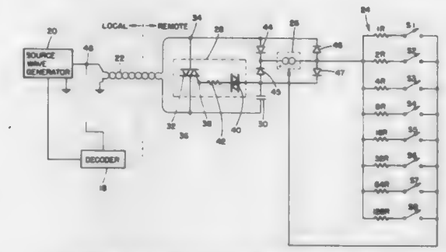
and logical AND gate means enabling the loading into the memory (M) of the data from the shift register when both the outputs of the first control flip-flop (DC_1) and the pointer flip-flop (PNT) are in the logic state "1", and when also said stored identification signal (ADC) is present as well an end-of-sequence acceptance signal (ACN), signalling the end of a data sequence following said address sequence.

4,695,840

REMOTE SWITCH POSITION DETERMINATION USING DUTY CYCLE MODULATION

Glenn T. Darilek, San Antonio, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,966
Int. Cl.[4] H04Q *9/00*; G08C *19/00*
U.S. Cl. 340—825.054 **34 Claims**



1. A system for determining the position of a plurality of remotely located switches at a local test station comprising:

means for generating a waveform having a predetermined duty cycle at said location test station across a two conductor line connecting said local test station to said remote switches;

uniquely weighted current controlling means connected to each switch for controlling the output of a constant current source connected to said current controlling means;

switching means connected across said two wire line at said remote location for terminating the duty cycle of said generated waveform;

timing means for triggering said switching means in response to the output of said constant current source thereby modulating the duty cycle of said generated waveform to provide a resultant waveform at said local test station having a duty cycle indicative of the position of said remote switches; and

decoding means at said local test station responsive to said resultant waveform for deriving digital output data indicative of the position of each said remote switches.

4,695,841

METHOD FOR DECEIVING ACTIVE ELECTROMAGNETIC DETECTORS AND CORRESPONDING DECOYS

Alain Billard, Muret, France, assignor to Societe E. Lacrois - Tour Artifices, France

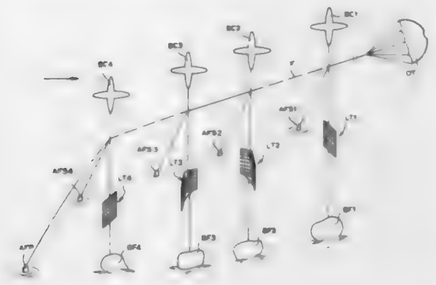
Continuation of Ser. No. 454,683, Dec. 30, 1982, abandoned. This application Jan. 21, 1986, Ser. No. 821,502
Claims priority, application France, Dec. 30, 1981, 81 24523
Int. Cl.[4] G01S *7/42*; H01Q *17/00*
U.S. Cl. 342—8 **3 Claims**

1. A method for deceiving active electromagnetic detectors comprising the step of:

deploying at least one decoy at sea between an altitude between 3 and 20 meters having:

at least one panel with a cellular structure defining a network of contiguous, identical retroreflective trihedrons,

said structure being reversible, the contigous retroreflective trihedrons being arranged head-to-tail and after deployment defined by immediately adjacent rows of cells in alternating head-to-tail relationship wherein the edges of trihedrons comprising one row touch the edges of trihedrons comprising an immediately adjacent row, said rows being anticulated about axes for mutual pivotal movement in such a way that prior to deployment the rows are folded one on to the other with the cells of the adjacent



rows fitting within and receiving one another for enclosure in a launch vehicle wherein the step of deploying comprises firing from an ammunition housing said at least one decoy associated with at least one group of balloons, said balloon groups being adapted for folding to fit inside said ammunition housing together with its associated folded decoy and providing a member for interconnecting said balloons in said group of balloons associated with each of said decoys to keep the interconnected groups in the wind after release, each of said folded balloon groups and respective folded decoys being located adjacent one another in respective cross section sectors within the ammunition housing prior to deployment.

4,695,842

AIRCRAFT RADAR ARRANGEMENT

Franz Jehle, and Holger Meinel, both of Ulm, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP84/00319, § 371 Date Jul. 30, 1985, § 102(e) Date Jul. 30, 1985, PCT Pub. No. WO85/01799, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 16, 1984, Ser. No. 748,303

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1983, 3337649

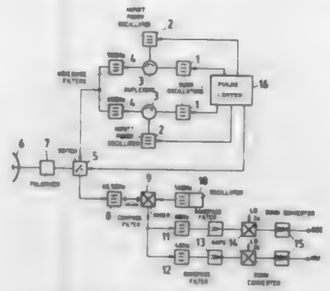
Int. Cl.⁴ G01S *13/87*

U.S. Cl. 342—59 **14 Claims**

1. In an aircraft radar arrangement comprising transmitting means and receiving means, a transmit/receive antenna, and a transmit/receive switch for alternatingly connecting the antenna to the transmitting means and receiving means the improvement wherein:

said transmitting means comprises first and second transmitting devices for generating transmitting signals at a first frequency and at a second frequency (f_2), respectively, with the first frequency (f_1) lying in a region of maximum atmospheric attenuation and being used for obstacle warning and the second frequency (f_2) lying in the vicinity of the first frequency and in a region of low atmospheric attenuation and being used for moving target detection, and said first and second transmitting devices being jointly connected with said antenna by said transmit/receive switch; and

said receiving means includes first and second frequency selective devices jointly connected to said antenna by said transmit/receive switch, and first and second receiving channels connected to said first and second frequency selective devices, respectively, said first frequency selective device passing first received signals corresponding to



echoes of the first transmitted signal of frequency (f_1) to said first receiving channel to be processed for obstacle warning, and said second frequency selective device passing second received signals corresponding to echoes of the second transmitted signal of frequency (f_2) to said second receiving channel to be processed, independently and separately of said first received signals, for moving target detection.

4,695,843

METHOD FOR PROCESSING RADIO SIGNALS FOR RADIONAVIGATION AND RECEIVER FOR CARRYING OUT THE SAID METHOD

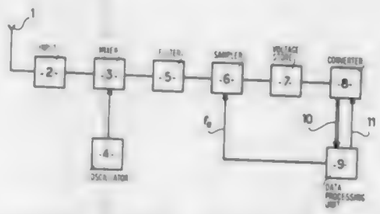
Christian Lamiraux, Saint Sebastien Sur Loire, France, assignor to MLR Electronic, France

Filed May 29, 1984, Ser. No. 614,769

Claims priority, application France, May 30, 1983, 8308916; Apr. 26, 1984, 8406597

Int. Cl.⁴ G01S *5/08*

U.S. Cl. 342—417 **17 Claims**



1. A method for processing a series of signals, particularly radiofrequency signals presenting a same interval of low frequency between adjacent ones of said signals, particularly radiofrequency signals of a radionavigation system such as the RANA system, adapted for determining the location of a station or vehicle carrying a radiofrequency processing receiver, by using the phases of the received signals, wherein the received radio signals are converted into a series of signals of lower frequency presenting said same low frequency interval between adjacent ones of said lower frequency signals, in a way that each of said lower frequency signals constitutes a harmonic or a multiple of said interval frequency between two of said adjacent radiofrequency signals, forming a composite signal by superposing said lower frequency signals constituting harmonics of said interval frequency, said composite signal is

then sampled and a series of signals is locally produced in said receiver which includes the same frequency components as the sampled composite signal, a correlation is established between the frequency components of the sampled signal and of the locally produced frequency components and the values, particularly the phases of said local signals are determined by means of said correlation.

4,695,844

DEVICE FOR RECEIVING DUAL POLARIZED MICROWAVE SIGNALS

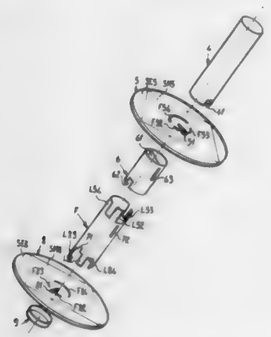
Zavoche Houchangnia, Angers, France, assignor to Societe D'Electronique de La Region Pays de Loire, Paris, France

Filed Aug. 30, 1985, Ser. No. 770,951

Claims priority, application France, Aug. 31, 1984, 84 13509

Int. Cl.⁴ H01Q *1/38, 19/17*

U.S. Cl. 343—781 CA **12 Claims**



1. Device for receiving a dual polarized microwave signal from an antenna and a depolarization converter electrically coupled to said antenna, said converter coupled to an input of said device and provided to separate the dual polarized microwave signal into two rectilinear polarized components, comprising:

a first waveguide having an input coupled to said converter and an output, said first waveguide having predetermined dimensions and defining a longitudinal axis;

a first sensor comprising a first dielectric substrate and a first metallization formed on said first dielectric substrate, said substrate arranged perpendicular to said longitudinal axis, said first metallization located under said first waveguide adjacent the output of said first waveguide, said first dielectric substrate having at least one slot arranged with a predetermined orientation relative to said first metallization;

a second waveguide defining a longitudinal axis the same as that of said first waveguide and having an input, an output, and internal dimensions the same as that of said first waveguide, said input of said second waveguide arranged adjacent a side of said first dielectric substrate opposite the first waveguide;

a second sensor comprising a second dielectric substrate and a second metallization formed on said second dielectric substrate, said second substrate arranged perpendicular to said longitudinal axis at the output of said second waveguide, said second dielectric substrate having at least one slot arranged with a predetermined orientation relative to said second metallization;

a tube for mechanically coupling said first and second substrates and said second waveguide such that said first and second metallizations provided on said first and second substrates are orthogonal, said tube having an internal dimension equal to the external dimensions of said second waveguide and opposite ends each having at least one protruding tongue, said tube surrounding said second waveguide with said tongues protruding through and mating with the slots of said first and second substrates so that the predetermined orientations of said slots produce orthogonality between said first and second metallizations; and

means provided attached to said tube and said second waveguide for decoupling said sensors.

4,695,845

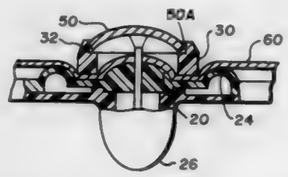
THEFT-DETECTION WAFER ATTACHMENT SYSTEM INCLUDING SHIELD MEMBER

Earl H. Hildt, 2806 Glavin Way, Apt. E, Baltimore, Md. 21234

Filed Oct. 11, 1985, Ser. No. 786,592

Int. Cl.⁴ H01Q *1/40*

U.S. Cl. 343—873 **17 Claims**



1. A theft-prevention wafer attachment system, comprising:

a fastener having a head and a shank connected to said head;

a theft detection element having a projection that includes a shank-receiving bore and having a ridge surrounding said projection, and means for releasably engaging a shank inserted into the shank-receiving bore; and

a shield into the shank-receiving bore; and

a shield member having a bore for accepting said head, said projection and having a counterbore for accepting said head, said shield member being proportioned so as to substantially fill the area on said theft detection element between said projection and said ridge, whereby said ridge cannot be used as a fulcrum to pry said fastener away from said theft detection element.

4,695,846

INK-JET RECORDING PROCESS

Eiichi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 834,147, Feb. 25, 1986, abandoned, which is a continuation of Ser. No. 585,935, Mar. 5, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 938,343

Claims priority, application Japan, Aug. 3, 1983, 58-37704

Int. Cl.⁴ G01D *15/16;* **C09D** *11/00;* **H04N** *1/46;* **G03C** *5/00*

U.S. Cl. 346—1.1 **13 Claims**

1. An ink jet color recording process of impacting ink dots of varying sizes on a recording medium, said ink dots provided by at least one of at least two inks which express a color, each ink comprising at least one dye of the same color, a solvent and a wetting agent, wherein each said ink exhibits a continuous gradient of image density when used individually and a discontinuous gradient when used together, said recording process capable of expressing an image density gradient of color from a lower density to a higher density, said image density gradient characterized by a change in chroma or a change in brightness, wherein said expressed color maintains a substantially constant hue throughout said gradient, which comprises;

(a) toning at least one of said inks by adding a toning dye to

said ink and thereby substantially reducing or eliminating said discontinuous gradient, wherein said toning dye is at



least one of a dye of a different color or a dye of the same color in a different molar ratio; and

(b) recording an ink jet color image with said inks.

4,695,847

METHOD AND APPARATUS FOR RECORDING

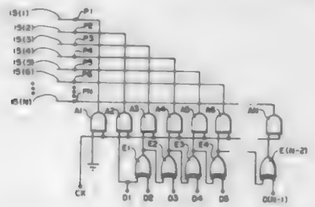
Hiroshi Ishii, Kashihara; Syunzi Nakai, Moriguchi, and Yukihiro Mizumoto, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1986, Ser. No. 831,346

Claims priority, application Japan, Mar. 5, 1985, 60-43281

Int. Cl.⁴ G01D *15/06, 15/10*

U.S. Cl. 346—1.1 **14 Claims**



1. A recording method comprising the steps of

causing a recording sheet to exist between a plurality of electrically conductive needle electrodes and a recording paper, said recording sheet being in contact with said electrodes and having a thermally fusible solid ink layer and a resistive layer, said solid ink layer facing said recording sheet, said needle electrodes being mutually insulated electrically, and

applying a variable potential difference between each of selected pairs of said electrodes for thermal fusion of said solid ink layer and transfer onto said recording paper.

4,695,848

INKJET PRINTING SYSTEM

Marco Padalino, Dallas County, Tex., assignor to Ricoh Co., Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Filed Apr. 21, 1986, Ser. No. 853,918

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—1.1 **21 Claims**

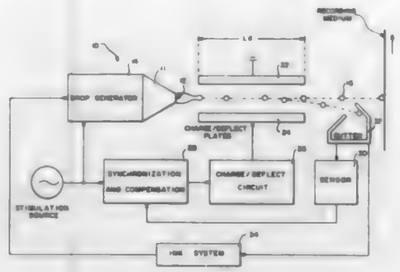
1. An inkjet printing apparatus wherein ink droplets impinge upon a recording medium in a controlled pattern corresponding to information to be recorded, comprising

means for generating an inkjet stream of synchronous droplets toward a recording medium,

a pair of electrodes elongated in the direction of travel of said drops, said electrodes comprising means for selectively charging the drops and for deflecting the drops during a time period each drop passes between the electrodes,

gutter means for capturing drops which are not to appear on said recording medium,

synchronization means coupled to said electrodes for applying a controlled voltage to the plates to allocate each drop's time period between the plates between drop



charging and drop deflection, wherein said electrodes normally carry a voltage which is used to deflect charge drops to continue to travel in the direction of landing on said recording medium or in the direction of said gutter means, said synchronization means altering said voltage on said pair of electrodes to a defined level to apply a level of charge to each drop consistent with landing on said medium or in said gutter.

4,695,849

RECORDING APPARATUS

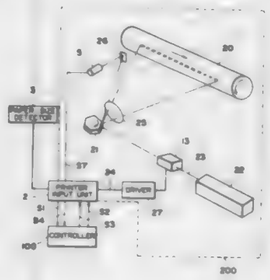
Katsuhito Dei, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,571

Claims priority, application Japan, Feb. 28, 1985, 60-37435; Feb. 28, 1985, 60-37436

Int. Cl.⁴ G01D *15/10*; **H04N** *1/21*; **G06F** *3/12*; **B41J** *5/30*

U.S. Cl. 346—76 L **17 Claims**



1. A recording apparatus comprising:

a recording unit for recording an image on the basis of recording data; and

a control unit for sending said recording data to said recording unit;

wherein said control unit comprises output means for outputting a first clock signal for sending said recording data to said recording unit, said recording data being sent to said recording unit in synchronism with said first clock signal, said first clock signal generated by said output means being sent from said control unit to said recording unit, and

wherein said recording unit includes first latch means for latching said recording data sent from said control unit, said first latch means latching said recording data in synchronism with said clock signal sent from said control unit.

4,695,850

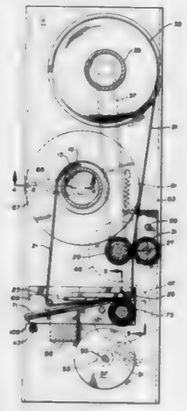
CARD GUIDE APPARATUS FOR USE IN A NON-INPACT PRINTER

Richard C. Nubson, Eden Prairie, Minn., assignor to Data Card Corporation, Minnetonka, Minn.

Filed Aug. 26, 1985, Ser. No. 769,841

Int. Cl.⁴ G01D *15/10*; **H05B** *1/00*; **B41J** *3/20*

U.S. Cl. 346—76 PH **9 Claims**



1. Thermal transfer printing apparatus for printing on the face of a plastic card, comprising:

a base;

a print roller mounted on the base and rotatable about an axis perpendicular to the base;

card guide means mounted on the base for slidably supporting a card having its face perpendicular to the base and delivered therethrough to a printing station adjacent the surface of the print roller;

a thermal transfer foil sheet supported for movement in contact with the face of the card as it passes through the printing station, the sheet bearing thermally transferrable printing material on the surface thereof;

a capstan roller rotatable about an axis perpendicular to the base;

spring loaded support means upon which the capstan roller is mounted, the spring loaded support means mounted on the base for urging the capstan roller into pressure applying contact with the face of the card beyond the printing station thereby curving a portion of the face of the card to conform to the print roller through the printing station; and

a print head mounted on the spring loaded support means and having at least one row of thermal elements projecting above a planar surface, the row of thermal elements being aligned with the axis of the print roller and arranged for contacting the carrier sheet in the printing station thereby enabling selected thermal elements of the print head when energized, to transfer printing material from portions of the transfer foil to the face of the card.

4,695,851

INK JET PRINTER

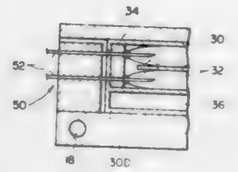
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

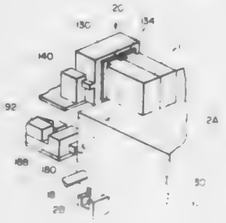
Filed Feb. 20, 1985, Ser. No. 703,484

Claims priority, application Japan, Feb. 24, 1984, 59-34753; Feb. 24, 1984, 59-34754; Feb. 24, 1984, 59-34755; Feb. 24, 1984, 59-34756; Feb. 24, 1984, 59-34757

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **14 Claims**





1. An ink jet printer comprising:

liquid discharge recording means for discharging ink onto the recording surface of a recording medium and effecting recording;

transportation means carrying said liquid discharge recording means and being movable in a predetermined direction relative to said recording surface;

suction means for sucking ink from said liquid discharge recording means through joining means connectable with said liquid discharge recording means when said transportation means is positioned at a predetermined position in which said liquid discharge recording means is not opposed to said recording surface;

waste ink containing means removably mountable on said transportation means; and

discharge means for communicating with said waste ink container means in said predetermined position and discharging into said waste ink container means the ink sucked by said suction means.

4,695,852

INK JET PRINT HEAD

Alessandro Scardovi, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 23, 1986, Ser. No. 922,451

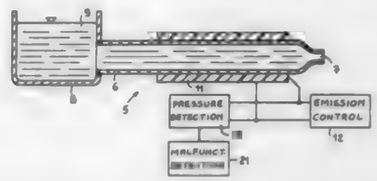
Claims priority, application Italy, Oct. 31, 1985, 67918 A/85

Int. Cl.⁴ G01D *15/18*

U.S. Cl. 346—140 R **8 Claims**

1. An ink jet print head comprising an ink reservoir connected to at least one print element having an ink outlet, a piezoelectric transducer which is actuable by a pulse generated selectively by a control circuit for causing the emission of a drop of ink through the outlet, and a circuit for detecting the pressure of the ink in the element during the printing operation, characterised in that said control circuit can be regulated in

such a way as to vary the form and the duration of the pulse in such a way that acoustic reflection waves arising from the pressure wave generated by expulsion of the ink drop are



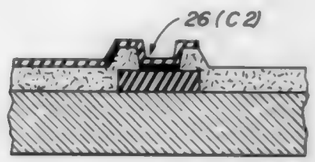
cancelled, and memory means controlled by said control circuit are provided to store data corresponding to the pressure detected after emission of the ink drop.

4,695,853

THIN FILM VERTICAL RESISTOR DEVICES FOR A THERMAL INK JET PRINTHEAD AND METHODS OF MANUFACTURE

David E. Hackleman, Monmouth, Oreg.; James G. Bearss, Boise, Id., and Eldurkar V. Bhaskar, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 12, 1986, Ser. No. 941,006
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R 9 Claims



1. A thin film resistor device suitable for use in a thermal ink jet printhead comprising:
a. a substrate member,
b. a conductive patten disposed atop an upper surface of said substrate member,
c. an insulating layer disposed on said conductive pattern and having openings therein aligned with preselected areas on said conductive pattern,
d. a resistive layer of a selected resistivity formed on said preselected areas on said conductive pattern, and
e. a metal barrier layer disposed atop said resistive layer and thereby providing an electrical path for current flowing through said resistive layer and also a shield against ink corrosion and cavitation wear.

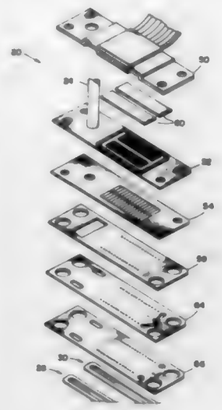
4,695,854

EXTERNAL MANIFOLD FOR INK JET ARRAY

Antonio S. Cruz-Uribe, Cobalt, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 30, 1986, Ser. No. 890,665
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R 45 Claims

1. An impulse ink jet print head of the type including a plurality of operating plates, all lying in parallel planes, held together in a contiguous superposed relationship comprising:
a first plate including a plurality of nozzles therein for ejecting droplets of ink therethrough;
a second plate defining a plurality of ink chambers therein;
an ink supply including compliant manifold means external of said plurality of operating plates;
first passage means connecting each of said chambers to said ink supply;
each of said chambers overlying an associated one of said nozzles and having an outlet for directing ink thereto; and



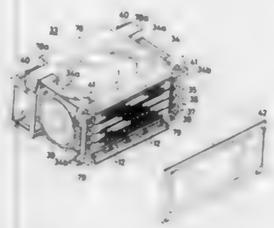
a third plate contiguous with said second plate and including driver means for displacing ink in said chambers thereby causing the ejection of ink droplets from each of said nozzles.

4,695,855

INK JET RECORDER

Hiroo Ichihashi, Hiratsuka; Masakazu Ozawa, Ebina; Ryuichi Ebinuma, Hiratsuka, and Atsushi Saito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,739
Claims priority, application Japan, Sep. 4, 1985, 60-193864
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—145 6 Claims



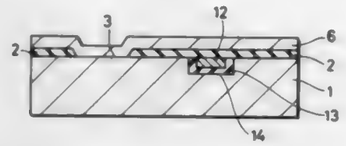
1. An ink jet recorder having a head assembly removably mounted on a recorder body, said head assembly having a plurality of head elements each including a plurality of nozzles arranged widthwise of a record sheet, and a removable cover for covering front sides of said head elements, comprising:
a connector for electrical connection with the recorder body removably mounted on said head assembly by a lever; and
a knob mounted on said cover to mechanically engage or disengage said head assembly with or from the recorder body;
said cover being constructed such that it cannot be mounted unless said lever is in a position to disconnect said connector.

4,695,856

SEMICONDUCTOR DEVICE

Terunori Warabisako, Nishitama; Makoto Ohkura, Hachioji, both of Japan, and Masanobu Miyao, Amsterdam, Netherlands, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,258
Claims priority, application Japan, Aug. 19, 1983, 58-150149
Int. Cl.[4] H01L *27/12*
U.S. Cl. 357—4 3 Claims



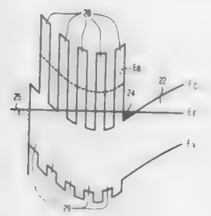
1. A semiconductor device comprising:
a semiconductor substrate;
a first insulating film which is disposed on said semiconductor substrate;
a single crystalline semiconductor film which is continuously disposed on both the surface of said semiconductor substrate and a desired portion of said first insulating film;
a second insulating film which is disposed in a groove provided in said semiconductor substrate; and
a conductive layer which is disposed between said second insulating film and said first insulating film,
wherein said conductive layer and said first and second insulating films are arranged so that said single crystalline semiconductor film will be flat without a stepped portion where it overlies a portion of said first insulating film which overlies said conductive layer and said second insulating film.

4,695,857

SUPERLATTICE SEMICONDUCTOR HAVING HIGH CARRIER DENSITY

Toshio Baba; Takashi Mizutani, and Masaki Ogawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,333
Claims priority, application Japan, Jun. 24, 1983, 58-113801; Jul. 26, 1983, 58-136128; Jul. 26, 1983, 58-136129; Aug. 31, 1983, 58-159813; Aug. 31, 1983, 58-159815; Aug. 31, 1983, 58-159816
Int. Cl.[4] H01L *29/267, 29/205, 29/207*
U.S. Cl. 357—16 6 Claims



1. A superlattice type semiconductor having a multilayered structure of alternately piled first and second layers, said first layers being a semiconductor which is selected from the group of GaAs, InP, Si, Ge, ZnTe and CdTe, and does not involve aluminum, a combination of arsenic and phosphorous, a combination of arsenic and antimony and a combination of silicon and germanium as elements of said semiconductor, each of said first layers having a thickness within a range from 5 Å to 100 Å and doped with P-type impurities, said second layers being a material having a sum of electron affinity and band gap larger than the sum of electron affinity and band gap of said semiconductor selected from a group of ZnSe, CaF_2, ZnS and MgO-Al_2O_3 spinels, and each of said second layers having a thickness within a range from 5 Å to 100 Å.

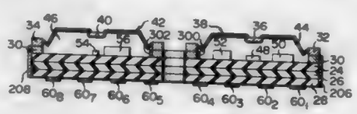
2. A superlattice type semiconductor having a multilayered structure of alternately piled first and second layers, said first layers being made of GaAs semiconductor having a thickness within a range from 5 Å to 100 Å, wherein said semiconductor does not involve aluminum, a combination of arsenic and phosphorous, a combination of arsenic and antimony and a combination of silicon and germanium as elements of said semiconductor, each of said first layers having an N-type impurity doped region sandwiched by impurity-free regions, said impurity-free regions contacting said second layers, said second layers being made of AlAs which produces lattice defect by contacting with said impurities and has an electron affinity smaller than said GaAs semiconductor, said second layers having a thickness within a range from 5 Å to 100 Å.

4,695,858

DUPLEX OPTICAL COMMUNICATION MODULE UNIT

Hatsuo Takezawa, Yokohama; Kenichi Donuma, Koshigaya; Shubei Katagiri, Tokyo, and Shigeyuki Sakura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 15, 1983, Ser. No. 514,250
Claims priority, application Japan, Jul. 19, 1982, 57-124424; Jun. 20, 1983, 58-109345
Int. Cl.[4] H01L *31/12*
U.S. Cl. 357—19 19 Claims



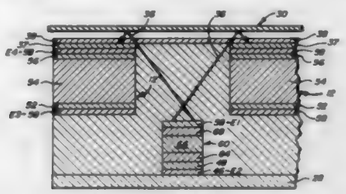
1. A duplex optical communication module unit comprising:
a first ceramic substrate having first and second major surfaces, first conductor layers being formed on said first major surface;
a first shell of metal, having a first transparent window member, heremetically sealed to said first major surface of said first ceramic substrate and defining a first space with said first major surface of said first ceramic substrate;
a second shell of metal, having a second transparent window member, heremetically sealed to said first major surface of said first ceramic substrate and defining a second space with said first major surface of said first ceramic substrate;
a first metallization layer formed on said first major surface of said first ceramic substrate substantially over the entire area in said first space except for insulating areas surrounding said first conductor layers;
a light-receiving element formed on said first major surface of said first ceramic substrate in said first space in opposition to said first transparent window member;
a circuit element formed on said first major surface of said first ceramic substrate in said first space, for amplifying the output current of said light-receiving element, said circuit element having an AC-grounded terminal;
a light-emitting element formed on said first major surface of said first ceramic substrate in said second space in opposition to said second transparent window member; and
a lead terminal connected to said AC-grounded terminal of said circuit element.

4,695,859

THIN FILM LIGHT EMITTING DIODE, PHOTONIC CIRCUIT EMPLOYING SAID DIODE AND IMAGER EMPLOYING SAID CIRCUITS

Subhendu Guha, Troy, and Satish Agarwal, Clawson, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 20, 1986, Ser. No. 921,030
Int. Cl.[4] H01L *31/12, 31/16*
U.S. Cl. 357—19 **47 Claims**



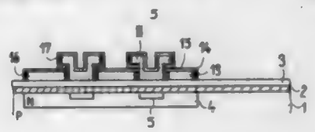
1. A solid state, integrated photonic structure comprising:
a substrate;
means for emitting light in response to an applied electrical stimulus, said light emitting means formed of a plurality of layers of thin film semiconductor alloy material deposited on said substrate;
means for detecting light emanating from the emitting means, said light detecting means formed of a plurality of layers of thin film semiconductor alloy material also deposited on said substrate;
said light detecting means (1) disposed in sufficient proximity to and (2) including a photogenerative layer having a band gap tailored so as to generate a detectible signal in response to light emanating from said light emitting means; and
said light emitting means and said light detecting means electrically isolated from one another by a layer of deposited insulating material.

4,695,860

GATE STRUCTURE FOR AN INTEGRATED CIRCUIT COMPRISING ELEMENTS OF THE GATE-INSULATOR-SEMICONDUCTOR TYPE AND A METHOD OF FABRICATION OF AN INTEGRATED CIRCUIT USING SAID STRUCTURE

Pierre Blanchard, Vierrieres-le-Buisson; Pierrick Descure, Biviers, and Jacques Chautempe, St. Egreve, all of France, assignors to Thomson-CSF, Paris, France

Filed Sep. 12, 1983, Ser. No. 531,440
Claims priority, application France, Sep. 21, 1982, 82 15905
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—24 LR **6 Claims**



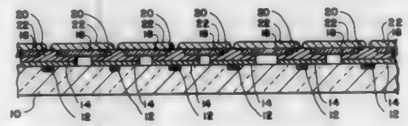
1. A photosensitive charge-transfer device comprising photosensitive transfer elements of the gate-insulator-semiconductor type which are positioned on first and second overlapping levels comprising a semiconductive substrate over which lies a gate insulating layer, a plurality of first level gates spaced apart along the substrate and insulated therefrom by the gate insulating layer, each first level gate comprising a first layer of doped polycrystalline silicon, the top surface of which is covered with a first layer of a compatible insulating material having a refractive index higher than 1.5 and the side surfaces of which are covered with a first layer of silicon oxide, the silicon oxide layer being positioned under the edge portions of the first layer of compatible insulating material, a plurality of second level gates spaced apart along the substrate and interleaved with the plurality of first level gates, each second level gate comprising a second layer of doped polycrystalline silicon, the top surface of which is covered with a second layer of a compatible insulating material having a refractive index higher than 1.5, each second level gate interleaved between two first level gates including symmetric edge portions overlapping said two interleaved first level gates for charge transfer between adjacent gates, and a layer of insulating material separating the overlapping portions of the first and second level gates.

4,695,861

BACKSIDE MOSAIC PHOTOCONDUCTIVE INFRARED DETECTOR ARRAY

Christopher G. Paine, Worcester; William J. White, Chelmsford, both of Mass., and Susan J. Resnick, Great Neck, N.Y., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 770,893, Oct. 21, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 13,186
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **12 Claims**



5. A backside contacted photoconductive detector apparatus, said apparatus comprising:
A. a first substrate made of a detector material;
B. a second substrate;
C. said second substrate including a plurality of first contact pads fastened to one surface of said second substrate, and wherein said first contact pads are positioned to avoid electrical contact between each of said first contact pads;
D. a plurality of insulating passivations on a first surface of said first substrate, said passivations shaped to expose portions of said first substrate;
E. a plurality of second contact pads on said first substrate, each of said second contact pads having first and second surfaces and each of said second contact pads is positioned between two of said passivations so that edges of said first surfaces overlap respective edges of said passivations and a portion of said first surface between said passivations is in electrical contact with the first substrate;
F. wherein said first and said second substrates are in physical contact such that each of said first contact pads is in electrical contact with respective said second surfaces of said second contact pads; and
G. said first substrate being cut through so as to form a plurality of individual detectors, each of which overlies one of said passivations, and such that each of said detectors is in electrical contact with two of said second contact pads which are on each side of each of said plurality of insulating passivations.

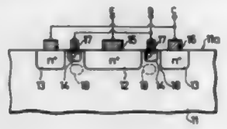
4,695,862

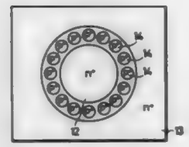
SEMICONDUCTOR APPARATUS

Yoji Kato, Kanagawa; Seiichi Watanabe, Tokyo, and Masaru Wada, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1985, Ser. No. 778,537
Claims priority, application Japan, Sep. 20, 1984, 59-197304
Int. Cl.[4] H01L *29/72, 29/80*
U.S. Cl. 357—36 **6 Claims**

1. A semiconductor apparatus comprising, a semi-insulating semiconductor substrate, a disc-shaped emitter region of a first conductivity type formed in said semiconductor substrate, a collector region of a first conductivity type formed in said semiconductor substrate and spaced from said emitter region, and formed with a round central opening in which said disc-shaped emitter region is symmetrically mounted, a plurality of third regions of a second conductivity type formed in said semiconductor substrate in said central opening between said collector and said disc-shaped emitter regions and arranged in





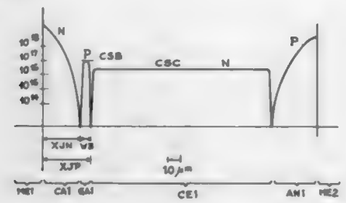
a circular shape, first voltage biasing means for forward biasing said emitter region relative to said plurality of third regions, and second voltage biasing means for reverse biasing said collector region relative to said plurality of third regions, to form imaginary base regions in said semi-insulating substrate beneath said plurality of third regions by majority carrier implantation from said plurality of third regions so that said semiconductor apparatus operates as a bipolar transistor.

4,695,863

GATELESS PROTECTION THYRISTOR WITH A THICK, HEAVILY DOPED CENTRAL N-LAYER

Jean P. Noguier, St. Cyr sur Loir, and Jean P. Montaut, Tours, both of France, assignors to Thomson CSF, Paris, France

Filed Mar. 12, 1986, Ser. No. 838,934
Claims priority, application France, Mar. 12, 1985, 85 03626
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **3 Claims**



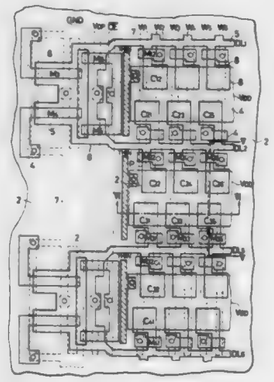
1. A thyristor of the type without a gate electrode, comprising:
a semiconductor substrate, which includes the superimposition of a plurality of layers which includes (a) a heavily doped P type anode layer, (b) a slightly doped N type central layer, (c) a moderately doped P type gate layer and (d) a heavily doped N type cathode layer;
wherein: the gate region has a thickness less than 10 microns between the cathode layer and the central layer and an impurity concentration between 5×10^{16} atoms/cm^3 and 5×10^{18} atoms/cm^3, and the central layer has a thickness greater than 100 microns and an impurity concentration of at least 10^{16} atoms/cm^3.

4,695,864

DYNAMIC STORAGE DEVICE WITH EXTENDED INFORMATION HOLDING TIME

Hiroshi Kawamoto, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 154,826, May 30, 1980, which is a continuation of Ser. No. 851,692, Nov. 15, 1977, abandoned. This application Apr. 26, 1983, Ser. No. 488,644
Claims priority, application Japan, Nov. 19, 1976, 51-138341
The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.
Int. Cl.[4] H01L *27/02, 29/78, 29/04;* **G11C** *11/24*
U.S. Cl. 357—41 **17 Claims**



1.
A semiconductor memory circuit device comprising:
a memory cell array formed at a predetermined area in a main surface of a semiconductor substrate, said memory cell array including a plurality of word lines arranged in parallel with each other in columns, a plurality of data lines arranged in parallel with each other in rows, and a plurality of 1-element type memory cells arrayed in rows and columns, each said memory cell comprising a capacitor which is made up of a semiconductor portion of said main surface of the semiconductor substrate serving as its one electrode and a conductive layer serving as its other electrode and formed on an insulating film formed over said portion of said semiconductor substrate and an insulated gate field-effect transistor electrically connected in series with said capacitor and having its gate electrode connected to one of said word lines, the series connection of said capacitor and insulated gate field-effect transistor being coupled to one of said data lines; and
at least one semiconductor region having a conductivity type opposite to the conductivity type of said semiconductor substrate, extending substantially along and adjacently to said semiconductor portions of said capacitors of the memory cells arrayed at the most outside row or column of said memory cell array, and formed outside said predetermined area in said main surface of the semiconductor substrate along an edge of said predetermined area which is not opposite transistors in peripheral circuits of said semiconductor memory circuit, but not formed between said adjacent semiconductor portions of the capacitors arrayed at the adjacent rows or columns.

4,695,865

INTEGRATED LOGIC CIRCUIT HAVING INSULATED GATE FIELD EFFECT TRANSISTORS

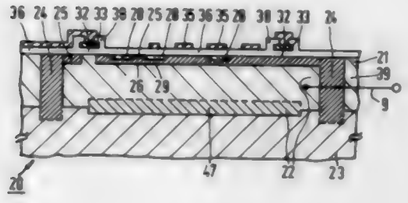
Kornelis J. Wagenaar, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1985, Ser. No. 719,950

Claims priority, application Netherlands, Apr. 9, 1984, 8401117

Int. Cl.[4] H01L 27/02

U.S. Cl. 357—41 12 Claims



1. A semiconductor device comprising a semiconductor body having a plural transistor structure, a major surface and a first semiconductor region of a first conductivity type which adjoins said major surface and which comprises a first electrode zone common to said plural transistor structure, which transistor structure comprises a second semiconductor zone of a second conductivity type opposite to the first conductivity type which extends from the major surface into the semiconductor body down to a smaller depth than that of the first semiconductor region, the second semiconductor zone forming with the first semiconductor region a first pn junction which terminates at the major surface while forming at this major surface a first outer ede of the second semiconductor zone, third surface zones of the first conductivity type, plural second electrode zones associated with the transistor structures and formed by said third surface zones of the first conductivity type, located within the second semiconductor zone and separated by second pn junction from the second semiconductor zone, said second pn junctions terminating at the major surface while forming at said surface a second outer edge of each of the third surface zones, channel regions between each of the third surface zones and the common first electrode zone, an insulating layer adjoining said channel regions, and a first conductive layer serving as an insulated gate, each of the channel regions being separated by the insulating layer from said first conductive layer, a second conductive layer, said third surface zones being provided at the major surface with an electrical connection formed by said second conductive layer, the second semiconductor zone in at least a first of the transistor structures being common to two or more third surface zones and the electrical connection of these third surface zones being separated from each other and forming signal outputs, the first transistor structure having a common signal input associated with said signal outputs, characterized in that the channel regions of the transistor structures are located at the major surface between the first and second outer edges, the second semiconductor zone of the first transistor structure is connected to the second semiconductor zone of at least one of the remaining transistor structures, and the signal inputs comprise the insulated gates of the transistor structures, the insulated gates having at least a strip-shaped part and one or more third surface zones being arranged along a long side of the strip-shaped part.

4,695,866

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

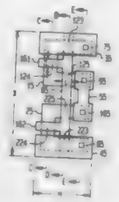
Kunihiro Koyabu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,718

Claims priority, application Japan, Sep. 28, 1983, 58-179601

Int. Cl.[4] H01L 27/02

U.S. Cl. 357—42 3 Claims



1. A semiconductor integrated circuit device comprising a semiconductor substrate, a transistor forming region provided in a major surface of one conductivity type region of said semiconductor substrate and including a first rectilinear portion extending in one direction and second and third rectilinear portions connected to the opposite ends of said first rectilinear portion and extending in parallel to each other and in a direction at right angles to said one direction, a single gate electrode including a main portion extending in said one direction and crossing over channel forming locations of said second and third rectilinear portions, respectively and a branch portion connected to a part of said main portion extending in the direction at a right angle to said one direction to cross over a channel forming location of said first rectilinear portion, and source and drain regions of the opposite conductivity type provided in the locations other than said channel forming locations of said transistor forming region.

4,695,867

MONOLITHICALLY INTEGRATED PLANAR SEMICONDUCTOR ARRANGEMENT

Peter Flohrs, and Hartmut Michel, both of Reutlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

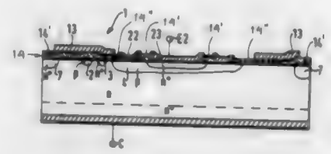
PCT No. PCT/DE85/00118, § 371 Date Aug. 21, 1985, § 102(e) Date Aug. 21, 1985, PCT Pub. No. WO85/05497, PCT Pub. Date Dec. 5, 1985

PCT Filed Apr. 16, 1985, Ser. No. 775,044

Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417474

Int. Cl.[4] H01L 27/02

U.S. Cl. 357—46 3 Claims



1. Monolithically integrated planar semiconductor arrangement comprising a substrate of a type of conductivity; at least one zone of an opposite type of conductivity being diffused into the substrate to form a p-n junction; a resistor strip of the same type of conductivity as said zone being diffused into said substrate at a distance from the periphery of said p-n junction, said resistor strip having a tap to form a voltage divider; a highly doped outer guard ring of the same type of conductivity as the substrate being diffused into said substrate to delimit the

semiconductor arrangement; a highly doped guard strip of the same type of conductivity as said outer guard ring being diffused into the substrate between said resistor strip and said p-n junction and being connected at one end thereof with the outer guard ring; a passivation layer provided on the substrate; a cover electrode provided on the passivation layer over space-charged areas generated during reversed bias mode of operation, said cover electrode being connected with said tap of the resistor strip; and said passivation layer beneath said cover electrode being thinner in the regions between said p-n junction and said guard strip and between said p-n junction and a facing part of said outer guard ring than in the remaining area beneath the cover electrode.

4,695,868

PATTERNED METALLIZATION FOR INTEGRATED CIRCUITS

Albert W. Fisher, East Amwell Township, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 13, 1985, Ser. No. 808,531

Int. Cl.[4] H01L 23/52, 23/54

U.S. Cl. 357—68 4 Claims



1. In a structure comprising a semiconductor substrate having thereon an area of metallization at least about 10 micrometers in its smallest dimension other than thickness and a layer of dielectric material overlying said area of metallization, said dielectric material and metallization having substantially differing thermal coefficients of expansion, the improvement wherein said area is replaced with an interconnected patterned area of metallization having about the same conductivity, such that there is substantial direct contact between the substrate and the dielectric material through openings in said patterned area, said openings being at least about three micrometers in their smallest dimension and the metal land between said openings being not greater than about ten micrometers.

4,695,869

GAAS SEMICONDUCTOR DEVICE

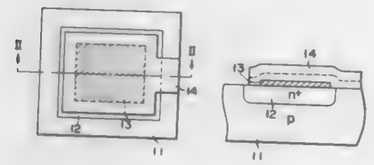
Kazuhiko Inoue, Kawasaki; Tatsuro Mitani, Tokyo, and Yoshihiro Kishita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 613,186, May 23, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 883,011

Claims priority, application Japan, May 31, 1983, 58-94859

Int. Cl.[4] H01L 23/48, 23/54

U.S. Cl. 357—71 14 Claims



1. A GaAs semiconductor device comprising:

a GaAs substrate;

a plurality of ohmic contact electrodes formed on said substrate and each including a layer of alloy of gold; and

a plurality of conductive members respectively formed on said ohmic contact electrodes and each including an upper layer of aluminum and a lower layer of a metal capable of preventing gold from passing therethrough, said lower layer being formed to cover completely the top and side surfaces of a corresponding one of said ohmic contact electrodes.

4,695,870

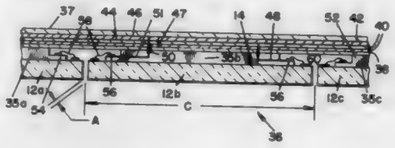
INVERTED CHIP CARRIER

Nils E. Patraw, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 27, 1986, Ser. No. 811,207

Int. Cl.[4] H01L 23/02

U.S. Cl. 357—74 22 Claims



1. A microelectronic chip interface apparatus for electrically coupling to circuit interface means provided upon a microelectronic chip, said apparatus comprising:

a mesa portion having a plurality of mesa interface means, said mesa portion being mounted upon a top surface of the chip,

at least one ledge portion extending outwardly from said mesa portion, said ledge portion having a plurality of ledge interface means,

said ledge interface means being electrically coupled to a plurality of coupling wires, each of said wires further being coupled to a corresponding circuit interface means,

a plurality of carrier internal conductors, said carrier internal conductors being selectively electrically coupled to said plurality of mesa interface means, and

said carrier internal conductors also being selectively electrically coupled to said plurality of ledge interface means whereby each of said circuit interface means is electrically coupled to one of said mesa interface means.

4,695,871

LIGHT-TRIGGERED SEMICONDUCTOR DEVICE

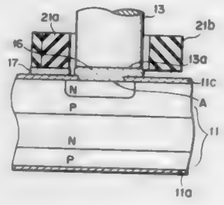
Yoshiaki Tsunoda, and Hideo Matsuda, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 26, 1983, Ser. No. 526,807

Claims priority, application Japan, Aug. 31, 1982, 57-149995; Dec. 28, 1982, 57-230688

Int. Cl.[4] H01L 23/02, 23/12

U.S. Cl. 357—74 3 Claims



1. A light-triggered thyristor which comprises:

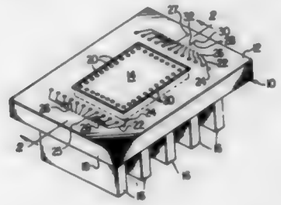
at least one light-triggered semiconductor chip having a light-sensitive area;
means for providing an airtight enclosure for said at least one light-triggered semiconductor chip;
transparent means proximate the periphery of said air-tight enclosure means for receiving light, said transparent means positioned outside an area directly above said light-sensitive area;
guide means for projecting light within said airtight enclosure means an onto said light-sensitive area, said guide means having a first end connected to said transparent means, a second end connected adjacent to said light-sensitive area and an intermediate portion between said first and second ends, wherein said second end includes an elastic transparent material fitted thereon and wherein said said second end has a larger transverse section than said light-sensitive area; and
a light guide-locating assembly for locating said transverse section to project light therefrom substantially uniformly onto all of said light sensitive area and having a fixed member attached to said chip, said fixed member being positioned around at least a portion of said guide means proximate said second end, said locating assembly also having a flexible member enveloping at least a substantial portion of both said guide means and said fixed member, while engaging at least a portion of said fixed member.

4,695,872

HIGH DENSITY MICROPACKAGE FOR IC CHIPS

Pallab K. Chatterjee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 1, 1986, Ser. No. 892,224
Int. Cl.[4] H01L *23/16*
U.S. Cl. 357—75 **19 Claims**



1. High density packaging apparatus for mounting a plurality of integrated circuit chips thereto, comprising:
a chipmount having a plurality of channels on one face thereof for holding a corresponding plurality of integrated circuit chips, and a cavity on another face of said chipmount for holding an integrated circuit chip; and
a plurality of interconnections for electrically connecting the plurality of integrated circuit chips mounted on said one face to one another, and for electrically connecting the plurality of integrated circuit chips on said one face with the integrated circuit chip mounted on said another face.

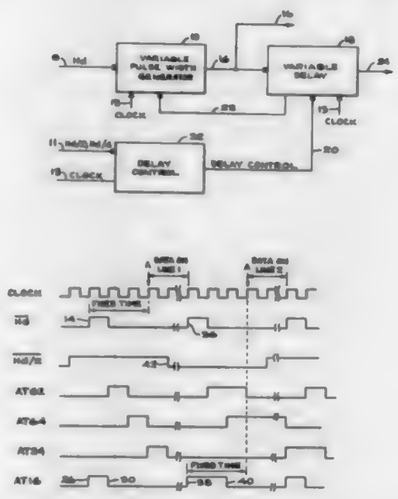
4,695,873

HORIZONTAL LINE DATA POSITION AND BURST PHASE ENCODING APPARATUS AND METHOD

Terrance Smith, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jun. 10, 1986, Ser. No. 872,568
Int. Cl.[4] H04N *9/44*
U.S. Cl. 358—13 **19 Claims**

1. In a system for processing a digitally encoded composite color television signal comprising a horizontal line synchronizing signal and a color burst signal having predetermined phase relationships to said horizontal line synchronizing signal which differ on consecutive horizontal lines of said color television signal, apparatus for encoding information related to a beginning of data pertaining to each horizontal line and to a phase of said color burst signal on consecutive lines of said digitally encoded signal, said apparatus comprising:
variable width pulse forming means, coupled to receive a first synchronizing signal having a predetermined phase relationship with said horizontal line synchronizing signal and a frequency corresponding thereto, for providing a variable width output pulse having a first transition of a predetermined phase relationship with said first signal;



delay control means, coupled to receive a signal indicating said predetermined phase relationship of said color burst signal at a beginning of each horizontal line, for providing respective delay control signals for respective values of said phase relationship; and
variable delay means coupled to receive said delay control signals, for applying responsively a delayed control signal to a control input of said variable width pulse forming means, said variable width pulse forming means coupled to provide a second transition of said variable width output pulse in response to said delayed control signal.

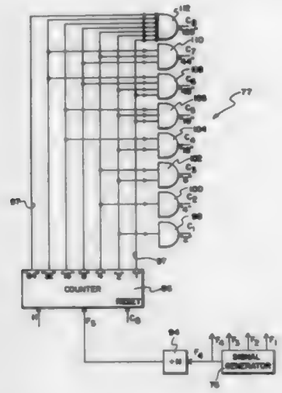
4,695,874

APPARATUS FOR PROCESSING A TIME-DIVISION MULTIPLEX VIDEO SIGNAL HAVING SIGNAL DURATIONS DIVISIBLE BY THE SAME NUMBER

Steven J. Sasson, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,820
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—21 R **7 Claims**

4. Time-division-multiplex (TDM) video signal apparatus comprising:
means for providing a color video signal having a sync signal portion, and a video portion having a chrominance component signal, and a luminance component signal concurrent in time with said chrominance component signal;
circuit means coupled to said providing means for producing, from said color video signal, a TDM color video signal having in time sequential order, a compressed sync signal, a compressed chrominance component signal, a first buffer and a compressed luminance component signal wherein each of said compressed chrominance and luminance component signals constitute a series of time-compressed samples of equal sample duration; and
control means for controlling said circuit means so that the durations of said compressed sync signal, said compressed chrominance component signal, said buffer and said compressed luminance component signal respectively of said TDM color video signal are equal to an integral multiple of said sample duration and each such TDM signal duration is divisible by the same integral number greater than one.

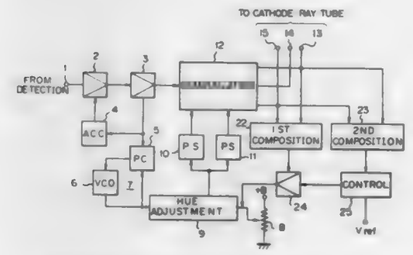


4,695,875

AUTOMATIC HUE CORRECTION CIRCUIT

Hiroyasu Kishi, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,844
Claims priority, application Japan, Mar. 14, 1985, 60-50867; Mar. 14, 1985, 60-50868; Mar. 14, 1985, 60-50869; Aug. 10, 1985, 60-176551; Aug. 20, 1985, 60-182422
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—28 **8 Claims**



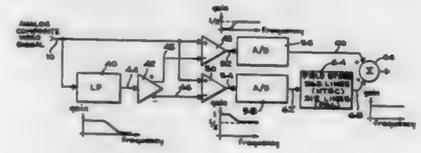
1. An automatic hue correction circuit in a color television receiver, comprising;
demodulation means for demodulating three color difference signals from a chroma signal which is separated from a received composite video signal,
first composition means for composing a Q signal by using the demodulated color difference signals,
second composition means for composing an I signal by suing the demodulated color difference signals,
amplification means for producing an adjustment signal which is formed from the Q signal derived from the first composition means,
hue correction means for supplying to the demodulation means a subcarrier signal for rotating demodulation axes in the demodulation means so that a level of the Q signal becomes smaller in accordance with the adjustment signal derived from the amplification means, and
control means for making the amplification means active when a level of the I signal derived from the second composition means exceeds a reference level.

4,695,876

METHOD AND APPARATUS FOR THE EXTRACTION OF LUMINANCE INFORMATION FROM A VIDEO SIGNAL USING A FIELD STORE

Daniel A. Beaulier, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 482,118, Apr. 4, 1983, abandoned. This application Jul. 15, 1986, Ser. No. 885,992
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **13 Claims**



1. Apparatus for extracting luminance information from a video signal composed of first and second fields of a plurality of frequency components wherein a plurality of high frequency components, containing non-luminance information, are out of phase by 180° from the first to the second fields, the apparatus comprising:
first filter means responsive to the video signal of the first field for analogly producing a filtered first field signal comprised of those signals having frequency components below the selected frequency increased in amplitude by twice a constant gain and those signals having frequency components above the selected frequency increased in amplitude by the constant gain;
second filter means responsive to the video signal of the second field for analogly producing a filtered second field signal comprised of those signals having frequency components below the selected frequency decreased in amplitude to zero and those signals having frequency components above the selected frequency increased in amplitude by the constant gain;
analog-to-digital conversion means responsive to the filtered first field signal for producing a digitized first field signal that is a digital representation of the filtered first signal, and responsive to the filtered second field signal for producing a digitized second field signal that is the digital representation of the filtered second field signal;
delay means responsive to the digitized first field signal for digitally producing a delayed first field signal that is the digitized first field signal delayed by a period of a field; and
summing means responsive to the delayed first field signal and the digitized second field signal for extracting the luminance information by digitally summing the delayed first field signal and the digitized second field signal so that out of phase non-luminance components cancel.
6. Apparatus for extracting luminance information from a

video signal composed of successive fields of a plurality of frequency components wherein a plurality of high frequency components, containing non-luminance information, are out of phase by 180° from field to successive field, the apparatus comprising:

filtering means responsive to the video signal for analogly producing a first and second filter output signal so that the first filter output signal contains the low frequency components present in the video signal and the second filter output signal contains the low frequency components present in the video signal shifted in phase by 180°;

a first summing means responsive to the video signal and the first filter output signal for analogly producing a first output signal equal to the difference between the video signal and the first filter output signal;

a second summing means responsive to the video signal and the second filter output signal for analogly producing a second output signal equal to the difference between the video signal and the second filter output signal;

a first conversion means for producing a first digitized signal which is a digital representation of the first output signal;

a second conversion means for producing a second digitized signal which is a digital representation of the second output signal;

a delay means responsive to the second digitized signal for digitally producing a delayed signal which is delayed by the period of a field; and

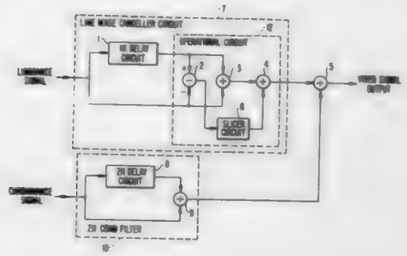
summing means responsive to the delayed signal and the first digitized signal for extracting the luminance information by digitally summing the delayed signal and the first digitized signal so that out of phase non-luminance components cancel.

4,695,877

VIDEO SIGNAL PROCESSING APPARATUS FOR COMPENSATING FOR TIME DIFFERENCES BETWEEN LUMINANCE AND CHROMINANCE SIGNALS OF A PAL SYSTEM

Tokikazu Matsumoto, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 12, 1985, Ser. No. 797,034
Claims priority, application Japan, Dec. 5, 1984, 59-256701
Int. Cl.⁴ H04N *5/21*
U.S. Cl. 358—36 **3 Claims**



1. A video signal processing apparatus for compensating for time differences between luminance and chrominance signals of a PAL system comprising:

a 1H delay means for delaying a luminance signal of the PAL system by one horizontal synchronizing period;

an operational means for allowing an output signal of said delay means to pass therethrough when a difference between levels of said luminance signal and said output signal of said delay means is larger than a predetermined value, and for outputting a sum of said luminance signal and said output signal of said delay means when said difference is smaller than said predetermined value;

a 2H comb filter for passing a chrominance signal of the PAL system; and

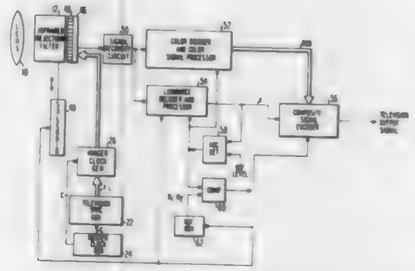
an adder means for adding an output signal of said operational means and an output signal of said 2H comb filter so as to thereby obtain a video signal.

4,695,878

COLOR TELEVISION CAMERA WITH SELECTIVELY REMOVABLE INFRARED REJECTION FILTER

Peter A. Levine, Mercer County; Arthur L. Cobb, Jr., Cherry Hill; Cydney A. Johnson, Marlton, and Gary R. Peterson, Camden County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1985, Ser. No. 793,234
Int. Cl.⁴ H04N *9/07, 5/33, 9/04, 9/67*
U.S. Cl. 358—44 **13 Claims**



1. A color television camera, comprising:

imaging means responsive to incident radiation of visible wavelengths as well as additional wavelengths for developing an image-representative output signal in response to said incident radiation;

optical means for directing said incident radiation to said imaging means along an optical path;

rejection filter means for substantially blocking the passage of said additional wavelengths of said incident radiation in said optical path so that said imaging means normally responds to only said visible wavelengths of said incident radiation;

signal processing means responsive to said image-representative output signal for producing a television signal;

said signal processing means including controllable weighting luminance signal matrixing circuitry;

control means coupled to said rejection filter means for preventing said rejection filter means from substantially blocking the passage of said additional wavelengths of said incident radiation in said optical path so that said imaging means responds to both said visible and additional wavelengths of said incident radiation; and

said control means also being coupled to said controllable weighting luminance signal matrixing circuitry to alter said weighting when said imaging means responds to both said visible and additional wavelengths of said incident radiation.

4,695,879

TELEVISION VIEWER METER

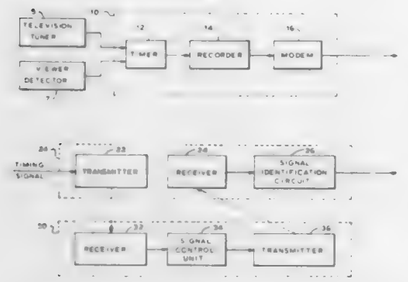
Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Filed Feb. 7, 1986, Ser. No. 827,760
Int. Cl.⁴ H04H *9/00;* **H04N** *17/00*
U.S. Cl. 358—84 **8 Claims**

1. Apparatus for determining the television viewing habits of at least one selected individual, which apparatus is usable with recording means coupled to a tuner of a television set for storing a television channel to which said tuner is tuned, said apparatus comprising:

a stationary monitoring unit adapted to be placed in close proximity to said television set, said unit including first transmitter means for regularly emitting an activation signal, a first receiver means, and a signal identification means coupled to the output of said first receiver means; and

a portable monitoring unit adapted to be worn on the heat of said by least one selected individual and including a second receiver coupled to a signal control means, said second receiver means being responsive to said activation signal only when the individual wearing it is looking in the direction of the television set and including means aimed



to point in substantially the same direction in which said head is pointed, said signal control means being responsive only to said activation signal to generate a control signal, and a second transmitter means responsive to said control signal for emitting an identification signal unique to the at least one selected individual wearing said portable monitoring unit; and

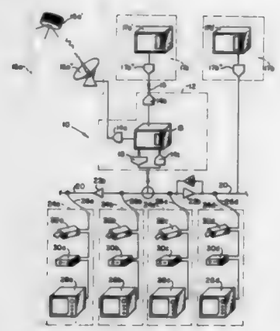
said signal identification means of the stationary monitoring unit recognizes said identification signal and generates a viewer signal to be stored on said recording means in association with the corresponding recorded television channel.

4,695,880

ELECTRONIC INFORMATION DISSEMINATION SYSTEM

Terry W. Johnson, Birmingham; Daryl E. Harms, Mountain Brook, and Ricky L. Curl, Pinson, all of Ala., assignors to Postron Corp., Birmingham, Ala.

Filed Jul. 30, 1985, Ser. No. 760,491
Int. Cl.⁴ H04H *1/04;* **H04N** *7/10*
U.S. Cl. 358—86 **16 Claims**



8. In an information dissemination system of the type for transmitting data signals over distances from a central data handling station to a plurality of remote stations via an existing communication medium, wherein the data signals include both a global message under a global code common to all of the remote stations and individual messages under distinct codes that are each unique to particular remote station, the remote stations each having apparatus for receiving and printing the messages contained in the data signals, the apparatus comprising:

receiver means for receiving the data signals including the global message and the individual messages;

selection means operatively connected with the receiver means for identifying and storing the global message under the global code and an individual message under the distinct code for the particular remote station;

data combining means for combining the individual message with the global message and generating print signals for reproducing the combined global and individual messages; and

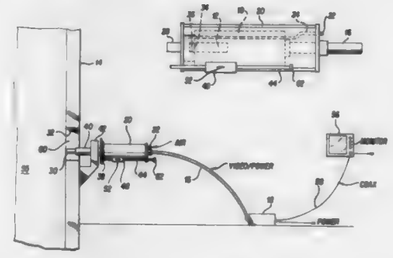
printing means responsive to the print signals for printing the combined global and individual messages selected by the selection means.

4,695,881

APPARATUS FOR IMAGING INFRARED EMITTING SURFACES

Jesse R. Kennedy, 5217 S. Marietta Dr., and Marcus R. Kennedy, Rte. 3, Box 94, both of Mobile, Ala. 36618

Filed Dec. 16, 1985, Ser. No. 809,329
Int. Cl.⁴ H04N *7/18*
U.S. Cl. 358—100 **9 Claims**



1. An imaging apparatus comprising

a television camera assembly and extension lens assembly for televising an interior of an apertured chamber;

a tubular member mounted in a wall of the chamber and aligned with the aperture;

a plurality of guide rods constructed integral with and having axes disposed parallel to the tubular member;

bearings attached to a camera housing in the television camera assembly;

the bearings having openings concentric with and slidably mounted on the guide rods;

a fixed stop which limits the forward movement of the bearings on the guide rods;

an image detection means cooperating with the television camera assembly sensitive in the infrared region for sensing an infrared image of emitting surfaces within the apertured chamber;

lens means for projecting and focusing the infrared image of the emitting surfaces on the image detection means;

optical filter means placed in cooperation with the lens means limiting the spectral sensitivity of the imaging apparatus including an edge filter limiting the spectral sensitivity of the imaging apparatus to wavelengths upward of 0.7 micrometers;

display means responsive to the image detection means for producing a visual image of the emitting surfaces being observed;

the optical filter means further including a neutral density

optical filter for improving the clarity of an image produced and for prolonging life of the image detection means, and

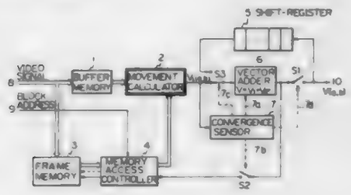
controls for the television camera assembly being positioned remotely from the television camera assembly.

4,695,882

MOVEMENT ESTIMATION SYSTEM FOR VIDEO SIGNALS USING A RECURSIVE GRADIENT METHOD

Masahiro Wada, and Hirohisa Yamaguchi, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,371
Claims priority, application Japan, Jan. 30, 1984, 59-13501
Int. Cl.⁴ H04N *7/12, 7/18*
U.S. Cl. 358—136 **4 Claims**



1. A movement estimation system for a video signal using a gradient method which estimates movement of a picture block between a present frame and a preceding frame based on the relations of a spatial gradient of a video signal in a frame and difference between present frame and preceding frame; said system comprising:

a buffer memory for storing a video signal of present frame;

a frame memory for storing a video signal of preceding frame;

a movement calculator for providing estimation of movement of a block in a picture using contents in said buffer memory and said frame memory;

a factor adder for accumulating output of said movement calculator; and

a convergence sensor for continuing and/or stopping said movement calculator upon detection that output of said movement calculator is larger or less than a predetermined value, such that a gradient method is carried out interatively to provide a series of sub-movements which are provided by said movement calculator until a sub-movement V1 is obtained between a block (B) in a present frame and a block (B'1) in a preceding frame, a second sub-movement V2 is obtained between said block (B) and a block (B'2) defined by said first movement (V1) in the preceding frame, i'th sub-movement, when I is an integer, is obtained between said block (B) and a block defined by preceding sub-movements in the preceding frame, and resultant movement (V) is given as the sum ($V=V1+V2+—$) of each of said sub-movements.

4,695,883

DIGITAL VIDEO COMPRESSION SYSTEM WITH VARIABLE DIGITAL FILTER

Van S. Chandler, Fort Worth, and Robert A. Arnstein, Dallas, both of Tex., assignors to Concept Communications, Inc., Stamford, Conn.

Filed Oct. 24, 1985, Ser. No. 790,869
Int. Cl.⁴ H04N *7/12, 11/06, 11/20, 1/419*
U.S. Cl. 358—138 **20 Claims**

1. A method of compressing television video frames for display, comprising in combination:

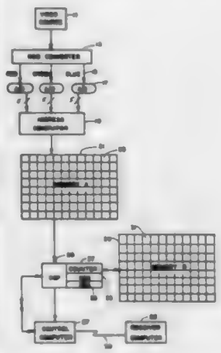
(a) digitizing a first frame into digital pixel values representing red, green and blue components of each pixel of the first frame;

(b) storing the pixel values in a memory A in consecutive locations;

(c) storing a selected form of the values into a memory B in consecutive locations;

(d) digitizing a next frame into digital pixel values representing red, green, and blue components of each pixel of the next frame;

(e) storing the pixel values of said next frame into memory A, replacing the stored pixel values of the the first frame;



(f) determining the differences between selected forms of the values of said next frame with the selected forms from the first frame previously stored in memory B;

(g) comparing the differences determined in step (f) with a predetermined filter number; and

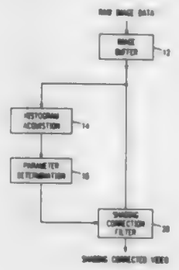
(h) outputting for display only the pixel values stored in memory A for which the differences determined in step (f) were greater than the filter number.

4,695,884

CORRECTION OF SHADING EFFECTS IN VIDEO IMAGES

Dimitris Anastassiou, New York, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 454,909, Dec. 30, 1982, abandoned. This application Feb. 1, 1985, Ser. No. 697,300
Int. Cl.⁴ H04N *5/14, 5/228;* **G06K** *9/38*
U.S. Cl. 358—163 **12 Claims**



1. A method for correcting shading effects in a video image using a histogram of gray scale intensity values of picture elements or pels making up the image, which histogram contains a median and black and white color extremes, comprising the steps of:

generating a histogram of distribution of gray scale intensity values of the pels in an original image to be corrected:

determining an acceptable range of background intensity values by:

calculating the median and the black and white color extremes in the histogram: and

calculating the distance between the histogram median and the color extreme on the side of the median having the majority of gray scale intensity values and setting said range as twice that distance centered at the median;

creating a first background image by sampling the gray scale intensity value of each pel to be corrected and setting all values outside of said acceptable range to that of the color extreme least distant therefrom;

creating a duplicate background image from said first background image;

sampling the gray scale values of a number of pels in a predetermined region around a first pel in said duplicate background image;

changing the value of the pel in said first background image corresponding to said first pel, to the largest value among those of said first pel and the sampled pels;

continuing the foregoing sampling and changing steps until all of the pel values in said first background image have been changed accordingly;

changing the duplicate background image in accordance with the changes in said first background image;

repeating the sampling step over a larger region and a larger number of pels with the corresponding changing in the first background image; and

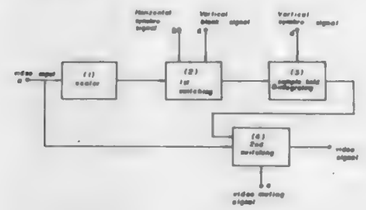
repeating the foregoing changing until a desired corrected background image is obtained which becomes the shading correction for the original image.

4,695,885

AUTOMATIC BRIGHTNESS CONTROL DEVICE

Joo W. Kim, Kuro-Apartment 3 dong, Room 301, Kuroku, Seoul, Rep. of Korea

Filed Dec. 27, 1985, Ser. No. 813,700
Claims priority, application Rep. of Korea, Dec. 28, 1984, 14312/84[U]
Int. Cl.⁴ H04N *5/235, 5/57*
U.S. Cl. 358—168 **5 Claims**



1. An automatic brightness control device for preventing deterioration of large quality caused by frequent image muting to delete unnecessary images on a video screen which comprises:

an input terminal for receiving an integrated image signal,

a scaler connected to said input terminal for providing a mean value signal of the input signal,

first switch means connected to said scaler for transmitting an output signal of the scaler in response to a horizontal synchronizing signal and a vertical blanking signal,

sample/hold and integrating circuit connected to said first switch means for integrating the mean value signal and a vertical synchronizing signal sample, and holding the mean value signal until the integrating circuit is reset, and

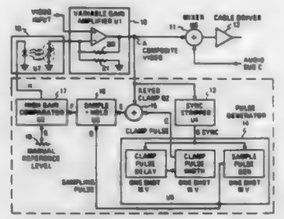
second switch means connected to said sample/hold for transmitting the mean value signal in response to a video muting signal when the image signal is turned off.

4,695,886

AUTOMATIC LEVELING CIRCUIT FOR A COMPOSITE VIDEO SIGNAL

William S. Schofield, Whitesville, Ky., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 7, 1985, Ser. No. 785,007
Int. Cl.⁴ H04N *5/53*
U.S. Cl. 358—176 **5 Claims**



1. A circuit for automatically leveling to a desired amplitude level a composite video signal having horizontal synchronizing pulses and a video portion whose amplitude level bears a standard relationship to the amplitude level of the horizontal synchronizing pulses, comprising:

A. means for supplying the composite video signal at an amplitude level typically differing from the desired amplitude level,

B. a wideband variable gain amplifier, for producing a composite video output signal, comprising an operational amplifier having a non-inverting terminal coupled to the composite video signal, an inverting terminal, and an output terminal and having a gain determined by the relationship of a first resistance (R_f), coupled between said output terminal and said inverting input terminal, and a second resistance (R_g) coupled between said inverting terminal and ground, said second resistance (R_g) being formed at least in part by a photo-sensitive resistor,

C. means coupled to the output terminal of said operational amplifier for developing an electrical quantity proportional to the amplitude level of the horizontal synchronizing pulses in the composite video output signal, and

D. a comparator, having first and second inputs, an adjustable reference amplitude level applied to the first input, and said electrical quantity proportional to the amplitude level of the horizontal synchronizing pulses applied to the second input, for producing an output dependent upon the difference between the amplitude levels of said first and second inputs, and

E. a light emitting diode, whose energization is controlled by the output of said comparator, optically coupled to said photo-sensitive resistor to vary the gain of the operational amplifier in a sense to maintain the amplitude level of the composite video output signal in substantial equality with said adjustable reference amplitude level, while maintaining accurate differential phase and differential gain.

4,695,887

VARIABLE SPEED VIDEO CAMERA

Dean M. Peterson, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1986, Ser. No. 930,199
Int. Cl.⁴ H04N *5/225;* **G03B** *9/10*
U.S. Cl. 358—213.13 **4 Claims**

1. A variable speed video camera comprising:

an image sensor;

first and second shutter discs, each of which has opening means which are alignable with said image sensor;

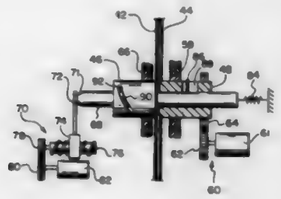
first and second hollow shaft means for respectively rotatably mounting said first and second shutter discs, said first and second shaft means having axes of rotation which

coincide but are spaced from each other so as to mount said first and second shutter discs at a fixed distance with respect to each other;

a push rod which is mounted coaxially with the axes of rotation of said first and second shutter discs and which is axially slidably mounted within said first and second hollow shaft means;

first linkage means for linking said first shutter disc with said first hollow shaft means such that said push rod is constrained against rotation with respect to said first shutter disc and first hollow shaft means but is axially slidable with respect thereto;

second linkage means for connecting said push rod with said second hollow shaft means such that said push rod is movable in concurrent axial and rotational movement



with respect to said second hollow shaft means in a helical locus of movement;

means connected to one of said first or second hollow shaft means for rotating said hollow shaft means at a fixed rotational speed wherein rotation of said first or second shaft means is transmitted to said push rod and to said other of said first and second shaft means by said first and second linkage means so that said first and second shutter discs are rotated at said rotational speed; and

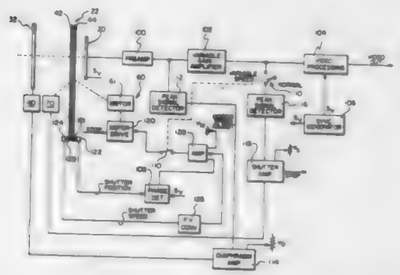
means for slidably moving said push rod within said first and second hollow shaft means in order to vary the rotational position of said first and second shutter discs with respect to each other, thereby to vary the relative opening between said first and second opening means to vary the speed of said shutter.

4,695,888

VIDEO CAMERA WITH AUTOMATICALLY VARIABLE DIAPHRAGM AND SHUTTER SPEED CONTROL

Dean M. Peterson, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1986, Ser. No. 930,200
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—213.13 **2 Claims**



1. A video camera with automatically variable diaphragm and shutter speed control, comprising:

image sensor means for converting the image of a scene into a video signal having a predetermined image repetition rate;

variable diaphragm means for controlling the light intensity of said image on said sensor;

variable shutter means for controlling the interval within an image repetition interval during which said sensor is exposed to said image; and

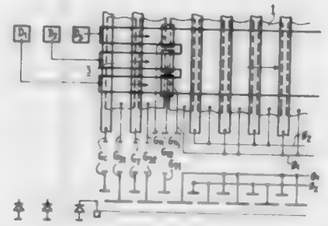
control means for controlling the peak to peak level of said video signal at a constant level in response to changing light intensity of said image by first, setting said variable shutter means to the shortest exposure interval while controlling said variable diaphragm means in response to varying light intensity and, second, when said variable diaphragm means is opened to its maximum opening, by controlling said variable shutter means to increase the exposure interval while maintaining said diaphragm means at said maximum opening.

4,695,889

CHARGE ACCUMULATION READ-OUT DEVICE WITH SIMULTANEOUSLY READ MULTIPLE OUTPUT SIGNALS

Jacques Portmann, St. Egreve, France, assignor to Thomson CSF, Paris, France

Filed Feb. 12, 1986, Ser. No. 828,743
Claims priority, application France, Feb. 12, 1985, 85 01972
Int. Cl.[4] H04N *1/024*
U.S. Cl. 358—213.26 **14 Claims**



1. A charge accumulation read-out device for information signal producing photosensitive detectors in a line to ensure in-phase summation of information, comprising:

at least one charge transfer, multiple-stage shift register, adapted to be connected to receive information from N detectors disposed in the same line, and having a substantially constant storage capacity over the whole of its length and includes an output port wherein information collected at different times from said detectors can be output without mixing; and

means for reading out, from said output port, charges stored in a plurality of stages of the register, said plurality of stages being read-out simultaneously to provide an in-phase summation of the informations.

4,695,890

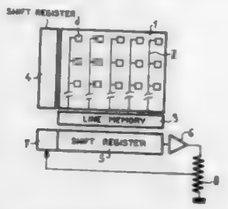
LINE TRANSFER READING DEVICE WITH FEEDBACK REGULATING THE DRIVE CHARGE

Gilles Boucharlat, and Louis Brissot, both of St. Egreve, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 7, 1986, Ser. No. 849,197
Claims priority, application France, Apr. 19, 1985, 85 06009
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.31 **2 Claims**

1. A device for reading a matrix of photosensitive detectors by line transfer, having a stage for series injection of a drive charge at the input of a register ensuring the reading successively of each line of detectors of the matrix, which device comprises means providing feedback of a portion of the video signal from a line of the matrix which is read to the injection

stage so as to modulate the value of the drive charge which is added to the video signal of the line of the matrix which will



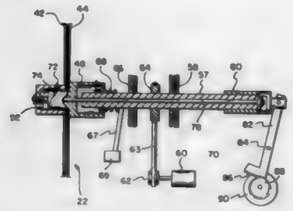
then be read, this modulation being directly proportional to the video signal of the line which is read and dependent on the transfer inefficiency of the device.

4,695,891

VARIABLE SPEED VIDEO CAMERA

Dean M. Peterson, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1986, Ser. No. 930,201
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—213.13 **3 Claims**



1. A variable speed video camera comprising:

an image sensor for producing a video signal representative of an image of a scene;

first and second shutter discs, each of which has an aperture which is alignable with said image sensor;

first and second hollow shaft means for respectively rotatably mounting said first and second shutter discs, said first shaft means being rotatably and slidably mounted on a portion of said second shaft means;

a cable which is connected at one end to said first shaft means, which extends through said first and second hollow shaft means and which is connected at its other end to a control member;

linkage means for linking said first and second hollow shaft means for concurrent axial and rotational displacement in a helical locus with respect to each other;

means for rotating said first and second shaft means at a predetermined rotational speed thereby rotating said first and second shutter discs at said predetermined speed; and

means for actuating said control member in response to a change in signal intensity of said sensor to thereby move said cable to cause said first shaft means to move in said helical locus of displacement relative to said second shaft means whereby said first and second shutter discs are rotated relative to each other to change the relative opening between said discs and thereby the shutter speed at which said sensor is exposed to said image.

4,695,892

METHOD FOR DETERMINING THE ANGULAR DIMENSIONS OF A SCENE RECORDED BY A VIDEO SYSTEM

Donald J. Mary, New Carrollton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 27, 1986, Ser. No. 880,512
Int. Cl.[4] H04N *5/272, 5/225*
U.S. Cl. 358—225 **7 Claims**



1. A method of calibrating a video system, including a video camera having a lens for viewing a scene and a video recorder for recording the scene on video tape, to determine angular dimensions of the scene, comprising the steps of:

focusing the video camera lens for infinity;

projecting into the video camera lens an image of an illuminated reticle pattern of known angular shape and size formed at infinity; and

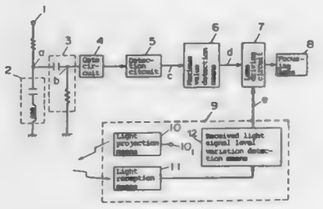
recording the image projected into the video camera lens on the video tape.

4,695,893

AUTOMATIC FOCUSING APPARATUS

Hiroshi Makino, Hirakata; Tsunemi Yoshino, Nara; Tadaharu Kihara, Habikino, and Akira Takashima, Osaka, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

PCT No. PCT/JP85/00072, § 371 Date Oct. 4, 1985, § 102(e) Date Oct. 4, 1985
PCT Filed Feb. 20, 1985, Ser. No. 786,959
Claims priority, application Japan, Feb. 21, 1984, 59-30858; Feb. 24, 1984, 59-34655
Int. Cl.[4] H04N *5/232;* **G03B** *3/00*
U.S. Cl. 358—227 **15 Claims**



1. An automatic focusing apparatus with a lens movement termination means, comprising:

a sharpness signal generation means which detects a sharpness signal from high-frequency components of a brightness signal contained in a video signal corresponding to an object;

a maximum value detection means which generates a lens movement termination signal which stops movement of a focusing lens when said sharpness signal has a peak value;

a distance variation detection means comprising a light projection means which projects a specified amount of infrared light onto said object, a light reception means which receives reflected lights caused by projection of said specified amount of infrared light onto said object, and a received light signal level variation detection means which detects variations of the light level of said reflected infrared light for issuing a lens movement start signal; and

a lens driving means including a driving source for control-

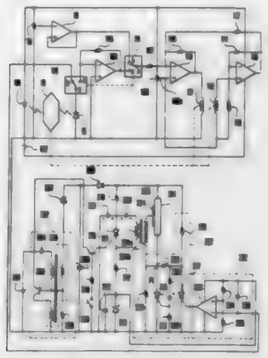
ling the movement of a lens in response to said lens movement termination signal and said lens movement start signal.

4,695,894

EXPOSURE CONTROL APPARATUS

Syuichiro Saito, Kanagawa, and Tadashi Okino, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Japan

Division of Ser. No. 565,618, Dec. 27, 1983, Pat. No. 4,563,070. This application May 10, 1985, Ser. No. 733,123
Claims priority, application Japan, Dec. 28, 1982, 57-230077
Int. Cl.[4] G03B *7/085*; H04N *5/238*
U.S. Cl. 358—228 **17 Claims**



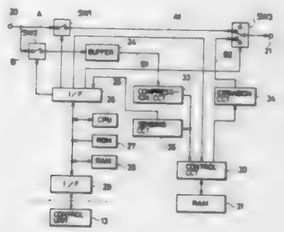
1. An image pick-up apparatus, comprising:
(a) image receiving means for pick-up an image of an object;
(b) light metering means for detecting the brightness of the object;
(c) illumination means for illuminating the object;
(d) restriction means for restricting the amount of light incidence on the image pick-up means; and
(e) changeover means for using an output of the light metering means selectively for the illumination means or the restriction means.

4,695,895

IMAGE PROCESSING SYSTEM

Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,353
Claims priority, application Japan, Nov. 2, 1983, 58-204757; Nov. 2, 1983, 58-204758
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—280 **8 Claims**



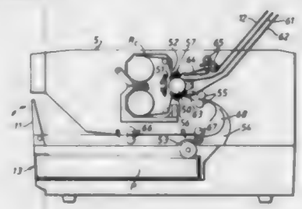
1. An image processing system comprising:
input means for entering image data;
means for compressing the image data entered by said input means;
memory means for storing the image data compressed by said compressing means;
means for expanding the image data stored in said memory means;
means for image formation;
control means for causing the image data entered from said input means to be supplied through said compressing means to said memory means as well as to said image forming means for a first image formation and causing the image data stored in said memory means to be supplied through said expanding means to said image forming means for ensuing image formation; and
means for detecting the storage status of the compressed image data in said memory means;
wherein said control means is adapted to cause the image data entered from said input means to be supplied to said image forming means for the ensuing image formation, when said detecting means detects an improper storage of the compressed image data in said memory means.

4,695,896

IMAGE FORMING APPARATUS

Eiichi Yamanishi, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1985, Ser. No. 726,468
Claims priority, application Japan, May 30, 1984, 59-110263
Int. Cl.[4] H04N *1/23*
U.S. Cl. 358—296 **19 Claims**



1. An image forming apparatus for transferring a color pattern of an original onto a copying sheet, comprising:
reading means for reading a color pattern of said original;
conversion means for converting the color pattern read by said reading means into a color signal indicative thereof;
transfer means for transfering on said copying sheet according to said color signal, said transfer means including a plurality of colors;
means for selectively commanding one of a 2-color nonlap print mode and a lap print mode; and
image forming means for selecting one color of said plurality of colors of the transfer means according to said color signal for one picture element of said copying sheet when said commanding means commands a two color nonlap print mode, and for transferring only said one color onto said picture element of said copying sheet.

4,695,897

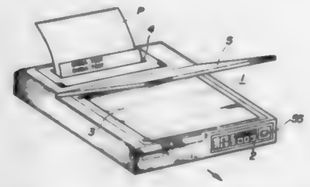
IMAGE BUILDING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 7, 1985, Ser. No. 795,921
Claims priority, application Japan, Nov. 7, 1984, 59-234623
Int. Cl.[4] H04N *1/21*; G03G *15/00*; G01D *15/10*
U.S. Cl. 358—296 **23 Claims**

1. An apparatus for forming an image of an original on a printing medium, comprising:
a housing having a front forward portion and a top upper portion;
an original holding board on the top upper portion of said housing for holding the original thereon;
scanning means disposed below said original holding board,

said scanning means for moving in a transverse direction as seen from the front of said housing to scan the original on the original holding board to read image information off the original, said scanning means including,
a first carriage including a lamp for emitting a light beam toward the original and a first mirror against which the light beam transmitted from the original is reflected, said first carriage being adapted to move along the original in a direction transverse to the front of said housing,
a second carriage including second and third mirrors against which the light beam transmitted from the first mirror is reflected, said second carriage adapted to move parallel to the direction of movement of the first carriage, the speed of movement of said second carriage



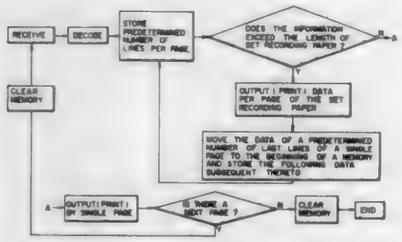
being half of the speed of movement of said first carriage,
lens means disposed in the path of the light beam transmitted from the third mirror, and
photoelectric converting means into which the light beam is introduced after passing through said lens means for outputting an electrical signal in response to the introduced light beam; and
printing means disposed behind said scanning means as seen from the front of the housing, said printing means for forming an image on the printing medium by driving a recording head in response to the electrical signal transmitted from said photoelectric converting means, said printing medium being transported in a direction substantially perpendicular to the direction of movement of said scanning means.

4,695,898

FACSIMILE MACHINE USING CUT SHEETS OF PAPER

Kazumasa Ishikawa, Kawasaki, and Yuji Koseki, Machida, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,599
Claims priority, application Japan, Jun. 20, 1985, 60-132943
Int. Cl.[4] H04N *1/21, 1/23, 1/00, 1/40*
U.S. Cl. 358—296 **13 Claims**



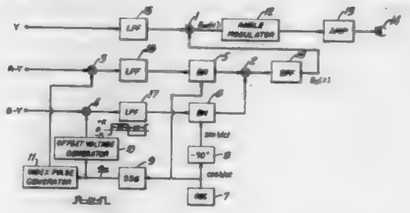
1. A method for recording data in a facsimile machine using cut sheets of recording paper of a predetermined size, comprising the machine-implemented steps of:
determining whether or not a larger cut sheet of paper is required for recording said data than said predetermined size; and
recording a predetermined number of lines recorded at the end of a cut sheet of recording paper at the beginning of a next cut sheet of recording paper if a larger cut sheet of paper is required for recording said data than said predetermined size.

4,695,899

RECORDING AND REPRODUCING SYSTEM EMPLOYING BALANCED MODULATION FOR COLOR VIDEO SIGNAL

Masahiko Nagano, and Naoaki Sakaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 27, 1984, Ser. No. 675,289
Claims priority, application Japan, Nov. 30, 1983, 58-225990
Int. Cl.[4] H04N *9/79*
U.S. Cl. 358—310 **6 Claims**



1. A color video signal recording system comprising:
means for modulating a first color signal and a second color signal onto a subcarrier by a quadrature two-phase balanced modulation;
means for generating a reference phase signal having a frequency equal to the frequency of said subcarrier;
multiplexing means for combining said reference phase signal with a modulated color signal outputted by said modulation means and with a luminance signal, said multiplexing means outputting a multiplexed signal wherein said reference phase signal is frequency-interleaved with said modulated color signal;
means for applying an angle modulation to said multiplexed signal; and
means for recording on a recording medium an angle-modulated signal outputted by said angle modulation means

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4,695,900

MAGNETIC RECORDING AND PLAYBACK APPARATUS FOR TELETEXT SIGNALS

Masahiro Honjo, Neyagawa, and Akio Hashima, Tuzuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 12, 1985, Ser. No. 722,452
Claims priority, application Japan, Apr. 12, 1984, 59-73231; Apr. 13, 1984, 59-75529; Nov. 20, 1984, 59-245128
Int. Cl.[4] H04N *9/79*
U.S. Cl. 358—310 **10 Claims**

1. A magnetic recording and playback apparatus for recording on and reproducing from a magnetic recording medium a video signal on which a teletext signal is superposed, comprising:
a recording signal processing means for processing said video signal to obtain a recordable signal;
a recording head for recording said recordable signal on said recording medium;
a reproducing head for reproducing the recorded signal from said recording medium; and
a reproduced signal processing means for processing the reproduced signal from said reproducing head to obtain a

reproduced video signal which is equivalent to said video signal,

said recording signal processing means comprising:

a first low-pass filter for extracting a luminance signal from said video signal;

a frequency modulator for frequency-modulating said luminance signal;

a first high-pass filter for reducing noise components contained in the frequency-modulated luminance signal;

a first band-pass filter for extracting a chrominance signal from said video signal;

a first frequency converter for converting a frequency band of said chrominance signal to a low frequency band;

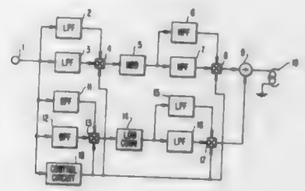
a second low-pass filter for reducing noise components contained in the low-frequency-band chrominance signal;

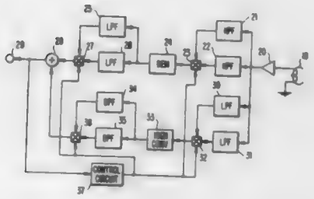
a first mixer for mixing output signals of said first high-pass and second low-pass filters to obtain said recordable signal; and

a first control means for producing a first control signal which is indicative of a period in which said teletext signal is superposed on said video signal,

said reproducing signal processing means comprising:

a second high-pass filter for extracting a reproduced frequency-modulated luminance signal from said reproduced signal;





a frequency demodulator for frequency-demodulating said reproduced frequency-modulated luminance signal to obtain a reproduced luminance signal;

a third low-pass filter for reducing noise components contained in said reproduced luminance signal;

a fourth low-pass filter for extracting a reproduced low-frequency-band chrominance signal from said reproduced signal;

a second frequency converter for converting said low frequency band of said reproduced low-frequency-band chrominance signal to said frequency band of said chrominance signal to obtain a reproduced chrominance signal;

a second band-pass filter for reducing noise components contained in said reproduced chrominance signal;

a second mixer for mixing output signals of said third low-pass and second band-pass filters to obtain said reproduced video signal; and

a second control means for producing a second control signal which is indicative of a period in which said teletext signal is superposed on said reproduced video signal,

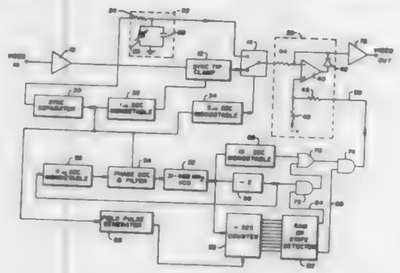
wherein at least one of said first low-pass and first high-pass filters is adapted to widen its frequency passband in response to said first control signal, and at least one of said second high-pass and third low-pass filters is adapted to widen its frequency passband in response to said second control signal, thereby passing said teletext signal, which has a wide frequency band.

4,695,901

METHOD AND APPARATUS FOR REMOVING PSEUDO-SYNC AND/OR AGC PULSES FROM A VIDEO SIGNAL

John O. Ryan, Cupertino, Calif., assignor to Macrovision, Santa Clara, Calif.

Filed Mar. 4, 1986, Ser. No. 836,019
Int. Cl.[4] H04N *5/76*
U.S. Cl. 380—5 **31 Claims**



1. A method of removing pseudo-sync pulses added after normal sync pulses to a video signal for inhibiting the making of acceptable video recordings of the video signal, comprising the steps of:

providing a selectively-operable negative-peak clipping device to pass unchanged the video signal in one operation state thereof and to pass the video signal with selected negative-value components thereof removed in a second operation state thereof;

detecting normal sync pulses and pseudo-sync pulses of the video signal;

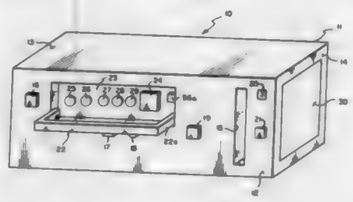
selectively operating the clipping device in accordance with the detected sync pulses so that the video signal is padded by the clipping device unchanged during the detection of normal sync pulses and passed by the clipping device as modified by the second operation state thereof during the detection of at least some of the pseudo-sync pulses, thereby outputting a video signal which is regenerated free from at least some of the added pseudo-sync pulses to permit more acceptable video recordings thereof.

4,695,902

COLOR VIDEO PRINTER INCLUDES A COLOR VIEWER AND IMAGE ADJUSTMENT CONTROLS WHICH ARE INHIBITED DURING EXPOSURE

Dana W. Wolcott, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,233
Int. Cl.[4] H04N *9/81, 5/84*
U.S. Cl. 358—332 **4 Claims**



1. Color video printer apparatus comprising:

monochrome display means for displaying an image of a video signal;

an exposure station which is located along a first optical path from said display means and at which is located a photographic element;

an image viewing station;

an optical assembly movable between an exposing position out of said first optical path and a viewing position intercepting said first optical path to establish a second optical path between said image viewing station and said display means;

first and second continously moving color filters, each of which has first, second and third primary color filters sequentially movable into said respective first and second optical paths in synchronism with the field frequency of a video signal applied to said display means; and

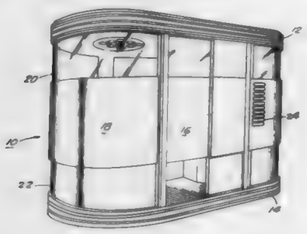
selectively actuatable means coupled to said optical assembly for moving said assembly (1) to said exposing position to permit the exposing of a photographic element at said exposure station to color images produced by said display means and said first color filter and (2) to said viewing position to permit the viewing at said image viewing station of color images produced by said display means and said second color filter.

4,695,903

AUDIO VIDEO ENTERTAINMENT MODULE

Earl Serap, and Deborah Serap, both of Santa Monica, Calif., assignors to Deborah Pauline Schuman, Los Angeles, Calif.

Filed Jun. 17, 1985, Ser. No. 745,613
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 **8 Claims**



1. An entertainment module for presenting prerecorded visual and audible entertainment comprising in combination:

a. a viewing chamber adapted to substantially surround occupants for providing substantial acoustic and light isolation from the surrounding environment to enhance the presentation of visual and audible entertainment;

b. seating means within said viewing chamber for accommodating a limited number of viewers of the entertainment to be provided;

c. image presenting means within said viewing chamber for displaying visual images to occupants of said seating means;

d. acoustical transducing means within said viewing chamber for providing audible entertainment to occupants of said seating means;

e. coin operated selection means within said viewing chamber for enabling the occupants of said seating means to choose one of a predetermined inventory of pre-recorded entertainment programs;

f. audio-visual display generating means within said viewing chamber coupled to said coin operated selection means and operable in response thereto for providing visual images to said image presenting means and audible entertainment to said acoustical transducing means;

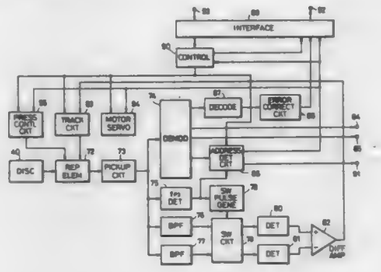
whereby an occupant of said seating means within said viewing chamber can select a pre-recorded program from an inventory of programs and by inserting one or more coins into said selection means, can cause a selected program to be visually and audibly presented in an environment that is relatively free from the ambient light and sound existing at the exterior of said viewing chamber.

4,695,904

INFORMATION SIGNAL RECORDING DISC RECORDED WITH AN END SIGNAL FOR SELECTIVELY PREVENTING UNWANTED ACCESS TO PREDETERMINED RECORDED INFORMATION AND DISC REPRODUCING APPARATUS THEREFOR

Tatsuya Shinyagaito; Terumasa Kuramoto, both of Iwai; Toyotaka Machida; Kikuji Saito, both of Kashiwa; Shunichi Shichijo, Sagamihara; Tooru Yamagishi, Tokyo; Yoshinao Kobayashi, Machida; Kazuyoshi Ishii, Sagamihara, and Atsumi Hirata, Fujisawa, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Apr. 29, 1985, Ser. No. 728,308
Claims priority, application Japan, May 1, 1984, 59-88103
Int. Cl.[4] G11B *7/00*
U.S. Cl. 358—342 **11 Claims**



1. An information signal recording disc playable on a disc reproducing apparatus which comprises a reproducing element for reproducing recorded signals from track turns of the information signal recording disc, said reproducing element reproducing the recorded signals from the track turns of the information signal recording disc in a playing position and stopping the reproduction in a rest position, said information signal recording disc comprising:

a first region comprising track turns recorded with an information signal at least including a video signal;

a second region comprising track turns intermittently recorded with an end signal, said end signal being used to forcibly and automatically return the reproducing element of the disc reproducing apparatus from the playing position to the rest position, said second region being provided at a position prior to said first region in a direction of a reproducing sequence of the recorded signals on the information signal recording disc; and

a third region made up of at least one track turn, said third region being provided at a position subsequent to a position where the recording of the information signal terminates in the direction of the reproducing sequence of the recorded signals on the information signal recording disc,

said track turns being recorded with an address signal with a constant period, said address signal indicating the position on the information signal recording disc,

said end signal being recorded in place of said address signal in predetermined track turns within said second region,

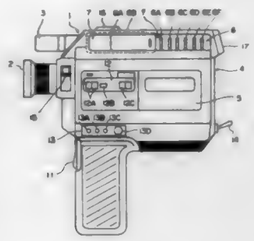
said end signal being recorded in place of said address signal in all track turns within said third region.

4,695,905

VIDEO RECORDING/REPRODUCING CAMERA

Mikio Utsugi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 17, 1985, Ser. No. 735,348
Claims priority, application Japan, May 19, 1984, 59-99722
Int. Cl.[4] H04N 5/78
U.S. Cl. 360—33.1 12 Claims



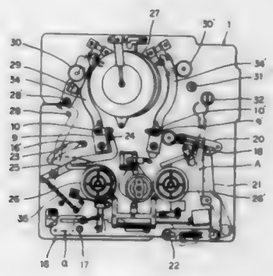
1. A video recording/reproducing camera comprising:
an image pickup means for picking up an image of an object and for converting said picked up image into a video signal;
a recording/reproducing means for recording and/or reproducing said video signal;
means for initiating a recording operation by said recording-/reproducing means;
a preventing member for preventing the touching of control members associated with a reproduction operation of said recording/reproducing means, except when said recording/reproducing means is in a reproduction mode;
a sensor means for sensing whether said control members are prevented from being touched by said preventing member; and
a control means for disabling operation of said initiating means and enabling only a reproduction operation of said recording/reproducing means when said sensor means detects that said preventing member permits the touching of said control members, and for enabling operation of said initiating means when said sensor means detects that the touching of said control members is prevented.

4,695,906

APPARATUS FOR QUICK STARTING TAPE IN VIDEO CASSETTE RECORDERS

Jin H. Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 26, 1985, Ser. No. 813,613
Claims priority, application Rep. of Korea, Dec. 28, 1984, 1984-8495
Int. Cl.[4] G11B 5/027, 15/665
U.S. Cl. 360—85 1 Claim



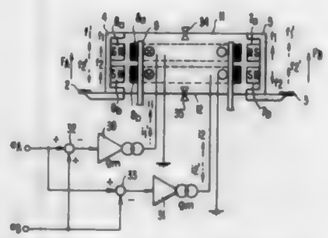
1. An apparatus for quick starting of tape forwarding-and-rewinding operations for a video cassette recorder, said apparatus comprising:
(a) a cam gear (2) which is mounted under the recorder main deck (1), rotates through a connecting gear (5) by a loading motor (4), and has guide grooves (3, 3') at its bottom and top surfaces;
(b) a sector gear (6) which is rotatable by means of a guide pin (6') captured in the said guide groove (3') and in turn rotates ring gears (8, 8') through transmission gears (7, 7');
(c) loading plates (9, 9') having loading rollers (10, 10') and loading poles (11, 11') which are elastically connected to the said ring gears (8, 8') by tension springs (14, 14') and also additionally by supporting plates (12, 12') and connecting pins (13') inserted in openings (13) formed in the said ring gears (8, 8'), the said loading rollers (10, 10') and loading poles (11, 11') being exposed above the recorder main deck (1) through loading holes (34, 34') formed in the recorder main deck (1);
(d) an operating rod (15) which has a guide pin (15') captured in the guide groove (3) and is connected to a slide plate (16) above the recorder main deck (1) by a connecting pin (17), the front end of the slide plate (16) being connected to the tension rod (21) through a connecting rod (22);
(e) a pinch arm (20) which is formed with a pinch roller (18) and a guide roller (19) on each end of it and operated by the said tension rod (21); and
(f) a guide pin (16') which is installed on the front end of the operating rod (15) and protrudes above the recorder main deck (1) through a guide hole (23), the said guide pin (16') serving to guide a tension arm (25) with a tension pole (24).

4,695,907

ROTARY HEAD DEFLECTION APPARATUS

Toshio Inaji, Mino; Hiroshi Okamoto, Nara, and Nobuyoshi Yokobori, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 15, 1984, Ser. No. 671,583
Claims priority, application Japan, Nov. 15, 1983, 58-215488; Nov. 21, 1983, 58-218911; Nov. 29, 1983, 58-224716
Int. Cl.[4] G11B 5/588, 21/04
U.S. Cl. 360—107 6 Claims



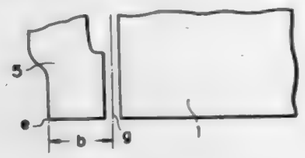
1. A deflectable rotary head assembly comprising:
a rotary member rotatable around an axis of rotation;
first and second movable members each of which is mounted on said rotary member for displacement in opposite directions parallel to the axis of rotation of said rotary member;
a magnetic head mounted on each of said first and second movable members;
first and second magnets mounted on each of said first and second movable members and positioned relative to each other in a direction parallel to said axis of rotation, the first and second magnets on said first movable member being magnetized to have the like polarities aligned in a direction parallel to the axis of rotation and the first and second magnets on said second movable member being magnetized to have unlike polarities aligned in a direction parallel to the axis of rotation;
a stationary member having a cylindrical surface with the cylindrical axis coinciding with the axis of rotation of said rotary member;
first and second driving coils wound on said cylindrical surface of said stationary member and being spaced at predetermined distances from said first and second magnets on each of said first and second movable members and positioned for urging said first and second magnets, respectively, in directions parallel to said axis of rotation; and
control circuit means for feeding first and second control currents to said first and second driving coils, respectively, for producing urging forces on said magnets for independently urging said first and second magnets on one of said movable members in either an up or down direction while urging the first and second magnets on the other of said movable members in opposite directions,
whereby each of said first and second movable members can be displaced in a direction paralle to the axis of rotation of said rotary member in response to said first and second control currents for urging the magnetic head on one of said first and second movable members up or down while the other movable member remains fixed.

4,695,908

THIN FILM TYPE MAGNETIC TRANSDUCER HEAD

Shigeyoshi Imakoshi; Yutaka Soda, and Hideo Suyama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,542
Claims priority, application Japan, Aug. 29, 1983, 58-157647
Int. Cl.[4] G11B 5/23
U.S. Cl. 360—119 3 Claims



1. A thin film type magnetic transducer head comprising a magnetic substrate, and a thin film magnetic core forced on said substrate through an effective magnetic gap at one end of said substrate arranged to face a travelling magnetic recording medium, said magnetic substrate and said thin film magnetic core forming a magnetic circuit to reproduce signals on said travelling magnetic medium, wherein a length b and a wave length $\lambda m = v/f_m$ satisfy the following relations

$$b < 0.64\lambda m, \text{ or } 0.83\lambda m < b < 1.61\lambda m$$

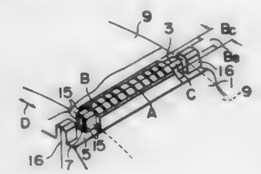
wherein b is the thickness of said thin film magnetic core facing said travelling magnetic recording medium plus one-half the gap length of said effective magnetic gap, v is the relative velocity of said travelling magnetic recording medium to said magnetic transducer head, and f_m is maximum frequency or half of transmission rate.

4,695,909

MAGNETIC HEAD ASSEMBLY

Kazuhiro Momata, Chigasaki; Yoshinori Dekura, Ebina; Tadashi Honzawa, and Hiromi Matsushige, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,583
Claims priority, application Japan, Nov. 10, 1983, 58-211294
Int. Cl.[4] G11B 5/187, 5/29, 15/64, 5/10
U.S. Cl. 360—122 19 Claims



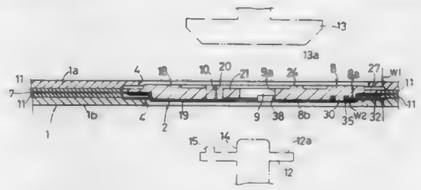
1. A magnetic head for performing recording or reproduction on or from a flexible magnetic recording medium, wherein said magnetic head and said flexible recording medium are arranged to be movable relative to each other, and said flexible recording medium is movable in a transport direction, said magnetic head comprising:
an elongated surface member opposite to said flexible recording medium and receiving electromagnetic conversion means therein for enabling at least one of recording and reproduction, said elongated surface member being arranged for supporting said flexible recording medium through a fluid pressure during transport of said flexible recording medium, said elongated surface member having opposite end portions and a central portion therebetween, said elongated surface member extending in a direction transverse to the transport direction of said flexible magnetic recording medium; and
fluid pressure reducing means provided in said elongated surface member proximate to both opposite end portions of said elongated surface member for enabling the fluid pressure existing between said flexible magnetic recording medium and said elongated surface member to be smaller in an area proximate to both opposite end portions than in an area at the central portion of said elongated surface member.

4,695,910

RECORDING DISC CARTRIDGE HAVING AN IMPROVED HUB ASSEMBLY

Hiroshi Maruyama, Yuki; Kunio Mizushima, Toride; Akito Sakemoto, Tsukuba, and Nobuhiro Umebayashi, Yuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 31, 1984, Ser. No. 636,377
Claims priority, application Japan, Aug. 3, 1983, 58-142359
Int. Cl.[4] G11B 23/03
U.S. Cl. 360—133 8 Claims



1. A recording disc cartridge comprising a disc case having a top section and a bottom section combined together, drive shaft insertion holes defined through said top section and said bottom section, a recording disc rotatably mounted in said disc

case, said recording disc including a recording medium and a hub assembly disposed about said drive shaft insertion holes, said hub assembly supporting said recording medium at a central portion of said recording medium, a spindle insertion hole defined at a central portion of said hub assembly and a drive pin engaging means defined at a position apart radially outward from said spindle insertion hole, characterized in that said hub assembly comprises a hub body having an upper face and a lower face with a reinforcing plate formed on said lower face of said hub body, said recording medium having an inner portion secured to said reinforcing plate and said spindle insertion hole has an inner face, a part thereof being formed by a part of said reinforcing plate, said hub body having an outer peripheral stepped portion at least on the upper face of said hub body providing an annular flange projecting outward from said hub body, in contact with an inner peripheral edge of said recording medium, so as to cover and protect said inner peripheral edge of said recording medium.

4,695,911

FLOPPY DISKETTE PROTECTION DEVICE

Ron Loosen, 10885 Portal Dr., Los Alamitos, Calif. 90720

Filed May 3, 1985, Ser. No. 730,678
Int. Cl.⁴ G11B *23/03*
U.S. Cl. 360—133 **13 Claims**



1. A device for installation onto a jacketed floppy diskette having a jacket with a first side and a second side on opposite sides of a disk and four edges at which said first and second sides meet at their perpheries, said floppy diskette having a central opening and a read-write access opening in each side of said jacket said floppy diskette of the type which is typically inserted into a disk drive having guides for opposing edges of the jacket, said device for protecting said floppy diskette by covering the central openings and the read-write access openings in the sides of said jacket when said floppy diskette is not in use and by uncovering said openings when said floppy diskette is in use, said device remaining installed when said floppy diskette is inserted into a disk drive, said device comprising:

an assembly having thin first and second portions corresponding to the first and second sides of a floppy diskette jacket, said assemlby foldable over a first edge of said jacket to place said first portion adjacent the first side of said jacket and said second portion adjacent the second side of said jacket, said first and second portions attachable respectively to said first and second sides when said assembly is folded over said first edge, said first and second portions not covering said respective openings in the sides of said jacket and not extending over the other edges of said floppy diskette jacket when so attached;

a first substantially flat shutter rotably held by said first portion against said first side of said jacket, said first shutter for movement in a plane generally parallel to said floppy diskette between a first position for covering said openings in said first side of said jacket and a second position for uncovering said respective openings; and

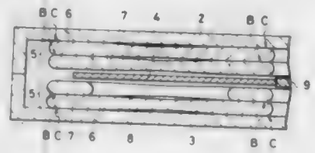
a second substantially flat shutter rotatably held by said second portion aganst said second side of said jacket, said second shutter for movement in a plane generally parallel to said floppy diskette between a first position for covering said openings in said second side of said jacket and a second position for uncovering said respective openings.

4,695,912

DUSTPROOF LINER FOR A MAGNETIC DISC CARTRIDGE

Masayoshi Moriwaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 27, 1986, Ser. No. 866,834
Claims priority, application Japan, Jun. 14, 1985, 60-89014[U]
Int. Cl.⁴ G11B *23/03*
U.S. Cl. 360—133 **8 Claims**



1. A disc cartridge, comprising:

a case having an upper case half and a lower case half,

a disc sheet having two surfaces and adapted to be rotated within said case between said upper and lower case halves; and

a first liner disposed between said disc sheet and said upper case half, and a second liner disposed between said disc sheet and said lower disc half, each liner comprising a double-layered structure with a first layer, positioned adjacent to, and secured to, a different one of said upper and lower case halves and being electrostatically chargeable, and a second layer, positioned adjacent a different one of said disc surfaces and being electrostatically non-chargeable, said first and second layers being bonded to each other, each said second layer having aperture means therein and facing a distinct recording portion of a respective one of said disc surfaces and permitting passage of dust particles from said disc sheet through said second layer aperture means onto said first layer.

4,695,913

SHUNT EFFECT LOW VOLTAGE CIRCUIT BREAKER

Claude Terracol, and Jean-Pierre Roulet-Dubonnet, both of Eybens, France, assignors to Merlin Gerin, Grenoble, France

Filed May 20, 1986, Ser. No. 864,878
Claims priority, application France, May 29, 1985, 85 08178
Int. Cl.⁴ H01H *9/38, 9/40*
U.S. Cl. 361—13 **8 Claims**

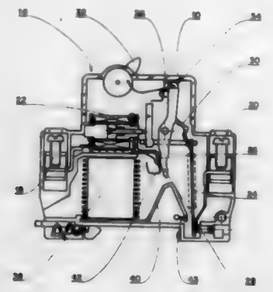
1. A low voltage electrical circuit breaker having:

a phase pole and a neutral pole, the phase pole comprising a first pair of contacts, first input and output terminals and a first connection circuit of said first terminals in which said first pair of contacts is inserted, said first pair of contacts being connected to the first input terminal, the neutral pole comprising a second pair of contacts, second input and output terminals and a second connection circuit of said second terminals in which said second pair of contacts is inserted, an arc chute being associated only with said first pair of contacts and not with said second pair of contacts;

a first operating mechanism for manual opening and closing and automatic opening on a fault of said first pair of contacts;

an electrode disposed in proximity to and clear from said first pair of contacts so as to be insulated from the first pair of contacts in the closed position and to pick up a drwan arc, when said first pair of contacts open on a fault;

a shunt circuit connecting said electrode to said second input terminal to create a short-circuit connection between said first and second input terminals via the contact among said first pair of contacts, an arc, said electrode and said shunt circuit, said shunt circuit being adapted to shunt said



second pair of contacts, as soon as the arc has been diverted onto said electrode and to limit the fault current flowing through said second pair of contacts; and

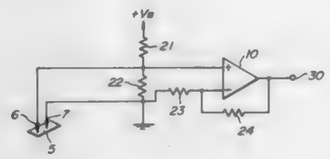
a second operating mechanism for opening and closing of said second pair of contacts, disposed to give said second pair of contacts an electrodynamic withstand notably lower than that of said first pair of contacts.

4,695,914

ELECTRONIC CARD CONNECTING CIRCUIT

Tomonari Ohtzuki, Mooka, and Kazuyoshi Tsurumaki, Minami-Saitama, both of Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1986, Ser. No. 899,254
Claims priority, application Japan, Aug. 23, 1985, 60-128380[U]
Int. Cl.⁴ H02H *9/08*
U.S. Cl. 361—42 **8 Claims**



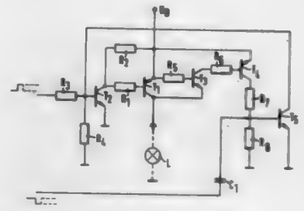
1. An electronic card connecting circuit comprising first contact means earthing a ground terminal of an electronic card, second contact means electrically contacting said ground terminal to detect said ground terminal being earthed by said first contact means, and detection control means including an active element which detects said second contact means being connected through said ground terminal to said first contact means.

4,695,915

SHORT CIRCUIT AND OVERLOAD PROTECTION CIRCUIT FOR OUTPUT STAGE TRANSISTORS

Josef Mahalek, Neufahrn, and Egon Vetter, Hofheim, both of Fed. Rep. of Germany, assignors to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 710,513
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409058
Int. Cl.⁴ H02H *3/08, 9/02*
U.S. Cl. 361—56 **18 Claims**



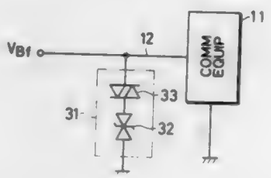
1. Short circuit and overload protection circuit for an output stage transistor which is connected to the output of a driving transistor for the output stage transistor, wherein a limitation and threshold value network means is provided for detecting the emitter collector voltage of the output stage transistor to be protected and for supplying a control voltage derived from the detected said emitter collector voltage to the base of a protective transistor, wherein the collector of this protective transistor is connected to the base of the driving transistor of the output stage transistor and the emitter of this protective transistor is connected to ground potential, and wherein the limitation and threshold value network means contains: a resistor which is located between the emitter of the output stage transistor and the base of a first switching transistor which is complementary with the output stage transistor and whose emitter is directly connected to the collector of the output stage transistor, and a further resistor which is connected between the collector of the first switching transistor and the base of a second switching transistor which is complementary with the first switching transistor, whose emitter is connected to a pole of the supply voltage source, and whose collector is connected to a voltage divider.

4,695,916

PROTECTOR CIRCUIT

Hidetaka Satoh, Tokorozawa; Hideyuki Kurosawa, Hachioji; Yoshiaki Kamijoh, Kitatsuru, and Hiromichi Jyumonji, Kunitachi, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Dec. 17, 1985, Ser. No. 809,825
Claims priority, application Japan, Dec. 24, 1984, 59-272555
Int. Cl.⁴ H02H *9/00*
U.S. Cl. 361—56 **12 Claims**



1. A protector circuit connected between a signal line con-

nected to a communication equipment and ground for protecting said equipment from surge voltages applied to said signal line, said signal line supplying a battery feed voltage V_{BF} to said communication equipment, said protector circuit comprising:

a bidirectional voltage limiting element having a breakdown voltage V_B slightly higher than the battery feed voltage V_{BF} on said signal line and lower than a predetermined non-operation voltage V_A of said protector circuit; and

a bidirectional thyristor connected in series with said bidirectional voltage limiting element, the sum of the breakover voltage V_{BO} of said bidirectional thyristor and said breakdown voltage V_B being lower than the breakdown voltage V_R of said equipment and higher than said non-operation voltage V_A.

4,695,917

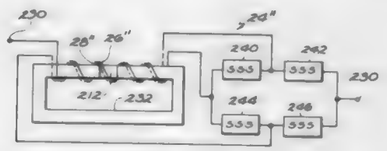
INDUCTIVE POWER CONTROLLER

Kenneth R. Jackson, Huntington Beach, and Farshid Tofigh, Mission Viejo, both of Calif., assignors to Leach Corporation, Buena Park, Calif.

Filed Dec. 4, 1985, Ser. No. 805,072

Int. Cl.[4] H02H *9/08*

U.S. Cl. 361—58 **25 Claims**



1. Apparatus for controlling power to a load, comprising:

inductive circuit means controllable between a first condition of low inductance and a second condition of higher inductance, the inductive circuit means comprising:

first coil means; and

second coil means electrically connectable to the first coil means for energization therewith to produce magnetizing forces when the inductive circuit means is in either of said first and second conditions;

the first and second coil means being constructed and arranged so that the magnetizing force produced by current flow in the second coil means opposes the magnetizing force produced by current flow in the first coil means in said first condition of low inductance and reinforces the magnetizing force produced by current flow in the first coil means in said second condition of higher inductance, with the first and second coil means connected electrically in series when the inductive circuit means is in said second condition of higher inductance;

means for applying a voltage to a load through said inductive circuit means;

means for sensing current to the load; and

means for switching the inductive circuit means from the first condition of low inductance to the second condition of higher inductance in response to sensing of a preselected overcurrent condition.

4,695,918

PRE-INSERTION INDUCTOR ARRANGEMENT

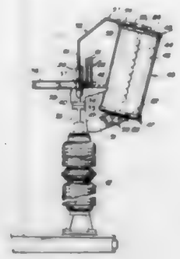
Raymond P. O'Leary, Evanston, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Jul. 24, 1986, Ser. No. 890,425

Int. Cl.[4] H01H *33/16*

U.S. Cl. 361—58 **19 Claims**

1. A pre-insertion inductor arrangement utilized with a high voltage switch and being inserted into a circuit having an applied source voltage and source frequency to limit the transient inrush current and/or voltages in the circuit during closure of the switch, the pre-insertion inductor arrangement comprising a pre-insertion inductor and means for inserting



said pre-insertion inductor for a plurality of cycles of the source frequency during closure of the switch.

4,695,919

CIRCUIT ARRANGEMENT FOR PROTECTION AGAINST SURGE VOLTAGES FOR A REPEATER

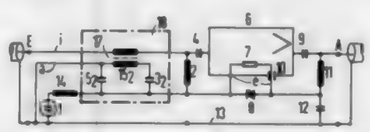
Peter Wendt, Augsburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,091

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411942

Int. Cl.[4] H02H *1/04*

U.S. Cl. 361—110 **9 Claims**



1. A circuit arrangement which protects against coarse surge voltages at a repeater between incoming and outgoing coaxial cables each including an inner conductor and an outer conductor, said arrangement comprising: an intermediate coaxial cable means including an inner

conductor and an outer conductor means, an input terminal connecting said inner conductor of said intermediate cable means to said inner conductor of said incoming coaxial cable and first and secind output terminals respectively connecting said inner conductor of said intermediate cable means to said inner conductor of said outgoing coaxial cable and said outer conductor means of said intermediate cable means to said outer conductor of said outgoing coaxial cable;

a pair of current supply separating filters respectively connected between said input and output terminals and said outer conductor means of said intermediate coaxial cable means;

a surge voltage arrester which protects against coarse surge voltages;

a remote current feed path including said inner conductor of said intermediate coaxial cable means including said current supply separating filters;

each of said current supply separating filters comprising an inductor connected to said input and first output terminals, respectively;

a connection between said inductors; and

a series circuit including said surge voltage arrester, an inductor, a low-pass filter connecting said series circuit to said connection between the outer conductors of said incoming and outgoing cables.

4,695,920

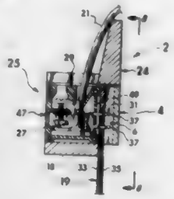
ISOTHERMAL CAVITY AND SPARK GAP PROTECTION ASSEMBLY FOR INPUT/OUTPUT CONNECTION TERMINALS FOR ELECTRONIC MODULES

John M. Klebba, Golden, and Kenneth L. Hultman, Louisville, both of Colo., assignors to Geomation, Inc., Golden, Colo.

Filed Aug. 14, 1986, Ser. No. 896,628

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—118 **45 Claims**



1. In combination with a printed circuit board having a substantially planar, card member with first and second end portions spaced from each other along a first axis and with a printed circuit thereon, and a terminal pin connector panel having a plurality of input and output pins extending along respective axes, said panel being positioned adjacent the first end portion of said card member with the pins of the panel electrically connected to portions of said printed circuit and the respective pin axes substantially perpendicular to the plane of said card member, each of said pins having a free standing end spaced from the plane of said card member, the improvement comprising apparatus for forming an isothermal cavity about said panel and a spark gap of least impedance at the free standing end of each pin, said apparatus including:

isothermal means substantially surrounding said panel to create an isothermal cavity about said panel, said isothermal means having high thermal conducting properties and having a portion thereof positioned immediately adjacent said panel in substantially an abutting relationship therewith, said portion further being positioned substantially between said panel and the second end portion of said card member and

spark gap means positioned adjacent the free standing ends of said pins to present a path of least impedance between each of said pins and said spark gap means for discharging any high potential voltages in each pin above a predetermined amount.

4,695,921

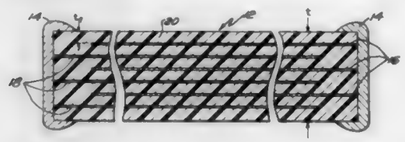
FILM CHIP CAPACITOR

William L. Robbins, Newton Center, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1985, Ser. No. 794,984

Int. Cl.[4] H01G *1/13, 4/08*

U.S. Cl. 361—308 **2 Claims**



1. A film chip capacitor for micro-electronic printed circuit boards, comprising:

a plurality of flat, parallel, rectangular, organic dielectric films, each said film having a first and second end, each said film being of preselected length "l" and width "w", each said film having a thickness t_f not exceeding 3 mils and wherein said dielectric film is an organic material containing ceramic particles;

a first plurality of flat, parallel, rectangular aluminum electrodes, having interposed therebetween two each of said plurality of dielectric films, each said first electrode having a preselected thickness and further having a width equal to "w" and a length $<$"l" of said dielectric film, each said electrode having one end of width "w" aligned with said first ends of said dielectric films;

a second plurality of flat, parallel, rectangular aluminum electrodes, having interposed therebetween two each of said plurality of dielectric films and one each of said first electrodes, each said second electrode having a preselected thickness equal to said first electrodes and further having a width equal to "w" and a length $<$"l" of said dielectric film, each said electrode having one end of width "w" aligned with said second ends of said dielectric films thereby forming a rectangular block having a first end and a second end, said block further having a top and a bottom, said dielectric film forming the outer surfaces thereof, the surfaces of adjacent dielectric films and electrodes being bonded together using bonding agents selected to provide the mechanical stability of said block;

a first aluminum end cap means, perpendicular to and conductively attached to each of said first electrodes at said first block end for providing electrical mounting and conducting means to said printed circuit board; and

a second aluminum end cap means, perpendicular to and conductively attached to each of said second electrodes at said second block ends for providing electrical mounting and conducting means to said printed circuit board.

4,695,922

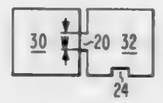
CONSTANT RATIO, SIZE INSENSITIVE, CAPACITOR STRUCTURE

John A. Olmstead, Branchburgh Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 3, 1986, Ser. No. 925,982

Int. Cl.[4] H01G *4/38*

U.S. Cl. 361—329 **6 Claims**



1. In an integrated circuit device, a pair of matched capacitors each of which comprises at least one of a unit capacitor and a first subcapacitor having a top plate, a bottom plate, and a layer of dielectric material therebetween, wherein at least said top plate of said first subcapacitor includes a rectangularly shaped tab having a width W, said tab projecting outwardly from a side of said subcapacitor for a distance substantially equal to one half W, and a rectangularly shaped opening in a side of said subcapacitor having a width substantially equal to W and extending inwardly from said side for a distance substantially equal to one half W, wherein said unit capacitor abuts said tab along its entire width W.

4,695,923

PRINTED CIRCUIT BOARD BOLT-ON POWER DISTRIBUTION SYSTEM

Ronald F. Abraham, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 28, 1986, Ser. No. 901,235

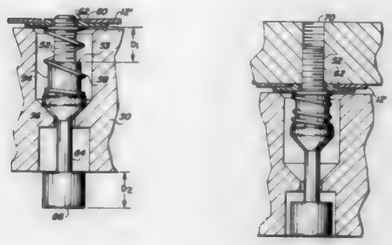
Int. Cl.[4] H02B *1/20*

U.S. Cl. 361—361 **4 Claims**

1. An apparatus for connecting a first element to a second element, the second element having a hole, such that a minimum predetermined force exists at the connection between

said first element and said second element, said apparatus comprising:

(a) shaft means, having a first, second, and third diameter along the axis of said shaft means, forming a first, second, and third shaft, respectively, said first diameter being the smallest diameter and said third diameter being the largest diameter, said first shaft being threaded, for mating with said second element; and



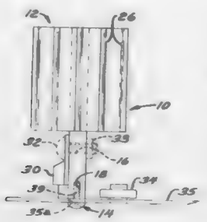
(b) spring means, having an inside diameter smaller than the diameter of said third shaft and having a length approximately equal to the length of the first and second shaft, coaxially positioned over said first and second shaft, and when said first element is placed in contact with said second element, for applying a minimum predetermined force between said first and second element when said first shaft is inserted into the hole of said second element to the point where the base of said second shaft contacts the surface of said first element.

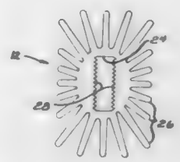
4,695,924

TWO PIECE HEAT SINK WITH SERRATED COUPLING

George Wozniczka, Chicago, Ill., assignor to Zenith Electronics Corporation, Gleaview, Ill.

Filed Jul. 17, 1986, Ser. No. 887,147
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 10 Claims





1. For mounting on a printed circuit (PC) board, a heat sink comprising:

a generally linear, elongated first member having a longitudinal axis and first and second end portions and comprised of a high thermal conductivity material, wherein said first member is tapered in proceeding from the first to the second end portion thereof and the first end portion thereof includes mounting means for securely mounting said first member to a printed circuit board; and

a second member comprised of a high thermal conductivity material and including a plurality of spaced, generally planar fins disposed on the periphery thereof and aligned along the longitudinal axis of said first member, said second member having an aperture therein adapted to receive the second end of said first member in tight fitting relation, wherein said aperture is defined around the periphery thereof by a plurality of serrations which are adapted for deformation upon contact with said first member when the second end of said first member is inserted under pressure into the aperture of said second member, whereupon intimate engagement and high thermal conductivity is established between said first and second members.

4,695,925

IC CARD

Syojiro Kodai; Noriaki Fujii; Hiroshi Gamo, all of Itami, and Bujirou Kobayashi, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1986, Ser. No. 913,365
Claims priority, application Japan, Sep. 30, 1985, 60-218624
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—395 6 Claims



1. An IC card used for conducting a transfer of information through a connector to a card reading out device, said card being provided with electrode terminals for connection to the outside, said card comprises:

a slidable shutter within said card for covering said electrode terminals in a usual state;

a hole provided at a front portion of said card, said hole receives a projection provided at said connector when said card is inserted into said connector; and

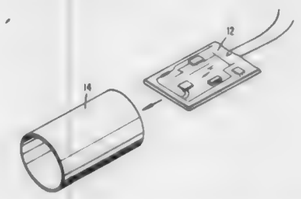
said shutter being retreated when said projection of said connector comes into contact therewith thereby exposing said electrode terminals when said card in inserted into said connector.

4,695,926

ENCAPSULATION AND INSULATION OF ELECTRONIC CIRCUIT BOARD STRUCTURES

Michael G. McDermott, Glenside, Pa., assignor to Bell of Pennsylvania, Conshohocken, Pa.

Filed Jul. 1, 1986, Ser. No. 881,172
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—395 7 Claims



1. An electronic circuit board structure, comprising:

circuit board for mounting electronic components thereon, and

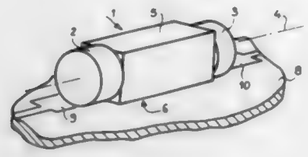
a heat shrink tubing layer enclosing the circuit board, whereby wiring patterns and any components mounted on said circuit board are insulated from moisture.

4,695,927

PACKAGE FOR A SURFACE MOUNTABLE COMPONENT

Lucien Barre, Tours, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 11, 1986, Ser. No. 884,493
Claims priority, application France, Jul. 12, 1985, 85 10720
Int. Cl.[4] H05K 1/11
U.S. Cl. 361—400 1 Claims



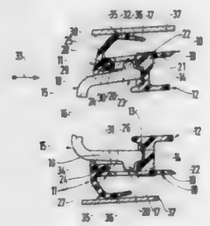
1. An electrical component comprising two cylindrical exposed conductive end caps extending along a common axis, and a plastic body between said end caps, said body having a substantially planar upper face and a substantially planar lower face, said upper and lower faces being separated by a distance which is slightly smaller than the diameter of said end caps so that a layer of glue may be placed between the body and a printed circuit when the component is placed on such a circuit board with its end caps in contact with the printed circuit board.

4,695,928

FRAME FOR HEADLIGHTS OF MOTOR VEHICLES

Friedrich Schauwecker, Pfullingen, and Walter Weber, Reisensburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 893,891
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531220
Int. Cl.[4] B60Q 1/00
U.S. Cl. 362—61 7 Claims



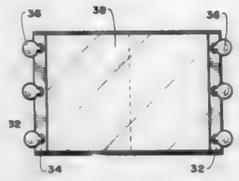
1. A frame for headlights of motor vehicles for covering a gap between a reflector of a headlight and a body of the vehicle, the frame comprising a connection member, and a screening member connected to said connection member in a locking fashion, the headlight having a housing secured to the body of the vehicle and a transparent pane which extends through an opening in the body of the vehicle, said connection member having a plurality of openings (20) each forming a shoulder (21), the housing of the headlight having a plurality of projections (22) extending inwardly from said transparent pane (15) whereby, upon the insertion of the frame into its functional position in the body of the vehicle, each shoulder engages with a respective projection.

4,695,929

OMNI-DIRECTIONAL DISPLAY DEVICE

Charles Smith, 8509 Lennox Ave., Panorama City, Calif. 91402

Filed Mar. 14, 1985, Ser. No. 711,971
Int. Cl.[4] F21V 33/00
U.S. Cl. 362—140 4 Claims



1. A device for providing a reflected display of an object comprising:

a pair of front surface mirrors positioned with one respective edge of each in abutment; said mirrors being positioned at an angle of substantially ninety degrees to one another;

a third surface window-mirror positioned in abutment with the free edges of said-pair of front surface opposite the abuting ninty degree edges, said third mirror forming with said pair of a mirrors a right isosceles triangular polyhedron enclosure;

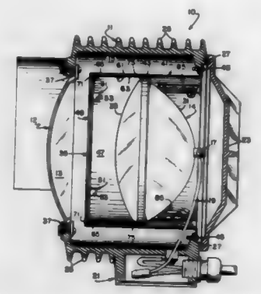
base mounting means for mounting said enclosure formed by said mirrors for viewing an object placed in said enclosure.

4,695,930

INFRARED FLOODLIGHT ASSEMBLY

Julian J. Wierzbicki, Peabody, and Kirti B. Chakrabarti, Danvers, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 3, 1985, Ser. No. 783,710
Int. Cl.[4] F21V 9/00
U.S. Cl. 362—293 14 Claims



1. An infrared floodlight assembly comprising:

a heat conductive housing including a forward opening and defining a chamber therein;

a lens member secured to said housing and providing a cover for said forward opening;

an infrared floodlight positioned within said chamber of said heat conductive housing for providing infrared radiation upon activation thereof; and

retention means located within said chamber of said heat conductive housing and including a heat conducting member for securedly retaining said floodlight therein in a spaced relationship from the internal walls of said housing and in an aligned manner relative to said lens member such that infrared radiation from said floodlight will be directed substantially toward said lens member, said heat

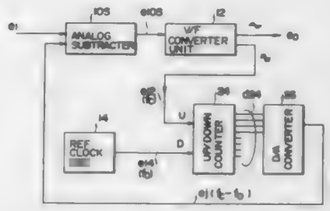
conducting member having an open end located adjacent said forward opening of said housing and defining a cavity therein, said floodlight being located within said cavity such that infrared radiation therefrom will pass through said open end.

4,695,931

VOLTAGE/FREQUENCY CONVERTER WITH FREQUENCY DRIFT COMPENSATION LOOP

Mitsuru Yamaura, and Norio Fujisawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1986, Ser. No. 867,929
Claims priority, application Japan, Jun. 3, 1985, 60-118778
Int. Cl.⁴ H03L *7/00*
U.S. Cl. 363—8 **22 Claims**



18. A voltage/frequency converter comprising:

voltage/frequency converter means for generating a voltage/frequency conversion output having a frequency corresponding to the potential of a voltage/frequency conversion input;

reference signal source means for generating a reference signal having a predetermined reference frequency;

counter means for providing a digital count output which corresponds to the difference between the number of oscillations of said voltage/frequency conversion output, obtained within a predetermined period of time, and the number of oscillations of said reference signal, obtained within said predetermined period of time, said digital count output being incremented by either one of said voltage/frequency conversion output and said reference signal and being decremented by the other;

digital/analog converter means for generating an analog compensation signal having a potential corresponding to said digital count output; and

signal mixer means for mixing said compensation signal with an a.c. converter input signal to produce said voltage/frequency conversion input, said converter input signal having an average level equal to zero in the absence of drift,

wherein said counter means, digital/analog converter means, signal mixer means and voltage/frequency conversion means constitute a negative feedback loop which compensates both for a frequncy drift of said voltage/frequency conversion output and an average level drift of the converter input signal so that the frequency of said voltage/frequency conversion output follows said reference frequency.

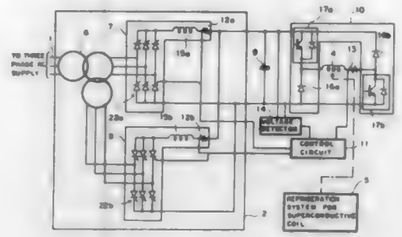
4,695,932

SUPERCONDUCTIVE ENERGY STORAGE CIRCUIT

Shigenori Higashino, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,759
Claims priority, application Japan, May 15, 1985, 60-101436
Int. Cl.⁴ H02M *7/00*
U.S. Cl. 363—14 **6 Claims**

1. A superconductive energy storage circuit comprising an AC/DC converter circuit connected to an AC supply line and capable of controlling an output current, a DC capacitor connected between the terminals of the DC output of said AC/DC converter circuit, a chopper circuit connected in parallel to said DC capacitor, and a superconductive energy storage coil connected to the output of said chopper circuit, said AC/DC



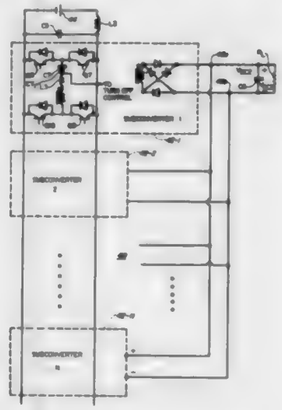
converter circuit having a current capacity selected to meet the electrical energy transferral requirements between said AC supply line and said superconductive energy storage coil.

4,695,933

MULTIPHASE DC-DC SERIES-RESONANT CONVERTER

Vietson M. Nguyen, Florissant, Mo.; P. John Dhyanchand, and Pierre Thollot, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 11, 1985, Ser. No. 700,449
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—17 **10 Claims**



1. A DC-DC converter for converting input DC power from a DC source into output DC power at a certain level, comprising:

a plurality of N successive DC-DC sine wave resonant subconverters each for converting the input DC power into a subconverter output having a ripple component at a particular frequency;

means for operating the N subconverters so that a phase displacement of $2\pi/N$ electrical degrees exists between output currents of successive subconverter outputs; and

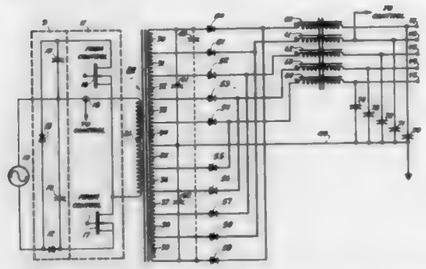
means for summing the subconverter outputs to develop output power having a ripple component at a frequency equal to N times the frequency of a subconverter output ripple component.

4,695,934

MULTIPLE OUTPUT RESONANT POWER SUPPLY

Robert L. Steigerwald, Scotia, N.Y., and Keku M. Mistry, Fort Walton Beach, Fla., assignors to General Electric Company, Schenectady, N.Y.

Filed May 13, 1985, Ser. No. 733,349
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—17 **7 Claims**



1. A multiple output resonant power supply comprising:

a transformer having a primary winding and multiple secondary windings, said secondary windings connected in series and having a tap between each pair of adjacently connected windings, one of the taps comprising a center tap and the remainder of the taps being equal in number on both sides of the center tap, said primary winding being wound on a single core and adapted to receive a variable frequency voltage, said multiple secondary windings being layered on said single core;

capacitive means including a pair of directly connected in series across said secondary windings, the junction of said pair of capacitors being connected to said center tap; and

a plurality of diodes each having its anode connected to a separate one of said remainder of the taps, respectively, the cathodes of said diodes being connected in pairs, the diodes of each of said pairs being connected to said secondary windings on opposite sides of said center tap;

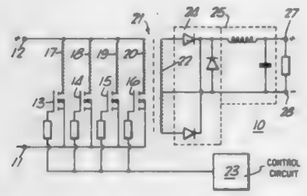
whereby a plurality of DC voltages are provided between said center tap and each of said diode pairs.

4,695,935

POWER SUPPLY

Sverre Oen, Oslo; Dag Poppe, Kolsas, and Sverre N. Tronsli, Nittedal, all of Norway, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Jun. 27, 1986, Ser. No. 879,686
Claims priority, application Norway, Jun. 28, 1985, 852598
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



1. A power supply comprising:

a DC/DC converter including

at least two transistors connected in parallel, each having low drain-source resistance;

a control circuit connected to each of said transistors to control the conductive state thereof, said transistors being controlled in parallel by a common control signal from said control circuit and exhibiting corresponding intervals of conduction, each of said transistors having output terminals; and

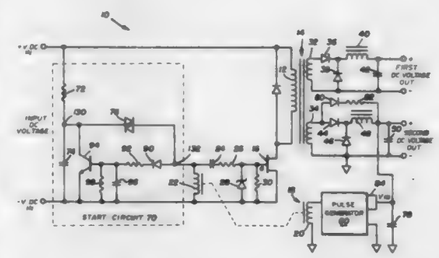
a transformer coupler including similarly wound primary windings constituted by a plurality of windings interconnected with said output terminals.

4,695,936

SWITCHING MODE POWER SUPPLY START CIRCUIT

Rex W. J. Whittle, Kowloon, Hong Kong, assignor to Astec Components, Ltd., Santa Clara, Calif.

Filed Feb. 7, 1986, Ser. No. 827,808
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—21 **17 Claims**



1. In a DC/DC converter power supply including a DC voltage source, a power transformer including a primary winding and a secondary winding, rectifier and filter means connected to said secondary winding for generating an output DC voltage from the current output by said secondary winding, pulse generator means for generating a train of pulses of varying pulse width as a function of the present value of said output voltage, switch means coupled to said primary winding such that when said switch means closes, said DC voltage source is coupled across said primary winding, means for coupling said train of pulses to said switch means, said pulses causing said switch means to close for the duration of each said pulse, the improvement comprising start means responsive to the initiation of said DC voltage source for starting the operation of said pulse generator means, said start means including:

relaxation oscillator means connected to said DC voltage source for periodically generating a start pulse at a predetermined frequency;

means for coupling said start pulse to said switch means, said start pulse causing said switch means to close for a predetermined duration; and

means connected to said secondary winding for powering said pulse generator means, said powering means including energy storage means; means for coupling an incremental amount of energy to said storage means each time said start pulse is generated; means for detecting when sufficient energy is stored in said storage means to enable initial operation of said pulse generator means; means responsive to said detecting means for coupling said stored energy to said pulse generator means; and means for coupling ongoing power to said pulse generator means once said pulse generator means begins operation.

4,695,937

POWER SUPPLIES

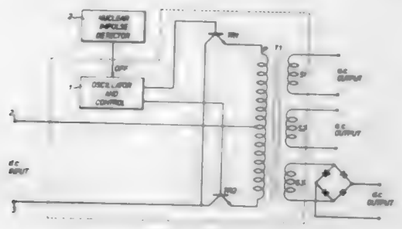
Philip R. Verity, Addlestone, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Feb. 29, 1984, Ser. No. 584,627

Claims priority, application United Kingdom, Mar. 1, 1983, 8305645

Int. Cl.⁴ H02M *3/335*

U.S. Cl. 363—25 **13 Claims**



1. A switch mode power supply comprising an oscillator arranged to drive the primary winding of a transformer and a nuclear impulse detector comprising a monostable trigger circuit which is triggered upon detection of a nuclear impulse and is effective to discontinue drive to the primary winding, wherein the monostable trigger circuit comprises first and second voltage supply lines, a biasing circuit connected between the supply lines and comprising a series arrangement of a first resistor, a capacitor and a diode connected in that order between the first and second supply lines with the diode arranged to be forward biased, a first transistor of one polarity type having its base electrode coupled with the second supply line via a second resistor and its emitter electrode coupled with the junction between the diode and the capacitor, a second transistor of said one polarity type having its collector electrode coupled with the junction between the capacitor and the first resistor and its emitter electrode coupled with the second supply line, a third transistor of opposite polarity type having its base electrode coupled with the collector electrode of the first transistor via a first resistive means, its emitter electrode coupled with the first supply line and its collector electrode coupled with the base electrode of the second transistor via a second resistive means.

4,695,938

INVERTER CONTROLLING METHOD

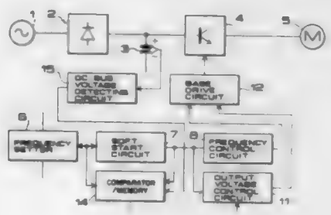
Hidcaki Tada, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1985, Ser. No. 751,547

Claims priority, application Japan, Jul. 5, 1984, 59-137877

Int. Cl.⁴ H02M *5/45*

U.S. Cl. 363—37 **4 Claims**



4. An inverter apparatus for driving an AC motor comprising:

(a) a power rectifier for converting an AC voltage of a commercial AC power supply to a DC voltage;

(b) a power inverter for converting said DC voltage to an AC voltage of a variable frequency and a variable voltage to drive said AC motor;

(c) a frequency setter which produces a voltage corresponding to a desired frequency condition of said inverter;

(d) a soft start circuit connected to the frequency setter for producing an output frequency control signal which increases gradually;

(e) a DC bus voltage detecting circuit for detecting a DC voltage of the output of said power rectifier; and

(f) a comparator/memory circuit having inputs connected to respective outputs of the frequency setter, the soft start circuit and the DC bus voltage detecting circuit wherein the comparator/memory circuit stores the output signal of said DC bus voltage detecting circuit when the output of said soft start circuit is equal in magnitude to the output of the frequency setter, and the comparator/memory outputs the stored DC bus voltage signal upon the next start of an output signal from the frequency setter;

(g) a base drive circuit connected to said power inverter for operating the power inverter;

(h) a frequency control circuit having an input connected to the output of the soft start circuit and having an output connected to a frequency control input of said base drive circuit; and

(i) an output voltage control circuit having respective inputs connected to the output of the soft start circuit and the output of the comparator/memory circuit and having an output connected to a voltage control input of said base drive circuit for producing a corrected voltage control signal in conformity to the AC power supply.

4,695,939

THREE-PHASE EXCITER FOR SYNCHRONOUS MACHINES

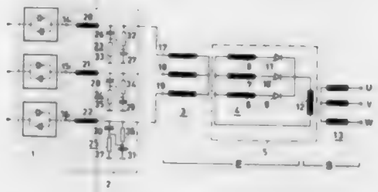
Muzaffer Canay, Birr, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 29, 1986, Ser. No. 868,059

Claims priority, application Switzerland, Jul. 4, 1985, 2888/85

Int. Cl.⁴ H02J *3/01;* **H02K** *19/00*

U.S. Cl. 363—39 **11 Claims**



1. A three-phase exciter for synchronous machines having a brushless excitation system, comprising:

a three-phase exciter machine having a rotor including a multi-phase rotor winding including plural phase windings, and a stator having a stator winding;

a rectifier star circuit located on said rotor and connected to said rotor phase windings;

a synchronous machine including an exciter winding which is fed by said rectifier star circuit;

a three-phase source for feeding power to said three-phase exciter machine, including a three-phase power controller having a three-phase input connected to a three-phase power source, and a three-phase output for feeding a three-phase output current; and

a protection circuit having a low-pass characteristic connected between the three-phase output of said power controller and said stator winding of the three-phase exciter machine for protecting said rectifier star circuit, said protection circuit bypassing high frequency currents developed in said three-phase source and said stator of the exciting machine in order to reduce interaction between stator and rotor harmonics.

4,695,940

DYNAMIC FREQUENCY DIVIDER WITH A MIXER STAGE AND AN AMPLIFIER

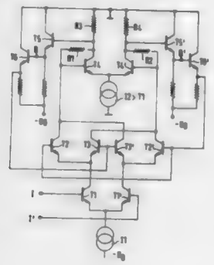
Hans-Martin Rein, Wittes, Fed. Rep. of Germany, assignor to Telefunken electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 835,988

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1985, 3509327

Int. Cl.⁴ H02M *5/00*

U.S. Cl. 363—157 **7 Claims**



1. A dynamic frequency divider for producing a signal having a frequency f from a signal having a frequency 2f, comprising: a mixer stage having first and second inputs and an output, said first input receiving a signal of frequency 2f; and a transimpedance amplifier having an input connected to the output of said mixer stage and an output connected to the second input of said mixer stage for feeding back to said mixer stage a signal of frequency f.

4,695,941

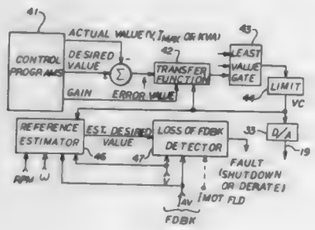
LOSS OF ELECTRICAL FEEDBACK DETECTOR

Ajith K. Kumar, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jul. 29, 1985, Ser. No. 760,204

Int. Cl.⁴ G05B *13/02*

U.S. Cl. 364—165 **17 Claims**



1. In a controller for a system which includes means for supplying a controllable amount of electric power to an electric load circuit, means for deriving at least first, second and third feedback signals that are representative, respectively, of certain system quantities, and means associated with the power supplying means for varying the amount of power supplied to the load circuit as a function of the value of a variable control signal produced by the controller in selective response to the feedback signals and to a given command signal, improved means for detecting the loss of a feedback signal, comprising:

a. first means for periodically estimating the desired value of a predetermined system quantity that is represented by the first feedback signal;

b. second means associated with said first means and responsive to said first feedback signal for finding the difference between the estimated desired value of said predetermined quantity and the actual value thereof as indicated by said first feedback signal;

c. third means for providing a biased error value equal to said difference value plus or minus a predetermined bias value;

d. integrating means associated with said third means for providing a resultant value that is representative of the time integral of said biased error value;

e. polarity detecting means associated with both said third means and said integrating means for periodically causing said bias value to be added to said difference value if the polarity of said resultant value is negative and for periodically causing said bais value to be subtracted from said difference value if the polarity of said resultant value is positive; and

f. level detecting means responsive to said resultant value for signaling the loss of said first feedback signal if the magnitude of said resultant value exceeds a predetermined threshold.

4,695,942

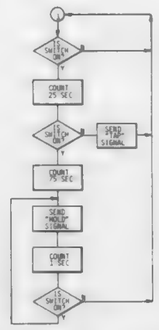
MANUAL SWITCH FOR ALTERING A PARAMETER IN OPPOSITE DIRECTIONS BASED ON LENGTH OF TIME OF SWITCH ACTUATION

Michael R. Levine; James T. Russo; Anthony C. Cairo, and Victor H. Rigotti, all of Ann Arbor, Mich., assignors to Honeywell Inc., Minneapolis, Mich.

Division of Ser. No. 709,918, Mar. 8, 1985, Pat. No. 4,606,401. This application Aug. 7, 1986, Ser. No. 894,296

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—188 **14 Claims**



1. In a device including a programmable memory and one or more two-state manual input means for loading said memory with a desired value for a multivalue parameter having a given initial value, the improvement comprising:

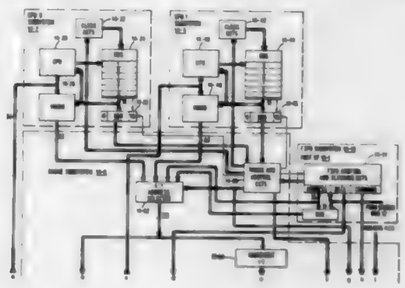
function control means operable to adjust the initial value of the multivalue parameter in one direction if the program input means is maintained in a preselected state for a period of time less than a specified period of time and adjust that multivalue parameter in the opposite direction if the program input means is maintained in the preselected state for a period of time greater than a specified period of time.

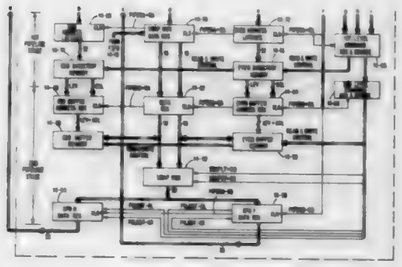
4,695,943

MULTIPROCESSOR SHARED PIPELINE CACHE MEMORY WITH SPLIT CYCLE AND CONCURRENT UTILIZATION

James W. Keeley, Hudson, N.H., and Thomas F. Joyce, Westford, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 27, 1984, Ser. No. 655,473
Int. Cl.[4] G06F *13/00*; G11C *7/00*
U.S. Cl. 364—200 **33 Claims**





1. A data processing system comprising:

a plurality of data requesting sources, each operative to generate memory requests for data, each request including an address; and,

a cache memory unit having a number of pipeline stages and coupled to receive said memory requests from said data requestng sources, said unit including:

timing and control means for generating sequences of timing signals, said timing and control means being coupled to apply said timing signal to each of said sources for synchronizing their operations with said cache unit, said each sequence of timing signals defining a number of time intervals in which a different one of said intervals is preallocated for access to a first one of said pipeline stages by each of said plurality of said sources for receiving said requests;

a first one of said pipeline cache stages being coupled to said sorces and to said timing and control means to receive phase control signals from said timing and control means generated in response to a request being received from one of said sources during a preallocated interval, said first pipeline stage being enabled by said phase control signals to generate information signals during a following one of said time intervals for accessing said requested data specified by said request address when stored in said cache memory unit; and,

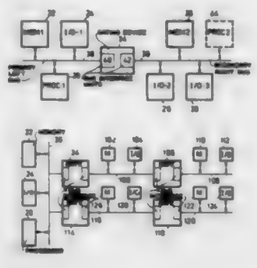
a second one of said pipeline cache stage being coupled to receive said phase control signals from said timing and control means, to said first pipeline stage and to said sources, said second pipeline stage being conditioned by said phase control signals to receive said information signals and access the designated data during a following another one of said time intervals for transfer to the requesting source thereby enabling the conflict-free concurrent processing of requests from said plurality of data requesting sources such that a first data requesting source can be utilizing the first pipeline stage while another data requesting source is utilizing the second pipeline stage.

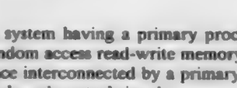
4,695,944

COMPUTER SYSTEM COMPRISING A DATA, ADDRESS AND CONTROL SIGNAL BUS WHICH COMPRISES A LEFT BUS AND A RIGHT BUS

Frederik Zandveld, and Jeroen M. Visser, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 495,379, May 17, 1983, abandoned. This application Sep. 22, 1986, Ser. No. 910,796
Claims priority, application Netherlands, May 19, 1982, 8202060
Int. Cl.[4] G06F *13/14, 13/38*
U.S. Cl. 364—200 **7 Claims**





1. A computer system having a primary processor station (**20**) and a first random access read-write memory (**22**) having a first address space interconnected by a primary bus (**36**) for data, address signals and control signals;

said primary processor station having intercommunicating means for communicating sequentially a request signal from a prospective master station (BUSRN), then a bus allocation signal (MSN), then a "bus occupied" signal from said primary processor station (BSYN) and thereafter data signals, addres signals, master handshake signals (TMRN, TMPN) and slave handshake signals (TSMN) between an actual master station and an actual station accessed by said master station;

coupler means (**34**) having first interface mans (**40**) for interfacing to said primary bus and functioning thereto as a slave station, and second interface means (**42**);

a second random access read-write memory (**24**) having a second address space outside of said first address space, and at least one first peripheral apparatus (**28**) interconnected by a secondary bus (**38**) for data, address and control signals, said second interface means functioning as a potential master station with respect to said secondary bus;

said coupler means having, by means of inteconnection of said first and second interface means, a transmitting state for exchange of data characters, addresses, data request signals, data acknowledge signals and control signals between said primary bus and said secondary bus for executing an information exchange between a master station on said primary bus and a slave station on said secondary bus; characterized in that:

said coupler means having static deadlock preventing means comprising unidirectionally transmitting means for transmitting initiating request signals exclusively from said primary bus to said secondary bus while blocking any transfer initiation requst signals generated by a station connected to said secondary bus;

said coupler means having alternatively to said transmitting state a non-transmitting state for allowing the coexistnece of a request on said primary bus and also data transfer between at least two stations on said secondary bus;

said second interface means for operating in a bus controller state for said secondary bus in absence of a further processor station on said secondary bus having allocation control means for exclusively controlling said secondary bus under control of a request signal (BUSRN) from said primary bus to the secondary bus; said allocation control means having first signalling means for generating on a first bus wire a secondary bus request signal (BUSRN), second signalling means for generating on a second bus wire a secondary bus "master selected" (MSN) signal, third signalling means on a third bus wire for generating a secondary "bus occupied" signal (BSYN), fourth signalling means for generating on a fourth bus wire secondary master handshake signals (TMRN, TMPN) under the control of master handshake signals from said primary bus after allocating said secondary bus to a request signal from said primary bus; and

gating means under the control of a secondary bus slave handshake signal (TSMN) on a fifth bus wire for gating slave handshake signals (TSMN) from said secondary bus to said primary bus;

said second interface means having an alternative state to said bus controller state for operating upon presence of said further processor station on the secondary bus for relinquishing control of the "bus occupied" signal to said further processor while retaining control of said other bus allocation control and bus handshake signals; and

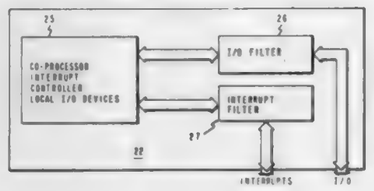
said coupler means are also transmissive for a start signal emanated from the primary processor station for a peripheral apparatus connected to said secondary bus and also for an interrupt signal from a peripheral connected to said secondary bus to said primary processor station.

4,695,945

PROCESSOR I/O AND INTERRUPT FILTERS ALLOWING A CO-PROCESSOR TO RUN SOFTWARE UNKNOWN TO THE MAIN PROCESSOR

John W. Irwin, Georgetown, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,802
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **20 Claims**



1. In a data processing system including a main processor and at least one input/output device connected to a bus, the improvement for configuring said system to allow the addition of a co-processor to operate concurrently with said main processor and selectively sharing utilization of said input/output device, comprising:

means dynamically controlled by said main processor for selectively preventing direct access to said input/output device in response to an attempted access by said co-processor;

means connected to said means for selectively preventing for utilizing said main processor to service said attempted access of said input/output device by said co-processor when said means for selectively preventing has been enabled to prevent direct access to said input/output device by said co-processor; and

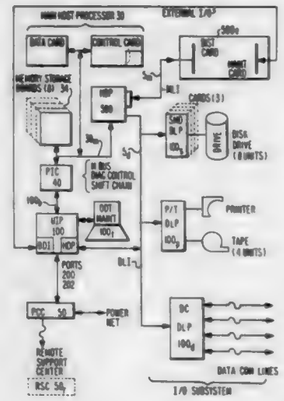
said means for selectively preventing and said main processor allowing concurrent utilization of said input/output device by said main processor and co-processor when said means for selectively preventing has not been enabled.

4,695,946

MAINTENANCE SUBSYSTEM FOR COMPUTER NETWORK INCLUDING POWER CONTROL AND REMOTE DIAGNOSTIC CENTER

David A. Andreasen, Newton Square, Pa.; John H. Armstrong, Laguna Niguel, Calif.; Jerrold E. Buggert, San Juan Capistrano, Calif.; Harshad K. Desai, Mission Viejo, Calif.; Stephen D. Baumgardner, El Toro, Calif.; Kenneth E. Buckmaster, Maidenhead, England, and Zubair Hussain, Sunnyvale, Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Oct. 25, 1984, Ser. No. 664,670
Int. Cl.[4] G06F *11/22*
U.S. Cl. 364—200 **14 Claims**



1. In a computer network comprising a host computer and I/O subsystem connected to remote peripheral units via data link processors and also connected to a maintenance subsytem for initialization, testing and diagnostic operations, the maintenance subystem comprising:

(a) user interface processor means connected to said host computer and I/O subsystem and having further connections to a remote support-diagnostic center via a power control card unit, said user interface processor means including:

(a1) means to control the power on/off condition of any connected unit in the said computer network;

(a2) means to initiate self-test operations within said interface processor means;

(a3) means to initiate self-test routines in said data link processors;

(a4) means to transmit/receive diagnostic information to/from a remote support-diagnostic center;

(a5) means to display data, instructions and diagnostic information on an operator display terminal;

(a6) and wherein said user interface processor means operates to detect and identify any card or module having:

(i) a power fault;

(ii) a logic fault;

(iii) memory unit failure;

(iv) peripheral device failure;

(v) an intermittent hardware or software failure;

(a7) dual function controller means providing mainte-

nance data transfer connections to said host computer and said data link processors, said dual function means including:

(a7a) means to execute maintenance data transfers to and from said data link processors while operating as a master to said data link processors;

(a7b) means to execute maintenance data transfers to and from said host computer while operating as a slave to said host computer;

(b) processor interface card unit means, connected to said main host computer and said I/O sybsystem, for providing a data transfer interface to said host computer and data link processors, said processor interface card unit means including:

(b1) interface means to said main host computer for data transfer operations;

(b2) means for storing a multi-word history trace of data resulting from a given input signal;

(b3) means for recording a series of events for analysis of operations;

(c) said operator display terminal, connected to said interface user processor means, for displaying data, instructions and diagnostic information to a human operator;

(d) power control card unit means, connected to said interface processor means and said remote support-diagnostic center, said power control card unit means including:

(d1) protocol circuit means providing bidirectional communication with said remote support center means;

(d2) means to execute instructions for powering on or powering off any said connected unit in said computer network;

(d3) means to detect power failures in the power modules of any said unit connected in the computer network;

(d4) means to transmit power status information to said interface processor means and to said remote support-diagnostic center;

(e) remote support-diagnostic center means for receiving data from said poweer control card unit means and said interface processor means, said diagnostic center means including:

(e1) means to analyze said received data and to generate remedial instructions to said interface processor means for display on said operator display terminal;

(e2) means to initiate and operate said user interface processor means for operation of those parts of the said host computer and I/O subsystem which are tested as operable.

4,695,947

VIRTUAL ADDRESS SYSTEM HAVING FIXED COMMON BUS CYCLES

Koichi Ikeda, Atsugi; Kozi Nakamura, and Toshihiro Okabe, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,497
Claims priority, application Japan, Feb. 28, 1983, 58-32573
Int. Cl.[4] G06F *12/10, 13/00*
U.S. Cl. 364—200 3 Claims

1. An information processing system comprising:

a processor unit;

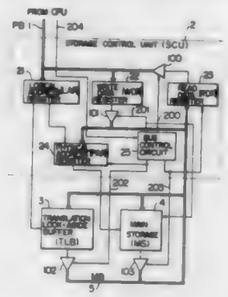
a main storage;

a storage control unit coupled between said processor unit and said main storage for controlling data-transferring operations between said processor unit and said main storage in response to receipt of a logical address from said processor unit, including a logical address register for storing said logical address received from said processor unit, a physical address register for storing a physical address to be supplied to said main storage for accessing said main storage, a write data register for storing data to be written in said main storage, and a read data register for storing data read from said main storage;

address translation means connected to said storage control unit for translating said logical address stored in said logical address register into a physical address; and

bus means connected to said main storage, said address translation means, said write data register, said read data register, and said physical address register for transferring data and addresses therebetween;

said storage control unit including bus control means for controlling said bus means in such a manner that at any time there is performed only one of two operations which consist of transferring a physical address obtained from



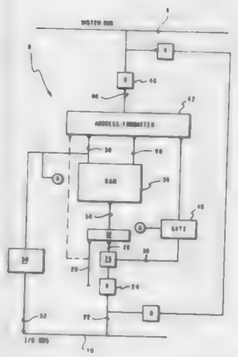
said address translation means to said physical address register and transferring data between said storage control unit and said main storage, said bus control means including means for controlling said bus means to effect transferring of a physical address obtained from said address translation means to said physical address register, transferring of data read from said main storage to said read data register and transferring of data stored in said write data register to said main storage through said bus means at selectively different times.

4,695,948

BUS TO BUS CONVERTER USING A RAM FOR MULTIPLE ADDRESS MAPPING

Ballard J. Blevins, Lexington, Ky.; William G. Kulpa, Austin, Tex.; Joseph R. Mathis, Georgetown, Tex., and John W. McCullough, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,734
Int. Cl.[4] G06F *12/10*
U.S. Cl. 364—200 10 Claims



1. An improved data processing system comprising a global system storage unit, a central processing unit, a system bus connecting the central processing unit and the global system storage unit, a bus converter interfacing the system bus with an I/O bus, said I/O bus having a plurality of I/O ports, and means for connecting a plurality of randomly selected I/O devices respectively to said I/O ports and having one such I/O device so connected, the improvement in the bus converter comprising:

means connected to said I/O bus for partitioning I/O address fields which are transmitted from said I/O bus into a high order field and a low order field;

means connected to receive a DMA ID of said connected I/O device from said I/O bus and for combining the DMA ID of said I/O device with the high order field of said I/O address to form a first combined address;

means for accessing a RAM with said first combined address to obtain data containing

a control field and a prefix field and outputting the same;

an address formatter connected to receive said control field, said prefix field and said low order address field and for providing a second combined address from said prefix field , said lower order field and said control field; and

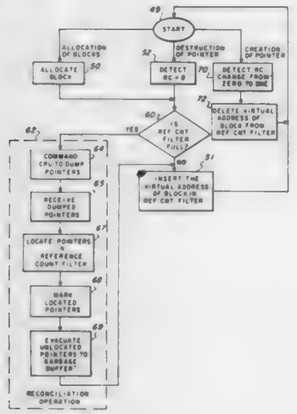
means connected to said address formatter for transmitting said second combined address onto said system bus.

4,695,949

METHOD FOR EFFICIENT SUPPORT FOR REFERENCE COUNTING

Satish Thatte, Richardson, and Donald W. Oxley, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1984, Ser. No. 632,564
Int. Cl.[4] G06F *12/02*
U.S. Cl. 364—200 2 Claims



1. Apparatus for identifying garbage blocks in a block oriented memory of the type in which each memory block has an associated reference count representing a number of pointers to it from other memory blocks and itself, but not including pointers from a CPU, comprising:

means for creating a data structure for containing pointers to blocks of memory;

means for inserting in the data structure a pointer to each block of memory which has a reference count of zero;

means for deleting from the data structure the pointer to each block of memory whose reference count changes from zero;

means for comparing pointers in the CPU with the pointers in the data structure;

means for marking memory blocks which are in the data structure and not pointed to by the CPU as garbage blocks; and

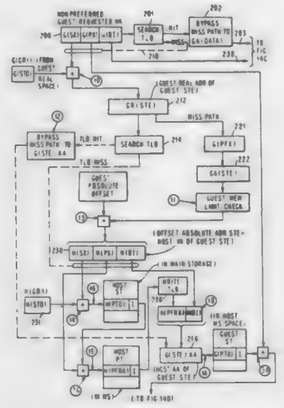
means for moving the pointers to memory blocks marked as garbage blocks from the data structure to a garbage buffer.

4,695,950

FAST TWO-LEVEL DYNAMIC ADDRESS TRANSLATION METHOD AND MEANS

Henry R. Brandt; Patrick M. Gannon, both of Poughkeepsie, N.Y.; Wan L. Leung, Coral Springs, Fla., and Timothy R. Marchini, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,491
Int. Cl.[4] G06F *12/10*
U.S. Cl. 364—200 10 Claims



1. A method for obtaining dynamic address translation (DAT) for a nonpreferred guest (NPG) requested virtual address (VA) for guest requested data or instructions utilizing a translation lookaside buffer (TLB) for storing recent address translations, when a TLB miss occurs for a NPG requested VA, comprising the steps of:

sequencing hardware logic circuits to perform the DAT for the NPG requested VA by:

firstly generating a guest real (GR) segment table entry (STE) address by adding a guest segment table origin (STO) and a segment index (SX) field from the NPG requested VA, searching the TLB for the GR STE address,

having a TLB hit during the TLB search for the GR STE address, obtaining the translated GR STE address from the TLB, and bypassing sequencing steps available in the hardware logic circuits for generating a translation of the GR STE address,

secondly, accessing a guest STE with the translated GR STE address, obtaining a page table origin (PTO) field in the guest STE, adding a page index (PX) field of the NPG requested VA to the obtained PTO field to generate a GR address of a page table entry (GR PTE address), searching the TLB for the GR PTE address,

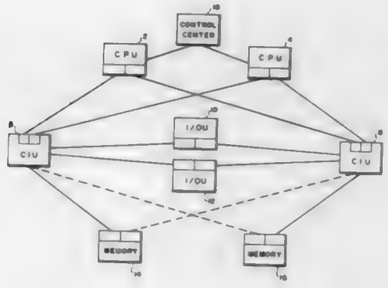
having a TLB hit during the TLB search for the GR PTE address, obtaining the translated GR PTE address from the TLB, and bypassing sequencing steps available in the hardware logic circuits for generating a translation of the GR PTE address.

4,695,951

COMPUTER HIERARCHY CONTROL

Lane K. Hooker, Phoenix; Thomas H. Howell, Scottsdale, and Charles W. Ferrell, Phoenix, all of Ariz., assignors to Honeywell Bull Inc., Phoenix, Ariz.

Filed Jul. 7, 1983, Ser. No. 511,616
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 3 Claims



1. A data processing system comprising:

a plurality of data processing units;

each such processing unit including a store into cache memory unit for storing data directly available for the use of the associated processing unit;

a main memory unit;

a central interface unit coupled to interface between individual ones of said plurality of processor units and between said processor units and said main memory unit;

each processing unit having access through said central interface unit to extract selected blocks of data from said main memory for storage in the associated cache memory unit, said extracted blocks of data, when modified by said processing units being returned for storage to the cache memory unit of the individual modifying processing unit wherein the latest modification of any modified block of data resides only in the cache unit of the modifying processing unit; and

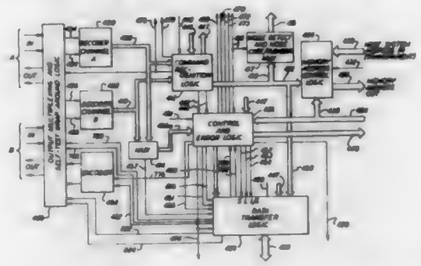
said central interface unit including means for producing control signals, a swap buffer means for storing blocks of data, there being a swap buffer means for each processor unit, and multiplexer means, said multiplexer means responsive to control signals produced by the central interface unit's means for producing control signals, for transmitting a block of data stored in any one swap buffer means directly to the cache memory unit of a data processing unit or to the main memory unit; said central interface unit responsive to a request signal from a requesting data processing unit requesting a given block of modified data stored in the cache unit of another data processing unit, hereinafter the possessor data processing unit, for causing the possessor data processing unit to transfer the given block of modified data from its cache unit to the swap buffer of the central interface unit associated with the possessor data processing unit, said central interface unit responsive to the storage of said given block of modified data in the swap buffer associated with the possessor data processing unit for causing the central interface unit's means for producing control signals to produce control signals causing the multiplexer means to transmit said given block of modified data stored in the swap buffer associated with the possessor data processing unit directly to the cache unit of the requesting data processing unit.

4,695,952

DUAL REDUNDANT BUS INTERFACE CIRCUIT ARCHITECTURE

Gary R. Howland, Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 30, 1984, Ser. No. 635,944
Int. Cl.[4] G06F *13/40*
U.S. Cl. 364—200 10 Claims



1. A bus interface circuit for transferring digital signals formatted as command, data, and status words between a signal processor having an associated memory and one of two redundant serial data buses, comprising:

control means responsive to both serial data buses for identifying and selecting one of the buses for transferring words between the memory and the identified and selected serial data bus according to the last bus to provide a valid command word;

data transfer means responsive to words from the selected serial data bus and the signal processor for transferring data, status and command words at a data port of the bus interface circuit between the identified and selected bus and the memory; and

addressing means, responsive to command words for addressing memory at an address port of the bus interface circuit, said addressing means also responsive to addressing signals from the signal processor for addressing the memory, whereby the signal processor is always granted access to the memory and whereby the interface circuit addresses the memory only when the signal processor is busy on tasks other than accessing the memory.

4,695,953

TV ANIMATION INTERACTIVELY CONTROLLED BY THE VIEWER

Preston E. Blair, 26212 Mesa Dr., Carmel, Calif. 93923, and Frank S. Preston, 3860 Dixon Pl., Palo Alto, Calif. 94306

Continuation of Ser. No. 526,464, Aug. 25, 1983, abandoned.
This application Apr. 14, 1986, Ser. No. 831,170
Int. Cl.[4] G06F *15/44*; G11B *31/00*; A63F *9/22*
U.S. Cl. 364—410 9 Claims

1. A video game system providing repeated switching of multiple tracks of different actions of the same animated character according to the skill of the operator in contacting the camera-originated animation display, comprising:

multiple tracks of animated motion picture production of different actions of the same character providing coded frames for track switching and coded location coordinates of said character target,

a video-audio input terminal providing means to operate multiple tracks of animation, providing for the switching thereof during operation, and providing for film track selection, masking, and centering to the full raster,

a player input terminal including a playing instrument deployed before the display with a transducer and a microphone combination mounted on the mutually perpendicular sides of the face of said monitor, providing means for producing digital signals representative of the two coordinates of the location of said playing instrument with respect to the image on said monitor,

means of entering a table of values representing digital coordinates of the locations of animation targets per frame and means for entering episode cueing (cuing) data into memory storage at the start of the episode,

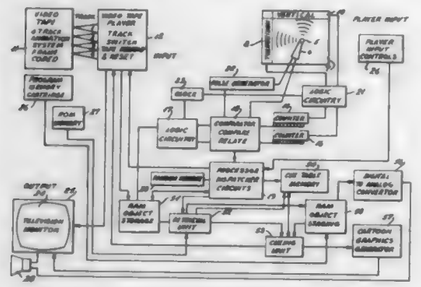
means of retrieval of said digital coordinates of the location of said target area at a designated frame from the memory storage,

means of comparing and matching the coodinates of the location of said playing instrument transducer to the coordinates of the location of said animated target area retrieved from said memory storage at a designated frame, to obtain the category of proximity,

means of processing and dispatching to effect the switching of multiple tracks of animation to the said video-audio terminal based on the said determined category of proximity obtained by the comparison of the location of said playing instrument transducer to animated target area and frame cueing from said memory storage,

continuing means of processing and dispatching for instructing said video-audio terminal to re-wind multiple tracks of animation to another episode determined by means of random choice or player input at the termination of an episode.

2. Apparatus as set forth in claim 1 as a primary circuit, and a secondary circuit providing digital animation, digital graphics and audio scoring the game and related to the game-originated animation and player's actions, and controlling the progress of both primary and secondary circuits, comprising:



a second player input terminal providing means of system control for the said means of processing and dispatching,

permanent memory means providing a mass storage of digital graphics image data for a means to generate cartoon graphics for a video monitor display,

said means of retrieval retrieving said digital graphics image data from said permanent memory means for storage in a random access memory means,

said permanent memory providing storage of control data including cue commands, said cue commands comprising schedule commands for said processing and dispatching means,

said means of retrieval retrieving said control data from said permanent memory means for storage in said random access memory means, said permanent memory means storing audio and/or graphics data for a random access memory of object video staging,

said means of retrieval retrieving said audio and/or graphics data from said permanent memory means for said random access memory of object video staging,

said processing and dispatching means controlling the course of the digital animation,

a cue table memory means for storing cue commands from said processing and dispatching means,

a cueing unit repeatedly scanning said cue table memory means to get said cue commands, and to execute said cue commands,

said processing and dispatching means requesting successive blocks of control information from said means of retrieval for operations scheduling instructions for storage in said cue table memory means for use by said cueing unit - said processing and dispatching means repeatedly updating said operations scheduling instructions as the cartoon progresses,

said cueing unit executing cue commands at the times therein specified by conveying to the said means to generate cartoon graphics blocks of binary coded data from said means of retrieval from storage in said random-access memory of video staging, to generate cartoon frames for display on said video monitor,

program memory cartridge means for providing individual game data to reinforce said audio and/or graphics data stored in said random-access memory of object video staging,

said means of retrieval obtaining digital audio data from said permanent memory means for said randon-access memory of object video staging, to be sent to a means of converting digital data to analog form, and hence to a system speaker,

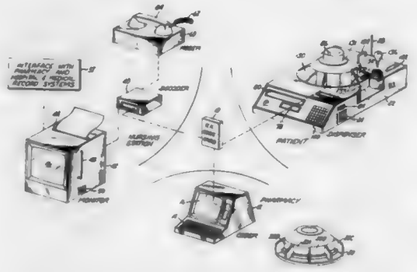
said processing and dispatching means controlling progress of the game involving said primary and secondary circuits using data from said program memory cartridge means, said permanent memory means obtained through said means of retrieval and said cueing unit, said means of processing and dispatching ordering said control information of the game for the primary circuit to be sent from said cueing unit to the video-audio input terminal.

4,695,954

MODULAR MEDICATION DISPENSING SYSTEM AND APPARATUS UTILIZING PORTABLE MEMORY DEVICE

Robert J. Rose, 201 East First, Park Rapids, Minn. 56470, and Russell L. Trimble, 70 Carriage Lane, Burnsville, Minn. 55337

Filed Oct. 31, 1984, Ser. No. 663,916
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413 45 Claims



1. A modular system for distributing and dispensing medications, including:

portable memory means for storing data representative of patient medication dispensing information and capable of use with other elements of the system including programming means, dispenser means and monitor means;

programming means, including means for releasably receiving the portable memory means, for receiving medication dispensing information and for writing data representative of the medication dispensing information to the portable memory means;

dispenser means for dispensing prescribed medications, the dispenser means including:

memory receiving means for releasably receiving the portable memory means to which data representative of

the medication dispensing information has been written through use of the programming means;

read means for reading the data representative of the medication dispensing information from the portable memory means when the portable memory means is positioned in the memory receiving means;

container means having a plurality of individual compartments for storing prescribed medications;

control means coupled to the read means for providing control signals as a function of the data representative of the medication dispensing information;

access means coupled to the control means and responsive to the control signals for making the prescribed medications within individual compartments of the container means accessible to a patient at prescribed times in accordance with the data representative of the medication dispensing information;

sensor means for sensing patient compliance information representative of whether the prescribed medications were accessed by the patient when made accessible by the access means;

write means coupled to the sensor means for writing data representative of the patient compliance information to the portable memory means when the portable memory means is positioned in the memory receiving means; and

monitor means, including memory receiving means for releasably receiving the portable memory means, for providing a display of the medication dispensing information and the patient compliance information stored by the portable memory means; wherein the programming means, dispenser means and monitor means can be positioned at locations remote from each other.

4,695,955

ELECTRONIC DEVICE PROVIDING A UNIVERSAL INTERFACE BETWEEN SENSORS AND AN ACQUISITION AND PROCESSING UNIT OF THE SIGNALS ORIGINATING FROM SAID SENSORS

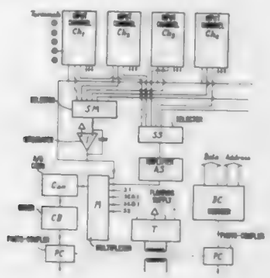
Yves Faisandier, Paris, France, assignor to A2F, Paris, France

Filed Dec. 26, 1984, Ser. No. 686,450

Claims priority, application France, Dec. 26, 1983, 83 20770

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—413 **10 Claims**



1. An electronic device providing a universal interface between sensors and an acquisition and processing system of the signals originating from the sensors, wherein the various sensors are connected to standardized terminals, appearing all identical to the user and comprising energization and amplifying elements, capable of being adapted to said sensors, and identification means for automatically recognizing the sensor present in the terminal, so as to allow for programming of the signal amplification, energization and processing elements.

4,695,956

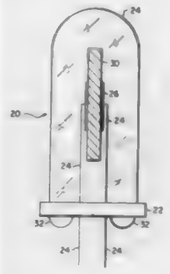
APPARATUS AND METHOD OF QUANTIFYING HEMOSTASIS USING OSCILLATIONS FROM A TRANSDUCER IMMERSED IN THE BLOOD SAMPLE

Eric G. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407, and Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147

Filed Nov. 1, 1984, Ser. No. 667,007

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—416 **9 Claims**



1. An apparatus for measuring blood viscosity changes during coagulation comprising, in combination: a housing of known volume adapted to receive blood therein; an oscillating member and post means contained in said housing at a distance from one another such that said blood can fill the distance by capillary action and adapted to be immersed in blood received in said housing; said oscillating member being composed of crystal which is capable of producing vibrations having frequencies from 100 hertz to 1 megahertz, computation means adapted to measure oscillations of said oscillating member as a functional of a known time period and calculate viscosity of blood, said computation means comprising a digital computer and algorithms stored on magnetic media adapted to be executed by said digital computer, said oscillating member connected to said computation means; and a display means coupled to said computing means and adapted to display said calculated viscosity of blood.

4,695,957

DRILLING MONITOR WITH DOWNHOLE TORQUE AND AXIAL LOAD TRANSDUCERS

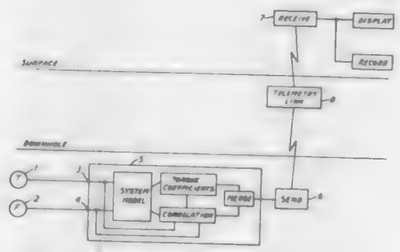
Bernard P. J. M. Peltier, Chesterton, England, assignor to PRAD Research & Development N.V., Curacao, Netherlands

Filed Jun. 27, 1985, Ser. No. 750,562

Claims priority, application United Kingdom, Jun. 30, 1984, 8416708

Int. Cl.⁴ E21B *44/00, 47/12*

U.S. Cl. 364—422 **5 Claims**



1. A drilling monitor for sensing downhole drilling conditions, said monitor comprising: downhole transducers for providing signals representative of torque and axial load,

downhole computing means adapted to receive the torque and load signals for implementing a drilling model and for computing therefrom coefficients representative of drilling conditions, said model comprising a function relating torque and axial load to one another, and means for combining said coefficients into a surface sendable signal indicative of drilling conditions.

2. A drilling monitor as claimed in claim 1 wherein the computing means is arranged to calculate the coefficients by implementing a curve fitting algorithm of the function to transducer signal samples over a sample period and wherein the computing means continuously updates the coefficients.

4,695,958

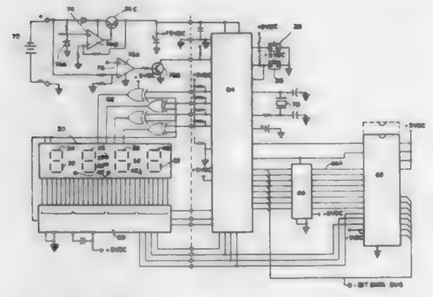
DIGITAL PACING INDICATOR FOR MOTORCYCLES

Kerry Mackenroth, Rte. 2, Box 277, Lacombe, La. 70445

Continuation of Ser. No. 692,666, Jan. 17, 1985, abandoned. This application May 19, 1986, Ser. No. 866,992

Int. Cl.⁴ G06F *15/14; A63B 21/00; B61L 3/00*

U.S. Cl. 364—424 **19 Claims**



1. A pacing apparatus for enduro motorcycle racing, comprising:

(a) input means, for inputting into said apparatus, values representing a desired speed for and length of an enduro race segment;

(b) computing means for automatically computing should-be distance, and for automatically computing a plurality of locations at which an unannounced enduro race check point would be possible along a course of an enduro race, from values provided via said input means;

(c) means for initiating said computing means; and

(d) display means, electrically connected to said computing means, for visually displaying to a rider manipulating a motorcycle, should-be distance and an indication of locations at which an unannounced enduro race checkpoint would be possible along a course of an enduro race, wherein at any given time during a race:

a should-be distance which is displayed on said display means represents a distance the motorcycle should have travelled up until the given time for comparison with a distance the motorcycle has actually travelled up until the given time, and

a location, which is indicated upon said display means, whereat an unannounced enduro race check point would be possible, is beyond the should-be distance displayed at the given time, and before all other locations at which an unannounced enduro race check point would be possible.

4,695,959

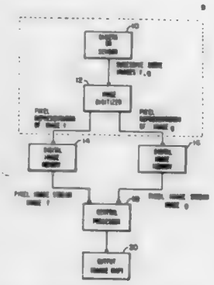
PASSIVE RANGE MEASUREMENT APPARATUS AND METHOD

David E. B. Lees, Lexington, and John Merchant, Needham, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 597,621, Apr. 6, 1984, abandoned. This application Aug. 29, 1986, Ser. No. 902,262

Int. Cl.⁴ G01C *3/00; G01S 13/89*

U.S. Cl. 364—458 **13 Claims**



12. A method for determining a range from a passive sensor to points in a scene within the field of view of said sensor, comprising the steps:

A. forming one image of at least a portion of said scene from data acquired by a first passive sensor located at one location, said one image comprised of pixels, each pixel having an address locating said pixel in said scene;

B. forming another image of said portion of said scene from data acquired by a second passive sensor at another location removed from said one location, said another image comprised of pixels, each pixel having an address locating it in said another image;

C. calculating location addresses for pixels in said one image to locate said pixels in a first plane a first distance from said one location;

D. calculating a location address for pixels in said another image to locate said pixels in said first plane;

E. calculating an address for said pixels in said another image to warp said another image into registration with said one image;

F. correlating pixels of said one image and said another image at address locations obtained in steps, c, d, and e;

G. calculating a range to regions of said scene represented by pixels which correlate based on an assumption said regions lie in said first plane.

4,695,960

METHOD AND APPARATUS FOR NUMERICAL CONTROL OF MACHINE TOOLS

Jürgen-Andreas Reimann, Erlangen, and Herbert Basilowski, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,845

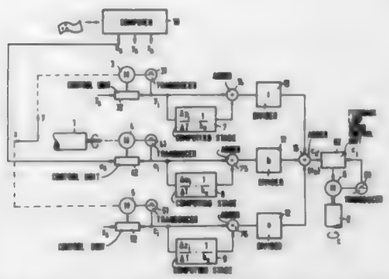
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443016

Int. Cl.⁴ B23F *5/00; H02P 5/00*

U.S. Cl. 364—474 **10 Claims**

1. In a numerical control of a machining apparatus for manufacturing a gear from a workpiece, said numerical control including position control means for controlling a rotation of said workpiece in accordance with a motion of a tool, said numerical control including means for generating an electrically encoded control variable fed to said position control means to determine the operation thereof, the improvement wherein the numerical control is provided with compensation

means for reducing a lag in the response of said position control means and in the rotation of the workpiece with respect to changes in an actual rate of rotation of the tool, said compensation means including computing means for calculating a correction quantity representative of said lag, said compensation means further including means for combining said correction quantity with said control variable prior to the feeding thereof to said position control means so that said lag is reduced.



4,695,961

SOLID STATE OVERCURRENT DETECTOR

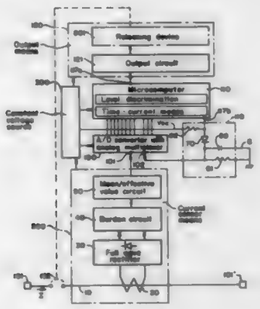
Ichirou Arinobu, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1984, Ser. No. 634,361

Claims priority, application Japan, Jul. 29, 1983, 58-140286; Jul. 29, 1983, 58-140287; Nov. 24, 1983, 58-222668; Nov. 24, 1983, 58-222669

Int. Cl.⁴ H02H *3/06, 6/00;* **G06G** *7/18*

U.S. Cl. 364—483 **21 Claims**



1. A solid state overcurrent detector comprising:

current sensor means for issuing an output signal indicative of an amount of current in an AC power line;

processing means for: (1) discriminating a level of said output signal of said current sensor means, (2) performing a time-current operation and issuing a time-current operating signal responsive to said discriminating, and (3) producing a charge signal, said charge signal corresponding to an amount of heat energy produced by said current during said time-current operation;

output means for issuing an overcurrent detection signal responsive to said time-current operating signal; and

charge-discharging means for being charged by said charge signal and for being discharged with a predetermined time constant;

wherein said processing means is also for (4) memorizing a voltage remaining in said charge-discharging means as an initial value for performing said time-current operation when a subsequent overcurrent takes place.

4,695,962

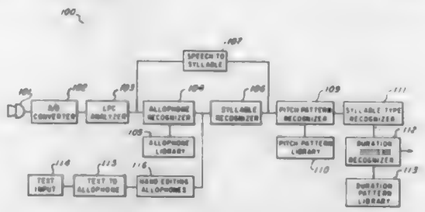
SPEAKING APPARATUS HAVING DIFFERING SPEECH MODES FOR WORD AND PHRASE SYNTHESIS

Kathleen M. Goudie, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1983, Ser. No. 548,581

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 364—513.5 **14 Claims**



1. A speech producing apparatus comprising:

input means for receiving a sequence of input data, said sequence of input data including a first part containing a sequence of phonological linguistic unit indicia and a second part including at least word boundary indicia indicative of word boundaries;

control means connected to said input means for converting said sequence of input data into a sequence of speech identifying data by (1) substituting internal phonological linguistic unit indicia for word final phonological linguistic unit indicia occurring at word endings where vocalic phonological lignuistic unit indicia are beginning the next word, and (2) substituting shorter strong vowel phonological linguistic unit indicia for long strong vowel phonological linguistic unit indicia occurring in nonfinal word positions; and

speech synthesis means connected to said control means for generating one or more audible words of human language corresponding to said sequence of speech identifying data.

4,695,963

PRESSURE SENSE RECOGNITION CONTROL SYSTEM

Shinobu Sagisawa, Yokohama; Teizo Takahama, Yokosuka, and Mitsuo Kobayashi, Fujisawa, all of Japan, assignors to Fuji Electric Corporate Research and Developement Ltd., Yokosuka, Japan

Filed Apr. 10, 1985, Ser. No. 721,804

Claims priority, application Japan, Apr. 13, 1984, 59-75250

Int. Cl.⁴ G05B *19/42;* **G01L** *1/16, 5/16*

U.S. Cl. 364—513 **38 Claims**

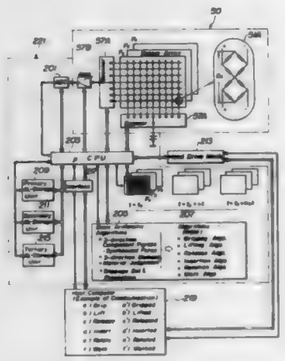
1. A pressure sense recognition control system for controlling the driving of an object, said system comprising:

pressure detection means mounted on the object for detecting the distribution, in a plane, of the components of a force in three selected directions of a rectangular coordinate system, said detection means including a plurality of pressure sensor modules, each said module having at least one pressure sensor cell having a pressure sensing member made of single crystal silicon, said pressure sensing member having a pressure receiving surface lying in the plane for receiving the force, and a plurality of diffusion type strain gauges provided on at least one surface of said pressure sensing member which is substantially perpendicular to said pressure receiving surface for detecting the three force components in the three directions applied to said pressure receiving surface, said strain gauges being electrically connected to constitute at least one bridge circuit for producing detection signals indicative of the amplitude of the three force components;

signal processing and storing means for deriving the detection signals from said pressure detection means sequentially, for converting said detection signals into pressure sense detection data, and for storing the converted pressure sense detection data corresponding to each said pressure receiving surface for each of said component forces in the three directions;

primary arithmetic operation and storage means for processing said pressure detection data derived from said signal processing and storing meansin accordance with a predetermined basic arithmetic/logic operation algorithm to obtain basic pressure data and for storing said basic pressure data;

secondary arithmetic operation and storage means for processing said basic pressure data read out from said primary arithmetic operation and storage means and said pressure sense detection data read from said signal processing and storing means in accordance with a predetermined pressure recognition algorithm to obtain pressure sense recognition data and for storing said pressure recognition data;



tertiary arithmetic operation and storage means responsive to command data from an external control means for controlling the drive of said object for processing said pressure sense detection data read out from said signal processing and storing means, said basic pressure data read out from said primary arithmetic operation and storage means and said pressure sense recognition data read out from said secondary arithmetic operation and storage means in accordance with a predetermined control algorithm to obtain control data required to control the drive of the object and for outputting said control data to the external control means; and

data communication means for communicating data between said tertiary arithmetic operation and storage means and the external control means.

4,695,964

IMAGE CORRECTION PROCESSING METHOD

Youichi Seto, Hadano; Koichi Homma, Sagamihara; Fuminobu Komura, Yokohama, and Hideo Ota, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,921

Claims priority, application Japan, Dec. 2, 1983, 58-226857

Int. Cl.⁴ G01C *7/02;* **G03B** *27/68;* **G06F** *15/31*

U.S. Cl. 364—518 **4 Claims**

1. A satellite image geometric correction processing method for use in an image correction system for correcting distortion in an image produced by displaying received data resulting from reciprocating scanning of an image detecting device mounted on a satellite, comprising the steps of:

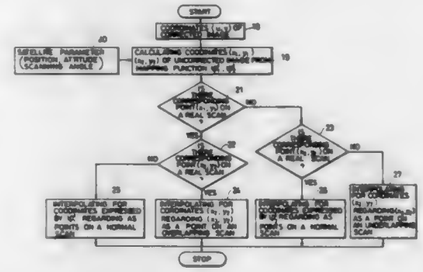
establishing a first coordinate system for a corrected image;

allocating data signals representing received image data to second and third coordinate systems to provide uncorrected images for the forward and backward scanning directions of said image detecting device, respectively;

locating the respective coordinate points of the received image data in said second and third coordinate systems which correspond to the points of said first coordinate system;

determining for each point of said first coordinate system whether or not the corresponding points of said second and third coordinate systems exist on a scanning region in the respective coordinate system;

determining the intensity of image data at a point of said first



coordinate system through interpolation by assuming that the point exists on an underlapping scanning region when the corresponding coordinate point of said second and third coordinate system does not exist on a scanning region of either of said second and third coordinate system; and

visually producing the corrected image data in said first coordinate system on the basis of the determined intensity of each point therein.

4,695,965

MONITORING DATA DISPLAY METHOD AND DEVICE

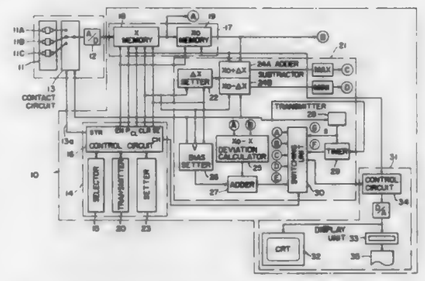
Shigeru Fujita; Hideo Banzai, and Makoto Takada, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,822

Claims priority, application Japan, Feb. 22, 1983, 58-28851

Int. Cl.⁴ G06F *15/40;* **G09G** *1/06;* **G01R** *19/50*

U.S. Cl. 364—518 **2 Claims**



2. In a method of displaying monitoring data of a continuously varying operation condition of a drive mechanism driven by an actuator, in which data regarding the operation of the drive mechanism is detected as a variable of time and sampled, the data being output at an output frequency and then displayed, the improvement comprising the steps of:

storing detected data of one operation cycle of the drive mechanism as reference data;

preliminarily displaying the reference data;

visually superposing detected data of an operation cycle of the drive mechanism succeeding to said one operation

cycle on said reference data on a coordinate axis to show deviation between the reference data and detected data of the succeeding operation cycle;
determining allowable uppermost and lowermost limits of said reference data;
storing said allowable uppermost and lowermost limits;
displaying said uppermost and lowermost limits of said reference data on said coordinate axis with the detected data;
calculating deviation data between said reference data and the detected data of said operation cycle succeeding said one operation cycle;
forming output data obtained by adding a predetermined constant bias data to said deviation data after said reference data has been stored; and
counting an operation time of each operation cycle of the drive mechanism and adjusting a sampling frequency on the basis of the counted operation time and a frequency for outputting sampling data.

4,695,966

IMAGE PROCESSING DEVICE

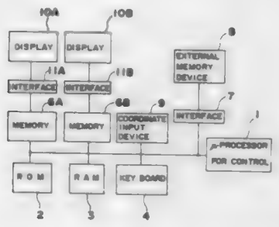
Masaki Takakura, Tenri; Yoji Noguchi, Ikoma; Yasukuni Yamane, and Noritoshi Kako, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,757

Claims priority, application Japan, Mar. 22, 1984, 59-55665; Mar. 22, 1984, 59-55666; Mar. 22, 1984, 59-55668; Apr. 18, 1984, 59-78910; Jun. 4, 1984, 59-116308; Dec. 24, 1984, 59-280825; Mar. 18, 1985, 60-55477

Int. Cl.⁴ G06F *15/626;* **G09G** *1/28*

U.S. Cl. 364—521 **1 Claim**



1. An image processing device, comprising a first memory means and a second memory means for storing the color light and shade information of at least two picture-face portions, a coordinate inputting means, a means for transferring and processing between said first and second memory means the image information of points specified by said coordinate inputting means, at least two units of display means for displaying the contents of said first memory means and said second memory means respectively, a plurality of means for performing cursor-displays in the different picture-image portions simultaneously on said units of display means corresponding to the coordinate points inputted by said coordinate inputting means, each of said plurality of means for performing cursor-displays being adapted for providing images different in shape from each other.

4,695,967

HIGH SPEED MEMORY ACCESS CIRCUIT OF CRT DISPLAY UNIT

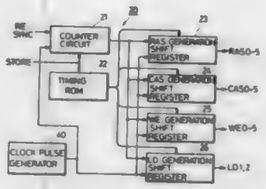
Masahiro Kodama; Tatsuya Sakae, both of Kusatsu, and Yoshio Urano, Ootsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Mar. 5, 1985, Ser. No. 708,583

Claims priority, application Japan, Mar. 9, 1984, 59-46232; Mar. 15, 1984, 59-50390

Int. Cl.⁴ G06F *15/62;* **G09G** *1/14*

U.S. Cl. 364—521 **3 Claims**



1. A high speed memory access circuit of a CRT display unit for representing a pattern by a plurality of dots on the screen of said CRT display unit, comprising:
a frame memory formed by dynamic random access memories including storage regions corresponding to the dots to be represented in the whole display area of said CRT screen, said storage regions being specified in advance by odd numbers and even numbers, so that data can be read out and written in a nibble mode;
clock pulse generating means, coupled to said frame memory, for generating clock pulses of different phases for reading out the data of the odd number regions and the data of the even number regions from said frame memory;
address control means, responsive to an external write signal, for generating address control signals for reading out first and second data, each comprising a plurality of bits and for generating first and second load pulses corresponding to the first and second data, said address control means including:
timing data storage means for storing in advance, write timing data and read timing data of said frame memory, so that the write timing data is provided upon receipt of the external write signal and the read timing data is provided in the absence of the external write signal;
counting means, coupled to said clock pulse generating means, for counting by a first predetermined number the clock pulses generated by said clock pulse generating means in a write mode selected upon receipt of the external write signal, and for counting by a second predetermined number the clock pulses generated in a read mode selected in the absence of the external write signal; and
shift registers, coupled to said timing data storage means and said counting means, in which said write timing data or said read timing data provided from said timing data storage means are loaded each time said counting means counts the clock pulses by said first or second predetermined number, the address control signals and the first and second load pulses being generated by said shift registers in response to the loaded write timing data or read timing data and the clock pulses;
first parallel/series conversion means for receiving and supplying in series a plurality of bits of data corresponding to the odd number regions of the first data read out from said frame memory;
second parallel/series conversion means for receiving and supplying in series a plurality of bits of data corresponding to the even number regions of the first data read out from said frame memory;
third parallel/series conversion means for receiving and supplying in series a plurality of bits of data corresponding to the odd number regions of the second data read out from said frame memory;
fourth parallel/series conversion means for receiving and supplying in series a plurality of bits of data corresponding to the even number regions of the second data read out from said frame memory;
first control means for controlling said first and third parallel/series conversion means so that when the first load pulse is received, said third parallel-series conversion means is disabled only during the supply of data in series by said first parallel/series conversion means and after completion of the supply of data, said third parallel/series conversion means is enabled; and
second control means for controlling said second and fourth parallel/series conversion means, so that when the second load pulse is received, said fourth parallel/series conversion means is disabled only during the supply of data in series by said second parallel/series conversion means and after completion of the supply of data, said fourth parallel/series conversion means is enabled.

4,695,968

DIGITAL SYSTEM SIMULATION METHOD AND APPARATUS HAVING IMPROVED SAMPLING

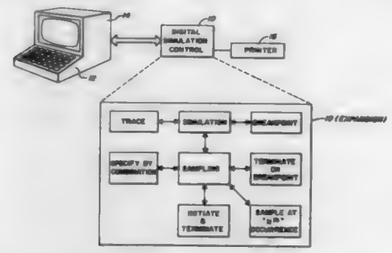
Roderick B. Sullivan, II, Natick; Mahesh Doshi, Framingham, and Lorne Cooper, Watertown, all of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Feb. 2, 1984, Ser. No. 576,364

Claims priority, application PCT Int'l. Appl., Nov. 3, 1983, PCT/US83/01741

Int. Cl.⁴ G06G *7/48;* **G06F** *15/60*

U.S. Cl. 364—578 **13 Claims**



1. Apparatus for hierarchical simulation of the behavior of a digital circuit, the digital circuit having a plurality of connected circuit elements, each said circuit element being any of gate level, function level, behavioral level, or switch level elements, the apparatus comprising
input definition means for defining inputs to said circuit elements, said input definition means including means for defining inputs to any one of gate level, function level, behavioral level, or switch level elements,
output definition means for defining output signal levels for outputs of said circuit elements based upon a defined relationship with said inputs, said output definition means including means for defining output signal levels for any one of gate level, function level, behavioral level, or switch level elements,
simulation means connected with said input definition means and with said output definition means for simulating the behavior of the digital circuit,
sampling means connected with said simulation means for interactively specifying during said simulation of said circuit behavior, at least one of said inputs and outputs to be repeatedly sampled, and
recording means connected with said simulation means and with said sampling means for recording said sampled values.

4,695,969

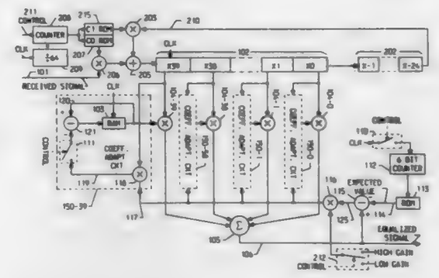
EQUALIZER WITH IMPROVED PERFORMANCE

Nelson R. Sollenberger, West Keansburg, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 17, 1984, Ser. No. 682,378

Int. Cl.⁴ G06F *15/31*

U.S. Cl. 364—724 **17 Claims**



1. An equalizer comprising
means for receiving samples of a digital signal, said samples being arranged into successive sequences wherein each sequence comprises a plurality of samples and each sample in any sequence has a corresponding sample in another sequence.
means for combining only the corresponding ones of said samples in said sequences during a predetermined time interval.
means for multiplying selected ones of said combined samples by associated coefficients. and
means for summing the products formed by said multiplying means to form an equalizer output.

4,695,970

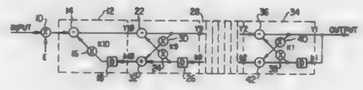
LINEAR PREDICTIVE CODING TECHNIQUE WITH INTERLEAVED SEQUENCE DIGITAL LATTICE FILTER

Karl H. Renner, Dallas, and Alec J. Morton, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,869

Int. Cl.⁴ G06F *15/31;* **G10L** *1/00*

U.S. Cl. 364—724 **18 Claims**



1. A digital lattice filter having n operational stages for calculating Y-values and B-values for a linear predictive coding voice compression technique in accordinace with the equations:

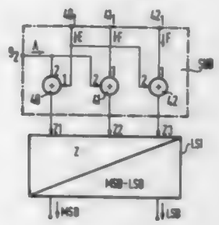
$$Y(n)_i = Y(n+1)_i - k(n)_{i-1}$$

$$b(N+1)_i = b(n)_{i-1} + k(n)Y(n)_i$$

where:
n is the operational stage in which the equation is processed,
i is the sample time required to process the equations through the n operational stages, and
k is a multiplier constant, there being n multiplier constants, the digital lattice filter comprising:
full adder means having two inputs and an output for receiving two digital values and generating the digital sum therefore on the output;

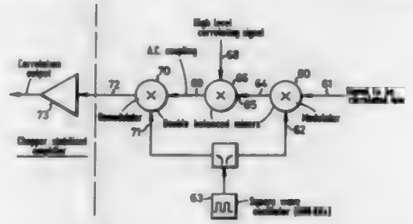
stack means for storing the k multiplier constants;
first delay storage means connected to the output of said full adder means for receiving and storing calculated B-values and delaying them for use in the i+1 sample time;
second delay storage means connected to the output of said full adder means for receiving and storing the calculated Y-values as addends for use in calculation of the next sequential Y-value;
multiplication means for interfacing with said adder means for receiving a selected multiplier and multiplicand to generate and sum partial products with said adder means in accordance with a predetermined multiplication algorithm to generate a product, said multiplication means selectively changing the sign of the selected multiplier to generate a negative product for calculation of Y values;
multiplexing means for controlling the operation of said adder means and said multiplication means to perform a multiplication operation and then add the generated product with an addend;
said multiplexing means interfaced with the output of said stack means for selecting a multiplier constant and said first and second delay means for selecting multiplicands and addends therefrom in accordance with the linear predictive coding technique to sequentially calculate the Y- and B-values;
timing means for controlling said multiplexing means, said first and second delay means and said stack means to calculate the Y- and B-values in an interleaved sequence with Y- and B-values alternately calculated, the calculation of a B-value using the previously calculated Y-value as a multiplicand and a delayed B-value output from said first storage means as an addend, and calculation of a Y-value utilizing the previously calculated Y-value stored in said second storage means as an addend and a delayed B-value output from said first storage means as a multiplicand; and
register means for storing the final Y-value calcualted in accordance with the linear predictive coding technique for n equal to 1.

4,695,971
CIRCUIT FOR RAPIDLY DETERMINING THE GREATEST DIFFERENCE AMONG THREE BINARY NUMERICAL VALUES
Udo Reimann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Nov. 30, 1984, Ser. No. 676,673
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343404
Int. Cl.⁴ G05F *7/50*; G05B *1/00*
U.S. Cl. 364—769 **6 Claims**



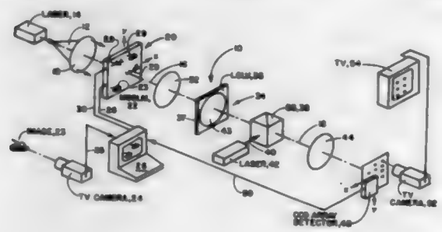
1. A circuit for rapidly determining a greatest difference among three binary values and for classifying said greatest difference in one of a plurality of ranges and for encoding a control signal consisting of two control bits identifying the range in which said greatest difference is classified, said circuit comprising:
a subtraction unit for forming at respective outputs three binarily represented differences from said three binary values, each binarily represented difference having an operational sign bit followed by a plurality of bits of decreasing significance; and
a logic unit connected to the outputs of said subtraction units, said logic unit having a plurality of operational sign inputs for receiving said respective operational sign bits and having a selected number of data inputs for receiving only a selected number of the most significant bits from each of said binarily represented difference, said logic unit having two logic sub-units for respectively forming said control bits, each logic sub-unit having a plurality of first stage NOR gates and a plurality of first stage AND gates, each of said first stage NOR and AND gates having a plurality of inputs to which said operational sign bits and a number of said most significant bits less than said selected number of most significant bits from each said binarily represented difference are supplied, and each logic sub-unit further having a second stage NOR gate to which the output of each of said first stage NOR gates and AND gates are supplied, said second stage NOR gate having an output at which the control bit for the respective logic sub-unit is present.

4,695,972
CORRELATOR HAVING SPURIOUS SIGNAL CANCELLATION CIRCUITRY
James H. A. McKeown, Ipswich, England, assignor to British Telecommunications Public Limited Company, England
Continuation-in-part of Ser. No. 502,755, Jun. 9, 1983, Pat. No. 4,561,067. This application May 24, 1985, Ser. No. 737,417
Claims priority, application United Kingdom, Jun. 23, 1982, 8218166
Int. Cl.⁴ G06G *7/19*
U.S. Cl. 364—819 **13 Claims**



1. A correlator comprising:
first input means for a first signal;
second input means for a second signal;
a source of predetermined alternating current (ac) signals having a predetermined frequency;
first mixer means connected to said first input means and said source to mix thereby the first signal and said ac signals in a manner to modulate said ac signals with said first signal to generate a mixed signal;
multiplying means connected to said first mixer means and to said second input means to multiply thereby said mixed signal and the second signal to generate a multiplying signal;
second mixer means connected to the multiplying means and to said source to mix thereby the multiplying signal and the said ac signals in a manner to generate a demodulated output signal; and
means for integrating the demodulated output signal from said second mixer means to thereby reduce the effects of any spurious signals associated with said first or said second signal.

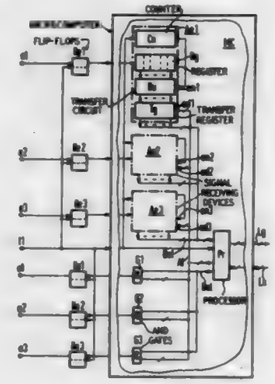
4,695,973
REAL-TIME PROGRAMMABLE OPTICAL CORRELATOR
Francis T. S. Yu, State College, Pa., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 22, 1985, Ser. No. 790,292
Int. Cl.⁴ G06G *9/00*
U.S. Cl. 364—822 **18 Claims**



1. A real-time programmable optical correlator, comprising:
means for providing a first beam of electromagnetic radiation and directing said beam of electromagnetic radiation along a preselected optical axis;
means located at a first preselected location along said optical axis for receiving said first beam of electromagnetic radiation, a first input signal and a second input signal and for generating images representative of said first and said second input signals;
means at a second preselected location along said optical axis for receiving said images and forming a joint Fourier transform of said images at a third preselected location along said optical axis;
means for providing a second beam of electromagnetic radiation and directing said second beam of electromagnetic radiation to said third preselected location along said optical axis;
means positioned at said third preselected location along said optical axis for receiving said joint Fourier transform of said images and said second beam of electromagnetic radiation and for generating a coherent power spectrum representative of said images;
means positioned at a fourth preselected location along said optical axis for forming an inverse Fourier transform of said coherent power spectrum of said images at a fifth preselected location along said optical axis, said inverse Fourier transform being representative of a correlation between said first and said second input signals.

4,695,974
CIRCUIT ARRANGEMENT FOR RECEIVING AND/OR TRANSMITTING BINARY SIGNALS SERIALLY APPEARING ON THE PLURALITY OF LINES TO AND FROM A PROCESSING DEVICE CONTAINING A MICRO-COMPUTER OR MICROPROCESSOR
Pieter Wolff, and Hartmut Wedler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jun. 4, 1985, Ser. No. 740,976
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420787
Int. Cl.⁴ G11C *7/00, 19/00*
U.S. Cl. 364—900 **3 Claims**

1. A circuit arrangement for receiving and processing binary signals appearing serially on a plurality of signal receiving lines and transmitting the processed signals as serially appearing binary signals by way of a plurality of signal output lines, the serial signals comprising
a predetermined number of bits, comprising:
a plurality of first clock-controlled flip-flops each connected to a respective signal receiving line;
a plurality of second flip-flops each connected to a respective signal output line;
a plurality of selectively operable switches each including a plurality of inputs and each including a output connected to a respective second flip-flop;
a plurality of signal receiving devices each connected to a respective first flip-flop and each comprising
a clock-controlled counter including an output for carrying an enable signal upon reaching a predetermined count,
a register connected to the respective first flip-flop for receiving the clocked end bits, and
a transfer circuit connected to said register and including an enable input connected to said output of said counter;
a transfer register connected to said transfer circuit and including an address input;



a bus system including an address bus connected to each of said address inputs of said transfer registers and to some of said inputs of said switches, an incoming data bus connected to each of said transfer registers, and an output data bus connected to some of said inputs of each of said switches;
processing means connected to said address bus, to said incoming data bus and to said output data bus, said processor operable to select the signal receiving lines via the respective signal transfer registers, to select the signal output lines via the respective switches, and to receive and process the incoming data and transmit the processed data; and
each of said flip-flops and said processor comprising a common clock input for synchronous operation of said arrangement.

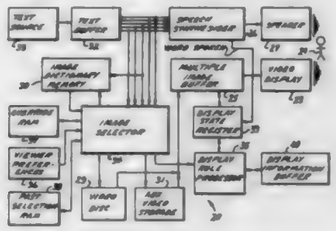
4,695,975
MULTI-IMAGE COMMUNICATIONS SYSTEM
Orest J. Bedrij, Poughkeepsie, N.Y., assignor to Profit Technology, Inc., New York, N.Y.
Filed Oct. 23, 1984, Ser. No. 663,893
Int. Cl.⁴ G06F *3/14, 3/16*
U.S. Cl. 364—900 **41 Claims**

1. A visual communication device for translating a natural language into visual images to be viewed by a human receiver comprising, in combination,
video memory means for storing a plurality of predetermined video images at predetermined image addresses,
video display means for displaying selected images from said video memory to said human receiver,
image dictionary memory means for storing predetermined sets of said image addresses associated with respective

ones of a predetermined set of natural language words and addressable to obtain the respective stored set of image addresses for a selected natural language word,

input means for receiving selected natural language words, and

control means for repetitively obtaining individual ones of the selected natural language words from said input



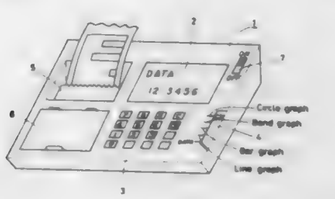
means, addressing said image dictionary memory means to obtain the respective sets of image addresses for the selected natural language words, and addressing said video memory means at the respective sets of image addresses to obtain images for display by said video display for viewing by said human receiver, so that the selected natural language words are automatically translated into a succession of visual images for viewing by said human receiver.

4,695,976

COMBINED ELECTRONIC TABLE PREPARATION AND GRAPH DRAWING APPARATUS

Yasuhiro Nakanishi, Nara, and Shoichi Kawai, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 7, 1983, Ser. No. 530,071
Claims priority, application Japan, Sep. 8, 1982, 57-157326
Int. Cl.⁴ G06F *3/02, 3/14, 7/00*
U.S. Cl. 364—900 **1 Claim**



1. An integrated electronic device having table preparation and graph drawing capabilities comprising:

input means for inputting elements of numerical data into the apparatus:

table preparation means, responsive to an operation of said input means, for tabling the input elements of numerical data into data columns and data rows, each element of numerical data being in a said data column and a said data row, said table preparation means including switch means for controlling start, advance and end of tabling of the numerical data;

means, responsive to an operation of said table preparation means, for summing said elements of numerical data in each said data column or each said data row to form column sums or row sums, respectively, and for storing said column sums or row sums, said means for summing and storing being also directly responsive to said input means for storing numerical data introduced thereby;

graph drawing means, responsive to an operation of said means for summing and storing, for drawing a graph from a plurality of different graph types based on said column sums or said row sums stored therein; and

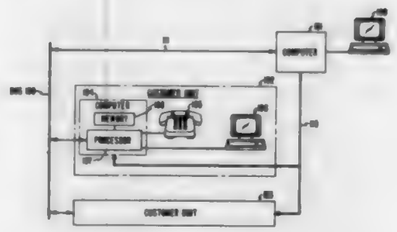
mode selection means for selecting a table preparation mode and a graph drawing mode, said mode selection means selecting the table preparation mode to activate the table preparation means and selecting the graph drawing mode to actuate the graph drawing means, said mode selection means further selecting, when said graph drawing mode is selected, the type of graph to be drawn by said graph drawing means.

4,695,977

CONTROL OF REAL-TIME SYSTEMS UTILIZING A NONPROCEDURAL LANGUAGE

Terris L. Hansen, Aurora; Wayne E. Hyatt, Glenview, and Wu-Hon F. Leung, Downers Grove, all of Ill., assignors to American Telephone and Telegraph Company and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1985, Ser. No. 812,940
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—900 **32 Claims**



1. A method for controlling a real-time telephone process utilizing a computer system executing program scripts written in a nonprocedural language with each of said scripts defining an operation to be performed by said said real-time process, comprising the steps of:

executing a first one of said scripts by said computer system to control a first operation in said process in response to a first signal from said process;

blocking the execution of a second one of said scripts in response to said first signal by said computer system in response to the next sequential signal;

reexecuting said first one of said scripts to control a second operation in said process by said computer systems in response to a second signal from said process; and

allowing in said execution of said one of said scripts by said computer system the execution of said second one of said scripts by said computer system in response to said second signal thereby performing another operation in said process.

4,695,978

SEMICONDUCTOR MEMORY DEVICE

Tohru Itakura, Kuwana, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

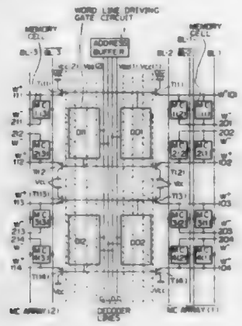
Filed Nov. 14, 1985, Ser. No. 798,186
Claims priority, application Japan, Nov. 15, 1984, 59-241205
Int. Cl.⁴ G11C *5/02*
U.S. Cl. 365—51 **5 Claims**

1. A semiconductor memory device comprising:

a pair of memory cell arrays having a plurality of word lines, a plurality of bit lines, and a plurality of memory cells disposed at intersections of said word lines and said bit lines;

a plurality of word line driving transistors respectively connected to said word lines and aligned at inner edges of said pair of memory cell arrays;

a pair of word line driving gate circuits having input terminals and output terminals, the pitch of said word line driving gate circuits being matched to the pitch of adjacent word lines, arranged along the direction of said word lines between said pair of memory cell arrays, the output terminals of said word line driving gate circuits being respectively connected to said word line driving transistors; and



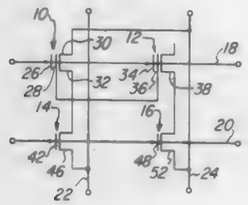
a plurality of decoder lines extending between said pair of word line driving gate circuits and connected to said input terminals of said word line driving gate circuits, said pair of word line driving gate circuits decoding signals on said decoder lines independently input to said input terminals, said decoded signals driving said word line driving transistors.

4,695,979

MODIFIED FOUR TRANSISTOR EEPROM CELL

James A. Tuvell, Houston, and Michael C. Smayling, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 9, 1985, Ser. No. 773,492
Int. Cl.⁴ G11C *11/34*
U.S. Cl. 365—185 **6 Claims**



1. An electrically erasable programmable memory cell of a type having interconnected transistors coupled to a conducting read, write, sense and row line, comprising:

a floating gate transistor having a control gate, connected to said sense line, a source to drain conducting path and a floating gate;

a tunnel device having a cathode coupled to the floating gate, an anode, and a tunnel control electrode coupled to the sense line;

read switch means for providing a conducting path between said read line and one end of the source to drain path of said floating gate transistor in response to the voltage on said row line exceeding a selective threshold value and for opening the conductive path when the row line voltage falls below the selective threshold value;

write switch means for providing a conductive path between said write line and the anode of said tunnel device in response to the voltage on said row line exceeding a write selective value and for opening the conductive path when the row line voltage falls below the write selective value;

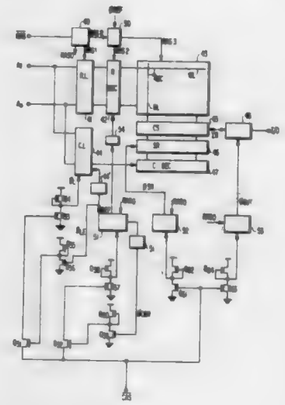
wherein another end of the source to drain path of said floating gate transistor is connected to said write line and said tunnel device is operative in response to a voltage between said sense line and said write line exceeding a tunnel threshold value to tunnel electrons to or from said cathode.

4,695,980

INTEGRATED CIRCUIT HAVING A COMMON INPUT TERMINAL

Yukio Fukuzo, and Yasukazu Inoue, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,091
Claims priority, application Japan, Jul. 9, 1984, 59-141803
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—222 **8 Claims**



1. An integrated circuit comprising:

a common external terminal;

a first circuit for receiving a first control signal;

a second circuit for receiving a second control signal;

a first switch coupled between said common external terminal and said first circuit;

a second switch coupled between said common external terminal and said second circuit;

a first detection circuit coupled to said first circuit for generating a first detection signal when said first circuit assumes a first state;

a first control circuit responsive to said first detection signal for rendering said first switch conductive to allow said first circuit to receive a signal applied to said common external terminal;

a second detection circuit coupled to said second circuit for generating a second detection signal when said second circuit assumes a second state; and

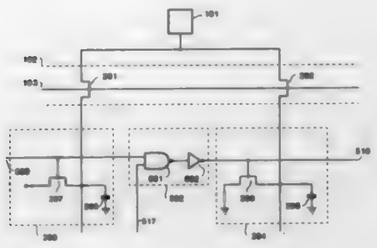
a second control circuit responsive to said second detection signal for rendering said second switch non-conductive to isolate said second circuit from said common external terminal.

4,695,981

INTEGRATED CIRCUIT MEMORY CELL ARRAY USING A SEGMENTED WORD LINE

Joseph P. Sikich, and Richard R. Doaconbe, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 4, 1984, Ser. No. 678,181
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—227 8 Claims



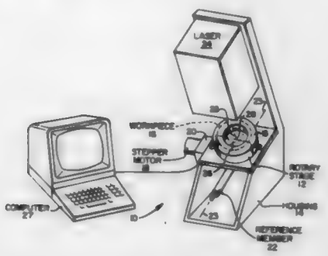
1. A combination comprising:
a plurality of cells arranged in an array, the array having a plurality of columns and a plurality of rows wherein each row in the plurality of rows has a plurality of segments;
row selection means for selecting cells within a first row of the plurality of rows; and,
segment selection means for selecting cells within a segment of the first row wherein the segment selection means selects segments accumulatively.

4,695,982

HUB HOLE CHARACTERIZATION SYSTEM

Vladimir Preysman, Santa Clara, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Jul. 12, 1985, Ser. No. 754,543
Int. Cl.[4] G06F *15/46, 15/70;* G01B *21/30*
U.S. Cl. 364—506 6 Claims



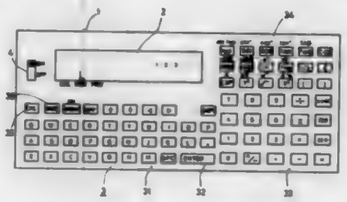
1. Apparatus for characterizing the roundness of a workpiece aperture, said apparatus comprising:
(a) a rotary stage adapted to receive a workpiece having an aperture to be characterized, said rotary stage including a central aperture surrounding the workpiece aperture;
(b) a reference surface mounted to provide a fixed radial reference point approximately at the axis of rotation of said rotary stage;
(c) movement means for incrementally rotating said rotary stage, to rotate the workpiece in a stepwise manner around the fixed radial reference point;
(d) a non-contact detection means for measuring a radial distance associated with each angular position of the workpiece, each radial distance extending along a predetermined radial path between the fixed radial reference point and the corresponding periphery of the workpiece aperture; and
(e) programmable computer means, in communication with said movement means and having an input for receiving a signal from said detection means corresponding to each radial distance that is measured, said computer means being adapted to coordinate each radial distance with the corresponding angular position of the workpiece, to characterize the size and the shape of the workpiece aperture.

4,695,983

CALCULATOR OR POCKET COMPUTER WITH SELECTABLE OPERATIONAL SEQUENCE

Koichi Oda, Sakai; Koichi Hatta, Yamatokoriyama, and Toshihiko Sumitani, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1984, Ser. No. 614,135
Claims priority, application Japan, May 30, 1983, 58-97341; May 30, 1983, 58-83072[U]
Int. Cl.[4] G06F *3/02*
U.S. Cl. 364—709 2 Claims



1. A calculator for executing formula calculations according to a selected operational sequence, said calculator comprising:
input keys for inputting data into said calculator according to individual key operations;
means for selecting modes under which a plurality of said input keys can be operated, said means for selecting modes comprising a sequential operational key for activating a sequential operational mode and a formula memory operational key for activating a formula memory operational mode, each said mode being capable of having different operational sequences, one of said keys of said means for selecting being actuated before a plurality of said input keys are actuated;
means for executing operations in response to actuation of one of said keys of said means for selecting, said means for executing performing operations in accordance with operational sequences corresponding to the actuated key of the means for selecting; and
said formula memory operational mode calculating said formulas according to an actuation sequence of said individual key operations according to a preference order of said operations after input of said individual key operations, said preference order being capable of calculating said formulas in a sequence different from said actuation sequence.

4,695,984

METHOD FOR ESTABLISHING A SURFACE CONSISTENT CORRECTION FOR THE EFFECTS OF THE LOW VELOCITY LAYER IN SEISMIC DATA PROCESSING

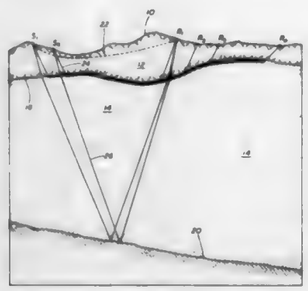
Ernest F. Paal, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,522
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—54 19 Claims

1. A method for correcting multifold seismic data for the effects of the low-velocity layer, comprising the steps of:
(a) selecting at least three sets of seismic traces from said seismic data, the traces within each of said seismic trace sets having a common offset;
(b) determining for each trace within said seismic trace sets the source to receiver transit time for that seismic signal path corresponding to refraction along the lower boundary of the low-velocity layer;
(c) establishing for each trace within said seismic trace sets an equation of the form

$$T_{ij}=S_i+R_j+T_{1\ PS}$$

where



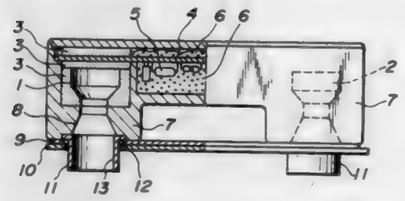
T_{ij}=source to receiver transit time along the refraction interface at the lower boundary of the low-velocity layer
S_i=time contribution due to source at location i
R_j=time contribution due to receiver at location j
T_1=transit time for seismic wave travel a preselected distance along the lower boundary of the low velocity layer; and
(d) solving the equations established in step c;
(e) applying the values S_i and R_j to correct said multifold seismic data for the effects of the low velocity layer; and,
(f) displaying the corrected multifold seismic data.

4,695,985

APPARATUS FOR PREVENTING A ROUNDABOUT OF SUPERSONIC WAVE IN A SUPERSONIC WAVE TRANSMITTER AND RECEIVER FOR A VEHICLE

Seiei Takeoka, Yokohama, Japan, assignor to Niles Parts Co., Ltd, Omorinishi, Japan

Filed Mar. 18, 1986, Ser. No. 840,748
Claims priority, application Japan, Nov. 26, 1985, 60-182013[U]
Int. Cl.[4] G01S *9/66;* H04R *1/02*
U.S. Cl. 367—87 15 Claims



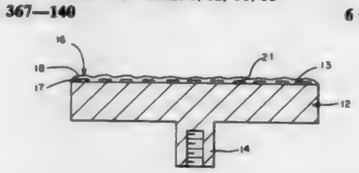
1. An apparatus for preventing a roundabout of a supersonic wave in a supersonic wave transmitting and receiving device having a supersonic wave sender and a supersonic wave receiver for a vehicle in which a vehicle height and the like with respect to a road surface is sensed by a reflected wave of the supersonic wave device, said sensor and said receiver each having a horn which opens outwardly to wave-passing openings in said device, said apparatus being characterized in that a cylindrical member for preventing the roundabout of the supersonic wave between said sender and said receiver is arranged on said device at one of said wave-passing openings in said device and in communication with said horn connecting said wave-passing opening with at least one of the sender or the receiver of the supersonic wave transmitting and receiving device for use in transmitting the supersonic wave signal and receiving the reflected supersonic wave from and to said device.

4,695,986

ULTRASONIC TRANSDUCER COMPONENT AND PROCESS FOR MAKING THE SAME AND ASSEMBLY

James M. Hossack, Redmond, Wash., assignor to Ultrasonic Arrays, Inc., Woodinville, Wash.

Filed Mar. 28, 1985, Ser. No. 716,988
Int. Cl.[4] H04R *1/02, 31/00*
U.S. Cl. 367—140 6 Claims



1. In an ultrasonic transducer assembly, a cylindrical element having a planar surface formed of a conducting material, an insulating foil element having first and second surfaces overlying the planar surface of the cylindrical element, the foil element having a conducting layer carried by the first surface and a plurality of spaced apart support elements formed of an insulating material disposed between the planar surface of the cylindrical element and the second surface of the foil whereby when an electric field is applied between the conducting layer of the foil element and the planar surface of conducting material of the cylindrical element, the foil element will move toward and away from the spaced apart support elements at a predetermined frequency in accordance with the applied voltage to create ultrasonic energy at this frequency.

4,695,987

HYDROACOUSTIC APPARATUS

John V. Bouyoucos, Pittsford, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Jan. 7, 1985, Ser. No. 689,521
Int. Cl.[4] B06B *3/00;* G01V *1/38;* H04R *1/02*
U.S. Cl. 367—143 33 Claims



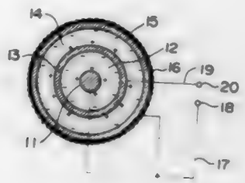
1. Hydroacoustic apparatus for transferring acoustic energy efficiently and over a broad bandwidth to an acoustic load such as, but not limited to, either a radiating plate or disc, which apparatus comprises a source of acoustic energy in which liquid flow is modulated, a load coupling structure including a liquid filled drive cavity, and a coupling element including a stepped piston transformer in series between said source and said liquid filled drive cavity, said load coupling structure and said coupling element defining a tuned filter having a center frequency f_o and bandwidth Δf over which said acoustic energy is transmitted to said load.

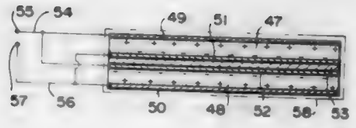
4,695,988

UNDERWATER PIEZOELECTRIC ARRANGEMENT

Hisao Banno, Tokkai, Japan, assignor to NGK Spark Plug Co. Ltd., Japan

Filed Sep. 5, 1985, Ser. No. 772,911
Claims priority, application Japan, Sep. 12, 1984, 59-192318; Oct. 19, 1984, 59-221050
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—154 11 Claims





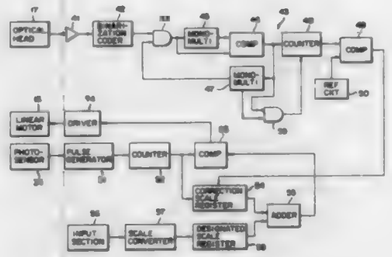
1. An underwater piezoelectric arrangement comprising first and second piezoelectric layers, said first piezoelectric layer being made of a polarized ceramic-polymer composite having a first hydrophone constant and generating electrostatic charges of opposite polarities on the opposed surfaces thereof in response to stresses which act on said first piezoelectric layer in a direction parallel to said surfaces thereof, said second piezoelectric layer being made of a poled ceramic-polymer composite having a second hydrophone constant smaller than said first constant and generating electrostatic charges of opposite polarities on the opposed surface thereof in response to stresses which act on said second piezoelectric layer in a direction parallel to said surfaces thereof, the levels of said charges generated on the surfaces of each of said piezoelectric layers in response to said stresses being substantially equal; positive and negative electrode members on respective opposed surfaces of each of said first and second piezoelectric layers; means for electrically connecting the positive electrode member of said first layer and the negative electrode member of said second layer, and for electrically connecting the negative electrode member of said first layer and the positive electrode member of said second layer; and means for connecting a pair of terminals to said positive electrode members and negative electrode members so as to provide detection of an output signal produced in accordance with the difference between the hydrophone constants of said first and second piezoelectric layers only in response to acoustic waves being received by the arrangement and so as to provide cancellation of noise signals produced in accordance with said charges on said first and second piezoelectric layers.

4,695,989

OPTICAL DISC APPARATUS WITH SELECTIVE TRACK ACCESSING USING A CORRECTION SCALE VALUE

Katsumi Kimoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 525,821, Aug. 23, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 912,662
Claims priority, application Japan, Aug. 31, 1982, 57-150955
Int. Cl.[4] G11B *27/28, 7/095, 21/08*
U.S. Cl. 369—32 5 Claims



1. An optical disk apparatus comprising:

optical head means, movable in a radial direction on an optical disk having a number of tracks including inner and outer tracks, said optical head means having a photosensor for photoelectrically detecting said tracks to produce a track signal having constant signal components corresponding to said tracks, said photosensor photoelectrically detecting at least one of scars, scratches and dust accidentally existing on said optical disk to produce an irregular signal;

driving means for driving said optical head means in a radial direction on said optical disc;

gate means supplied with the track signals and irregular signal produced from said photodetector of said optical head means to inhibit the irregular signal corresponding to at least one of scars, scratches and dust and to pass the track signal;

means for obtaining a reference position signal from the track signal passed through said gate means and corresponding to one of the inner and outer tracks;

scale means having an initial position for measuring the extent of movement of said optical head from said initial position;

means for determining a measured value of said scale means as a correction scale value corresponding to a difference between the initial position of said scale means and the reference position of the optical disk, in response to said reference position signal;

means for generating track designation data designating a desired track of said optical disc; and

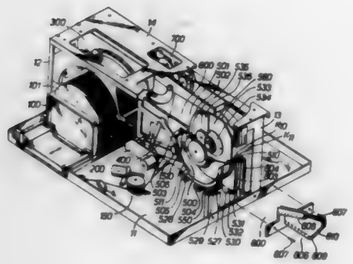
accessing means for determining a preset position of said optical head from said correction scale value and track designation data and causing said driving means to move said optical head to said preset position, said accessing means including means for converting said track designation data into a designated scale value, means for adding together said designated scale value and said corrected scale value to obtain an access scale value, and means for comparing a scale value corresponding to the extent of movement of said scale means and said access scale value.

4,695,990

AUTOCHANGER TYPE DISC PLAYER

Hiroshi Kawakami, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Division of Ser. No. 618,937, Jun. 8, 1984, Pat. No. 4,601,026. This application Mar. 4, 1986, Ser. No. 836,160
Claims priority, application Japan, Jun. 13, 1983, 58-105281
Int. Cl.[4] G11B *17/04, 17/22*
U.S. Cl. 369—38 9 Claims



1. An autochanger type disc player for selectively playing stored discs comprising:

a housing having a disc storage section, a disc playback section, and means for slidably positioning said disc storage section relative to said disc playback section, said disc storage section having means for retaining a plurality of said discs, said disc playback section having means for individually playing said discs and means for holding said playback section in a receive position and an unload position;

first disc transferring means between said disc storage section and said playback section to allow transfer of said discs from said disc storage section to said receive position, said first disc transferring means including loading means for transmitting a first rotating force to said discs and for guiding said discs along said first disc transferring means, said loading means including pulley means for rotatably engaging the periphery of said discs and a loading member for continuing rotation of said discs within said first disc transferring means and for guiding said discs into said receive position;

second disc transferring means between said disc storage section and said playback section to allow transfer of said discs from said unload position to said disc storage section, said second disc transferring means including unloading means for transmitting a second rotating force to said discs in a direction of rotation opposite said first rotating force and for guiding said discs into said disc storage section;

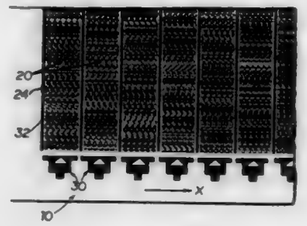
means for controlling said disc playback section and said means for slidably positioning said disc storage section, wherein said retaining means is aligned with said second disc transferring means to allow said disc playback section to play discs received from said disc storage section through said first disc transferring means and to return said discs to said disc storage section through said second disc transferring means.

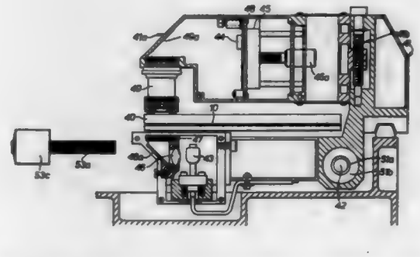
4,695,991

READING INFORMATION STORED IN MULTIPLE FRAME FORMAT

Geoffrey M. Hudson, Fitzroy, Australia, assignor to Storage Research Pty. Ltd., Hawthorn, Australia

Continuation-in-part of Ser. No. 403,763, Jul. 28, 1982, abandoned. This application Apr. 20, 1984, Ser. No. 602,453
Claims priority, application Australia, Dec. 9, 1980, PE6831; Dec. 9, 1981, PCT/AU81/00188; Nov. 8, 1983, PG2272
Int. Cl.[4] G11B *7/09, 20/10*
U.S. Cl. 369—44 59 Claims





42. A method of observing a succession of machine readable position markers in a medium comprising:

observing the markers in turn and storing observed values indicating marker position for at least two markers preceding each marker being observed;

determining whether each observed value is outside a selected trend established by the stored values by more than a predetermined margin; and, if so,

reducing the effect of that value.

4,695,992

OPTICAL INFORMATION RECORDING-REPRODUCING APPARATUS IN WHICH THE RELATIVE POSITION OF A PRIMARY BEAM AND SECONDARY BEAMS ON RECORDING MEDIUM IS VARIED DURING RECORDING AND REPRODUCTION OF INFORMATION

Shigeru Aoi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,060
Claims priority, application Japan, Jan. 31, 1983, 58-12659; Jan. 31, 1983, 58-12663
Int. Cl.[4] G11B *7/135, 7/00*
U.S. Cl. 369—46 8 Claims

1. An optical information recording-reproducing apparatus comprising:

a light source;

grating means for splitting a beam from said light source into a primary beam and at least two secondary beams;

an optical system for applying the primary beam and the secondary beams to a recording medium;

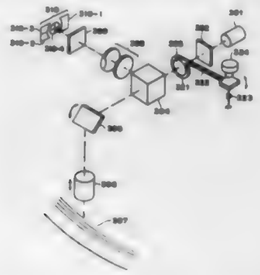
means for selectively carrying out an information recording on the recording medium in the form of an information

track by the primary beam and a reproduction of the recorded information from the information track;

means for detecting the secondary beams modulated by the recording medium to obtain a tracking signal;

means for effecting tracking of the primary beam and the secondary beams according to the tracking signal; and

means for varying a relative position of the primary beam and the secondary beams on the recording medium between times of the information recording and the information reproduction so that at least two of the secondary beams are applied to positions different widthwisely of the information track and not applied to a guide track adjacent to the information track being and not applied to a guide track adjacent to the information track scanned by the primary beam, at the time of the information reproduction, and that at least a part of at least one of the secondary beams is applied to said guide track adjacent to the information track being formed by the primary beam, at the time of the information recording.



4,695,993

OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS AND OPTICAL DISC

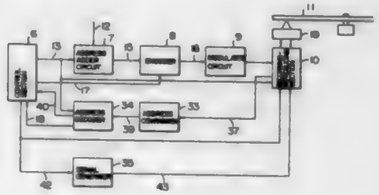
Yuuji Takagi; Isao Satoh, both of Neyagawa, and Tatsuo Sugimura, Fukuoka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 10, 1985, Ser. No. 743,314

Claims priority, application Japan, Jun. 15, 1984, 59-122999; Jun. 15, 1984, 59-123005; Nov. 19, 1984, 59-243665

Int. Cl.[4] G11B *5/09, 15/04*

U.S. Cl. 369—54 **6 Claims**



1. An information recording and reproducing apparatus comprising means including a recording medium having an information recording region divided into a plurality of sectors each having an address part recorded with an address signal and a data recording part to be recorded with data, and means for overwriting a predetermined signal in the address part of a sector thereby making the reproduction of the sector address of the address part impossible.

4,695,994

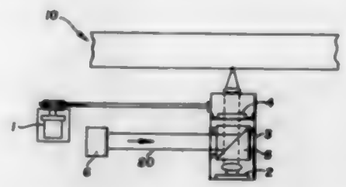
METHOD AND APPARATUS FOR VARYING LASER INTENSITY LEVEL

Christiaan Steenbergen, Colorado Springs, Colo.; Peter G. Howard, Eugene, Oreg.; Roger R. Bracht, and Henk van der Put, both of Colorado Springs, Colo., assignors to Laser Magnetic Storage International Company, Colorado Springs, Colo.

Filed Apr. 5, 1985, Ser. No. 720,218

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—54 **19 Claims**



1. In an information storage device which employs radiant energy from a radiant energy source for reading and writing detectable modulations in record media for use with said storage device, wherein the point of application of said radiant energy upon said media and said media are moveable relative to one another, apparatus used during the write operation comprising:

a radiant energy source controlling apparatus for varying the intensity of radiant energy at said point of application in said record media among at least a low tensity first level sufficient for reading, a second level of higher intensity than said first level sufficient for writing, and an intermediate level of an intensity different from said first level and insufficient for writing during the normal operations of said information storage device but of a high intensity than that required for reading;

first means for causing said radiant energy source to emit radiant energy at said second level during a period of writing the detectable modulations in the record media;

second means for causing said radiant energy source to emit radiant energy at said first level during a period of reading the detectable modulations in the record media; and

third means for causing said radiant energy source to emit radiant energy at said intermediate level during a period when not writing of the detectable modulations is being done.

4,695,995

FRONT LOADING DISK PLAYER WITH IMPROVED DISK SENSOR POSITIONING

Toshiaki Koizumi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

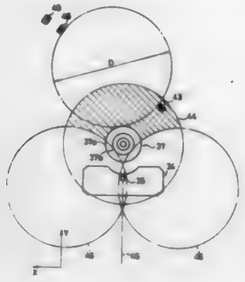
Filed Aug. 27, 1985, Ser. No. 769,644

Claims priority, application Japan, Aug. 28, 1984, 59-179024; Aug. 28, 1984, 59-179025

Int. Cl.[4] G11B *17/04*

U.S. Cl. 369—75.2 **5 Claims**

1. A front loading disk player comprising: a housing (2); playing means provided in said housing including an optical pickup and a turntable (37), said turntable comprising a tapered wheel (37*b*) sized to be received in a center hole of a disk; a disk conveying mechanism for conveying a disk to a playing position, said disk conveying mechanism comprising a disk carrying portion (10,19) capable of carrying any one of a plurality of disks (16,17,18) of different outer diameters; means for selectively projecting said disk carrying portion out of said housing and retracting said disk carrying portion into said housing; a clamping mechanism for clamping a disk conveyed to said playing position against said turntable; and detecting means for detecting when said disk has been clamped in said playing position against said turntable, said detecting means comprising a reading spot of said optical pickup and a smallest disk sensor (43) for detecting the presence of a smallest diameter disk, said smallest disk sensor having a detecting point disposed within a range (44) outside an outer circumference of said smallest diameter disk (16) with a center of a rotary shaft of said turntable as a center of said smallest diameter disk, and said range excluding a portion encompassed by a locus of cylinders (46) having diameters which are equal to the diameter of said smallest disk, said cylinders circumscribing the reading spot on a locus (45) of reading spots of said optical pickup and being tangent to said outer circumference of said tapered wheel.



4,695,996

AUTOMATIC LOADING DISC PLAYER

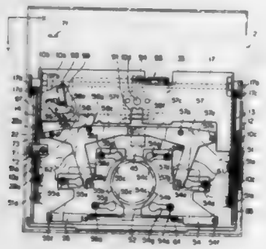
Masanori Sugihara; Atsushi Kurosawa; Akihiko Okamoto, all of Kawagoe; Kouji Shimoda, Tokorozawa; Toshiyuki Kimoto, Tokorozawa, and Tomomitsu Koono, Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 721,933

Claims priority, application Japan, Apr. 11, 1984, 59-072050; Sep. 25, 1984, 59-200153; Sep. 25, 1984, 59-200147

Int. Cl.[4] G11B *3/60*

U.S. Cl. 369—77.1 **7 Claims**



1. An automatic optical disc player of anti-shock type, which comprises:

a housing having an elongated slot;

a chassis member mounted within and on said housing via a first decoupling resilient means;

disc playback means accommodated within said housing; and

disc carrier means mounted direct on said chassis member for carrying a disc inserted into said slot between a start position close to said slot and a transfer position close to said playback means and for transferring and receiving said disc to and from said playback means,

said disc playback means including a support structure mounted on said chassis member via second decoupling resilient means, disc drive means rigidly mounted on said support structure for rotating said disc transferred thereto from said disc carrier means about a rotating axis, and optical pick-up means for reading a signal from said disc,

said pick-up means including a carriage assembly carrying thereon said optical pick-up device which emits a light beam and produces an electric signal converted from an optical signal contained in a reflected light beam returned thereto, guide assembly rigidly mounted on said support structure for guiding said carriage assembly along a radial direction of said rotating axis, and a positioning assembly connected to said carriage assembly for positioning said carriage assembly with respect to said support structure structure while urging said carriage assembly to move along said guide assembly,

said support structure being hung through said second resilient means from said chassis member.

4,695,997

DEVICE FOR PERFORMING WRAP TESTS ON A MULTIPLEX LINK IN A DATA COMMUNICATION SY5TEM

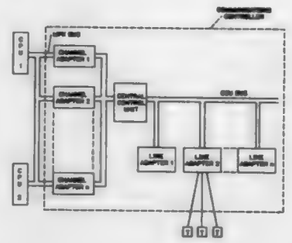
Gerard M. Montanari, Cagnes/Mer; Francis E. Baudelot, Nice, and Michel L. Costes, Cagnes/Mer, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 14, 1985, Ser. No. 744,704

Claims priority, application European Pat. Off., Jun. 29, 1984, 84430023.6

Int. Cl.[4] H04J *1/16*; H04M *1/24*

U.S. Cl. 370—13 **1 Claim**



1. In a communication system for the bidirectional exchange of messages between a central process unit (CPU) and a time multiplexed link serving a number of remote terminals via a communication controller which includes a central control unit (CCU) connected to the CPU and to the time multiplex link via a line adapter (LA) having a line scanner, a device for performing wrap tests on the multiplex line within any given time slot compriaing,

first means (2, 12) for setting a wrap control bit which is associated with the bits from the CPU to be transmitted within each time slot, to a first or to a second state indicating that the link is either in wrap test mode or in a normal mode of operation, and

second means (32, 51) including a logic circuit responsive to the state of said wrap control bit to cause the data bits received from the CPU to be returned to the CPU within those time slots during which said wrap control bit is in a first state ("O") or to cause the data bits received from the CPU to be sent over the multiplex link, and those received from the multiplex link to be sent to the CPU during those time slots within which said wrap control bit is in the second state ("1"), said second means includes:

first input registers (10 and 12) which receive from the line scanner, whenever a line is scanned, the bit to be transmitted over the scanned line and the associated control bits including said wrap control bit,

a memory (16) a storage area of which is allocated to each line and which receives, under the control of a transfer circuit (14), the contents of said first registers, so as to

assemble the data bytes to be transmitted during the time slots allocated to the lines,

first output registers (**30, 32**) the first of which receives at appropriate times, under the control of a transfer circuit (**28**) responsive to Frame Start Identification (F) and Signal Element Timing (S) signals from the multiplex link, the data bytes and the associated control bits from the storage areas of said memory,

second input registers (**40** and **42**) which receives from the multiplex link the data bits and the associated control bits,

a memory (**48**) a storage area of which is allocated to each line and whic receives within each time slot under the control of a transfer circuit (**46**) responsive to the Frame Start Identification and Signal Element Timing signals from the multiplex link, the data bits and the associated control bits,

second output registers (**15, 17**) which receives during each line scan period the content of said storage area through a transfer circuit (**50**) to thereby deserialize the bits received within each time slot and send said bits, one at a time, to the scanner whenever a line is scanned,

said logic circuit including:

a first set of gates (**86, 84, 82, 80**) which are closed when the wrap control bit is in said second state to send the data and control bits, except the wrap control bit, contained in said first output registers over the multiplex link and to transfer the bits received from the multiplex link to the second input register, and which are open when said wrap control bit is in said first state, and

a second set of gates (**81, 87**) which are closed when the wrap control bit is in the first state and open when said bit is in the second state, to thereby cause the data and control bits, except said wrap control bit, in said first output registers (**30, 32**) to be transferred to the second input registers (**40, 42**).

4,695,998

METHOD AND CIRCUIT ARRANGEMENT FOR THE COMPENSATION OF ECHO SIGNALS

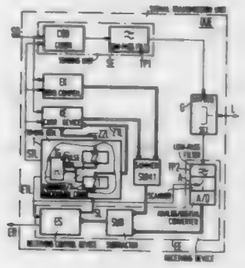
Gero H. J. Schollmeier, Gauting, and Heinrich Sailer, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,850

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327467

Int. Cl.[4] **H04B** *3/20*

U.S. Cl. 370—32.1 **10 Claims**



1. In a method for the compensation of echo signals in a signal transmission unit for the duplex transmission of digital signals which signal transmission unit is connected to a duplex channel arrangement with a two-wire line, which signal transmission unit includes a sending device and a receiving device, and in which signal transmission unit, compensation signals are generated by an echo compensator for the compensation of echo signals that are received in the receiving device of the signal transmission unit when digital signals are sent by the sending device of the signal transmission unit over the two-wire line where,

echo compensation signals are subtracted in the receiving device of the signal transmission unit from digital signals and the echo signals received in the receiving device at scanning times that occur in uniform time intervals, and, where

adjustment data are fed by the receiving device to a timing generator to regulate the phase position of clock pulses of a clock pulse sequence in predetermined phase grid steps which clock pulses determine by their occurrence the scanning times, the improvement in said method comprising the steps of:

(a) accumulating control data for shifting the phase position of the clock pulses by an amount determined by a phase grid step and maintaining a phase position that has been previously set;

(b) deriving correction signals based upon the accumulated control data and summing said correction signals with the echo compensation signals so that echo signals are substantially eliminated; and

(c) shifting the phase position of the clock pulses by only one phase grid step when the accumulated control data reaches a predetermined threshold.

4,695,999

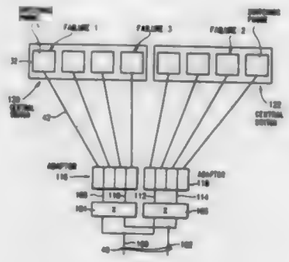
CROSS-POINT SWITCH OF MULTIPLE AUTONOMOUS PLANES

Gerald Lebizay, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 624,881, Jun. 27, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 903,862

Int. Cl.[4] **H04Q** *11/04*

U.S. Cl. 370—58 **6 Claims**



1. A switching system for selectively connecting a plurality of users, comprising:

(1) a central switching station, said central switching station comprising a plurality of switching units, each of said switching units comprising a plurality of switching planes;

(2) a plurality of data links, each of said data links being coupled at a first end thereof to a respective one of said switching planes; and

(3) a plurality of user stations, each of said user stations comprising:

a. a plurality of switching adaptor means for dividing data messages to be transmitted to another user station onto a plurality of said data links and for receiving divided data messages on said data links and recombining said divided data messages, at least one of said adaptor means being provided for each of said switching units, each of said adaptor means comprising a plurality of sets of mini-adaptors, each of said mini-adaptors being coupled to a second end of a respective one of said data links; and

b. switching means for distributing data between internal data lines of said user station and selected ones of said mini-adaptors of selected sets of mini-adaptors, only one mini-adaptor of any one set being selected at any one time;

wherein failure of at least one switching plane within each of said switching units can occur without loss of bandwidth for message transmission between pairs of users connected through said central switching station and said bandwidth can be varied by selection of a number of sets of said mini-adaptors used for transmission.

4,696,000

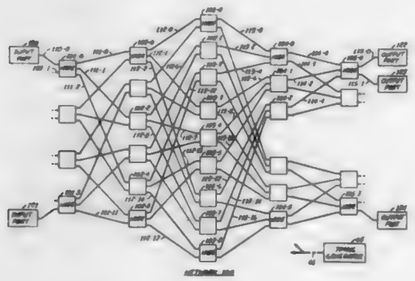
NONBLOCKING SELF-ROUTING PACKET AND CIRCUIT SWITCHING NETWORK

William A. Payne, III, Lombard, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 12, 1985, Ser. No. 808,344

Int. Cl.[4] **H04Q** *11/04*

U.S. Cl. 370—60 **10 Claims**



1. A non-blocking switching network for the communication of packets and circuit switched information from network input ports to network output ports, said network comprising:

a plurality of sequential broadcast stages followed by a plurality of routing stages;

a plurality of sequential links for sequentially interconnecting said stages;

each of said broadcast stages comprises a plurality of switch nodes each responsive to the receipt of address signals designating an output port received from one of said input ports for communicating the received address signals as a plurality of sets of said received address signals to all of the interconnected nodes of a subsequent one of said stages;

each of said routing stages comprises a plurality of switch nodes each comprises means responsive to receipt of a plurality of sets of said address signals for selecting one of said sets; and

each of said switch nodes of said routing stages further comprises means responsive to the selected one of said sets of address signals for transmitting said one of said sets to the switch node in the subsequent stage designated by said address signals.

4,696,001

RECONFIGURABLE HIGH-SPEED INTEGRATED LOCAL NETWORK

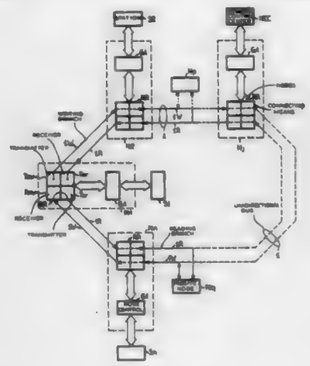
Fabrizio Gagliardi, Turin; Livio Lambarelli, Turin; Gianfranco Panarotto, Turin; Daniele Roffinella, Moncalieri, and Maurizio Sposini, Valdellatorre, all of Italy, assignors to Cselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 8, 1986, Ser. No. 817,031

Claims priority, application Italy, Mar. 6, 1985, 67229 A/85

Int. Cl.[4] **H04J** *3/14*

U.S. Cl. 370—88 **12 Claims**



1. Reconfigurable high-speed integrated local network comprising:

a unidirectional optical fiber line;

a plurality of stations, each of said plurality of stations forming a node, said node being selected from the group of bus-head node, folding-point node, bus-head-folding-point node, transit node, and passive node, said plurality of stations being connected by said line, said plurality of stations exchange through said line information coded and organized in hybrid frames having a first region assigned to circuit switched communications and a second region assigned to packet switched communications, whereby said line being bus folded, at said folding-point node, as to form a writing branch and a reading branch, said writing branch and said reading branch being active at the same time, wherein said writing branch begins and said reading branch ends at said bus-head node, if said folding-point node and said bus-head node are identical herein referred to as said bus-head-folding-point node, wherein at said transit node said line information being received via said writing branch is sent to a next node via said writing branch and said line information being received via said reading branch being sent to said next node via said reading branch, and wherein at said passive node there being no regeneration of said information, each of said plurality of stations comprising:

a connecting means for connecting and reconfiguring each of said plurality of stations to said line, wherein during regular network operations said bus-head node and said folding-point node are identical forming said bus-head-folding point node, whereby during a failure in said network, said connecting means isolates said failure in said network referred to as a failed component, wherein said connecting means reconfigures said bus-head-folding-point node to form said transit node and first adjacent station of said plurality of stations forming said folding-point node and second adjacent station of said plurality of stations forming said bus-head node, said connecting means for each of said plurality of stations being controlled locally at each of said plurality of stations, and

a line access means for line access handling an ordered access protocol for each of said plurality of stations in said first region and said second region, said protocol being based on physical position of said node and being such that each of said plurality of stations access said unidirectional optical fiber line, said line access means having a frame signal generator, which at least generates a start-of-frame signal, a region-boundary signal, a start-of-packet-round signal, wherein only said frame signal generator of said bus-head node being enabled.

4,696,002

RESETTING CIRCUIT FOR MICROPROCESSORS

Richard Schleupen, Ingersheim; Ulrich Mayer, Waiblingen; Bernhard Bauer, Renningen, and Arnd M. Laugner, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

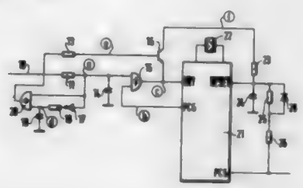
PCT No. PCT/DE85/00089, § 371 Date Oct. 3, 1985, § 102(e) Date Oct. 3, 1985, PCT Pub. No. WO86/00155, PCT Pub. Date Jan. 3, 1986

PCT Filed Mar. 20, 1985, Ser. No. 787,795

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421584

Int. Cl.⁴ G06F *11/04*

U.S. Cl. 371—12 **6 Claims**



1. In a reset circuit for a microprocessor, in particular for a micro-processor for controlling systems in motor vehicles, said microprocessor being cyclically fed from a system to be controlled by input signals fed at an input of said microprocessor, said microprocessor having an output at which output signals are emitted, the improvement comprising means for receiving and combining said input signals with said output signals, said means (17 to 20, 40 to 43, 50 to 55) being connected to said input and output, respectively, and generating reset signals for said microprocessor if a predetermined output signal at said output of the microprocessor does not follow a switching signal of the cyclically fed signals.

4,696,003

SYSTEM FOR TESTING INTERACTIVE SOFTWARE

Randal H. Kerr, Richford, and Robert M. Mesnard, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1986, Ser. No. 838,239

Int. Cl.⁴ G06F *11/00*

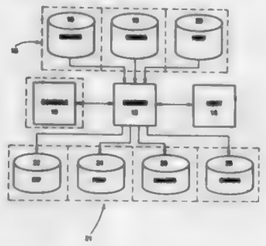
U.S. Cl. 371—19 **17 Claims**

1. A method for testing host resident interactive software, the steps comprising:

(a) executing a first version of host resident interactive software;

(b) capturing an interactive test case generated during said execution of said software;

(c) executing said test case on a second version of said interactive software, said second version of said intereactive software being different than said first versin thereof;



(d) detecting differences between said different versions of said interactive software; and

(e) presenting said differences.

4,696,004

LOGIC ANALYZER

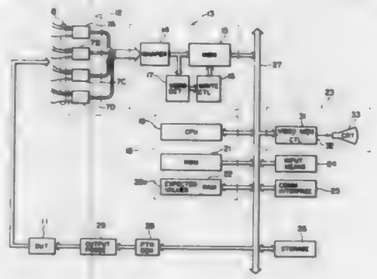
Takayuki Nakajima, Gyoda; Tetsuo Aoki, Kohnosu; Katsumi Kobayashi, Gyoda, and Noboru Akiyama, Kumegaya, all of Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,466

Claims priority, application Japan, May 28, 1984, 59-108921; May 30, 1984, 59-110380

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—25 **12 Claims**



1. A logic analyzer for a circuit under test having plurality of output channels, comprising:

data storage memory means, coupled to the circuit under test, for sequentially storing a plurality of output data simultaneously obtained from the plurality of output channels of the circuit under test in response to respective input data supplied to the circuit under test;

expected value memory means for storing expected value data corresponding to the expected values of said output data;

comparison means, operatively connected to said data storage memory means and said expected value memory means, for comparing said output data from said data storage memory means with the corresponding expected value data stored in the expected value memory means;

code producing means for producing character codes of block elements each representing plural input and output bits being compared and indicating whether there is any mismatch in each block of a predetermined number of the data patterns;

display means, of a scanning type and including a display screen, for displaying dot patterns of block elements and characters on the display screen;

video memory means for storing character codes representing the respective block elements and characters at addresses corresponding to respective positions of display on said display screen and reading therefrom the character codes in synchronism with scanning of said display means;

dot pattern memory means having stored therein dot patterns of the block elements and characters, for receiving the character codes read out from said video memory means and reading out from said dot pattern memory means the dot patterns of the block elements and characters using the character codes as addresses; and

control unit means for writing the character codes of the block elements and characters into said video memory means at the addresses corresponding to the positions on said display screen such that the block elements are displayed in matrix form and the characters are displayed around the matrix on said display sceen.

4,696,005

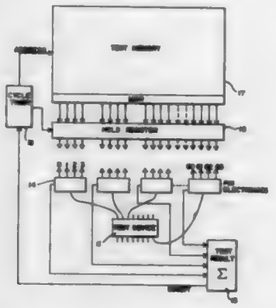
APPARATUS FOR REDUCING TEST DATA STORAGE REQUIREMENTS FOR HIGH SPEED VLSI CIRCUIT TESTING

Ernest H. Millham, Catlett, Va.; John J. Moser; John J. Shusherebe, both of Essex Junction, and Gary P. Visco, Hinesburg, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,592

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—27 **9 Claims**



1. In an automatic testing system, apparatus for supplying test data for a plurality of test cycles identifying test conditions for a multipin electronic circuit, comprising:

a random access memory having a plurality of higher order addresses identifying a plurality of memory rows containing a complete field of test data, some of said rows containing an operational code specifying a number of subsequent test cycles over which a minority of data in said rows are to change without changing the remaining data of the row, and having a smaller number of lower order addresses which contain data in the same position within the data field as said minority of data;

means for sequentially addressing each of said higher order addresses;

a repeat buffer for sequentially addressing said lower order addresses;

a hold register for receiving each row of addressed data in said memory and for outputting test data identifying test conditions for a multipin electronic circuit; and

processor means for indexing said means for sequentially addressing said higher order addresses and decoding each operational code received in said holding register, said processor connected to inhibit addressing by said means for sequentially addressing said higher order addresses and addressing said repeat buffer for a number of test cycles identified by said operational code whereby only said minority of data bits in said holding register having a field position corresponding to data bits in said lower order memory address change.

4,696,006

METHOD OF GENERATING TEST PATTERNS FOR LOGIC NETWORK DEVICES

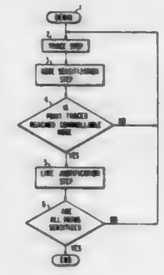
Masato Kawai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,114

Claims priority, application Japan, Nov. 26, 1984, 59-248244

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—27 **13 Claims**



1. A method of testing a network, said network comprising a controllable node responsive to a given input pattern, an operator node for performing a predetermined function for the input pattern, an observable node for observing an output of the operator node and signal path segments for connecting the nodes, said method including the steps of:

tracing a path from said observable node to said controllable node through operator node;

determining a sensitizing condition for sensitizing said traced path;

generating an input pattern sequence for sensitizing said traced path, said input pattern sequence comprising at least first and second input patterns provided at different times;

applying said generated patterns to said network: and

examining outputs of said network to determine the existence of faults in said network.

4,696,007

METHOD OF CORRECTING ERRORS IN BINARY CODED WORDS

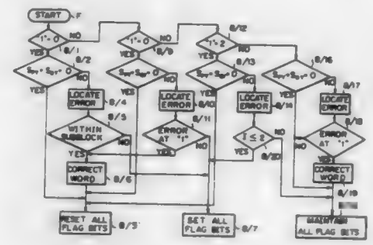
Yoshiaki Moriyama, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 756,687

Claims priority, application Japan, Jul. 20, 1984, 59-150765

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37 **9 Claims**



1. A method of correcting errors in binary coded words

organized in a word block consisting of a plurality of data words and a plurality of error check words and consisting of a plurality of subblocks which can be selectively grouped on the basis of one of three different criteria to form one of three different sets of subblocks which consist of first, second and third sets of subblocks wherein, if at least two of the data words and error check words in said word block are included in one of said first, second and third subblocks, said at least two of the data words and error check words could not be concurrently included within each of the other subblocks, comprising

generating a first error correction code on the basis of each of the subblocks in said first set of subblocks, a second error correction code on the basis of each of the subblocks in said second set of subblocks, and an error detection code on the basis of each of the subblocks in said third set of subblocks,

adding a binary coded flag to each of said plurality of data words and said plurality of error check words, said flag being indicative of the presence or absence of an error within the word to which the flag is added,

detecting errors within each of said third set of subblocks on the basis of each of said error detection codes,

correcting errors within each of said first set of subblocks on the basis of said first error correction code with reference to the flags respectively added to the words in each of the subblocks and correcting errors within each of said second set of subblocks on the basis of said second error correction code with reference to the flags respectively added to the words in each of the subblocks,

altering the flag of any of the data and error check words in each of said first set of subblocks each time the correction of errors within each of said first set of subblocks is complete and altering the flag of any of the data and error check words in each of said second set of subblocks each time the correction of errors within each of said second set of subblocks is complete thereafter so that, each time the flag is altered, the flag is indicative of the absence of an error if a word being checked for an error is unlikely to contain an error and indicative of the presence of an error if the word being checked for an error is likely to contain an error or is likely to fail to be detected to be in error,

altering the flag of any of the data and error check words if the flag has remained unaltered after the correction of errors on the basis of said first error correction code or on the basis of said second error correction code and if additionally the detection of errors on the basis of said error detection code is executed immediately upon correction of errors, and

maintaining the flag of any of the data and error check words so that the flag maintained coincides with the flag added to the word being checked for an error before the word was corrected if the flag has remained unaltered after the correction of errors on the basis of said first error correction code or on the basis of said second error correction code and if additionally the detection of errors on the basis of said error detection code is not executed immediately upon correction of errors,

characterized in that correction of errors is effected a plurality of times for the data and error check words in a subblock on the basis of at least one of the first error correction code and the second error correction code and in that the manner of altering the flag of any of the data and error check words in each of said first set of subblocks or in each of said second set of subblocks and the manner of correcting errors within each of said third set of subblocks are varied depending upon the numbers of times the correction of errors is repeated.

4,696,008

DATA STORING DEVICE HAVING POSITION DETERMINING MEANS

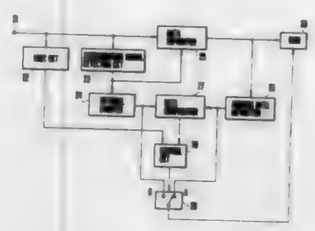
Masahiro Takei, Kanagawa; Susumu Kozuki, Tokyo; Toshiyuki Masui; Masahide Hirasawa, both of Kanagawa, and Motokazu Kashida, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Nov. 28, 1984, Ser. No. 675,766

Claims priority, application Japan, Dec. 2, 1983, 58-228689; Dec. 2, 1983, 58-228690

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—47 **9 Claims**



1. A data storing device comprising:

(a) first separation means for separating synchronizing data from a plurality of transmitted data blocks each including the synchronizing data, address data and information data;

(b) second separation means for separating the address data from the plurality of transmitted data blocks;

(c) counting means for counting the synchronizing data separated by said first separation means;

(d) error detection means for detecting data errors in each of said transmitted data blocks;

(e) output means for selectively outputting the address data separated by said second separation means or data produced by said counting means based on an output signal of said error detection means; and

(f) storing means for storing the information data in a memory at positions determined by output data from said output means.

4,696,009

METHOD AND ARRANGEMENT FOR PRODUCING ULTRASHORT LIGHT PULSES

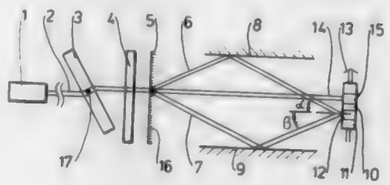
Karl-Ernst Süse, 1, Hermann-Matern-Strasse, 6902 Jena-Lobeda, and Frank Weidner, No. 20b, 6901 Löhachütz, No. 20b, District of Gera, German Democratic Rep.

Filed Nov. 25, 1985, Ser. No. 806,890

Claims priority, application German Democratic Rep., Dec. 27, 1984, 2718100

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—25 **11 Claims**



4. Device for producing ultrashort light pulses comprising

a pumping radiation source for emitting a substantially coherent bundle of radiation,

means for focusing said coherent bundle of radiation and for producing therefrom first, second and third partial bundles of coherent radiation,

first deviating means,

second deviating means,

a laser active material,

said first deviating means and said second deviating means being arranged to direct said first partial bundle and said second partial bundle, respectively, for superimposition of said first and said second partial bundle and for interference pattern formation in a first range of said laser active medium for producing laser radiation therein, means for directing said third partial bundle upon a second range in said laser active medium through which said laser radiation passes

means for mutually displacing said first and said second ranges, and means for adjusting the energy of said first two partial bundles with respect to the energy in said third partial bundle.

4,696,010

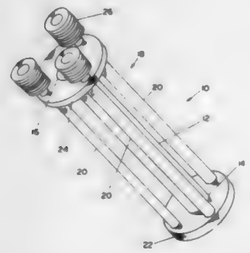
THERMALLY STABILIZED LASER CAVITY

George Y. Eastman, Lancaster, Pa., assignor to Thermacore, Inc., Lancaster, Pa.

Filed Jul. 16, 1986, Ser. No. 886,169

Int. Cl.⁴ H01S *3/04*

U.S. Cl. 372—34 **8 Claims**



1. A temperature stabilized laser cavity support structure comprising:

at least two heat pipes functioning as structural elements in a laser cavity; and

thermal stabilization means attached to all the heat pipes and furnishing a heat transfer path between them to maintain the heat pipes at essentially the same temperature.

4,696,011

LASER DEVICE EMPLOYING A POROUS MATERIAL IN THE DISCHARGE CHAMBER

Andrew J. Kearsley, Oxford, England, assignor to Oxford Lasers Limited, Oxford, England

Filed Oct. 18, 1985, Ser. No. 788,976

Claims priority, application United Kingdom, Oct. 18, 1984, 8426319

Int. Cl.⁴ H01S *3/03*

U.S. Cl. 372—61 **16 Claims**



1. A laser device comprising

a hollow elongated element, the interior of said element forming a discharge chamber;

a lasing medium contained within said chamber;

means for producing within said chamber conditions for stimulated emission of said medium; and

a porous material extending along at least a major portion of the length of the interior of said hollow elongated element, a portion of said lasing medium being vaporized when said conditions for stimulated emission exist within said chamber and the remainder thereof being molten, the molten portion of said lasing medium being absorbed into said porous material and retained therein without allowing conduction therethrough along the length of said chamber.

4,696,012

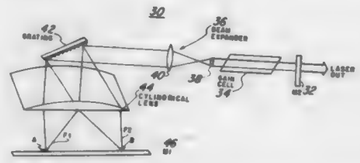
TUNABLE MULTILINE/MULTIBAND LASER

Robert C. Harshaw, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 11, 1985, Ser. No. 743,545

Int. Cl.⁴ H01S *3/08*

U.S. Cl. 372—99 **14 Claims**



1. A tunable multiline/multiband laser comprising a partial reflecting mirror, gain cell, splitting means and a mirror means constituting an optical path, the splitting means for spatially separating initially parallel rays of different wavelengths originating from the gain cell and projecting the spectrum onto the surface of the mirror means operable for normalizing the round trip gain of each frequency component.

4,696,013

VESSEL OF A METALLURGICAL FURNACE, ESPECIALLY OF AN ARC FURNACE

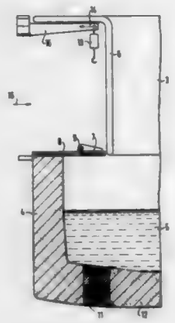
Joachim Ehle, Lautenbach; Gerhard Fuchs, Kehl-Bodersweier; Klaus Kimmer, Willstätt, and Horst-Rüdiger Langfeldt, Baden-Baden, all of Fed. Rep. of Germany, assignors to Fuchs Systemtechnik GmbH, Willstätt-Legelshurst, Fed. Rep. of Germany

Filed Sep. 10, 1986, Ser. No. 905,494

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533755; Nov. 27, 1985, 3541873; Mar. 10, 1986, 3607906

Int. Cl.⁴ F27D *1/00, 3/00*

U.S. Cl. 373—71 **30 Claims**



1. A furnace vessel of a metallurgical furnace, in particular an electric arc furnace comprising:

(a) a lower vessel, oval in plan, for accommodating a molten metal bath and having a refractory lining, a floor, and a tap hole disposed eccentrically in the floor; the tap hole

being arranged within the lower vessel in the region of the longitudinal axis of the oval in the vicinity of the wall of the vessel;

(b) an upper vessel formed from fluid-cooled wall elements and having a lower edge which is fitted on to an upper edge of the lower vessel; the upper vessel, above the tap hole, including an upper vessel portion which is displaced relative to the lower vessel towards the center of the vessel; and

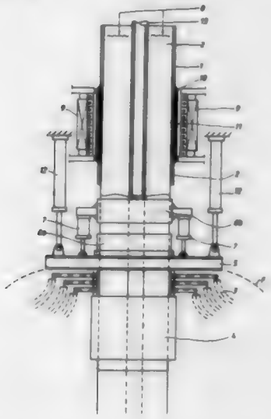
(c) a maintenance opening located above the tap hole in said upper vessel portion and closable by a cover.

4,696,014

SELF-BAKING ELECTRODES

Bengt Orrling, Linköping, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 22, 1986, Ser. No. 909,924
Claims priority, application Sweden, Sep. 25, 1985, 8504425
Int. Cl.⁴ H05B *7/107*
U.S. Cl. 373—89 **9 Claims**



1. Apparatus for producing a consumable electrode, for use in a melting or reduction are furnace, from an electrode paste contained in a metallic casing and for supplying electrical current to the electrode by means of at least one current supply unit,

the improvement wherein

an electrode heater is arranged in the direction of advance of the electrode into the furnace upstream of the current supply unit, said electrode heater being arranged to be moved in said direction of advance with the electrode when the electrode is advanced into the arc furnace, said electrode heater surrounding the electrode paste and being adapted to supply thermal energy to the electrode paste to bake it into a selfcoherent form before it reaches the current supply unit.

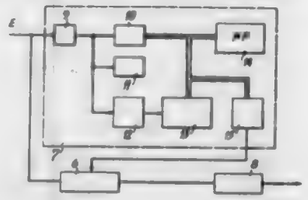
4,696,015

ECHO CORRECTION ESPECIALLY FOR TELEVISION BROADCAST SYSTEMS

Jacques P. Palicot, and Guy P. Dubiet, both of Rennes, France, assignors to Etablissement Public de Diffusion dit Telediffusion de France, France

Filed Oct. 19, 1984, Ser. No. 662,961
Claims priority, application France, Oct. 28, 1983, 83 17438
Int. Cl.⁴ H03H *7/30*; H03D *1/06*
U.S. Cl. 375—14 **9 Claims**

1. A digital transmission echo analog cancellation apparatus for cancelling echoes in received video analog signals, the cancellation apparatus comprising analog transversal filter means and computing circuit means for generating direct coefficients a1–ar and recursive coefficients b1–bm of the analog transversal filter, a signal input of said computing circuit means being coupled to a signal input of the analog transversal filter means, the computing circuit means comprising an analog-to-digital converter having an output which is coupled to a self-adaptive digital transversal filter that includes a mean calculating circuit, sample memory means coupled to said analog-to-digital converter means for storing output samples from the



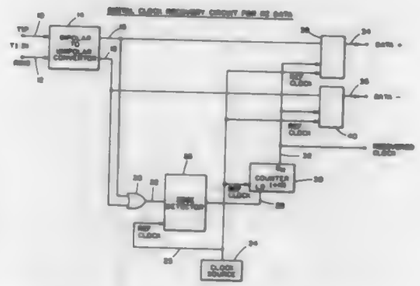
analog-to-digital converter, microprocessor means and buffer memory means interconnected by data bus means, the microprocessor being coupled to operate and control the computing circuit means as a self-adaptive digital transversal filter with decisions made inside a loop, the buffer memory means storing those of the said direct and recursive coefficients which are selected by the microprocessor, and outputs of said buffer memory means connected to coefficient inputs of the analog transversal filter.

4,696,016

DIGITAL CLOCK RECOVERY CIRCUIT FOR RETURN TO ZERO DATA

John G. Rozema, Elmhurst, and Kenneth A. Thompson, Lockport, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 2, 1986, Ser. No. 914,688
Int. Cl.⁴ H04L *7/02*
U.S. Cl. 375—20 **11 Claims**



10. A data-rate clock pulse recovery circuit for use with a bipolar digital data stream comprising:

means for providing a reference clock signal having a predetermined frequency;

means for converting the bipolar data stream to at least one return-to-zero data stream representing the pulses in the bipolar data stream;

means for detecting the next positive going edge of said reference clock signal after detecting a positive going edge of the pulse of said return-to-zero data stream, said means for detecting, receiving said return-to-zero data stream and said reference clock signal and producing an edge detected data stream; and

means for counting, receiving said edge detected data stream

and said reference clock signal to produce a recovered clock signal;

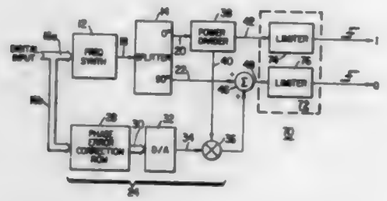
wherein said means for counting skips or repeats a state when the phase of said return-to-zero data stream drifts.

4,696,017

QUADRATURE SIGNAL GENERATOR HAVING DIGITALLY-CONTROLLED PHASE AND AMPLITUDE CORRECTION

Michael S. Masheff, and David E. Sanders, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Feb. 3, 1986, Ser. No. 825,478
Int. Cl.⁴ H04L *25/49*
U.S. Cl. 375—60 **11 Claims**



1. A quadrature signal generator, comprising:

a frequency synthesizer for receiving an input signal and generating an output signal having a predetermined frequency, the output signal having amplitude error components;

a splitter for receiving the output signal and generating an in-phase (I) signal and a quadrature phase (Q) signal at the predetermined frequency, the in-phase and quadrature phase signals having a substantially 90° phase difference;

a table look-up memory for receiving the input signal as an address input and in response thereto generating a digital correction word;

digital-to-analog conversion means for receiving the digital correction word and in response thereto generating a predetermined phase correction signal;

means for receiving the phase correction signal and the in-phase signal and in response thereto generating a phase error correction signal;

means for adding the phase error correction signal to the quadrature phase signal to correct the phase error; and

amplitude correction means for receiving the in-phase and phase error corrected quadrature-phase signals for correction of the amplitude error components.

4,696,018

DIGITAL FM DETECTOR FOR DIGITIZED FM SIGNALS

Edmund Zaehringer, Bad Krozingen; Peotr Baker, Allington, and Rolf Zettel, Denzlingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,717
Claims priority, application European Pat. Off., Dec. 24, 1983, 83113112
Int. Cl.⁴ H03D *3/18*; H04L *27/06*
U.S. Cl. 375—82 **8 Claims**

1. A digital FM detector for FM signals digitized by means of a first sampling signal, said detector comprising:

a sample and hold circuit receiving said digitized FM signals and having an output;

a first sampling stage coupled to said sample and hold circuit output and clocked by a second sampling signal at a frequency which is an integral multiple of the frequency of the first sampling signal;

a digital interpolating filter having an input coupled to said first sampling stage, and being clocked by said second sampling signal;

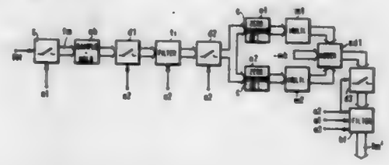
a second sampling stage coupled to said digital interpolating filter and clocked by said second sampling signal;

a first zero crossing detector for detecting positive going zero crossings coupled to said second sampling stage;

a first group delay controlled multivibrator coupled to the output of said first zero-crossing detector;

a second zero-crossing detector for detecting negative going zero crossings coupled to said second sampling stage;

a second group delay controlled multivibrator coupled to the output of said second zero-crossing detector;



an adder for adding the outputs of said first and second multivibrators and an average-value compensation signal identical with the quotient of the carrier frequency and the maximum possible frequency of the analog FM signals;

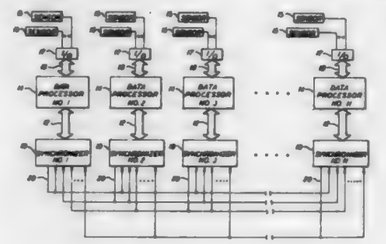
a third sampling stage having its intput coupled to the output of said adder and clocked by said second sampling signal, a digital conversion filter coupled to the output of said third sampling stage and clocked by said first and second sampling signals and a third sampling signal having a frequency which is a submultiple of said second sampling signal frequency.

4,696,019

MULTI-CHANNEL CLOCK SYNCHRONIZER

Bhalchandra R. Tulpule, Vernon; Edward M. Oscarson, Bristol, and David J. Vosgien, Meriden, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 19, 1984, Ser. No. 652,028
Int. Cl.⁴ H04L *7/00*; G05B *15/08*
U.S. Cl. 375—107 **13 Claims**



1. A synchronizer for use in a multi-channel system, each channel having an oscillator and a synchronizer associated therewith, the oscillator for providing clock pulse signals at a selected clock frequency, comprising:

counter means, responsive to clock pulse signals for counting clock pulses and providing a frame output signal pulse upon reaching a selected clock pulse count, said counter means providing said frame output signal pulse at a selected frame frequency equal to the quotient of the selected clock frequency divided by said selected clock pulse count, said counter means also responsive to an input voted frame sync signal pulse from a selected synchronizer within the channel associated with said counter means for resetting said counter means' count; and

voter means, responsive between occurrences of sasid input voted frame sync signal pulse to a plurality of incoming

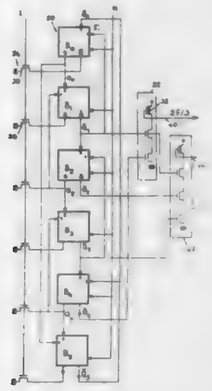
counter frame output signal pulses, one counter frame output signal pulse from each of the channels in the system, for providing an output voted frame sync signal pulse upon or after reception of a selected number of separate counter frame output signal pulses, each of said separate pulses from a different channel in the system.

4,696,020

DIGITAL CIRCUIT FOR FREQUENCY OR PULSE RATE DIVISION

Jean-Claude Carlach, Rennes, France, assignor to Etat Francais represent par le Secretariat d'Etat aux Postes et Telecommunications (Centre National d'Etudes des Telecommuncations), Issy les Moulineaux and Etablissement Public de Diffusion, dit "Telediffusion de France" , Montrouge Cedex, both of, France

Filed Sep. 17, 1986, Ser. No. 909,027
Claims priority, application France, Sep. 19, 1985, 85 13914
Int. Cl.[4] H03K *23/48, 23/52*
U.S. Cl. 377—48 **9 Claims**



1. Digital circuit for receiving a master clock signal at a frequency rate f on an input and delivering a rectangular shaped output signal at a lower frequency (M/N)f where M is an integer and N is an even integer greater than M, comprising an even number N of series connected flip-flops in a ring arrangement, each flip-flop being connected to receive input signals from the preceding flip-flop and from the following flip-flop and to receive a master clock signal on a clock input, the even numbered flip-flops being of a type different from the type of the odd numbered flip-flops and a signal at a frequency lower than the master clock frequency being taken from at least one output of said flip-flops.

4,696,021

SOLID-STATE AREA IMAGING DEVICE HAVING INTERLINE TRANSFER CCD MEANS

Atsushi Kawahara, and Norihiko Takatsu, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 499231, May 31, 1983, abandoned. This application Jul. 16, 1986, Ser. No. 884,865
Claims priority, application Japan, Jun. 3, 1982, 57-93987; Aug. 31, 1982, 57-150122
Int. Cl.[4] G11C *19/28;* **H01L** *29/78, 27/14, 31/00*
U.S. Cl. 377—58 **2 Claims**

1. A solid-state area imaging device having first and second stripe-shaped light intensity detecting means arranged adjacent to a predetermined plane, each of said light intensity detecting means comprising:

(a) a plurality of photosensitive elements each having a photosensitive surface arranged near said predetermined plane so as to produce an amount of electric charge corresponding to an intensity of light received by said photosensitive surface, said plurality of photosensitive elements being arranged in a row;

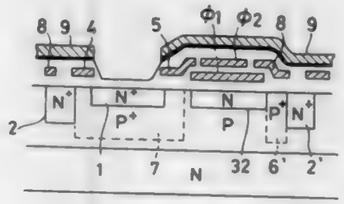
(b) drain means for draining a portion of said charges produced by said plurality of photosensitive elements, said drain means being arranged along said row of said plurality of photosensitive elements;

(c) first gate means for forming a first potential barrier, said first gate means being arranged between said drain means and said row of said plurality of photosensitive elements;

(d) transfer means for storing charges and then transferring said charges to outside of said device, said transfer means forming a second potential barrier and a potential well whereby the potential of said second potential barrier is higher than the potential of said potential well and being arranged along said row of photosensitive elements on the side opposite to said first gate means;

(e) second gate means for forming a third potential barrier, said second gate means being arranged along said transfer means on the side opposite to said row of photosensitive elements; and

(f) control means for controlling the potential of said second potential barrier and said potential well with the potential difference between said second potential barrier and said potential well being substantially constant, said control



means having first, second and third control states, said potential well being arranged between said second potential barrier and said third potential barrier,

wherein said control means controls the potential of said second potential barrier whereby the potential of said second potential barrier is lower than the potential of said first potential barrier and said third potential barrier and said transfer means stores charges produced by said plurlaity of photosensitive elements in said potential well when said control means is in said first control state,

said control means controls the potential of said second potential barrier and said potential well whereby the potential of said second potential barrier is higher than the potential of said first potential barrier and the potential of said potential well is lower than the potential of said third potential barrier and said transfer means transfers charges to outside of said device when said control means is in said second control state, and

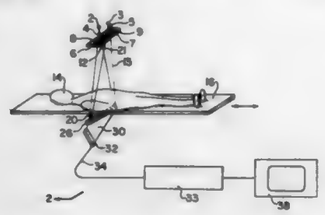
said control means controls the potential of said potential well whereby the potential of said potential well is not less then the potential of said third potential barrier and said transfer means of one light intensity detecting means transfers charges therein to said drains means of the other light intensity detecting means when said control means is in said third control state.

4,696,022

STEREOSCOPIC RADIOGRAPHY APPARATUS AND METHOD

Donald Sashin, Pittsburgh, Pa., and Ernest J. Sternglass, Bloomington, Ind., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jan. 27, 1984, Ser. No. 574,588
Int. Cl.[4] A61B *6/02*
U.S. Cl. 378—41 **27 Claims**



1. Stereoscopic radiography apparatus comprising

radiation source means for generating substantially simultaneously a first radiation beam and a second radiation beam,

collimator means interposed between said radiation source means and an object to be exposed to radiation for converting said first and said second radiation beams into generally fan-shaped beams,

radiation detector means disposed on the opposite side of said object from said radiation source means for converting the portion of said first and second radiation beams passing through said object into responsive electrical signals, containing first image information from said first beams and second image information from said second beams, and

signal receiving means operatively associated with said radiation detector means to store, process or display said image information

said radiation detector means includes scintillator means and an array of solid-state detector means,

said scintillator means adapted to convert said radiation into light,

said array of solid-state detector means adapted to receive said light from said scintillator means and emit a responsive electrical signal, and

fiber optic coupling means operatively associated with said scintillator means and said solid-state detector means for delivering light emitted by said scintillator means with substantial continuity to said array of solid-state detector means.

4,696,023

PROCEDURE AND MEANS FOR MEASURING WITH AID OF AN X-RAY TUBE THE DISTRIBUTION OF FILLERS OR EQUIVALENT IN A WEB

Juhani Kuusi, Helsinki, Finland, assignor to Robotest Oy, Finland

PCT No. PCT/FI83/00076, § 371 Date Jul. 30, 1984, § 102(e) Date Jul. 30, 1984, PCT Pub. No. WO84/02191, PCT Pub. Date Jun. 7, 1984
PCT Filed Nov. 30, 1983, Ser. No. 638,472
Claims priority, application Finland, Dec. 1, 1982, 824142
Int. Cl.[4] G01N *22/223, 33/34*
U.S. Cl. 378—46 **29 Claims**

1. A method of measuring, without destroying the specimen, the distribution in the thickness direction of the filler and/or coating materials of paper or cardboard, and the content of said materials, wherein radiation emitted by an X-ray tube is used to excite in the material component to be examined, of the object of measurement, its characteristic X-ray radiation, the intensity of said characteristic radiation being observed, measurements are made on both sides of the paper or cardboard under examination, the contents of said materials are determined by X-ray absorption measurements for eliminating the effects of these components disturbing the distribution measurement, and measurement is made of the base weight of the paper or cardboard under examination by radiation absorption, said method comprising the steps of

making a number of X-ray absorption measurements, the number of measurements being at least equal to the number of different filler components, for determining the



contents of the different filler components and the coating materials by means of constant energy X-ray radiation;

making a number of measurements of the characteristic X-ray fluorescent radiation of the material components excited via the X-ray tube of the paper or cardboard; and

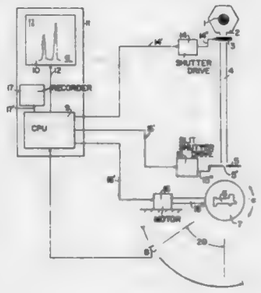
determining the distributions of fillers and coating materials by calculative joint processing of the results from said measurements.

4,696,024

METHOD AND APPARATUS FOR DETECTING FLAWS IN SINGLE CRYSTAL TEST SAMPLES

Wilfried Pesch, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,453
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439471
Int. Cl.[4] G01N *23/207*
U.S. Cl. 378—73 **4 Claims**



1. An apparatus for inspecting single crystal test samples for flaws, comprising a radioactive source of gamma rays for passing gamma rays through said test sample, collimator means operatively connected to said source of gamma rays for providing a focussed beam of gamma rays, shutter means arranged for cooperation with said collimator means for controlling a timed application of said focussed beam to a test sample, movement means for providing a relative movement between said source of gamma rays and said test sample so that the test sample is exposed to said focussed beam, stationary detector means located relative to said movement means for detecting an intensity profile of a diffracted reflection of said focussed beam of gamma rays which pass through said sample, and a central processing unit including measuring means operatively connected to said detector means for measuring the half peak

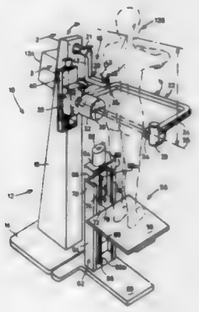
width of said reflection as an indication of a flaw in said test sample, wherein said collimator means comprise a tubular collimator for focussing said gamma rays, said shutter means comprising a first shutter located at one end of said tubular collimator facing said source of gamma rays, and a second shutter in the form of a slit stop at an opposite end of said tubular collimator, first drive means (14) for operating said first shutter, second drive means (15) for operating said second shutter, means connecting said first and second drive means also to said central processing unit for controlling the timed application of said focussed beam to a test sample in synchronism with said movement means for detecting an intensity profile of a diffracted reflection throughout the volume of said test sample.

4,696,025

SCANNING APPARATUS

Kenneth W. Taylor, Mississauga, Canada, assignor to University of Toronto Innovations Foundation, Toronto, Canada

Filed Jun. 2, 1986, Ser. No. 870,316
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—146 **11 Claims**



1. Radiological examination apparatus comprising a source of radiation to irradiate a body to be examined;

imaging means to receive radiation from said source after transmission through said body and provide an image thereof;

support means to connect said source and said imaging means to maintain alignment therebetween whilst permitting relative movement between said imaging means and said body along a predetermined path to provide a scan of an enlongate portion of said body;

recording means to record the image provided by said imaging means during said scan, said recording means being moveable along said path with said imaging means, and

motion control means acting on said recording means to maintain movement thereof in a predetermined ratio to movement of said imaging means relative to said body whereby the length of the image on said recording means is less than the distance moved by said imaging means relative to said body.

4,696,026

MULTIPLEXED TERMINAL FOR MONITORING AND CONTROLLING A PLURALITY OF REMOTE TELEPHONE SWITCHES

Donald A. Plouff, Nobelsville, Ind., assignor to General Telephone Company of Indiana, Westfield, Ind.

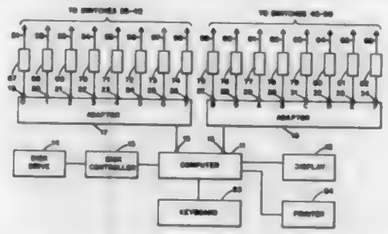
Filed Apr. 30, 1986, Ser. No. 858,474
Int. Cl.[4] H04M *3/24*
U.S. Cl. 379—34 **1 Claim**

1. A multiplexed terminal for continuously displaying the status of a plurality of remotely located stored program control telephone switches having remote control and display ports, said multiplexed terminal comprised of:

a computer having at least one I/O port;

first means coupled to said I/O port for providing a plurality of extended I/O ports;

means for coupling said extended I/O ports to dedicated



channels for communication with remote control and display ports of remotely located stored program control telephone switches; and

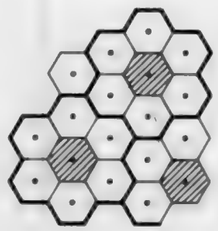
software means for controlling said computer, to multiplex said extended ports, and to simultaneously display clusters of data corresponding to the status and identification of each of said switches.

4,696,027

HANDOFF APPARATUS AND METHOD WITH INTERFERENCE REDUCTION FOR A RADIO SYSTEM

Jeffrey D. Bonta, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1986, Ser. No. 893,116
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—60 **25 Claims**



1. A method of interference reduction in a multichannel two way radio system having at least two geographic radio coverage areas established by a fixed site apparatus in each coverage area and a plurality of remote stations, each remote station capable of transmitting at one of a plurality of power levels and capable of being handed off from one coverage area to another, comprising the steps of:

calculating a power level for a remote station transmitting to fixed site apparatus in a first coverage area which will produce a received signal level of a predetermined magnitude at fixed site apparatus in a second coverage area; and

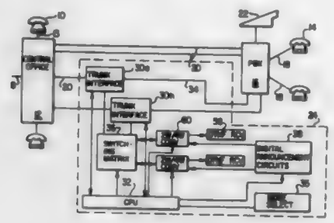
communicating said power level to said transmitting remote station during a handoff of said transmitting remote station from said first coverage area to said second coverage area.

4,696,028

PBX INTERCEPT AND CALLER INTERACTIVE ATTENDANT BYPASS SYSTEM

Sanford J. Morganstein, Elgin, Ill.; Edward F. Tuck, West Covina, Calif.; Bakulesh A. Mehta, Bolingbrook, and Herbert B. Krakau, Elmhurst, both of Ill., assignors to Dytel Corporation, Schaumburg, Ill.

Filed Mar. 26, 1984, Ser. No. 593,526
Int. Cl.[4] H04M *3/50, 7/14*
U.S. Cl. 379—88 **48 Claims**



7. A call processor for use in conjunction with a telephone switching system having provisions for a call completion assistant, for processing concurrent incoming calls directed to the switching system and allowing calling parties to choose whether to complete the calls directly to destinations associated with the switching system, or by the call completion assistant, comprising:

a plurality of extension telephone station lines for connecting said call processor to the telephone switching system;

detector means for detecting requests for service from the respective calling parties initiating calls to the telephone switching system;

means responsive to the detection of the requests for service by said detector means for causing respective connection paths to be established to the calling parties;

message announcement means for generating a message for transmission to the calling parties on said respective connection paths while the parties are placing concurrent calls;

means responsive to said detector means detecting said requests for service for transmitting said message to the calling parties;

means adapted for receiving a plurality of numbers input by the calling parties while said message is being transmitted to the calling parties; and

means responsive to a first type of response from the calling parties for receiving and for transferring respective destination determining information to the switching system, and responsive to a second type of response from the calling parties for transferring respective destination determining information associated with the call completion assistant to the switching system such that calls by the calling parties can be completed according to the respective said first or second types of responses, at the calling parties' options.

4,696,029

TELEPHONE TRAFFIC LOAD CONTROL SYSTEM

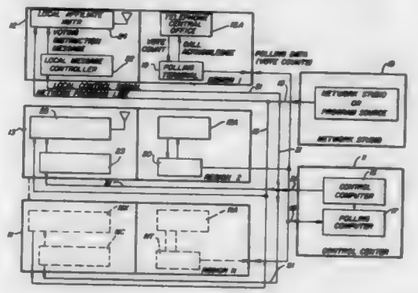
Fred Cohen, Philadelphia, Pa., assignor to Telesciences, Inc., Mount Laurel, N.J.

Filed Dec. 12, 1985, Ser. No. 808,249
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—92 **17 Claims**

1. A system for controlling the initiation of telephone calls responsive to a message broadcast by a broadcast station having a transmitter by controlling message generators at the broadcast station through a control center which receives real-time feedback of telephone traffic data from polling terminals at telephone central offices and utilizes this information to regulate stimuli broadcast by the station, comprising in combination,

(a) message generator means operatively coupled to the broadcast station signal transmitter and effective responsive to control means to cause a specific message to be broadcast,

(b) at least one polling terminal connected to a telephone system central office and operative to receive incoming calls on a plurality of discrete telephone lines, said terminal including means for recording the number of calls received on said plurality of telephone lines and means for recording and storing each instance when all of such plurality of telephone lines are in a "busy" condition,



(c) polling means for interrogating said at least one polling terminal to determine the "busy" condition thereof,

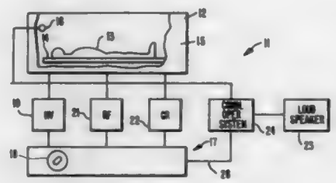
(d) control means operatively coupled to said message generator means and to said polling means and receiving information from the latter regarding the "busy" condition of said at least on polling terminal, said control means including decision making means responsive to the said information received from said polling means effective to control the rate or duration of the message caused to be broadcast by said message generator means, whereby, the rate of initiation of telephone calls responsive to the broadcaast message may be regulated.

4,696,030

PATIENT OPERATOR INTERCOM ARRANGEMENTS FOR MAGNETIC RESONANCE IMAGING SYSTEMS

Avihay Egozi, Netanya, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Dec. 16, 1987, Ser. No. 809,248
Int. Cl.[4] H04M *9/00;* **H04B** *15/00*
U.S. Cl. 379—167 **7 Claims**

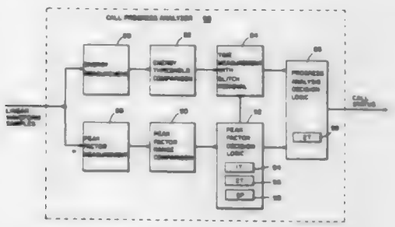


1. A patient intercom arrangement for transmitting intercom signals in magnetic resonance imaging (MRI) systems and enabling a patient to speak to an operator during scan procedures that use gradient pulses, said intercom arrangement substantially eliminating gradient noise interference with intercom signals, said intercom arrangement comprising:

(a) microphone means in the vicinity of the patient for converting audio signals into electrical intercom signals;

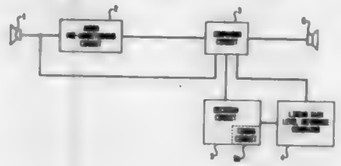
(b) loudspeaker means in the vicinity of the operator for converting the electrical intercom signals to audio signals;
(c) operating circuit means coupling said microphone means to said loud speaker means;
(d) said operating circuit means including means for substantially cancelling gradient noise caused signals transmitted to the loud speaker while leaving the voice signals substantially unaffected;
(e) said means for substantially cancelling gradient noise caused signals comprising recording means for recording said electrical intercom signals;
(f) difference means for subtracting the recorded intercom signals from newly generated intercom signals including patient voice caused signals and gradient noise caused signals;
(g) said recording means including first and second memory means;
(h) means for connecting said first memory means to selecting means for connecting either said first or said second memory means to said difference means for subtracting the recorded electrical intercom signals from the newly generated intercom signals;
(i) said selecting means also connecting the other of either said first or said second memory means to receive the newly generated electrical intercom signals;
(j) comparison means for determining the voice content of the recorded electrical intercom signals in the first memory means and in the second memory means for selecting between the first memory means and the second memory means to obtain the memory means with the lowest voice content for the next subtraction of the contents of the memory means from the newly generated electrical intercom signals; and
(k) means for connecting the output of the difference means to supply electrical signals to the loudspeaker.

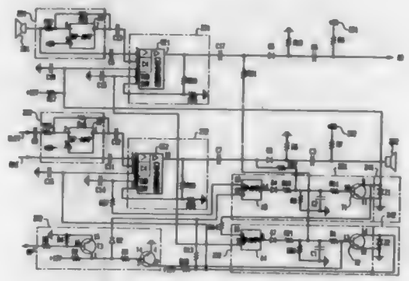
4,696,031
SIGNAL DETECTION AND DISCRIMINATION USING WAVEFORM PEAK FACTOR
Richard L. Freudberg, Auburndale, Mass., and Marshall B. Garrison, Derry, N.H., assignors to Wang Laboratories, Inc., Lowell, Mass.
Filed Dec. 31, 1985, Ser. No. 815,424
Int. Cl.⁴ H04M *3/22*
U.S. Cl. 379—386 **41 Claims**



32. A method of determining the progress of a call comprising:
receiving waveforms from a telephone line;
making peak factor measurements of the received waveforms;
determining call status using the peak factor measurements.

4,696,032
VOICE SWITCHED GAIN SYSTEM
Allan Levy, Delray Beach, Fla., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.
Filed Feb. 26, 1985, Ser. No. 705,935
Int. Cl.⁴ H04M *9/08;* **H04R** *3/06*
U.S. Cl. 379—390 **6 Claims**

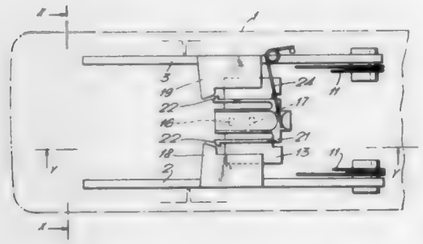




2. A voice switched gain system for a loudspeaking telephone including an electret microphone, the system comprising first and second voice switch gain circuits for providing three states of operation of the loudspeaking telephone, the voice switched gain system being connected at a near end of a transmission channel having an audio source at a far end, a first, nonpre-emptive, idle state wherein neither an audio source at the loudspeaking telephone controls audio signal transmission nor does the audio source at the far end of the transmission channel to the loudspeaking telephone control audio signal transmission, a second, preemptive state where the audio source at the near end controls audio signal transmission, and a third, preemptive state where the audio source at the far end controls audio signal transmission,
the first and second voice switched gain circuits each comprising: a controlled compandor connected in series with the transmission channel, a decision circuit and a reference gain level generator, the decision circuit providing a two state control signal for controlling the activation of the compandor to perform an expansion of an input signal and provide an expanded signal at its output when an input signal level presented to the compandor exceeds a level provided by the reference gain level generator; the first voice switched gain circuit effectuating the second preemptive state and, the second voice switch gain circuit effectuating the third state, each controlled compandor being switched off and providing no gain in the transmission channel during the first, non-preemptive idle state.

6. A carbon transmitter emulation circuit for a telephone, the emulation circuit having an idle state, a square law state and a linear gain state of operation, the emulation circuit comprising an electret microphone circuit for providing an output, an audio preconditioning circuit for conditioning the output of the electret microphone circuit, a controlled compandor circuit, and a reference gain level generating circuit, the emulation circuit being in the linear gain state for expanding audio input signals presented to it when the level of the output of the electret microphone circuit exceeds a reference gain level output of the reference gain level generating circuit, the controlled compandor circuit effectuating the audio input signal expansion in a linear manner.

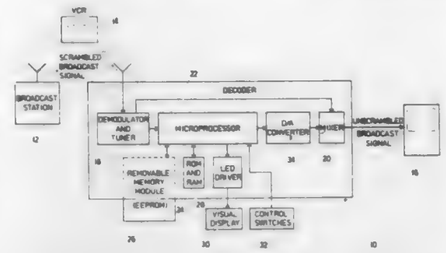
4,696,033
ONE-PIECE TELEPHONE HOOK SWITCH OPERATING MECHANISM
Ronald Else, Woodbridge, England, assignor to British Telecommunications public limited company, Great Britain
Filed Jan. 23, 1985, Ser. No. 694,038
Claims priority, application United Kingdom, Jan. 23, 1984, 8401721
Int. Cl.⁴ H04M *1/08*
U.S. Cl. 379—424 **7 Claims**



1. A one-piece telephone instrument provided with a hook switch operating mechanism, the mechanism comprising: a first and second members each having a respective actuating portion arranged, in use, for projection from an outer surface of said telephone instrument biased towards relatively extended positions, and arranged for mutually independent displacement with respect to said outer surface; and a switch actuating member for actuating the hook switch of said telephone instrument, wherein the mechanism further includes means linking the motion of the first and second members and of the switch actuating member such that, in use, when the first and second acutating portions are both at relatively retracted positions with respect to the said outer surface the switch actuating member is disposed such that the hook switch is in the on-hook state, and when one or both of the first and second actuating portions is or are at a relatively extended position or positions with respect to said outer surface the switch actuating member is disposed such that the hook switch is in the off-hook state.

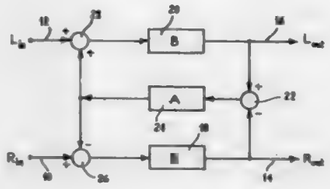
4,696,034
HIGH SECURITY PAY TELEVISION SYSTEM
John D. Wiedemer, Houston, Tex., assignor to Signal Security Technologies, Houston, Tex.
Filed Oct. 12, 1984, Ser. No. 660,512
Int. Cl.⁴ H04N *7/167;* **G06K** *15/00*
U.S. Cl. 380—16 **23 Claims**

9. In a pay television system, a receiving station signal decoder for a scrambled broadcast signal comprising
an internal fixed memory containing a fixed, station-unique internal code;
a removable, electrically alterable, removable memory module containing at least one pre-written station-unique, external code which can be combined with the internal code to generate a systemwide system code, and also a portion onto which program information may be entered;
means for generating a descrambling signal complementary to the scrambling signal upon input of a proper numerical sequence; and
a microprocessor programmed (1) to read the internal code from the fixed memory and the external code from the portable memory module, (2) to combine the external code with the internal code to generate the systemwide system code, to generate and output to the descrambling signal generating means a numerical signal generated from the system code, (4) to derive a broadcast code from the scrambled broadcast signal, and (5) to write information



about programs actually descrambled, as determined from the broadcast code, in the memory module so that use of the decoder can be billed on a usage basis.

4,696,035
SYSTEM FOR EXPANDING THE STEREO BASE OF STEREOPHONIC ACOUSTIC DIFFUSION APPARATUS
Guido Torelli, S. Alessio, and Alejandro De La Plaza, Bergamo, both of Italy, assignors to SGS Microelectronica S.p.A., Catania, Italy
Filed Jul. 28, 1986, Ser. No. 889,921
Claims priority, application Italy, Aug. 9, 1985, 21898 A/85
Int. Cl.⁴ H04R *5/00*
U.S. Cl. 381—1 **8 Claims**



1. A system for expanding the stereo base for stereophonic acoustic diffusion apparatus, in which a first and a second input signal, constituting a stereophonic pair, are amplified in respective direct amplifier means, in order to obtain a first and a second output signal, wherein, in order to expand the stereo base, said output signals are added by adder means in a predetermined phase relationship, chosen between phase coincidence and phase opposition, and the sum signal thus produced is processed by a feedback block having a predetermined transfer function, and is then superimposed on the first input signal with opposite phase, and is superimposed on said second input signal in phase opposition or phase coincidence, depending on whether said output signals are added respectively in phase coincidence or phase opposition.

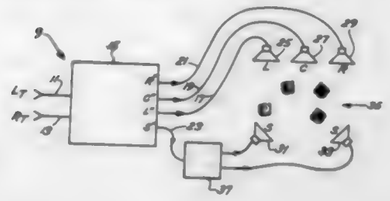
4,696,036
DIRECTIONAL ENHANCEMENT CIRCUIT
Stephen D. Julstrom, Chicago, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.
Filed Sep. 12, 1985, Ser. No. 775,437
Int. Cl.⁴ H04R *5/00*
U.S. Cl. 381—22 **20 Claims**

1. A system for receiving N number of audio input signals encoded with sound information including a plurality of directional sounds, and for driving at least N+1 loudspeakers, the loudspeakers being physically arranged to generate apparent

sound images in relation to the encoded directional sounds, comprising:

input means for receiving said encoded input signals;

means for analyzing said encoded input signals for determining whether at least one of said plurality of directional sounds encoded by said input signals exceeds one of a plurality of directional predominance thresholds, said analyzing means generating a plurality of logic control



signals, each said logic control signal representing a directional sound and having a logic state representing directional predominance exceeding a corresponding one of said plurality of directional predominance thresholds;

speaker drive means for generating loudspeaker signals from said input signals, said speaker drive means being responsive to said logic signals for dynamically enhancing the directional stability of the apparent sound images generated by the loudspeakers.

4,696,037

LOUDSPEAKER ARRANGEMENT COMPRISING ONE OR MORE FLAT DIAPHRAGMS

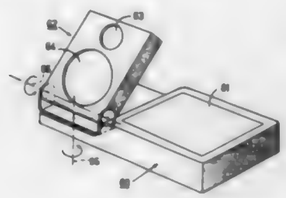
Gustaaf E. M. Flerens, Dendermonde, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,309

Claims priority, application Netherlands, Jan. 4, 1983, 8300011

Int. Cl.⁴ H04R *5/00*

U.S. Cl. 381—24 **30 Claims**



1. A loudspeaker arrangement comprising: a first loudspeaker unit for reproducing a low-frequency audio signal, a second separate loudspeaker unit provided with a loudspeaker for reproducing a high-frequency audio signal, the two loudspeaker units being constructed to have no mechanical connection between them, and means electrically connecting the loudspeaker units to one another and which comprise interengageable parts that can be disengaged from one another to disconnect the units, characterized in that the first loudspeaker unit comprises at least two flat diaphragms.

4,696,038

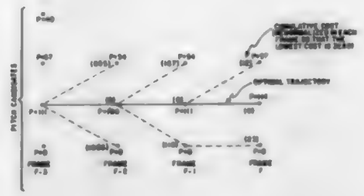
VOICE MESSAGING SYSTEM WITH UNIFIED PITCH AND VOICE TRACKING

George R. Doddington, and Bruce G. Secrest, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1983, Ser. No. 484,718

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—36 **10 Claims**



1. In a voice messaging system for receiving a human speech signal and reconstituting said human speech signal at a receiver which is spatially or temporally remote, the combination comprising:

LPC analysis means for analyzing an analog speech signal provided as an input thereto in accordance with an LPC (Linear Predictive Coding) model, said LPC analysis means providing LPC parameters and a residual signal organized in a sequence of speech data frames and the respective residual signals corresponding thereto as an output representative of the analog speech signal;

pitch extraction means operably associated with said LPC analysis means for determining a plurality of pitch candidates for each of the speech data frames in said sequence;

optimization means operably associated with said LPC analysis means and said pitch extraction means for performing dynamic programming with respect both to said plurality of pitch candidates for each speech data frame and also to a voiced/unvoiced decision for each speech data frame to determine both an optimal pitch and an optimal voicing decision for each speech data frame in the context of sequence of speech data frames, said optimization means defining a transition error between each pitch candidate of the current frame and each pitch candidate of the preceding frame, and defining a cumulative error for each pitch candidate in the current frame which is equal to the transition error between said pitch candidate of said current frame plus the cumulative error of an optimally identified pitch cnadidate in the preceding frame, said optimally identified pitch candidate in the preceding frame being chosen from among the pitch candidates for said preceding frame such that the cumulative error of said corresponding pitch candidate in said current frame is at a minimum; and

means operably associated with said LPC analysis means, said pitch extraction means and said optimization means for encoding said LPC parameters and said optimal pitch and optimal voicing decision for each speech data frame.

4,696,039

SPEECH ANALYSIS/SYNTHESIS SYSTEM WITH SILENCE SUPPRESSION

George R. Doddington, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 13, 1983, Ser. No. 541,497

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—46 **2 Claims**

1. A speech coding system, comprising:

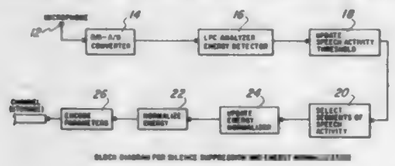
an analyzer connected to recieve speech input data and to generate therefrom a sequence of frames of speech parameters, said frames each having plural parameters including an energy value;

a buffer connected to said analyzer for storing up to a predetermined number of said frames;

a nonsilent energy tracker for adjusting a value representing an energy contour for nonsilent frames;

a silent energy tracker for adjusting a value representing an energy contour for silent frames; and

silence suppression means connected to said buffer, and to said silent and nonsilent energy trackers, for identifying each frame as silent or nonsilent, wherein said silence suppression means, once a nonsilent frame has been identified, identifies a silent frame only when a continuous succession of frames having an energy less than a predetermined function of the silent energy contour value is generated, and wherein said silence suppression means,



once a silent frame has been identified, identifies a nonsilent frame only when a voiced frame having an energy higher than a predetermined function of the nonsilent energy contour value is generated;

wherein, when a silent frame is identified following a nonsilent frame, all previous frames in said buffer which have an energy less than a predetermined function of the silent energy contour value are retroactively identified as silent;

and wherein, when a nonsilent voiced frame is identified following a silent frame, all previous frames in said buffer which have an energy value greater than a predetermined function of the nonsilent energy contour value, and which are not separated from the nonsilent voiced frame by more than a selected number of frames having an energy level less than the predetermined function of the nonsilent energy contour value, are identified as nonsilent frames.

4,696,040

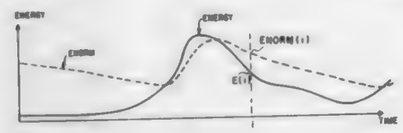
SPEECH ANALYSIS/SYNTHESIS SYSTEM WITH ENERGY NORMALIZATION AND SILENCE SUPPRESSION

George R. Doddington, and Panos E. Papamichalis, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 13, 1983, Ser. No. 541,410

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—46 **26 Claims**



1. A speech coding system, comprising:

an analyzer for receiving a digital speech signal and generating therefrom a sequence of frames, each frame having speech parameters, said parameters of each frame including an energy value;

means coupled to said analyzer for normalizing the energy value of each said speech frame with respect to energy values of subsequently generated frames of the sequence; and

means coupled to said normalizing means for loading said parameters for each said speech frame of the sequence, including said normalized energy parameter of each said speech frame, into a data channel.

4,696,041

APPARATUS FOR DETECTING AN UTTERANCE BOUNDARY

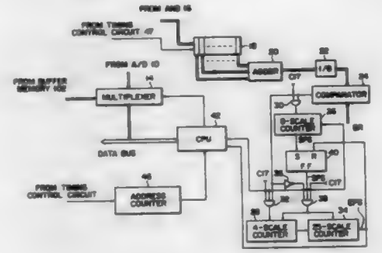
Tomio Sakata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

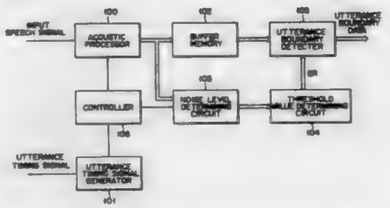
Filed Jan. 30, 1984, Ser. No. 575,383

Claims priority, application Japan, Jan. 31, 1983, 58-13997

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—46 **3 Claims**





1. An apparatus for detecting an utterance boundary by comparing a speech signal with a threshold value generated in accordance with an average value of the speech signals in a predetermined period of time which begins immediately after inputting of the speech signal comprising:

utterance timing signal generating means for generating an utterance timing signal when a speech signal including a silent period is input as uttered words;

speech parameter generating means for receiving the speech signal which is input according to the utterance timing signal from said utterance timing signal generating means and generating speech parameter time sequence data;

noise level determining means for generating noise level data which is the average value of speech parameter values of a background noise corresponding to the silent period in a predetermined period of time which begins immediately after inputting of the speech signal generated in synchronism with the utterance timing signal from said utterance timing signal generating means on the basis of the speech parameter time sequence data output from the speech parameter generating means;

threshold value determining means for calculating based on the noise level data output from the noise level determining means, an utterance boundary detetion threshold value including a predetermined bias value which is variable in response to change in the average value of the speech parameter values; and

utterance boundary detecting means for producing utterance boundary data including a start point and end point for determining an utterance boundary on the basis of the utterance boundary detection threshold value and speech

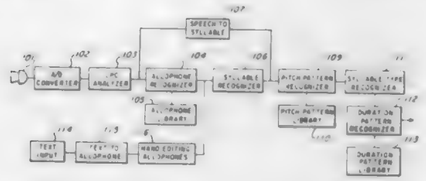
parameter time sequence data generated from the speech parameter generating means.

4,696,042

SYLLABLE BOUNDARY RECOGNITION FROM PHONOLOGICAL LINGUISTIC UNIT STRING DATA

Kathleen M. Goudie, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1983, Ser. No. 548,597
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—51 **13 Claims**



1. A speech data processing apparatus comprising:
input means for receiving a sequence of input data including a sequence of phonological linguistic unit indicia;
phonetic classifying means connected to said input means for classifying said phonological linguistic unit indicia as a vowel indicia or as one of a plurality of types of consonant indicia;
syllable boundary determining means connected to said input means and said phonetic classifying means for grouping said sequence of phonological linguistic unit indicia into syllables by inserting a syllable boundary between the first and second vowel indicia following the previous syllable boundary at a location depending upon the type of any consonant indicia between said first and second following vowel indicia; and
transmission means connected to said input means and said syllable boundary determining means for transmitting said sequence of phonological linguistic unit indicia and an indication of said syllable boundaries.

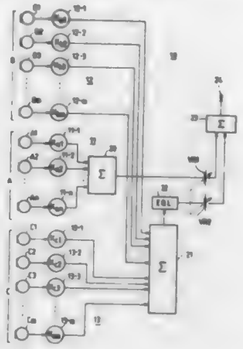
4,696,043

MICROPHONE APPARATUS HAVING A VARIABLE DIRECTIVITY PATTERN

Makoto Iwahara, Sagamihara; Naotaka Miyaji, Yamato, and Atsushi Sakamoto, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Aug. 16, 1985, Ser. No. 766,280
Claims priority, application Japan, Aug. 24, 1984, 59-176288; Aug. 29, 1984, 59-130756[U]
Int. Cl.[4] H04R *1/40*
U.S. Cl. 381—92 **20 Claims**

1. A microphone apparatus comprising:
an array of equally spaced microphones, the microphones being divided into a center subarray and a pair of side subarrays located one on each side of the center subarray;
a first weighting network having a plurality of weighting factors for impressing a first weighting function on signals from the microphones of the center subarray.
second and third weighting networks each having a plurality of weighting factors for impressing second and third weighting functions respectively on signals from the microphones of said side subarrays, said first, second and third weighting functions corresponding respectively to center and side portions of a sensitivity profile which varies as a function of positions on said array;
a first adder for summing signals from said first weighting network;
a second adder for summing signals from said second and third weighting networks;
a third adder for summing signals from said first and second adders to produce an output signal; and



level setting means for adjusting the level of an output signal from said second adder in a predetermined relationship with the level of an output signal from said first adder to provide a variable directivity pattern.

4,696,044

DYNAMIC NOISE REDUCTION WITH LOGARITHMIC CONTROL

James K. Waller, Jr., 9901 Allen Rd., Clarkston, Mich. 48016

Filed Sep. 29, 1986, Ser. No. 912,525
Int. Cl.[4] H03G *7/00*
U.S. Cl. 381—106 **7 Claims**



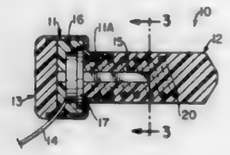
1. A system for deriving a dc control signal from an input audio frequency signal comprising:
means for filtering said input signal to reduce the level of said input signal when said signal falls within a preselected frequency range;
means for compressing said filtered signal proportionately with respect to its logarithm;
means for deriving from said compressed signal a signal proportional to the absolute value of said compressed signal;
means for generating a reference signal of variably selectable level;
means for combining said reference signal of variably selectable level with said absolute value signal;
means for deriving a dc signal from said combined signal; and
means for passing said derived dc signal when its level exceeds a preselected signal level and for blocking said derived dc signal when its level falls below said preselected signal level.

4,696,045

EAR MICROPHONE

James M. Rosenthal, Cooper City, Fla., assignor to ACR Electronics, Hollywood, Fla.

Filed Jun. 4, 1985, Ser. No. 741,249
Int. Cl.[4] H04R *1/04, 1/10, 1/46, 17/02*
U.S. Cl. 381—114 **8 Claims**



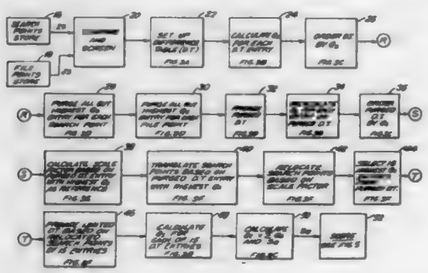
1. An ear microphone comprising:
an electroacoustic transducer;
a rigid housing, said transducer being partially disposed within said housing and partially extending out from said housing;
a helically wound compression spring partially disposed within and supported by said housing, and partially extending outward of said housing and surrounding said transducer;
semi-soft compound enclosing at least a portion of said transducer and said spring, said semi-soft compound having a shape adapted for insertion into a user's ear,
said compound being adapted to provide a better mechanical impedance match of said transducers to the human ear than to air to thereby reduce the effect of response of said transducer to airborne vibrations.

4,696,046

MATCHER

Michael Schiller, Riverdale, N.Y., assignor to Fingermatrix, Inc., North White Plains, N.Y.

Continuation-in-part of Ser. No. 762,118, Aug. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 718,870, Apr. 2, 1985, abandoned. This application Mar. 27, 1986, Ser. No. 845,154
Int. Cl.[4] G06H *9/00*
U.S. Cl. 382—5 **19 Claims**



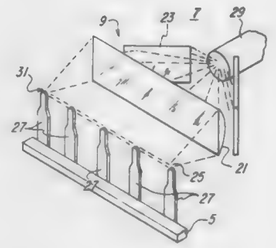
1. A matcher improvement for matching a set of Search identification points against a set of File identification points employing a difference table, comprising:
first memory means for storing a set of Search identification points as a set of binary value signals,
second memory means for storing a set of File identification points as a set of binary value signals,
multiple comparator means, each of said comparator means being coupled to a predetermined subset of said Search identification points and to a corresponding predetermined subset of said File identification points, each of said multiple comparative means having:
(i) differencing means to provide a first difference table and a first proximity value for each entry on said difference table,
(ii) constant adjustament means to provide a difference plane translation of that entry in said difference table which has the highest proximity value to the origin of the difference plane represented by said difference table, all of the entries in said difference table being translated by the same amount,
(iii) differential adjustment means to differentially adjust each entry in said difference table as a function of the distance between the Search point of the entry being adjusted and the Search point of the entry having the highest proximity value,
(iv) means to provide a final set of proximity values based on the difference table provided by said constant and said differential adjustment means, and
(v) means to provide at least one figure of merit based on said final set of proximity values for the Search subset involved, and
means to combine said figures of merit from each of said subsets to provide at least one overall figure of merit indicating the degree of match between said set of Search points and said set of File points.

4,696,047

APPARATUS FOR AUTOMATICALLY INSPECTING ELECTRICAL CONNECTING PINS

Donald J. Christian, Richardson, and Michael J. Stachowicz, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 28, 1985, Ser. No. 707,116
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—8 **6 Claims**



1. A pin inspection system for inspecting a plurality of pins tips arranged in a predetermined configuration comprising:
illuminating means for illuminating the tips only, of pins which are of correct length, and which do not illuminate the tips of pins which are too long or too short;
video camera means for obtaining a video image of the illuminated pin tips by sweeping in a raster scan fashion the pin tips to obtain a first waveform representing light intensity versus relationship to the raster scan position;
a comparator for comparing the first waveform to a predetermined threshold and to provide a first logic state when the amplitude of the waveform is about the predetermined threshold and a second logic state when the amplitude of the first waveform is below the predetermined threshold;
memory means for arranging the first and second logic states according to the raster scan position;
summation means for locating clusters of the first logic states in both the row and column directions of the memory means;
isolation means for isolating clusters in the first logic state;
inertia measuring means for locating the first moment of

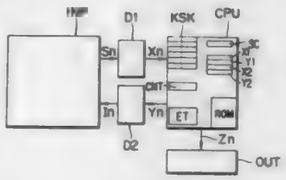
inertia for each of the isolated clusters of the first logic state to obtain a first coordinate for each cluster;
transformation means for transforming the first coordinates to physical distances;
comparator means for comparing the physical distance to a predetermined criterion; and
classifying according to the results of the comparison the transform coordinates to obtain the results of the pin tips inspection.

4,696,048

INPUT DEVICE

Ichiro Sado, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 505,859, Jun. 20, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 912,652
Claims priority, application Japan, Jun. 28, 1982, 57-109955
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—13 **12 Claims**



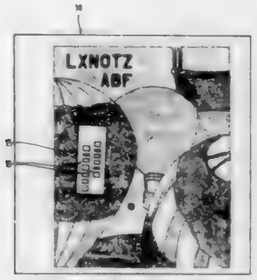
1. An input device comprising:
a plurality of selectively actuable switching matrices;
signal generating means for generating a plurality of signals;
signal scanning means for supplying said signals to each of said plurality of switching matrices in different scanning patterns;
signal receiving means for receiving said plurality of signals from said plurality of switching matrices in different scanning patterns; and
discrimination means for discriminating an actuated one of said plurality of switching matrices by said plurality of signals from said signal receiving means.

4,696,049

IMAGE SCANNING PROCESS AND UNIT FOR DETECTING SET FORMS

Giorgio Musso, Genoa, Italy, assignor to Elettronica San Giorgio-Elsag S.p.A., Genova-Sestri, Italy

Filed Apr. 17, 1985, Ser. No. 724,244
Claims priority, application Italy, Apr. 20, 1984, 67404 A/84
Int. Cl.⁴ G06K *9/20*
U.S. Cl. 382—22 **15 Claims**



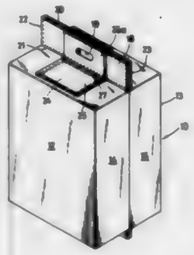
1. Image scanning process for detecting a set form (15) of an image characterised by the fact that it comprises a first stage for analysing signals (5) representing points on said image, for selecting first points (33, 34, 35, 36, 45, 46, 47, 48) defining areas in which the variation in contrast exceeds a given threshold, and for determining the direction (Ye) of a tangent line (37, 49) relative to each of said first points; a second stage for detecting whether, for each of said first points, there exist other first points (45, 46, 47, 48) lying on at least one line (40, 41, 42, 43) having a set length (L) and angle in relation to the direction (Ye) of the line (37) tangent with the point in question (33, 34, 35, 36) and in projecting on to said tangent line (37) projection points if the direction of the said other first point (45, 46, 47, 48) lying on the said line (L) has a second set angle in relation to the said tangent line (37); a third stage for memorising and accumulating the number of the said projections relative to the said projection points and in extracting said projection points (52, 53, 54, 55, 56, 57, 58, 59, 60) the accumulated value of which exceeds a given number threshold; and a fourth stage for selecting from among said extracted points (52, 53, 54, 55, 56, 57, 58, 59, 60) those points (52, 53, 54, 55) defining said set form (15) wherein said signals (5) representing points on the said image are supplied by scanning the surface of an item (2) and by means of optical-electronic conversion.

4,696,050

PACKAGE FORMED AS BAG TO BE CARRIED

Karl-Heinz Sengewald, Postfach 1460, 4802 Halle in Westf. 1, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,759
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438601
Int. Cl.⁴ B65D *33/62, 33/08*
U.S. Cl. 383—10 **12 Claims**



1. A package formed as a bag to be carried, comprising a plurality of lateral walls having upper wall portions and lower wall portions, said lateral walls including two first opposite walls which form folds and two second opposite walls; a body part formed by said lower portions of said lateral walls; a gripping part including said upper portions of said second opposite walls, a gripping opening provided in each of said upper portions of said second opposite walls, and welding seams provided above and below said gripping opening so as to connect said first opposite walls and said second opposite walls with one another and also to separate said gripping part from said body part, one of said second opposite walls having a section which adjoins said gripping part and is provided with a window-like opening; and a covering foil which easily detachably covers said window-like opening.

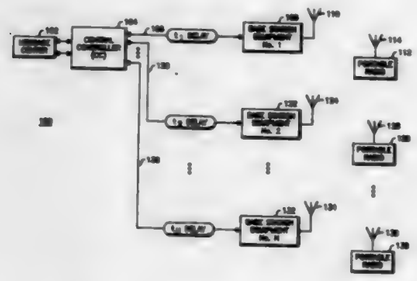
4,696,051

SIMULCAST TRANSMISSION SYSTEM HAVING AUTOMTIC SYNCHRONIZATION

Robert L. Breeden, Boynton Beach, Fla., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 31, 1985, Ser. No. 815,334
Int. Cl.⁴ H04B *7/00*
U.S. Cl. 455—33 **7 Claims**

1. A simulcast transmission system having automatic synchronization for a plurality of transmitters which permit a message source to transmit message signals via a radio channel to a geographical area partitioned into zones, the system comprising:
a central controller, including a normal synchronized first mode and a second mode of operation, coupled to the message source for exchanging message signals therebetween;
a plurality of base station, each remotely sited to an assigned zone within a geographical area, each having at least one transmitter coupled to an antenna for transmitting message signals on the radio channel, each having an interconnect link exhibiting an associated value of fixed but unstable delay with respect to said central controller, and each including adaptive delay means coupled to said transmitter and said interconnect link; and



master timing signal receiving means included at e base station and at the central controller, for providing a reference sync signal therefrom,
said central controller periodically initiating said second mode by issuing a re-sync command coinciding with said sync signal, and
said adaptive delay means each having first and second modes of operation, with said second mode activated upon receiving said re-sync command for varying an adjustable time delay therein in opposite fashion to said fixed but unstable delay associated with said interconnect link for re-adjusting during said second mode and automatically maintaining during said first mode a constant total delay to each of said base stations, for sending message signals from said base stations in precise time synchronization.

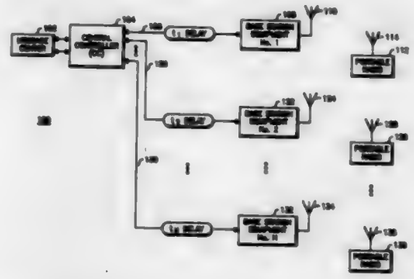
4,696,052

SIMULCAST TRANSMITTER APPARATUS HAVING AUTOMATIC SYNCHRONIZATION CAPABILITY

Robert L. Breeden, Boynton Beach, Fla., assignor to Motorola Inc., Schaumburg, Ill.

Filed Dec. 31, 1985, Ser. No. 815,432
Int. Cl.⁴ H04B *1/00, 7/00*
U.S. Cl. 455—51 **11 Claims**

1. In a plurality of base stations, each having a transmitter connected to a central controller via an interconnect link having an associated time delay and forming one branch of a simulcast transmission system for transmitting message signals in a synchronized first mode, apparatus for providing automatic synchronization capability, the apparatus comprising in combination:
adaptive delay means, inserted between said interconnect link and said transmitter, having a first input electrically connected to said interconnect link and a second input for utilizing a reference sync signal; and
master timing signal receiving means electrically connected to said second input of said adaptive delay means for providing said reference sync signal thereto,
said adaptive delay means having a first and a second mode of operation, with said second mode activated upon detecting a re-sync command from said central controller at said first input and utilizing said reference sync signal at said second input for varying an adjustable time delay therein in opposite fashion to said associated delay, for



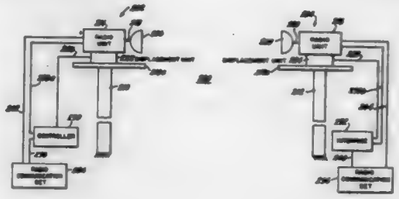
re-adjusting, during said second mode and automatically maintaining during said first mode, a constant total delay from said central controller to each of said transmitters, for sending message signals from said base stations in precise time synchronization.

4,696,053

ANTENNA ALIGNMENT SYSTEM AND METHOD

Dennis Mastriani, Lakewood; Donald Jacoby, Elberon; Jeanne Weise, Ocean; Bruce Linick, Wayside; John Mariabo, Elizabeth, and Charles M. DeSantis, Neptune, all of N.J., assignors to Canadian Marconi Corporation, Montreal, Canada

Filed Jul. 3, 1985, Ser. No. 751,386
Int. Cl.⁴ H04B *7/14*
U.S. Cl. 455—67 **21 Claims**



1. In a method for effecting communication between first and second antennas, the steps of:
(a) mutually displacing said first and second antennas, determining received signal strength at each antenna from transmissions by the other thereof and positioning said antennas accordingly to obtain a first quality level of communication therebetween; and
(b) effecting a second quality level of communication as between said first and second antennas, said second quality level exceeding said first quality level, by defining a plurality of succeedingly diminishing search movement patterns for each of said first and second antennas, transmitting individually from said first and second antennas while displacing the receiving antenna thereof in such patterns and detecting the level of receipt of such transmitted energy by the receiving antenna thereof,
wherein said step (a) is practiced by equipping said first and second antennas with concurrently operative transmit and receive capability and simultaneously transmitting from and receiving at each said antenna while displacing same at respectively different rates.

4,696,054

POCKETABLE WIRELESS TRANSMITTER AND RECEIVER

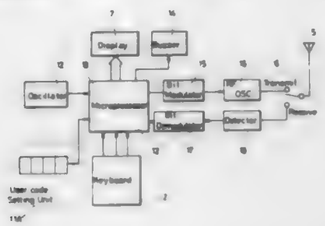
Shinji Tsugei, and Tomohiro Inoue, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 561,291, Dec. 14, 1983, abandoned. This application Jun. 23, 1986, Ser. No. 876,670

Claims priority, application Japan, Dec. 16, 1982, 57-191094[U]

Int. Cl.[4] H04B 1/38, 1/06

U.S. Cl. 455—89 5 Claims



1. A wireless communicating device for wirelessly communicating message codes representative of specific messages with one of a plurality of additional communicating devices, comprising:

an antenna;

demodulator means, connected to said antenna, for detecting and demodulating a transmission received by said antenna on a predetermined frequency band, said demodulator means converting said transmission into a bit pulse train;

said bit pulse train comprising a start bit, a binary user code specifying a particular said communicating device selected to recognize said transmission, a binary message code, and a stop bit;

means for selecting a desired user code for said wireless communicating device;

means for displaying a decimal representatio of a detected message code;

processor means, operatively connected to said demodulator means, said means for selecting and said means for displaying, for receiving said bit pulse train, for detecting a coincidence between said binary user code of said bit pulse train and said desired user code selected by said means for selecting, and for supplying said message code of said bit pulse train to said means for displaying in response to the detected coincidence;

keyboard means for introducing a desired message code to be transmitted;

said processor means being responsive to said keyboard and developing a said bit pulse train for transmission to a selected additional communicating device, said bit pulse train including a binary user code of the selected additional communicating device to receive said bit pulse train;

bit modulator means responsive to said processor means for modulating said bit pulse train into a tone burst waveform; and

oscillator means, operatively connected to said bit modulator means, for converting said tone burst waveform into a transmission, said oscillator means supplying said transmission to said antenna;

said processor means repeatedly supplying said bit pulse train to said bit modulator means and oscillator means to repetitively transmit said transmission when said device is in a transmitting mode, said processor means supplying said message code to said means for displaying only after detecting said bit pulse train received by said device a predetermined repeated number of times when in a receiving mode.

4,696,055

RF TUNING CIRCUIT WHICH PROVIDES IMAGE FREQUENCY REJECTION

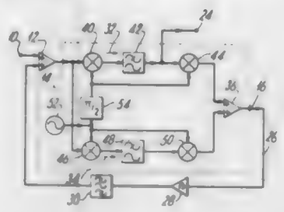
Christopher B. Marshall, Horley, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 17, 1985, Ser. No. 809,694

Claims priority, application United Kingdom, Dec. 19, 1984, 8432010

Int. Cl.[4] H04B 1/04, 1/26, 1/10

U.S. Cl. 455—118 8 Claims



1. An improved radio frequency (RF) tuning circuit which suppresses image frequencies of the frequency band to which it is tuned and which comprises: an RF amplifier having an input for RF signals supplied thereto, a feedback signal input, and an output; such output being connected to the input of an N-path filter which includes a local oscillator; and a feedback path connecting the output of said filter to the feedback signal input of said RF amplifier; such improvement being characterized in that said N-path filter comprises:

first and second quadrature related signal paths connecting the output of said RF amplifier to first and second inputs, respectively, of a summing amplifier, said summing amplifier having an output at which it produces output RF signals corresponding to the supplied RF signals, the output of said summing amplifier being connected to said feedback path to supply such output RF signals thereto as feedback signals;

said first signal path including in series a first mixer, a first filter and a second mixer, the output of said second mixer being coupled to the first input of said summing amplifier;

said second signal path including in series a third mixer, a second filter and a fourth mixer, the output of said fourth mixer being coupled to the second input of said summing amplifier;

and phase shift means coupling the output of said local oscillator in quadrature to said first and third mixers, respectively, and in quadrature to said second and fourth mixers, respectively;

such feedback path causing the center frequency of the transfer characteristic of said filter to be displaced from the frequency of said local oscillator therein by an amount determined by the relative gains of said feedback path and said RF amplifier;

whereby substantially only a single sideband of the signals produced at the outputs of said third and fourth mixers is included in the output RF signals produced by said summing amplifier.

4,696,056

FREQUENCY CONVERTING CIRCUIT

Hiroyuki Morita, Kumagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 2, 1985, Ser. No. 751,235

Claims priority, application Japan, Jul. 5, 1984, 59-137986

Int. Cl.[4] H04B 1/26

U.S. Cl. 455—182 19 Claims

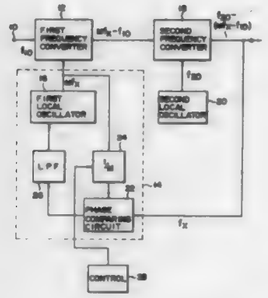
1. A frequency converting circuit for converting an input frequency into a stable output frequency, said frequency converting circuit comprising:

a first frequency converter for converting said input frequency into a first intermediate frequency;

first oscillator means for supplying a first oscillating frequency to said first frequency converter, said first oscillator means including a voltage controlled oscillator providing said first oscillating frequency;

a second frequency converter for converting said first intermediate frequency into a second intermediate frequency comprising; and

control means coupled between said first oscillator means and said second frequency converter, for controlling said first oscillating frequency of said first oscillator means according to said second intermediate frequency supplied



from said second frequency converter, said control means including a phase locked loop circuit coupled to said voltage controlled oscillator, said phase locked loop circuit further including programmable divider for dividing said first oscillating frequency of said voltage controlled oscillator by factor M, and a phase comparing circuit for comparing the phase of an output signal of said programmable divider with the phase of an output signal of said second frequency converter, the result of the comparison controlling said first oscillating frequency of said voltage controlled oscillator.

4,696,057

CN RATIO MEASUREMENT CIRCUIT

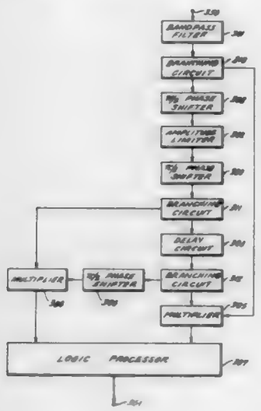
Susumu Otani, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 15, 1985, Ser. No. 787,422

Claims priority, application Japan, Oct. 16, 1984, 59-217047

Int. Cl.[4] H04B 17/00

U.S. Cl. 455—226 1 Claim



1. A circuit for measuring carrier power to noise power ratio in a communication transmission channel including a nonlinear signal processing element, comprising:

a bandpass filter for band-limiting an input signal;

a first branching circuit for branching an output of said bandpass filter to produce two outputs;

a first $\pi/2$ phase shifter for rotating a phase of one of said two outputs of said first branching circuit by $\pi/2$ radians;

an amplitude-limiter for limiting an amplitude of an output of said first $\pi/2$ phase shifter;

a second $\pi/2$ phase shifter for rotating a phase of an output of said amplitude-limiter by another $\pi/2$ radians;

a second branching circuit for branching an output of said second $\pi/2$ phase shifter to produce two outputs;

a delay circuit for delaying one of said two outputs of said second branching circuit;

a third branching circuit for branching an output of said delay circuit to produce two outputs;

a first multiplier for producing a product of one of said two outputs of said third branching circuit and the other output of the first branching circuit;

a third $\pi/2$ phase shifter for rotating a phase of the other output of the third branching circuit by $\pi/2$ radians;

a second multiplier for producing a product of an output of said third $\pi/2$ phase shifter and the other output of the second branching circuit;

a first averaging circuit for averaging an output of the first multiplier;

a first squaring circuit for producing a square of an output of said first averaging circuit;

a second squaring circuit for producing a square of an output of the second multiplier;

a second averaging circuit for averaging an output of said second squaring circuit;

a divider for dividing an output of the first squaring circuit by an output of said second averaging circuit; and

a constant circuit for multiplying an output of said divider by a predetermined constant.

4,696,058

DIVERSITY RECEIVER

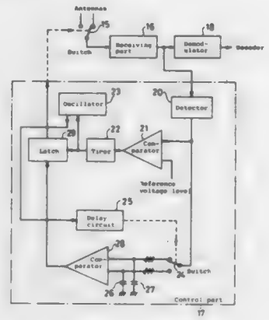
Ryobun Tachita, Kawasaki, and Akio Teranishi, Ebina, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 4, 1984, Ser. No. 678,161

Claims priority, application Japan, Dec. 6, 1983, 58-230110; Dec. 6, 1983, 58-230111; Jul. 13, 1984, 59-146446

Int. Cl.[4] H04B 1/06

U.S. Cl. 455—277 10 Claims



1. A diversity receiver comprising:

at least first and second antennas;

a receiving part for receiving a signal from said antennas;

connecting means for selectively connecting one of said antennas to said receiving part;

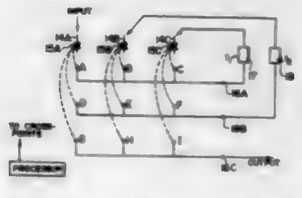
detecting means for detecting an output signal from said receiving part;
means for generating a timing signal when said output signal detected by said detecting means has a higher level than a predetermined level;
means for generating a first control signal to supply to said connecting means for selectively connecting respective antennas during a predetermined period defined by said timing signal;
means for selecting one antenna which is receiving the most intensive signal by comparing levels of outputs of said detecting means each delivered from said first and second antennas during a period wherein said first control signal is supplied to said connecting means; and
means for generating a second control signal to connect said receiving part to said one antenna selected by said selecting means during a period wherein said timing signal exists.

4,696,059

REFLEX OPTOELECTRONIC SWITCHING MATRIX

R. I. MacDonald; D. K. W. Lam, both of Ottawa, and R. W. Jenkins, Almonte, all of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et D'Exploitation Limitee, Ottawa, Canada

Filed Mar. 7, 1984, Ser. No. 586,777
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—600 **63 Claims**



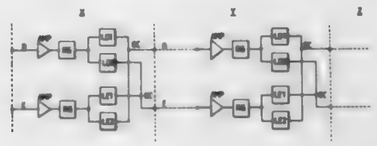
31. A signal processor comprising an optoelectronic switching matrix having switching crosspoints, a plurality of input ports, a plurality of output ports, and means for switching different signal delay means between all but one of the input ports and all but one of the output ports via the switching matrix.

4,696,060

OPTICAL TRANSMISSION SYSTEMS

Thomas Oswald, Dartford, United Kingdom, assignor to STC plc, London, England

Filed Oct. 3, 1985, Ser. No. 783,570
Claims priority, application United Kingdom, Oct. 5, 1984, 8425232
Int. Cl.[4] H04B *9/00*; **H04L** *1/22*
U.S. Cl. 455—601 **6 Claims**



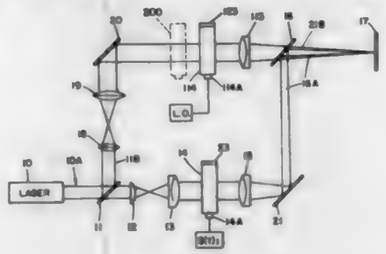
1. An optical repeater comprising at least two separate input and two separate optical fibre paths and two optical output sources coupled with each input path, wherein the sources coupled with each input path are permaneatly optically coupled with different respective output paths, and a supervisory system operatively connected to said sources is provided for selecting operation of a particular optical source by switching the source whereby transmission from an input path can be transferred to a different output path.

4,696,061

ACOUSTO-OPTIC R-F RECEIVER WHICH IS TUNABLE AND HAS ADJUSTABLE BANDWIDTH

Joseph H. Labrum, West Jordan, Utah, assignor to Sperry Corporation, Blue Bell, Pa.

Continuation of Ser. No. 566,437, Dec. 28, 1983, abandoned. This application Sep. 22, 1986, Ser. No. 910,793
Int. Cl.[4] H04B *9/00*; **G02F** *1/11*
U.S. Cl. 455—609 **11 Claims**



1. An acousto-optic filter comprising,
light source means for providing a main coherent light beam,
beam splitter means for receiving and splitting said main light beam into first and second coherent light beams,
local oscillator means for supplying a fixed frequency first signal,
signal source means for supplying a second signal,
first and second acousto-optic cells driven by said first and second signals, respectively, each disposed to respectively receive one of said first and second coherent light beams at an acousto-optical angle, for diffracting and modulating said first and second light coherent beams in response to said first and second signals, respectively, in order to form first and second diffracted and modulated light beams,
optical superimposing and Fourier transform lens means for providing and projecting a heterodyned light beam derived from said first and second diffracted and modulated light beams,
and detection means having a detecting surface wherein said detection means is constructed for detecting said Fourier transformed heterodyned beam of light and for providing an electrical signal of an intermediate frequency derived from said first and second signals, said detecting surface being positioned at the Fourier focal plane of said Fourier transform lens means to intercept said heterodyned light beam so that an area of light is illuminated on said detecting surface at an instant of time which is representative of said heterodyned light beam such that the size and location of any such area on said detecting surface is respectively a function of said intermediate frequency and said first signal at said instant of time.

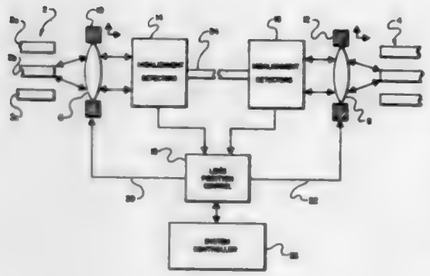
4,696,062

FIBER OPTIC SWITCHING SYSTEM AND METHOD

Edward V. LaBudde, 1769 Upper Ranch Rd., Westlake Village, Calif. 91362

Filed Jul. 12, 1985, Ser. No. 754,643
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—612 **30 Claims**

1. A fiber optic switching system capable of rapidly switching among optical rods fixed in position in a multirod cable for optical connection with a communications channel, comprising:
a lens adapted to focus optical radiation emitted from a rod fixed in position to a beam suitable for transmission by the communications channel, means for adjusting the lens position relative to the fixed rod,
position control means adapted to control the position adjusting means to sequentially position the lens at the approximate locations of desired fixed rods in the cable, and



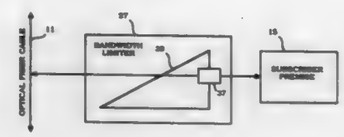
means responsive to radiation transmitted from a desired fixed rod through the lens for detecting misalignments between the lens and said fixed rod,
the position control means controlling the position adjusting means in response to detected misalignments to adjust the lens position so as to oppose detected misalignments between the lens and fixed rod.

4,696,063

OPTICAL FIBER BANDWIDTH LIMITING METHOD

John J. Schembri, Daly City, Calif., assignor to Pacific Bell, San Francisco, Calif.

Filed Aug. 30, 1985, Ser. No. 771,266
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—612 **2 Claims**



1. In a fiber optic communication system wherein a plurality of subscribers are connected to a central office by optical fiber connections over each of which information is transmitted pursuant to a subscription agreement designating a predetermined subscription bandwidth for each said optical fiber connection, each of said optical fiber connections providing an information path extending from said central office to a respective subscriber premise, the improvement comprising means for regulating subscriber usage of each of said optical fiber connections comprising a plurality of bandwidth limiting devices, each connected in series in a respective one of said optical fiber connections in said information path, each said bandwidth limiting device including means for introducing material dispersion to the associated one of said optical fiber connections beyond that inherently present in said connection, said material dispersion being selected to limit the bandwidth of the associated one of said optical fiber connections to the said subscription bandwidth designated in the said subscription agreement associated with said optical fiber connection by limiting the frequency which can be transmitted on the associated optical fiber connection to a maximum frequency which is greater than or equal to the subscription bandwidth for said subscriber optical fiber connection but below that of the total capacity of said subscriber optical fiber connection.

DESIGN PATENTS

GRANTED SEP. 22, 1987

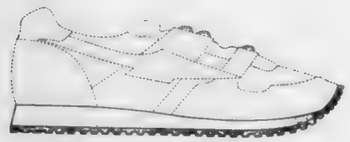
ERRATA

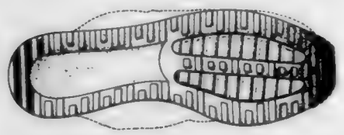
For CLASS	See PATENT NO.
D12-181	291,978

291,940
FOOD PRODUCT
Geoffrey N. Jureidini, Summer Hill, Australia, assignor to Allied Mills Industries Pty. Limited, New South Wales, Australia
Filed Jan. 4, 1985, Ser. No. 688,994
Claims priority, application Australia, Jul. 19, 1984, 8237/84
Term of patent 14 years
U.S. Cl. D1—120



291,941
SHOE SOLE
Robert L. Peterson, Taichung, Taiwan, assignor to Pensa, Inc., Portland, Oreg.
Filed Jul. 9, 1986, Ser. No. 883,530
Term of patent 14 years
U.S. Cl. D2—320

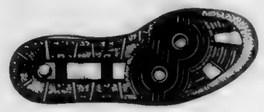




291,942
FLASHING LIGHT SAFETY BELT
Vernon D. Green, 104 East, 5350 South, Ogden, Utah 84403
Filed Jul. 13, 1984, Ser. No. 630,745
Term of patent 14 years
U.S. Cl. D2—628



291,943
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,394
Term of patent 14 years
U.S. Cl. D2—320





291,944
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,395
Term of patent 14 years
U.S. Cl. D2—320





291,945
SHOE SOLE
Brenda Kelley, Beaverton, and Jack Curley, Portland, both of Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,415
Term of patent 14 years
U.S. Cl. D2—320



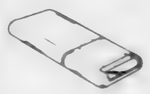


291,946
TOOL CASE
Arduino Dottori, and Roberto Ingegnere, both of Milan, Italy, assignors to FACOM "Societe Anonyme", Morangis, France
Filed Jan. 30, 1985, Ser. No. 696,356
Claims priority, application France, Aug. 1, 1984, 843 457
Term of patent 14 years
U.S. Cl. D3—73





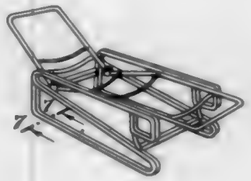
291,947
CASE FOR WRITING INSTRUMENTS
Toshiaki Nakata, Tokyo, Japan, assignor to Plus Corporation, Tokyo, Japan
Filed Mar. 19, 1986, Ser. No. 845,359
Claims priority, application Japan, Nov. 22, 1985, 60-49040
Term of patent 14 years
U.S. Cl. D3—74



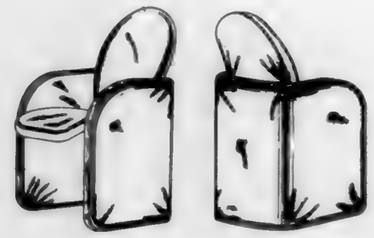




291,948
FRAME FOR AN ADJUSTABLE CHAISE
Marks M. Conn, Moorpark, Calif., assignor to Mallin Company, Los Angeles, Calif.
Filed Mar. 26, 1985, Ser. No. 716,187
Term of patent 14 years
U.S. Cl. D6—361



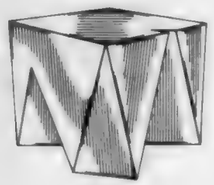
291,949
CHAIR
William B. Hendrick, Grand Rapids, Mich., assignor to Mueller Furniture Corporation, Grand Rapids, Mich.
Filed Apr. 5, 1985, Ser. No. 720,360
Term of patent 14 years
U.S. Cl. D6—375



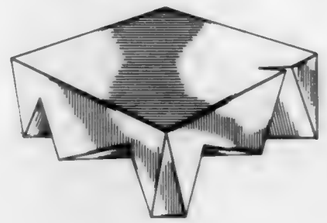
291,950
TABLE
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Industries, Lenoir, N.C.
Filed Apr. 15, 1985, Ser. No. 723,515
Term of patent 14 years
U.S. Cl. D6—430



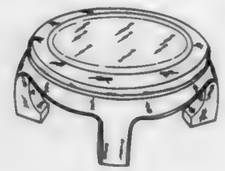
291,951
TABLE
Edward F. Lorio, 832 Arlington, Deland, Fla. 32724
Filed May 6, 1985, Ser. No. 730,477
Term of patent 14 years
U.S. Cl. D6—482



291,952
TABLE
Edward F. Lorio, 1207 Nathan Hunt Rd., Greensboro, N.C. 27410
Filed May 13, 1985, Ser. No. 733,115
Term of patent 14 years
U.S. Cl. D6—482



291,953
TABLE
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Industries, Lenoir, N.C.
Filed Apr. 15, 1985, Ser. No. 723,512
Term of patent 14 years
U.S. Cl. D6—488



291,954
WINDOW SHADE PULL
Robert H. Litowitz, Old Pump House, Harriman Rd., Irvington, N.Y. 10533
Filed Dec. 21, 1984, Ser. No. 685,158
Term of patent 14 years
U.S. Cl. D6—581







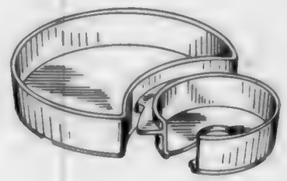
291,955
SILK SCREEN STENCIL DECORATION FOR A PLATE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Jun. 5, 1985, Ser. No. 741,471
Term of patent 14 years
U.S. Cl. D7—39



291,956
SWIZZLE STICK
Paul A. Fenner, P.O. Box 39, Guildford, Surrey GU1 4QU, England
Filed Nov. 16, 1984, Ser. No. 672,066
Claims priority, application United Kingdom, May 21, 1984, 1019798
Term of patent 14 years
U.S. Cl. D7—42



291,957
COMBINED CANAPE TRAY AND GLASS HOLDER
Kenneth V. Stevens, Brooklyn, N.Y., assignor to Grainware Company, Chicago, Ill.
Filed Feb. 7, 1985, Ser. No. 699,077
Term of patent 14 years
U.S. Cl. D7—70



291,958
ROASTING RACK
William M. Tullberg, 44, Church Street, Calne, Wiltshire, SN11 0HZ, United Kingdom
Filed Oct. 1, 1984, Ser. No. 656,413
Claims priority, application United Kingdom, Mar. 31, 1984, 1018864
Term of patent 14 years
U.S. Cl. D7—409

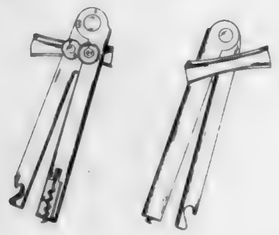


291,959
GRAIN SCOOP
Harold O. Eads, Parkersburg, and Rudolph F. Planthaber, Mineral Wells, both of W. Va., assignors to O. Amos Co., Parkersburg, W. Va.
Filed Apr. 23, 1985, Ser. No. 726,381
Term of patent 14 years
U.S. Cl. D8—10





291,960
CAN OPENER
Peter Kerti, 45 Bromley Crescent, Toronto, Ontario (M9A 3X1)
Filed Mar. 12, 1984, Ser. No. 588,315
Claims priority, application Canada, Sep. 14, 1983, 1409831
Term of patent 14 years
U.S. Cl. D8—18



291,961
IMPACT WRENCH
Sten-Ake Andersson, Box 8, S-360 24 Linneryd, Sweden
Filed May 9, 1984, Ser. No. 609,671
Claims priority, application Sweden, Nov. 9, 1983, 832927
Term of patent 14 years
U.S. Cl. D8—24



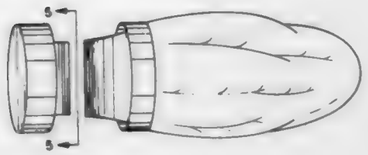
291,962
HACKSAW FOR HAND USE
William G. Johnson, Mequon, and James L. Clark, Thiensville, both of Wis., assignors to Johnson Level & Tool Mfg. Co., Milwaukee, Wis.
Filed Sep. 28, 1984, Ser. No. 655,578
Term of patent 14 years
U.S. Cl. D8—95



291,963
CLAMP
William Farmer, 334 Orenda Cir., Westfield, N.J. 07090
Filed Oct. 15, 1984, Ser. No. 661,239
Term of patent 14 years
U.S. Cl. D8—394



291,964
DISPENSING CONTAINER
Lawrence S. Albright, Plant City, Fla., assignor to Jerry Burnett Jones and Virginia Leoin Jones, both of Lakeland, Fla.
Filed Aug. 20, 1984, Ser. No. 642,530
Term of patent 14 years
U.S. Cl. D9—302



291,965
BOTTLE
Philip C. Best, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 29, 1985, Ser. No. 728,059
Term of patent 14 years
U.S. Cl. D9—376



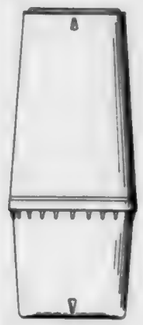
291,966
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Coseden Technology, Inc., Big Spring, Tex.
Filed Jul. 22, 1985, Ser. No. 757,400
Term of patent 14 years
U.S. Cl. D9—389



291,967
PACKAGING CONTAINER
Donald N. MacLaughlin, and Mark W. Sumeren, both of Midland, Mich., assignors to Coseden Technology, Inc., Big Spring, Tex.
Filed Dec. 5, 1985, Ser. No. 805,018
Term of patent 14 years
U.S. Cl. D9—390



291,968
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Coseden Technology, Inc., Big Spring, Tex.
Filed Dec. 5, 1985, Ser. No. 805,015
Term of patent 14 years
U.S. Cl. D9—398



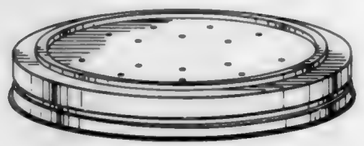
291,969
PLASTIC SUPPLY BOTTLE
Gregory D. Kramer, North St. Paul, and Daniel L. Vanlaasen, Stacy, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 29, 1985, Ser. No. 728,658
Term of patent 14 years
U.S. Cl. D9—413



291,970
LID FOR A CONTAINER
Gene L. Downing, 15630 Cecil Ave., Riverside, Calif. 92504, and Ronald A. Fields, 15432 Golden Star, Riverside, Calif. 92506
Filed Dec. 6, 1984, Ser. No. 678,656
Term of patent 14 years
U.S. Cl. D9—436



291,971
CONTAINER LID
Ernest L. Smith, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed Mar. 5, 1985, Ser. No. 708,428
Term of patent 14 years
U.S. Cl. D9—447



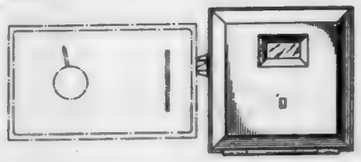
291,972
DISPENSING PUMP CLOSURE
Peter Pfeiffer, Gaienhofen, Fed. Rep. of Germany, assignor to Pfeiffer Kunststofftechnik GmbH, Fed. Rep. of Germany
Filed Oct. 9, 1984, Ser. No. 658,645
Term of patent 14 years
U.S. Cl. D9—448



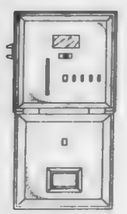
291,973
TOY ROBOT-AIRCRAFT WATCH
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 30, 1985, Ser. No. 696,641
Claims priority, application Japan, Dec. 27, 1984, 59-53237
Term of patent 14 years
U.S. Cl. D10—33



291,974
AUTOMATIC THERMOSTAT CONTROL
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Division of Ser. No. 622,871, Jun. 20, 1984, Pat. No. Des. 288,068. This application Dec. 31, 1986, Ser. No. 948,295
Term of patent 14 years
U.S. Cl. D10—50

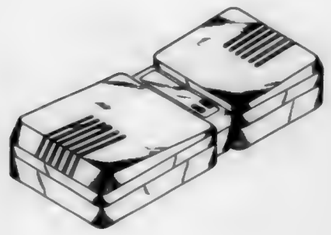








291,975
ALARM
Yau Ching-Hua, P.O. Box 2064, Taichung, Taiwan
Filed Jan. 11, 1985, Ser. No. 690,742
Term of patent 14 years
U.S. Cl. D10—106



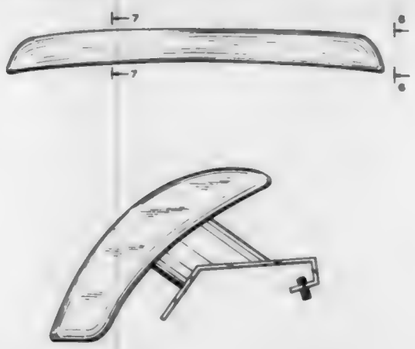
291,976
ANTENNA HOUSING FOR AN ELECTRONIC ARTICLE SURVEILLANCE SYSTEM
Jeffrey A. Alward, and Stanley T. Greseno, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 24, 1984, Ser. No. 685,408
Term of patent 14 years
U.S. Cl. D10—121



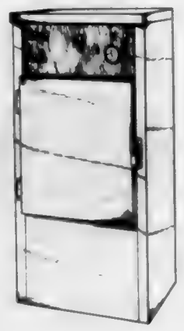
291,977
JEWELRY FINDING
Linda B. Sebring, 302 Deerfield Dr., New Carlisle, Ohio 45344
Filed May 7, 1985, Ser. No. 731,364
Term of patent 14 years
U.S. Cl. D11—54



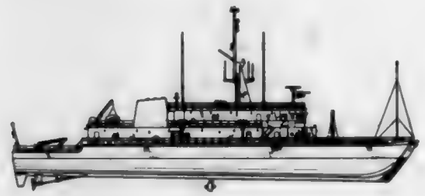
291,978
SPOILER VANE FOR SMALL VANS
Alan Parr, Utica, and Lee K. Graves, Bloomfield, both of Mich., assignors to Wickes Manufacturing Company, Southfield, Mich.
Filed Jul. 11, 1985, Ser. No. 753,752
Term of patent 14 years
U.S. Cl. D12—181



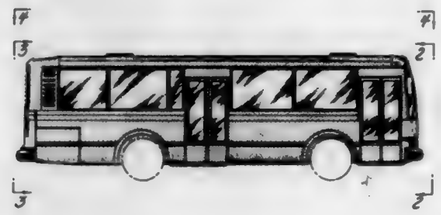
291,979
SEED GERMINATOR OR SIMILAR ARTICLE
Richard O. Klemm, 559 Cross Creek, Crystal Lake, Ill. 60014
Filed Apr. 2, 1985, Ser. No. 719,169
Term of patent 14 years
U.S. Cl. D11—145



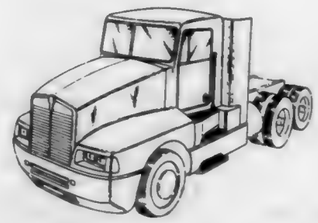
291,980
SURFACE EFFECT SHIP
John B. Chaplin, Covington, La., assignor to Textron Inc., Providence, R.I.
Filed Jul. 18, 1985, Ser. No. 756,456
Term of patent 14 years
U.S. Cl. D12—5



291,981
BUS BODY
Donald L. Manning, 4002 Normanwood Dr., Orchard Lake, Mich. 48033
Filed May 3, 1985, Ser. No. 729,923
Term of patent 14 years
U.S. Cl. D12—84



291,982
TRUCK CAB
Wayne K. Simons; Roy L. Merryman, and Larry W. Orr, all of King County, Wash., assignors to Paccar Inc, Bellevue, Wash.
Filed Feb. 6, 1985, Ser. No. 698,771
Term of patent 14 years
U.S. Cl. D12—96



291,983
DASHBOARD PANEL
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed Jul. 11, 1985, Ser. No. 754,350
Term of patent 14 years
U.S. Cl. D12—192



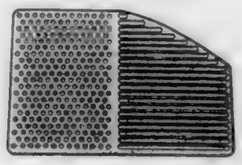
291,984
DASHBOARD PANEL
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed Jul. 12, 1985, Ser. No. 754,351
Term of patent 14 years
U.S. Cl. D12—192



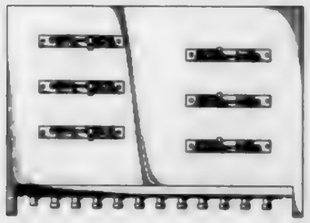
291,985
DASHBOARD PANEL
Paul D. Cornwell, Littleton, Colo., assignor to Import Auto Products, Ltd., Denver, Colo.
Filed Jul. 12, 1985, Ser. No. 754,352
Term of patent 14 years
U.S. Cl. D12—192

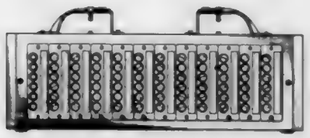


291,986
FRONT FLOOR MAT FOR AN AUTOMOBILE
Aina K. Nilsson, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Trollhättan, Sweden
Filed Jul. 16, 1985, Ser. No. 755,713
Claims priority, application Sweden, Jan. 16, 1985, 85-0091
Term of patent 14 years
U.S. Cl. D12—203



291,987
MOBILE LIGHTGUIDE CABLE ACCESS UNIT FOR TESTING, REARRANGING AND POWERING OPTICAL FIBERS
Robert A. Jordan, Waukegan; Michael P. Hogan, Chicago, and Henry J. Mackay, Countryside, all of Ill., assignors to Illinois Bell Telephone Company, Chicago, Ill.
Filed Sep. 21, 1984, Ser. No. 652,902
Term of patent 14 years
U.S. Cl. D13—41

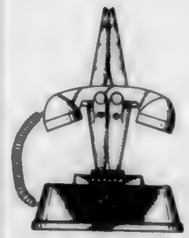


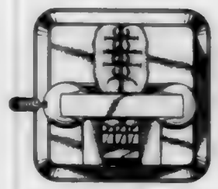


291,988
SPEAKER
Hideaki Ishizaki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 15, 1985, Ser. No. 734,223
Claims priority, application Japan, Dec. 21, 1984, 59-52604
Term of patent 14 years
U.S. Cl. D14—30



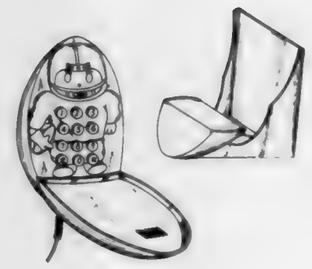
291,989
TELEPHONE
Donald R. Roach, and Evangeline J. Boyd, both of Baton Rouge, La., assignors to Religious Telephone Company Ltd., Baton Rouge, La.
Filed Jun. 26, 1986, Ser. No. 879,168
Term of patent 14 years
U.S. Cl. D14—53





291,990
HANDSET TELEPHONE AND STAND SET
Peter Lee, 2nd Fl., 7 Lane 93, Pao Ping Rd., YungHo City, Taiwan
Filed Feb. 8, 1985, Ser. No. 699,477
Term of patent 14 years
U.S. Cl. D14—83



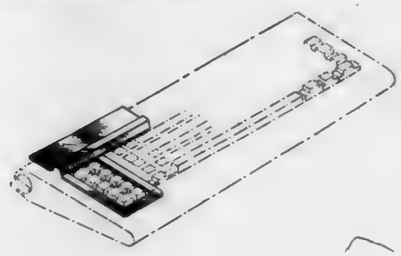


291,991
HANDSET TELEPHONE
Peter Lee, 4th Fl., 7, Alley 25, Lane 300, Jen Ai Rd., Sec. 4, Taipei, Taiwan
Filed Dec. 19, 1985, Ser. No. 810,681
Term of patent 14 years
U.S. Cl. D14—64

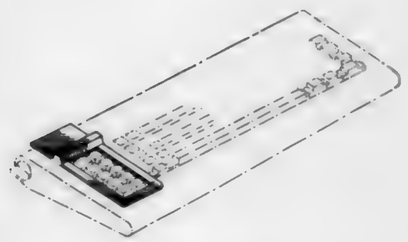




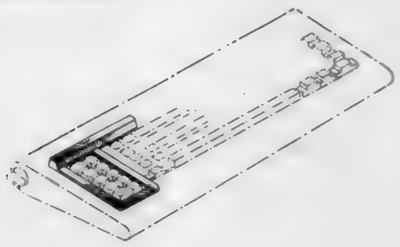
291,992
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,634
The portion of the term of this patent subsequent to Sep. 22, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



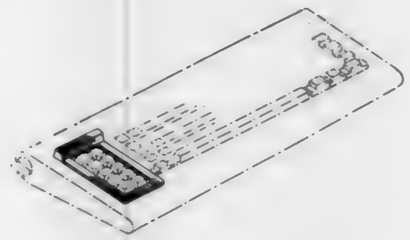
291,993
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,635
The portion of the term of this patent subsequent to Sep. 22, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



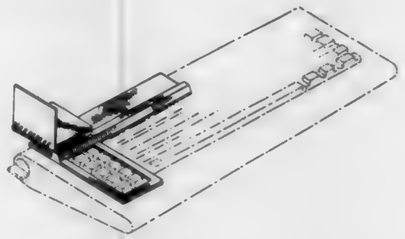
291,994
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,636
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



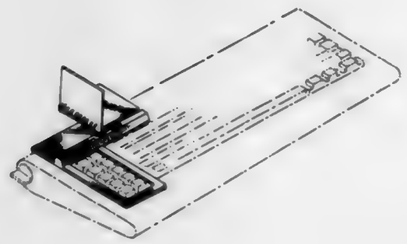
291,995
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,637
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



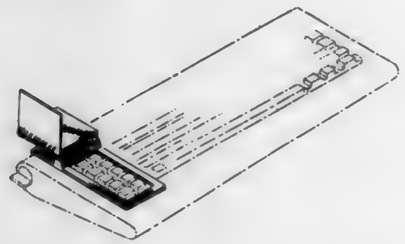
291,996
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,638
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



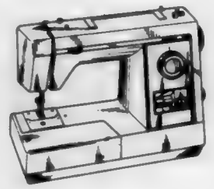
291,997
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,639
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



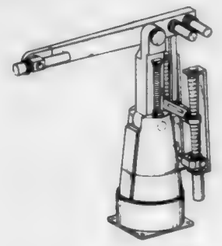
291,998
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed May 31, 1985, Ser. No. 739,640
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114

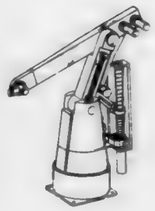


291,999
SEWING MACHINE
Yoshihide Yoneda, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed May 31, 1984, Ser. No. 615,740
Term of patent 14 years
U.S. Cl. D15—69

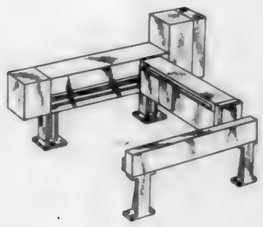


292,000
INDUSTRIAL ROBOT
Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Ko Tsuji, Hunabashi; Akira Uchida, and Masayuki Ohshiro, both of Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 14, 1985, Ser. No. 701,522
Claims priority, application Japan, Aug. 17, 1984, 59-34381; Aug. 17, 1984, 59-34382
Term of patent 14 years
U.S. Cl. D15—199

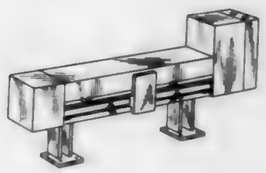




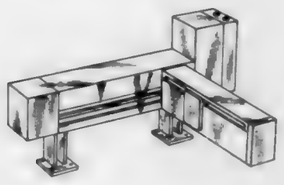
292,001
INDUSTRIAL ROBOT
Yutaka Imaizumi, Yaizu; Housei Higashi, Shimizu, and Masato Shibayama, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,719
Claims priority, application Japan, Sep. 19, 1984, 59-38545
Term of patent 14 years
U.S. Cl. D15—199



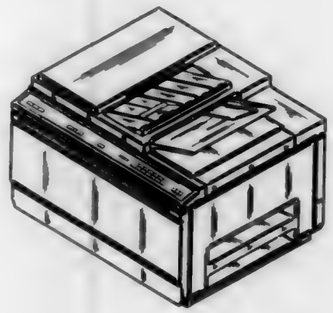
292,002
INDUSTRIAL ROBOT
Masato Shibayama, Sayama; Yutaka Imaizumi, Yaizu, and Housei Higashi, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,722
Claims priority, application Japan, Sep. 19, 1984, 59-38543
Term of patent 14 years
U.S. Cl. D15—199



292,003
INDUSTRIAL ROBOT
Yutaka Imaizumi, Yaizu; Housei Higashi, Shimizu, and Masato Shibayama, Sayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1985, Ser. No. 704,725
Claims priority, application Japan, Sep. 19, 1984, 59-3854
Term of patent 14 years
U.S. Cl. D15—199

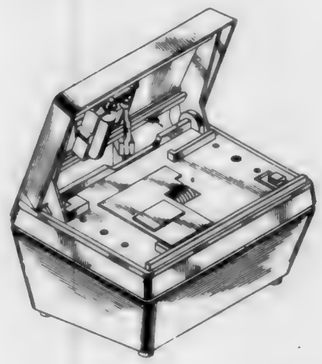


292,004
ELECTRONIC COPYING MACHINE
Harumi Fukuda, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 28, 1985, Ser. No. 696,600
Term of patent 14 years
U.S. Cl. D16—31

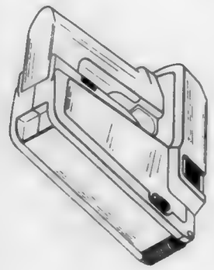


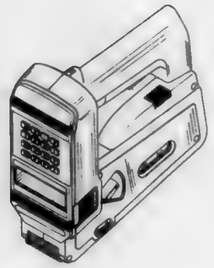
292,005
ELECTRICALLY POWERED IMPRINTER
Harvey K. McQuarrie, Kitchener, Canada, assignor to National Business Systems, Ontario, Canada
Filed Sep. 27, 1985, Ser. No. 780,968
Term of patent 14 years
U.S. Cl. D18—14





292,006
LABELER
Mitsuo Fujita, Washimiyamachi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan
Filed Nov. 19, 1985, Ser. No. 805,924
Claims priority, application Japan, Jun. 11, 1985, 60-24429
Term of patent 14 years
U.S. Cl. D18—19



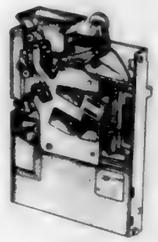


292,007
FLEXIBLE PEN
Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024
Filed Feb. 25, 1985, Ser. No. 704,788
Term of patent 14 years
U.S. Cl. D19—48

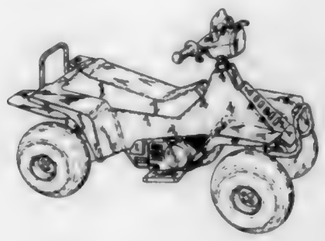




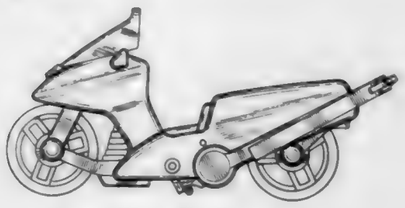
292,008
COIN SELECTOR FOR AUTOMATIC VENDOR
Osamu Kobayashi; Masanori Tanaka; Masaki Akagawa, all of Sakado, and Ryoji Yamagishi, Kawagoe, all of Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan
Filed Dec. 11, 1984, Ser. No. 680,546
Claims priority, application Japan, Jun. 29, 1984, 59-26564
Term of patent 14 years
U.S. Cl. D20—9



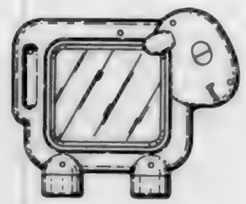
292,009
RIDING TOY
Lawrence R. Harrod, Fort Wayne, Ind., assignor to Kransco Manufacturing, Inc., San Francisco, Calif.
Filed May 29, 1985, Ser. No. 738,880
Term of patent 14 years
U.S. Cl. D21—76



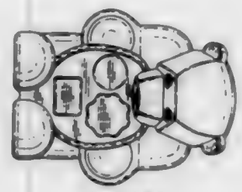
292,010
TOY VEHICLE
Robert K. Allen; Howard N. Bollinger; David A. Myers, all of Cincinnati, Ohio; Eric J. Simpson, Newport, and W. Grey Williams, Covington, both of Ky., assignors to Kenner Parker Toy Inc., Beverly, Mass.
Filed Feb. 14, 1985, Ser. No. 701,590
Term of patent 14 years
U.S. Cl. D21—78



292,011
CHILD'S FIGURE TOY
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Ltd., Great Britain
Filed Feb. 19, 1985, Ser. No. 702,484
Claims priority, application United Kingdom, Jan. 14, 1985, 1024389
Term of patent 14 years
U.S. Cl. D21—148



292,012
TOY FIGURE
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Ltd., Great Britain
Filed Feb. 19, 1985, Ser. No. 702,669
Claims priority, application United Kingdom, Jan. 14, 1985, 1024391
Term of patent 14 years
U.S. Cl. D21—159



292,013
CLOWN DOLL
Bret Chia, 7807 Telegraph Rd. #G, Montebello, Calif. 90640
Filed Nov. 28, 1986, Ser. No. 936,135
Term of patent 14 years
U.S. Cl. D21—173



292,014
FOOTBAG
Robert J. Stalberger, Jr., Vancouver, and LeRoy F. Kennedy, Camas, both of Wash., assignors to Kransco Manufacturing, Inc., San Francisco, Calif.
Filed Dec. 5, 1983, Ser. No. 557,966
The portion of the term of this patent subsequent to Nov. 26, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—205



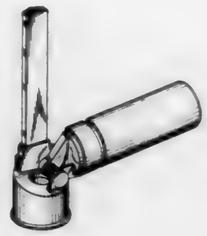
292,015
HYDROTHERAPY VEST
James G. McWaters, 5074 Shelby Dr., Birmingham, Ala. 35243
Continuation of Ser. No. 674,503, Nov. 7, 1984, abandoned. This application Nov. 10, 1986, Ser. No. 906,839
Term of patent 14 years
U.S. Cl. D21—238



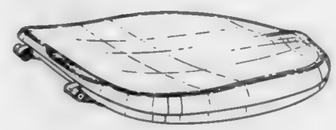
292,016
HORSE-SHAPED SWING
Lewis D. Osterman, 1245 Norwood #42, Boulder, Colo. 80302
Filed Dec. 26, 1984, Ser. No. 686,446
Term of patent 14 years
U.S. Cl. D21—246



292,017
DEMINERALIZING FILTER FOR ULTRASONIC HUMIDIFIERS
Nobuo Tsuchida, Sanjo, Japan, assignor to Uchida Manufacturing Co., Ltd., Niigata, Japan
Filed Jul. 24, 1985, Ser. No. 758,249
Claims priority, application Japan, Mar. 16, 1985, 60-010455
Term of patent 14 years
U.S. Cl. D23—4



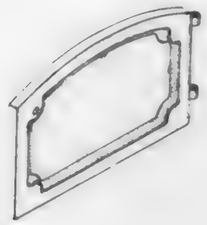
292,018
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Louis L. Lepoix, Baden-Baden, France, assignor to Dansk Pressalit A/S, Arhus C, Denmark
Filed Aug. 1, 1985, Ser. No. 761,371
Claims priority, application Denmark, Feb. 22, 1985, 142-85
Term of patent 14 years
U.S. Cl. D23—71



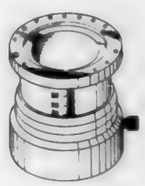
292,019
TOILET SEAT COVER
Brenda A. Hall, 4100 Abbott St., Fort Wayne, Ind. 46806
Filed Feb. 5, 1985, Ser. No. 698,360
Term of patent 14 years
U.S. Cl. D23—11



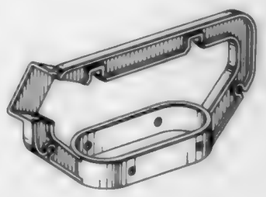
292,020
STOVE DOOR
Kurt W. F. Rumene, and Robert E. Holley, both of 10850 117th Pl. NE., Kirkland, Wash. 98033
Filed Nov. 30, 1984, Ser. No. 676,669
Term of patent 14 years
U.S. Cl. D23—128



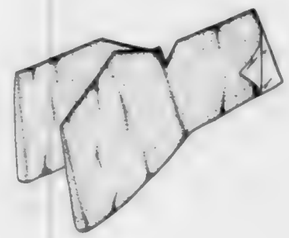
292,021
COMBINED ENDODONTIC GAUGE AND INSTRUMENT HOLDER
Walter Stoll, 2943 Emmick Dr., Toledo, Ohio 43606
Filed Nov. 19, 1985, Ser. No. 805,928
Term of patent 14 years
U.S. Cl. D24—16

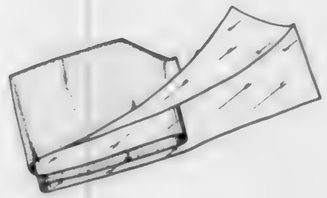


292,022
HANDLE FOR A DIAGNOSTIC URINEMETER UNIT
James K. Bullock, Burbank; William G. Bloom, Northridge; Bernard Siegel, Los Angeles, and Richard Lobodzinski, Sunland, all of Calif., assignors to American Hospital Supply Corp., Evanston, Ill.
Filed Mar. 14, 1985, Ser. No. 712,573
Term of patent 14 years
U.S. Cl. D24—17



292,023
SURGICAL SHEET
Carl-Otto Hanssen, Kullavik, and Bo M. Starzmann, Göteborg, both of Sweden, assignors to Molnlycke Aktiebolag, Göteborg, Sweden
Filed Oct. 11, 1984, Ser. No. 659,882
Claims priority, application Sweden, May 29, 1984, 841660
Term of patent 14 years
U.S. Cl. D24—49

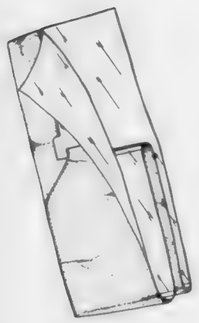


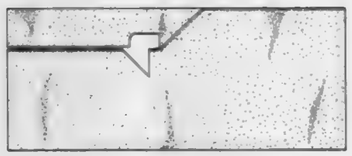




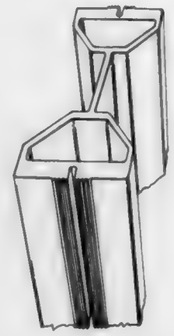
292,024
SURGICAL SHEET
Carl-Otto Hanssen, Kullavik, and Bo M. Starzmann, Göteborg, both of Sweden, assignors to Molnlycke Aktiebolag, Göteborg, Sweden
Filed Oct. 9, 1984, Ser. No. 658,824
Claims priority, application Sweden, May 29, 1984, 841661
Term of patent 14 years
U.S. Cl. D24—49



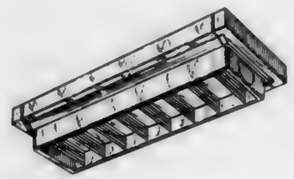




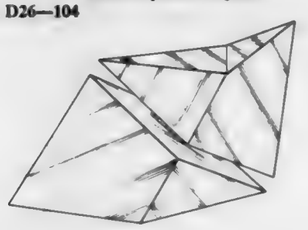
292,025
STRUCTURAL BEAM
Lars-Birger Lundström, Skellefteå, Sweden, assignor to H. B. Megaron, Skellefteå, Sweden
Filed Aug. 21, 1984, Ser. No. 642,941
Term of patent 14 years
U.S. Cl. D25—77



292,026
LIGHTING FIXTURE
Leonardus A. C. Krol, Gorkum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 16, 1985, Ser. No. 776,326
Claims priority, application Netherlands, Mar. 29, 1985, DM/005.015
Term of patent 14 years
U.S. Cl. D26—77



292,027
LAMP
Eric LaRoye, Koningstraat 14 -Bus 2, B-8400 Oostende, Belgium
Filed Dec. 27, 1984, Ser. No. 686,946
Claims priority, application Belgium, Jul. 4, 1984, 1236902
Term of patent 14 years
U.S. Cl. D26—104



292,028
POCKET ASHTRAY
Andrew Rhodes, 51 Watson Ave., Ossining, N.Y. 10562
Filed Aug. 12, 1985, Ser. No. 764,571
Term of patent 14 years
U.S. Cl. D27—8



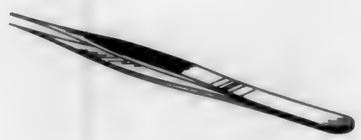
292,029
LIGHTER
Sadao Yoshinaga, Ichikawa, Japan, assignor to Yoshinaga Prince Company Limited, Tokyo, Japan
Filed Jul. 18, 1985, Ser. No. 756,763
Claims priority, application Japan, Apr. 6, 1984, 59-13536; Nov. 7, 1984, 59-45878
Term of patent 14 years
U.S. Cl. D27—36



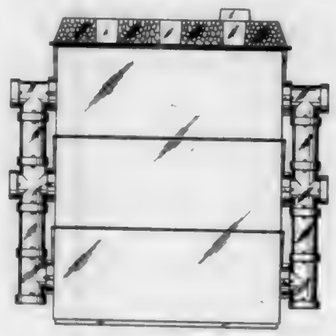
292,030
ORNAMENTAL HAIRBAND OR SIMILAR ARTICLE
Ronny Revson, 225 E. 57th St., New York, N.Y. 10022
Filed Dec. 11, 1986, Ser. No. 940,636
Term of patent 14 years
U.S. Cl. D28—41

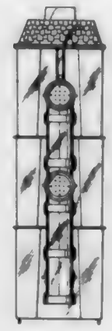


292,031
TWEEZER
Herman G. Kirkpatrick, 9801 Cedar, Overland Park, Kans. 66207
Filed Jun. 6, 1985, Ser. No. 741,839
Term of patent 14 years
U.S. Cl. D28—55

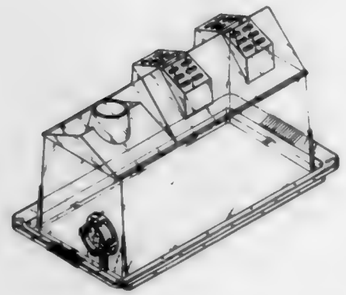


292,032
RODENT HABITAT
Jerry Margolis, Br., Newark County, N.J., assignor to Metaframe Inc., Irvington, N.J.
Filed Oct. 25, 1985, Ser. No. 791,575
Term of patent 14 years
U.S. Cl. D30—1

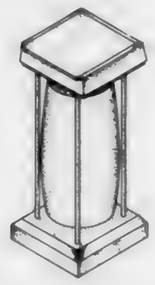




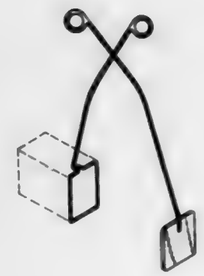
292,033
RODENT HABITAT
Jerry Margolis, Br., Newark County, N.J., assignor to Metaframe Inc., Irvington, N.J.
Filed Oct. 25, 1985, Ser. No. 791,576
Term of patent 14 years
U.S. Cl. D30—1



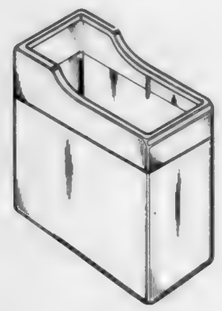
292,034
AQUARIUM
William H. Perkinson, 730 Woodrow, Festus, Mo. 63028
Filed Oct. 25, 1985, Ser. No. 791,467
Term of patent 14 years
U.S. Cl. D30—8



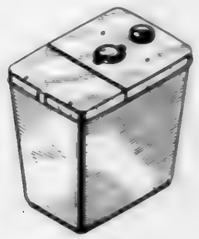
292,035
PET LITTER RETRIEVER
Frank J. Aksamit, 12605 Blackberry Row, Bayonet Point, Fla. 33567
Filed Oct. 23, 1985, Ser. No. 790,383
Term of patent 14 years
U.S. Cl. D30—99



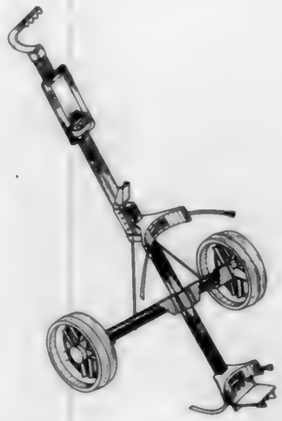
292,036
TRASH BAG HOLDER
Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069
Filed Aug. 2, 1985, Ser. No. 761,797
Term of patent 14 years
U.S. Cl. D34—6



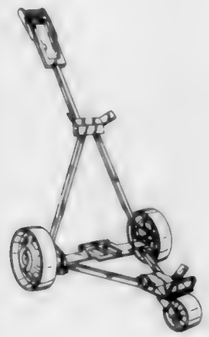
292,037
WASTE RECEPTACLE
Paul H. Hasifl, Barrington, Ill., assignor to Sage Products, Inc., Cary, Ill.
Filed Oct. 4, 1985, Ser. No. 784,515
Term of patent 14 years
U.S. Cl. D34—7



292,038
FOLDING GOLF CART
Ming-Chih Hsieh, 6F-3, 67, Sung-Chiang Rd., Taipei, Taiwan
Filed Apr. 29, 1985, Ser. No. 728,697
Term of patent 14 years
U.S. Cl. D34—15



292,039
FOLDING GOLF CART
Harold J. Moore, Fountain Ct., 48 Benwick Rd., Doddington, Cambridgeshire, United Kingdom PE15 OGT
Filed Oct. 2, 1985, Ser. No. 782,802
Claims priority, application United Kingdom, Apr. 2, 1985, 1025937
Term of patent 14 years
U.S. Cl. D34—15



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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Duda & Sons, Inc.: *See*—
Boots, Gordon C., 4,694,717, Cl. 83-222.000.
Aalto, Erkki; and Yla-Hemmila, Veikko, to Halton Oy. Flow regulator and its use. 4,694,851, Cl. 137-499.000.
AB Dentatus: *See*—
Edwardson, Svante R., 4,695,252, Cl. 433-73.000.
AB Hedemora Verkstader: *See*—
Ragnegard, Samuel, 4,695,381, Cl. 210-403.000.
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Zhigalov, Gennady V.; Abduganiev, Abdurakhim; Kim, Sergei Y.; and Mosheev, Robert R., 4,694,642, Cl. 57-5.000.
Abdulally, Iqbal F.: *See*—
Gorzegno, Walter P.; and Abdulally, Iqbal F., 4,694,758, Cl. 110-347.000.
Abe, Akira; Nakajima, Junya; and Nishikawa, Toshihiro, to Fuji Photo Film Co., Ltd. Image-forming process. 4,695,529, Cl. 430-351.000.
Abe, Mitsuo: *See*—
Iriyama, Shozo; and Abe, Mitsuo, 4,694,508, Cl. 2-21.000.
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Abraham, Ronald F., to Honeywell Information Systems Inc. Printed circuit board bolt-on power distribution system. 4,695,923, Cl. 361-361.000.
Abramowski, Larry A.: *See*—
Koper, Kenneth T.; Willard, Sylvester L.; and Abramowski, Larry A., 4,695,520, Cl. 429-116.000.
Acco Babcock Inc.: *See*—
Lichtenberg, Norman B.; and Chaczyk, Adam W., 4,694,706, Cl. 74-501.50R.
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Ackeret, Peter. Container for flat recording media. 4,694,957, Cl. 206-309.000.
Ackman, Terry E.; and Place, John M., to United States of America, Interior. Acid mine water aeration and treatment system. 4,695,378, Cl. 210-198.100.
Acla, Howard L. R.: *See*—
Ritsko, Joseph E.; Houck, David L.; and Acla, Howard L. R., 4,695,439, Cl. 423-263.000.
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Armbruster, David R., 4,694,905, Cl. 166-280.000.
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Rosenthal, James M., 4,696,045, Cl. 381-114.000.
Adam, Jean-Marie: *See*—
Lacroix, Roger; Adam, Jean-Marie; and Vincze, Janos, 4,695,406, Cl. 260-372.000.
Adams, Kenneth D., to SSMC Inc. Sewing machine bed slide retention. 4,694,763, Cl. 112-184.000.
Adams, Robert W. Condensing sub-cooler for refrigeration systems. 4,694,662, Cl. 62-509.000.
Aderski, Pentcho K.: *See*—
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Advance Transformer Company: *See*—
Hallay, Alexander R., 4,695,771, Cl. 315-290.000.
Advanced Extraction Technologies, Inc.: *See*—
Bunting, Terry N., 4,695,672, Cl. 585-867.000.
Advanced Magnetics Inc.: *See*—
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,695,392, Cl. 252-62.540.
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,695,393, Cl. 252-62.540.
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Berry, W. Wes, 4,695,386, Cl. 210-665.000.
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AEPLC: *See*—
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af Ekenstam, Bo T.; and Bovin, Christer, to Astra Lake Medel Aktiebolag. L-N-n-propylpipecolic acid-2,6-xylidide. 4,695,576, Cl. 514-330.000.
Agarwal, Satish: *See*—
Guha, Subhendu; and Agarwal, Satish, 4,695,859, Cl. 357-19.000.
Agback, Karl H.; Agback, Tamara; and Nygren, Alf S., to Pharmacia AB. Novel arylacetic acid derivatives. 4,695,648, Cl. 560-053.000.
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Aghili, Hafez K.: *See*—
Montgomery, George J., IV; and Aghili, Hafez K., 4,695,303, Cl. 42-74.000.
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Aickin Development Corporation: *See*—
Lindberg, Verne L.; and Stockinger, Paul A., 4,695,019, Cl. 248-74.300.
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Muto, Yoshiyuki; Etani, Tadao; Aida, Satoru; and Kato, Shinya, 4,695,007, Cl. 242-58.400.
Air Products and Chemicals, Inc.: *See*—
Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., 4,695,369, Cl. 208-112.000.
Aisan Kogyo Kabushiki Kaisha: *See*—
Nomura, Yoshihisa; Suda, Koichi; and Kozawa, Tadashi, 4,694,734, Cl. 92-130.00R.
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Kito, Masahiro; and Mori, Katsuhiro, 4,694,894, Cl. 165-135.000.
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,694,707, Cl. 74-606.00A.
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Yukimoto, Kazuyoshi; Fukura, Kenichi; and Yamauchi, Nobuhiro, 4,695,036, Cl. 254-126.000.
Ajinomoto Co., Inc.: *See*—
Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, 4,695,651, Cl. 560-141.000.
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Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, 4,695,651, Cl. 560-141.000.
Akashi, Tamotsu; and Sawaoka, Akira, to New Mexico Tech Research Foundation. Dynamic compaction of composite materials containing diamond. 4,695,321, Cl. 75-243.000.
Akatsuka, Takao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,694,809, Cl. 123-489.000.
Akiyama, Noboru: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,696,004, Cl. 371-25.000.
Aktiebolaget ASEA ATOM: *See*—
Nylund, Olov, 4,695,426, Cl. 376-441.000.
Aktiebolaget Hassle: *See*—
Berglund, Bengt G.; Falk, Karl-Erik L.; Magnusson, Dan A.; Nilson, Nils B.; and Nilsson, Ake S., 4,695,272, Cl. 604-84.000.
Aktiebolaget Iggesunds Bruk: *See*—
Holmberg, Erne L.; and Andersson, Torbjorn C., 4,694,995, Cl. 241-92.000.
Aktieselskabet Laur.Knudsen Nordisk Elektricitets Selskab: *See*—
Leth-Olsen, Henrik; and Marot, Lajos K. D., 4,695,691, Cl. 200-303.000.
Akutagawa, Susumu: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.
Albert Rosink Maschinenbau: *See*—
Rosink, Albert, deceased, 4,694,540, Cl. 19-159.00R.
Albizzati, Enrico; Pettenati, Enrico; Zucchini, Umberto; and Cuffiani, Illaro, to Montedison S.p.A. Catalysts for homo- and copolymerization of ethylene and the polymers obtained by use thereof. 4,695,558, Cl. 502-123.000.
Alcatel N.V.: *See*—
Oen, Sverre; Poppe, Dag; and Tronsli, Sverre N., 4,695,935, Cl. 363-21.000.
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Knauss, William F., Jr.; Pal, Uday B.; and Patil, Balaji V., 4,695,318, Cl. 75-51.100.
Allied Corporation: *See*—
Cordova, Colleen W.; and Rowan, Hugh H., 4,695,509, Cl. 428-267.000.
Li, Hsin L.; and Prevorsek, Dusan C., 4,695,240, Cl. 425-207.000.
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Zupancic, Joseph J.; and Swedo, Raymond J., 4,695,483, Cl. 427.244.000.

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Lauk, Willi, 4,695,277, Cl. 604-304.000.

Allyn, Jerome B.: *See*—
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Aloisio, Leonard. Emergency air system for partially submerged vessels. 4,694,768, Cl. 114-71.000.

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Suzuki, Shoji, 4,694,983, Cl. 226-181.000.

Alps Electric Co., Ltd.: *See*—
Hatanai, Takashi; and Nakashima, Keishi, 4,695,512, Cl. 428-408.000.
Noda, Yasuhiko, 4,695,692, Cl. 200-335.000.

Alsthom: *See*—
Doyen, Gerard, 4,694,533, Cl. 16-257.000.
Obrecht, Georges, 4,694,914, Cl. 175-61.000.

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Altmann, Horst-Dieter; and Haupt, Eberhard, to I.G. Bauerhin GmbH Elektro-Technische Fabrik. Heat conductor connections between seats and backrests of vehicles. 4,695,091, Cl. 297-180.000.

Alton, Norman K.; Peters, Mary A.; Stabinsky, Yitzhak; and Snitman, David, to Amgen. Consensus human leukocyte interferon. 4,695,623, Cl. 530-351.000.

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Christini, Roy A.; and Frizzell, Kenneth P., 4,695,320, Cl. 75-67.00A.

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Dreyer, Heinz; Scheufler, Bernd; Wiemeyer, Benno; and Luhrmann, Johannes, 4,694,759, Cl. 111-85.000.

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Hart, Robert D.; and Ambrozaitis, John J., 4,694,599, Cl. 40-449.000.

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Amerasia International Technology, Inc.: *See*—
Kwong, Chung T., 4,695,404, Cl. 252-514.000.

American Can Company: *See*—
Godar, Joseph L., 4,695,492, Cl. 428-35.000.

American Cyanamid Company: *See*—
Walgenbach, Paul J., 4,695,564, Cl. 514-127.000.

American Home Products Corporation: *See*—
Boyle, John T. A.; and Todd, Richard S., 4,695,574, Cl. 514-313.000.

American Red Cross: *See*—
Holme, Stein, 4,695,460, Cl. 424-101.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Berkstresser, George W.; and Shmulovich, Joseph, 4,695,762, Cl. 313-474.000.
Gordon, Eugene I.; and Levy, Uri, 4,695,332, Cl. 437-126.000.
Hansen, Terris L.; Hyatt, Wayne E.; and Leung, Wu-Hon F., 4,695,977, Cl. 364-900.000.
Lebowitz, Joseph, 4,694,561, Cl. 437-52.000.
Payne, William A., III, 4,696,000, Cl. 370-60.000.
Sollenberger, Nelson R., 4,695,969, Cl. 364-724.000.

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Everhart, Robert W.; and Huck, Charles T., 4,695,836, Cl. 340-750.000.

Ameron, Inc.: *See*—
Mowrer, Norman R., 4,695,618, Cl. 528-55.000.

Amgen: *See*—
Alton, Norman K.; Peters, Mary A.; Stabinsky, Yitzhak; and Snitman, David, 4,695,623, Cl. 530-351.000.

Amirsakis, Charles J., to Morton Thiokol, Inc. Electron beam curable polyuethane polymers for magnetic tape applications. 4,695,604, Cl. 525-28.000.

AMISTAR Corporation: *See*—
Rudolph, John M.; and Wohlhieter, George M., 4,694,570, Cl. 29-740.000.

AMP Incorporated: *See*—
Feldman, Steven; and Tennant, Robert J., 4,695,106, Cl. 439-83.000.
Grabbe, Dimitry; Korsunsky, Iosif; Klunk, Thomas M.; and DiOrazio, Joseph S., 4,695,111, Cl. 439-266.000.
Ney, Reuben E.; Pan, Raymond V.; and Yeager, Patrick F., 4,695,105, Cl. 439-95.000.
Wasserlein, Henry G., 4,695,110, Cl. 439-289.000.

Ampex Corporation: *See*—
Beaulier, Daniel A., 4,695,876, Cl. 358-31.000.
Smith, Terrance, 4,695,873, Cl. 358-13.000.

Anastassiou, Dimitris; and Pennebaker, William B., to International Business Machines Corporation. Correction of shading effects in video images. 4,695,884, Cl. 358-163.000.

Ance, Louis: *See*—
Carswell, David A.; and Ance, Louis, 4,695,018, Cl. 248-74.200.

Anchor Hocking Corporation: *See*—
Hayes, Thomas H., 4,694,970, Cl. 215-252.000.

Anderson, Laurel L. Fishing device. 4,694,603, Cl. 43-21.200.

Anderson, Patricia P.: *See*—
Takekoshi, Tohru; and Anderson, Patricia P., 4,695,612, Cl. 525-433.000.

Anderson, Paul T.; Irwin, Lawrence; Matthews, John C.; and Paugh, Charles E., to Babcock & Wilcox Company, The. Vacuum sealing device for insulated steam injection tubing. 4,694,634, Cl. 53-88.000.

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Andersson, Goran: *See*—
Forslund, Alf; and Andersson, Goran, 4,695,414, Cl. 264-3.100.

Andersson, Sven-Goran B., to Chemical Dynamics Development AB. Method for dealkylation of alkyl-aryl ethers. 4,695,659, Cl. 568-835.000.

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Holmberg, Erne L.; and Andersson, Torbjorn C., 4,694,995, Cl. 241-92.000.

Andis, Matthew L. Hair grooming attachment for a curling iron. 4,695,704, Cl. 219-222.000.

Ando, Hideki; and Miki, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Digital-to-analog converter. 4,695,826, Cl. 340-347.0DA.

Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, to Unisys Corporation. Maintenance subsystem for computer network including power control and remote diagnostic center. 4,695,946, Cl. 364-200.000.

Andromaque S.A.: *See*—
Vander Poorten, Henri, 4,695,356, Cl. 204-180.900.

Anic, S.p.A.: *See*—
Caporossi, Adolfo; and Del Signore, Leonello, 4,695,616, Cl. 526-207.000.

Anicon, Inc.: *See*—
Learn, Arthur J.; and DuBois, Dale R., 4,694,778, Cl. 118-728.000.

Annacker, Ralph; and Dietl, Joachim, to Telefunken electronic GmbH. Circuit arrangement having clearing transistors for discharging a Darlington stage. 4,695,807, Cl. 330-310.000.

Anson Limited: *See*—
Anderson, Robert W., 4,695,078, Cl. 285-98.000.

Anthony, Myron L., to Grand Junction Reality Co., Inc. Reduction and disposal of toxic waste. 4,695,448, Cl. 423-659.000.

Anthony, Thomas R.; Lindner, Philip A.; and Tucker, Jewell G., to General Electric Company. Self-aligned double grids for vacuum tubes. 4,695,760, Cl. 313-348.000.

Anttonen, Kauko K.: *See*—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,695,821, Cl. 338-316.000.

Aoi, Shigeru, to Canon Kabushiki Kaisha. Optical information recording-reproducing apparatus in which the relative position of a primary beam and secondary beams on recording medium is varied during recording and reproduction of information. 4,695,992, Cl. 369-46.000.

Aoki, Tetsuo: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,696,004, Cl. 371-25.000.

Aono, Shunji: *See*—
Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.

Aoshima, Terutaka: *See*—
Yamashita, Kiyoshi; Aoshima, Terutaka; Narita, Ryuuho; and Imai, Masahiro, 4,695,710, Cl. 219-506.000.

Aoyama, Motoo; Maruyama, Hiromi; Umegaki, Kikuo; and Uchikawa, Sadao, to Hitachi, Ltd. Fuel assembly. 4,695,425, Cl. 376-435.000.

Apostolov, Rumen K.: *See*—
Popov, Entcho N.; Stanilov, Krastyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., 4,695,754, Cl. 310-156.000.

Aqua-Aerobic Systems, Inc.: *See*—
Astrom, Gordon L.; Weis, Ronald J.; and Shubert, Wesley M., 4,695,376, Cl. 210-122.000.

Araghi, Mehdi N.: *See*—
Tandon, Jagdish C.; and Araghi, Mehdi N., 4,695,716, Cl. 250-211.000R.

Arai, Ken-ichi: *See*—
Yokota, Takashi; Lee, Frank; Resnick, Donna; and Arai, Ken-ichi, 4,695,542, Cl. 435-68.000.

Arai, Masatoshi: *See*—
Inoue, Yoshio; Arai, Masatoshi; and Inoue, Takeo, 4,695,603, Cl. 524-723.000.
Inoue, Yoshio; Arai, Masatoshi; Sato, Shinichi; and Yokoo, Koji, 4,695,617, Cl. 528-32.000.

Arakawa, Mitsuaki; Fehn, John H.; and Crooks, Lawrence E., to University of California, The Regents of the. Matched quadrature coils for MRI with minimized intercoil coupling. 4,695,801, Cl. 324-318.000.

Araki, Michio: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Arisobu, Ichirou, to Mitsubishi Denki Kabushiki Kaisha. Solid state overcurrent detector. 4,695,961, Cl. 364-483.000.

Armbruster, David R., to Acme Resin Corporation. Precured coated particulate material. 4,694,905, Cl. 166-280.000.

Armstrong, John H.: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Armstrong, Robert B.: *See*—
Eszenack, Daniel D.; and Armstrong, Robert B., 4,695,367, Cl. 208-106.000.

Arnstein, Robert A.: *See*—
Chandler, Van S.; and Arnstein, Robert A., 4,695,883, Cl. 358-138.000.

Aronson, Eric G.: *See*—
Van Iperen, Willem H. P.; Sandt, Henry J., Jr.; and Aronson, Eric G., 4,695,211, Cl. 410-77.000.

Arzberger, Maximilian: *See*—
Bauer, Karlheinz; and Arzberger, Maximilian, 4,694,915, Cl. 175-91.000.

Asahi Glass Company Ltd.: *See*—
Nakaya, Keiichi; and Tanaka, Kunio, 4,695,445, Cl. 423-635.000.

Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for an internal combustion engine with an atmospheric pressure responsive correction operation. 4,694,803, Cl. 123-440.000.

Asakura, Toshimitsu; and Tagami, Tomoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,694,924, Cl. 180-68.300.

Asano, Masuo, to Brother Kogyo Kabushiki Kaisha. VR type linear stepper motor. 4,695,777, Cl. 318-135.000.

Asatiani, Georgy N.; Pikus, Evgeny A.; Kutelia, Elgudzha R.; Tsivtsivadze, David M.; Mudzhiri, Yason N.; and Dzhalabadze, Nikolai V., to Gruzinsky Politekhnichesky Institute. Device for electrochemical-etching determination of corrosion resistance of metals. 4,695,360, Cl. 204-404.000.

Asea Aktiebolag: *See*—
Lindholm, Carl-Henrik; and Lundstrom, Christer, 4,695,027, Cl. 248-325.000.
Orrling, Bengt, 4,696,014, Cl. 373-89.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,695,605, Cl. 525-109.000.

Asoshina, Eishi: *See*—
Yamamoto, Hiraku; Suzuki, Toshimichi; Katayama, Shigeru; Uratsuka, Isao; and Asoshina, Eishi, 4,695,598, Cl. 523-400.000.

Astec Components, Ltd.: *See*—
Whittle, Rex W. J., 4,695,936, Cl. 363-21.000.

Asten Group, Inc.: *See*—
Sarrazin, Yvon; and Smolens, Harry D., 4,695,498, Cl. 428-121.000.

Astra Lake Medel Aktiebolag: *See*—
af Ekenstam, Bo T.; and Bovin, Christer, 4,695,576, Cl. 514-330.000.

Astrom, Gordon L.; Weis, Ronald J.; and Shubert, Wesley M., to Aqua-Aerobic Systems, Inc. Floating decanter. 4,695,376, Cl. 210-122.000.

Atlantic Richfield Company: *See*—
Skinner, James L., 4,694,901, Cl. 166-77.000.

Atlas Copco Aktiebolag: *See*—
Ripl, Wilhelm K.; and Verner, Bo L., 4,695,384, Cl. 210-602.000.

Attain, Inc.: *See*—
Haven, Kenneth R., 4,695,024, Cl. 248-281.100.

Atterton and Ellis Limited: *See*—
Bernhard, Stephen, 4,694,613, Cl. 51-34.00C.

Audibert, Francoise: *See*—
Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, 4,695,562, Cl. 514-13.000.

Auerbach, Anthony: *See*—
Sacha, Frederick; Auerbach, Anthony; McGarrigle, Richard G.; and Neil, James E., 4,695,709, Cl. 219-494.000.

August Froscher G.m.b.H. & Co. K.G., Firma: *See*—
Suhr, Heinz-Peter; and Weinberger, Bernd, 4,695,093, Cl. 297-300.000.

Ault, Robert M., to TRE Corporation. Honeycomb core load bearing structure. 4,695,495, Cl. 428-73.000.

Ausnit, Steven; and Bentsen, Per, to Mixigrip, Inc. Maintaining single link chain bags against skewing. 4,694,959, Cl. 206-390.000.

Automation Service Equipment, Inc.: *See*—
Murphy, Robert E.; Ballard, Gary R.; and Kuechenmeister, Rodney D., 4,694,953, Cl. 198-627.000.

Avar, Lajos, to Sandoz Ltd. Tetraalkylpiperidines. 4,695,600, Cl. 524-103.000.

AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H., Prof.Dr.Dr.h.c. Hans List: *See*—
Bilek, Andreas; and Wunsche, Peter, 4,694,786, Cl. 123-73.0AD.

Avram, Elena: *See*—
Revici, Emanuel, 4,695,583, Cl. 514-449.000.

Axia Incorporated: *See*—
Reed, Larry T., 4,695,161, Cl. 356-254.000.

Azimi, Hossein. Modular block and modular structural elements constructed therefrom. 4,694,629, Cl. 52-611.000.

Azuray Inc.: *See*—
Lau, Robert S.; Murphy, Roy E.; and Quick, Robert G., Jr., 4,695,772, Cl. 315-370.000.

A2P: *See*—
Faisandier, Yves, 4,695,955, Cl. 364-413.000.

B & B Chlorination: *See*—
Behrens, Kelly D., 4,694,900, Cl. 166-75.100.

Baba, Toshio; Mizutani, Takashi; and Ogawa, Masaki, to NEC Corporation. Superlattice semiconductor having high carrier density. 4,695,857, Cl. 357-16.000.

Babcock & Wilcox Company, The: *See*—
Anderson, Paul T.; Irwin, Lawrence; Matthews, John C.; and Paugh, Charles E., 4,694,634, Cl. 53-88.000.

Badger Company, Inc., The: *See*—
Whittle, Leslie F., 4,695,664, Cl. 585-440.000.

Bagby, John P.; and Hedden, Richard L., to Hughes Aircraft Company. Plural-zone mirror focusing system. 4,695,139, Cl. 350-620.000.

Baggio, Giorgio; and Balbinot, Renzo, to Nordica S.p.A. Closure device particularly for rear entrance ski boots. 4,694,592, Cl. 36-117.000.

Bagolin, Alain; and Gay, Joel, to Frimair S.A. Dry cleaning machine. 4,694,588, Cl. 34-77.000.

Baigent Maurice G., to AEPLC. Structural bearing. 4,695,169, Cl. 384-36.000.

Bailey, James R.; and Basov, Emma, to Switchcraft, Inc. Stacked electrical jacks. 4,695,116, Cl. 439-188.000.

Baird, Elldon: *See*—
Overman, Patrick, Sr.; and Baird, Elldon, 4,694,516, Cl. 5-93.00R.

Bajgrowicz, Edward J.: *See*—
Heckaman, Douglas E.; Higman, Roger H.; Frisco, Jeffrey A.; and Bajgrowicz, Edward J., 4,695,810, Cl. 333-1.000.

Baker, Dean M.: *See*—
Colvell, William F.; and Baker, Dean M., 4,694,569, Cl. 29-724.000.

Baker, Joseph G.: *See*—
Sparkes, Laurie R.; and Baker, Joseph G., 4,694,773, Cl. 114-354.000.

Baker, Peotr: *See*—
Zachringer, Edmund; Baker, Peotr; and Zettel, Rolf, 4,696,018, Cl. 375-82.000.

Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., to Redland Roof Tiles Limited. Method and apparatus for manufacturing roof tiles and tiles made thereby. 4,695,418, Cl. 264-151.000.

Bakow, Leon: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,695,213, Cl. 411-506.000.

Balbinot, Renzo: *See*—
Baggio, Giorgio; and Balbinot, Renzo, 4,694,592, Cl. 36-117.000.

Balkwill, Peter H.; Bishop, David J.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G. Disubstituted ethanes and their use in liquid crystal materials and devices. 4,695,131, Cl. 350-350.00R.

Ballantine Laboratories, Inc.: *See*—
Katzmann, Fred L., 4,695,793, Cl. 324-106.000.

Ballard, Gary R.: *See*—
Murphy, Robert E.; Ballard, Gary R.; and Kuechenmeister, Rodney D., 4,694,953, Cl. 198-627.000.

Balleis, Peter, to Lorenz Bolz GmbH & Co. Toy spinning top having a leg support. 4,695,263, Cl. 446-256.000.

Ballentine, Richard E.; and Henson, Robert M., to J. W. Harris Company. Solder composition. 4,695,428, Cl. 420-561.000.

Bally Manufacturing Corporation: *See*—
Vazquez, Hilario, Jr.; and Yarnold, Paul R., 4,695,053, Cl. 273-143.00R.

Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, to BASF Aktiengesellschaft. Preparation of acyloxybenzenesulfonic acids and their alkali metal and alkaline earth metal salts. 4,695,412, Cl. 260-507.00R.

Bammel, Stanley E.: *See*—
Beilfuss, Robert C.; Lanier, David M.; Bammel, Stanley E.; Huang, Terry J.; and Banks, David M., 4,695,246, Cl. 431-31.000.

Banfi, Claudio, to General Electric Company. Closing delay arrangement for current limiting circuit breaker contacts. 4,695,690, Cl. 200-147.00R.

Banich, Howard P.; and Norton, Daniel E., to Wolverine World Wide, Inc. Toe off athletic shoe. 4,694,591, Cl. 36-102.000.

Banks, David M.: *See*—
Beilfuss, Robert C.; Lanier, David M.; Bammel, Stanley E.; Huang, Terry J.; and Banks, David M., 4,695,246, Cl. 431-31.000.

Banno, Hisao, to NGK Spark Plug Co. Ltd. Underwater piezoelectric arrangement. 4,695,988, Cl. 367-154.000.

Banzai, Hideo: *See*—
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, 4,695,965, Cl. 364-518.000.

Bar-on, Ari, to Standard Oil Company, The. Preformed, thin-film front contact current collector grid for photovoltaic cells. 4,695,674, Cl. 136-256.000.

Barbu, Stefan; Valkestijn, Leonardus; and van de Kerkhof, Franciscus A. M., to U.S. Philips Corporation. Slave-type interface circuit operating with a series bus. 4,695,839, Cl. 340-825.060.

Bardl, Artur; and Lindner, Manfred, to Siemens Aktiengesellschaft. Apparatus for generating a multi-frequency signal. 4,695,804, Cl. 328-14.000.

Barnes, Andrew C.; and Cummings, Susan G., to Mycogen Corporation. Cellular encapsulation of pesticides produced by expression of heterologous genes. 4,695,455, Cl. 424-93.000.

Barnes, Andrew C.; and Cummings, Susan G., to Mycogen Corporation. Cellular encapsulation of biological pesticides. 4,695,462, Cl. 424-195.100.

Barnett, Daniel J.: *See*—
Battey, James F.; Nelson, Norvell J.; and Barnett, Daniel J., 4,695,348, Cl. 156-647.000.

Barr, John D., to NL Petroleum Products Limited. Rotary drill bits with nozzle former and method of manufacturing. 4,694,919, Cl. 175-393.000.

Barr & Stroud Limited: *See*—
Neil, Iain A., 4,695,119, Cl. 350-1.200.

Barraza, Arthur; and Kearney, Calvin T., to Kidde, Inc. Recirculating toilet pump assembly. 4,695,222, Cl. 415-80.000.

Barre, Lucien, to Thomson-CSF. Package for a surface mountable component. 4,695,927, Cl. 361-400.000.

Barrera, Giorgio, to Officine Meccaniche Pavesi & C. S.p.A. Apparatus for treating stator winding leads. 4,694,560, Cl. 29-564.100.

Barrett, Ronald A., to Tektronix, Inc. Precision remotely-switched attenuator. 4,695,806, Cl. 330-254.000.

Bartlett, Robert L.: *See*—
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,694,713, Cl. 82-14.00R.

Barton, James C.; Hefner, Robert E.; Reid, Paul A.; and Sable, Frank R., to Caterpillar Industrial Inc. Operator restraint system. 4,694,928, Cl. 180-268.000.

BASF Aktiengesellschaft: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.
Merger, Franz; and Towae, Friedrich, 4,695,645, Cl. 560-24.000.
Sommer, Karl; Heinz, Robert; Hettche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, 4,695,397, Cl. 252-181.000.

Basic American Foods: *See*—
Dover, Jerome J., 4,694,742, Cl. 99-404.000.

Basilowski, Herbert: *See*—
Reimann, Jurgen-Andreas; and Basilowski, Herbert, 4,695,960, Cl. 164-474.000.

Basov, Emma: *See*—
Bailey, James R.; and Basov, Emma, 4,695,116, Cl. 439-188.000.

Battey, James F.; Nelson, Norvell J.; and Barnett, Daniel J., to PSI Star. Copper etching process and product. 4,695,348, Cl. 156-647.000.

Baudelot, Francis E.: *See*—
Montanari, Gerard M.; Baudelot, Francis E.; and Costes, Michel L., 4,695,997, Cl. 370-13.000.

Bauer, Bernhard: *See*—
Schleupen, Richard; Mayer, Ulrich; Bauer, Bernhard; and Langner, Arnd M., 4,696,002, Cl. 371-12.000.

Bauer, Karlheinz; and Arzberger, Maximilian, to Karl Bauer Spezialtiefbau GmbH & Co KG. Slotted wall milling cutter. 4,694,915, Cl. 175-91.000.

Bauer, Kurt H.; and Pins, Heinrich, to Warner Lambert Company. Anhydrous emulsions and the use thereof. 4,695,450, Cl. 424-22.000.

Baughman, Davis L. Method and apparatus for imparting a simple contour to a workpiece. 4,694,672, Cl. 72-53.000.

Bauman, Jack. Submergible laryngoscope battery housing. 4,694,822, Cl. 128-11.000.

Baumgardner, Stephen D.: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Baxter Travenol Laboratories, Inc.: *See*—
Christine, William, 4,695,337, Cl. 156-69.000.

Baxter, William R. S.: *See*—
Jones, Robert; Jones, Keith W.; and Baxter, William R. S., 4,694,690, Cl. 73-146.000.

Bayer Aktiengesellschaft: *See*—
Berneth, Horst; and Brack, Alfred, 4,695,633, Cl. 544-286.000.
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.
Haas, Peter, 4,695,630, Cl. 544-75.000.
Harnisch, Horst; and Siegel, Edgar, deceased, 4,695,405, Cl. 252-600.000.
Kalk, Walter; Schundehutte, Karl H.; and Soll, Manfred, 4,695,632, Cl. 544-194.000.
Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, 4,695,563, Cl. 514-105.000.
Maurer, Fritz; and Grohe, Klaus, 4,695,646, Cl. 560-43.000.
Oeckl, Siegfried; Mitschker, Alfred; Lange, Peter M.; and Martinola, Friedrich, 4,695,556, Cl. 502-11.000.
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.
Schwabe, Peter; and Voigt, Reiner, 4,695,322, Cl. 106-35.000.
Seng, Floris; and Bremen, Josef, 4,695,652, Cl. 564-343.000.

BBC Brown, Boveri & Company, Limited: *See*—
Canay, Muzaffer, 4,695,939, Cl. 363-39.000.
Hellat, Jsan; and Keller, Jakob, 4,695,225, Cl. 415-189.000.

Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, to Univ. of Tennessee Research Corp. Synthetic peptide compounds. 4,695,562, Cl. 514-13.000.

Bearss, James G.: *See*—
Hackleman, David E.; Bearss, James G.; and Bhaskar, Eldurkar V., 4,695,853, Cl. 346-140.00R.

Beaulier, Daniel A., to Ampex Corporation. Method and apparatus for the extraction of luminance information from a video signal using a field store. 4,695,876, Cl. 358-31.000.

Bech, Marcus C.; and Koster, Ole, to Stormax International A/S. Method and apparatus for grouping, orienting, and packing articles. 4,694,637, Cl. 53-448.000.

Bechtel International Corporation: *See*—
Wallace, Norman R., 4,695,189, Cl. 405-169.000.

Bechtolsheimer, Hans-Heinrich: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.

Beck, Richard, Jr., to Sundstrand Corporation. Anti-plug control. 4,694,648, Cl. 60-452.000.

Becker, Benedikt: *See*—
Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, 4,695,563, Cl. 514-105.000.

Becker, E. Robert; and Jung, Hyun J., to Johnson Matthey, Inc. Selective catalytic reduction catalysts. 4,695,438, Cl. 423-239.000.

Becker, Hans; and Linde, Gerhard, to Linde Aktiengesellschaft. Process and apparatus for distillation and/or stripping. 4,695,349, Cl. 203-26.000.

Beckman Instruments, Inc.: *See*—
Goodale, David L.; and Darden, Nick, 4,694,861, Cl. 137-624.190.

Becton Dickinson and Company: *See*—
O'Connell, James P.; Piran, Uri; and Wagner, Daniel B., 4,695,554, Cl. 436-528.000.

Becton Dickinson and Co., Inc.: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,695,553, Cl. 436-177.000.

Bedekovic, Davor; and Fletcher, Ian J., to Ciba-Geigy Corporation. Chromogenic dihydrofuropyridinones. 4,695,636, Cl. 546-116.000.

Bedrij, Orest J., to Profit Technology, Inc. Multi-image communications system. 4,695,975, Cl. 364-900.000.

Beebe International, Inc.: *See*—
Smith, Glenn S., 4,695,010, Cl. 242-158.00R.

Behrens, Kelly D., to B & B Chlorination. Dry pellet dispensing device for wells. 4,694,900, Cl. 166-75.100.

Behrenz, Wolfgang: *See*—
Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, 4,695,563, Cl. 514-105.000.

Beilfuss, Robert C.; Lanier, David M.; Bammel, Stanley E.; Huang, Terry J.; and Banks, David M., to Lennox Industries, Inc. Ignition control system for a gas appliance. 4,695,246, Cl. 431-31.000.

Beining, August H.; Dial, Larry A.; Smith, William A.; and Rieck, Gene W., to Hughes Aircraft Company. Electromagnetic energy interference seal for light beam touch panels. 4,695,827, Cl. 340-365.00P.

Beisemann, Heinz: *See*—
Predohl, Wilhelm; Beisemann, Heinz; and Reitemeyer, Paul, 4,695,236, Cl. 425-131.100.

Beisler, Alfons, to Beisler GmbH. Device for transferring a fabric strip from a deposit station. 4,694,767, Cl. 112-303.000.

Beisler GmbH: *See*—
Beisler, Alfons, 4,694,767, Cl. 112-303.000.

Bell, James A.: *See*—
Coates, Ian H.; Bell, James A.; Humber, David C.; and Ewan, George B., 4,695,578, Cl. 514-397.000.

Bell, Noel G. Traveling trench shore. 4,695,204, Cl. 405-283.000.

Bell of Pennsylvania: *See*—
McDermott, Michael G., 4,695,926, Cl. 361-395.000.

Belleau, Gordon F.; Jelcin, Michael J.; and Verga, Charles F., to General Motors Corporation. Method of forming truck cab frames. 4,695,342, Cl. 156-173.000.

Bellingham, Ronald S.; and White, Malcolm J., to Chubb & Son's Lock and Safe Company Limited. Shackle mechanisms. 4,694,666, Cl. 70-16.000.

Belouet, Christian, to Compagnie Generale d'Electricite; and Societe Nationale Elf Aquitaine. Method and apparatus for drawing a tape constituted by a support coated in a layer of semiconductor material, said tape being drawn from a liquid bath of said material. 4,695,480, Cl. 437-225.000.

Benchmark Industries Incorporated: *See*—
Schoenbaum, Gary L.; Latanzi, Lewis A.; Hedrick, Stephen L.; and Johnson, Harold V., 4,695,157, Cl. 356-237.000.

Bennett, David E., to Impco Carburetion, Inc. Air-gas mixing device with dual-control fuel valve. 4,694,811, Cl. 123-527.000.

Benoit, Roland A., to Gem Industries, Inc. Corner bracket. 4,694,519, Cl. 5-200.00C.

Bentsen, Per: *See*—
Ausnit, Steven; and Bentsen, Per, 4,694,959, Cl. 206-390.000.

Beral Bremsbelag GmbH: *See*—
Jonas, Siegfried, 4,694,937, Cl. 188-73.100.

Berecz, Imre, to Microdot Inc. Composite channel and plate nut assembly. 4,695,212, Cl. 411-85.000.

Berg, Lloyd. Separation of n-hexyl acetate from n-hexyl alcohol by extractive distillation. 4,695,350, Cl. 203-51.000.

Berger, Herbert: *See*—
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Bernd; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.

Berglund, Bengt G.; Falk, Karl-Erik L.; Magnusson, Dan A.; Nilson, Nils B.; and Nilsson, Ake S., to Aktiebolaget Hassle. Drug release device. 4,695,272, Cl. 604-84.000.

Bergstrom, Michael: *See*—
Gent, Derek J.; and Bergstrom, Michael, 4,695,774, Cl. 315-408.000.

Berkhof, Hendrikus, to Honeywell B.V. Hot water heating system using a heat consumption meter. 4,695,052, Cl. 237-8.00R.

Berkowitz, Phillip T., to Olin Corporation. Stable, low viscosity polymer/polyisocyanate dispersion. 4,695,596, Cl. 521-137.000.

Berkstresser, George W.; and Shmulovich, Joseph, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Electron beam pumped rod-like light emitters. 4,695,762, Cl. 313-474.000.

Berl, Marta N.; and Turner, Esther. Toothbrush. 4,694,844, Cl. 132-84.00R.

Berleth, Manfred, to Cambridge Instruments GmbH. Specimen holder clamp for a microtome. 4,695,046, Cl. 269-210.000.

Berneth, Horst; and Brack, Alfred, to Bayer Aktiengesellschaft. Chromogenic 4,4-diaryl-dihydroquinazolones, their preparation and their use. 4,695,633, Cl. 544-286.000.

Bernhard, Stephen, to Atterton and Ellis Limited. Relief grinding of lawn mower cylindrical blades. 4,694,613, Cl. 51-34.00C.

Berry, Jimmy D.: *See*—
Pettibone, Craig R.; and Berry, Jimmy D., 4,695,073, Cl. 180-690.000.

Berry, W. Wes, to Advanced Separation Technologies Incorporated. Process for the decolorization of pulp mill process streams. 4,695,386, Cl. 210-665.000.

Berry, W. Wes; and Erickson, William R., to Advanced Separation Technologies Incorporated. Removal of ammonia from wastewater. 4,695,387, Cl. 210-676.000.

Berwind Corporation: *See*—
Fleckenstein, Phillip P.; and Marsh, Norman F., 4,695,685, Cl. 200-61.210.

Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, to Chevron Research Company. Removable bottom founded structure. 4,695,201, Cl. 405-224.000.

Bespalova, Zhanna D.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Best, Michael J. A.; Jones, Richard H.; Hynes, Joseph H.; Pond, Richard J.; and Gordon, Colin R., to Smith International, Inc. Pressure-balanced stab connection. 4,695,190, Cl. 405-169.000.

Beyer, Karl-Heinz: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.

Bhalaik, Arun; Braddick, Peter W.; Brittin, Darryl S.; and Johnson, Gerald L., to Santa Fe International Corporation. Mobile marine operations structure. 4,695,194, Cl. 405-207.000.

Bhaskar, Eldurkar V.: *See*—
Hackleman, David E.; Bearss, James G.; and Bhaskar, Eldurkar V., 4,695,853, Cl. 346-140.00R.

Bhula, Dilipkumar N.: *See*—
Watt, Brian J.; Bhula, Dilipkumar N.; and Birdy, Jal N., 4,695,197, Cl. 405-224.000.

Biethan, Uwe: *See*—
Olbrich, Juergen; Biethan, Uwe; and Sorge, Gernold, 4,695,613, Cl. 525-533.000.

Bifa Corporation: *See*—
Fabbro, Miguel, 4,694,816, Cl. 126-41.00R.

Bilek, Andreas; and Wunsche, Peter, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik m.b.H., Prof.Dr.Dr.h.c. Hans Cist. One-cylinder, two-stroke internal combustion engine with crankcase scavenging. 4,694,786, Cl. 123-73.0AD.

Billard, Alain, to Societe E. Lacrois - Tour Artifices. Method for deceiving active electromagnetic detectors and corresponding decoys. 4,695,841, Cl. 342-8.000.

Billet, Daniel; and Cesarini, Jean F., to Thomson CSF. Device for detecting and locating penetration of water into a marine acoustic streamer. 4,695,787, Cl. 324-557.000.

Bimonte, Michael; and Cleary, Dennis. Apparatus for refuse collection and disposal. 4,694,972, Cl. 220-401.000.

Bio/Data Corporation: *See*—
Coville, William E.; Grossman, Hyman; and Sokol, Michael, 4,695,430, Cl. 422-65.000.

Birdy, Jal N.: *See*—
Watt, Brian J.; Bhula, Dilipkumar N.; and Birdy, Jal N., 4,695,197, Cl. 405-224.000.

Bishop, David I.: *See*—
Balkwill, Peter H.; Bishop, David I.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G., 4,695,131, Cl. 350-350.00R.

Bishop, John F., to Eastman Kodak Company. Poly(ethylene oxide) stripping agents for photographic products. 4,695,526, Cl. 430-215.000.

Bjorheden, Orvar: *See*—
Flyborg, Nils O.; and Bjorheden, Orvar, 4,694,645, Cl. 60-221.000.

Black, Alee R. Rod support system having end brackets and auxiliary support brackets. 4,694,532, Cl. 16-94.00D.

Blair, Preston E.; and Preston, Frank S. TV animation interactively controlled by the viewer. 4,695,953, Cl. 364-410.000.

Blake, Rodger D.: *See*—
Meek, Thomas T.; and Blake, Rodger D., 4,695,695, Cl. 219-10.55M.

Blakeley, Douglas M.; Kershaw, Carolyn A.; and Gangarosa, Raymond E., to Picker International, Inc. Cardiac and respiratory gated magnetic resonance imaging. 4,694,837, Cl. 128-653.000.

Blanchard, Pierre; Descure, Pierrick; and Chautemps, Jacques, to Thomson-CSF. Gate structure for an integrated circuit comprising elements of the gate-insulator-semiconductor type and a method of fabrication of an integrated circuit using said structure. 4,695,860, Cl. 357-24.0LR.

Blaney, Peter G., to Zemco Group, Inc. Electronic automotive compass and display. 4,694,583, Cl. 33-361.000.

Blaszyk, Gotthardt: *See*—
Henne, Heinrich; Blaszyk, Gotthardt; Eickholt, Hubert; and Lohnherr, Ludger, 4,694,994, Cl. 241-79.100.

Blevins, Ballard J.; Kulpa, William G.; Mathis, Joseph R.; and McCullough, John W., to International Business Machines Corporation. Bus to bus converter using a RAM for multiple address mapping. 4,695,948, Cl. 364-200.000.

Blount, David H. Process for the production of cellular organic silicate products. 4,695,595, Cl. 521-99.000.

Bloy, Graham P.; and Miramonti, John L., to Metme Communications. Analog-digital conversion system. 4,695,825, Cl. 340-347.0SH.

Boag, James T., to Colorado Medical, Inc. Dialyzer reuse system. 4,695,385, Cl. 210-636.000.

Bocciarelli, Louis R.: *See*—
Marchitto, Michael J.; and Bocciarelli, Louis R., 4,695,226, Cl. 416-106.000.

Bochard, Michel; and Lafaye, Michel, to La Telemecanique Electrique. Electric safety switch. 4,695,684, Cl. 200-43.070.

Bock, Wolfgang: *See*—
Kortmann, Heinrich; and Bock, Wolfgang, 4,695,315, Cl. 75-0.50R.

Boden, Heinrich: *See*—
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.

Bodine, Albert G. Sonic impeller for sonic well pump. 4,695,231, Cl. 417-241.000.

Boecker, Wolfgang D. G.: *See*—
Korzekwa, Tadeusz M.; McMurtry, Carl H.; and Boecker, Wolfgang D. G., 4,695,294, Cl. 51-307.000.

Boehringer Mannheim GmbH: *See*—
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Bernd; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.
Schmitt, Urban; Deeg, Rolf; and Ziegenhorn, Joachim, 4,695,552, Cl. 436-66.000.
Zivitz, Maury; Ko, Eric; and Eslick, Mark, 4,695,164, Cl. 356-427.000.

Boeing Company, The: *See*—
McKinney, Donald L., 4,694,998, Cl. 242-1.000.

Boerger, Daniel A. Clipper attachment device. 4,694,575, Cl. 30-221.000.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Method of separating and purifying hydrogen. 4,695,446, Cl. 423-648.00R.

Bolte, Steven B.: *See*—
Knapp, John F.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., 4,695,524, Cl. 430-32.000.

Bonin, Wayne A.; McCumber, Roger D.; and Teder, Rein S., to Vericom Corporation. Vehicle performance analyzer. 4,694,687, Cl. 73-116.000.

Bononi, Walter H. Pad. 4,695,140, Cl. 351-139.000.

Bonta, Jeffrey D., to Motorola, Inc. Handoff apparatus and method with interference reduction for a radio system. 4,696,027, Cl. 379-60.000.

Boodanian, Leon P.: *See*—
Magdesyan, Garnik; Magdesyan, Stepan; and Boodanian, Leon P., 4,695,118, Cl. 439-726.000.

Boots, Gordon C., to A. Duda & Sons, Inc. Single pass sod cutting machine for producing hexagonally shaped plugs. 4,694,717, Cl. 83-222.000.

Borchert, Werner, to GEA Energiesystemtechnik GmbH & Co. Apparatus for retrieving spherically shaped cleansing bodies. 4,694,892, Cl. 165-95.000.

Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, to Eszakmagyarorszagi Vegyimuvek. Composition for prolonging the action of herbicides and herbicide compositions with a prolonged action. 4,695,309, Cl. 71-88.000.

Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, to Eszakmagyarorszagi Vegyimuvek. Composition for prolonging the action of herbicides and herbicide compositions with a prolonged action. 4,695,313, Cl. 71-100.000.

Borg-Warner Automotive, Inc.: *See*—
Hall, David A.; and Yuergens, Kenneth C., 4,694,941, Cl. 192-3.280.

Borg-Warner Chemicals, Inc.: *See*—
Halpern, Yuval, 4,695,601, Cl. 524-362.000.

Borg-Warner Corporation: *See*—
Fildes, John M.; and Krueger, Robert H., 4,694,686, Cl. 73-104.000.

Borgmann, Robert E.: *See*—
Monteith, Robert C.; and Borgmann, Robert E., 4,695,701, Cl. 219-121.0LV.

Borodulin, Anatoly F.: *See*—
Gendelman, Mikhail A.; Borodulin, Anatoly F.; Golubeva, Diana F.; and Bychkov, Sergei V., 4,694,867, Cl. 139-192.000.

Bos, Jacobus J.; Cuperus, Rinze; and Wielinga, Rudolf, to Gist-Brocades N.V. Preparation of 6-amino-penicillanic acid-1,1-dioxide. 4,695,628, Cl. 540-312.000.

Boshold, Raymond F., to Weas Industries, Inc. Container guidance system for extrusion press. 4,694,673, Cl. 72-272.000.

Boston, Ronald P., to Fronda Limited. Process for producing carbonated beverages. 4,695,468, Cl. 426-8.000.

Botstein, David; Fink, Gerald R.; and Davis, Ronald W., to Collaborative Research, Inc. Rennin-containing disrupted yeast cells used in cheese manufacture. 4,695,470, Cl. 426-37.000.

Bottom, Michael T., to T. J. Bottom Industries, Inc. Knock-down adjustable awning construction. 4,694,876, Cl. 160-45.000.

Bouchard, Roland D. Garbage truck with trash bin cleaning system. 4,694,846, Cl. 134-78.000.

Boucharlat, Gilles; and Brissot, Louis, to Thomson-CSF. Line transfer reading device with feedback regulating the drive charge. 4,695,890, Cl. 358-213.310.

Boulder 12 Investments: *See*—
Petrak, Harry A., 4,694,943, Cl. 192-35.000.

Boumendil, Jean-Paul: *See*—
Cousin, Stephane; and Boumendil, Jean-Paul, 4,695,338, Cl. 156-71.000.

Boussert, Anne S., to Dow Chemical Company, The. Removal of unsaturated hydrocarbons in anhydrous hydrogen halide by infrared laser radiation. 4,695,357, Cl. 204-157.410.

Bouygues: *See*—
Richard, Pierre, 4,694,622, Cl. 52-223.00R.

Bouyoucos, John V., to Hydroacoustics Inc. Hydroacoustic apparatus. 4,695,987, Cl. 367-143.000.

Bovin, Christer: *See*—
af Ekenstam, Bo T.; and Bovin, Christer, 4,695,576, Cl. 514-330.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D., 4,694,992, Cl. 239-265.230.

Bowsher, Glynne T., to Lucas Industries Public Limited Company. Pedal device. 4,695,819, Cl. 338-153.000.

Box, Richard B.: *See*—
Sullivan, James B.; and Box, Richard B., 4,694,589, Cl. 36-44.000.

Boyer, Elton W. Ambulatory vehicle carrier. 4,695,218, Cl. 414-462.000.

Boykin, Richard C. Vent window securing device for vans and trucks. 4,695,081, Cl. 292-96.000.

Boyle, John T. A.; and Todd, Richard S., to American Home Products Corporation. 4-Quinolinylamino-N-[pyrrolidinyl or piperdinyl)alkyl]-benzenesulphonamides. 4,695,574, Cl. 514-313.000.

Bracht, Roger R.: *See*—
Steenbergen, Christiaan; Howard, Peter G.; Bracht, Roger R.; and van der Put, Henk, 4,695,994, Cl. 369-54.000.

Brack, Alfred: *See*—
Berneth, Horst; and Brack, Alfred, 4,695,633, Cl. 544-286.000.

Braddick, Peter W.: *See*—
Bhalaik, Arun; Braddick, Peter W.; Brittin, Darryl S.; and Johnson, Gerald L., 4,695,194, Cl. 405-207.000.

Bradlow, H. Leon: *See*—
Fleisher, Martin; Bradlow, H. Leon; and Schwartz, Morton K., 4,695,471, Cl. 436-64.000.

Bramwell, Byrne E.: *See*—
Ringer, Thomas R.; and Bramwell, Byrne E., 4,695,017, Cl. 144-428.000.

Brande, Bruce R. Folding boat dock. 4,695,195, Cl. 405-220.000.

Brandes, Rolf, to University of California, The Regents of the. Method and apparatus for generating frequency selective pulses for NMR spectroscopy. 4,695,798, Cl. 324-307.000.

Brandi, Roberto: *See*—
Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Fraacesco; Vanore, Silvestro; and Carraro, Roberto, 4,695,193, Cl. 405-204.000.

Brandt, Henry R.; Gannon, Patrick M.; Leung, Wan L.; and Marchini, Timothy R., to International Business Machines Corporation. Fast two-level dynamic address translation method and means. 4,695,950, Cl. 364-200.000.

Brauers, Bert; and Morsbach, Martin, to Goetze AG. Piston ring assembly and expander. 4,695,064, Cl. 277-139.000.

Breckenridge, Virgil H. Agri-chemical spreader. 4,694,991, Cl. 239-171.000.

Breddo, Inc.: *See*—
Forsythe, Curtis J., 4,695,469, Cl. 426-24.000.

Breeden, Robert L., to Motorola Inc. Simulcast transmission system having automtic synchronization. 4,696,051, Cl. 455-33.000.

Breeden, Robert L., to Motorola Inc. Simulcast transmitter apparatus having automatic synchronization capability. 4,696,052, Cl. 455-51.000.

Bremen, Josef: *See*—
Seng, Florin; and Bremen, Josef, 4,695,652, Cl. 564-343.000.

Breuker, Gordon W.: *See*—
Scrivo, Jerry V.; and Breuker, Gordon W., 4,695,433, Cl. 422-112.000.

Brickner, Louis C., Jr.; and Skipworth, Jerry D., to Delta International Machinery Corp. Miter box construction. 4,694,720, Cl. 83-471.300.

Brickner, Louis C., Jr., to Delta International Machinery Corp. Motor pack for circular saw. 4,694,721, Cl. 83-471.300.

Bridgestone Corporation: *See*—
Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, 4,695,235, Cl. 425-29.000.

Bridginfill Design Ltd.: *See*—
Mikhailovsky, Leonid; and Ramotar, Jay G., 4,695,187, Cl. 405-124.000.

Bridgwater, Jon, to Morton Metalcraft Company. Fireplace grate for gas fired fireplace including forced air heat exchanger. 4,694,818, Cl. 126-121.000.

Brierley, Philip R.; and Lowry, Stephen R., to Nicolet Instrument Corporation. Optical analytical instrument with automatic sample changing. 4,695,727, Cl. 250-328.000.

Briggs & Stratton Corporation: *See*—
Uuskallio, Arvo F., 4,694,792, Cl. 123-187.50R.

Brighty, Katherine E., to Pfizer Inc. 1-aza-4,5-dithiabicyclo [4.2.0] oct-2-en-8-one-2 carboxylate esters. 4,695,626, Cl. 540-214.000.

BRIntec Corp.: *See*—
Carswell, Joseph; and Ance, Louis, 4,695,018, Cl. 248-74.200.

Brissot, Louis: *See*—
Boucharlat, Gilles; and Brissot, Louis, 4,695,890, Cl. 358-213.310.

Bristol-Myers Company: *See*—
Sloma, Alan, 4,695,543, Cl. 435-70.000.

British Gas Corporation: *See*—
Dickinson, Alan J., 4,694,574, Cl. 30-94.000.

British Petroleum Company p.l.c., The: *See*—
Hall, Antony H. P.; and McCarroll, John J., 4,695,663, Cl. 585-417.000.
Stephenson, Graham W.; and Toft, Richard C., 4,694,909, Cl. 166-359.000.

British Steel Corporation: *See*—
Spenceley, Gene D.; and Henderson, Steven, 4,694,889, Cl. 164.488.000.

British Telecommunications public limited company: *See*—
Else, Ronald, 4,696,033, Cl. 379-424.000.
McKeown, James H. A., 4,695,972, Cl. 364-819.000.

Brittin, Darryl S.: *See*—
Bhalaik, Arun; Braddick, Peter W.; Brittin, Darryl S.; and Johnson, Gerald L., 4,695,194, Cl. 405-207.000.

Brogren, Eric: *See*—
Goodacre, John H.; and Brogren, Eric, 4,695,198, Cl. 405-224.000.

Broken Hill Proprietary Co., Ltd., The: *See*—
Seddon, Duncan, 4,695,670, Cl. 585-533.000.

Brooks, Royce L., to Koerner, Norman D. Athlete carrier. 4,695,072, Cl. 280-650.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Masuo, 4,695,777, Cl. 318-135.000.
Tomida, Yasutaka, 4,695,173, Cl. 400-120.000.
Ueno, Hideo; Hattori, Hiroshi; Maeda, Kumiko; and Yamada, Keiko, 4,695,172, Cl. 400-83.000.

Broughton, George L.; and Macier, James E., to Outboard Marine Corporation. Marine propulsion engine voltage generator arrangement. 4,695,261, Cl. 440-900.000.

Broussard, Edison L. One-piece metal covering for insulated pipe bends. 4,694,547, Cl. 29-157.00R.

Brown, Chester. Collar for the commutator of an automotive starter. 4,695,755, Cl. 310-236.000.

Brown, Edward M.: *See*—
Proctor, John D.; Towns, Edward J.; and Brown, Edward M., 4,694,968, Cl. 215-224.000.

Brown, Eric W., to I-Flow Corporation. Multiple needle holder and subcutaneous multiple channel infusion port. 4,695,273, Cl. 604-173.000.

Brown, Frederick W.: *See*—
Provence, John D.; Brown, Frederick W.; and Jones, John I., 4,695,700, Cl. 219-121.0PD.

Brown, Gregory D.; Clark, Darrel E.; and Schuermann, Rodger W., to Technical Oil Tools Corporation. Drilling fluid density measurement system. 4,694,692, Cl. 73-155.000.

Brown, Richard A.: *See*—
Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., 4,695,658, Cl. 568-763.000.

Bruce, Donald; and Goode, Richard L. Middle ear ventilation tube. 4,695,275, Cl. 604-264.000.

Brunswick Corporation: *See*—
Swisher, Steven L., 4,695,009, Cl. 242-84.10R.

Bryan, Philip S.; and Herz, Arthur H., to Eastman Kodak Company. Silver halide photosensitive material. 4,695,534, Cl. 430-569.000.

Bryan, Philip S.; and Herz, Arthur H., to Eastman Kodak Company. Silver halide photosensitive material. 4,695,535, Cl. 430-569.000.

Buchler G-Set A.G.: *See*—
Buchler, Rene , 4,695,210, Cl. 409-219.000.

Buchler, Rene , to Buchler G-Set A.G. Apparatus for the machining of workpieces. 4,695,210, Cl. 409-219.000.

Buckley, Thomas F., to Chevron Research Company. Modified succinimides (IX). 4,695,391, Cl. 252-51.50A.

Buckmaster, Kenneth E.: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Buckner, Carrol E. Stove with catalytic converter. 4,694,820, Cl. 126-139.000.

Buderus Aktiengesellschaft: *See*—
Feuring, Kurt, 4,694,879, Cl. 164-7.200.

Budzich, Tadeusz, to Caterpillar Inc. Load compensated valve. 4,694,731, Cl. 91-421.000.

Bugg, Richard E. F., to U.S. Philips Corporation. Data display systems. 4,695,835, Cl. 340-750.000.

Buggert, Jerrold E.: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Buhler, Hans-Eugen: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Bulkmaa, Dirk; Helzel, Thomas; and Roschman, Peter, to U.S. Philips Corporation. MRI tomography apparatus for generating a motion signal. 4,694,836, Cl. 128-653.000.

Bull, Randy A.: *See*—
Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., 4,695,658, Cl. 568-763.000.

Bunting, Terry N., to Advanced Extraction Technologies, Inc. Process for extractive-stripping of lean hydrocarbon gas streams at high pressure with a preferential physical solvent. 4,695,672, Cl. 585-867.000.

Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., to Stauffer Chemical Company. S-benzyl thiolcarbamates and their use in controlling weeds in rice fields. 4,695,314, Cl. 71-100.000.

Burgman, Herbert A.: *See*—
Lahoda, Edward J.; Burgman, Herbert A.; and Kwon, Young J., 4,695,441, Cl. 423-347.000.

Burke, Lawrence J. Drafting table accessory storage attachment device. 4,694,967, Cl. 211-126.000.

Burlington Industries, Inc.: *See*—
Griffin, Everett, 4,694,636, Cl. 53-399.000.
Schwartz, William C., 4,695,507, Cl. 428-228.000.

Burroughs Wellcome Co.: *See*—
Krenitsky, Thomas A., 4,695,570, Cl. 514-261.000.

Busch, Paul F., to Metcal, Inc. Flexible autoregulating heater with a latching mechanism. 4,695,712, Cl. 219-535.000.

Buschmann, Gerd: *See*—
Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, 4,695,566, Cl. 514-234.000.

Busk, Robert S., to Dow Chemical Company, The. Method for making thixotropic materials. 4,694,881, Cl. 164-113.000.

Busk, Robert S., to Dow Chemical Company, The. Method for making thixotropic materials. 4,694,882, Cl. 164-113.000.

Busson, Christian: *See*—
Galtier, Pierre; and Busson, Christian, 4,695,370, Cl. 208-113.000.

Butler, David R.; and Corbett, Clifford F., to Foseco International Limited. Molten metal casting and feeder sleeves for use therein. 4,694,884, Cl. 164-359.000.

Butler Manufacturing Company: *See*—
Johnston, Bruce L., 4,694,921, Cl. 177-136.000.

Bychkov, Sergei V.: *See*—
Gendelman, Mikhail A.; Borodulin, Anatoly F.; Golubeva, Diana F.; and Bychkov, Sergei V., 4,694,867, Cl. 139-192.000.

Byers, Lance R.: *See*—
Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., 4,695,658, Cl. 568-763.000.

C & C Concepts, Inc.: *See*—
Cornelson, Donald P.; and Carlson, Jess W., 4,695,056, Cl. 273-262.000.

Cabanias, Frank W.; and Lockwood, James M., to NCR Corporation. Varying frequency oscillator for the reduction of radiated emissions of electronic equipment. 4,695,808, Cl. 331-57.000.

Cadaureille, Gerard: *See*—
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, 4,694,585, Cl. 33-502.000.

Cairo, Anthony C.: *See*—
Levine, Michael R.; Russo, James T.; Cairo, Anthony C.; and Rigotti, Victor H., 4,695,942, Cl. 364-188.000.

Cajon Company: *See*—
Klopp, James L., 4,694,863, Cl. 138-96.00R.

California Health Technologies: *See*—
Lippman, Richard D., 4,695,590, Cl. 514-724.000.

Cambridge Instruments GmbH: *See*—
Berleth, Manfred, 4,695,046, Cl. 269-210.000.

Camco, Incorporated: *See*—
Morris, Arthur J.; and Newton, Donald E., 4,694,908, Cl. 166-310.000.

Camp, Joan A. Standing seed planter. 4,694,760, Cl. 111-92.000.

Campbell, Harry J., III. Dynamic balancing for skis. 4,694,684, Cl. 73-65.000.

Canadian Marconi Corporation: *See*—
Mastriani, Dennis; Jacoby, Donald; Weise, Jeanne; Linick, Bruce; Marinho, John; and DeSantis, Charles M., 4,696,053, Cl. 455-67.000.

Canadian Patents and Development Limited: *See*—
Ringer, Thomas R.; and Bramwell, Byrne E., 4,695,017, Cl. 246-428.000.

Canadian Patents and Development Limited-Societe Canadienne des Brevets et D'Exploitation Limitee: *See*—
MacDonald, R. I.; Lam, D. K. W.; and Jenkins, R. W., 4,696,059, Cl. 455-600.000.

Canay, Muzaffer, to BBC Brown, Boveri & Company, Limited. Three-phase exciter for synchronous machines. 4,695,939, Cl. 363-39.000.

Candor, James T.: *See*—
Tassone, Joseph V.; and Candor, James T., 4,695,269, Cl. 474-268.000.

Cannon, Albert W., to Focalpoint Armoury Limited. Improvements in sights for firearms and other articles. 4,695,159, Cl. 356-247.000.

Canon Kabushiki Kaisha: *See*—
Aoi, Shigeru, 4,695,992, Cl. 369-46.000.
Chito, Yasuo; and Ogawa, Masahiko, 4,695,778, Cl. 318-314.000.
Dei, Katsuhito, 4,695,849, Cl. 346-76.00L.
Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, 4,695,717, Cl. 250-213.00R.
Ichihashi, Hiroo; Ozawa, Masakazu; Ebinuma, Ryuichi; and Saito, Atsushi, 4,695,855, Cl. 346-145.000.
Kawamoto, Kenichi, 4,695,145, Cl. 354-271.100.
Kimizuka, Junichi; Ushio, Yukihide; and Seto, Kaoru, 4,695,714, Cl. 250-205.000.
Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, 4,695,133, Cl. 350-427.000.
Nagashima, Nao, 4,695,895, Cl. 358-280.000.
Nakayama, Hiroki; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,695,134, Cl. 350-432.000.
Sado, Ichiro, 4,696,048, Cl. 382-13.000.
Saito, Syuichiro; and Okino, Tadashi, 4,695,894, Cl. 358-228.000.
Sawamura, Mitsuharu; Hongou, Kazuoki; and Kikuchi, Kazuhiko, 4,695,510, Cl. 428-336.000.
Shikaumi, Masao, 4,695,149, Cl. 354-430.000.
Suzuki, Eiichi, 4,695,846, Cl. 346-1.100.
Takeda, Masami, 4,695,421, Cl. 264-318.000.
Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,696,008, Cl. 371-47.000.
Tazaki, Shigemitsu, 4,695,824, Cl. 346-140.00R.
Terasawa, Koji, 4,695,851, Cl. 346-140.00R.

Cantatore, Giuseppe, to Ciba-Geigy Corporation. Use of dipiperidine-di-carbamates as stabilizers for synthetic polymers. 4,695,599, Cl. 524-103.000.

Cantor, Charles R.; and Schwartz, David C., to Columbia University in the City of New York, The Trustees of. Gel inserts useful in electrophoresis. 4,695,548, Cl. 435-179.000.

Caporossi, Adolfo; and Del Signore, Leonello, to Anic, S.p.A. Process for polymerization of vinyl chloride in suspension. 4,695,616, Cl. 526-202.000.

Carbotek, Inc.: *See*—
Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., 4,694,907, Cl. 166-303.000.

Cardinal Industries, Inc.: *See*—
Collier, Ronald T.; and Thompson, Robert E., 4,694,722, Cl. 83.485.000.

Cardo, Carlos C.: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.

Carl Freudenberg, Firma: *See*—
Schmitt, Wolfgang; and Forch, Hans, 4,695,063, Cl. 277-134.000.

Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,694,617, Cl. 51-287.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See*—
Jorgens, Reinhard; Faltermeier, Bernd; and Trautwein, Franz, 4,695,137, Cl. 350-521.000.

Carlach, Jean-Claude, to Etat Francais represent par le Secretariat d'Etat aux Postes et Telecommunications (Centre National d'Etudes des Telecommuncations); and Etablissement Public de Diffusion, dit "Telediffusion de France" . Digital circuit for frequency or pulse rate division. 4,696,020, Cl. 377-48.000.

Carlson, E. Ronald: *See*—
Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, 4,695,201, Cl. 405-224.000.

Carlson, Jess W.: *See*—
Cornelson, Donald P.; and Carlson, Jess W., 4,695,056, Cl. 273-262.000.

Carlson, Melvin C.; and Dean, Raymond H., to Tempmaster Corporation. Control installation for variable volume air diffusers. 4,694,988, Cl. 236-49.000.

Carlson, Melvin C.; and Dean, Raymond H., to Tempmaster Corporation. Control installation for variable volume air diffusers. 4,694,989, Cl. 236-49.000.

Carmel Medical Devices: *See*—
Chester, Martin H., 4,694,826, Cl. 128-303.00R.

Carmichael, Robert J.: *See*—
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Carr Lane Roemheld Manufacturing Co., Inc.: *See*—
Ehrhardt, Winfried; Richter, Klaus; and Lehr, Adolf, 4,695,047, Cl. 249-309.000.

Carrara, Giuseppe. Furnace for the complete, smokeless combustion of liquid or partially liquid materials. 4,694,756, Cl. 110-238.000.

Carraro, Roberto: *See*—
Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Francesco; Vanore, Silvestro; and Carraro, Roberto, 4,695,193, Cl. 405-204.000.

Cars & Concepts, Inc.: *See*—
Draper, David L., 4,695,090, Cl. 296-216.000.

Carswell, Joseph; and Ance, Louis, to BRIntec Corp. Cable hanger. 4,695,018, Cl. 248-74.200.

Carter, Charles A.: *See*—
Towner, Geoffrey F.; and Carter, Charles A., 4,694,910, Cl. 166-379.000.

Carter, George A., III; and Dooley, James L., to Photon Marketing Limited. Simulated shooting game with continuous transmission of target identification signals. 4,695,058, Cl. 273-311.000.

Carter, William S., to Xilinx, Inc. Bidirectional buffer amplifier. 4,695,740, Cl. 307-242.000.

Cartlidge, Jesse M., to Inductotherm Corporation. Multiple induction furnace system using single power supply. 4,695,316, Cl. 75-10.140.
Casco Products Corporation: *See—*
Lupoli, Peter J.; and Mattis, Donald J., 4,695,429, Cl. 422-49.000.
Casenhiser, Elaine J. Fingertip cover. 4,694,843, Cl. 132-73.000.
Casio Computer Co., Ltd.: *See—*
Shinohara, Isao; and Yoshimoto, Itsuro, 4,694,723, Cl. 84-1.030.
Yamamoto, Haruo, 4,695,828, Cl. 340-365.00S.
Caspar, Hans-Peter; and Schutz, Gunter, to Leybold-Heraeus GmbH. Turbomolecular vacuum pump with a rotor and at least one antifriction bearing. 4,695,223, Cl. 415-90.000.
Cassella Aktiengesellschaft: *See—*
Reh, Kuno; and Schophoff, Friedrich, 4,695,656, Cl. 568-587.000.
Cassels, Mark A. Sheet carrier. 4,695,085, Cl. 294-15.000.
Caswell, Michael L.; Corr, James J.; Dobrovolny, Mark S.; Lander, Lynn H.; Narath, William R.; and Theiler, Richard F., to Lever Brothers Company. Cleaning compositions with skin protection agents. 4,695,395, Cl. 252-121.000.
Caterpillar Inc.: *See—*
Budzich, Tadeusz, 4,694,731, Cl. 91-421.000.
Grawey, Charles E.; and Winters, Scot L., 4,695,420, Cl. 264-265.000.
Vize, Robert M., 4,694,870, Cl. 141-326.000.
Caterpillar Industrial Inc.: *See—*
Barton, James C.; Hefner, Robert E.; Reid, Paul A.; and Sable, Frank R., 4,694,928, Cl. 180-268.000.
Cecconi, Arnold L.: *See—*
Spadaro, Peter R.; Smith, Jay E.; Speer, Elmer L.; and Cecconi, Arnold L., 4,695,299, Cl. 55-274.000.
Cemco, Inc.: *See—*
Lawrence, William A. P., 4,694,935, Cl. 187-111.000.
Centerchem, Inc.: *See—*
Wilder, Martin S., 4,695,456, Cl. 424-94.500.
Centre National de la Recherche Scientifique (C.N.R.S.): *See—*
Colin, Yves; Rosse, Gabriel; Guyader, Jean; and Laurent, Yves, 4,695,432, Cl. 422-98.000.
Century Adhesives Corp.: *See—*
Friedlander, Randal H.; Nash, Sheryl A.; and Komitor, Greg A., 4,695,493, Cl. 428-40.000.
Cesarini, Jean F.: *See—*
Billet, Daniel; and Cesarini, Jean F., 4,695,787, Cl. 324-557.000.
Ceylan, Sukru , to O & K Orenstein & Koppel Aktiengesellschaft. Travelling hopper belt car. 4,694,948, Cl. 198-311.000.
CGR Ultrasonic: *See—*
Maerfeld, Charles, 4,694,700, Cl. 75-628.000.
Chaczyk, Adam W.: *See—*
Lichtenberg, Norman B.; and Chaczyk, Adam W., 4,694,706, Cl. 74-501.50R.
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., to Advanced Magnetics Inc. Magnetic particles for use in separations. 4,695,392, Cl. 252-62.540.
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., to Advanced Magnetics Inc. Magnetic particles for use in separations. 4,695,393, Cl. 252-62.540.
Chakrabarti, Kirti B.: *See—*
Wierzbicki, Julian J.; and Chakrabarti, Kirti B., 4,695,930, Cl. 362-293.000.
Chamberlain, John: *See—*
Zimmerman, Bernd; and Chamberlain, John, 4,695,128, Cl. 350-96.230.
Champion Spark Plug Company: *See—*
Podiak, Richard S., 4,695,759, Cl. 313-136.000.
Chandler, Van S.; and Arnstein, Robert A., to Concept Communications, Inc. Digital video compression system with variable digital filter. 4,695,883, Cl. 358-138.000.
Chang, Chin-Lung; and Feth, John R., to Litton Systems, Inc. Cutoff polarizer and method. 4,695,123, Cl. 350-96.150.
Chang, Kuo Y., to Dow Chemical Company, The. Preparation of trisphenol methanes. 4,695,408, Cl. 260-395.000.
Chang, Raymond S.: *See—*
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S., 4,695,544, Cl. 435-119.000.
Chao, Sam T.: *See—*
Varma, Ravi K.; Chao, Sam T.; and Gordon, Eric M., 4,695,586, Cl. 514-469.000.
Chao, Tai-Hsiang; and Sachtler, J. W. A., to UOP Inc. Phosphorus-containing alumina catalyst for the isomerization of aromatics. 4,695,666, Cl. 585-481.000.
Chaplin, Gervaise M.: *See—*
Wyndham, Ronald; Chaplin, Gervaise M.; and Swanson, William M., 4,695,436, Cl. 423-135.000.
Chapman, Jon. Releasable connector. 4,694,544, Cl. 24-625.000.
Chapman, Norman V.: *See—*
Timmerman, Tom; and Chapman, Norman V., 4,694,785, Cl. 123-52.00A.
Chase, Thomas L.; and Long, Kenneth A., to RCA Corporation. Apparatus for securing a cathode-ray tube during processing. 4,695,045, Cl. 269-152.000.
Chatterjee, Pallab K., to Texas Instruments Incorporated. High density micropackage for IC chips. 4,695,872, Cl. 357-75.000.
Chautemps, Jacques: *See—*
Blanchard, Pierre; Descure, Pierrick; and Chautemps, Jacques, 4,695,860, Cl. 357-24.0LR.
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., to Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskikh Nauk SSSR. Hexapeptide. 4,695,622, Cl. 530-329.000.
Chedid, Louis: *See—*
Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, 4,695,562, Cl. 514-13.000.
Cheeke, John D. N., to Universite de Sherbrooke. Acoustic microscopy. 4,694,699, Cl. 73-606.000.
Chemical Dynamics Development AB: *See—*
Andersson, Sven-Goran B., 4,695,659, Cl. 568-805.000.
Chen, I-Ting: *See—*
Chen, Sheng K.; Horng, Shi Y.; and Chen, I-Ting, 4,694,639, Cl. 56-10.200.
Chen, Sheng K.; Horng, Shi Y.; and Chen, I-Ting. Robotic lawn mower. 4,694,639, Cl. 56-10.200.
Cherill, Robert J.: *See—*
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,695,637, Cl. 146-207.000.
Cherne Industries, Inc.: *See—*
Hanson, Daniel R.; and Nesheim, Ludwig D., 4,695,258, Cl. 439-67.000.
Chester, Martin H., to Carmel Medical Devices. Endotracheal tube guide. 4,694,826, Cl. 128-303.00R.
Chevron Research Company: *See—*
Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, 4,695,201, Cl. 405-224.000.
Buckley, Thomas F., 4,695,391, Cl. 252-51.50A.
Goodacre, John H.; and Brogren, Eric, 4,695,198, Cl. 405-224.000.
Goodacre, John H.; and Hall, Larry J., 4,695,199, Cl. 405-224.000.
Hall, Larry; and Goodacre, John H., 4,695,200, Cl. 405-224.000.
New, Richard, 4,695,192, Cl. 405-203.000.
New, Richard, 4,695,196, Cl. 405-224.000.
Plavac, Frank, 4,695,291, Cl. 44-62.000.
Sweeney, W. Alan, 4,695,401, Cl. 252-312.000.
Watt, Brian J.; Bhula, Dilipkumar N.; and Birdy, Jal N., 4,695,197, Cl. 405-224.000.
Chiba, Kimio: *See—*
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.
Chicopee: *See—*
Mays, Alfred T., 4,695,334, Cl. 156-62.200.
Chisso Corporation: *See—*
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,695,398, Cl. 252-299.500.
Chito, Yasuo; and Ogawa, Masahiko, to Canon Kabushiki Kaisha. Rotation phase control device. 4,695,778, Cl. 318-314.000.
Cho, Yu H. Process for coloring granite. 4,695,487, Cl. 427-294.000.
Choiniere, Remi. Suction device. 4,694,529, Cl. 15-393.000.
Chou, Lung-Chiao. Disposable container. 4,694,986, Cl. 229-41.00R.
Choy, Clement K.; Keen, Frederick I.; Garabedian, Aram; and Spurgeon, Colleen J., to Clorox Company, The. Thickened aqueous cleanser. 4,695,394, Cl. 252-97.000.
Christe, Karl O., to Rockwell International Corporation. Method for the selective separation of gases. 4,695,296, Cl. 55-68.000.
Christensen, Burton G.: *See—*
Hannah, John; and Christensen, Burton G., 4,695,565, Cl. 514-206.000.
Christian, Donald J.; and Stachowicz, Michael J., to Texas Instruments Incorporated. Apparatus for automatically inspecting electrical connecting pins. 4,696,047, Cl. 382-8.000.
Christine, William, to Baxter Travenol Laboratories, Inc. Apparatus and method for attaching a fitment to a web of film. 4,695,337, Cl. 156-69.000.
Christini, Roy A.; and Frizzell, Kenneth P., to Aluminum Company of America. Magnesium refining process. 4,695,320, Cl. 75-67.00A.
Chronar Corporation: *See—*
Ramaprasad, K. R., 4,695,331, Cl. 437-126.000.
Chrysler Motors Corporation: *See—*
Hlavach, Mark C., 4,695,084, Cl. 293-126.000.
Maston, Donald M.; and Mertz, Kenneth H., 4,695,112, Cl. 439-350.000.
Chubb & Son's Lock and Safe Company Limited: *See—*
Bellingham, Ronald S.; and White, Malcolm J., 4,694,666, Cl. 70-16.000.
Chugai Denki Kogyo K.K.: *See—*
Shibata, Akira, 4,695,330, Cl. 148-6.300.
Chung, Alfred: *See—*
Ryan, James W.; and Chung, Alfred, 4,695,577, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,695,582, Cl. 514-423.000.
Chung-Bong-Chan, Alexander; and Wolfram, Leszek J., to Clairol Incorporated. Process for coloring keratinaceous materials. 4,695,285, Cl. 8-429.000.
Ciba-Geigy Corporation: *See—*
Bedekovic, Davor; and Fletcher, Ian J., 4,695,636, Cl. 546-116.000.
Cantatore, Giuseppe, 4,695,599, Cl. 524-103.000.
Lacroix, Roger; Adam, Jean-Marie; and Vincze, Janos, 4,695,406, Cl. 260-372.000.
Oertle, Konrad; and Wetter, Hansjurg, 4,695,643, Cl. 556-428.000.
Topfl, Rosemarie, 4,695,289, Cl. 8-573.000.
Ciemiega, Jan A. Exercise device. 4,695,049, Cl. 272-67.000.
Ciletti, Guy D.; and Trudeau, Michael J. Security box. 4,694,668, Cl. 70-63.000.
Cincinnati Milacron Inc.: *See—*
Gibbemeyer, Joseph F., 4,694,951, Cl. 198-468.300.

Monteith, Robert C.; and Borgmann, Robert E., 4,695,701, Cl. 219-121.0LV.
City of Columbus, Ohio, The: *See—*
Hawkins, Richard A.; and Hunter, Merle D., 4,694,757, Cl. 110-271.000.
Clairol Incorporated: *See—*
Chung-Bong-Chan, Alexander; and Wolfram, Leszek J., 4,695,285, Cl. 8-429.000.
Clark, Darrel E.: *See—*
Brown, Gregory D.; Clark, Darrel E.; and Schuermann, Rodger W., 4,694,692, Cl. 73-155.000.
Clark, Maynard H. Puppet apparatus. 4,695,265, Cl. 446-329.000.
Clasen, Rolf, to U.S. Philips Corporation. Method of for manufacturing glass bodies. 4,695,305, Cl. 65-18.300.
Clausen, Edvin L., to Norsk Hydro a.s. Heat exchanger element comprising a single and integrally extruded member including at least two hollow tubes integrally joined by at least two webs. 4,694,898, Cl. 165-171.000.
Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, to Hoechst Aktiengesellschaft. Process for the preparation of 6-methyl-3,4-dihydro-1,2,3-oxathiazin-4-one 2,2-dioxide and its non-toxic salts. 4,695,629, Cl. 544-2.000.
Cleary, Dennis: *See—*
Bimonte, Michael; and Cleary, Dennis, 4,694,972, Cl. 220-401.000.
Cleer, Clarence W., Jr. Multiple boiler heating system with improved venting and heat reclamation. 4,694,783, Cl. 122-448.00B.
Clements, Judson S.: *See—*
Mizuno, Akira; and Clements, Judson S., 4,695,358, Cl. 204-174.000.
Cline, Ronald L.: *See—*
Conner, George W.; Donald, Raymond G.; and Cline, Ronald L., 4,694,566, Cl. 437-48.000.
Clites, James L. Cutting torch holder. 4,695,041, Cl. 266-66.000.
Clorox Company, The: *See—*
Choy, Clement K.; Keen, Frederick I.; Garabedian, Aram; and Spurgeon, Colleen J., 4,695,394, Cl. 252-97.000.
Clossen, Kenneth. Bracket and repair method. 4,695,039, Cl. 254-134.30R.
Co-Ordinate Technology Ltd.: *See—*
Sandbach, Rex H.; and Poole, Alan, 4,694,776, Cl. 118-500.000.
Coates, Ian H.; Bell, James A.; Humber, David C.; and Ewan, George B., to Glaxo Group Limited. 1,2,3,9-tetrahydro-3-imidazol-1-ylmethyl-4H-carbazol-4-ones, composition containing them, and method of using them to treat neuronal 5HT function disturbances. 4,695,578, Cl. 514-397.000.
Cobb, Arthur L., Jr.: *See—*
Levine, Peter A.; Cobb, Arthur L., Jr.; Johnson, Cydney A.; and Peterson, Gary R., 4,695,878, Cl. 358-44.000.
Cobb, Raymond L., to Phillips Petroleum Company. Tetramethyltetrahydronaphthalene purification process. 4,695,671, Cl. 585-858.000.
Coburn, Joseph W., Jr. Phosphorescent material and process of manufacture. 4,695,336, Cl. 156-67.000.
Cody, Charles A.: *See—*
Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.
Cohen, Fred, to Telesciences, Inc. Telephone traffic load control system. 4,696,029, Cl. 379-92.000.
Cohen, Theodore; and Matz, James, to University of Pittsburgh. Method of synthesizing brevicomin and using same in beetle control. 4,695,584, Cl. 514-456.000.
Cole, Charles J.: *See—*
Nagy, Monte L., Jr.; and Cole, Charles J., 4,695,497, Cl. 428-96.000.
Coleman, John R., to General Motors Corporation. Master cylinder with reservoir mounting arrangement. 4,694,652, Cl. 60-585.000.
Colgate-Palmolive Company: *See—*
Straw, Alan; and Shields, Stewart, 4,695,451, Cl. 424-47.000.
Colignon, Dietmar: *See—*
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.
Colin, Yves; Rosse, Gabriel; Guyader, Jean; and Laurent, Yves, to Centre National de la Recherche Scientifique (C.N.R.S.); and Universite de Rennes I. Nitrides and oxynitrides which can be used as selective detectors of reducing gases in the atmosphere, and detection device containing them. 4,695,432, Cl. 422-98.000.
Collaborative Research, Inc.: *See—*
Botstein, David; Fink, Gerald R.; and Davis, Ronald W., 4,695,470, Cl. 426-37.000.
Collier, Ronald T.; and Thompson, Robert E., to Cardinal Industries, Inc. Apparatus for scoring and cutting wallboard and the like. 4,694,722, Cl. 83-885.000.
Collins, John. Apparatus for holding disposable bags. 4,695,020, Cl. 248-100.000.
Colorado Medical, Inc.: *See—*
Boag, James T., 4,695,385, Cl. 210-636.000.
Colsen, Ronnie H.: *See—*
Kairis, Alexandre; and Colsen, Ronnie H., 4,694,840, Cl. 128-735.000.
Columbia University in the City of New York, The Trustees of: *See—*
Cantor, Charles R.; and Schwartz, David C., 4,695,548, Cl. 435-179.000.
Colvell, William F.; and Baker, Dean M. Bearing extractor. 4,694,569, Cl. 29-724.000.
Comer, Robert C.; Hampel, Wilbur J.; and Rogers, Edward A., to Toro Company, The. Convertible vacuum-blower. 4,694,528, Cl. 15-330.000.
Commonwealth Scientific and Industrial Research Organisation: *See—*
Seddon, Duncan, 4,695,670, Cl. 585-533.000.
Compagnie Generale d'Electricite: *See—*
Belouet, Christian, 4,695,480, Cl. 437-225.000.
Compton, Diana R.: *See—*
Fulkerson, Emmet M.; Somers, Ralph M.; and Compton, Diana R., 4,695,721, Cl. 250-234.000.
Compton, Russell A.: *See—*
Kramer, David M.; Compton, Russell A.; Strenk, Lawrence M.; and Murdoch, James B., 4,695,800, Cl. 324-309.000.
Concept Communications, Inc.: *See—*
Chandler, Van S.; and Arnstein, Robert A., 4,695,883, Cl. 358-138.000.
Conley, John L. Sheet gripping assembly. 4,694,543, Cl. 24-461.000.
Conner, George W.; Donald, Raymond G.; and Cline, Ronald L., to Signetics Corporation. Method for manufacturing programmable read-only memory containing cells formed with opposing diodes. 4,694,566, Cl. 437-48.000.
Conrad, Neal D.: *See—*
McClelland, Sandra K.; Conrad, Neal D.; and Desai, Nitin V., 4,695,490, Cl. 428-1.000.
Conradty GmbH & Co. Metallelektroden KG: *See—*
Koziol, Konrad, 4,695,355, Cl. 204-252.000.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Gerloff, Klaus; Ehlert, Dieter; and von der Wall, Klaus, 4,694,873, Cl. 152-380.000.
Continental Molding Corporation: *See—*
MacDonald, John B.; and McLinn, David E., 4,695,103, Cl. 312-18.000.
Convey Teknik AB: *See—*
Forslund, Alf; and Andersson, Goran, 4,695,414, Cl. 264-3.100.
Cook, John S., to Dorran Photonics, Incorporated. Method and apparatus for effecting light energy transmission with lessened reflection. 4,695,126, Cl. 350-96.210.
Cooper Industries, Inc.: *See—*
Ohlhaber, Ronald L.; and Ulijasz, Thaddeus R., 4,695,127, Cl. 350-96.230.
Cooper, Lorne: *See—*
Sullivan, Roderick B., II; Doshi, Mahesh; and Cooper, Lorne, 4,695,968, Cl. 364-578.000.
Corbett, Clifford F.: *See—*
Butler, David R.; and Corbett, Clifford F., 4,694,884, Cl. 164-359.000.
Corcom, Inc.: *See—*
Talend, Donald R., 4,695,115, Cl. 439-76.000.
Cordova, Colleen W.; and Rowan, Hugh H., to Allied Corporation. Polyamide fiber reinforcement in thermoset polyurethane composites. 4,695,509, Cl. 428-267.000.
Cornelson, Donald P.; and Carlson, Jess W., to C & C Concepts, Inc. Variable surface board game. 4,695,056, Cl. 273-262.000.
Corr, James J.: *See—*
Caswell, Michael L.; Corr, James J.; Dobrovolny, Mark S.; Lander, Lynn H.; Narath, William R.; and Theiler, Richard F., 4,695,395, Cl. 252-121.000.
Costes, Michel L.: *See—*
Montanari, Gerard M.; Baudelot, Francis E.; and Costes, Michel L., 4,695,997, Cl. 370-13.000.
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., to Sloan-Kettering Institute for Cancer Research. Human monoclonal antibodies to cell surface antigens. 4,695,538, Cl. 435-7.000.
Cothery, Jeffrey R., to Reid Manufacturing Co., Inc. Tool for removing windshield sealant. 4,694,576, Cl. 30-280.000.
Cousin, Stephane; and Boumendil, Jean-Paul, to Isover Saint-Gobain. Insulating and impervious roofing panels and a process and apparatus for their manufacture. 4,695,338, Cl. 156-71.000.
Coville, William E.; Grossman, Hyman; and Sokol, Michael, to Bio/-Data Corporation. Analytical apparatus. 4,695,430, Cl. 422-65.000.
Covington, Edward J.; Cridland, John E.; and Gorman, John P., to General Electric Company. Bimetal switch for electrode heat cutout within an electrically insulating support. 4,695,768, Cl. 315-73.000.
Craig, John A. Internal combustion engine rocker arm. 4,694,788, Cl. 123-90.160.
Craig Medical Products Limited: *See—*
Steer, Graham E., 4,695,279, Cl. 604-397.000.
Crane, Roger M.; and Macander, Aleksander B., to United States of America, Navy. Resin impregnation and processing technique for rigidizing net-shaped fibrous skeletal composite preforms. 4,695,344, Cl. 156-242.000.
Cridland, John E.: *See—*
Covington, Edward J.; Cridland, John E.; and Gorman, John P., 4,695,768, Cl. 315-73.000.
Cronin, James J., to Microgon, Inc. Combined fluid filter and delivery tubing. 4,695,382, Cl. 210-436.000.
Crooks, Lawrence E.: *See—*
Arakawa, Mitsuaki; Fehn, John H.; and Crooks, Lawrence E., 4,695,801, Cl. 324-318.000.
Crosby, Jane M.; and Hutchins, MaryGail K., to LNP Corporation. Fiber reinforced thermoplastics containing silicone interpenetrating polymer networks. 4,695,602, Cl. 524-439.000.
Crosby, Michael A.; and Foss, Art J., to Mattel, Inc. Toy rotating gear accessory for use with gyroscopic top. 4,695,262, Cl. 446-236.000.

Crossett, Edward H. Convertible sofa mechanism. 4,694,514, Cl. 5-12.00R.

Crossley, David W.: *See*—
Simmel, Thomas L.; Crossley, David W.; and Morehouse, Mark N., 4,695,267, Cl. 446-462.000.

Crotti, Aldo, to Societa' Italtractor Meccanica Itm S.p.A. Lubricated roller for the tracks of crawler vehicles, in particular, a top roller with fixed overhung shaft and rolling bearings. 4,695,102, Cl. 305-11.000.

Cruz-Uribe, Antonio S., to Pitney Bowes Inc. External manifold for ink jet array. 4,695,854, Cl. 346-140.00R.

Cselt - Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See*—
Gagliardi, Fabrizio; Lambarelli, Livio; Panarotto, Gianfranco; Roffinella, Daniele; and Sposini, Maurizio, 4,696,001, Cl. 370-48.000.

Caffiani, Illaro: *See*—
Albizzati, Enrico; Pettenati, Enrico; Zucchini, Umberto; and Caffiani, Illaro, 4,695,558, Cl. 502-123.000.

Callmann Handelsgesellschaft fur Verbrauchsgutter mbH: *See*—
Lemfelder, Klaus, 4,695,021, Cl. 248-168.000.

Cummings, Susan G.: *See*—
Barnes, Andrew C.; and Cummings, Susan G., 4,695,455, Cl. 424-93.000.
Barnes, Andrew C.; and Cummings, Susan G., 4,695,462, Cl. 424-195.100.

Cummins Engine Company, Inc.: *See*—
Mathews, Will W., 4,694,551, Cl. 29-402.080.

Cuneo, Carol A.; and Lambert, Charles, to General Foods Corporation. Dry, sugar-free instant pudding mix. 4,695,474, Cl. 426-579.000.

Cunningham, Robert A., to Hughes Tool Company - USA. Drill pipe inside blowout preventer. 4,694,855, Cl. 137-519.500.

Cuperus, Rinze: *See*—
Bos, Jacobus J.; Cuperus, Rinze; and Wielinga, Rudolf, 4,695,628, Cl. 540-312.000.

Curl, Ricky L.: *See*—
Johnson, Terry W.; Harms, Daryl E.; and Curl, Ricky L., 4,695,880, Cl. 358-86.000.

Curro, John J.; Trusty, Alan J.; and Vernon, George M., to Procter & Gamble Company, The. Production of formed material by solid-state formation with a high-pressure liquid stream. 4,695,422, Cl. 264-504.000.

Custode, Frank Z., to Rockwell International Corporation. Method of making hardened CMOS sub-micron field effect transistors. 4,694,565, Cl. 437-34.000.

Custom Machinery Design, Inc.: *See*—
Gietman, Peter J., Jr., 4,695,005, Cl. 242-56.00R.

Daalmans, Gabriel M., to Siemens Aktiengesellschaft. Method for making a superconducting gradiometer having a three-dimensional structure and associated connecting lines for a device for measuring weak magnetic fields. 4,694,567, Cl. 29-599.000.

Dabich, Kathyleen A. Pit cover assembly with flood protection. 4,694,619, Cl. 52-20.000.

Dabisch, Wolfgang: *See*—
Dabisch, Wolfgang H.; Kung, Peter; Muller, Siegfried R.; and Narayanan, Krishnamoorthy, 4,695,528, Cl. 430-290.000.

Dabisch, Wolfgang H.; Kung, Peter; Muller, Siegfried R.; and Narayanan, Krishnamoorthy, to Dabisch, Wolfgang. Process for forming images using body with reversible fixable and temperature-variable light extinctions. 4,695,528, Cl. 430-290.000.

Dabrowski, Henry. Reeling mandrel for winding metal strips. 4,695,008, Cl. 242-68.500.

Dadpey, Habib: *See*—
Shero, David J.; and Dadpey, Habib, 4,695,783, Cl. 318-808.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Tanaka, Teruo; Tanaka, Teruya; and Kitamura, Masato, 4,695,484, Cl. 427-245.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, 4,694,749, Cl. 101-426.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Iriyama, Shozo; and Abe, Mitsuo, 4,694,508, Cl. 2-21.000.

Daiichi Denshi Kogyo Kabushiki Kaisha: *See*—
Ohtsuki, Tomonari; and Tsurumaki, Kazuyoshi, 4,695,914, Cl. 361-42.000.

Daikin Industries, Ltd.: *See*—
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,695,488, Cl. 427-385.500.
Kodama, Masahiro; Sakae, Tatsuya; and Urano, Yoshio, 4,695,967, Cl. 364-521.000.

Daimler-Benz Aktiengesellschaft: *See*—
Faust, Eberhard; Niethammer, Kurt; and Hammer, Ludwig, 4,695,095, Cl. 297-410.000.
Siebler, Helmut, 4,695,094, Cl. 297-331.000.

Dainichi-Nippon Cables, Ltd.: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Nishihama, Takamichi; Okada, Kotaro; and Kadota, Shigekazu, 4,695,044, Cl. 269-21.000.

Daintrey, Joseph W.; and Thomson, Peter, to Sankey Vending Limited. Apparatus for beverage brewing. 4,694,739, Cl. 99-289.00R.

D'Aleo, Michael J.; and Smaich, Mark, to Lutron Electronics Co. Inc. Safety device for apparatus having relatively movable members. 4,695,820, Cl. 338-179.000.

Daloz, Joanny, to SEB S.A. Domestic appliance using a hydrophilic powder. 4,694,740, Cl. 99-323.300.

Dana Corporation: *See*—
Pearch, Dean A.; and Pung, Thomas F., 4,694,946, Cl. 192-85.0AA.

Darden, Nick: *See*—
Goodale, David L.; and Darden, Nick, 4,694,861, Cl. 137-624.190.

Darilek, Glenn T., to Mobil Oil Corporation. Remote switch position determination using duty cycle modulation. 4,695,840, Cl. 340-825.054.

Data Card Corporation: *See*—
Nubson, Richard C., 4,695,850, Cl. 346-76.0PH.

Data General Corporation: *See*—
Latham, Paul W., II, 4,695,747, Cl. 307-317.00R.

Davis, Ronald W.: *See*—
Botstein, David; Fink, Gerald R.; and Davis, Ronald W., 4,695,470, Cl. 426-37.000.

Dawson, John, to General Electric Company. Actuator for variable vanes. 4,695,220, Cl. 415-9.000.

Dayco Products, Inc.: *See*—
Tassone, Joseph V.; and Candor, James T., 4,695,269, Cl. 474-268.000.

De La Plaza, Alejandro, to SGS Microelettronica S.p.A. Sampling-data integrator with commutated capacitance utilizing a unitary-gain amplifier. 4,695,751, Cl. 307-490.000.

De La Plaza, Alejandro: *See*—
Torelli, Guido; and De La Plaza, Alejandro, 4,696,035, Cl. 381-1.000.

Dean, Raymond H.: *See*—
Carlson, Melvin C.; and Dean, Raymond H., 4,694,988, Cl. 236-49.000.
Carlson, Melvin C.; and Dean, Raymond H., 4,694,989, Cl. 236-49.000.

Dean, Robert A.: *See*—
Woodard, Kenneth E., Jr.; Dean, Robert A.; Fair, David L.; and Fister, Julius C., Jr., 4,695,359, Cl. 204-255.000.

Deeg, Rolf: *See*—
Schmitt, Urban; Deeg, Rolf; and Ziegenhorn, Joachim, 4,695,552, Cl. 436-66.000.

Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, to Mitsui Engineering & Shipbuilding Co., Ltd. Method for production of lanthanide-containing alloy. 4,695,427, Cl. 420-129.000.

De Graff, Richard R., to UOP Inc. Process for alkylation of hydrocarbons. 4,695,665, Cl. 585-450.000.

DeGrazia, Torey W., Jr. Fuel injection apparatus for automobile. 4,694,804, Cl. 123-462.000.

Degussa Aktiengesellschaft: *See*—
Jansen, Martin; and Standke, Burkhard, 4,695,353, Cl. 204-96.000.

Dehennau, Claude; and Vandendael, Yannick, to Solvay & Cie. (Societe Anonyme). Rigid and semirigid thermoplastic structures with multiple coextruded polymeric layers incorporating an inner vinylidene chloride copolymer layer and use of these structures for the manufacture of packages. 4,695,506, Cl. 428-212.000.

Dei, Katsuhito, to Canon Kabushiki Kaisha. Recording apparatus. 4,695,849, Cl. 346-76.00L.

Deissenberger, Hans: *See*—
Dreher, Anton; and Gramer, Josef, 4,695,001, Cl. 242-25.00R.

Deitz, Victor R. Chemically impregnated in situ regeneration of the efficiency of activated carbon filters for trapping radioactive iodine. 4,695,561, Cl. 502-401.000.

Dekura, Yoshinori: *See*—
Momata, Kazuhiro; Dekura, Yoshinori; Honzawa, Tadashi; and Matsushige, Hiromi, 4,695,909, Cl. 360-122.000.

Delfino, Gerolamo; Franco, Simone; and Verdi, Cesare, to Minnesota Mining and Manufacturing Company. Light-sensitive elements for radiographic use in the formation of an X-ray image. 4,695,531, Cl. 430-513.000.

Del Signore, Leonello: *See*—
Caporossi, Adolfo; and Del Signore, Leonello, 4,695,616, Cl. 526-202.000.

Delta International Machinery Corp.: *See*—
Brickner, Louis C., Jr.; and Skipworth, Jerry D., 4,694,720, Cl. 83-471.300.
Brickner, Louis C., Jr., 4,694,721, Cl. 83-471.300.

Dempster Systems, Inc.: *See*—
Sutton, Gary, 4,694,858, Cl. 137-596.000.

Den Exter Blokland, Hendrikus B.; and van Raay, Petrus J., to U.S. Philips Corp. Information display panel. 4,695,135, Cl. 350-452.000.

Denkoh Co. Ltd.: *See*—
Mizushina, Youichi, 4,695,706, Cl. 219-390.000.

DeNuccio, Ron J.; Kim, Han J.; and Leung, Chi H., to GTE Products Corporation. Bimetal thermostats and method of manufacture. 4,694,558, Cl. 29-527.200.

Dernis, David. Attachment of rings without sewing. 4,694,545, Cl. 29-1.00R.

Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., to Mobil Oil Corporation. Method for preparing crystalline zirconium phosphates. 4,695,642, Cl. 556-14.000.

Derrico, Gerard G., to Dynapert-HTC Corporation. Vapor phase processing machine. 4,694,775, Cl. 118-64.000.

Desai, Harshad K.: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Desai, Jagdish A.: *See*—
Rane, Dinanath F.; Desai, Jagdish A.; and Pike, Russell E., 4,695,579, Cl. 514-397.000.

Desai, Nitin V.: *See*—
McClelland, Sandra K.; Conrad, Neal D.; and Desai, Nitin V., 4,695,490, Cl. 428-1.000.

DeSantis, Charles M.: *See*—
Mastriani, Dennis; Jacoby, Donald; Weise, Jeanne; Linick, Bruce; Marinho, John; and DeSantis, Charles M., 4,696,053, Cl. 455-67.000.

Desbois, Michel, to Rhone-Poulenc Specialites Chimiques. Process for preparing compounds containing a difluoromethylene group in a position α to an oxygen atom. 4,695,657, Cl. 568-656.000.

Des Brisay, George S., Jr., to Hughes Aircraft Company. Multiple input dissymmetric latch. 4,695,743, Cl. 307-272.200.

Descure, Pierrick: *See*—
Blanchard, Pierre; Descure, Pierrick; and Chautemps, Jacques, 4,695,860, Cl. 357-24.0LR.

Desport, Lucien A., to Engineering Management Data Processing (E.M.D.P.). Convertible mould. 4,695,032, Cl. 249-112.000.

Dessau, R. M.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., 4,695,642, Cl. 556-14.000.

Detox International Corporation: *See*—
Shultz, Clifford G., 4,695,447, Cl. 423-659.000.

Deutsch, Volker K.; and Roddeck, Werner F., to Karl Deutsch Prufund Messgeratebau GmbH+Co. KG. Method of and apparatus for layer thickness measurement. 4,695,797, Cl. 324-230.000.

Development Finance Corporation: *See*—
Wondergem, Anthony L., 4,695,101, Cl. 303-117.000.

Dhyanchand, P. John: *See*—
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,695,776, Cl. 318-14.000.
Nguyen, Vietson M.; Dhyanchand, P. John; and Thollot, Pierre, 4,695,933, Cl. 363-17.000.

Dial, Larry A.: *See*—
Beining, August H.; Dial, Larry A.; Smith, William A.; and Rieck, Gene W., 4,695,827, Cl. 340-365.00P.

Dianalog Systems, Inc.: *See*—
Zarate, Humberto T., 4,694,890, Cl. 165-12.000.

Dick, Franklin A., to Marbetech Corporation. Apparatus and methods for determining the wettability of various substrates. 4,694,685, Cl. 73-104.000.

Dicke, Grant D.; and Williams, Jeffrey A., to Dicke Tool Company. Portable collapsible highway sign. 4,694,601, Cl. 40-610.000.

Dicke Tool Company: *See*—
Dicke, Grant D.; and Williams, Jeffrey A., 4,694,601, Cl. 40-610.000.

Dickinson, Alan J., to British Gas Corporation. Pipe scraper. 4,694,574, Cl. 30-94.000.

Didier Engineering GmbH: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Didier-Werke AG: *See*—
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Diehl, Konrad, to Pfaff Industriemaschinen GmbH. Adjustable apparatus for sewing machine thread tensioning device. 4,694,765, Cl. 112-254.000.

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Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,695,575, Cl. 514-322.000.

Dietl, Joachim: *See*—
Annacker, Ralph; and Dietl, Joachim, 4,695,807, Cl. 330-310.000.

Digital Equipment Corporation: *See*—
Mallary, Michael L., 4,695,351, Cl. 204-15.000.

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Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Francesco; Vanore, Silvestro; and Carraro, Roberto, 4,695,193, Cl. 405-204.000.

Dill, James M., to EOL_3 Company, Inc. Protective light filter system for image intensifier. 4,695,718, Cl. 250-213.0VT.

Dines, Jack E.; and Gillingham, Ernest L., to Jet Research Inc. Multiphase charge holder. 4,694,754, Cl. 102-310.000.

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Grabbe, Dimitry; Korsunsky, Iosif; Klunk, Thomas M.; and DiOrazio, Joseph S., 4,695,111, Cl. 439-266.000.

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DNAX Research Institute of Molecular and Cellular Biology, Inc.: *See*—
Yokota, Takashi; Lee, Frank; Rennick, Donna; and Arai, Ken-ichi, 4,695,542, Cl. 435-68.000.

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Caswell, Michael L.; Corr, James J.; Dobrovolny, Mark S.; Lander, Lynn H.; Narath, William R.; and Theiler, Richard F., 4,695,395, Cl. 252-121.000.

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Suzuki, Shigeo; Doi, Yoshiharu; and Soga, Kazuo, 4,695,557, Cl. 502-103.000.

Dollfus-Meig & Cie: *See*—
Saingier, Jean; and Joly, Jean-Pierre A., 4,695,641, Cl. 549-552.000.

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Domtar Inc.: *See*—
Janssen, Wladmir, 4,694,683, Cl. 73-63.000.

Donald, Raymond G.: *See*—
Conner, George W.; Donald, Raymond G.; and Cline, Ronald L., 4,694,566, Cl. 437-48.000.

Donuma, Kenichi: *See*—
Takezawa, Hatsuo; Donuma, Kenichi; Katagiri, Shuhei; and Sakura, Shigeyuki, 4,695,858, Cl. 357-19.000.

Dooley, James L.: *See*—
Carter, George A., III; and Dooley, James L., 4,695,058, Cl. 273-311.000.

Dorling, Rolf: *See*—
Premel, Ulrich; Dorling, Rolf; and Schultze, Manfred, 4,694,782, Cl. 122-7.00R.

Dorman, Linneaus C.; Meyer, Victor E.; and Wu, Marinda L., to Dow Chemical Company, The. Gas separation membranes from polymers containing a hydrocarbon backbone and pendant (hydrocarbylamido)alkyl ester moieties. 4,695,295, Cl. 55-16.000.

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Cook, John S., 4,695,126, Cl. 350-96.210.

Dorsett, Preston H., to University of Tennessee Research Corp., The. Particles sensitized with detergent-treated antigen for agglutination immunoassay. 4,695,537, Cl. 435-5.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Noda, Kimio; Ozeki, Kiyoshi; Furukawa, Hiroaki; and Watai, Katsunori, 4,695,730, Cl. 250-370.000.

Doshi, Mahesh: *See*—
Sullivan, Roderick B., II; Doshi, Mahesh; and Cooper, Lorne, 4,695,968, Cl. 364-578.000.

Doss, Hubert M. Well string section spinning tool. 4,694,712, Cl. 81-57.170.

Dotter, Fritz: *See*—
Volk, Heinrich; Harter, Karl; and Dotter, Fritz, 4,694,745, Cl. 101-111.000.

Doughman, Donald J.: *See*—
Lindstrom, Richard L.; Doughman, Donald J.; and Skelnik, Debra, 4,695,536, Cl. 435-1.000.

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Hutchins, Richard D.; and Dovan, Hoai T., 4,694,906, Cl. 166-294.000.

Dover, Jerome J., to Basic American Foods. Deep fat fryer. 4,694,742, Cl. 99-404.000.

Dow Chemical Company, The: *See*—
Alderman, Daniel A., 4,695,464, Cl. 424-449.000.
Allada, Sambasiva R., 4,695,621, Cl. 528-483.000.
Boussert, Anne S., 4,695,357, Cl. 204-157.410.
Busk, Robert S., 4,694,881, Cl. 164-113.000.
Busk, Robert S., 4,694,882, Cl. 164-113.000.
Chang, Kuo Y., 4,695,408, Cl. 260-395.000.
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Stevens, James C.; and Fordyce, William A., 4,695,669, Cl. 585-511.000.

Dow Corning Corporation: *See*—
Spells, Sherwood; Warren, James R.; and Wieck, Ronald W., 4,695,185, Cl. 404-107.000.

Dowell Schlumberger Incorporated: *See*—
Kubala, Gregory, 4,695,389, Cl. 252-8.553.

Downes, Richard T.: *See*—
Nohren, John E., Jr.; and Downes, Richard T., 4,695,379, Cl. 210-282.000.

Downham, David, to Leslie Hartridge Limited. Press incorporating saftey system. 4,694,671, Cl. 72-26.000.

Doyen, Gerard, to Alsthom. Hinge and sectional panels on a frame enabling assembly and disassembly thereof. 4,694,533, Cl. 16-257.000.

Dragerwerk AG: *See*—
Slemmer, Janos; and Schroter, Gottfried, 4,694,825, Cl. 128-205.240.

Draper, David L., to Cars & Concepts, Inc. Externally retractable sunroof assembly. 4,695,090, Cl. 296-216.000.

Dreckmann, Karl; Schneider, Jakob; and Theuner, Hans-Werner, to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik. Apparatus for applying transverse weld seams to an intermittently moved plastic foil web. 4,695,346, Cl. 156-361.000.

Dreher, Anton; and Gramer, Josef, to Deisseenberger, Hans. Means for cutting to length and winding winding material. 4,695,001, Cl. 242-25.00R.

Dreschmann, Peter; and Walter, Wilhelm, to FAG Kugelfischer Georg Schafer (KGaA). Pressure relieving sealing rings for rotating elements. 4,695,062, Cl. 277-27.000.

Dreyer, Heinz; Scheufler, Bernd; Wiemeyer, Benno; and Luhrmann, Johannes, to Amazonen Werke H. Dreyer GmbH & Co. KG. Seed drill. 4,694,759, Cl. 111-85.000.

Dries, Hubertus W. A. A., to Shell Oil Company. Apparatus for cleaning solids-laden gas. 4,695,298, Cl. 55-223.000.

Drug Science Foundation: *See*—
Eller, Thomas D.; Halushka, Perry V.; Knapp, Daniel R.; and Mais, Dale, 4,695,647, Cl. 560-53.000.

DSM Rim Nylon V.O.F.: *See*—
Mottus, Edward H.; and Hedrick, Ross M., 4,695,611, Cl. 525-432.000.

DSO "Elprom": *See*—
Popov, Entcho N.; Stanilov, Krestyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., 4,695,754, Cl. 310-156.000.

Dubiet, Guy P.: *See*—
Palicot, Jacques P.; and Dublet, Guy P., 4,696,015, Cl. 375-14.000.

DuBois, Dale R.: *See*—
Learn, Arthur J.; and DuBois, Dale R., 4,694,778, Cl. 118-728.000.

Ducharme, Gerald L., to Eastman Kodak Company. Subbing layer for dye-donor element used in thermal dye transfer. 4,695,288, Cl. 8-471.000.

Duke University: *See*—
Wijayarthna, Bandula; and Newman, Glenn E., 4,694,838, Cl. 128-658.000.

Dunbar, Dona D., to Inside Outfitters, Inc. Manually operated shade lowering and raising mechanism for atrium walls. 4,694,877, Cl. 160-273.00R.

Duncombe, Richard R.: *See*—
Sikich, Joseph P.; and Duncombe, Richard R., 4,695,981, Cl. 365-227.000.

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Dunn, Joseph E.; and Pearlman, Jay S., to Maxwell Laboratories, Inc. Methods and apparatus for extending the shelf life of fluid food products. 4,695,472, Cl. 426-237.000.

Dunn, Patrick J.: *See*—
Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, 4,695,201, Cl. 405-224.000.

Du Pont de Nemours, E. I., and Company: *See*—
Rorer, Morris P., 4,695,310, Cl. 71-90.000.
Rorer, Morris P., 4,695,311, Cl. 71-92.000.
Spinelli, Harry J., 4,695,607, Cl. 525-272.000.

Dutkewych, Oleh B., to Shipley Company Inc. Ductile electroless copper. 4,695,505, Cl. 428-209.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Herrmann, Gero, 4,694,623, Cl. 52-223.00L.

Dyer, John; and Kennette, John W., to Johnson & Johnson Products, Inc. Stabilized fabric. 4,695,500, Cl. 428-134.000.

Dykes, Charles D.: *See*—
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Dynaflair Corporation Canada Inc.: *See*—
Schwalb, Horst, 4,694,669, Cl. 70-100.000.

Dynapert-HTC Corporation: *See*—
Derrico, Gerard G., 4,694,775, Cl. 118-64.000.

Dynes, Paul J.: *See*—
Hamermesh, Charles L.; Dynes, Paul J.; and Hogenson, Peter A., 4,695,619, Cl. 528-73.000.

Dytel Corporation: *See*—
Morganstein, Sanford J.; Tuck, Edward F.; Mehta, Bakuleah A.; and Krakau, Herbert B., 4,696,028, Cl. 379-88.000.

Dzhalabadze, Nikolai V.: *See*—
Asatiani, Georgy N.; Pikus, Evgeny A.; Kutelia, Elgudzha R.; Tsivtsivadze, David M.; Mudzhiri, Yason N.; and Dzhalabadze, Nikolai V., 4,695,360, Cl. 204-404.000.

Dzhikia, Alexandr A.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Essig, Willi; and Petri, Heinz, 4,695,816, Cl. 337-394.000.
Schreder, Felix, 4,695,708, Cl. 219-486.000.

E. R. Squibb & Sons, Inc.: *See*—
Varma, Ravi K.; and Gordon, Eric M., 4,695,585, Cl. 514-469.000.
Varma, Ravi K.; Chao, Sam T.; and Gordon, Eric M., 4,695,586, Cl. 514-469.000.

E-Systems, Inc.: *See*—
Masheff, Michael S.; and Sanders, David E., 4,696,017, Cl. 375-60.000.

Eagle, Paul A.: *See*—
Maddux, Forrest E., Jr.; Eagle, Paul A.; and Robbins, Robert L., 4,694,638, Cl. 53-459.000.

Eagle-Picher Industries, Inc.: *See*—
Meisner, Edward O.; and Romine, Charles F., 4,695,061, Cl. 277-27.000.

Eastman Christensen Co.: *See*—
Heidemann, Gerhard; and Witte, Johannes, 4,694,917, Cl. 175-299.000.

Eastman, George Y., to Thermacore, Inc. Thermally stabilized laser cavity. 4,696,010, Cl. 372-34.000.

Eastman Kodak Company: *See*—
Bishop, John F., 4,695,526, Cl. 430-215.000.
Bryan, Philip S.; and Herz, Arthur H., 4,695,534, Cl. 430-569.000.
Bryan, Philip S.; and Herz, Arthur H., 4,695,535, Cl. 430-569.000.
Ducharme, Gerald L., 4,695,288, Cl. 8-471.000.
Evans, Steven; and Lum, Kin K., 4,695,287, Cl. 8-471.000.
Kissel, Thomas R., 4,695,362, Cl. 204-419.000.
Minor, James C., 4,695,723, Cl. 250-325.000.
Peterson, Dean M., 4,695,887, Cl. 358-213.130.
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Ponticello, Ignazio S.; and Otocka, Edward P., 4,695,532, Cl. 430-533.000.
Sasson, Steven J., 4,695,874, Cl. 358-21.00R.
Thibault, Jean, 4,695,147, Cl. 354-322.000.
Vanier, Noel R.; and Lum, Kin K., 4,695,286, Cl. 8-471.000.
Wolcott, Dana W., 4,695,902, Cl. 358-332.000.

Ebeling, Wilfried: *See*—
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.

Eberhart, Edward; and Ingram, Arlen E., to Ingram, Arlen E. Sanding tool. 4,694,618, Cl. 51-392.000.

Ebinuma, Ryuichi: *See*—
Ichihashi, Hiroo; Ozawa, Masakazu; Ebinuma, Ryuichi; and Saito, Atsushi, 4,695,855, Cl. 346-145.000.

ECI Building Components, Inc.: *See*—
Vondergoltz, O. Earl; and Hammack, Milton E., 4,694,628, Cl. 52-528.000.

Ecker, Howard J.: *See*—
Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., 4,694,552, Cl. 29-418.000.

Ecker Mfg. Corp.: *See*—
Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., 4,694,552, Cl. 29-418.000.

Ecker, Robert S.: *See*—
Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., 4,694,552, Cl. 29-418.000.

Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., to Ecker Mfg. Corp.; and Product Design & Development, Inc. Method for fabricating a compound portal frame extrusion profile. 4,694,552, Cl. 29-418.000.

Eckhaus, Ira. Electrical wire connectors for wire of varied sizes. 4,695,113, Cl. 439-404.000.

Ecole Nationale Superieure de Creation Industrielle: *See*—
Sibertin-Blanc, Jean-Baptiste; and Tellier, Yves, 4,694,931, Cl. 182-3.000.

Ecole Polytechnique: *See*—
Roy, Gilles, 4,695,792, Cl. 324-83.00D.

Edelstein, William A.: *See*—
Hardy, Christopher J.; and Edelstein, William A., 4,695,799, Cl. 324-307.000.

Edwardson, Svante R., to AB Dentatus. Quick mount face-bow device for an articulator. 4,695,252, Cl. 433-73.000.

Egawa, Mitsuo: *See*—
Ninomiya, Kunihiro; Nitta, Isei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, 4,695,568, Cl. 514-258.000.

Egli, Annmarie O.; and St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Semi-2-interpenetrating networks of high temperature systems. 4,695,610, Cl. 525-426.000.

Egli, Werner H., to Honeywell Inc. Error cancelling bias system. 4,695,160, Cl. 356-350.000.

Egozi, Avihay, to Elscint Ltd. Patient operator intercom arrangements for magnetic resonance imaging systems. 4,696,030, Cl. 379-167.000.

Ehle, Joachim; Fuchs, Gerhard; Kimmer, Klaus; and Langfeldt, Horst-Rudiger, to Fuchs Systemtechnik GmbH. Vessel of a metallurgical furnace, especially of an arc furnace. 4,696,013, Cl. 373-71.000.

Ehlert, Dieter: *See*—
Gerloff, Klaus; Ehlert, Dieter; and von der Wall, Klaus, 4,694,873, Cl. 152-380.000.

Ehrfeld, Wolfgang; and Hagmann, Peter, to Kernforschungszentrum Karlsruhe GmbH. Method for producing a spinning nozzle plate. 4,694,548, Cl. 29-157.00C.

Ehrhardt, Winfried; Richter, Klaus; and Lehr, Adolf, to Carr Lane Roemheld Manufacturing Co., Inc. T-slot hydraulic clamp system. 4,695,047, Cl. 269-309.000.

Eichenbaum, Daniel M. Laser system for intraocular tissue removal. 4,694,828, Cl. 128-303.100.

Eichweber, Kurt, to Precitronic Gesellschaft. Method for practicing aiming with the use of a laser firing simulator and of a retroreflector on the target side, as well as firing simulator for carrying out this method. 4,695,256, Cl. 434-22.000.

Eickholt, Hubert: *See*—
Henne, Heinrich; Blaszyk, Gotthardt; Eickholt, Hubert; and Lohaherr, Ludger, 4,694,994, Cl. 241-79.100.

Eidsmore, Paul G. Fluid-flow isolation and control apparatus and method. 4,694,860, Cl. 137-614.210.

Eisenloeffel, Helmut, to Valco/Valley Tool & Die, Inc. Compression clamp for a picture frame. 4,694,598, Cl. 40-155.000.

Ekelund, Folke J. B.; Lilja, Per O.; Wald, Roland J. E.; and Stahl, Matts F., to Telefonaktiebolaget LM Ericsson. Protective circuit for a hacker type DC converter. 4,695,413, Cl. 361-18.000.

Elettronica San Giorgio-Elsag S.p.A.: *See*—
Musso, Giorgio, 4,696,049, Cl. 382-22.000.

Eli Lilly and Company: *See*—
Nakatsukasa, Walter M., 4,695,545, Cl. 435-119.000.

Eller, Thomas D.; Halushka, Perry V.; Knapp, Daniel R.; and Mais, Dale, to Drug Science Foundation. Aromatic derivatives of 13-aza-prostanoic acid. 4,695,647, Cl. 560-53.000.

Ellig, Daniel L.: *See*—
Gattuso, Mark J.; and Ellig, Daniel L., 4,695,560, Cl. 502-222.000.

Ellis, Joseph J., Jr., to International Business Machines Corporation. Plasma panel display selectively updatable on pel line basis. 4,695,838, Cl. 340-771.000.

Elmec Corporation: *See*—
Kameya, Kazuo, 4,695,812, Cl. 333-156.000.

Elscint Ltd.: *See*—
Egozi, Avihay, 4,696,030, Cl. 379-167.000.

Else, Ronald, to British Telecommunications public limited company. One-piece telephone hook switch operating mechanism. 4,696,033, Cl. 379-424.000.

Elsenbaumer, Ronald L.: *See*—
Shacklette, Lawrence W.; Toth, James E.; and Elsenbaumer, Ronald L., 4,695,521, Cl. 429-194.000.

Elsener, Carl. Ear ornamentation. 4,694,664, Cl. 63-12.000.

Elsmo, Thad; and Horvath, Ronald. Tamperproof package. 4,694,971, Cl. 215-253.000.

Emelyanov, Sergei I.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Emerson Electric Co.: *See*—
Schmitt, Thomas J., 4,694,932, Cl. 182-109.000.

Emhart Industries Inc.: *See*—
Merchant, David E., 4,695,686, Cl. 200-61.860.
Nebelung, Hermann H., 4,695,307, Cl. 65-242.000.

EMR Elektronische Messund Regelgerate Gesellschaft m.b.H.: *See*—
Rieder, Heinz; and Schwaiger, Max, 4,695,720, Cl. 250-231.0SE.

Emuge-Werk Richard Glimpel Fabrik fuer Praezisionswerkzeuge (vormals Moschkau & Glimpel): *See*—
Schmidt, Wolfgang, 4,694,944, Cl. 192-56.00R.

Endo, Kazuma: *See*—
Endo, Shigeharu; and Endo, Kazuma, 4,694,993, Cl. 241-46.110.

Endo, Shigeharu; and Endo, Kazuma. Crushing and washing processing appartus for ballast and sand. 4,694,993, Cl. 241-46.110.

Endou, Hideyasu: *See*—
Itagaki, Masanori; Takahashi, Junichi; and Endou, Hideyasu, 4,695,678, Cl. 174-52.0FP.

Energy Conversion Devices, Inc.: *See*—
Guha, Subhendu; and Agarwal, Satish, 4,695,859, Cl. 357-19.000.

Enertrols, Inc.: *See*—
Heideman, Robert J.; and Mitera, Richard T., 4,694,939, Cl. 188-287.000.

Engineering Management Data Processing (E.M.D.P.): *See*—
Desport, Lucien A., 4,695,032, Cl. 249-112.000.

Engler, David A.; and Maistrovich, Anthony R., to Minnesota Mining and Manufacturing Company. Continuous process for making polymers having pendant azlactone or macromolecular moieties. 4,695,608, Cl. 525-308.000.

English Clays Lovering Pochin & Company: *See*—
Goodman, Howard; and Fugler, Andrew R., 4,695,511, Cl. 428-404.000.

English Electric Valve Company Limited: *See*—
Nixon, Ralph D., 4,695,764, Cl. 313-497.000.
Nixon, Ralph D., 4,695,765, Cl. 313-497.000.

Enkegaard, Torben, to F. L. Smidth & Co. A/S. Method and apparatus for producing clinker. 4,695,325, Cl. 106-100.000.

Enoki, Takatomo; Yamasaki, Kimiyoshi; and Ohwada, Kuniki. Method for the manufacture of a Schottky gate field effect transistor. 4,694,564, Cl. 437-40.000.

Enzaki, Yoshiki; Kitahara, Kazuki; Terasaka, Satoru; Mori, Kenji; and Kimura, Takeshi, to Director-General of the Agency of Industrial Science & Technology. Combustor of gas turbine. 4,695,247, Cl. 431-352.000.

EOL_3 Company, Inc.: *See*—
Dill, James M., 4,695,718, Cl. 250-213.0VT.

Epstein, David. Panoramic rear view automobile mirror. 4,695,138, Cl. 350-615.000.

Era, Yoshiyuki; and Kumagai, Yasuo, to Okabe Co., Ltd. Joint for reinforcing bar employed in concrete construction. 4,695,178, Cl. 403-14.000.

Erhardt, Manfred: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,694,617, Cl. 51-287.000.

Erickson, Curtis W. Portable elevating device. 4,694,934, Cl. 182-142.000.

Erickson, William R.: *See*—
Berry, W. Wes; and Erickson, William R., 4,695,387, Cl. 210-676.000.

Erlandsson, Kjell L, to Kelley Company, Inc. Vehicle restraint. 4,695,216, Cl. 414-401.000.

Ermacora, Rino; and Jehl, Patrice, to Kuhn S.A. Mowing machine for cutting hay and cereal grass. 4,694,640, Cl. 56-16.400.

Ernst Leitz Wetzlar GmbH: *See*—
Jacoby, Hans-Dieter; and Schmidt, Peter, 4,695,215, Cl. 414-225.000.

Ersfeld, Heinrich: *See*—
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.

Eshoff, Donald D.: *See*—
Mendonsa, Alvin A.; and Eshoff, Donald D., 4,695,022, Cl. 248-176.000.

Eskelinen, Pekka, to Valmet Oy. Method and apparatus in a twin-wire cylinder drying section of a paper machine. 4,694,587, Cl. 34-23.000.

Ealick, Mark: *See*—
Zivitz, Maury; Ko, Eric; and Ealick, Mark, 4,695,164, Cl. 356-427.000.

Esparza, Natividad G. System for the self-lighting of cigarettes. 4,694,841, Cl. 131-351.000.

Esperanza y Cia, S.A.: *See*—
Ibarra, Inigo A., 4,694,755, Cl. 102-445.000.

Esselte Meto International GmbH: *See*—
Volk, Heinrich; Harter, Karl; and Dotter, Fritz, 4,694,745, Cl. 101-111.000.

Essex Group, Inc.: *See*—
Graham, Randall C., 4,695,830, Cl. 340-677.000.

Essig, Willi; and Petri, Heinz, to E.G.O. Elektro-Gerate Blanc u. Fischer. Thermal cut-out. 4,695,816, Cl. 337-394.000.

Estes, Donna L.; and Hilson, Carol A. Combination garment and protective seat cover. 4,694,511, Cl. 2-69.000.

Eszakmagyarorszagi Vegyimuvek: *See*—
Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,309, Cl. 71-88.000.
Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,313, Cl. 71-100.000.

ETA SA Fabriques D'Ebauches: *See*—
Meister, Pierre-Andre ; Schmidli, Pierre; and Soltermann, Bertrand, 4,695,168, Cl. 368-31.000.

Etablissement Public de Diffusion, dit "Telediffusion de France" : *See*—
Carlach, Jean-Claude, 4,696,020, Cl. 377-48.000.
Palicot, Jacques P.; and Dublet, Guy P., 4,696,015, Cl. 375-14.000.

Etani, Tadao: *See*—
Muto, Yoshiyuki; Etani, Tadao; Aida, Satoru; and Kato, Shinya, 4,695,007, Cl. 242-58.400.

Etat Francais represent par le Secretariat d'Etat aux Postes et Telecommunications (Centre National d'Etudes des Telecommuncations): *See*—
Carlach, Jean-Claude, 4,696,020, Cl. 377-48.000.

ETD Technology, Inc.: *See*—
Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,694,682, Cl. 73-61.10C.

Ethyl Corporation: *See*—
Laurent, Sebastian M.; and Sanders, Robert N., 4,695,461, Cl. 424-154.000.

Eugene Tech International, Inc.: *See*—
Prince, Alfred M.; and Kim, Kwang S., 4,695,454, Cl. 424-89.000.

Eutectic Corporation: *See*—
Gartland, Thomas J., 4,695,702, Cl. 219-137.630.

Evans, Steven; and Lum, Kin K., to Eastman Kodak Company. Cyan dye-donor element used in thermal dye transfer. 4,695,287, Cl. 8-471.000.

Everett, Charles J.; and Ochsner, Rolf H., to Robertshaw Controls Company. Temperature level indicating device and method of making the same. 4,695,829, Cl. 340-586.000.

Everhart, Robert W.; and Huck, Charles T., to American Telephone and Telegraph Company AT&T-Technologies. Methods of and systems for transmitting oscilloscope signals. 4,695,836, Cl. 340-750.000.

Ewan, George B.: *See*—
Coates, Ian H.; Bell, James A.; Humber, David C.; and Ewan, George B., 4,695,578, Cl. 514-397.000.

Ex-Cell-O Corporation: *See*—
Scrivo, Jerry V.; and Breuker, Gordon W., 4,695,433, Cl. 422-112.000.

Excelermatic Inc.: *See*—
Kraus, Charles E., 4,694,704, Cl. 74-200.000.

Exxon Production Research Company: *See*—
Paal, Ernest F., 4,695,984, Cl. 367-54.000.

Exxon Research and Engineering Company: *See*—
West, Theodore H., 4,695,363, Cl. 208-33.000.

Ezernack, Daniel D.; and Armstrong, Robert B., to M. W. Kellogg Company, The. Diesel fuel production. 4,695,367, Cl. 208-106.000.

F. Gegauf AG Bernina Nahmaschinenfabrik: *See*—
Janouschek, Heinz, 4,694,764, Cl. 112-237.000.

F. L. Smidth & Co. A/S: *See*—
Enkegaard, Torben, 4,695,325, Cl. 106-100.000.

Fabbro, Miguel, to Bifa Corporation. Grille apparatus. 4,694,816, Cl. 126-41.00R.

Facet Enterprises, Inc.: *See*—
Tallis, John R., Jr.; and Voliso, Nicholas A., 4,695,735, Cl. 290-38.00R.

Faensen, Louis M. H.; and Khoe, Giok D., to U.S. Philips Corp. Viewer having head mounted display unit for cinerama pictures. 4,695,129, Cl. 350-96.250.

FAG Kugelfischer Georg Schafer (KGaA): *See*—
Dreschmann, Peter; and Walter, Wilhelm, 4,695,062, Cl. 277-27.000.

Fair, David L.: *See*—
Woodard, Kenneth E., Jr.; Dean, Robert A.; Fair, David L.; and Fister, Julius C., Jr., 4,695,359, Cl. 204-255.000.

Fairchild Semiconductor Corporation: *See*—
Lam, Nim C., 4,695,749, Cl. 307-455.000.

Fairdale Orthodontic Company: *See*—
Mariol, James F., 4,695,250, Cl. 433-5.000.

Faisandier, Yves, to A2F. Electronic device providing a universal interface between sensors and an acquisition and processing unit of the signals originating from said sensors. 4,695,955, Cl. 364-413.000.

Falk, Karl-Erik L.: *See*—
Berglund, Bengt G.; Falk, Karl-Erik L.; Magnusson, Dan A.; Nilson, Nils B.; and Nilsson, Ake S., 4,695,272, Cl. 604-84.000.

Falk, Timothy L.: *See*—
Leber, David C.; and Falk, Timothy L., 4,694,572, Cl. 29-840.000.

Faltermeier, Bernd: *See*—
Jorgens, Reinhard; Faltermeier, Bernd; and Trautwein, Franz, 4,695,137, Cl. 350-521.000.

FANUC LTD: *See*—
Inaba, Yoshiharu, 4,695,237, Cl. 425-135.000.
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,695,780, Cl. 318-561.000.

Farrall, George A.; and Seymour, Raymond K., to General Electric Company. Electrical contact construction. 4,695,688, Cl. 200-144.00B.

Farrell, Gregory A., to Technicon Instruments Corporation. Volumetric pumping apparatus and method for supplying fluids to sheath stream flow cells. 4,695,431, Cl. 422-81.000.

Fast, Jacob. Product information display tag. 4,694,595, Cl. 40-19.500.

Fast, Jacob. Merchandise information tag with improved mounting portion. 4,694,596, Cl. 40-20.00R.

Faulconer, Mark; and Greatrake, Scott E., to U.S.D. Corp. Diver's buoyancy compensator belt. 4,694,772, Cl. 114-315.000.

Faust, Eberhard; Niethammer, Kurt; and Hammer, Ludwig, to Daimler-Benz Aktiengesellschaft. Arrangement for securing the end position of a guided support rod of a headrest. 4,695,095, Cl. 297-410.000.

Fehn, John H.: *See*—
Arakawa, Mitsuaki; Fehn, John H.; and Crooks, Lawrence E., 4,695,801, Cl. 324-318.000.

Feild, Alexander L., Jr., to Westinghouse Electric Corp. Process for coating the internal surface of zircconium tubes with neutron absorbers. 4,695,476, Cl. 427-6.000.

Feldman, Steven; and Tennant, Robert J., to AMP Incorporated. Surface mount, miniature connector. 4,695,106, Cl. 439-83.000.

Fendley, James R., to Zenith Electronics Corporation. Tension shadow mask support structure. 4,695,761, Cl. 313-407.000.

Ferrante, Cesare M.: *See*—
Ferrari Aggradi, Gian P.; and Ferrante, Cesare M., 4,695,202, Cl. 405-227.000.

Ferrari Aggradi, Gian P.; and Ferrante, Cesare M., to Nuovo Pignone S.p.A. System of submarine linking between the legs of a platform and the relating foundation piles. 4,695,202, Cl. 405-227.000.

Ferrell, Charles W.: *See*—
Hooker, Lane K.; Howell, Thomas H.; and Ferrell, Charles W., 4,695,951, Cl. 364-200.000.

Feth, John R.: *See*—
Chang, Chin-Lung; and Feth, John R., 4,695,123, Cl. 350-96.150.

Feuling, James J. Friction reduction for moving elements in contact with a fluid medium. 4,695,229, Cl. 416-241.00A.

Feuring, Kurt, to Buderus Aktiengesellschaft. Process for producing castings. 4,694,879, Cl. 164-7.200.

Fibre Converters, Inc.: *See*—
Robinson, Leonard W., 4,695,501, Cl. 428-159.000.

Fierens, Gustaaf E. M., to U.S. Philips Corporation. Loudspeaker arrangement comprising one or more flat diaphragms. 4,696,037, Cl. 381-24.000.

Fikentscher, Rolf: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.

Fildes, John M.; and Krueger, Robert H., to Borg-Warner Corporation. Cutting tool wear monitor. 4,694,686, Cl. 73-104.000.

Fingermatrix, Inc.: *See*—
Schiller, Michael, 4,696,046, Cl. 382-5.000.

Fink, Gerald R.: *See*—
Botstein, David; Fink, Gerald R.; and Davis, Ronald W., 4,695,470, Cl. 426-37.000.

Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D., and Johnson, Johnny R., to NL Chemicals, Inc. Organophilic clay gellants and process for preparation. 4,695,402, Cl. 252-315.200.

Fischer, Jay P. Quick release clamp. 4,695,030, Cl. 248-507.000.

Fischer, Klaus, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the formation of single crystals from the gas phase. 4,695,347, Cl. 156-610.000.

Fischer, Lothar: *See*—
Homann, Walter K.; and Fischer, Lothar, 4,695,661, Cl. 148-903.000.

Fischer, William H.: *See*—
Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, 4,695,201, Cl. 405-274.000.

Fisher, Albert W., to RCA Corporation. Patterned metallization for integrated circuits. 4,695,868, Cl. 357-68.000.

Fister, Julius C., Jr.: *See*—
Woodard, Kenneth E., Jr.; Dean, Robert A.; Fair, David L.; and Fister, Julius C., Jr., 4,695,359, Cl. 204-255.000.

Fitzmayer, Louis H.: *See*—
Staats, James E.; and Fitzmayer, Louis H., 4,695,693, Cl. 219-10.55F.

Fleckenstein, Phillip P.; and Marsh, Norman F., to Berwind Corporation. Rotating paddle bin level indicator. 4,695,685, Cl. 200-61.210.

Fleisher, Martin; Bradlow, H. Leon; and Schwartz, Morton K., to Sloan-Kettering Institute for Cancer Research. Breast cyst fluid screening method for cancer risk assessment. 4,695,471, Cl. 436-64.000.

Fletcher, Ian J.: *See*—
Bedekovic, Davor; and Fletcher, Ian J., 4,695,636, Cl. 546-116.000.

Flexible Steel Lacing Company: *See*—
Musil, Edward C., 4,694,958, Cl. 206-340.000.

Floating Technology Company Limited, The: *See*—
Wagstaff, William L., 4,695,191, Cl. 405-195.000.

Flockenhaus, Claus: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,599, Cl. 502-183.000.

Flohrs, Peter; and Michel, Hartmut, to Robert Bosch GmbH. Monolithically integrated planar semiconductor arrangement. 4,695,867, Cl. 357-46.000.

Flora, David D.: *See*—
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,694,713, Cl. 82-14.00R.

Florida State University: *See*—
Mizuno, Akira; and Clements, Judson S., 4,695,358, Cl. 204-174.000.

Flosi, Corrado; Gobbi, Alberto; Macciosi, Roberto; and Simonetta, Guerrieri. Upper body protector for off-road riders. 4,694,505, Cl. 2-2.000.

Floyd, Lawrence, Jr.: *See*—
Knapp, John F.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., 4,695,524, Cl. 430-32.000.

Floyd, William C.; and Hui, Sai H., to Sun Chemical Corporation. Coating binder additive. 4,695,606, Cl. 525-160.000.

Fluechter, Horst: *See*—
Rossmann, Christian; Fluechter, Horst; Schreiber, Gerald; and Wichelhaus, Winfried, 4,695,396, Cl. 252-135.000.

Flutec Fluidtechnische Gerate GmbH: *See*—
Klauck, Manfred, 4,695,232, Cl. 417-410.000.

Flyborg, Nils O.; and Bjorheden, Orvar, to Kamewa AB. Propeller assembly. 4,694,645, Cl. 60-221.000.

Flynn, William M., to Westinghouse Electric Corp. Cell for a spent nuclear fuel rack. 4,695,424, Cl. 376-272.000.

FMC Corporation: *See*—
Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., 4,695,658, Cl. 568-763.000.

Focalpoint Armoury Limited: *See*—
Cannon, Albert W., 4,695,159, Cl. 356-247.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Liedtke, Kurt, 4,694,714, Cl. 83-13.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Process and apparatus for changing reels in connection with packaging machines. 4,694,714, Cl. 83-13.000.

Foggini, Paolo, to Foggini Progetti S.r.l. Device for controlling opening and closing of movable objects, in particular doors and drawers in motor vehicles, having mutually cooperating stator and rotor. 4,694,530, Cl. 16-82.000.

Foggini Progetti S.r.l.: *See*—
Foggini, Paolo, 4,694,530, Cl. 16-82.000.

Fogt, Eric J.: *See*—
Meyerhoff, Mark E.; Fogt, Eric J.; and Untereker, Darrel F., 4,694,834, Cl. 128-635.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Two compartment carryout carton. 4,694,987, Cl. 229-114.000.

Forch, Hans: *See*—
Schmitt, Wolfgang; and Forch, Hans, 4,695,063, Cl. 277-134.000.

Ford Aerospace & Communications Corporation: *See*—
Motooka, Wesley D., 4,695,722, Cl. 250-235.000.

Ford, George A., to R. C. Ltd. Continuous coring drill bit. 4,694,916, Cl. 175-249.000.

Ford Motor Company: *See*—
Frost, Derek, 4,694,789, Cl. 123-90.170.

Fordyce, William A.: *See*—
Stevens, James C.; and Fordyce, William A., 4,695,669, Cl. 585-511.000.

Forslund, Alf; and Andersson, Goran, to Convey Teknik AB. Method and apparatus for pressing powder material. 4,695,414, Cl. 264-3.100.

Forsythe, Curtis J., to Breddo, Inc. Shortening replacing and fresh slice improving agents for yeast-raised bakery products. 4,695,469, Cl. 426-24.000.

Forte, Mark R.; Khowaylo, Alex; and Schloesser, Ewald, to Osteonics Corp. Acetabular cup assembly with selective bearing face orientation. 4,695,282, Cl. 623-22.000.

Foseco International Limited: *See*—
Butler, David R.; and Corbett, Clifford F., 4,694,884, Cl. 164-359.000.

Foss, Art J.: *See*—
Crosby, Michael A.; and Foss, Art J., 4,695,262, Cl. 446-236.000.

Foster Wheeler Energy Corporation: *See*—
Gorzegno, Walter P.; and Abdulally, Iqbal F., 4,694,758, Cl. 110-347.000.
Grochowski, Horst; Zurawsky, Dieter; Knoblauch, Karl; Goldschmidt, Klaus; and Schwarte, Jurgen, 4,695,444, Cl. 423-569.000.
Rabe, George B., 4,694,549, Cl. 29-157.30C.
Rabe, George B., 4,694,677, Cl. 72-393.000.

Fowler, George F., Jr.; and Lehnert, Charles W., to Georgia-Pacific Corporation. Fire-resistant article and method of manufacture. 4,695,494, Cl. 428-71.000.

Fox, Cheryl: *See*—
Fox, Jeffrey A.; and Fox, Cheryl, 4,695,029, Cl. 248-360.000.

Fox, Jeffrey A.; and Fox, Cheryl. Support device for securing a razor to a shaving cream dispenser. 4,695,029, Cl. 248-360.000.

Fox, Richard L. Protected hypodermic needle. 4,695,274, Cl. 604-198.000.

Foy, Peter S. Suspended overhead hollow track support system. 4,694,531, Cl. 16-87.40R.

Framatome: *See*—
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, 4,694,585, Cl. 33-502.000.

Franco, Simone: *See*—
Delfino, Gerolamo; Franco, Simone; and Verdi, Cesare, 4,695,531, Cl. 430-513.000.

Frankhouse, Thomas J.; and Spease, Arthur L., to Teleflex Incorporated. Molded terminal for remote control assembly (lollipop). 4,694,705, Cl. 74-501.00R.

Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,694,741, Cl. 99-354.000.

Fredenburgh, Evan A.: *See*—
Matuska, David G.; and Fredenburgh, Evan A., 4,695,341, Cl. 156-161.000.

Fretz, Walter; and Hefti, Walter, to Maschinenfabrik Rieter AG. Device for winding-up a thread. 4,695,000, Cl. 242-18.0DD.

Freudberg, Richard L.; and Garrison, Marshall B., to Wang Laboratories, Inc. Signal detection and discrimination using waveform peak factor. 4,696,031, Cl. 379-386.000.

Friedlander, Randal H.; Nash, Sheryl A.; and Komitor, Greg A., to Century Adhesives Corp. Peel-and-stick carpet assemblies, components thereof and methods of construction. 4,695,493, Cl. 428-40.000.

Friesen, Peter. Rotational arm for molding machine. 4,695,244, Cl. 425-429.000.

Frimair S.A.: *See*—
Bagolin, Alain; and Gay, Joel, 4,694,588, Cl. 34-77.000.

Frisco, Jeffrey A.: *See*—
Heckaman, Douglas E.; Higman, Roger H.; Frisco, Jeffrey A.; and Bajgrowicz, Edward J., 4,695,810, Cl. 333-1.000.

Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, to Framatome. Device for measuring clearance around a pin for centering the upper internal equipment of a pressurized water nuclear. 4,694,585, Cl. 33-502.000.

Frizzell, Kenneth P.: *See*—
Christini, Roy A.; and Frizzell, Kenneth P., 4,695,320, Cl. 75-67.00A.

Fronda Limited: *See*—
Boston, Ronald P., 4,695,468, Cl. 426-8.000.

Frost, Derek, to Ford Motor Company. Variable valve timing. 4,694,789, Cl. 123-90.170.

Frye, Ruth E. Therapeutic stuffed toy. 4,694,829, Cl. 128-399.000.

FSI Corporation: *See*—
Grant, Robert W., 4,694,852, Cl. 137-501.000.

Fuchs, Gerhard: *See*—
Ehle, Joachim; Fuchs, Gerhard; Kimmer, Klaus; and Langfeldt, Horst-Rudiger, 4,696,013, Cl. 373-71.000.

Fuchs Systemtechnik GmbH: *See*—
Ehle, Joachim; Fuchs, Gerhard; Kimmer, Klaus; and Langfeldt, Horst-Rudiger, 4,696,013, Cl. 373-71.000.

Fugler, Andrew R.: *See*—
Goodman, Howard; and Fugler, Andrew R., 4,695,511, Cl. 428-404.000.

Fuji Electric Co., Ltd.: *See*—
Monno, Asao; Watanabe, Kiyoo; and Kaneko, Kazuyuki, 4,695,729, Cl. 250-358.100.

Fuji Electric Co., Ltd: *See*—
Tominaga, Hiroshi, 4,694,521, Cl. 5-453.000.

Fuji Electric Corporate Research and Developement Ltd.: *See*—
Sagisawa, Shinobu; Takahama, Teizo; and Kobayashi, Mitsuo, 4,695,963, Cl. 364-513.000.

Fuji Facom Corporation and Kawasaki Steel Corporation: *See*—
Monno, Asao; Watanabe, Kiyoo; and Kaneko, Kazuyuki, 4,695,729, Cl. 250-358.100.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kurokawa, Ryogo; Oyama, Fusami; and Takahashi, Akira, 4,695,069, Cl. 280-91.000.
Miyamoto, Yasuhiko, 4,694,810, Cl. 123-516.000.
Nagai, Masaaki, 4,694,801, Cl. 123-425.000.
Yamashita, Masatoshi; and Tsunoda, Norio, 4,695,059, Cl. 273-360.000.

Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira; Nakajima, Junya; and Nishikawa, Toshihiro, 4,695,529, Cl. 430-351.000.
Mori, Nobufumi; Hosoi, Yuichi; Takahashi, Kenji; and Miyahara, Junji, 4,695,725, Cl. 250-327.200.
Moriwaki, Masayoshi, 4,695,912, Cl. 360-133.000.
Nagano, Masahiko; and Sakaki, Naoaki, 4,695,899, Cl. 358-310.000.
Nakamura, Kotaro; and Ishikawa, Takatoshi, 4,695,530, Cl. 430-381.000.
Oshikoshi, Yuji; Kato, Masashi; and Kikuchi, Hisashi, 4,695,143, Cl. 354-86.000.
Sugihara, Mitsuru; and Sugimoto, Naohiko, 4,695,354, Cl. 204-180.100.
Tsukase, Masaaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, 4,695,525, Cl. 430-151.000.
Utsugi, Mikio, 4,695,905, Cl. 360-33.100.
Watanabe, Hideo; and Nakajima, Nobuyoshi, 4,695,726, Cl. 250-327.200.

Fuji Photo Optical Co., Ltd.: *See*—
Kondo, Mitsuo, 4,694,821, Cl. 128-4.000.

Fuji Seal Industry Co., Ltd.: *See*—
Fujio, Masaaki; and Yamamoto, Tetsuhiro, 4,694,633, Cl. 53-49.000.

Fujieda, Yasuhiko: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.

Fujii, Isao: *See*—
Yagi, Shizuo; Hirosawa, Yoshiaki; Kawai, Makoto; and Fujii, Isao, 4,694,799, Cl. 123-425.000.

Fujii, Noriaki: *See*—
Kodai, Syojiro; Fujii, Noriaki; Gamo, Hiroshi; and Kobayashi, Bujirou, 4,695,925, Cl. 361-395.000.

Fujii, Shoichiro: *See*—
Takanobashi, Kunio; Yoshida, Tsuneaki; and Fujii, Shoichiro, 4,695,639, Cl. 548-165.000.

Fujio, Masaaki; and Yamamoto, Tetsuhiro, to Fuji Seal Industry Co., Ltd. Film wrapping machine. 4,694,633, Cl. 53-49.000.

Fujirex Company, Limited: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,694,748, Cl. 101-401.100.

Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, to Fujirex Company, Limited. Device for moving offset plates. 4,694,748, Cl. 101-401.100.

Fujisawa, Norio: *See*—
Yamaura, Mitsuru; and Fujisawa, Norio, 4,695,931, Cl. 363-8.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, 4,695,466, Cl. 424-456.000.
Uemura, Toshinobu; Shinooka, Kiyohide; and Kajiho, Tokuaki, 4,695,467, Cl. 424-502.000.

Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, to Toshiba Kikai Kabushiki Kaisha. Monitoring data display method and device. 4,695,965, Cl. 364-518.000.

Fujitsu Limited: *See*—
Itakura, Tohru, 4,695,978, Cl. 365-51.000.
Tsukada, Tetsuo; Shimobuchi, Hideyuki; and Yoshikawa, Takahiro, 4,695,175, Cl. 400-196.100.
Yoshizawa, Takeshi, 4,694,527, Cl. 15-308.000.

Fujiwara, Kozo: *See*—
Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.

Fukano, Michio: *See*—
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Fukasawa, Akira: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.

Fukase, Hisahiko: *See*—
Matsui, Kunio; Fukase, Hisahiko; and Nomura, Akihiro, 4,694,887, Cl. 164-428.000.

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Hill, James D.; and Wooden, Gene R., 4,695,694, Cl. 219-10.55D.
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Gelardi, Anthony L., to Shape Inc. Leader tape staking rod and related method of assembly. 4,694,557, Cl. 29-525.000.
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Banfi, Claudio, 4,695,690, Cl. 200-147.00R.
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Farrall, George A.; and Seymour, Raymond K., 4,695,688, Cl. 200-144.00B.
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Hardy, Christopher J.; and Edelstein, William A., 4,695,799, Cl. 324-307.000.
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Pressman, Eric, 4,695,594, Cl. 521-92.000.
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Takekoshi, Tohru; and Anderson, Patricia P., 4,695,612, Cl. 525-433.000.
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Murray, Ledell L., 4,694,600, Cl. 40-518.000.
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General Motors Corporation: *See*—
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Popov, Entcho N.; Stanilov, Krastyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., 4,695,754, Cl. 310-156.000.
Gerhart, Fritz; and Mamont, Pierre, to Merrell Dow Pharmaceuticals Inc. Gem-dihalo-1,8-diamino-4-aza-octanes. 4,695,654, Cl. 564-510.000.
Gerloff, Klaus; Ehlert, Dieter; and von der Wall, Klaus, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel with run-flat support. 4,694,873, Cl. 152-380.000.
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Gibes, Terrence R. Portable radiation contamination detector. 4,695,728, Cl. 250-336.100.
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Glaser, Donald A., to Glendo Corporation. Controlled impact power tool. 4,694,912, Cl. 173-115.000.
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Goethel, James H., to Liebel-Flarsheim Company. Angiographic injector. 4,695,271, Cl. 604-49.000.
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Goodwin, Richard S., to R. Goodwin International Ltd. Wafer check valves. 4,694,853, Cl. 137-512.100.
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Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, to Chisso Corporation. Cyclohexane derivative. 4,695,398, Cl. 252-299.500.
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Grabitz, Ernst B., to Hasunor A.G. Metabolically active preparations obtained from yeast of any type. 4,695,549, Cl. 435-267.000.
Grace, William G., to Repco Limited. Continuous or semi-continuous process for forming reconsolidated wood product. 4,695,345, Cl. 156-264.000.
Grady, Mark P., to Seatronics, Inc. Oxygen sensor. 4,695,361, Cl. 204-415.000.
Graf, Lothar; Maerte, Leo; and Skorka, Thomas, to Ing. Erich Pfeiffer GmbH & Co. KG. Fluid dispenser. 4,694,977, Cl. 222-259.000.
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Green, Joseph H., to Greenco Corporation. Cable shield for a rodless cylinder. 4,694,733, Cl. 92-88.000.
Greenawalt, Kent S. Arch support unit and method of formation. 4,694,590, Cl. 36-91.000.
Greenberg, Robert, to Ray Industries, Inc. Marine propeller shaft/key assembly. 4,695,183, Cl. 403-356.000.
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Groff, Horace E. Method and apparatus for frying product. 4,694,743, Cl. 99-404.000.

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Coville, William E.; Grossman, Hyman; and Sokol, Michael, 4,695,430, Cl. 422-65.000.

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Grove, Jerry E. Snap fastener tool. 4,694,550, Cl. 29-267.000.

Gruber, Robert J.: *See*—
Knapp, John P.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., 4,695,524, Cl. 430-32.000.

Grubman, Moe M. Non-pucker necktie. 4,694,509, Cl. 2-144.000.

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Asatiani, Georgy N.; Pikus, Evgeny A.; Kutelia, Elgudzha R.; Tsivtsivadze, David M.; Mudzhiri, Yason N.; and Dzhalabadze, Nikolai V., 4,695,360, Cl. 204-404.000.

GTE Products Corporation: *See*—
DeNuccio, Ron J.; Kim, Han J.; and Leung, Chi H., 4,694,558, Cl. 29-527.200.
Ritsko, Joseph E.; Houck, David L.; and Acla, Howard L. R., 4,695,439, Cl. 423-263.000.
Schulze, Harry O.; and Karam, Ronald E., 4,695,478, Cl. 427-71.000.
Wierzbicki, Julian J.; and Chakrabarti, Kirti B., 4,695,930, Cl. 361-393.000.

Gugel, Bernd; Niebel, Harald; and Ott, Hubert, to Mannesmann Aktiengesellschaft. Magnetic circuit for matrix print head. 4,695,174, Cl. 400-124.000.

Guha, Subhendu; and Agarwal, Satish, to Energy Conversion Devices, Inc. Thin film light emitting diode, photonic circuit employing said diode imager employing said circuits. 4,695,859, Cl. 357-19.000.

Guibet, Jean-Claude: *See*—
Stern, Robert; Hillion, Gerard; Gateau, Paul; and Guibet, Jean-Claude, 4,695,411, Cl. 260-410.90R.

Gunther International, Ltd.: *See*—
Gunther, William H., Jr., 4,694,631, Cl. 53-55.000.
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Gunther, William H., Jr., to Gunther International, Ltd. Mechanism for folding an envelope around an insert. 4,694,631, Cl. 53-55.000.

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GV Medical, Inc.: *See*—
Kosa, Nadhir B., 4,695,697, Cl. 219-121.0LZ.

H. Krantz GmbH & Co.: *See*—
Grafen, Karl; and Schiffers, Theo, 4,694,526, Cl. 15-306.00A.

Haas, Franz, Jr.: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,694,741, Cl. 99-354.000.

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Haas, Johann: *See*—
Haas, Franz, Sr.; Haas, Franz, Jr.; and Haas, Johann, 4,694,741, Cl. 99-354.000.

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Teuchert, Eberhardt; Haas, Klaus-Arne; and Gerwin, Helmut, 4,695,423, Cl. 376-265.000.

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Hackleman, David E.; Beams, James G.; and Bhaskar, Eldurkar V., to Hewlett-Packard Company. Thin film vertical resistor devices for a thermal ink jet printhead and methods of manufacture. 4,695,853, Cl. 346-140.000.

Hackler, Erich: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Hadbavny, David L. Lifting apparatus. 4,695,037, Cl. 254-131.000.

Haffer, Gregor: *See*—
Sauer, Gerhard; and Haffer, Gregor, 4,695,635, Cl. 546-69.000.

Haga, Noriyuki: *See*—
Kawamata, Yuuji; Iino, Tomohiko; Suzuki, Ryoichi; and Haga, Noriyuki, 4,695,481, Cl. 427-96.000.

Hagan, Richard J., to McKesson Corporation. Method and apparatus for storing and dispensing fluids contained under gas pressure. 4,694,975, Cl. 222-1.000.

Hagmann, Peter: *See*—
Ehrfeld, Wolfgang; and Hagmann, Peter, 4,694,548, Cl. 29-157.00C.

Haiduk, Klaus, to Klockner-Humboldt-Deutz AG. Hollow core molding apparatus. 4,694,883, Cl. 164-186.000.

Hakoun, Roland; and Jurczyszyn, Michel, to Optiques Compagnie Lyonnaise de Tranmissions. Automatic machine for welding two optical fibers end-to-end. 4,695,306, Cl. 65-152.000.

Hall, Antony H. P.; and McCarroll, John J., to British Petroleum Company p.l.c., The. Production of aromatics from hydrocarbon feedstock. 4,695,663, Cl. 585-417.000.

Hall, Arthur B., to TP Orthodontics, Inc. Method of making an optically clear tooth positioning and retaining appliance. 4,695,417, Cl. 264-80.000.

Hall, David A.; and Yuergens, Kenneth C., to Borg-Warner Automotive, Inc. Drive hub for torque converter clutch. 4,694,941, Cl. 192-3.280.

Hall, David R., to Smith International, Inc. Rock bit with diamond tip inserts. 4,694,918, Cl. 175-329.000.

Hall, James R., to Rockwell International Corporation. Electromagnetic launcher assembly. 4,694,729, Cl. 89-8.000.

Hall, Larry; and Goodacre, John H., to Chevron Research Company. Membrane seal for a removable bottom founded structure. 4,695,200, Cl. 405-224.000.

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Beskow, Robert H.; Dunn, Patrick J.; Goodacre, John H.; Hall, Larry J.; Fischer, William H.; and Carlson, E. Ronald, 4,695,201, Cl. 405-224.000.
Goodacre, John H.; and Hall, Larry J., 4,695,199, Cl. 405-224.000.

Hallay, Alexander R., to Advance Transformer Company. Ignition circuit for high pressure arc discharge lamps. 4,695,771, Cl. 315-290.000.

Halliburton Company: *See*—
Ringgenberg, Paul D., 4,694,903, Cl. 166-250.000.

Halpern, Yuval, to Borg-Warner Chemicals, Inc. Polyphenylene ether thermoplastic protected from discoloration during processing. 4,695,601, Cl. 524-362.000.

Halton Oy: *See*—
Aalto, Erkki; and Yla-Hemmila, Veikko, 4,694,851, Cl. 137-499.000.

Halushka, Perry V.: *See*—
Eller, Thomas D.; Halushka, Perry V.; Knapp, Daniel R.; and Mais, Dale, 4,695,647, Cl. 560-53.000.

Hamada, Tetsuro: *See*—
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,695,068, Cl. 280-91.000.

Hamaguri, Kenji, to Minolta Camera Kabushiki Kaisha. Noninvasive device for photoelectrically measuring the property of arterial blood. 4,694,833, Cl. 128-633.000.

Hamai, Kyugo, to Nissan Motor Company, Limited. Fuel supply system for internal combustion engine. 4,694,797, Cl. 123-339.000.

Hamanaka, Tadashi: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshiboru; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.

Hamermesh, Charles L.; Dynes, Paul J.; and Hogenson, Peter A., to Rockwell International Corporation. Intumescent flame-resistant coating composition. 4,695,619, Cl. 528-73.000.

Hammack, Milton E.: *See*—
Voadergoltz, G. Earl; and Hammack, Milton E., 4,694,628, Cl. 52-528.000.

Hammer, Ludwig: *See*—
Faust, Eberhard; Niethammer, Kurt; and Hammer, Ludwig, 4,695,095, Cl. 297-410.000.

Hammond, Martin L.; and Ramiller, Charles L., to Tetron, Inc. Reactor apparatus for semiconductor wafer processing. 4,694,779, Cl. 118-730.000.

Hampel, Wilbur J.: *See*—
Comer, Robert C.; Hampel, Wilbur J.; and Rogers, Edward A., 4,694,528, Cl. 15-330.000.

Hamu, Kaino J. Silkscreen frame mounting assembly for press. 4,694,746, Cl. 101-124.000.

Hanada, Toshiro: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshiboru; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.

Yamashiki, Kazuhiko; and Hanada, Toshiro, 4,695,540, Cl. 435-10.000.

Hane, Fuyuki: *See*—
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youjt; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Hane, Toshiyuki, to NSK-Warner K.K. Position adjusting device for movable anchor latch mechanism. 4,695,076, Cl. 280-804.000.

Hanna, Gayda; and Vadino, Winston A., to Schering Corporation. Controlled release dosage forms comprising hydroxypropylmethylcellulose. 4,695,591, Cl. 514-781.000.

Hannah, John; and Christensen, Barton G., to Merck & Co., Inc. Antibacterial 7β-heterocyclic-cephem. 4,695,565, Cl. 514-206.000.

Hansen, Jens O. E., to Kongskilde Koncernselskab A/S. Pneumatic conveyor for particulate material. 4,695,206, Cl. 406-65.000.

Hansen, Terris L.; Hyatt, Wayne E.; and Leung, Wu-Hon F., to American Telephone and Telegraph Company and AT&T Bell Laboratories. Control of real-time systems utilizing a nonprocedural language. 4,695,977, Cl. 364-900.000.

Hanson, Daniel R.; and Nesheim, Ludwig D., to Cherne Industries, Inc. Connector assembly for electrically connecting flexible and rigid printed circuits. 4,695,258, Cl. 439-67.000.

Hantschk, Gunther, to Netzsch-Mohnopumpen GmbH. Erecting rig for a well pump. 4,695,040, Cl. 254-264.000.

Hara, Hiroyuki; Nakamura, Michinori; and Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Voltage level converting circuit. 4,695,750, Cl. 307-475.000.

Harara, Mitsuhiko: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Hardy, Christopher J.; and Edelstein, William A., to General Electric Company. NMR magnetization inversion by non-linear adiabatic fast passage. 4,695,799, Cl. 324-307.000.

Harms, Daryl E.: *See*—
Johnson, Terry W.; Harms, Daryl E.; and Curl, Ricky L., 4,695,880, Cl. 358-86.000.

Harner, Kermit I.: *See*—
Doman, Glidden S.; Kos, Joseph M.; Harner, Kermit I.; DiValentin, Eugene D.; and Healy, Henry S., 4,695,736, Cl. 290-44.000.

Harnisch, Horst; and Siegel, Edgar, deceased (by Gabriele, E. Helena-Maria Siegel, heiress), to Bayer Aktiengesellschaft. Process for quenching fluorescence, and new cationic or amphoteric aromatic nitro compounds. 4,695,405, Cl. 252-600.000.

Haro, Rudy: *See*—
Rabon, Joe D.; and Haro, Rudy, 4,695,737, Cl. 307-31.000.

Harold A. Williamson: *See*—
Holt, David R., 4,695,142, Cl. 354-76.000.

Harold R. Lauterbach: *See*—
Woods, James A., 4,694,679, Cl. 73-1.00R.

Harris Corporation: *See*—
Heckaman, Douglas E.; Higman, Roger H.; Frisco, Jeffrey A.; and Bajgrowicz, Edward J., 4,695,810, Cl. 333-1.000.

Harris, Robert S., to Stant Inc. Fuel sender unit. 4,694,857, Cl. 137-565.000.

Harris, Stephen J.: *See*—
Leonard, Raymond G.; and Harris, Stephen J., 4,695,615, Cl. 526-194.000.

Harshaw, Robert C., to Texas Instruments Incorporated. Tunable multiline/multiband laser. 4,696,012, Cl. 372-99.000.

Hart, James B.: *See*—
Kitner, William M.; and Hart, James B., 4,694,770, Cl. 114-123.000.

Hart, Robert D.; and Ambrozaitis, John J., to Minelco, Inc. Electromagnetic flip-type visual indicator. 4,694,599, Cl. 40-449.000.

Harter, Karl: *See*—
Volk, Heinrich; Harter, Karl; and Dotter, Fritz, 4,694,745, Cl. 101-111.000.

Hartmann, Dirck T. Single speed transmission for pedal-propelled vehicle. 4,694,708, Cl. 74-750.00B.

Haruta, Masahiro: *See*—
Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, 4,695,717, Cl. 250-213.00R.

Harvey Hubbell Incorporated: *See*—
Rue, Robert H., 4,695,803, Cl. 324-403.000.

Hasegawa, Yukio: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.

Hashima, Akio: *See*—
Honjo, Masahiro; and Hashima, Akio, 4,695,900, Cl. 358-310.000.

Hashimoto, Akio: *See*—
Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.

Hashimoto, Minoru; Takeuchi, Hajime; and Itoh, Takeo, to Kabushiki Kaisha Toshiba. Magnetic recording medium. 4,695,513, Cl. 428-425.900.

Hashimoto, Toshie: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.

Hassmer A.G.: *See*—
Grabitz, Ernst B., 4,695,549, Cl. 435-267.000.

Hata, Takehisa: *See*—
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, 4,695,466, Cl. 424-456.000.

Hatanai, Takashi; and Nakashima, Keishi, to Alps Electric Co., Ltd. Magnetic head for perpendicular magnetic recording. 4,695,512, Cl. 428-408.000.

Hatta, Koichi: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.
Oda, Koichi; Hatta, Koichi; and Sumitani, Toshihiko, 4,695,983, Cl. 364-709.000.

Hattori, Hiroshi: *See*—
Ueno, Hideo; Hattori, Hiroshi; Maeda, Kumiko; and Yamada, Keiko, 4,695,172, Cl. 400-83.000.

Hattori, Isao; and Noiri, Hifuo, to NGK Insulators, Ltd. Plunger molding machine having blank loading device. 4,695,242, Cl. 425-376.00R.

Hattori, Tadashi: *See*—
Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, 4,695,758, Cl. 313-130.000.

Haupt, Eberhard: *See*—
Altmann, Horst-Dieter; and Haupt, Eberhard, 4,695,091, Cl. 297-190.000.

Haven, Kenneth R., to Attain, Inc. Test system manipulator arm. 4,695,024, Cl. 248-281.100.

Haverberg Auto Laundry Equipment Company: *See*—
Van Brakel, Russel A., 4,694,523, Cl. 15-53.00B.

Hawkins, Richard A.; and Hunter, Merle D., to City of Columbus, Ohio, The. Tuyere construction for refuse burning boiler systems. 4,694,757, Cl. 110-271.000.

Hayase, Yoshio; Ohtsuka, Toshikazu; Ide, Kinya; and Takahashi, Toshio, to Shionogi & Co., Ltd. 4,5,6,7-tetrahydro-2H-indazole derivatives and herbicides containing them. 4,695,312, Cl. 71-92.000.

Hayashi, Souichi; Miyake, Johji; Koyama, Motoosugu; and Sakaguchi, Kanji, to Toyota Jidosha Kabushiki Kaisha. Method for manufacturing a cylinder head of cast aluminum alloy for internal combustion engines by employing local heat treatment. 4,695,329, Cl. 148-3.000.

Hayashi, Tsutomu; Kawaguchi, Takeshi; and Tsuchida, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Braking device for vehicle. 4,694,938, Cl. 188-181.00A.

Hayashida, Shigeru: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; Tanaka, Makoto; and Hayashida, Shigeru, 4,695,465, Cl. 424-449.000.

Hayes, Thomas H., to Anchor Hocking Corporation. Tamper evident composite closure. 4,694,970, Cl. 215-252.000.

Haze, Setsuo: *See*—
Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, 4,694,920, Cl. 177-25.000.

Hazelett Strip-Casting Corporation: *See*—
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Head, Robert E.; and Yao, Samuel S., to Hughes Helicopters Inc. All composite, constant speed universal joint for use in a shaft driven tiltable main rotor for a helicopter. 4,695,227, Cl. 416-134.00A.

Healy, Henry S.: *See*—
Doman, Glidden S.; Kos, Joseph M.; Harner, Kermit I.; DiValentin, Eugene D.; and Healy, Henry S., 4,695,736, Cl. 290-44.000.

Heather, James B.; and Milano, Pamela D., to Stauffer Chemical Company. Process for the production of acylated 1,3-dicarbonyl compounds. 4,695,673, Cl. 568-310.000.

Heck, Michael; and Singer, Nathan. Escapement apparatus for an automatic screw feeding machine. 4,694,974, Cl. 221-263.000.

Heckaman, Douglas E.; Higman, Roger H.; Frisco, Jeffrey A.; and Bajgrowicz, Edward J., to Harris Corporation. Waffleline-configured microwave transmission link. 4,695,810, Cl. 333-1.000.

Hedden, Richard L.: *See*—
Bagby, John P.; and Hedden, Richard L., 4,695,139, Cl. 350-670.000.

Hedrick, Ross M.: *See*—
Mottus, Edward H.; and Hedrick, Ross M., 4,695,611, Cl. 525-432.000.

Hedrick, Stephen L.: *See*—
Schoenbaum, Gary L.; Latanzi, Lewis A.; Hedrick, Stephen L.; and Johnson, Harold V., 4,695,157, Cl. 356-237.000.

Hefner, Robert E.: *See*—
Barton, James C.; Hefner, Robert E.; Reid, Paul A.; and Sable, Frank R., 4,694,928, Cl. 180-268.000.

Hefti, Walter: *See*—
Fretz, Walter; and Hefti, Walter, 4,695,000, Cl. 242-18.0DD.

Heideman, Robert J.; and Mitera, Richard T., to Enertrols, Inc. Shock absorber with stop collar. 4,694,939, Cl. 188-287.000.

Heidemann, Gerhard; and Witte, Johannes, to Eastman Christensen Co. Mechanical jarring devices for use in drilling. 4,694,917, Cl. 175-299.000.

Heikkila, Kurt E.; Williams, Rodney K.; and Pyikki, Russell J., to ETD Technology, Inc. Analysis of organic additives in plating baths using novel chromatographic methods in a mass balance approach. 4,694,682, Cl. 73-61.10C.

Heilweil, I. J.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., 4,695,642, Cl. 556-14.000.

Hein, Arthur G. Electrostatic precipitator. 4,695,297, Cl. 55-112.000.

Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, to Kali-Chemie Pharma GmbH. 3-aminocarbonylmethoxy-5-phenylpyrazole compounds, antiarrythmic compo-

sitions containing them, and intermediates in their preparation. 4,695,566, Cl. 514-234.000.

Heinrich, William P.; and Leopoldi, Norbert, to Genentech, Inc. Height-measuring device. 4,694,581, Cl. 33-169.00R.

Heinz, Robert: *See*—
Sommer, Karl; Heinz, Robert; Hettche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, 4,695,397, Cl. 252-182.000.

Hellat, Jaan; and Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Axial swirl body for generating rotary flows. 4,695,225, Cl. 415-189.000.

Hellgren, Lars G. I.; Mohr, Viggo; and Vincent, Jan G., to Pharmacia AB. Enzyme composition acting as a digestion promoter on various levels in the alimentary tract, and a method for facilitating digestion. 4,695,457, Cl. 424-94.000.

Helzel, Thomas: *See*—
Buikman, Dirk; Helzel, Thomas; and Roschman, Peter, 4,694,836, Cl. 128-653.000.

Henderson, Steven: *See*—
Spenceley, Gene D.; and Henderson, Steven, 4,694,889, Cl. 164-483.000.

Henkel Corporation: *See*—
Tuominen, Francis W.; Maier, Helmut K.; and Howland, Warren W., 4,695,453, Cl. 424-81.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.
Rossmann, Christian; Fluechter, Horst; Schreiber, Gerald; and Wichelhaus, Winfried, 4,695,396, Cl. 252-135.000.

Henne, Heinrich; Blaszcyk, Gotthardt; Eickholt, Hubert; and Lohnherr, Ludger, to Krupp Polysius AG. Roller mill. 4,694,994, Cl. 241-79.100.

Henniger, Peter W.: *See*—
Verweij, Jan; Grootveld, Herman H.; Hirs, Henri G. J.; Van Veen, Gerardus J.; Kalter, Jan; and Henniger, Peter W., 4,695,627, Cl. 540-224.000.

Hens, Jozef E.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef E.; and Van Offenwert, Theophilus T. J. M., 4,695,569, Cl. 514-258.000.

Hens, Jozef F.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,695,575, Cl. 514-322.000.

Henson, Robert M.: *See*—
Ballentine, Richard E.; and Henson, Robert M., 4,695,428, Cl. 420-561.000.

Hepburn, James; and Malashenko, Leon, to John T. Hepburn, Limited. Hydraulic press without conventional side slabs and cross-head. 4,694,744, Cl. 100-214.000.

Herb, Phillip: *See*—
Strauss, Richard F.; Herb, Phillip; Noorily, Peter; and Rodrigues, Julio, 4,695,679, Cl. 174-117.0FP.

Herben, William C.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,694,913, Cl. 175-61.000.

Hergeth Hollingsworth GmbH: *See*—
Pinto, Akiva; and Lucassen, Guenter, 4,694,538, Cl. 19-105.000.

Hermann Hemschedit Maschinenfabrik GmbH & Co.: *See*—
Krieger, Karl; and Reinelt, Werner, 4,694,730, Cl. 91-170.0MP.

Herrell, John M. Tooth replacement. 4,695,254, Cl. 433-213.000.

Herrmann, Gero, to Dyckerhoff & Widmann Aktiengesellschaft. Closed ring-shaped reinforcing member for a concrete structure. 4,694,623, Cl. 52-223.00L.

Herrmeyer, Dennis C., to Rigid Form, Inc. Latch for pickup truck cover doors and the like. 4,695,083, Cl. 292-241.000.

Herz, Arthur H.: *See*—
Bryan, Philip S.; and Herz, Arthur H., 4,695,534, Cl. 430-569.000.
Bryan, Philip S.; and Herz, Arthur H., 4,695,535, Cl. 430-569.000.

Herzenberg, Leonard A.: *See*—
Steinman, Lawrence; Waldor, Matthew K.; Sriram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., 4,695,459, Cl. 424-95.000.

Herzenberg, Leonore A.: *See*—
Steinman, Lawrence; Waldor, Matthew K.; Sriram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., 4,695,459, Cl. 424-95.000.

Hess, Ruediger: *See*—
Grosse, Joachim; Hess, Ruediger; Kuhl, Wilfried; and Mueller, Reiner, 4,695,687, Cl. 200-144.00B.

Hettche, Albert: *See*—
Sommer, Karl; Heinz, Robert; Hettche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, 4,695,397, Cl. 252-182.000.

Hewitt, Paul, to George Blair P.L.C. Track tread. 4,694,556, Cl. 29-451.000.

Hewlett-Packard Company: *See*—
Hackleman, David E.; Bearss, James G.; and Bhaskar, Eldurkar V., 4,695,853, Cl. 346-140.00R.
Miller, Robert V., 4,695,791, Cl. 324-78.00D.
Sikich, Joseph P.; and Duncombe, Richard R., 4,695,981, Cl. 365-227.000.

Higashino, Shigenori, to Mitsubishi Denki Kabushiki Kaisha. Superconductive energy storage circuit. 4,695,932, Cl. 363-14.000.

Hight, Andrew T., to Lever Brothers Company. Cool water fabric washing process using a particulate detergent containing a nonionic and a fatty acid builder salt. 4,695,284, Cl. 8-137.000.

Higman, Roger H.: *See*—
Heckaman, Douglas E.; Higman, Roger H.; Frisco, Jeffrey A.; and Bajgrowicz, Edward J., 4,695,810, Cl. 333-1.000.

Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, to Ajinomoto Co., Inc. Biphenyl-based diester compounds and liquid crystal compositions containing same. 4,695,651, Cl. 560-141.000.

Hildt, Earl H. Theft-detection wafer attachment system including shield member. 4,695,845, Cl. 343-873.000.

Hilgendorff, Walter; Kahn, Gerhard; and Kaschemekat, Jurgen, to GKSS Forschungszentrum Geesthacht GmbH. Diaphragm-equipped fluid treating apparatus. 4,695,380, Cl. 210-347.000.

Hill, James D.; and Wooden, Gene R., to Fusion Systems Corporation. Structure for minimizing microwave leakage. 4,695,694, Cl. 219-10.55D.

Hilliard, Jeffrey L.; and Moloney, Maurice M., to Hilliard, Jeffrey L. Probe for electrofusion, electroporation, or like procedure. 4,695,547, Cl. 435-173.000.

Hillion, Gerard: *See*—
Stera, Robert; Hillion, Gerard; Gateau, Paul; and Guibet, Jean-Claude, 4,695,411, Cl. 260-410.90R.

Hilson, Carol A.: *See*—
Estes, Donna L.; and Hilson, Carol A., 4,694,511, Cl. 2-69.000.

Himono, Yusaku; Moriya, Yoshiaki; Miyahara, Masato; and Suzuki, Kazuhiro, to Furukawa Electric Co., Ltd., The. Plastic optical fiber cable with ferrule. 4,695,124, Cl. 350-96.200.

Hinchman, Steven B.: *See*—
Sengul, M. Marc; and Hinchman, Steven B., 4,694,904, Cl. 166-252.000.

Hirai, Masaru: *See*—
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,695,488, Cl. 427-385.500.

Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Semi-conductor device and electronic apparatus using the same. 4,695,717, Cl. 250-213.00R.

Hiraka, Masahiro: *See*—
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,694,573, Cl. 29-846.000.

Hirano, Yoshinori; and Kubozuka, Takao, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,694,784, Cl. 123-41.120.

Hirasawa, Masahide: *See*—
Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,696,008, Cl. 371-47.000.

Hirata, Atsumi: *See*—
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Hirata, Yoshiaki: *See*—
Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, 4,695,235, Cl. 425-29.000.

Hirokane, Junji: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; and Ohta, Kenji, 4,695,514, Cl. 428-432.000.

Hirosawa, Yoshiaki: *See*—
Yagi, Shizuo; Hirosawa, Yoshiaki; Kawai, Makoto; and Fujii, Isao, 4,694,799, Cl. 123-425.000.

Hirose, Michio: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Hirota, Yuichi: *See*—
Takeuchi, Yasuhito; Hirota, Yuichi; Sano, Shinichi; and Ishiguro, Shinichi, 4,694,680, Cl. 73-1.0DV.

Hirs, Henri G. J.: *See*—
Verweij, Jan; Grootveld, Herman H.; Hirs, Henri G. J.; Van Veen, Gerardus J.; Kalter, Jan; and Henniger, Peter W., 4,695,627, Cl. 540-224.000.

Hirt, Adam: *See*—
Gademann, Lothar; Hirt, Adam; Michel, Hartmut; Schmid, Hans-Dieter; and Schneider, Michael, 4,694,814, Cl. 123-644.000.

Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, to Daikin Industries, Ltd. Soil release composition and use thereof. 4,69 98, Cl. 427-385.500.

Hitachi Construction Machinery Co.: *See*—
Ogura, Yukio; and Nasu, Seiji, 4,695,833, Cl. 340-722.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Miyajima, Takeshi, 4,694,698, Cl. 73-570.000.

Hitachi Engineering Co., Ltd.: *See*—
Ogura, Yukio; and Nasu, Seiji, 4,695,833, Cl. 340-722.000.

Hitachi, Ltd.: *See*—
Aoyama, Motoo; Maruyama, Hiromi; Umegaki, Kikuo; and Uchikawa, Sadao, 4,695,425, Cl. 376-435.000.
Ikeda, Koichi; Nakamura, Kozi; and Okabe, Toshihiro, 4,695,947, Cl. 364-200.000.
Ishida, Koji; and Matumura, Hiroyoshi, 4,695,122, Cl. 350-96.120.
Kawamoto, Hiroshi, 4,695,864, Cl. 357-41.000.
Kurosawa, Yukio; and Iwashita, Kiyoji, 4,695,689, Cl. 200-144.00B.
Momata, Kazuhiro; Dekura, Yoshinori; Honzawa, Tadashi; and Matsushige, Hiromi, 4,695,909, Cl. 360-122.000.

Seto, Youichi; Homma, Koichi; Komura, Fuminobu; and Ota, Hideo, 4,695,964, Cl. 364-518.000.
Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syoichi, 4,694,688, Cl. 73-116.000.
Warabisako, Terunori; Ohkura, Makoto; and Miyao, Masanobu, 4,695,856, Cl. 357-4.000.

Hitachi Maxell, Ltd.: *See*—
Maruyama, Hiroshi; Mizushima, Kunio; Sakemoto, Akito; and Umebayashi, Nobuhiro, 4,695,910, Cl. 360-133.000.

Hitachi Zosen Corporation: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.
Sakaguchi, Haruo, 4,694,886, Cl. 164-416.000.

Hittie, Debra A. Padded infant seat liner. 4,695,092, Cl. 297-230.000.

Hlavach, Mark C., to Chrysler Motors Corporation. Movable molding for a vehicle. 4,695,084, Cl. 293-126.000.

Ho, Phillman N., to Union Oil Company of California. Extraction of hydrocarbon-containing solids. 4,695,373, Cl. 208-428.000.

Hochiki Corporation: *See*—
Honma, Hiroshi; and Narumiya, Junichi, 4,695,734, Cl. 250-573.000.

Hodge, Allan M. Permanent padlock-chain assembly. 4,694,667, Cl. 70-49.000.

Hoechst Aktiengesellschaft: *See*—
Claus, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,695,629, Cl. 544-2.000.
Geissler, Ulrich; and Lampas, Heide, 4,695,527, Cl. 430-256.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Kosley, Raymond W., Jr.; and Cherill, Robert J., 4,695,637, Cl. 546-207.000.
Shutske, Gregory M.; and Pierrat, Frank A., 4,695,573, Cl. 514-290.000.

Hoffmann, Helmuth, to Hydrotechnik GmbH. Measuring turbine. 4,694,681, Cl. 73-3.000.

Hogenson, Peter A.: *See*—
Hamermesh, Charles L.; Dynes, Paul J.; and Hogenson, Peter A., 4,695,619, Cl. 528-73.000.

Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, to Kabushikikaisha Tokyo Keiki. Vibration-type gyro apparatus. 4,694,696, Cl. 73-497.000.

Holck, Jens-Peter: *See*—
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Bernd; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.

Holder, James D., to United States of America, Army. Optic-coupled integrated circuits. 4,695,120, Cl. 350-96.110.

Hollrock Engineering, Inc.: *See*—
Hollrock, J. Richard, 4,695,087, Cl. 296-14.000.

Hollrock, J. Richard, to Hollrock Engineering, Inc. Convertible truck bed for pickup. 4,695,087, Cl. 296-14.000.

Holmberg, Erne L.; and Andersson, Torbjorn C., to Aktiebolaget Iggesunds Bruk. Device in connection with choppers. 4,694,995, Cl. 241-92.000.

Holme, Stein, to American Red Cross. Synthetic, plasma-free, transfusible platelet storage medium. 4,695,460, Cl. 424-101.000.

Holmstrom, Robert P. Exhaust port equalizer device. 4,694,646, Cl. 60-272.000.

Holt, David R., to Harold A. Williamson. Automatic photo imaging system. 4,695,142, Cl. 354-76.000.

Holzinger, Dieter: *See*—
Grossmann, Udo; Holzinger, Dieter; and Rohde, Guenter, 4,695,004, Cl. 242-56.00R.

Homann, Walter K.; and Fischer, Lothar, to Huls Aktiengesellschaft. Catalytic system and a process for preparing alpha, omega-C_4 through C_{20} alkenols. 4,695,661, Cl. 568-903.000.

Homeyer, Bernhard: *See*—
Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, 4,695,563, Cl. 514-105.000.

Homma, Koichi: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; and Ota, Hideo, 4,695,964, Cl. 364-518.000.

Honda Giken Kogyo K.K.: *See*—
Yatabe, Fumio; and Wazaki, Yoshio, 4,694,805, Cl. 123-489.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, 4,694,803, Cl. 123-440.000.
Asakura, Toshimitsu; and Tagami, Tomoyuki, 4,694,924, Cl. 180-68.100.
Hayashi, Tsutomu; Kawaguchi, Takeshi; and Tsuchida, Tetsuo, 4,694,938, Cl. 188-181.00A.
Kamiji, Koichi; and Ohya, Toshikazu, 4,695,075, Cl. 280-735.000.
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,695,068, Cl. 280-91.000.
Ogano, Takeo; Komatsuzaki, Takeshi; Shigenari, Ryoichi; and Uesugi, Naomoto, 4,694,942, Cl. 192-13.00A.
Yagi, Shizuo; Hirosawa, Yoshiaki; Kawai, Makoto; and Fujii, Isao, 4,694,799, Cl. 123-425.000.

Honeywell Bull Inc.: *See*—
Hooker, Lane K.; Howell, Thomas H.; and Ferrell, Charles W., 4,695,951, Cl. 364-200.000.

Honeywell B.V.: *See*—
Berkhof, Hendrikus, 4,695,052, Cl. 237-8.00R.

Honeywell Inc.: *See*—
Egli, Werner H., 4,695,160, Cl. 356-350.000.
Jatnieks, Girts U., 4,695,782, Cl. 318-748.000.
Lees, David E. B.; and Merchant, John, 4,695,959, Cl. 364-458.000.
Levine, Michael R.; Russo, James T.; Cairo, Anthony C.; and Rigotti, Victor H., 4,695,942, Cl. 364-188.000.
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,695,861, Cl. 357-30.000.
Wilwerding, Dennis J., 4,695,719, Cl. 250-216.000.

Honeywell Information Systems Inc.: *See*—
Abraham, Ronald F., 4,695,923, Cl. 361-361.000.
Keeley, James W.; and Joyce, Thomas F., 4,695,943, Cl. 364-200.000.

Honguu, Kazuoki: *See*—
Sawamura, Mitsuharu; Honguu, Kazuoki; and Kikuchi, Kazuhiko, 4,695,510, Cl. 428-336.000.

Honjo, Masahiro; and Hashima, Akio, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and playback apparatus for teletext signals. 4,695,900, Cl. 358-310.000.

Honma, Hiroshi; and Narumiya, Junichi, to Hochiki Corporation. Photoelectric smoke sensor including a photosensing data correction ratio correction circuit. 4,695,734, Cl. 250-573.000.

Honmoh, Masao: *See*—
Ogasawara, Toshitaka; Nohmi, Kazumasa; Honmoh, Masao; and Iseki, Yukito, 4,695,763, Cl. 313-487.000.

Honzawa, Tadashi: *See*—
Momata, Kazuhiro; Dekura, Yoshinori; Honzawa, Tadashi; and Matsushige, Hiromi, 4,695,909, Cl. 360-122.000.

Hooker, Lane K.; Howell, Thomas H.; and Ferrell, Charles W., to Honeywell Bull Inc. Computer hierarchy control. 4,695,951, Cl. 364-200.000.

Horiuchi, Yutaka. Carrying case with a hinged lid and closure member. 4,694,940, Cl. 190-109.000.

Hormansdorfer, Gerd. Procedure and device for determining the jamming point of a pipe line in a drill hole. 4,694,902, Cl. 166-250.000.

Horng, Shi Y.: *See*—
Chen, Sheng K.; Horng, Shi Y.; and Chen, I-Ting, 4,694,639, Cl. 56-10.200.

Hornivius, Lothar, to Kuster & Co. GmbH. Cable window lift for vehicles. 4,694,610, Cl. 49-351.000.

Horvath, Ronald: *See*—
Elsmo, Thad; and Horvath, Ronald, 4,694,971, Cl. 215-253.000.

Hosiden Electronics Co., Ltd.: *See*—
Ichitsubo, Norio, 4,695,108, Cl. 439-59.000.

Hosoi, Yuichi: *See*—
Mori, Nobufumi; Hosoi, Yuichi; Takahashi, Kenji; and Miyahara, Junji, 4,695,725, Cl. 250-327.200.

Hossack, James M., to Ultrasonic Arrays, Inc. Ultrasonic transducer component and process for making the same and assembly. 4,695,986, Cl. 367-140.000.

Houchangnia, Zavoche, to Societe D'Electronique de La Region Pays de Loire. Device for receiving dual polarized microwave signals. 4,695,844, Cl. 343-781.0CA.

Houck, David L.: *See*—
Ritsko, Joseph E.; Houck, David L.; and Acla, Howard L. R., 4,695,439, Cl. 423-263.000.

Houghton, Alan N.: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.

Howard, Peter G.: *See*—
Steenbergen, Christiaan; Howard, Peter G.; Bracht, Roger R.; and van der Put, Henk, 4,695,994, Cl. 369-54.000.

Howe, Steve R.; Warner, William B.; and Shores, J. Wallace. Container for attachment to animal ear tags. 4,694,781, Cl. 119-156.000.

Howell, Thomas H.: *See*—
Hooker, Lane K.; Howell, Thomas H.; and Ferrell, Charles W., 4,695,951, Cl. 364-200.000.

Howeth, David F. Pressure limiting acceleration control system and valve for hydraulic motors. 4,694,649, Cl. 60-468.000.

Howland, Gary R., to United Technologies Corporation. Dual redundant bus interface circuit architecture. 4,695,952, Cl. 364-200.000.

Howland, Warren W.: *See*—
Tuominen, Francis W.; Maier, Helmut K.; and Howland, Warren W., 4,695,453, Cl. 424-81.000.

Hoyt, Edwin D.: *See*—
Williams, David E.; and Hoyt, Edwin D., 4,695,703, Cl. 219-212.000.

Huang, Terry J.: *See*—
Beilfuss, Robert C.; Lanier, David M.; Bammel, Stanley E.; Huang, Terry J.; and Banks, David M., 4,695,246, Cl. 431-31.000.

Huck, Charles T.: *See*—
Everhart, Robert W.; and Huck, Charles T., 4,695,836, Cl. 340-750.000.

Hudson, Geoffrey M., to Storage Research Pty. Ltd. Reading information stored in multiple frame format. 4,695,991, Cl. 369-44.000.

Huels Aktiengesellschaft: *See*—
Olbrich, Juergen; Biethan, Uwe; and Sorge, Gernold, 4,695,613, Cl. 525-533.000.

Hughes Aircraft Company: *See*—
Bagby, John P.; and Hedden, Richard L., 4,695,139, Cl. 350-620.000.
Beining, August H.; Dial, Larry A.; Smith, William A.; and Rieck, Gene W., 4,695,827, Cl. 340-365.00P.
Des Brisay, George S., Jr., 4,695,743, Cl. 307-272.200.

Lau, Kreisler S. Y.; and Kelleghan, William J., 4,695,655, Cl. 368-58.000.
Marshall, Neil A., 4,695,788, Cl. 324-527.000.
Patraw, Nils E., 4,695,870, Cl. 357-74.000.

Hughes Helicopters Inc.: *See*—
Head, Robert E.; and Yao, Samuel S., 4,695,227, Cl. 416-134.00A.

Hughes Tool Company: *See*—
Gambertoglio, Louis M., 4,694,878, Cl. 166-377.000.

Hughes Tool Company - USA: *See*—
Cunningham, Robert A., 4,694,855, Cl. 137-519.500.

Hui, Hsu W. Steerable electric toy car. 4,695,266, Cl. 446-454.000.

Hui, Sai H.: *See*—
Floyd, William C.; and Hui, Sai H., 4,695,606, Cl. 525-160.000.

Huls Aktiengesellschaft: *See*—
Homann, Walter K.; and Fischer, Lothar, 4,695,661, Cl. 568-903.000.
Otte, Werner; and Nehring, Rudolf, 4,695,660, Cl. 568-830.000.

Hultman, Kenneth L.: *See*—
Klebbe, John M.; and Hultman, Kenneth L., 4,695,920, Cl. 361-118.000.

Humber, David C.: *See*—
Coates, Ian H.; Bell, James A.; Humber, David C.; and Ewan, George B., 4,695,578, Cl. 514-397.000.

Humphrey Instruments, Inc.: *See*—
Shinn, Alan L., 4,695,831, Cl. 340-707.000.

Hung, Lam H., to Longreen Limited. Toy guns for firing pellets. 4,694,815, Cl. 124-27.000.

Hunter, Merle D.: *See*—
Hawkins, Richard A.; and Hunter, Merle D., 4,694,757, Cl. 110-271.000.

Hunter, Wayne W. Device for holding construction materials. 4,695,028, Cl. 248-354.100.

Hussain, Zubair: *See*—
Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.

Hutchins, MaryGail K.: *See*—
Crosby, Jane M.; and Hutchins, MaryGail K., 4,695,602, Cl. 524-439.000.

Hutchins, Richard D.; and Dovan, Hosi T., to Union Oil Company of California. Method for emplacement of a gelatinous foam in gas flooding enhanced recovery. 4,694,906, Cl. 166-294.000.

Hwang, Chern. Automobile fuse with damage indicator. 4,695,815, Cl. 337-266.000.

Hyatt, Wayne E.: *See*—
Hansen, Terris L.; Hyatt, Wayne E.; and Leung, Wu-Hon F., 4,695,977, Cl. 364-900.000.

Hydroacoustics Inc.: *See*—
Bouyoucos, John V., 4,695,987, Cl. 367-143.000.

Hydrotechnik GmbH: *See*—
Hoffmann, Helmuth, 4,694,681, Cl. 73-3.000.

Hynes, Joseph H.: *See*—
Best, Michael J. A.; Jones, Richard H.; Hynes, Joseph H.; Pond, Richard J.; and Gordon, Colin R., 4,695,190, Cl. 405-169.000.

I-Flow Corporation: *See*—
Brown, Eric W., 4,695,273, Cl. 604-173.000.

I.G. Bauerhin GmbH Elektro-Technische Fabrik: *See*—
Altmann, Horst-Dieter; and Haupt, Eberhard, 4,695,091, Cl. 297-180.000.

Iacovangelo, Charles D.: *See*—
Zarnoch, Kenneth P.; and Iacovangelo, Charles D., 4,695,489, Cl. 427-438.000.

Ibarra, Inigo A., to Esperanza y Cia, S.A. Shell for firing practice. 4,694,755, Cl. 102-445.000.

Ichihashi, Hiroo; Ozawa, Masakazu; Ebisuma, Ryuichi; and Saito, Atsushi, to Canon Kabushiki Kaisha. Ink jet recorder. 4,695,855, Cl. 346-145.000.

Ichikawa, Katsumi: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.

Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, to Kabushiki Kaisha SG; and Bridgestone Corporation. Bag-cylinder control device in a tire vulcanizer. 4,695,235, Cl. 425-29.000.

Ichitsubo, Norio, to Hosiden Electronics Co., Ltd. Connector for flexible printed circuit board. 4,695,108, Cl. 439-59.000.

Ide, Kinya: *See*—
Hayase, Yoshio; Ohtsuka, Toshikazu; Ide, Kinya; and Takahashi, Toshio, 4,695,312, Cl. 71-92.000.

Igaki, Tetsuo: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Iijima, Toshijumi: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Iino, Tomohiko: *See*—
Kawamata, Yuuji; Iino, Tomohiko; Suzuki, Ryoichi; and Haga, Noriyuki, 4,695,481, Cl. 427-96.000.

Ikeda, Koichi; Nakamura, Kozi; and Okabe, Toshihiro, to Hitachi, Ltd. Virtual address system having fixed common bus cycles. 4,695,947, Cl. 364-200.000.

Ikeda, Masaki: *See*—
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,694,573, Cl. 29-846.000.

Ikemori, Keiji: *See*—
Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, 4,695,133, Cl. 350-427.000.

Ikoma, Kazuhiko: *See*—
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,695,517, Cl. 428-698.000.

Imaeda, Fumihiro; and Imaeda, Yoshio, to Shin Nihon Kohan Co., Ltd. Modular panel for mold. 4,695,033, Cl. 249-189.000.

Imaeda, Yoshio: *See*—
Imaeda, Fumihiro; and Imaeda, Yoshio, 4,695,033, Cl. 249-189.000.

Imai, Masahiro: *See*—
Yamashita, Kiyoshi; Aoshima, Terutaka; Narita, Ryuuho; and Imai, Masahiro, 4,695,710, Cl. 219-506.000.

Imai, Miho: *See*—
Yamamoto, Hiromi; Imai, Miho; and Suzuki, Noboru, 4,694,525, Cl. 15-160.000.

Imajo, Minoru: *See*—
Kawakita, Tsunchiro; and Imajo, Minoru, 4,694,793, Cl. 123-196.005.

Imakoshi, Shigeyoshi; Soda, Yutaka; and Suyama, Hideo, to Sony Corporation. Thin film type magnetic transducer head. 4,695,908, Cl. 360-119.000.

Imanaka, Tadayuki: *See*—
Aiba, Shuichi; and Imanaka, Tadayuki, 4,695,546, Cl. 435-172.300.

Impco Carburetion, Inc.: *See*—
Bennett, David E., 4,694,811, Cl. 123-527.000.

Imperial Chemical Industries PLC: *See*—
Pinto, Alwyn; and Johnson, John B. H., 4,695,442, Cl. 423-359.000.

Imura, Yutaka: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.

Inaba, Yoshiharu, to FANUC LTD. Injection molding apparatus. 4,695,237, Cl. 425-135.000.

Inaji, Toshio; Okamoto, Hiroshi; and Yokobori, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Rotary head deflection apparatus. 4,695,907, Cl. 360-107.000.

Inanaga, Takugi: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,695,011, Cl. 242-199.000.

Inariba, Tokuzo. Manufacture of a miniature electric motor. 4,695,419, Cl. 264-159.000.

Incardona, Angelo: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,695,213, Cl. 411-506.000.

Inductotherm Corporation: *See*—
Cartlidge, Jesse M., 4,695,316, Cl. 75-10.140.

Ing. C. Olivetti & C., S.p.A.: *See*—
Scardovi, Alessandro, 4,695,852, Cl. 346-140.00R.

Ing. Erich Pfeiffer GmbH & Co. KG: *See*—
Graf, Lothar; Maerte, Leo; and Skorka, Thomas, 4,694,977, Cl. 123-259.000.
Schuetz, Hans-Josef, 4,694,976, Cl. 222-189.000.

Ingersoll-Rand Company: *See*—
Kursar, James V., 4,694,732, Cl. 92-60.500.

Ingram, Arlen E.: *See*—
Eberhart, Edward; and Ingram, Arlen E., 4,694,618, Cl. 51-392.000.

Innova/Pure Water Inc.: *See*—
Nohren, John E., Jr.; and Downes, Richard T., 4,695,379, Cl. 210-282.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi; and Kaneko, Hideo, 4,695,333, Cl. 148-306.000.
Inoue, Kazuhiko; Mitani, Tatsuro; and Kishita, Yoshihiro, to Kabushiki Kaisha Toshiba. GAAS semiconductor device. 4,695,869, Cl. 357-71.000.
Inoue, Kimio: *See*—
Fukumizu, Shinnichi; Inoue, Kimio; and Kuriyama, Akimasa, 4,695,165, Cl. 366-90.000.
Inoue, Kiyoshi; and Kaneko, Hideo, to Inoue-Japax Research Incorporated. Iron-chromium-base spinodal decomposition-type magnetic (hard or semi-hard) alloy. 4,695,333, Cl. 148-306.000.
Inoue, Takeo: *See*—
Inoue, Yoshio; Arai, Masatoshi; and Inoue, Takeo, 4,695,603, Cl. 524-723.000.
Inoue, Takeshi: *See*—
Magami, Masato; Saeki, Kazumi; Miura, Takanori; and Inoue, Takeshi, 4,695,649, Cl. 560-86.000.
Inoue, Tomohiro: *See*—
Tsugei, Shinji; and Inoue, Tomohiro, 4,696,054, Cl. 455-89.000.
Inoue, Yasukazu: *See*—
Fukuzo, Yukio; and Inoue, Yasukazu, 4,695,980, Cl. 365-222.000.
Inoue, Yoshio; Arai, Masatoshi; and Inoue, Takeo, to Shin-Etsu Chemical Co., Ltd. Room temperature curable silicone rubber composition. 4,695,603, Cl. 524-723.000.
Inoue, Yoshio; Arai, Masatoshi; Sato, Shinichi; and Yokoo, Koji, to Shin-Etsu Chemical Co., Ltd. Room temperature-curable organopolysiloxane composition. 4,695,617, Cl. 528-32.000.

Inside Outfitters, Inc.: *See*—
Dunbar, Donn D., 4,694,877, Cl. 160-273.00R.

Institut Francais du Petrol: *See*—
Stern, Robert; Hillion, Gerard; Gateau, Paul; and Guibet, Jean-Claude, 4,695,411, Cl. 260-410.90R.

Institut Francais du Petrole: *See*—
Galtier, Pierre; and Busson, Christian, 4,695,370, Cl. 208-113.000.

Integrated Carbons Corporation: *See*—
Kindig, James K.; and Reynolds, James E., 4,695,290, Cl. 44-1.05R.

Inter-Lock Steel Company, Inc.: *See*—
Mort, Edgar A., 4,694,675, Cl. 72-325.000.

International Business Machines Corporation: *See*—
Anastassiou, Dimitris; and Pennebaker, William B., 4,695,884, Cl. 358-163.000.
Blevins, Ballard J.; Kulpa, William G.; Mathis, Joseph R.; and McCullough, John W., 4,695,948, Cl. 364-200.000.
Brandt, Henry R.; Gannon, Patrick M.; Leung, Wan L.; and Marchini, Timothy R., 4,695,950, Cl. 364-200.000.
Ellis, Joseph J., Jr., 4,695,838, Cl. 340-771.000.
Irwin, John W., 4,695,945, Cl. 364-200.000.
Kerr, Randal H.; and Mesnard, Robert M., 4,696,003, Cl. 371-19.000.
Lebizay, Gerald, 4,695,999, Cl. 370-58.000.
Millham, Ernest H.; Moser, John J.; Shushereba, John J.; and Visco, Gary P., 4,696,005, Cl. 371-27.000.
Montanari, Gerard M.; Baudelot, Francis E.; and Costes, Michel L., 4,695,997, Cl. 370-13.000.

International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Vock, Manfred H., 4,695,473, Cl. 426-535.000.

Inumaru, Susumu: *See*—
Yoshida, Masahiro; and Inumaru, Susumu, 4,694,888, Cl. 164-467.000.

Iriyama, Shozo; and Abe, Mitsuo, to Daido Tokushuko Kabushiki Kaisha. Fingertip protectors for work gloves. 4,694,508, Cl. 2-21.000.

Irwin, John W., to International Business Machines Corporation. Processor I/O and interrupt filters allowing a co-processor to run software unknown to the main processor. 4,695,945, Cl. 364-200.000.

Irwin, Lawrence: *See*—
Anderson, Paul T.; Irwin, Lawrence; Matthews, John C.; and Paugh, Charles E., 4,694,634, Cl. 53-88.000.

Iseki, Yukito: *See*—
Ogasawara, Toshitaka; Nohmi, Kazumasa; Honmoh, Masao; and Iseki, Yukito, 4,695,763, Cl. 313-487.000.

Ishibashi, Hiroshi: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Ishibashi, Takao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,694,809, Cl. 123-489.000.

Ishida, Koji; and Matumura, Hiroyoshi, to Hitachi, Ltd. Optical thin film waveguide. 4,695,122, Cl. 350-96.120.

Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, to Kabushiki Kaisha Toshiba. Toroidal winding apparatus. 4,694,999, Cl. 242-4.00R.

Ishida Scales Manufacturing Company, Ltd.: *See*—
Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, 4,694,920, Cl. 177-25.000.

Ishida, Takao; Yoshida, Yukio; and Ohno, Kenzo, to Yoshida Kogyo K.K. Apparatus for detecting door movement data in an automatic door system. 4,694,607, Cl. 49-25.000.

Ishida, Toru: *See*—
Nishimura, Tsutomu; Nakatani, Seiichi; Yuhaku, Satoru; and Ishida, Toru, 4,695,403, Cl. 252-513.000.
Watanabe, Hirotoshi; Makino, Osamu; and Ishida, Toru, 4,695,504; Cl. 428-209.000.

Ishiguro, Nobuya: *See*—
Kondo, Kazuo; Ishiguro, Nobuya; and Tada, Teruo, 4,695,491, Cl. 428-35.000.

Ishiguro, Shinichi: *See*—
Takeuchi, Yasuhito; Hirota, Yuichi; Sano, Shinichi; and Ishiguro, Shinichi, 4,694,680, Cl. 73-1.0DV.

Ishii, Akihiro: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Ishii, Fumio: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Ishii, Hiroshi; Nakai, Syunzi; and Mizumoto, Yukihiro, to Sharp Kabushiki Kaisha. Method and apparatus for recording. 4,695,847, Cl. 346-1.100.

Ishii, Kazuyoshi: *See*—
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, to Minolta Camera Kabushiki Kaisha. Reader-printer having an image rotation device. 4,695,155, Cl. 355-45.000.

Ishikawa, Katsuji: *See*—
Yoshino, Tsunemi; Ishikawa, Katsuji; and Iwata, Hiroshi, 4,695,144, Cl. 354-195.110.

Ishikawa, Kazumasa; and Koseki, Yuji, to Ricoh Company, Ltd. Facsimile machine using cut sheets of paper. 4,695,898, Cl. 358-296.000.

Ishikawa, Sueyoshi: *See*—
Hisamoto, Iwao; Hirai, Masaru; and Ishikawa, Sueyoshi, 4,695,488, Cl. 427-385.500.

Ishikawa, Takatoshi: *See*—
Nakamura, Kotaro; and Ishikawa, Takatoshi, 4,695,530, Cl. 430-381.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Matsui, Kunio; Fukase, Hisahiko; and Nomura, Akihiro, 4,694,887, Cl. 164-428.000.

Ishizumi, Kikuo: *See*—
Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.

Isotechnologies, Inc.: *See*—
Miles, James E., 4,695,100, Cl. 303-10.000.

Isover Saint-Gobain: *See*—
Cousin, Stephane; and Boumendil, Jean-Paul, 4,695,338, Cl. 156-71.000.

ISPO GmbH: *See*—
Nicklas, Hans; and Pruzina, Christoph, 4,694,626, Cl. 52-309.120.

Isuzu Motors Limited: *See*—
Kawamura, Hideo, 4,694,653, Cl. 60-597.000.
Kawamura, Hideo, 4,694,654, Cl. 60-605.000.

Itaba, Tunesaku: *See*—
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,694,707, Cl. 74-606.00A.

Itagaki, Masanori; Takahashi, Junichi; and Endou, Hideyasu, to Ricoh Company, Ltd. Electronic device carrier. 4,695,678, Cl. 174-52.0FP.

Itakura, Tohru, to Fujitsu Limited. Semiconductor memory device. 4,695,978, Cl. 365-51.000.

Ito, Kenji, to Kabushiki Kaisha Toshiba. Digital time interval measuring apparatus. 4,695,781, Cl. 318-603.000.

Ito, Mikiya: *See*—
Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, 4,695,235, Cl. 425-29.000.

Ito, Shintaro: *See*—
Iwasaki, Hiroshi; and Ito, Shintaro, 4,694,562, Cl. 437-57.000.

Ito, Takao: *See*—
Watanabe, Fumio; Komaki, Shojiro; Miyamoto, Masao; and Ito, Takao, 4,695,724, Cl. 250-292.000.

Itoh, Hajime; and Mitani, Kazutami, to Mitsubishi Rayon Co., Ltd. Hydrophilized porous membrane and production process thereof. 4,695,592, Cl. 521-54.000.

Itoh, Hirotaka: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Itoh, Takeo: *See*—
Hashimoto, Minoru; Takeuchi, Hajime; and Itoh, Takeo, 4,695,513, Cl. 428-425.900.

Itonaga, Makoto; and Kayanuma, Kanji, to Victor Company of Japan, Ltd. Film thickness measuring apparatus. 4,695,162, Cl. 356-369.000.

ITT Industries, Inc.: *See*—
Zaehringer, Edmund; Baker, Peotr; and Zettel, Rolf, 4,696,018, Cl. 375-82.000.

Iwahara, Makoto; Miyaji, Naotaka; and Sakamoto, Atsushi, to Victor Company of Japan, Ltd. Microphone apparatus having a variable directivity pattern. 4,696,043, Cl. 381-92.000.

Iwakura, Tatsuya: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.

Iwamoto, Michinori: *See*—
Shimizu, Tetsuo; Tujimura, Kiyoharu; and Iwamoto, Michinori, 4,695,034, Cl. 251-129.060.

Iwamoto, Tetsuo: *See*—
Amemori, Hiroyuki; Nishiyama, Shigeru; and Iwamoto, Tetsuo, 4,694,702, Cl. 73-861.240.

Iwasaki, Hiroshi; and Ito, Shintaro, to Kabushiki Kaisha Toshiba. Method for manufacturing a semiconductor integrated device including bipolar and CMOS transistors. 4,694,562, Cl. 437-57.000.

Iwashita, Kiyoji: *See*—
Kurosawa, Yukio; and Iwashita, Kiyoji, 4,695,689, Cl. 200-144.00B.

Iwata, Hiroshi: *See*—
Yoshino, Tsunemi; Ishikawa, Katsuji; and Iwata, Hiroshi, 4,695,144, Cl. 354-195.110.

Izumi, Tsunetada: *See*—
Gojo, Tomomi; Yagi, Yoshio; and Izumi, Tsunetada, 4,695,834, Cl. 340-734.000.

J. M. Ney Company, The: *See*—
Kulig, Frank M., 4,695,705, Cl. 219-354.000.

J. M. Voith GmbH: *See*—
Grosamann, Udo; Holzinger, Dieter; and Rohde, Guenter, 4,695,004, Cl. 242-56.00R.

J. W. Harris Company: *See*—
Ballentine, Richard E.; and Henson, Robert M., 4,695,428, Cl. 420-561.000.

Jackson, Carl E. Exterior brake for tandem tires. 4,694,936, Cl. 188-2.00R.

Jackson, Kenneth R.; and Tofigh, Farshid, to Leach Corporation. Inductive power controller. 4,695,917, Cl. 361-58.000.

Jacobson, Dov, to Time Video Information Services, Inc. Analog color selector. 4,695,832, Cl. 340-709.000.

Jacoby, Donald: *See—*
Mastriani, Dennis; Jacoby, Donald; Weise, Jeanne; Linick, Bruce; Marinho, John; and DeSantis, Charles M., 4,696,053, Cl. 455-67.000.

Jacoby, Hans-Dieter; and Schmidt, Peter, to Ernst Leitz Wetzlar GmbH. Device for automatically transporting disk shaped objects. 4,695,215, Cl. 414-225.000.

Jahnke, Andreas; Ries, Gunter; and Meier, Konrad, to Siemens Aktiengesellschaft. Apparatus for manufacturing a disc-shaped curved magnet coil. 4,694,868, Cl. 140-92.100.

James, Donald R.: *See—*
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.

Jang, Young H. Combined key and combination lock. 4,694,670, Cl. 70-301.00R.

Janos, Eva: *See—*
Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,309, Cl. 71-88.000.
Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,313, Cl. 71-100.000.

Janouschek, Heinz, to F. Gegauf AG Bernina Nahmaschinenfabrik. Laterally swingable sewing machine presser device. 4,694,764, Cl. 112-237.000.

Jansen, Johann: *See—*
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Jansen, Martin; and Standke, Burkhard, to Degussa Aktiengesellschaft. Process for the production of silver (III) oxide. 4,695,353, Cl. 204-96.000.

Janssen Pharmaceutica N.V.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef E.; and Van Offenwert, Theophilus T. J. M., 4,695,569, Cl. 514-258.000.
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,695,575, Cl. 514-322.000.

Janssen, Wladmir, to Domtar Inc. Method to automatically determine the size distribution of shive and analyzer therefor. 4,694,683, Cl. 73-63.000.

Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef E.; and Van Offenwert, Theophilus T. J. M., to Janssen Pharmaceutica N.V. Bicyclic heterocyclyl containing N-(bicyclic heterocyclyl)-4-piperidinamines. 4,695,569, Cl. 514-258.000.

Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., to Janssen Pharmaceutica, N.V. 4-[(bicycle heterocyclyl)-methyl and -hetero]-piperidines. 4,695,575, Cl. 514-322.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Yamazaki, Yoshihide; Uchimura, Kazumi; Yamashita, Satoshi; and Takeuchi, Mikio, 4,695,614, Cl. 526-142.000.

Japan Tobacco, Inc.: *See—*
Muto, Yoshiyuki; Etani, Tadao; Aida, Satoru; and Kato, Shinya, 4,695,007, Cl. 242-58.400.

Japane Styrene Paper Corporation: *See—*
Kuwabara, Hideki; Kitagawa, Atsuhi; and Sudo, Yoshimi, 4,695,593, Cl. 521-60.000.

Jatnieks, Girts U., to Honeywell Inc. System for insuring rotational direction for an alternating current motor. 4,695,782, Cl. 318-748.000.

Jehl, Patrice: *See—*
Ermacora, Rino; and Jehl, Patrice, 4,694,640, Cl. 56-16.400.

Jehle, Franz; and Meinel, Holger, to Licentia Patent-Verwaltungs-GmbH. Aircraft radar arrangement. 4,695,842, Cl. 342-59.000.

Jelcin, Michael J.: *See—*
Belleau, Gordon F.; Jelcin, Michael J.; and Verga, Charles F., 4,695,342, Cl. 156-173.000.

Jenison, Robert E. Collapsible dumbbells. 4,695,051, Cl. 272-122.000.

Jenkins, R. W.: *See—*
MacDonald, R. I.; Lam, D. K. W.; and Jenkins, R. W., 4,696,059, Cl. 455-600.000.

Jenkner, Erwin. Process for the manufacture of panel-type workpieces with assembly bores, more particularly, made of wood or wood-like material and apparatus for performing the process. 4,694,871, Cl. 144-35.00R.

Jensen, Otto S. Oil drop collector. 4,695,088, Cl. 296-38.000.

Jet Research Inc.: *See—*
Dines, Jack E.; and Gillingham, Ernest L., 4,694,754, Cl. 102-310.000.

JGB Industries, Inc.: *See—*
Sparkes, Laurie R.; and Baker, Joseph G., 4,694,773, Cl. 114-354.000.

Jidosha Denki Kogyo Kabushiki Kaisha: *See—*
Saito, Yasuziro, 4,695,180, Cl. 403-114.000.

John T. Hepburn, Limited: *See—*
Hepburn, James; and Malashenko, Leon, 4,694,744, Cl. 100-214.000.

Johnson, Cydney A.: *See—*
Levine, Peter A.; Cobb, Arthur L., Jr.; Johnson, Cydney A.; and Peterson, Gary R., 4,695,878, Cl. 358-44.000.

Johnson, Gerald L.: *See—*
Bhalaik, Arun; Braddick, Peter W.; Brittin, Darryl S.; and Johnson, Gerald L., 4,695,194, Cl. 405-207.000.

Johnson, Harold V.: *See—*
Schoenbaum, Gary L.; Latanzi, Lewis A.; Hedrick, Stephen L.; and Johnson, Harold V., 4,695,157, Cl. 356-237.000.

Johnson, John B. H.: *See—*
Pinto, Alwyn; and Johnson, John B. H., 4,695,442, Cl. 423-359.000.

Johnson, Johnny R.: *See—*
Finlayson, Claude M.; Cody, Charles A.; Kennetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.

Johnson & Johnson Products, Inc.: *See—*
Dyer, John; and Kennette, John W., 4,695,500, Cl. 428-134.000.

Johnson Matthey, Inc.: *See—*
Becker, E. Robert; and Jung, Hyun J., 4,695,438, Cl. 423-239.000.
Jung, Hyun J., 4,695,437, Cl. 423-239.000.

Johnson, Terry W.; Harms, Daryl E.; and Curl, Ricky L., to Postron Corp. Electronic information dissemination system. 4,695,880, Cl. 358-86.000.

Johnston, Bruce L., to Butler Manufacturing Company. Shear beam weigh axle transducer. 4,694,921, Cl. 177-136.000.

Johnston, Fred E. Hand powered tricycle having a wheelchair hitch. 4,695,071, Cl. 290-204.000.

Johnston, John G., to M. O. Enterprises, Inc. Air pressure gauge tool. 4,694,691, Cl. 73-146.800.

Jolivet, Michel: *See—*
Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, 4,695,562, Cl. 514-13.000.

Joly, Jean-Pierre A.: *See—*
Saingier, Jean; and Joly, Jean-Pierre A., 4,695,641, Cl. 549-552.000.

Jonas, Siegfried, to Beral Bremsbelag GmbH. Friction elements, especially for drum brakes. 4,694,937, Cl. 188-73.100.

Jones, John I.: *See—*
Provence, John D.; Brown, Frederick W.; and Jones, John I., 4,695,700, Cl. 219-121.0PD.

Jones, Keith W.: *See—*
Jones, Robert; Jones, Keith W.; and Baxter, William R. S., 4,694,690, Cl. 73-146.000.

Jones, Lloyd G.; and Stowe, Lawrence R., to Mobil Oil Corporation. Situ disposable gel canister. 4,694,727, Cl. 86-20.150.

Jones, Richard H.: *See—*
Best, Michael J. A.; Jones, Richard H.; Hynes, Joseph H.; Pond, Richard J.; and Gordon, Colin R., 4,695,190, Cl. 405-169.000.

Jones, Robert; Jones, Keith W.; and Baxter, William R. S., to Pandrol Limited. Measuring displacement between two relatively movable structures. 4,694,690, Cl. 73-146.000.

Jongerius B.V.: *See—*
Jongerius, Sebastiaan C. E., 4,694,715, Cl. 83-72.000.

Jongerius, Sebastiaan C. E., to Jongerius B.V. Slicing device for bread or the like. 4,694,715, Cl. 83-72.000.

Jorgens, Reinhard; Faltermeier, Bernd; and Trautwein, Franz, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Motorized focus drive for a microscope. 4,695,137, Cl. 350-521.000.

Jorgensen, Walter E.; and Linquist, Robert L. Flow control valve. 4,694,848, Cl. 137-114.000.

Jos. Schneider Optische Werke Kreuznach GmbH & Co. KG: *See—*
Schitthof, Hiltrud, 4,695,136, Cl. 350-472.000.

Josephson, Lee: *See—*
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,695,392, Cl. 252-62.540.
Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,695,393, Cl. 252-62.540.

Joyce, Thomas F.: *See—*
Keeley, James W.; and Joyce, Thomas F., 4,695,943, Cl. 364-300.000.

Juarros, Richard D.: *See—*
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,695,776, Cl. 318-14.000.

Juhas, William M. Modular pre-insulated, pre-finished building block. 4,694,624, Cl. 52-228.000.

Juhola, Pentti, to Rintekno Oy. Method and equipment for utilization of the freezing heat of water as a source of heat of a heat pump. 4,694,658, Cl. 62-100.000.

Julstrom, Stephen D., to Shure Brothers, Inc. Directional enhancement circuit. 4,696,036, Cl. 381-22.000.

Jung, Hyun J., to Johnson Matthey, Inc. Selective catalytic reduction catalysts. 4,695,437, Cl. 423-239.000.

Jung, Hyun J.: *See—*
Becker, E. Robert; and Jung, Hyun J., 4,695,438, Cl. 423-239.000.

Jurczyszyn, Michel: *See—*
Hakoun, Roland; and Jurczyszyn, Michel, 4,695,306, Cl. 65-152.000.

Jyumonji, Hiromichi: *See—*
Satoh, Hidetaka; Kurosawa, Hideyuki; Kamijoh, Yoshiaki; and Jyumonji, Hiromichi, 4,695,916, Cl. 361-56.000.

Kable, Robert G., to Scriptel Corporation. Stylus for position responsive apparatus having electrographic application. 4,695,680, Cl. 178-19.000.

Kabushiki Kaisha Hikoma Seisakusho: *See—*
Kishi, Mitsuhiro, 4,694,930, Cl. 182-2.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.

Fukumizu, Shinnichi; Inoue, Kimio; and Kuriyama, Akimasa, 4,695,165, Cl. 366-90.000.
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, 4,695,233, Cl. 418-83.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Yoshida, Kazuhiro, 4,694,647, Cl. 60-442.000.

Kabushiki Kaisha Riken: *See—*
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,694,707, Cl. 74-606.00A.

Kabushiki Kaisha SG: *See—*
Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, 4,695,235, Cl. 425-29.000.

Kabushiki Kaisha Toshiba: *See—*
Hara, Hiroyuki; Nakamura, Michinori; and Sugimoto, Yasuhiro, 4,695,750, Cl. 307-475.000.
Hashimoto, Minoru; Takeuchi, Hajime; and Itoh, Takeo, 4,695,513, Cl. 428-425.900.
Inoue, Kazuhiko; Mitani, Tatsuro; and Kishita, Yoshihiro, 4,695,869, Cl. 357-71.000.
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,694,999, Cl. 242-4.00R.
Ito, Kenji, 4,695,781, Cl. 318-603.000.
Iwasaki, Hiroshi; and Ito, Shintaro, 4,694,562, Cl. 437-57.000.
Kawakami, Hiroshi, 4,695,990, Cl. 369-38.000.
Morita, Hiroyuki, 4,696,056, Cl. 455-182.000.
Watanabe, Junji, 4,695,151, Cl. 355-3.00R.
Watanabe, Junji, 4,695,154, Cl. 355-8.000.
Watanabe, Junji, 4,695,897, Cl. 358-296.000.
Yamanishi, Eiichi, 4,695,896, Cl. 358-296.000.
Yamashita, Kiyoshi; Aoshima, Terutaka; Narita, Ryuuho; and Imai, Masahiro, 4,695,710, Cl. 219-506.000.
Yamaura, Mitsuru; and Fujisawa, Norio, 4,695,931, Cl. 363-8.000.

Kabushikikaisha Tokyo Keiki: *See—*
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Kadota, Shigekazu: *See—*
Nishihama, Takamichi; Okada, Kotaro; and Kadota, Shigekazu, 4,695,044, Cl. 269-21.000.

Kageyama, Kunio; and Takasugi, Sumio, to Yokohama Rubber Co., Ltd., The. Adhesive composition. 4,695,508, Cl. 428-261.000.

Kahn, Gerhard: *See—*
Hilgendorff, Walter; Kahn, Gerhard; and Kaschemekat, Jurgen, 4,695,380, Cl. 210-347.000.

Kainer, Hartmut: *See—*
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Kairis, Alexandre; and Colsen, Ronnie H., to Waco Trading Corporation. Electro-therapeutic device. 4,694,840, Cl. 128-735.000.

Kaiser, Timothy D.: *See—*
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Kajiho, Tokuaki: *See—*
Uemura, Toshinobu; Shinooka, Kiyohide; and Kajiho, Tokuaki, 4,695,467, Cl. 424-502.000.

Kako, Noritoshi: *See—*
Takakura, Masaki; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,695,966, Cl. 364-521.000.

Kalaskie, Frank E.: *See—*
Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Kalfa, Horst: *See—*
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Kali-Chemie Pharma GmbH: *See—*
Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, 4,695,566, Cl. 514-234.000.

Kalk, Walter; Schundehutte, Karl H.; and Soll, Manfred, to Bayer Aktiengesellschaft. Quaternary reactive compounds. 4,695,632, Cl. 544-194.000.

Kallberg, Bjorn. Device for guiding a tool along a curve. 4,694,579, Cl. 33-23.080.

Kalopissis, Gregoire; and Vanlerberghe, Guy, to L'Oreal. Cationic surface-active agents. 4,695,653, Cl. 564-505.000.

Kalt, Charles G. Electrostatic display device with improved fixed electrode. 4,695,837, Cl. 340-763.000.

Kalter, Jan: *See—*
Verweij, Jan; Grootveld, Herman H.; Hirs, Henri G. J.; Van Veen, Gerardus J.; Kalter, Jan; and Henniger, Peter W., 4,695,627, Cl. 340-324.000.

Kamewa AB: *See—*
Flyborg, Nils O.; and Bjorheden, Orvar, 4,694,645, Cl. 60-221.000.

Kameya, Kazuo, to Elmec Corporation. Electromagnetic delay line with inductance element with transversely staggered stacked conducting portions. 4,695,812, Cl. 333-156.000.

Kamiji, Koichi; and Ohya, Toshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Air bag device for vehicles. 4,695,075, Cl. 280-735.000.

Kamijoh, Yoshiaki: *See—*
Satoh, Hidetaka; Kurosawa, Hideyuki; Kamijoh, Yoshiaki; and Jyumonji, Hiromichi, 4,695,916, Cl. 361-56.000.

Kamimura, Tetsuro: *See—*
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,695,011, Cl. 242-199.000.

Kamrath, Theresa K. Bib with teething surface. 4,694,510, Cl. 2-49.00R.

Kanai, Hideo; Komba, Toshinori; and Mogi, Eiji, to Nagase Medical Supply Co., Ltd. Apparatus for automatically changing X-ray films. 4,694,571, Cl. 29-806.000.

Kaneko, Hideo: *See—*
Inoue, Kiyoshi; and Kaneko, Hideo, 4,695,333, Cl. 148-306.000.

Kaneko, Kazuyuki: *See—*
Momo, Asao; Watanabe, Kiyoo; and Kaneko, Kazuyuki, 4,695,729, Cl. 250-358.100.

Kaneoya, Tatsuo: *See—*
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.

Kansai Environmental Development Co., Ltd.: *See—*
Sakamoto, Tsutomu, 4,694,716, Cl. 83-112.000.

Kanzawa, Masahide: *See—*
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.

Kao Corporation: *See—*
Yamamoto, Hiromi; Imai, Miho; and Suzuki, Noboru, 4,694,525, Cl. 15-160.000.

Karam, Ronald E.: *See—*
Schulze, Harry O.; and Karam, Ronald E., 4,695,478, Cl. 427-71.000.

Karl Bauer Spezialtiefbau GmbH & Co KG: *See—*
Bauer, Karlheinz; and Arzberger, Maximilian, 4,694,915, Cl. 175-91.000.

Karl Deutsch Pruf- und Messgeratebau GmbH+Co. KG: *See—*
Deutsch, Volker K.; and Roddeck, Werner F., 4,695,797, Cl. 324-230.000.

Karlsson, Axel T.; and Stand, Mille. Thermal spray apparatus for coating a substrate with molten fluent material. 4,694,990, Cl. 239-81.000.

Kaschemekat, Jurgen: *See—*
Hilgendorff, Walter; Kahn, Gerhard; and Kaschemekat, Jurgen, 4,695,380, Cl. 210-347.000.

Kashida, Motokazu: *See—*
Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,696,008, Cl. 371-47.000.

Kashiwagi, Hiroshi: *See—*
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Kasle, Leonard: *See—*
Lundy, Allen W.; and Kasle, Leonard, 4,694,559, Cl. 29-559.000.

Kasle Steel Corporation: *See—*
Lundy, Allen W.; and Kasle, Leonard, 4,694,559, Cl. 29-559.000.

Katagiri, Hidenori: *See—*
Miura, Hirohisa; Satoh, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,695,319, Cl. 75-63.000.

Katagiri, Shuhei: *See—*
Takezawa, Hatsuo; Donuma, Kenichi; Katagiri, Shuhei; and Sakura, Shigeyuki, 4,695,858, Cl. 357-19.000.

Katayama, Hiroyuki: *See—*
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; and Ohta, Kenji, 4,695,514, Cl. 428-432.000.

Katayama, Shigeru: *See—*
Yamamoto, Hiraku; Suzuki, Toshimichi; Katayama, Shigeru; Uratsuka, Isao; and Asoshina, Eishi, 4,695,598, Cl. 523-400.000.

Kato, Kenji; Matsushita, Soichi; and Nakanishi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha. Method and device for control of internal combustion engine variable swirl air fuel intake system with direct helical intake passage. 4,694,794, Cl. 123-306.000.

Kato, Masaki; and Yamazaki, Tsutomu, to Nissan Motor Company, Limited. Automotive engine idling speed control system with variable idling speed depending upon cooling air temperature in automotive air conditioning system. 4,694,798, Cl. 123-339.000.

Kato, Masashi: *See—*
Oshikoshi, Yuji; Kato, Masashi; and Kikuchi, Hisashi, 4,695,143, Cl. 354-86.000.

Kato, Masatoshi: *See—*
Tsukase, Masaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, 4,695,525, Cl. 430-151.000.

Kato, Nobuyuki: *See—*
Nakakura, Yukinori; and Kato, Nobuyuki, 4,695,479, Cl. 437-228.000.

Kato, Shinya: *See—*
Muto, Yoshiyuki; Etani, Tadao; Aida, Satoru; and Kato, Shinya, 4,695,007, Cl. 242-58.400.

Kato, Shunichi: *See—*
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,694,999, Cl. 242-4.00R.

Kato, Yasuo: *See—*
Konagaya, Shigeji; Watanabe, Osamu; Kuzumoto, Hideshi; Tokai, Masaya; Narusawa, Haruhiko; and Kato, Yasuo, 4,695,383, Cl. 210-500.370.

Kato, Yoji; Watanabe, Seiichi; and Wada, Masaru, to Sony Corporation. Semiconductor apparatus. 4,695,862, Cl. 357-36.000.

Katoh, Katsunori: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Katsube, Junki: *See*—
Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.

Katz, Alan H.: *See*—
Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., 4,695,658, Cl. 568-763.000.

Katzmann, Fred L., to Ballantine Laboratories, Inc. Resistive sensing thermal device for current measurement. 4,695,793, Cl. 324-106.000.

Kawada, Shin-Ichi: *See*—
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Kawaguchi, Masao: *See*—
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,694,809, Cl. 123-489.000.

Kawaguchi, Takeshi: *See*—
Hayashi, Tsutomu; Kawaguchi, Takeshi; and Tsuchida, Tetsuo, 4,694,938, Cl. 188-181.00A.

Kawahara, Atsushi; and Takatsu, Norihiko, to Nippon Kogaku K.K. Solid-state area imaging device having interline transfer CCD means. 4,696,021, Cl. 377-58.000.

Kawai, Makoto: *See*—
Yagi, Shizuo; Hirosawa, Yoshiaki; Kawai, Makoto; and Fujii, Isao, 4,694,799, Cl. 123-425.000.

Kawai, Masato, to NEC Corporation. Method of generating test patterns for logic network devices. 4,696,006, Cl. 371-27.000.

Kawai, Shoichi: *See*—
Nakanishi, Yasuhiro; and Kawai, Shoichi, 4,695,976, Cl. 188-900.000.

Kawakami, Hiroshi, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,695,990, Cl. 369-38.000.

Kawakatsu, Satoshi: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Kawakita, Tsunehiro; and Imajo, Minoru, to Nissan Motor Co., Ltd. Engine lubricant type and condition monitoring system. 4,694,793, Cl. 123-196.00S.

Kawamata, Syooichi: *See*—
Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syooichi, 4,694,688, Cl. 73-116.000.

Kawamata, Yuuji; Iino, Tomohiko; Suzuki, Ryoichi; and Haga, Noriyuki, to Senju Metal Industry Co., Ltd. Method of performing plating of an item having fine parts and a support device therefor. 4,695,481, Cl. 427-96.000.

Kawamoto, Hiroshi, to Hitachi, Ltd. Dynamic storage device with extended information holding time. 4,695,864, Cl. 357-41.000.

Kawamoto, Kenichi, to Canon Kabushiki Kaisha. Motor built-in lens mounting. 4,695,145, Cl. 354-271.100.

Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, to Honda Giken Kogyo Kabushiki Kaisha. Front and rear wheel steering device. 4,695,068, Cl. 280-91.000.

Kawamura, Hideo, to Isuzu Motors Limited. Engine energy recovery apparatus. 4,694,653, Cl. 60-597.000.

Kawamura, Hideo, to Isuzu Motors Limited. Exhaust energy recovery and generator for use with an engine. 4,694,654, Cl. 60-605.000.

Kawanabe, Tomohiko: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, 4,694,803, Cl. 123-440.000.

Kawasaki, Keiji, to NGK Insulators, Ltd. Method and device for spin-testing of turbocharger rotor. 4,694,689, Cl. 73-118.100.

Kaya, Seiji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,694,748, Cl. 101-401.100.

Kayanuma, Kanji: *See*—
Itonaga, Makoto; and Kayanuma, Kanji, 4,695,162, Cl. 356-369.000.

Kearney, Calvin T.: *See*—
Barraza, Arthur; and Kearney, Calvin T., 4,695,222, Cl. 415-80.000.

Kearsley, Andrew J., to Oxford Lasers Limited. Laser device employing a porous material in the discharge chamber. 4,696,011, Cl. 372-61.000.

Keeley, James W.; and Joyce, Thomas F., to Honeywell Information Systems Inc. Multiprocessor shared pipeline cache memory with split cycle and concurrent utilization. 4,695,943, Cl. 364-200.000.

Keen, Frederick I.: *See*—
Choy, Clement K.; Keen, Frederick I.; Garabedian, Aram; and Spurgeon, Colleen J., 4,695,394, Cl. 252-97.000.

Kehrbach, Wolfgang: *See*—
Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, 4,695,566, Cl. 514-234.000.

Keithley, Howard W., Jr., to Keithley, Marie E.; Keithley, Steven W.; and Kelly, Gwenn M., part interest to each. Shape adaptable protective cushion device and method of making and using same. 4,694,774, Cl. 114-361.000.

Keithley, Marie E.: *See*—
Keithley, Howard W., Jr., 4,694,774, Cl. 114-361.000.

Keithley, Steven W.: *See*—
Keithley, Howard W., Jr., 4,694,774, Cl. 114-361.000.

Keilleghan, William J.: *See*—
Lau, Kreisler S. Y.; and Keilleghan, William J., 4,695,655, Cl. 568-56.000.

Keller, Jakob: *See*—
Heilat, Jaan; and Keller, Jakob, 4,695,225, Cl. 415-189.000.

Kelley Company, Inc.: *See*—
Erlandsson, Kjell L., 4,695,216, Cl. 414-401.000.

Kelly, Gwenn M.: *See*—
Keithley, Howard W., Jr., 4,694,774, Cl. 114-361.000.

Kemmler, Ralf-Rainer, to Stihl, Andreas. Motor-driven chain saw. 4,694,578, Cl. 30-383.000.

Kemnetz, Steven J.: *See*—
Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.

Kemper, Yves J., to Tractiontec Corporation. Radially oriented nutational traction drive transmission with large range of speed ratios. 4,694,701, Cl. 74-191.000.

Keneticon Limited: *See*—
Young, David N., 4,695,707, Cl. 219-392.000.

Kennedy, James D. Drilling assembly for percussion drilling of deep wells. 4,694,911, Cl. 173-62.000.

Kennedy, Jesse R.; and Kennedy, Marcus R. Apparatus for imaging infrared emitting surfaces. 4,695,881, Cl. 358-100.000.

Kennedy, John M.; and Kennedy, William R. Jack for installing a mine stopping. 4,695,035, Cl. 254-93.00R.

Kennedy, Marcus R.: *See*—
Kennedy, Jesse R.; and Kennedy, Marcus R., 4,695,881, Cl. 358-100.000.

Kennedy, William R.: *See*—
Kennedy, John M.; and Kennedy, William R., 4,695,035, Cl. 254-93.00R.

Kennette, John W.: *See*—
Dyer, John; and Kennette, John W., 4,695,500, Cl. 428-134.000.

Kennis, Ludo E. J.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,695,575, Cl. 514-322.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Fischer, Klaus, 4,695,347, Cl. 156-610.000.
Teuchert, Eberhardt; Haas, Klaus-Arne; and Gerwin, Helmut, 4,695,423, Cl. 376-265.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Ehrfeld, Wolfgang; and Hagmann, Peter, 4,694,548, Cl. 29-157.00C.

Kerr, G. T.: *See*—
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., 4,695,642, Cl. 556-14.000.

Kerr, Randal H.; and Mesnard, Robert M., to International Business Machines Corporation. System for testing interactive software. 4,696,003, Cl. 371-19.000.

Kershaw, Carolyn A.: *See*—
Blakeley, Douglas M.; Kershaw, Carolyn A.; and Gangarosa, Raymond E., 4,694,837, Cl. 128-653.000.

Kessler, Saul. Fuel additive. 4,695,293, Cl. 44-68.000.

Keuter, Dale H.; and Keuter, Karl A. Animal actuated feeder. 4,694,780, Cl. 119-53.500.

Keuter, Karl A.: *See*—
Keuter, Dale H.; and Keuter, Karl A., 4,694,780, Cl. 119-53.500.

Khoe, Giok D.: *See*—
Faessen, Louis M. H.; and Khoe, Giok D., 4,695,129, Cl. 350-96.250.

Khowaylo, Alex: *See*—
Forte, Mark R.; Khowaylo, Alex; and Schloesser, Ewald, 4,695,282, Cl. 623-22.000.

Kidde, Inc.: *See*—
Barraza, Arthur; and Kearney, Calvin T., 4,695,222, Cl. 415-80.000.

Kigasawa, Kazuo; Ohtani, Hideaki; Tanaka, Makoto; and Hayashida, Shigeru, to Takeda Chemical Industry, Ltd. Soft patch. 4,695,465, Cl. 424-449.000.

Kihara, Tadaharu: *See*—
Makino, Hiroshi; Yoshino, Tsunemi; Kihara, Tadaharu; and Takashima, Akira, 4,695,893, Cl. 358-227.000.

Kikendall, Garth D.: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,695,213, Cl. 411-506.000.

Kikkawa, Masatoshi, to Nissan Motor Co., Ltd. Vehicle steering system. 4,694,926, Cl. 180-132.000.

Kikuchi, Hisashi: *See*—
Oshikoshi, Yuji; Kato, Masashi; and Kikuchi, Hisashi, 4,695,143, Cl. 354-86.000.

Kikuchi, Kazuhiko: *See*—
Sawamura, Mitsuharu; Hongou, Kazuoki; and Kikuchi, Kazuhiko, 4,695,510, Cl. 428-336.000.

Kikuchi, Kenichi, to Sumitomo Electric Industries, Ltd. Process for making Schottky-barrier gate FET. 4,694,563, Cl. 437-40.000.

Kikuchi, Toshiyuki; and Yamamoto, Koichi, to Mazda Motor Corporation. Control of a vehicle automatic transmission. 4,694,709, Cl. 74-866.000.

Kikumoto, Ryoji: *See*—
Ninomiya, Kunihiro; Nitta, Isei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, 4,695,568, Cl. 514-258.000.

Kikumoto, Tadao; and Murakami, Isato, to Roland Kabushiki Kaisha. Synchronizing signal generator for musical instrument. 4,694,724, Cl. 84-1.030.

Kim, Han J.: *See*—
DeNuccio, Ron J.; Kim, Han J.; and Leung, Chi H., 4,694,558, Cl. 29-527.200.

Kim, Jin H., to Samsung Electronics Co., Ltd. Apparatus for quick starting tape in video cassette recorders. 4,695,906, Cl. 360-85.000.

Kim, Joo W. Automatic brightness control device. 4,695,885, Cl. 358-168.000.

Kim, Jung T.: *See*—
Nalewajek, David; Kim, Jung T.; and McCarry, Lynn E., 4,695,522, Cl. 429-206.000.

Kim, Kwan C. Clamping head for replaceable string mop. 4,694,524, Cl. 15-150.000.

Kim, Kwang S.: *See*—
Prince, Alfred M.; and Kim, Kwang S., 4,695,454, Cl. 424-89.000.

Kim, Sergei Y.: *See*—
Zhigalov, Gennady V.; Abduganiev, Abdurakhim; Kim, Sergei Y.; and Mosheev, Robert R., 4,694,642, Cl. 57-5.000.

Kimberly-Clark Corporation: *See*—
Westphal, Dean W.; and Strohbeen, David T., 4,694,978, Cl. 215-74.000.

Kimizuka, Junichi; Ushio, Yukihide; and Seto, Kaoru, to Canon Kabushiki Kaisha. Light source stabilizer with intensity and temperature control. 4,695,714, Cl. 250-205.000.

Kimmer, Klaus: *See*—
Ehle, Joachim; Fuchs, Gerhard; Kimmer, Klaus; and Langfeldt, Horst-Rudiger, 4,696,013, Cl. 373-71.000.

Kimoto, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Optical disc apparatus with selective track accessing using a correction scale value. 4,695,989, Cl. 369-32.000.

Kimoto, Toshiyuki: *See*—
Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, 4,695,996, Cl. 369-77.100.

Kimura, Takayoshi; Tsuyuguchi, Seiichi; and Mori, Yoshiaki, to Sumitomo Metal Mining Company Limited. Method of treating silicate ore containing gold and silver. 4,695,317, Cl. 75-24.000.

Kimura, Takeshi: *See*—
Enzaki, Yoshiki; Kitahara, Kazuki; Terasaka, Satoru; Mori, Kenji; and Kimura, Takeshi, 4,695,247, Cl. 431-352.000.

Kincaid, Donald M. Motorcycle passenger arm rest. 4,695,096, Cl. 297-417.000.

Kindig, James K.; and Reynolds, James E., to Integrated Carbons Corporation. Integrated coal cleaning process with mixed acid regeneration. 4,695,290, Cl. 44-1.0SR.

Kindsvater, Hans: *See*—
Omet, Reinhard; Kindsvater, Hans; and Wall, Hans J., 4,695,796, Cl. 324-226.000.

King-Seeley Thermos Co.: *See*—
Tarozzi, Richard A., 4,694,738, Cl. 99-279.000.

King, Timothy W. Asphalt handling apparatus. 4,695,186, Cl. 404-111.000.

Kinoshita, Kimiaki: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Kinshofer, Alfred. Two-sided grab bucket with plural operating cylinders. 4,695,086, Cl. 294-68.230.

Kinsley, Robert J., to Vogel Tool & Die Corporation. Tube cut off apparatus. 4,694,718, Cl. 83-319.000.

Kinugawa, Tadami: *See*—
Masumoto, Mituhiko; Yanada, Shigeo; and Kinugawa, Tadami, 4,695,620, Cl. 528-204.000.

Kishi, Hiroyasu, to Sanyo Electric Co., Ltd. Automatic hue correction circuit. 4,695,875, Cl. 358-28.000.

Kishi, Mitsuhiro, to Kabushiki Kaisha Hikoma Seisakusho. Lifting apparatus. 4,694,930, Cl. 182-2.000.

Kishita, Yoshihiro: *See*—
Inoue, Kazuhiko; Mitani, Tatsuro; and Kishita, Yoshihiro, 4,695,869, Cl. 357-71.000.

Kissel, Thomas R., to Eastman Kodak Company. Acid or acid salt wash of a metal chloride layer of an ion selective electrode. 4,695,362, Cl. 204-419.000.

Kisuzemi Innovacios Iroda: *See*—
Sinko, Tibor, 4,694,933, Cl. 182-128.000.

Kitagawa, Atsushi: *See*—
Kuwabara, Hideki; Kitagawa, Atsushi; and Sudo, Yoshimi, 4,695,593, Cl. 521-60.000.

Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. High range zoom lens. 4,695,133, Cl. 350-427.000.

Kitaguchi, Hiroshi: *See*—
Tsukase, Masaaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, 4,695,525, Cl. 430-151.000.

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Enzaki, Yoshiki; Kitahara, Kazuki; Terasaka, Satoru; Mori, Kenji; and Kimura, Takeshi, 4,695,247, Cl. 431-352.000.

Kitamura, Masato: *See*—
Tanaka, Teruo; Tanaka, Teruya; and Kitamura, Masato, 4,695,484, Cl. 427-245.000.

Kitano, Kahei: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Kitner, William M.; and Hart, James B. Watercraft stabilizing flotation structure. 4,694,770, Cl. 114-123.000.

Kito, Masahiro; and Mori, Katsuhiro, to Aisin Seiki Kabushiki Kaisha. Heat exchangers. 4,694,894, Cl. 165-135.000.

Kiziah, Floyd G. Drain. 4,694,513, Cl. 4-288.000.

Klauck, Manfred, to Flutec Fluidtechinische Gerate GmbH. Central body to which are connected both a driving motor and a pump. 4,695,232, Cl. 417-410.000.

Klebba, John M.; and Hultman, Kenneth L., to Geomation, Inc. Isothermal cavity and spark gap protection assembly for input/output connection terminals for electronic modules. 4,695,920, Cl. 361-118.000.

Klein, Mark S. Wheel spoke adjuster guard. 4,695,099, Cl. 301-37.0SA.

Klepach, Wilhelm; and Plobst, Dietmar, to Senoplast Klepach & Co. Thermoplastic sheet forming device. 4,695,239, Cl. 425-194.000.

Klimovskoe Spetsialnoe Konstruktorskoe Bjuro Po Proektirovaniju Tkatskogo Oborudovania: *See*—
Gendelman, Mikhail A.; Borodulin, Anatoly F.; Golubeva, Diana F.; and Bychkov, Sergei V., 4,694,867, Cl. 139-192.000.

Klockner-Humboldt-Deutz AG: *See*—
Haiduk, Klaus, 4,694,883, Cl. 164-186.000.

Kloiber, Gerald, to Siemens Aktiengesellschaft. Electrical resistor with a negative temperature coefficient for incremental resistance values and method for manufacturing same. 4,695,818, Cl. 338-22.00R.

Klopp, James L., to Cajon Company. Protective cap. 4,694,863, Cl. 138.96.00R.

Klunk, Thomas M.: *See*—
Grabbe, Dimitry; Korsunsky, Iosif; Klunk, Thomas M.; and DiOrazio, Joseph S., 4,695,111, Cl. 439-266.000.

Knape & Vogt Manufacturing Co.: *See*—
Sorenson, Robert E.; and Scriba, John M., Jr., 4,694,966, Cl. 211-88.000.

Knapp, Daniel R.: *See*—
Eller, Thomas D.; Halushka, Perry V.; Knapp, Daniel R.; and Mais, Dale, 4,695,647, Cl. 560-53.000.

Knapp, John F.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., to Xerox Corporation. Process for ultra high quality images with magnetic developer composition. 4,695,524, Cl. 430-32.000.

Knauss, William F., Jr.; Pal, Uday B.; and Patil, Balaji V., to Allegheny Ludlum Corporation. Method of making steel. 4,695,318, Cl. 75-51.100.

Knebel & Rottger GmbH & Co.: *See*—
Knebel, Werner; and Sieberhagen, Gunter, 4,694,512, Cl. 4-192.000.

Knebel, Werner; and Sieberhagen, Gunter, to Knebel & Rottger GmbH & Co. Plumbing mixing circuit control apparatus for a combination set. 4,694,512, Cl. 4-192.000.

Kniskern, Peter J.: *See*—
Marburg, Stephen; Tolman, Richard L.; and Kniskern, Peter J., 4,695,624, Cl. 530-395.000.

Knoblauch, Karl: *See*—
Grochowski, Horst; Zurawsky, Dieter; Knoblauch, Karl; Goldschmidt, Klaus; and Schwarte, Jurgen, 4,695,444, Cl. 423-569.000.

Knox, Ronald A. Safety hanger for mud flaps. 4,695,070, Cl. 280-154.50R.

Knudsen, Christian W.: *See*—
Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., 4,694,907, Cl. 166-303.000.

Ko, Eric: *See*—
Zivitz, Maury; Ko, Eric; and Eslick, Mark, 4,695,164, Cl. 356-427.000.

Kobayashi, Bujirou: *See*—
Kodai, Syojiro; Fujii, Noriaki; Gamo, Hiroshi; and Kobayashi, Bujirou, 4,695,925, Cl. 361-395.000.

Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, to Kabushiki Kaisha Riken; and Aisin Seiki Kabushiki Kaisha. Rod seal device for stirling engines. 4,694,707, Cl. 74-606.00A.

Kobayashi, Katsumi: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,696,004, Cl. 371-25.000.

Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,695,074, Cl. 280-707.000.

Kobayashi, Kiyoshi: *See*—
Komatsu, Teruaki; Kobayashi, Kiyoshi; Tatsu, Kunihiko; and Shibata, Shoichi, 4,695,065, Cl. 279-60.000.

Kobayashi, Kouzou. Tea-containing tobacco. 4,694,842, Cl. 131-359.000.

Kobayashi, Michiaki: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, 4,694,749, Cl. 101-426.000.

Kobayashi, Mitsuo: *See*—
Sagisawa, Shinobu; Takahama, Teizo; and Kobayashi, Mitsuo, 4,695,963, Cl. 364-513.000.

Kobayashi, Yoshinao: *See*—
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Koch, Frederick W.; and Pialet, Joseph W., to Lubrizol Corporation, The. Reaction product of polyalrylene-substituted polycarboxylic acid acylating agent, polyamine and sulfolene as a dispersant. 4,695,390, Cl. 252-47.500.

Kodai, Syojiro; Fujii, Noriaki; Gamo, Hiroshi; and Kobayashi, Bujirou, to Mitsubishi Denki Kabushiki Kaisha. IC card. 4,695,925, Cl. 361-395.000.

Kodama, Hisashi; and Okabe, Yoshio, to Ainin Seiki Kabushiki Kaisha. Automatic tensioner having locking mechanism. 4,695,268, Cl. 474-110.000.

Kodama, Masahiro; Sakae, Tatsuya; and Urano, Yoshio, to Daikin Industries, Ltd. High speed memory access circuit of CRT display unit. 4,695,967, Cl. 364-521.000.

Kodera, Hiroyuki: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshibonu; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.

Koerner, Norman D.: *See*—
Brooks, Royce L., 4,695,072, Cl. 280-650.000.

Koitabashi, Takatoshi, to Sanden Corporation. Electromagnetic clutch with an improved magnetic rotatable member. 4,694,945, Cl. 192-84.00C.

Koito Seisakusho Co., Ltd.: *See*—
Uchida, Kihachirou, 4,695,259, Cl. 439-271.000.

Koizumi, Toshiaki, to Pioneer Electronic Corporation. Front loading disk player with improved disk sensor positioning. 4,695,995, Cl. 369-75.200.

Koken Co., Ltd.: *See*—
Miyata, Teruo; and Noishiki, Yasuharu, 4,695,281, Cl. 623-11.000.

Kokura, Yasuhide: *See*—
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,695,155, Cl. 355-45.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Wada, Masahiro; and Yamaguchi, Hirohisa, 4,695,882, Cl. 358-136.000.

Kolbenschmidt AG: *See*—
Mielke, Siegfried, 4,694,813, Cl. 123-668.000.

Kollonitsch, Janos; and Patchett, Arthur A., to Merck & Co., Inc. Fluorinated amino acids. 4,695,588, Cl. 514-538.000.

Kollross, Gunter. Process and device for the fixture of suspension elements to sausages. 4,694,537, Cl. 17-49.000.

Komaki, Shojiro: *See*—
Watanabe, Fumio; Komaki, Shojiro; Miyamoto, Masao; and Ito, Takao, 4,695,724, Cl. 250-292.000.

Komatsu, Teruaki; Kobayashi, Kiyoshi; Tatsu, Kunihiko; and Shibata, Shoichi, to Matsushita Electric Works, Ltd. Keyless chuck for rotary tool. 4,695,065, Cl. 279-60.000.

Komatsubara, Masahiro; Kamimura, Tetsuro; Imanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette tape machine. 4,695,011, Cl. 242-199.000.

Komatsuzaki, Takeshi: *See*—
Ogano, Takeo; Komatsuzaki, Takeshi; Shigenari, Ryoichi; and Uesugi, Naomoto, 4,694,942, Cl. 192-13.00A.

Komba, Toshinori: *See*—
Kanai, Hideo; Komba, Toshinori; and Mogi, Eiji, 4,694,571, Cl. 29-606.000.

Komitor, Greg A.: *See*—
Friedlander, Randal H.; Nash, Sheryl A.; and Komitor, Greg A., 4,695,493, Cl. 428-40.000.

Komura, Fuminobu: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; and Ota, Hideo, 4,695,964, Cl. 364-518.000.

Konagaya, Shigeji; Watanabe, Osamu; Kuzumoto, Hideshi; Tokai, Masaya; Narusawa, Haruhiko; and Kato, Yasuo, to Toyo Boseki Kabushiki Kaisha. Permselective membrane. 4,695,383, Cl. 210-500.370.

Kondo, Kazuo; Ishiguro, Nobuya; and Tada, Teruo, to Okura Industrial Co., Ltd. Heat-shrinkable composite packaging film. 4,695,491, Cl. 428-35.000.

Kondo, Mitsuo, to Fuji Photo Optical Co., Ltd. Air feed control device for an endoscope. 4,694,821, Cl. 128-4.000.

Kongskilde Koncerneiskab A/S: *See*—
Hansen, Jens O. E., 4,695,206, Cl. 406-65.000.

Konishi, Takeshi: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Koper, Kenneth T.; Willard, Sylvester L.; and Abramowski, Larry A., to United States of America, Navy. Electrochemical reserve battery. 4,695,520, Cl. 429-116.000.

Koppe, Lou W. Foldable closure for flexible bags comprising flat sheet with integral axial hinge groove, lead in notch, and gripping aperture. 4,694,542, Cl. 24-30.50S.

Korsunsky, Iosif: *See*—
Grabbe, Dimitry; Korsunsky, Iosif; Klunk, Thomas M.; and DiOrazio, Joseph S., 4,695,111, Cl. 439-266.000.

Kortmann, Heinrich; and Bock, Wolfgang, to Studiengesellschaft fur Eisenerzaufbereitung. Method of minimizing reduction disintegration of iron ores and iron ore agglomerates to be used as blast furnace burden. 4,695,315, Cl. 75-0.50R.

Korzekwa, Tadeusz M.; McMurtry, Carl H.; and Boecker, Wolfgang D. G., to Stemcor Corporation. Vibratory grinding of silicon carbide. 4,695,294, Cl. 51-307.000.

Kos, Joseph M.: *See*—
Doman, Glidden S.; Kos, Joseph M.; Harner, Kermit I.; DiValentin, Eugene D.; and Healy, Henry S., 4,695,736, Cl. 290-44.000.

Kosa, Nadhir B., to GV Medical, Inc. Fiber tip monitoring and protection assembly. 4,695,697, Cl. 219-121.0LZ.

Koseki, Yuji: *See*—
Ishikawa, Kazumasa; and Koseki, Yuji, 4,695,898, Cl. 358-296.000.

Kosley, Raymond W., Jr.; and Cherill, Robert J., to Hoechst-Roussel Pharmaceuticals Inc. Intermediates for spiro[2H-1,4 benzodioxepin-3(5H)4'-piperidine and -3'-pyrrolidine] compounds. 4,695,637, Cl. 546-207.000.

Koster, Ole: *See*—
Bech, Marcus C.; and Koster, Ole, 4,694,637, Cl. 53-448.000.

Kotaka, Fumitaka; and Maeda, Takanori, to Pioneer Electronic Corporation. Focus error detector. 4,695,158, Cl. 356-123.000.

Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, to Sumitomo Chemical Company, Limited. Method for purifying 1-aminoanthraquinone. 4,695,407, Cl. 760-378.000.

Kotzmann, Heinz. Combustion process with ionization control. 4,695,245, Cl. 431-9.000.

Kouno, Tomomitsu: *See*—
Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, 4,695,996, Cl. 369-77.100.

Kovacs, Magda, nee Kalman: *See*—
Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,309, Cl. 71-88.000.

Kovacs nee Kalman, Magda: *See*—
Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,313, Cl. 71-100.000.

Kovats, Tibor F. I.: *See*—
Sinclair, William J.; Kovats, Tibor F. I.; and Straus, Jozef, 4,695,125, Cl. 350-96.200.

Kowal, Steven J., to Stanadyne, Inc. Inverted bucket tappet with collapsing diaphragm seal. 4,694,790, Cl. 123-90.580.

Koyabu, Kunihiro, to NEC Corporation. Semiconductor integrated circuit device. 4,695,866, Cl. 357-42.000.

Koyama, Mototsugu: *See*—
Hayashi, Souichi; Miyake, Johji; Koyama, Mototsugu; and Sekaguchi, Kanji, 4,695,329, Cl. 148-3.000.

Kozawa, Tadashi: *See*—
Nomura, Yoshihisa; Suda, Koichi; and Kozawa, Tadashi, 4,694,734, Cl. 92-130.00R.

Koziol, Konrad, to Conradty GmbH & Co. Metallelektroden KG. Electrode for membrane electrolysis. 4,695,355, Cl. 204-252.000.

Kozuki, Susumu: *See*—
Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,696,008, Cl. 371-47.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Purcaru, Bebe-Titu, 4,695,228, Cl. 416-223.00A.

Krakau, Herbert B.: *See*—
Morganstein, Sanford J.; Tuck, Edward F.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,696,028, Cl. 379-88.000.

Kramer, David M.; Compton, Russell A.; Streak, Lawrence M.; and Murdoch, James B., to Technicare Corporation. Non harmonic NMR spin echo imaging. 4,695,800, Cl. 324-309.000.

Kraus, Charles E., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,694,704, Cl. 74-200.000.

Krenitsky, Thomas A., to Burroughs Wellcome Co. Antiviral compound use. 4,695,570, Cl. 514-261.000.

Krieger, Karl; and Reinelt, Werner, to Hermann Hemschedit Maschinenfabrik GmbH & Co. Prop control valve. 4,694,730, Cl. 91-170.0MP.

Krueger, Robert H.: *See*—
Fildes, John M.; and Krueger, Robert H., 4,694,686, Cl. 73-104.000.

Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Arthropodicidal phosphorus-containing heterocycles. 4,695,563, Cl. 514-105.000.

Krumeich, Jorg H. Solution of alpha-chymotrypsin. 4,695,458, Cl. 424-94.000.

Krumme, John F., to Metcal, Inc. Autoregulating, electrically shielded heater. 4,695,713, Cl. 219-553.000.

Krupp Polysius AG: *See*—
Henne, Heinrich; Blaszyk, Gotthardt; Eickholt, Hubert; and Lohnherr, Ludger, 4,694,994, Cl. 241-79.100.

Kubala, Gregory, to Dowell Schlumberger Incorporated. Aqueous gelling and/or foaming agents for aqueous acids and methods of using the same. 4,695,389, Cl. 252-8.553.

Kubo, Kazuo: *See*—
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, 4,695,233, Cl. 418-83.000.

Kuboki, Hitoshi: *See*—
Shiino, Kouji; and Kuboki, Hitoshi, 4,695,276, Cl. 604-283.000.

Kubota, Shinichi: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, 4,694,803, Cl. 123-440.000.

Kubozuka, Takao: *See*—
Hirano, Yoshinori; and Kubozuka, Takao, 4,694,784, Cl. 123-41.120.

Kudou, Takenori, to Nippon Steel Corporation. Lance supporting apparatus. 4,695,042, Cl. 266-226.000.

Kuechenmeister, Rodney D.: *See*—
Murphy, Robert E.; Ballard, Gary R.; and Kuechenmeister, Rodney D., 4,694,953, Cl. 198-627.000.

Kuei-Wen, Sheu. Electric perpetual calendar. 4,694,597, Cl. 40-117.000.

Kuhl, Ulrich: *See*—
Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, 4,695,566, Cl. 514-234.000.

Kuhl, Wilfried: *See*—
Grosse, Joachim; Hess, Ruediger; Kuhl, Wilfried; and Mueller, Reiner, 4,695,687, Cl. 200-144.00B.

Kuhn S.A.: *See*—
Ermacora, Rino; and Jehl, Patrice, 4,694,640, Cl. 56-16.400.

Kulig, Frank M., to J. M. Ney Company, The. Apparatus and method for localized heating of an object at precise temperatures. 4,695,705, Cl. 219-354.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,695,817, Cl. 338-4.000.

Kulpa, William G.: *See*—
Blevins, Ballard J.; Kulpa, William G.; Mathis, Joseph R.; and McCullough, John W., 4,695,948, Cl. 364-200.000.

Kumagai, Naotake: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 180-707.000.

Kumagai, Yasuo: *See*—
Era, Yoshiyuki; and Kumagai, Yasuo, 4,695,178, Cl. 403-14.000.

Kumamoto, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Comparing device. 4,695,748, Cl. 307-355.000.

Kumar, Ajith K., to General Electric Company. Loss of electrical feedback detector. 4,695,941, Cl. 364-165.000.

Kumashiro, Kenji: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Kumobayashi, Hidenori: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.

Kung, Peter: *See*—
Dabisch, Wolfgang H.; Kung, Peter; Muller, Siegfried R.; and Narayanan, Krishnamoorthy, 4,695,528, Cl. 430-290.000.

Kuo-Ching, Huang; and Yong-Hung, Lin. Shedding device for a circular weaving machine. 4,694,866, Cl. 139-13.00R.

Kuo, Youti. Dentifrice dispensing toothbrush. 4,695,177, Cl. 401-150.000.

Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, to Fanuc Ltd. Servomotor velocity control system. 4,695,780, Cl. 318-561.000.

Kuramoto, Terumasa: *See*—
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Kuraoka, Koji: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.

Kuriyama, Akimasa: *See*—
Fukumizu, Shinnichi; Inoue, Kimio; and Kuriyama, Akimasa, 4,695,165, Cl. 366-90.000.

Kurokawa, Ryogo; Oyama, Fusami; and Takahashi, Akira, to Fuji Jukogyo Kabushiki Kaisha. Steering system for rear wheels. 4,695,069, Cl. 280-91.000.

Kurosawa, Atsushi: *See*—
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Kurosawa, Hideyuki: *See*—
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Zwiercan, Gary A.; Lacourse, Norman L.; and Lenchin, Julianne M., 4,695,475, Cl. 426-582.000.

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Cuneo, Carol A.; and Lambert, Charles, 4,695,474, Cl. 426-579.000.

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Langner, Arnd M.: *See*—
Schleupen, Richard; Mayer, Ulrich; Bauer, Bernhard; and Langner, Arnd M., 4,696,002, Cl. 371-12.000.

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Mayor, Jean-Michel; Steffen, Jurg; and Wuthrich, Peter, 4,695,698, Cl. 219-121.00L.

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Jackson, Kenneth R.; and Tofigh, Farshid, 4,695,917, Cl. 361-58.000.

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Yokota, Takashi; Lee, Frank; Rennick, Donna; and Arai, Ken-ichi, 4,695,542, Cl. 435-68.000.

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Steinman, Lawrence; Waldor, Matthew K.; Sriram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., 4,695,459, Cl. 424-95.000.

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Dreckmann, Karl; Schneider, Jakob; and Theuner, Hans-Werner, 4,695,346, Cl. 156-361.000.

Lenchin, Julianne M.: *See*—
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Leppert, James B. Integrated circuit sockets. 4,695,107, Cl. 439-83.000.

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Lessard, William W.: *See*—
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Brandt, Henry R.; Gannon, Patrick M.; Leung, Wan L.; and Marchini, Timothy R., 4,695,950, Cl. 364-200.000.

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Hansen, Terris L.; Hyatt, Wayne E.; and Leung, Wu-Hon F., 4,695,977, Cl. 364-900.000.

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Levine, Michael R.; Russo, James T.; Cairo, Anthony C.; and Rigotti, Victor H., to Honeywell Inc. Manual switch for altering a parameter in opposite directions based on length of time of switch actuation. 4,695,942, Cl. 364-188.000.

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Levkov, Biagoje: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

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Li, Hsin L.; and Prevorsek, Dusan C., to Allied Corporation. Apparatus for extruding small quantities of material. 4,695,240, Cl. 425-207.000.

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Jehle, Franz; and Meinel, Holger, 4,695,842, Cl. 342-59.000.

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Focke, Heinz; and Liedtke, Kurt, 4,694,714, Cl. 83-13.000.

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Becker, Hans; and Linde, Gerhard, 4,695,349, Cl. 203-26.000.
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Lindig, Markus: *See*—
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.

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Anthony, Thomas R.; Lindner, Philip A.; and Tucker, Jewell G., 4,695,760, Cl. 313-348.000.

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Clauss, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,695,629, Cl. 544-2.000.

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Tyree, Lewis, Jr., 4,695,302, Cl. 62-10.000.

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Liu, Leland L.; and Touhsaent, Robert E., to Mobil Oil Corporation. Coated, oriented, polymer film laminate. 4,695,503, Cl. 428-207.000.

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Crosby, Jane M.; and Hutchins, MaryGail K., 4,695,602, Cl. 524-439.000.

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Lockwood, James M.: *See*—
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Loctite (Ireland) Limited: *See*—
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Lohnherr, Ludger: *See*—
Hense, Heinrich; Blasczyk, Gotthardt; Eickholt, Hubert; and Lohnherr, Ludger, 4,694,994, Cl. 241-79.100.

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Long, Charles A., Jr., to Long Enterprises, Inc. Apparatus and process for rapid sewage sludge separation. 4,695,388, Cl. 210-760.000.

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Long, Kenneth A.: *See*—
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Longreen Limited: *See*—
Hung, Lam H., 4,694,815, Cl. 124-27.000.

Loos, Herbert; and Erhardt, Manfred, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Method for the precision working of the tooth system of bevel gears. 4,694,617, Cl. 51-287.000.

Loosen, Ron. Floppy diskette protection device. 4,695,911, Cl. 360-133.000.

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Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,695,653, Cl. 564-505.000.

Lorenz Bolz GmbH & Co.: *See*—
Balleis, Peter, 4,695,263, Cl. 446-256.000.

Lowi, Alvin, Jr. Compression ignition engine fumigation system. 4,694,802, Cl. 123-431.000.

Lown, Harold, to General Electric Company. Centrifugal compressor with injection of a vaporizable liquid. 4,695,224, Cl. 415-116.000.

Lowry, Stephen R.: *See*—
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Lubrizol Corporation, The: *See*—
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Pruneda, Domingo C., 4,694,795, Cl. 123-373.000.

Lucassen, Guenter: *See*—
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Luccarelli, Domenick, Jr.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Vock, Manfred H., 4,695,473, Cl. 426-535.000.

Luhrmann, Johannes: *See*—
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Lutich, James L.; and Zarkovacki, John. Cabinet having a retractable bed. 4,694,518, Cl. 5-136.000.

Lum, Kin K.: *See*—
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Vanier, Noel R.; and Lum, Kin K., 4,695,286, Cl. 8-471.000.

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Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Engine exhaust particulate ignitor construction. 4,695,429, Cl. 422-49.000.

Lutron Electronics Co. Inc.: *See*—
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Lynch, Gary J.; and Yang, Chen-Hsyong, to Monsanto Company. Recovery of phenol from aqueous solution. 4,695,410, Cl. 260-410.500.

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Maccioni, Roberto: *See*—
Flosi, Corrado; Gobbi, Alberto; Maccioni, Roberto; and Simonetta, Guerrieri, 4,694,505, Cl. 2-2.000.

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Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, 4,694,585, Cl. 33-502.000.

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Broughton, George L.; and Macier, James E., 4,695,261, Cl. 440-900.000.

MacKay, Joseph H., Jr. Disposable depressed center grinding wheel having an integral mounting hub. 4,694,615, Cl. 51-168.000.

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Macleod, Robert B., Jr., to Shape Inc. Tape cassette assembly tray. 4,694,950, Cl. 198-465.300.

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Ryan, John O., 4,695,901, Cl. 380-5.000.

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Ueno, Hideo; Hattori, Hiroshi; Maeda, Kumiko; and Yamada, Keiko, 4,695,172, Cl. 400-83.000.

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Kotaka, Fumitaka; and Maeda, Takanori, 4,695,158, Cl. 356-123.000.

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Graf, Lothar; Maerte, Leo; and Skorka, Thomas, 4,694,977, Cl. 222-259.000.

Magami, Masato; Saeki, Kazumi; Miura, Takanori; and Inoue, Takeshi, to Yoshitomi Pharmaceutical Industries, Ltd. Phthalate compounds. 4,695,649, Cl. 560-86.000.

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Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.

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Magnusson, Dan A.: *See*—
Berglund, Bengt G.; Falk, Karl-Erik L.; Magnusson, Dan A.; Nilson, Nils B.; and Nilsson, Ake S., 4,695,272, Cl. 604-84.000.

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Mahapatra, Amaresh; McMahon, Donald H.; Robinson, William C.; and Sanford, Norman A., to Polaroid Corporation. Integrated optic resonant structres and fabrication method. 4,695,121, Cl. 350-96.120.

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Tuominen, Francis W.; Maier, Helmut K.; and Howland, Warren W., 4,695,453, Cl. 424-81.000.

Mairot, Guy, to S.c.a.i.m.e. Instrument for measuring and recording forces. 4,694,922, Cl. 177-178.000.

Mais, Dale: *See*—
Eller, Thomas D.; Halushka, Perry V.; Knapp, Daniel R.; and Mais, Dale, 4,695,647, Cl. 560-53.000.

Maistrovich, Anthony R.: *See*—
Engler, David A.; and Maistrovich, Anthony R., 4,695,608, Cl. 525-508.000.

Makino, Hiroshi; Yoshino, Tsunemi; Kihara, Tadaharu; and Takashima, Akira, to West Electric Company, Ltd. Automatic focusing apparatus. 4,695,893, Cl. 358-227.000.

Makino, Osamu: *See*—
Watanabe, Hirotoshi; Makino, Osamu; and Ishida, Toru, 4,695,504, Cl. 428-209.000.

Malashenko, Leon: *See*—
Hepburn, James; and Malashenko, Leon, 4,694,744, Cl. 100-214.000.

Malburg, Werner: *See*—
Seidel, Albert; and Malburg, Werner, 4,694,655, Cl. 62-51.000.

Mallary, Michael L., to Digital Equipment Corporation. Method for producing magnetic heads. 4,695,351, Cl. 204-15.000.

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Wijayarthna, Bandula; and Newman, Glenn E., 4,694,838, Cl. 128.659.000.

Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,695,817, Cl. 338-4.000.

Malm, Robert E., to Northrop Corporation. Infrared imaging array employing metal tabs as connecting means. 4,695,715, Cl. 250-211.000.

Mamont, Pierre: *See*—
Gerhart, Fritz; and Mamont, Pierre, 4,695,654, Cl. 564-510.000.

Mannesmann Aktiengesellschaft: *See*—
Gugel, Bernd; Niebel, Harald; and Ott, Hubert, 4,695,174, Cl. 400-124.000.

Mannesmann Kienzle GmbH: *See*—
Gorner, Horst; Furstwangler, Walter; and Uebeck, Walter, 4,695,048, Cl. 271-122.000.

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Rott, Horst, 4,694,862, Cl. 137-625.500.

Mans, Rusty J., to University of Florida. ATP: polynucleotide adenylyltransferase enzyme and method of preparation thereof. 4,695,550, Cl. 435-194.000.

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Sengal, M. Marc; and Hinchman, Steven B., 4,694,904, Cl. 166-252.000.

Marbetech Corporation: *See*—
Dick, Franklin A., 4,694,685, Cl. 73-104.000.

Marburg, Stephen; Tolman, Richard L.; and Kniskern, Peter J., to Merck & Co., Inc. Covalently-modified polyanionic bacterial polysaccharides, stable covalent conjugates of such polysaccharides and immunogenic proteins with bigeneric spacers, and methods of preparing such polysaccharides and conjugates and of coafirming covalency. 4,695,624, Cl. 530-395.000.

Marchetti, Augusto. Machine for sealing cardboard boxes of constant width. 4,694,635, Cl. 53-137.000.

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Brandt, Henry R.; Gannon, Patrick M.; Leung, Wan L.; and Marchini, Timothy R., 4,695,950, Cl. 364-200.000.

Marchio, Fabio: *See*—
Mensiti, Pietro; and Marchio, Fabio, 4,695,786, Cl. 323-303.000.

Marchitto, Michael J.; and Bocciarelli, Louis R., to United Technologies Corporation. Helicopter rotor backup damper system. 4,695,226, Cl. 416-106.000.

Marinho, John: *See*—
Mastriani, Dennis; Jacoby, Donald; Weise, Jeanne; Linick, Bruce; Marinho, John; and DeSantis, Charles M., 4,696,053, Cl. 455-67.000.

Mariol, James F., to Fairdale Orthodontic Company. Breakaway orthodontic face bow appliance. 4,695,250, Cl. 433-5.000.

Marks, George R. Reversible mortise lock. 4,695,082, Cl. 292-169.160.

Marot, Lajos K. D.: *See*—
Leth-Olson, Henrik; and Marot, Lajos K. D., 4,695,691, Cl. 200-303.000.

Marozzi, Alfred A. Print head operating mechanism. 4,694,747, Cl. 101-301.000.

Marsh, Norman F.: *See*—
Fleckenstein, Phillip P.; and Marsh, Norman F., 4,695,685, Cl. 200-61.210.

Marshall, Christopher B., to U.S. Philips Corporation. RF tuning circuit which provides image frequency rejection. 4,696,055, Cl. 455-118.000.

Marshall, Neil A., to Hughes Aircraft Company. Open fault location system for photovoltaic module strings. 4,695,788, Cl. 324-527.000.

Martin, Ronald G.: *See*—
Trocciola, John C.; Powers, Joseph; and Martin, Ronald G., 4,695,518, Cl. 429-12.000.

Martinola, Friedrich: *See*—
Oeckl, Siegfried; Mitschker, Alfred; Lange, Peter M.; and Martinola, Friedrich, 4,695,556, Cl. 502-11.000.

Maruyama, Hiromi: *See*—
Aoyama, Motoo; Maruyama, Hiromi; Umegaki, Kikuo; and Uchikawa, Sadao, 4,695,425, Cl. 376-435.000.

Maruyama, Hiroshi; Mizushima, Kunio; Sakemoto, Akito; and Umebayashi, Nobuhiro, to Hitachi Maxell, Ltd. Recording disc cartridge having an improved hub assembly. 4,695,910, Cl. 360-133.000.

Mary, Donald J., to United States of America, Army. Method for determining the angular dimensions of a scene recorded by a video system. 4,695,892, Cl. 358-225.000.

Masaki, Shinzaburo: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaseoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.

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Fretz, Walter; and Hefti, Walter, 4,695,000, Cl. 242-18.0DD.

Masheff, Michael S.; and Sanders, David E., to E-Systems, Inc. Quadrature signal generator having digitally-controlled phase and amplitude correction. 4,696,017, Cl. 375-60.000.

Massingill, Larry W.; and Perkins, Derrick O., to OnLine Computer Systems Inc. Apparatus for generating signals synchronized to an unstable external signal. 4,695,805, Cl. 328-72.000.

Maston, Donald M.; and Mertz, Kenneth H., to Chrysler Motors Corporation. Printed circuit board, edgeboard connector therefor. 4,695,112, Cl. 439-350.000.

Mastriani, Dennis; Jacoby, Donald; Weise, Jeanne; Linick, Bruce; Marinho, John; and DeSantis, Charles M., to Canadian Marconi Corporation. Aatenna alignment system and method. 4,696,053, Cl. 455-67.000.

Masuhara, Kenichi; Yamayoshi, Kazuo; and Wakabayashi, Kouji, to Nisshin Steel Co., Ltd. Heat resistant precoated steel sheet and process for the production thereof. 4,695,516, Cl. 428-623.000.

Masui, Toshiyuki: *See*—
Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, 4,696,008, Cl. 371-47.000.

Masumoto, Mitukiko; Yanada, Shigeo; and Kinugawa, Tadami, to Mitsubishi Gas Chemical Company, Inc. Copolycarbonate resin from branched chain alkylene bis phenol. 4,695,620, Cl. 528-204.000.

Mathews, Will W., to Cummins Engine Company, Inc. Method of remanufacturing a rock drill bit. 4,694,551, Cl. 29-402.080.

Mathis, Joseph R.: *See*—
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Mathis, Ronald F., to General Dynamics Electronics Division. RF frequency spectrum analyzer subsystem. 4,695,790, Cl. 324-77.00K.

Matolcsy, Gyorgy: *See*—
Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,309, Cl. 71-88.000.
Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,313, Cl. 71-100.000.

Matsubara, Yasuko: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Matsuda, Hideo: *See*—
Tsunoda, Yoshiaki; and Matsuda, Hideo, 4,695,871, Cl. 357-74.000.

Matsuda, Hiroshi: *See*—
Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, 4,695,717, Cl. 250-213.00R.

Matsui, Kunio; Fukase, Hisahiko; and Nomura, Akihiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Dual roll type continuous casting machine. 4,694,887, Cl. 164-428.000.

Matsui, Susumu: *See*—
Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.

Matsuki, Yuji: *See*—
Ichikawa, Wataru; Matsuki, Yuji; Hirata, Yoshiaki; and Ito, Mikiya, 4,695,235, Cl. 425-29.000.

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Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, 4,694,749, Cl. 101-426.000.

Matsumoto, Tokikazu, to Matsushita Electric Industrial Co., Ltd. Video signal processing apparatus for compensating for time differences between luminance and chrominance signals of a PAL system. 4,695,877, Cl. 358-36.000.

Matsumoto Yoshiaki; Yamagata, Shinji; and Sagihara, Kazuyoshi, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,695,814, Cl. 337-77.000.

Matsumoto, Yukihiro: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, 4,694,803, Cl. 123-440.000.

Matsunaga, Satoshi: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Matsushige, Hiromi: *See*—
Momata, Kazuhiro; Dekura, Yoshinori; Honzawa, Tadashi; and Matsushige, Hiromi, 4,695,909, Cl. 360-122.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Masahiro; and Hashima, Akio, 4,695,900, Cl. 358-310.000.
Inaji, Toshio; Okamoto, Hiroshi; and Yokobori, Nobuyoshi, 4,695,907, Cl. 360-107.000.
Matsumoto, Tokikazu, 4,695,877, Cl. 358-36.000.
Nishimura, Tsutomu; Nakatani, Seiichi; Yuhaku, Satoru; and Ishida, Toru, 4,695,403, Cl. 252-513.000.
Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, 4,694,573, Cl. 29-846.000.
Tachita, Ryobun; and Teranishi, Akio, 4,696,058, Cl. 455-277.000.
Takagi, Yuuji; Satoh, Isao; and Sugimura, Tatsuo, 4,695,993, Cl. 369-54.000.
Watanabe, Hirotoshi; Makino, Osamu; and Ishida, Toru, 4,695,504, Cl. 428-209.000.

Matsushita Electric Works, Ltd.: *See*—
Komatsu, Teruaki; Kobayashi, Kiyoshi; Tatsu, Kunihiko; and Shibata, Shoichi, 4,695,065, Cl. 279-60.000.
Nobutoki, Kazuhiro; and Ono, Kenji, 4,695,813, Cl. 335-78.000.

Matsushita Electronics Corporation: *See*—
Ogasawara, Toshitaka; Nohmi, Kazumasa; Honmoh, Masao; and Iseki, Yukito, 4,695,763, Cl. 313-487.000.

Matsushita, Mitsuo, to Mita Industrial Co., Ltd. Doctor blade positioning in electrophotographic copying machines. 4,695,153, Cl. 355-3.0DD.

Matsushita, Soichi: *See*—
Kato, Kenji; Matsushita, Soichi; and Nakanishi, Kiyoshi, 4,694,794, Cl. 123-306.000.

Mattel, Inc.: *See*—
Crosby, Michael A.; and Foss, Art J., 4,695,262, Cl. 446-236.000.

Matthews, John C.: *See*—
Anderson, Paul T.; Irwin, Lawrence; Matthews, John C.; and Paugh, Charles E., 4,694,634, Cl. 53-88.000.

Mattis, Donald J.: *See*—
Lupoli, Peter J.; and Mattis, Donald J., 4,695,429, Cl. 422-49.000.

Matumura, Hiroyoshi: *See*—
Ishida, Koji; and Matumura, Hiroyoshi, 4,695,122, Cl. 350-96.120.

Matuska, David G., to United Technologies Corporation. Filament wound structure having filament wound reinforcing rings for use as a torque drive. 4,695,340, Cl. 156-161.000.

Matuska, David G.; and Fredenburgh, Evan A., to United Technologies Corporation. Filament wound structure for use as a torque drive. 4,695,341, Cl. 156-161.000.

Matz, James: *See*—
Cohen, Theodore; and Matz, James, 4,695,584, Cl. 514-456.000.

Maurer, Fritz; and Grohe, Klaus, to Bayer Aktiengesellschaft. Aminoacrylic acid derivatives. 4,695,646, Cl. 560-43.000.

Maurer, William C.: *See*—
McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,694,913, Cl. 175-61.000.

Max, Arnold: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Maxwell Laboratories, Inc.: *See*—
Dunn, Joseph E.; and Pearlman, Jay S., 4,695,472, Cl. 426-237.000.

Mayer, Ulrich: *See*—
Schleupen, Richard; Mayer, Ulrich; Bauer, Bernhard; and Langner, Arnd M., 4,696,002, Cl. 371-12.000.

Mayor, Jean-Michel; Steffen, Jurg; and Wuthrich, Peter, to Larassay Holding AG. Method of, and apparatus for, generating a predetermined pattern using laser radiation. 4,695,698, Cl. 219-121.00L.

Mays, Alfred T., to Chicopee. Method of making water impervious materials. 4,695,334, Cl. 156-62.200.

Mazda Motor Corporation: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.
Kikuchi, Toshiyuki; and Yamamoto, Koichi, 4,694,709, Cl. 74-866.000.
Yagii, Koji; Miyata, Jun; and Takasuga, Shunzo, 4,695,699, Cl. 219-121.0LD.

McCafferty, Stanley E. Platform assembly for slanted ladder. 4,695,023, Cl. 248-238.000.

McCarroll, John J.: *See*—
Hall, Antony H. P.; and McCarroll, John J., 4,695,663, Cl. 585-417.000.

McClelland, Sandra K.; Conrad, Neal D.; and Desai, Nitin V., to RCA Corporation. Seal for liquid crystal display. 4,695,490, Cl. 428-1.000.

McCullen, Carol A. Bingo game marking template. 4,695,057, Cl. 273-269.000.

McCullough, John W.: *See*—
Blevins, Ballard J.; Kulpa, William G.; Mathis, Joseph R.; and McCullough, John W., 4,695,948, Cl. 364-200.000.

McCumber, Roger D.: *See*—
Bonin, Wayne A.; McCumber, Roger D.; and Teder, Rein S., 4,694,687, Cl. 73-116.000.

McCurry, Lynn E.: *See*—
Nalewajek, David; Kim, Jung T.; and McCurry, Lynn E., 4,695,522, Cl. 429-206.000.

McDaniel, Steven G., to United States of America, Army. Fiber optic guided missile aimer. 4,694,728, Cl. 89-1.110.

McDarren, Robert S.: *See*—
Simmel, Thomas L.; Crossley, David W.; and Morehouse, Mark N., 4,695,267, Cl. 446-462.000.

McDermott International, Inc.: *See*—
Montgomery, George J., IV; and Aghili, Hafez K., 4,695,303, Cl. 62-24.000.

McDermott, Michael G., to Bell of Pennsylvania. Encapsulation and insulation of electronic circuit board structures. 4,695,926, Cl. 361-395.000.

McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., to Gas Research Institute. Guided earth boring tool. 4,694,913, Cl. 175-61.000.

McDonnell, Damien G.: *See*—
Balkwill, Peter H.; Bishop, David I.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G., 4,695,131, Cl. 350-350.00R.

McEvoy, Alfred P.: *See*—
Pruden, Charles W.; McEvoy, Alfred P.; and McEvoy, Charles S., 4,694,612, Cl. 49-445.000.

McEvoy, Charles S.: *See*—
Pruden, Charles W.; McEvoy, Alfred P.; and McEvoy, Charles S., 4,694,612, Cl. 49-445.000.

McGarrigle, Richard G.: *See*—
Sachs, Frederick; Auerbach, Anthony; McGarrigle, Richard G.; and Neil, James E., 4,695,709, Cl. 219-494.000.

McGeorge, Gram J., to Robershaw Controls Company. Electrically operated appliance controls and methods of making the same. 4,695,711, Cl. 219-506.000.

McGimpsey, Samuel B., to Vaal Reefs Mining and Exploration Co., Ltd. Cage deck. 4,695,219, Cl. 414-787.000.

McGinnis, Henry J. Tower and method of constructing a tower. 4,694,630, Cl. 52-649.000.

McGrath, John E. Method of clamping off a tubular member such as the neck of a balloon. 4,694,554, Cl. 29-450.000.

McKeown, James H. A., to British Telecommunications Public Limited Company. Correlator having spurious signal cancellation circuitry. 4,695,972, Cl. 364-819.000.

McKesson Corporation: *See*—
Hagan, Richard J., 4,694,975, Cl. 222-1.000.

McKinney, Donald L., to Boeing Company, The. Vacuum assembly for wire unwrapper. 4,694,998, Cl. 242-1.000.

McLeod, Marvin K., Jr. Convertible stuffed figure. 4,695,264, Cl. 446-321.000.

McLinn, David E.: *See*—
MacDonald, John B.; and McLinn, David E., 4,695,103, Cl. 312-18.000.

McMahon, Donald H.: *See*—
Mahapatra, Amaresh; McMahon, Donald H.; Robinson, William C.; and Sanford, Norman A., 4,695,121, Cl. 350-96.120.

McMurtry, Carl H.: *See*—
Korzekwa, Tadeusz M.; McMurtry, Carl H.; and Boecker, Wolfgang D. G., 4,695,294, Cl. 51-307.000.

Mechanical Technology Incorporated: *See*—
Vincent, Ronald J., 4,694,650, Cl. 60-520.000.

Medina, Antonio; and Zeevi, Yehoshua Y. Camera flash attachment for three dimensional imaging systems. 4,695,130, Cl. 350-132.000.

Medley, Frank W., III. Fluid filter having separable elements. 4,695,377, Cl. 210-132.000.

Medley, Travis D., Jr. Holder for eye glasses. 4,695,026, Cl. 248-316.500.

Medtronic, Inc.: *See*—
Meyerhoff, Mark E.; Fogt, Eric J.; and Untereker, Darrel F., 4,694,834, Cl. 128-635.000.
Rao, T. V.; and Samec, Robert C., 4,695,519, Cl. 429-52.000.

Meek, Thomas T.; and Blake, Rodger D., to United States of America, Energy. Mixture for producing fracture-resistant, fiber-reinforced ceramic material by microwave heating. 4,695,695, Cl. 219-10.55M.

Mehta, Bakulesh A.: *See*—
Morganstein, Sanford J.; Tuck, Edward F.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,696,028, Cl. 379-88.000.

Meier, Konrad: *See*—
Jahnke, Andreas; Ries, Gunter; and Meier, Konrad, 4,694,868, Cl. 140-92.100.

Meijer, Johan B. A., to Rodisc Intercessor Ltd. Scraper cleaning apparatus for reversible conveyor belts. 4,694,952, Cl. 198-499.000.

Meinel, Holger: *See*—
Jehle, Franz; and Meinel, Holger, 4,695,842, Cl. 342-59.000.

Meisner, Edward O.; and Romine, Charles F., to Eagle-Picher Industries, Inc. Valve stem seal. 4,695,061, Cl. 277-27.000.

Meister, Pierre-Andre ; Schmidli, Pierre; and Soltermann, Bertrand, to ETA SA Fabriques D'Ebauches. Electronic watch having two motors and comprising means for perpetually indicating the day of the month. 4,695,168, Cl. 368-31.000.

Melvin, Lawrence S., to Pfizer Inc. Tricyclic oxindole antiinflammatory agents. 4,695,571, Cl. 514-275.000.

Menaker, Mark: *See*—
Nineberg, Edward; and Menaker, Mark, 4,694,947, Cl. 193-34.000.
Mendonsa, Alvin A.; and Eshoff, Donald D. Clarinet stand. 4,695,022, Cl. 248-176.000.
Menendez, Rita J. Food carrier assembly. 4,694,961, Cl. 206-508.000.
Menniti, Pietro; and Marchio, Fabio, to SGS Microelettronica SpA. Voltage regulator for an alternator having an auxiliary stage for starting the alternator at a low rotational speed. 4,695,786, Cl. 323-303.000.
Merchant, David E., to Emhart Industries Inc. Valve supervisory switch. 4,695,686, Cl. 200-61.860.
Merchant, John: *See*—
Lees, David E. B.; and Merchant, John, 4,695,959, Cl. 364-458.000.
Merck & Co., Inc.: *See*—
Hannah, John; and Christensen, Burton G., 4,695,565, Cl. 514-206.000.
Kollonitsch, Janos; and Patchett, Arthur A., 4,695,588, Cl. 514-538.000.
Marburg, Stephen; Tolman, Richard L.; and Kaiskern, Peter J., 4,695,624, Cl. 530-395.000.
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S., 4,695,544, Cl. 435-119.000.
Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Process for the preparation of N,o-substituted mono-and/or polyurethanes. 4,695,645, Cl. 560-24.000.
Merlin Gerin: *See*—
Terracol, Claude; and Roulet-Debonnet, Jean-Pierre, 4,695,913, Cl. 361-13.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Gerhart, Fritz; and Mamont, Pierre, 4,695,654, Cl. 564-510.000.
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Berad; Strein, Klaus; and Roesch, Egon, to Boehringer Mannheim GmbH. Pyrrolobenzimidazoles, pharmaceutical compositions containing them and method of using them to treat certain heart and circulatory diseases. 4,695,567, Cl. 514-253.000.
Mertz, Kenneth H.: *See*—
Mastos, Donald M.; and Mertz, Kenneth H., 4,695,112, Cl. 439-350.000.
Menard, Robert M.: *See*—
Kerr, Randal H.; and Menard, Robert M., 4,696,003, Cl. 371-19.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Seidel, Albert; and Malburg, Werner, 4,694,655, Cl. 62-51.000.
Metcal, Inc.: *See*—
Busch, Paul F., 4,695,712, Cl. 219-535.000.
Krumme, John F., 4,695,713, Cl. 219-553.000.
Metme Communications: *See*—
Bloy, Graham P.; and Miramonti, John L., 4,695,825, Cl. 340-347.0SH.
Meyer, Victor E.: *See*—
Dorman, Linneaus C.; Meyer, Victor E.; and Wu, Marinda L., 4,695,295, Cl. 55-16.000.
Meyerhoff, Mark E.; Fogt, Eric J.; and Untereker, Darrel F., to Medtronic, Inc. Gas sensor. 4,694,834, Cl. 128-635.000.
Michel, Hartmut: *See*—
Flohrs, Peter; and Michel, Hartmut, 4,695,867, Cl. 357-46.000.
Gademann, Lothar; Hirt, Adam; Michel, Hartmut; Schmid, Hans-Dieter; and Schneider, Michael, 4,694,814, Cl. 123-644.000.
Microdot Inc.: *See*—
Berecz, Imre, 4,695,212, Cl. 411-85.000.
Microgon, Inc.: *See*—
Crosin, James J., 4,695,382, Cl. 210-436.000.
Mielke, Siegfried, to Kolbenschmidt AG. Piston for internal combustion engines. 4,694,813, Cl. 123-668.000.
Mieth, Guenther; and Schwarz, Ulf, to Siemens Aktiengesellschaft. Circuit arrangement for feeding an electrical load from a solar generator. 4,695,783, Cl. 323-222.000.
Mikami, Naoko: *See*—
Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, 4,695,651, Cl. 560-141.000.
Mikami, Takashi: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.
Mikhailovsky, Leonid; and Ramotar, Jay G., to Bridgefill Design Ltd. Concrete arch buried bridge. 4,695,187, Cl. 405-124.000.
Miki, Takahiro: *See*—
Ando, Hideki; and Miki, Takahiro, 4,695,826, Cl. 340-347.0DA.
Miki, Yutaka: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshibonu; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.
Milano, Pamela D.: *See*—
Heather, James B.; and Milano, Pamela D., 4,695,673, Cl. 368-110.000.
Miles, James E., to Isotechnologies, Inc. Valve system for exercise apparatus. 4,695,100, Cl. 303-10.000.
Miller, J. Wayne; and Ward, John W., to Union Oil Company of California. Desulferization process. 4,695,366, Cl. 208-91.000.
Miller, John C., Jr. Holder for side-handle baton with allen wrench. 4,694,981, Cl. 224-251.000.
Miller, Kevin P.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Vock, Manfred H., 4,695,473, Cl. 426-535.000.
Miller, Randolph F.: *See*—
Smith, David B.; and Miller, Randolph F., 4,695,050, Cl. 272-72.000.
Miller, Robert V., to Hewlett-Packard Company. Auto ranging of a frequency measuring instrument. 4,695,791, Cl. 324-78.00D.
Miller, Roy W., to Pullman Rail Leasing Inc. Pneumatic gate operator and outlet cap. 4,695,207, Cl. 406-130.000.
Miller, Russell S., to General Electric Company. Low cost intermediate radiation shield for a magnet cryostat. 4,694,663, Cl. 62-514.00R.
Millham, Ernest H.; Moser, John J.; Shushereba, John J.; and Visco, Gary P., to International Business Machines Corporation. Apparatus for reducing test data storage requirements for high speed VLSI circuit testing. 4,696,005, Cl. 371-27.000.
Mills, Floyd J. Reduced volume digital inclinometer. 4,694,584, Cl. 33-366.000.
Mimoto, Toshio; and Sakiyama, Keizo, to Sharp Kabushiki Kaisha. Monolithic semiconductor integrated circuit with programmable elements for minimizing deviation of threshold value. 4,695,745, Cl. 307-297.000.
Minelco, Inc.: *See*—
Hart, Robert D.; and Ambrozaitis, John J., 4,694,599, Cl. 40-449.000.
Minigrip, Inc.: *See*—
Ausnit, Steven; and Bentsen, Per, 4,694,959, Cl. 206-390.000.
Minnesota Mining and Manufacturing: *See*—
Pool, Daniel L., 4,695,006, Cl. 242-56.300.
Minnesota Mining and Manufacturing Company: *See*—
Delfino, Gerolamo; Franco, Simone; and Verdi, Cesare, 4,695,531, Cl. 430-513.000.
Engler, David A.; and Maistrovich, Anthony R., 4,695,608, Cl. 525-308.000.
Moris, Alfred H., 4,695,003, Cl. 242-55.19A.
Randklev, Ronald M., 4,695,251, Cl. 433-8.000.
Strand, Jerome E., 4,694,835, Cl. 128-640.000.
Minolta Camera Kabushiki Kaisha: *See*—
Hamaguri, Kenji, 4,694,833, Cl. 128-633.000.
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,695,155, Cl. 355-45.000.
Minor, James C., to Eastman Kodak Company. Corona-charging apparatus. 4,695,723, Cl. 250-325.000.
Miramonti, John L.: *See*—
Bloy, Graham P.; and Miramonti, John L., 4,695,825, Cl. 340-347.0SH.
Mistry, Keku M.: *See*—
Steigerwald, Robert L.; and Mistry, Keku M., 4,695,934, Cl. 363-17.000.
Misumi, Shikao: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.
Mita Industrial Co., Ltd.: *See*—
Matsushita, Mitsuo, 4,695,153, Cl. 355-3.0DD.
Mitani, Kazutami: *See*—
Itoh, Hajime; and Mitani, Kazutami, 4,695,592, Cl. 521-54.000.
Mitani, Tatsuro: *See*—
Inoue, Kazuhiko; Mitani, Tatsuro; and Kishita, Yoshihiro, 4,695,869, Cl. 357-71.000.
Mitchell, Arthur W. Gas or vapor dispersing apparatus. 4,694,604, Cl. 43-114.000.
Mitera, Richard T.: *See*—
Heideman, Robert J.; and Mitera, Richard T., 4,694,939, Cl. 188-287.000.
Mitschker, Alfred: *See*—
Oeckl, Siegfried; Mitschker, Alfred; Lange, Peter M.; and Martinola, Friedrich, 4,695,556, Cl. 502-11.000.
Mitsubishi Chemical Industries Limited: *See*—
Ninomiya, Kunihiro; Nitta, Isaei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, 4,695,568, Cl. 514-258.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ando, Hideki; and Miki, Takahiro, 4,695,826, Cl. 340-347.0DA.
Arinobu, Ichirou, 4,695,961, Cl. 364-483.000.
Higashino, Shigenori, 4,695,932, Cl. 363-14.000.
Kodai, Syojiro; Fujii, Noriaki; Gamo, Hiroshi; and Kobayashi, Bujirou, 4,695,925, Cl. 361-395.000.
Kumamoto, Toshio, 4,695,748, Cl. 307-355.000.
Matsumoto Yoshiaki; Yamagata, Shinji; and Sugihara, Kazuyoshi, 4,695,814, Cl. 337-77.000.
Ozaki, Yoshio; Tsurumoto, Kazuo; Yatomi, Takeshi; and Yamamoto, Masahiro, 4,695,696, Cl. 219-69.00P.
Tada, Hideaki, 4,695,938, Cl. 363-37.000.
Takeda, Masatoshi, 4,695,741, Cl. 307-643.000.
Tobita, Youichi, 4,695,746, Cl. 307-297.000.
Wataya, Seiji; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,694,806, Cl. 123-494.000.
Yamamoto, Yuuichi, 4,695,675, Cl. 174-15.0CA.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Masumoto, Mituhiko; Yanada, Shigeo; and Kinugawa, Tadami, 4,695,620, Cl. 528-204.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.
Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, 4,694,749, Cl. 101-426.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Itoh, Hajime; and Mitani, Kazutami, 4,695,592, Cl. 521-54.000.
Setsuie, Takashi; Otani, Takeji; and Yoshida, Kanji, 4,695,415, Cl. 264-29.200.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Degawa, Toru; Fujiwara, Koso; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.
Mitsui Sugar Co., Ltd.: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.
Miura, Hirohisa; Satoh, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, to Toyota Jidosha Kabushiki Kaisha. Metal distillation method utilizing double vaporization. 4,695,319, Cl. 75-63.000.
Miura, Takanori: *See*—
Magami, Masato; Saeki, Kazumi; Miura, Takanori; and Inoue, Takeshi, 4,695,649, Cl. 560-86.000.
Miyahara, Junji: *See*—
Mori, Nobufumi; Hosoi, Yuichi; Takahashi, Kenji; and Miyahara, Junji, 4,695,725, Cl. 250-327.200.
Miyahara, Masato: *See*—
Himono, Yusaku; Moriya, Yoshiaki; Miyahara, Masato; and Suzuki, Kazuhiro, 4,695,124, Cl. 350-96.200.
Miyaji, Naotaka: *See*—
Iwahara, Makoto; Miyaji, Naotaka; and Sakamoto, Atsushi, 4,696,043, Cl. 381-92.000.
Miyajima, Takeshi, to Hitachi Construction Machinery Co., Ltd. Method of measuring factor of stress concentration by utilizing ultrasound. 4,694,698, Cl. 73-570.000.
Miyake, Johji: *See*—
Hayashi, Souichi; Miyake, Johji; Koyama, Mototsugu; and Sakaguchi, Kanji, 4,695,329, Cl. 148-3.000.
Miyamoto, Masao: *See*—
Watanabe, Fumio; Komaki, Shojiro; Miyamoto, Masao; and Ito, Takao, 4,695,724, Cl. 250-292.000.
Miyamoto, Yasuhiko, to Fuji Jukogyo Kabushiki Kaisha. Fuel cock for an internal combustion engine. 4,694,810, Cl. 123-516.000.
Miyao, Masanobu: *See*—
Warabisako, Terunori; Ohkura, Makoto; and Miyao, Masanobu, 4,695,856, Cl. 357-4.000.
Miyaoka, Takashi: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.
Miyasaka, Katsuhiko: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.
Miyashita, Kunio: *See*—
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Miyashita, Yoshibonu: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshibonu; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.
Miyata, Jun: *See*—
Yagi, Koji; Miyata, Jun; and Takasuga, Shunzo, 4,695,699, Cl. 219-121.0LD.
Miyata, Teruo; and Noishiki, Yasuharu, to Koken Co., Ltd. Medical material. 4,695,281, Cl. 623-11.000.
Miyazawa, Katsuhiko: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, to Kabushiki Kaisha Kobe Seiko Sho. Screw rotor mechanism. 4,695,233, Cl. 418-83.000.
Mizumoto, Yukihiro: *See*—
Ishii, Hiroshi; Nakai, Syunzi; and Mizumoto, Yukihiro, 4,695,847, Cl. 346-1.100.
Mizuno, Akira; and Clements, Judson S., to Florida State University. Method of removing SO_2, NO_x and particles from gas mixtures using streamer corona. 4,695,358, Cl. 204-174.000.
Mizushima, Kunio: *See*—
Maruyama, Hiroshi; Mizushima, Kunio; Sakemoto, Akito; and Umebayashi, Nobuhiro, 4,695,910, Cl. 360-133.000.
Mizushina, Youichi, to Denkoh Co. Ltd. Vertical furnace for heat-treating semiconductor. 4,695,706, Cl. 219-390.000.
Mizutani, Takashi: *See*—
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ML Corporation: *See*—
Nineberg, Edward; and Menaker, Mark, 4,694,947, Cl. 193-34.000.
MLR Electronic: *See*—
Lamiraux, Christian, 4,695,843, Cl. 342-417.000.
Mobil Oil Corporation: *See*—
Darilek, Glenn T., 4,695,840, Cl. 340-825.054.
Derouane, E. G.; Dessau, R. M.; Heilweil, I. J.; and Kerr, G. T., 4,695,642, Cl. 556-14.000.
Graziani, Kenneth R.; Kyan, Chwan P.; Shih, Stuart S.; and Sowiak, Raymond M., 4,695,364, Cl. 208-59.000.
Jones, Lloyd G.; and Stowe, Lawrence R., 4,694,727, Cl. 86-20.150.
Liu, Leland L.; and Touhsaent, Robert E., 4,695,503, Cl. 428-307.000.
Mochida, Takashi: *See*—
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Mochizuki, Toshio: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,694,748, Cl. 101-401.100.
Mogi, Eiji: *See*—
Kanai, Hideo; Komba, Toshinori; and Mogi, Eiji, 4,694,571, Cl. 29-806.000.
Mohr, Viggo: *See*—
Hellgren, Lars G. I.; Mohr, Viggo; and Vincent, Jan G., 4,695,457, Cl. 424-94.000.
Mohri, Masakazu: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.
Molecular Diagnostics, Inc.: *See*—
Taylor, Peter W., 4,695,541, Cl. 435-18.000.
Moloney, Maurice M.: *See*—
Hilliard, Jeffrey L.; and Moloney, Maurice M., 4,695,547, Cl. 435-173.000.
Momata, Kazuhiro; Dekura, Yoshinori; Honzawa, Tadashi; and Matsushige, Hiromi, to Hitachi, Ltd. Magnetic head assembly. 4,695,909, Cl. 360-122.000.
Momiyama, Kikuo: *See*—
Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, 4,695,133, Cl. 350-427.000.
Momose, Yutaka: *See*—
Kobayashi, Daisaku; Itaba, Tunesaku; and Momose, Yutaka, 4,694,707, Cl. 74-606.00A.
Monaghan, Richard L.; Goetz, Michael A.; and Chang, Raymond S., to Merck & Co., Inc. Process for the preparation of cholecystokinin antagonists. 4,695,544, Cl. 435-119.000.
Monno, Asao; Watanabe, Kiyoo; and Kaneko, Kazuyuki, to Fuji Electric Co., Ltd.; and Fuji Facom Corporation and Kawasaki Steel Corporation. Tubular part wall thickness measuring device. 4,695,729, Cl. 250-358.100.
Monsanto Company: *See*—
Lynch, Gary J.; and Yang, Chen-Hsyong, 4,695,410, Cl. 260-410.900.
Montanari, Gerard M.; Baudelot, Francis E.; and Costes, Michel L., to International Business Machines Corporation. Device for performing wrap tests on a multiplex link in a data communication system. 4,695,997, Cl. 370-13.000.
Montaut, Jean P.: *See*—
Noguier, Jean P.; and Montaut, Jean P., 4,695,863, Cl. 357-38.000.
Montedison S.p.A.: *See*—
Albizzati, Enrico; Pettenati, Enrico; Zucchini, Umberto; and Cuffiani, Illaro, 4,695,558, Cl. 502-123.000.
Monteith, Robert C.; and Borgmann, Robert E., to Cincinnati Milacron Inc. Laser wrist. 4,695,701, Cl. 219-121.0LV.
Montgomery, George J., IV; and Aghili, Hafez K., to McDermott International, Inc. Method for recovery of natural gas liquids. 4,695,303, Cl. 62-24.000.
Moore Business Forms, Inc.: *See*—
Pretre, Roger, 4,695,077, Cl. 283-81.000.
Moorehead, Eric L.: *See*—
Ackelson, Donald B.; Moorehead, Eric L.; Ward, John W.; and Probst, Jon D., 4,695,365, Cl. 208-89.000.
Moosmann, Horst, to Gebruder Junghans GmbH. Explosive system for guided missiles and rocket projectiles. 4,694,751, Cl. 102-202.000.
Morehouse, Mark N.: *See*—
Simmel, Thomas L.; Crossley, David W.; and Morehouse, Mark N., 4,695,267, Cl. 446-462.000.
Morell, Joseph: *See*—
Petrini, Roland; and Morell, Joseph, 4,694,593, Cl. 36-120.000.
Morelli, Amedeo J.; and Gaylord, Francis L., to North American Philips Corporation. Method of manufacturing chip resistors with edge around terminations. 4,694,568, Cl. 29-620.000.
Morganstein, Sanford J.; Tuck, Edward F.; Mehta, Bakulesh A.; and Krakau, Herbert B., to Dytel Corporation. PBX Intercept and caller interactive attendant bypass system. 4,696,028, Cl. 379-88.000.
Mori, Katsuhiro: *See*—
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Mori, Kenji: *See*—
Enzaki, Yoshiki; Kitahara, Kazuki; Terasaka, Satoru; Mori, Kenji; and Kimura, Takeshi, 4,695,247, Cl. 431-352.000.
Mori, Masashi; Nonaka, Shingo; and Nagai, Seiji, to Shinagawa Refractories Co., Ltd. Apparatus for mixing and pumping slurry. 4,695,167, Cl. 366-181.000.
Mori, Mitio: *See*—
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, 4,695,466, Cl. 424-456.000.
Mori, Nobufumi; Hosoi, Yuichi; Takahashi, Kenji; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Method of detecting a focus defect of an electron microscope image. 4,695,725, Cl. 250-327.200.
Mori, Yasushi, to Nissan Motor Company, Limited. System and method for controlling fuel supply to a vehicular internal combustion engine with fuel supply cutoff function. 4,694,796, Cl. 123-325.000.

Mori, Yasuhi, to Nissan Motor Company, Limited. Fuel injection control system for internal combustion engine with asynchronous fuel injection for fuel supply resumption following temporary fuel cut-off. 4,694,807, Cl. 123-501.000.
Mori, Yoshiaki: *See*—
Kimura, Takayoshi; Tsuyuguchi, Seiichi; and Mori, Yoshiaki, 4,695,317, Cl. 75-24.000.
Mori, Yuichi: *See*—
Watanabe, Koji; Okamoto, Miyoshi; Mori, Yuichi; and Noishiki, Yasuharu, 4,695,280, Cl. 623-1.000.
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, to Research Association for Petroleum Alternatives Development. Crystalline aluminosilicate ISI-6. 4,695,440, Cl. 423-328.000.
Moris, Alfred H., to Minnesota Mining and Manufacturing Company. Self adjusting endless loop tape cartridge. 4,695,003, Cl. 242-55.19A.
Morishita Jintan Co., Ltd.: *See*—
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, 4,695,466, Cl. 424-456.000.
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, to Morishita Jintan Co., Ltd.; and Fujisawa Pharmaceutical Co., Ltd. Multiple soft capsules and production thereof. 4,695,466, Cl. 424-456.000.
Morita, Hiroyuki, to Kabushiki Kaisha Toshiba. Frequency converting circuit. 4,696,056, Cl. 455-182.000.
Morita, Tatsuo, to Nissan Motor Company, Limited. System and method for controlling ignition timing for an internal combustion engine. 4,694,800, Cl. 123-425.000.
Moriwaki, Masayoshi, to Fuji Photo Film Co., Ltd. Dustproof liner for a magnetic disc cartridge. 4,695,912, Cl. 360-133.000.
Moriya, Yoshiaki: *See*—
Himono, Yusaku; Moriya, Yoshiaki; Miyahara, Masato; and Suzuki, Kazuhiro, 4,695,124, Cl. 350-96.200.
Moriyama, Masatoshi; and Ohira, Masaki, to NEC Corporation. Method of making a bipolar transistor. 4,695,328, Cl. 437-31.000.
Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Method of correcting errors in binary coded words. 4,696,007, Cl. 371-37.000.
Morris, Arthur J.; and Newton, Donald E., to Camco, Incorporated. Method and apparatus of injecting fluid into a well conduit by coil tubing. 4,694,908, Cl. 166-310.000.
Morsbach, Martin: *See*—
Brauers, Bert; and Morsbach, Martin, 4,695,064, Cl. 277-139.000.
Mort, Edgar A., to Inter-Lock Steel Company, Inc. Method of making a connector plate. 4,694,675, Cl. 72-325.000.
Morton, Alec J.: *See*—
Renner, Karl H.; and Morton, Alec J., 4,695,970, Cl. 364-724.000.
Morton Metalcraft Company: *See*—
Bridgwater, Jon, 4,694,818, Cl. 126-121.000.
Morton Thiokol, Inc.: *See*—
Amirsakis, Charles J., 4,695,604, Cl. 525-28.000.
Moser, John J.: *See*—
Millham, Ernest H.; Moser, John J.; Shushereba, John J.; and Visco, Gary P., 4,696,005, Cl. 371-27.000.
Mosheev, Robert R.: *See*—
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Wohrl, Bernhard, 4,694,895, Cl. 165-136.000.
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Breeden, Robert L., 4,696,051, Cl. 455-33.000.
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Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Bernd; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.
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Murata Kikai Kabushiki Kaisha: *See*—
Nakagawa, Osamu, 4,694,949, Cl. 198-351.000.
Murata Manufacturing Co., Ltd.: *See*—
Tanaka, Yasuhiro, 4,695,756, Cl. 310-355.000.
Murata, Shuji: *See*—
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Kramer, David M.; Compton, Russell A.; Strenk, Lawrence M.; and Murdoch, James B., 4,695,800, Cl. 324-309.000.
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Lau, Robert S.; Murphy, Roy E.; and Quick, Robert G., Jr., 4,695,772, Cl. 315-370.000.
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Musil, Edward C., to Flexible Steel Lacing Company. Safety strip for wire hook fasteners. 4,694,958, Cl. 206-340.000.
Musso, Giorgio, to Elettronica San Giorgio-Elsag S.p.A. Image scanning process and unit for detecting set forms. 4,696,049, Cl. 382-22.000.
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Mycogen Corporation: *See*—
Barnes, Andrew C.; and Cummings, Susan G., 4,695,455, Cl. 424-93.000.
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Nadolski, Klaus: *See*—
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.
Nagae, Kiyoshi, to Tokai TRW & Co., Ltd. Vehicular speed responsive power steering device. 4,694,927, Cl. 180-132.000.
Nagai, Kunio: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.
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Kanai, Hideo; Komba, Toshinori; and Mogi, Eiji, 4,694,571, Cl. 29-896.000.
Nagashima, Nao, to Canon Kabushiki Kaisha. Image processing system. 4,695,895, Cl. 358-280.000.
Nagata, Shoji: *See*—
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Nagy, Monte L., Jr.; and Cole, Charles J., to Allied Corporation. Method of imparting stain resistance to colored substrates which include a filamentary material. 4,695,497, Cl. 428-96.000.
Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, to Ishida Scales Manufacturing Company, Ltd. Combination weighing system and method. 4,694,920, Cl. 177-25.000.
Nakagawa, Osamu, to Murata Kikai Kabushiki Kaisha. Article selecting system. 4,694,949, Cl. 198-351.000.
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Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, 4,694,920, Cl. 177-25.000.
Nakagiri, Takashi: *See*—
Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, 4,695,717, Cl. 250-213.00R.
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Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Nakai, Syunzi: *See*—
Ishii, Hiroshi; Nakai, Syunzi; and Mizumoto, Yukihiro, 4,695,847, Cl. 346-1.100.
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Abe, Akira; Nakajima, Junya; and Nishikawa, Toshihiro, 4,695,529, Cl. 430-351.000.
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Watanabe, Hideo; and Nakajima, Nobuyoshi, 4,695,726, Cl. 250-227.200.
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, to Takeda Riken Kogyo Kabushikikaisha. Logic analyzer. 4,696,004, Cl. 371-25.000.
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Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.
Nakakura, Yukinori; and Kato, Nobuyuki, to Sharp Kabushiki Kaisha. MOSFET semiconductor device and manufacturing method thereof. 4,695,479, Cl. 437-228.000.
Nakamizo, Hiromitsu; and Mochida, Takashi, to Sony Corporation. Rotation sensor with co-planar velocity and position responsive elements. 4,695,795, Cl. 324-208.000.
Nakamura, Kotaro; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for forming image using silver halide color photographic light-sensitive material. 4,695,530, Cl. 430-381.000.
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Ikeda, Koichi; Nakamura, Kozi; and Okabe, Toshihiro, 4,695,947, Cl. 364-200.000.
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Hara, Hiroyuki; Nakamura, Michinori; and Sugimoto, Yasuhiro, 4,695,750, Cl. 307-475.000.
Nakamura, Norio: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,694,748, Cl. 101-401.100.
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Kato, Kenji; Matsushita, Soichi; and Nakanishi, Kiyoshi, 4,694,794, Cl. 123-306.000.
Nakanishi, Yasuhiro; and Kawai, Shoichi, to Sharp Kabushiki Kaisha. Combined electronic table preparation and graph drawing apparatus. 4,695,976, Cl. 364-900.000.
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, to Toyota Jidosha Kabushiki Kaisha. Method and system for internal combustion engine oxygen sensor heating control with time smoothing. 4,694,809, Cl. 123-489.000.
Nakashima, Keishi: *See*—
Hatanai, Takashi; and Nakashima, Keishi, 4,695,512, Cl. 428-408.000.
Nakatani, Seiichi: *See*—
Nishimura, Tsutomu; Nakatani, Seiichi; Yuhaku, Satoru; and Ishida, Toru, 4,695,403, Cl. 252-513.000.
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Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.
Nakatsukasa, Walter M., to Eli Lilly and Company. Culture and process for producing A41030 antibiotics. 4,695,545, Cl. 435-119.000.
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Nakayama, Hiroki; Sato, Yasuhisa; and Yamada, Yasuyuki, to Canon Kabushiki Kaisha. Compact photographic lens. 4,695,134, Cl. 350-432.000.
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,695,533, Cl. 430-558.000.
Nalewajek, David; Kim, Jung T.; and McCurry, Lynn E., to Allied Corporation. Aqueous battery with $(C_y F_x Cl_2)_n$ cathode. 4,695,522, Cl. 429-206.000.
Nanbu, Morio: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.
Narath, William R.: *See*—
Caswell, Michael L.; Corr, James J.; Dobrovolny, Mark S.; Lander, Lynn H.; Narath, William R.; and Theiler, Richard F., 4,695,395, Cl. 252-121.000.
Narayanan, Krishnamoorthy: *See*—
Dabisch, Wolfgang H.; Kung, Peter; Muller, Siegfried R.; and Narayanan, Krishnamoorthy, 4,695,528, Cl. 430-290.000.
Narita, Ryuuho: *See*—
Yamashita, Kiyoshi; Aoshima, Terutaka; Narita, Ryuuho; and Imai, Masahiro, 4,695,710, Cl. 219-506.000.
Narumiya, Junichi: *See*—
Honma, Hiroshi; and Narumiya, Junichi, 4,695,734, Cl. 250-573.000.
Narusawa, Haruhiko: *See*—
Konagaya, Shigeji; Watanabe, Osamu; Kuzumoto, Hideshi; Tokai, Masaya; Narusawa, Haruhiko; and Kato, Yasuo, 4,695,383, Cl. 210-500.370.
Nash, Sheryl A.: *See*—
Friedlander, Randal H.; Nash, Sheryl A.; and Komitor, Greg A., 4,695,493, Cl. 428-40.000.
Nasu, Seiji: *See*—
Ogura, Yukio; and Nasu, Seiji, 4,695,833, Cl. 340-722.000.
National Coupling Company, Inc.: *See*—
Smith, Robert E., III, 4,694,859, Cl. 137-614.040.
National Starch and Chemical Corporation: *See*—
Zwiercan, Gary A.; Lacourse, Norman L.; and Lenchin, Julianne M., 4,695,475, Cl. 426-582.000.
Natsume, Toshio: *See*—
Miura, Hirohisa; Satoh, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,695,319, Cl. 75-63.000.
Navratil, Frank. Heat exchanger. 4,694,896, Cl. 165-142.000.
NCR Corporation: *See*—
Cabaniss, Frank W.; and Lockwood, James M., 4,695,808, Cl. 331-57.000.
Seevers, Daniel B.; and Robulich, John J., 4,694,725, Cl. 84-1.270.
Nebelung, Hermann H., to Emhart Industries, Inc. Baffle moving mechanism for use in a glassware manufacturing machine of the individual section type. 4,695,307, Cl. 65-242.000.
NEC Corporation: *See*—
Baba, Toshio; Mizutani, Takashi; and Ogawa, Masaki, 4,695,857, Cl. 357-16.000.
Fukuzo, Yukio; and Inoue, Yasukazu, 4,695,980, Cl. 365-222.000.
Kawai, Masato, 4,696,006, Cl. 371-27.000.
Koyabu, Kunihiro, 4,695,866, Cl. 357-42.000.
Moriyama, Masatoshi; and Ohira, Masaki, 4,695,328, Cl. 437-31.000.
Otani, Susumu, 4,696,057, Cl. 455-226.000.
Neefe, Charles W. Method of making a contact lens material which may be identified by colored fluorescence. 4,695,399, Cl. 252-301.350.
Nehring, Rudolf: *See*—
Otte, Werner; and Nehring, Rudolf, 4,695,660, Cl. 568-830.000.
Neil, Iain A., to Barr & Stroud Limited. Infrared optical system. 4,695,119, Cl. 350-1.200.
Neil, James E.: *See*—
Sachs, Frederick; Auerbach, Anthony; McGarrigle, Richard G.; and Neil, James E., 4,695,709, Cl. 219-494.000.
Nelson, Norvell J.: *See*—
Battey, James F.; Nelson, Norvell J.; and Barnett, Daniel J., 4,695,348, Cl. 156-647.000.
Nesheim, Ludwig D.: *See*—
Hanson, Daniel R.; and Nesheim, Ludwig D., 4,695,258, Cl. 439-67.000.
Nesmith, David V.: *See*—
Garcia, Armando; and Nesmith, David V., 4,694,605, Cl. 43-137.000.
Neste Oy: *See*—
Pulkkinen, Jorma, 4,695,188, Cl. 405-150.000.
Netzsch-Mohnopumpen GmbH: *See*—
Hantschk, Gunther, 4,695,040, Cl. 254-264.000.
Neves, Jason W.: *See*—
Lawrence, Alvah A.; and Neves, Jason W., 4,695,676, Cl. 174-22.00R.
New Mexico Tech Research Foundation: *See*—
Akashi, Tamotsu; and Sawaoka, Akira, 4,695,321, Cl. 75-243.000.
New, Richard, to Chevron Research Company. Flapper-type sealing system for a removable bottom founded structure. 4,695,192, Cl. 405-203.000.
New, Richard, to Chevron Research Company. Pad-type inflatable seal for a removable bottom founded structure. 4,695,196, Cl. 405-224.000.
New York Blood Center, Inc.: *See*—
Prince, Alfred M.; and Kim, Kwang S., 4,695,454, Cl. 424-89.000.
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr. Illuminated translucent golf ball. 4,695,055, Cl. 273-213.000.
Newcomb, Nelson F., Jr.: *See*—
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr., 4,695,055, Cl. 273-213.000.
Newman, Glenn E.: *See*—
Wijayarthna, Bandula; and Newman, Glenn E., 4,694,838, Cl. 128-638.000.
Newton, Donald E.: *See*—
Morris, Arthur J.; and Newton, Donald E., 4,694,908, Cl. 166-310.000.
Ney, Reuben E.; Pass, Raymond V.; and Yeager, Patrick F., to AMP Incorporated. Filtered electrical receptacle. 4,695,105, Cl. 439-95.000.
NGK Insulators, Ltd.: *See*—
Hattori, Isao; and Noiri, Hifuo, 4,695,242, Cl. 425-376.00R.
Kawasaki, Keiji, 4,694,689, Cl. 73-118.100.
NGK Spark Plug Co. Ltd.: *See*—
Banno, Hisao, 4,695,988, Cl. 367-154.000.
Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, 4,695,517, Cl. 428-698.000.
Nguyen, Vietson M.; Dhyanchand, P. John; and Thollot, Pierre, to Sundstrand Corporation. Multiphase DC-DC series-resonant converter. 4,695,933, Cl. 363-17.000.
Nicklas, Hans; and Pruzina, Christoph, to ISPO GmbH. Insulating board. 4,694,626, Cl. 52-309.120.
Nicolet Instrument Corporation: *See*—
Brierley, Philip R.; and Lowry, Stephen R., 4,695,727, Cl. 250-328.000.
Niebel, Harald: *See*—
Gugel, Bernd; Niebel, Harald; and Ott, Hubert, 4,695,174, Cl. 400-124.000.
Niethammer, Kurt: *See*—
Faust, Eberhard; Niethammer, Kurt; and Hammer, Ludwig, 4,695,095, Cl. 297-410.000.
Niikura, Masakazu: *See*—
Ouchi, Chiaki; Niikura, Masakazu; and Suenaga, Hiroyoshi, 4,694,985, Cl. 228-235.000.

Niles Parts Co., Ltd: *See*—
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Nilson, Nils B.: *See*—
Berglund, Bengt G.; Falk, Karl-Erik L.; Magnusson, Dan A.; Nilson, Nils B.; and Nilsson, Ake S., 4,695,272, Cl. 604-84.000.

Nilsson, Ake S.: *See*—
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Nilsson, Sture. Heating stove and method for the combustion of fuels in heating stoves. 4,694,817, Cl. 126-76.000.

Nineberg, Edward; and Menaker, Mark, to ML Corporation. Dump chute assembly. 4,694,947, Cl. 193-34.000.

Ninomiya, Kunihiro; Nitta, Isei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, to Mitsubishi Chemical Industries Limited. Thieno[2,3-d]pyrimidine derivatives and salts thereof. 4,695,568, Cl. 514-258.000.

Nippon Kogaku K. K.: *See*—
Ogasawara, Akira, 4,695,150, Cl. 354-448.000.
Terui, Nobuhiko; and Takahata, Hisatoshi, 4,695,148, Cl. 354-413.000.

Nippon Kogaku K.K.: *See*—
Kawahara, Atsushi; and Takatsu, Norihiko, 4,696,021, Cl. 377-58.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Ouchi, Chiaki; Niikura, Masakazu; and Suenaga, Hiroyoshi, 4,694,985, Cl. 228-235.000.

Nippon Soken, Inc.: *See*—
Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, 4,695,758, Cl. 313-130.000.
Takagi, Shigeru, 4,695,300, Cl. 55-485.000.

Nippon Steel Corporation: *See*—
Kudou, Takenori, 4,695,042, Cl. 266-226.000.

Nippon Tansan Gas Co., Ltd.: *See*—
Fumino, Ichiro, 4,694,850, Cl. 137-318.000.

Nippon Telegraph and Telephone Corporation: *See*—
Satoh, Hidetaka; Kurosawa, Hideyuki; Kamijoh, Yoshiaki; and Jyumonji, Hiromichi, 4,695,916, Cl. 361-56.000.

Nippondenso Co., Ltd.: *See*—
Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, 4,695,758, Cl. 313-130.000.
Okajima, Atushi; Yoshida, Hitoshi; Takeuchi, Yukihisa; and Fukutani, Masanori, 4,695,301, Cl. 55-523.000.

Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, to Nippondenso Co., Ltd.; Toyota Jidosha Kabushiki Kaisha; and Nippon Soken, Inc. Small-sized spark plug having a spark gap parallel to an axis running through the center electrode. 4,695,758, Cl. 313-130.000.

Nishihama, Takamichi; Okada, Kotaro; and Kadota, Shigekazu, to Dainippon Screen Mfg. Co., Ltd. Apparatus for securing a photosensitive sheet. 4,695,044, Cl. 269-21.000.

Nishikawa, Toshihiro: *See*—
Abe, Akira; Nakajima, Junya; and Nishikawa, Toshihiro, 4,695,529, Cl. 430-351.000.

Nishimoto, Tsuneo: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Nishimura, Tsutomu; Nakatani, Seiichi; Yuhaku, Satoru; and Ishida, Toru, to Matsushita Electric Industrial Co., Ltd. Thick film conductor composition. 4,695,403, Cl. 252-513.000.

Nishimura, Yukinobu: *See*—
Wataya, Seiji; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,694,806, Cl. 123-494.000.

Nishimura, Yukuo: *See*—
Hirai, Yutaka; Haruta, Masahiro; Nishimura, Yukuo; Matsuda, Hiroshi; and Nakagiri, Takashi, 4,695,717, Cl. 250-213.00R.

Nishino, Atsushi; Ikeda, Masaki; Watanabe, Yoshihiro; and Hiraka, Masahiro, to Matsushita Electric Industrial Co., Ltd. Method of forming electrically conductive circuit. 4,694,573, Cl. 29-846.000.

Nishitani, Kunihiko: *See*—
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, 4,695,233, Cl. 418-83.000.

Nishiyama, Hisaki: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.

Nishiyama, Shigeru: *See*—
Amemori, Hiroyuki; Nishiyama, Shigeru; and Iwamoto, Tetsuo, 4,694,702, Cl. 73-861.240.

Nissan Motor Company, Limited: *See*—
Hamai, Kyugo, 4,694,797, Cl. 123-339.000.
Hirano, Yoshinori; and Kubozuka, Takao, 4,694,784, Cl. 123-41.120.
Kato, Masaki; and Yamazaki, Tsutomu, 4,694,798, Cl. 123-339.000.
Kawakita, Tsunehiro; and Imajo, Minoru, 4,694,793, Cl. 123-196.00S.
Kikkawa, Masatoshi, 4,694,926, Cl. 180-132.000.
Mori, Yasushi, 4,694,796, Cl. 123-325.000.
Mori, Yasushi, 4,694,807, Cl. 123-501.000.
Morita, Tatsuo, 4,694,800, Cl. 123-425.000.
Murasihi, Masakazu, 4,695,097, Cl. 297-452.000.

Nisshin Steel Co., Ltd.: *See*—
Masuhara, Kenichi; Yamayoshi, Kazuo; and Wakabayashi, Kouji, 4,695,516, Cl. 428-623.000.

Nitta, Isei: *See*—
Ninomiya, Kunihiro; Nitta, Isei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, 4,695,568, Cl. 514-258.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Yamamoto, Hiraku; Suzuki, Toshimichi; Katayama, Shigeru; Uratsuka, Isao; and Asoshina, Eishi, 4,695,598, Cl. 523-400.000.

Nixon, Ralph D., to English Electric Valve Company Limited. Display arrangements. 4,695,764, Cl. 313-497.000.

Nixon, Ralph D., to English Electric Valve Company Limited. Display arrangements. 4,695,765, Cl. 313-497.000.

NL Chemicals, Inc.: *See*—
Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.

NL Industries, Inc.: *See*—
Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., 4,694,555, Cl. 29-451.000.

NL Petroleum Products Limited: *See*—
Barr, John D., 4,694,919, Cl. 175-393.000.

Nobutoki, Kazuhiro; and Ono, Kenji, to Matsushita Electric Works, Ltd. Polarized electromagnetic relay. 4,695,813, Cl. 335-78.000.

Nobutugu, Hideo: *See*—
Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, 4,694,920, Cl. 177-25.000.

Noda, Kimio; Ozeki, Kiyoshi; Furukawa, Hiroaki; and Watai, Katsunori, to Doryokuro Kakunenryo Kaihatsu Jigyodan; and Ohyo Koken Kogyo Co., Ltd. Local radiation exposure alarm apparatus. 4,695,730, Cl. 250-370.000.

Noda, Yasuhiko, to Alps Electric Co., Ltd. Switch with pivoting clip-type contacts. 4,695,692, Cl. 200-335.000.

Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, to Mitsubishi Jukogyo Kabushiki Kaisha. Helical guide apparatus usable for a gear shaper. 4,695,209, Cl. 409-42.000.

Noguchi, Yoji: *See*—
Takakura, Masaki; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,695,966, Cl. 364-521.000.

Noguier, Jean P.; and Montaut, Jean P., to Thomson CSF. Gateless protection thyristor with a thick, heavily doped central N-layer. 4,695,863, Cl. 357-38.000.

Nohmi, Kazumasa: *See*—
Ogasawara, Toshitaka; Nohmi, Kazumasa; Honmoh, Masao; and Iseki, Yukito, 4,695,763, Cl. 313-487.000.

Nohren, John E., Jr.; and Downes, Richard T., to Innova/Pure Water Inc. Water treatment apparatus. 4,695,379, Cl. 210-282.000.

Noiri, Hifuo: *See*—
Hattori, Isao; and Noiri, Hifuo, 4,695,242, Cl. 425-376.00R.

Noishiki, Yasuharu: *See*—
Miyata, Teruo; and Noishiki, Yasuharu, 4,695,281, Cl. 623-11.000.
Watanabe, Koji; Okamoto, Miyoshi; Mori, Yuichi; and Noishiki, Yasuharu, 4,695,280, Cl. 623-1.000.

Nomura, Akihiro: *See*—
Matsui, Kunio; Fukase, Hisahiko; and Nomura, Akihiro, 4,694,887, Cl. 164-428.000.

Nomura, Yoshihisa; Seda, Koichi; and Kozawa, Tadashi, to Toyota Jidosha Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Sealing construction for slide type vacuum pump with finger portions of spring element pressing cylindrical portion of seal element against cylinder bore. 4,694,734, Cl. 92-130.00R.

Nonaka, Shingo: *See*—
Mori, Masashi; Nonaka, Shingo; and Nagai, Seiji, 4,695,167, Cl. 366-181.000.

Noorily, Peter: *See*—
Strauss, Richard F.; Herb, Phillip; Noorily, Peter; and Rodrigues, Julio, 4,695,679, Cl. 174-117.0FF.

Nordica S.p.A.: *See*—
Baggio, Giorgio; and Balbinot, Renzo, 4,694,592, Cl. 36-117.000.

Norsk Hydro a.s.: *See*—
Clausen, Edvin L., 4,694,898, Cl. 165-171.000.

North American Philips Corporation: *See*—
Morelli, Amedeo J.; and Gaylord, Francis L., 4,694,568, Cl. 29-620.000.

Northern Telecom Limited: *See*—
Sinclair, William J.; Kovats, Tibor F. I.; and Straus, Jozef, 4,695,125, Cl. 350-96.200.

Northrop Corporation: *See*—
Malm, Robert E., 4,695,715, Cl. 250-211.00J.

Norton, Daniel E.: *See*—
Banich, Howard P.; and Norton, Daniel E., 4,694,591, Cl. 36-102.000.

Novatome: *See*—
Libin, Bernard, 4,694,864, Cl. 138-113.000.

Nozue, Kazunobu: *See*—
Suzuki, Hideo; and Nozue, Kazunobu, 4,695,260, Cl. 440-61.000.

NSK-Warner K.K.: *See*—
Hane, Toshiyuki, 4,695,076, Cl. 280-804.000.

Nubson, Richard C., to Data Card Corporation. Card guide apparatus for use in a non-inpact printer. 4,695,850, Cl. 346-76.0PH.

Nukushina, Masanori: *See*—
Takano, Kunio; and Nukushina, Masanori, 4,694,762, Cl. 112-121.120.

Nuovo Pignone S.p.A.: *See*—
Ferrari Aggradi, Gian P.; and Ferrante, Cesare M., 4,695,202, Cl. 405-227.000.

Nygren, Alf S.: *See*—
Agback, Karl H.; Agback, Tamara; and Nygren, Alf S., 4,695,648, Cl. 360-013.000.

Nylund, Olov, to Aktiebolaget ASEA-ATOM. Spacer for fuel rods. 4,695,426, Cl. 376-441.000.

O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Ceylan, Sukru , 4,694,948, Cl. 198-311.000.

O/Y Kyro A/B Tamglass: *See*—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,695,821, Cl. 338-316.000.

Oberoi, Bhusan K.: *See*—
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.

Obrecht, Georges, to Alsthom. Drilling string for drilling a bent bore, a method of using said string, and a bending device used in said string. 4,694,914, Cl. 175-61.000.

O'Brien, Gerald A., to General Motors Corporation. Method of manufacturing tri-pot universal joint housings. 4,694,676, Cl. 72-348.000.

Ochsner, Rolf H.: *See*—
Everett, Charles J.; and Ochsner, Rolf H., 4,695,829, Cl. 340-586.000.

O'Connell, James P.; Piran, Uri; and Wagner, Daniel B., to Becton Dickinson and Company. Sac or liposome containing dye (sulforhodamine) for immunoassay. 4,695,554, Cl. 436-528.000.

Oda, Koichi; Hatta, Koichi; and Sumitani, Toshihiko, to Sharp Kabushiki Kaisha. Calculator or pocket computer with selectable operational sequence. 4,695,983, Cl. 364-709.000.

Oeckl, Siegfried; Mitschker, Alfred; Lange, Peter M.; and Martinola, Friedrich, to Bayer Aktiengesellschaft. Catalyst resins and process for their preparation. 4,695,556, Cl. 502-11.000.

Oen, Sverre; Poppe, Dag; and Tronsli, Sverre N., to Alcatel N.V. Power supply. 4,695,935, Cl. 363-21.000.

Oertle, Konrad; and Wetter, Hansjurg, to Ciba-Geigy Corporation. Silanes, process for their preparation, and their use. 4,695,643, Cl. 556-428.000.

Oetiker, Hans. Pipe connection. 4,695,080, Cl. 285-334.500.

Oettgen, Herbert F.: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.

Officine Meccaniche Pavesi & C. S.p.A.: *See*—
Barrera, Giorgio, 4,694,560, Cl. 29-564.100.

Ogano, Takeo; Komatsuzaki, Takeshi; Shigenari, Ryoichi; and Uesugi, Naomoto, to Honda Giken Kogyo Kabushiki Kaisha. Interlinking control device for brake and clutch in tractor-mounted working machines. 4,694,942, Cl. 192-13.00A.

Ogasahara, Yoshio: *See*—
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.

Ogasawara, Akira, to Nippon Kogaku K. K. Diaphragm-control apparatus for camera. 4,695,150, Cl. 354-448.000.

Ogasawara, Toshitaka; Nohmi, Kazumasa; Honmoh, Masao; and Iseki, Yukito, to Matsushita Electronics Corporation. Reflector type fluorescent lamp for optical apparatus. 4,695,763, Cl. 313-487.000.

Ogawa, Masahiko: *See*—
Chito, Yasuo; and Ogawa, Masahiko, 4,695,778, Cl. 318-314.000.

Ogawa, Masaki: *See*—
Baba, Toshio; Mizutani, Takashi; and Ogawa, Masaki, 4,695,857, Cl. 357-16.000.

Ogawa, Tetsuya: *See*—
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,695,398, Cl. 252-299.500.

Ogura, Yukio; and Nasu, Seiji, to Hitachi Construction Machinery Co.; and Hitachi Engineering Co., Ltd. Man-machine interface type portable ultrasonic composite measuring apparatus. 4,695,833, Cl. 340-722.000.

Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, to Sumitomo Pharmaceuticals Company, Ltd. Phenylserine derivatives and processes for preparing the same. 4,695,580, Cl. 514-412.000.

Ohira, Masaki: *See*—
Moriyama, Masatoshi; and Ohira, Masaki, 4,695,328, Cl. 437-31.000.

Ohkura, Makoto: *See*—
Warabisako, Terunori; Ohkura, Makoto; and Miyao, Masanobu, 4,695,856, Cl. 357-4.000.

Ohlhaber, Ronald L.; and Ulijasz, Thaddeus R., to Cooper Industries, Inc. Hybrid coaxial-optical cable and method of use. 4,695,127, Cl. 350-96.230.

Ohno, Kenzo: *See*—
Ishida, Takao; Yoshida, Yukio; and Ohno, Kenzo, 4,694,607, Cl. 49-25.000.

Ohta, Kenji: *See*—
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; and Ohta, Kenji, 4,695,514, Cl. 428-432.000.

Ohta, Kosei: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.

Ohtani, Hideaki: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; Tanaka, Makoto; and Hayashida, Shigeru, 4,695,465, Cl. 424-449.000.

Ohtsuka, Toshikazu: *See*—
Hayase, Yoshio; Ohtsuka, Toshikazu; Ide, Kinya; and Takahashi, Toshio, 4,695,312, Cl. 71-92.000.

Ohtsuki, Tomonari; and Tsurumaki, Kazuyoshi, to Daiichi Denshi Kogyo Kabushiki Kaisha. Electronic card connecting circuit. 4,695,914, Cl. 361-42.000.

Ohwada, Kuniki: *See*—
Enoki, Takatomo; Yamasaki, Kimiyoshi; and Ohwada, Kuniki, 4,694,564, Cl. 437-40.000.

Ohya, Toshikazu: *See*—
Kamiji, Koichi; and Ohya, Toshikazu, 4,695,075, Cl. 280-735.000.

Ohyo Koken Kogyo Co., Ltd.: *See*—
Noda, Kimio; Ozeki, Kiyoshi; Furukawa, Hiroaki; and Watai, Katsunori, 4,695,730, Cl. 250-370.000.

Okabe Co., Ltd.: *See*—
Era, Yoshiyuki; and Kumagai, Yasuo, 4,695,178, Cl. 403-14.000.

Okabe, Toshihiro: *See*—
Ikeda, Koichi; Nakamura, Kozi; and Okabe, Toshihiro, 4,695,947, Cl. 364-200.000.

Okabe, Yoshio: *See*—
Kodama, Hisashi; and Okabe, Yoshio, 4,695,268, Cl. 474-110.000.

Okada, Kotaro: *See*—
Nishihama, Takamichi; Okada, Kotaro; and Kadota, Shigekazu, 4,695,044, Cl. 269-21.000.

Okajima, Atushi; Yoshida, Hitoshi; Takeuchi, Yukihisa; and Fukutani, Masanori, to Nippondenso Co., Ltd. Porous ceramic monoliths. 4,695,301, Cl. 55-523.000.

Okamoto, Akihiko: *See*—
Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, 4,695,996, Cl. 369-77.100.

Okamoto, Hiroshi: *See*—
Inaji, Toshio; Okamoto, Hiroshi; and Yokobori, Nobuyoshi, 4,695,907, Cl. 360-107.000.

Okamoto, Miyoshi: *See*—
Watanabe, Koji; Okamoto, Miyoshi; Mori, Yuichi; and Noishiki, Yasuharu, 4,695,280, Cl. 623-1.000.

Okamura, Youji: *See*—
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Okawa, Koji: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hiroe, Michio, 4,695,515, Cl. 428-458.000.

O'Keeffe, Andrew F. Liquid chromatographic detector and method. 4,695,555, Cl. 436-150.000.

Okino, Tadashi: *See*—
Saito, Syuichiro; and Okino, Tadashi, 4,695,894, Cl. 358-228.000.

Okumura, Katsuhiro, to Toyota Jidosha Kabushiki Kaisha. Construction of door frame in motor vehicle. 4,694,611, Cl. 49-441.000.

Okumura, Shinichi; and Okumura, Yasushi, to Okumura, Shinichi. Boiler apparatus utilizing exhaust gas heat. 4,694,891, Cl. 165-41.000.

Okumura, Yasushi: *See*—
Okumura, Shinichi; and Okumura, Yasushi, 4,694,891, Cl. 165-41.000.

Okuno, Akiyasu; Watanabe, Masakazu; and Ikoma, Kazuhiko, to NGK Spark Plug Co., Ltd. Composite layer aluminum nitride base sintered body. 4,695,517, Cl. 428-698.000.

Okura Industrial Co., Ltd: *See*—
Kondo, Kazuo; Ishiguro, Nobuya; and Tada, Teruo, 4,695,491, Cl. 428-35.000.

Okuyama, Gen: *See*—
Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.

Olbrich, Juergen; Biethan, Uwe; and Sorge, Gernold, to Huels Aktiengesellschaft. Powder varnish compositions containing carboxy curing agents. 4,695,613, Cl. 525-533.000.

Old, Lloyd J.: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.

O'Leary, Raymond P., to S&C Electric Company. Pre-insertion inductor arrangement. 4,695,918, Cl. 361-58.000.

Olin Corporation: *See*—
Berkowitz, Phillip T., 4,695,596, Cl. 521-137.000.
Thomas, Karen A., 4,694,753, Cl. 102-289.000.
Woodard, Kenneth E., Jr.; Dean, Robert A.; Fair, David L.; and Fister, Julius C., Jr., 4,695,359, Cl. 204-255.000.

Olmstead, John A., to RCA Corporation. Constant ratio, size insensitive, capacitor structure. 4,695,922, Cl. 361-329.000.

Omet, Reinhard; Kindsvater, Hans; and Wall, Hans J., to Phonix Armaturen-Werke Bregel GmbH. Magneto-optic measuring device. 4,695,796, Cl. 324-226.000.

Omholt, Ray E. Resiliently-cushioned adhesively-applied floor system and method of making the same. 4,694,627, Cl. 52-390.000.

OnLine Computer Systems Inc.: *See*—
Massingill, Larry W.; and Perkins, Derrick O., 4,695,805, Cl. 328-72.000.

Ono, Kenji: *See*—
Nobutoki, Kazuhiro; and Ono, Kenji, 4,695,813, Cl. 335-78.000.

Onodera, Tamio: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,695,667, Cl. 585-481.000.

Ontario Die Company Limited: *See*—
Levene, Martin M.; and Lessard, William W., 4,694,719, Cl. 83-451.000.

Optiques Compagnie Lyonnaise de Tranmissions: *See*—
Hakoun, Roland; and Jurczyszyn, Michel, 4,695,306, Cl. 65-152.000.

Orrling, Bengt, to ASEA Aktiebolag. Self-baking electrodes. 4,696,014, Cl. 373-89.000.

Osborg, Hans. Motor fuel compositions and methods. 4,695,292, Cl. 44-64.000.

Oscarson, Edward M.: *See*—
Tulpule, Bhalchandra R.; Oscarson, Edward M.; and Vosgien, David J., 4,696,019, Cl. 375-107.000.

Osgood, Roderic L., to Santa Barbara Research Center. Voltage calibration in E-beam probe using optical flooding. 4,695,794, Cl. 324-158.00R.

Oshikoshi, Yuji; Kato, Masashi; and Kikuchi, Hisashi, to Fuji Photo Film Co., Ltd. Instant photographic apparatus. 4,695,143, Cl. 354-84.000.

Osteonics Corp.: *See*—
Forte, Mark R.; Khowaylo, Alex; and Schloesser, Ewald, 4,695,282, Cl. 623-22.000.

Oswald, Thomas, to STC plc. Optical transmission systems. 4,696,060, Cl. 455-601.000.

Ota, Hideo: *See*—
Seto, Youichi; Homma, Koichi; Komura, Fuminobu; and Ota, Hideo, 4,695,964, Cl. 364-518.000.

Otani, Susumu, to NEC Corporation. CN ratio measurement circuit. 4,696,057, Cl. 455-226.000.

Otani, Takeji: *See*—
Setsuie, Takashi; Otani, Takeji; and Yoshida, Kanji, 4,695,415, Cl. 264-29.200.

Otocka, Edward P.: *See*—
Ponticello, Ignazio S.; and Otocka, Edward P., 4,695,532, Cl. 430-533.000.

Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, to Takasago Perfumery Co., Ltd. Process for the preparation of enamines or imines. 4,695,631, Cl. 544-170.000.

Otsuki, Hajime: *See*—
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,695,155, Cl. 355-45.000.

Ott, Hubert: *See*—
Gugel, Bernd; Niebel, Harald; and Ott, Hubert, 4,695,174, Cl. 400-124.000.

Otte, Werner; and Nehring, Rudolf, to Huls Aktiengesellschaft. Method of producing cyclohexyl compounds. 4,695,660, Cl. 568-830.000.

Ouchi, Chiaki; Niikura, Masakazu; and Suenaga, Hiroyoshi, to Nippon Kokan Kabushiki Kaisha. Method of producing titanium clad steel plate by hot rolling. 4,694,985, Cl. 228-235.000.

Outboard Marine Corporation: *See*—
Broughton, George L.; and Macier, James E., 4,695,261, Cl. 440-900.000.

Overman, Patrick, Sr.; and Baird, Elldon. Playpen sun cover. 4,694,516, Cl. 5-93.00R.

Overmyer, Thad J. Method of cooling and lubricating human hard tissue during power tool cutting. 4,695,255, Cl. 433-215.000.

Owen, Steven M. Welder's hood having a chin operated window closure. 4,694,507, Cl. 2-8.000.

Oxford Lasers Limited: *See*—
Kearsley, Andrew J., 4,696,011, Cl. 372-61.000.

Oxley, Donald W.: *See*—
Thatte, Satish; and Oxley, Donald W., 4,695,949, Cl. 364-200.000.

Oyama, Fusami: *See*—
Kurokawa, Ryogo; Oyama, Fusami; and Takahashi, Akira, 4,695,069, Cl. 280-91.000.

Ozaki, Yoshio; Tsurumoto, Kazuo; Yatomi, Takeshi; and Yamamoto, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machine with control of the machining pulse's current value in accordance with the delay time. 4,695,696, Cl. 219-69.00P.

Ozawa, Masakazu: *See*—
Ichihashi, Hiroo; Ozawa, Masakazu; Ebinuma, Ryuichi; and Saito, Atsushi, 4,695,855, Cl. 346-145.000.

Ozeki, Kiyoshi: *See*—
Noda, Kimio; Ozeki, Kiyoshi; Furukawa, Hiroaki; and Watai, Katsunori, 4,695,730, Cl. 250-370.000.

Paal, Ernest F., to Exxon Production Research Company. Method for establishing a surface consistent correction for the effects of the low velocity layer in seismic data processing. 4,695,984, Cl. 367-54.000.

Pacific Bell: *See*—
Schembri, John J., 4,696,063, Cl. 455-612.000.

Padalino, Marco, to Ricoh Co., Ltd.; and Ricoh Systems, Inc. Inkjet printing system. 4,695,848, Cl. 346-1.100.

Paine, Christopher G.; White, William J.; and Resnick, Susan J., to Honeywell Inc. Backside mosaic photoconductive infrared detector array. 4,695,861, Cl. 357-30.000.

Pal, Uday B.: *See*—
Knauss, William F., Jr.; Pal, Uday B.; and Patil, Balaji V., 4,695,318, Cl. 75-51.100.

Palac, Kazimir, to Zenith Electonics Corporation. Method of screening a flat mask cathode ray tube. 4,695,523, Cl. 430-23.000.

Palicot, Jacques P.; and Dubiet, Guy P., to Etablissement Public de Diffusion dit Telediffusion de France. Echo correction especially for television broadcast systems. 4,696,015, Cl. 375-14.000.

Panarotto, Gianfranco: *See*—
Gagliardi, Fabrizio; Lambarelli, Livio; Panarotto, Gianfranco; Roffinella, Daniele; and Spozini, Maurizio, 4,696,001, Cl. 370-88.000.

Pandrol Limited: *See*—
Jones, Robert; Jones, Keith W.; and Baxter, William R. S., 4,694,690, Cl. 73-146.000.

Panthel, Guenter: *See*—
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.

Papamichalis, Panos E.: *See*—
Doddington, George R.; and Papamichalis, Panos E., 4,696,040, Cl. 381-46.000.

Papper, Ernest G.: *See*—
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.

Parma Corporation: *See*—
Rogers, Walter C., Jr., 4,694,515, Cl. 5-13.000.

Parnell, Raymond, to Tomorrow Group, Inc., The. Modular panels for a display apparatus. 4,694,965, Cl. 211-87.000.

Pass, Raymond V.: *See*—
Ney, Reuben E.; Pass, Raymond V.; and Yeager, Patrick F., 4,695,105, Cl. 439-95.000.

Patchett, Arthur A.: *See*—
Kollonitsch, Janos; and Patchett, Arthur A., 4,695,588, Cl. 514-538.000.

Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH: *See*—
Wittmann, Horst, 4,695,767, Cl. 315-58.000.

Patil, Balaji V.: *See*—
Knauss, William F., Jr.; Pal, Uday B.; and Patil, Balaji V., 4,695,318, Cl. 75-51.100.

Patraw, Nils E., to Hughes Aircraft Company. Inverted chip carrier. 4,695,870, Cl. 357-74.000.

Paugh, Charles E.: *See*—
Anderson, Paul T.; Irwin, Lawrence; Matthews, John C.; and Paugh, Charles E., 4,694,634, Cl. 53-88.000.

Paul, Patrick R. D.; and Price, James H., to SSI Medical Services, Inc. Patient support apparatus. 4,694,520, Cl. 5-453.000.

Paurat, Friedrich W.; and Paurat, Roland. Excavator, particularly for continuous strip mining of minerals. 4,695,098, Cl. 299-64.000.

Paurat, Roland: *See*—
Paurat, Friedrich W.; and Paurat, Roland, 4,695,098, Cl. 299-64.000.

Pawelek, John M., to Yale University. Composition and method for treatment of melanomas. 4,695,449, Cl. 424-1.100.

Payne, William A., III, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Nonblocking self-routing packet and circuit switching network. 4,696,000, Cl. 370-60.000.

Pearch, Dean A.; and Pung, Thomas F., to Dana Corporation. Clutch assembly for a diesel engine blower. 4,694,946, Cl. 192-85.0AA.

Pearlman, Jay S.: *See*—
Dunn, Joseph E.; and Pearlman, Jay S., 4,695,472, Cl. 426-237.000.

Pearson, Andrew D.: *See*—
Balkwill, Peter H.; Bishop, David I.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G., 4,695,131, Cl. 350-350.00R.

Pekelis, Boris L.: *See*—
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Anastassiou, Dimitris; and Pennebaker, William B., 4,695,884, Cl. 358-163.000.

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Wilder, Martin S., 4,695,456, Cl. 424-94.500.

Pereira, Ruy J.: *See*—
Vlakancic, Connor G.; Pereira, Ruy J.; and Goodman, Larry R., 4,694,694, Cl. 73-386.000.

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Veneklasen, Lee H.; and Yagunoff, Guy G., 4,695,773, Cl. 315-382.000.

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Massingill, Larry W.; and Perkins, Derrick O., 4,695,805, Cl. 328-72.000.

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Peters, Klaus-Jurgen, to Robert Bosch GmbH. Method and fuel injection system for fuel supply to a mixture-compressing internal combustion engine having externally supplied ignition. 4,694,808, Cl. 123-453.000.

Peters, Mary A.: *See*—
Alton, Norman K.; Peters, Mary A.; Stabinsky, Yitzhak; and Saitman, David, 4,695,623, Cl. 530-351.000.

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Levine, Peter A.; Cobb, Arthur L., Jr.; Johnson, Cydney A.; and Peterson, Gary R., 4,695,878, Cl. 358-44.000.

Petrak, Harry A., to Boulder 12 Investments. Ground clutch assembly with dynamic engagement and disengagement. 4,694,943, Cl. 192-35.000.

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Essig, Willi; and Petri, Heinz, 4,695,816, Cl. 337-394.000.

Petrini, Roland; and Morell, Joseph, to Salomon S.A. Ski boot with spring action flex control. 4,694,593, Cl. 36-120.000.

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Pettibone, Craig R.; and Berry, Jimmy D., to Specialty Products, Inc. Toe and camber adjusting system. 4,695,073, Cl. 280-690.000.

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Diehl, Konrad, 4,694,765, Cl. 112-254.000.

Pfizer Inc.: *See*—
Brighty, Katherine E., 4,695,626, Cl. 540-214.000.
Melvin, Lawrence S., 4,695,571, Cl. 514-275.000.
Schnur, Rodney C., 4,695,634, Cl. 544-300.000.

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Agback, Karl H.; Agback, Tamara; and Nygren, Alf S., 4,695,648, Cl. 560-053.000.
Hellgren, Lars G. I.; Mohr, Viggo; and Vincent, Jan G., 4,695,457, Cl. 424-94.000.

Philion, Richard E., to Sterling Drug Inc. Alpha-(aminoalkyl-4-hydroxy-3-(alkylthio)benzenemethanols. 4,695,589, Cl. 514-653.000.

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Cobb, Raymond L., 4,695,671, Cl. 585-858.000.
Scinta, James, 4,695,214, Cl. 414-221.000.

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Omet, Reinhard; Kindsvater, Hans; and Wall, Hans J., 4,695,796, Cl. 324-226.000.

Photon Marketing Limited: *See*—
Carter, George A., III; and Dooley, James L., 4,695,058, Cl. 273-311.000.

Pialet, Joseph W.: *See*—
Koch, Frederick W.; and Pialet, Joseph W., 4,695,390, Cl. 252-47.500.

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Blakeley, Douglas M.; Kershaw, Carolyn A.; and Gangarosa, Raymond E., 4,694,837, Cl. 128-653.000.

Pickering, John F.: *See*—
Yardley, Alfred; and Pickering, John F., 4,694,651, Cl. 60-578.000.

Piels, Barry Y.: *See*—
Simmel, Thomas L.; Crossley, David W.; and Morehouse, Mark N., 4,695,267, Cl. 446-462.000.

Pierce, Lyle R. Multi-function switch-controlled lamp circuit. 4,695,739, Cl. 307-141.000.

Pierrat, Frank A.: *See*—
Shutske, Gregory M.; and Pierrat, Frank A., 4,695,573, Cl. 514-190.000.

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Rane, Dinanath F.; Desai, Jagdish A.; and Pike, Russell E., 4,695,579, Cl. 514-397.000.

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Asatiani, Georgy N.; Pikus, Evgeny A.; Kutelia, Elgudzha R.; Tsivtsivadze, David M.; Mudzhiri, Yason N.; and Dzhalabadze, Nikolai V., 4,695,360, Cl. 204-404.000.

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Bauer, Kurt H.; and Pins, Heinrich, 4,695,450, Cl. 424-22.000.

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Pinto, Alwyn; and Johnson, John B. H., to Imperial Chemical Industries PLC. Ammonia synthesis process. 4,695,442, Cl. 423-359.000.

Pioneer Electronic Corporation: *See*—
Koizumi, Toshiaki, 4,695,995, Cl. 369-75.200.
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,695,011, Cl. 242-199.000.
Kotaka, Fumitaka; and Maeda, Takanori, 4,695,158, Cl. 356-123.000.
Moriyama, Yoshiaki, 4,696,007, Cl. 371-37.000.
Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, 4,695,996, Cl. 369-77.100.

Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, to Henkel Kommanditgesellschaft auf Aktien. Control of disalt in α-sulfofatty acid ester surfactants. 4,695,409, Cl. 260-400.000.

Piran, Uri: *See*—
O'Connell, James P.; Piran, Uri; and Wagner, Daniel B., 4,695,554, Cl. 436-528.000.

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Cruz-Uribe, Antonio S., 4,695,854, Cl. 346-140.00R.

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McDonald, William J.; Pittard, Gerard T.; Maurer, William C.; Wasson, Michael R.; and Herben, William C., 4,694,913, Cl. 175-61.000.

Pittet, Alan O.; Muralidhara, Ranya; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with gem dithioethers of phenylalkanes. 4,695,473, Cl. 426-535.000.

Place, John M.: *See*—
Ackman, Terry E.; and Place, John M., 4,695,378, Cl. 210-198.100.

Plastic Specialties, Inc.: *See*—
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Plavac, Frank, to Chevron Research Company. Poly(oxyalkylene) aminoether carbamates as deposit control additives. 4,695,291, Cl. 44-62.000.

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Verity, Philip R., 4,695,937, Cl. 363-25.000.

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Klepsch, Wilhelm; and Plobst, Dietmar, 4,695,239, Cl. 425-194.000.

Plouff, Donald A., to General Telephone Company of Indiana. Multiplexed terminal for monitoring and controlling a plurality of remote telephone switches. 4,696,026, Cl. 379-34.000.

Plumb, Edwin W., to Pressmate, Inc. Side by side air feeder for advancing stock to a power press and the like. 4,694,982, Cl. 226-115.000.

Podiak, Richard S., to Champion Spark Plug Company. Method for producing a composite center electrode and an electrode. 4,695,759, Cl. 313-136.000.

Polaroid Corporation: *See*—
Mahapatra, Amaresh; McMahon, Donald H.; Robinson, William C.; and Sanford, Norman A., 4,695,121, Cl. 350-96.120.

Poldervaart, Leendert; and Personnat, Jean C. M., to Single Buoy Moorings Inc. Mooring device. 4,694,771, Cl. 114-230.000.

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Wingler, William C.; and Pomponio, Edward V., 4,695,683, Cl. 200-38.00R.

Pond, Richard J.: *See*—
Best, Michael J. A.; Jones, Richard H.; Hynes, Joseph H.; Pond, Richard J.; and Gordon, Colin R., 4,695,190, Cl. 405-169.000.

Ponticello, Ignazio S.; and Otocka, Edward P., to Eastman Kodak Company. Photographic silver halide element containing new adhesion promoting polymeric materials and polyester support. 4,695,532, Cl. 430-533.000.

Pool, Daniel L., to Minnesota Mining and Manufacturing. Paper converting machine. 4,695,006, Cl. 242-56.300.

Poole, Alan: *See*—
Sandbach, Rex H.; and Poole, Alan, 4,694,776, Cl. 118-500.000.

Pope, Ralph E. Rotatable building. 4,694,620, Cl. 52-65.000.

Popov, Entcho N.; Stanilov, Krestyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., to DSO "Elprom". Permanent magnet rotor for an electrical machine. 4,695,754, Cl. 310-156.000.

Poppe, Dag: *See*—
Oen, Sverre; Poppe, Dag; and Tronsli, Sverre N., 4,695,935, Cl. 363-21.000.

Porter, John R. Crop harvesting and soil tilling apparatus. 4,694,641, Cl. 56-328.00R.

Portmann, Jacques, to Thomson CSF. Charge accumulation read-out device with simultaneously read multiple output signals. 4,695,889, Cl. 358-213.260.

Postron Corp.: *See*—
Johnson, Terry W.; Harms, Daryl E.; and Curl, Ricky L., 4,695,880, Cl. 358-86.000.

Power-Flo Products Corporation: *See*—
Simonette, Dallas W.; and Wiener, Bruce A., 4,695,176, Cl. 401-144.000.

Powers, Joseph: *See*—
Trocciola, John C.; Powers, Joseph; and Martin, Ronald G., 4,695,518, Cl. 429-12.000.

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Peltier, Bernard P. J. M., 4,695,957, Cl. 364-422.000.
Precitronic Gesellschaft: *See*—
Eichweber, Kurt, 4,695,256, Cl. 434-22.000.
Precor Incorporated: *See*—
Smith, David B.; and Miller, Randolph F., 4,695,090, Cl. 272-72.000.
Predohl, Wilhelm; Beisemann, Heinz; and Reitemeyer, Paul, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for continuous extrusion of a multilayer synthetic resin web. 4,695,236, Cl. 425-131.100.
Premel, Ulrich; Dorling, Rolf; and Schultze, Manfred, to L. & C. Steinmuller GmbH. Process and apparatus for producing high-pressure and superheated steam. 4,694,782, Cl. 122-7.00R.
Press Technology Corporation: *See*—
Zeitlin, Alexander; and Zandel, Adam, 4,694,678, Cl. 72-455.000.
Pressman, Eric, to General Electric Company. Modified flame retardant polyphenylene ether resins having improved foamability and molded articles made therefrom. 4,695,594, Cl. 521-92.000.
Pressmate, Inc.: *See*—
Plumb, Edwin W., 4,694,982, Cl. 226-115.000.
Preston, Frank S.: *See*—
Blair, Preston E.; and Preston, Frank S., 4,695,953, Cl. 364-410.000.
Pretre, Roger, to Moore Business Forms, Inc. Automobile insurance card. 4,695,077, Cl. 283-81.000.
Prevorsek, Dusan C.: *See*—
Li, Hsin L.; and Prevorsek, Dusan C., 4,695,240, Cl. 425-207.000.
Preysman, Vladimir, to Verbatim Corporation. Hub hole characterization system. 4,695,982, Cl. 364-506.000.
Price, James H.: *See*—
Paul, Patrick R. D.; and Price, James H., 4,694,520, Cl. 5-453.000.
Prime Computer, Inc.: *See*—
Sullivan, Roderick B., II; Doshi, Mahesh; and Cooper, Lorne, 4,695,968, Cl. 364-578.000.
Prince, Alfred M.; and Kim, Kwang S., to New York Blood Center, Inc.; and Eugene Tech International, Inc. Process for preparing hepatitis B surface antigen containing particles in novel forms which are highly immunogenic. 4,695,454, Cl. 424-89.000.
Probst, Jon D.: *See*—
Ackelson, Donald B.; Moorehead, Eric L.; Ward, John W.; and Probst, Jon D., 4,695,365, Cl. 208-89.000.
Procter & Gamble Company, The: *See*—
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,695,422, Cl. 264-504.000.
Lawson, Michael I., 4,695,278, Cl. 604-385.00A.
Proctor, Edward A. Gang form. 4,695,031, Cl. 249-91.000.
Proctor, John D.; Towns, Edward J.; and Brown, Edward M., to Lermer Packaging Corp. Tightly sealing safety cap. 4,694,968, Cl. 215-224.000.
Product Design & Development, Inc.: *See*—
Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., 4,694,552, Cl. 29-418.000.
Profit Technology, Inc.: *See*—
Bedrij, Orest J., 4,695,975, Cl. 364-900.000.
Proton AG: *See*—
Samhaber, Wolfgang; and Renn, Werner, 4,695,551, Cl. 435-292.000.
Provence, John D.; Brown, Frederick W.; and Jones, John L, to Texas Instruments Incorporated. Dual detector system for determining endpoint of plasma etch process. 4,695,700, Cl. 219-121.0PD.
Pruden, Charles W.; McEvoy, Alfred P.; and McEvoy, Charles S., to Western Extrusions Corporation. Wood-clad aluminum window frame and associated window assembly. 4,694,612, Cl. 49-445.000.
Pruneda, Domingo C., to Lucas Industries Public Limited Company. Governor mechanism. 4,694,795, Cl. 123-373.000.
Pruzina, Christoph: *See*—
Nicklas, Hans; and Pruzina, Christoph, 4,694,626, Cl. 52-309.120.
PSI Star: *See*—
Battey, James F.; Nelson, Norvell J.; and Barnett, Daniel J., 4,695,348, Cl. 156-647.000.
Pulkkinen, Jorma, to Neste Oy. Lined rock cistern or tunnel. 4,695,188, Cl. 405-150.000.
Pullman Rail Leasing Inc.: *See*—
Miller, Roy W., 4,695,207, Cl. 406-130.000.
Pung, Thomas F.: *See*—
Pearch, Dean A.; and Pung, Thomas F., 4,694,946, Cl. 192-85.0AA.
Purcaru, Bebe-Titu, to Kraftwerk Union Aktiengesellschaft. Turbomachine blade. 4,695,228, Cl. 416-223.00A.
Purusar Corporation: *See*—
Grebinski, Thomas J., 4,695,327, Cl. 134-11.000.
Pust, Klaus O. M. Revolver handgun. 4,694,602, Cl. 42-59.000.
Pylkki, Russell J.: *See*—
Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,694,682, Cl. 73-61.10C.
Quick, Robert G., Jr.: *See*—
Lee, Robert S.; Murphy, Roy E.; and Quick, Robert G., Jr., 4,695,772, Cl. 315-370.000.
R. C. Ltd.: *See*—
Ford, George A., 4,694,916, Cl. 175-249.000.
R. Goodwin International Ltd.: *See*—
Goodwin, Richard S., 4,694,853, Cl. 137-512.100.
R. W. Lyall & Company, Inc.: *See*—
Lyall, Lucian H., 4,695,335, Cl. 156-64.000.
Raasch, Hans, to W. Schlafhorst & Co. Driven thread storage device. 4,695,002, Cl. 242-47.010.
Rabe, George B., to Foster Wheeler Energy Corporation. Method for remotely replacing tube ends in a heat exchanger. 4,694,549, Cl. 29-157.30C.
Rabe, George B., to Foster Wheeler Energy Corporation. Elongated tube expander tool. 4,694,677, Cl. 72-393.000.
Rabon, Joe D.; and Haro, Rudy, to Southern California Edison. Microcomputer controlled power regulator system and method. 4,695,737, Cl. 307-31.000.
Rada, David C. Method for preparing tissue sections. 4,695,339, Cl. 156-80.000.
Radkov, Peyu V.: *See*—
Popov, Estcho N.; Stanilov, Krestyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., 4,695,754, Cl. 310-156.000.
Rae, Malcolm C.: *See*—
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.
Raets, Hubert C., to U.S. Philips Corporation. Circuit for switching current in an inductive load. 4,695,770, Cl. 315-207.000.
Ragnegard, Samuel, to AB Hedemora Verkstader. Filter for continuous filtering of a suspension under pressure. 4,695,381, Cl. 210-403.000.
Rahmede, Karl-Heinz; and Stemmer, Horst-Heinz, to TRW Ehrenreich GmbH & Co. KG. Ball joint. 4,695,181, Cl. 403-135.000.
Raines, Max: *See*—
Wickers, Francis A.; and Raines, Max, 4,694,766, Cl. 112-262.100.
Ramaprasad, K. R., to Chronar Corporation. Hetero-augmentation of semiconductor materials. 4,695,331, Cl. 437-126.000.
Ramiller, Charles L.: *See*—
Hammond, Martin L.; and Ramiller, Charles L., 4,694,779, Cl. 118-730.000.
Ramotar, Jay G.: *See*—
Mikhailovsky, Leonid; and Ramotar, Jay G., 4,695,187, Cl. 405-124.000.
Rampen, William H. S. Hydraulic control valves. 4,694,849, Cl. 137-312.000.
Randall, Bruce E., to Sangamo Weston, Inc. Charge balance voltage-to-frequency converter utilizing CMOS circuitry. 4,695,742, Cl. 307-271.000.
Randklev, Ronald M., to Minnesota Mining and Manufacturing Company. Orthodontic bracket adhesive and abrasive for removal thereof. 4,695,251, Cl. 433-8.000.
Randolph, Barney J.: *See*—
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.
Rane, Dinanath F.; Desai, Jagdish A.; and Pike, Russell E., to Schering Corporation. Antifungal 2-azolylmethyl-3-difluorobenzyloxy-2,3-dihydrofluoro-benzo(B) thiophenes. 4,695,579, Cl. 514-397.000.
Rank, Kenneth A., Jr. Display carton. 4,694,955, Cl. 206-45.290.
Rao, T. V.; and Samec, Robert C., to Medtronic, Inc. Electrochemical cell construction and fill method. 4,695,519, Cl. 429-52.000.
Ratchford, Lloyd G., to Allied Corporation. Quick release connector. 4,695,109, Cl. 439-155.000.
Rawlings, Kirk A., to Wausau Metals Corporation. Apparatus for stripping paint. 4,694,546, Cl. 29-81.00D.
Ray Industries, Inc.: *See*—
Greenberg, Robert, 4,695,183, Cl. 403-356.000.
Raychem Corp.: *See*—
Lawrence, Alvah A.; and Neves, Jason W., 4,695,676, Cl. 174-77.00R.
Raytheon Company: *See*—
Waterman, John K., 4,695,766, Cl. 315-3.500.
Razavi, Homaune A.: *See*—
Walba, David M.; and Razavi, Homaune A., 4,695,650, Cl. 560-109.000.
RCA Corporation: *See*—
Chase, Thomas L.; and Long, Kenneth A., 4,695,045, Cl. 269-152.000.
Fisher, Albert W., 4,695,868, Cl. 357-68.000.
Giordano, Raymond L., 4,695,744, Cl. 307-279.000.
Levine, Peter A.; Cobb, Arthur L., Jr.; Johnson, Cydney A.; and Peterson, Gary R., 4,695,878, Cl. 358-44.000.
McClelland, Sandra K.; Conrad, Neal D.; and Desai, Nitin V., 4,695,490, Cl. 428-1.000.
Olmstead, John A., 4,695,922, Cl. 361-329.000.
Ritzman, Ira G.; and Wright, Joseph W., 4,695,775, Cl. 315-410.000.
Redland Roof Tiles Limited: *See*—
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.
Reed, Larry T., to Axia Incorporated. Automatic ranging gun sight. 4,695,161, Cl. 356-254.000.
Reh, Kuno; and Schophoff, Friedrich, to Cassella Aktiengesellschaft. Process for the preparation of 2,4-dinitrophenyl ethers. 4,695,656, Cl. 568-587.000.
Reichert, William W.: *See*—
Finlayson, Claude M.; Cody, Charles A.; Kemnetz, Steven J.; Reichert, William W.; Magauran, Edward D.; and Johnson, Johnny R., 4,695,402, Cl. 252-315.200.
Reid Manufacturing Co., Inc.: *See*—
Cothery, Jeffrey R., 4,694,576, Cl. 30-280.000.
Reid, Paul A.: *See*—
Barton, James C.; Hefner, Robert E.; Reid, Paul A.; and Sable, Frank R., 4,694,928, Cl. 180-268.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Predohl, Wilhelm; Beisemann, Heinz; and Reitemeyer, Paul, 4,695,236, Cl. 425-131.100.
Reilly Tar & Chemical Corporation: *See*—
Toomey, Joseph E., Jr., 4,695,352, Cl. 204-74.000.
Reimann, Jurgen-Andreas; and Basilowski, Herbert, to Siemens Aktiengesellschaft. Method and apparatus for numerical control of machine tools. 4,695,960, Cl. 364-474.000.
Reimann, Udo, to Siemens Aktiengesellschaft. Circuit for rapidly determining the greatest difference among three binary numerical values. 4,695,971, Cl. 364-769.000.
Rein, Hans-Martin, to Telefunken electronic GmbH. Dynamic frequency divider with a mixer stage and an amplifier. 4,695,940, Cl. 363-157.000.
Reinelt, Werner: *See*—
Krieger, Karl; and Reinelt, Werner, 4,694,730, Cl. 91-170.0MP.
Reitemeyer, Paul: *See*—
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Renn, Werner: *See*—
Samhaber, Wolfgang; and Renn, Werner, 4,695,551, Cl. 435-292.000.
Renner, Karl H.; and Morton, Alec J., to Texas Instruments Incorporated. Linear predictive coding technique with interleaved sequence digital lattice filter. 4,695,970, Cl. 364-724.000.
Rennick, Donna: *See*—
Yokota, Takashi; Lee, Frank; Rennick, Donna; and Arai, Ken-ichi, 4,695,542, Cl. 435-68.000.
Repco Limited: *See*—
Grace, William G., 4,695,343, Cl. 156-264.000.
Research Association for Petroleum Alternatives Development: *See*—
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,695,440, Cl. 423-328.000.
Research Foundation of State University of New York, The: *See*—
Sachs, Frederick; Auerbach, Anthony; McGarrigle, Richard G.; and Neil, James E., 4,695,709, Cl. 219-494.000.
Resnick, Susan J.: *See*—
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,695,861, Cl. 357-30.000.
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., to O/Y Kyro A/B Tamglass. Resistor element assembly for a heating furnace of glass sheets and method of replacing a resistor element. 4,695,821, Cl. 338-316.000.
Reuschling, Dieter: *See*—
Claus, Karl; Linkies, Adolf; and Reuschling, Dieter, 4,695,629, Cl. 544-2.000.
Revici, Emanuel, to Avram, Elena. Method for relieving pain or producing analgesia. 4,695,583, Cl. 514-449.000.
Reynolds, James E.: *See*—
Kindig, James K.; and Reynolds, James E., 4,695,290, Cl. 44-1.0SR.
Reynolds, William R. Voltage and current limiting phase-triggered battery charger with continuous optimization of charging rate. 4,695,784, Cl. 320-32.000.
Reznik, David. Apparatus and method for drying and curing coated substrates. 4,694,586, Cl. 34-1.000.
Rheinische Braunkohlenwerke AG.: *See*—
Lambertz, Johannes; and Schumacher, Ingo, 4,695,789, Cl. 324-61.00P.
Rhoads, Gary E. Automatic fluid distributing valve timing device. 4,694,787, Cl. 123-90.130.
Rhone-Poulenc Specialites Chimiques: *See*—
Desbois, Michel, 4,695,657, Cl. 568-656.000.
Richard, Pierre, to Bouygues. Concrete structural elements, process and device for manufacturing these elements. 4,694,622, Cl. 52-223.00R.
Richardson, David G.: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,695,213, Cl. 411-506.000.
Richter, Klaus: *See*—
Ehrhardt, Winfried; Richter, Klaus; and Lehr, Adolf, 4,695,047, Cl. 269-309.000.
Ricoh Company, Ltd.: *See*—
Gojo, Tomomi; Yagi, Yoshio; and Izumi, Tsunetada, 4,695,834, Cl. 340-734.000.
Ishikawa, Kazumasa; and Koseki, Yuji, 4,695,898, Cl. 358-296.000.
Itagaki, Masanori; Takahashi, Junichi; and Endou, Hideyasu, 4,695,678, Cl. 174-52.0FP.
Padalino, Marco, 4,695,848, Cl. 346-1.100.
Sakuma, Nobuo, 4,695,132, Cl. 350-409.000.
Ricoh Systems, Inc.: *See*—
Padalino, Marco, 4,695,848, Cl. 346-1.100.
Rieck, Gene W.: *See*—
Beining, August H.; Dial, Larry A.; Smith, William A.; and Rieck, Gene W., 4,695,827, Cl. 340-365.00P.
Rieder, Heinz; and Schwaiger, Max, to EMR Elektronische Messund Regelgerate Gesellschaft m.b.H. Optoelectronic incremental measuring system with adjustable LED positioning. 4,695,720, Cl. 250-231.0SE.
Ries, Gunter: *See*—
Jahnke, Andreas; Ries, Gunter; and Meier, Konrad, 4,694,868, Cl. 140-92.100.
Rigid Form, Inc.: *See*—
Herrmeyer, Dennis C., 4,695,083, Cl. 292-241.000.
Rigotti, Victor H.: *See*—
Levine, Michael R.; Russo, James T.; Cairo, Anthony C.; and Rigotti, Victor H., 4,695,942, Cl. 364-188.000.
Ringer, Thomas R.; and Bramwell, Byrne E., to Canadian Patents and Development Limited. Railroad switch snow deflecting air nozzle apparatus. 4,695,017, Cl. 246-428.000.
Ringgenberg, Paul D., to Halliburton Company. Flapper type annulus pressure responsive tubing tester valve. 4,694,903, Cl. 166-250.000.
Rintekno Oy: *See*—
Juhola, Pentti, 4,694,658, Cl. 62-100.000.
Ripl, Wilhelm K.; and Verner, Bo L., to Atlas Copco Aktiebolag. Method for improving the phosphorus elimination capacity of a lake. 4,695,384, Cl. 210-602.000.
Ritsko, Joseph E.; Houck, David L.; and Acla, Howard L. R., to GTE Products Corporation. Yttrium oxide stabilized zirconium oxide. 4,695,439, Cl. 423-263.000.
Ritterbex, Horst: *See*—
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.
Ritzman, Ira G.; and Wright, Joseph W., to RCA Corporation. Imaging system having an improved electrostatic yoke and method of making same. 4,695,775, Cl. 315-410.000.
Robbins, Kenneth W.: *See*—
Ross, Gerald F.; and Robbins, Kenneth W., 4,695,752, Cl. 307-518.000.
Robbins, Robert L.: *See*—
Maddux, Forrest E., Jr.; Eagle, Paul A.; and Robbins, Robert L., 4,694,638, Cl. 53-459.000.
Robbins, William L., to United States of America, Navy. Film chip capacitor. 4,695,921, Cl. 361-308.000.
Robershaw Controls Company: *See*—
McGeorge, Gram J., 4,695,711, Cl. 219-506.000.
Robert Bosch GmbH: *See*—
Flohrs, Peter; and Michel, Hartmut, 4,695,867, Cl. 357-46.000.
Gademann, Lothar; Hirt, Adam; Michel, Hartmut; Schmid, Hans-Dieter; and Schneider, Michael, 4,694,814, Cl. 123-644.000.
Peters, Klaus-Jurgen, 4,694,808, Cl. 123-453.000.
Schauwecker, Friedrich; and Weber, Walter, 4,695,928, Cl. 362-61.000.
Schleupen, Richard; Mayer, Ulrich; Bauer, Bernhard; and Langner, Arnd M., 4,696,002, Cl. 371-12.000.
Roberts, Maurice P., to TRW Inc. Steering apparatus. 4,694,925, Cl. 180-79.100.
Robertshaw Controls Company: *See*—
Everett, Charles J.; and Ochsner, Rolf H., 4,695,829, Cl. 340-586.000.
Robinson Brothers Limited: *See*—
Stevenson, Arthur, 4,695,609, Cl. 525-352.000.
Robinson, Leonard W., to Fibre Converters, Inc. Thermoformable composite articles. 4,695,501, Cl. 428-159.000.
Robinson, William C.: *See*—
Mahapatra, Amaresh; McMahon, Donald H.; Robinson, William C.; and Sanford, Norman A., 4,695,121, Cl. 350-96.120.
Robishaw, Alces P.; and Robishaw, Paul A. Locks for construction components. 4,695,184, Cl. 403-410.000.
Robishaw, Paul A.: *See*—
Robishaw, Alces P.; and Robishaw, Paul A., 4,695,184, Cl. 403-410.000.
Robotest Oy: *See*—
Kuusi, Juhani, 4,696,023, Cl. 378-46.000.
Roche, Gregory A. Apparatus for, and methods of, depositing a substance on a substrate. 4,694,777, Cl. 118-725.000.
Rockwell International Corporation: *See*—
Christe, Karl O., 4,695,296, Cl. 55-68.000.
Custode, Frank Z., 4,694,565, Cl. 437-34.000.
Hall, James R., 4,694,729, Cl. 89-8.000.
Hamermesh, Charles L.; Dynes, Paul J.; and Hogenson, Peter A., 4,695,619, Cl. 528-73.000.
Rozema, John G.; and Thompson, Kenneth A., 4,696,016, Cl. 375-20.000.
Roddeck, Werner F.: *See*—
Deutsch, Volker K.; and Roddeck, Werner F., 4,695,797, Cl. 324-230.000.
Rodiac Intercessor Ltd.: *See*—
Meijer, Johan B. A., 4,694,952, Cl. 198-499.000.
Rodrigues, Julio: *See*—
Strauss, Richard F.; Herb, Phillip; Noorily, Peter; and Rodrigues, Julio, 4,695,679, Cl. 174-117.0FF.
Rodriguez, Rodolfo R.: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,695,553, Cl. 436-177.000.
Roesch, Egon: *See*—
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Bernd; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.
Roffinella, Daniele: *See*—
Gagliardi, Fabrizio; Lambarelli, Livio; Panarotto, Gianfranco; Roffinella, Daniele; and Sposini, Maurizio, 4,696,001, Cl. 370-88.000.
Rogers, Edward A.: *See*—
Comer, Robert C.; Hampel, Wilbur J.; and Rogers, Edward A., 4,694,528, Cl. 15-330.000.
Rogers, Walter C., Jr., to Parma Corporation. Self-inflatable air mattress in a foldable support. 4,694,515, Cl. 5-13.000.

Rogers, William H., to Safariland Ltd., Inc. Handgun holster. 4,694,980, Cl. 224-243.000.

Rohde, Guenter: *See—*
Grossmann, Udo; Holzinger, Dieter; and Rohde, Guenter, 4,695,004, Cl. 242-56.00R.

Rohm, Gunter H. Chip-shedding hammer-drill chuck. 4,695,066, Cl. 279-62.000.

Rohulich, John J.: *See—*
Seevers, Daniel B.; and Rohulich, John J., 4,694,725, Cl. 84-1.270.

Rokkaku, Tadashi: *See—*
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Roland Kabushiki Kaisha: *See—*
Kikumoto, Tadao; and Murakami, Isato, 4,694,724, Cl. 84-1.030.

Roland, Leonard A.: *See—*
Grellmann, Heinz E.; and Roland, Leonard A., 4,695,811, Cl. 333-105.000.

Romine, Charles F.: *See—*
Meisner, Edward O.; and Romine, Charles F., 4,695,061, Cl. 277-27.000.

Rommerskirchen, Hans J.: *See—*
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.

Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Benzofuran and benzothiophene sulfonamides. 4,695,310, Cl. 71-90.000.

Rorer, Morris P., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,695,311, Cl. 71-92.000.

Roschman, Peter: *See—*
Buikman, Dirk; Helzel, Thomas; and Roschman, Peter, 4,694,836, Cl. 128-653.000.

Rose, K. Daniel; Yarbrough, Charles; and Strachan, Alan F., to Warmwipes, Inc. Warming device for disposable towel dispenser. 4,694,973, Cl. 221-46.000.

Rose, Robert J.; and Trimble, Russell L. Modular medication dispensing system and apparatus utilizing portable memory device. 4,695,954, Cl. 364-413.000.

Rosenthal, James M., to ACR Electronics. Ear microphone. 4,696,045, Cl. 381-114.000.

Rosink, Albert, deceased (by Rosink, Lieselotte, heiress), to Albert Rosink Maschinenbau. Can coiler. 4,694,540, Cl. 19-159.00R.

Rosink, Lieselotte, heiress: *See—*
Rosink, Albert, deceased, 4,694,540, Cl. 19-159.00R.

Ross, Gerald F.; and Robbins, Kenneth W., to Sperry Corporation. Narrow range gate baseband receiver. 4,695,752, Cl. 307-518.000.

Rosse, Gabriel: *See—*
Colin, Yves; Rosse, Gabriel; Guyader, Jean; and Laurent, Yves, 4,695,432, Cl. 422-98.000.

Rossmann, Christian; Fluechter, Horst; Schreiber, Gerald; and Wichelhaus, Winfried, to Henkel Kommanditgesellschaft auf Aktien. Two-component alkaline cleaning compositions and methods of preparing and using same. 4,695,396, Cl. 252-135.000.

Rothfuss, Hans: *See—*
Winkelmann, Manfred; Rothfuss, Hans; Muschner, Udo; and Schmitt, Karl H., 4,695,043, Cl. 266-265.000.

Rotoflow Corporation: *See—*
Swearingen, Judson S., 4,695,221, Cl. 415-36.000.

Rott, Horst, to Mannesmann Rexroth GmbH. Valve for attachment to an actuating means. 4,694,862, Cl. 137-625.500.

Roulet-Dubonnet, Jean-Pierre: *See—*
Terracol, Claude; and Roulet-Dubonnet, Jean-Pierre, 4,695,913, Cl. 361-13.000.

Routson, Gregory S., to Lear Siegler, Inc. Circumferentially oriented flexure suspension. 4,694,703, Cl. 74-5.00F.

Rowan, Hugh H.: *See—*
Cordova, Colleen W.; and Rowan, Hugh H., 4,695,509, Cl. 428-267.000.

Roy, Gilles, to Ecole Polytechnique. Method and system for measuring the amplitude and phase angle of harmonics in a periodic signal. 4,695,792, Cl. 324-83.00D.

Rozema, John G.; and Thompson, Kenneth A., to Rockwell International Corporation. Digital clock recovery circuit for return to zero data. 4,696,016, Cl. 375-20.000.

Rudelle, Marie-Irene, to U.S. Philips Corporation. Microwave sweep frequency oscillator. 4,695,809, Cl. 331-117.00D.

Ruderian, Max J. Nasal inhalation system. 4,694,824, Cl. 128-203.220.

Rudolph, John M.; and Wohlhieter, George M., to AMISTAR Corporation. Surface mounted component transport mechanism. 4,694,570, Cl. 29-740.000.

Rudy, Willi; and Lange, Gerhard, to Wafios Maschinenfabrik GmbH & Co. KG. Method and apparatus for producing oval chain links from round wire. 4,694,644, Cl. 59-27.000.

Rue, Robert H., to Harvey Hubbell Incorporated. HID lamp ballast tester. 4,695,803, Cl. 324-403.000.

Rueckl, Roger L., to United States Steel Corporation. High strength coke-oven mortar. 4,695,323, Cl. 106-85.000.

Ruether, John A.: *See—*
Warzinski, Robert P.; and Ruether, John A., 4,695,372, Cl. 208-311.000.

Rush, John L. Interlocking landscape planking. 4,695,502, Cl. 428-192.000.

Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., to NL Industries, Inc. Assemblies for supporting electrical circuit boards within tubes and method of using same. 4,694,555, Cl. 29-451.000.

Russo, James T.: *See—*
Levine, Michael R.; Russo, James T.; Cairo, Anthony C.; and Rigotti, Victor H., 4,695,942, Cl. 364-188.000.

Ruth, Dale G.; and Yuhas, Robert J. Wire tensioning system. 4,695,677, Cl. 194-45.0TD.

Ryan, James W.; and Chung, Alfred, to University of Miami. Antihypertensive agents. 4,695,577, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Inhibitors of angiotensin converting enzyme. 4,695,582, Cl. 514-423.000.

Ryan, John O., to Macrovision. Method and apparatus for removing pseudo-sync and/or agc pulses from a video signal. 4,695,901, Cl. 380-5.000.

S.c.a.i.m.e.: *See—*
Mairot, Guy, 4,694,922, Cl. 177-178.000.

S&C Electric Company: *See—*
O'Leary, Raymond P., 4,695,918, Cl. 361-58.000.

Sable, Frank R.: *See—*
Barton, James C.; Hefner, Robert E.; Reid, Paul A.; and Sable, Frank R., 4,694,928, Cl. 180-268.000.

Sachs, Frederick; Auerbach, Anthony; McGarrigle, Richard G.; and Neil, James E., to Research Foundation of State University of New York, The. Method and apparatus for heating and controlling the temperature of ultra small volumes. 4,695,709, Cl. 219-494.000.

Sachtler, J. W. A.: *See—*
Chao, Tai-Hsiang; and Sachtler, J. W. A., 4,695,666, Cl. 585-481.000.

Sado, Ichiro, to Canon Kabushiki Kaisha. Input device. 4,696,048, Cl. 382-13.000.

Saeki, Kazumi: *See—*
Magami, Masato; Saeki, Kazumi; Miura, Takanori; and Inoue, Takeshi, 4,695,649, Cl. 560-86.000.

Safariland Ltd., Inc.: *See—*
Rogers, William H., 4,694,980, Cl. 224-243.000.

Sage, Ian C.: *See—*
Balkwill, Peter H.; Bishop, David I.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G., 4,695,131, Cl. 350-350.00R.

Sagisawa, Shinobu; Takahama, Teizo; and Kobayashi, Mitsuo, to Fuji Electric Corporate Research and Developement Ltd. Pressure sense recognition control system. 4,695,963, Cl. 364-513.000.

Sailer, Heinrich: *See—*
Schollmeier, Gero H. J.; and Sailer, Heinrich, 4,695,998, Cl. 370-32.100.

Saingier, Jean; and Joly, Jean-Pierre A., to Dollfus-Meig & Cie. N-oxiranemethane N,N,N-trialkylammonium compounds. 4,695,641, Cl. 549-552.000.

St. Clair, Terry L.: *See—*
Egli, Annmarie O.; and St. Clair, Terry L., 4,695,610, Cl. 525-426.000.

Saito, Atsushi: *See—*
Ichihashi, Hiroo; Ozawa, Masakazu; Ebinuma, Ryuichi; and Saito, Atsushi, 4,695,855, Cl. 346-145.000.

Saito, Kikuji: *See—*
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Saito, Masahiko: *See—*
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Saito, Morikuni: *See—*
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Saito, Morinobu: *See—*
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.

Saito, Shuichi: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,695,155, Cl. 355-45.000.

Saito, Syuichiro; and Okino, Tadashi, to Canon Kabushiki Kaisha. Exposure control apparatus. 4,695,894, Cl. 358-228.000.

Saito, Yasuziro, to Jidosha Denki Kogyo Kabushiki Kaisha. Link coupling device. 4,695,180, Cl. 403-114.000.

Saji, Yoshiaki: *See—*
Goto, Giichi; and Saji, Yoshiaki, 4,695,572, Cl. 514-278.000.

Sakae, Tatsuya: *See—*
Kodama, Masahiro; Sakae, Tatsuya; and Urano, Yoshio, 4,695,967, Cl. 364-521.000.

Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, to Hitachi Zosen Corporation. Apparatus for continuous casting of thin metallic plate. 4,694,885, Cl. 164-416.000.

Sakaguchi, Haruo, to Hitachi Zosen Corporation. Horizontal continuous casting apparatus. 4,694,886, Cl. 164-416.000.

Sakaguchi, Kanji: *See—*
Hayashi, Souichi; Miyake, Johji; Koyama, Mototsugu; and Sakaguchi, Kanji, 4,695,329, Cl. 148-3.000.

Sakai, Tokuji: *See—*
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,695,667, Cl. 585-481.000.

Sakaki, Naoaki: *See—*
Nagano, Masahiko; and Sakaki, Naoaki, 4,695,899, Cl. 358-310.000.

Sakamoto, Atsushi: *See—*
Iwahara, Makoto; Miyaji, Naotaka; and Sakamoto, Atsushi, 4,696,043, Cl. 381-92.000.

Sakamoto, Keiji: *See—*
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,695,780, Cl. 318-561.000.

Sakamoto, Tsutomu, to Kansai Environmental Development Co., Ltd. Machine for cutting solid bodies. 4,694,716, Cl. 83-112.000.

Sakata, Tomio, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting an utterance boundary. 4,696,041, Cl. 381-46.000.

Sakata, Yoshitsugu; Miyashita, Yoshibonu; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, to Wako Pure Chemical Industries, Ltd. Process for quantitative determination of substrate treated with oxidase. 4,695,539, Cl. 435-10.000.

Sakemoto, Akito: *See—*
Maruyama, Hiroshi; Mizushima, Kunio; Sakemoto, Akito; and Umebayashi, Nobuhiro, 4,695,910, Cl. 360-133.000.

Sakiyama, Keizo: *See—*
Mimoto, Toshio; and Sakiyama, Keizo, 4,695,745, Cl. 307-297.000.

Sakuma, Nobuo, to Ricoh Company, Ltd. F0 single lens. 4,695,132, Cl. 350-409.000.

Sakura, Shigeyuki: *See—*
Takezawa, Hatsuo; Donuma, Kenichi; Katagiri, Shuhei; and Sakura, Shigeyuki, 4,695,858, Cl. 357-19.000.

Sakurai, Takao: *See—*
Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, 4,695,651, Cl. 560-141.000.

Sakurama, Teruo: *See—*
Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.

Salminen, Ari, to Tamfelt Oy Ab. Improvements relating to belts of inter-woven spiral wires. 4,695,015, Cl. 245-6.000.

Salomon S.A.: *See—*
Petrini, Roland; and Morell, Joseph, 4,694,593, Cl. 36-120.000.

Samec, Robert C.: *See—*
Rao, T. V.; and Samec, Robert C., 4,695,519, Cl. 429-52.000.

Samhaber, Wolfgang; and Renn, Werner, to Proton AG. Sampling apparatus for a biological reactor. 4,695,551, Cl. 435-292.000.

Samsung Electronics Co., Ltd.: *See—*
Kim, Jin H., 4,695,906, Cl. 360-85.000.

Sandbach, Rex H.; and Poole, Alan, to Co-Ordinate Technology Ltd. Step and repeat apparatus. 4,694,776, Cl. 118-500.000.

Sanden Corporation: *See—*
Koitabashi, Takatoshi, 4,694,945, Cl. 192-84.00C.

Sander, Theo: *See—*
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Sanders, David E.: *See—*
Masheff, Michael S.; and Sanders, David E., 4,696,017, Cl. 375-60.000.

Sanders, Robert N.: *See—*
Laurent, Sebastian M.; and Sanders, Robert N., 4,695,461, Cl. 424-154.000.

Sandoz Ltd.: *See—*
Avar, Lajos, 4,695,600, Cl. 524-103.000.

Sandt, Henry J., Jr.: *See—*
Van Iperen, Willem H. P.; Sandt, Henry J., Jr.; and Aronson, Eric G., 4,695,211, Cl. 410-77.000.

Sanford, Norman A.: *See—*
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Sangamo Weston, Inc.: *See—*
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Sanjo Machine Works, Ltd.: *See—*
Muto, Yoshiyuki; Etani, Tadao; Aida, Satoru; and Kato, Shinya, 4,695,007, Cl. 242-58.400.

Sankey Vending Limited: *See—*
Daintrey, Joseph W.; and Thomson, Peter, 4,694,739, Cl. 99-INV.00K.

Sankyo Company Limited: *See—*
Terahara, Akira; and Tanaka, Minoru, 4,695,587, Cl. 514-510.000.

Sano, Shimchi: *See—*
Takeuchi, Yasuhito; Hirota, Yuichi; Sano, Shinichi; and Ishiguro, Shinichi, 4,694,680, Cl. 73-1.0DV.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Sugimoto, Makoto, 4,694,929, Cl. 180-311.000.
Suzuki, Hideo; and Nozue, Kazunobu, 4,695,260, Cl. 440-61.000.

Santa Barbara Research Center: *See—*
Osgood, Roderic L., 4,695,794, Cl. 324-158.00R.

Santa Fe International Corporation: *See—*
Bhalnik, Arun; Braddick, Peter W.; Brittin, Darryl S.; and Johnson, Gerald L., 4,695,194, Cl. 405-207.000.

Santel, Hans-Joachim: *See—*
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.

Sanyo Electric Co., Ltd.: *See—*
Kishi, Hiroyasu, 4,695,875, Cl. 358-28.000.

Sapitowicz, Thomas P., to General Instrument Corp. Horizontally or vertically orientable compact ticket processor. 4,695,171, Cl. 400-70.000.

Sapper, Rainer, to Linde Aktiengesellschaft. Separation of CO_2 from a gaseous mixture. 4,695,304, Cl. 62-27.000.

Sargeant, Paul R.: *See—*
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.

Sargent Oil Well Equipment Company of Dover Resources, Incorporated: *See—*
Yates, Kenneth H., 4,695,779, Cl. 318-484.000.

Sarrazin, Yvon; and Smolens, Harry D., to Asten Group, Inc. Papermakers flat woven fabric. 4,695,498, Cl. 428-121.000.

Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Stereoscopic radiography apparatus and method. 4,696,022, Cl. 378-41.000.

Sasson, Steven J., to Eastman Kodak Company. Apparatus for processing a time-division multiplex video signal having signal durations divisible by the same number. 4,695,874, Cl. 358-21.00R.

Sato, Kazuteru: *See—*
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Sato, Kozo: *See—*
Tsukase, Masaaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, 4,695,525, Cl. 430-151.000.

Sato, Michitaka: *See—*
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.

Sato, Shinichi: *See—*
Inoue, Yoshio; Arai, Masatoshi; Sato, Shinichi; and Yokoo, Koji, 4,695,617, Cl. 528-32.000.

Sato, Yasuhisa: *See—*
Nakayama, Hiroki; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,695,134, Cl. 350-432.000.

Satoh, Hidetaka; Kurosawa, Hideyuki; Kamijoh, Yoshiaki; and Jyumonji, Hiromichi, to Nippon Telegraph and Telephone Corporation. Protector circuit. 4,695,916, Cl. 361-56.000.

Satoh, Hiroshi: *See—*
Miura, Hirohisa; Satoh, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,695,319, Cl. 75-63.000.

Satoh, Isao: *See—*
Takagi, Yuuji; Satoh, Isao; and Sugimura, Tatsuo, 4,695,993, Cl. 369-54.000.

Satoh, Yutaka: *See—*
Ishii, Kenjiro; Satoh, Yutaka; Fukumoto, Fumio; Otsuki, Hajime; Kokura, Yasuhide; and Saito, Shuichi, 4,695,155, Cl. 355-45.000.

Sauer, Gerhard; and Haffer, Gregor, to Schering Aktiengesellschaft. Process for the production of 2,3-dihydroergolines. 4,695,635, Cl. 546-69.001.

Sawamura, Mitsuharu; Honguu, Kazuoki; and Kikuchi, Kazuhiko, to Canon Kabushiki Kaisha. Opto-magnetic recording medium. 4,695,510, Cl. 428-336.000.

Sawaoka, Akira: *See—*
Akashi, Tamotsu; and Sawaoka, Akira, 4,695,321, Cl. 75-243.000.

Scardovi, Alessandro, to Ing. C. Olivetti & C., S.p.A. Ink jet print head. 4,695,852, Cl. 346-140.00R.

Schachar, Ronald A. Method and apparatus for determining surface shapes using reflected laser light. 4,695,163, Cl. 356-369.000.

Schallner, Otto: *See—*
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.

Schauwecker, Friedrich; and Weber, Walter, to Robert Bosch GmbH. Frame for headlights of motor vehicles. 4,695,928, Cl. 362-61.000.

Schembri, John J., to Pacific Bell. Optical fiber bandwidth limiting method. 4,696,063, Cl. 455-612.000.

Schering Aktiengesellschaft: *See—*
Sauer, Gerhard; and Haffer, Gregor, 4,695,635, Cl. 546-69.000.

Schering Corporation: *See—*
Hanna, Gayda; and Vadino, Winston A., 4,695,591, Cl. 514-781.000.
Rane, Dinanath F.; Desai, Jagdish A.; and Pike, Russell E., 4,695,579, Cl. 514-397.000.

Scheufler, Bernd: *See—*
Dreyer, Heinz; Scheufler, Bernd; Wiemeyer, Benno; and Luhrmann, Johannes, 4,694,759, Cl. 111-85.000.

Schiffers, Theo: *See—*
Grafen, Karl; and Schiffers, Theo, 4,694,526, Cl. 15-306.00A.

Schiller, Michael, to Fingermatrix, Inc. Matcher. 4,696,046, Cl. 382-5.000.

Schitthof, Hiltrud, to Jos. Schneider Optische Werke Kreuznach GmbH & Co. KG. Projection objective assembly. 4,695,136, Cl. 350-472.000.

Schleupen, Richard; Mayer, Ulrich; Bauer, Bernhard; and Langner, Arnd M., to Robert Bosch GmbH. Resetting circuit for microprocessors. 4,696,002, Cl. 371-12.000.

Schloesser, Ewald: *See—*
Forte, Mark R.; Khowaylo, Alex; and Schloesser, Ewald, 4,695,282, Cl. 623-22.000.

Schmid, Hans-Dieter: *See—*
Gademann, Lothar; Hirt, Adam; Michel, Hartmut; Schmid, Hans-Dieter; and Schneider, Michael, 4,694,814, Cl. 123-644.000.

Schmid, Karl H.: *See—*
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.

Schmidli, Pierre: *See—*
Meister, Pierre-Andre ; Schmidli, Pierre; and Soltermann, Bertrand, 4,695,168, Cl. 368-31.000.

Schmidt, Peter: *See—*
Jacoby, Hans-Dieter; and Schmidt, Peter, 4,695,215, Cl. 414-225.000.

Schmidt, Robert R.: *See—*
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.

Schmidt, Wolfgang, to Emuge-Werk Richard Glimpel Fabrik fuer Praezisionswerkzeuge (vormals Moschkau & Glimpel). Overload clutch particularly for thread-cutting chucks or the like. 4,694,944, Cl. 192-56.00R.

Schmidt, Wolfgang: *See—*
Piorr, Robert; Panthel, Guenter; Schmid, Karl H.; Colignon, Dietmar; Rommerskirchen, Hans J.; Schmidt, Wolfgang; and Ritterbex, Horst, 4,695,409, Cl. 260-400.000.

Schmitt, Karl H.: *See—*
Winkelmann, Manfred; Rothfuss, Hans; Muschner, Udo; and Schmitt, Karl H., 4,695,043, Cl. 266-265.000.

Schmitt, Thomas J., to Emerson Electric Co. Structural support shoe and method of manufacturing the same. 4,694,932, Cl. 182-109.000.

Schmitt, Urban; Deeg, Rolf; and Ziegenhorn, Joachim, to Boehringer Mannheim GmbH. Process and reagent for the determination of the hemoglobin-haptoglobin complex in the presence of free hemoglobin. 4,695,552, Cl. 436-66.000.

Schmitt, Wolfgang; and Forch, Hans, to Carl Freudenberg, Firma. Radial shaft seal ring with backfeed ribs and damming ribs. 4,695,063, Cl. 277-134.000.

Schneider, Jakob: *See—*
Dreckmann, Karl; Schneider, Jakob; and Theuner, Hans-Werner, 4,695,346, Cl. 156-361.000.

Schneider, Michael: *See—*
Gademann, Lothar; Hirt, Adam; Michel, Hartmut; Schmid, Hans-Dieter; and Schneider, Michael, 4,694,814, Cl. 123-644.000.

Schneider, Walter: *See—*
Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, 4,695,166, Cl. 366-160.000.

Schnell, Raimund. Fastening arrangement for a minimum of three struts along the spatial axes. 4,695,179, Cl. 403-24.000.

Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,695,634, Cl. 544-300.000.

Schoen, Uwe: *See—*
Heinemann, Henning; Kehrbach, Wolfgang; Schoen, Uwe; Buschmann, Gerd; and Kuhl, Ulrich, 4,695,566, Cl. 514-234.000.

Schoenbaum, Gary L.; Latanzi, Lewis A.; Hedrick, Stephen L.; and Johnson, Harold V., to Benchmark Industries Incorporated. Solder process inspection diffuser assembly. 4,695,157, Cl. 356-237.000.

Schofield, William S., to Motorola, Inc. Automatic leveling circuit for a composite video signal. 4,695,886, Cl. 358-176.000.

Schollmeier, Gero H. J.; and Sailer, Heinrich, to Siemens Aktiengesellschaft. Method and circuit arrangement for the compensation of echo signals. 4,695,998, Cl. 370-32.100.

Schonbach, Bernard H., to Fuller Company. Apparatus for exerting a downward force on a grinding roller. 4,694,997, Cl. 241-117.000.

Schophoff, Friedrich: *See—*
Reh, Kuno; and Schophoff, Friedrich, 4,695,656, Cl. 568-587.000.

Schreder, Felix, to E.G.O. Elektro Gerate Blanc u. Fischer. Electric cooker. 4,695,708, Cl. 219-486.000.

Schreiber, Gerald: *See—*
Rossmann, Christian; Fluechter, Horst; Schreiber, Gerald; and Wichelhaus, Winfried, 4,695,396, Cl. 252-135.000.

Schroter, Gottfried: *See—*
Slemmer, Janos; and Schroter, Gottfried, 4,694,825, Cl. 128-205.240.

Schuermann, Rodger W.: *See—*
Brown, Gregory D.; Clark, Darrel E.; and Schuermann, Rodger W., 4,694,692, Cl. 73-155.000.

Schuetz, Hans-Josef, to Ing. Erich Pfeiffer GmbH & Co. KG. Discharge apparatus for flowable media. 4,694,976, Cl. 222-189.000.

Schulte, Klaus; Nadolski, Klaus; Ersfeld, Heinrich; Ebeling, Wilfried; Boden, Heinrich; and Schneider, Walter, to Bayer Aktiengesellschaft. Piston metering device for the production of plastic material from at least two flowable reaction components. 4,695,166, Cl. 366-160.000.

Schultze, Manfred: *See—*
Preinel, Ulrich; Dorling, Rolf; and Schultze, Manfred, 4,694,782, Cl. 122-7.00R.

Schulze, Harry O.; and Karam, Ronald E., to GTE Products Corporation. Gray body colored zinc sulfide activated with copper. 4,695,478, Cl. 427-71.000.

Schumacher, Ingo: *See—*
Lambertz, Johannes; and Schumacher, Ingo, 4,695,789, Cl. 324-61.00P.

Schuman, Deborah Pauline: *See—*
Serap, Earl; and Serap, Deborah, 4,695,903, Cl. 358-335.000.

Schundehutte, Karl H.: *See—*
Kalk, Walter; Schundehutte, Karl H.; and Soll, Manfred, 4,695,632, Cl. 544-194.000.

Schuster, Werner: *See—*
Sommer, Karl; Heinz, Robert; Hettiche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, 4,695,397, Cl. 252-182.000.

Schutz, Gunter: *See—*
Caspar, Hans-Peter; and Schutz, Gunter, 4,695,223, Cl. 415-90.000.

Schwabe, Peter; and Voigt, Reiner, to Bayer Aktiengesellschaft. Dust-free alginate impression materials. 4,695,322, Cl. 106-35.000.

Schwaiger, Max: *See—*
Rieder, Heinz; and Schwaiger, Max, 4,695,720, Cl. 250-231.0SE.

Schwalb, Horst, to Dynaflair Corporation Canada Inc. Door lock structure. 4,694,669, Cl. 70-100.000.

Schwarte, Jurgen: *See—*
Grochowski, Horst; Zarawsky, Dieter; Knoblauch, Karl; Goldschmidt, Klaus; and Schwarte, Jurgen, 4,695,444, Cl. 423-569.000.

Schwartz, David C.: *See—*
Cantor, Charles R.; and Schwartz, David C., 4,695,548, Cl. 435-179.000.

Schwartz, Morton K.: *See—*
Fleisher, Martin; Bradlow, H. Leon; and Schwartz, Morton K., 4,695,471, Cl. 436-64.000.

Schwartz, William C., to Burlington Industries, Inc. Low toxic ceiling board facing. 4,695,507, Cl. 428-228.000.

Schwarz, Ulf: *See—*
Mieth, Guenther; and Schwarz, Ulf, 4,695,785, Cl. 323-222.000.

Schweickardt, Karl, to Wide-Lite International. Logarithmic-to-linear photocontrol apparatus for a lighting system. 4,695,769, Cl. 315-158.000.

Schweighardt, Frank K.: *See—*
Garg, Diwakar; Givens, Edwin N.; and Schweighardt, Frank K., 4,695,369, Cl. 208-112.000.

Scinta, James, to Phillips Petroleum Company. Apparatus and method for feeding solid materials to a high pressure vessel. 4,695,214, Cl. 414-221.000.

Scriba, John M., Jr.: *See—*
Sorenson, Robert E.; and Scriba, John M., Jr., 4,694,966, Cl. 211-88.000.

Scriptel Corporation: *See—*
Kable, Robert G., 4,695,680, Cl. 178-19.000.

Scrivo, Jerry V.; and Breuker, Gordon W., to Ex-Cell-O Corporation. Valved mix-head for rim process. 4,695,433, Cl. 422-112.000.

Sea-Land Corporation, Inc.: *See—*
Van Iperen, Willem H. P.; Sandt, Henry J., Jr.; and Aronson, Eric G., 4,695,211, Cl. 410-77.000.

Seatronics, Inc.: *See—*
Grady, Mark P., 4,695,361, Cl. 204-415.000.

SEB S.A.: *See—*
Daloz, Joanny, 4,694,740, Cl. 99-323.300.

Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Francesco; Vanore, Silvestro; and Carraro, Roberto, to Tecnomare S.p.A. Slender flexible marina structure for hydrocarbon production and ship mooring in deep seas. 4,695,193, Cl. 405-204.000.

Secrest, Bruce G.: *See—*
Doddington, George R.; and Secrest, Bruce G., 4,696,038, Cl. 381-38.000.

Seddon, Duncan, to Broken Hill Proprietary Co., Ltd., The; and Commonwealth Scientific and Industrial Research Organisation. Production of gasoline. 4,695,670, Cl. 585-533.000.

Seevers, Daniel B.; and Rohulich, John J., to NCR Corporation. Sound generating system for a keyboard. 4,694,725, Cl. 84-1.270.

Seidel, Albert; and Malburg, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Controllable helium-II phase separator. 4,694,655, Cl. 62-51.000.

Seiko Instruments & Electronics Ltd.: *See—*
Watanabe, Fumio; Komaki, Shojiro; Miyamoto, Masao; and Ito, Takao, 4,695,724, Cl. 250-292.000.

Seino, Masanori, to Shin-Etsu Chemical Co., Ltd. Organopolysiloxane composition for fire-resistant foamed silicone rubber. 4,695,597, Cl. 521-154.000.

Seltzer, Charles J. Massage footwear. 4,694,831, Cl. 128-582.000.

Seng, Florin; and Bremen, Josef, to Bayer Aktiengesellschaft. Process for the preparation of β-aminoethyl ketones. 4,695,652, Cl. 564-343.000.

Sengewald, Karl-Heinz. Package formed as bag to be carried. 4,696,050, Cl. 383-10.000.

Sengul, M. Marc; and Hinchman, Steven B., to Marathon Oil Company. Cyclic flooding of a naturally-fractured formation. 4,694,904, Cl. 166-252.000.

Senju Metal Industry Co., Ltd.: *See—*
Kawamata, Yuuji; Iino, Tomohiko; Suzuki, Ryoichi; and Haga, Noriyuki, 4,695,481, Cl. 427-96.000.

Senkingwerk GmbH: *See—*
Stoll, Karl-Heinz, 4,694,665, Cl. 68-27.000.

Senoplast Klepech & Co.: *See—*
Klepech, Wilhelm; and Plobst, Dietmar, 4,695,239, Cl. 425-194.000.

Serap, Deborah: *See—*
Serap, Earl; and Serap, Deborah, 4,695,903, Cl. 358-335.000.

Serap, Earl; and Serap, Deborah, to Schuman, Deborah Pauline. Audio video entertainment module. 4,695,903, Cl. 358-335.000.

Serizawa, Mitsuya: *See—*
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,695,068, Cl. 280-91.000.

Servais, Raoul, to AGFA-Gevaert N.V. Method for the production of a combined live-action and animation motion picture film. 4,695,141, Cl. 352-50.000.

Servend International, Inc.: *See—*
Landers, Jerry L., 4,694,661, Cl. 62-344.000.

Seto, Kaoru: *See—*
Kimizuka, Junichi; Ushio, Yukihide; and Seto, Kaoru, 4,695,714, Cl. 250-205.000.

Seto, Youichi; Homma, Koichi; Komura, Fuminobu; and Ota, Hideo, to Hitachi, Ltd. Image correction processing method. 4,695,964, Cl. 364-518.000.

Setsuie, Takashi; Otani, Takeji; and Yoshida, Kanji, to Mitsubishi Rayon Co., Ltd. Method for producing acrylic fiber precursors. 4,695,415, Cl. 264-29.200.

Sewell, Glenwood H.: *See—*
Sewell, Rickey E.; and Sewell, Glenwood H., 4,694,695, Cl. 73-40.50R.

Sewell, Rickey E.; and Sewell, Glenwood H. Sewer pipe smoke blocking device. 4,694,695, Cl. 73-40.50R.

Seymour, Raymond K.: *See—*
Farrall, George A.; and Seymour, Raymond K., 4,695,688, Cl. 200-144.00B.

SGS Microelectronica S.p.A.: *See—*
Torelli, Guido; and De La Plaza, Alejandro, 4,696,035, Cl. 381-1.000.

SGS Microelettronica S.p.A.: *See—*
De La Plaza, Alejandro, 4,695,751, Cl. 307-490.000.

SGS Microelettronica SpA: *See—*
Menniti, Pietro; and Marchio, Fabio, 4,695,786, Cl. 323-303.000.

Shacklette, Lawrence W.; Toth, James E.; and Elsenbaumer, Ronald L., to Allied Corporation. Conjugated polymer as substrate for the plating of alkali metal in a nonaqueous secondary battery. 4,695,521, Cl. 429-194.000.

Shaffer, Donald L. Locking means for fireplace screen. 4,694,819, Cl. 126-140.000.

Shape Inc.: *See—*
Gelardi, Anthony L., 4,694,557, Cl. 29-525.000.
Macleod, Robert B., Jr., 4,694,950, Cl. 198-465.300.

Sharma, Shri C.: *See—*
Yang, Robert K.; and Sharma, Shri C., 4,695,463, Cl. 424-440.000.

Sharp Kabushiki Kaisha: *See—*
Ishii, Hiroshi; Nakai, Syunzi; and Mizumoto, Yukihiro, 4,695,847, Cl. 346-1.100.
Mimoto, Toshio; and Sakiyama, Keizo, 4,695,745, Cl. 307-297.000.
Nakakura, Yukinori; and Kato, Nobuyuki, 4,695,479, Cl. 437-228.000.
Nakanishi, Yasuhiro; and Kawai, Shoichi, 4,695,976, Cl. 364-900.000.
Oda, Koichi; Hatta, Koichi; and Sumitani, Toshihiko, 4,695,983, Cl. 364-709.000.
Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; and Ohta, Kenji, 4,695,514, Cl. 428-432.000.
Takakura, Masaki; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,695,966, Cl. 364-521.000.
Tsugei, Shinji; and Inoue, Tomohiro, 4,696,054, Cl. 455-89.000.

Shell Oil Company: *See—*
Dries, Hubertus W. A. A., 4,695,298, Cl. 55-223.000.

Shelton, Samuel V. Dual bed heat pump. 4,694,659, Cl. 62-106.000.

Shero, David J.; and Dadpey, Habib, to Westinghouse Electric Corp. Induction motor control apparatus and method. 4,695,783, Cl. 318-801.000.

Shibata, Akira, to Chugai Denki Kogyo K.K. Method of manufacturing internal oxidized Ag-SnO system alloy contact materials. 4,695,330, Cl. 148-6.300.

Shibata, Shoichi: *See—*
Komatsu, Teruaki; Kobayashi, Kiyoshi; Tatsu, Kunihiko; and Shibata, Shoichi, 4,695,065, Cl. 279-60.000.

Shichijo, Shunichi: *See—*
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Shields, Stewart: *See—*
Straw, Alan; and Shields, Stewart, 4,695,451, Cl. 424-47.000.

Shigenari, Ryoichi: *See—*
Ogano, Takeo; Komatsuzaki, Takeshi; Shigenari, Ryoichi; and Uesugi, Naomoto, 4,694,942, Cl. 192-13.00A.

Shih, Stuart S.: *See—*
Graziani, Kenneth R.; Kyan, Chwan P.; Shih, Stuart S.; and Sowiak, Raymond M., 4,695,364, Cl. 208-59.000.

Shikaumi, Masao, to Canon Kabushiki Kaisha. Light measuring device. 4,695,149, Cl. 354-430.000.

Shimizu, Junichi: *See—*
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.

Shimizu Kensetsu Kabushiki Kaisha: *See—*
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.

Shimizu, Tetsuo; Tujimura, Kiyoharu; and Iwamoto, Michinori, to STEC Inc. Fluid control device. 4,695,034, Cl. 251-129.060.

Shimobuchi, Hideyuki: *See—*
Tsukada, Tetsuo; Shimobuchi, Hideyuki; and Yoshikawa, Takahiro, 4,695,175, Cl. 400-196.100.

Shimoda, Kouji: *See—*
Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, 4,695,996, Cl. 369-77.100.

Shimomura, Setsuhiro: *See—*
Wataya, Seiji; Shimomura, Setsuhiro; and Nishimura, Yukinobu, 4,694,806, Cl. 123-494.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Inoue, Yoshio; Arai, Masatoshi; and Inoue, Takeo, 4,695,603, Cl. 524-723.000.
Inoue, Yoshio; Arai, Masatoshi; Sato, Shinichi; and Yokoo, Koji, 4,695,617, Cl. 528-32.000.
Seino, Masanori, 4,695,597, Cl. 521-154.000.

Shin Nihon Kohan Co., Ltd.: *See—*
Imaeda, Fumihiro; and Imaeda, Yoshio, 4,695,033, Cl. 249-189.000.

Shin Nisso Kako Co., Ltd.: *See—*
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Shinagawa Refractories Co., Ltd.: *See—*
Mori, Masashi; Nonaka, Shingo; and Nagai, Seiji, 4,695,167, Cl. 366-181.000.

Shinn, Alan L., to Humphrey Instruments, Inc. Light pen having actuating accelerometer. 4,695,831, Cl. 340-707.000.

Shinno, Kouji; and Kuboki, Hitoshi, to Terumo Kabushiki Kaisha. Medical instrument. 4,695,276, Cl. 604-283.000.

Shinohara, Isao; and Yoshimoto, Itsuro, to Casio Computer Co., Ltd. Training type electronic musical instrument with keyboard indicators. 4,694,723, Cl. 84-1.030.

Shinooka, Kiyohide: *See—*
Uemura, Toshinobu; Shinooka, Kiyohide; and Kajiho, Tokuaki, 4,695,467, Cl. 424-502.000.

Shinozaki, Kaoru: *See—*
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, to Victor Company of Japan, Ltd. Information signal recording disc recorded with an end signal for selectively preventing unwanted access to predetermined recorded information and disc reproducing apparatus therefor. 4,695,904, Cl. 358-342.000.

Shionogi & Co., Ltd.: *See—*
Aiba, Shuichi; and Imanaka, Tadayuki, 4,695,546, Cl. 435-172.300.
Hayase, Yoshio; Ohtsuka, Toshikazu; Ide, Kinya; and Takahashi, Toshio, 4,695,312, Cl. 71-92.000.

Shipley Company Inc.: *See—*
Dutkewych, Oleh B., 4,695,505, Cl. 428-209.000.

Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, to Dainichi-Nippon Cables, Ltd. Metal cored board and method for manufacturing same. 4,695,515, Cl. 428-458.000.

Shmulovich, Joseph: *See—*
Berkstresser, George W.; and Shmulovich, Joseph, 4,695,762, Cl. 313-474.000.

Shopsmith, Inc.: *See—*
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,694,713, Cl. 82-14.00R.

Shores, J. Wallace: *See—*
Howe, Steve R.; Warner, William B.; and Shores, J. Wallace, 4,694,781, Cl. 119-156.000.

Showa Precision Machinery Co., Ltd.: *See—*
Tanaka, Masami, 4,694,791, Cl. 123-179.00F.

Shubert, Wesley M.: *See—*
Astrom, Gordon L.; Weis, Ronald J.; and Shubert, Wesley M., 4,695,376, Cl. 210-122.000.

Shultz, Clifford G., to Detox International Corporation. Destruction of inorganic hazardous wastes. 4,695,447, Cl. 423-659.000.

Shure Brothers, Inc.: *See—*
Julstrom, Stephen D., 4,696,036, Cl. 381-22.000.

Shushereba, John J.: *See—*
Millham, Ernest H.; Moser, John J.; Shushereba, John J.; and Visco, Gary P., 4,696,005, Cl. 371-27.000.

Shutske, Gregory M.; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals Inc. 9-amino-1,2,3,4-tetrahydroacridin-1-ol and related compounds. 4,695,573, Cl. 514-290.000.

Shyang, Yang C. Multipurpose polisher. 4,694,614, Cl. 51-141.000.

Sibertin-Blanc, Jean-Baptiste; and Tellier, Yves, to Ecole Nationale Superieure de Creation Industrielle. Automatic tripping rescue system. 4,694,931, Cl. 182-3.000.

Sicor Societa Italiana Corticosteroidi S.p.A.: *See—*
Macdonald, Peter, 4,695,625, Cl. 540-63.000.

Sieberhagen, Gunter: *See—*
Knebel, Werner; and Sieberhagen, Gunter, 4,694,512, Cl. 4-192.000.

Siebler, Helmut, to Daimler-Benz Aktiengesellschaft. Motor-vehicle seat with backrest which can be swung forward out of a position of use. 4,695,094, Cl. 297-331.000.

Siecor Corporation: *See—*
Zimmerman, Bernd; and Chamberlain, John, 4,695,128, Cl. 350-96.230.

Siegel, Edgar, deceased: *See—*
Harnisch, Horst; and Siegel, Edgar, deceased, 4,695,405, Cl. 252-600.000.

Siegel Family Revocable Trust: *See—*
Siegel, Harold B., 4,694,996, Cl. 241-100.000.

Siegel, Harold B., to Siegel Family Revocable Trust. Multi cavity medication card crusher. 4,694,996, Cl. 241-100.000.

Siemens Aktiengesellschaft: *See—*
Bardl, Artur; and Lindner, Manfred, 4,695,804, Cl. 328-14.000.

Daalmans, Gabriel M., 4,694,567, Cl. 29-599.000.
Grosse, Joachim; Hess, Ruediger; Kuhl, Wilfried; and Mueller, Reiner, 4,695,687, Cl. 200-144.00B.
Jahnke, Andreas; Ries, Gunter; and Meier, Konrad, 4,694,868, Cl. 140-92.100.
Kloiber, Gerald, 4,695,818, Cl. 338-22.00R.
Lekholm, Anders, 4,694,830, Cl. 128-419.0PG.
Mieth, Guenther; and Schwarz, Ulf, 4,695,785, Cl. 323-222.000.
Reimann, Jurgen-Andreas; and Basilowski, Herbert, 4,695,960, Cl. 364-474.000.
Reimann, Udo, 4,695,971, Cl. 364-769.000.
Schollmeier, Gero H. J.; and Sailer, Heinrich, 4,695,998, Cl. 370-32.100.
Wendt, Peter, 4,695,919, Cl. 361-110.000.
Wolff, Pieter; and Wedler, Hartmut, 4,695,974, Cl. 364-900.000.

Siemens Corporate Research & Support, Inc.: *See*—
Levy, Allan, 4,696,032, Cl. 379-390.000.

Signal Security Technologies: *See*—
Wiedemer, John D., 4,696,034, Cl. 380-16.000.

Signetics Corporation: *See*—
Conner, George W.; Donald, Raymond G.; and Cline, Ronald L., 4,694,566, Cl. 437-48.000.

Sikich, Joseph P.; and Duscombe, Richard R., to Hewlett-Packard Company. Integrated circuit memory cell array using a segmented word line. 4,695,981, Cl. 365-227.000.

Silvestri, Frank, to Taylor, Greg. Drum skin tightening arrangement. 4,694,726, Cl. 84-413.000.

Simmel, Thomas L.; Crossley, David W.; and Morehouse, Mark N., to McDarren, Robert S.; Piels, Barry Y.; and Simmel, Thomas L. Battery-powered small-scale toy vehicle. 4,695,267, Cl. 446-462.000.

Simmons, Lacy. Apparatus for electrically stunning poultry. 4,694,534, Cl. 17-1.00E.

Simmons, Lacy. Post stunner for poultry. 4,694,535, Cl. 17-1.00E.

Simon, Charles R.: *See*—
Wood, John F. B.; Kainer, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., 4,694,899, Cl. 164-452.000.

Simonetta, Guerrieri: *See*—
Flosi, Corrado; Gobbi, Alberto; Maccioni, Roberto; and Simonetta, Guerrieri, 4,694,505, Cl. 2-2.000.

Simonette, Dallas W.; and Wiener, Bruce A., to Power-Flo Products Corporation. Fountain application handle with refill valve. 4,695,176, Cl. 401-144.000.

Sims, Edward H. Display receptacle for deciduous teeth. 4,694,956, Cl. 206-63.000.

Sinclair and Rush, Inc.: *See*—
Ventimiglia, Joseph J., 4,695,241, Cl. 425-275.000.

Sinclair, William J.; Kovats, Tibor F. I.; and Straus, Jozef, to Northern Telecom Limited. Hermetic optical attenuator. 4,695,125, Cl. 350-96.200.

Singer, Nathan: *See*—
Heck, Michael; and Singer, Nathan, 4,694,974, Cl. 221-263.000.

Single Buoy Moorings Inc.: *See*—
Poldervaart, Leendert; and Personnaz, Jean C. M., 4,694,771, Cl. 114-230.000.

Sinko, Tibor, to Kisuzemi Innovacios Iroda. Self-propelled scaffold for buildings and rope tensioning means, as well as process for the construction and/or for the servicing of high buildings. 4,694,933, Cl. 182-128.000.

Skelnik, Debra: *See*—
Lindstrom, Richard L.; Doughman, Donald J.; and Skelnik, Debra, 4,695,536, Cl. 435-1.000.

Skinner, James L., to Atlantic Richfield Company. Apparatus for removal of wellbore particles. 4,694,901, Cl. 166-77.000.

Skipworth, Jerry D.: *See*—
Brickner, Louis C., Jr.; and Skipworth, Jerry D., 4,694,720, Cl. 83-471.300.

Skorka, Thomas: *See*—
Graf, Lothar; Maerte, Leo; and Skorka, Thomas, 4,694,977, Cl. 222-259.000.

Skyba, Helmut K. Elastic tie-down with rope adjustment means. 4,694,541, Cl. 24-301.000.

Slemmer, Janos; and Schroter, Gottfried, to Dragerwerk AG. Control for respirators. 4,694,825, Cl. 128-205.240.

Sloan-Kettering Institute for Cancer Research: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.
Fleisher, Martin; Bradlow, H. Leon; and Schwartz, Morton K., 4,695,471, Cl. 436-64.000.

Sloma, Alan, to Bristol-Myers Company. Alpha Interferon GX-1. 4,695,543, Cl. 435-70.000.

Smaich, Mark: *See*—
D'Aleo, Michael J.; and Smaich, Mark, 4,695,820, Cl. 338-179.000.

Smayling, Michael C.: *See*—
Tuvell, James A.; and Smayling, Michael C., 4,695,979, Cl. 365-185.000.

Smirnov, Vladimir N.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Smith, Charles. Omni-directional display device. 4,695,929, Cl. 362-140.000.

Smith, David B.; and Miller, Randolph F., to Precor Incorporated. Exercise rowing machine. 4,695,050, Cl. 272-72.000.

Smith, Frank A.: *See*—
Baker, Robin M.; Sargeant, Paul R.; Papper, Ernest G.; Oberoi, Bhusan K.; Smith, Frank A.; and Rae, Malcolm C., 4,695,418, Cl. 264-151.000.

Smith, Glenn S., to Beebe International, Inc. Levelwind mechanism. 4,695,010, Cl. 242-158.00R.

Smith International, Inc.: *See*—
Best, Michael J. A.; Jones, Richard H.; Hynes, Joseph H.; Pond, Richard J.; and Gordon, Colin R., 4,695,190, Cl. 405-169.000.
Hall, David R., 4,694,918, Cl. 175-329.000.

Smith, Jack: *See*—
Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., 4,694,713, Cl. 82-14.00R.

Smith, Jay E.: *See*—
Spadaro, Peter R.; Smith, Jay E.; Speer, Elmer L.; and Cecconi, Arnold L., 4,695,299, Cl. 55-274.000.

Smith, Robert E., III, to National Coupling Company, Inc. Undersea hydraulic coupling and metal seal. 4,694,859, Cl. 137-614.040.

Smith, Terrance, to Ampex Corporation. Horizontal line data position and burst phase encoding apparatus and method. 4,695,873, Cl. 358-13.000.

Smith, William A.: *See*—
Beining, August H.; Dial, Larry A.; Smith, William A.; and Rieck, Gene W., 4,695,827, Cl. 340-365.00P.

Smolens, Harry D.: *See*—
Sarrazin, Yvon; and Smolens, Harry D., 4,695,498, Cl. 428-121.000.

Snitman, David: *See*—
Alton, Norman K.; Peters, Mary A.; Stabinsky, Yitzhak; and Snitman, David, 4,695,623, Cl. 530-351.000.

Snyder, Steven A.; Smith, Jack; Flora, David D.; and Bartlett, Robert L., to Shopsmith, Inc. Duplicating system for a lathe. 4,694,713, Cl. 82-14.00R.

Societa' Italtractor Meccanica Itm S.p.A.: *See*—
Crotti, Aldo, 4,695,102, Cl. 305-11.000.

Societe D'Electronique de La Region Pays de Loire: *See*—
Houchangnia, Zavoche, 4,695,844, Cl. 343-781.0CA.

Societe E. Lacroix - Tour Artifices: *See*—
Billard, Alain, 4,695,841, Cl. 342-8.000.

Societe Nationale Elf Aquitaine: *See*—
Belouet, Christian, 4,695,480, Cl. 437-225.000.

Soda, Yutaka: *See*—
Imakoshi, Shigeyoshi; Soda, Yutaka; and Suyama, Hideo, 4,695,908, Cl. 360-119.000.

Soga, Kazuo: *See*—
Suzuki, Shigeo; Doi, Yoshiharu; and Soga, Kazuo, 4,695,557, Cl. 502-103.000.

Sokol, Michael: *See*—
Coville, William E.; Grossman, Hyman; and Sokol, Michael, 4,695,430, Cl. 422-65.000.

Soll, Manfred: *See*—
Kalk, Walter; Schundehutte, Karl H.; and Soll, Manfred, 4,695,632, Cl. 544-194.000.

Sollenberger, Nelson R., to American Telephone and Telegraph Company AT&T Bell Laboratories. Equalizer with improved performance. 4,695,969, Cl. 364-724.000.

Soltermann, Bertrand: *See*—
Meister, Pierre-Andre ; Schmidli, Pierre; and Soltermann, Bertrand, 4,695,168, Cl. 368-31.000.

Solvay & Cie. (Societe Anonyme): *See*—
Dehennau, Claude; and Vandendael, Yannick, 4,695,506, Cl. 428-212.000.

Somers, Ralph M.: *See*—
Fulkerson, Emmet M.; Somers, Ralph M.; and Compton, Diana R., 4,695,721, Cl. 250-234.000.

Sommer, Karl; Heinz, Robert; Hettche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, to BASF Aktiengesellschaft. Granular bleaching activator. 4,695,397, Cl. 252-182.000.

Sony Corporation: *See*—
Imakoshi, Shigeyoshi; Soda, Yutaka; and Suyama, Hideo, 4,695,908, Cl. 360-119.000.
Kato, Yoji; Watanabe, Seiichi; and Wada, Masaru, 4,695,862, Cl. 357-36.000.
Nakamizo, Hiromitsu; and Mochida, Takashi, 4,695,795, Cl. 324-208.000.

Sorenson, Robert E.; and Scriba, John M., Jr., to Knape & Vogt Manufacturing Co. Merchandising tray. 4,694,966, Cl. 211-88.000.

Sorge, Gernold: *See*—
Olbrich, Juergen; Blethan, Uwe; and Sorge, Gernold, 4,695,613, Cl. 525-533.000.

Southern California Edison: *See*—
Rabon, Joe D.; and Haro, Rudy, 4,695,737, Cl. 307-31.000.

Sowers, J. James. Method and apparatus for stepping a sailboat mast. 4,694,769, Cl. 114-90.000.

Sowiak, Raymond M.: *See*—
Graziani, Kenneth R.; Kyan, Chwan P.; Shih, Stuart S.; and Sowiak, Raymond M., 4,695,364, Cl. 208-59.000.

Spadaro, Peter R.; Smith, Jay E.; Speer, Elmer L.; and Cecconi, Arnold L., to United States of America, Energy. Method and apparatus for in-cell vacuuming of radiologically contaminated materials. 4,695,299, Cl. 55-274.000.

Sparkes, Laurie R.; and Baker, Joseph G., to JGB Industries, Inc. Remote control tilting system for raising and lowering radar and radio arch for boats. 4,694,773, Cl. 114-354.000.

Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, to Lockheed Corporation. Controlled expansion protruding-head rivet design. 4,695,213, Cl. 411-506.000.

Spease, Arthur L.: *See*—
Frankhouse, Thomas J.; and Spease, Arthur L., 4,694,705, Cl. 74-501.000.

Specialty Products, Inc.: *See*—
Pettibone, Craig R.; and Berry, Jimmy D., 4,695,073, Cl. 280-690.000.

Spector, Donald. Aroma-generating unit. 4,695,434, Cl. 422-116.000.

Spector, Donald. Light-activated aroma generator. 4,695,435, Cl. 422-124.000.

Spectrol Electronics Corporation: *See*—
Vaughn, Eldon D., 4,694,657, Cl. 62-80.000.

Speer, Elmer L.: *See*—
Spadaro, Peter R.; Smith, Jay E.; Speer, Elmer L.; and Cecconi, Arnold L., 4,695,299, Cl. 55-274.000.

Spells, Sherwood; Warren, James R.; and Wieck, Ronald W., to Dow Corning Corporation. Sealant applicator. 4,695,185, Cl. 404-107.000.

Spenceley, Gene D.; and Henderson, Steven, to British Steel Corporation. Cooling of materials. 4,694,889, Cl. 164-488.000.

Sperry Corporation: *See*—
Labrum, Joseph H., 4,696,061, Cl. 455-609.000.
Ross, Gerald F.; and Robbins, Kenneth W., 4,695,752, Cl. 307-518.000.

Spinelli, Harry J., to Du Pont de Nemours, E. I., and Company. Group transfer processes for acrylic star polymers. 4,695,607, Cl. 525-272.000.

Sposini, Maurizio: *See*—
Gagliardi, Fabrizio; Lambarelli, Livio; Panarotto, Gianfranco; Roffinella, Daniele; and Sposini, Maurizio, 4,696,001, Cl. 370-68.000.

Spurgeon, Colleen J.: *See*—
Choy, Clement K.; Keen, Frederick I.; Garabedian, Aram; and Spurgeon, Colleen J., 4,695,394, Cl. 252-97.000.

Sriram, Subramanian: *See*—
Steinman, Lawrence; Waldor, Matthew K.; Sriram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., 4,695,459, Cl. 424-95.000.

SSI Medical Services, Inc.: *See*—
Paul, Patrick R. D.; and Price, James H., 4,694,520, Cl. 5-453.000.

SSI Technologies, Inc.: *See*—
Wendt, David L., 4,694,812, Cl. 123-571.000.

SSMC Inc.: *See*—
Adams, Kenneth D., 4,694,763, Cl. 112-184.000.

Staats, James E.; and Fitzmayer, Louis H., to General Electric Company. Triangular antenna array for microwave oven. 4,695,693, Cl. 219-10.55F.

Stabinsky, Yitzhak: *See*—
Alton, Norman K.; Peters, Mary A.; Stabinsky, Yitzhak; and Snitman, David, 4,695,623, Cl. 530-351.000.

Stachowicz, Michael J.: *See*—
Christian, Donald J.; and Stachowicz, Michael J., 4,696,047, Cl. 382-8.000.

Stahl, Charles R.; Gibson, Michael A.; and Knudsen, Christian W., to Carbotek, Inc. Thermally-enhanced oil recovery method and apparatus. 4,694,907, Cl. 166-303.000.

Stahl, Matts F.: *See*—
Ekelund, Folke J. B.; Lilja, Per O.; Wald, Roland J. E.; and Stahl, Matts F., 4,695,413, Cl. 361-18.000.

Stanadyne, Inc.: *See*—
Kowal, Steven J., 4,694,790, Cl. 123-90.580.

Stand, Mille: *See*—
Karlsson, Axel T.; and Stand, Mille, 4,694,990, Cl. 239-81.000.

Standard Elektrik Lorenz AG: *See*—
Viohl, Uwe, 4,695,477, Cl. 427-68.000.

Standard Oil Company, The: *See*—
Bar-on, Ari, 4,695,674, Cl. 136-256.000.
Velenyi, Louis J., 4,695,668, Cl. 585-500.000.

Standke, Burkhard: *See*—
Jansen, Martin; and Standke, Burkhard, 4,695,353, Cl. 204-96.000.

Stanilov, Krestyo A.: *See*—
Popov, Entcho N.; Stanilov, Krestyo A.; Apostolov, Rumen K.; Dundarov, Pantcho G.; Radkov, Peyu V.; Aderski, Pentcho K.; and Georgiev, Georgi A., 4,695,754, Cl. 310-156.000.

Stant Inc.: *See*—
Harris, Robert S., 4,694,857, Cl. 137-565.000.
Szlaga, Emil, 4,694,847, Cl. 137-39.000.

Stanton, James R.; and Legg, James R. Lighting fixture. 4,695,114, Cl. 439-573.000.

Starbuck, Arthur E. Nonaqueous coal cleaning process. 4,695,371, Cl. 209-211.000.

Stark, William C. Paint shields and painting methods. 4,695,486, Cl. 427-282.000.

Stauffer Chemical Company: *See*—
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.
Heather, James B.; and Milano, Pamela D., 4,695,673, Cl. 568-310.000.
Leon, Albert M., 4,695,443, Cl. 423-443.000.

STC plc: *See*—
Oswald, Thomas, 4,696,060, Cl. 455-601.000.

STEC Inc.: *See*—
Shimizu, Tetsuo; Tujimura, Kiyoharu; and Iwamoto, Michinori, 4,695,034, Cl. 251-129.060.

Steenbergen, Christiaan; Howard, Peter G.; Bracht, Roger R.; and van der Put, Henk, to Laser Magnetic Storage International Company. Method and apparatus for varying laser intensity level. 4,695,994, Cl. 369-54.000.

Steer, Graham E., to Craig Medical Products Limited. Incontinence briefs and pants. 4,695,279, Cl. 604-397.000.

Steffen, Jurg: *See*—
Mayor, Jean-Michel; Steffen, Jurg; and Wuthrich, Peter, 4,695,698, Cl. 219-121.00L.

Steigerwald, Robert L.; and Mistry, Keku M., to General Electric Company. Multiple output resonant power supply. 4,695,934, Cl. 363-17.000.

Stein, Hermann: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Steinhardt, Lothar: *See*—
Giehl, Klaus U., 4,694,854, Cl. 137-519.000.

Steinman, Lawrence; Waldor, Matthew K.; Sriram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., to Leland Stanford Junior University, The Board of Trustees of. Method of treating autoimmune diseases that are mediated by Leu3/CD4 phenotype T cells. 4,695,459, Cl. 424-95.000.

Stemcor Corporation: *See*—
Korzekwa, Tadeusz M.; McMurtry, Carl H.; and Boecker, Wolfgang D. G., 4,695,294, Cl. 51-307.000.

Stemmer, Horst-Heinz: *See*—
Rahmede, Karl-Heinz; and Stemmer, Horst-Heinz, 4,695,181, Cl. 403-135.000.

Stendel, Wilhelm: *See*—
Kruger, Bernd-Wieland; Behrenz, Wolfgang; Becker, Benedikt; Homeyer, Bernhard; and Stendel, Wilhelm, 4,695,563, Cl. 514-105.000.

Stender, Werner: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Biagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Stephenson, Graham W.; and Toft, Richard C., to British Petroleum Company p.l.c., The. Riser support system. 4,694,909, Cl. 166-359.000.

Sterling Drug Inc.: *See*—
Philion, Richard E., 4,695,589, Cl. 514-653.000.

Stern, Robert; Hillion, Gerard; Gateau, Paul; and Guibet, Jean-Claude, to Institut Francais du Petrol. Process for manufacturing a composition of fatty acid esters useful as gas oil substitute motor fuel with hydrated ethyl alcohol and the resultant esters composition. 4,695,411, Cl. 260-410.90R.

Sterner, Maurice E., Jr.: *See*—
Ecker, Warren S.; Ecker, Howard J.; Ecker, Robert S.; and Sterner, Maurice E., Jr., 4,694,552, Cl. 29-418.000.

Sternglass, Ernest J.: *See*—
Sashin, Donald; and Sternglass, Ernest J., 4,696,022, Cl. 378-41.000.

Stetter, Jorg: *See*—
Gehring, Reinhold; Lindig, Markus; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Stetter, Jorg, 4,695,308, Cl. 71-86.000.

Stevens, James C.; and Fordyce, William A., to Dow Chemical Company, The. Process for propylene dimerization. 4,695,669, Cl. 585-511.000.

Stevenson, Arthur, to Robinson Brothers Limited. Vulcanizable rubber compositions containing xanthogen polysulfide and xanthate compounds. 4,695,609, Cl. 525-352.000.

Stihl, Andreas: *See*—
Kemmler, Ralf-Rainer, 4,694,578, Cl. 30-383.000.

Stockinger, Paul A.: *See*—
Lindberg, Verne L.; and Stockinger, Paul A., 4,695,019, Cl. 248-74.300.

Stoll, Karl-Heinz, to Senkingwerk GmbH. Counterflow washing machine. 4,694,665, Cl. 68-27.000.

Storage Research Pty. Ltd.: *See*—
Hudson, Geoffrey M., 4,695,991, Cl. 369-44.000.

Stormax International A/S: *See*—
Bech, Marcus C.; and Koster, Ole, 4,694,637, Cl. 53-448.000.

Stouffer, Ronald D., to Bowles Fluidics Corporation. Novel inertance loop construction for air sweep fluidic oscillator. 4,694,992, Cl. 239-265.230.

Stowe, Lawrence R.: *See*—
Jones, Lloyd G.; and Stowe, Lawrence R., 4,694,727, Cl. 86-20.150.

Strachan, Alan F.: *See*—
Rose, K. Daniel; Yarbrough, Charles; and Strachan, Alan F., 4,694,973, Cl. 221-46.000.

Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Biomedical electrode. 4,694,835, Cl. 128-640.000.

Straus, Jozef: *See*—
Sinclair, William J.; Kovats, Tibor F. I.; and Straus, Jozef, 4,695,125, Cl. 350-96.200.

Strauss, Richard F.; Herb, Phillip; Noorily, Peter; and Rodrigues, Julio, to Thomas & Betts Corporation. Flat multiconductor cable for undercarpet wiring system. 4,695,679, Cl. 174-117.0FF.

Straw, Alan; and Shields, Stewart, to Colgate-Palmolive Company. Aerosol antiperspirant composition. 4,695,451, Cl. 424-47.000.

Street, Robert W., to General Tire, Inc. Machine for guiding and marking plystock. 4,694,580, Cl. 33-32.600.

Strein, Klaus: *See*—
Mertens, Alfred; Holck, Jens-Peter; Berger, Herbert; Muller-Beckmann, Berad; Strein, Klaus; and Roesch, Egon, 4,695,567, Cl. 514-253.000.

Strenk, Lawrence M.: *See*—
Kramer, David M.; Compton, Russell A.; Strenk, Lawrence M.; and Murdoch, James B., 4,695,800, Cl. 324-309.000.

Strohbeen, David T.: *See*—
Westphal, Dean W.; and Strohbeen, David T., 4,694,978, Cl. 271-28.000.

Studiengesellschaft fur Eisenerzaufbereitung: *See*—
Kortmann, Heinrich; and Bock, Wolfgang, 4,695,315, Cl. 75-0.50R.

Studiengesellschaft Kohle mbH: *See*—
Bogdanovic, Borislav, 4,695,446, Cl. 423-648.00R.

Suda, Koichi: *See*—
Nomura, Yoshihisa; Suda, Koichi; and Kozawa, Tadashi, 4,694,734, Cl. 92-130.00R.

Sudo, Yoshimi: *See*—
Kuwabara, Hideki; Kitagawa, Atsushi; and Sudo, Yoshimi, 4,695,593, Cl. 521-60.000.

Suehiro, Teruyoshi: *See*—
Sakaguchi, Haruo; Suehiro, Teruyoshi; Nagai, Kunio; Hashimoto, Toshie; Nishiyama, Hisaki; and Mohri, Masakazu, 4,694,885, Cl. 164-416.000.

Suenaga, Hiroyoshi: *See*—
Ouchi, Chiaki; Niikura, Masakazu; and Suenaga, Hiroyoshi, 4,694,985, Cl. 228-235.000.

Sugihara, Kazuyoshi: *See*—
Matsumoto Yoshiaki; Yamagata, Shinji; and Sugihara, Kazuyoshi, 4,695,814, Cl. 337-77.000.

Sugihara, Masanori; Kurosawa, Atsushi; Okamoto, Akihiko; Shimoda, Kouji; Kimoto, Toshiyuki; and Kouno, Tomomitsu, to Pioneer Electronic Corporation. Automatic loading disc player. 4,695,996, Cl. 369-77.100.

Sugihara, Mitsuru; and Sugimoto, Naohiko, to Fuji Photo Film Co., Ltd. Medium for electrophoresis. 4,695,354, Cl. 204-180.100.

Sugimori, Shigeru: *See*—
Goto, Yasuyuki; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,695,398, Cl. 252-299.500.

Sugimoto, Makoto, to Sanshin Kogyo Kabushiki Kaisha. Frame body of motorcycles. 4,694,929, Cl. 180-311.000.

Sugimoto, Michio: *See*—
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,695,440, Cl. 423-328.000.

Sugimoto, Naohiko: *See*—
Sugihara, Mitsuru; and Sugimoto, Naohiko, 4,695,354, Cl. 204-180.100.

Sugimoto, Yasuhiro: *See*—
Hara, Hiroyuki; Nakamura, Michinori; and Sugimoto, Yasuhiro, 4,695,750, Cl. 307-475.000.

Sugimura, Tatsuo: *See*—
Takagi, Yuuji; Satoh, Isao; and Sugimura, Tatsuo, 4,695,993, Cl. 369-54.000.

Suhr, Heinz-Peter; and Weinberger, Bernd, to August Froscher G.m.b.H. & Co. K.G., Firma. Work chair. 4,695,093, Cl. 297-300.000.

Sukagawa, Masaru: *See*—
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.

Sullivan, James B.; and Box, Richard B. Elastomeric shoe innersole. 4,694,589, Cl. 36-44.000.

Sullivan, Roderick B., II; Doshi, Mahesh; and Cooper, Lorne, to Prime Computer, Inc. Digital system simulation method and apparatus having improved sampling. 4,695,968, Cl. 364-578.000.

Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, to Teijin Petrochemical Industries, Ltd. Novel crystalline aluminosilicate zeolites and process for production thereof. 4,695,667, Cl. 585-481.000.

Sumitani, Toshihiko: *See*—
Oda, Koichi; Hatta, Koichi; and Sumitani, Toshihiko, 4,695,983, Cl. 364-709.000.

Sumitomo Chemical Company, Limited: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyacka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kikuchi, Kenichi, 4,694,563, Cl. 437-40.000.

Sumitomo Light Metal Industries, Ltd.: *See*—
Yoshida, Masahiro; and Inumaru, Susumu, 4,694,888, Cl. 164-467.000.

Sumitomo Metal Mining Company Limited: *See*—
Kimura, Takayoshi; Tsuyuguchi, Seiichi; and Mori, Yoshiaki, 4,695,317, Cl. 75-24.000.

Sumitomo Pharmaceuticals Company, Ltd.: *See*—
Ohashi, Naohito; Nagata, Shoji; Nakatsuka, Masashi; Ishizumi, Kikuo; Katsube, Junki; Aono, Shunji; and Sakurama, Teruo, 4,695,580, Cl. 514-412.000.

Sun Chemical Corporation: *See*—
Floyd, William C.; and Hui, Sai H., 4,695,606, Cl. 525-160.000.

Sundstrand Corporation: *See*—
Beck, Richard, Jr., 4,694,648, Cl. 60-452.000.

Nguyen, Vietson M.; Dhyanchand, P. John; and Thollot, Pierre, 4,695,933, Cl. 363-17.000.

Sunstrand Corporation: *See*—
Dishner, Bryan W.; Juarros, Richard D.; and Dhyanchand, P. John, 4,695,776, Cl. 318-14.000.

Susse, Karl-Ernst; and Weidner, Frank. Method and arrangement for producing ultrashort light pulses. 4,696,009, Cl. 372-25.000.

Sutton, Gary, to General Signal Corporation; and Dempster Systems, Inc. Hydraulic control valve. 4,694,858, Cl. 137-596.000.

Suyama, Hideo: *See*—
Imakoshi, Shigeyoshi; Soda, Ystaka; and Suyama, Hideo, 4,695,908, Cl. 360-119.000.

Suzuki, Eiichi, to Canon Kabushiki Kaisha. Ink-jet recording process. 4,695,846, Cl. 346-1.100.

Suzuki, Hideo; and Nozue, Kazunobu, to Sanshin Kogyo Kabushiki Kaisha. Tilting device for marine propulsion device. 4,695,260, Cl. 440-61.000.

Suzuki, Kazuhiro: *See*—
Himono, Yusaku; Moriya, Yoshiaki; Miyahara, Masato; and Suzuki, Kazuhiro, 4,695,124, Cl. 350-96.200.

Suzuki, Kazumasa: *See*—
Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, 4,695,326, Cl. 127-30.000.

Suzuki, Noboru: *See*—
Yamamoto, Hiromi; Imai, Miho; and Suzuki, Noboru, 4,694,525, Cl. 15-160.000.

Suzuki, Ryoichi: *See*—
Kawamata, Yuuji; Iino, Tomohiko; Suzuki, Ryoichi; and Haga, Noriyuki, 4,695,481, Cl. 427-96.000.

Suzuki, Shigeo; Doi, Yoshiharu; and Soga, Kazuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst for polymerization of olefins. 4,695,557, Cl. 502-103.000.

Suzuki, Shoji, to Alpine Electronics Inc. Device for controlling pinch roller in cassette tape recorder. 4,694,983, Cl. 226-181.000.

Suzuki, Toshimichi: *See*—
Yamamoto, Hiraku; Suzuki, Toshimichi; Katayama, Shigeru; Uratsuka, Isao; and Asoshine, Eishi, 4,695,598, Cl. 523-400.000.

Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, to Teikoku Hormone Mfg. Co., Ltd. 2-(3,5-dialkyl-4-hydroxyphenyl)indole derivatives. 4,695,581, Cl. 514-415.000.

Suzumura, Masanaga: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 350-707.000.

Swales, Michael G.: *See*—
Knapp, John F.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., 4,695,524, Cl. 430-32.000.

Swanson, William M.: *See*—
Wyndham, Ronald; Chaplin, Gervaise M.; and Swanson, William M., 4,695,436, Cl. 423-135.000.

Swearingen, Judson S., to Rotoflow Corporation. Turbine shutdown control system. 4,695,221, Cl. 415-36.000.

Swedo, Raymond J.: *See*—
Zupancic, Joseph J.; and Swedo, Raymond J., 4,695,483, Cl. 427-244.000.

Sweeney, W. Alan, to Chevron Research Company. Nonionic emulsifier and substituted succinic anhydride compositions therewith. 4,695,401, Cl. 252-312.000.

Swisher, Steven L., to Brunswick Corporation. Bait alert for spin cast reel. 4,695,009, Cl. 242-84.10R.

Switchcraft, Inc.: *See*—
Bailey, James R.; and Basov, Emma, 4,695,116, Cl. 439-188.000.
Kysiak, William J., 4,695,117, Cl. 439-188.000.

Szlaga, Emil, to Stant Inc. Roll-over valve with sealing ball. 4,694,847, Cl. 137-39.000.

T. J. Bottom Industries, Inc.: *See*—
Bottom, Michael T., 4,694,876, Cl. 160-45.000.

Tachita, Ryobun; and Teranishi, Akio, to Matsushita Electric Industrial Co., Ltd. Diversity receiver. 4,696,058, Cl. 455-277.000.

Tada, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Inverter controlling method. 4,695,938, Cl. 363-37.000.

Tada, Teruo: *See*—
Kondo, Kazuo; Ishiguro, Nobuya; and Tada, Teruo, 4,695,491, Cl. 428-35.000.

Taft, Jeffrey D., to Westinghouse Electric Corp. Range finding method and apparatus. 4,695,156, Cl. 356-1.000.

Tagami, Tomoyuki: *See*—
Asakura, Toshimitsu; and Tagami, Tomoyuki, 4,694,924, Cl. 180-68.300.

Takada, Makoto: *See*—
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, 4,695,965, Cl. 364-518.000.

Takagi, Shigeru, to Nippon Soken, Inc. Radial flow type dust collecting filter. 4,695,300, Cl. 55-485.000.

Takagi, Yuuji; Satoh, Isao; and Sugimura, Tatsuo, to Matsushita Electric Industrial Co., Ltd. Optical information recording and reproducing apparatus and optical disc. 4,695,993, Cl. 369-54.000.

Takahama, Teizo: *See*—
Sagisawa, Shinobu; Takahama, Teizo; and Kobayashi, Mitsuo, 4,695,963, Cl. 364-513.000.

Takahashi, Akira; Murakami, Yoshiteru; Hirokane, Junji; Katayama, Hiroyuki; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Magneto-optical memory element. 4,695,514, Cl. 428-432.000.

Takahashi, Akira: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,695,011, Cl. 242-199.000.
Kurokawa, Ryogo; Oyama, Fusami; and Takahashi, Akira, 4,695,069, Cl. 280-91.000.

Takahashi, Junichi: *See*—
Itagaki, Masanori; Takahashi, Junichi; and Endou, Hideyasu, 4,695,678, Cl. 174-52.0FP.

Takahashi, Kenji: *See*—
Mori, Nobufumi; Hosoi, Yuichi; Takahashi, Kenji; and Miyahara, Junji, 4,695,725, Cl. 250-327.200.

Takahashi, Sadatoshi: *See*—
Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, 4,695,133, Cl. 350-427.000.

Takahashi, Tadashi; Miyashita, Kunio; and Kawamata, Syooichi, to Hitachi, Ltd. Crank angle sensor. 4,694,688, Cl. 73-116.000.

Takahashi, Toshio: *See*—
Hayase, Yoshio; Ohtsuka, Toshikazu; Ide, Kinya; and Takahashi, Toshio, 4,695,312, Cl. 71-92.000.

Takahata, Hisatoshi: *See*—
Terui, Nobuhiko; and Takahata, Hisatoshi, 4,695,148, Cl. 354-413.000.

Takakura, Masaki; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, to Sharp Kabushiki Kaisha. Image processing device. 4,695,966, Cl. 364-521.000.

Takano, Kunio; and Nukushina, Masanori, to Tokyo Juki Industrial Co., Ltd. Sewing machine control apparatus. 4,694,762, Cl. 112-121.120.

Takanohashi, Kunio; Yoshida, Tsuneaki; and Fujii, Shoichiro, to Takeda Chemical Industries, Ltd. Thiazole derivatives. 4,695,639, Cl. 548-165.000.

Takasago Perfumery Co., Ltd.: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.

Takashima, Akira: *See*—
Makino, Hiroshi; Yoshino, Tsunemi; Kihara, Tadaharu; and Takashima, Akira, 4,695,893, Cl. 358-227.000.

Takasu, Noboru: *See*—
Ishida, Masahiro; Kato, Shunichi; and Takasu, Noboru, 4,694,999, Cl. 242-4.00R.

Takasuga, Shunzo: *See*—
Yagii, Koji; Miyata, Jun; and Takasuga, Shunzo, 4,695,699, Cl. 219-121.0LD.

Takasugi, Sumio: *See*—
Kageyama, Kunio; and Takasugi, Sumio, 4,695,508, Cl. 428-261.000.

Takatsu, Kozo: *See*—
Morimoto, Nobuyuki; Takatsu, Kozo; and Sugimoto, Michio, 4,695,440, Cl. 423-328.000.

Takatsu, Norihiko: *See*—
Kawahara, Atsushi; and Takatsu, Norihiko, 4,696,021, Cl. 377-58.000.

Takazoe, Ichiro; Ohta, Kosei; Shimizu, Junichi; Suzuki, Kazumasa; Iwakura, Tatsuya; and Nakajima, Yoshikazu, to Mitsui Sugar Co., Ltd. Low-cariogenic sweeteners. 4,695,326, Cl. 127-30.000.

Takeda Chemical Industries, Ltd.: *See*—
Goto, Giichi; and Saji, Yoshiaki, 4,695,572, Cl. 514-278.000.
Takanohashi, Kunio; Yoshida, Tsuneaki; and Fujii, Shoichiro, 4,695,639, Cl. 548-165.000.

Takeda Chemical Industry, Ltd.: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; Tanaka, Makoto; and Hayashida, Shigeru, 4,695,465, Cl. 424-449.000.

Takeda, Masami, to Canon Kabushiki Kaisha. Method of molding a member having undercut portions. 4,695,421, Cl. 264-318.000.

Takeda, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Switchgear. 4,695,741, Cl. 307-643.000.

Takeda Riken Kogyo Kabushikikaisha: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,696,004, Cl. 371-25.000.

Takei, Masahiro; Kozuki, Susumu; Masui, Toshiyuki; Hirasawa, Masahide; and Kashida, Motokazu, to Canon Kabushiki Kaisha. Data storing device having position determining means. 4,696,008, Cl. 371-47.000.

Takekoshi, Tohru; and Anderson, Patricia P., to General Electric Company. Secondary amine-terminated oligomers and copolyurethanecarbonates prepared therefrom. 4,695,612, Cl. 525-433.000.

Takeoka, Seiei, to Niles Parts Co., Ltd. Apparatus for preventing a roundabout of supersonic wave in a supersonic wave transmitter and receiver for a vehicle. 4,695,985, Cl. 367-87.000.

Takesako, Sumiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for sorting sheets. 4,694,963, Cl. 209-534.000.

Takeuchi, Hajime: *See*—
Hashimoto, Minoru; Takeuchi, Hajime; and Itoh, Takeo, 4,695,513, Cl. 428-425.900.

Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, to Dai Nippon Insatsu Kabushiki Kaisha; and Mitsubishi Jukogyo Kabushiki Kaisha. Method of presetting plate cylinders for registering in an offset printing press. 4,694,749, Cl. 101-426.000.

Takeuchi, Koji: *See*—
Higuchi, Ryoichi; Sakurai, Takao; Mikami, Naoko; Akaiwa, Kiriko; and Takeuchi, Koji, 4,695,651, Cl. 560-141.000.

Takeuchi, Masashi: *See*—
Tsukase, Masaaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, 4,695,525, Cl. 430-151.000.

Takeuchi, Mikio: *See*—
Yamazaki, Yoshihide; Uchimura, Kazumi; Yamashita, Satoshi; and Takeuchi, Mikio, 4,695,614, Cl. 526-142.000.

Takeuchi, Yasuhito; Hirota, Yuichi; Sano, Shinichi; and Ishiguro, Shinichi, to Yokogawa Medical Systems, Limited. Ultrasound diagnostic equipment. 4,694,680, Cl. 73-1.0DV.

Takeuchi, Yukihisa: *See*—
Okajima, Atushi; Yoshida, Hitoshi; Takeuchi, Yukihisa; and Fukutani, Masanori, 4,695,301, Cl. 55-523.000.

Takezawa, Hatsuo; Donuma, Kenichi; Katagiri, Shuhei; and Sakura, Shigeyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Duplex optical communication module unit. 4,695,858, Cl. 357-19.000.

Takizawa, Shozo: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Talend, Donald R., to Corcom, Inc. Telephone connector with bypass capacitor. 4,695,115, Cl. 439-76.000.

Tallis, John R., Jr.; and Volino, Nicholas A., to Facet Enterprises, Inc. Engine starter drive with integral starter relay. 4,695,735, Cl. 290-38.00K.

Tamfelt Oy Ab: *See*—
Salminen, Ari, 4,695,015, Cl. 245-6.000.

Tanaka, Atsuo: *See*—
Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,694,735, Cl. 92-208.000.

Tanaka, Kunio: *See*—
Nakaya, Keiichi; and Tanaka, Kunio, 4,695,445, Cl. 423-635.000.

Tanaka, Makoto: *See*—
Kigasawa, Kazuo; Ohtani, Hideaki; Tanaka, Makoto; and Hayashida, Shigeru, 4,695,465, Cl. 424-449.000.

Tanaka, Masami, to Showa Precision Machinery Co., Ltd. Starting device with air motor for internal combustion engines. 4,694,791, Cl. 123-179.00F.

Tanaka, Minoru: *See*—
Terahara, Akira; and Tanaka, Minoru, 4,695,587, Cl. 514-510.000.

Tanaka, Tadao: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Tanaka, Teruo; Tanaka, Teruya; and Kitamura, Masato, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for forming moisture-permeable waterproof coating on fabrics. 4,695,484, Cl. 427-245.000.

Tanaka, Teruya: *See*—
Tanaka, Teruo; Tanaka, Teruya; and Kitamura, Masato, 4,695,484, Cl. 427-245.000.

Tanaka, Toyoji: *See*—
Fujisawa, Kunio; Tanaka, Toyoji; Mochizuki, Toshio; Nakamura, Norio; and Kaya, Seiji, 4,694,748, Cl. 101-401.100.

Tanaka, Tsunefumi: *See*—
Kitagishi, Nozomu; Takahashi, Sadatoshi; Ikemori, Keiji; Momiyama, Kikuo; and Tanaka, Tsunefumi, 4,695,133, Cl. 350-427.000.

Tanaka, Yasuhiro, to Murata Manufacturing Co., Ltd. Laminated terminal layer for electronic component. 4,695,756, Cl. 310-355.000.

Tandon, Jagdish C.; and Araghi, Mehdi N., to Xerox Corporation. Image sensor array for assembly with like arrays to form a longer array. 4,695,716, Cl. 250-211.00R.

Tani, Kazuhide: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.

Taniguchi, Yasutaka: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Taniguchi, Yoshiya, to Toyo Machinary & Metal Co., Ltd. Injection molder. 4,695,238, Cl. 425-145.000.

Tanoue, Shohachi: *See*—
Morishita, Takashi; Hata, Takehisa; Mori, Mitio; and Tanoue, Shohachi, 4,695,466, Cl. 424-456.000.

Taplin, Lael B., to Vickers, Incorporated. Power transmission. 4,695,230, Cl. 417-218.000.

Tarozzi, Richard A., to King-Seeley Thermos Co. Automatic drip coffee maker. 4,694,738, Cl. 99-279.000.

Tartar, Andre: *See*—
Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, 4,695,562, Cl. 514-13.000.

Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin: *See*—
Zhigalov, Gennady V.; Abduganiev, Abdurakhim; Kim, Sergei Y.; and Mosheev, Robert R., 4,694,642, Cl. 57-5.000.

Tassone, Joseph V.; and Candor, James T., to Dayco Products, Inc. Layer of reinforced polymeric material, method and apparatus for making the same and a product containing the same. 4,695,269, Cl. 474-268.000.

Tate, Ralph, Jr.; and Woods, John T., to Whirlpool Corporation. Method of manufacturing refrigeration apparatus cabinet construction utilizing prepainted steel panels. 4,694,553, Cl. 29-445.000.

Tatematsu, Yoshiaki; and Tanaka, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Piston for internal combustion engine. 4,694,735, Cl. 92-208.000.

Tatemoto, Minoru: *See*—
Kobayashi, Kazuyoshi; Takizawa, Shozo; Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,695,074, Cl. 280-707.000.

Tatsu, Kunihiko: *See*—
Komatsu, Teruaki; Kobayashi, Kiyoshi; Tatsu, Kunihiko; and Shibata, Shoichi, 4,695,065, Cl. 279-60.000.

Taub, Ronald H. Standard dimension pallet assembly formed of separate abutted segments. 4,694,962, Cl. 206-600.000.

Tauschmann, Otto. Conduit. 4,694,865, Cl. 138-148.000.

Taylor, Edward C.; Katz, Alan H.; Bull, Randy A.; Byers, Lance R.; and Brown, Richard A., to FMC Corporation. Aryl carboxylate process. 4,695,658, Cl. 568-763.000.

Taylor, Greg: *See*—
Silvestri, Frank, 4,694,726, Cl. 84-413.000.

Taylor, Kenneth W., to University of Toronto Innovations Foundation. Scanning apparatus. 4,696,025, Cl. 378-146.000.

Taylor, Peter W., to Molecular Diagnostics, Inc. Enzymatic detection of bacterial capsular polysaccharide antigens. 4,695,541, Cl. 435-18.000.

Tazaki, Shigemitsu, to Canon Kabushiki Kaisha. Ink storing apparatus with a first case having plural ink tanks and second case having one ink tank and a waste ink receptacle. 4,695,824, Cl. 346-140.00R.

Teach, Eugene G.: *See*—
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.

Technical Oil Tools Corporation: *See*—
Brown, Gregory D.; Clark, Darrel E.; and Schuermann, Rodger W., 4,694,692, Cl. 73-155.000.

Technicare Corporation: *See*—
Kramer, David M.; Compton, Russell A.; Strenk, Lawrence M.; and Murdoch, James B., 4,695,800, Cl. 324-309.000.

Technicon Instruments Corporation: *See*—
Farrell, Gregory A., 4,695,431, Cl. 422-81.000.

Tecnomare S.p.A.: *See*—
Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Francesco; Vanore, Silvestro; and Carraro, Roberto, 4,695,193, Cl. 405-204.000.

Tecumseh Products Company: *See*—
Gannaway, Edwin L., 4,694,660, Cl. 62-196.400.

Teder, Rein S.: *See*—
Bonin, Wayne A.; McCumber, Roger D.; and Teder, Rein S., 4,694,687, Cl. 73-116.000.

Teijin Petrochemical Industries, Ltd.: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,695,667, Cl. 585-481.000.

Teikoku Hormone Mfg. Co., Ltd.: *See*—
Suzuki, Yasushi; Hasegawa, Yukio; Sato, Michitaka; Saito, Morinobu; Yamamoto, Norio; Miyasaka, Katsuhiko; Mikami, Takashi; and Miyazawa, Katsuhiko, 4,695,581, Cl. 514-415.000.

Tektronix, Inc.: *See*—
Barrett, Ronald A., 4,695,806, Cl. 330-254.000.
Grellmann, Heinz E.; and Roland, Leonard A., 4,695,811, Cl. 333-105.000.
Leber, David C.; and Falk, Timothy L., 4,694,572, Cl. 29-840.000.

Telechron, Inc.: *See*—
Wingler, William C.; and Pomponio, Edward V., 4,695,683, Cl. 200-11.00R.

Teleflex Incorporated: *See*—
Frankhouse, Thomas J.; and Spease, Arthur L., 4,694,705, Cl. 74-501.00R.

Telefonaktiebolaget LM Ericsson: *See*—
Ekelund, Folke J. B.; Lilja, Per O.; Wald, Roland J. E.; and Stahl, Matts F., 4,695,413, Cl. 361-18.000.

Telefunken electronic GmbH: *See*—
Annacker, Ralph; and Dietl, Joachim, 4,695,807, Cl. 330-310.000.
Mahalek, Josef; and Vetter, Egon, 4,695,915, Cl. 361-56.000.
Rein, Hans-Martin, 4,695,940, Cl. 363-157.000.

Telesciences, Inc.: *See*—
Cohen, Fred, 4,696,029, Cl. 379-92.000.

Tellier, Yves: *See*—
Sibertin-Blanc, Jean-Baptiste; and Tellier, Yves, 4,694,931, Cl. 182-3.000.

Tempmaster Corporation: *See*—
Carlson, Melvin C.; and Dean, Raymond H., 4,694,988, Cl. 236-49.000.
Carlson, Melvin C.; and Dean, Raymond H., 4,694,989, Cl. 236-49.000.

Tennant, Robert J.: *See*—
Feldman, Steven; and Tennant, Robert J., 4,695,106, Cl. 439-83.000.

Terahara, Akira; and Tanaka, Minoru, to Sankyo Company Limited. M-4 and IsoM-4 derivatives, their preparation and compositions containing them. 4,695,587, Cl. 514-510.000.

Teramachi, Hiroshi. Endless ball spline. 4,695,170, Cl. 384-45.000.

Teranishi, Akio: *See*—
Tachita, Ryobun; and Teranishi, Akio, 4,696,058, Cl. 455-277.000.

Terasaka, Satoru: *See*—
Enzaki, Yoshiki; Kitahara, Kazuki; Terasaka, Satoru; Mori, Kenji; and Kimura, Takeshi, 4,695,247, Cl. 431-352.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet printer. 4,695,851, Cl. 346-140.00R.

Terracol, Claude; and Roulet-Dubonnet, Jean-Pierre, to Merlin Gerin. Shunt effect low voltage circuit breaker. 4,695,913, Cl. 361-13.000.

Terui, Nobuhiko; and Takahata, Hisatoshi, to Nippon Kogaku K. K. Flash photographing system. 4,695,148, Cl. 354-413.000.

Terumo Kabushiki Kaisha: *See*—
Shinno, Kouji; and Kuboki, Hitoshi, 4,695,276, Cl. 604-283.000.

Tetron, Inc.: *See*—
Hammond, Martin L.; and Ramiller, Charles L., 4,694,779, Cl. 118-730.000.

Teuchert, Eberhardt; Haas, Klaus-Arne; and Gerwin, Heimut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method for loading, operating, and unloading a ball-bed nuclear reactor. 4,695,423, Cl. 376-265.000.

Texas Instruments Incorporated: *See*—
Chatterjee, Pallab K., 4,695,872, Cl. 357-75.000.
Christian, Donald J.; and Stachowicz, Michael J., 4,696,047, Cl. 382-8.000.
Doddington, George R.; and Secrest, Bruce G., 4,696,038, Cl. 381-38.000.
Doddington, George R., 4,696,039, Cl. 381-46.000.
Doddington, George R.; and Papamichalis, Panos E., 4,696,040, Cl. 381-46.000.
Goudie, Kathleen M., 4,695,962, Cl. 364-513.500.
Goudie, Kathleen M., 4,696,042, Cl. 381-51.000.
Harshaw, Robert C., 4,696,012, Cl. 372-99.000.
Provence, John D.; Brown, Frederick W.; and Jones, John L., 4,695,700, Cl. 219-121.0PD.
Renner, Karl H.; and Morton, Alec J., 4,695,970, Cl. 364-724.000.
Thatte, Satish; and Oxley, Donald W., 4,695,949, Cl. 364-200.000.
Tuvell, James A.; and Smayling, Michael C., 4,695,979, Cl. 365-185.000.

Texaust Australia Limited: *See*—
Towner, Geoffrey F.; and Carter, Charles A., 4,694,910, Cl. 166-379.000.

Thatte, Satish; and Oxley, Donald W., to Texas Instruments Incorporated. Method for efficient support for reference counting. 4,695,949, Cl. 364-200.000.

Theiler, Richard F.: *See*—
Caswell, Michael L.; Corr, James J.; Dobrovolny, Mark S.; Lander, Lynn H.; Narath, William R.; and Theiler, Richard F., 4,695,395, Cl. 252-121.000.

Thermacore, Inc.: *See*—
Eastman, George Y., 4,696,010, Cl. 372-34.000.

Theuner, Hans-Werner: *See*—
Dreckmann, Karl; Schneider, Jakob; and Theuner, Hans-Werner, 4,695,346, Cl. 156-361.000.

Thibault, Jean, to Eastman Kodak Company. Apparatus and method for preventing the formation of a deposit from a processing solution on a film transport member. 4,695,147, Cl. 354-322.000.

Thollot, Pierre: *See*—
Nguyen, Vietson M.; Dhyanchand, P. John; and Thollot, Pierre, 4,695,933, Cl. 363-17.000.

Thomas & Betts Corporation: *See*—
Strauss, Richard F.; Herb, Phillip; Noorily, Peter; and Rodrigues, Julio, 4,695,679, Cl. 174-117.0FF.

Thomas, Karen A., to Olin Corporation. Continuous production of low density base grain with a salt-free liquor. 4,694,753, Cl. 102-289.000.

Thompson, Kenneth A.: *See*—
Rozema, John G.; and Thompson, Kenneth A., 4,696,016, Cl. 375-20.000.

Thompson, Robert E.: *See*—
Collier, Ronald T.; and Thompson, Robert E., 4,694,722, Cl. 83-885.000.

Thomson-CSF: *See*—
Barre, Lucien, 4,695,927, Cl. 361-400.000.
Billet, Daniel; and Cesarini, Jean F., 4,695,787, Cl. 324-557.000.
Blanchard, Pierre; Descure, Pierrick; and Chautemps, Jacques, 4,695,860, Cl. 357-24.0LR.
Boucharlat, Gilles; and Brissot, Louis, 4,695,890, Cl. 358-213.310.
Noguier, Jean P.; and Montaut, Jean P., 4,695,863, Cl. 357-38.000.
Portmann, Jacques, 4,695,889, Cl. 358-213.260.

Thomson, Peter: *See*—
Daintrey, Joseph W.; and Thomson, Peter, 4,694,739, Cl. 99-289.00R.

Thomson, Timothy M.: *See*—
Cote, Richard J.; Thomson, Timothy M.; Houghton, Alan N.; Oettgen, Herbert F.; Old, Lloyd J.; and Cardo, Carlos C., 4,695,538, Cl. 435-7.000.

Thones, Gustav, to L. & C. Steinmuller GmbH. Heat exchanger for heat exchange between hot gas and medium flowing through tube bundles. 4,694,897, Cl. 165-160.000.

Thorud, Richard A.; and White, Donald M., III, to Toro Company, The. Single stage snowthrower. 4,694,594, Cl. 37-244.000.

Tilles, Harry: *See*—
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.

Time Video Information Services, Inc.: *See*—
Jacobson, Dov, 4,695,832, Cl. 340-709.000.

Timme, William F. Auxiliary stimulation apparatus for apnea distress. 4,694,839, Cl. 128-721.000.

Timmerman, Tom; and Chapman, Norman V. Piston apparatus. 4,694,785, Cl. 123-52.00A.

Titov, Mikhail I.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Titova, Galina P.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Titus, John D., to Motorola, Inc. Fuze actuating method having an adaptive time delay. 4,694,752, Cl. 102-215.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Suzuki, Shigeo; Doi, Yoshiharu; and Soga, Kazuo, 4,695,557, Cl. 502-103.000.

Tobe, Akihiro: *See*—
Ninomiya, Kunihiro; Nitta, Issei; Tobe, Akihiro; Egawa, Mitsuo; and Kikumoto, Ryoji, 4,695,568, Cl. 514-258.000.

Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Substrate potential generating circuit. 4,695,746, Cl. 307-297.000.

Todd, Richard S.: *See*—
Boyle, John T. A.; and Todd, Richard S., 4,695,574, Cl. 514-313.000.

Tofigh, Farshid: *See*—
Jackson, Kenneth R.; and Tofigh, Farshid, 4,695,917, Cl. 361-58.000.

Toft, Richard C.: *See*—
Stephenson, Graham W.; and Toft, Richard C., 4,694,909, Cl. 166-359.000.

Togawa, Yoichi: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Tokai, Masaya: *See*—
Konagaya, Shigeji; Watanabe, Osamu; Kuzumoto, Hideshi; Tokai, Masaya; Narusawa, Haruhiko; and Kato, Yasuo, 4,695,383, Cl. 210-500.370.

Tokai TRW & Co., Ltd.: *See*—
Nagae, Kiyoshi, 4,694,927, Cl. 180-132.000.

Tokico Ltd.: *See*—
Amemori, Hiroyuki; Nishiyama, Shigeru; and Iwamoto, Tetsuo, 4,694,702, Cl. 73-861.240.

Tokyo Juki Industrial Co., Ltd.: *See*—
Takano, Kunio; and Nukushina, Masanori, 4,694,762, Cl. 112-121.120.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kimoto, Katsumi, 4,695,989, Cl. 369-32.000.
Sakata, Tomio, 4,696,041, Cl. 381-46.000.
Takesako, Sumiyoshi, 4,694,963, Cl. 209-534.000.
Takezawa, Hatsuo; Donuma, Kenichi; Katagiri, Shuhei; and Sakura, Shigeyuki, 4,695,858, Cl. 357-19.000.
Tsunoda, Yoshiaki; and Matsuda, Hideo, 4,695,871, Cl. 357-74.000.

Tolman, Richard L.: *See*—
Marburg, Stephen; Tolman, Richard L.; and Kniskern, Peter J., 4,695,624, Cl. 530-395.000.

Tomida, Yasutaka, to Brother Kogyo Kabushiki Kaisha. Printing apparatus with a thermal print head. 4,695,173, Cl. 400-120.000.

Tomikawa, Shinichiro: *See*—
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.

Tominaga, Hiroshi, to Fuji Electric Co., Ltd. Human body supporting device. 4,694,521, Cl. 5-453.000.

Tomorrow Group, Inc., The: *See*—
Parnell, Raymond, 4,694,965, Cl. 211-87.000.

Tonohara, Yoshiharu: *See*—
Noguchi, Takayo; Togawa, Yoichi; Nishimoto, Tsuneo; Tonohara, Yoshiharu; Rokkaku, Tadashi; Nakai, Seigo; Araki, Michio; and Kitano, Kahei, 4,695,209, Cl. 409-42.000.

Toomey, Joseph E., Jr., to Reilly Tar & Chemical Corporation. Electrochemical reduction of pyridine carboxamide bases. 4,695,352, Cl. 204-74.000.

Topfl, Rosemarie, to Ciba-Geigy Corporation. Process for improving the colour yield and wetfastness properties of dyeings or prints produced on cellulosic fabrics with anionic dyes: treatment with cationic imidazole. 4,695,289, Cl. 8-573.000.

Torabi, Mohammad T. Double-hung closure for access openings. 4,694,609, Cl. 49-193.000.

Toray Industries, Inc.: *See*—
Watanabe, Koji; Okamoto, Miyoshi; Mori, Yuichi; and Noishiki, Yasuharu, 4,695,280, Cl. 623-1.000.

Torelli, Guido; and De La Plaza, Alejandro, to SGS Microelectronica S.p.A. System for expanding the stereo base of stereophonic acoustic diffusion apparatus. 4,696,035, Cl. 381-1.000.

Toro Company, The: *See*—
Comer, Robert C.; Hampel, Wilbur J.; and Rogers, Edward A., 4,694,528, Cl. 15-330.000.
Thorud, Richard A.; and White, Donald M., III, 4,694,594, Cl. 37-244.000.

Torremans, Joseph L. G.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef E.; and Van Offenwert, Theophilus T. J. M., 4,695,569, Cl. 514-258.000.
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,695,575, Cl. 514-322.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Banzai, Hideo; and Takada, Makoto, 4,695,965, Cl. 364-518.000.

Toth Aluminum Corporation: *See*—
Wyndham, Ronald; Chaplin, Gervaise M.; and Swanson, William M., 4,695,436, Cl. 423-135.000.

Toth, James E.: *See*—
Shacklette, Lawrence W.; Toth, James E.; and Elsenbaumer, Ronald L., 4,695,521, Cl. 429-194.000.

Touhsaent, Robert E.: *See*—
Liu, Leland L.; and Touhsaent, Robert E., 4,695,503, Cl. 428-207.000.

Towae, Friedrich: *See*—
Merger, Franz; and Towae, Friedrich, 4,695,645, Cl. 560-24.000.

Towner, Geoffrey F.; and Carter, Charles A., to Texaust Australia Limited. Packing tube assembly for pumping wells. 4,694,910, Cl. 166-379.000.

Towns, Edward J.: *See*—
Proctor, John D.; Towns, Edward J.; and Brown, Edward M., 4,694,968, Cl. 215-224.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,694,536, Cl. 17-37.000.

Townsend, Ray T., to Townsend Engineering Company. Compound pump mechanism for meat encasing machines and the like. 4,694,536, Cl. 17-37.000.

Toyne, Kenneth J.: *See*—
Balkwill, Peter H.; Bishop, David I.; Pearson, Andrew D.; Sage, Ian C.; Gray, George W.; Lacey, David; Toyne, Kenneth J.; and McDonnell, Damien G., 4,695,131, Cl. 350-350.00R.

Toyo Boseki Kabushiki Kaisha: *See*—
Konagaya, Shigeji; Watanabe, Osamu; Kuzumoto, Hideshi; Tokai, Masaya; Narusawa, Haruhiko; and Kato, Yasuo, 4,695,383, Cl. 210-500.370.

Toyo Machinary & Metal Co., Ltd.: *See*—
Taniguchi, Yoshiya, 4,695,238, Cl. 425-145.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Tsuzuki, Kenji; and Uotani, Takeshi, 4,695,644, Cl. 558-249.000.

Toyosawa, Yukio: *See*—
Kurakake, Mitsuo; Sakamoto, Keiji; and Toyosawa, Yukio, 4,695,780, Cl. 318-561.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hayashi, Souichi; Miyake, Johji; Koyama, Mototsugu; and Sakaguchi, Kanji, 4,695,329, Cl. 148-3.000.
Kato, Kenji; Matsushita, Soichi; and Nakanishi, Kiyoshi, 4,694,794, Cl. 123-306.000.
Miura, Hirohisa; Satoh, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,695,319, Cl. 75-63.000.
Nakano, Jiro; Ishibashi, Takao; Akatsuka, Takao; and Kawaguchi, Masao, 4,694,809, Cl. 123-489.000.
Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, 4,695,758, Cl. 313-130.000.
Nomura, Yoshihisa; Suda, Koichi; and Kozawa, Tadashi, 4,694,734, Cl. 92-130.00R.
Okumura, Katsuhiro, 4,694,611, Cl. 49-441.000.
Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,694,735, Cl. 92-208.000.

TP Orthodontics, Inc.: *See*—
Hall, Arthur B., 4,695,417, Cl. 264-80.000.

Tractiontec Corporation: *See*—
Kemper, Yves J., 4,694,701, Cl. 74-191.000.

Trampnau, Ulrich. Landing aid. 4,695,013, Cl. 244-17.130.

Trautwein, Franz: *See*—
Jorgens, Reinhard; Faltermeier, Bernd; and Trautwein, Franz, 4,695,137, Cl. 350-521.000.

TRE Corporation: *See*—
Ault, Robert M., 4,695,495, Cl. 428-73.000.

Treffner, Charles: *See*—
Treffner, Peter; and Treffner, Charles, 4,695,416, Cl. 264-45.400.

Treffner, Peter; and Treffner, Charles. Method and apparatus for mould-forming expanded plastics form blocks. 4,695,416, Cl. 264-45.400.

Trieselt, Wolfgang: *See*—
Sommer, Karl; Heinz, Robert; Hettche, Albert; Perner, Johannes; Schuster, Werner; and Trieselt, Wolfgang, 4,695,397, Cl. 252-182.000.

Trim-Lok, Inc.: *See*—
Whitener, Gary, 4,695,499, Cl. 428-122.000.

Trimble, Russell L.: *See*—
Rose, Robert J.; and Trimble, Russell L., 4,695,954, Cl. 364-413.000.

Trocciola, John C.; Powers, Joseph; and Martin, Ronald G., to United Technologies Corporation. Silicon carbide matrix for fuel cells. 4,695,518, Cl. 429-12.000.

Tronsli, Sverre N.: *See*—
Oen, Sverre; Poppe, Dag; and Tronsli, Sverre N., 4,695,935, Cl. 363-21.000.

Trudeau, Michael J.: *See*—
Ciletti, Guy D.; and Trudeau, Michael J., 4,694,668, Cl. 70-63.000.

Trusty, Alan J.: *See*—
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,695,422, Cl. 264-504.000.

TRW Ehrenreich GmbH & Co. KG: *See*—
Rahmede, Karl-Heinz; and Stemmer, Horst-Heinz, 4,695,181, Cl. 403-135.000.

TRW Inc.: *See*—
Roberts, Maurice P., 4,694,925, Cl. 180-79.100.
Wood, Ruey E., Jr., 4,695,182, Cl. 403-140.000.

Tsivtsivadze, David M.: *See*—
Asatiani, Georgy N.; Pikus, Evgeny A.; Kutelia, Elgudzha R.; Tsivtsivadze, David M.; Mudzhiri, Yason N.; and Dzhalsbadze, Nikolai V., 4,695,360, Cl. 204-404.000.
Tsuboi, Noboru: *See*—
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, 4,695,233, Cl. 418-83.000.
Tsuchida, Tetsuo: *See*—
Hayashi, Tsutomu; Kawaguchi, Takeshi; and Tsuchida, Tetsuo, 4,694,938, Cl. 188-181.00A.
Tsugei, Shinji; and Inoue, Tomohiro, to Sharp Kabushiki Kaisha. Pocketable wireless transmitter and receiver. 4,696,054, Cl. 455-89.000.
Tsukada, Tetsuo; Shimobuchi, Hideyuki; and Yoshikawa, Takahiro, to Fujitsu Limited. Color printer having apparatus for shifting ink ribbon. 4,695,175, Cl. 400-196.100.
Tsukase, Masaaki; Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Image forming process. 4,695,525, Cl. 430-151.000.
Tsunoda, Norio: *See*—
Yamashita, Masatoshi; and Tsunoda, Norio, 4,695,059, Cl. 273-360.000.
Tsunoda, Yoshiaki; and Matsuda, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Light-triggered semiconductor device. 4,695,871, Cl. 357-74.000.
Tsurumaki, Kazuyoshi: *See*—
Ohtsuki, Tomonari; and Tsurumaki, Kazuyoshi, 4,695,914, Cl. 361-42.000.
Tsurumoto, Kazuo: *See*—
Ozaki, Yoshio; Tsurumoto, Kazuo; Yatomi, Takeshi; and Yamamoto, Masahiro, 4,695,696, Cl. 219-69.00P.
Tsuyuguchi, Seiichi: *See*—
Kimura, Takayoshi; Tsuyuguchi, Seiichi; and Mori, Yoshiaki, 4,695,317, Cl. 75-24.000.
Tsuzuki, Kenji; and Uotani, Takeshi, to Toyo Soda Manufacturing Co., Ltd. Process for producing phenyl chlorothioformates. 4,695,644, Cl. 558-249.000.
Tuchiya, Takanori: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.
Tuck, Edward F.: *See*—
Morganstein, Sanford J.; Tuck, Edward F.; Mehta, Bakulesh A.; and Krakau, Herbert B., 4,696,028, Cl. 379-88.000.
Tucker, Jewell G.: *See*—
Anthony, Thomas R.; Lindner, Philip A.; and Tucker, Jewell G., 4,695,760, Cl. 313-348.000.
Tujimura, Kiyoharu: *See*—
Shimizu, Tetsuo; Tujimura, Kiyoharu; and Iwamoto, Michinori, 4,695,034, Cl. 251-129.060.
Tulpule, Bhalchandra R.; Oscarson, Edward M.; and Vosgien, David J., to United Technologies Corporation. Multi-channel clock synchronizer. 4,696,019, Cl. 375-107.000.
Tunstall, Timothy F. Golf club. 4,695,054, Cl. 273-171.000.
Tuominen, Francis W.; Maier, Helmut K.; and Howland, Warren W., to Henkel Corporation. Thickened alcoholic antimicrobial compositions. 4,695,453, Cl. 424-81.000.
Turner, Esther: *See*—
Berl, Marta N.; and Turner, Esther, 4,694,844, Cl. 132-84.00R.
Tuske, Marton: *See*—
Bordas, Barna; Gimesi, Antal; Kovacs, Magda, nee Kalman; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,309, Cl. 71-88.000.
Bordas, Barna; Gimesi, Antal; Kovacs nee Kalman, Magda; Janos, Eva; Matolcsy, Gyorgy; and Tuske, Marton, 4,695,313, Cl. 71-100.000.
Tuvell, James A.; and Smayling, Michael C., to Texas Instruments Incorporated. Modified four transistor EEPROM cell. 4,695,979, Cl. 365-185.000.
Tyler, Truman V. Self-contained hydraulically operable water purifier. 4,695,375, Cl. 210-110.000.
Tyree, Lewis, Jr., to Liquid Carbonic Corporation. Production of large quantities of CO_2 snow. 4,695,302, Cl. 62-10.000.
Tyron, Inc.: *See*—
White, Basil D., 4,694,874, Cl. 152-381.500.
Tysse, Thomas M. Oral evacuation device and method. 4,695,253, Cl. 433-136.000.
U.S.D. Corp: *See*—
Faulconer, Mark; and Greatrake, Scott E., 4,694,772, Cl. 114-315.000.
Uchida, Kihachirou, to Koito Seisakusho Co., Ltd. Waterproof lamp socket construction. 4,695,259, Cl. 439-271.000.
Uchida, Seiju: *See*—
Degawa, Toru; Fujiwara, Kozo; Hashimoto, Akio; Uchida, Seiju; Okuyama, Gen; and Matsui, Susumu, 4,695,427, Cl. 420-129.000.
Uchida, Takashi: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.
Uchikawa, Sadao: *See*—
Aoyama, Motoo; Maruyama, Hiromi; Umegaki, Kikuo; and Uchikawa, Sadao, 4,695,425, Cl. 376-435.000.
Uchikawa, Takaaki: *See*—
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.
Uchimura, Kazumi: *See*—
Yamazaki, Yoshihide; Uchimura, Kazumi; Yamashita, Satoshi; and Takeuchi, Mikio, 4,695,614, Cl. 526-142.000.
Ueberreiter, Ekkehard. Device for conveying components particularly integrated chips, from an input magazine to an output magazine. 4,694,964, Cl. 209-549.000.
Ueda, Masahiro: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; Ueda, Masahiro; Kubota, Shinichi; Kushida, Noritaka; and Matsumoto, Yukihiro, 4,694,803, Cl. 123-440.000.
Uegaki, Masatoshi: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Macgawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.
Uemurre, Toshinobe; Shinooka, Kiyohide; and Kajiho, Tokuaki, to Fujisawa Pharmaceutical Co., Ltd. Sustained release tablet. 4,695,467, Cl. 424-502.000.
Ueno, Hideo; Hattori, Hiroshi; Maeda, Kumiko; and Yamada, Keiko, to Brother Kogyo Kabushiki Kaisha. Printer with display for double-width character. 4,695,172, Cl. 400-83.000.
Uesugi, Naomoto: *See*—
Ogano, Takeo; Komatsuzaki, Takeshi; Shigenari, Ryoichi; and Uesugi, Naomoto, 4,694,942, Cl. 192-13.00A.
Ulijasz, Thaddeus R.: *See*—
Ohlhaber, Ronald L.; and Ulijasz, Thaddeus R., 4,695,127, Cl. 350-96.230.
Ultra Bagger Co. of Cincinnati, The: *See*—
Maddux, Forrest E., Jr.; Eagle, Paul A.; and Robbins, Robert L., 4,694,638, Cl. 53-459.000.
Ultrasonic Arrays, Inc.: *See*—
Hossack, James M., 4,695,986, Cl. 367-140.000.
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Umeda, Morio: *See*—
Fukutomi, Hisao; Konishi, Takeshi; Kuraoka, Koji; Umeda, Morio; Tuchiya, Takanori; and Imura, Yutaka, 4,695,089, Cl. 296-107.000.
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Ungerstedt, Carl U. Dialysis probe. 4,694,832, Cl. 128-632.000.
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Ackelson, Donald B.; Moorehead, Eric L.; Ward, John W.; and Probst, Jon D., 4,695,365, Cl. 208-89.000.
Ho, Philman N., 4,695,373, Cl. 208-428.000.
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Andreasen, David A.; Armstrong, John H.; Buggert, Jerrold E.; Desai, Harshad K.; Baumgardner, Stephen D.; Buckmaster, Kenneth E.; and Hussain, Zubair, 4,695,946, Cl. 364-200.000.
United DC: *See*—
Levine, Marc S., 4,695,205, Cl. 406-38.000.
United States of America
Air Force: *See*—
Yu, Francis T. S., 4,695,973, Cl. 364-822.000.
Army: *See*—
Holder, James D., 4,695,120, Cl. 350-96.110.
Mary, Donald J., 4,695,892, Cl. 358-225.000.
McDaniel, Steven G., 4,694,728, Cl. 89-1.110.
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Meek, Thomas T.; and Blake, Rodger D., 4,695,695, Cl. 219-10.55M.
Spadaro, Peter R.; Smith, Jay E.; Speer, Elmer L.; and Ceccoui, Arnold L., 4,695,299, Cl. 55-274.000.
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Ackman, Terry E.; and Place, John M., 4,695,378, Cl. 210-198.100.
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Egli, Annmarie O.; and St. Clair, Terry L., 4,695,610, Cl. 525-426.000.
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Crane, Roger M.; and Macander, Aleksander B., 4,695,344, Cl. 156-242.000.
Koper, Kenneth T.; Willard, Sylvester L.; and Abramowski, Larry A., 4,695,520, Cl. 429-116.000.
Robbins, William L., 4,695,921, Cl. 361-308.000.
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Barbu, Stefan; Valkestijn, Leonardus; and van de Kerkhof, Franciscus A. M., 4,695,839, Cl. 340-825.060.
Bugg, Richard E. F., 4,695,835, Cl. 340-750.000.
Buikman, Dirk; Helzel, Thomas; and Roschman, Peter, 4,694,836, Cl. 128-653.000.
Clasen, Rolf, 4,695,305, Cl. 65-18.300.
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Gent, Derek J.; and Bergstrom, Michael, 4,695,774, Cl. 315-408.000.
Larkin, Keith J., 4,695,731, Cl. 250-374.000.
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Raets, Hubert C., 4,695,770, Cl. 315-207.000.
Rudelle, Marie-Irene, 4,695,809, Cl. 331-117.00D.
Wagenaar, Kornelis J., 4,695,865, Cl. 357-41.000.
Ward, Rodney, 4,695,732, Cl. 250-492.200.
Zandveld, Frederik; and Visser, Jeroen M., 4,695,944, Cl. 364-200.000.
Zijlstra, Hinne, 4,695,802, Cl. 324-319.000.
United States Steel Corporation: *See*—
Rueckl, Roger L., 4,695,323, Cl. 106-85.000.
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Doman, Glidden S.; Kos, Joseph M.; Harner, Kermit I.; DiValentin, Eugene D.; and Healy, Henry S., 4,695,736, Cl. 290-44.000.
Howland, Gary R., 4,695,952, Cl. 364-200.000.
Marchitto, Michael J.; and Bocciarelli, Louis R., 4,695,226, Cl. 416-106.000.
Matuska, David G., 4,695,340, Cl. 156-161.000.
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Beachey, Edwin H.; Tartar, Andre; Gras-Masse, Helene; Jolivet, Michel; Audibert, Francoise; and Chedid, Louis, 4,695,562, Cl. 514-13.000.
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Cheeke, John D. N., 4,694,699, Cl. 73-606.000.
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Arakawa, Mitsuaki; Fehn, John H.; and Crooks, Lawrence E., 4,695,801, Cl. 324-318.000.
Brandes, Rolf, 4,695,798, Cl. 324-307.000.
University of Colorado Foundation: *See*—
Walba, David M.; and Razavi, Homaune A., 4,695,650, Cl. 560-109.000.
University of Florida: *See*—
Mans, Rusty J., 4,695,550, Cl. 435-194.000.
University of Miami: *See*—
Ryan, James W.; and Chung, Alfred, 4,695,577, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,695,582, Cl. 514-423.000.
University of Pittsburgh: *See*—
Cohen, Theodore; and Matz, James, 4,695,584, Cl. 514-456.000.
Sashin, Donald; and Sternglass, Ernest J., 4,696,022, Cl. 378-41.000.
University of Tennessee Research Corp., The: *See*—
Dorsett, Preston H., 4,695,537, Cl. 435-5.000.
University of Toronto Innovations Foundation: *See*—
Taylor, Kenneth W., 4,696,025, Cl. 378-146.000.
Untereker, Darrel F.: *See*—
Meyerhoff, Mark E.; Fogt, Eric J.; and Untereker, Darrel F., 4,694,834, Cl. 128-635.000.
UOP Inc.: *See*—
Chao, Tai-Hsiang; and Sachtler, J. W. A., 4,695,666, Cl. 585-481.000.
De Graff, Richard R., 4,695,665, Cl. 585-450.000.
Gattuso, Mark J.; and Ellig, Daniel L., 4,695,560, Cl. 502-222.000.
Vora, Bipin V., 4,695,662, Cl. 585-324.000.
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Tsuzuki, Kenji; and Uotani, Takeshi, 4,695,644, Cl. 558-249.000.
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Kodama, Masahiro; Sakae, Tatsuya; and Urano, Yoshio, 4,695,967, Cl. 364-521.000.
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Urso, Charles J., Jr., to Xerox Corporation. Charge erase device for an electrophotographic printing machine. 4,695,152, Cl. 355-3.00R.
Ury, Michael G.; and Wood, Charles H., to Fusion Systems Corporation. Method and apparatus for cooling electrodeless lamps. 4,695,757, Cl. 313-44.000.
Usbeck, Walter: *See*—
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Ushio, Yukihide: *See*—
Kimizuka, Junichi; Ushio, Yukihide; and Seto, Kaoru, 4,695,714, Cl. 250-205.000.
USM Corp.: *See*—
Wickers, Francis A.; and Raines, Max, 4,694,766, Cl. 112-262.100.
Utsugi, Mikio, to Fuji Photo Film Co., Ltd. Video recording/reproducing camera. 4,695,905, Cl. 360-33.100.
Uusikallio, Arvo F., to Briggs & Stratton Corporation. Wet priming mechanism for an internal combustion engine. 4,694,792, Cl. 123-187.30R.
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McGimpsey, Samuel B., 4,695,219, Cl. 414-787.000.
Vadino, Winston A.: *See*—
Hanna, Gayda; and Vadino, Winston A., 4,695,591, Cl. 514-781.000.
Valco/Valley Tool & Die, Inc.: *See*—
Eisenloeffel, Helmut, 4,694,598, Cl. 40-155.000.
Valkestijn, Leonardus: *See*—
Barbu, Stefan; Valkestijn, Leonardus; and van de Kerkhof, Franciscus A. M., 4,695,839, Cl. 340-825.060.
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Van Brakel, Russel A., to Haverberg Auto Laundry Equipment Company. Tire scrubbing machine for automatic car washers. 4,694,523, Cl. 15-53.00B.
van de Kerkhof, Franciscus A. M.: *See*—
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van der Merwe, Jacobus C.; and van der Merwe, Lucas C. Self-propelled, self-steered vehicle for power driven plant trimming tools. 4,694,577, Cl. 30-379.500.
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van der Merwe, Jacobus C.; and van der Merwe, Lucas C., 4,694,577, Cl. 30-379.500.
Vander Poorten, Henri, to Andromaque S.A. Electrochemical procedure for the direct forming of generally thin elements with various contours and surfaces of usual and technical ceramics or refractory material. 4,695,356, Cl. 204-180.900.
van der Put, Henk: *See*—
Steenbergen, Christiaan; Howard, Peter G.; Bracht, Roger R.; and van der Put, Henk, 4,695,994, Cl. 369-54.000.
Vanier, Noel R.; and Lum, Kin K., to Eastman Kodak Company. High molecular weight polycarbonate receiving layer used in thermal dye transfer. 4,695,286, Cl. 8-471.000.
Van Iperen, Willem H. P.; Sandt, Henry J., Jr.; and Aronson, Eric G., to Sea-Land Corporation, Inc. Refrigerated carrier floor clamp. 4,695,211, Cl. 410-77.000.
Vanlerberghe, Guy: *See*—
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,695,653, Cl. 364-505.000.
Van Offenwert, Theophilus T. J. M.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef E.; and Van Offenwert, Theophilus T. J. M., 4,695,569, Cl. 514-258.000.
Vanore, Silvestro: *See*—
Sebastiani, Gaetano; Brandi, Roberto; Di Lena, Francesco; Vanore, Silvestro; and Carraro, Roberto, 4,695,193, Cl. 405-204.000.
van Raay, Petrus J.: *See*—
Den Exter Blokland, Hendrikus B.; and van Raay, Petrus J., 4,695,135, Cl. 350-452.000.
Van Veen, Gerardus J.: *See*—
Verweij, Jan; Grootveld, Herman H.; Hira, Henri G. J.; Van Veen, Gerardus J.; Kalter, Jan; and Henniger, Peter W., 4,695,627, Cl. 540-224.000.
Varma, Ravi K.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. 7-oxabicyclo(2.2.1)heptane analogs useful as inhibitors of 5-lipoxygenase and cyclooxygenase. 4,695,585, Cl. 514-469.000.
Varma, Ravi K.; Chao, Sam T.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. 7-oxabicyclo(2.2.1)heptane-based derivatives useful as antiinflammatory, antiasthma and antipsoratic agents. 4,695,586, Cl. 514-469.000.
Vaughan, Thomas L. Hanger assembly. 4,695,025, Cl. 248-293.000.
Vaughn, Eldon D., to Spectrol Electronics Corporation. Adaptive defrost control and method. 4,694,657, Cl. 62-80.000.
Vawter, James R. Problem solving game. 4,695,257, Cl. 434-333.000.
Vazquez, Hilario, Jr.; and Yarnold, Paul R., to Bally Manufacturing Corporation. Gaming device having player selectable winning combinations. 4,695,053, Cl. 273-143.00R.
Velenyi, Louis J., to Standard Oil Company, The. Molybdenum-tungsten-containing catalyst and methane conversion process using same. 4,695,668, Cl. 585-500.000.
Velleman, Koen, to Velleman-Switch, naamloze vennootschap. Membrane for membrane switches and composing elemeats thereof. 4,695,681, Cl. 200-5.00A.
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Veneklasen, Lee H.; and Yagunoff, Guy G., to Perkin-Elmer Corporation, The. Field emission gun electrode geometry for improved focus stability. 4,695,773, Cl. 315-382.000.
Ventimiglia, Joseph J., to Sinclair and Rush, Inc. Dip mold and process. 4,695,241, Cl. 425-275.000.
Verbatim Corporation: *See*—
Preysman, Vladimir, 4,695,982, Cl. 364-506.000.
Verdi, Cesare: *See*—
Delfino, Geroiamo; Franco, Simone; and Verdi, Cesare, 4,695,531, Cl. 430-513.000.
Verga, Charles F.: *See*—
Belleau, Gordon F.; Jelcin, Michael J.; and Verga, Charles F., 4,695,342, Cl. 156-173.000.
Vericom Corporation: *See*—
Bonin, Wayne A.; McCumber, Roger D.; and Teder, Rein S., 4,694,687, Cl. 73-116.000.
Verity, Philip R., to Plessey Overseas Limited. Power supplies. 4,695,937, Cl. 363-25.000.
Verner, Bo L.: *See*—
Ripl, Wilhelm K.; and Verner, Bo L., 4,695,384, Cl. 210-602.000.

Vernon, George M.: *See*—
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,695,422, Cl. 264-504.000.

Vernon, Roger W. Vehicle tire monitoring apparatus. 4,695,823, Cl. 340-58.000.

Vertical Instruments, Inc.: *See*—
Vlakancic, Connor G.; Pereira, Ruy J.; and Goodman, Larry R., 4,694,694, Cl. 73-386.000.

Verweij, Jan; Grootveld, Herman H.; Hirs, Henri G. J.; Van Veen, Gerardus J.; Kalter, Jan; and Henniger, Peter W., to Gist-Brocades N.V. Cephalosporin deoxygenation process. 4,695,627, Cl. 540-224.000.

Vetter, Egon: *See*—
Mahalek, Josef; and Vetter, Egon, 4,695,915, Cl. 361-56.000.

Vickers, Incorporated: *See*—
Taplin, Lael B., 4,695,230, Cl. 417-218.000.

Victor Company of Japan, Ltd.: *See*—
Itonaga, Makoto; and Kayanuma, Kanji, 4,695,162, Cl. 356-369.000.
Iwahara, Makoto; Miyaji, Naotaka; and Sakamoto, Atsushi, 4,696,043, Cl. 381-92.000.
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Vincent, Jan G.: *See*—
Hellgren, Lars G. I.; Mohr, Viggo; and Vincent, Jan G., 4,695,457, Cl. 424-94.000.

Vincent, Ronald J., to Mechanical Technology Incorporated. Externally tuned vibration absorber. 4,694,650, Cl. 60-520.000.

Vincze, Janos: *See*—
Lacroix, Roger; Adam, Jean-Marie; and Vincze, Janos, 4,695,406, Cl. 260-372.000.

Vinogradov, Valentin A.: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

Viohl, Uwe, to Standard Elektrik Lorenz AG. Method of producing a plane phosphor screen. 4,695,477, Cl. 427-68.000.

Visco, Gary P.: *See*—
Millham, Ernest H.; Moser, John J.; Shusbereba, John J.; and Visco, Gary P., 4,696,005, Cl. 371-27.000.

Visser, Jeroen M.: *See*—
Zandveld, Frederik; and Visser, Jeroen M., 4,695,944, Cl. 364-200.000.

Vize, Robert M., to Caterpillar Inc. Vented fuel system for a vehicle. 4,694,870, Cl. 141-326.000.

Vlakancic, Connor G.; Pereira, Ruy J.; and Goodman, Larry R., to Vertical Instruments, Inc. Solid state accumulating altimeter. 4,694,694, Cl. 73-386.000.

Vock, Manfred H.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Vock, Manfred H., 4,695,473, Cl. 426-535.000.

Vogel Tool & Die Corporation: *See*—
Kinsley, Robert J., 4,694,718, Cl. 83-319.000.

Voigt, Reiner: *See*—
Schwabe, Peter; and Voigt, Reiner, 4,695,322, Cl. 106-35.000.

Volino, Nicholas A.: *See*—
Tallis, John R., Jr.; and Volino, Nicholas A., 4,695,735, Cl. 290-38.000R.

Volk, Heinrich; Harter, Karl; and Dotter, Fritz, to Esselte Meto International GmbH. Printed band, in particular for price marking devices. 4,694,745, Cl. 101-111.000.

Vondergoltz, G. Earl; and Hammack, Milton E., to ECI Building Components, Inc. Metal building panel with standing seam edge formations. 4,694,628, Cl. 52-528.000.

von der Wall, Klaus: *See*—
Gerloff, Klaus; Ehlert, Dieter; and von der Wall, Klaus, 4,694,873, Cl. 152-380.000.

Vora, Bipin V., to UOP Inc. Light paraffin dehydrogenation process. 4,695,662, Cl. 585-324.000.

Vosgien, David J.: *See*—
Tulpule, Bhalchandra R.; Oscarson, Edward M.; and Vosgien, David J., 4,696,019, Cl. 375-107.000.

Vsesojuzny Kardiologicheshy Nauchny Tsentr Akademii Meditsinskikh Nauk SSSR: *See*—
Chazov, Evgeny I.; Smirnov, Vladimir N.; Vinogradov, Valentin A.; Titov, Mikhail I.; Penin, Vladimir A.; Giorgadze, Alexandr K.; Titova, Galina P.; Bespalova, Zhanna D.; Pekelis, Boris L.; Permyakov, Nikolai K.; Emelyanov, Sergei I.; and Dzhikia, Alexandr A., 4,695,622, Cl. 530-329.000.

W. Schlafhorst & Co.: *See*—
Langen, Manfred, 4,694,539, Cl. 19-159.00A.
Raasch, Hans, 4,695,002, Cl. 242-47.010.

Waco Trading Corporation: *See*—
Kairis, Alexandre; and Colsen, Ronnie H., 4,694,840, Cl. 128-735.000.

Wada, Hajime: *See*—
Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; Iijima, Toshijumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Uchida, Takashi; Wada, Hajime; Ishii, Fumio; Matsunaga, Satoshi; Matsubara, Yasuko; and Shinozaki, Kaoru, 4,695,533, Cl. 430-558.000.

Wada, Masahiro; and Yamaguchi, Hirohisa, to Kokusai Denshin Denwa Co., Ltd. Movement estimation system for video signals using a recursive gradient method. 4,695,882, Cl. 358-136.000.

Wada, Masaru: *See*—
Kato, Yoji; Watanabe, Seiichi; and Wada, Masaru, 4,695,862, Cl. 357-36.000.

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Rudy, Willi; and Lange, Gerhard, 4,694,644, Cl. 59-27.000.

Wagenaar, Kornelis J., to U.S. Philips Corporation. Integrated logic circuit having insulated gate field effect transistors. 4,695,865, Cl. 357-41.000.

Wagener, Dietrich; Lane, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, to Didier-Werke AG; and Didier Engineering GmbH. Catalyst for the selective reduction of nitrogen oxides in waste gases and process for the manufacture of such a catalyst. 4,695,559, Cl. 502-183.000.

Wagner, Daniel B.: *See*—
O'Connell, James P.; Piran, Uri; and Wagner, Daniel B., 4,695,554, Cl. 436-528.000.

Wagstaff, William L., to Floating Technology Company Limited, The. Handling system for effecting a submerged coupling. 4,695,191, Cl. 405-195.000.

Wakabayashi, Kouji: *See*—
Masuhara, Kenichi; Yamayoshi, Kazuo; and Wakabayashi, Kouji, 4,695,516, Cl. 428-623.000.

Wako Pure Chemical Industries, Ltd.: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshibou; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.
Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,540, Cl. 435-10.000.

Walba, David M.; and Razavi, Homaune A., to University of Colorado Foundation. Liquid crystal compounds and compositions containing same. 4,695,650, Cl. 560-109.000.

Wald, Roland J. E.: *See*—
Ekelund, Folke J. B.; Lilja, Per O.; Wald, Roland J. E.; and Stahl, Matts F., 4,695,413, Cl. 361-18.000.

Waldor, Matthew K.: *See*—
Steinman, Lawrence; Waldor, Matthew K.; Srirram, Subramanian; Herzenberg, Leonard A.; and Herzenberg, Leonore A., 4,695,459, Cl. 424-95.000.

Walgenbach, Paul J., to American Cyanamid Company. Insecticidal compositions comprising a synergistic mixture of terbufos or phorate and a pyrethroid. 4,695,564, Cl. 514-127.000.

Walker, Francis H.: *See*—
Buren, Lawrence L.; James, Donald R.; Randolph, Barney J.; Teach, Eugene G.; Tilles, Harry; and Walker, Francis H., 4,695,314, Cl. 71-100.000.

Wall, Hans J.: *See*—
Omet, Reinhard; Kindsvater, Hans; and Wall, Hans J., 4,695,796, Cl. 324-226.000.

Wallace, Norman R., to Bechtel International Corporation. Rotating connection assembly for subsea pipe connection. 4,695,189, Cl. 405-169.000.

Waller, James K., Jr. Dynamic noise reduction with logarithmic control. 4,696,044, Cl. 381-106.000.

Walston, Donald R., Jr. Blade setting tool for wood jointer/planer machines. 4,694,582, Cl. 33-635.000.

Walter, Wilhelm: *See*—
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Wang Laboratories, Inc.: *See*—
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Warabisako, Terunori; Ohkura, Makoto; and Miyao, Masanobu, to Hitachi, Ltd. Semiconductor device. 4,695,856, Cl. 357-4.000.

Ward, John W., to Union Oil Company of California. Process for producing high octane gasoline. 4,695,368, Cl. 208-111.000.

Ward, John W.: *See*—
Ackelson, Donald B.; Moorehead, Eric L.; Ward, John W.; and Probst, Jon D., 4,695,365, Cl. 208-89.000.
Miller, J. Wayne; and Ward, John W., 4,695,366, Cl. 208-91.000.

Ward, Rodney, to U.S. Philips Corporation. Electron lithography apparatus. 4,695,732, Cl. 250-492.200.

Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., to Becton Dickinson and Co., Inc. Method for increasing agglutination of groups of cells to produce improved cell layer interface in centrifuged blood sample using antibodies. 4,695,553, Cl. 436-177.000.

Warmwipes, Inc.: *See*—
Rose, K. Daniel; Yarbrough, Charles; and Strachan, Alan F., 4,694,973, Cl. 221-46.000.

Warner Lambert Company: *See*—
Bauer, Kurt H.; and Pins, Heinrich, 4,695,450, Cl. 424-22.000.
Yang, Robert K.; and Sharma, Shri C., 4,695,463, Cl. 424-440.000.

Warner, William B.: *See*—
Howe, Steve R.; Warner, William B.; and Shores, J. Wallace, 4,694,781, Cl. 119-156.000.

Warren, James R.: *See*—
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Rawlings, Kirk A., 4,694,546, Cl. 29-81.00D.

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Yatabe, Fumio; and Wazaki, Yoshio, 4,694,805, Cl. 123-489.000.

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Boshold, Raymond F., 4,694,673, Cl. 72-272.000.

Weber, Walter: *See*—
Schauwecker, Friedrich; and Weber, Walter, 4,695,928, Cl. 362-61.000.

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Wolff, Pieter; and Wedler, Hartmut, 4,695,974, Cl. 364-900.000.

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Susse, Karl-Ernst; and Weidner, Frank, 4,696,009, Cl. 372-25.000.

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Suhr, Heinz-Peter; and Weinberger, Bernd, 4,695,093, Cl. 297.300.000.

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Russell, Michael K.; Wesenberg, Donald L.; and Leaney, Peter A., 4,694,555, Cl. 29-451.000.

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Makino, Hiroshi; Yoshino, Tsunemi; Kihara, Tadaharu; and Takashima, Akira, 4,695,893, Cl. 358-227.000.
Yoshino, Tsunemi; Ishikawa, Katsuji; and Iwata, Hiroshi, 4,695,144, Cl. 354-195.110.

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Pruden, Charles W.; McEvoy, Alfred P.; and McEvoy, Charles S., 4,694,612, Cl. 49-445.000.

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Mourani, George D., 4,695,014, Cl. 244-213.000.

Westfalia Separator AG: *See*—
Zettier, Karl-Heinz, 4,695,270, Cl. 494-34.000.

Westinghouse Electric Corp.: *See*—
Feild, Alexander L., Jr., 4,695,476, Cl. 427-6.000.
Flynn, William M., 4,695,424, Cl. 376-272.000.
Gerlowski, Thomas J., 4,694,693, Cl. 73-168.000.
Lahoda, Edward J.; Burgman, Herbert A.; and Kwon, Young J., 4,695,441, Cl. 423-347.000.
Shero, David J.; and Dadpey, Habib, 4,695,783, Cl. 318-808.000.
Taft, Jeffrey D., 4,695,156, Cl. 356-1.000.

Westphal, Dean W.; and Strohbeen, David T., to Kimberly-Clark Corporation. Apparatus and method for simultaneously inverting, folding and pleating. 4,694,978, Cl. 223-28.000.

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Forbes, Hampton E., Jr., 4,694,987, Cl. 229-114.000.

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Oertle, Konrad; and Wetter, Hansjurg, 4,695,643, Cl. 556-428.000.

Whirlpool Corporation: *See*—
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Thorud, Richard A.; and White, Donald M., III, 4,694,594, Cl. 37-244.000.

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Bellingham, Ronald S.; and White, Malcolm J., 4,694,666, Cl. 70-16.000.

White, William J.: *See*—
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,695,861, Cl. 357-30.000.

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Chagnon, Mark S.; Groman, Ernest V.; Josephson, Lee; and Whitehead, Roy A., 4,695,392, Cl. 252-62.540.
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Whittle, Leslie F., to Badger Company, Inc., The. Method of recovering heat from low temperature effluent. 4,695,664, Cl. 585-440.000.

Whittle, Rex W. J., to Astec Components, Ltd. Switching mode power supply start circuit. 4,695,936, Cl. 363-21.000.

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Rossmann, Christian; Fluechter, Horst; Schreiber, Gerald; and Wichelhaus, Winfried, 4,695,396, Cl. 252-135.000.

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Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.

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Schweickardt, Karl, 4,695,769, Cl. 315-158.000.

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Bos, Jacobus J.; Cuperus, Rinze; and Wielinga, Rudolf, 4,695,628, Cl. 540-312.000.

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Dreyer, Heinz; Scheufler, Bernd; Wiemeyer, Benno; and Luhrmann, Johannes, 4,694,759, Cl. 111-85.000.

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Simonette, Dallas W.; and Wiener, Bruce A., 4,695,176, Cl. 401-144.000.

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Wilder, Martin S., to Centerchem, Inc.; and Pentapharm AG. Method for alleviating skin irritation by formulations containing superoxide dismutase. 4,695,456, Cl. 424-94.500.

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Koper, Kenneth T.; Willard, Sylvester L.; and Abramowski, Larry A., 4,695,520, Cl. 429-116.000.

Willey, Robert P. Wheeled article carrier. 4,695,067, Cl. 280-47.220.

William Prym-Werke GmbH. & Co. KG: *See*—
Altwicker, Gerhard H. J., 4,694,984, Cl. 227-18.000.

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Dicke, Grant D.; and Williams, Jeffrey A., 4,694,601, Cl. 40-610.000.

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Heikkila, Kurt E.; Williams, Rodney K.; and Pylkki, Russell J., 4,694,682, Cl. 73-61.10C.

Wilmot, Daniel. Energy management system. 4,695,738, Cl. 307-31.000.

Wilwerding, Dennis J., to Honeywell Inc. Apparatus and method for opto-electronic package. 4,695,719, Cl. 250-216.000.

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Winkelmann, Manfred; Rothfuss, Hans; Muschner, Udo; and Schmitt, Karl H., to Didier-Werke AG. Gas scavenging apparatus for metallurgical vessels. 4,695,043, Cl. 266-265.000.

Winogrocki, Ray F. Seat switch. 4,695,682, Cl. 200-5.00R.

Winters, Scot L.: *See*—
Grawey, Charles E.; and Winters, Scot L., 4,695,420, Cl. 264-265.000.

Witte, Johannes: *See*—
Heidemann, Gerhard; and Witte, Johannes, 4,694,917, Cl. 175-299.000.

Wittlinger, Gerhard, to Wuerttembergische Metallwarenfabrik AG. Coffee percolator. 4,694,737, Cl. 99-279.000.

Wittmann, Horst, to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH. Single-ended fluorescent lamp-base combination. 4,695,767, Cl. 315-58.000.

Wohlhieter, George M.: *See*—
Rudolph, John M.; and Wohlhieter, George M., 4,694,570, Cl. 29-740.000.

Wohrl, Bernhard, to Motoren-und Turbinen-Union Munchen GmbH. Apparatus for securing a component exposed to elevated temperature to a thermally insulated wall. 4,694,895, Cl. 165-136.000.

Wolcott, Dana W., to Eastman Kodak Company. Color video printer includes a color viewer and image adjustment controls which are inhibited during exposure. 4,695,902, Cl. 358-332.000.

Wolf, Helmut: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,695,412, Cl. 260-507.00R.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Spinning or twisting machine. 4,694,643, Cl. 57-100.000.

Wolff, Pieter; and Wedler, Hartmut, to Siemens Aktiengesellschaft. Circuit arrangement for receiving and/or transmitting binary signals serially appearing on the plurality of lines to and from a processing device containing a micro-computer or microprocessor. 4,695,974, Cl. 364-900.000.

Wolford, Otis, Jr.; and Wolford, Richard P. Tool for wrapping drop wires for suspended grid ceiling. 4,694,869, Cl. 140-119.000.

Wolford, Richard P.: *See*—
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Wolfram, Leszek J.: *See*—
Chung-Bong-Chan, Alexander; and Wolfram, Leszek J., 4,695,285, Cl. 8-429.000.

Wolverine World Wide, Inc.: *See*—
Banich, Howard P.; and Norton, Daniel E., 4,694,591, Cl. 36-102.000.

Wondergem, Anthony L., to Development Finance Corporation. Pressure regulator. 4,695,101, Cl. 303-117.000.

Wood, Charles H.: *See*—
Ury, Michael G.; and Wood, Charles H., 4,695,757, Cl. 313-44.000.

Wood, Donald C.; and Wood, James D. Seeding process and apparatus. 4,694,606, Cl. 47-56.000.

Wood, James D.: *See*—
Wood, Donald C.; and Wood, James D., 4,694,606, Cl. 47-56.000.

Wood, John F. B.; Kaiser, Timothy D.; Allyn, Jerome B.; Dykes, Charles D.; Kalaskie, Frank E.; Carmichael, Robert J.; and Simon, Charles R., to Hazelett Strip-Casting Corporation. Edge dam synchronization and tensioning control method and system for the shaping and profiling of continuously cast metal sections by means of a continuous casting machine. 4,694,899, Cl. 164-452.000.

Wood, Ronald E.: *See*—
Sparling, Kenneth P.; Incardona, Angelo; Kikendall, Garth D.; Richardson, David G.; Wood, Ronald E.; and Bakow, Leon, 4,695,213, Cl. 411-506.000.

Wood, Ruey E., Jr., to TRW Inc. Ball joint with mechanical interlock. 4,695,182, Cl. 403-140.000.

Woodard, Kenneth E., Jr.; Dean, Robert A.; Fair, David L.; and Fister, Julius C., Jr., to Olin Corporation. Filter press membrane electrolytic cell with diffusion bonded electrode elements and elastomeric frames. 4,695,359, Cl. 204-255.000.

Wooden, Gene R.: *See*—
Hill, James D.; and Wooden, Gene R., 4,695,694, Cl. 219-10.55D.

Woods, James A., to Harold R. Lauterbach. Gravitometer prover. 4,694,679, Cl. 73-1.00R.

Woods, John T.: *See*—
Tate, Ralph, Jr.; and Woods, John T., 4,694,553, Cl. 29-445.000.

Wool Development International, Ltd.: *See*—
Gibson, Jame D. M., 4,695,485, Cl. 427-256.000.

Worack, Stephen A. Slow motion actuating device. 4,695,016, Cl. 246-415.00A.

Wozniczka, George, to Zenith Electronics Corporation. Two piece heat sink with serrated coupling. 4,695,924, Cl. 361-386.000.

Wright, Joseph W.: *See*—
Ritzman, Ira G.; and Wright, Joseph W., 4,695,775, Cl. 315-410.000.

Wu, Marinda L.: *See*—
Dorman, Linneaus C.; Meyer, Victor E.; and Wu, Marinda L., 4,695,295, Cl. 55-16.000.

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Wunderlich, Egmar: *See*—
Wagener, Dietrich; Laue, Karl H.; Wunderlich, Egmar; Sander, Theo; Flockenhaus, Claus; Hackler, Erich; Levkov, Blagoje; Grimm, Daniel; Kainer, Hartmut; Stein, Hermann; Buhler, Hans-Eugen; Kalfa, Horst; Jansen, Johann; Stender, Werner; and Max, Arnold, 4,695,559, Cl. 502-183.000.

Wunsche, Peter: *See*—
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Wuthrich, Peter: *See*—
Mayor, Jean-Michel; Steffen, Jurg; and Wuthrich, Peter, 4,695,698, Cl. 219-121.00L.

Wycech, Joseph S., to General Motors Corporation. Method of reinforcing a structural member. 4,695,343, Cl. 156-196.000.

Wyndham, Ronald; Chaplin, Gervaise M.; and Swanson, William M., to Toth Aluminum Corporation. Process for manufacturing high purity metal chlorides. 4,695,436, Cl. 423-135.000.

Xerox Corporation: *See*—
Knapp, John F.; Gruber, Robert J.; Floyd, Lawrence, Jr.; Bolte, Steven B.; and Swales, Michael G., 4,695,524, Cl. 430-32.000.
Tandon, Jagdish C.; and Araghi, Mehdi N., 4,695,716, Cl. 250-211.00R.
Urso, Charles J., Jr., 4,695,152, Cl. 355-3.00R.

Xilinx, Inc.: *See*—
Carter, William S., 4,695,740, Cl. 307-242.000.

Yagi, Misao: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.

Yagi, Shizuo; Hirosawa, Yoshiaki; Kawai, Makoto; and Fujii, Isao, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control system for internal combustion engines. 4,694,799, Cl. 123-425.000.

Yagi, Yoshio: *See*—
Gojo, Tomomi; Yagi, Yoshio; and Izumi, Tsunetada, 4,695,834, Cl. 340-734.000.

Yagii, Koji; Miyata, Jun; and Takasuga, Shunzo, to Mazda Motor Corporation. Method of making composite member. 4,695,699, Cl. 219-121.0LD.

Yagunoff, Guy G.: *See*—
Veneklasen, Lee H.; and Yagunoff, Guy G., 4,695,773, Cl. 315-382.000.

Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, to Shin Nisso Kako Co., Ltd. Addition compound of fluoran compounds and ketone. 4,695,640, Cl. 549-226.000.

Yale University: *See*—
Pawelek, John M., 4,695,449, Cl. 424-1.100.

Yamada, Keiko: *See*—
Ueno, Hideo; Hattori, Hiroshi; Maeda, Kumiko; and Yamada, Keiko, 4,695,172, Cl. 400-83.000.

Yamada, Seiji: *See*—
Naito, Kazufumi; Haze, Setsuo; Nobutugu, Hideo; Nakagawa, Yukio; Yamada, Seiji; and Murata, Shuji, 4,694,920, Cl. 177-25.000.

Yamada, Yasuyuki: *See*—
Nakayama, Hiroki; Sato, Yasuhisa; and Yamada, Yasuyuki, 4,695,134, Cl. 350-432.000.

Yamagata, Shinji: *See*—
Matsumoto Yoshiaki; Yamagata, Shinji; and Sugihara, Kazuyoshi, 4,695,814, Cl. 337-77.000.

Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, to Shimizu Kensetsu Kabushiki Kaisha. Clean room. 4,694,736, Cl. 98-31.600.

Yamagata, Tsuneaki: *See*—
Otsuka, Seinosuke; Tani, Kazuhide; Yamagata, Tsuneaki; Akutagawa, Susumu; Kumobayashi, Hidenori; and Yagi, Misao, 4,695,631, Cl. 544-170.000.

Yamagishi, Tooru: *See*—
Shinyagaito, Tatsuya; Kuramoto, Terumasa; Machida, Toyotaka; Saito, Kikuji; Shichijo, Shunichi; Yamagishi, Tooru; Kobayashi, Yoshinao; Ishii, Kazuyoshi; and Hirata, Atsumi, 4,695,904, Cl. 358-342.000.

Yamaguchi, Hirohisa: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Furukawa, Naoki, 4,695,822, Cl. 340-53.000.

Yamamoto, Haruo, to Casio Computer Co., Ltd. Electronic apparatus for entering pattern data by finger activation. 4,695,828, Cl. 340-365.00S.

Yamamoto, Hiraku; Suzuki, Toshimichi; Katayama, Shigeru; Uratsuka, Isao; and Asoshina, Eishi, to Nitto Electric Industrial Co., Ltd. Epoxy resin coating composition. 4,695,598, Cl. 523-400.000.

Yamamoto, Hiromi; Imai, Miho; and Suzuki, Noboru, to Kao Corporation. Hairbrush. 4,694,525, Cl. 15-160.000.

Yamamoto, Kanshi: *See*—
Hojo, Takeshi; Kawada, Shin-Ichi; Fukano, Michio; Yamamoto, Kanshi; Okamura, Youji; Sato, Kazuteru; Saito, Masahiko; and Hane, Fuyuki, 4,694,696, Cl. 73-497.000.

Yamamoto, Koichi: *See*—
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Yamamoto, Masahiro: *See*—
Ozaki, Yoshio; Tsurumoto, Kazuo; Yatomi, Takeshi; and Yamamoto, Masahiro, 4,695,696, Cl. 219-69.00P.

Yamamoto, Norio: *See*—
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Yamamoto, Shinichi: *See*—
Yamagata, Taizo; Uchikawa, Takaaki; Yamamoto, Shinichi; Tomikawa, Shinichiro; Ogasahara, Yoshio; and Sukagawa, Masaru, 4,694,736, Cl. 98-31.600.

Yamamoto, Tetsuhiro: *See*—
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Yamamoto, Yuuichi, to Mitsubishi Denki Kabushiki Kaisha. Electric lead device for superconducting electric apparatus. 4,695,675, Cl. 174-15.0CA.

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Takakura, Masaki; Noguchi, Yoji; Yamane, Yasukuni; and Kako, Noritoshi, 4,695,966, Cl. 364-521.000.

Yamanishi, Eiichi, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,695,896, Cl. 358-296.000.

Yamanishi, Kazuhiko; and Hanada, Toshiro, to Wako Pure Chemical Industries, Ltd. Quantitative determination of substrate treated with oxidase. 4,695,540, Cl. 435-10.000.

Yamanishi, Kazuhiko: *See*—
Sakata, Yoshitsugu; Miyashita, Yoshibonu; Hamanaka, Tadashi; Kodera, Hiroyuki; Miki, Yutaka; Yamanishi, Kazuhiko; and Hanada, Toshiro, 4,695,539, Cl. 435-10.000.

Yamasaki, Kimiyoshi: *See*—
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Yamasaki, Yasuo: *See*—
Sumitani, Koji; Sakai, Tokuji; Yamasaki, Yasuo; and Onodera, Tamio, 4,695,667, Cl. 585-481.000.

Yamashita, Kiyoshi; Aoshima, Terutaka; Narita, Ryuuho; and Imai, Masahiro, to Kabushiki Kaisha Toshiba. Electric rice cooker with timer having plural memory areas. 4,695,710, Cl. 219-506.000.

Yamashita, Masatoshi; and Tsunoda, Norio, to Fuji Jukogyo Kabushiki Kaisha. Hit indicating system in towed target for aerial firing practice. 4,695,059, Cl. 273-360.000.

Yamashita, Satoshi: *See*—
Yamazaki, Yoshihide; Uchimura, Kazumi; Yamashita, Satoshi; and Takeuchi, Mikio, 4,695,614, Cl. 526-142.000.

Yamashita, Toshiyuki: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Yamauchi, Nobuhiro: *See*—
Yukimoto, Kazuyoshi; Fukura, Kenichi; and Yamauchi, Nobuhiro, 4,695,036, Cl. 254-126.000.

Yamaura, Mitsuru; and Fujisawa, Norio, to Kabushiki Kaisha Toshiba. Voltage/frequency converter with frequency drift compensation loop. 4,695,931, Cl. 363-8.000.

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Masuhara, Kenichi; Yamayoshi, Kazuo; and Wakabayashi, Kouji, 4,695,516, Cl. 428-623.000.

Yamazaki, Tsutomu: *See*—
Kato, Masaki; and Yamazaki, Tsutomu, 4,694,798, Cl. 123-339.000.

Yamazaki, Yoshihide; Uchimura, Kazumi; Yamashita, Satoshi; and Takeuchi, Mikio, to Japan Synthetic Rubber Co., Ltd. Process for producing an olefin copolymer rubber. 4,695,614, Cl. 526-142.000.

Yanada, Shigeo: *See*—
Masumoto, Mituhiko; Yanada, Shigeo; and Kinugawa, Tadami, 4,695,620, Cl. 528-204.000.

Yanagihara, Toshio: *See*—
Amano, Itaru; Fujieda, Yasuhiko; Ichikawa, Katsumi; Kanzawa, Masahide; Yanagihara, Toshio; and Misumi, Shikao, 4,695,234, Cl. 425-23.000.

Yang, Chen-Hsyong: *See*—
Lynch, Gary J.; and Yang, Chen-Hsyong, 4,695,410, Cl. 260-410.500.

Yang, Robert K.; and Sharma, Shri C., to Warner-Lambert Company. Delivery system for active ingredients and preparation thereof. 4,695,463, Cl. 424-440.000.

Yang, Tai-Her. Adjustable wrench. 4,694,711, Cl. 81-57.500.

Yankoff, Gerald K. Tool holder. 4,695,208, Cl. 407-106.000.

Yao, Samuel S.: *See*—
Head, Robert E.; and Yao, Samuel S., 4,695,227, Cl. 416-134.00A.

Yarbrough, Charles: *See*—
Rose, K. Daniel; Yarbrough, Charles; and Strachan, Alan F., 4,694,973, Cl. 221-46.000.

Yardley, Alfred; and Pickering, John F., to Lucas Industries Limited. Brake master cylinder. 4,694,651, Cl. 60-578.000.

Yarnold, Paul R.: *See*—
Vazquez, Hilario, Jr.; and Yarnold, Paul R., 4,695,053, Cl. 273-143.00R.

Yatabe, Fumio; and Wazaki, Yoshio, to Honda Giken Kogyo K.K. Air-fuel ratio control method for internal combustion engines. 4,694,805, Cl. 123-489.000.

Yates, Kenneth H., to Sargent Oil Well Equipment Company of Dover Resources, Incorporated. Motor protection system and process. 4,695,779, Cl. 318-484.000.

Yatomi, Takeshi: *See*—
Ozaki, Yoshio; Tsurumoto, Kazuo; Yatomi, Takeshi; and Yamamoto, Masahiro, 4,695,696, Cl. 219-69.00P.

Yeager, Patrick F.: *See*—
Ney, Reuben E.; Pass, Raymond V.; and Yeager, Patrick F., 4,695,105, Cl. 439-95.000.

Yla-Hemmila, Veikko: *See*—
Aalto, Erkki; and Yla-Hemmila, Veikko, 4,694,851, Cl. 137-499.000.

Yli-Vakkuri, Erkki P. J.: *See*—
Reunamaki, Pauli T.; Yli-Vakkuri, Erkki P. J.; and Anttonen, Kauko K., 4,695,821, Cl. 338-316.000.

Yokobori, Nobuyoshi: *See*—
Inaji, Toshio; Okamoto, Hiroshi; and Yokobori, Nobuyoshi, 4,695,907, Cl. 360-107.000.

Yokogawa Medical Systems, Limited: *See*—
Takeuchi, Yasuhito; Hirota, Yuichi; Sano, Shinichi; and Ishiguro, Shinichi, 4,694,680, Cl. 73-1.0DV.

Yokohama Rubber Co., Ltd., The: *See*—
Kageyama, Kunio; and Takasugi, Sumio, 4,695,508, Cl. 428-261.000.

Yokoo, Koji: *See*—
Inoue, Yoshio; Arai, Masatoshi; Sato, Shinichi; and Yokoo, Koji, 4,695,617, Cl. 528-32.000.

Yokota, Takashi; Lee, Frank; Rennick, Donna; and Arai, Ken-ichi, to DNAX Research Institute of Molecular and Cellular Biology, Inc. cDNA clones coding for polypeptides exhibiting multi-lineage cellular growth factor activity. 4,695,542, Cl. 435-68.000.

Yong-Hung, Lin: *See*—
Kuo-Ching, Huang; and Yong-Hung, Lin, 4,694,866, Cl. 139-13.00R.

Yoritsune, Osamu: *See*—
Takeuchi, Hideo; Kobayashi, Michiaki; Yoritsune, Osamu; and Matsumoto, Takemasa, 4,694,749, Cl. 101-426.000.

Yoshida, Hitoshi: *See*—
Okajima, Atushi; Yoshida, Hitoshi; Takeuchi, Yukihisa; and Fukutani, Masanori, 4,695,301, Cl. 55-523.000.

Yoshida, Kanji: *See*—
Setsuie, Takashi; Otani, Takeji; and Yoshida, Kanji, 4,695,415, Cl. 264-29.200.

Yoshida, Kazuhiro, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit system for use in hydraulically operated vehicles. 4,694,647, Cl. 60-442.000.

Yoshida Kogyo K.K.: *See*—
Ishida, Takao; Yoshida, Yukio; and Ohno, Kenzo, 4,694,607, Cl. 49-25.000.

Yoshida, Masahiro; and Inumaru, Susumu, to Sumitomo Light Metal Industries, Ltd. Electromagnetic levitation casting. 4,694,888, Cl. 164-467.000.

Yoshida, Tsuneaki: *See*—
Takanohashi, Kunio; Yoshida, Tsuneaki; and Fujii, Shoichiro, 4,695,639, Cl. 548-165.000.

Yoshida, Yukio: *See*—
Ishida, Takao; Yoshida, Yukio; and Ohno, Kenzo, 4,694,607, Cl. 49-25.000.

Yoshikawa, Takahiro: *See*—
Tsukada, Tetsuo; Shimobuchi, Hideyuki; and Yoshikawa, Takahiro, 4,695,175, Cl. 400-196.100.

Yoshimoto, Itsuro: *See*—
Shinohara, Isao; and Yoshimoto, Itsuro, 4,694,723, Cl. 84-1.030.

Yoshimura, Kunimasa: *See*—
Nishida, Minoru; Hattori, Tadashi; Yoshimura, Kunimasa; and Muraki, Tetsuzo, 4,695,758, Cl. 313-130.000.

Yoshimura, Masakatsu: *See*—
Kotera, Norio; Uegaki, Masatoshi; Yoshimura, Masakatsu; Masaki, Shinzaburo; Kaneoya, Tatsuo; Miyaoka, Takashi; Maegawa, Yuzo; and Fukasawa, Akira, 4,695,407, Cl. 760-378.000.

Yoshimura, Shouji: *See*—
Miyoshi, Kiyotada; Tsuboi, Noboru; Nishitani, Kunihiko; Kubo, Kazuo; and Yoshimura, Shouji, 4,695,233, Cl. 418-83.000.

Yoshinaka, Shinji: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Kinoshita, Kimiaki; Saito, Morikuni; Yamashita, Toshiyuki; and Nanbu, Morio, 4,695,640, Cl. 549-226.000.

Yoshino, Tsunemi; Ishikawa, Katsuji; and Iwata, Hiroshi, to West Electric Company, Ltd. Drive apparatus of lens and exposure mechanism by motor. 4,695,144, Cl. 354-195.110.

Yoshino, Tsunemi: *See*—
Makino, Hiroshi; Yoshino, Tsunemi; Kihara, Tadaharu; and Takashima, Akira, 4,695,893, Cl. 358-227.000.

Yoshioka, Michihiko: *See*—
Shirai, Hideaki; Chiba, Kimio; Okawa, Koji; Ishibashi, Hiroshi; Ishii, Akihiro; Itoh, Hirotaka; Kuzushita, Hirokazu; Yoshioka, Michihiko; and Hirose, Michio, 4,695,515, Cl. 428-458.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Magami, Masato; Saeki, Kazumi; Miura, Takanori; and Inoue, Takeshi, 4,695,649, Cl. 560-86.000.

Yoshizawa, Takeshi, to Fujitsu Limited. Mask washing apparatus for production of integrated circuit. 4,694,527, Cl. 15-308.000.

Young, David N., to Keneticon Limited. Heating oven. 4,695,707, Cl. 219-392.000.

Young, Marilyn M. Neck and facial lift band assembly. 4,694,823, Cl. 128-76.00H.

Yu, Francis T. S., to United States of America, Air Force. Real-time programmable optical correlator. 4,695,973, Cl. 364-822.000.

Yuergens, Kenneth C.: *See*—
Hall, David A.; and Yuergens, Kenneth C., 4,694,941, Cl. 192-3.280.

Yuhaku, Satoru: *See*—
Nishimura, Tsutomu; Nakatani, Seiichi; Yuhaku, Satoru; and Ishida, Toru, 4,695,403, Cl. 252-513.000.

Yuhas, Robert J.: *See*—
Ruth, Dale G.; and Yuhas, Robert J., 4,695,677, Cl. 194-45.0TD.

Yukimoto, Kazuyoshi; Fukura, Kenichi; and Yamauchi, Nobuhiro, to Aisin Seiki Kabushiki Kaisha. Screw bar for a pantograph-type jack. 4,695,036, Cl. 254-126.000.

Zachringer, Edmund; Baker, Peotr; and Zettel, Rolf, to ITT Industries, Inc. Digital FM detector for digitized FM signals. 4,696,018, Cl. 375-82.000.

Zandel, Adam: *See*—
Zeitlin, Alexander; and Zandel, Adam, 4,694,678, Cl. 72-455.000.

Zandveld, Frederik; and Visser, Jeroen M., to U.S. Philips Corporation. Computer system comprising a data, address and control signal bus which comprises a left bus and a right bus. 4,695,944, Cl. 364-200.000.

Zarate, Humberto T., to Dianalog Systems, Inc. Analog computer variable duty modulator. 4,694,890, Cl. 165-12.000.

Zarkovacki, John: *See*—
Lukich, James L.; and Zarkovacki, John, 4,694,518, Cl. 5-136.000.

Zarnoch, Kenneth P.; and Iacovangelo, Charles D., to General Electric Company. Electroless nickel plating composition and method. 4,695,489, Cl. 427-438.000.

Zay, John. Coin counter and wrapper and method of counting and wrapping coins. 4,694,845, Cl. 453-59.000.

Zeevi, Yehoshua Y.: *See*—
Medina, Antonio; and Zeevi, Yehoshua Y., 4,695,130, Cl. 350-132.000.

Zeitlin, Alexander; and Zandel, Adam, to Press Technology Corporation. Tie-rods fabricated of composite materials for forging presses. 4,694,678, Cl. 72-455.000.

Zemco Group, Inc.: *See*—
Blaney, Peter G., 4,694,583, Cl. 33-361.000.

Zenith Electonics Corporation: *See*—
Palac, Kazimir, 4,695,523, Cl. 430-23.000.

Zenith Electronics Corporation: *See*—
Fendley, James R., 4,695,761, Cl. 313-407.000.
Wozniczka, George, 4,695,924, Cl. 361-386.000.

Zettel, Rolf: *See*—
Zachringer, Edmund; Baker, Peotr; and Zettel, Rolf, 4,696,018, Cl. 375-82.000.

Zettler, Karl-Heinz, to Westfalia Separator AG. Drum for clarifying and separating centrifugates. 4,695,270, Cl. 494-34.000.

Zhigalov, Gennady V.; Abduganiev, Abdurakhim; Kim, Sergei Y.; and Moshcev, Robert R., to Tashkentskoe Spetsialnoe Konstruktorskoe Bjuro Textilnykh Mashin. Method and apparatus for producing reinforced thread. 4,694,642, Cl. 57-5.000.

Ziegenhorn, Joachim: *See*—
Schmitt, Urban; Deeg, Rolf; and Ziegenhorn, Joachim, 4,695,552, Cl. 436-66.000.

Zijlstra, Hinne, to U.S. Philips Corporation. Nuclear magnetic resonance apparatus with a permanent magnet. 4,695,802, Cl. 324-319.000.

Zimmerman, Bernd; and Chamberlain, John, to Siecor Corporation. Fiber optic cable. 4,695,128, Cl. 350-96.230.

Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,694,643, Cl. 57-100.000.

Zivitz, Maury; Ko, Eric; and Ealick, Mark, to Boehringer Mannheim GmbH. Position detector and mount therefor for a centrifugal analyzer. 4,695,164, Cl. 356-427.000.

Zucchini, Umberto: *See*—
Albizzati, Enrico; Pettenati, Enrico; Zucchini, Umberto; and Caffiani, Illaro, 4,695,558, Cl. 502-123.000.

Zupancic, Joseph J.; and Swedo, Raymond J., to Allied Corporation. Method for the preparation of composite membranes based on interpenetrating polymer networks. 4,695,483, Cl. 427-244.000.

Zurawsky, Dieter: *See*—
Grochowski, Horst; Zurawsky, Dieter; Knoblauch, Karl; Goldschmidt, Klaus; and Schwarte, Jurgen, 4,695,444, Cl. 423-569.000.

Zwiercan, Gary A.; Lacourse, Norman L.; and Lenchin, Julianne M., to National Starch and Chemical Corporation. Imitation cheese products containing high amylose starch as total caseinate replacement. 4,695,475, Cl. 426-582.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Feucht, Robert H., to Goodyear Tire & Rubber Company, The. Hose structure. Re. 32,508, Cl. 138-119.000.

Goodyear Tire & Rubber Company, The: *See*—
Feucht, Robert H., Re. 32,508, Cl. 138-119.000.

Hightower, George H., Jr., to Thomaston Mills, Inc. Snake proof chaps. Re. 32,506, Cl. 2-22.000.

Raasch, Hans: *See*—
Schmid, Friedbert; and Raasch, Hans, Re. 32,507, Cl. 57-408.000.

Schmid, Friedbert; and Raasch, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Opening roller unit for open-end spinning installations. Re. 32,507, Cl. 57-408.000.

Stahlecker, Fritz: *See*—
Schmid, Friedbert; and Raasch, Hans, Re. 32,507, Cl. 57-408.000.

Stahlecker, Hans: *See*—
Schmid, Friedbert; and Raasch, Hans, Re. 32,507, Cl. 57-408.000.

Thomaston Mills, Inc.: *See*—
Hightower, George H., Jr., Re. 32,506, Cl. 2-22.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bond, Raymond G., to Fortel Inc. Message playback control system for telephone answering machine. B1 4,558,179, 9-22-87, Cl. 379-70.000.

Delta Central Refining, Inc.: *See*—
O'Blasny, Richard H., B1 4,439,311, Cl. 208-179.000.
O'Blasny, Richard H., B1 4,504,383, Cl. 208-179.000.

Fortel Inc.: *See*—
Bond, Raymond G., B1 4,558,179, Cl. 379-70.000.

O'Blasny, Richard H., to Delta Central Refining, Inc. Rerefining used lubricating oil with hydride reducing agents. B1 4,439,311, 9-22-87, Cl. 208-179.000.

O'Blasny, Richard H., to Delta Central Refining, Inc. Rerefining used oil with borohydride reducing agents. B1 4,504,383, 9-22-87, Cl. 208-179.000.

LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Shibayama, Masato; Abe, Takeshi; Tsuji, Ko; Uchida, Akira; and Ohshiro, Masayuki, 292,000, Cl. D15-199.000.

Akagawa, Masaki: *See*—
Kobayashi, Osamu; Tanaka, Masanori; Akagawa, Masaki; and Yamagishi, Ryoji, 292,008, Cl. D20-9.000.

Aksamit, Frank J. Pet litter retriever. 292,035, 9-22-87, Cl. D30-99.000.

Albright, Lawrence S., to Jones, Jerry Burnett; and Jones, Virginia Leola. Dispensing container. 291,964, 9-22-87, Cl. D9-302.000.

Allen, Robert K.; Bollinger, Howard N.; Myers, David A.; Simpson, Eric J.; and Williams, W. Grey, to Kenner Parker Toy Inc. Toy vehicle. 292,010, 9-22-87, Cl. D21-78.000.

Allied Mills Industries Pty. Limited: *See*—
Jureidini, Geoffrey N., 291,940, Cl. D1-120.000.

Alward, Jeffrey A.; and Greseus, Stanley T., to Minnesota Mining and Manufacturing Company. Antenna housing for an electronic article surveillance system. 291,976, 9-22-87, Cl. D10-121.000.

Ambasz, Emilio. Flexible pen. 292,007, 9-22-87, Cl. D19-48.000.

American Hospital Supply Corp.: *See*—
Bullock, James K.; Bloom, William G.; Siegel, Bernard; and Lobodzinski, Richard, 292,022, Cl. D24-17.000.

Andersson, Sten-Ake. Impact wrench. 291,961, 9-22-87, Cl. D8-24.000.

AVIA Group International, Inc.: *See*—
Kelley, Brenda; and Curley, Jack, 291,945, Cl. D2-320.000.
Tong, James K., 291,943, Cl. D2-320.000.
Tong, James K., 291,944, Cl. D2-320.000.

Bernhardt Industries: *See*—
Keller, H. Thomas, 291,950, Cl. D6-430.000.
Keller, H. Thomas, 291,953, Cl. D6-488.000.

Best, Philip C., to Procter & Gamble Company, The. Bottle. 291,965, 9-22-87, Cl. D9-376.000.

Bloom, William G.: *See*—
Bullock, James K.; Bloom, William G.; Siegel, Bernard; and Lobodzinski, Richard, 292,022, Cl. D24-17.000.

Bollinger, Howard N.: *See*—
Allen, Robert K.; Bollinger, Howard N.; Myers, David A.; Simpson, Eric J.; and Williams, W. Grey, 292,010, Cl. D21-78.000.

Boyd, Evangeline J.: *See*—
Roach, Donald R.; and Boyd, Evangeline J., 291,989, Cl. D14-53.000.

Bullock, James K.; Bloom, William G.; Siegel, Bernard; and Lobodzinski, Richard, to American Hospital Supply Corp. Handle for a diagnostic urinemeter unit. 292,022, 9-22-87, Cl. D24-17.000.

Chaplin, John B., to Textron Inc. Surface effect ship. 291,980, 9-22-87, Cl. D12-5.000.

Chia, Bret. Clown doll. 292,013, 9-22-87, Cl. D21-173.000.

Ching-Hua, Yau. Alarm. 291,975, 9-22-87, Cl. D10-106.000.

Clark, James L.: *See*—
Johnson, William G.; and Clark, James L., 291,962, Cl. D8-95.000.

Conn, Marks M., to Mallin Company. Frame for an adjustable chaise. 291,948, 9-22-87, Cl. D6-361.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard panel. 291,983, 9-22-87, Cl. D12-192.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard panel. 291,984, 9-22-87, Cl. D12-192.000.

Cornwell, Paul D., to Import Auto Products, Ltd. Dashboard panel. 291,985, 9-22-87, Cl. D12-192.000.

Coaden Technology, Inc.: *See*—
MacLaughlin, Donald N., 291,966, Cl. D9-389.000.
MacLaughlin, Donald N.; and Sumeren, Mark W., 291,967, Cl. D9-390.000.
MacLaughlin, Donald N., 291,968, Cl. D9-398.000.

Curley, Jack: *See*—
Kelley, Brenda; and Curley, Jack, 291,945, Cl. D2-320.000.

Dansk Pressalit A/S: *See*—
Lepoix, Louis L., 292,018, Cl. D23-71.000.

Doi, Takayoshi, to Takara Co., Ltd. Toy robot-aircraft watch. 291,973, 9-22-87, Cl. D10-33.000.

Dottori, Arduino; and Ingegnere, Roberto, to FACOM "Societe Anonyme". Tool case. 291,946, 9-22-87, Cl. D3-73.000.

Downing, Gene L.; and Fields, Ronald A. Lid for a container. 291,970, 9-22-87, Cl. D9-436.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,992, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,993, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,994, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,995, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,996, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,997, 9-22-87, Cl. D14-114.000.

Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,998, 9-22-87, Cl. D14-114.000.

Durand, Jean-Jacques. Silk screen stencil decoration for a plate or similar article. 291,955, 9-22-87, Cl. D7-39.000.

Eads, Harold O.; and Planthaber, Rudolph F., to O. Ames Co. Grain scoop. 291,959, 9-22-87, Cl. D8-10.000.

FACOM "Societe Anonyme": *See*—
Dottori, Arduino; and Ingegnere, Roberto, 291,946, Cl. D3-73.000.

Farmer, William. Clamp. 291,963, 9-22-87, Cl. D8-394.000.

Fenne, Kenneth R., to Pittway Corporation. Automatic thermostat control. 291,974, 9-22-87, Cl. D10-50.000.

Fenner, Paul A. Swizzle stick. 291,956, 9-22-87, Cl. D7-42.000.

Fields, Ronald A.: *See*—
Downing, Gene L.; and Fields, Ronald A., 291,970, Cl. D9-436.000.

Fujita, Mituo, to Kabushiki Kaisha Shinsei Industries. Labeler. 292,006, 9-22-87, Cl. D18-19.000.

Fukuda, Harumi, to Sharp Corporation. Electronic copying machine. 292,004, 9-22-87, Cl. D16-31.000.

Grainware Company: *See*—
Stevens, Kenneth V., 291,957, Cl. D7-70.000.

Graves, Lee K.: *See*—
Parr, Alan; and Graves, Lee K., 291,978, Cl. D12-181.000.

Green, Vernon D. Flashing light safety belt. 291,942, 9-22-87, Cl. D2-628.000.

Gresens, Stanley T.: *See*—
Alward, Jeffrey A.; and Gresens, Stanley T., 291,976, Cl. D10-121.000.

Hall, Brenda A. Toilet seat cover. 292,019, 9-22-87, Cl. D23-11.000.

Hanifl, Paul H., to Sage Products, Inc. Waste receptacle. 292,037, 9-22-87, Cl. D34-7.000.

Hanssen, Carl-Otto; and Starzmann, Bo M., to Molnlycke Aktiebolag. Surgical sheet. 292,023, 9-22-87, Cl. D24-49.000.

Hanssen, Carl-Otto; and Starzmann, Bo M., to Molnlycke Aktiebolag. Surgical sheet. 292,024, 9-22-87, Cl. D24-49.000.

Harrod, Lawrence R., to Kransco Manufacturing, Inc. Riding toy. 292,009, 9-22-87, Cl. D21-76.000.

Hendrick, William B., to Mueller Furniture Corporation. Chair. 291,949, 9-22-87, Cl. D6-375.000.

Hestair Kiddicraft Ltd.: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 292,011, Cl. D21-148.000.
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 292,012, Cl. D21-159.000.

Higashi, Housei: *See*—
Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, 292,001, Cl. D15-199.000.
Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, 292,003, Cl. D15-199.000.
Shibayama, Masato; Imaizumi, Yutaka; and Higashi, Housei, 292,002, Cl. D15-199.000.

Hitachi, Ltd.: *See*—
Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, 292,001, Cl. D15-199.000.
Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, 292,003, Cl. D15-199.000.
Shibayama, Masato; Abe, Takeshi; Tsuji, Ko; Uchida, Akira; and Ohshiro, Masayuki, 292,000, Cl. D15-199.000.
Shibayama, Masato; Imaizumi, Yutaka; and Higashi, Housei, 292,002, Cl. D15-199.000.

Hogan, Michael P.: *See*—
Jordan, Robert A.; Hogan, Michael P.; and Mackay, Henry J., 291,987, Cl. D13-41.000.

Holley, Robert E.: *See*—
Rumens, Kurt W. F.; and Holley, Robert E., 292,020, Cl. D23-128.000.

Hsieh, Ming-Chih. Folding golf cart. 292,038, 9-22-87, Cl. D34-15.000.

Illinois Bell Telephone Company: *See*—
Jordan, Robert A.; Hogan, Michael P.; and Mackay, Henry J., 291,987, Cl. D13-41.000.

Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, to Hitachi, Ltd. Industrial robot. 292,001, 9-22-87, Cl. D15-199.000.

Imaizumi, Yutaka; Higashi, Housei; and Shibayama, Masato, to Hitachi, Ltd. Industrial robot. 292,003, 9-22-87, Cl. D15-199.000.

Imaizumi, Yutaka: *See*—
Shibayama, Masato; Imaizumi, Yutaka; and Higashi, Housei, 292,002, Cl. D15-199.000.

Import Auto Products, Ltd.: *See*—
Cornwell, Paul D., 291,983, Cl. D12-192.000.
Cornwell, Paul D., 291,984, Cl. D12-192.000.
Cornwell, Paul D., 291,985, Cl. D12-192.000.

Ingegnere, Roberto: *See*—
Dottori, Arduino; and Ingegnere, Roberto, 291,946, Cl. D3-73.000.

Ishizaki, Hideaki, to Pioneer Electronic Corporation. Speaker. 291,988, 9-22-87, Cl. D14-30.000.

Johnson Level & Tool Mfg. Co.: *See*—
Johnson, William G.; and Clark, James L., 291,962, Cl. D8-95.000.

Johnson, William G.; and Clark, James L., to Johnson Level & Tool Mfg. Co. Hacksaw for hand use. 291,962, 9-22-87, Cl. D8-95.000.

Jones, Jerry Burnett: *See*—
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CLASSIFICATION OF PATENTS

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214 4,694,744

CLASS 101
111 4,694,745
124 4,694,746
301 4,694,747
401.1 4,694,748
426 4,694,749
4,694,750

CLASS 102
202 4,694,751
215 4,694,752
289 4,694,753
310 4,694,754
443 4,694,755

CLASS 106
35 4,695,322
[illegible] 4,695,323
[illegible] 4,695,324
[illegible] 4,695,325

CLASS 110
238 4,694,756
271 4,694,757
347 4,694,758

CLASS 111
85 4,694,759
92 4,694,760

CLASS 112
[illegible].71 4,694,761
121.12 4,694,762
184 4,694,763
237 4,694,764
254 4,694,765
262.1 4,694,766
[illegible] 4,694,767

CLASS 114
71 4,694,768
90 4,694,769
123 4,694,770
230 4,694,771
315 4,694,772
354 4,694,773
361 4,694,774

CLASS 118
64 4,694,775
500 4,694,776
725 4,694,777
728 4,694,778
730 4,694,779

CLASS 119
53.5 4,694,780
156 4,694,781

CLASS 122
7 R 4,694,782
448 B 4,694,783

CLASS 123
41.12 4,694,784
52 A 4,694,785
73 AD 4,694,786
90.13 4,694,787
90.16 4,694,788
90.17 4,694,789
[illegible] 4,694,790
179 F 4,694,791
187.5 R 4,694,792
196 S 4,694,793
[illegible] 4,694,794
325 4,694,796
339 4,694,797
4,694,798
373 4,694,795
425 4,694,799
4,694,800
4,694,801
431 4,694,802
440 4,694,803
453 4,694,808
462 4,694,804
489 4,694,805
4,694,809
494 4,694,806
[illegible] 4,694,807
516 4,694,810
527 4,694,811
571 4,694,812
[illegible] 4,694,814
668 4,694,813

CLASS 124
27 4,694,815

CLASS 126
41 R 4,694,816
76 4,694,817
121 4,694,818
140 4,694,819
289 4,694,820

CLASS 127
30 4,695,326

CLASS 128
4 4,694,821
11 4,694,822
76 B 4,694,823
203.22 4,694,824
[illegible].24 4,694,825
300 R 4,694,826
4,694,827
303.1 4,694,828
[illegible] 4,694,829
419 PG 4,694,830
[illegible] 4,694,831
632 4,694,832
[illegible] 4,694,833
[illegible] 4,694,834
640 4,694,835
653 4,694,836
4,694,837
[illegible] 4,694,838
721 4,694,839
735 4,694,840

CLASS 131
351 4,694,841
359 4,694,842

CLASS 132
73 4,694,843
84 R 4,694,844

CLASS 134
11 4,695,327
78 4,694,846

CLASS 136
256 4,695,674

CLASS 137
39 4,694,847
114 4,694,848
312 4,694,849
318 4,694,850
[illegible] 4,694,851
[illegible] 4,694,852
512.1 4,694,853
519 4,694,854
519.5 4,694,855
555 4,694,856
[illegible] 4,694,857
[illegible] 4,694,858
614.04 4,694,859
614.21 4,694,860
624.19 4,694,861
625.5 4,694,862

CLASS 138
96 R 4,694,863
113 4,694,864
119 Re.32,508
148 4,694,865

CLASS 139
13 R 4,694,866
192 4,694,867

CLASS 140
92.1 4,694,868
119 4,694,869

CLASS 141
326 4,694,870

CLASS 144
35 R 4,694,871

CLASS 148
3 4,695,329
6.3 4,695,330
306 4,695,333

CLASS 151
216 4,694,872
380 4,694,873
381.5 4,694,874

CLASS 156
62.2 4,695,334
64 4,695,335
87 4,695,336
89 4,695,337
71 4,695,338
80 4,695,339
141 4,695,340
4,695,341
173 4,695,342
196 4,695,343
242 4,695,344
264 4,695,345
281 4,695,346
B1 4,695,347
647 4,695,348

CLASS 157
1.24 4,694,875

CLASS 160
45 4,694,876
273 R 4,694,877

CLASS 164
7.2 4,694,879
113 4,694,881
4,694,882
186 4,694,883
359 4,694,884
416 4,694,885
4,694,886
428 4,694,887
452 4,694,899
459 4,694,880
467 4,694,888
488 4,694,889

CLASS 165
12 4,694,890
41 4,694,891
95 4,694,892
104.34 4,694,893
135 4,694,894
136 4,694,895
142 4,694,896
180 4,694,897
171 4,694,898

CLASS 166
75.1 4,694,900
77 4,694,901
250 4,694,902
4,694,903
252 4,694,904
280 4,694,905
294 4,694,906
303 4,694,907
310 4,694,908
359 4,694,909
377 4,694,878
379 4,694,910

CLASS 173
62 4,694,911
115 4,694,912

CLASS 174
15 CA 4,695,675
22 R 4,695,676
52 FP 4,695,678
117 FF 4,695,679

CLASS 175
61 4,694,913
4,694,914
91 4,694,915
249 4,694,916
299 4,694,917
329 4,694,918
393 4,694,919

CLASS 177
25 4,694,920
136 4,694,921
178 4,694,922

CLASS 178
19 4,695,680

CLASS 180
6.5 4,694,923
68.3 4,694,924
79.1 4,694,925
132 4,694,926
4,694,927
268 4,694,928
311 4,694,929

CLASS 182
2 4,694,930
3 4,694,931
109 4,694,932
128 4,694,933
142 4,694,934

CLASS 187
111 4,694,935

CLASS 188
2 R 4,694,936
73.1 4,694,937
181 A 4,694,938
187 4,694,939

CLASS 190
109 4,694,940

CLASS 192
3.28 4,694,941
13 A 4,694,942
35 4,694,943
56 R 4,694,944
84 C 4,694,945
85 AA 4,694,946

CLASS 193
34 4,694,947

CLASS 194
45 TD 4,695,677

CLASS 198
311 4,694,948
351 4,694,949
465.3 4,694,950
468.3 4,694,951
499 4,694,952
827 4,694,953

CLASS 200
5 A 4,695,681
5 R 4,695,682
38 R 4,695,683
43.07 4,695,684
61.21 4,695,685
61.86 4,695,686
144 B 4,695,687
4,695,688
4,695,689
147 R 4,695,690
303 4,695,691
335 4,695,692

CLASS 203
26 4,695,349
51 4,695,350

CLASS 204
15 4,695,351
74 4,695,352
86 4,695,353
157.41 4,695,357
174 4,695,358
180.1 4,695,354
180.9 4,695,356
252 4,695,355
255 4,695,359
804 4,695,360
415 4,695,361
419 4,695,362

CLASS 206
45.26 4,694,954
45.29 4,694,955
83 4,694,956
339 4,694,957
340 4,694,958
350 4,694,959
468 4,694,960
508 4,694,961
600 4,694,962

CLASS 208
33 4,695,363
39 4,695,364
89 4,695,365
91 4,695,366
106 4,695,367
111 4,695,368
112 4,695,369
113 4,695,370
179 B1 4,439,311
B1 4,504,383
311 4,695,372
428 4,695,373

CLASS 209
211 4,695,371
534 4,694,963
549 4,694,964

CLASS 210
110 4,695,375
122 4,695,376
132 4,695,377
198.1 4,695,378
282 4,695,379
347 4,695,380
403 4,695,381
436 4,695,382
500.37 4,695,383
602 4,695,384
636 4,695,385
665 4,695,386
676 4,695,387
700 4,695,388

CLASS 211
87 4,694,965
88 4,694,966
126 4,694,967

CLASS 215
224 4,694,968
252 4,694,969
4,694,970
253 4,694,971

CLASS 219
10.55 D 4,695,694
10.55 F 4,695,693
10.55 M 4,695,695
69 P 4,695,696
121 L 4,695,698
121 LD 4,695,699
121 LV 4,695,701
121 LZ 4,695,697
121 PD 4,695,700
137.63 4,695,702
212 4,695,703
222 4,695,704
234 4,695,705
390 4,695,706
392 4,695,707
486 4,695,708
494 4,695,709
506 4,695,710
4,695,711
535 4,695,712
553 4,695,713

CLASS 220
401 4,694,972

CLASS 221
46 4,694,973
263 4,694,974

CLASS 222
1 4,694,975
189 4,694,976
259 4,694,977

CLASS 223
28 4,694,978

CLASS 224
151 4,694,979
243 4,694,980
251 4,694,981

CLASS 226
115 4,694,982
183 4,694,983

CLASS 227
18 4,694,984

CLASS 228
235 4,694,985

CLASS 229
41 R 4,694,986
114 4,694,987

CLASS 236
49 4,694,988
4,694,989

CLASS 237
8 R 4,695,052

CLASS 239
81 4,694,990
171 4,694,991
265.23 4,694,992

CLASS 241
46.11 4,694,993
79.1 4,694,994
92 4,694,995
100 4,694,996
117 4,694,997

CLASS 242
1 4,694,998
4 R 4,694,999
18 DD 4,695,000
25 R 4,695,001
47.01 4,695,002
55.19 A 4,695,003
56 R 4,695,004
4,695,005
56.1 4,695,006
58.4 4,695,007
84.1 4,695,008
84.1 R 4,695,009
158 R 4,695,010
199 4,695,011

CLASS 244
17.13 4,695,013
26 4,695,012
213 4,695,014

CLASS 245
6 4,695,015

CLASS 246
415 A 4,695,016
428 4,695,017

CLASS 248
74.2 4,695,018
74.3 4,695,019
180 4,695,020
168 4,695,021
176 4,695,022
238 4,695,023
281.1 4,695,024
293 4,695,025
316.5 4,695,026
325 4,695,027
354.1 4,695,028
360 4,695,029
507 4,695,030

CLASS 249
91 4,695,031
112 4,695,032
189 4,695,033

CLASS 250
205 4,695,714
211 J 4,695,715
211 R 4,695,716
213 R 4,695,717
213 VT 4,695,718
216 4,695,719
231 SE 4,695,720
234 4,695,721
235 4,695,722
292 4,695,724
325 4,695,723
327.2 4,695,725
4,695,726
328 4,695,727
336.1 4,695,728
358.1 4,695,729
370 4,695,730
374 4,695,731
492.2 4,695,732
551 4,695,733
573 4,695,734

CLASS 251
129.06 4,695,034

CLASS 252
8.553 4,695,389
47.5 4,695,390
51.5 A 4,695,391
62.34 4,695,392
4,695,393
97 4,695,394
121 4,695,395
135 4,695,396
182 4,695,397
299.5 4,695,398
301.35 4,695,399
309 4,695,400
312 4,695,401
315.2 4,695,402
513 4,695,403
514 4,695,404
803 4,695,405

CLASS 254
93 R 4,695,035
126 4,695,036
131 4,695,037
134.3 FT 4,695,038
134.3 R 4,695,039
264 4,695,040

CLASS 260
372 4,695,406
395 4,695,408
400 4,695,409
410.5 4,695,410
410.9 R 4,695,411
507 R 4,695,412

CLASS 264
3.1 4,695,414
29.2 4,695,415
45.4 4,695,416
80 4,695,417
151 4,695,418
159 4,695,419
268 4,695,420
318 4,695,421
809 4,695,422

CLASS 266
66 4,695,041
226 4,695,042
285 4,695,043

CLASS 269
21 4,695,044
152 4,695,045
210 4,695,046
309 4,695,047

CLASS 271
122 4,695,048

CLASS 272
67 4,695,049
72 4,695,050
122 4,695,051

CLASS 273
143 R 4,695,053
171 4,695,054
213 4,695,055
262 4,695,056
349 4,695,057
311 4,695,058
360 4,695,059
404 4,695,060

CLASS 277
27 4,695,061
4,695,062
134 4,695,063
139 4,695,064

CLASS 279
60 4,695,065
82 4,695,066

CLASS 280
47.22 4,695,067
91 4,695,068
4,695,069
154.5 R 4,695,070
650 4,695,072
690 4,695,073
707 4,695,074
735 4,695,075
804 4,695,076

CLASS 283
81 4,695,077

CLASS 285
98 4,695,078
278 4,695,079
334.5 4,695,080

CLASS 290
38 R 4,695,735
44 4,695,736
204 4,695,071

CLASS 291
96 4,695,081
169.16 4,695,082
241 4,695,083

CLASS 293
126 4,695,084

CLASS 294
15 4,695,085
68.23 4,695,086

CLASS 296
14 4,695,087
38 4,695,088
107 4,695,089
216 4,695,090

CLASS 297
180 4,695,091
230 4,695,092
308 4,695,093
331 4,695,094
410 4,695,095
417 4,695,096
452 4,695,097

CLASS 299
64 4,695,098

CLASS 301
37 SA 4,695,099

CLASS 303
10 4,695,100
117 4,695,101

CLASS 305
11 4,695,102

CLASS 307
31 4,695,737
4,695,738
141 4,695,739
242 4,695,740
271 4,695,742
272.2 4,695,743
279 4,695,744
297 4,695,745
317 R 4,695,746
355 4,695,747
455 4,695,748
475 4,695,749
480 4,695,750
495 4,695,751
518 4,695,752
530 4,695,753
643 4,695,741

CLASS 310
156 4,695,754
236 4,695,755
355 4,695,756

CLASS 311
18 4,695,103
86 4,695,104

CLASS 313
44 4,695,757
130 4,695,758
136 4,695,759
348 4,695,760
407 4,695,761
474 4,695,762
487 4,695,763
497 4,695,764
4,695,765

CLASS 315
3.5 4,695,766
58 4,695,767
73 4,695,768
158 4,695,769
207 4,695,770
290 4,695,771
371 4,695,772
382 4,695,773
408 4,695,774
410 4,695,775

CLASS 318
14 4,695,776
135 4,695,777
314 4,695,778
434 4,695,779
561 4,695,780
603 4,695,781
748 4,695,782
808 4,695,783

CLASS 320
32 4,695,784

CLASS 323
132 4,695,785
303 4,695,786

CLASS 324
61 P 4,695,789
77 K 4,695,790
78 D 4,695,791
83 D 4,695,792
106 4,695,793
158 R 4,695,794
208 4,695,795
226 4,695,796
230 4,695,797
307 4,695,798
4,695,799
309 4,695,800
318 4,695,801
319 4,695,802
403 4,695,803
527 4,695,788
557 4,695,787

CLASS 318
14 4,695,804
72 4,695,805

CLASS 330
254 4,695,806
310 4,695,807

CLASS 331
57 4,695,808
117 D 4,695,809

CLASS 333
1 4,695,810
105 4,695,811
156 4,695,812

CLASS 335
78 4,695,813

CLASS 337
77 4,695,814
266 4,695,815
394 4,695,816

CLASS 338
4 4,695,817
22 R 4,695,818
153 4,695,819

179 4,695,820
316 4,695,821

CLASS 340
53 4,695,822
58 4,695,823
347 DA 4,695,826
347 SH 4,695,825
365 P 4,695,827
365 S 4,695,828
386 4,695,829
677 4,695,830
707 4,695,831
709 4,695,832
722 4,695,833
734 4,695,834
750 4,695,835
4,695,836
763 4,695,837
771 4,695,838
825.054 4,695,840
825.06 4,695,839

CLASS 342
8 4,695,841
59 4,695,842
417 4,695,843

CLASS 343
781 CA 4,695,844
873 4,695,845

CLASS 346
1.1 4,695,846
4,695,847
4,695,848
76 L 4,695,849
76 PH 4,695,850
140 R 4,695,824
4,695,851
4,695,852
4,695,853
4,695,854
145 4,695,855

CLASS 350
1.2 4,695,119
96.11 4,695,120
96.12 4,695,121
4,695,122
96.15 4,695,123
96.20 4,695,124
4,695,125
96.21 4,695,126
96.23 4,695,127
4,695,128
96.25 4,695,129
132 4,695,130
350 R 4,695,131
409 4,695,132
427 4,695,133
432 4,695,134
452 4,695,135
472 4,695,136
521 4,695,137
615 4,695,138
620 4,695,139

CLASS 351
139 4,695,140

CLASS 352
50 4,695,141

CLASS 354
76 4,695,142
86 4,695,143
195.11 4,695,144
271.1 4,695,145
309 4,695,146
322 4,695,147
413 4,695,148
430 4,695,149
448 4,695,150

CLASS 358
3 DD 4,695,153
3 R 4,695,151
4,695,152
8 4,695,154
45 4,695,155

CLASS 356
1 4,695,156
123 4,695,158
237 4,695,157
247 4,695,159
254 4,695,161
350 4,695,160
369 4,695,162
4,695,163
427 4,695,164

CLASS 357
4 4,695,856
16 4,695,857
19 4,695,858
4,695,859
24 LR 4,695,860
101 4,695,861
106 4,695,862
38 4,695,863
41 4,695,864
4,695,865
42 4,695,866
46 4,695,867
60 4,695,868
71 4,695,869
74 4,695,870
4,695,871
75 4,695,872

CLASS 358
13 4,695,873
21 R 4,695,874
28 4,695,875
31 4,695,876
36 4,695,877
44 4,695,878
84 4,695,879
86 4,695,880
100 4,695,881
136 4,695,882
138 4,695,883
163 4,695,884
168 4,695,885
176 4,695,886
213.13 4,695,887
4,695,888
4,695,891
213.26 4,695,889
213.31 4,695,890
225 4,695,892
227 4,695,893
228 4,695,894
230 4,695,895
396 4,695,896
4,695,897
4,695,898
310 4,695,899
4,695,900
332 4,695,902
335 4,695,903
342 4,695,904

CLASS 360
33.1 4,695,905
85 4,695,906
107 4,695,907
119 4,695,908
122 4,695,909
133 4,695,910
4,695,911
4,695,912

CLASS 361
13 4,695,913
18 4,695,413
42 4,695,914
56 4,695,915
4,695,916
58 4,695,917
4,695,918
110 4,695,919
118 4,695,920
308 4,695,921
329 4,695,922
361 4,695,923
386 4,695,924
395 4,695,925
4,695,926
400 4,695,927

CLASS 362
61 4,695,928
140 4,695,929
293 4,695,930

CLASS 363
8 4,695,931
14 4,695,932
17 4,695,933
4,695,934
21 4,695,935
4,695,936
25 4,695,937
37 4,695,938
39 4,695,939
157 4,695,940

CLASS 364
185 4,695,941
188 4,695,942
201 4,695,943
4,695,944
4,695,945
4,695,946
4,695,947
4,695,948
4,695,949
4,695,950
4,695,951
4,695,952
410 4,695,953
413 4,695,954
416 4,695,955
4,695,956
422 4,695,957
428 4,695,958
454 4,695,959
474 4,695,960
483 4,695,961
506 4,695,982
513 4,695,962
513.5 4,695,963
518 4,695,964
4,695,965
521 4,695,966
4,695,967
578 4,695,968
709 4,695,983
724 4,695,969
4,695,970
769 4,695,971
819 4,695,972
822 4,695,973
900 4,695,974
4,695,975
4,695,976
4,695,977

CLASS 365
51 4,695,978
188 4,695,979
222 4,695,980
227 4,695,981

CLASS 366
90 4,695,165
160 4,695,166
181 4,695,167

CLASS 367
54 4,695,984
87 4,695,985
140 4,695,986
143 4,695,987
154 4,695,988

CLASS 368
31 4,695,168

CLASS 369
32 4,695,989
38 4,695,990
44 4,695,991
46 4,695,992
54 4,695,993
4,695,994
75.2 4,695,995
77.1 4,695,996

CLASS 370
13 4,695,997
32.1 4,695,998
58 4,695,999
60 4,696,000
88 4,696,001

CLASS 371
12 4,696,002
19 4,696,003
25 4,696,004
27 4,696,005
4,696,006
37 4,696,007
47 4,696,008

CLASS 372
25 4,696,009
34 4,696,010
61 4,696,011
99 4,696,012

CLASS 373
71 4,696,013
89 4,696,014

CLASS 375
14 4,696,015
20 4,696,016
60 4,696,017
82 4,696,018
107 4,696,019

CLASS 376
265 4,695,423
272 4,695,424
435 4,695,425
441 4,695,426

CLASS 377
48 4,696,020
58 4,696,021

CLASS 378
41 4,696,022
86 4,696,023
73 4,696,024
116 4,696,025

CLASS 379
34 4,696,026
60 4,696,027
80 B1 4,558,179
88 4,696,028
92 4,696,029
167 4,696,030
286 4,696,031
390 4,696,032
424 4,696,033

CLASS 380
5 4,695,901
16 4,696,034

CLASS 381
1 4,696,035
22 4,696,036
24 4,696,037
38 4,696,038
46 4,696,039
4,696,040
4,696,041
51 4,696,042
92 4,696,043
106 4,696,044
114 4,696,045

CLASS 382
5 4,696,046
8 4,696,047
13 4,696,048
22 4,696,049

CLASS 383
10 4,696,050

CLASS 384
36 4,695,169
45 4,695,170

CLASS 400
70 4,695,171
83 4,695,172
120 4,695,173
124 4,695,174
196.1 4,695,175

CLASS 401
144 4,695,176
150 4,695,177

CLASS 403
14 4,695,178
24 4,695,179
114 4,695,180
135 4,695,181
140 4,695,182
356 4,695,183
410 4,695,184

CLASS 404
107 4,695,185
111 4,695,186

CLASS 405
124 4,695,187
150 4,695,188
169 4,695,189
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195 4,695,191
203 4,695,192
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227 4,695,202
230 4,695,203
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CLASS 406
38 4,695,205
65 4,695,206
130 4,695,207

CLASS 407
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106 4,695,208

CLASS 409
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CLASS 410
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CLASS 411
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CLASS 414
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225 4,695,215
401 4,695,216
404 4,695,217
462 4,695,218
787 4,695,219

CLASS 415
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116 4,695,224
189 4,695,225

CLASS 416
106 4,695,226
134 A 4,695,227
223 A 4,695,228
241 A 4,695,229

CLASS 417
218 4,695,230
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CLASS 418
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CLASS 420
129 4,695,427
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CLASS 422
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98 4,695,432
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CLASS 423
135 4,695,436
239 4,695,437
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648 R 4,695,446
659 4,695,447
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CLASS 424
1.1 4,695,449
22 4,695,450
47 4,695,451
59 4,695,452
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CLASS 425
23 4,695,234
39 4,695,235
131.1 4,695,236
135 4,695,237
145 4,695,238
194 4,695,239
207 4,695,240
275 4,695,241
376 R 4,695,242
388 4,695,243
429 4,695,244

CLASS 426
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24 4,695,469
37 4,695,470
237 4,695,472
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CLASS 427
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68 4,695,477
71 4,695,478
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282 4,695,486
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385.5 4,695,488
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CLASS 428
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CLASS 429
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CLASS 431
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CLASS 432
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CLASS 433
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CLASS 434
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CLASS 436
64 4,695,471
66 4,695,552
150 4,695,555
177 4,695,553
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CLASS 437
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34 4,694,565
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CLASSIFICATION OF PATENTS

57	4,694,562		CLASS 455	261	4,695,570	723	4,695,603	170	4,695,631	310	4,695,673
126	4,695,331	33	4,696,051	275	4,695,571		CLASS 525	194	4,695,632	317	4,695,656
	4,695,332	51	4,696,052	278	4,695,572	71	4,695,604	286	4,695,633	636	4,695,657
225	4,695,480	67	4,696,053	290	4,695,573	109	4,695,605	300	4,695,634	763	4,695,658
228	4,695,479	89	4,696,054	313	4,695,574	160	4,695,606		CLASS 546	805	4,695,659
	CLASS 439	118	4,696,055	322	4,695,575	272	4,695,607	69	4,695,635	830	4,695,660
39	4,695,108	182	4,696,056	330	4,695,576	308	4,695,608	116	4,695,636	903	4,695,661
67	4,695,258	226	4,696,057	362	4,695,577	352	4,695,609	207	4,695,637		CLASS 585
76	4,695,115	277	4,696,058	397	4,695,578	426	4,695,610		CLASS 548	324	4,695,662
81	4,695,106	600	4,696,059		4,695,579	432	4,695,611	165	4,695,639	417	4,695,663
	4,695,107	601	4,696,060	412	4,695,580	433	4,695,612		CLASS 549	440	4,695,664
95	4,695,105	609	4,696,061	415	4,695,581	533	4,695,613	226	4,695,640	450	4,695,665
155	4,695,109	612	4,696,062	423	4,695,582		CLASS 526	552	4,695,641	481	4,695,666
188	4,695,116		4,696,063	440	4,695,583	142	4,695,614		CLASS 556		4,695,667
	4,695,117		CLASS 474	456	4,695,584	184	4,695,615	14	4,695,642	500	4,695,668
266	4,695,111	110	4,695,268	469	4,695,585	202	4,695,616	428	4,695,643	511	4,695,669
271	4,695,259	268	4,695,269		4,695,586		CLASS 528		CLASS 558	533	4,695,670
289	4,695,110		CLASS 494	510	4,695,587	32	4,695,617	249	4,695,644	558	4,695,671
350	4,695,112	34	4,695,270	518	4,695,588	55	4,695,618		CLASS 560	867	4,695,672
414	4,695,113		CLASS 502	653	4,695,589	73	4,695,619	24	4,695,645		CLASS 604
573	4,695,114	11	4,695,556	724	4,695,590	204	4,695,620	43	4,695,646	49	4,695,271
726	4,695,118	113	4,695,557	781	4,695,591	483	4,695,621	53	4,695,647	84	4,695,272
	CLASS 440	123	4,695,558		CLASS 521		CLASS 530	66	4,695,649	173	4,695,273
61	4,695,260	183	4,695,559	38	4,695,592	329	4,695,622	053	4,695,648	198	4,695,274
900	4,695,261	222	4,695,560	89	4,695,593	351	4,695,623	109	4,695,650	264	4,695,275
	CLASS 446	411	4,695,561	92	4,695,594	395	4,695,624	141	4,695,651	283	4,695,276
236	4,695,262		CLASS 514	99	4,695,595		CLASS 540		CLASS 564	304	4,695,277
256	4,695,263	13	4,695,562	137	4,695,596	63	4,695,625	343	4,695,652	385 A	4,695,278
321	4,695,264	105	4,695,563	154	4,695,597	214	4,695,626	365	4,695,653	397	4,695,279
329	4,695,265	127	4,695,564		CLASS 523	224	4,695,627	510	4,695,654		CLASS 623
454	4,695,266	306	4,695,565	400	4,695,598	312	4,695,628		CLASS 568	1	4,695,280
462	4,695,267	234	4,695,566		CLASS 524		CLASS 544	56	4,695,655	11	4,695,281
	CLASS 483	253	4,695,567	103	4,695,599	2	4,695,629			22	4,695,282
59	4,694,845	258	4,695,568		4,695,600	75	4,695,630			23	4,695,283
			4,695,569	362	4,695,601						CLASS 760
				439	4,695,602					378	4,695,407

CLASSIFICATION OF DESIGNS

D1—	120	291,940		70	291,957		50	291,974		84	291,991	D20—	9	292,008			292,024
D2—	320	291,941		105	291,958		106	291,975		114	291,992	D21—	76	292,009	D25—	77	292,025
		291,943	D8—	10	291,959	D11—	34	291,977			291,993		78	292,010	D26—		292,026
		291,944		18	291,960		121	291,976			291,994		108	292,011		101	292,027
		291,945		24	291,961	D12—	145	291,979			291,995		159	292,012	D27—	8	292,028
	628	291,942		95	291,962		5	291,980			291,996		173	292,013		36	292,029
D3—	73	291,946		394	291,963		84	291,981			291,997		205	292,014	D28—	41	292,030
	74	291,947	D9—	102	291,964		86	291,982			291,998		221	292,015		55	292,031
D6—	361	291,948		376	291,965		181	291,978	D15—	89	291,999		246	292,016	D30—	1	292,032
	375	291,949		389	291,966		192	291,983		189	292,000	D23—	6	292,017			292,033
	430	291,950		390	291,967			291,984			292,001		11	292,019		8	292,034
	482	291,951		398	291,968			291,985			292,002		71	292,018		88	292,035
		291,952		413	291,969		203	291,986			292,003		128	292,020	D34—	6	292,036
	488	291,953		436	291,970	D13—	41	291,987	D18—	31	292,004	D24—	16	292,021		7	292,037
	581	291,954		447	291,971	D14—	30	291,988	D19—	14	292,005		17	292,022		13	292,038
D7—	39	291,955		448	291,972		53	291,989		19	292,006		49	292,023			292,039
	42	291,956	D10—	33	291,973			291,990	D19—	48	292,007						

CLASSIFICATION OF PLANTS

P.—	68	6,017				
		6,018	6,019	6,020	6,021	6,022	6,023

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,694,728		4,694,860		4,695,459		4,694,943		4,694,717		4,694,958
	4,695,120		4,694,861		4,695,462		4,695,073		4,694,753		4,694,960
	4,695,200		4,694,906		4,695,472		4,695,257		4,694,816		4,694,962
	4,695,388		4,694,935		4,695,486		4,695,290		4,694,828		4,694,979
	4,695,428		4,694,956		4,695,495		4,695,385		4,694,874		4,695,016
	4,695,880		4,694,967		4,695,499		4,695,448		4,694,974		4,695,035
	4,695,881		4,694,973		4,695,542		4,695,650		4,694,980		4,695,053
04 :	4,694,752		4,694,975		4,695,547		4,695,719		4,694,996		4,695,096
	4,695,006		4,694,981		4,695,595		4,695,823		4,695,020		4,695,115
	4,695,123		4,695,014		4,695,618		4,695,920		4,695,085		4,695,116
	4,695,496		4,695,022		4,695,619		4,695,994		4,695,106		4,695,117
	4,695,590		4,695,024		4,695,623	09 :	4,694,519		4,695,110		4,695,127
	4,695,923		4,695,025		4,695,655		4,694,599		4,695,114		4,695,142
	4,695,951		4,695,026		4,695,673		4,694,631		4,695,146		4,695,198
05 :	4,694,712		4,695,029		4,695,676		4,694,632		4,695,183		4,695,199
	4,694,991		4,695,041		4,695,703		4,694,738		4,695,275		4,695,254
06 :	4,694,511		4,695,049		4,695,712		4,694,831		4,695,379		4,695,261
	4,694,514		4,695,067		4,695,713		4,694,982		4,695,386		4,695,302
	4,694,518		4,695,070		4,695,715		4,695,030		4,695,387		4,695,376
	4,694,543		4,695,072		4,695,722		4,695,087		4,695,424		4,695,420
	4,694,544		4,695,088		4,695,733		4,695,157		4,695,550		4,695,483
	4,694,554		4,695,118		4,695,737		4,695,226		4,695,577		4,695,492
	4,694,565		4,695,139		4,695,740		4,695,267		4,695,582		4,695,523
	4,694,566		4,695,189		4,695,743		4,695,340		4,695,718		4,695,560
	4,694,570		4,695,201		4,695,749		4,695,341		4,695,810		4,695,601
	4,694,583		4,695,212		4,695,772		4,695,429		4,696,017		4,695,662
	4,694,586		4,695,213		4,695,773		4,695,449		4,696,032		4,695,665
	4,694,606		4,695,218		4,695,788		4,695,452		4,696,045		4,695,666
	4,694,615		4,695,221		4,695,790		4,695,518		4,696,051		4,695,728
	4,694,619		4,695,222		4,695,794		4,695,541		4,696,052		4,695,761
	4,694,621		4,695,227		4,695,801		4,695,553	13 :	Re.32,506		4,695,771
	4,694,657		4,695,229		4,695,827		4,695,571		4,694,534		4,695,776
	4,694,667		4,695,231		4,695,831		4,695,596		4,694,535		4,695,918
	4,694,668		4,695,262		4,695,870		4,695,626		4,694,620		4,695,924
	4,694,691		4,695,273		4,695,873		4,695,634		4,694,659		4,695,977
	4,694,694		4,695,274		4,695,876		4,695,705		4,694,858		4,696,000
	4,694,708		4,695,291		4,695,887		4,695,736		4,695,494		4,696,016
	4,694,729		4,695,293		4,695,888		4,695,829	15 :	4,694,524		4,696,027
	4,694,746		4,695,296		4,695,891		4,695,854	16 :	4,694,742		4,696,028
	4,694,770		4,695,314		4,695,901		4,695,952	17 :	4,694,532		4,696,036
	4,694,772		4,695,327		4,695,903		4,696,019		4,694,581	18 :	4,694,553
	4,694,777		4,695,335		4,695,911	10 :	4,694,987		4,694,601		4,694,600
	4,694,778		4,695,348		4,695,917		4,695,310		4,694,686		4,694,661
	4,694,779		4,695,365		4,695,929		4,695,311		4,694,718		4,694,819
	4,694,787		4,695,366		4,695,953		4,695,602		4,694,790		4,694,847
	4,694,802		4,695,368		4,695,982		4,695,607		4,694,804		4,694,857
	4,694,811		4,695,373		4,696,062	11 :	4,695,028		4,694,818		4,694,925
	4,694,822		4,695,375		4,696,063	12 :	4,694,513		4,694,869		4,695,061
	4,694,824		4,695,382		4,558,179		4,694,545		4,694,872		4,695,207
	4,694,826		4,695,391	08 :	4,694,584		4,694,552		4,694,905		4,695,352
	4,694,846		4,695,394		4,694,609		4,694,595		4,694,928		4,695,417
	4,694,848		4,695,401		4,694,781		4,694,596		4,694,947		4,695,447
	4,694,852		4,695,455		4,694,904		4,694,602		4,694,955		4,695,545

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UNITED STATES PATENT AND TRADEMARK OFFICE
September 29, 1987 Volume 1082 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel for A Decision Without a Hearing as of Aug. 31, 1987.

Chemical Discipline	–	September 15, 1986
Mechanical Discipline	–	April 12, 1985
Electrical Discipline	–	June 12, 1985

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Aug. 31, 1987.

Chemical	–	June 13, 1985
Electrical	–	December 1, 1985
Mechanical	–	October 1, 1985

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of Aug. 1987.

Affirmed	232
Affirmed-in-Part	35
Reversed	139
Total Decided	406

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 25, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,472,835 through 4,473,906
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 12, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,392,262	06/312,715	7/12/83
4,392,268	06/330,687	7/12/83
4,392,273	06/393,247	7/12/83
4,392,275	06/246,694	7/12/83
4,392,284	06/284,899	7/12/83
4,392,286	06/229,940	7/12/83
4,392,306	06/268,582	7/12/83
4,392,311	06/289,764	7/12/83
4,392,312	06/311,484	7/12/83
4,392,315	06/338,960	7/12/83
4,392,318	06/302,363	7/12/83
4,392,320	06/373,263	7/12/83
4,392,322	06/290,483	7/12/83
4,392,325	06/302,982	7/12/83
4,392,327	06/275,194	7/12/83
4,392,328	06/280,358	7/12/83
4,392,339	06/324,814	7/12/83
4,392,348	06/290,138	7/12/83
4,392,350	06/246,665	7/12/83
4,392,369	06/246,178	7/12/83
4,392,389	06/299,078	7/12/83
4,392,395	06/226,273	7/12/83
4,392,398	06/268,401	7/12/83
4,392,407	06/296,737	7/12/83
4,392,408	06/276,823	7/12/83
4,392,410	06/279,644	7/12/83
4,392,413	06/222,148	7/12/83
4,392,420	06/353,337	7/12/83
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4,392,434	06/233,192	7/12/83
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4,392,446	06/251,464	7/12/83
4,392,455	06/278,044	7/12/83
4,392,457	06/221,718	7/12/83
4,392,466	06/386,273	7/12/83
4,392,477	06/258,633	7/12/83
4,392,480	06/393,066	7/12/83
4,392,484	06/273,287	7/12/83
4,392,488	06/267,388	7/12/83
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4,392,529	06/317,750	7/12/83
4,392,532	06/244,085	7/12/83
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4,392,569	06/339,598	7/12/83
4,392,578	06/313,833	7/12/83
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4,392,609	06/226,558	7/12/83
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4,392,653	06/316,752	7/12/83
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Patent Number	Serial Number	Issue Date
4,392,663	06/274,671	7/12/83
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4,392,675	06/226,346	7/12/83
4,392,679	06/263,759	7/12/83
4,392,684	06/239,031	7/12/83
4,392,685	06/228,160	7/12/83
4,392,690	06/242,015	7/12/83
4,392,692	06/282,515	7/12/83
4,392,711	06/245,720	7/12/83
4,392,737	06/324,098	7/12/83
4,392,754	06/347,716	7/12/83
4,392,755	06/347,649	7/12/83
4,392,760	06/386,512	7/12/83
4,392,761	06/251,039	7/12/83
4,392,767	06/236,399	7/12/83
4,392,794	06/220,271	7/12/83
4,392,800	06/230,586	7/12/83
4,392,802	06/316,776	7/12/83
4,392,806	06/311,358	7/12/83
4,392,810	06/222,752	7/12/83
4,392,816	06/239,553	7/12/83
4,392,817	06/239,554	7/12/83
4,392,818	06/247,832	7/12/83
4,392,819	06/228,522	7/12/83
4,392,820	06/220,827	7/12/83
4,392,822	06/268,810	7/12/83
4,392,824	06/306,152	7/12/83
4,392,830	06/315,496	7/12/83
4,392,832	06/276,075	7/12/83
4,392,833	06/294,480	7/12/83
4,392,847	06/260,964	7/12/83
4,392,853	06/244,000	7/12/83
4,392,863	06/335,759	7/12/83
4,392,866	06/318,532	7/12/83
4,392,873	06/272,964	7/12/83
4,392,875	06/347,949	7/12/83
4,392,883	06/237,093	7/12/83
4,392,890	06/354,347	7/12/83
4,392,895	06/319,159	7/12/83
4,392,904	06/225,009	7/12/83
4,392,921	06/217,318	7/12/83
4,392,925	06/257,891	7/12/83
4,392,926	06/265,347	7/12/83
4,392,945	06/346,173	7/12/83
4,392,946	06/330,108	7/12/83
4,392,952	06/255,883	7/12/83
4,392,957	06/281,932	7/12/83
4,392,976	06/391,590	7/12/83
4,392,996	06/282,910	7/12/83
4,392,999	06/301,807	7/12/83
4,393,004	06/344,118	7/12/83
4,393,014	06/302,946	7/12/83
4,393,024	06/332,312	7/12/83
4,393,039	06/301,075	7/12/83
4,393,054	06/379,528	7/12/83
4,393,057	06/371,400	7/12/83
4,393,065	06/249,762	7/12/83
4,393,069	06/324,680	7/12/83
4,393,073	06/371,621	7/12/83
4,393,074	06/338,476	7/12/83
4,393,100	06/295,462	7/12/83
4,393,101	06/387,580	7/12/83
4,393,120	06/294,030	7/12/83
4,393,137	06/276,425	7/12/83
4,393,141	06/352,070	7/12/83
4,393,146	06/380,070	7/12/83
4,393,174	06/319,614	7/12/83
4,393,175	06/300,621	7/12/83
4,393,216	06/275,619	7/12/83
4,393,217	06/224,606	7/12/83
4,393,220	06/249,323	7/12/83
4,393,233	06/337,900	7/12/83
4,393,236	06/282,419	7/12/83
4,393,242	06/280,623	7/12/83
4,393,266	06/412,448	7/12/83
4,393,268	06/265,325	7/12/83
4,393,284	06/322,755	7/12/83
4,393,300	06/316,056	7/12/83
4,393,394	06/293,525	7/12/83
4,393,395	06/300,226	7/12/83
4,393,425	06/248,809	7/12/83
4,393,427	06/220,197	7/12/83
4,393,434	06/323,586	7/12/83
4,393,437	06/284,095	7/12/83
4,393,487	06/328,550	7/12/83
4,393,489	06/248,776	7/12/83
4,393,509	06/252,737	7/12/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c);37 CFR 1.378)

The patents listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,383,139	06/239,346	5/10/83	3/2/81	8/27/87
4,371,295	06/245,454	2/1/83	3/19/81	9/2/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicatedExamining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,176,316, Re. S.N. 004,369, Filed Jan. 15, 1987, Cl. 380/32, SECURE SINGLE SIDEBAND COMMUNICATION SYSTEM USING MODULATED NOISE SUBCARRIER, Louis A. DeRosa, et al., Owner of Record: *International Telephone & Telegraph Corp., Nutley, N.J.,* Attorney or Agent: Paul W. Hemminger, et al., Ex. Gp.: 222

4,408,616, Re. S.N. 084,700, Filed Aug. 7, 1987, Cl. 128/731, BRAIN ELECTRICAL ACTIVITY MAPPING, Frank H. Duffy, et al., Owner of Record: *Children's Medical Center Corp., Boston, Mass.,* Attorney or Agent: David E. Brook, et al., Ex. Gp.: 335

4,496,806, Re. S.N. 008,431, Filed Jan. 29, 1987, Cl. 200/16R, ELECTRIC CONTACT SWITCHING DEVICE, Kozo Maenishi, et al., Owner of Record: *Omron Tateisi Electronics Co., Kyoto, Japan,* Attorney or Agent: Barry E. Bretschneider, et al., Ex. Gp.: 214

4,501,965, Re. S.N. 084,670, Filed Aug. 7, 1987, Cl. 253/288, METHOD AND APPARATUS FOR SAMPLING A PLASMA INTO A VACUUM CHAMBER, Donald James Douglas, Owner of Record: *Donald James Douglas, Ontario, Canada,* Attorney or Agent: Charles A. Laff, et al., Ex. Gp.: 256

4,534,713, Re. S.N. 084,424, Filed Aug. 10, 1987, Cl. 417/377, PUMP APPARATUS, William F. Wanner, Owner of Record: *Recovery Engineering, Inc., Minneapolis, Minn.,* Attorney or Agent: Curtis B. Hamre, et al., Ex. Gp.: 343

4,546,048, Re. S.N. 047,238, Filed May 7, 1987, Cl. 428/460, COMPOSITE THERMAL SHIELD FOR ENGINE COMPONENTS, William D. Guenthers, Owner of Record: *Dana Corp., Toledo, Ohio,* Attorney or Agent: Robert M. Leonard, et al., Ex. Gp.: 154

4,564,019, Re. S.N. 044,066, Filed Apr. 29, 1987, Cl. 128/660, METHOD FOR MEASURING CHARACTERISTICS OF LIVING TISSUES BY ULTRASONIC WAVES, Hidrohide Miwa, Owner of Record: *Fujitsu Ltd., Kanagawa, Japan,* Attorney or Agent: James D. Halsey, Jr., Ex. Gp.: 335

4,567,971, Re. S.N. 085,837, Filed Aug. 17, 1987, Cl. 192/012, HYDRAULIC CIRCUIT FOR ACTIVATING A CLUTCH AND A THROTTLE VALVE USED IN THE CIRCUIT, Hans-Jorg Hille, Owner of Record: *Deere Co., Moline, Ill.,* Attorney or Agent: John M. Nolan, et al., Ex. Gp.: 352

4,610,733, Re. S.N. 076,051, Filed June 8, 1987, Cl. 148/12.7A, HIGH STRENGTH WELDABLE ALUMINUM BASE ALLOY PRODUCT AND METHOD OF MAKING SAME, Robert E. Sanders, Jr., et al., Owner of Record: *Aluminum Co. of America, Alcoa, Pa.,* Attorney or Agent: Andrew Alexander, et al., Ex. Gp.: 111

4,626,118, Re. S.N. 084,554, Filed Aug. 12, 1987, Cl. 401/104, WRITING INSTRUMENT WITH FASTENING MEANS, Roger T. Bellavance, Owner of Record: *Inventor,* Attorney or Agent: David S. Fishman, Ex. Gp.: 332

4,635,287, Re. S.N. 084,031, Filed Aug. 10, 1987, Cl. 381/194, AUDIO-FREQUENCY ELECTROMECHANICAL VIBRATOR, Mutsuo Hirano, Owner of Record: *Sanden Corp., Isesaki-Shi, Japan,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 261

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,121,818, Reexam. No. 90/001,302, Requested: Aug. 6, 1987, Cl. 270/54, SIGNATURE COLLATING AND BINDING SYSTEM, Wayne A. Riley, et al., Owner of Record: *R. R. Donnelley & Sons Co., Chicago, Ill.,* Attorney or Agent: Wood, Dalton, et al., Ex. Gp.: 330, Requester: Owner

4,252,576, Reexam. No. 90/001,306, Requested: Aug. 10, 1987, Cl. 148/33.400, EPITAXIAL WAFER FOR USE IN PRODUCTION OF LIGHT EMITTING DIODE, Shinichi Hasegawa, et al., Owner of Record: *Mitsubishi Monsanto Chemical Co., Tokyo, Japan,* Attorney or Agent: Fitzpatrick, Cella, et al., Ex. Gp.: 110, Requester: Owner

4,349,987, Reexam. No. 90/001,305, Requested: Aug. 7, 1987, Cl. 46/265, DOLL WHICH RISES FROM PRONE TO STANDING POSITION, Philip D. Bart, Owner of Record: *Inventor, Coral Springs, Fla.,* Attorney or Agent: Daniel M. Rosen, Ex. Gp.: 330, Requester: Kenner Products, Inc., Cincinnati, Ohio

4,389,074, Reexam. No. 90/001,308, Requested: Aug. 17, 1987, Cl. 299/79, MINE TOOLS UTILIZING COPPER-MANGANESE NICKEL BRAZING ALLOY, Mark S. Greenfield, Owner of Record: *GTE Products Corp., Stamford, Conn.,* Attorney or Agent: D. R. Castle, Ex. Gp.: 320, Requester: Kennametal, Inc., Latrobe, Pa.

4,503,095, Reexam. No. 90/001,303, Requested: Aug. 7, 1987, Cl. 427/359, HEAT-SENSITIVE COLOR TRANSFER RECORDING MEDIA, Tadao Seto, et al., Owner of Record: *Fuji Kagakushi Kogyo Co., Osaka, Japan,* Attorney or Agent: R. J. Kubovcik, Ex. Gp.: 130, Requester: J. J. Brown, Rockville, Md.

4,595,627, Reexam. No. 90/001,304, Requested: Aug. 17, 1987, Cl. 428/241, FLUORESCENT TEXTILE MATERIAL, Barry Steinman, Owner of Record: *Safety Trim Industries, Inc., New York, N.Y.,* Attorney or Agent: Temko & Temko, Ex. Gp.: 150, Requester: Fitzpatrick, Cella, et al., New York, N.Y.

4,599,366, Reexam. No. 90/001,300, Requested: Aug. 3, 1987, Cl. 521/57, ANTI-STATIC STYRENE POLYMER PARTICLES, Haven S. Resling, Jr., et al., Owner of Record: *Atlantic Richfield Co., Newtown Square, Pa.,* Attorney or Agent: John C. Martin, Ex. Gp.: 150, Requester: Owner

4,609,561, Reexam. No. 90/001,301, Requested: July 27, 1987, Cl. 426/565, FROZEN AERATED FRUIT JUICE DESSERT, Bill R. Wade, et al., Owner of Record: *Olympus Industries, Inc., Spokane, Wash.,* Attorney or Agent: E. W. Oldham, Ex. Gp.: 130, Requester: Christensen, O'Connor, et al., Seattle, Wash.

4,610,077, Reexam. No. 90/001,307, Requested: Aug. 17, 1987, Cl. 29/572, PROCESS FOR FABRICATING A WRAPAROUND CONTACT SOLAR CELL, Joseph A. Minahan, et al., Owner of Record: *Hughes Aircraft Co., Los Angeles, Calif.,* Attorney or Agent: J. E. Holman Ex. Gp.: 110, Requester: Owner

4,662,875, Reexam. No. 90/001,309, Requested: Aug. 17, 1987, Cl. 604/389, ABSORBENT ARTICLE, Dennis O. Hirotsu, et al., Owner of Record: *The Procter & Gamble Co., Cincinnati, Ohio,* Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: Owner

Erratum

"All reference to Patent No. 4,679,288 to Guy Monfort, et al., of Braives, Belgium, for 'SURFACE TREATMENT OF A ROLLING MILL ROLL', appearing in the Official Gazette of July 14, 1987, should be deleted since no patent was granted."

"All reference to Patent No. 4,679,907 to Bruce D. Campbell, et al., of Calif., for 'METHODS, APPARATUS AND ARTICLES FOR OPTICAL FIBER SYSTEMS', appearing in the Official Gazette of July 14, 1987, should be deleted since no patent was granted."

"All reference to Patent No. 4,680,322 to Yuzo Yokota, et al., of Japan, for 'COMPOSITION FOR FORMING A LAYER OF THE SUPPORTING PLATE FOR USE IN LITHOGRAPHY AND PROCESS FOR PRODUCING THE COMPOSITION', appearing in the Official Gazette of July 14, 1987, should be deleted since no patent was granted."

"All reference to Patent No. 4,684,410 to Alpha L. Morehouse, of Iowa, for 'LOW D.E. STARCH HYDROLYZATES', appearing in the Official Gazette of Aug. 4, 1987, should be deleted since no patent was granted."

"All reference to Patent No. 4,689,088 to Alpha L. Morehouse, of Iowa, for 'LOW D.E. STARCH HYDROLYZATES', appearing in the Official Gazette

of Aug. 25, 1987, should be deleted since no patent was granted."

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Aug. 25, 1987, were listed inadvertently:

1,454,058	TM 156	Aug. 25, 1987
1,454,480	TM 164	Aug. 25, 1987

Consequently, the certificates of registration bearing the above-identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

PATRICIA M. DAVIS,
Administrator for
Trademark Operations.

Sept. 1, 1987.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Dec. 11, 1984, was listed inadvertently:

1,309,437	TM 394	Dec. 11, 1984

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
Administrator for
Trademark Operations.

Sept. 1, 1987.

Department of Commerce
Patent and Trademark Office
[Docket No. 70470-7070]

Electronic Data Dissemination Policies and Guidelines

Correction

In notice document 87-19056 beginning on page 31442 in the issue of Thurs., Aug. 20, 1987, make the following corrections:

On page 31443, in the first column, under **SUPPLEMENTARY INFORMATION**, in the second paragraph, in the sixth line, "not will" should read "not nor will".

2. On the same page, in the second column, under **Background**, in the fourth paragraph, in the fifth line, "relected" should read "selected".

3. On the same page, in the third column, in the fourth line, "patent" should read "patents".

BILLING CODE 1505-01-D

Adverse Decisions in Interference

In the designated interferences involving the following patent, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,200,520, Elroy M. Gladrow and William E. Winter, CATALYTIC CRACKING PROCESS, Interference No. 101,160, decided Mar. 31, 1987, claims 1-9.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,026,819, Ronald Francis Langere, Otto Ernest Loeffler and Thomas Francis Santini, PRODUCTION OF HYDROUS PENTAVALENT ANTIMONY OXIDE SOL COMPOSITION, DRY POWDER PREPARED THEREFROM, AND PRODUCTION OF SAID DRY POWDER, Interference No. 101,703, decided July 31, 1987, claims 1-4.

Patent No. 4,130,588, Alton E. Martin, Warren D. White and Samuel L. Smolik, PROCESS FOR PRODUCING METHYLENE DIANILINE, Interference No. 101,693, decided July 15, 1987, claims 1-10.

Patent No. 4,200,745, Allen S. Katner, 7[2-(2-AMINOTHIOZOL-4-YL)-2-ALKOXYIMINO]ACETAMIDO 3[4-ALKYL-5-OXO-6-HYDROXY-3,4 DIHYDRO 1,2,4-TRIAZIN-3-YL] THIOMETHYL CEPHALOSPORINS, Interference No. 101,677, decided July 7, 1987, claims 1-12.

Patent No. 4,233,308, Walter Kunz, Wolfgang Eckhardt and Adolf Hubele, MICROBICIDAL COMPOSITIONS, Interference No. 101,722, decided July 14, 1987, claims 1-9.

Patent No. 4,454,756, Harper E. Sharp, Leo Spiegel, Richard M. Masters, Elmer J. Frey, John R. Howatt and Gary E. Walker, INERTIAL BOREHOLE SURVEY SYSTEM, Interference No. 101,351, decided Aug. 6, 1987, claims 13-15, 20-22, 24-26, 29, 30, 32 and 33.

Patent No. 4,469,979, Shih S. Chuang, MICRORESONATOR OF DOUBLE-ENDED TUNING FORK CONFIGURATION, Interference No. 101,559, decided July 22, 1987, claim 11.

Patent No. 4,470,983, Jurgen Blumbach, Walter Durckheimer and Karl Seeger, CEPHALOSPORIN DERIVATIVES, Interference No. 101,774, decided July 23, 1987, claims 1-4.

Patent No. 4,481,275, Masahide Iseki, Tadanobu Nakajima, Hiroshi Kajita and Masuo Kawamoto, METHOD OF PREVENTING TONER FROM SCATTERING IN AN ELECTROSTATIC COPYING MACHINE, Interference No. 101,519, decided Mar. 31, 1987, claims 1-3.

Patent No. 4,498,966, Alton T. Tabereaux, ALUMINA REDUCTION CELL, Interference No. 101,711, decided July 16, 1987, claims 1-6.

Patent No. 4,532,215, Richard J. Daemer, Stephen M. Feinstone, Ian D. Gust and Robert H. Purcell, ISOLATION OF HEPATITIS A VIRUS STRAIN HM-175, Interference No. 101,583, decided July 13, 1987, claims 1-3.

Patent No. 4,553,035, Igor Malinsky, Jose B. Cofino and Richard J. McKay, DATA ACQUISITION CONTROL METHOD AND SYSTEM FOR A HAND HELD READER, Interference No. 101,558, decided July 1, 1987, claims 1-17.

Patent No. 4,599,333, Kikuo Yasuda, Takayuki Takezaki, Rikio Ohuchi, Hiroshi Ohuyabu, Yoshitaka Tanimoto, Toshimi Seki, Takashi Yamaguchi, Akihiro Izumi, Norio Himori and Tsutomu Ishimori, HYDRAZINOPYRIDAZINE COMPOUND, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF AS MEDICAMENT, Interference No. 101,791, decided July 14, 1987, claims 1-11.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals
and Interferences.

Status of PTO Services

The following is an update of the status of PTO services for August 1987:

Service Item	FY 1987 Goal (Calendar Days*)	Monthly Average (Calendar Days*)
Filing Receipts:		
Patents	22	31
Trademarks	30	59**
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	14 Hours
Window Coupons	5	1
Mail Coupons	12	4
Letter Orders	16	9
Certified Copies:		
Trademark Registrations	21	23
Applications-As-Filed	17	15***
File-Wrapper/Contents	N/A	24
Walk-up Certification	1	2
Trademark Search Library:		
Filing Pending Marks	21	45**
Filing Reg. Certificates	Issue Date	Issue Date
Assignments:		
Patents	20	38 (see narrative)
Trademarks	20	47 (see narrative)
Receipt Date of Trademark Documents Returned		July 31, 1987
Receipt Date of Patent Documents Returned		July 17, 1987
Avg. Days from Issue Fee Payment to Issue Date	90-100	87
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	86% on Issue Date****
Trademark Copies Available	95% on Issue Date	98% on Issue Date

* Unless otherwise noted.
** Keying contractor delays.
*** The 5% of orders for which fiche are not on site are not included in calculations.
**** Printer delivered copies late.

IMPROVEMENTS TO SERVICES

- Until June 1987, trademark assignments containing more than 99 properties were pulled from the normal processing pipeline and handled separately. This was being done since the automatic typewriters used to record the information must be reset to accommodate for more than 99 properties. However, this procedure had resulted in delays in recording such assignments, and in their being processed well after other assignments with earlier receipt dates. An intensive effort has been underway to record all those assignments and the backlog has now been completed. All trademark assignments, regardless of the number of properties, are now being processed in date order and we are planning to be back on schedule by the end of Sept.

  Similarly, patent assignments involving several properties had also been delayed. The increase in the days to process assignments reflects the working off of this backlog. It is expected to be completed by the end of Sept. and all patent assignments should be back on target in Oct.

HELPFUL HINTS

- *Certificate of Mailing AND Return Post Card* — Use of the Certificate of Mailing Procedure is strongly encouraged.

  37 CFR 1.8(a) provides for the use of a Certificate of Mailing on most correspondence with the PTO, whereby the correspondence (and/or fee) will be considered as timely filed if deposited with the U.S. Postal Service within the set time period. Consistent use of this procedure is extremely beneficial to practitioners, whether or not the Post Card Receipt provision of MPEP 503 is used.

  In those instances where the PTO never receives the correspondence, no post card receipt will be available to evidence the filing and/or timeliness of the correspondence. However, in those instances where a Certificate of Mailing is properly used, 37 CFR 1.8(b) provides relief, even if the correspondence is *not* received in the PTO at all. Under 37 CFR 1.8(b) the party who forwarded the correspondence need only (1) inform the PTO of the previous mailing of the correspondence, (2) supply a copy of the previously mailed correspondence and Certificate, and (3) include a declaration which adequately attests to the previous timely mailing.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

Sept. 8, 1987.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 29, 1987

D. 290,329	4,631,679	4,656,268	4,664,827
4,393,875	4,634,855	4,656,400	4,665,219
4,482,825	4,636,378	4,657,305	4,665,816
4,485,099	4,637,706	4,657,377	4,665,895
4,504,771	4,640,135	4,657,645	4,665,909
4,507,763	4,640,655	4,657,683	4,666,253
4,514,212	4,642,100	4,658,121	4,666,734
4,516,968	4,642,118	4,658,706	4,666,813
4,518,574	4,643,192	4,659,016	4,667,056
4,519,137	4,644,296	4,659,074	4,667,063
4,520,617	4,644,457	4,659,225	4,667,153
4,529,455	4,646,681	4,659,739	4,667,590
4,531,563	4,646,790	4,659,877	4,668,232
4,557,550	4,648,037	4,660,342	4,668,240
4,573,169	4,648,358	4,660,371	4,668,396
4,575,554	4,648,572	4,660,853	4,669,722
4,576,629	4,648,963	4,661,165	4,669,974
4,583,592	4,649,144	4,661,271	4,670,630
4,586,291	4,649,641	4,661,442	4,670,733
4,591,762	4,650,464	4,661,837	4,670,949
4,602,655	4,651,071	4,662,041	4,671,083
4,604,619	4,652,197	4,662,072	4,673,742
4,608,061	4,652,318	4,662,430	4,673,990
4,610,521	4,653,438	4,663,014	4,674,031
4,612,319	4,653,500	4,663,100	4,676,630
4,613,379	4,654,100	4,663,243	4,676,944
4,619,712	4,654,351	4,663,734	4,678,293
4,627,072	4,654,848	4,663,837	4,678,440
4,627,348	4,654,946	4,664,760	4,678,624

Disclaimers

4,623,583.—*Vladimir Mischutin*, Union City N.J. FLAME RETARDANT TEXTILE FABRICS. Patent dated Nov. 18, 1986. Disclaimer filed July 13, 1987, by the assignee, *White Chemical Corp.*

The term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

4,645,588.—*Waldeen C. Buss*, Kensington and *Thomas R. Hughes*, Orinda, Calif. REFORMING WITH A PLATINUM-BARIUM-ZEOLITE OF L FAMILY. Patent dated Feb. 24, 1987. Disclaimer filed Aug. 13, 1987, by the assignee, *Chevron Research Co.*

The term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

4,658,583.—*David C. Shropshire*, Lafayette, Ind. DOUBLE STAGED, INTERNAL ROTARY PUMP WITH FLOW CONTROL. Patent dated Apr. 21, 1987. Disclaimer filed July 13, 1987, by the assignee, *TRW, Inc.*

Hereby enters this disclaimer to claims 1–4, 10 and 11 of said patent.

Disclaimers and Dedications

4,368,351.—*Scott E. Zimmer*, Fairfield, Conn. AMPLITUDE MODULATED DIGITIZER. Patent dated Jan. 11, 1983. Disclaimer and Dedication filed June 25, 1987, by the assignee, *Summagraphics Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,598,505.—*Jack A. McGown*, Houston, Tex. FLASHING MEMBER. Patent dated July 8, 1986. Disclaimer and Dedication filed June 19, 1987, by the *inventor.*

Hereby disclaims and dedicates to the Public all claims of said patent.

DEPARTMENT OF COMMERCE

Patent and Trademark Office

37 CFR Part 1

[Docket No. 70635-7135]

Deposit of Biological Materials for Patent Purposes

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Advance notice of proposed rulemaking.

SUMMARY: This advanced notice of proposed rulemaking sets forth proposed rules and guidelines that the Patent and Trademark Office (PTO) is considering to govern the deposit of biological materials for patent purposes.

Every patent must contain a written description of the invention adequate to instruct a person skilled in the art to which the invention pertains how to make and use the invention. In certain instances, such as with some biotechnological inventions, the written description of the invention may not in itself be adequate to permit reproduction of the invention. In these cases, the written description must be supplemented by a deposit of the biological material which constitutes the invention or on which the invention depends if the biological material is not otherwise known and readily available to those skilled in the art. The deposited material becomes unconditionally available to the public at the time the patent is granted.

The rules being considered for proposal by the PTO prescribe the conditions under which a deposit must be made, the kinds of materials that may be deposited, the type of depository which is acceptable to the Office, the time for making an original deposit, the procedures and obligations applicable to the making and maintaining of a deposit and its possible replacement, the term of a deposit and other matters relating to the deposit of a biological material. In general, the rules being considered by the PTO would continue and clarify both long-standing practices of the Patent and Trademark Office and judicially developed principles of patent law. The explanations associated with the rules that are ultimately adopted along with the substantive content of the comments and responses will be incorporated into a set of guidelines that will be published in the Manual of Patent Examining Procedure.

In response to a draft policy statement on the deposit of biological materials for patent purposes, which was circulated among interested bar and industry groups and published in the BNA-Patent, Trademark and Copyright Journal on May 22, 1986, the PTO received twenty five (25) written comments directed to that draft statement. This advance notice addresses the comments received. Interested persons are invited to comment on the rules being considered for proposal. A proposed rulemaking could be made as early as January 1988. A hearing could be held as early as March 1988.

DATE: Comments must be received on or before November 30, 1987 to insure consideration.

ADDRESS: Address written comments to: Commissioner of Patents and Trademarks, Box 4, Washington, DC 20231.

Mark to the attention of Stanley D. Schlosser (703) 557–3065. All comments received will be publicly available for inspection in the PTO in room 11C28, Crystal Plaza Building 3 (2021 Jefferson Davis Highway, Arlington, Virginia).

FOR FURTHER INFORMATION CONTACT: Mr. Stanley D. Schlosser by telephone at (703) 557–3065.

SUPPLEMENTARY INFORMATION: An applicant for a patent involving biological material must meet the same requirements for disclosing the invention as apply to other kinds of technology. These requirements are set forth in the first paragraph of § 112 of the patent law (Title 35, United States Code). The invention must be described in such full, clear, concise and exact terms as to enable a person skilled in the relevant technology to make and use the invention. The best mode contemplated by the inventor for carrying out the invention must also be disclosed. The statutory requirements for claiming inventions set forth in the second paragraph of 35 U.S.C. 112 also apply to inventions involving biological material. That is, claims must particularly point out and distinctly claim that which applicants for patent regard as their invention.

Where the invention involves a biological material and words alone are not sufficient to describe the invention adequately to meet the requirements of 35 U.S.C. 112, the required biological material completing the written description must either already be known and readily available and likely to continue to be available or be deposited into a suitable depository. Samples of the deposited material must be publicly and unconditionally available upon issuance of the patent. The deposit will be considered part of the patent disclosure and taken into account in determining the scope of the invention and related questions of infringement. As indicated above, the requirement for making a deposit only applies in situations where the biological material is essential to a complete disclosure and either is not known and readily available to the public, or cannot be readily produced from publicly available material according to the information contained in the patent.

A new chapter of rules of practice devoted exclusively to biological inventions, entitled "Deposit of Biological Materials for Patent Purposes", would be added, beginning with proposed new rule 1.200. This new chapter would specifically incorporate into patent practice judicially developed principles applicable to the deposit of biological materials and would be consistent with the duties and responsibilities of the United States as a signatory country to the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. It must be recognized, however, that a comprehensive body of patent law has not yet been developed by the courts dealing with the treatment of inventions relating to biological material. In situations where the courts have not provided specific guidance, appropriate rules and procedures are extracted or implied as far as possible from available decisions and existing practices.

The rules being considered for proposal are intended to apply to patent rights pursued under section 101 of the patent law (Title 35, United States Code). Patent applications filed under the Plant Patent Act (35 U.S.C. 161–164) would be unaffected by this advanced notice. However, comments are solicited on the question of whether the Office should consider requiring a deposit of plants in appropriate circumstances where it is clear that a deposit is possible and is necessary to complete the description of an invention under 35 U.S.C. 162, first paragraph.

New rule 1.200 would be proposed to define the nature of biological material that falls within the scope of the rules. The definition is not intended to provide an exhaustive list of materials which may be deposited in accordance with these procedures. Rather, the need for a deposit and the types of material which must be deposited will be developed through experience and judicial decisions. Meanwhile, some guidelines can be provided.

First, biological material includes material that is capable of self-replication, either directly or after insertion into a host. Assuming the continued viability of the samples

deposited, this should provide a reproducible supply of the biological material for the term of the deposit.

Chemical compounds, no matter how important or defined their biological activity, are not regarded as biological material within the scope of these regulations. Chemical compounds are capable of description at least through the identification of starting materials and explanation of appropriate procedures used in making the compounds. It must not require undue experimentation in order to make or use the chemical compound from the written description in the patent application. Thus, materials such as proteins, enzymes, or other complex organic materials need not be deposited where the written description alone is adequate to enable those skilled in the art to make and use the claimed invention.

Plant material must be deposited when the patent application is filed outside the Plant Patent Act if needed to meet the requirements of 35 U.S.C. 112. As with other biological material, the deposit of plant material together with the written specification must enable those skilled in the art to make and use the claimed invention. Thus, if a plant itself is claimed, deposit of plant cells can be accepted only if the deposited cells will develop into the plant for which a patent is sought through the exercise of procedures either known in the art or taught in the application disclosure. Seeds may be deposited, but must be deposited in sufficient quantity to insure an adequate and timely supply once a patent is granted. The PTO solicits comments on the setting of an appropriate minimum number of seeds to ensure availability of the seed through the enforceable life of the patent. The replacement provisions of proposed rule 1.204 would also apply to replenishing the supply of seeds but may require special provisions because of the time required to provide new seeds—e.g. the replacement provision could be coupled with a terminal disclaimer provision for appropriate reasons. If a hybrid variety is claimed, the PTO will take a position that applicant must deposit the parent lines of the hybrid variety unless applicant is able to establish that propagation of the variety can be achieved by micropropagation or other techniques from the hybridized seed or plants grown from such seed. In the latter case, the deposit of the hybrid seed itself would make an adequate deposit.

While the proposed rules under consideration would be applicable to multicellular living organisms other than plants, including animals, it is anticipated that inventions relating to the development of animals having new and otherwise patentable characteristics will rely on the identification and description of a known and readily available animal that will be treated in a reproducible process to obtain the new animal variety. The PTO is presently not aware of any organization that is willing and able to undertake the responsibilities of a suitable depository for live animals.

Rule 1.201 would be proposed to provide an operative definition of when a deposit is required and also define when a biological material would be considered to be known and readily available to the public so that a separate deposit would not be required. The third paragraph of this rule would provide that there is no presumption that a specific biological material is required for the practice of an invention simply because it is mentioned in an application disclosure. The need to make a deposit of a biological material in accordance with these rules is necessitated only where the biological material is essential to meet one or more of the requirements of 35 U.S.C. 112 and is not known and readily available and cannot be obtained through procedures known in the art or described in the application from known and readily available materials.

If a biological material is known and readily available at the time the patent is granted, and there is no reasonable basis to believe that the biological material will cease to be available during the life of the patent, no requirement for a separate deposit would be made.

While it is not possible to list all circumstances under which a biological material may be considered to be known and readily available to the public, it is clear that the written description in the specification should be sufficient to allow one of ordinary skill in the art to identify and to obtain the known and readily available material. The present commercial availability of the biological material through normal commercial suppliers, particularly suppliers not under the control of those relying on the availability of the biological material, would make the material known and readily available. The mere fact that the biological material is commercially available only through the patent holder or the patent holder's agents or assigns shall not by itself justify a finding of non-availability, absent a reason to believe that access to the biological material would later be improperly restricted. Since the public has a continuing interest in the availability of information and materials necessary to make and use an invention claimed in a patent, regardless of the patent holder's interest, actual distribution of the biological matter in the marketplace may be required if commercial availability is to be relied on to establish that a specific biological material is known and readily available to the public.

Evidence that a biological material is known and readily available may also take the form of a reference in printed publications or a declaration of accessibility by those working in the field to which the invention relates which establishes wide distribution and ready availability of the biological material. The probative value of this type of evidence will depend on whether the evidence establishes that the biological materials are known and accessible without restriction to those who desire to obtain and test the biological material.

Evidence that a biological material is known and readily available may take the form of a statement showing that it is readily identifiable and available in nature in useful form or that it is available in nature coupled with the existence of a reliable screening test or procedure defined in the specification disclosure or known to those skilled in the art that could be used to isolate the required biological material with reasonable predictability from an identified genus of biological material. See *Tabuchi v. Nubel*, 194 USPQ 521 (CCPA 1977). A deposit made of a biological material that was known and accessible without restriction to those who desired to obtain and test the biological material would also satisfy the definition of being known and readily available to the public. However, since a mere reference to a biological material deposit in a patent would not necessarily mean that it was accessible without restriction to the public the burden would be on the applicant to establish its ready availability without restriction as through a statement from the depository.

New rule 1.202 would be proposed to define an acceptable depository for the deposit of biological materials for patent purposes for applications before the United States Patent and Trademark Office. This rule states that a deposit may be made either in an International Depositary Authority (IDA) as established under the Budapest Treaty or a depository recognized to be suitable by the Patent and Trademark Office. The depository may be domestic or foreign to the United States, public or private. While it would be administratively convenient for the Patent and Trademark Office to limit acceptable depositories to an IDA, such a restricted policy would not provide a patent applicant with the type of flexibility and availability necessary in the event no available IDA would accept a deposit of a particular biological material. Nevertheless, a depository other than an IDA would be called upon to essentially establish compliance with the administrative and technical requirements set forth in the Budapest Treaty for IDAs in order to establish suitability of the depository to the Office. While there is a desire to provide flexibility to a patent applicant in selecting an appropriate depository, these guidelines are not intended to permit each patent applicant to become its own depository since both the patent owner and the public have an interest in the continued availability and accessibility of the deposit during the enforceable life of a patent and the public has a continuing interest in its availability when the patent is no longer enforceable.

Paragraph (c) of new rule 1.202 indicates that the Office will recognize the transfer of a sample to a suitable depository from a depository which either defaults or discontinues the performance of any of the tasks it should perform. Where such a transfer takes place after a patent issues, a suitable Certificate of Correction would be acceptable to identify the new depository and/or accession number. An appropriate amendment to a pending application to identify the new depository and/or accession number would not constitute new matter. Cf. *In re Lundak*, 227 USPQ 90 (Fed. Cir. 1985).

Paragraph (d) of new rule 1.202 sets forth the procedure for notifying the Commissioner of the intent to be recognized as a suitable depository by the Patent and Trademark Office. The depositories recognized as suitable by the Office will be published in the Official Gazette of the Patent and Trademark Office as will the identity of a depository which has defaulted or discontinued its performance under these rules.

New rule 1.203 would be proposed to set forth the time for making an original deposit. An original deposit may be made at any time before the application is filed or during pendency pursuant to a requirement that will be made no later than the date the Notice of Allowance and Issue Fee Due is mailed. The decision in *Lundak* indicated that a specification disclosure need not be enabling until such time as a patent is granted. Unless the examiner and applicant agree on whether a deposit is required, what must be deposited and the appropriate conditions, the deposit issues will be resolved pursuant to a rejection under 35 U.S.C. 112. The time specified in this particular rule for making a suitable deposit is the last practical moment that the Office can insure that a deposit has been made in accordance with these regulations before a patent is granted. After the issue fee is paid in an application the application undergoes preparation for printing for a period of 8 to 10 weeks so that all the information necessary for printing should be in the application file and should have been approved by the examiner as conforming to these regulations at the time the issue fee is paid. Where a deposit is made after the Notice of Allowance and Issue Fee Due is mailed, applicant would be required to file an amendment under 37 CFR 1.312 to add a description of the accession number and depository together with any required statement

Unless the regular deposit is made before the effective filing date of an application for patent in the United States, a verified statement will be required from a person in a position to corroborate that the biological material described in the application as filed is the same biological material which is deposited in a suitable depository. The nature of this corroboration will depend on the circumstances in the particular application under consideration including the length of time between the application filing date and the date of deposit.

New rule 1.204 would be proposed to define the circumstances and procedures for replacing a deposit which is necessary for patent purposes. Failure to replace a deposit within three (3) months after learning or receiving notice from a depository that a replacement is needed may cause the application or patent involved to be treated by the PTO as if no deposit were made. The Patent and Trademark Office will apply a rebuttable presumption of an identity between the original and the replaced sample in the event a deposit is replaced where the application or patent making reference to the deposit is relied upon during any Patent and Trademark Office proceeding.

New rule 1.205 would be proposed to define the term of a deposit to be a minimum of 5 years after the most recent request for the furnishing of a sample of the deposited biological material and at least 30 years after the date of deposit. Any deposit which is made pursuant to the Budapest Treaty will be for a term acceptable to the Office. However, where a deposit is not made under the Budapest Treaty, samples must be stored under an agreement that would make them available for at least the term specified in the Budapest Treaty so long as it extended beyond the enforceable life of the patent for which a deposit was made. The enforceable life of a patent includes the original term of seventeen years, shortened by any terminal disclaimer or lengthened by any patent term extension, plus six (6) years to cover the statute of limitations and any additional time beyond this period where the enforceability of the patent remains in litigation.

The period for storing a deposit as literally stated in the Budapest Treaty is likely to cover almost all of the circumstances before the Patent and Trademark Office. However, in the event that the period of storage would expire before the earliest possible expiration date of the enforceable life of the patent, one of the basic intents of Congress to insure that the public can practice the invention claimed in an expired patent may be frustrated, and it is not believed that the period set forth in the Budapest Treaty intended for such a situation to arise. The availability of the deposited biological material which is essential for making and/or using the subject matter claimed in the patent is a legitimate ground for concern on the part of the Patent and Trademark Office. *Ex parte Lundak* (decided August 21, 1984, reversed on other grounds *In re Lundak*, 227 USPQ 90 (Fed. Cir. 1985)). The Board of Patent Appeals considered the possibility that an initially enabling disclosure might become non-enabling over a period of time. *In re Metcalfe*, 410 F2d. 1378, 161 USPQ 789 (CCPA 1969). Suggesting that a rule of reason approach similar to that applied by the Court in *Metcalfe* should continue to inhere in the deposit procedure of the Patent and Trademark Office, the Board suggested that it was appropriate to insist that the depository be contractually obligated to maintain the deposit for at least a reasonable time after expiration of the patent rights. In determining whether the period is sufficient to extend beyond the enforceable life of the patent, neither the possibility of patent term extension nor the possibility of protracted litigation will be considered. Where the minimum period of storage would not extend beyond the enforceable life of the patent, as where there is prolonged pendency of an application or continuation or divisional applications

are involved, one approach would be to require applicant to undertake to request a sample every five years beyond the 30 years measured from the date of deposit so that the deposit would be stored for a period beyond the enforceable life of the patent.

A non-viable deposit cannot be relied upon to supplement a written description in a patent application. Experience has shown that as many as 10% of the deposits made with American Type Culture Collection (ATCC) on which a viability test was conducted were not viable when received at the depository. The requirement for verification of the viability of deposits is consistent with the Budapest Treaty and is a subject of proposed new rule 1.206.

The viability of a deposit made under the Budapest Treaty is a requirement. Thus, a mere statement by applicant, an authorized representative of applicant or assignee that the deposit has been accepted under the Budapest Treaty would satisfy this rule. Otherwise, viability may be tested by the depository or any other entity provided that the material tested is received from the depository. The viability test must conclude that the deposited biological material is capable of reproduction directly or indirectly and no evidence will be required to satisfy the deposit requirement relative to the ability of the deposited material to perform any function described in the application. However, as with any other issue of description or enablement, if the examiner has evidence or reason to question the objective statements made in the application, applicants may be required to demonstrate that the deposited biological material will perform in the manner described.

A viability statement for each deposit which is not made under the Budapest Treaty must be filed in the patent application and contain the information identified in paragraph (b) of proposed new rule 1.206. The examiner shall not question the conclusion in a viability statement issued by a depository recognized under either proposed new rule 1.202 (a) or (b). If the viability test indicates that the deposit is not viable upon receipt, or the examiner cannot for scientific or other valid reasons accept a statement of viability received from the applicant, the examiner shall so notify the applicant stating the reasons for not accepting the statement and proceed with the examination process as if no deposit had been made.

New rule 1.207 would be proposed to address the conditions under which a deposit must be made in order to satisfy access to the deposit. First, access during the pendency of an application to a deposit must be available to one determined by the Commissioner to be entitled thereto under 37 CFR 1.14 and 35 U.S.C. 122. A deposit pursuant to the Budapest Treaty meets this requirement. Secondly, the deposit must be made under conditions that all restrictions on the availability to the public of the deposited biological material will be irrevocably removed upon the granting of the patent. Conditions on the release of a deposited biological material such as identifying the ultimate recipient of the material, or a provision on the further transfer of the material, or any other stipulation that acts as a precondition to the release of the biological material referenced in an issued patent will be considered to be a prohibited restriction on the availability to the public of the biological material so deposited. The depository may be asked to provide to the depositor such information as the identity of sample recipients but not as a precondition to release after the patent is granted.

Since the mere description of a deposit or identity of a deposit in a patent specification is not necessarily an indication that a requirement for deposit or compliance with these rules has been made, the Office will certify whether a deposit was stated as having been made under conditions which make it available to the public provided the request contains the information set forth in Paragraph (c) of proposed new rule 1.207.

New rule 1.208 would be proposed to set forth the procedures which would be followed by an examiner once the examiner determines that a specific biological material is both essential to make and use the claimed invention and is not known and readily available within the meaning of rule 1.201(b). It is only when the examiner has made these determinations based on the record in the application being considered that the need for a deposit of the identified biological material must be considered. A deposit accepted by an IDA under the Budapest Treaty shall be accepted for patent purposes by the PTO if additional statements are made that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent, and the deposit will be replaced if viable samples cannot be dispensed by the depository.

A deposit under the Budapest Treaty would mean that a viable deposit has been made (Budapest Rule 10) in an acceptable depository (IDA) for a period of five years after the most recent request and at least 30 years from the date of deposit (Budapest Rule 9) under conditions that access to the deposit will be available during pendency of the patent application to one determined by the Commissioner to be entitled thereto under 37 CFR 1.14 and 35 U.S.C. 122 (Budapest Rule 11.1). Assurance of reasonably permanent availability of the deposited material through the depository is reasonably assured through the deposit of a viable culture under the Budapest Treaty and the requirement to make a new deposit in § 1.204(a). It is sufficient if a written statement is made by applicant, an attorney or agent prosecuting the application or a person representing the assignee that a deposit has been accepted by an IDA under the Budapest Treaty under conditions that all restrictions on the availability to the public of the deposit will be irrevocably removed upon the granting of the patent. A suitable statement would be as follows:

(1) I am (relationship to application)
(2) Viable samples of—
Material:
Accession Number:
Deposit Date:
were deposited and will be maintained with
(3) (Name and Address of Depository)
(4) Under terms which are in accordance with the provisions of the Budapest Treaty.
(5) Upon issuance of a patent on this application, all restrictions on the availability of the deposited material to the public will be irrevocably removed.

Date _____
Name _____

If the examiner determines that a deposit is required and has not been made in compliance with these rules, the examiner shall reject all the affected claims in the application under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed or why a deposit which was made cannot be accepted for patent purposes. Although the Court in *Lundak* indicated that the enablement requirement of 35 U.S.C. 112 need not be satisfied until the patent issues, the only way the Office can efficiently and effectively address the deposit issue is during the examination of the application. After the examiner has determined that a deposit is required, and until a deposit in accordance with these rules is made, or until the Office is assured in writing that a deposit in accordance with these rules will be made up to and including the date the issue fee is paid, or the examiner is convinced that a deposit is not required under the circumstances of the application being considered, the rejection will be made and maintained by the examiner. Written assurance may take the form that an identified specimen will be deposited and maintained in an IDA under the Budapest Treaty before the issue fee is paid under conditions that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent, or any other specific assurance that the examiner can recognize and accept that there are no outstanding issues to be resolved on the deposit question.

In the circumstances where the Office has received written assurance that an acceptable deposit will be made before or on the date of payment of the issue fee, and there are no other outstanding matters to be considered relative to the patentability of the claims, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the required deposit be made within three (3) months. The period for satisfying the requirement for deposit will be extendable under 37 CFR 1.136(a), as is the case with a requirement for drawing corrections made at the time the Notice of Allowance and Issue Fee Due is mailed. In appropriate circumstances, relief also may be available under 37 CFR 1.136(b) if sufficient cause is shown for an extension of time in order to make the appropriate deposit. Sufficient cause would be decided by the appropriate Group Director. Failure to make the required deposit in accordance with the requirement will result in abandonment of the application for failure to prosecute. Since the opportunity exists to request extensions of time under 37 CFR 1.136 to make a viable deposit, no application should go abandoned for failure to make a viable deposit. However, the Office reserves the right to require the filing of a terminal disclaimer where the time required to make a viable deposit unreasonably delays the issuance of a patent.

The contents of the specification regarding any deposit made are specified in new rule 1.208(d). In addition to such identifying criteria as accession number for the deposit and the name and address of the depository, the specification should include the date of deposit (i.e. the date from which the term of deposit specified in new rule 1.205 is to be measured) and a taxonomic description of the deposit. This written description is that required by 35 U.S.C. 112, first paragraph and should be sufficient to characterize and distinguish the biological material deposited. This written description will serve to inform the public of the essential characteristics of the deposited material once the patent is granted, and will facilitate the examination process which necessarily involves comparisons with prior art biological material.

Other Considerations

The rule change being considered for proposal is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96–354), Executive Order 12291 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The rule changes being considered for proposal are not expected to have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96–354). The proposed deposit practice will not impose extra work on patent applicants (whether small or large businesses or individuals).

The Patent and Trademark Office has determined that this rule change being considered for proposal is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increases in costs or prices for consumers, individual industries, Federal,State or local government agencies, or geographic regions. There will be no adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

Any information collection requirements that may be contained in the proposed rulemaking resulting from proceedings under this advance notice will be submitted for OMB approval at the time the proposed rulemaking is announced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

For the reasons set out, 37 CFR Part 1 is being considered for proposed amendment as follows:

PART 1—RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. Centered heading and new §§ 1.200 to 1.208 are added as set forth below:

* * * * *

Deposit of Biological Material

Sec.
1.200 Biological material.
1.201 Need to make a deposit.
1.202 Acceptable depository.
1.203 Time of making an original deposit.
1.204 Replacement of deposit.
1.205 Term of deposit.
1.206 Viability of deposit.
1.207 Furnishing of samples.
1.208 Examination procedures.

Deposit of Biological Material

§ 1.200 Biological material.

For the purposes of these regulations pertaining to the deposit of biological material for patent purposes, the term biological material shall include material that is capable of self-replication either directly or after insertion into a host. Representative examples include bacteria, fungi including yeast, algae, protozoa, cell lines, plant tissue cells and seeds. Viruses, vectors, cell organelles and other non-living material existing in and reproducible from a living cell may be deposited by deposit of the host cell capable of reproducing the non-living material. Materials analogous to conventional chemical compounds such as proteins and enzymes are not subject to these regulations.

§ 1.201 Need to make a deposit.

(a) Where a claimed invention is, or relies on, a biological material, the requirements of the first and second paragraphs of 35 U.S.C. 112 apply. Applicant is required to comply with these requirements in the written description of the invention, which may include reference to known and readily available biological material. If the written description does not meet the requirements of 35 U.S.C. 112, the specification may be supplemented by a deposit of samples of the biological material necessary to meet those requirements in a depository and under conditions complying with these regulations.

(b) Biological material need not be deposited if it is known and readily available to the public or can be made or isolated in a reproducible manner from known and readily available material. Biological material will be considered to be known and readily available to the public if samples of the biological material are known and accessible without restriction to those who desire to obtain and test the biological material. Samples will be considered to be accessible even though some requirement of law or regulation of the United States or of the country in which the depository institution is

located permits access to the material only under conditions imposed for safety, public health or similar reasons.

(c) The reference to a specific organism or other biological material in a specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit in accordance with these regulations is required.

§ 1.202 Acceptable depository.

(a) A deposit may be made in any International Depositary Authority (IDA) as established under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.

(b) A deposit may be made in any depository recognized to be suitable by the Office. Suitability will be determined by the Commissioner on the basis of the administrative and technical competence, and agreement of the depository to comply with the terms and conditions applicable to deposits for patent purposes. The Commissioner may seek the advice of impartial consultants from the biotechnology industry on the suitability of a depository. The depository must:

(1) Have a continuous existence;

(2) Exist independent of the control of the depositor;

(3) Possess the staff and facilities sufficient to enable it to examine the viability of a deposit and store it in a manner which ensures that it is kept viable and uncontaminated;

(4) Provide for sufficient safety measures to minimize the risk of losing biological material deposited with it;

(5) Be impartial and objective; and

(6) Furnish samples of the deposited material in an expeditious and proper manner.

(c) If any depository under (a) or (b) defaults or discontinues the performance of any of the tasks it should perform, the Office will recognize as a substitute in any pending application or patent a viable deposit made with an IDA or depository recognized to be suitable by the Office which is transferred to said depository from the defaulting depository in the manner required for replacing a deposit under § 1.204.

(d) A depository seeking status under paragraph (b) of this section must direct a communication to the Commissioner which shall:

(1) Indicate the name and address of the depository to which the communication relates;

(2) Contain detailed information as to the capacity of the depository to comply with the requirements of paragraph (b) of this section, including information on its legal status, scientific standing, staff and facilities;

(3) Indicate that the depository intends to be available, for the purposes of deposit, to any depositor under these same conditions;

(4) Where the depository intends to accept for deposit only certain kinds of biological material, specify such kinds;

(5) Indicate the amount of any fees that the said depository will, upon acquiring the status of suitable depository under paragraph (b) of this section, charge for storage, viability statements and furnishing of samples of the deposit.

(e) Once a depository is recognized to be suitable by the Commissioner or has defaulted or discontinued its performance under this section, notice thereof will be published in the Official Gazette of the Patent and Trademark Office.

§ 1.203 Time of making an original deposit.

(a) An original deposit may be made at any time before filing an application for patent or during pendency of the application for patent pursuant to a requirement that will be made by the examiner no later than the date the Notice of Allowance and Issue Fee Due is mailed.

(b) When the original deposit is made in a depository defined in §§ 1.202 (a) or (b) after the effective filing date of an application for patent, a verified statement will be required from a person in a position to corroborate the fact that the biological material described in the application as filed is the same biological material which is deposited in the depository defined in §§ 1.202 (a) or (b).

§ 1.204 Replacement of deposit.

(a) Where a depository possessing the original deposit cannot furnish samples of the deposit for any reason, the depository shall, promptly after having noted its inability to furnish samples, notify the depositor of such inability, indicating the cause thereof, and the depositor shall be required to make a new deposit of the biological material which was originally deposited within three months of receiving notification that the depository cannot furnish samples. The replacement shall be made in the same depository as the original deposit except:

(1) Where the original depository has lost its status under §§ 1.202 (a) or (b) or no longer carries out its obligations applicable to the involved deposit; or

(2) Where the depository for health or other legitimate reasons is unable to provide samples to requesters outside of the jurisdiction where the depository is located.

(b) An applicant or patent owner shall notify the Office in writing as soon as reasonably possible after a replacement deposit is made in each application or patent affected. This notification shall state the name and address of the depository, the accession number for the deposit, the date of making the deposit, the results of a viability test (as provided for in § 1.206), the reason for making the replacement deposit, and a statement that the replacement deposit is to the best of the depositor's knowledge identical to the original deposit. The notification shall be placed in each application or patent file.

(c) A depositor's failure to replace a deposit within three months after learning or after receiving written notice from a depository that a replacement is needed may cause the application or patent involved to be treated in any Office proceeding as if no deposit were made.

(d) In the event a deposit is replaced, the PTO will apply a rebuttable presumption of an identity between the original and the replaced sample where the application or patent making reference to the deposit is relied upon during any Office proceeding.

§ 1.205 Term of deposit.

A deposit shall be made for a term of at least thirty (30) years after the date of a viable deposit and at least five (5) years after the most recent request for the furnishing of a sample of the deposited biological material was received by the depository. In any case, samples must be stored under agreements that would make them available beyond the enforceable life of the patent for which the deposit was made.

§ 1.206 Viability of deposit.

(a) A deposit of biological material must be viable at the time of deposit and during the term of deposit. Viability may be tested by the depository or by another provided the material tested is received from the depository. The test must conclude only that the deposited material is capable of reproduction. No evidence is necessarily required relative to the ability of the deposited material to perform any function described in the patent application.

(b) A viability statement for each deposit not made under the Budapest Treaty must be filed in the application and must contain:

(1) Name and address of the depository;

(2) Name and address of the depositor;

(3) The date of deposit;

(4) The identity of the deposit and the accession number given by the depository;

(5) The date of the viability test;

(6) The procedures used to obtain a sample if the test is not done by the depository; and

(7) A statement that the deposit is capable of reproduction.

(c) If a viability test indicates that the deposit is not viable upon receipt, or the examiner cannot, for scientific or other valid reasons, accept the statement of viability received from the applicant, the examiner shall proceed as if no deposit has been made. The examiner will accept the conclusion set forth in a viability statement issued by a depository recognized under §§ 1.202 (a) or (b).

§ 1.207 Furnishing of samples.

The deposit must be made under conditions that assure that:

(a) Access to the deposit will be available during pendency of the patent application making reference to the deposit to one determined by the Commissioner to be entitled thereto under § 1.14 and 35 U.S.C. 122, and

(b) All restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent.

(c) Upon request, the Office will certify whether a deposit has been stated to have been made under conditions which make it available to the public as of the issue date of the patent grant provided the request contains:

(1) The name and address of the depository;

(2) The accession number given to the deposit;

(3) The patent number and issue date of the patent referring to the deposit; and

(4) The name and address of the requesting party.

§ 1.208 Examination procedures.

(a) The examiner shall determine in each application for an invention if a deposit is needed, in case one has not been made, or if a deposit actually made is acceptable for patent purposes. A deposit accepted in any depository under the Budapest Treaty shall be accepted for patent purposes if made under conditions complying with § 1.207(b). If a deposit is required and has not been made in accordance with these regulations, the examiner shall in an Office action reject the affected claims in the application under the appropriate provision of 35 U.S.C. 112, explaining why a deposit is needed and/or why a deposit actually made cannot be accepted.

(b) The applicant shall respond to a rejection under paragraph (a) of this section by—

(1) making an acceptable deposit or assuring the Office in writing that an acceptable deposit will be made on or before the date of payment of the issue fee or;

(2) Establishing that the involved biological material is known and readily available to the public or;

(3) Arguing why a deposit is not required under the circumstances of the application considered.

Other replies to the examiner's action shall be considered non-responsive. The rejection will be repeated until either paragraph (b)(1) or (b)(2) of this section is satisfied or the examiner is convinced that a deposit is not required.

(c) If an application is otherwise in condition for allowance except for the required deposit and the Office has received a written assurance that an acceptable deposit will be made on or before payment of the issue fee, the Office will mail to the applicant a Notice of Allowance and Issue Fee Due together with a requirement that the required deposit be made within three months. The period for satisfying this requirement is extendable under 37 CFR 1.136. Failure to make the required deposit in accordance with this requirement will result in abandonment of the application for failure to prosecute.

(d) For each deposit made pursuant to these regulations, the specification shall contain:

(1) Accession number for the deposit;

(2) Date of the deposit;

(3) Taxonomic description of the deposit; and

(4) Name and address of the depository.

Comments and Responses:

(Editorial Note.—These comments and responses will not appear in the Code of Federal Regulations)

The following responses are directed to the comments received in response to the draft policy statement on the deposit of biological materials for patent purposes. The comments are arranged to generally correspond to the order of topics addressed in the draft guidelines.

Comment: The guidelines should make explicit that it is the Examiner's, not the applicant's, burden to show that a written description is not adequate to describe the invention as claimed. This has been a real problem in that simply because a microorganism or other biological material is involved in a particular claimed invention, it is automatically assumed that a deposit should be required. This is, of course, quite out of touch with reality especially when it comes to inventions relating to recombinant technology.

Response: This suggestion has been in effect, since the PTO clearly has the initial burden of giving reasons, supported by the record as a whole, as to why the written description is not sufficient to enable one skilled in the art to make and use the claimed invention in the absence of a particular microorganism or other biological material. All assertions that the written description is not enabling without a deposit must be supported by the examiner with (1) evidence or (2) reasons to support the conclusion of noncompliance. New rule 1.201(c) being considered for proposal also provides explicitly that there is no presumption that a specific material is required simply because it is described in the specification.

Comment: If enablement and description requirements can be met with a written description, is a deposit required solely for compliance with the best mode requirement?

Response: The best mode requirement of the first paragraph of 35 U.S.C. 112 is a separate and distinct requirement from the enabling requirement. *In re* Newton, 414 F2d 1400, 163 USPQ 34 (CCPA 1969). The best mode requirement is a safeguard against the possible selfish desire on the part of some people to obtain patent protection without making a full disclosure. The requirement does not permit an inventor to disclose only what is known to be the second-best embodiment, retaining the best as a trade secret. The fundamental issue that should be addressed is whether there was evidence to show that the quality of an applicant's best mode disclosure is so poor as to effectively result in concealment. *In re* Sherwood, 615 F2d 809, 204 USPQ 537 (CCPA 1980). If a deposit is the only way to comply with the best mode requirement then the deposit must be made.

Comment: We regret that the PTO has not attempted to provide some guidance as to the circumstances under which a biotechnology invention will be deemed to be reproducible from the written description alone. One such circumstance would appear to be where sequence data for the transcriptional unit of rDNA vector is available either directly from the specification, or from the published literature.

Response: While such guidance may be of some assistance, it may be of momentary value because of the changing nature and development of technology. In addition, useful guidelines would be difficult in view of the tremendous variety of factual circumstances that play a role in determining whether the claimed invention can be practiced without undue experimentation. Some guidance is available in *Ex Parte Forman*, 230 USPQ 546 (BPAI 1986) where the Board of Patent Appeals and Interferences summarized eight (8) factors to be considered in a determination of "undue experimentation."

Comment: Please consider replacing the word "define" in the phrase "define the metes and bounds of the claimed invention" with the word—support—because applicant should be allowed to select representative biological samples to place on deposit which support rather than define the "metes and bounds" of the claimed invention.

Moreover, the deposited biological sample which applicant demonstrates, by the description in the application, to be operable should be deemed sufficient by the PTO to satisfy the deposit requirement and provide adequate basis for applicant to claim variants of the deposited material. Another comment expressed concern that limiting claims to the deposited material (*Ex Parte Jackson*) may become the norm in patent examination practice if such language is included.

Response: Claims are required to set out and circumscribe a particular area with a reasonable degree of precision and particularity. 35 U.S.C. 112, second paragraph. This requirement is separate and distinct from the requirement of the first paragraph of 35 U.S.C. 112 that the specification disclosure enable one skilled in the art to make and use the invention to a degree commensurate in scope with the claims. Under appropriate circumstances, it may be necessary to specially recite and limit the claims to the deposited biological material in order to adequately define the metes and bounds of the claimed invention. *Ex parte* Jackson, 217 USPQ 804 (Bd. App. 1982). However, the mere facts that a claimed invention requires the use of a living organism or that samples of a living organism that may be used in the claimed invention have been deposited are *never alone* sufficient to require applicant to comply with the deposit guidelines or limit any claim to the deposited material.

Comment: There is some interest that the Patent and Trademark Office be requested to print deposit information on the front page of the issued patent—analogous to the cited references rather than buried in the general text.

Response: At the last meeting of the WIPO Permanent Committee on Patent Information, a revised standard was approved recommending use of INID (*I*nternationally agreed *N*umbers for The *I*dentification of *D*ata) codes to identify bibliographic data on the front page of patent documents. A new INID Code (83) has been approved to identify information concerning the deposit of microorganisms, e.g., under the Budapest Treaty.

The PTO is not considering the publication of deposit information on the front page of an issued patent because of the substantial administrative burden that would be involved for a relatively small number of patents. No compelling need or rationale is apparent that would justify the cost for the rare case where such a format may be more convenient.

Comment: The practice of presenting a microorganism for deposit in connection with a patent application was initially adopted as a means for complying with the requirements of section 112. The PTO's current proposal would make a deposit mandatory under administrative rulemaking, for compliance with the requirements of 35 U.S.C. 112 in an invention which "depends on the use of biological material".

Response: The PTO proposal does *not* make a deposit mandatory for an invention which depends on the use of biological material. The PTO policy and deposit requirements are intended to provide guidance in those situations when it is determined that a deposit is necessary to satisfy one or more requirements of 35 U.S.C. 112. The proposed rules concern the requirements and procedures for making a suitable deposit if it is determined that a deposit is required before a patent can be granted. The guidelines associated with the proposed rules recognize that the specification may properly rely on information which is publicly available.

Comment: Some recognized culture collections do not make their strains readily available. What can a requester do if it is found that the biological material is not readily available. Most of us do not have access to legal recourse.

Response: The PTO will assume that any deposit made according to these regulations will be readily available upon the granting of the patent. This is a rebuttable presumption that could be overcome only by evidence of the nature which would show that the patent relied upon is inoperative. Since every patent is presumed valid and since that presumption includes the presumption of operability, the burden of proof is high. The PTO does not have the resources to police the depositories such that the depositor must assume the risk that the depository selected will preserve and maintain the deposit made.

Comment: It was suggested that the statement that the availability of the biological material must be such that there is no reasonable basis to question the continued availability of the biological material beyond the enforceable life of a patent was overly stringent. Citing *In re Metcalfe*, 410 F.2d 1378, 161 USPQ 789 (CCPA 1969).

Response: The suggestion that the proper perspective should be whether there is reasonable basis to believe that the biological material will cease to be available during the life of the patent has been adopted.

Comment: The draft guidelines indicated that a material would be considered to be known and readily available to the public even though some requirement of law or regulation restricted access to material for safety, public health or similar reasons. It has been suggested that the term "national security" be specifically defined in the list of exceptions since this constitutes the basis which precludes making available to the public significant amounts of governmental information. It was further suggested that the phrase "of either of the United States or of the state in which the depositor or the depository institution is located" be added after regulation in the acknowledgment of the fact that biotechnology is an international industry. Finally, it was noted that companies may find it advisable to restrict access even in the absence of any formal legal requirement for product liabilty reasons so that the PTO should regard more leniently restrictions which are fully imposed for public health reasons even if not required by law or regulation, and particularly if they are required by an insurer.

Response: First, the PTO has not seen fit to add national security as a specific item which would permit restriction on access to a biological material which would still be considered to be known and readily available. It is difficult to determine with any degree of certainty what any country may consider to be national security. Further, an invention which involved national security matters would not be published before the restrictions on access to that invention involving national security were removed.

Secondly, while the international scope of the biotechnology industry is clearly recognized, the proposal to include the country or state in which the depositor is located would appear to be unnecessary so long as the requirement of law or regulation would apply to that the depository institution where the deposit is located. accordingly, the suggestion has been adopted to this extent.

Finally, it is believed inappropriate for the PTO to accept a biological material to be known and readily available to the public on the basis of what some private insurer may require of the depositor. Unless the restriction is based on some requirement of law or regulation which restricts access to the material for safety, public health or similar reasons, the PTO will not consider that a biological material is known and readily available to the public.

Comment: It was suggested that a biological material should not have to be deposited if it could be readily reproduced from materials known and available to the public based on the description of how to make and use found in the disclosure.

Response: This suggestion has been adopted in the first sentence of new rule 1.201(b) being considered for proposal which includes the statement that the biological material need not be deposited if it can be made or isolated in a reproducible manner from known and readily available material.

Comment: The guidelines had stated that the fact that the biological material had multiple known uses would tend to provide assurance that the required biological material would continue to be available. It was noted that this might be construed to mean that a recitation of multiple uses in applicant's disclosure is evidence that the biological material would be readily available to the public which clearly it is not.

Response: The person making the comment accurately noted that the two have no bearing one to the other. However, if there was evidence that the biological material had been put to use for more than one purpose by a variety of people, it would be considered to constitute at least an indication that the biological material in question was known and accessible to those who desire to obtain at least a sample of the subject biological material. It would have been evidence of distribution in commerce, consistent with the idea that it was known and readily available.

Comment: With respect to biological material that is known and readily available, the initial guidelines indicated that the written description in the specification should contain information on the biological material to the extent available. This, according to the comment, could be construed as requiring an enormous amount of information.

Response: This comment is well taken. Accordingly, new rule 1.201(b) would be proposed to require that the written description of the biological material should be sufficient to allow one of ordinary skill in the art to identify and obtain the publicly available material.

Comment: The initial guidelines stated that material would be considered to be known and readily available if the biological material was known and accessible to those who would desire a sample to practice the invention. The comment indicated that the word "practice" implies a right to utilize the deposited materials and thus the invention. This right does not exist absent a license if the material is protected by a patent. Experimental use is not a right but rather an exception to a finding of infringement and thus subject to different burdens of proof. It was suggested that the word "test" be substituted for practice.

Response: This suggestion would be adopted in new rule 1.201(b) since the concept of whether a biological material is known and readily available to the public is not determined on the basis of whether or not its manufacture, use or sale would infringe an existing patent.

Comment: There is no statutory basis in U.S. law for supporting the position that availability of the biological material must extend beyond the enforceable life of a patent. To require otherwise is to inequitably place a patentee in a position that amounts to guaranteeing a supply of the "manufacturing facilities" to competitors at little or no cost and at a time when the competitors are free to use the deposited material without an accompanying benefit to the ex-patentee.

Response: This provision finds specific basis in the decision of *Ex Parte Lundak*, and is based on one of the basic principles of the patent system—i.e. that a patent is an exclusionary right granted for a "limited" time and that the public is not excluded from practicing the invention once the patent expires. This does not mean that the patentee must be a perpetual supplier of the biological materials that may be necessary to practice the invention. However, it does mean that the patentee should not be permitted to place a limitation on the accessibility of the necessary biological material once the patent expires. As noted by the Court in *In re Metcalfe*, 410 F2d. 1378, 161 USPQ 789 (CCPA 1969) it is always possible that the practice of a given patented invention may become impossible because an essential material becomes unavailable due to a lack of raw materials, public disaster, or other occurrence not within the control of the patentee. The proposed regulations contemplate that the patentee would not control the availability of the biological material once the patent has expired.

Comment: The phrase "known and readily available" should be in the disjunctive. There is no case regarding regular chemical inventions that chemicals used by an applicant need to be both known and readily available.

Response: The phrase "known and readily available" was selected to indicate public accessibility to those wishing to test the biological material. A material may be known in the sense that its existence has been published, but is not available to those who wish to test that particular known biological material. In addition, a biological material may be available in the sense that those having possession of it would make it available upon request, but no one has been informed of its existence. Consequently, the concept of known and readily available is considered to accurately define the level of public accessibility to the biological material intended.

Comment: An examination of the PTO policy statement on the deposit of biological materials suggests that the only safe procedure for satisfying the requirements of 35 U.S.C. 112 would be to require a deposit or to establish that the biological material is readily available in nature or can be obtained by some type of screening procedure. The other criteria set forth pertaining to "known and readily available to the public" did not appear to have sufficient safeguards for access during the term of the patent and after its expiration date.

Response: While there is clearly an element of risk involved in trying to preserve living matter over an extended period of time even with a deposit, the Office believes that where there is a sufficient indication that the biological material has reached a sufficient level of accessibility and availability for distribution which is intended to be captured by the concept of "known and readily available" the public interest has been served as necessary to support a patent grant. The incentives provided by the patent system should not be constrained by the possibility that a disclosure that was once enabling would become non-enabling over a period of time through no fault of the patentee. *In re Metcalfe.*

Comment: Several people made comments relative to the commercial availability of the biological material being an indicator that the material was known and readily available.

Suggestions were made to substitute "applicant or applicant's assignee" for those relying on the availability of the biological material and to clarify the "patent holder's agent".

Response: The PTO does not want to guess or be constrained by any particular business relationship that may be created to control accessibility of the biological material to the public. The concept was intended to embrace the situation where an applicant or a patentee before the Patent and Trademark Office relying on the public availability of the biological material through a commercial supplier is not likely to restrict access once the patent is granted.

Comment: While some characterize the PTO's concern for commercial suppliers under the control of those relying on the availability of the biological material as almost insulting, others indicated that they could appreciate the PTO's concern when the patent holder controls commercial availability. One person suggested that a patent owner who tried to restrict access after a decision was made not to enforce the patent would run the risk that a disgruntled requester would seek treble damages anti-trust action based on patent misuse, or a requester might file a complaint with the FTC or the anti-trust division of the U.S. Department of Justice. Moreover, it was suggested that a disappointed requester could certainly notify the PTO of the incident which might result in a disciplinary proceeding against the patent counsel, and would certainly discredit subsequent attempts by the same patent owner to rely on an allegation of commercial availability. It was also suggested that it would be appropriate for the PTO to suggest one or more means by which a patent owner could provide acceptable assurance that the biological materials would remain available such as by deposit of a performance bond which would be forfeited if the biological material is not provided to a lawful customer upon tender of payment.

Response: The PTO does not have the resources or expertise to engage in the type of enforcement procedures suggested in these comments. Further, there is clearly no evidence at this point in time to provide for the mere possibility that a commercial supplier may be motivated to eliminate or otherwise restrict access to the biological material once the patent is no longer enforceable or a decision is made not to enforce the patent.

The PTO will accept commercial availability as evidence that a biological material is known and readily available only when the evidence is clear and convincing that the public has unrestricted access to the material. A product could be commercially available but only at a price which effectively eliminates its accessibility to those desiring to obtain a sample. The relationship between an applicant relying on a biological material and the commercial supplier relied upon is simply one factor that would be considered in determining whether the biological material was known and readily available. However, the mere fact that the biological material is commercially available only through the patent holder or the patent holder's agents or assigns shall not by itself justify a finding of non-availability, absent reason to believe that access to the biological material would later be improperly restricted.

Comment: Several comments were received directed to the use of printed publications providing evidence that the biological material is known and available to the public. It was suggested that the probative value of this type of evidence should depend not only on the number of publications but also the character and institutional affiliation of the publications. It was also suggested that foreign applicants would rightfully object to consideration of whether the publications are domestic or foreign. One comment stated that the concept of peer review should be eliminated and that inquiry be made into whether the publication policy of the journal makes references to the availability of cited material, and whether that policy is in fact enforced. Finally, it was indicated that it was impractical to expect an applicant to provide a tally or comprehensive search of technical journals and patent literature to establish availability of biological materials.

Response: The PTO does not believe that it is possible to list all the possible factors that might be considered relevant or how they would be weighed under any particular factual circumstances to determine whether a biological material is known and readily available to the public. However, it is considered appropriate to list exemplary factors that might be considered in determining the probative value of this type of evidence. There was no intent to discriminate between domestic and/or foreign applicants or publications, but the reference to domestic and foreign publications could be an indication of the scope of distribution of the biological material in question. Thus, publications in a single country, whether it be domestic or foreign to the United States, would suggest more limited distribution than references and publications of both domestic and foreign origin. Finally, there is no requirement to demonstrate that a biological material is known and readily available by any particular set of facts, but the PTO has provided some guidance in proposed rule 1.201(b) and associated text as to the variety of circumstances that an applicant may use to establish that a biological material is known and readily available to the public.

Comment: The language pertaining to declarations of accessibility which indicate a preference for those who are not members of the same organization as applicants in the application should be deleted because it suggests a higher level of credibility attaches to the declaration of such an individual.

Response: While it is recognized that the declaration executed by any declarant is subject to the same penalties under § 1001 of Title 18 of United States Code, it can be agreed that the evaluation of declarations should be based solely on their merit and not the organizational relationship between the inventor and the declarant. However, the preference was directed not to the credibility of the declarant, but whether accessibility was known beyond the confines of the organization of which both the applicant and the declarant were members. The knowledge might be compared to an uncataloged manuscript in a library that was distributed among the staff of an organization which included that library but was unknown to people outside that organization. Again, the mere fact that applicant and declarant were members of the same organization should not by itself justify a finding that the biological material in question is not known and readily available. Other factors such as the nature of the organization, distribution of the biological material, and procedures or mechanisms for access would also be considered.

Comment: The meaning of the term "abundantly" as modifying the availability in nature of the biological material was not understood. It was pointed out that a rare microorganism might be readily obtained if a good screening procedure was available. It was also pointed out that it was not understood what is meant by evidence of being available in nature since a description in the patent of a precise geographic location should be sufficient because this is an instance when a deposit is not required.

Response: These suggestions have been essentially adopted. As noted in one of the comments, the decision by the PTO Board of Patent Appeals and Interferences (Reinhardt, US Patent 4,548,814) held that a description of the precise geographic location of Marine Tunicates used in the patent was adequate to satisfy the enablement requirement. However, use of the term "readily" to define availability is considered appropriate to define that degree of availability which would be reasonable under the circumstances. For example, when an applicant tried to rely on patent applications which had been opened for public inspection in Rhodesia, Panama and Luxembourg to fulfill the enabling requirement, the Court held that when no guide at all has been given in the application, an applicant must show that anyone skilled in the art would actually possess the requisite knowledge or would reasonably be expected to check the source which the applicant relies upon to complete his disclosure and would be able to locate the information with no more than reasonable diligence. In re *Howarth*, 210 USPQ 689 (CCPA 1981).

Comment: It was suggested that there is no good reason why a previous deposit can be relied upon only when it is referred to in a United States patent or statutory invention registration as opposed to a foreign patent. One person went so far as to suggest that any reference to a microorganism deposited in one of the recognized depositories should be sufficient in and of itself.

Response: Since the arrangement made with the depository is one between the depository and the depositor, the simple deposit of a biological material in a recognized depository is not sufficient in and of itself to satisfy the requirement of the biological material to be known and readily available. However, if the deposit has been accepted under the Budapest Treaty and made under conditions that all restrictions on its accessibility will be irrevocably removed upon the granting of the patent, whether the deposit is referenced in a United States or foreign patent document would not make any difference. However, there may be limitations on release of the biological materials that are permitted in other countries but which are not within the scope of the conditions accepted in the United States once the patent has been granted. Consequently, the mere reference in any document, be it a United States patent or a patent in a country foreign to the United States is not in and of itself sufficient to establish that it is known and readily available unless the deposit has been made under conditions which are consistent with those specified in these proposed rules.

Comment: It would be very helpful if you included a statement to the effect that if a deposit meets the requirement of the Budapest Treaty, the Office will accept the deposit.

Response: An explicit provision to this affect would be included in new rule 1.208(a). It would state that a deposit accepted in any depository under the Budapest Treaty shall be accepted for patent purposes if made under the conditions complying with 1.207(b)—that all restrictions on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. The additional requirement of 1.207(b) must be stated since the Budapest Treaty leaves to the national laws the specific provisions to obtain access to a sample after the patent has issued. The requirement to maintain a viable deposit of the biological material (1.204a) recognizes the public interest in the availability of the information and materials to make and use the claimed invention.

Comment: The inventor of a biological invention should not be hostilely discriminated against by satisfying a higher burden to prove enablement but should instead be treated on the same basis as are all other applicants. The proposed guidelines should allow for and recognize that in many instances a deposit simply is not required.

Response: There was no intent in the proposed guidelines nor in the proposed rules to alter in any way the standard of enablement required by 35 U.S.C. 112, first paragraph. The rules being considered by the PTO specifically indicate that a biological material need not be deposited if the written description is sufficient to meet the requirements of 35 U.S.C. 112 or if the biological material is known and readily available to the public or can be made or isolated in a reproducible manner from known and readily available materials. See new rules 1.202 (a) and (b) being considered for proposal. In addition, it is specifically stated that the mere reference to a specific organism or other biological material in a specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit is required to be made. See new rule 1.201(c) being considered for proposal.

Comment: Requiring that the deposits be made in an IDA is excessively burdensome, particularly to a small inventor and those academic institutions which generate in the course of a typical research program dozens or even hundreds of hybridomas which must then be deposited if the institution is to comply with PTO deposit guidelines. Depositing of biological materials (when required) at any location should be sufficient providing that the averments for appropriate access and supply of viable material can be made. The patentee has the most at stake in insuring that the deposit is maintained and available during the life of the patent. If the deposit is permanently lost, the patent will be lost also. The entire rationale for requiring an independent depositor is to remove the responsibility from the patentee and place it in the hands of an independent third party. If the depository is required to replace a strain if it becomes non-viable, it would appear that double depositing is necessary. The logical thing, according to one comment, is either to have the third party depository entirely responsible for the culture or to permit the depositor to maintain his own cultures.

Response: The concept of an independent depository or an IDA as an acceptable depository is based on the need and desire to ensure the safe and reliable storage of a deposited biological material under circumstances that are free of the opportunity for intentional or negligent handling of the deposited material. The use of an independent depository or an internationally recognized depository will tend to preserve the integrity of the deposit process against those that may accidently alter the deposited material, may wish to tamper with the deposited material or may wish to resume control of its availability when the patent is no longer enforceable, and to preserve the interest of the public in the free access to the biological material for any purpose once the term of the patent expires. Further, while the PTO is constrained to approve independent depositories other than an IDA, the PTO has neither the resources nor capability to assess the individual capability of any party that wishes to act as its own depository. The rules under consideration are intended to minimize depositories that will be found acceptable.

The concept of having an independent depository in addition to the requirement of the depositor to replace a culture which is no longer viable is based on the premise that the patent owner has an interest in maintaining the accessibility of the deposit during the enforceable life of the patent for its own protection, and has an obligation to the public to ensure access to that deposit

during the period of enforceability so that a third party could test the biological material, and availability to the public after the patent expires. A patentee should not be able to intentionally convert a patented biological material to a trade secret merely because it was no longer interested or able to enforce the patent.

Comment: A depository does not normally notify the depositor when his strains are supplied to third parties except under the Budapest Treaty. Does this mean we must now change our policy.

Response: No.

Comment: Several comments were received to the effect that due to the nature of deposits, and the ease with which harmful infringing acts can be practiced following access to deposited material, it is reasonable to require that minimum restrictions be made before a request for access to a deposit is satisfied. Such minimum restrictions should include (1) identification of the ultimate recipient and (2) an averment that the ultimate recipient will not use the deposited materials for any uses which would infringe a valid claim and (3) a prohibition against transfer to third parties. The thrust of these arguments is that a patentee has a definite interest in knowing to whom the deposited material is being released and such restrictions would provide the patentee with some measure of protection against those who would unfairly profit from the required deposit. It was concluded that these provisions would not in any substantive way interfere with the purpose of a deposit under 35 U.S.C. 112 or the public disclosure function served by the patent system.

Response: While the unique nature of a deposit in satisfying the enabling or other requirements of 35 U.S.C. 112 is recognized, every patent is required to place in the hands of those skilled in the art to which the invention pertains the information required to make and use the invention without undue experimentation. The PTO does not restrict or otherwise monitor the sale of other patent documents containing an enabling disclosure nor place any limits on the further disposition of patents that it sells. Consequently, there is no basis in the law for treating a patent directed to an invention requiring the use of a deposited biological material in any manner different from a patent which does not require a deposit. Patents not requiring a deposit may involve subject matter which is just as difficult to detect infringement as it may be where no deposit is required.

The PTO recognizes the unique nature of an invention which requires the deposit of a sample of a biological material as part of the disclosure, particularly as it relates to the attendant risks that the sample may be used in a way or location that would avoid infringement of the patent. The PTO, however, solicits comments on the advisability of and rationale for seeking a provision in the law that would permit the type of restrictions on access to a deposit after the patent issues that are recommended in the April 8, 1987 WIPO report on the Industrial Property Protection of Biotechnological Inventions. These recommendations, on which we are seeking comment, were as follows:

Samples shall be furnished only if the requesting party has undertaken vis-a-vis the owner of the patent on which the request is based, for the period during which the patent is in force:

(i) Not to make the deposited biological material or any biological material derived therefrom available to any third party;

(ii) To use the deposited biological material or any biological material derived therefrom only for experimental purposes concerning the invention;

(iii) Not to export the deposited biological material or any biological material derived therefrom to any other country or, if the sample was obtained in the country where the depository institution is located and that country is not the country in or for which the patent on which the request was based has been granted, to any other country than the country in or for which the relevant patent has been granted;

(iv) The requesting party shall have the burden of proof concerning compliance with the undertakings referred to in subparagraphs (i–iii); and

(v) For the purposes above, any biological material shall be deemed to be derived from the deposited biological material if it is derived therefrom by culturing or in any other way of replication, provided that the derived matter still exhibits those characteristics of the deposited biological which are essential for the carrying out of the invention.

Comment: The guidelines appear to ignore that the identification of ultimate recipient and limitations on further transfer are required in many cases under the export control laws administered by the Commerce Department. Depositories such as the ATCC regularly apply for licenses before releasing strains. It would appear entirely consistent, therefore, to allow depositors to require that requesters comply with the export control laws since the depository must do so in any event.

Response: The rules being considered by the PTO require only that the depositor make the deposit under such conditions that all restrictions made by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of the patent. This condition does not affect laws or regulations that restrict access for public health or safety [illegible].

Comment: The requirement for the patentee to notify the depository promptly after issuance of the patent is unwise and unnecessary. One comment suggested that the use of the word "promptly" is vague and presents the opportunity for problems to arise. The provision was considered unnecessary because the depository releases the deposit when the requester provides the depository with a copy of the issued patent.

Response: This provision has been removed from the rules being considered by the PTO. However, it should be noted (new rule 1.201(c) being considered for proposal) that the mere reference to a specific biological material in the specification disclosure does not create any presumption that the specific material is necessary to satisfy one or more requirements of 35 U.S.C. 112 or that a deposit in accordance with Office policy has been made. A procedure is defined in new rule 1.207(c) being considered for proposal whereby the Office would certify whether a deposit has been made under conditions which make it available to the public as of the issue date of the patent grant.

Comment: Some of the comments received on the requirement for a viability statement provide an adequate response to other comments received. For example, some comments indicated that there should be a presumption that the microorganism is alive and that such testing should not be required. On the other hand, one comment was received to the effect that we should be aware of the problem that material shipped to depositories which, presumably, was viable when shipped, is received and when tested is not viable. This is not uncommon at the ATCC. Another comment indicated that if a viability statement is required it should be done by the depository if the biological material is deposited in a public depository. Another comment indicated that this person was pleased that we have included the third party competent to test for viability option. In some cases tests for viability can require expertise which might not be available at a depository. This option could be very helpful.

Response: Based on the evidence and comments received to date, the PTO is convinced that the requirement for a viability test is appropriate.

Comment: A deposit for either the enforceable life of the patent or for the 30/5 years of the Budapest Treaty should be considered acceptable. While the Budapest Treaty is an executive agreement, and therefor cannot override any clear dictate of 35 U.S.C. 112, it seems presumptuous for an office of an executive department to adopt a policy which is contrary to that embodied in an executive agreement.

Response: The period literally defined in the Budapest Treaty is considered acceptable for a deposit made under that Treaty. However, it is not difficult to imagine a situation where the period defined in the Budapest Treaty would not necessarily extend beyond the enforceable life of the patent. In the Board's decision in Ex Parte *Lundak*, it was noted that one of the basic principles of the patent system was that the public would not be prohibited from practicing the invention after the enforceable life of the patent. Implicit in that basic principle is the logic that a depositor should not be able to make a deposit under conditions that do not provide for storage beyond the enforceable life of the patent. Nor do we believe that the Budapest Treaty contemplated that the deposit would not be available while the patent is in force. The patentee need not be a guarantor of the availability of the deposited material after the enforceable life of the patent, but neither should the patentee be permitted to provide for storage only up to the date the patent expires.

Comment: The requirement for corroboration goes beyond the holding in *Lundak*. The requirement is unprecedented in ex parte prosecution. The PTO has regularly accepted Rule 131 declarations without corroboration, and to require it in the deposit situation would be completely inconsistent. The guidelines also fail to address what would be sufficient corroboration.

Response: The degree of corroboration required would depend on circumstances in the individual application. For a situation such as *Lundak* where a mistake was made relative to the presence of a deposit at the time of filing followed by a deposit within a week to ten days, a verified statement tracing the steps undertaken to deposit the biological material from the point of time of the filing date of the application to the actual deposit would be sufficient. It is the function of the description requirement to ensure that the subject matter that is later claimed in the patent was described in the application as originally filed. Consequently, an applicant who waits to make the deposit until sometime after the filing date of the application has the burden of showing that which is later deposited was the same biological material as existed and was described in the application as originally filed. Corroboration can take any form which is suitable to establish the fact, as opposed to a bare statement made on information and belief, that the deposited material is the same as that which existed as of the filing date of the application. If the material was viable and capable of reproduction as of the time of deposit, the verified statement should indicate that the material was viable and capable of reproduction as of the filing date.

Comment: It would seem that the two month formalities notice under Ex Parte *Quayle* would be appropriately used in instances where an application is allowable but assurance of public accessibility has not yet been made. There is no statutory authority for setting a three month period for response which would not be extendable upon payment of the appropriate fee.

Response: The PTO believes that once the issue of deposits has been either resolved or is in dispute, no additional time should be necessary. The basic concern is an adverse impact on pendency and disclosure to the public for no apparent reason. If an applicant is going to dispute the necessity of a deposit or the conditions under which it is made, then an appropriate appeal can be taken on that issue. If applicant agrees that a deposit is necessary, the three month period to pay the issue fee is considered adequate to get that job done. Nevertheless, provision has been made in new rule 1.208(c) being considered for proposal for an extension of time under 37 CFR 1.136.

Comment: There should be more specific guidelines as to the form of assurances that will be accepted for making an appropriate deposit. An averment by the applicant, assignee or attorney, in papers submitted during pendency of the application should be acceptable to the PTO. Deceit by such applicant, attorney or assignee should be dealt with in the same manner as deceit in conventional chemical cases.

Response: The Office will accept any assurance made in the record with the intent that the PTO rely on applicant to fulfill the deposit requirement as set forth in these proposed rules. The PTO will ensure that applicants have filed a statement that all conditions have been satisfied before the application is allowed to become a patent.

Comment: The PTO policy and guidelines should not make statements or predictions as to burden of proof during enforcement or other actions in a court of law. The indication that the burden of proof to establish an identity between the replaced sample and the original deposit may be on those seeking to enforce the patent outside the PTO goes against a statutory presumption of validity.

Response: The rules being considered by the PTO are limited to the presumption that the PTO will make in any proceeding involving the patent before the PTO.

Comment: It has been suggested that the procedure to be followed when biological material becomes unavailable be separate from the rest of the paragraph dealing with replacement deposits so that these separate situations are not viewed as one. For example, cessation of availability of biological material not previously deposited can result from, for example, the bankruptcy of the sole commercial supplier of the material. Under such circumstance, a deposit of no longer readily available material would be required.

Response: Since the necessity or desirability of replacing a deposit may arise from a number of circumstances, the PTO does not consider it appropriate to define separate rules or procedures for making a replacement under each circumstance. The rules being considered by the PTO are limited to a replacement right only for the original depositor. As one comment observed, the law on property rights in biological materials is somewhat unclear at this time and redeposit by a party other than the original depositor might be considered an act of conversion, depending on the precise circumstances. Moreover, the PTO has indicated an intention of applying a rebuttable presumption that once a biological material has been deposited for the term and under conditions specified in these rules under consideration by the PTO, the biological material deposited would be considered to be known and readily available to the public.

Comment: The guidelines are unclear as to the ability to obtain the benefit of a foreign priority date. Apparently, the PTO is aware that *Lundak* held that 35 U.S.C. 112 requires that a deposit be made and a reference added to the specification before the U.S. patent issues. Thus, 35 U.S.C. 119 affords the benefit of the priority date even if the priority document fails to mention a deposit and even if a deposit had not been made.

Response: The PTO will follow the same procedures for handling a claim for foreign priority in all applications. The examiner will acknowledge a claim for foreign priority when all formal requirements are met and will not consider the merits of an applicant's claim of priority unless a reference is found with an effective date between the date of foreign filing and the date of filing in the United States or when an interference situation is under consideration. Where the merits of a claim for priority need to be determined, the examiner will follow the guidelines in § 201.15 of the Manual of Patent Examining Procedure in making that determination. It must also be emphasized that applicants may not be granted priority in applications filed in countries foreign to the United States if they fail to make a deposit in a permanent depository acceptable to that foreign country before the filing date of the application in the United States.

Comment: If a deposit is found to be contaminated, what option does a depositor have? Can the deposit be replaced and the original deposit date be retained?

Response: If a deposit can still be considered to be viable, even though contaminated, the rules being considered by the PTO would not permit replacement of the original deposit. While there may be an appropriate mechanism for substitution of a deposit number in an existing application, the original deposit, even though contaminated, would provide the best evidence of whatever it was that was originally deposited and should be preserved.

Comment: If a deposit does not produce the product for which it was deposited (antibiotic, for instance), what option does a depositor have? Can the deposit be replaced and the original date retained?

Response: Any deposit which is made in accordance with the rules being considered by the PTO would have only a viability statement associated with it. There is absolutely no proof that the material originally deposited was capable of producing the product for which it was deposited. While it's clearly in the interest of the public to have a deposit available to it which is capable of making the product for which it was deposited, the destruction or replacement of the best evidence of what was originally deposited should not be lost if made in association with an existing patent. Perhaps the depositories should consider preservation of samples of the original deposit in conjunction with a deposit which is neither contaminated nor incapable of producing the product for which it was deposited.

Dated: June 19, 1987.

Donald J. Quigg,

Assistant Secretary and Commissioner of Patents and Trademarks.

[FR Doc. 87-20528 Filed 9-8-87; 8:45 am]

BILLING CODE 3510-16-M

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Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
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Colorado	Denver Public Library	(303) 571-2347
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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
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North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 15, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-13-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-16-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-25-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,522,401 to 3,526,003, inclusive
Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

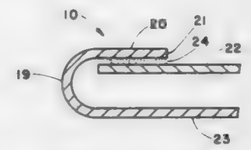
SEPTEMBER 29, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,575,123 (763rd)
REPORT COVER

John P. Giblin, Mountain Lake, N.J.; Andrew E. Semancik, Joppa, Md., and Sherman D. Forehand, Trussville, Ala., assignors to Champion International, Stamford, Conn.

Reexamination Request No. 90/001,114, Oct. 10, 1986.
Reexamination Certificate for Patent No. 4,575,123, issued Mar. 11, 1986, Ser. No. 634,374, Jul. 25, 1984.
Int. Cl.[4] B42D *3/10, 3/18;* B42B *5/06*
U.S. Cl. 281—48



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 4, 5, 7** and **8** are cancelled.

Claims **1** and **6** are determined to be patentable as amended.

Claim **3**, dependent on an amended claim, is determined to be patentable.

1. A report cover comprising a folded cover adapted to hold papers each having one edge extending parallel and contiguous to the fold in the cover, a strip secured to one of the exterior sides of the cover and extending parallel and contiguous to the fold in the cover, *said strip being an extension beyond the fold line of the other side of the cover and overlapping and being secured to the one side of the cover,* a channel-shaped gripping member extending along the fold and having the interior of the free end of one of its legs formed with a stop that juts out in the direction of the other leg, the gripping member being adapted to firmly grip the cover and the papers by laterally sliding the gripping member onto the cover so that the stop of the one leg interlocks with a longitudinal edge of the strip and the one side of the cover to prevent motion of the gripping member toward and perpendicular to the longitudinal edge of the strip and the other leg engages the other side of the cover.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,509

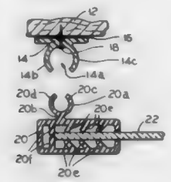
INSULATING STORM WINDOW ATTACHMENT

David G. Werner, Oshkosh, Wis., assignor to Nu Lease Corporation, Oshkosh, Wis.

Original No. 4,452,020, dated Jun. 5, 1984, Ser. No. 372,336, Apr. 27, 1982. Application for reissue Oct. 30, 1985, Ser. No. 792,913

Int. Cl.[4] E06B *3/26*

U.S. Cl. 52—202 16 Claims



1. An insulating storm window assembly for attachment to an existing window casing, for providing enhanced insulation characteristics for the window comprising:

a storm window frame, having a slot;

a storm window glazing fastened into the slot of said frame;

said storm window frame also having a ridge;

as a separate component, a frame retainer, having channel means for snap-accepting the ridge of said frame such that *said ridge is received into said channel means and* said frame is allowed to pivot with respect to said retainer, *and about said channel means,* and thus providing an airtight seal; and

means for permanently attaching said retainer to the existing window casing.

Re. 32,510

HOSE STORAGE APPARATUS

Cosmo N. Tisbo, Lake Barrington Shores; Thomas A. Tisbo, Barrington; Richard D. Recker, and Bruce Heggeland, both of Palatine, all of Ill., assignors to Suncast Corporation, Ill.

Original No. 4,512,361, dated Apr. 23, 1985, Ser. No. 445,100, Nov. 29, 1982. Application for reissue Oct. 29, 1986, Ser. No. 925,692

Int. Cl.[4] B65H *75/34*

U.S. Cl. 137—355.27 17 Claims

27. A portable garden hose cart for windably holding a garden hose and for use in transporting said garden hose between a storage location and a use location, said cart comprising:

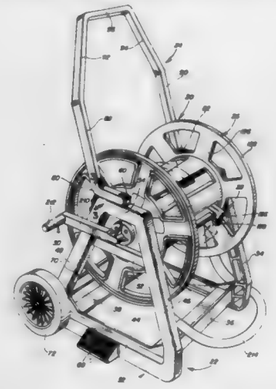
a frame including a pair of generally vertical sides each of which has a bearing with a bearing surface;

a reel for windably receiving said garden hose disposed between said frame sides, said reel including a pair of reel sides and a hose support surface extending between the sides, each reel side including a generally horizontally extending hub, each hub being rotatably received in the corresponding bearing surface of its associated frame side;

an outlet tube carried by said reel for rotation therewith and having an end adapted for attachment to an end of the garden hose;

an inlet tube mounted in one of said hubs so that said inlet tube does not rotate with said reel with said inlet tube and said outlet tube being in fluid communication; and

circular resilient sealing means in sealing engagement with both said inlet tube and a component rotatable with said reel, said sealing means being retained inside said one of said hubs substantially vertically aligned with the bearing surface of the frame side holding that hub.



Re. 32,511

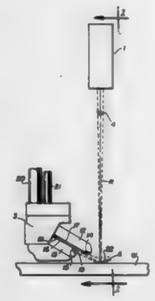
METHOD AND APPARATUS FOR MAKING INSTANTANEOUS SCARFING CUTS

Stephen A. Engel, Granite Springs, and Ronald E. Fuhrhop, West Nyack, both of N.Y., assignors to L-TEC Company, Florence, S.C.

Original No. 4,084,988, dated Apr. 18, 1978, Ser. No. 789,720, Apr. 25, 1977. Continuation-in-part of Ser. No. 684,833, May 10, 1976, Pat. No. 4,038,108. Application for reissue Apr. 11, 1980, Ser. No. 139,450

Int. Cl.[4] B23K *7/08*

U.S. Cl. 148—9.5 11 Claims



11. A method for initiating a gas deseaming process on a workpiece by melting of the surface of the workpiece to ignition temperature by means of a point heat source, characterized in that the point heat source is given a motion parallel to the orifice of the planing nozzle in direct connection to this, oxidizing gas simultaneously flowing through the planing nozzle.

Re. 32,512

METHOD FOR PRODUCING FOIL ELECTRODES FOR ELECTROLYTIC CAPACITOR

Nobuyoshi Kanzaki, Jyoyo; Kenji Toyama, Uji; Katsutoshi Nakano, Jyoyo; Ryoichi Shimatani, Hirakata, and Fumio Kudo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

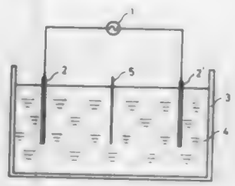
Original No. 4,276,129, dated Jun. 30, 1981, Ser. No. 162,738, Jun. 25, 1980. Application for reissue Jun. 28, 1982, Ser. No. 393,033

Int. Cl.⁴ C25D *11/08, 11/10*

U.S. Cl. 204—58 **4 Claims**

4. In the method for producing electrodes for use in aluminum electrolytic capacitor whose effective surface area is enlarged by electrochemically etching aluminum foil in an aqueous solution including hydrogen chloride and at least one additive capable of anodizing said aluminum foil with electric power supplied in alternating current, an improvement characterised in that:

the concentration of the hydrogen chloride in said solution is set at a range between 0.5 N and 3.5 N, the concentration of said additive is set at a range between 0.001 mole/liter and 0.4 mole/liter, the frequency of said alternating current power supply is ranging from 5 Hz to 120 Hz and its current density



is ranging from 0.1 A/cm² to 0.6 A/cm², while the temperature of said solution is being maintained at 25° C.–60° C., said additive being acetic acid or a salt thereof.

PLANT PATENTS

GRANTED SEPTEMBER 29, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,024

NECTARINE TREE 51G110S

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 16, 1985, Ser. No. 809,137

Int. Cl.⁴ A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, characterized by its large size, vigorous, upright growth, a productive and regular bearer of large size, firm, yellow flesh, clingstone fruit with attractive red skin color and good eating quality; the tree is further characterized in comparison with May Grand Nectarine (U.S. Plant Pat. No. 2,794) by producing fruit that ripens 5 to 6 days earlier and being able to produce fruit with more uniform size throughout the tree, especially on smaller fruiting wood in the lower portion of the tree.

6,025

PEACH TREE (B-41871)

Leo Balakian, 41871 Rd. 52, Reedley, Calif. 95654, assignor to Leo Balakian and Rosalie Balakian, both of Fresno, Calif.

Filed Sep. 5, 1985, Ser. No. 772,934

Int. Cl.⁴ A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized—in comparison to the Maycrest—by more vigorous tree growth; by above average uniformity of fruit distribution on the tree; by more advancement of the external color of the fruit in the early stages of ripening; and by ripening to picking maturity of the semi-freestone fruit, approximately six days earlier.

6,026

RHODODENDRON PLANT—SAMMETGLUT VARIETY

Hans Hachmann, Barmstedt in Holstein, Fed. Rep. of Germany, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jul. 17, 1984, Ser. No. 631,718

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of Rhododendron plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a well-branched, compact plant of good vigor,

(b) very attractive blossoms having a clean, bright red color, which contrasts handsomely with the white stamens,

(c) winter hardiness to −25° C., and

(d) an aptitude for rooting from mature cuttings which compares favorably with presently known varieties.

6,027

GERANIUM PLANT NAMED MARY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,167

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Mary, as described and illustrated, and particularly characterized by its pure white flower color, with the petals being variegated with pink; floriferous, strong growth habit; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; medium green foliage; medium early flowering; and ease of propagation and good rooting habit.

6,028

GERANIUM PLANT NAMED DOLLY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,166

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Dolly, as described and illustrated, and particularly characterized by its light coral-red flower color fringed with white; ease of propagation and good rooting habit; very early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; and compact, self-branching growth habit.

6,029

GERANIUM PLANT NAMED VICKY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,168

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Vicky, as described and illustrated, and particularly characterized by its salmon-pink flower color variegated with deep salmon-red on upper petals; medium early flowering; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; vigorous, self-branching growth habit; and by its ease of propagation and good rooting habit.

6,030

GERANIUM PLANT NAMED HONEY

Wolfgang Kirmann, Langenzersdorf, Austria, assignor to Mirko Vavra, Bisamberg, Austria

Filed Dec. 19, 1985, Ser. No. 811,169

Int. Cl.⁴ A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium named Honey, as described and illustrated, and particularly characterized by its salmon-rose flower color with dark salmon-red variegation; light green foliage; early flowering and very floriferous habit; good bud production at night temperatures up to 16° C., thus providing a long and continuous flowering period; very compact, self-branching growth habit; and, by its ease of propagation and good rooting habit.

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PATENTS

GRANTED SEP. 29, 1987

ERRATA

For CLASS	See PATENT NO.
437-005	4,696,092
437-176	4,696,093
437-023	4,696,094
437-078	4,696,095
437-193	4,696,097
437-187	4,696,098
060-489	4,696,148
604-085	4,696,164
192-003	4,696,222
279-121	4,696,513
439-011	4,696,523
439-197	4,696,524
439-069	4,696,525
439-068	4,696,526
439-053	4,696,527
439-160	4,696,528
439-267	4,696,529
439-266	4,696,530
439-851	4,696,531
439-863	4,696,532
350-255	4,696,566
252-062	4,696,725
512-008	4,696,766
424-118	4,696,794
430-271	4,696,820
437-225	4,696,833
437-225	4,696,834
220-462	4,696,840

PATENTS

GRANTED SEPTEMBER 29, 1987

GENERAL AND MECHANICAL

4,696,064
NECKTIE AND METHOD OF TYING
Robert A. Morwood, 722 N. Jefferson, Mason City, Iowa 50401
Filed Apr. 20, 1987, Ser. No. 40,136
Int. Cl.[4] A42B *5/00*
U.S. Cl. 2—144 **4 Claims**



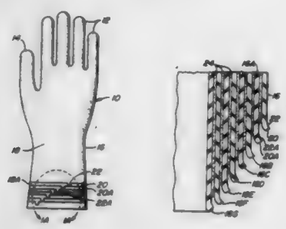
1. A necktie having front and rear sections with each section having front and rear faces, the front face of the front section and the rear face of the rear section being arranged to face in the same direction when the tie is lying flat,

said front section being substantially 3/5 of the total length of said tie and the rear section being substantially 2/5 of the total length of said tie,

said front section and said rear section each comprising a tapered point at its widest end and secured together at their narrow ends by a fastening means,

said fastening means being mounted on the narrow end of each of the front and rear sections and cooperating to secure these sections together and forming an index point for aiding in positioning of the tie at the nape of the collar of a user.

4,696,065
PEEL AWAY MULTI-LAYER GLOVES
Barbara Elenteny, 8140 Surrey La., Oakland, Calif. 94605
Filed Mar. 13, 1987, Ser. No. 25,518
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—168 **8 Claims**



1. A glove adapted to be worn on a human hand and adapted for use in medical procedures subject to bacterial contamination, said glove comprising:

an inner layer of impervious elastomeric material;

an outer layer of impervious elastomeric material covering said inner layer; and a plurality of additional layers of elastomeric material between said inner and outer layers, each adjacent pair of layers being separated by said release means; and

release means between said layers for enabling a wearer of the glove to remove and strip away said outer layer whenever it becomes contaminated so that a clean inner layer will be exposed;

said inner layer and each successive adjacent layer having a longer wrist portion than the next outermost layer, so that all multiple layers of said glove have a different length and are easily distinguishable from each other.

6. A method for making a multi-layered medical glove comprising the steps of:

(1) providing hand-shaped mold;

(2) dipping said mold into a body of liquid elastomeric material;

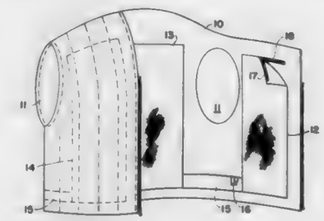
(3) withdrawing said mold when a first layer of said elastomeric material has become adhered to it;

(4) drying said first layer of elastomeric material on said mold;

(5) applying a release agent to said first layer on said mold;

(6) dipping said mold with said first layer into said elastomeric material and repeating steps 2–4 for as many layers as desired for said glove; and removing said glove from said mold, each successive dipping forming a layer that is shorter than the layer directly under it.

4,696,066
HEATED COAT LINER
Joyce A. Ball, and Glen W. McKettrick, both of 7031 Mills Ave., Jacksonville, Fla. 32211
Filed Sep. 15, 1986, Ser. No. 907,235
Int. Cl.[4] A41D *27/02*
U.S. Cl. 2—272 **8 Claims**



1. A coat liner comprising a back panel, a left front panel and a right front panel, each said panel adapted to be attached to the inside of a coat, each said panel including a layer of fire retardant fabric having two surfaces and a pattern of electric resistance heating wire attached to one said surface thereof, a layer of fabric having two sides and coated on one side with a polyfluorocarbon resin, said resin coating lying against said heating wire, and a layer of coating fabric lying against the other of said sides of said fabric, and an electrically insulated wire connecting said heating wire to a plug attachable to a source of electric power.

4,696,067
WOMEN'S URINAL FOR USE IN ERECT POSITION
Marylou Woodward, 3255 Randall Ave. (Apt. 2H), Bronx, N.Y. 10465
Continuation-in-part of Ser. No. 646,472, Aug. 30, 1984, abandoned, which is a continuation-in-part of Ser. No. 614,877, May 29, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 912,668
Int. Cl.[4] A47K *11/00;* **A61B** *5/00*
U.S. Cl. 4—144.1 **11 Claims**

1. A urinal of light, relatively stiff material capable of facilitating hygienic and convenient urination by a female person in an erect position, comprising a substantially flat bottom of

substantially rectangular shape and having a front to back length not more than 50% greater than its width and corners sufficiently round to eliminate sharp edges, and having also side walls integral with said bottom upstanding therefrom to a height exceeding the front to back length of the bottom, so as to provide a capacity of between one-half liter and one liter, said sidewalls being composed of lateral walls and front and rear end walls joined together with said bottom to form a



container having a rim of approximately rectangular contour and a width of at least 8 cm, the stiffness of said container at said rim and the width of said rim being sufficiently great to deform a female user's thighs to an extent which spreads her labia apart out of the way of a stream of urine discharged by her urethra to minimize interference of the labia with urination, and reinforcement means for giving the rim more stiffness than the wall portion below the rim.

4,696,068

SHOWER WALL AND BATHTUB MOUNTED BACK WASHER

Mary B. Kenner, 1 Mile Course, Kings Mill, Williamsburg, Va. 23185

Filed Jul. 17, 1986, Ser. No. 886,334
Int. Cl.[4] A47K *7/02*
U.S. Cl. 4—606 **4 Claims**



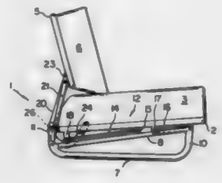
1. A back washer for mounting on the wall of a shower bath, bathtub or the like, comprising a pad of resilient material having characteristics that prevent it from absorbing water, means mounting the pad from a supporting surface and a fabric cover for the pad having structural characteristics enabling it to absorb water and enabling removal and replacement of the cover so that the back or other inaccessible surface areas of the body of a person can be brought into contact with the cover for washing such surface areas when moved in relation to the cover and pad while being retained against the cover, said pad being constructed of foam plastic material and including a water proof covering mounted thereon, said means mounting the pad including a substantially rigid backing panel having a perimeter generally coinciding with the perimeter of the pad, and a plurality of suction cups mounted on the panel for mounting the panel on a supporting surface such as the vertical wall of a shower bath or the inclined wall of a bathtub, said fabric cover also engaging the panel to retain the panel, pad and cover in assembled relation, said cover including a front panel overlying and conforming generally with the dimensional characteristics of the pad and a peripheral flange overlying the periphery of the pad and a drawstring in a hem engaging the periphery of the panel and disposed inwardly of the periphery to retain the pad and cover on the panel, and a pocket on the interior of the front panel of the cover for receiving material to be applied to the surface areas of the body engaged with the cover.

4,696,069

SOFA BED

Robert P. Crosthwaite, Lethbridge, Canada, assignor to Ducan Steel Benders Ltd., Lethbridge, Canada

Filed Jun. 2, 1986, Ser. No. 869,514
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—37 R **7 Claims**



1. A sofa bed comprising generally U-shaped base means for resting on a floor, said base means including substantially vertical front and rear arm means; rearwardly inclined track means extending between said front arm means and said rear arm means; seat frame means supported by said base means; back frame means supported by said base means and by said seat frame means; first link means pivotally connected to the top end of said front arm means and to said seat frame means between the front end and middle thereof; second link means rigidly connected to the rear end of said seat frame means, and slidably and pivotally connected to said track means, whereby said seat frame means can be moved from a rearwardly inclined sofa position to a horizontal bed position by lifting the front end of said seat frame means, rotation of the first link means from a rearwardly and downwardly extending position to a forwardly extending, substantially horizontal position, and sliding of said second link means forwardly along said track means; third generally C-shaped link means rigidly connected at one end to the bottom end of said back frame means and pivotally connected to said seat frame means at a location forwardly of said second link means for normally supporting said back frame means steeply inclined with respect to said seat frame means; and fourth link means pivotally connected to said rear arm means and to said back frame means near the bottom thereof, whereby movement of said seat frame means from the sofa position to the bed position causes corresponding movement of the back frame means from the inclined, sofa position to the horizontal, bed position.

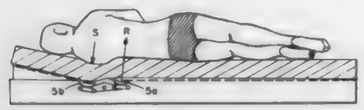
4,696,070

UNDERMATTRESS FOR RECLINING FURNITURE

Hugo Degen, Seltisberg, Switzerland, assignor to Marpal AG, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,409
Claims priority, application Switzerland, Dec. 28, 1984, 6218/84
Int. Cl.[4] A47C *23/06*
U.S. Cl. 5—238 **5 Claims**

1. Undermattress for reclining furniture, having a frame which is equipped with spring bridges which are mounted at preselected distances in the longitudinal side sections of the frame and which have, in turn in each case, at least one cross-slat, further having adjustable supporting means arranged between a head part and a body support part of said undermattress wherein the said supporting means comprises two rigid rocking cradles (2) which are arranged at the inner surfaces of said longitudinal side sections (1) each of which is at a central location pivotably suspended about a swivel axis (A) which runs transversely to the longitudinal axis of the reclining furniture at the transitional area from the shoulder (S) to the upper



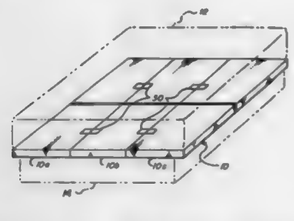
rib part (R) of a reclining person and which said axis is located in the upper cradle area, and wherein each said rocking cradle carries at its two ends a pair of support bodies (*5a, 5b*) which accommodate said spring bridges for supporting the shoulder part and the upper, side rib part of the reclining person in its side position.

4,696,071

DECK FOR SUPPORTING A FLOATATION SLEEP SYSTEM BLADDER

Philip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625

Filed Jul. 25, 1986, Ser. No. 889,231
Int. Cl.[4] A47C *27/08, 19/00*
U.S. Cl. 5—451 **6 Claims**



1. A deck of a size and strength sufficient to support a fluid-filled bladder of a floatation sleep system, said deck adapted to be supported on a pedestal, said deck comprising:

a plurality of rigid members; and

means for separately encasing said rigid members as a unit hingeable, between such members, said encasing means including a decorative, flexible material having a plurality of sealable pockets for receiving said plurality of rigid members respectively, whereby such unit is readily foldable to a compact configuration for handling and transport, and unfoldable to provide support for a fluid-filled bladder.

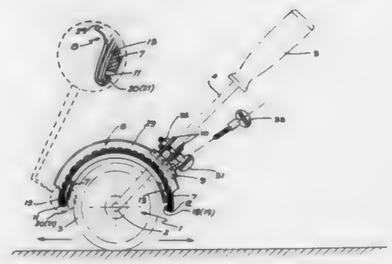
4,696,072

SPATTER GUARD FOR PAINT ROLLERS

Owen R. Cormack, 13 Leeds St., Rhodes NSW 2138, and James H. Keane, 6/12 Garrick St., Coolangatta Qld 4225, both of Australia

PCT No. PCT/AU85/00250, § 371 Date Oct. 21, 1985, § 102(e) Date Oct. 21, 1985, PCT Pub. No. WO85/02564, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 5, 1984, Ser. No. 773,008
Claims priority, application Australia, Dec. 6, 1983, PG2719
Int. Cl.[4] B05C *17/04*
U.S. Cl. 15—248 A **6 Claims**

1. A paint roller spatter guard comprising an arcuate shaped trough member having a pad of absorbent material fixed therein, said trough member being fixed in a cradle secured to a support member fixed by a clamp to a paint roller assembly whereby the spatter guard is spaced from but embraced by part of the roller and is positioned between the roller and the roller handle, said pad of absorbent material being supported on a flexible backing strip, said flexible backing strip having longitudinal edges which engage in channel members on each longitudinal edge of said trough member.

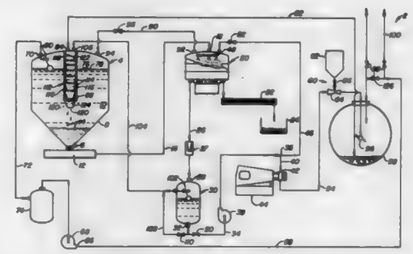


4,696,073

RECYCLED LIQUID CLEANING SYSTEM

William G. Urbania, Stockton, Calif., assignor to Industrial Innovations, Inc., Stockton, Calif.

Continuation-in-part of Ser. No. 662,880, Oct. 19, 1984, Pat. No. 4,616,377, and a continuation-in-part of Ser. No. 657,284, Oct. 2, 1984, Pat. No. 4,619,015. This application Aug. 19, 1985, Ser. No. 767,006
The portion of the term of this patent subsequent to Oct. 14, 2002, has been disclaimed.
Int. Cl.[4] B08B *9/08*
U.S. Cl. 15—302 **25 Claims**



12. A system for cleaning a dirty surface comprising:

a pressure vessel partially filled with a cleaning liquid;

vacuum means for drawing a partial vacuum within the pressure vessel in a partial vacuum region above a free surface of the cleaning liquid;

means for removing liquid from the main vessel and directing the liquid against the dirty surface;

means for transferring cleaning liquid and dislodged contaminants from a cleaning liquid and dislodged contaminants collection point associated with the dirty surface to the main vessel; and

said liquid removing means including:

a solids separator, including an inlet, connected to a bottom region of the main vessel, a liquid outlet and a solids outlet;

a centrifuge having a centrifuge inlet fluidly connected to the solids separator liquid outlet, a centrifuge liquid outlet and a centrifuging solids outlet;

a pressure pump; and

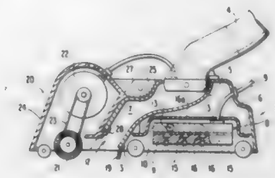
a makeup tank connected to a liquid outlet of the solids separator having a first outlet fluidly connected to the inlet of the pressure pump and a second outlet fluidly connected to the partial vacuum region.

4,696,074

MULTI-PURPOSE HOUSEHOLD APPLIANCE PARTICULARLY FOR CLEANING FLOORS, CARPETS, LAID CARPETINGS, AND THE LIKE

Alfredo Cavalli, Via Galileo Galilei, 9-20060 Pessano Con Bornago (Milan), Italy

Filed Nov. 21, 1985, Ser. No. 799,772
Claims priority, application Italy, Nov. 21, 1984, 23851/84[U]
Int. Cl.[4] A44B *11/00*
U.S. Cl. 15—321 **1 Claim**



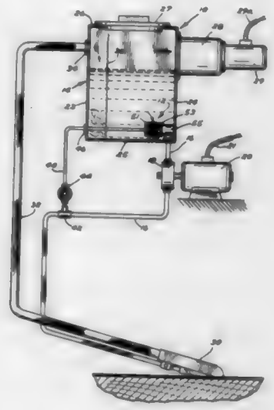
1. A household appliance for cleaning substantially flat surfaces such as floors, carpets and the like comprising a working head, a handle connected to said working head, a steam generator mounted in said working head in communication with a water supply conduit and a vacuum chamber having an air-liquid suction port located in said working head in communication with a vacuum conduit comprising a portion of said handle, said steam generator being comprised of two superimposed metal plates having electrical heating means incorporated in at least one of said plates, a vaporizing chamber disposed in one of said plates in communication with said water supply conduit, steam passages located between said plates in communication with said vaporizing chamber and a plurality of holes extending through the other of said plates in communication with said steam passages for dispensing steam outwardly of said head adjacent said suction port.

4,696,075

FILTER STRUCTURE

Dale L. Grave, 125 Queensland Lane North, Plymouth, Minn. 55447

Filed Jan. 21, 1986, Ser. No. 820,168
Int. Cl.[4] A47L *11/30*
U.S. Cl. 15—321 **6 Claims**



1. A recycling surface cleaning apparatus embodying a nonclogging filter structure, having in combination,

a reservoir tank of cleaning fluid of a surface material cleaning apparatus,

an outlet line withdrawing said cleaning fluid from said tank and passing the same to a cleaning head,

an inlet line from said cleaning head to said tank,

means carried by said tank withdrawing cleaning fluid from said cleaning head and drawing the same into said tank through said inlet line,

a filter having a wall thereabout within said tank and being connected to said outlet line,

means carried by said tank withdrawing cleaning fluid from said cleaning head and drawing the same into said tank through said inlet line,

means from said outlet line supplying fluid therefrom into the body of fluid within said filter under a greater pressure than the withdrawal of said cleaning fluid from said tank by said outlet line causing a counterflow motion of fluid within said filter,

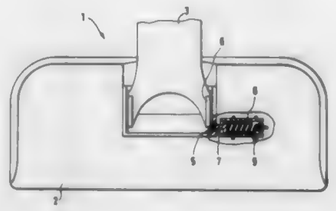
whereby said counterflow motion causes fluid to pass through portions of the wall of said filter creating adequate motion about said wall to repel interfering contaminants in the cleaning fluid in said tank from collecting upon and clogging said wall of said filter and thus permitting cleaning fluid to be passed through the filter and be withdrawn from said tank.

4,696,076

VACUUM CLEANER NOZZLE

Heinz-Jürgen Ahlf, Bergisch-Gladbach; Wieland Gühne, Remscheid; Hans-Peter Simm, Wuppertal, and Peter Wulf, Ennepetal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 845,174
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 8509150[U]
Int. Cl.[4] A47L *9/02*
U.S. Cl. 15—415 R **5 Claims**



1. A vacuum cleaning nozzle for attachment to vacuum generating means, the vacuum cleaning nozzle comprising:

a housing;

an attachment stub for attachment to the vacuum generating means, said attachment stub being pivotally mounted in said housing for movement in a plane through an angle between a first angular position and a second angular position defining an end region of said movement;

detent means arranged on said nozzle so as to interface between said housing and said attachment stub for latching said attachment stub to said housing when the latter is pivotally moved to said second angular position so that a swivelling of said attachment stub causes said housing to be swivelled therewith; and,

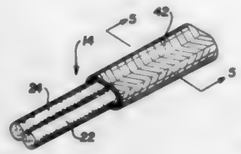
said detent means including a movable member movably journalled in said housing so as to be movable transversely to said plane for latching said stub to said housing; and, cam means conjointly defined by said movable member and said attachment stub responsive to a force tending to move said attachment stub out of said second position thereby unlatching said stub from said housing.

4,696,077

HANDLE ASSEMBLY FOR LUGGAGE CASE

Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed May 29, 1986, Ser. No. 868,099
Int. Cl.[4] A47B *95/02*
U.S. Cl. 16—125 **6 Claims**



1. A handle assembly for a luggage case of the type in which a handgrip element is attached to the body of the luggage case, the improvement of said handgrip element comprising:

a flexible, heavy cord material formed into at least two longitudinal and closely spaced rows which provide a substantial central portion for said handgrip element,

an outer piece of material having the characteristics to complement said luggage case enwrapped around said at least two rows of said cord material and having longitudinal edges secured along a longitudinal centerline of and between said at least two rows in at least said central portion which forms a pliable sturdy said central portion, said outer piece of material consisting of at least two sections, each section adapted to enwrap a different longitudinally disposed row of said cord of material, whereby the longitudinal edges of each section substantially mates with that of the other along said centerline, and

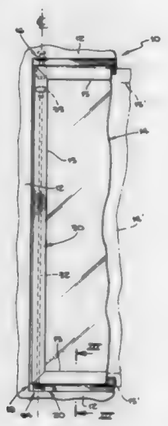
means for securing said mating surfaces of each section to opposed mating surfaces along said centerline of said center portion.

4,696,078

COMBINED ADJUSTABLE DOOR HINGE PIN SOCKET AND ADJUSTABLE TORQUE ROD ANCHOR DEVICE

Michael E. Stromquist, Encino, Calif., assignor to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed May 6, 1982, Ser. No. 375,754
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—301 **4 Claims**



1. A torque rod adjustment device for use in a torsionally operated door assembly having a door that swings on hinges about a vertical pivot axis on one side of the door, and a surrounding cabinet wherein a torque rod is positioned along the pivot axis of the door and has one of its ends secured to the door to prevent rotation of said end relative to the door and has its other end secured to the cabinet to prevent rotation of this end relative to the cabinet, said torque rod adjustment device comprising:

a base member adapted to be fixedly secured to the cabinet;

a cover connected to the base member and having an anchor therein to receive the end of the torque rod to be secured to the cabinet;

a worm wheel rotatively housed in the cover and having a central aperture adapted to matingly receive the end of the torque rod in a non-rotative relationship; and

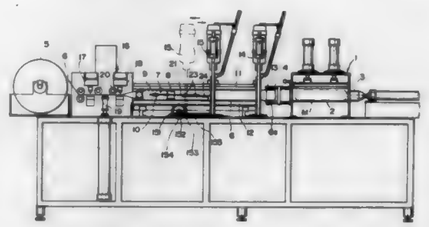
a worm housed by the cover in engaging relationship with the worm wheel and adapted to be selectively turned so as to adjust the torque of the torque rod.

4,696,079

APPARATUS FOR AUTOMATICALLY STUFFING MEAT IN A CASING

Keiichi Kawai; Setsuo Yasuda, and Zenichiro Sakaime, all of Osaka, Japan, assignors to Futabadenki Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1986, Ser. No. 857,199
Claims priority, application Japan, May 8, 1985, 60-97334
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—33 **1 Claim**



1. An apparatus for automatically stuffing meat in a casing, the apparatus comprising:

a meat extruder including a filling nozzle;

means for supplying a continuous band of casing;

a carrier means for carrying the casing from the supplying means to the filling nozzle, wherein the carrier means includes a stop means whereby the casing is secured to the carrier means so as to effect the unitary movement thereof;

a casing holder means for holding the open end of the casing so as to assist the casing to ride on an open end of the filling nozzle;

a first cutting-and-fastening means located at a casing supply side; and

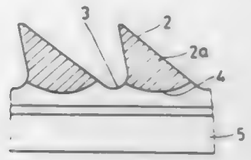
a second cutting-and-fastening means located at a casing outlet side, wherein the second device is adjustable with respect to the first device, the second cutting-and-fastening device including a cam plate having a cam face whereby the stop means is caused to assume a locking position and an unlocking position with respect to the casing against the carrier means.

4,696,080

METALLIC WIRE FOR SPINNING MACHINERY AND THE METHOD OF MANUFACTURING THE SAME

Ritsuji Nakamura, Daito, Japan, assignor to Kanai Juyo Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Dec. 30, 1985, Ser. No. 814,722
Int. Cl.[4] D01G *15/12*
U.S. Cl. 19—114 3 Claims



1. Metallic wire for spinning machinery, said metallic wire comprising:

hard drawn steel wire or alloy steel wire having a plurality of quench hardened teeth spaced apart from one another by respective valley parts; and

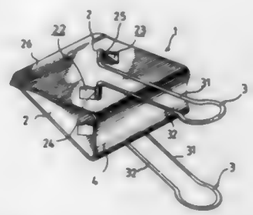
said wire having boundaries defined thereon extending between adjacent ends of the valley parts at respective roots of the teeth which are arcuate and convex away from the teeth, said quench hardened teeth being on one side of the boundaries, and the valley parts being on the other side of said boundaries and having a hardness which is less than the hardness of said quench hardened teeth.

4,696,081

CLIP RESILIANT

Down W. Yen, No. 654, Wu Chia 2nd Road, Feng Shan City, Kaohsiung Hsine, Taiwan

Filed Jan. 6, 1987, Ser. No. 870
Int. Cl.[4] B42F *1/04*
U.S. Cl. 24—558 1 Claim



1. An improved clip structure comprising:

a resilient metal sheet forming an upper face, a lower face and a back portion connecting said upper face and said lower face, the upper and lower face normally contacting each other at the front ends thereof;

two pairs of hinges with a first pair of hinges on said upper face and a second pair of hinges on said lower face, said first and second pairs of hinges respectively defining hinge axes for pivotal movement lying parallel to said respective upper and lower faces set diagonally on said upper and lower faces relative to said back portion so that one hinge of each of said two pairs is closer to said back portion than the other;

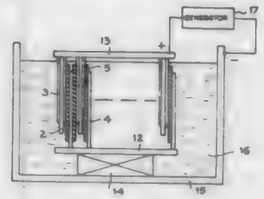
a first and a second shank, said first shank being positioned on said upper face and second shank being positioned on said lower face, each of said shanks having a longer arm and a shorter arm, the ends of said longer arms having portions pivotally retained by the hinges adjacent to the edges of the clip structure and said shorter arms having portions pivotally retained by the hinges adjacent to the back portion of the clip structure, said shanks being pivotable 90 degrees from an extending upright position beyond said back portion about the axes respectively formed by said first and second pairs of hinges to a position substantially parellel to said back portion.

4,696,082

METHOD FOR MANUFACTURING ELECTROLYTIC CAPACITORS AND CAPACITORS THUS OBTAINED

Robert Foufria, Dijon; Marie P. Risbet, Ste. Suzanne, and Jean L. Zattara, Dijon, all of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jun. 9, 1986, Ser. No. 871,791
Claims priority, application France, Jun. 11, 1985, 8508909
Int. Cl.[4] H01G *9/00*
U.S. Cl. 29—25.42 8 Claims



1. Method for manufacturing electrolytic capacitors, wherein the method comprises at least the following steps:

a. obtaining at least one capactive strip by winding on a spool an anodic foil, a cathodic foil and an electrolyte support;

b. schooping of the lateral faces of the strip so as to carry out anodic and cathodic armatures;

c. removing the capacitive strip from the wheel;

d. delimiting capacitive blocks from said capacitive strip by providing notches or recesses in the strip to partially sever the strip but leave intact its anodic armature;

e. subjecting the capacitive blocks to an anodic oxidation to restore the dielectric of the anodic foils;

f. impregnating the said electrolyte support by an electrolyte;

g. putting in place the capacitive blocks on connecting means intended to form the electrodes of the capacitors;

h. coating the blocks with a protective material so as to allow the parts of the connecting means to protrude;

i. form shaping the said parts so as to constitute the electrodes of the capacitors.

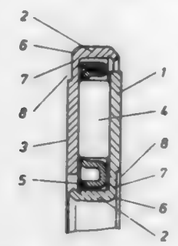
4,696,083

METHOD FOR MAKING MACHINE PARTS AND MACHINE PARTS PRODUCED THEREBY

Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Hermann Hetterich, Heidenfeld, and Heinrich Kunkel, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,823
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440961
Int. Cl.[4] B21D *53/12*
U.S. Cl. 29—148.4 C 1 Claim

1. A method for making hardened parts such as a rotary disk for axial roller bearings comprising an annular ring shaped body and a circumferentially extending flange extending angularly relative to the body, consisting of the steps of forming the disk to the desired shape in the soft state, densifying only one annular ring shaped section of the ring shaped body adjacent



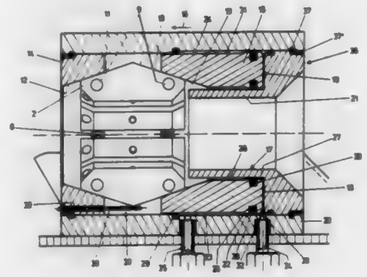
the flange by cold rolling or pressing, and thereafter hardening the entire disk.

4,696,085

APPARATUS FOR PRESSING TUBULAR PARTS

Karl Sauder, Zurich, Switzerland, assignor to Firma Compat Aktiengesellschaft, Fürstentum, Liechtenstein

PCT No. PCT/EP83/00024, § 371 Date Oct. 4, 1983, § 102(e) Date Oct. 4, 1983, PCT Pub. No. WO83/02737, PCT Pub. Date Aug. 18, 1983
Continuation of Ser. No. 552,138, Oct. 4, 1983, abandoned. This PCT application Feb. 1, 1983, Ser. No. 882,432
Claims priority, application Austria, Feb. 4, 1982, 424/82
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—237 7 Claims



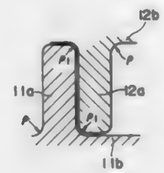
1. An apparatus for pressing tubular parts onto pipes, sleeves or hoses, comprising an external cylinder sleeve and a coaxially inserted tubular part forming an annular cylinder having a base, a plurality of spring-loaded radially adjustable clamping jaws and an annular piston which acts upon said jaws, the interior of said piston enlarged conically at the ends of said jaws, the radially outer boundary surfaces thereof having a corresponding angle of inclination and bearing upon said conical enlargement, and said piston movable hydraulically toward said jaws and returnable hydraulically to its neutral postion, wherein the effective piston area which is acted upon to return the double-acting piston to its neutral position has a size which is only a fraction of the piston area facing away from said jaws and extending parallel to said base which piston area is acted upon to advance said piston, and wherein said piston has its largest cross-sectional area at said end constituting the effective piston area which is acted upon to advance said piston, the end of said piston remote from said jaws engaging in said annular cylinder, wherein said external cylinder sleeve has a free end and extends axially from said cylinder to said free end, a conical ring inserted from said cylinder to said free end, a conical ring inserted permanently coaxially with said piston at said free end of said external cylinder sleeve facing away from said annular cylinder, the inner surface of said conical ring widening conically toward said piston and the outer surfaces of said jaws narrowing conically toward both ends in axial direction, wherein said conical ring and the component formed by said tubular part and said base of said cylinder are fixed to said external cylinder sleeve at both ends thereof by means of lock rings which engage in grooves defined in said external cylinder sleeve, wherein said base of said cylinder is formed integrally with said inserted tubular part, wherein said lock rings are of L-shaped cross-section, one of the legs bearing against the inner wall of said cylinder sleeve and the other leg engaging said groove, and said lock rings are divided at least once in the peripheral direction, the dividing surfaces of said rings running at an acute angle to a radial plane of said lock rings.

4,696,084

METHOD FOR FORMING SCROLL MEMBERS USED IN A SCROLL TYPE FLUID MACHINE

Takahisa Hirano; Shoji Fukami; Yasuharu Maruiwa, all of Nagoya; Takuyuki Itoh; Tamio Sugimoto, both of Aichi; Tetsuo Ono, Nagoya, and Masatoshi Mukai, Aichi, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 745,393, Jun. 14, 1985. This application Feb. 26, 1986, Ser. No. 833,180
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R 1 Claim



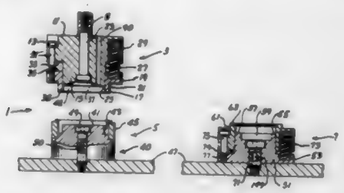
1. A method for forming scroll members used in a scroll type fluid machine comprising a pair of engaged scroll members each including a side plate and a spiral lap uprightly disposed on an inside surface of said side plate; when said scroll members are relatively revolved, a fluid volume in sealed chambers defined by said pair of engaged scroll members being varied, so that a pressure of the fluid in said sealed chambers is thereby varied in order to discharge a gas therefrom, said method being characterized by roughly working each corner of an inner end base portion of said lap and said inside surface of said side plate of said scroll member so as to form a complete round having a relatively large curvature radius which is enough to provide said lap with fatigue strength, by the use of a cutter, and the finishing, at each corner portion, a round having a relatively small curvature radius which does not contact with a tip end portion of said lap of the partner scroll member, by the use of a cutter.

4,696,086

DIE SET APPARATUS FOR BADGES

John W. Dickerson, 16480 Burleigh Pl., Brookfield, Wis. 53005

Filed Jan. 22, 1986, Ser. No. 821,474
Int. Cl.[4] B23P 11/00
U.S. Cl. 29—243.52 13 Claims



1. A die set for manufacturing badges from a plurality of badge components comprising:

a. first die means for supporting at least one first badge component;

b. second die means including a pair of relatively reciprocable members for supporting at least one second badge component;

c. punch means including a pair of relatively reciprocable members for vertical reciprocation in alignment with a selected first and second die means and for cooperating with the first die means to load the first badge component in the punch means and with the second die means to push the first badge component from the punch means and into assembled relationship with the second badge component; and

wherein:

d. the second die means comprises:

i. a base for supporting the second badge component;

ii. a crimp ring having an end face and adapted to reciprocate on the base, the crimp ring being biased upwardly relative to the base with a first force; and

iii. fastener means for restraining the crimp ring in a predetermined location relative to the base against the first force; and

e. the punch means comprises:

i. a block having an end face;

ii. a punch ring adapted to reciprocate on the block and having an end face adapted to abut the crimp ring end face, the punch ring being biased downwardly relative to the block with a second force that is less than the first force; and

iii. fastener means for restraining the punch ring on the block in a predetermined location relative thereto against the second force.

4,696,087

MAGNETIC TAPE CASSETTE ASSEMBLING METHOD AND APPARATUS

Akira Mizuta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1986, Ser. No. 899,359
Claims priority, application Japan, Sep. 5, 1985, 60-194745
Int. Cl.[4] B23P 11/00, 19/00
U.S. Cl. 29—434 6 Claims

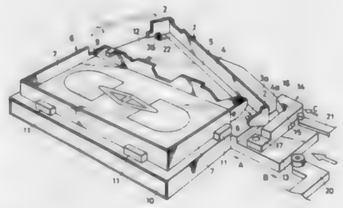
1. A method of assembling a magnetic tape cassette comprising a substantially L-shaped guard panel which has first and second supporting shafts formed respectively at both end pieces thereof and is adapted to cover an opening formed in the front longitudinal part of said magnetic tape cassette, said first and second supporting shafts being inserted respectively into a first hole formed in the upper half case and a second hole formed by the upper and lower half cases, said method comprising the steps of:

positioning said guard panel in front of a front, longitudinal part of said upper half case and inclined with respect to said front part of said upper half case substantially in the same plane in such a manner that said first supporting shaft is set beside said first hole while said second supporting shaft is positioned forwardly of said upper half case;

moving at least one of said guard panel and said upper half case in a longitudinal direction of said upper half case so that pushing means regulates the position of said guard panel to cause said first supporting shaft to confront with said first hole; and

swinging said guard panel by said pushing means so that said second supporting shaft engages with said second hole while said first supporting shaft is inserted into said first hole.

3. An apparatus for assembling a magnetic tape cassette comprising a substantially L-shaped guard panel which has first and second supporting shafts formed respectively at both end pieces thereof and is adapted to cover an opening formed in a front, longitudinal part of said magnetic tape cassette, said first and second supporting shafts being inserted respectivly into a first hole formed in an upper half case and a second hole



formed by said upper half case and a lower half case, said apparatus comprising:

a first table for holding said upper half case;

a second table for holding said guard panel, said first table and a surface of said second table for holding said guard panel being adjacent to each other substantially in the same plane; and

pushing means rotatably included on said second table having for embracing at least a corner of said guard panel which confronts with said first hole and having regulating surfaces which are inclined at predetermined angles with respect to a longitudinal direction of said upper half case;

at least one of said first table and said second table being movable in parallel with said longitudinal direction of said upper half case;

wherein, after said at least one of said first table and said secod table is moved to allow said first supporting shaft to confront with said first hole, said pushing means is turnable while pushing said guard panel, to combine said guard panel with said upper half case.

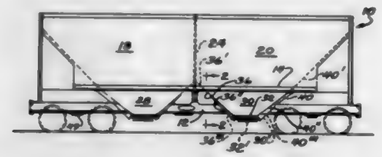
4,696,088

METHOD OF CONVERTING A HOPPER TYPE OF RAIL CAR TO ACCEPT A WIDER OUTPUT GATE

Roy W. Miller, Highland, Ind., assignor to Pullman Rail Leasing Corporation, Chicago, Ill.

Filed Oct. 17, 1986, Ser. No. 919,973
Int. Cl.[4] B21K 7/12
U.S. Cl. 29—401.1 4 Claims

1. A method of converting a hopper type of rail car from a first hopper configuration which includes a hopper having side sills and a center sill and which further includes a first set of outside, end and center slope sheets which are joined to each other and affixed to the body of the hopper at a first set of slope angles, said first set of slope sheets being welded directly to a first mounting flange of a first bottom outlet gate of a first predetermined rectangular size, into a second hopper configuration in which the hopper has outside, end and center slope sheets which are joined to each other and affixed to the body of the hopper at a second, and different set of slope angles, said second set of slope sheets being affixed directly to a second mounting flange of an outlet gate of a second, and different, predetermined rectangular configuration, said method comprising the steps of: removing said first mounting flange; cutting apart the slope sheets of said first set along at least the lines where they are joined to each other in the region thereof located beneath said side sills; cutting away and removing portions of at least the side extremities of a first opposed pair of slope sheets in said first set and cutting away and removing at least that portion of a second opposed pair of slope sheets in said first set which is located in the region beneath said side sills; replacing the removed portion of said second opposed pair of slope sheets in said first set with new slope sheet por-



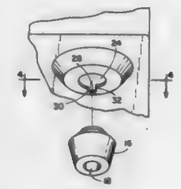
tions which have a greater width at their lower ends than the removed portions; locating and positively retaining the second mounting flange in its desired final location relative to the side sills and the center sill; applying force to each of the first opposed pair of slope sheets to cause their lower edges to move divergently from each other and into contact with a first pair of opposed side portions of said second mounting flange; attaching said new slope sheet portions to a second pair of opposed side portions of said second mounting flange; applying heat to said first opposed pair of slope sheets in a horizontal line at an upper portion thereof to relieve the stress introduced therein by said step of applying force; and welding all of said slope sheets in said second set to each other and to said second mounting flange.

4,696,089

METHOD FOR APPLYING ELASTOMERIC SUPPORT PADS TO RIGID CASINGS

Harvey J. Gjesdal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 21, 1986, Ser. No. 921,659
Int. Cl.[4] B23P 11/02
U.S. Cl. 29—451 4 Claims



1. A method for mounting elastomeric support pads to a rigid casing comprising:

providing an elastomeric support pad having a body portion, a flange portion and an intermediate post portion,

providing a hole in a rigid casing wall, the wall having a thickness substantially the length of the post portion and the hole having a diameter substantially the diameter of the post portion,

providing said flange portion of the support pad with a rim diameter greater than the hole diameter which is at least partially compressible, and the improvement which comprises:

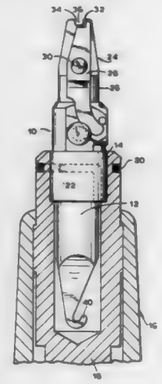
providing a cutout in the casing wall from the edge of the hole, said cutout and intersecting hole edge forming an outwardly angled corner, said cutout and outwardly angled corner providing a lead-in ramp for the flange portion of the pad, and inserting a portion of the rim of the flange under the corner and thereby inside the casing, and turning the pad to force a continuation of the rim of the flange under the hole edge while compressing a small section of the flange until that compressed section is positioned at the cutout whereat the full flange portion is inserted inside the casing wall.

4,696,090

REMOVABLE BLADE ASSEMBLY

Donald L. Gregson, Oxnard, and John J. McGuigan, Studio, both of Calif., assignors to Harris Corporation, Melbourne, Fla.

Filed May 8, 1986, Ser. No. 861,206
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—566.4 20 Claims



1. A removable blade assembly adapted for use with a termination tool of the type used to connect an electrical conductor to a terminal clip comprising:

a main body with an elongated opening therein defining a cavity,

a slide member slidably connected to said main body and movable between an extended position and a retracted position,

biasing means disposed within said cavity for yieldably biasing said slide member toward said extended position,

said slide member including a first end portion extending into said cavity and operatively engaging said biasing means, and a second end portion opposite said first end portion including means for pressing the electrical conductor into engagement with the terminal clip,

cutting means for severing the electrical conductor upon insertion into the terminal clip, said cutting means including a movable cutting member pivotally mounted to said second end portion of said slide member, said movable cutting member including a first cutting surface adapted to engage the electrical conductor and the cam follower,

said cutting means further including a second cutting surface carried by said slide member and oppositely disposed of said first cutting surface of said movable cutting member,

cam means attached to said main body for cooperation with said cam follower to pivot said cutting member upon movement of said slide member between said extended position and said retracted position to sever the electrical conductor during movement of said slide member toward said retracted position, and

releasable fastening means associated with said main body

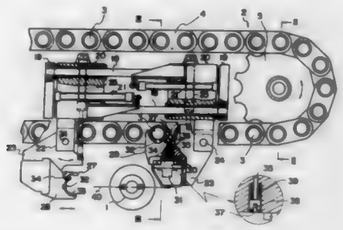
for removably mounting said blade assembly in the termination tool.

4,696,091

AUTOMATIC TOOL CHANGER

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan

Filed May 24, 1985, Ser. No. 737,444
Claims priority, application Japan, May 25, 1984, 59-104805
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **5 Claims**



1. An automatic tool changer for a machine tool, comprising:

a machine tool spindle;

a tool magazine comprising a plurality of tool pots which form receptacles for holders fitted with tools, said tool pots being arranged at pre-determined intervals on an endless chain such that an axis of each said tool pot is parallel to the rotational axis of said spindle;

first and second arms arranged in the vicinity of said machine tool spindle such that said spindle is positioned between said first arms and said second arms;

each of said and first and second arms, respectively, being provided with tool gripping means at the outer end thereof nearest said machine tool spindle so as to be capable of separately performing a tool changing operation;

first and second slide bases arranged, respectively, to be moveable in a direction perpendicular to the rotational axis of said machine tool spindle and alternately of said spindle and perpendicular to the axes of said tool pots, and wherein said first and second slide bases are operably coupled to supporting bases having guide bars;

said slide bases being mechanically coupled to said first and second arms, respectively, as to cause corresponding movement of said arms;

first and second rotary plates, respectively, pivotally mounted with respect to said first and second slide bases and mechanically coupled to said first and second arms, respectively, as to cause pivotal motion of said said first and second arms;

first and second cylinder means, respectively, for actuating said first and second slide bases toward and away from each other along said guide bars; and

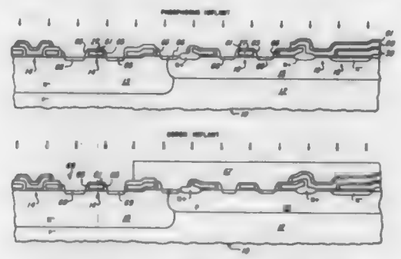
third and fourth cylinder means, respectively, for actuating said first and second rotary plates.

4,696,092

METHOD OF MAKING FIELD-PLATE ISOLATED CMOS DEVICES

Robert R. Doering, Plano, and Gregory J. Armstrong, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 626,572, Jul. 2, 1984, Pat. No. 4,561,170.
This application Dec. 31, 1985, Ser. No. 815,428
The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.
Int. Cl.⁴ H01L *21/263, 29/78, 27/04*
U.S. Cl. 437—5 **20 Claims**



1. A method of making a CMOS twin-well semiconductor device, comprising the steps of:

implanting N impurity into a face of a P type silicon body creating an N well area, and growing oxide over said area,

implanting P impurity into said face using said oxide as a mask to create a P well area, and driving both said N well and P well into said face by heat treatment,

forming a thin oxide and an oxidation mask on said face over both the N well and P well areas and opening holes in both the thin oxide and oxidation mask over a selected area of said P well area, then implanting N+ impurity in said selected area and growing oxide over the selected area to create a buried N+ region beneath such oxide, and implanting lighter doped N regions in capacitor areas of the P well,

applying a first conductive coating over said face and patterning it to provide a capacitor plate and an isolation field-plate, said first conductive coating being insulated from the face in the capacitor area by a thermal oxide thinner than an oxide coating an area beneath said isolation field-plate,

applying a second conductive coating to said face isolated from said first conductive coating by an an insulator, and patterning it to provide a transistor gate and interconnect,

forming sidewall oxide spacers on the edges of said gate,

implanting N impurity into said face in both the N well and P well areas to create N+ source/drain regions, masked by said sidewall oxide spacers,

masking the P well areas and implanting a P impurity into the N well areas to create P+ source/drain regions counterdoping said N impurity, and

applying a third conductive coating over said face isolated from said second and first conductive coatings by an insulator except at a contact area, and patterning the third conductive coating to define an interconnect and a contact.

4,696,093

FABRICATION OF SCHOTTKY BARRIER MOSFETS

James D. Welch, 10328 Pinehurst Ave., Omaha, Nebr. 68124

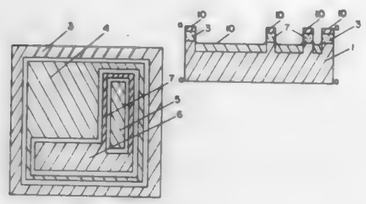
Filed Jun. 9, 1986, Ser. No. 872,147
Int. Cl.⁴ H01L *21/441*
U.S. Cl. 437—176 **4 Claims**

1. A single mask/etch method for fabricating MOSFETs comprising:

selecting a silicon substrate;

growing SiO_2 on top of the silicon substrate to a depth appropriate for use as channel oxide under a gate;

etching the SiO_2 to the silicon to form a pattern comprising a source region surrounded by channel and gate SiO_2, which channel and gate SiO_2 is surrounded by a drain region, which drain region is surrounded by a device delineating SiO_2;



depositing chromium to a depth just under that which would cause the chromium on the SiO_2 to be continuous with that on the silicon in the etched source and drain regions so that the resulting metalization is discontinuous; and

annealing the resulting system so that junctions form in the source and drain regions between the deposited chromium and the silicon in the source and drain regions.

4,696,094

PROCESS OF MANUFACTORING AN INDIUM ANTIMONIDE PHOTODIODE

Henry Yves; André Nicollet, and Michel Villard, all of Paris, France, assignors to Thomson - CSF, Paris, France

Filed Nov. 30, 1984, Ser. No. 676,622
Claims priority, application France, Dec. 2, 1983, 83 19317
Int. Cl.⁴ H01L *21/18*
U.S. Cl. 437—23 **6 Claims**



1. A method for manufacturing an indium antimonide photodiode having an ionic implantation of the S_{34}^+ isotope of sulphur on a P type indium antimonide substrate which comprises providing an ionic implantation consisting essentially of the S_{34}^+ isotope of sulphur on a P type indium antimonide substrate then in heating the implanted substrate.

4,696,095

PROCESS FOR ISOLATION USING SELF-ALIGNED DIFFUSION PROCESS

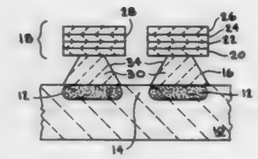
Mammen Thomas, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 27, 1986, Ser. No. 844,908
Int. Cl.⁴ H01L *21/31*
U.S. Cl. 437—78 **34 Claims**

1. In a process for fabricating semi-oxide insulated devices, which includes providing a substrate, forming patterned regions of a first conductivity type in a major surface of said substrate, forming an epitaxial layer on said substrate over said major surface, forming a patterned mask layer on said epitaxial layer so as to define openings therethrough to expose portions of said epitaxial layer, removing said exposed portions of said epitaxial layer to define mesa structures which overlie said patterned regions of said first conductivity type, forming regions of a second conductivity type in said substrate between said patterned regions, forming a field oxide between said mesa structures, and forming devices on said mesa structures, wherein said devices are isolated from each other by said regions of said second conductivity type, the improvement which comprises:

(a) employing as said patterned mask a mask consisting essentially of a material selected from the group consisting of (1) a multilayer structure comprising at least two each of alternating layers of silicon dioxide and silicon nitride, (2) silicon nitride and (3) metal;

(b) removing said exposed portions of said epitaxial layer by a partially anisotropic etchant to undercut portions of said



patterned mask, form said mesa structures having side walls, and expose portions of said substrate;

(c) forming an oxide layer on said side walls of said mesa structure and on said exposed portions of said substrate;

(d) removing said oxide layer lying under said openings in said patterned mask to expose corresponding regions of said substrate, said corresponding regions lying between said patterned regions; and

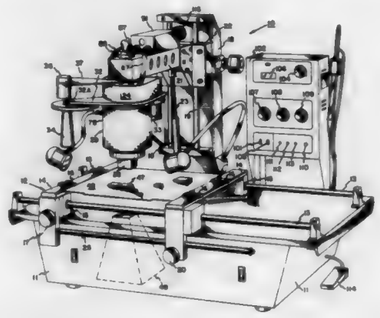
(e) forming said regions of said second conductivity in said corresponding regions through openings in said oxide layer.

4,696,096

REWORKING METHODS AND APPARATUS FOR SURFACE MOUNTED TECHNOLOGY CIRCUIT BOARDS

LaVerne M. Green, Danbury; Adrio L. Vannoni, Redding Ridge, and Ivan K. Pummell, New Milford, all of Conn., assignors to Micro Electronic Systems, Inc., Brookfield, Conn.

Filed Feb. 21, 1986, Ser. No. 832,040
Int. Cl.⁴ H05K *3/00*; B23P *19/00*
U.S. Cl. 29—829 **15 Claims**



1. Apparatus for reworking circuit boards carrying surface mounted components by removing a selected solder-connected component from a circuit board and replacing it with a fresh substitute component, comprising

a base,

a column projecting upward from the base and incorporating upwardly elongated track means,

a support arm movably mounted on the track means for up and down traversing movement,

a heat transfer block pivotally supported on the support arm for angular pivoting movement about
a substantially vertical axis, maneuvering means connected to the heat transfer block to govern up and down movement and its angular pivoting movement about said axis,
a board-supporting X-Y table positioned on the base for clamping the circuit board in an adjusted position placing a target component centered on said axis,
a component gripping head anchored to the heat transfer block with a component gripping socket cavity on said axis facing said circuit board,
control means connected to initiate a heating cycle delivering heat via the heat transfer block to the periphery of the target component for a predetermined period of time, and
torquing means connected to drive the gripping head angularly, pivoting about said axis, over an angular sector less then 20 degrees,

whereby the peripheral terminal leads of the target component have their soldered terminal leads raised to solder-melting temperature, and the angular pivoting movement of the component gripping head shears any cement bonding it to the circuit board, facilitating removal of the component from the board.

9. A method for removing a surface mounted target component having a plurality of peripheral terminal leads each individually solder-connected to a different terminal pad on a printed circuit board, comprising the steps of

positioning and clamping the circuit board with the target component intersected by a working axis,
delivering heat to the target component's peripheral solder-connected terminal leads to bring them to solder-melting temperature, while diverting said heat from the central portion of the surface mounted target component,
applying torque to the target component and rotating it through a small angle less than 20 degrees about the working axis,

whereby all solder terminal lead connections are melted and any cement adhesively holding the target component to the circuit board is sheared and the component is released from the board.

4,696,097

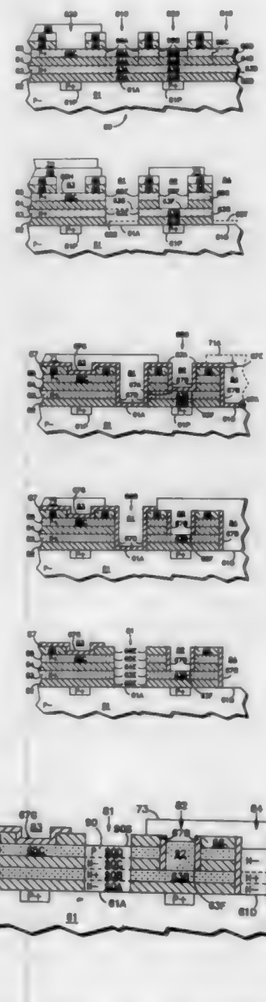
POLY-SIDEWALL CONTACT SEMICONDUCTOR DEVICE METHOD

Kevin L. McLaughlin, Chandler, and Thomas P. Bushey, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 8, 1985, Ser. No. 785,414
Int. Cl.⁴ H01L *21/283, 21/302*
U.S. Cl. 437—193 **8 Claims**

1. A process for forming a sidewall contact semiconductor device comprising:

providing a semiconductor substrate;
forming on said substrate, and without masking operations, substantially continuous superposed layers of a first dielectric, a first polycrystalline conductor, a second dielectric, a second polycrystalline conductor and a third dielectric, wherein the third dielectric has an outer surface;
forming on the outer surface a first mask having first, second and third openings above first, second and third portions respectively of each of the substrate, the first, second and third dielectric layers and the first and second polycrystalline conductor layers;
exposing first edge portions of the first and second polycrystalline conductor layers and the second and third dielectric layers beneath the first opening, the second portion of the first polycrystalline conductor layer and second edge portions of the second polycrystalline conductor layer and second and third dielectric layers beneath the second opening, and the third portion of the seond polycrystalline conductor layer beneath the third opening;
conformally covering the structure with a fourth dielectric layer;
covering the fourth dielectric layer with a further mask having a fourth opening encompassing the second opening;
anisotropically etching the portion of the fourth dielectric layer exposed in the fourth opening so as to remove the portion of the fourth dielectric layer above the second portion of the first polycrystalline conductor layer while not substantially removing the portion of the fourth dielectric layer on the second edge portion of the second polycrystalline conductor layer;



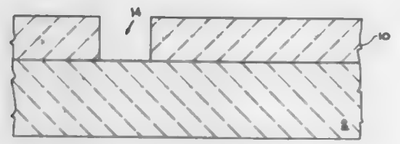
covering the fourth dielectric layer with an additional mask having a fifth opening encompassing the first opening;
isotropically etching the portion of the fourth dielectric layer exposed in the fifth opening so as to remove at least the portions of the fourth dielectric layer on the first edge portions of the first and second polycrystalline conductor layers and on the first portion of the substrate;
then forming a single crystal semiconductor pillar above the first portion of the substrate and in contact with the first edge portions of the first and second polycrystalline conductor layers, and forming a polycrystalline conductor pillar above and in contact with the second portion of the first polycrystalline conductor layer;
forming a device in the single crystal semiconductor pillar; and
providing electrical connections to the third portion of the second polycrystalline conductor layer, the single crystal semiconductor pillar and the polycrystalline pillar.

4,696,098

METALLIZATION TECHNIQUE FOR INTEGRATED CIRCUIT STRUCTURES

Yung-Chau Yen, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 24, 1986, Ser. No. 878,093
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22*
U.S. Cl. 437—187 **23 Claims**



1. An improved process for forming one or more metal strips on an integrated circuit structure by wet etching of a metal layer which comprises:

(a) forming an intermediate layer over said integrated circuit structure;
(b) forming slots in said intermediate layer;
(c) forming a metal layer of non-uniform thickness over said intermediate layer; and
(d) wet etching said metal layer sufficiently to remove all metal in said slots while retaining metal on said intermediate layer between said slots to form said desired one or more metal strips.

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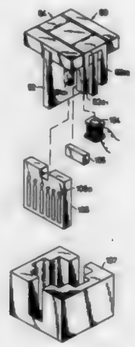
METHOD OF PRODUCING A MAGNETIC HEAD

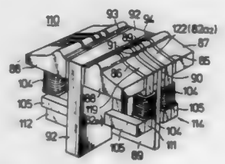
Hiroshi Matsunaga, and Shinichi Morita, both of Tokyo, Japan, assignors to TEAC Corporation, Musashino, Japan

Filed Aug. 8, 1986, Ser. No. 894,799
Claims priority, application Japan, Aug. 19, 1985, 60-181541
Int. Cl.⁴ G11B *5/127*
U.S. Cl. 29—603 **6 Claims**

1. A method of producing a magnetic head for a plurality of channels, said magnetic head comprising a plurality of head pairs each of which corresponds to one of said plurality of channels and comprises a write head and a read head aligned in a tape transporting direction in which a magnetic tape is transported, said plurality of head pairs being aligned in a direction perpendicular to the tape transporting direction, a write head and a read head of each head pair being isolated by a center shield and center spacers, write heads and read heads of two mutually adjacent head pairs being isolated by a channel shield and channel spacers, said method comprising the steps of:

forming a reference core block having right and left side surfaces which are finished with a high accuracy so that a distance between said right and left side surfaces is accurately equal to a predetermined value and a degree of parallelism of said right and left side surfaces is accurate, said reference core block integrally comprising legs which are used to finally form respective one core halves of a write head and a read head of each head pair;
forming a core assembly by connecting a first side core block and a second side core block to said right and left side surfaces of said reference core block, each of said first and second side core blocks integrally comprising legs which are used to finally form respective other core halves of the write head and the read head of each head pair, said core assembly comprising gaps of the write heads and the read heads of said plurality of head pairs at said right and left side surfaces of said reference core block;





forming a core-shield-spacer assembly by fitting between the cores of said core assembly said center shield and said center spacers so as to isolate the write head and the read head of each head pair and said channel shield and said channel spacers so as to isolate the write heads and the read heads of the two mutually adjacent head pairs;
forming a head surface by grinding an upper surface of said core-shield-spacer assembly until the legs of said reference core block and the legs of said first and second core blocks become independent and said center shield, said center spacers, said channel shield and said channel spacers become exposed; and
grinding said core-shield-spacer assembly to form an approximately semi-cylindrical tape guide portion at each end of said head surface along the tape transporting direction.

4,696,100

METHOD OF MANUFACTURING A CHIP COIL

Hiromasa Yamamoto, Toyonaka; Sankichi Shida, Nara, and Tsunehiko Todoroki, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

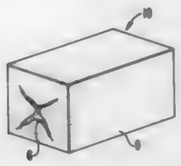
Division of Ser. No. 704,136, Feb. 21, 1985, abandoned, which is a continuation of Ser. No. 418,173, Sep. 14, 1982, abandoned.
This application Jun. 30, 1986, Ser. No. 882,567
Int. Cl.⁴ H01F *41/00*
U.S. Cl. 29—605 **5 Claims**

1. A method of manufacturing a chip coil comprising the steps of:

winding a conductor wire coated with a heat-resistive insulating film around a magnetic core, and connecting first and second internal terminal electrodes to respective opposite ends of the conductor wire, thereby to produce a coil element;

surrounding the coil element with a protective coating of magnetic substance powder;

after said step of surrounding, firing the coil element and coating of magnetic substance powder to obtain a single sintered mass of magnetic substance completely embedding therein the coil element without any gaps between the coil element and the single sintered mass so as to cover the conductor wire with the mass of magnetic substance in intimate contact with the entire outer surface of the conductor wire;



exposing at least part of each of the first and second internal terminal electrodes; and

connecting first and second external terminal electrodes respectively with the first and second internal terminal electrodes at the exposed part thereof, thereby obtaining the chip coil.

4,696,101

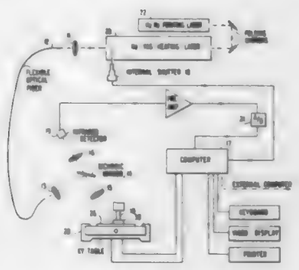
METHOD AND APPARATUS FOR PLACING AND ELECTRICALLY CONNECTING COMPONENTS ON A PRINTED CIRCUIT BOARD

Riccardo Vanzetti, Brockton, and Ashod S. Dostoomian, Stoughton, both of Mass., assignors to Vanzetti Systems, Inc., Stoughton, Mass.

Continuation of Ser. No. 742,178, Jun. 7, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 908,920

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—740 **5 Claims**



1. An apparatus for placing, soldering and inspecting components and soldered connections on a printed circuit board, comprising: support means for moveably supporting a printed circuit board; supply means for sequentially supplying electronic components, a single mechanical means for automatically selecting, transferring and temporarily holding each electronic component at a predetermined location on said printed circuit board, in a predetermined sequence, wherein said single mechanical means is comprised of a pick and place head which continuously engages each component through said sequence board; laser means for injecting thermal energy into solder material disposed at desired contact points between one of said electronic components and said circuit board to liquify the solder material to form a plurality of solder joints, while each component is held by said mechanical means; infrared radiation sensing means for continuously sensing infrared radiation emitted from each solder joint during heating of each solder joint for providing a signal indicative of liquifaction of said solder material; control means receiving said signal indicative of liquifaction of said solder material for terminating the injecting of thermal energy by said laser means upon liquification of said solder material; and inspection means for comparing the signal provided by said infrared sensing means with a standard signal to determine acceptability of each solder joint.

4,696,102

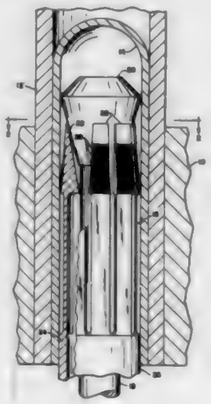
COLLET TYPE GRIPPER

Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 6, 1986, Ser. No. 816,609

Int. Cl.[4] B23P *15/26, 19/04*

U.S. Cl. 29—726 **2 Claims**



1. In combination, a member having an inner wall forming a cylindrical opening, gripping means for tightly gripping the inner wall of the member, said gripping means including a shaft having an enlarged first end extending into the cylindrical opening, and a second end located outside of the member, a hollow member surrounding the shaft, the hollow member having a plurality of flexible metal fingers extending therefrom towards the enlarged first end of the shaft, the end portion of each finger being tapered at given first and second angles on its inner and outer surfaces, respectively; and the enlarged first end of the shaft being frustoconical and forming a third given angle, the first and second angles being such that together they equal the third angle, so that when the enlarged first end of the shaft is moved axially outwardly of the cylindrical opening, the fingers are moved radially outwardly thereby, and the outer surface of the end portions lie parallel to the inner wall of the cylindrical opening and thus, each finger end portion engages the inner wall over a large surface area.

4,696,103

METHOD OF MAKING A ROTATING DISK ELECTRODE

Wishvender K. Behl, Ocean, N.J., and Der-Tau Chin, Winthrop, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1986, Ser. No. 937,804

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 **4 Claims**

1. Method of making a rotating disk electrode of a soft alkali metal reactive to oxygen and moisture in the air from a stainless steel core, a tubular Teflon sheath, a circular disk electrode of said soft alkali metal, a self-tapping stainless steel screw to secure said soft alkali electrode, and a steel spring to provide electric contact to said soft alkali metal electrode, said method including steps of:

(A) machining the top end of the stainless steel core to fit into the shaft of a high-speed rotator,

(B) pressure fitting the bottom end of the stainless steel core containing the self-tapping screw into the Teflon sheath,

(C) bringing the unit into a dry box having a dry and inert argon atmosphere,

(D) placing a short section of coiled steel spring into the opening of the Teflon sheath,

(E) inserting into the Teflon sheath a rod of the soft alkali metal with its diameter slightly smaller than the inside diameter of the Teflon sheath and its length slightly longer than the depth of the opening so that rotation of the rod of



the soft alkali metal forces the self-tapping screw to thread into the rod of the soft alkali metal until the steel spring is sufficiently compressed against the stainless steel core,

(F) measuring the ohmic resistance between the stainless steel core and the inserted rod of the soft alkali metal with a multimeter to ensure that a good electric contact is provided to the rotating disk electrode of the soft alkali metal,

(G) placing the bottom end of the Teflon sheath containing a small amount of excess soft alkali metal into the cavity of an aluminum electrode holder and pressing the entire unit axially until the soft alkali metal expands to completely fill the opening of the Teflon sheath, and

(H) removing the rotating disk assembly from the electrode holder, and removing the excess soft alkali metal on the bottom end of the Teflon sheath by polishing on a carborundum paper.

4,696,104

METHOD AND APPARATUS FOR PLACING AND ELECTRICALLY CONNECTING COMPONENTS ON A PRINTED CIRCUIT BOARD

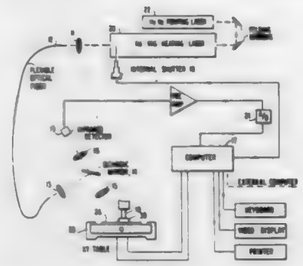
Riccardo Vanzetti, Brockton, and Ashod S. Dostoomian, Stoughton, both of Mass., assignors to Vanzetti Systems, Inc., Stoughton, Mass.

Division of Ser. No. 742,178, Jun. 7, 1985, abandoned. This application Aug. 12, 1986, Ser. No. 895,633

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—840 **2 Claims**

1. A method for placing, soldering and inspecting components and soldered connections on a printed circuit board at a single work station, comprising the step of: automatically transferring electronic components from supply means to a printed circuit board by using mechanical transfer means; providing each component to be soldered with at least one point having solder material contact holding each component to be soldered in position on said circuit lowed by said mechanical transfer means; injecting thermal energy into said solder material by using laser means, while each electronic component is held in position on said circuit board by said mechanical transfer means, thereby liquifying the solder material at each contact point; detecting infrared radiation emitted from the



solder material injected with thermal energy by using infrared detector means, thereby determining the instant said solder material has been melted at each contact point, thereby providing a signal for turning off the laser means turning off said laser means turning off said laser means when said solder material has melted; and comparing the signal provided by the infrared detector means with a standard ideal signal stored in a memory, thereby determining if a fault is present in the solder joint.

4,696,105

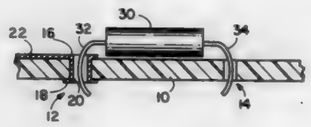
MOUNTING METHOD FOR ELECTRICAL COMPONENTS HAVING CONNECTIONS BOTH ON AND OFF A CIRCUIT BOARD

Edward F. Breya, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 30, 1986, Ser. No. 925,849

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—840 **1 Claim**



1. A method for mounting an electrical component having at least one connection to be made to a circuit board and at least one connection to be made to a terminal off the circuit board, comprising the steps of:

machine inserting the components such that a first lead passes through a first opening in the circuit board and a second lead passes through a second opening in the circuit board, wherein only the first opening has metallic material adjacent thereto;

flow soldering the circuit board such that the first lead is bonded to the metallic material adjacent the first opening while the second lead remains unbonded;

raising the unbonded second lead from the second opening and connecting said second lead to said terminal; and

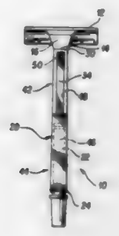
soldering said second lead to said terminal.

4,696,106

SINGLE USE DISPOSABLE MEDICAL RAZOR

Robert J. Cross, Haverhill, and William A. Barabino, 19 Sunset Ave., N. Reading, Mass. 01864, assignors to William A. Barabino, N. Reading, Mass.

Filed Jun. 23, 1986, Ser. No. 877,332
Int. Cl.[4] B26B *21/44*
U.S. Cl. 30—41 6 Claims



1. A single use disposable medical razor comprising

an elongated handle means within which is longitudinally disposed a hollow portion defining a reservoir having inner surfaces extending from a proximate end to a distal end therof,

closure means for the reservoir at the proximate end of the reservoir,

a dispensing orifice at the distal end of the reservoir,

plunger means transversely disposed to the hollow portion of the reservoir and essentially filling generally a first half of the reservoir generally adjacent the proximate end thereof and adapted to move along throughout a length of the second half of the reservoir from about a midportion of the hollow portion to a distal end thereof, the reservoir adapted for storing shaving cream in the second half thereof, the plunger having a projecting face for contacting the shaving cream in the second half of the reservoir,

a race means disposed along an element of the reservoir and extending less than the entire length of the handle from about a midpoint of the hollow portion to the proximate end thereof essentially generally along the first half,

protrusion means extending from the plunger means outwardly through the race means for grasping manually by a user and whereby displacement of the plunger means is by grasping the protrusion means and moving it along the race means and by moving the plunger means into the second half of the reservoir for causing the shaving cream to be dispensed from the dispensing orifice in the distal end,

adhesive tape means closing off the dispensing orificce,

an inclined land molded on one of the inner surfaces of the reservoir at the midportion of the reservoir for locking the plunger against reverse movement after the projecting face overrides the inclined land, thus preventing removal of the plunger from the reservoirs and

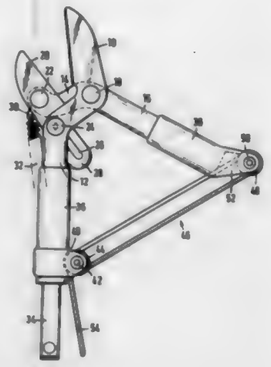
a second inclined land molded on said one inner surface of the reservoir at the furthest point of travel of the projecting face adjacent the dispensing orifice for locking the plunger against reverse movement after the projecting face overrides the second inclined land, thus preventing refilling of the reservoir through the orifice.

4,696,107

PRUNING SHEARS

Peter Held, Betzdorf/Sieg, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 774,069
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1984, 8426495[U]
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—246 8 Claims



1. Pruning shears comprising a pair of levers and a pivot connection between the levers intermediate the lengths of the levers by which the levers are pivotally connected together;

each lever having a first portion extending on one side of the pivot connection and the first portions cooperating to form together a cutting tool adapted for pruning;

each lever having a second portion extending on the other side of the pivot connection forming a pair of handles operable toward and away from each other;

a spring disposed between the shears levers for driving the first portions of the levers apart;

a force multiplying rope-and-pulley connection between the second portions of the levers comprising a pulley on each lever second portion and a rope wrapped around the pulleys; an end of the rope extending to facilitate manual grasping thereof;

a coupling member connected to one of the lever second portions, the coupling member having means to removably secure and position an extension of the one lever forming a manual support for the pruning shears;

a holding plate pivoted to the one lever at the first portion thereof; and which comprises an anvil, the anvil being attached on the holding plate to pivot therewith; the lever opening spring having one end anchored to the holding plate, a pin on the second portion of the one lever arm, the other end of the spring being anchored to the pin on the second portion of the one lever arm.

4,696,108

PRUNING APPARATUS

Gerhard Zerrer, Korb, and Günter Mayer, Untereisesheim, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,512
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3421999
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 4 Claims

1. Portable pruning apparatus for cutting shoots from vines in a vineyard, the apparatus comprising:

a carrier adapted for mounting on the back of an operator;

drive motor means mounted on said carrier;

a handle for holding the apparatus when cutting vegetation therewith, said handle having a first end portion facing toward said drive motor means and a second end portion facing away from said drive motor means;

a wand-like guide tube mounted to said handle unit at said second end portion thereof and having an outer end facing away from said second end portion;

a connecting tube connected between said drive motor means and said first end portion;

said guide tube and said handle conjointly defining a rigid unit freely rotatable about an axis through said guide tube with respect to said connecting tube;

elongated and flexible torque transmitting means disposed in said guide tube and said connecting tube for transmitting torque from said drive motor means to said outer end of said guide tube;

an outer shaft rotatably journalled in said outer end of said guide tube and connected to said torque transmitting means for rotation therewith;

knife means mounted on said output shaft so as to permit rotation of said output shaft relative to said knife means;

a slip coupling interposed between said output shaft and said knife means for transmitting rotational torque to said knife means up to a predetermined limit torque thereby restricting the cutting action of said knife means to the removal of

said shoots and protecting the vine against damage by said knife means;

a circular cover having a peripheral edge and a first diameter, said cover being interposed between said outer end and said knife means;

said knife means having an outermost tip defining an outermost cutting circle of a second diameter;

said second diameter being greater than said first diameter thereby defining a cutting ring directly adjacent said peripheral edge; and,

said cover being a single cover and being fixedly attached to said output end so as to cause said peripheral edge adjacent said cutting ring to be clearly visible by the operator thereby facilitating the placement of said peripheral edge at the shoot to be cut from the vine;

said drive motor means being an internal combustion engine; and,

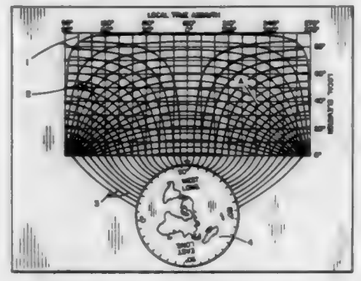
a safety arrangement for starting said engine, said starting arrangement including a starter mounted on said carrier; a starter cord extending from said starter; and, mounting means for guiding said starter cord so as to permit the latter to be pulled only by the operator with the left hand and only in the downward direction while the carrier is mounted on the back of the operator.

4,696,109

SATELLITE LOCATOR

John H. Whaley, Jr., 1019 E. 36th Pl., Tulsa, Okla. 74105

Filed Oct. 3, 1985, Ser. No. 783,459
Int. Cl.[4] G01C *21/02*
U.S. Cl. 33—1 B 1 Claim



1. An apparatus for determining the azimuth and elevation angles from a known location on the surface of the earth to points in geostationary earth orbit comprising:

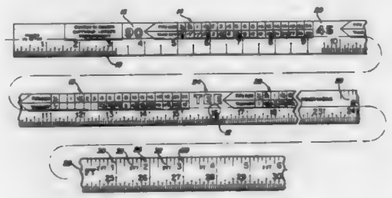
a sheet of suitable material imprinted with a mercator projection grid of true azimuth versus elevation lines with superimposed curves corresponding to geostationary orbital points as calculated from various earth latitudes and superimposed curves corresponding to equal orbital longitude points with an attached rotatable circular dial with markings representing earth longitudes which is appropriately placed to cooincide with the equal orbital longitude curves which extend from said mercator projection grid to the periphery of said circular dial.

4,696,110

PIPEFITTERS TAPE MEASURE

Don W. Walker, and Lynn Rush, both of Santa Fe, Tex., assignors to Billy J. Hawkins, Sr., Frienswood, Tex., a part interest

Filed Jun. 6, 1986, Ser. No. 871,889
Int. Cl.[4] G01B *3/10*
U.S. Cl. 33—137 R 1 Claim



1. A pipe fitter's measuring tape strip having a front surface marked adjacent one edge with first measuring indicia along the entire length of the strip, and along an opposite edge adjacent a leading first end portion of the strip with separate end to end take-off charts extending lengthwise of the strip providing information respectively for different pipe fittings, said opposite edge of said front surface being marked with further measuring indicia along a second portion of the length of the strip following the first end portion having said charts thereon, said strip measuring a number of feet in length, said first measuring indicia including cumulative inch markings along the length of the strip with selected inch markings repeated at 16″ spaces

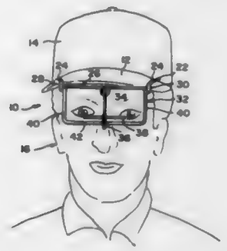
being distinctively marked, said further indicia including cumulative footage markings at the respective footage intervals, and inch markings from one to eleven between each footage marking, said further indicia markings also including total footage marks between selected inch marks, each of said take-off charts comprising an identifying mark at one end thereof, a lengthwise column of pipe size marks, and an adjacent registering column of corresponding take-off marks, the opposite surface of said strip is marked with respective charts located end-to-end and providing information of different size pipe flanges related to different pipe sizes with the most frequently used charts being located at a leading end portion of the strip.

4,696,111

DEVICE FOR ASSESSING INCLINATION

Richard O. Gardner, 419 Marin Ave., Mill Valley, Calif. 94941

Filed May 5, 1986, Ser. No. 859,375
Int. Cl.[4] G01C *9/12*
U.S. Cl. 33—262 **7 Claims**



1. A viewing device which can be optionally used by a golfer or the like for assessing transverse inclination of terrain, comprising

base means for attachment to a cap, hat or headpiece worn by the golfer or other wearer,

a vertical plumb element supported on the base means in front of the wearer for pivotal movement about an axis parallel to the wearer's sight line of the terrain,

a horizontal sighting element affixed to the vertical plumb element perpendicular both to the plumb element and its pivotal axis whereby the wearer may view selected terrain relative to the horizontal sighting element and rapidly assess transverse inclination of the terrain,

hinge means interconnecting the base means and vertical plumb element for permitting selective movement of the vertical plumb element and horizontal sighting element out of the wearer's sight line, and

retainer means for selectively maintaining the plumb element and sighting element out of the wearer's sight line.

4,696,112

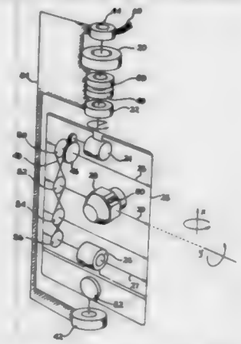
BORE HOLE NAVIGATOR

George J. Hoffman, Malibu, Calif., assignor to Condor Pacific Industries, Inc., Canoga Park, Calif.

Filed Sep. 5, 1986, Ser. No. 903,608
Int. Cl.[4] G01C *19/16;* **E21B** *47/022*
U.S. Cl. 33—304 **6 Claims**

1. A bore hole navigator comprising

a two axis platform for lowering down a bore hole on a cable with its longitudinal axis parallel to the local bore hole direction, said two axis platform having an outer gimbal, bearing supported on the outer gimbal axis for rotation about the longitudinal axis of said platform, and an inner gimbal axis orthogonal to said outer gimbal axis, said inner gimbal axis having multiple axis segments spaced along the longitudinal axis of said platform and each bearing supported on said outer gimbal, a first said inner gimbal axis segment having a two axis gyro mounted thereon with its spin axis orthogonal to the respective inner gimbal axis segment, a first gyro sensitive axis parallel to the respective inner gimbal axis segment and a second gyro sensitive axis orthogonal to the spin axis and the first gyro sensitive axis, a second said inner gimbal axis segment having a pitch torquer thereon operative to provide a controllable torque about the respective inner gimbal axis segment, a third said inner gimbal axis segment having a pitch resolver thereon operative to measure rotation of the respective inner gimbal axis segment with respect to said outer gimbal, said first, second and third inner gimbal axis segments being coupled to rotate together, said outer gimbal having a yaw torquer thereon to provide a controllable torque about the outer gimbal axis, and a yaw resolver thereon to measure rotation of the outer gimbal about the outer gimbal axis, said outer gimbal also having a single axis accelerometer therein having its sensitive axis orthogonal to said outer gimbal axis and said inner gimbal axis segments.

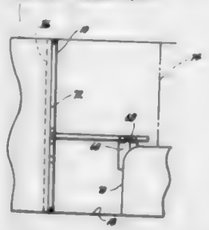


4,696,113

APPARATUS FOR LOCATING THE OUTLINE OF AN ACCESSORY IN DRY WALL OR A DECORATIVE PANEL

George Rice, 120 Stevens Dr., Apt. 104, Ypsilanti, Mich. 48197

Filed Sep. 30, 1985, Ser. No. 781,344
Int. Cl.[4] G01B *5/14*
U.S. Cl. 33—562 **1 Claim**



1. A method for defining the location of an accessory on a wall with respect to a first panel having a vertical edge attached to a vertical wall stud and transferring the location to a second panel to be mounted on the wall adjacent the first panel, comprising the steps of:

tacking a vertical arm to the vertical wall stud along a line defined by the vertical edge of the first panel such that one end of the vertical arm is adjacent either the upper or lower horizontal edge of the first panel;

locating a horizontal arm, connected to the vertical arm, in a position adjacent the accessory;

locating a template, connected to the horizontal arm, such that the template engages the accessory;

locking the horizontal arm to the vertical arm;

locking the template to the horizontal arm;

removing the locked vertical and horizontal arms and template from the vertical wall stud and mounting same on the second panel such that the vertical arm is mounted along a first edge of the second panel, and said one end of the vertical arm is disposed adjacent a second edge of the second panel so that the template is located in a position on the second panel corresponding to the position of the accessory with respect to the first panel;

forming an outline of the accessory on the second panel;

removing a portion of the second panel defined by said outline to form an opening for receiving the accessory; and

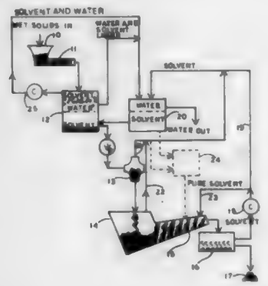
installing the second panel on the wall with the first edge of the second panel attached to the stud such that the opening in the second panel receives the accessory.

4,696,114

METHOD AND APPARATUS FOR THE DRYING OF SOLID MATERIALS BY DISPLACEMENT

Leonard A. Duval, 207 Harmon Rd., Aurora, Ohio 44202

PCT No. PCT/US84/01617, § 371 Date Jul. 10, 1986, § 102(e) Date Jul. 10, 1986, PCT Pub. No. WO86/02434, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 10, 1984, Ser. No. 890,144
Int. Cl.[4] F26B *5/16*
U.S. Cl. 34—9 **22 Claims**



1. A method for displacing a first liquid, said first liquid surrounding and wetting finely divided particulate matter, by a second liquid immiscible with said first liquid and having a substantially lower boiling point than said first liquid, said method comprising

heating said wetted finely divided particulate matter to a temperature between the boiling points of said first liquid and of said second liquid; and

admixing said heated wetted finely divided particulate matter with a sufficient quantity of said second liquid to displace said first liquid from said finely divided particulate matter, causing said second liquid to boil in the vicinity of said finely divided particulate matter.

4,696,115

METHOD AND APPARATUS FOR DRYING WET PARTICULATE MATERIAL TO A PREDETERMINED UNIFORM MOISTURE CONTENT

Paul F. Spadafora, Lagrangeville, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jul. 22, 1986, Ser. No. 887,328
Int. Cl.[4] F26B *3/06*
U.S. Cl. 34—43 **22 Claims**

1. A method for the drying of wet particles in a particle bed in a drying oven, said particles having an average surface temperature rising during a first drying phase, remaining substantially constant during a second drying phase and again rising during a third drying phase, said method comprising the automatically performed steps of:

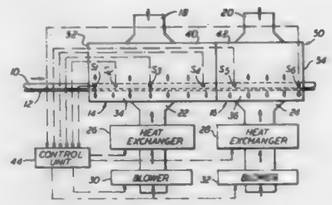
supplying drying air to the oven;

measuring a first average temperature of a group of wet particles in said oven at a first instant during a drying operation;

measuring a second average temperature of said group of wet particles at a second instant subsequent to said first instant during said drying operation, said first and said second instant occurring during the first drying phase;

measuring a third average temperature of said group of wet particles at a third instant subsequent to said second instant, said third instant occurring during said second drying phase;

measuring a fourth average temperature of said group of wet particles at a fourth instant subsequent to said third instant, said fourth instant occurring during said third drying phase;



calculating a difference between said first and said second average temperature;

calculating a difference between said third and said fourth average temperature;

comparing each of the calculated differences with a respective predetermined value; and

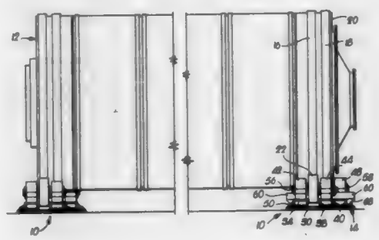
modifying a parameter of the drying operation in response to a detected deviation between either of the calculated differences and the respective predetermined value, whereby at a termination of said drying operation the moisture content of a dried product is substantially uniform despite variations in moisture content of the product at a beginning of said drying operation.

4,696,116

MOUNTING STRUCTURE FOR ROTARY DRUM DRYER

Andrew D. Livingston, Independence, Kans., assignor to Guaranty Performance Co., Inc., Independence, Kans.

Filed Jun. 23, 1986, Ser. No. 877,531
Int. Cl.[4] F26B *25/02*
U.S. Cl. 34—108 **4 Claims**



1. Mounting structure for use in rotationally supporting an elongated, substantially horizontally oriented, cylindrical body having a vertical plane of symmetry through the rotational axis thereof, said mounting structure comprising:

first and second proximal, juxtaposed, continuous annular tracks fixedly secured to said body, said tracks each presenting an outer engagement face;

first track support means contacting said first track face on a first side of said vertical plane for rotatably supporting

said first track, said first support means being the sole rotational support for said first track; and

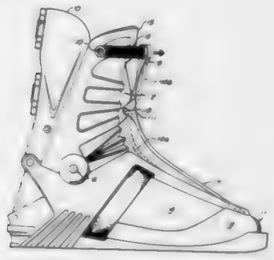
second track support means contacting said second track face on a second opposed side of said vertical plane for rotatably supporting said second track, said second support means being the sole means of rotational support for said second track.

4,696,117

SPRING STRUCTURE FOR SKI BOOT

Marco T. Ottieri, 148 Bridge St., Manchester, Mass. 01944

Filed Oct. 10, 1986, Ser. No. 917,910
Int. Cl.⁴ A43B *5/04*
U.S. Cl. 36—117 **9 Claims**



1. In a ski boot having a base element providing at least sole, toe, and instep portions,

means forming a leg cuff hingedly secured to said base element for supportingly engaging at least the calf and shin of a wearer,

a forward lean control element coupled between said base element and said cuff, said forward lean control element including elongate resiliently-flexing spring means having an intermediate portion joining first and second end portions,

coupling means on said cuff for coupling said first end portion of said spring means to said cuff, and

coupling means for coupling said second end portion of said spring means to said toe portion

the improvement comprising hinge means for hingedly connecting said intermediate portion of said spring means to said cuff,

so that a first portion of said spring means resiliently flexes between said first end portion and said hinge means, and a second portion of said spring means resiliently flexes between said hinge means and said second end portion.

4,696,118

DESK CALENDAR

Carroll N. Cross, 1104 E. Lakeview Cir., Altamonte Springs, Fla. 32714

Filed Dec. 2, 1985, Ser. No. 803,147
Int. Cl.⁴ G09D *3/04*
U.S. Cl. 40—120 **9 Claims**

1. A display mount comprising:

first, second, third and fourth panels, each having a plurality of edges;

the first panel being hinged to the second panel with a flexible hinge between one edge of the first panel and one edge of the second panel and the second panel being hinged to the third panel with a flexible hinge between one edge of the third panel and a second edge of the second panel and the third panel being hinged to the fourth panel with a ductile hinge material between one edge of the fourth panel and a second edge of the third panel, the first and second panels being of substantially the same length and the third panel being of a shorter length then the first and second panels and the fourth panel being of shorter length then the first, second and third panels, whereby the fourth panel can be bent on its bendable hinge relative to the



third panel when the first and second panels are folded to lay on the fourth panel for displaying in one position and the first panel can be supported in an upright position with its edge on the third panel in a second displaying position, and the first and second panels can be folded for reference or writing upon; and

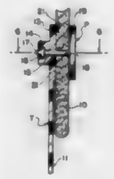
polymer banding material banded around said first panel and said banding material supporting a plurality of sheets to said first panel.

4,696,119

ANIMAL IDENTIFICATION DEVICE AND APPLICATOR THEREFOR

Steven R. Howe, Longmont, and Phillip D. Howe, Berthoud, both of Colo., assignors to An-Tech International Livestock Products, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 402,910, Jul. 29, 1982, abandoned. This application Aug. 8, 1984, Ser. No. 638,983
Int. Cl.⁴ G09F *3/00*
U.S. Cl. 40—301 **16 Claims**



1. An animal identification tag for use with an attachment device having a stem surmounted by a generally conical member and having means for penetrating an ear or other portion of an animal for attaching said tag to said portion of said animal, comprising:

a body having at least one area on which indicia may be placed;

a socket extending laterally from said body and having a well adjacent the outer end of said socket, said body and socket having a hole communicating with said well and through which said generally conical member of said attachment device may be moved, after penetration of said animal with the side thereof opposite said socket being adapted to abut said portion of said animal; and

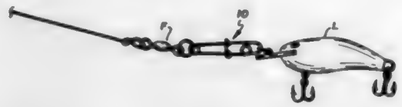
a plurality of passageways formed by an undulating configuration of the surface of said side of said tag opposite said socket for permitting a flow of outside air to the area of said animal around said stem of said attaching device with said side of said tag opposite said socket abutting said portion of said animal.

4,696,120

FISHLINE SNAP CONNECTOR

Donald R. Schroeder, Rte. 3, Box 54, Amery, Wis. 54001

Filed Feb. 13, 1987, Ser. No. 14,728
Int. Cl.⁴ A01K *91/04*
U.S. Cl. 43—44.83 **8 Claims**



1. A snap connector for connecting lures to fishing lines and the like, said connector including:

a. a wire of predetermined length and of a material to provide a spring force tending to return the wire to a straight condition;

b. a first spring loop formed in said wire to provide a pair of arms;

c. a first of said arms being substantially shorter than the second of said arms and being provided with a formed hook on the ultimate end thereof;

d. the second of said arms providing a second spring loop spaced from said first spring loop with a portion of said second arm extending beyond said second loop; and,

e. said second arm extending portion providing an engagement area to receive said hook of said first arm and further providing a formed second hook on the ultimate end thereof to engage with the length of said second arm intermediate said first and second spring loops.

4,696,121

FISHING LURE BREAKAWAY CLIP

Bradley W. Hernden, 20488 Poinciana, Redford, Mich. 48240

Continuation-in-part of Ser. No. 589,228, Mar. 14, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,311
Int. Cl.⁴ A01K *91/04*
U.S. Cl. 43—17.2 **10 Claims**



1. A breakaway clip connected between a fishing lure and hook, said fishing lure connected to a fishing line, said clip comprising:

a formed wire member having a substantially straight center section with first and second loop portions extending from opposite ends of said straight center section, said loop portions having a section which is positioned in close proximity to said center section, said loop portions terminating in curled ends which diverge from said center section, whereby said curled ends enable said clip to be attached to said hook and said lure by sliding said hook or lure along said center section and contacting said curled ends, thereby deflecting said loop portions and permitting said hook or lure to be retained by said loop portions, and said clip formed from wire stock of a diameter which is selected to cause said clip to fail at a predetermined repeatable release load level which is substantially less than the failure release load level of said fishing line attached to said lure such that said clip fails by plastic deformation when said predetermined load level is reached, enabling said lure to be retrieved.

4,696,122

FISHING ROD HOLDER/CARRIER

Jad D. Van Der Zyl, 1140 NE. 51st Ave., Des Moines, Iowa 50313

Filed Mar. 9, 1987, Ser. No. 23,573
Int. Cl.⁴ A01K *97/10*
U.S. Cl. 43—21.2 **10 Claims**



1. Apparatus for holding fishing poles comprising:

a first shaft having a first longitudinal axis;

a second shaft having a second longitudinal axis disposed substantially parallel to said first longitudinal axis;

first clip means attached to one end thereof to said first shaft and at the other end thereof to said second shaft for holding a lower portion of a fishing rod;

second clip means attached at one end thereof to said first shaft and at the other end thereof to said second shaft for holding an upper portion of a fishing rod, said second clip means being spaced from said first clip means;

first support means attached to one end of said first and second shafts;

second support means attached to the other end of said first and second shafts;

a first pair of substantially parallel legs operatively attached, one to each end of said first support means, said first pair of substantially parallel legs being transversely disposed with respect to said first and second longitudinal axes of said first and second shafts; and

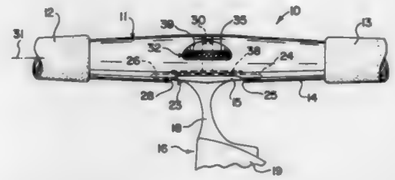
a second pair of substantially parallel legs operatively attached, one to each end of said second support means, said second pair of legs being generally transversely disposed with respect to said first and second longitudinal axes of said first and second shafts.

4,696,123

REEL MOUNT FOR A FISHING ROD

Joe B. Bailey, Jr., Lexington, S.C., assignor to Shakespeare Company, Columbia, S.C.

Filed Aug. 27, 1982, Ser. No. 412,203
Int. Cl.⁴ A01K *87/06*
U.S. Cl. 43—22 **8 Claims**



1. In the handle of the fishing rod, a reel mount comprising:

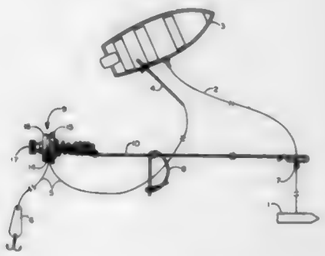
a gripping portion, said gripping portion having a smoothly contoured exterior gripping surface and a hollow interior cavity into which the foot of a reel may be received; an aperture penetrating said gripping surface, the dimensions of said aperture permitting the foot of the reel to be button holed therethrough; a fixed seating surface within said cavity at the longitudinal extremities of said aperture; a pressure plate received within said cavity in opposition to said aperture; and, adjusting means to translate said pressure plate and thereby releasably to clamp the reel foot between said pressure plate and said seating surface.

4,696,124

DOWNRIGGER FISHING LINE RELEASE APPARATUS

Mark E. Wille, 133 Seager Dr., Oconomowoc, Wis. 53066

Filed Jul. 14, 1986, Ser. No. 885,175
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—43.12 **1 Claim**



1. Downrigger fishing line release apparatus comprising a primary fishing line loop release apparatus wherein the improvement comprises:
(a) secondary fishing line release apparatus consisting of primary fishing line release wire and
(b) secondary line release eye
(c) freely slidable on said primary fishing line release wire, and
(d) secondary line release loop on one leg of said line release eye, and
(e) secondary line release leg of said line release eye extending through said secondary line release loop, and
(f) secondary line release loop to flex beyond the end of secondary line release leg when force is applied outward by fishing line at site of line release loop.

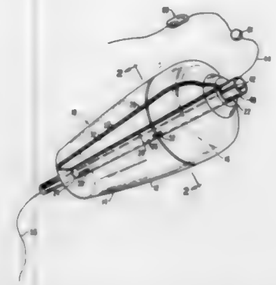
4,696,125

CASTING FLOAT WITH LINE STOP

Walter Rayburn, P.O. Box 892, Loveland, Colo. 80539-0892

Filed Jun. 18, 1982, Ser. No. 390,130
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—43.14 **3 Claims**

1. A fishing float that comprises:
a hollow shell that has openings at respective opposite ends thereof;
a slit formed longitudinally in the wall of said shell;
a tube longitudinally extending internally of said shell and joined to said shell at opposing ends to define an open path from one of said openings to the other;
means defining generally-radial parallel-spaced walls that extend from corresponding margins of said slit through the wall of said tube;
a conduit sized and formed to fit frictionally within said tube, the interior diameter of said conduit accommodating a slip-fit upon a fishing line;
accepting means defined longitudinally in the wall of said conduit for admitting said line from said slit into the interior of said conduit, permitting captivation of said line within said conduit upon misalignment of said accepting means relative to said slit;
an aperture defined in the wall of said tube intermediate said



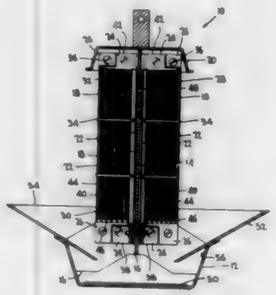
openings, said aperture serving as a vent to allow water to flow into or out of the interior of said shell but said aperture being closed by said conduit upon fitting of the latter in place within said tube.

4,696,126

METHOD OF TRAPPING FLYING INSECTS

Roger H. Grothaus, and Donald W. Hildebrandt, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 607,371, May 7, 1984. This application May 1, 1986, Ser. No. 858,416
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 **4 Claims**



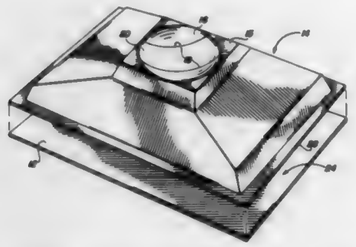
1. A method for trapping flies and flying insects of comparable size, comprising:
making available to the flying insects a trap which comprises an array of substantially parallel exposed conductors, means below the array for receiving and holding insects, means adjacent the array for directing downwardly flying insects into contact with the receiving-and-holding means, and means for periodically generating opposing pulsating charges and delivering such charges to adjacent pairs of the conductors;
applying no charge to the adjacent pairs of conductors so as to allow flying insects that are attracted to the trap to alight on adjacent pairs of the conductors; and
operating the pulsating-charge means so as to deliver to the exposed conductors charges having about 25 to 40 volts peak and a frequency of about 60 to 600 Hz, thereby causing the flies that have alighted on adjacent pairs of the conductors to be subjected to a less-than-lethal shock which causes the conductor-alighted flies to fly in a generally downward direction into the insect receiving-and-holding means via the flying insect-directing means.

4,696,127

CONTAINER FOR CAPTURING INSECTS

Nathan F. Dobbs, P.O. Box 1075, Ormond Beach, Fla. 32074

Filed Dec. 22, 1986, Ser. No. 944,185
Int. Cl.[4] A01M *1/14*
U.S. Cl. 43—121 **10 Claims**



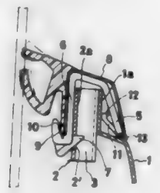
1. A sealable container for capturing insects comprising:
(a) a base member having:
(i) an upper side;
(ii) a lower side; and
(iii) a peripheral edge which borders said upper and lower sides;
(b) a top portion attachable to said base member, wherein said top portion defines a hollow cavity and comprises:
(i) a lower edge which is attachable to the upper side of said base member along the peripheral edge; and
(ii) ingress means openable and closeable for allowing insects to enter the hollow cavity when opened and for preventing insects from exiting the hollow cavity when closed;
(c) attachment means for securing the lower edge of said top portion to the upper side of said base member along the peripheral edge thereof; and
(d) adhesive means placed at least on the upper side of said base member for trapping insects within the hollow cavity when said top portion is attached to said base member.

4,696,128

DEVICE FOR SECURING MOLDING OF AUTOMOBILE DOOR

Kunihiro Fukuhara, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Jan. 29, 1986, Ser. No. 823,680
Claims priority, application Japan, Feb. 5, 1985, 60-14223[U]
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—492 **4 Claims**



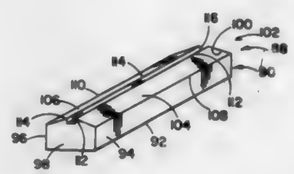
1. A clip for securing molding of an automobile door to a marginal portion of the door presenting opposite surfaces facing outwardly and inwardly with respect to the interior of the automobile, said clip being of substantially channel-shaped downwardly open sectional profile and including outer and inner legs connected by a web, said inner and outer legs having free ends distal the web for embracing said marginal portion and overlapping said outwardly and inwardly facing surfaces, said inner leg integral with a resilient lock pawl extending inwardly from said inner leg for engaging a complementary edge on said inner surface for securing said inner leg with respect to said marginal portion, the outer leg having an inner projection projecting obliquely inwardly from the free end of the inner surface of the outer leg toward said web and terminating in a free end, and the inner projection having a further portion extending from the free end of the inner projection outwardly toward and adjacent to the inner surface of the outer leg and being located for engaging between and contacting both said outer leg and said outwardly facing surface of the door marginal portion for preventing detachment of the clip from the door marginal portion when the clip is fully assembled with the door marginal portion.
2. The clip in claim 1 in combination with the marginal portion of an automobile door and a window molding having a substantially channel-shaped sectional profile open downward, said molding further having a hook shaped portion provided along its outer lower surface engaging the free end of the outer leg of the clip, and a pawl shaped portion provided along its inner lower surface engaging with a folded hook located along the free end of the inner leg of the clip.

4,696,129

HONING DEVICE

Timothy A. Roberts, 824 Linlawn Dr., Wabash, Ind. 46992

Continuation of Ser. No. 613,896, May 24, 1984, abandoned. This application May 27, 1986, Ser. No. 867,614
Int. Cl.[4] B24D *15/06*
U.S. Cl. 51—214 **7 Claims**



1. A honing device for simultaneously engaging a plurality of discrete broadhead blades equally spaced circumferentially about and radiating outwardly from a common ferrule and the cutting edge of each blade tapering relative to a longitudinal axis of the the common ferrule, the device comprising:
a base;
an upper portion integral with said base and including two spaced-apart planar honing surfaces, each having an adjacent edge, and disposed relative to one another so that each of said spaced-apart honing surfaces engages one of said discrete broadhead blades along substantially the entire length of its cutting edge so as to abrade the engaged cutting edge of said blades in a direction that is not parallel to the cutting edge upon the longitudinal movement of the common ferrule; and
means, disposed between said adjacent edges of said honing surfaces, for accommodating the unobstructed travel of the ferrule as said spaced-apart honing surfaces engage said discrete broadhead blades to hone said engaged blade surfaces upon relative longitudinal movement between said honing surfaces and broadhead blades wherein said accommodating means includes a channel having a pair of opposite upstanding walls, said channel being dimensioned so that the ferrule does not contact either upstanding wall upon relative longitudinal movement between said honing surfaces and broadhead blades.

4,696,130

METHOD OF PROFILING AND DRESSING GRINDING WHEELS

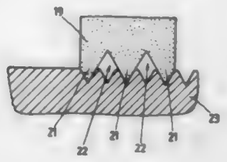
Heinz Beithle, Aichwald, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1986, Ser. No. 901,774

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3531044

Int. Cl.⁴ B24D *18/00*

U.S. Cl. 51—293 **2 Claims**



1. A method of profiling and dressing a grinding wheel, for the grinding of external threads with a diamond roll having a profiling rib, comprising the steps of using the rib of the roll to provide the periphery of the wheel with a first groove, withdrawing the rib from the first groove, moving the roll in paralleliam with the axis of the wheel, and using the rib to provide the periphery of the wheel with a second groove.

4,696,131

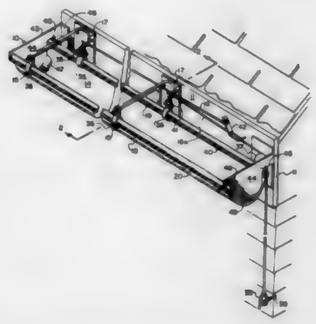
EAVES RAIN GUTTER

Robert Z. Schreffler, 12817 Richmond St., Chester, Va. 23831

Filed Oct. 3, 1986, Ser. No. 914,919

Int. Cl.⁴ E04D *13/00*

U.S. Cl. 52—11 **6 Claims**



1. An eaves rain gutter for mounting upon fascia of a building comprising:

(a) an elongated flexible trough having first and second parallel stiffened edge extremities, the first edge extremity being held in fixed horizontal position, and the second edge extremity being movably held in a horizontally disposed water-holding state at an elevation adjacent said first edge extremity and causing said trough to have a sling-like configuration, said second edge extremity being capable of falling freely by gravity to a dumped state wherein the trough is disposed as a vertically oriented substantially flat sheet pendantly supported by aid first edge extremity,

(b) a plurality of supporting brackets attachable to said fascia and configured to hold said first edge extremity in a fixed horizontal position, and hold said second edge extremity in a releasible horizontal position,

(c) a plurality of tether lines interactive with said second edge extremity at horizontally spaced sites thereof and adapted to raise said second edge extremity from its position in the dumped state to its position in the water-holding state,

(d) anchoring means for maintaining said tether lines in a fixed position in the water-holding state of the rain gutter, and

(e) guide means which slidably engage said tether lines in a manner causing an angular directional change of the tether lines permitting movement of said tether lines in horizontal and substantially vertical directions, whereby

(f) force applied to said tether lines in their horizontal directions causes said second edge extremity to be raised from said dumped state to said water-holding state.

4,696,132

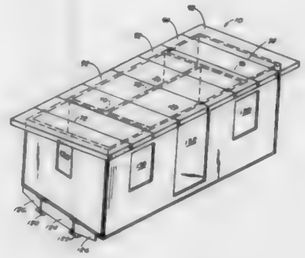
FOLDABLE SHELTER SYSTEM AND METHOD OF CONSTRUCTION

J. T. LeBlanc, P.O. Box 17501, Baton Rouge, La. 70893

Continuation of Ser. No. 725,626, Apr. 22, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 907,573

Int. Cl.⁴ E04B *1/344*

U.S. Cl. 52—69 **3 Claims**



1. A foldable shelter, comprising:

a. a substantially rectangular floor portion;

b. a plurality of wall portions hingedly attached to said floor portion movable between horizontal positions along said floor portion to upright vertical positions for supporting a roof thereupon;

c. corner post members for interconnecting the adjoining edges of the wall portions when the wall portions are in the vertical upright position, the corner post members further including an internal channel for housing electrical conduit between the roof and the floor portion;

d. means on said floor portion for accommodating a plurality of interior wall portions;

e. means on exterior wall portions for interconnecting said exterior wall portions to said interior wall portions; and

f. roof means, including a plurality of panels interconnectable so that a pair of vertically disposed lip members interlock in a first position with a substantially horizontally disposed lower member positioned within a mating position in a horizontal groove, and further providing means positioned between the members to form a fluid tight seal therebetween.

4,696,133

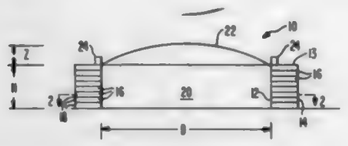
BUILDING WITH COVERED INTERIOR OPEN SPACE

Michael Wren, Rushville; Paul W. Lantz, Columbus; George W. Acock, Jr., Columbus, and James A. Rhodes, Columbus, all of Ohio, assignors to James A. Rhodes & Associates, Columbus, Ohio

Continuation-in-part of Ser. No. 541,212, Oct. 12, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 822,491

Int. Cl.⁴ F04B *1/342*

U.S. Cl. 52—80 **12 Claims**



1. A building system having enclosed building units surrounding a dome-covered open space, said building system comprising an annular structure having an annular inner wall, an annular outer wall, and a plurality of interior walls, said walls defining said building units, with an open space located within said inner wall; a dome roof covering the open space; said inner wall having a surface area Aw and a thickness Lw and being formed of a material having a coefficient of thermal conductivity Kw and said roof having a surface area Ar and a thickness Lr and being formed of a material having a coefficient of thermal conductivity Kr such that KwAw/Lw=-KrAr/Lr, thereby providing improved climate control, including minimizing heat loss or gain, and so minimizing power requirements for atmospheric control within the building and open space.

4,696,134

DEVICE FOR MARKING OUT LAND

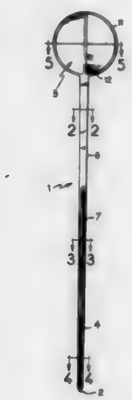
Robert Neaume, Bourpeuil-le Vigeant, 86150 l'Isle Jourdain, France

Filed Jul. 1, 1986, Ser. No. 881,056

Claims priority, application France, Jul. 9, 1985, 85 10500

Int. Cl.⁴ E01F *9/02*

U.S. Cl. 52—103 **5 Claims**



1. A device for marking out land, in particular agricultural land, said device comprising a stake of flexible plastics material including a stem which has a point at a lower end thereof and which is extended at an upper end thereof by a marker head formed integrally with said stem, said stem having an upper region integral with said marker head and a lower region including said point and adapted to be driven into the ground, said upper region being less rigid than said lower region, said lower region of said stem having a cross-shaped section defined by a first arm extending longitudinally of said stem up to said marker head with a gradually increasing width in the direction of said marker head, and a second arm which crosses said first arm in section and which tapers out at least in the vicinity of said marker head.

4,696,135

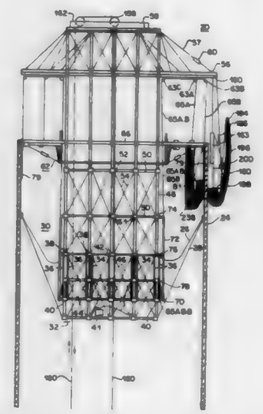
METHOD AND APPARATUS FOR CONSTRUCTING TOWERS

Franz Kallinger, Greenwich, Conn., and Mark E. Killion, Paris, Ill., assignors to Custodis-Cottrell, Inc., Branchburg, N.J.

Filed Mar. 25, 1986, Ser. No. 843,720

Int. Cl.⁴ B06C *23/62*

U.S. Cl. 52—121 **20 Claims**



1. A derrick for use in the construction of a tower, which derrick may be suspended from the tower by cable means, the derrick having:

an upper part and a lower part, one of which may be vertically extended relative to the other to vary the vertical dimension of the derrick;

pulley means for automatically maintaining an item which is suspended from the derrick at a constant elevation when the derrick is extended, and for raising the item when the derrick is retracted,

said pulley means comprising:

cable means attached to the item;

at least one first pulley suspended from a relatively high point on the upper part of the derrick through which the cable means suspends the item from the derrick and through which the cable means is turned downwards;

a post attached to a bottom of the upper part of the derrick and extending down past the bottom of the upper part and past a top of the lower part of the derrick;

a second pulley on a lower part of the post which turns the cable means form the pulley toward the top of the lower part of the derrick; and

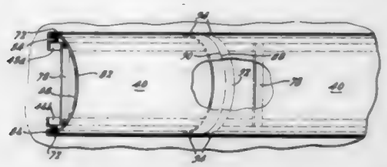
an attachment point at the top of the lower part of the derrick to which the cable means is attached.

4,696,136

SIMULATED PIPE CONSTRUCTION

Ronald E. Grewe, Novi, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Aug. 11, 1986, Ser. No. 895,452
Int. Cl.⁴ E04B *1/00*
U.S. Cl. 52—222 **44 Claims**



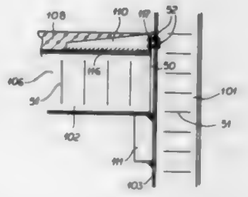
1. A simulated pipe construction for attaching to a building having a plurality of corner defining faces comprising:
first and second pipe sections for attaching to two of said corner defining faces;
each pipe section having a first elongated and flexible panel having first and second edges in the longitudinal dimension and third and fourth edges in the transverse dimension;
each pipe section having at least one holding means having first and second edge securing means in spaced relation to one another for holding said first and second edges of said panels in said holding means;
said first and second edge securing means being closer together than the transverse dimension of said panel, so that said panel assumes an arc shaped configuration when held along said first and second edges by said holding means;
a spring force generated in said panel upon insertion such that said spring force is outwardly exerted against said holding means for holding said first and second longitudinal edges in said holding means;
corner means for attaching between two of said corner defining faces, said corner means having an arc-shaped exterior geometrically conforming to said arc-shaped configuration of said panel such that said corner means has a longitudinal radius for simulating bending of a pipe around two of said corner defining faces and having means for receiving and joining said third edge of said first pipe section panel and said fourth edge of said second pipe section panel so that said panel sections when so joined lie on lines which intersect one another thereby simulating a pipe extending around a corner of said building.

4,696,137

BEAM-COLUMN JUNCTION

Jean-Baptiste Schleich, Kockelscheuer, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Jan. 29, 1986, Ser. No. 823,598
Claims priority, application Luxembourg, Feb. 1, 1985, 85753
Int. Cl.⁴ E04B *1/00*
U.S. Cl. 52—251 **8 Claims**



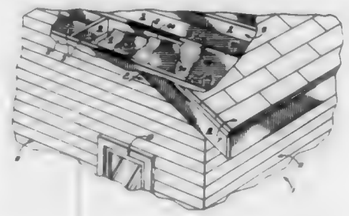
1. In a beam support joint for a column and a beam, in which said column and said beam are each constructed from concrete and at least one metal section having a pair of flanges joined by a web and defining at least one recess, wherein said recess of said metal section is filled with concrete and outer surfaces of said flanges of said metal section are not covered with concrete and are otherwise exposed, the improvement wherein an upper support strap is positioned on an upper flange of said beam, and is attached to said column and said beam to take up tension, and wherein said upper support strap and said webs of both said beam and said column all lie substantially in the same plane and a lower support plate is welded to one of said outer surfaces of one of said flanges of said column for supporting said beam, which has a width, which substantially corresponds to the width of said flange of said column onto which said lower support plate is welded, said upper strap being provided with a cover plate at said column, and the attachment of said cover plate with said flange of said column is enabled by at least one threaded bolt.

4,696,138

INSULATION CONFIGURATIONS AND METHOD OF INCREASING INSULATION EFFICIENCY

Christopher A. Bullock, 3321 Pines Rd., Shreveport, La. 71119

Continuation-in-part of Ser. No. 577,525, Feb. 6, 1984. This application Jan. 4, 1985, Ser. No. 688,876
Int. Cl.⁴ E04B *2/00*
U.S. Cl. 52—407 **15 Claims**



1. An insulation configuration for attic floors comprising a layer of non-solid insulation material adjacent said attic floor and at least one moisture vapor-permeable film means positioned horizontally over said insulation material and exposed to the air, whereby air circulation into said insulation material from the attic is reduced.

14. A method for increasing the efficiency of a non-solid insulation layer adjacent the floor of an attic comprising installing at least one sheet of moisture-vapor permeable film horizontally over said insulation layer and exposed to the air in the attic, to reduce air circulation into said insulation.

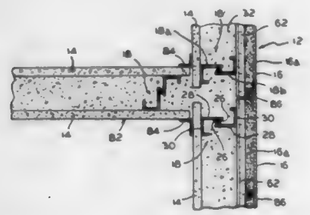
4,696,139

MODULAR STRUCTURE, STUD THEREFOR, AND METHOD OF CONSTRUCTION

Donald L. Kiselewski, 4705 Holly Dr., Palm Beach Gardens, Fla. 33410

Division of Ser. No. 470,160, Feb. 28, 1983, Pat. No. 4,551,961. This application Sep. 11, 1985, Ser. No. 774,668
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.⁴ E04B *2/00*
U.S. Cl. 52—426 **4 Claims**

1. A wall system formed of an inner and outer panel supported by a perforated stud to define a cavity therebetween, comprising:
a first portion of said perforated stud to which said inner panel is adapted to be secured without exposed fasteners and a second portion of said perforated stud to which said outer panel is adapted to be secured without exposed fasteners, said first and second portions of said perforated stud being substantially identical to one another, each of said first and second portions of said perforated stud having a mounting flange with a web extending therefrom, said web of said first portion of said perforated stud extending toward said outer panel and said web of said second portion of said perforated stud extending toward said inner panel after said inner and outer panels have been secured to said first and second portions to form said wall, said first and second portions of said perforated stud having respective engagement means at the ends of said webs remote from said mounting flanges and being relatively movable toward and away from one another for assembling said inner and outer panels into the form of said wall after said inner and outer panels have been secured to said first and second portions of said perforated stud, at least



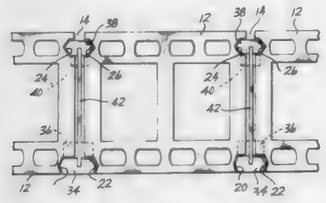
one of said webs of said first and second portions of said perforated stud being perforated inwardly of said inner and outer panels and outwardly of said engagement means within said cavity, said cavity being adapted to receive concrete to force said respective engagement means into firm engagement by applying an outwardly directed force to said inner and outer panels after assembly into the form of a wall, said perforated web accommodating the flow of concrete therethrough to permanently interlock and encase said first and second portions of said perforated stud;
whereby said inner and outer panels of said wall can be permanently maintained in space apart relationship by a preselected distance to form a rigidized modular structure.

4,696,140

CONNECTOR GUIDE SYSTEM FOR CONSTRUCTION WALLS

Robert H. Marshall, 22811 Orville Rd. East, Orting, Wash. 98360

Continuation-in-part of Ser. No. 455,210, Jan. 3, 1983, abandoned. This application Aug. 9, 1985, Ser. No. 764,431
Int. Cl.⁴ E04B *2/20, 1/02*; E04C *1/10*
U.S. Cl. 52—442 **7 Claims**



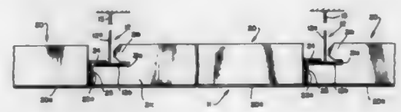
1. A wall construction, comprising:
a plurality of blocks, each having an exterior face and an interior face, and two ends, and two vertical notches formed in each end of the block, one adjacent the exterior face and the other adjacent the interior face;
a plurality of connector guides, one at each end of each block, each connector guide comprising:
a pair of vertically extending guide members, one for each notch, each said guide member having a portion which fits into its notch, and each including a lower end platform leg which projects laterally below a portion of the block adjacent the notch,
tie means interconnecting the two guide members;
said connector guides positioning the blocks to provide a substantially true alignment of the blocks and also spacing the blocks apart both vertically and horizontally by amounts to provide substantially uniform mortar joint spaces between the blocks;
wherein the tie means for each connector guide comprises an upper connector rod member having end portions embedded in the upper ends of the guide members and a lower connector rod member having end portions embedded in the lower ends of the guide member, and
wherein the ends of the rod members are bent to extend longitudinally of the guide members.

4,696,141

SUSPENDED CEILING HAVING A CONCEALED SUSPENSION GRID AND LAY-IN METAL PANELS SUPPORTED THEREON

Martin Nassof, Cliffside Park, N.J., assignor to Simplex Ceiling Corp., Hoboken, N.J.

Filed Jun. 19, 1986, Ser. No. 875,944
Int. Cl.⁴ E06B *3/54*
U.S. Cl. 52—484 **4 Claims**



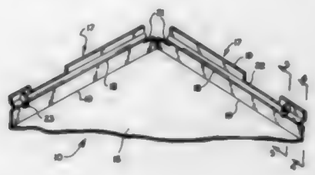
1. A suspended ceiling system for a room, which comprises a plurality of inverted T-shaped members suspended from the structural ceiling of the room and extending across the room; each said T-shaped member having a horizontal base portion;
a plurality of open metal ceiling panels having opposed first and second side walls, opposed first and second end walls and a bottom wall;
said first side wall of a said panel having a flange projecting therefrom in a direction away from said second side wall, said flange being parallel to and spaced from said bottom wall;
said end walls of a said panel having first and second ends adjacent said first and second side walls, respectively, said end walls having a lower portion integral with said bottom wall and an upper portion spaced from said lower portion at said end wall second end to define an open slot in each said end wall parallel to and spaced from said bottom wall, the opening of each said slot facing said second side wall, said upper portion being set back from said lower portion at each end wall second end;
said panels being supported by said inverted T-shaped members with the flange of a said panel resting on and supported by one side of the horizontal base portion of a said T-shaped member while the other side of said horizontal base portion is received in the slots of the end walls of an adjacent abutting panel; and said first side wall of a said panel having a plurality of longitudinally spaced apart detents formed therein and projecting in a direction away from said first side wall and said second side wall having a plurality of open notches therein spaced apart such that the detents of a said panel will be received in the notches of an adjacent abutting panel, and wherein said detents have upper and lower portions relative to said bottom wall, said upper portion being planar and substantially perpendicular to said first side wall; whereby the joints between adjacent panels are aligned.

4,696,142

SUSPENSION CEILING WITH SNAP-UP PANELS

David F. Mieyal, Strongsville, and Gerald L. Koski, Parma, both of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Sep. 26, 1986, Ser. No. 911,773
Int. Cl.[4] E04B *5/57*
U.S. Cl. 52—762 **9 Claims**



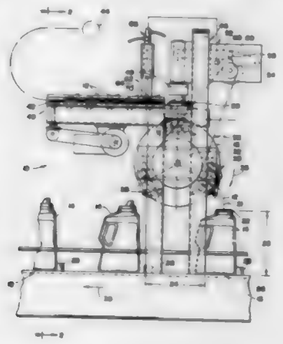
1. A snap-up pan for installation in suspension ceiling grids formed of runners intersecting to provide openings surrounded by lips, comprising sheet metal providing a planar portion and laterally extending flanges surrounding said planar portion, said flanges providing a rib therein extending lengthwise of the associated flange, and detents substantially adjacent to the ends of each flange aligned with said ribs, said detents extending laterally with respect to said flanges in the same direction as said ribs beyond the extremities thereof, the lower side of said detents blending into the lower side of the associated of said ribs, said ribs and detents being operable to snap over adjacent of said lips to support said pans on said adjacent lips in said opening, said detents being operable to provide a supporting connection with said lips which compensates for variations in spacing between said lips adjacent to the corners of said openings.

4,696,143

CONTAINER CAPPING APPARATUS

William P. Young, Southfield, Mich., assignor to William P. Young Co., Farmington, Mich.

Filed May 6, 1986, Ser. No. 860,084
Int. Cl.[4] B67B *5/00, 3/22;* **B65B** *7/28*
U.S. Cl. 53—289 **20 Claims**



1. An apparatus for installing caps on containers having an open neck, the opening in the neck having a central axis, comprising:

a first conveyor for sequentially, individually delivering a plurality of containers to and through a predetermined work station position along a direction of conveyance;

a means for individually positioning a cap in registration with a container neck at said predetermined work station position and for depressing the cap against the open neck of the container;

wherein said positioning and depressing means includes a carriage having an axis of rotation and having means for receiving at least one of said caps at a circumferential position of said carriage;

means for rotatably supporting said carriage in a fixed position at said work station position so that its axis of rotation is aligned perpendicular to said direction of conveyance and perpendicular to the central axis of the opening in the neck, and wherein the axis of rotation is spaced along said central axis so that a proximate carriage position closest to said conveyor positions a cap received in said receiving means for seating engagement with the container neck; and

means for rotating said carriage about its axis so that the tangential velocity of the proximate carriage position closest to said first conveyor is in the same direction as said direction of conveyance;

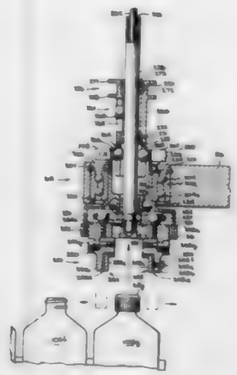
wherein said carriage includes means for deflecting at least a portion of said neck as said receiving means approaches said proximate carriage position.

4,696,144

CONTAINER CAPPER AND TORQUE TESTER

Geza E. Bankuty, and LeRoy F. Byron, both of Easton, Conn., assignors to New England Machinery, Inc., New Haven, Conn.

Filed Oct. 29, 1986, Ser. No. 924,861
Int. Cl.[4] B67B *3/20;* **B65B** *7/28*
U.S. Cl. 53—331.5 **25 Claims**



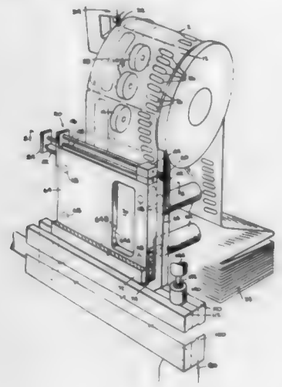
1. Apparatus for grasping and rotating container caps, comprising a rotatable head member, jaw members movably carried by said head member and movable between a first position, at which the jaw members grasp a container cap with a predetermined gripping force, and a second position, at which the jaw members release the container cap, means for moving said jaw members between said first and second positions, means for rotating said head member at a predetermined speed, means for selectively changing the predetermined speed of rotation of said head member to thereby selectively change the torque with which the cap is tightened onto a container, and means coupled between said rotating means and said jaw members and responsive to changes in torque on said jaw members for correspondingly changing the gripping force of said jaws on said cap in response to said torque change.

4,696,145

AUTOMATIC CONTAINER STUFFING APPARATUS AND METHOD

Richard Schmidt, Ambler, Pa., and Joseph A. Pizzo, Cherry Hill, N.J., assignors to Enviro-Spray Systems Incorporated, Hoboken, N.J.

Filed Jan. 13, 1984, Ser. No. 570,376
The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.
Int. Cl.[4] B65B *1/24*
U.S. Cl. 53—436 **71 Claims**



1. Apparatus for inserting flexible sheet products into containers, each of said products comprising an expandable pouch for pressurizing a container, said pouch including burstable means for generating pressurizing gas within said pouch, said apparatus comprising:

first plate means disposed at a first location;

second plate means disposed at the first location extending parallel to and adjacent said first plate means and spaced apart therefrom, said sheet products being received between said first and second plate means;

actuating means for relatively moving said first and second plate means toward each other so as successively to compress said flexible sheet products to burst said burstable means;

means for deforming said sheet products into an elongate shape, said deforming means being disposed at a second location spaced away from said first location whereby said compressed sheet products must move from said first location to and second location to be deformed; and

means for successively inserting said deformed sheet products into the containers.

4,696,146

PACKAGING MACHINES

Friedrich D. Esch, Andover, and John G. Price, Bishop's Waltham, both of United Kingdom, assignors to AMF Incorporated, Minneapolis, Minn.

PCT No. PCT/GB85/00308, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00596, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 11, 1985, Ser. No. 849,502
Claims priority, application United Kingdom, Jul. 12, 1984, 8417813; Aug. 2, 1984, 8419705; Nov. 15, 1984, 8428908; Nov. 15, 1984, 8428909
Int. Cl.[4] B65B *43/28, 63/02, 43/12*
U.S. Cl. 53—529 **13 Claims**

1. A packaging machine comprising

(a) an intermittently rotatable pouch filling turret having a plurality of pouch receiving stations;

(b) a pouch supplier;

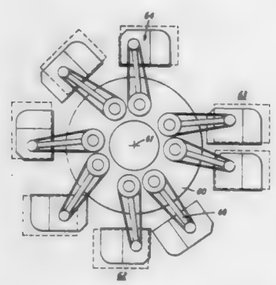
(c) a pouch transfer unit for taking empty pouches in sequence from said pouch supplier and delivering the pouches in pairs to a first receiving position of the filling turret, said pouch transfer unit

(i) including a central hub,

(ii) an even number of arms pivoted on said hub on a pitch circle concentric with the rotary axis of the hub,

(iii) a set of clamping plates at the distal ends of each of the arms, and

(iv) means for causing an oscillatory movement of said arms during rotation of the hub and relative change in angular acceleration and deceleration between pairs of



said arms whereby the clamping plates receive the pouches in sequence at a pouch receiving position and deliver adjacent pairs of pouches to said first receiving position of the filling turret,

(d) means for supplying material to be packaged in measured portions to said turret at a second receiving position of said turret,

(e) means for discharging the measured portions from the turret into said pouches in pairs, and

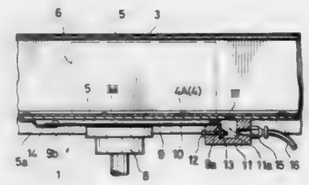
(f) a pouch take-off device for taking off the pairs of filled pouches at a delivery position of said turret.

4,696,147

FILM TUBING DEVICE FOR USE IN PACKAGING APPARATUS

Chuji Noh, Sakai, Japan, assignor to Tokiwa Kogyo Co., Ltd., Japan

Filed Dec. 19, 1986, Ser. No. 943,932
Int. Cl.[4] B65B *9/06*
U.S. Cl. 53—550 **6 Claims**



1. A film tubing device for use in a packaging apparatus, comprising:

a tube former arranged in a transfer path of a continuous length of a heat-meltable film having a pair of longitudinal side edges,

said former including an inner former member on which said film is wrapped with said side edges overlapping each other,

said former further including an outer former member having a longitudinal outlet through which said overlapping side edges project out,

a pair of longitudinal sealers disposed adjacent to said longi-

tudinal outlet as slightly spaced from said outer former member for nipping said overlapping side edges,

at least one of said sealers being heated for heat-sealing said overlapping side edges together,

a thin air guide plate arranged between said outer former member and at least said one of said sealers to define a clearance between said guide plate and said outer former member, and

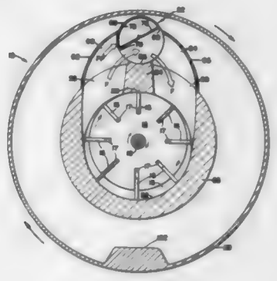
air supplying means for feeding cooling air into said clearance.

4,696,146

HYDRAULIC POWER TRANSMISSION SYSTEM

R. Lyle Brace, P.O. Box 2785, Gulfport, Miss. 39505

Filed Jan. 18, 1985, Ser. No. 692,714
Int. Cl.[4] F16D *39/00*
U.S. Cl. 60—489 7 Claims



1. A fluid continuously variable transmission system, comprising, a combination:

a body forming a chamber,

rotor means positioned in said chamber and rotatably movable relative to said body,

a power input shaft connected to said rotor means,

valve means connected to said body and movable between fully open and fully closed positions and a plurality of intermediate positions therebetween, said valve means comprising a rotary plug valve including a valve seat, said plug valve being rotatably connected to said body, and said valve seat being connected to said body,

said body forming high pressure channel means between said chamber and said valve means and low pressure channel means between said valve means and said chamber,

said chamber, said high pressure channel, and said low pressure channel being filled with a fluid capable of exerting fluid pressure against said valve means, said valve means being capable of passing said fluid to create a closed fluid circuit with said chamber and said high and low pressure channel means,

said rotor means pressuring said fluid from said chamber to said valve means wherein when said valve means is in said fully closed position, said fluid pressure causes said valve means and said body to rotate with the rotational speed of said input shaft; wherein when said valve means is in said fully open position, said fluid passes through said valve means to said chamber and said body is immobile relative to said input shaft and said rotor means; and wherein when said valve means is in any of said intermediate positions, a first portion of said fluid applies pressure against said valve means and a second portion of said fluid passes through said valve means to said chamber, the relation between said first and second fluid portions being proportional to the degree of closing of said valve means,

a power output shaft,

means for connecting said body with said output shaft;

support means at said input shaft and said output shaft for rotatably supporting said body, and

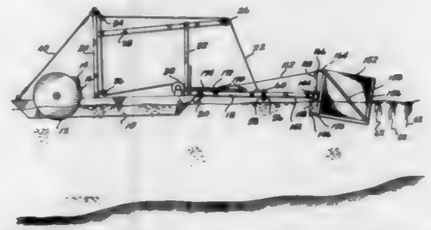
control means connected to said body for adjusting said valve means between said open and closed positions in accordance with torque requirements of said output shaft, wherein the speed of said output shaft can be varied relative to the speed of said input shaft in a plurality of speed ratios between a ratio of one-to-one and a ratio of one and a preselected multiple of one, respectively.

4,696,149

AQUATIC WEED CONTROL METHOD AND APPARATUS

James L. Hawk, 22435 SE. 288th, Kent, Wash. 98031

Filed Sep. 27, 1985, Ser. No. 780,919
Int. Cl.[4] A01D *44/00*
U.S. Cl. 56—8 4 Claims



1. An apparatus for removing aquatic plants from a body of water comprising:

a floating hull;

an elongate boom pivotally attached at a first end thereof to a forward end of said hull;

rigging means associated with said hull and said boom for raising and lowering said boom about said point of pivotal attachment of said boom to said hull;

a first implement for mounting on a second end of said boom, said first implement including a drag bar oriented transversely to said boom;

implement-mounting means associated with the second end of said boom constructed and arranged to removably connect an implement to said boom;

a second implement, said second implement constructed and arranged for attachment to said boom by said implement-mounting means in the absence of said first implement, said second implement including a scoop of foraminous material, one side of said scoop being open to receive weeds and a second side closed to provide resistance to said weeds to keep them in said scoop, said second implement further including an auxiliary boom in line with said elongate boom, a first end of said auxiliary boom being adapted to be connected to said elongate boom by said implement-mounting means and a second end of said auxiliary boom having said scoop pivotally mounted thereto, said scoop being movable between the normal position and a dumping position; and

pivot control means associated with said elongate boom and said scoop and operable to move said scoop between said normal and dumping positions, said pivot control means including a cable attached at a first end thereof to said scoop and a second end of the cable being attached to a block and tackle, said block and tackle being associated with a hydraulic actuator mounted on said elongate boom such that the input side of said block and tackle is connected to one end of a piston movably mounted in said hydraulic actuator, said actuator and said block and tackle cooperably connected such that a movement of one unit of linear measure by said piston is amplified by said block and tackle to cause a movement of greater than one measuring unit by said first end of said cable.

4,696,150

POWER MOWER WITH BLADE-BRAKE CLUTCH

Joseph S. Geeck, III, 6355 Jefferson Hwy., Harahan, La. 70123

Filed Apr. 23, 1982, Ser. No. 371,235
Int. Cl.[4] A01D *69/10*
U.S. Cl. 56—11.3 4 Claims



1. In a power mower operated by an operator who walks behind it, the mower having a wheeled body, a gasoline engine mounted on the body, a rotatable shaft driven by the engine, rotatable grass-cutting means adapted to be driven by power from said shaft, and an upstanding handle for grasping by the operator to guide the mowing, the improvement wherein said power mower further includes:

(a) a centrifugal cluth interposed between said drive shaft and said cutting means;

(b) a manually actuatable engine control associated with said handle and connected so that upon and during actuation the control enables the engine to be operated at a predetermined rate of speed at least high enough for the centrifugal clutch to engage, and upon termination of such actuation of the control, it causes the engine to operate at a predetermined rate of speed at least low enough for the centrifugal clutch to disengage; and

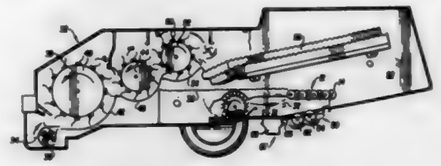
(c) brake means including a V-groove drum that rotates with the grass-cutting means, as well as a V-belt sized to fit the V-groove but fixed so that it cannot rotate with the groove, said brake means being connected to the control and to the grass-cutting means to stop rotation of said cutting means concurrently with the disengagement of the centrifugal clutch when the control is not actuated, the engine control including a governor system comprising a pivotable governor arm linked to a carburetor throttle control and to a spring that urges said arm toward a position wherein the carburetor throttle control is at a setting causing the engine to operate in a preselected normal clutch-engaging operating speed range, and the engine control further including a push-pull actuator cable moveable in response to manual actuation and termination of manual actuation of said control by the operator, and a pivotal lever linked to said push-pull actuator cable and positioned so that (i) upon manual actuation of said engine control by the operator said cable causes said lever to release from said arm so that the force of said spring moves said arm to a position wherein the carburetor speed control is at a setting causing the engine to operate in a preselected normal operating speed range, and (ii) upon termination of manual actuation of said engine control by the operator said actuator cable causes said lever to apply a force upon said arm overriding the force of said spring and to force said arm against the urging of said spring to a position wherein it holds the carburetor speed control at a setting causing the engine to operate in a preselected low speed or idle range.

4,696,151

SEPARATOR SYSTEM FOR PEANUT COMBINE

Oliver K. Hobbs, Suffolk, Va., assignor to Hobbs-Adams Engineering Company, Suffolk, Va.

Filed Oct. 2, 1985, Ser. No. 783,133
Int. Cl.[4] A01F *12/44*; A01D *41/00*
U.S. Cl. 56—14.6 16 Claims



1. A peanut combine having means for lifting peanut-carrying vines from the ground and a series of means for thrashing the peanuts from the vine, a screen below the last thrashing means which will permit peanuts to fall therethrough and retain vine remnants, and means downstream of said last thrashing means for separating the peanuts from associated foreign material, said separating means comprising:

a disk separator having a plurality of parallel shafts mounted for rotation in a generally horizontal plane;

each shaft carrying a plurality of disks spaced along its length, with the distance between adjacent shafts and the spacing of the disks along adjacent shafts being such that the disks interdigitate to form a plurality of openings between adjacent disks of a size and shape which will permit a peanut to pass therethrough and the space between each disk periphery and the adjacent shaft defining a close fit so that a peanut cannot pass therethrough;

means for driving said shafts so that they all rotate in the same direction; and

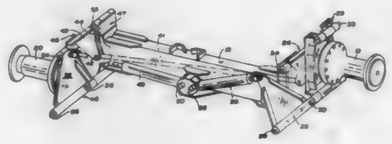
blower means for directing a stream of air to pass upwardly and rearwardly through said disk separator, said stream of air being of a velocity to carry lightweight foreign material up and away from the disk separator so that it does not pass therethrough, but permitting passage of peanuts through the openings.

4,696,152

APPARATUS FOR LEVELING A COMBINE

Jon E. Kinzenbaw, R.R. 1, Box 184, Williamsburg, Iowa 52361

Filed Sep. 20, 1985, Ser. No. 778,532
Int. Cl.[4] A01D *41/12, 75/28*
U.S. Cl. 56—209 9 Claims



1. In an agricultural implement having a frame with an axle, apparatus for maintaining said axle in a generally horizontal disposition, comprising: first and second support wheel means for the left and right side of said axle respectively; first and second wheel linkage means for mounting said first and second support wheel means respectively to the left and right sides of said axle and for maintaining the respective axes of rotation of said wheel means generally parallel to the axis of said axle, said first and second wheel linkage means each comprising a four-bar linkage; synchronizing means for synchronizing the movement of said first and second wheel linkages means such that vertical movement of one of said support wheel means relative to said axle will cause the other wheel linkage means to move

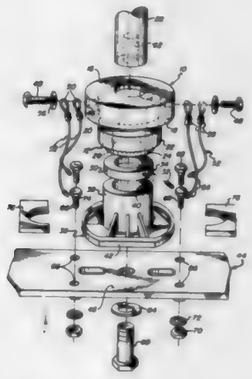
its associated support wheel means relative to said axle substantially the same distance as, but in an opposite vertical direction to the movement of said first support wheel means; and power means connected between said frame and at least one of said wheel linkage means for actuating the same and causing the associated support wheel means to move in a vertical direction relative to said axle for causing said associated wheel means to move vertically relative to said axle.

4,696,153

LAWN MOWER BLADE SAFETY ASSEMBLY

Maurice Bosins, Jr., 124 Audubon Ave., Newington, Conn. 06111

Filed Feb. 5, 1986, Ser. No. 826,306
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—295 **19 Claims**



1. A fail-safe system for the blade of a power-driven rotary lawn mower or the like, comprising:
- a bearing assembly comprised of an attachment member and a hub member journalled therewithin, said assembly having an axial passageway therethrough for slideable and rotatable mounting upon a cylindrical drive shaft;
- a retainer adapted for affixation to the drive shaft adjacent said bearing assembly, said retainer and assembly being so constructed as to permit engagement of said hub member with said retainer, free from interference with said attachment member; and
- means adapted to symmetrically connect said attachment member to a blade mounted upon the drive shaft of a rotary lawn mower with said retainer disposed between the blade and said attachment member.

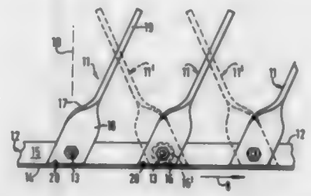
4,696,154

CROP ENGAGING DEVICE AND METHOD

Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 477,872, Mar. 23, 1983, Pat. No. 4,545,188. This application Aug. 7, 1985, Ser. No. 763,222
Claims priority, application United Kingdom, Mar. 26, 1982, 8209019
The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—364 **11 Claims**

1. Apparatus for picking up and conveying grass or other fibrous crop comprising
- a mobile frame for movement over the ground,
- a rotor mounted on the frame for picking up and conveying crop,
- drive means for driving the rotor in rotation in a sense such that the rotor picks up cut crop and carries the crop upwardly and rearwardly over the rotor,
- a housing extending at least around part of the front half of the rotor and forming with the rotor a crop flow passage between the rotor and the housing along which the crop is conveyed by the rotor,
- said rotor having a plurality of crop engaging elements arranged in a series of transverse arrays each of which extends in a direction transverse to the principal direction of crop flow through the apparatus, the axis of rotation of the rotor being transverse to said principal direction of crop flow, and each transverse array being spaced circumferentially from the next succeeding transverse array around the axis of rotation of the rotor,
- each crop engaging element having a principal plane which traverses said principal direction of crop flow and having asymmetrical side edges which, at the crop engaging region of the element, converge towards each other in the outward direction, one of the said edges constituting a principal crop engaging edge which is inclined away from



a plane perpendicular to the rotor axis, the elements of each array being arranged with a number of adjacent elements along the array being similarly inclined in that said principal crop engaging edges thereof are all inclined away from said plane in the same sense, the prevailing sense of inclination of each transverse array being the same as the prevailing sense of inclination of the next succeeding transverse array around the circumference of the rotor, said similarly inclined elements acting on said crop to produce a prevailing alignment of the strands of the fibrous crop generally transverse to said principal direction of crop flow through the apparatus,
- each crop engaging element being unsharpened and being arranged to engage and convey the crop substantially without cutting of the crop, each element being resiliently yieldable upon contact with an abnormal load and being mounted with sufficient stiffness for the elements to be capable of returning after yielding to their undeflected dispositions at least predominantly by virtue of resilience without sole reliance on centrifugal effect.

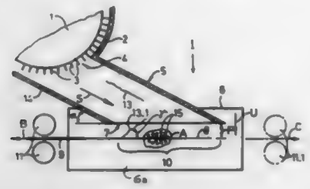
4,696,155

FRICTION SPINNING DEVICE CONTAINING A FRICTION SPINNING MEANS AND METHOD OF USE OF THE FRICTION SPINNING DEVICE

Herbert Stalder, Kollbrunn; Arthur Würmli, Winterthur; Josef Baumgartner, Sirnach, and Emil Briner, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Jun. 16, 1986, Ser. No. 874,522
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3521665
Int. Cl.[4] D01H *1/135, 7/885*
U.S. Cl. 57—401 **13 Claims**

1. A friction spinning device for production of a yarn or the like comprising:
- a perforated friction spinning means having a yarn formation position;
- means defining a pneumatic fiber transport passage for transporting freely-floating fibers onto the friction spinning means for forming said freely-floating fibers into a yarn at said yarn formation position;
- means for withdrawing said formed yarn in a predetermined withdrawal direction;
- said pneumatic fiber transport passage having an opening disposed in a predetermined position relative to said yarn formation position and at a predetermined spacing therefrom;



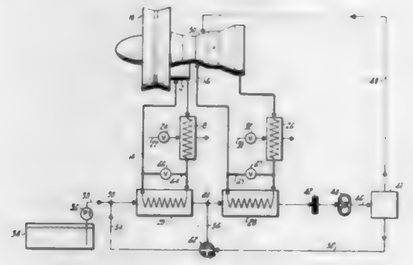
said pneumatic fiber transport passage being inclined to said yarn formation position at an angle substantially between 5° and 90°; and
- the perforated friction spinning means having perforations arranged such that straight lines joining individual ones of said perforations are inclined relative to said yarn formation position in a sense opposite to said inclined pneumatic fiber transport passage and define relative to said yarn formation position an angle substantially between 0° and 90°.

4,696,156

FUEL AND OIL HEAT MANAGEMENT SYSTEM FOR A GAS TURBINE ENGINE

Donald N. Burr, Glastonbury; Paul S. Danilowicz, Manchester; Thomas C. Franz; Thomas P. Mortimer, both of Bolton, and Edward B. Pero, Somers, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 3, 1986, Ser. No. 870,192
Int. Cl.[4] F02C *7/06, 7/224*
U.S. Cl. 60—39.08 **7 Claims**



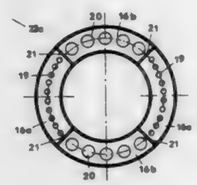
1. A system for transferring heat energy among a heat generating gas turbine engine, a heat generating accessory drive coupled to the gas turbine engine, a stream of fuel flowing at a metered flow rate, and a stream of cooling air, comprising:
- a first oil circulation loop wherein a first flow of oil circulates through the accessory drive, a first air-oil cooler having a first, regulated portion of the cooling air stream also passing therethrough, and a first fuel-oil heat exchanger;
- a second oil circulation loop wherein a second flow of oil circulates through the gas turbine engine, a second air-oil cooler having a second, regulated portion of the cooling air stream also passing therethrough, and a second fuel-oil heat exchanger;
- means for conducting at least a portion of the metered fuel stream, in sequence, through the first fuel-oil heat exchanger, the second fuel-oil heat exchanger, and a main fuel pump, the main fuel pump operating at a fuel delivery rate in excess of the metered fuel flow rate;
- a fuel controller for receiving the fuel flowing from the main fuel pump and dividing the received fuel between a supply stream having a flow rate equal to the metered flow rate, and a bypass stream having a flow rate equal to the excess of the main pump delivery rate over the metered flow rate; and
- means, in fluid communication with the fuel controller and the conducting means, for returning the bypass fuel stream into the fuel conducting means upstream of the main fuel pump at a plurality of distinct locations.

4,696,157

FUEL AND AIR INJECTION SYSTEM FOR A TURBOJET ENGINE

Gerard Y. G. Barbier, Morangis; Gerald J. P. B. Lebouré, Avon; Michel A. A. Desaulty, Vert St Denis; Rodolphe Martinez, Perigny/Yerres, and Jérome Perigne, Vaux le Penil, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", Paris, France

Filed Oct. 15, 1986, Ser. No. 919,126
Claims priority, application France, Oct. 18, 1985, 85 15925
Int. Cl.[4] F02C *3/14*
U.S. Cl. 60—39.23 **9 Claims**



1. In a turbojet engine having a combustion chamber, at least one fuel injector to inject fuel into an upstream end of the combustion chamber, at least one external swirl vane passing air into the combustion chamber to create a turbulent fuel/air mixture, and a first diaphragm control means to modulate the intake air of the external swirl vane, the improved fuel and air injection system comprising:
- (a) a bowl shaped member mounted adjacent to an upstream end of the combustion chamber, the bowl shaped member defining air inlet means, and an impact cooling chamber communicating with the air inlet means and having a downstream wall flaring radially outwardly in the downstream direction;
- (b) a plurality of generally radially extending partitions extending through the cooling chamber and dividing the chamber into a plurality of pairs of sectors, each sector of the pair being located diametrically opposite the other sector of the pair;
- (c) a first plurality of openings defined by the downstream wall and located in a first pair of sectors so as to communicate with the cooling chamber and the combustion chamber; and,
- (d) a second plurality of openings defined by the downstream wall and located in a second pair of sectors so as to communicate with the cooling chamber and the combustion chamber, wherein the sizes of the second plurality of openings are greater than the sizes of the first plurality of openings.

4,696,158

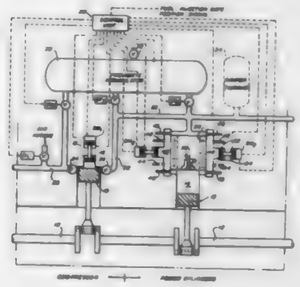
INTERNAL COMBUSTION ENGINE OF POSITIVE DISPLACEMENT EXPANSION CHAMBERS WITH MULTIPLE SEPARATE COMBUSTION CHAMBERS OF VARIABLE VOLUME, SEPARATE COMPRESSOR OF VARIABLE CAPACITY AND PNEUMATIC ACCUMULATOR

Roberto F. DeFrancisco, Cra. 6a. No. 30A-30, 2nd Floor, c/o Ingetec, Bogota, D. E., Colombia

Continuation-in-part of Ser. No. 431,733, Sep. 29, 1982, abandoned. This application Oct. 18, 1985, Ser. No. 789,772

Int. Cl.[4] F02G *1/02*

U.S. Cl. 60—39.62 **3 Claims**



1. An internal combustion engine comprising:

an air compressor of variable capacity, having means to change its clearance volume;

control means, pressure responsive, for regulating the output of said compressor for maintaining constant, at a certain adjustable value, the pressure of the compressed air supplied from said compressor for combustion purposes;

a pneumatic accumulator to store the compressed air from said air compressor during a braking mode of operation when the compressed air is not used for combustion purposes, for subsequent use of the stored compressed air during super power output modes of operation of the engine;

a plurality of combustion chambers of variable volume;

a discharge header coupled to said compressor to convey compressed air to said combustion chambers and having discharge header air duct branches leading to said accumulator;

an air duct to communicate said accumulator with an intake of said compressor;

servovalves provided at said air ducts of the accumulator;

said control means comprising means for: being effective during said braking mode of operation to open one of said servovalves for allowing compressed air to enter said accumulator; being effective during one of said super power output modes of operation to control respective ones of said servovalves for allowing the stored compressed air, when in a sufficiently high pressure range, to exit said accumulator and feed the combustion chambers described herein below; and being effective during other of said super power output modes of operation to control respective ones of said servovalves for allowing compressed air, when in a low pressure range, to exit said accumulator and feed said compressor;

power cylinders of positive displacement, each provided with a reciprocating piston driven by high pressure combustion gases during each power stroke, each of said power cylinders including exhaust valve means, for allowing combustion gases to exit the cylinder during the upstroke of said reciprocating piston, and having inlet openings for allowing high pressure combustion gases to enter the cylinder during power strokes;

said plurality of combustion chambers being located externally of said power cylinders, with at least two of said combustion chambers associated with each one of said power cylinders for supplying combustion gases alternately from said combustion chambers to the respective power cylinder;

fuel injection means with a fuel injection gate and valve means including inlet and outlet valves provided for each of said combustion chambers for allowing compressed air to enter the chamber, to achieve fuel injection and combustion with the inlet and outlet valves closed, and to supply the high pressure combustion gases to the respective power cylinder;

a cylindrical portion with a piston provided in each of said combustion chambers to vary by means of said piston the effective volume of the chamber;

a servomotor-operated mechanism to change the position of said piston of each combustion chamber; and

said control means including means for being made adjustable and responsive to position of the fuel injection gate in said fuel injection means, for commanding said servomotor in order to change by means of said piston the volume of each of said combustion chambers in proportion to the fuel charge injected in the chamber, in this manner maintaining constant the air/fuel ratio at any load or power output of the engine.

4,696,159

GAS TURBINE OUTLET ARRANGEMENT

John J. Horgan, Wethersfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1986, Ser. No. 892,532

Int. Cl.[4] F02K *3/02*

U.S. Cl. 60—226.1 **6 Claims**



1. An engine outlet section for an axial-flow gas turbine engine having a hot core gas flow and a surrounding annular bypass fan air flow, comprising:

an annular flow separator, separating the core gas from the fan air upstream of the outlet section and terminating at a circular trailing edge;

an annular mixer, secured to the trailing edge of the flow separator, the mixer including a plurality of alternately radially inwardly and outwardly extending flow lobes, the outwardly extending lobes having a small radial height relative to the radial height of the fan air flow annulus;

an axial nozzle plug, disposed downstream of the annular mixer and having a diameter increasing with axial downstream displacement to a maximum diameter greater than or equal to the diameter of the trailing edge of the flow separator, said plug diameter decreasing with further downstream axial displacement; and

an outer annular engine fairing, confining the fan air upstream of the convoluted mixer and confining the mixing fan air and core gas flow downstream of the mixer, the outer engine fairing further terminating at a downstream edge at a point axially proximate the maximum diameter of the nozzle plug.

4,696,160

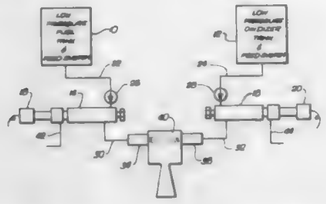
PRESSURE PUMP AND INJECTOR VALVE SYSTEM FOR LIQUID-PROPELLANT ENGINES

Nahum Gat, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 14, 1985, Ser. No. 734,005

Int. Cl.[4] F02K *9/00*

U.S. Cl. 60—258 **3 Claims**



1. A propellant delivery system for use in a liquid-propellant rocket, the system comprising:

a solenoid-actuated high-pressure pump, for delivering bursts of high-pressure liquid propellant obtained from a low-pressure propellant storage tank; and

a pressure-actuated injector valve installed in an inlet nozzle to a rocket engine combustion chamber, and coupled to the pump to receive the bursts of high-pressure liquid propellant, and to atomize the propellant as it enters the combustion chamber;

and in which the high-pressure pump includes

a generally cylindrical pump body having an axial passage through it, an inlet port at one end of the axial passage, for connection to the low-pressure propellant tank, a first outlet port for connecting the axial passage to the injector valve, and a second outlet port for connecting the axial passage with a return line,

a hollow plunger mounted for sliding movement within the axial passage,

a solenoid for moving the plunger axially in a forward stroke in the pump body,

a one-way check valve connected to prevent reverse flow through the inlet port and permit pressure to rise during the forward stroke,

a return spring for moving the plunger in a return stroke in the pump body,

means for coupling the high-pressure fluid within the plunger to the first outlet port during the forward stroke, and

means for venting the high-pressure fluid to the second outlet port at the end of the forward stroke.

4,696,161

CONTROL DEVICE FOR HYDROSTATIC STEERING MEANS

Ivar Rasmussen, Sonderborg, and Poul H. H. Pedersen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

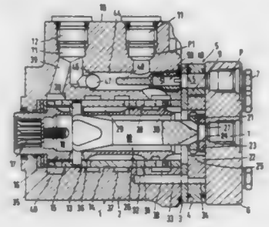
Filed Mar. 3, 1986, Ser. No. 835,570

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507901

Int. Cl.[4] F16D *31/02;* **F01C** *1/02*

U.S. Cl. 60—384 **8 Claims**

1. A hydrostatic power steering unit, comprising, an outer internally toothed ring gear, an inner externally toothed gear being in orbital and rotational engagement therewith, said gears forming compression chambers therebetween upon relative movement between said gears, an end plate on one side of said ring gear in juxtaposition thereto, a valve unit on the other side of said ring gear having a housing in juxtaposition thereto, said cover plate having at the outer surface thereof a fluid inlet pump connection and a fluid outlet drain connection and a pair of motor connections, said housing having a bore which is coaxial relative to said ring gear, valve means including inner and outer sleeve members rotatably mounted in said bore, said sleeve members having a rotational movement therebetween for changing valve settings therebetween to selectively generate directional control pressures in said pair of motor connections, said valve means including cooperating fluid passage means in said housing and said sleeve members and being operable to connect said fluid inlet pump connection selectively to either of said motor connections while connecting the other of said motor connections to said fluid outlet drain connection, said inner sleeve member having coupling means for connection to a steering control member, said externally toothed gear having a central bore, a cardan shaft and coupling



means connecting one end thereof to said outer sleeve member for rotation therewith and the other end thereof to said externally toothed gear for rotational and orbital movement therewith, said ring gear having axially extending bores extending through the teeth thereof, screws for attaching said end plate to said ring gear and said valve housing extending through some of said ring gear bores, said fluid passage means including one of said ring gear bores for providing fluid communication between said fluid supply pump connection and said valve means, and said fluid passage means including two of said ring gear bores for providing fluid communication between said pair of motor connections and said pump and drain connections.

4,696,162

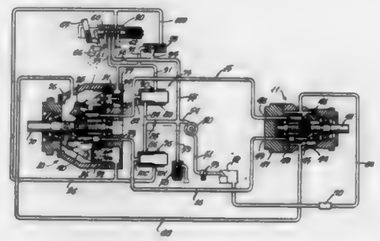
MULTI-FUNCTION VALVE

Keith R. Williams, Nevada, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 610,085, May 9, 1984, Pat. No. 4,617,797. This application Jul. 17, 1986, Ser. No. 886,348

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—433 **7 Claims**



1. A hydrostatic transmission having a pair of hydraulic displacement units connected in a closed loop circuit by a pair of pressure lines with one of the units being of variable displacement and having bypass means, said bypass means comprising, a valve body with a bore and a pair of valve seats, a charge check valve having a poppet valve member associated with one valve seat to block flow between said bore and a first port, a relief valve having a hollow relief valve spool movably positioned within said poppet valve member and having an end

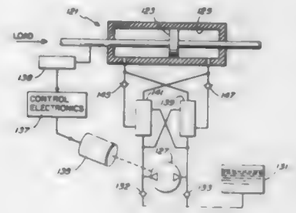
wall abutting a transverse wall of said poppet valve member, a spring acting on said relief valve spool to urge said valve members into abutting relation and the poppet valve member against its valve seat, said poppet valve member having a passage in the transverse wall thereof communicating with said first port, said relief valve spool end wall having an orifice opening to said first port through said transverse wall passage, a charge pressure port in said valve body opening to said bore, passage means in the wall of said poppet valve member connecting the interior of said poppet valve member with the bore exteriorly of the poppet valve member, said relief valve spool blocking said passage means when the valve members are in abutting relation, a servo port, passage means connecting the interior of the hollow relief valve spool with the servo port, a second poppet valve member exposed to pressure in said interior coacting with a poppet seat to close said last-mentioned passage means, an additional relatively heavy spring compared to the spring acting on the relief valve spool for urging the last-mentioned poppet valve member onto its poppet seat, and means for deactivating said additional spring.

4,696,163

CONTROL VALVE AND HYDRAULIC SYSTEM EMPLOYING SAME

J. Robert Glomeau, Dover, Mass., assignor to REXA Corporation, Dover, Mass.

PCT No. PCT/US84/00448 § 371 Date Nov. 16, 1984 § 102(e) Date Nov. 28, 1984, PCT Pub. No. WO 84/03916, PCT Pub. Date Oct. 11, 1984. PCT Filed Mar. 22, 1984.
Continuation-in-part of Ser. No. 479,672, Mar. 28, 1983, Pat. No. 4,557,180, and Ser. No. 479,673, Mar. 28, 1983, Pat. No. 4,625,513. This application Nov. 16, 1984, Ser. No. 674,537
Int. Cl.⁴ F15B *13/04, 9/03*
U.S. Cl. 60—476 **2 Claims**



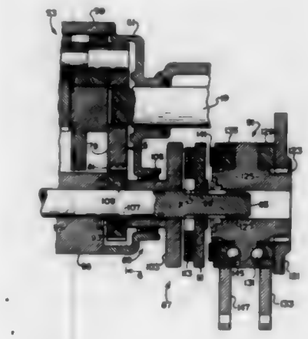
1. A hydraulic system comprising:
a double acting piston and cylinder having first and second ports accessing opposite sides of the piston;
a bidirectional pump;
a pair of flow matching control valves each having a source port, a load port and a pair of drain ports, a hydraulic flow into the source port producing a controlled flow into the load port, the flows exiting through respective drain ports;
means connecting each side of said pump to the source port of a respective control valve;
means connecting the load port of each control valve to a respective one of said cylinder ports;
means connecting the load drain ports of each control valve to the source port of the other control valve; and
check valve means connecting the source drain port of each control valve to the load port of the other control valve.

4,696,164

HYDROSTATIC TRANSAXLE AND LOCKING DIFFERENTIAL AND BRAKE THEREFOR

David W. Giere, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 26, 1985, Ser. No. 769,033
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—485 **16 Claims**



1. A hydrostatic transaxle assembly for use on a vehicle having a source of motive power, a fluid pump driven by said source of power, and a pair of driven wheels; said transaxle assembly comprising manifold means and first and second motor assemblies; said manifold means defining a fluid inlet adapted to be in fluid communication with the fluid outlet of the pump, and a fluid outlet adapted to be in fluid communication with the fluid inlet of the pump, and fluid passage means communicating between said fluid inlet and said fluid outlet of said manifold means, and flowing through said first and second motor assemblies, respectively; each of said first and second motor assemblies including a rotary fluid pressure actuated device and axle means operable to transmit the rotary output of said motor assembly to the respective driven wheel; said fluid pump comprising the sole source of fluid input to both of said first and second motor assemblies; each of said first and second motor assemblies including a housing and a gear set operably disposed between said fluid pressure actuated device and said axle means to transmit the rotary output of said fluid pressure actuated device to said axle means; each of said first and second motor assemblies including a gear member having its axis of rotation fixed relative to said housing of the respective motor assembly and a speed of rotation representative of the speed of rotation of the respective motor assembly; characterized by:

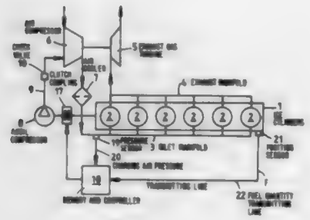
(a) interwheel differential means comprising first and second lock gear members in toothed engagement with said gear members of said first and second motor assemblies, respectively;
(b) said differential means further comprising engagement means operably associated with said first and second lock gear members, and including a single clutch means operable to fix said first and second lock gear members relative to each other; and
(c) actuation means operably associated with said engagement means and selectively operable to move said engagement means between:
(i) a first position in which said first and second lock gear members are free to rotate relative to each other, thus permitting normal differentiation between said first and second motor assemblies and the speeds of the driven wheels; and
(ii) a second position in which said first and second lock gear members are fixed relative to each other, thus preventing said normal differentiation between said first and second motor assemblies and the speeds of the driven wheels.

4,696,165

SUPERCHARGING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Jakob Bucher, Bobingen, Fed. Rep. of Germany, assignor to M.A.N.-B&W Diesel GmbH, Augsburg, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,520
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443324
Int. Cl.⁴ F02B *37/04*
U.S. Cl. 60—609 **8 Claims**



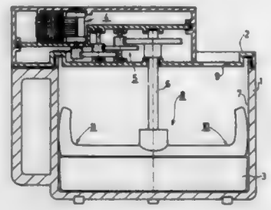
1. Supercharging control system for an internal combustion engine (ICE) (1) having
an exhaust gas turbine (5) driven by exhaust gases from the ICE (1);
a main air compressor (6) driven by the exhaust gas turbine (5) and providing compressed air to an inlet manifold (3) of the ICE (1),
an auxiliary air compressor (8) driven by rotary power derived from the ICE to provide additional air to said main compressor (6);
a controlled clutch (17) drivingly connected to the auxiliary compressor (8) and the ICE (1) to selectively establish or disconnect rotary drive power between the ICE (1) and the auxiliary compressor (8);
fuel quantity sensing means (21) for sensing quantity of fuel being supplied to the ICE (1) and providing a fuel quantity signal (F);
air pressure sensing means (19) coupled to an air inlet (3) of the ICE for sensing charging air pressure and providing an air pressure signal (P);
and comprising ;
a memory and controller (18) coupled to control, selectively, establishment and disconnection of the rotary drive power between the ICE and the auxiliary compressor, and wherein
said memory and controller is coupled to receive the air pressure signal (P) and the fuel quantity signal (F) and storing the relationship between air supply pressure and fuel quantity for desired performance of the ICE;
said memory and controller (18) provides an output signal coupled to and controlling the controlled clutch (17) to obtain said desired performance;
and wherein said main compressor (6) comprises a centrifugal compressor including nozzles (14) positioned about the outer circumference of a chamber within which rotary blades (15) of the centrifugal compressor operate, said nozzles (14) receiving compressed air from the auxiliary compressor (8) and being oriented to apply additional drive power to the main compressor (6).

4,696,166

ICE-CREAM MAKER

Romuald L. Bukoschek, and Reinhard Huszar, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,630
Claims priority, application Austria, Jun. 26, 1985, 1902/85
Int. Cl.⁴ A23G *9/12*
U.S. Cl. 62—136 **6 Claims**



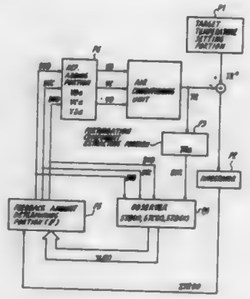
1. An ice-cream maker comprising:
a cylindrical container provided with at least one cooled surface for ice-cream formation, a shaft positioned concentrically within said container, an autosynchronous single-phase electric motor driving said shaft through a gear unit;
a scraper and stirrer tool mounted on said shaft and coacting with the cooled surface, said scraper and stirrer tool including for each direction of rotation of the shaft, at least one section effective substantially in the direction of rotation, said sections positioned symmetrically with respect to a plane of symmetry through said shaft.

4,696,167

AIR CONDITIONER FOR AUTOMOBILES

Katsumasa Matsui; Masahiro Ohba, both of Okazaki; Tohru Kakehi, Nagoya, and Takayoshi Kawai, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

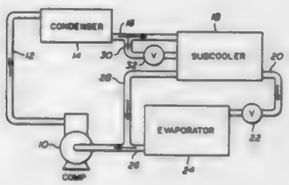
Filed Oct. 18, 1985, Ser. No. 789,013
Claims priority, application Japan, Oct. 19, 1984, 59-220769; Mar. 26, 1985, 60-62714; Mar. 27, 1985, 60-64581; Mar. 27, 1985, 60-64582; Apr. 5, 1985, 60-73198
Int. Cl.⁴ F25D *17/00*; G05B *13/04*
U.S. Cl. 62—180 **19 Claims**



1. An air conditioner for a vehicle, comprising:
(a) air duct means for supplying a vehicle compartment with air;
(b) supply heat quantity controlling means for controlling an amount of heat of the air supplied from said air duct means to said vehicle compartment;

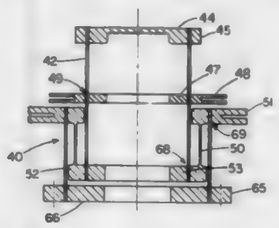
(c) temperature setting means for setting a target temperature for air in said vehicle compartment;
(d) compartment temperature detecting means for detecting an actual temperature of air in said vehicle compartment as a detected compartment temperature;
(e) deviation computing means for computing the temperature deviation of said detected compartment temperature from said target temperature;
(f) temperature perturbation component computing means for computing perturbation components of said detected compartment temperature relative to a reference temperature of said vehicle compartment under a steady air-conditioning state in a dynamic model used for controlling said heat quantity which is predetermined through system identification;
(g) internal state estimating means for estimating an estimated internal state of said dynamic model using said perturbation components computed by said temperature perturbation component computing means;
(h) adjusting amount perturbation component computing means for computing adjusting amount perturbation components of said supply heat quantity controlling means relative to a reference adjusting amount under said steady air-conditioning state in said dynamic model on the basis of said temperature deviation computed by said deviation computing means and said estimated internal state of said internal state estimating means; and
(i) control adjusting amount determining means for determining an adjusting amount of said amount of heat of air on the basis of said adjusting amount perturbation components and said reference adjusting amount.

4,696,168
REFRIGERANT SUBCOOLER FOR AIR CONDITIONING SYSTEMS
Donald R. Woods, and Helga S. Woods, both of Nederland, Tex., assignors to Roger Rasbech, Houston, Tex.
Filed Oct. 1, 1986, Ser. No. 913,919
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—200 **16 Claims**



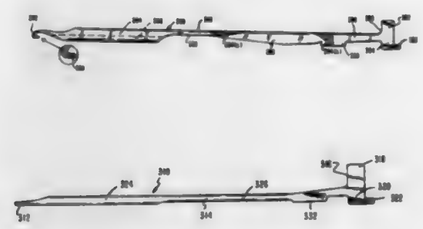
1. In an air conditioning system having a compressor, a first heat exchange means connected to the compressor for receiving refrigerant therefrom, a second heat exchange means connected to the first heat exchange means for receiving liquid refrigerant therefrom; and suction line means between the second heat exchange means and the compressor for routing refrigerant from the second heat exchanger means to the compressor; an improved refrigerant subcooler for at least one of said heat exchange means for supplying subcooled refrigerant thereto, said improved subcooler comprising:
an elongate outer tubular housing having an inlet end and an outlet end for refrigerant to said one of said heat exchange means;
an elongate inner tubular housing positioned within said outer tubular housing in a generally concentric relation to said outer tubular housing and defining an annulus between the outer periphery of said inner housing and the inner periphery of said outer housing, said inner housing having an inlet end and an outlet end in inwardly spaced relation to the respective inlet and outlet ends of said outer housing;
a refrigerant main supply line connected to said inner tubular housing adjacent the inlet end thereof to supply refrigerant to be cooled to said inner tubular housing;
a refrigerant inlet branch line diverging from the main supply line adjacent the inlet end of the inner housing and connected to the inner tubular housing to divert a relatively small portion of the main body of refrigerant from the main supply line to the inner tubular housing for flowing from the inlet end to the outlet end of said inner housing and cooling the main body of refrigerant therein;
an expansion valve in said inlet branch line adjacent the inlet end of said inner housing for vaporizing the refrigerant therein;
means within the inner tubular housing to separate the diverted refrigerant therein from the main body of refrigerant to be cooled during simultaneous flow of the refrigerants in a first pass from said inlet end of the inner housing to the outlet end thereof such that the diverted refrigerant absorbs heat from the main body of refrigerant;
a refrigerant outlet line from the outlet end of said inner housing to said one of said heat exchange means to supply the main body of subcooled refrigerant thereto;
means adjacent said outlet end of the inner housing to direct the diverted vaporized refrigerant being discharged thereat from the inner housing into the annulus between the inner and outer housings for a second reverse pass of the vaporized refrigerant in an opposite direction along the annulus from the outlet end of said inner housing to said inlet end thereof such that the vaporized refrigerant in the annulus absorbs heat from the refrigerant within the inner housing during flow along the annulus; and
outlet line means adjacent said inlet end of said inner housing to conduct the flow of gaseous refrigerant from the annulus to said suction line means for flow to the compressor.

4,696,169
CRYOGENIC SUPPORT MEMBER
Ralph C. Niemann, Downers Grove; John D. Gonczy, Oak Lawn, and Thomas H. Nicol, Aurora, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 15, 1986, Ser. No. 863,492
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **19 Claims**



1. A cryogenic support member for restraining a cryogenic system comprising;
a rod having a depression at a first end, said rod being made of non-metallic material, said non-metallic material having an effectively low thermal conductivity;
a metallic plug; and
a metallic sleeve,
said plug and said sleeve shrink-fitted to the depression in said rod and assembled thereto such that said plug is disposed inside the depression of said rod, said sleeve is disposed over the depression in said rod and said rod is clamped therebetween, the shrink-fit clamping said rod being generated between said metallic plug and said metallic sleeve.

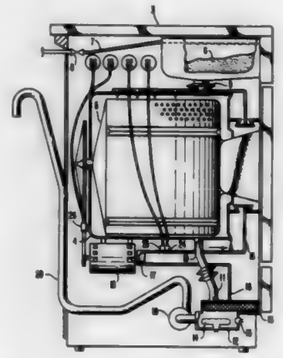
4,696,170
COMPOUND KNITTING NEEDLE
E. C. Tibbals, Jr., Rt. 2, Box 386, High Point, N.C. 27260
Division of Ser. No. 398,303, Jul. 14, 1982, abandoned. This application Nov. 26, 1985, Ser. No. 761,766
Int. Cl.[4] D04B *35/06*
U.S. Cl. 66—120 **21 Claims**



8. A needle element for a compound knitting needle member formed of such needle element and a closing element comprising an elongate body portion having knitting hook means at one terminal end thereof and transversely extending cam butt means at the other terminal end thereof,
said body portion being selectively shaped intermediate said terminal ends to include,
an upper bifurcated segment defining a channel for guiding the path of displacement of said closing element relative to said hook means,
a lower slotted segment sized to accomodate the dependent end portion of said closing element and permit independent longitudinal and transverse displacement of said dependent end portion of said closing element relative thereto, and
an intermediate segment of reduced cross sectional extend sized to permit elastic flexure of the cam butt means containing terminal end relative to said bifurcated segment of said body portion.

4,696,171
LAUNDRY WASHING MACHINE
Piero Babuin, Pordenone, Italy, assignor to Zanussi Elettrodomestici SPA, Pordenone, Italy
Filed Nov. 20, 1985, Ser. No. 799,986
Claims priority, application Italy, Nov. 20, 1984, 45725 A/84
Int. Cl.[4] D06F *37/00*
U.S. Cl. 68—207 **21 Claims**

1. A washing machine comprising:
a wash tub having a basket therein;
a housing positioned below said wash tub and in fluid communication with said wash tub;
at least one heating element provided in said housing;
at least one thermostatic sensor provided in said housing, said at least one thermostatic sensor connected to said at least one heating element for controlling the temperature of washing liquid contained in said housing;
a recirculation conduit in fluid communication with said wash tub and said housing;
electric recirculation pump mea.ns in fluid communication with said recirculation conduit for recirculating washing liquid from said housing to said wash tub;
means for automatically controlling the filling level of washing liquid into said wash tub including an inlet hose for supplying washing liquid to said wash tub, an electric valve in fluid communication with said inlet hose for controlling the amount of washing liquid supplied to said wash tub, washing liquid level sensor means for controlling the level of washing liquid supplied to the wash tub, and electric circuit means connected to said electric valve and said washing liquid level sensor means for operating said electric valve in response to signals from said washing liquid level sensor means;
said washing liquid level sensor means including a first pressure switch operatively connected to said electric valve and said electric circuit means for causing the addition of washing liquid to said tub at a normal level regardless of the type or quantity of the load placed in said wash tub, a second pressure switch operatively connected to said electric valve and said electric circuit means for causing



the addition of washing liquid to said housing at a level above said at least one heating element and said at least one thermost,atic sensor, a third pressure switch operatively connected to said electric valve and said electric circuit means for causing the addition of washing liquid to said tub at a level which is dependent on the load placed in said tub but is lower than the level set by said first pressure switch, and a fourth pressure switch operatively connected to said electric valve and said electric circuit for causing the addition of washing liquid to said tub at a level higher than the washing liquid levels set by said first and third pressure switches.

4,696,172
ANTI-THEFT DEVICE FOR ROAD VEHICLES
Robert T. Farrow, 3638 Yorkingham Dr., Houston, Tex. 77066
Filed Sep. 4, 1985, Ser. No. 772,609
Int. Cl.[4] E05B *65/12*
U.S. Cl. 70—238 **9 Claims**

9. An anti-theft device for road vehicles comprising;
an elongated rod member having an upper end formed into an inverted generally U-shaped configuration to releasably engage a portion of the vehicle steering wheel and an externally threaded lower end for adjustable connection of said rod to an intermediate connector member,
an intermediate connector member having internal threads threadedly received on the threaded lower end of said elongated rod and movable thereon for placement at selective distances relative to the upper end of said rod member and having a flat tab projecting outwardly from one side at the bottom thereof said tab having at least one hole extending transversely therethrough for releasably connecting said intermediate connector member to a pedal block member,
a lock nut threadedly received on the threaded lower end of said elongated rod for securing said intermediate connector member on said rod at a selective distance from the upper end of said rod member,
a yoke comprising a rectangular control block member

adapted to be removably received between a pedal and the vehicle floor board, said yoke having a vertical slot extending downwardly a distance from the top surface for receiving a portion of the pedal and a series of vertically spaced holes transverse to the slot extending through opposing side walls of the block member,

said slot adapted to receive the brake pedal and said intermediate member tab in vertical relation,

a lock pin having a head larger than said holes in said side walls and said tab, a shank smaller in diameter than said holes, a hole extending transversely through the shank near the outer end for receiving a lock, and



a washer received on the end of the shank between the side wall of said block member and said transverse hole,

said lock pin being received through said holes in said tab and said block member to connect said intermediate connector with said block member and retain said pedal within said slot and, said connection secured by the conventional lock member,

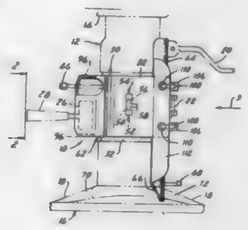
said anti-theft device in the locked position providing a mechanical interlock between the vehicle steering wheel and the brake pedal to prevent rotation of the steering wheel, and between the pedal and floorboard of the vehicle and said control pedal block member preventing the pedal from being depressed.

4,696,173

VEHICLE STEERING WHEEL AND SHIFT LEVER GUARD

James D. Lee, 22340 Natasha La., South Lyon, Mich. 48178-9713

Filed Mar. 14, 1986, Ser. No. 839,606
Int. Cl.[4] E05B *13/02, 17/14*
U.S. Cl. 70—427 20 Claims



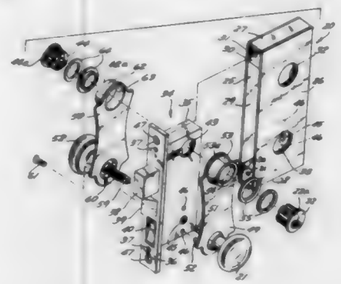
1. A protective guard for a steering wheel and a shift lever on a steering column with a housing between the steering wheel and shift lever and the housing having a projecting portion for enclosing a turn signal switch, the guard comprising, a metallic carrier member and a metallic arm member which can be assembled together to encircle the column housing in operative relationship therewith, said carrier member having a cavity constructed and arranged to receive at least part of the projecting switch portion of the housing when said members are assembled together in operative relationship with the column housing, said cavity having a first pair of wall portions generally circumferentially spaced apart and constructed and arranged to overlap with and lie adjacent wall portions of the projecting switch portion of the column housing and limit the extent to which said carrier member can be moved generally circumferentially with respect to the column housing when said members are assembled together in operative relationship with the column housing, and said cavity having a second pair of wall portions generally axially spaced apart and constructed and arranged to overlap and lie adjacent wall portions of the projecting switch portion of the column housing and limit the extent to which said carrier member can be moved generally axially with respect to the column housing when said members are assembled together in operative relationship with the column housing, said carrier member being generally U-shaped and having a pair of legs which are spaced apart and disposed generally on opposite sides of the column housing when said members are assembled together in operative relationship with said column housing, a hinge joint between one of said legs and said arm member which in assembly connects said one leg and arm member while permitting said arm to be pivoted so that said other leg and said arm can be releasably interlocked, said other leg and said arm being constructed and arranged such that they can be releasably locked together when said arm extends between said legs with said carrier and arm members together encircling the column housing when said members are assembled together in operative relationship with the column housing, a first stop carried by said arm member and constructed and arranged to underlie and be adjacent the shift lever to limit the extent to which the shift lever can be moved generally circumferentially in at least one direction with respect to the column when said members are assembled together in operative relationship with said column housing, at least one second stop carried by said arm and constructed and arranged to be lapped with a spoke of the steering wheel and to limit rotation of the steering wheel with respect to the column when bearing on the wheel when said members are assembled together in operative relationship with said column housing.

4,696,174

REVERSIBLE MORTISE LOCKSET

George R. Marks, 19 The Hemlocks, Roslyn Estates, N.Y. 11576

Filed Oct. 31, 1985, Ser. No. 793,140
Int. Cl.[4] E05B *9/08*
U.S. Cl. 70—451 7 Claims



1. In combination with a metal door furnished with a lock box having two opposed vertical walls, each wall of the lock box having two vertically aligned holes of equal diameter, each hole being horizontally aligned with a similar hole in the other lock box wall,

a reversible mortise lockset comprising:

a mortise lock having an internally threaded lock cylinder hole about equal in diameter to each of the holes in the lock box wall, a door knob spindle hole, and a through bolt hole,

the mortise lock being insertable into the lock box in either of two orientations, in one of the orientations the lock cylinder hole being aligned with the upper hole in each lock box wall and the door knob spindle hole and through bolt hole being exposed through the lower hole in each lock box wall, and in the other of the orientations the lock cylinder hole being aligned with the lower hole in each lock box wall and the door knob spindle hole and through bolt hole being exposed through the upper hole in each lock box wall,

a pair of plates, one for mounting on the exterior surface of each of the lock box walls, each plate being adapted to accommodate a door knob and spindle near one of its ends so that the door knob projects outwardly from the plate and the door knob spindle projects inwardly therefrom for insertion into the door knob spindle hole in the mortise lock,

a single mounting means projecting inwardly from one of the plates for insertion into the through bolt hole in the mortise lock,

a cooperable mounting element for securing the other plate to the mounting means, the mounting means and mounting elements securing one end of each plate to the lock box and mortise lock,

a lock cylinder hole near the end of each plate opposite the end carrying the mounting means, the lock cylinder hole in the mortise lock plate registering with the lock cylinder hole in the mortise lock and with a hole in the lock box wall adjacent to the plate when the mounting means is located within its respective hole, and

an externally threaded lock cylinder passing through the lock cylinder hole in each plate and through the hole in the lock box wall in registry with the hole in the plate, and the lock cylinder being threaded into the lock cylinder hole in the mortise lock, so as to fasten the other end of each plate to the lock box and mortise lock,

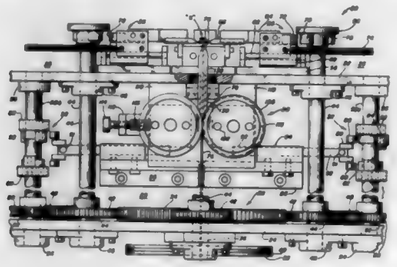
whereby the mortise lockset can be assembled with the lock box so that the door knobs are either above or below the lock cylinders depending upon which of the two orientations are chosen for insertion of the mortise lock into the lock box.

4,696,175

CLUTCH APPARATUS FOR SPRING MAKING MACHINE

Eugene M. Skupien, 66 S. Vista Ave., Addison, Ill. 60101

Filed Apr. 29, 1986, Ser. No. 857,243
Int. Cl.[4] B21F *3/02*
U.S. Cl. 72—135 8 Claims



1. A motor-driven wire forming machine having a housing supporting a plurality of forming slides for forming a wire into a selected shape, the improvement comprising:

a main drive gear driven by the motor and driving a planetary gearing means;

wire feed roll means operable to drivably feed the wire to the forming slides;

a plurality of feed drive clutch means for providing continuous driving of said wire feed roll means;

cam means driven by said planetary gearing means for driving said feed drive clutch means; and

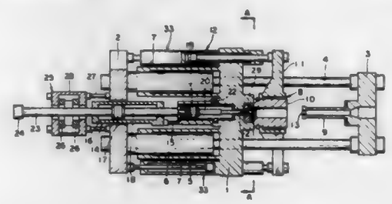
connector drive means interconnecting said feed drive clutch means with said wire feed roll means, said connector drive means selectively driven by at least one of said plurality of feed drive clutch means and operable to continuously drive said wire feed roll means regardless of which said feed drive clutch means is in a driving condition at any given time.

4,696,176

PULLBACK TYPE DOUBLE-ACTING INDIRECT EXTRUSION PRESS

Akira Asari, Osaka, and Takahisa Tabuchi, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 23, 1986, Ser. No. 824,582
Int. Cl.[4] B21C *23/21, 35/04*
U.S. Cl. 72—273.5 3 Claims



1. A pullback type indirect extrusion press, comprising:

a fixed platen having an opening formed therein for allowing for piercing of a billet;

first and second movable platens rigidly connected to each other, said first and second movable platens, respectively, being arranged in front of and behind said fixed platen;

means connected to said first movable platen and said fixed platen for producing an extruding force provided between said fixed platen and said first movable platen;

a container device connected to said fixed platen and a die stem connected to said second movable platen arranged between said fixed platen and said second movable platen;

a piercing cylinder mechanism mounted on said fixed platen and positioned between said fixed platen and said first movable platen, and provided independent of said means for producing an extruding force, wherein said piercing cylinder mechanism further comprises a mandrel extending through said opening and cooperating with a die hole of the die stem to determine a shape of a material to be extruded in an extruding direction;

a feed-liquid switching valve mechanism for reciprocatingly sliding the mandrel along the axis of the press; and

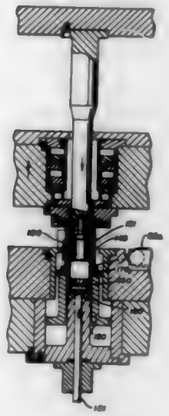
a mandrel stopper mechanism positioned on a side of said first movable platen opposite said piercing cylinder mechanism and having a gate member engageable and disengageable with an engaging portion of the piercing mechanism extending through an opening in said first movable platen.

4,696,177

METHOD AND APPARATUS FOR FORMING CONTAINERS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Dec. 31, 1986, Ser. No. 49
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—379 16 Claims



1. A method of forming a container in one or more double acting presses, comprising the steps of:
(A) at a first station, in a single stroke
(1) forming a blank of material;
(2) drawing an inverted flanged cup from said blank;
(3) reverse drawing said inverted cup to form a flanged cup; and
(4) removing said flanged cup to a second station; and
(B) at said second station, in a single stroke
(1) drawing said flanged cup into a second inverted cup;
(2) reverse redrawing said second inverted cup into a flanged container; and
(3) profiling the bottom of said flanged container at the bottom of the stroke.

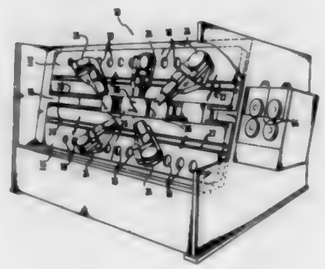
7. Apparatus for forming flanged containers in one or more double acting presses from a sheet of material, comprising:
(A) at a first station
(1) a blank and draw punch;
(2) a fixed hollow die core ring;
(3) said blank and draw punch being movable toward said die core ring to form an inverted cup from the material over the top of said die core ring;
(4) a draw horn movable toward said die core ring to reverse draw said inverted cup within said die core ring to form a flanged cup;
(B) at a second station
(1) a hollow redraw sleeve;
(2) a first pressure sleeve movable toward said redraw sleeve to invert said flanged cup over the top of said redraw sleeve;
(3) a profile punch movable toward said redraw sleeve to reverse draw said inverted cup within said redraw sleeve.

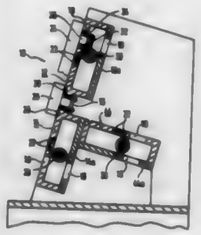
4,696,178

WIRE AND BAND PROCESSING MACHINE

Otto Bihler, Halblech, Fed. Rep. of Germany, and Eduard Brüller, Trimbach, Switzerland, assignors to Otto Bihler, Halblech, Fed. Rep. of Germany

Continuation of Ser. No. 736,525, May 21, 1985, abandoned, which is a continuation of Ser. No. 463,556, Feb. 3, 1983, abandoned. This application Aug. 11, 1986, Ser. No. 895,518
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205493
Int. Cl.[4] B21F *1/00*
U.S. Cl. 72—384 63 Claims





1. A wire and band processing machine comprising two processing plates disposed in spaced relation and forming a space therebetween, each of said processing plates having a plurality of holes extending therethrough from one side to the other, a drive system located within said space, said drive system including at least one worm shaft extending parallel to said processing plates, securing means on the sides of said processing plates remote from said space and arranged for mounting processing equipment thereon, at least selected ones of said holes receiving coupling means arranged for drivingly coupling processing equipment with said at least one worm shaft, said coupling means including a worm gear to mesh with said worm shaft, said worm gear having an axis extending transversely of said worm shaft.

4,696,179

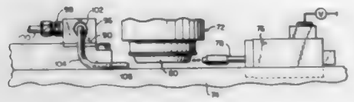
AIR ASSIST MEANS FOR USE IN TRANSFERRING RELATIVELY FLAT OBJECTS

Steven T. Cook, Bellbrook, and David K. Wynn, Dayton, both of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Feb. 6, 1986, Ser. No. 826,635
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 19 Claims

1. In an apparatus for transferring a relatively flat object from a first station to a destination, including:
means for supporting and operating on the object at the first station;

said supporting means supporting the object from an upper surface thereof;
means defining an at least partially enclosed transfer path extending from an entrance adjacent said first station toward said destination; and
means for propelling the object from said supporting means in edgewise fashion into said transfer path, wherein said propelling means directs the object into said path in substantially free flight;
the improvement comprising air assist means for acting upon the object moving into and along said path, said assist means including:
means for supplying air under pressure;



an outlet conduit connected to said supply means and defining an open outlet end;
valve menas disposed along said outlet conduit for contolling flow of air along said conduit; and
control means connected to said valve means for selectively controlling said valve means in response to operation of said first station so that said valve means is actuated to supply air to the transfer path just after each flat object has entered the enclosed transfer path;
said outlet conduit being disposed with said outlet end at said entrance to said transfer path, and with said end positioned in a direction into said path whereby air is directed along said path in the direction of movement of the object.

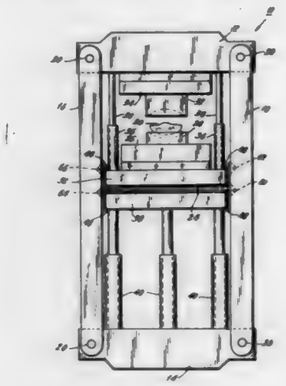
4,696,180

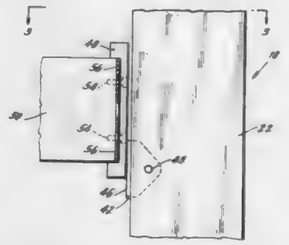
GUIDING ARRANGEMENT FOR FORGING PRESS COLUMNS ASSEMBLED OF FLAT TIE-ROD LAYERS

Adam Zandel, Forest Hills, N.Y., assignor to Press Technology Corporation, White Plains, N.Y.

Filed Feb. 26, 1986, Ser. No. 833,043
Int. Cl.[4] B21D *37/00*; B21J *13/04*
U.S. Cl. 72—456 12 Claims

1. A forging press, comprising:
(a) a generally rectangular frame including: a load-opposing upper and generally horizontally extending crosshead assembly comprised of a plurality of overlapping plates and a lower crosshead assembly spaced from, parallel to, and generally coextensive with said upper crosshead assembly; and left and right vertically extending columns extending between said upper and lower crosshead assemblies for completing said frame, each column comprising a plurality of spaced tie-rod plates having end regions, said end regions being interlaced with corresponding end regions of said crosshead assemblies, and pins passing through said end regions to connect said columns and said crosshead assemblies to one another;
(b) forging press components including: a bridge extending through said frame; a lower platen on said bridge facing said upper crosshead assembly and an upper platen mounted to said upper crosshead assembly, means for moving at least one of said lower and upper platens to render said platens movable toward and away from each other, at least portions of said forging press components and said frame being movable vertically relatively to one another durng forging cycles of said forging press; and
(c) a flexible guiding arrangement at least partially disposed between said forging press components and said columns of said frame for guiding and keeping said forging press aligned during said forging cycles, said guiding arrangement including a plurality of sliding plates, each of said sliding plates being mounted to those of said forging press components facing one or the other of said columns of said frame and which are movable relative to said columns of said frame, and a plurality of metal segments interposed between said tie-rod plates of said columns and pivotably mounted thereto in a manner which enables said metal segments to pivot in generally vertically oriented planes; each of said metal segments pivoting independently of all other ones of said metal segments whereby the degree of





pivoting of each one of said metal segment is inherently adjusted to optimize stress distribution in the transverse direction across said tie-rod plates; said segments protruding from said tie-rod plates sufficiently to slidingly abut against a respective one of said sliding plates, said sliding plates and said metal segments being sized to slide over each other during the entirety of each of said forging press cycles of said forging press.

4,696,181

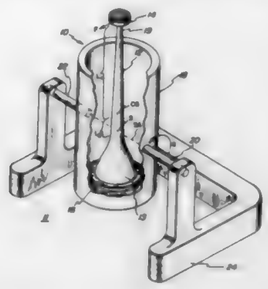
DECOUPLING SUSPENSION SYSTEM FOR AN OSCILLATING ELEMENT MICROBALANCE

Georg Rupprecht, Voorheesville, and David R. Hassel, Troy, both of N.Y., assignors to Rupprecht & Patashnick Co., Inc., Albany, N.Y.

Filed Apr. 10, 1986, Ser. No. 850,290
Int. Cl.[4] G01G *3/16, 21/23*
U.S. Cl. 73—580 18 Claims

1. Mass measuring apparatus comprising:
a microbalance having an elongate elastic element which can be excited to oscillate at a resonant frequency, said element having a longitudinal axis, one end of said element being available to support a specimen to be measured and being free to oscillate, the other end of said element being anchored to the base of a housing, the housing at least partially enclosing said element, the mass of said specimen

being measured by monitoring changes in the resonant frequency of the oscillating element;
a support member; and
suspension means connected to and between said support member and housing for suspending said microbalance from said support member, said suspension means extending along a first axis which intersects an instant center of



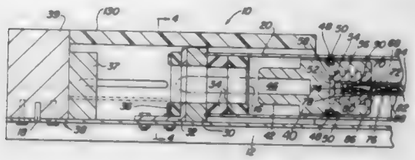
rotation of said microbalance, said instant center of rotation comprising a single location on said longitudinal axis which would experience no translation were the microbalance operated unsupported in a gravity free environment, whereby vibration losses from the oscillating element and external mechanical perturbations to the microbalance are minimized.

4,696,182

IMPACT TEST APPARATUS

Avraham A. Meir, Willow Grove, Pa., assignor to Seti Inc., Montgomeryville, Pa.

Filed Jun. 10, 1986, Ser. No. 872,720
Int. Cl.⁴ G01N *3/30*
U.S. Cl. 73—12 **16 Claims**



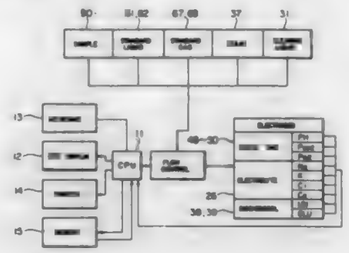
1. An impact test apparatus comprising:
a barrel adapted to contain pressurized gas and having a sealed end and an opposed open end;
a shuttle positioned for translation within the barrel, the shuttle including means for releasably carrying a test sample and sealing means for sealingly engaging the barrel, the sealing means dividing the interior of the barrel into a portion open to the atmosphere and a sealed portion;
means for supplying pressurized gas to the sealed portion of the interior of the barrel;
trigger means for selectively retaining the shuttle in a fixed position in the barrel and for releasing the shuttle to permit the shuttle to accelerate toward the open end of the barrel as the pressurized gas in the sealed portion of the barrel expands; and
stopping means proximate the open end of the barrel to decelerate the shuttle and retain the shuttle substantially within the barrel while allowing the test sample to travel toward a target aligned with the open end of the barrel.

4,696,183

METHOD AND APPARATUS OF FLOW ANALYSIS

Hiroshi Mitsumaki; Naoya Ono; Isao Shiado, and Nobuyoshi Takano, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,806
Claims priority, application Japan, Mar. 1, 1985, 60-40911
Int. Cl.⁴ G01N *33/49, 27/46, 27/56*
U.S. Cl. 73—19 **14 Claims**



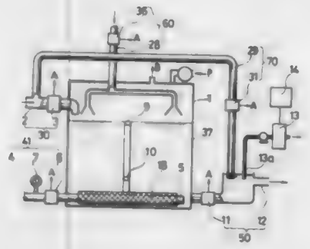
1. An apparatus of flow analysis comprising:
a common flow path having a sample introducing nozzle;
a plurality of branch flow paths each connected to said common flow path;
means for detecting a flow path blockage, said means being disposed in a first branch flow path;
means for removing the blockage by cleaning said common flow path when said flow path blockage is detected by said flow path blockage detecting means;
a measuring electrode disposed in a second branch flow path, said measuring electrode being apt to be affected by a pressure change in the flow path; and
means for introducing a sample into said second branch flow path after the blockage in said common flow path is removed.

4,696,184

DEVICE FOR MEASURING THE ABSOLUTE VALUE OF THE DENSITY OF SALTS IN ATMOSPHERE

Takaaki Fukumoto, Kishiwada, and Toshiaki Ohmori, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,932
Claims priority, application Japan, Dec. 20, 1984, 59-270269
Int. Cl.⁴ G01N *27/00*
U.S. Cl. 73—32 R **16 Claims**



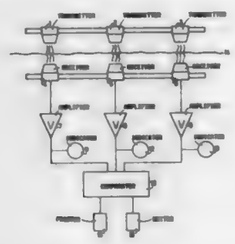
1. A measuring device for measuring the absolute value of the density of salts in an atmosphere, which comprises:
a substantially airtight water tank containing super pure water of a predetermined quantity;
a supplying means operatively associated with said water tank for supplying super pure water to said water tank;
a bubbling means disposed in said water tank for bubbling a predetermined quantity of atmosphere into said super pure water contained in said water tank;
an exhausting means operatively associated with said water tank for exhausting said super pure water from said water tank;
a sodium ion analyzer means operatively associated with said exhaust means for measuring the density of sodium ions in said super pure water after said super pure water is exhausted from said exhaust means; and
an introduction means operatively associated with said water tank and said bubbling means for introducing said atmosphere to said bubbling means based upon the pressure differences between the inside of said water tank and said atmosphere.

4,696,185

METHOD AND APPARATUS FOR CONTROLLING THE DYE RECEPTIVITY OF TEXTILES

Hellmut Beckstein, Bad Abbach, Fed. Rep. of Germany, assignor to Mahlo GmbH +Co. KG., Donau, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,605
Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316171
Int. Cl.⁴ G01N *33/36*
U.S. Cl. 73—37.7 **8 Claims**



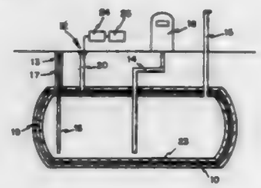
1. A method for preparing a record of the dye receptivity characteristics of an undyed web of textile for the subsequent use by a dyer when dyeing said web, comprising the following steps:
(a) running said undyed web of textile through a measuring station including mechanical energy transmitter means and mechanical energy receiver means,
(b) applying mechanical energy to said undyed web of textile by said transmitter means,
(c) measuring mechanical energy passed through or reflected by said undyed web,
(b) comparing the applied mechanical energy with the measured mechanical energy for determining said dye receptivity of said undyed web of textile,
(d) comparing mechanical energies measured at different locations in said undyed web of textile with each other for determining non-uniformities in said dye receptivity, and
(f) recording said non-uniformities in said dye receptivity to form said record for said subsequent use by the dyer for dyeing said undyed web of textile.

4,696,186

STORAGE TANKS HAVING SECONDARY CONTAINMENT MEANS

Bruce R. Sharp, 4090 Rose Hill Ave., Cincinnati, Ohio 45229

Division of Ser. No. 740,869, Jun. 3, 1985, Pat. No. 4,607,522, which is a continuation-in-part of Ser. No. 544,013, Oct. 21, 1983, Pat. No. 4,523,454, and Ser. No. 580,800, Feb. 16, 1984, Pat. No. 4,524,609, which is a continuation-in-part of Ser. No. 544,012, Oct. 21, 1983, abandoned. This application Aug. 22, 1986, Ser. No. 899,484
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.⁴ G01M *3/32*
U.S. Cl. 73—49.2 **14 Claims**



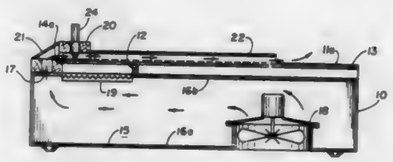
1. A storage tank system having secondary containment capability and leakage detection capability, comprising:
(a) an outer tank shell having rigid walls fitted with a fill pipe and a dispensing line;
(b) a bladder adapted for fitting within the outer tank shell to hold liquid, said bladder having openings with means for sealed connection with the fill pipe and dispensing line or points at which the fill pipe and dispensing line enter the outer shell;
(c) gas pervious material positioned between the bladder and the wall of the outer tank shell and securely adhered to said bladder and wall;
(d) means in communication with the closed space occupied by the gas pervious material to maintain a non-atmospheric pressure in the space; and
(e) a pressure change detector in communication with the closed space for the purpose of detecting leakage of the outer tank shell or bladder.

4,696,187

CHROMATOGRAPHY METHOD

Reiner H. Kopp, Copake, and Allen I. Panetz, Huntington, both of N.Y., assignors to Biochemical Diagnostics, Inc., Farmingdale, N.Y.

Division of Ser. No. 410,490, Aug. 23, 1982, which is a continuation of Ser. No. 232,134, Feb. 6, 1981, Pat. No. 4,351,800. This application Jan. 30, 1985, Ser. No. 696,399
Int. Cl.⁴ G01N *31/08*
U.S. Cl. 73—61.1 C **2 Claims**



1. In a method of eluting and spotting for identifying unknown substances by chromatography beginning with a column in which the packing medium has the unknown substance entrained therein, the steps of
placing the spotting applicator on the chromatography plate in contact therewith to establish a point of spotting;

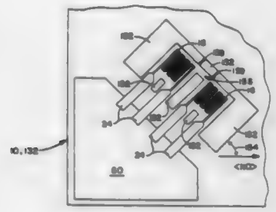
establishing a continuous flow path from the column to the chromatography plate;
placing an eluting solvent into the column above the packing medium;
metering the flow directly to the plate while causing air to blow over the plate at the point of spotting, thereby to establish a continuous solvent flow from the column above the packing media through the applicator to the plate and controlling the spot size and concentrating the unknown substance by the evaporation due to the flow of air.

4,696,188

SEMICONDUCTOR DEVICE MICROSTRUCTURE

Robert E. Higashi, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 480,644, Mar. 31, 1983, abandoned, which is a division of Ser. No. 310,262, Oct. 9, 1981, abandoned. This application Sep. 6, 1985, Ser. No. 773,106
Int. Cl.⁴ G01F *1/68*
U.S. Cl. 73—204 **93 Claims**



1. An integrated semiconductor device comprising:
a semiconductor body having a depression formed by an anisotropic etch applied to a first surface of the body, the semiconductor body comprising (100) silicon having a (100) plane and a <110> direction, the first surface of the semiconductor body being substantially parallel to the (100) plane;
a thin film dielectric member comprising first and second static electric elements, the member having a predetermined configuration suspended over the depression, the predetermined configuration being oriented at a non-zero angle to the <110> direction, the member being connected to the first surface at first and second substantially opposing ends so that the predetermined configuration is bridged across the depression, the depression opening to the first surface around at least a portion of the predetermined configuration, the depression, the opening, and the member providing substantial physical and thermal isolation between the first and second elements and the semiconductor body;
whereby an integrated semiconductor device provides an environment of substantial physical and thermal isolation between the first and second elements and the semiconductor body.

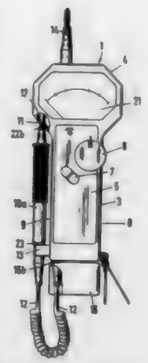
4,696,189

HOUSING FOR A MEASURING DEVICE

Karl Hochreuther, Nuremberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 10, 1986, Ser. No. 850,265
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513345
Int. Cl.⁴ G01D *11/24;* **G01R** *1/04*
U.S. Cl. 73—431 **12 Claims**

1. Measuring device housing, comprising two mutually assembled housing shells having mutually engaged dust protection edges, a trowel shape with a relatively narrow handle-type holder part changing into a relatively wide plate-type indicator part, an operating surface having mutually opposite finger and thumb sides, a switching wheel operating element mounted on said operating surface and extending beyond said thumb side thereof, another operating element disposed on said operating surface laterally of said switching wheel, said operating elements being disposed within the swinging range of a



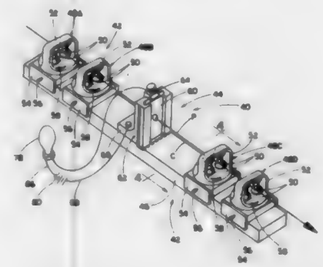
thumb of the right hand of an operator of the measuring device gripping said holder part from behind for actuating said operating elements, a measuring probe having a free end disposed in a recess formed in a portion of said indicator part protruding over said holder part and another end, a mounting fork detachably fastening said other end of said measuring probe to said housing shells, and a connecting cable connecting between said other end of said measuring probe and said housing shells.

4,696,190

TUBE STRAIGHTNESS CHECKING APPARATUS

George D. Bucher, Allison Park; John A. Catanese, Seward, and William D. Clawson, Burrell Township, Indiana County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1985, Ser. No. 775,210
Int. Cl.⁴ G01B *5/20, 7/28*
U.S. Cl. 73—865.8 **13 Claims**



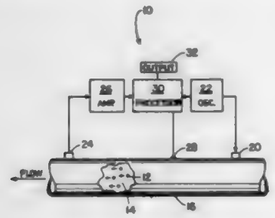
1. A tube straightness checking apparatus, comprising:
(a) means for receiving and guiding a tube along a generally linear path; and
(b) a gauging mechanism disposed along said linear path and being operable to check the straightness of the tube as it is moved along said path past said mechanism by detecting deviation greater than a predetermined amount of the tube from an imaginary centerline which is generally coincident with said linear path;
(c) said gauging mechanism including a gauge plate with a circular gauging orifice defined therein through which the tube passes as it is moved along said linear path, said gauging orifice having a center aligned coincident with said imaginary centerline of the tube and being of a predetermined diametric size which establishes the out-of-straightness tolerance for the tube;
(d) said gauging mechanism also including a holder member releasably mounting said gauge plate across said linear path whereby said gauge plate can be interchanged with other plates having circular orifices of different diametric sizes for checking the straightness of tubes of different diameter sizes.

4,696,191

APPARATUS AND METHOD FOR VOID/PARTICULATE DETECTION

Thomas N. Claytor, Woodridge, Ill.; Carl E. Ockert, Vienna, Va., and Richard Randall, Canoga Park, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 24, 1986, Ser. No. 877,959
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—600 **23 Claims**



1. Apparatus for detecting voids and particulates in a fluid within a containing means, the apparatus comprising:
(a) first transducer means, coupled to a first location on the containing means, for transmitting a diffuse sound field of predetermined frequency into the fluid;
(b) second transducer means, coupled to a second location on the containing means, for receiving a portion of the transmitted sound field and for generating a signal representative of the received portion of the sound field; and
(c) signal processing means, coupled to the second transducer, for processing the second transducer signal to determine the presence of voids and particulates responsive to attenuation of the sound field transmitted through fluid.

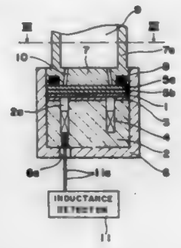
4,696,192

FLUID PRESSURE SENSOR

Ichiro Yamashita, Hirakata; Masayuki Wakamiya, Suita; Hiroyuki Hase, Katano, and Shinya Tokuono, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 7, 1986, Ser. No. 882,535
Claims priority, application Japan, Jul. 4, 1985, 60-147526
Int. Cl.⁴ G01L *7/08, 9/16*
U.S. Cl. 73—728 **9 Claims**

1. A fluid pressure sensor comprising;
a body made of a soft magnetic material with a groove formed therein;
a coil installed in said body in said groove;
at least one magnetostrictive plate placed on said body over said groove;
at least one non-magnetic plate placed over said magnetostrictive plate;
a casing for accommodating said body carrying said coil, said magnetostrictive plate, and said non-magnetic plate; and
a lid member for closing said casing, said lid member having a surface for receiving a fluid pressure and at least one through hole formed in said lid member within said fluid pressure receiving surface, said through hole extending to



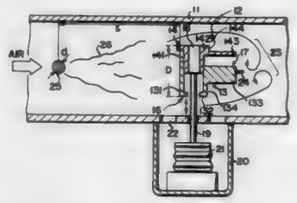
said non-magnetic plate at position over said groove, whereby said magnetostrictive plate is partially distorted by said fluid pressure.

4,696,193

AIRFLOW RATE MEASURING APPARATUS OF KARMAN VORTEX TYPE

Sinzi Nanba, Kariya; Kazuma Matsui, Toyohashi; Toru Mizuno, Aichi, and Tukasa Goto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 5, 1985, Ser. No. 804,848
Claims priority, application Japan, Dec. 5, 1984, 59-256829
Int. Cl.⁴ G01F *1/32*
U.S. Cl. 73—861.22 **14 Claims**



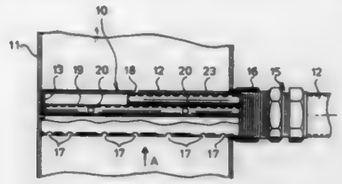
1. An airflow rate measuring apparatus of Karman vortex type, comprising:
a vortex generator which is arranged in an airflow designated for measurement and generates vortexes of a frequency corresponding to an airflow rate at a downstream side thereof;
vortex detecting means, arranged at a downstream side of said vortex generator, for generating an electrical signal corresponding to the frequency of vortexes;
a turbulence generator arranged at an upstream side of said vortex generator at a location corresponding to a central part of the airflow which flows against said vortex generator, said turbulence generator including a rod member having a width smaller than a surface of said vortex generator which faces the airflow so as to decrease the speed of the central part of the airflow flowing against said vortex generator,
said vortex generator comprising a columnar member which extends across the airflow and a ratio d/D being about 0.38, where d is a diameter of said rod member and D is the typical dimension along the widthwise direction of the surface of said vortex generator against which air flows, said rod member being parallel to the axis of said vortex generator.

4,696,194

FLUID FLOW MEASUREMENT

James C. Taylor, Colchester, England, assignor to Taurus Controls Limited, Colchester, England

Filed Feb. 20, 1986, Ser. No. 831,938
Int. Cl.[4] G01F *1/46*
U.S. Cl. 73—861.66 **10 Claims**



1. A sensing probe for use in determining fluid flow rates along a duct, which sensing probe comprises:

a probe pipe adapted for mounting within said duct so as to extend thereacross with one end of said pipe closed and the other end of said pipe communicating with the exterior of said duct;

a plurality of first orifices extending through the wall of said probe pipe and arranged along a length of said pipe;

at least one second orifice extending through the wall of said pipe at a position spaced by at least 90° of arc from said first orifices;

averaging tube means comprising a single tube mounted within and extending along said pipe and having at least two spaced-apart openings giving communication between the interior of said pipe and the interior of said tube means, each opening consisting of a bore extending wholly across said single tube and the openings being positioned to each side of the duct axis when the probe is mounted therewithin;

first pressure connector means disposed externally of said duct, said averaging tube means lending thereto;

a static pressure tube also mounted within said probe pipe and being connected directly to said second orifice; and

second pressure connector means disposed externally of said duct, said static pressure tube leading thereto;

whereby when said probe pipe is mounted in said duct with said first orifices facing fluid flow in the duct and said second orifice downstream of said first orifices, the fluid flow rate can be deduced from the difference between the averaged total pressure appearing at said first pressure connector means and the pressure appearing at said second pressure connector means.

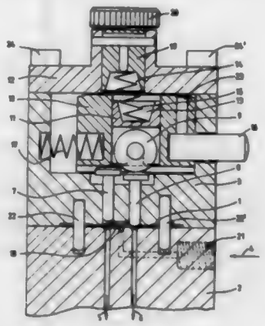
4,696,195

VALVE DEVICE

Jukka Savoulahti; Pertti Ekholm, both of Helsinki, and Hannu Harjunmaa, Espoo, all of Finland, assignors to Labsystems Oy, Finland

Filed Feb. 28, 1985, Ser. No. 706,507
Claims priority, application Finland, Mar. 2, 1984, 840846
Int. Cl.[4] G01N *1/10*
U.S. Cl. 73—864.84 **11 Claims**

1. A valve device suitable for transferring small and precise quantities of fluid comprising: a valve body defining a valve surface with a plurality of valve orifices within a valve area; a support body coupled to said valve body defining a support surface in facing relationship with said valve surface said support surface having a recess opposite said valve area; a resilient membrane secured between said support surface and said valve surface along a region encircling said orifices, said membrane being positioned, configured and dimensioned to yield so as to allow fluid transfer between said orifices in response to a pressure differential across said membrane; a pair of male closure members corresponding to at least two of said plurality of orifices slidingly mounted on means for supporting said closure members, each of said closure members being positioned facing and in alignment with said orifices on the opposite side of said membrane from said orifices and having an end configured to urge said membrane into contact with the respective peripheral edges of said orifices upon advancement theretoward, whereby said orifices are securely closed; and means coupled to said closure member for selectively advancing said closure members towards said orifices, at least two of said orifices being directly interconnected by a groove in said valve surface.

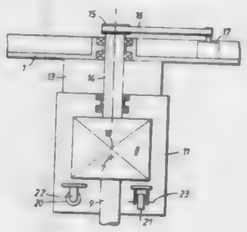


4,696,196

STABILIZED PLATFORM ARRANGEMENT

Svet O. Vucevic, Chelmsford, England, assignor to Marconi International Marine Company Limited, Stanmore, England

Filed May 2, 1986, Ser. No. 858,717
Claims priority, application United Kingdom, May 28, 1985, 8513372
Int. Cl.[4] H01Q *1/18*
U.S. Cl. 74—5.22 **4 Claims**



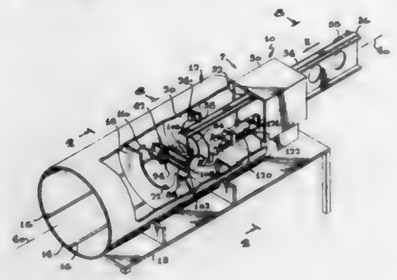
1. A stablished platform arrangement including a platform mounted on a support by means of a universal joint; a gyroscopic assembly including a pair of gyroscopic rotors each of which is mounted for rotation about respective axes which are mutually non-parallel, the assembly being linked to the platform so that the assembly and the platform together constitute a pendulous structure having a centre of gravity below the axes of the universal joint; and gearing means for coupling azimuth rotation of the gyroscopic assembly to that of the platform, the gear ratio of said gearing means being such that a given angular movement of the platform in azimuth causes a lesser corresponding angular movement of the gyroscopic assembly.

4,696,197

SYSTEM FOR COUNTERBALANCING TOOL MOUNT LOADS IN A MACHINE TOOL

Clifford L. Hannel, Los Angeles, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Apr. 11, 1986, Ser. No. 851,041
Int. Cl.[4] F16H *25/24*; B23B *39/14*; G05G *11/00*
U.S. Cl. 74—89.15 **7 Claims**



1. In a machine including a frame member having a longitudinal axis, a beam member rotatably mounted to the frame member extending substantially perpendicularly outward in one direction from the axis of rotation thereof, the axis of rotation being substantially aligned with the longitudinal axis of the frame member, and a variable weight mounted to the beam member, a system to counterbalance the static torque produced by the weight about the axis of rotation of the beam member comprising:

a support member rotatably mounted to the frame member and coupled to the beam member for simultaneous rotation about the axis of rotation, said support member extending substantially perpendicularly outward in the opposite direction from the axis of rotation;

a pressurizable power actuator having a first end pivotally mounted to the frame member moveable in a horizontal plane and a second end having an output shaft for producing an output force proportional to the pressure level within the actuator;

coupling means connecting said output shaft to said support member; and

pressure level control means for maintaining said pressure level within said actuator at a value to produce a torque sufficient to counterbalance the torque produced by the weight.

4,696,198

POWER ASSIST DEVICE FOR AUTOMOTIVE STEERING SYSTEM

Shinichi Komatsu, Hatano, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed Sep. 30, 1985, Ser. No. 782,135
Claims priority, application Japan, Oct. 22, 1984, 59-221544
Int. Cl.[4] F15B *9/10*
U.S. Cl. 74—388 PS **11 Claims**

1. An automotive steering system having an unbalanced cylinder and a fluid control valve disposed in a hydraulic circuit connecting said cylinder to a fluid pressure source and to a fluid reservoir for controlling supply and drain of working fluid to said cylinder, comprising:

said unbalanced cylinder having:

an enclosed hollow cylinder;

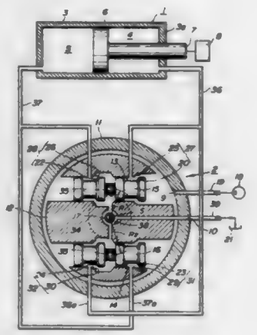
a piston disposed within the internal space of said cylinder so as to divide same into first and second working chambers; and

a piston rod connected to said piston at one end and connected at the other end to a steering member which actuates re-alignment of vehicular wheels for steering, said piston rod extending through said first chamber and exiting said cylinder for connection to said steering member at said other end; said fluid control valve having:

a valve housing connected to a manually operable steering stub shaft by means of a yielding structural member;

a first and a second bore passing through said valve housing, which first and second bores are arranged substantially in parallel relationship to each other and radially oriented at different positions relative to a rotation axis of said steering stub shaft;

a first and second spool valve disposed reciprocably within said first and second bore respectively, said first and second spool valves being connected to said steering stub shaft so as to be driven reciprocably in response to relative displacement between said valve housing and said steering stub shaft due to yielding of said yielding member, and said first and second spool valves having identical structures, and said first and second spool valves are so associated with said first and second bores as to differentiate magnitude of shifting relative to said first and second bores from each other;



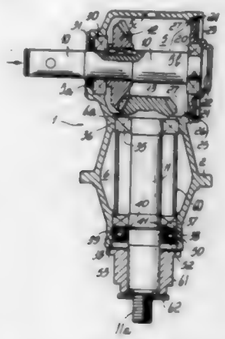
first and second means defining a first supply orifice and a first drain orifice between said first spool valve and the inner periphery of said first bore, the flow cross-section of said first supply orifice varying with the position of the first spool valve for control of the supply of working fluid to said first working chamber in said cylinder, and the flow cross-section of said first drain orifice varying with the position of said first spool valve for control of drainage of working fluid from said second working chamber, and a second supply orifice and a second drain orifice between said second spool valve and the inner periphery of said second bore, the flow cross-section of said second supply orifice varying with the position of said second spool valve for control of the working fluid supply to said second working chamber of said cylinder, and the flow cross-section of said second drain orifice varying with the position of said second spool valve for control of drainage of working fluid from said first chamber of said cylinder, and said flow cross-section of said first supply orifice and said first drain orifice being greater than that of the corresponding second supply orifice and second drain orifice.

4,696,199

ANGLE DRIVE TRANSMISSION UNIT PARTICULARLY FOR AGRICULTURAL MACHINERY

Fabrizio Fabbri, Modena, Italy, assignor to COMER S.p.A., Villanova Di Reggiolo, Italy

Filed Dec. 23, 1985, Ser. No. 812,022
Claims priority, application Italy, Jan. 8, 1985, 20421/85[U]
Int. Cl.[4] F16H 1/14, 57/02
U.S. Cl. 74—417 8 Claims



1. An angle drive transmission unit particularly for agricultural machinery, comprising:

a box like housing having a longitudinal and a widthwise extension, said housing defining therein a first and a second chamber arranged in longitudinal succession to and in communication with each other,

an input shaft arranged in said first chamber,

an output shaft arranged in said second chamber,

said input shaft and said output shaft being arranged transverse to each other,

a first bevel gear carried by said input shaft,

a second bevel gear carried by said output shaft,

said first and said second bevel gears being in mutual mesh engagement,

bearings arranged in said housing for said input and said output shafts,

at least one removable lid member in said housing for closing one of said chambers, said lid member having seat formations for accommodating therein one of said bearings,

an elastically deformable retainer member for detachably affixing said removable lid member to said housing.

4,696,200

COMPOSITE GEARWHEEL STRUCTURE FOR THE CONTROL OF GRIPPER-CARRYING STRAPS IN WEAVING LOOMS

Luigi Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy

Filed Oct. 23, 1985, Ser. No. 790,483
Claims priority, application Italy, Oct. 26, 1984, 23626/84[U]
Int. Cl.[4] F16H 3/22
U.S. Cl. 74—434 2 Claims

1. Composite gearwheel having a plastic, circular gearwheel body comprising a peripheral portion having a plurality of radially outwardly projecting gear teeth disposed at regular intervals on said peripheral portion, each said tooth defining at least one summit and each two adjacent said teeth defining a recess therebetween; and a continuous metal strip disposed on and coextensive with said peripheral portion, said metal strip covering each said summit of said plurality of plastic gear teeth, said metal strip being embedded in and encased by said plastic peripheral portion radially inwardly of each said recess, said peripheral portion and said teeth having a same and constant thickness; said strip having a width substantially equal to and coextensive with said constant thickness at each said summit; said strip having a width less than said constant thickness



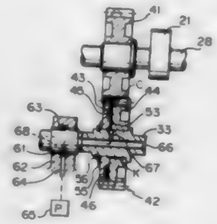
and axially recessed from said peripheral portion, radially inwardly of each said recess.

4,696,201

GEAR ASSEMBLY FOR TRANSMITTING ROTATION BETWEEN TWO SHAFTS

Kyo Hattori; Kazuo Kato, and Shuji Morita, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 29, 1985, Ser. No. 793,269
Claims priority, application Japan, Jan. 26, 1965, 60-8653[U]
Int. Cl.[4] F16H 57/04
U.S. Cl. 74—467 7 Claims



1. A gear assembly for transmitting rotation between two camshafts which have cams for opening or closing intake or exhaust valves of a double overhead camshaft engine, comprising:

a first gear fitted to one of said camshafts,

a second gear fitted to the other of said camshafts, teeth of said second gear meshing with teeth of said first gear, said second gear being divided into two gear elements by a plane perpendicular to the axis thereof, said second gear further including a spring urging said two gear elements in opposite circumferential directions so that a tooth of one of said two gear elements and a tooth of another of said two gear elements hold a tooth of said first gear so that backlash between said first and second gears is eliminated,

means for pressurizing lubricating oil including a pressurized lubricant supply source, and

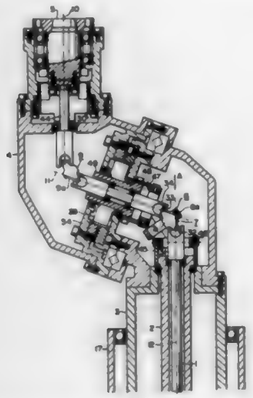
means for lubricating a meshing portion at which teeth of said first and second gears are mated to each other, said lubricating means having a passage formed between said two gear elements including a clearance between the teeth of said two gear elements of said second gear, said clearance extending from a bottom land to a crest of the teeth, said pressurized lubricant supply source supplying pressurized lubricating oil to said passage so that lubricating oil flows to the entire surface of said teeth in said meshing portion, said spring being located within said passage.

4,696,202

WRIST MECHANISM FOR INDUSTRIAL ROBOT

Tatenori Jinriki, Funabashi, and Fusaaki Kozawa, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,103
Claims priority, application Japan, Apr. 30, 1985, 60-90805
Int. Cl.[4] B66C 1/10
U.S. Cl. 74—479 11 Claims



1. A wrist mechanism for an industrial robot, having a movable arm including:

a first wrist member disposed rotatably on the robot arm;

a second wrist member disposed rotatably on said first wrist member;

a drive shaft rotatably mounted on the rotational center line of said first wrist member;

universal joint means coupling said drive shaft for rotating the second wrist member;

means mounting said second wrist member relative to said first wrist member so that the rotational center lines of both said wrist members adjustably intersect each other at an angle of 90 degrees or less; and

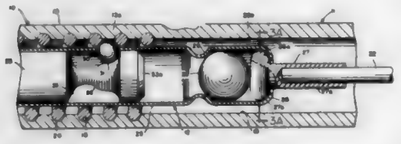
said universal joint means being constituted by first universal joint elements which include as their input shaft said drive shaft for rotating said second wrist member and an intermediate shaft as an output shaft, and by second universal joint elements which include as their input shaft said intermediate shaft and, as their output shaft, said second wrist member.

4,696,203

PUSH-PULL VERNIER CONTROL AND METHOD OF MANUFACTURE THEREOF

Ted W. Gregory, Libertyville, Ill., assignor to Areas Controls, Inc., Evanston, Ill.

Filed Sep. 10, 1984, Ser. No. 648,532
Int. Cl.[4] F16C 1/10
U.S. Cl. 74—501 R 10 Claims



1. A control assembly comprising an elongated sleeve having a threaded bore; a plunger assembly including a thin-walled cylindrical plunger tube slidably and rotatably received within said bore; said plunger tube having proximal and distal ends; a control wire equipped at one end wih a swivel connector having an enlarged head portion rotatably received within the distal end of said plunger tube; an entirely spherical ball mounted within said plunger tube proximal to said head and providing a spherical surface engagable with said head for low resistance to independent relative rotation of said connector and plunger tube under compression loads; said plunger tube curving inwardly and distally about said head to provide an annular flange having a smooth annular bearing surface engagable with said head for low resistance to relative rotation of said connector and plunger tube under tension loads; said head being circular in transverse section and having rounded peripheral bearing surfaces when viewed in longitudinal section.

6. A control assembly comprising an elongated sleeve having a threaded bore; a plunger assembly including a thin-walled cylindrical plunger tube slidably and rotatably received within said bore; said plunger tube having proximal and distal ends; a control wire equipped at one end with a swivel connector having an enlarged head portion rotatably received within the distal end of said plunger tube; a ball mounted within said plunger tube proximal to said head and providing a spherical surface engagable with said head for low resistancee to independent relative rotation of said connector and plunger tube under compression loads; said plunger tube curving inwardly and distally about said head to provide an annular flange having a smooth annular bearing surface engagable with said head for low resistance to relative rotation of said connector and plunger tube under tension loads; said plunger tube having a perforated non-circular opening in the wall thereof; a spherical member disposed within said tube having diameter smaller than said opening when measured in a first direction but larger than said opening when measured in a second direction; said spherical member being movable radially between an inwardly-displaced inoperative position and an outwardly-displaced operative position in which said member projects outwardly through said opening and is engagable with the the threads of said bore; and means for selectively shifting said member in radial directions within said tube.

7. A control assembly comprising an elongated sleeve having a threaded bore; a plunger assembly including a thin-walled cylindrical plunger tube formed of flexible material and slidably and rotatably received within said bore; said plunger tube having a perforated oval opening in the wall thereof; a spherical member disposed within said tube having a diameter smaller than the dimension of said oval opening measured along its major axis but larger than the dimension of said opening measured along its minor axis; said spherical member being movable radially between an inwardly-displaced inoperative position and an outwardly-displaced operative position in which said member projects outwardly through said oval opening and is engagable with the threads of said bore; and means for selectively shifting said member in radial directions within said tube.

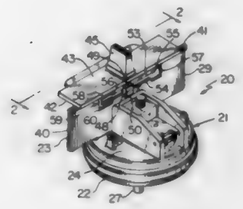
10. A control assembly comprising an elongated sleeve having a threaded bore; a plunger assembly including a thin-walled cylindrical plunger tube formed of flexible material and being slidably and rotatably received within said bore; said plunger tube having a generally oval-shaped opening in the wall thereof; said opening having a length greater than its width; a spherical member disposed within said tube having a diameter smaller than the length of said opening but larger than the width thereof; said spherical member being movable radially between an inwardly-displaced inoperative position and an outwardly-displaced operative position in which said member projects outwardly through said opening and is engagable with the threads of said bore; and means for selectively shifting said member in radial directions within said tube; said material of said plunger tube being capable of flexing for increasing the width of said opening to allow forceful insertion of said spherical member there-through during assembly operations and thereafter returning to unflexed condition for retaining said spherical member within said plunger tube.

4,696,204

WATER LEVEL CONTROL DEVICE AND METHOD OF MAKING THE SAME

Thomas M. Buckshaw, Indiana, and David T. Llewellyn, Strongstown, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 29, 1986, Ser. No. 857,636
Int. Cl.[4] H01H *35/34*
U.S. Cl. 74—567 **13 Claims**



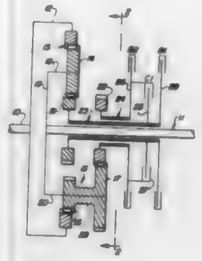
1. In a water level control device comprising a frame means provided with elongated slot means having a first portion, said frame means comprising a substantially flat frame plate having opposite sides with said slot means passing therethrough, movable cam follower means carried by said frame means for setting the desired water levels to be provided by said device, and a slide cam member having projection means extending through said slot means to guide sliding movement thereof relative to said frame means, said projection means having interlocking means interlocking with said frame means while said projection means is disposed in said first portion of said slot means, said cam member having cam surfaces means engaging said cam follower means to set the same in desired water level setting positions thereof when said projection means is in said first portion of said slot means, the improvement wherein said slot means has a second portion thereof for unlocking with said interlocking means when said projection means of said cam member is disposed in said second portion whereby said cam member can be easily detached from or attached to said frame means and wherein said interconnection means of said cam member bears against one of said sides of said frame plate when said projection means is in said first portion of said slot means, said cam member having abutment means bearing against the other of said sides of said frame plate when said projection means is in said first portion of said slot means, said projection means of said cam member being under tension when said projection means is in said first portion of said slot means whereby said interlocking means and said abutment means compress said frame plate therebetween and thereby provide resistance to sliding movement of said cam member relative to said frame means when said projection means is in said first portion of said slot means, said cam surface means having a reset area thereon for resetting said control device when said reset area is engaging said cam follower means, said slot means having a third portion thereof for receiving said projection means of said cam member therein, said reset area of said cam member engaging said cam follower means only when said projection means of said cam member is disposed in said third portion of said slot means, said frame means having means cooperating with said interlocking means to relieve the tension in said projection means when said projection means is disposed in said third portion of said slot means.

4,696,205

THREE-SPEED PLANETARY TRANSMISSION

Jeffrey C. Marks, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 4, 1986, Ser. No. 826,164
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—767 **10 Claims**



1. A multispeed planetary transmission for transferring power between a ring gear shaft and a carrier shaft comprising:
(a) a ring gear fixed concentrically to a ring gear shaft;
(b) a first planet gear set having planet gears all of which mesh with said ring gear;
(c) a second planet gear set having axially inner planet gears meshing with said gear and axially outer planet gears coaxial and coupled for rotation with said inner planet gears;
(d) a planet carrier attached concentrically and nonrotatably to a carrier shaft and having said first and second planet gear sets rotatably mounted thereon;
(e) an axially inner sun gear concentric with said shafts and meshing with said gears of said first planet gear set;
(f) an axially outer speed control gear concentric with said shafts and meshing with said outer planet gears of said second planet gear set;
(g) means for coupling said outer speed control gear with said inner sun gear to obtain a direct drive between said ring gear shaft and said carrier shaft;
(h) means for preventing rotation of said inner sun gear to obtain a first speed ratio between said shafts; and
(i) means for preventing rotation of said outer speed control gear to obtain a second speed ratio between said shafts.

4,696,206

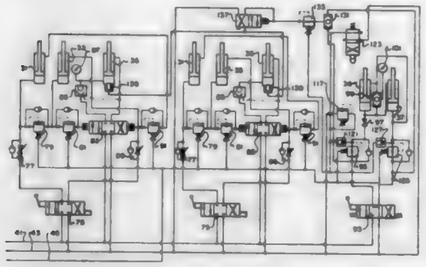
TORQUE WRENCH

James G. Reafro, Spring, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Apr. 10, 1986, Ser. No. 850,313
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—57.34 **5 Claims**

1. A tool for gripping a section of pipe, the tool comprising:
a wrench assembly;
clamping means, on the wrench assembly, for clamping onto the section of drill pipe;
torque means for applying a torque to the wrench assembly, to cause a rotation of the wrench assembly;
power means for supplying hydraulic pressure to the clamping means and the torque means;

adjustment means for adjusting the hydraulic pressure applied to the torque means; and



valve means for causing the hydraulic pressure applied to the clamping means to automatically vary linearly with the hydraulic pressure applied to the torque means.

4,696,207

WELL PIPE HANDLING MACHINE

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Division of Ser. No. 727,724, Apr. 26, 1985. This application Apr. 21, 1986, Ser. No. 854,404
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—57.34 **64 Claims**



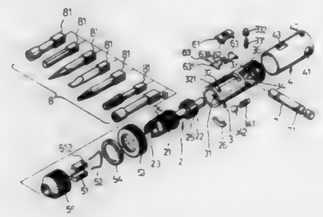
29. A well pipe handling machine for use in a rig having a floor and having a string of pipe extending vertically along an axis of a well and having a rack for receiving and holding a series of pipe sections from said string in essentially vertically extending condition, comprising:
a support column structure which extends essentially vertically and is movable generally horizontally to store said sections of pipe in said rack or retrieve them therefrom;
two vertically spaced pipe holding units carried by said support column structure for movement therewith and adapted to hold a section of pipe in vertical condition during such movement;
upper and lower carriage structures connected to upper and lower ends respectively of said column structure;
two synchronized drive mechanisms for actuating said carriage structures genrally horizontally in correspondence with one another between a first position in which the support column structure extends essentially vertically and said pipe holding units support said pipe section in vertical condition in alignment with said axis of the well and a second position in which said support column structure remains in essentially vertically extending condition but is offset horizontally from said first position and said pipeholding units can move a pipe supported thereby in vertical condition into or out of said rack;
pivotal connections attaching upper and lower ends of said column structure to said upper and lower carriage structures repsectively for pivotal movement about a vertical axis offset from the axis of said well to face said rack;
powered means for pivoting said column structure relative to said two carriage structures;
tracks adapted to extend horizontally along said rig floor and guide said lower carriage structure between said first and second positions;
a third carriage structure mounted to said column structure for movement upwardly and downwardly relative thereto and for movement with said column structure pivotally and between said first and second positions thereof;
means for actuating said third carriage structure upwardly and downwardly;
a parallelogram mechanism mounting said two pipe holding units to said third carriage structure for movement upwardly and downwardly therewith relative to the column structure and for movement with the column strucutre between said first and second positions thereof;
said parallelogram mechanism including two swinging arms carrying said pipe holding units respectively and connected to said third carriage structure at vertically spaced locations for swinging movement in unison relative thereto to move the pipe holding units and a carried pipe generally horizontally toward and away from said column structure while retaining the pipe in essentially vertical condition;
actuating means for swinging said arms in unison;
a control station for carrying an operator and having controls for operating the machine, and which control station is connected to said third carriage structure for movement therewith upwardly and downwardly and pivotally and between said first and second posoitions;
a torque wrench connected to said third carriage structure for movement therewith and located near said control station; and
a spinner connected to said third carriage structure for movement therewith and located above and in alignment with said torque wrench.

4,696,208

DIRECTION-CHANGEABLE STRUCTURE OF HAND TOOL HANDLE

Tsay T. Lay, No. 11, Alley 22, Sec. 2, Change Ping Rd., Taichung, Taiwan

Continuation of Ser. No. 808,510, Dec. 13, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 948,407
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—58 **3 Claims**



1. A direction-changeable handle structure for a hand tool comprising:
(a) a body having a gear wheel attached thereto near a first

end portion of the body, a second portion of the body having threads, and defining a slot and a chucking block seat;

(b) two arc plates extending from said chucking block seat having flat inner faces so as to form a rectangular shape when engaged with a pair of chucking blocks;

(c) a pair of chucking blocks connected by a spring clip which is located in said slot of said body, the chucking block being disposed in the chucking block seat;

(d) first and second rings threadedly attached to the second end of the body so as to transmit torque to the body, said first ring, having a relatively greater thickness, and said second ring being screwed on the threads of said body, said second ring having a relatively smaller thickness and being screwed on said threads after said first ring;

(e) a chuck bearing against a portion of the chucking blocks and threadedly engaging with the second end portion of the body adjacent to the second ring so as to attach a variety of tools to the handle;

(f) a coupling tube concentrically arranged about the body, the coupling tube defining an "H" shaped slot, a key way, a transverse hole and a spring attachment hole;

(g) a key member disposed in the key way and bearing against the body to prevent removal of the body from the coupling tube to keep the body in its position;

(h) a substantially "T" shaped plate disposed in each leg of the "H" shaped plate engaging with the gear wheel;

(i) switch means connected to the "T" shaped plates such that either one or both may engage the gear wheel so as to control the direction of torque which is exerted by the handle, the switch means being manually manipulable from the exterior of the coupling tube;

(j) a sleeve concentrically arranged about the coupling tube, the sleeve defining openings aligned with the transverse hole of the coupling tube, a switch opening and a spring attachment opening;

(k) spring biased attachment means located in the spring attachment hole and a engaging button for attaching the sleeve to the coupling tube; and

(l) ball detent means located in the coupling tube so as to retain a handle bar inserted into the transverse hold.

4,696,209

LATHE HAVING AN INTEGRATED CHUCK

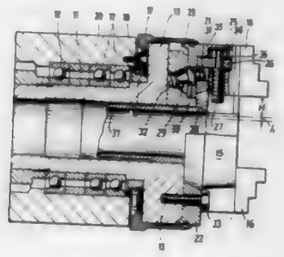
Klaus Felten, Waldbronn; Walter Honroth, Osterrainen; Siegfried Kuhn, Dürnau; Hermann Schulten, Birenbach, and Bruno Zeller, Lauterstein, all of Fed. Rep. of Germany, assignors to Oerlikon-Boehringer GmbH, Goppingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 531,344, Sep. 12, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,356

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233914

Int. Cl.[4] B23B *31/14*

U.S. Cl. 82—40 R **5 Claims**



1. A lathe comprising:

a headstock spindle having a flange on one end thereof;

a chuck body having a chuck base integral with said spindle flange;

chuck jaws mounted on said chuck body;

means for compensating for centrifugal force acting on said chuck jaws, said means including radial grooves defined in said headstock spindle flange, counterweights movably located in said radial grooves and reversing levers connecting said counterweights to said chuck jaws for transmitting movement of said counterweights to said chuck jaws.

4,696,210

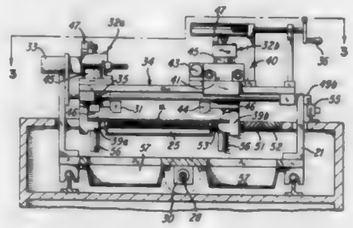
TWO HOLE AUTOMATIC PRECISION PUNCH

Charles E. Cain, Tipp City, and Gary L. Cain, New Carlisle, both of Ohio, assignors to Chief Technology Systems, Inc., New Carlisle, Ohio

Filed Jun. 30, 1986, Ser. No. 879,895

Int. Cl.[4] B21D *28/04;* **B26F** *1/38*

U.S. Cl. 83—33 **8 Claims**



8. A method of producing registration holes in a sheet-like workpiece that is provided with registration marks, said method including the steps of:

providing a workpiece with registration marks;

moving one of a first carriage and said workpiece relative to the other in a first direction until a first sensor means senses the position of said first carriage relative to a given one of said registration marks on said workpiece;

moving one of a second carriage and said workpiece relative to the other in a second direction, at right angles to said first direction, until a second sensor means senses the position of said second carriage relative to said same given registration mark on said workpiece;

moving one of a third carriage and said workpiece relative to the other substantially in said first direction until a third sensor means senses the position of said third carriage to another one of said registration marks on said workpiece;

punching out said given one of said registration marks to produce a registration hole in said workpiece; and

punching out said another one of said registration marks to produce another registration hole in said workpiece.

4,696,211

METHOD AND APPARATUS FOR NIBBLING CUTOUTS WITH RECTILINEAR AND CURVILINEAR CONTOURS BY ROTATION OF TOOLING WITH CUTTING SURFACES OF RECTILINEAR AND CURVILINEAR CONTOURS AND NOVEL TOOLING THEREFOR

Hubert Bitzel, Ditzingen, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,132

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] B26D *5/22*

U.S. Cl. 83—49 **13 Claims**

1. In a method for nibbling contoured cutouts with both curvilinear and rectilinear portions in a sheet-like workpiece, the steps comprising:

(a) providing a punch press having a frame with a base and a head spaced thereabove, a ram assembly on the head including a lower portion reciprocatable along a vertical axis relative to the base of said punch press frame;

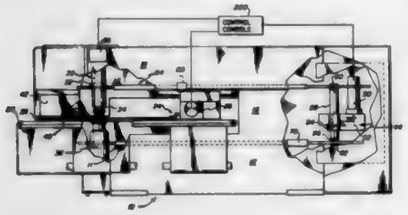
(b) locating a punch in alignment with said ram lower portion for reciprocation thereby along said vertical axis, said punch having a cutting edge portion extending across the lower end in a common plane and including at least one arcuate cutting edge surface A^1 defined by a radius R^1 and at least one rectilinear cutting edge surface A^2;

(c) locating in alignment with said punch a die having an aperture cooperatively dimensioned and configured to receive said cutting edge portion of said punch, said punch and die defining a workstation therebetween substantially in alignment with said vertical axis of said ram assembly lower portion;

(d) supporting a sheet-like workpiece at said workstation between said die and punch;

(e) reciprocating said ram lower portion to reciprocate and drive said cutting edge portion of said punch through said workpiece at said workstation to produce a cutout;

(f) indexing said workpiece in horizontal plane a predetermined distance relative to said workstation, said distance being less than the length of a first one of said punch cutting edge surfaces;



(g) rotating said punch and die at said workstation substantially at and about said vertical axis a predetermined amount to orient a desired one of said cutting edge surfaces at the desired angular position for the desired contour of a large contoured cutout in said workpiece;

(h) reciprocating said ram lower portion to drive said cutting edge portion of said punch through said workpiece at said workstation to produce a second cutout contiguous to said first cutout; and

(i) repeating steps (f)–(h) to produce a large contoured cutout, at least some of said rotation steps effecting rotation of said punch and die substantially at and about said vertical axis to orient the other one of said cutting edge surfaces at the desired angular position for the desired contour of the large contoured cutout in said workpiece and at least some of said rotation steps consecutively effecting rotation of said punch and die substantially in and about said vertical axis to orient the same cutting edge surface at the desired angular position for that portion of the desired contour of the large contoured cutout in said workpiece, thereby defining said contour of said large contoured cutout with rectilinear surface portions and arcuate surface portions by at least said two cutting surfaces.

4,696,212

ROTARY CUTTER

Masateru Tokuno, Nishinomiya; Tetsuya Sawada, Kyoto, and Yasuharu Mori, Amagasaki, all of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

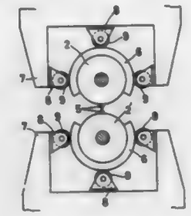
Filed Jun. 16, 1986, Ser. No. 874,964

Claims priority, application Japan, Jun. 17, 1985, 60-132821

Int. Cl.[4] B26D *1/62;* **B23D** *25/12;* **B27L** *5/08*

U.S. Cl. 83—343 **4 Claims**

1. A rotary cutter for cutting a web material to desired lengths, said rotary cutter including a pair of rolls mounted to rotate synchronously in opposite directions, a knife fixedly mounted on each of said rolls so as to extend axially to cut the web material fed to a position between said rolls, and driving means for driving said rolls, characterized in that a plurality of rolling bodies are arranged around each of said rolls to bear the



shock upon cutting through said rolls, that a plurality of raised portions are provided on the outer periphery of each roll so as to extend circumferentially except near said knife, and that said rolling bodies are adapted to roll on said raised portions, preventing said knives from hitting said rolling bodies.

4,696,213

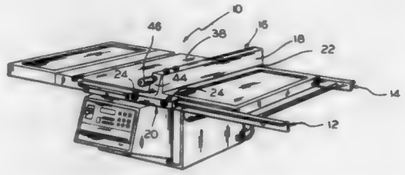
TOOL FINE ADJUSTMENT MECHANISM

Martin L. Conneally, Lombard, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill.

Filed Jan. 2, 1986, Ser. No. 815,525

Int. Cl.[4] B23Q *3/02;* **B26D** *7/01*

U.S. Cl. 83—438 **14 Claims**



1. In a tool having a laterally slidable adjustment means including a corresponding track and guide slidable thereon, and having means for releasably securing said guide on said track in a selected position of adjustment, the improvement comprising:

friction drive means operatively associated with said guide so as to normally be free of friction driving engagement with said track, said friction drive means being selectively manually frictionally engageable with said track, said friction drive means cooperating with said track for making fine adjustments in the position of said laterally slidable adjustment means of said tool;

said guide including a pair of spaced apart surfaces adapted to be disposed on opposite sides of said track in generally parallel relation thereto, said spaced apart surfaces of said guide being joined by a transversely extending wall disposed in generally parallel relation to said track, said wall including an opening facing outwardly away from said track and said friction drive means being accessible through said opening for manual operation thereof;

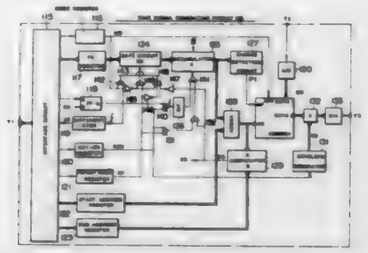
said friction drive means including a rotatable member disposed about an axis extending generally perpendicular to said spaced apart surfaces of said guide, said rotatable member having a portion extending through said opening in said wall of said guide and frictionally engageable with said track for rotationally driven movement therealong.

4,696,214

ELECTRONIC MUSICAL INSTRUMENT

Tetsuji Ichiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 10, 1986, Ser. No. 917,909
Claims priority, application Japan, Oct. 15, 1985, 60-229081
Int. Cl.[4] G10H *7/00*
U.S. Cl. 84—1.01 **7 Claims**



1. An electronic musical instrument comprising:
mode selection means for selecting one of a plurality of modes including sampling and play modes, said mode selection means outputting a mode signal representative of the selected mode;
transducer means for converting a tone into a tone signal representative of said tone;
memory means comprising a plurality of storage areas each having a plurality of addresses;
read/write rate designation means for outputting a first rate signal designating a first rate of access to the addresses of said memory means when said mode signal represents said sampling mode, and for outputting a second rate signal designating a second rate of access to the addresses of said memory means when said mode signal represents said play mode;
storage area designation means for designating one of said plurality of storage areas and for outputting an area signal indicative of the designated storage area;
read/write control means responsive to said mode signal, said first rate signal and said area signal for storing data representing said tone signal into the addresses in said designated storage area only at said first rate when said mode signal represents said sampling mode, and responsive to said mode signal and said second rate signal for reading data from the addresses in said plurality of storage areas at said second rate when said mode signal represents said play mode; and
tone generating means for generating a tone in accordance with the data read from said memory means.

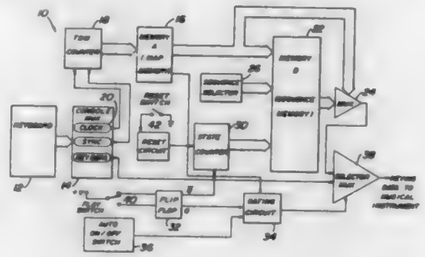
4,696,215

MANUALLY CONTROLLED PERFORMANCE APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Walter L. Greenwood, Alburtis, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed Sep. 24, 1985, Ser. No. 779,764
Int. Cl.[4] G10F *1/00*; G10H *7/00*
U.S. Cl. 84—1.03 **10 Claims**

1. An electronic musical instrument comprising:
(a) manually actuated control means for generating operator-derived control data,
(b) at least two keyboards,
(c) time-division multiplexing means for encoding key actuations of the keyboards into time-division multiplexed keyboard-notes data signals,
(d) memory means for storing note data representative of predetermined combinations of musical notes,
(e) preprogrammed addressing means synchronous with the time-division multiplexing means for generating mode control data representative of predetermined operating modes for each of the keyboards and address data for addressing the note data stored in the memory means,
(f) counter means responsive to the operator-derived control data for enabling the memory means to recall therefrom time-division multiplexed stored-notes data signals representative of the predetermined combinations of musical notes associated with respective counts of the counter means,



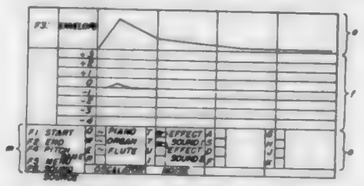
(g) selector means for selecting between the keyboard-notes data signals for keyboards in a first operating mode and the stored-notes data signals for keyboards in a second operating mode and forming a composite-notes data signal,
(h) selector control means responsive to the operator-derived control data and the mode control data for controlling the selector means, and
(i) means responsive to the composite-notes data signal for producing the sounds of the instrument corresponding to the notes encoded in the composite-notes data signal.

4,696,216

ACOUSTIC OUTPUT DEVICE FOR PERSONAL COMPUTER

Takeoki Asahi, Ikoma, and Toshihiko Yoshida, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1985, Ser. No. 739,852
Claims priority, application Japan, May 31, 1984, 59-112740
Int. Cl.[4] G10H *1/057, 7/00*; G09B *15/04*
U.S. Cl. 84—1.13 **12 Claims**



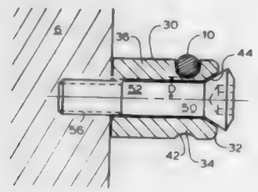
1. An acoustic output device comprising:
envelope setting means for creating elements of a tone, including creating an envelope pattern representing elements of said tone over time and having a plurality of user defined envelope segments;
first storage means, responsive to said envelope setting means, for storing data representative of each envelope segment of said tone;
music note setting means for setting note information for a piece of music;
second storage means, responsive to said music note setting means, for storing the note information;
acoustic output means responsive to said music note setting means and said envelope setting means for reading-out the note information and said data and providing a tone having said elements with the plurality of envelope segments represented by said data; and
display means, responsive to said envelope setting means, for displaying note information having the envelope pattern created thereby.

4,696,217

HARP AND IMPROVED STATIONARY NUT

William MacWilliams, Oakbrook Terrace, Ill., assignor to Lyon & Healy Harps Inc., Chicago, Ill.

Filed Oct. 1, 1986, Ser. No. 913,983
Int. Cl.[4] G10D *1/04*
U.S. Cl. 84—266 **4 Claims**



4. In a musical harp, comprising a soundboard and a multiplicity of harp strings, and a stationary nut adapted to be engaged for a limited length extent circumferentially by a said harp string extending from a tuning pin, about said stationary nut to a soundboard, said string between said stationary nut and said soundboard, extending between sharpening pins of the action plate,
the improvement wherein,
for adjusting the position of said string relative to said sharpening pins of said action plate,
said stationary nut comprises:
a annular collar defining a central bore and, on its outer surface, a generally circumferential groove sized and adapted to be engaged by said harp string, and
an elongated shaft sized and adapted to extend through said central bore for fastening said annular collar to said harp,
the respective axes of said elongated shaft and said generally circumferential groove defined about said collar being different, and relative rotation between said collar and said shaft is effective to change the radial distance of a segment of the groove surface supporting the harp string from the axis of the shaft in a manner to change the position of said string relative to said sharpening disk,
whereby the said harp string may be centered on the action plate for improved playing tone of said harp.

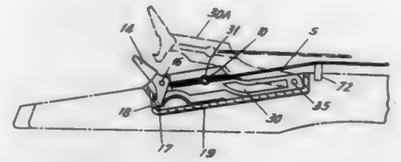
4,696,218

FASTENING MEANS FOR GUITAR STRINGS

Yoshihiro Hoshino, Nagoya, and Kazuhiro Matsui, Aichi, both of Japan, assignors to Hoshino Gakki Co., Ltd., Japan

Filed Sep. 8, 1986, Ser. No. 904,278
Claims priority, application Japan, Dec. 13, 1985, 60-192393[U]
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—297 R **11 Claims**

1. A tailpiece section for a stringed musical instrument including:
a string stopping member;
a string;
a retaining member secured to said string at a predetermined location thereof in the vicinity of its tail end;
said stopping member including a holding formation for engaging said retaining member;
a saddle disposed at a position forward of said retaining member for supporting said string while it is in tension;
said stopping member being mounted for movement between a first position for string tensioning and a second position for string relaxation;



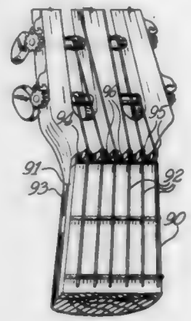
a releasable latch for retaining said stopping member in said first position;
said retaining member being deformed to lock same at said predetermined location.

4,696,219

NUT FOR STRINGED INSTRUMENTS

Raphael Plescia, 1048 California Ave., Salt Lake City, Utah 84104

Filed Mar. 14, 1986, Ser. No. 839,899
Int. Cl.[4] G10D *3/04, 3/06, 3/12*
U.S. Cl. 84—314 N **17 Claims**



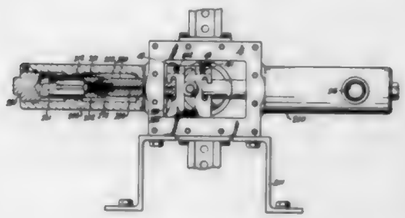
1. An improved nut for positioning near the fingerboard of a stringed instrument and for supporting strings of the instrument above a level of the fingerboard, said nut comprising:
a nut body configured for snug fit with respect to the fingerboard and neck of the instrument, said body having a front face for placement proximate to the fingerboard, a back face, a base for secure mounting of the nut with respect to the neck of the instrument and a crown having string support means for positioning and retaining the strings at properly spaced distances with respect to adjacent strings and above the fingerboard;
the crown of the nut being formed of two separate alternating sections wherein the first section comprises the string support means positioned at appropriate heights above the level of the fingerboard for proper positioning of strings;
the second section of the nut comprising a fluted portion between at least two adjacent string support means wherein most of the space between (i) the two adjacent strings, (ii) the front and back nut faces and (iii) the level of the fingerboard and level of the strings is void of nut material;
the string support means being thereby adapted for receiving and transmitting increased vibrational energy from the string into the neck and fingerboard of the instrument.

4,696,220
VIOLIN STUDENT SIZING DEVICE
Michael J. Pagliaro, 219 Sprain Rd., Scarsdale, N.Y. 10583
Filed Dec. 10, 1986, Ser. No. 940,111
Int. Cl.[4] G10G 7/00
U.S. Cl. 84—453 4 Claims



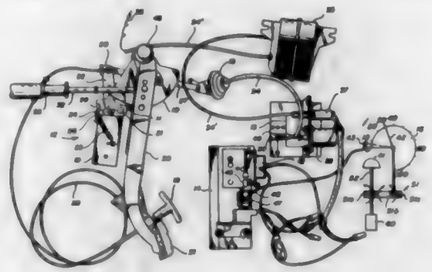
1. A violin student sizing device comprises: a chin rest having a flat bottom surface that rests on the shoulder of the student and a top surface with a depression that conforms in configuration to the chin rest of a violin and which the chin and cheek of the student rest; a first rod having an elongated slot and markings in juxtaposition to said slot and connected to said chin rest; and a second rod telescoping within said first rod and having a measuring dowel that slides within said elongated slot of said first rod; and wherein the length of said sizing device ranges from approximately 14¼" to 23¼".

4,696,221
DUAL VALVE CONTROL FOR DOUBLE ACTION HYDRAULIC CYLINDER
William M. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Division of Ser. No. 449,823, Dec. 14, 1982, Pat. No. 4,571,939.
This application Oct. 9, 1985, Ser. No. 785,886
Int. Cl.[4] F15B 13/02
U.S. Cl. 91—51 8 Claims



1. A device for direction control of a double action hydraulic cyclinder comprising: spaced supply-exhaust fluid control valves having means for fluid connection, respectively, with the extend and retract opposing power ends of said hydraulic cylinder; drive means including a fluid motor; a scotch-yoke coupling said motor with said fluid control valves for operating said valves; a pilot valve coupled with said scotch-yoke for controlling fluid to said motor; means for supplying fluid to said pilot valve; and release valves for controlling said fluid control valves operated by said motor.

4,696,222
BRAKE HOLDING SYSTEM
Joon H. Han, 816 Gregorio Dr., Silver Spring, Md. 20901
Continuation-in-part of Ser. No. 763,715, Aug. 8, 1985, Pat. No. 4,646,903. This application Dec. 5, 1985, Ser. No. 804,786
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.[4] B60K 41/24
U.S. Cl. 192—3 H 12 Claims

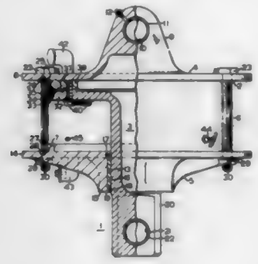


1. A brake holding system for a vehicle having, in combination, a brake pedal, a master cylinder, a vacuum system and a power supply, which comprises
a moon gear having a plurality of teeth on one side thereof, said moon gear being operably connected to the master cylinder,
a spring biased holding unit adapted to engage the teeth of the moon gear, against said spring bias whenever the holding system is activated,
an on/off member,
a vacuum actuator providing communication between said holding unit and said on/off member,
a speed monitoring device operatively associated with a speedometer and communicating with said on/off member for automatically activating said holding unit upon the application of the brake pedal against said spring biss to engage said moon gear during the time when the speed of the vehicle is reduced to between 0 and 3 mph, and
releasing switch communicating with said on/off member for disengaging said holding unit upon the depression of an accelerator pedal.

4,696,223
PNEUMATIC PRESSURE ACTUATOR
Charles T. Link, Pleasant Hills; Bennie M. Gray, Pittsburgh, and Harold L. Shumaker, Monroeville, all of Pa., assignors to American Standard Inc., Pittsburgh, Pa.
Continuation of Ser. No. 105,325, Dec. 19, 1978, abandoned.
This application Jun. 18, 1987, Ser. No. 274,956
Int. Cl.[4] F01B 31/00
U.S. Cl. 92—86.5 2 Claims

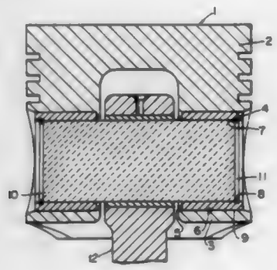
1. A short stroke fluid motor comprising, a cylinder assemblage and a metallic piston having an enlarged head portion formed on one end and having a piston rod integrally formed on the other end, said cylinder assemblage including a metallic top header casting, a metallic bottom header casting, and an all-plastic cylinder casing fixedly secured between said top and bottom header castings, said top header casting and said enlarged head portion of said metallic piston being hollowed out to lessen the mass of the fluid motor, said piston rod passing through a bore located in said bottom header casting for permitting said metallic piston to reciprocate in said plastic cylinder casing, a cushion ring carried by said enlarged head portion of said hollow metallic piston, said cushion ring includes a grease accommodating V-groove facing the inner wall of said plastic cylinder to reduce wear and to provide a better seal between said piston and said cylinder and to prevent said enlarged head portion from contacting said plastic cylinder casing, and said plastic cylinder casing is made of moly-disulfied fiberglass material.

2. A short stroke fluid motor comprising, a cylinder assemblage and a metallic piston having an enlarged head portion formed on one end and having a piston rod integrally formed on the other end, said cylinder assemblage including a metallic top header casting, a metallic bottom header casting, and an all-plastic cylinder casing fixedly secured between said top and bottom header castings, said top header casting and said enlarged head portion of said metallic piston being hollowed out to lessen the mass of the fluid motor, said piston rod passing



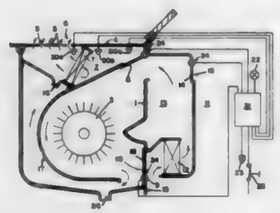
through a bore located in said bottom header casting for permitting said metallic piston to reciprocate in said plastic cylinder casing, a cushion ring carried by said enlarged head portion of said hollow metallic piston, said cushion ring includes a grease accommodating V-groove facing the inner wall of said plastic cylinder to reduce wear and to provide a better seal between said piston and said cylinder and to prevent said enlarged head portion from contacting said plastic cylinder casing, and a grease fitting and petcock are provided on the outside of said plastic cylinder casing to permit the lubricating of said cushion ring.

4,696,224
PISTON FOR INTERNAL COMBUSTION ENGINE
Yoshibumi Mishima, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1984, Ser. No. 682,420
Claims priority, application Japan, Dec. 21, 1983, 58-196965[U]
Int. Cl.[4] F16J 1/14
U.S. Cl. 92—187 4 Claims



1. A piston and piston pin for an internal combustion engine, wherein the improvement comprises a piston made of an aluminum alloy having two spaced piston pin bosses, a bushing made of a material having a smaller thermal expansion coefficient than said aluminum alloy fitted in the inner circumference of each of said piston pin bosses, and a piston pin made entirely of ceramic fitted in said bushings.

4,696,225
AIR FILTER ARRANGEMENT FOR VEHICLE AIR-CONDITIONING SYSTEM
Karl-Heinz R. Weller, Gerlingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 9, 1986, Ser. No. 871,790
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520413
Int. Cl.[4] B60H 3/06
U.S. Cl. 98—2.11 23 Claims



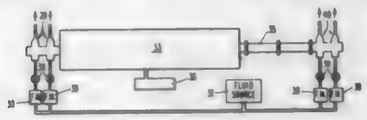
1. An air filter arrangement for a heating or air conditioning system of a motor vehicle comprising:
filter means arranged in an air inlet flow means between the outside of the vehicle and the passenger space of the vehicle;
fan means arranged behind the filter means in the direction of the passenger space of the vehicle; and
flow altering means for altering the air flow path;
wherein, during normal operation, the flow altering means are arranged so as to cause air flow from the outside of the vehicle, through the inlet flow means, filter means, to an inlet of the fan means and into the passenger space, and during an air filter cleaning operation, the flow altering means are arranged so as to cause air flow from the passenger spaced through the inlet of the fan means, the inlet flow means and the filter means to the outside of the vehicle.

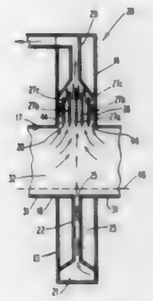
4,696,226
FLUID BARRIER CURTAIN SYSTEM
Warner H. Witmer, Penn Center Plaza, Quakertown, Pa. 18951
Filed Aug. 28, 1986, Ser. No. 901,380
Int. Cl.[4] F24F 9/00
U.S. Cl. 98—36 5 Claims

1. A fluid barrier curtain at an aperture to maintain separation of fluids on opposite sides of said barrier curtain while permitting passage of objects through said aperture, comprising:
means defining an aperture zone through which objects may pass;
and a fluid curtain barrier system for substantially opposing transverse interchange of fluids across said aperture zone, said fluid curtain barrier system comprising
means for supplying fluid to the fluid curtain barrier system,
fluid flow shaping means directing the supplied fluid flow in a concentrated laminar sheet substantially within said zone and from one boundary of said zone toward an opposite boundary thereof,
receiving means located opposite said laminar fluid flow shaping means for receiving a resulting flow stream and fluids entrained therewith and inducing the fluids arriving in its vicinity to be collected together and caused to emerge from said aperture zone as a coherent fluid effluent, said receiving means including an opening extending across the opposite boundary of said aperture zone,
said opening being wider in the direction transverse of said aperture zone than the width of the laminar sheet of fluid exiting said fluid flow shaping means,

a box-like housing extending from said opening away from the aperture zone, and

a plurality of spaced-apart vanes fixedly positioned in said housing and having thin edges substantially coplanar with





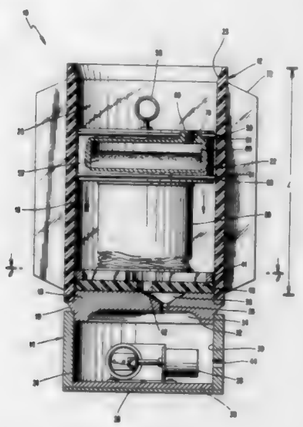
said opening, said vanes being substantially parallel to said aperture zone through which objects may pass and serving to separate the fluid flowing out of the aperture zone into laminar-flow segments.

4,696,227

PRESS FOR COMPACTING SMALL SCALE OBJECTS

W. Jeffrey Van Buskirk, P.O. Box 1385, 302 S. Leach St., Hobbs, N. Mex. 88240

Filed May 16, 1986, Ser. No. 863,695
Int. Cl.⁴ B30B *1/16, 1/42*
U.S. Cl. 100—902 **23 Claims**



1. A self-contained, manually portable press for compacting small scale objects, comprising:

a hollow, cylindrical housing having a floor and sidewalls extending substantially perpendicularly therefrom to define a housing cavity;

compacting means slidable within said housing cavity, said compacting means including means arranged to travel with said compacting means in said housing cavity in close proximity to said sidewalls; and

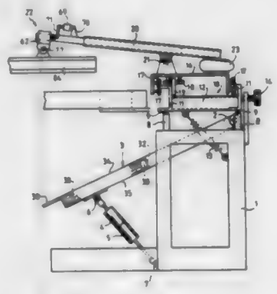
means for drawing said compacting means toward said floor of said housing cavity, said drawing means being arranged within the housing for drawing said compacting means downwardly with sufficient force to substantially crush an object positioned between the compacting means and the floor of the housing cavity.

4,696,228

SCREEN PROCESS PRINTING MACHINE

Bernard David, 20, rue Denis Papin, Bagnolet, and Roger Tetard, 5, rue Bassano, Paris, both of France

Filed Sep. 10, 1985, Ser. No. 774,463
Claims priority, application France, Sep. 11, 1984, 84 14227
Int. Cl.⁴ B41L *13/02;* **B41F** *15/26*
U.S. Cl. 101—123 **5 Claims**



1. A screen printing machine comprising:

a support frame comprising vertical and horizontal members and having a rear side, a front side spaced horizontally forward therefrom, and a plurality of stanchions projecting upward between the front and rear sides;

an auxiliary frame lying and horizontally movable on the stanchions and projecting forward past the front side of the support frame;

an abutment fixed on the support frame behind the auxiliary frame;

a spring engaged between the auxiliary frame and the support frame and pulling the auxiliary frame down against the stanchions and back against the abutment;

means for affixing a screen to the auxiliary frame so that said screen is cantilevered on and projects forward beyond the front side of the support frame so that said screen lies fully forward of the front side of the support frame;

a platen disposed below said screen and forward of the front side of the support frame;

means including a horizontal pivot disposed at the rear side of the support frame for pivoting the platen on the support frame about a pivot axis so that said platen projects wholly beyond said front side of said support frame and access to said platen and said screen is afforded on all sides thereof except for rear edges of said screen and said platen which are proximal to said support frame;

a carriage displaceable along said auxiliary frame generally parallel to the axis defined by said pivot; and

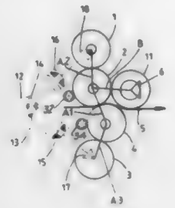
a scraping and lapping device overlying said screen and cantilevered from said carriage so as to be disposed wholly forward of said front side of said support frame above the screen and plate.

4,696,229

ROTARY OFFSET PRINTING PRESS EQUIPPED FOR FLYING PLATE CHANGE

Wilhelm Bexler, Augsburg, and Ingo Kobler, Anhausen, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,988
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510822; Mar. 26, 1985, 3510823
Int. Cl.⁴ B41F *5/04, 5/22*
U.S. Cl. 101—177 **6 Claims**



1. Rotary off-set printing press utilizing a multiple array of roller cylinders capable of dual-mode selective operation, either as a prime and verso offset-printing press in which a strip to be printed may be printed simultaneously on both sides or else as a single-side printing press equipped for changing plates on the plate cylinder of a first pair of offset-printing cylinders while the press continues uninterruptedly to print with a second pair of offset-printing cylinders against a counterpressure cylinder common to both pairs of offset-printing cylinders, each of said cylinder pairs including a plate cylinder and a rubber-cloth surfaced cylinder, and comprising, in addition to said pairs of cylinders and said counterpressure cylinder:

axle positioning means for shifting the axle of at least one cylinder of at least one of said first and second pairs of cylinders between a first position in which said rubber cloth cylinders of said first and second pairs are able to print on a strip of printable material passing between them and a second position in which said rubber cloth cylinders of said first and second cylinder pairs are spaced apart so that one of them can be driven while the other remains at rest and also for axle shifting from said second position such as to relatively approach or separate each of said rubber cloth cylinders of said first and second cylinder pairs, selectively, respectively to or from said counterpressure cylinder, respectively for printing and for flying plate change;

a main drive for providing rotary power for operating said printing press;

first operating means for operating said printing press in prime and verso offset-printing comprising;

first rotary force transmitting means for transmitting force from said main drive for driving said rubber cloth cylinder of both said first and second cylinder pairs when said axle positioning means is in said first position thereof, and

means for driving a drive gear of said counterpressure cylinder with rotary force derived from said main drive whereby said counterpressure cylinder may serve as a feed-out cylinder for printed strip, and

second means for operating said offset-printing press as a single-side printing press with facility for plate change without stopping the press, including:

first controllable power-transmission means for selectively driving either said rubber cloth cylinder of said first offset-printing cylinder pair or said rubber cloth cylinder of said second offset-printing cylinder pair by force derived from said main drive while the other of said first and second cylinder pairs is enabled to be disconnected from said main drive by said axle-positioning means, then subjected to a plate change and then brought back into connection with said main drive, and

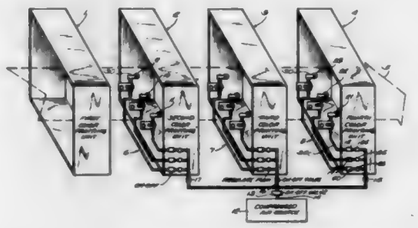
auxiliary drive means connectable for transmitting rotary force to said first or said second cylinder pair for putting into rotation and accelerating a said cylinder pair disconnected from said main drive and bringing it into synchronism for engagement with said main drive.

4,696,230

ADJUSTABLE BUSTLE-FORMING APPARATUS FOR MAINTAINING REGISTRATION OF MULTICOLOR IMAGES ON PRINTING WEBS

George J. Barkley, North Barrington, Ill., assignor to Barkley Corporation, Elk Grove Village, Ill.

Filed Sep. 25, 1986, Ser. No. 911,397
Int. Cl.⁴ B41F *13/02*
U.S. Cl. 101—181 **21 Claims**



1. A combination wheel-air bustling device for producing an adjustable bustle in a printing web as it travels between successive printing units of a multicolor printing press,

such device comprising supporting means having mounting means for mounting such supporting means in a selected location between the successive printing units and opposite the printing web,

carriage means movably mounted on such supporting means for movement in a direction generally perpendicular to the printing web,

air nozzle means mounted on such carriage means to direct an air jet against the web for producing a bustle therein,

bustle wheel means mounted on such carriage means to engage and deflect the web for producing a bustle therein,

selecting means to produce relative movement between the bustle wheel means and the air nozzle means for selectively bringing either the air nozzle means or the bustle wheel means into its operative bustle-forming relationship with the printing web to form a bustle therein,

and adjusting means for producing adjusting movement of the carriage means and the selected air nozzle means or bustle wheel means in a direction generally perpendicular to the printing web for adjusting the depth of the bustle formed therein by the selected air nozzle means or bustle wheel means.

4,696,231

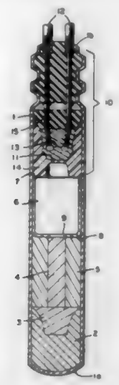
SHOCK-RESISTANT DELAY DETONATOR

Paul J. Bryan, Hewitt, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1986, Ser. No. 832,777
Int. Cl.⁴ F42B *3/10;* **F42C** *19/08*
U.S. Cl. 102—202.5 **9 Claims**

1. In a delay detonator comprising a tubular metal shell integrally closed at one end and containing, in sequence from the closed end, (a) a base charge of a detonating explosive composition, of pentaerythritol tetranitrate (b) a priming charge of a heat-sensitive detonating explosive composition, (c) a delay charge of an exothermic-burning composition, and

(d) an ignition assembly for igniting said delay charge, the improvement comprising a priming charge of lead azide above-standard weight weighing at least 0.26 grams and output level of a magnitude which adapts the detonator, without reinforcement of said shell around said base and priming



charges, to give consistent full-output detonation upon being actuated in a water-filled steel pipe after the simultaneous detonation therein of a side-by-side pair of detonators separated therefrom, base charge from base charge, by a distance of 12.7 cm.

4,696,232

DETONATOR SAFETY DEVICE FOR A WEAPON

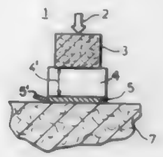
Manfred Held, Aresing, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Nov. 19, 1985, Ser. No. 799,407

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443331

Int. Cl.⁴ F42C *15/34*

U.S. Cl. 102—254 **8 Claims**



1. A detonator safety device having a safety position and a firing position, for a weapon including a main explosive charge, said detonator safety device comprising a detonator charge, a detonator member for firing said detonator charge, an igniter plate having a protecting function and an igniter function, said igniter plate being arranged between said detonator charge and said main explosive charge for transmitting a firing impact to said main explosive charge when said detonator safety device is in its firing position, and means for mounting said igniter plate in said safety position at a predetermined first distance (4') from said detonator charge, said predetermined first distance (4') being sufficient for preventing a transmission of said firing impact to said main explosive charge when said igniter plate is in said safety position, whereby said igniter plate performs said protecting function if said detonator charge should be accidentally fired in said safety position of said igniter plate to avoid firing the main explosive charge in said safety position, said detonator safety device further comprising means for providing a second distance (6) between said igniter plate and said main explosive charge in said firing position in which said igniter plate is enabled to perform said igniter function, wherein said mounting means permit resting said igniter plate on said main explosive charge in said safety position, and wherein said means for providing said second distance (6) comprise means for shifting said igniter plate out of said safety position away from said main explosive charge, toward said detonator charge in said firing position, whereby said igniter plate rests against said detonator charge in said firing position.

4,696,233

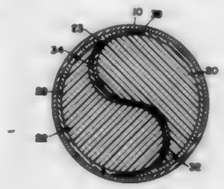
HIGH PROPELLANT MASS FRACTION HIGHLY STRESS RELIEVED END-BURNING GRAIN STRUCTURE

Ronald B. Paxton, Brigham City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 31, 1986, Ser. No. 824,806

Int. Cl.⁴ C06D *5/06*

U.S. Cl. 102—287 **9 Claims**



1. A high propellant mass fraction highly stress relieved end-burning grain structure for a rocket motor comprising,

first and second longitudinal propellant components, said components being cured in side-by-side relation to create a cylindrical structure with internal mating surfaces, as seen in cross section, having a substantially "S" shape,

at least one longitudinal inhibiting means having substantially an "S" shape in cross section formed on and completely covering the internal mating surfaces of said propellant components, and

insulation means formed on and substantially completely covering the outer longitudinal surfaces of said components.

4,696,234

DEVICE FOR DESTROYING WATER MINES AND MINE-SWEEPING METHOD

Hans-Joachim Kaltmann, Düsseldorf, and Hermann Schaper, Vallendar, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,405

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528329

Int. Cl.⁴ F42B *1/02, 23/26*

U.S. Cl. 102—308 **16 Claims**

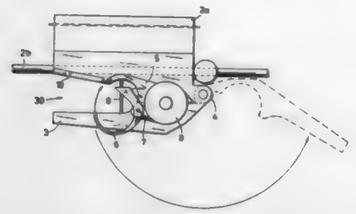
1. A versatile apparatus for destroying water mines comprising

at least one drive means for moving the apparatus through the water,

a carrier removably affixed to the drive means and having forward and rearward portions,

an actuable gripping means carried by the carrier, for selectively contacting a part of a mine selected from the group consisting of a cable of a mine and the outer surface of a mine,

an actuable buoyancy-producing means carried by the carrier, and



at least one detonator-actuated pyrotechnic charge carrier by the carrier for explosive destruction of the mine.

4,696,235

STEEL ROADWAY FOR MAGNETIC TRACKS

Peter Wagner, Frankfurt, Fed. Rep. of Germany, assignor to Geri Engineering GmbH, Fed. Rep. of Germany

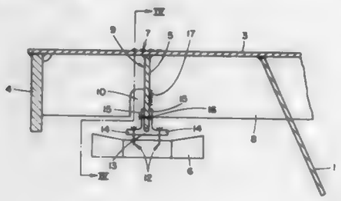
PCT No. PCT/EP85/00135, § 371 Date Jul. 15, 1985, § 102(e) Date Jul. 15, 1985

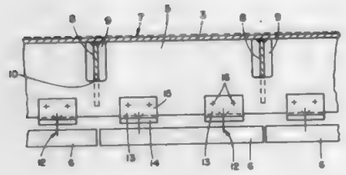
PCT Filed Mar. 29, 1985, Ser. No. 760,756

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412401

Int. Cl.⁴ E01B *25/08;* **B60L** *13/04*

U.S. Cl. 104—124 **2 Claims**





1. A steel roadway for magnetic tracks with a roadway support, including a cover plate forming an upper securing member, which is connected at its lower side along the two longitudinal edges thereof with a side guiderail and at a spacing in parallel therewith, with respectively a web-shaped longitudinal support for the receipt of stator components or the like, including web-shaped cross-supports extending at right angles thereto, characterized in that each said cross-support (8) is constructed as a unitary web extending between the two side guiderails (4), which incorporates a cutout (10) in the crossing region with the longitudinal support (5) opening towards the edge of the cross-support (8), and wherein each said longitudinal support (5) is constructed comb-shaped and incorporates a cutout (9) in the crossing region with the cross-support (8) which is directed opposite to the cutout (10) in the cross-support (8), said cutouts (10) in the cross-supports (8) opening towards the lower free edge thereof, and the cutouts (9) of the longitudinal supports (5) opening towards the cover plate (3), the longitudinal support (5) contacting one of the two perpendicular side edges bounding the cutout (10) the cross-support (8), and being welded to said side edge, or the longitudinal supports (5) and the cross-supports (8) are interconnected at their crossing locations through threaded bolt connections (18), and fastening elements (11,13) for the stator components (6) or the like being welded or detachably attached to the lower edge of the longitudinal supports (5).

4,696,236

CONVEYOR APPARATUS

Hitoshi Kanayama, Sagamihara, Japan, assignor to Hokoku Chain Co., Ltd., Kanagawa, Japan

Filed May 28, 1985, Ser. No. 738,226

Claims priority, application Japan, Feb. 21, 1985, 60-33434

Int. Cl.⁴ B61B *13/12*

U.S. Cl. 104—165 **8 Claims**



1. A conveyor apparatus comprising:

rails laid at a predetermined interval in parallel with each other;

a truck movable by means of wheels on said rails;

a conveying belt moving in parallel with said rails;

a unit roller mechanism mounted on said truck and having two rollers rotatably supported on roller shafts and arranged longitudinally along the direction of said belt, said roller shafts being slidably inserted into two long slots of a holder plate which is mounted on said truck and which supports the roller shafts; and

means for pressing the rollers of said unit roller mechanism to said belt and in contact with each other;

whereby when the truck is stopped while the conveying belt continues to move, one of said rollers is caused to rotate, thereby causing the other roller to become separated from the conveying belt.

4,696,237

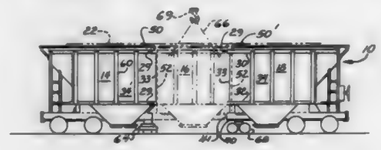
MULTIPLE HOPPER RAIL CAR WITH OFFSET VERTICAL WELD FROM CONVERSION

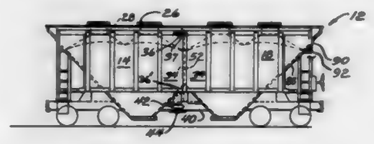
Roy W. Miller, Highland, Ind., assignor to Pullman Rail Leasing Incorporated, Chicago, Ill.

Filed Feb. 11, 1986, Ser. No. 828,415

Int. Cl.⁴ B61D *7/00;* **B61F** *1/08*

U.S. Cl. 105—248 **9 Claims**





1. A covered, dual hopper rail car having its two hopper sections joined by a common transverse central bulkhead, said hopper sections each having side portions formed by metal side sheets with the top and bottom portions of said side sheets being reinforced by an upper side plate and a lower side sill, respectively, said rail car being characterized in that said side sheets adjacent said transverse central bulkhead include a weld

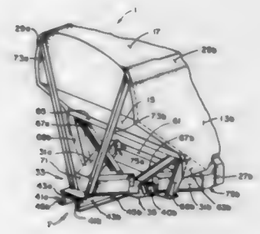
joint which has a first elongated intermediate portion which extends vertically in a first line between said upper side plate and said lower side sill, a pair of end portions which extend vertically in a pair of vertically spaced apart second lines which are also spaced from, and parallel to, said first line, said end portions extending only in the region of said upper side plate and said lower side sill, and a pair of horizontal portions extending along a third pair of lines which join each end of said intermediate portion to one of said end portions, said weld joint serving to reinforce and bond together the end hopper sections of a three hopper rail car from which the center hopper section was previously removed by being cut along said first, second and third lines.

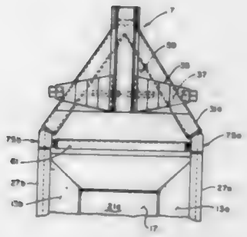
4,696,238

END STRUCTURE FOR RAILWAY CAR

Robert H. Billingsley, Jr., Allegheny County, Pa.; Steven L. Jantzen, St. Charles County, Mo.; Walter E. O'Leary, St. Louis County, and John A. Krug, St. Charles County, both of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Filed Oct. 28, 1985, Ser. No. 792,215
Int. Cl.[4] B61D *7/00, 17/00*
U.S. Cl. 105—248 **13 Claims**





8. An end structure for a center stub sill railway car, the latter having a pair of side sheets, a pair of side sills, said end structure comprising a center stub sill extending longitudinally from an end of the car toward a respective end hopper of the car, a body bolster assembly secured to said center stub sill, said body bolster extending transversely of the car, an end sheet extending at least in part over said body bolster assembly and over said center stub sill, a generally horizontal reinforcing member secured to the end sheet and extending transversely of the car, a pair of reinforcing members extending in a generally vertical plane between the ends of said bolster assembly and said horizontal reinforcing members, and a pair of diagonal reinforcement members extending between said bolster assembly and said horizontal reinforcing member, each said side sill having an end portion beginning generally at the lower portion of said end sheet and angling inwardly with respect to the longitudinal centerline of the car toward said center stub sill, said end portions being secured at one end to their respective side sills and being secured to their other or outer ends to said center stub sill, wherein said angled side sill end portions extend over said bolster assembly inwardly of said reinforcing members extending between said bolster assembly and said horizontal reinforcing member.

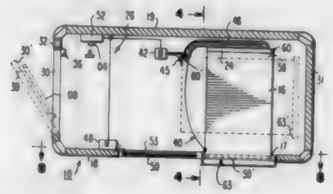
9. In a center stub sill railway car having a car body, a side sill secured to each side of said car body, the improvement comprising: an end structure assembly at each end of the car, each said end structure including a center stub sill, a tie plate secured to said center stub sill, but free of said side sills, each of said side sills extending longitudinally of the car body along the lower portions of said car body, a pair of side sill extensions, one for each of said side sills, extending inwardly form the end of a respective side sill toward said center stub sill for carrying all of the longitudinal loads between said side sills and said center stub sill, said side sill extensions being secured to said tie plate, and means for connecting each of said sill extensions to its respective side sill.

4,696,239

SECURITY ENCLOSURE FOR TRANSACTION MACHINE

A. William Truckseis, 451 Creek Rd., RD #2, Moorestown, N.J. 08057

Filed Apr. 18, 1985, Ser. No. 724,461
Int. Cl.[4] G07G *5/00*
U.S. Cl. 109—24.1 **15 Claims**



1. Security apparatus for a transaction processing machine comprising:

a walled enclosure;

and means for mounting a transaction processing machine within said enclosure;

said enclosure including means for providing user access through a wall of said enclosure to an operating interface of said machine,

said means for mounting including: (a) means for turning said machine about an axis within said enclosure to a position for service access within said enclosure at another portion of said machine, said axis being movable during turning, and (b) coupling means between said machine and said enclosure for guiding said axis to move transversely of itself during turning of said machine.

4,696,240

SAFETY CONTAINER

Heinz Maxeiner, Neu-Isenburg, Fed. Rep. of Germany, assignor to Bode-Panzer, Fed. Rep. of Germany

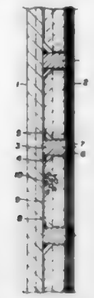
Filed Jan. 16, 1986, Ser. No. 819,394
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507214
Int. Cl.[4] E04B *2/02*
U.S. Cl. 109—82 **5 Claims**

1. A lightweight safety container comprising at least one rigid wall having an outer layer of a metal alloy characterized by resistance to the heat of a cutting torch,

an inner metal layer,

said layers being interconnected in spaced relation by a series of spaced parallel ribs to form elongated channels between adjacent ribs, said ribs extending substantially the entire length of said wall,

said ribs being welded to said layers along their entire length by practically linear welds, said welds projecting into grooves in the face of one of said layers,



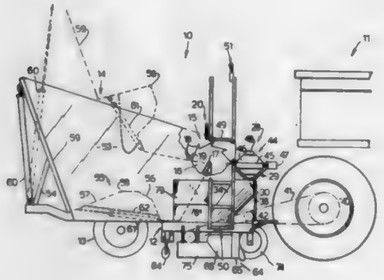
bars of high thermal conductive metal disposed within and extending along the length of said channels, and bodies of drill resistant hardness embedded in said bars.

4,696,241

CANE BILLET PLANTER

Peter Morellini, P.O. Box 188, Ingham, Queensland, 4850, Australia

PCT No. PCT/AU85/00118, § 371 Date Feb. 3, 1986, § 102(e) Date Feb. 3, 1986, PCT Pub. No. WO85/05531, PCT Pub. Date Dec. 19, 1985
PCT Filed Jun. 3, 1985, Ser. No. 830,524
Claims priority, application Australia, Jun. 1, 1984, PG5349
Int. Cl.[4] A01C *11/00*
U.S. Cl. 111—3 **15 Claims**



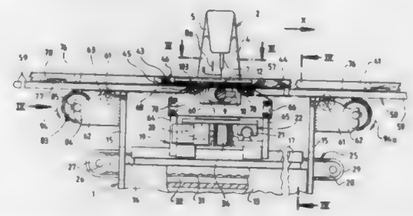
1. Apparatus for planting elongate cane billets in planting furrows, said apparatus comprising a mobile frame assembly, an elongated hopper assembly on said frame assembly for receiving billets to be planted, a pair of conveyor means associated with said hopper assembly and arranged to receive billets therefrom, each said conveyor means including an endless chain having a run extending longitudinally of said hopper assembly, said chain runs being disposed adjacent, and extending substantially parallel to each other, a plurality of spaced apart billet engaging projections on each said chain, said projections extending upwardly from said chain runs and defining therebetween respective compartments for individual said billets, said billets when disposed in said compartments lying substantially parallel to said chain runs, and elongated divider between said chain runs and extending substantially parallel thereto, said divider extending upwardly to a height substantially the same as the height of said projections, drive means for said chains for driving the respective said runs of said chains in opposite directions so as to convey billets in said compartments to opposite sides of said apparatus, and means for receiving billets from said compartments and directing said billets into planting furrows.

4,696,242

SEWING MACHINE

Hans Scholl, Oerlinghausen-Lipperreihe; Horst Thiele, and Eckhard Hägemann, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 18, 1986, Ser. No. 944,433
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1985, 3546238
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.14 **9 Claims**



1. Sewing machine controlled by a computer for producing a relative movement between a sewing head with a needle and at least one workpiece holder receiving a workpiece to be sewn during a sewing process in a plane substantially perpendicular to a direction of movement of the needle, whereby for producing said relative movement in two coordinate directions at right angles to one another servomotors controlled by said computer are provided for moving said sewing head relative to the at least one workpiece holder and whereby at the end of a sewing process the sewing head and the workpiece holder are brought into a position relative to one another in which the workpiece holder is free from the sewing head, wherein below the at least one workpiece holder is provided a supporting plate supporting the at least one workpiece holder and which supporting plate is fixed relative to said sewing head in one of said two coordinate directions and which supporting plate extends at least over the maximally possible relative movement in said one coordinate direction and which has a recess extending in the other one of said two coordinate directions for a passage of the needle.

4,696,243

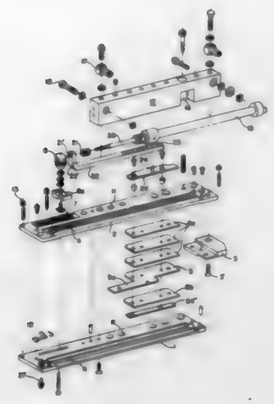
PNEUMATIC ACTION ACCESSORY HOLDER SPECIFICALLY FOR SEWING MACHINES

Antonino Romano, Via Chiesa Nuova 22, 03039 Sora (FR), Italy

PCT No. PCT/IT85/00031, § 371 Date Apr. 29, 1986, § 102(e) Date Apr. 29, 1986, PCT Pub. No. WO86/01547, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 28, 1985, Ser. No. 871,403
Int. Cl.[4] D05B *23/00, 75/00*
U.S. Cl. 112—257 **10 Claims**

1. A pneumatic action accessory holding device comprising first and second base plates, each base plate defining an elongated slot; a blade defining an accessory holder profiled plate positioned between said first and second plates and movable parallel to said slots; a distributor; means to mount said distributor on said first and second plates in different positions; a pneumatic cylinder mounted on said distributor to which fluid is fed from said distributor; a piston rod mounted within said pneumatic cylinder and having an end extending therefrom; a leg having an end connected to said extended end of said piston

rod and said blade; means for limiting the movement of the blade mounted on said first and second plates; and seats on said



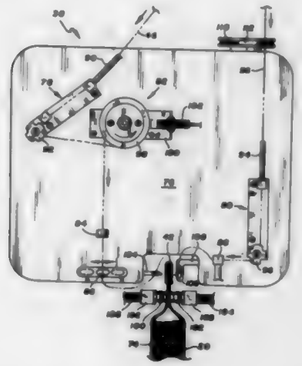
first and second plates for fixing said device to a sewing machine.

4,696,244

THREAD CHAINING DETECTOR

Mark E. Sampson, Cottage Grove, Minn., and Marvin E. Rosen, New Richmond, Wis., assignors to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Dec. 22, 1986, Ser. No. 944,875
Int. Cl.⁴ D05B *13/02, 51/00*
U.S. Cl. 112—262.1 **24 Claims**



1. An apparatus for closing the open ends of pliant containers including:
- a frame; a closing station mounted with respect to said frame; and a container transport means mounted to said frame for moving a plurality of pliant containers in succession past said closing station;
- a first supply means mounted to said frame for continuously feeding a first closure material to said closing station, for the joinder of said first closure material with said containers at said open ends, to close said containers as they are moved past said closure station;
- a first sensing means mounted with respect to said frame for generating a first signal having a first signal level which varies with the velocity of said container transport means;
- a second sensing means mounted with respect to said frame for generating a second signal having a second signal level that varies with the speed at which said first closure material is moved from said supply means toward said closing station; and
- comparator means, receiving said first and second signals as inputs for comparing said first and second levels and for providing a first fault indication whenever the ratio of said first and second levels deviates from a first predetermined normal range.

13. An apparatus for detecting the speed of thread as it is fed from a supply means to a sewing station, including:
- a frame, a thread supply means mounted to the frame, and a sewing station mounted to the frame in spaced apart relation to the thread supply means;
- an idler pulley mounted rotatably with respect to said frame along the path of said thread, and frictionally engaged with respect to the thread;
- a first indicator element carried on said idler pulley, and a sensing means mounted with respect to said frame for registering a pulse each time said first indicator element passes proximate the sensing means, thereby to generate a velocity signal which varies with the rotational velocity of said idler pulley; and
- a comparator means for comparing the level of said velocity signal with a reference signal level, and a fault indicator means for indicating a sensed deviation of said velocity signal level from a predetermined relation to said reference signal level.

21. A process for effecting a closure of the open ends of pliant containers, and for detecting a deviation from a desired amount of closure material employed in said closure, including the steps of:
- transporting a pliant container past a stitching station using a container transport means;
- generating a first signal, the level of which is directly related to the transport speed of said containers;
- supplying thread to said stitching station;
- generating a second signal, the frequency of which is directly related to the speed at which thread is supplied to said stitching station;
- comparing the levels of said first and second signals; and
- generating a thread fault indication responsive to a sensed deviation in the ratio of said first and second levels from a predetermined ratio.

4,696,245

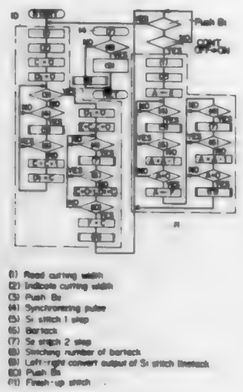
METHOD OF AUTOMATIC BUTTONHOLE STITCHING WITH A COMPUTERIZED SEWING MACHINE

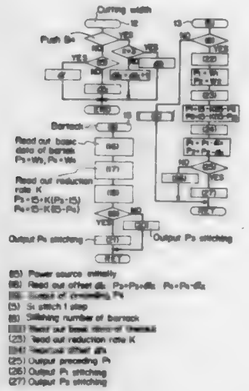
Kenji Kato, and Yasuro Sano, both of Tokyo, Japan, assignors to Janome Sewing Machine, Co. Ltd., Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,875
Claims priority, application Japan, Aug. 17, 1984, 59-170431
Int. Cl.⁴ D05B *3/06*
U.S. Cl. 112—264.1 **4 Claims**

1. In a computerized sewing machine having means for selecting a cut width and amplitude of needle drops for left and right line tacks, and the electronic read only memory (ROM) and a random access memory (RAM), a method of automatically stitching buttonholes comprising the steps of
- storing in the ROM basic data pertaining to initial amplitude values of a right line tack (RL) and/or a left line tack (LL) of a buttonhole, and initial amplitude coordinate values of an upper bar tack (UB) and/or lower bar tack (LB) pertaining to a present offsetting value (αx) of an initial cut width;
- selecting a desired cut width and a desired amplitude of needle drops for buttonhole stitchings to be performed, and storing the selected data in the RAM:
- computing the adjustment of amplitude coordinate values of said stored selected data relative to amplitude coordinates of stored basic data for offsetting in parallel the selected amplitudes of the needle drops for respective line tacks

relative to a standard center of a predetermined maximum amplitude, by amounts each corresponding to half the value of the selected cut width;
- adjusting amplitude coordinate values of the bar tacks relative to the standard center in accordance with the selected cut width;





- storing the adjusted amplitude coordinate values in the RAM; and
- automatically stitching the buttonhole in accordance with the stored adjusted amplitude coordinate values.

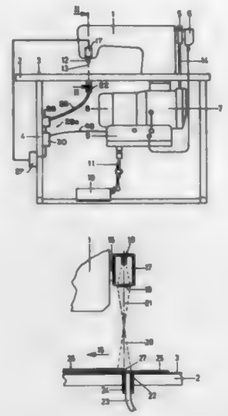
4,696,246

DEVICE FOR DETECTING AN OVERLAPPING EDGE OF MATERIAL ON A SEWING MACHINE

Gustav Rohr, Heidelberg, and Gerd Nohl, Rauenberg, both of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH, Schwetzingen, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,790
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519729
Int. Cl.⁴ D05B *35/00*
U.S. Cl. 112—272 **20 Claims**

1. A device for detecting an overlapping edge of material on a sewing machine, comprising, in combination:
- a signal-level discriminator having only one single electro-optic sensor responsive to light and a detector means electrically responsive to light sensed by the one electro-optic sensor for determining an absolute, light-intensity value of the sensed light; and
- an optical waveguide having a light-receiving end on the sewing machine for receiving light through the overlapping edge of the material on the sewing machine and an end remote from the light-receiving end for providing the received light to the one electro-optic sensor of the signal-level discriminator.

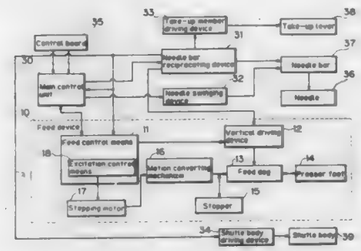


4,696,247

FEED DEVICE FOR A SEWING MACHINE

Fujio Horie, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 24, 1986, Ser. No. 934,000
Claims priority, application Japan, Dec. 16, 1985, 60-283286
Int. Cl.⁴ D05B *27/22*
U.S. Cl. 112—315 **5 Claims**



5. A feed device for a sewing machine including an endwise reciprocatable needle and feed means having a feed dog and operative to impart a horizontal feed motion and a vertical feed motion to said feed dog in timed relation with the reciprocation of said needle; wherein feed means comprises,
- a stepping motor operatively connected with said feed dog for said horizontal feed motion and having excitation modes as many as a predetermined number P, said stepping motor being capable of shifting by a unit amount S when the excitation mode thereof is changed over from one to the next,
- a pair of stopper means disposed at a first and a second stoppage position corresponding to two limit positions defining the maximum range of said horizontal feed motion, and
- feed control means for controlling said horizontal feed mo-

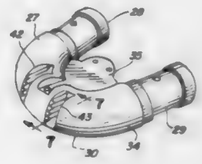
tion by sequentially changing over the excitation modes of said stepping motor in response to signals instructing the feed distance of said feed dog, said feed control means including excitation control means for alternately performing the changeover to a first specific excitation mode at the start of said horizontal feed motion and changeover to a second specific excitation mode at the end of said horizontal feed motion, each of said first and second specific excitation modes being predetermined from among the excitation modes to be changed over while said stepping motor shifts by an amount P-S/2 from a position where said stepping motor is positioned when the position of said feed dog is restricted to each of said first and second stoppage positions.

4,696,248

OUTHAUL BOOM END PART FOR SAILBOARD BOOM ASSEMBLY

Heinz F. Nedoluha, Salzburg, Austria, assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 19, 1985, Ser. No. 811,022
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—39 **13 Claims**





1. An outhaul boom end part for a sailboard boom assembly having a pair of booms which lie in a first plane, the boom end part being generally U-shaped and having a pair of tubular end portions adapted to be attached to the booms and a central portion extending between the end portions, a pair of means on the central portion for securing an outhaul line extending in a direction approximately parallel to a second plane which bisects the booms perpendicularly to said first plane, and a sheave on the central portion having an axis which extends perpendicularly to the plane of the U-shaped boom end part.

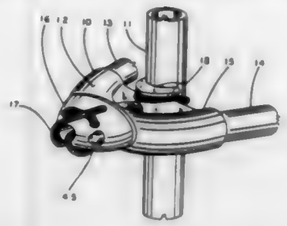
4,696,249

APPARATUS FOR ATTACHING SAIL-BOARD BOOM TO MAST

Michael W. Foy, 125 Lake Ave. W. #3, Kirkland, Wash. 98033

Filed Mar. 28, 1986, Ser. No. 845,839
Int. Cl.[4] B63B *15/00*
U.S. Cl. 114—99 **4 Claims**

1. Apparatus for attaching a sailboard boom to a sailboard mast comprising:
a first fixture integrated into said boom,
a length of line,
said first fixture having means for adapting it for attachment to said mast by said length of line with tension in said line,
said apparatus further comprising:
means for adjusting said tension in said line comprising a second fixture moveable relative to said first fixture,



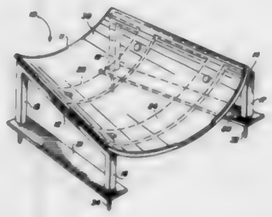
said tension being adjustable by motion of said second fixture relative to said first fixture.

4,696,250

PORTABLE BOAT RAMP FOR SMALL WATERCRAFT

John E. Antonides, 1834 W. Kerry La., Phoenix, Ariz. 85027

Filed Jul. 22, 1985, Ser. No. 757,482
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—343 **5 Claims**



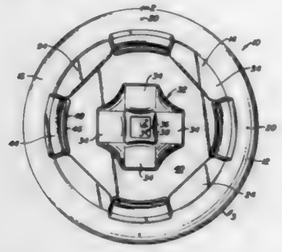
1. A portable and temporary ramp for small watercraft for supporting the hull of a boat in a position out of contact with the waterbed, said ramp comprising:
(a) a frame having a front and rear having an opposite spaced-apart pair of rails generally forwardly inclined and convergent, said frame further including at least one transverse member extending between said rails forming a cradle, and legs depending from said rails at opposite ends thereof;
(b) protective means associated with said cradle defining a generally transversely curved saddle having an upper surface, said upper surface being substantially coextensive with said rails and extending substantially the length thereof and occupying substantially the entire area between said rails, said upper surface being substantially free of obstruction and generally forwardly inclined and converging and extending longitudinally a distance corresponding to a portion of the bow of the boat whereby boats of various hull sizes and configurations will seat in a supported position on said saddle out of contact with the waterbed;
(c) bearing pad means associated with the lower end of said leg means, said bearing pad means being generally perpendicular to said leg means and adapted to engage a surface area of the waterbed to distribute the load thereon and to stabilize the ramp in position on the waterbed; and
(d) ground engaging means extending from at least one of said bearing pad means for anchoring the ramp whereby said ramp can be conveniently stored as a unit in said boat and when desired, anchored in at least a partially submerged position to support a forward portion of the boat hull in an out-of-contact position with the waterbed.

4,696,251

RAPID RIVER RIDE BOAT

Robert Spieldiener, Im Winkel 13, FL-9496 Balzers, Liechtenstein; Reinhold Spieldiener, Aussichtsstrasse 23, 8704 Herrliberg, and Alfons Saiko, Spoerstrasse 26A, Oberrieden, both of Switzerland

Continuation of Ser. No. 585,124, Mar. 1, 1984, abandoned. This application Jul. 7, 1986, Ser. No. 882,505
Int. Cl.[4] B63B *3/00*
U.S. Cl. 114—346 **5 Claims**



1. A circular flotation vehicle constructed to uniformly seat a plurality of passengers for an amusement ride, comprising:
an annular deformable float and an inner substantially rigid inset with a circular flotation platform and a coupled passenger shell, the passenger shell having a central core with a plurality of integral fixed seats uniformly arranged in a single concentric course around the periphery of the core and with a raised center structure forming backrests for said seats, said substantially rigid inset being constructed with a concentric floor and a raised contoured outer rim which abuts the annular float, said inset being arranged to seat a plurality of passengers around the central core with the passengers'feet positioned on the floor or outer rim and the passengers' backs positioned against the raised structure of the core wherein the passengers face outward for improved visibility, safety and centralized location of aggregate passenger weight and wherein the outer rim of the inset has a raised splashguard portion in front of the seats and a low entry portion between the splashguard portions.

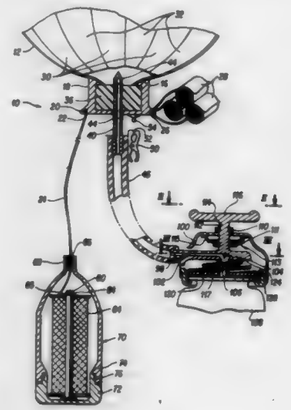
4,696,252

SIGNALLING DEVICE

Edward Grill, Box 562, Harlem, Mont. 59526

Filed May 30, 1986, Ser. No. 868,688
Int. Cl.[4] B64B *1/40*
U.S. Cl. 116—210 **11 Claims**

11. A unitized signal balloon device and package assembly for connection to a body of a user comprising:
a package including a casing for containing (1) a deflated and collapsed plastic type inflatable balloon, (2) a cartridge of compressed gas secured onto the casing, (3) a container with a length of monofilament tether line, one end of said tether line is secured on a portion of an anchor means on the balloon, said container being secured to said casing and including means for preventing tangling of the line, and (4) a set of several rolled aluminized MYLAR ® radar reflective streamers secured to another portion of the anchor means of the balloon,
the anchor means being formed at a lower extremity of the inflatable balloon and having an aperture accessing an elastomeric self-sealing end seal of the balloon,
a releasable carrying element affixed to said casing for wrapping around a part of the body of the user said carrying element having VELCRO ® means for securing the carrying element to said part of the user's body,
a penetrating needle having an axial hollow passage, the penetrating needle piercing the elastomeric self-sealing end seal of the balloon, said penetrating needle and said elastomeric self-sealing end seal forming a quick release valve,
one end of a flexible hose communicating with the axial hollow passage and a second end of said hose communicating with a gas outlet conduit of an impact valve, a second penetrating needle centered over an end seal of the gas cartridge and located within said conduit of said impact valve which upon being forced toward and through the end seal of the gas cartridge permits said gas to pass into said balloon,
the impact valve constituting a non-freezing mechanism,
a spring release clamp affixed to one end of said flexible hose



for releaseably engaging a third portion of the anchor means for securing the balloon and,
the impact valve further including a slide means terminating in an impact handle for depressing and actuating the impact valve,
a safety pin for retaining the slide means in a locked open position until manually removed by the user,
the safety pin having a leather pull strap for grasping by the user,
the leather pull strap being adaptable to grasping by the user's teeth, and
the impact handle being adaptable to being depressed by a body member of the user such as a chin.

4,696,253

APPARATUS FOR APPLYING A STRIP-SHAPED POWDER LAYER ONTO A WELD SEAM OF CONTAINERS

Siegfried Frei, Schoeckstrasse 3, 9000 St. Gallen, and Ernst Hohl, Wittenbach, both of Switzerland, assignors to Siegfried Frei, St. Gallen, Switzerland

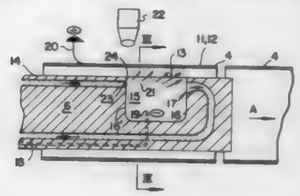
Division of Ser. No. 589,346, Mar. 14, 1984, Pat. No. 4,588,605. This application Mar. 26, 1986, Ser. No. 844,347
Claims priority, application Switzerland, Mar. 21, 1983, 1537/83
Int. Cl.[4] B05B *5/02, 13/06*
U.S. Cl. 118—308 **5 Claims**

1. An apparatus for forming and applying a substantially strip-shaped powder layer onto a weld seam of a can body, comprising:
spray head means including a spray chamber;
means for supplying a powder composed of powder particles transported by a carrier gas in the form of a substantially bundled powder jet into said spray chamber of said spray head;
said spray chamber being provided with a spray opening

which is open towards the weld seam and is located opposite the weld seam;

means for establishing a pressure in the spray chamber which is lower than the pressure of the surrounding atmosphere to ensure retention of the bundled powder jet entering said spray chamber and to prevent formation of a spray cloud of the powder particles of said bundled powder jet composed of the powder transported by the carrier gas;

means for diverting at least part of the powder particles of the bundled powder jet from the spray chamber in the direction of the weld seam and for depositing said diverted powder particles onto the weld seam in the form of a substantially strip-shaped powder layer;



said powder supplying means including a supply conduit which supplies the powder particles into said spray chamber so that they travel in a natural flight path;

said pressure establishing means including a suction conduit having an inlet opening located in said natural flight path of the powder particles; and

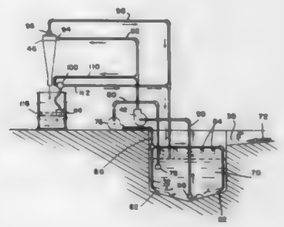
a spray nozzle located upstream of said spray chamber with respect to a predetermined direction of travel of the can body and arranged to supply the powder particles at an obtuse angle directly onto the weld seam.

4,696,254

FLUID WASH SPRAY PAINT SYSTEM

Irvin Spindler, Princeton, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Jun. 11, 1996, Ser. No. 872,977
Int. Cl.[4] B05B *15/12*
U.S. Cl. 118—610 **6 Claims**



1. A fluid wash spray paint system comprising:

a plurality of paint spray booths, each booth including a fluid wash device to entrap paint overspray in a moving fluid to remove said overspray from said booth;

a sludge pit for collecting said fluid and entrapped paint overspray from the plurality of spray booths, said pit having a bottom section;

means for introducing a sludge-producing agent into said fluid and entrapped paint overspray to cause said paint to settle as sludge to said bottom section of said sludge pit;

centrifugal means for separating and removing said settled sludge from said fluid;

first means for circulating said fluid and sludge from said bottom section of said sludge pit through said centrifugal means and returning said fluid to said sludge pit;

second means for circulating said fluid from said sludge pit through said plurality of fluid wash spray devices;

means for agitating said fluid and said settled sludge located in said sludge pit to keep said sludge partially suspended in said fluid near said bottom section of said sludge pit, and

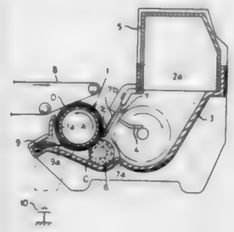
at least one spray nozzle located above said sludge pit and adapted to spray a portion of said circulating fluid and sludge onto the said fluid and sludge agitated by said agitating means.

4,696,255

DEVELOPING APPARATUS

Hidetoshi Yano, Yokohama; Ryubun Seimiya; Noriyoshi Tarumi, both of Tokyo; Hiromi Demizu, Yokohama, and Makoto Obu, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1985, Ser. No. 761,610
Claims priority, application Japan, Aug. 7, 1984, 59-164246; Aug. 8, 1984, 59-166133; Aug. 9, 1984, 59-165584
Int. Cl.[4] G03G *15/08*
U.S. Cl. 118—653 **16 Claims**



1. A developing apparatus for supplying a thin layer of a developer to a latent image carrying member of a copying machine to develop a latent image on said latent image carrying member, comprising a storage means for storing said developer, a developer supply member rotatably supported for supplying said developer to said latent image carrying member, said developer supply member having a surface portion composed of an electrically insulative layer having minute, electrically floating, conductive regions dispersed therein, a developer feeding member disposed rotatably between said storage means and said developer supply means and being in contact with said developer supply means for feeding said developer from said storage means to said developer supply means, and a layer thickness regulating member having a portion in pressure contact with said surface portion of said developer supply member for regulating the thickness of said thin layer of said developer on said developer supply member.

4,696,256

APPARATUS FOR THE PRODUCTION OF MULTIPLE LAYER GLASS SHEETS WITH PLASTIC SEALS

Karl Lenhardt, Neuhausen-Hamberg, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

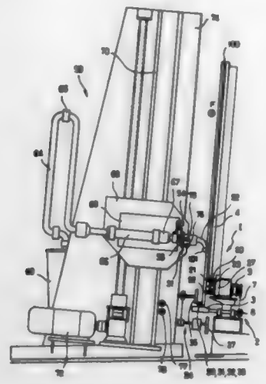
Filed Aug. 22, 1985, Ser. No. 768,220
Claims priority, application France, Aug. 22, 1984, 84 13088; Sep. 17, 1984, 84 14185; Sep. 17, 1984, 84 14186
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—680 **20 Claims**

1. An apparatus for applying a butyl rubber base plastic bead onto a face of a glass sheet, comprising:

a panel having a substantially vertical surface for supporting a glass sheet;

first conveyor means for linearly moving said glass sheet supported by said panel in two senses of a first direction;

extrusion means having an extrusion nozzle positionable adjacent said face of said glass sheet supported by said panel; and



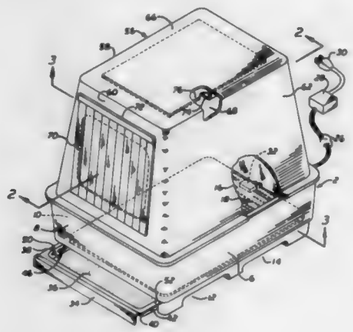
means for linearly moving said nozzle in a second direction parallel to said face of said glass sheet supported by said panel.

4,696,257

SELF DRYING PET LITTER BOX

John F. Neary, 7540 34th St., St. Petersburg, Fla. 33711; John T. Peddy, Clearwater, and David H. Willis, Largo, both of Fla., assignors to John F. Neary, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 771,519, Aug. 30, 1985, Pat. No. 4,649,862. This application Aug. 20, 1986, Ser. No. 896,680
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **20 Claims**



1. A self-drying pet litter box for controlling odors by destroying bacteria comprising

a box-like container having upwardly extended sides with at least one aperture through a lower portion of at least one of said sides, whereby air may pass through the aperture from points exterior to the container to the interior of the container,

a foraminous panel received within said container and having at least one substantially flat surface, said panel extending substantially continuously between said container sides with the apertures through said panel being distributed across substantially the entire panel, and

means for supporting said panel generally horizontally and spaced above the lowermost portion of said container sides with said substantially flat surface panel facing upwardly to support particulate litter material placed thereupon and another surface of said panel facing downward, whereby exterior air may enter the litter box through the apertures in the panel to dry the particulate litter material placed thereupon;

means for applying heat to said panel, whereby liquid and solid waste material deposited by an animal upon the particulate litter material supported by the panel may be heated;

means both for selectively controlling said application of heat to said panel such that the temperatures of said panel and of the litter material supported thereupon are raised to predetermined levels and maintained at those levels for a time sufficient to destroy bacteria and viruses residing upon said panel and upon the particulate litter material and carried by the liquid and solid waste deposited thereupon and also for thereafter discontinuing said application of heat.

4,696,258

METHOD AND SUBSTANCE FOR THE DETECTION OF COWS IN ESTRUS

Joseph M. Magrath, McCook, Nebr.; Thomas R. Tice, Birmingham, Ala.; William E. Meyers, Helena, Ala., and Thomas O. Dappert, Birmingham, Ala., assignors to The Magrath Company, McCook, Nebr.

Continuation-in-part of Ser. No. 595,625, Apr. 4, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,219
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **17 Claims**



14. A coating material for location on an area of the body of an animal for detecting the application of pressure to such area during mounting by another animal, said material comprising a body of liquid having therein a mass of very small frangible capsules, each capsule containing a liquid dye, said material when spread over a surface drying and setting to provide a layer of said capsules on the surface, when said layer has been provided on a surface positioned in said area of the body of an animal, pressure against said surface for a predetermined period of time of the order of five seconds will break at least a subsatantial portion of the capsules and impart the color of said dye to said surface and thereby provide a visual indication that pressure of the order of that present between cattle during mounting has been applied to said area of the animal for at least said period of time.

4,696,259

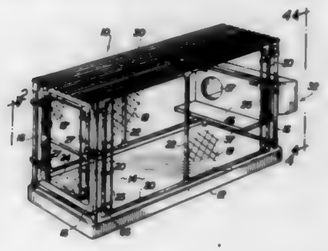
ENCLOSURE AND HOUSING FACILITY FOR AN ANIMAL

Cary M. Fewox, Mulberry, Fla., assignor to C&M Custom and Portable Kennels, Inc., Mulberry, Fla.

Filed Nov. 21, 1985, Ser. No. 800,249
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—19 **13 Claims**

1. A housing assembly for an animal of the type primarily designed to enclose and provide shelter, said assembly comprising:

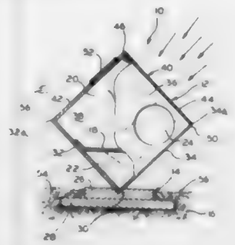
(a) a base including an exposed support surface disposed and structured to support an animal thereon,
(b) enclosure means mounted in substantially surrounding relation to said base for containment of the animal thereon, said enclosure means extending upwardly relative to said support surface,
(c) said enclosure means including a wall portion configured to at least partially surround and define an enclosure interior, a cover connected to said wall portion and disposed in spaced, overlying relation to said support surface of said base and in substantially covering relation to an animal contained on said support surface,
(d) a housing mounted on said enclosure means in spaced relation above said support surface and distanced therefrom sufficient to allow access thereto by the animal contained within said enclosure means,
(e) said wall portion including an open mesh construction extending substantially from said support surface of said



base upwardly to at least said housing and in surrounding relation to said enclosure interior,
(f) said housing including an entrance positioned in accessible relation to said enclosure interior, said housing dimensioned and structured to house the animal within a housing interior of said housing in shielded, protected relation to harsh weather conditions,
(g) said housing including a support platform disposed adjacent and beneath said entrance in substantially parallel relation to said support surface of said based, said support platform projecting outwardly from said entrance into said enclosure interior and being disposed and structured to support an animal theron, and said base made from a rigid, substantially lightweight material and said enclosure means and said housing interconnected in supported relation thereon, each of said enclosure means, base and housing collectively structured as a dependent unit and selectively movable to anyone of a variety of locations.

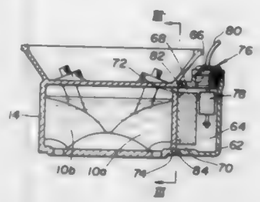
4,696,260
ANIMAL SHELTER
Joseph Panessidi, 10835 Monticello, Pinckney, Mich. 48169
Filed Jul. 24, 1985, Ser. No. 758,257
Int. Cl.⁴ A01K *1/03*
U.S. Cl. 119—19 **17 Claims**

1. A shelter for an animal, comprising:
a base member adapted to support said shelter in a fixed position relative to the ground;
a substantially enclosed structure mounted on said base member, said structure including a generally horizontal floor for supporting said animal within said structure, said floor dividing said structure into an upper compartment and a lower compartment;
said base member being generally rectangular in shape, said base member including an upper portion adapted to support said structure and a lower portion adapted to be disposed below the surface of the ground, said lower portion having a greater width than said upper portion;
said upper portion of said base member including an upwardly facing, longitudinally extending V-shaped groove, said structure being generally cube-shaped and including two sides intersecting at substantially the same angle as the angle defined by said groove, said structure being mounted on said base member with said two intersecting sides disposed in said V-shaped groove;
said upper compartment being adapted to house and protect



said animal within said structure, said lower compartment comprising a dead air space, said lower compartment being disposed substantially entirely above the ground; and
an opening in said structure providing means of ingress and egress for said animal relative to said upper compartment.

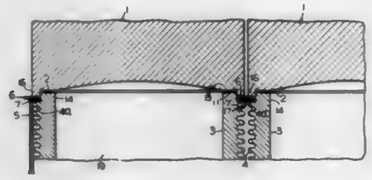
4,696,261
COOLANT LEVEL SENSOR ARRANGEMENT IN BOILING LIQUID COOLING SYSTEM
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 699,315, Feb. 7, 1985, abandoned. This application Aug. 7, 1986, Ser. No. 894,090
Claims priority, application Japan, Feb. 21, 1984, 59-23459[U]
Int. Cl.⁴ F01P *3/22*
U.S. Cl. 123—41.21 **6 Claims**



1. A boiling liquid cooling system for an engine having a cylinder head, comprising:
a coolant jacket in said cylinder head into which coolant is introduced in a liquid state and from which coolant is discharged in a gaseous state;
means for condensing the gaseous coolant from said coolant jacket into condensed liquid coolant;
a pump for pumping said condensing liquid coolant into the coolant jacket of the cylinder head when energized;
a separate chamber member directly connected to said cylinder head, said chamber member having two ports respectively connected with two ports formed in said cylinder head, the interior of said chamber member thereby being in fluid communication with the coolant jacket of the cylinder head so as to be in heat transfer communication with said cylinder head, said chamber member containing therein liquid coolant at substantially the same level as in said coolant jacket, said chamber member thereby providing means for isolating the liquid coolant therein from transient liquid level variations in said jacket due to boiling of said liquid coolant in said jacket; and

a level sensor mounted in said separate chamber member to detect the level of liquid coolant in the chamber member and thereby to control operation of said pump in accordance with the level.

4,696,262
AIR-COOLED INTERNAL COMBUSTION ENGINE
Martin Roggendorff, Cologne, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany
Filed Jan. 21, 1986, Ser. No. 820,941
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1985, 3502668
Int. Cl.⁴ F01P *1/02*
U.S. Cl. 123—41.69 **13 Claims**



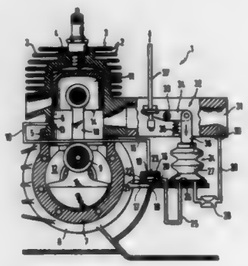
1. In an air-cooled internal combustion engine having at least one cylinder unit including a cylinder and a cylinder head on top of and in a sealing juncture with the cylinder, means for conducting cooling air past the cylinders of the engine to facilitate its use as heating air including a generally flat partition near the plane of said sealing juncture between said cylinder head and said cylinder, said partition being gas-tight sealing engagement with said cylinder independently of said sealing juncture whereby cooling air flowing beneath said partition and past said cylinder will not be contaminated by combustion gases leaking from said sealing juncture between said cylinder and said cylinder head.

4,696,263
REED VALVES FOR INTERNAL COMBUSTION ENGINES
Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.
Continuation-in-part of Ser. No. 754,243, Jul. 12, 1985, abandoned. This application Sep. 25, 1986, Ser. No. 911,485
Int. Cl.⁴ F02B *75/02*
U.S. Cl. 123—65 V **9 Claims**



1. A two-cycle engine comprising a cylinder, a piston working in the cylinder, the engine having a compression chamber below the piston, a fuel intake system including a ported valve seat for delivering fuel into the compression chamber, the cylinder having an exhaust port and a transfer passage for delivering compressed fuel from the compression chamber to the space above the piston, and a reed valve overlying the port in the valve seat and adapted to flex away from the ported seat during the upward stroke of the piston, the reed valve being of multiple layer construction with an outlet layer formed of relatively rigid resin material and an inner layer presented inwardly for contact with the valve seat and formed of relatively flexible temperature-resistant synthetic rubber material, the rubber layer being thinner than the resin layer and the resin and rubber layers being adhesively bonded to each other.

4,696,264
TWO-STROKE ENGINE
Werner Vondernau, Backnang-Waldrems; Jürgen Weber, Kernen-Rommelshausen; Hans Nickel, Cottenweiler; Michael Wissmann, Schorndorf-Weiler, and Harald Schliemann, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 704,083, Feb. 21, 1985, Pat. No. 4,590,896. This application Aug. 9, 1985, Ser. No. 764,220
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509540
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—73 V **9 Claims**



1. A two-stroke engine equipped with a control device to control an operating condition of the engine, the engine comprising:
a crankcase subjected to continuously alternating underpressure and overpressure conditions;
an output actuator connected to said control device for adjusting said operating condition;
pneumatic actuating means responsive to a change in pressure therein for acting on said output actuator so as to cause the latter to adjust said control device to control said operating condition;
pressure connecting means for connecting said pneumatic actuating means to said crankcase; and,
resonance valve means connected into said pressure connecting means for opening the latter in response to a predetermined resonance frequency thereby subjecting said pneumatic actuating means to one of said pressure conditions and causing a pressure change therein.

4,696,265
DEVICE FOR VARYING A VALVE TIMING AND LIFT FOR AN INTERNAL COMBUSTION ENGINE
Hidetaka Nohira, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Dec. 26, 1985, Ser. No. 813,555
Claims priority, application Japan, Dec. 27, 1984, 59-274001
Int. Cl.⁴ F01L *1/24, 1/34*
U.S. Cl. 123—90.16 **10 Claims**

1. A device for varying valve timing and lift comprising:
a first valve lifter movable along an axis and adapted to contact a valve;
a second valve lifter, adapted to contact a cam, movable along ssaid axis, said first and second valve lifters defining a pressure chamber therebetween;
first means for providing a pressure in said pressure chamber, a sole source of pressure to said pressure chamber being by supplying oil to an inlet portion of said pressure chamber; and

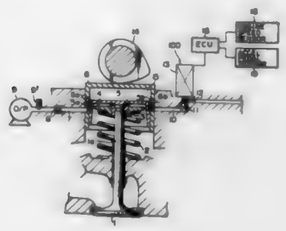
second means, coupled to an outlet portion different from said inlet portion, of said pressure chamber, for selectively relieving pressure in said pressure chamber; and

high speed actuator means for controlling said pressure relieving of said second means, including: check ball valve means for selectively blocking said second means, and actuator means for directly opening said check ball valve means, said check ball valve means disposed so that pressure of said oil closes said check ball valve means.

8. A method of controlling a valve, comprising the steps of:

transferring motion from a cam to a first valve lifter;

transferring motion from a second valve lifter to said valve;



controlling the volume of a pressure chamber defined between said first and second valve lifters which has independent inlet and outlet paths, by supplying a pressurized oil into said pressure chamber, through said inlet path and selectively commanding a check ball valve in said outlet path to open against said oil pressure, said check ball valve disposed so that said oil pressure would normally close said check ball valve;

selectively opening said check ball valve by transmitting force from an actuator to said check ball valve;

using only said oil pressure as controlled by said check ball valve to apply a force to said second valve lifter.

4,696,266

DECOMPRESSION APPARATUS FOR ENGINES

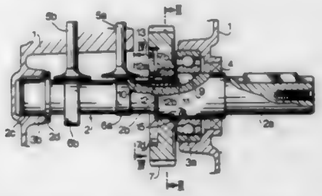
Mitsuyoshi Harada, Gyoda, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,645

Claims priority, application Japan, Jul. 5, 1985, 60-102524

Int. Cl.⁴ F01L *13/08*

U.S. Cl. 123—182 **4 Claims**



1. In a decompression apparatus for an engine having a camshaft, a cam gear having a longitudinal bore along a central axis thereof, and a tappet engaging with an actuating cam on the camshaft, the improvement comprising:

a releasing lever comprising a shaft and a weight secured to the shaft;

the shaft forming a semicircular cam at one end;

the camshaft having a first recess in a longitudinal direction;

the cam gear having a second recess adjacent the bore;

a bearing member for engaging with the first and second recesses and for rotatably supporting the shaft;

a flat bottom notch for supporting said semicircular cam and being provided on the camshaft close to the actuating cam; and

the semicircular cam being arranged to project beyond a periphery of the actuating cam when engine operation is stopped.

4,696,267

CYLINDER BLOCK STRUCTURE FOR INTERNAL COMBUSTION ENGINE

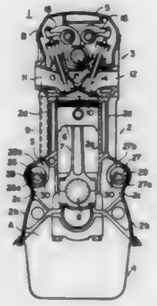
Kouji Kohno; Hiroichi Takubo, and Toshinobu Ito, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Oct. 23, 1985, Ser. No. 790,508

Claims priority, application Japan, Oct. 27, 1984, 59-226139; Oct. 27, 1984, 59-226140

Int. Cl.⁴ F02B *75/06*

U.S. Cl. 123—192 B **11 Claims**



1. A cylinder block structure for an internal combustion engine having a top part on which a cylinder head defining a head chamber with a cylinder-head cover mounted thereon is to be mounted, a lower part on which an oil pan is to be mounted, a plurality of cylinder bores in which pistons are to be inserted, and partition walls which are provided between adjacent cylinder bores to support a crank-shaft, wherein the improvement comprises a balancer case which is formed on a side wall of the cylinder block integrally therewith to accommodate therein a balance shaft which is provided with a balance weight and is operatively connected to the crankshaft to be driven thereby, and a blowbly passage which communicates between an interior of a crankcase in the cylinder block and the head chamber defined by said cylinder head and the cylinder-head cover to be mounted thereon, the interior of the balancer case forming a part of the blowby passage, wherein said balancer case is formed at a position higher than the position where the crankshaft is supported, wherein said balancer case extends through said partition walls between said cylinders and wherein said blowby passage communicating with said head chamber opens to the balancer case in one of said partition walls.

4,696,268

ROTARY PISTON INTERNAL COMBUSTION ENGINE WITH WATER INJECTION

Otto Zimmermann, Lehenweg 4, Hard, Austria (6971)

Filed Jun. 13, 1985, Ser. No. 745,243

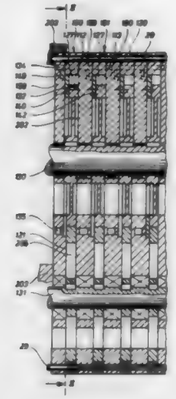
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422487

Int. Cl.⁴ F02B *53/00*

U.S. Cl. 123—203 **10 Claims**

1. A rotary piston machine of a combustion motor having pistons on rotating piston rotors and associated circular working chambers each defined circumferentially behind an associated piston in a direction of rotation of the associated rotor, the piston rotors attached to a shaft and each piston aligned for mating engagement with a recess in at least one shut-off rotor

engaging circumferentially a respective piston rotor, the shaft of the piston rotors and a shaft of the shut-off rotor interconnected by coupling gears, rotary valves connected with the shaft of the piston rotors in order to effect admission and discharge of a fuel mixture for the working chambers, the fuel mixture being injected in each working chamber and ignition causing an expansion phase therein of the fuel mixture, and in each working chamber injection of water being provided during the expansion phase characterized in that the machine includes four water injection nozzles, a first of said nozzles is positioned circumferentially at a location corresponding to the



position of the piston near the beginning of the expansion phase, and a second of said nozzles is positioned circumferentially at a location corresponding to the position of the piston near the end of the expansion phase, such that each of the first two water injection nozzles injects water following movement of the respective piston past each of the first two water injection nozzles, and the other two water injection nozzles are positioned circumferentially downstream of the first two water injection nozzles in the direction of rotor rotation to inject water before movement of the respective piston past the other two water injection nozzles.

4,696,269

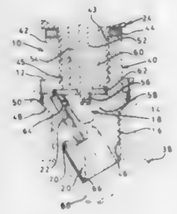
DEVICE FOR IMPROVING THE IGNITION OF FUEL-AIR MIXTURES IN INTERNAL COMBUSTION ENGINES

Donald Blackburn, Roane County, Tenn., assignor to Oak Ridge Systems, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 806,678, Dec. 9, 1985, Pat. No. 4,646,695. This application Jan. 23, 1987, Ser. No. 6,103

Int. Cl.⁴ F02B *19/16, 19/18*

U.S. Cl. 123—256 **20 Claims**



1. A flame ignitor for internal combustion engines for achieving self-regulation of ignition timing, improved fuel economy, and substantial elimination of combustion knock, which comprises:

a body member extending from exterior of such engine to a cylindrical combustion chamber of such engine, said body member being provided with a bore having a first end proximate an outer surface of such engine and a second end proximate an ignition region of said combustion chamber, said first end of said bore adapted to receive a spark producing device, said second end of said bore having an axis aligned at a selected angle, θ, to an axis of said combustion chamber;

a barrier wall positioned within said bore dividing said bore into a primary ignition chamber proximate said first end for surrounding said spark producing device and a secondary ignition chamber proximate said second end, said barrier wall being provided with a channel providing communication between said primary ignition chamber and said secondary ignition chamber, said primary chamber being provided with extended passageways for retarding a flame front exiting said primary chamber and thus regulating the velocity of a flame exiting said secondary ignition chamber as a function of pressure within said primary ignition chamber for achieving timing delay according to engine speed to substantially prevent combustion knock and improve fuel economy; and

wherein said angle, θ, is selected for directing said axis of said second end of said bore toward a region of fuel-rich mixture within said combustion chamber above a piston head within said combustion chamber.

4,696,270

COMBUSTION PROCESS FOR INTERNAL COMBUSTION ENGINE

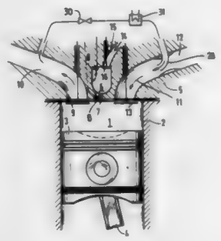
Franz Pischinger, Aachen, Fed. Rep. of Germany, assignor to FEV Forschungsgesellschaft für Energietechnik und Verbrennungsmotoren mbH, Aachen, Fed. Rep. of Germany

Filed Feb. 24, 1986, Ser. No. 832,435

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506217

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—274 **2 Claims**



1. A combustion process for a compression ignition internal combustion engine having a main combustion chamber and at least one precombustion chamber connected with said combustion chamber by at least one opening, introducing at least a fuel into said precombustion chamber, separately introducing fuel, air and recirculated exhaust gas directly into said combustion chamber for producing an admixture therein, and igniting said admixture, providing a 3-way catalyst connected to the flow of exhaust gas from said combustion chamber, and measuring the oxygen content of the exhaust gas entering said catalyst for regulating the ratio of fuel and air entering said combustion and pre-combustion chambers in a nearly stoichiometric range.

4,696,271

FUEL INJECTION PUMP

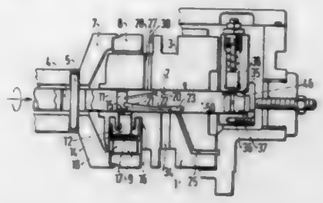
Jean LeBlanc, Lyons, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 690,976, Jan. 11, 1985, abandoned. This application May 9, 1986, Ser. No. 861,307

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1984, 3400612; Dec. 5, 1984, 3444234

Int. Cl.⁴ F02M *41/06*

U.S. Cl. 123—299 **14 Claims**



1. A fuel injection pump for internal combustion engines, comprising at least one pumping piston delimiting a variable work space, connecting means rotating in synchronism with said pumping piston to connect the work space during each delivery stroke to a fuel injection conduit and during each suction stroke to a fuel storage space, means for adjusting the axial position of said connecting means relative to said fuel injection conduit and said fuel storage space according to a desired duration of main fuel injection; means for varying strokes of said pumping piston according to a desired duration of preliminary fuel injection; a fuel offtake device including a fuel offtake space provided with an access channel, a movable wall for varying the volume of said fuel offtake space, biasing means for displacing said movable wall toward said access channel into a limit position in which said fuel offtake space has a minimum volume, abutment means for limiting the movement of said movable wall in the direction away from said access channel, said connecting means including at least one control passage for connecting, from a predetermined position of the pumping piston during each delivery stroke, the work space of the pump with said access channel; and means for adjusting the position of said fuel offtake device relative to said connecting means whereby fuel delivered after a partial pumping stroke which is variable according to predetermined operational parameters, acts on said movable wall to establish a connection between said work space and said variable fuel offtake space.

4,696,272

IGNITION TIMING CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT IDLE

Akira Kato, Tokyo; Yutaka Otobe, Shiki, and Shigehiro Kimura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

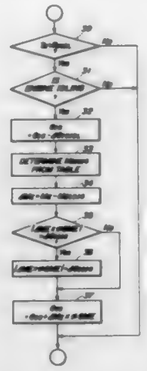
Filed Feb. 21, 1986, Ser. No. 832,246

Claims priority, application Japan, Feb. 22, 1985, 60-032563; Feb. 22, 1985, 60-032564; Feb. 22, 1985, 60-032565

Int. Cl.⁴ F02M *3/00*

U.S. Cl. 123—339 **17 Claims**

1. A method of controlling the timing of ignition of a mixture being supplied to an internal combustion engine on the basis of an ignition timing value determined in response to operating conditions of said engine, the method comprising the steps of: (1) determining whether or not said engine is in a predetermined idling region; (2) determining whether or not a temperature of said engine is above a predetermined value; (3) retarding the determined ignition timing value by a predetermined amount when said engine is determined to be in said predetermined idling region and the engine temperature is determined to be above said predetermined value; (4) setting a desired idling speed in response to operating conditions of said engine; (5) calculating a correction value by multiplying the difference between the set desired idling speed and actual engine speed by a predetermined coefficient; (6) correcting the ignition timing



value retarded by the predetermined amount at the step (3), by said correction value thus calculated; and (7) controlling the ignition timing to said ignition timing value thus corrected.

4,696,273

IGNITION TIMING CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

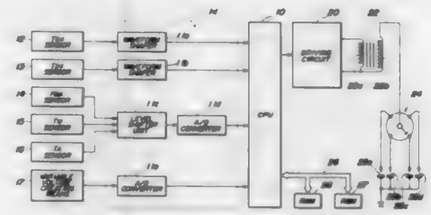
Yutaka Otobe, Shiki; Yoshio Suzuki, Wakoh; Shigehiro Kimura, Niiza, and Naoki Ohsawa, Wakoh, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed May 22, 1986, Ser. No. 866,462

Claims priority, application Japan, May 27, 1985, 60-113762; May 31, 1985, 60-117967

Int. Cl.⁴ F02P *5/04*

U.S. Cl. 123—417 **10 Claims**



1. An ignition timing control method for an internal combustion engine wherein ignition timing of the engine is controlled in response to operating conditions of the engine to appropriate values for the operating conditions of the engine, based upon advance angle control data read from memory means in which they are stored, the method comprising the steps of:

(1) storing beforehand a plurality of correction values as a function of the rotational speed of the engine and an output voltage from a variable voltage creating means which is humanly adjustable to a voltage value appropriate to each individual engine from the outside of an ignition timing control system to which said method is applied, after mass production of said system;

(2) detecting said output voltage from said variable voltage creating means;

(3) detecting the rotational speed of the engine;

(4) reading one of said correction values, which corresponds

to the detected output voltage and the detected rotational speed of the engine; and

(5) arithmetically correcting the ignition timing which is determined beforehand in response to operating conditions of the engine, by the use of said read one correction value.

4,696,274

FUEL INJECTION CONTROL FOR INTERNAL COMBUSTION ENGINE

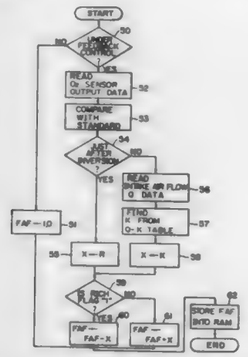
Kunihiko Sato, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 689,815, Jan. 8, 1985, abandoned. This application Jun. 25, 1986, Ser. No. 880,348

Claims priority, application Japan, Aug. 7, 1984, 59-164189

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—440 **3 Claims**



1. A fuel injection control apparatus for an internal combustion engine comprising:

means for detecting a concentration of a specific component of an engine exhaust gas;

means for calculating at predetermined intervals of time an air-fuel ratio feedback correction coefficient in accordance with the detected concentration of the specific component, said calculating means including means for integrating the detected concentration of the specific component with respect to time by using an integration constant;

means for detecting an intake air flow of the engine; and

means for selecting the integration constant, in accordance with the detected intake air flow, so that at least the envelope of a correction signal based on a plurality of feedback correction coefficients has an amplitude that is constant even if the intake air flow rate is changed.

4,696,275

FUEL INJECTION METHOD AND DEVICE PROVIDING SIMPLE ATMOSPHERIC PRESSURE COMPENSATION FOR ENGINE INCORPORATING OPEN TO ATMOSPHERE FUEL PRESSURE REGULATOR VALVE

Naoto Kushi; Hiroshi Okano; Nobuyuki Kobayashi, and Naoki Sugita, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 6, 1985, Ser. No. 805,902

Claims priority, application Japan, Feb. 5, 1985, 60-020729; Mar. 13, 1985, 60-049553

Int. Cl.⁴ F02D *41/32*

U.S. Cl. 123—478 **2 Claims**

1. A device for fuel injection in an internal combustion engine which has an intake system, comprising:

(a) fuel injector means, fitted to said intake system for injecting fuel into said intake system according to an opening and closing of said fuel injector means;

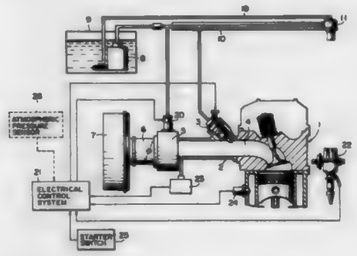
(b) means for supplying pressurized fuel to said fuel injector means;

(c) means for controlling a pressure difference between a pressure of said pressurized fuel which is supplied to said fuel injector means and a current value of atmospheric pressure to be substantially equal to a determinate value;

(d) means for calculating an actual fuel injection time interval by:

(1) determining a basic time interval for fuel injection, according to engine operational parameters and a certain atmosphere pressure;

(2) if the current value of atmospheric pressure is higher than said certain atmospheric pressure value, then applying a reduction correction amount which decreases said basic fuel injection time interval to said basic fuel injection time interval, to derive said actual fuel injection time interval; and



(3) if the current value of atmospheric pressure is not higher than said certain atmospheric pressure, then applying an increase correction amount which has an absolute value that diminishes as the absolute value of the pressure in said intake system diminishes to said basic fuel injection time interval, to derive said actual fuel injection time interval; and

said correction amount being determined by multiplying the basic fuel injection time interval by a correction coefficient;

said correction coefficient being determined by adding, to the product of a first correction value and a second correction value, a third correction value;

said first correction value being a function only of intake system pressure;

said second correction value being a function only of ambient atmospheric pressure; and

and said third correction value being a function only of ambient atmospheric pressure; and

(e) means for controlling said fuel injection means to be open for substantially said actual fuel injection time interval.

4,696,276

METHOD FOR INFLUENCING THE METERING OF FUEL TO AN INTERNAL COMBUSTION ENGINE

Ulrich Flaig, Markgröningen, and Albrecht Sieber, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 14, 1986, Ser. No. 839,896

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1985, 3510216

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—478 **10 Claims**

1. A method for controlling the metering of fuel to an internal combustion engine as a function of at least one of the revolutions of the engine and the working strokes of the engine, using a first means for measuring a quantity (LZ) representing one of said revolutions of the engine and said working strokes

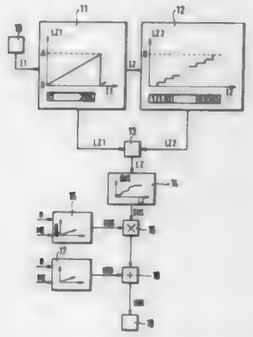
of the engine as engine elapsed operating time, said method comprising the steps of:

(1) memorizing said (LZ) quantity with a volatile storage second means (11) between the values of (0) and (A), with (LZ1) representing the non-volatile storage value between (0) and (A);

(2) resetting (LZ1) to (0) when said (A) value is reached;

(3) transferring said (A) value to a non-volatile storage third means (12) each time said (A) value is reached;

(4) compounding said non-volatile storage value (A) up to a predetermined quantity (B);



(5) generating a drift-correction signal (DUS) in dependence upon said non-volatile storage value (B) represented by (LZ2);

(6) developing an aging characteristic field (14) from input signal LZ which satisfies the relationship

$$LZ=LZ1+LZ2\times A;$$

and,

(7correcting speed (15) and pump (17) characteristic fields with said drift correction signal (DUS) to provide the proper metering to injector (19).

4,696,277

ENGINE ALARM SYSTEM

Takeshi Katayama, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 3, 1986, Ser. No. 926,175

Claims priority, application Japan, Nov. 4, 1985, 60-247604

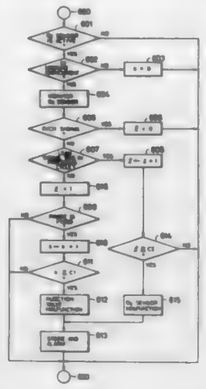
Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—479 **10 Claims**

1. In an electronic engine control system which performs at least fuel injection control of an engine via fuel injection valves in response to control signals which are derived from output signals of sensors detecting operating conditions of the engine and from an output signal of an air-to-fuel ratio sensor disposed in an exhaust system of the engine in accordance with a program stored in a microcomputer, an alarm system comprising:

(a) first means for detecting when the fuel injection control is being operative to supply the engine with a rich air-fuel mixture;

(b) second means for detecting whether or not the air-to-fuel ratio sensor periodically generates mixture lean signals in synchronism with revolutions of an ouput shaft of the engine when the fuel injection control is being operative to supply the engine with the rich mixture; and



(c) third means for determining a malfunction of at least one of the fuel injection valves in accordance with the detection by the second means.

4,696,278

METHOD AND DEVICE FOR CONTROL OF INTERNAL COMBUSTION ENGINE AT END OF FUEL CUT OFF

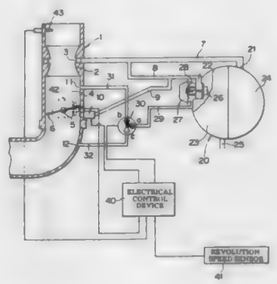
Toshimitsu Ito, and Chigaku Murata, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 19, 1986, Ser. No. 830,879

Claims priority, application Japan, Feb. 20, 1985, 60-31934

Int. Cl.⁴ F02D *41/12*

U.S. Cl. 123—493 **8 Claims**



1. A method of fuel control for an engine for which cut off of fuel supply is performed while the engine is in a decelerating operational condition, comprising the steps of, at the time of fuel cut off termination, judging whether the rate of reduction of the revolution speed of the engine is greater than a predetermined value or not, and supplying a temporary injection of fuel through an auxiliary fuel injector into an intake system of said engine at substantially the same time as stopping the fuel cut off only when the rate of reduction of the revolution speed of the engine is greater than said predetermined value, wherein the amount of the temporary fuel injection is controlled according to the temperature of the air being sucked into said engine intake system so as to be decreased as said air temperature increases at least within a predetermined range of said air temperature.

4,696,279

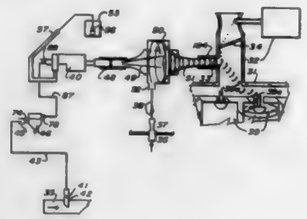
COMBUSTION CONTROL SYSTEM

John E. Lindberg, Point Richmond, Calif., assignor to Combustion Control Developments, Ltd., Richmond, Calif.

Filed Aug. 30, 1985, Ser. No. 771,290

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—570 **30 Claims**



1. A combustion control method for an automotive engine in a vehicle having a large, open intake manifold leading to a plurality of cylinders with intake valves and exhaust valves leading to an exhaust conduit, comprising

keeping the intake manifold wide open with no ducts and no barriers, so that all of the cylinders are joined in said large, open intake manifold,

supplying fuel to said intake manifold,

withdrawing a sidestream of gas from said exhaust gas,

cooling said sidestream to below water condensation temperature,

removing the condensed water from said cooled sidestream,

creating a whirling, tornado-like stream of gas,

providing said stream with the cooled, moisture-free exhaust gas, and also with a desired quantity of liquid, said tornado-like stream acting to shear said liquid and vaporize it,

sending said stream with its exhaust gas and liquid vapor into said manifold with a low-pressure vortex center, thereby creating a vapor-laden whirling charge to each cylinder when its said intake valve is open.

4,696,280

HIGH-TENSION CAPACITOR-DISCHARGE IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINES

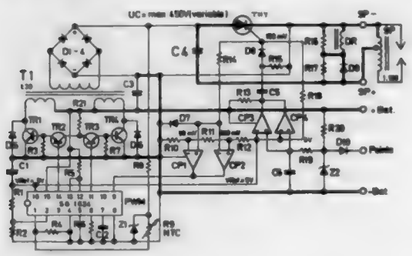
Gert G. Niggemeyer, Steinbecker Mühlenweg 95, D-2110 Buchholz, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,408

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535365

Int. Cl.⁴ F02P *3/08*

U.S. Cl. 123—598 **14 Claims**



1. In a high voltage capacitor-discharge ignition apparatus for internal combustion engines and including an interruptable source of electrical power comprising a pulse width modulator controlled low-to-high voltage DC-DC converter operable as a blocking oscillator in the audio frequency range, a firing capacitor for receiving a high voltage charge from said electrical power source, and a thyristor triggerable by ignition pulses at its gate electrode to change from a nonconductive to a conductive condition for discharging said firing capacitor into an ignition coil having a primery winding and which generates a flyback pulse, said thyristor being returned to said nonconductive condition by interrupting the operation of said electrical power source, the improvement comprising:

at least a first comparator connected to the gate electrode of said thyristor for directly and continuously monitoring the voltage at said gate electrode as an indicator of the operating condition of the thyristor, for comparing said gate electrode voltage with at least a first predetermined reference voltage, and for generating an output signal based upon said comparison to interrupt the operation of said power source only so long as said thyristor is in said conductive condition; and

a circuit connected to the primary winding of the ignition coil for deriving an electrical pulse from the flyback pulse and accelerating the change of said thyristor from said conductive to said nonconductive condition.

4,696,281

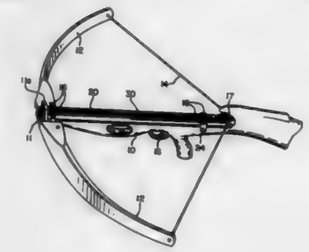
PROJECTILE SHOOTING GUIDE FOR BOWS

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Filed Oct. 6, 1986, Ser. No. 915,421

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—25 **5 Claims**





1. In combination, a projectile and a shooting bow,

said shooting bow comprising

an elongated frame extending longitudinally in a shooting direction of the projectile,

a pair of flexible arms with tip ends for providing tension in a bowstring, the pair of arms connected to the frame,

a bowstring extending between the tip ends of the flexible arms,

a bowstring catch and trigger mechanism on the frame for holding the bowstring in a drawn position and for releasing it to propel the projectile,

an elongated projectile track extending longitudinally on the elongated frame in a shooting direction of the projectile,

said projectile track including an elongated top portion and elongated opposite side portions, the top and side portions

being substantially open to allow easy grasping of the projectile when it is loaded on the top of the projectile track,

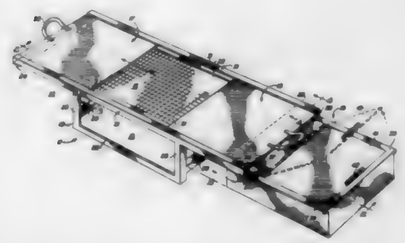
an elongated bar extending longitudinally over the top of at least a portion of the projectile when the latter is loaded on the top of the projectile track, the elongated bar allowing forwardly sliding movements of the projectile while restricting the latter's upwardly movements when it is propelled forwardly by the bowstring.

4,696,282

CAMP STOVE

Corkey Incitti, Weston, Colo. 81091

Filed Oct. 14, 1986, Ser. No. 918,208
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 R 9 Claims



1. A camp stove comprising:

an open metallic framework defining below it first and second auxiliary fire area and a primary fire area disposed therebetween, said fire areas including a source of fire;

a metallic grate supported by said open framework above said primary fire area;

a first metallic griddle plate supported by said open framework and slidable thereon between one position above said first auxiliary fire area and another position over and directly adjacent to said grate; and

a second metallic griddle plate supported by said open framework above second auxiliary fire area.

4,696,283

KINETIC HEATER

Charles W. Kohlmetz, 27 Brook Hill Ln., Rochester, N.Y. 14625; James J. Urban, and John Kenny, both of Main St., Dunstable, Mass. 01827

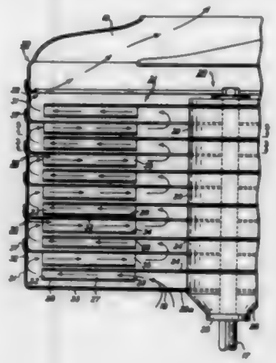
Filed Mar. 6, 1986, Ser. No. 836,693
Int. Cl.[4] F24C *9/00*
U.S. Cl. 126—247 18 Claims

1. An air heater and pump comprising:

a. a rotor having a plurality of vaned impellers for pumping air radially outward, said impellers being axially spaced in series and providing the sole motivating force for pumping air through said heater;

b. a stator having multi-stages interleaved with and out of contact with said rotor impellers, each of said stator stages having a radially walled passageway substantially filling the usable space between said rotor impellers without contacting said rotor impellers for guiding inbound air radially inward to an impeller inlet region; and

c. each of said stator stages having an outer rim extending axially of said heater from said stator passageway to engage an outer rim of an adjacent stator stage, for spacing said stator passageways clear of said impellers, each of said stator passageways extending inward from said outer rim and having an entrance spaced from said outer rim, and each of said outer rims forming an impingement surface radially surrounding one of said rotor impellers so that outwardly pumped air discharged from the surrounded impeller against said impingement surface retroverts directly into an inbound course through one of said stator passageways so that each retroverted pass through



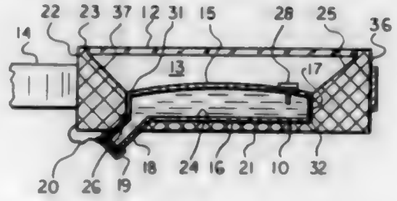
a stage of said rotor and stator increases the temperature of air being pumped through said heater.

4,696,284

SOLAR HEATED CANTEEN

Dennis E. Stowell, P.O. Box 796, Parowan, Utah 84761

Continuation-in-part of Ser. No. 826,802, Feb. 6, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 937,685
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—437 7 Claims



1. Apparatus for confining a supply of water and enabling said water to be heated by solar radiation, said apparatus comprising:

(a) a water-confining vessel having an panel of spherically rounded contour convexly directed outwardly from the vessel and centered upon an axis perpendicular to said vessel, an opposed lower panel, a boundary of circular configuration joining said upper and lower panels, and a sealable spout communicating with the interior of the vessel,

(b) a jacket of self-supporting thermally insulative material, and comprised of (1) a bottom wall of circular perimeter adapted to lie in abutment with said lower panel, (2) a sidewall rising upwardly from the perimeter of said bottom wall as a continuous extension thereof and having an exterior surfact extending between upper and lower extremities and an interior surface comprised of a lower portion which faces said vessel and abuts said boundary, and an upper portion disposed above the upper panel of the vessel and shaped as a conical section which tapers outwardly away from the vessel toward the upper extremity of said exterior surface and (3) a channel which permits close-fitting passage of said spout,

(c) a circular lens window of larger diameter than sind vessel affixed at its perimeter to the upper extremity of said sidewall and coacting with the jacket to define an air

chamber above the vessel, said lens being perpendicularly centered upon the axis of the upper panel and having a focal point coinciding with the center of curvature of said upper panel at a site on said axis below the bottom wall of the jacket, whereby light rays passing through the lens converge to the area of the upper panel while passing through the air chamber, and impinge perpendicularly upon the upper panel and heat the vessel, and

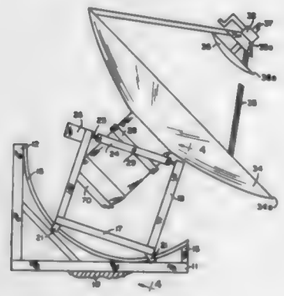
(d) a carrying strap forming a substantially closed loop, a part of which embraces the exterior surface of said sidewall.

4,696,285

SOLAR COOKER

David M. Zwach, 518 North State, New Ulm, Minn. 56073

Filed Nov. 15, 1985, Ser. No. 798,473
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—451 16 Claims



1. A solar unit comprising a solar oven having an open end, a generally concave parabolic main reflector joined to the oven to move therewith and reflect solar radiation away from the oven, said main reflector having a central opening opening to the oven open end, a generally parabolic convex secondary reflector for reflecting radiation from the main reflector through the central opening to the open end of the oven, means for mounting the secondary reflector on the main reflector for movement therewith, a frame, and means for mounting the oven on the frame for adjustable movement relative to the frame to permit adjusting the angular position relative to the earth, the last mentioned means including means for supporting the oven including first and second pairs of pivot members that respectively have a first pivot axis and a second pivot axis that extends perpendicular to the first pivot axis, the oven extending between each of the first pivot members and each of the second pivot members.

4,696,286

COATED TRANSPLANTS AND METHOD FOR MAKING SAME

Kent C. Cochrum, Corte Madera, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 711,664, Mar. 14, 1985, abandoned. This application May 22, 1986, Ser. No. 866,167
Claims priority, application Norway, Mar. 7, 1986, 860858
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R 16 Claims

1. A transplant suitable for transplantation into a genetically dissimilar individual, said transplant being coated with an immunological barrier membrane that conforms to the surface of the transplant,

said membrane comprising a noncytotoxic inner layer that is bonded chemically to the surface of the transplant, and an outer, biologically compatible, water-insoluble semipermeable layer bonded chemically to the inner layer, wherein the inner layer is compriaed of a material selected from the group consisting of:

(a) aluminum hydroxide;

(b) a disaccharide;

(c) a polyfunctional cross-linking agent;

(d) an immunoglobulin to a surface component of the transplant;

(e) a lectin; and

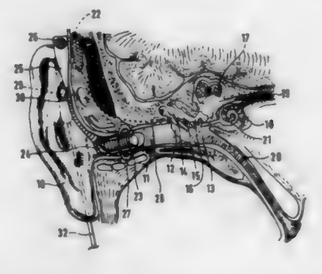
(f) a polyionic polyamino acid having an opposite charge to that of the transplant surface; and the outer layer is comprised of a polyamino acid that has reactive carboxyl, amino or imino side groups.

4,696,287

TRANSMISSION SYSTEM FOR IMPLANTED HEARING AIDS

Guenther Hortmann, Neckartenzlingen; Klaus Kunick, and Hans Fenner, both of Stuttgart, all of Fed. Rep. of Germany, assignors to HORTMANN GmbH, Neckartenzlingen, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,989
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506721
Int. Cl.[4] A61N *1/30*
U.S. Cl. 128—1 R 6 Claims



1. A transmission system for an implanted hearing aid, comprising at least one excitation electrode implanted in a patient's ear, an implanted receiver unit provided with a receiver coil, said receiver coil surrounding auditory channel of the ear; a transmitter unit provided with a separate transmitter coil, an acoustic converter coupled via said transmitter and receiver units to said excitation electrode, a fitting piece enclosing said transmitter coil, said fitting piece being inserted in said auditory channel at a position at which said transmitter coil is concentric with said receiver coil and a stable inductive coupling between said coils is established.

4,696,288

CALIBRATING APPARATUS AND METHOD OF USING SAME FOR GASTRIC BANDING SURGERY

Lubomyr I. Kuzmak, 657 Irvington Ave., Newark, N.J. 07106, and Robert E. Hoyt, 326 El Gaucho Rd., Santa Barbara, Calif. 93111

Filed Aug. 14, 1985, Ser. No. 766,091
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R 8 Claims

1. A method for performing a gastric banding operation on the stomach of a human body comprising the steps of

inserting into the opening of the stomach of a human body a calibrating apparatus comprising a single-lumen tubing which has a first orifice at the proximal portion thereof and a second orifice at the distal tip thereof which is operatively coupled to an elongated thin-walled sensor having a circular cross-section and which defines a cavity within the interior thereof and wherein the thin-walled sensor is capable of having its cross-sectional diameter varied in response to a variable force being applied to the

exterior of the sensor, a toroidal-shaped balloon operatively coupled to and surrounding the exterior of the single-lumen tubing at a preselected location near the distal tip and an elongated tubing which extends from a location exterior to the single-lumen tubing, through the interior of the single-lumen tubing, and into communication with the interior of the balloon and proceeding the calibrating apparatus into the interior of the stomach;

inflating the balloon while the calibrating apparatus is within the stomach by passing a fluid under pressure through said elongated tubing to expand the balloon to a selected expanded dimension and retrograding the inflated balloon against the stomach opening;

constricting the stomach located immediately below the expanded balloon by applying a adjustable gastric band around the periphery of the stomach and urging the interior of the stomach into engagement with and around the exterior of the sensor;

tightening the adjustable band around the periphery of the



stomach, which in turn applies pressure around the periphery of the exterior of the sensor, until a selected pressure is detected as being applied to the sensor and suturing the band to form a passageway between the inner walls of the stomach wherein the passageway has a diameter which is substantially equal to the cross-sectional diameter of the sensor at the applied pressure developed by the adjustable band to establish an upper cavity having a volume which is substantially equal to the selected expanded dimension of the balloon and a lower cavity which communiates with the first cavity through said passageway having said predetermined cross-sectional area;

suturing together the sidewalls of the stomach forming the upper and lower cavities enclosing the adjustable gastric band to defining an annular-shaped opening around the adjustable gastric band; and

withdrawing the fluid from the interior of the balloon, collapsing the same, and retrograding the calibrating apparatus through the opening of the first cavity and out of the human body.

4,696,289

METHOD OF PROMOTING VENOUS PUMP ACTION

Arthur M. N. Gardner, and Roger H. Fox, both of Devon, England, assignors to Electro-Biology, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 763,686, Aug. 5, 1985, Pat. No. 4,614,180, and a continuation-in-part of Ser. No. 794,443, Nov. 4, 1985, Pat. No. 4,614,179, said Ser. No. 763,686, is a continuation-in-part of Ser. No. 621,499, Jun. 18, 1984, abandoned, said Ser. No. 794,443, is a continuation-in-part of Ser. No. 751,150, Jul. 2, 1985, abandoned, said Ser. No. 751,150, is a division of Ser. No. 621,499,. This application Aug. 1, 1986, Ser. No. 889,376

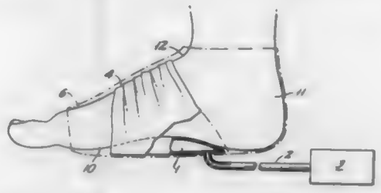
Claims priority, application United Kingdom, Jun. 22, 1983, 8316959; Nov. 18, 1983, 8330138

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—64 **23 Claims**

1. The method of promoting venous pump action in the leg of a living body, which method comprises simultaneously applying (a) upward and spreading force at longitudinally spaced plantar regions of the sole of the foot, said regions being essentially limited by and between the ball and heel of the foot and (b) downward force at the region of the midtarsal joint, said forces being applied in a cyclical pattern of a relatively rapid-time period in which said forces are rapidly increased to a predetermined upper force limit, then said upper force limit



is retained for a holding period of time before relaxation for a period substantially exceeding an application time, whereby said application time includes both said rapid increase time period and said holding time period and the arch of the foot is caused to flatten periodically and this to stretch and neck down the internal local sectional area of the veins of the lateral plantar complex, with resulting venous-pump action.

4,696,290
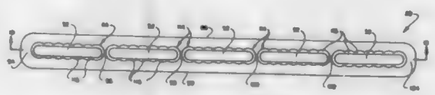
APPARATUS FOR STRAIGHTENING SPINAL COLUMNS

Arthur D. Steffee, Moreland Hills, Ohio, assignor to AcroMed Corporation, Cleveland, Ohio

Division of Ser. No. 562,438, Dec. 16, 1983, Pat. No. 4,611,581. This application Mar. 31, 1986, Ser. No. 846,018

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—69 **8 Claims**



1. An apparatus for use with fasteners for maintaining vertebrae in a desired relationship, said apparatus comprising:

an elongated plate for connecting at least two vertebrae, said elongated plate having a first major side surface for facing the vertebrae and a second major side surface extending generally parallel to said first major side surface, said first and second major side surfaces having first and second minor side surfaces extending therebetween;

said elongated plate also having at least one elongated slot extending therethrough and intersecting said first and second major side surfaces and located along the longitudinal central axis of said elongated plate, said slot being capable of receiving a fastener therein at any one of a plurality of locations along the slot and which fastener is connectable with a vertebra; and

said slot being defined by opposed slot surfaces extending longitudinally of said elongated plate and arcuate recesses in said opposed slot surfaces and spaced therealong, the recesses in one of said opposed slot surfaces being aligned with the recesses in the other of said opposed slot surfaces to define said plurality of locations, said recesses comprising means for blocking sliding movement of aid elongated plate relative to the fastener and of said elongated plate relative to the vertebrae when the fastener is located in a pair of aligned recesses.

4,696,291

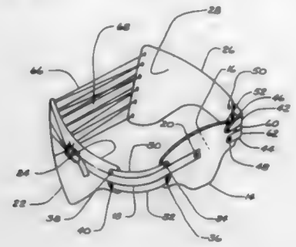
PELVIC STABILIZATION DEVICE

James H. Tyo, 633 E. Walnut St., Green Bay, Wis. 54301

Filed Mar. 6, 1986, Ser. No. 837,025

Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **10 Claims**



1. A pelvic stabilization device comprising:

a substantially rigid abdomen plate mounted between the symphsis pubis distally and the anterior superior iliac spines laterally operable to compress the abdomen between the symphsis pubis distally and the anterior superior iliac spines laterally;

a first substantially rigid gluteal member operable to compress the right gluteal;

a second substantially rigid gluteal member, operable to compress the left gluteal; the skin contact surface of such abdomen plate and gluteal plates being made of a material insensitive to human skin, insoluble in and non-reactive to body fluids and cleaning solutions;

straps connecting the abdomen plate to each gluteal member;

a tension adjustment strap affixed to the abdomen plate and to the gluteal members;

a fastener operable to secure the tension adjustment strap.

4,696,292

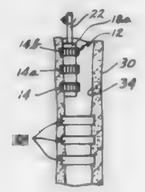
TOOL FOR USE IN ANCHORING IMPLANTABLE PROSTHESIS AND METHOD

Kingsbury G. Heiple, 2410 Derbyshire Rd., Cleveland Heights, Ohio 44106

Filed Jul. 2, 1985, Ser. No. 751,327

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 V **9 Claims**



1. In a method for preparing a femur for the receipt of an implantable prosthesis comprising clearing the medullary canal of marrow, inserting a cutting tool having a rotatable cutter thereon interiorly of said canal, rotating said cutter and moving said tool laterally in said canal into engagement with a confronting interior surface of the canal to cut a groove in said interior surface, withdrawing said tool from said canal and inserting surgical cement into said canal with a prosthesis, to implant said prosthesis in the cement in said canal, with said cement entering said groove for firmly anchoring said prosthesis in said canal upon hardening of said cement.

4,696,293

HINGED EXTERNAL FIXATOR

Ciullo, Jerome V., 5914 Nottingham, Detroit, Mich. 48224

Filed Sep. 30, 1982, Ser. No. 432,090

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 ZK **12 Claims**



1. An articulated external fixator for the joint of at least a pair of articulated tubular bony parts, comprising: first and second elongated structural members having adjacent ends pivotally connected for generally only single axis pivotal movement with respect to one another about the anatomic axis of articulation of said bony parts, each of said first and second structural members adapted to be positioned on one or the other of said bony parts in distraction with longitudinal axis generally parallel to the longitudinal axis of the associated bony part so that said articulated movement of said structural members corresponds with the articulated movement of said bony parts about the joint;

first and second holding means carried on said first and second structural members respectively and adapted to receive pins to be inserted in the bony part; and

limiting means for limiting the articulated movement of said structural members.

4,696,294

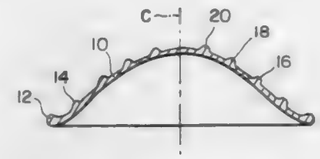
CONTRACEPTIVE DEVICE AND RELATED METHOD

Franklin C. Reyner, 165 N. Village Ave., Rockville Center, N.Y. 11570

Filed Aug. 31, 1981, Ser. No. 298,209

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—131 **22 Claims**



1. A diaphragm or pessary comprising a flexible wall having a shape adapted for accommodation in a vaginal cavity and for capping the cervical os in said cavity, said wall having an at least generally convex outer surface, and means in the form of projections distributed on said surface generally therethroughout for providing a texture simulating the natural vaginal mucosa.

4,696,295

BREATHING APPARATUS

Trevor Constance-Hughes, Abergavenny, Wales, assignor to Siebe Gorman & Company Limited, Berkshire, England

Filed Mar. 6, 1986, Ser. No. 837,056

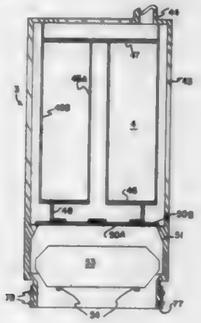
Claims priority, application United Kingdom, Mar. 6, 1985, 8505787; Apr. 15, 1985, 8509604; Jan. 27, 1986, 8601871

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—202.26 **11 Claims**

1. Closed-circuit breathing apparatus comprising a breathing bag, and a purifier including housing means; permeable purifying material for removing carbon dioxide from a life-supporting gas mixture located within said housing means; first and

second permeable wall means separating said purifying material from respective first and second spaces within said housing means; said housing means defining a first and a second opening, each of the said first and second openings providing communication between the exterior and the interior of said housing means; the first opening providing direct communication between the exterior of said housing means and both said first space and said second space, and the second opening providing direct communication between the exterior of said housing means and said first space while providing communication between the exterior of said housing means and said second



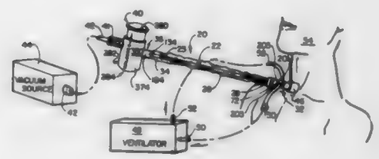
space only through said first space, said first permeable wall means, said purifying material and said second permeable wall means in turn; non-return valve means permitting gas to flow between said first space and the exterior of said housing means through the first opening in one direction only so that gas flowing between said first space and the exterior of said housing means in the opposite direction caused to flow through said purifying material; and said purifier having said first opening in communication with said breathing bag and said second opening arranged, when said apparatus is in use, to be in communication with a user.

4,696,296

ASPIRATING/VENTILATING APPARATUS

Darrel Palmer, Sandy, Utah, assignor to Ballard Medical Products, Midvale, Utah

Division of Ser. No. 767,400, Aug. 20, 1985, Pat. No. 4,638,539, which is a division of Ser. No. 633,570, Jul. 23, 1984, Pat. No. 4,569,344. This application Oct. 7, 1986, Ser. No. 916,341
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.16 **6 Claims**



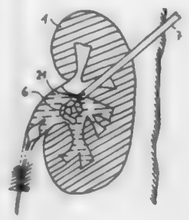
1. An indwelling ventilating aspirating apparatus by which a medical patient is subjected to involuntary respiratory therapy and by which fluids from the trachea and/or bronchi are evacuated, the apparatus comprising:
an elongated sterile aspirating catheter tube for manual insertion into the trachea/bronchi of the patient;
a sterility preserving collapsible envelope essentially surrounding the catheter tube, the envelope maintaining sterility of the catheter tube while accommodating manual manipulation of the catheter tube to and fro by externally collapsing the envelope upon the catheter tube;
first coupling means accommodating manual reciprocation of the catheter tube therethrough;
second coupling means comprising means associated with a proximal end of the catheter tube;
tracheostomy fitting means connected to the first coupling means by which ventilating air is introduced into and exhausted from the lungs of the patient and through which the aspirating catheter tube is displaced into and removed from the patient's trachea/bronchi;
vacuum control valve structure comprising valve body means having fluid flow passageway means and valve means operable within the valve body means between activated and non-activated positions to respectively accommodate and prohibit vacuum caused fluid flow along the passageway means, the control valve structure further comprising means interposed between the valve body means and the valve means which prohibits bacterial entry between the valve body means and the valve means and thus prevents bacterial contamination within the passageway means and along the catheter tube.

4,696,297

PROCESS FOR COLLECTING FRAGMENTS WHICH ARE OBTAINED ON SHATTERING STONES IN BODY CAVITIES OF LIVING HUMANS AND OTHER MAMMALS

Peter Pleines, Cologne, and Erich Wolf, Overath, both of Fed. Rep. of Germany, assignors to Farco-Pharma GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,096
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506873
Int. Cl.[4] A61B *17/00, 17/22*
U.S. Cl. 128—303.1 **21 Claims**



1. A method of shattering a stone in a body cavity of a human or another mammal, comprising the steps of surrounding the stone with a substance in flowable state; transforming said substance to a non-flowable state so that at least the major part of the stone is confined by said substance; and shattering the stone while said substance is in said non-flowable state and confines the stone to thereby reduce scattering of the resulting stone fragments.

4,696,298

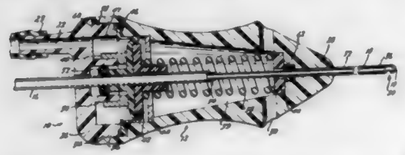
VITRECTOMY CUTTING MECHANISM

Daniel E. Higgins, St. Louis, and James C. Easley, Fenton, both of Mo., assignors to Storz Instrument Company, St. Louis, Mo.

Filed Nov. 19, 1985, Ser. No. 799,748
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **16 Claims**

1. A microsurgical cutting device for cutting and removing fibrous gel, comprising a housing, a substantially hollow outer needle having an outward end with an aperture therein, a cutting blade disposed within said outer needle, actuation means, and suction means;

said housing containing a spring compartment and containing means for communicating with said actuation means, said spring compartment containing a compression spring acting against said actuation means;
said outer needle extending outwardly from said housing and containing a hollow tubular member reciprocable within said outer needle, said hollow tubular member communicating with said suction means and having said cutting blade extending toward said apertured end of said outer needle;
said inner tubular member being reciprocable within said outer needle between a first open position and a second cutting position wherein said cutting blade slides across said apertured end of said outer needle, said actuation means tending to force said inner tubular member and cutting blade toward said second position and said compression spring tending to restore said inner tubular member and cutting blade to said first position;
said aperture in said outer needle having a cutting edge and a radially rounded leading edge opposing said cutting edge, said cutting edge having an axially inwardly curved surface and said opposing edge having a surface inwardly beveled toward said cutting edge; and
wherein said actuation means comprises a sealed fluid com-



partment in said housing and communicating with a pressurized fluid source and a diaphragm, said fluid compartment separated from said spring compartment by said diaphragm, said diaphragm urging said tubular member toward said second position when pressurized fluid is injected into said fluid chamber.

8. An improved microsurgical cutting blade for use with a surgical probe having a reciprocable blade holding actuation means, suction means and an outer probe needle having a smooth, uniform inner diameter and at least one cutting edge wherein:
said blade is substantially tubular and is reciprocable within and substantially conforms to the inner diameter of said probe needle;
said blade has a first end disposed within and supported by said blade holding means and is operatingly connected to said suction means; and
said blade has a preformed flared cutting end having a predetermined degree of flexibility said cutting end receiving a compressive force from said probe needle and said cutting end providing a corresponding tension force, said tension force tending to force said flared end against said probe needle and increasing the efficiency of the shearing effect of reciprocating said blade past said cutting edge of said probe needle.

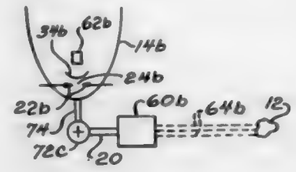
4,696,299

NON-INVASIVE DESTRUCTION OF KIDNEY STONES

William R. Shene, Plattsburgh, N.Y.; Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, both of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Division of Ser. No. 666,770, Oct. 31, 1984, Pat. No. 4,620,545.
This application Apr. 3, 1986, Ser. No. 847,696
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 **10 Claims**

1. Apparatus for the non-invasive disintegration of concretions such as kidney stones within a living body, comprising means including a focussing reflector comprising a portion of an ellipsoid open at one end and having a first focus point within said reflector and having a second focus point outside of said reflector positioned beyond said open end, said first and second focus points lying on the focal axis of said reflector, said reflector being adapted to contain a fluid such as water, a fluid retaining diaphragm closing said open end and engagable with said body, sonic aiming means disposed entirely exteriorly of said reflector and positioned relative to said reflector to permit said sonic aiming means to focus on said concretion exteriorly of and free of obstruction by said reflector, said sonic aiming



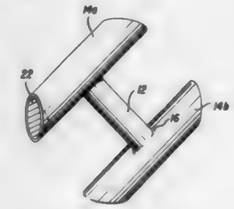
means having a focussing direction displaced from and non-intersecting with said reflector focal axis, said reflector being interconnected with and movable with said sonic aiming means focus to bring said second focus point into coincidence with said concretion with concurrent movement of said sonic aiming means away from said concretion, and spark gap means in said reflector at said first focus point for generating a shock wave which will travel through said fluid, said diaphram and through said body to disintegrate said concretion.

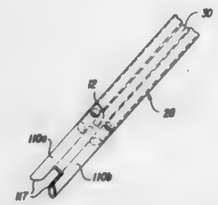
4,696,300

FASTENER FOR JOINING MATERIALS

Gary Anderson, Dorchester, Mass., assignor to Deanison Manufacturing Company, Framingham, Mass.

Filed Apr. 11, 1985, Ser. No. 722,083
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 R **15 Claims**





1. Apparatus for fastening materials, comprising:
a connecting member having at least two ends;
a plurality of head members, one connected to each of said ends, with each head having at least two ends defining non-parallel planes; and
means for driving said heads through needles having slotted bores;

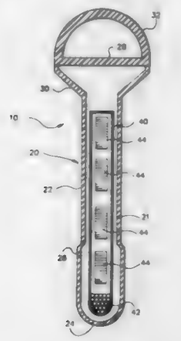
wherein said head ends are provided with apertures disposed to securely receive the driving means.

4,696,301
WOUND CLOSING METHOD
David J. Barabe, 2741 Lansdale La., Winston-Salem, N.C. 27103
Filed Jul. 16, 1986, Ser. No. 886,637
Int. Cl.[4] A61L *17/00*
U.S. Cl. 128—335.5 **2 Claims**



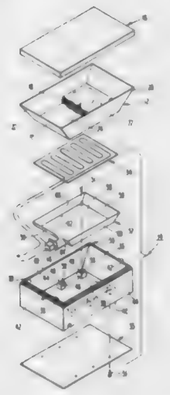
1. A surgical method for closing an elongate wound of a patient without requiring piercing of the skin comprising:
applying a small amount of glue to the patient's skin at spaced intervals along each side of the wound and then placing one end of each of a plurality of suture threads into a respective one of said spaced glue applications until it is adhesively secured to the skin;
tying together laterally spaced-apart suture threads into a plurality of suture knots in order to close the wound and maintain it in a closed condition to facilitate healing thereof; and
maintaining the tied sutures in place until the wound heals.

4,696,302
PROCTOLOGIC DEVICE
Leigh B. Clark, R.F.D. Box 142, Del Mar, Calif. 92014; Larry Howell, 6939 Caminito Entrada, San Diego, Calif. 92119, and Richard G. Hunter, 9129 Village Glen Dr., #275, San Diego, Calif. 92123
Filed Aug. 9, 1985, Ser. No. 764,106
Int. Cl.[4] A61F *7/03, 7/12*
U.S. Cl. 128—401 **13 Claims**



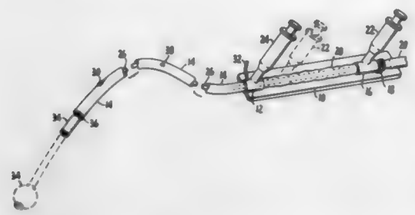
1. A disposable device for self-administered heat treatment, comprising:
an outer vessel dimensioned for manual rectal insertion comprising:
a hollow, thin walled, flexible, elongated tubular body portion having a volume less than about 7 cubic centimeters; with an inner closed and, and an outer closed end;
chemical means within said outer vessel including components for producing an exothermic reaction and for heating and maintaining said outer vessel at a temperature of about 45 degrees centigrade; at least a particular one of the components being mobile for mixture with other components to provide a thermal reaction between component;
an inner vessel disposed within said outer vessel; said inner vessel containing at least one of said chemical components; said inner vessel being fracturable upon flexion of said outer vessel to provide for mixture of the mobile component with the other components;
said components comprising:
water;
a salt for quickly raising the device to a desired temperature through dissolution in said water;
an oxide for providing heat over a prolonged period through hydration with said water; and
a hydrophobic agent.

4,696,303
PORTABLE HEAT TREATMENT SYSTEM
Ronald J. Bernardini, Ambler, Pa., assignor to Michael Litman, Philadelphia, Pa., a part interest
Filed May 7, 1982, Ser. No. 376,000
Int. Cl.[4] A61F *7/00*
U.S. Cl. 128—402 **19 Claims**



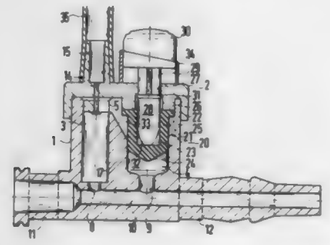
1. A portable heat treatment system for providing heat therapy to part of the human body, said system being characterized by:
(a) a portable heating shoe having;
(1) a heat conductive base member,
(2) heating means connected to said base member for transmitting heat along said base member;
(b) a removable and replaceable unit including;
(1) a heat conductive container having;
(i) a base,
(ii) peripheral walls extending upwardly from the base and cooperating therewith to define a heat treatment compartment;
(2) a body treating material including paraffin wax in the heat treating compartment of the container for application in a liquid state to a part of the human body to be provided with heat therapy and
(3) said container being removably retained within te heating shoe with the base of said container being supported by the heat conductive base member of said shoe.

4,696,304
THERMODILUTION FLOW-DIRECTED CATHETER ASSEMBLY AND METHOD
Albert K. Chin, Irving, Tex., assignor to Thomas J. Fogarty, Palo Alto, Calif.
Continuation of Ser. No. 648,822, Sep. 10, 1984, abandoned. This application Apr. 23, 1986, Ser. No. 855,143
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—673 **19 Claims**



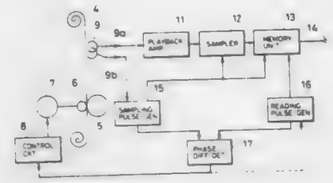
1. A catheter assembly comprising:
an outer catheter having a first lumen;
an inner catheter slidably disposed in said first lumen of said outer catheter and having second and third lumens, with said outer catheter extending along a substantial length of said inner catheter;
retaining means to prevent said inner catheter from being fully retracted from said outer catheter;
an inflatable balloon disposed at a distal end of said inner catheter, with the said balloon having an interior which is in communication with said second lumen;
an inflation port disposed at a proximal end of said inner catheter, opposite said distal end, and in communication with said second lumen, said inflation port for coupling to a balloon inflation source; and
a pressure port disposed at said proximal end of said inner catheter and in communication with said third lumen, said pressure port for coupling to pressure measurement apparatus.

4,696,305
FLOW CONTROLLER
Peter von Berg, Neukeferloh, Fed. Rep. of Germany, assignor to Peter von Berg Extrakorporale Systems-Medizintechnik GmbH, Munich, Fed. Rep. of Germany
Filed Jun. 19, 1986, Ser. No. 876,170
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525191
Int. Cl.[4] A61M *5/00;* **F16K** *51/00*
U.S. Cl. 128—673 **14 Claims**



1. A flow control device for use in fluid flow systems for pressure monitoring during blood pressure measurements, comprising a housing having at least one passage therethrough, said passage having an inlet and an outlet adapted for coupling to a catheter which is continuously flushed by the fluid, a capillary bore defining a non-closable first flow path from said inlet to said outlet, a closeable second flow path from said inlet to said outlet having a greater cross-sectional area than said first flow path, said second flow path comprising a chamber and a valve within said chamber having a valve body formed of elastically deformable material having a poriton positioned to press against the wall of said chamber to close off said second flow path, and a plunger movably coupled to said housing and positioned to distend and elongate said valve body portion within said chamber, thereby reducing the cross-sectional area of said valve body portion and causing said valve body portion to move away from said chamber wall to open said second flow path.

4,696,306
ELECTROCARDIOGRAM PLAYBACK SYSTEM AND METHOD
Yoshihiko Shiozaki, Tokyo, Japan, assignor to Akai Electric Co., Ltd., Tokyo, Japan
Filed Nov. 20, 1986, Ser. No. 932,528
Claims priority, application Japan, Nov. 20, 1985, 60-262017
Int. Cl.[4] A61B *5/04;* **G01D** *9/00*
U.S. Cl. 128—711 **11 Claims**

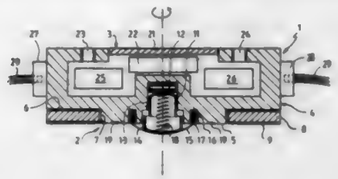


1. An electrocardiogram playback system comprising:
a plurality of track heads for simultaneously reading an electrocardiogram recorded on one track of a multi-track magnetic tape and reference clock signals recorded on another track of said tape;
means for driving said tape past said heads;
a sampling pulse generator connected to said heads for producing sampling pulses in response to the recorded reference clock signals;
sampling means for sampling the recorded electrocardiogram in response to said sampling pulses;
memory means for storing the sampled electrocardiogram;
reading pulse generator means for producing a timing pulse for reading said sampled electrocardiogram from said memory means;
a phase detector means for detecting the phase between said sampling pulses and said timing pulses; and
control circuit means for maintaining said phase difference constant.

4,696,307
DEVICE FOR CONTINUOUSLY DETECTING THE BREATHING RHYTHM, IN PARTICULAR WITH A VIEW TO PREVENTING THE SUDDEN DEATH OF AN INFANT DUE TO CESSATION OF BREATHING DURING SLEEP
Francois F. Montgieux, 15, rue Paispharnerie, 84000 Avignon, France
Filed Sep. 10, 1985, Ser. No. 774,445
Claims priority, application France, Sep. 11, 1984, 84 13915
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—721 **7 Claims**

1. A device for the continuous detection of a child's breathing rhythm, in particular for preventing the sudden death of the child by the cessation of breathing during sleep, this device comprising a box having an application wall, said application wall comprising a rigid peripheral zone and a movable centreal zone adapted to follow movements produced on the child's

akin by the child's breathing, said box housing a transducer which comprises a movable metallized electret, an electrode rigidly mounted in the box and placed opposite said electret and reducing means which are interposed between said movable zone and said electret and which transmit to said electret a fraction of the movements of said central zone, said electret



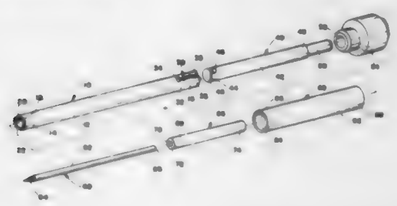
being electrically charged and inducing on said electrode a current which is representative of said movements, said box being equipped with fasteners to be connected to the body of the child and which are adapted to keep said peripheral zone and said central zone against the skin of the child, said fasteners providing the transducer through said peripheral zone and said box with a reference position.

4,696,308

CORE SAMPLING APPARATUS

Bruce T. Meller, Middleburg Heights; Michael T. Manley, Shaker Heights, and Bernard N. Stulberg, Chagrin Falls, all of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Apr. 9, 1986, Ser. No. 849,781
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—754 **22 Claims**



1. A non-reusable device for extracting biopsy cores or the like, comprising:

a hollow tubular body having front and rear ends and a longitudinal bore extending in said body between said ends, at least a major portion of said bore having a smooth periphery;

an annular cutting edge, adapted for rotary penetration into tissue, provided on said body front end;

an axial engagement means provided on said body rear end, said axial engagement means including a slit extending from said body rear end towards said body front end, said slit terminating in an enlarged aperture which is adapted to cooperate with a protrusion of an associated adapter means to enable said tubular body to rotate; and,

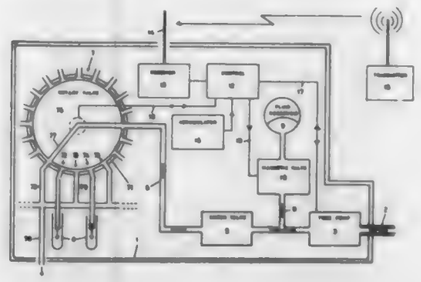
blocking means for preventing reuse of the device once said axial engagement means has been engaged by said associated adapter means.

4,696,309

PORTABLE APPARATUS FOR TAKING BLOOD SAMPLES

Eberhart Stephan, Freihorstfeld 70, D-3000 Hannover 71, Fed. Rep. of Germany

PCT No. PCT/DE84/00078, § 371 Date Dec. 11, 1984, § 102(e) Date Dec. 11, 1984, PCT Pub. No. WO84/04033, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 5, 1984, Ser. No. 691,570
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313074
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—762 **10 Claims**



1. Portable extraction apparatus of a size to be worn on the body for sequentially taking samples of blood and other body fluids comprising a housing containing:

pump means having an outlet and an inlet, and first conduit means for connecting said inlet of said pump means to a catheter,

multiple storage means providing a plurality of chambers for separately storing a plurality of samples of body fluid,

fluid discharge means comprising a common discharge passage for discharging fluid not to be stored,

first valve means having an outlet connectable alternatively to said storage means and said fluid discharge means and an inlet,

second conduit means connecting the outlet of said pump with the inlet of said first valve means,

a check valve in said second conduit means downstream of said pump to restrict flow of fluid in said second conduit means to flow in a direction from said pump to said first valve means,

fluid reservoir means for storing a supply of rinsing fluid,

third conduit means connecting said rinsing fluid reservoir means to a junction with said second conduit means at a location between said pump and said check valve,

second valve means in said third conduit means for opening and closing said third conduit means, and,

central control means for controlling said pump, said first valve means and said second valve means in accordance with the following program to:

(a) operate said pump with said second valve means closed and said first valve means connecting the outlet thereof with said fluid discharge means to pump rinsing fluid and an initial portion of body fluid from said catheter to said fluid discharge means,

(b) stop said pump and shift said first valve means to connect the outlet thereof with a chamber of said multiple storage means;

(c) operate said pump to pump a sample of body fluid from said catheter to said chamber of said multiple storage means;

(d) stop said pump and shift said first valve means to connect the outlet thereof to said fluid discharge means,

(e) open said second valve means for a short period of time to supply rinsing fluid through said third conduit means to said second conduit means, check valve and first valve means and to said pump and said first conduit means, and

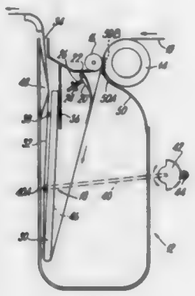
(f) close said second valve means and repeat said program with said outlet of said first valve means connected to a different chamber of said multiple storage means.

4,696,310

PAPER FEED FOR CIGARETTE MAKING MACHINES

Dennis Graham-Troll, Saunderton, England, assignor to Molins PLC, Great Britain

Filed Feb. 18, 1986, Ser. No. 829,988
Claims priority, application United Kingdom, Feb. 18, 1985, 8504044
Int. Cl.⁴ A24C *5/20*
U.S. Cl. 131—105 **8 Claims**



1. A reservoir for a bobbin changer for cigarette paper or a similar paper web including, adjacent to an inlet at which the paper enters the reservoir, a deflector which is mounted in the reservoir for movement toward and away from the inlet and is arranged to engage and deflect the paper as it enters the reservoir, at least while paper is being accumulated in the reservoir, and to promote the folding of the paper into loops in which the paper can safely be stored in the reservoir.

4,696,311

FORMING A ROD OF SMOKABLE MATERIAL

Brian C. Chard, Bristol; John D. Hooper, and Christopher R. Bale, both of Keynsham, all of England, assignors to Imperial Group Public Limited Company, England

Filed Dec. 19, 1985, Ser. No. 810,502
Claims priority, application United Kingdom, Dec. 21, 1984, 8432410
Int. Cl.⁴ A24C *5/18*
U.S. Cl. 131—109.1 **7 Claims**

1. An apparatus for controlling the ratio of two fluent materials fed from hopper means containing separate first and second fluent materials to a receiving area, the apparatus comprising,

(a) conveyor means arranged to receive the fluent materials from the hopper means so that the fluent materials lie in juxtaposition on the conveyor means,

(b) means for controlling the speed of the conveyor means,

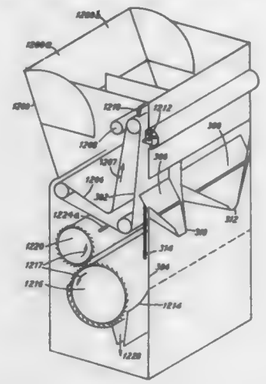
(c) chute means for transferring the fluent materials in the same relative juxtaposition to the receiving area,

(d) means for continuously removing a proportion of the fluent materials from the receiving area thereby leaving a proportion of the fluent materials in the receiving area,

(e) first and second controllable interception means for independently intercepting and diverting away from the receiving area respective first and second fluent materials falling down the chute means,

(f) first and second monitor means for monitoring the quantities of the first and second fluent materials respectively remaining in the receiving area and generating respective first or second signals dependent on the quantity of the first or second fluent material falling below a first predetermined level in the receiving area, and,

(g) first circuit means responsive to the said signals and adapted on receipt of one or said signals that the amount of one said fluent material has fallen below said predetermined level in the receiving area to actuate one of the interception means so as to intercept and divert other said fluent material away from the receiving area and to increase the speed of the conveyor means from a first value so as to increase the rate of supply of one said fluent material to the receiving area, and, on a cessation of said signal indicating that the amount of one said fluent material has risen to said first predetermined level in the receiving area, to de-actuate said one of the interception means so as to restore flow of other said fluent material to the receiving area and to decrease the speed of the conveyor means to its first value.



4,696,312

METHOD AND APPARATUS FOR PRODUCING CIGARETTE FILLER

Louis R. Turano, Colonial Heights; William T. Callaham; John F. Sherwood, both of Richmond, and Richard E. Thatcher, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 17, 1986, Ser. No. 839,922
Int. Cl.⁴ A24B *3/07*
U.S. Cl. 131—109.1 **10 Claims**



1. A method for processing whole leaf tobacco for producing cigarette filler, said method comprising the steps of:

cutting said whole leaf tobacco to substantially the same width as cigarette filler to produce strands of tobacco consisting of lamina and strands of tobacco comprising lamina and stem;

carding said cut whole leaf tobacco, without first cutting said strands to a shorter length, to disentangle said strands of cut leaf; and

separating said strands comprising lamina and stem from said strands consisting of lamina.

4,696,313

EXPANSION OF TOBACCO

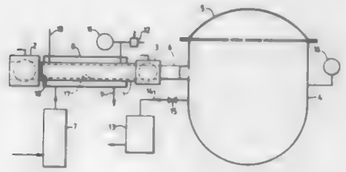
Ian C. Brown, Winchester; Roger W. Hedge, Lymington, and David J. Molyneux, Hythe, all of England, assignors to British-American Tobacco Company Limited, London, England

Filed May 31, 1984, Ser. No. 615,998

Claims priority, application United Kingdom, Jun. 10, 1983, 8315987

Int. Cl.[4] A24B *3/18*

U.S. Cl. 131—291 **14 Claims**



1. A method of expanding tobacco lamina, comprising contacting tobacco lamina with an organic expansion agent in the liquid phase having a boiling point temperature at a pressure of one atmosphere, of at least, about 20° C., heating within the interior of a closed first vessel tobacco lamina thus contacted so that the temperature of said agent in the liquid phase in said tobacco lamina attains a temperature value above the boiling point temperature corresponding to a release pressure of said agent, which release pressure is lower than the pressure in said first vessel at said temperature value, said temperature value being below the boiling point temperature of said agent at said pressure in said first vessel, and subsequently bringing the interior of said first vessel suddenly into gas flow communication with the interior of a closed second vessel in which the pressure immediately before the establishment of said communication is said release pressure, whereby the filling value of said tobacco lamina is increased by at least 50%.

4,696,314

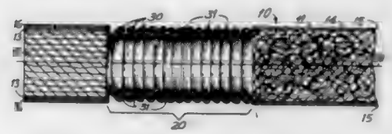
FILTER CIGARETTE

Andrew G. Kallianos, Midlothian, Va., and Christopher N. Kounnas, Durham, N.C., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,157

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 **37 Claims**



1. A filter cigarette comprising:

a substantially cylindrical cigarette rod;

a substantially cylindrical filter plug having a mouth end and a rod end open to the passage of air and smoke, the cigarette rod and the filter plug having substantially the same cross-sectional area and shape;

plug wrapping circumscribing said filter plug;

tipping paper circumscribing said wrapped filter plug;

a section of flexible corrugated tubing having a first end affixed to said filter plug and a second end affixed to said cigarette rod, whereby the shape of said filter cigarette can be changed; and

means for varying the air dilution value of said filter cigarette responsive to the change of shape of said filter cigarette.

4,696,315

HERBAL SNUFF COMPOSITION

John K. Summers, Anderson, Ind., assignor to Better Life International, Inc., Stuart, Fla.

Filed Sep. 19, 1985, Ser. No. 777,614

Int. Cl.[4] A24B *15/18*; A24D *1/18*

U.S. Cl. 131—359 **33 Claims**

22. A herbal composition comprising herbs and casing material wherein said herbs comprise:

	Red Clover	10 gms.
	Dandelion	1.3 gms.
	Echinacia	0.6 gms.
	Slippery Elm Bark	0.2 gms.
and wherein said casing material comprises:		
	Sea Salt	1.3 gms.
	Jamacian Ginger	0.7 gms.
	Rose hips	0.4 gms.
	Cayenne	1.2 gms.
	Molasses	15.0 gms.
	Unsulfurized Molasses	0.5 gms.
	Distilled water	1.0 gms.
and Mint Oils		
	Spearmint	1.0 drops
	Wintergreen	1.0 drops
	Clove	1.0 drops

4,696,316

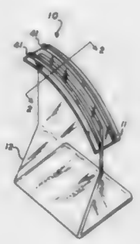
STAND FOR POLISHING ARTIFICIAL FINGERNAILS

Sandra M. Stanley, 2603 Massachusetts Ave., Lemon Grove, Calif. 92045

Filed Jan. 10, 1986, Ser. No. 817,593

Int. Cl.[4] A45D *29/00*

U.S. Cl. 132—73 **4 Claims**



1. A stand for retaining and polishing artificial fingernails, with comprises:

a plate having an upper surface and a bottom surface;

means for supporting the plate, wherein said means for supporting is secured to the bottom surface;

at least one base for supporting fingernails secured to the upper surface;

a releasable means for adhering the fingernails to the base;

wherein the base comprises at least one ridge having a convex head, said head being shaped and dimensioned to receive, retain and provide elevation to the fingernails.

4,696,317

VANITY CASE

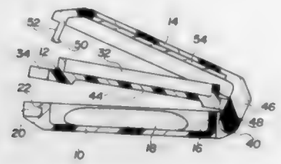
Yuji Shioi, Tokyo, and Yukitomo Yuhara, Abiko, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,666

Claims priority, application Japan, May 17, 1985, 60-72242[U]

Int. Cl.[4] A45D *33/00*

U.S. Cl. 132—82 R **6 Claims**



1. A vanity case comprising:

a receptacle member having formed therein a hollow space for receiving therein a puff;

a cover member hinged with said receptacle member at respective rear ends thereof; and

a tray disposed between said receptacle member and said cover member and hinged therewith, said tray including an upper surface, a lower surface and a periphery, said upper surface having defined thereon a space for containing therein cosmetic material, said periphery being sandwiched between said receptacle member and said cover member, and said lower surface having formed therein a concavity extending between opposite sides of said tray to define a recess, said recess communicating said hollow space to the outside of said vanity case to thereby ventilate said hollow space.

4,696,318

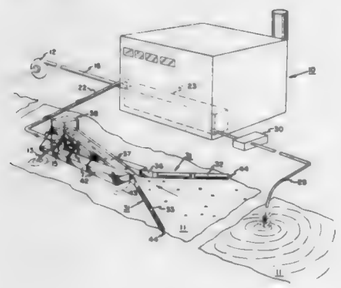
WASHING METHODS AND APPARATUS FOR HEAT EXCHANGER TUBE CLEANING PLUGS

Millard F. Smith, Westport, Conn., assignor to Slickbar Products Corp., Southport, Conn.

Filed Nov. 12, 1985, Ser. No. 797,203

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—73 **10 Claims**



1. Apparatus for cleaning and recycling flexible floating cleaning plugs introduced into the tubes of a power plant heat exchanger located near a flowing body of water comprising

A. a recycling pump having its intake positioned in a body of water and its outlet connected to one end of the heat exchanger tubes to deliver cooling water,

B. a cooling water outlet conduit connected to deliver used cooling water from the other end of the heat exchanger tubes and a plurality of said flexible floating cleaning plugs propelled therethrough to discharge them into said flowing body of water,

C. a containment barrier positioned downstream from the discharge of the outlet conduit, and having a convergent weir region at its downstream end,

D. an upward traveling conveyor positioned to pick up floating cleaning plugs arriving at the convergent weir which separates the plugs from the flotsam and conveys them through a washing zone,

E. washing spray means in the washing zone positioned to sluice away from said plugs carried by said conveyor the accumulated flotsam, scale, sediment, dirt and sludge gathered by the plugs from the heat exchanger tubes, and

F. a recycling conduit positioned to receive washed plugs emerging from the washing zone and deliver them for recycled use into the heat exchanger tubes.

4,696,319

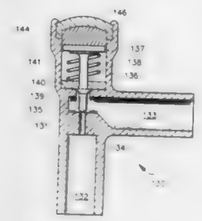
MOISTURE-ACTUATED APPARATUS FOR CONTROLLING THE FLOW OF WATER

Martin Gant, 2 Bernarra Street, The Gap, Queensland 4061, Australia

Continuation-in-part of Ser. No. 579,112, Feb. 10, 1984, abandoned. This application Nov. 18, 1985, Ser. No. 798,976

Int. Cl.[4] A01G *27/00*

U.S. Cl. 137—78.3 **21 Claims**



1. An actuating element, comprising:

a wicking matrix lamina formed from strands of wicking material arranged to form a regular, two-dimensional matrix of recesses; and

thixotropic, hydrophilic, mineral expandite material in said recesses for expandingly absorbing moisture from a moisture-conducting medium having a higher concentration of moisture than said material and for contractingly emitting moisture to said medium when said medium has a lower concentration of moisture than said material.

4,696,320

PRESSURE CONTROL VALVE WITH PUSH-PULL LOCKING ADJUSTMENT KNOB

Walter E. Bull, Aurora, Colo., assignor to Wilkerson Corporation, Englewood, Colo.

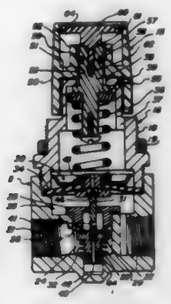
Filed Dec. 5, 1986, Ser. No. 938,484

Int. Cl.[4] G05D *11/00*

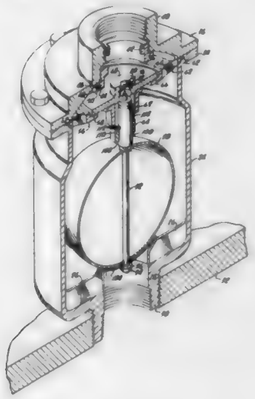
U.S. Cl. 137—116.5 **9 Claims**

1. In a pressure regulator for fluid pressure lines, the regulator including a valve body housing a pressure regulator valve, a valve stem rotatably housed in a bonnet mounted on said valve body for adjusting said valve, and a knob in rotational engagement with said valve stem for rotating the same, the

improvement comprising means mounting said knob for sliding movement on said valve stem and means on said knob releasably and slidably engagable with said bonnet for selectively preventing rotation of said knob.



4,696,321
AIR RELEASE AND VACUUM BREAKER VALVE SYSTEM
James R. Reese, and William Yelich, both of Costa Mesa, Calif., assignors to Cla-Val Company, Costa Mesa, Calif.
Filed May 2, 1986, Ser. No. 858,666
Int. Cl.[4] F16K *33/00, 31/20*
U.S. Cl. 137—202 19 Claims



1. In an air release and vacuum breaker vacuum breaker valve having a valve body defining a float chamber and a chamber entrance, and having a float mounted in the chamber for vertical motion in accordance with the level of liquid in the chamber, said valve having valving elements connected to be operated to open or close the float chamber to ambient atmosphere in response to motion of said float within the chamber, and wherein liquid flowing at high velocity into said chamber through said chamber entrance tends to create a decreased pressure effect at a lower side of said float, thereby decreasing effective buoyancy of the float, whereby the float tends to rise suddenly and cause undesirably rapid closing of said valve elements as liquid in said chamber rises, the improvement comprising

means on said float for attenuating the decreased pressure effect created by flow of liquid at high velocity into said chamber, said means comprising liquid flow disturbing means on said float positioned closely adjacent to and extending along the surface of a lower portion of said float.

4,696,322
FAUCET VALVE WITH ANTI-SIPHON BACK FLOW PREVENTER
Alfons Knapp, Biberach an der Riss, Fed. Rep. of Germany; Robert D. Roland, Zionsville, and Joe D. Hutto, Indianapolis, both of Ind., assignors to Masco Corporation, Taylor, Mich.
Filed Dec. 5, 1985, Ser. No. 805,280
Int. Cl.[4] F16K *24/02*
U.S. Cl. 137—218 15 Claims



1. A faucet valve characterized by:

a housing having a valve chamber, at least one supply inlet and a supply outlet in communication with said valve chamber;

a ball valve mounted within said valve chamber having a valving surface with valve port means therethrough for selectively covering and uncovering said at least one supply inlet and closing and opening communication to said supply outlet;

said ball valve having a ball section and control stem extending therefrom;

said control stem extending through an opening in said housing;

a seal operably mounted between said ball valve and housing to prevent fluid from said valve chamber to flow between said ball valve and housing to said opening;

an aperture extending through the ball section and in communication with said opening;

said opening, aperture, hollow interior and valve port means of said ball valve forming an anti-siphon passageway to said at least one supply inlet;

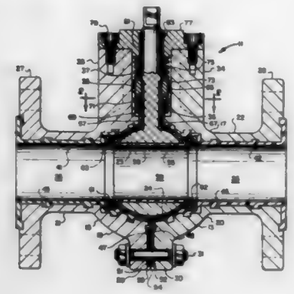
a check valve mounted within said ball valve in said anti-siphon passageway to prevent hydraulic fluid from said at least one supply inlet from exiting said opening and to allow air to enter from said opening through said ball valve to said at least one supply inlet if negative pressure exists at said at least one supply inlet.

4,696,323
PLASTIC LINED ROTATABLE VALVE
Rene Iff, Bern, Switzerland, assignor to Neotecha AG, Hombrechtikon, Switzerland
Filed Aug. 30, 1985, Ser. No. 771,191
Int. Cl.[4] F16L *7/00*
U.S. Cl. 137—375 11 Claims

1. A valve, which comprises:

a valve body including a pair of separably body parts connected together at a junction, each of said body parts including a plastic liner with each of said liners including a sealing flange positioned adjacent said junction, said valve body including a chamber disposed between a pair of flow conduits and a stem passageway between said chamber and the exterior of said valve body, each of said body parts including axially aligned body flanges extending outwardly of said sealing flanges, each of said body flanges including axially aligned abuttment surfaces facing each other, said abuttment surfaces being positioned outwardly of said sealing flanges, at least one of said abuttment surfaces including an axially extending rim abuttable with the other of said abuttment surfaces to form a substantially rigid valve body when said body parts are connected together;

resilient means for urging said sealing flanges into sealing engagement with each other;

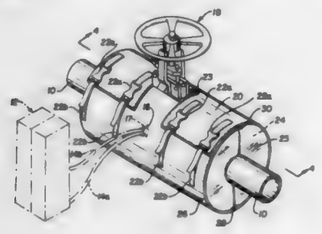


a plastic encapsulted valve member positioned within said valve body;

a plastic encapsulated stem connected to said valve member and extending through said stem passageway;

and means for sealing between said stem and said stem passageway.

4,696,324
HEAT FOAM INSULATION JACKET
Dennis A. Petronko, 1490 Redfern Dr., Pittsburgh, Pa. 15241
Filed Oct. 2, 1986, Ser. No. 914,379
Int. Cl.[4] F16L *7/00*
U.S. Cl. 137—375 9 Claims



1. A multi-layered, unitary, removable, and reuseable thermal insulating jacket for pipe accouterments, valves, and the like, which comprises:

(a) a generally rectangular outer layer, said outer layer fabricated out of a flexible, non-shrinkable, non-elastic heat and water-resistant material and having two sides and two ends;

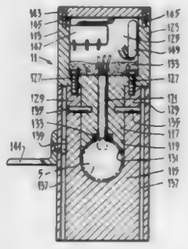
(b) a generally rectangular inner layer fabricated out of a flexible, heat-shrinkable plastic material, having two sides and two ends, and joined to said outer layer by a seam which extends around the perimeter of the inner layer, said inner layer adapted to conform to the shape of the pipe accouterment, valve or the like upon heating;

(c) a central transverse seam joining said inner and outer layers and extending from side to side of said jacket to form two sully-enclosed, independent pockets between said inner and outer layers;

(d) a middle layer of rigid-cell polyurethane foam contained within said pockets; and

(e) means to secure said jacket around the pipe accouterment valve or the like whereby said pockets are positioned on opposite sides of said pipe accouterment, valve or the like with said inner layer positioned immediately adjacent thereto.

4,696,325
SENSING OF FIRE INSTALLATION WATER VALVES BEING CLOSED
Anthony J. Magee, 1 Curdies Street, East Bentleigh, Victoria 3165, Australia
PCT No. PCT/AU85/00156, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00970, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 18, 1985, Ser. No. 847,655
Claims priority, application Australia, Jul. 18, 1984, PG6074; Sep. 4, 1984, PG6928
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—552 6 Claims



1. A method of modifying a water supply gate valve for a fire installation so that said valve can provide an alarm when said valve is closed, said method comprising:

(a) attaching appropriate magnetic material to a part of said valve which moves when the gate of said valve moves;

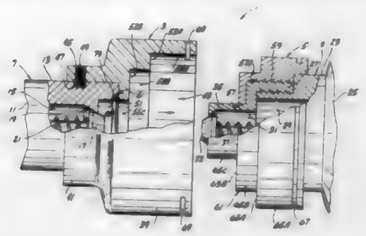
(b) fixedly mounting a first magnetically operable sensor relative to said vlave, externally of a valve chamber of said valve, wherein said first sensor is mounted in a housing and wherein said housing includes a second sensor for sensing if a lid of said housing is opened; and

(c) connecting a signal emitting alarm to said first sensor, said mounting of said first sensor being at a positon where it will cooperate with said appropriate magnetic material such that when said valve is open, no signal will be emitted but when said valve is closed, a signal will be emitted, said first sensor being of the type which does not require power to be supplied thereto to place it into a magnetic sensing condition for use.

4,696,326
ANTI-MISMATCH SYSTEM
James L. Sturgis, 11860 W. 91st St., Overland Park, Kans. 66214
Filed Jun. 5, 1986, Ser. No. 870,929
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—614.04 16 Claims

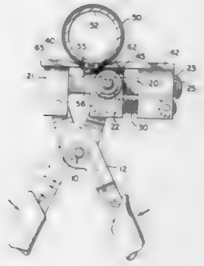
1. For use in connecting a plurality of pairs of fluid conduits wherein each pair comprises matching first and second conduits comprising interengageable valve components at respective ends of the conduits, an anti-mismatch system for preventing the inadvertent connection of mismatched fluid conduits, said system comprising a plurality of sets of anti-mismatch fittings, each set including a first anti-match fitting formed for detachable connection with respect to the valve component of the first fluid conduit of each of said pairs of matching fluid conduits and a second anti-mismatch fitting formed for detachable connection with respect to the valve component of the second fluid conduit of each of said pairs of matching fluid conduits, the first and second anti-mismatch fittings of each set being formed to surround their respective conduit ends and

being uniquely configured for interengagement only with one another and not with anti-mismatch fittings of different sets



thereby to enable connection only of matching first and second fluid conduits.

4,696,327
BAND FINISHING TOOL
Wayne B. Wolcott, Englewood, Ohio, assignor to Electro Adapter, Chatsworth, Calif.
Filed Jun. 18, 1986, Ser. No. 875,579
Int. Cl.[4] B21F *15/00*
U.S. Cl. 140—150 **7 Claims**



1. Apparatus for folding the free end of a band back over a band buckle, comprising:
(a) a scissors assembly including a pair of handles and a pair of operating arms pivotally interconnected for movement toward and away from each other,
(b) complementary means on said arms for gripping the opposite ends of the buckle in line with the band end, and
(c) means on one of said arms responsive to movement of said arms toward each other for bending the band end into overlying relation with the buckle.

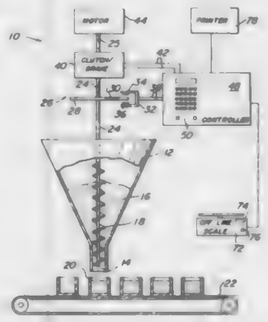
4,696,328
SPILLAGE PREVENTION
Harold B. Rhodes, Jr., 1805 Wilton Rd., Leucadia, Calif. 92024
Filed Aug. 11, 1986, Ser. No. 895,123
Int. Cl.[4] B65D *47/10*
U.S. Cl. 141—1 **2 Claims**

1. A method of pouring liquid into a machine through an opening in the machine without spilling the liquid outside of the opening in the machine, comprising the steps of
(a) providing the liquid in a bottle made of a flexible material that may be squeezed to decrease the interior volume of the bottle, and having an elongated neck terminating in an opening that is wide enough to enable viscous liquid to pour freely therethrough from the bottle when the bottle is tilted, said bottle including an airtight seal secured to the perimeter of the neck and closing the opening for preventing liquid from being poured from the opening when the bottle is tilted, wherein the seal is rupturable upon pressure being exerted thereon by the contents of the bottle when the bottle is squeezed;
(b) tilting the bottle and inserting the neck of the tilted bottle into the opening of the machine; and



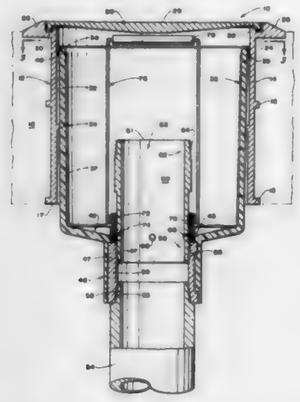
(c) rupturing the seal by squeezing the tilted bottle and thereafter pouring the liquid from the tilted bottle by gravity and into the machine without spilling the liquid outside of the opening of the machine.

4,696,329
FEEDBACK CONTROL FOR AUTOMATIC FILLING MACHINE
Anthony J. Izzi, Malvern, Pa., assignor to Mateer Burt Co., Inc., Wayne, Pa.
Filed Jun. 9, 1986, Ser. No. 872,367
Int. Cl.[4] B65B *1/12*
U.S. Cl. 141—1 **22 Claims**



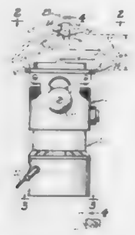
14. Method of automatically adjusting a preselected volume of material dispensed by a volumetric filling machine into containers to be filled by weight, comprising the steps of
(a) sequentially weighing a plurality of containers each containing the preselected volume of material dispensed by the volumetric filling machine, generating an equal plurality
(b) sequentially generating an equal plurality of weight signals representative of the weight of the dispensed material in the containers,
(c) receiving the sequential weight signals and determining whether the weight signals are within preselected tolerance limits,
(d) rejecting weight signals outside the preselected tolerance limits and storing signals within the preselected tolerance limits in a memory,
(e) calculating from the stored sequential weight signals an average weight value and range value equal to the difference between the maximum stored sequential weight signal and minimum sequential weight signal,
(f) comparing the average weight value to a preselected weight value,
(g) generating a correction signal representative of the comparison, and
(h) adjusting the preselected volume by an amount sufficient to cause the average weight to be equal to the preselected weight value.

4,696,330
SPILL COLLECTOR ASSEMBLY FOR LIQUID STORAGE VESSELS
Charles J. Randman, 877 Peri Ct., Redding, Calif. 96001, and Philip E. Smith, 2781 Rancho Dr., Redding, Calif. 96002
Filed Aug. 14, 1986, Ser. No. 899,180
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—86 **31 Claims**



1. A liquid spill collector assembly for attachment to the inlet pipe of a storage vessel comprising:
a stationary outer housing having a top opening;
a receptacle mounted for at least axial movement within said housing having an open top portion with a side wall merging into a bottom wall and a lower drain outlet in communication with said inlet pipe, said housing having an inner wall surface with at least a part of said receptacle side wall in slidable engagement with said inner wall surface;
an upstanding center pipe secured within said drain outlet and positioned to block access to said outlet from said receptacle, said center pipe having passageways permitting access to said outlet; and,
valve means for controlling access to said passageways.

4,696,331
FIXTURE FOR A ROUTER
Thomas E. Irland, 5118 Artistic Cir., Colorado Springs, Colo. 80917
Filed Jun. 19, 1986, Ser. No. 875,888
Int. Cl.[4] B27C *5/10*
U.S. Cl. 144—134 D **2 Claims**



1. Apparatus comprising:
a router housing having a front surface with an outer edge thereon;
a finishing tool having a cylindrical guide surface on one end thereof disposed around a longitudinal axis of said finishing tool, said finishing tool having a cutting edge thereon adjacent to said cylindrical guide surface;
means for selectively holding the other end of said finishing tool;
means disposed at least partially within said housing for selectively rotating the holding means and the finishing tool about the longitudinal axis of the finishing tool;
fixture means for permitting said one end of said finishing tool to be movable along a radius edge of a countertop for trimming an edge off of such countertop, said fixture means including a base member adapted to be attached to said front surface of said router housing and a central flange rigidly connected to said base member and extending from said base member toward said one end of said finishing tool, an opening disposed in a central portion of said base member and extending through a central portion of said central flange, said central flange having a rounded front end thereon adjacent to the cutting edge of said finishing tool, the distance of said rounded front end of said central flange from said front surface of the router housing being greater than the distance of the outer edge of said front surface of the router housing from the longitudinal axis of said finishing tool, whereby there will be a clearance between the outer edge of the front surface of the router housing and the countertop when the rounded front end of the central flange is moved along the radius edge of the countertop while the cylindrical guide surface is on top of the countertop and the cutting edge trims off a portion of the top front edge of the countertop; and
means for connecting said fixture means to the front surface of said router housing.

4,696,332
ELASTOMER FREE GRID REINFORCEMENT OF PRESSURABLE ELASTOMER REPAIRED ARTICLES
Russell W. Koch, Hartville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 718,666, Apr. 1, 1985, Pat. No. 4,618,519, which is a continuation-in-part of Ser. No. 584,426, Feb. 28, 1984, abandoned, and a continuation-in-part of Ser. No. 767,998, Apr. 21, 1985, abandoned, which is a continuation of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 872,311
Int. Cl.[4] B60C *21/00*
U.S. Cl. 152—367 **11 Claims**

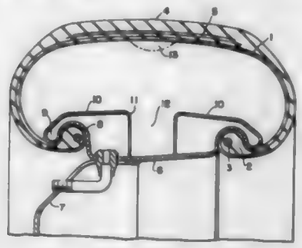
1. A repaired elastomer article; comprising:
the elastomer article, said elastomer article being cured and capable of being pressurized, said elastomer article having a hollow therein, said hollow having a repair material therein, said article having an interior hollow surface area,
an elastomer free grid, said grid located on said article interior surface area and traversing said interior hollow area, said grid adhered to said article interior by an amine curable polymer or prepolymer, and
a rubber patch, said patch having reinforcement therein, said patch residing on said amine adhered grid.

4,696,333
RIM FOR A PNEUMATIC VEHICLE TIRE
Heinz-Dieter Rach, Garbsen, and Udo Frerichs, Langenhagen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Apr. 25, 1986, Ser. No. 856,587
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515320
Int. Cl.[4] B60C *17/04*
U.S. Cl. 152—379.3 **8 Claims**

1. A rim of pneumatic vehicle tire, the bends of which are

adapted to be mounted on the radially inner periphery of the rim; said rim comprises:

a rim ring that includes wall means and that is provided with seating surfaces on the radially inward side for said tire beads; axially outwardly of said seating surfaces, said wall means of said rim ring is bent to form respective rim



flanges that extend essentially radially inwardly; said rim flanges then being bent axially inwardly and then radially outwardly, and then, at a radial spacing from the bead seating surfaces of said rim ring, said rim flange extends axially inwardly, so that two annular support surfaces are provided for supporting said tire when the latter is no longer properly inflated.

4,696,334

DEFLATING DEVICE FOR PNEUMATIC TIRES OF VEHICLES

Robert le Chatelier; André Stnic, both of Paris, and Jean-Jacques Diefenbach, Sannois, all of France, assignors to Precision Mecanique Labinal, France

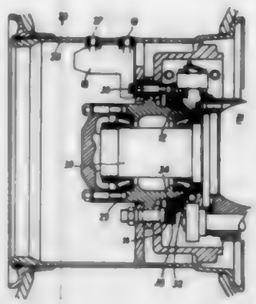
Filed Feb. 18, 1986, Ser. No. 630,268

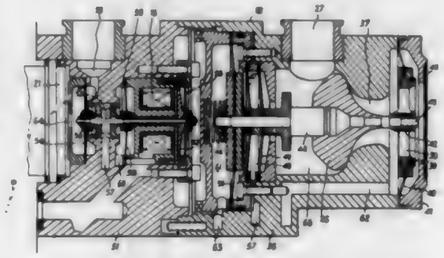
Claims priority, application France, Feb. 18, 1985, 85 02296; Sep. 3, 1985, 85 13059

Int. Cl.⁴ B60C *23/00, 29/00*

U.S. Cl. 152—417 **28 Claims**

1. A device for deflating tires of wheels of a vehicle, and in particular a rapid intervention vehicle or a military vehicle having a chassis, adapted to permit, by means of a centralized control, an extremely rapid deflation of the tires of the wheels of the vehicle, said device comprising, on each wheel having a tire to be deflated, a servovalve having a large-section passage directly connected to the tire and capable of instantaneously putting the tire in communication with the open air, an electrovalve associated with the servovalve for causing the closure of the servovalve, a pressure sensor responsive to the pressure of the tire, and an electrical circuit associated with the sensor and connected to the electrovalve, said device further comprising, in the region of each of said wheels, an electromagnetic coupling element constituted by a rotating transmitter having a primary winding which is fixed relative to the chassis of the vehicle and a secondary winding which is mounted on the wheel and is rotatable without contact with the primary winding and in facing relation to the primary winding and connected to the electrovalve for causing the opening of the servovalve and connected to the electrical circuit associated with the sensor, which electrical circuit is so adapted and arranged that, when the pressure detected by the sensor reaches a predetermined low value, the electrical circuit causes the closure of the servovalve, a source of electrical current, and power supply lines connecting the source to the primary windings of the rotating transmitters associated with the various wheels.





4,696,335

PNEUMATIC RADIAL TIRE

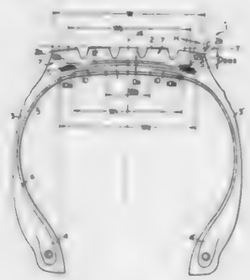
Tetsuhito Tsukagoshi, Kodaira; Tamotsu Matsunuma, Urawa, and Shigeo Makino, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 31, 1985, Ser. No. 760,876

Claims priority, application Japan, Aug. 7, 1984, 59-165435

Int. Cl.⁴ B60C *9/18, 9/28*

U.S. Cl. 152—535 **8 Claims**



1. A pneumatic radial tire comprising a tread portion extending circumferentially thereabout and having a mid-circumferential centerline contained in a plane which is substantially perpendicular to the rotational axis of the tire, a pair of side portions, a pair of bead portions, a carcass disposed between the tread portion and the carcass portion;

said belt portion being constituted by at least a pair of first belts, a second belt through a (n−1)th belt and a nth belt which are arranged from radially inward to outward, the n being a natural number not less than 4;

said first belt, second belt through said (n−1)th belt and said nth belt having a first series of parallel cords, a second series of parallel cords through a (n−1)th series of parallel cords and a nth series of parallel cords embedded therein, respectively;

said first belts being capable of resisting in the directions of said cords a tensile force of between 970 and 2150 kg per a length of 25.4 mm of said first belt measured in the direction substantially perpendicularly passing through said parallel cords thereof;

said second belt through (n−1)th belt and nth belt having belt widths W_2 through W_{n-1} and W_n, respectively, which are reduced from said second belt to said nth belt;

a (k−1)th belt and the lateral end of a kth belt being radially spaced apart a distance $D_{k-1 \cdot k}$ defined by an equation $D_{k-1 \cdot k}/D_{k-2 \cdot k-1}=\beta(W_k/W_{k-1})$ wherein the k is a number arbitrarily selected from 4 to said n, the W_k is a width of the kth belt, and the β is between 0.3 and 1.0;

said first belts being laterially spaced apart a predetermined lateral space symmetrically with respect to the mid-circumferential centerline and said cords thereof being disposed at an angle of between 40 to 60 degrees with respect to the mid-circumferential centerline;

said spaced-apart first belts having opposite laterally outer ends which are located laterally inwardly within less than 5 percent of the belt width W_3 of said third belt from the corresponding opposite lateral ends of said third belt, respectively;

said first series of the cords of said first belt and said second series of the cords of said second belt being oriented in same directions with respect to said mid-circumferential centerline; and

two adjacent sets of the cords of two adjacent belts of between the second and kth belts being oriented in opposite directions with each other with respect to said mid-circumferential centerline.

4,696,336

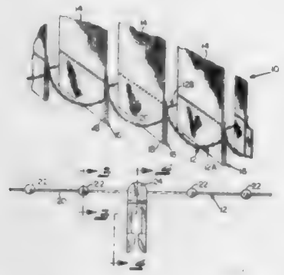
VERTICAL BLINDS CHAIN

John A. Dixon, 9576 Ledge Acres Rd., Macedonia, Ohio 44056

Filed Jan. 27, 1986, Ser. No. 823,188

Int. Cl.⁴ E06B *9/38*

U.S. Cl. 160—178 R **5 Claims**



1. A chain for attachment to a vertical blind, comprising a longitudinally extending length of thread, a plurality of plastic clips fixedly secured to said length of thread at spaced intervals, each of said plastic clips having a means for engaging a portion of a vertical blind, each of said plastic clips having a portion completely circumscribing a respective portion of said thread, a plurality of plastic objects fixedly secured to said length of thread at a plurality of locations spaced between said clips, each of said plastic objects completely circumscribing its respective location on said thread, each of said plastic clips and said plastic objects being integrally molded to said length of thread.

4,696,337

APPARATUS FOR ANTICIPATION OF STRUCTURE OF CASTING ALLOYS AND PARTICULARLY THE DEGREE OF SPHEROIDIZATION OF CAST IRON

Tadeusz Grochal, Wieliczka; Roman Ryglicki, and Wojciech Wierzchowski, both of Cracow, all of Poland, assignors to Instytut Odlewnictwa, Cracow, Poland

Filed Oct. 17, 1986, Ser. No. 920,561

Claims priority, application Poland, Oct. 31, 1985, 256069

Int. Cl.⁴ B22D *2/00, 27/02, 46/00*

U.S. Cl. 164—150 **2 Claims**



1. Apparatus for anticipation of the structure of casting alloys and, particularly, the degree of spheroidization of cast iron, the apparatus comprising a cylindrical casting mould having a mould cavity and provided with a cylindrical pouring cup having a cross sectional area greater than that of the mould cavity; a first vertical wall which divides the mould cavity into two equal halves; a second vertical wall which divides one of the two equal halves into two equal parts, the first and second vertical walls having a height less than the height of the mould cavity; electrodes built in the bottom of the mould and projecting into each of the two equal parts delimited by the second vertical wall; a supply system connected to suitable electrodes; and a measuring system connected to suitable electrodes.

4,696,338

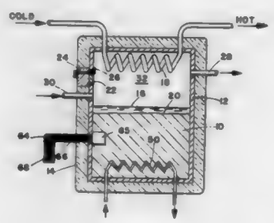
LATENT HEAT STORAGE AND TRANSFER SYSTEM AND METHOD

Eric A. Jensen, Salt Lake City, Utah; James Hitchin, Del Mar, Calif.; Albert G. Tsai, San Diego, Calif., and Gustaf O. Arrhenius, La Jolla, Calif., assignors to Thermal Energy Stroage, Inc., San Diego, Calif.

Continuation of Ser. No. 382,971, Jun. 1, 1982, abandoned. This application Mar. 6, 1985, Ser. No. 708,669

Int. Cl.⁴ F28D *21/00*

U.S. Cl. 165—1 **28 Claims**



8. The method of latent and sensible heat storage and transfer comprising (1) providing a body of hot, molten crystallizable phase change heat storage material in a closed container containing about 5% by weight, water or other protic solvent of said heat storage material, (2) disposing a body of volatile

liquid-vapor phase change heat transfer material that is significantly admissible in said heat storage material in liquid state in direct contact with said molten heat storage material, (3) crystallizing portions of said heat storage material to release heat of crystallization for vaporizing portions of said body of heat transfer material, (4) maintaining the vapor pressure of heat transfer material in said container sufficiently high to retain portions of said heat transfer material in liquid state in contact with said body of heat storage material and (5) recovering latent and sensible heat by condensing vaporized heat transfer material, said heat transfer material having a boiling point of the vapor pressure in said container during heat recovery not higher than the crystallization temperature of said heat storage material.

4,696,339

OIL COOLER

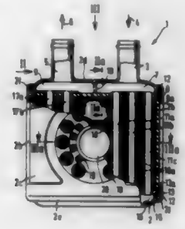
Gebhard Schwarz, Stuttgart, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr, GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 30, 1985, Ser. No. 793,123

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440064

Int. Cl.[4] F28D *7/00*; F28E *9/16*

U.S. Cl. 165—51 **11 Claims**



1. An oil cooler arrangement for an internal combustion engine which is interposable between an engine and an oil filter, comprising:

housing chamber means for housing said oil cooler having a rectangular box-shaped center part,

a ribbed pipe block tightly held in the box-shaped center part, said pipe block including a plurality of parallel pipes connected to one another by continuous ribs extending transverse to the longitudinal direction of the pipes,

said pipes providing a coolant flow path therethrough for cooling said pipes and ribs which in turn cool oil flowing around the pipes and ribs in the pipe block, and

coolant collecting space means formed at one end of the pipe block for communicating coolant with the pipes, said coolant collecting space means being formed by a coolant space end wall penetrated by the pipes and a hood-shaped coolant box,

said ribbed pipe block being insertable into said box-shaped center part,

said box-shaped center part including a side wall and an integral flanged edge for clampingly holding the ribbed pipe block in assembled condition, said flanged edge extending over a portion of said coolant box to clamp said coolant space end wall between said coolant box and said side wall.

4,696,340

AIR CONDITIONER

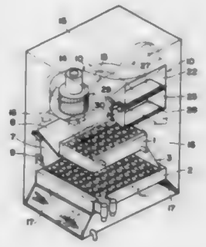
Teruyuki Nagao; Yuji Kawamura, and Koichi Kashima, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1986, Ser. No. 882,529

Claims priority, application Japan, Jul. 8, 1985, 60-149625

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—58 **5 Claims**



1. An air conditioner comprising:

an outer casing;

an inner casing mounted within said outer casing and spaced therewithin from said outer casing for defining an internal air intake passage between said inner casing and said outer casing; said inner casing having an inlet open to and communicating with said internal air intake passage, and said inner casing having an outlet;

at least one heat exchanger mounted within said inner casing between said inlet and said outlet thereof;

blower means having an intake hole open to and communicating with said outlet of said inner casing and a discharge hole, said blower means for drawing air thereto from said inner casing through said outlet of said inner casing and for forcing the air drawn thereto out of said discharge hole; and

an air intake-discharge selector mechanism within said outer casing for placing said discharge hole of the blower means in communication with the outside of the air conditioner while placing the outside of the air conditioner in communication with said internal air intake passage,

said air intake-discharge selector mechanism including a pair of outer openings extending through said outer casing thereby open to and communicating with the outside of the air conditioner, a pair of connecting passages each of which is open between a respective one of said outer openings and said internal air intake passage, a pair of shutters each of which is movably mounted over a respective one of said connecting passages for moving over and away from said connecting passages to respectively close and open said connecting passages thereby selectively communicating said outer openings with said internal air intake passage, and synchronizing means for moving one of said pair of shutters over the respective connecting passage thereof as the other of said pair of shutters moves away from the respective connecting passage thereof.

4,696,341

DEVICE FOR CHANGING THE NUMBER OF PART STREAMS OF A FLOWING MEDIUM

Ulf Bolmstedt, Staffanstorp, and Björn-Olow Johansson, Lomma, both of Sweden, assignors to Alfa-Laval Food and Dairy Engineering AB, Tumba, Sweden

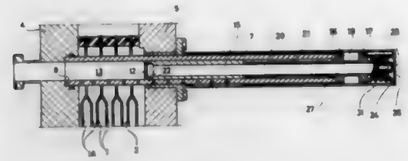
PCT No. PCT/SE86/00224, § 371 Date Jan. 7, 1987, § 102(e) Date Jan. 7, 1987, PCT Pub. No. WO86/07418, PCT Pub. Date Dec. 18, 1986

PCT Filed May 14, 1986, Ser. No. 12,130

Claims priority, application Sweden, Jun. 11, 1985, 8502875

Int. Cl.[4] F28F *7/02*

U.S. Cl. 165—101 **4 Claims**



1. A device for changing the number of part streams of a flowing medium, comprising a tube (7) with a plurality of holes (11) through the tube wall arranged one after the other in the length direction of the tube, a piston (12), which divides the interior of the tube into a first compartment (13), through which the medium is intended to flow, and a second compartment (14), which is closed from the first compartment (13), and a piston rod (15), which extends from the piston (12) through the second compartment (14) and with an end portion extends a distance outside the tube (7), the number of part streams being determined by the number of holes (11) through the tube wall communicating with the first compartment (13), characterized by

a first stop member (16), which is arranged axially displaceable on the end portion of the piston rod (15) extending out from the tube (7) and which is adapted to abut against an end surface of the tube (7),

a second stop member (17), which is arranged to keep the first stop member (16) axially pressed against said end surface of the tube, and

a determined number of sleeve members (18–21) of different axial extension, which are removably applied one after the other around the piston rod (15) within the tube (7) and which together have such an axial extension that they serve as spacing means between the piston (12) and said first stop member (16), when the latter is pressed against said end surface of the tube by the second stop member (17), a change of the number of part streams being possible by at least one of the sleeve members (19–21) being movable to and clampable as a spacing means in a position between the two stop members (16, 17), and the remaining sleeve members being clampable between the piston (12) and the first stop member (16).

4,696,342

PLATE-TYPE HEAT EXCHANGER

Yoshiyuki Yamauchi, Aichi; Toshio Ohara, Kariya, and Toshio Takahashi, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

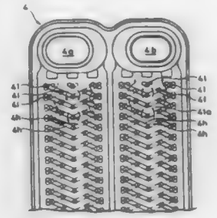
Filed Jun. 24, 1986, Ser. No. 877,730

Claims priority, application Japan, Jun. 28, 1985, 60-143373

Int. Cl.[4] F28D *1/02*

U.S. Cl. 165—152 **8 Claims**

1. A plate-type heat exchanger comprising a stack of flat fluid flow tubes each composed of a pair of confronting core plates joined to each other and defining a fluid flow pass therebetween, each of said core plates having an inlet hole for introducing a fluid into said fluid flow pass and an outlet hole for discharging the fluid from said fluid flow pass, said core plate having a plurality of ribs on an inner wall surface thereof which project into said fluid flow pass, said ribs on each of said pair of core plates being grouped in plural rows along said fluid pass and being held in contact with the confronting ribs of at least two rows on the other core plate, so that there is no



rib-free line along said fluid flow pass, and one end of each of said ribs in one row being positionally displaced from one end of an adjacent one of said ribs in another row along said fluid flow pass, so that there is no transverse rib-free line across the fluid flow pass.

4,696,343

WIRELINE DUMP BAILER

Richard V. Anderson, Arlington, and Wendall D. Carnes, Bedford, both of Tex., assignors to S.I.E., Inc., Fort Worth, Tex.

Filed May 23, 1986, Ser. No. 866,589

Int. Cl.[4] E21B *33/132*

U.S. Cl. 166—164 **8 Claims**



1. A dump bailer adapted to be lowered on a wireline into a well for placing a slurry on a retainer positioned in the well, comprising in combination:

a tubular housing;

a weight bar carried in the housing for axial movement relative thereto between upper and lower positions;

means for mounting an electrically ignited detonator to the bottom of the weight bar;

port means for introducing the slurry into the housing below the weight bar and for immersing the detonator in the slurry when the weight bar is in the upper position;

means for electrically connecting the detonator to the wireline to ignite the detonator;

a plug releasably inserted into the lower end of the housing to retain the slurry in the housing when the weight bar is in the upper position; and

shear means for allowing the plug to be expelled from the

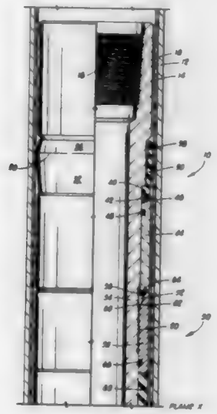
housing due to the explosive force of the detonator when ignited transmitting a shock wave through the slurry, allowing the weight bar to move to the lower position to push the slurry from the housing.

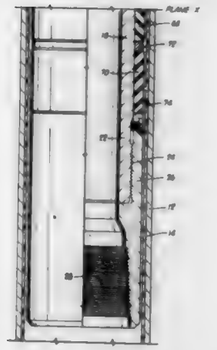
4,696,344

ANNULUS PRESSURE OPERATED RATCHET DEVICE

Theron A. Scott, Odessa, Tex., and Robert T. Evans, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 25, 1985, Ser. No. 801,898
Int. Cl.[4] E21B *33/126*
U.S. Cl. 166—182 **8 Claims**





1. A tubing conveyed, hydraulically set, slipless well packer for sealing a well bore having fluid therein without damage to the well bore or the permanent, plastic deformation of the well bore, said well packer being adapted to be attached to a tubing string to be used in said well bore, said well packer comprising:

a mandrel having one end thereof connected to said tubing string;

an elastomeric packer disposed about said mandrel, said elastomeric packer capable of sealingly engaging said well bore without damage to the well bore or the permanent, plastic deformation of the well bore while anchoring said well packer in said well bore from movement therein;

ratchet means associated with said mandrel adjacent said elastomeric packer for maintaining said elastomeric packer in a compressed condition responsive to activation of said ratchet means wherein said elastomeric packer sealingly engages said well bore without damage to the well bore or the permanent, plastic deformation of the well bore while anchoring said well packer in said well bore from movement therein; and

piston means associated with said mandrel and being slidable along the axis thereof responsive to fluid pressure in the annulus between said mandrel connected to said tubing string and the well bore, said ratchet means being activated responsive to such piston means sliding relative to said mandrel to compress said elastomeric packer into sealing engagement with said well bore without damage to the well bore or the permanent, plastic deformation of the well bore while anchoring said well packer in said well bore from movement therein;

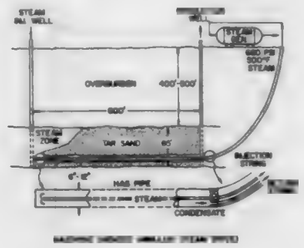
whereby said well packer is conveyed into said well bore on said tubing string and is set by increasing the pressure of said fluid in said well bore in the annulus between said mandrel connected to said tubing string and the well bore thereby causing said piston means to move relative to said mandrel to cause said elastomeric packer to sealingly engage said well bore without damage to the well bore or the permanent, plastic deformation of the well bore while anchoring said well packer in said well bore from movement therein, said elastomeric packer being maintained in sealing engagement with said well bore by said ratchet means.

4,696,345

HASDRIVE WITH MULTIPLE OFFSET PRODUCERS

Limin Hsueh, Buena Park, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 21, 1986, Ser. No. 898,549
Int. Cl.[4] E21B *43/24, 43/30*
U.S. Cl. 166—245 **4 Claims**



1. In the method of recovering viscous petroleum from a petroleum-containing formation comprising:

(a) providing a steam injection well from the earth's surface through the formation,

(b) extending at least one lateral hole from the vicinity of the steam injection well through at least a portion of the formation,

(c) forming a flow path in the hole isolated from the formation for flow of fluid through the formation,

(d) circulating a hot fluid through the flow path to reduce the viscosity of the viscous petroleum in the formation adjacent the outside of the flow path to form a communication path for flow of petroleum in the formation outside of the flow path, and

(e) injecting a driving fluid into the formation through the steam injection well and the communication path to promote flow of petroleum in the formation to production wells penetrating the petroleum-containing formation for recovery from the formation,

The Improvement Comprising

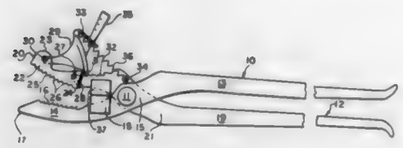
having at least two of the production wells offset from the flow path by from 2% to 8% the distance from the steam injection well.

4,696,346

FARRIER'S TOOL

Michael K. Ryan, 111 W. 9th #143, Clovis, Calif. 93612

Filed Sep. 2, 1986, Ser. No. 902,496
Int. Cl.[4] A01L *11/00*
U.S. Cl. 168—45 **4 Claims**



1. A multi-functional adjustable hand tool useful in attaching shoes to the hooves of horses, comprising:

(a) a first lever member of integral monolithic construction comprised of an elongated straight first handle portion and a fixed jaw portion elongated in a direction substantially parallel to said first handle portion, said fixed jaw and handle portion being joined by a transition portion diagonally disposed to said fixed fixed jaw and handle portion,

(b) a second lever member comprised of an elongated straight second handle portion and an adjustable jaw, said adjustable jaw and second handle portion being joined by a transition portion diagonally disposed to said second handle portion and adjustable jaw,

(c) said first and second lever members being interconnected by first pivot means in said transition portions, whereby the handle portions and jaws of both lever members are in facing relationship, the jaws representing the forward extremity of the tool,

(d) said adjustable jaw being comprised of: (1) a gripping arm having upper and lower extremities and a toothed forward surface, and second pivot means which join said lower extremity to said second lever member adjacent the transition portion thereof in a manner permitting movement of said gripping arm toward and away from said fixed jaw, (2) a positioning arm interengaged by third pivot means with the upper extremity of said gripping arm and rearwardly directed therefrom, and having a downwardly directed holding edge, (3) a series of holding grooves in said second lever member adapted to selectively engage said holding edge, thereby determining the spacing of the gripping arm with respect to the fixed jaw, (4) spring means adapted to urge said positioning arm downwardly to expedite secure engagement of said grooves by said holding edge, and (5) manipulating means attached to said positioning arm and extending upwardly and rearwardly therefrom, permitting manipulative movement of the position arm against the urging of said spring means, and

(e) cutting means associated with said fixed and adjustable jaws.

4,696,347

ARRANGEMENT FOR PROPULSION LIQUIDS OVER LONG DISTANCES

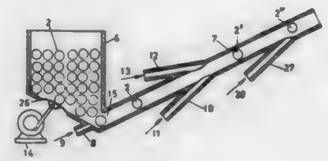
Michael Stolov; Sara Stolov; Adi Stolov, and Ilana Stolov-Hecht, all of 25 Hapoel Street, Nof-Yam, Herzlia 46 105, Israel

Filed Feb. 18, 1986, Ser. No. 830,473
Claims priority, application Israel, Feb. 4, 1986, 77783
Int. Cl.[4] A62C *17/00, 19/00*; F42B *11/24, 13/14*
U.S. Cl. 169—46 **20 Claims**

1. An arrangement for propelling substances in large quantities over long distances, comprising

a substance to be propelled in large quantities over long distances, said substance being in the form of a plurality of spheres, each sphere having a generally spherical form with a plurality of dimples on the outer surface thereof;

a launching pipe having a first inlet means for continuously receiving said spheres, a second inlet means for feeding compressed gas to said launching pipe to drive spheres of said substance within said launching pipe and therethrough, and an outlet through which said spheres are driven by the compressed gas;



a mechanical feeder for feeding the spheres to said first inlet of said launching pipe;

means for feeding highly compressed gas to said second inlet of said launching pipe;

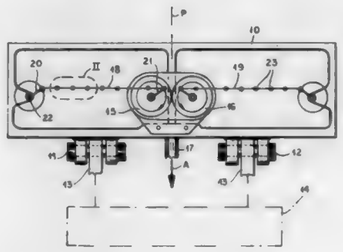
whereby a jet of said spheres is thrown out through the outlet of said pipe at a high velocity in the desired direction, the dimples on said spheres allowing the substance to reach long distances.

4,696,348

POWER RAKE

Boris Novoselsky, 66-01 110th St., Apt. 1B, Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 720,260, Apr. 5, 1985, Pat. No. 4,596,113. This application Feb. 13, 1986, Ser. No. 830,052
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] A01B *33/06*
U.S. Cl. 172—102 **15 Claims**



1. A power rake which comprises:

a support displaceable over the ground in a travel direction;

at least one member mounted on said support for cyclical displacement with at least a component of said displacement being transverse to said travel direction;

an array of mutually-spaced tines mounted on said member and engageable with the ground;

respective means journaling each of said tines on said member for swingable displacement between two limiting positions relative to said member about a respective pivot axis transverse to said member and to the ground;

respective stops on said member engageable with said tines in each of said positions whereby said tines are each swung into one of said positions by movement of said member and engagement of the tine with the ground during at least part of each cycle of displacement of said member and are swung into the other position upon move-

ment of said member along another part of each cycle of displacement of said member; and

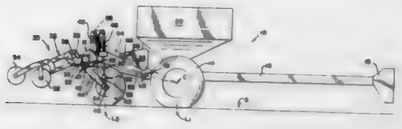
drive means connected to said member for cyclically displacing same relative to said support.

4,696,349

FARM IMPLEMENT WITH FRAME CONNECTED THERETO BY LINKAGE MECHANISM

J. Richard Harwood, Innerkip, and Frank A. Bell, Hamilton, both of Canada, assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 31, 1986, Ser. No. 824,413
Int. Cl.[4] A01B *63/11, 63/22*
U.S. Cl. 172—323 **4 Claims**



1. A farm implement supported by transversely spaced wheels, said implement having a frame pivotally connected thereto rearwardly thereof by a linkage mechanism, said frame having soil-engaging tools mounted thereon, wheel means mounted on said frame for raising and lowering said frame relative to the ground between transport and working positions, said linkage mechanism comprising: first-linking means connected at spaced opposite-end portions thereof by respective first and second pivot means pivotally linking the frame to the implement with a line interconnecting said respective first and second pivot means defining a first axis; second-linking means connected at spaced opposite-end portions thereof by respective first and second pivot means pivotally linking the frame to the implement with a line intersecting said last mentioned respective first and second pivot means defining a second axis; the axes of said first-linking means and second-linking means intersecting substantially at the axis of the transversely spaced wheels of the implement when the frame is in its transport position; and the axes of said first-linking means and second-linking means intersecting rearwardly of the frame when the frame is in its working position to cause a downwardly-acting force to be imposed upon the engaging tools for engaging the soil.

4,696,350

MOTOR GRADER WITH SADDLE MOUNTED TO TRANSVERSE PIN ON MAIN FRAME

Martin L. Ruhter; Dennis A. Brimeyer, and David W. Stubben, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

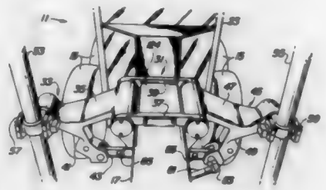
Filed Sep. 25, 1985, Ser. No. 780,048
Int. Cl.[4] E02F *3/80*
U.S. Cl. 172—793 **4 Claims**

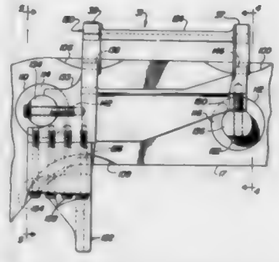
1. In a motor grader having a fore-and-aft extending main frame, a saddle comprising:

an upper portion having a generally longitudinal extending section joining spaced apart forward and rear facings, said facings having a generally vertical orientation;

said main frame having a first pin and a second pin mounted transversely in the main frame in longitudinal spaced apart relationship; and

said forward facing straddling said main frame and fixably mounted to opposite ends of said first pin, and said rear





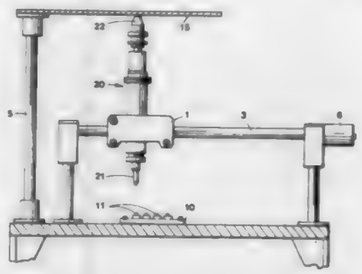
facing straddling said main frame and fixably mounted to opposite ends of said second pin.

4,696,351

ASSEMBLY ROBOT WITH REACTION ABSORBING PLATFORM

Laszlo S. Horvah, Geneva, Switzerland, assignor to C O D Inter Techniques SA, Geneva, Switzerland

PCT No. PCT/CH84/00132, § 371 Date Apr. 23, 1985, § 102(e) Date Apr. 15, 1985, PCT Pub. No. WO85/01003, PCT Pub. Date Mar. 14, 1985
PCT Filed Aug. 22, 1984, Ser. No. 726,893
Claims priority, application Switzerland, Aug. 26, 1983, 4691/83
Int. Cl.[4] B21J *13/04*
U.S. Cl. 173—32 **10 Claims**



1. An assembly robot for assembling parts comprising an assembly tool, a part holder (10) for the parts (11) in an assembly area and a head (1) carrying the assembly tool (21), wherein the head is movable with respect to the part holder by means of guiding supports (3, 4) and is positioned by motors (6), and wherein the head carries a device (20) for enabling application of the tool (21) to a part (11) with a predetermined force, and at least one platform (15, 16) mounted independently of said guiding supports and said head for absorbing the reaction to the force applied by said device, said device including

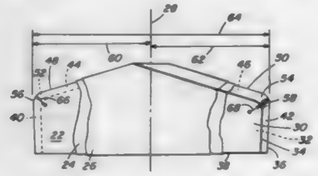
a bearing part (22) placed in such a manner that the head (1) is between the platform (15, 16) and the part holder (10), said platform being mechanically coupled to the part holder by rigid elements (5) located outside an open space defined between the assembly area and the platform (15, 16) so as to be capable of withstanding a pushing force tending to push the platform away from the supports, and wherein the bearing part (22) is movable with respect to the head in the direction of said pushing force, and wherein said device further includes a jack constructed to move the tool axially while the head (1) is immobile, and to exert a force between the tool (21) and the bearing part (22) independently of the head, this latter force being transmitted by the tool (21) to the part (11), and the reaction to this force being transmitted by the bearing part (22) to the platform (15, 16) so that neither the head (1), nor its guiding supports (3, 4) are subjected to the force or to the reaction to this force.

4,696,352

INSERT FOR A DRILLING TOOL BIT AND A METHOD OF DRILLING THEREWITH

Sergej-Tomislav Buljan, Acton, and J. Gary Baldoni, Walpole, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 17, 1986, Ser. No. 840,309
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—57 **22 Claims**



1. A method of drilling a hole in a hard material such as rock, coal, masonry, concrete, and the like comprising:

positioning a drilling tool having a drilling tool bit insert comprising a shaped substrate formed of a hard, fracture resistant material and coated with one or more thin adherent layers of refractory coating material, the material of each layer comprising a composition independently selected from the group consisting of carbides, nitrides, and carbonitrides of titanium, hafnium, vanadium, tantalum, and niobium, and oxides of aluminum and zirconium, and mixtures and solid solutions thereof;

rotating the drilling tool bit insert at a sufficient rate and applying sufficient thrust to the drilling tool bit insert to drill the hole in the hard material.

4,696,353

DRILLING MUD CLEANING SYSTEM

Steven A. Elmquist, North Ridgeville, and Leonard E. Boesger, Aurora, both of Ohio, assignors to W. S. Tyler, Incorporated, Mentor, Ohio

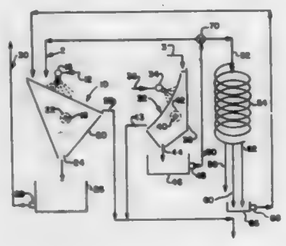
Filed May 16, 1986, Ser. No. 863,760
Int. Cl.[4] E21B *7/18*
U.S. Cl. 175—206 **2 Claims**

1. A mud cleaning system for removal of drill cuttings and recovery of drilling mud coming from an oil well, where the mud slurry may be made up essentially of barite particles having a specific gravity of 4.2 or more and a particle size mostly under 200 mesh, drill cuttings having a specific gravity of 2–3, and varying particle sizes ranging from 200 mesh to ¼ inch or more, and water; said system comprising:

a. a first screen means having a top end and a bottom end and a screen member extending therebetween having a plurality of openings therein, said first screen means adapted to receive at its top end the mud slurry from the well and to discharge an overflow slurry comprising oversize drill cuttings at the bottom while passing an underflow mud slurry containing substantially all of the barite particles that may be present in the mud through the plurality of openings in the screen member, the screen member of said first screen means comprising a sieve bend having openings near the top end thereof sized to pass material having a topsize ranging from 1/6 inch to ¼ inch and openings near the bottom end thereof sized to pass material having a topsize ranging from 35 to 65 mesh;

b. first sump means for collecting the underflow mud slurry passing through the plurality of openings in the screen member of said first screen means;

c. a spiral separator having an upper end having an inlet for receiving the underflow mud slurry, a lower end having an outlet for discharging substantially all of the barite particles separately from a majority of the drill cuttings and the water in the received underflow mud slurry, and a spiral chute interconnecting the upper and lower ends of the spiral separator along which the received underflow



mud slurry flows thereby effectuating the separation of substantially all of the barite particles from the slurry;

d. second sump means for collecting the drill cuttings and the water passing from the spiral separator;

e. second screen means for receiving and dewatering a slurry;

f. valve means having an inlet, a first outlet and a second outlet for receiving the underflow mud slurry from the first sump means through a first transport line interconnecting the first sump means to the inlet of the valve means and for selectively directing the received underflow mud slurry to the second screen means through a second transport line interconnecting the first outlet of the valve means to the second screen means when there are no barite particles present in the underflow mud slurry or to the spiral separator through a third transport line interconnecting the second outlet of the valve means to the inlet of the spiral separator when barite particles are present in the underflow mud slurry; and

g. a fourth transport line interconnecting the second sump means to the second screen means.

4,696,354

DRILLING BIT WITH FULL RELEASE VOID AREAS

William W. King, and Edmund C. Houle, Jr., both of Houston, Tex., assignors to Hughes Tool Company - USA, Houston, Tex.

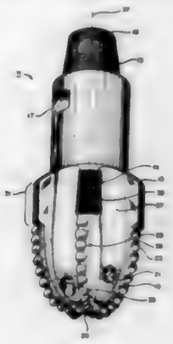
Filed Jun. 30, 1986, Ser. No. 880,214
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—329 **6 Claims**

1. A bit for use in drilling earthen formations, comprising:

a body including a bit face on one end and a shank on the opposite end with means for connection to a drill string for rotation about a longitudinal axis, the bit body having a tubular bore which communicates with an interior bore of the drill string for circulation of fluids, the bit face

increasing in external diameter in the direction of the shank to form a gage region of the bit;

at least one fluid opening communicating the bit face with the tubular bore for circulating fluid to the bit face; and



a plurality of fluid courses disposed on the exterior of the bit body and extending from a lowermost downhole location upwardly in the direction of the shank, the fluid courses becoming ever wider and ever deeper along their entire disposition from their lowermost incorporation through the gage region thereof.

4,696,355

DRILLING TOOLS

August Haussmann, Oberzell, Fed. Rep. of Germany, assignor to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Jan. 6, 1986, Ser. No. 816,577

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500202

Int. Cl.⁴ E21B *10/36, 10/44*

U.S. Cl. 175—395 **5 Claims**



1. A drilling tool in combination with a carbide cutting tip for percussion drilling machines, said drilling tool having a longitudinal dimension and a cutting end and said carbide cutting tip being inserted into said cutting end of said tool and being secured to said tool, said tool having a cylindrical surface interrupted only by double helical fluting which is terminated at the vicinity of said cutting end, in two diametrically opposed flute runout surfaces extending substantially parallel to the longitudinal dimension of said tool, wherein said runout surfaces are in mirror symmetry to a second plane parallel to the longitudinal dimension of said tool, and said cutting tip extends substantially perpendicularly to the second plane.

4,696,356

GUN POWDER DISPENSING AND MEASURING APPARATUS

Dolores D. Ellion, and Max E. Ellion, both of 2152 Highland Oaks Dr., Arcadia, Calif. 91006

Continuation-in-part of Ser. No. 688,230, Jan. 2, 1985. This application Jan. 14, 1986, Ser. No. 818,723

Int. Cl.⁴ G01G *13/02, 23/10*

U.S. Cl. 177—123 **20 Claims**

1. A dispensing apparatus for dispensing a precise amount of powder to a scale comprising:

a plurality of rotatable barrel means for dispensing said powder;

electric drive means for rotatably driving said plurality of barrel means; said electric drive means being constructed to drive said plurality of barrel means at an independently variable rotational rate from one another;

weighing scale means;

opto-electronic sensing means mounted on said weighing scale electronically sensing the weight measurement on said weighing scale means as said powder is being dispensed;

electronic circuit means for receiving the output from said opto-electronic sensing means and controlling the electric drive means for rotatable driving said plurality of barrel means at a first faster net flow rate and for switching said electronic drive means to rotate said plurality of barrel means at a second slow net flow rate as the amount of powder dispensed to said weighing scale means approaches a preselected weight and stop said electric drive means from rotating said plurality of barrel dispensing means when the amount of powder on said scale reaches the preselected amount;

whereby precise amounts of said powder can be rapidly and automatically dispensed and measured.

4,696,357

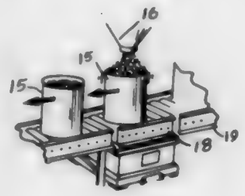
PACKER/WEIGH-SCALE

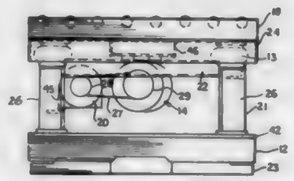
David E. Beehler; Timothy E. Drake, and Timothy E. Hawk, all of Westfield, N.Y., assignors to Renold, Inc., Westfield, N.Y.

Filed May 27, 1986, Ser. No. 867,148

Int. Cl.⁴ G01G *19/00, 21/10*

U.S. Cl. 177—145 **8 Claims**





1. A packer/weigh-scale made up of a scale platform, a vibrator attached to said scale platform adapted to vibrate said scale platform in a vertical plane only,

an upper frame,

resilient means supporting said an upper frame on said scale platform,

a scale base,

at least one load cell supported on said scale base,

flexible tension means supporting said upper frame on said load cell whereby vibrations from said vibrator are transmitted to said scale in a vertical plane only, whereby material supported on said upper frame will be vibrated.

4,696,358

WEIGHING A NUMBER OF OBJECTS IN SUCCESSION

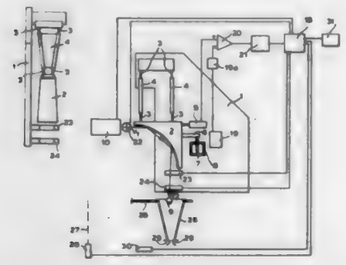
Eryk S. Doerman, 45 Cromwell Road, London SW7 2ED; William J. Turner, 83 Twyford Road, Harrow, Middlesex HA2 0SJ; David A. Homer, 35 Keble Road, Maidenhead, SL6 6BB; Andrew D. G. Stewart, The Old Rectory, Ashampstead, Reading, Berkshire, and Ian Clarke, 63 High Street, Thames Cottage, Wargrave, Berkshire, all of England

Filed Nov. 15, 1985, Ser. No. 798,298

Claims priority, application United Kingdom, Nov. 16, 1984, 8428976

Int. Cl.⁴ G01G *19/00, 23/00;* **G01N** *3/08*

U.S. Cl. 177—145 **26 Claims**



1. Apparatus for weighing a number of discrete objects in spaced succession, comprising:

a reaction member having an object-contacting surface;

means for directing each object in succession along a substantially predetermined engagement trajectory intersecting said object-contacting surface, whereby the object strikes said object-contacting surface and the line of travel of the object is changed through an angle substantially greater than 0° and substantially less than 180° by engagement of the object with the reaction member; and means for giving a signal which varies with the dynamic reaction of the reaction member to the impact thereon of the object.

4,696,359

ELECTRONIC WEIGHING APPARATUS

Albert W. Gibbery, Upland, Calif., assignor to National Transducer Corporation, Rancho Cucamonga, Calif.

Filed Aug. 22, 1986, Ser. No. 899,487

Int. Cl.⁴ G01G *3/14;* **G01L** *1/22*

U.S. Cl. 177—211 **15 Claims**

1. A weighing apparatus comprising:

force responsive strain gauge means providing an electrical output;

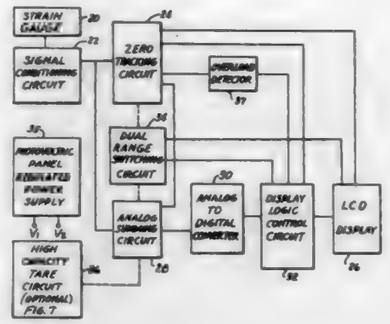
said force responsive strain gauge means having a high impedance;

sample and hold circuit means receiving the output from said force responsive transducer means for sampling and holding said output;

sequencing means for sequentially turning said force responsive strain guage means and said sample and hold means on and off;

digital processing means for processing the output of said sample and hold means;

display means for displaying the output of said digital processing means; and



low voltage power supply means supplying power to said force responsive transducer and to said sample and hold circuit means.

4,696,360

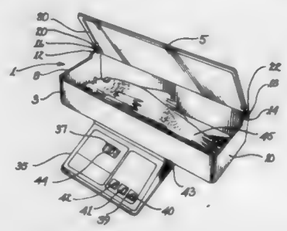
WEIGHING APPARATUS AND METHOD FOR USE IN WEIGHING LIVE FISH

Manny Homen, 5798 E. Paseo Cimarron, Tucson, Ariz. 85715

Filed Aug. 11, 1986, Ser. No. 895,129

Int. Cl.⁴ G01G *21/22, 23/00*

U.S. Cl. 177—262 **13 Claims**



1. A weighing apparatus for use in weighing live fish, comprising:

a container means having a base member for accommodating therein said live fish;

a cover member means for swingably coupling thereabove said container means;

a guide member means for coupling therebelow said base member; and

a weighing scale means for slidably coupling thereabove said container means, said guide member means is suitable for guiding said container means when said container means is slidably mounted thereabove said weighing scale means.

4,696,361

SWING-UP RADIATOR AND OIL COOLER ASSEMBLY

Brian C. Clark, and Michael D. Jines, both of Owatonna, Minn., assignors to Owatonna Manufacturing Company, Owatonna, Minn.

Continuation of Ser. No. 592,720, Mar. 23, 1984, abandoned. This application Apr. 22, 1986, Ser. No. 858,072

Int. Cl.⁴ B60K *11/04*

U.S. Cl. 180—68.4 **12 Claims**

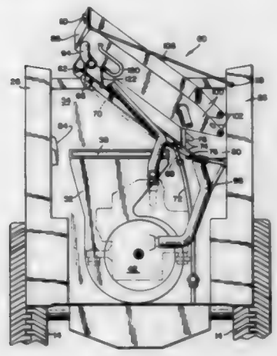
1. In combination with a skid steer loader including a frame defining a ventilated engine compartment with an engine located between a pair of laterally spaced-apart opposing up-

rights behind an operators compartment, a cooling system comprising:

a fan located between the engine and the operators compartment;

a shroud surrounding the fan and extending generally upward from an inlet to an outlet;

a laterally extending upper radiator disposed between the uprights, over the outlet of said fan shroud;



means for supporting said upper radiator for pivotal movement between raised and lowered positions relative to said lower radiator;

means secured to at least one upright for supporting said upper radiator in the lowered position adjacent said lower radiator;

means for releasably securing said upper radiator in the lowered position; and

means for releasably supporting said upper radiator in the raised position.

4,696,362

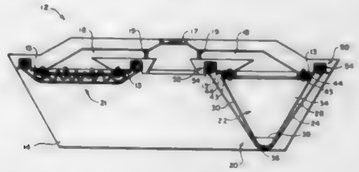
RETRACTABLE, LEVER ACTION, SCROLL SEAL FOR A SURFACE EFFECT SHIP

Fred W. Wilson, Mt. Airy, and Timothy D. Smith, College Park, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,952

Int. Cl.[4] B60V *1/16*

U.S. Cl. 180—116 **38 Claims**



1. A seal for a Surface Effect Ship, comprising:

an inflatable inner seal member, affixed to and depending from the hull of the Surface Effect Ship, disposed between the sidehulls, and in physical communication therewith;

means for inflating said inner seal member; and, an outer seal member, composed of a flexible sheet material, scrollably affixed to the ship hull fore and aft of said inner seal member, said outer seal member retractably enclosing said inner seal member in cooperation with said ship hull and sidehulls;

wherein said means for inflating said inner seal member comprises;

a source of pressurized air,

conduit system means for providing fluid communication between said source of pressurized air and said inner seal member and,

valve means for regulating the flow of air between said source of pressurized air and said inner seal member, disposed within said conduit system means, for inflating and deflating said inner seal member.

4,696,363

MOTORCYCLE FRAME

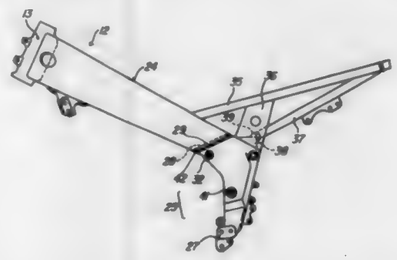
Ryuichi Enda, Iwata, Japan, assignor to Yamaha, Japan

Filed Aug. 6, 1986, Ser. No. 893,670

Claims priority, application Japan, Aug. 7, 1985, 60-173830

Int. Cl.[4] B62K *19/22*

U.S. Cl. 180—219 **6 Claims**



1. A frame assembly for a motorcycle type vehicle comprising a head pipe adapted to dirigibly support a front wheel, a pair of main frame members affixed at their forward ends to said head pipe and diverging rearwardly therefrom, said main frame members extending downwardly from said head pipe to their rear ends, a pair of engine and rear wheel supporting members each affixed to a respective rear end of said main frame members, a seat rail affixed to said main frame members forwardly of the connection of said main frame members to said engine and rear wheel supporting member and extending rearwardly and upwardly from their point of attachment to said main frame members, and supporting bracket means affixed to said engine and rear wheel supporting member and extending upwardly therefrom, said seat rails being supported by said supporting bracket means intermediate the ends of said seat rails.

4,696,364

POWER-UNIT SUPPORT STRUCTURE OF MOTORCYCLE

Shigenaga Enoki; Kazuya Yoshio, and Nobuo Yamaguchi, all of Asaka, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,106

Claims priority, application Japan, Dec. 26, 1984, 59-278772

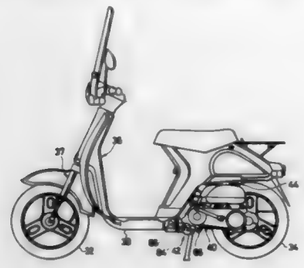
Int. Cl.[4] B60K *5/12*

U.S. Cl. 180—228 **13 Claims**

1. A power unit support structure of a motorcycle having a power unit and a frame structure including a support member having a tubular end portion terminating in conjunction with said power unit, which comprises:

an elongated swing member positioned between said power unit and said tubular end portion and having a first end thereof pivotally connected with said power unit;

a pivot support assembly for pivotally supporting said elongated swing member on said support member; and



an elastic damper element accommodated within said tubular end portion and coupled with a second end of said swing member.

4,696,365

FOUR WHEEL DRIVE VEHICLE

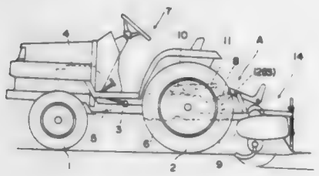
Shozo Ishimori, Sakai; Mikio Ishida, Osaka; Hiroyuki Miki, Sakai; Seiichi Ishizumi, Sakai, and Kazuo Hirata, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Oct. 30, 1986, Ser. No. 925,066

Claims priority, application Japan, May 2, 1986, 61-102716; Sep. 1, 1986, 61-205445; Sep. 2, 1986, 61-135208[U]

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—233 **7 Claims**



1. A four wheel drive vehicle comprising;

an engine,

a transmission case housing a main propelling drive transmission,

front wheels and rear wheels driven by the engine, the front wheels being dirigible,

front wheel drive transmission means connected to the main transmission for effecting changeover between a first four wheel drive mode in which the front wheels and the rear wheels are driven at a substantially equal peripheral speed and a second four wheel drive mode in which the front wheels are driven at a higher peripheral speed than the rear wheels,

said front wheel drive transmission means including a first transmission mechanism for effecting the first four wheel drive mode, a second transmission mechanism for effecting the second four wheel drive mode, and clutching means, said clutching means having a first clutch for operatively connecting the first transmission mechanism to the front wheels, a second clutch for operatively connecting the second transmission mechanism to the front wheels, a hydraulically operable piston movable between a position to disengage the first clutch and engage the second clutch and a position to engage the first clutch and disengage the second clutch, and a spring for biasing the piston toward the position to engage the first clutch and disengage the second clutch, and

hydraulic control means for actuating the piston and including a control valve mechanically interlocked to a steering section of the vehicle.

4,696,366

MOTORCYCLE

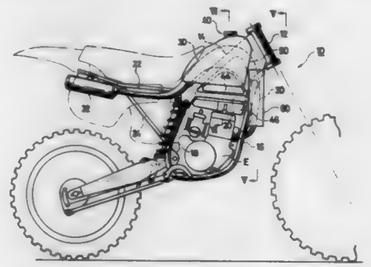
Shigeru Hattori, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1985, Ser. No. 815,109

Claims priority, application Japan, Jan. 11, 1985, 60-2163

Int. Cl.[4] B60K *13/04*

U.S. Cl. 180—296 **1 Claim**



1. A motorcycle comprising a main frame and cross pipes extending from a head pipe toward the rear of a vehicle body, a fuel tank mounted to said main frame in such mode that said fuel tank can be mounted to and dismounted from the side of said vehicle body, and an exhaust pipe disposed along said main frame at the same level as said fuel tank, said exhaust pipe having an upper portion positioned on a longitudinal vertical center plane of said motorcycle, said fuel tank being divided into left and right fuel tank sections mounted to said main frame from the left and right sides, respectively, of said vehicle body, and the opposed inside walls of said respective fuel tank sections are recessed and protruded so as to embrace said exhaust pipe disposed along said main frame, said main frame and said cross pipes therebetween.

4,696,367

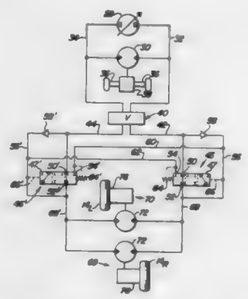
AUXILIARY HYDROSTATIC DRIVE SYSTEM

Larry M. Delfs, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 5, 1986, Ser. No. 826,459

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—306 **8 Claims**



1. An auxiliary drive system for a vehicle having a pair of main drive wheels, a pair of steerable wheels, a main reversible hydraulic motor, variable ratio transmission means for interconnecting the main hydraulic motor with the main drive wheels, a variable displacement, reversible delivery pump, and

first and second fluid lines interconnecting opposite sides of the main motor with opposite sides of the pump, the auxiliary drive system comprising:

a pair of reversible auxiliary hydraulic motors, each individually connected to one of the pair of steerable wheels;

a directional control valve having first and second ports communicated with opposite sides of the pump and having third and fourth ports for communicating with the auxiliary drive motors;

a third fluid line communicating the third port with a first side of each of the auxiliary hydraulic motors;

a fourth fluid line communicating the fourth port with a second side of each of the auxiliary hydraulic motors; and

a pressure-limiting and relieving valve means interposed in each of the third and fourth fluid lines for limiting pressures communicated to the auxiliary hydraulic motors to no greater than a limit pressure and for relieving pressure from a high pressure side of the auxiliary hydraulic motors to a low pressure side of the auxiliary hydraulic motors when the auxiliary hydraulic motors perform a dynamic braking function.

4,696,368

METHOD OF PROTECTING VEHICLE EXHAUST SYSTEM

Gene S. Hummel, and Mark L. Hummel, both of Baltimore, Md., assignors to Humco, Inc., Baltimore, Md.

Filed Mar. 14, 1986, Ser. No. 839,637
Int. Cl.[4] F01N *1/02*
U.S. Cl. 180—309 **3 Claims**



1. A method of preventing acces to the interior of the exhaust system by a terrorist via the tailpipe of a vehicle having an internal combustion engine, comprising the steps of

sliding a one-piece ruggedized, tight fitting tubular metal extension of at least sixteen gauge steel having an open inlet end and a ruggedized integral grate enclosure of at least 16 gauge steel at the opposite outlet end thereof, onto the tailpipe such that exhaust gases will flow from the grate during operation of the vehicle wherein the tailpipe is impervious to objects exceeding the dimensions of holes in the grate from outside the vehicle, and

irreversibly securing said extension to the tailpipe by means to prevent separation thereof by other than extraordinary force.

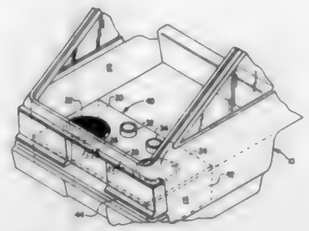
4,696,369

SPEAKER AND BAFFLE SYSTEM FOR A VEHICLE STORAGE WELL AND METHOD OF INSTALLING SAME

Gregg W. Dodrill, 7308 Campbell Rd., Dallas, Tex. 75248

Filed Jul. 7, 1986, Ser. No. 882,226
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—141 **3 Claims**

1. A speaker system for use with a storage well formed in the rear floor of a vehicle, said speaker system comprising an enclosure dimensioned to fit within said well with minimum clearance and enclosing a fixed volume of air; said enclosure including a baffle extending over said well and flush with said floor; at least one loudspeaker mounted on said baffle and extending through a corresponding opening formed through said baffle for interacting with said volume of air; and means



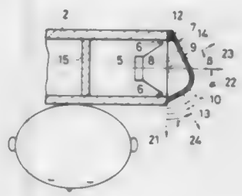
for venting said enclosure a predetermined amount to optimally tune said speaker to said volume of air.

4,696,370

HEADREST-MOUNTED ACOUSTIC DEVICE

Akio Tokumo; Kazunori Takagi, and Shuichi Mori, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 801,994
Claims priority, application Japan, Nov. 30, 1984, 59-253218
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—141 **10 Claims**



1. An acoustic device comprising:

a headrest having at least a first hollow inner portion at a side portion thereof, said headrest being mounted on top of a seat;

at least a first speaker mounted within said first hollow portion of said headrest, a sound radiating direction of said speaker being substantially parallel to the central axis of said headrest;

a cover mounted outside said headrest in the sound radiating direction of said first speaker, said cover having a front surface, side surfaces, and reflecting surface, said surfaces being so connected as to form a chamber with said first speaker, said front surface having an axis of orientation which is at an angle other than normal to said sound radiating direction; and

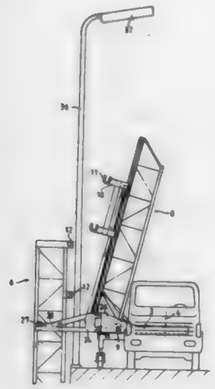
a sound radiating part for altering a frequency response characteristic of said first speaker, said sound radiating part being constituted by an opening in said front surface and having an area substantially smaller than an area which is defined by the diameter of said speaker, said frequency response charcteristic being altered in accordance with the area of said sound radiating part.

4,696,371

BRIDGE BOTTOM INSPECTION APPARATUS

Alfons Moog, Untersiggingen 100, 7774 Deggenhausertal 3, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 714,016
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410952
Int. Cl.[4] E04G *3/10*
U.S. Cl. 182—63 **17 Claims**



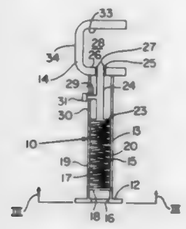
1. An improved bridge bottom inspection apparatus with an operating chassis which stands on the bridge and which is movable adjacent a barrier along the edge of the bridge, with a raisable and lowerable lift tower which is operatively retained and supported by the chassis and which extends downwards past the edge of the bridge, and with a work platform which is attached to the lift tower and which is cantilevered beneath the bridge, wherein the improvement comprises: a guide tower (**8**) which is operatively supported by the chassis (**1**) and which is located on the inside of the edge barrier (**34**) of the bridge (**32**); and support means, overhanging the edge barrier, said support means having cantilevered members with free ends and cradle means at the free ends to releasably mount said lift tower (**6**) on the guide tower, the support means being movable upward and downward on the guide tower.

4,696,372

PORTABLE STEP AND CARRYING DEVICE FOR STUD WALLS

Tom R. Fields, 5714 Verner Oak Ct., Sacramento, Calif. 95841

Continuation of Ser. No. 626,766, Jul. 2, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 856,947
Int. Cl.[4] E04G *3/00*
U.S. Cl. 182—92 **6 Claims**



1. A portable step-forming device releasably attachable to a vertical wooden stud of an open studwall to form a step usable in performing work on or about the studwall, comprising:

a U-shaped gripping member having two opposed prongs lying parallel to each other in a first general plane, the two prongs being spaced apart slightly more widely than the thickness of a stud, with a bight portion joining the prongs at one end to form the U-shaped member so that a stud can be closely received in the U-shaped member between the prongs;

a step member fixedly attached to an outer side of one prong of the gripping member so that it extends perpendicularly from the prong and lies in said first generaly plane with the two prongs, the step member being of a length sufficient to receive transversely a foot of a user;

an enlarged outer end of the step member for helping retain the foot of the user on the step member;

each prong having an inner stud-facing side with generally linear, parallel, spaced apart upper and lower edges which define second and third planes, one at each prong, the second and third planes being substantially perpendicular to the first plane and parallel to each other;

gripping means for holding the step-forming device in position after the device has been placed on a wall stud and prior to a user's stepping on the step member, the gripping means comprising a spring-loaded reciprocable member having a stud-engaging end and wherein the step member is hollow and contains the reciprocable member for sliding movement therein with the stud-engaging end extending through an opening in said one prong;

whereby, with the step-forming device retained in position on a stud by the gripping means, when the user's weight is applied to the step member the step-forming device tends to tip or pivot on the wooden stud, causing the lower edge of one prong and the upper edge of the other prong to press into the wooden stud and to tightly grip the stud, preventing slipping of the device as the weight of the user is carried, and whereby the step-forming device may be placed on a stud, from the same side of the studwall, to extend the step member to the right.

5. A method for providing a temporary step on an open studwall for use by a worker performing work at out-of-reach heights on or near the studwall, comprising;

providing a portable step-forming device having a U-shaped gripping member with two opposed prongs lying parallel to each other in a first general plane, with a bight portion joining the prongs at one end; a step member fixedly attached to an outer side of one prong so that it extends perpendicularly from the prong and lies in said first general plane with the two prongs; each prong having an inner stud-facing side with generally linear, parallel, spaced apart upper and lower edges which define second and third planes, one at each prong, the second and third planes being substantially perpendicular to the first plane and parallel to each other; and with a gripping means for holding the step-forming device in a selected position on a wall stud against slippage down the stud, the gripping means comprising a spring-loaded reciprocable member having a pointed tip for engaging the side of the wooden stud;

placing the portable step-forming device at a desired level on a vertical wall stud of a studwall open at least at one side, with the stud closely received between the two prongs and including manually retracting the reciprocable member against the spring when placing the step-forming device on the stud, then releasing the reciprocable member to let the pointed tip engage the stud to hold the step-forming device in place against slippage down the stud until the weight of a user is applied; and

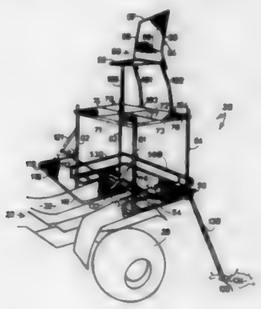
stepping on the step member and applying the weight of the user to the step member, thereby tending to slightly tip or pivot the step-forming device on the wooden stud and causing the edges of the prongs to press into the wooden stud a and to tightly grip the stud, preventing slipping of the step-forming device as it carries the weight of the user.

4,696,373
TWO-POSITION LADDER PLATFORM
Gerald R. Page, 8 Price St., Hopkinton, Mass. 01748
Filed Jul. 25, 1986, Ser. No. 890,164
Int. Cl.[4] E06C *7/16*
U.S. Cl. 182—121 **6 Claims**



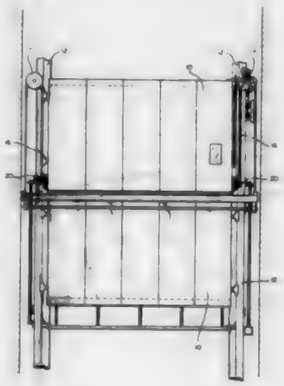
1. A support device to be attached to a ladder and capable of being placed in an erected position and a recessed position, respectively, comprising:
a platform section with first and second sides;
at least one platform hook mounted pivotally along said first side of said platform section and designed to be suspended and to engage a first rung of said ladder; and
leg sections mounted along said first and second sides of said platform section, each leg section further comprising:
a mounted portion affixed to said platform section,
an arm section connected to said mounted portion and including a terminal end distal said mounted portion, and
a fork hook adjustably connected to said terminal end of said arm section and wherein said fork hook is extensibly adjustable with respect to said arm section to engage a second rung of said ladder, said second rung located below said first rung, and wherein
said leg section is adapted to permit said platform section to move from said erected position to said recessed position by moving said platform section toward said ladder while said platform section passes over said first rung, and said fork hooks rotate around the axis of and remain in substantial contact with said second rung.

4,696,374
ATV HUNTING STAND
John E. Hale, 5423 Maple St., North Little Rock, Ark. 72118
Filed Oct. 31, 1986, Ser. No. 925,616
Int. Cl.[4] A01M *31/02*
U.S. Cl. 182—127 **8 Claims**



1. A portable, foldable, hunter stand adapted to be retrofitted to all terrain vehicles (ATV's) such as three-wheelers, four-wheelers, or the like; said stand comprising:
a plurality of support stanchions coupled to a conventional rear deck associated with said ATV ; said support stanchions user foldable between generally horizontal and vertical positions relative to said ATV;
a chair support plate operatively foldably coupled to the front ones of said stanchions and adapted to be semi-permanently elevated thereby in generally horizontal, parallel spaced apart relation with respect to said rear deck; said support plate including a plurality of quick connect fittings; and,
a chair deployable in either generally flat transportation position or a vertically elevated operational position, said chair foldably coupled to said chair support plate and said chair comprising a seat portion, a back rest foldably coupled to said seat portion, a pair of seat support struts foldably coupled to said seat and adapted to quickly connect to said quick connect fittings, and a front stabilizer leg adapted to be selectively coupled to said support plate and adapted to firmly secure said seat portion above said seat support plate.

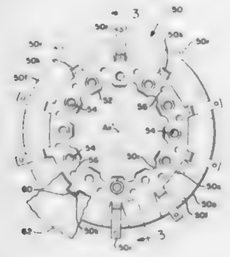
4,696,375
CHAIN BREAK SAFETY DEVICE
Ronald Matthews, Downers Grove, and John J. Jecmen, Oak Brook, both of Ill., assignors to Harris Preble Company, Chicago, Ill.
Filed Jun. 16, 1986, Ser. No. 874,581
Int. Cl.[4] B66B *13/00*
U.S. Cl. 187—58 **15 Claims**



1. A chain break safety device adapted for use with a vertically moving, bi-parting, counter-balanced elevator door system, said device adapted to be attached to an elevator door, said chain break safety device comprising:
a block having a vertically-disposed, tapered opening therein, said tapered opening defined by a vertical surface and a tapered surface, said opening having a wider portion and a narrower portion, said tapered opening being oriented with its wider portion disposed downwardly, said opening adapted to slideably engage a static vertical frame member of said elevator door system, said block having limited vertical moveability with respect to said door;
a braking member positioned within said tapered opening, between said tapered surface and said static vertical frame member, said braking member dimensioned to fit loosely within the wider portion of said tapered opening, but dimensioned to be pinched in the narrower portion of said tapered opening, wherein a cage comprises a vertically disposed plate having an opening therein to surround said braking member;
said cage maintains said braking member within said tapered opening;

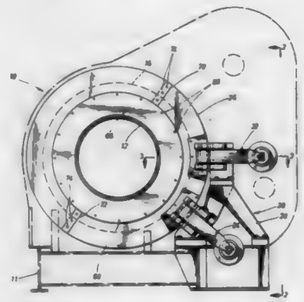
means to connect said block to said counter-balance mechanism of said elevator door system;
a resilient member, adapted to be deflected by tension of said counter-balance system, whereby said deflection causes said block to move upwardly with respect to said door, thus positioning said braking member in the wider portion of said tapered opening, but upon removal of said tension, said resilient member adapted to recover from its deflected position and cause said block to slide downwardly, positioning said braking member in the narrower portion of said tapered opening and pinching said braking member between said tapered surface and said static vertical frame member.

4,696,376
CONFIGURATION FOR A DISK BRAKE TORQUE TUBE
Daniel S. Reynolds, Canal Fulton, Ohio, assignor to Loral Corporation, New York, N.Y.
Filed Apr. 30, 1986, Ser. No. 859,282
Int. Cl.[4] F16D *55/36*
U.S. Cl. 188—71.5 **4 Claims**



1. In a wheel and brake assembly having an inboard end and an outboard end as determined by a brake housing at the inboard end, the brake assembly including a plurality of disk elements comprising a brake disk stack wherein various ones of the stack are keyed for rotation with the wheel while various alternate ones are keyed to be relatively stationary to effect braking of the wheel when the disk stack is compressed in the axial direction of the assembly, said wheel being mounted for rotation about an outboard end of a wheel axle having an inboard end affixed to the brake housing;
a torque tube adapted for stationary mounting to the brake housing and coaxial about the wheel axle and in keyed engagement with the alternate ones of the brake disk stack and comprising:
a substantially cylindrical body having an open outboard end and a substantially closed inboard end, the inboard end having an axial bore of sufficient diameter for receiving the wheel axle therethrough and having a plurality of radially located axial holes each of which receives a bolt to effect mounting of the torque tube to the brake housing, the cylindrical body having an outward-facing peripheral surface characterized by a plurality of key surfaces for engagement with the alternate ones of the brake disk stack and each said key surface extends longitudinally from the inboard end to the outboard end and terminates at the outboard end in a transition radius which meets a rib extending radially therefrom and the cylindrical body between adjacent key surfaces extends into a radially extending flange which is at least in part outboard of said key surfaces and which is annularly continuous about the outboard end of the body and each said radially extending rib and radially extending flange of the cylindrical body between adjacent ribs define a T-section at the outboard extent of each said key.

4,696,377
BRAKE SYSTEM FOR DRAWWORKS
Eugene M. Richardson, Pasadena; Norbert O. Brehm, Friendswood, and Larry G. Null, Pasadena, all of Tex., assignors to LTV Energy Products Company, Dallas, Tex.
Filed Sep. 27, 1985, Ser. No. 781,400
Int. Cl.[4] F16D *65/24*
U.S. Cl. 188—170 **6 Claims**

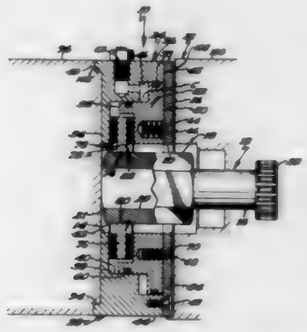


1. A safety brake mechanism for a drawworks comprising:
a caliper disc brake system comprising:
a rotor mounted on a drum barrel on said drawworks;
a first spring actuated caliper assembly mounted on said drawworks such that it can engage said rotor to stop rotation of said drum barrel, said first assembly being biased such that it lightly engages a first side of said rotor during normal operation;
a second spring actuated caliper assembly mounted on said drawworks such that it can engage said rotor to stop rotation of said drum barrel, said second assembly being biased such that it lightly engages a second side of said rotor during normal operation;
means for activating said first and second caliper assemblies; and
a hydraulically actuated band brake assembly for controlling rotation of said drum barrel during normal operation and under emergency conditions, said band brake assembly including an emergency actuator for engaging said band brake.

4,696,378
AXIALLY COMPACT BRAKE
Edward Brooks, Fridley, Minn., assignor to Houton Manufacturing Co., Inc., Minneapolis, Minn.
Filed May 23, 1985, Ser. No. 737,160
Int. Cl.[4] F16D *65/24*
U.S. Cl. 188—170 **16 Claims**

1. Brake for rotationally controlling a shaft of an electric motor for driving a machine, robot, or other apparatus component, with the machine, robot or other apparatus component including a base plate, with the base plate including a recess having a diameter, with the electric motor having a casing including an annular lip, with the electric motor having mounting flanges including axially extending mounting apertures, comprising, in combination: an air-chamber housing portion having a generally square outer perimeter including corners, with the air-chamber housing portion including a radially oriented, annular disc and a generally axially extending, cylindrical member extending from a first face of the annular disc, with the generally axially extending, cylindrical member being integral with the radially oriented, annular disc, with the generally axially extending, cylindrical member including a first, annular portion having a first, interior cylindrical surface and including a second, annular portion having a second, interior cylindrical surface and a radial, annular surface having an

outer diameter, with the first, annular portion being integral with the second, annular portion; mounting pads formed in the corners of the outer perimeter beyond the second, annular portion of the air-chamber housing portion, with the mounting pads including axially extending bores; an annular piston, with the piston including an annular portion having a radially extending interface surface, an axially extending annular flange extending from the radially extending interface surface of the annular portion, with the axially extending annular flange having an outer diameter defining a first surface of the piston, and a radially extending annular flange extending from the annular portion radially outward of the axially extending annular flange from the radially extending interface surface, with the radially extending annular flange having an outer diameter defining a second surface of the piston, with the first surface of the piston having a diameter complementary to and for slidable receipt within the first, interior cylindrical surface of the air-chamber housing portion and the second surface of the piston having a diameter complementary to and for slidable receipt within the second, interior cylindrical surface of the air-chamber housing portion, with a fluid pressure cylinder being formed and defined by the axially extending cylindrical member of the air-chamber housing portion and the piston for the receipt of fluid pressure therein for moving the piston in a first axial direction away from the radially oriented, annular disc of the air-chamber housing portion; a generally flat, annular plate having an axially extending aperture, a thickness, and an outer



diameter equal to the outer diameter of the radial, annular surface of the air-chamber housing portion and the diameter of the recess of the machine, robot, or other apparatus component, with the annular plate abutting with and secured to the radial, annular surface of the second, annular portion of the air-chamber housing portion, with the mounting pads extending axially beyond the radial, annular surface of the second, annular portion of the air-chamber housing portion generally one half the thickness of the annular plate, with the mounting pads including a recess having an interior cylindrical surface having a diameter equal to the outer diameter of the radial, annular surface of the air-chamber housing portion for receiving the annular plate; torque pins extending between the annular plate and the piston for preventing the piston from rotating relative to the annular plate and to the air-chamber housing portion; axially extending coil springs extending between the annular plate and the piston for biasing the piston in the opposite axial direction towards the radially oriented, annular disc of the air-chamber housing portion; bolts extending through the mounting apertures of the mounting flanges of the motor and through the axially extending bores of the mounting pads of the air-chamber housing portion and threadably secured into the base plate of the machine, robot, or other apparatus component for mounting the electric motor to the base plate of the machine, robot, or other apparatus component with the air-chamber housing being sandwiched between and supported by the electric motor and the base plate; an input hub attached to and supported by the shaft of the electric motor and independent of the air-chamber housing portion, with the input hub including means for driving the machine, robot or other apparatus component, with the air-chamber housing portion being independent of the input hub, with the input hub being rotatable within the air-chamber housing portion; an interface member slidably mounted but rotatable with the input hub, with the interface member being capturable between the radially oriented, annular disc of the air-chamber housing portion and the radially extending interface surface of the piston for interfacing between the first face of the radially oriented, annular disc of the air-chamber housing portion and the input hub; a lip located on the radially oriented, annular disc opposite to its first face forming a pilot rabbet motor mount for receipt on the annular lip of the casing of the electric motor for insuring that the air-chamber housing portion is centrally and concentrically located with respect to the motor casing and to prevent radial movement between the air-chamber housing portion and the electric motor casing, with the independence of the input hub and the air-chamber housing portion from each other permitting the brake to be axially compact allowing the machine, robot or other apparatus component to be located closely adjacent to the electric motor and preventing a significant increase in the stress load placed upon the shaft of the electric motor due to its support of the input hub.

4,696,379

HYDRAULIC BUFFER

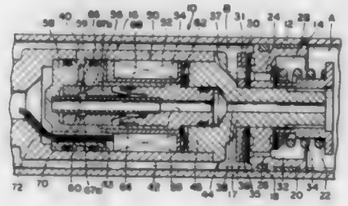
Toshiaki Yamamoto, Toyota; Hiroyoshi Kako, Aichi; Takuo Shibata, Okazaki; Takashi Izuo, Toyota; Hajime Kamimae, Toyota, and Hiroaki Takegawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 772,931, Sep. 5, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,240

Claims priority, application Japan, Oct. 8, 1984, 59-151164

Int. Cl.[4] F16F *9/34, 9/46*

U.S. Cl. 188—299 **6 Claims**



1. A hydraulic buffer comprising:

a cylinder containing liquid;

a piston disposed movably in the cylinder to partition the interior of said cylinder into two liquid chambers;

a piston rod connected to the piston and having a first path communicating with one of said liquid chambers and extending axially beyond said piston and a second path communicating with the other of said liquid chambers;

a solenoid valve provided with a tubular spool disposed in said piston rod for movement axially with respect to the piston rod and having a third path extending radially and located for communicating with the second path in said piston rod in at least one axial position of said spool; and

a pipe disposed inside and extending all the way through said spool, the pipe having a first end sealingly communicating with the first path in said piston rod, having a second closed end, and having a fourth path extending radially intermediate said first and second ends in substantial radial alignment with said second path and located for communicating with the third path in said spool at least when the spool is in said one axial position, such that the pipe substantially isolates the ends of the spool from liquid flowing between the fist and second paths, thereby eliminating the influence, on the axial position of the spool, of the pressure gradient due to flow of said liquid between said first and second paths.

4,696,380

DECELERATION CONTROL SYSTEM FOR AUTOMOBILES

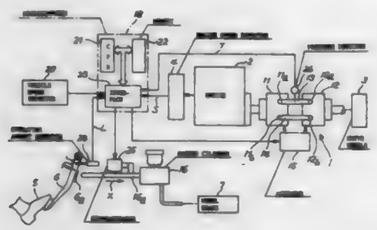
Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 28, 1985, Ser. No. 792,299

Claims priority, application Japan, Oct. 31, 1984, 59-230928

Int. Cl.[4] B60K *41/26*

U.S. Cl. 192—4 A **13 Claims**



1. A deceleration control system for an automobile provided with an engine, drive wheels, a braking system including a brake pedal and wheel brakes, and a continuously variable transmission interposed between said engine and said drive wheels, a reduction ratio of said transmission being continuously variable in accordance with an operating signal applied to an actuating terminal for controlling said reduction ratio, and

said deceleration control system comprising:

an engine speed detector means for detecting a rotational speed of said engine;

means for detecting brake pedal movement during actuation thereof;

an engine brake controller means for producing an operating signal corresponding to said brake pedal movement by a driver and for applying said operating signal to said actuating terminal thereby to change said reduction ratio so as to provide engine braking commensurate with said ratio change;

a wheel brake controller means for augmenting said engine braking by operating said wheel brakes, only when the engine speed detected by said engine speed detector reaches a predetermined level, so that said engine speed will not exceed said predetermined level.

4,696,381

CLUTCH AND BRAKE APPARATUS

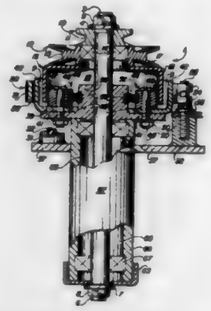
Lee A. Johnson, Sr., P.O. Box 717, Ridgeland, Miss. 39157

Filed Sep. 27, 1985, Ser. No. 780,834

Int. Cl.[4] F16D *67/02;* **A01D** *69/08*

U.S. Cl. 192—17 R **14 Claims**

1. A clutch and brake apparatus for a power-driven implement comprising a shaft; at least one drive pulley rotatable on said shaft, said drive pulley cooperating in driving relationship with the power source in the power-driven implement; a pulley drum fixedly attached to said drive pulley; a hub assembly keyed to said shaft and a hub plate provided on said hub assembly; a pair of arcuate drum segments pivotally mounted on said hub plate in a plane which is substantially perpendicular to the axis of said shaft; a pair of curved brake shoes fixedly carried by said drum segments, respectively, said brake shoes located inwardly of said pulley drum; and a pair of coil springs provided in cooperation with said brake shoes for normally biasing said brake shoes into contact with said pulley drum; and a brake band normally disposed in close proximity to said drum segments, said brake band operable to selectively engage said drum segments and disengage said brake shoes from said pulley



drum and stop rotation of said shaft, without interrupting rotation of said drive pulley and said pulley drum on said shaft and operation of the power source.

4,696,382

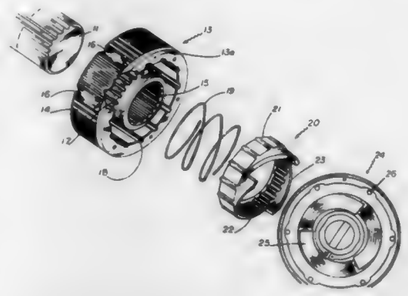
FRONT WHEEL HUB CLUTCH

Richard Aho, 5551 NE. 33rd Ave., Fort Lauderdale, Fla. 33308

Filed Jul. 14, 1986, Ser. No. 885,582

Int. Cl.[4] F16D *1/06, 11/00*

U.S. Cl. 192—67 R **1 Claim**



1. A clutch to permit engagement and disengagement of a splined axle **11** with a power drive means **13** which has an inner axle hub **15**, internally splined to engage with said axle and externally splined, and a body **14** with internal ridges and grooves **18** and external grooves and ridges connectable to a power source, comprising:

(a) a clutch ring **20** having exterior ridges and grooves **21**, interior ridges and grooves **22** and a plurality of rearwardly extending ramps **23**; wherein said exterior ridges and grooves **21** are engaged with said body internal ridges and grooves **18**;

(b) a movable control body **24** having a plurality of forwardly extending leaf springs **25** registerable with said ramps; and

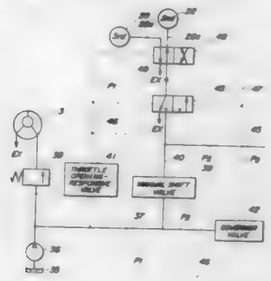
(c) a spring **19** forward of said clutch ring; whereby rotation of said body **24** causes said clutch ring **20** to move forward so that its interior ridges and grooves **22** engage the inner axle hub **15** while reverse rotation causes the clutch ring **20** to move rearward so as to disengage.

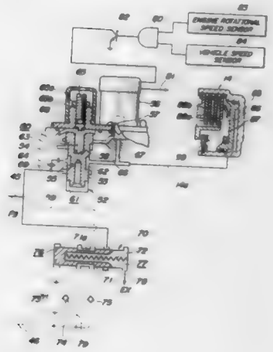
4,696,383

HYDRAULIC CLUTCH FOR MOTOR VEHICLES, HAVING CREEP-INHIBITING FEATURE

Takashi Aoki, Fujimi; Yukihiro Fukuda, Asaka, and Masao Nishikawa, Nerima, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,068
Claims priority, application Japan, Jul. 13, 1984, 59-106224[U]
Int. Cl.[4] F16D *13/72, 25/061, 25/14*
U.S. Cl. 192—70.12 **2 Claims**





1. A frictionally engaging device for power transmission of an automotive vehicle, comprising:

frictionally engaging elements;

a hydraulically operated piston for urging said frictionally engaging elements into engagement with each other;

a first pressure chamber defined in part by said piston at one side of said piston;

a second pressure chamber defined in part by said piston at another side thereof and accommodating said frictionally engaging elements;

an operating fluid pressure source for supplying said first pressure chamber with an operating fluid pressure acting upon said piston to bias same in a direction of engaging said frictionally engaging elements with each other;

spring means acting upon said piston to bias same in a direction of disengaging said frictionally engaging elements from each other;

hydraulic pressure control means interposed between said operating fluid pressure source and said first pressure chamber, for controlling said operating fluid pressure supplied from said operating fluid pressure source at least to a value higher than a first predetermined value which causes engagement of said frictionally engaging elements and to a second predetermined value slightly lower than said first predetermined value, which causes disengagement of said frictionally engaging elements to inhibit creeping of said frictionally engaging elements;

first valve means having a first through hole formed in said piston for allowing escape of operating fluid from said second pressure chamber to said first pressure chamber, and a valve body adapted to open and close said first through hole, said first valve means being adapted to open when said operating fluid pressure within said first pressure chamber is lower than said second predetermined value to allow escape of said operating fluid from said second pressure chamber to said first pressure chamber; and

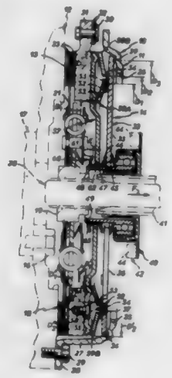
second valve means having a second through hole formed in said piston, and a valve body arranged on a side surface of said piston at said one side thereof to open and close said second through hole, the opening area of said second through hole of said second valve means being smaller than the opening area of said first through hole of said first valve means, said second valve means being adapted to open when operating fluid pressure within said first pressure chamber is equal to or lower than said first predetermined value, said second valve means being adapted to open to such a degree that an operating fluid pressure within said first pressure chamber can be maintained at said second predetermined value so long as said operating fluid pressure within said first pressure chamber is lower than said first predetermined value to permit flow of said operating fluid from said first pressure chamber to said second pressure chamber, so that said frictionally engaging elements are cooled by said flowing operating fluid.

4,696,384

CLUTCH COVER ASSEMBLY AND CLUTCH INCORPORATING SAME

Alain Huber, Paris, France, assignor to Valeo, Paris, France

Filed Oct. 24, 1986, Ser. No. 923,040
Claims priority, application France, Oct. 28, 1985, 85 15964
Int. Cl.[4] F16D *13/44*
U.S. Cl. 192—70.27 **16 Claims**



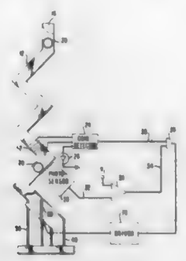
1. Clutch cover assembly comprising a substantially annular cover adapted to enable said assembly to be attached to a reaction plate or flywheel, a substantially annular pressure plate axially movable relative to but constrained to rotate with said cover, and engagement means adapted to urge said pressure plate in the axial direction away from said cover and formed at least in part by axially acting spring means comprising at least two Belleville washers disposed radially one inside the other with the larger diameter periphery of one Belleville washer lying on a circumference of smaller diameter than a circumference on which lies the smaller diameter periphery of the other Belleville washer.

4,696,385

ELECTRONIC COIN DETECTION APPARATUS

Ronald C. Davies, South Wales, United Kingdom, assignor to Digital Products Corporation, Fort Lauderdale, Fla.

Filed Jan. 5, 1984, Ser. No. 617,334
Int. Cl.[4] G07D *5/08*
U.S. Cl. 194—319 **12 Claims**



1. Coin detector apparatus comprising:

means for measuring the response of a coin to be tested to an oscillating electromagnetic field so as to provide an output indicative of a measured value related to the mass and conductivity of said coin;

means for exposing said coin to be tested to radiation;

means in light communication with said coin to be tested for providing a signal representative of the

average reflectivity of the coin;

means for comparing said signal to a predetermined level; and

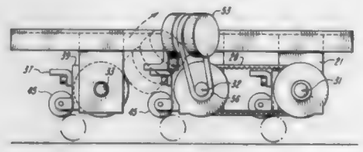
means responsive to said measured value exceeding a selected threshold and said signal exceeding said predetermined level for providing an indication that said coin is genuine.

4,696,386

CONVEYOR SYSTEM DIVERTER TURN ASSEMBLY

Hans J. Lem, 352 Hillview Ter., Franklin Lakes, N.J. 07417

Filed Jun. 14, 1985, Ser. No. 745,257
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—372 **6 Claims**



1. In a conveyor system in which articles are conveyed at a preselected nominal base height, a diverter assembly comprising:

a plurality of rotatable shafts extending transversely to the direction from which articles approach the diverter assembly;

means for rotating at least one of said plurality of rotatable shafts;

coupling means for causing said shafts to rotate together;

a respective rocker frame journaled for pivotal motion around each shaft, each frame carrying a plurality of wheels mounted on respective brackets which are individually adjustable as to angular orientation with respect to said shaft;

means for affirmatively driving each wheel from the respective shaft at an individually selectable speed ratio relative to the rotation of said respective shaft, said individually selectable speed ratio increasing across said respective shaft; and

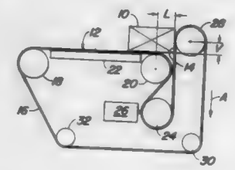
means for rocking said frames about their respective shafts to move the wheels between a first position in which the wheels are below the nominal base height and a second position in which the wheels are above the nominal base height so as to engage and control articles being transported by said conveyor system, said means for rocking said frames maintaining said wheels in a plane substantially parallel to the plane of the nominal base height ; said speed ratio increasing from a smaller speed ratio with which the wheel which engages and controls the inner portion of articles being transported by said conveyor system is driven to a larger speed ratio with which the wheel which engages and controls the outer portion of articles being transported by said conveyor system is driven.

4,696,387

WORKPIECE ROLLOVER APPARATUS

Larry D. Durchenwald, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 21, 1986, Ser. No. 854,284
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—394 **11 Claims**



1. An apparatus for positioning an article comprising:

conveyor means having first and second conveyor sections said first conveyor section being advanceable along a predetermined path and at least partially supporting said article;

said second conveyor section being located above and perpendicularly traversing the path of said first conveyor section, said second conveyor section having a path of travel at a substantially right angle to said first conveyor section, said article being conveyed simultaneously by said first and second conveyor sections, whereby said article can be rolled to a desired orientation by said conveyor sections; and

means for advancing said first conveyor section toward said second conveyor section, said second conveyor section away from said first conveyor section, and simultaneously stopping and holding said article motionless.

4,696,388

CONVEYOR BELT SCRAPER BLADE ASSEMBLY WITH CONTOURED SURFACE

Donald L. Stoll, Huntington, W. Va., assignor to Richwood Industries, Inc., Huntington, W. Va.

Filed Dec. 3, 1985, Ser. No. 804,215
Int. Cl.[4] B65G *45/00*
U.S. Cl. 198—493 **10 Claims**

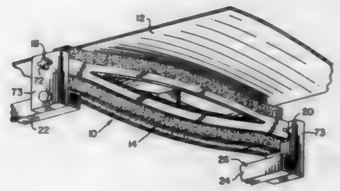
1. A scraper blade assembly for a conveyor belt comprising:

an elongate blade body made of a resilient material and having a longitudinally-extending, continuous belt scraping surface and a central longitudinal axis;

frame means attached to said body for imparting a convex shape to said belt scraping surface such that said surface is at a greater distance from said axis at a mid-portion of said body than at ends thereof; and

means for attaching said blade assembly to support structure

such that said elongate blade body extends transversely of an associated conveyor belt, whereby substantially an



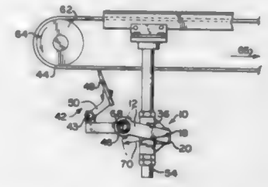
entire width of said belt is contacted by said scraping surface.

4,696,389

MOUNTING FOR A CONVEYER BELT SCRAPER ASSEMBLY

Hans-Otto Schwarze, Recklinghausen, Fed. Rep. of Germany, assignor to Hosch-Fordertechnik GmbH, Recklinghausen, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,414
Int. Cl.⁴ B65G *45/00*
U.S. Cl. 198—499 **8 Claims**



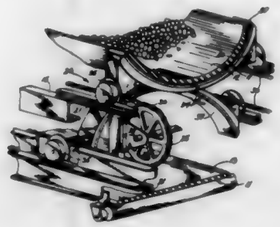
1. A mounting for a belt scraper assembly including displacement means adapted to permit arcuate displacement of the assembly when the belt executes a reverse movement, said displacement means comprising a lever arm having at its one end a formation in which a mounting shaft supporting a blade assembly is secured, said blade assembly including a first pivotal mounting permitting said blade assembly to be pivotally mounted to said mounting shaft, said first pivotal mounting including a first torque storage means permitting the blade assembly to execute an arcuate movement about the first pivotal mounting; said lever arm being pivotally mounted at its other end to a support shaft via a second pivotal mounting, said second pivotal mounting including a second torque storage means permitting the lever arm to execute an arcuate movement about the second pivotal mounting; said second torque storage means adapted to apply pressure to the belt assembly to track the belt and resist arcuate displacement of the belt assembly, said second torque storage means comprising a shaft of angular cross-section mounted within an angular sleeve with plural pads of elastic material interposed between the shaft and the sleeve, the torque stored in the second torque storage means having a predetermined value of a sufficient magnitude to ensure that the blade assembly is only arcuately displaced when the belt reverses its direction; said mounting further including an adjustable stop for adjusting and limiting the arcuate travel of the lever arm in the direction toward the belt.

4,696,390

BULK CONVEYOR

Marland Curtis, E. 5825 Railroad, Spokane, Wash. 99212

Filed Jan. 27, 1986, Ser. No. 822,859
Int. Cl.⁴ B65G *15/08*
U.S. Cl. 198—823 **13 Claims**



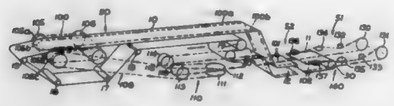
1. A bulk conveyor, comprising:
an elongated endless belt;
an elongated frame having opposed ends;
end rolls on the elongated frame for mounting the endless belt to form an elongated working flight and a return flight;
drive means for moving the belt through the working flight and return flight;
a plurality of cradle means, each having an elongated belt receiving surface extending between cradle ends for releasably receiving the belt along the working flight thereof;
wheel means on each end of each cradle means for free rotation thereon about wheel axes oriented longitudinally with respect to the elongated belt receiving surfaces;
a first set of rigid track means on the frame extending longitudinally between the end rolls and adjacent the working flight for receiving the wheel means and supporting the cradle means and belt along the working flight between the end rolls;
a second set of rigid track means on the frame extending longitudinally between the end rolls and adjacent the return flight for receiving the wheel means and supporting the cradle means clear of the return flight between the end rolls;
means on the frame for receiving and supporting the belt along its return flight clear of the cradle means;
a first pair of chain sprockets mounted to a first sprocket shaft for common rotation about a first sprocket axis that is transverse to the endless belt and positioned between the first and second sets of tracks;
a second pair of chain sprockets mounted to a second sprocket shaft for common rotation about a second sprocket axis transverse to the endless belt and positioned between the first and second sets of tracks with each sprocket of said second pair aligned with a sprocket of the first pair;
a pair of endless roller chains extending between and engaged around aligned sprockets of the first and second sprocket pair; and
means on each cradle means, separate and spaced from the wheel means and wheel axis for connecting each cradle means to the roller chains at points along the lengths of said roller chains such that the belt receiving surfaces of said cradle means are held transverse to the endless belt and stationary relative to the associated connection points along the chains.

4,696,391

CONVEYING APPARATUS

Gerald R. O. Pentith, Ashby de la Zouch, United Kingdom, assignor to Fletcher Sutcliffe Wild Ltd., United Kingdom

Filed Aug. 8, 1986, Ser. No. 897,659
Claims priority, application United Kingdom, Aug. 20, 1985, 8520817; Nov. 7, 1985, 8527522
Int. Cl.⁴ B65G *23/14*
U.S. Cl. 198—833 **10 Claims**



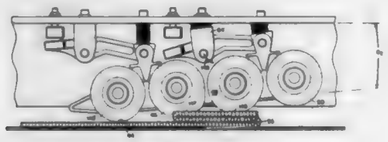
1. Conveying apparatus comprising a continuous looped belt supported on cable portions in turn supported on pulley arrangements, the cable portions being driven by drive means to form upper and lower runs which support upper and lower runs of the belt, the cable portions forming part of a single cable and reversing pulleys and cross-over pulleys being provided for guiding the cable from each of the pulley arrangements to the other pulley arrangement, characterised in that the belt has formations within its width which seat on the cable portions, means are provided for divergently guiding the cables at specific locations to allow the belt to pass between the cable portions, and the pulley arrangements for the two cable portions are parallel, so that the lengths of cable in one cable portion are equal to corresponding lengths of cable in the other cable portion between the drive means and return pulleys, between the return pulleys and the reversing pulleys, between the reversing pulleys and the cross-over pulleys and between the cross-over pulleys and the drive means.

4,696,392

CAGE ROLL ASSEMBLY

Donald P. Chisholm, Jr., Merrimac, N.H., assignor to Specialty Equipment Corporation, Worcester, Mass.

Filed May 16, 1986, Ser. No. 864,040
Int. Cl.⁴ B65G *39/18*
U.S. Cl. 198—836 **14 Claims**



1. In a conveyor having a belt adapted to move in a predetermined direction, an anti-toggling continuous contact cage roll asembly for use in the transportation of corrugated blanks along said moving belt comprising:
a modified four-bar linkage system extending fore and aft relative to the direction of movement of said belt, said linkage system including two linkage arms, a frame, and a bar linked to said frame by said linkage arms, with one end of each arm pivotally mounted to respective fore and aft ends of said bar and with the other end of each arm pivotally mounted to said frame respectively in fore and aft frame mounts, with one frame mount having compliant means to permit the associated arm pivot to move, thereby to permit canting of said bar with respect to said frame;
a number of rollers mounted for rotation to said bar; and,
means for urging said bar away from said frame.

4,696,393

APPLICATOR WIPE FOR INVISCID FLUIDS

Thomas C. Laipply, 13530 Fox Den East, Russell, Ohio 44072

PCT No. PCT/US85/00120, § 371 Date Sep. 23, 1985, § 102(e) Date Sep. 23, 1985, PCT Pub. No. WO85/03275, PCT Pub. Date Aug. 1, 1985
Continuation-in-part of Ser. No. 312,879, Oct. 19, 1981, Pat. No. 4,427,115, and a continuation-in-part of Ser. No. 312,880, Oct. 19, 1981, Pat. No. 4,427,111. This PCT application Jan. 23, 1984, Ser. No. 781,236
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.⁴ B65D *83/00, 75/00*
U.S. Cl. 206—210 **15 Claims**



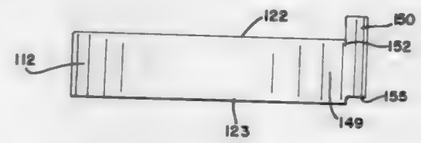
1. A combined fluid storage container and applicator device for relatively inviscid fluids, said device comprising a sheet-like fluid impermeable material having generally symmetrical halves positioned in generally flat parallel overlying relation to each other, a pair of respective edges of said material halves being securely joined along an effective fold line as an effectively single integral sheet of said material halves, temporary seal means sealing said halves to each other along a temporary seal line beginning and ending at said fold line forming a cavity and enclosing fluid between said halves and within said temporary seal line and said fold line, a fluid in said cavity, and separation means for simultaneously applying separating force substantially symmetrically to both said halves of said sheet and to said temporary seal means without tearing said sheet, said separation means including means for applying simultaneously in at least two opposing directions continuous separating force out of the plane and at an angle that is no greater than about a perpendicular to the generally planar extent of the device to open said temporary seal means along at least a portion of the length of said seal line to form a flat surface covered with the fluid while the integrity of said sheet is maintained.

4,696,394

EASILY REMOVABLE PROTECTIVE COVERING FOR ANNULAR OBJECTS

Michael H. Estkowski; Robert S. Doumani, both of St. Joseph, and Christopher G. Estkowski, Coloma, all of Mich., assignors to Shepherd Products U.S., Inc., St. Joseph, Mich.

Continuation-in-part of Ser. No. 800,754, Nov. 22, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 927,534
Int. Cl.⁴ B65D *37/00, 85/02*
U.S. Cl. 206—303 **2 Claims**



1. A protective covering for a caster wheel tread comprising a continuous band of heat-shrinkable polyvinyl chloride defining spaced marginal side edges thereabout,
said band being proportioned to be closely received over

and about the wheel tread in overlapping relation to the wheel along both side edges of the wheel tread for heat shrinking thereagainst and thereabout, whereby said band including said side edges thereof will be tensioned against the wheel tread and the wheel tread side edges respectively, when the wheel is centered within said protective covering and said protective covering is heat shrunk against such wheel tread,

said band including release means formed perpendicular to its periphery for effecting finger gripping of one side edge thereof and pulling free of said band between said side edges thereof for severing said band whereby the severed band under said tension springs away from the wheel tread when such section is formed,

said release means including an upstanding finger grip tab extending from one of said edges thereof,

said tab being integral with said band and extending laterally of said band, and

a pair of tear slits formed in said band, one disposed on either side of said tab at said one of said edges of said band,

said slits being directed toward the other of said edges of said band, and

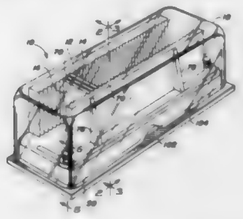
a tear notch formed in said band at said other of said edges of said band, said notch being aligned with said tab.

4,696,395

SUBSTRATE CONTAINER

Mark S. Rivoli, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Nov. 14, 1986, Ser. No. 930,849
Int. Cl.⁴ B65D *85/30*
U.S. Cl. 206—334 **21 Claims**



1. A container for retaining, supporting and transporting a plurality of hybrid substrates in a vertical orientation comprising:

a base having a fixed, horizontally extending block with a fixed lateral support vertically upstanding from one face of the block and having a plurality of v-shaped notches formed therein facing toward the opposite face of the block;

a slide having a horizontally extending plate adjustably positionable upon the upper surface of the horizontally extending block with an adjustable lateral retainer upstanding from one edge of the horizontally extending plate and having a plurality of v-shaped notches formed therein facing the v-shaped notches of the fixed lateral support;

attachment means to releasably secure the slide to the base in any one of a plurality of positions; and

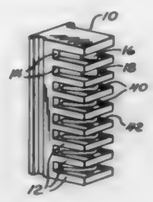
a cover positionable over the base and slide to protect the hybrid substrates supported by the block and slide.

4,696,396

HEMOSTATIC CLIP CARTRIDGE

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403

Continuation of Ser. No. 810,581, Dec. 19, 1985, abandoned.
This application Mar. 9, 1987, Ser. No. 22,576
Int. Cl.⁴ B65D *85/16*
U.S. Cl. 206—339 **5 Claims**



1. A cartridge for storing and singly dispensing hemostatic clips which are preformed into the proper shape for engagement by a clip applicator,

said cartridge having a body portion with a plurality of parallel walls each face thereof defining one side of a clip compartment,

means for retaining a clip in each of said clip compartments for permitting dispensing of said clip upon insertion of said clip applicator,

said clip compartments being dimensioned to permit reception of said applicator without deformation of said parallel walls,

said means for retaining and dispensing the clips comprising a pair of outwardly projecting, opposed channel members extending from each face of each parallel wall into said clip compartments, said opposed channel members positioned and dimensioned so that a clip is releasably compressed therebetween,

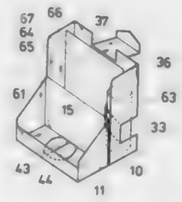
whereby removal of a clip from one compartment by insertion of the applicator does not release or compress clips in adjacent compartments.

4,696,397

CONTAINER FOR FLOPPY DISKS AND THE LIKE

Yoshiro Nakamats, 1-10-1105, Minami Apyama 5-chome, Minato-ku, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,429
Claims priority, application Japan, May 7, 1984, 59-89223
Int. Cl.⁴ B65D *85/30*
U.S. Cl. 206—444 **12 Claims**



1. A container for articles such as floppy disks and the like comprising a body and a lid, pivotal means pivotably connecting said lid to said body, said body having a bottom wall and a front wall connected to said bottom wall, said lid having a top wall and a front wall connected to said top wall, the container having a closed position in which said top wall overlies said bottom wall and the front wall of said lid forms a generally coplanar continuation of the front wall of said body, the container having an open position in which the lid is pivoted from said closed position 180° about said pivotal means to locate the front wall of said lid side-by-side and parallel to the front wall

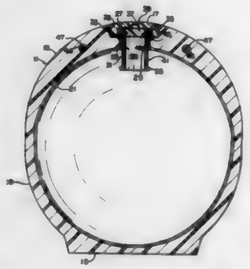
of the body such that both the body and the lid open upwardly to receive said articles in the body and in the lid, and latch flap means on said body and said lid which are interengaged when said lid is in its open position to latch said body and lid together in said open position, whereby the body and lid are latched to one another by said latch flap means while both the body and lid are open at the top to receive articles therein, said latch flap means comprising a latch flap section formed on said front wall of said body and defined by a latch flap cut line and a latch flap fold line such that the latch flap section can be pivoted along said latch flap fold line between a non-latching position in which the latch flap section is coplanar with said front wall of said body and a latching position in which the latch flap section extends generally perpendicularly to said front wall of said body, said latch flap means further comprising a cut line in said lid for receiving said latch flap section when the latter is in said latching position to thereby latch said lid to said body.

4,696,398

FREE DROP LIQUID CONTAINER WITH EXTENDABLE SPOUT

Floyd Steinmetz, Jr., c/o Steinmetz & Sons Machinery Co., P.O. Box 393, Moscow, Pa. 18444

Filed Oct. 17, 1984, Ser. No. 661,959
Int. Cl.⁴ B65D *85/72*
U.S. Cl. 206—521 **29 Claims**



1. A free drop container for liquids adapted to be dropped from aircraft, comprising

a molded, impact resistant, strong and substantially rigid outer shell having a generally spherical shape and being made of a plastic material that is resilient and adapted to deform on impact and then spring back into shape,

said outer shell being free-standing and self-supporting when empty,

port means in said shell defining a port hole through the wall of said shell for passing liquids into and out of the container, said hole having a first diameter portion extending from the exterior partially through said shell wall and a second smaller diameter portion extending through the rest of the shell wall to the interior thereof, said first and second diameters portions defining a seat in said shell wall;

said container having a substantially smooth outer surface with no protuberances that might break on impact or might break the container on impact when the container is dropped to the ground from an aircraft;

a cap removably fitted to close said first diameter portion of said hole and forming a substantially smooth shape with the outer surface of the rest of the container so as to provide a substantially smooth outer surface with no protuberances;

an integral retractable pour spout sized to slidably fit said second diameter portion and positioned to extend out from said shell when said cap is removed and it is desired to pour the liquid from the container, and is retracted and positioned inside the container when being stored or transported so as to not protrude from the container;

plug means removably fitted in said pour spout to seal the interior of said inner shell; and

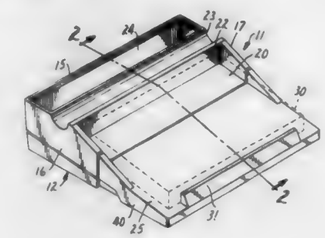
a liner covering the interior of said shell made of elastic material that is adapted to expand and contract and is approved for containing water for contact with potable liquids inside said shell.

4,696,399

NOTEPAPER DISPENSING TRAY

David C. Windorski, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 634,972, Jul. 27, 1984, abandoned. This application Oct. 29, 1985, Ser. No. 793,481
Int. Cl.⁴ B65D *6/04*
U.S. Cl. 206—565 **4 Claims**



1. A dispenser for a stack of sheet material comprising sheets joined in the stack by a narrow band of pressure-sensitive adhesive on one side of each sheet adjacent one end and affording dispensing of single sheets from the stack and separation of the adhesive coated end of the single sheet from the remaining sheets in the stack, said dispenser comprising:

a support member having a generally planar support surface for supporting the stack of sheet material,

clamping means cooperating with said support surface for engaging the lowermost sheet of said stack between said adhesive coated end and the other end opposite aid coated end, and fixing said sheet in relationship to the support, and

abutment means projecting above the plane of the support surface for engaging said other end of said stack for cooperating with said clamping means for restricting movement of said stack in relationship to the support surface during separation of the top sheet from a said stack, wherein

said clamping means cooperating with said support surface comprises a clamping plate adapted to be positioned over a lowermost sheet in a said stack and said clamping plate is formed with a clamp member comprising a flange connected to the forward edge of the clamping plate and extending transversely of the support member and a second plate member positioned beneath the support member which is normally spaced from the clamping plate by a distance less than the thickness of the support member to urge the clamping plate toward the support surface to frictionally fix said lowermost sheet onto said support surface.

4,696,400

KIT FOR CREATING WALL MURALS

Leigh Warman, 81 Penshurst Gardens, Edgware, Middlesex, England

Filed Oct. 2, 1985, Ser. No. 783,000
Int. Cl.⁴ B65D *71/00;* **G03B** *29/00*
U.S. Cl. 206—575 **5 Claims**

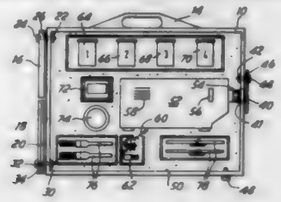
1. A kit for producing a wall mural on one of a pair of opposing walls in a room, the apparatus comprising:

a housing defining an opening and a plurality of recesses;

an upper bracket pivotally secured to said housing for securing an upper part of the housing to the other of said pair of walls;

a pair of lower brackets pivotally secured to the housing for securing the lower part of the housing to the said other of said pair of walls;

at least one slide carrying an image to be reproduced on said one wall, the image comprising boundary lines designating areas of different color and a designation in each area corresponding to a designated color for that area;



a slide projector mounted in one of said recesses and so positioned therein as to be able to project the said image of the said slide through said opening on to said one wall;

a plurality of paint containers each containing a different colored paint having a said designated color and each bearing the designation of the color of the paint contained therein;

and a plurality of brushes for painting the said one wall in accordance with the projected image.

4,696,401

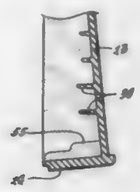
CUSHIONING PACKAGING MEDIA

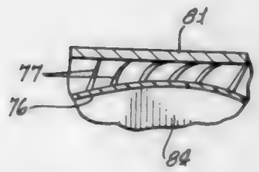
Robert S. Wallace, 823 S. Longwood, Los angeles, Calif. 90005, assignor to Robert S. Wallace, Los Angeles and Jack Bauman, Pacific Palisades, both of, Calif., a part interest

Continuation-in-part of Ser. No. 744254, Jun. 13, 1985, Pat. No. 4,592,468. This application Jun. 2, 1986, Ser. No. 869,670

Int. Cl.[4] B65D *81/10, 81/16*

U.S. Cl. 206—594 13 Claims





1. For use in packaging a structure, the combination with and including said structure comprising:

(a) a container and an associated interior support wall, said structure located within the container, and

(b) solid fins integral and one piece with said wall and projecting generally toward said structure at different sides thereof and to confine same during said packaging,

(c) said fins being resiliently and yieldably deflectable to bend relative to said support wall in response to squeezing relatively toward said structure, said support wall and fins consisting of readily cuttable plastic material,

(d) said fins extending in generally the same direction along said wall and having terminal edges that define a positioning plane relative to which said fins are out of perpendicularity,

(e) the fins extending in substantially parallel relation and at an angle α relative to the plane defined by the wall, the fins tapering outwardly away from that wall and toward fin terminals, said angle α being between about 70° and 88°,

(f) the fins squeezed between said structure and the support wall so that the fins are resiliently bent and to varying extents, the support wall being flexible.

4,696,402

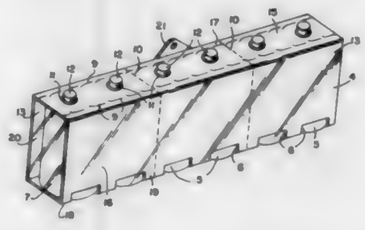
EASY-OPEN, INDIVIDUAL UNIT DISPENSING PACKAGE

Charles H. Harmon, Deforest; Thomas F. Ward, Madison, and Robert W. Zimmermann, Sun Prairie, all of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Mar. 19, 1985, Ser. No. 713,554

Int. Cl.[4] B65D *5/54*

U.S. Cl. 206—602 10 Claims



1. An easily opened container capable of dispensing, one at a time, each of a plurality of individual product units placed therein, while securely holding each undispensed unit in place, which container comprises at least one perforated tear strip formed by two substantially parallel lines of perforations in close proximity to one another, the strip having at least two openings therein, each of which is capable of enclosing and securely binding a portion of an individual product unit, wherein the container further comprises means for preventing an individual product unit bound within one of said openings from engaging in motion sufficient to dislodge itself from an opening, wherein said means does not prevent easy removal of an individual product unit which is not bound by an opening.

4,696,403

BOTTLE BAG

Gregory A. Hoover, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Sep. 16, 1986, Ser. No. 906,456

Int. Cl.[4] B65D *30/22*

U.S. Cl. 206—602 3 Claims

1. In a plastic "T-shirt" bag comprising generally coextensive overlying flexible front and rear panels, and a closed bottom, said panels defining front and rear overlying side edge-joined walls projecting upwardly from said bottom, an open upward directed bag mouth defined by said walls, said panels further defining a pair of handles integral with said front and rear walls and projecting upwardly from said bag mouth, said handles being laterally spaced from each other with the bag mouth therebetween; the improvement comprising said front and rear walls engaging each other along a linear vertical portion extending between said bottom and said bag mouth intermediate said handles and defining a bottle-receiving vertical compartment with an upwardly-opening compartment mouth to each side of said vertical portion, joinder means bonding said front and rear walls in engagement with each



other along said vertical portion, each of said handles generally aligning over a different one of said compartments, and a severable line defined along said joinder means between said closed bottom and said open mouth for enabling selective severing of said compartments, each with a generally aligned handle and open mouth, from each other, said joinder means defining a side edge seam along each severed compartment.

4,696,404

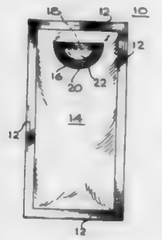
HEAT SEALED PACKAGE WITH PERFORATED COMPARTMENT SEAL

Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602

Filed Aug. 27, 1986, Ser. No. 900,748

Int. Cl.[4] B65D *65/30*

U.S. Cl. 206—604 15 Claims



1. In a peripherally sealed dispensing package that includes a compartment with opposing walls, the improvement which comprises:

an inner seal disposed within said compartment and sealingly engaging an oppositely aligned portion of said opposing walls; and

a finger traversable and gripable aperture extending through said inner seal, said aperture defining a finger pull for tearing open said sealed package to permit dispensing of the package contents.

4,696,405

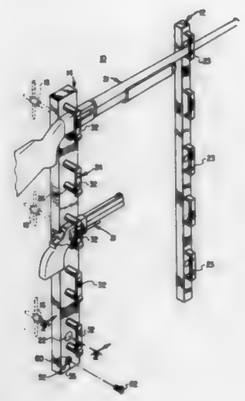
GUN RACK

Patrick M. Waring, 3800 Spring Valley, #177, Dallas, Tex. 75234

Filed Jun. 13, 1986, Ser. No. 874,223

Int. Cl.[4] E05B *73/00*

U.S. Cl. 211—4 10 Claims



1. A gun rack comprising:

first and second channel shaped support members;

a plurality of gun barrel support brackets operatively connected to the first support member;

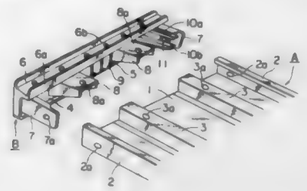
a plurality of locking plate means including a plurality of locking plates pivotally mounted in a spaced relationship to the second support member, said locking plates having walls forming passages in open communication with aperture walls for forming apertures positioned interiorly of the locking plates with open access passages;

a corresponding plurality of locking plate retainer pins operatively connected to the second support means, said locking plate retainer pins extending outwardly of the second support means and having adjacent to ends thereof pairs of grooves on opposing sides for passing the open passage forming walls of the locking plates and for engaging the aperture walls of the locking plates with the locking plate retainer pins;

an apertured lock member reciprocally mounted within the second support member and L-shaped connectors having first and second legs mounted to each other, said apertured lock member having a plurality of vertically spaced apertures through which the first portions of the L-shaped connectors pass and the locking plate retainer pins have apertures through which the second portions of the L-shaped connectors pass; and

a lock means including an L-shaped lock member having first and second leg portions normal to each other, the first leg portion having an end operatively connected to the apertured lock member, a sleeve mounted in the second support member for forming a passage therethrough for the outwardly extending second leg portion, said second leg portion having a circular cross section and a plurality of spaced notches formed in the periphery thereof adjacent to the end, whereby a key having a bore with lands corresponding to the notches of the second leg portion rotates the second leg portion of the lock to raise the second leg portion of the L-shaped lock member, apertured plate, and first leg portions of the L-shaped connectors for rotating the second portions and the locking plate retainer pins to lock the locking plates to the locking plate retainer pins.

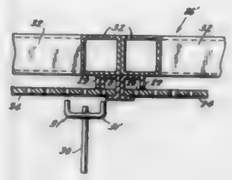
4,696,406
RACK BOARD
Masashi Karashima, 88-5, Nakano, Ebina-shi, Kanagawa-ken, Japan
Filed Sep. 5, 1985, Ser. No. 772,677
Claims priority, application Japan, Oct. 15, 1984, 59-214303
Int. Cl.⁴ A47F *5/00*
U.S. Cl. 211—153 **4 Claims**



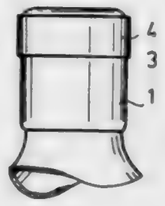
1. A rack board comprising:
a metal plate having front and rear sides and right and left edge sides, said front and rear sides each comprised of a respective front and rear plate section extending transverse to said metal plate, a fastening hole disposed on ends of said front and rear plate sections at said right and left edge sides, said right and left edge sides each consisting of a respective edge extending along said metal plate and said front and rear plate sections;
plastic side covers for covering said left and right edge sides, said plastic covers each comprised of upper and lower horizontal portions extending along said right and left edge sides and disposed in planes parallel to said metal plate, a vertical section extending between and transverse to said upper and lower horizontal portions, front and rear vertical portions extending between said upper and lower horizontal portions at the ends of said upper and lower horizontal portions and disposed in planes parallel with said front and rear plate sections, and first side bracket means attached to said vertical section and spaced from said front vertical portion and said upper horizontal portion and second side bracket means attached to said vertical section and spaced from said rear vertical portion and said upper horizontal portion, said side bracket means projecting towards said metal plate, said side bracket means each having a fastening hole for aligning with a respective said fastening hole of said front and rear plate sections for receiving a fastener to attach said side covers to said metal plate, said ends of said front and rear plate sections extending between said bracket means and said front and rear vertical portions respectively, said plate means extending between said side bracket means and said upper horizontal portion.

4,696,407
AMPHITHEATER DISPLAY
Robert P. Franklin, Lake Hopatcong, N.J., assignor to Trans-World Manufacturing Corporation, E. Rutherford, N.J.
Filed Jan. 21, 1986, Ser. No. 821,261
Int. Cl.⁴ A47F *5/00*
U.S. Cl. 211—183 **11 Claims**

1. A display unit, comprising:
a rear wall having a front side and a back side, a plurality of rows and columns of openings formed in said rear wall and through which hangers for supporting items to be displayed may be inserted; and
a support frame coupled to said back side of said rear wall and providing structural support thereof, said support frame including an open channel having an open side which is aligned with and straddles at least one of said rows and/or columns of holes such that hangers may be inserted into those holes in said straddled rows and/or columns despite the presence of said support frame.



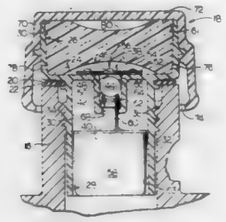
4,696,408
PLASTIC CLOSURE WITH SAFETY BAND
Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic AG, Switzerland
Filed Jul. 9, 1986, Ser. No. 883,615
Claims priority, application Switzerland, Jul. 23, 1985, 3189/85
Int. Cl.⁴ B65D *41/46*
U.S. Cl. 215—237 **17 Claims**



1. A single piece plastic closure for a container comprising a base (1) and a cap connected to said base by a hinge (3), characterized in that a detachable safety band (4) is detachably engaged with said base and overlays less than about half of the perimeter of said cap and extends approximately as high as said cap, said safety band (4) arranged symmetrically and oppositely with respect to said hinge (3), whereby said closure cannot be opened without detaching said safety band from said closure.

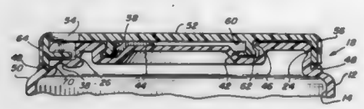
4,696,409
VENTED FUEL TANK CAP ASSEMBLY
Robert M. Vize, Bettendorf, Iowa, assignor to Caterpillar Inc., Peoria, Ill.
Filed Jun. 13, 1986, Ser. No. 873,882
Int. Cl.⁴ B65D *51/16*
U.S. Cl. 220—203 **9 Claims**

1. A vent cap assembly for obstructing liquid egress from a tank through the cap assembly and for permitting gaseous exchange between the tank and the atmosphere, said cap assembly comprising:
a body member having first and second end portions and an interior passageway, said passageway having a stepped cross section profile and being open and unrestricted at the second end portion;
a valve seat disposed in said body member across said passageway and having an orifice therethrough, said valve seat including a flexible diaphragm having a port therein which forms a part of said orifice;
a float disposed in said passageway between said valve seat and said second end portion of said body member, said float being movable between a sealing position and a venting position; and



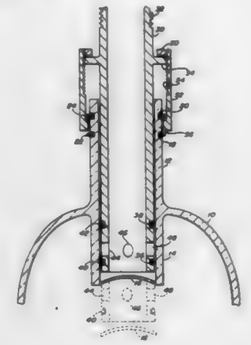
valve means for sealing said orifice in response to one of a condition of said float assuming said sealing position and a condition of said orifice being at a lower elevation than said float's center of mass, said valve means including;
a spherical plugging member disposed in said passageway between and being engageable with said float and said valve seat, said plugging member having a projected area which is greater than the area of said port, and having a density which is about ⅓ the density of carbon steel.

4,696,410
CLOSURE WITH SIDE CUT TAMPER EVIDENT FEATURE
Walter J. Kreiseder, Barrington, Ill., assignor to Courtesy Mold & Tool Corporation, Wheeling, Ill.
Filed Mar. 26, 1987, Ser. No. 30,139
Int. Cl.⁴ B56D *51/22*
U.S. Cl. 220—267 **10 Claims**



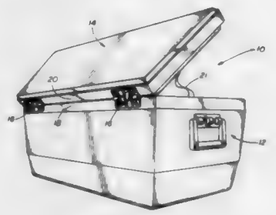
1. A tamper evident end closure for a container comprising:
a stationary endcap portion integrally joined to and forming a closed end of said container by means of a weakened annular band and an integral well having first and second ends and a hinged portion, said well being located on said endcap portion and in said annular band;
an overcap portion attached to and covering said endcap portion and being coaxially rotatable thereabout; and
a knife blade secured to said overcap portion and arranged to engage and circumscribe said annular band as said overcap portion is rotated about said endcap portion, severing said endcap from said first end of said well to said second end of said well, forming a hinged lid for said container.

4,696,411
LARGE BREAKSEAL ACTUATOR WITH BUILT-IN VALVE
Hans-Juergen Graf, Oceanside, and Peter T. Randke, San Marcos, both of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed May 20, 1986, Ser. No. 865,147
Int. Cl.⁴ B65D *43/04*
U.S. Cl. 220—281 **3 Claims**



1. A quartz or glass vessel for high purity chemicals comprising a container and means for permitting access to the contents of the container comprising:
an access tube (12) extending into the vessel having the internal end thereof closed by a discoid breakseal (16);
a removal tube (3) inside the access tube, the internal end closed and having formed through the walls thereof proximate the internal end thereof at least one passage (44, 46 or 48);
means forming a slidable seals (36, 38 40 and 42) between the removal tube (30) and the internal wall of the access tube (12) respectively on the proximal and distal side of the passage (44, 46 or 48); and
means (34, 52, 18 and 20) for moving the removal tube (30) axially in gas-tight sealed relationship with the access tube (12) to break the breakseal (16) and extend the proximal end of the removal tube (30) into the vessel (10) to provide fluid communication through the passage through the wall thereof 44, 46 or 48).

4,696,412
HINGE CONSTRUCTION FOR CONTAINER COVERS
Ronald C. McGowan, and Ninh G. Pham, both of Houston, Tex., assignors to Igloo Corporation, Chicago, Ill.
Filed Mar. 9, 1987, Ser. No. 23,549
Int. Cl.⁴ B65D *43/24*
U.S. Cl. 220—335 **20 Claims**



11. In a container having a body and a lid over the body to permit access to the body; an improved hinge mounting the lid for pivotal movement between a closed general horizontal

position over the container and an open generally vertical position; said improved hinge comprising:

a pair of interfitting leaves each having a base defining a rear face and an opposed front face;

a boss extending outwardly from the front face of each of said leaves and having a longitudinally extending opening therethrough, the bosses on the interfitting leaves being in axial alignment with each other and having axially aligned longitudinally extending openings therein;

a hinge pin received in said axially aligned openings for pivotally connecting said hinge leaves to each other; and

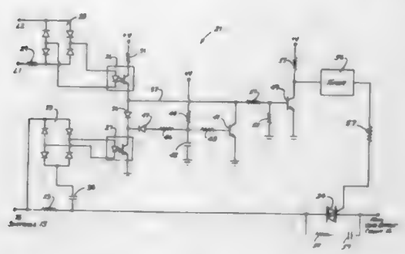
a cam surface on one of said leaves and a latch member on the other of said leaves in opposed relation to said cam surface and adapted to ride along said cam surface in contact relation thereto, said cam surface having a high point thereof in engagement with said latch member at a position of the cover intermediate its open and closed positions, and a relatively flat cam surface portion adjacent said high point for contacting said latch member in the open generally vertical position of the cover for releasably holding the cover in an open position.

4,696,413

VENDING SYSTEM AND METHOD FOR PREVENTING MULTIPLE PRODUCT VENDS

Aaron W. Wilson, Boise, Id., and Richard A. Pollock, Fresno, Calif., assignors to The Vendo Company, Fresno, Calif.

Filed Jan. 15, 1986, Ser. No. 819,223
Int. Cl.⁴ G07F *11/00*
U.S. Cl. 221—13 **17 Claims**



1. In a vending machine: a plurality of product delivery channels each having an electrically energized vend motor for delivering a product during a vend operation, product selection switches connected electrically in series in a power circuit and to the vend motors in respective ones of the product delivery channels for selectively energizing the motors with power from the power circuit to initiate a vend operation, means active upon the initial energization of one of the vend motors for maintaining the motor in an energized condition to complete the vend operation, means for monitoring the current in the power circuit to detect an interruption in the current due to actuation of one of the product selection switches once a first one of the vend motors has been energized, and means responsive to the interruption in the power circuit current for inhibiting energization of a second one of the vend motors for a predetermined period of time.

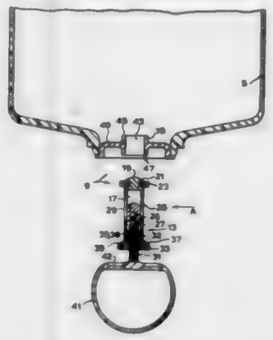
4,696,414

DISCHARGE ASSEMBLY

Mok K. Huat, Building 205, Jurong East St. 21,03,139, Singapore, Singapore

Filed Nov. 18, 1985, Ser. No. 799,004
Claims priority, application United Kingdom, Nov. 21, 1984, 8429360
Int. Cl.⁴ B67D *5/08*
U.S. Cl. 222—67 **12 Claims**

1. A dispensing valve for a container comprising: a valve seat having means defining a first opening therein, a chamber having means defining a second opening therein, the chamber being movable relative to the valve seat between a filling position in which the chamber is fillable with liquid from the container through the second opening and a discharge position in which liquid in the chamber may be discharged through the second opening: first and second sealing surfaces between which the chamber is disposed, said surfaces sealing the first opening in said filling and discharge position respectively; a



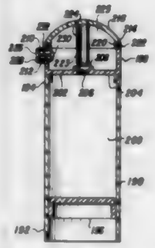
groove connected to and extending from the second opening, the groove reducing in cross sectional area away from the second opening and being arranged so that air may pass through the groove and second opening during movement of the chamber from the discharging to the filling position; a member movable in the chamber so as to adjust the volume thereof; and wherein the distance between the sealing surfaces remains constant independent of the volume of the chamber.

4,696,415

APPARATUS FOR DISPENSING PRODUCTS FROM A SELF-SEALING DISPENSER

Philip Meshberg, 2500 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Feb. 26, 1985, Ser. No. 705,657
Int. Cl.⁴ B65D *37/00*; G01F *11/00*
U.S. Cl. 222—82 **8 Claims**



1. A vacuum pump for a dispenser having a primary compartment containing product to be dispensed comprising:

(a) means for defining a pumping compartment including a rigid base, generally cylindrical sidewall portion and movable means to reduce the volume of said compartment and dispense product therefrom;

(b) a spout, extending radially from said sidewall portion, comprising a channel cut therethrough, an inner opening communicating with one end of the channel and the pumping compartment, and an outer opening, through which product is dispensed, communicating with the other end of the channel and the ambient environment;

(c) a unitary self-sealing closure member mounted in the spout having a sealing tip for closing said outer opening in said spout;

(d) means biasing said member into a position where said tip abuts the other end of the channel thereby closing said outer opening in said spout when said pumping compartment is in an unoperated position;

(e) said closure member responsive to movement of said pumping compartment movable means to move said tip out of said closed position;

(f) means for deterring backflow from said pumping compartment and dispensing a controlled dosage of product including a tapered flange terminating in an aperture in said rigid base and a valve element coupled to said movable means wherein said base separates the pump compartment from a primary compartment containing product to be dispensed;

(g) said valve element comprises a plunger for opening and closing said aperture during operation;

(h) said plunger includes stop means located at a predetermined intermediate position along the plunger for dispensing a predetermined dosage of product from the spout when the stop means contacts the tapered flange; and

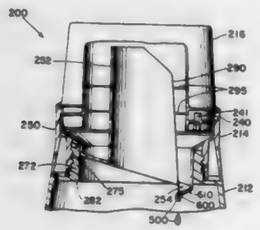
(i) said aperture in said rigid base comprises a thin detachable section which breaks away from said base to form said aperture upon initial operation of said plunger.

4,696,416

LIQUID PRODUCT DISPENSING PACKAGE WITH SELF DRAINING FEATURE EMPLOYING DRIP CONCENTRATOR

Delmar R. Muckenfuhs, Middletown, and Robert H. Van Coney, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 656,049, Sep. 28, 1984, abandoned. This application Jan. 30, 1987, Ser. No. 8,805
Int. Cl.⁴ B67D *1/16*
U.S. Cl. 222—109 **20 Claims**



1. An improved package for dispensing liquid without contaminating the exterior surfaces of the package, said package comprising:

(a) a container for housing said liquid, said container having a dispensing orifice;

(b) a collar sealingly secured about its periphery to said dispensing orifice, said collar having an outwardly projecting pouring spout generally aligned with the vertical axis of said container, a circumscribing wall extending above the base of said pouring spout, said base of said pouring spout being joined about its periphery to said circumscribing wall by a drain back partition including a drain hole located at the lowermost point of said drain back partition; and

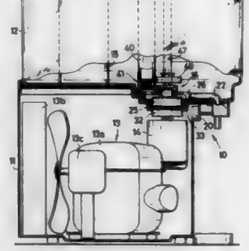
(c) a drip concentrating member originating in the lowermost surface of said drain back partition at the periphery of said drain hole and extending generally downwardly from said drain back partition to form a single, predetermined drip concentrating point comprising the lowermost extremity of said drip concentrating member in the interior of said container, said drip concentrating member being so configured and positioned relative to said dispensing orifice in said container that it does not restrict the flow of liquid passing through said dispensing orifice of said container during normal dispensing operations in which said container is not completely inverted, said drip concentrating member also being so oriented relative to said dispensing orifice in said container that it is substantially free of horizontal surfaces on which liquid can accumulate when said container is stored in an upright position intermediate dispensing cycles; whereby liquid deposited on the exterior of said drain back partition during dispensing will be drawn from said drain back partition by said drip concentrating member intermediate dispensing cycles and will coalesce to form a liquid droplet on said drip concentrating point, said droplet continuing to grow in size until such time as the weight of said droplet exceeds the surface tension forces exerted by the liquid comprising said droplet on said drip concentrating point, at which time said droplet falls back into said container, said coalescing cycle repeating itself until substantially all of said liquid deposited on the exterior of said drain back partition is returned to said container.

4,696,417

REFRIGERATED BEVERAGE DISPENSER, WITH WHIPPER DEVICE

Giancarlo Ugolini, Milan, Italy, assignor to Ugolini S.p.A., Milan, Italy

Filed May 6, 1986, Ser. No. 860,047
Claims priority, application Italy, Mar. 28, 1986, 19912 A/86
Int. Cl.⁴ B67D *1/10, 5/62*
U.S. Cl. 222—146.6 **10 Claims**



1. Refrigerated beverage dispenser and whipper device comprising:

a base having on an upper part at least one container,

a device for circulating and whipping a beverage housed within said at least one container, and communicating with the outside of the container,

motor means operatively linked by a magnetic transmission means to said circulating and whipper device and housed inside said base,

a refrigerator unit housed inside said base,

an evaporator of said refrigerator unit sealingly housed within said at least one container, said circulating and whipper device includes:

an impeller magnetically driven by said motor means,

a housing chamber having ports in communication with said at least one container and with the outside of said container, within which the said impeller is housed,

a pivot means housed inside said housing chamber and provided with a hollow interior in communication with holes on its upper part and on its lower part around which said impeller rotates,

a first pipe having a non-return valve in a peripheral portion of said housing chamber,

said first pipe being connected to a first of said ports in fluid communication between said container and said housing,

a bell-shaped structure provided in the lower part of said pivot means

said pivot means projecting through a second of said ports,

a second pipe inside which said pivot means ends, and having an upper end above the surface of a beverage within said container,

a float mounted coaxially to said pivot means, and to a portion of said chamber inside of which said pivot means is housed,

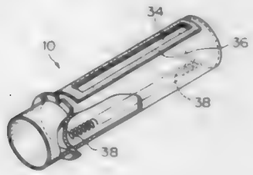
and said motor means is a single two-speed electrical motor controllable by a switch actuated from the outside of said container.

4,696,418

DEVELOPER CONTAINER FOR DRY-PROCESS DEVELOPMENT

Sigeo Kurotaka, Sagamihara, and Moriyosi Tukano, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,606
Claims priority, application Japan, Aug. 20, 1984, 59-173919
Int. Cl.⁴ B65D *23/04, 83/06*
U.S. Cl. 222—167 **2 Claims**



1. A developer container for supplying a dry-process developing unit with a developer, comprising:

a rotatable cylindrical hollow body accommodating the developer therein;

an elongated slot formed through the cylindrical wall of said body in a lengthwise direction of the body for discharging the developer therethrough; and

agitating means freely movably disposed in the body for agitating the developer, said agitating means comprising at least one small diameter wire coil having a constant diameter along the length thereof, said coil being dimensioned so as to be prevented from falling out of the container and having a length greater than that of said slot and substantially greater than a diameter of said hollow body, whereby rotation of said hollow body causes rotation of said coil so that said developer is scraped from said wall of said body.

4,696,419

HOLSTER

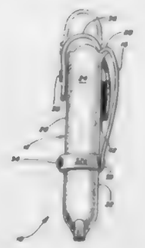
James O. Holtzclaw, Jr., Broomfield, and Marvin A. Novotny, Denver, both of Colo., assignors to The Hunter Company, Inc., Westminster, Colo.

Filed Jan. 14, 1986, Ser. No. 818,735
Int. Cl.⁴ F41C *33/02*
U.S. Cl. 224—243 **4 Claims**

1. A handgun holster comprising:

a handgun-receiving pocket member having a back wall for disposition adjacent the wearer and a front wall defining a pocket for receiving a handgun, the pocket having an open upper end for receiving a handgun, the back wall having a slot therethrough;

a flexible support strap extending downwardly along the back wall, the support strap having an upper end connected to an upper portion of the back wall and a lower end releasably attached to a lower portion of the back wall by fastening means to enable the holster to be removably supported on a belt, said fastening means comprising a generally T-shaped subassembly having a fixed portion with a pair of horizontally spaced snap fastener members thereon and a movable fastening strap, said movable fastening strap having a free end and a snap fastener member affixed thereto, said support strap having complementary snap fastener members thereon for cooperation with the snap fastener members on the subassembly, said fastening strap being movable between a detached position in which it extends straight downward from said fixed portion of the subassembly, and an attached position in which it is bent around the lower end of the support strap in a generally U-shaped configuration and fastened thereto; and



a safety strap assembly comprising: a safety strap of predetermined length spanning the opening at the upper end of the pocket member and passing through the slot in said back wall, first attachment means for releasably attaching a first portion of said safety strap adjacent a first end thereof to the front wall at a predetermined location on the front wall, and second attachment means for releasably attaching a second portion of said safety strap adjacent a second end thereof to the back wall of the holster at any position in a predetermined range;

the safety strap being adjustable between various positions to enable it to securely retain guns of various sizes in the pocket;

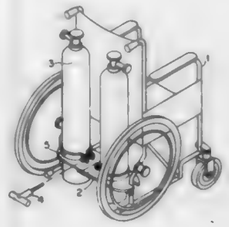
said second attachment means and the second end of the safety strap being disposed between the support strap and the back wall of the pocket member.

4,696,420

OXYGEN CARRIER

Helmut Kulik, 169 Green Pond Rd., Rockaway, N.J. 07866

Filed Jan. 17, 1986, Ser. No. 800,170
Int. Cl.⁴ B60R *7/00;* **A47C** *7/62*
U.S. Cl. 224—275 **1 Claim**



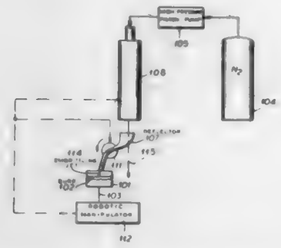
1. An oxygen tank carrier for use on a wheelchair, said wheelchair including two downwardly directed support arms on which the rear wheels are supported, said oxygen tank carrier comprising, two plates hinge together, each plate including a notch at the end farthest from the hinge, said notches engaging said downwardly directed support arms, said plates are pushed down in between said support arms, said plates including holes therein to accommodate an oxygen tank, each hole having a clamp associated therewith to secure the oxygen tank to said carrier, each said clamp being tighted to the tank with an Allan wrench and associated Allan screw.

4,696,421

METHOD OF DEBURRING OR DEFLASHING ARTICLES

Dieter Dürr, Baierbrunn, Fed. Rep. of Germany, assignor to Linde AG, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,555
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510964; Dec. 12, 1985, 3543910
Int. Cl.⁴ B26F *3/00;* **B29C** *37/02, 35/16*
U.S. Cl. 225—1 **13 Claims**



1. In a method of removing a flashing from an article having a flashing waste projecting from a body of the article and in which the flashing can be embrittled by a cryogenic coolant and the embrittled flashing can be broken away from the body, the improvement which comprises the steps in combination of:

initially embrittling said flashing by subjecting said flashing to a cryogenic coolant; and

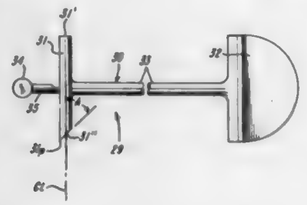
thereafter training a jet substantially consisting exclusively of said cryogenic coolant upon said flashing and controlling the flow velocity of said jet so that the flashing waste is broken away solely by the force and energy of said jet after embrittlement of said flashing waste, at least a portion of said jet being deflected onto said flashing initially to embrittle said flashing before the full jet is directly trained on said flashing to cut away said flashing.

4,696,422

HAND-HELD TAG ATTACHER, METHOD OF ATTACHING TAGS AND FASTENERS

Larry D. Strausburg, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 654,333, Sep. 25, 1984, Pat. No. 4,673,120. This application Sep. 22, 1986, Ser. No. 909,661
Int. Cl.⁴ A43D *69/00;* **B23P** *19/02, 19/04*
U.S. Cl. 227—39 **16 Claims**



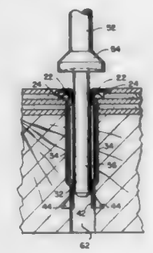
1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the tag attacher comprising: an attacher body having a hopper for holding a stack of tags and having a handle, a needle mounted to the body and having an elongate needle bore and an elongate side opening communicating with the needle bore, the needle having a pointed front end, means for feeding bar sections of fastener one-at-a-time into alignment with the needle bore, the body having a hopper for receiving a stack of tags, means for feeding one tag at a time from the hopper to a position behind the needle, a push rod engageable with a bar section of a fastener for driving the bar section through the tag and into and through the needle bore to attach the tag to merchandise, and means including a manually engageable actuator disposed at the handle, for moving the tag feeding means, the fastener feeding means and the push rod.

4,696,423

HIGH CAPACITY SHEAR FASTENER

John L. Ryan, 2814-27th West, Seattle, Wash. 98199

Continuation-in-part of Ser. No. 567,274, Dec. 30, 1983, abandoned. This application Mar. 5, 1986, Ser. No. 837,010
Int. Cl.⁴ B21J *15/04, 15/10*
U.S. Cl. 227—55 **7 Claims**



1. A tool for joining together wood or wood product assemblies designed to be subjected to high shear and bending stress loadings, said tool being adapted to drive a fastener into a prebored lead hole in the assemblies, the fastener being of the type comprising a hollow shaft core of predetermined dimensions formed by a plurality of shaft sides with a plurality of driving head flanges at one end of the hollow shaft core,

said tool comprising:

an adapter shank for mating with and transmitting driving force from a mechanical power source;

a circular driving flange attached to said shank, said flange having a generally concave driving face adapted to mate with the fastener driving head flanges and designed to vector the driving force from the mechanical power source inwardly toward the hollow shaft core and into the shaft sides;

an elongated, round, rigid rod attached to said shank and said circular driving flange, said rod being adapted to be inserted into the hollow shaft core with a light friction fit;

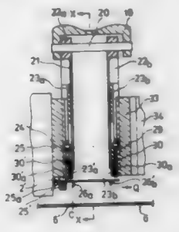
whereby a desired alignment of the prebored lead hole, the fastener, the tool and the mechanical power source can be maintained prior to and during driving of the fastener into the assemblies under severe mechanical impacting and compressive resistance while preventing both longitudinal and transverse deformation of the fastener and while maintaining design integrity of the fastener.

4,696,424

JUMPER WIRE INSERTING APPARATUS

Yoshihiko Misawa, Katano; Taira Ishii, Hirakata, and Yoshinobu Maeda, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 13, 1984, Ser. No. 671,127
Claims priority, application Japan, Nov. 14, 1983, 58-214375; Nov. 14, 1983, 58-214379; Nov. 14, 1983, 58-214380
Int. Cl.[4] B27F *7/21*
U.S. Cl. 227—84 **5 Claims**



1. Jumper wire inserting apparatus comprising:
a bobbin on which wire is wound;
an inserting unit;
jumper wire sending means for sending wire from said bobbin to said inserting unit, said sending means including means to control the length of the sent wire to be proportionate to the pitch of a pair of holes in a printed circuit substrate;
cutting means on said inserting unit for cutting the sent wire to produce a jumper wire;
transforming means on said inserting unit for bending the ends of the jumper wire to transform it to a length corresponding to the pitch of the hole pair,
said transforming means comprising first fixed members adjacent said cutting means and first movable members spaced from and adjustable toward and away from said first fixed members to correspond to the pitch of the hole pair;
means on said inserting unit for inserting the bent ends of the transformed jumper wire into the pair of holes in the printed circuit substrate, said inserting means comprising a second fixed member adjacent said cutting means and a second movable member adjustable, with said first movable members, toward and away from said second fixed member to correspond to the pitch of the hole pair; and
means connected to said transforming means, to said inserting means and to said sent wire length control means for simultaneously adjusting said first movable members, adjusting said second movable member and controlling the length of the sent wire.

4,696,425

PROGRAMMABLE ULTRASONIC POWER SUPPLY

James L. Landes, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 17, 1984, Ser. No. 631,658
Int. Cl.[4] B23K *1/06, 20/10*
U.S. Cl. 228—1.1 **19 Claims**

1. A generator for providing ultrasonic power to a wire bonder for connecting wires from locations on an integrated circuit to locations on a lead frame carrying said integrated circuit, comprising:
means for generating ultrasonic power for application to said bonder having voltage and current envelope waveforms dynamically controllable during formation of a bond to have one of a plurality of different, predetermined shapes, and
programmed digital computer means for continuously controlling during formation of the bond at least the amplitude of at least said voltage envelope waveform to have one of a plurality of different, predetermined shapes.

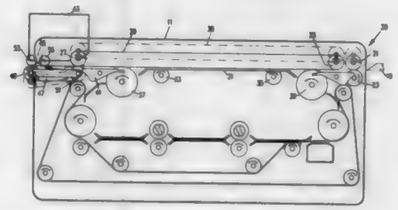


4,696,426

DOCUMENT READING ENVELOPE DEPOSITORY

Dale D. Decker, and Mary E. Stanhope, both of Charlotte, N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed May 30, 1986, Ser. No. 869,169
Int. Cl.[4] G07G *5/00*
U.S. Cl. 232—43.1 **11 Claims**



1. A depository comprising:
a single opening for receiving both envelopes and single document deposit items;
a common transport for receiving said deposit items from said opening;
a thickness detector mounted between said opening and an input end of said common transport for detecting whether a deposit item is a single document;
a diverter mounted at an output end of said common transport for diverting single documents from said common transport to an input end of a read transport;
said diverter passing deposit items which are envelopes to a deposit receiving means.

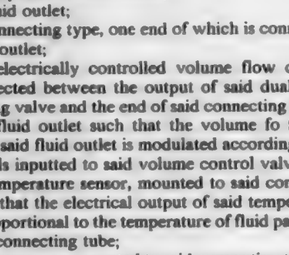
4,696,427

METHOD OF TRANSFORMING A PRE-EXISTING HEAT INSTALLATION, AND CONTROL DEVICE FOR IMPLEMENTING THE METHOD

Jacky Pichot, La Grande Paroisse, and Jacques Oddou, Fontainebleau, both of France, assignors to Electricite de France, France

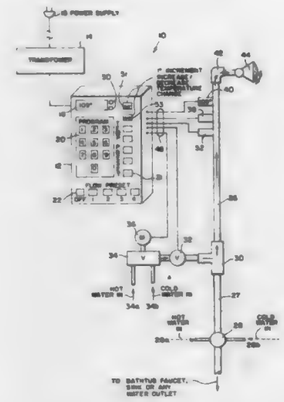
Filed Mar. 25, 1986, Ser. No. 843,702
Claims priority, application France, Mar. 28, 1985, 85 04665
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—1 E **17 Claims**

1. A method of transforming a pre-existing heating installation having a main heat generator, at least one radiator, a three path modulating mixer valve wherein a first path of said valve is connected to the output of the main generator, a second path of the valve is connected to the input of the radiator, the output of the radiator is connected to input of main heat generator and is also connected to the third path of the valve, a motor for controlling opening and closing of the valve, a first probe measuring the outside temperature T_{ext}, a second probe disposed between the second path of the valve and the input of the radiator to measure the departure temperature T_d of the fluid supplied to the radiator, a comparator-regulator which compares the outside temperature T_{ext} and the departure temperature T_d and which generates on two outputs of the comparator-regulator two on/off signals for actuating said motor, said method comprising the steps of
(1) adding a plurality of auxiliary heat generators in the form of heat pumps which are connected in parallel between the output of the radiator on the one hand and the input of the main heat generator and the third path of the valve on the other hand,
(2) adding between said comparator-regulator and said motor controlling the mixer valve a control device which comprises:



an integrator module having its inputs connected to the outputs of the comparator-regulator,
a plurality of threshold relays having respectively different thresholds, said threshold relays being controlled by the output of said integrator module, so as to bring into service in succession the auxiliary heat generators, and to bring into service the main heat generator when the signal output by the integrator module exceeds a predetermined threshold, and
a switch controlled by said threshold relays, said switch being closed when the signal output by the integrator module exceeds said predetermined threshold to apply the on/off signals generated by the comparator-regulator to said motor.

the rate of flow of said fluid passing through said connecting tube;
(i) an electrical controller which uses the signal outputted by said temperature sensor to modulate the signal inputted to said mixing valve actuating motor, thereby controlling the temperature of the fluid discharge from said fluid outlet; and, also uses the signal outputted by said flow sensor to modulate the signal inputted to said volume flow control valve, thereby controlling the rate of flow of the fluid discharged from said fluid outlet; and,



(j) a T-fitting, two of whose legs are connected between the output of said volume control valve and said connecting tube, wherein the third leg is connected to a conventionally manually controlled source of pressurized liquid, so that when said volume flow control valve is turned off, said conventional source is capable of being used to manually control the temperature and rate of flow of liquid discharged from said water outlet.

4,696,428

ELECTRONIC FLUID TEMPERATURE FLOW CONTROL SYSTEM

Paul Shakalis, 19 Gordon Ave., Plainview, N.Y. 11803

Filed Jul. 10, 1986, Ser. No. 884,051
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.12 **14 Claims**

1. An electronic fluid temperature and flow control system comprising:
(a) a source of hot and cold pressurized fluid;
(b) a dual temperature mixing valve which, at its output, controls the ratio of said hot to said cold fluid;
(c) a mixing valve actuator motor which activates said dual temperature mixing valve depending upon electrical signals inputted to said motor;
(d) a fluid outlet;
(e) a connecting type, one end of which is connected to said fluid outlet;
(f) an electrically controlled volume flow control valve connected between the output of said dual temperature mixing valve and the end of said connecting tube opposite said fluid outlet such that the volume fo fluid released from said fluid outlet is modulated according to electrical signals inputted to said volume control valve;
(g) a temperature sensor, mounted to said connecting tube, such that the electrical output of said temperature sensor is proportional to the temperature of fluid passing through said connecting tube;
(h) a flow sensor, mounted to said connecting tube, such that the electrical output of said flow sensor is proportional to

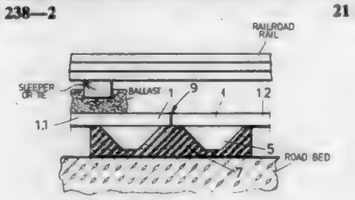
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4,696,429

ELASTIC MAT FOR A BALLAST BED UNDERLAYMENT

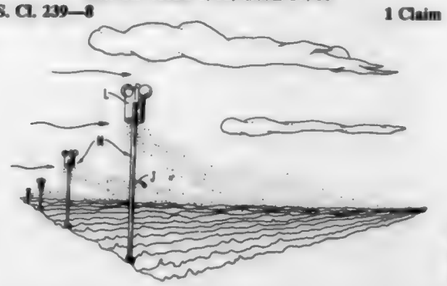
Hermann Ortwein, Cologne, Fed. Rep. of Germany, assignor to Clouth Gummiwerke Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 754,029
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425647
Int. Cl.[4] E01B *2/00, 19/00;* **E01C** *3/06, 5/18*
U.S. Cl. 238—2 **21 Claims**



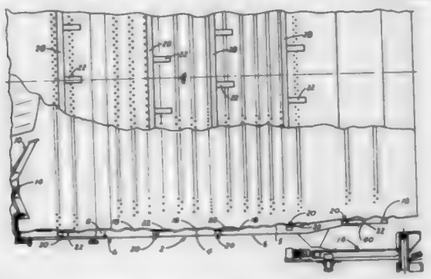
1. The combination with a raillway road bed and a ballast of a ballast-underlayment mat disposed between said bed and said ballast and comprising an elastic body formed on an underside with a plurality of projections and along an upper side with an upper layer of a high-strength fabric exposed to penetrating tendencies of the ballast.

4,696,430
METHOD AND APPARATUS FOR APPLYING POWDERED SUBSTANCES ON FARM FIELDS, FORRESTS AND SWAMP AREAS
Genaro C. Hernandez, Paseo de las Fuentes, 4412 Fracc, Villa de las Fuentes, Monterrey, Nuevo Leon, Mexico
Division of Ser. No. 757,938, Jul. 23, 1985, Pat. No. 4,609,152. This application May 12, 1986, Ser. No. 861,717
Int. Cl.[4] A62C *1/12*; B05B *17/00*
U.S. Cl. 239—8 1 Claim



1. A method of applying a powdered substance over a given area, comprising the steps of:
providing a plurality of wind-powered devices for slowly dispersing said powdered substance, each of said devices including a container for holding a quantity of said powdered substance and means directly powered by the wind for dispensing said powdered substance from said container;
positioning said plurality of devices spaced apart in a grid avove the given areas; and
placing a quantity of the powdered substance in said containers of one or more of the devices.

4,696,431
AUGMENTOR LINER SUPPORT BAND HAVING FINGER POSITIONERS
Paul M. Buxe, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Nov. 29, 1985, Ser. No. 803,048
Int. Cl.[4] B64D *33/04*
U.S. Cl. 239—265.15 13 Claims



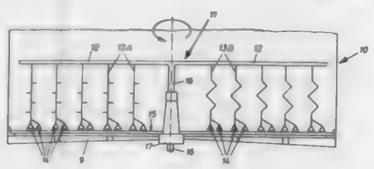
1. An augmentor liner having an outer surface for a jet engine; an augmentor liner support band being located around the outer surface of the augmentor liner; said support band having an inner strip with an inner surface spaced from the outer surface of the liner, an outer strip spaced from said inner strip, and a corrugated strip located between said inner strip and outer strip; means fixing said strips together, said corrugated strip permitting flow through said support band; said inner strip having a plurality of axially extending flexible fingers for fixing said support band in place; said axially extending flexible fingers permitting flow therebetween; each axially extending flexible finger being fixedly attached to an axially spaced portion of said augmentor liner.

4,696,432
FORAGE HARVESTER BLOWER
Roger A. Russ, and John J. Hennen, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Apr. 25, 1986, Ser. No. 855,658
Int. Cl.[4] B02C *18/22*
U.S. Cl. 241—101.7 5 Claims



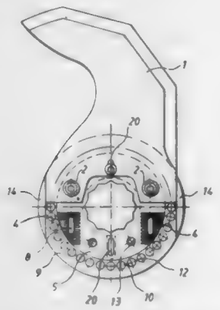
1. In a forage harvester including an impeller housing including a section arranged cylindrically about a horizontal axis and containing an impeller having a rotor mounted for rotation about said axis and including a plurality of radially extending blades having outer ends which trace a cylindrical path spaced closely to said housing section, an inlet duct extending fore-and-aft substantially tangentially into a lower forward quadrant of said housing, an outlet duct extending upwardly substantially tangentially out from an upper rear quadrant of said housing, and a rotary crop handling apparatus mounted for delivering crop tangentially into an outer portion of the blades, the improvement comprising: said rotor includes a shaft having a pair of radially extending plates fixed thereto at axially spaced locations; a plurality of equiangularly spaced uniform diameter, straight rods arranged parallel to said shaft and being axially shiftably received in said pair of plates for permitting their selective removal therefrom; releasable securing means for preventing axial movement of each rod relative to the pair of plates and at least one blade being pivotally mounted on each rod.

4,696,433
BREAKING UP DEVICE FOR USE IN STRAINING TUNS TO OBTAIN WORT IN THE PRODUCTION OF BEER
Bernhard Lenz, and August Lenz, both of D-8710, Kitzingen, Fed. Rep. of Germany
Filed Jul. 23, 1986, Ser. No. 888,370
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528647
Int. Cl.[4] B02C *18/10*
U.S. Cl. 241—199.12 15 Claims



1. Breaking up device for use in a straining tun having a filter base to obtain wort in the production of beer, the device comprising laterally extending arms fastened to an upright, rotatable shaft, the arms supporting a row of radially spaced cutting blades having bottom ends, cutting shoes fastened to the bottom ends of the cutting blades in order to loosen up brewer's grain cakes on the filter base of the straining tun along different circular paths when the shaft is rotated, characterized in that at the bottom end of each cutting blade (13) are arranged at least two cutting shoes (14) side by side, so that an intensified loosening up of the brewer's grain cake is produced by the cutting shoes (14) of each blade (13) rotating on different circular paths.

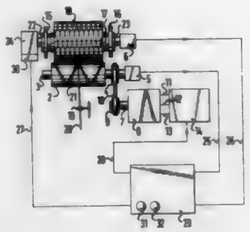
4,696,434
CUTTER HEAD FOR MEAT CUTTER
Paul Vomhof, Bad Laasphe; Karlheinz Schmidt, Steffenberg-Quotshausen, and Peter Oster, Biedenkopf-Wallau, all of Fed. Rep. of Germany, assignors to Kramer & Grebe GmbH & Co. KG, Biedenkopf-Wallau, Fed. Rep. of Germany
Filed May 16, 1986, Ser. No. 864,132
Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518530
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—282.2 13 Claims



1. A cutter head for a meat cutter comprising
a cutter adjustable in a radial direction;
a securing disk for mounting said cutter positively locked to a rotatable shaft;
holding means allowing radial adjustment and axially securing said cutter to said securing disk;
said securing disk having at least one toothed area on a front surface of said securing disk having teeth forming grooves and ridges extending outward from the plane of said securing disk;
at least one securing bolt means for securing said cutter to said securing disk in the radial direction and penetrating an aperture in said cutter, said securing bolt means having a front toothing with grooves and ridges complementary to said toothed area of said securing disk for adjustment in the radial direction.

4,696,435
METHOD AND DEVICE FOR AVOIDING THE FORMATION OF IRREGULAR TURNS DURING THE WINDING OF A CROSS-WOUND COIL
Ferdinand-Josef Hermanns, Erkelenz, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchen-Gladbach, Fed. Rep. of Germany
Filed Jun. 12, 1986, Ser. No. 873,392
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521152
Int. Cl.[4] B65H *54/38*
U.S. Cl. 242—18.1 10 Claims

1. Method of avoiding the formation of irregular thread turns during the winding of a cross-wound coil driven by a drive drum formed with reversing thread grooves cooperating with a thread guide, a rotating element connectible to the cross-wound coil being braked with a varying braking force, which comprises the steps of continuously varying the peripheral velocity of the drive drum, and simultaneously braking, at least one of the cross-wound coil and the rotating element connected thereto, with a variable braking force in such manner that the peripheral velocity of the cross-wound coil remains constant within given tolerance limits.



4,696,436
MULTI-POSITION YARN SPINNING/WINDING APPARATUS
John Whiteley, Clitheroe, England, assignor to Hollingsworth (UK) Limited, Accrington, England
Filed Oct. 16, 1986, Ser. No. 920,101
Claims priority, application United Kingdom, Jun. 20, 1986, 8615090
Int. Cl.[4] B65H *54/20, 54/28*
U.S. Cl. 242—35.5 R 10 Claims



1. Multi-position yarn handling machine including:
(a) a plurality of yarn handling positions along the machine;
(b) respective yarn package-forming means including a package former at each said position;
(c) respective traverse guide means for each package-forming means for traversing the yarn across said package former; and
(d) means driving the traverse guide means such that at least the majority of said traverse means execute traverse guide motions phased such that pairs of said positions which are not necessarily alongside one another but are on the same side of the machine have the traverse guide motions of their traverse means directly out of phase, wherein said pairs comprise a first pair having a first phase angle and a second pair having a second phase angle, such that the first phase angle is less than 180° displaced from the second phase angle.

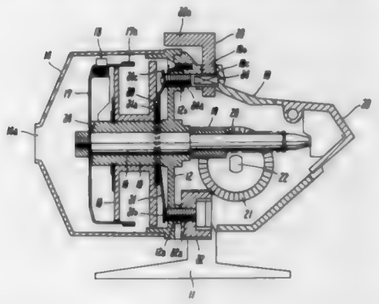
4,696,437
DRAG ADJUSTING DEVICE FOR A CLOSED-FACE TYPE FISHING REEL
Osamu Yoshikawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Continuation of Ser. No. 740,520, Jun. 3, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 885,743
Int. Cl.[4] A01K *89/01, 89.02*
U.S. Cl. 242—84.5 A 1 Claim

1. In a closed-face type fishing reel including a reel body, a spool supported rotatably to said reel body, and a drag adjusting device for applying a braking force against rotation of said spool, said device comprising:
a brake plate disposed at one axial side of said spool,
a drag actuating plate having two lengthwise ends extending radially relative to said spool and urging said brake plate toward a side of said spool to apply a braking force to said

spool, said two lengthwise ends being disposed at a phase difference of about 180° relative to one another,

a drag setting thumb nut operatively engaged with one lengthwise end of said drag actuating plate, for changing a position of said drag actuating plate with respect to said spool and for setting the braking force to be applied to said spool, said drag setting thumb nut being positioned on said reel body at a lower portion thereof which is close to a mounting leg means of said reel,

an adjusting member operatively engaged with another lengthwise end of said drag actuating plate for adjusting said braking force set by said drag setting thumb nut by operation of said adjusting member in an amount larger than that adjusted by operation of said thumb nut, said



adjusting member being positioned on said reel body at an upper portion thereof opposite to said position of said drag setting thumb nut, and

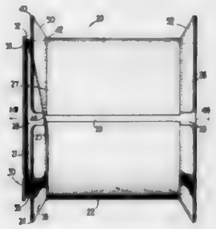
a means for limiting an amount by which said adjusting member can adjust said braking force within a predetermined range, said adjusting member comprising a lever supported by a shaft member including a first screw means screwably supported by a second screw means mounted on said reel body, for holding said adjusting member at an adjustment position to which said adjusting member has been moved by an angler, wherein said drag setting thumb nut is scewably supported to said reel body and said first screw means has a thread pitch which is larger than a thread pitch by which said drag setting thumb nut is supported to said reel body.

4,696,438

SPOOL FOR HOLDING OPTICAL FIBER

Daryl L. Myers, Lawrenceville, Ga., assignor to American Telephone and Telegraph Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Oct. 24, 1986, Ser. No. 922,593
Int. Cl.⁴ B65H *55/00, 75/14*
U.S. Cl. 242—118.41 **13 Claims**



1. A spool which is adapted to hold convolutions of an optical fiber, said spool comprising:

a hub having a longitudinal axis and a cross sectional configuration which is normal to the longitudinal axis and which is generally circular;

first and second flanges being attached to opposite ends of said hub with each of said flanges having a truncated conical shape with a large diameter portion thereof facing outwardly and a small diameter portion thereof being attached to said hub and further with said first flange including a slot which is formed radially through said first flange; and

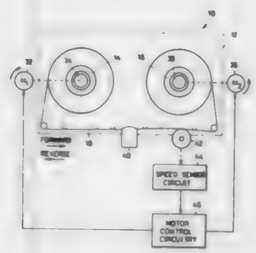
a collector attached to said first flange for accumulating a few convolutions of the optical fiber to provide access to an end portion of the optical fiber, said collector including a flange and a peripheral surface on which the convolutions are wound with said slot in said first flange having sufficient width and the thickness of said first flange being sufficiently thin to minimize the curvature of a portion of the optical fiber which extends through said slot from convolutions in said collector to convolutions on said hub.

4,696,439

TAPE SPEED AND TENSION CONTROL SYSTEM FOR A MAGNETIC TAPE CASSETTE APPARATUS

Motoyuki Sukigara, Tokyo, and Kazuhiko Yasuda, Fussa, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,757
Claims priority, application Japan, Apr. 12, 1985, 60-78063
Int. Cl.⁴ G11B *15/32, 15/46, 15/54*
U.S. Cl. 242—186 **7 Claims**



1. In an apparatus for use with a magnetic tape cassette of the type having a length of magnetic tape which extends between first and second hubs within a housing for travel in both forward (from the first to the second hub) and reverse (from the second to the first hub) directions and which is partly exposed through a series of apertures defined in the front edge of the cassette housing, the apparatus including a magnetic head for relative sliding contact with the tape of the tape cassette through a centrally located one of the apertures in the cassette housing, a tape transport and tape speed and tension control system comprising:

(a) a first variable speed drive motor for driving the first cassette hub;

(b) a second variable speed drive motor for driving the second cassette hub;

(c) a speed sensing roller arranged for frictional engagement with the tape through another of the apertures in the cassette housing which is closer to the second cassette hub than to the first cassette hub;

(d) a speed sensor circuit driven by the speed sensing roller for generating an electric tape speed signal representative of actual tape speed;

(e) a motor drive circuit connected to the speed sensor circuit and responding to the tape speed signal for putting out a motor drive signal for delivery to a takeup side one of the drive motors for constant tape speed during tape travel in either direction;

(f) first switching means for causing the motor drive signal to be applied to the first drive motor during tape travel in the reverse direction, and to the second drive motor during tape travel in the forward direction;

(g) a tape tension control circuit for generating a tape tension signal in response to a tape reel diameter signal indicative of the increasing diameter of the tape reel on a takeup side one of the cassette hubs during tape travel in either direction, the tape tension signal increasing in magnitude with the increase in the diameter of the tape reel on the takeup side one of the cassette hubs;

(h) second switching means connected between the tape tension control circuit and the first and second drive motors for applying the tape tension signal to the first drive motor during tape travel in the forward direction and to the second drive motor during tape travel in the reverse direction, either of the first and second drive motors when applied with the tape tension signal of increasing magnitude being effective to exert increasing tension on the tape; and

(i) a reverse tape tension drop circuit connected to the tape tension control circuit for making the tape tension signal smaller in magnitude during reverse tape travel than during forward tape travel under the condition of the same tape reel diameter on a takeup side one of the cassette hubs;

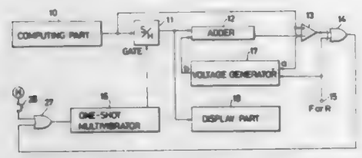
(j) whereby the tape tension is rendered approximately the same at the magnetic head during forward and reverse tape travels under the condition of the same tape reel diameter on a takeup side one of the cassette hubs, in the face of the dynamically asymmetrical tape path due to the offset arrangement of the speed sensing roller in frictional engagement therewith.

4,696,440

INFORMATION SIGNAL AND/OR REPRODUCING APPARATUS

Isao Harigaya, and Kouji Takahashi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha

Continuation of Ser. No. 727,584, Apr. 26, 1985, abandoned.
This application Oct. 15, 1986, Ser. No. 919,540
Claims priority, application Japan, Apr. 28, 1984, 59-86888
Int. Cl.⁴ B65H *61/00;* **G03B** *1/16*
U.S. Cl. 242—191 **11 Claims**



1. An information signal recording and/or reproducing apparatus for recording and/or reproducing an information signal on or from a tape-shaped record bearing medium wound around a pair of reels by allowing the record bearing medium to travel in a longitudinal direction thereof, said information signal recording and/or reproducing apparatus comprising:

(a) detecting means for detecting a rotating speed of at least one of said pair of reels to produce a first information;

(b) computing means for computing an amount of a portion of said tape-shaped record bearing medium wound on one of said pair of reels based on said first information to produce a second information;

(c) display means for making a display in response to said second information; and

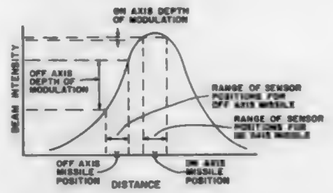
(d) changing means for changing a display step of said second information by said display means on the basis of said first information.

4,696,441

MISSILE REFERENCED BEAMRIDER

Michael M. Jones, Arab; Walter E. Miller, Jr., and Robert R. Mitchell, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 6, 1986, Ser. No. 860,354
Int. Cl.⁴ F41G *7/26*
U.S. Cl. 244—3.13 **4 Claims**



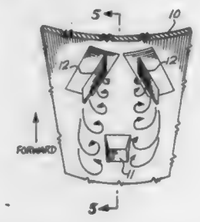
1. A method for generating guidance signals to a rotating missile comprising the steps of generating and transmitting a guidance beam having a center position along which the missle is to be guided, said guidance beam having a cross section such that the amplitude of the intensity of the beam will decrease as a function of the distance from the center of the beam, locating a sensor off axis on said rotating missile for sensing said amplitude of said guidance beam and generating a modulation signal, detecting modulation signal of said sensor for generating a guidance signal, detecting phase of the modulation signal of said sensor for determining a pointing direction towards the center of said guidance beam; generating and transmitting a reference beam having a cross section in which there is no change in the amplitude of the intensity of the reference beam respective to distance from the center of the reference beam, and said sensor detecting this reference beam amplitude so that a function of the distance a missile is from the center of said guidance beam can be generated.

4,696,442

VORTEX GENERATORS FOR INLETS

Frederick Mazzitelli, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 14, 1986, Ser. No. 885,062
Int. Cl.⁴ B64D *33/02*
U.S. Cl. 244—53 B **11 Claims**



1. Inlet fluid flow inducing means, comprising: a pair of fin-like elements mounted upstream to the direction of free stream fluid flow over an inlet; said pair of fin-like elements being spaced apart normal to the direction of the free stream fluid flow for producing a pair of trailing vortex filaments therefrom; said pair of trailing vortex filaments, in cross-section, having adjacent counter-rotating vortices that merge in a similar-directional fluid flow into a downstream area between the fin-like elements and the inlet; said pair of fin-like elements being optimally spaced apart normal to the direction of the free

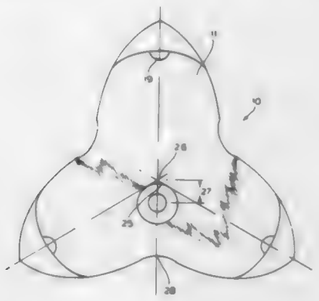
stream fluid flow to insure that the pair of trailing vortex filaments produced therefrom, are divergently swept apart to pass astride the inlet in order that no vortices are ingested by the inlet; thereby, inducing a higher mean total pressure in the fluid mass flow ingested by the inlet.

4,696,443

SCATTERABLE RAM AIR DECELERATOR

Alexey T. Zacharin, 37 Copeland Rd., Denville, N.J. 07834

Filed Jan. 21, 1986, Ser. No. 821,035
Int. Cl.[4] B64D *17/80*
U.S. Cl. 244—113 **10 Claims**



1. An inflatable decelerator for deployment with an attached load unit in an airstream comprising:
   - an inflatable chamber having a center and having a plurality of radially outwardly projecting lobes relative to the center and in spaced-apart relationship to each other;
   - at least one air inlet means for inletting air to the inflatable chamber;
   - air scoop means operatively related to each said air inlet means for capturing a portion of external airflow around said chamber and directing said portion into said inlet to inflate said chamber; and
   - a mounting means for mounting a body to the inflatable decelerator, said mounting means being affixed to the inflatable decelerator at a location offset from the center of the inflatable chamber whereby a lateral force is exerted on the decelerator during descent in to an air stream to cause lateral drifting of the decelerator.

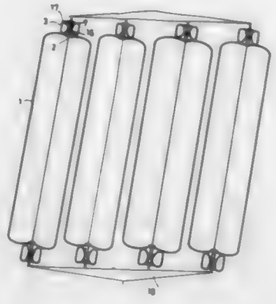
4,696,444

DEVICE FOR COUPLING A BALLOON ENVELOPE WITH AN ELEMENT EXTERNAL TO THE ENVELOPE

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales (C.N.E.S.), Paris, France

Filed Apr. 18, 1986, Ser. No. 853,446
Claims priority, application France, Apr. 25, 1985, 85 06465
Int. Cl.[4] B64B *1/40, 1/50*
U.S. Cl. 244—127 **11 Claims**

1. A coupling device for coupling a flexible ballon envelope (1) having symmetry of revolution about an axis, with an external element, said device comprising:
   - a ballonet (3) made of flexible material, having symmetry of revolution about an axis and having two fasteners (4, 5) located on the axis of revolution on two opposite zones of the surface of said ballonet, said fasteners (4, 5) being connected to a harness of high tensile-strength cables (7, 17) for providing their relative positioning, in a position where at least one of said fasteners (5) is kept away from the corresponding zone of the surface of said ballonet,
   - means (2, 16) for coupling the envelope and one of said fasteners (5) of the ballonet (3), fitted to position the axis of revolution of said ballonet approximately in the extension of the axis of revolution of the envelope, so as to create a contact surface (Z1) between said ballonet (3) and said envelope, away from said axis of revolution, and



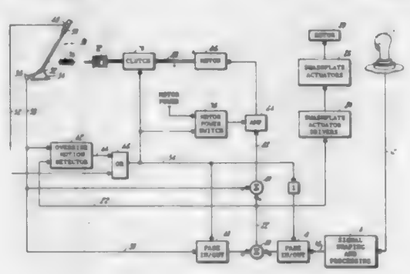
   - link means (8–15) for connecting the other of said fasteners (4) of said ballonet (3) to the external element.

4,696,445

COLLECTIVE CONTROL SYSTEM FOR A HELICOPTER

Stuart C. Wright, Woodbridge; Lorren Stiles, Jr., Woodbury, and Don L. Adams, Fairfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 18, 1986, Ser. No. 909,046
Int. Cl.[4] B64C *13/12*
U.S. Cl. 244—229 **4 Claims**



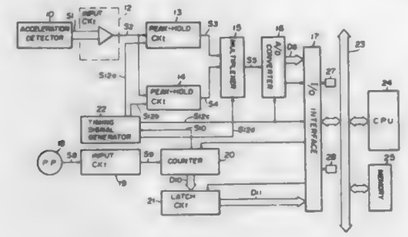
1. A helicopter collective control system comprising:
   - a summing junction (20) for providing a collective position command signal to a mechanism for determining the collective pitch of the helicopter main rotor blades;
   - a multi-axis, force-type control stick (10) operable to provide a first signal indicative of a desired blade collective pitch;
   - a displacement-type control stick (30) and associated position transducer operable to provide a second signal indicative of a desired blade collective pitch;
   - first means (18) for alternately fadeing in or out the first signal to the summing junction (20);
   - second means (40) for alternately fading in or out the second signal to the summing junction (20);
   - third means for simultaneously causing the first means (18) to fade in and the second means (40) to fade out, and for alternately simultaneously causing the first means (18) to fade out and the second means to fade in.

4,696,446

SYSTEM FOR DETECTING FLAT PORTION OF PERIPHERAL SURFACE OF VEHICLE WHEEL

Azuhi Mochizuki, Yokohama; Kira Ozawa, Mie; Shinichiro Fujita, and Kuniaki Yamada, both of Tokyo, all of Japan, assignors to Shinko Electric Co. Ltd. and Japanese National Railways, both of Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,535
Claims priority, application Japan, Apr. 7, 1983, 58-61472
Int. Cl.[4] B61L *1/20;* **B61K** *13/00*
U.S. Cl. 246—169 S **1 Claim**



1. A system for detecting a flat portion of a peripheral surface of a wheel mounted on a vehicle in rolling engagement with a track rail, comprising:
   - a. means mounted on the vehicle in the vicinity of the wheel for detecting vibrations of the wheel caused by the rolling of the wheel on the rail, and producing a first detection signal representative of the magnitude of the vibrations;
   - b. rotation detecting means mounted on the vehicle for detecting the rotation of the wheel and producing a predetermined number of pulses for each rotation of the wheel;
   - c. memory means having a plurality of storage areas, each having a plurality of memory locations equal in number to said pulses produced during one rotation of the wheel, said memory means further storing data representative of the relationship between the length of a flat portion and the vibration of the wheel;
   - d. addressing means, responsive to said pulses, for addressing the memory locations of said memory means to sequentially store data corresponding to said first detection signal into said memory locations over said plural storage areas in accordance with the rotation of the wheel;
   - e. means for comparing the data stored in said plurality of memory locations to detect a flat portion of the wheel when one of the data abruptly increases from the immediately-preceding data and when a difference between said one data and the data in the corresponding-disposed memory locations of the storage areas, other than the storage area in which the memory location storing said one data, is below a predetermined level; and
   - f. flat length determination means responsive to said detection of a flat portion for reading the data in memory to determine the length of the wheel flat based on the data in memory and said one data.

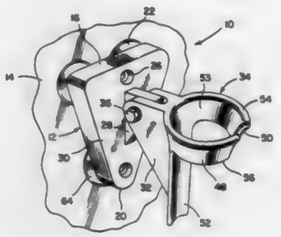
4,696,447

BLOW DRYER HOLDING DEVICE

Dennis Strecker, 1079 Colonial Club Dr., Harahan, La. 70123

Filed May 12, 1986, Ser. No. 861,997
Int. Cl.[4] F16B *47/00*
U.S. Cl. 248—206.3 **13 Claims**

1. A device for holding a portable hair dryer on a vertical surface, the hair dryer having a rigid handle portion and an air discharge portion, said holding device including a base, means for attaching the base to the vertical surface and retainer means for receiving the handle portion of the hair dryer in spaced relation to the base, the improvement comprising means pivotally connecting the retainer means to the base for angular displacement about a pivot axis to an adjusted position, frictional means connected to the pivotal connecting means for holding the retainer means in said adjusted position and elongated abutment means depending from the retainer means in



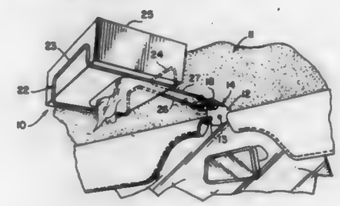
engagement with the handle portion for maintaining the air discharge portion of the hair dryer operatively oriented about vertical axis within the retainer means.

4,696,448

TISSUE BOX HOLDER

Abolfazl Mazloom; Mazloom, Ahmad; Manoochehr Mazloom, and Iraj Mazloom, all of 900 S. Kilbourne Rd., Columbia, S.C. 29205

Filed Dec. 2, 1985, Ser. No. 806,980
Int. Cl.[4] A47K *1/08*
U.S. Cl. 248—311.2 **3 Claims**



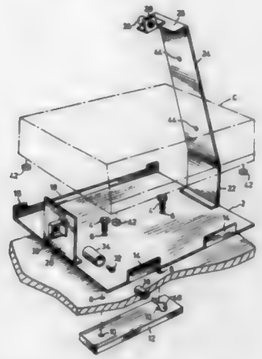
1. An apparatus for mounting, in an inverted position, a standard tissue box to a visor holder in the middle of the front windshield of an automobile, which apparatus comprises:
   - a bracket, having bottom ends for attaching said bracket beneath said visor holder and having top ends pressed downwardly to form half circle ends, each half circle end having a hole centered therein, and
   - a tube mounted between said half circle ends of said bracket to serve as a retainer, and
   - a wire holder, rectangular in shape, having an upwardly extending portion at the front and a downwardly extending portion at the back of said wire holder, to slidably engage the sides of said standard tissue box and having extending arms whose extreme ends are bent inwardly in the horizontal plane at a 90 degree angle and repectively pass through the centered holes of said opposing half circle ends and rest well within the opposing ends of said tube, and
   - two coil springs, each coil spring wrapped around the opposite ends of said tube and each coil spring having an inside end, to engage the underside of said bracket, and having an outside end bent outwardly in the horizontal plane at a 90 degree angle, to form a hook, under tension, beneath and partially encircling one of said extending arms of said wire holder.

4,696,449

SECURITY DEVICE FOR ELECTRONIC EQUIPMENT

Kenneth Woo, Toronto, and Z. Mamak, Kettleby, both of Canada, assignors to The Board of Governors of Ryerson Polytechnical Institute, Toronto, Canada

Filed Nov. 7, 1985, Ser. No. 795,840
Int. Cl.[4] E05B 73/00
U.S. Cl. 248—553 5 Claims



1. A security device for preventing unauthorized removal of a computer or peripheral unit, comprising a tray having a bottom wall with an upper surface of a size to provide distributed support to the base of a single unit to be protected; upstanding flanges at front and rear edges of the bottom wall of the tray, said flanges being located to prevent substantial forward or rearward movement of the unit to be protected when standing on the bottom of the tray; releasable securement means to secure a lower surface of the bottom wall of the tray in tight engagement with a support member, said releasable securement means comprising a plate beneath the support member and extending in a plane parallel to the bottom wall of the tray, and a plurality of screws having threaded shanks extending downwardly from heads engaging the upper surface of the bottom wall of the tray, through the bottom wall of the tray and the support member, and having lower ends received in threaded bores in the plate, the screw heads being accessible only from the upper surface of the tray; side plates extending upwardly from the lateral edges of the tray such as to flank closely portions of the end surfaces of the unit to be protected which are not required for user access or ventilation; a crossbar hinged to one of said side plates and movable to an operative position extending between the side plates closely adjacent a zone extending laterally across a full width of an upper surface of the unit which is not required for user access or maintenance; and means releasably locking said crossbar in said operative position, with the side plates supporting the crossbar to form with the bottom wall of the tray a releasable girdle having an internal perimeter not substantially greater than the external perimeter of the unit in the plane of the girdle, whereby the girdle embraces the unit sufficiently closely to prevent disengagement of the latter from the upstanding flanges on the tray.

4,696,450

FAN MOTOR ASSEMBLY SUPPORT FRAME

Kuo C. Huang, No. 17, Hsin Ren Road, An-Ping District, Tainan, 000

Filed Apr. 4, 1986, Ser. No. 848,266
Int. Cl.[4] F16M 1/00
U.S. Cl. 248—661 11 Claims

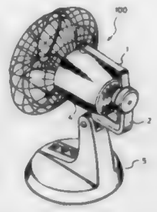
1. A fan assembly, comprising

a fan,

motor means coupled to said fan for rotating said fan with respect to a first fan axis of rotation,

a motor housing in which said motor means are housed,

primary frame means coupled to said motor housing for permitting pivotal movement of said motor housing and primary frame means with respect to each other around a second axis which is substantially perpendicular to said first fan axis of rotation,



secondary frame means coupled to said primary frame means for permitting pivotal movement of said primary frame means and secondary frame means with respect to each other around a third axis which lies substantially in the same plane as and which is substantially perpendicular to said second axis, and

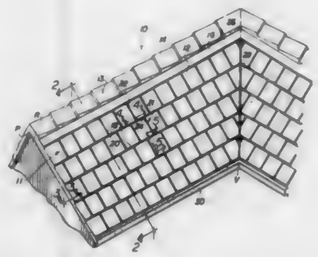
a base on which said secondary frame means are mounted.

4,696,451

GRID SYSTEM AND METHOD FOR CAST FORMING MONOLITHIC CONCRETE ROOF COVERING

Peter W. Mansfield, 511 59th St., Holmes Beach, Fla. 33510

Continuation-in-part of Ser. No. 749,391, Jun. 27, 1985, Pat. No. 4,624,082. This application Nov. 24, 1986, Ser. No. 934,946
Int. Cl.[4] E04G 9/08, 9/10; E04B 7/02
U.S. Cl. 249—16 12 Claims



2. A reusable grid system for cast forming a monolithic roof covering of concrete or other like pourable, curable material atop a sloped roof, the cured roof covering having an exposed finished surface and having the stepped, segmented appearance of a conventional tile roof, said grid system comprising:

a plurality of elongated dam bars placeable parallel and spaced apart horizontally atop the roof;

a plurality of elongated spacer bars releasably and supportively connectable transversly and spaced apart between each two adjacent said horizontally disposed dam bars;

means for supportively spacing the bottom edge of each said dam bar above the roof and forming a flow slot for the pourable concrete;

the finished concrete surface formed by the plurality of planes each defined by the top edge of each particular said horizontally disposed dam bar and the top edges of said transversly disposed spacer bars;

each of said planes generally parallel and offset in step fashion one to another;

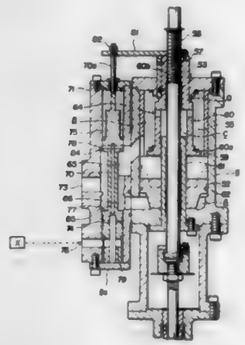
the bottom edge of each said transversly disposed spacer bar spaced above the roof so as to form recess lines in the finished surface of the roof covering.

4,696,452

TRIP THROTTLE VALVE

Teiji Miyagawa; Yoshio Iwamura, and Masao Hayakawa, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation of Ser. No. 573,378, Jan. 24, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 834,103
Claims priority, application Japan, Jan. 28, 1983, 58-9970[U]; Jan. 28, 1983, 58-9971[U]; Jan. 28, 1983, 58-9972[U]
Int. Cl.[4] F16K 31/143
U.S. Cl. 251—25 4 Claims



1. A trip throttle valve operable under hydraulic pressure comprising:

a main passage for passing fluid therethrough and having a valve body and a valve seat therein;

a valve stem secured to said valve body at one end and arranged to close and open said main passage when said stem is moved in its axial direction;

a hydraulic portion including a piston, a sleeve and a cylinder disposed around an end portion of said stem opposite said valve body, both said piston and said sleeve being movable along an axial direction of said stem, said stem, having a male thread around said end portion which is threadably engaged with said sleeve, which has a compatible female thread, so that the rotation of said stem will cause relative axial movements therebetween, a compression spring located in said cylinder wherein said sleeve together with stem are urged by said compression spring in a direction to close said main passage, a stopper positioned in said cylinder wherein said piston is urged towards said sleeve when hydraulic pressure is applied through an inlet port of said hydraulic portion, and is arrested at a terminal position within said cylinder by said stopper, said piston restricting movement of said sleeve when said sleeve abuts against said piston arrested at said terminal position under hydraulic pressure and thereafter allowing axial movement of said stem upon rotation of said stem;

a by-passing passage for the hydraulic liquid to discharge said liquid supply through said inlet port outwardly from said outlet port of said hydraulic portion except in a case when said pistion is in said arrested terminal position, said inlet and said outlet port being arranged to discharge liquid from said hydraulic portion when the supply of the hydraulic liquid to said hydraulic portion is stopped so as to cause sudden movement of said sleeve under biasing of said compression spring so as to instantly close said main passage;

closing means for closing said by-passing passage;

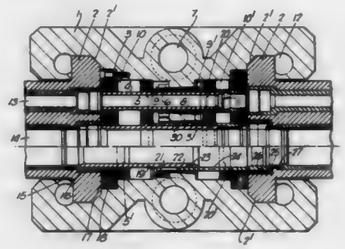
manipulating means for rotating said valve stem, said piston being disconnected from said sleeve and said stem and wherein a movable stroke of said piston is not greater than a movable distance of said sleeve, so that axial movement of said stem by rotation thereof causes said sleeve to move axially so as to separate said sleeve from said piston and said axial movement of said stem is interrelated with said closing means so as to close said by-passing passage only after one axial end of said sleeve adjacent said piston clears said stopper whereby said piston is prevented from causing the movement of said sleeve while being arrested by said stopper.

4,696,453

COUPLING DEVICE FOR SUBMARINE PIPELINE SYSTEM

Edgar Furuholt, Trondheim, and Anders M. Liasen, Alesund, both of Norway, assignors to Den norske stats oljeselskap a.s. and Liasen Industrier A/S, both of, Norway

Filed Apr. 15, 1986, Ser. No. 852,347
Claims priority, application Norway, Apr. 19, 1985, 851569
Int. Cl.[4] F16L 37/28
U.S. Cl. 251—149.6 8 Claims



1. A releasable coupling unit for a subsea pipeline system, said coupling unit adapted for joining adjacent ends of two adjacent pipeline sectons of said subsea Pipeline system, each adjacent end of said adjacent pipeline sections having an end flange and each said adjacent pipeline sections having at least one conduit running therethrough, said coupling unit comprising:

(a) a casing having two through running grooves, one groove positioned at one end of said casing, the other groove positioned at the other end of said casing, each said groove adapted to fit one end flange;

(b) prestressing means for releasably locking said end flanges when said end flanges are in said through running grooves, said prestressing means positioned adjacent to said through running grooves in said casing;

(c) axially displaceable connecting tubes mounted in said casing for joining said conduit of said adjacent pipeline sections when said end flanges are positioned in said through running grooves;

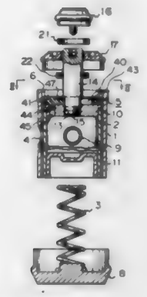
(d) locking device mounted in said casing for releasably locking said connecting tubes in place when said connecting tubes have been axially displaced thereby joining the conduit of adjacent pipeline sections and coupling said adjacent pipeline sections.

4,696,454

VALVE SHIFTING MECHANISM FOR A BRASS INSTRUMENT

Shinji Hamanaga, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jun. 24, 1986, Ser. No. 877,894
Claims priority, application Japan, Jun. 26, 1985, 60-139899
Int. Cl.⁴ F16K *3/314, 3/315;* **G10D** *9/04*
U.S. Cl. 251—321 **4 Claims**



1. A valve shifting mechanism for a brass instrument, said mechanism comprising:
- a generally cylindrical tubular valve casing closed at both ends and provided, in its inner face, with a longitudinal groove;
- a generally cylindrical piston tube coaxial with and slidably accommodated in said valve casing;
- means fur urging said piston tube towards one closed end of said valve casing;
- a piston rod seat attached to one end of said piston tube near said one closed end of said valve casing;
- a valve guide made of synthetic resin and provided with an elongated slot extending in the radial direction of said piston tube and a radial projection which extends along a longitudinal center axis of said slot, said radial projection being in slidable engagement with said longitudinal groove in said valve casing; and
- a piston rod attached at one end to said piston rod seat and extending through said one closed end of said valve casing and said slot in said valve guide so as to fix said valve guide to said piston rod seat.

4,696,455

ZIRCON AND MGO PREHEATABLE INSULATING REFRACTORY LINERS AND METHODS OF USE THEREOF

Howard B. Johnson, Cincinnati, Ohio, assignor to Consolidated Ceramic Products, Inc., Blanchester, Ohio

Filed Oct. 30, 1984, Ser. No. 666,492
Int. Cl.⁴ C21C *5/44*
U.S. Cl. 266—44 **29 Claims**

1. A preheatable molded refractory insulating liner structure prior to preheating of predetermined shape having insulating porosity for temporarily lining a casting vessel and for developing sufficient hot strength to maintain the integrity of the structure at vessel preheat and metal casting temperatures which are in the range of about 1900° F. to about 3000° F. during its use as a liner in a casting vessel, comprising
- a molded uniform mixture having a substantial insulating porosity on the order of about 50% prior to preheating containing a particulate refractory component in an amount of about 75% to about 98.5% by weight of said preheatable liner structure of a mixture of zircon and MgO refractory grain wherein said zircon and MgO refractory grain are in a ratio of about 1:1.5 to about 1:24, respectively, and
- a binder for said component and inorganic fibrous material in sufficient amounts to maintain the predetermined shape of insulating porosity at least prior to the preheat temperatures wherein said zircon and MgO refractory grain are of a particle size in said preheatable liner structure to facilitate the formation of fosterite bonding which results in increased hot strength with substantial maintenance of insulating porosity and shape without substantial shrinkage at both the vessel preheat temperatures of about 1900° F. to about 2400° F. and higher metal casting temperatures when said preheatable liner structure is used as a liner in a casting vessel and heated for a sufficient period of time.

4,696,456

METHOD OF IMPROVING PERMEABILITY OF METALLURGICAL VESSELS, AND MATERIAL FOR IMPLEMENTING THE SAME

Guy Denier, Metz, France, and Romain Henrion, Esch, Luxembourg, assignors to Institut de Recherches de la Siderurgie Francaise, Metz, France and Arbed S/A, Luxembourg, Luxembourg

Filed Apr. 20, 1983, Ser. No. 486,845
Claims priority, application France, Apr. 22, 1982, 82 07117
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.⁴ C21C *5/44*
U.S. Cl. 266—44 **3 Claims**

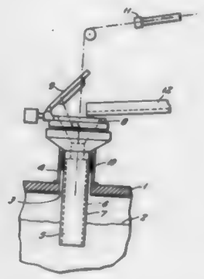
1. A method of improving permeability of the bottom of a metallurgical vessel provided with permeable refractory elements for controlled injection of a stirring fluid into a molten metal bath, comprising the steps of emptying a metallurgical vessel of its contents; depositing onto the bottom of the vessel a hydraulic magnesian refractory castable compatible with the material of the bottom, this castable comprising a content of water substantially between 8 and 10% by weight to provide a sufficient fluidity which insures spreading thereof over the bottom of the vessel and leaving the castable to dry and set, while maintaining in the permeable refractory elements a sufficient pressure to insure a permanent flow of the stirring fluid approximately 30 m^3/h per refractory element.

4,696,457

MEANS FOR CHARGING LIQUID SLAG TO A CLOSED SMELTING FURNACE

Jan A. J. Aune, Langhus, and Knut K. Evensen, Aadebu, both of Norway, assignors to Elkem a/s, Norway

Division of Ser. No. 662,996, Oct. 19, 1984, Pat. No. 4,593,886.
This application Mar. 10, 1986, Ser. No. 837,837
Claims priority, application Norway, Nov. 4, 1983, 834023
Int. Cl.⁴ C21C *7/10*
U.S. Cl. 266—207 **16 Claims**



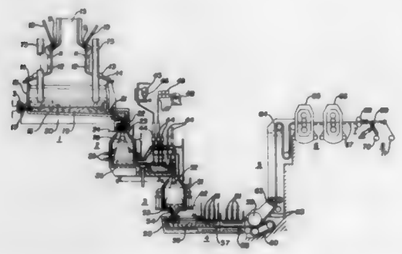
1. An apparatus for charging liquid slag to a roofed smelting furnace containing slag and a furnace gas comprising:
- (a) a movable tube member for positioning in the roof, said tube member having an upper end which will be positioned above the roof and a lower end which will be positioned below the roof;
- (b) a gas-tight lid member for closing the upper end of said tube member which will thereby prevent furnace gas from escaping through said tube member; and
- (c) means for moving said tube member between a first position where the lower end of said tube member will be below the slag level and a second position where the lower end of said tube member will be above the slag level thereby allowing liquid slag to be charged to said furnace and preventing furnace gas from escaping from said furnace when said apparatus is positioned in the roof and said tube member is in said first position.

4,696,458

METHOD AND PLANT FOR FULLY CONTINUOUS PRODUCTION OF STEEL STRIP FROM ORE

Semyon E. Royzman, Mt. Lebanon Township, Allegheny County, Pa., assignor to Blaw Knox Corporation, Pittsburgh, Pa.

Division of Ser. No. 819,501, Jan. 15, 1986, Pat. No. 4,664,701.
This application Sep. 22, 1986, Ser. No. 909,599
Int. Cl.⁴ C21C *1/00*
U.S. Cl. 266—212 **4 Claims**



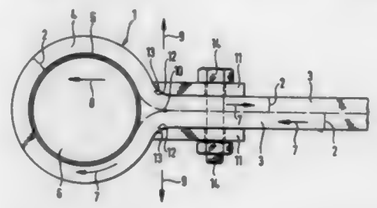
1. Apparatus for continuous production of steel strip from ferrous ore which comprises
- (1) an upright metallic ore reducing furnace having a hearth at its bottom, ferrous ore injection means, oxygen injection means and coal injection means, all positioned above the hearth, a slag tapping port, and a hot metal discharge port at about the hearth level,
- (2) a metal refining furnace connected to the metal discharge port of the metallic ore reducing furnace by a closed passage and intermediate device for introduction of hot metal at the top of the metal refining furnace, a hearth at the bottom of the furnace, oxygen injection means and limestone injection means positioned in the metal refining furnace for injection of oxygen and limestone into the metal as it descends through the furnace to the hearth, an outlet of controlled height from the hearth leading to an enclosed porous floor, inert gas injecting means connected to the porous floor, an enclosed deep settle bath section beyond the porous floor, flux and alloy injecting means adjacent the settle bath section, and metal and slag outlet from the settle bath,
- (3) a degassing chamber connected by a closed passage to the metal outlet from the settle bath section, and a metal outlet from the bottom of the degassing chamber, and
- (4) continuous casting means positioned to receive metal from the metal outlet of the degassing chamber, and having an outlet for discharge of continuously cast metal.

4,696,459

PLASTIC LEAF SPRING WITH AT LEAST ONE SPRING-EYE BODY OR SPRING-EYE SECTION

Herbert Woltron, Moedling, and Christian Huber, Eisenstadt, both of Austria, assignors to Isoport Verbundbauteile Ges. m.b.H., Austria

PCT No. PCT/EP85/00075, § 371 Date Oct. 16, 1985, § 102(e) Date Oct. 16, 1985, PCT Pub. No. WO85/03988, PCT Pub. Date Sep. 12, 1985
PCT Filed Mar. 1, 1985, Ser. No. 793,694
Claims priority, application Australia, Mar. 2, 1984, 711/84
Int. Cl.⁴ B60G *11/12;* **F16F** *1/28*
U.S. Cl. 267—36.1 **8 Claims**



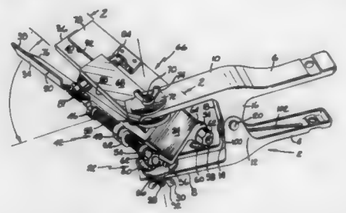
1. A plastic leaf spring with at least one spring-eye section of fiber-reinforced plastic having a spring-eye opening and being arranged at one of the spring ends, which comprises a layer (2,16,29) of essentially constant thickness, with a center section (4,18,31) looping the spring-eye opening (6) and two connecting sections (3,17,32) appropriately essentially parallel to each other, with the latter appropriately forming at least part of the spring end, and with the outer surface of the layer (2,16,29) forming a hollow groove (13,24,33) at least at one transition between its center section (4,18,31) and the connecting section (3,17,32), wherein at least at one of said spring-eye sections two reinforcing elements (11,22,34) made of steel and separated from each other are provided, which outwardly adjoin these connecting section (3,17,32) under pressure, and of which at least one thereby having a rounded edge with which it touches the layer surface at the said hollow groove (13,24,33), and which are connected to each other in a form locking manner.

4,696,460

CLAMPING APPARATUS

Eugene P. Genereaux, 7837 S. Forest St., Littleton, Colo. 80122; Samuel M. Jameson, 834 S. Tejon St., and Timothy K. Brooks, 852 S. Raritan St., both of Denver, Colo. 80223

Filed Jul. 11, 1986, Ser. No. 884,484
Int. Cl.⁴ B23Q *1/04*
U.S. Cl. 269—6 **20 Claims**



1. Clamping apparatus particularly useful in holding two workpieces of different thicknesses clamped together comprising:
- a pair of handle means;
- a first jaw means connected to one of said pair of handle means so as to have a common longitudinal axis therewith;
- second jaw means connected to the other of said pair of

handle means so as to have a common longitudinal axis therewith;

first pivot means located between said pair of handle means and said first and second jaw means for pivotally connecting said pair of handle means and said first and second jaw means for pivotal movement about a first pivot axis extending transversely to said common longitudinal axes of said pair of handle means and said first and second jaw means to permit movement of said first and second jaw means toward and away from each other and vary the angular relationship between said common longitudinal axis of said first jaw means and said one of said pair of handle means and said common longitudinal axis of said second jaw means and said other of said pair of handle means;

first holding means attached to said first jaw means and having a pair of elongated members having surfaces having an angular relationship therebetween of less than 180 degrees, said elongated members having a longitudinal axis extending generally in a direction parallel to said common longitudinal axis of said first jaw means and said one of said handle means;

second holding means attached to said second jaw means and comprising a bar member having a pair of elongated members attached thereto, said elongated members having surfaces and a longitudinal axis extending generally in the same direction as said longitudinal axis of said elongated members of said first holding means;

said surfaces of said elongated members of said second holding means facing said surfaces of said elongated members of said first holding means for holding at least two workpieces therebetween;

second pivot means connecting a portion of said second jaw means to said bar member for pivotal movement of said second holding means about a second pivot axis transverse to said longitudinal axes of said first and second holding means;

said pivot means permitting movement of said bar member relative to said portion of said second jaw means so that said longitudinal axis of said second holding means is generally parallel to said longitudinal axis of said elongated members of said first holding means when said common longitudinal axis of said second jaw means and said other of said pair of handle means is not parallel to said common axis of said first jaw means and said one of said pair of handle means;

slidable means mounting said bar member on said second pivot means for permitting linear sliding movement of said bar member in either direction along said second pivot means so that workpieces of different thicknesses may be held together in clamped relationship; and

means for applying a force on said first and second jaw means to move said first and second jaw means together so that said first and second holding means will hold said workpieces of different thicknesses in said abutting angular relationship.

4,696,461

PORTABLE, COLLAPSIBLE STAND FOR USE IN CLEANING A MUZZLE LOADING RIFLE OR A MUZZLE LOADING SHOTGUN

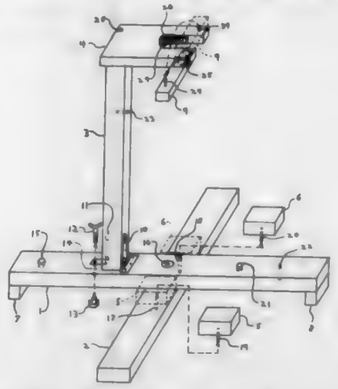
Roger M. Zelinski, R.D. #1, Little Falls, N.Y. 13365

Filed Jul. 19, 1984, Ser. No. 632,609

Int. Cl.⁴ B25B *11/00*

U.S. Cl. 269—16 **1 Claim**

1. A portable stand for use in cleaning thebarrel of a muzzle loading rifle or a muzzle loading shotgun comprising a base which is of adequate dimensions to provide substantial stability to said stand and which is formed by two members which pivot about a central axis such that when in use, said members are at approximate right angles with one another and in storage, said members are approximately parallel with one another; means adapted to engage said membes to lock them at substantially right angles with one another and to provide a larger support surface for supporting a bucket used in cleaning the barrel; an upright member attached to said base via hinged means such that when in use, said upright member is approximately perpendicular to said base and ins torage, said upright member folds to approximately lie along side said base; and a barrel receiving mechanism attached to said upright member wherein said barrel receiving mechanism comprises a generally U-shaped member and a latch which closes off the open end of



said U-shaped member, said latch virturally insuring that the barrel cannot be forced from said barrel receiving mechanism except by the use of unwarranted force, said latch comprising an elongated member attached to one side of said U-shaped member via a hinge and further containing a barrel retainer pin which coincides with a hole on the other side of said U-shaped member; further said barrel receiving mechanism also contains another U-shaped slot for purposes of receiving a barrel cleaning rod.

4,696,462

PAPER SUPPLYING DEVICE

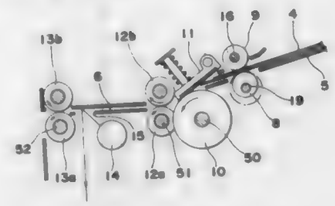
Hironori Tanaka; Masafumi Matsumoto, and Matahira Kotani, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1985, Ser. No. 790,962

Claims priority, application Japan, Oct. 27, 1984, 59-226226; Oct. 27, 1984, 59-226227

Int. Cl.⁴ B65H *3/06*

U.S. Cl. 271—10 **5 Claims**



1. A paper supplying device which comprises:

first feed rollers eccentrically mounted on a horizontal rotational shaft, having convex feed surfaces whereby said feed rollers are capable of coming in contact with a first surface of a paper to be fed;

an urging means disposed so as to face said feed surfaces of said feed rollers, for urging said paper toward said feed rollers while contacting the other surface of said paper;

an interrupting means arranged at the downstream side of said first feed rollers with respect to a feeding direction of said paper, for interrupting the movement of remaining sheets of paper other than said paper in contact with said convex feed surfaces of said first feed rollers;

second feed means arranged at the downstream side of said first feed rollers with respect to said feeding direction of said paper, for feeding said paper in contact with said feed surfaces, according to an angular displacement of said first feed rollers; and

a transport means arranged at a downstream side of said second feed means with respect to the feeding direction of said paper.

4,696,463

AUTOMATIC ORIGINAL SHEET FEEDING APPARATUS

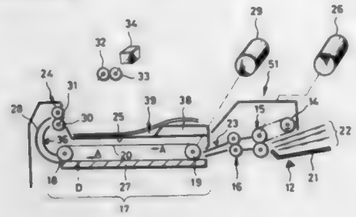
Yukitaka Nakazato; Kenji Hashimoto, both of Tokyo, and Takashi Taruki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,492

Claims priority, application Japan, Mar. 27, 1985, 60-43247[U]

Int. Cl.⁴ B65H *29/68*

U.S. Cl. 271—176 **4 Claims**



1. An automatic original sheet feeding apparatus for carrying original sheets mounted on an original sheet mounting table to a predetermined work position and ejecting them in succession by an ejecting roller from said predetermined work position to an original sheet receiver such that the ejected sheets are approximately horizontal on said receiver comprising:

an original sheet detecting means disposed in an original sheet carrying passage between said work position and said ejecting roller for detecting said original sheets;

a brake means capable of applying a braking force to said ejecting roller to gradually reduce the rotation speed of said ejecting roller;

a control means responsive to an output information from said original sheet detecting means for actuating said brake means; and

wherein after an original sheet has been engaged by said ejecting roller, said ejecting roller is braked gradually to finally be stopped by said brake means, while said original sheet is being ejected thereby, to thereby eject said original sheets onto a region in the vicinity of said ejection roller without substantial inertia.

4,696,464

METHOD OF AND AN APPARATUS FOR UNITING AT LEAST TWO STREAMS OF SHINGLED LAID OUT PRODUCTS, PARTICULARLY FOLDED PAPER PRODUCTS

Hagen Gämmerler, Ichoring 44, D-8021 Icking, Fed. Rep. of Germany

Filed Jan. 28, 1986, Ser. No. 823,307

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502896

Int. Cl.⁴ B65H *29/66;* **B65G** *47/26*

U.S. Cl. 271—202 **3 Claims**



1. A method of uniting at least two streams of shingled paper products and the like, comprising the steps of passing a first stream of shingled products along a moving conveyor; passing a second stream of shingled products along a second conveyor at a higher elevation than said first conveyor; synchronizing the movement of the first product stream with the movement of the second product stream; merging the second stream of shingled products with the first stream of shingled products by ejecting the second stream from the higher elevation second conveyor to the first conveyor; and separating the merged first and second streams into a non-shingled single product stream by drawing out the merged first and second streams.

4,696,465

METHOD AND DEVICE FOR ALIGNING SHEETS

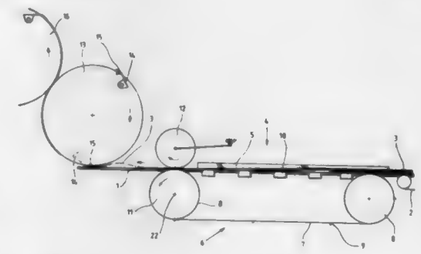
Jeschke Willi, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 798,821

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442135

Int. Cl.⁴ B65H *9/06*

U.S. Cl. 271—237 **21 Claims**



1. Method of aligning sheets during stream feeding of a multiplicity of sheets over a feed table to a first steadily rotating cylinder of a sheet-processing machine, which comprises in a first feeding stage, conveying the sheets in an imbricated arrangement thereof via the feed table and in a given direction to an alignment region; in a second feeding stage, aligning a lateral and a leading edge of the sheets in the alignment region while the sheets remain in the imbricated arrangement thereof and without interrupting movement of the sheets in the given direction and, in a third feeding stage, accelerating the speed at which the sheets are stream fed to a peripheral speed of a rotating cylinder and feeding the sheets to the first steadily rotating cylinder, while finally aligning the sheets at front markers.

4,696,466

SORTER FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Kimihito Yamasaki, Ikoma, and Shoichiro Yoshiura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1985, Ser. No. 804,474

Claims priority, application Japan, Dec. 5, 1984, 59-258632

Int. Cl.⁴ B65H *39/10*

U.S. Cl. 271—288 **4 Claims**

1. An electrophotographic copying machine comprising:

a plurality of sorter bins for receiving a plurality of copied papers in a sort mode;

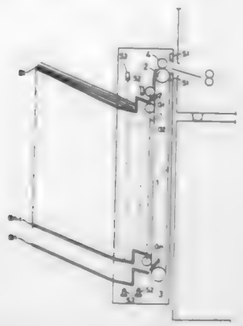
a plurality of sorter guides for sequentially guiding each of the plurality of copied papers into each of said plurality of sorter bins;

sort switch means for interrupting the sort mode and conducting an additional sort mode;

memory means for storing the serial number of a last bin to receive a copied paper in the sort mode;

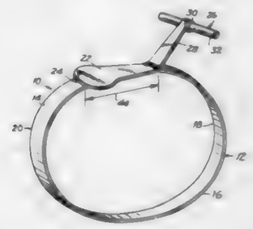
means for detecting the operation of said sort switch means

each time a single one of said plurality of copied papers is received in a respective sorter bin; and



interruption means, responsive to said means for detecting, for sorting one or more copied papers into one or more of said bins having the next higher serial number to said bin whose serial number is sorted in said memory means.

4,696,467
RIDABLE RECREATION DEVICE
Margaret Markow, 141 Coanetquot Dr., Oakdale, N.Y. 11769
Filed Feb. 20, 1986, Ser. No. 831,487
Int. Cl.[4] A63B *25/08*
U.S. Cl. 272—114 **16 Claims**



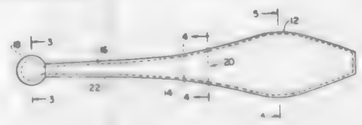
1. A device adapted to be ridden for recreation or exercise, said device having resilient means for propelling said device bouncingly across the riding surface comprising:

a thin solid resilient upright non-metallic annular spring body member having its axis located in the horizontal plane, said spring member having an upper top segment, a lower bottom segment in direct contact with a reacting directly against the surface on which the device is to be ridden, and a pair of opposing substantially ellipsoidal ends, the distance between said ends being less than the distance between said upper and said lower segments, said annular spring having nearly constant flexural and stiffness properties throughout the entire annulus;

handle means to be grasped for support by the rider of said device, said handle means being fixed at least on said upper segment; and

seat means fixed on the radially outer surface of said upper segment proximate said handle means such that said device can be straddled by a rider with his feet in contact with the riding surface and wherein the elasticity of said spring member is such that said rider, by following an operating sequence in which he stores energy in the spring member by flexing his legs to impose his weight thereon and releases said energy to do work by extending his legs, can use the elasticity of said spring member to propel the device and himself bouncingly across said surface.

4,696,468
JUGGLING CLUB
Brian J. Dubé, 24 Washington Sq. N., New York, N.Y. 10011
Filed Jul. 20, 1982, Ser. No. 400,108
Int. Cl.[4] A63B *15/00*
U.S. Cl. 272—124 **7 Claims**



1. A juggling club, comprising: a hollow, unitary, molded plastic body substantially in the configuration of a kingpin in which one end of said club includes a bulged portion and the opposite end thereof includes a knob portion, said bulged portion and said knob portion being integrally connected by an elongated handle portion, where the thickness of the body wall of said juggling club gradually increases from the bulged end to the knob end wherein such thickness results in the center of gravity of the club being located at between 55 and 59 percent of the longitudinal length of the club from the knob end of the club toward the bulged end so as to bring the center of gravity in close proximity to the physical center of the club, further wherein the ratio of the greatest width of the body wall to the least width of the body width is about 1.9.

4,696,469
HAMSTRING MUSCLE EXERCISER
Michael G. Elder, 106 N. Spruce, Goddard, Kans. 67052
Filed Jan. 21, 1986, Ser. No. 820,131
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **9 Claims**



1. Apparatus for exercising the hamstring muscles of the human body, said apparatus comprising:

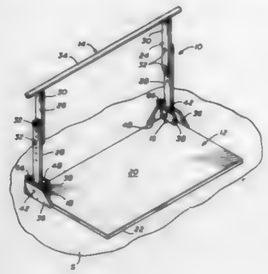
means for supporting the body in position for articulating the knee joint;

lever means pivotally coupled with the supporting means and including leg engageable means carried by the lever means and adapted to be engaged by the users leg below the knee for swinging of the lever through a vertical arc during said articulation of the knee joint;

means biasing the lever toward the lowermost end of its path of travel, said biasing means being yieldable under the influence of force exerted through the user's leg utilizing hamstring muscles to articulate the knee joint and thereby swing the lever through said arc;

means operably coupled with the support and with the lever respectively for limiting the arc of swing of the lever, said limiting means and said biasing means each being individually adjustable; and said limiting means including an adjustable means for limiting both the upper and lower directional limits of the arc swing of the lever as to limit the length of the exercising stroke to that for which will involve substantially only the hamstring muscles in the swinging of the lever by the user during articulation of the knee joint.

4,696,470
PORTABLE PLATFORM ASSEMBLY FOR DANCERS AND THE LIKE
Edwin H. Fenner, 2909 Princeton, Midland, Tex. 79701
Filed Jan. 13, 1986, Ser. No. 818,598
Int. Cl.[4] A63B *5/02*; F16C *11/00*; E04G *1/34*
U.S. Cl. 272—144 **6 Claims**



5. A portable platform assembly foldable between a collapsed inoperable position for storage and an extended operable position for supporting a person thereon comprising:

a platform of a generally rectangular shape in plan view and having four corners, said platform in the extended operable position of said assembly defining an upper horizontal surface for supporting a person thereon;

a support base on each of a pair of adjacent corners of said platform including a pair of spaced inner and outer sides extending upwardly from said platform in the extended operable position thereof to provide a pivotal mount;

a pair of generally parallel legs pivotally mounted at their lower ends between the inner and outer sides of the associated support bases and adapted to be pivoted between an extending position at right angles to said platform in said operable position and a generally parallel position with said platform in said collapsed position for storage of said assembly, each support base including a rear abutting support member secured to said platform behind the associated leg and inner side for supporting said leg in its extended position;

releasable retaining means between the associated leg and said rear support member to releasably retain the leg in an extended upright position; and

a rail extending between the upper ends of said parallel legs adapted to be contacted by the body of a person supported on the platform in the operable position of said assembly.

4,696,471
TENNIS PRACTICE AID
Ann M. McGrath, and James A. Douglas, both of 15507 La Madre Selva, P.O. Box 1995, Rancho Santa Fe, Calif. 92067
Filed May 7, 1986, Ser. No. 860,629
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—29 A **19 Claims**

1. A device for mounting on an installed tennis net for practice purposes, comprising:

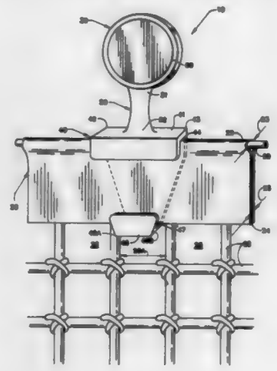
a target member defining a silhouette having a size generally on the order of the size of a conventional tennis ball;

a mounting member adapted to be removably secured to a conventional tennis net headband by engagement of just the headband;

connecting means for connecting the target member to the mounting member so that the target member is supported slightly above a headband to which the mounting member is secured;

an upper edge portion of the mounting member adapted to engage the top edge of a conventional tennis net headband, the upper edge portion defining an upper channel having a generally inverted U-shape for placement over the top edge of a headband, the upper channel having a width slightly larger than the thickness of the top edge of a conventional tennis net headband;

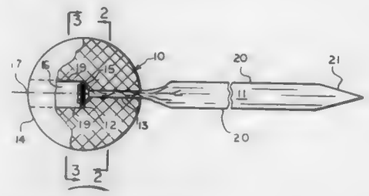
a lower edge portion of the mounting member adapted to engage the bottom edge of a convention tennis net headband, the lower edge portion having a length generally no larger than the width of a conventional net opening, the lower edge portion defining a lower channel generally parallel to the upper channel having a generally upright U-shape for placement over the bottom edge of a headband, the lower channel having a channel width slightly



larger than the thickness of the bottom edge of a conventional tennis net headband; and

an interconnecting portion of the mounting member extending from the upper edge portion to the lower edge portion, the interconnecting portion having a height between the upper and lower edge portions such that the upper and lower channels are separated by a distance on the general order of the width of a conventional tennis net headband, to enable placement of the upper and lower channels over respective ones of the top and bottom edges of a headband and removably secure the device to the headband with the target member disposed slightly above the headband.

4,696,472
THROWING TOY AND METHOD OF MANUFACTURE
David L. Meyer, 3285 Old Salem Rd., Albany, Oreg. 97321
Filed Nov. 12, 1986, Ser. No. 929,729
Int. Cl.[4] A63B *43/02*
U.S. Cl. 273—58 A **5 Claims**



1. A throwing toy comprising:

(a) a spherically surfaced ball whose interior is comprised of resilient foam material, and having: (1) a circular cylindrical channel extending from an interior extremity at the center of the ball to the surface of the ball and (2) a slot defined by paired facing flat surfaces joined at straight parallel side extremities, said slot extending from the surface of the ball to the center thereof in communication

with said channel and centered upon a line which when extended is coaxial with the axis of said channel and constitutes a diameter of the ball, the width of said slot, measured between its parallel side extremities being greater than the diameter of said channel, and the depth of said slot, measured between said paired flat surfaces being smaller than the diameter of said channel,

(b) a tether comprising a flat ribbon elongated between anchored and free extremities fabricated of lightweight fibrous material of high tensile strength having a width of ¾ to 2 inches measured between opposed boundary edges and a length of 3 to 5 feet measured between said anchored and free extremities, said anchored extremity having a loop extending transversely to the long axis of the ribbon, and

(c) a straight rigid anchoring member insertively engaging said loop and extending beyond each edge of the ribbon in tranverse abutment with the circular channel at its interior extremity, whereby

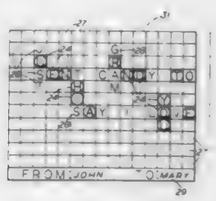
(d) a portion of the ribbon adjacent its anchored extremity passes through said channel in gathered form.

4,696,473

GAME PACKAGE FOR CONFECTIONS

Casmere J. Wyzykowski, 6425 S. Gessner, #2179, Houston, Tex. 77036

Filed Feb. 4, 1986, Ser. No. 826,002
Int. Cl.[4] A63F *9/06*
U.S. Cl. 273—153 R **15 Claims**



7. A game package for packaging and sale of confections comprising;

a plurality of individual edible playing piece confections, some of which display letters of the alphabet,

a playing surface having series of crossing lines defining a grid containing a plurality of similar enclosed spaces slightly larger than said playing piece confections,

some of said spaces displaying letters of the alphabet arranged in a pattern to form a predetermined message or phrase, which is initially unintelligible and unknown to the player, by positioning selected playing pieces in selected unmarked spaces,

a set of instructions for instructing the player to fill the unmarked spaces with selected playing piece confections,

an answer sheet secreted from the player containing the correct completed phrase, and

a container for enclosing said playing piece confections, said playing surface, said set of instructions and said answer sheet.

4,696,474

GOLF COURSE

Harold G. Tegart, 9147 Foothill Blvd., Sunland, Calif. 91040

Continuation-in-part of Ser. No. 431,567, Sep. 30, 1982, Pat. No. 4,572,512. This application Dec. 30, 1985, Ser. No. 814,601
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—176 A **13 Claims**

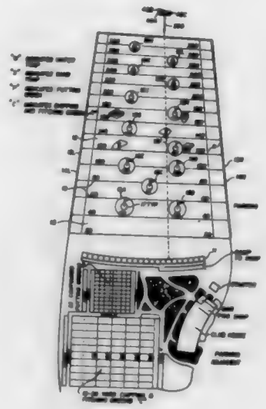
1. A compact golf course with closed circuit television aid to golfers comprising:

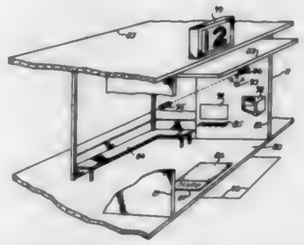
a compact golf course including a plurality of tees directed toward a common fairway area having a number of range markers and target greens for indicating the distances from the tees;

at least one closed circuit television camera located down range of said course and directable toward the fairway and said tees;

a television monitor at each of said tees and coupled to said television camera;

said tees including an illuminatable tee identifier sign associated with each of said tees and directed toward said common fairway area and visible to said closed circuit television camera; and





means at said tees for energizing the illuminatable tee identifier to provide of the player's tee as a player drives a ball therefrom whereby the television camera detects the play actuated illuminated tee identifier and the player can view on a closed circuit TV monitor at his tee the origin of flight of his ball and so follow the flight of the ball to where it rests in relation to the range markers, where with the aid of the closed circuit TV monitor, he can clearly see a closeup of the accurate distance he has hit the ball.

4,696,475

THREAD-WOUND GOLF BALL

Seisuke Tomita, Tokorozawa, and Yoshinori Egashira, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 11, 1985, Ser. No. 774,743
Claims priority, application Japan, Sep. 11, 1984, 59-190080; Nov. 20, 1984, 59-245808
Int. Cl.[4] C08L *7/00, 9/00;* A63B *37/06*
U.S. Cl. 273—227 **15 Claims**

1. A thread-wound golf ball comprising:

a ball core containing rubber material,

a rubber thread layer containing rubber material, and

a cover

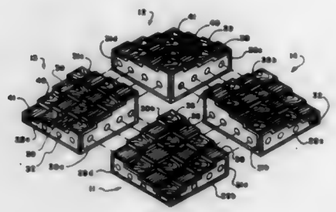
wherein at least one of the rubber thread layer or the ball core is a mixture of an isoprene-butadiene random copolymer which contains more than 30 parts by weight of the isoprene-butadiene random copolymer based on 100 parts by weight of the total rubber ingredient and one or more rubber ingredients selected from the group consisting of natural rubber, synthetic isoprene rubber and butadiene rubber, said isoprene-butadiene random copolymer having from 5 to 90% by weight of a butadiene component and from 95 to 10% by weight of an isoprene component, and having a cis-1,4 structure content of more than 80% by weight based on the entire copolymer.

4,696,476

MULTI-STEPPED GAMEBOARD APPARATUS

Gene W. Eplett, 108 Euclid Ave., Ardsley, N.Y. 10502

Filed May 8, 1986, Ser. No. 861,153
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—241 **12 Claims**



1. A three-dimensional game board apparatus comprising at least four sections, each of said sections having at least one surface accommodating a checkerboard design and said surface constructed in seven planar levels having sixteen square steps in a monotonic arrangement, whereby said square steps in each diagonal row from one corner to a second corner of said section are of a similar color, said sections arrangeable n a variety of configurations and nestable forming a rectangular polyhedron, wherein there is one square step at a first planar level, two square steps at a second planar level, three square steps at a third planar level, four square steps at a fourth planar level, three square steps at a fifth planar level, two square steps at a sixth planar level and one square step at a seventh planar level, and said sixteen square steps descend from said first planar level to said seventh planar level.

4,696,477

GAME APPARATUS

Akio Tsuzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Jan. 30, 1986, Ser. No. 824,104
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—241 **7 Claims**

1. An amusement device, comprising:

(a) a base having a path formed thereon;

(b) a plurality of movable means attached to the base and forming a part of the path;

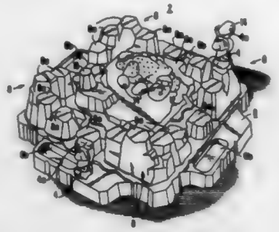
(c) a single operating means connected to the plurality of movable means for randomly moving one of the plurality of the movable means;

(d) actuating means connected to the operating means,

(e) at least one first figure movable about the path; and

(f) at least one loose member capable of being temporarily received by the first figure,

wherein, when the actuating means is actuated, the operating means moves the maovable means with the potential for displacing at least one of the first figure from the



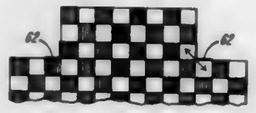
movable means and the at least one loose member from the first figure.

4,696,478

NEUTRAL ZONE, PIECE-CAPTURE GAME

Robert F. Farrell, 25 Churchill Rd., Quincy, Mass. 02169

Filed Nov. 1, 1985, Ser. No. 794,051
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—261 **2 Claims**



1. A piece-capture game board having playing pieces adapted to be placed on said board at playing positions in which only one piece can occupy one position at a time, said board having a matrix-type piece position pattern thereon and at least one defined zone including numbers of piece positions and means for distinguishing said zone from the rest of the board so as to differentiate the spaces within said zone from the spaces outside said zone, said zone the being designated in a manner to indicate that pieces within said zone have their originally defined powers altered such that the manner of play of the game is altered for pieces within said zone, said game board having differently colored squares arranged in a chess or checker-board manner, with adjacent squares having a predetermined light/dark pattern and with selected squares being designated as being within said zone, the squares within said defined zone having the same light/dark pattern as squares adjacent said zone, said zone being cruciform in pattern and having arms extending in different directions, the arms of said cruciform pattern being offset and over-lapping in a central region.

4,696,479

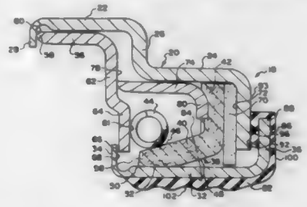
UNITIZED SHAFT SEAL ASSEMBLY

Merrill Karcher, Lake Geneva, Wis., assignor to Triseal Corporation, Woodstock, Ill.

Filed Aug. 26, 1985, Ser. No. 769,177
Int. Cl.[4] F16J *15/32, 15/34, 15/54*
U.S. Cl. 277—37 **8 Claims**

1. A unitized shaft seal assembly comprising an outer rigid annular member including an inner annular ring portion and an outer annular ring portion axially spaced from each other and generally parallel to each other, a first, short, radially inwardly extending flange extending from one edge of said outer annular ring portion, a second, longer radially inwardly extending flange extending from one edge of said inner annular ring portion, and an intermediate flange extending between and integral with the other edges, respectively, of said inner and

outer annular ring portions with said outer annular ring portion extending axially outwardly in one direction from said intermediate flange and said inner annular ring portion extending axially outwardly in the opposite direction from said intermediate flange, an inner rigid annular member including an annular, third ring portion generally parallel to said ring portions of said outer annular member, a third, short radially outwardly extending flange extending from one edge of said third ring portion and a fourth, longer radially outwardly extending flange extending from the other edge of said third ring portion, a flexible annular sealing member disposed between said rigid annular members, a coiled spring extending completely around a portion of said flexible annular sealing member for urging a radially inwardly facing surface or edge of said sealing member against a radially outwardly facing surface of said inner annular member, a generally L in cross-section, intermediate rigid annular member being positioned on one axially facing side of said assembly and including a radially extending annular body having a radially inwardly disposed inner portion which is positioned adjacent to and axially inwardly of said third, short flange of said inner annular member so as to be situated between said spring and said third, short flange so that said third, short flange overlaps said inner portion of said radially extending annular body of said intermediate member and said inner portion having an inner annular edge spaced radially outwardly from said radially outwardly facing surface of said inner annular member, said radially extending annular body being spaced axially inwardly of said first, short flange of said outer annular member and having a radially outwardly extending outer portion positioned parallel to said intermediate flange, said intermediate annular member also including an



outer ring portion which is integral with an outer annular edge of said outer portion of said radially extending annular body, which extends axially outwardly from said annular body and which is positioned adjacent to and generally parallel to said outer annular ring portion of said outer annular member and having an outer edge on one axially facing side of said intermediate member which is disposed adjacent to an inner axially facing surface of said first, short flange of said outer annular member, and said radially inwardly extending inner portion being disposed axially inwardly of said third, short flange of said inner annular member, an annular elastomeric layer of material on a radially inwardly facing surface of said inner annular member and extending axially from a circle generally opposite said third short flange on and along said inwardly facing surface of said inner annular member to the other axially disposed side of said inner annular member, radially outwardly along said fourth, longer flange around an outer end of said fourth flange and radially inwardly along an axially inwardly facing surface of said fourth flange toward the radially outwardly facing surface of said inner annular member, said second longer flange of said outer annular member having an inner annular edge spaced radially outwardly from said radially outwardly facing surface of said inner annular member and being positioned adjacent and axially inwardly of said fourth, longer flange of said inner annular member, said first, short flange being thinner than said second, longer flange and said third, short flange being thinner than said fourth, longer flange, and said layer of elastomeric material having an annular bead integral therewith and located on the axially inwardly facing surface of said fourth, longer flange, radially inwardly of the outer end of said fourth, longer flange, and, extending outwardly of said layer of elastomeric material and axially of the assembly to engage and form a seal with an outer axially facing surface of said second, longer flange of said outer annular member, and the outer radially inwardly facing surface of said layer of elastomeric material providing at least one sealing surface with a shaft on which the seal assembly is mounted.

4,696,480

DEVICE FOR REMOVING DIRT FROM A SURFACE, ESPECIALLY A BRUSH SEALING DEVICE

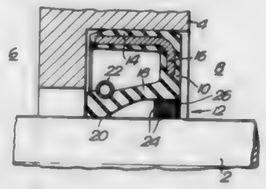
Lennart Jörnhagen, Värnamo, Sweden, assignor to Forsheda AB, Forsheda, Sweden

Filed Oct. 24, 1986, Ser. No. 922,970

Claims priority, application Sweden, Oct. 24, 1985, 8505013; Dec. 18, 1985, 8506002

Int. Cl.⁴ F16J *15/447*

U.S. Cl. 277—53 **7 Claims**



1. A device for removing dirt and contaminants from a surface comprising:

a plurality of fibers firmly supported at one end, said fibers extending towards and engaging by means of a contact surface, the surface from which the dirt and contaminants are to be removed, said fibers being adapted to remove the dirt and contaminants while being transitionally moved in relation to this surface, said fibers forming conveyor surfaces extending obliquely with respect to the relative movement between said fibers and the surface, and adapted to remove the dirt and contaminants away from the surface in a direction extending transversely to the direction of the relative movement between said fibers and the surface from which dirt and contaminants are to be removed.

4,696,481

LIQUID COOLED FERROFLUID-TYPE ROTATING SEALS

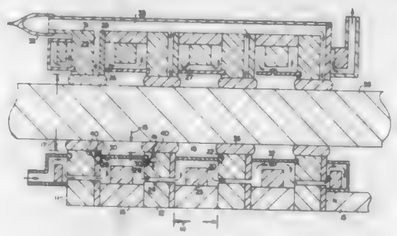
Arthur H. Iversen, 15315 Sobey Rd., Saratoga, Calif. 95070

Continuation of Ser. No. 699,428, Feb. 7, 1985, Pat. No. 4,592,557. This application Apr. 1, 1986, Ser. No. 846,612

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.⁴ F16J *15/40, 15/44, 15/54*

U.S. Cl. 277—80 **12 Claims**



1. In a ferrofluid seal apparatus for a rotary shaft, said seal being of the type comprising a magnet adapted to surround said shaft and a plurality of spaced magnetically permeable pole piece elements magnetically cooperating with said magnet, each of said pole piece elements being disposed to provide a separate magnetic flux path for magnetically capturing ferrofluid in a ferrofluid seal region between a face of said pole piece element and said shaft, the improvement wherein:

said seal includes means, formed of non-magnetic material in the vicinity of said ferrofluid seal regions, for forming a conduit for liquid coolant between magnetic pole piece in close proximity to said ferrofluid seals; and said magnetic pole pieces include passages therethrough for providing fluid communication between adjacent conduits.

4,696,482

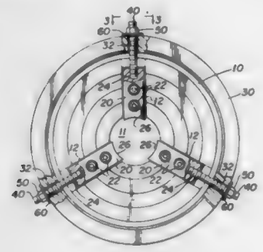
JAW LOCKING MEANS FOR CHUCKS

Lawrence H. Brown, Ambler, Pa., assignor to L. H. Brown, Inc., Ambler, Pa.

Filed Sep. 15, 1986, Ser. No. 907,329

Int. Cl.⁴ B23B *31/10*

U.S. Cl. 279—1 SJ **6 Claims**



1. For use with a chuck, such a lathe chuck or the like, having a plurailty of hard jaws guided for sliding movement toward and away from a chuck center and radially to the chuck axis by the jaw setting means of the lathe or the like, and a soft jaw secured on top of each of said hard jaws for conjoint movement therewith as a unit radially to the chuck axis,

a jaw locking means comprising:

a ring means adapted to be arranged to encircle the soft jaws, said ring means having radially extending holes aligned with the axis of radial movement of said soft jaws,

a plurality of studs, one stud associated with each soft jaw and being secured thereto to extend radially outwardly therefrom,

each stud extending through an associated radial hole in said ring means to provide a threaded portion projecting radially outwardly from the outer surface of said ring means,

and a plurality of nuts, each of said nuts being threadedly engaged on each of said studs at the outwardly projecting portion thereof including means associated with each nut and located on the outer surface of said ring means to provide a scale extending around said nut, including a reference mark for providing an indication of the amount of adjustment of said nut relative to said stud.

4,696,483

VEHICLE SUSPENSION APPARATUS

Shozo Takizawa; Minoru Tatemoto, both of Okazaki; Akio Furumura, Toyota; Tadashi Sugawara, Okazaki; Shigeo Kariya, Nagoya, and Kazuo Hiroshima, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo K.K., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 747,107

Claims priority, application Japan, Jun. 26, 1984, 59-94569[U]

Int. Cl.⁴ B60G *17/00*

U.S. Cl. 280—6 H **24 Claims**

1. A vehicle suspension apparatus comprising:

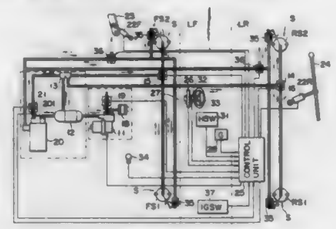
height control fluid spring chambers arranged between respective wheels and a vehicle body;

fluid supply means for supplying a fluid from a fluid source to said fluid spring chambers through fluid supply control valve means;

fluid exhaust means for exhausting the fluid from said fluid spring chambers through fluid exhaust control valve means;

a height sensor for detecting the height of a vehicle from the ground;

height control means for comparing the height detected by said height sensor with a target height and controlling said supply or exhaust control valve means so as to make the detected height equal to the target height;



a high height selection switch;

extra high height control means for opening said supply control valve means for a predetermined period of time so as to increase the detected height by a predetermined value upon the operation of said high height selection switch; and

wherein said apparatus further comprises a velocity sensor for detecting a velocity, and said extra high height control means is operated only when a velocity detected by said velocity sensor is lower than a preset velocity.

4,696,484

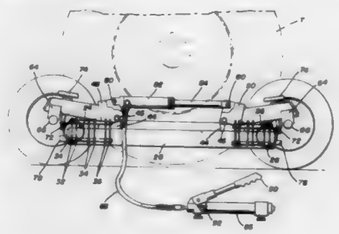
DOLLY FOR TOWING VEHICLES

Robert Casey, Washington, Ill., assignor to Dover Corporation, Chattanooga, Tenn.

Filed Apr. 28, 1986, Ser. No. 856,202

Int. Cl.⁴ B62D *33/08*

U.S. Cl. 280—43.16 **5 Claims**



1. A towing dolly for lifting and supporting a pair of laterally spaced wheels of a disabled vehicle for towing thereof, said dolly comprising a pair of side rails, a pair of spaced apart cross members, mounting means for removably connecting each cross member to both rails for supporting said cross members and for spacing said rails apart laterally, the cross members being adapted to support and cradle the wheels of the disabled vehicle thereon, a pair of pivot blocks for each side rail, journal means for pivotably mounting each pair of pivot blocks at spaced locations on the respective side rail, a rocker arm secured to each pivot block for moving therewith, the rocker arms of each side rail extending away from and in opposite directions to each other, support means for rotatably carrying a dolly support wheel on each rocker arm remote from a respective journal means, abutment means carried by each

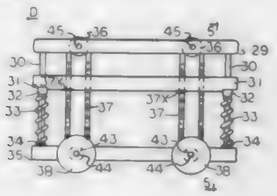
pivot block spaced from said journal means facing toward the other pivot block associated with each respective rail, a removable extendible jack means adapted to be placed selectively between and engage the abutment means associated with a respective rail, such that extension of the jack means forces the pair of blocks associated with a rail to pivot relative to the rail to lift the rail relative to the support wheels associated with that rail, and hold-down means for securing said rocker arms to the corresponding side rail when said rail has been raised so that said jack means may be removed from engagement with the abutment means associated with the lifted rail and repositioned between and engage the abutment means associated with the other rail for lifting said other rail.

4,696,485

OSCILLATING WEIGHT CARRIERS

Robert E. Lee, 640 S. Main St., Los Angeles, Calif. 90014

Continuation-in-part of Ser. No. 895,511, Apr. 11, 1978, Pat. No. 4,451,055. This application Jun. 27, 1983, Ser. No. 508,028
Int. Cl.⁴ B62M *1/00*
U.S. Cl. 280—221 **4 Claims**



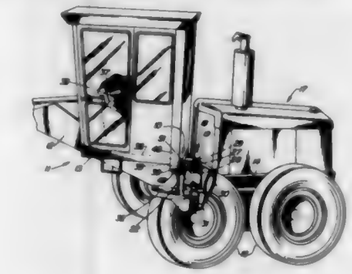
1. A weight carrier vehicle propelled by shifting of weight comprising:
- a carriage having upper and lower frame members, a plurality of rods connecting said frame members, said lower frame member having axles with ground engaging wheels fixed to said axles;
- a footboard slideably mounted on said rods for vertical oscillation;
- a plurality of compression springs carried by said rods between said lower frame member and said footboard;
- a pair of spindles mounted on said upper frame member with idler sprockets rotatably mounted on said spindles;
- a set of drive sprockets mounted on said axles carrying said ground engaging wheels;
- a set of one-way clutches mounted on said axles and drivingly connected between said sprockets and said ground engaging wheels; and
- a plurality of endless chains engaging said idler sprockets and said drive sprockets with one run of each chain connected to said footboard in driving relationship for driving said ground engaging wheels by the vertical oscillation of said footboard.

4,696,486

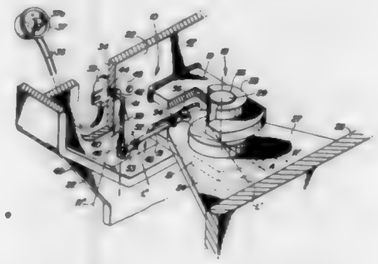
REAR STEER ANGLE INDICATOR FOR ARTICULATING VEHICLE

Martin L. Ruhter, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 21, 1986, Ser. No. 821,385
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 280—400 **5 Claims**



1. In a vehicle having a steerable wheelmounted mainframe and a wheelmounted engine frame articulately mounted to the rear of the mainframe, the articulation joint comprising a forwardly extended, horizontally disposed tongue portion on the engine frame and a rearwardly extended horizontally disposed plate mounted on a vertically disposed plate portion of the mainframe, both plate and tongue portion pivotally connected by a vertically disposed pin, an improved rear steer angle indicator unit comprising:
- sensing means capable of converting mechanical motion to electrical signals, said sensing means mounted on the side of said vertically disposed mainframe plate portion opposite the articulation joint;
- gauge means electrically connected to said sensing means and capable of indicating the degree and direction of movement of the engine frame relative to the mainframe;
- sensing arm means inserted through said vertically disposed mainframe plate portion and connected with said sensing means, said sensing arm means comprising an L-shaped arm the upper portion of which is inserted into said sensing means about a normally horizontal axis, and the lower portion of which depends from the upper portion parallel and closely adjacent a rear face of said vertically disposed mainframe plate portion; and
- linkage means connected at one end thereof to the engine frame tongue at a location between said tongue and said plate, and at the other end thereof to said sensing arm means, whereby movement of the tongue relative to said vertically disposed mainframe plate portion results in like amount of movement of said sensing arm means in said sensing means and consequent indication by said gauge means of the degree and direction of movement of the engine frame relative to the mainframe.



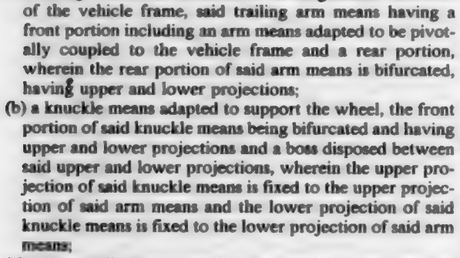
4,696,487

SKI WHICH IS STIFF IN TORSION AND RELATIVELY WEAK IN BEAM

Donald A. Girard, P.O. Box 172, Rancho Cordova, Calif. 95670

Filed Oct. 7, 1985, Ser. No. 785,334
Int. Cl.⁴ A63C *5/07*
U.S. Cl. 280—602 **18 Claims**

1. A ski that is stiff in torsion and is flexible in the vertical direction, comprising
- a ski with a bottom surface and a top surface, a curved-up front end, a rear end, and a ski binding area in between its ends for affixation of a user's ski boot,
- a pair of substantially rigid rectilinear members that are stiff in torsion, and
- a series of mounting means rigidly secured on said ski defining pivoting means for pivotally mounting said rigid members about two axes transverse to said ski, comprising one pair of mounting means to the rear of said binding area for mounting a rear said rigid member and one pair of mounting means in front of said binding area for mounting a forward said rigid member, said rigid members being



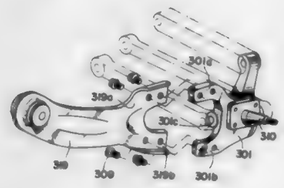
mounted longitudinally of said ski, all the pivoting being about the two axes transverse to the longitudinal axis of said ski,
- one said pivoting means of each said two mounts being directly pivoted to its said rigid member about an axis tangential to the longitudinal axis of said ski, the other said pivoting means having an intermediate member pivoted about an axis transverse to said ski and also pivoted about an axis tangential to the longitudinal axis of said ski at a point spaced therefrom to its said rigid member.

4,696,488

SUSPENSION FOR MOTOR VEHICLES

Keiichi Mitobe, and Kanji Kubo, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,644
Claims priority, application Japan, Sep. 22, 1983, 58-175677; Oct. 26, 1983, 58-200365
Int. Cl.⁴ B60G *3/00*
U.S. Cl. 280—690 **5 Claims**



1. A suspension system for suspending a wheel on a motor vehicle frame, said suspension system comprising:
- (a) trailing arm means extended in the longitudinal direction of the vehicle frame, said trailing arm means having a front portion including an arm means adapted to be pivotally coupled to the vehicle frame and a rear portion, wherein the rear portion of said arm means is bifurcated, having upper and lower projections;
- (b) a knuckle means adapted to support the wheel, the front portion of said knuckle means being bifurcated and having upper and lower projections and a boss disposed between said upper and lower projections, wherein the upper projection of said knuckle means is fixed to the upper projection of said arm means and the lower projection of said knuckle means is fixed to the lower projection of said arm means;
- (c) an upper link arm extending substantially transverse to the vehicle frame, said upper link arm having a first end adapted to be pivotally coupled to the vehicle frame and a second end pivotally coupled to said knuckle means;
- (d) a lower link arm extending substantially transverse to the vehicle frame, said lower link arm having a first end adapted to be pivotally coupled to the vehicle frame and a second end pivotally coupled to said knuckle means, wherein said lower arm is positioned lower than said upper arm;
- (e) a compensation link having a first end adapted to be pivotally coupled to the vehicle frame and a second end pivotally coupled to said boss on said knuckle means; and
- (f) spring means adapted to be coupled between said trailing arm means and the vehicle frame.

4,696,489

AUTOMOTIVE SUSPENSION SYSTEM WITH VARIABLE DAMPING CHARACTERISTICS

Takeshi Fujishiro, Yokohama; Sadahiro Takahashi, and Takanobu Kaneko, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 13, 1986, Ser. No. 818,265
Claims priority, application Japan, Jan. 14, 1985, 60-4791
Int. Cl.⁴ B60G *17/04*
U.S. Cl. 280—707 **12 Claims**



1. A suspension control system for an automotive vehicle comprising:
- a vehicular suspension system with damping characteristics variable at least between a first harder suspension mode and a second softer suspension mode;
- a first sensor means for monitoring vertical displacement of a vehicle body within a gravity field and producing a first sensor signal indicative of the vertical speed of said vehicle body;
- a second sensor means for monitoring relative distance between the vehicle body and a vehicular wheel assembly and producing a second sensor signal indicative of the relative speed between said vehicle body and said wheel assembly;
- a controller responsive to said first and second sensor signals for predicting the effect of damping characteristics of the suspension system from between a first condition in which said damping characteristics of the suspension system act to amplify vehicle body vibrations and a second condition in which damping characteristics of the suspension system act to absorb vehicle body vibrations, said controller causing said vehicular suspension system to assume said second softer suspension mode when said first condition is predicted and to assume said first harder suspension mode when said second condition is predicted.

4,696,490

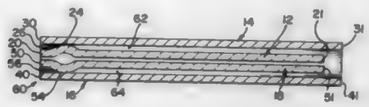
BOOK POCKET ASSEMBLY AND BLANK THEREFOR

Bernard T. Sendor, Westbury, and Mortimer S. Sendor, Queens Village, both of N.Y., assignors to Sendor Bindery, Inc., New York, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,641
Int. Cl.⁴ B42D *3/18*
U.S. Cl. 281—15 R **17 Claims**

1. A pocket assembly formed from a single sheet of paperboard material for use with a book, said pocket assembly com-

prising at least one pocket, said pocket comprising a support panel and a retaining panel articulated to said support panel along a fold line and disposed in parallel generally face-to-face relationship with said support panel, said pocket further being defined by an elongated embossment unitary with said paperboard material and extending away from said fold line and



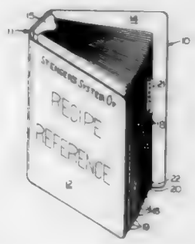
extending intermediate said retaining panel and said support panel, said pocket further comprising an adhesive material disposed intermediate said retaining panel and said support panel and substantially adjacent said embossment, said adhesive material securing said retaining panel to said support panel adjacent said embossment, whereby said embossment prevents the spread of the adhesive into the pocket.

4,696,491

INFORMATION REFERENCE BOOK AND INDEXING SYSTEM

Barbara J. Stenger, P.O. Box 403, Brimfield, Ill. 61517

Filed Jun. 19, 1986, Ser. No. 875,947
Int. Cl.[4] B42F *21/00, 19/00, 13/00*
U.S. Cl. 283—37 **11 Claims**



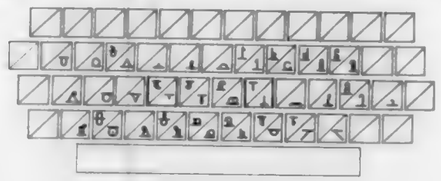
1. An information reference book for storing abstracted material from a larger source in a single depository comprising;
a looseleaf binder;
a plurality of dividers receivable within the binder and having alphabetical tabs of a predetermined relatively small size outwardly extended therefrom, and said dividers providing a plurality of alphabetized abstracting forms receiving spaces therebetween;
an auxiliary divider disposed within the binder and having an elongated tab outwardly extended thereform of a form and size larger than said alphabetical tabs;
a form storage space defined behind said auxiliary divider;
and a supply of unused abstract forms initially temporarily stored in said form storage space behind said auxiliary divider with said unused forms being transferable after use to appropriate ones of said alphabetized spaces in the binder.

4,696,492

SOUNDWRITING—A PHONETIC SCRIPT WITH KEYBOARD

Evelyn L. Hardin, 1625 28th Ave., Meridian, Miss. 39301

Filed Jun. 27, 1985, Ser. No. 749,414
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—45 **3 Claims**



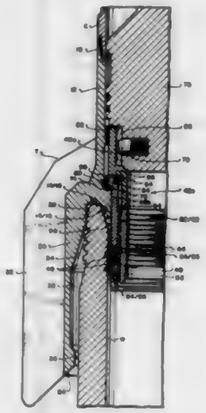
1. A font of characters as shown in FIG. 5.

4,696,493

SUBSEA WELLHEAD TIEBACK SYSTEM

Norman Brammer, Ventura, Calif., assignor to Vetco-Gray Inc., Houston, Tex.

Filed Jun. 11, 1986, Ser. No. 872,794
Int. Cl.[4] F16L *37/08*
U.S. Cl. 285—3 **5 Claims**



1. A conductor tieback connector for connecting a conductor to an internally grooved subsea wellhead comprising;
a tubular body sealably and rigidly connectible to the conductor;
a downwardly opening funnel means with internal bearing surfaces for aligning the connector, said funnel means being connected to said tubular body;
internal threads on said tubular body;
abutting surfaces on the wellhead and said tubular body for abutting when said tubular body is fully engaged within the wellhead; and
lockdown means comprising, a two-piece bushing located within said tubular body, including external threads on one piece of said bushing engagable with said internal threads on said tubular body, locking means on said other piece of said bushing for engaging said wellhead, means for interlocking said one piece with a rotating tool, means for interlocking both pieces together, means internal of said tubular body and engagable with means on said bushing for preventing downward movement of said bushing relative to said tubular body, and means for preventing

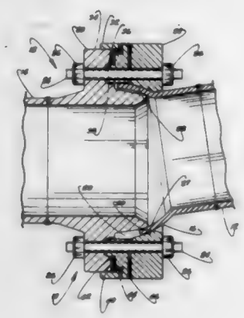
rotation of said one piece and for disconnecting said means for interlocking both pieces together whereby said other piece, upon continued rotation, will urge and lock said locking means in said wellhead grooves.

4,696,494

FLOWLINE ADJUSTABLE JOINT

Thomas R. Schmitz, Katy, and William M. Taylor, Houston, both of Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 5, 1985, Ser. No. 741,269
Int. Cl.[4] F16L *27/06*
U.S. Cl. 285—18 **5 Claims**



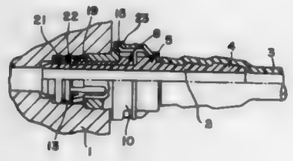
1. An adjustable flowline joint comprising
an arcuate bell flange,
an annular flanged assembly having a flange and a ring secured thereto with facing arcuate surfaces on the flange and the ring,
tension means for securing said flange to said ring,
said arcuate surfaces being contoured to receive said bell flange therebetween,
tensioning of said tension means clamping said bell flange between said arcuate surfaces,
pressure responsive means between said flange and ring, and
means for introducing fluid under pressure to said pressure responsive means to increase the tension on said tension securing means to displace said arcuate surfaces and thereby release said bell flange for angular adjustment by pivoting with respect to said flanged assembly.

4,696,495

PIPE FITTING ASSEMBLY

Patrick R. Oliver, Bristol, Great Britain, assignor to Bendix Limited, Bristol, Great Britain

Filed Aug. 19, 1986, Ser. No. 897,965
Int. Cl.[4] F16L *27/00*
U.S. Cl. 285—96 **9 Claims**



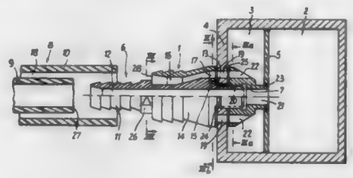
1. A pipe fitting assembly for rotatably securing a pipe in an opening in a housing, said pipe fitting assembly including a first part carried in said opening and a second part connected to said pipe, said first part including a member nonrotatably mounted in said opening and an insert carried by said member, and rotatable with respect thereto, said insert and said member including cooperating means for preventing axial withdrawal of the insert from said member, said insert defining an aperture slidably receiving said second part, first abutment means on said insert cooperating with second abutment means on said second part to oppose withdrawal of said second part from the first part by locking said second part to said insert, said first and second abutment means including releasing means responsive to rotation of said insert relative to said second part to disengage said first and second abutment means to permit withdrawal of said second part from the insert.

4,696,496

SYSTEM FOR PUTTING TWO CONTIGUOUS ENCLOSURES INTO INDIVIDUAL COMMUNICATION WITH THE OUTSIDE

Hubert V. de Guells, Le Pecq, and Pascal Doute, Verneuil-sur-Seine, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Oct. 18, 1985, Ser. No. 789,152
Claims priority, application France, Oct. 31, 1984, 84 16704
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—137.1 **8 Claims**



1. A system for putting two contiguous enclosures disposed on the same side of a common wall into individual communication with the outside, wherein the system comprises:
both a two-piece coupling part constituted by:
a first tubular end piece suitable for being coupled to a first pipe and provided with a first axially disposed passage in communication with a first opening provided in said common wall, said first end piece having first connecting means and being intended to be mounted on said common wall, on the opposite side to said enclosures; and
a second end piece suitable for being coupled to a second pipe surrounding and enclosing said first pipe in such a manner as to provide an intermediate space between the outside wall of the first pipe and the inside wall of the second pipe, said second end piece being fixed to said first end piece, being coaxial therewith, and being disposed in such a manner as to include at least one second passage which is eccentric relative to said first passage, and suitable for being put into communication with said intermediate space between the pipes and with a second opening provided through said common wall, said second end piece being intended to be mounted on said common wall on the side opposite to said enclosures;
and also a fixing part disposed on the same side as said enclosures and provided with second connecting means for fixing said coupling part by way of said first connecting means to the said common wall, said fixing part including an axial passage opening out into one of said enclosures and intended to be put into communication with said first passage through said first end piece and said first opening through said common wall, together with at least one eccentric passage opening out into the other enclosure and intended to be put into communication with said second passage through said second end piece and said second opening through the common wall of the enclosures.

4,696,497

QUICK CONNECTOR

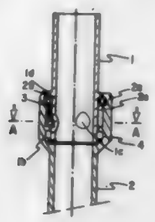
Hermann Schwarzensteiner, D-8447, Windberg, Fed. Rep. of Germany

Filed May 30, 1986, Ser. No. 869,009

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525402

Int. Cl.⁴ F16L *37/08*

U.S. Cl. 285—307 **5 Claims**



1. A quick connector for coupling one tubular member having a socket end portion to another tubular member and portion formed with a plurality of concave recesses, said socket end extending from an eccentric rim having at least one projection thereon, said other tubular member end portion extending to a locking collar, said collar having at least one indentation adapted to interlock with said eccentric rim projection, said tubular member end portions defining a gap therebetween when said socket end slidingly receives said other member end portion, a locking ring in said socket end portion, said locking ring comprising a plurality of radially resilient detent fingers extending axially into said gap wherein each of said fingers terminates in a radially inwardly, obliquely angled web movable in the direction of and circumferentially aligned with one of said recesses.

4,696,498

TUBULAR CONNECTION

Kristy L. Church, Houston, Tex., assignor to Quanex Corporation, Houston, Tex.

Filed Oct. 29, 1986, Ser. No. 924,652

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—334 **9 Claims**



1. A high tensile strength two step threaded connection for adjacent mating end portions of a pair of plain end, non-upset axially aligned tubular members, said two step connection comprising:

a male tubular member having a tapered threaded end portion and being of uniform inner and outer diameters throughout its length except for said threaded end portion, said end portion defining an annular end shoulder and an outer peripheral surface tapering outwardly from said end shoulder in a generally transverse relation to the end shoulder, said outer peripheral surface being generally smooth directly adjacent said end shoulder to provide a metal-to-metal seal contact area;

a female tubular member having a mating tapered threaded end portion and an inner diameter forming a smooth continuation of the inner diameter of said male tubular member to provide a straight interior bore of a uniform inner diameter, said female tubular member having an annular inner shoulder about its inner periphery and an inner peripheral surface tapering outwardly from said inner shoulder in generally complementary relation to said outer peripheral surface of said male tubular member, said inner peripheral surface being generally smooth directly adjacent said inner shoulder to form a seal contact area for engaging said seal contact area on said male tubular member in a compressible metal-to-metal sealing relation;

the threaded end portion of each of said tubular members having a pair of stepped sets of mating tapered hook threads adjacent the smooth seal contact area thereof with each set of hook threads having a steep taper and a coarse pitch thereby to provide an increased stabbing depth and to prevent cross threading when the connection is assembled with imperfect axial alignment;

said steep taper and coarse pitch being constructed and arranged so that said tubular members are rotated less than around one turn from an initial hand tight plane to a power tight plane at final assembly thereby to minimize galling and scraping action between the tubular members and to facilitate making and breaking the connection;

said smooth metal-to-metal contact areas upon rotation of said tubular members from a hand tight plane to a power tight plane after said contact areas initially engage each other resulting in compressible metal-to-metal sealing contact thereby to provide a metal-to-metal seal against internal fluid pressure which maintains its sealing pressure upon an increase in internal fluid pressure,

said tubular members being constucted and arranged so that said connection after final assembly to said power tight plane will have a tensile yield strength at least equal to the tensile yield strength of the tubular members thereby providing a high strength connection for plain end tubular members.

4,696,499

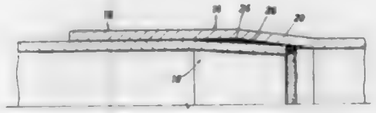
MECHANICAL PIPE JOINT AND METHOD OF FORMING THE SAME

Major G. Butler, Houston, Tex., assignor to Butler Taper Joint, Houston, Tex.

Continuation of Ser. No. 267,841, Jun. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,722, Jun. 25, 1980, abandoned. This application Apr. 29, 1983, Ser. No. 489,832

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—234.4 **5 Claims**



1. A mechanical pipe joint for connecting two pipe sections, comprising a pin on the end of one section and a socket on the end of the other section into which the pin is inserted, said socket including a cylindrical section having an inside diameter less than the outside diameter of the pin to form an interference fit with the pin when the pin is inserted into the socket and an outwardly extending tapered section connecting the cylindrical section to the pipe section, said pin including an inwardly tapered section having an angle of taper less than the angle of taper of the tapered section of the socket to form a substantially closed annular cavity between the tapered section of the socket and a portion of the cylindrical section of the socket in which sealant may be trapped to seal the joint when the tapered section of the pin is moved into position close to the tapered section of the socket.

4,696,500

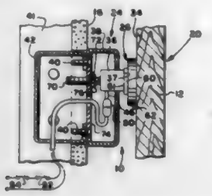
DOORHOLDER ASSEMBLY FOR A POCKET DOOR

Richard L. Zankel, 218 Loon Ct., Foster City, Calif. 94404

Filed Jan. 2, 1986, Ser. No. 815,549

Int. Cl.⁴ E05C *17/56*

U.S. Cl. 292—251.5 **3 Claims**



1. A doorholder assembly for use with a pocket door which is biased by a doorcloser from an open position in which the door is located in a pocket in a wall toward a closed position, said doorholder assembly comprising a housing mountable on a vertical surface of the wall inside the pocket, an electromagnet supported by said housing, said electromagnet having an armature engaging surface, an armature mountable on the door to be movable with the door when the door moves from its closed position to its open position into engagement with said armature engaging surface of said electromagnet, adjustable mounting means for mounting said electromagnet to said housing and being adjustable to vary the distance that said armature engaging surface is disposed relative to the surface of the wall on which said housing is to be mounted to enable the visible surface of the door when in its held open position to be aligned coplaner with the wall outside of the pocket and means for selectively energizing said electromagnet to attract said armature to said armature engaging surface to override the biasing force of the doorcloser to hole the door in its open position and de-energizing said electromagnet to release said armature from said armature engaging surface allowing the door to be biased toward its closed position, said armature including an annular metallic member having an annular shoulder thereon, said metallic member being attractable to said armature engaging surface when said electromagnet is energized, an annular mounting member for mounting said metallic member on the door, said annular mounting member having an annular opening disposed therein through which said annular metallic member projects to engage with said armature engaging surface of said electromagnet and an annular shoulder disposed about said annular opening, said annular shoulder on said mounting member having a diameter which is less than the diameter of the annular shoulder on said metallic member to provide an interference fit between said metallic member within said annular opening in said mounting member and limit movement of said metallic member relative to said mounting member, and compressable resilient means disposed between said annular shoulder on said metallic member and said annular shoulder on said mounting member, said annular metallic member being movable toward said annular mounting member when said metallic member is attracted to said armature engaging surface to compress said resilient means between said annular shoulder located on said metallic member and said annular shoulder located on said mounting member, said resilient means when compressed allowing said metallic member to move relative to said mounting member to compensate for angular misalignment between said metallic member and said armature engaging surface, and wherein said resilient means comprises a resilient ring, said electromagnet when energized establishing vibration therein from the AC current passing therethrough which is transmitted to said metallic member when said metalic member is engaged with said armature engaging surface of said electromagnet, said resilient ring absorbing vibration established upon energization of the electromagnet by AC current and preventing the transmittal of said vibration from the electromagnet and the metallic member, to the mounting ring and the door.

4,696,501

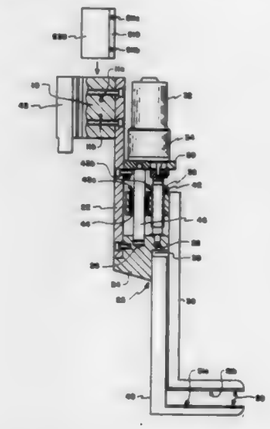
ROBOT GRIPPER

Winston S. Webb, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1986, Ser. No. 824,049

Int. Cl.⁴ B25J *15/02*

U.S. Cl. 294—86.4 **19 Claims**



1. An electronic force-detecting robot gripper for gripping objects comprising:

first and second gripper jaws for gripping objects;

motor means for driving the jaws in a first direction to grip the objects and in a second direction to release the objects;

electrical circuit means supplying an electrical signal to the motor means for driving the jaws in the first direction, the electrical signal varying as a function of the amount of force applied to the objects by the jaws and wherein the electrical circuit means for supplying a signal to the motor means further comprises:

feedback means responsive to a preselected electrical signal for terminating the driving of the jaws in the first direction;

a first driver input coupled to the feedback means;

a second driver input coupled to the feedback means;

a first output connected to a first control line of the motor means;

a second output connected to a second control line of the motor means;

a third output connected to the feedback means;

first, second, third, fourth, fifth, and sixth transistors each having a collector, base, and emitter;

a first amplifier coupled to the first driver input having a noninverting output coupled to the base of the first transistor, and further having an inverting input;

a second amplifier coupled to the second driver input and the noninverting output of the first amplifier, the second amplifier having a noninverting output coupled to the second transistor and an inverting input coupled to the input of the first amplifier;

the collector of the first transistor being connected through a first resistance means to the base of the third transistor, and the emitter of the first transistor being coupled to the base of the fourth transistor;

the collector of the second transistor being connected through a second resistance means to the base of the fifth transistor, and the emitter of the second transistor being connected to the base of the sixth transistor;

the base of the third transistor being connected through a third resistance means to an external dc voltage source, the emitter of the third transistor being connected to the dc voltage source, and the collector of the third transistor being connected to the first output of the electrical circuit means and also to the collector of the sixth transistor;

the collector of the fourth transistor being connected to the collector of the fifth transistor and to the second output of the electrical circuit means, and the emitter of the fourth transistor being connected to the emitter of the sixth amplifier and the third output of the electrical circuit means;

the base of the fifth transistor being connected through a fourth resistance means to the dc voltage source and the collector of the fifth transistor; and

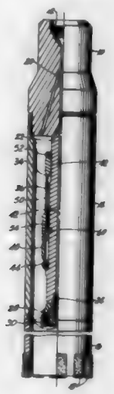
the transistors, resistors, and first and second amplifiers having parameters selected so that when a first combination of predetermined logical signals are received through the first and second inputs, the motor means drives the jaws in the first direction to grip the objects, when a second combination of predetermined logical signals are received through the first and second inputs, the motor means drives the jaws in the second direction to release the object, and when a third combination of predetermined logical signals are received through the first and second inputs, the motor means is turned off, further, the third output of the electrical circuit means carries the motor means electrical signal to the input of the feedback means.

4,696,502

DUAL STRING PACKER MILL

Praful C. Desai, Kingwood, Tex., assignor to Smith International, Newport Beach, Calif.

Filed Aug. 19, 1985, Ser. No. 767,039
Int. Cl.[4] E21B *31/16, 31/20*
U.S. Cl. 294—86.17 **9 Claims**



1. A packer mill comprising:

an annular sleeve;

means on the lower end of the sleeve for milling the periphery of a packer;

an axial mandrel inside the sleeve;

means on the lower end of the mandrel for milling an axial hole into the upper end of a packer at an elevation above the milling of the periphery of the packer;

an axially slidable gripper sleeve on the mandrel including a plurality of longitudinally extending fingers, each of the fingers comprising outwardly facing serrations for gripping the walls of the hole in the packer;

a camming sleeve on the mandrel inside the gripper sleeve for camming the fingers radially outwardly for engaging the walls of the axial hole milled in the packer for supporting the packer;

a release ring around the mandrel engaging an end of the camming sleeve; and

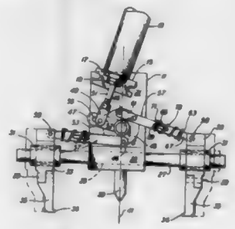
means for bursting the ring in hoop tension upon application of sufficient axial force between the mandrel and camming sleeve for releasing the camming sleeve for axially sliding away from the gripper sleeve for permitting the fingers to collapse radially inwardly.

4,696,503

PNEUMATIC ACTUATED CAM DRIVEN PARALLEL GRIPPER

Zurino P. Collodel, Vernon, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 27, 1986, Ser. No. 923,225
Int. Cl.[4] B25J *15/08*
U.S. Cl. 294—88 **16 Claims**



1. A parallel gripper comprising:

a supporting bracket for attaching to an end of an arm of a robot or a pick and place system;

at least one shaft secured to said bracket and extending therefrom in two directions;

first and second slides mounted on said shaft for sliding motion thereof;

means to prevent said slides from rotating on said shaft;

first and second fingers detachably connected to said slides whereby said fingers can be readily replaced or interchanged;

actuating means; and

means for coupling said actuating means to said slides such as to move said slides between a first position where said fingers are separated by a first distance and a second position where said fingers are separated by a second distance, said coupling means including first and second arms biasingly coupled to the first and second slides and to said actuating means, said coupling means being compliant so as to permit movement of different fingers between the first and second positions.

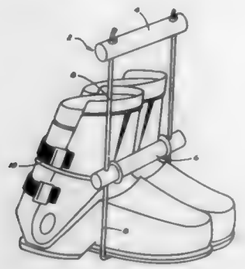
4,696,504

BOOT CARRIER

Roland Q. Roberts, Jr., 4135 Jonquil Clr. North, Palm Beach Gardens, Fla. 33410

Filed Sep. 30, 1986, Ser. No. 913,521
Int. Cl.[4] B65D *63/18*
U.S. Cl. 294—148 **11 Claims**

1. A boot carrier comprising a handle of rigid material with two holes therethrough, one hole near each end of the handle; a solid holding bar of rigid material with two holes through it, one hole near each end of the holding bar; a flexible down cord of nonelastic material, said cord extending through the hole at one end of the handle and then through the hole at one end of the solid holding bar and forming a U-shape for extending around the bottom of a boot and then extending through the other hole in the other end of the solid holding bar and then through the other hole in the other end of the handle; stop means connected to the ends of the down cord to prevent the down cord from slipping through the holes in the handle, the solid holding bar being slidable up and down on the flexible down cord between the handle and the bottom of the U-shape for placement against a boot shaft; a stretchable retention cord; means connecting each end of said retention cord to the solid



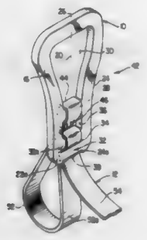
holding bar for extending around the back of a boot shaft, each end of said stretchable retention cord having a loop, said connecting means including each loop being located over said solid holding bar between said two holes in said solid holding bar.

4,696,505

HANDLE AND STRAP APPARATUS FOR HAND-CARRYING ARTICLES

Ralph E. Shadoan, 12537 SE. 38th St., Choctaw, Okla. 73020

Filed Nov. 10, 1986, Ser. No. 928,978
Int. Cl.[4] A45C *13/26;* **B65D** *71/00*
U.S. Cl. 294—153 **17 Claims**



1. Apparatus for hand-carrying an article, comprising:

a handle for use with an elongated flexible carrying member adapted to be formed into a carrying loop portion wrapped around the article and having an end portion, and a connecting loop portion, said handle having:

an axis;

a grip portion extending generally transversely to said axis and adapted to be grasped by a user of said apparatus; and

connecting means, spaced apart from said grip portion, for anchoring a first portion of said handle to said end portion of said carrying loop and for adjustably connecting a second portion of said handle to said connecting loop portion of said carrying member in a manner such that:

(1) when said grip portion and said carrying loop portion are pulled in opposite directions generally parallel to said axis said connecting loop portion frictionally locks said carrying loop portion to said handle and prevents enlargement of said carrying loop portion, and

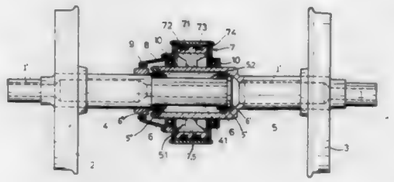
(2) when tension on said carrying loop portion is relaxed it may be selectively lenghtened or shortened to adjustably loosen or tighten said carrying loop about the article, by pulling on a portion of said carrying member to shift the location of said connecting loop portion thereon.

4,696,506

WHEEL SET FOR RAIL VEHICLES

Rolf Leo, Wertingen; Karl-Heinz Meusel, and Alfred Uttner, both of Donauwoerth all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 31, 1985, Ser. No. 815,399
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1985, 3501488
Int. Cl.[4] B60B *35/14;* **B61F** *5/38*
U.S. Cl. 295—38 **5 Claims**



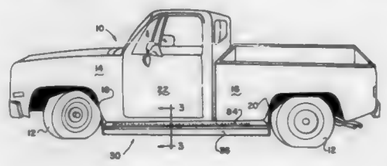
1. A wheel set for rail vehicles, comprising an axle having a longitudinal axis, two wheels secured to said axle, said axle being divided into a first axle section and a second axle section, clutch means interconnecting said first and second axle sections for selectively permitting said first and second axle sections to rotate at different r.p.m.s for permitting a differential r.p.m., one of said axle sections having a hollow end forming a radially outer axle section end, the other of said axle sections having a radially inner axle stub forming a radially inner axle section end fitting into said hollow radially outer axle section end, first bearing means (6) interposed between said hollow radially outer axle section end and said radially inner axle stub for permitting relative rotation while preventing axial movement between said axle sections, said clutch means comprising a radially inner clutch component (7.2) and a radially outer clutch component (7.1), first means (7.5) rigidly securing said radially inner clutch component on said radially outer axle section end, second means for rotatably supporting said radially outer clutch component on said radially outer axle section end and for rigidly connecting said radially outer clutch component to said other axle section outside said radially inner axle stub, whereby both clutch components are mounted on said radially outer axle section end.

4,696,507

RUNNING BOARD AND TOOLBOX

Mark L. Alldredge, 1823 N. University, Lubbock, Tex. 79415

Filed Aug. 4, 1986, Ser. No. 892,948
Int. Cl.[4] B60R *9/02*
U.S. Cl. 296—37.6 **9 Claims**



1. A toolbox adapted to be attached to a land vehicle having two ground engaging wheels on each side of the vehicle, a body including

i. a wheel well over each wheel,

ii. at least one door on each side of the vehicle between the wheel wells;

wherein the improvement comprises:

a top plate,

a back panel attached to

a bottom panel,

a side panel attached to the bottom panel,

a front end panel attached to the bottom panel, and

a rear end panel attached to the bottom panel,

tread material on the top plate to make it suitable for use as a running board,

attachment means on each end panel for attaching the end panels and thus the toolbox to the wheel wells of the vehicle,

end lips formed by bending a top edge of each end panel inward are located next to the top plate and parallel to the bottom panel,

a side lip formed by bending a top edge of a side panel outward is located next to the top plate and parallel to the bottom panel,

a back hip formed by bending an upper edge of the back panel inward,

a back lip formed by bending a top part of the back hip inward, the back lip located next to the top plate and parallel to the bottom panel and the back hip forming about a 45° angle both to the back panel and to the back lip,

said side panel, bottom panel, back panel, back hip, side lip, and back lip folded from a single sheet of metal with the side panel and back panel normal to the bottom panel,

a back shield attached to the back hip near the back panel and said shield spaced from the hip,

a flange on the shield above the top plate and normal to the bottom panel,

a back catch on the top plate between the shield and hip and parallel to the shield and hip,

a side face on the top plate extending downward parallel to the side panel,

a top lip on the side face extending inward parallel to the bottom panel, and

compressible material in the form of weather stripping attached to the top plate and contacting the end lips, back lip, and side lip.

4,696,508

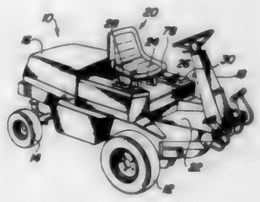
DEVICE HOLDING SEAT IN RAISED POSITION

Peter F. Brautigam, Kewaskum, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 4, 1986, Ser. No. 892,666

Int. Cl.⁴ B62D *25/00*

U.S. Cl. 296—65 R **6 Claims**



1. A vehicle seat positioned over a battery for the vehicle and having a seat frame mounted on the vehicle to swing vertically about a transverse horizontal axis located forwardly of said battery, the improvement comprising: a battery housing including at least one vertical fore-and-aft extending plate positioned alongside the battery and having a vertical opening therein with opposed vertical edges and with the edge facing rearwardly having vertically spaced notches therein, each of said notches being formed by a convex entry lip extending forwardly to join a rear portion of a concave edge section of said notch that is lower than said lip, and continuing from said concave section to an upwardly and rearwardly extending inclined edge section that joins the rearmost end of the convex entry lip of the next higher notch; an L-shaped latch rod having a vertical leg portion positioned alongside said vertical plate with a lower end thereof extending horizontally into said opening and seatable in the concave section of a selected one of the said notches, said L-shaped latch rod having an upper horizontal leg portion journalled on the underside of said seat to rock about a transverse horizontal axis and extending to an end positioned adjacent an edge of the seat; a vertical hand lever rigid with the latter end and extending vertically upwardly for moving said lower end forwardly; and a prestressed spring extending between said vertical leg portion and said fore-and-aft extending plate for biasing said lower end toward said notches and to effect ratcheting of said lower end along said inclined edge sections between said notches and to effect seating in a selected concave edge section when the seat is released as said seat frame is swung vertically.

4,696,509

WINDSHIELD ADJUSTMENT DEVICE

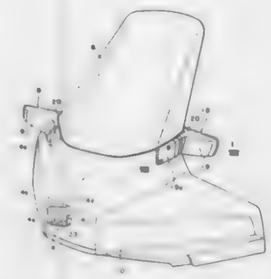
Akio Yagasaki, Fuchu, and Kazuo Marishima, Shiga, both of Japan, assignors to Honda Giken Kogyo KK, Tokyo, Japan

Continuation of Ser. No. 756,114, Jul. 18, 1985, abandoned. This application Aug. 13, 1986, Ser. No. 895,539

Claims priority, application Japan, Jul. 18, 1984, 59-147599; Jul. 20, 1984, 59-109624[U]

Int. Cl.⁴ B62J *17/04*

U.S. Cl. 296—84 A **3 Claims**



1. Device for adjusting the windshield of a vehicle comprising left and right rear view mirrors attached to a frame, each of said mirrors having a mirror housing provided with generally vertically extending curved guide groove means engaged by side edges of said windshield, edges of said windshield operatively engaging in said guide groove means for generally vertical up-and-down sliding movement simultaneously producing a change in the angle of tilt of said windshield.

4,696,510

SWIVEL BEARING FOR AUTOMOBILE SUN VISORS

Gerhard Zwirner, Haan, Fed. Rep. of Germany, assignor to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 882,084

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524098

Int. Cl.⁴ B60J *3/02*

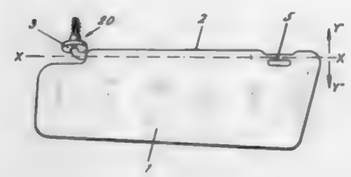
U.S. Cl. 296—97 K **7 Claims**

1. A swivel bearing for supporting an automobile sun visor, the bearing comprising a visor shaft which includes a mounting arm and an attached support arm which meet to define an L-shape for the shaft, the support arm of the shaft being adapted for supporting a sun visor body;

the swivel bearing further comprising;

a bearing housing and means for fastening the bearing housing to the body of a vehicle;

a mounting bore defined in the bearing housing for receiving and supporting the mounting arm of the shaft therein, the mounting bore having an inlet wherein when the mounting arm is inserted in the mounting bore, the inlet is toward the support arm; the mounting bore having an outlet, the mounting bore being shaped to define at least over a part of its axial length a slot in which the mounting arm may tilt and pivot and the shaft of the sun visor is both tiltable in a cross axis direction and rotatable around its axis within the swivel bearing; the inlet of the mounting



bore being relatively more circular in shape than the outlet and the outlet of the mounting bore being relatively more oblong in shape than the inlet; the dimension of the oblong outlet along one short axis thereof being substantially equal to a diameter of the mounting arm of the shaft and wherein the dimension of the oblong outlet along a long axis thereof is larger than the diameter of the relatively more circular inlet; the support arm that supports the mounting shaft and is embedded in the main part of the sun visor being substantially parallel to the windshield; the major axis of the slot thereby paralleling the support arm that supports the mounting shaft of the sun visor which support arm also supports the main body of the sun visor.

4,696,511

OPENING ROOF ARRANGEMENT FOR A MOTOR VEHICLE ROOF

Bernard Laville, Bressuire, and Philippe Prouteau, Airvault, both of France, assignors to Etablissements Farnier & Penin, France

Filed Sep. 25, 1986, Ser. No. 911,336

Claims priority, application France, Sep. 26, 1985, 85 14270

Int. Cl.⁴ B60J *7/047, 7/11*

U.S. Cl. 296—216 **4 Claims**



1. An opening roof arrangement for a motor vehicle roof, comprising a carrier structure (1) in the form of a frame which is capable of being mounted in an opening in a vehicle roof and retained on the edges thereof, a panel (3) which is mounted to a support assembly (5, 6, 7, 11) pivotably mounted on the frame (1) about a pivot axis which is parallel to and in the vicinity of the front edge of the frame, and an operating and locking member (16) which is mounted to the support assembly and which co-operates with a rear edge of the frame to cause said support assembly to pivot from a first position in which it extends in a horizontal plane of the frame (1), the panel (3) forming a closure means for the opening by resting on a sealing means (2) provided on the inside edge of the frame (1), to a second position in which the support assembly is inclined with respect to the horizontal plane of the frame (1) about said pivot axis, characterized in that said support assembly is formed by a pair of parallel telescopic struts (6, 7) which are substantially perpendicular to the pivot axis, each strut having a slideway member (6) which is pivotally mounted at one end (5) thereof about said axis and a slider (7) mounted slidably on said slideway member (6), the panel (3) being connected to each of said struts (6, 7) by a fixing member (8) having a first lug (9) mounted slidably in said slideway member (6) and a second lug (10) mounted slidably in said slider (7).

4,696,512

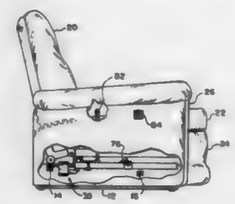
MOTORIZED RECLINER CHAIR WITH RELEASE MECHANISM

William Burnett, Livingston; James R. Houghton; David A. Walker, both of Cookeville, and Larry Key, Livingston, all of Tenn., assignors to Berkline Corporation, Morristown, Tenn.

Filed Mar. 6, 1986, Ser. No. 836,709

Int. Cl.⁴ A47C *1/035*

U.S. Cl. 297—68 **15 Claims**



1. In a recliner chair having a base, a seat-footrest assembly mounted on the base and movable between upright and recline positions and mechanical linkage operational for moving the seat-footrest assembly,

motor drive means mounted to said base and connected to the mechanical linkage by a spring biased decoupling means to actuate said mechanical linkage; and

said spring biased decoupling means operable by an occupant of the chair for disengaging said motor drive means from said mechanical linkage so that the occupant can manually move said seat-footrest assembly independently of said motor drive means.

4,696,513

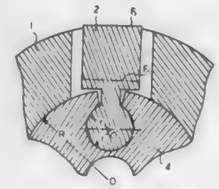
CHUCKING DEVICE FOR MACHINE TOOLS

Akira Nobukawa, 676, Mukai-nagatani, Ekiya-cho, Fukuyama, Hiroshima-ken; Tatsue Sawaguchi, 390-2, Habu-cho, Fuchu-shi, Hiroshima-ken, and Yoshihiro Kuroki, 69, Akaya, Kozan-cho, Sera-gun, Horishima-ken, all of Japan

Filed Aug. 20, 1985, Ser. No. 767,467

Int. Cl.⁴ B23B *31/12*

U.S. Cl. 279—121 **2 Claims**



1. A chuck device in a machine tool comprising:

(a) a body,

(b) a plunger and jaws engaged with said plunger, the engagement part of the respective jaws with said plunger being wedge-shaped,

(c) a sliding surface on the engagement part of the wedge part of jaws which, with the plunger, forms a circular arc, and

(d) slot grooves in said body;

(e) said jaws engaged with and inserted in said slot grooves;

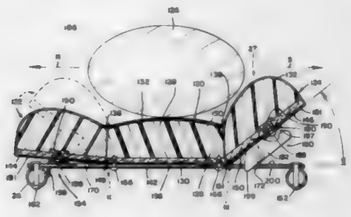
(f) large, horizontal clearance being provided between said slot grooves and said jaws, whereby said jaws freely swing like a pendulum.

4,696,514

HIGH CHAIR WITH ADJUSTABLE BACK

Kevin Maloney, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.

Continuation of Ser. No. 747,855, Jun. 24, 1985, which is a division of Ser. No. 581,977, Feb. 21, 1984, Pat. No. 4,603,902. This application Sep. 5, 1986, Ser. No. 904,041
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—284 **11 Claims**



1. A small child's chair comprising
a frame,
a seat having a base portion and a back support portion including a stationary central section and at least a first side section movable with respect to the stationary central section to position the child, and
retention means for retaining the movable first side section in a selected position relative to the stationary central section, the retention means including an elongated bar member fixed to the frame and being formed to include an aperture, means for attaching the bar member to the central section, and a latch member movably mounted to the first side section, the latch member including a first engaging portion for engaging the aperture of the bar member when the side section is in a first position to support the side section in the first position and a separate second engaging portion for lockably engaging the bar member when the side section is in a second position.

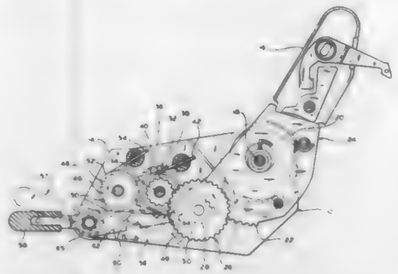
4,696,515

INFINITE MANUAL SEAT BACK RECLINER

Max O. Heesch, Ypsilanti, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 24, 1986, Ser. No. 832,829
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—374 **12 Claims**

10. A seat recliner comprising:
a base frame;
a seat back support pivotably mounted to said base frame for movement to a selected position between an upright position and a reclined position including a sector gear;
a gear set mounted to said base frame meshed with said sector gear;
first spring coil clutch means operatively connected to said gear set for releasably holding said seat back support in said selected position against a first rotational load developed in a first direction at said seat back support; and
second spring coil clutch means operatively connected to said first spring coil clutch means by a load reduction gear interposed between said first spring coil clutch means and said second spring coil clutch means for releasably holding said seat back support in said selected position against



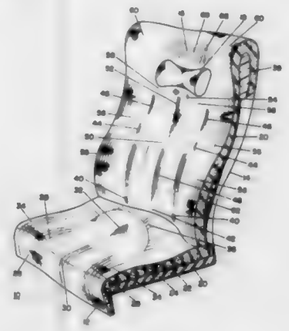
a second rotational load developed in a second direction at seat back support.

4,696,516

CONTOURED AIRCRAFT AND CAR SEAT

Hee-Sung Yeum, Seoul, Rep. of Korea, assignor to DAE-AH Human Engineering Inc., Rep. of Korea

Continuation of Ser. No. 793,590, Oct. 31, 1985. This application Oct. 3, 1986, Ser. No. 915,942
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—458 **15 Claims**



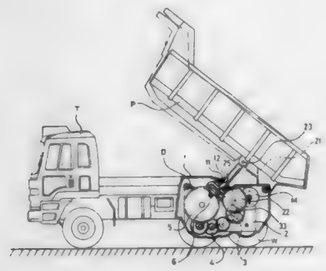
1. A contoured seat, comprising:
a bottom portion having a bottom cushion disposed on top of a bottom support and attached to a basic frame, said bottom cushion comprising urethane foam having a plurality of indentations and having a curved front edge, rear edge and side edges, a downwardly sloping center ridge extending perpendicular to said front edge and extending from, at its highest point, the center of said front edge to, at its lowest point, halfway across said bottom portion, an indented fundament section of semielliptical shape having an open end, which section receives said lowest point of said center ridge generally at the center of its open end, and a rear portion formed between said rear edge and said fundament section, and thigh portions which are surrounded by side portions that adjoin said side edges and are separated by said center ridge, which thigh portions are indented and extend from said front edge into said fundament section below said surrounding rear and side portions to provide a receiving area in which a person comfortably sits;
a back portion, supported by said basic frame and a plastic frame attached thereto, said back portion having a lower edge, top edge and side edges, said lower edge being adjustably attached to said rear edge of said bottom portion, said back portion being divided by a central plane extending from the center of said lower edge to the center of said top edge, where said central plane has a first central plane portion adjoining said bottom portion and extending slightly outwardly to support the person's extreme lower back area, a second central plane portion extending outwardly in the lordotic direction, a third central plane portion extending inwardly in the kyphotic direction, and a fourth central plane portion extending outwardly to meet the upper back in the area between the shoulder blades, said back portion further having two lower side portions symmetrically disposed about said first central plane portion to support the body's hip area, two through portions symmetrically disposed about said second and third central plane portions, and two thoracic portions symmetrically disposed about said fourth central plane portion to support the shoulder blades, wherein between said back portion and said basic frame is disposed a memory material support, which extends between said side edges of said back portion and from said first central plane portion to said third central portion, so as to conform to the lower back of said person using said seat.

4,696,517

DUMPING MECHANISM FOR A DUMPING TOY TRUCK

Toshiaki Nagano, Tokyo, Japan, assignor to Shinsei Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,453
Claims priority, application Japan, Sep. 26, 1984, 59-145156[U]; Sep. 26, 1984, 59-145157[U]
Int. Cl.[4] A63H *17/05*
U.S. Cl. 298—1 T **4 Claims**



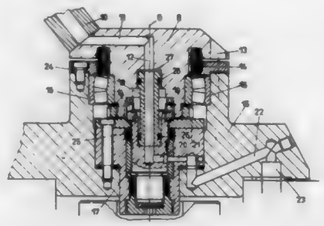
1. A dumping mechanism for a dumping toy truck, which is mounted in a car body for lifting a rear deck to an inclined position and which comprises a lifting rod that extends retractably from the car body, characterized in that the car body at its upper wall is provided with a passing means whose exterior surface is convex in an extension direction of the lifting rod and has a hole of longer dimension in an oscillating direction for passing the lifting rod therethrough, and in that the passing means has an interior concave surface which is slidably in contact with a corresponding convex surface of a covering element which consists of a sealing part having a through-hole for passing the lifting rod and side walls at either side of the sealing part, each of said side walls being provided with a bearing pin protruding therefrom for swingably supporting said covering element on the toy truck, the lifting rod being movable in the extension direction through said hole and said through-hole.

4,696,518

CUTTING MACHINE

Alfred Zitz, and Wilfried Maier, both of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 14, 1986, Ser. No. 818,750
Claims priority, application Austria, Jan. 21, 1985, 139/85
Int. Cl.[4] E21C *25/00*; E21B *10/60*
U.S. Cl. 299—75 **13 Claims**



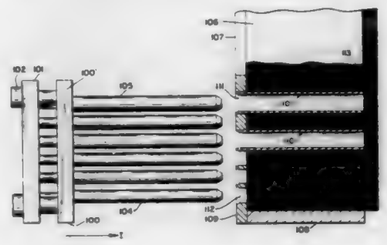
1. In a cutting machine: a cutting arm which is swivellable in height direction and in lateral direction; at least one cutting head rotatably supported on said cutting arm for rotation about an axis transverse to the axis of the cutting arm, said cutting head having internal gearing for driving the same and having external cutting bits and water spray nozzles, and said cutting head being composed of a plurality of discs arranged coaxially with said transverse axis, one of which discs is an outermost disc located remote from said cutting arm relative to other discs and can remain stationary while the rest of the cutting head rotates; and a water supply system for supplying water to the nozzles, said water supply system comprising an axial cavity in said cutting head, a stationary water supply conduit having a discharge end and an essentially axial bore in said outermost disc placing said discharge end of said water supply conduit in communication with said axial cavity in said cutting head.

4,696,519

FILAMENT STOCK BOX AND PICKING APPARATUS

John C. Lewis Jr., Salisbury, Vt., assignor to Tucel Industries Inc., Forest Dale, Vt.

Filed Mar. 11, 1986, Ser. No. 838,549
Int. Cl.[4] A46D *1/08*
U.S. Cl. 300—7 **12 Claims**



1. In an apparatus for making tufted, fused constructions of at least two different types of synthetic cut-to-length filament tufts including means for picking said tufts including at least two hollow picking tubes, means for simultaneously heat sealing and pre-fusing the non working ends thereof and means for simultaneously fusing said pre-fused ends onto a substrate, the improvement comprising:
at least two stock boxes, each containing a different type of filament, each box having a face with apertures therethrough disposed to register with and to receive said

picking tubes, the filament therein being oriented longitudinally perpendicular to said face; and

filament blocking means disposed within each stock box for vacating an area of filament behind at least one of said apertures so that when the picking tubes enter the apertures at least one of said tubes will not pick a tuft, and at least one of said tubes will pick a tuft of filament.

4,696,520

RUNNING WHEEL FOR TRACK VEHICLES

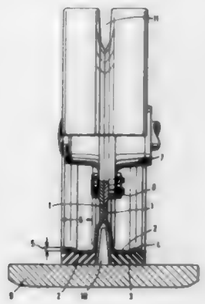
Klaus Henke, Dortmund, and Johannes Wozniak, Lippstadt, both of Fed. Rep. of Germany, assignors to Hoesch Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,852

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515918

Int. Cl.[4] B60B *3/04;* **B62D** *55/08*

U.S. Cl. 301—63 DS **4 Claims**



1. A running wheel for track vehicles comprising two similar discs attached in back-to-back relationship and defining therebetween a radially extending guide gap for track teeth, each of said discs having a substantially axially extending outer annular surface, a hollow tubular rubber coating disposed about the outer annular surface of each disc, the axially outer third of the outer annular surface of each disc including a radially inwardly directed annular stiffening bead, and each rubber coating having a complimentary annular bead entered in its annular disc bead to retain the coatings against relative axial displacement.

4,696,521

VEHICLE ANTI-SKID AIR BRAKING SYSTEMS

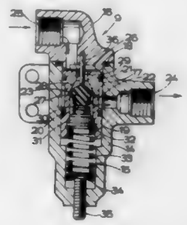
Denis J. McCann, and Colin F. Ross, both of Crickhowell, Wales, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed Mar. 13, 1986, Ser. No. 839,427

Claims priority, application United Kingdom, Mar. 18, 1985, 8506978

Int. Cl.[4] B60T *11/34*

U.S. Cl. 303—92 **8 Claims**



1. A vehicle anti-skid air braking system comprising a supply of compressed air, an air reservoir connected to said supply, a wheel brake, a service wheel brake actuator operatively connected to said wheel brake, a relay valve means controlling communication between said service wheel brake actuator and said reservoir, and between said service wheel brake and atmosphere, a brake pedal, a service air supply controlled by said brake pedal and connected to said relay valve means for controlling the operation thereof, a skid sensor for providing skid signals, a modulator valve means accodiated with said relay valve means, said modulator valve means operating said relay valve means in response to a skid signal from said skid sensor to modulate the pressure applied to said service wheel brake actuator; a spring brake actuator operatively connected to said wheel brake, and a spring brake supply circuit for connecting said spring brake actuator to said reservoir, said spring brake supply circuit incorporating a spring brake operating valve means for isolating said spring brake actuator from said reservoir and a control valve means, said control valve means operating in response to a control pressure and having first and second conditions, and changing from said first to said second condition in response to a drop in said control pressure below a predetermined value, whereby in said first condition said control valve means comprises a one-way valve substantially preventing return flow of air from said spring brake actuator to said reservoir, and in said second condition said one-way valve is disabled to permit said return flow of fluid through said one-way valve itself, said control valve means comprising a housing with a bore having first and second ends, a hollow piston slidably sealed in said bore, said piston having first and second ends, and an interior, a valve seat on said piston, and a one-way valve member housed in said piston, with resilient means biassing said valve member against said seat, said valve seat surrounding a port extending axially through said first end of said piston, a valve control pin in said first end of said bore extending through said port for unseating said valve member when said piston is urged towards said control pin, said first end of said bore being connected to a first housing port for connection to said reservoir and said interior of said piston being connected to a second housing port for connection to said spring brake actuator.

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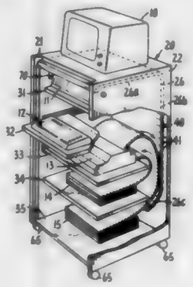
CABINET FOR MICROCOMPUTER COMPONENTS

Gary M. Lowe, San Jose, Calif., assignor to Devoke Co., Santa Clara, Calif.

Filed May 9, 1986, Ser. No. 861,430

Int. Cl.[4] E06B *9/14*

U.S. Cl. 312—297 **2 Claims**



1. A cabinet for housing microcomputer components comprising:

side walls

a rear wall

a top

shelf means for supporting a printer, a supply of paper for said printer and a stack of printed paper, said paper passing through said printer and moving downwardly toward said stack of printed paper,

each of said side walls having a tambour door guide, comprising a groove formed therein in which a tambour door means slides, said groove having a portion extending downwardly adjacent said rear wall, and said groove having a further portion extending forwardly below said printer towards the front of the cabinet

tambour door means guided by said guide and movable between open and closed positions, said tambour door forming a front wall enclosing said cabinet in the closed position said tambour door means, in said open position, having an inturned end which is caused by the door being guided by the forwardly extending portion of the guide means so that in said open position said inturned end is positioned above said stack of printed paper and below said printer, said inturned end forming a baffle, said baffle serving to deflect, fold and stack said printer paper in a fanfold stack on a shelf below said printer.

4,696,523

DEVICE FOR TRANSFERRING CURRENT BETWEEN TWO CONTACT POINTS WHICH ARE MOVABLE RELATIVE TO EACH OTHER

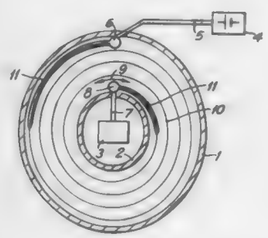
Friedrich Schauer, Heroldsberg, and Hans Berthold, Eckenthal-Brand, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,872

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541287

Int. Cl.[4] H01R *39/00*

U.S. Cl. 439—11 **10 Claims**



1. In a device for transferring electric current between two contact points connected by a ribbon cable serving for the electrical connection, the cable having at least two electric conductors and being wound in the manner of a spring with its turns lying concentric to each other, and wherein ends of the cable are firmly attached to the two contact points, and at least one of the two contact points is movable relative to the other on a path concentric to the turns of the ribbon cable, the improvement comprising

a strip-shaped stabilizer of dimensionally stable plastic and having a U-shaped cross section which is bent to follow a radius of curvature of the ribbon cable, said stabilizer being at least as wide as the ribbon cable and closely enclosing the ribbon cable on opposite flat sides and one narrow side of said ribbon cable, and wherein

said stabilizer, in cross-sectional dimensions, is long relative to its width.

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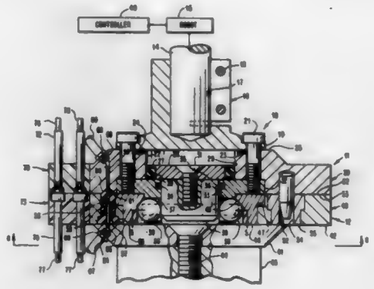
ROBOT ARM COUPLING APPARATUS

William C. Cloyd, Lexington, Ky., assignor to Custom Tool & Mfg. Co. and Automation Development Corporation, both of Lexington, Ky., part interest to each

Filed Mar. 3, 1986, Ser. No. 835,520

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—197 **20 Claims**



1. An apparatus for connecting a tool or the like to a robot arm including:

an inner assembly;

means to attach said inner assembly to a robot arm;

an outer assembly;

said outer assembly including means for attachment to a tool or the like;

locking means to lock said outer assembly to said inner assembly;

said locking means including;

means slidably supported by said inner assembly;

first means to cause movement of said slidably supported means to move said slidably supported means to its locking position, said slidably supported means remaining in the locking position after said first means is rendered ineffective;

second means to cause movement of said slidably supported means to remove said slidably supported means from the locking position;

a plurality of balls surrounding said slidably supported means and supported by said inner assembly;

a cam locking ring supported by said outer assembly and having means cooperating with said balls to retain said balls to lock said outer assembly to said inner assembly when said first means of said locking means moves said slidably supported means to the locking position;

and resilient means supported by said inner assembly to move said balls out of retention by said cam locking ring when said second means of said locking means removes said slidably supported means from the locking position;

each of said inner assembly and said outer assembly having electrical means cooperating with each other to provide a plurality of electrical connections extending through said inner assembly and said outer assembly when said inner assembly and said outer assembly are locked to each other by said locking means;

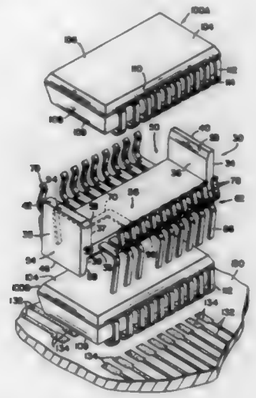
and each of said inner assembly and said outer assembly having air passage means cooperating with each other to provide a plurality of air sealed passage means extending through said inner assembly and said outer assembly when said inner assembly and said outer assembly are locked to each other by said locking means.

4,696,525

SOCKET FOR STACKING INTEGRATED CIRCUIT PACKAGES

James R. Coller, Kernersville, and Joseph R. Goodman, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 13, 1985, Ser. No. 809,091
Int. Cl.[4] H01R *13/00*
U.S. Cl. 439—69 **17 Claims**



1. A socket for interconnecting two integrated circuit packages, each having a plurality of package leads extending from opposite sides, the socket comprising means for stacking the two integrated circuit packages and commoning package leads, the socket further comprising:

a central body, and

a plurality of socket leads, each lead comprising a central portion lying along a central plane common with all central portions, each central portion being partially embedded within the body and extending therefrom, and two contact arms extending from the associated central portion, the arms extending in opposite directions from the plane of the central portion, a first plurality of contact arms extending upwardly and transversely of the central plane establishing a first socket, and a second plurality of contact arms extending downwardly and transversely of the central plane to establish a second socket, whereby

the contact arms interconnect the package leads of the integrated circuit packages, one package disposed above and one package disposed below the socket body.

4,696,526

CARRIER FOR TAPE AUTOMATED BONDED SEMICONDUCTOR DEVICE

Edward L. Newton, Tempe, and Steven D. Swendrowski, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

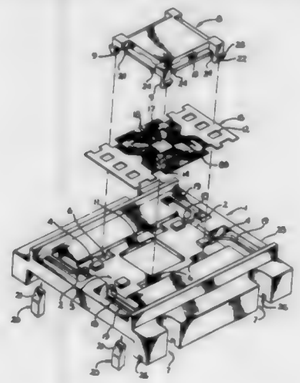
Filed Jul. 26, 1985, Ser. No. 759,657
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—68 **3 Claims**

1. A carrier for holding a semiconductor device attached to a tape during testing of said semiconductor device, said device being bonded to leads attached to said tape, said leads being coupled to test pads, located on said tape, for making contact to circuits in said semiconductor device, said carrier comprising:

a base unit having a seating plane on which said tape is mounted, said base unit having recesses located on the outer frame of said unit for aligning a punching die with said base unit and portions thereof;

at least two retractable latches on said base unit, each of said latches having a tip that abuts the top of said tape when said latch is not retracted and when said tape is mounted on said seating plane so that said latch secures said tape against said seating plane, each of said latches having an arm connected to said tip, said arm being attached to said base unit and being flexible so that said latch may be retracted thereby lifting said tip off said tape permitting said tape to be removed from said carrier; and

at least two alignment posts protruding from said seating plane, said alignment posts engaging sprocket holes in said tape to align said tape to said base unit so that a plating bus node on said tape, which plating bus node couples at least some of said leads, is aligned over an opening in said seating plane, said opening accepting said punching die so that said plating bus node can be punched out of said tape



while said tape is in said carrier thereby making said circuits available for testing;

a cover for protecting said device, said cover having at least two legs to engage receptacles in said seating plane, said legs being positioned to engage said receptacles and having means to secure said legs to said base unit, and

a conductive blade attached to the underside of said cover and positioned so that when said cover is placed over said tape on said base unit, said conductive blade interconnects at least some of said leads, thereby shorting out some of said leads;

whereby, said carrier protects said semconductor device against physical damage and damage by electrostatic discharge.

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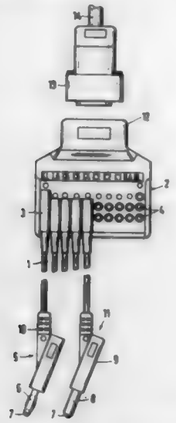
CABLE CONNECTOR

Wolfgang Ding, Brunswick, and Werner Arnold, Juechen, both of Fed. Rep. of Germany, assignors to ARBO Medizin-Technologie GmbH., Braunschweig, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,136
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1985, 8533107[U]
Int. Cl.[4] H01R *13/66, 29/00*
U.S. Cl. 439—53 **3 Claims**

1. A cable connector arrangement which connects a multiplicity n of separate body electrode cables to an at least n-pole trunk cable having a first connector fixedly connected thereto that is connectable to a control apparatus, comprising:

an intermediate connector having a plurality of contacts which receives one end of the body electrode cables and having a second connector for receiving the first connector of said trunk cable; and



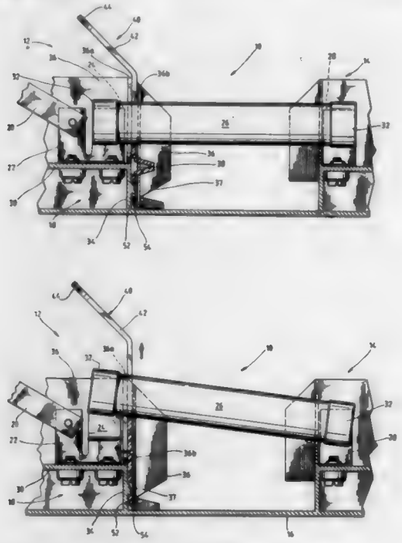
protective resistors within the intermediate connector, each arranged in series in an electrical connection with at least one of said contacts and a pole of said second connector.

4,696,528

FUSIBLE SWITCH AND FUSE PULLER ASSEMBLY

Carey D. Harnois, Charlottesville, Va., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 1, 1986, Ser. No. 891,976
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—160 **18 Claims**



1. A fuse puller apparatus comprising:

a fuse puller body including

a handle portion;

the fuse engaging portion; a lower end portion;

a body portion between said fuse engaging portion and said lower end portion, said body portion having a transverse length between said fuse engaging portion and said lower end portion; and

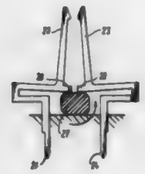
means for allowing expansion of the transverse length of said body portion between said fuse engaging portion and said lower end portion.

4,696,529

CARD HOLDER

Laurentius M. Verhoeven, Veghel, and Cornelis G. J. van Nes, Oisterwijk, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1986, Ser. No. 830,841
Claims priority, application Netherlands, Mar. 1, 1985, 8500597
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—267 **10 Claims**



1. A holder for receiving a card with electronically stored data or a printed circuit board comprising:

guide means forming part of said holder and an connector being provided with a plurality of contact springs for contacting connection strips disposed on said card or board, one end of each said contact spring being clamped while the other end is freely movable and makes contact with one of the connection strips when the card or board is inserted;

each said contact spring having a first spring end part which is adjacent to the movable end of the contact spring, an intermediate spring part bent into a U-shape and a second clamped spring end part serving as connection terminal, in which the one and the other legs of the U join the first and second spring end parts respectively, said first spring part being disposed substantially perpendicular to the intermediate spring part, and said intermediate part being substantialy perpendicular to the infeed plane of the holder;

a stop element located at the point where the first spring end part and the intermediate spring part join, said stop element extending from the plane of the first spring end part into the infeed plane of the holder;

whereby in the rest condition, the legs of the intermediate spring part converge slightly to each other in the direction of their ends;

said first spring end part extending slanting past the infeed path of the connection strips of the card or board; and

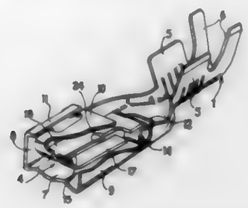
a biasing rod having a substantially rectangular cross-section to be inserted and/or operated from outside, said rod lying parallel to and between the stop elements and the bottom of the holder in the rest condition of the contact springs and when rotated by a fourth of one revolution, the U-legs and the first spring end parts are bent from the infeed path of the connecting strips, so that in the subsequent inserting of the card or board without contact pressure, said card or board abuts with its front edge against the stop elements of the contact springs, whereafter the biasing rod is newly rotated by a fourth of one revolution and then the contacting strips contact the contact points of the first end part of the springs.

4,696,530

FEMALE ELECTRICAL CONTACT ELEMENT

Bertrand Vandame, Villepreux, France, assignor to Precision Mechanique Labinal, Bois d'Arcy, France

Filed Nov. 5, 1986, Ser. No. 927,189
Claims priority, application France, Nov. 5, 1985, 85 16351
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—266 **9 Claims**



1. A female electrical contact element fabricated from thin sheet metal that is resilient and a good conductor of electricity comprising:

(a) An anterior portion at one end including means for attachment to an electrical conductor, and

(b) a posterior portion at an opposite end including a channel having a substantially rectangular transverse cross-section adapted to receive a substantially flat male contact member, said channel comprising:

(i) a base provided with an opening adapted to receive a catch;

(ii) two side walls attached to said base; and

(iii) a top wall, attached to one of said side walls, having an extended portion with a free end bent into a hook-shaped catch and folded so as to be positioned between said top wall and said base within said channel, said extended portion including a slot having a generally elongate area dividing said extended portion into two elongate members, wherein said elongate area of the slot has a longitudinal axis parallel to a longitudinal axis of said extended portion, and said slot further includes a transverse area having an axis offset by an angle from said longitudinal axis which opens into an edge of said extended portion, so that one of said two elongate members is a shorter member and the other of said two elongate members is a longer member, wherein said longer member is integral with said free end of the extended portion and is adapted to be engaged by a male electrical contact member, and wherein said shorter member is adapted to make electrical contact with a male electrical contact member.

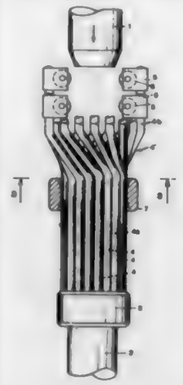
4,696,531

PLUG-IN TYPE CONTACT ARRANGEMENT

Helmut Böhme; Helmut Löbl, and Steffen Grossmann, all of Dresden, German Democratic Rep., assignors to VEB "Otto-Buchwitz" Starkstrom-Anlagebau Dresden, Dresden, German Democratic Rep.

Filed Nov. 8, 1985, Ser. No. 796,371
Claims priority, application German Democratic Rep., Dec. 20, 1984, 2712595
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—851 **6 Claims**

1. An electrical plug-in type contact arrangement comprising a first movable contact member, a second fixed contact member, a plurality of contact fingers, means for mounting said plurality of contact fingers on said second contact member, each of said contact fingers comprising at a free end portions thereof a contact element, each of said contact fingers being crimped or twisted to form a first portion of said contact finger in one axial plane and to form a second portion of said contact finger in a different axial plane offset with respect to the first axial plane, thereby to transform a pressure exerted by said first contact member when moved into contacting position towards said second contact member into a torsional loading arising



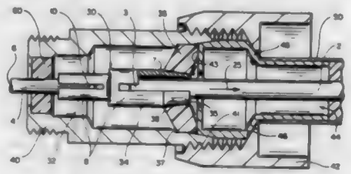
within said contact fingers, means for surrounding said contact fingers adjacent the region of the crimping said contact fingers having free end portions each having a contact element adapted to exert pressure on the movable contact.

4,696,532

CENTER CONDUCTOR SEIZURE

John S. Mattis, Sunnyvale, Calif., assignor to Raychem Corp., Menlo Park, Calif.

Filed Dec. 3, 1984, Ser. No. 677,155
Int. Cl.[4] H01R *4/50, 17/04*
U.S. Cl. 439—863 **8 Claims**



1. An apparatus for terminating a conductor, comprising:

a spring sleeve having first and second spring portions sized to receive a connection pin and the conductor respectively therein, the first and second spring portions being constructed such that a pull-out clamping force exerted on the connection pin by the first spring portion is less than a pull-out clamping force exerted on the conductor by the second spring portion, said second spring portion having a conical outer surface on one end thereof; and

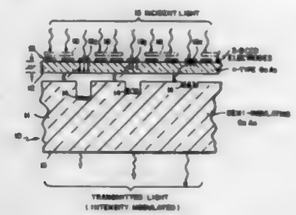
means for engaging said conical outer surface such that movement of said spring sleeve relative to said engaging means along a predetermined direction increases said clamping force on said conductor, the connection pin being fixed and contained within the first spring portion of the spring sleeve, the spring sleeve being preferentially moveable relative to the connection pin rather than the conductor when the conductor is urged axially away from the connection pin.

4,696,533

SPATIAL LIGHT MODULATOR

Robert H. Kingston, and Frederick J. Leonberger, both of Lexington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 12, 1981, Ser. No. 224,140
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **17 Claims**



1. An electro-optical system for use as a spatial light modulator comprising

a substrate;

a charge-coupled device formed in a layer at a selected surface of said substrate, said layer having a plurality of electrodes each having a charge storage well associated therewith;

means for supplying input data to said charge-coupled device so that the charge levels in each of said charge storage wells represent the magnitude of said input data;

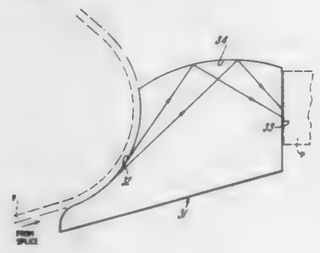
said charge-coupled device being arranged so that an input electromagnetic wave can be directed through said electro-optical system to provide an output electromagnetic wave, the intensity of said output electromagnetic wave thereby being spatially modulated by the electric fields controlled by the charge levels in said storage wells.

4,696,534

APPARATUS FOR EXTRACTING LIGHT FROM THE CORE OF AN OPTICAL FIBRE THROUGH THE CLADDING AND BUFFER COATING THEREOF AND ITS USE IN OPTICAL FIBRE SPLICING

Sanjiv Sahu, London, England, assignor to BICC Public Limited Company, London, England

Filed Jul. 30, 1985, Ser. No. 760,675
Claims priority, application United Kingdom, Aug. 8, 1984, 8420135
Int. Cl.[4] G02B *6/26, 6/38*
U.S. Cl. 350—96.15 **13 Claims**



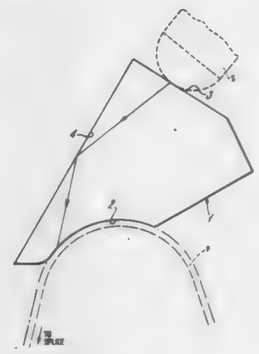
1. Apparatus for extracting light from the core of an optical fibre through the cladding and buffer coating thereof, which apparatus comprises a body which is made of a substantially rigid transparent material and which has at least three faces, a contact face which is of substantially arcuate shape and which is adapted to bear against a smoothly curved length of buffer coated optical fibre, an exit face through which light emerging from the optical fibre and into the body can pass and a reflecting face which is of substantially arcuate shape and which will reflect light entering the body through said contact face in a direction towards said exit face, the shapes of said contact, reflecting and exit faces and the positions of the reflecting and exit faces relative to the contact face being such that at least a major proportion of light passing from the core of a smoothly curved length of buffer coated optical fibre against which said body bears, through the cladding and buffer coating of the optical fibre and through the smoothly curved contact face into the body will be directed and reflected towards said exit face from where it can pass into a light detector.

4,696,535

APPARATUS FOR INJECTING LIGHT THROUGH A BUFFER-COATED OPTICAL FIBRE INTO THE CORE THEREOF AND ITS USE IN OPTICAL FIBRE SPLICING

Sanjiv Saha, London, England, assignor to BICC Public Limited Company, London, England

Filed Jul. 30, 1985, Ser. No. 760,681
Claims priority, application United Kingdom, Jul. 30, 1984, 8419408
Int. Cl.[4] G02B *6/26, 6/38*
U.S. Cl. 350—96.15 **12 Claims**



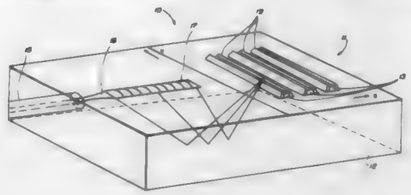
1. Apparatus for injecting light through a buffer coated optical fibre into the core thereof, which apparatus comprises a body which is made of a substantially rigid transparent material and which has at least three faces inclined relative to one another, said faces including a contact face which is of substantially arcuate shape and which is adapted to bear against a smoothly curved length of buffer coated optical fibre, an entry face through which light emitted by a light source can be injected into the body in a direction towards said contact face and a reflecting face which is of substantially planar form and which will reflect injected light in a direction towards said contact face, the inclinations of said faces relative to one another being such that at least a major proportion of light injected through the entry face into the body will be directed or reflected towards a part of the length of said smoothly curved contact face from where it will pass through the buffer coating and cladding of an optical fibre against which said body bears into the core of the optical fibre.

4,696,536

INTEGRATED OPTICAL WAVELENGTH DEMULTIPLEXER

Donald J. Albares, and Ronald E. Reedy, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 750,630
Int. Cl.⁴ G02B *6/34*
U.S. Cl. 350—96.19 **15 Claims**



1. An apparatus for wavelength demultiplexing single mode optical data transmitted in a plurality of discrete optical wavelengths on an integrated chip substrate comprising:

an optical waveguide disposed on and integrated with the integrated chip substrate for guiding the plurality of optical wavelengths therethrough:

means provided to coextend in the integrated optical waveguide for diffracting the plurality of optical wavelengths therefrom, the diffracting means being configured in a chirped grating to diffract each of the plurality of optical wavelengths into focussed discrete beams at discrete diffraction angles out of the plane of the chirped grating that are different one from the other;

a semiconductor film integrated with and disposed on the integrated chip substrate having its lattice matched to that of the substrate;

a plurality of photodetectors integrated in the semiconductor film on the integrated circuit chip substrate in a juxtaposed relationship each at a location corresponding to where the discrete beams are diffracted and focussed for intercepting the beams and optically detecting the information content thereof to generate representative electrical signs, the seminconductor film and the plurality of photodetectors are located in a substantially coplanar relationship with respect to the optical waveguide and chirped grating; and

means disposed on a parallel side of the substrate spaced from the optical waveguide and the chirped grating for reflecting the diffracted discrete beams onto the photodetectors, the apparatus combining the optical demultiplexing and electronic functions on the integrated chip substrate.

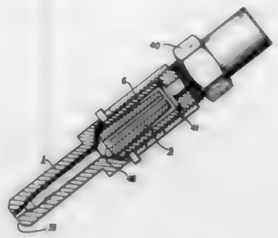
4,696,537

CONNECTOR FOR FIBER OPTIC CABLES

Anton E. Bauer, Neckarsulm; Gerhard Billmann, Bad Rappenau; Jörg Rathke, Untergruppenbach; Hans-Joachim Schimanek, Heilbroun; Georg W. Schrott, Heilbronn, and Haas Wodok, Heilbroun, all of Fed. Rep. of Germany, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 24, 1980, Ser. No. 200,124
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943180
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **20 Claims**

1. A connector for a cable containing at least one fiber optic filament and having an outer jacket surrounding said filament, said filament tending to move relative to said jacket in lengthwise direction of said cable under at least one of temperature change and bending influences, said connector comprising a housing including a front part having a bore for receiving said filament and means for fastening said filament to said front part in a filament fastening zone, a rear part having means for fastening said jacket thereto in a jacket fastening zone, and means for holding said filament fastening zone in a fixed spaced



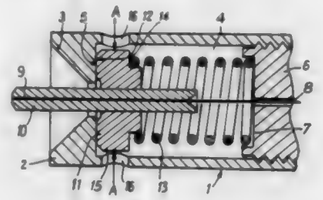
relationship in lengthwise direction of said cable from said jacket fastening zone and defining a space therebetween for receiving a portion of said filament with substantial looseness to provide freedom of lateral movement to said filament.

4,696,538

OPTICAL FIBER CONNECTOR AND METHOD OF MECHANICALLY CENTERING AN INTERIOR ELEMENT IN AN OUTER BODY

Jean-Bernard Despouys, Paris, France, assignor to Radiall Industrie, Rosny-Sous-Bois, France

Filed May 13, 1985, Ser. No. 733,318
Claims priority, application France, May 11, 1984, 84 07300
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **6 Claims**



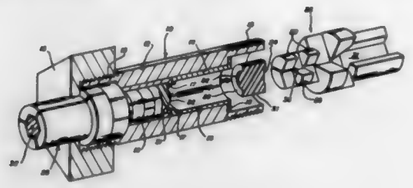
1. An optical fiber ferrule assembly comprising an outer body having an axially extending cavity, a plurality of generally radially extending circumferentially spaced apart openings communicating with the axially extending cavity, and a flat surface at one end of the cavity perpendicular to the axis of the body, a hub having an axial opening and a flat face perpendicular to its axial opening, means for securing an optical fiber in the axial opening of the hub, said hub being of a size to be received in said cavity, said hub having a flat face seatable on said flat surface of said outer body, means within said outer body for elastically pressing said hub against said body, and surface means on said hub in the region of said radial openings for engagement by a tool to displace said hub and fiber perpendicular to the axis of the body by sliding the face of the hub on the surface of the body, to adjust the radial position of the hub and fiber in the body.

4,696,539

FIBER OPTIC CABLE CONNECTOR

Robert G. Knowles, Northfield, Conn., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Jul. 23, 1984, Ser. No. 633,704
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.21 **11 Claims**



1. A connector for optical fibers, comprising:

an elongated tubular housing having a bore therethrough

a first and a second termination-assembly means, each surrounding an end of a optical fiber for positioning each optical fiber in said housing;

a pair of lens elements, wherein one of the lens elements is adjacent one end of each termination-assembly means;

a first and a second sleeve, each surrounding one lens element and a portion of said termination-assembly means adjacent each lens element; and

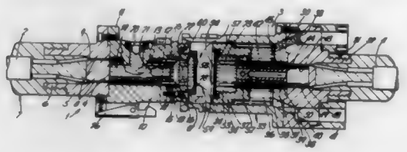
means on each sleeve for spacing said lens element one from another, wherein each sleeve is mounted in the bore of said housing to coaxially align said pair of lens elements with each other.

4,696,540

OPTICAL FIBRE CONNECTOR HAVING PARTICULAR UTILITY FOR UNDERWATER USE

Graham L. Adams, London, and Richard C. E. Durrant, Bishops Stortford, both of England, assignors to STC, plc, Strand, England

Filed Nov. 18, 1985, Ser. No. 799,313
Claims priority, application United Kingdom, Dec. 12, 1984, 8431281
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **19 Claims**



1. An optical fibre connector including two connector elements, wherein when the connector elements are disconnected optical fibre terminations to be optically coupled by the connector are disposed in respective chambers of the connector elements, which channels are sealed against external fluid pressure by respective diaphragm means, wherein when the two connector elements are connected the diaphragm means are in sealing contact with one another and the terminations of the connector element are disposed in the chamber of the other element having penetrated both diaphragm means, and wherein each of the optical fibre terminations of one connector element is secured to one end of a respective flexible tube through which the respective optical fibre extends, the other end of which tubes are secured to a housing member of the one connector element.

4,696,541

OPTICAL CABLE HAVING A PLURALITY OF BASIC ELEMENTS ARRANGED IN A COMMON SHEATH

Helmut Haag, Waldniel, and Klaus Nothofer, Düsseldorf, both of Fed. Rep. of Germany, assignors to AEG Kabel Aktiengesellschaft, Monchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,463
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1982, 3247090
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **32 Claims**



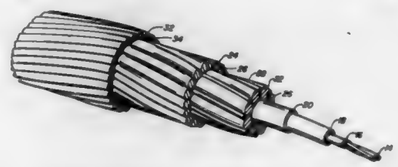
1. An optical cable having a radial direction comprising a common sheath and a plurality of elongate basic elements enclosed by said common sheath, each said basic element comprising a stable sheath and at least one optical fiber housed and loosely guided in said stable sheath, and said plurality of basic elements being assembled together to form a plurality of basic units each of which is composed of several of said basic elements and is deformable transverse to the length of said basic elements, said plurality of basic units being assembled together to form at least one cylindrical layer of said cable, with each said basic unit in said cylindrical layer having a noncircular cross-sectional configuration which is flattened in the radial direction of said cable, while said stable sheaths of said basic elements are not significantly deformed, as a result of a deformation pressure exerted radially inwardly on said circular layer.

4,696,542

ARMORED OPTICAL FIBER CABLE

Robert E. Thompson, Roanoke, Va., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 408,975, Aug. 17, 1982. This application Dec. 7, 1984, Ser. No. 679,195
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **10 Claims**



1. An abrasion resistant well logging cable having a design breaking load at least as great as about 10,000 pounds, and being adapted to be wound repeatedly about sheaves and wound and unwound from a drum, said cable comprising the combination of:

optical fiber means having a proof test stress value of at least about 150,000 pounds per square inch;

and a compact arrangement of layers of helically wound strength elements surrounding and protecting said optical fiber means; said arrangement having such a low permenant radial contraction under repeated loading to about 90% of the design breaking load that said cable's permanent elongation after being stretched repeatedly to about 90% of the design breaking load is no greater than about

0.4% and including at least two torque balancing layers wound in opposite helical directions.

4,696,543

OPTICAL FIBER CABLE HAVING A LOW PERMEABILITY TO HYDROGEN

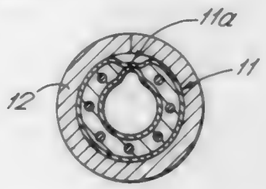
Gilles D. Pitt, Saffron Walden; Philip Extance, Cambridge, and Roger E. Jones, Little Shelford, all of United Kingdom, assignors to Standard Telephone and Cables, Plc, London, England

Filed May 1, 1985, Ser. No. 729,180

Claims priority, application United Kingdom, May 22, 1984, 8413241

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **12 Claims**



1. A cable including an optical fibre which is hermetically sealed within a member formed from one or more ribbons comprised of a metallic glass serving to prevent exposure of the optical fibre to hydrogen gas present in the cable.

4,696,544

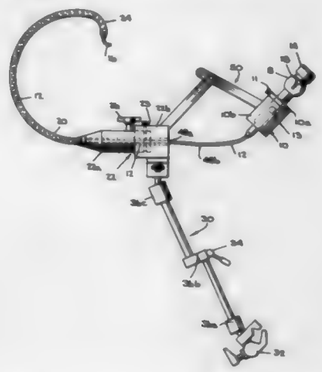
FIBERSCOPIC DEVICE FOR INSPECTION OF INTERNAL SECTIONS OF CONSTRUCTION, AND METHOD FOR USING SAME

James G. Costella, Suffolk County, N.Y., assignor to Olympus Corporation, Lake Success, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,005

Int. Cl.⁴ G02B *23/26*; A61B *1/00*; G01N *21/16*; B25J *1/00*

U.S. Cl. 350—96.26 **21 Claims**



1. A device for inspecting interior sections of a construction, said device comprising the combination of

a guide control body having a bore therethrough, a hollow, flexible guide insertion tube extending from said guide control body, and means to articulate at least a distal end portion of said flexible guide insertion tube remote from said guide control body;

a fiberscope including a body, an elongated probe, and means for illuminating and transmitting images of at least a portion of said interior, wherein said fiberscope probe is inserted through said guide control body and said hollow guide insertion tube; and

means to move said fiberscope body selectively toward and away from said guide control body to displace said fiberscope probe relative to said guide control body and said hollow guide insertion tube, whereby said means to articulate said hollow, flexible guide insertion tube and said means to move said fiberscope body are used selectively from the exterior of said construction to aim and control said fiberscope probe within said construction.

20. A method for inspecting interior sections of a construction comprising the steps of

inserting a fiberscope probe through a guide control body and a flexible guide insertion tube extending from said guide control body, at least said guide control body and said flexible guide insertion tube including means to articulate at least a distal end portion of said guide insertion tube,

inserting said fiberscope probe and guide insertion tube into the interior of said construction, and

manipulating at least one of said fiberscope probe and said guide insertion tube, including selectively articulating said guide insertion tube to aim said fiberscope probe from the exterior of said construction and axially displacing said fiberscope probe relative to said guide insertion tube, to direct said fiberscope probe in a desired direction within said construction.

4,696,545

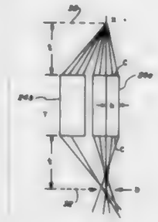
SHORT FOCAL LENGTH IMAGING DEVICE

William L. Lama, and Michael E. Harrigan, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 15, 1985, Ser. No. 765,748

Int. Cl.⁴ G02B *27/00*; G03B *27/00*

U.S. Cl. 350—167 **1 Claim**



1. A short focal length imaging device for forming an erect 1:1 image of an object at an object plane on a photosensitive image plane, said device comprising a noble metal photosensitive glass having formed on the surfaces a plurality of raised spherical lenses, said imaging device having a vertex distance t defined by the expression:

$$t = \frac{T}{(n-1)cT - 2n}$$

where T is the device thickness, n is the refractive index of the glass and c is the curvature of each lens of the array and wherein the aperture of each lens of the array has an optimum radius h_{opt} given by

$$h_{opt} = \left[\frac{0.61\lambda(n-1)^2/n}{\left(\frac{1}{t}+\frac{2}{T}\right)^2\left(\frac{n}{t}+\frac{2}{T}\right)} \right]^{\frac{1}{4}}$$

where λ is the optical wavelength.

4,696,546

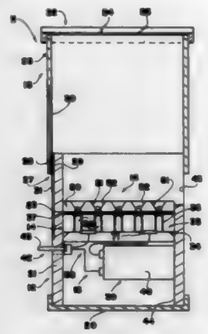
EXAMINING APPARATUS

Daryl H. Hodges, P.O. Box 1273, Big Timber, Mont. 59011

Filed May 22, 1986, Ser. No. 865,805

Int. Cl.⁴ G02B *27/02*

U.S. Cl. 350—235 **19 Claims**



1. Examining apparatus including a base portion, a telescoping portion, an illuminating portion, a power supplying portion and a specimen displaying portion; said base portion including a bottom section and a first sidewall section extending upwardly therefrom; said telescoping portion including a top section and a second sidewall section extending downwardly therefrom, said top section including a magnifying lens, said second sidewall section being of a size and configuration to provide adjustable overlapping engagement with said first sidewall section of said base portion, means disposed between overlapping surfaces of said first and second sidewall sections maintaining the positioning therebetween; said illuminating portion including a first support member disposed within said base portion substantially parallel to said bottom section and spaced therefrom, said support member including a plurality of spaced first openings, a light emitting diode lamp disposed within each first opening; said power supplying portion including circuitry connecting said light emitting diode lamps electrically with a power source, means for actuating said lamps, said circuitry being selectively engageable with said illuminating portion; said specimen displaying portion including a second support member disposed within said base portion and resting on said illuminating portion, said second support member having major surfaces of the same general configuration as those of said first support member, said second support member including a plurality of spaced second openings, one of said second openings being aligned over each of said light emitting diode lamps of said illuminating portion, each of said second openings in said second support member including a converging conical section; whereby specimens positioned in said conical sections of said displaying portion can be examined through said magnifying lens as illuminated by said lamps disposed therebelow.

4,696,547

WINDOW FOR SHIELDED ENCLOSURE

Richard E. Sims, Arlington Heights, Ill., assignor to The Curran Company, Addison, Ill.

Filed Nov. 13, 1985, Ser. No. 797,708

Int. Cl.⁴ G02B *5/24, 5/28*

U.S. Cl. 350—319 **10 Claims**

1. A radio frequency shielded enclosure comprising wall means enclosing an electromagnetic radiation shielded space, said wall means including a substantially continuous metal shield, a window opening in said wall means, and an electrically conductive window in the opening for blocking radio frequency electromagnetic radiation while passing visible light;

said window including a continuous frame fastened to said wall means and including electrically conductive means in electrical contact with the metal shield;

a first light transmitting panel attached to said frame facing toward the shielded space, and a second light transmitting panel spaced from said first panel and attached to said frame facing away from the shielded space;

said frame and panels defining an enclosed window space; and

an electrolyte in said window space in electrical contact with said conductive means.

4,696,548

ANTIGLARE MIRROR FOR AN AUTOMOBILE

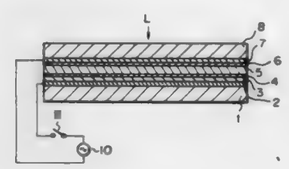
Yoshiki Ueno, Okazaki; Takasi Taguchi, Anjo, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 7, 1985, Ser. No. 742,525

Claims priority, application Japan, Jun. 8, 1984, 59-118878; Aug. 29, 1984, 59-181561

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—338 **15 Claims**



1. An antiglare mirror arrangement for an automobile, comprising:

a metal layer for reflecting incident light;

a liquid crystal layer positioned such that incident light must travel therethrough before striking said metal layer, the transparency of said liquid crystal layer being variable by an electric field applied to said liquid crystal layer for preventing glare;

a first TiO_2 transparent dielectric layer also positioned such that incident light must travel therethrough before striking said metal layer, said first dielectric layer being supported by a glass substrate and having a higher refractivity than that of said liquid crystal layer and a selected thickness, so that light reflecting from said mirror and passing

through said first dielectric layer has desired color characteristics.

4,696,549

COMPOUNDS CONTAINING A FLUOROBIPHENYLYL GROUP AND THEIR USE IN LIQUID CRYSTAL MATERIAL AND DEVICES

Lawrence Kam Ming Chan, Hull; George W. Gray, Cottingham; Kenneth J. Toyne; David Lacey, both of Hull, all of England; Rudolf Eidenschink, Münster, and Michael Römer, Rodgau, both of Fed. Rep. of Germany, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

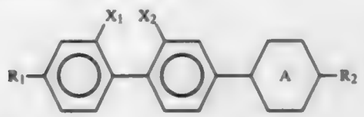
Division of Ser. No. 632,322, Jul. 19, 1984, Pat. No. 4,594,465. This application Dec. 5, 1985, Ser. No. 804,741

Claims priority, application United Kingdom, Jul. 22, 1983, 8319849

Int. Cl.⁴ C09K *19/12;* **G02F** *1/13*

U.S. Cl. 350—350 R **8 Claims**

1. A liquid crystal device including two dielectric substrates at least one of which is optically transparent, a layer of liquid material sandwiched between the substrates and electrodes on the inner surfaces of the substrates to enable an electric field to be applied across the layer of liquid crystal material to provide an electro-optical effect therein, characterized in that the liquid material is a mixture of compounds at least one of which is a compound having the formula:



wherein:

R_1 is selected from alkyl, alkoxy, and alkylcarbonyl;

R_2 is selected from alkyl and alkoxy;

X_1 is selected from H and fluorine;

X_2 is selected from H and fluorine; and



provided that one of X_1 and X_2 is fluorine.

4,696,550

INTENSITY CONTROL OF EXCITATION MEANS OF THERMALLY ADDRESSED DISPLAY

Toshio Shionoya, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

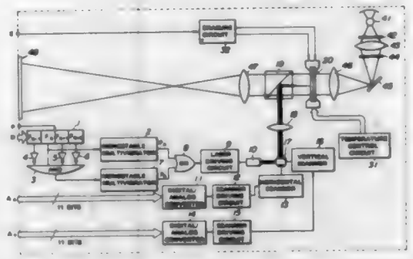
Filed Dec. 30, 1985, Ser. No. 814,611

Claims priority, application Japan, Dec. 29, 1984, 59-278509

Int. Cl.⁴ G02F *1/137*

U.S. Cl. 350—351 **8 Claims**

1. A liquid crystal display apparatus in which writing into the liquid crystal cell is done with a laser beam, comprising decision means for deciding that writing is to be done in a spot in a liquid crystal cell corresponding to a picture element wherein writing did not occur in any of the immediately adjacent spots and for deciding the amount of energy supplied to said spot, and means responsive to the output of said decision means for increasing the amount of the energy supplied to the spot in which the writing is to be done said decision means takes into consideration that writing will not occur on only the



one spot immediately and only two spots immediately succeeding said spot.

4,696,551

ACOUSTOOPTIC MODULATION ELEMENT AND SYSTEM FOR ACOUSTOOPTICALLY CARRYING OUT MODULATION, OF A PLURALITY OF PARALLEL BEAMS BY THE USE OF A SINGLE ACOUSTOOPTIC MEDIUM

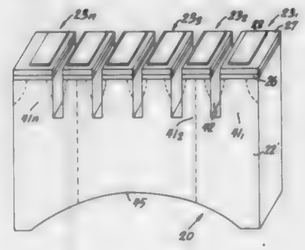
Satoru Amano, Niiasaki; Shigenori Horiuchi, and Takeru Shinohara, both of Yamanashi, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Division of Ser. No. 517,346, Jul. 26, 1983, Pat. No. 4,592,621. This application Sep. 23, 1985, Ser. No. 778,786

Claims priority, application Japan, Jul. 27, 1982, 57-129656; Jul. 27, 1982, 57-129657; Jul. 27, 1982, 57-129658; Jul. 27, 1982, 57-129659

Int. Cl.⁴ G02F *1/33;* **G02B** *5/18*

U.S. Cl. 350—358 **6 Claims**



1. An acoustooptic modulation system responsive to a single incident beam and a plurality of electric signals for producing output light beams, said acoustooptic modulation system comprising:

a grating member for diffracting said incident light beam into a plurality of diffracted light beams; and

a single acoustooptic modulation element responsive to said plurality of the diffracted light beams as input light beams for acoustooptically modulating said input light beams in response to said electric signals to produce said output beams determined by said electric signals.

2. An acoustooptic modulation system responsive to a single incident beam and a plurality of electric signals for producing output light beams, said acoustooptic modulation system comprising:

beam splitting means for splitting said incident light beam into a plurality of light beams substantially parallel to one another;

a single acoustooptic medium block having a first surface, a second surface opposite said first surface, and a plurality of plateaus which are equal in number to said input light beams and which are arranged in parallel between said first and said second surfaces so that a channel is left between two adjacent plateaus, each of said input light beams being incident on one of said plateaus at said first surface while said output light beams exit from said plateaus at said second surface; and

a plurality of transducing means each of which is mounted on one of said plateaus and each of which is responsive to one of said electric signals, for individually transducing each said electric signal into an acoustic wave which is propogated into one said plateau to cause the output light beams at said second surface to be modulated by said acoustic waves when said electric signals are applied to the respective transducing means.

4,696,552

PROJECTION DEVICE WITH REFRACTIVE INDEX DISTRIBUTION TYPE LENS

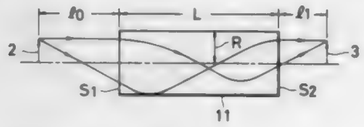
Jun Hattori, Yokohama, and Shigeyuki Suda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 767,868, Aug. 21, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 879,504

Claims priority, application Japan, Aug. 28, 1984, 59-178580; Feb. 22, 1985, 60-34784

Int. Cl.⁴ G02B *3/00, 5/14*

U.S. Cl. 350—413 **11 Claims**



1. A projection device having:

an illuminating system for illuminating an object; and

an index distribution type lens for projecting the image of said object, said lens having a refractive index distribution substantially proportional to the square of the distance from the optic axis in a cross-section perpendicular to the optic axis and a refractive index distribution monotonously varying in the direction of the optic axis.

4,696,553

ZOOM LENS HAVING A LARGE ZOOM RATIO

Sadahiko Tsuji, Kanagawa; Sadatoshi Takahashi, Tokyo, and Kazuo Fujibayashi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha

Filed Mar. 3, 1983, Ser. No. 471,839

Claims priority, application Japan, Mar. 4, 1982, 57-34206; Mar. 9, 1982, 57-37435; Mar. 23, 1982, 57-45778; Mar. 23, 1982, 57-45779; Apr. 15, 1982, 57-62851

Int. Cl.⁴ G02B *15/20*

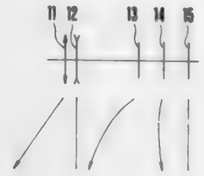
U.S. Cl. 350—427 **11 Claims**

1. A zoom lens comprising:

at least four lens groups,

said four lens groups including, from front to rear, a first lens group which has a positive refractive power, and a second lens group which has a negative refractive power and is composed of a negative lens having a concave surface directed toward the image and a cemented lens of a bi-concave lens and a bi-convex lens,

wherein zooming is performed by moving said first lens group and at least one of the lens groups which are ar-



ranged on the image side of said second lens group independently of each other and said second lens group is fixed during zooming; and

the image magnification of said second lens group is made to include unity of image magnification.

4,696,554

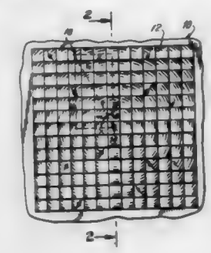
METHOD AND APPARATUS FOR PROVIDING A VARIABLE MULTIPLE IMAGE VISUAL EFFECT

James Seawright, 155 Wooster St., New York, N.Y. 10012

Filed Jun. 28, 1985, Ser. No. 750,687

Int. Cl.⁴ G02B *5/08, 5/10, 5/124, 7/18*

U.S. Cl. 350—613 **33 Claims**



1. A visual display apparatus for providing a variable multiple image visual effect comprising:

a first plurality of planar specular reflective surfaces disposed in a pseudo spherical optical array, said array having a first common center of curvature associated with said first plurality of reflective surfaces and an array center, each of said specular reflective surfaces having a center disposed normal to a radius emanating from said first common center of curvature, whereby each of said planar specular reflective surfaces is disposed tangent to the pseudo spherical optical array pseudo spherical surface, said pseudo spherical optical array having a focal point disposed at said first common center of curvature; and a mounting means for each of said plurality of specular reflective surfaces, each of said specular reflective surfaces being mounted in said array for providing multiple substantially identical reflected visual images of an object disposed at said focal point in front of said array and progressively shifted images from said object as said object to be reflected shifts orthogonally from said focal point, said array providing a pair of orthogonally displaced conjugate foci for said orthogonally shifted object, said pair of conjugate foci being symmetrically displaced from said focal point, said focal point being substantially disposed at the height of said array center, said array center being substantialy disposed at eye level, whereby a

multiple image spherical reflector visual effect capable of providing multiple progressively related reflected visual images of an object in said array is provided from a plurality of planar reflective surfaces.

4,696,555

ELECTRIC REMOTE CONTROL MIRROR APPARATUS

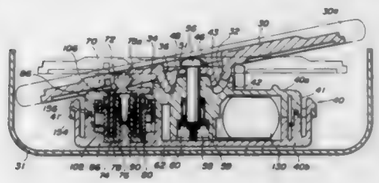
Masao Enomoto, Hadano, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed May 14, 1986, Ser. No. 862,960

Claims priority, application Japan, May 14, 1985, 60-70080[U]; May 14, 1985, 60-70081[U]; May 14, 1985, 60-70082[U]; May 14, 1985, 60-70083[U]; May 27, 1985, 60-77628[U]; Apr. 4, 1986, 61-049756[U]; Apr. 14, 1986, 61-054722[U]; Apr. 14, 1986, 61-054723[U]

Int. Cl.[4] B60R *1/02;* **G02B** *7/18*

U.S. Cl. 350—634 **13 Claims**



1. An electric remote control mirror apparatus comprising:
a mirror,
a mirror body fixed to said mirror,
a mirror housing for receiving said mirror body,
supporting means fixed within said mirror housing for holding said mirror body in said mirror housing, said supporting means including a housing member fixed in said mirror housing and means for pivotably supporting said mirror body and connecting said mirror housing with said housing member,
two ball bases mounted on the back side of said mirror body wherein one ball base lies on a lateral pivot axis of said mirror body and the other ball base lies on a longitudinal pivot axis of said mirror body and said lateral and longitudinal axes are perpendicualr to one another,
a pair of hollowed cylindrical threaded rods each of which has an inner surface provided with screw threads and a ball portion at the end portion of said each threaded rod, said ball portion being adapted to be fitted to each of said ball bases respectively, and said pair of the hollowed cylindrical threaded rods being disposed in said ball bases, and each of said pair of hollowed cylindrical threaded rods being movable in its axial direction through a cylindrical hole mounted on said housing member, but each of said pair of hollowed cylindrical threaded rods being unrotatable with respect to said housing member,
a pair of rotation members rotatably mounted in said housing member, each of said rotation members having at least two portions having a plurality of screw threads, said two portions spaced apart from each other and said plural screw threads being coupled to said screw threads of each of said threaded rods,
gear means connected to each of said rotation members for transmitting a driving force to each of said rotation members,
electric motor means for driving said rotation member through said gear means, and
resilient O-rings fixedly disposed in said housing member and contacting the respective outer surfaces of said threaded rods, such that each threaded rod is supported by said housing member.

4,696,556

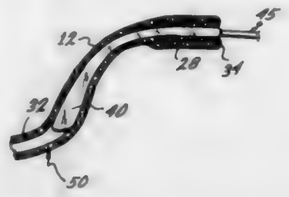
EYEGLASS RETAINER

Charles D. Perry, III, 14612 Larch, Lawndale, Calif. 90260

Filed May 6, 1985, Ser. No. 731,114

Int. Cl.[4] G02C *5/14, 3/00*

U.S. Cl. 351—157 **14 Claims**



1. An eyeglass retainer headband comprising a substantially continuous tube of pliable textile material having a normal inner diameter between two open ends, a segment of said tube at each said end being turned into said tube to form a double walled end portion of somewhat reduced inner diameter in relation to said normal diameter and increased stiffness for securely gripping the ends of eyeglass frame temple pieces inserted into said folded end portion while also providing a smoothly contoured folded edge around each end opening of the tube.

4,696,557

COLLAPSIBLE OVERHEAD PROJECTOR

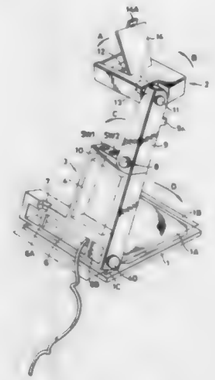
Mitsuo Tomizuka, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 23, 1986, Ser. No. 888,374

Claims priority, application Japan, Jul. 31, 1985, 60-169339

Int. Cl.[4] G03B *21/16*

U.S. Cl. 353—66 **14 Claims**



1. An overhead projector comprising:
a base supporting a lens and serving as a document table;
a main projector body pivotally supported on said base by a first hinge means and formed as a substantially L-shaped box as viewed in elevation so as to define a recess;
a post arm pivotally supported on said main projector body by a second hinge means extending at a right angle to said first hinge means;
a head pivotally supported on said post arm by a third hinge means extending parallel with said first hinge means and having a mirror and a light source, said head being held in confronting relation to said base when the overhead projector is in use;
wherein said first hinge means is at the bottom of said L-shaped box and at one side of said base so that said base, said main projector body, said post arm, and said head are collapsible into a combined assembly with said head housed in said recess of said L-shaped box.

4,696,558

FOCUS CONDITION DETECTING ARRANGEMENT

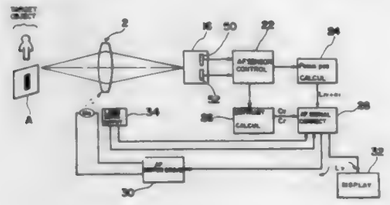
Toshihiko Karasaki; Toru Matsui, both of Sakai, and Hiroshi Ueda, Habikino, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1986, Ser. No. 916,620

Claims priority, application Japan, Oct. 11, 1985, 60-227092

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—406 **5 Claims**



1. A focus condition detecting arrangement for use in a photographic camera, which comprises a focus condition detecting device including photo-sensor means having sensitivity with respect to a visible light and an infrared light from a target object to be photographed and adapted to produce a focus condition detection signal based on the output of the photosensor means, a contrast detecting means for detecting contrast of said target object with respect to the respective lights, and a correcting means for correcting the focus condition detection signal based on an output of said contrast detecting means, so that a corrected focus condition detection signal representing the focus condition with respect to the visible light is obtained.

4,696,559

VARIABLE FOCAL LENGTH, AUTOMATIC FOCUSING CAMERA WITH A SINGLE MOTOR

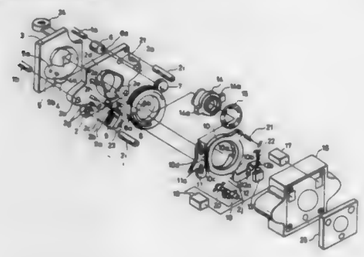
Shigeru Kondo, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,259

Claims priority, application Japan, Nov. 27, 1984, 59-251321

Int. Cl.[4] G03B *3/08, 9/08*

U.S. Cl. 354—403 **5 Claims**



1. An automatic focusing barrel lens unit for attachment to a camera body for movement towards and away from said body, comprising:
means of aligning an optical axis of said barrel unit with a photographic axis of said camera;
a main lens system disposed in said barrel unit along said optical axis;
first means, disposed within said barrel unit, for moving at least a part of said main lens system along said optical axis for focusing said main lens system;
an automatic focusing mechanism, disposed within said barrel unit, for controlling said first means and including a mechanical scanning mechanism;
a shutter mechanism, disposed within said barrel unit, for controlling the passage of light along said optical axis;
a motor disposed within said barrel unit;
second means, disposed entirely within said barrel unit operatively engaging said first means, said mechanical scanning mechanism, and said shutter mechanism and mechanically driven solely by said motor for providing sole mechanical power from said motor to said first means, said mechanical scanning mechanism and said shutter mechanism.

4,696,560

CAMERA SHUTTER

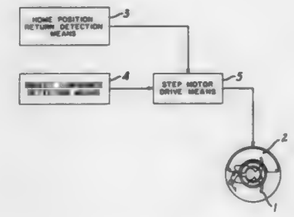
Masuo Ogihara; Hajime Oda; Yoichi Seki, and Hiroshi Yamazaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed May 6, 1985, Ser. No. 730,743

Claims priority, application Japan, May 9, 1984, 59-92183

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—439 **14 Claims**



1. A camera shutter comprising: a shutter mechanism body including a sector defining a lens aperture to be opened and closed, a forwardly/reversely rotatable step motor for driving the sector to open and close the lens aperture, and a control unit having home position return detection means for detecting whether or not said sector is positioned in a home position; object luminance detection means for outputting a signal corresponding to an object luminance; and motor driver means for rotating said step motor in forward and reverse directions in a rotational quantity according to the signal from said object luminance detection means and reversely rotating said step motor when said home position return detection means detects that said sector is not positioned in the home position before and after an exposure operation of the shutter mechanism body.

4,696,561

FIXING ROLLER PRESSING MECHANISM FOR COPYING MACHINES

Tutomu Katoh, and Hiranaga Yamamoto, both of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 15, 1986, Ser. No. 819,101

Claims priority, application Japan, Jan. 22, 1985, 60-7799[U]

Int. Cl.[4] G03G *15/20*

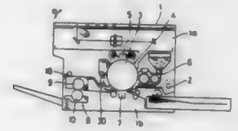
U.S. Cl. 355—3 FU **3 Claims**

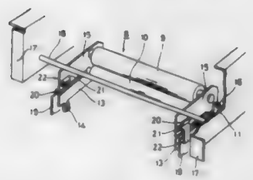
1. A fixing-roller pressing mechanism for a copying machine having an upper and lower half comprising:
a fixation unit including upper and lower fixing roller means:
a projecting wall means which projects upward from said lower half of said copying machine;
lower frame members pivotally held to said projecting wall

means and supported by a compression means so that said lower frame member can move in a vertical direction, said lower frame member supporting said lower fixing roller means;

upper frame members pivotally held to said projecting wall means above said lower frame members, said upper frame members supporting said upper fixing roller means;

pressure member installed in said upper half of said copying machine, which causes said upper fixing roller means to press against said lower fixing roller means via said upper





frame means when said upper half of said copy machine is closed; and

means of retention installed between said lower and upper halves of said copy machine, which cause said upper fixing roller means to remain in a half-pressed condition against said lower fixing roller means when said upper half of said copy machine is open, said pressing condition allowing for clogged paper to be easily removed from said fixing rollers and prevents following copies from being stained by toner.

4,696,562

MULTIFUNCTIONAL COPYING MACHINE

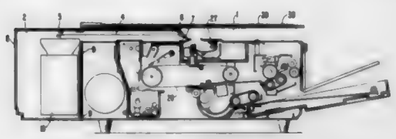
Yoshihito Urata, Katano; Masaichiro Tatekawa, Sakai, and Toshiharu Sasaki, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 18, 1985, Ser. No. 746,112

Claims priority, application Japan, Jun. 18, 1984, 59-125645; Jun. 18, 1984, 59-125647

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **6 Claims**



1. A multifunctional copying machine comprising:

an electro-photographic copying unit having: a housing; a document table on said housing for supporting thereon a document to be copied; a photosensitive body within said housing; an exposure means within said housing for forming on a surface of said photosensitive body an electrostatic latent image corresponding to an image on the document; developing means within said housing for developing the electrostatic latent image with a toner; and transfer means within said housing for transferring the developed image onto a transfer sheet positioned sequentially around said photosensitive body; said copying unit having an unobstructed space extending along said document table below said document table and having one end opening to the outside of said housing and the other end having an opening between said space and said photosensitive body;

a laser scanning unit detachably attached to said copying unit on the exterior of said housing for producing a laser beam for scanning said surface of said photosensitive body; and

guide means for guiding said laser beam from outside said copying unit into said one end of said space and through said space below said document table and through said opening to said photosensitive body.

4,696,563

SPLIT SCANNING COPIER

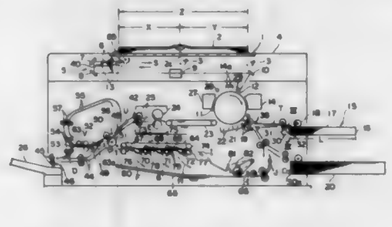
Mitsuo Shibusawa, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,718

Claims priority, application Japan, Dec. 3, 1984, 59-254166

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—8 **12 Claims**



1. A copying apparatus comprising:

a housing;

holding means provided on said housing for holding thereon stationarily an original to be copied, said holding means having a first scanning range and a second scanning range in a side-by-side relation;

storing means for storing a quantitY of copy sheets;

detecting means for detecting the size of said copy sheets stored in said storing means, said detecting means detecting at least the length of said copy sheets;

transporting means for transporting said copy sheets one by one along at least partly a predetermined path defined in said housing;

imaging means disposed inside of said housing for forming a copy image on a copy sheet being transported by said transporting means, said imaging means including scanning means for scanning said original placed on said holding means;

input means for manually inputting at least one of a plurality of operational commands which can be carried out by said apparatus selectively; and

control means for controlling the operation of each of said transporting means and said imaging means in accordance with said at least one operational command input by said input means, said control means having means for determining a range of scanning movement of said scanning means for a predetermined reference position in registry with at least one of said first and second scanning ranges on said holding means selectively in accordance with the length of said copy sheets detected by said selecting means.

4,696,564

IMAGE FORMING APPARATUS

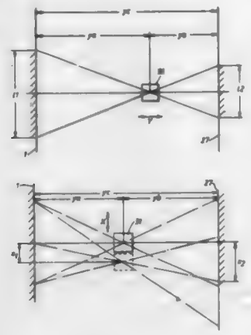
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,728

Claims priority, application Japan, Jul. 11, 1985, 60-153068; Aug. 16, 1985, 60-180214

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **20 Claims**



1. An image forming apparatus comprising:

detection means for detecting a presence of a copy paper and determining an offset amount of said copy paper from a prescribed position in a direction perpendicular to a feeding direction of said copy paper;

scan means for optically scanning an original document;

visible image forming means for forming a document image corresponding to said original document scanned by said scan means as a visible image on said copy paper; and

image moving means for moving said visible image, in said direction perpendicular to a feeding direction of said copy paper, formed on said copy paper by said visible image forming means on the basis of said determination of said detection means.

4,696,565

CLEANING DEVICE FOR A MONOCHROMATIC COPYING MACHINE

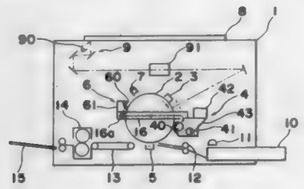
Yoshiaki Imanaka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 3, 1986, Ser. No. 881,788

Claims priority, application Japan, Jul. 5, 1985, 60-148792

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—15 **1 Claim**



1. A cleaning device for a monochromatic copying machine for processing residue toner removed ty a blade assembly from a photoreceptor, said copying machine being of a type capable of accommodating selectively a plurality of developer boxes containing respective masses of toner of different colors, which device comprises:

a toner recovery duct extending between a cleaning box, adapted to accommodate therein residue toner removed from the photoreceptor, and a developer box, for feeding the residue toner accommodated within the cleaning box towards the developer box, one of said developer boxes for use with the mass of black-colored toner having a single chamber defined therein, said chamber being communicated with the toner recovery duct when said developer box is set in position within said copying machine, each of the remaining developer boxes for use with masses of toner respective colors other than black having working and collecting chambers defined therein, separated by a partition wall from each other, said collecting chamber being communicated with the other recovery duct when any one of said remaining developer boxes is set in position within said copying machine.

4,696,566

THREE-DIMENSIONAL DRIVING ARRANGEMENT

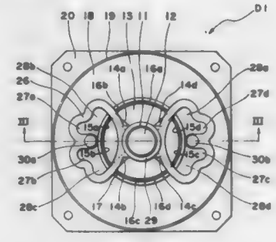
Yoshihiro Sekimoto; Shigeo Terashima, both of Tenri, and Kunio Kojima, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1985, Ser. No. 697,465

Claims priority, application Japan, Feb. 8, 1984, 59-22493; Feb. 8, 1984, 59-22494; Apr. 13, 1984, 59-75544; Apr. 13, 1984, 59-75545

Int. Cl.⁴ G11B *7/12*

U.S. Cl. 350—255 **1 Claim**



1. A three-dimensional driving arrangement for an objective lens, which comprises an objective lens support member having an objective lens provided at a central portion thereof, a driving means for driving said objective lens support member vertically and horizontally in three directions, and elastic members respectively provided at upper and lower portions of the objective lens support member for movably supporting said support member and for effecting damping action in the respective vertical and horizontal directions, said elastic members being reduced in thickness in the vertical direction and each formed, in a top plan view thereof, generally into a shape of a figure eight provided with constricted portions respectively in the two horizontal directions.

4,696,567

RADIATION DETECTION METHOD

James Ruger, Hoffenheim, and Wolfgang Welz, Bammental, both of Fed. Rep. of Germany, assignors to Eltro GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 673,130

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344798

Int. Cl.⁴ G01P *3/36*

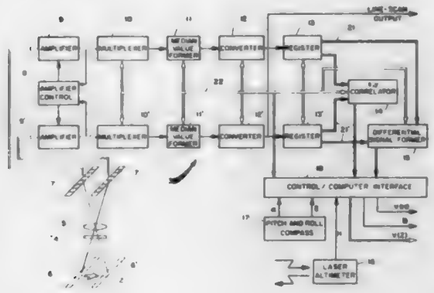
U.S. Cl. 356—28 **16 Claims**

1. A method of detecting radiation of a moving object from a reconnaissance flight body, comprising the steps of:

flying over the moving object and surrounding scene with the reconnaissance flight body;

measuring the altitude of the flight body over ground with a laser altimeter, and the pitch angle and roll angle of the

flight body with a compass of the navigational system of the flight body;
during over-flight, first scanning the object and scene with first radiation receiving means;
then scanning the object and scene with a second radiation receiving means offset parallel to and of similar type than said first receiving means;
said first and second radiation receiving means being respectively a serial arrangement of first and second receiving elements;



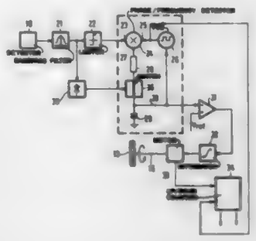
setting the amount of data to be correlated depending on the range of speed, height, pitch angle and resulting slide slip angle of the flight body, and depending on a target speed by means of a two-dimensional correlation window;
placing the signals of said first radiation receiving means in parallel storage, correlating the stored signals of the first radiation receiving means with the arriving signals of the second radiation receiving means longitudinally and transversely in relation to an axis of said reconaissance flight body, forming a differential signal signature, registering said signature, and evaluating the same.

4,696,568

METHOD OF AND APPARATUS FOR MEASURING THE VELOCITY AND/OR THE LENGTH OF MOVING OBJECTS

Marten P. Weistra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1984, Ser. No. 609,244
Claims priority, application Netherlands, May 31, 1983, 8301917
Int. Cl.⁴ G01P *3/36*
U.S. Cl. 356—28.5 **19 Claims**



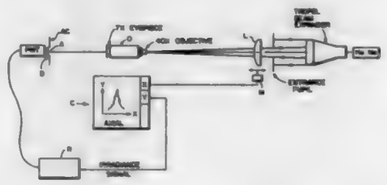
1. A method of measuring the velocity and/or length of a moving object in accordance with the Doppler principle comprising the following steps:
(1) generating an electromagnetic wave having a given fixed frequency,
(2) preshifting the electromagnetic wave to obtain at least one frequency shifted or phase modulated electromagnetic wave,
(3) directing the preshifted electromagnetic wave towards the moving object,
(4) adjusting the degree of preshift of said electromagnetic wave in a sense such that the algebraic sum of a frequency preshift and a Doppler shift produced by motion of the object is constant, whereby said Doppler shift has a predetermined fixed frequency, and
(5) determining the velocity and/or length of the moving object from the difference between the Doppler shift and the preshift of the electromagnetic wave.

4,696,569

METHOD OF MEASURING SPHERICAL ABERRATION AND APPARATUS THEREFOR

Joseph M. Geary, Edgewood, and Phillip R. Peterson, Albuquerque, both of N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1985, Ser. No. 721,968
Int. Cl.⁴ G01B *9/00*
U.S. Cl. 356—124 **4 Claims**



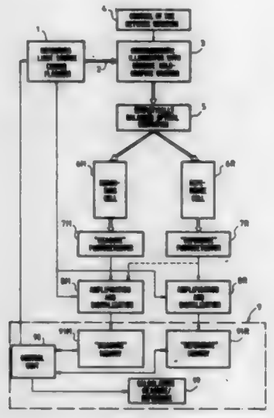
1. An apparatus for measurement of spherical aberration of a test lens, comprising:
a beam expander,
a micrometer-mount for said test lens,
a means for moving said test lens longitudinally along its optical axis,
a microscope,
a diffuser,
an aperture card defining an aperture therein,
a photo-amplifying means, and
a means for measuring irradiance,
said beam expander, micrometer mount, microscope, diffuser, aperture card, and amplifying means being aligned along a common axis, said test lens placeable in said axis by means of said micrometer-mount, and said test lens being moved along its optical axis by said moving means to provide proper axial intensities from said test lens, collimated light being projectable through said beam expander and along said axis and through said aperture to impinge upon said amplifying means, said measuring means receiving and measuring said collimated light from said photo-amplifying means and determining a location of a paraxial focus by measuring light along an optical axis of said test lens, said measuring means determining a location of an actual focus of said test lens by measuring said collimated light in proximity to said paraxial focus, said actual focus and said paraxial focus yielding therefrom the spherical aberration of the test lens.

4,696,570

SPECTROPHOTOMETER WITH STATISTICALLY BALANCED LIGHT FOR VERY HIGH RESOLUTION

A. Pierre Joliot, Antony, and Daniel Beal, Orsay, France, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France

Filed Apr. 29, 1985, Ser. No. 728,295
Claims priority, application France, Apr. 23, 1985, 85 06172
Int. Cl.⁴ G01J *3/42*
U.S. Cl. 356—319 **15 Claims**



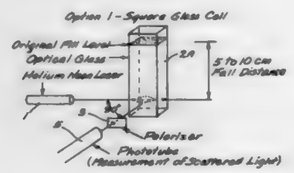
1. A differential spectrophotometer, comprising two sample locations, optical means for applying to the two samples monochromatic measuring light, photodetectors for selectively collecting the light transmitted through each one of the two samples, and electronic means for comparing the quantities of transmitted light thus measured by the two photodetectors, said optical means distributing the measuring light statistically balanced to the two samples and including a flash source illuminating an inlet slit diaphragm of a monochromator with a concave holographic grid, a parallelepipedic light guide optically coupled to an outer slit diaphragm of the monochromator and followed by a Y-shaped guide of optical fibers where the optical fibers are substantially randomly distributed between two branches of the Y providing the statistical balanced light.

4,696,571

SUSPENDED SEDIMENT SENSOR

Marvin C. Goldberg, Englewood; Kirkwood M. Cunningham, Lakewood, and Eugene R. Weiner, Denver, all of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 25, 1985, Ser. No. 791,286
Int. Cl.⁴ G01N *15/02*
U.S. Cl. 356—336 **5 Claims**



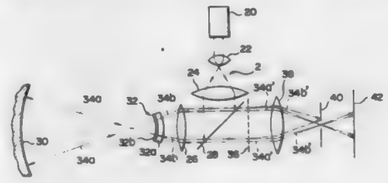
1. An apparatus for simultaneously measuring particle mass and size of suspended sediment in liquids comprising:
means for holding a sample of liquid having sediment of a size between 5 and 50 microns suspended therein to be measured, said sediment size being large enough to cause immediate settling of said sediment under the mere influence of gravity, undisturbed by convection flows or external forces, said holding means containing said sample of liquid;
light surce means for producing laser light beam polarized in a predetermined plane and directing said laser light beam through said sample holding means during at least a portion of the time that said sediment is settling;
photodetector means disposed at an approximately 90° angle with respect to said laser light beam for detecting the amount of light from said light source means passing through said sample holding means at said 90° angle; and
means disposed between said sample holding means and said photodetector means for polarizing the light being detected by said photodetector means in the same plane as the polarization of said laser light beam.

4,696,572

SURFACE INSPECTION APPARATUS

Akira Ono, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1985, Ser. No. 702,636
Int. Cl.⁴ G01B *9/021*
U.S. Cl. 356—348 **33 Claims**



1. A surface inspection apparatus for inspecting the condition of an aspherical subject surface, comprising:
emitting means for emtting a parallel light beam;
a carrier frequency hologram;
light dividing means for dividing the light beam emitted from the emitting means into an object light directed toward the subject surface and a reference light directed toward the hologram;
an optical system for applying the object light at right angles to the subject surface and directing the applied object light toward the hologram; and
selecting means for selectively extracting zeroth-order diffracted rays of the reference light passed through the hologram and Nth-order diffracted rays of the object light passed through the hologram and causing the diffracted rays to interfere with each other,
said hologram being designed so that the Nth-order diffracted rays of the object light have the same wave front as the zeroth-order diffracted rays of the reference light, and having a carrier frequency $f<3\cdot\Delta f$, where Δf represents the maximum frequency bandwidth of the transmitted rays of the object light,
wherein the condition of the subject surface is judged from interference fringes of the diffracted rays which are caused to interfere with each other.

4,696,573

DUAL SHEAR WAVEFRONT SENSOR

Richard A. Hutchin, Marlboro, Mass., assignor to Itek Corporation, Lexington, Mass.

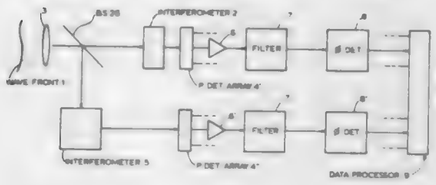
Filed Jul. 3, 1985, Ser. No. 751,633
Int. Cl.⁴ G01B *9/02*
U.S. Cl. 356—353 **16 Claims**

1. A method of measuring a given wavefront of light with a

first shearing interferometer having a given shear and dynamic range, and with a second interferometer having a relatively small shear with respect to said given shear and having a relatively large dynamic range comprising the steps of:

a. directing most of said light of said wavefront to said first interferometer and at least a portion of the remaining light of said wavefront to said second interferometer;

b. utilizing said first interferometer to produce a first set of phase difference measurements having values indicative of wavefront slopes, each measurement of said first set having a plurality of virtual candidate measurements due to measurement ambiguity produced by said large shear;



c. utilizing said second interferometer to produce a second set of phase difference measurements having values indicative of wavefront slopes;

d. comparing each difference measurement of said second set of measurements with said virtual candidate measurements of each corresponding difference measurement of said first set;

e. determining for each measurement of step d which of said candidate measurements are closest to the corresponding measurement of said second set; and

f. utilizing the closest candidate measurements determined in accordance with step e to measure the shape of said wavefront.

4,696,574

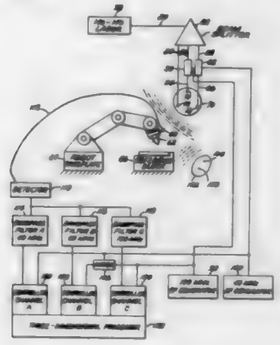
PRECISION REMOTE LOCATION OF A MOVABLE POINT EMPLOYING LIGHT INTERFERENCE FRINGES

Carl M. Penney, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 622,906, Jun. 21, 1984, abandoned. This application Aug. 21, 1986, Ser. No. 898,565

Int. Cl.[4] G01B *11/14;* **B25J** *19/00*

U.S. Cl. 356—375 **4 Claims**



1. A system for determining the change in position of a point on a robot, comprising:

at least three spaced coherent light sources having predetermined difference frequencies and constituting a defined number of light source pairs, the sources of each light source pair having a unique difference frequency, and each light source pair projecting throughout a working volume of at least one cubic meter a moving pattern of interference fringes which has a known fringe spacing and is independent of the moving pattern of interference fringes from each of the other light source pairs;

a single filament fiber optic whose tip is located at said point on said robot, which is movable anywhere within the working volume, and senses instantaneous illumination;

said fiber optic being coupled to a photodetector that provides a detector signal having, for each of the moving patterns of interference fringes, a frequency component determined by the number of interference fringes crossing said fiber optic tip per unit time;

a filter for each of said light source pairs for separating out of said detector signal the frequency component of the corresponding moving pattern of interference fringes; and

a signal processor for comparing each detector signal frequency component to the light source difference frequency of the corresponding pair to determine the change in position of said point on said robot over any time interval.

4,696,575

SINGLE-SCREW EXTRUDER FOR PRODUCING THERMOPLASTIC AND ELASTOMERIC PRODUCTS

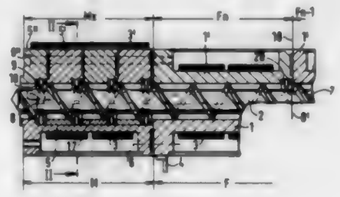
Hartmut Upmeier, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 18, 1985, Ser. No. 789,145

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1984, 3438649

Int. Cl.[4] B29B *7/12*

U.S. Cl. 366—80 **11 Claims**



1. A single-screw extruder for producing thermoplastic and elastomeric products, comprising a hollow cylindrical barrel, which is provided with inwardly protruding mixing elements, and a screw, which is rotatably disposed in the barrel and has a core and at least one helical land on the core said at least one helical land formed with recesses with the mixing elements extending into the helical land recesses, wherein the mixing elements are carried by split carrying rings, which are axially spaced apart by interposed spacing rings, the split carrying rings having on their outside surfaces on both sides of their interfaces axially extending step-shaped recesses which are mirror images of each other, the barrel having a longitudinal recess, and wherein the carrying ring recesses and the barrel recess define grooves for key means which extend into the grooves to non-rotatably support the carrying rings in the barrel when the extruder is assembled.

4,696,576

FOOD SERVICE TICKET TIMER

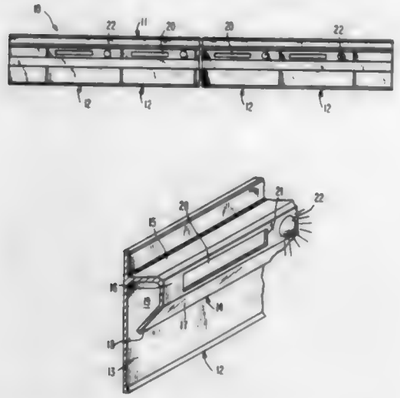
Frankie A. Moore, P.O. Box 9422, Columbus, Ga. 39108

Filed Nov. 12, 1986, Ser. No. 929,732

Int. Cl.[4] G04F *8/00*

U.S. Cl. 368—10 **1 Claim**

1. A fast service ticket timer, comprising, a control board having a row units, each unit including an electrical timer in a circuit, and means for closing said circuit at a set time after a meal order has been received, and comprising a timer ticket having said meal order written thereon, and each said unit



being adaptable to receive said ticket, and said ticket closing said circuit.

4,696,577

INTEGRAL WATCH CASE MIDDLE AND MOVEMENT PLATE AND METHOD OF MAKING SAME

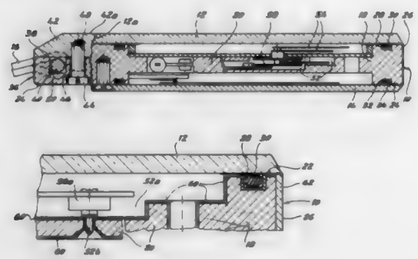
Jacques Müller, Reconvilier, and André Triponez, Lamboing, both of Switzerland, assignors to ETA S.A. Fabriques d'Ebauches, Grenchen, Switzerland

Filed Aug. 27, 1986, Ser. No. 900,924

Claims priority, application Switzerland, Sep. 6, 1985, 03857/85

Int. Cl.[4] G04B *57/00*

U.S. Cl. 368—276 **18 Claims**



1. An integral watch case middle and movement plate made of brass comprising top and bottom faces with at least one formed with recesses for receiving components of a watch movement, and side faces, and provided with a coating made of a material that is chemically more inert than brass, said coating including a first part that protects the brass in the regions of said middle and said plate that are formed with said recesses and a second part that protects the brass at least over said side faces and which is thicker and more resistant to chemical and physical attack than the first part.

4,696,578

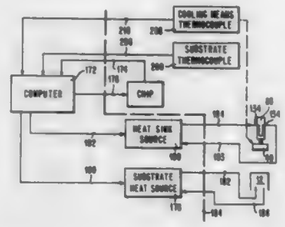
SINGLE CHIP THERMAL TESTER

Mohanlal S. Mansuria, Coral Springs, Fla.; Rolf G. Meinert, Wappingers Falls, N.Y.; Sevgin Oktay, Poughkeepsie, N.Y., and Carl D. Ostergren, Montgomery, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1986, Ser. No. 876,143

Int. Cl.[4] G01N *25/00;* **G01R** *31/26*

U.S. Cl. 374—45 **24 Claims**



1. An apparatus for precisely measuring the thermal resistance of a heat transfer device for carrying heat away from a semiconductor chip comprising, in combination:

a heat source packaged in a housing having the size and configuration of a semiconductor chip to be cooled by a heat transfer device;

first temperature sensing means disposed on said heat source to sense the temperature of said heat source;

a support means for supporting said heat source in a thermal transfer relationship;

second temperature sensing means disposed to substantially measure the temperature of said heat source at the contact surface between said support means and said heat source;

positioning means in thermal contact with the heat transfer device at one end thereof for positioning the heat transfer device so that its other end is in thermal contact with said heat source so as to provide the desired heat transfer from said heat source to the heat transfer device;

third temperature sensing means disposed substantially at the contact between said positioning means and the heat transfer device;

means for placing the heat transfer device, said heat source, said first temperature sensing means, said support means, said second temperature sensing means, said positioning means and said third temperature sensing means in substantially a vacuum; and

means to adjust the temperature of said support means, said heat source and said positioning means so that in the steady state heat generated by said heat source only flows through the heat transfer device toward said positioning means thereby making possible a determination of the thermal resistance of the heat transfer device.

4,696,579

THERMOSTAT

Pietro De Filippis; Ciro Calenda, both of Aversa; Giuseppe Notaro, Pomigliano D'Arco, all of Italy, and Henry Boulanger, Nicholasville, Ky., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1985, Ser. No. 781,619

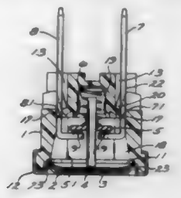
Claims priority, application Italy, Oct. 24, 1984, 49059 A/84

Int. Cl.[4] H01H *37/12, 37/54*

U.S. Cl. 374—187 **6 Claims**

1. A thermostat comprising a monolithic base having a chamber open at one end, two terminals connectable to an electric circuit inserted into the base, each terminal carrying a stationary contact within the base chamber, a movable contact element movable between a position interconnecting the stationary contacts and a position spaced from said stationary contacts, a spring mounted in the base biasing the movable

contact element to one of said positions relative to the stationary contacts, a thermally responsive bimetallic element movable in response to temperature change, a sliding element for moving the movable contact element against biasing of the spring in response to movement of the bimetallic element, and a lid which positions said bimetallic element on said base characterized in that the sliding element is adjustably joined in



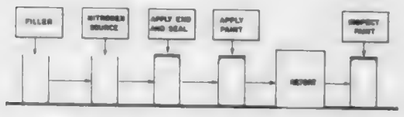
operative relation to the movable contact element for disposing an extending portion of the sliding element with a selected spacing from the movable contact element in a selected position between the movable contact element and the bimetallic element for calibrating the thermostat to move the movable contact element from one of said positions to the other position against biasing of said spring when the bimetallic element moves in response to selected temperature change.

4,696,580

METHOD FOR DETECTING STERILIZATION

Toshinori Kameda, Ibaraki, Japan, assignor to National Can Corporation, Chicago, Ill.

Filed Mar. 3, 1986, Ser. No. 835,692
Claims priority, application Japan, May 16, 1985, 60-102772
Int. Cl.[4] G01K *11/12*; G01N *25/00*
U.S. Cl. 374—162 **7 Claims**



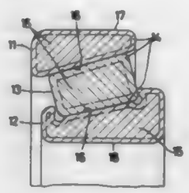
1. A method for detecting sterilization effect applied to a thin wall soft type can, such as aluminum, filled with low acid foods or drinks, which comprises the steps of applying a thermal sensitive paint in the form of descriptions or marks to an exterior surface of said can which is already filled with said low acid foods or drinks and hermetrically sealed off, said thermal sensitive paint having its inherent nature of manifesting a visible color change when exposed to a steam of a predetermined temperature for a predetermined interval which corresponds to desired conditions for retort sterilization treatment to be applied to said low acid foods or drinks; applying said retort sterilization treatment to said low acid foods or drinks contained in said can; and detecting said visible color change of said thermal sensitive paint of said can so that said can with said thermal sensitive paint manifesting no visible color chane is regarded as having been subjected to incomplete retort sterilization.

4,696,581

ROLLING BEARING

Noriyuki Tsushima, Kuwana, and Hirokazu Nakajima, Gifu, both of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed Dec. 2, 1986, Ser. No. 936,860
Claims priority, application Japan, Dec. 3, 1985, 60-273078
Int. Cl.[4] F16C *33/34*, *33/62*
U.S. Cl. 384—565 **1 Claim**



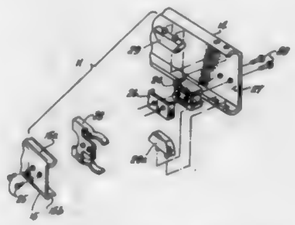
1. A rolling bearing comprising outer and inner bearing rings and a plurality of rolling elements disposed between said inner and outer bearing rings, said bearing rings and said rolling elements being made of carburized steel having an oxygen content of not more than 15 PPM and a carbon content of 0.15 to 0.4 percent, said bearing rings and said rolling elements having a surface hardened layer which has a hardness of not less than 58 in HRC and having a core hardness of not less than 48 and not more than 58 in HRC, the depth of said surface hardened layer being not less than 0.05 for said bearing rings and not less than 0.07 for said rolling elements in terms of depth/diameter of said rolling element.

4,696,582

THREE MEMBER DRAWER SLIDE WITH SEQUENTIAL MOVEMENT

Donald A. Kasten, Pomona, Calif., assignor to Standard precision, Inc., Santa Fe Springs, Calif.

Filed Oct. 27, 1986, Ser. No. 923,210
Int. Cl.[4] F16C *29/04*
U.S. Cl. 384—18 **15 Claims**



1. An improved three member drawer slide of the type having a drawer slide affixed to an intermediate member and a cabinet slide positioned below said drawer slide and affixed to said intermediate member, said drawer slide having a drawer slide outer member, a drawer slide inner member and said drawer slide having a plurality of ball bearings held by an upper ball retainer and said cabinet slide having a cabinet slide outer member, a cabinet slide inner member and a plurality of ball bearings held by a lower ball retainer wherein the improvement comprises means to cause the movement of the lower ball retainer to occur before the movement of the upper ball retainer, said means comprising:

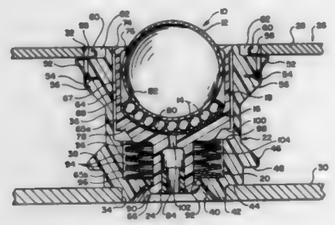
releasable gripping means between said drawer slide outer member and said intermediate member, said releasable gripping means performing a gripping action only when said drawer slide outer member is fully retracted and said cabinet slide outer member being more free to move outwardly with respect to said intermediate member than said drawer slide outer member when said cabinet slide outer member is retracted whereby when said three member drawer slide is extended from a fully retracted position, the cabinet slide outer member will move outwardly completely before the drawer slide outer member will move with respect to the drawer slide inner member.

4,696,583

BALL SUPPORT ASSEMBLY

Frederick J. Gorges, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 829,404, Feb. 11, 1986, abandoned, which is a continuation of Ser. No. 614,277, May 25, 1984, abandoned. This application Oct. 24, 1986, Ser. No. 922,703
Int. Cl.[4] F16C *29/04*; B60B *33/08*; B65G *13/00*
U.S. Cl. 384—49 **25 Claims**



1. A ball support assembly adapted for use as part of a cargo handling system, said assembly comprising:

a. a base member comprising:
   1. an upper base portion having upper peripheral side wall means defining an upper chamber,
   2. a lower base portion having a lower peripheral side wall means defining a lower chamber,
   3. a bottom base portion,

b. a mounting member means mounted within said base member for limited up and down movement between an upper normal position and a lower depressed position, said mounting member means comprising:
   1. an upper ball retaining portion positioned in said upper chamber and having side wall means and bottom wall means defining a ball receiving recess,
   2. a lower connecting portion connected to and extending downwardly from the ball retaining portion,
   3. said connecting portion having an operative connection with said bottom base portion to limit upward movement of said mounting member means beyond said upper normal position and yet to permit downward movement to said depressed position,

c. said mounting member means and said base member having cooperating stop means to limit any downward movement of the mounting member means beyond the depressed position,

d. a ball member rotatably mounted in said recess and positioned to provide a rotatable ball support surface,

e. compression spring means positioned in the lower chamber of the lower base portion of the base member in a manner to press downwardly against said bottom base portion and upwardly against said mounting member means in a manner to resiliently hold the mounting member means at the upper normal position and to yieldingly resist downward movement of the mounting member means due to loads imposed on the ball support surface,

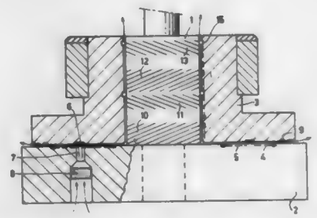
f. said assembly being characterized in that an upward force exerted by said spring means against said mounting member means is, with said mounting member means in the normal position, and with no substantial downward load being exerted on the ball member, resisted at least primarily by said connecting portion reacting substantially in tension between said bottom base portion and said upper ball retaining portion of the mounting member means.

4,696,584

SELF-CLEANING AIR BEARING COMPRISING A FLOW EQUALIZING GROOVE AT THE BEARING PERIPHERY

Leonardus P. M. Tielemans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 547,147, Oct. 31, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,779
Claims priority, application Netherlands, Nov. 19, 1982, #204481
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—107 **2 Claims**



2. A self-cleaning air bearing comprising a first part which rotates about an axis, and a second part, each of said parts having cooperating bearing surfaces dimensioned and configured to define at least one bearing gap, said gap having at least one circular periphery having an area at which the bearing gap opens into the atmosphere,

an air inlet communicating with said bearing gap at a location spaced from said periphery, and with the atmosphere,

at least one filter disposed in said air inlet,

at least one pattern of grooves formed on one of said surfaces for causing air to flow through said at least one filter into said gap, and

at least one continuous circular flow equalizing groove formed in one of said bearing surfaces, and disposed at least adjacent said area, arranged such that a flow of air is maintained outward to the atmosphere along all of said area;

said bearing comprising a thrust bearing and a cylindrical bearing;

said thrust bearing having an outer circumference and an inner circular periphery, said flow equalizing groove being an annular groove disposed adjacent said outer circumference of said bearing, said gap extending between said groove and said inner circular periphery, and said air inlet being spaced intermediately between said groove and said inner circular periphery;

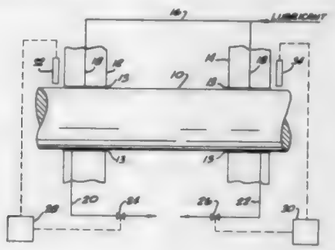
said cylindrical bearing having a cylindrical bearing surface concentric about said axis, having a cylindrical gap arranged to communicate with said inner circular periphery and to extend axially to an outer cylindrical area communicating with the atmosphere; and a second continuous circular groove at least adjacent said outer cylindrical area,

said thrust bearing being arranged so as to pump air from said air inlet to said annular groove and to said inner periphery, and

said cylindrical bearing being arranged such that air flows through said cylindrical gap from said inner periphery to said second groove,

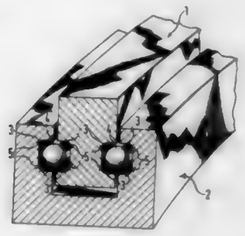
whereby air outflow through the entire outer cylindrical area prevents dust from entering said bearing.

4,696,585
BEARING SUPPORT SYSTEM WITH CONTROLLABLE SPRING RATE
Judson S. Swearingen, 27403 Pacific Coast Hwy., Malibu, Calif. 90264
Filed Jan. 17, 1986, Ser. No. 820,534
Int. Cl.⁴ F16C *17/02*
U.S. Cl. 384—399 5 Claims



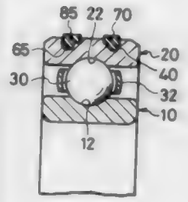
1. A bearing support for a high speed rotating shaft, comprising
- a journal bearing having a cylindrical bearing seat for supporting a shaft therein;
- at least a pair of opposed fluid apertures defined in the inner face of said bearing seat;
- fluid vent lines extending between each said pair of fluid apertures;
- a vibration sensor positioned adjacent said bearing for generating a control signal responsive to shaft vibration;
- a valve disposed in each said fluid vent line to control fluid communication between said apertures; and
- at least a valve controller responsive to said control signal for controlling at least one said valve in response to shaft vibration.

4,696,586
WIRE ROLL BEARING
Ulrich Krug, Hagen, Fed. Rep. of Germany, assignor to Hoesch Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 783,418, Oct. 3, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,133
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436406
Int. Cl.⁴ F16C *33/61*
U.S. Cl. 384—500 4 Claims



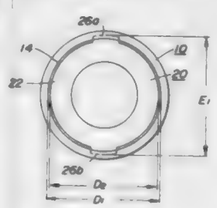
1. Wire roll bearing with slide and guideway and therebetween roll bodies arranged on running wires, with the running wires being movably positioned in the wire bed, characterized in that the running wires are tensioned at least at one end in compression or tension by the interposition of spring means, and further characterized by being structured as a circle segment bearing.

4,696,587
EXPANSION COMPENSATING BEARING
Soji Nishida, Fujisawa, and Nobuhiko Miyake, Yokohama, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 3, 1986, Ser. No. 881,896
Claims priority, application Japan, Jul. 16, 1985, 60-107630[U]
Int. Cl.⁴ F16C *27/04, 43/04*
U.S. Cl. 384—536 13 Claims



1. A bearing including an inner race and an outer race disposed concentrically, a plurality of rolling members interposed between said two races, and first and second ring members of synthetic resin axially spaced on an outer peripheral surface of said outer race and wherein a rotating member is inserted in said inner race and said outer race is fitted and held in a non-rotating member through said first and second ring members, characterized in that:
- first and second axially spaced circumferential grooves are provided in said outer peripheral surface of said outer race,
- each of said circumferential grooves comprises a first portion situated toward a respective one axial end of said outer race and which has a bottom surface that includes an arcuate surface portion of a single radius, and a second portion located more toward the opposite axial end of said outer race than said first portion and being narrower and shallower than said first portion,
- said first and second portions are formed continuously to each other,
- said first and second ring members are respectively closely held in said first and second circumferential grooves by injection-molding synthetic resin, and
- an outer peripheral surface of each of said first and second ring members protrudes radially outward further than said outer peripheral surface of said outer race.

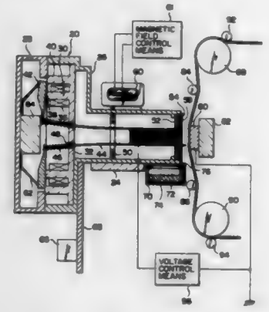
4,696,588
NON-SEPARABLE THRUST ROLLING BEARING
Yasuo Tanaka, and Akio Nikura, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 31, 1986, Ser. No. 846,268
Claims priority, application Japan, Mar. 29, 1985, 60-46167
Int. Cl.⁴ F16C *19/10, 33/58*
U.S. Cl. 384—615 15 Claims



1. A non-separable thrust rolling bearing having a rotational axis comprising:

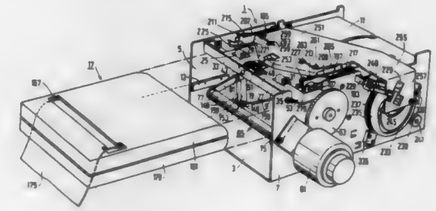
first and second annular bearing rings each having an inner and an outer dimetral end portion respectively;
- a bent portion formed on an end of one of the inner and outer diametral portions of the second bearing ring and extending radially in a direction toward the other of the inner and outer diametral portions thereof, said bent portion being proximate one of the inner and outer diametral edge portions of the first bearing ring; and
- a pair of opposed coupling members integrally formed on an end of one of the inner and outer diametral end portions of the one of the first and second bearing rings and having a radial width greater than the difference between the diameters of the bent portion as measured at the greatest radial extension thereof and of the one of the inner and outer diametral edge portions of the first bearing ring proximate the bent portion.

4,696,589
INK-DOT PRINTER
Shigeru Okuno; Yoshihiro Torisawa, both of Mishima; Mitsuharu Endo, Susono; Tetsuroh Nakayama, Mishima; Masashi Shimosato, Shizuoka, and Takafumi Fukushima, Fuji, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Oct. 21, 1985, Ser. No. 789,618
Claims priority, application Japan, Oct. 26, 1984, 59-225531; Nov. 6, 1984, 59-233946
Int. Cl.⁴ B41J *3/12, 27/19*
U.S. Cl. 400—119 3 Claims



1. An ink-dot printer comprising:
- a pair of slit forming members arranged so as to define a slit therebetween;
- ink storage means for storing ink so that the slit between the two slit forming members is immersed in the ink;
- a recording medium opposed to the slit;
- a needle movable between a rest postition in which the distal end portion of the needle facing the recording medium is located in the slit and a projected position in which said distal end portion of the neele is projected from the slit so as to be located closer to the recording medium than when it is in the rest position;
- driving means for moving the needle between the rest position and the projected position;
- ink attracting means for generating a magnetic or electric field in the slit between the two slit forming ember for thereby attracting ink from the ink storage means into the slit to cause the attracted ink to attach to the distal end portion of the needle located in the rest position;
- said ink attracting means including an electromagnet connected to the pair of slit forming members for generating a magnetic field in the slit; and
- control means for electrically controlling said ink attracting means to cause it to generate a field to produce an ink attracting magnetic or electric force of sufficient intensity to attract ink from the ink storage means into the slit at the time of ink attraction, and for further electrically controlling said ink attracting means to cause it to generate a lower intensity field to produce an ink holding magnetic or electric force which is of lower intensity than said attracting magnetic or electric force, said ink holding magnetic or electric force being of a sufficient intensity to hold a predetermined amount of ink in the slit after the predetermined amount of ink is attracted into the slit;
- said control means including a timer for setting the length of the ink attracting magnetic or electric force generating time;
- wherein the ink attaching to the distal end portion of the needle at the rest position is moved to the recording medium to form an ink dot thereon as the needle moves to approach the recording medium in a projected position.

4,696,590
PRINTER HAVING A GUIDE FOR AN INSERTABLE CASSETTE WHICH CAN HOLD DATA AND TRANSFER STRIPS
Waltherus C. J. Bierhoff; Pieter D. Schultmaker; Cornelis Ouwerkerk, and Robertus J. M. Verhoeven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 26, 1985, Ser. No. 780,733
Claims priority, application Netherlands, May 30, 1985, 8501541
Int. Cl.⁴ B41J *11/58*
U.S. Cl. 400—613 11 Claims



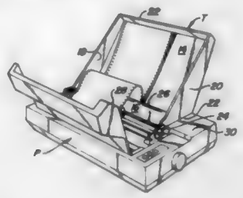
1. A printer having a guide for an insertable cassette, in which is provided a receipt strip displaceable with respect to a printing head, the cassette being provided with at least one entrance window for transport members of the said strip, characterized in that a lock releasable by an initial translation of the cassette in the printer releases a transport roller which is pivotable about a fixed shaft, is cylindrical and performs after a further translation of the cassette a pivotal movement into a cassette window on a first cassette side and consequently gets into pressure contact with the printing head on a second cassette side located opposite the first cassette side, the receipt strip being clamped during printing between the transport roller and the printing head.

4,696,591
FAN FOLDED PRINTER OUTPUT COLLECTOR
Robert W. Boyden, 6 Lakeview Ct., Novato, Calif. 94947
Filed Feb. 19, 1986, Ser. No. 831,224
Int. Cl.⁴ B41J *15/04*
U.S. Cl. 400—613.2 6 Claims

1. A paper collecting tray for attachment to a printer, said printer having fan folded printer output which is guided from the printer exit towards said tray in a substantially horizontal direction, said tray comprising:
- a tray body;
- a cam surface attached to said tray body, said cam surface adjacent said printer exit for receiving said printer output and guiding said printer output to and towards a paper receiving notch, said cam surface sloping from the point of printer output from said printer exit to an angle below

the horizontal and substantially normal to said tray body whereby fan folded printer output impinges upon said cam surface, climbs over the top of said cam surface, and passes to said paper receiving notch;

means for cantilevering said tray body from said printer adjacent said paper exit attached to said cam surface and tray surface; and



a tray surface on said tray body extending upwardly at an angle cantilevered from said printer exit in the range of 20° to 50°, said tray surface terminating at the lower end of said tray at said cam surface to define said paper receiving notch therebetween, whereby the major surface of said fan folded paper having a fold on said paper receiving notch stacks on said tray surface utilizing the columnar strength of said paper and the weight of said paper.

4,696,592

PAPER FEED CONTROL IN A PRINTER

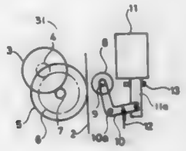
Yukihiko Oka, Yamatokoriyama, and Toyohiko Morimoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1985, Ser. No. 736,711

Claims priority, application Japan, May 22, 1984, 59-104205; May 23, 1984, 59-75996[U]; May 25, 1984, 59-106779

Int. Cl.⁴ B41J *13/02*

U.S. Cl. 400—636 **5 Claims**



1. A print control system in a printer which performs a printing operation onto a record-receiving medium, said print control system comprising:

input means for introducing a print instruction into said print control system;

printing means for performing said printing operation onto said record-receiving medium;

feed means for shifting said record-receiving medium through said printing means in a predetermined direction for a predetermined distance before and after said printing operation;

a print repetition control circuit which enables a predetermined number of successive printing operations by said printing means upon completion of each printing operation; and

control means, responsive to said input means, for controlling said printing means and said feed means in said printing operation;

said feed means including,

drive roller means for engaging and shifting said record-receiving medium through said printing means as said drive roller means rotates,

means for rotating said drive roller means only before and after each successive printing operation, said means for rotating holding said drive roller means stationary during each printing operation,

pinch roller means in opposing confrontation with said drive roller means for selectively securing said record-receiving medium against said drive roller means in each printing operation,

a shaft positioned through the axis of said pinch roller means so that said pinch roller means rotates freely therearound,

a solenoid having a reciprocally movable rod, and

a rotatable arm engaged with the shaft of said pinch roller means and with a portion of said reciprocally movable solenoid rod, wherein said solenoid is selectively activated by said control means to position said pinch roller means in contact with said record-receiving medium, thereby securing said record-receiving medium against said drive roller means during a printing operation.

4,696,593

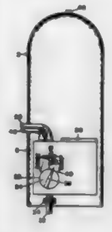
CAR WASHING MITT

James D. Bayless, 412 S. Bellaire, Kansas City, Mo. 64123

Filed Dec. 5, 1986, Ser. No. 938,455

Int. Cl.⁴ A46B *11/06;* **A47K** *7/03;* **B05C** *1/00*

U.S. Cl. 401—7 **3 Claims**



1. A car washing mitt comprising:

a. a glove which may be worn on the hand of a user,

b. a control valve mounted on said glove,

c. means whereby said control valve may be furnished with a constant supply of water under pressure,

d. a pad of sponge material mounted on the palm of said glove,

e. means for delivering water from said control valve to the interior of said pad,

f. a liquid soap reservoir also mounted on said glove and comprising an elongated hollow cylinder vented to the atmosphere at one end thereof,

g. soap-water mixing means mounted on said glove and operable by the flow of water therethrough comprising a passageway operable to receive water from said control valve and to deliver it to the interior of said pad and having a restricted portion whereby the flow of water therethrough creates a zone of sub-atmospheric pressure, said zone of sub-atmospheric pressure being interconnected to said hollow cylinder at the end thereof opposite from its atmospheric vent and

h. A piston mounted frictionally in said hollow cylinder for movement therealong, whereby when soap is withdrawn from said hollow cylinder said piston follows to render liquid soap continuously available at said zone of sub-atmospheric pressure, regardless of the physical position of said glove, said control valve being operable to deliver water selectively either through said mixing means to said pad, or directly to said pad in by-passing relation to said mixing means, or to stop the flow of water.

4,696,594

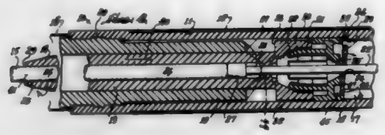
COSMETIC PENCIL HAVING ADVANCEABLE COSMETIC MASS

Ronald J. Powers, 109 S. Poinsettia Ave., Manhattan Beach, Calif. 90266

Filed Sep. 16, 1985, Ser. No. 776,390

Int. Cl.⁴ A45D *40/02, 40/20*

U.S. Cl. 401—65 **17 Claims**



1. A cosmetic pencil containing a cosmetic mass in a thin pencil lead-like configuratio having means for advancing the cosmetic mass comprising:

an elongated lower cylindrical stop element assembly having a hollow opening which has a disk stop element adjacent said opening;

a forward barrel having a hollow opening affixed to said elongated lower cylindrical stop element assembly and axially aligned therewith, said stop element assembly and said forward barrel forming a holding tube assembly;

a sheath and push-rod member having an elongated hollow sheath having an applicator end and an inner end and having an axial cylindrical bore therethrough, said bore being at least partially filled with a cosmetic mass and having a push-rod member having its inner terminus positioned within said bore and having its outer terminus extending outwardly past the inner end of said sheath, said sheath and push-rod member having a shoulder on the outer surface thereof near the inner end thereof, said sheath and push-rod member being held in said forward barrel so that the applicator end of the sheath is extendable outwardly of said forward barrel and the push rod member extends into the hollow opening of the holding tube assembly, said holding tube assembly having a first holding tube inner shoulder which surrounds the sheath and push rod member and stops the forward movement of the shoulder of the sheath and push rod member;

a gripping disk having a sheath facing side and a stop element facing side and having a central opening which has an inside diameter which is slightly larger than the outside diameter of said push rod member and said disk being positioned about the push rod member and said disk fitting within said holding tube assembly and abutting the disk stop element of the lower cylindrical stop element assembly near its outer edge;

a gripping disk supporting member adjacent the sheath facing side of said gripping disk and closely surrounding the push rod member, said gripping disk supporting member having an inner gripping disk supporting ring including a gripping disk supporting face adjacent to the push rod member and normal to the axis of the push rod member and an annular recess around the exterior of said gripping disk supporting ring extending from within the area adjacent the sheath facing side of said gripping disk and outwardly apst the outer periphery of said gripping disk; and

spring means between said gripping disk supporting member and said sheath which urges said sheath toward the shoulder of the holding tube assembly, whereby when said sheath is moved inwardly with respect to said disk stop element, the gripping disk abuts the disk stop element of the lower cylindrical stop element assembly and an edge thereof moves into the recess of the disk supporting member and causes it to grip the push rod member so that the cosmetic mass is moved outwardly of said sheath at its applicator end.

4,696,595

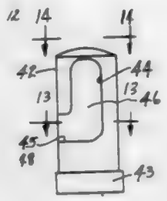
LOOSE LEAF BINDER LIFT LOCK

James Pinkney, Southgate, Mich., assignor to South Park Sales & Mfg., Inc., Lincoln Park, Mich.

Filed Dec. 4, 1986, Ser. No. 938,234

Int. Cl.⁴ B42F *3/02*

U.S. Cl. 402—54 **8 Claims**



1. A loose leaf binder lift lock having a tubular body, a tubular locking ball carrier movably mounted in the body and carrying a plurality of locking balls in one end for locking engagement with a locking rod attached to the rear cover of a loose leaf binder, a pull ring stud mounted in the other end of the ball carrier, a retainer spring for retaining the ball carrier, and a pull ring attached to the pull ring stud for moving the ball carrier to a ball unlocking position, characterized in that:

(a) the pull ring stud has a longitudinal slot, having an outer end and an inner end, formed on each of a pair of diametrical opposite sides and spaced transversely apart by a central rib;

(b) each of said longitudinal slots having a communicating entrance slot at the inner end thereof; and,

(c) the pull ring has a pair of attachment arms, with their inner ends spaced apart from each other, and with each attachment arm detachably mounted in one of the longitudinal slots, and movable into or out of the longitudinal slots through the entrance slots when the ball carrier is moved to the unlocking position.

4,696,596

EQUIPMENT MOUNTING MECHANISM

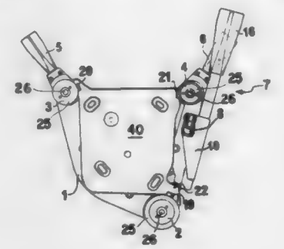
Lionel V. F. Russell, Suffolk, United Kingdom, assignor to W. Vinten Limited, England

Filed Jun. 17, 1985, Ser. No. 744,972

Claims priority, application United Kingdom, Jun. 16, 1984, 8415417

Int. Cl.⁴ F41G *1/38;* **F16M** *11/04;* **F16B** *21/00*

U.S. Cl. 403—321 **10 Claims**



1. An equipment mounting mechanism for removably mounting a component to an object comprising:

a female section attached to one of the component and object;

a male section attached to the other of the component and object;

a holding means on said female section for adjustably hold-

ing said male section to said female section, said holding means including;

(a) first, second, and third engagement means which form a plane and between which said male section is located for immovably engaging said male section in two of three mutually perpendicular axes and for allowing free movement of said male section along the third mutually perpendicular axis which third axis is in the plane,

(b) a first mounting means for fixedly mounting said first engagement means to said female section,

(c) a second mounting means for adjustably and lockably mounting said second engagement means in the direction of the third axis,

(d) a third mounting means for adjustably and lockably mounting said third engagement means is a direction perpendicular to the plane, and

(e) a locking means for releasably locking said male section against movement along the third axis after a desired alignment with said second and third mounting means whereby said male section is removable from said female section along the third axis by release from said locking means and returnable to the desired alignment by reinsertion along the third axis and locking in place with said locking means.

4,696,597

EQUIPMENT FOR CARRYING OUT WORK, UNDER DRY CONDITIONS, ON AN UNDERWATER STRUCTURE

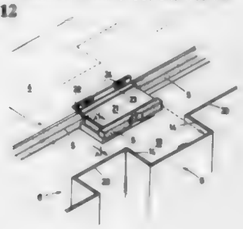
Willy Sonck, Denderleeuw, Belgium, assignor to General Coatings, Desderleeuw, Belgium

Filed May 22, 1986, Ser. No. 866,120

Claims priority, application Belgium, May 29, 1985, 215094; Sep. 11, 1985, 215568

Int. Cl.[4] B63C *11/00, 11/40*

U.S. Cl. 405—12 **5 Claims**



1. Equipment for carrying out work under dry conditions on an underwater structure having a generally vertical surface with substantially vertical grooves formed therein at predetermined intervals, said equipment comprising:

a caisson having two vertical walls and a floor,

means to keep the caisson pressed against the underwater structure before the caisson is emptied by pumping, and

a plurality of horizontally adjustable sealing sheets supported by said floor, said horizontally adjustable sealing sheets being extendable into said substantially vertical grooves,

said vertical walls and floor having exposed edges lined with strips made of an elastic sealing material,

said sealing sheets also having exposed edges lined with strips made of an elastic sealing material.

4,696,598

ERECTING/LYING-DOWN DAM OR SLUICE GATE MADE OF FLEXIBLE SHEET

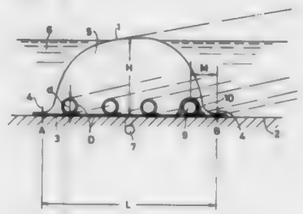
Yoshiomi Tsuji; Ichiro Maruyama, and Hiroshi Takuma, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 30, 1986, Ser. No. 880,663

Claims priority, application Japan, Aug. 21, 1985, 60-184875; Aug. 21, 1985, 60-184876

Int. Cl.[4] E02B *7/20*

U.S. Cl. 405—115 **13 Claims**



1. A collapsible dam or sluice gate which is expandable upon fluid supply therein and deflatable upon fluid discharge therefrom comprising:

a cover made of a flexible sheet which can expand and deflate;

an attaching means including at least two rows of fittings extending in a transverse direction to the direction of the flow of a river or the like, for attaching said cover to the bottom of said river or the like; and

a lower interior surface means having

a base sheet situated between said two rows of fittings, being attached to said cover and able to be supported along a bottom of a river or the like by a concrete formation or the like,

a plurality of corrugations forming members, located between said fittings for forming a non-planar lower interior surface means, so that the area of an upper surface of said lower interior surface is increased relative to a planar surface, and upon deflation, when said cover lies along said non-planar lower interior surface means, the length of a floating portion of said deflated cover is minimized.

4,696,599

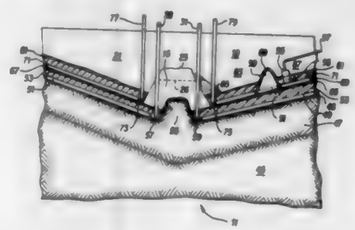
SECURE LANDFILL AND METHOD OF OPERATING A LANDFILL FOR HAZARDOUS WASTE

Randolph W. Rakoczynski, Niagara Falls; Stephen S. Odojewski, N. Tonawanda, and John I. Rolfe, Youngstown, all of N.Y., assignors to Waste Resource Associates, Inc., Niagara Falls, N.Y.

Filed Jul. 14, 1986, Ser. No. 885,428

Int. Cl.[4] C02F *1/00*

U.S. Cl. 405—129 **8 Claims**



1. A hazardous waste landfill comprising:

(a) a foundation having generally concave contour having side portions and a bottom portion, said foundation having a common low area or point to which liquids within the landfill can be centrally collected,

(b) a sub-base comprised of a substantially water impermeable material, said material lining said side and bottom portions of said foundation,

(c) a first continuous, water impervious synthetic liner overlaying said sub-base,

(d) a secondary leachate collection system positioned atop said liner, said collection system comprised of a plurality of permeable pipes imbedded in a layer of aggregate material, said system draining toward said common low area or point,

(e) means for collecting and removing liquid from said secondary leachate collection system,

(f) a second continuous water impervious synthetic liner overlaying said secondary leachate leak collection system,

(g) a plurality of berms fabricated of substantially water impermeable material positioned atop said second liner dividing the landfill area into a plurality of separate water tight zones,

(h) a primary leachate collection system positioned atop said second liner overlaying said secondary leachate collection system, comprised of a plurality of permeable pipes embedded in a layer of aggregate material, said system draining toward said common low area or point, and

(i) means for collecting and recovering liquids from said primary leachate system.

4,696,600

METHOD AND APPARATUS FOR MODIFYING THE CROSS-SECTIONAL PROFILE OF AN ADIT, TUNNEL OR THE LIKE

Georg Hurtz, Erkelenz-Holzweiler; Willi Steufmehl, Erkelenz, and Wolfgang Krappen, Wassenberg, all of Fed. Rep. of Germany, assignors to Wirth Maschinen- und Bohrgerate-Fabrik GmbH, Erkelenz, Fed. Rep. of Germany

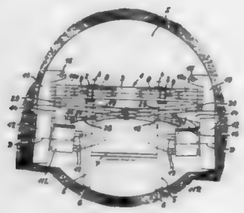
PCT No. PCT/DE85/00199, § 371 Date Feb. 12, 1986, § 102(e) Date Feb. 12, 1986, PCT Pub. No. WO86/00113, PCT Pub. Date Jan. 3, 1986

PCT Filed Jun. 10, 1985, Ser. No. 848,047

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421704

Int. Cl.[4] E01G *3/04*

U.S. Cl. 405—138 **23 Claims**



1. A method of modifying a cross-sectional profile of an adit, tunnel gallery or like elongate aperture comprising widening the profile in selected areas thereof with a rotary boring head having an axis of rotation oriented transversely to a longitudinal axis of the aperture and to which a feed movement can be imparted in the direction of said axis of rotation, the method including the steps of using the boring head to bore a first recess in a wall of the aperture by imparting the feed movement to the boring head, retracting the boring head, moving the boring head forward in the lengthwise direction of the aperture, then using the boring head to form another recess in the wall of the aperture overlapping the first recess, the boring, retracting, and forward moving steps of the boring head being repeated in such a manner that a plurality of individual recesses overlapping one another is produced in the wall of the aperture as a sequence extending in the lengthwise direction of the aperture.

4,696,601

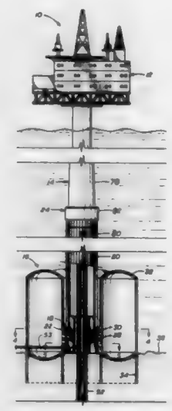
ARTICULATED COMPLIANT OFFSHORE STRUCTURE

George F. Davenport, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,358

Int. Cl.[4] E02B *17/00*

U.S. Cl. 405—202 **30 Claims**



1. A compliant offshore structure, comprising:

a base adapted to be supported on the ocean floor;

a substantially vertical tower extending upward from said base to a position proximate the ocean surface, the longitudinal axis of said tower defining the central axis of said structure;

a joint establishing the interface between said tower and said base, said joint being articulated to permit said tower to pivot about said base; and

a plurality of elongate stabilizing members each having a first end secured to said base at a spaced lateral distance from said central axis and a second end secured to said tower at a stabilizing member anchorage located a spaced distance above said articulated joint, said stabilizing members being installed in a pretensioned condition, said stabilizing members being arranged in an array surrounding said central axis whereby at least some of said stabilizing members undergo elongation in response to pivoting of said tower about said base.

4,696,602

APPARATUS AND SYSTEM FOR FLOODING SUBMERGED STRUCTURES

Richard A. Daigle, Sr., Thibodaux, La.; William G. Stanfield, and Michael E. Crenshaw, both of Dallas, Tex., assignors to LTV Energy Products Company, Dallas, Tex.

Filed Mar. 27, 1986, Ser. No. 844,711

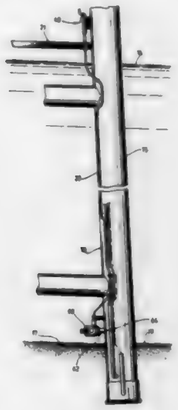
Int. Cl.[4] E02B *17/02;* **E02D** *21/00, 23/02*

U.S. Cl. 405—205 **6 Claims**

1. A flooding system to set a marine platform in a body of water where the platform includes a surface structure disposed above the body of water, at least one support structure attached to and extending below the surface structure to penetrate the bottom of the body of water, each support structure defining a hollow member having at least one port below the

waterline whereby closure of the port renders the hollow member sealed, the system comprising:

a valve assembly coupled to the support structure at the port operable to open and close the port, the valve assembly defining a water flow path between a valve inlet and a valve outlet coupled to the port when the valve assembly is in the open position and sealing the hollow member when in the closed position;



a remote control assembly coupled to the valve assembly, the remote control assembly comprising an outer flexible casing, a flexible member disposed for axial movement within the flexible casing, and means disposed between the flexible casing and the flexible member for reducing friction between the flexible casing and flexible member; and

means for imparting axial movement to the flexible member, thereby to operate the valve assembly into the open and closed positions.

4,696,603

COMPLIANT OFFSHORE PLATFORM

Mark A. Danaczko; Lyle D. Finn; M. Sidney Glasscock; Michael P. Piazza; Kenneth M. Steele, and Timothy O. Weaver, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

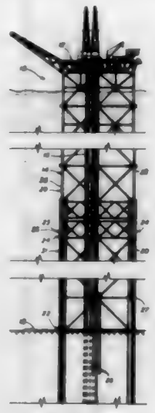
Filed Dec. 5, 1985, Ser. No. 806,055
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—227 **42 Claims**

1. A compliant offshore platform for use in hydrocarbon drilling and producing operations, comprising:

a deck;

a substantially rigid vertical tower adapted to support said deck above the ocean surface, said tower having a base and being adapted to pivot relative to the ocean floor about its base in response to the action of waves, the combination of said deck and tower having a net negative buoyancy and being free from guyline support; and

means for applying a vertical couple to said tower in response to pivoting of said tower, said couple being applied at a position on said tower intermediate said tower base and the bottom of the wave zone of the ocean environment in which said tower is situated, said vertical couple tending to resist sway of the tower away from the vertical.



4,696,604

PILE ASSEMBLY FOR AN OFFSHORE STRUCTURE

Lyle D. Finn, and Kenneth M. Steele, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 8, 1986, Ser. No. 894,547
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—227 **22 Claims**



1. A pile assembly adapted for use in supporting a compliant offshore structure having a plurality of vertical support legs extending from the ocean floor to a work deck proximate the ocean surface, said pile assembly comprising:

a plurality of elongate, substantially vertical lower piles set into the ocean floor;

a plurality of elongate, substantially vertical upper piles having opposed upper and lower end portions, the lower end portion of each of said upper piles being laterally adjacent and fixedly secured to the upper end of at least one of said lower piles;

means for securing the upper end portion of each of said upper piles to a corresponding one of said vertical support legs; and

means for maintaining a fixed spacing between the lower ends of said upper piles.

4,696,605

COMPOSITE REINFORCED CONCRETE AND TIMBER PILE SECTION AND METHOD OF INSTALLATION

Gerard J. Gillen, Jr., 4512 Ithaca St., Metairie, La. 70006

Filed Mar. 7, 1986, Ser. No. 837,707
Int. Cl.[4] E02D *5/22, 5/52*
U.S. Cl. 405—251 **8 Claims**



1. A method for installing a composite pile of a timber pile section and a precast, reinforced concrete pile section comprising the steps of:

a. simultaneously driving a timber pile section and a tubular sleeve positioned vertically above the sleeve and connected thereto into the earth so that the timber pile section is a distance well below the earth's surface, a distance substantially equal to the length of the reinforced concrete pile section;

b. using a tubular sleeve with a hollow bore during the simultaneous driving of the timber pile section and the tubular sleeve to prevent soil from entering the area vertically above the timber pile;

c. placing a precast, reinforced concrete pile in the bore of the sleeve;

d. joining the bottom of the concrete pile and the top of the timber pile with a connector that is embedded partially in the lower end of the concrete pile prior to joining;

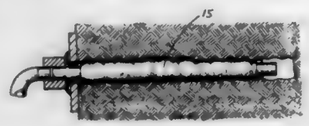
e. removing the tubular sleeve so that soil encroachment can laterally support the reinforced concrete pile section.

4,696,606

METHOD OF STABILIZING A ROCK STRUCTURE

Lorne R. Herron, Beaconsfield, Canada, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 16, 1986, Ser. No. 874,627
Claims priority, application Sweden, Jun. 17, 1985, 8502981
Int. Cl.[4] E21D *20/00*
U.S. Cl. 405—259 **18 Claims**



1. A method of stabilizing a rock structure, comprising:

boring a borehole in said rock structure;

inserting a tubular stabilizer into said borehole such that at least a portion of said tubular stabilizer protrudes from said borehole, said tubular stabilizer being made of mild steel and having a substantially circular cross-section which is slimmer than the cross-section of said borehole;

pressurizing an expandable body inside said tubular stabilizer while said tubular stabilizer is in said borehole, by applying a pressure fluid to the interior of said expandable body, to thereby expand said expandable body within said tubular stabilizer past the inner original perimeter limits of said tubular stabilizer over a substantial portion of the length of said tubular stabilizer so that said tubular stabilizer is widened radially over a substantial portion of its length to fill irregularities of said borehole and is caused to elastically widen the rock around said tubular stabilizer; and

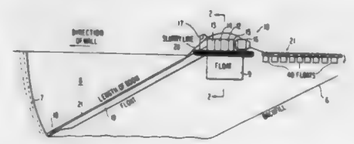
then depressurizing said expandable body to reduce the diameter of said expandable body so as to release said expandable body from said tubular stabilizer, and then removing said expandable body from said tubular stabilizer which is left anchored in said borehole by a shrinkage fit between the rock and said tubular stabilizer when said rock shrinks after depressurization of said expandable body.

4,696,607

SLURRY TRENCH METHOD AND APPARATUS FOR CONSTRUCTING UNDERGROUND WALLS

Arturo L. Rossi di Cervia, New York, N.Y., assignor to Finic, B.V., Rotterdam, Netherlands

Filed Jul. 30, 1980, Ser. No. 173,538
Int. Cl.[4] E02D *5/00, 29/00*
U.S. Cl. 405—267 **14 Claims**



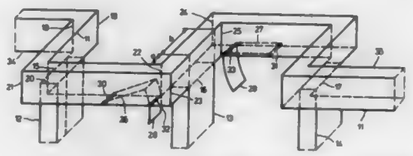
I. In a system for constructing a narrow underground wall, said system including a first apparatus for excavating from one end of a slurry filled trench and a second apparatus for filling the trench with a wall forming material, the improvement comprising floatation means and wherein at least a part of said first apparatus is floated at the surface of the slurry in said trench on said floatation means.

4,696,608

TRANSPORT DUCT FOR FIBER FLOCKS

Paul Stäheli, Wilen bei Wil, Switzerland, assignor to Maschinenfabrik Rieter A.G., Winterthur, Switzerland

Filed Oct. 28, 1985, Ser. No. 792,829
Claims priority, application Switzerland, Oct. 30, 1984, 5176/84
Int. Cl.[4] B65G *53/36, 53/40*
U.S. Cl. 406—155 **12 Claims**



10. A transport duct of substantially constant rectangular cross section for feeding a fibrous material carried by a transport medium flowing through the interior of the duct via respective openings into a plurality of chutes which are spaced from one another longitudinally of the duct and lead to pro-

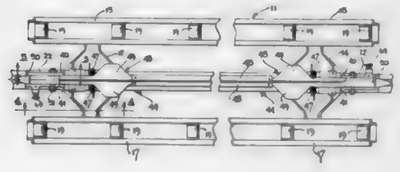
cessing equipment for the fibrous material, comprising at least one duct section situated immediately upstream of one of said chutes as considered in the direction of flow of the transport medium, at which the duct undergoes an abrupt change of direction of between 70° and 110° for the fibrous material to be decelerated by contact with the duct and descend more abundantly than otherwise onto said one chute, said duct including a top wall, a bottom wall, and two lateral walls together bounding the interior of the duct; and a control plate mounted in said interior for pivoting about an axis located at said bottom wall and extending transversely of the direction of flow between an open position in which said control plate rests on said bottom wall and a plurality of closing positions in which it partially obstructs the flow of said transport medium, said control plate being situated immediately upstream of said section and extending in the downstream direction from said axis, and being arrestable in said positions thereof.

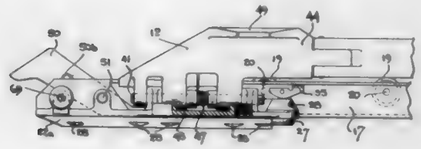
4,696,609

PALLET RESTRAINT MECHANISM FOR CARGO LOADING SYSTEM

Stephen C. Cole, Hermosa Beach, Calif., assignor to Ancra Corporation, Hawthorne, Calif.

Filed Apr. 21, 1986, Ser. No. 854,110
Int. Cl.[4] B60P *1/64, 7/13;* B64C *1/22*
U.S. Cl. 410—69 **8 Claims**





1. A device for use in alternatively loading either predetermined wider or narrower cargo onto the floor of a vehicle and restraining such loaded cargo comprising:

a frame structure including roller means for supporting said cargo,

means for mounting said frame structure on the vehicle floor,

a pair of similar wing members,

means for pivotally mounting said wing members on said frame structure for movement between an upright position whereat the wing members are directly opposite each other and a spread apart flattened position,

spring means for urging said wing members towards the upright position, and

cam means for driving said wing members to the spread apart flattened position, said cam means including a cam arm pivotally mounted on said frame structure, said cam arm engaging said wing members, said cam arm being driven by said wider cargo to drive said wing members to the flattened position to permit the cargo to ride thereon,

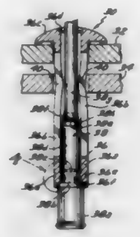
said wing members having clamping means formed thereon for retaining said narrower cargo in position on said frame structure when the wing members are in the upright position.

4,696,610

BLIND FASTENER

Jewel L. Wright, 1506 W. Flora Ave., Santa Ana, Calif. 92704

Filed Sep. 18, 1985, Ser. No. 777,464
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—38 **6 Claims**



1. A blind fastener having a stem movably positioned within a sleeve and attached thereto for pulling a solid annular blind end of said sleeve and urging legs of said sleeve into engagement with a work piece, the combination therewith of,

legs formed in said sleeve extending longitudinally thereof and separated by slots, said legs terminating at a location axially spaced from said blind end; and

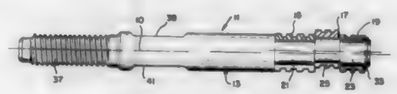
at least one crimped portion formed in each of said legs to control the collapse of said legs as said stem pulls said legs into engagement with said work piece, said crimped portions being closer to the stem than the remainder of the respective leg, and said crimped portions being at substantially the same axial location in each leg so that the legs collapse uniformly, said crimped portions being axially located within the grip range of the particular blind fastener.

4,696,611

REUSABLE ANCHOR

Albert Guay, 5060 Henderson St., Los Angeles, Calif. 90032, assignor to Albert Guay, Los Angeles, Calif.

Filed Apr. 15, 1986, Ser. No. 852,145
Int. Cl.[4] F16B *37/04, 39/00*
U.S. Cl. 411—103 **10 Claims**



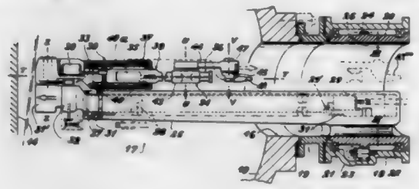
1. A reusable anchor for securing a drill supporting base in place along a substrate to be drilled comprising a first body portion engageable to the base, a second body portion extendable into a bore formed within the substrate to be drilled, and first and second sleeves, said first sleeve having a concentric bore formed therethrough and rotatable about said second body portion to remain in place within the bore as said first body portion is rotated, said second sleeve having an eccentric bore formed therethrough and rotatable about said second body portion such that upon rotation of said first body portion said second sleeve is urged to an eccentric position with respect to said first sleeve to wedge the anchor in place with minimal rotational friction within the bore.

4,696,612

TOOL HOLDER ROBOT FOR INTERVENING IN AN ENCLOSURE HAVING AN ACCESS OPENING

Jean-Claude Germond, and Gilles Clement, both of Paris, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 19, 1985, Ser. No. 777,714
Claims priority, application France, Sep. 20, 1984, 84 14433
Int. Cl.[4] B25J *19/00*
U.S. Cl. 414—8 **12 Claims**



1. A tool holder robot for carrying out interventions within an enclosure having a cylindrical access opening, comprising a cylindrical ferrule fixed to said opening, said ferrule having two open ends, a cylindrical shaft mounted in rotary manner in the ferrule, an axial guide rail having an opened U-shaped cross-section parallel to central axis Y—Y of the shaft, fixed to the inner wall of the shaft but offset with respect to said central axis Y—Y of said shaft so that said guide rail only occupies part of the cross-section of the cylindrical shaft and leaves free a passage space, a first arm slidingly mounted in said guide rail, said first arm having a first end guided in said guide rail and a free second end which remains outside the guide rail when said first arm is sliding within said guide rail, a second arm mounted in a pivotable manner on said second end of the first arm about an axis Z—Z perpendicular to axis Y—Y of the shaft, and a tool holder carriage slidingly mounted on the second arm, said second arm being able to pivot 360° about axis Z—Z and to be positioned so that its longitudinal axis T—T is parallel to axis Y—Y of the shaft, said first arm being capable of sliding along said guide rail when said longitudinal axis T—T of said second arm is parallel to said axis Y—Y of said cylindrical shaft so that said tool holder carriage carrying a tool is able to go through said free passage space left free by the offsetting of said guide rail with respect to said longitudinal axis Y—Y of said cylindrical shaft, so as to permit a change in the tool carried by said tool holder carriage from the outside of the enclosure without removing the tool holder robot.

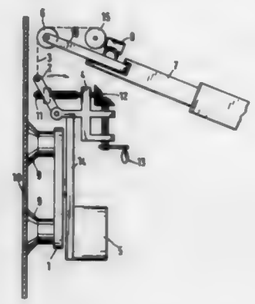
4,696,613

ARRANGEMENT FOR VERTICALLY POSITIONING PLATE-SHAPED BODIES

Thomas O. Hahn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Glasbau Hahn GmbH & Co.Kg., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 16, 1985, Ser. No. 776,572
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435144
Int. Cl.[4] E04G *21/14;* B66C *1/02*
U.S. Cl. 414—11 **5 Claims**

1. An arrangement for use with a crane arm for vertically positioning a plate-shaped body, comprising a suction device operative for holding the plate-shaped body by suction at a suction plane and a traverse for supporting said suction device, means for hoisting and lowering said suction device, comprising an elongated flexible element, a support for said flexible element, said flexible element having a free end portion; a cable pulley and a cable rope, and means for raising and lowering said cable rope; means for mounting said suction device on said end portion of said flexible element at a variable point of attachment, comprising a tilting device connected to said suction device and to said rope, means for driving said tilting device, said means for mounting the suction device being operative to displace said point of attachment toward and away from said suction plane, whereby the position of the center of gravity of the combination of said arrangement with said plate-shaped body varies until the point of attachment is above said center of gravity and said plate-shaped body extends vertically; and wherein said suction device has a side which faces away from said suction plane and comprising a counterweight attached to said side of said suction device.

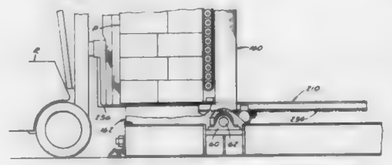


4,696,614

APPARATUS FOR RECUBING BOXES

Lenard E. Moen, 7914 Michigan, Whittier, Calif. 90602

Division of Ser. No. 479,800, Mar. 23, 1983, abandoned. This application Dec. 18, 1985, Ser. No. 810,209
Int. Cl.[4] B65G *57/28*
U.S. Cl. 414—28 **11 Claims**



1. Apparatus for recubing palletized containers arranged in a cubed plurality of adjacent rows each having a plurality of tiers, comprising:

a conveyor of sufficient width, transversely to its conveying direction, to receive the long axis of a pallet thereon for sidewise translation of the pallet and its contents towards a discharge end of said conveyor;

a first tilt station positioned adjacent said discharge end of said conveyor, said tilt station having a horizontally disposed tilt axis that is substantially parallel to the long axis of a pallet on said conveyor;

said first tilt station having a right angularly related pair of first and second frames that are copivotable between two positions about said tilt axis within an arcuate range;

said range being sufficiently large that the weight of a palletized load of containers disposed between said frames can be shifted sufficiently to opposite sides of said tilt axis to effect free gravitational biasing of the containers against both of said frames;

a first one of said frames in a first position of said first tilt station being essentially horizontally disposed to receive a palletized load of cubed containers thereon from said conveyor;

powered means to effect tilting of said first tilt station through said range to effect free shifting of the gravitational bias of a palletized load of cubed containers onto

said second frame when said first tilt station is tilted away from said first position of said first frame; and

pressure plate means on said first tilt station comprising a pair of plates positioned to apply opposing pressures to opposite ends of a palletized load of containers in said tilt station, said pressure plate means further comprising power means to effect application of such opposing pressure by said plates only after said load has been sufficiently tilted to be gravitationally biased against said second frame.

4,696,615

COPYING MACHINE

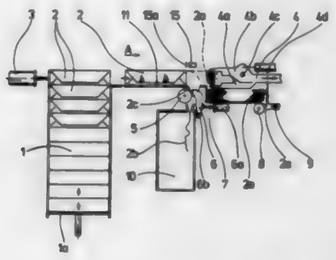
Helmut Ettischer, Ostfildern; Arno Ebner, Stuttgart; Rolf Munz, Kernen, and Raimund Pollak, Elslingen, all of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1985, Ser. No. 802,109

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1984, 3443362

Int. Cl.⁴ B65H *1/30*

U.S. Cl. 414—114 **7 Claims**



1. In a reproduction machine for making visible representation of information on paper sheets fed by a sheet separating device from a sheet supply, means for refilling said sheet supply comprising:

a container containing a plurality of fully closed packaged paper stacks;

means for removing a packaged paper stack from said container;

means for receiving a packaged paper stack and opening the packaging thereof;

means for gripping the paper stack within an opened package, said gripping means being movable to a position associated with said sheet supply to remove the stack from its opened package and transport the stack into operative association with the sheet separating device for feeding such sheets seriatem to have information reproduced thereon.

4,696,616

APPARATUS FOR UNLOADING CYLINDRICAL ARTICLES FROM PALLETS

Kenneth F. C. Avey, Epping, England, assignor to W & C Pantin Ltd., Epping, England

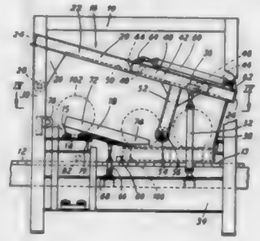
Division of Ser. No. 675,935, Nov. 28, 1984, Pat. No. 4,632,633. This application Nov. 17, 1986, Ser. No. 931,182

Claims priority, application United Kingdom, Oct. 25, 1984, 8427037

Int. Cl.⁴ B65G *65/00*

U.S. Cl. 414—417 **6 Claims**

1. Apparatus for removing cylindrical articles such as kegs from a pallet on which the articles are arranged in a plurality of rows, resting on their sides, the apparatus comprising means for moving a loaded pallet to an unloading station adjacent a discharge conveyor, and a transfer mechanism for moving the articles row by row from a pallet at the unloading station to the discharge conveyor, the transfer mechanism comprising a sub-frame, a carriage mounted in the sub-frame so as to be movable relative to the sub-frame in a direction towards and away from the discharge conveyor, the sub-frame being pivotable about a horizontal axis at right angles to such movement of the carriage so as to effect movement of the carriage between a raised position and a lowered position, a pusher member suspended from the carriage being arranged when the carriage is in the lowered position to engage a row of articles on the pallet and when in the raised position to clear the articles on the pallet, and means for moving the carriage so that the pusher member is moved behind each row of articles in turn to push the row of articles from the pallet onto the discharge conveyor.



4,696,617

APPARATUS FOR FEEDING BAR-LIKE MATERIALS

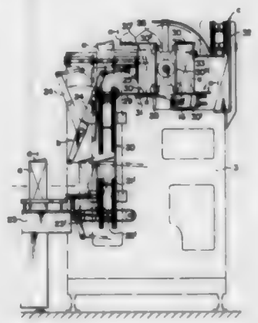
Katsuhiko Kumata; Isao Endo, both of Nagareyama; Syozi Numa, Tokyo; Ichiro Hirose; Takayoshi Sagawa, both of Hiratsuka, and Katsuyoshi Matono, Fukuoka, all of Japan, assignors to Tokyo Automatic Machinery Works, Ltd. and Japan Tobacco, Inc., both of Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,217

Claims priority, application Japan, Oct. 18, 1983, 58-195749

Int. Cl.⁴ B65G *65/23*

U.S. Cl. 414—422 **9 Claims**



1. An apparatus for feeding bar-like materials, comprising:

a feeding frame which forms a flat bottomed feeding passage,

means located at an inlet end of the feeding passage for containing the bar-like materials in layered form across the feeding passage,

means for inverting receiving boxes which contain the bar-like materials therein and which have open upper faces,

means on the feeding frame for collectively feeding the bar-like materials in each receiving box to the feeding passage by lifting each receiving box which comes to a predetermined position in the feeding passage,

means on the feeding frame for discharging each lifted receiving box which is now blank, from the feeding frame, and

means located at the inlet end of the feeding passage for successively conveying the inverted receiving boxes, one by one, to the feeding passage, in at least a closely adjacent relation to each other such that the discharged bar-like materials in layered form across the feeding passage are further contained by the next closely adjacent receiving box which forms a back wall for said discharged bar-like materials and such that said next closely adjacent receiving box transfers said discharged bar-like materials to a storing device during subsequent conveyance of said next closely adjacent receiving box to said feeding passage.

4,696,618

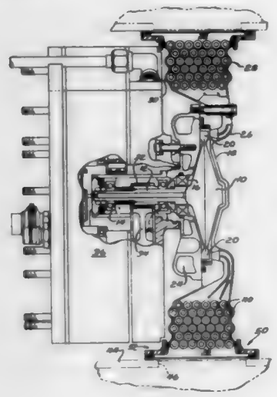
HIGH TEMPERATURE SEAL AND TURBINE MOUNT

Jeffery Fairchild; Steven A. Heitz, and John Symington, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 17, 1985, Ser. No. 788,625

Int. Cl.⁴ F01K *1/06*

U.S. Cl. 415—119 **8 Claims**



5. A power plant comprising

a turbine wheel rotatable about an axis;

a turbine housing surrounding said turbine wheel and having a radially directed, peripheral outlet including two axially spaced side walls;

a tubular housing containing said turbine wheel and said turbine housing and including a radially inwardly opening port aligned with said outlet;

rings of elastomeric material secured to respective ones of said walls near the radially outer peripheries thereof and about said axis; and

O-ring seals sealingly engaging said tubular housing about said port and sealed to said elastomeric rings.

4,696,619

HOUSING FOR A TURBOJET ENGINE COMPRESSOR

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Feb. 13, 1986, Ser. No. 829,019

Claims priority, application France, Feb. 23, 1985, 85 02023

Int. Cl.⁴ F01D *25/26*

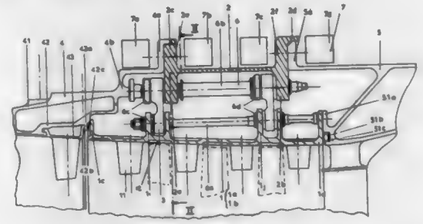
U.S. Cl. 415—138 **10 Claims**

1. A housing for a turbojet engine compressor having at least one annular array of stator vanes and at least one rotor blade wheel rotating about a longitudinal axis of the engine, comprising:

(a) first and second semi-cylindrical inner housing portions joined together along a common plane containing the longitudinal axis of the engine, the inner portions having the stator vanes attached thereto and extending about the rotor blade wheel such that a clearance is defined between the inner portions and tips of the blades on the rotor blade wheel;

(b) an annular outer housing portion extending about the first and second inner housing portions and radially spaced therefrom;

(c) a plurality of links extending in a generally radial direction, each link having first and second ends;



(d) first attaching means to pivotally attach the first ends of the links to the inner housing portions; and,

(e) second attaching means to pivotally attach the second ends of the links to the annular outer housing, such that thermal expansion or contraction of the inner and outer housing portions serves to maintain the clearance between the inner housing portions and the rotor blade tips throughout variations in operating parameters of the turbojet engine.

4,696,620

FLUID FLOW MACHINE

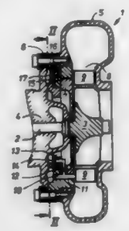
Georg Ruetz, Immenstaad, and Jürgen Giesselmann, Markdorf, both of Fed. Rep. of Germany, assignors to MTU Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 828,878

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513823

Int. Cl.⁴ F01D *17/14*

U.S. Cl. 415—164 **5 Claims**



1. A fluid flow machine, comprising fluid flow housing means, a radial rotor arranged in said housing means, said housing means including an annular space which is radially traversed by the fluid medium, a guide wheel arranged in said annular space whose adjustable guide blades are operatively connected with bearing pins aligned substantially parallel to the rotor axis, bearing housing means for a rotor shaft, said bearing pins being rotatably supported in bearing bores of a housing wall ring means attached at the bearing housing means and forming a housing part of the fluid flow housing means, said bearing pins being operatively connected with actuating lever means which cooperate with an adjusting ring means for the guide blade adjustment, the housing wall ring means being

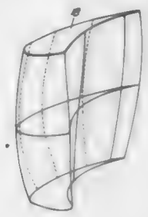
divided along the center of the bearing bores, and the guide blades being constructed in one piece with the bearing pins and the actuating lever means.

4,696,621

AEROFOIL SECTION MEMBERS FOR GAS TURBINE ENGINES

Martin Hambiett, Derby, and Duncan J. Livsey, Burton-on-Trent, both of England, assignors to Rolls-Royce, London, England

Filed Apr. 29, 1986, Ser. No. 856,986
Claims priority, application United Kingdom, Jun. 28, 1985, 8516436
Int. Cl.[4] F04D *29/68*
U.S. Cl. 415—191 **4 Claims**



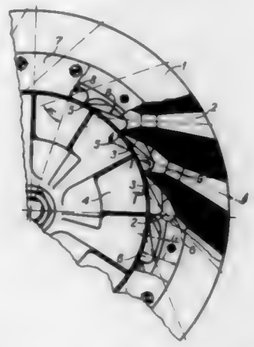
1. An aerofoil section member for a gas turbine engine the member having a pressure surface comprising a concave flank and a suction surface comprising a convex flank, both said flanks extending radially between the ends of the member, the member being defined by a stack of elemental aerofoil shaped sections, the thickness of each elemental aerofoil section at locations between the ends of the member varying so that both the convex and concave flanks are convex in the spanwise direction along the member.

4,696,622

ULTRASONIC CHANNEL DIFFUSER

Jan Traczyk; Jacek Brejnak, and Krzysztof Kawalec, all of Warsaw, Poland, assignors to Instytut Lotnictwa, Warsaw, Poland

Filed Feb. 13, 1985, Ser. No. 701,088
Claims priority, application Poland, Mar. 27, 1984, 246883
Int. Cl.[4] F04D *29/44*
U.S. Cl. 415—211 **3 Claims**



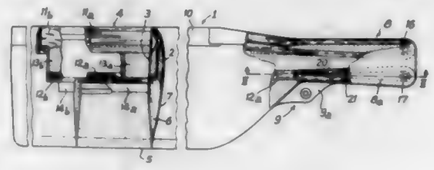
1. A supersonic channel diffuser, particularly a radial one, comprising an impeller rotatable about a diffuser axis, and a ring with equally spaced channels surrounding the impeller, wherein inter-channel walls, defined by the shape of the channels, are permanently connected to at least one side wall of the ring, the improvements being characterized in that, on the inlet side of the diffuser, the inter-channel walls, in cross-sections defined by planes passing through the diffuser axis, have a pair of surfaces which are convergent towards the impeller and are terminated with sharp edges close to the center of said cross-sections, and said inter-channel walls have a second pair of surfaces, formed from a side of each of the channels, situated closer to the impeller, which are convergent towards the impeller.

4,696,623

HELICOPTER ROTOR BLADE MADE FROM A MULTISPAR COMPOSITE MATERIAL WITH TORSION COMPARTMENTS AND A PROCESS FOR MANUFACTURING SAME

Michel Bost, Val-de-Marne, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 10, 1985, Ser. No. 807,148
Claims priority, application France, Dec. 19, 1984, 84 19432
Int. Cl.[4] B64C *27/46*
U.S. Cl. 416—230 **5 Claims**



1. A composite material blade for a helicopter rotor comprising a resistant compartmented framework formed in the vicinity of a leading edge of the blade, the resistant compartmented framework being substantially centered at the front quarter of the cross section of the blade, said framework comprising two longitudinal superimposed compartments, each compartment including a front strut and a rear strut, each strut being formed from a bundle of rovings made from resin preimpregnated fibers, a filling core made from a light material disposed between the two struts, and a casing enclosing said struts and said core comprising at least one layer of fabric made from parallel fibers disposed slantwise with respect to the longitudinal axis of the blade so as to form a shell resisting in torsion, the two compartments being joined together by simultaneous ploymerization of the superimposed and jointing parts of their respective casings; a filling element disposed at the rear of the framework; and an external covering covering the whole of the framework and the filling element.

4,696,624

CASING PUMP

Harold E. Bass, and Richard E. Bass, both of Washington, Okla., assignors to Bassco, Inc., Washington, Okla.

Filed Apr. 8, 1987, Ser. No. 37,388
Int. Cl.[4] F04B *47/12;* **F16J** *1/06*
U.S. Cl. 417—56 **22 Claims**

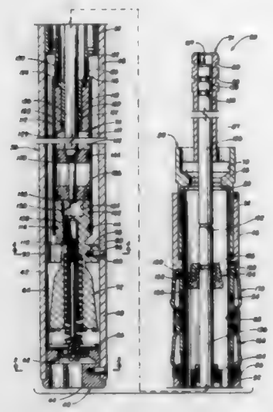
1. A natural gas operated pump for use in the casing of an oil well, comprising:

a tubular pump body having an open lower end for admitting well fluids to the interior of the pump body and an open upper end, wherein a downwardly facing seating surface is formed on the inner periphery of the pump body adjacent the upper end thereof;

means for forming a seal between the pump body and the casing of the well;

a rod extending longitudinally through the seating surface formed in the pump body and protruding from the upper end of the pump body;

a valve member mounted on the rod below the seating surface and shaped to mate with the seating surface; and



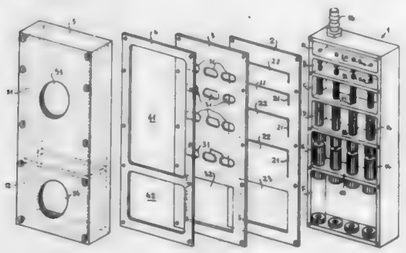
means for vertically positioning the rod in proportion to fluid pressure within the pump body.

4,696,625

EJECTOR AND METHOD OF FABRICATION

Dan Greenberg, 4 Rehov Haganim, Kiryat Bialik, Israel

Filed Jan. 30, 1986, Ser. No. 824,165
Claims priority, application Israel, Feb. 8, 1985, 74282
Int. Cl.[4] F04F *5/00;* **B65B** *31/04;* **B21D** *53/00*
U.S. Cl. 417—174 **7 Claims**



1. Method of producing an ejector device with several ejectors assembled in a first common ejector housing part comprising a multiple number of suction chambers with one side left open, an inlet opening for a pressure medium, a plurality of ejector nozzles in each suction chamber being positioned co-axially one after the other, one of said suction chambers being provided with an evacuation inlet port, the method comprising the steps of producing the first housing part, forming therein the suction chambers, forming holes in the walls of the first housing part and said chambers for accommodation of the ejector nozzles, inserting the ejector nozzles into said holes, covering the open side of the first housing part by means of a flexible cover provided with flaps, placing on top of the flexible cover a plate member with openings, placing a seal member on top of the plate member, placing a second housing part having an inlet port and an outlet port on top of the seal member, and securing the first housing part to said second housing part.

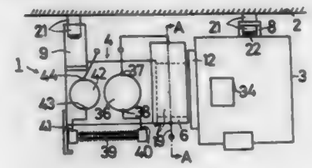
5. An ejector device comprising a first housing part having multiple suction chambers with one side of each of said suction chambers left open, a plurality of ejector nozzles in each suction chamber positioned co-axially one after the other, a flexible cover having flaps abutting said first housing part and covering the open side of said suction chambers, a plate member having multiple openings covering said flexible cover, a seal member covering said plate member, a second housing part having an inlet port and an oulet port covering said seal member, and fastening means for securing said first housing part to said second housing part.

4,696,626

RAILROAD CAR AIR COMPRESSOR UNIT

Yasuhisa Hats; Takeshi Hatimaki, both of Akashi, and Satoshi Ogura, Kobe, all of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Feb. 7, 1986, Ser. No. 827,848
Claims priority, application Japan, Feb. 8, 1985, 60-17472[U]
Int. Cl.[4] F04B *39/16*
U.S. Cl. 417—312 **5 Claims**



1. A motor-driven air compressor unit for a railroad vehicle comprising, an intermediate hollow mounting member having an outer diameter which is smaller than the outer diameter of the motor and the compressor, said intermediate hollow mounting member has an open flange formed on one end, a matching section formed on one end of the motor so that the compressor is connectable to the motor, the drive shaft of the motor and the crank shaft of the compressor are coupled by a coupling located inside of the intermediate hollow mounting member, and a suction filter and a suction muffler are connected to each other by a connecting line, the suction filter is located in a space formed on one side of the outer surface of the intermediate hollow mounting member and adjacent the ends of the motor and the compressor, the suction muffler is located in a space formed on the other side of the intermediate hollow mounting member and adjacent the ends of the motor and the compressor, and the motor and the compressor are suspended beneath the floor of the railroad vehicle by a pair of suspension pieces which are isolated by vibration-absorbing members.

4,696,627

SCROLL COMPRESSOR

Hideo Asano, Gifu; Kazuhisa Makida, and Kenichi Fujiwara, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 15, 1986, Ser. No. 897,021
Claims priority, application Japan, Aug. 15, 1985, 60-178641; Aug. 15, 1985, 60-178642
Int. Cl.[4] F01C *1/02*
U.S. Cl. 418—15 **8 Claims**

1. A scroll compressor comprising:

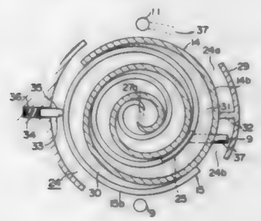
a housing including therein a suction chamber;

a stationary scroll member fixedly disposed within said housing, said stationary scroll member including a first end plate and a first scroll element projecting from one surface of said first end plate;

a movable scroll member movably disposed within said housing, said movable scroll member including a second end plate and a second scroll element projecting from one surface of said second end plate opposite said one surface of said first end plate;

means for driving said movable scroll member to make it revolve around a center axis of said stationary scroll mem-

ber but preventing said movable scroll member from revolving around its own axis;
a plurality of working chamber each defined by said first scroll element and said second scroll element which is angularly offset from and engaged with said first scroll element, a radially outermost working chamber opening to said suction chamber to introduce fluid to be pressurized from said suction chamber, and each of said working chambers moving centripetally and circumferentially, in order while decreasing a volume thereof upon revolution of said movable scroll member; outlet port means for discharging the pressurized fluid from said working chamber, said outlet port means including an outlet port;
a stationary partition extending from an inner wall surface of said housing to a radially outermost surface of said first scroll element of said stationary scroll member;
a movable partition radially reciprocatingly projecting from said inner surface of said housing and abutting against a radially outermost surface of said second scroll element of said movable scroll member;



two suction chamber sections into which said suction chamber is divided by both said scroll members and both said partitions;
first inlet port means having a first inlet port opening to one of said suction chamber sections for introducing thereinto fluid to be pressurized having a first pressure level;
second inlet port means having a second inlet port opening to the other suction chamber section for introducing thereinto fluid to be pressurized having a second pressure level different from said first pressure level; and
sub-suction port means having a sub-suction port for introducing fluid to be pressurized having a third pressure level which is higher than said first pressure level, said sub-suction port means, at an initial stage of a compression process of the fluid having said first pressure level in one of said working chambers, being caused to communicate with said one working chamber into which is introduced the fluid having said third pressure level.

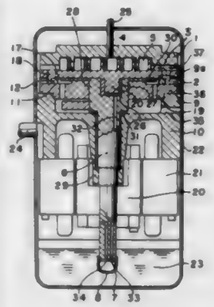
4,696,628

SCROLL-TYPE FLUID TRANSFERRING MACHINE WITH INTAKE PORT AND SECOND INTAKE PASSAGE

Tadashi Kimura; Masahiro Sugihara, and Tsutomu Inaba, all of Wakayama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1986, Ser. No. 847,524
Claims priority, application Japan, May 16, 1985, 60-106304
Int. Cl.⁴ F01C *1/04*
U.S. Cl. 418—15 **3 Claims**

1. A scroll type fluid transferring machine comprising:
a shell;
means for defining a stationary scroll member in said shell;
means for defining an oscillatable scroll member having a wrap cooperating with a wrap of said stationary scroll member to form a compression chamber;
bearing frame means in said shell for supporting said oscillatable scroll member for oscillation;
means for causing said oscillatable scroll member to oscillate, including an oldham's coupling having an oscillating ring member in a recess of said bearing frame means;
intake port means for feeding a fluid to said compression chamber, whereby said fluid may be compressed in said compression chamber during oscillation of said oscillatable scroll member;
outlet port means for discharging the compressed fluid from said shell;
means for supplying lubricant to said recess of said bearing frame means;



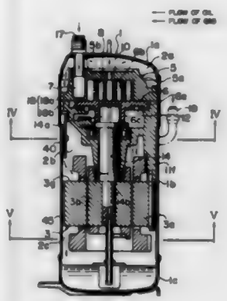
means for introducing the fluid into said shell;
means for defining a first passage in said stationary scroll member between a low pressure portion of the interior of said shell in communication with the fluid from said means for introducing and said intake port means; and
means for defining a second passage in said bearing frame means between said low pressure portion of said shell and said intake port means, said second passage having a sectional area varying as a function of a position of oscillation of said oscillatable scroll member.

4,696,629

HERMETIC SCROLL COMPRESSOR WITH WELDED CASING SECTION

Masao Shibayashi, and Akira Murayama, both of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,865
Claims priority, application Japan, Aug. 16, 1985, 60-179414
Int. Cl.⁴ F04C *18/04*; F04B *39/12*
U.S. Cl. 418—55 **4 Claims**



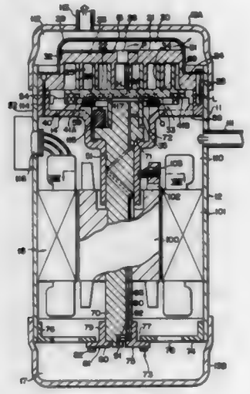
1. A hermetic scroll compressor comprising a hermetic casing, a scroll compressor section and an electric motor section both contained in said hermetic casing, said scroll compressor and motor sections being connected with each other through a rotary shaft supported by a frame, a space in said hermetic casing being separated into upper and lower chambers by said frame, said compressor section including stationary and orbiting scroll members each having a disk-shaped end plate and a spiral wrap protruding upright therefrom and assembled together with their wraps meshing inwardly with each other to define compression chambers therebetween, said orbiting scroll member being operably engaged by an eccentric shaft portion formed on said rotary shaft and being provided with rotation prevention means, said stationary scroll member being formed in its end plate with a discharge port opening through a central portion of the end plate and a suction port opening through a peripheral portion thereof, said orbiting scroll member being driven in orbital motion relative to said stationary scroll member without rotation about its own axis to move said compression chambers toward center of both scroll members with capacity of said compression chambers progressively decreased so that a refrigerant gas drawn through said suction port into said compression chambers is compressed, discharged through said discharge port to said upper chamber and introduced therefrom through a communication passage formed in a peripheral portion of said frame to said lower chamber, in which said electric motor section is disposed, to be delivered to outside of said compressor through a discharge pipe, wherein said hermetic casing has an upper casing section, barrel section and a lower casing section which are formed separately and hermetrically welded together, said barrel section is formed with a sheet material rolled into a cylindrical shape and welded at opposite ends thereof to form a weld joint, and said frame is fixedly secured in said barrel section of said casing with said weld joint on said barrel section disposed within a circumferential width of said communication passage so that entire periphery of said frame except for the portion where said communication passage is formed is in close contact with an inner peripheral surface of said barrel section of said casing.

4,696,630

SCROLL COMPRESSOR WITH A THRUST REDUCTION MECHANISM

Hirotsugu Sakata, Chigasaki; Shigemi Nagatomo; Makoto Hayano, both of Tokyo, and Mitsuo Hatori, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 655,429, Sep. 28, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 903,872
Claims priority, application Japan, Sep. 30, 1983, 58-180499
Int. Cl.⁴ F04C *18/04, 27/00, 29/02*
U.S. Cl. 418—55 **19 Claims**



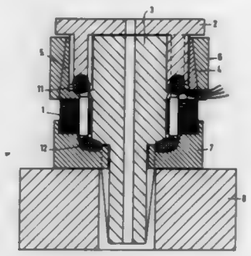
1. A scroll compressor with a thrust reduction mechanism for compressing gas, said scroll compressor comprising:
(a) a sealed housing having a discharge port and a suction port;
(b) scroll compressing means located between the discharge and suction ports, said scroll compressing means including a stationary scroll member and an orbiting scroll member defining a compressing chamber therebetween which communicates with the discharge port, whereby, during operation, a lower pressure fluid is introduced from the suction port into said sealed housing to fill it with the lower pressure fluid and part of the fluid in said sealed housing is introduced into the compression chamber, compressed therein, and discharged from the discharge port through the discharge outlet;
(c) means arranged in said sealed housing to cause said orbiting scroll member to orbit, thereby compressing the fluid introduced into the compression chamber;
(d) connecting means penetrating said orbiting scroll member to communicate the compression chamber with the inside of said sealed housing;
(e) pressure receiving means provided in said sealed housing adjacent said orbiting scroll member in position to be exposed to the lower pressure fluid, said pressure receiving means receiving compressed fluid from the compression chamber through said connecting means, whereby, during operation, the compressed fluid in said pressure receiving means gives a thrust load to said orbiting scroll member, thereby partially compensating for the force exerted on said orbiting scroll member by the compression chamber;
(f) a frame fixed to said sealed housing to transmit the thrust load to said sealed housing, said frame supporting said pressure receiving means, whereby, during operation, the thrust load applied to said pressure receiving means is transmitted to said sealed housing through said frame; and
(g) supporting means for preventing said pressure receiving means from orbiting together with said orbiting scroll member.

4,696,631

APPARATUS FOR COMPRESSION MOLDING OF COIL END TURNS

Karl-Heinz Nitt, Wuerzburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich

Filed Sep. 30, 1986, Ser. No. 913,813
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534923
Int. Cl.⁴ B29C *43/30*
U.S. Cl. 425—117 **7 Claims**



1. Apparatus for compression molding of coil end turns, which are generally cylindrical and have an inside and an outside and which apparatus includes a form shell that is pressed against the coil end turns, comprising:
an inner form core as a part of the form shell which radially confines the coil end turns on the inside;
a radially advanced outer confining form shell divided into at least two parts in the circumferential direction, which radially confine the coil end turns on the outside;

a compression form shell with an end surface contour for engaging the coil end turns, which compression form shell is advanced axially against the coil end turns;

an outside and an inside circumferential surface of the compression form shell having respective outer and inner guide projections projecting axially in the direction of the coil end turns, said guide projections extending over the outer surfaces and inner surfaces of the coil end turns; and

the outer confining form shell and the inner form core having inner and outer guide recesses, cooperating with the inner and outer guide projections, respectively, into which guide recesses the inner and outer guide projections extend.

4,696,632

MOLD OPENING/CLOSING SPEED CONTROL DEVICE

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

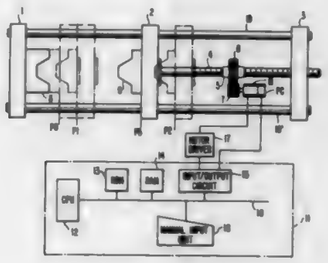
PCT No. PCT/JP84/00618, § 371 Date Jul. 8, 1985, § 102(e) Date Jul. 8, 1985, PCT Pub. No. WO85/02812, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 26, 1984, Ser. No. 752,621

Claims priority, application Japan, Dec. 28, 1983, 58-245421

Int. Cl.⁴ B29C *45/80*

U.S. Cl. 425—150 **6 Claims**



1. A mold opening/closing speed control device in an injection molding apparatus having molds, comprising:

teaching/operation mode selecting means, manually operable by an operator, for selecting either a teaching mode for teaching an acceleration/deceleration position of a mold opening/closing speed, or an operation mode for opening/closing molds;

teaching means, manually operable by the operator, for setting the acceleration/deceleration position;

memory means for storing the acceleration/deceleration position set by said teaching means;

mold driving means, including a servo motor as a drive source, for moving the molds with respect to one another;

position detecting means for detecting a moving position of the molds; and

control means for determining whether either the teaching mode or the operation mode is selected by manual operation of said teaching/operation mode selecting means, for determining whether said teaching means is manually operated, for controlling said mold driving means to cause the molds to move at a low speed when said control means determines that the teaching mode is selected, for controlling said memory means to store therein a mold position detected by said position detecting means at the time said control means determines that the teaching mode is selected and that said teaching means is manually operated, and for controlling said mold driving means so that the opening/closing speed of the molds is controlled in accordance with the mold position stored in said memory means when said control means determines that the operation mode is selected.

4,696,633

MELT SPINNING APPARATUS

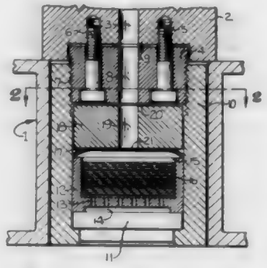
Erich Lenk, and Max Feth, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 593,034, Mar. 23, 1984, Pat. No. 4,645,444. This application May 24, 1985, Ser. No. 738,170

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419772

Int. Cl.⁴ D01D *4/08*

U.S. Cl. 425—192 S **8 Claims**



1. A melt spinning apparatus for extruding and spinning a thermoplastic material and comprising

a stationary melt supply assembly having a cylindrical connecting plug directly mounted thereto, and with a melt supply line extending through said melt supply assembly and said connecting plug,

a nozzle assembly including a spin plate having a plurality of openings extending therethrough, and a tubular casing having a cylindrical internal bore portion and enclosing and supporting said spin plate and so as to define a cavity on one side of said spin plate,

thread means on said internal bore portion of said casing and said cylindrical connecting plug for releasably interconnecting said casing to said connecting plug and such that said melt supply line communicates with said cavity and thus one side of said spin plate, and such that the nozzle assembly may be readily disassembled from said melt supply assembly by rotation of said casing with respect to said connecting plug, and

means mounted within said cavity between said connecting plug and said spin plate and operable by the pressure of the melt in said cavity for sealing the nozzle assembly to said melt supply assembly, said sealing means including a piston mounted in said cavity for axial movement in a direction between said connecting plug and said spin plate, said piston having an opening extending therethrough and which is in alignment with said melt supply line, and diaphragm means positioned in said cavity between said piston and said spin plate for biasing said piston against said connecting plug upon pressurized melt being received in said cavity.

4,696,634

APPARATUS FOR PARTICULATING AN OLEAGINOUS PRODUCT

Zellis C. Zeller, Des Moines, Iowa, assignor to Triple "F", Inc., Des Moines, Iowa

Filed Jun. 6, 1985, Ser. No. 741,859

Int. Cl.⁴ B29C *43/46, 47/00*

U.S. Cl. 425—237 **3 Claims**

1. In an extruder machine for processing an oleaginous product under conditions of pressure and heat having a discharge outlet and wherein the product on admission into the atmosphere is cooled and expanded and a product forming unit having rolls for receiving the product from said outlet while

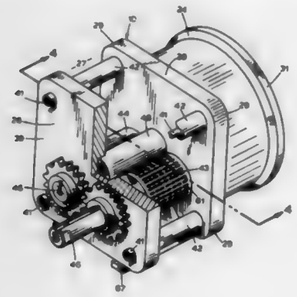
under said pressure and heat conditions the improvement comprising:

(a) a housing having an elongated product receiving chamber means with an inlet and an elongated outlet,

(b) means mounting said housing on said extruder machine with said inlet open to said discharge outlet, said inlet being at an end of said chamber means adjacent one of the ends of said rolls so that there is movement of the product through said chamber in a direction axially of said rolls,

(c) a pair of like said rolls in said housing having peripheral contact in a linear zone located in a plane common to the axes of said rolls,

(d) means rotatably supporting said rolls so that opposed peripheral portions thereof movable toward each other in



a direction toward the linear contact zone are in contact engagement with said chamber means at opposite sides of said elongated outlet to provide a trough from said elongated outlet to said contact zone, and

(e) means on said housing for confining the product in said trough within the axial length of said rolls, whereby the product under substantially the pressure and heat conditions at said discharge outlet is directed through said chamber means and trough into the rolls contact zone,

(f) with one of said rolls having mold cavities in the peripheral surface thereof into which the product is pressed at said contact zone, said product on travel into the atmosphere from said contact zone being expanded and self-ejected from said cavities in the form of said mold cavities.

4,696,635

APPARATUS FOR FORMING UNEVENNESS ON AN OUTER SURFACE OF A SYNTHETIC RESIN-COATED STEEL PIPE

Teruo Ohtani; Toshihisa Tamura; Yuji Ikeda; Mutsuya Araikawa, and Kazuyoshi Kywata, all of Aichi Pref., Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

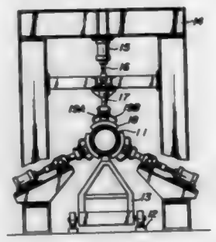
Continuation of Ser. No. 712,451, Mar. 13, 1985, abandoned, which is a continuation of Ser. No. 474,549, Mar. 11, 1983, abandoned. This application May 9, 1986, Ser. No. 862,165

Claims priority, application Japan, Mar. 16, 1982, 57-40258

Int. Cl.⁴ B29C *59/02*

U.S. Cl. 425—330 **2 Claims**

1. Apparatus for forming an uneven outer groove and ridge surface on synthetic resin coated steel pipe, comprising a housing, moving-means for transporting said pipe, a plurality of urging means supported by said housing and directed toward the center of the pipe, working tool means flexibly connected to and supported by said urging means for contact engagement with the circumferential surface of said pipe, said working tool means being disposed longitudinally with respect to the pipe and having a concave inner surface in the shape of a cylindrical segment formed with a pattern of groove portions and ridge portions, heater means disposed within each of said working tool means, said working tool means having supporting leaf spring members connected to the urging means so that the



working tool means flexibly conform to the curved surface of the pipe.

4,696,636

THERMOPLASTIC CONTAINER FORMING APPARATUS

William W. Evely, Chardon, Ohio, assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 714,733, Mar. 22, 1985, Pat. No. 4,650,628. This application Oct. 27, 1986, Ser. No. 923,464

Int. Cl.⁴ B29C *49/04*

U.S. Cl. 425—526 **24 Claims**

1. Apparatus for producing thermoplastic containers, which apparatus comprises:

extruding means, comprising a crosshead, for extruding thermoplastic tubing along a first axis that lies in a first plane;

severing means for severing a parison tube from said thermoplastic tubing that includes a first end, a first holding portion, a first body portion, and a neck and moil portion;

blow mold means, comprising a blow mold having first and second mold halves, having a first holding cavity, and a first body cavity, and having a neck and moil cavity, for opening and closing said cavities by relative movement of said mold halves along a second axis that is substantially orthogonal to said first axis and that is substantially orthogonal to said first plane, for grasping said first holding portion of said parison tube in said first holding cavity, for enclosing said first body portion in said body cavity, for enclosing said neck and moil portion in said neck and moil cavity, and for blow forming a first container;

actuating means, for actuating said halves of said blow mold to an open position wherein said blow mold receives said parison tube, to intermediate positions wherein said first holding cavity grasps said first holding portion of said parison tube, and to a closed position; and

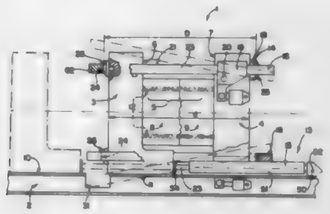
means for applying a transverse force to said parison tube for straightening said parison tube prior to completion of said closing of said blow mold.

4,696,637

TRACTION TYPE PRESS

Guy Rivière, 382 Boulevard Albert 1er, 59500 Douai, and Jean P. Luczak, 34, Rue Jules Guesde, 62430 Sallaumines, both of France

Filed Jun. 19, 1986, Ser. No. 875,998
Claims priority, application France, Jun. 19, 1985, 85 09674
Int. Cl.⁴ B29C *45/64, 45/66*
U.S. Cl. 425—589 **11 Claims**



1. Traction type press comprising a rigid framework and at least two plates having work surfaces, of which is a mold assembly disposed between the work surfaces, said mold assembly comprising two mold halves each carried by one of the plates, said mold halves being provided with their own self positioning means;

one of the plates being movable with respect to the rigid framework and to the other plate, said other plate being fixed with respect to the framework,

the movable plate having at least one side for moving along a bearing surface of the framework,

wherein translational movement of the movable plate takes place from an endmost open position, in which the tool assembly is open wide, to an endmost closed position in which the component parts of the tool assembly cooperate closely,

wherein the closure of the press takes place in two steps, a first step for bringing the plates together and a second step for applying clamping force,

wherein the press uses separate means for carrying out the first and second steps, the press having an approach means providing rapid movement over a large distance but without a high force to accmplish the first step, and a clamping means providing movement over a short distance and developing the clamping force to accomplish the second step, press:

and wherein the action of the clamping means is retransmitted from one of the plates to the other by at least one clamping structure which consists substantially of a rigid substantially rectangular frame of inner dimensions sufficient for passing with play about the fixed and movable plates, said frame comprising longitudinal members each situated on one side of the press and two transverse beams situated behind the fixed and movable plates where said transverse beams form bearing element with the fixed movable plates,

each clamping structure being attached to one of the plates by a pivoting means, the press further comprising a means for controlling swinging of the clamping structure so as to free a corresponding bearing element from the opposite plate and allow opening of the press,

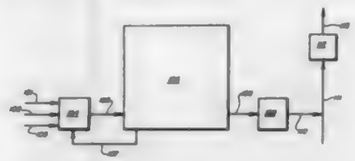
and wherein the clamping means bears directly on one of the plates and on the bearing element of the transverse beam situated behind said one of the plates.

4,696,638

OIL FUEL COMBUSTION

Marvin J. DenHerder, 816 Brookwood Dr., Olympia Fields, Ill. 60461

Filed Jul. 7, 1986, Ser. No. 882,806
Int. Cl.⁴ F23J *7/00;* **C10L** *1/32*
U.S. Cl. 431—4 **23 Claims**



1. A process for the improved combustion of oil fuels in a combustion zone, comprising the steps of:

(a) preparing a water-in-oil emulsion in a combustible oil carrier fluid, said water-in-oil emulsion containing from about 20 to about 90 volume % water present as droplets having a diameter within the range from about 1 to about 10 microns;

(b) thereafter blending the water-in-oil emulsion into the fuel in a proportion selected to provide a water content dispersed in the fuel within the range from about 2 to about 10 volume %; and

(c) introducing the blended fuel to the combustion zone.

22. Apparatus, for the improved preparation of water-in-oil emulsions for use in the combustion of oil fuels in a combustion zone, said emulsions containing water droplets having an average diameter within the range from about 1 to about 10 microns, comprising:

(a) an emulsification vessel, affording means for the preparation of a water-in-oil emulsion;

(b) separate metered lines for feeding, respectively water, combustible oil carrier fluid, and emulsification additive to the emulsification vessel;

(c) an emulsion holding tank;

(d) cycling means for the circulation of water-in-oil emulsion between the emulsification vessel and the emulsion holding tank;

(e) an oil fuel blending zone;

(f) first delivery means, for the metered delivery of the water-in-oil emulsion to the oil fuel blending zone; and

(g) second delivery means, for the transfer of blended emulsion and oil fuel from the blending zone to the combustion zone, or optionally, to an intermediate storage zone.

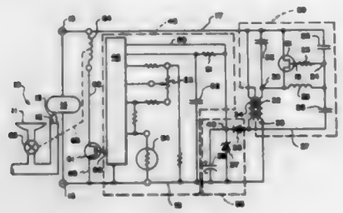
4,696,639

SELF-ENERGIZING BURNER CONTROL SYSTEM FOR A FUEL BURNER

John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 6, 1986, Ser. No. 927,485
Int. Cl.⁴ F23Q *9/08*
U.S. Cl. 431—59 **9 Claims**

1. A self-energizing burner control system for burner means having a pilot burner and a main burner, including: thermoelectric generator means responsive to a flame from said pilot burner to generate a direct current potential; fuel valve means for controlling fuel to said main burner; solid state switch means and said fuel valve means connected in series to said direct current poteatial wherein the operation of said solid state switch means controls said direct current potential to in turn control said valve means; oscillator means including connection means connecting said oscillator means to said direct current potential to energize said oscillator means to produce an alternating current output voltage; voltage step-up means having an input responsive to said oscillator means output voltage, and an output connected to rectifier and capacitor means to provide a direct current power supply; solid state temperature control means energized from said direct current power supply means; said solid state temperature control means including a temperature sensor and said temperature



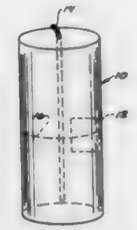
control means having an output connected to said solid state switch means; said solid state temperature control means controlling said solid state switch means to operate said valve means.

4,696,640

FORTUNE CANDLE

Thomas E. Pitchford, Box 21, Napolean, N. Dak. 58561

Filed Mar. 19, 1986, Ser. No. 841,151
Int. Cl.⁴ F23D *3/16*
U.S. Cl. 431—289 **1 Claim**



1. A candle having a hidden presealed surprise message therein, comprising a candle having a wick, and a top and bottom, said candle having an outer periphery, a sealed packet having an interior chamber, said sealed packet being made of non-flamable material that protects the interior from heat of the candle and being manually openable, said packet being completely enclosed within the candle periphery at a location spaced upwardly from the bottom of the candle initially and positioned to be exposed as the candle is consumed, and a message containing sheet separate from the packet, contained in the interior chamber of the packet.

4,696,641

PRIMER MATERIAL AND PHOTOFLASH LAMP

John W. Shaffer, Montoursville, and Ronald E. Sindlinger, Muncy, both of Pa., assignors to GTE Products Corporation, Danvers, Mass.

Filed Aug. 11, 1986, Ser. No. 895,555
Int. Cl.⁴ F21K *5/02*
U.S. Cl. 431—362 **24 Claims**

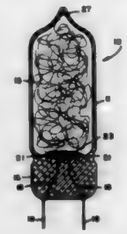
1. A primer material for a photoflash lamp comprising a mixture of a combustible metal powder, part of said powder being in large particle form; an oxidizer; a binding agent; and solid electrically insulating beads, said beads being coated with a layer of friction-reducing material.

11. A high-voltage photoflash lamp comprising:

an hermetically-sealed light-transmitting envelope including a combustion-supporting atmosphere therein;

a quantity of filamentary combustible material located within said envelope;

ignition means for igniting said combustible material, said ignition means including a pair of electrical conductors sealed within said envelope and projecting therefrom, each of said conductors including an end portion having access to the interior of said envelope;



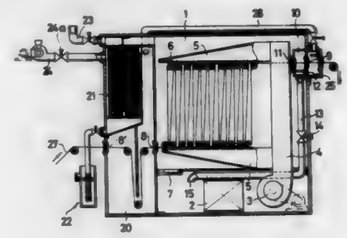
a mass of primer material located within said envelope in electrical contact with said end portions of said electrical conductors, said primer material comprising a mixture of a combustible metal powder, part of said powder being in large particle form; an oxidizer; a binding agent; and electrically insulating beads, said beads being coated with a friction-reducing material.

4,696,642

APPARATUS FOR CONTINUOUSLY HEATING AN ELONGATED TEXTILE ARTICLE

Keizo Hatta, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 1, 1986, Ser. No. 857,963
Claims priority, application Japan, May 15, 1985, 60-71889[U]
Int. Cl.⁴ F27B *9/28*
U.S. Cl. 432—59 **1 Claim**



1. An apparatus for continuously heating an elongate textile article, comprising: a heating chamber divided into a pair of upper and lower sections, said upper chamber section having an inlet at one side for continuously introducing the textile article into said heating chamber, and an outlet at the other side for continuously discharging the textile article out of said heating chamber; a heater mounted in said lower chamber section for heating air therein; a heated-air circulating system for continuously transmitting the heated air from said lower chamber section to said upper chamber section; a box mounted on said heating chamber at least at one of said inlet and outlet so as to cover the same and having a slit for passage of the textile article, said box having therein an eave-like baffle partition disposed between said slit and said one end of said pipe, said eave-like partition being coextensive with the width of said box and projecting from an inner wall of said box toward and terminating short of an outer wall of said heating chamber;

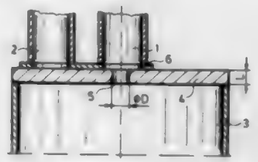
and a pipe opening at one end into said box and at the other end toward an upstream side of said heater, said one end of said pipe being disposed centrally in a bottom of said box so as to lie under said eave-like partition.

4,696,643

PROCESS AND APPARATUS FOR HEATING OF PASTY MATERIALS

Péter Szody, Nagykata; Péter Dunajcsik, Budapest; Miklós Villányi, Budapest; Ferenc Bosánszky, Budapest; Endre Libor, Budapest, and Ferenc Kiss, Budapest, all of Hungary, assignors to Budapest Muszaki Egyetem, Budapest, Hungary

Filed Mar. 25, 1985, Ser. No. 716,786
Claims priority, application Hungary, Apr. 2, 1984, 1315/84
Int. Cl.[4] F27B *9/00*
U.S. Cl. 432—120 **3 Claims**



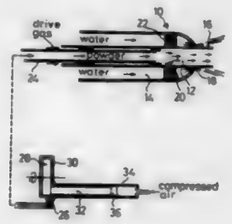
1. Apparatus for the heating of pasty materials with surface heating and infusion type heating, comprising a heating chamber for the material to be processed, a steam chamber, an infusion chamber, a space divider, said space divider being arranged between said chambers, a plurality of through holes, said through holes being formed in said space divider for selectively interconnecting at a time the infusion chamber with either the heating chamber or with the steam chamber, said space divider thereby acting as a heat exchanger between the said chambers, said heating chamber and said steam chamber being arranged vertically above the infusion chamber for enhancing the drop formation of the pasty material during the feeding thereof into said infusion chamber, said through holes communicating at one time only with one of said chambers, a sliding member for providing a connection between said heating chamber and said steam chamber, said heating and steam chambers being arranged on said sliding member, said heating and steam chambers being movable said space divider.

4,696,644

TOOTH CLEANING INSTRUMENT

Sven K. L. Goof, 236A, Gl. Strandvej, DK-3050 Humlebaek, Denmark

PCT No. PCT/DK84/00106, § 371 Date Jul. 10, 1985, § 102(e) Date Jul. 10, 1985, PCT Pub. No. WO85/02107, PCT Pub. Date May 23, 1985
PCT Filed Nov. 12, 1984, Ser. No. 758,672
Claims priority, application Denmark, Nov. 11, 1983, 5176/83
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—88 **4 Claims**



1. An instrument for discharging powdered abrasive and water for cleaning surfaces, especially tooth surfaces, said instrument comprising

a handpiece having a distal nozzle portion (**10**) defining an end opening,

a central conduit (**12**) for conducting abrasive material and gas, said central conduit extending longitudinally through said nozzle portion and having an outlet portion (**16**) protruding through, and extending a substantial distance beyond, said end opening, and

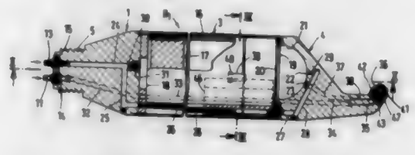
an annular water passage (**14**) defined in said nozzle portion about said central conduit for supplyiing water to said end opening, said nozzle portion having converging inside wall surfaces defining, in combination with the outer surface of said central conduit, a constricted, annular throttle throat (**18**) at said end opening for discharging water about and against said outlet portion (**16**) protruding through and beyond said end opening.

4,696,645

APPARATUS FOR REMOVING PLAQUE AND STAINS FROM THE SURFACES OF TEETH

Martin Saupe, Offenbach; Hans Dauernheim, Dreieich, and Maximillian Markl, Königstein, all of Fed. Rep. of Germany, assignors to Emda Fabrik Elektro-Medizinischer und Dentaler Apparate Georg Hartmann GmbH & Co. KG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 24, 1985, Ser. No. 790,731
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1984, 3439584
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—125 **26 Claims**



1. Apparatus for removing plaque and stains from the surfaces of teeth with a jet containing a mixture of flowable solid particles and a gaseous medium, comprising a hollow housing constituting a handle and includinga nozzle having at least one orifice arranged to discharge the mixtures against the teeth, and a receiving portion having an inlet connectable with a source of pressurized gaseous medium, said housing having a vortex chamber in communication with said inlet and said orifice; and a container for a supply of flowable solid particles in said housing, said container having outlet means for addission of flowable solid particles into said chamber, and said housing further including a foraminous partition which is interposed between the outlet means of said container and said chamber.

4,696,646

DENTAL WEDGE AND METHOD OF USING SAME

Ronald I. Maitland, 155 East Fifty-fifth St., New York, N.Y. 10022

Filed Dec. 23, 1985, Ser. No. 812,350
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—149 **24 Claims**

1. A device for dental restoration which assures sufficient separation to provide firm and properly located interproximal contact, comprising a wedge of highly crush resistant and wear resistant dental cured restorative composite resin for insertion into a prepared cavity within a tooth adapted to be filled with uncured restorative composite resin, the wedge being shaped to frictionally engage at least one wall of the cavity so that the wedge can be inserted into the uncured resin where said wedge remains, the uncured resin containing the wedge can be cured,



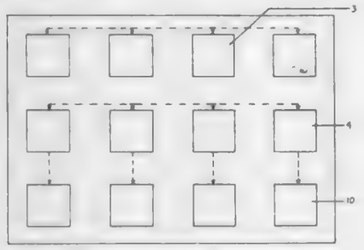
and the cured resin can be finished to an appropriate anatomical shape.

4,696,647

ELECTRONIC ASSEMBLY TOY

Shamoon Ahmad, 829 A. Donaldson Ave., Highland Park, N.J. 08904

Filed Feb. 20, 1986, Ser. No. 831,187
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—224 **4 Claims**



1. An electronic circuit educational device including,

base means containing an electronic circuit with designed open circuits;

said base means containing an electronic circuit with designed open circuits;

said base means futher including a plurality of differently shaped slots physically located at each open circuit location;

a plurality of eletronic component block means, certain of said means containing therein working electronic components, other of said block means containing non-working electronic components, said block means shaped to fit correspondingly shaped slots in said base means;

whereby, when all said blocks have been inserted into their proper shaped slots, a working electronic device or circuit is obtained.

4,696,648

HETEROSTRUCTURE INTERDIGITAL HIGH SPEED PHOTOCONDUCTIVE DETECTOR

Charles W. Slayman, Newbury Park, and Luis Figueroa, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 559,509, Feb. 27, 1984, Pat. No. 4,593,304. This application Feb. 11, 1986, Ser. No. 828,406
Int. Cl.[4] H01L *21/283, 21/12, 31/02*
U.S. Cl. 437—5 **10 Claims**

1. A process for fabricating at least one high speed photodetector responsive to incident optical radiation comprising:

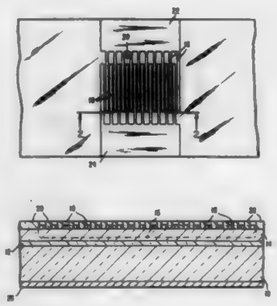
(a) providing a substrate of semiconductor material;

(b) forming on at least a portion thereof an isolation layer of semiconductor material;

(c) forming on said isolation layer an active layer of semiconductor material having a bandgap less than that of said semiconductor material comprising said isolation layer;

(d) forming on said active layer a passivation layer of semiconductor material having a bandgap greater than that of said semiconductor material comprising said active layer;

(e) patterning and etching said passivation layer to provide exposed portions of said active layer which define interdigitated electrode regions and transmission line regions; and



(f) forming a pair of interdigitated electrically conducting electrodes in said interdigitated electrodes regions on the exposed portions of said active layer so as to be non-blocking to majority and minority carriers in said active layer, at least one of said electrodes forming a Schottky-barrier contact to said active layer, the thickness of said active layer being approximately equal to or less than the spacing between said electrodes; and

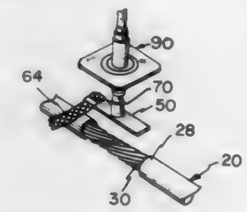
(g) forming a transmission line connected to each electrode in said transmission line regions.

4,696,649

IN-LINE CONNECTOR

Adam Smorzaniuk, Oxford, and Larry N. Siebens, Whippany, both of N.J., assignors to Amerace Corporation, Hackettstown, N.J.

Filed Oct. 18, 1985, Ser. No. 781,022
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—98 **17 Claims**



1. A surface mounted grounding device for coupling a grounding conductor to the shield of a jacketed high-voltage electrical cable comprising metallic contact means for engaging and making electrical contact with the bared portion of the electrically conductive shield of a jacketed high-voltage electrical cable from which a portion of the jacket has been removed; coupling means connected to said contact means for receiving and making electrical contact with a grounding conductor; a conformable preformed liquid sealing form positioned over at least a portion of said contact means, said coupling means and adjacent one end of said grounding conductor; and flexible sealing means for tightly uniting said preformed

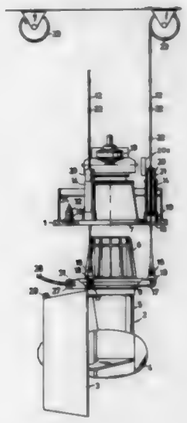
liquid sealing form about said contact means, said grounding conductor and said coupling means to provide a liquid-tight seal about the joint between said grounding conductor and said electrically conductive shield of a jacketed high-voltage electrical cable.

4,696,650

ARRANGEMENT FOR FITTING A PROPELLER ASSEMBLY TO AN OPENING IN A BOTTOM STRUCTURE OF A WATERCRAFT AND FOR DISMANTLING THE ASSEMBLY THEREFROM

Kjell Haglund, Karlstad, Sweden, assignor to Kamewa AB, Kristinehamn, Sweden

Filed May 21, 1985, Ser. No. 736,532
Claims priority, application Sweden, May 23, 1984, 8402793
Int. Cl.[4] B63H *1/14*
U.S. Cl. 440—49 **11 Claims**



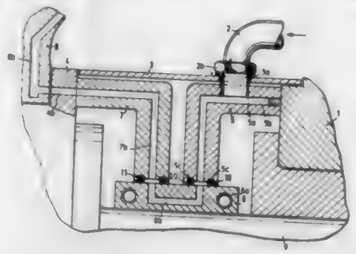
1. An arrangement for mounting and dismounting a thruster propeller unit in an opening located in a bottom part of a shell structure of a watercraft, externally of said shell structure and beneath the surface of the water in which the craft floats, said thruster propeller unit being provided with a mounting flange which can be fastened in a pressure-tight fashion around said opening in said shell structure, and the arrangement including
- a plurality of lifting lines operable from lifting devices located in the watercraft and provided with connection means at their ends,
- for each said lifting line, an associated line opening arranged in said shell structure adjacent said opening so that the associated lifting line can be passed through each said line opening,
- for each said lifting line, an associated line attachment arranged on said mounting flange of the thruster propeller unit so that, when the propeller unit is mounted in position by being connected to said shell structure via said mounting flange, each said line attachment is located in the associated line opening and is accessible from the inside of the shell structure,
- wherein said connection means at the end of each said associated lifting line can be connected to and disconnected from said line attachment from inside the shell structure, and each said line attachment is provided with sealing means for sealing the associated line opening when the propeller unit is in its mounted position, said sealing means being located externally of the connection between the line attachment and the connection means on the end of the lifting line.

4,696,651

APPARATUS FOR A SHIP'S PROPELLER

Harry Wagemann, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 3, 1985, Ser. No. 804,279
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1984, 3444084
Int. Cl.[4] B63H *1/28*
U.S. Cl. 440—88 **14 Claims**



1. An air coupling for a propeller of a ship, said propeller having propeller blades, which propeller blades have means for ejecting air therefrom, said air coupling being for connecting an air compressor on said ship through an air conduit with said propeller for providing compressed air to said ejecting means, said air coupling comprising:
- stationary means for accepting air from said air conduit and for feeding said air;
- said stationary aid feed means having means for attachment thereof to said air conduit;
- a propeller shaft rotatable air feed sleeve being mounted on said propeller shaft and for rotating with said propeller shaft;
- a rotatable means for feeding air to and rotating with said propeller;
- said sleeve for accepting air from said stationary means and feeding air to said rotating means when installed, said stationary means having means for feeding air to said rotatable air feed sleeve when installed;
- said sleeve having means for feeding air from said stationary means to said rotatable means, and said rotatable means having means for feeding air from said sleeve to said propeller;
- said stationary means and said sleeve and said rotating air feed means for being disposed when assembled to feed air from said stationary means through said propeller shaft rotatable sleeve to said rotating air feeding means and to said propeller and
- said stationary means, said rotating means and said rotating sleeve each comprising at least two parts each, each of said at least two parts of each of said stationary means, said rotating means and said rotating sleeve each having adjacent surfaces when installed.

4,696,652

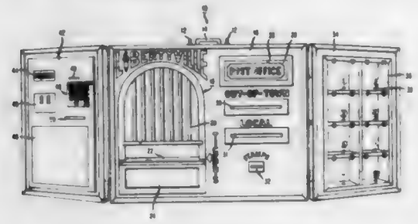
PORTABLE, FOLDABLE REPLICA OF A FACADE OF COMMERCIAL ESTABLISHMENTS

James A. Reeder, and Joanne E. Reeder, both of 101 Roxie Ave., North Beach, N.J. 08008

Filed Jun. 19, 1986, Ser. No. 876,378
Int. Cl.[4] A63H *33/04, 3/52*
U.S. Cl. 446—75 **14 Claims**

1. A replica device of commercial establishments and with said device providing a portable case and in an opened condition for use as a toy for children, said case in a closed condition providing an interior cavity for protection and storage of loose components used therewith, said device including:
- (a) a main panel member having an outwardly- and an inwardly-disposed portion;

- (b) right- and left-panel portions hingedly attached to main-panel portion and with limiting means associated with the main panel and hinged panels to establish the outward and open swing of each hinged panel to a predetermined extent;
- (c) a window formed in the main panel member;
- (d) a counter shelf disposed substantially normal to said main panel member;
- (e) a box door associated with the main panel;
- (f) means for securing and displaying signs selectively indicating the replica usage and below said sign display providing slots for main drops, stamps and the like;
- (g) a plurality of doors provided in one of hingedly-attached panel portions, each plurality of doors disposed for selective individual opening;



- (h) day, date and like indicia display means provided on a removable panel;
- (i) means for moving of said box door;
- (j) detachable containers attachable to the interior of the main panel member so as to receive and retain items inserted through said slots;
- (k) bank teller replica apparatus carried so as to be simulated and actuated from the exterior of the device and with slots for receiving and dispensing money, and
- (l) means for folding the several panel portions into a suitcase-type of device and with selectively operable latch means for retaining said device in a closed condition until openingand using said device is desired.

4,696,653

SPEAKING TOY DOLL

James McKeefery, Milpitas, Calif., assignor to Worlds of Wonder, Inc., Fremont, Calif.

Filed Feb. 7, 1986, Ser. No. 827,812
Int. Cl.[4] A63H *3/28*
U.S. Cl. 446—175 **8 Claims**



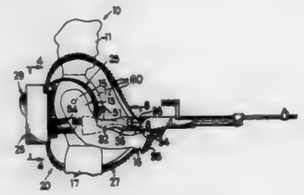
1. A toy comprising:
a body assembly having an at least partially flexible outer covering with an appearance simulating at least some life like features,
- a plurality of switch means within said body assembly, each of said switch means being covered by said outer covering of one of said life like features so as to provide a switch signal response to a person's touching of the respective life like feature,
- voice synthesizing means for electrical synthesizing any of a plurality of words responsive to control signals provided thereto, said voice sythesizing means including speaker means for audibilizing said electronically synthesized words, and sequencing means coupled between said plurality of switch means and said voice synthesizing means, said sequencing means being a means for providing a sequence of control signals to said synthesizing means responsive to said switch means to cause said synthesizing means to synthesize a sequence of words responsive to which said switch means provided a switch signal,
- a battery power supply, a gravity switch means and a power coupling means, said power coupling means being coupled to said battery power supply, said gravity switch means, said voice synthesizing means and said sequencing means, said gravity switch means being responsive to motion and orientation with respect to gravity to provide a tilt switch signal to said power coupling means, said power coupling means being a means for coupling power to said voice synthesizing means and said sequencing means responsive to said tilt switch signal, said power coupling means being responsive to said voice synthesizing means so as to decouple power to said voice synthesizing means and said sequencing means upon the prolonged absence of a synthesized word therein,
- a microphone in said body assembly coupled to said sequencing means, said microphone being responsive to sounds orriginating from other than said toy, said sequencing means also being responsive to said microphone to cause said synthesizing means to synthesize a sequence of words upon said microphone detecting sounds followed by an apparent absence of sounds for a predetermined period of time, said power coupling means coupled to said microphone, said power coupling means being responsive to said microphone so as to decouple power to said voice synthesizing means upon the prolonged absence of activation of said microphone.

4,696,654

AMMUNITION BELT ADVANCING ATTACHMENT FOR TOY FIGURES

Bennie R. Welch, Chicago; Russell G. Rasmussen, Skokie, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 6, 1986, Ser. No. 827,246
Int. Cl.[4] A63H *5/04*
U.S. Cl. 446—268 **18 Claims**



1. An attachment for a toy figure comprising:
a weapon attachable to the figure in a firing position;
- a slot extending through the weapon;
- a flexible belt having simulated ammunition on one side of the belt;

the belt being received in the slot for movement through the slot;

means mountable on the figure and cooperating with the belt to move the belt through the weapon;

the moving means including a gear with teeth engaging the simulated ammunition; and

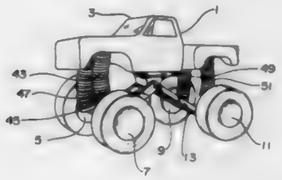
teeth on the gear generally diametrically opposite the teeth engaging the ammunition being engagable by part of a child's hand to rotate the gear and move the belt.

4,696,655

TOY VEHICLE WITH ADJUSTABLE SUSPENSION SYSTEM

Bruce M. D'Andrade, 3 Ten Eyck Rd., Whitehouse Station, N.J. 08889, and Joseph A. Marino, P.O. Box 306, South Ryland Rd., Whitehouse, N.J. 08888

Filed Aug. 15, 1986, Ser. No. 896,645
Int. Cl.[4] A63H *3/20, 17/26*
U.S. Cl. 446—330 **15 Claims**



1. A toy vehicle, comprising:

(a) a vehicular-type body;

(b) two wheels on a single axis and at least one other wheel;

(c) wheel support means having a movable component with an upper end and a lower end, said movable component of said wheel support means being movably connected to said body at its upper end and being connected to said two wheels on a single axis at its lower end so as to permit movement of said two wheels on a single axis, said movable component being hingedly connected to said body at approximately the center of the underside of said body; and,

(d) a suspension system containing at least one hollow tube of thermoplastic material having a flexible zone intermediate the ends thereof, said flexible zone having a plurality of circumferential corrugations extending along its length and having a close-packed position in which they adjoin, the hollow tube being stretchable to sequential lengths until the corrugations assume a longitudinally spaced position, the wall thickness throughout the corrugations being substantially uniform, with said corrugations having side walls, one of which is long and the other of which is short, both of which extend at an acute angle with respect to the axis of said hollow tube, said tube being connected at one end to said body and at the other end to said movable component of said wheel support means.

4,696,656

RECONFIGURABLE TOY

Ronald Torres, Pico Rivera; Edward Mayer, Los Angeles, and Steve Nelson, Palos Verdes, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

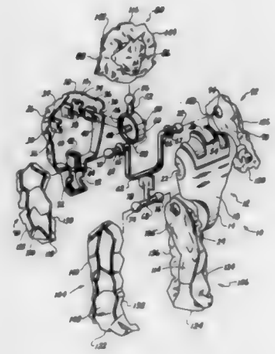
Filed Jan. 14, 1986, Ser. No. 818,839
Int. Cl.[4] A63H *3/46*
U.S. Cl. 446—376 **3 Claims**

1. A reconfigurable toy comprising:

a hollow torso member having a slot at one end thereof, a plurality of apertures at both sides thereof, an outside surface simulating a torso of a robotic humanoid figure and an outside surface simulating a rock surface, said hollow torso member having a plurality of webs with apertures and two extensions with slots attached to inside surfaces thereof;

a head retainer rotatably mounted inside said hollow torso member, said head retainer having side pins rotatably engaging at least two of said apertures of said webs and a pin extending through said slot of said hollow torso member, said pin having a ball member attached to the end thereof and disposed outside said hollow torso member;

a Y-shaped leg and arm retainer mounted inside said hollow torso member, said leg and arm retainer having (a) a horizontal member extending through one of said apertures at each side of said hollow torso member with ball members attached to the ends thereof and disposed outside said torso member, (b) a plate engaging said slots of said two extensions of said hollow torso member and (c) two horizontal extensions engaging at least two of said apertures of said webs, each of said two horizontal extensions passing through one of said apertures at one of said sides of said hollow torso member and having a disk-shaped member attached thereto and a ball member attached to the end thereof and disposed outside said hollow torso member;



a head member having a surface simulating a face of a robotic humanoid figure and a surface simulating a rock surface, said head member being rotatably coupled to said head retainer by said ball member of said head retainer which operably engages a cylindrical bore and spherical socket in said head member;

two arm members each having a surface simulating an arm of a robotic humanoid figure and a surface simulating a rock surface, each of said arm members being rotatably coupled to said Y-shaped leg and arm retainer by one of said ball members attached to said two horizontal extensions which operably engages a cylindrical bore and spherical socket in each of said arm members; and

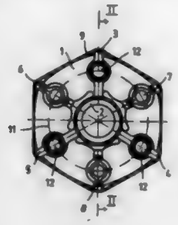
two leg members each having a surface simulating a leg of a robotic humanoid figure and a surface simulating a rock surface, each of said leg members being rotatably coupled to said Y-shaped leg and arm retainer by one of said ball members attached to said horizontal member which operably engages a cylindrical bore and spherical socket in each of said leg members.

4,696,657

ELASTIC SHAFT COUPLING FOR TRANSMISSION OF TORQUE BETWEEN SHAFTS

Rolf Johnen, Bergisch-Gladbach; Hans Kirch, Burscheid, and Volkmar Otto, Leverkusen, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,970
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429519
Int. Cl.[4] F16D *3/68*
U.S. Cl. 464—93 **3 Claims**



1. An elastic shaft coupling for the transmission of torque between a drive shaft and a driven shaft, comprising:

a polygonal rubber ring;

a hub spider having an inner circumference and a plurality of radially extending arms vulcanized in said rubber ring, each said arm having first connecting means for connecting said ring to the drive shaft for transmission of torque therebetween, said first connecting means comprising a bore for receiving a fastening member for connecting a respective one of said arms to the drive shaft;

fastening elements disposed between said arms and vulcanized into said rubber ring, each said fastening element having second connecting means for connecting said ring to the driven shaft for transmission of torque therebetween; and

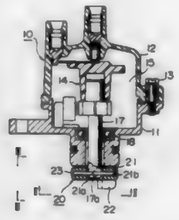
centering means, comprising a projection extending axially from said hub spider provided in the region of the inner circumference of said hub spider for engaging a corresponding recess in the drive shaft, for centering said shaft comprising substantially without radial play relative to the drive shaft.

4,696,658

SHAFT COUPLER FOR COUPLING A ROTARY SHAFT OF AN IGNITION DISTRIBUTOR TO AN ENGINE CAMSHAFT

Eiichi Senda, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 28, 1985, Ser. No. 792,008
Claims priority, application Japan, Oct. 31, 1984, 59-230788
Int. Cl.[4] F16D *3/16*
U.S. Cl. 464—112 **9 Claims**



1. A coupler for coupling a rotary shaft of an ignition distributor to an engine camshaft in an internal combustion engone, said coupler comprising:

an annular member provided at a centre portion thereof with a circular axial recess, a diameter of which is larger than a diameter of the rotary shaft of the ignition distributor, whereby the rotary shaft loosely projects into said recess at one axial end of said annular member;

at least one projection provided on the other axial end of said annular member, said projection being slidably movable along and inclinable within a diametrical groove formed on a top end of said engine camshaft;

a straight bore diametrically extending through said annular member, an axis of said straight bore crossing a line passing through said projection in a centre of said annular member at a cross angle θ which is more than about 10° and less than about 85°; and

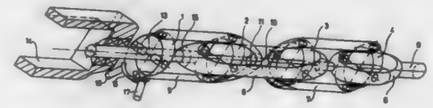
connecting pin means extending through said straight bore and a diametrical bore fixed at a distal end portion of the rotary shaft of the ignition distributor.

4,696,659

SWIVEL-JOINTED ROBOT ARM

Ole Molaug, Jernbanegaten 4, N-4340, Byrne, Norway

Continuation of Ser. No. 532,449, Sep. 15, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,785
Claims priority, application Norway, Sep. 28, 1982, 823260
Int. Cl.[4] F16C *1/04;* **B25J** *17/00*
U.S. Cl. 464—148 **1 Claim**



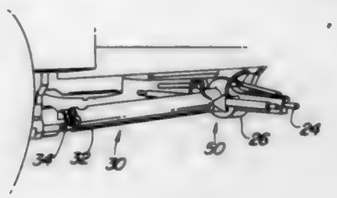
1. A swivel-jointed robot arm adapted to be driven in controlled flexing and rotational movements by a robot drive means including a rotatable shaft projecting forwardly along a robot drive axis, comprising a plurality of interconnected rigid links wherein successive links are linked together in the fashion of chain links and are mutually pivotally connected by universal joints disposed between the interlinking ends of the links, wherein two adjacent links are joined to the same intermediate link and have respective link ends in abutting relationship, and wherein the rearwardmost link end is joined to the forwardly projecting rotatable shaft, and wherein the forwardmost link end is joined to a tool-coupling shaft, the respective links further comprising the intermediate link having a rearwardly facing link end having an opening with a spherical bearing affixed therein and a ball rotatable in said bearing, said ball having a hole therethrough sized to slidably accept said drive means forwardly projecting rotatable shaft to permit unrestrained movement of said link end along said robot drive axis and also having a forwardly facing link end having an opening with a spherical bearing affixed therein and a ball rotatable in said bearing, said ball having a hole therethrough; the rewardmost of the two adjacent links having a forwardly facing link end having an opening with a spherical bearing affixed therein and a ball rotatable in said bearing, said ball having a hole therethrough; the forwardmost of the two adjacent links having a rearward facing link end having a pin affixed thereto, said pin slidably engaging the hole in the ball in the forwardly facing link end of said rewardmost adjacent link; and a further front link joined to the too-coupling shaft, said further front link having a rearward facing link end having a pin affixed thereto, said pin slidably engaging the hole in the ball in the forwardly facing link end of said intermediate link.

4,696,660

TRACTOR DRIVE SHAFT SHIELD ASSEMBLY

Kenneth E. Murphy, Dike; Ronald A. Martin, Cedar Falls, and Gary M. Nies, Waterloo, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 20, 1984, Ser. No. 642,026
Int. Cl.[4] F16C *1/26*
U.S. Cl. 464—170 **2 Claims**



1. In a vehicle having a transmission enclosed by a first housing, an axle enclosed by a second housing and a drive shaft connected to the transmission and to the axle via U-joints, a shield assembly comprising:

a cylindrical quill fixed to the first housing;

a support ring fixed to the second housing;

a one-piece, non-telescoping cylindrical shield coaxially surrounding the drive shaft and at least one of the U-joints, the shield having a first end slidably and rotatably engaging and supported by a portion of the quill and a second end slidably and rotatably engaging and supported by the ring, at least one end of the shield having an opening through which lubrication of the at least one U-joint may be achieved, the shield being rotatable from a first position wherein the opening faces upwardly to a second position wherein the opening faces downwardly;

means for releasably holding the shield in its first position while the drive shaft is rotating during normal operation of the vehicle; and

means fixed to the support ring for preventing debris from entering the shield at its second end, comprising a pair of arcuate-shaped members, each member having a flange extending therefrom for attachment to a part of the support ring so that the arcuate members extend across an annular space between the shield and the drive shaft.

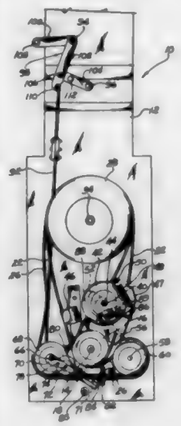
4,696,661

FORWARD-REVERSE BELT TRANSMISSION

Weber Rehlander, 4922 N. Fall Rd., Laporte, Ind. 46350

Filed Dec. 22, 1986, Ser. No. 944,370
Int. Cl.[4] F16H *11/04*
U.S. Cl. 474—5 **10 Claims**

1. In a power transmission including a rotatable drive member, first and second rotatable driven members, first belt means connected between said drive member and first and second driven members for effecting rotation of the first driven member in a first direction, third and fourth rotatable driven members positioned adjacent said drive member, and second belt means connected between said drive member and said first, third and fourth driven members for effecting rotation of said first driven member in a second direction opposite that of said first direction, the improvement comprising a clutch member carried by one of said third and fourth driven members for pivotal movement relative to said drive member, said third and fourth driven members positioned on opposite sides of said drive member and pivotally movable relative to the drive member, and means for shifting said second, third and fourth driven members between a neutral position wherein no tension is placed on either of said belt means and said first driven member is stationary, a forward position wherein said second driven member exerts tension on said first belt means to effect rotation of said first driven member in its said first direction, and a reverse position wherein said third and fourth driven members exert tension on said second belt means to effect rotation of said first driven means in its said second direction, said clutch member constituting means for momentarily engaging said first belt means as said third and fourth driven members are shifted from their said neutral position into their said forward position wherein a smooth transmission from neutral into forward is achieved.

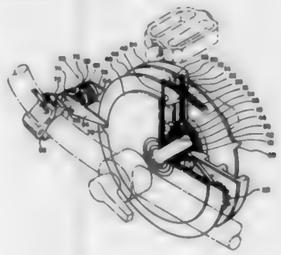


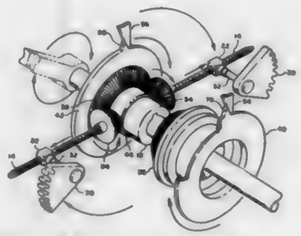
4,696,662

VARIABLE-SPEED DRIVE UNIT

Henry E. Gummeringer, 307 E. 121st St., Tacoma, Wash. 98445

Filed Aug. 4, 1986, Ser. No. 892,905
Int. Cl.[4] F16H *55/52*
U.S. Cl. 474—49 **7 Claims**





1. A variable-speed drive unit comprising:

a hub adapted for driving connection to a shaft;

a drive wheel;

a series of radially extending threaded rods rotatably mounted between said hub and said drive wheel;

a primary bevel gear rigidly mounted to the radially inner end of each of said threaded rods;

a pair of secondary bevel gears, each of said secondary bevel gears being rotatably mounted around said hub, and in driving engagement with said primary bevel gear;

an actuator disk rigidly attached to each of said secondary bevel gears;

an internally threaded boss means threadedly attached to each of said threaded rods and slidably mounted to said drive wheel;

a pair of chain sprocket segments, each of said segments rigidly attached to said boss means on radially opposite threaded rods;

a chain sprocket rotatably atttached to each of said threaded bosses which are not attached to said sprocket segments; and

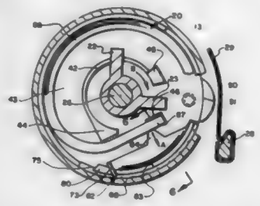
an actuator cam means adapted for selective engagement with one or the other of said actuator disks whereby rotation of said hub and drive wheel during said engagement will cause rotation of said threaded shafts resulting in selective radially inward or outward movement of said chain sprocket segments and chain sprockets.

4,696,663

BELT TENSIONER

Henry W. Thomey, Windsor, and John B. Heuninck, Tecumseh, both of Canada, assignors to Dyneer Corporation, Scottsdale, Ariz.

Filed Apr. 14, 1986, Ser. No. 851,460
Int. Cl.[4] F16H *7/08*
U.S. Cl. 474—133 **25 Claims**



1. A belt tensioner construction for automatically tensioning an endless belt of a drive system for vehicle accessories, said tensioner construction including:

(a) a housing adapted to be mounted on a vehicle adjacent the drive belt;

(b) lever means pivotally mounted with respect to the housing for movement toward and away from the drive belt;

(c) pulley means rotatably mounted on the lever means and engageable with the drive belt for applying a tensioning force on said belt when the lever means is biased in a belt-tensioning direction toward the drive belt;

(d) spring means acting between the housing and lever means for biasing the lever means in the belt tensioning direction;

(e) brake means mounted on the lever means for frictional engagement with the housing for retarding pivotal movement of the lever means with respect to the housing; and

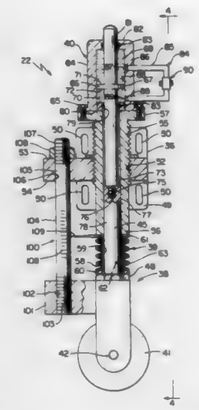
(f) fulcrum means formed on the lever means and engaged by the spring means for directing a first end of the spring means into engagement with the brake means biasing the brake means into frictional engagement with the housing as the spring means biases the lever means in the belt tensioner direction.

4,696,664

BELT TENSIONING MEANS

Leslie B. Wilson, Reeds Spring, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,694
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—138 **5 Claims**



1. In a method of tensioning a power transmission belt that operates in an endless path by utilizing a tensioner for said belt, said tensioner comprising a support means fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, and mechanical spring means operatively associated with said support means and said belt engaging means urging said belt engaging means relative to said support means in a belt tensioning direction and against said belt with a force to tension said belt, the improvement comprising the step of arranging said spring means to increase its urging force on said belt engaging means as said belt engaging means moves in said belt tensioning direction relative to said support means throughout the entire normal tensioning range of movement of said belt engaging means relative to said support means.

4,696,665

PULLEY FOR A SYNCHRONOUS DRIVE SYSTEM COMPRISING A POLYMERIC MATERIAL TOOTHED-BELT AND RELATED TRANSMISSION

Vincenzo Macchiarulo, Chieti, and Ezio Marcelli, Pescara, both of Italy, assignors to Pirelli Transmissioni Industriali S.p.A., Milan, Italy

Filed Jun. 7, 1985, Ser. No. 742,237
Claims priority, application Italy, Jun. 11, 1984, 21346 A/84
Int. Cl.[4] F16H *7/02*
U.S. Cl. 474—153 **12 Claims**

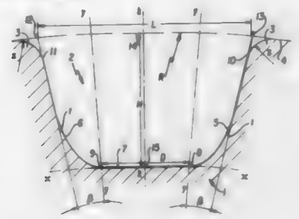
1. A pulley suitable for the transmission of motion with a flexible toothed belt of polymeric material comprising a plurality of grooves alternating with teeth, each groove comprising two flanks and each flank having a parabolic arc-shaped profile, said groove having a bottom whose ends coincide with the vertices of the parabolic arc-shaped profiles, the length of said bottom being at least approximately 65% of the length of each parabolic arc-shaped profile of the flanks of said groove, the length of each parabolic arc-shaped profile being measured between said vertices and a point of a circle having a predetermined radius r connecting the flank with the tooth of the pulley, each of said arc-shaped profiles being defined by the curve:

$$y = Kx^2$$

where:

$$K = \frac{\tan^2(90 - \beta)}{4Yo}$$

$Yo = H - r(1 - \sin \beta)$ and is the ordinate position of a tangent point between said parabolic arc-shaped profile and said circle of radius r;



y is an axis passing through one of the two ends of said bottom of the pulley;

x is an axis orthogonal to said axis y passing through said one of the two ends at the bottom of the pulley;

H is the height of the groove;

r is the radius of the circle connecting each flank with the teeth of the pulley; and

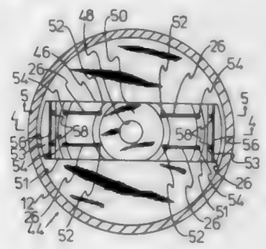
β is the angle formed by a tangent line common to said parabolic arc-shaped profile and to said circle of radius r, with the axis y.

4,696,666

CENTRIFUGE MACHINE AND ROTOR

Richard D. Rice, Jr., 3030 S. Xeric Ct., Denver, Colo. 80231

Filed Jul. 18, 1986, Ser. No. 886,913
Int. Cl.[4] B04B *5/02*
U.S. Cl. 494—16 **18 Claims**



1. A centrifuge rotor for use in blood analysis for separating red blood cells from blood plasma used with a tube having an inside and an outside with at least one end of the tube sealed with sealing means, the tube containing blood which is subjected to rotary action, comprising:

(a) a base;

(b) at least two first tube retainer means fixedly attached to the base;

(c) at least two second tube retainer means fixedly attached to the base;

(d) an elongated hole in at least two of the tube retainer means for securely positioning the tube in place; and

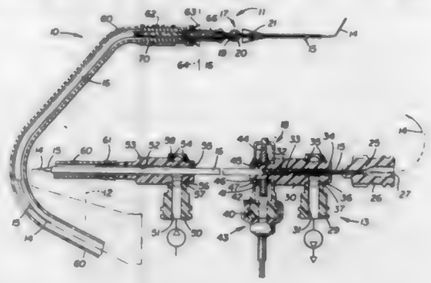
(e) whereby the centrifuge rotor is rotated and the red blood cells are separated from the blood plasma, the first and second retainer means serving to securely hold the tube containing the blood in place during centrifuging thereby eliminating the use of a separate cover to retain the tube in place.

4,696,667

INTRAVASCULAR CATHETER AND METHOD

Helmut Maech, 764 Asbury St., San Jose, Calif. 95126

Filed Mar. 20, 1986, Ser. No. 841,879
Int. Cl.[4] A61B *17/20*
U.S. Cl. 604—22 **23 Claims**



1. An intravascular catheter for clearing a blockage in a blood vessel or the like comprising

flexible guide means for locating said vessel,

a flexible first tube having said guide means mounted for relative rotational and reciprocal movement therein,

a rotary flexible second tube having said first tube mounted for relative reciprocal movement therein,

means for selectively rotating said second tube, and

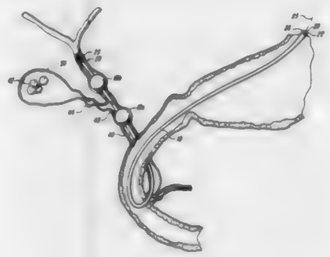
cutting means for cutting said blockage into fragments in response to rotation of said second tube comprising an outer cutting head mounted on said first tube, an inner cutting head rotatably mounted in protected relationship within said outer cutting head and connected to said second tube for simultaneous rotation therewith and co-operating blade means between said outer and inner cutting heads for cutting said blockage.

4,696,668

DOUBLE BALLOON NASOBILIARY OCCLUSION CATHETER FOR TREATING GALLSTONES AND METHOD OF USING THE SAME

Gilbert M. Wilcox, 12 Towne Rd., Boxford, Mass. 01921

Filed Jul. 17, 1985, Ser. No. 756,065
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—28 **4 Claims**



1. A method of dissolving gallstones lodged in the gallbladder of a human body with a dissolution agent, comprising the steps of:

inserting a double balloon nasobiliary occlusion catheter into a human body in which gallstones have lodged in the gallbladder, said catheter having passages running therethrough for venting bile, for inflating and deflating balloons, and for infusing a dissolution agent and aspirating bile, cholesterol or other pigment laden dissolving solutions, said catheter being inserted so that the catheter extends into the common bile duct and common hepatic duct with a balloon positioned in the bile duct on each side of the entrance to the cystic duct;

inflating said balloons by forcing a fluid through said inflating and deflating passage, said balloons being inflated through a diameter greater than the diameter of the bile duct so as to isolate the portion of the bile duct between said balloons;

injecting a dissolution agent through said infusing and aspirating passage of said catheter into said isolated portion of the bile duct and into the cystic duct and gallbladder;

aspirating said dissolution agent and dissolved gallstones from said gallbladder and cystic duct through said infusing and aspirating passage of said catheter;

while said balloons are inflated, venting bile from the common hepatic duct through a distal end of said catheter through said bile venting passage of said catheter to the proximal end of said catheter;

once said gallstones are dissolved, deflating said balloons by allowing the inflating fluid to be discharged through said inflating and deflating passage, and

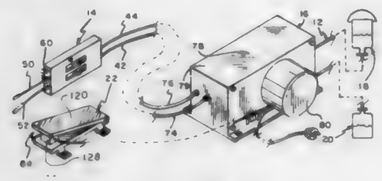
withdrawing the catheter from the body.

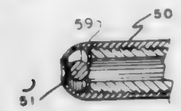
4,696,669

HAND HELD COMBINATION FLUSH WITH ADJUSTABLE NOZZLE AND/OR SUCTION APPARATUS

Monty J. Menhusen, 2441 Winstead Cir., Wichita, Kans. 67226

Filed Mar. 24, 1986, Ser. No. 843,114
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—34 **1 Claim**





1. A combination flush and/or suction apparatus operable to supply and/or remove fluid from an area being operated on, comprising:

(a) a control and dispenser apparatus which can be held in one hand of a person;

(b) a pump assembly connected to said control and dispenser apparatus to provide independently a fluid supply and a fluid suction thereto;

(c) said control and dispenser apparatus including a main support body having an inlet assembly and an outlet assembly connected thereto and having a spray nozzle assembly and a vacuum nozzle assembly projecting outwardly therefrom connected to said outlet assembly;

(d) a control assembly operably connected to the said outlet assembly to control fluid flow outwardly through said outlet spray nozzle assembly and independently control suction through said vacuum nozzle assembly; and

(e) said pump assembly having first and second tube members therein and a pump roller assembly engagable with said first and second tube members; and

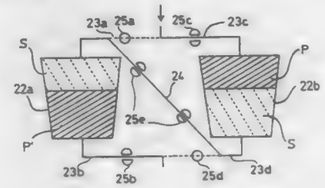
(f) said pump roller assembly operable on rotation thereof to engage said first and second tube members to provide concurrently a fluid flow function in one of said tube members and a fluid suction function in the other tube members caused by rotation of said pump roller assembly; and said spray nozzle assembly having a chamber at its distal end thereof wherein a circular axially moveable seal means resides, said chamber being threadedly adjustable to regulate and control the flow through said distal end of the nozzle assembly.

4,696,670

METHOD AND APPARATUS FOR TREATING BLOOD CONSTITUENTS

Michikazu Ohnishi, Kobe, and Nobutaka Tani, Minoo, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1985, Ser. No. 795,663
Claims priority, application Japan, Nov. 13, 1984, 59-240199
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—49 **2 Claims**



1. A method for treating circulatory fluid constituents, wherein in the specified order:

(a) a selective switching means switches the upstream side of a first circulatory fluid treatment device to receive from a source a flow of circulatory fluid, and switches the downstream side of said first circulatory fluid treatment device to send to a destination said flow of circulatory fluid; and then:

(b) said selective switching means, while maintaining said switching of said flow of circulatory fluid to the destination from the downstream side of said first circulatory fluid treatment device, switches the upstream side of said first circulatory fluid treatment device to interrupt communication with said flow of circulatory fluid from said source, further switches the upstream side of said second circulatory fluid treatment device to receive said flow of circulatory fluid from said source, and further switches the downstream side of said second circulatory fluid treatment device to communicate said flow of circulatory fluid to the upstream side of said first circulatory fluid treatment device; and then:

(c) said selective switching means, while maintaining said switching of said flow of circulatory fluid from said source into the upstream side of said second circulatory fluid treatment device, switches the downstream side of said first circulatory fluid treatment device to intercept sending flow of circulatory fluid to said destination, and further switches the downstream side of said second circulatory fluid treatment device to send to said destination said flow of circulatory fluid.

4,696,671

INFUSION SYSTEM HAVING PLURAL FLUID INPUT PORTS AND AT LEAST ONE PATIENT OUTPUT PORT

Paul Epstein, Brookline; Harry Petschek, Lexington, both of Mass.; Eric LaWhite, South Royalton, Vt.; Clair Strohl, Norfolk; Henry Coyne, Framingham, both of Mass.; Edward Kaleskas, Jefferson, and George Adaniya, Swampscott, both of Mass., assignors to Omni-Flow, Inc., Woburn, Mass.

Continuation of Ser. No. 578,180, Feb. 8, 1984, abandoned. This application Jun. 11, 1986, Ser. No. 873,478
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—67 **51 Claims**

1. An infusion system, comprising:

a housing having disposable cassette receiving means;

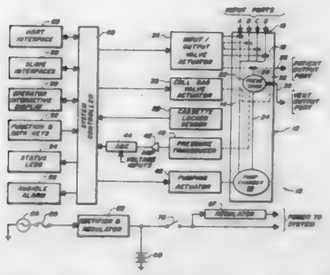
a disposable cassette releasably mounted to said cassette receiving means of said housing;

said disposable cassette including means for receiving individual ones of plural infusion flow lines;

means for pumping to at least one output line;

means cooperative with said line receiving means for selecting among plural sources of fluid respectively in fluid communication with said plural infusion flow lines that are to be individually pumped in any order by said pumping means;

said disposable cassette including means coupled to all of



said plural sources of fluid and cooperative with said selecting means for guiding each individual fluid selected from among the plural sources of fluid to the pumping means along a fluid path common to the plural sources and for guiding each such fluid from the pumping means to the at least one output line;

a clock for providing a timing signal;

means connected to the pumping means and to the clock for controlling the pumping means in accordance with the said instructions and said timing signal; and

means for establishing said set of instructions for each of said plural sources to include rate of pumping.

4,696,672

BLADDER CONTROL DEVICE

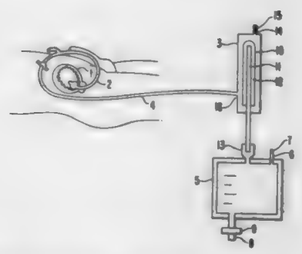
Masatsugu Mochizuki, Shiga; Masanobu Jige, and Yoshihiro Umemura, both of Kyoto all of Japan, assignors to Unitaka Ltd., Hyogo, Japan

Continuation of Ser. No. 704,001, Feb. 21, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 912,173

Claims priority, application Japan, Feb. 23, 1984, 59-33981; Apr. 6, 1984, 59-70525

Int. Cl.[4] A61M *5/325*

U.S. Cl. 604—128 **5 Claims**



1. A bladder assist device comprising:

a urethral catheter adapted to be embedded in a bladder of a patient;

a pressure control chamber having an upper end, a lower end and a concentric-type siphon tube therein between said upper end and said lower end, said siphon tube including an inner tube having an open end at an upper portion thereof and an outer tube around said inner tube, said outer tube having a closed upper end located above said inner tube and said outer tube having an open end at a lower end thereof spaced above said lower end of said pressure control chamber, said pressure control chamber having connection means connecting said pressure control chamber to said urethral catheter, said connection means connected to an opening in said pressure control chamber at a position between said open end of said upper portion of said inner tube and said open end of said lower end of said outer tube, said connection means also being vertically below a point at which said urethral catheter is embedded in the bladder of a patient and said open end of said upper portion of said inner tube being located at a position vertically above a point at which said urethral catheter is embedded in the bladder of a patient, said inner tube having the other end thereof located outside of said pressure control chamber;

a chamber connected to said other end of said inner tube for collecting urine passed through said concentric-type siphon tube; and

an air flow regulating filter disposed in an opening located in said pressure control chamber at a position above said upper portion of said inner tube.

4,696,673

COLON IRRIGATOR FOR USE WITHIN A TOILET BASIN

Birgitta B. M. Ledin-Bonevik, Vintervägeu 9, S-542 00 Mariestad, Sweden

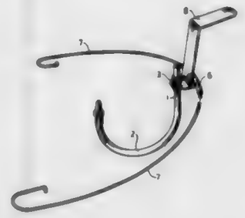
PCT No. PCT/SE85/00146, § 371 Date Nov. 27, 1985, § 102(e) Date Nov. 27, 1985, PCT Pub. No. WO85/04331, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 29, 1985, Ser. No. 821,735

Claims priority, application Sweden, Mar. 30, 1984, 8401786

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—150 **7 Claims**



1. A colon irrigation apparatus, comprising: a toilet basis (5) having a flushing outlet lip extending around an upper, inner periphery of a cavity of the basin, a colon irrigation device adapted to be readily attached to and removed from within said toilet basin and including a rigid rube (2) mounted to a rigid holder (1), one end of said tube being adapted for connection to a water container located at a higher level than the toilet basin (5) or to another water supply, and another, opposite end of said tube being connected to a rectum catheter (11) via a check valve (CV), the holder being disposed within the cavity of the toilet basin at the rear thereof with the rectum catheter extending substantially vertically upwardly in and above a central portion of the basin, and a pair of spring attachment arm means (7) extending laterally in mutually opposite directions from the holder in a common horizontal plane and arranged, when in use, to resiliently abut and engage mutually opposite inner wall portions of the toilet basin just under said flushing outlet lip thereof, with one arm on either side of the center line of the basin, said spring arm means being arcuate and generally conforming to the curvature of the inner wall of the basin, and being self-biased outwardly away from the center of the basin to ensure a firm engagement therewith.

4,696,674

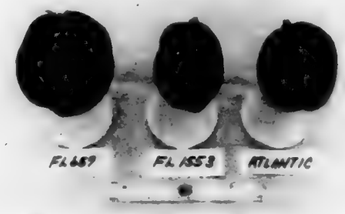
NOVEL POTATO CULTIVAR

Martin S. Cipar, Verona, Wis., assignor to Frito-Lay, Inc, Dallas, Tex.

Filed Feb. 10, 1986, Ser. No. 827,373

Int. Cl.[4] A01H *5/00*

U.S. Cl. 800—1 **5 Claims**



1. A potato cultivar of the genus and species *Solanum tuberosum*, Group Tuberosum, having dark green, slow-growing but ultimately, vigorous vine growth and white flowers and resistance to a golden nematode race, having tubers characterized by a pale yellow flesh color, a relatively high specific gravity, a substantially smooth round to oval shape, and having the protein electrophoretic fingerprint pattern substantially as shown in FIG. 1 of the drawings.

4,696,675

PROCESS FOR PREPARING WATER-INSOLUBLE BLUE AZO DYES ON THE FIBER: HYDROXYNAPHTHOIC AMIDE AND DIAZOTIZED DI-ALKOXY-BENZIDINE

Hasso Hertel, Mühlheim am Main; Klaus Hunger, Kelkheim, and Heinrich Frölich, Niedernhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 845,623

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511543

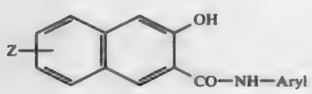
Int. Cl.[4] C09B *35/02*; D06P *1/12, 3/68*

U.S. Cl. 8—669 22 Claims

1. A process for preparing a water-insoluble disazo dye on a fiber, according to an azoic dyeing method, by bringing the fiber material, after its impregnation with a coupling component, into contact with the diazonium compound of an aromatic diamine in aqueous medium and coupling that bis-diazonium compound with the coupling component, which process comprises using as a bis-diazotizable diazo component a compound of the formula



in which R is a straight-chain or branched alkyl of 3 to 5 carbon atoms or a (C_1–C_3)-alkoxy-(C_2–C_4)-alkyl having straight-chain and/or branched alkyls of in total 3 to 5 carbon atoms, and as the coupling component a compound of the formula



in which Z is hydrogen, halogen or alkoxy of 1 to 4 carbon atoms, and aryl is phenyl or 1-naphthyl, or phenyl or 1-naphthyl substituted by 1, 2 or 3 substituents selected from the group consisting of halogen, nitro, alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms, and carrying out the coupling reaction and dye formation on the fiber at a pH of between 4 and 10.

4,696,676

USE OF 1-NONEN-3-OL FOR REPELLING INSECTS

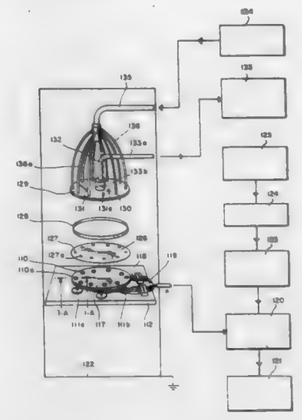
Richard A. Wilson, Westfield, N.J.; Jerry F. Butler, Gainesville, Fla.; Donald Withycombe, Lincroft; Braja D. Mookherjee, Holmdel, both of N.J.; Ira Katz, West Long Branch, and Kenneth R. Schrankel, Tinton Falls, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y. and The University of Florida, Gainesville, Fla.

Division of Ser. No. 879,426, Jun. 27, 1986. This application Jan. 9, 1987, Ser. No. 2,020

Int. Cl.[4] C10L *5/00*

U.S. Cl. 44—7.5 3 Claims

1. A candle comprising a molded hydrocarbon wax composition having a protruding wick embedded therein said molded hydrocarbon wax composition consisting essentially of:



(a) crystalline paraffin wax; and
(b) an insect repelling quantity of 1-nonen-3-ol.

4,696,677

QUATERNARY AMMONIUM SALTS OF ANIONIC GUMS

George T. Colegrove, and Kenneth Clare, both of San Diego, Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 11, 1986, Ser. No. 850,467

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 7 Claims

1. A partially derivatized quaternary ammonium salt of an anionic gum comprising 3–20% quaternary ammonium compound by weight anionic gum, wherein said quaternary ammonium compound contains a single alkyl or alkenyl substituent of 13–24 carbon atoms or two alkyl or alkenyl substituents of 12–24 carbon atoms per substituent, and the ethylene oxide substituted analogs thereof.

7. An aqueous coal slurry comprising by weight 50–78% coal, 0–20% petroleum fuel, 0.01 to 0.1% partially derivatized quaternary ammonium salt of claim 1, 0–2% dispersant, and water to 100%.

4,696,678

METHOD AND EQUIPMENT FOR GASIFICATION OF COAL

Shuntaro Koyama; Hiroshi Miyadera, both of Hitachi, and Tomohiko Miyamoto, Takahagi, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 353,902, Mar. 2, 1981, abandoned. This application Oct. 22, 1984, Ser. No. 663,813

Claims priority, application Japan, Mar. 6, 1981, 56-31120

Int. Cl.[4] C10J *3/54*

U.S. Cl. 48—201 2 Claims

1. A method for gasification of coal in a fluidized bed gasifier to improve gasification efficiency comprising the steps of:

introducing coal having a predetermined particle size distribution into an upper thermal cracking zone of a fluidized bed gasifier and introducing gasifying agents containing steam and an oxygen containing gas to the bottom of said fluidized bed gasifier;

thermally cracking the coal in the upper zone of the fluidized bed gasifier;

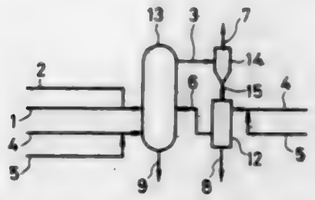
partially combusting the char, which is produced by the thermal cracking in said upper zone, and has moved down to the lower zone of the fluidized bed gasifier, in said

lower zone of the fluidized bed gasifier and recovering the ash produced thereby from the bottom of the fluidized bed gasifier;

recovering a first product gas from the top of the fluidized bed gasifier which contains fine char;

separating the fine char from the first product gas;

introducing the recovered fine char together with a predetermined amount of steam and an oxygen-containing gas into a high temperature gasifier maintained at a temperature higher than the melting point of the ash constituents



of the fine char to produce, by partial combustion of the fine char, a high temperature second product gas containing H_2 and CO as its main components and recovering the fine ash as the molten slag from the bottom of the high temperature gasifier; and

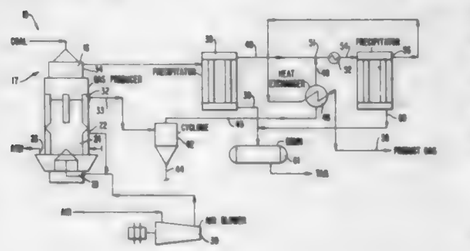
feeding the high temperature second product gas containing H_2 and CO directly to the coal feeding portion of the fluidized bed gasifier in the thermal cracking zone to promote the thermal cracking of the coal supplied to the upper zone of the fluidized bed gasifier.

4,696,679

METHOD FOR CLEANING GAS PRODUCED FROM SOLID CARBONACEOUS MATERIAL IN A TWO-STAGE GAS PRODUCER

Marilena Albulescu, Essex Fells, and Joseph F. McMahon, Clinton, both of N.J., assignors to Foster Wheeler USA Corporation, Livingston, N.J.

Filed Oct. 23, 1985, Ser. No. 790,675
Int. Cl.⁴ C10K *1/04*
U.S. Cl. 48—203 **21 Claims**



1. A method for cleaning gas produced from solid carbonaceous material in a two stage gas producer consisting essentially of the steps of:

(a) passing second stage gas from the two stage gas producer through a first precipitator means to remove oil mist and particulates from the second stage gas;

(b) passing first stage gas from the two stage gas producer through a cyclone means to remove particulates from the first stage gas;

(c) cooling the first stage gas from the cyclone means;

(d) mixing the cooled first stage gas and the second stage gas from the first precipitator means, while maintaining the temperature of the gas mixture at least at the temperature of the second stage gas;

(e) cooling the gas mixture to a temperature in the range of about 25° F. to about 125° F. above the water dew point of the gas mixture; and

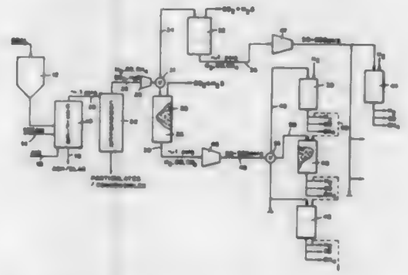
(f) passing the cooled gas mixture through a second precipitator means to remove oil mist and particulates from the gas mixture and yield an industrial usable gas.

4,696,680

METHOD AND APPARATUS FOR THE SELECTIVE SEPARATION OF GASEOUS COAL GASIFICATION PRODUCTS BY PRESSURE SWING ADSORPTION

Madhav R. Ghate, Morgantown, W. Va., and Ralph T. Yang, Williamsville, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,606
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—25 **13 Claims**



1. The method for bulk separation of multi-component gases generated in a coal gasification process wherein coal is gasified in a gasifier to produce gasification products including a mixture of gases comprising hydrogen, carbon monoxide, methane, and acid gas components carbon dioxide and hydrogen sulfide, comprising the steps of conveying a stream comprising the mixture of gases into one end of an elongated column containing a solid adsorbent for each of said gases forming the mixture of gases, pressurizing the charge of gases within said column to a pressure within a range sufficient to effect the adsorption by the adsorbent of the conveyed gases including said hydrogen defining the least absorbable gas in said mixture of gases, decreasing the partial pressure of the charge of gases in said column to effect the sequential desorption of the gases hydrogen, carbon monoxide, and methane from the adsorbent in said column, and conveying the adsorbed gases from said column upon desorption thereof from said adsorbent.

4,696,681

PSA ASSEMBLY

Andrew LLoyd-Williams, High Bridge, N.J., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Oct. 1, 1986, Ser. No. 914,099
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—28 **13 Claims**

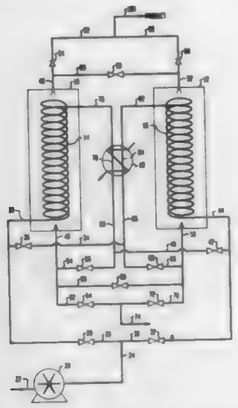
1. In a process for selective enrichment of a component of a compressed gaseous mixture wherein at least two beds of adsorption material are cycled through an adsorption step and a desorption step, the improvement comprising passing said compressed gaseous mixture in indirect heat transfer relationship to a bed of said adsorption material during desorption of said bed of said adsorption material and passing said gaseous mixture in indirect heat transfer relationship through a bed of adsorption material during selective enrichment of said component prior to the introduction of said gaseous mixture into said bed of adsorption material for selective enrichment.

7. A process for selective enrichment of a component of a gaseous mixture, which comprises the steps of:

(a) compressing said gaseous mixture;

(b) passing said gaseous mixture in indirect heat transfer relationship to a first bed of adsorption material to enhance desorption of an adsorbed component of said gaseous mixture;

(c) cooling said gaseous mixture of step (b);



(d) passing said gaseous mixture of step (c) in indirect heat transfer relationship through a second bed of adsorption material;

(e) cooling said gaseous mixture of step (d);

(f) passing said gaseous mixture of step (e) through said second bed of adsorption material to adsorb a component of said gaseous mixture; and

(g) recovering a gaseous product from step (f) enriched in said component.

4,696,682

SOLID ADSORBENT FOR CARBON MONOXIDE AND PROCESS FOR SEPARATION FROM GAS MIXTURE

Hidefumi Hirai; Makoto Komiyama; Susumu Hara, all of Tokyo, and Keiichiro Wada, Kiyose, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 411,000, Aug. 24, 1982, Pat. No. 4,470,829.
This application Mar. 8, 1984, Ser. No. 587,674
Claims priority, application Japan, Aug. 31, 1981, 56-136526; Dec. 16, 1981, 56-203053; Jan. 22, 1982, 57-008303
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—68 **6 Claims**

1. A process for separating carbon monoxide from a gas mixture containing the same, comprising the steps of:

(1) contacting the gas mixture containing carbon monoxide with a solid adsorbent comprising (a) at least one copper (I) halide and (b) at least one aluminum (III) halide supported on (c) activated carbon or graphite in which the molar ratio of the copper (I) halide to the aluminum (III) halide is 0.3 to 10 and the weight ratio of the activate carbon or graphite to the copper (I) halide is 0.25 to 25, said contacting conducted at a temperature of from 0° C. to 90° C., and

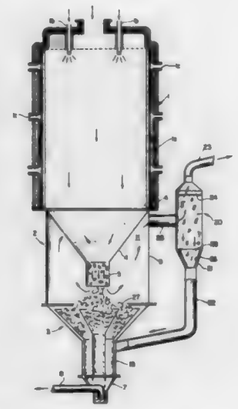
(2) desorbing the adsorbed carbon monoxide from the solid adsorbent and recovering the carbon monoxide.

4,696,683

METHOD AND EQUIPMENT FOR SEPARATION OF SOLIDS FROM GASEOUS MIXTURES

Jaroslav Vltovec, Prague; Jan Cermák, Karlstejn, and Jiri Smolik, Prague, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

Filed Feb. 27, 1986, Ser. No. 833,958
Claims priority, application Czechoslovakia, Jul. 16, 1985, 5276-85
Int. Cl.⁴ B01D *59/08*
U.S. Cl. 55—82 **6 Claims**



1. A method for separation of phthalic anhydride from a gaseous stream which originates from desublimation cooling of vapor of phthalic anhydride by water spraying in a desublimator, wherein the mixture upon exiting an outlet from the desublimator contains solid phthalic anhydride in the form of flakes and the velocity of its flow is 0.15 to 1 m/s, wherein the method comprises accelerating the flow of the gaseous stream after desublimation through a frusto-conical member to a velocity of 0.6 to 25 m/s to agglomerate said solid phthalic anhydride and subsequently decelerating said flow to a velocity of 0.15 to 1 m/s for gravitationally separating 95 to 99% of the phthalic anhydride in the form of agglomerated solids from the gaseous stream and recovering the gaseous stream.

4,696,684

METHOD AND APPARATUS FOR ELIMINATING CAVITATION IN HYDRAULIC SYSTEMS

Hanshi Shen, Room 403, 93, 11 Cun, Shanghai Petroleum and Chemical Factory, Jinshan, Shanghai, China

Filed Jun. 13, 1986, Ser. No. 873,810
Claims priority, application China, Jun. 13, 1985, 85104763
Int. Cl.⁴ B01D *19/00*
U.S. Cl. 55—89 **12 Claims**

1. A method for eliminating cavitation in hydraulic system, comprising the following operations:

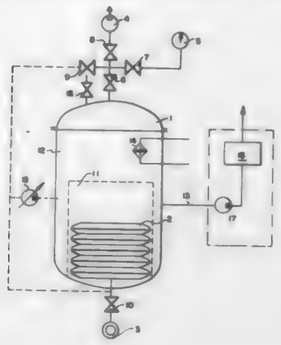
a. Filling a sealed tank with hydraulic fluid to full extent when a volume changeable device, which is connected to said sealed tank, is pressurized,

b. Vacuumizing the volume changeable device so that the level of hydraulic fluid in said sealed tank descends, making space in the top portion of said tank to make the air, water content and volatile substances to separate from said hydraulic fluid and escape to the top portion of said sealed tank without volatilization of said hydraulic fluid,

c. Vacuumizing said top portion of said sealed tank and volume changeable device simulaneously for exhausting said air, water content and volatile substances out of said tank, but not drawing out said hydraulic fluid, when the

vacuum pressure in said sealed tank is substantially kept balanced,

d. Gradually pressurizing said volume changeable device to



make it expand until the desired operating pressure inside said sealed tank is reached, and

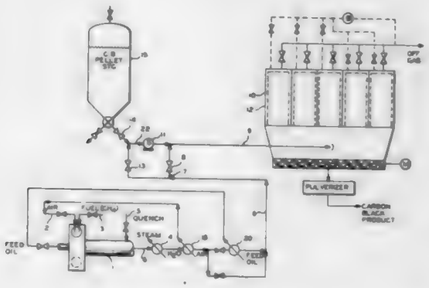
e. Pumping said hydraulic fluid out of said sealed tank to supply said hydraulic system.

4,696,685

FILTER BAG PREPARATION

James Q. Wood, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1985, Ser. No. 772,980
Int. Cl.⁴ B01D *46/00*
U.S. Cl. 55—97 **7 Claims**



1. A process for extending the life of bags used as filters in a carbon black process, comprising the steps of (1) preheating new bags with carbon black free hot gases until the bags reach operating temperature (2) flowing particle dry carbon black having a low aromatic content and a photelometer value of at least about 90 in a hot gas carrier into said bags for a length of time sufficient to provide the bags with a coating of dry carbon black and (3) thereafter filtering carbon black process effluent.

4,696,686

OXYGEN SEPARATING MEMBER AND PROCESS FOR PRODUCING THE SAME

Kyohei Usami, Inazawa, and Katsuhiko Watanabe, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 19, 1985, Ser. No. 810,569
Claims priority, application Japan, Dec. 27, 1984, 59-276715
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—158 **19 Claims**

1. An oxygen separating member comprising:

a composite membrane consisting of a porous substrate and a single organopolysiloxane film formed on a surface of said substrate, a fluorine-containing organic compound



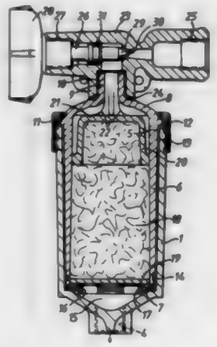
being chemically combined in said organopolysiloxane film in a non-plasma atmosphere.

4,696,687

FILTERS

Colin T. Billiet, Durham; David Baggett, Newcastle upon Tyne, and Robert M. Fielding, Blyth, all of England, assignors to Domnick Hunter Filters Limited, Durham, England

Filed Jun. 12, 1986, Ser. No. 873,398
Claims priority, application United Kingdom, Jun. 13, 1985, 8515047
Int. Cl.⁴ B01D *53/02*
U.S. Cl. 55—316 **9 Claims**



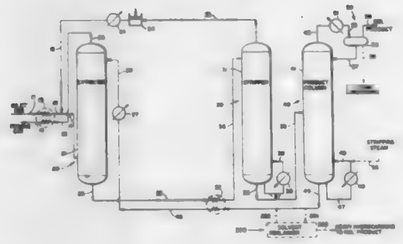
1. A filter pack for connection to a supply of compressed air in order to provide an unfiltered primary output supply of air from the pack and a filtered secondary output supply of air from the pack, the pack comprising a first housing member having an inlet port and a first outlet port, means for connecting said inlet port to a supply of compressed air, means for connecting said first outlet port to a primary output supply line; a second housing member removably fitted into said first housing member through an opening in said first housing member and having a section accessible through said opening; means for releasably securing the two housing members together; activated carbon filter material at least partially filling said second housing member and said second housing member having a wall portion thereof which is formed with an inlet into the interior thereof, said wall portion combining with part of said first housing member to form a chamber in communication with said inlet port and with said first outlet port; said accessible section of said second housing member comprising a second outlet port adapted to be connected to a secondary output supply air line, whereby the pack defines a first flow path directly from said inlet port through said chamber to said first outlet port for discharge of unfiltered air from the pack, and a second flow path from said inlet port through said chamber and through said filter material to said second outlet port for discharge of filtered air from the pack.

4,696,688

CONVERSION OF LEAN OIL ABSORPTION PROCESS TO EXTRACTION PROCESS FOR CONDITIONING NATURAL GAS

Yuv R. Mehra, Odessa, Tex., assignor to Advanced Extraction Technologies, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 808,463, Dec. 13, 1985, which is a continuation-in-part of Ser. No. 784,566, Oct. 4, 1985, Pat. No. 4,617,038, which is a continuation-in-part of Ser. No. 759,327, Jul. 26, 1985, Pat. No. 4,623,371, which is a continuation-in-part of Ser. No. 758,351, Jul. 24, 1985, Pat. No. 4,601,738, which is a continuation-in-part of Ser. No. 637,210, Aug. 3, 1984, Pat. No. 4,578,094, which is a continuation-in-part of Ser. No. 532,005, Sep. 14, 1983, Pat. No. 4,526,594, which is a continuation-in-part of Ser. No. 507,564, Jun. 24, 1983, Pat. No. 4,511,381, which is a continuation-in-part of Ser. No. 374,270, May 3, 1982, Pat. No. 4,421,535. This application Feb. 13, 1986, Ser. No. 828,996
Int. Cl.⁴ F25J *3/00*
U.S. Cl. 62—17 **47 Claims**



1. In an absorption process for the removal of C_2+ hydrocarbons from a natural gas stream by absorbing said C_2+ hydrocarbons with a lean oil to produce a residue gas stream of pipeline quality and a rich oil from which the C_2+ hydrocarbons are recovered,

the improvement which comprises providing the capability, within existing equipment after reasonable retrofit thereof of selectively extracting said C_2+ hydrocarbons from said gas stream with a lean preferential physical solvent according to said maximum recoveries and to said selected degree of (a) ethane in amounts ranging up to 95%, (b) propane in amounts ranging up to 100%, (c) butane in amounts ranging up to 100%, or (d) pentanes and hihger molecular weight hydrocarbons in amounts ranging up to 100% by:

A. selecting an absorber plant, having said existing equipment, which is used for recovering maximum quantities of said C_2+ hydrocarbons from said gas stream while using lean oils as solvent for said C_2+ hydrocarbons;

B. selecting a preferential physical solvent which is selective for ethane and heavier hydrocarbon components of said gas stream such that the relative volatility of methane over ethane is at least 6.0 and the solubility of ethane in said solvent is at least 1.0 standard cubic foot of ethane per gallon of said solvent or the preferential factor is at least 6.0;

C. replacing said oils in said selected absorber plant with a selected volume of said selected preferential physical solvent; and

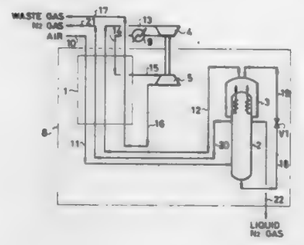
D. while using said equipment in extraction mode, contacting said gas stream with said lean preferential physical solvent at a selected flow rate within the range of 0.001–0.5 gallon of lean solvent per standard cubic foot of said gas stream to produce a residue gas stream of pipeline specifications and a rich solvent stream containing said ethane and heavier hydrocarbon components.

4,696,689

METHOD AND APPARATUS FOR SEPARATING OF PRODUCT GAS FROM RAW GAS

Hideharu Mori; Shozi Koyama, and Masahiro Yamazaki, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,675
Claims priority, application Japan, Nov. 30, 1984, 59-251822
Int. Cl.⁴ F25J *3/02*
U.S. Cl. 62—32 **28 Claims**



1. A gas separating apparatus comprising:

a heat exchanger for cooling raw gas by effecting a thermal exchange with returning low temperature gas;

a fractionating tower for taking in said raw gas cooled down by means of said heat exchanger, fractionally separating said raw gas into at least one product gas and an offgas and outputting said at least one product gas and said offgas, respectively;

an expansion turbine for taking in a low temperature gas within a process and subjecting said low temperature gas to adiabatic expansion for generating a cryogenic effect;

a path for leading normal temperature gas to a booster actuated by said expansion turbine after said low temperature gas has been restored to a normal temperature to form said normal temperature gas by means of said heat exchanger, said booster being capable of pressurizing said normal temperature gas;

a cooling means for cooling said gas pressurized by said booster to a much lower temperature; and

a path for leading said gas cooled by said cooling means to said expansion turbine.

4,696,690

METHOD AND DEVICE FOR PREHEATING RAW MATERIALS FOR GLASS PRODUCTION, PARTICULARLY A CULLET MIXTURE

Helmut Roloff, Neinburg, Fed. Rep. of Germany, assignor to Himly, Holscher GmbH & Co., Nienburg, Fed. Rep. of Germany

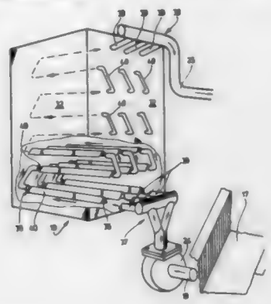
Filed Feb. 7, 1986, Ser. No. 826,953
Int. Cl.⁴ C03B *1/00*
U.S. Cl. 65—27 **20 Claims**

1. A method for preheating a cullet mixture used for glass production and stored in a bunker (**19**), comprising: first, passing exhaust gas from a glass melting furnace (**10**) through a heat exchanger (**13**) to preheat fresh combustion air for the glass melting furnace (**10**); and, then, via a plurality of flow ducts (**33**) connected in flow-communication with one another, flowing the exhaust gas from the heat exchanger through the cullet mixture (**20**) in the bunker (**19**) to cause the residual heat in the exhaust gas to preheat the cullet mixture (**20**); and, to raise the temperature in the bunker (**19**), mixing exhaust gas coming directly from the glass melting furnace (**10**) with the exhaust gas exiting the heat exchanger.

10. A device for preheating cullet (**20**) used for glass production and stored in a bunker (**19**), comprising:

a plurality of flow ducts (**33**) arranged in the bunker (**19**); horizontal groups of adjacent paralle flow ducts (**33**) lying

alongside one another in several vertically-spaced duct levels (34);
the flow ducts (33) in adjacent duct levels (34) being offset with respect to each other;
the same number of flow ducts (33) being in each duct level (34); and
wherein an upper half of each duct (33) is formed as an equal-sided angle section (40) whose apex edge (42) is directed upward, and



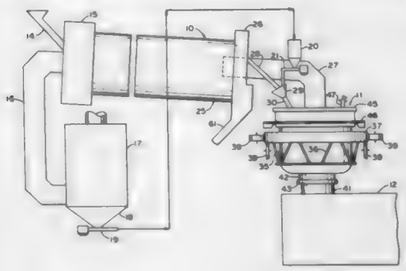
front sides of the angle sections (40) being affixed to opposite side walls (32) of the bunker (19); and
an overflow duct (36, 48) interconnecting each duct (33) in a level (34) with a corresponding duct (33) in an adjacent level (44), each overflow duct (36, 48) being assigned to the front side of the corresponding flow duct (33) directed toward the same side wall (32) of the bunker (19).

4,696,691

METHOD OF GLASS BATCH PREHEATING AND LIQUEFYING WITH RECYCLING OF PARTICULATES

Robert A. Lawhon, Chehalis, Wash.; Robert B. Heithoff, LaVale, Md., and Wayne H. Gonzalez, Tumwater, Wash., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1986, Ser. No. 914,226
Int. Cl.[4] C03B 3/00
U.S. Cl. 65—27 19 Claims



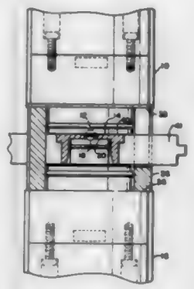
1. In a method for processing batch materials wherein pulverulent material is preheated by contact with hot gas whereby particulate material becomes entrained in the gas, and preheated material is transferred to a liquefying zone where intensified heating rapidly renders the material to an at least partially melted liquefied condition, characterized by separating the entrained particulates from the gas and adding the particulates to the preheated material immediately prior to being liquefied so as to incorporate the particulates into the liquefied mass.

4,696,692

KINEMATICALLY DETERMINATE GLASS PRESSING MOLD ASSEMBLY AND METHOD OF USE

Paul S. Schmitt, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 10, 1986, Ser. No. 940,120
Int. Cl.[4] C03B 23/26
U.S. Cl. 65—102 17 Claims



1. A multi-part mold assembly for molding glass lenses comprising:
a first mold, a first molding surface formed in a face of said first mold;
a second mold, a second molding surface formed in a face of said second mold, the faces of said molds being opposed;
means for closing said first and second molds along a first axis to form a mold cavity including said first and second molding surfaces;
sleeve means positioned between said first and second molds for kinematically determining the alignment of said first and second molding surfaces;
one of said sleeve means and said first mold having a first set of three alignment pads formed thereon, the other of said sleeve means and said first mold set having first surface means for abutting said alignment pads and for constraining said first mold against rotation about axes which are orthogonal to the direction of closing said molds; and
one of said sleeve means and said second mold having a second set of three alignment pads formed thereon, the other of said sleeve means and said second mold having second surface means for abutting said second set of alignment pads and for constraining said second mold against rotation about axes which are orthogonal to the direction of closing said molds.

15. A method of precision molding optical elements from heat-softened glass preforms which comprises:
providing a first mold having a first molding surface;
providing a second mold having a second molding surface;
providing a sleeve member between said first and second molds for cooperating therewith to kinematically align said first and second molding surfaces;
providing a sleeve insert for retaining a glass preform to be molded into a precision optical element;
heat-softening said preform; and
moving said first and second molds along a first axis toward one another to form a mold cavity including said first molding surface, said second molding surface and a cavity in said sleeve insert for precision molding an optical element from the heat-softened preform retained by said insert, while simultaneously kinematically aligning said first and second molding surfaces solely with respect to five degrees of freedom including displacements with respect to said first axis and second and third axes orthogonal to each other and said first axis and with respect to angular rotation about said second and third axes.

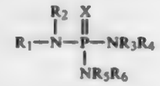
4,696,693

OXIDIZED SULFUR DERIVATIVES OF DIAMINOPHOSPHINYL COMPOUNDS AS UREASE INHIBITORS AND UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS

Michael D. Swerdloff, Parsippany; Milorad M. Rogic, Whippany, both of N.J., and Larry L. Hendrickson, Camillus, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 563,347, Dec. 20, 1983, Pat. No. 4,629,491. This application May 12, 1986, Ser. No. 861,809
Int. Cl.[4] C05C 9/00
U.S. Cl. 71—28 8 Claims

1. A method of inhibiting the urease catalyzed hyrolysis of urea at a situs which comprises applying to said situs a urease inhibiting effective amount of one or more compounds of the formula:



Wherein:
X is oxygen or sulfur;
R^1 is



wherein
R_1' is amino or substituted or unsubstituted alkyl, aryl or amino wherein permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, 0-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl;
R_2 is hydrogen, or substituted or unsubstituted alkyl or aryl where permissible substituents are selected from the group consisting of one or more alkyl, aryl, halogen, trihalomethyl, nitro, cyano, alkanoyl, alkylcarboxylate, arylcarboxylate, alkoxy, hydroxy, alkylmercapto, arylmercapto, mercapto, amino, alkylamino, dialkylamino, arylamino, diarylamino, diaminophosphinyl, N-diaminophosphinyl, 0-diaminophosphinyl, S-diaminophosphinyl, carbamoyl and carbamoyldiaminophosphinyl groups; and
R_3, R_4, R_5 and R_6 are the same or different and are hydrogen or alkyl having from about 1 to about 4 carbon atoms.

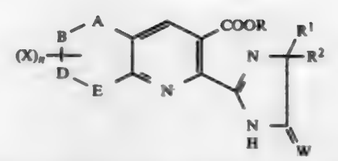
4,696,694

PYRIDINE DERIVATIVES AND THEIR HERBICIDAL COMPOSITIONS

Tatsuo Numata; Masataka Hatanaka, both of Funabashi; Junichi Watanabe, Narashino; Takasi Ikai, Tokyo; Tsutomu Nawamaki, Yono, and Kenji Hattori, Urawa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Jul. 7, 1986, Ser. No. 882,408
Claims priority, application Japan, Jul. 25, 1985, 60-164407; Jan. 16, 1986, 61-6979; May 26, 1986, 61-120455
Int. Cl.[4] A01N 43/40; C07D 49/052
U.S. Cl. 71—86 9 Claims

1. A pyridine derivative having the formula:



(I)

wherein one of A, B, D and E is an oxygen atom, a sulfur atom, —SO—, —SO_2— or —NR^3—, with the rest being all carbon atoms, one double bond may or may not be present in the ring; X is a halogen atom, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 haloalkyl group, a C_1–C_4 haloalkoxy group, a C_1–C_4 alkylthio group, a C_1–C_4 haloalkylthio group, a C_1–C_4 alkoxycarbonyl group, a C_1–C_4 alkylthioalkyl group, a tetrahydrothiopyranyl group, a hydroxyl group, a CF_3 group or a phenyl or pyridyl group (which may be substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, CF_3, nitro or halogen); n is an integer of from 0 to 6, and when n is an integer of from 2 to 6, the plurality of X may be the same or different; W is an oxygen atom or a sulfur atom; R is a hydrogen atom, a di-lower alkylimino group, a C_1–C_5 alkyl group (which may be substituted by C_1–C_3 alkoxy, hydroxyl, C_3–C_6 halocycloalkyl carboxyl, lower alkoxycarbonyl, cyano, dialkylphosphonyl, halogen, benzyloxy, tri-lower alkylammonium or phenyl which may be substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro), a C_2–C_5 alkenyl group (which may be substituted by C_1–C_3 alkoxy, lower alkoxycarbonyl, two C_1–C_3 alkoxy or phenyl), a C_2–C_5 alkynyl group, a C_4 or C_5 oxacycloalkyl group, a C_2–C_5 mono-, di- or tri-haloalkenyl group, a C_2–C_5 haloalkynyl group, a glycidyl group, a furfuryl group, an alkylthioalkyl group, a C_3–C_6 cycloalkyl group which may be substituted by C_1–C_3 alkyl, or a cation selected from the group consisting of an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a quaternary ammonium ion; R^1 is a C_1–C_4 alkyl group, R^2 is a C_1–C_4 alkyl group or a C_3–C_6 cycloalkyl group, or R^1 and R^2 together with the adjacent carbon atom, form a C_3–C_6 cycloalkyl group which may be substituted by C_1–C_3 alkyl; and R^3 is a hydrogen atom or a C_1–C_3 alkyl group; or an optical isomer of the derivative when R^1 and R^2 are different from each other.

9. A method for controlling weeds which comprises applying to the weeds or to the locus of the weeds an effective amount of a pyridine derivative or its optical isomer as defined in claim 1.

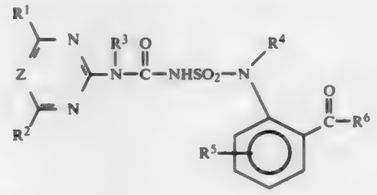
4,696,695

SULFAMOYL UREA DERIVATIVES

Barry V. Gemert, Massillon, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 791,269, Oct. 25, 1985, Pat. No. 4,622,065, which is a continuation-in-part of Ser. No. 667,513, Nov. 1, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,989
Int. Cl.[4] C07D 239/69; A01N 43/54
U.S. Cl. 71—92 4 Claims

1. A compound represented by the formula:



wherein:
Z is CH;

R^1 and R^2 are the same or different and represent halogen or C_1 to C_6 alkyl, or alkoxy;
R^3 and R^4 are the same or different and represent hydrogen, C_1 to C_4 alkyl, alkoxyalkyl, haloalkyl, or up to C_3 alkenyl or alkynyl;
R^5 is hydrogen, halogen or C_1 to C_4 alkyl or haloalkyl; and
R^6 is methyl or ethyl.

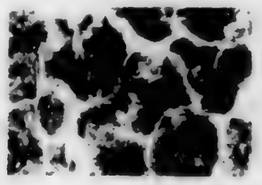
4. In a method of controlling weeds wherein a herbicidally effective amount of herbicide is applied to a growth medium prior to emergence of weeds therefrom or to the weeds subsequent to their emergence from the growth medium, the improvement residing in using as the herbicide a compound or mixture of compounds defined in claim 1.

4,696,696

SINTERED ALLOY HAVING IMPROVED WEAR RESISTANCE PROPERTY

Yoshiaki Fujita, Saitama, and Satoshi Kawai, Tochigi, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jun. 4, 1986, Ser. No. 870,373
Claims priority, application Japan, Jun. 17, 1985, 60-130006
Int. Cl.⁴ C22C *29/02*
U.S. Cl. 75—246 **8 Claims**



1. A wear-resistant sintered alloy consisting essentially of: from 2.0% to 3.5% by weight of C, from 0.3% to 0.8% by weight of P, from 0.5% to 3.0% by weight of Mn, and remainder Fe, said alloy being sintered in liquid phase.

4,696,697

POLISHING COMPOSITION

Hirohito Kitano; Toshiki Oowaki, and Takashi Baba, all of Aichi, Japan, assignors to Fujimi Kenmazai Kogyo Kabushiki Kaisha, Japan

Filed Feb. 7, 1986, Ser. No. 827,195
Claims priority, application Japan, Jun. 4, 1985, 60-121200
Int. Cl.⁴ C09G *1/04*
U.S. Cl. 106—3 **9 Claims**

1. A polishing composition comprising water, a polishing agent of aluminum oxide and a polishing accelerator of nickel sulfate, said polishing composition being neutral or weak acid in pH measurement.

5. In a polishing process with a polishing composition applied between a surface of a product and a surface of a polishing pad which is slidable on the surface of the product, the improvement wherein the polishing composition comprises water, a polishing agent of aluminum oxide and a polishing accelerator of nickel sulfate, and said polishing composition is neutral or weak acid in pH measurement.

4,696,698

FLEXIBLE GROUT COMPOSITION AND METHOD

Todd D. Harriett, Elk Grove Village, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Filed Oct. 15, 1985, Ser. No. 787,505
Int. Cl.⁴ C04B *12/04*
U.S. Cl. 106—74 **22 Claims**

1. A grout composition for admixture with water to form a gelled grout essentially impermeable to water comprising, where percentages are percent by weight of the composition before admixture with water:
10–80% water-swellable clay;
20–80% solid, particulate filler;
0.5–35% water soluble silicate;
0.5 to 5% dispersing agent for the water-swellable clay; and
0.5–35% gelling agent for the water-swellable clay wherein the dispersing agent and gelling agent combination prevents the clay from gelling after admixture of the composition with water for at least one hour.

4,696,699

FLEXIBLE GROUT COMPOSITION AND METHOD

Todd D. Harriett, Elk Grove Village, Ill., assignor to American Colloid Company, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 787,505, Oct. 15, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 849,048
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.⁴ C04B *12/04*
U.S. Cl. 106—74 **23 Claims**

1. A grout composition for admixture with water to form a gelled grout essentially impermeable to water comprising, where percentages are percent by weight of the composition before admixture with water:
10–80% water-swellable clay;
20–80% solid, essentially non water-swellable particulate filler;
0.5–35% water soluble silicate;
0.5–5% dispersing agent for the water-swellable clay; and
0.5–35% gelling agent for the water-swellable clay wherein the dispersing agent and gelling agent combination prevents the clay from gelling after admixture of the composition with water for at least one hour.

4,696,700

INORGANIC PIGMENTS AND PROCESS FOR THEIR PRODUCTION

Robert Fischer, Obertshausen, and Dieter de Ahna, Egelsbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 512,992
Int. Cl.⁴ C04B *14/30*; C08K *3/22*; C09C *1/10*
U.S. Cl. 106—291 **22 Claims**
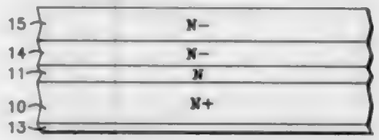
1. In an inorganic pigment having a spinel structure and having the formula AB_2O_4 where A is at least one of Co, Ni, Cu, Zn, Cd, Mg, Mn and Fe and B is at least one of Al, Cr, Fe, Ga, In, La and V, the improvement wherein a substantial portion of said pigment has the form of platelets, wherein the pigment has high covering power.

4,696,701

EPITAXIAL FRONT SEAL FOR A WAFER

Daniel J. Sullivan, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 12, 1986, Ser. No. 929,320
Int. Cl.⁴ H01L *29/36, 29/38*
U.S. Cl. 148—33.5 **5 Claims**



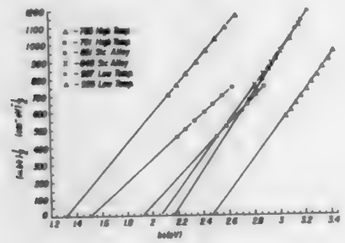
1. A semiconductor wafer having a seal layer to reduce autodoping during subsequent growth of additional epitaxial layers, comprising: a semiconductor wafer of a first conductivity; a first epitaxial layer covering the semiconductor wafer to serve as the seal layer and being of the first conductivity and having a thickness in the range of 10 to 15 micrometers; and a second epitaxial layer covering the first epitaxial layer, wherein the seal layer has a resistivity of the order of 0.1 ohm cm for an N-type conductivity and a resistivity in the range of 0.5 to 4.5 ohm cm for a P-type conductivity wherein the semiconductor wafer has a maximum resistivity of 0.0055 ohm cm.

4,696,702

METHOD OF DEPOSITING WIDE BANDGAP AMORPHOUS SEMICONDUCTOR MATERIALS

Frank B. Ellis, Jr., Princeton Junction, and Alan E. Delahoy, Rocky Hill, both of N.J., assignors to Chronar Corp., Princeton, N.J.

Continuation of Ser. No. 694,650, Jan. 24, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 933,972
Int. Cl.⁴ H01L *21/205*
U.S. Cl. 437—88 **8 Claims**



1. The method of fabricating an amorphous silicon semiconductor material on a substrate which comprises:
decomposing one or more gaseous phase higher order silanes in the presence of a p-type catalytic dopant without photo-sensitization at a substrate temperature of about 200° C. and a pressure in the range from about 1 to 50 Torr to deposit on said substrate a p-type amorphous semiconductor material having a wide bandgap in the range from about 1.8 to 2.6 electron volts.

4,696,703

CORROSION RESISTANT AMORPHOUS CHROMIUM ALLOY COMPOSITIONS

Richard S. Henderson; Michael A. Tenhover, both of Solon, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 15, 1985, Ser. No. 755,247
Int. Cl.⁴ C22C *27/00*
U.S. Cl. 148—403 **20 Claims**

1. An amorphous metal alloy of the formula

$$Cr_aM_bB_cC_dR_e$$

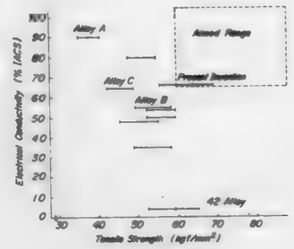
wherein
M is at least one metal selected from the group consisting of Mo, W, Nb and Ta;
R is at least one element selected from the group consisting of N, P, As, S and Se; and
wherein
a ranges from about greater than 0.4 to about 0.6;
b ranges from about 0.15 to about less than 0.4;
c ranges from zero to about 0.16;
d ranges from zero to about 0.2; and
e ranges from zero to about 0.3;
with the proviso that the sum of (c+d+e) ranges from about 0.04 to about 0.35.

4,696,704

MATERIAL FOR LEAD FRAMES

Kazumasa Takeuchi, Aichi; Takaharu Iwadachi, Handa, and Kazuo Ikushima, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 28, 1986, Ser. No. 867,440
Claims priority, application Japan, Jun. 13, 1985, 60-129048
Int. Cl.⁴ C22C *9/06*
U.S. Cl. 148—412 **16 Claims**



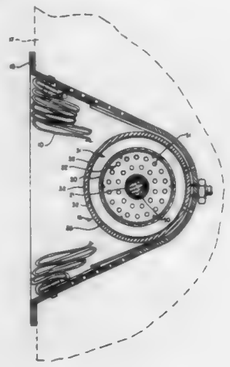
1. A thin plate alloy for lead frames comprising 0.1–0.28% by weight of Be, 0.5–1.3% by weight of Ni, and a remainder being Cu and unavoidable impurities, said thin plate alloy having an electrical conductivity of at least 65% IACS, and a tensile strength of at least 56 kgf/mm².

4,696,705

GAS GENERATING MATERIAL

Brian K. Hamilton, Littleton, Colo., assignor to TRW Automotive Products, Inc., Lyndhurst, Ohio

Filed Dec. 24, 1986, Ser. No. 946,376
Int. Cl.⁴ C06B *45/02*
U.S. Cl. 149—21 **7 Claims**



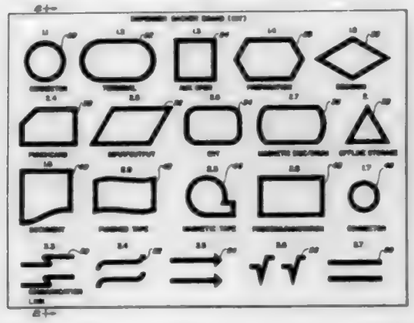
1. A structure for generating gas, said structure comprising:
a grain made of an azide based material which generates gas and forms a sinter upon combustion,
said gas generating material including from about 2 to about 6% by weight of graphite fibers,
said graphite fibers having a diameter of 3–15 microns and an average length of 40 to 125 thousandths of an inch to reinforce the sinter which remains after combustion of the gas generating material.

4,696,706

METHOD OF USING LOGIC DESIGN ADHESIVE SYMBOLS

Kevin W. Griffin, 4085 Dianthus La., Titusville, Fla. 32796, and Robert P. Mallette, 119 E. Leon La., Cocoa Beach, Fla. 32931

Filed Oct. 31, 1985, Ser. No. 793,135
Int. Cl.⁴ B32B *31/12*
U.S. Cl. 156—62 **11 Claims**



1. A method of preparing a functional logic diagram comprising the steps of:
   (a) providing a plurality of distinct logic symbols, some of said logic symbols having different shapes corresponding to distinctly different logic functions, each logic symbol having a writing surface and an adhesive backing to allow all of the distinct logic symbols to be secured to a surface;
   (b) storing the plurality of distinct logic symbols in a dispensing means;
   (c) selecting from the plurality of distinct logic symbols, a logic symbol corresponding to a chosen logic function;
   (d) removing from the dispensing means the selected distinct logic symbol; and
   (e) attaching the selected distinct logic symbol in a position corresponding to the chosen logic function.

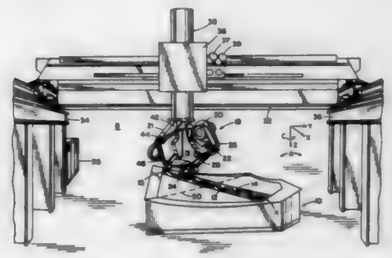
2. The method recited in claim 1 further comprising the step of writing upon said writing surface of said selected logic symbol.

4,696,707

COMPOSITE TAPE PLACEMENT APPARATUS WITH NATURAL PATH GENERATION MEANS

Henry W. Lewis, and Jorge E. Romero, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Oct. 31, 1985, Ser. No. 794,172
Int. Cl.⁴ B31D *1/00*
U.S. Cl. 156—64 **44 Claims**



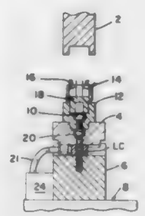
1. A multi-axis tape laying machine for depositing composite tape in selected generally parallel courses upon a mandrel having a complex contoured surface to form thereon a conforming ply and for laying succeeding plies in like manner upon said first-mentioned ply to build a laminated structure upon said mandrel, said tape laying machine comprising:
   a tape laying head movable in a plurality of axes under controlled power applied in accordance with control signals;
   a control processor for receiving machine instructions and for generating said control signals in accordance with said machine instructions; and
   means for generating said machine instructions defining the natural path of each selected tape course on the surface of said mandrel from a representation of said surface, an incremental step distance of movement along said natural path, and the width of said tape.

4,696,708

ULTRASONIC WELDING

Joseph R. Keller, and Bruce C. Longenecker, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1985, Ser. No. 797,583
Int. Cl.⁴ B29C *65/08*; **G01N** *29/00*
U.S. Cl. 156—64 **13 Claims**



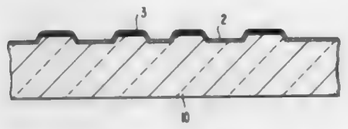
1. A method of measuring the relative ultrasonic energy coupled to a load cell through a workpiece to be welded in an ultrasonic welding operation, the method comprising the steps of:
   placing said workpiece in a work holder, said workholder being disposed beneath, and being spaced from, an ultrasonic welding horn, with said load cell supported beneath said workholder in a mechanically preloaded condition so that said load cell produces an output signal proportional to the amplitude of the ultrasonic energy to which the load cell is couple through the workpiece;
   starting, upon the initiation of the welding operation, a timer arranged to run for a predetermined welding period of time;
   processing the output signal of the load cell to produce a sinusoidal voltage which is instantaneously proportional to the ultrasonic energy coupled through the workpiece to the load cell;
   summing said voltage over time so as to be proportional to the accumulated ultrasonic energy applied to the workpiece;
   generating a reference voltage of a value corresponding to the accumulated ultrasonic energy that should have been applied to the workpiece during said predetermined period of time in order satisfactorily to weld the workpiece;
   comparing said summed voltage with said reference voltage; and
   generating a success signal if the value of said summed voltage reaches the value of said reference voltage whilst said timer is running.

4,696,709

PROCESS FOR PRODUCTION OF AN EXPANDED POLYOLEFIN PANEL

Werner Hargarten, Windeck/Hoppengarten, and Rudolf Kautz, Hennef, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Filed Jun. 19, 1985, Ser. No. 746,532
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422682
Int. Cl.⁴ B32B *31/14, 5/20*
U.S. Cl. 156—79 **6 Claims**



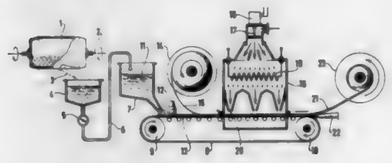
1. A process for producing a foamed polyolefin panel wherein a polyolefin or a mixture of a polyolefin with rubber and/or with a synthetic resin miscible therewith is blended homogeneously with a crosslinking agent and a chemical blowing agent and shaped into a panel-like matrix below decomposition temperature of the blowing agent and below the activation temperatuare of the crosslinking agent, and a film of a thermoplastic synthetic resin, is applied unilaterally or bilaterally to the matrix, and then the matrix, provided with the film, is crosslinked and expanded by heating to a temperature above the activation temperature of the crosslinking agent and the decomposition temperature of the blowing agent, characterized in that the film is imprinted on one surface side with printing ink in correspondence with a pattern and is placed with the printed surface side onto the matrix, and that, during expansion and crosslinking of the matrix, the areas provided with printing inks are caused to expand somewhat more vigorously than the areas not provided with printing inks, so that slightly raised printed areas are formed on the surface of the expanded polyolefin panel.

4,696,710

METHOD OF MANUFACTURING A COMPOSITE REINFORCED STRUCTURE OF CERAMICS MATERIAL

Louis Minjolle, Tarbes; Claudette Drouet, Juillan; Alain Hordonneau, Saint Aubin de Medoc, and Bernard Capdepuy, Saint Medard en Jalles, all of France, assignors to Ceramiques et Composites, Courbevoie, France

Continuation of Ser. No. 829,863, Feb. 18, 1986, abandoned, which is a continuation of Ser. No. 614,076, May 25, 1984, abandoned. This application Nov. 20, 1986, Ser. No. 933,275
Claims priority, application France, May 25, 1983, 83 08573
Int. Cl.⁴ B32B *18/00, 31/26*
U.S. Cl. 156—89 **9 Claims**



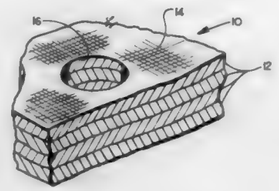
1. A method of forming a composite structure comprised of ceramic material reinforced with refractory fibers, said method comprising the steps of:
   providing a slip comprised of a ceramic powder, a synthetic resin capable of wetting said ceramic powder and said refractory fibers, and a solvent for said synthetic resin;
   spreading said slip on moving belt means;
   introducing refractory fibers into said slip;
   drying said slip to eliminate the liquid phase and form a sheet;
   stacking a plurality of said sheets;
   heating the resultant stack to join said plurality of sheets to form said composite structure; and
   sintering said ceramic material in said composite structure without degrading said refractory fibers.

4,696,711

METHOD FOR FORMING HOLES IN COMPOSITES

Longin B. Greszczuk, Mission Viejo, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 30, 1983, Ser. No. 537,867
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—173 **6 Claims**



1. A method for the formation of holes in composite structure comprising the steps of:
   forming composite structure impregnated with a matrix material;
   B-staging the composite structure;
   cutting an appropriate size hole in the composite structure;
   inserting a male forming die in the composite structure;
   completing the curing of the structure with the die in place;
   removing the male forming die leaving close tolerance hole in the composite structure.

4,696,712

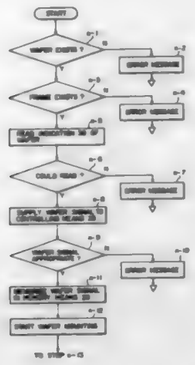
SEMICONDUCTOR WAFER MOUNTING AND CUTTING SYSTEM

Yuzo Nonaka, Chiba, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 646,326, Aug. 31, 1984, abandoned. This application Oct. 25, 1985, Ser. No. 791,488
Claims priority, application Japan, Nov. 7, 1983, 58-207496
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—351 **10 Claims**

1. A semiconductor wafer mounting and cutting system including a wafer mounting machine for mounting a semiconductor wafer to a frame and a wafer cutting machine for receiving the frame and the wafer mounted thereto fed from said wafer mounting machine and cutting the wafer as required, said system comprising
   controlling means for forming a relative relation signal showing a relative relation between a first indication means which has been or is applied to the frame and a

second indication means of the wafer, which wafer has been or is mounted to the frame and

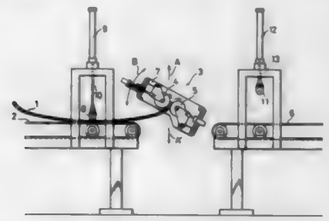


memory means for memorizing the relative relation signal formed by said controlling means.

4,696,713
METHOD AND APPARATUS FOR PRESSING LAMINATED GLASS

Masaharu Okafuji, Maizuru; Yoshinori Ochi, Nishinomiya; Atsushi Miyake, Maizuru; Junichi Noguchi, Maizuru, and Ichiro Matsuo, Maizuru, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 627,858, Jul. 5, 1984, abandoned. This application Feb. 5, 1986, Ser. No. 825,964
Claims priority, application Japan, Jul. 5, 1983, 58-122198
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—358 **19 Claims**

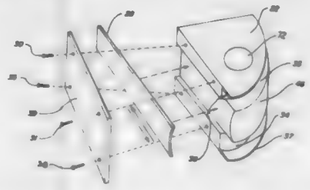


1. A press roll apparatus for curved laminated glass, comprising:
- a press roll unit having press rolls which press against the opposite sides of a laminated glass assembly having a curved surface to press it together;
- press roll drive means for driving said press rolls to roll along the surface of the laminated glass and move it in a given direction;
- a roll frame for rotatably supporting said press roll unit;
- roll frame drive means for rotating said roll frame so that the pressure of the press rolls on the laminated glass assembly is normal to the glass surface;
- a support frame for supporting said roll frame at various heights;
- support frame drive means for shifting the height of said support frame;
- memory means for storing a plurality of sets of data corresponding, respectively, to each of a series of locations along the curved surface of the laminated glass assembly in the direction of rolling through said apparatus, each set of data including:
- first data representing the distance of the location along the surface of the glass, in said direction of rolling, from a reference location;
- second data representing the angle of the surface of the glass at said location relative to a reference angle and
- third data representing the height of the glass at said location relative to a reference height;
- and means for operating said press roll, roll frame and support frame drive means in synchronism according to each set of data in succession such that said press rolls, said roll frame and said support frame are simultaneously driven from their respective locations corresponding to one set of data, to their respective locations corresponding to the next successive set of data.

4,696,714
FOIL APPLICATOR

Theodore Voorhees, 331 Greenacres Dr., Anderson, Calif. 96007

Filed Jan. 22, 1986, Ser. No. 821,478
Int. Cl.⁴ B31F *1/00*; B32B *31/00*; B44C *1/00*
U.S. Cl. 156—468 **3 Claims**

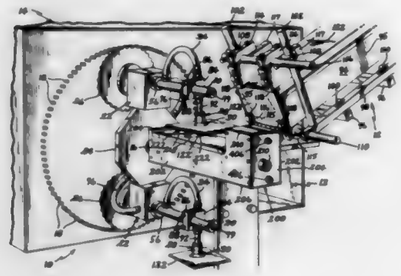


1. A foil applicator capable of applying decorative film from transfer foil to a contoured edge of a workpiece, comprising:
- a base;
- a preformed transfer block substantially rigidly attached to said base having a contoured face with a contour substantially the same as the contour of said contoured edge of said workpiece to which said transfer foil is to be applied;
- heating means for heating said contoured face of said preformed transfer block so that said transfer foil substantially conforms to said contoured face when pulled taut against said contoured face;
- means for routing said transfer foil to said preformed transfer block and over said contoured face of said preformed transfer block;
- tension means for maintaining tension on said transfer foil to ensure that said transfer foil conforms to said contoured face of said preformed transfer block;
- means for transporting said contoured edge of said workpiece past said contoured face of said preformed transfer block;
- a hammer having a contoured surface the contour of which is substantially the same as said contour of said contoured edge of said workpiece and said contour of said contoured face of said preformed transfer block, positioned in close proximity to said preformed transfer block, and
- activating means for pounding said hammer against said transfer foil and said contoured edge of said workpiece
- whereby said decorative film from said transfer foil heated by and conformed to said contour of said contoured face of said preformed transfer block is securely adhered to said contoured edge of said workpiece.

4,696,715
PICK-AND-PLACE GLUE APPLICATOR

Melford J. Bahr, Corcoran, Minn., assignor to MGS Machine Corporation, Minneapolis, Minn.

Filed Feb. 11, 1986, Ser. No. 828,389
Int. Cl.⁴ B65C *9/12*
U.S. Cl. 156—568 **11 Claims**

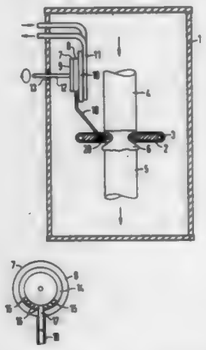


1. A pick-and-place glue applicator comprising:
- a frame member;
- a support shaft supported on said frame member;
- means for mounting said support shaft to rotate about a secondary axis of rotation;
- a suction cup secured to said support shaft and extending radially therefrom to a suction end;
- means for rotating said support shaft about said secondary axis and simultaneously moving said shaft in an orbit about a primary axis parallel to and spaced from said secondary axis with said support shaft rotating in a direction opposite from a direction of rotation of said primary axis with said suction cup following a repeating path as such support shaft completes an orbit, said repeating path including a plurality of outwardly projecting positions with said cups projecting away from said primary axis and a plurality of connecting paths connecting said positions with said cups in said connecting paths projecting into an area bounded by said repeating path;
- said means for rotating said support shaft being arranged for said cup to move in a generally hypotrochoidal path having distinct outwardly projecting positions and having connecting paths between said positions with generally linear portions; said means for applying said glue positioned adjacent one of said linear portions;
- means for producing a vacuum;
- means for releasing a vacuum;
- means for alternately connecting said cup to said vacuum means and vacuum release means;
- said means for alternately connecting said cup to said vacuum means and vacuum release means includes means for applying a vacuum to a cup approaching one of said outwardly projecting positions and maintaining said vacuum as said cup passes said means for applying said glue to a subsequent outwardly projecting position;
- means for supporting an article to be picked by said cup adjacent one of said outwardly projecting positions;
- means for applying glue to an article supported by a cup as said cup moves along a connecting path; and
- said means for applying said glue being supported by said frame member and extending into a center of said orbit and presenting a glue applying surface opposing a linear portion of a connecting path and spaced therefrom a distance for an article carried by a cup to contact said glue applying surface to transfer glue from said surface to said carried article.

4,696,716
APPARATUS FOR DOPING SEMICONDUCTOR RODS WITH SOLID DOPANTS

Wolfgang Keller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,218
Claims priority, application Fed. Rep. of Germany, May 20, 1985, 3518073
Int. Cl.⁴ C30B *13/10*, *13/12*
U.S. Cl. 156—605 **12 Claims**

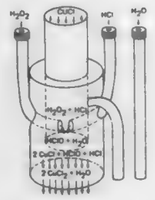


1. An arrangement for doping a semiconductor rod, the arrangement comprising an enclosure for the semiconductor rod and the semiconductor rod having a crucible-free, localized float-zone, dopant pellets are introduced to the float-zone, the arrangement having at least one hopper for introducing the dopant pellets, the hopper having an exit port connected to an outlet conduit directed at the float-zone, the hopper is mounted on the inside of said enclosure, and means for operating the hopper from the outside of said enclosure.

4,696,717
PROCESS FOR AUTOMATICALLY REGENERATING COPPER CHLORIDE ETCH SOLUTIONS

Werner D. Bissinger, Sindelfingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,560
Claims priority, application European Pat. Off., Oct. 19, 1984, 84112630.3
Int. Cl.⁴ C23F *1/46*
U.S. Cl. 156—642 **16 Claims**



1. A process for regenerating an aqueous copper chloride etch solution form a separate etch unit which, in a depleted state, includes more than about 6 g/l Cu^+ ions as copper (I) chloride, a reduced amount of copper (II) ions as copper (II) chloride, less than about 30 ml/l 32 percent HCl and sodium chloride comprising:

(i) converting a quantity of H_2O_2 corresponding to the copper (I) ion concentration in the solution in its depleted

state into HClO by combining the H_2O_2 in a separate oxidation reactor with a stoichiometric quantity of HCl;

(ii) immediately thereafter in the oxidation reactor allowing the HClO to combine with the solution in its depleted state to accomplish oxidation of copper (I) chloride to copper (II) chloride by the HClO to provide a regenerated solution; and

(iii) transferring the regenerated solution to a separate regeneration unit in sufficient quantity that the CU^+ ion concentration of the solution in the regeneration unit is decreased to less than about 6 g/l.

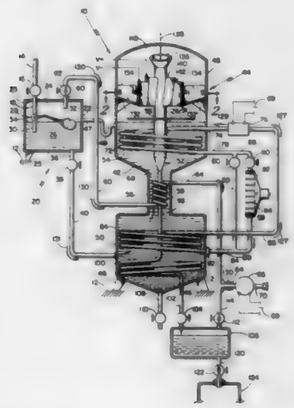
13. A regeneration system for implementing the process according to claim 1 comprising storage tanks for hydrogen peroxide, hydrochloric acid and water, a redox electrode for controlling the addition of hydrogen peroxide responsive to the concentration of Cu^+ ions in the solution, solenoid valves or dosing pumps for adding computed quantities of hydrochloric acid and water, wherein the storage tanks are connected through connecting lines and solenoid valves or dosing pumps to an oxidation reactor receiving the solution to be regenerated from the separate etch unit, and wherein the oxidation reactor is connected to a regeneration unit which includes a connecting line with a pump back to an etch unit and an overflow to an overflow tank.

4,696,718

WATER PURIFICATION DEVICE

Henry C. Lasater, P.O. Box 616, Cuba, N. Mex. 87013

Filed Feb. 4, 1986, Ser. No. 826,083
Int. Cl.[4] B01D 3/02
U.S. Cl. 202—176 20 Claims



1. An energy conserving water purification device comprising: means enabling support on a surface for degassing and distilling impure water containing dissolved gases and other solid impurities and for connecting to a power source and for accomplishing degassification by applying a partial vacuum to the water, such partial vacuum producing a thermal side effect sufficient that the removed gases are warmed and the degassed water cooled during degassification, including,

a degassification apparatus for extracting the dissolved gases from the impure water and including a degassification container for receiving the impure water and having a top, a bottom and a water inlet and outlet, said container constructed and arranged to be selectively sealable so as to maintain at least a partial vacuum therein;

a distillation apparatus for removing the solid impurities from the impure water and connected in fluid flow relationship with said outlet of said degassification container to receive degassed water therefrom, said distillation apparatus including a boiler, a condenser and a purified water reservoir;

means for selectively establishing a partial vacuum in said degassification container and in said distillation apparatus for causing to be produced cooled, degassed water and warmed removed gases above said cooled degassed water in said container and to produce a lowered boiling point for water in said distillation apparatus; and

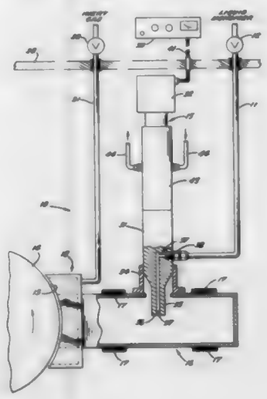
a gas exhaust channel extending from said top of said degassification container and including a gas outlet, said exhaust channel positioned to receive the warmed gases removed from the water in said degassification container and positioned in heat transfer relationship with at least one of said apparatuses to transfer heat from the warmed gases received within said exhaust channel to the cooled, degassed water so as to warm the degassed water.

4,696,719

MONOMER ATOMIZER FOR VAPORIZATION

Gregg C. Bischoff, Gansevoort, N.Y., assignor to Spectrum Control, Inc., Erie, Pa.

Continuation of Ser. No. 692,746, Jan. 18, 1985, abandoned. This application Aug. 25, 1986, Ser. No. 900,241
Int. Cl.[4] B01D 3/06, 3/10
U.S. Cl. 202—205 8 Claims



1. An atomizer for liquids to be vaporized comprising, in combination, an elongated unitary structure having a tip portion at one end, an ultrasonic vibration device coupled to the opposite end of said structure, means for energizing said device to impart ultrasonic vibration to said tip portion, the tip portion having an end surface and defining a capillary passage ending at said end surface, the tip being mounted such that the end surface is located at approximately one-quarter wavelength from a nodal position and means for conveying liquid to said passage for liquid flow onto said surface and dispersion into atomized liquid particles.

4. A liquid vaporization apparatus comprising, in combination, a vacuum chamber, a heated vaporization chamber mounted in said vacuum chamber, an elongated unitary structure mounted in said vacuum chamber including a tip portion at one end extending into said vaporization chamber, an ultrasonic vibration device coupled to the opposite end of said structure, means for energizing said device to impart ultrasonic vibration to said tip portion, said tip portion having an end surface located approximately one-quarter wavelength from a nodal position and defining a capillary passage ending at said end surface, means for conveying liquid to said passage for liquid flow onto said surface and dispersion into atomized liquid particles to be vaporized, a cooling chamber interposed in said structure between said vaporization chamber and said device, and means for flowing cooling fluid through said chamber so as to thermally isolate the device from the vaporization chamber.

4,696,720

REMOVAL OF WATER FROM AQUEOUS ALCOHOL MIXTURES

Donald L. Kiser, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed May 12, 1986, Ser. No. 862,049
Int. Cl.[4] B01D 15/00
U.S. Cl. 203—19 9 Claims

1. A process for removing water from a water-containing alcohol which comprises passing a low molecular weight hydrophilic liquid dehydrating agent through a bed of ion exchange resin to remove water therefrom, then passing a water-containing alcohol through said bed of ion exchange resin until the water-absorbing capacity of the ion exchange resin falls to a predetermined level.

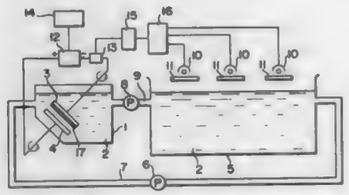
4. A process for removing water from a water-containing alcohol which comprises passing a water-containing alcohol through a bed of ion exchange resin until the water-absorbing capacity of the ion exchange resin falls to a predetermined level, then passing a liquid regenerating agent through said ion exchange resin bed to restore the water absorbing capacity.

4,696,721

ELECTROFORMING METHOD AND ELECTROFORMING APPARATUS

Hiroyuki Higashino, Yokohama, and Hideki Ohkawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1986, Ser. No. 944,513
Claims priority, application Japan, Dec. 27, 1985, 60-293120; Feb. 13, 1986, 61-29304
Int. Cl.[4] C25D 1/00
U.S. Cl. 204—3 23 Claims



1. An electroforming method comprising the steps of immersing a conductive matrix and an insoluble electrode having a high oxygen overvoltage, in an electroforming solution, containing sulfamate ions, which is held in an electroforming tank, applying voltage between said conductive matrix and insoluble electrode, to electrolyze said electroforming solution, thereby to deposit a metal layer on the surface of said matrix, wherein electromagnetic radiation, having a wavelength shorter than 400 nm, is emitted to said electroforming solution.

4,696,722

LOW COST TOOLING REPLICATION TECHNIQUE

Howard E. Towlson, Baldwinsville, N.Y., assignor to General Electric Company, Princeton, N.J.

Filed Mar. 24, 1986, Ser. No. 843,439
Int. Cl.[4] C25D 1/10
U.S. Cl. 204—6 17 Claims

1. A method of replicating glass pressing tools capable of producing precision complex optical surfaces in molten glass comprising the steps of:

passivating a master glass pressing surface which is to be replicated;

plating a metal on said master glass pressing surface to a thickness sufficient to give the plated metal mechanical strength;

separating the plated metal from said master glass pressing surface to reveal a negative master surface;

passivating said negative master surface;

plating the negative master surface with a plating metal selected to withstand a glass working temperature of around 1000° C. and the abrasive properties of a molten glass being pressed to a thickness sufficient to give the plated metal mechanical strength; and

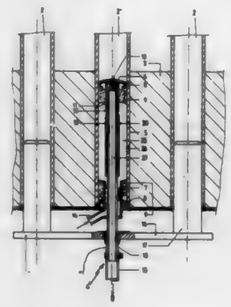
separating the plated metal from said negative master surface to reveal a replication of said master glass pressing surface.

4,696,723

PROCESS FOR REPAIRING THE TUBES OF A STEAM GENERATOR

Herman Bosquet, Kallo, and Stanislas F. Ulens, Beisele, both of Belgium, assignors to N.V. Verenigde Energiebedrijven Van Het Scheideland Mechelsesteenweg, Antwerp, Belgium

Filed May 8, 1985, Ser. No. 732,030
Claims priority, application Belgium, May 11, 1984, 0/212.910
Int. Cl.[4] C25D 3/12, 7/04
U.S. Cl. 204—16 3 Claims



1. A process for repairing the tubes (2) of steam generators by supplying an impervious internal metallic sleeve for covering a defective area, characterised in forming said sleeve by electrolytically depositing nickel from a nickel sulphamate soulution free from chlorine along the defective area (26) of the internal wall of the tube (2'), said depositing step including providing a closed cavity by sealing the front part (26) of the tube (2') along a length of from 20 to 80 cm in the manner of an electrolytic cell.

4,696,724

SURFACE TREATMENT OF HIGH-NICKEL/IRON ALLOY STEEL PLATE FOR LNG OR LPG TANKS

Takenori Deguchi; Kazuko Uchida; Takao Ikita, all of Chiba; Shigeaki Maruhashi, Yamaguchi; Kazuo Hoshino, Yamaguchi, and Keiji Oosaki, Yamaguchi, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Division of Ser. No. 652,611, Sep. 20, 1984, Pat. No. 4,592,965, which is a continuation-in-part of Ser. No. 392,131, Jun. 25, 1982, abandoned. This application Mar. 27, 1986, Ser. No. 844,979
Claims priority, application Japan, Jun. 26, 1981, 56-98216
Int. Cl.[4] C23C 22/24, 28/00
U.S. Cl. 204—27 4 Claims

1. A method of increasing the corrosion resistance of a nickel/iron alloy steel plate for LNG or LPG tanks said plates

having a 35–37% nickel content as provided by ASTM SA-658 comprising the steps of:

(1) coating said steel with metallic nickel in an amount of about 1 to 10 g/m^2 calculated as nickel metal; and

(2) surface treating said nickel/iron alloy steel plate coated with metallic nickel with a chromating step so as to provide a chromate film on said metallic nickel coating, said chromate film containing 5 to 100 mg/m^2 of chromate calculated as chromium metal.

4,696,725

MAGNETIC CORE AND PREPARATION THEREOF

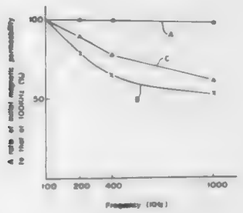
Kumi Ochiai, Yokohama; Hiromichi Horie, Yokosuka; Itsuo Arima, Kawasaki; Mikio Morita, and Hisato Kamohara, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Apr. 16, 1986, Ser. No. 852,719

Claims priority, application Japan, Jun. 26, 1985, 60-137941; Sep. 12, 1985, 60-200565

Int. Cl.^{4} C04B *35/04*; H01F *1/26*

U.S. Cl. 252—62.54 **19 Claims**



1. A process for producing a magnetic core, consisting essentially of a first step of bringing magnetic powder of a metal into contact with a polymer dispersion comprising polymer particles, followed by drying, to form an insulating layer on the surface of said magnetic powder, and a second step of compression molding said magnetic powder.

4,696,726

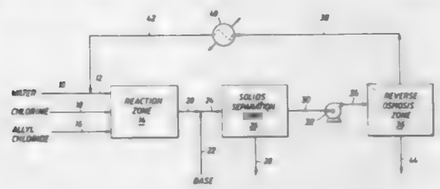
PROCESS FOR THE PRODUCTION OF DICHLOROHYDRIN

George C. Blytas; F. Norman Grimsby, both of Houston, Tex., and John F. Scamehorn, Norman, Okla., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,519

Int. Cl.^{4} B01D *13/02*

U.S. Cl. 204—182.4 **5 Claims**



1. A continuous process for the production of dichlorohydrin which comprises:

(a) reacting allyl chloride, water and chlorine in a reaction zone to form an aqueous reaction mixture of dichlorohydrin and reaction by-products,

(b) passing said reaction mixture from said reaction zone as feed to a reverse osmosis zone,

(c) subjecting said feed to reverse osmosis to afford: (1) a retentate stream having a dichlorohydrin content higher than said feed, and (2) a permeate stream having a dichlorohydrin content less than about 10 per cent of the dichlorohydrin content in said feed,

(d) withdrawing said retentate stream, and

(e) recycling at least part of said permeate stream to said reaction zone in an amount from about 25 to about 90% by volume of the volume of the total amount of water fed to said reaction zone.

4,696,727

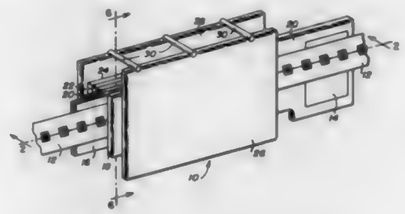
UNIVERSAL SELECTIVE PLATING HEAD

Saad Mukhtar, San Jose, and Syed A. Husain, Fremont, both of Calif., assignors to Automated Semiconductor, Inc., San Jose, Calif.

Filed Nov. 12, 1986, Ser. No. 929,721

Int. Cl.^{4} C25D *17/00*

U.S. Cl. 204—206 **6 Claims**



1. A universal selective plating head comprising:

a masking means for controlling the area and the pitch of a sample to be plated, said masking means including a plurality of mask apertures; and

a multipitch centerline feed block including a universal nozzle block and an electrode with said electrode extending lengthwise along the feed block, and means for spraying a uniform blade of plating solution on said masking means, said means for spraying comprising an insert blade and a drain insert, said insert blade including a first channel containing a plurality of jets for spraying the uniform blade of plating solution on the masking means, and a second and a third channel situated on either side of said first channel for receiving said electrode, and said drain insert adapted to slidably fit inside of said insert blade and over said first, second and third channels, and including a space cut into said drain insert for allowing exposure of said electrode and uniform blade of plating solution to the masking means, said drain insert also including a plurality of raised landings to create drainage passageways through which plating solution can drain away from the masking means after spraying.

4,696,728

APPARATUS FOR MASS ELECTROPLATING OF BULK GOODS

Siegfried Birkle, Höchstadt/Aisch, and Johann Gehring, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

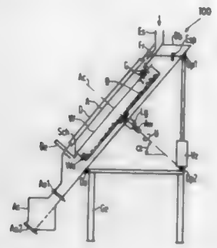
Filed Sep. 11, 1986, Ser. No. 906,037

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533151; May 15, 1986, 3616429

Int. Cl.^{4} C25D *17/16*

U.S. Cl. 204—213 **21 Claims**

1. In an apparatus for mass electroplating of bulk goods, particulary for the electro-deposition of aluminum from an aprotic, oxygen-free and water-free, aluminum-organic electrolyte, said apparatus comprising a plating tank for the acceptance of an electrolyte, a goods carrying dish having an axis and a floor; means for mounting the goods carrying dish in the tank for rotation around an inclined axis and immersed in the electrolyte; and at least one disk-shaped anode being immersed in the electrolyte and aligned mainly parallel to the floor of the goods carrying dish, said dish having at least one dog for



spreading the bulk goods on the floor of the carrying dish, the improvements comprising the dog being formed by a helically extending track.

4,696,729

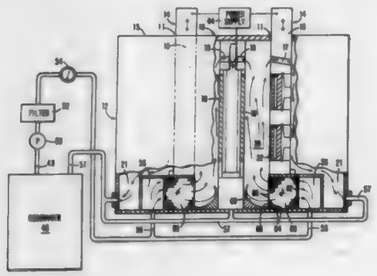
ELECTROPLATING CELL

Hugo A. A. Santini, San Jose, Calif., assignor to International Business Machines, Armonk, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,699

Int. Cl.^{4} C25D *17/06, 17/16*

U.S. Cl. 204—224 R **12 Claims**



1. An electroplating cell comprising:

first and second spaced wall members fixed in position to define a channel which provides a flow path for plating solution between said wall members;

a first elongated electrode forming at least part of said first wall member;

a second elongated electrode forming at least part of said second wall member, said second electrode including an article to be plated;

input means for introducing a plating solution under pressure to said plating cell;

an isostatic chamber for receiving plating solution from said input means and for discharging said plating solution into said flow path at a substantially equal predetermined pressure over the entire area of said flow path so that a uniform laminar flow of said plating solution is produced along the length of said flow path; and

means for producing a uniform current density across said electrodes in the presence of said laminar flow of said plating solution whereby a film of uniform thickness is plated on said article.

4,696,730

CIRCUIT FOR THE ELECTRICAL CONNECTION OF ROWS OF ELECTROLYSIS CELLS FOR THE PRODUCTION OF ALUMINUM AT VERY HIGH CURRENT

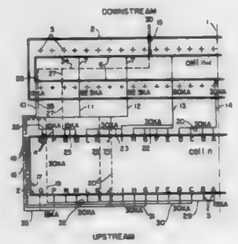
Joseph Chaffy, and Bernard Langon, both of Saint Jean de Maurienne, France, assignors to Aluminium Pechiney, Paris, France

Filed Jun. 5, 1986, Ser. No. 870,850

Claims priority, application France, Jun. 5, 1985, 85 08923

Int. Cl.^{4} C25C *3/16*

U.S. Cl. 204—243 M **9 Claims**



1. In a circuit for electrical connection between at least two successive cells of rank n and rank n+1 in a row of cells for the production of aluminium by electrolysis of alumina dissolved in molten cryolite by the Hall-Heroult process at a total electrolysis current J higher than 250,000 amperes, and possibly attaining 300 to 600 kA, each cell being constituted by an insulated parallelepiped metal container of which the large axis is perpendicular to the axis of the row and the small axis parallel to the axis of the row, the two ends of the container comprising heads, the container supporting a cathode formed by the juxtaposition of carbonaceous blocks in which there are sealed metal rods of which the rod ends issue from the container generally on its two large upstream and downstream sides relative to the direction of the current in the line, each cell also comprising an anode system formed by at least one horizontal rigid beam supporting at least one horizontal conducting rod comprising an anode frame on which the shafts for suspension of the anodes are attached, the circuit for connection between two successive cells being constituted by cathode collectors which are connected on the one hand to the cathode outputs of the cell of rank n and on the other hand to the connecting conductors which join, via risers, the anode frame of the cell of rank n+1 in the row, the improvement comprising the anode frame (**6**) of the cell of rank n+1 in the row being supplied with current simultaneously via a plurality of upstream risers such as (**11**, **12**, **13**) which are substantially equidistant and symmetrical relative to the vertical plane containing the small axis (**1**) of the cell and by at least two downstream risers (**15**) (**15S**) which are substantially symmetrical to this same vertical plane, these downstream risers (**15**, **15S**) being supplied by conductors connected to the downstream cathode outputs (**4**) of the cell of rank n, at least one portion (**24**) of these connecting conductors passing beneath the cell of rank n+1 along a path substantially parallel to the large axis of this cell, the direction of the current in these portions (**24**) of conductors passing from the heads (**17**) towards the small axis (**1**) of the cell.

4,696,731

AMORPHOUS METAL-BASED COMPOSITE OXYGEN ANODES

Michael A. Teshover, Solon, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 16, 1986, Ser. No. 942,173
Int. Cl.[4] C25B *1/02*
U.S. Cl. 204—290 R 40 Claims

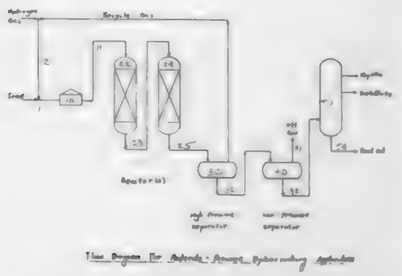
1. Amorphous metal-based composite anodes comprising:
a substrate material;
a first coating of an amorphous metal alloy applied thereto; and
a second coating of a mixed metal oxide applied to said first coating and fused therewith.

4,696,732

SIMULTANEOUS HYDROTREATING AND DEWAXING OF PETROLEUM FEEDSTOCKS

Philip J. Angevine, Mantua; Yung F. Chu, Cherry Hill; Kenneth M. Mitchell, Mt. Laurel; Stephen M. Oleck, Moorestown; Stuart S. Shih, Cherry Hill, and Robert C. Wilson, Jr., deceased, late of Woodbury, all of N.J. (by Lillian S. Wilson, executrix), assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 665,604, Oct. 29, 1984, Pat. No. 4,568,655, and a continuation-in-part of Ser. No. 665,605, Oct. 29, 1984, abandoned, and a continuation-in-part of Ser. No. 683,755, Dec. 19, 1984, abandoned, and a continuation-in-part of Ser. No. 783,399, Oct. 3, 1985, abandoned. This application Feb. 14, 1986, Ser. No. 829,729
Int. Cl.[4] C10G *45/08, 45/12, 45/64, 47/20*
U.S. Cl. 208—111 13 Claims



1. A process comprising the steps of simultaneous demetallating, hydrodesulfurizing and dewaxing petroleum residua at least 50% of which boils above 750° F. by contacting said residua with a catalyst, comprising:
(a) a hydrogenation/dehydrogenation component supported on catalytically active alumina, said alumina having a controlled pore size whereby said catalyst has 75% of its pore volume in pores no greater than 100 Angstrom units in diameter, and about 20% of its pore volume in pores greater than about 300 Angstrom units in diameter; and
(b) an intermediate pore zeolite, and zeolite beta as a large pore component and a large pore non-zeolitic inorganic binder.

4,696,733

PROCESS FOR SELECTIVELY HYDROGENATING POLYCONDENSED AROMATICS

Ying-Yen P. Tsao, Langhorne, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,008
Int. Cl.[4] C10G *45/00*
U.S. Cl. 208—144 12 Claims

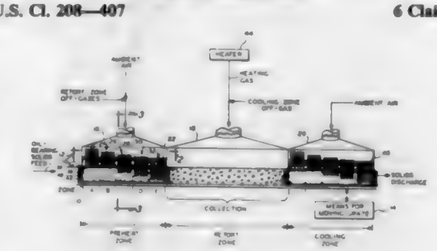
1. A process for preparing hydrogenated or partially hydrogenated polynuclear aromatic hydrogen donors from a hydrocarbon feed comprising polynuclear aromatic hydrogen acceptors, single ring aromatic hydrogen acceptors and double ring aromatic hydrogen acceptors, wherein said polynuclear aromatics are selectively hydrogenated by contacting said feed with hydrogen in the presence of maganese nodules.

4,696,734

METHOD FOR GAS TREATMENT OF A BED OF PARTICLES

Cecil C. Gentry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 692,457, Jan. 18, 1985, Pat. No. 4,606,138. This application Apr. 28, 1986, Ser. No. 856,529
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—407 6 Claims



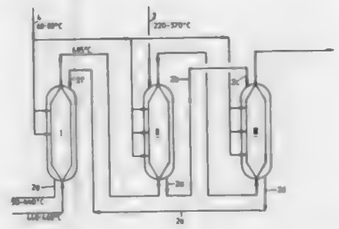
1. A method for gas treating a bed of solid particles supported on a surface of a grate comprising:
(a) moving the bed of particles in a generally horizontal direction by moving the grate in said direction;
(b) releasing the gas, during step (a), into the bed from the open ends of a plurality of conduits, said open ends being located at a plurality of different distances from the grate surface so that the gas is released at different depths in the bed, wherein distance and depth is measured along lines generally normal to said direction.

4,696,735

METHOD AND APPARATUS FOR MULTIPHASE COAL HYDROGENATION REACTORS WITH EXOTHERMAL HEAT OF REACTION HAVING GAS COOLING IN SUMP-PHASE REACTORS

Eckard Wolowski, Mülheim; Frank Mirtsch, Bottrop, and Herbert Dybus, Essen, all of Fed. Rep. of Germany, assignors to Ruhrkohle Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 21, 1985, Ser. No. 789,799
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438606
Int. Cl.[4] C10G *1/00*; B01J *10/00*
U.S. Cl. 208—408 22 Claims



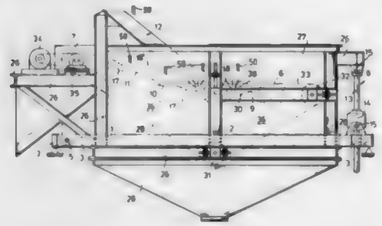
1. Method for cooling at least one reactor in a reaction process, said at least one reactor being a thermally loaded and pressurized coal product hydrogenation reactor operating in the sump phase, said method comprising the steps of:
introducing a multiphase reactant mixture into at least one reaction chamber of said at least one reactor, said multiphase reactant mixture including at least two phases chosen from the group consisting of solid, liquid and gas;
passing a substantially completely gaseous component through passage means about said at least one reaction chamber of said at least one reactor, whereby a substantial portion of heat generated in said at least one reactor is transferred to said gaseous component;
injecting cold gas into said at least one reactor for cooling said reaction chamber and the reactants therein;
adjusting said injecting of cold gas to adjust the temperature of the reaction along and in said at least one reaction chamber within a substantially constant range, thereby reducing substantially the quantity of said injected cold gas from a quantity of injected cold gas injected when said gaseous component is not passed about said at least one reaction chamber, while maintaining said substantially constant temperature range along and in said at least one reaction chamber; and
recovering, in said reaction process, a substantial portion of the heat transferred to said gaseous component.

4,696,736

DEVICE FOR WASHING OUT ORGANIC LOAM-LIKE IMPURITIES FROM CONTINUOUSLY FED LARGE AND FINE GRANULAR SOLIDS

Klaus Bleh, Meckenheimer Strasse 6, 6701 Rodersheim-Gronau 1, Fed. Rep. of Germany

Filed Apr. 16, 1986, Ser. No. 852,843
Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517982
Int. Cl.[4] B03D *1/00*
U.S. Cl. 209—173 4 Claims



1. A device for washing out organic and loam-like impurities from continuously fed large and fine granular solids, such as freshly dredged/excavated and prepared gravel, having a chute (12) feeding the material to a washing trough (30), and spray jets for establishing a flow rate of washing fluid, an endless conveyor belt (29) supported on support rollers located in the machine frame (1), an initial part (9) of the conveyor belt (29) in the direction of the material flow in the chute (12) providing the washing trough (30) with a second part (11) of the conveyor belt (29) beneath the chute (12),, said second part (11) being inclined upwards, the conveyor belt (29) being driven against the direction of flow of thematerial fed over the chute (12), and the conveyor belt (29) being height adjustably guided at the centre support (2) of the machine frame (1) by an upper pressure roller (18) to vary the depth of said trough (30) a deflecting roller (6) adjacent this pressure roller (18) for said initial part (9) of the conveyor belt (29), with which a further outboudn return roller (32) is associated within the machine frame (1), a section (33) of the conveyor belt (29) running horizontally is provided between the deflecting roller and the outbound return roller (6, 32) for retaining fine particles, and in which an outer return roller (7) of the belt section (11) situated beneath the chute (12) a machine frame (1,2,26) is pivotally mounted at one end on a base frame (3) by a journal axle bearer (4) extending transversely to the direction (10) of the conveyor belt (29), and the machine frame (1,2,26) is coupled at the opposite end to a height adjustment mechanism (8) whereby upon adjustment of said height mechanism (8) the inclination of the machine frame may be altered about the journal axle bearer and thereby the flow rate from the trough may be changed independently of aforesaid variance in the depth of said trough (30) thereby enabling more retention of fine particles on section (33) upon adjustment to less inclination about said journal axle bearer (4) and less retention upon adjustment to more inclination.

4,696,737

FIBER RECOVERY ELUTRIATING HYDROCYCLONE

Charles W. Bouchillon, Starkville, Miss., assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Feb. 28, 1986, Ser. No. 834,999
Int. Cl.[4] B03D *1/00*
U.S. Cl. 209—210 4 Claims



1. An improved method of centrifugally separating, cleaning or classifying solids contained in a fluid flow delivered to a hydrocyclone of the type having an axially elongated substantially conical separating chamber having an axially aligned rejects outlet at the apex end thereof and an axially aligned accepts outlet at the base end thereof wherein the solids containing fluid flow is introduced through an inlet means at the base end of the separating chamber in a substantially helical swirling flow pattern so as to establish within the conical separating chamber counterflowing inner and outer vortices inherently causing solids in the fluid flow which are lighter and relatively less dense to move to the inner vortex and exit through the accepts outlet as an accepts stream while causing solids in the fluid flow which are heavier and relatively more dense to move to the outer vortex and exit through the rejects outlet as an rejects stream, the improvement comprising:
a. introducing a secondary fluid flow having a solids content of less than about 0.2% by weight into the separating chamber of the hydrocyclone at the base end thereof in a substantially helical swirling flow pattern coaxially about the inner and outer vortices of the solids containing fluid flow so as to establish a reduced solids content boundary layer vortex along the wall of separating chamber rotating co-directionally with the outer vortex;
b. providing a substantially conical secondary housing coaxially about the apex end of the hydrocyclone defining an axially extending secondary separating chamber adapted to receive the rejects stream from the separating chamber of the hydrocyclone and having a rejects outlet at the apex end thereof through which the rejects stream exists the secondary separating chamber; and
c. introducing an additional flow of the secondary fluid into the secondary separating chamber in a substantially helical swirling flow pattern coaxially about the rejects stream entering the secondary separating chamber so as to establish a reduced solids content boundary layer vortex

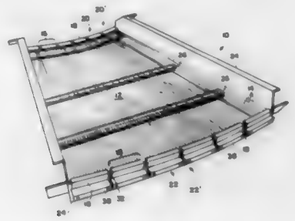
along the wall of the secondary separating chamber rotating co-directionally with the rejects stream entering the secondary separating chamber.

4,696,738

MATERIAL SEPARATING SURFACE

Charles N. Risley, 2949 SE. Walta Vista Ct., Milwaukie, Oreg. 97222

Filed Mar. 20, 1985, Ser. No. 714,002
Int. Cl.⁴ B07B *1/04, 1/46*
U.S. Cl. 209—352 **4 Claims**



1. A material separating surface for separating bulk material having particles of various sizes flowing across said surface comprising:

(a) an array of longitudinally-extending members extending substantially in the direction of material flow, said members arranged so as to create longitudinally extending spaces between adjacent ones of said members, said members diverging in the direction of material flow so that the width of said spaces increases in the direction of material flow;

(b) each of said members including tensioned wire means for oscillating individually in response to vibratory stimulus;

(c) said array including two or more discrete, interchangeable panels, each of said panels including a plurality of said wire means; and

(d) frame means for supporting said tensioned wire means in diverging arrangement, said frame means including a plurality of longitudinally-extending compression members in diverging arrangement, said compression members being proximate to and substantially parallel to said tensioned wire means.

4,696,739

WATER PURIFICATION APPARATUS

John A. Pedneault, Bohemia, N.Y., assignor to Aqua Strip Corporation, Somers, N.Y.

Continuation of Ser. No. 595,619, Apr. 2, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 894,748
Int. Cl.⁴ C02F *1/78, 9/00*
U.S. Cl. 210—121 **5 Claims**

1. An apparatus for removing hydrocarbon contaminants from water comprising:

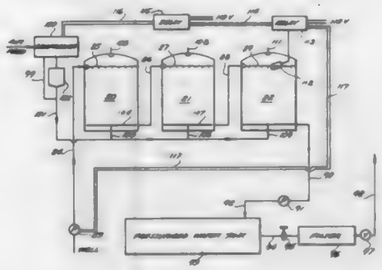
(a) a plurality of tubular chambers interconnected in series relationship to flow water therethrough with a water input means at one end and a water outlet means at the other end of each tubular chamber;

(b) first pump means to flow a contaminated water through a first water conduit means to the first of said plurality of tubular chambers, said first pump means being controlled by the water level in the last of said plurality of tubular chambers;

(c) second water conduit means at the other end of the last of said plurality of tubular chambers to flow a purified water to a reservoir;

(d) each of said plurality of tubular chambers having at the lower portion thereof means for injecting air into the water contained therein and at the upper end thereof outlet means for said injected air;

(e) means connecting the air outlet means of one tubular chamber with the air inlet means of the adjacent tubular chamber; and



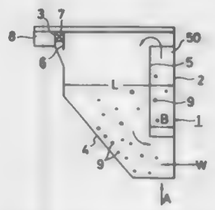
(f) compressor means controlled by the level of water in the last of said plurality of chambers with conduit means to flow the compressed air to the last of said plurality of chambers.

4,696,740

UNIT TYPE WASTE WATER TREATING APPARATUS

Tadao Mochizuki, Kamagaya; Akira Nakajima, Sagamihara, and Reizo Fukushima, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho, Japan

Continuation-in-part of Ser. No. 667,064, Nov. 1, 1984, abandoned, which is a continuation of Ser. No. 481,462, Apr. 1, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 777,599
Claims priority, application Japan, Apr. 7, 1982, 57-56611
Int. Cl.⁴ C02F *1/74, 3/22;* **B01D** *21/02*
U.S. Cl. 210—151 **8 Claims**



1. A unit type waste water treating apparatus having a variable treatment capacity, said apparatus comprising:

a plurality of identical treatment tanks communicating in series or parallel with each other, the capacity of said apparatus increasing as the number of tanks in said plurality of tanks increases;

each tank having a rectangular cross-sectional configuration defined by four side walls, one side wall of one tank of said plurality of tanks disposed closely adjacent to a side wall of an adjacent tank of said plurality of tanks, and each tank being loaded with a quantity of carrier particles separated from the carrier particles in an adjacent tank by said side walls;

means for admitting air and waste water to be treated into each tank;

vertical air lift means disposed in each tank;

said carrier particles being covered by sludge contained in said waste water so as to form activated sludge;

said air causing said carrier particles covered by said activated sludge to circulate in each tank through said air lift means together with said waste water;

said air lift means in each tank comprising a reaction zone and a remaining portion of each tank having substantially larger volume than said reaction zone forming a separation zone in which said activated sludge peels off from said carrier particles and floats upwardly, said reaction zone having a width B expressed by a relation

$$\frac{1}{3}L \geq B > 0$$

wherein L represents a horizontal length of the tank; and

at least one separator provided at an upper end of one side wall of each tank for discharging, by overflow, purified water and the sludge peeled off from said carrier particles, said separator comprising a plurality of spaced inclined plates;

a bottom portion of each tank on which said carrier particles tend to precipitate being inclined at an angle sufficient to cause said carrier particles to gravitate toward the base of said tank; and

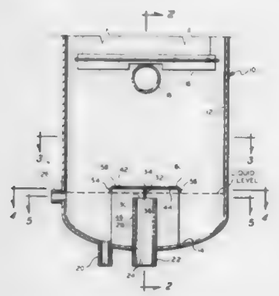
said air admitting means being provided for said base at a location beneath said air lift means.

4,696,741

VORTEX BREAKER FOR USE IN A LIQUID-LIQUID SEPARATOR OR THE LIKE

William C. Rahlwes, West Columbia, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1986, Ser. No. 853,328
Int. Cl.⁴ B01D *21/24*
U.S. Cl. 210—232 **12 Claims**



1. In a vessel of the type in which two fluid phases are separated, said vessel having a side wall and a bottom wall, first liquid outlet means in the bottom wall, and fluid inlet means communicating with said vessel above said first liquid outlet means, the improvement comprising: means for breaking vortices including,

tubular conduit means in fluid flow communication with said first liquid outlet means and extending a distance vertically into said vessel, said tubular conduit means having a vertical longitudinal axis and an upper terminal end face opening into said vessel, said terminal end face lying ibn a generally horizontal plane;

center baffle plate means having an upper edge, a lower edge and opposite side edges and lying in a first vertical plane and extending upwardly from the upper terminal end face of said tubular conduit means with the vertical longitudinal axis of said tubular conduit means lying in said first vertical plane of said center baffle plate means;

top baffle plate means disposed above the upper terminal end face of said tubular conduit means and lying in a generally horizontal plane, said top baffle plate means having a lower face intersecting the upper edge of said center baffle plate means, said top baffle plate means being spaced a distance above the upper terminal end face of said tubular conduit means by said center baffle plate means; and

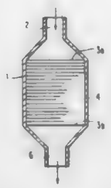
first and second vertical side wall means disposed respectively on opposite sides of said tubular conduit means, said first and second vertical side wall means lying in respective mutually parallel vertical planes each being normal to the generally horizontal plane of said top baffle plate means and normal to the first vertical plane of said center baffle plate means, said first and second vertical side wall means each having an upper edge intersecting the lower face of said top baffle plate means with the opposite side edges of said center baffle plate means intersecting said first and second vertical side wall means, and said first and second vertical side wall means each having a lower edge intersecting the bottom wall of said vessel.

4,696,742

ACTIVE CARBON FIBERS AND FILTER ADSORPTION UNIT FOR WATER PURIFICATION COMPRISING SAID FIBERS

Kenji Shimazaki, Shizuoka, Japan, assignor to Toho Beslon Co., Ltd., Tokyo, Japan

Division of Ser. No. 682,955, Dec. 18, 1984, Pat. No. 4,576,929. This application Jan. 6, 1986, Ser. No. 799,056
Claims priority, application Japan, Dec. 22, 1983, 58-240874
Int. Cl.⁴ B01D *15/00*
U.S. Cl. 210—287 **7 Claims**



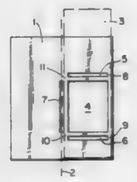
1. A filter adsorption unit for water purification, comprising a vessel having an inlet for water to be treated, a packing space for active carbon fibers and an outlet for treating water, said packing space further containing at least first active carbon fibers being derived from acrylic fibers and having a BET specific surface area (SA_1) of from 800 to 2,000 m^2/g, a ratio (S_1) of pore volume (Vp_1) to BET specific surface area (SA_1) of from 5×10^{-4} to 14.5×10^{-4}, and a methylene blue adsorption rate constant (MB_1) of not less than 5×10^{-1} sec^{-1}.

4,696,743

CENTRIFUGATION

Alan J. Gordon, Liverpool, and Donald G. Billington, Stoke on Trent, both of England, assignors to Shandon Southern Products Limited, Runcorn, England

Filed Jun. 5, 1986, Ser. No. 871,061
Int. Cl.⁴ B01D *33/22*
U.S. Cl. 210—361 **10 Claims**



1. In centrifugation apparatus including a sample chamber, a deposit-receiving surface and a filter card apertured to define on that surface a solids deposition area communicating with said sample chamber, the improvement that comprises said filter card having liquid flow paths from the perimeter of its said aperture of selectively restricted cross-sectional area for

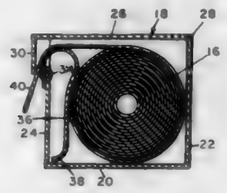
engendering substantially constant velocity flow of liquid from the sample chamber substantially normal to all points on the periphery of said aperture sufficient for promoting substantially uniform deposition of said solids on said surface throughout said deposition area to facilitate inspection of said deposition.

4,696,744

COFFEE FILTERS AND DISPENSER CONTAINER THEREFOR

Raymond Sedlacek, P.O. Box 41, Flagler Beach, Fla. 32036

Filed Jan. 27, 1986, Ser. No. 822,819
Int. Cl.[4] B01D *27/06, 27/08*
U.S. Cl. 210—387 **1 Claim**



1. Coffee filters adapted for use in coffee making machines requiring a filter, comprising:

a. a continuous strip of filter paper in the form of an elongated tape shaped to form a series of longitudinally spaced, generally circular segments each configurated to serve as a single filter, said segments being severably connected by relatively narrow connecting strips of filter paper left intact adjacent the center line of the tape, said tape being longitudinally rolled whereby to permit the storage of a large number of said segments in a very small space, said tape being extendable from said roll to enable separation of said segments therefrom one at a time,

b. a dispenser container for said roll of filter paper tape, said roll being carried in said container for axial rotation therein, said container having a narrow exit opening through which tap led from said roll exits said container, said container also having a cutting edge against which the connecting strips between the segments of said tape may be severed, and,

c. a filler member comprising a thin sheet of resiliently flexible material mounted in said container, the plane of said sheet extending the full length of said paper roll and being parallel with but spaced from said roll, and having a cross-section contour including a smoothly curved portion bounding said exit opening and extending away from said opening toward the interior of said container, over the convex side of which paper leaving said roll must pass, and an extension projecting interiorly into said container and operable by its resilience to engage and press said roll against an opposite wall of said container, whereby to apply a braking force resisting rotation of said roll within said container.

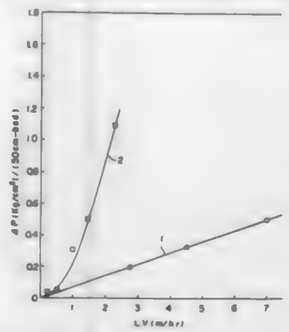
4,696,745

SEPARATING AGENT WITH FLUOROALKYL GROUP

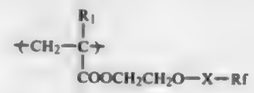
Takaharu Itagaki; Hiroshi Kusano, both of Yokohama; Eiji Miyata, Tokyo, and Hirohisa Kubota, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

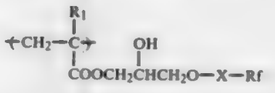
Filed Apr. 9, 1986, Ser. No. 849,764
Claims priority, application Japan, Apr. 9, 1985, 60-74705; Jun. 10, 1985, 60-125642
Int. Cl.[4] B01D *15/08;* **C08J** *9/36*
U.S. Cl. 210—502.1 **10 Claims**

1. A separating agent, consisting essentially of porous particles of a cross-linked copolymer having a porosity in a range of from 0.5 to 3 ml/g and an average particle diameter in a range of from 1 to 2,000 μm, said copolymer being composed essentially of a cross-linking component consisting of alkylene di(meth)acrylate and/or glycerine poly(meth)acrylate; an ester

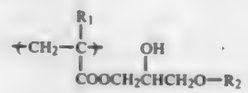


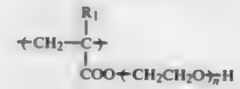
component containing a fluorine compound represented by the following general formulae (1) and/or (2); and a glycerine-derived ester component and/or a polyethylene glycol ester component represented by the following general formulae (3) and/or (4):


(1)

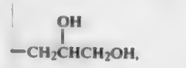

(2)

(in the above general formulae (1) and (2), R_1 denotes hydrogen or a methyl group; X represents a methylene group or a carbonyl group; and Rf designates a fluoroalkyl group in a straight chain or branched chain form, and having less than 10 carbon atoms)

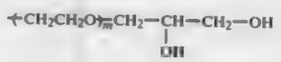

(3)


(4)

(in the above general formulae (3) and (4), R_1 denotes hydrogen or a methyl group; R_2 represents $-CH_2CH_2)_lH$ (l is an integer of from 0 to 10), $-CH_2C(CH_2OH)_3$,



—Glu (Glu is a residual group of glucose), —(CD designates a residual group of cyclodextrin), or



(m is an integer of 0 or 1); and n is an integer of from 1 to 4).

4,696,746

TWO PHASE ANAEROBIC DIGESTION

Sambhunath Ghosh, Homewood; David P. Chynoweth, St. Charles, and Paul B. Tarman, Elmhurst, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Oct. 30, 1984, Ser. No. 666,332
Int. Cl.[4] C02F *11/04*
U.S. Cl. 210—603 **20 Claims**



1. A process for improved methane production by two phase anaerobic digestion of organic carbonaceous material comprising the steps:

introducing said organic carbonaceous material into an acid phase digester at a rate of about 0.2 to about 10 pounds total organics per cubic foot per day;

maintaining an active acid forming microbial population in said acid phase digester and fermenting said organic carbonaceous material under mesophilic or thermophilic anaerobic conditions and a pH about 4 to about 8 for a detention time of about 1 hour to about 5 days;

passing liquid/solids effluent from said acid phase digester to a methane phase I digester and passing gaseous product of said acid phase digester only to a separate methane phase II digester operated in parallel with said methane phase I digester; and

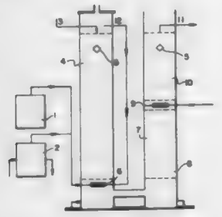
maintaining an active methane forming microbial population in each of said methane phase I and said methane phase II digesters and withdrawing gas comprising methane from each said methane phase I and methane phase II digesters.

4,696,747

PROCESS FOR THE ELIMINATION OF NITRATES BY MEANS OF A MICROBIOLOGICAL CONVERSION IN THE PRESENCE OF HYDROGEN GAS

Willy Verstraete, Wondelgem, and Jozef De Ley, Deurle, both of Belgium, assignors to Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme, Brussels, Belgium

Filed Feb. 25, 1986, Ser. No. 832,758
Claims priority, application European Pat. Off., Feb. 25, 1985, 852002492
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 **19 Claims**



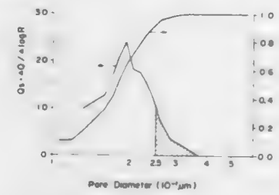
1. A microbiological denitrification process consisting essentially of the steps of (a) directing an aqueous stream comprising at least one nitrate into contact with a first denitrifying biomass contained in a cell, said denitrifying biomass having an affinity for hydrogen and also being contacted by hydrogen gas introduced as a gas into said cell, wherein a portion of said hydrogen gas is recycled for use in subsequent denitrification via said process; (b) directing said aqueous stream into contact with a second denitrifying biomass, such that hdyrogen introduced into said stream during step (a) is consumed and then (c) directing said aqueous stream into contact with a nitrifying biomass which is also contacted with a fluid containing oxygen or at least one constituent which, upon contact with said aqueous stream, releases oxygen, such that all nitrogenous components in said aqueous stream are converted to nitrate to produce potable water.

4,696,748

PLASMA SEPARATOR AND A PROCESS FOR PREPARING THE SAME

Yoshiaki Nitadori, Oita, and Toru Nakano, Nobeoka, both of Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,125
Claims priority, application Japan, Oct. 16, 1984, 59-215201; Oct. 16, 1984, 59-215202; Nov. 1, 1984, 59-229001
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 **9 Claims**



1. A plasma separator comprising:

a vessel provided with a blood introduction means, a blood withdrawal means and a plasma withdrawal means; and

a plurality of porous hollow fibers which are contained within the vessel, leaving spaces between the inner surface of said vessel and said plurality of porous hollow fibers and between and inside said plurality of porous hollow fibers;

said blood introduction means and said blood withdrawal means communicating with each other through said plurality of porous hollow fibers fluid tightly connected therebetween;

said hollow fibers being adapted to pass blood therethrough while causing the plasma component of the blood to be selectively passed through the walls of the hollow fibers and withdrawn through the plasma withdrawal means;

each hollow fiber being made of a polyolefin oriented in the lengthwise direction of the hollow fiber and having elliptic pores defined by microfibrils that are oriented in the lengthwise direction of the hollow fiber and knotted portions that are cross-connected to said microfibrils and are each in the form of stacked lamellae, said pores including intermediate pores which are present within the wall of the porous hollow fiber in communicating relationship and end pores which open at the inner and outer wall surfaces of the hollow fiber and forming throughpaths running from the inner wall surface of the porous hollow fiber to the outer wall surface of the porous hollow fiber;

each end pore which opens at the inner wall surface of the hollow fiber having:

an average nominal major axis (dl) of from 0.3 to 3.0 μm, and an average nominal minor axis (d_s) of from 0:1 to 0.5 μm;

each hollow fiber having:

a fraction of pores having a diameter of 0.25 μm or more, relative to the whole pores, of 15% or more, as measured from a pore diameter distribution curve obtained in accordance with the wet membrane gas permeation method,

a water permeability of from 5 to 20 l/hr.m^2.mmHg,

a permeability for colloidal silica, which has an average particle diameter of 0.08 μm, of 70% or more, and a per-

meability for polymer latex, which has an average particle diameter of 0.2 μm, of from 10% to 80%, and

a limiting pore diameter (D_L), as measured in accordance with the standard particle permeation method, satisfying an inequality:

$$D_L/d_s \geq 0.9$$

wherein d_s is as defined above;

said spaces and said pores being filled with a sterile water or sterile solution substantially not containing any non-physiological organic compound;

and which separator has been sterilized with a sterilizing gas before said spaces and said pores are filled with the sterile water or sterile solution and is aseptically isolated from the environment after said spaces and said pores are filled with the sterile water or sterile solution.

4,696,749

OXIDATIVE TREATMENT OF WASTEWATERS

Wolfgang Habermann, Mainz; Peter Hammes, Ruppertsberg; Hubert Engelhardt, Ludwigshafen; Wolfgang Geiger, Plankstadt; Walter Haltrich, Edingen-Neckarhausen, and Werner Simmler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,326

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1984, 3430484

Int. Cl.⁴ C02F *1/72*

U.S. Cl. 210—721 **16 Claims**

1. A process for the oxidative treatment of a wastewater whereby said wastewater is passed through filter beds containing a carbon-containing catalyst and an oxidizing agent, wherein the carbon-containing catalyst is formed by subjecting a carbon carrier to anodic oxidation in an aqueous mineral acid at a potential ϵ_h of from about +1.3 to +10 V and then doped with one or more compounds selected from the group consisting of molybdenum-(VI), tungsten (VI) and vanadium.

4,696,750

FLOCCULATION OF PARTICLES BY POLYMERS THAT PRECIPITATE OUT OF SOLUTION

Jay Donald, Summit, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 23, 1985, Ser. No. 812,517

Int. Cl.⁴ B01D *21/00*

U.S. Cl. 210—727 **4 Claims**

1. A process for flocculating solid fines selected from the group consisting of coke fines, catalyst fines, synthetic fuel fines, coal fines, and shale fines from a solution comprising said solid fines and an organic liquid which comprises the steps of:

(a) adding with mixing about 100 to about 500 ppm of a water insoluble unneutralized or neutralized sulfonated polystyrene to said solution of solid fines, wherein said sulfonated polystyrene is dissolved in a dissolving organic liquid at a concentration level of about 0.01 to about 20 weight percent and has from about 5 to about 200 meq. pendant sulfonate groups per 100 grams of polymer, and wherein said sulfonated polystyrene is absorbed on the surface of said solid fines; and

(b) adding with mixing about 5 to about 25 weight percent of an antisolvent to the mixture of the sulfonated polystyrene and said solution of said solid fines wherein said antisolvent is an aliphatic hydrocarbon having about 7 to 30 carbon atoms, and wherein said solid fines collide to form agglomerates which precipitate out of said solution.

4,696,751

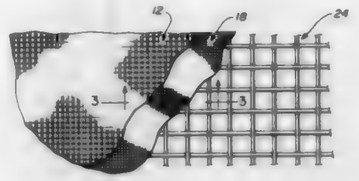
VIBRATORY SCREENING APPARATUS AND METHOD FOR REMOVING SUSPENDED SOLIDS FROM LIQUID

Dennis R. Eifling, Katy, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 4, 1986, Ser. No. 892,644

Int. Cl.⁴ B01D *39/10*; **B07B** *1/40*

U.S. Cl. 210—780 **14 Claims**



1. A vibratory screening apparatus to effectively prevent suspended solids from becoming lodged therein during removal of suspended solids from a liquid comprising:

a. a first upper mesh screen having openings with first and second different dimensions for receiving said suspended solids thereon,

b. a second lower mesh screen in superimposed abutting relationship with said first screen and having openings with a third and fourth dimension perpendicular to the dimensions of said first screen openings, said third dimension being larger than the smaller of said dimensions of said first mesh screen openings and said fourth dimension being smaller than the larger of said dimensions of said first mesh screen openings, and

c. vibratory means coupled to said abutting screens for vibrating said screens whereby said abutting screens effectively prevent suspended solids from becoming lodged in said upper and lower mesh screen openings.

8. A method of effectively preventing suspended solids from becoming lodged in a vibrating screening apparatus during removal of said suspended solids from a liquid comprising the steps of:

a. forming a first upper mesh screen having openings with first and second different dimensions for receiving said suspended solids thereon,

b. placing a second lower mesh screen in superimposed abutting relationship with said first screen, said second screen having openings with a third and fourth dimension perpendicular to the dimensions of said first screen openings and having said third dimension larger than the smaller of said dimensions of said first mesh screen openings and said fourth dimension smaller than the larger of said dimensions of said first mesh screen openings,

c. passing said liquid through said screens, and

d. vibrating said screens with a vibratory source coupled to said abutting screens such that said abutting screens effectively prevent said suspended solids from becoming lodged in said openings.

4,696,752

SYSTEM FOR ACIDIZING OIL AND GAS WELLS

Michael C. Lysandrou, Houston, and Clarence L. Dulaney, Missouri City, both of Tex., assignors to Standard Oil Company, Chicago, Ill.

Filed Sep. 28, 1982, Ser. No. 425,386

Int. Cl.⁴ E21B *43/27*, *43/12*

U.S. Cl. 252—8.553 **1 Claim**

1. A composition for use in acidizing oil and gas wells, which composition comprises about 25 wt % methanol, about 11.6 wt % 2-octanol, and about 63.4 wt % isopropyl alcohol.

4,696,753

LUBRICANT FOR A TIRE AND WHEEL ASSEMBLY

Henning Umland, Winsen/Luhe, and Gerhard Fricke, Bad Münder, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 887,818

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526428

Int. Cl.⁴ C10M *103/04*

U.S. Cl. 252—26 **6 Claims**

1. A lubricant for a tire and wheel assembly to reduce friction between the inner wall of a tire and the rim or other parts of the vehicle wheel, said lubricant comprising:

50% to 70% by weight of at least one of the group consisting of polyethylene glycol and polyglycol ether;

49 to 27% by weight aluminum bronze; and

1 to 3% by weight of a wetting agent.

4,696,754

LUBRICANT-STABILIZER COMPOSITIONS FOR HALOGEN-CONTAINING ORGANIC POLYMERS AND POLYMER COMPOSITIONS THEREOF

Gary M. Conroy, and Karl R. Wursthorn, both of Cincinnati, Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

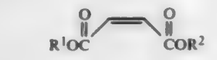
Filed Aug. 11, 1986, Ser. No. 895,183

Int. Cl.⁴ C10M *129/30*

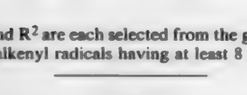
U.S. Cl. 252—40.5 **25 Claims**

1. A lubricating-stabilizing composition for halogen-containing organic polymers comprising:

(a) from about 50 to about 85% by weight of a dihydrocarbyl ester of maleic acid of the formula:



(b) from about 15 to about 50% by weight of a calcium salt of a monohydrocarbyl ester of maleic acid of the formula:



wherein R^1 and R^2 are each selected from the group consisting of alkyl and alkenyl radicals having at least 8 carbon atoms.

4,696,755

LUBRICATING OIL COMPOSITIONS CONTAINING HYDROXY POLYETHER POLYAMINES

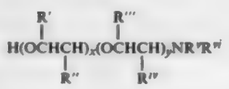
Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 547,558, Oct. 31, 1983, abandoned. This application Dec. 28, 1984, Ser. No. 687,046

Int. Cl.⁴ C10M *119/24*

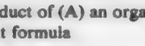
U.S. Cl. 252—515 R **6 Claims**

1. A lubricating oil composition comprising a major portion of an oil of lubricating viscosity, and a dispersant effective amount of an additive having the formula:

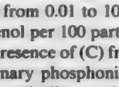


wherein:

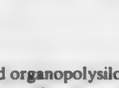
R′ and R″ independently are selected from the group consisting of hydrogen and alkyl groups having from 1 to 4 carbon atoms, and where at least one of R′ and R″ has at least 2 carbon atoms; R‴ and R^{iv} are independently hydrogen or methyl; R^v and R^{vi} independently are hydrogen or



where z is an integer from 1 to 5; x and y independently are integers from 1 to 30; and wherein



contains more carbon atoms than



4,696,756

ORGANOPOLYSILOXANE COMPOSITION FOR VISCOUS FLUID COUPLING

Makoto Yoshitake, and Keiichi Kishimoto, both of Tokyo, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1986, Ser. No. 917,330

Claims priority, application Japan, Nov. 8, 1985, 60-250378

Int. Cl.⁴ C10M *107/50*

U.S. Cl. 252—78.3 **14 Claims**

8. An organopolysiloxane composition comprising:

(i) a liquid organopolysiloxane having the average unit formula

$$R_aSiO_{(4-a)/2}$$

wherein R is a monovalent hydrocarbon radical and a is 1.7 to 2.3: and

(ii) a reaction product of (A) an organopolysiloxane having the average unit formula

$$R^1_bSiO_{(4-a)/2}$$

wherein R^1 is a monovalent hydrocarbon group and b is 1.4 to 2.3 with (B) from 0.01 to 10 parts by weight of an aromatic aminophenol per 100 parts of said organopolysiloxane (A), in the presence of (C) from 0.001 to 1.0 part by weight of a quaternary phosphonium hydroxide per 100 parts of said organopolysiloxane (A) and in the presence of (D) from 0 to 20 parts by weight of an organopolysiloxane cyclic having the general formula

per 100 parts of said organopolysiloxane (A), wherein R is a monovalent hydrocarbon group and n in an integer having a value of 3 to 6.

4,696,757

STABLE HYDROGEN PEROXIDE GELS

Robert G. Blank, Vineland, and Dhiraj S. Mody, Hammonton, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,739

Int. Cl.[4] C08K 5/14; C08L 71/02

U.S. Cl. 252—186.29 **2 Claims**

1. A gel stable at temperatures below about 50° F. comprising, based on a total of 100 parts by weight,

(a) from about 5 parts to about 20 parts of hydrogen peroxide,

(b) from about 20 parts to about 60 parts of water, and

(c) from about 18 parts to about 30 parts of a co-polymer of the formula

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_aH$$

wherein a is an integer such that the hydrophobe base represented by (C_3H_6O) has an average molecular weight of from 2750 to 4000 and b is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes from about 45 to 80 weight percent of the copolymer, and

(d) at least 30 parts of glycerine.

4,696,758

GAS MIXTURES FOR THE VAPOR DEPOSITION OF SEMICONDUCTOR MATERIAL

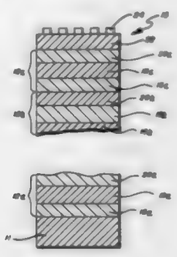
Stanford R. Ovshinsky, Bloomfield Hills; Subhendu Guha, Clawson; Prem Nath, Rochester; Chi Chung Yang, Troy; Jeffrey Fournier, St. Clair Shores, and James Kulman, Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 718,661, Apr. 1, 1985, Pat. No. 4,637,895. This application Oct. 6, 1986, Ser. No. 897,236

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] C09K 11/07

U.S. Cl. 252—188.31 **9 Claims**



1. A gaseous precursor mixture from which semiconductor alloy material may be deposited by glow discharge decomposition:

said mixture including a polysilane compound and a germanium-containing compound, said compounds capable of decomposing and depositing at substantially similar rates when subjected to electromagnetic energy; and said polysilane compound having the general formula $Si_xR_yH_z$, where R is chosen from the group consisting essentially of hydrogen, fluorine, chlorine, iodine, bromine and combinations thereof, x is an integer greater than one, y and z are each an integer or zero, and $y+z=2x+2$.

4,696,759

ESTER COMPOUND

Toyoshiro Isoyama; Yasuyuki Goto; Tetsuya Ogawa, all of Yokohamashi, and Shigeru Sugimori, Fujisawashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

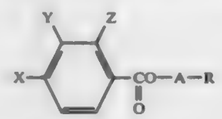
Filed May 5, 1986, Ser. No. 859,801

Claims priority, application Japan, May 22, 1985, 60-109399; Aug. 15, 1985, 60-179708

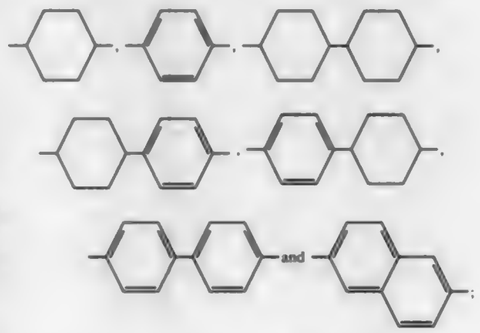
Int. Cl.[4] C09K 19/30, 19/32, 19/12, 19/20; C07C 69/76

U.S. Cl. 252—299.62 **6 Claims**

1. An ester compound expressed by the formula



wherein X represents F; Y represents H, F or Cl; Z represents F or H, with the proviso that when Y is F or Cl, Z is H and when Z is F, Y is H; —A— represents a member selected from the group consisting of



and R represents an alkyl group or an alkoxy group each of 1 to 10 carbon atoms.

4. A liquid crystal composition having at least two components at least one of which is an ester compound as set forth in claim 1.

4,696,760

METHOD FOR PRODUCTION OF AQUEOUS DISPERSION OF N-SUBSTITUTED N',N'-ALKYLENE UREA

Yutaka Morimoto, Yokohama; Minoru Ssotome, Ebina, and Atsushi Komai, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

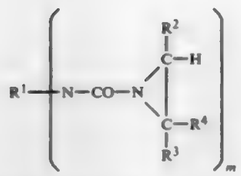
Filed Dec. 5, 1984, Ser. No. 678,247

Claims priority, application Japan, Dec. 8, 1983, 58-230613; Dec. 9, 1983, 58-231347

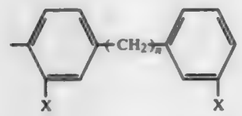
Int. Cl.[4] C09K 3/00; B01J 13/00; C07D 203/12

U.S. Cl. 252—314 **16 Claims**

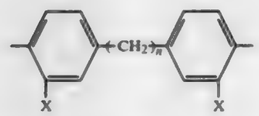
1. A method for the production of an aqueous dispersion of a water insoluble N-substituted N',N'-alkylene urea having the general formula I:



wherein R^1 denotes alkyl having 6 to 20 carbon atoms, phenyl or



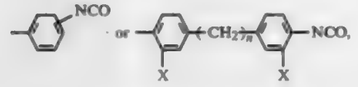
in case of m=1, or R^1 denotes alkylene having 6 to 20 carbon atoms, phenylene or



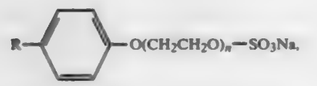
in case of m=2, where X denotes H, CH_3 or OCH_3 and n is 0 or 1, R^2 denotes H or CH_3, R^3 denotes H, CH_3 or C_2H_5 and R^4 denotes H or CH_3, by the reaction of an alkylene imine having 2 to 4 carbon atoms with an isocyanate represented by the general formula II:

$$R—NCO \qquad (II)$$

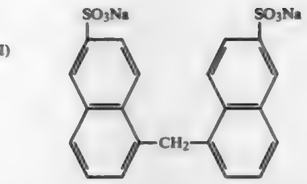
wherein R denotes an alkyl having 6 to 20 carbon atoms,



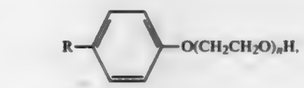
wherein X and n are the same as above in the presence of at least one surface active agent selected from the group consisting of (a) at least one anionic surface active agent selected from the group consisting of alkyl-sulfate type $R—OSO_3Na$, polyoxyethylene-alkyl ether sulfate type $R—O(CH_2CH_2O)_n-SO_3Na$, polyoxyethylene-alkylphenyl ether sulfate type



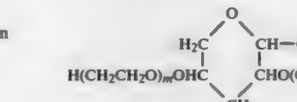
β-naphthalene sulfonic acid-formaldehyde polycondensate type



(I)



and (b) at least one nonionic surface active agent selected from the group consisting polyoxyethylene alkyl ether type $R—O(CH_2CH_2O)_nH$, polyoxyethylene alkylaryl ether type



olyoxyethylene carboxylic ester type $R—COO(CH_2CH_2O)_nH$ and polyoxyethylene sorbitan fatty ester type

(wherein R' represents an alkyl having 6 to 25 carbon atoms and m an integer having the value of 5 to 50) at a temperature of not more than 25° C. under vigorous stirring or grinding.

4,696,761

DE-FOAMER AND PROCESSES FOR ITS PRODUCTION

Karlheinz Haubennestel, Wesel; Daniela Breil, Hamminkeln; Alfred Bubat, Wesel-Bislich, and Werner Spratte, Wesel-Flüren, all of Fed. Rep. of Germany, assignors to Byk-Chemie GmbH, Wesel, Fed. Rep. of Germany

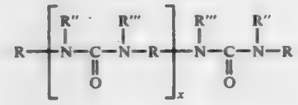
Continuation of Ser. No. 558,153, Dec. 5, 1983. This application May 2, 1986, Ser. No. 860,686

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245482

Int. Cl.[4] B01D 17/04, 19/04

U.S. Cl. 252—358 **8 Claims**

1. A de-foamer composition produced in situ in an organic carrier medium by a process comprising reacting mono- and-/or polyfunctional isocyanates with mono and/or polyfunctional amines at temperatures lying below the melting temperature of the resulting urea in said carrier medium, said organic carrier medium not being a true solvent for said urea, said de-foamer containing as an active component at least one urea of the formula:



wherein

R is C_4 to C_{30} alkyl;

R' is C_2 to C_{12} alkylene, phenylene, or naphthylene with or without substitution by one or more C_1 to C_9 alkyl groups, or cycloalkylene;

R'' is H or CH_3;

R''' is H or CH_3; and

x is 0 or 1,

said reaction being performed at a temperature lying below the melting temperature of the resulting urea whereby the resulting urea is formed in the carrier medium as a monodispersed or micellular structure.

4,696,762

HYDROXYPROPYLMETHYLCELLULOSE

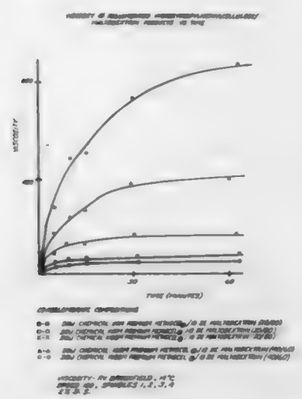
Eugene H. Sander, and Douglas R. Cook, both of Hayfield, Minn., assignors to Zumbro Enterprises, Inc., Hayfield, Minn.

Filed Dec. 6, 1985, Ser. No. 805,990

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.⁴ B01J *13/00*; A23L *1/04*

U.S. Cl. 252—311 **7 Claims**



1. A method of dispersing a hydroxypropylmethylcellulose (HPMC) in an aqueous solution, regardless of the temperature of the solution, the method comprising:

agglomerating HPMC in a gaseous air stream by intermittently spraying the particles with a liquid spray while the particles are in a fluidized state causing the surfaces of the particles to become tacky and the particles to stick to each other and permitting the particles to dry between spraying intervals and continuing spraying and drying of the particles until agglomerated particles are formed; and

dispersing the agglomerated particles in an aqueous solution.

4,696,763

COMPOSITIONS CONTAINING HETEROCYCLIC CORROSION INHIBITORS

Robert L. Bentley, Urmston; William Hoyle, and James Jack, both of Stockport, all of England, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

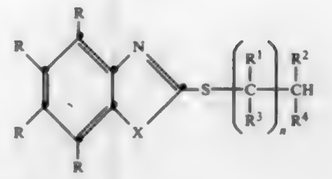
Filed May 3, 1985, Ser. No. 730,028

Claims priority, application United Kingdom, May 11, 1984, 8412063

Int. Cl.⁴ C09K *15/30*

U.S. Cl. 252—391 **24 Claims**

1. A composition which comprises (A) an aqueous or non-aqueous coating composition suitable for preparing a surface coating which is a paint, and (B) an effective corrosion-inhibiting amount of a compound of formula II



(II)

in which

X is sulphur;

R is each independently of one another hydrogen, alkyl, haloalkyl, alkoxy, alkylthio, alkylsulfonyl, cycloalkyl, phenyl, alkylphenyl, phenylalkyl, halogen, cyano, nitro, hydroxy, —COOH, —COOalkyl or a primary-, secondary- or tertiary-amino or carbamoyl group;

n is 0 or 1;

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl, hydroxyalkyl, haloalkyl, alkoxyalkyl, phenyl, phenylalkyl, said phenyl or said phenylalkyl substituted by one or two of halogen, of alkyl, of alkoxy, of carboxy or of hydroxy; carboxy, alkyl substituted by one, two or three of carboxy or of —COOZ; or —COOZ where

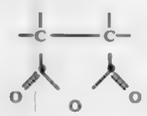
Z is C_1–C_{18}-alkyl, said alkyl interrupted by one or more O or S atoms or by one or more NR^o groups where R^o is C_1–C_{18}-alkyl, C_5–C_8-cycloalkyl, phenyl, napthyl, C_7–C_9-phenylalkyl or C_7–C_{18}-alkylphenyl; or said alkyl substituted by —SH, by —$COOR^o$, by —$CONH_2$, by —CN or by halogen; C_2–C_1-hydroxyalkyl or said hydroxyalkyl interrupted by one or more NR^o groups or by one or more oxygen atoms; C_2–C_{18}-alkenyl, C_3—C_{12}-cycloalkyl or said cycloalkyl substituted by C_1–C_4-alkyl, by —OH, by —SH, by —$COOR^o$, by —$CONH_2$, by —CN or by halogen;

C_7–C_9-phenylalkyl, C_7–C_{18}-alkylphenyl, or C_6–C_{10}-aryl or said phenyl or said aryl substituted by C_1–C_{12}-alkoxy, by C_1–C_{12}-alkylthio, by —COOH, by —OH, by halogen or by nitro; or

(B) is a compound of formula II where the moiety

$$[—C(R^1)(R^3)]_n—CH(R^2)(R^4)$$

contains a group of formula III or IIIa



(III)



(IIIa)

or where R^1 and R^2 or R^1 and R^3 together form a straight or branched alkylene, or said alkylene substituted by one or two —COOH or by one or two —COOZ; or where R^1 and R^2 form a direct bond;

with the proviso that at least two of R^1, R^2, R^3 and R^4 must contain a carboxy group or a derivative thereof which is a —COOZ group or an anhydride of formula III or IIIa, and that at least one —COOH and one —COOZ, or one anhydride group must be present, and with the further proviso that when n is 1 and R^1 or R^3 is —COOZ, then neither R^2 nor R^4 is —COOZ; or when n is 0, R^2 or R^4 is not —COOZ; or

(B) is a non-toxic base addition salt of a compound of formula II which contains a free carboxy group.

4,696,764

ELECTRICALLY CONDUCTIVE ADHESIVE COMPOSITION

Taro Yamazaki, Yokohama, Japan, assignor to Osaka Soda Co., Ltd., Osaka, Japan

Filed Nov. 30, 1984, Ser. No. 676,876

Claims priority, application Japan, Dec. 2, 1983, 58-227057; Sep. 17, 1984, 59-195139

Int. Cl.⁴ H01B *1/04*

U.S. Cl. 252—503 **10 Claims**

1. An electrically conductive adhesive composition which provides electric conductivity between facing electrodes but maintains electric insulation in the lateral direction across the facing direction, said composition comprising (a) a nonconductive base resin and (b) electrically conductive particles incorporated and dispersed in the resin (a); wherein

(I) said electrically conductive particles (b) are composed of

(b-1) 10 to 75%, based on the total weight of the components (a), (b-1) and (b-2), of abrasive grain-like electrically conductive particles having an average particle diameter of at least 1 micrometer, and

(b-2) 0.2 to 20% by weight, based on the total weight of the components (a), (b-1) and (b-2), of electrically conductive fine particles having an average particle diameter of not more than 0.5 micrometer, and

(II) said electrically conductive adhesive composition contains a solvent for said base resin (a) in an amount required to form said composition into the state of a printing ink or a paint.

4,696,765

SEMICONDUCTIVE RESIN COMPOSITION

Tetsuji Kakizaki; Toshikazu Mizutani, and Hiroshi Yui, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1984, Ser. No. 663,593

Claims priority, application Japan, Oct. 27, 1983, 58-201347

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **15 Claims**

1. A semiconductive resin composition comprising:

(A) 100 parts by weight of a base resin of at least one member selected from the group consisting of a low-density polyethylene, an ethylene/vinyl acetate copolymer having a vinyl acetate content of 25% by weight or less and an ethylene/(meth)acrylate copolymer having a (meth)acrylate content of 20% by weight or less, and

(B) 6 to 25 parts by weight of an electroconductive carbon black having a DBP-absorption number of 220 to 340 ml/100 g and an impurity metal residue of 0.2% by weight or less.

4,696,766

(2R*,3S*)-(E)-3-METHYL-5-(2,2,3-TRIMETHYLCYCLOPENT-3-EN-1-YL)PENT-4-EN-2-OL

Richard E. Naipawer, Wallington, N.J., assignor to Givaudan Corporation, Clifton, N.J.

Filed Mar. 19, 1986, Ser. No. 841,500

Int. Cl.⁴ A61K *7/46*; C11B *9/00*; C07C *35/06*

U.S. Cl. 512—8 **27 Claims**

1. A mixture of isomers of 3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4en-2-ol comprising at least ten percent (2R*,3S*)-(E)-3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4-en-2-ol.

4,696,767

SURFACTANT COMPOSITIONS

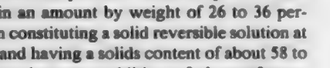
Mario Novakovic, Kew Garden Hills, N.Y., and Phillip G. Abead, Fairlawn, N.J., assignors to Finetex, Inc., Elmwood Park, N.J.

Division of Ser. No. 720,071, Apr. 3, 1985, Pat. No. 4,612,136. This application Jun. 23, 1986, Ser. No. 877,134

Int. Cl.⁴ C11D *1/22*

U.S. Cl. 252—557 **6 Claims**

1. A surfactant composition for subsequent addition to a soap slurring comprising an acyloxy alkane sulfonate salt having the formula:



Wherein R is a hydrocarbyl radical, n is an integer of from 2 to 4 inclusive, and M is an alkali metal, a polyol and water, said sulfonate salt being present in an amount by weight of about 44 percent ot about 56 percent, said polyol being present in an amount by weight of about 2 percent to about 6 percent, and water being present in an amount by weight of 26 to 36 percent, said composition constituting a solid reversible solution at ambient temperature and having a solids content of about 58 to 72 percent, whereby subsequent addition of the surfactant composition to a soap slurry results in formation of a soap/detergent bar having a smooth texture, uniform wear properties and a lack of grittiness.

4,696,768

PROCESS FOR THE SEPARATION OF LARGE AMOUNTS OF URANIUM FROM SMALL AMOUNTS OF RADIOACTIVE FISSION PRODUCTS, WHICH ARE PRESENT IN BASIC, AQUEOUS CARBONATE CONTAINING SOLUTIONS

Sameh A. H. Ali, Ettlingen, and Juergen Haag, Worms, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,364

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428877

Int. Cl.⁴ C01G *43/00*; C22B *60/02*; C09K *3/00*

U.S. Cl. 252—628 **10 Claims**

1. Process for separating large amounts of uranium from small amounts of radioactive fission products, which are present in basic, aqueous carbonate containing solutions in which the uranium is present in the form of uranyl-carbonato complex, by means of a basic, organic anion exchanger, comprising:

(a) adjusting the aqueous solution to a molar ratio of uranyl ion concentration to carbonate ion-concentration or CO_3^{--}/HCO_3^- concentration of $1(UO_2^{++})$ to at least 4.5 (CO_3^{--}, or CO_3^{--}/HCO_3^-), at a maximum U concentration of not more than 60 g/l,

(b) leading the adjusted solution over a basic anion exchanger comprising a polyalkene matrix provided with a preponderant part tertiary and a minor part quaternary amino groups to adsorb fission product ions or fission products containing ions, and

(c) recovering the unadsorbed uranyl-carbonato complex, decontaminated and preponderantly fission product free, by separating the uranium containing, remaining aqueous solution from the ion exchanger.

4,696,769

METHOD AND BINDER FOR THE MANUFACTURE OF NUCLEAR FUEL PELLETS, AND THE PRODUCT

Richard I. Larson, Wilmington; Richard P. Ringle, Scotts Hill; John D. Connolly, Jr., and Timothy J. Gallivan, both of Wilmington, all of N.C., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 517,588, Jul. 27, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 744,962

Int. Cl.[4] G21C *21/00*; C09K *11/04*; C07F *5/00*

U.S. Cl. 252—638 21 Claims

18. A method of producing coherent compacts of particulate ceramic nuclear fuel which imparts enduring plasticity to the particulate ceramic material for extended processing, consisting essentially of the steps of:

(a) adding a fugitive binder comprising a uranyl oxalate-carbonate reaction product of a combination of an amine compound in solution selected from the group consisting of carbonate or carbamate of ethylenediamine; monomethylene; 3,3 diaminodipropylamine; 1,3 diaminopropane; 1,6 diaminohexane; n butyl amine; diethylenetriamine; and 1,7 diaminoheptane and ammonium oxalate interacted at a temperature of at least about 65° C. and with uranium dioxide and having the composition of $(UO_2(CO_3)(C_2O_4).2H_2O).2H_2O$ to particulate nuclear fuel material containing uranium dioxide, and blending the resulting binder reaction product therethrough; and

(b) pressing the resultant blend comprising particulate fuel material and binder into a coherent compact.

4,696,770

METHOD FOR THE SYNTHESIS OF SULFONATED RUBRENE

David L. Dauplaise, Norwalk, and William J. Trzaskos, Ridgefield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 7, 1984, Ser. No. 607,843

Int. Cl.[4] C09K *11/06*

U.S. Cl. 252—700 4 Claims

1. A process for the production of a sulfonated rubrene which comprises slowly charging an aqueous solution of fuming sulfuric acid to a solution of a rubrene in a solvent mixture of dioxane, and at least one of ethylene dichloride and methylene dichloride, reacting the acid and rubrene for at least about 12 hours, and recovering the resultant sulfonate rubrene.

4,696,771

AMINOPOLYOLS AND POLYURETHANES PREPARED THEREFROM

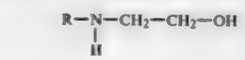
Don E. Floyd, Minneapolis, Minn., assignor to Henkel Corporation, Ambler, Pa.

Filed Dec. 3, 1985, Ser. No. 805,073

Int. Cl.[4] C11C *3/00*; C07C *93/04*

U.S. Cl. 260—404 4 Claims

1. An aminopolyol obtained by reacting an N-substituted alkanolamine of the general formula



where R is an alkyl group containing up to 3 carbon atoms with a terminal epoxy compound selected from the group consisting of a glycidyl ether of a fatty alcohol having 12–14 carbon atoms and a glycidyl ester of a branched chain fatty acid having 9–11 carbon atoms.

4,696,772

AMINE OXIDATION USING CARBON CATALYST HAVING OXIDES REMOVED FROM SURFACE

Shine K. Chou, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 705,391, Feb. 28, 1985, which is a continuation-in-part of Ser. No. 608,831, May 10, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,764

Int. Cl.[4] C07F *9/38*; C07C *101/20*

U.S. Cl. 260—502.5 F 4 Claims

1. In a process for the selective production of secondary amines and primary amines by bringing together under reaction conditions a tertiary amine or a secondary amine with oxygen or an oxygen-containing gas in the presence of an activated carbon catalyst, the improvement which comprises using an activated carbon catalyst wherein carbon functional groups containing oxygen and hetero atom functional groups containing oxygen have been removed from the surface thereof.

4,696,773

PROCESS FOR THE PREPARATION OF ISETHIONIC ACID

Elvin R. Lukenbach, Somerset; Prakash Naik-Satam, East Windsor, both of N.J., and Anthony M. Schwartz, Rockville, Md., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jul. 7, 1986, Ser. No. 882,660

Int. Cl.[4] C07C *143/02*

U.S. Cl. 260—513 R 3 Claims

1. A process for the preparation of isethionic acid under anhydrous conditions comprising contacting anhydrous sodium isethionate with anhydrous hydrogen chloride in the presence of an alcohol solvent.

4,696,774

DECOLORIZING ARYLSULFONYL HALIDES

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 24, 1986, Ser. No. 843,408

Int. Cl.[4] C07C *143/00*

U.S. Cl. 260—543 R 35 Claims

1. A process for decolorizing an halide prepared from the reaction of an arylsulfonic acid with a sulfur halide and the corresponding halogen comprising contacting the arylsulfonyl halide with a decolorizing agent selected from the group consisting of an oxidizing agent, a reducing agent, and a compound having at least one alkene linkage, said compound selected from the group consisting of a polybutadiene, a C_{14} to C_{30} alpha-olefin, and an unsaturated vegetable oil.

4,696,775

DEVICE FOR PRODUCING A GAS-AND-LIQUID MIXTURE

Peggy F. M. David, De Bilt, Netherlands, assignor to Kartell SpA, Italy

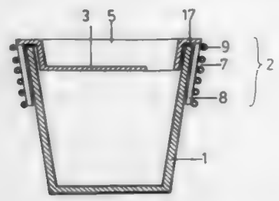
Filed Aug. 1, 1986, Ser. No. 891,615

Claims priority, application Netherlands, Sep. 2, 1985, 8502391

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—1 19 Claims

1. Device for producing a gas-and-liquid mixture, such as for intake by humans, comprising a supply member for the liquid and a feeding arrangement for the gas, characterized in that the supply member for the liquid consists of a holder that is furnished with an element adapted to cooperate with a user's upper lip to comprise a liquid feed valve, which in part blocks the free discharge opening of the holder and can serve at the same time as a supporting surface for the upper lip, in such a way that the upper lip can occlude at most a part of the liquid supply and the supporting surface for the lower lip at the same time constitutes the feeding arrangement for the gas, and is so designed that the lower lip can occlude at most a part of the gas feed.



4,696,776

METHOD OF PRODUCING POLYURETHANE FOAMS FOR LOW STRESS ENCAPSULATION

James R. Hooker, and Robert M. Foos, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 21, 1986, Ser. No. 887,596

Int. Cl.[4] B29C *67/00*

U.S. Cl. 264—46.4 3 Claims

1. A method of encapsulating electronic components and the like comprising the steps of:

selecting an uncured liquid thermosetting polyurethane formulation;

selecting one or more of the group consisting of elastomeric, rigid and semi-rigid finely ground particulate foams to act as a nucleating agent;

adding said particulate foam by weight to said liquid polyurethane formulation;

mixing said particulate foam and said liquid polyurethane formulation into a substantially homogeneous mixture;

applying said homogeneous mixture of said particulate foam and said liquid polyurethane formulation to one of a form, casting, and the like containing electronic components to be encapsulated; and

curing said homogeneous mixture encapsulating electronic components for a pre-determined period of time at a pre-determined temperature relative to the polyurethane formulation used.

4,696,777

COMPOSITE CERAMIC STRUCTURE AND METHOD FOR MANUFACTURING THE SAME

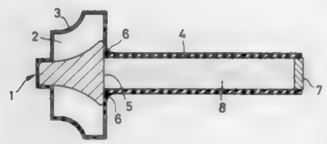
Shigenori Ito, Kasugai, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 781,713

Claims priority, application Japan, Oct. 4, 1984, 59-208962

Int. Cl.[4] C04B *33/32*, *37/00*

U.S. Cl. 264—60 5 Claims



1. A method of producing a composite ceramic structure, comprising the steps of:

preparing a formed ceramic piece which constitutes a first portion of said composite ceramic structure; preparing a rubber mold having a molding surface defining a remaining portion of said composite ceramic structure; positioning said rubber mold in contact with a joining part of said formed ceramic piece from which said remaining portion of the composite ceramic structure extends; covering an entire exposed surface of said formed ceramic piece, and at least an end of said rubber mold adjacent to said joining part of the formed ceramic piece, with an elastic member; filling said rubber mold with a mass of ceramic powder such that the mass of ceramic powder contacts said joining part of said formed ceramic piece, said mass of ceramic powder being substantially identical with a ceramic material of which said formed ceramic piece is formed; applying a static hydraulic pressure to an assembly of said formed ceramic piece and said mass of ceramic powder in said rubber mold, thereby compacting said ceramic powder in said rubber mold and integrating the compacted mass of ceramic powder with said formed ceramic piece into an integral piece; and firing said integral piece to form said composite ceramic structure.

4,696,778

PROCESS FOR SINTERING SILICON NITRIDE ARTICLES

Jeffrey T. Neil, Pepperell, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 31, 1986, Ser. No. 824,754

Int. Cl.[4] C04B *35/64*

U.S. Cl. 264—65 6 Claims

1. A process for sintering a silicon nitride article to a density greater than 98% of theoretical comprising the following steps:

(1) heating in a protective atmosphere under a pressure a silicon nitride article containing sintering aids having a liquidus temperature in a covered container to a temperature equal to or greater than the liquidus temperature of the sintering aids contained in said silicon nitride article;

(2) sintering the silicon nitride article from step (1) at the temperature obtained from step (1) for a period sufficient to obtain a density equal to or greater than 98% of theoretical density in said protective atmosphere at said pressure to form a sintered silicon nitride article;

(3) changing said pressure of step (2) sufficiently to displace greater than one quarter by volume of said protective atmosphere in said covered container, said changing of said pressure of step (2) having a minimum pressure, said minimum pressure during said changing of said pressure being sufficient to minimize weight loss of said silicon nitride article during said period of said sintering in step (2); and

(4) cooling the product from step (3) to room temperature and reducing the pressure of step (3) to atmospheric.

4,696,779

METHOD AND APPARATUS FOR FORMING AN ISOTROPIC SELF-ADHERING ELASTOMERIC RIBBON

Ronald H. Wideman, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 17, 1986, Ser. No. 840,263

Int. Cl.[4] B29C *47/34*

U.S. Cl. 264—211.13 12 Claims

1. Apparatus for providing uniform gradient cooling simultaneously on all sides of an extrudable material to maintain the physical properties uniformly throughout the material, comprising:

means for extruding the material,

foraminous means for conveying the extruded material,

bisurfacially cooling means for directing a cooling medium simultaneously against the sides of the extruded material, and

temperature-gradient control means operatively connected to said bisurfacial cooling means for selectively varying the temperature of the cooling medium to provide continuous gradient cooling on all sides of the material to maintain its physical properties uniformly throughout.

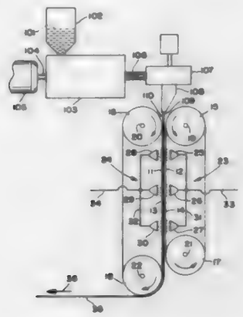
10. A method for providing uniform gradient cooling simul-

taneously on all sides of an extrudable material to maintain the physical properties uniformly through the material, comprising the steps of:

extruding the material,

providing a foraminous support member,

conveying the extruded material on the foraminous support member,



bisurfacially cooling the material by directing a cooling medium simultaneously against the sides of the extruded material, and

uniformly varying the temperature of the cooling medium to provide continuous gradient cooling on all sides of the material to maintain its physical properties uniformly thereout.

4,696,780

METHOD OF MANUFACTURING A PROSTHESIS CUFF TO RECEIVE AN AMPUTATION STUMP

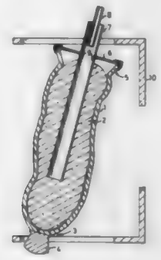
Lars Häggland, Veberöd, Sweden, assignor to Landstingens Inkopscentral LIC, Sweden

Filed Dec. 17, 1984, Ser. No. 682,166

Claims priority, application Sweden, Dec. 21, 1983, 83070763

Int. Cl.[4] B29C *45/14, 61/02, 65/66*

U.S. Cl. 264—222 **16 Claims**



1. A method of manufacturing a prosthesis cuff to receive an amputation stump, comprising the steps of:

providing a positive cast of an amputation stump;

forming a tubularly-shaped rough prosthesis cuff by introducing a starting plastic material having thermal plastic memory into a mold, the mold having an internal shape to form the rough prosthesis with a closed end and an open end, the rough cuff defining an interior space which is smaller than the positive cast;

embedding an adaptor at the closed end of the rough cuff during formation of the rough cuff, the adaptor being suitable for connecting the rough cuff to another prosthesis part;

stretching the rough cuff to enlarge the interior space thereof sufficiently to enable the positive cast to fit in the rough cuff;

inserting and positioning the positive cast in the rough cuff;

heating the rough cuff, while the positive cast is positioned therein, in a manner that is effective for causing the rough cuff to shrink around the positive cast and to conform to the surface contour of the positive cast whereby the rough cuff is transformed into a finished prosthesis cuff; and

allowing the finished prosthesis cuff to cool and removing the positive cast from the finished prosthesis cuff.

4,696,781

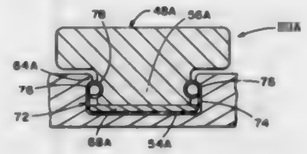
COMPOSITE FIRST WALL FOR FUSION DEVICE

Robert F. Bourque, San Diego, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed Oct. 24, 1984, Ser. No. 664,162

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—136 **12 Claims**



1. A first wall structure for use in a plasma device including a plasma region surrounded by a vacuum region, a blanket structure, and a magnet structure, said first wall structure surrounding said plasma region and said vacuum region inside said blanket structure and said magnet structure and comprising:

a base wall coolant;

a base wall which is substantially continuous and vacuum tight and surrounds said plasma region and said vacuum region and has substantial electrical resistance parallel to the direction of plasma in said plasma region as to permit ready entry into said plasma region of magnetic flux from said magnet structure, said base wall having an inner surface facing said plasma region and an outer surface facing the base wall coolant, said inner surface having a plurality of recesses surrounding said vacuum region and providing respective thin sections of said base wall,

a plurality of discrete inserts corresponding in number to said recesses, each insert being secured in a respective recess, said inserts extending inwardly into said vacuum region beyond said inner base wall surface and being made of a material having a greater capability of transmitting heat flux through substantial thickness while withstanding thermal stresses than the material from which said base wall is formed, said thin sections transmitting to said base wall coolant heat flux transmitted by said inserts,

each of said inserts comprising a stem portion disposed in a respective recess, and an enlarged head extending from said stem toward said plasma region,

the portion of said base wall defining each recess having an undercut so that each recess has a constricted throat, and

a holder disposed in each recess below the level of said throat, said holder having side walls with enlargements, said stem having groove means with said enlargements concurrently being received by said groove means and engaging said throat to retain said inserts in their corresponding recesses.

4,696,782

ORE IRRADIATOR

Colin G. Clayton, Abingdon, and Ramon Speckmaa, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 26, 1984, Ser. No. 674,738

Claims priority, application United Kingdom, Nov. 30, 1983, 8331911

Int. Cl.[4] G21G *1/06*

U.S. Cl. 376—159 **10 Claims**



1. An irradiator for irradiating lumps of ore for detecting the presence of a selected substance in the lumps, the irradiator comprising a cylindrical chamber, means for causing the lumps to pass through the chamber, and adjacent to but outside one end of the chamber at least one coaxial annular neutron source arranged so that the resulting neutron flux in the chamber ensures that in passing through the chamber all the lumps are activated uniformly each such neutron source comprising a target which generates neutrons when a beam of ions is incident upon it, the irradiator also including means for generating a beam of ions and for directing said beam of ions onto said target in an annular pattern, said pattern being coaxial with said chamber.

4,696,783

ELECTROMAGNETIC CONTROL BAR DRIVE DEVICE, WITH REDUCED HEAT LOSSES

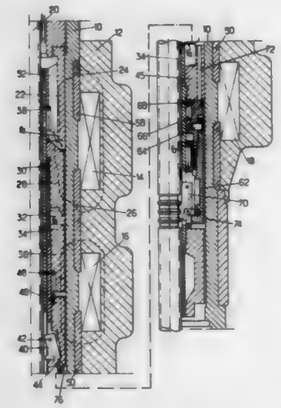
Guy Lesaulnier, Courbevoie, and Fernand Savary, Saint Leu La Foret, both of France, assignors to Framatome, Courbevoie, France

Filed Jan. 29, 1986, Ser. No. 823,545

Claims priority, application France, Jan. 29, 1985, 85 01216

Int. Cl.[4] G21C *7/12*

U.S. Cl. 376—228 **6 Claims**



1. In a nuclear reactor having a coolant containment vessel closed with a lid, an electromagnetic device for rectilinearly moving a shaft connectable to a control bar, comprising a fluid tight casing projecting from the reactor vessel lid; a first and second sets of shaft gripping means for gripping the shaft, staggered in the longitudinal direction and movable longitudinally of said casing, the first set of means being associated with a first movable pole co-operating with a holding coil, carried by the casing and movable by energization and de-energization of the holding coil between a position in which the first set of means grips the shaft and a position in which it releases said shaft, and the second set of means being associated with a movable plunger co-operating with a transfer coil and movable, by energization and de-energization of this coil., between a position in abutment against an other pole in which the second set of means grips the shaft and a position in which it releases said shaft; a lifting coil co-operating with said other pole for moving said other pole between two positions spaced apart by a predetermined step, wherein the movable pole co-operating with the holding coil belongs to means for cutting off a thermosiphon for connection flow of coolant between the inside of the vessel and a space defined by the casing.

4,696,784

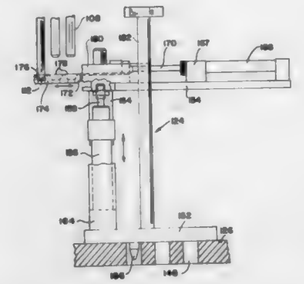
SYSTEM FOR MANIPULATING RADIOACTIVE FUEL RODS WITHIN A NUCLEAR FUEL ASSEMBLY

Ralph W. Tolino, Wilkinsburg; William E. King, Plum; Jack L. Blickenderfer, Forest Hills, and Charles H. Roth, Jr., North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1984, Ser. No. 594,157

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—245 **39 Claims**



1. A tool for manipulating the peripherally located fuel rods of a fuel assembly so that said rods can be visually inspected, wherein said fuel assembly includes top and bottom nozzles, each of which is connected to a support skeleton, as well as a plurality of grids, and wherein said rods are retained within said grids and confined between the top and bottom nozzles thereof, comprising:

(a) a fixture that is detachably connectable to one of said nozzles of the fuel assembly, said fixture having a plurality of holes therein;

(b) rotating means pivotally mountable within said holes of said fixture for selectively gripping and rotating said rod, and

(c) a displacing means mounted on said fixture for reciprocably displacing said rods within said fuel assembly, including a lifting assembly and a push-down assembly for lifting and pushing down a selected one of said rods, respectively,

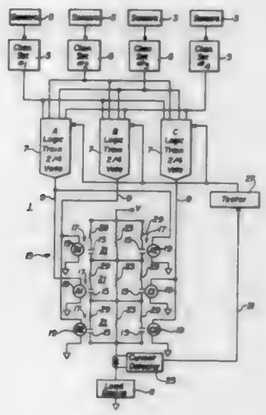
whereby said rods can be selectively rotated, lifted, and pushed down in order to expose portions of said rods which are normally hidden to visual inspection while said nozzles stay connected to said support skeleton and said rods stay confined between the top and bottom nozzles of said fuel assembly.

4,696,785

TESTABLE VOTED LOGIC POWER CIRCUIT AND METHOD OF TESTING THE SAME

Bruce M. Cook, and Jerzy Gutman, both of Plum Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1985, Ser. No. 793,383
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **12 Claims**



4. A protection system for a nuclear reactor comprising:

redundant sets of detectors for monitoring preselected reactor parameters and operating conditions and for generating redundant partial actuation signals in response to preselected values and conditions;

three independent logic trains, to each of which each redundant partial actuation signal is applied, said logic trains each generating an actuation signal in response to a preselected number of the redundant partial actuation signals;

a load;

a voltage source;

three pairs of switches connected in three groups of two switches each with the two switches in each group associated with a different pair of switches and being connected in parallel, and with the three groups of switches being connected in series with each other and with the load across the voltage source;

means for applying a different one of said actuating signals independently to each of said pairs of switches to actuate the same, and thereby actuate the load when at least two out of the three actuation signals are generated;

a resistor shunting each group of switches to provide a leakage path between the voltage source and the load device; and

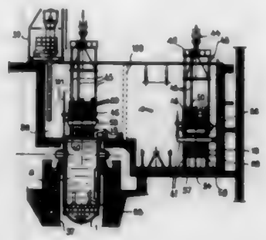
a current detector for measuring the current drawn from the voltage source, the impedance of said resistors being several magnitudes larger than the impedance of a closed switch, such that the current through the leakage path is insufficient to energize the load, but sufficient for the current measuring means to detect whether a switch is actuated.

4,696,786

PROCESS AND DEVICE FOR ADAPTING NEW UPPER INTERNAL EQUIPMENT TO THE VESSEL OF A PRESSURIZED WATER NUCLEAR REACTOR

Alain Frizot, Montcenis; Gerard Cadaureille, Saint Bonnet de Mure; Jean-Christophe Laiere, Lyons, and Jean-Yves Machuron, Le Creusot, all of France, assignors to Framatome, Courbevoie, France

Filed Jul. 29, 1986, Ser. No. 890,225
Claims priority, application France, Aug. 2, 1985, 85 11902
Int. Cl.[4] G21C *17/00, 19/00*
U.S. Cl. 376—245 **13 Claims**



1. Process for adapting new upper internal equipment to the vessel of a pressurized water nuclear reactor containing irradiated lower internal equipment (8) which comprises a horizontal lower plate (4), a core support shell (6) as well as the core screening (7), while the upper internal equipment (13) comprises an upper core plate (11) and a lower plate (10) which forms an upper core plate, which are held together by vertical spacer columns (12), slots (33, 28) being provided on the peripheral part of the upper plate (11) of the upper internal equipment and on the peripheral parts of the upper core plate (10), in angularly offset positions, alignment pins (20) being provided at the upper part of the lower internal equipment (8) and centering pins (25) being fixed to the core support shell (6) which are intended to cooperate with the slots (33) in the upper plate (11) of the upper internal equipment and with the slots (28) in the upper core plate (10), respectively, for installing the upper internal equipment (3) in the vessel:

with the vessel (1) opened and filled with water, and the core assemblies having been removed, the process comprising:

means for measuring alignment (50) and means for measuring clearance (56, 58, 59) are mounted on the new upper internal equipment (13), together with a jig (54) corresponding to the peripheral assemblies of the core under the upper core plate (10) and skidblocks (53) under the upper plate (11) of the upper internal equipment,

thruster devices (52) are mounted in the region of the upper part of the lower internal equipment (8) on the support flange for the vessel head and means (55) for receiving the alignment measuring devices (50) are mounted on the lower core plate (4),

the upper internal equioment (13) is introduced into the vessel (1) so as to rest on the upper part of the lower internal equipment (8), through the intermediacy of the skid blocks (53),

measurements of the vertical alignment of the upper internal equipment (13) and of the lower internal equipment (8) are carried out,

the upper internal equipment (13) is moved on the lower internal equipment (8) by the use of the thruster devices (52) to correct their respective alignment, as a function of the results of the alignment measurements,

the clearances existing between the edge of the upper core plate (10) and the opposing part of the core support shell (6) are measured at four points spaced at equal angular intervals on the periphery of the plate (10),

if appropriate, the upper internal equipment (13) is moved again to correct the errors in the measured clearances, while a satisfactory alignment of the internal equipment (13, 8) is maintained,

the clearances existing between, on the one hand, the alignment (20) and centering (25) pins and, on the other hand the corresponding slots (33, 28) are measured,

the upper internal equipment (13) is withdrawn from the vessel (1),

adapters (31, 31*b*, 36) machined to sizes which are determined by the measurements of clearances around the pins (21, 25) are fixed to the upper internal equipment (13), inside the slots (28, 33),

the upper internal equipment (13) fitted with the adapters (31*a*, 31*b*, 36) and only the alignment-measuring devices (50) is reintroduced into the vessel (1),

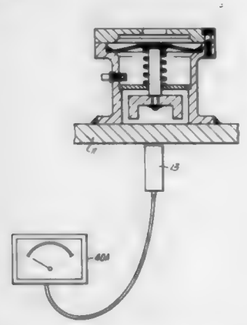
and the alignment of the upper internal equipment (13) relative to the lower internal equipment (8) is checked.

4,696,787

MONITORING PRESSURE WITHIN A VESSEL

Eric Pendleton, Culcheth; Karl A. Roberts, Warrington, and Alan Murray, Roby Merseyside, all of England, assignors to National Nuclear Corporation Limited, London, England

Filed May 6, 1985, Ser. No. 731,036
Claims priority, application United Kingdom, May 21, 1984, 8412981
Int. Cl.[4] G21C *17/06*; G01K *13/02*
U.S. Cl. 376—247 **20 Claims**



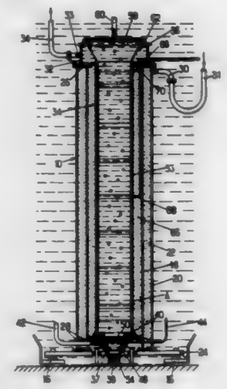
1. A vessel provided internally with a device for enabling external detection of pressure drop within the vessel, said device comprising a permanent magnet, means mounting the magnet within the vessel for movement toward and away from a boundary wall of the vessel, means for translating the internal pressure within the vessel into a force which, together with the magnetic force developed by the magnet, maintains the magnet in a predetermined position with respect to said boundary wall of the vessel, the magnet being located and arranged such that it is magnetically urged toward said predetermined position, and means responsive to the internal pressure for urging the magnet away from said predetermined position whereby, in the event of a substantial drop in pressure within the vessel, the latter means becomes effective to displace the magnet relative to said boundary wall to vary the magnetic field strength detectable by detector means located on the external side of the boundary wall.

4,696,788

PROCESS AND DEVICE FOR DETECTING DEFECTIVE CLADDING SHEATHS IN A NUCLEAR FUEL ASSEMBLY

Michel Sell, Caluire, France, assignor to Framatome et Cogema "Fragema", Courbevoie, France

Filed Aug. 8, 1985, Ser. No. 763,732
Claims priority, application France, Aug. 8, 1984, 84 12561
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—253 **10 Claims**



1. A process for detecting defective fuel elements in a nuclear fuel assembly, comprising the steps of

(a) locating a fuel assembly in a sipping hood;

(b) causing said fuel assembly to heat for increasing gas pressure in the sheaths of the fuel assembly;

(c) forming a mixture of water and inert gas dispersed in said water and continuously introducing said mixture at the lower portion of said hood for sweeping said fuel assembly in said hood with an upward circulation of said mixture;

(d) separating said water and inert gas in the mixture leaving said hood at an upper portion of the hood above said fuel assembly and circulating the separated water and inert gas through separate respective measuring loops;

(e) continuously monitoring the presence of water-soluble fission products in the water loop by measuring the activity of the separated water and monitoring the presence of fission products dispersed in said inert gas in said gas loop, and

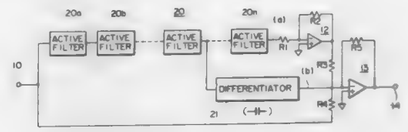
(f) recycling said inert gas and water to form said mixture.

4,696,789

NUCLEAR REACTOR POWER METER

Minoru Oda, Amagasaki, and Kunio Oba, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 23, 1985, Ser. No. 790,625
Claims priority, application Japan, Oct. 25, 1984, 59-223016
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—254 **5 Claims**



1. A nuclear reactor power meter for measuring the output of a nuclear reactor from the concentration signal of radioiso-

tope ^{16}N contained in a primary coolant in a primary coolant loop, the nuclear reactor power meter comprising:

a detector mounted at the outlet of said reactor for detecting gamma rays radiated from said primary coolant flowing therethrough; and

a transient response correction circuit responsive to the output of said detector and including an approximated normal distribution response filter having a group delay time substantially corresponding to a single circulation time necessary for said primary coolant loop and having a rise time in the step response substantially corresponding to a spread time in the rise of said ^{16}N concentration signal due to agitation occurring during said single circulation time, said filter comprising multicascaded first order lag elements, the number of the cascaded stages being substantially equal to $2\pi(t/t_{10\text{-}90})^2$, and the time constant of each of said first order lag elements being substantially equal to $\frac{1}{2}\pi(t^2_{10\text{-}90}/t)$ where said circulation time is t and said spread time is $t_{10\text{-}90}$.

4,696,790

PRESTRESSED CONCRETE PRESSURE VESSEL, IN PARTICULAR FOR A NUCLEAR REACTOR INSTALLATION

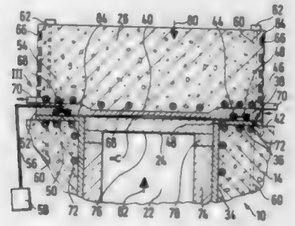
Claus Elter, Bad Duerkheim, and Josef Schoening, Hambruecken, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Dortmund, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 687,656

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402055

Int. Cl.⁴ G21C *13/06, 17/00*

U.S. Cl. 376—296 **8 Claims**



1. A prestressed concrete pressure vessel, for a nuclear reactor installation, comprising:

a concrete main body having a hollow inside section;

an opening in the main body which leads from outside the pressure vessel into the inside section;

thermal insulation disposed against said opening;

a prestressed concrete cover for closing off said opening, said cover having a periphery of lesser diameter than the main body;

a support surface surrounding said opening on the main body of the pressure vessel;

a bearing surface on the periphery of the cover bearing substantially all forces exerted on said prestressed concrete cover, which rests on said support surface, and which defines a seam between itself and said support surface;

two annular grooves in said bearing surface which encompass said opening;

a gasket disposed in each of the annular grooves;

an annular channel in said bearing surface, disposed between the two annular grooves, and being in continuous contact with the seam said annular channel is recessed from said seam between said bearing surface and said support surface;

at least one connecting channel leading from the annular channel to the outside of the pressure vessel;

a gas detector associated with said connecting channel;

a plurality of clamping elements which function to hold down the cover in such a manner that the bearing surface elastically conforms to any deformation of the pressure vessel and support surface which may result from pressure in the inside section.

4,696,791

NUCLEAR REACTOR INSTALLATION

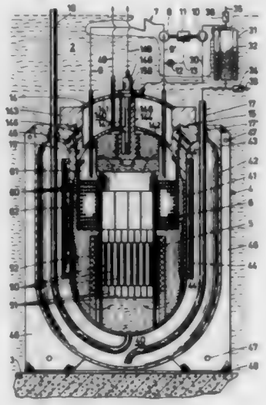
Hermann Straub, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 17, 1985, Ser. No. 756,033

Claims priority, application Switzerland, Jul. 17, 1984, 3455/84

Int. Cl.⁴ G21C *9/00*

U.S. Cl. 376—299 **14 Claims**



1. A nuclear reactor installation comprising

a pressure vessel having a pair of concentric walls defining a peripheral chamber therebetween;

a reactor core disposed within said pressure vessel for heating a primary coolant;

a cooling circuit for conveying a secondary coolant in heat exchange relation with the primary coolant, said circuit including at least one primary heat exchanger within said pressure vessel, at least one secondary heat exchanger outside said pressure vessel, coolant lines extending through said pressure vessel and connecting said heat exchanges together, and circulating mens for circulating a secondary coolant through said heat exchangers;

a heat sink extending around said pressure vessel;

a source of at least on flowable heat-insulating agent outside said pressure vessel;

a source of at least one flowable heat-conductive agent outside said pressure vessel;

first means communicating said source of heat-insulating agent with said peripheral chamber during normal operation of said reactor core; and

second means communicating said source of heat-conductive agent with said peripheral chamber to fill said chamber with heat-conductive agent in response to a disturbance in reactor core cooling.

4,696,792

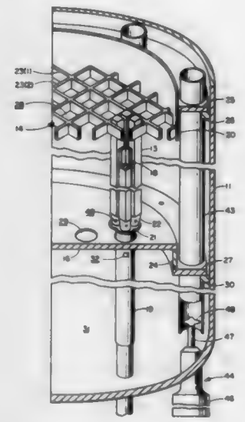
NUCLEAR REACTOR COOLANT RECIRCULATION

Robert R. Hobson, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jul. 30, 1984, Ser. No. 635,730

Int. Cl.⁴ G21C *15/06*

U.S. Cl. 376—377 **7 Claims**



1. A system for forcing a liquid water coolant to recirculate through an unshrouded nuclear core in a pressure vessel, said core including an array of spaced fuel assemblies supported between a lower core support member and an upper core support member, each of said fuel assemblies being fitted with a tubular flow channel for containing water coolant flowing therethrough; an annular lower support ring attached to said pressure vessel and connected to said lower core support member for support thereof, said lower core support member, said lower support ring and the lower part of said pressure vessel forming a lower plenum wherein said coolant can be pressurized; an upper support ring attached to said pressure vessel and connected to said upper core support member, a space in said pressure vessel above said upper core support member forming an upper plenum for containing water coolant; a plurality of coolant pressurizers within said pressure vessel each having a coolant inlet and a coolant outlet; a plurality of vertically oriented elongated coolant conducting conduits positioned in radially spaced relation between said core and the inner wall of said pressure vessel and extending from the upper plenum to the lower plenum, each connected to the coolant inlet of a respective one of said coolant pressurizers and each penetrating said upper support ring for conducting coolant from said upper plenum to said coolant inlet, the coolant outlet of each coolant pressurizer being in fluid communication with said lower plenum for pressurizing the coolant therein; primary coolant passages through said lower support member for admitting pressurized coolant from said lower plenum into said fuel assemblies; and coolant outlet means at the upper end of said core for discharging liquid coolant from said core to said upper plenum whereby said coolant is recirculated from said lower plenum, through said core to said upper plenum and back to said lower plenum.

4,696,793

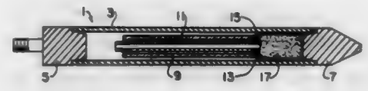
BURNABLE POISON ROD FOR USE IN A NUCLEAR REACTOR

Gary E. Paul, Monroeville; Ronald H. Carr, Swissvale, and Lee W. Stern, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1984, Ser. No. 594,156

Int. Cl.⁴ G21C *3/32, 7/10*

U.S. Cl. 376—447 **12 Claims**



1. In a nuclear reactor fuel assembly, a nonfuel burnable poison rod comprising:

(a) a tubular metallic cladding having upper and lower closure means, said lower closure means sealing the lower portion of said tubular cladding;

(b) a neutron absorber in the form of an outer tube positioned concentrically within said tubular metallic cladding;

(c) a neutron moderating spacing means for positioning said outer neutron absorber tube in spaced relation to said lower closure means, said neutron moderating spacing means being in the form of a solid cylindrical mass of a neutron moderating material; and

(d) support means in the form of an inner metallic tube concentrically disposed within said outer neutron absorber tube and resting on said solid cylindrical mass of neutron moderating material.

4,696,794

CL-1957D ANTIBIOTIC COMPOUND AND ITS PRODUCTION

Richard H. Bunge; James C. French; Timothy R. Hurley, and Neil E. Willmer, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 835,399, Mar. 3, 1986, abandoned. This application Nov. 7, 1986, Ser. No. 928,443

Int. Cl.⁴ A61K *35/74;* **C12D** *1/06*

U.S. Cl. 424—118 **7 Claims**

1. An antibiotic compound designated CL-1957D or a pharmaceutically acceptable salt thereof; compound CL-1957D being characterized by:

(a) an elemental analysis of C, 53.6%; H, 7.89%; N, 12.96%; O, 25.54%;

(b) a melting point of 182°–184° C.;

(c) an optial rotation of +17.7° (1.03% in methanol);

(d) an ultraviolet absorption spectrum that shows only end absorption in methanol;

(e) an infrared absorption spectrum in KBr showing principal absorption peaks at 2972, 2954, 2877, 1754, 1643, 1524, 1414, 1256, 1196, and 1803 reciprocal centimeters;

(f) a 200 MHz proton magnetic resonance spectrum in deuterochloroform solution showing principal signals at 0.78–0.87 (multiplet), 0.95–1.03 (multiplet), 1.20 (doublet), 1.34–1.40 (multiplet), 1.56 (singlet), 1.59–1.69 (multiplet), 1.82–2.1 (multiplet), 2.21–2.28 (multiplet), 2.67–2.79 (multiplet), 3.10–3.20 (multiplet), 3.68–3.76 (multiplet, 1 proton), 3.91 (doublet of doublets, 1 proton), 4.59–4.88 (multiplets, 4 protons), 5.04–5.15 (multiplet, 1 (proton), 5.25–5.40 (multiplet), 6.07–6.15 (multiplet), 6.47 (singlet*, 1 proton), 7.01–7.11 multiplet, 2 protons), 7.96 (singlet*, 1 proton), and 9.13 (singlet*, 1 proton) parts per million downfield from tetramethylsilane; *exchangeable with D_2O;

(g) a 75.4 MH ^{13}C nuclear magnetic resonance spectrum in deuterochloroform solution showing principal 176.03, 172.52, 172.47, 171.04, 170.28, 169.17, 98.93, 78.97, 76.84, 71.75, 53.54, 52.90, 49.37, 49.04, 47.12, 46.80, 46.28, 42.13,

29.54, 38.61, 31.06, 30.97, 29.93, 27.42, 24.87, 23.89, 23.31, 21.77, 21.58, 20.38, 19.90, 19.39, 18.73, 18.18, 12.94, 11.84, and 11.64 parts per million downfield from tetramethylsilane;

(h) a retention time (high pressure liquid chromatography, μBondpak (TM) C-18-silica gel column, 3.9 mm i.d.×30 cm, Waters Associates, Milford, Ma., solvent: 0.05M ammonium phosphate buffer (pH 6.5)-acetonitrile (35:65); flow rate 1.5 ml/minute) of 6.1 minutes;

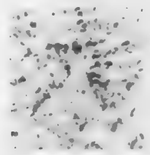
(i) a R_f (high performance thin-layer chromatography on silica gel 60F254, E. Merck, solvent: chloroform-methanol-acetonitrile-28% NH_3 (75:9:15:1)) of 0.6.

4,696,795

TEST MEDIUM FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Senichi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 670,923, Nov. 13, 1984, Pat. No. 4,643,978.
This application Oct. 10, 1985, Ser. No. 786,286
Claims priority, application Japan, Jul. 24, 1984, 59-153799
Int. Cl.[4] G01N *31/22*
U.S. Cl. 422—56 **6 Claims**



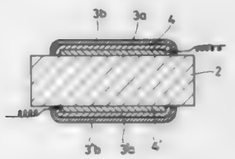
1. A test medium for use in detecting phosphorus segregates in a metallic material, in the form of a sheet impregnated with an aqueous solution consisting of 0.1 to 80% by weight of silver nitrate in water.

4,696,796

MOISTURE SENSOR

Syotaro Oka, Muko; Shu Tahara, Nagaokakyo, and Junya Kobayashi, Kyoto, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Sep. 4, 1985, Ser. No. 772,562
Claims priority, application Japan, Sep. 8, 1984, 59-188660
Int. Cl.[4] G01N *27/12*
U.S. Cl. 422—88 **2 Claims**



1. A moisture sensor comprising:

(a) a solid substrate comprising a piezoelectric element;

(b) a pair of electrodes formed on said substrate; and

(c) a moisture sensitive film formed on at least one of said electrodes, said film comprising:

an inner, plasma-polymerized, highly crosslinked high polymer layer of a hydrophobic organic compound, and

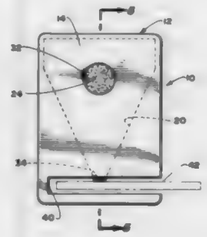
an outer surface layer chemically bonded to said inner layer, said outer surface layer comprising an amino-containing highly crosslinked high polymer layer of an organic amino compound formed by plasma polymerization, said outer surface layer having incorporated therein a concentration gradient of ammonium salt-containing hydrophilic groups, decreasing from an exposed surface of said surface layer to said inner layer.

4,696,797

SUSPENSION LIQUID SEPARATOR

Arden A. Kelton, Fountain Valley, Calif., assignor to Environmental Diagnostics, Inc., Irvine, Calif.

Filed Apr. 15, 1985, Ser. No. 723,162
Int. Cl.[4] G01N *1/18*; B01D *15/08*
U.S. Cl. 422—101 **5 Claims**



1. In a suspension liquid separator, the combination of: a housing having a separator chamber and an eluant port, a liquid suspension receiving port and a liquid discharge port communicating with said chamber; and a depth-type, planar, liquid filter body located in said chamber in juxtaposition to said ports, said filter body having one portion adjacent said eluant and liquid suspension receiving ports and another portion adjacent said liquid discharge port, the width of said chamber at said another portion being configured such that said another portion completely fills said chamber, whereby fluid flow is restricted within said filter body.

4. In a liquid suspension separator for providing a liquid test specimen from which particulates have been removed, the combination of: a housing incorporating a separator chamber, said housing having eluant and liquid suspension ports located at one extremity of said chamber and a discharge port communicating with another extremity of said chamber; a depth-type planar liquid filter body located in said separator chamber in juxtaposition to said ports, said filter body having one portion adjacent said eluant and liquid suspension receiving ports and another portion adjacent said liquid discharge port, the width of said chamber at said another portion being configured such that said another portion completely fills said chamber, whereby fluid flow is restricted within said filter body said filter body incorporating laterally operative filtration passages whereby eluant and liquid suspension introduced into said chamber through said respective ports will be conveyed to said discharge port while said particulates are retained in said filter body; and receptor means on said another extremity adjacent said discharge port for receiving, positioning and holding a test device in immediate proximity to said discharge port.

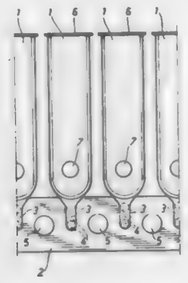
4,696,798

CUVETTE SET FOR BLOOD ANALYSIS

Carl J. Timgren, Helsinki, Finland, assignor to Perlos Oy, Nurmijarvi, Finland

Filed Feb. 6, 1986, Ser. No. 827,276
Claims priority, application Finland, Mar. 6, 1985, 850890
Int. Cl.[4] B29C *45/14*; G01N *21/03*
U.S. Cl. 422—102 **8 Claims**

1. A cuvette set for blood analysis, comprising a plurality of plastic cuvettes molded onto a carrier and guide band, each of said cuvettes including a bottom wall portion extending to first and second sets of opposed side wall portions, the side wall portions of said first set being located on opposite sides of a first central plane of the cuvette and the side wall portions of said second set being located on opposite sides of a second central plane of the cuvette, said first central plane being essentially perpendicular to said second central plane, and an integral protrusion extending below the bottom wall portioon of the cuvette, said band comprising a strip of rigid material different from the plastic material forming said cuvettes and having two opposed flat surfaces located on opposite sides of a central plane of the strip of material, said band being located



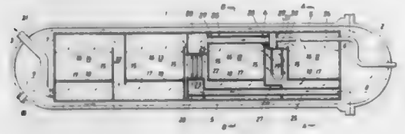
below the bottom wall portions of the cuvettes with said central plane of the strip of material being substantially parallel to said first central plane of the cuvettes, each of said protrusions extending along at least one of said flat surfaces of the band and being rigidly fixed to the band by first fastening means to accurately position said cuvettes with respect to said band, said band including second fastening means constructed and arranged to engage a control device to carry the band and cuvettes through an analyzer with the cuvettes in a proper position for analysis of samples contained therein.

4,696,799

AMMONIA SYNTHESIS CONVERTER

Stephen A. Nue, Houston, Tex., assignor to The M. W. Kellogg Company, Houston, Tex.

Filed Jul. 15, 1986, Ser. No. 885,620
Int. Cl.[4] C01C *1/04*
U.S. Cl. 422—148 **3 Claims**



1. A horizontal ammonia converter having a first end and a second end which comprises:

(a) a cylindrical pressure shell having outer heads contiguous therewith at the first and secodn ends;

(b) a cylindrical inner shell disposed within substantially the entire length of the pressure shell and defining a shell annulus therewith, the inner shell having first and second end closures contiguous with the cylindrical inner shell, the first end outer head defining a first gas plenum with the first end closure and the second end outer head defining a second gas plenum with the second end closure;

(c) gas inlet means disposed in the second end outer head in serial fluid communication with the second gas plenum, the shell annulus, and the first gas plenum;

(d) gas outlet means;

(e) first, second, and third, slab-flow catalyst beds defined by transverse bulkheads within the inner shell and opposed side portions of the inner shell, the first catalyst bed being proximate the first end of the converter and the second catalyst bed being spaced between the first and third catalyst beds, each of the catalyst beds having a top inlet face and a bottom outlet face;

(f) a first heat exchanger having an upper end and vertical U-tubes with inlet and outlet means at the upper end of the exchanger, the first heat exchanger being disposed between the first and second catalyst beds;

(g) a second heat exchanger having vertical tubes with inlet and outlet means, the second heat exchanger being disposed between the second and third catalyst beds;

(h) first longitudinal conduit means disposed within the cylindrical inner shell below and externally proximate to the first and second catalyst beds providing fluid communication between the first gas plenum and the inlet means of the second heat exchanger;

(i) second longitudinal conduit means disposed within the cylindrical inner shell above and externally proximate to only the second catalyst bed providing fluid communication between the outlet means of the second heat exchanger and the inlet means of the first heat exchanger;

(j) baffle means for conducting gas successively from the outlet means of the first heat exchanger downwardly through the first catalyst bed, across tube exteriors of the first heat exchanger, downwardly through the second catalyst bed, across tube exteriors of the second heat exchanger and downwardly through the third catalyst bed; and

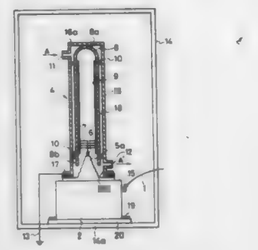
(k) means for conducting gas from the bottom outlet face of the third catalyst bed to the gas outlet means.

4,696,800

OZONE GENERATING APPARATUS

Toshihiko Sasaki; Yooji Sunayama; Isao Yoshida, all of Hyogo, and Masayuki Endo, Okayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,384
Int. Cl.[4] C01B *13/11*; B01J *19/08*
U.S. Cl. 422—186.18 **1 Claim**



1. In an ozone generating apparatus comprising:

a housing,

a high voltage transformer within said housing,

a casing enclosing said high voltage transformer,

an ozonizer fixedly mounted within said housing,

a high voltage bushing fixedly mounted to one end of said ozonizer and electrically connected to said high voltage transformer,

the improvement wherein said ozonizer comprises:

a cylindrical ground electrode tube having a closed end and an open end,

a dielectric glass discharge tube of cylindrical shape, of a diameter less than that of the ground electrode tube, insertably mounted within the inside of said ground electrode tube, and fixedly spaced therefrom and having a closed end and an open end, said open end being proximate to the open end of the ground electrode tube,

a conductive film formed on the inner surface of the electric glass discharge tube,

said high voltage bushing is fixedly mounted to said high voltage transformer casing and projects outwardly

thereof, wherein said open end of said cylindrical ground electrode tube is fixedly mounted to said high voltage transformer casing about said high voltage bushing, and

means internally of the cylindrical ground electrode tube for directly connecting said high voltage bushing to said ozonizer comprising a conductive bar extending outwardly of said high voltage bushing into the open end of said electric glass discharge tube is proximity to said conductive film, and a power supply brush connecting the end of said conductive bar to said dielectric glass discharge tube conductive film.

4,696,801

PROCESS FOR THE EXTRACTION OF METAL VALUES WITH BISIMIDAZOLE METAL EXTRACTANTS

David P. Devonald, Oldham; Anthony J. Nelson, Manchester; Peter M. Quan, Rochdale, and David Stewart, Royton, all of England, assignors to Imperial Chemical Industries PLC, London, England

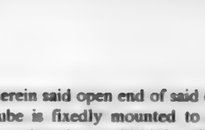
Filed Feb. 12, 1986, Ser. No. 828,748

Claims priority, application United Kingdom, Feb. 25, 1985, 8504819

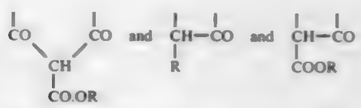
Int. Cl.[4] C01G *51/00, 3/00, 9/00, 11/00*

U.S. Cl. 423—24 **18 Claims**

1. A process for extracting metal values from aqueous solutions of metal salts containing halide or pseudo halide anions which comprises contacting the aqueous solution with a solution in a water-immiscible organic solvent of a biimidazole or bibenzimidazole extractant of formula:



wherein X and Y, which may be the same or different, taken together contain a total of from 12 to 52 saturated carbon atoms and are each selected from the group R—, RCO—, —$CH_2CO.OR$, —$CH(CO.OR)_2$ and —CO.OR wherein R is a hydrocarbyl group; or wherein X and Y taken together contain a total of from 12 to 52 saturated carbon atoms and taken together are selected from the groups



wherein R is a hydrocarbyl group; and wherein A, B, C which may be the same or different are each hydrogen or a substituent Z wherein Z is lower alkyl, halogen, nitro, cyano or—CO.OR′ wherein R′ is lower alkyl; or A and B taken together with the two carbon atoms joining them form an optionally substituted cyclohexene ring and/or C and D taken together with the two carbon atoms joining them form an optionally substituted cyclohexene ring; or A and B taken together with the two carbon atoms joining them form an optionally susbstituted benzene ring and/or C and D taken together with the two carbon atoms joining them form an optionally substituted benzene ring.

4,696,802

DRILLING GEOTHERMAL WELLS WITH REMOVAL OF H_2S

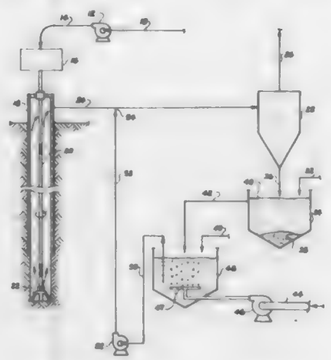
Stephen A. Bedell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 27, 1985, Ser. No. 802,138

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[4] C01B *17/04;* **F03G** *7/00*

U.S. Cl. 423—226 **10 Claims**



1. A process for the treatment of raw geothermal steam produced during the drilling, flow testing, or reworking of a geothermal well whereby the H_2S gas contained in said steam is abated which comprises the steps of

(A) contacting said raw steam containing entrained solids and H_2S gas with an aqueous solution having 1 to 6 moles of ferric chelate for each mole of H_2S in said steam, 25 to 3000 parts per million of one or more water soluble cationic polymeric catalysts, and a pH in the range of 7 to 11 whereby H_2S is substantially completely absorbed and rapidly converted into sulfur solids and whereby a ferrous chelate solution is generated.

(B) separating said ferrous chelate solution from entrained solids, and sulfur solids,

(C) converting said ferrous chelate solution with an oxygen containing gas stream into a ferric chelate solution,

(D) recycling said ferric chelate solution back to said contacting step for reuse.

4,696,803

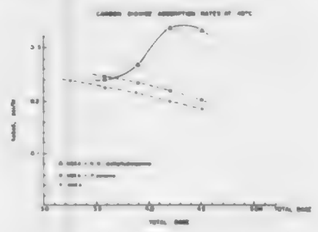
TREATMENT OF GAS STREAMS FOR REMOVAL OF ACID GASES

Edward C. Y. Nieh, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 13, 1986, Ser. No. 829,347

Int. Cl.[4] C01B *17/16*

U.S. Cl. 423—228 **5 Claims**



1. A method for the purification of a stream of gas compris-

ing a normally gaseous hydrocarbon or synthesis gas contaminated with acid gases which comprises the steps of:

countercurrently contacting said gas stream in an absorption zone with a treating agent to thereby remove a substantial portion of the acid contaminants from said hydrocarbon gas stream by absorption into said treating agent, discharging an at least partially purified hydrocarbon gas stream from said absorption zone, and discharging said treating agent enriched with absorbed acid gas components from said absorption zone, said treating agent consisting essentially of an aqueous solution of from about 40 to about 60 wt. % of N-methyldiethanolamine and from about 5 to about 15 wt. % of N,N-diethyl hydroxylamine.

4,696,804

METHOD FOR TREATING SO_2, SO_3 AND DUST SIMULTANEOUSLY

Naoharu Shinoda; Atsushi Tatani; Masakazu Onizuka; Susumu Okino, all of Hiroshima, and Taku Shimizu, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 23, 1986, Ser. No. 821,608

Claims priority, application Japan, Feb. 5, 1985, 60-19270

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **6 Claims**

1. In a method for treating an exhaust gas which contains SO_2, SO_3 and dust wherein the gas is passed through a dry dust collector to remove most of the dust, the thus treated gas is treated in an absorbing device containing an absorbent selected from the group consisting of calcium hydroxide and calcium carbonate to remove SO_2 and remaining dust, the improvement which comprises the steps of blowing air into an absorbing solution fed to said gas absorbing device in order to oxidize said absorbing solution and to thereby form a gypsum therein; separating a part of said absorbing solution into a first slurry containing mainly said gypsum grains and a second slurry containing mainly said dust by utilizing the difference between the precipitation speeds of dust and gypsum particles in the slurry; obtaining said gypsum from said first slurry; adding an alkali to said second slurry; spraying the alkali second slurry into said exhaust gas on the upstream side of said dry dust collector; collecting, drying and solidifying SO_3; and collecting the resultant solid together with said dust with said dry dust collector.

4,696,805

METHOD FOR DESULFURIZING EXHAUST GAS

Naoharu Shinoda; Atsushi Tatani; Masakazu Onizuka; Susumu Okino, all of Hiroshima, and Taku Shimizu, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 23, 1986, Ser. No. 821,600

Claims priority, application Japan, Feb. 5, 1985, 60-19269; Feb. 5, 1985, 60-19273

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **6 Claims**

1. A method for simultaneously treating SO_2 and HCl comprising passing said gas through a gas absorbing solution which absorbs SO_2 and HCl to produce an acid solution containing a sulfite and a chloride; and oxidizing section in which said sulfite is oxidized by blowing air into said absorbing solution to oxidize said sulfite; neutralizing said absorbing solution by adding a compound selected from the group consisting of $CaCO_3$ and $Ca(OH)_2$; said gas absorbing solution being passed through a closed circulating circuit for delivering said solution from said gas absorbing section to said oxidizing section, delivering said solution drawn out from said oxidizing section to said neutralizing section, and delivering said solution drawn out from said neutralizing section to said gas absorbing section; and recovering gypsum as a by-product from said absorbing solution in said closed circulating circuit; said chloride being taken out in the form of an aqueous solution.

4,696,806

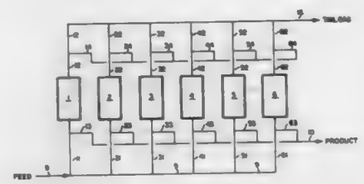
METAL HYDRIDE ADSORPTION PROCESS FOR HYDROGEN PURIFICATION

Janice C. Peterson, Allentown, and Stephen P. DiMartino, Topton, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 9, 1986, Ser. No. 849,660

Int. Cl.[4] C01B *1/32*

U.S. Cl. 423—248 **16 Claims**



1. A process for recovering hydrogen from a feed stream containing hydrogen and at least one other gaseous component, said process comprising a metal hydride adsorption cycle utilizing at least six separate metal hydride beds wherein said cycle comprises the steps of:

(a) passing the hydrogen-containing feed stream over a first metal hydride bed whereby a portion of the hydrogen contained in the feed is adsorbed by said first bed;

(b) equalizing the pressure of the first bed with another metal hydride bed in the cycle which is undergoing repressurization;

(c) rising said first bed with a hydrogen-rich stream;

(d) depressurizing the first bed to a pressure sufficient to desorb the hydrogen from the metal hydrides, thereby producing a hydrogen-rich stream;

(e) repressurizing the first bed by contacting it with effluent streams produced during the equalization and rinse steps of a subsequent metal hydride bed in the cycle;

(f) further repressurizing the first bed to bring said bed to adsorption pressure; and

(g) repeating steps (a) through (f) for each of the separate metal hydride beds such that the start of the adsorption step is staggered between successive beds by about one-half the total adsorption time.

4,696,807

CRYSTALLINE MICROPOROUS OXIDE MCM-21 AND PROCESS FOR ITS PREPARATION

Cynthia T-W Chu, Pennington, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,933

Int. Cl.[4] C01B *15/16*

U.S. Cl. 423—305 **6 Claims**

1. A synthetic crystalline microporous oxide material having a composition, on an anhydrous basis, expressed by the formula:

$$xR:Fe_2O_3:(1.0\pm0.2)P_2O_5$$

wherein R is an organic component resulting from organics present during synthesis of said crystalline material selected from the group consisting of compounds of tetramethylammonium, ethylenediamine, and quinuclidine, and x is from 0 to about 2; and being characterized by an X-ray diffraction pattern exhibiting values as set forth in TABLE 1 of the specification.

3. A method for preparing a synthetic crystalline microporous oxide material having a composition, on an anhydrous basis, expressed by the formula:

$$xR:Fe_2O_3:(1.0\pm0.2)P_2O_5$$

wherein R is an organic component resulting from organics present during synthesis of said crystalline material and x is from 0 to about 2, and being characterized by an X-ray diffraction pattern exhibiting values as set forth in TABLE 1 of the specification, said method comprising preparing a reaction mixture capable of forming said material upon crystallization, said reaction mixture containing sufficient amounts of alkali metal or alkaline earth metal cations, an oxide of iron, water, orthophosphoric acid and organic component selected from the group consisting of compounds of tetramethylammonium, tetrapropylammonium, ethylenediamine, and quinuclidine, said reaction mixture having a composition in terms of mole ratios within the following ranges:

$M_{2/p}O:R$	≦10
$R:P_2O_5$	0.01 to 3
$Fe_2O_3:P_2O_5$	0.5 to 5

wherein M is said alkali metal or alkaline earth metal cation, R is said organic component and p is the valence of M, and maintaining said reaction mixture under crystallization conditions including a temperature of from anout 50° C. to about 300° C. until crystals of said material are formed.

4,696,808

PROCEDURE TO PREPARE TRANSPARENT SILICA GELS

Patrick G. Barber, Keysville, Va., and Norman R. Simpson, Rockville, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 24, 1986, Ser. No. 933,961
Int. Cl.[4] C01B *33/12*
U.S. Cl. 423—338 **6 Claims**

1. A process for the preparation of a transparent silica gel which is useful as a crystal growth medium which comprises the sequential steps of:

obtaining a quantity of cation exchange resin beads;

mixing said cation exchange resin beads with a concentrated solution of a soluble potassium salt;

stirring the mixture of cation exchange resin beads and soluble potassium salt solution for a period of time to allow the potassium ions to replace the cations on the resin beads;

decanting the supernatant liquid from the mixture of the previous step through a filter and rinsing the treated resin beads with distilled water;

preparing a sodium silicate solution;

transferring said treated resin beads to said sodium silicate solution and stirring the mixture for a period of time to allow the sodium ions in the solution to exchange with the potassium ions on the beads;

pouring the treated silicate solution through a filter;

adding a volume of boiled, cooled distilled water to a volume of said treated silicate solution and then adding a volume of acetic acid solution to the mixture of distilled water and treated silicate solution;

allowing the mixture of the previous step to remain at room temperature;

whereby a transparent silica gel is produced.

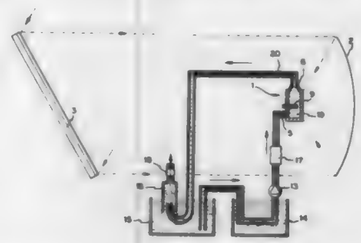
4,696,809

PROCESS AND APPARATUS FOR THERMOLYTICALLY DISSOCIATING WATER

André Vialaron, Toulouse; Gabriel Olalde, and Daniel Gauthier, both of Font Romeu, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Oct. 29, 1985, Ser. No. 792,600
Claims priority, application France, Oct. 29, 1984, 84 16627
Int. Cl.[4] C01B *13/00, 3/06;* B01J *19/12*
U.S. Cl. 423—579 **14 Claims**

1. A process for continuously dissociating water into hydrogen and oxygen comprising thermolytically reacting the water in contact with a refractory body surface immersed therein and raised to a thermolytic temperature capable of decomposing water molecules, while maintaining said refractory-body surface (*9a*) immersed in a body of said water (**19**), and heating said surface by an energy input sufficient to maintain said surface at the thermolytic temperature within said body of water for maintaining a boiling state and vaporizing the water



thereby forming a gas film in the immediate vicinity of said surface and for assuring a decomposition of the vaporized water at said immersed surface and producing gaseous hydrogen and oxygen decomposition products, and providing the water in which the refractory body surface is immersed in a sufficient quantity for maintaining the water in liquid form around the gas film produced in the vicinity of said surface for cooling of the decomposition products.

4,696,810

WET PROCESS FOR THE PRODUCTION OF A READILY SINTERABLE POWDER MATERIAL OF PEROVSKITE OR ITS SOLID SOLUTION

Shin-ichi Shirasaki, Sakura; Yasunari Hotta, Otsu; Hiroshi Yamamura, Sakura; Shin-ichi Matsuda, Ibaraki; Kazuyuki Kakegawa, Saitama; Yusuke Moriyoshi, Sakura; Koichiro Takahashi, Sakura, and Hajime Haneda, Sakura, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Niihari, Japan

Continuation of Ser. No. 717,034, Mar. 28, 1985. This application Apr. 2, 1986, Ser. No. 847,148
Claims priority, application Japan, Aug. 16, 1984, 59-171244; Aug. 16, 1984, 59-171245; Aug. 16, 1984, 59-171246
Int. Cl.[4] C01G *25/02, 23/04*
U.S. Cl. 423—593 **2 Claims**

1. A process for producing a powdered perovskite represented by the formula:

$$ABO_3$$

wherein A is selected from the group consisting of Pb, Ba, Ca, Sr and La; and B is selected from the group consisting of Ti and Zr, which comprises

contacting in a vessel an aqueous or alcohol solution of an ion of either component A or component B with a precipitating solution selected from the group consisting of solutions of ammonia, ammonium carbonate, sodium hydroxide, potassium hydroxide and oxalic acid, to form a first precipitate of said component,

mixing in said vessel an aqueous or alcohol solution of the other component thereby forming a second precipitate of said other component,

drying and calcining the resulting powder mixture at a temperature of from 400° to 1200° C., wherein during said calcining a solid phase reaction occurs in said powder mixture to form said perovskite.

4,696,811

METHOD AND COMPOSITION FOR PREVENTION AND TREATMENT OF ORAL DISEASE

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Continuation of Ser. No. 846,342, Mar. 31, 1986, abandoned. This application Dec. 29, 1986, Ser. No. 17,241
Int. Cl.[4] A61K *7/20, 33/20*
U.S. Cl. 424—53 **1 Claim**

1. A method for reducing dental plaque, said method comprising the step of killing and reducing the number of streptococcus mutans to a 99% level by topical application within the oral cavity for a period of ten seconds of a solution containing stabilized chlorine dioxide in a concentration in the range of 0.005% to 0.2%.

4,696,812

THROMBIN PREPARATIONS

Steven B. Silbering, Forest Hills, N.Y.; Russell U. Nesbitt, Somerville, and Mahdi B. Fawzi, Flanders, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 28, 1985, Ser. No. 791,836
Int. Cl.[4] A61K *9/70, 37/48;* A61L *15/00*
U.S. Cl. 424—445 **6 Claims**

1. A stable thrombin preparation consisting essentially of:

(a) about 10 to about 10,000 units/ml thrombin,

(b) an antiautolytic quantity of a buffer which maintains the pH at about 5.0 to 8.0., and

(c) about 10 to about 40 wt % of a polyhydroxy stabilizer and about 0.9 to 2.7 wt % sodium chloride.

4,696,813

MELANIN INHIBITING COSMETIC COMPOSITION

Yoshitaka Higa, Dazaifu, Japan, assignor to Sansho Seiyaku Co., Ltd., Fukuoka, Japan

Filed Jul. 3, 1985, Ser. No. 751,755
Int. Cl.[4] A61K *7/021, 35/50, 35/84*
U.S. Cl. 424—59 **4 Claims**

1. A cosmetic composition for inhibiting the formation of melanine comprising placentin and kojic acid, wherein the weight ratio of kojic acid to placentin ranges from about 0.1:10 to about 3:10.

4,696,814

PARENTERAL PHENYTOIN COMPOSITIONS

Shui-Hsi Kao; Allen I. Kay, both of Succasunna, and Karla Sampson, West Caldwell, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 21, 1985, Ser. No. 767,997
Int. Cl.[4] A61K *31/79, 31/415*
U.S. Cl. 424—80 **12 Claims**

1. An injectable composition containing a mixture of about 1–10 wt % phenytoin sodium and about 3 to about 17 wt % polyvinylpyrrolidone and having a pH of about 10 to about 12.3.

4,696,815

ANTI-DIABETIC PHARMACEUTICAL FORMS AND THE PREPARATION THEREOF

Gottfried Schepky, Ulrich-von-Hutten-Weg 2, Biberach 1, Fed. Rep. of Germany (D-7950); Rolf Brickl, Erlenweg 37, Warthausen, Fed. Rep. of Germany (D-7951); Eckhard Rupprecht, Riedbachstrasse 15, Aulendorf-Tannhausen, Fed. Rep. of Germany (D-7960), and Andreas Greischel, Dunantstrasse 5, Biberach 1, Fed. Rep. of Germany (D-7950)

Filed May 31, 1984, Ser. No. 615,892
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320582
Int. Cl.[4] A61K *31/79, 31/495, 31/47, 31/415*
U.S. Cl. 424—80 **14 Claims**

1. An oral antidiabetic pharmaceutical composition consisting essentially of a conventional pharmaceutical excipient and the evaporation residue of a solution of an effective antidiabetic amount of an acidic, amphoteric or basic antidiabetic sulfonyl urea, a basic or acidic excipient and polyvinylpyrrolidone in an inert polar solvent, where the molar ratio of sulfonyl urea to basic or acid excipient is less than 1:1 and the ratio of sulfonyl urea to polyvinylpyrrolidone is about 1:0.5 to 1:10 by weight.

4,696,816

METHOD FOR TREATING INTERVERTEBRAL DISC DISPLACEMENT WITH ENZYMES

Mark D. Brown, 8900 SW. 96 St., Miami, Fla. 33176

Filed Nov. 7, 1985, Ser. No. 796,302
Int. Cl.[4] A61K *37/48*
U.S. Cl. 424—94.65 **5 Claims**

1. A method for the treatment of intervertebral disc displacement in humans who have been medically examined and screened for contraindications to chemonucleolysis which comprises administering an effective amount of the cartilage-dissolving enzyme chondroitenase directly into the intervertebral disc space.

4,696,817

EXTRACTION OF TEICHOMYCIN A_2 FROM WHOLE CULTURE FERMENTATION BROTH

Carl E. Snipes, and John S. Coleman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 11, 1983, Ser. No. 540,266
Int. Cl.[4] A61K *35/74*
U.S. Cl. 424—123 **19 Claims**

1. A method of extracting Teichomycin A_2 from a whole culture fermentation broth containing a mycelial mass comprising

(a) mixing the broth containing the mycelial mass with an effective amount of a water miscible solvent,

(b) agitating the mixture for a time sufficient to accumulate the Teichomycin A_2 in the broth/solvent liquid,

(c) separating the broth/solvent liquid containing the accumulated Teichomycin A_2 from the mycelial mass,

(d) reducing the volume of the broth/solvent liquid to concentrate the Teichomycin A_2,

(e) precipitating the Teichomycin A_2 in the reduced volume of broth/solvent liquid, and

(f) separating the precipitated Teichomycin A_2 from the broth/solvent liquid.

4,696,818

METHOD OF TREATMENT DURING WITHDRAWL FROM DRUG DEPENDENCY

Tuk M. Kim, 2546 San Bruno Ave., San Francisco, Calif. 94134

Continuation-in-part of Ser. No. 586,060, Mar. 5, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 794,404
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **6 Claims**

1. A method for treatment of opium, morphine or cocaine dependent human subjects comprising the step of orally administering during the period of drug withdrawal a composition comprising *Radix angelica sinensis, Herba pogostemi, Cyperus rotundus* and *Swquama manitis pendactilae* in unit dosage form.

4,696,819

ANOREXIC MATERIAL EXTRACTED FROM COCA LEAVES AND METHOD OF PREPARING

John A. Bedford; Hala N. Elsohly; Marvin C. Wilson, all of Oxford, Miss., and Carlton E. Turner, Alexandria, Va., assignors to University of Mississippi, Oxford, Miss.

Filed Apr. 30, 1982, Ser. No. 373,695
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **8 Claims**

1. The method of preparing an anorexigenic cocaine free compound or mixture of compounds from coca leaves (Erythroxylon coca) comprising the first step of grinding the leaves to fine powder; second, extracting the water soluble constituents from the powder; third, treating the water soluble constituents with a base to make alkaline; fourth, extracting the water soluble constituents with water and a water immiscible organic solvent that will dissolve water insoluble organic constituents; fifth, separating the water extract from the orgainc solvent extract; and sixth, evaporating the water extract to obtain a solid residue.

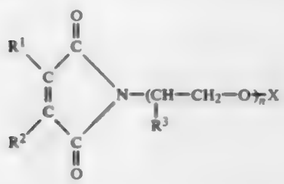
4,696,820

PHOTOSENSITIVE ELEMENTS CONTAINING POLYMER OF IMIDYLCOMPOUNDS

Beat Müller, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 724,426, Apr. 18, 1985, Pat. No. 4,629,773, which is a division of Ser. No. 405,472, Aug. 5, 1982, Pat. No. 4,532,332. This application Sep. 8, 1986, Ser. No. 904,583
Claims priority, application Switzerland, Aug. 17, 1981, 5303/81
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—271 **8 Claims**

1. A photographic recording material which comprises
(a) a carrier substrate, and
(b) a photosensitive, crosslinkable homopolymer as a layer thereon, said homopolymer having a molecular weight of 1000 to 1,000,000, as measured by the viscosity of a 0.5% by weight solution in methyl cellosolve at 25° C., prepared by the polymerization of an imidyl compound of formula I



(I)

wherein
R^1 and R^2 independently of one another are C_1–C_4-alkyl, or
R^1 and R^2 together are tetramethylene,
R^3 is a hydrogen atom or normal C_1–C_4-alkyl,
n is a number from 2 to 30, and
X is —CO—CR^4=CH_2, in which R^4 is a hydrogen atom or methyl.

4,696,821

TRANSDERMAL DELIVERY SYSTEM FOR ADMINISTRATION OF NITROGLYCERIN

Susan C. Belsole, Chester, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 11, 1983, Ser. No. 540,249
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—448 **9 Claims**

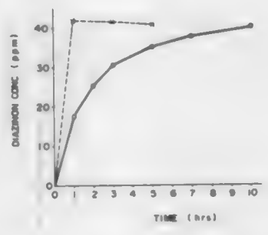
1. A tape for transdermal delivery of nitroglycerin comprising nitroglycerin-containing pyrrolidone film coated on one surface of aluminum foil with the uncoated surface of said aluminum foil mounted on the adhesive strip wherein the dimensions of said adhesive strip are larger than said aluminum foil, and said film contains 10 to 30 mg nitroglycerin dissolved in a solvent selected from the group consisting of octyl hydroxystearate, octly palmitate, mineral oil, lanolin alcohol, dimethicone fluid and capric/caprylic triglyceride and 30–70% by weight water soluble polyvinylpyrrolidone of molecular weight 10,000 to 360,000 plasticized with a plasticizer selected from the group consisting of glycerin, PEG-400, propylene glycol, sorbitol, PEG-75 lanolin oil, diethylene glycol, sorbitol, PEG 75 lanolin oil, diethylene glycol, butylene glycol, acetylated lanolin and a mixture thereof.

4,696,822

INSECTICIDAL COMPOSITIONS

Takafumi Matsumura, Mishima, and Masataka Morishita, Shizuoka, both of Japan, assignors to Toyo Jozo Company, Ltd., Shizuoka, Japan

Filed Jun. 21, 1985, Ser. No. 747,642
Claims priority, application Japan, Jul. 9, 1984, 59-140494
Int. Cl.[4] A61K *9/04;* **B01J** *13/02*
U.S. Cl. 424—490 **9 Claims**



1. An insecticidal composition containing microcapsules each of which comprises a core substance having 20 to 85% by weight of an insecticidal ingredient of diazinon or chlorpyrifos and 50% or less by weight of a diluent and a wall substance having 10 to 30% by weight of a polycationic water-soluble nitrogen-containing compound and 10% by weight or less of a hardener, said composition further containing 0.25–5% by weight of a coagulation-preventing agent of noionic surfactant and 5 to 30% by weight of water-soluble thickener, said percentages being based on the weight of the composition.

4,696,823

METHOD OF MAKING A PIZZA-TYPE PRODUCT OF DOUGH

Eugene L. DeChristopher, Belvedere, Calif., assignor to Boboli, Inc., San Rafael, Calif.

Filed Jun. 2, 1986, Ser. No. 869,374
Int. Cl.[4] A21D *8/02*
U.S. Cl. 426—496 **4 Claims**



1. The method of making a pizza-type product of bread dough comprising the steps of:
providing a properly proofed, unsheeted dough ball of bread-type dough;
providing a press with a plurality of downwardly projecting protuberances of various lengths and cross-sections thereon;
forcing said press down against said dough ball to press it into a thick but relatively flat configuration with a plurality of dimple indentations of irregular size and spacing in the upper surface thereof, leaving rises therebetween for entrapment of gases, and
placing said dough in a heated oven and baking said dough in said oven.

4,696,824

BULK HANDLING OF RAISINS

Frank J. Meczkowski, Battle Creek, and Ronald J. Triani, Kalamazoo, both of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,226
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—102 **7 Claims**

1. A process for improving bulk handling, transportation and processing or raisins consisting of:
(a) coating raisins with glycerine in amounts ranging from 0.5 to 1.0% by weight of the raisins;
(b) coating the glycerine coated raisins with oil in amounts ranging from 0.5 to 1.0% by weight of the coated raisins; and
(c) packing the coated raisins in sizes of at least 1 lb. for bulk transportation without refrigeration.

4,696,825

CONTINUOUS PRODUCTION OF SHELF-STABLE MULTI-TEXTURED SHREDDED CEREAL BISCUITS HAVING A PASTE FILLING

Kevin J. Leibfred, Oakland, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jan. 25, 1985, Ser. No. 695,059
Int. Cl.[4] A23L *1/164*
U.S. Cl. 426—283 **16 Claims**

1. A process for the continuous production of a shelf-stable paste-filled ready-to-eat shredded cereal biscuit comprising:
(a) continuously laminating a first plurality of shredded cereal dough layers, each of the layers having a plurality of generally parallel longitudinal strands and a plurality of crosshatchings generally perpendicular to said strands, said crosshatchings and said longitudinal strands forming an integral net-like sheet,
(b) continuously depositing at least one extrudate rope filling upon said first plurality of shredded layers, each extrudate rope being deposited generally parallel to said longitudinal strands,
(c) continuously laminating a second plurality of shredded cereal dough layers upon said at least one extrudate rope to obtain a filled laminate the number of crosshatchings of the integral net-like sheets adjacent to the at least one extrudate rope filling being greater than the number of crosshatchings of the next net-like sheets further removed from the filling, the crosshatchings of the net-like sheets preventing substantial penetration of the filling through said adjacent net-like sheets, said further removed net-like sheets providing a region of light texture and said adjacent net-like sheets providing region of dense texture in the filled biscuit,
(d) cutting the filled laminate, and
(e) baking the cut filled laminate.

4,696,826

PROCESS FOR MANUFACTURE OF EMULSIONS CONTAINING SOY PROTEIN

Steven J. Leusner, Lakewood; Barbara C. Raphael, Princeton, and William G. Swanhart, Jr., Plainsboro, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 16, 1986, Ser. No. 864,176
Int. Cl.[4] A23C *11/08;* **A23L** *1/19;* **A23G** *9/00*
U.S. Cl. 426—565 **9 Claims**

1. A process for preparing a soy protein-containing emulsion having improved uniformity and more desirable viscosity, comprising the steps of:
(a) dispersing a soy protein material in a non-milk fat;
(b) blending said dispersion with emulsifiers, stabilizers, sodium caseinate and water; and
(c) homogenizing said blend so as to form an emulsion.

4,696,827

SILICON CARBIDE-CARBON COMPOSITE MOLDED PRODUCT AND PROCESS FOR MANUFACTURING THE SAME

Kiyohito Okamura; Yoshio Hasegawa, both of Ibaraki; Yoshiyasu Kuroo, Koganei, and Masana Ugaji, Tokyo, all of Japan, assignors to Sony Corporation and The Foundation: The Research Institute for Special Inorganic Materials, both of Tokyo, Japan

PCT No. PCT/JP83/0076 §371 Date Nov. 9, 1983 §102(e) Date Nov. 9, 1983
PCT Filed Mar. 11, 1983
Continuation of Ser. No. 557,183, filed as PCT JP83/00076 on Mar. 11, 1983, abandoned. This application Dec. 6, 1985, Ser. No. 805,268
Claims priority, application Japan, Mar. 12, 1982, 57-39771
Int. Cl.[4] B05D *3/06, 3/02*
U.S. Cl. 427—36 **16 Claims**

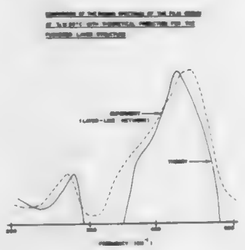
1. A process for manufacturing a silicon carbide-carbon composite molded product, comprising the first step of securing an organic silicon polymer having a skeleton consisting mainly of carbon-silicon bonds to an organic polymer base material having a desired shape and capable of forming a fibrous, granular or filmy carbon structure when it is burned in a non-oxidizing atmosphere, and the second step of burning said base material at a temperature ranging from 700° C. to 2,000° C. in a vacuum or in a non-oxidizing gas atmosphere to thereby thermally decompose said organic silicon polymer and create an inorganic matrix consisting mainly of SiC in which said fibrous, granular or filmy carbon structure exists in amorphous form.

4,696,828

PASSIVATION OF INP BY PLASMA DEPOSITED PHOSPHORUS

Rozalie Schachter, Flushing; Marcello Viscogliosi, North Tarrytown; Lewis A. Bunz, Peekskill; Diego J. Olego, Croton-on-Hudson; Harvey B. Serreze, Pound Ridge, all of N.Y., and Paul M. Raccah, Chicago, Ill., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 581,115, Feb. 17, 1984, abandoned. This application May 21, 1985, Ser. No. 736,750
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **13 Claims**



1. A method of reducing the density of surface states of InP near the conduction band comprising depositing an amorphorous phosphorous film thereon in an RF plasma.

4,696,829

PROCESS FOR INCREASING THE WEAR LIFE OF CERAMIC DIES AND PARTS

Keith O. Legg, Atlanta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation of Ser. No. 614,555, May 29, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 772,187

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 427—38 **14 Claims**

1. A process for increasing the wear life of ceramic dies and other ceramic parts which comprises firing a beam of nitrogen, carbon or carbon monoxide ions into said ceramic dies and other parts which an energy sufficient to implant said ions in said die and other parts, thereby improving the wear resistance of the same.

4,696,830

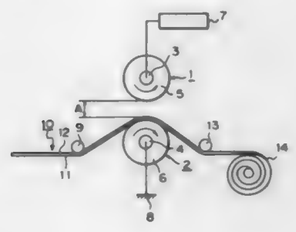
PROCESS FOR PREPARATION OF WATER-PROOF SHEETS

Tsutomo Obayashi, Tokyo; Shinobu Watanabe, Ora, and Kazuhide Ino, Soka, all of Japan, assignors to Hirsoka & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 782,355, Oct. 1, 1985. This application Jun. 12, 1986, Ser. No. 873,764

Int. Cl.⁴ C08D *3/06*

U.S. Cl. 427—41 **2 Claims**



1. A process for the preparation of a water-proof fabric sheet having polymer coatings on both surfaces of a fibrous textile fabric substrate, which has been formed into said substrate through the use of weaving, non-woven and knitting fabric forming techniques, comprising the steps of:

(a) treating the fibrous fabric substrate with a water repellant treatment;

(b) subjecting both surfaces of the treated fabric to corona discharge treatment; and

(c) forming a polymer coating on both surfaces of the fabric.

4,696,831

METHOD OF ORIENTING MAGNETIC DISC BY MAGNETIC FIELD

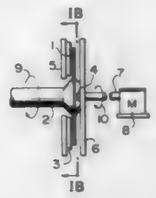
Isao Sakaguchi, and Tatsuo Kawaide, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 5, 1986, Ser. No. 826,338

Claims priority, application Japan, Feb. 14, 1985, 60-26896

Int. Cl.⁴ B05D *3/14, 5/12*

U.S. Cl. 427—48 **8 Claims**



1. A method of orienting magnetic particles in the thin magnetic film of a magnetic disc in the circumferential direction of the magnetic disc by applying a horizontal magnetic field to the magnetic disc in the circumferential direction thereof immediately after the thin magnetic film has been formed on the magnetic disc, said method comprising:

a first step of performing particle orientation in such a manner that a magnetic field formed between a pair of magnetic poles which have the same polarity and are disposed so as to be substantially symmetrical with respect to a magnetic disc, is applied to both surfaces of said magnetic disc; and

a second step of performing particle orientation in such a manner that a magnetic field due to a magnetic pole of a first polarity and a magnetic field due to a magnetic pole of a second polarity are alternately applied to at least one surface of said magnetic disc which has been subjected to particle orientation by said first step.

4,696,832

CONTACT STABILIZATION COATING MATERIAL FOR ELECTRICAL CONTACT SURFACES AND METHOD

William M. D. Wright, Richmond Hill, Canada, assignor to D. W. Electrochemicals Ltd., Richmond Hill, Canada

Continuation-in-part of Ser. No. 743,643, Jun. 11, 1985, abandoned, which is a division of Ser. No. 613,319, May 23, 1984, abandoned. This application Jun. 19, 1986, Ser. No. 876,082

Int. Cl.⁴ B05D *5/12;* **B32B** *9/04*

U.S. Cl. 427—58 **20 Claims**

1. A method of coating electrical contact surfaces so as to enhance the flow of electrical signal current between such surfaces at frequencies in the range of from DC to Ultra High Radio Frequencies, comprising the step of applying an amount of a contact stabilization material to at least one of a pair of co-operating contact surfaces in such quantity that both said co-operating contact surfaces will have a substantial portion of each coated by at least a very thin film of said material when said co-operating contact surfaces are placed in co-operating contact relationship one to the other; wherein said contact stabilization material comprises at least one block polymer of poloxypropylene together with polyoxyethylene.

4,696,833

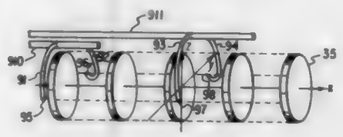
METHOD FOR APPLYING A UNIFORM COATING TO INTEGRATED CIRCUIT WAFERS BY MEANS OF CHEMICAL DEPOSITION

Kenneth A. Monnig, Palo Alto, Calif., and David W. Quint, Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 412,327, Aug. 27, 1982, abandoned. This application Oct. 30, 1985, Ser. No. 794,311

Int. Cl.⁴ H01L *21/88*

U.S. Cl. 437—225 **3 Claims**



1. An improved method of coating integrated circuit wafers by a chemical vapor deposition process of the type in which reactant gases are supplied into a reaction chamber that is enclosed by a chamber wall having a cylindrical side wall and a a pair end walls, said improvement comprising the step of:

encircling the volume containing the wafers with a cylindrical liner which is adjacent to the edges of the wafers, whereby the amount of reactant prdoucts depositing on the side wall of the reaction chamber is reduced and whereby deposits on the side wall which flake off of the side wall are prevented from falling onto the wafers;

at least one of the reactant gases is supplied into the reaction chamber as a plurality of jets of gas that are directed against the inside of the liner before the jets pass into the vicinity of the wafers, thereby producing a turbulence which mixes said at least one of the reactant gases with the other reactants before dispersing them into the vicinity of the wafers;

said jets having the same circumferential direction about the axis of the cylindrical liner so that the reactant gases receive a net rotational motion around the edges of the wafers.

4,696,834

SILICON-CONTAINING COATINGS AND A METHOD FOR THEIR PREPARATION

Sudarsanan Varaprath, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 28, 1986, Ser. No. 835,029

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 437—223 **12 Claims**

1. A method of forming silicon-containing coatings on a solid substrate, which method comprises decomposing in a reaction chamber a halosilane, halodisilane, or mixture of halosilanes in the vapor phase, in the presence of a metal catalyst and a substrate, at a temperature in the range of 400 degrees to 600 degrees Centigrade, wherein the halosilane, halodisilane, or halosilanes each contain at least one halogen atom selected from the group consisting of fluorine, chlorine, bromine, and iodine, and wherein the catalyst is selected from the group consisting of chromium, magnesium, stainless steel, copper, and zirconium, whereby a substrate containing a coating thereon is obtained.

4,696,835

PROCESS FOR APPLYING AN ELECTRICALLY CONDUCTING POLYMER TO A SUBSTRATE

Louis Maus, Camarillo; Edward F. Witucki, Van Nuys, and Leslie F. Warren, Camarillo, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 646,717, Sep. 4, 1984, Pat. No. 4,617,228. This application Jul. 8, 1986, Ser. No. 883,260

Int. Cl.⁴ B05D *3/02, 5/12*

U.S. Cl. 427—121 **24 Claims**

1. A process for producing an electrically conductive composite which comprises:

(a) contacting a dielectric substrate with a solution of a strong oxidant capable of oxidizing a pyrrole to a pyrrole polymer,

(b) drying said substrate, and

(c) contacting the so treated substrate with the vapors of a pyrrole and oxidizing said pyrrole by said strong oxidant in the presence of a substantially non-nucleophilic anion, and depositing polypyrrole on said substrate.

4,696,836

HAND STAMP METHOD FOR APPLYING ADHESIVES

Wolfgang Dierichs, Duesseldorf; Gerhard Gierenz, Solingen, and Gabriella Kraus, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 2, 1986, Ser. No. 847,417

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512818

Int. Cl.⁴ B05D *5/10*

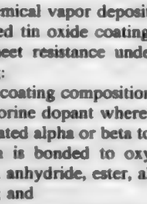
U.S. Cl. 427—208.4 **16 Claims**

1. A method of applying a liquid adhesive to an intended surface using a hand stamp adhesive applicator comprising the steps of:

(a) storing a liquid adhesive within a container supported in a housing of the applicator;

(b) retaining in a pore system of a compressible adhesive transfer stamp pad a quantity of liquid adhesive transfered to the stamp pad from the container;

(c) transfering liquid adhesive from the pore system of the stamp pad to an outer surfce of an adhesive applying stamp body made of a material non-permeable to the liquid adhesive when the stamp body is in an upwardly facing inoperative position in contact with a lower surface of the stamp pad; and



(d) applying the adhesive from the outer surface of the stamp body to the intended surface by moving the applicator at a right angle to the intended surface to thereby move the stamp body away from the stamp pad, rotate the stamp body 180° to a downward operative position and press the outer surface of the stamp body to the intended surface.

4,696,837

CHEMICAL VAPOR DEPOSITION METHOD OF PRODUCING FLUORINE-DOPED TIN OXIDE COATINGS

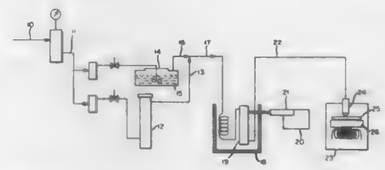
Goerg H. Lindner, KV Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Continuation-in-part of Ser. No. 748,648, Jun. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 687,067, Dec. 28, 1984, Pat. No. 4,590,096. This application Nov. 12, 1985, Ser. No. 797,364

The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.

Int. Cl.⁴ C23C *16/40*

U.S. Cl. 427—255.3 **62 Claims**



1. An improved chemical vapor deposition method of producing a fluorine-doped tin oxide coating which has a minimum and constant sheet resistance under different process conditions, comprising:

(a) forming a liquid coating composition comprising:

(1) an organic fluorine dopant wherein at least one fluorine atom is located alpha or beta to a functional group wherein carbon is bonded to oxygen selected from carboxylic acid, anhydride, ester, alcohol, ketone, acid halide, or ether; and

(2) an organotin compound, which is an alkyltin trichloride, a dialkyltin dichloride an alkyldichlorotin acetate, a dialkylchlorotin diacetate, or an ester tin trichloride; or tin tetrachloride;

(b) vaporizing said liquid coating composition into a wet carrier gas to form a vapor mixture of carrier gas, water, organic fluorine dopant and said organotin compound or said tin tetrachloride; and

(c) decomposing said vapor mixture on a substrate to form said coating, characterized in that: the vapor concentra-

tions of said components are such that a parameter M, defined as:

$$M = \frac{(AIR)\,(H_2O)}{(OFD)\,(O)}$$

where

(AIR) is the concentration of the carrier gas, in moles 1 hr,

(H_2O) is the concentration of water in the carrier gas, in moles 1 hr,

(OFD) is the concentration of organic fluorine dopant in the carrier gas, in moles 1 hr, and

(O) is the concentration of organotin compound in the carrier gas, in moles 1 hr,

has a value of less than 50,000, thereby to produce a fluorine-doped tin oxide coating having a minimum and constant sheet resistance for said values of M.

4,696,838

METHOD OF FORMING BUILT-UP FILM OF FLUORINATED ALIPHATIC COMPOUND ON SUBSTRATE SURFACE

Seizo Miyata; Hidenari Nakahama, and Takeshi Kasuga, all of Tokyo, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jun. 16, 1986, Ser. No. 874,847

Claims priority, application Japan, Jun. 26, 1985, 60-137850

Int. Cl.⁴ B05D *1/36*

U.S. Cl. 427—407.2 **7 Claims**

1. A method of forming a built-up film of a fluorinated aliphatic compound having a hydrophilic group at one terminal on a solid substrate surface, the method comprising the steps of:

spreading a monomolecular film of a compound represented by the general formula $CF_3(CF_2)_n(CH_2)$—X, wherein X represents a hydrophilic group, n is an integer from 5 to 20 and m is 0 or an integer from 1 to 10, on the surface of an aqueous phase which comprises trivalent metal ions;

transferring said monomolecular film onto a solid substrate surface by the Langmuir-Blodgett's technique; and

repeatedly transferring the monomolecular film onto the surface of the monomolecular layer or layers already existing on the substrate surface by the Langmuir-Blodgett's technique.

4,696,839

POLYMER CONCRETE ARTICLES AND PROCESS FOR MANUFACTURING SAME

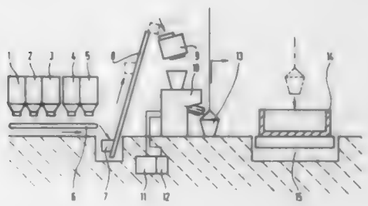
Hansjoerg Renker, Hilterfingen, and Martin Abeggien, Interlaken, both of Switzerland, assignors to Fritz Studer AG, Thun, Switzerland

Filed Feb. 5, 1986, Ser. No. 826,208

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503763

Int. Cl.⁴ C08K *3/36*

U.S. Cl. 428—15 **20 Claims**



1. A polymer concrete article comprising:

substantially cubic rock particles having a grain size at least equal to a preselected value, said rock particles abutting in a substantially planar manner, said rock particles having a first modulus of elasticity, and

mechanically resistant fine particles having a grain size less than said preselected value and having a second modulus of elasticity greater than said first modulus of elasticity, said fine particles being located essentially in hollow spaces between said cubic particles, and

a binding agent.

4,696,840

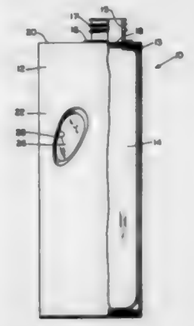
BLOWN BAG-IN-BOX COMPOSITE CONTAINER AND METHOD AND APPARATUS FOR MAKING THE SAME

Michael J. McCullough, Ft. Thomas, Ky.; Gary E. McKibben, Cincinnati, and John E. Skidmore, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 13, 1985, Ser. No. 808,587

Int. Cl.⁴ B65D *1/08*

U.S. Cl. 220—462 **9 Claims**



1. A bag-in-box composite container comprising:

(a) a one-piece outer box constructed from a rigid material and having a continuous side wall and at least one end panel joined thereto thereby defining a hollow box cavity, said at least one end panel having an aperture therein; and

(b) a one-piece inner bag located within said hollow box cavity of said outer box, said inner bag being blow-molded from a preformed tube and having an integrally formed ouring spout connected thereto, said pouring spout extending through said aperture in said end panel and having an outer surface, wherein said inner bag and said pouring spout are an integrally-formed unit having no heat seals or other discontinuities at their attachment interface.

4,696,841

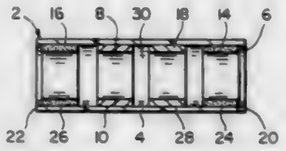
HEAT RECOVERABLE TERMINATION DEVICE

Lajos J. Vidakovits, Mountain View, Calif., assignor to Raychem Corp., Menlo Park, Calif.

Filed May 28, 1985, Ser. No. 738,623

Int. Cl.⁴ H01R *4/00*

U.S. Cl. 428—36 **19 Claims**



1. A termination device comprising:

a dimensionally heat-unstable tubular member having a wall, a fusible insert and a dimensionally heat-unstable insert;

wherein dimensionally heat-unstable refers to said tubular member and said heat-unstable insert having plastic or elastic memory which defines the property of certain materials as being unstable at higher temperatures so that when the materials are exposed to this higher temperature, the materials return to their heat-stable shape;

said fusible insert and said dimensionally heat-unstable insert positioned within said tubular member and in abutting relationship with the wall of said tubular member;

said fusible insert being meltable and said dimensionally heat-unstable insert being recoverable at a temperature used to recover said tubular member.

4,696,842

CUSTOM MOLDABLE HAND GRIP

Ruxton C. Doubt, Rte. 1, Box 414, Vashon, Wash. 98070

Filed Mar. 26, 1986, Ser. No. 844,064

Int. Cl.⁴ A63B *49/08*

U.S. Cl. 428—40 **21 Claims**



1. A moldable article, for individualizing the hand grip surface of an implement, said article comprising:

a sheet of dripless, dough-like moldable polymeric material pliable at room temperature, and wrapable around the hand grip surface of the implement to substantially cover the hand grip surface, said sheet having opposed end portions positionable together in generally end-to-end relationship, said sheet being of sufficient thickness to form a molded impression therein of a desired depth upon the intended user of the implement grasping the hand grip surface with said sheet therebetween, said moldable polymer material including a polymer, partially solvated by a volatile solvent into a moldable mass, said material having a consistency sufficiently soft to readily accept the impression under normal hand-applied pressure and sufficiently firm to permit handling prior to formation of the impression without significant deformation and to hold the impression immediately upon its formation and as evaporation of said solvent occurs without the intended user continuing to grasp the hand grip surface, said sheet being covered by at least one removable film layer covering an outward facing surface of said sheet and preventing evaporation of said solvent prior to formation of the impression, said sheet allowing gradual evaporation of said solvent after removal of said film layer at a rate sufficiently slow to allow formation of the impression into said sheet, and upon sufficient evaporation of said solvent curing into a permanent molding retaining the impression.

4,696,843

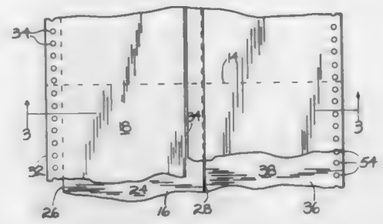
DIFFERENTIAL PRESSURE SENSITIVE ADHESIVE JOINED BUSINESS FORM

Eric R. Schmidt, Palatine, Ill., assignor to Uarco Incorporated, Barrington, Ill.

Filed Nov. 19, 1986, Ser. No. 932,358

Int. Cl.⁴ B32B *3/06*

U.S. Cl. 428—41 **13 Claims**



1. A continuous business form comprising:

an elongated ply of first label stock of a desired width and having one side coated with a first pressure sensitive adhesive having a given adhesive characteristic;

an elongated ply of first release liner stock of about said desired width and having a release side releasably engaged with said first adhesive on said one side;

said first release liner and said first label stock plies being laterally offset from one another so that a narrow longitudinal strip of said first adhesive unengaged with said first release liner exists;

an elongated ply of second release liner stock of greater width than said narrow strip and releasably adhered at one edge to said first label stock at said narrow longitudinal strip of first adhesive; and

an elongated ply of second label stock having one side coated with a second pressure sensitive adhesive having a given adhesive characteristic;

said second label stock and said second release liner being releasably adhered to each other by said second adhesive.

4,696,844

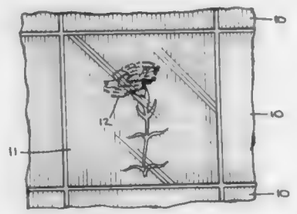
FILM TYPE AIR FRESHENER

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Nov. 20, 1986, Ser. No. 932,610

Int. Cl.⁴ B32B *3/14;* **B44C** *1/28*

U.S. Cl. 428—46 **6 Claims**



1. An air freshener in combination with a wall tile having predetermined dimensions and a smooth surface having a solid color, which tile is identical to other tiles in an array thereof on the same wall, comprising:

A a transparent, flexible film of polymeric material having substantially the same dimensions as the tile impregnated with a volatile fragrance that is slowly released from the film, the fragrance being in a concentration resulting in a relatively prolonged emission thereof from the film;

B a low-tack, pressure-sensitive adhesive coating on the rear face of the film whereby the film may be adhered onto said tile and later peeled therefrom without difficulty when the fragrance is exhausted; and

C an artwork imprinted on the film, the fragrance being thematically related to the artwork, whereby the visual impression made by the artwork is enhanced by the fragrance and the artwork is seen against the color of the tile which is the same as the other wall tiles.

4,696,845

MAGNETIC STORAGE MEDIUM WITH LUBRICATING COATING

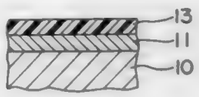
Masahiro Yanagisawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,834

Claims priority, application Japan, Aug. 27, 1984, 59-177949; Oct. 22, 1984, 59-221729; Oct. 22, 1984, 59-221730

Int. Cl.⁴ G11B *5/71*

U.S. Cl. 428—64 **28 Claims**



1. A magnetic storage medium, comprising a layer of a ferromagnetic material coated on a base and a lubricant layer formed on the outer side of the ferromagnetic material layer, said lubricant layer comprises a perfluoroalkyl compound represented by the general formula (1):

$$R_f\text{—}J'\text{—}CF_2\text{—}J\text{—}_n\text{—}R_f \quad (1)$$

wherein R_f represents C_mF_{2m+1} (m is a positive integer), n is a positive integer not smaller than 5, J and J' each represent

—O—, —S—, —C(=O)—O—, —C(=O)—NH—, —NH—.

—NHC(=O)—O—, —C(=O)— or —CH(OH)—.

23. A magnetic medium comprising a layer of a ferromagnetic material coated on a base and a lubricant layer formed on the outer side of the ferromagnetic material layer, said lubricant layer comprising a perfluoroalkyl compound represented by one of the general formulas (5A), (5B), (5C), (5D), (5E) and (5F):

$$R_f\text{—}J'^{*}\text{—}\underset{\displaystyle C_kF_{2k'+1}}{\overset{\displaystyle C_kF_{2k+1}}{C}}\text{—}J'\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R_f^{*} \quad (5A)$$

$$R_f\text{—}J'^{*}\text{—}C_jF_{2j}\text{—}J'''\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R_f^{*} \quad (5B)$$

$$G\text{—}R\text{—}\underset{G'}{\overset{C_kF_{2k+1}}{C}}\text{—}J'\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R'\text{—}G' \quad (5C)$$

$$G\text{—}R\text{—}\underset{G'}{\overset{C_iF_{2i-1}}{C}}\text{—}J'\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R'\text{—}G' \quad (5D)$$

-continued

$$R_f\text{—}J'^{*}\text{—}\underset{J'^{*}}{R_f}\text{—}J'\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R_f^{*} \quad (5E)$$

$$R_f^{**}\text{—}J^{*}\text{—}\underset{J''^{*}}{R_f^{*}}\text{—}J''\text{—}_p\text{—}R_f'^{*}\text{—}O\text{—}_q\text{—}R_f^{***}$$

$$R_f\text{—}J'^{*}\text{—}\underset{J'^{*}}{R_f}\text{—}J'\text{—}_p\text{—}R_f'\text{—}O\text{—}_q\text{—}R_f^{*} \quad (5F)$$

$$R_f^{**}\text{—}J^{*}\text{—}\underset{J''^{*}}{R_f^{*}}\text{—}J''\text{—}_p\text{—}R_f'^{*}\text{—}O\text{—}_q\text{—}R_f^{***}$$

wherein R_f, R_f^{*}, R_f^{**} and R_f^{***} each represent C_mF_{2m+1} (m is a positive integer), R_f', R_f'', $R_f'^{*}$ and $R_f'^{*}$ each represent a radical consisting of carbon and fluorine atoms, J', J'', J''', J'*, J''* and J* each represent one of —O—, —S—,

—C(=O)—, —C(=O)—O—, —CH(OH)—, —C(=NH)—.

—NH—, —NH—CO—, —NHCO—NH— and —NHCOO— or a combination of two or more thereof on condition that J''' never represent —O—, R and R' each represents C_wX_{2+2} (w is 0 or an integer, X represent H, F, Cl, Br or I), G and G' each represent a functional group selected from —NCO, —SH, —SO_3H, —SO_3M (M represents Na, K or Li), —CN, —NCS, —NO_2,

—$CONH_2$, —I, —COOH, —$COOC_jH_{2j+1}$ (j is a positive integer), —$C_jH_{2j}OH$, —NH_2, —$CH{=}CH_2$, $Si(C_hH_{2h+1})_gX_{3-g}$ (h is a positive integer, g is 0, 1 or 2, X represents Cl, —OH, —OC_fH_{2f+1} (f is a positive integer) or —A—$Si(C_hH_{2h+1})_gX_{3-g}$ (h, g and X are as defined above, A represents a radical consisting of at least one element selected from C, H, N, O and S), p is a positive integer, q is 0 or a positive integer, k is a positive integer, k' is 0 or a positive integer, p' is 0 or a positive integer, q' is a positive integer and i is 0 or a positive integer when referring to G and G' and i is a positive integer in all other cases.

4,696,846

METHOD FOR FORMING PROTECTIVE LAYER ON A FLEXIBLE MAGNETIC DISC SHEET

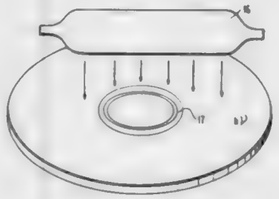
Mikihiko Kato; Shigeo Komine; Kazuhiko Morita, and Yasutoshi Okuzawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 658,712, Oct. 9, 1984, Pat. No. 4,647,473. This application Jul. 31, 1986, Ser. No. 891,070

Claims priority, application Japan, Oct. 7, 1983, 58-188221

Int. Cl.⁴ G11B *5/72*

U.S. Cl. 428—65 **4 Claims**



1. A flexible magnetic disc comprising a flexible magnetic disc sheet and a jacket enclosing said disc sheet, wherein both of said disc sheet and said jacket have central apertures, and

the diameter of the aperture of said jacket is larger than the diameter of the aperture of said disc sheet, with a protective layer provided on a surface portion surrounding the edge of the aperture of the disc sheet, and said protective layer has an inner diameter larger than the diameter of the aperture of the disc sheet and an outer diameter smaller than the diameter of the aperture of the jacket enclosing the disc sheet, and said protective layer is formed by screen-printing a radiation polymerizable composition on said surface portion surrounding the edge of aperture of the disc sheet and hardening the composition by exposure to radiation, wherein the flexible magnetic disc has the protective layer about the central aperture thereof and a small coefficient of friction with respect to a position-determining means.

4,696,847

INSULATING AND IMPERVIOUS ROOFING PANELS

Stephane Cousin, Lamorlaye, and Jean-Paul Boumendil, Paris, both of France, assignors to Isover Saint-Gobain, Courbevoie, France

Division of Ser. No. 547,219, Oct. 31, 1983. This application Sep. 16, 1986, Ser. No. 907,984

Claims priority, application France, Oct. 29, 1982, 82 18166

Int. Cl.⁴ B32B *1/04*

U.S. Cl. 428—76 **20 Claims**



1. A heat insulating and liquid impervious fibrous panel positionable between a roof with a slight slope and at least one hot applied bituminous coating or sheathing, comprising:

a mat consisting of a dense felt of mineral fibers bonded together by a first thermosetting binder finely dispersed in the felt, and a composite waterproof impervious covering comprising a reinforcing layer of mineral fibers impregnated with a second binder and glued by said second binder to said dense felt and, a sheet of separating agent capable of binding to the reinforcing layer by means of said second binder impregnating said reinforcing layer, and capable of selt hot welding.

4,696,848

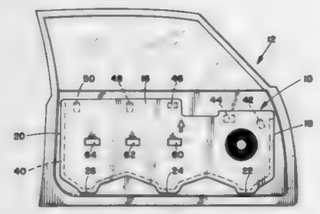
SURFACE PROTECTOR WITH EXPANSIBLE POCKET

Wallace R. Jones, Waite Hill Village, and Robert A. Isaksen, Chardon, both of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Filed Jul. 9, 1986, Ser. No. 883,826

Int. Cl.⁴ B32B *3/02, 3/28*

U.S. Cl. 428—80 **17 Claims**



1. A shield device for use in protecting a surface comprising:

(a) a generally flat and relatively thin sheet of flexible plastic material having a peripheral edge shaped to generally conform to the shape of the surface to be protected;

(b) adhesive means carried by said sheet at least in areas adjacent said peripheral edge for allowing said sheet to be joined to the surface to be protected; and,

(c) a predetermined area of said sheet being at least partially enclosed by a series of relatively small and closely spaced deformations formed to extend outwardly over the plane of the sheet a short distance for permitting said predetermined area to be selectively deflected laterally of the plane of the sheet to form a pocket for generally conforming to a discontinuity in said surface, said predetermined area being substantially in the plane of said sheet until an external force is applied to produce lateral deflection.

4,696,849

PROCESS FOR PREPARING POLYURETHANE-BACKED TEXTILES

Larry W. Mobley, and Don H. Kelley, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 16, 1985, Ser. No. 776,320

Int. Cl.⁴ B32B *3/00*

U.S. Cl. 428—95 **27 Claims**

12. A textile having an adherent polyurethane backing, said backing being prepared from a polyurethane forming composition which comprises:

(A) a first polyol which comprises a relatively high equivalent weight polyol containing an average of about 1.4–1.95 hydroxyl groups per molecule, of which hydroxyl groups at least 30% are primary hydroxyls or a mixture thereof with at least one additional relatively high equivalent weight polyol containing at least 2.05 hydroxyl groups per molecule, of which at least 30% are primary hydroxyls;

(B) a relatively low equivalent weight compound having about 2 active hydrogen containing moieties per molecule;

(C) a polyisocyanate and

(D) a catalytic amount of a catalyst for the reaction of a polyol and a polyisocyanate, wherein the functionalities and proportions of components (A), (B), and (C) are such that such components have an average functionality of about 1.97–2.03, and the composition has an isocyanate index of about 85 to about 125.

4,696,850

IRON-ON INTERLINING COMPOSITE OF KNIT LAYER AND NONWOVEN LAYER OF SIMILAR STRUCTURE

Manfred Jost, Hemsbach; Jurgen Knoke, Weinheim, both of Fed. Rep. of Germany; Zenji Yoshida, Shiga, Japan; Noburo Ohta, and Terumo Nakanishi, both of Sashima, Japan, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 921,228

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610029

Int. Cl.⁴ B32B *3/00*

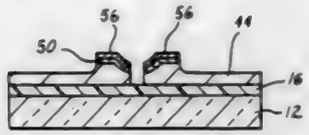
U.S. Cl. 428—197 **16 Claims**

1. A composite interlining comprising:

a first ply of nonwoven fabric having a weight of about 10 to 70 g/m^2; and

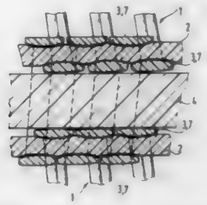
a second ply of knit fabric adhered to the first layer, and wherein the knit fabric has a nonwoven fiber structure, a weight of about 10 to 40 g/m^2, a yarn titer of about 12 to 30 dtex at a mesh count of about 60 to 12 wales/cm and about 8 to 26 rows/cm.

4,696,851
HYBRID AND MULTI-LAYER CIRCUITRY
Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.
Continuation-in-part of Ser. No. 715,446, Mar. 25, 1985. This application Dec. 20, 1985, Ser. No. 811,907
Int. Cl.[4] B05D *5/12*; B32B *3/00, 7/02*
U.S. Cl. 428—210 26 Claims



1. The process of forming a circuit assembly, comprising the steps of:
providing a ceramic substrate;
providing a layer of copper alloy foil having an electrical conductivity of more than about 60% IACS;
providing a polymeric material having a process temperature from about 350° to about 500° C.;
disposing said polymeric material between said layer of copper alloy foil and said ceramic substrate;
heating the assembly of said polymeric material, said layer of copper alloy foil and said ceramic substrate to he process temperature;
pressing the assembly together at a lamination pressure whereby said polymeric material bonds said layer of copper alloy foil to said ceramic substrate; and
forming electrical circuitry in the layer of copper alloy foil.

4,696,852
SPIRAL LINK BELT OF REDUCED AIR PERMEABILITY AND METHOD OF PRODUCING SAME
Johannes Lefferts, LM Enschede, Netherlands, assignor to Siteg Siebtechnik GmbH, Akaus-Alstatte, Fed. Rep. of Germany
Filed Mar. 27, 1986, Ser. No. 845,143
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511166
Int. Cl.[4] B65G *15/54*
U.S. Cl. 428—222 4 Claims



1. A spiral link belt comprising a multiplicity of synthetic resin helices in which the windings of one helix mesh with the windings of the adjacent helices in zipper fashion without any tensile or compressive spring-like stress, pintle wires inserted into channels formed by the meshing windings of each two helices, with the windings of said helices penetrating into the material of the pintle wires, said helices being of oval shape with heads at the windings arcs that are widened in longitudinal direction of the helices, and the interior of said helices is stuffed with filler material, wherein the width of the heads of the winding arcs corresponds to about one and one half to two times the diameter of the wire from which the helices are wound whereby empty space in the central plane of the spiral link belt between adjacent winding heads and the filler material is substantially eliminated.

4,696,853
TEXTILE REINFORCEMENT ADAPTED TO BE USED FOR MAKING LAMINATED COMPLEXES AND PROCESS FOR OBTAINING SAME
André Fourezon, Le Cheylard, France, assignor to Etablissements les Fils d'Auguste Chomarat & Cie, France
Filed Feb. 14, 1986, Ser. No. 829,108
Claims priority, application France, Feb. 22, 1985, 85 02784
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—257 6 Claims

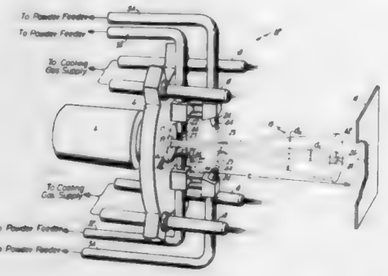


1. A textile reinforcement adapted to be used for making laminated complexes, comprising:
filling yarns extending transversely with respect to the length of said reinforcement;
a loose binding warp interwoven with said filling yarns, the density of said binding warp being less than the density of said filling yarns,
said filling yarns being disposed on a bias with respect to said binding warp,
said binding warp comprising yarns which are superficially thermally fused to said filling yarns, thereby maintaining said bias.

4,696,854
BILAYER SUBSTRATE
Dolores O. Ethier, White Bear Lake, Minn., assignor to Lectec Corporation, Minnetonka, Minn.
Filed Oct. 6, 1986, Ser. No. 915,511
Int. Cl.[4] B32B *27/34*
U.S. Cl. 428—287 7 Claims

1. An integral bilayer porous non-woven substrate in which one side comprises a fibrous organic polymeric matrix having substantially unaltered surface adhesion characteristics and the second side comprises a cured silicone resin in which said bilayer structure has substantially the equivalent air permeability of the porous substrate alone and the cured silicone layer on said second side exhibits release properties but has substantially no adverse effect upon the adhesion characteristics of said one side, said substrate being formed by (a) the application of said silicone resin in an uncured state to said second side in the absence of significant polar or nonpolar solvent whereby the uncured resin will remain at least temporarily in the vicinity of the second side of the substrate and (b) curing the uncured resin by exposure to a beam of radiation prior to saturation of the matrix by the resin.

4,696,855
MULTIPLE PORT PLASMA SPRAY APPARATUS AND METHOD FOR PROVIDING SPRAYED ABRADABLE COATINGS
Harold W. Pettit, Jr., West Palm Beach; Charles G. Davis, Jupiter, and Frederick C. Walden, Jensen Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Apr. 28, 1986, Ser. No. 856,897
Int. Cl.[4] B05D *1/12*
U.S. Cl. 428—312.8 6 Claims

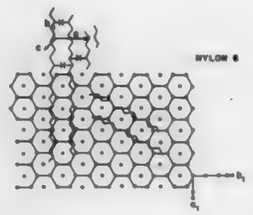


1. A method for providing a sprayed powder deposit on a substrate, the deposit characterized by a homogeneous mixture of first and second powder particles, the method comprising the steps of:
(a) generating a high velocity and high temperature stream of gases, and directing the stream of gases onto the substrate, wherein the central portion of the stream is hotter than the outer portion of the stream;
(b) injecting particles of a first powder type into the stream of gases such that they are carried along the central portion of the stream and are impacted upon the substrate;
(c) simultaneously injecting particles of a second powder type into the stream of gases such that the second powder particles are carried along the outer portion of the stream and are impacted upon the substrate without substantial mixing in the stream with the first powder particles; and
(d) moving the stream of gases containing the first and second powder particles relative to the substrate to form a homogeneous powder deposit on the substrate.

4,696,856
PRESSURE-SENSITIVE RECORDING MATERIAL
Yoshio Okada; Nobuo Ahiko, and Yuriko Igarashi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 29, 1985, Ser. No. 770,788
Claims priority, application Japan, Sep. 7, 1984, 59-186590; Sep. 20, 1984, 59-197551
Int. Cl.[4] B41M *5/00*
U.S. Cl. 428—321.5 19 Claims

1. A pressure-sensitive recording material comprising a supporting material a face of which is coated with the microcapsules encapsulating minute particles of a pigment dispersed in a solution of an adhesive dissolved in a hydrophobic solvent as a core material of said microcapsules, the size of said particles of the pigment being less than 50 nm and the content of said pigment and said adhesive in the core material being less than 25% by weight and 1.5 to 30% by weight, respectively.

4,696,857
ANNEALED THIN WALLED POLYMER ARTICLES AND METHOD TO ANNEAL
John P. Sibilia, Livingston; Abraham M. Kotliar, Westfield; Narasimhaiah S. Murthy, Belle Mead, and William Sacks, Gillette, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.
Filed Dec. 13, 1985, Ser. No. 808,807
Int. Cl.[4] B32B *5/16*; B29B *17/00*
U.S. Cl. 428—323 17 Claims



1. A film comprising
a polyamide having a melt index of from 0.01 to 10 g/10 minutes as measured on ASTM D-1238 at 100 gram load at 235° C.;
from 10 to 50 weight percent of a platelet filler wherein the filler has an average equivalent diameter of from 1 to 8 micrometers, a maximum diameter of 25 micrometers, and a thickness of less than 0.5 micrometers, the filler being substantially parallel to the plane of the film, the film being from 10 to 100 micrometers in thickness, wherein the improvement comprises that the film having the platelet filler substantially parallel to the plane of the film was then annealed for from 30 sec to 24 hrs at a temperature greater than the glass transistion temperature of the polyamide.

4,696,858
MAGNETIC RECORDING MEDIUM
Katsumi Ryoke; Nobutaka Yamaguchi; Masatoshi Takahashi; Kazuko Hanai; Hideaki Kosha, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 18, 1985, Ser. No. 789,221
Claims priority, application Japan, Oct. 19, 1984, 59-218636
The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 5 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer being provided on one surface of the support and a backing layer being provided on the surface of the support opposite to said magnetic layer, the backing layer containing (A) a binder comprised of resin having a 100% modulus of 150 kg/cm^2 or less present in an amount of 50 to 95 wt % based on the total weight amount of binder and (B) non-magnetic particles comprised of (i) carbon black having an average particle size of more than 0.1 μm to 1.0 μm, and (ii) carbon black having an average particle size of 0.01 μm to 0.1 μm in a weight ratio of carbon black (i)/carbon black (ii) of 95/5 to 5/95, with the non-magnetic particles in the backing layer being present in an amount of 40 to 300 parts by weight per 100 parts by weight of the total binder.

4,696,859

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Nobuo Aoki; Takashi Yoneyama; Akira Kasuga; Toshimitu Okuta; Masaaki Fujiyama, and Yasutoshi Okuzawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 28, 1986, Ser. No. 834,680
Claims priority, application Japan, Feb. 28, 1985, 60-39733
Int. Cl.[4] G11B *5/71, 5/714*
U.S. Cl. 428—323 **9 Claims**

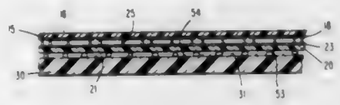
1. A magnetic recording medium comprising a non-magnetic support having coated thereon a magnetic layer, the magnetic layer containing (i) ferromagnetic alloy particles having an average length in the long axis of 0.25 μm or less and (ii) fatty acid components comprising behenic acid in an amount of 20 to 75 wt %, stearic acid in an amount of 10 to 45 wt % and oleic acid in an amount of 10 to 45 wt % based on the total weight of the three fatty acids, wherein the ferromagnetic alloy particles having a specific surface area of 45 m^2/g or more.

4,696,860

PARTICULATE SPACERS FOR INHIBITING NEWTON RINGS IN TOUCH SENSITIVE OVERLAYS

David L. Epperson, Granite Falls, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Sep. 26, 1985, Ser. No. 780,583
Int. Cl.[4] B32B *19/04, 5/16*
U.S. Cl. 428—325 **19 Claims**



1. An apparatus in which two spaced-apart light transmitting normally parallel layers of transparent materials are positioned to be held very close to each other locally, with substantial avoidance in the the generation of Newton rings thereby, comprising:

a first layer, of a first transparent material, comprising a first surface and a parallel second surface, whereof said first surface received incident light and transmits a first portion of said light through said first layer and out through said second surface;

a second layer, of a second transparent material, comprising a third surface and a parallel fourth surface, whereof said third surface is located adjacent to and parallel to said second surface of said first layer such as to receive light transmitted therethrough, said second layer transmitting through said fourth surface a second portion of said light received at said third surface; and

fine particles, randomly sized within a predetermined size range, adhered to one of said second surface and said third surface such that the larger of said particles are randomly distributed in a predetermined density and in simultaneous contact with said second surface and said third surface.

2. An apparatus according to claim 1, wherein: said fine particles comprise glass beads.

4,696,861

SUBSTRATE PROCESSED FOR ELECTROLESS PLATING FOR PRINTED WIRING PATTERN AND PROCESS FOR MANUFACTURING THE PROCESSED SUBSTRATE

Hiromu Tatematsu, and Takeshi Miyabayashi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 666,778, Oct. 31, 1986, abandoned. This application Sep. 10, 1986, Ser. No. 906,624
Claims priority, application Japan, Nov. 9, 1983, 58-210610
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—328 **9 Claims**



1. A processed substrate including an electrically insulating base which is adapted to be subjected to electroless plating with an electrically conductive material to produce a metal-plated board for manufacturing a printed-wiring board, comprising:

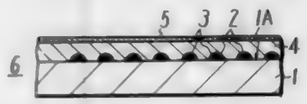
a metal oxide film consisting of a large number of fine particles of a reducible metal oxide which are distributed over a surface of said insulating base, said fine particles serving as catalytic cores for the electroless plating of said insulating base with said electrically conductive material, portions of each of said fine particles being embedded in a skin layer of said insulating base adjacent to said surface thereof by bombardment of said fine particles onto the surface of the insulating base, so that said metal oxide film is fixed to the surface of the insulating base, the remaining portions of each of the fine particles being exposed over the surface of the insulating base, said fine particles being absent in the interior of said insulating base.

4,696,862

MAGNETIC RECORDING MEDIUM

Takahiro Kawana, Tagajo, and Norio Yokoyama, Sendai, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00185, § 371 Date Jan. 12, 1983, § 102(e) Date Jan. 12, 1983, PCT Pub. No. WO82/04158, PCT Pub. Date Nov. 25, 1982
PCT Filed May 21, 1982, Ser. No. 459,602
Claims priority, application Japan, May 22, 1981, 56-77539
Int. Cl.[4] G11B *5/66*
U.S. Cl. 428—336 **6 Claims**



1. A magnetic recording medium comprising a nonmagnetic base, a metal discontinuous layer formed on one major surface of said nonmagnetic base as discrete island shapes and at least the surfaces of which are oxidized, nitrogenated or carbonized, and a metal magnetic layer formed so as to cover completely said discontinuous layer and the portions of said nonmagnetic base which extend between said discrete island shapes.

4,696,863

BIOCAPSULE

Toshihiko Matsushita, Tokyo; Sadao Morishita, Ibaraki; Mikiya Sekine, Warabi, and Shigetoshi Hiraishi, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,489
Claims priority, application Japan, Aug. 28, 1984, 59-179938; Oct. 4, 1984, 59-209450
Int. Cl.[4] B01J *13/02*
U.S. Cl. 428—402.2 **16 Claims**

1. A biocapsule comprising an Eumycete and at least one member selected from the group consisting of (1) a hydrophobic substance or a hydrophilic substance and (2) a photohardenable resin and a photopolymerization initiator, captured by said Eumycete and confined therein, said Eumycete containing lipids in an amount of less than 10% by weight.

4,696,864

METHOD OF PROVIDING STRUCTURAL SUPPORT FOR COMPOSITIONS

Thomas A. Ward, Gibsonia; Victor G. Petracca, Apollo, and Timothy Figore, Springdale, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 26, 1985, Ser. No. 759,215
Int. Cl.[4] C09J *5/02;* **B32B** *27/38, 15/08*
U.S. Cl. 428—413 **18 Claims**

8. A method of providing a structural support for the insulating char residue derived from a char forming a self-adhering composition on a substrate, comprising:

I. anchoring to the surface of a substrate a multiplicity of fire resistant members, said members protruding from the surface of the substrate;

II. applying said char forming self-adhering composition to the surface of the substrate so as to at least partially encapsulate the protruding fire resistant members.

15. The method of claim 8 wherein the char forming composition is an intumescent curable composition comprising:

(a) an epoxy resin;

(b) a curing agent adapted to cure said epoxy resin; and

(c) an additive component comprising a mixture of materials adapted to provide a source of,

(1) phosphorus,

(2) zinc,

(3) boron, and

(4) an expansion gas upon thermal decomposition.

18. An article according to the method of claim 15.

4,696,865

HOLLOW COPOLYAMIDE ARTICLE

John C. Richardson, St. Louis, Mo., and Morris Salame, Windsor, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 20, 1984, Ser. No. 602,318
Int. Cl.[4] B32B *27/08;* **C08G** *69/08*
U.S. Cl. 428—474.4 **12 Claims**

1. A new article of manufacture comprising a hollow, shaped, blow molded article formed of a composition comprising a copolyamide of hexamethylene terephthalamide and hexamethylene isophthalamide, the ratio of terephthalic acid to isophthalic acid used in forming the copolyamide being between about 1.0 to about 1.9, said article having the following barrier properties: oxygen permeability no greater than

$$1.5 \frac{(cc)\ (mil)}{(100\ sq.\ in.)\ (day)\ (atm)},$$

measured at 23° C., 50% relative humidity; water permeability no greater than

$$3.5 \frac{(gm)\ (ml)}{(100\ sq.\ in.)\ (day)},$$

measured at 30° C., and hydrocarbon permeability as measured using heptane no greater than

$$0.2 \frac{(gm)\ (mil)}{(100\ sq.\ in.)\ (day)},$$

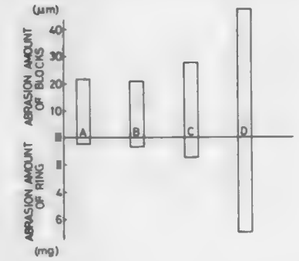
measured at 23° C.

4,696,866

FIBER REINFORCED METAL COMPOSITE MATERIAL

Atsuo Tanaka, and Tadashi Dohnomoto, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 2, 1985, Ser. No. 803,297
Claims priority, application Japan, Jan. 21, 1985, 60-8894
Int. Cl.[4] B32B *5/02, 15/20;* **C22C** *1/09;* **C22F** *1/04;* **F01D** *5/28*
U.S. Cl. 428—614 **6 Claims**



1. A fiber reinforced metal composite material having a metal matrix and reinforcing fibers in a volume ratio of t 5 to 15% embedded in said matrix, wherein

said reinforcing fibers consist essentially of at least one member selected from the group consisting of alumina fibers and alumina-silica-type fibers with an average diameter of less than 10 microns, and

said matrix consists essentially of a hypereutectic aluminum-silicon-type alloy containing silicon in an amount of 13 to 30 wt. % in which primary crystal silicon is dispersed.

4,696,867

ALUMINUM BASED BEARING ALLOYS

Barry J. Eastwood, Aylesbury, England, assignor to AEPLC, Rugby, England

Filed Feb. 24, 1984, Ser. No. 583,198
Claims priority, application United Kingdom, Jul. 5, 1983, 8318156
Int. Cl.[4] B32B *15/20*
U.S. Cl. 428—650 **11 Claims**

1. An alloy consisting essentially of from 3 to 5% by weight particulate silicon of a maximum particle size of 20 microns, from 8 to 20% by weight tin in continuous phase, about 60% of said silicon being incorporated in the tin phase and from 0.2 to 2% by weight copper, the balance being aluminium in continuous phase.

4,696,868

INTENSIFYING SCREENS

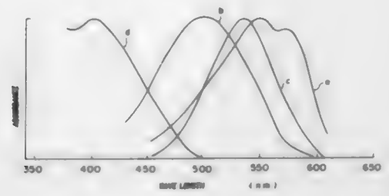
Yuji Aoki, Odawara; Hidenaga Horiuchi; Akio Umemoto, both of Oi, and Norio Miura, Isehara, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 784,996, Oct. 7, 1985. This application Sep. 29, 1986, Ser. No. 912,515

Claims priority, application Japan, Oct. 17, 1984, 59-216435

Int. Cl.[4] H05B *33/00*

U.S. Cl. 429—690 **9 Claims**



1. An intensifying screen, consisting of: a support, a fluorescent layer on the support and a protective layer on the fluorescent layer, wherein the fluorescent layer is composed essentially of a blue light emitting phosphor selected from the group consisting of (I) a $M^{II}WO_4$ phosphor, wherein M^{II} is at least one of Mg, Ca, Zn and Cd, (2) a $CaWO_4$ phosphor, (3) a $BaSO_4$:Pb phosphor, (4) a $BaSO_4:Eu^{2+}$ phosphor, (5) a (Ba, Sr)$SO_4:Eu^{2+}$ phosphor, (6) a $MeF_2.pMe'X_2.qKX'.rMe''SO_4:mEu^{2+}$, nTb^{3+} phosphor, wherein Me is at least one of Mg, Ca, Sr and Ba, each of Me' and Me'' is at least one of Ca, Sr and Ba, each of X and X' is at least one of Cl and Br, and p, q, r, m and n are numbers which satisfy the conditions of $0.80 \leq p \leq 1.5$, $0 \leq q \leq 2.0$, $0 \leq r \leq 1.0$, $0.001 \leq m \leq 0.10$ and $0 \leq n \leq 0.05$, respectively, provided $q+r \neq 0$, (7) a LnOX:Tm phosphor, wherein Ln is La or Gd, and X is Cl or Br, (8) a $Ln(Ta_{1-x}, Nb_x)O_4$:Tm phosphor, wherein Ln is at least one of La, Y, Gd and Lu, and $0 \leq x \leq 0.3$, (9) a Y_2O_2S:Tb phosphor, (10) a CsI:Na phosphor, (11) a CsI:Tl phosphor, (12) a NaI phosphor, (13) a ZnS:Ag phosphor and (14) a HfP_2O_7:Cu phosphor, and wherein at least one of the fluorescent and protective layers is colored with a colorant which has a main absorption peak at a wavelength in the region of 400 to 600 nm.

4,696,869

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Teruhisa Miyata, Kyoto; Kenichi Inoue, Muko, and Akira Miyake, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Feb. 27, 1986, Ser. No. 833,200

Claims priority, application Japan, Feb. 27, 1985, 60-38355

Int. Cl.[4] G11B *5/71*

U.S. Cl. 428—695 **11 Claims**

1. A magnetic recording medium which comprises a substrate and a magnetic layer formed on at least one surface thereof comprising magnetic powder, a resinous binder and an ester of a polyvalent alcohol with a fatty acid and an ester of a monovalent alcohol with an unsaturated fatty acid.

4,696,870

SOLUTION CIRCULATION TYPE METAL-HALOGEN BATTERY

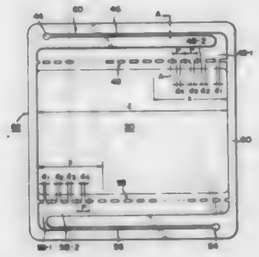
Torahiko Sasaki, Susono; Kazuo Sato, Numazu; Masahiro Ohkawa, Okazaki; Yoshihiro Suzuki, Susono; Masato Kubota, Susono; Hatsuo Nakao, Susono, and Kyoichi Tange, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 7, 1986, Ser. No. 837,267

Claims priority, application Japan, Mar. 12, 1985, 60-35981[U]; Mar. 25, 1985, 60-42482[U]

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—14 **8 Claims**



1. A solution circulation type metal-halogen battery in which an electrolyte is circulated between a reaction tank and an electrolyte storage tank, comprising a first group of rectifying plates and a second group of rectifying plates aligned in a row, respectively, provided between the inlet of said electrolyte and said reaction tank and between the outlet thereof and said reaction tank, such as to partition them, the intervals between each of said rectifying plates in said first and second groups of rectifying plates being such as to increase in accordance with a predetermined functional equation in the direction of moving from the inlet or outlet of said electrolyte.

4,696,871

ELECTRICITY PRODUCTION

Alwyn Pinto, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Oct. 14, 1986, Ser. No. 918,580

Claims priority, application United Kingdom, Oct. 22, 1985, 8526055

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—17 **7 Claims**

1. A process for the production of electricity using a fuel cell wherein

(a) a hydrocarbon-containing feedstock is reacted with steam to produce a hydrogen-containing gas stream at superatmospheric pressure,

(b) the hydrogen-containing gas stream is fed, at superatmospheric pressure, to the anode gas space of a fuel cell,

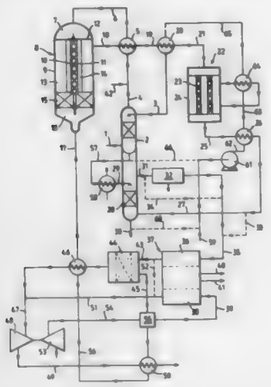
(c) air at superatmospheric presure is fed to the cathode gas space of the fuel cell, and

(d) at least the off-gas from the anode gas space of the fuel cell is let down through a turbine driving an air compressor compressing the air required in step (c),

characterised in that

(i) the hydrocarbon-containing feedstock is reacted with steam and with air at superatmospheric pressure supplied by said compressor with the heat required for the endothermic reaction of said feedstock and steam being supplied by the exothermic.reaction of said feedstock and said air, and

(ii) before being let down through said turbine, the off-gas from said fuel cell anode gas space is reacted with compressed air from said compressor to produce a heated waste gas stream and heat is recovered from said waste gas by heat exchange to preheat at least one of the reactants required in step (i).



4,696,872

PROCESS FOR PRODUCING A CATALYTIC LAYER FOR A FUEL CELL ELECTRODE

Alain P. O. Blanchart, Balen, and Christian J. E. C. Van Der Poorten, Turnhout, both of Belgium, assignors to Electrochemische Energieconversie N.V. (Elenco N.V.), Mol, Belginm

Filed Sep. 3, 1986, Ser. No. 903,221

Claims priority, application Netherlands, Sep. 5, 1985, 8502435

Int. Cl.[4] H01M *4/88, 4/96*

U.S. Cl. 429—42 **15 Claims**

1. Process for producing a catalytic layer for a fuel cell electrode, characterized in that in a first step at least two carbons or mixtures of carbons are separately mixed with binder, subsequently in a second step these separate carbon/-binder mixtures are intimately mixed together and after that in a third step the mixture obtained is formed into a catalytic layer of the desired dimensions.

4,696,873

RECHARGEABLE ELECTROCHEMICAL CELL WITH A NEGATIVE ELECTRODE COMPRISING A HYDROGEN ABSORBING ALLOY INCLUDING RARE EARTH COMPONENT

Eriko Yagasaki, Tokyo; Motoya Kanda, Yokohama; Kiyoshi Mitsuyasu, Yokohama, and Yuji Sato, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

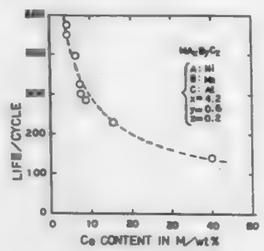
Filed Jun. 11, 1986, Ser. No. 872,844

Claims priority, application Japan, Jun. 21, 1985, 60-133985; Mar. 26, 1986, 61-65877; May 13, 1986, 61-107614

Int. Cl.[4] H01M *10/52*

U.S. Cl. 429—59 **39 Claims**

1. A rechargeable electrochemical cell comprising a positive electrode, an alkaline electrolyte and a negative electrode made of a hydrogen absorbing alloy containing a rare earth component consisting of a mixture of at least two rare earth elements including Ce; characterized in that the amount of Ce contained in said hydrogen absorbing alloy is less than 40% by weight relative to the total amount of rare earth elements.



4,696,874

PLUG FOR CELLS OF ELECTRICAL STORAGE BATTERIES

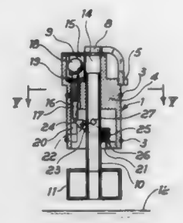
Mario Tadiello, Cassano d'Adda, Italy, assignor to La Batteria di M. Tadiello S.r.l., Cassano d'Adda, Italy

Filed Jun. 23, 1986, Ser. No. 877,300

Claims priority, application Italy, Jul. 3, 1985, 21425 A/85; May 2, 1986, 20284 A/86

Int. Cl.[4] H01M *2/36*

U.S. Cl. 429—64 **10 Claims**



1. A plug for cells of electrical storage batteries with centralized in-series self-levelling of the electrolyte, which comprises:

a cylindrical body fastened to the vent stack of a cover, and provided with water feed and discharge pipes;

a first central longitudinal duct through said cylindrical body;

a water feed chamber provided laterally of said central duct;

a second lateral duct parallel to the first duct, placing said feed chamber in communication with the electrolyte;

a hollow stem, affixed at one end thereof to a hollow float, sliding in the interior of the central duct;

a rod sliding in the interior of the lateral duct;

a sphere supported by said rod and sliding in the interior of the water feed chamber, and

a rocker element linking the hollow stem to the lateral rod, so that to the moving downwards of the stem, the moving upwards of the rod corresponds, and vice-versa.

4,696,875

POSITIVE ELECTRODE FOR ALKALINE STORAGE CELLS

Oskar Glemser; Dieter H. Buss, both of Gottingen, and Jürgen Bauer, Hildesheim, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,759

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520108

Int. Cl.⁴ H01M *10/24*

U.S. Cl. 429—206 **16 Claims**

1. A positive electrode for secondary cells having alkaline electrolytes, wherein the active material comprises a double hydroxide having the formula

$$[M^{2+}_{(1-x)}Fe^{3+}_{x}(OH)_2]^{x+}[(x/n)X^{n-}\cdot yH_2O]^{x-}$$

wherein x is in the range $0.05 \leqq x \leqq 0.4$

wherein the M^{2+} is an oxidizable and reducible cation, and wherein X^{n-} is at least one anion.

4,696,876

PHOTOPOLYMERIZABLE COMPOSITION

John J. Cael, Shrewsbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 12, 1986, Ser. No. 862,022

Int. Cl.⁴ G03C *1/70, 9/08*; G03G *1/04*

U.S. Cl. 430—1 **23 Claims**

14. The method of forming a photopolymer image which comprises imagewise exposing a photopolymerizable alkaline composition comprising an ethylenic unsaturated monomer, a dye sensitizer and a linear polyethylenimine to light absorbed by said dye sensitizer, said dye sensitizer and said linear polyethylenimine providing a photopolymerization system, thereby affecting imagewise photopolymerization of said monomer.

16. The method of claim 14 wherein said ethylenic unsaturated monomer is a monovalent salt of acrylic acid.

17. The method of claim 16 wherein said ethylenic unsaturated monomer is lithium acrylate.

18. The method of claim 17 wherein said photopolymerizable composition includes poly-N-vinyl pyrrolidone.

19. The method of claim 18 wherein said photopolymerizable composition is a coated layer on a support.

4,696,877

PHOTO-MASK BLANK COMPRISING A SHADING LAYER HAVING A VARIABLE ETCH RATE

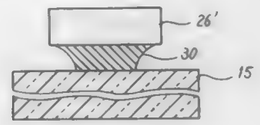
Shigekazu Matsui; Kenichi Kagaya; Masao Ushida, and Kouichi Maruyama, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Division of Ser. No. 552,156, Nov. 15, 1983, Pat. No. 4,563,407. This application Jan. 6, 1986, Ser. No. 816,213

Claims priority, application Japan, Nov. 16, 1982, 57-199786; Nov. 16, 1982, 57-199787

Int. Cl.⁴ G03F *9/00*

U.S. Cl. 430—5 **6 Claims**



1. A photo-mask blank for use in a lithography technique, comprising a transparent substrate member having a principal surface and a shading layer of chromium having a first surface in contact with said principal surface and a second surface opposite said first surface, said shading layer comprising:

a first portion which is adjacent said principal surface and which provides said first surface, said first portion having a first etch rate; and

a second portion which is farther from said first surface than said first portion and which provides said second surface, said second portion having a second etch rate lower than first etch rate to provide in combination therewith a means for rapidly reducing undesired spots of the chromium layer remaining on the substrate to a number which is not greater than $0.1/cm^2$ wherein the difference in etch time between the first and second portions is sufficiently great to effect reduction in a time period which is not more than 1.4 times greater than the time period for producing etching without undercutting.

4,696,878

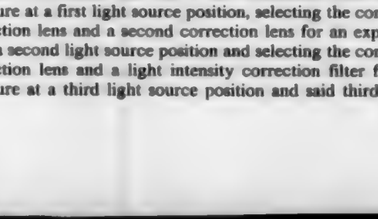
ADDITIVE PROCESS FOR MANUFACTURING A MASK FOR USE IN X-RAY PHOTOLITHOGRAPHY AND THE RESULTING MASK

Alexander R. Shimkunas, Palo Alto, Calif., assignor to Microfix Corporation, Los Gatos, Calif.

Filed Aug. 2, 1985, Ser. No. 762,583

Int. Cl.⁴ G03F *9/00*

U.S. Cl. 430—5 **3 Claims**



1. In a process for manufacturing a mask, the process steps of:

providing an x-ray transparent viaible light transparent plating base comprising indium tin oxide:

providing a layer of a first material on said plating base, said first material being x-ray transparent, said first material comprising boron nitride;

removing portions of said first material, thereby exposing portions of said plating base, the remaining portions of said first material serving as a stencil layer; and

plating a layer of x-ray opaque material on said exposed portions of said plating base, wherein said step of removing portions comprises the steps of forming resist over said first material, said resist comprising photoresist or E-beam resist, patterning said resist, and transferring said pattern in said resist to said first material.

4,696,879

METHOD FOR EXPOSING A COLOR TRI-CATHODE RAY TUBE PANEL TO FORM THREE SEPARATE COLOR PHOSPHOR STRIPE PATTERNS BY EXPOSURE FROM THREE SEPARATE LIGHT SOURCE POSITIONS USING COMBINATION OF CORRECTIVE LENSES

Jun Yamazaki, and Yukio Ito, both of Aichi, Japan, assignors to Sony Corporation, Tokyo, Japan

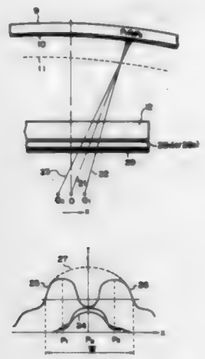
Filed Oct. 10, 1984, Ser. No. 659,421

Claims priority, application Japan, Oct. 14, 1983, 58-192095

Int. Cl.⁴ G03C *5/00*; B05D *5/06*; G03B *41/00*

U.S. Cl. 430—24 **2 Claims**

1. A method for exposing a tri-color cathode ray tube having a panel, wherein plural positions of each exposure light source are exposed to a prescribed stripe width using transmission light intensity distribution with superposition of plural Fresnel diffraction waveforms, comprising the steps of selecting a common correction lens and a first correction lens for an exposure at a first light source position, selecting the common correction lens and a second correction lens for an exposure from a second light source position and selecting the common correction lens and a light intensity correction filter for an exposure at a third light source position and said third light source position is centered between said first and second light source positions, and wherein the absolute value of the transmission light intensity distribution or amount of exposure and the derivative I/x of the transmission light intensity distribution or exposure amount at positions corresponding to edge of the strips width are optimized throughout the inside surface of



the panel, exposing a first color stripe from said first light source position developing said first color stripe, exposing a second color stripe from said second light source position, developing said second color stripe, exposing a third color stripe from said third light source position and developing said third color stripe.

4,696,880

METHOD AND APPARATUS FOR REPRODUCING MULTI-COLOR IMAGE AND PHOTORECEPTOR THEREOF

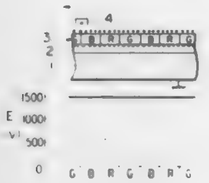
Hisashi Shoji; Satoshi Haneda, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1985, Ser. No. 772,651

Claims priority, application Japan, Sep. 6, 1984, 59-185439; Sep. 6, 1984, 59-185440; Sep. 6, 1984, 59-187044; Sep. 6, 1984, 59-198127

Int. Cl.⁴ G03G *13/01, 13/22*

U.S. Cl. 430—42 **12 Claims**



1. A method for reproducing a multi-colored image comprising

1. providing a photoreceptor having a photoconductive layer on a conductive member and an insulating layer including a filter layer having groups of fine-fibers distributed therein, each of said groups being capable of passing a specific color, said insulating layer on said photoconductive layer,

2. charging said photoreceptor with a charging means whereby a first substantially uniform charge is placed thereon,

3. imagewise exposing the surface of said photoreceptor in the presence of an alternating current or a charge opposite to said uniform charge,

4. uniformly exposing said surface with light corresponding to said specific color, whereby a potential pattern is formed on portions of said photoreceptor corresponding to said specific color,

5. developing said potential pattern by a toner of appropriate color,

6. repeating said uniformly exposing said developing, and

7. subjecting said surface to a second substantially uniform charge opposite to said first uniform charge, before said uniformly exposing in said repating whereby deposition of said toner on unwanted areas is minimized.

4,696,881

MEMBER HAVING LIGHT RECEIVING LAYER WITH SMOOTHLY CONNECTED INTERFACES

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Sakurashinmachi; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,920

Claims priority, application Japan, Jul. 10, 1984, 59-141306; Jul. 11, 1984, 59-142123; Jul. 12, 1984, 59-143295; Jul. 16, 1984, 59-146112; Jul. 17, 1984, 59-146970; Jul. 18, 1984, 59-150189; Jul. 19, 1984, 59-148650; Jul. 20, 1984, 59-149659; Jul. 23, 1984, 59-151378; Oct. 24, 1984, 59-222227; Oct. 25, 1984, 59-223021; Oct. 26, 1984, 59-224040; Oct. 27, 1984, 59-225109; Oct. 29, 1984, 59-225985; Oct. 30, 1984, 59-226665

Int. Cl.⁴ G03G *5/085*

U.S. Cl. 430—57 **98 Claims**

1. A light-receiving member comprising a substrate and a light-receiving layer of a multi-layer structure having at least one photosensitive layer and a surface layer comprising an amorphous material containing silicon atoms and carbon atoms, said light-receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction, said nonparallel interfaces being connected to one another smoothly in the direction in which they are arranged.

4,696,882

MEMBER HAVING LIGHT RECEIVING LAYER WITH SMOOTHLY INTERCONNECTING NONPARALLEL INTERFACES

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 753,011

Claims priority, application Japan, Jul. 12, 1984, 59-143294; Jul. 13, 1984, 59-144387; Jul. 16, 1984, 59-146110; Jul. 17, 1984, 59-146968; Jul. 18, 1984, 59-150187; Jul. 19, 1984, 59-148651; Oct. 22, 1984, 59-220377; Oct. 23, 1984, 59-221257; Oct. 24, 1984, 59-222225; Oct. 25, 1984, 59-223019; Oct. 26, 1984, 59-224038; Oct. 27, 1984, 59-225107

Int. Cl.⁴ G03G *5/085*

U.S. Cl. 430—57 **56 Claims**

1. A light receiving member comprising a substrate and a light-receiving layer of a multi-layer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms and a second layer comprising an amorphous material containing silicon atoms and exhibiting photoconductivity provided successively from the substrate side, said light-receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction, said non-parallel interfaces being connected to one another smoothly in the direction in which they are arranged.

4,696,883

MEMBER HAVING LIGHT RECEIVING LAYER WITH SMOOTHLY CONNECTED NON-PARALLEL INTERFACES AND SURFACE REFLECTIVE LAYER

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 753,048

Claims priority, application Japan, Jul. 9, 1984, 59-140723; Jul. 10, 1984, 59-141305; Jul. 11, 1984, 59-142122; Jul. 13, 1984, 59-144388; Jul. 16, 1984, 59-146111; Jul. 17, 1984, 59-146969; Jul. 18, 1984, 59-150188; Jul. 19, 1984, 59-148649; Jul. 20, 1984, 59-149658; Oct. 23, 1984, 59-221258; Oct. 24, 1984, 59-222226; Oct. 25, 1984, 59-223020; Oct. 26, 1984, 59-224039; Oct. 27, 1984, 59-225108; Oct. 29, 1984, 59-225984

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 **94 Claims**

1. A light-receiving member comprising a substrate and a light-receiving layer of a multi-layer structure having at least one photosensitive layer and a surface layer having reflection preventive function provided successively from the substrate side, said light-receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction, said non-parallel interfaces being connected to one another smoothly in the direction in which they are arranged.

4,696,884

MEMBER HAVING PHOTOSENSITIVE LAYER WITH SERIES OF SMOOTHLY CONTINUOUS NON-PARALLEL INTERFACES

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,516

Claims priority, application Japan, Feb. 27, 1984, 59-35700; Feb. 28, 1984, 59-36903; Mar. 6, 1984, 59-43495

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—58 **46 Claims**

1. A light-receiving member comprising a light-receiving layer of a multi-layer structure having at least one photosensitive layer on a substrate, said light-receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickess direction, each of said non-parallel interfaces being smoothly continuous in the direction in which they are arranged and wherein said at least one pair of non-parallel interfaces has a cycle length (l)≦ the spot size of incident light and the difference in thickness of the layer between the non-parallel interfaces at said cycle l, is $\geqq \lambda/2_n$ wherein λ is the wavelength of said incident light and n is the refractive index of said layer, whereby the tendency of said layer to form interference fringes is suppressed since the direction of said incident light reflected from one of said interfaces of said light-receiving layer is different from the direction of light emitted by the reflection of said incident light from the other of said interfaces.

4,696,885

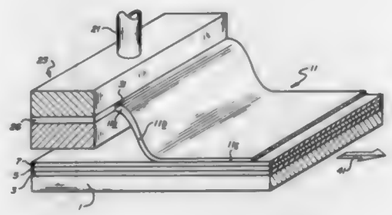
METHOD OF FORMING A LARGE SURFACE AREA INTEGRATED CIRCUIT

Meera Vijan, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 735,268, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 529,436, Sep. 6, 1983, abandoned. This application May 9, 1986, Ser. No. 861,756

Int. Cl.[4] H01L *21/312*

U.S. Cl. 430—311 **41 Claims**



1. A method of forming an electronic circuit element comprising the steps of:

(1) depositing a photoresist layer atop a surface of the element to be subsequently processed by:

a. forming a viscous liquid comprising photoresist and solvent separate from the electronic circuit element surface;

b. forcing the viscous liquid through an elongate, horizontal orifice less than 50 microns thick and in close proximity to but spaced from the electronic circuit element surface to form a flexible, substantially continuous viscous web thereof less than 50 microns thick and capable of maintaining its form and integrity between the orifice and the electronic circuit element surface;

c. moving the circuit element linearly with respect to the orifice at a linear velocity greater than the linear velocity of the viscous composition issuing from the elongated horizontal orifice whereby to draw down and stretch the viscous liquid composition between the orifice and the electronic circuit element surface, thereby depositing a wet film of photoresist on the electronic circuit element surface at a lesser thickness then the viscous composition issuing from the orifice; and

d. heating the film of photoresist to drive off solvent therefrom, thereby providing a thin, adherent film of photoresist of 0.2 to 2.0 micron thickness on the electronic circuit element surface.

(2) exposing at least portions of the photoresist film to actinic radiation;

(3) developing at least portions of the photoresist film;

(4) removing soluble portions of the photoresist to uncover at least portions of the electronic circuit element surface; and

(5) processing at least portions of the uncovered circuit element surface.

4,696,886

POSITIVE PHOTORESIST COMPOSITION WITH M-HYDROXY-α-METHYLSTYRENE HOMOPOLYMER AND QUINONEDIAZIDE COMPOUND

Makoto Hanabata, Ibaraki; Akihiro Furuta; Seimei Yasui, both of Takarazuka, and Kunihiko Tanaka, Nara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 497,912, May 25, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,064

Claims priority, application Japan, May 25, 1982, 57-89482

Int. Cl.[4] G03C *1/60, 1/495*

U.S. Cl. 430—192 **2 Claims**

1. A positive type alkali-developable photoresist composition comprising in admixture an m-hydroxy-α-methylstyrene homopolymer and, as a photo-sensitizer, a quinonediazide compound, wherein the photo-sensitizer and the m-hydroxy-α-methylstyrene homopolymer are present in a ratio of in the range of 1:1 to 1:6 by weight.

2. A positive type alkali-developable photoresist composition comprising in admixture an m-hydroxy-α-methylstyrene homopolymer, a novolak resin, and, as a photo-sensitizer, a quinonediazide compound, wherein the photo-sensitizer component and the sum of the m-hydroxy-α-methylstyrene homopolymer and the novolak resin are present in a ratio in the range of 1:1 to 1:6 by weight with the amount of the m-hydroxy-α-methylstyrene polymer being 11 wt % or more based on the weight of novolak resin.

4,696,887

METHOD FOR FORMATION OF AN IMAGE COMPRISING A HEATING STEP

Kozo Sato; Hiroshi Kitaguchi; Masashi Takeuchi; Masaaki Tsukase, and Masatoshi Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1986, Ser. No. 829,032

Claims priority, application Japan, Feb. 13, 1985, 60-26039

Int. Cl.[4] G03C *5/54, 1/06, 5/26, 1/34*

U.S. Cl. 430—203 **13 Claims**

1. A method for formation of an image which comprises imagewise exposing a heat-developable light-sensitive silver halide material to radiation during or after the imagewise exposure, the heating being carried out in the presence of a compound of general formula (I):

$$X—SO_2(DI) \quad (I)$$

wherein X represents a reducing group capable of reducing a silver salt and capable of being oxidized by heating and in its oxidized state capable of releasing a compound represented by (DI)—SO_2NH_2 by reaction with a nucleophilic agent; and (DI) represents a development inhibiting group capable of inhibiting the oxidation reduction reaction of the silver salt and a reducing agent.

13. A method for formation of an image comprising a heating step as claimed in claim 1, said silver halide light-sensitive material contains a compound of general formula (III):

$$(Dye—X')_n—Y' \quad (III)$$

wherein Dye represents a dye residue or a dye precursor residue; X' represents a single bond or a linking group; Y' represents a group capable of yielding a difference of diffusibility of a compound of formula (Dye—X')$_n$—Y', corresponding to or reversely corresponding to a light-sensitive silver salt in imagewise latent image distribution, or alternatively Y' represents a group capable of releasing Dye and yielding a difference of diffusibility between the released Dye and the compound of formula (Dye—X')$_n$Y'; and n is an integer of 1 or 2.

4,696,888

LIGHT-SENSITIVE COMPOUNDS POSSESSING TRICHLOROMETHYL GROUPS, A PROCESS FOR THEIR PRODUCTION AND LIGHT-SENSITIVE MIXTURES CONTAINING THESE COMPOUNDS

Gerhard Buhr, Koenigstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

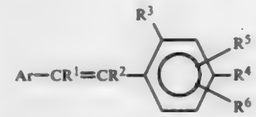
Division of Ser. No. 660,098, Oct. 12, 1984, Pat. No. 4,619,998. This application Jul. 30, 1986, Ser. No. 890,537

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337024

Int. Cl.[4] G03C *1/495, 1/70;* **G02B** *5/23;* **F21V** *9/04*

U.S. Cl. 430—270 **9 Claims**

1. A light-sensitive mixture comprising (a) a bistrichloromethyl-s-triazine and (b) a compound which is capable of reacting with the photoreaction product of said triazine (a) in such a way that a product is formed that has a light absorption or solubility in developer which is different from that of (b), said triazine (a) having the formula



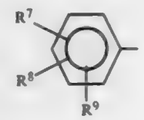
wherein

R^1 and R are each a hydrogen atom or a lower alkyl group,

R^3 and R^4 are different from one another and each is a hydrogen atom or a 4,6-bis-trichloromethyl-s-triazin-z-yl group

R^5 and R^6 are identical or different and each is a hydrogen atom, a halogen atom, an alkyl group having 1 to 3 carbon atoms, or a methoxy group, and

Ar is (i) a mononuclear group having a formula,



wherein R^7, R^8 and R^9 are identical or different and each is a hydrogen atom; a halogen atom; an unsubstituted alkyl group or an alkyl group substituted by halogen, carbocyclic aryl or carbocyclic aryloxy; such that any two of R^7 through R^9 can be connected together to form an ortho-fused 5- or 6-membered ring wherein one or two of the ring carbons can be replaced by an O- or a S-atom; a cycloalkyl group; an alkenyl group; an aryl group; or an aryloxy group, the total number of carbon atoms for R^7, R^8 and R^9 being 12 or (ii) a carbocyclic binuclear or trinuclear group which is unsubstituted or substituted by halogen, an alkyl group having 1 to 3 carbon atoms, an alkoxy group having 1 to 4 atoms, or an alkoxyalkyl group having 3 to 6 carbon atoms.

3. A light-sensitive mixture as claimed in claim 1, wherein said compound (b) contains at least one acid-cleavable C—O—C—bond.

4,696,889

METHOD OF PHOTOFORMING OPTICAL PATTERNS FOR VLSI DEVICES

George J. Yevick, 536 Nordhoff Dr., Leonia, N.J. 07605

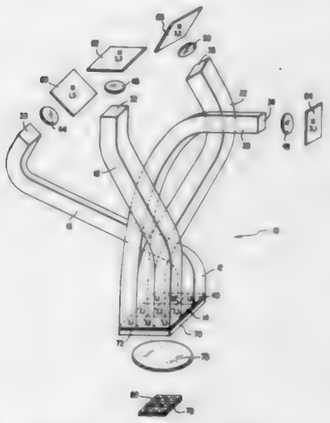
Filed Aug. 23, 1985, Ser. No. 768,700

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—311 **10 Claims**

1. A method of photoforming a composite optical pattern on a photosensitive surface,, the composite pattern being adapted to be optically imaged on said surface, the method including the steps of (a) optically projecting a plurality of original

optical patterns onto at least some of the optical input ends of a plurality of coherent fiber optic sub-bundles, each of said projected original optical patterns being projected onto a responsive one of said input ends, the sub-bundles being bunched together at their other, light output ends to define a trunk of coherent fiber optic bundles, the sub-bundles being separated from each other at their optical input ends, (b) projecting the original optical patterns exiting from said trunk onto said photosensitive surface, (c) processing said photosensitive surface to thereby produce a composite optical pattern, the composite optical pattern consisting of all of those original optical patterns which were projected through the fiber optic sub-bundles, whereby the composite optical pattern is employed to produce electrical circuits on a single substrate.



4,696,890

PROCESSES FOR PREPARING PROTECTIVE COATINGS AND RELIEF STRUCTURES

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1986, Ser. No. 845,892

Claims priority, application Switzerland, Apr. 11, 1985, 1553/85

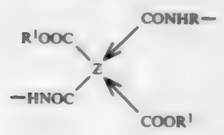
Int. Cl.[4] **G03C** *5/00;* **B05D** *3/06*

U.S. Cl. 430—325 **44 Claims**

1. A process for producing a protecting coating on a substrate which comprises

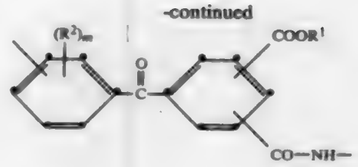
applying to at least one surface of a substrate a coating of at least one polyamic acid ester which comprises

(a) 50 to 100 mol.%, based on the polyamic acid ester, of at least one recurring structural unit of formula I or II or a mixture thereof,



(I)

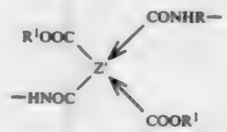
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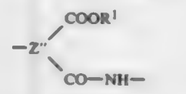
(II)

and

(b) 0 to 50 mol.% of at least one recurring structural unit of formula III or IV or a mixture thereof

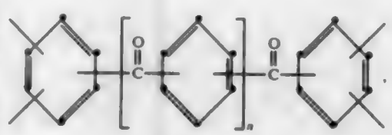


(III)

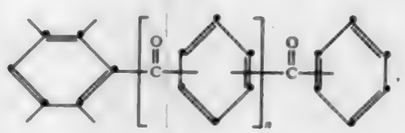


(IV)

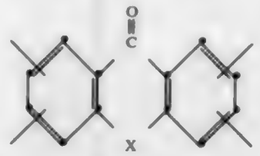
wherein the arrows denote position isomerism, Z is a tetravalent phenyl-aromatic radical having the formula V, VI or VII



(V)



(VI)



(VII)

wherein n is 0 or 1 and X is a direct bond, —CH_2—, —O—, —S—, —SO—, —SO_2—, —NR^x—, CR^xR^y— or —CO—, and the free bonds are located in the ortho-position, R^x is hydrogen or C_1–C_6alkyl, phenyl, benzyl or cyclohexyl, and R^y has the significance of R^x but is not hydrogen,

in which one of the ester groups and one of the amide groups in formula I are attached in the ortho-position either to one phenyl radical or to two different phenyl radicals, and the ester and amide groups in formula II are located in the ortho-position, Z′ is a tetravalent aromatic radical which differs from Z and Z″ is a trivalent aromatic radical which differs from the radical of formula II, wherein one ester group and one amide group are located in the ortho- or peri-position, R is an unsubstituted or substituted divalent organic radical, R^1 is a saturated aliphatic hydrocarbon, and R^2 is a substituent, and m is 0 or an integer from 1 to 4,

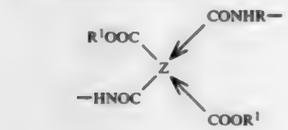
irradiating the coated surface with high energy radiation, and

subsequently converting the polyamic acid ester to the corresponding polyimide by heating.

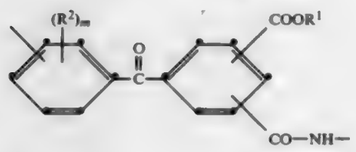
23. A process for producing a photographic relief image on a substrate which comprises

applying to the surface of a substrate a coating of at least one polyamic acid ester which comprises

(a) 50 to 100 mol.%, based on the polyamic acid ester, of at least one recurring structural unit of formula I or II or a mixture thereof,



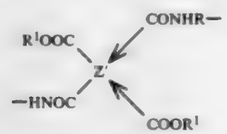
(I)



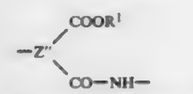
(II)

and

(b) 0 to 50 mol.% of at least one recurring structural unit of formula III or IV or a mixture thereof

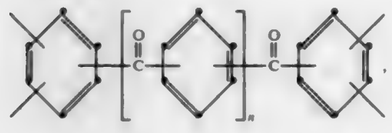


(III)

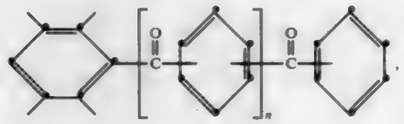


(IV)

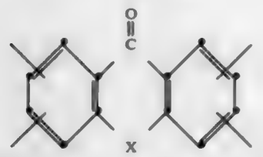
wherein the arrows denote position isomerism, Z is a tetravalent phenyl-aromatic radical having the formula V, VI or VII



(V)



(VI)



(VII)

wherein n is 0 or 1 and X is a direct bond, —CH_2—, —O—, —S—, —SO—, —SO_2—, —NR^x—, CR^xR^y— or —CO—, and the free bonds are located in the ortho-position, R^x is hydrogen or C_1–C_6alkyl, phenyl, benzyl or cyclohexyl, and R^y has the significance of R^x but is not hydrogen,

in which one of the ester groups and one of the amide groups in formula I are attached in the ortho-position either to one phenyl radical or to two different phenyl radicals, and the ester and amide groups in formula II are located in the ortho-position, Z′ is a tetravalent aromatic radical which differs from Z and Z″ is a trivalent aromatic radical which differs from the radical of formula II, wherein one ester group and one amide group are located in the ortho- or peri-position, R is an unsubstituted or substituted divalent organic radical, R^1 is a saturated aliphatic hydrocarbon, and R^2 is a substituent, and m is 0 or an integer from 1 to 4,

irradiating the coated surface with high energy radiation through a photomask,

developing the unexposed areas with a solvent or a solvent mixture, and

converting the irradiated polyamic acid ester to the corresponding polyimide by heating.

4,696,891

PROCESS FOR THE PRODUCTION OF NEGATIVE RELIEF COPIES USING PHOTOSENSITIVE COMPOSITION HAVING 1,2-QUINONE DIAZIDE AND QUATERNARY AMMONIUM COMPOUND

Alberto Guzzi, Verona, Italy, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 667,154, Nov. 1, 1984, abandoned. This application Aug. 1, 1986, Ser. No. 892,893

Claims priority, application Italy, Nov. 8, 1983, 23634 A/83

Int. Cl.[4] **G03F** *7/08, 7/26*

U.S. Cl. 430—325 **3 Claims**

1. A process for the production of negative relief copies, comprising the steps of

(i) imagewise exposing a photosensitive material uniformly applied as a coating to a support, which material comprises in admixture (a) at least one photosensitive 1,2-quinone diazide which is present in an amount sufficient to impart light-sensitivity to said coating (b) a quaternary ammonium compound which is present in an amount between 0.03 and about 0.5 parts by weight per 1 part by weight of said diazide; and (c) a polymeric binder which is insoluble in water and soluble in aqueous-alkaline solutions, said binder being present in an amount sufficient to stabilize said coating structurally;

(ii) after step (i), heating said photosensitive material at a temperature ranging between about 80° to 120° C. for about 0.5 to 5 minutes; then

(iii) after cooling said coating, uniformly exposing said photosensitive material; and

(iv) after step (iii), developing said photosensitive material by means of an aqueous-alkaline developer, such that areas of said photosensitive material not exposed in step (i) are solubilized.

4,696,892

OPTICAL INFORMATION RECORDING MEDIUM

Michiharu Abe; Masaakira Umehara; Tsutomu Sato; Hideaki Oba; Yutaka Ueda, all of Yokohama, and Makoto Kunikane, Chigasaki, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,221

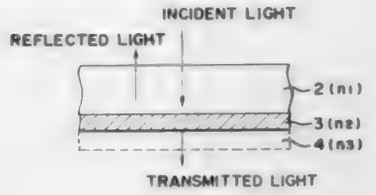
Claims priority, application Japan, Mar. 6, 1984, 59-41240

Int. Cl.[4] **G03C** *1/00;* **G01D** *15/10, 9/00*

U.S. Cl. 430—495 **14 Claims**

1. An optical information recording medium having a reflectivity of not less than 16% and an absorptivity of not less than 30%, comprising a transparent substrate having applied thereon a film of an organic coloring material, said organic coloring material being chemically inert to the substrate, wherein information is recorded on said recording medium by the thermal pit-forming action of laser light on said film of said

organic coloring material when said laser light is irradiated through the transparent substrate,
wherein said film of said organic coloring material has:
(a) an extinction coefficient of at least 1,
(b) a film thickness of 200-1,000 Å and
(c) no binder is contained in said film.



11. An optical information recording medium as claimed in claim 1, wherein said recording medium further comprises an underlayer formed between said substrate and said film, said underlayer comprising a layer of Ag or Al and having a thickness of from 0.1-200μ.

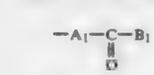
4,696,893

COLOR PHOTOGRAPHIC MATERIAL CONTAINING CERTAIN COMBINATIONS OF CYAN AND MAGENTA COUPLERS

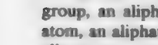
Makoto Umemoto; Kotaro Nakamura, and Nobuo Furutachi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 740,455, Jun. 3, 1985. This application Sep. 30, 1985, Ser. No. 781,603
Claims priority, application Japan, Jun. 1, 1984, 59-112558
Int. Cl.[4] G03C *7/32, 1/40*
U.S. Cl. 430—543 **11 Claims**

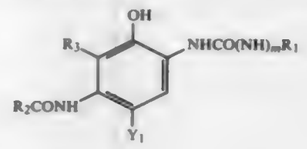
1. A color photographic material comprising a support having thereon (i) a silver halide emulsion layer containing a compound represented by formula (I) or (II), and (ii) a silver halide emulsion layer containing a 5-pyrazolone coupler having an arylthio group at the coupling position of said coupler, wherein said arylthio group includes an aliphatic oxy group or an aromatic oxy group at an ortho-position with respect to the sulfur atom of the arylthio group, the aliphatic group or aromatic group of said aliphatic oxy group or aromatic oxy group being unsubstituted or substituted by at least one member selected from
(a) a halogen atom,
(b) a cyano group,
(c) an unsubstituted or substituted aliphatic, aromatic, or heterocyclic sulfonyl, sulfinyl, or phosphonyl group, and
(d) a group represented by the formula



wherein A_1 represents a single bond, an oxygen atom, a sulfur atom, an imino group, or a divalent aliphatic, aromatic, or heterocyclic group and B_1 represents a hydroxy group, an aliphatic or aromatic oxy group, a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an unsubstituted or substituted noncyclic amino group, or an unsubstituted or substituted hydrazino group, and
(e) a group represented by the formula

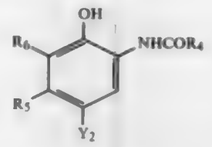


wherein A_2 represents a single bond, a divalent aliphatic, aromatic, or heteropcyclic group, B_2 represents a hydrogen atom, an aliphatic group, an aromatic group or a heterocyclic group, M represents an oxygen atom, a sulfur atom, or an imino group, and n represents an integer of 1 to 4; and formulae (I) and (II) are represented by



(I)

and



(II)

wherein R_1, R_2, and R_4 each represents an unsubstituted or substituted aliphatic group, an unsubstituted or substituted aromatic group, or an unsubstituted or substituted heterocyclic group; R_3 and R_6 each represents a hydrogen atom, a halogen atom, an aliphatic group, or an acylamino group; or R_2 and R_3 together represent a non-metallic atomic group forming a nitrogen-containing 5-membered or 6-membered ring; R_5 represents an unsubstituted or substituted aliphatic group containing at least 2 carbon atoms; Y_1 and Y_2 each represents a hydrogen atom or a group capable of being released during oxidative coupling with a developing agent; and m represents 0 or 1; and said coupler can form a dimer or higher oligomer coupler by linking through a group of the groups represented by R_2, R_3, and Y_1 or the groups represented by R_5, R_6, and Y_2.

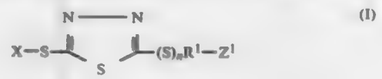
4,696,894

SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING 1,3,4-THIADIAZOLE DERIVATIVES HAVING A POLAR SUBSTITUENT

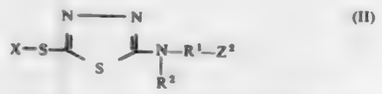
Naoyasu Deguchi; Tetsuro Kojima; Shigeru Ohno; Koki Nakamura, and Hideo Miyazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 24, 1985, Ser. No. 813,198
Claims priority, application Japan, Dec. 27, 1984, 59-278856
Int. Cl.[4] G03C *1/28, 1/34*
U.S. Cl. 430—551 **11 Claims**

1. A silver halide photographic material comprising at lest one compound represented by formula (I) or formula (II)



(I)



(II)

wherein R^1 represents a straight or branched chain alkylene, alkenylene or aralkylene group, or an arylene group; R^2 represents a hydrogen atom, or a substituted or unsubstituted alkyl, aryl, alkenyl or aralkyl group; X represents a hydrogen atom, an alkali metal atom, an ammonium group, or a precursor capable of providing a hydrogen atom or an alkali metal atom under an alkaline condition; Z^1 and Z^2 each represents a polar substituent, wherein Z^1 represents a quaternary ammonium group, an alkoxy group, an alkylthio group, an arylthio group, a heterocyclic oxy group, a carbamoyl group, a sulfamoyl group, an acyloxy group, a ureido group, a thioureido group, or a sulfonyloxy group; and Z^2 represents a quaternary ammonium group, an alkoxy group, an alkylthio group, an arylthio group, a heterocyclic oxy group, a heterocylic thio group, a carbamoyl group, a sulfamoyl group, an acyloxy group, a ureido group, a thioureido group, a sulfonyloxy group, a substituted or unsubstituted amino group or a salt thereof, an aryloxy group, a heterocyclic group or a cyano group; and n represents 0 or 1.

4,696,895

MONOCLONAL ANTI-PROTEIN C ANTIBODY, ITS PREPARATION AND USE THEREOF

Tatsuo Yamashita, Kobe; Masafumi Terada, Higashiosaka, and Koji Suzuki, Tsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 9, 1984, Ser. No. 658,560
Claims priority, application United Kingdom, Oct. 18, 1983, 8327860
Int. Cl.[4] G01N *33/53, 33/535, 33/577*
U.S. Cl. 435—7 **8 Claims**

1. A monoclonal anti-human protein C antibody, wherein said antibody has the following characteristics:
(i) molecular weight determined by SDS-polyacrylamide gel electrophoresis:
ca. 192,000
(ii) molecular weight of reduced products by 2-mercaptoethanol:
ca. 26,000 and 46,000
(iii) subclass:
IgG_1
(iv) inhibitory activity toward protein Ca activity:
negative
(v) inhibitory activity toward Factor Va:
positive, and
(vi) antigenic determinant:
binds to the heavy chain of protein C.

4,696,896

GONOCOCCAL PILI PROCESSES FOR THE PREPARATION THEREOF AND THE USE THEREOF FOR THE DETECTION OF AND PREVENTION OF INFECTIONS CAUSED BY *NEISSERIA GONORRHOEAE*

Charles C. Brinton, Pittsburgh, and John C. McMichael, Imperial, both of Pa., assignors to Bactex, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 427,126, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 188,463, Sep. 18, 1980, abandoned, which is a continuation of Ser. No. 571,200, Apr. 25, 1975, abandoned. This application Mar. 19, 1984, Ser. No. 590,544
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.[4] G01N *33/531, 33/544, 33/569;* **A61K** *39/095*
U.S. Cl. 435—7 **19 Claims**

1. Material selected from the group consisting of single rod and agglomerated rod material derived from *N. gonorrhoeae* pili which is substantially free of cells or cell debris and which, when agglomerated, shows strong agglutination ability against sera containing antibodies against pili derived from at least one of the strains of *N. gonorrhoeae* designated Pittsburgh 3-2 (ATCC 31149), CDCT-2 (ATCC 31150), CDCM-2 (ATCC 31148) and Pittsburgh 4-2 (ATCC 31151), and is insoluble below pH 7.7 and soluble above pH 9.2.

4,696,897

PROCESS FOR PREPARING 2-KETO-L-GULONIC ACID

Takayasu Sonoyama; Shigeo Yagi, and Bunji Kageyama, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 469,781, Feb. 25, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,393
Claims priority, application Japan, Mar. 5, 1982, 57-35455
Int. Cl.[4] C12P *39/00, 7/60*
U.S. Cl. 435—42 **20 Claims**

1. A process for preparing 2-keto-L-gulonic acid from D-glucose, comprising: cultivating in a nutrient medium containing D-glucose a mixed culture of a first microorganism selected from the group consisting of the species *Erwinia citreus, Erwinia punctata, Erwinia terreus* and mutants thereof capable of converting D-glucose into 2,5-diketo-D-gluconic acid and a second microorganism belonging to the genus Brevibacterium or Corynebacterium capable of converting 2,5-diketo-D-gluconic acid into 2-keto-L-gulonic acid wherein said first and second microorganisms are incubated in the medium in such a manner that both microorganisms coexist and grow together therein during at least the latter part of the cultivation.

4,696,898

VECTOR ENCODING HEPATITIS B SURFACE ANTIGEN

Renee A. Fitts, Framingham; Nancy Hsiung, Wellesley, both of Mass., and Dean H. Hamer, Washington, D.C., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Jan. 16, 1984, Ser. No. 570,940
Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 5/00, 1/00*
U.S. Cl. 435—68 **11 Claims**

1. A recombinant DNA vector comprising (1) a promoter for a eukaryotic metallothionein gene ligated to a gene sequence encoding human hepatitis B surface antigen, and (2) at least the 69% transforming region of the bovine papilloma virus genome, expression of said hepatitis B surface antigen encoding gene sequence being under the control of said metallothionein promoter.

5. A mammalian cell transformed with a recombinant DNA vector comprising (1) a promoter for a eukaryotic metallothionein gene ligated to a gene sequence encoding human hepatitis B surface antigen, and (2) at least the 69% transforming region of the bovine papilloma virus genome, expression of said hepatitis B surface antigen encoding gene sequence being under the control of said metallothionein promoter.

4,696,899

PROCESS FOR THE PREPARATION OF HUMAN LEUKOCYTE AND HUMAN GAMMA INTERFERON

Miklós Tóth, Szeged; Valéria Endrész, Adony; Iloan Béládi, and Sándor Tóth, both of Szeged, all of Hungary, assignors to EGYT Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Dec. 10, 1984, Ser. No. 681,451
Claims priority, application Hungary, Dec. 13, 1983, 4237-83
Int. Cl.[4] C12P *21/00;* **A61K** *45/02*
U.S. Cl. 435—68 **20 Claims**

1. A process for the preparation of alpha-interferon and gamma-interferon one after the other in the same leukocyte culture, which comprises:
(a) isolating the buffy coat fraction of blood,
(b) removing the erythrocytes,
(c) suspending the leukocytes in a suitable nutrient medium,
(d) pretreating said suspension with alpha- or beta-interferon,
(e) then contacting it with an alpha-interferon inducer,
(f) separating the liquid containing the alpha-interferon from the cells,
(g) washing and suspending the cells in a suitable nutrient medium,
(h) treating said cells with a mitogenic agent,
(i) separating the liquid containing gamma-interferon and alpha-interferon from the cells, and
(j) finally recovering gama-interferon from the mixture.

4,696,900

PRODUCTION OF BACTERIAL POLYSACCHARIDES

Derek C. Ellwood, Winterbourne Stoke; Charles G. T. Evans, and Richard G. Yee, both of Salisbury, all of England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 097,449, Nov. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 766,037, Feb. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 739,145, Nov. 5, 1976, abandoned. This application Jan. 6, 1984, Ser. No. 617,743

Claims priority, application United Kingdom, Nov. 12, 1975, 46784

Int. Cl.[4] C12P *19/06;* **C12R** *1/64*

U.S. Cl. 435—104 **23 Claims**

1. A process for the production of a polysaccharide by culturing polysaccharide-producing bacteria of the *Xanthomonas campestris* group in continuous culture, comprising:

(a) introducing into a culture vessel a culture of polysaccharide-producing bacteria of the *Xanthomonas campestris* group;

(b) continuously supplying a culture medium to the culture vessel at a rate such that an essentially steady state is maintained in the vessel;

(c) maintaining conditions of aeration, pH and temperature within the culture vessel, such as to promote the simultaneous growth of bacteria and production of polysaccharides; and

(d) continuously withdrawing the resulting polysaccharide-containing culture broth from the culture vessel at substantially the same rate as the culture medium is supplied to the culture vessel, the said culture medium being a chemically-defined culture medium consisting of the following nutrient sources: a carbon source at a concentration of at least 10 gm liter^{-1} calculated as elemental carbon, a nitrogen source, and sources of further elements, consisting of phosphorus, sulphur, magnesium, potassium and elements other than O, H, C, N, P, S, Mg and K, which are essential for the growth of said polysaccharide-producing bacteria, the sources of said further elements being salts that provide said further elements in the form of inorganic ions in solution;

the medium having a growth-limiting substrate selected from the nitrogen, phosphorus, sulphur, magnesium and potassium source;

and the nutrient sources, the rate of supply of the culture medium to the culture vessel and the conditions within the culture vessel being selected such that the formation of non-polysaccharide-producing strains of Xanthomonas is substantially reduced and thereby a fall-off in polysaccharide yield is substantially avoided.

4,696,901

IMMOBILIZATION OF MICROORGANISMS ON A PLASTIC CARRIER

Brian W. Robertson, and Gareth T. Phillips, both of Sittingbourne, England, assignors to Shell Internationale Research Maatschappij B.V., The Hague and Gist Brocades N.V., Delft, both of, Netherlands

Filed Dec. 7, 1983, Ser. No. 558,749

Claims priority, application United Kingdom, Dec. 23, 1982, 8236719

Int. Cl.[4] C12N *11/08, 11/00, 1/26*

U.S. Cl. 435—180 **13 Claims**

1. In a process for the immobilisation of one or more hydrocarbon-utilising microorganisms on a plastic carrier in which the immobilisation is carried out in an aqueous nutrient medium, the improvement comprising adding to the nutrient medium from about 0.1–3 ml of a water-immiscible hydrocarbon substrate per 100 cm^2 of plastic carrier surface area.

4,696,902

MODULAR APPARATUS FOR CELL CULTURE

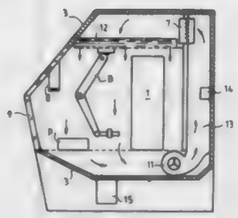
Jean-Claude Biscoste, Paris, France, assignor to Institut National de la Sante et de la Recherche Medicale (INSERM), Paris, France

Filed Jun. 6, 1985, Ser. No. 742,046

Claims priority, application France, Jun. 6, 1984, 84 08839

Int. Cl.[4] C12M *1/18*

U.S. Cl. 435—300 **29 Claims**



1. A modular apparatus for cell culture, comprising in the same sealed enclosure (2) with isotherms walls (3):

at least one device (1, R, E) for storing culture containers and further comprising a plurality of modules forming shelving (R) provided with sealed compartments (16) containing said culture containers (4*a*);

a temperature regulation device (7);

a closed circuit laminar flow sterilization device (11, 12, 13, 14), including a filter which sterilizes gas flow by removing microbes;

a device for supplying and regulating respiratory gases, said enclosure containing at least one additional device for carrying out a cell culture operation and defining a modular workpost in addition to the modular post corresponding to said storage device (1, R, E), the sealed enclosure also containing at least one automatic and programmable arm (B) which is provided with a handling gripper (21) and which carries out all cell culutre operations corresponding to each of the work posts, and comprising a microprocessor for controlling all cell culture operations.

4,696,903

METHOD AND APPARATUS FOR EXAMINING EARTH FORMATIONS

Murl Owen, Chanute, Kans., assignor to Lalos & Keegan, Washington, D.C.

Filed Dec. 21, 1982, Ser. No. 451,970

Int. Cl.[4] G01N *31/22, 21/01*

U.S. Cl. 436—28 **6 Claims**

1. A method for examining earth formations in a bore hole for determining the presence of petroleum hydrocarbon comprising the steps of:

illuminating a preselected formation with light having a frequency in the ultraviolet range,

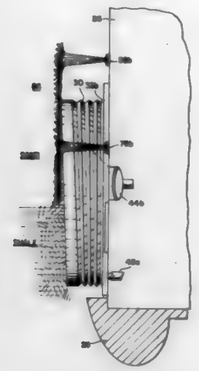
producing a visual display of the color characteristic of light selected from the illuminated formation,

indicatng the presence of petroleum hydrocarbons responsive to the presence of a predetermined color content of said visual display,

applying a colorant to the formation being examined, said colorant having the characteristic that it adheres to petroleum hydrocarbon molecules,

illuminating said preselected formation,

producing a visual display of the color characteristic of light reflected from the illuminated formation, and



indicating, additionally, the degree of presence of petroleum hydrocarbons responsive to a predetermined intensity of color produced by said colorant in said visual display.

4,696,904

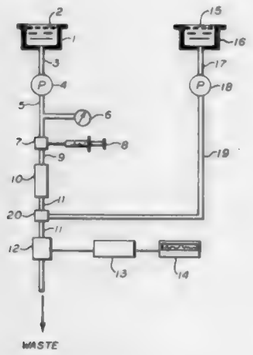
APPARATUS AND METHOD FOR THE DETERMINATION OF WATER BY LIQUID CHROMATOGRAPHY

Timothy S. Stevens, Midland, and Hamish Small, Leland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 24, 1986, Ser. No. 843,423

Int. Cl.[4] G01N *33/18*

U.S. Cl. 436—39 **11 Claims**



1. A method for the determination of water by liquid chromatography comprising the steps of:

adding a predetermined volume of a sample containing a water component and another component to a flowing stream of a nonaqueous eluent;

eluting the sample through a separating medium effective to separate the water component from said another component so that the separated water component emerges from the separating medium in an effluent eluent stream; and

electrochemically detecting the separated water component in the effluent eluent stream from the separating medium in a manner effective to obtain a signal to noise ratio of greater than two.

4,696,905

METHOD FOR DIAGNOSING CANCER USING ESR

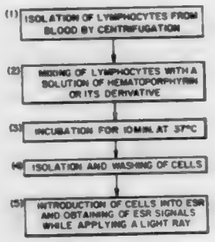
Masaaki Aoyama; Mitsuharu Itabashi; Mariko Miura, and Masahiro Kohno, all of Tokyo, Japan, assignors to Special Reference Laboratories, Inc. and JEOL Ltd., both of Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,996

Claims priority, application Japan, May 13, 1983, 58-83651; Dec. 23, 1983, 58-243453; Mar. 27, 1984, 59-58664

Int. Cl.[4] G01N *24/00, 33/48, 33/50*

U.S. Cl. 436—64 **15 Claims**



1. A method for diagnosis of cancer in vitro utilizing an ESR spectrometer for quantitative measurements of radicals found in lymphocytes taken from a patient, comprising the steps of:

(a) mixing cells from a patient with a reagent solution, selected from the group consisting of hematoporphyrin and hematoporphyrin derivatives;

(b) isolating the resulting reaction product from unreacted reagent;

(c) irradiating said reaction product with light to generate porphyrin radicals.

(d) obtaining an ESR spectral signal, S_x, of said reaction product indicative of the quantity of radicals contained therein; and

(e) diagnosing the presence or absence of cancer on the basis of value S_x by comparing S_x to S values preestablished to be indicative of cancerous and/or noncancerous states.

4. A method for diagnosis of cancer in vitro utilizing an ESR spectrometer for quantitative measurement of radicals found in lymphocytes taken from a patient, comprising the steps of:

(a) isolating lymphocytes from blood extracted from a patient;

(b) mixing said lymphocytes with a solution selected from the group consisting of hematoporphyrin and hematoporphyrin derivatives;

(c) isolating the resulting reaction product from the mixture;

(d) irradiating said reaction product with light to generate porphyrin radicals,

(e) obtaining ESR spectral signal of said reaction product;

(f) determining a value S_x indicative of the quantity of the radicals contained in said reaction product on the basis of the ESR signal; and

(g) diagnosing for the presence or absence of cancer on the basis of value S_x by comparing S_x to S values preestablished to be indicative of cancerous and/or noncancerous states.

7. A method for diagnosis of cancer in vitro utilizing an ESR spectrometer for quantitative measurement of radicals found in lymphocytes taken from a patient, comprising the steps of:

(a) mixing cells from a patient with a reagent solution, selected from the group consisting of hematoporphyrin; and hematoporphyrin, derivatives;

(b) isolating the resulting reaction product from unreacted reagent;

(c) irradiating said reaction product with light to generate porphyrin radicals,

(d) obtaining ESR spectral signal of said reaction product;

(e) determining the value, S_x, indicative of the quantity of

radicals contained in said reaction product and determining a g-value, g_x, of said radicals on the basis of the ESR signal; and

(f) diagnosing the presence or absence of cancer on the basis of the values S_x and g_x by comparing to S values and a value preestablished to be indicative of cancerous and/or noncancerous states.

4,696,906

TEST MEDIUM SOLUTION FOR DETECTING PHOSPHORUS SEGREGATES IN METALLIC MATERIAL

Yoshiko Funahashi; Yoshikazu Kamino; Yasuharu Matsumura, and Senichi Harimaya, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 670,923, Nov. 13, 1984, Pat. No. 4,643,978. This application Oct. 10, 1985, Ser. No. 786,285
Claims priority, application Japan, Jul. 24, 1984, 59-153799
Int. Cl.⁴ G01N *33/20*
U.S. Cl. 436—78 **2 Claims**



1. A test medium for use in detecting phosphorus segregates in a metallic material, in the form of an aqueous solution consisting of 0.1 to 80% by weight of silver nitrate in water and alcohol.

4,696,907

IDENTIFICATION OF REAGINS IN THE BLOOD SERUM OF ALLERGEN SENSITIZED VERTEBRATES

John H. Brewer, and Terry L. Foster, both of Abilene, Tex., assignors to Science Research Center, Inc., Abilene, Tex.

Division of Ser. No. 493,413, May 10, 1983, Pat. No. 4,486,540, which is a continuation-in-part of Ser. No. 323,762, Nov. 23, 1981, abandoned, which is a division of Ser. No. 170,143, Jul. 18, 1980, Pat. No. 4,331,650. This application Aug. 30, 1984, Ser. No. 645,665
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.⁴ G01N *33/539, 33/547*
U.S. Cl. 436—513 **8 Claims**

1. A method of determining the presence of absence of a given reagin in the blood serum of a vertebrate sensitized by a polar allergen corresponding to said reagin, which comprises;

A. providing an in-vitro specimen of the blood serum suspected of containing the reagin;

B. providing an aqueous dispersion of solid, non-polar hydrophobic carrier particles having adsorbed thereon a first complex of said polar allergen and a phospholipid compound and a second complex of said allergen and a non-phospholipid compound, said phospholipid and said non-phospholipid compounds both being a compound of the formula: X—Y wherein X represents a hydrophilic, polar moiety and y represents a hydrophobic, non-polar, moiety, said first and second complexes having the formula:

(A)X—Y

wherein X and Y have the meanings ascribed to them above and (A) is the polar allergen molecule, and wherein X and Y are chemically bound together and the X—Y compound is complexed with the allergen such that the Y moiety is oriented away from the polar allergen molecule;

C. admixing the blood serum provided with the aqueous dispersion; and

D. observing the mixture obtained for an agglutination reaction;

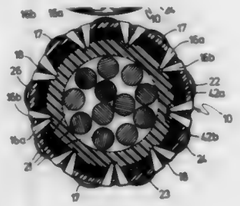
wherein a positive reaction is indicative of the presence of said reagin and a negative reaction is indicative of the absence of said reagin.

4,696,908

INSULATION DISPLACING GROUND STRAP

David H. Gutter, and Walter C. Shatto, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 10, 1986, Ser. No. 918,432
Int. Cl.⁴ H01R *4/66*
U.S. Cl. 439—98 **11 Claims**



1. A grounding strap for terminating an outer conductor of an electrical cable, comprising:

an elongated conductive strip having a thickness bent into first bowed portions and second bowed portions,

a plurality of prongs along said strip and projecting outwardly in a common direction from said thickness of said strip,

said strip being deformable into a curved configuration around an electrical cable with said prongs extending toward an outer conductor of said cable to engage conductively said outer conductor upon compression of said strip around said cable.

said first bowed portions of said strip being spaced apart from each other along said strip and positioned between corresponding adjacent said prongs, said first bowed portions of said strip projecting in the same direction as said prongs to engage said electrical cable upon compression of said strip around said cable.

and, said second bowed portions of said strip being spaced apart from each other along said strip, said second bowed portions projecting outwardly away from said first bowed portions for receiving the application of compression against said strip to result in said compression of said strip around said cable.

4,696,909

PLATINUM CORROSION REDUCING PREMELTED OXIDE COMPOSITIONS FOR LEAD CONTAINING SOLDER GLASSES

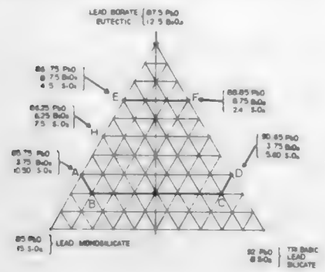
Edward A. Weaver, Toledo, Ohio, assignor to Owens-Illinois Television Products Inc., Toledo, Ohio

Filed Apr. 7, 1986, Ser. No. 848,551
Int. Cl.⁴ C03C *3/072, 8/24*
U.S. Cl. 501—75 **4 Claims**

1. A method of making in a platinum melter a Pb_3O_4 free solder glass composition containing PbO and containing at least one of the oxides SiO_2 and B_2O_3, the composition optionally containing one or more of the oxides ZnO, BaO, Al_2O_3 and Bi_2O_3, the method comprising the steps of

(A) providing raw batch ingredients to provide the above solder glass compositions; and

(B) premixing with the raw batch ingredients a premelted oxide composition mixture of PbO and B_2O_3 or a premelted mixture of PbO and SiO_2, or a mixture of PbO, B_2O_3 and SiO_2, or a mixture thereof, the premelted oxide composition mixture being above the line ABCD of the



ternary diagram of the FIGURE, at least about 50% by weight of the Pb_3O_4 in the raw batch being replaced by the premelted oxide composition.

4,696,910

CATALYST ELEMENT, A PROCESS FOR THE PREPARATION THEREOF AS WELL AS A USE THEREOF

Hans Gustafsson, Lidingö; Stephan Schwartz, Vaxholm, and Karl-Bertil Widén, Åkersberga, all of Sweden, assignors to Electro Cell AB, Åkersberga, Sweden

PCT No. PCT/SE85/00105, § 371 Date Oct. 31, 1985, § 102(e) Date Oct. 31, 1985, PCT Pub. No. WO85/04118, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 8, 1985, Ser. No. 800,597
Claims priority, application Sweden, Mar. 19, 1984, 8401515
Int. Cl.⁴ B01J *31/06*
U.S. Cl. 502—159 **24 Claims**

1. A catalyst element for reacting a lyophobic fluid with a lyophilic fluid comprising a porous lyophobic body which has a pore size essentially below 20 μm, a porosity of at least 20% and an exposed surface layer having a thickness of at most 100 μm of lyophilic catalyst particles with a size essentially below 50 μm, across part of its periphery only, said catalyst layer having been formed by sintering and/or pressing the catalyst particles into the porous, lyophobic body.

4. A catalyst element according to claim 1 wherein the lyophobic body is of a polymeric material.

4,696,911

NICKEL BORIDE-POLYMER CATALYST

Hiepke Boerma, Vlaardingen; Rudolph O. de Jongh, The Hague, and Cornelis Van Dijk, Zwijndrecht, all of Netherlands, assignors to Unilever Patent Holdings B.V., Netherlands

Filed Oct. 16, 1986, Ser. No. 919,643
Claims priority, application European Pat. Off., Oct. 18, 1985, 85201708.6
Int. Cl.⁴ B01J *31/06*
U.S. Cl. 502—159 **8 Claims**

1. Catalyst composition comprising finely dispersed nickel boride stabilised with a linear polymer containing pyrrolidone groups, in which the composition also contains a partial fatty acid polyol ester in an amount which ranges between 5 and 0.5 times the weight of nickel.

4,696,912

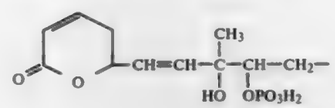
STABILIZED COMPOSITIONS

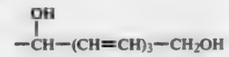
Allen I. Kay, Succasunna, and Gerard C. Hokanson, Long Valley, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 10, 1986, Ser. No. 818,504
Int. Cl.⁴ A61K *37/16*
U.S. Cl. 514—7 **2 Claims**

1. A stabilized drug composition containing

(a) the compound of the formula





or a pharmaceutically acceptable salt thereof, and

(b) a pharmaceutically acceptable alkali or alkaline earth metal salt or an alkyl ester of ascorbic acid in which alkyl group has one to five carbon atoms, wherein the molar ratio of (a) to (b) is from about 1:0.5 to about 1:6.

4,696,913

NOVEL PEPTIDES WHICH ARE ACTIVE ON THE CENTRAL NERVOUS SYSTEM AND HAVE AN ACTION ON THE CHOLINERGIC SYSTEM

Rolf Geiger, Frankfurt am Main; Hermann Gerhards, Hofheim am Taunus, and Hansjörg Kruse, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 663,193, Oct. 22, 1984, Pat. No. 4,623,715. This application Sep. 2, 1986, Ser. No. 902,615
Int. Cl.⁴ A61K *37/02*; C07K *5/10, 7/06*
U.S. Cl. 514—15 **4 Claims**

1. A pharmaceutical composition comprising an effective amount of a compound of the general formula I

$$R^4\text{-}A^5\text{-}A^6\text{-}R^7 \quad (I)$$

in which:

R^4 denotes benzyloxycarbonyl (Z), $(C_2–C_6)$-alkanoyl, $(C_6–C_{10})$-aryl-$(C_2–C_4)$-alkanoyl or cycloalkanoyl with up to 2 alkyl and 5–7 cycloalkyl carbon atoms, bonded via Nα, or

R^3-A^4, in which

A^4 is selected from the group consisting of Ala, Val, Leu, Ile, Met, Ser($C_1–C_6$-alkyl), Thr ($C_1–C_6$-alkyl), Cys($C_1–C_6$-alkyl), Phe, C-phenylgycine and Tyr($C_1–C_6$-alkyl) and

R^3 represents hydrogen, Z, $(C_2–C_6)$-alkanoyl, $(C_6–C_{10})$-aryl-$(C_2–C_4)$-alkanoyl or cycloalkanoyl with up to 2 alkyl and 5–7 cycloalkyl carbon atoms, bonded via Hα, or

R^2-A^3-A^4, in which

A^4 is as defined above,

A^3 denotes His, Ala, Phe or D-Lys and

R^2 is defined as R^3, or represents $(C_2–C_4)$-alkanoyl-ω-amino-$(C_5–C_8)$-n-alkanoyl, methylsulfonyl-ω-amino-$(C_5–C_8)$-n-alkanoyl, 4-methylsulfonylbenzoyl, succinoyl or glutaroyl, bonded via Hα, or

R^1-A^2-A^3-A^4, in which

A^3 and A^4, are as defined above,

A^2 represents pyroglutamyl, Glu, D-Glu or Ala and

R^1 is defined as R^2, or represents $(C_2–C_4)$-alkanoyl-ω-amino-$C_3–C_4$)-n-alkanoyl, methylsulfonyl-ω-amino-$(C_3–C_4)$-n-alkanoyl, methylamido-glutaroyl, H-Met, H-D-Met, H-Met(O), H-D-Met(O), H-Met(O_2), H-D-

Met (O_2), H-Gly, Z-Gly, H-Tyr, Z-Tyr or pyroglutamyl, bonded via Nα,

A^5 denotes D-Lys or Lys,

A^6 denotes the radical of phenylalanine, N-methylphenylalanine, 4-(C_1–C_4)-alkoxyphenylalanine or 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid and

R^7 denotes NH-$(CH_2)_n$-NH_2, Gly-NH-$(CH_2)_m$-NH_2, Gly-Lys-R^8 or Gly-D-Lys-R^8, in which n represents an integer from 4 to 10, m represents a integer from 2 to 6 and R^8 represents 1-pyrrolidinyl, 1-piperidinyl, NH-R or NR_2, where R=(C_1–C_4)-alkyl,

or one of its physiological acceptable salts, and a physiological acceptable carrier.

Asx	13.0 ± 0.8	(13)	Arg.	4.7 ± 0.1	(5)
Thr	2.8 ± 0.1	(3)	Pro	1.8 ± 0.0	(2)
Ser	3.7 ± 0.2	(4)	Total	(105)	
Glx	39.5 ± 1.6	(40)			
Gly	6.5 ± 0.2	(7)			
Ala	10.8 ± 0.5	(11)			
Val	4.5 ± 0.1	(5)			
Ile	0.05 ± 0.01	(0)			
Leu	2.0 ± 0	(2)			
Lys	12.5 ± 3	(13)			

4,696,914

MATERIAL FOR IMPROVING THE FERTILITY OF MAMMALS AND PROCESS FOR ITS PRODUCTION

Meinhard W. Rüsse, Schnaitsee; Rudolf Bolze, Hanau, and Friedhelm Koch, Grosskrotzenburg, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,570

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3527356

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—19 **18 Claims**

1. A process of increasing fertility in a female mammal having a cycle comprising supplying the female mammal with a sufficient amount of L-tyrosine or an alkali metal or alkaline earth metal salt of L-tyrosine, an alkyl ester of L-tyrosine having 1 to 5 carbon atoms in the alkyl group, glycyl-L-tyrosine, an N-fatty acid acyl substituted L-tyrosine having 2 to 22 carbon atoms in the acyl group or N-hydroxmethyl L-tyrosine to increase the fertility of the mammal.

4,696,915

PARATHYMOSIN ALPHA

Bernard L. Horecker, New York, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 614,007, May 25, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,273

Int. Cl.[4] C07K *15/12;* **A61K** *35/26, 37/24*

U.S. Cl. 514—21 **4 Claims**

1. A peptide of about 105 amino acids having a pI of about 4.15, a partial amino acid sequence at the amino-terminal as follows: X-Ser-Lys-Ser-Glu-Val-Glu-Ala-Ala-Ala-Glu-Leu-Ser-Ala-Lys-Asp-Leu-Lys-Glu-Lys-Lys-Asp-Lys-Val-Glu-Glu-Lys-Ala-Gly-Arg-Lys-

wherein X is a blocking group; said peptide having an amino acid composition as follows:

Asx	13.0 ± 0.8	(13)	Arg.	4.7 ± 0.1	(5)
Thr	2.8 ± 0.1	(3)	Pro	1.8 ± 0.0	(2)
Ser	3.7 ± 0.2	(4)	Total	(105)	
Glx	39.5 ± 1.6	(40)			
Gly	6.5 ± 0.2	(7)			
Ala	10.8 ± 0.5	(11)			
Val	4.5 ± 0.1	(5)			
Ile	0.05 ± 0.01	(0)			
Leu	2.0 ± 0.0	(2)			
Lys	12.5 ± 0.3	(13)			

3. A method for modulating immune response in an animal comprising administering to said animal an immuno-modulating effective amount of a peptide of about 105 amino acids having a pI of about 4.15, a partial amino acid sequence at the amino terminal as follows:

X-Ser-Lys-Ser-Glu-Val-Glu-Ala-Ala-Ala-Glu-Leu-Ser-Ala-Lys-Asp-Leu-Lys-Glu-Lys-Lys-Asp-Lys-Val-Glu-Glu-Lys-Ala-Gly-Arg-Lys-

Wherein X is a blocking group; said peptide having an amino acid composition as follows:

Asx	13.0 ± 0.8	(13)	Arg.	4.7 ± 0.1	(5)
Thr	2.8 ± 0.1	(3)	Pro	1.8 ± 0.0	(2)
Ser	3.7 ± 0.2	(4)	Total	(105)	
Glx	39.5 ± 1.6	(40)			
Gly	6.5 ± 0.2	(7)			
Ala	10.8 ± 0.5	(11)			
Val	4.5 ± 0.1	(5)			
Ile	0.05 ± 0.01	(0)			
Leu	2.0 ± 0	(2)			
Lys	12.5 ± 3	(13)			

4,696,916

INTRAVENOUS NUTRIENT

Yasunori Yabushita, Nara, and Kunihiko Takagi, Kyoto, both of Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Aug. 3, 1982, Ser. No. 404,743

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—25 **21 Claims**

21. A process for providing a high calorie nutrient to a patient which comprises intravenously administering to said patient an intravenous nutrient composition containing a fatty acid ester of carbohydrate selected from the group consisting of a monosaccharide, an oligosaccharide, a homopolysaccharide, and a heteropolysaccharide, and water, wherein the amount of the fatty acid ester of carbohydrate is from about 0.001 to about 80% by weight based on the total amount of the fatty acid ester of carbohydrate and water, the fatty acid ester of carbohydrate is dissolved in the water and the fatty acid is at least one fatty acid selected from the group consisting of a saturated fatty acid, an unsaturated fatty acid and a branched-chain fatty acid, said composition being administerable by intravenous injection.

4,696,917

IRRIGATION SOLUTION

Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391, and Debra L. Skelnik, Box 344, Rte. 5, Cambridge, Minn. 55008

Filed Aug. 1, 1985, Ser. No. 761,407

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—54 **6 Claims**

1. A composition for the irrigation and flushing of body tissue during surgical procedures, which composition comprises effective amounts of:

a. Eagle's Minimum Essential Medium with Earle's salts, without L-glutamine and phenol red, and supplemented with non-essential amino acids;

b. chondroitin sulfate;

c. a buffer system based on N'-2-hydroxyethylpiperazine-N'ethane sulfonic acid;

d. 2-mercaptoethanol; and,

e. a pyruvate.

4. A method of irrigating or flushing body tissue during surgical procedures which comprises bringing the composition of claim 1 into contact with said tissue.

4,696,918

SOLUBILIZED PLATINUM COMPOUND

James F. Stoddart, Sheffield, and David R. Alston, Tonbridge, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Filed Oct. 31, 1985, Ser. No. 793,341

Claims priority, application United Kingdom, Nov. 2, 1984, 8427767; Nov. 16, 1984, 8429030; Feb. 11, 1985, 8503432

Int. Cl.[4] C08G *59/00, 65/08;* **C07F** *15/00*

U.S. Cl. 514—58 **7 Claims**

2. A pharmaceutical composition comprising the inclusion compound of 1,1-cyclobutanedicarboxylatediammine-platinum(II) and α-cyclodextrin in admixture or solution with an inert, pharmaceutically-acceptable diluent, carrier or solvent.

4,696,919

METHOD OF PREVENTING AND TREATING OBESITY

Yoshikazu Hinohara, Gunma; Rokuro Kaifu, and Isao Matsunaga, both of Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

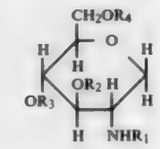
Filed Oct. 10, 1984, Ser. No. 660,421

Claims priority, application Japan, Oct. 13, 1983, 58-192015

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—62 **6 Claims**

1. A method of preventing or treating obesity by administering to a patient in need of such therapy as the active ingredient, an effective amount of a compound of the formula



wherein R_1, R_2, R_3 and R_4 are the same or different and are selected from a hydrogen atom or an acetyl group or a pharmaceutically acceptable acid addition salt thereof.

4,696,920

CERTAIN 2-SUBSTITUTED 1,3-PROPYLIDENEDIPHOSPHONATE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTIHYPERTENSIVE AGENTS

Craig L. Bentzen, Chavannes-de-bogis, Switzerland; Yves Guyon-Gellin, Annemasse, France; Kyriacos Kalathakis, Grand-Lancy, Switzerland; Hieu T. Phan, Tannay, Switzerland; Lân Nguyen Mong, Nyon, Switzerland; Eric Niesor, Gland, Switzerland, and Jean-Robert Rossier, Grand-Lancy, Switzerland, assignors to Symphar S.A., Le Lignon, Switzerland

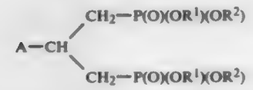
Filed Jul. 16, 1985, Ser. No. 755,712

Claims priority, application Switzerland, Jul. 18, 1984, 3488/84

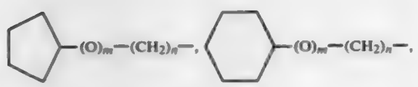
Int. Cl.[4] C07F *9/58, 9/40;* **A61K** *31/675, 31/66*

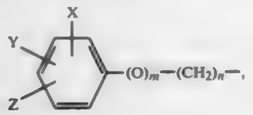
U.S. Cl. 514—89 **29 Claims**

1. 1,3-propylidenediphosphonate derivatives of the formula

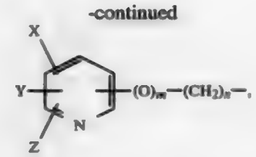


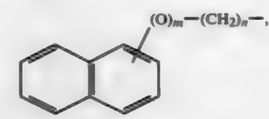
wherein R^1 and R^2 are each selected from the group consisting of hydrogen, sodium potassium, magnesium, ammonium, and C_{1-8} alkyl; and A is selected from the group consisting of

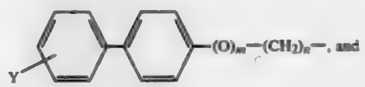


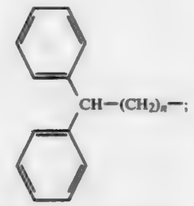


-continued









wherein m is zero or 1, n is an integer from zero to 8, and X, Y and Z are each selected from the group consisting of H, F, Cl, Br, I, CF_3, CHF_2, NO_2, CN, CH_3, C_2H_5, CH=CH—CH_2, n-propyl, isopropyl, n-butyl, isobutyl, t-butyl, OH, CH_2OH, —OCH_2O—, OCH_3, OC_2H_5, OC_3H_7, OC_4H_9, SCH_3, NH_2, NMe_2, NEt_2, $(CH_2)_t$—NMe_2, and $(CH_2)_t$—NEt_2 wherein t is an integer from 1 to 4.

23. A method for treating hypertension, comprising administering orally or intravenously to a human in need of a said treatment an anti-hypertensively effective amount of a compound according to claim 1.

4,696,921

ANTIMALARIAL PHARMACEUTICAL COMPOSITIONS

Bernhard Merkli, Frenkendorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 331,360, Dec. 16, 1981, abandoned, which is a continuation of Ser. No. 122,645, Feb. 19, 1980, abandoned, which is a continuation of Ser. No. 904,958, May 11, 1978, abandoned. This application Nov. 7, 1983, Ser. No. 549,377

Claims priority, application Luxembourg, May 18, 1977, 77364

Int. Cl.[4] A61K *31/635, 31/505, 31/47*

U.S. Cl. 514—157 **5 Claims**

1. An active substance mixture for the treatment or prophylaxis of malaria comprising erythro-α-2-piperidyl-2,8-bis(trifluoromethyl)-4-quinolinemethanol or a pharmaceutically acceptable salt thereof, sulfadoxine and pyrimethamine, in a weight ratio in the range of 10-30:2-20:1.

4,696,922

5-AZOLYLACETOXYMILBEMYCINS AS ECTO- AND ENDOPARASITES

Elmar Sturm, and Peter Maienfisch, both of Aesch, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 18, 1985, Ser. No. 799,373

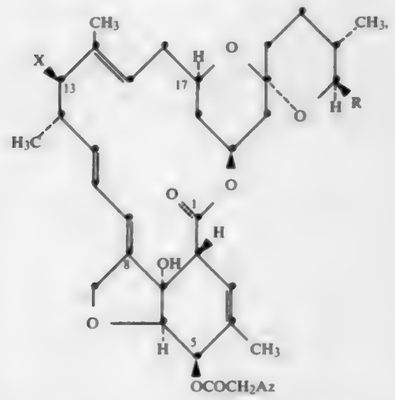
Claims priority, application Switzerland, Nov. 26, 1984, 5631/84

Int. Cl.⁴ C07D *249/08*

U.S. Cl. 514—185 **16 Claims**

1. A milbemycin derivative of the formula I

(I)



wherein X is hydrogen or β-halogen, R is methyl, ethyl, isopropyl or sec-butyl and Az is a 5 membered heterocyclic aromatic ring which contains 2–4 nitrogen atoms and is attached in the 1-position and which is unsubstituted or substituted by one or two C_1–C_6alkyl groups, or an acid addition salt or metal complex thereof.

4,696,923

6-[1-HYDROXYETHYL]-2-SR⁸-1-METHYL-1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

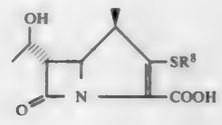
Barton G. Christensen, Cliffside, and David H. Shih, Manalapan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 23, 1984, Ser. No. 603,036

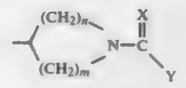
Int. Cl.⁴ C07D *487/04*; A61K *31/40*

U.S. Cl. 514—210 **4 Claims**

1. A compound having the formula:



and pharmaceutically acceptable salts and esters thereof, wherein R^8 is



and wherein n is 1 or 2 and m is 1; X is —NR; and Y is —R; and wherein R is hydrogen or methyl.

4,696,924

METHOD FOR USING DILTIAZEM FOR TREATING STROKE

Frank W. Marcoux, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 818,505, Jan. 10, 1986, Pat. No. 4,654,372. This application Aug. 6, 1986, Ser. No. 893,841

Int. Cl.⁴ A61K *31/55*

U.S. Cl. 514—211 **1 Claim**

1. A method of use for treating stroke in a subject suffering therefrom comprising administering to said subject diltiazem, in an effective amount for treating stroke in a unit dosage form.

4,696,925

CHOLECYSTOKININ ANTAGONIST COMPOUNDS

David R. Houck, Fanwood; Edward S. Inamine, Rahway, and Michael A. Goetz, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

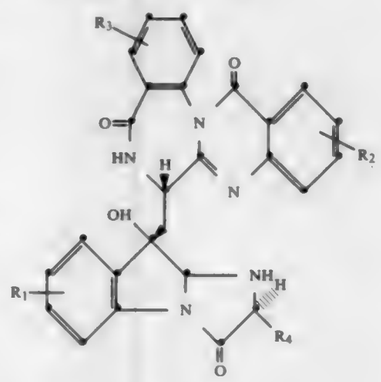
Filed Jan. 25, 1985, Ser. No. 695,113

Int. Cl.⁴ A61K *31/55*; C07D *519/00*; C12P *17/18*; C12R *1/66*

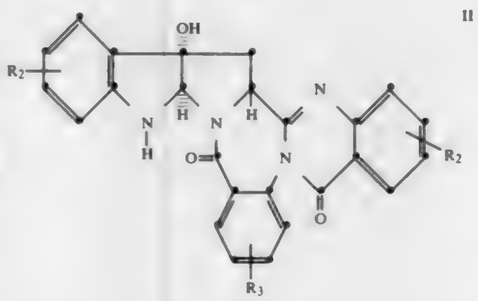
U.S. Cl. 514—219 **9 Claims**

1. A compound having the formula

I



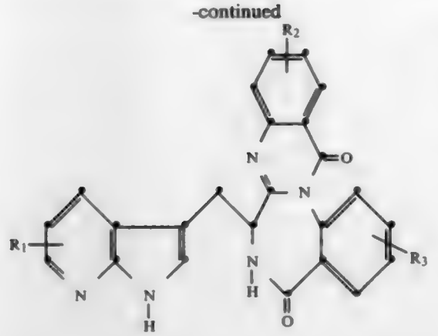
II



or

-continued

III



and pharmaceutically acceptable salts thereof wherein R_1, R_2, and R_3 are independently selected from H, F, and CH_3 and R_4 is selected from phenyl, cyclohexyl, cyclopentyl, $(CH_3)_2CH—CH_2—$, $(CF_3)(CH_3)CH—CH_2—$, $CH_2=C(CH_3)CH_2—$, $CH_2=CHCH_2—$, $CH_3—CH_2—CH_2—$, $CH_3—CH_2—(CH_3)CH$, $CH_3(CH_2)_3—$, $CH_3—S—(CH_2)_2—$, and $CH_3—CH_2—CH_2—S—CH_2—$with the proviso that (i) R_1, R_2 and R_3 are all H only when R_4 is other than $(CH_3)_2—CH—CH_2$ and (ii) in structure II R_1, R_2 and R_3 are not all H.

9. A pharmaceutical composition for effecting cholecystokinin inhibition containing a thereapeutically effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

4,696,926

SPIRO MORPHOLINE COMPOUNDS, COMPOSITIONS AND INSECTICIDAL AND NEMATOCIDAL USE

Michael D. Turnbull, Reading, and Ian T. Kay, Penzance, both of England, assignors to Imperial Chemical Industries plc, London, England

Filed Dec. 12, 1986, Ser. No. 941,101

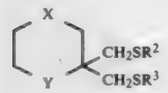
Claims priority, application United Kingdom, Dec. 19, 1985, 8531284; Dec. 19, 1985, 8531285

Int. Cl.⁴ A01N *43/90*; C07D *498/10*

U.S. Cl. 514—230 **8 Claims**

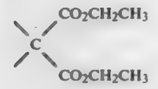
1. A compound of formula (IA):

(IA)



or a salt thereof; wherein one of X or Y is oxygen and the other is NR^1 where R^1 is alkyl, aralkyl or acryl; and R^2, and R^3 together form an optionally substituted methylene group or a bond.

3. A compound according to claim **1** wherein X is oxygen, Y is $>NCH_3$ and R^2 and R^3 together form the group



4,696,927

4-(2-PYRIMIDINYL)-1-PIPERAZINYL HETEROCYCLIC CARBONYL DERIVATIVES

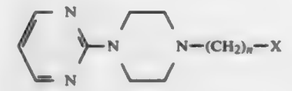
Maurice W. Gittos, Plobsheim, and Marcel Hibert, Strasbourg, both of France, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 836,277, Mar. 5, 1986, abandoned. This application Dec. 17, 1986, Ser. No. 943,513

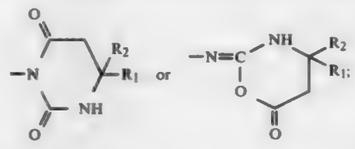
Int. Cl.⁴ A61K *31/505*, *31/535*; C07D *413/14*

U.S. Cl. 514—236 **8 Claims**

1. A 4-(2-pyrimidinyl)-1-piperazinyl heterocyclic carbonyl derivative having the formula:



wherein n is an integer of from 2 to 5; X is the radical



R_1 and R_2 are each methyl or when taken together form a tetramethylene or pentamethylene ring; and the pharmaceutically acceptable acid addition salts thereof.

7. A method for relieving the symptoms of anxiety in a patient in need thereof, which comprises the administration to said patient of an anxiolytic effective amount of a compound of claim **1**.

4,696,928

SUBSTITUTED DIHYDROIMIDAZO[1,2-A]QUINOXALINES

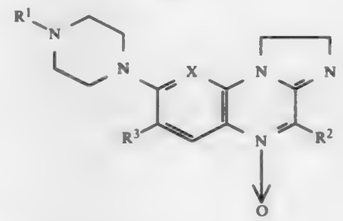
George J. Ellames, High Wycombe, and Albert A. Jaxa-Chamiec, Marlow, both of United Kingdom, assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 9, 1985, Ser. No. 774,218

Int. Cl.⁴ C07D *487/04*, *487/14*; A61K *31/495*

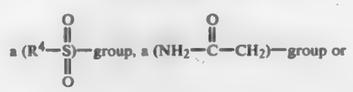
U.S. Cl. 514—250 **18 Claims**

1. A compound of the formula



wherein

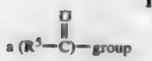
R^1 is C_1–C_6 alkyl, benzyl, phenyl, a



group, a

group or

-continued



wherein R^4 is C_1–C_6 alkyl, and R^5 is C_1–C_8 alkyl, aminomethyl, pyridinyl, phenyl, halophenyl or a

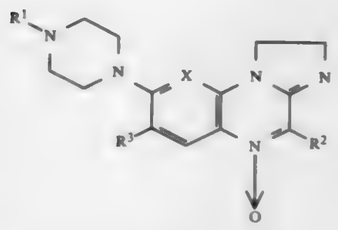
wherein R^6 is C_1–C_6 alkyl;

R^2 is phenyl or substituted phenyl having 1 or 2 substituents selected from the group consisting of halo or C_1–C_6 alkoxy;

R^3 is hydrogen or halogen; and

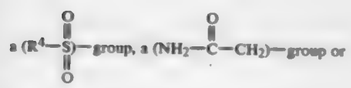
X is =CH— or =N—.

13. A method for treating an infectious disease in mammals caused by anaerobic bacteria comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula

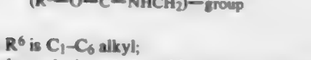


wherein

R^1 is C_1–C_6 alkyl, benzyl, phenyl,



wherein R^4 is C_1–C_6 alkyl, and R^5 is C_1–C_8 alkyl, aminomethyl, pyridinyl, phenyl, halophenyl or a



wherein R^6 is C_1–C_6 alkyl;

R^2 is phenyl or substituted phenyl having 1 or 2 substituents selected from the group consisting of halo or C_1–C_6 alkoxy;

R^3 is hydrogen or halogen; and

X is =CH— or =N—.

4,696,929

DERIVATIVE OF PIPERAZINE HAVING ANTI-ALLERGIC AND ANTI-INFLAMMATORY ACTION

Ichiro Yamawaki; Kazuo Ogawa; Naohiko Ono; Takaji Honna; Sekio Nagayama, all of Tokushima, and Mitsugi Yasumoto, Honjo, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

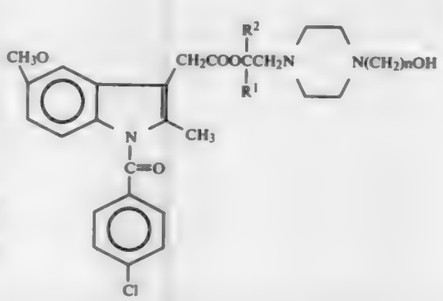
Filed Dec. 17, 1985, Ser. No. 809,876

Claims priority, application Japan, Dec. 27, 1984, 59-276273

Int. Cl.[4] A61K *31/495;* **C07D** *403/12*

U.S. Cl. 514—253 **4 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is lower alkyl or phenyl, R^2 is hydrogen or lower alkyl, and n is an integer of 2 to 10, together with the pharmaceutically acceptable acid salts thereof.

3. A method of treating an inflammatory condition in a patient in need of such treatment, said method comprising administering to said patient an anti-inflammatory effective amount of a compound of claim 1 or a pharmaceutically acceptable acid salt thereof.

4. A method of treating an allergic condition in a patient in need of such treatment, said method comprising administering to said patient an anti-allergic effective amount of a compound of claim 1, or a pharmaceutically acceptable acid salt thereof.

4,696,930

N-(HETEROARYLALKYL)ACYLANILIDE DERIVATIVES AS ANTIARRHYTHMIC AGENTS

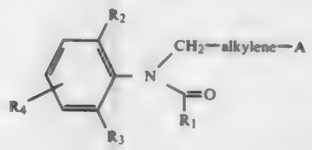
John G. Mullin, Jr., Hawthorne, N.J.; Keiji Nakamura, Kamakura, Japan; Jefferson W. Tilley, North Caldwell, N.J., and Hiroshi Watanabe, Chigasaki, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 12, 1985, Ser. No. 722,650

Int. Cl.[4] C07D *213/56, 239/26, 401/12;* **A61K** *31/44*

U.S. Cl. 514—256 **27 Claims**

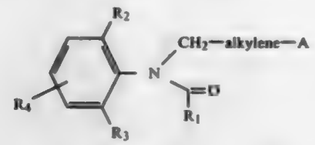
1. A compound of the formula



I

wherein R_1 is —alkylene'—NH_2 or —alkylene'—A'; R_2, R_3 and R_4 are, independently, hydrogen or methyl; A and A' are, independently, unsubstituted or lower alkyl or aryl substituted pyridinyl, or pyrimidinyl; alkylene and alkylene' are independently straight chain alkylene moieties of 1–5-carbon atoms optionally substituted with one or more alkyl substitutents of 1–5 carbon atoms, or when an asymmetric carbon is present, an enantiomer thereof, or a racemic mixture thereof; or a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition comprising an antiarrhythmically effective amount of a compound of the formula



I

wherein R_1 is —alkylene'—NH_2 or —alkylene'—A'; R_2, R_3 and R_4 are, independently, hydrogen or methyl; A and A' are, independently, unsubstituted or lower alkyl or aryl substituted pyridinyl, or pyrimidinyl; alkylene and alkylene' are independently straight chain alkylene moieties of 1–5 carbon atoms optionally substituted with one or more alkyl substituents of 1–5 carbon atoms or when an asymmetric carbon is present an enantiomer thereof, or a racemic mixture thereof; or a pharmaceutically acceptable salt thereof; and a pharmaceutically inert carrier material.

4,696,931

IMIDAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Norbert Hauel; Volkhard Austel, both of Biberach; Joachim Heider, Warthausen; Manfred Reiffen, and Willi Diederen, both of Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

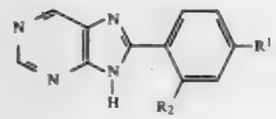
Division of Ser. No. 506,454, Jun. 21, 1983, Pat. No. 4,582,837. This application Apr. 30, 1985, Ser. No. 728,754

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224512

Int. Cl.[4] C07D *473/00;* **A61K** *31/52*

U.S. Cl. 514—261 **7 Claims**

1. A compound of the formula



wherein

R_1 is (alkane of 1 to 3 carbon atoms)sulfonylamino, N-(alkyl of 1 to 3 carbon atoms)-(alkane of 1 to 3 carbon atoms)sulfonylamino, aminocarbonyl, (alkyl of 1 to 3 carbon atoms) amino-carbonyl, di(alkyl of 1 to 3 carbon atoms)amino carbonyl, aminosulfonyl, (alkyl of 1 to 3 carbon atoms) aminosulfonyl, or di(alkyl of 1 to 3 carbon atoms)amino-sulfonyl; and

R_2 is alkoxy of 1 to 3 carbon atoms;

a tautomer thereof; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,696,932

BIOLOGICALLY-ACTIVE XANTHINE DERIVATIVES

Kenneth A. Jacobson, Silver Spring, Md.; John W. Daly, Washington, D.C., and Kenneth L. Kirk, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 664,953, Oct. 26, 1984. This application Mar. 29, 1985, Ser. No. 717,616

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/52;* **C07D** *473/06*

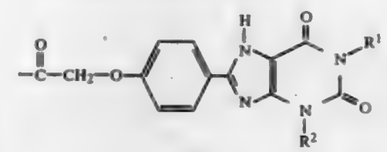
U.S. Cl. 514—263 **13 Claims**

1. Compounds having the formula:

A—B

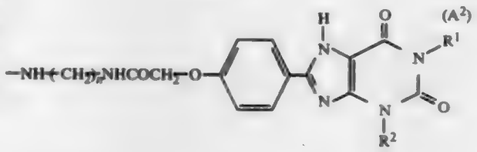
where

A and B are linked together in an amide linkage, and where A (the primary pharmacophore) is:



(A[1])

or



(A[2])

where

R^1 and R^2 are alkyl of 1–6 carbons and n=2–6

and B (the carrier) is a natural amino acid of the L or D configuation or an oligopeptide having 2–5 natural amino acids of the L or D configuration, or an oligopeptide having 1–5 natural amino acids of the L or D configuration in which a 3(2'-thienyl) alanine moiety is bonded through an amide linkage to the terminal amino acid of said oligopeptide, or a 3(2'-thienyl) alanine moiety.

4,696,933

GUANIDINE COMPOUNDS USEFUL AS HISTAMINE H2-ANTAGONISTS

Tobias O. Yellin, Fremont, Calif., and David J. Gilman, Tytherington, United Kingdom, assignors to ICI Americas Inc. and Imperial Chemical Industries PLC, United Kingdom

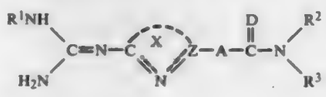
Division of Ser. No. 353,423, Mar. 1, 1982, Pat. No. 4,496,564. This application Feb. 12, 1985, Ser. No. 701,012

Claims priority, application United Kingdom, Mar. 9, 1981, 8107272

Int. Cl.[4] A01K *31/41;* **C07D** *249/04, 401/12*

U.S. Cl. 514—275 **9 Claims**

1. A guanidine compound of the formula I:



I

in which

R^1 is a hydrogen atom or a 1–10C alkyl, 3–8C cycloalkyl, 4–14C cycloalkylalkyl, 3–6C alkenyl, 3–6C alkynyl, 1–6C alkanoyl, phenyl, 7–11C phenylalkyl or benzoyl radical, the phenyl, phenylakyl and benzoyl radicals being optionally substituted on the phenyl ring by one or two substituents selected from halogen atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino radicals;

in ring X the dotted line is a double bond on one side of the nitrogen atom and Z is a carbon or nitrogen atom such that ring X is a 5-membered aromatic heterocyclic ring which contains at least one nitrogen atom and may optionally contain one or two additional hetero atoms selected from oxygen, nitrogen and sulphur atoms, which heterocyclic ring may, where possible, carry one or two optional substituents, the optional substituents on ring X being selected from fluorine, chlorine and bromine atoms and

1–6C alkyl, 1–6C alkoxy, trifluoromethyl, hydroxy and amino radicals;

A is a phenylene or 5–7C cycloalkylene radical or a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyl radicals and into which is optionally inserted, as part of the backbone of the chain, one or two groups selected from oxygen and sulphur atoms and NH, 1–6C N-alkyl, cis and trans vinylene, ethynylene, phenylene and 5–7C cycloalkylene radicals, provided that the shortest link between ring X and C=D is of at least 3 atoms, provided that when an optional insertion is made in chain A which results in the inserted group being directly attached to C=D the inserted group is other than an oxygen or sulphur atom or an NH or N-alkyl radical, and provided that no two insertions selected from oxygen and sulphur atoms and NH and N-alkyl radicals are directly attached one to the other;

D is an oxygen or sulphur atom;

R^2 is a hydrogen atom or a hydroxy, amino, 1–6C alkylamino, 1–6C haloalkylamino, 1–6C alkanoylamino, 1–6C alkyl, 3–8C cycloalkyl, 4–12C cycloalkylalkyl, 2–6C alkenyl, 2–6C alkynyl, 1–6 haloalkyl, 1–6C alkoxy, 1–6C hydroxyalkyl, 2–10C alkoxyalkyl, 2–10C alkylthioalkyl, 1–6C aminoalkyl, 2–8C alkylaminoalkyl, 3–12C dialkylaminoalkyl, 2–8C alkanoylaminoalkyl, 8–14C benzoylaminoalkyl 3–10C alkoxycarbonylalkyl, 2–8C carbamoylalkyl, phenyl, 7–11C phenylalkyl, heteroaryl or heteroarylalkyl radicals, wherein the heteroaryl part is a heterocyclic aromatic ring containing one, two or three heteroatoms selected from oxygen, nitrogen and sulphur atoms, wherein the alkyl part of the heteroarylalkyl radical is 1–6C and wherein, when R^3 is or contains an aryl or heteroaryl ring, that ring is optionally substituted by one or two groups selected from flourine, chlorine, bromine and iodine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, 2–6C dialkylamino, 2–6C alkanoyl, trifluoromethyl, hydroxy and amino radicals;

R^3 is a hydrogen atom or R^2 and R^3 and the nitrogen atom to which they are attached together form a 5-, 6- or 7-membered saturated ring which optionally contains a double bond, or in which ring one carbon atom is replaced by oxygen, NH or NR wherein R is a 1–6C alkyl radical; provided that when R^1 is a hydrogen atom or an alkyl radical, ring X is a thiazole ring in which A is attached at the 4-position and A is an alkylene chain which has a single optional insertion of a sulphur atom, then NR^2R^3 is other than NH_2, NHOH or NH alkyl: and the pharmaceutically-acceptable acid-addition salts thereof.

8. A pharmaceutical composition which comprises a guanidine compound as claimed in claim 1 in association, in an amount effective to inhibit gastric acid secretion, with a pharmaceutically-acceptable diluent or carrier.

4,696,934

METHOD FOR USING NIFEDIPINE FOR TREATING STROKE

Frank W. Marcoux, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 818,505, Jan. 10, 1986, Pat. No. 4,654,372. This application Aug. 6, 1986, Ser. No. 893,839

Int. Cl.[4] A61V *31/435*

U.S. Cl. 514—277 **1 Claim**

1. A method of use for treating stroke in a subject suffering therefrom comprising administering to said subject nifedipine in an effective amount for treating stroke in a unit dosage form.

4,696,935

METHOD OF TREATING TRANSPLANTED TUMORS AND MODULATING THE IMMUNE RESPONSE

Keith C. Murdock, Pearl River, N.Y.; Martin R. Damiani, Allendale, and Frederick E. Durr, Ridgewood, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 183,612, Sep. 2, 1980, Pat. No. 4,314,061, which is a continuation-in-part of Ser. No. 89,805, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 954,279, Oct. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 821,039, Aug. 1, 1977, abandoned. This application Oct. 27, 1981, Ser. No. 315,559

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—297 **3 Claims**

1. A method of stimulating the immune response in a mammal in need of such stimulation which comprises administering to said mammal an effective immunostimulating amount of a compound selected from the group consisting of 3,6-bis[2-(1-piperidino)ethoxy]acridine and the pharmacologically acceptable acid-addition salts thereof.

4,696,936

3,6-BIS (SUBSTITUTED) ACRIDINE N-OXIDES AND N,N-DIOXIDES AND METHODS OF RESTORING, STIMULATING OR ENHANCING THE IMMUNE SYSTEM WITH THEM

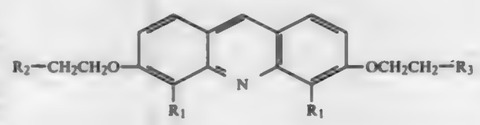
Ralph G. Child; Thomas L. Fields, both of Pearl River, N.Y.; Raymond G. Wilkinson, Montvale, N.J., and Yang-I Lin, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 9, 1984, Ser. No. 669,917

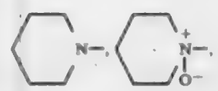
Int. Cl.[4] A61K *31/47*; C07D *219/06*

U.S. Cl. 514—297 **28 Claims**

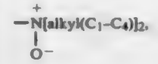
1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, halogen, hydroxymethyl, formyl, —COOH and alkyl-(C_1–C_3); R_2 and R_3 may be the same or different and are selected from the group consisting of



—N-[alkyl(C_1–C_4)]$_2$ and



with the proviso that at least one of R_2 and R_3 must be in the N-oxide form, and the pharmaceutically acceptable salts thereof.

13. A method of restoring, stimulating or enhancing the immune system in a warm-blooded animal which comprises administering to said animal an effective amount of a compound of the formula as recited in claim 1 and the pharmaceutically acceptable salts thereof.

4,696,937

THIOSULFONATE DERIVATIVES FOR INHIBITING MALFORMATION OR DESTRUCTION OF RED BLOOD CORPUSCULES

Bernard Sebille, Clamart; Yves Beuzard, Paris, and Henri Demarne, Montpellier, all of France, assignors to Sanofi and Institut National de la Sante et de la Recherche Medicale (Inserm), both of Paris, France

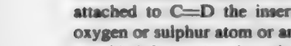
Filed Nov. 13, 1985, Ser. No. 797,521

Claims priority, application France, Nov. 13, 1984, 84 17286

Int. Cl.[4] A61K *31/47, 31/415*; C07D *401/12, 233/84*

U.S. Cl. 514—314 **8 Claims**

1. A thiosulfonate derivative having a formula:



in which R represents a 1H-imidazol-2-yl radical and R_1 represents a lower alkyl, (hydroxy) lower alkyl, phenyl, (lower alkyl) phenyl, (hydroxy lower alkyl) phenyl, (lower alkanoyl) phenyl or quinolin-8-yl radical.

7. Method for inhibiting the malformation or destruction of the red blood corpuscules due to a genetic modification of the haemoglobin or to parasites in a host in need of such inhibitory treatment comprising the administration to the said host of an effective dose of at least one thiosulfonate derivative according to claim 1.

4,696,938

INSECTICIDAL 6-ARYL-PYRIDINE THIOSEMICARBAZONES

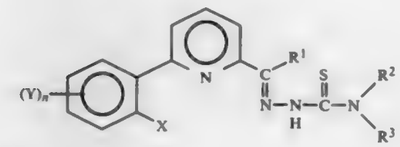
Dat P. Le, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 25, 1986, Ser. No. 856,629

Int. Cl.[4] C07D *401/12*; A61K *31/44, 31/445*

U.S. Cl. 514—343 **20 Claims**

1. A compound having the formula



where

R^1 is hydrogen or methyl;

R^2 and R^3 taken together with the nitrogen atom to which they are attached form a 3 to 6 membered heterocycle having 2 to 5 nuclear carbon atoms;

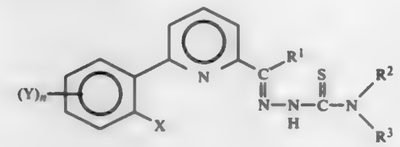
X is halo, nitro, (C_1–C_4)alkyl, (C_1–C_4)haloalkyl or (C_1–C_4)alkoxy;

Y is hydrogen, halo, NO_2, (C_1–C_4)alkyl or (C_1–C_4)alkoxy; or when two adjacent positions on the phenyl ring are substituted with alkoxy groups, these alkoxy groups may be joined to form a dioxolano or dioxano heterocyclic ring;

n is 0, 1 or 2;

and the agronomically acceptable salts thereof.

13. A method of controlling insects which comprises contacting said insects with an insecticidally effective amount of a compound having the formula



where

R^1 is hydrogen or methyl;

R^2 is (C_1–C_4)alkyl;

R^3 is (C_1–C_4)alkyl; or

R^2 and R^3 may be taken together with the nitrogen atom to which they are attached to form a 3 to 6 membered heterocycle having 2 to 5 nuclear carbon atoms;

X is halo, nitro, (C_1–C_4)alkyl, (C_1–C_4)haloalkyl or (C_1–C_4)alkoxy;

Y is hydrogen, halo, NO_2, (C_1–C_4)alkyl or (C_1–C_4)alkoxy; or when two adjacent positions on the phenyl ring are subsituted with alkoxy groups, these alkoxy groups may be joined to form a dioxolano or dioxano heterocyclic ring;

n is 0, 1 or 2;

and the agronomically acceptable salts thereof.

4,696,939

BENZOTHIADIAZOLE COMPOUNDS FOR TREATING HYPERTENSION

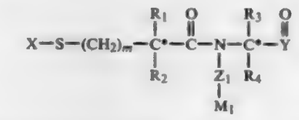
John T. Suh, Greenwich, Conn.; John J. Piwinski, Parsippany, N.J.; Howard Jones, Ossining, N.Y., and Edward S. Neiss, New Canaan, Conn., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Division of Ser. No. 584,576, Feb. 29, 1984, Pat. No. 4,576,941. This application Nov. 29, 1985, Ser. No. 802,921

Int. Cl.[4] A61K *31/41*; C07D *285/14*

U.S. Cl. 514—361 **11 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

X is hydrogen or



wherein A is C_{1-7} alkyl, phenyl, or phenyl substituted with up to 3 substituents selected from the group consisting of halo, C_{1-7} alkyl, —CF_3, —OH, —COOH, —NH_2, —SO_2NH_2;

m is 0 to 3 inclusive;

Y is —OR or —N(R)R;

R_1, R_2, R_3 and R_4 are independently R or amino-C_{1-7} alkyl;

Z_1, reading toward the M_1 substituent, is selected from the group consisting of —$(CH_2)_n$—, —N(R)$CH_2(CH_2)_n$—, —N(R)$CH_2(CH_2)_n$NH—, —$(CH_2)_nSO_2$—, —$(CH_2)_nN(R)SO_2$—, —$(CH_2)_n$—N(R)—, —$(CH_2)_nN(R)C(O)$—, —$(CH_2)_nC(O)N(R)$—, or —$(CH_2)_nC(O)$—, in which n is 0 to 6 inclusive, and one of the (CH_2) groups can be mono- or disubstituted with methyl or ethyl;

M_1 is benzothiadiazole having two or three substitutents selected from the group consisting of halogen, alkyl, aminoalkyl, aralkyl, cycloalkyl, alkylamino, acylamino, acylaminoalkyl, acylaminoalkylamino, trifluoromethyl, nitro, cyano, —OR, —SR, —C(O)OR, —S(O)R, —SO_2R, —C(O)N(R)R, —N(R)R, or —SO_2N(R)R;

wherein in each occurrence R is independently hydrogen, alkyl, cycloalkyl, aryl, aralkyl, heteroalkyl, heteroaralkyl, or heteroaryl;

wherein the alkyl groups and moieties have 1 to 7 carbon atoms, and the cycloalkyl, heteroalkyl, aryl and heteroaryl groups and moieties are selected from the group consisting of cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, adamantyl, norbornyl, phenyl, tolyl,

benzyl, phenethyl, indoyl, indolinyl, hydroxybenzyl, indanyl, naphthyl, tetrahydronaphthyl, decanhydronaphthyl, pyridyl, quinolyl, isoquinolyl, guanidino, pyrrolidyl, pyrrolyl, morpholinyl, furyl, furfuryl, tetrahydrofurfuryl, benzimidazolyl, thienyl, imidazolyl, and tetrahydroisoquinolyl.

11. A method of treating hypertension comprising administering to a subject suffering therefrom a compound or salt according to claim 1 in an amount effective to alleviate said hypertension.

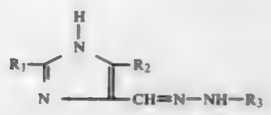
4,696,940

METHOD FOR TREATING HYPERTENSION USING 3-(4-IMIDAZOLYLMETHYLENE)-CARBAZIC AND DITHIOCARBAZIC ACID ESTERS

Peter S. Chan, Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 29, 1986, Ser. No. 924,394
Int. Cl.[4] A61R *31/415*
U.S. Cl. 514—400 **9 Claims**

1. A method of treating hypertension in a mammal in need of said treatment which comprises administering to said mammal a hypotensive effective amount of a compound of the formula:



wherein R_1 is alkyl(C_1–C_6), methoxymethyl or benzyl; R_2 is hydrogen or methyl; and R_3 is a moiety of the formulae:—$CO_2C_2H_5$ or —CS_2CH_3.

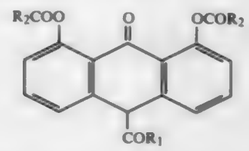
4,696,941

1,8-DIACYLOXY-10-ACYLANTHRONES

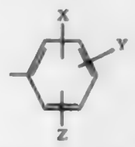
Braham Shroot, Antibes; Gérard Lang, Epinay-sur-Seine, and Jean Maignan, Tremblay les Gonesse, all of France, assignors to Groupement d'Interet Economique dit: Centre International 'de Recherches Dermatologiques C.I.R.D., Valbonne, France

Filed Jun. 28, 1985, Ser. No. 750,088
Claims priority, application France, Jun. 29, 1984, 84 10324
Int. Cl.[4] A01N *35/00*; C07C *50/70, 50/16*
U.S. Cl. 514—423 **8 Claims**

1. A compound of the formula



wherein R_1 and R_2 are the same or different and represent a straight-chain or branched alkyl group of 1 to 15 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, a 2-furyl, 3-furyl, 3-pyridyl, 4-pyridyl or 2-thienyl group or an aromatic group of the formula



wherein X, Y and Z are the same or different and represent hydrogen, alkyl of 1 to 3 carbon atoms, trifluoromethyl, alkoxy with 1 to 4 carbon atoms, halogen, nitro or hydroxy groups.

4,696,942

TREATMENT OF MEMORY IMPAIRMENT USING (R)-ALPHA-ETHYL-2-OXO-1-PYRROLIDINEACETAMIDE

Jean Gobert; Corneliu Giurgea, both of Brussels; Jean-Pierre Geerts, Leglise, and Guy Bodson, Bellefontaine, all of Belgium, assignors to UCB Societe Anonyme, Brussels, Belgium

Filed May 14, 1985, Ser. No. 733,791
Claims priority, application United Kingdom, May 15, 1984, 8412358
Int. Cl.[4] A61K *31/40*
U.S. Cl. 514—424 **1 Claim**

1. A method for treating memory impairment in a patient in need thereof which comprises administering to said patient an effective amount of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide.

4,696,943

(S)-ALPHA-ETHYL-2-OXO-1-PYRROLIDINEACETAMIDE

Jean Gobert, Brussels; Jean-Pierre Geerts, Leglise, and Guy Bodson, Bellefontaine, all of Belgium, assignors to U C B Societe Anonyme, Brussels, Belgium

Filed May 14, 1985, Ser. No. 733,790
Claims priority, application United Kingdom, May 15, 1984, 8412357
Int. Cl.[4] A61K *31/40*
U.S. Cl. 514—424 **1 Claim**

1. A method for achieving an anti-hypoxia and anti-ischemia effect in a patient in need thereof, which comprises administering to said patient an effective amount of (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide.

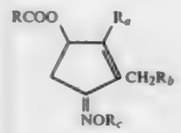
4,696,944

PESTICIDAL CYCLOPROPANE CARBOXYLIC ACID ESTERS, THEIR COMPOSITIONS AND USE

Michael Elliott, Stevenage; Norman F. Janes, Luton, and Bhupinder P. S. Khambay, Harrow Weald, all of England, assignors to National Research Development Corporation, United Kingdom

Filed Mar. 14, 1985, Ser. No. 711,812
Claims priority, application United Kingdom, Mar. 15, 1984, 8406731
Int. Cl.[4] A01N *53/00*; C07C *69/743, 131/08*
U.S. Cl. 514—531 **17 Claims**

1. A compound of the formula I



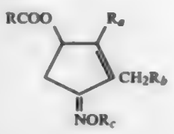
in which formula:

R_a is hydrogen or alkyl of 1 to 6 carbon atoms, and R_c is alkyl of 1 to 6 carbon atoms:

R_b is phenyl unsubstituted or substituted by alkyl of 1 to 6 carbon atoms or halogen, a group of the formula —CH=CR_dR_e in which R_d and R_e are identical or different and each is hydrogen or alkyl or a group of the formula —CH=NOR_f in which R_f is hydrogen or alkyl of 1 to 6 carbon atoms and

RCOO is a residue of an acid RCO_2H selected from the group consisting of chrysanthemic acid and 2,2-dimethyl-3-(dihalovinyl)cyclopropane carboxylic acid.

6. A pesticidal composition useful for controlling pest infestation which comprises a pestically effective amount of a compound of the formula I:



wherein:

R_a is hydrogen or alkyl of 1 to 6 carbon atoms, and R_c is alkyl of 1 to 6 carbon atoms:

R_b is phenyl unsubstituted or substituted by alkyl of 1 to 6 carbon atoms or halogen, a group of the formula —CH=CR_dR_e in which R_d and R_e are identical or different and each is hydrogen or alkyl or a group of the formula —CH=NOR_f in which R_f is hydrogen or alkyl of 1 to 6 carbon atoms and

RCOO is a residue of an acid RCO_2H selected from the group consisting of chrysanthemic acid and 2,2-dimethyl-3-(dihalovinyl)cyclopropane carboxylic acid, in combination with a suitable carrier.

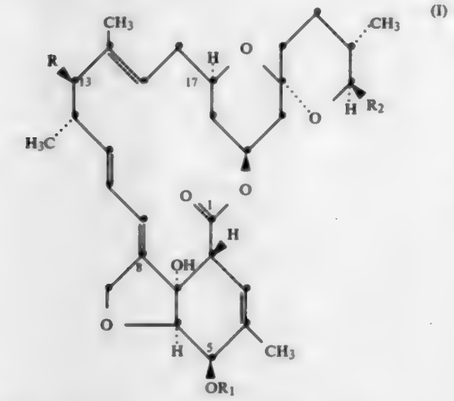
4,696,945

13β-MILBEMYCIN DERIVATIVES FOR CONTROLLING ECTO- AND ENDOPARASITES OF PLANTS AND ANIMALS

Bruno Frei, Liestal, and Anthony C. O'Sullivan, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 803,354, Dec. 2, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 885,066
Claims priority, application Switzerland, Dec. 4, 1984, 05750/84
Int. Cl.[4] C07D *315/00, 311/96*; A61K *31/365*
U.S. Cl. 514—450 **15 Claims**

1. A compound of formula I



(I)

wherein

R_1 is hydrogen or an acyl or silyl protecting group;

R_2 is methyl, ethyl, isopropyl or sec-butyl; and

R is a radical R_3 which is bound through sulfur and is selected from the group consisting of C_1–C_{10}-alkyl, C_1–C_{10}haloalkyl, C_1–C_{10}hydroxyalkyl, C_1–C_{10}mercaptoalkyl, C_2–C_{10}-alkoxyalkyl, C_3–C_{10}alkoxyalkoxyalkyl, hydroxy- or mercapto-substituted C_3–C_{10}alkoxyalkoxyalkyl, C_4–C_{10}alkoxyalkoxyalkoxyalkyl, hydroxy- or mercapto-substituted C_4–C_{15}alkoxyalkoxyalkoxyalkyl, C_2–C_{10}-alkenyl, C_2–C_{10}haloalkenyl, C_2–C_{10}alkynyl, C_2–C_{10}haloalkynyl, phenyl which is unsubstituted or substituted by halogen, C_1–C_3-alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3-haloalkoxy, cyano and/or nitro, and benzyl which is unsubstituted or substituted by halogen, C_1–C_3alkyl, C_1–C_3-haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, cyano and/or nitro, or R is one of the groups —SH or —S—C(O)OR_4, wherein R_4 is C_1–C_{10}alkyl, C_1–C_{10}haloalkyl, or a phenyl or benzyl group which is unsubstituted or substituted by halogen, C_1–C_3alkyl, C_1–C_3haloalkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, cyano and/or nitro.

4,696,946

TOPICAL TREATMENT OF HYPERPROLIFERATIVE SKIN DISEASES

Michael J. Green, Skillman, and Anil K. Saksena, Upper Montclair, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 30, 1985, Ser. No. 772,077
Int. Cl.[4] A61K *31/19, 31/41*
U.S. Cl. 514—574 **13 Claims**

1. A process for treating a human being for hyperproliferative skin disease comprising the topical adminstration of an effective amount of a compound having the structural formula I, II or III:

I

T is straight or branched chain alkyl having from 7 to 15 carbon atoms which may optionally contain from 1 to 3 non-cumulative double or triple bonds;

U is —CH_2CH_2—, —CH=CH— or —C≡C—;

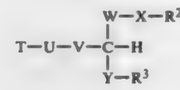
V is a straight or branched chanin alkylene having from 1 to 4 carbon atoms or is a direct bond;

W and W^1 may be the same or different and are O or $S(O)_m$ wherein m is 0, 1 or 2;

X and X^1 may be the same or different and are straight or branched chain alkylene having from 2 to 12 carbon atoms which may optionally contain from 1 to 3 non-cumulative double or triple bonds and which may optionally be substituted with —NHR^a {wherein R^a is hydrogen, alkyl having from 1 to 6 carbon atoms, $COCF_3$, $CO(CH_2)_2CH(NH_2)CO_2H$, or SO_2R^b (wherein R^b is alkyl having from 1 to 6 carbon atoms or CF_3)};

R^1 is hydrogen or straight or branched chain alkyl having from 1 to 6 carbon atoms;

R^2 and R^3 may be the same or different and are CH_2OR^c {wherein R^c is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, tetrahydropyran-2-yl or $COCH_2CH_2CO_2H$}, CHO, 2-tetrazolyl, COR^d {wherein R^d is hydroxy, alkoxy having from 1 to 6 carbon atoms, $OCH_2OC(O)C(CH_3)_3$, NHR^e (wherein R^e is hydrogen, alkyl having from 1 to 6 carbon atoms or CH_2CO_2H)} or SO_3H, with the proviso that at least one of R^2 and R^3 is 2-tetrazoly or carboxyl;

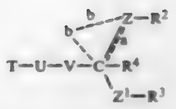


II

wherein

T, U, V, W, X, R^2 and R^3 are defined above;

Y is straight or branched chain alkylene having from 1 to 12 carbon atoms which may optionally be substituted with the group OR^c {wherein R^c is as defined above} and may optionally contain from 1 to 3 non-cumulative double or triple bonds; or



III

wherein

T, U, V, R^2 and R^3 are defined above;

Z and Z^1 may be the same or different and are straight or branched chain alkylene having from 1 to 12 carbon atoms which may optionally contain from 1 to 3 non-cumulative double or triple bonds;

R^4 is hydrogen, hydroxyl, or is combined with Z to form a double bond as indicated by the dashed line "a" or a cyclopropyl ring as indicated by the dashed lines "b", or 1-methane,1,1-{(2-pentadecynylidene) bis(oxy)} bis carboxylic acid.

4,696,947

NEMATOCIDE

Yasuhisa Kurosu; Hiroshi Kawada; Haruki Kanasugi, and Akio Hosokawa, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 300,618, Sep. 9, 1981, abandoned. This application Feb. 1, 1983, Ser. No. 462,964

Claims priority, application Japan, Oct. 21, 1980, 55-146360; Oct. 21, 1980, 55-146361

Int. Cl.[4] A01N *25/00, 47/10*

U.S. Cl. 514—478 **7 Claims**

1. A formulation for a parasitic-nematocidal composition comprising 5–40% of S-methyl-N,N-di C_{1-2} alkyl-thiocarbamate as an active ingredient of said composition; and an inert carrier; wherein the improvement comprises:

formulating said nematocidal composition in the form of granules.

4,696,948

INDANYL DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Karl Petzoldt, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

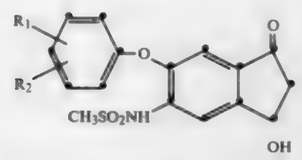
Filed Nov. 28, 1984, Ser. No. 675,596

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1983, 3343331

Int. Cl.[4] A01N *41/06;* **A61K** *31/18;* **C07C** *143/74*

U.S. Cl. 514—605 **6 Claims**

1. A compound of the formula



wherein R_1 and R_2, independently chosen, are hydrogen, fluorine or chlorine, with the proviso that R_1 and R_2 are not both H.

4,696,949

NOVEL TRI-PHENYL ALKANE AND ALKENE DERIVATIVES AND THEIR PREPARATION AND USE

Reijo J. Toivola; Arto J. Karjalainen, both of Oulu; Kauko O. A. Kurkela, Oulu; Marja-Liisa Soderwall, Oulu; Lauri V. M. Kangas, Turki; Guillermo L. Blanco, Oulu, and Hannu K. Sundquist, Kaarina, all of Finland, assignors to Farmos Group Ltd., Turku, Finland

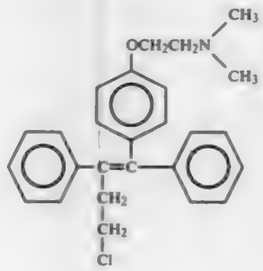
Continuation of Ser. No. 497,813, May 25, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 823,856

Claims priority, application United Kingdom, Jun. 25, 1982, 8218414

Int. Cl.[4] A61K *31/135;* **C07C** *91/06*

U.S. Cl. 514—648 **7 Claims**

1. A compound of the formula:



or a non-toxic pharmaceutically acceptable salt or N-oxides thereof.

4,696,950

SUBSTANTIALLY STATIC-FREE, CELLULAR EXPANDED OR FOAMED THERMOPLASTIC ARTICLES, INCLUDING CUPS AND CONTAINERS, AND PROCESSES FOR THE MANUFACTURE OF THESE ARTICLES INCLUDING THE MANUFACTURE OF INTERMEDIATE MATERIALS SUITABLE FOR USE IN SUCH MANUFACTURE

Harold S. Cox, Greenford, England, assignor to Roboserve Limited, Greenford, England

Continuation-in-part of Ser. No. 563,580, Dec. 20, 1983, abandoned, Ser. No. 563,620, Dec. 20, 1983, abandoned, and Ser. No. 563,610, Dec. 20, 1983, abandoned. This application Dec. 11, 1985, Ser. No. 807,812

Claims priority, application Canada, Dec. 23, 1982, 418528

Int. Cl.[4] C08J *9/22, 9/24*

U.S. Cl. 521—57 **54 Claims**

1. A process of combining an anti-static agent with thermoplastic beads to be pre-expanded for use to manufacture cups or containers of cellular expanded or foamed thermoplastic material, or fully expanded into a cup or container of cellular expanded or foamed thermoplastic material, the anti-static agent being suitable for use with comestibles and being combined in sufficient amounts either:

(a) with thermoplastic beads to be expanded prior to injection into a hot air moisture free pre-expander, and thereafter injecting the combinations into the preheated hot air moisture free pre-expander for pre-expanding the beads; or

(b) with the beads in a preheated hot air moisture free pre-expander shortly after injection of the beads into the preheated hot air moisture free pre-expander for pre-expanding the beads; or

(c) in liquid form the hot moisture free air for delivery to a mold cavity for intermixing with pre-exapnded beads for molding into the cup or container, whereby the anti-static agent upon contacting the said heated environment is misted or atomized, filling the space of the environment, uniformly coating the expanding beads with anti-static agent in the pre-expander or mold rendering the material anti-static.

4,696,951

ETHYLENE VINYL ACETATE COMPOSITIONS FOR FLOCKING ADHESIVES

David Lunsford, Mauldin, S.C., and James L. Walker, Whitehouse Station, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 12, 1986, Ser. No. 861,964

Int. Cl.[4] L08J *9/30*

U.S. Cl. 521—65 **10 Claims**

1. A foamable flocking adhesive composition characterized by an excellent balance of softness, strength, and formulation stability comprising a thickener selected from the group consisting of hydroxyethylcellulose, carboxymethylcellulose, polyacrylatehydrolyzed acrylonitrile and carboxylic acid/acrylate emulsions or solutions, pigments, a foaming agent activatable by beating air or another gas into the composition comprising a water soluble salt of an aliphatic carboxylic acid containing 16 to 20 carbon atoms, and an aqueous emulsion, the latter prepared by the emulsion polymerization of a copolymer consisting essentially of:

(a) a vinyl ester of an alkanoic acid having 1 to 13 atoms interpolymerized with the following comonomers;

(b) 5 to 30% by weight of ethylene;

(c) 0.5 to 6% by weight of N-methylol acrylamide or N-methylol methacrylamide;

(d) 1 to 5% by weight of an alkenoic acid having 3 to 6 carbon atoms or an alkenedioic acid having 4 to 6 carbon atoms;

(e) 0.2 to 3% by weight of a latex stabilizer; and

(f) 0 to 1% by weight of at least one polyunsaturated copolymerizable monomer;

the vinyl ester being added in an amount to total 100%.

4,696,952

PRODUCTION OF POLYURETHANE FOAM

Kenji Shimomura; Shigeaki Kouketsu, both of Yokohama; Toru Okuyama, Sagamihara, and Take Sato, Yokohama, all of Japan, assignors to Ikeda Bussan Co., Ltd., Kanagawa and Bridgestone Corp., Tokyo, both of, Japan

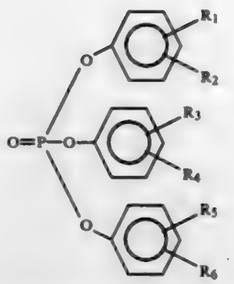
Filed Jul. 19, 1985, Ser. No. 756,800

Claims priority, application Japan, Jul. 26, 1984, 59-156176

Int. Cl.[4] C08K *5/52, 5/53;* **C08G** *18/08*

U.S. Cl. 521—107 **15 Claims**

1. A process for producing a flexible polyurethane foam which comprises reacting a polyhydroxy compound, organic polyisocyanate compound, blowing agent, catalyst, foam stabilizer, and flame retardant, wherein the flame retardant contains a triaryl phosphate ester presented by the following formula:



wherein R_1 to R_6 are substituent groups independently selected from the group consisting of H and C_nH_{2n+1} and n is an integer of 1 to 9, with the exception of the instances wherein $R_1=R_3=R_5=H$ and $R_2=R_4=R_6=CH_3$,

and wherein said polyhydroxy compound is a mixture composed of (1) 100 parts by weight of a high-molecular-weight polyhydroxy compound having a hydroxyl number lower than 100 and (2) 0.5 to 10 parts by weight of a low-molecular-weight polyhydroxy compound having a hydroxyl number higher than 560 and having 2 to 4 hydroxyl groups in each molecule.

4,696,953

SCAVENGERS FOR THE REMOVAL OF IMPURITIES FROM ARSINE AND PHOSPHINE

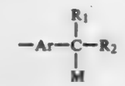
Glenn M. Tom, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 888,160, Jul. 21, 1986, Pat. No. 4,659,552. This application Dec. 5, 1986, Ser. No. 938,701

Int. Cl.[4] C08F *14/00*

U.S. Cl. 521—146 **3 Claims**

1. A macroreticulate polymer scavenger comprising the reaction product of (1) a hydride selected from the group consisting of arsine and phosphine and (2) a metallated macroreticulate polymer having a plurality of pendant functional groups or mixtures of functional groups having the general formula:



where Ar is an aromatic hydrocarbon radical containing from one to three rings, R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen and alkyl hydrocarbon radicals containing from 1 to 12 carbon atoms, and M is a metal selected from the group consisting of sodium, potassium and lithium, said metallated macroreticulate polymer having within its pores a compound selected from the group consisting of a 1–12 carbon alkyl compound of M and a hydride of M, or mixtures thereof.

4,696,954

THERMALLY STABLE AND HIGH IMPACT RESISTANT STRUCTURAL POLYURETHANE FOAM

James R. Pritchard, and Dale F. Regelman, both of Wallingford, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 23, 1986, Ser. No. 854,968

Int. Cl.[4] C08G *18/00, 18/14*

U.S. Cl. 521—167 **20 Claims**

1. A molded cellular polymer which comprises the reaction product obtained by bringing together in the presence of a

blowing agent and a urethane forming catalyst, an organic polyisocyanate, a polyol and extender, said polyol and extender being an active hydrogen composition comprising:

A. a polyester polyol mixture derived from the reaction of,
(i) an aromatic polycarboxylic compound containing two or more carboxylic groups; and
(ii) an excess of at least one polyol having from 2 to 8 hydroxyl groups and an equivalent weight of from about 30 to about 250; and

B. a primary or secondary amine terminated polyether of greater than 1500 molecular weight and amine functionality of from about 2 to about 8 wherein greater than 50 percent of the active hydrogens are in the form of amine hydrogens, said polyether being present in from about 5 to about 30 percent by weight based on (A) and (B).

4,696,955

X-RAY OPAQUE DENTAL FILLING COMPOSITION-BROMINATED AROMATIC DI-METHACRYLIC ESTER POLYMERIZABLE COMPONENT

Werner Kuhlmann, Mainz-Hechtsheim, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Nov. 9, 1984, Ser. No. 669,846

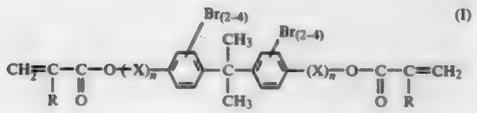
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342601

Int. Cl.⁴ A61K *6/08;* **A61C** *8/00*

U.S. Cl. 522—77 **24 Claims**

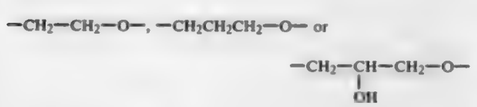
1. A dental restoration material capable of being polymerized in a tooth cavity under physiologically tolerable conditions, comprising:

between approximately 15 and approximately 50 percent by weight of polymerizable compounds, said polymerizable compounds containing an effective amount to impart X-ray opacity to the composition of one or more brominated monomers of the formula:



(I)

where R represents hydrogen or a methyl group, X represents a



group and n is 0 to 3; and
a silanized dental filler.

4,696,956

RESIN COMPOSITION HAVING ELECTROMAGNETIC WAVE SHIELDING EFFECT

Takeshi Nabeta, and Isamu Hanahara, both of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 645,938, Aug. 30, 1984, Pat. No. 4,602,051. This application Nov. 20, 1985, Ser. No. 800,004

Claims priority, application Japan, Sep. 7, 1983, 58-164353; Sep. 14, 1983, 58-169909; Dec. 2, 1983, 58-227019; Dec. 28, 1983, 58-247068; Mar. 10, 1984, 59-46277

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.⁴ C08K *3/04, 3/10;* **H01B** *1/00;* **G21F** *1/10*

U.S. Cl. 523—137 **19 Claims**

1. A resin composition having an electromagnetic wave shielding effect, comprising:

35 to 90 wt% of copolymer of an ethylenic unsaturated nitrile, a diene rubber and an aromatic vinyl compound or a mixture of said copolymer with another copolymer of an ethylenic unsaturated nitrile and an aromatic vinyl compound;

1 to 25 wt% of a plasticizer;

an electrically conductive filler consisting essentially of 5 to 25 wt% of carbon fibers with metallized surfaces; and

0.5 to 10 wt% of an alkylamine antistatic agent.

4,696,957

MULTI-COMPONENT COATING COMPOSITIONS

Hilary E. Adesey, Surrey Hills, and Derrard M. Hall, Glen Waverley, both of Australia, assignors to Dulux Australia Ltd., Victoria, Australia

Filed Jul. 9, 1985, Ser. No. 753,067

Claims priority, application Australia, Aug. 27, 1984, PG6784

Int. Cl.⁴ C08G *59/18, 59/42*

U.S. Cl. 523—406 **6 Claims**

1. An aqueous coating composition comprising at least two discrete film-forming components which are mixed prior to application of the composition to a substrate and which react to form a continuous, cross-linked coating film, the components together including

(a) a constituent which comprises epoxide groups;

(b) a constituent which comprises addition polymer; and

(c) a constituent which comprises reactive groups which are capable of reaction with epoxide groups, characterised in that

(d) the constituent (a) comprises on average at least one epoxide group per molecule and has a number average molecular weight of from 200–10,000;

(e) the addition polymer of constituent (b) comprises from 5–80% by weight of the film-forming solids and is in the form of an aqueous dispersion and further characterised in that the particles of the dispersion of addition polymer additionally comprise at least one of the other constituents and;

(f) there is present in the composition from 0.2–1.5 equivalents of reactive groups per equivalent of epoxide groups.

4,696,958

ELECTROPHORETIC TECHNIQUE FOR SEPARATION OF LIPOPROTEINS AND ELECTROPHORETIC GEL FOR USE THEREIN

William A. Gurske, Placentia, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 22, 1985, Ser. No. 801,113

Int. Cl.⁴ C08L *1/00, 3/00, 5/00*

U.S. Cl. 524—21 **20 Claims**

1. An electrophoretic gel comprising a matrix selected from the group consisting of polysaccharides and derivatives thereof, a buffer having a buffering capacity in an alkaline pH range, and an effective amount of a poly(oxyethylene)-poly(oxypropylene)-poly(oxyethylene) block copolymer.

4,696,959

MODIFIED PIPERIDINES AS ULTRAVIOLET LIGHT STABILIZERS

Wen-Hsuan Chang; Michael M. Chau, and Robert Piccirilli, all of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

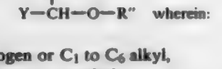
Filed Sep. 26, 1983, Ser. No. 536,143

Int. Cl.⁴ C08K *5/34;* **C09K** *15/16;* **C08F** *82/80;* **C07D** *251/00*

U.S. Cl. 524—91 **16 Claims**

1. A reaction product which comprises a material formed from the reaction of

(a) a methylol or alkoxy alkyl-containing material which is represented by the following structural formula:

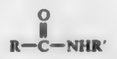


wherein:

R'' is hydrogen or C_1 to C_6 alkyl,

R_{10} is hydrogen or methyl

Y is a radical derived from a material selected from the group consisting of amino substituted triazines, ureas, glycolurils, phenols, and amides of the formula:



wherein:

R' is hydrogen or C_1 to C_{12} alkyl and R is an aliphatic, cycloaliphatic, or olefinic radical, or an acrylic polymer moiety; and

(b) an alkyl substituted piperidine-containing material having at least one group selected from hydroxyl, carboxyl, amido, and ureido, said reaction proceeding between a methylol or alkoxy alkyl group of (a) and the group selected from hydroxyl, carboxyl, amido and ureido of (b).

4,696,960

COMPOSITION OF TRIGLYCIDYLISOCYANURATE WITH REDUCED TACKINESS

Egidius J. M. Verheijen, Born, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 18, 1985, Ser. No. 777,301

Claims priority, application Netherlands, Sep. 19, 1984, 8402868

Int. Cl.⁴ C08K *5/34*

U.S. Cl. 524—100 **8 Claims**

1. Composition of triglycidylisocyanurate with reduced tackiness, wherein the preparation consists of a solid mixture of at least triglycidylisocyanurate and a non-reactive polyester, wherein said polyester is non-functional.

4,696,961

POLYMERIC COMPOUNDS CONTAINING PIPERIDINE RADICALS AND THEIR USE AS STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Bitonto, Italy, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

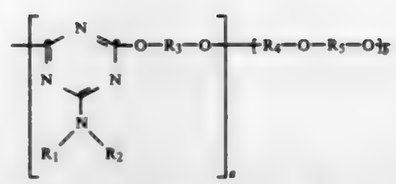
Filed Sep. 20, 1984, Ser. No. 652,631

Claims priority, application Italy, Sep. 23, 1983, 22976 A/83

Int. Cl.⁴ C08K *5/34;* **C08F** *283/00*

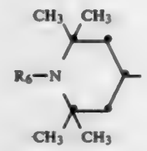
U.S. Cl. 524—100 **3 Claims**

1. A light-stabilized, heat-stabilized and oxidation-stabilized polymer composition comprising a synthetic polymer and one or more stabilizers of the formula (I),



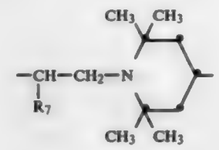
(I)

in which R_1 and R_2 can be identical or different and are (1) hydrogen, (2) C_1–C_{18}-alkyl, (3) C_2–C_{12}-alkyl substituted by —OH, a C_1–C_{18}-alkoxy group or a C_2–C_{18}-dialkylamino group, (4) C_3–C_{18}-alkenyl, (5) C_5–C_{18}-cycloalkyl, (6) C_6–C_{18}-aryl, (7) C_7–C_{18}-aralkyl or (8) a radical of the formula

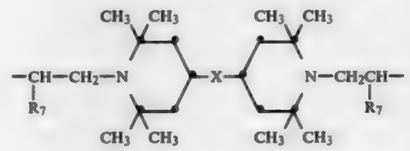


(II)

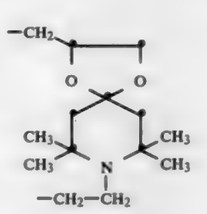
where R_6 is hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or -alkynyl, C_7–C_{12}-aralkyl or C_1–C_{12}-acyl, or R_1 and R_2, together with the nitrogen atom to which they are bonded, are a heterocyclic radical, such as pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl or 4-methylpiperazin-1-yl, R_3 and R_5 can be identical or different and are radicals of the formula (III), (IV), (V) or (VI)



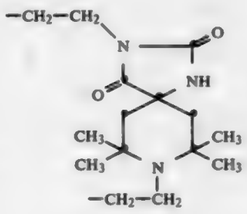
(III)



(IV)

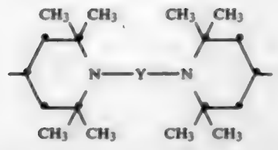


(V)



(VI)

and R_5 additionally can be a radical of formula VII



(VII)

wherein R_7 is hydrogen, C_1–C_6-alkyl or phenyl, X is a group —O—$(CH_2)_n$O— or —N(R_8)—C(O)—$(CH_2)_n$C(O)—N(R_8)—, n is a number between 1 and 6, R_8 has the same meaning as R_1 or R_2 and Y is C_2–C_{12}-alkylene, C_3–C_{12}-alkylene substituted by one hydroxyl or containing an oxygen atom in the chain, C_4–C_{12}-alkenylene or C_8–C_{12}-aralkylene, R_4 is C_2–C_{18}-diacyl or a radical of the formula (VIII)



(VIII)

in which R_1 and R_2 are as defined above, a is a number between 0.2 and 1, and b is a number between zero and 0.8; and the compounds of the formula (I) have a number average molecular weight $\bar{M}n$ between 1,000 and 20,000, said compound(s) of formula (I) being present in a quantity from 0.01 to 5% by weight, relative to the weight of the synthetic polymer which is selected from the group consisting of high-density and low-density polyethylene, polypropylene, ethylene/propylene copolymers, ethylene vinyl acetate copolymers, polybutadiene, polyisoprene, polystyrene, butadiene/styrene copolymers, vinyl chloride/vinylidene chloride polymers and copolymers, polyoxymethylene, polyurethanes, saturated and unstaturated polyesters, polyamides, polycarbonates, polyacrylates, alkyd resins and epoxide resins.

4,696,962

HYDROPHILIC CATIONIC COPOLYMERS OF ACRYLAMIDE OR METHACRYLAMIDE

Bernard Danner, Riedisheim, France, and James R. Runyon, Oberwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jul. 24, 1984, Ser. No. 633,807

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1983, 3327600

Int. Cl.⁴ C08K *5/52*

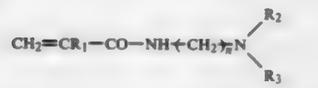
U.S. Cl. 524—140 **34 Claims**

1. A water-miscible composition comprising

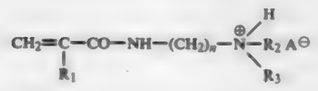
(a) a hydrophilic cationic copolymer of

(a_1) acrylamide or methacrylamide or a mixture thereof, and

(a_2) a cationic monomer of formula I or II



I



II

in which

R_1 is hydrogen or methyl,

each of R_2 and R_3, independently, is methyl or ethyl,

n is 2 or 3

and $A^{\ominus}$ is an anion,

or mixture thereof, the molar quantity of cationic monomer units (a_2) being from 0.2 to 9 mol % of the total (a_e)+(a_2) and said copolymer being free of anionic monomer components,

(b) an anionic sulphonated hydrocarbon surfactant in the form of a salt which does not give a true solution in water, the molar quantity of (b) being not greater than the molar quantity of the cationic monomer units of (a_2), and the cationic monomer units (a_2) being at least partially converted to a salt form having as anion the anion of the anionic surfactant (b), and

(c) a water-immiscible oil in which the copolymer (a) is insoluble.

4,696,963

HALOGENATED ALKYL PHOSPHATE ESTERS AND POLYMER SYSTEMS INCORPORATING THEM

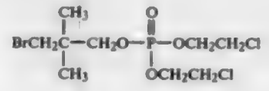
James A. Albright, San Leandro, Calif., and Theodore C. Wilkinson, Dublin, Ohio, assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Oct. 10, 1985, Ser. No. 786,208

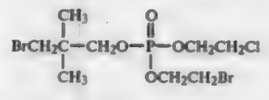
Int. Cl.⁴ C08K *5/53*

U.S. Cl. 524—144 **8 Claims**

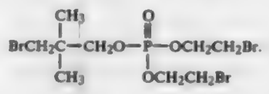
1. A flame retardant non-mutagenic halogenated alkyl phosphate ester mixture consisting essentially of compounds of the formula:



(I)



(II)



(III)

4,696,964

COMPOSITIONS STABILIZED WITH ETHERS OF DI- AND TRI-SUBSTITUTED HYDROXYLAMINES

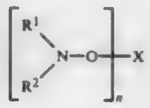
Ramanathan Ravichandran, Yonkers, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 11, 1986, Ser. No. 850,810

Int. Cl.⁴ C07C *93/12, 93/08, 93/02;* **C08K** *5/32*

U.S. Cl. 524—236 **32 Claims**

1. A composition of matter comprising a, polymer or lubricating oil subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound selecting from the group consisting of α,α′-bis (benzyloxyamino)-p-xylene and compounds having the formula



wherein

R^1 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

R^2 is alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

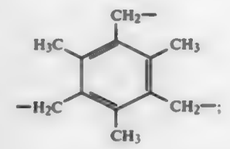
carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

n is 1–4;

X, when n is 1, is the same as R^2;

X, when n is 2, is alkylene of 2 to 12 carbon atoms, cycloalkylene of 6 to 10 carbon atoms or alkylenearylenealkylene of 8 to 10 carbon atoms;

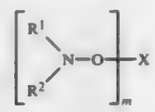
X, when n is 3, is alkanetriyl of 3 to 6 carbon atoms or



and

X, when n is 4, is alkanetetrayl of 4 to 6 carbon atoms.

25. A compound of the formula



wherein

m is 2–4;

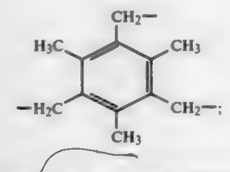
R^1 is hydrogen, alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

R^2 is alkyl of 1 to 36 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 36 carbon atoms;

at least one of R^1 and R^2 being said aralkyl or said substituted aralkyl when m is 2;

X, when m is 2, is alkylene of 2 to carbon atoms, cycloalkylene of 6 to 10 carbon atoms or alkylenearylenealkylene of 8 to 10 carbon atoms;

X, when m is 3, is alkanetriyl of 3 to 6 carbon atoms or



and X, when m is 4, is alkanetetrayl of 4 to 6 carbon atoms.

4,696,965

POLYAMIDE-ACRYLIC BLENDS

Jerald K. Rasmussen, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 23, 1985, Ser. No. 758,044

Int. Cl.⁴ C08L *77/00;* **C08K** *5/05*

U.S. Cl. 524—380 **12 Claims**

1. A composition of matter comprising a blend comprising:

(1) at least one condensation-based polyamide prepared by reaction of stoichiometric amounts of acid and amine functionality, and

(2) at least one pressure sensitive acrylic polymer,

the ratio by weight of the acrylic and polyamide polymers being 99.99:0.01 to 0.01:99.99, said blend being only organic solvent soluble and said blend being an uncrosslinked pressure sensitive adhesive.

4,696,966

FLAME RETARDANT, IMPACT RESISTANT POLYAMIDE COMPOSITIONS

Ian G. Williams, Cleveland, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 1, 1986, Ser. No. 858,043

Claims priority, application United Kingdom, May 14, 1985, 8512119

Int. Cl.⁴ C08K *3/22, 3/10*

U.S. Cl. 524—412 **12 Claims**

1. A polyamide composition comprising:

a. a synthetic, fibre forming polyamide comprising repeating carbonamide groups,

b. from 1 to 25% by weight of the total composition of a rubbery toughening additive copolymer having a glass transition temperature below 20° C., and which is formed from at least one ethylenically unsaturated monomer and a monomer providing functional groups selected from maleic, fumaric, norbornadiene and succinic anhydrides or an alicyclic carboxylic acid or functional derivative thereof having a cis-form double bond in the ring,

c. from 10 to 30% by weight of the total composition of a fire retardant additivie comprising a halogenated polymer having a weight average molecular weight in excess of 5,000, wherein the halogenated polymer is selected from the group consisting of poly(tribromostyrene), brominated epoxy resins, brominated polyphenylene oxide and poly(penta halobenzyl acrylate), and

d. a synergist for the fire retardant additive, the percentage weights of the components of the composition totaling 100% by weight.

4,696,967

THERMOPLASTIC ELASTOMER COMPOSITIONS

Charles D. Shedd, Blairstown, and David J. Anzini, Hampton Township, Hunterdon County, both of N.J., assignors to BP Performance Polymers Inc., Hackettstown, N.J.

Continuation-in-part of Ser. No. 736,547, May 21, 1985, abandoned. This application Nov. 6, 1986, Ser. No. 926,888

Int. Cl.⁴ C08L *23/10, 33/04, 23/26;* **C08K** *3/22*

U.S. Cl. 524—437 **19 Claims**

1. A compatibilized low smoke and flame retardant reprocessable thermoplastic elastomer composition consisting essentially of a partially cured binary polymer blend of an acrylate rubber and a polyolefin resin selected from the group consisting of crystalline propylene homopolymers and copolymers, and a compatibilizing amount of aluminum trihydrate, wherein the ratio of acrylate rubber to polyolefin resin varies from about 95:5 to 50:50 respectively, in parts by weight, and the aluminum trihydrate is present in amounts of about 25 to 250 parts per 100 parts of acrylate rubber and polyolefin resin.

4,696,968

MELT-FORMABLE ORGANOALUMINUM POLYMER

Frederick N. Tebbe, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 4, 1986, Ser. No. 903,448

Int. Cl.⁴ C08G *79/10*

U.S. Cl. 524—610 **27 Claims**

1. A polymer comprising the reaction product of R_2AlNH and R_3Al having a mole fraction derived from R_3Al greater than zero and less than 1, wherein R is selected from C_xH_{2x+1}, wherein x is 1 to 10.

4,696,969

EMULSION POLYMERIZED SILICONE EMULSIONS HAVING SILOXANE-BONDED UV ABSORBERS

Raymond J. Thimineur, Scotia, and William J. Raleigh, Rensselaer, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 27, 1984, Ser. No. 634,935

Int. Cl.⁴ C08K *5/06*

U.S. Cl. 524—762 **11 Claims**

1. A method for making an emulsion substantially free of

amino-functional units and having a substantially neutral or acidic pH, comprising:

I. preparing an aqueous emulsion consisting essentially of:
(a) a low molecular weight polydiorganosiloxane,
(b) an emulsifier or mixture of emulsifiers,
II. partially polymerizing said low molecular weight polydiorganosiloxane by emulsion polymerization;
III. adding to the partially emulsion polymerized polydiorganosiloxane an ultraviolet light absorbing agent, and
IV. emulsion polymerizing the polydiorganosiloxane of the emulsion of step III such that the ultraviolet light absorbing agent is chemically bonded to the polydiorganosiloxane prepared by said emulsion polymerization.

4,696,970

METHOD FOR PRODUCING A SILICONE POLYMER-FILLER MIXTURE

Shin-ichi Sumimura, and Akira Tazawa, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed May 12, 1986, Ser. No. 861,882
Claims priority, application Japan, May 28, 1985, 60-114454
Int. Cl.[4] C08L *83/04*
U.S. Cl. 524—860 **12 Claims**

1. Method for producing a silicone polymer-filler mixture, characterized in that a silicone polymer-filler mixture is produced by passing

(A) 100 weight parts siloxane oligomer selected from the group consisting of

(a) polydiorganosiloxane with the general formula

$$HO(R_2SiO)_xH,$$

(b) polydiorganosiloxane with the general formula

$$(R_2SiO)_y$$

and their mixtures,

where each R is independently an unsubstituted or substituted monovalent hydrocarbon group, x is from 1 to 200 on average and y is from 3 to 10 on average,

(B) 1 to 150 weight parts filler; and

(C) a catalyst in a quantity sufficient to catalyze the polymerization of said silicone oligomer in the presence of said filler,

through a continuous kneader extruder with polymerization of said silicone oligomer into silicone polymer.

4,696,971

PROCESS FOR THE PREPARATION OF POLYVINYL BUTYRAL HAVING IMPROVED PROPERTIES

Robert Degeilh, Le Port Marly, France, assignor to Saint Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 620,053, Jun. 13, 1984, abandoned. This application Mar. 10, 1986, Ser. No. 838,230
Claims priority, application France, Jun. 14, 1983, 83 09840
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—61 **14 Claims**

1. A process for the preparation of a polyvinyl butyral having improved properties which comprises subjecting a polyvinyl alcohol in an aqueous medium in the presence of butyraldehyde and an acid catalyst and an emulsifier to form a reaction mixture and thereafter recovering the polyvinyl butyral, said process being characterized in that:

said polyvinyl alcohol comprises about 8 to 15 percent by weight of said aqueous medium;

said emulsifier comprises sodium dioctyl sulfosuccinate (DOS) in an amount effective as an emulsifier, and between about 0.1 and 0.3 percent by weight calculated on the weight of polyvinyl alcohol;

said DOS is added to said reaction mixture before said butyraldehyde;

prior to addition of said butyraldehyde to said reaction mixture, said aqueous medium of polyvinyl alcohol, acid catalyst, and emulsifier have a temperature of about 5° to 12° C.;

said butyraldehyde comprises sufficient weight to react about 75 to 88 percent of said polyvinyl alcohol in said reaction mixture;

said butyraldehyde is reacted gradually to precipitate said polyvinyl butyral within a time period ranging from about 10 to 90 minutes after the start of said reaction;

subsequent to forming said reaction mixture, said reaction mixture is agitated for a time period of at least about 30 minutes at a temperature of about 8° to 15° C.;

subsequently, the temperature of the reaction mixture is raised to a temperature range between about 60° to 80° C. for a period of time between about 1½ and 4 hours;

subsequently a base is incorporated into said reaction mixture to neutralize it to a pH of approximately 5, the pH being maintained at this value throughout the subsequent recovery process;

said reaction mixture then cured between said 60° to 80° C. temperature range for a period of less than about 10 minutes; and

precipitated polyvinyl butyral is then washed from said reaction mixture with water.

4,696,972

POLYMERIC MOLDING COMPOSITION CONTAINING STYRENIC COPOLYMER, POLYCARBONATE AND MBS POLYMER

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 578,941, Feb. 10, 1984, Pat. No. 4,530,965. This application Apr. 1, 1985, Ser. No. 718,588
Int. Cl.[4] C08L *69/00*
U.S. Cl. 525—67 **9 Claims**

1. A polymeric molding composition which comprises a blend of (A) a polycarbonate resin, (B) a polmerization product of (B.1) a vinyl aromatic monomer and (B.2) an $\alpha\beta$ unsaturated cyclic anhydride in the presence of a rubber, and (C) a core-shell copolymer in which said core is about 90 to 50 parts by weight of polybutadiene or a copolymer of butadiene with up to 50 percent of at least one monomer selected from the group consisting of styrene, lower alkyl methacrylates, lower alkyl acrylates, acrylonitrile and olefins, and in which said shell is about 10 to 50 parts of a lower alkyl methacrylate or a copolymer of a lower alkyl methacrylate with up to 50 percent of at least one monomer selected from the group consisting of styrene, acrylonitrile and lower alkyl acrylates; wherein the rubber is a conjugated diene/styrenic copolymer and said conjugated diene is present in an amount of 65% by weight or more and is butadiene, isoprene, or a mixture thereof.

4,696,973

IMPACT MODIFIER AND THERMOPLASTIC RESIN COMPOSITION USING THE SAME

Kazumasa Kamata, Koganei; Kazuo Ueda, and Kiyokazu Kitai, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 641,989
Claims priority, application Japan, Aug. 25, 1983, 58-155325; Aug. 25, 1983, 58-155326
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] C08L *51/04, 53/04*
U.S. Cl. 525—71 **4 Claims**

1. An impact modifier comprising a blend of 100 parts by weight of a graft copolymer (A) obtained by graft-polymerizing a monomer or a monomer mixture consisting of 95 to 100% by weight of at least one monomer selected from the group consisting of alkyl acrylates, alkyl methacrylates, aromatic vinyl compounds and vinyl cyanide compounds and 0 to 5% by weight of a polyfunctional crosslinking agent on an acrylic elastomer mainly composed of an alkyl acrylate and containing 0.1 to 5% by weight of polyfunctional crosslinking agent, a butadiene elastomer composed of a polybutadiene or a copolymer of 50% by weight or more of a butadiene and 50% by weight or less of other vinyl compound copolymerizable therewith and containing 0 to 5% by weight of a polyfunctional crosslinking agent, or mixtures thereof, and 0.1 to 20 parts by weight of a copolymer (B) obtained by copolymerizing 3 to 30% by weight of an unsaturated acid monomer and 97 to 70% by weight of vinyl monomer copolymerizable therewith selected from the group consisting of alkyl acrylates, alkyl methacrylate, aromatic vinyl compounds, vinyl cyanide compounds and mixtures thereof.

4,696,974

HYDROPHILIC SILICONE COMPOSITE AND THE METHOD FOR PRODUCING THEREOF

Jiří Salc; Petr Vondrácek, and Petr Lopour, all of Praha, Czechoslovakia, assignors to Ceskoslevenska Akademie Ved, Czechoslovakia

Filed May 13, 1986, Ser. No. 862,675
Claims priority, application Czechoslovakia, May 20, 1985, 3599-85
Int. Cl.[4] C08L *83/04*
U.S. Cl. 525—92 **3 Claims**

1. A hydrophilic silicone composite comprising a cross-linked silicone polymer which forms a continuous matrix, having incorporated therein a powdered hydrogel filler comprising particles having a particle size from about 10^{-6} to 10^{-1} mm, said hydrogel being selected from the group consisting of

cross-linked polymers and copolymers of glycol monomethacrylates, polyol monomethacrylates, dihydroxyester monomethacrylates, acrylamide, methacrylamide, N-substituted acrylamide, N-substituted methacrylamide, N,N-disubstituted acrylamide, N,N-disubstituted methacrylamide, and

multiblock copolymers of acrylonitrile with acrylamide and/or acrylic acid;

said powdered hydrogel filler being present in an amount from about 10 to about 150 weight parts per 100 weight parts of silicone polymer.

4,696,975

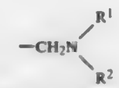
ROOM TEMPERATURE-CURABLE RESIN COMPOSITION

Masatsku Ooka, Nara; Yaeko Okuda, Hyogo, and Motoyasu Kunugiza, Nishinomiya, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

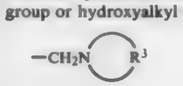
Continuation of Ser. No. 576,892, Feb. 3, 1984, abandoned. This application Aug. 16, 1985, Ser. No. 766,679
Claims priority, application Japan, Feb. 4, 1983, 58-17192
Int. Cl.[4] C08F *8/46*; C08L *63/10*
U.S. Cl. 525—113 **17 Claims**

1. A resin composition curable at room temperature, said composition consisting essentially of

(A) a polymer having both carboxyl and tertiary amino groups, the polymer being the reaction product of (a-1) a vinyl polymer having both carboxylic anhydride and carboxyl groups with (a-2) a compound having both at least one group containing an active hydrogen selected from the group consisting of hydroxyl, primary amino, secondary amino and thiol and at least one basic nitrogen atom-containing group selected from the group consisting of



wherein R^1 and R^2, which may be the same or different, each denote a C_{1-4} alkyl group or hydroxyalkyl group;



wherein R^3 denotes a C_{2-5} alkylene group or $—CH_2CH_2OCH_2CH_2$;

and

N-C_{1-2} alkylpiperazinyl group, and

(B) a polyepoxy compound.

4,696,976

VINYL URETHANE COMPOSITE POLYMER CONTAINING DISPERSED SOFT COPOLYMER PARTICLES

Gilbert B. Ellerbe, III, and Donald B. Parrish, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1984, Ser. No. 679,325
Int. Cl.[4] C08F *8/00*; C08L *75/00*
U.S. Cl. 525—126 **11 Claims**

1. A vinyl urethane composite polymer comprising the reaction product of a reaction mixture comprising

(a) a polymer polahl containing dispersed soft polymer particles, which dispersed particles have a T_g of less than 20° C.,

(b) a vinyl monomer having a boiling point above the temperature incurred in reacting said reaction mixure, and

(c) a polyisocyanate.

4,696,977

PROCESS FOR PREPARING NYLON BLOCK COPOLYMERS

Albert Y. Garner, Springfield; James D. Gabbert, Wilbraham, both of Mass., and Ross M. Hedrick, St. Louis, Mo., assignors to DSM Rim Nylon V.O.F., Geleen, Netherlands

Division of Ser. No. 658,958, Oct. 9, 1984, Pat. No. 4,587,305, which is a continuation-in-part of Ser. No. 560,644, Dec. 12, 1983, abandoned. This application Sep. 12, 1985, Ser. No. 775,544
Int. Cl.[4] C08L *23/26, 67/02, 71/02*
U.S. Cl. 525—184 **35 Claims**

1. A process for preparing a nylon block copolymer comprising:

bringing into reactive admixture:

(a) a first solution of an acyllactam and magnesium halide in epsilon-caprolactam formed by reaction of 2±0.2 equivalents of an acid halide functional material with one mole of a magnesium dilactam, said acid halide functional material comprising an oligomer or polymer containing at least one acid halide group per molecule; and

(b) a second solution of magnesium dilactam and epsilon-caprolactam containing sufficient magnesium dilactam to interact with the magnesium halide of the first solution to form a halomagnesium lactam and polymerize the epsilon-caprolactam monomer whereby a nylon block copolymer is obtained containing 10 to 90 wt. % of elastomeric segments provided by said acid halide functional material.

4,696,978

MODIFIED ACRYLIC POLYMERS

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 3, 1986, Ser. No. 825,302
Int. Cl.[4] C08L *33/12, 33/24*
U.S. Cl. 525—205 **10 Claims**

1. A moldable thermoplastic composition which is transparent upon molding comprising an alkyl methacrylate homo-or copolymer matrix resin and of an interpolymer consisting essentially of a methylmethacrylate/N-substituted maleimide copolymer and an alkyl acrylate homopolymer linked through a difunctional reactive monomer prepared in a one-step reaction by reacting together methylmethacrylate monomer, an alkyl acrylate monomer, and a difunctional reactive monomer bearing acrylate or methacrylate reactive groups, the inter-

polymer being present in an amount sufficient to improve the impact strength of molded alkyl methacrylate resin.

4,696,979

PROCESS FOR PRODUCING PROPYLENE COPOLYMER

Akinobu Shiga, Tokyo; Masahiro Kakugo, Chiba; Junpei Kozima, Chiba, and Kizuku Wakatsuki, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 27, 1984, Ser. No. 686,864

Claims priority, application Japan, Dec. 27, 1983, 58-248520; Nov. 15, 1984, 59-241086

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.⁴ C08L *23/10, 23/14*

U.S. Cl. 525—247 **8 Claims**

1. A process for producing a crystalline propylene copolymer, which compriaes carrying out in separate steps (A) and (B), (A) the polymerization of a vinyl cycloalkane selected from the group consisting of vinyl cyclopentane, vinyl-3-methyl cyclopentane, vinyl cyclohexane, vinyl-2-methyl cyclohexane, and vinyl norbornane and (B) the polymerization of monomer consisting essentially of propylene or consisting essentially of propylene with ethylene in a multiplicity of steps using a Ziegler-Natta catalyst comprising a titanium compound and organoaluminum compound to thereby produce a propylene copolymer containing 0.05 weight ppm to 10,000 weight ppm of the vinyl cycloalkane unit.

4,696,980

SULFONE ACTIVATED THIOETHER ADSORBENTS FOR THE SEPARATION OF PROTEINS AND THE LIKE

Jerker Porath, Bodalsvägen 4A, S-18136 Lidingö , Sweden

Filed Apr. 30, 1985, Ser. No. 729,344

Claims priority, application Sweden, May 17, 1984, 8402663

Int. Cl.⁴ C08C *8/00;* **C07H** *5/00*

U.S. Cl. 525—326.1 **4 Claims**

1. Adsorbent for separation and immobilization, comprising a hydrophilic polymeric netting selected from the group consisting of agar, agarose, cellulose, polyacrylamide and polyvinyl alcohol, said netting comprising cross-links bound to said netting, said cross-links having the structure

$$Y—S—CH_2—CH_2—SO_2—CH_2—CH_2—X—,$$

where Y is selected from the group consisting of a heteroaromatic ring having at least one nitrogen atom, a phenyl group substituted with at least one nitro group, and a phenyl group substituted with at least one nitro group, and further substituted with alkyl, acyl, amino, or hydroxy groups; and X is selected from the group consisting of ether oxygen, thioether sulfur, and nitrogen.

4,696,981

METHOD OF MANUFACTURING POLYAMINO ACID WITH MICROWAVES

Kaoru Harada; Akira Shimoyama, both of Ibaraki, and Hiroji Mizumoto, Osaka, all of Japan, assignors to Diamond Shamrock Chemicals Company, Irving, Tex.

Filed Mar. 13, 1986, Ser. No. 839,353

Claims priority, application Japan, Mar. 25, 1985, 60-60219

Int. Cl.⁴ C09G *69/10*

U.S. Cl. 525—328.2 **12 Claims**

1. A method of manufacturing anhydropolyaspartic acid (imide) by irradiating with microwaves, any one member selected from the group consisting of monoammonium, diammonium, monoamide, diamide and monoamideammonium salts of malic acid, maleic acid fumaric acid and mixtures thereof.

4,696,982

PROCESS FOR REMOVING RESIDUAL SALTS FROM EPOXY NOVOLACS

Lawrence E. Neil, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 17, 1986, Ser. No. 908,539

Int. Cl.⁴ C08G *59/06, 59/08*

U.S. Cl. 525—507 **15 Claims**

1. A method of separating dispersed salt ions soluble catalyst particles and solidified polymer particles from a flow of phenolic epoxy novolac or phenolic derivative epoxy resin intermediates by washing with water to selectively remove such impurities with the wash water comprising the steps of:

(a) through a water injection means, injecting a flow of water into the epoxy resin intermediate stream while forming the water flow into droplets for emulsifying in the epoxy resin stream wherein the droplets are sufficiently small so as to enhance diffusion between the phases; and

(b) passing the epoxy resin stream with emulsified water droplets through an electrostatic coalescer means to extract water from the epoxy resin stream wherein the water carries the impurities therewith to discharge a stream of washed phenolic epoxy novolac or phenolic derivative epoxy resin intermediates having reduced impurity content.

4,696,983

POLYMERIZATION REACTOR COATINGS AND USE THEREOF

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 16, 1985, Ser. No. 776,283

Int. Cl.⁴ C08F *2/16, 2/18, 2/22, 20/06*

U.S. Cl. 526—62 **29 Claims**

12. A method for reducing polymer build-up on the internal surfaces of a polymerization vessel exposed to polymerization reaction mixtures comprising applying on said internal surfaces of the polymerization vessel exposed to contact with the polymerization reaction mixtures, prior to adding the polymerization reaction mixture to the polymerization vessel, a coating material comprising an anionic, water-soluble carboxyl polymer salt and surface active agent, said salt being an ammonium, amine or metal salt, said copolymer being greater than 10 to 100% salt, said surface active agent being a water-soluble anionic, cationic or non-ionic surfactant present in amount sufficient to provide a contact angle of less than 30°, adding said reaction mixture to the thus coated polymerization vessel and effecting polymerization thereof in the presence of said water-soluble coating material.

4,696,984

ISOPRENE POLYMERIZATION PROCESS

Antonio Carbonaro, Milan, and Domenico Ferraro, San Donato Milanese, both of Italy, assignors to Enichem Elastomeri, S.p.A., Palmero, Italy

Filed May 22, 1986, Ser. No. 866,147

Claims priority, application Italy, Jun. 5, 1985, 21037 A/85

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.⁴ C08F *4/52*

U.S. Cl. 526—98 **5 Claims**

1. A bulk polymerization process for preparing isoprene polymers and copolymers having a high cis content, high molecular weight and substantially no gel, wherein the respective monomer or monomers are brought into contact with a catalytic system comprising:

(a) at least one element of Group IIIB of the Periodic Table having an atomic number of between 57 and 71 or at least one compound thereof;

(b) at least one aluminum compound of the formula AlR_2R', wherein R is alkyl, cycloalkyl or alkylaryl, and R' is R or hydrogen;

(c) at least one compound selected from organic halogen derivatives, halides of elements able to exist in at least two valence states with the halide corresponding to a higher valence state than the minimum, halogens and hydrogen halide acids;

(d) at least one compound containing at least one salifiable hydroxyl group, said process comprising carrying out the reaction in the absence of diluents and at a ratio of component (b) to component (a) equal to or less than 20.

4,696,985

CATALYST COMPOSITION FOR POLYMERIZATION OF CYCLOOLEFINS

Andrea E. Martin, Avondale, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 672,423, Nov. 16, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 845,482

Int. Cl.⁴ C08F *4/62*

U.S. Cl. 526—119 **16 Claims**

1. A method of forming a polymerizable cycloolefin solution comprising:

(a) providing cycloolefin defined by the following formulas:



wherein

R and R^1 are independently selected from hydrogen, alkyl groups of 1 to 20 carbon atoms, and saturated and unsaturated hydrocarbon cyclic groups formed by R and R^1 together with the two ring carbon atoms,

R^2 and R^3 are independently selected from hydrogen and alkyl groups containing 1 to 20 carbon atoms,

(b) providing WCl_6;

(c) providing an oxygen transfer agent;

(d) transferring a controlled proportion of oxygen from said oxygen transfer agent to said WCl_6 to form a mixture of WCl_4O and WCl_6, said mixture having substantial activity for the polymerization of said cycloolefin; and

(e) combining said mixture with said cycloolefin to form a polymerizable cycloolefin solution.

4,696,986

MODIFIER FOR LITHIUM CATALYSTS

Adel F. Halasa, Bath, and Robert E. Cunningham, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 12, 1986, Ser. No. 895,646

Int. Cl.⁴ C08F *4/46*

U.S. Cl. 526—181 **23 Claims**

1. A process for preparing a vinyl group containing polymer comprising polymerizing at least one diolefin monomer in the presence of a catalyst system which is comprised of (a) from 0.01 phm to 1 phm of at least one organolithium compound and (b) from 0.1 to about 40 moles of at least one trialkoxybenzene modifier selected from the group consisting of 1,2,3-trianloxybenzenes and 1,2,4-trialkoxybenzenes per mole of the organolithium compound, wherein the alkyl groups in said trialkoxybenzenes contain from 1 to about 10 carbon atoms.

4,696,987

PROCESS FOR THE PREPARATION OF POLYMERS OF VINYLPHOSPHONIC ACID IN PROTIC SOLVENTS

Walter Dürsch, Königstein/Taunus; Walter Herwig, Bad Soden am Taunus, and Friedrich Engelhardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 27, 1983, Ser. No. 565,862

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248491

Int. Cl.⁴ C08F *4/38, 4/34*

U.S. Cl. 526—216 **6 Claims**

1. A process for the preparation of a polymer of vinylphosphonic acid in a protic diluent with the aid of a catalyst which forms free radicals, which comprises heating vinylphosphonic acid at temperatures of 40° to 130° C. in a total of 10 to 150% by weight of a protic diluent for a total of 4–60 hours in the presence of 1.0 to 5.5% by weight of an aliphatic peroxy-ester, an aliphatic diacyl peroxide or mixtures thereof which decompose by half in one hour at temperatures below 122° C.

4,696,988

PROCESS FOR PREPARATION OF REACTIVE POLYMERS AND POLYMERS PREPARED BY SAID PROCESS

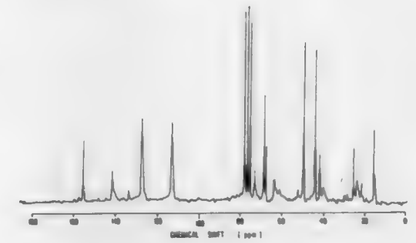
Toshinobu Higashimura; Mitsuo Sawamoto, both of Kyoto; Yoshiki Toyoshima, Ehime; Shuuichi Kanagawa, Osaka; Tsutomu Takahashi, and Noriaki Saito, both of Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 29, 1986, Ser. No. 868,386

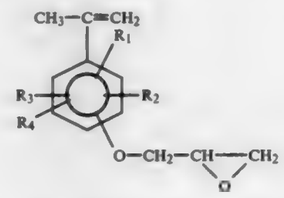
Claims priority, application Japan, May 30, 1985, 60-117190; Oct. 16, 1985, 60-230683; Oct. 17, 1985, 60-233001; Oct. 18, 1985, 60-234133; Feb. 25, 1986, 61-040926

Int. Cl.⁴ C08F *2/06, 4/00, 224/00*

U.S. Cl. 526—220 **6 Claims**



1. A process for preparing a reactive polymer having a molecular weight of from 500 to 50,000 by polymerizing a monomer comprising at least one isopropenylphenyl glycidyl ether represented by formula



(1)

wherein R_1, R_2, R_3 and R_4 are each a hydrogen atom, a halogen atom, an alkyl group having from 1 to 4 carbon atoms, or a phenyl group, or in combination with other cation polymerizable unsaturated monomer to provide a reactive polymer of at least one unit of monomer comprising formula (1) to 99 units

of said unsaturated monomer by the use of at least one catalyst selected from halogens and hydrogen iodide in an amount of from 0.0001 to 0.1 mol per mol of the total monomer at a temperature ranging from −100° C. to 30° C. in the presence of at least one solvent selected from aromatic hydrocarbons, halogenated hydrocarbons and nitrohydrocarbons.

4,696,989

FLUORINE-CONTAINING ELASTOMERIC COPOLYMER

Masahiko Oka, Shiga; Yutaka Ueta; Hideo Kano, both of Osaka; Masayasu Tomoda, Shiga, and Shoji Kawachi, Hyogo, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Apr. 9, 1986, Ser. No. 849,734
Claims priority, application Japan, Apr. 10, 1985, 60-77097
Int. Cl.⁴ C08F *14/18, 14/22, 14/28*
U.S. Cl. 526—254 **6 Claims**

1. A copolymer comprising repeating units derived from tetrafluoroethylene, vinylidene fluoride and hexafluoropropylene in a molar ratio within an area defined on a tetrafluoroethylene, vinylidene fluoride and hexafluoropropylene ternary composition diagram by a hexagon with,

a first vertex A at 34.0% by weightof tetrafluoroethylene, 8.5% by weight of vinylidene fluoride and 57.5% by weight of hexafluoropropylene;

a second vertex B at 26.5% by weight of tetrafluoroethylene, 14.5% by weight of vinylidene fluoride and 59.0% by weight of hexafluoropropylene;

a third vertex C at 31.0% by weight of tetrafluoroethylene, 24.0% by weight of vinylidene fluoride and 45.0% by weight of hexafluoropropylene;

a fourth vertex D at 49.0% by weight of tetrafluoroethylene, 26.5% by weight of vinylidene fluoride and 24.5% by weight of hexafluoropropylene;

a fifth vertex E at 49.0% by weight of tetrafluoroethylene, 11.0% by weight of vinylidene fluoride and 40.0% by weight of hexafluoropropylene; and

a sixth vertex F at 50.0% by weight of tetrafluoroethylene, 9.0% by weight of vinylidene fluoride and 41.0% by weight of hexafluoropropylene.

4,696,990

NOVEL PHOTOCROSSLINKABLE LIQUID CRYSTALLINE POLYMERS

John M. Noonan, and Anthony F. Caccamo, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,416
Int. Cl.⁴ C08F *20/30*
U.S. Cl. 526—304 **7 Claims**

1. A photocrosslinkable liquid crystalline polymer comprising a vinyl backbone having from 60 to 100 mole percent of recurring pendant groups comprising an alkyl or alkoxy light-sensitive cinnamate component connected to the vinyl backbone through (a) a component which provides stiffness and rod-like character to the cinnamate component and (b) a spacer group having a backbone of from 7 to 14 atoms.

4,696,991

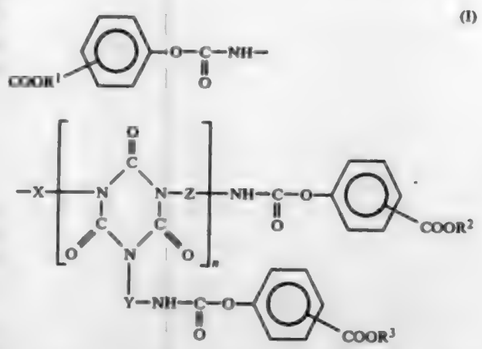
BLOCKED POLYISOCYANURATE

Yoshimichi Kobayashi, and Hisaharu Hotta, both of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,822
Claims priority, application Japan, Sep. 3, 1985, 60-194188
Int. Cl.⁴ C08G *18/80*
U.S. Cl. 528—45 **3 Claims**

1. A blocked polyisocyanurate having the formula:

(I)



wherein each of X, Y and Z which may be the same or different, is a residue of a diisocyanate compound devoid of the isocyanate groups, each of R^1, R^2 and R^3 which may be the same or different, is a group selected from the group consisting of C_1–C_{20} alkyl, alkoxyalkyl, aryl, alkaryl and aralkyl, and n is an integer of from 1 to 10.

4,696,992

THIOL CARBAMATES AS LATENT ACCELERATORS FOR CURING EPOXY RESINS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 17, 1986, Ser. No. 931,325
Int. Cl.⁴ C08G *59/68*
U.S. Cl. 528—90 **8 Claims**

1. A process for accelerating the rate of cure of an epoxy resin formulation comprising including in the epoxy resin formulation a thiocarbamate cure accelerator.

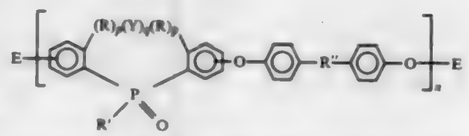
4,696,993

PHOSPHORUS-CONTAINING POLYARLENE ETHER

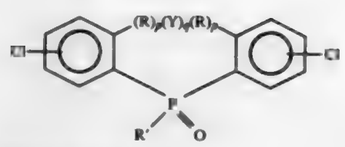
Werner Ude, Darmstadt-Arheilgen; Joachim Knebel, Darmstadt, and Guenter Schroeder, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jun. 4, 1986, Ser. No. 870,370
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521124
Int. Cl.⁴ C08G *79/04*
U.S. Cl. 528—167 **16 Claims**

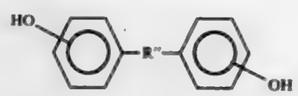
1. A method for making a resinous phosphorus-containing polyarylene ether of the formula



which method comprises polycondensing, at an elevated temperature, in the presence of an amount of alkali equivalent to the amount of halogen in the reagents, and for at least 10 hours, a bis-(chlorophenyl)phosphine oxide of the formula



with a bisphenol of the formula



wherein

R hydrogen, p is 1, and q is zero, or wherein p is zero, q is 1 and y is a single bond, or y is oxygen, sulfur, or a sulfonyl, carbonyl, methylene or isopropylidene bridge;

R′ is alkyl or aryl;

R″ is a single bond or R″ represents divalent oxygen, sulfur, or a divalent organic radical having from 5 to 15 carbon atoms and having free valences attached to quaternary carbon atoms;

E is an end group which is chlorine, hydrogen, hydroxyl, alkyl, alkoxy, aryl, aryloxy, acyl, or acyloxy group; and

n has an average value of at least 10.

4,696,994

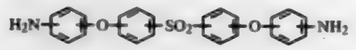
TRANSPARENT AROMATIC POLYIMIDE

Kohei Nakajima; Kazuaki Nishio, and Hiroshi Watanabe, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Ube, Japan

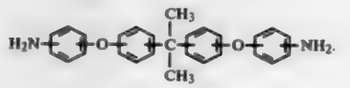
Filed Dec. 16, 1985, Ser. No. 809,528
Claims priority, application Japan, Dec. 14, 1984, 59-262976; Dec. 25, 1984, 59-272079
Int. Cl.⁴ C08L *79/08*
U.S. Cl. 528—176 **19 Claims**

1. A transparent aromatic polyimide produced by polymerization and imidation of an aromatic tetracarboxylic acid containing as a principal component biphenyltetracarboxylic acid and an aromatic diamine containing as a principal component bis(aminophenoxy-phenyl)sulfone of the formula (I) or bis-(aminophenoxy-phenyl)propane of the formula (II):

(I)



(II)



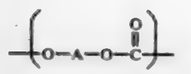
4,696,995

POLY(ESTER-CARBONATES) AND BLENDS BASED ON 3-METHYL-4-HYDROXY-BENZOIC ACID

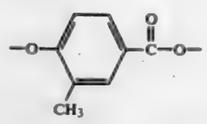
Edward N. Peters, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 6, 1985, Ser. No. 708,731
Int. Cl.⁴ C08G *63/62*
U.S. Cl. 528—206 **18 Claims**

1. A linear, high molecular weight, heat resistant thermoplastic copoly(ester-carbonate) resin comprising recurring carbonate units of the formula



in which A is a divalent aromatic radical of a dihydric phenol, and recurring ester units of the formula



the average number of repeating units being at least about 30.

4,696,996

PREPARATION OF POLYPHENYLENE ETHERS, AND AN APPARATUS FOR THIS PURPOSE

Hermann Brandt, Schifferstadt; Hermann Fischer, Limburgerhof; Hermann Dreher, Seeheim-Jugenheim; Eduard Heil, Limburgerhof; Juergen Hambrecht, Heidelberg; Herbert Naarmann, Wattenheim; Adolf Echte, Ludwigshafen; Hermann Gausepohl, Mutterstadt; Peter Siebel, Limburgerhof; Johann Swoboda, Ludwigshafen; Gerd Schwoebel, Wattenheim, and Albert Nikles, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 797,884
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442117
Int. Cl.⁴ C08G *65/38*
U.S. Cl. 528—214 **5 Claims**

1. A process for the preparation of a polyphenylene ether from a monohydric phenol having alkyl substituents in the two ortho-positions, but not in the para-position, by an oxidative coupling reaction with oxygen at from 15° to 50° C. and under from 1 to 10 bar in the presence of a catalyst complex and a solvent, wherein the conversion of the phenol is carried out in two or more reaction zones in which some or all of the solvent, the catalyst complex and the phenol is initially added to a reaction zone and is circulated by means of a conveying unit in such a way that the volume circulated per hour is from 5 to 50 times the total volume in the reaction zones, and about 60–100% of the stoichiometric amount of oxygen required in the oxidative coupling is introduced into the first reaction zone while from 0 to about 40% of the said stoichiometric amount is introduced into the second reaction zone, the heat of reaction produced in the reaction zones being removed in the reaction zone itself and/or downstream of this.

4,696,997

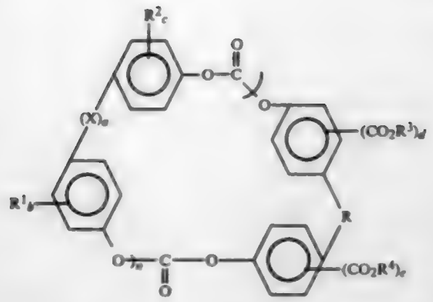
CYCLIC CARBONATE OLIGOMER COMPOSITION

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 12, 1985, Ser. No. 796,984
Int. Cl.⁴ C08G *63/62*
U.S. Cl. 528—271 **4 Claims**

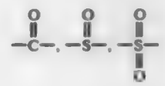
1. A composition comprising at least one oligmer of the formula

I.



wherein

X is selected from the group consisting of alkylene of two to twelve carbon atoms, inclusive, alkylidene of one to twelve carbon atoms, inclusive, cycloalkylene of four to twelve carbon atoms, inclusive, cycloalkylidene of four to twelve carbon atoms, inclusive, —S—, —O—, —S—S—,



a is zero or 1;

n is an integer of one to about fifteen;

R is alkylene of two to eight carbon atoms, inclusive, or alkylidene of one to eight carbon atoms, inclusive;

R^1 and R^2 are the same or different and are alkyl or one to four carbon atoms, inclusive or halo;

b and c are the same or different and are an integers of zero to four; and

R^3 and R^4 are the same or different and are alkyl of one to eight carbon atoms, inclusive, or phenyl; and

d and e are individually integers of 0, 1 or 2 with the proviso that d+e is at least one.

4,696,998

CYCLIC HETEROCARBONATES AND METHODS FOR THEIR PREPARATION AND USE

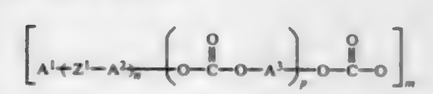
Daniel J. Brunelle; Thomas L. Guggenheim; Eugene P. Boden, all of Scotia; Thomas G. Shannon, Schenectady, and Joseph W. Gulles, Cohoes, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 28, 1986, Ser. No. 890,053

Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—272 **29 Claims**

1. A composition comprising cyclic heterocarbonate oligomers having the formula



(I)

wherein:

each of A^1, A^2 and A^3 is independently a divalent aromatic hydrocarbon or substituted aromatic hydrocarbon radical;

Z^1 is a divalent radical containing at least two non-carbon linking atoms not part of a carbonate radical;

m is from 1 to about 12;

n is from 1 to about 6; and

p is from 0 to about 6;

the total number of carbonte moieties in each of said oligomers being up to about 12.

4,696,999

PROCESS FOR THE PRODUCTION OF POLYBENZAMIDE WITH HALIDE CATALYST

Manfred Spies, Marburg; Peter Strohriegl, Hummeltal, and Walter Heitz, Kirchhain, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

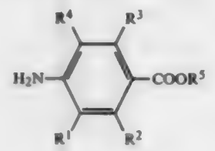
Filed Feb. 14, 1986, Ser. No. 829,766

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505903

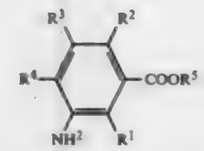
Int. Cl.⁴ C08G *69/08*

U.S. Cl. 528—319 **3 Claims**

1. A process for the production of a polybenzamide comprising polycondensation of aminobenzoic acid corresponding to formula (Ia) or (Ib) or a mixture of both



(Ia)



(Ib)

in which

R^1 to R^4 represent halogen, hydrogen, C_1–C_{20} alkyl, C_5–C_{10} cycloalkyl, C_6–C_{14} aryl or C_7–C_{20} aralkyl linked to the benzene ring directly or via O, N, P or S; and

R^5 represents C_1–C_8 alkyl, C_5–C_{10} cycloalkyl, C_6–C_{14} aryl, C_7–C_{15} aralkyl or hydrogen,

wherein the polycondensation is conducted in the presence of at least one halide of an element from the 3rd or 4th main group or the 4th secondary group of the Periodic Table of the elements according to Mendeleyev.

4,697,000

PROCESS FOR PRODUCING POLYPYRROLE POWDER AND THE MATERIAL SO PRODUCED

Edward F. Witucki, Van Nuys, and Leslie F. Warren, Camarillo, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 646,717, Sep. 4, 1984, Pat. No. 4,617,228. This application Jul. 8, 1986, Ser. No. 883,202

Int. Cl.⁴ C07D *207/30*; C08G *73/20*; H01B *1/12*

U.S. Cl. 528—423 **15 Claims**

1. A process for producing electrically conductive polypyrrole powder which comprises:

treating a liquid pyrrole with a solution of a strong oxidant capable of oxidizing pyrrole to a pyrrole polymer, said strong oxidant being a cation selected from the group consisting of Fe^{3+}, Cu^{2+}, Ce^{4+}, NO^+, NO_2^+ and $(C_6H_5)_3C^+$ cations, and

oxidizing said pyrrole by said strong oxidant in the presence of a substantially non-nucleophilic anion, and precipitating a conductive polypyrrole powder.

11. An electrically conductive polypyrrole powder produced by the process of claim 1.

4,697,001

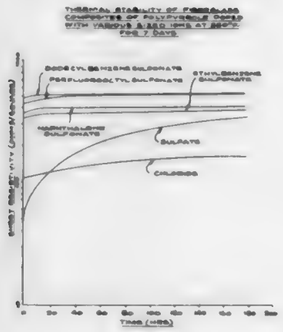
CHEMICAL SYNTHESIS OF CONDUCTING POLYPYRROLE

John A. Walker, Los Angeles; Edward F. Witucki, Van Nuys, and Leslie F. Warren, Camarillo, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 646,717, Sep. 4, 1984, Pat. No. 4,617,228, and a continuation-in-part of Ser. No. 883,202, Jul. 8, 1986, and a continuation-in-part of Ser. No. 883,260, Jul. 8, 1986. This application Oct. 9, 1986, Ser. No. 916,917

Int. Cl.⁴ C07D *207/30*; C08G *73/20*; H04B *1/12*

U.S. Cl. 528—423 **21 Claims**



1. A process for producing electrically conductive polypyrrole which comprises:

treating a liquid pyrrole with a solution of a strong oxidant capable of oxidizing pyrrole to a pyrrole polymer, said strong oxidant being a cation selected from the group consisting of Fe^{3+}, Cu^{2+}, Ce^{4+}, and $(C_6H_5)_3C^+$ cations,

oxidizing said pyrrole by said strong oxidant in the presence of a dopant anion selected from the group consisting of (1) alkyl and aryl sulfonates and (2) fluorinated carboxylates, and

precipitating a conductive polypyrrole solid.

15. An electrically conductive polypyrrole produced by the process of claim 1.

4,697,002

CALCITONIN GENE RELATED PEPTIDE ANALOGS WITH AMINO ACID SUBDSTITUENTS AT THE PENULTIMATE POSITION 36

Tomas G. Kempe, 16604 Windermere Pl., Minnetonka, Minn. 55345

Filed Dec. 23, 1985, Ser. No. 812,900

Int. Cl.⁴ C07K *7/10*

U.S. Cl. 530—324 **5 Claims**

1. [Ser^{36}] human calcitonin gene-related peptide.

4,697,003

METHOD OF PREPARING ALPHA-1-PROTEINASE INHIBITOR

Michael H. Coan, El Cerrito, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 1, 1985, Ser. No. 793,807

Int. Cl.⁴ C07G *7/00*

U.S. Cl. 530—380 **18 Claims**

1. A method for separating alpha-1-proteinase inhibitor from an aqueous solution of plasma proteins containing alpha-1-proteinase inhibitor selected from the group consisting of Cohn Effluent II+III, Cohn Effluent I and cryosupernatant solution which comprises the steps of:

(a) treating the aqueous solution to lower the concentration of salts therein to about 0.02M or below by at least one means selected from diafiltration and gel filtration;

(b) contacting the solution obtained from step (a) with an anion exchange resin having a selective affinity for the alpha-1-proteinase inhibitor in the solution to selectively bind to the resin the alpha-1-proteinase inhibitor and to allow the plasma proteins which do not bind to the resin to elute through the resin into a first eluate;

(c) contacting the anion exchange resin having selectively bound thereto alpha-1-proteinase inhibitor obtained from step (b) with an eluant having sufficient ionic strength to displace the alpha-1-proteinase inhibitor from the resin into a second eluate; and

(d) recovering alpha-1-proteinase inhibitor from the second eluate obtained from step (c).

4,697,004

PROCESS FOR PREPARING LOW PHYTATE SOY PROTEIN ISOLATE

Gabor Puski, Newburgh; Grant H. Hartman, Jr., Evansville, and Robert D. Talbott, Newburgh, all of Ind., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 6, 1985, Ser. No. 773,481

Int. Cl.⁴ A23J *1/14*

U.S. Cl. 530—378 **23 Claims**

1. A process for preparing a soy protein isolate with significantly reduced aluminum content and substantially free of phytate which comprises treating a defatted soybean raw material containing soy protein by forming a slurry with an aqueous medium at a pH within the range of pH 8 to 10 and at a temperature above 65° C. for a period of time sufficient to solubilize the soy protein; but reduce extraction of phytates; separating said slurry into an insoluble fraction containing a substantial portion of the polysaccharides and insoluble phytates and a soluble fraction which includes the solubilized soy protein; adjusting the pH of said soluble fraction above the isoelectric range to 5.0 to 5.5 to precipitate the soy protein and thereby produce a whey fraction containing soluble phytate and a soy protein solids fraction having a phytate concentration below 0.3%.

4,697,005

1-FLUORO, 4-FLUORO, AND 1,4-DIFLUORO ANTHRACYCLINE ANTICANCER ANTIBIOTICS

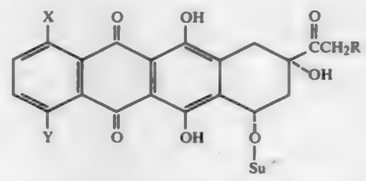
John S. Swenton; Gary W. Morrow, and Waldemar Priebe, all of Columbus, Ohio, assignors to Ohio State University Research Foundation, Columbus, Ohio

Filed Mar. 20, 1985, Ser. No. 714,131

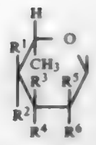
Int. Cl.⁴ C07H *15/24*

U.S. Cl. 536—6.4 **13 Claims**

1. A compound of the formula (I)



where R is hydrogen or hydroxyl, one of X and Y is fluorine and the other is hydrogen or both X and Y are fluorine, and S_u is a hydrogen atom or a sugar moiety represented by the formula



wherein one of R^1 and R^2 is hydrogen and the other is hydroxy, acyloxy having 2 to 4 carbon atoms or a halogen atom; one of R^3 and R^4 is hydrogen and the other is amino; and R^5 and R^6 are hydrogen; and pharmaceutically acceptable acid addition salts thereof.

4,697,006

MODIFIED OLIGOSACCHARIDES USED AS SUBSTRATE FOR MEASURING α-AMYLASE ACTIVITY

Tokuji Ikenaka, Sakai, and Kaoru Omichi, Toyonaka, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 532,099, Sep. 14, 1983, Pat. No. 4,622,295. This application Sep. 15, 1986, Ser. No. 907,358

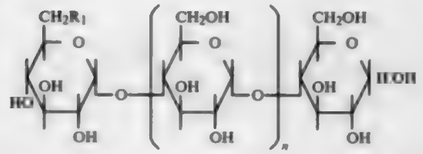
Claims priority, application Japan, Sep. 16, 1982, 57-161457; Jul. 28, 1983, 58-138344

Int. Cl.[4] C08B *37/00*; C12Q *1/40, 1/54*; C12N *9/26*

U.S. Cl. 536—17.2 **4 Claims**

1. A modified oligosaccharide represented by the formula:

(I)



wherein R_1 is a 2-aminopyridyl group, a 3-aminopyridyl group, an anilino group, a methylanilino group, a hydroxyanilino group or a carboxyphenylamino group; and n is an integer of 2 to 5.

4,697,007

PREPARATION OF MICROCRYSTALLINE TRIACETYLCELLULOSE

Georg Seitz, Darmstadt, and Rainer Wernicke, Neu-Isenburg, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,130

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407596

Int. Cl.[4] C08B *3/06*

U.S. Cl. 536—83 **6 Claims**

1. In a process for the preparation of microcrystalline triacetylcellulose comprising acetylating microcrystalline cellulose in the presence of an acid catalyst, the improvement which comprises employing a catalytic amount of at least one perfluoralkanesulfonic acid having 1–8 carbon atoms as the catalyst.

4,697,008

PRODUCTION OF WATER-INSOLUBLE ALKALI METAL SALTS OF CARBOXYALKYL CELLULOSE

Hideharu Asano, Nakakubiki, and Hisakazu Senda, Joyo, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Dec. 11, 1986, Ser. No. 940,420

Claims priority, application Japan, Dec. 13, 1985, 60-281612

Int. Cl.[4] C08B *11/20*

U.S. Cl. 536—89 **11 Claims**

1. A method of producing a water-insoluble alkali metal salt of carboxyalkyl cellulose which comprises reacting a water-soluble alkali metal salt of carboxyalkyl cellulose with an aliphatic hydroxycarboxylic acid.

4,697,009

N-SILYLPROPYL-N'-ACYL-UREAS AND PROCESS FOR THEIR PRODUCTION

Ulrich Deschler; Peter Kleinschmit, both of Hanau, and Rudolf Michel, Freigericht, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 18, 1986, Ser. No. 875,867

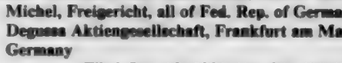
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524215

Int. Cl.[4] C07F *7/10*

U.S. Cl. 540—487 **16 Claims**

1. A N-silylpropyl-N'-acyl-urea of the formula:

(III)



in which

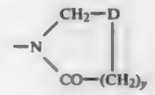
x is 0, 1, or 2

R is C_1–C_6 alkyl, (2'-methoxy)ethyl or aryl,

A is



where R^1 is C_1–C_6 alkyl, R^2 is hydrogen, C_1–C_6 alkyl or A is



where y is 1, 2, or 3 and D is $—CH_2—$, or $>NR^1$.

4,697,010

CATALYZED OXIME CONVERSIONS

Patrick E. McMahon, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 5, 1986, Ser. No. 870,822

Int. Cl.[4] C07D *201/04*

U.S. Cl. 540—536 **3 Claims**

1. A process comprising reacting cyclohexanone oxime in with an inert diluent over a catalyst composition comprising a HAMS-1B crystalline borosilicate molecular sieve incorporated into an inorganic matrix to form caprolactam.

4,697,011

N-FLUORO-N-PERFLUOROMETHYL SULFONAMIDES

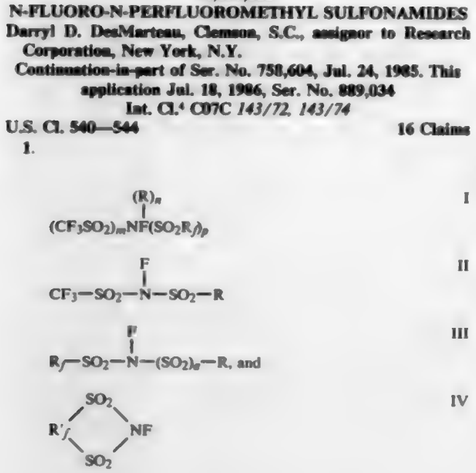
Darryl D. DesMarteau, Clemson, S.C., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 758,604, Jul. 24, 1985. This application Jul. 18, 1986, Ser. No. 889,034

Int. Cl.[4] C07C *143/72, 143/74*

U.S. Cl. 540—544 **16 Claims**

1.



wherein

R is a hydrocarbon radical which is substituted or is unsubstituted and which is a C_{1-30} branched or straight chain alkyl, C_{3-30} cycloalkyl, or aryl (C_{1-10} alkyl) or aryl group wherein aryl and aryl are C_{6-14} arylene,

R_f is a perfluorinated radical which is C_{2-30} branched or straight chain alkyl, C_{3-30} cycloalkyl, or aryl (C_{1-10} alkyl) or aryl group wherein aryl and aryl are C_{6-14} arylene,

R'_f is a perfluorinated radical which is $(CF_2)_{n'}$ wherein n' is 1 to 4,

a is 0 or 1 and

m is 1 or 2, n is 0 or 1, p is 0 or 1 and m+n+p=2.

4,697,012

MORPHOLINO PYRIDYL THIAZOLE COMPOUND

David A. Boulton, Edison; Ihor E. Kopka, Newark; Vernon L. Moore, Scotch Plains, and Arsenio A. Pessolano, Colonia, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 25, 1984, Ser. No. 634,094

Int. Cl.[4] C07D *413/14*

U.S. Cl. 544—124 **1 Claim**

1. The compound

2-benzyl-4-[2-(morpholino)-4-pyridyl]thiazole.

4,697,013

CONDENSED AS-TRIAZINE DERIVATIVES

András Messmer; Sándor Bátori; György Hajós; Pál Benkó; László Pallos; Lujza Petöcz; Grasser Katalin, and Ibolya Kosóczky, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Sep. 20, 1984, Ser. No. 652,613

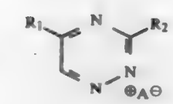
Claims priority, application Hungary, Sep. 20, 1983, 2251/3241/83

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.[4] C07D *253/08*

U.S. Cl. 544—183 **3 Claims**

1. A compound of the formula I

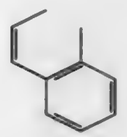


Z

and isomers thereof wherein

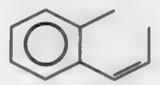
R_1 is C_{1-10} alkyl or phenyl or naphthyl, the two latter groups being optionally substituted by one or more halogen, nitro, amino, hydroxy, C_{1-4} alkyl and/or C_{1-4} alkoxy substituents is halogen,

Z is buta-1,3-dienyl or a group of the formula a



a

or b



b

and

A^- is an anion.

4,697,014

CATALYTIC PARTIAL CYCLOTRIMERIZATION OF POLYISOCYANATES AND PRODUCT THEREOF

Jean Robin, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 25, 1986, Ser. No. 843,512

Claims priority, application France, Mar. 25, 1985, 85 04608

Int. Cl.[4] C07D *251/34*; C08G *18/02*; C08F *4/16*

U.S. Cl. 544—193 **14 Claims**

1. A process for the preparation of a storage-stable polyisocyanurate-polyisocyanate, comprising catalytically cyclotrimerizing an aliphatic or cycloaliphatic polyisocyanate in the presence of a catalytically effective amount of an aminosilyl catalyst, and further comprising terminating the cyclotrimerization reaction when a predetermined desired amount of isocyanurate groups has been reached, by adding to the reaction mixture a reaction terminating amount of water.

14. The product of the process as defined by claim 1.

4,697,015

LIQUID CRYSTALLINE PYRIMIDINYL PHENYL CARBOXYLIC ACID ESTER DERIVATIVES

Mitsuru Kano, Furukawa, and Jun Nakanowatari, Miyagi, both of Japan, assignors to Alps Electric Co., Ltd., Japan

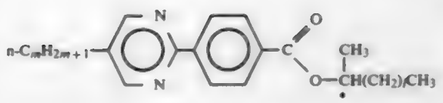
Filed Oct. 2, 1986, Ser. No. 914,284

Claims priority, application Japan, Oct. 4, 1985, 60-221552

Int. Cl.[4] C07D *239/26*

U.S. Cl. 544—335 **5 Claims**

1. A liquid crystalline compound represented by the following general formula:



(I)

where m and l represent individually integers within a range as: $6 \leq m \leq 14$ and $1 \leq l \leq 5$, the symbol * rerents an asymmetric carbon atom and the compound is required to be optically active.

4,697,016

INTERMEDIATES FOR THE PREPARATION OF A CARBOXYLIC ACID

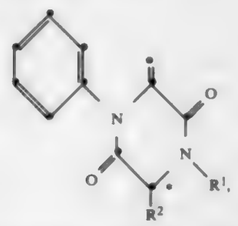
Achim Roloff, Rheinfelden, Switzerland, and Heinz W. Gschwend, New Providence, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 664,916, Oct. 26, 1984, Pat. No. 4,595,766. This application Feb. 14, 1986, Ser. No. 829,336

Int. Cl.[4] A61K *241/18, 471/04, 487/04, 487/14*

U.S. Cl. 544—344 **7 Claims**

1. A compound of the formula



II

wherein R^1 is hydrogen, lower alkyl or aryl-lower alkyl, R^2 is lower alkyl or lower alkyl which is substituted by lower alkoxy, lower alkylthio, aryl or lower alkoxyaryl, or is aryl, or wherein R^1 and R^2, when taken together, are C_2–C_6 alkylene which may be substituted by lower alkoxy or fused to a 5- to 7-membered saturated, partly saturated or aromatic carbocyclic ring, and wherein the symbol * denotes a carbon atom which is either in the S or in the R configuration.

4,697,017

PROCESS FOR THE PREPARATION OF 2-BROMO-α-ERGOCRYPTINE

Gábor Megyeri; Tibor Keve; János Galambos; Lajos Kovács, Jr.; Béla Stefkó; Erik Bogsch, and Ferenc Trischler, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed May 30, 1986, Ser. No. 869,203

Claims priority, application Hungary, Jun. 12, 1985, 2300

Int. Cl.[4] C07D *519/02*

U.S. Cl. 544—346 **2 Claims**

1. A process for the preparation of 2-bromo-α-ergocryptine and its acid addition salts by brominating α-ergocryptine, which comprises carrying out the bromination at room temperature by using a dimethylsulphoxide-hydrogen bromide mixture containing no more than 0.02% of water and, if desired, converting the thus-obtained 2-bromo-α-ergocryptine to an acid addition salt by using a method known per se.

4,697,018

9-JULOLIDINYL DERIVATIVES AND PROCESS OF PREPARING THEM

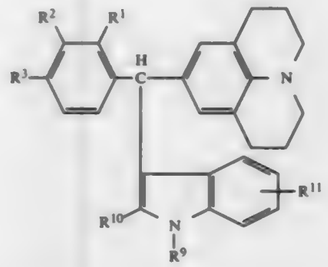
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 290,657, Aug. 6, 1981, Pat. No. 4,403,791. This application Sep. 30, 1985, Ser. No. 781,589

Int. Cl.[4] C07D *455/02, 209/02*

U.S. Cl. 546—94 **7 Claims**

1. A [(2-R^1-3-R^2-4-R^4-phenyl)(9-julolidinyl)(1-R^9-2-R^{10}-5/6-R^{11}-indol-3-yl)]methane having the formula



wherein:

R^1 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl;

R^2 represents hydrogen or nitro;

R^3 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, nitro, dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or alkyl;

R^9 represents hydrogen, C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

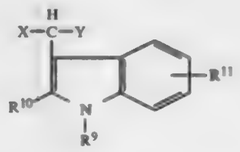
R^{10} represents hydrogen, C_1 to C_3 alkyl, phenyl or



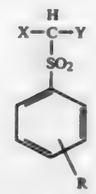
in which B'' represents hydrogen, C_1 to C_{18} alkyl, C_2 to C_8 alkenyl, benzyl or benzyl substituted in the benzene ring by C_1 to C_{12} alkyl, halo or C_1 to C_8 alkoxy; and

R^{11} represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro.

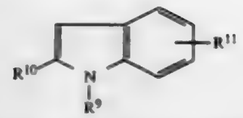
3. A process for preparing a [(X)(Y)(1-R^9-2-R^{10}-5/6-R^{11}-indol-3-yl)]methane having the formula



which comprises interacting a [(X)(Y)(R-phenylsulfonyl)]methane having the formula

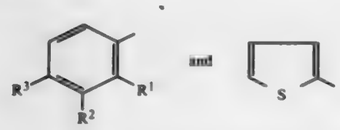


with an indole of the formula



in the presence of an alkaline or an acid catalyst wherein:

X represents a moiety selected from the class having the formulas



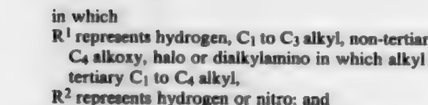
in which

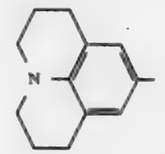
R^1 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl,

R^2 represents hydrogen or nitro; and

R^3 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, nitro, dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

Y represents a moiety selected from the group having the formulas





in which

R^4 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl,

R^5 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, dialkylamino or N-alkylbenzylamino in which alkyl is a non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl,

R^6 represents hydrogen, non-tertiary C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of C_1 to C_3 alkyl or halo,

R^7 represents hydrogen, C_1 to C_3 alkyl or phenyl, and

R^8 represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro;

R^9 represents hydrogen, non-tertiary C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^{10} represents hydrogen, C_1 to C_3 alkyl, phenyl or carboxy;

R^{11} represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro; and

R represents one or two of hydrogen, non-tertiary C_1 to C_{12} alkyl, C_1 to C_3 alkoxy, halo, nitro or acetamido.

4,697,019

AZABICYCLO COMPOUNDS, USEFUL AS INTERMEDIATES

Francis D. King, Newport, England, assignor to Beecham Group p.l.c., Epsom, England

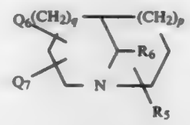
Division of Ser. No. 484,317, Apr. 12, 1983, Pat. No. 4,612,319. This application Mar. 21, 1986, Ser. No. 824,205

Claims priority, application United Kingdom, Apr. 14, 1982, 8210847; Apr. 14, 1982, 8210848

Int. Cl.[4] C07D *221/04, 223/14*

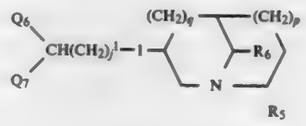
U.S. Cl. 546—112 **11 Claims**

1. A compound of formula (XXII):



(XXII)

or a compound of formula (XXIII):



(XXIII)

wherein

in formula (XXIII), j^1-1 is 1 to 4; and

Q_6 and Q_7 are on the same carbon atom; and

wherein,

in formulae (XXII) and (XXIII),

Q_6 is NH_2 and Q_7 is H and either p is 0 to 2 and q is 1; or p is 1 and q is 0 to 3; and

one of R_5 and R_6 is hydrogen, C_{1-6} alkyl, phenyl or phenyl —C_{1-3} alkyl, which phenyl moieties may be substituted by C_{1-6} alkyl, C_{1-6} alkoxy, CF_3 or halogen;

and the other of R_5 and R_6 is hydrogen or C_{1-6} alkyl.

4,697,020

DERIVATIVES OF 2,4-THIAZOLIDINEDIONE

Angelo Storni, Allschwil, and Alex Meisels, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 754,566, Jul. 12, 1985, abandoned, which is a division of Ser. No. 393,907, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 45,158, Jun. 4, 1979, abandoned, which is a continuation of Ser. No. 639,025, Dec. 9, 1975, abandoned, which is a continuation of Ser. No. 441,680, Feb. 11, 1974, abandoned. This application Oct. 9, 1986, Ser. No. 918,584

Claims priority, application Switzerland, Feb. 13, 1973, 2016/73; Nov. 13, 1973, 15960/73; Nov. 13, 1973, 15961/73

Int. Cl.⁴ C07D *233/28*; A61K *31/425*

U.S. Cl. 548—184 **4 Claims**

1. A member selected from the group consisting of (1) a compound which is the 2,2'-azine of 3-(2-methyl-allyl)-5-methyl-2,4-thiazolidinedione and of 3-methyl-5-hydroxy-2,4-thiazolidinedione, (2) a compound which is the 2,2'-azine of 3-(2-methyl-allyl)-5-hydroxy-2,4-thiazolidinedione and of 3-methyl-5-hydroxy-2,4-thiazolidinedione, (3) a compound which is 3-allyl-3'-methyl-5,5'-dihydroxy-2,2'-dithio-1,1'-bihydantoin.

4,697,021

1,6-DIHYDRO-6-OXO-3-PYRIDINECARBONITRILES, INTERMEDIATES FOR CARDIOTONIC AGENTS

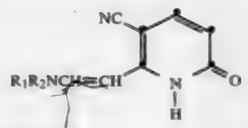
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 824,491, Jan. 31, 1986, Pat. No. 4,657,915, which is a continuation-in-part of Ser. No. 737,129, May 23, 1985, abandoned, and a continuation-in-part of Ser. No. 816,591, Jan. 6, 1986, Pat. No. 4,634,772, and a continuation-in-part of Ser. No. 811,040, Dec. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 765,900, Aug. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 695,603, Jan. 28, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,890

Int. Cl.⁴ C07D *211/84*

U.S. Cl. 546—288 **4 Claims**

1. 2-[2-(di-lower-alkylamino)ethenyl]-1,6-dihydro-6-oxo-3-pyridinecarbonitrile having the formula III



III

and acid-addition salt thereof.

4,697,022

PROCESS FOR THE PREPARATION OF OPTICALLY-ACTIVE CARBAZOLE DERIVATIVES, NEW R- AND S-CARBAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THESE COMPOUNDS

Herbert Leinert, Heppenheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

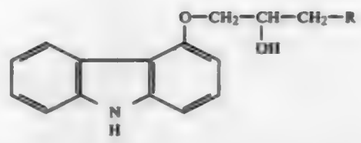
Filed May 21, 1984, Ser. No. 612,255

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319027

Int. Cl.⁴ C07D *209/88*

U.S. Cl. 548—444 **2 Claims**

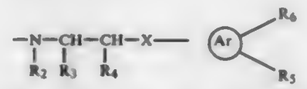
1. A process for the preparation of an R-carbazole derivative of the formula:



(I)

or its pharmacologically acceptable salts wherein

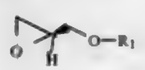
R is an amino group, an amino group substituted by a lower alkyl radical, or the radical:



in which R_2 is a hydrogen atom, lower alkyl, benzyl, phenylethyl or phenylpropyl; R_3 is a hydrogen atom or lower alkyl; R_4 is a hydrogen atom or lower alkyl; X is a valency bond, a $—CH_2—$ group, or an oxygen or sulphur atom; Ar is a phenyl, naphthyl, indanyl, tetrahydronaphthyl or pyridyl; and R_5 and R_6, which can be the same or different, are hydrogen or halogen atoms, lower alkyl, aminocarbonyl, hydroxyl, lower alkoxy, benzyloxy, lower alkylthio, lower alkysulphinyl or lower alkysulphonyl or together represent methylenedioxy;

comprising the steps of

reacting an S-epoxide derivative of the formula:



(II)

in which R_1 is the residue of a substituted sulphonic acid derivative selected from the group consisting of methanesulphonic acid, p-toluenesulphonic acid and benzenesulphonic acid, with 4-hydroxycarbazole in the presence of an organic solvent selected from the group consisting of dimethylsulfoxide, dimethyl formamide and dioxane in an alkaline medium; and

reacting the R-4-(2,3-epoxypropoxy)-carbazole obtained, with ammonia or a substituted amine of the formula RH, in which R has the same meaning as above;

thereafter recovering the R-carbazole derivative or converting the carbazole derivative into a pharmacologically acceptable salt and recovering said salt.

4,697,023

PROCESS FOR THE PREPARATION OF OXY-DIPHTHALIC ANHYDRIDES

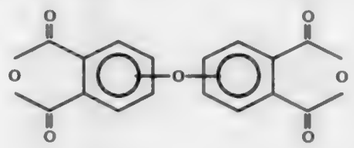
Willis T. Schwartz, Grand Island, and Joseph A. Pawlak, Cheektowaga, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 3, 1986, Ser. No. 914,955

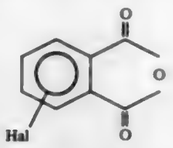
Int. Cl.⁴ C07D *307/89*

U.S. Cl. 549—241 **24 Claims**

1. A process for the preparation of a diphthalic ether dianhydride of the formula



comprising reacting a halo-phthalic anhydride of the formula



where Hal is F, Cl, Br or I, with water and an alkali metal compound selected from the group consisting of KF, CsF, and K_2CO_3 in the presence of polar, aprotic solvent.

4,697,024

MEDROXALOL INTERMEDIATES

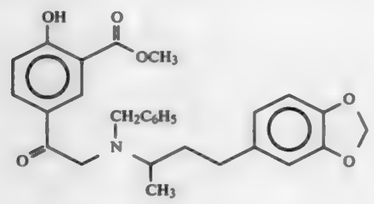
Richard E. Donaldson, and John F. Hoops, both of Midland, Mich., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Nov. 24, 1986, Ser. No. 933,821

Int. Cl.⁴ C07D *317/54*

U.S. Cl. 549—444 **2 Claims**

1. A compound, methyl 5-((4-(3,4-methylenedioxyphenyl)-N-benzyl-2-butylamino)acetyl)salicylate, having the structural formula:



or an acid addition salt thereof.

4,697,025

CARBOXYLATE SALT COMPOUND AND METHOD FOR FLAVORING FOODSTUFFS AND TOBACCO

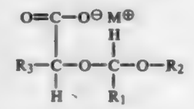
Brian Byrne, Mahwah, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 16, 1985, Ser. No. 776,300

Int. Cl.⁴ C07F *5/06*

U.S. Cl. 556—183 **11 Claims**

1. A compound of the general formula:



where R_1 is an alkyl having from 1 to 14 carbons, alkenyl having from 2 to 14 carbons, cycloalkyl, cycloalkenyl, aryl, or furyl having from 4 to 14 carbons; R_2 is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, or cycloalkynyl of from 1 to 7 carbons, aryl or oxyaryl of from 5 to 18 carbons, or a cycloaliphatic ether of from 5 to 6 carbons; and R_3 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, or cycloalkynyl of from 1 to 7 carbons, aryl, or oxyaryl of from 5 to 18 carbons, or a cycloaliphatic ether of from 5 to 6 carbons, or a radical of the general formula:



where R_4 and R_5 independently are hydrogen or alkyl of from 1 to 6 carbons; and R_6 is aryl, alkylaryl, aryloxy, alkoxy, cyclic acetal of from 3 to 7 carbons, dioxyalkenyl ether of from 4 to 8 carbons; and M is consumable cation other than hydrogen ion.

4,697,026

ACRYL FUNCTIONAL SILICONE COMPOUNDS

Chi-long Lee, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 6, 1986, Ser. No. 816,477

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—418 **26 Claims**

1. An acryl functional silicone compound consisting essentially of at least one silicon atom having an acryl functional radical bonded to the silicon atom through a silicon-carbon bond, where the acryl functional radical contains at least one carbon-nitrogen-carbon bond and an acrylate, methacrylate, acrylamide, or methacrylamide group, any other groups bonded to the silicon atom being monovalent hydrocarbon radicals, fluorinated alkyl radicals, hydrolyzable groups whose hydrolyzed groups do not form a salt with the nitrogen atoms, divalent oxygen atoms which bond two silicon atoms in an Si—O—Si linkage, divalent hydrocarbon radicals bonding at least two silicon atoms together, silicon atoms which are present and which do not have an acryl functional radical bonded thereto can have bonded thereto monovalent hydrocarbon radicals, fluorinated alkyl radicals, hydrolyzable groups whose hydrolyzed groups do not form a salt with the nitrogen atoms, divalent oxygen atoms which bond radicals, fluorinated alkyl radicals, hydrolyzable groups whose hydrolyzed groups do not form a salt with the nitrogen atoms, divalent oxygen atoms which bond two silicon atoms in an Si—O—Si linkage, divalent hydrocarbon radicals bonding at least two silicon atoms together, silicon atoms which are present and which do not have an acryl functional radical bonded thereto can have bonded thereto monovalent hydrocarbon radicals, fluorinated alkyl radicals, hydrolyzable groups whose hydrolyzed groups do not form a salt with the nitrogen atoms, divalent oxygen atoms which bond two silicon atoms in an Si—O—Si linkage, divalent hydrocarbon radicals bonding at least two silicon atoms together.

4,697,027

METHOD FOR PURIFYING ALKOXYSILANE

Junpei Sugihara; Takeshi Imai; Shuzo Toida, and Ikuzo Takahashi, all of Chiba, Japan, assignors to Toray Silicon Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,378

Claims priority, application Japan, Nov. 14, 1985, 60-255469

Int. Cl.⁴ C07F *7/08, 7/18*

U.S. Cl. 556—466 **14 Claims**

1. A method for purifying an alkoxysilane having the general formula

$$R_mSi(OR^1)_{4-m}$$

wherein R is a hydrogen atom, C_{1-8} substituted or unsubstituted monovalent hydrocarbon group; R^1 is a C_{1-8} substituted or unsubstituted monovalent hydrocarbon group; and m is an integer having a value of 0, 1, 2, or 3, the method comprising:

(i) heating the alkoxysilane in the presence of a treating agent selected from a group which consists of acid clays and metal halides;

(ii) contacting the alkoxysilane with a neutralization agent; and

(iii) separating the alkoxysilane from treating agent, the unused neutralization agent and the by-products of neutralization.

4,697,028

PROCESS FOR PRODUCING A DISULFIDE DIMER OF EPTD

Louis F. Bolzan, Briarcliff Manor, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 16, 1985, Ser. No. 809,631
Int. Cl.⁴ C07F 9/38
U.S. Cl. 558—99 **8 Claims**

1. A process for producing a disulfide dimer of hydrocarbylthiophosphonic dichloride which comprises the reaction of hydrocarbylthiophosphonic dichloride of the formula



wherein R is a hydrocarbyl radical free of aliphatic unsaturation and hydrogen sulfide and wherein a solvent is used for preparing and recovering the product.

4,697,029

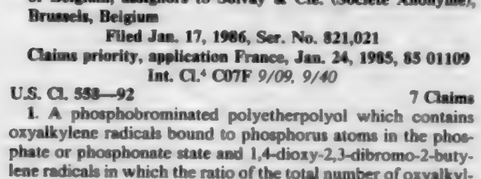
PHOSPHOBROMINATED POLYETHERPOLYOLS AND PROCESSES FOR PRODUCTION THEREOF

André Collin, Ligny, and Henri Wautier, Braine-le-Comte, both of Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

Filed Jan. 17, 1986, Ser. No. 821,021
Claims priority, application France, Jan. 24, 1985, 85 01109
Int. Cl.⁴ C07F 9/09, 9/40
U.S. Cl. 558—92 **7 Claims**

1. A phosphobrominated polyetherpolyol which contains oxyalkylene radicals bound to phosphorus atoms in the phosphate or phosphonate state and 1,4-dioxy-2,3-dibromo-2-butylene radicals in which the ratio of the total number of oxyalkylene radicals to the total number of phosphorus atoms is at least 7, and corresponding to the general formula:

(I)

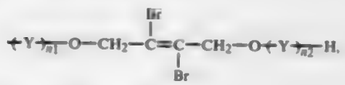


in which

Z denotes a non-hydroxylated aliphatic radical containing from 1 to 6 carbon atoms and of valence z

Y denotes oxyalkylene radicals derived from ethylene oxide, propylene oxide and/or butylene oxide, the radicals Y derived from ethylene oxide representing at most 50 moles % of all the Y radicals

X denotes monovalent aliphatic radicals, which may be identical or different, chosen from radicals of the —R or —OR type in which R denotes a saturated alkyl radical, optionally halogenated, containing from 1 to 3 carbon atoms, and radicals of the type



z denotes an integer ranging from 1 to 4

m denotes a number such that $0 \leqq zm \leqq 50$ z

p denotes a number such that $z \leqq zp \leqq 5$ z and

n_1 and n_2 denote numbers other than zero, such that $2\ pz \leqq pz\ (n_1+n_2) \leqq 12\ pz$, these phosphobrominated polyetherpolyols being further characterized by a ratio of the total number of oxyalkylene radicals to the total number of phosphorus atoms equal to at least 7.

4. Process for producing phosphobrominated polyetherpolyols according to claim 1, comprising steps for, condensing in a first stage, z moles of phosphodichlorinated reagent (IV) in the presence of one mole of hydroxylated initiator (II) to produce a phosphochlorinated product (V) and, condensing in a second stage, pz moles of brominated polyoxyalkylenediol (III) and (p−1) z moles of phosphodichlorinated reagent (IV) in the presence of the product (V) resulting from the preceding stage.

4,697,030

PHOSPHATE-CONTAINING AND PHOSPHONATE-CONTAINING PHOSPHATE ESTERS

Thomas A. Hardy, Thousand Oaks, Calif., and Edward N. Walsh, New City, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 23, 1985, Ser. No. 737,374
Int. Cl.⁴ C07F 9/11, 9/40
U.S. Cl. 558—163 **18 Claims**

1. A compound of the formula:



wherein R is:



R_8 is the same or different and is alkyl, haloalkyl, aryl or haloaryl;

R_2 and R_4 are the same or different and are alkylene or haloalkylene;

Y is an integer from 1–10; and

Z is an integer from 1–10.

8. A compound of the formula:

wherein R is:

R_1 and R_5 are the same or different and are alkyl, haloalkyl, aryl or haloaryl;

R_6 and R_7 are the same or different and are hydrogen, alkyl, haloalkyl, aryl or haloaryl;

R_2 is alkylene or haloalkylene, alkylene or haloalkylene;

n is an integer from 1–2;

a is 0 or 1; and

y is an integer from 1–10.

4,697,031

ANTIHYPERTENSIVE PHOSPHATE DERIVATIVES

Allan Wissner, Ardsley, and Phaik-Eng Sung, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 10, 1984, Ser. No. 679,792
Int. Cl.⁴ C07F 9/10
U.S. Cl. 558—169 **6 Claims**

1. 7-[[4-(phenylmethoxy)phenoxy]methyl]-4-hydroxy-N,N,N-trimethyl-9-oxo-3,5,8-trioxa-4-phosphadecan-1-aminium, 4-oxide, hydroxide, inner salt.

6. 8-[[[5-(dodecyloxy)-1-naphthalenyl]oxy]methyl]-5-hydroxy-N,N,N-trimethyl-10-oxo-4,6,9-trioxa-5-phosphadecan-2-aminium, 5-oxide, hydroxide, inner salt.

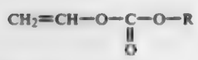
4,697,032

PROCESS FOR THE PREPARATION OF 1-BROMOETHYL HYDROCARBONYL CARBONATES AND NEW 1-BROMOETHYL HYDROCARBONYL CARBONATES

Thierry Malfroot, Saintry sur Seine; Marc Piteau, Itteville, and Jean-Pierre Senet, La Chapelle la Reine, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Nov. 8, 1985, Ser. No. 796,555
Claims priority, application France, Nov. 23, 1984, 84 17847
Int. Cl.⁴ C07C 68/06
U.S. Cl. 558—270 **6 Claims**

1. A process for the preparation of a 1-bromoethyl hydrocarbonyl carbonate, which consists of reacting anhydrous hydrobromic acid with a vinyl hydrocarbonyl carbonate of formula



wherein R is a saturated, C_1–C_8 aliphatic radical or alicyclic radical or an aromatic radical, wherein said aliphatic, alicyclic or aromatic radical is unsubstituted or substituted by halogen atoms or saturated hydrocarbon radicals, at a temperature between 10° C. and 100° C. and isolating said 1-bromoethyl hydrocarbonyl carbonate from the reaction mixture.

4,697,033

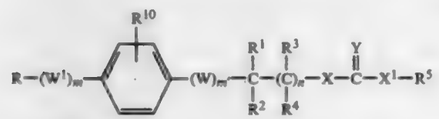
CARBAMIC AND CARBAMOTHIOIC ACID ESTERS AS PESTICIDES

Clive A. Henrick, Palo Alto, Calif., assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 24, 1985, Ser. No. 813,182
Int. Cl.⁴ C07C 149/40, 125/06, 155/02, 119/20
U.S. Cl. 558—233 **26 Claims**

1. A compound of the following formula (A):

(A)



wherein,

each of m and m′ is independently zero or one;

n is zero, one, two or three;

n′ is zero, one or two;

n″ is zero, one, two or three;

W is oxygen, sulfur, NR^6, CR^3R^4 or carbonyl;

W^1 is oxygen, sulfur, NR^6, CR^3R^4, carbonyl, sulfinyl or sulfonyl;

each of X and X^1 is oxygen, sulfur or NR^7; provided that one of X or X^1 must be NR^7, while the other of X or X^1 is oxygen or sulfur;

X^2 is oxygen or sulfur;

Y is oxygen, or sulfur;

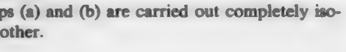
Z is oxygen or sulfur;

R is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower haloalkenyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylthioalkyl, cycloalkyl, halocycloalkyl, or cycloalkylalkyl,

each of R^1, R^2, R^3, R^4, and R^6 is independently hydrogen or lower alkyl;

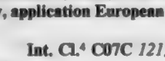
R^5 is lower alkyl, lower alkenyl, lower alkynyl, lower haloalkyl, lower haloalkenyl, lower haloalkynyl, cycloalkyl, cyaloalkylalkyl, phenyl or substituted phenyl;

R^7 is selected from the groups:



R^8 is hydrogen, lower alkyl, lower haloalkyl, lower cycnoalkyl, or substituted or unsubstituted aryl;

R^9 is lower alkyl, aryl, alkoxycarbonyl, substituted or unsubstituted aryloxycarbonyl, alkoxycarbonylalkyl, lower alkylsulfonyl, alkylaminosulfonyl, dialkylaminosulfonyl or the group



and

R^{10} is hydrogen, lower alkyl, lower haloalkyl or halogen.

4,697,034

PROCESS FOR MAKING DIARYL CARBONATES

Mojtaba Janatpour, Evansville, Ind., and Sheldon J. Shafer, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 551,718, Nov. 15, 1985, abandoned. This application Dec. 31, 1985, Ser. No. 815,205
Int. Cl.⁴ C07C 68/02
U.S. Cl. 558—274 **11 Claims**

1. A process for the synthesis of a diaryl carbonate which comprises:

(a) contacting a phenolic compound in a first reaction zone with an equimolar amount or less of an alkali metal hydroxide to form an alkali metal phenoxide compound,

(b) reacting said alkali metal phenoxide compound with phosgene at a temperature above the melting point of the diaryl carbonate being synthesized in a second reaction zone comprising a reactor-mixer providing a highly intimate admixture of the initial reaction system to form the diaryl carbonate, and

(c) recovering substantially pure diaryl carbonate from the reaction mixture;

wherein said steps (a) and (b) are carried out completely isolated from each other.

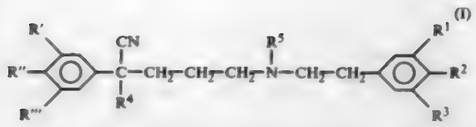
4,697,035

PROCESS FOR THE PREPARATION OF BASICALLY SUBSTITUTED PHENYLACETONITRILES

Lothar Kisielowski; Ingomar Grafe; Walter Liebenow, and Kurt H. Ahrens, all of Nuremberg, Fed. Rep. of Germany, assignors to Ludwig Heumann & Co., GmbH, Fed. Rep. of Germany

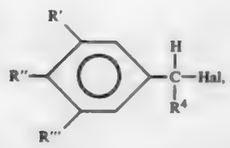
Filed Jun. 3, 1985, Ser. No. 740,250
Claims priority, application European Pat. Off., Jun. 15, 1984, 84106868.7
Int. Cl.⁴ C07C 121/78
U.S. Cl. 558—344 **11 Claims**

1. Process for the preparation of basically substituted phenyl acetonitriles corresponding to the general formula I



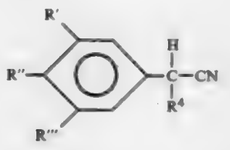
(I)

wherein R′,R″, R‴, R^1, R^2 and R^3 denote, independently of one another, a hydrogen atom, a halogen atom. a lower alkyl group, a lower alkoxy group, a lower alkylmercapto group, an amino group or an amino group which is mono- or disubstituted by a lower alkyl group, R^4 denotes a straight chained or branched aliphatic hydrocarbon group having 1 to 6 carbon atoms or a saturated or unsaturated cyclic hydrocarbon group having 5 or 6 carbon atoms, and R^5 denotes a hydrogen atom or a lower alkyl group, characterised in that a compound corresponding to the general formula II



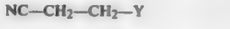
(II)

wherein R′,R″,R‴ and R^4 have the meanings indicated above and Hal stands for a halogen atom, is reacted with a cyanide of the formula Me—CN, wherein Me denotes a monovalent metal, to form the nitrile of formula III



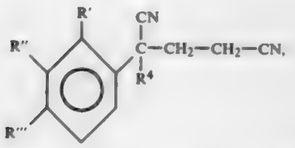
(III)

wherein R′,R″,R‴ and R^4 have the meanings indicated above, the resulting compound III is reacted with a β-substituted propionitrile corresponding to the general formula IV



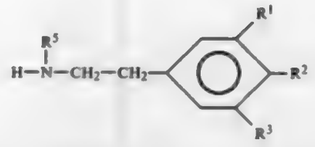
(IV)

wherein Y denotes a lower alkoxy group or the group NH-Z, wherein Z represents a lower alkyl group, a C_5-C_6-cycloalkyl group or an optionally substituted phenyl group, and the resulting compound V



(V)

wherein R′, R″, R ‴ and R^4 have the meanings indicated above, is reduced in the presence of a phenylethylamine corresponding to formula VI



(VI)

wherein R^1, R^2, R^3 and R^5 have the meanings indicated above, or in the presence of a salt thereof.

4,697,036

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE ALPHA-ARYLALKANOIC ACIDS AND NOVEL INTERMEDIATES THEREOF

Claudio Giordano, Vicenza; Graziano Castaldi, Brione; Fulvio Uggeri, Codogno, and Silvia Cavicchioli, Costermano, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

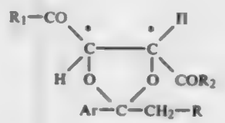
Filed Apr. 5, 1985, Ser. No. 720,380

Claims priority, application Italy, Apr. 6, 1984, 7204 A/84; Aug. 6, 1984, 7206 A/84; Aug. 6, 1984, 7207 A/84

Int. Cl.⁴ C07C *51/16*

U.S. Cl. 562—418 **8 Claims**

1. An enantioselective process for the preparation of an optically active alpha-arylalkanoic acid, said process comprising stereo specifically halogenating the carbon atom in the alpha-position to the ketal group in a homochiral ketal of the formula



in which

Ar represents aryl, aryl substituted by halogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, benzyl, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, phenoxy, thienylcarbonyl or benzoyl;

R represents linear or branched C_1–C_4 alkyl;

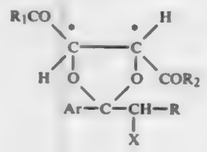
R_1 and R_2, which can be the same or different, represent hydroxy, O^-M^+, OR_3 or NR_4R_5, wherein R_3 is C_1–C_{24} alkyl, C_3–C_6 cycloalkyl, phenyl or benzyl;

M^+ is the cation of an alkaline metal;

R_4 and R_5, which can be the same or different, represent hydrogen, C_1–C_4 alkyl, C_5–C_6 cycloalkyl, or

$$-(CH_2)_n-CH_2OH$$

where n is 1, 2 or 3 or R_4 and R_5 together constitute $-(CH_2)_m-$ wherein m is 4 or 5 or $-CH_2-CH_2-R_7-CH_2-CH_2-$ wherein R_7 is an oxygen atom, NH or N-(C_1–C_4) alkyl; and the C atoms indicated by an asterisk both have (R) or (S) configuration, said ketal being halogenated in the alpha-position to the ketal group with an achiral halogenating reagent giving an epimeric mixture of alpha-halogenketals enriched in the RRS epimer when starting from the RR un-halogenated ketal, and enriched in the SSR epimer when starting from the SS un-halogenated ketal, said alpha-halogenketal having the formula



(A)

wherein:

A_r, R, R_1 and R_2 are as above-defined and X is Cl, Br or I, and

rearranging said mixture to an enantiomeric mixture of alpha-arylalkanoic acids of the formula



where Ar and R are as above-defined, having an enantiomeric ratio at least equal to or higher than the epimeric ratio of the starting alpha-haloketals, in a water-containing medium under acidic conditions.

4,697,037

PREPARATION OF DIBENZO[B,F]THIEPIN COMPOUNDS

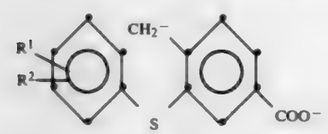
Thomas R. Verhoeven, Cranford, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 610,064, May 14, 1984, abandoned. This application Oct. 11, 1985, Ser. No. 786,768

Int. Cl.⁴ C07C *149/40, 149/42, 51/15, 147/13;* C07D *335/16*

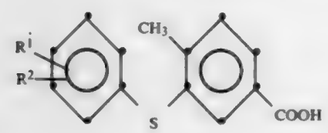
U.S. Cl. 562—432 **17 Claims**

1. A process for preparing a dianion of the formula II:



II

which comprises reacting, in a solvent, sodium hydride with a compound of Formula III:

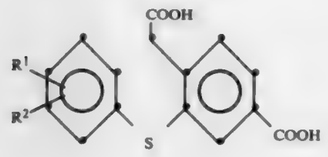


III

wherein

R^1 and R^2 are independently selected from hydrogen, halogen, alkyl or 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio wherein the alkyl moiety has 1 to 4 carbon atoms, alkylsulfinyl wherein the alkyl moiety has 1 to 4 carbon atoms, alkyl sulfonyl wherein the alkyl moiety has 1 to 4 carbon atoms, trifluoromethyl, trifluoromethylthio, cyano, nitro, dialkylamino wherein each alkyl moiety has 1 to 4 carbon atoms, carboxy, and phenylalkyl wherein the alkyl moiety has 1 to 4 carbon atoms, substituted phenylalkyl wherein the alkyl moiety has 1 to 4 carbon atoms and the phenyl group is substituted with halogen, nitro, or alkyl having 1 to 4 carbon atoms, followed by deprotonation with an alkali metal dialkylamide base, an alkylamide base, or an alkali metal amide base.

12. A process of claim 1 further comprising treating said dianion with carbon dioxide to produce a compound of formula I:



I

4,697,038

METAL EXTRACTION USING A NOVEL GROUP OF COMPOUNDS AND CHEMICAL PURIFICATION METHOD

John H. P. Tyman, London, England, assignor to 501 Brunel University, Middlesex, England

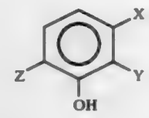
Filed Mar. 7, 1984, Ser. No. 587,068

Claims priority, application United Kingdom, Oct. 24, 1983, 8328403

Int. Cl.⁴ C07C *131/00*

U.S. Cl. 564—265 **8 Claims**

1. A compound useful for extraction of copper from acidic media of the formula



in which:

X represents a straight chain hydrocarbyl group containing from 8 to 17 carbon atoms,

Y represents H or the group —CH=NOH, and

Z represents H or the group —CH=NOH,

provided that Y and Z are different; or such compound containing at least one electronegative substituent on the aromatic ring selected from the group consisting of chloro, nitro and cyano.

4,697,039

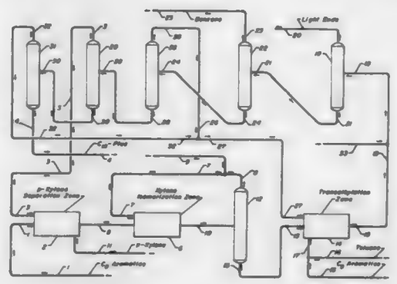
XYLENE PRODUCING PROCESS HAVING STAGED CATALYTIC CONVERSION OF ETHYLBENZENE

Robert J. Schmidt, Rolling Meadows, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 775,982, Sep. 13, 1985, Pat. No. 4,642,406. This application Feb. 9, 1987, Ser. No. 12,401

Int. Cl.⁴ C07C *5/22*

U.S. Cl. 585—477 **19 Claims**



1. In a process for the production of paraxylene wherein a feed stream comprising a mixture of C_8 aromatic hydrocarbons is passed into a processing complex, paraxylene is recovered from a C_8 aromatic hydrocarbon-rich stream in a xylene separation zone, a raffinate stream from the separation zone is processed in a catalytic isomerization zone to produce an isomerization zone effluent stream containing additional amounts of paraxylene, C_7 aromatic hydrocarbons are processed in a catalytic transalkylation reaction zone in contact

with a catalyst to produce benzene and additional xylenes, and the effluent of the transalkylation zone is separated by fractional distillation to recycle toluene and to recover mixed xylenes which are passed into the xylene separation zone; the improvement which comprises staged conversion of ethylbenzene present in the raffinate stream by conversion into paraxylene in the isomerization zone followed by dealkylation of ethylbenzene in the transalkylation zone by a series of steps which comprises passing the raffinate stream into the catalytic isomerization zone, and then passing a process stream containing substantially all of the ethylbenzene and xylenes present in the isomerization zone effluent stream directly into the transalkylation zone, which is operated at high severity conditions including a temperature over 426 degrees Celsius.

4,697,040

ISOMERIZATION OF VINYLIDENE OLEFINS

Roger C. Williamson, Kingwood, Tex., and James J. Harrison, Novato, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 833,296, Feb. 25, 1986, abandoned. This application Jan. 8, 1987, Ser. No. 1,930

Int. Cl.[4] C07C *5/25, 5/27*

U.S. Cl. 585—666 **4 Claims**

1. A process for isomerization of vinylidene olefins at least in part to tri-substituted ethylene compounds, which comprises contacting an olefinic feedstock, containing mostly vinyl olefins and minor amounts of vinylidene olefins, with a catalyst comprising LZ-Y52 zeolite under olefin isomerization reaction conditions.

4,697,041

INTEGRATED SOLAR CELLS

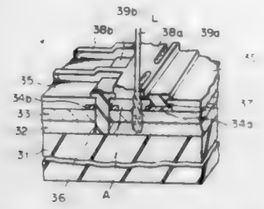
Hiroshi Okaniwa, Hachioji; Kenji Nakatani, and Tetsuo Sato, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Feb. 10, 1986, Ser. No. 828,197

Claims priority, application Japan, Feb. 15, 1985, 60-26426; Mar. 19, 1985, 60-53255; Apr. 19, 1985, 60-82172; May 15, 1985, 60-101540

Int. Cl.[4] H01L *27/14, 31/18*

U.S. Cl. 136—244 **29 Claims**



1. Integrated solar cells comprising a laminate of a bottom electrode layer, a photosensitive semiconductor layer, and a top electrode layer on a substrate and comprising a plurality of series-connected unit cells, at least said bottom and top electrode layers being divided to form said unit cells, the series-connection being made by electrically connecting a bottom electrode layer of a unit cell of neighboring unit cells with a top electrode layer of another unit cell of said neighboring unit cells, in which at least one of the top electrode layer and the semiconductor layer of the laminate has a laser-scribed groove in a designated pattern and an insulating strip is disposed at at least one of:

(a) between the top electrode layer and the semiconductor layer and

(b) between the bottom electrode layer and the semiconductor layer along said designated pattern.

4,697,042

SOLAR GENERATOR

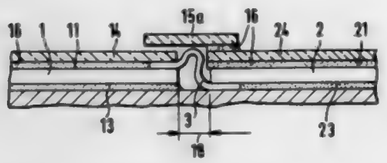
Roland Schilling, Gemmingen, Fed. Rep. of Germany, assignor to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 25, 1986, Ser. No. 889,343

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1985, 3527001

Int. Cl.[4] H02N *6/00*; H01L *25/02*

U.S. Cl. 136—244 **7 Claims**



1. A solar generator for use in space comprising separate and spaced semiconductor solar cells (1, 2) having surfaces (11, 21) provided for light incidence and electrically interconnected, elastically deformable connection contacts (3) for the light incidence surfaces and for the opposite rear faces (13 and 23), with each solar cell having a separate surface covering, wherein the surface coverings (14, 24) are so designed that the spaces (18) between adjacent solar cells, in which the connection contacts (3) are located, are each covered by a bridge (15) connected solely to, and supported solely by, a respective surface covering.

4,697,043

PERCHLOROETHYLENE DIELECTRIC FLUID CONTAINING ALIPHATIC HYDROCARBONS

Edward A. Rowe, Jr., North Perry, Ohio, assignor to Occidental Electrochemical Corporation, Niagara Falls, N.Y.

Filed Oct. 1, 1986, Ser. No. 914,060

Int. Cl.[4] H01B *3/24*

U.S. Cl. 174—17 LF **13 Claims**

9. In an electrical device containing a dielectric fluid, the improvement which comprises employing as the dielectric fluid a nonflammable composition containing perchloroethylene and a minor amount of C_{7-9} aliphatic hydrocarbon.

4,697,044

CASING FOR ELECTRONIC DEVICES

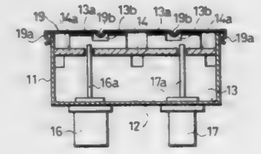
Keisuke Ishikawa, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 686,224, Dec. 26, 1984, abandoned. This application Aug. 25, 1986, Ser. No. 900,232

Claims priority, application Japan, Dec. 26, 1983, 58-200685[U]

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 R **2 Claims**



1. In a casing for electronic devices of the type having a frame formed by a metal plate which is open at an upper end, a cover formed by a metal plate attached by its ends to the frame for covering the open upper end of the frame, and at least one shield plate disposed within the frame extending in a longitudinal direction thereof for dividing the interior of the frame into at least two parts, the shield plate having an upper tip portion adapted to be placed in contact with and to support an inner surface of the cover when the cover is mounted to the frame,

the improvement wherein said cover is formed with a plurality of parallel, elongated bossed projections pressed into the metal plate of said cover facing in a downward direction relative to said frame, and said cover thereby being further provided with a bowed shape facing in the downward direction, whereby said inner surface of said cover, excluding the area of said projections, is pressed securely into contact with said tip portion of said shield plate when said cover is mounted to said frame,

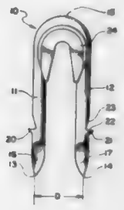
wherein said plurality of parallel projections are pressed in said cover extending in a direction transverse to the longitudinal direction of said shield plate, and said tip portion of said shield plate is divided into a corresponding plurality of sections each having a recess therein to accomodate a respective one of said projections, said casing containing a circuit board for mounting electronic devices thereon, and said plurality of tip sections of said shield plate extending upward through corresponding holes formed in said circuit board to contact said inner surface of said cover.

4,697,045

ELECTRICALLY INSULATIVE STAPLE

Marguerite R. Beatty, 5582 Club View Dr., Yorba Linda, Calif. 92686

Filed Apr. 3, 1986, Ser. No. 846,731
Int. Cl.[4] H01B *17/00*; F16B *15/06*; E01B *9/06*; E06C *9/04*
U.S. Cl. 174—159 2 Claims



1. In an electrically insulative staple intended to be impacted into a wood support structure and having a pair of parallel spaced apart prongs joined together at common ends by a semi-circular cross member and pointed at their opposite ends, the improvement which comprises:

a single barb carried on each one of said pair of prongs outwardly projecting from the external side thereof laterally extending beyond the outer dimension of said respective prongs;

said barb carried on each one of said prongs having a rounded portion outwardly disposed beyond the outer dimension of said respective prongs facing said pointed end of each one of said respective prongs opposite to their ends joined with said cross member;

said barb carried on each of said prongs further having a flat surface normal to the longitudinal axis of said each one of said prongs having an outer surface portion exposed beyond the outer dimension of said respective prong and facing said common end of each one of said prongs joined with said cross member and an inner surface portion disposed within the outer dimension of said respective prong;

an internal pocket provided in each one of said prongs immediately adjacent to said barb inner flat surface portion to be occupied by material of a wood support structure to prevent withdrawal of said staple after installation;

an insulative sleeve disposed on the inside surface of said semi-circular cross member and extending partly along the opposing inner length of each of said prongs, said insulative sleeve having a U-shape in front elevational view with an arcuate groove provided in its outer surface occupied by said cross member; and

said pointed ends of said prongs having terminating points which include angled flat surfaces lying on different planes facing the terminating points of said pointed ends for cooperating to spread said prongs during impacting installation procedure.

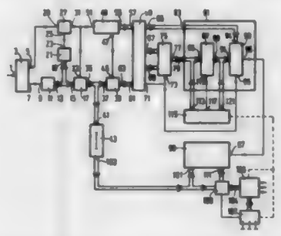
4,697,046

TELETEXT SIGNAL PROCESSING CIRCUIT FOR A TELETEXT RECEIVER

Michaël P. W. Geerings; Wilhelmus J. Christis; Wilhelmus F. Fekkes, and Herman J. R. Schmitz, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1986, Ser. No. 918,176
Claims priority, application Netherlands, Oct. 10, 1985, 8502766
Int. Cl.[4] H04L *13/08, 15/24*
U.S. Cl. 178—1 4 Claims

1. A teletext signal processing circuit for a teletext receiver comprising a page-address selection circuit for the selection of a received page address from a received teletext signal; and a multi-page memory which can be written into with received teletext information of pages determined by a page-number memory, wherein for obtaining a write command (output **96**) for the multi-page memory (**99**, input **97**) the page-number



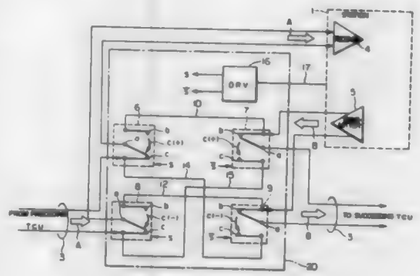
memory (**81**) is read by a received page address obtained from an output combination (**65**, **67**, **69**) of the page-address selection circuit (**59**).

4,697,047

TRUNK COUPLING UNIT

Masato Hirai; Masami Kurata, and Ryozo Yoshino, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Computer Engineering Co., Ltd., Kanagawa, both of, Japan

Filed Aug. 1, 1986, Ser. No. 891,886
Claims priority, application Japan, Aug. 21, 1985, 60-181807
Int. Cl.[4] H04B *3/42*
U.S. Cl. 178—2 C 3 Claims



3. A relay circuit including a plurality of relays for connecting a first terminal and either one of second terminals, wherein one of said relays is connected to the other of said relays in such a manner in which when one of said second terminal of said one relay is connected to one of said second terminal of said other relay, signal supplied to the other of said second terminals of said one relay is complementary to the signal supplied to the other second terminal of said other relay.

4,697,048

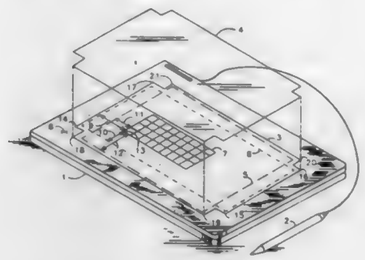
GRAPHICS TABLET MENU LOCATOR ACCOMMODATING DIFFERING SIZES OF PAPER

Brad Clements, Ft. Collins, and John C. Keith, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 29, 1986, Ser. No. 857,006
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 2 Claims

1. Apparatus comprising a digitizing surface upon which coordinates are digitized, the digitizing surface having within

its extent a recess bounded by a plurality of groups of four corners, the corners in each group describing an associated



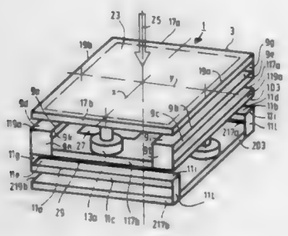
rectangle, and the corners of each group lying outside the rectangles described by the corners of the other groups.

4,697,049

DEVICE FOR PRODUCING X-Y COORDINATE ADDRESSES FOR A PICTURE SCREEN

Horst Peemöller, and Heino Svensson, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,572
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525499
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 5 Claims



1. A device for producing x-y coordinate addresses for a picture screen, comprising

a plurality of force measuring sensors,

an operating plate having a force-sensitive transparent surface which influences said force measuring sensors, so that when a force is exerted at a pressure point on said surface of said operating plate, said force measuring sensors produce pressure point electrical signals, and

an electronic system for converting said signals into digital x-y coordinate addresses which accurately correspond to a geographical place of said pressure point on said picture screen,

said operating plate having first side edges arranged approximately parallel and opposite to each other and second side edges shifted by about 90° with respect to the first side edges and also arranged approximately parallel and opposite to each other, said operating plate being arranged on resilient supports; and characterized by comprising

(a) a plurality of auxiliary plates arranged behind said operating plate in planes parallel to it, said operating plate and said auxiliary plates forming respective pairs of plates;

(b) a pair of resilient edge supports disposed between each pair of said plates, each of said pair of resilient edge supports being arranged between said respective pairs of said plates longitudinally in the same direction between said side edges extending parallel to and over each other, and further being shifted for said respective pairs of said plates alternately about 90° from said first to said second side edges and conversely; and

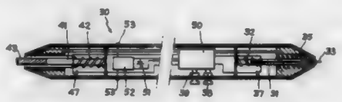
(c) further characterized in that said force measuring sensors are arranged halfway between each pair of said resilient edge supports, each of said force measuring sensors being adjacent said side edges of said plates.

4,697,050

DEVICE FOR DIGITALIZING GRAPHICAL DATA

Alain Farel, 2, allée des Coquelicots, 78630 Orgeval; Manuel Agobian, Pontcarre, and Sinh Le, Maisons Alfort, all of France, assignors to Alain Farel, Oregval, France

Filed Jul. 8, 1986, Ser. No. 883,312
Claims priority, application France, Jul. 9, 1985, 85 10506
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 6 Claims



1. Device for digitalizing graphical data at the time of their creation, comprising:

a drawing table incorporating a grid formed by a first assembly of conductors arranged in lines, and a second assembly of conductors arranged in columns;

write or erase means, comprising: write or erase members for selectively performing visible plottings or effective erasings on the drawing table; means for generating magnetic fields having different predetermined characteristics, each magnetic field corresponding to a respective one of the write or erase functions which can be performed, the generated magnetic field being determined according to the selected write or erase function, and electric supply means to enable the self-operation of the write or erase means, and

a detection and computing circuit, connected to the conductors of the grid to receive the signals induced in said conductors by the generated magnetic field and comprising processing means for working out a position data representing the position of the write or erase member used, with respect to the drawing table, and to differentiate, from the signals received on the conductors of the grid, the various magnetic fields, one from the other, so as to combine the data representing the selected write or erase functions which has been selected with the position data.

4,697,051

DATA TRANSMISSION SYSTEM

Richard D. Begga, Duluth; Harold W. Friesen, and Wendell G. Nutt, both of Dunwoody, all of Ga., assignors to AT&T Technologies Inc., AT&T Bell Laboratories, Berkeley Heights, N.J.

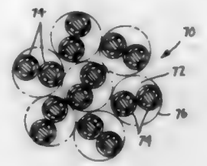
Filed Jul. 31, 1985, Ser. No. 760,867
Int. Cl.[4] H01B *11/04, 11/10*
U.S. Cl. 178—63 D 22 Claims

13. A cable which is capable of relatively high rate, substantially error-free data transmission, said cable comprising:

a core which includes a plurality of twisted pairs of individually insulated conductors wherein the manner in which the pairs are disposed in the core which inhibits substantially pair meshing and the twist lengths, which are relatively short, cause the pairs to be decoupled sufficiently from one another to allow substantially error-free data transmission over relatively long distances, the pairs being

assembled together such that each pair is disposed in a circle having a diameter equal to twice the outer diameter of an insulated conductor and such that the circle which circumscribes the cross-sectional areas of the insulated conductors of each pair is substantially uninterrupted by the circumscribed circle of any adjacent pair;

a metallic shield which encloses said core;



an inner jacket which is interposed between said core and said metallic shield and which has a relatively low dielectric constant, and wherein said inner jacket comprises a plastic material and has a thickness in the range of about one-third to three times the outer diameter of each insulated conductor; and

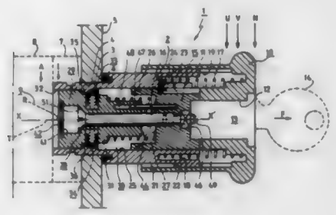
an outer jacket which comprises a plastic material and which encloses said metallic shield.

4,697,052

EMERGENCY SWITCHING APPARATUS

Xavier Ruaud, Soyaux, France, assignor to La Telemecanique Electrique, France

Filed Dec. 23, 1985, Ser. No. 812,685
Claims priority, application France, Dec. 28, 1984, 84 19988
Int. Cl.[4] H01H *27/08*
U.S. Cl. 200—43.07 **5 Claims**



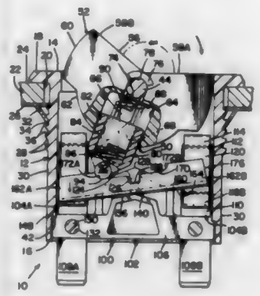
1. A switching apparatus comprising an electric switch having an actuating member and an emergency push-button returned to a neutral position by a return spring and concentrically sliding on a tubular body fitted with an internal sliding piston which is retained by resilient latching means in an inactive position before the push button has linearly travelled over a given distance when the push button is pressed in and which is held in an active position by this same latching means when the push-button has linearly travelled over said given distance said sliding piston being abruptly propelled into engagement with the actuating member by means of a loading spring placed between the sliding piston and the push-button, said piston being mounted inside a bore at one end of the tubular body for moving from said inactive to said active positions, said piston being placed about a connecting coaxial bolt having a first end which is integral with the emergency push-button and a head which is located in close proximity to said actuating member so as to push said actuating member when the push-button has traveled over said given distance and yet the piston has not been able to move towards its active position.

4,697,053

ROCKER SWITCH

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1986, Ser. No. 842,604
Int. Cl.[4] H01H *5/08*
U.S. Cl. 200—68.2 **23 Claims**



1. An electrical switch of the type having an actuator movable between a first position and a second position for moving a bridge member to electrically bridge a first pair of terminals or a second pair of terminals respectively, said terminals engageable with respective corresponding contact means, said switch comprising:

housing means having an actuating face and a contact face;

dielectric insert means mountable within said housing means proximate said contact face thereof;

a first pair of terminal means mounted to said dielectric insert means and having a spaced pair of first contact sections at a selected first location within said housing means after said insert means is mounted therein and further having outer first contact sections at said contact face for engagement with first corresponding contact means;

a second pair of terminal means mounted to said dielectric insert means and electrically insulated from said first pair of terminal means, and having a spaced pair of second contact sections at a selected second location within said housing means after said insert means is mounted therein, and further having outer second contact sections at said contact face for engagement with second corresponding contact means;

a bar having a first conductive end associated with said pair of first contact sections and a second conductive end associated with said pair of second contact sections;

mounting means for securing said bar to said dielectric insert means prior to mounting said dielectric insert means within said housing means such that said first end is proximate said pair of first contact sections and said second end is proximate said pair of second contact sections, said mounting means including a pivot means and permitting actuated movement of said bar about said pivot means between a first position and a second position;

actuating means secured to said housing means proximate said actuating face and movable between a first actuating position and a second actuating position, said actuating means including bearing means engageable with said bar at only a first engaging position proximate said first end thereof and a second engaging position proximate said second end thereof, said actuating means further including means for axially loading said bearing means;

biasing means for camming said bearing means away from loaded engagement with said bar at an initial one of said first and said second engaging positions, and permitting impacting of said bearing means into loaded engagement with said bar at a resulting one of said first and said second engaging positions, during movement of said actuating means between said first and said second positions; and

holding means for holding said bar stationary at an initial one of said first and said second bridging positions such that a respective one of said first and said second ends thereof is held under substantial contact normal force in electrical engagement with a respective pair of said first and second contact sections;

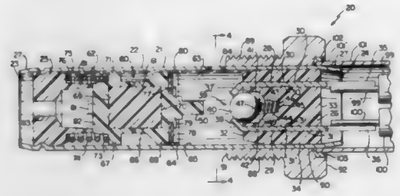
said bar being movable by said actuating means to a first bridging position electrically bridging only said pair of first contact sections when said actuating means is in said first actuating position and to a second bridging position electrically bridging only said pair of second contact sections when said actuating means is in said second actuating position, and said bar being held in said initial one of said first and second bridging positions until being moved to a resulting one of said first and second bridging positions by being impacted by said bearing means proximate said resulting one of said first and said second engaging positions.

4,697,054

DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH CONSTRUCTION AND METHOD OF MAKING THE SAME

Rolf H. Ochsner, Trumbull, and Charles J. Everett, Clinton, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 723,065, Apr. 15, 1985, Pat. No. 4,630,360.
This application Aug. 28, 1986, Ser. No. 900,995
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] H01H *35/38*
U.S. Cl. 200—82 R **3 Claims**



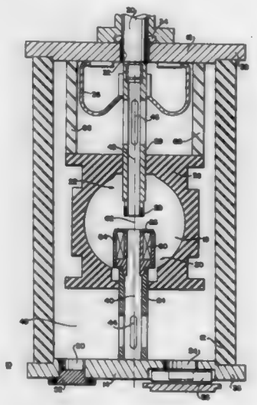
1. In a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid terminals that have body portions thereof disposed substantially parallel to each other and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals for each other when said switch means is in another operating condition thereof, said housing means having actuator means responsive to differential pressures acting across the same and being operatively associated with said switch means to cause said switch means to be in said one condition thereof when having a certain differential pressure acting across the same and to cause said switch means to be in said other condition thereof when having another certain differential pressure acting across the same, the improvement wherein said terminals have free ends bent toward each other at an angle other than a right angle relative to said body portion of its respective terminals, said switch means comprising a movable contact member and a biasing means operatively associated with said contact member for urging and wedging said contact member into bridging contact with said free ends of said terminals and thereby cause said switch means to be in said one condition thereof and for being out of engagement with said free ends of said terminals and threreby cause said switch means to be in said other condition thereof, said contact member comprising a ball, said ball being confined in its movement by said free ends of said terminals, said actuator means comprising a movable piston disposed in said housing means and having opposed ends respectively adapted to be subjected to said differential pressure, one of said ends being movable between said free ends of said terminals and thereby be engageable with said ball to cause movement thereof, a stop being carried by said housing means and being adapted to be engaged by said ball when said ball is moved by said piston to cause said switch means to be in said other operating condition thereof, said housing means comprising a tubular member having opposed open ends and an electrically insulating plug member disposed in one of said ends of said tubular member to close the same, said plug member carrying said terminals and having an end surface means that defines said stop, said free ends of said terminals extending beyond said surface means, said biasing means comprising a coiled compression spring disposed between said surface means and said ball, said ball being disposed between said free ends of said terminals and said spring so as to be confined in its movement by said free ends of said terminals.

4,697,055

ARC EXTINCTION DEVICE FOR GAS INSULATION ELECTRICAL SWITCHGEAR

Jean-Jacques Walter, Boulogne; Daniel Petit, Paris; Joseph Marzocca, Grenoble; Jean Amalric, Meylan, and Georges Bernard, St. Egrève, all of France, assignors to Merlin Gerin, France

PCT No. PCT/FR85/00141, § 371 Date Feb. 4, 1986, § 102(e) Date Feb. 4, 1986, PCT Pub. No. WO86/00169, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 5, 1985, Ser. No. 841,866
Claims priority, application France, Jun. 8, 1984, 84 09056
Int. Cl.[4] H01H *33/64*
U.S. Cl. 200—148 B **9 Claims**



1. Arc extinction device for self-expansion and gas insulation switch or circuit breaker, comprising:

a sealed housing filled with a high dielectric strength insulating gas, notably sulfur hexafluoride,

a divisional arc chute inside said housing,

a pair of separable contacts housed in said arc chute, at least one of the contacts being hollow,

a gas outflow duct from said arc chute to a discharge chamber in which expansion of the gas initially compressed in the arc chute takes place under the action of the arc drawn between the contacts separated when the circuit breaker opens,

and connection terminals in electrical connection with said contacts,

wherein the divisional arc chute comprises in a straight line with the contact separation area a wall forming a curved side revolution surface of a non linear curve, notably convex or concave, in such a way as to form an acoustic resonator reflecting the pressure waves inwardly, causing the gases to converge towards said separation area, and that the separable contacts are located in the vicinity of the middle area of said arc chute.

4,697,056

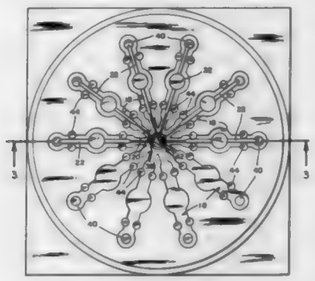
MULTIPOSITION MICROWAVE SWITCH WITH EXTENDED OPERATIONAL FREQUENCY RANGE

Jerzy Hoffman, Los Angeles, Calif., assignor to Dynatech/U-Z, Inc., Venice, Calif.

Continuation of Ser. No. 636,865, Aug. 2, 1984, abandoned. This application Nov. 15, 1985, Ser. No. 798,715

Int. Cl.⁴ H01P *1/12*

U.S. Cl. 200—153 S **7 Claims**



1. A multiposition microwave switch for coupling and switching microwave energy between a central cavity and a plurality of peripherally located coaxial connectors comprising:

(a) a metallic housing having a base and a cover plate, said base having an outer periphery and a plurality of non-recessed sections which define recessed spaced inwardly extending radial cavity sections formed in said base by side walls of the non-recessed sections which side walls, progressively from said periphery, first taper, then expand and then taper again and terminate at a central recessed cavity portion defined at the periphery of the central cavity by terminations of said non-recessed sections and the space between said terminations and wherein the space between cavity sections at said last taper of said side walls forms a narrower transition region between the central cavity than the wider space between the first taper of the side walls to minimize discontinuities encountered by microwave energy propagating between the central cavity and the radial cavity sections between the first taper portion of the side walls such that the microwave energy propagated is substantially constrained to the generally desired TEM mode of propagation;

(b) a central coaxial connector of predetermined characteristic impedance mounted in said base with an inner conductor extending into and coaxially with said central recessed cavity portion;

(c) a plurality of peripheral coaxial connectors each said peripheral connector having a characteristic impedance equal to that of said central connector and being mounted in said base with an inner conductor extending into a peripheral end of one of said radial cavity sections;

(d) a plurality of radial conductors equal in number to said plurality of peripheral connectors, each switchably disposed in one of said radial cavity sections and of a length sufficient to connect said inner conductor of said central connector to said inner conductor of said peripheral connector when in a first of two switchable positions, and biased to be grounded when in a second of said switchable positions; and

(e) actuating means for selectively switching said radial conductors between said two switchable positions.

4,697,057

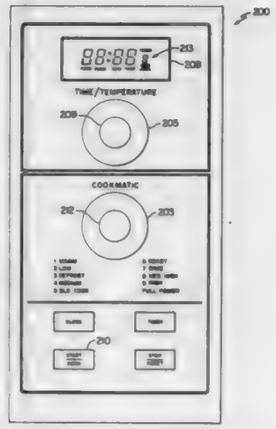
ELECTRICALLY OPERATED CONTROL DEVICE AND SYSTEM FOR A MICROWAVE OVEN AND METHOD OF MAKING THE SAME

Daniel L. Fowler, Kentwood, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 17, 1985, Ser. No. 745,669

Int. Cl.⁴ H05B *6/68*; **G09G** *3/02*

U.S. Cl. 219—10.55 B **5 Claims**



1. In an electrically operated control device for a microwave oven that has power means for cooking food, said device comprising a microprocessor for operating said power means at various selected power levels thereof, and a selector means electrically interconnected to said microprocessor for selecting a desired power level that said microprocessor is to operate said power means, the improvement wherein said selector means comprises a rotary switch means that is electrically interconnected to said microprocessor in such a manner that said selector means always selects the same set sequence of said power levels as said selector means is rotated in one direction from a beginning position thereof that selects a first power level of said sequence to an ending position thereof that selects a last power level of said sequence, said beginning position always being the position where said selector means was last set for a previously desired power level setting of said microprocessor even though said previously desired power level setting was a power level of said sequence other than said first power level thereof.

4,697,058

MICROWELD APPARATUS WITH AN IMPROVED ELECTRODE TIP DESIGN AND TIP SUPPORT

Wolfgang F. Mueller, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,514

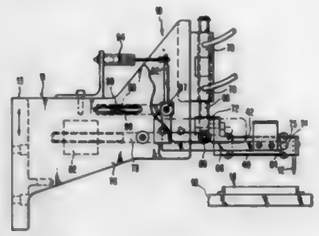
Int. Cl.⁴ B23K *11/32*

U.S. Cl. 219—56.21 **19 Claims**

1. In a welding apparatus for bonding wire with a diameter less than 3 mil to a conductive metal surface wherein an electric current is passed through a portion of the wire in contact with a welding tip, the improvement comprising

a welding tip support means for supporting said welding tip for rectilinear vertical movement, the portion of said tip

support means that moves with and physically supports the welding tip having a movable mass less than 10 grams which is thereby capable of rapid movement necessary to maintain electrical contact between said welding tip and said wire portion during the molten phase of the wire during the welding operation,



said welding tip support means including at least two parallel leaf springs, each with one end fixed to said apparatus, and the other end fixed to said welding tip, and

a means to urge said welding tip support means into engagement with said wire on said metal surface.

4,697,059

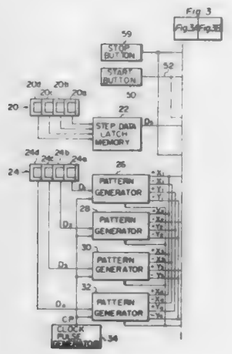
APPARATUS FOR PATTERN CONTROLLED ELECTRODE MOVEMENT FOR E.D.M.

Toshihiko Furukawa, Yamato, Japan, assignor to Sodick Co., Ltd., Japan

Division of Ser. No. 178,235, Aug. 14, 1980, Pat. No. 4,367,391. This application Aug. 31, 1982, Ser. No. 413,595

Int. Cl.⁴ B23H *7/06*

U.S. Cl. 219—69 W **3 Claims**



1. An electro-discharge machining apparatus for progressively conducting precise machining through relative straight and arcuate approach movements between an electro-discharge machining electrode and a workpiece in the horizontal direction substantially perpendicular to a direction in which said electrode is opposed to said workpiece, which apparatus is characterized by divider means dividing a movement region of said relative approach movement into a plurality of straight and arcuate sections with in the horizontal plane and designating trajectories of sid relative straight and arcuate approach movements for the respective straight and arcuate sections for successively and progressively achieving the machining.

4,697,060

ELECTRONIC BEAM WELDING METHOD FOR SCREEN CYLINDER

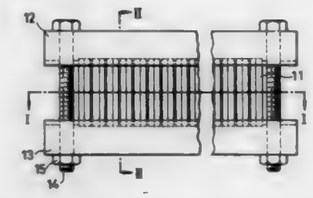
Akio Izuwa, and Tadanobu Yamaguchi, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 26, 1986, Ser. No. 878,804

Claims priority, application Japan, Jun. 26, 1985, 60-139380

Int. Cl.⁴ B23K *15/00*

U.S. Cl. 219—121 ED **2 Claims**



1. An electronic beam welding method for a screen cylinder for welding junctions between both ends of rod-like pieces arranged at regular intervals and flanges with an electronic beam, characterized in that the welding is effected so that the irradiation direction of the beam is directed in the same direction as the surfaces of the welding junction and inclined at an acute angle with respect to a welding direction and the beam completely penetrates the flanges.

4,697,061

METHOD FOR WELDING BY MEANS OF LASER LIGHT

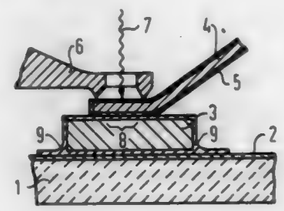
Lothar Spaeter, Aanweiler, and Herbert Prussas, Reichertshausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 901,657

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533468

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LD **5 Claims**



1. A method for laser light welding of a metallic base layer to a thin metallic covering lying thereon, whereby said covering which highly reflects said laser light is covered with a metal skin less highly reflective for said laser light, namely a metal skin which noticeably absorbs said laser light, comprising the steps of wetting both said covering as well as said base layer with a metal skin composed of a solder metal, and subsequently welding said covering to base layer by means of said laser light, wherein said covering utilized contains a high degree of copper which is first covered with said metal skin of solder metal and, subsequently thereto, said covering as welded to said base layer which likewise contains a high degree of copper and which is likewise covered with a metal skin of solder metal, being welded thereto by means of said laser light, wherein said base layer forms a lamina which has been attached as contact spots on a ceramic circuit carrier of an electronic switching system.

4,697,062

PULSE ARC WELDING MACHINE DISABLED DURING SHORT-CIRCUITS

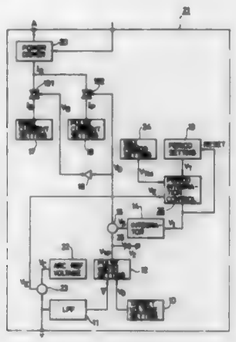
Yoshiro Awano; Hiroshi Suzuki; Takaji Mizuno, all of Aichi; Shigeo Ueguri, Hyogo, and Kenji Higashida, Aichi, all of Japan, assignors to Mitsubishi Denki K.K. and Toyota Jidosha K.K., both of Aichi, Japan

Filed May 16, 1986, Ser. No. 863,920

Claims priority, application Japan, May 16, 1985, 60-104527

Int. Cl.⁴ B23K *9/09*

U.S. Cl. 219—130.51 **7 Claims**



1. A pulse arc welding machine, comprising

means for applying a welding current, comprising current pulses with a predetermined period separated by periods of a base current of a level lower than that of said current pulses, to flow from a welding wire to a welding base metal, thereby performing welding;

means for detecting a difference voltage between said welding wire and said base metal;

means responsive to said difference voltage falling below a predetermined level, for inhibiting said applying means from applying a subsequent current pulse and maintaining said base current.

4,697,063

ELECTRIC HEATING ELEMENT

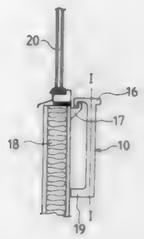
Lars Germundson, Göteborg, Sweden, assignor to L G Innovations AB, Vastra Frolunda, Sweden

Filed Apr. 28, 1986, Ser. No. 856,351

Claims priority, application Sweden, May 7, 1985, 8502235

Int. Cl.⁴ H05B *3/28*

U.S. Cl. 219—213 **11 Claims**



1. An electric heating element, comprising:

a core of electrically conductive material, moulded from a mixture having:

between 20 to 30 percentage by weight of graphite powder,

between 35 to 45 percentage by weight of cement and sand in 1:3 proportions,

between 25 to 35 percentage by weight of silicate of potassium, and

between 5 to 10 percentage by weight of water;

a surrounding shell of non-conductive and impermeable concrete;

conductors directly cemented into said core; and

means for connecting said conductors to a source of alternating current.

4,697,064

METHOD AND APPARATUS FOR HEATING SEATS ELECTRICALLY

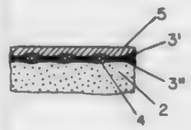
Horst-Dieter Altmann, Gründau-Lieblos, and Eberhard Haupt, Gründau-Rothenbergen, both of Fed. Rep. of Germany, assignors to I.G. Bauerhin GmbH Electro-Technische Fabrik, Gründau-Rothenbergen, Fed. Rep. of Germany

Filed Feb. 4, 1986, Ser. No. 826,068

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505652

Int. Cl.⁴ H05B *3/36*

U.S. Cl. 219—217 **10 Claims**



1. A process for the electrical heating of seats, comprising

(a) placing at least one elongated heat conductor on a first bearing foil made from a thermoplastic material;

(b) insulating said heaat conductor with heating insulation having a dimensional stability exceeding that of said foil by approximately fifty percent;

(c) spreading said heat conductor in meandering channels as closely as possible to each other;

(d) covering said heat conductor with a second bearing foil substantially identical to said first bearing foil; and

(e) bonding said first and second foil to each other and embedding said heat conductor in said meandering channels therebetween, said heat conductor being movable within said meandering channels.

4,697,065

VEHICLE MIRROR ARRANGEMENT

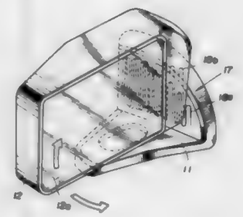
Kenji Ishitsubo, Kanagawa, and Yoshinobu Abe, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Mar. 7, 1986, Ser. No. 837,272

Claims priority, application Japan, Mar. 20, 1985, 60-38941[U]

Int. Cl.⁴ B60R *1/06;* **H05B** *3/20*

U.S. Cl. 219—219 **9 Claims**



1. A vehicle mirror arrangement comprising:

(a) a base attachable to a vehicle body;

(b) a mirror housing;

(c) means for movably connecting said mirror housing to said base; and

(d) means for heating a gap between said base and said mirror housing, said heating means including an electrically powered heating element mounted on at least a surface of said base opposing said mirror housing.

4,697,066

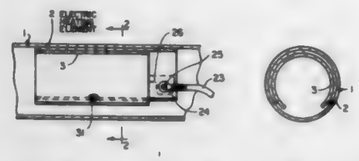
ELECTRIC HAIR CURLING WAVED WITH IMPROVED HEATING ELEMENT ARRANGEMENT

Dov Z. Glucksman, 1578 Beacon St., Brookline, Mass. 02146

Filed Sep. 30, 1985, Ser. No. 781,790

Int. Cl.⁴ A45D *1/04;* **H05B** *3/10;* **H01C** *7/00*

U.S. Cl. 219—225 **8 Claims**



1. In a hair curling wand comprising a handle, a tubular barrel having a far end and a near end, and being attached at said near end to said handle, and means for firmly holding strands of hair wrapped around said barrel, the improvement comprising

a heating element in the form of a flat flexible sheet of a non-conductive material and a resistor in the form of a flexible conductor layer applied to said sheet in a configuration effecting a higher heat output in opposite end areas and a lower heat output in the central area upon application of an electric potential, said heating element being positioned in rolled-up state in said barrel in contiguous relationship with a portion of its inside surface, with the end portions of higher heat output directed towards the respective two ends of said barrel,

terminals on said resistor layer for conductive connection to an electric power source,

elastic means in said barrel serving to urge said heating element onto the inside wall of said barrel, in the form of at least one elastic slotted compressible cylinder of an initially larger diameter than said barrel diameter, slotted lengthwise and provided with means for cooperation with a tool for compressing the cylinder during insertion of said cylinder in compressed state into said heating element inside said barrel.

4,697,067

STEAM-GENERATING DEVICE AND A COOKING OVEN EQUIPPED WITH SAID DEVICE

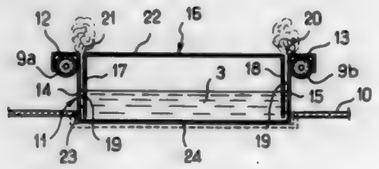
Roger Rosset, Rumilly, and Jacques Mayeur, Seynod, both of France, assignors to SEB S.A., Selongey, France

Filed Jan. 22, 1986, Ser. No. 821,002

Claims priority, application France, Jan. 25, 1985, 85 01053

Int. Cl.⁴ F22B *1/28;* **H05B** *3/00*

U.S. Cl. 219—401 **3 Claims**



1. A steam generator for an electric oven for food cooking, comprising a tubular electric heating resistor (**9**) having two legs (**9a**, **9b**) which are parallel to the bottom wall (**10**) of the oven, wherein a sheet-metal water reservoir (**11**) is placed between the two legs (**9a**, **9b**) of said heating resistor (**9**), said reservoir being provided with two flanges (**12**, **13**) formed respectively on two opposite side walls (**14**, **15**) of said reservoir, said flanges (**12**, **13**) being adapted to cover each of the two legs (**9a**, **9b**) of the heating resistor, said reservoir being closed by a sheet-metal cover (**16**) engaged within said reservoir and provided with side walls (**17**, **18**) which are located in closely spaced relation to the side walls (**14**, **15**) of the reservoir (**11**) and dip into the water (**3**) of said reservoir so as to form between said side walls a capillary space (**19**) which opens outwards in the zone (**20**) located between the two flanges (**12**, **13**) and the edge (**21**) of the top wall (**22**) of the cover (**16**).

4,697,068

ELECTRIC COOKER HEATING UNIT

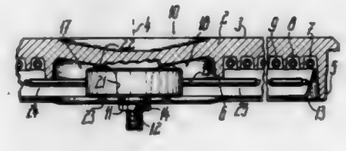
Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro Geräte Blanc u. Fischer, Fed. Rep. of Germany

Filed May 20, 1986, Ser. No. 865,171

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3519035; May 25, 1985, 8515560[U]

Int. Cl.⁴ H05B *3/76*

U.S. Cl. 219—449 **40 Claims**



1. An electric cooker heating unit, comprising:

a heated unit body having an outer side defining a heating surface, an inner side behind said heating surface and a central zone;

an electric heater means for heating said heating surface, said electric heater means having at least two heating resistors arranged behind said heating surface adjacent to said central zone defining a heated region, the heated region having an inside;

a power control device for operating said heating resistors at different power ratings in power units formed at least partly by alternative switched connections among the heating resistors and a power source;

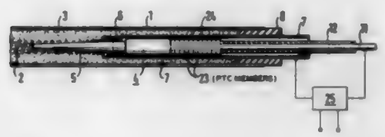
a thermal cutout device located behind the heating surface for disconnecting from the power source at least one of said heating resistors at a predetermined temperature setting, said thermal cutout device having a cutout casing means arranged in the central zone of said unit body and having a temperature sensing means for the unit body, and wherein the thermal cutout device includes a first and a second thermal cutout, the first and second thermal cutouts having two separate temperature sensors and the first and second thermal cutouts being operable at different temperature settings, the cutout casing means of the first and second thermal cutouts being arranged in the central zone and including at least one cutout casing, the first thermal cutout being arranged for disconnecting from the power source a first of said power units and the second thermal cutout means being arranged for disconnecting from the power source a second of said power units.

4,697,069

TUBULAR HEATER WITH AN OVERLOAD SAFETY MEANS

Ingo Bleckmann, Ignaz-Rieder-Kai 11, A-5020 Salzburg, Austria

Filed Aug. 22, 1983, Ser. No. 699,385
Int. Cl.[4] H05B 1/02
U.S. Cl. 219—517 3 Claims



2. A tubular heater comprising: a metallic casing tube; a heating coil of electrical resistance material disposed within the casing tube and spaced inwardly of an inner wall of said casing tube; electrical insulation material carried within said casing tube, said heating coil being embedded in said electrical insulation material; at least one tubular element positioned radially inwardly of and adjacent an end of the casing tube and having its axis concentric to the axis of the casing tube, said tubular element having a length substantially less than that of said casing tube to permit bending of said casing tube between the ends thereof; connection means carried within said tubular element and electrically connected with said heating coil; safety element means electrically connectable to a source of electrical power and replaceably positioned within said tubular element and spaced axially outwardly of said heating coil, said safety element means being electrically connected with said connection means for interrupting the flow of current to the heating coil when a predetermined temperature is exceeded,

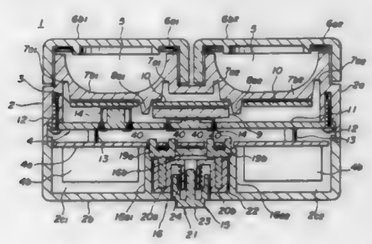
wherein said connection means includes two electrical connections extending out of an end of said casing tube, one of said connections directly electrically connected to said heating coil and the other of said connections electrically connected to said safety element means, and wherein the two connections are arranged concentrically relative to each other.

4,697,070

CONTACT LENS STERILIZATION DEVICE

Isao Kai, Kameoka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 26, 1986, Ser. No. 844,364
Claims priority, application Japan, Apr. 22, 1985, 60-87054; Apr. 22, 1985, 60-60866[U]; Apr. 22, 1985, 60-60867[U]
Int. Cl.[4] H05B 3/10
U.S. Cl. 219—521 9 Claims



8. A contact lens sterilization device, comprising:

a main body casing formed as an integral structure, with a main cavity and a power plug storage chamber being defined in said main body casing and being substantially sealed off from communication with one another by an insulating wall member, said main cavity further being substantially sealed off from communication with the outside, a contact lens sterilization chamber being at least partly defined by a portion of said main body casing which also defines one part of said main cavity;

a control system, comprising at least one electronic component and a printed circuit board, accomodated in said main cavity of said main body casing;

a heating system, likewise accomodated in said main cavity of said main body casing, and selectively actuated by said control system to produce heat and to apply said heat to said portion of said main body which partly defines said contact lens sterilization chamber; a pair of fixed contacts fitted from said main cavity of said main body casing through said insulating wall member to said plug storage chamber and electrically connected in said main cavity to portions of said printed circuit board;

and:

a power plug assembly, received in said power plug storage chamber, comprising:

a main plug body member;

a pair of terminal portions, mounted to said main plug body member, which according to movement of said power plug assembly within said power plug storage chamber selectively either can be projected to the outside from said power plug storage chamber or can be withdrawn to the inside of said power plug storage chamber;

a knob, an actuation portion of which protrudes to the outside of said power plug storage chamber;

and:

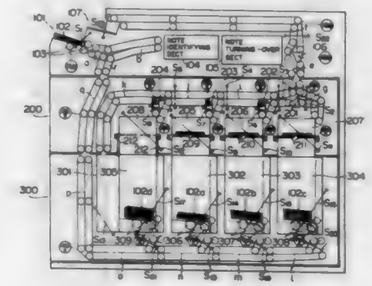
a spring which biases said knob and said main plug body member apart from one another so as to bias said actuation portion of said knob towards the outside and so as to bias said terminal portions each to contact one of said pair of fixed contacts.

4,697,071

CIRCULATION TYPE AUTOMATIC MONEY RECEIVING AND PAYING MACHINE WITH NOTE SIDE IDENTIFYING AND NOTE TURNING-OVER SECTIONS

Shigeaki Hiraoka, and Takamasa Seo, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Continuation of Ser. No. 596,350, Apr. 3, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 906,674
Claims priority, application Japan, Nov. 29, 1983, 58-225163
Int. Cl.[4] B07C 5/00; B65H 29/00, 29/40
U.S. Cl. 235—379 1 Claim



1. A circulation type automatic money receiving and paying machine for receiving and paying notes having a first side distinguishable from a second side on the reverse side thereof and edges, said machine comprising:

a first opening for receiving incoming notes;

a note accepting mechanism for successively accepting incoming notes inserted into said first opening;

a note accepting conveying path;

a note return conveying path;

the note accepting conveying path and the note return conveying path having a common conveying path;

note identifying means for identifying whether or not the incoming notes are false, a denomination of the notes, and the first and second sides of said notes;

a note turning-over section located downstream of said note identifying means, said section having a first conveying path for conveying notes identified by said note identifying means as having their first side facing in a predetermined direction, a second conveying path for conveying notes identified by said note identifying means as having their second side facing in said predetermined direction, the notes having said second side facing in said direction being turned over during conveying thereof by said conveying path, said first and second paths diverging at a junction located between said paths, a turning-over plate located at said junction, said plate being selectively movable to and from a position where it abuts on each of the leading edges of the notes conveyed successively through said note turning-over section, a roller located near said junction for transferring a note that has abutted said turning-over plate to said second path, said roller having vanes thereon, and a third conveying path located downstream of said first and second conveying paths, said first and second paths converging at said third conveying path, and third path passing correctly oriented notes;

temporary holding sections for temporarily holding turned-over notes in accordance with their monetary denominations;

cassette sections, downstream of said holding sections, for receiving notes temporarily held in said holding sections and accommodating the notes in a stack in accordance with their monetary denominations;

note releasing mechanisms, located downstream of said cassette sections, for successively releasing notes from said cassette sections in accordance with monetary denominations;

a released note conveying path for conveying notes released from said cassette sections;

the note common conveying path receiving incoming notes from said first opening, or released note conveyed by said released note conveying path;

a second opening for returning incoming false notes according to a discrimination of truth from falsehood by said note identifying means and for ejecting released notes;

the return conveying path conveying false notes and released notes from said note turning-over section to said second opening;

a distribution conveying path located downstream of said note turning-over section and between said note turning-over section and said temporary holding sections, said distribution conveying path distributing true notes from among incoming notes carried through said note turning-over section to said temporary holding sections according to the monetary denominations determined by said note identifying means; and

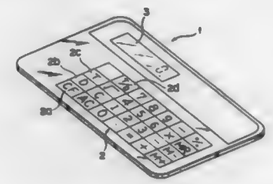
a switch located between said third conveying path of said note turning-over section and said distribution conveying path and between said third conveying path and said return conveying path, said switch receiving notes from said third conveying path and switching notes carried through said note turning-over section to said return conveying path or to said distribution conveying path.

4,697,072

IDENTIFICATION CARD AND AUTHENTICATION SYSTEM THEREFOR

Shigeyuki Kawana, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,872
Claims priority, application Japan, Sep. 7, 1984, 59-187406
Int. Cl.[4] G06K 5/10
U.S. Cl. 235—380 15 Claims



1. An identification card comprising:

input means having a keyboard for entering secret data unique to a card holder and transaction data;

calculating means for calculating encrypted data as a sales approval number (SAN) by using at least the secret and transaction data entered by said input means in accordance with a predetermined encryption algorithm; and

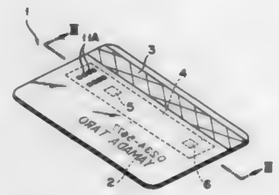
display means for visually displaying the encrypted data calculated by said calculating means, whereby the card holder and a transaction with the card in a store are authenticated in accordance with said encrypted data.

4,697,073

IC CARD

Kazuya Hara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 833,058
Claims priority, application Japan, Mar. 4, 1985, 60-43301
Int. Cl.[4] G06K 19/00
U.S. Cl. 235—487 13 Claims



1. An IC card comprising:

at least one IC chip having electrical terminals;

a sheet-like structure having one surface and supporting said IC chip;

internal connecting members formed on said one surface of said sheet-like structure and including a plurality of connection pads to be connected to the external device and wiring patterns connecting said connection pads to said terminals of said IC chip;

a sheet film having openings facing said connection pads and covering said one surface of said sheet-like structure; and

contact segments formed on said connection pads, having a thickness substantially equal to the thickness of said sheet film and fitted in said first openings.

4,697,074

THERMALLY IMPROVED PHOTODETECTOR HAVING A ROUGHENED, RECESSED, RAISED OR INCLINED LIGHT RECEIVING SURFACE

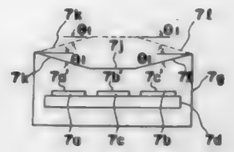
Kazuo Ito, Habikino; Toshiyuki Kudo, Hirakata, and Ritsuo Hama, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 11, 1985, Ser. No. 807,562

Claims priority, application Japan, Dec. 17, 1984, 59-191049[U]; Dec. 17, 1984, 59-191050[U]; Feb. 12, 1985, 60-18248[U]

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **6 Claims**



6. A photodetector for use in an optical head system, comprising:

a photocell assembly including,

a substrate, and

at least one photocell formed on the substrate and having a light receiving face, said photocell assembly being completely embedded in a transparent resin molded body, said resin molded body having a light receiving surface defined therein so as to permit an incoming light incident thereupon to travel directly to the light receiving face of the photocell, said light receiving surface being recessed or raised, such that a portion of the incoming light directed onto the light receiving face of the photocell and reflected outwardly toward the light receiving surface is prevented from being reflected by the light receiving surface back to said light receiving face of the photocell.

4,697,075

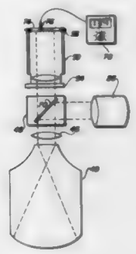
X-RAY IMAGING SYSTEM CALIBRATION USING PROJECTION MEANS

Hartog J. Roos, Brookfield, and Edward F. Schilling, West Allis, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Apr. 11, 1986, Ser. No. 850,515

Int. Cl.⁴ H01J *31/50*

U.S. Cl. 250—213 VT **10 Claims**



1. In an x-ray imaging system of the type including an x-ray source, an image intensifier tube for converting received x-ray radiation to optical images to be recorded photographically and/or electronically apparatus for in situ evaluation of the image intensifier tube performance comprising:

a cylindrical housing having first and second ends;

a lens mounted in said first end of said housing, said lens having a focal point at infinity;

means for mounting said first end to the imaging system in position for receiving light from the image tube;

a removable light diffuser mounted in said second end of said housing, said lens and said diffuser being arranged to be positioned exactly in the focal plane of said lens and displaying on said diffuser an image having a light intensity distribution proportional to the light intensity of the image produced by the image intensifier tube; and

light intensity measuring means for evaluating the light intensity distribution on said diffuser for determining the light intensity produced by the image intensifier tube.

4,697,076

LIGHTING DEVICE FOR INSPECTING OBJECTS FOR FLAWS

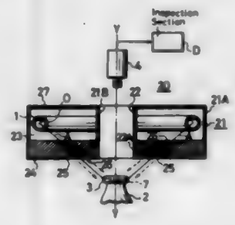
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Filed May 20, 1985, Ser. No. 735,952

Claims priority, application Japan, May 24, 1984, 59-105187

Int. Cl.⁴ G01N *21/47*; B07C *5/342*

U.S. Cl. 250—223 B **5 Claims**



1. An apparatus for inspecting objects for flaws having a photoelectric convertion sensor for receiving a reflected image of said object and producing an electric signal indicative thereof and a processor for receiving said electrical signal and judging whether said object is flawed or not, a lighting device for illuminating said object comprising a housing interposed between said sensor and said object, said housing being made of opaque material having a ring-shaped space and a central through hole axially aligned with said sensor and said object, a ring-shaped light source mounted within the ring-shaped space in said housing, and means interposed between said light source and said object for controlling the incidence of light from said light source on said work object, said controlling means comprising an opaque body having a central through-hole and a plurality of light paths disposed thereabout, said controlling means being mounted so that the central through-hole of said controlling means is coincident with the central through-hole of said housing and said light paths are arrayed in a predetermined direction such that the light passing therethrough onto said object will normally not be reflected through the central through-holes onto said sensor and will be reflected onto said sensor only when said object is flawed.

4,697,077

VANE ENCODER ASSEMBLY FOR ADJUSTING AN OPTICAL ENCODER IN A DATA STORAGE DEVICE

Otto K. Weber, and Sang S. Rhee, both of Chatsworth, Calif., assignors to Computer Optical Products, Inc., Chatsworth, Calif.

Filed May 12, 1986, Ser. No. 861,987

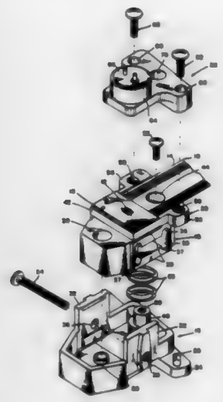
Int. Cl.⁴ G01D *5/34*; G11B *5/56, 21/24*

U.S. Cl. 250—231 SE **20 Claims**

1. An improvement in an apparatus for relative spatial adjustment of a first and second planar object while maintaining

relative angular orientation of said first and second object, said improvement comprising:

four-bar linkage means coupled to a selected one of said first and second objects, said four-bar linkage means for transporting said selected one of said first and second objects in a predetermined direction while maintaining angular orientation of said selected one of said first and second objects with respect to said predetermined direction constant; and



adjustment means for applying a force to said four-bar linkage means causing said four-bar linkage means to transport said selected one of said first and second objects in said predetermined direction,

whereby said selected one of said first and second objects is transported in said predetermined direction thereby altering the relative spatial relationship between said first and second objects while maintaining relative angular orientation of said first and second objects constant.

4,697,078

METHOD FOR QUALITY CONTROL OF COUNTING LOGS

Russel R. Randall, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Apr. 10, 1985, Ser. No. 722,098

Int. Cl.⁴ G01V *5/00*

U.S. Cl. 250—256 **14 Claims**

1. In a well logging method utilizing a counting measurement from a counting log, a method for quantitatively measuring the repeatability of a parameter, wherein said parameter is a function of the counts from said counting measurement, comprising the steps of:

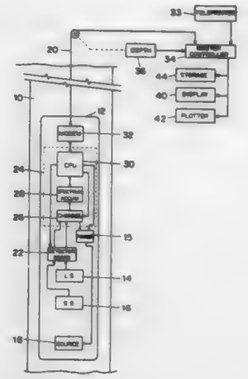
gathering counting data for each of a plurality of vertical depth increments, said increments being less than the vertical depth resolution of said counting log;

deriving from said counting data a value of said parameter for each of said plurality of increments;

deriving from a first and second parameter value a value indicative of the statistical deviation between said first and second values, said first and second values being from consecutive increments;

filtering a plurality of statistical values to generate said quantitative measure of the repeatability of said parameters; and

filtering by use of a variable weighted filter a preselected number of said parameter values, said number being dependent upon said quantitative measure of the repeatability of said parameters, wherein said quantitative measure



controls the weight of said filter and said number is preselected as a function of said weight of said filter.

4,697,079

ANALYZING FLUID FLOWS WITHIN HOLLOW BODIES

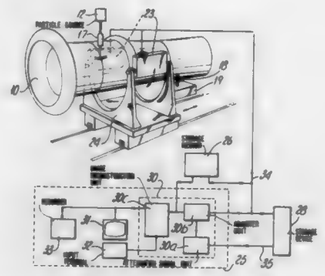
Peter A. E. Stewart, Bristol; Michael R. Hawkesworth, Birmingham, and Roger C. Witcomb, Cheltenham, all of England, assignors to Rolls-Royce plc, London, United Kingdom

Continuation-in-part of Ser. No. 318,939, Nov. 6, 1981. This application Mar. 22, 1985, Ser. No. 714,868

Claims priority, application United Kingdom, Mar. 23, 1984, 8407655

Int. Cl.⁴ G21H *5/02*

U.S. Cl. 250—303 **12 Claims**



1. A method of producing a representation of a fluid flow, comprising:

injecting into the fluid a quantity of particles capable of following the flow, the particles being labelled with a positron-emitting isotope, each particle being capable of bringing at least approximately ten percent of the positrons emitted within said particle to rest before they escape thereform, whereby gamma rays are emitted from the particles;

detecting said gamma rays emitted from the particles, by detection apparatus which produces output signals in response to said gamma rays; and

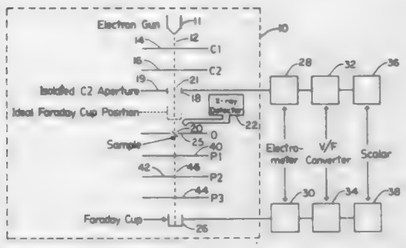
producing from the output signals a representation of the fluid flow.

4,697,080

ANALYSIS WITH ELECTRON MICROSCOPE OF MULTIELEMENT SAMPLES USING PURE ELEMENT STANDARDS

Wayne E. King, Western Springs, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1986, Ser. No. 818,308
Int. Cl.[4] G01N *23/225, 23/223*
U.S. Cl. 250—307 3 Claims



1. A method of determining the composition of a multielement sample containing a plurality of predetermined elemental components comprising the steps of

providing single component samples of each component having at least two thicknesses,

directing a beam of electrons at each sample to generate characteristic x-ray intensities,

simultaneously measuring the x-ray intensities (I) and beam dosage (ϕ) associated with said beam of electrons,

determining a K factor by

$$\frac{S_B}{S_A}\ \frac{\rho_A}{\rho_B}$$

where "S_B" and "S_A" are the slopes of curves of I/ϕ versus thickness determined from said single component samples at said thicknesses and ρA and ρ_B are the densities for components A and B, the K_{AB} factor being a constant in the equation

$$\frac{C_A}{C_B} = K_{AB}\frac{I_A}{I_B}$$

where I is intensity and C is concentration,

exposing the multicomponent sample to the beam of electrons to generate characteristic x-ray intensities for each component,

and measuring the individual intensities to determine the relative concentration of each in the above equation.

4,697,081

INFRA-RED RADIATION DETECTOR DEVICES

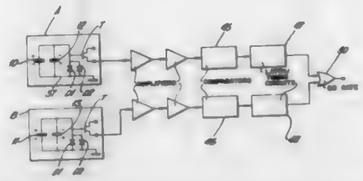
Geoffrey Baker, Southampton, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,031
Claims priority, application United Kingdom, Feb. 8, 1985, 8503240
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—338 11 Claims

1. An infrared radiation detector device comprising:

a first dual detector having first and second pyroelectric detector elements spaced from each other, each pyroelectric detector element producing an individual output signal and comprising a pyroelectric material having opposite surfaces with electrodes on the opposite surfaces, the first and second pyroelectric detector elements being electrically connected to each other to produce a detector output signal which is the difference between the individual output signals; and

a second dual detector having third and fourth pyroelectric detector elements spaced from each other, each pyroelectric detector element producing an individual output signal and comprising a pyroelectric material having opposite surfaces with electrodes on the opposite surfaces,



the third and fourth pyroelectric detector elements being electrically connected to each other to produce a detector output signal which is the difference between the individual output signals;

characterized in that the first pyroelectric detector element of the first dual detector is interdigitated with the third pyroelectric detector element of the second dual detector.

4,697,082

PROCESS AND APPARATUS FOR TESTING TRANSPARENT MATERIAL WEBS, PARTICULARLY PLATE GLASS RIBBONS

Lutz Bartelsen, Hamminkeln, Fed. Rep. of Germany, assignor to Flachglas Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 11, 1985, Ser. No. 807,795
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1984, 3445580
Int. Cl.[4] G01N *21/89*
U.S. Cl. 250—341 15 Claims



1. A process for testing a transparent material web for material defects, comprising the steps of:

conveying a web in its longitudinal direction;

scanning a conveyed web with a laser-produced flying spot over its width and at substantially right angles to the conveying plane and direction;

measuring forward and back scattering produced by the material defects in, in each case, a detection plane sloping with respect to the scanning plane;

deriving electrical signals from the measured values; and

processing said signals for material defect identification,

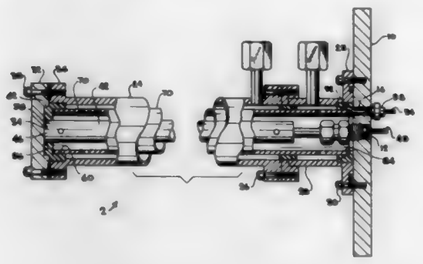
characterized in that the light spot source comprises a laser operating in the IR-range.

4,697,083

ION DETECTOR

Andrew M. Tullis, Livermore, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 30, 1986, Ser. No. 824,037
Int. Cl.[4] H01J *47/02*
U.S. Cl. 250—374 19 Claims



1. An improved ionization detection device comprising:

an ionization chamber;

a central electrode within said chamber;

a cylindrical electrode member within said chamber; and

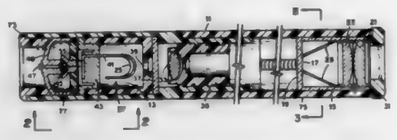
a collet frictionally fitted around at least one of said electrodes, said collet having electrical contact means carried in a groove therein to contact a surface of at least one of said electrodes.

4,697,084

FIBER-TYPE DOSIMETER WITH IMPROVED ILLUMINATOR

Richard J. Fox, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 23, 1985, Ser. No. 812,706
Int. Cl.[4] G01T *1/14;* H01J *47/04*
U.S. Cl. 250—376 5 Claims



1. In a dosimeter of the type comprising a tubular barrel, an ionization chamber disposed coaxially within said barrel and comprising an electrometer having a fiber supported by a frame, a microscope means disposed in a viewing end of said barrel for viewing the position of said fiber along a graduated scale, and means for charging said electrometer including a charging pin movably disposed along the axis of said barrel at the opposite light receiving end thereof, the improvement comprising:

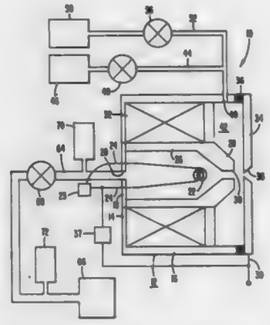
a totally reflecting condenser disposed within said barrel concentrically about said charging pin, said condenser comprising a concave paraboloidal light reflecting surface having a light conducting path passing through the center of said concave paraboloidal reflecting surface and a convex hyperboloidal light reflecting surface, said concave paraboloidal surface disposed to receive light rays from said light receiving end of said barrel and reflect said light rays onto said hyperboloidal surface which is disposed to further reflect said light rays through said light path passing through said concave paraboloidal surface to a focal point coincident with the mid-scale position of said fiber.

4,697,085

APPARATUS AND METHOD FOR PRODUCING IONS

Charles W. Magee, West Windsor Township, Mercer County, and Richard E. Honig, Princeton Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1986, Ser. No. 823,257
Int. Cl.[4] H01J *27/00*
U.S. Cl. 250—426 5 Claims



1. In an ion beam source which includes within a housing a filament cathode, an anode spaced from the cathode and having an opening therethrough, an intermediate electrode between the anode and the cathode and having an opening therethrough in alignment with the opening in the anode, means for providing a magnetic field within said housing, and means for admitting a gas to be ionized into the housing between the anode and the intermediate electrode to create an arc discharge, the improvement comprising

an outlet opening through the housing on the side of the cathode away from the anode and means for causing a flow of the ionizing gas over the cathode and out of the housing through said opening so that the gas removes impurities formed at the cathode.

4,697,086

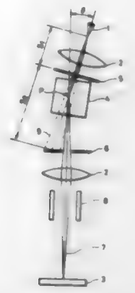
APPARATUS FOR IMPLANTING ION MICROBEAM

Tohru Ishitani, Sayama; Hifumi Tamura, Hachioji, and Kaoru Umemura, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP84/00372, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/01389, PCT Pub. Date Mar. 28, 1985
PCT Filed Jul. 20, 1984, Ser. No. 732,759
Claims priority, application Japan, Sep. 14, 1983, 58-168137
Int. Cl.[4] H01J *37/317, 37/20*
U.S. Cl. 250—492.2 2 Claims

1. An apparatus for implanting an ion microbeam comprising an ion source; beamfocusing means for accelerating ions emitted from said ion source, focusing said ions, separating said ions by mass, and deflecting said ions; and a sample stage which minutely moves a sample; said means including a Wien filter in which a uniform electric field intersects a uniform magnetic field at right angles so as to separate said ions in said beamfocusing means according to mass; said beamfocusing means focusing said ions so that a focusing point of said ions is within

said Wien filter; and a linear optical axis of said beam-focusing means is bent within said Wien filter; wherein the point at



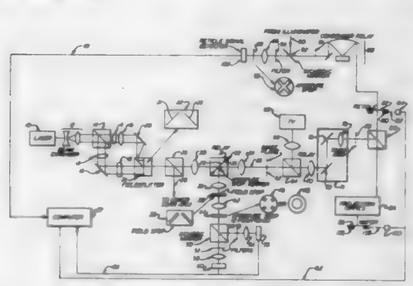
which said optical axis bends coincides with said focusing point of said ions.

4,697,087

REVERSE DARK FIELD ALIGNMENT SYSTEM FOR SCANNING LITHOGRAPHIC ALIGNER

Frederick Y. Wu, Cos Cob, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 31, 1986, Ser. No. 868,506
Int. Cl.[4] G01V *9/04*; G01B *11/27*
U.S. Cl. 250—548 **22 Claims**



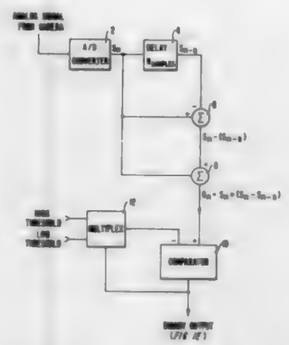
22. A method for aligning a wafer to a reticle comprising:
providing a wafer having a wafer target thereon;
providing a reticle having a reticle target therethrough;
illuminating said wafer target with an alignment image having a predetermined geometry;
scanning said wafer and said reticle relative to said alignment image;
reimaging a portion of said alignment image, which extends beyond said wafer target, onto said reticle target;
collecting light backscattered from said wafer target as said wafer target is scanned past said alignment image;
detecting said backscattered light and providing a first signal proportional thereto;
detecting the portion of said alignment image passing through said reticle target and providing a second signal proportional thereto;
computing alignment errors, magnification errors and rotational errors between said wafer and said reticle based on said first signal and said second signal.

4,697,088

METHOD OF AND APPARATUS FOR DISCRIMINATING SHARP EDGE TRANSITIONS PRODUCED DURING OPTICAL SCANNING OF DIFFERENTLY REFLECTIVE REGIONS

Robert Bishop, Brookline, Mass., assignor to Beltronics, Inc., Brookline, Mass.

Filed Jun. 24, 1985, Ser. No. 747,997
Int. Cl.[4] G01B *11/10*
U.S. Cl. 250—561 **6 Claims**



1. A method of discriminating sharp edge transitions produced during the scanning of differently reflective regions on a surface with insensitivity to subsequent spurious reflection variations in said regions, that comprises, scanning the surface to produce an output having one or more spaced pairs of sharp edge transitions each defining impulses representing relatively highly reflective regions spaced along the surface; converting said output into digital sampling signals; continually delaying N successive sampling signals where N represents the number of sample signals necessary to define the edge transition region, with N being selected as the number of samples required to define the slope of the transition region for the desired discrimination between the highly reflective regions and subsequent spurious reflection variations of different slope and amplitude characteristics; subtracting each sample signal from the previous Nth sample signal to produce a substantial difference signal indicating an edge transition; adding each difference signal and a corresponding sample signal such that only the edge transitions will be emphasized; and comparing the added signals with first and second thresholds that are selected to insure rejection of spurious reflection signals, to generate a binary "one" for the duration of each pair of sharp edge transitions and a "zero" between each pair.

4,697,089

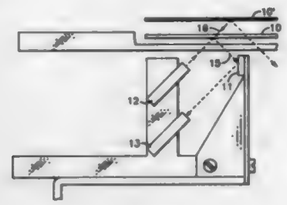
DUAL WAVELENGTH SENSOR WHICH EMPLOYS OBJECT AS PART OF A CORNER REFLECTOR

David J. Drage, Sebastopol, Calif., assignor to Tegal Corporation, Novato, Calif.

Filed Jun. 18, 1986, Ser. No. 875,820
Int. Cl.[4] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—561 **9 Claims**

1. Optical detecting means comprising:
a first means for emitting light at a first wavelength;

a second means for emitting light at a second wavelength;
detector means; and



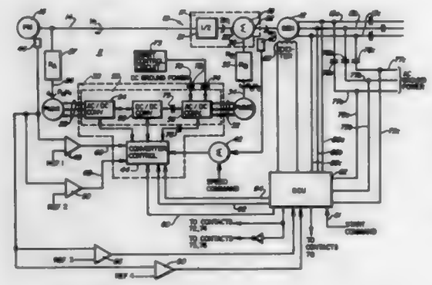
corner reflector means, including an article to be sensed, for re-directing light from said first and second emitters to said detector means.

4,697,090

STARTING SYSTEM FOR AN ELECTRICALLY-COMPENSATED CONSTANT SPEED DRIVE

Robert C. Baker, Loves Park, and Bryan W. Dishner, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 23, 1986, Ser. No. 945,875
Int. Cl.[4] F02N *11/04*
U.S. Cl. 290—4 R **14 Claims**



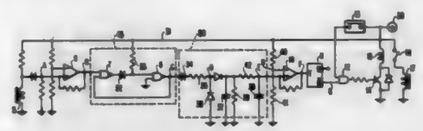
1. A starting system for an electrically-compensated constant speed drive (ECCSD) which develops constant speed motive power from variable speed motive power developed by a prime mover, the ECCSD including a first permanent magnet machine having a motive power shaft coupled to an output shaft of the prime mover, a differential speed summer having a first input shaft coupled to the output shaft of the prime mover, a second input shaft coupled to a motive power shaft of a second permanent magnet machine and an output shaft coupled to a generator and a power converter interconnecting electrical power windings of the first and second permanent magnet machines, comprising:
means coupled to the electrical power windings of the second permanent magnet machine for operating the second permanent magnet machine as a motor to thereby cause the differential output shaft to rotate at increasing speeds; and
means coupled to the generator and responsive to the differential output shaft speed achieving a predetermined speed for applying power to windings of the generator to cause same to operate as a motor and thereby develop motive power which is returned through the differential and the prime mover output shaft to the prime mover to start same.

4,697,091

SLIP DETECTING DEVICE FOR A PRIME MOVER

Yasuji Tamura, Ojima, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jul. 5, 1985, Ser. No. 752,066
Claims priority, application Japan, Jul. 5, 1984, 59-100633[U]
Int. Cl.[4] B61C *15/08*
U.S. Cl. 290—45 **17 Claims**



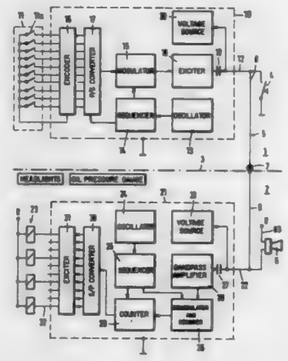
1. In an apparatus driven by a prime mover, a device for providing a slippage signal when slippage is present in the power transfer mechanism used to connect said apparatus to said prime mover, said prime mover also driving an alternator for generating a voltage, said device comprising:
detecting means for detecting a voltage signal frequency which corresponds to the frequency of the output voltage of said alternator;
reference signal means for providing a reference speed signal which correspondes to a speed less than the idling speed of said prime mover; and
comparator means for receiving said voltage signal frequency and said reference speed signal, wherein said comparator means provides said slippage signal when said speed signal corresponding to said voltage signal frequency is less than said reference speed signal.

4,697,092

CONTROL SYSTEM FOR ELECTRICALLY OPERATED COMPONENTS OF AN AUTOMOTIVE VEHICLE

Peter Roggendorf, and Rainer Buchmann, both of Frankfurt, Fed. Rep. of Germany, assignors to Petri AG, Aschaffenburg, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 630,935
Int. Cl.[4] H01H *9/00*
U.S. Cl. 307—10 R **7 Claims**



1. An automotive vehicle comprising a vehicle body having a chassis; a steering wheel mounted on said vehicle body for rotation relative thereto; an electrically energized emitter arrangement for emitting an acoustical warning signal mounted on said vehicle body; a source of electrical energy for said emitter arrangement mounted on said vehicle body; a switch for activating and deactivating said emitter arrangement mounted on said steering wheel; electrical conductor

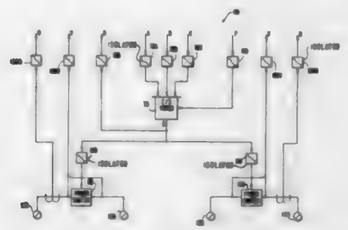
means connecting said emitter arrangement with said source and said switch, said conductor means including a first conductor which connects said emitter arrangement with said switch and a second conductor which connects said emitter arrangement with said source, and said first conductor having a first section which is connected with said switch and is rotatable with said steering wheel and a second section which is connected with said emitter arrangement and is fixed, said first and second sections being provided with cooperating collector means designed to permit relative rotation of said first and second sections; at least one electrically operated component additional to said emitter arrangement and mounted on said vehicle body; selector means for selecting the additional component to be operated and generating signals representative of the additional component mounted on said steering wheel; electrically energized operating means for operating said additional component in response to the signals generated by said selector means mounted on said vehicle body; and signal processing means interposed between said selector means and said operating means, said processing means including a first signal processing unit mounted on said steering wheel, and said first processing unit having first input means connected with said selector means, a source of carrier signals, an encoder for converting the signals from said selector means into binary codes, a modulator for modulating the the carrier signals so that the latter incorporate the binary code and first output means connected with said first section of said first conductor, said processing means further including at least one second signal processing unit mounted on said vehicle body and said second processing units having a demodulator for demodulating the signals generated by said modulator, second output means connected with said operating means and second input means connected with said second section of said first conductor, said first processing unit being designed to generate high frequency output signals and each of said first output means and said second input means having a coupling element which constitutes a d.c. barrier.

4,697,093

TESTABLE, FAULT-TOLERANT POWER INTERFACE CIRCUIT FOR CONTROLLING PLANT PROCESS EQUIPMENT

James F. Sutherland, Plum Boro, and William L. Miller, West Deer Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 23, 1985, Ser. No. 694,190
Int. Cl.[4] G21C *7/36*; G08B *23/00*
U.S. Cl. 307—38 **21 Claims**



1. A power interface circuit for supplying power from a power supply to a plant process control apparatus in dependence upon n input signals, comprising:

voter means, operatively connectable to receive the input signals, for generating a control signal when at least m of the n input signals indicate that the control signal should be generated;

power switches, operatively connected to said voter means and operatively connectable to the power supply and the process control apparatus, for supplying the power to the process control apparatus in dependence upon the control signal;

test pulse means, operatively connected to said voter means, for periodically supplying asymmetrical pulses to test said power switches without activating the process control apparatus; and

feedback and isolation means, having inputs operatively connected to said power switches, for outputting at least one of current and voltage feedback signals which respectively indicate one of current through and voltage across each of said power switches and for providing electrical isolation between said power switches and the at least one of current and voltage feedback signals

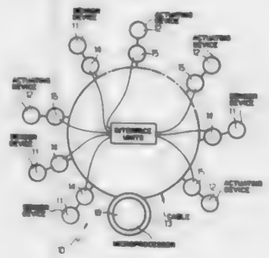
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4,697,094

SYSTEM FOR INTERCONNECTING SENSOR AND ACTUATING DEVICES

Mario Palazzetti, Avigliana, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 3, 1986, Ser. No. 825,234
Claims priority, application Italy, Feb. 4, 1985, 67101 A/85
Int. Cl.[4] H02J *13/00*
U.S. Cl. 307—40 **13 Claims**



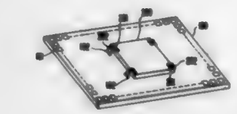
1. A system connecting with sensor devices for controlling operation of actuating devices comprising at least one cable having a preselected number of signal conducting lines, a plurality of interface units comprising flip-flop circuit containing counter stations, each of said interface units connected between said conducting lines of said cable and a respective sensor and actuating device, first means providing scanning signals, during scanning cycles of said stations, on first and second of said signal conducting lines for cyclically and sequentially enabling, by way of said interface units, connection of said sensor and actuating devices to a third line of said cable, which said third line is supplied with a sensing signal which is a function of a parameter detected by said sensor devices, second means in the interface units associated with said sensor devices for providing an input signal to third means in associated interface units for said actuating devices, said second and third means being like means in series connection in said second line comprising an interrupted and thus a non-continuous line, a preselected one of the interface units for a preselected actuating device being selectively operated under control of a preselected sensing device as a function of said sensing signal supplied to said third line and by the scanning signal on said first and second lines.

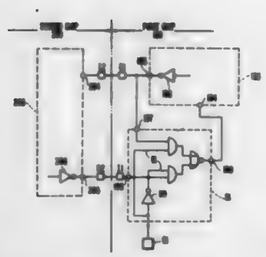
4,697,095

CHIP-ON-CHIP SEMICONDUCTOR DEVICE HAVING SELECTABLE TERMINAL CONNECTIONS

Shigeru Fujii, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 2, 1985, Ser. No. 782,931
Claims priority, application Japan, Oct. 5, 1984, 59-209236
Int. Cl.[4] H03K *17/693*
U.S. Cl. 307—243 **15 Claims**





1. A semiconductor device including a first chip and a second chip mounted on said first chip, said first and second chips having first and second internal circuits formed thereon, respectively, said first chip comprising:

an input node and an output node provided for said first internal circuit;

and input terminal and an output terminal formed at an inner region of said first chip, said input terminal being for receiving incoming signals from said second internal circuit, and said output terminal being connected to said output node of said first internal circuit;

a selecting circuit having first and second input nodes and an output node, said first and second input nodes of said selecting circuit being connected to said output terminal and said input terminal, respectively, and said output node of said selecting circuit being connected to said input node of said first internal circuit; and

a control signal input terminal for receiving a control signal for controlling said selecting circuit, said control signal input terminal being formed at a peripheral region of said first chip and connected to said selecting circuit,

wherein said selecting circuit switches said input node of said first internal circuit to connect to said input terminal or to said output terminal, according to said control signal.

4,697,096

HIGH VOLTAGE SOLID STATE SWITCH

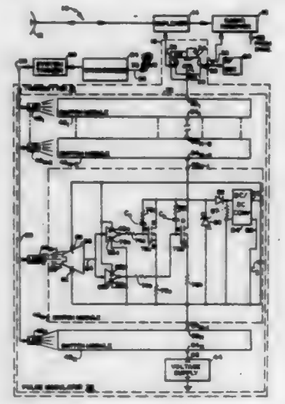
George M. Conrad, Marlboro, and Kenneth M. Smalley, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 707,931, Mar. 4, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 921,836
Int. Cl.[4] H03K *17/56, 3/42, 17/687*
U.S. Cl. 307—246 **15 Claims**

1. A switching circuit for electrically coupling, or decoupling, a voltage supply to, or from, a load selectively in accordance with an electrical control signal, such circuit comprising:

(a) means for converting the electrical control signal into a radiant energy signal; and,

(b) a plurality of switching modules serially coupled between the load and the voltage supply, each one of the modules being at a different reference potential, each one of such modules including: a switching transistor; means, responsive to the radiant energy signal, for providing a drive voltage to drive such transistor into either a conducting or a non-conducting condition selectively in accordance with the radiant energy; energy storing means, such energy storing means being coupled to the voltage supply for storing energy therein when such voltage source is decoupled from the load, such storing means



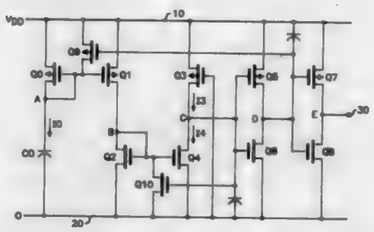
applying power to such drive voltage providing means when the voltage supply is coupled to the load; and means, coupled to such transistor, for regulating such drive voltage to a substantially constant predetermined voltage with respect to the reference potential of such module to maintain a substantially constant current from such voltage source through each of such transistors to such load during the conducting condition of such transistor.

4,697,097

CMOS POWER-ON DETECTION CIRCUIT

Andreas Ruznyak, Chene-Bougeries, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1986, Ser. No. 854,289
Int. Cl.[4] H03K *3/01, 5/153, 5/159, 5/22*
U.S. Cl. 307—296 R **11 Claims**



1. A CMOS power-on detection circuit comprising first and second power supply lines; capacitive means coupled between said supply lines, in which a charging current is generated in response to a rising supply potential wherein the charging current in the capacitive means may be generated through first diode means connected in series with the capacitive means between the first and second supply lines and forming a first node therebetween; first and second complementary MOS

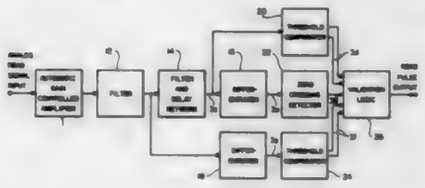
transistors connected in series between the first and second supply lines with their drain electrodes connected together to form a second node, the gate electrode of the first transistor being coupled to one of said supply lines so that the conductance of that transisitor increases as the supply potential rises; means coupling said second transistor to said capacitive means for driving the second transistor with a potential derived from the charging current, an indication of the supply potential having attained a predetermined or maximum value being provided by a predetermined potential change at the said second node.

4,697,098

COMPOSITE GATE GENERATOR CIRCUIT FOR DETECTING VALID DATA SIGNALS

Robert L. Cloke, Santa Clara, Calif., assignor to Prism Corporation, San Jose, Calif.

Filed Jan. 10, 1985, Ser. No. 743,037
Int. Cl.[4] H03K *5/153;* **H04B** *1/110*
U.S. Cl. 307—354 **7 Claims**



1. A gate generator circuit for validating and passing valid readout signals to an output utilization circuit comprising:
a source of input signals;
filtering means coupled to said source for filtering said input signals;
a first channel comprising:
a first differentiator means coupled to said filtering means for differentiating the filtered signal; and
a first threshold comparator coupled to said first differentiator means for comparing the differentiated signal from said first differentiator means to a fixed reference voltage;
a second channel comprising:
a second threshold comparator coupled to said filtering means for comparing an undifferentiated signal to a selected fixed reference voltage;
a third channel comprising:
a second differentiator means coupled to said filtering means for differentiating the filtered signal; and
a zero crossing detector coupled to said second differentiator means; and
a logic circuit coupled to said three channels for passing only valid readout signals.

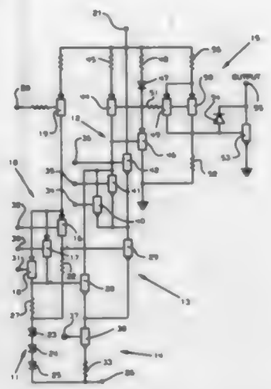
4,697,099

OPEN LINE DETECTOR CIRCUIT

Anthony R. Bonaccio, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1986, Ser. No. 925,018
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **5 Claims**

1. A multisignal comparator circuit comprising:
a pair of comparator stages, each of said stages comprising a plurality of like transistors,
the transistors of the first stage being of a type different from the transistors of the second stage,
each stage comprising a reference transistor having a reference voltage applied thereto and at least one receiving transistor having an input signal applied thereto,
the first stage being coupled to the second stage to control the current passing through the receiving transistor in the second stage,



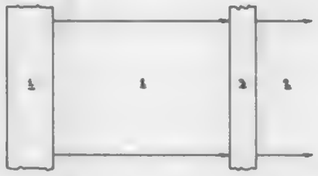
said first stage is provided with complementary outputs and said complementary outputs are coupled to an emitter coupled switch whose outputs are coupled to said second stage.

4,697,100

DEUTERATED L-ARGININE PHOSPHATE MONOHYDRATE

David Eimerl, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 17, 1986, Ser. No. 819,654
Int. Cl.[4] H03F *7/00;* **H01S** *3/10;* **G03C** *1/00*
U.S. Cl. 307—427 **18 Claims**



17. An apparatus for frequency conversion of light, the apparatus comprising:
a laser for generating a laser beam; and
at least one crystal according to the formula:

$$(X_2N)_2CNX\ (CH_2)_3\ CH\ (NX_3)^+COO^-\cdot X_3PO_4\cdot X_2O$$

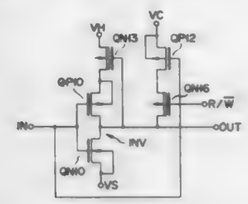
where one or more of the X's represent deuterium replacing hydrogen and with any remaining X locations still being hydrogen, the at least one crystal being placed in the laser beam in an orientation for frequency conversion of the laser beam.

4,697,101

READ/WRITE CONTROL CIRCUIT

Hiroshi Iwahashi, Yokohama; Masamichi Asano, Tokyo; Masaki Momodomi, Yokohama; Hidenobu Minagawa, Kawasaki; Kazuto Suzuki, Kawasaki, and Akira Narita, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba; Toshiba Micro-Computer Engineering Corp., both of Kawasaki and Toshac Computer System Co., Ltd., Tokyo, all of, Japan

Filed Aug. 29, 1984, Ser. No. 645,392
Claims priority, application Japan, Aug. 30, 1983, 58-158723; Sep. 8, 1983, 58-164112; Feb. 13, 1984, 59-24581; Apr. 23, 1984, 59-81289
Int. Cl.[4] H03K *19/096, 17/16;* **G06F** *7/38*
U.S. Cl. 307—452 **14 Claims**



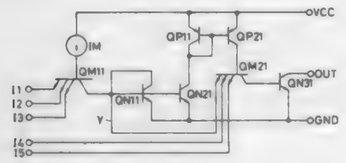
1. A semiconductor integrated circuit comprising:
a voltage terminal connected to receive a high voltage,
an output terminal,
a first MOSFET coupled between said voltage terminal and said output terminal,
a gate voltage setting MOSFET having a gate coupled to said output terminal, a first end coupled to said voltage terminal and the other end coupled to the gate of said first MOSFET, to set the gate voltage of said first MOSFET in accordance with the voltage of said output terminal,
capacitive means, and
a clock pulse generator for supplying a clock pulse to the gate of said first MOSFET, through said capacitive means.

4,697,102

BIPOLAR LOGIC CIRCUIT HAVING TWO MULTI-EMITTER TRANSISTORS WITH AN EMITTER OF ONE CONNECTED TO THE COLLECTOR OF THE OTHER TO PREVENT SATURATION

Takahiro Okabe, Nishitama; Makoto Hayashi; Katuhiro Morisuye, both of Kodaira; Tomoyuki Watanabe; Katsuyoshi Washio, both of Hachioji; Setsuo Ogura, Takasaki; Makoto Furihata, Sawa, and Shizuo Kondo, Takasaki, all of Japan, assignors to Hitachi Microcomputer Engineering Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed May 28, 1985, Ser. No. 737,872
Claims priority, application Japan, May 28, 1984, 59-106390; May 31, 1984, 59-162454
Int. Cl.[4] H03K *19/013, 19/082*
U.S. Cl. 307—454 **4 Claims**



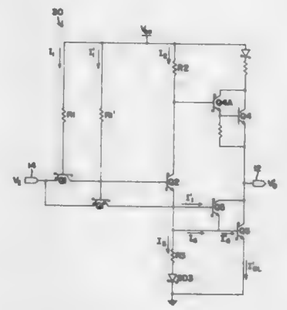
1. A logic circuit comprising:
a first multi-emitter transistor having a first base conductivity type, with its emitters coupled to a group of first input lines, and with its base coupled to a bias means;
a current source having an input and an output, said input being coupled to the collector of said first multi-emitter transistor, wherein output current from said output is substantially equal or proportional to input current into said input;
a second multi-emitter transistor having the first base conductivity type, with its base coupled to said output of said current source; and
a first transistor having the first base conductivity type, which has one or more collectors, with its base coupled to the collector of said second multi-emitter transistor, with its emitter coupled to common line, and with one or more collectors coupled to one or more output lines,
wherein one of the emitters of said second multi-emitter transistor is coupled to the collector of said first multi-emitter transistor, and wherein the rest of the emitters of said second multi-emitter transistor are coupled to a group of second input lines.

4,697,103

LOW POWER HIGH CURRENT SINKING TTL CIRCUIT

David A. Ferris, West Buxton, and Daniel J. DeSimone, Buxton, both of Me., assignors to Qundic Systems, Inc., South Portland, Me.

Filed Mar. 10, 1986, Ser. No. 838,519
Int. Cl.[4] H03K *19/088, 17/16, 19/00, 3/26*
U.S. Cl. 307—456 **14 Claims**



1. An improved TTL output buffer circuit for digital data transmission comprising:
a signal input for receiving binary data signals of high or low potential;
a signal output for delivering binary data signals of low or high potential in response to binary data signals at the input;
a pull-up transistor element for sourcing current from high potential (V_{cc}) to the signal output;
a first pull-down transistor element for sinking current from the signal output to low potential;
a phase splitter transistor element having an emitter coupled to the base of the first pull-down transistor element for controlling the conducting state of the first pull-down transistor element, said phase splitter transistor element having a collector coupled to the base of said pull-up transistor element;
first base drive means coupling the base of the phase splitter transistor element to the signal input;
a second pull-down transistor element having the collector coupled to the collector of the first pull-down transistor element at the signal output and the emitter coupled to drive the base of the first pull-down transistor element for square law enhancement and amplification of sinking current by the first pull-down transistor element;

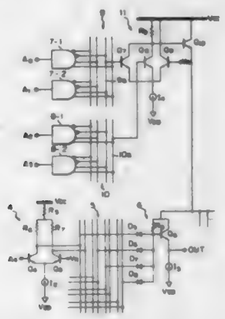
and second base drive means coupling the base of the second pull-down transistor element to the signal input for providing base drive independent from the first base drive means in response to binary data signals at the signal input.

4,697,104

TWO STAGE DECODER CIRCUIT USING THRESHOLD LOGIC TO DECODE HIGH-ORDER BITS AND DIODE-MATRIX LOGIC TO DECODE LOW-ORDER BITS

Yoshinori Okajima, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 24, 1985, Ser. No. 737,464
Claims priority, application Japan, May 31, 1984, 59-109500
Int. Cl.⁴ H03K *19/086, 19/084*
U.S. Cl. 307—463 **6 Claims**



4. A two-stage decoder circuit receiving an input signal having upper and lower bits, said two-stage decoder circuit comprising:

a first-stage decoder circuit, operatively connected to receive the upper bits of the input signal, utilizing threshold-operation type logic to produce a first selection signal in dependence upon at least two of the upper bits of the input signal; and

a second-stage decoder circuit, operatively connected to receive the lower bits of the input signal and the first selection signal, utilizing diode-matrix type logic to produce a second selection signal to be output from said two-stage decoder circuit, in dependence upon the lower bits of the input signal and the first selection signal.

4,697,105

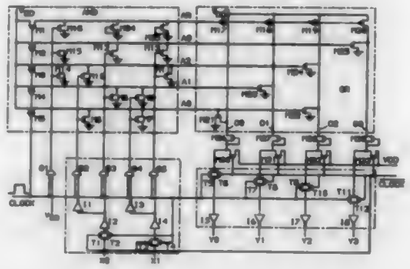
CMOS PROGRAMMABLE LOGIC ARRAY

Thomas H. Moy, Allentown, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 23, 1986, Ser. No. 888,796
Int. Cl.⁴ H03K *19/177, 17/284*
U.S. Cl. 307—465 **3 Claims**

1. An integrated circuit comprising a programmable logic array having an AND plane and an OR plane, wherein said AND plane includes conductive AND logic lines (A0 . . . A3) and precharge transistors (M5 . . . M2) controlled by a clock for charging the AND logic lines to a high voltage level, and said OR plane includes conductive OR logic lines (O0 . . . O3) and load transistors (M17 . . . M20) for pulling the OR logic lines toward a high voltage level,

CHARACTERIZED in that said AND plane further comprises a conductive delay line (AR) that is directly connected to the control electrodes of said load transistors in the OR plane, and charged to a high voltage level by a precharge transistor (M1) when said clock is in a first state, and discharged to a low voltage level by a discharge transistor (M16) when said clock is in a second state, and still further comprises at least one capacitive load transistor (M14,M15) connected to the control electrode of said



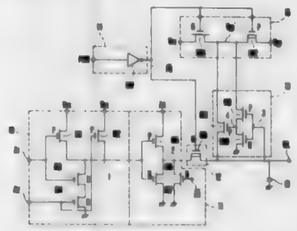
discharge transistor, and at least one capacitive load transistor (M34,M35) connected to said delay line.

4,697,106

PROGRAMMABLE MEMORY CIRCUIT

Takeshi Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 532,923, Sep. 16, 1983, Pat. No. 4,583,205.
This application Oct. 16, 1985, Ser. No. 788,367
Claims priority, application Japan, Sep. 17, 1982, 57-161861
Int. Cl.⁴ G11C *8/00;* **H03K** *19/094, 5/22;* **G01R** *19/145*
U.S. Cl. 307—463 **6 Claims**



1. A semiconductor circuit comprising:

a logic circuit having an output terminal and having at least one input terminal for receiving at least one input signal, said logic circuit selectively generating either one of first and second potentials at its output terminal in response to said at least one input signal;

a signal line;

connecting means for connecting said output terminal of said logic circuit to said signal line;

a voltage terminal receiving a third potential higher than said first potential;

switching means having a control terminal and having a current path coupled between said voltage terminal and said signal line; and

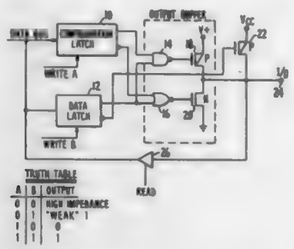
control means having an input terminal connected to said signal line and an output terminal connected to said control terminal of said switching means, said control means rendering said switching means conductive when said signal line is approximately at said first potential to thereby supply said third potential to said signal line and render said switching means non-conductive when said signal line is approximately at said second potential.

4,697,107

FOUR-STATE I/O CONTROL CIRCUIT

Ralph W. Haines, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 24, 1986, Ser. No. 889,686
Int. Cl.⁴ H03K *17/693*
U.S. Cl. 307—474 **9 Claims**



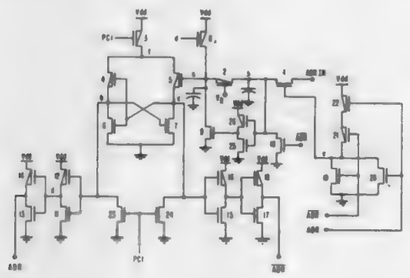
5. In an I/O control circuit of the type that receives only two inputs such that four sets of input conditions to the circuit are defined and wherein the circuit includes means responsive to a first set of input conditions to establish a low impedance path from the circuit output to a first supply voltage, means responsive to a second set of input conditions to establish a low impedance path from the output to a second supply voltage which is more negative than the first supply voltage and means responsive to a third set of input conditions to establish a high impedance path from the output to both the first supply voltage and the second supply voltage, the improvement comprising pull-up means connected to the output such that the fourth set of input conditions establishes a path from the output to the first supply voltage, the path having an impedance intermediate that of the low impedance path and the high impedance path.

4,697,108

COMPLEMENTARY INPUT CIRCUIT WITH NONLINEAR FRONT END AND PARTIALLY COUPLED LATCH

Barbara A. Chappell, Amawalk, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 9, 1986, Ser. No. 861,166
Int. Cl.⁴ H03K *19/096*
U.S. Cl. 307—475 **5 Claims**



1. An input circuit for transferring the state of an input external to an integrated circuit chip to the internal signal lines of the integrated circuit chip comprising:

a nonlinear input circuit having an input terminal for receiving an external input and providing an output to a first node only when the external input exceeds a reference voltage plus a threshold voltage, said nonlinear input circuit including first and second complementary conductivity transistor devices connected in series between said input terminal and said first node, each of said first and second transistor devices having a control input terminal, the control input terminal of said first transistor device being connected to a control node for turning said first transistor device off after voltage transfer is complete and the control input terminal of said second transistor device being connected to a reference voltage source; and

latch means including third and fourth complementary conductivity transistor devices connected in series between a common node and ground and fifth and sixth complementary conductivity transistor devices connected in series between said common node and ground, the common connections between said third and fourth transistor devices and between said fifth and sixth transistor devices being first and second output nodes, respectively, of said latch means, said first and second output nodes being connected to the internal signal lines of the integrated circuit chip, each of said third, fourth, fifth and sixth transistor devices having a control electrode, the control electrode of said third transistor device being connected to said second output node of said latch means which is the common connection between said first and sixth transistor devices, the control electrodes of said fifth and sixth transistor devices being connected to said first output node of said latch means which is the common connection between said third and fourth transistor devices, and the control electrode of said fourth transistor device being connected to said first node.

4,697,109

LEVEL CONVERTER CIRCUIT

Noriyuki Homma, Kokubunji; Goro Kitsukawa, Nishitama, and Makoto Suzuki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1985, Ser. No. 751,864
Claims priority, application Japan, Jul. 5, 1984, 139661
Int. Cl.⁴ H03K *19/092, 19/086, 19/003, 17/10*
U.S. Cl. 307—475 **7 Claims**

3. A level converter circuit which coverts an input signal to output signals having predetermined first and second voltage levels, said level converter circuit comprising:

a first level-shift circuit fed with said input signal;

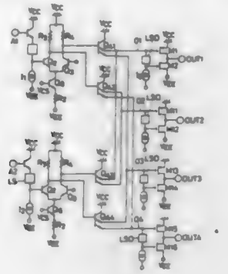
a current switch circuit fed with an output signal of said first level-shift circuit, said current switch circuit outputting a signal having a signal amplitude larger than the output signal amplitude of said first level-shift circuit;

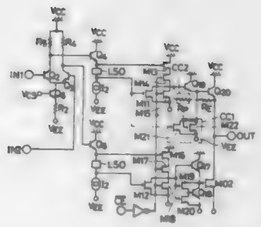
a second level-shift circuit fed with the output signal of said current switch circuit for generating a first output with a small level-shift and a second output with a larger level-shift than said first output; and

a first CMOS circuit including a PMOS transistor having its gate fed with said first output, and an nMOS transistor having its gate fed with said second output,

wherein said current switch provides output levels to turn off said PMOS transistor and to turn on said nMOS transistor at its high level and to turn on said PMOS transistor and to turn off said nMOS transistor at its low level to provide said output signals having said predetermined first and second voltage levels, and further wherein said cur-

rent switch circuit includes a reference terminal fed with a reference voltage controlled in accordance with fluctuations of power supply voltage or junction temperatures of transistors in said level converter circuit.



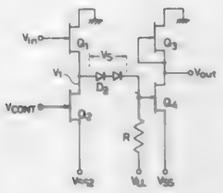


4,697,110

FLUCTUATION-FREE INPUT BUFFER

Noboru Masuda; Michio Asano; Takehisa Hayashi, all of Kokubunji; Hirotoshi Tanaka, Hachioji, and Akira Masaki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 28, 1983, Ser. No. 555,618
Int. Cl.[4] H03K *17/14, 19/094*
U.S. Cl. 307—475 14 Claims



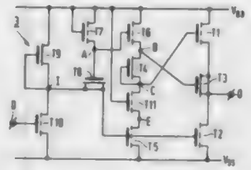
1. An input buffer comprising a source follower circuit having a logic threshold level which is subject to undesired fluctuations in logic threshold level which includes first and second FETs of an identical conductivity type connected in series, and in which a gate of said first FET is connected to a circuit input for receiving an input signal, and a FET inverter circuit, which receives an output of said source follower circuit derived from between said first and second FETs wherein the logic threshold level of said source follower circuit is controlled by a voltage which is produced by a means for producing a compensating voltage which varies in a manner opposite to the undesired fluctuations in logic threshold level, that is applied to a gate of said second FET in said source follower circuit to cancel said undesired fluctuations.

4,697,111

LOGIC BOATSTRAPPING CIRCUIT HAVING A FEEDFORWARD KICKER CIRCUIT

Adrianus T. Van Zanten; Hendrikus J. M. Veendrick; Leonardus C. M. G. Pfennings, and Wilhelmus C. H. Gubbels, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1985, Ser. No. 698,999
Claims priority, application Netherlands, Feb. 20, 1984, 8400523
Int. Cl.[4] H03K *4/58, 17/10, 17/04, 19/017*
U.S. Cl. 307—482 4 Claims



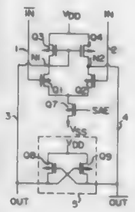
1. An integrated logic circuit comprising insulated gate field effect transistors, each of said transistors having a source, a gate and a drain electrode, said circuit having first and second inverting amplifiers each having an input and an output, the first amplifier comprising first and second transistors which are connected in series between a first and a second supply terminal and are controlled in phase opposition, a first capacitance, a junction between the first and the second transistors being coupled to the second inverting amplifier by said first capacitance, said gate electrode of the first transistor being connected to the output of the second amplifier, a third transistor, the gate electrode of the second transistor being connected to the gate electrode of the third transistor associated with the second amplifier and receiving an input signal, and a fourth transistor, characterized in that the second amplifier is connected by the fourth transistor to a first supply terminal, and a fifth transistor and a second capacitance, the gate electrode of the fourth transistor being connected by said fifth transistor, which is connected as a diode, to the first supply terminal and is also connected by said second capacitance to the gate electrodes of the second and third transistors, the first, second, third, fourth and fifth transistors being of the enhancement type.

4,697,112

CURRENT-MIRROR TYPE SENSE AMPLIFIER

Takayuki Ohtani, Tokyo; Mitsuo Isobe, Yokohama; Akira Aono, Yokohama, and Nobuaki Urakawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 25, 1986, Ser. No. 878,372
Claims priority, application Japan, Feb. 20, 1986, 61-35478
Int. Cl.[4] H03F *3/45*
U.S. Cl. 307—530 5 Claims



1. A current-mirror type sense amplifier comprising:
first and second input terminals;

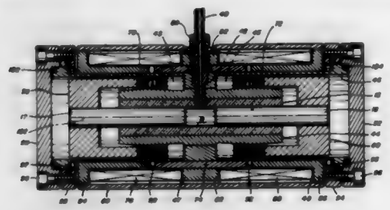
first and second output terminals;
a first power source node connected to a first power source potential;
a second power source node connected to a second power source potential;
a pull-up node connected to a pull-up potential;
a differential amplifier for amplifying an input signal between said first and second input terminals to create a potential difference between said first and second output terminals, said differential amplifier including first and second MOS transistors of a first conductivity type, said first MOS transistor having a gate connected to said first input terminal and a drain-source path coupled between said second power source node and said first output terminal, and said second MOS transistor having a gate connected to said second input terminal and a drain-source path coupled between said second power source node and said second output terminal;
a current-mirror type load circuit comprising third and fourth MOS transistors of a second conductivity type, said third and fourth MOS transistor having gates connected to each other and to said first output terminal, said third MOS transistor having a drain-source path coupled between said first power source node and said first output terminal, and said fourth MOS transistor having a drain-source path coupled between said first power source node and said second output terminal; and
pull-up circuit means for increasing the potential difference between said output terminals, said pull-up circuit means including fifth and sixth MOS transistors of said second conductivity type, said fifth MOS transistor having a gate connected to said second output terminal and a drain-source path coupled between said pull-up node and said first output terminal, and said sixth MOS transistor having a gate connected to said first output terminal and a drain-source path coupled between said pull-up node and said second output terminal.

4,697,113

MAGNETICALLY BALANCED AND CENTERED ELECTROMAGNETIC MACHINE AND CRYOGENIC REFRIGERATOR EMPLOYING SAME

Niels O. Young, Eagle, Id., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Aug. 1, 1985, Ser. No. 761,164
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—15 28 Claims



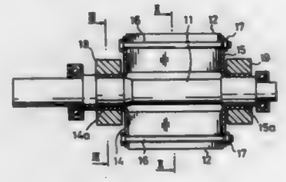
1. An electromagnetic machine comprising:
a pair of armatures mounted for reciprocal movement toward and away from each other; and
a stator having parallel magnetic flux paths between the armatures and oriented relative to the armatures such that movement of an armature transfers flux between the flux paths and such transfer of flux with movement of one armature not balanced by movement of the other armature in an opposite direction causes balancing magnetic forces between the armatures such that they tend to move equally and oppositely.

4,697,114

PERMANENT-MAGNET ROTOR SHRINK-FIT ASSEMBLY

Yoichi Ansenlya; Masatoyo Sogabe, and Kiyoshi Tagami, all of Hachioji, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP86/00101, § 371 Date Oct. 27, 1986, § 102(e) Date Oct. 27, 1986, PCT Pub. No. WO86/05332, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 933,643
Claims priority, application Japan, Feb. 28, 1985, 60-37650
Int. Cl.[4] H02K *15/02, 21/14*
U.S. Cl. 310—156 4 Claims



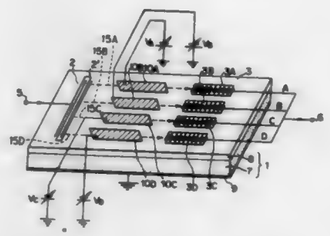
1. A permanent magnet rotor assembly comprising:
a rotor shaft;
a plurality of yokes arranged around the rotor shaft at circumferential intervals and extended along the axis of the rotor shaft;
permanent magnets extended along the axis of the rotor shaft and each held between two adjacent yokes;
a pair of end plates attached to axially opposite ends of the yokes, respectively, each of said end plates being formed of a non-magnetic material and being provided, in the central portion thereof, with a boss which is secured to the outer circumference of the rotor shaft by the compressive force of a fastening ring mounted thereon by thermal shrinkage insertion.

4,697,115

SURFACE ACOUSTIC WAVE DEVICE

Syuichi Mitsutsuka, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

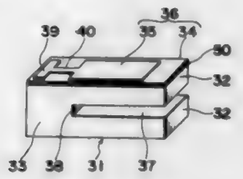
Filed Oct. 9, 1985, Ser. No. 785,938
Claims priority, application Japan, Oct. 15, 1984, 59-215952
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R 5 Claims



1. A surface acoustic wave device, comprising:
a semiconductor substrate;
a piezoelectric film disposed on said semiconductor substrate;
an input transducer and an output transducer disposed at two locations on said piezoelectric film;
a plurality of metal electrodes disposed between said input transducer and said output transducer;
bias voltage applying means for applying a respective bias voltage to each of said metal electrodes; and

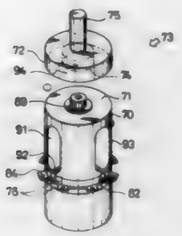
bias voltage regulating means for regulating said bias voltages;
wherein an insulating film is provided between said semiconductor substrate and said piezoelectric film; and
wherein a metal film is disposed between said metal electrodes and said output transducer on said insulating film.

4,697,116
PIEZOELECTRIC VIBRATOR
Takeshi Nakamura, Uji; Hiroshi Nishiyama, Muko, and Ikuo Matsumoto, Takatsuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Jan. 6, 1983, Ser. No. 456,307
Claims priority, application Japan, Jan. 7, 1982, 57-1512
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—322 **1 Claim**



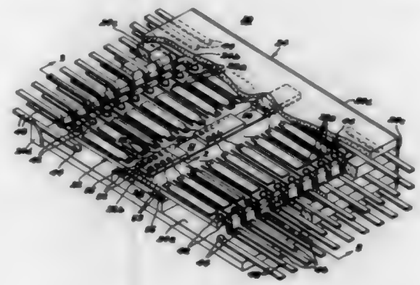
1. A piezoelectric vibrator, comprising:
a mechanical vibrating member made of elinvar;
an aluminum layer having first and second opposed surfaces, said first surface being located on one surface of said mechanical vibrating member;
a piezoelectric layer having first and second opposed surfaces, said first surface of said piezoelectric layer being located on said second surface of said aluminum layer; and
an electrode layer located on said second surface of said piezoelectric layer.

4,697,117
ROTARY ULTRASONIC MOTOR
Shoji Mishiro, Kanagawa, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan
Filed Nov. 14, 1986, Ser. No. 930,429
Claims priority, application Japan, Nov. 27, 1985, 60-266617; Dec. 24, 1985, 60-291732; Jan. 23, 1986, 61-12823
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **5 Claims**



1. A rotary ultrasonic motor comprising an ultrasonic vibrator with an electrostrictive element which is polarized in the direction of its thickness and has a plurality of electrode pairs arrayed at equal intervals in the circumferential direction, said electrostrictive element being held and clamped between two metallic members in which grooves are formed with the exception of end regions thereof along division lines corresponding in number to said electrode pairs of said electrostrictive element, wherein an intermediate portion of said ultrasonic vibrator is anchored to a frame, and a rotor kept in pressed contact with the output end of said ultrasonic vibrator is rotatably attached to said frame, said rotor having an output shaft at the center of rotation thereof.

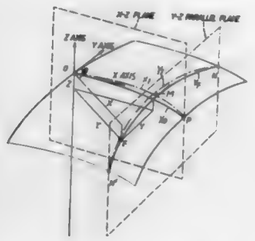
4,697,118
PIEZOELECTRIC SWITCH
John D. Haraden, Jr., Schenectady; William P. Kornrumpf, Albany; James E. Kohl, and Michael S. Adler, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 15, 1986, Ser. No. 896,792
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—331 **26 Claims**



1. A piezoelectric switch comprising:
a case including a first inner surface;
a piezoelectric bimorph element including at least two generally coplanar and oppositely extending fingers connected by a common spine;
means for mounting said element spine to said case with said fingers spaced from said first inner case surface;
means for applying a separate electrical potential to each of said element fingers for separately controlling their deflection in a direction generally perpenicular to the plane of said fingers;
at least one separate movable electrical contact disposed on each of said element fingers spaced from said spine and insulated from said electrical potential applying means; and
at least one separate stationary contact disposed on said inner case surface generally opposite each of said movable contacts;
whereby each of said fingers can be separately controlled by the application of an appropriate electrical potential to cause it to deflect and force its movable contact into electrical connection with the opposing stationary contact.

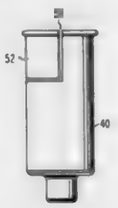
4,697,119
COLOR CATHODE RAY TUBE HAVING A NON-SPHERICAL CURVED MASK
Masatsugu Inoue, and Hidetoshi Yamazaki, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 31, 1985, Ser. No. 815,023
Claims priority, application Japan, Jan. 11, 1985, 60-2040; Nov. 25, 1985, 60-262375
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—408 **7 Claims**

1. A color cathode ray tube comprising:
a substantially rectangular curved panel having an inner surface on which is formed a phosphor screen, said panel having a central axis normal to said screen at the center of said panel;
a shadow mask having a center and a non-spherical curved surface and which is mounted via a substantially rectangular frame in a position such that the central axis of said panel passes through the center of the mask, said shadow mask having an effective area in which a plurality of apertures are formed to permit passage of electron beams through said apertures; and
said shadow mask having a major axis, a minor axis, opposed short edges and opposed long edges, said mask defining a three dimensional cartesian geometry in which the mask center is the origin, the major axis is the X axis, the minor axis is the Y axis, and an axis normal to the mask at the mask center is the Z axis, said mask having a first line of intersection formed between the opposed short edges by



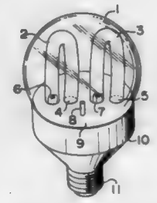
the intersection of a plane containing the X and Z axes (X-Z plane) and the effective area of the mask, said mask having second lines of intersection formed by intersections of parallel planes that are parallel to the Y and Z axes (Y-Z parallel planes) and the effective area, said second lines of intersection having varying values of radii of curvature along the first line of intersection with minimum radii of curvature occuring between the center of the mask and the opposed short edges of the mask, said second lines of intersection terminating at the opposed long edges of the mask, said long edges of the mask each having a cross section which defines a substantially circular arc.

4,697,120
COLOR DISPLAY SYSTEM WITH ELECTROSTATIC CONVERGENCE MEANS
Roger C. Alig, Princeton Junction; Stanley Bloom, Bridgewater, and Eric F. Hockings, Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.
Filed Jun. 26, 1986, Ser. No. 878,788
Int. Cl.[4] H01J *29/51, 29/62*
U.S. Cl. 313—412 **7 Claims**



1. In a color display system including a cathode-ray tube having an electron gun assembly for generating and directing three electron beams, located at the corners of an equilateral triangle, along paths toward a screen of said tube, said gun assembly comprising three electron guns each including electrodes comprising a beam-forming region and electrodes for forming a main focusing lens, and said system including a non-converging yoke, the improvement comprising
the main focusing lens electrode of each electron gun closest to the beam-forming region including means for forming a separate electrostatic dipole field in the path of an associated electron beam and the dipole fields being oriented to cause the electron beams to converge at the screen for all angles of deflection.

4,697,121
LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP
Yasuo Kato, Zama; Tetsuo Ono, Kokubunji; Yoshio Watanabe, Tokyo; Seiichi Murayama, Kokubunji; Shigeo Mikoshiba, Tokyo, and Hiromitsu Matsuno, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 577,611, Feb. 6, 1984, Pat. No. 4,611,148. This application Sep. 8, 1986, Ser. No. 904,398
Claims priority, application Japan, Feb. 21, 1983, 58-26168
The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.
Int. Cl.[4] H01J *17/44, 61/54*
U.S. Cl. 313—595 **1 Claim**

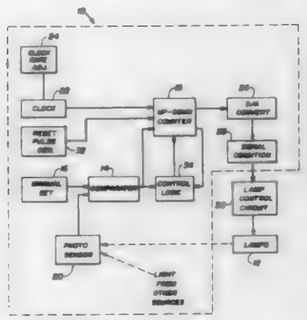


1. A low-pressure mercury vapor discharge lamp comprising an outer bulb gas-tightly enclosing a space filled with a rare gas and mercury, an inner tube arrangement disposed within the outer bulb, the inner tube arrangement being provided with an electrode at each of its two closed ends and the inner space of the inner tube arrangement communicating with the space enclosed by the outer bulb through an opening, a starting probe disposed in the proximity of the opening and inside of the outer bulb for establishing a subsidiary discharge path to each of the electrodes along a main discharge path which is formed between the electrodes, an operating circuit connected to the electrodes, and a starting probe circuit connected to the starting probe for applying a high voltage to the starting probe at the time of starting of the lamp.

4,697,122
SLOW ACTING PHOTO LAMP CONTROL
Roy D. Hoffer, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Aug. 1, 1986, Ser. No. 891,610
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—158 **8 Claims**

1. A light sensitive lamp controller comprising:
(a) a photosensor located to be affected by available light, including light from lamps being controlled by the lamp controller, and generating an electrical signal related to the quantity of light to which it is subjected;
(b) a manual setting means generating an electrical voltage related to the setting of a manual control;
(c) a signal comparator electrically connected to the photosensor and to the manual setting means, receiving electrical signals from both, and generating an output of a command signal which varys with the relationship between the signals received from the photosensor and the manual setting means;
(d) an electronic up-down counter electronically connected to the output of the signal comparator, receiving the command signal from the signal comparator, counting up or down in its register depending upon the command signal received, and generating an output signal varying with the level of the count on its register;

(e) a clock means electrically connected to the up-down counter and generating and feeding to the up-down counter a signal which repeats at a frequency determined by the clock means, the repeating signal acting upon the up-down counter to determine the rate at which the up-down counter changes the level of its count; and



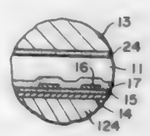
(f) lamp control means receiving electrical signals from the up-down counter and varying the electrical power applied to at least one lamp according to the level of the count of the up-down counter.

4,697,123

GAS DISCHARGE PANEL

Tsutae Shinoda, Akashi; Yoshinori Miyashita, Himeji; Yoshimi Sugimoto, Akashi; Hideo Sei, Kobe, and Shizuo Andoh, Akashi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 9, 1981, Ser. No. 319,404
Claims priority, application Japan, Nov. 19, 1980, 55-163712
Int. Cl.⁴ G09G *3/10*
U.S. Cl. 315—169.4 **13 Claims**



1. A monolithic gas discharge panel, comprising:
a plurality of electrode pairs for receiving a specified voltage and generating surface discharge;
a plurality of electrode supporting substrates each having side edge surfaces and a respective pair of said plurality of electrode pairs arranged on one side thereof in a specified pattern, said supporting substrates being combined such that the side edge surfaces of adjacent ones of said supporting substrates are arligned face-to-face to form a combination substrate with corresponding electrodes on adjacent supporting substrates being electrically connected;
a single cover substrate covering and arranged facing said supporting substrates with specificed gap therebetween to define a space for gas discharge between them.

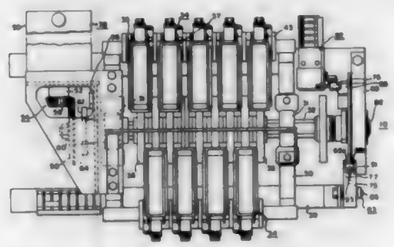
4,697,124

INTEGRAL SERIES PARALLEL AND POWER BRAKE CONTROLLER FOR A TRANSIT VEHICLE

William E. Schmitz, Wilkinsburg Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1986, Ser. No. 887,293
Int. Cl.⁴ H02P *7/67*
U.S. Cl. 318—63 **13 Claims**

1. An integral series parallel changeover and power dynamic brake controller apparatus for a transit vehicle, said vehicle including a plurality of wheels, electrical motors for driving said wheels, said electrical motors each having armature means and field means, power source means for providing power to said electrical motors, said controller apparatus comprising:
(a) a frame means;
(b) a single cam shaft carried by said frame means;
(c) switching means for switching said electrical motors from a parallel circuit arrangement to a series circuit arrangement as desired and for switching electrically said field means and said armature means of said electrical motors as desired to effect dynamic braking;
(d) a plurality of cams, said cams mounted on said cam shaft



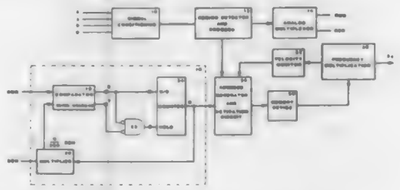
to engage said switching means at predetermined intervals;
(e) control motor means for rotating said cam shaft in a controlled manner;
(f) cam shaft stop means for maintaining the rotation of said single cam shaft between a predetermined starting point and a final point;
(g) cam shaft return spring means for rotating said cam shaft back to said starting point in case of loss of power to said control motor means;
(h) cam shaft return spring latch means for preventing said spring means from opposing said control motor means during normal operation.

4,697,125

METHOD AND APPARATUS FOR DETERMINING SHAFT POSITION AND FOR PROVIDING COMMUTATION SIGNALS

Jerry K. Goff, Doylestown, and Gary E. Chizever, Abington, both of Pa., assignors to Performance Controls, Inc., Horsham, Pa.

Filed Mar. 24, 1986, Ser. No. 843,218
Int. Cl.⁴ H02P *6/02*
U.S. Cl. 318—254 **39 Claims**



15. Apparatus for determining the angular displacement of a rotating shaft, comprising:
(a) digital memory means having a plurality of addresses, the digital memory means being programmed with at least one sequence of binary digits, the sequence of binary digits defining a predetermined stream of pulses, and
(b) means for activating a specific sequence of addresses in the memory means to produce an output signal, wherein the activating means is operatively connected to a means for sensing the angular position of the shaft,
wherein the output signal is a stream of pulses corresponding to the programmed sequence in the memory means, the frequency of which stream is proportional to the angular velocity of the shaft, the output signal being taken directly from the memory means.

19. Apparatus for providing commutation control for a brushless motor, the motor having a shaft, comprising:
(a) digital memory means having a plurality of addresses, the digital memory means being programmed with at least one sequence of binary digits, the sequence of binary digits defining a predetermined stream of pulses, and
(b) means for activating a specific sequence of addresses in the memory means to produce an output signal, wherein the activating means is operatively connected to a means for sensing the angular position of the shaft,
wherein the output signal is a stream of pulses, the pulses comprising commutation signals suitable for control of the motor, and wherein the memory means also comprises means for advancing and retarding the commutation signals.

22. A method of determining the angular displacement of a rotating shaft, comprising the steps of:
(a) sensing the instantaneous orientation of the shaft, and computing a digital signal according to the sensed instantaneous orientation of the shaft,
(b) activating an address, corresponding to said digital signal, in a digital memory means, the memory means being preprogrammed with at least one sequence of binary digits, the binary digits defining at least one stream of pulses, and
(c) repeating the computing and activating steps, while counting the pulses in the stream and while converting the number of pulses into a value of angular displacement.

28. A method of simultaneously determing the angular displacement of a rotating shaft, and of commutating a motor for driving the shaft, comprising the steps of:
(a) sensing the instantaneous orientation of the shaft, and computing a digital signal according to the sensed instantaneous orientation of the shaft, and
(b) activating an address, corresponding to said digital signal, in a digital memory means, the memory means being pre-programmed with at least two sequences of binary digits, the binary digits defining at least two streams of pulses, wherein there is at least one velocity pulse stream having a frequency proportional to the rotational velocity of the shaft, and wherein there is at least one commutation pulse stream comprising a commutation signal for the motor, and
(c) repeating the computing and activating steps, while counting the pulses in the velocity pulse stream and converting the number of pulses into a value of angular displacement, and while applying the commutation pulse stream to control the motor.

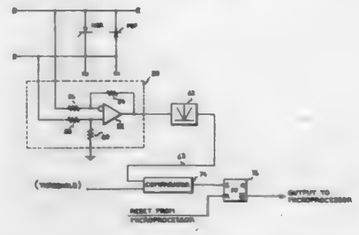
30. A digital memory circuit for generating a stream of pulses corresponding to the rotation of a shaft, the memory circuit comprising a plurality of addresses, each address containing at least one binary digit, the binary digits defining the stream of pulses, the circuit being divided into a plurality of regions, the regions corresponding to angular regions in which the shaft is instantaneously located, the binary digits in alternate regions being programmed for activation in opposite directions, and wherein the binary digits are arranged in a nonlinear form to compensate for nonlinear movement of the shaft, wherein activation of a sequence of addresses in the memory circuit causes the circuit to produce a stream of pulses indicative of the motion of the shaft.

4,697,126

CONTROL METHOD FOR DIRECT CURRENT MOTOR

W. Bruce Jarvinen, and Stephen J. Lukas, both of Roanoke, Va., assignors to General Electric Company, Salem, Va.

Filed Mar. 19, 1982, Ser. No. 359,962
Int. Cl.⁴ G05B *5/00*
U.S. Cl. 318—331 **8 Claims**



1. In a direct current motor drive system of the type in which motor current is supplied to the motor from a three-phase alternating current source by way of first and second rectifying bridges controlled to supply said current in an alternating fashion to the motor in low torque situations, an improved method of controlling said bridges comprising the steps:
(a) providing a command signal indicative of a desired level of motor operation;
(b) providing a feedback signal proportional to motor terminal voltage;
(c) combining said command signal and said feedback signal to derive a combined signal;
(d) integrating said combined signal to provide a control signal;
(e) determining if the motor current is discontinuous; and,
(f) determining, when said motor current is discontinuous, whether a first of said bridges may be rendered conductive next after a second of said bridges was rendered conductive comprising the steps of,
(1) retaining an indicium of said second bridge which was last rendered conductive,
(2) determining the difference in valve in said control signal at the approximate time that said second bridge was last rendered conductive and a time subsequent thereto; and,
(3) evaluating on the basis of said retained indicium and the difference in value in said control signal, the permissibility of next rendering said first bridge conductive; and,
(g) permitting réndering said first bridge conductive only if determined permissible.

4,697,127

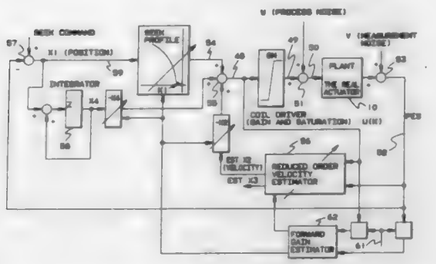
ADAPTIVE CONTROL TECHNIQUE FOR A DYNAMIC SYSTEM

Michael C. Stich; John B. Resman; Hjalmar H. Ottesen, and Todd B. Anderson, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1986, Ser. No. 871,949
Int. Cl.⁴ G05B *13/00*; G11B *21/08*
U.S. Cl. 318—561 **12 Claims**

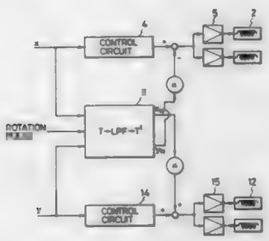
1. A rotating storage device having data stored thereon in parallel tracks comprising
transducer means;
an actuator assembly which includes a voice coil and is connected to said transducer means for moving said transducer means from one track location to another track location;
controller means, having an on-line adjustable gain characteristic, for controlling movement of said actuator assembly;

estimator means, having an on-line adjustable gain characteristic, for estimating actuator velocity and bias;
means for estimating the forward gain of said actuator assembly from position and coil current measurements;



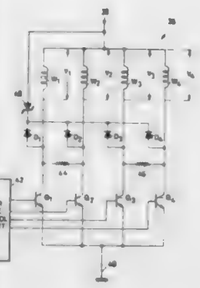
means for comparing said estimated value of forward gain with a nominal value of forward gain to generate an error signal; and
means to adjust said controller means and estimator means gain characteristics as a function of said error signal.

4,697,128
CONTROL APPARATUS FOR A ROTOR SUPPORTED BY AN ELECTROMAGNETIC BEARING
Osami Matsushita; Michiyuki Takagi; Mitsuho Yoneyama, and Toyomi Sugaya, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 8, 1986, Ser. No. 861,002
Claims priority, application Japan, May 13, 1985, 60-99564
Int. Cl.[4] G05B *1/02*
U.S. Cl. 318—607 **4 Claims**



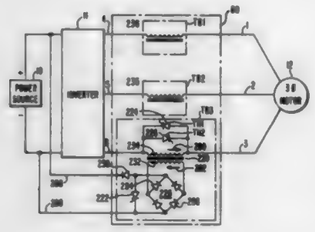
1. A control apparatus for a rotor supported by an electromagnetic bearing, comprising:
an X-direction servo circuit including an X-directional displacement detector which detects an X-axial deviation of the rotor from a preset radial position, and a control circuit which generates a signal for controlling the X-axial position of the rotor so as to be held at the preset radial position, on the basis of an X-directional displacement signal output from said X-directional displacement detector,
a Y-direction servo circuit including a Y-directional displacement detector which detects a Y-axial deviation of the rotor from a preset radial position, and a control circuit which generates a signal for controlling the Y-axial position of the rotor so as to be held at the preset radial position, on the basis of a Y-directional displacement signal output from said Y-directional displacement detector,
a rotational frequency-synchronized tracking filter whose center frequency is a frequency corresponding to a rotational speed of the rotor,
means for applying the X-directional displacement signal to said filter as an input signal and to additively supply said Y-direction servo circuit with an X-directional output signal delivered from said filter, and
means for applying the Y-directional displacement signal to said filter as an input signal and to subtractively supply said X-direction servo circuit with a Y-directional output signal delivered from said filter.

4,697,129
STEPPING MOTOR DRIVE SYSTEM AND METHOD CAPABLE OF STOPPING THE ROTOR IN A REQUIRED ANGULAR POSITION
Katsuya Enami, Tachikawa; Hiroshi Tsuyuguchi, and Takahiro Sakaguchi, both of Tokyo, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Feb. 13, 1986, Ser. No. 829,425
Claims priority, application Japan, Feb. 15, 1985, 60-27915; Feb. 15, 1985, 60-27916
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **8 Claims**



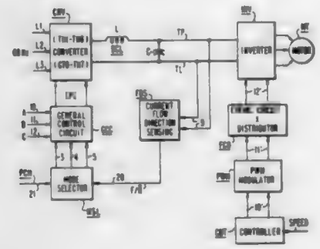
1. A drive system for a stepping motor of the type having a rotor and at least one set of different phase stator windings on respective stator poles, comprising:
(a) a supply terminal connected to the stator windings each at a first extremity thereof;
(b) a plurality of switching elements each connected between a second extremity of one of the stator windings and ground;
(c) a motor phase control circuit for making on/off control of the switching elements so as to cause sequential excitation of the stator windings with a current of a first predetermined magnitude from the supply terminal in order to cause the rotation of the rotor, at least one of the stator windings being so excited at a time; and
(d) rotor displacement means for causing, during the excitation of one of the stator windings under the control of the motor phase control circuit, at least one other of the stator windings to be excited with a current of a second predetermined magnitude less than the first predetermined magnitude;
(e) whereby when the sequential excitation of the stator windings is terminated, the rotor stops displaced to a predetermined degree in a predetermined direction from a position of exact alignment with the stator poles.

4,697,130
INDUCTION MOTOR REGENERATIVE BRAKE CONTROL APPARATUS AND METHOD
Habib Dadpey, Atlanta, Ga.; Paul J. Merlino, West Newton, Pa., and David J. Shero, South Park Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation of Ser. No. 696,938, Jan. 31, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 946,159
Int. Cl.[4] H02P *3/18*
U.S. Cl. 318—760 **16 Claims**



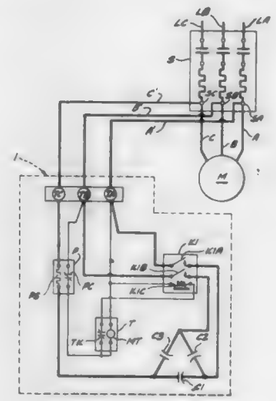
1. In brake control apparatus for an induction motor energized with a first voltage having a known phase relationship and provided by an inverter coupled with a power source, said control apparatus being responsive to a brake request signal, the combination of
a first winding connected between the motor and the inverter,
a second winding coupled with the first winding and connected with the power source for providing a second voltage for additionally energizing the motor, and
stabilizing switch means connected with the second winding and responsive to the brake request signal and the first voltage for controlling the time occurrence of the second voltage to centrally coincide with said known phase relationship of the first voltage in response to the brake request signal being provided so that the total braking torque energization of the motor is increased for an operating motor speed range by stably superimposing the first and second voltage energization of the motor.

4,697,131
VOLTAGE SOURCE INVERTER AND VARIABLE FREQUENCY, CONSTANT VOLTAGE AC MOTOR DRIVE EMBODYING THE SAME
Colin D. Schauder, and Theodore M. Heinrich, both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 11, 1985, Ser. No. 807,569
Int. Cl.[4] H02P *3/20*
U.S. Cl. 318—762 **9 Claims**



1. A method of pre-charging from three-phase AC input lines the DC-link capacitor of a constant voltage voltage-source inverter including: DC terminals connected to the input of the inverter; a DC-link capacitor across said DC terminals; a bridge of thyristors connected between respective one of said AC input lines and respective ones of said DC-link terminals; comprising the steps of:
firing one of said thyristors which is associated with one of said DC terminals and firing two of said thyristors which are associated with the other of said DC terminals in normal bridge sequential firing;
the operative firing angle of said one and two thyristors being retarded by a predetermined delay angle;
said delay angle being initially such that the AC voltage applied by said AC input lines to said one and two thyristors is substantially at zero-crossing; and
repeating such firing step upon each cycle of said applied voltage while decreasing said delay angle progressively with each cycle until said operative firing angle is reached, thereby applying maximum voltage to said DC-link capacitor.

4,697,132
REDUCTION OF VOLTAGE DROP IN POWER DISTRIBUTION SYSTEMS AND OF LOSS OF MOTOR TORQUE
Leroy B. Ronk, and Claude M. Hertz, both of Nokomis, Ill., assignors to Ronk Electrical Industries, Inc., Nokomis, Ill.
Filed Jul. 15, 1981, Ser. No. 283,636
Int. Cl.[4] H02P *1/26*
U.S. Cl. 318—795 **2 Claims**



1. Apparatus for reducing the voltage drop in an electrical power distribution system during the starting of a multi-phase induction motor having stator windings supplied therefrom and for decreasing the loss in starting torque of the motor comprising:
a capacitor for direct connection across each stator phase winding of said motor;
switching means for connecting and disconnecting the capacitors from the respective stator windings; and
means for controlling the switching means to simultaneously disconnect the capacitors from the respective stator windings when the motor has substantially reached its running speed, the capacitors having a capacitance which is substantially independent of any capacitance employed to effect power factor correction during running operation and which exceeds that required to raise the no-load power factor of the motor to unity at running speed but is less than that which will correct the power factor of the motor to unity under locked rotor conditions;
said capacitors being electrolytic-type capacitors having a

capacitance which will reduce the motor starting current by at least approximately 30%;

said switching means including normally open contacts in a circuit interconnecting the capacitors across respective stator windings;

said control means including a coil shunt-connected across a stator winding of the motor and which when energized closes said contacts thereby shunt-connecting the capacitors across the respective stator windings and which when deenergized effects opening of the contacts to maintain the capacitors disconnected during operation of the motor at running speed wherein the control means further includes a timer connected in a circuit with the coil for deenergizing said coil and disconnecting the capacitors from across said stator windings after a predetermined time interval which substantially corresponds to that time required to bring said motor up to running speed; and

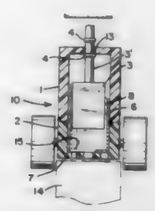
protective means responsive to both the magnitude of current flow through the capacitors and the period of time said current flows for disconnecting said capacitors from said stator windings when the product of period of time said current flows and the square of the current exceeds a preselected level.

4,697,133

RECHARGEABLE BATTERY POWERED TOY

Grigorios Pergandis, 45, Agoniston Stratopedou Haidarion Street, Haidari, Attica, Greece

Filed May 20, 1986, Ser. No. 865,047
Claims priority, application Greece, Aug. 23, 1985, 85.2151/A
Int. Cl.⁴ H02J *7/00;* **A63H** *29/22;* **F21V** *23/04*
U.S. Cl. 320—2 **5 Claims**



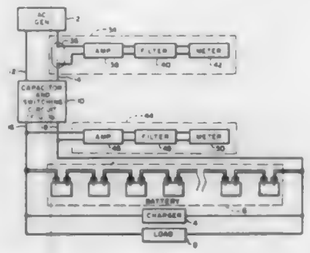
1. A toy vehicle apparatus having an electric power source which is rechargeable by a recharger having an upwardly projecting recharging probe comprising a housing having upper and lower portions and first and second ends, first and second axle means disposed through said housing and spaced toward said first and second ends respectively, motor means drivingly connected to one of said first or second axle means, said motor means having opposite electrical poles, a rechargeable battery, casing means slideably disposed within said housing and having an arm portion, a first opening in said housing, said arm portion of said casing means extending outwardly of said first opening in said housing, said rechargeable battery being movably carried by said casing means so as to be linearly movable between first and second positions within said housing, a second opening in said housing, said second opening being generally located opposite to said first opening, a first electrical contact means disposed between one of said poles of said motor and said first position of said battery, second electrical contact means extending between the other of said poles of said motor and communicating with both said first and said second positions of said battery, said motor means being electrically connected to said rechargeable battery when said rechargeable battery is in said first position and said rechargeable battery being moved out of electrical contact with said motor means when said rechargeable battery is in said second position.

4,697,134

APPARATUS AND METHOD FOR MEASURING BATTERY CONDITION

Merlin E. Burkum, Elmhurst, and Charles M. Gabriel, Lombard, both of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Filed Jul. 31, 1986, Ser. No. 892,793
Int. Cl.⁴ G01N *27/46;* **H02J** *7/00*
U.S. Cl. 320—48 **47 Claims**



1. A battery monitor comprising:

a. an AC signal generator adapted to generate an AC signal at a selected frequency;

b. means for applying the AC signal across a first pair of contacts of a battery;

c. means for determining first and second Ohms-law-related parameters indicative of impedance across a second pair of contacts of the battery, said determining means comprising:

first means for supplying a first input signal indicative of the first Ohms-law-related parameter;

first filter means coupled to the first supplying means for passing components of the first input signal at the selected frequency and for attenuating at least components of the first input signal in a first attenuation frequency range greater than the selected frequency, said filter means operating to generate a first filtered output signal; and

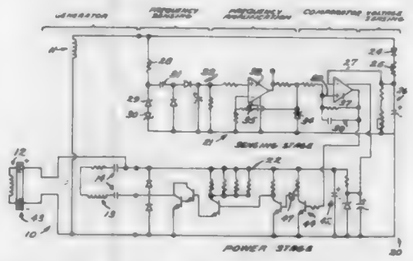
first means for measuring said first filtered output signal to determine said first Ohms-law-related parameter.

4,697,135

ELECTRONIC VOLTAGE REGULATOR

George M. Brandon, Charlotte, N.C., assignor to Textron, Inc., Providence, R.I.

Filed Jun. 24, 1986, Ser. No. 877,961
Int. Cl.⁴ H02P *9/00*
U.S. Cl. 322—24 **19 Claims**



1. An electronic voltage regulator for an ac electric generator having a field, output voltage, and frequency, comprising:

first means for producing a filtered dc representation of the output voltage of the generator;

second means for producing a small dc voltage which is proportional to the frequency of the generator;

third means for comparing the small dc voltages produced by said first and second means; and

fourth means for using the comparison of said third means to control the generator field and thereby regulate the output voltage of the generator;

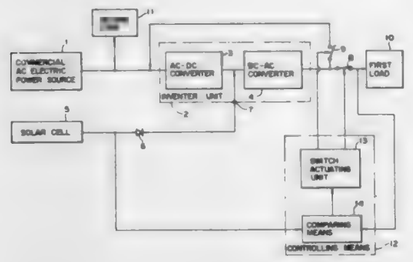
said regulator including a quad winding for the generator, said generator field being powered by said quad winding, wherein said fourth means controls the supply of emf from the quad winding to the field.

4,697,136

INVERTER SYSTEM FOR INPUTTING ALTERNATING CURRENT AND DIRECT CURRENT IN COMBINATION

Fumihiko Ishikawa, Kagawa, Japan, assignor to Shikoku Denryoku Kabushiki Kaisha, Takamatsu, Japan

Filed Dec. 1, 1986, Ser. No. 936,596
Claims priority, application Japan, Dec. 2, 1985, 60-185758
Int. Cl.⁴ G05F *1/00*
U.S. Cl. 323—267 **4 Claims**



1. An inverter system for inputting an alternating current and a direct current in combication, which comprises:

an AC-DC converter adapted to receive an DC electric power from an AC electric power source and to convert said AC electric power to a DC electiric power;

a DC-AC converter adapted to receive the DC electric power converted by said AC-DC converter and a DC electric power from a DC electric power source and to convert said DC electric powers thus received to an AC electric power;

a first switching means adapted to open or close an electric circuit between an output side of said DC-AC converter and a first load;

a second switching means adapted to open or close an electric circuit between said AC electric power source to which a second load is connected and the output side of said DC-AC converter; and

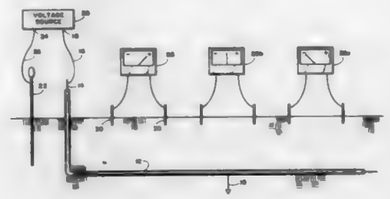
a controlling means constituted such that when a electric power consumption of the first load is larger than an output of the DC electric power source, the controlling means closes the first switching means and opens the second switching means; when an operation of the first load is stopped, the controlling means opens the first switching means and closes the second switching means; and when the electric power comsuption of the first load is smaller than the output of the DC electric power source, the controlling means closes both of the first and second switching means.

4,697,137

METHOD OF NONDESTRUCTIVELY ESTABLISHING AN EARTH GRADIENT FOR CABLE FAULT LOCATING

Merrill Haddon, Tigard, and Clifford H. Moulton, Portland, both of Oreg., assignors to Acqua-Tronics, Inc., Milwaukie, Oreg.

Filed Jan. 24, 1986, Ser. No. 822,126
Int. Cl.⁴ G01R *31/10*
U.S. Cl. 324—512 **6 Claims**



1. A method of locating a fault in an insulated electrical conductor buried in earth by establishing a voltage graident through said earth emanating from said fault and thereafter sensing the direction of said gradient to locate said fault, such method including establishing said gradient by electrically isolated said conductor at respective ends located on each side of said fault, embedding a ground rod in said earth, electrically connecting a voltage source, having a maximum voltage level capable of establishing a voltage graident from said fualt to said ground rod despite any existence of an aluminum hydroxide or copper oxide coating on said conductor at said fault, between one of said ends of said conductor and said ground rod, and applying a voltage from said voltage source to said conductor, wherein the improvement comprises applying said voltage initially to said conductor at an initial voltage level significantly less than the maximum voltage level which said voltage source is capable of applying to said conductor, sensing whether or not said initial voltage level is sufficient to establish said voltage gradient by observing a meter responsive to the flow of electrical current from said voltage source to said ground rod and, after sensing the establishment of said voltage gradient, sensing the direction of said gradient to locate said fualt.

4,697,138

LOGIC ANALYZER HAVING A PLURALITY OF SAMPLING CHANNELS

Mitsuhiro Morishita, and Masayasu Sugimori, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,817
Claims priority, application Japan, Jun. 20, 1985, 60-134711
Int. Cl.⁴ G01R *15/00, 31/28*
U.S. Cl. 324—73 R **2 Claims**

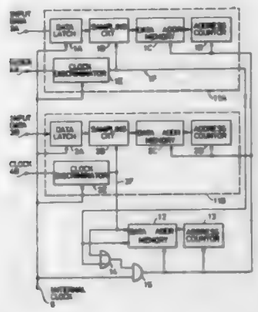
1. A logic analyzer including a plurality of sampling channels operative with different clock signals, comprising:

(a) a clock discriminating circuit disposed in each of said sampling channels and having inputs supplied with the clock signal of the associated sampling channel and an internal clock signal, said discriminating circuit producing an output signal in synchronism with said internal clock signal to thereby cause input data to be stored in the associated sampling channel;

(b) a memory having inputs applied with the outut signals of said clock discriminating circuits, respectively, for storing sequence in time in which said input data are sampled in said plurality of the sampling channels; and

(c) an address counter for updating the address of said mem-

ory in response to the outputs of said clock discriminating circuits.



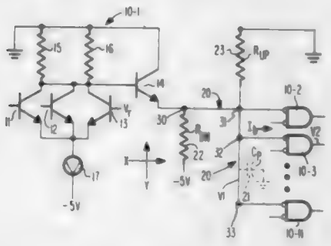
wherein upon every input of said clock signal to said sampling channels, the states of the output signals of said clock discriminating circuits are stored in said memory.

4,697,139

LOGIC CIRCUIT HAVING TESTABILITY FOR DEFECTIVE VIA CONTACTS

Laszlo V. Gal, Poway, Calif., assignor to Unisys Corporation, Detroit, Mich.

Continuation of Ser. No. 705,192, Feb. 25, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 11,368
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R **11 Claims**



1. An integrated circuit having improved testability for defective via contacts, comprising:

a plurality of N logic gages which are in a semiconductor chip;

one of said gates having an output terminal which is connected by a conductor in said chip to respective input terminals on the remaining N−1 logic gates;

said one logic gate having ON and OFF states which respectively couple and decouple at 1 voltage level to said conductor;

a first resistor means, having a resistance R1, which couples said conductor through a first via contact, in the absence of a defect therein, to a 0 voltage bus;

said remaining N−1 logic gates being constructed such that they each drain a current I_δ from said conductor through their respective input terminal; and

a second resistor means, having a resistance R2, which couples said conductor through a second via contact, in the absence of a defect therein, to another voltage bus;

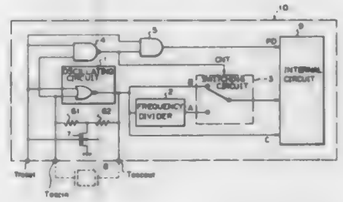
said resistance R2 being selected to (a) carry a current of magnitude $I_\delta(N-1)$ from said another volage bus to said conductor under the condition where said first via is open due to a defect and said one logic gate is OFF, (b) produce a voltage drop when said current of magnitude $I_\delta(N-1)$ is flowing such that the voltage coupled to said conductor is closer to said 1 voltage than to said 0 voltage, and (c) be substantially larger than said resistance R1.

4,697,140

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING A TEST CIRCUIT FOR TESTING AN INTERNAL CIRCUIT

Tadahiro Saito, Kawasaki, and Kunihiko Gotoh, Kunitachi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 11, 1986, Ser. No. 828,188
Claims priority, application Japan, Feb. 20, 1985, 60-030190
Int. Cl.[4] G01R *31/28*
U.S. Cl. 324—73 R **6 Claims**



1. A semiconductor integrated circuit formed on a chip, comprising:

an internal circuit on said chip having plural inputs and operable in testing and non-testing modes;

an oscillating circuit on said chip having an input and an output, said oscillating circuit generating a fundamental clock signal for operating said internal circuit in a non-testing mode of operation;

a pair of external connection terminals formed on said chip and respectively connected to said input and said output of said oscillating circuit;

means for selectively connecting an external oscillator between said pair of external connection terminals for operating said internal circuit in the non-testing mode and for connecting an external testing clock signal to the respective one of said pair of terminals connected to said output of said oscillating circuit for operating said internal circuit in the testing mode;

a frequency divider on said chip having an input connected to said output of said oscillating circuit and an output and providing a divided, fundamental clock frequency at said output thereof;

an external connection, reset terminal on said chip; and

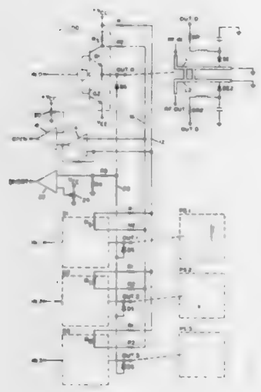
switching means on said chip connected to said external reset terminal and to the respective said terminal connected to said input of said oscillating circuit and responsive to a predetermined level of each of respective control signals selectively applied to said external connection reset terminal and said external connection terminal connected to said input of said oscillating circuit, for producing the testing mode of operation of said internal circuit and for rendering said oscillating circuit inoperative in the testing mode, said switching means further comprising a switching circuit having a first input connected to said output of said frequency divider and a second input connected to said output of said oscillating circuit, and an output connected to a corresponding input to said internal circuit, said switching circuit selectively connecting said first input thereof to said output thereof for supplying the divided fundamental clock signal from said frequency divider to said internal circuit in the non-testing mode, and said second input thereof to said output thereof for supplying the selectively applied external clock signal to said internal circuit in the testing mode of operation.

4,697,141

TESTING OF RF DIODE PHASE SHIFTERS

Paul H. Feldman, Center Moriches, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Jul. 31, 1986, Ser. No. 891,012
Int. Cl.[4] G01R *31/02*; H01Q *3/30*
U.S. Cl. 324—158 R **8 Claims**



1. A method of testing for proper operation of a radio frequency phase shifter of the kind in which a number of diode means are selectively forward and reverse biased thereby effecting corresponding incremental shifts in the phase of an RF wave energy signal passing through the phase shifter, comprising:

(a) driving each of said diode means with a drive stage which is energized by applying a supply voltage to the drive stage through a series resistance element thereby causing a voltage to be developed across the resistance element which is proportional to current supplied to the diode means when the drive stage is turned on and the diode means is forward biased;

(b) monitoring the voltage developed across each said series resistance element;

(c) establishing a normal forward bias current which is drawn by each of the diode means when driven by its drive stage and determining a corresponding first normal voltage which develops across the series resistance element of the drive stage when turned on;

(d) setting a first reference voltage corresponding to said first normal voltage,

(e) selecting one of the diode means for testing of an open circuit condition;

(f) turning on the drive stage with which the selected diode means is associated while turning off the drive stages of all remaining diode means of the phase shifter;

(g) testing for the existence of an open circuit condition for the selected diode means by comparing the voltage monitored in its drive stage with said first reference voltage;

(h) selecting another one of the diode means of the phase shifter for testing of an open circuit condition,

(i) turning on the drive stage with which the other selected diode means is associated while turning off all remaining drive stages; and

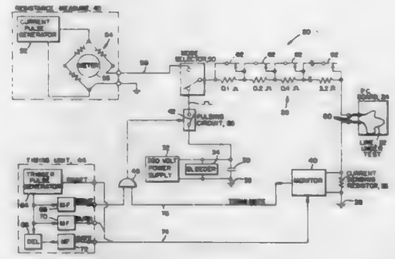
(j) repeating step (g) thereby testing for the existence of an open circuit condition for the other selected diode means.

4,697,142

PRINTED CIRCUIT CONDUCTOR TEST SYSTEM

James E. Frushour, Endwell, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,466
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 R **8 Claims**



1. A system for testing current capacity of a printed line conductor comprising:

switch means in circuit with said conductor for switching a current thereto;

pulse applying means operatively connected to said switch means for applying a test current pulse to said conductor, said pulse having sufficient power over a predetermined interval of time to burn out a constricted region of a printed line conductor having a cross sectional area less than a predetermined amount of area, said pulse applying means including timing means for driving said switch means and establishing said predetermined time interval, said timing means further providing a burnout time signal which terminates prior to said test pulse to designate a burnout time of shorter duration than said test pulse;

means for monitoring the waveform of a test pulse of current flowing in said conductor as a function of time to determine a condition of said conductor, said waveform varying in accordance with the condition of said conductor, said monitoring means providing a signal designating a type of waveform;

logic means operatively connected to said switch means and responsive to said signal of said monitoring means and to said burnout signal for terminating a flow of the current prior to the end of said predetermined interval when the waveform of said current pulse indicates the occurence of a burnout in said conductor, said logic means operating said switch means to terminate said test current pulse prior to said predetermined interval when said monitoring means indicates a burnout during said burnout time signal; and

wherein said monitoring means comprises means for detecting a peak amplitude of said test current pulse; and means for detecting a stepwise shift in current amplitude from a first current level to a second current current level within the duration of said current pulse, an occurrence of said stepwise shift during said burnout time signal designating a burnout of said conductor.

4,697,143

WAFER PROBE

Larry R. Lockwood, McMinnville; Kimberly R. Gleason, and Eric W. Strid, both of Portland, all of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.

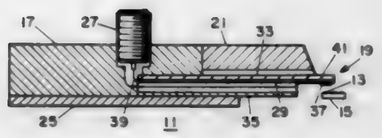
Filed Apr. 30, 1984, Ser. No. 605,462
Int. Cl.[4] G01R *31/00*; H01P *3/08*
U.S. Cl. 324—158 P **28 Claims**

16. A probe for connecting electrical test equipment to selected points on a small planar device on a semiconductive wafer, comprising:

a transmission line assembly having a probe board, at least

one metallic signal conductor and one more than an equal number of metallic ground conductors, the signal and ground conductors being deposited alternately in a coplanar fashion on one side of the probe board;





a metallic channel attached to the ground conductors and spanning, but not touching, the at least one signal conductor; and

selected microwave absorbing material generally surrounding the transmission line assembly, wherein the microwave absorbing material comprises iron.

4,697,144

POSITION SENSING APPARATUS

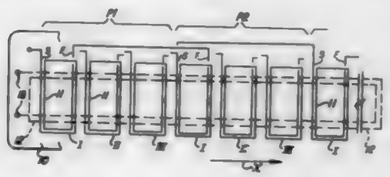
Ernest Howbrook, Stockport, England, assignor to Verify Electronics Limited, Stockport, England

Filed Apr. 10, 1985, Ser. No. 721,653

Claims priority, application United Kingdom, Apr. 19, 1984, 8410364; Sep. 21, 1984, 8423958

Int. Cl.[4] G01B *7/14*

U.S. Cl. 324—207 **9 Claims**



1. Position sensing apparatus having mutually static, coupled primary and secondary coil systems defining a path (x), and an unenergized movable member, devoid of electrical connections, dimensionally much smaller than said path, serving as a localized flux augmenter between the coil systems, and whose position on the path defined by the coil systems is represented as a progressive phase-variable output from the secondary coil system, said output being nominally zero in the absence of said member, characterized in that:

(a) the primary coil system (**12**) is single-phase energized:

(b) the coils (**11A, 11B . . .**, etc) of the secondary coil system (**11**) are:

(i) disposed series connected in pairs (e.g. coils **11A, 11G** in pair **11/1**) interspaced with other pairs (coils **11B, 11H** in pair **11/2**) as an array of coils along said path,

(ii) placed relative to the primary coil system so that on energization of that system the two coils of any pair have reversed polarity signals to generate said nominally zero output, and

(iii) located relatively to the movement of the unenergized member (**60**) so that they are close coupled with said member;

(c) phase shift networks (PC1, PC2 etc) for each pair, or series connected sequence (I, II, III etc) of pairs of secondary coils, said networks giving an incremental phase shifted output as between one pair, or sequence of series connected pairs, and the next; and

(d) means (**65**) combining the incremental phase shifted outputs to give a progressive phase shifted output (**66**) so that the position of the unenergized member is represented by said progressive output.

4,697,145

MEASURING SYSTEM AND MEASURING CELL FOR MAKING MAGNETIC FIELD MEASUREMENTS

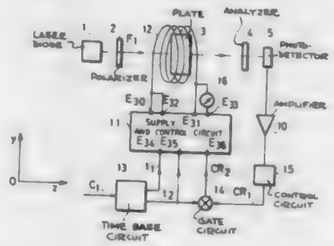
Gérard Doriath, Palaiseau; Pierre Hartemann, Paris, and Alain Jacobelli, St. Michel sur Orge, all of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 24, 1985, Ser. No. 694,275

Claims priority, application France, Jan. 27, 1984, 84 01289

Int. Cl.[4] G01R *33/02*; G02B *5/30*; G02F *1/29, 1/31*

U.S. Cl. 324—244 **4 Claims**



1. An apparatus for measuring a magnetic field using a coating of a ferrimagnetic material into which is passed, in accordance with a given axis, a light beam polarized in accordance with a given plane, in such a way that a magnetic field oriented in accordance with the axis of the beam has a Faraday effect rotation of the light polarizing plane, wherein said apparatus comprises:

a first means for inducing in the ferrimagnetic material coating, along the axis of the light beam, an alternating modulation magnetic field, whose amplitude exceeds the saturation limit of the ferrimagnetic material coating for a first predetermined time adequate to maintain a coherent oscillation of the magnetization in the ferrimagnetic material coating giving rise to an oscillation of the polarizing plane of the light beam, which is symmetrical with respect to said given plane,

a second means for simultaneously, progressively reducing in steps the modulating field intensity, the detection of any asymmetry of the oscillation of the polarizing plane of the light beam with respect to said given plane and induction along the light beam axis of a magnetic field corresponding to the detetion performed and for reestablishing the symmetry of oscillation.

4,697,146

SPHERICAL SHELL FIBRE OPTIC MAGNETIC FIELD SENSORS AND MAGNETOMETERS AND MAGNETIC GRADIENT DETECTORS INCORPORATING THEM

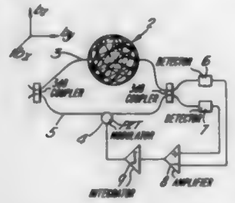
Philip Extance, Shirley, and Roger E. Jones, Little Shelford, both of England, assignors to STC, plc, London, England

Filed Feb. 10, 1986, Ser. No. 827,452

Claims priority, application United Kingdom, Feb. 23, 1985, 8504731

Int. Cl.[4] G01R *33/032*; G02B *6/02*; G02F *1/09*

U.S. Cl. 324—244 **8 Claims**



1. A magnetic field sensor with an omnidirectional response comprising a magnetically sensitive spherical shell formed by winding a length of magnetically sensitised single mode optical fibre in substantially random directions to produce a spherical shell shape, the fibre having a coating of a magnetostrictive material serving to magnetically sensitise it, disposition of the sensor in a magnetic field causing a corresponding length change of the optical fibre which can be detected interferometrically.

4,697,147

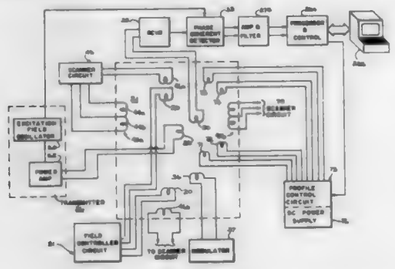
BLOOD FLOW IMAGING USING A CW NMR TECHNIQUE

Paul R. Moran, Winston-Salem, N.C., and Richard E. Halbach, Brookfield, Wis., assignors to Metriflow, Inc., Milwaukee, Wis.

Filed Nov. 14, 1985, Ser. No. 799,848

Int. Cl.[4] G01R *33/20*; G01N *24/08*

U.S. Cl. 324—306 **8 Claims**



1. In an NMR flowmeter which measures flow through an active region by applying a polarizing magnetic field having a relatively fixed magnitude in the active region and by applying a transverse excitation field within the active region to produce transverse magnetization in paramagnetic nuclei located in the active region, and receiving the signal produced by the transversely magnetized paramagnetic nuclei, the improved method comprising:

applying a first contoured polarizing magnetic field at one boundary of the active region such that paramagnetic nuclei flowing into said active region through said boundary do so from a region of substantially lower polarizing magnetic field strength;

receiving a first signal produced by the paramagnetic nuclei in the active region;

applying a second contoured polarizing magnetic field at said one boundary of the active region such that paramagnetic nuclei flowing into said active region through said boundary do so from a region of substantially higher polarizing magnetic field strength;

receiving a second signal produced by the paramagnetic nuclei in the active region; and

arithmetically combining the first and second signals to produce flow information.

4,697,148

PROCESS FOR THE EXCITATION OF A SAMPLE FOR NMR TOMOGRAPHY

Bernhard Ströbel, Waldbronn, and Dieter Ratzel, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,808

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414634

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **7 Claims**

1. In a process for the excitation of a samples for NMR tomography, in which the sample is exposed to a homogenous magnetic field and in addition to a selection gradient and is excited by means of a 90° selection pulse, whereafter the selection gradient is replaced by a phase coding gradient of limited time duration and a read gradient, the selection gradient, the phase coding gradient and the read gradient being mutually perpendicular to each other, and wherein finally the sample, after the ending of the phase coding gradient and with prevailing read gradient, is irradiated with a sequence of 180° pulses, whereby a plurality of core induction signals is generated in the form of so-called spin echos, the improvement comprising the step of subjecting the sample to the influence of the phase coding gradient in such a manner that the dephasing caused by the influences of the phase coding gradient and of the read gradient between each pair of 180° pulses is twice as great as the dephasing effected by the influences of these two gradients before the first 180° pulse.

4,697,149

NMR FLOW IMAGING USING A COMPOSITE EXCITATION FIELD AND MAGNETIC FIELD GRADIENT SEQUENCE

Paul R. Moran, Winston-Salem, N.C., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 4, 1985, Ser. No. 794,652

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **11 Claims**

1. In a gyromagnetic resonance instrument which performs a measurement cycle in which a FID signal produced by gyromagnetic material which is subjected to a polarizing magnetic field and has a magnetic moment is detected and processed to produce an indication of the amount of magnetization, the improvement comprising:

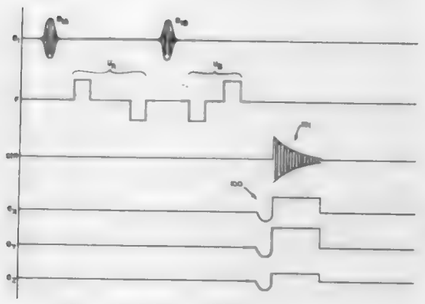
excitation means for applying an excitation field to the gyromagnetic material at the Larmor frequency of the gyromagnetic material and at a controllable strength and phase;

magnetic field gradient means for applying a magnetic field

to the gyromagnetic material which has a gradient in a controlled direction; and

control means coupled to the excitation means and the magnetic field gradient means and being operable to perform a measurement cycle that produces a FID signal indicative of the motion of gyromagnetic material, the measurement cycle including:

(a) applying a first excitation field pulse which tips the net magnetic moment of the gyromagnetic material away from the direction of the polarizing magnetic field;



(b) applying a motion sensitizing magnetic field gradient to the gyromagnetic material which has alternating polarity with respect to the net magnetic moment of the gyromagnetic material and in which the gradient is oriented to the direction in which motion is to be measured;

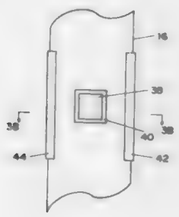
(c) applying a second excitation field pulse having a strength and phase which substantially restores the magnetic moment of stationary gyromagnetic material to the direction of the polarizing magnetic field.

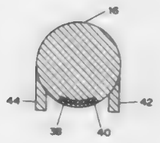
4,697,150

TWO ELECTRODE WELL LOGGING SYSTEM FOR MEASURING RESISTIVITY OF SUBSURFACE FORMATIONS

Gerald L. Marquis, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Oct. 11, 1985, Ser. No. 786,551
Int. Cl.[4] G01V *3/26, 3/18*
U.S. Cl. 324—373 **8 Claims**





1. Apparatus for obtaining indications of the electrical resistivity of relatively thin layers of earth formations traversed by a borehole containing relatively conductive liquids, including a two electrode array to be lowered into a borehole comprising:

an elongated, tubular instrument body member, said entire instrument body member forming an elongated guard electrode member;

a measure electrode mounted within and electrically insulated from said guard electrode member, said measure electrode for emitting a survey current into said earth formations;

means for decentralizing within said borehole said entire guard electrode member and for urging said guard electrode member into contact with the wall of said borehole; and

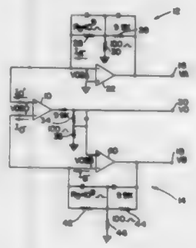
a pair of elongated auxiliary guard electrodes mechanically mounted on said guard electrode, said auxiliary guard electrodes mounted parallel to the longitudinal axis of said guard electrode and said auxiliary guard electrodes being in electrical contact with said guard electrode member.

4,697,151

METHOD AND APPARATUS FOR TESTING OPERATIONAL AMPLIFIER LEAKAGE CURRENT

Gregg A. Butler, Lawrence, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 5, 1986, Ser. No. 870,829
Int. Cl.[4] G01R *19/00*
U.S. Cl. 330—2 **2 Claims**



1. A system for measuring the leakage currents of an electrometer amplifier, said circuit comprising:

A. a first sensing circuit for connection to a first input terminal of an amplifier to be tested, said first sensing circuit comprising:

i. a first electrometer amplifier connected in a current-to-voltage configuration, the non-inverting input terminal of said first electrometer amplifier being connected to have a fixed potential relative to a common reference point;

B. a second sensing circuit comprising:

i. a second electrometer amplifier connected in a current-to-voltage configuration;

ii. a voltage divider for connection between the output terminal of the amplifier to be tested, if present, and said common reference point, the non-inverting input terminal of said second electrometer amplifier being connected to a tap on said voltage divider.

4,697,152

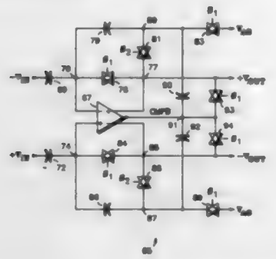
FULLY DIFFERENTIAL SWITCHED CAPACITOR AMPLIFIER HAVING AUTOZEROED COMMON-MODE FEEDBACK

Alan L. Westwick, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 11, 1986, Ser. No. 851,046
Int. Cl.[4] H03F *3/45, 1/34*
U.S. Cl. 330—9 **6 Claims**

1. A switched capacitor fully differential amplifier circuit, comprising:

differential amplifier means having first and second inputs and first and second outputs, the differential amplifier receiving first and second input voltages via the first and second inputs and providing first and second output voltages via said first and second outputs in proportion to a differential between the first and second input voltages, said differential amplifier maintaining an accurate common-mode output voltage in proportion to a common-mode feedback signal; and



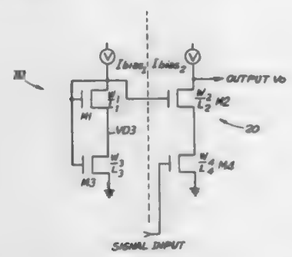
switched capacitor common-mode feedback means coupled to the differential amplifier means for providing said common-mode feedback signal in proportion to a sum of the first and second output voltages, said common-mode feedback means charge storing an error voltage associated with the common-mode output voltage during a nonvalid period of operation and cancelling the error voltage during a valid period of operation following the nonvalid period to provide an accurate common-mode output voltage.

4,697,153

CASCODE AUTO BIAS CIRCUIT

Charles A. Lish, Holbrook, N.Y., assignor to Standard Microsystems Corp., Hauppauge, N.Y.

Filed Sep. 18, 1986, Ser. No. 908,651
Int. Cl.[4] H03F *3/16*
U.S. Cl. 330—277 **1 Claim**



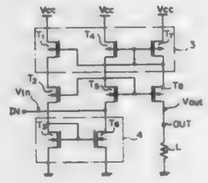
1. A cascode amplifier including an output amplifier stage and a biasing stage, said output amplifier stage comprising a first field effect transistor having a drain, source and gate, the signal established at the drain of said first field effect transistor constituting the output of the cascode amplifier, and a second field effect transistor having a drain connected to the source of said first field effect transistor and a gate for receiving an input signal, and a grounded source, said biasing stage comprising a third field effect transistor having a drain connected to a bias current source and to the gate of said first field effect transistor, and a fourth field effect transistor having a gate connected to the gate of said third field effect transistor and a drain connected to the source of said third field effect transistor, and a grounded source, the ratio of the source-drain channel width to the source-drain channel length of said fourth field effect transistor being selected such that the drain voltage of said fourth field effect transistor is substantially equal to the minimum drain voltage at saturation of said second field effect transistor, whereby the amplitude of the output signal at the drain of said first field effect transistor is at a maximum value and is substantially unaffected and/or optimized by possible variations in the major parameters of said field effect transistors.

4,697,154

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING IMPROVED LOAD DRIVE CHARACTERISTICS

Kunimitsu Kousaka, Kawasaki, and Kunihiko Gotoh, Kunitachi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 12, 1986, Ser. No. 839,027
Claims priority, application Japan, Mar. 18, 1985, 60-052478
Int. Cl.[4] H03F *3/18*
U.S. Cl. 330—277 **4 Claims**



1. A semiconductor integrated circuit, comprising:

first and second power supply terminal means for supplying power;

first and second transistors each having a gate and the gates being connected in common, each having a drain and the drain of said first transistor being connected to the gates of said first and second transistors and each having a source;

input terminal means and output terminal means for providing an output and said input and output terminal means being connected to the respective sources of said first and second transistors;

a first current mirror circuit comprising third, fourth, and fifth transistors each having a gate and the gates being connected in common, each having a source and the sources of said third, fourth, and fifth transistors connected to said first power supply terminal means, each having a drain, the drain of said third transistor being connected to the drain of said first transistor, the gates of said third, fourth, and fifth transistors and the drain of said fourth transistor being connected to the drain of said second transistor; and

a second current mirror circuit comprising sixth and seventh transistors, said sixth transistor being connected between said input terminal means and said second power supply terminal means, and said seventh transistor being connected between the drain of said fifth transistor and said second power supply terminal means.

4,697,155

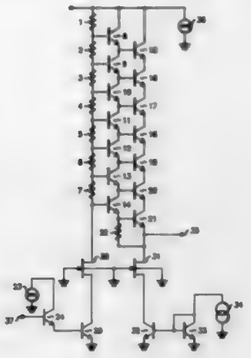
HIGH VOLTAGE AMPLIFIER

Heinz Lehning, Nyon, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1986, Ser. No. 853,799
Claims priority, application United Kingdom, May 10, 1985, #8511865
Int. Cl.[4] H03F *3/04*
U.S. Cl. 330—297 **18 Claims**

1. A high voltage amplifier output stage comprising a plurality of low voltage amplifying means connected between a relatively high voltage source and a current source to provide a common output, means for providing a low voltage input to

each of the amplifying means, and means including a low voltage transistor connected to supply an input signal to said



amplifying means via a high voltage FET which protects said low voltage transistor from high voltages.

4,697,156

DIGITALLY CONTROLLED VARIABLE FREQUENCY SYNTHESIZER

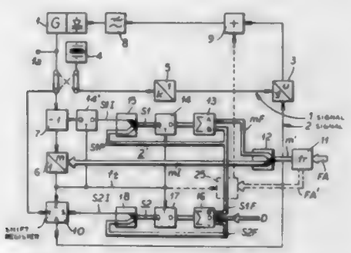
Georg Rudolph, Eningen, Fed. Rep. of Germany, assignor to Wandel u. Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,184

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544371

Int. Cl.⁴ H03L *7/18*

U.S. Cl. 331—1 A **18 Claims**



1. A signal generator or synthesizer with digital frequency setting, comprising:

a voltage-controlled oscillator having an output emitting an output signal of a frequency fa controlled in response to a signal applied to a control input of said oscillator;

a loop filter connected to said control input for applying a signal thereto to control the output frequency fa of said oscillator;

a phase detector connected to said loop filter for supplying a control signal thereto for application to said control input, said phase detector having two inputs;

a reference-frequency source connected to one of said inputs of said phase detector for applying a high-precision reference frequency signal fr thereto;

a variable frequency divider ratio divider connected to said output and receiving said output signal of frequency fa therefrom and dividing said frequency fa by a variable frequency divider ratio m to provide a divided-frequency output which is applied to the other of said inputs of said phase detector, said frequency divider, said phase detector and said loop filter forming a phase-locked loop with said voltage-controlled oscillator, said phase detector having a tendency to sawtooth output fluctuations causing frequency drift of the oscillator;

a logic and arithmetic circuit including:

means for determining a generally mixed-number division ratio m′ from a ratio of a desired output frequency FA and said frequency fr, where fa ideally is to equal FA and resolving said ratio m′ into a whole-number component mI which is applied to said divider to set the frequency divider ratio m thereof and a fractional component mF,

means for forming a first sum S1 from said fractional component mF and another fractional component S1F derived by resolving said first sum S1 into said other fractional component S1F and a whole-number component S1I, and

means for forming a second phase-error sum S2=S2I+S2F in the cadence of the output of said divider by adding the fractional component S1F′ resolved from said first sum of a preceding cycle period and a fractional component S2F′ resolved from said second sum in a preceding cycle period, said second sum being defined by S2=S1F′+S2F and being resolved into a second-sum fractional component S2F and a second-sum whole-number component S2I; and

a phase shifter connected between said divider and said phase detector and controlled by said second-sum whole-number component S2I to compensate for said tendency and stabilize the output frequency of said oscillator.

4,697,157

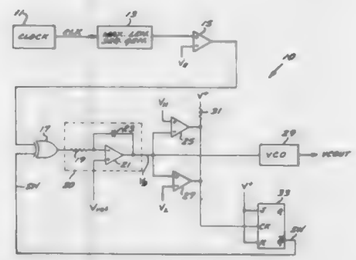
INHERENTLY FLAT SPECTRAL DENSITY PSEUDORANDOM NOISE GENERATOR

Charles L. Buddecke, Fullerton, and Robert F. Graham, Jr., Yorba Linda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 17, 1986, Ser. No. 921,163

Int. Cl.⁴ H03B *29/00*

U.S. Cl. 331—78 **28 Claims**



1. A noise generator comprising:

clock means for providing a clock signal having a selectable frequency;

means responsive to said clock signal for providing a digital signal having a pseudorandom sequence at a rate controlled by the clock means;

modulation means for providing a linearly changing modulation signal having a slope, the modulation means also for being responsive to said pseudorandom digital signal wherein the direction of the slope is controlled by said pseudorandom digital signal;

control means for controlling said modulation means so that said modulation signal remains with.n predetermined maximum and minimum limits; and

means responsive to said modulation signal for providing an output signal.

4,697,158

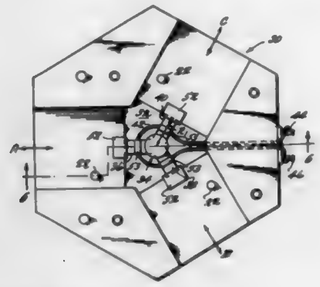
REDUCED HEIGHT WAVEGUIDE CIRCULATOR

John C. Hoover, Roswell, and David E. Giese, Duluth, both of Ga., assignors to Electromagnetic Sciences, Inc., Norcross, Ga.

Filed Apr. 15, 1986, Ser. No. 852,146

Int. Cl.⁴ H01P *1/39*

U.S. Cl. 333—1.1 **21 Claims**



1. A waveguide circulator comprising:

a conductive waveguide structure having a cavity located therewithin of a first predetermined height and said cavity having plural input/output waveguides of a second lesser predetermined height emanating therefrom:

a ferrite circulator element disposed within said central cavity and having an outer extremity spaced from an inner edge of at least one of said input/output waveguides by a gap G having a predetermined gap dimension which achieves an approximate impedance match between the impedance of the ferrite element and the higher impedance of a reduced height input/output waveguide and

means for creating a magnetic field within said ferrite element and causing it to act as a circulator element.

4,697,159

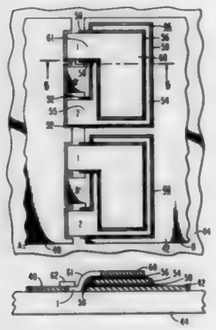
TUNING CAPACITORS WITH SELECTABLE CAPACITANCE CONFIGURATIONS FOR COUPLING BETWEEN MICROWAVE CIRCUITS

Franco N. Sechi, Princeton, and David Kalokitis, Hamilton Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1984, Ser. No. 666,811

Int. Cl.⁴ H01P *5/04*

U.S. Cl. 333—24 C **4 Claims**



1. In a microwave circuit comprising an insulating substrate and first and second separated conductors comprising upper and lower surfaces respectively, said lower surfaces being disposed on one surface of said substrate to be capacitively joined, where the upper surfaces of said first and second conductors are in a common plane, a tuning capacitor arrangement comprising in combination:

a first dielectric material layer fabricated atop one of said first and second conductors near to the other of said conductors;

a first conductive area fabricated atop said dielectric layer, the conductive area including at least one conductive bridge extending to a position on said substrate so as to form a tab thereon insulated from said first and second conductors, said tab having a lower surface and an upper surface, such that said upper surface of the tab lies in said common plane and said lower surface lies on said one surface of said substrate;

a second dielectric material layer fabricated atop said first conductive area;

a second conductive area fabricated atop said second dielectric material, said second conductive area including at least one conductive bridge extending to a position on said substrate so as to form a tab thereon insulated from said first and second conductors and first conductive area tab, said tab of said second conductive area having a lower surface and an upper surface, such that the upper surface of said tab lies in said common plane and said lower surface lies on said one surface of said substrate; and

one or more conductive means connecting selected ones of said tabs and the other of said first and second conductors to determine the total capacitance between said first and second conductors.

4,697,160

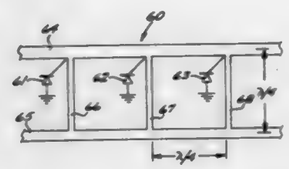
HYBRID POWER COMBINER AND AMPLITUDE CONTROLLER

Robert T. Clark, Buena Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1985, Ser. No. 811,870

Int. Cl.⁴ H01P *5/16, 5/18*

U.S. Cl. 333—103 **3 Claims**



1. A hybrid network power combiner and controller device operable at microwave frequencies, comprising:

a multi-branch hybrid power combiner circuit, comprising two main transmission lines coupled by at least three branch transmission lines which are an odd number of quarter-wave lengths of a frequency of interest in length; and

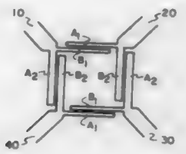
means for selectively shorting to ground each junction between one of said main transmission lines and each of said branch transmission lines.

4,697,161

DIRECTIONAL COUPLERS OF THE BRANCHLINE TYPE

Carlo Buoli, Mirandola, Italy, assignor to 501 GTE Telecomunicazioni S.p.A., Milan, Italy

Filed Sep. 5, 1985, Ser. No. 773,688
Claims priority, application Italy, Oct. 30, 1984, 23387 A/84
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—116 **2 Claims**



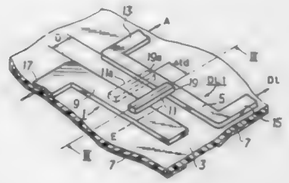
1. A directional coupler of the 3 dB and 90° branchline type, comprising:
first, second, third and fourth ports;
first, second, third and fourth pairs of coupled lines of microstrip construction;
a first branch, including connections to one of said first pair of coupled lines and one of said fourth pair of coupled lines,
forming said first port;
a second branch, including circuit connections to the other of said first pair of coupled lines and one of said second pair of coupled lines forming said second port;
a third branch, including circuit connections to the other of said second pair of coupled lines and one of said third pair of coupled lines, forming said third port;
a fourth branch, including circuit connections to the other of said third pair of coupled lines and the other of said fourth pair of coupled lines, forming said fourth port;
said first and third ports positioned geometrically opposite each other and including circuit connections to an associated circuit;
and said second and fourth ports unconnected to an associated circuit.

4,697,162

VARIABLE DELAY LINE SYSTEM

Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Feb. 5, 1986, Ser. No. 826,374
Int. Cl.[4] H01P *9/00, 3/08;* **H03H** *7/34*
U.S. Cl. 333—161 **12 Claims**



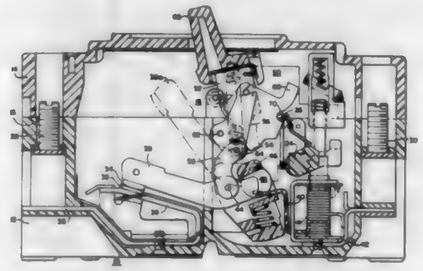
1. A variable delay line system, comprising:
a variable delay line comprising an insulating base board, an electroconductive strip formed on one surface thereof, and a ground plane formed on the other surface thereof, said electroconductive strip having two output ends and a plurality of input points defined therealong;
selection means for selecting one of said input points of said variable delay line and for inputting a signal thereto, comprising an input circuit formed on said base board along and spaced apart from said electroconductive strip, and a connecting piece which selectively connects said input circuit to one of said input points; and
switching means for selectively switching a signal from one of said output ends and outputting said signal.

4,697,163

CIRCUIT BREAKER WITH IMPACT TRIP DELAY

Kurt A. Grunert, Beaver Boro, and James R. Farley, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 27, 1986, Ser. No. 845,302
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—174 **6 Claims**



1. A circuit breaker comprising:
a pair of separable contacts including a movable contact;
a movable contact arm carrying the movable contact and movable between open and closed positions of the contacts;
an operable mechanism for actuating the contact arm and comprising a pivotally supported releasable member;
latching means for latching the releasable member and including a latch lever movable between latched and unlatched positions of the releasable member;
trip means including a trip bar for releasably holding the latch lever in the latched position;
trip delay means for avoiding premature unlatching of the trip bar and including a body movable against the trip bar and biased away therefrom;
an electromagnetic device responsive to a predetermined overcurrent condition and including a solenoid coil and a plunger for moving the body against the trip bar to an unlatched position thereof;
the plunger being slidably mounted on the body for movement of the body against the trip bar to thereby move the trip bar to the unlatched position of the latch lever; and
a delay spring between the plunger and the body for controlling movement of the plunger against the body by a force of the magnetic flux incurred by the solenoid coil as overcurrent conditions approach the predetermined overload conditions.

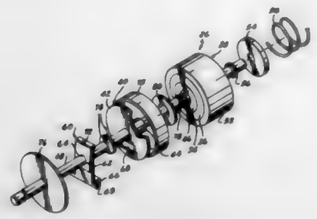
4,697,164

INCREMENTALLY INDEXING LINEAR ACTUATOR

John L. Ellertsen, 7300 Deep Run, Birmingham, Mich. 48010

Filed Aug. 18, 1986, Ser. No. 897,511
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—253 **36 Claims**

1. A linear actuator which comprises:
a shaft having a central axis,
first means mounting said shaft for linear motion in the direction of said axis,
second means carried by said shaft for sliding motion in the direction of said axis,
latching means having a first end pivotally mounted to said second means eccentrically of said axis, a central portion which extends laterally across said axis along one face of said second means and has an aperture which embraces said shaft, and a second end free to move with respect to said second means, and



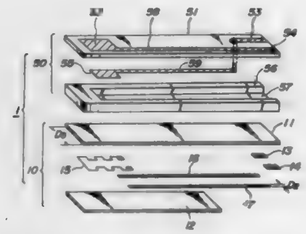
third means carried in fixed position on said first means and operatively coupled to said second means for moving said second means along said axis in a direction opposed to said one face, motion of said second means pivoting said latching means at said one end to grip said shaft at said aperture and move said shaft conjointly with said second means.

4,697,165

CERAMIC HEATER AND A METHOD OF MANUFACTURING THE SAME

Fujio Ishiguro, Nagoya, and Hideo Maeda, Kani, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 23, 1985, Ser. No. 790,539
Claims priority, application Japan, Nov. 1, 1984, 59-228874
Int. Cl.[4] H01C *7/00*
U.S. Cl. 338—34 **14 Claims**



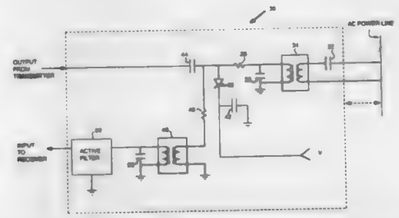
4. An oxygen sensor element comprising a heater unit and a sensor unit; said heater unit comprising an elongated plate-like ceramic substrate having a first end portion and a second end portion and a transverse width, a resistance heating element arranged in the vicinity of said first end portion of said ceramic substrate, said resistance heating element having two electrical connections and a pair of elongated strip-like conductive lead members, each of said lead members extending from one connection of said resistance heating element toward the second end portion of said ceramic substrate, each of said conductive lead members having a specific electrical resistance which is less than a specific electrical resistance of said resistance heating element and each of said lead members having a transverse width, wherein a sum of the transverse widths of the lead members is not more than one half the transverse width of the ceramic substrate; said sensor unit comprising an oxygen ion-conducting solid electrolyte body, at least one measuring electrode and one reference electrode arranged in the vicinity of said first end portion of said solid electrolyte body, and conductive lead members extending from each of said measuring and reference electrodes toward said second end portion of said solid electrolyte body; wherein said heater unit is integrally attached to said sensor, thereby heating at least one of said electrode and said reference electrode.

4,697,166

METHOD AND APPARATUS FOR COUPLING TRANSCEIVER TO POWER LINE CARRIER SYSTEM

Thomas J. Warnagiris, and William H. McGinnis, both of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Komaki, Japan

Filed Aug. 11, 1986, Ser. No. 896,111
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 R **11 Claims**



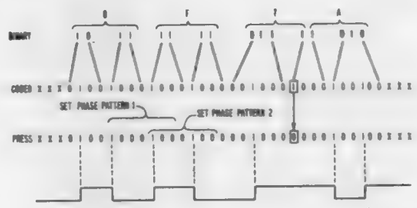
1. An apparatus for coupling a transceiver to an AC power line, said transceiver comprising a transmitter portion for providing a first data signal at a first frequency and a receiver portion for receiving a second data signal at a second frequency, comprising:
a resonant circuit for coupling said first data signal to said power line and for receiving said second data signal from said power line, said resonant circuit having first and second terminals, said first terminal connected to said power line, said second terminal connected to said transmitter to receive said first data signal therefrom, said resonant circuit defining a first bandpass filter for filtering said first and second data signals;
a second bandpass filter having first and second terminals, said first terminal of said second filter being connected to said second terminal of said resonant circuit to receive said second data signal therefrom, said second terminal of said second filter connected to said receiver; and
means for isolating said AC power line and said resonant circuit from said second bandpass filter.

4,697,167

SYNC PATTERN ENCODING SYSTEM FOR DATA SECTORS WRITTEN ON A STORAGE MEDIUM

Michael J. O'Keeffe; James M. Graba, both of Longmont, and George I. Noyes, Boulder, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 533,826, Sep. 19, 1983, abandoned. This application Nov. 21, 1985, Ser. No. 838,181
Int. Cl.[4] H03M *5/00*
U.S. Cl. 340—347 DD **7 Claims**



1. A method of generating a unique sync pattern for use with a group of valid data words that are encoded according to a

prescribed fixed rate run-length limited code, said method comprising the steps of:

(a) encoding a prescribed data word in accordance with said fixed rate run-length limited code; and

(b) changing at least one of the bits of said enclosed prescribed data word such that the resulting bit pattern of the changed encoded prescribed word still complies with the coding requirements of the prescribed fixed rate run-length limited code yet does not represent any valid encoded data word that can occur through encoding data according to said code, whereby the changed encoded word may be distinguished from other encoded data words, yet processed and handled in the same manner as are all the data words encoded in accordance with said prescribed fixed run-length limited code, wherein the prescribed fixed rate run-length limited code is a 2,7 code, and said prescribed data word comprises the word "BF7A" (hex), whereby said word when encoded in accordance with said 2,7 code is converted to a first code word comprising "01001000100010000010000000100100".

4,697,168

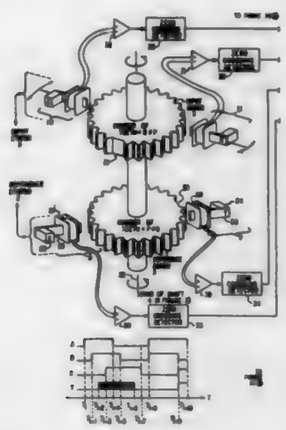
ANGLE TRANSDUCER STORING AN INTEGRAL NUMBER OF REVOLUTIONS' WORTH OF ROTOR-POLE TRANSITION DATA IN MEMORY

Alan J. Baker, 10329 33rd Ave. S.E., Everett, Wash. 98204

Division of Ser. No. 479,043, Mar. 25, 1983, Pat. No. 4,630,033. This application Oct. 20, 1986, Ser. No. 920,830

Int. Cl.[4] H03K *13/02;* **G05F** *15/20*

U.S. Cl. 340—347 P **6 Claims**



1. A transducer comprising:

first and second rotors journalled for simultaneous and identical rotation about an axis and each having a plurality of poles along respective first and second peripheries;

means coupled to the first and second rotors for rotating them about the axis;

first sensing means disposed adjacent the first periphery for producing a first sensor signal in response to the passage of poles along the first periphery;

second sensing means disposed adjacent the second periphery for producing a second sensor signal in response to the passage of poles along the second periphery;

first and second zero crossing detectors respectively coupled to the first and second sensor signals for producing first and second digital signals;

transition detection means coupled to the first and second digital signals for detecting that at least one of those signals has changed and for producing a trigger signal indicative thereof;

clock means for providing digital time information;

memory means coupled to the first and second digital signals, the digital time information and to the trigger signal for capturing the states of the first and second digital signals and the digital time information upon the occurrence of the trigger signal, and for storing therein state and time data for the first and second rotors over at least one revolution.

4,697,169

DEVICE FOR DETECTING AND LOCALIZING A FAULT IN AN AERIAL ROPE-WAY TRANSPORT INSTALLATION

Jean-Jacques Bertrand, Fontaine, France, assignor to Pomagalski S.A., Fontaine, France

Filed Sep. 30, 1985, Ser. No. 781,726

Claims priority, application France, Oct. 15, 1984, 84 15867

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—540 **13 Claims**



1. A detection device of the electrical condition of a safety line extending along the whole length of an aerial ropeway transport installation between the two terminal stations and comprising a plurality of electrical contacts located at intervals along the line, said contacts being electrically connected in series in the line and controlled for opening by fault detectors, notably of a rope derailment, comprising:

an AC signal generator located in one of the stations and connected on the one hand to the end of the safety line and on the other hand to a return circuit constituted by the earth or a return conductor which forms with the safety line a loop circuit joining the two stations,

a rectifier device, such as a diode, located in the opposite station from that of the generator and inserted in said loop circuit,

and a measuring device located in the same station as the generator, to measure the positive and negative alternations (+VL, −VL) of said signal and to supply a signal representative of the line condition.

4,697,170

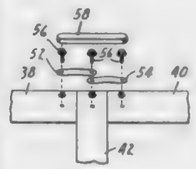
METHOD FOR MINIMIZING FALSE ALARMS AND ELECTRONIC NOISE IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEMS.

Earl B. Hoekman, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 31, 1985, Ser. No. 793,203

Int. Cl.[4] G08B *13/24*

U.S. Cl. 340—551 **4 Claims**



1. A method of minimizing false alarms and high noise environments potentially present in electromagnetic article surveillance systems in which a magnetic field alternating at a predetermined frequency is created in an interrogation zone and signals corresponding to harmonics of the predetermined frequency are detected, wherein in the vicinity of the interrogation zone are present metallic structures forming at least one substantially closed loop, such as created by a metallic door frame or the like, said method comprising the step of

electrically connecting across each joint of each such substantially closed loop at which the effective resistance may be variable, at least one section of conductive material to provide across all said joints a highly conductive, highly stable parallel electrical path having a low and constant effective resistance, thereby preventing large rapid changes in the alternating currents induced in said loop by said alternating field, with the result that the generation of currents alternating at frequencies which are high order harmonics of the alternating field are also prevented and confusion with marker produced harmonic signals is avoided, while also avoiding artifically high background electrical noise which tends to mask the detection of said marker produced signals.

4,697,171

ELECTRONIC LOCK AND KEY

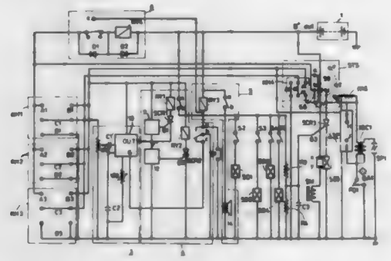
Kyung S. Suh, Seoul, Rep. of Korea, assignor to Daung Precision Company, Seoul, Rep. of Korea

Filed Jan. 27, 1986, Ser. No. 823,103

Claims priority, application Rep. of Korea, Mar. 25, 1985, 85-1940

Int. Cl.[4] E05B *45/06;* **B60R** *25/04*

U.S. Cl. 340—543 **12 Claims**



10. An electronic lock and key for use with vehicles comprising an electronic key which produces a predetermined unlocking signal to unlock said lock when said key is an authorized key and is inserted within said lock, an electronic lock having at least two key holders for receiving said key, an alcohol sensing means, a power source, wherein each of said key holders is coupled to a start switch and a control switch to comprise a start/switching means, said start/switching means being coupled between said lock and a starting system for said vehicle, said starting system including an ignition coil so that when said lock is unlocked by the insertion of said authorized key, power from said power source is supplied to said starting system thereby initiating operation of said starting system, wherein said alcohol sensing means is coupled between said power source and said ignition coil of said vehicle, so that when said alcohol sensing means receives an input representing intoxication of a driver, said alcohol sensing means prevents said ignition coil from receiving power from said power source, thereby preventing the operation of said starting system and said vehicle when said driver is intoxicated.

4,697,172

FIRE ALARM SYSTEM

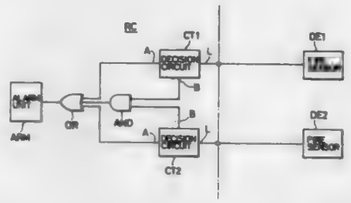
Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Japan

Filed Sep. 25, 1985, Ser. No. 780,094

Claims priority, application Japan, Dec. 25, 1984, 59-272098

Int. Cl.[4] G08B *29/00*

U.S. Cl. 340—587 **2 Claims**



1. In a fire alarm system comprising a plurality of fire sensors installed in a monitoring area and a fire signal receiver which issues a fire alarm in response to fire detection signals outputted by said fire sensors, the improvement wherein said receiver comprises:

a plurality of decision means receiving said fire detection signals from said fire sensors for producing fire occurrence signals representing a first level of probability that a fire has occurred and decision signals representing a second, lower, level of probability that a fire has occurred; and

fire alarm means for issuing a fire alarm when one of said fire occurrence signals is outputted or at least two said decision signals are produced, wherein said fire sensors comprise on-off type fire sensors, and each of said decision means produces a fire occurrence signal when the respective fire sensor has operated plural times within a predetermined period of time.

4,697,173

LOAD SENSING ALARM CONDITION MONITOR

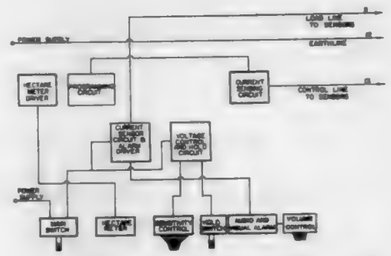
Dale R. Stokes, P.O. Box 58, Mingenew, Australia

Filed Apr. 10, 1985, Ser. No. 721,578

Claims priority, application Australia, Apr. 10, 1984, PG4507

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—684 **13 Claims**



1. A monitoring means for apparatus having a number of functional stations, said means comprising a plurality of sensors located to monitor the operation of at least some of said functional stations, each sensor having a critical condition indicator adjacent the respective station for indicating at least an alarm state and a non-alarm state, a central monitor having a power supply connected via a common connection to each of the sensors and a common signal line connected to the output of each of said sensors wherein each sensor provides an output on

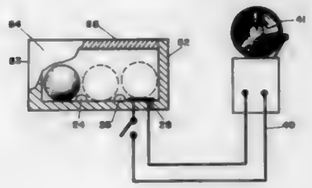
activation of the critical condition means activated through said signal line wherin each sensor provides an output signal to said signal line for effecting the alarm means to be activated and wherein said central monitor means includes manually actuable hold switching means coupled via a common control line to each of the sensors for latching the state of each of said condition indicators.

4,697,174

BALL ACTUATED ALARM DEVICE

John R. Viator, Sr., 530 Freetown Rd., New Iberia, La. 70560

Filed Oct. 10, 1985, Ser. No. 786,325
Int. Cl.[4] G08B *21/00*; H01H *35/02*
U.S. Cl. 340—689 **16 Claims**



1. A device for detecting a tilted condition of a structure, comprising:

a substantially even floor plate divided into first, second and third regions by first and second protuberances projecting from the floor plate;

a ball supported on said floor plate;

a ball-actuated switch in the third region of the floor plate;

an alarm means in a circuit connected to the switch for signaling a warning when the switch is activated by said ball;

wherein the diameter of said ball is sufficiently greater than the height of the first protuberance to allow the ball to move over the first protuberance and into the second region when the structure to which the device is attached tilts to a predetermined angle; and

wherein the second protuberance is of substantially the same height as the first protuberance, so that continued tilt of the structure will move the ball into the third region and activate the alarm.

4,697,175

LIGHTPEN CONTROL CIRCUIT

John B. Macdonald, West Windsor Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

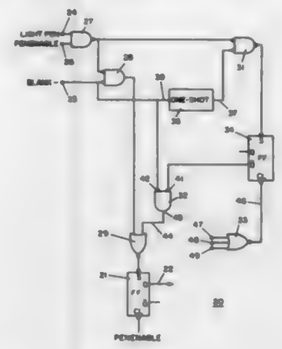
Filed Mar. 30, 1984, Ser. No. 595,124
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—707 **6 Claims**

1. A light pen control circuit for releasing a computer interrupt signal in response to a light pen hit signal generated by a light pen during or after a display of graphical information by a random scanning computer graphics system which is capable of displaying vectors having a drawing period shorter than the response time of the light pen, comprising:

means for generating a computer interrupt signal in response to a light pen hit signal generated within a predetermined interval corresponding to the display of graphical information or a prescribed period immediately thereafter;

means for determining whether the light pen hit signal occurred during or after the display of graphical information;

means for releasing the computer interrupt signal when the light pen hit signal occurred during the display of graphical information and for storing the computer interrupt signal when the light pen hit signal occurred after the display of graphical information; and



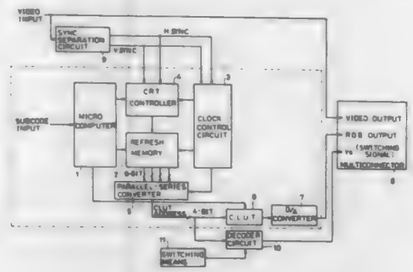
means for selectively releasing the stored computer interrupt signal contemporaneously with a display of subsequent graphical information.

4,697,176

VIDEO SUPERIMPOSITION SYSTEM WITH CHROMA KEYING

Kiyotada Kawakami, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jul. 29, 1986, Ser. No. 891,698
Claims priority, application Japan, Aug. 6, 1985, 60-172753
Int. Cl.[4] H04N *9/75*
U.S. Cl. 340—723 **2 Claims**



1. A graphic decoder circuit for generating picture switching signals to superimpose pictures based on RGB video signals obtained on the basis of color code signals recorded in a record medium on pictures based on other video signals, said graphic decoder circuit comprising:

color signal generation means addressed by said color code signals from said record medium for outputting said RGB video signals in correspondence to the designated addresses; and

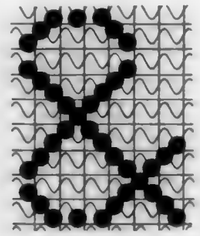
decoder means for decoding said color code signals to output said picture switching signals on the basis of specific color code signals, said decoder means including manually operable switching means for selecting one of said color code signals for producing said picture switching signal.

4,697,177

HIGH RESOLUTION DOT-MATRIX CHARACTER DISPLAY

Jonathan M. Schine, Los Angeles, Calif., assignor to High Resolution Television, Inc., Los Angeles, Calif.

Filed Dec. 26, 1984, Ser. No. 686,220
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—728 **6 Claims**



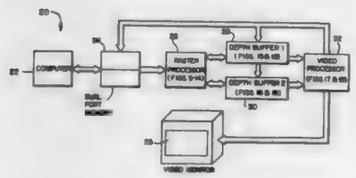
1. A method of displaying on a cathode ray tube having an intensity and raster-scan controlled beam enhanced resolution alphanumeric and other characters, including symbols of conventional and arbitrary form, in a dot-matrix of rows defined by raster scans and columns utilizing a HOM character generator comprising the steps of storing in said ROM character generator a qMxn matrix of binary 1's and 0's, said binary 1's representing dots created by intensity control of said beam making up characters to be displayed, where q is an integer greater than one for generating more than one dot for display in each dot space of an Mxn matrix, M is the number of horizontal dot spaces in each row, and n is the number of rows of dot spaces in a character matrix, and cyclically modulating in a vertical direction the cathode ray tube beam above and below the horizontal center of each row at a predetermined fixed rate for display of dots making up characters, thereby displacing said dots above and below said horizontal center of each row.

4,697,178

COMPUTER GRAPHICS SYSTEM FOR REAL-TIME CALCULATION AND DISPLAY OF THE PERSPECTIVE VIEW OF THREE-DIMENSIONAL SCENES

Todd A. Heckel, Clarksville, Md., assignor to Megatek Corporation, San Diego, Calif.

Filed Jun. 29, 1984, Ser. No. 626,385
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—729 **38 Claims**



1. A process for generating and displaying perspective images, without hidden surfaces on a view reference plane on a display device for scanning a pluraity of scanning lines in a raster with each line having a plurality of addressable pixels, of a scene having one or more three-dimensional objects in which each object has one or more planar surfaces comprising:

(a) storing the one or more objects to be displayed as a three-dimensional mathematical representation;

(b) processing the three-dimensional mathematical representation of the one or more objects to generate a list of line segments along the direction of scanning of the intersection of the scanning lines in the view reference plane with the one or more surfaces of the one or more objects with line segments from each line of scanning being stored in a separate line storage location which is addressed by the line from which the line segments were generated, each stored line segment including display information for each of the pixels therein, information enabling the identification of beginning and end pixels of its intersection along the line of scanning and information permitting the calculation of the depth of each pixel therein with respect to the view reference plane;

(c) initializing addressable storage locations in a depth buffer having a number of addressable storage locations equal in number to the number of pixels along a line of scanning with background depth information and background display information, each storage location having an address corresponding to one of the pixels along a line of scanning;

(d) processing sequentially in time the line storage locations in the order of scanning on the display device, each line storage location being individually processed to calculate for each pixel within each line segment stored therein its depth with respect to the view reference plane;

(e) comparing sequentially in time the calculated depth information of each line storage location with depth information stored in the depth buffer in the order of scanning on the display device, the calculated depth information of each line storage location being processed by comparing the calculated depth of each pixel within each line segment with depth information stored in the depth buffer at the corresponding address;

(f) storing calculated depth information and display information in the storage locations of the depth buffer sequentially in time for each of the line storage locations in the order of scanning on the display device, the calculated depth information and display information of each of the pixels of the line segments of each line storage location being stored in the depth buffer at the corresponding address when during the comparing the calculated depth information is determined to be closer to the view reference plane than the depth information stored at the corresponding address of the depth buffer to generate a line of display information; and

(g) displaying the display information stored within the addressable storage locations of the depth buffer sequentially in time on a line by line basis.

4,697,179

INDUCTIVE RADIO CONTROL SYSTEM FOR VEHICLES

Hiroshi Arimitsu; Kiyoshi Hatano, both of Kurashiki; Terayuki Nakanishi, Okayama; Yoshio Yoshimura, Kurashiki; Masaki Urabe, Tokyo, and Tsurakazu Honda, Zama, all of Japan, assignors to Kawasaki Steel Corporation, Kobe and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Mar. 26, 1985, Ser. No. 716,228
Claims priority, application Japan, Mar. 28, 1984, 59-58189; Oct. 5, 1984, 59-209510
Int. Cl.[4] H04Q *9/00*; H04B *7/00*; B61L *25/00*
U.S. Cl. 340—825.72 **5 Claims**

1. An inductive radio control system for vehicles comprising:

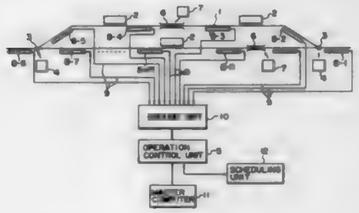
a traveling path;

a plurality of traveling means for traveling along the traveling path;

first transmitting/receiving means mounted on the traveling means, the first transmitting/receiving means including means for generating a first carrier signal having a first frequency, first tone generator means for generating a

plurality of first tone signals of different frequencies representing different operating states of said traveling means, and means for modulating the first carrier signal by the first tone signals for generating a traveling means monitoring signal;

a plurality of ground loop antenna means separately arranged along the traveling path, each of the ground loop antenna means including means for receiving said traveling means monitoring signal to obtain a carrier detection signal representing that one of said traveling means exists at the ground loop antenna means by detecting said first carrier signal, and means for transmitting a traveling means control signal to the first transmitting/receiving means;



second transmitting/receiving means including means for generating a second carrier signal of second frequency, second tone generator means for generating a plurality of second tone signals of different frequencies representing different operation states of the traveling means designated in accordance with a predetermined working schedule, and means for modulating the second carrier signal by the second tone signals for generating the traveling means control signal, wherein the number of said second transmitting/receiving means is set the same as the number of said traveling means; and

selecting means for selectively coupling the second transmitting/receiving means to one of the ground loop antenna means in accordance with an obtained carrier detection signal.

4,697,180

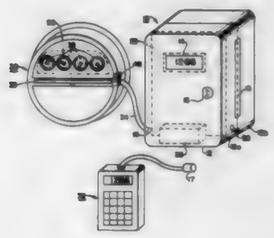
SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 776,719, Sep. 16, 1985, Pat. No. 4,639,728. This application Apr. 9, 1986, Ser. No. 849,896

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—870.02 **24 Claims**



1. A system for accumulating energy demand data from an electricity meter, comprising:

memory means for storing demand data accumulated during predetermined time intervals;

means for transmitting stored demand data from said memory means to a central computer over a telephone line at periodic time intervals; and

command means for receiving control commands from a central computer over said telephone line, said command means comprising telephone ring detecting means for detecting a ringing condition on said telephone line, and means responsive to said ringing condition for answering said telephone line only after said ringing condition has continued for a predetermined length of time.

4,697,181

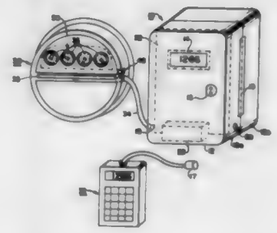
SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 776,719, Sep. 16, 1985, Pat. No. 4,639,728. This application Apr. 9, 1986, Ser. No. 849,898

Int. Cl.[4] G08B *1/08*

U.S. Cl. 340—870.02 **26 Claims**



14. A system for accumulating energy demand data from an electricity meter of a type having means for generating pulses at a predetermined rate corresponding to a demand rate, comprising:

means for detecting pulses generated by said meter;

scaling means responsive to pulses detected by said detecting means for providing a scaled count corresponding to a predetermined number of pulses during a first predetermined measurement interval;

means responsive to said scaled count during a second predetermined measurement interval for developing demand data, said demand data corresponding to a plurality of said pulses;

memory means for storing said demand data during predetermined time intervals; and

means for transmitting said stored demand data from said memory means to a central computer over a communications channel at periodic time intervals.

4,697,182

METHOD OF AND SYSTEM FOR ACCUMULATING VERIFIABLE ENERGY DEMAND DATA FROM REMOTE ELECTRICITY METERS

Scott C. Swanson, Roswell, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 776,719, Sep. 16, 1985, Pat. No. 4,639,728. This application Apr. 9, 1986, Ser. No. 849,899

Int. Cl.[4] G08C *19/16*

U.S. Cl. 340—870.02 **20 Claims**

1. A system for accumulating energy demand data from an electricity meter of a type having means for generating pulses corresponding to a demand rate comprising:

means for detecting pulses generated by said meter;

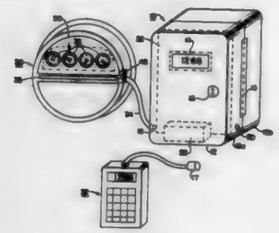
means for counting the pulses detected by said detecting

means during a predetermined measurement interval to develop demand data;

memory means for storing said demand data during predetermined time intervals;

means for transmitting stored demand data from said memory means to a central computer over a telephone line at periodic time intervals;

error condition detecting means for detecting the existence



of an eror condition in said system, said error condition corresponding to a meter error, and further comprising timing means responsive to pulses detected by said detecting means for indicating said meter error in response to the failure by said detecting means to detect a pulse within a predetermined time period, and

means responsive to said error condition for transmitting information corresponding to said error condition to said central computer over said telephone line.

4,697,183

MEANS FOR NON-CONTACTING SIGNAL AND ENERGY TRANSMISSION

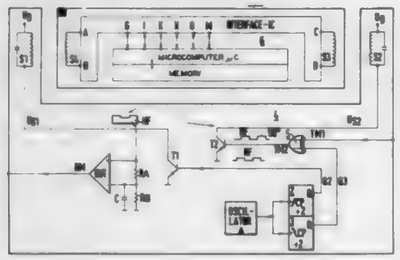
Michael Jenning, and Holger Mackenthun, both of Hamburg, Fed. Rep. of Germany, assignors to Angewandte Digital Elektronik, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 810,558

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3447560

Int. Cl.[4] G08C *19/24, 19/00*

U.S. Cl. 340—870.25 **12 Claims**



9. A device for non-contacting energy and signal transmission between a microstation and a microcomputer controlled microunit, comprising:

a microstation including:

means for generating first and second coherent periodic signals, said first signal being phase shifted by approximately 90 degrees with respect to said second signal;

means for selectively imparting an approximately 180 degree phase shift on one of said first and second signals;

first and second inductive couplers connected to said first and second signal generating means to transmit respective ones of said first and second signals;

a microunit including:

third and fourth inductive couplers mounted for selective coupling said first and second inductive couplers, said third coupler being couplable to said first coupler and said fourth coupler being couplable to said second coupler when said microunit and said microstation are in a first relative position and said third coupler being couplable to said second coupler and said fourth coupler being couplable to said first coupler when said microunit and said microstation are in a second relative position;

an interface connected between said third and fourth coils and said microcomputer, said interface including:

means for phase evaluation of signals at said third and fourth coils,

means for level definition of signals from said phase evaluation means,

means for rectifying signals from said third and fourth coils, and

means for regulating said rectified signal to supply power to said microcomputer;

whereby signal transmission from said microstation to said microunit ensues by said selective phase shifts.

4,697,184

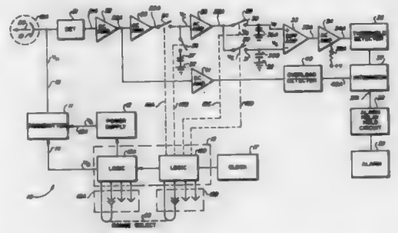
INTRUSION DETECTION RADAR SYSTEM WITH AMPLITUDE AND FREQUENCY CARRIER MODULATION TO ELIMINATE TARGETS AT SHORT AND LONG RANGES

James Chesl; James R. Fitzsimmons, and Edward J. Foley, all of Tempe, Ariz., assignors to Southwest Microwave, Tempe, Ariz.

Filed Feb. 9, 1984, Ser. No. 578,539

Int. Cl.[4] G01S *13/56, 13/38;* G08B *13/24*

U.S. Cl. 342—28 **24 Claims**



1. A method of reliably detecting intruding targets in a protected region, said method comprising the steps of:

(a) operating a transmitter to produce a microwave signal having successive, repetitive first and second portions of first and second frequencies, respectively, and radiating said microwave signal from an antenna into said protected region;

(b) operating a receiver to detect a resulting return signal received by said antenna from a target to produce first and second doppler signals corresponding to said first and second frequency portions of said microwave signal, respectively;

(c) operating the receiver to produce a gating signal and using the gating signal to gate said first and second doppler signals during first and second predetermined intervals onto first and second conductors, respectively, to reject any portion of said first and second doppler signals due to targets beyond a predetermined cutoff range;

(d) subtracting one of said gated first and second doppler signals from the other to produce a suppressed doppler signal the amplitude of which is approximately proportional to the range of the reflecting target; and

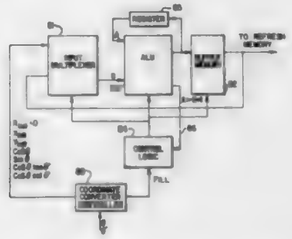
(e) producing an alarm signal in response to said suppressed doppler signal if said suppressed doppler signal exceeds a predetermined magnitude for at least a predetermined interval, to reject any portions of said first and second doppler signals which are due to small, close in targets such as rain on or vibration of a radome enclosing said antenna.

4,697,185

ALGORITHM FOR RADAR COORDINATE CONVERSION IN DIGITAL SCAN CONVERTERS

David M. Thomas, Ottawa, and Leonard J. Tubb, Kanata, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence and Control Data Canada, Ltd., both of Ottawa, Canada

Filed Jul. 1, 1983, Ser. No. 510,251
Claims priority, application Canada, Dec. 23, 1982, 418525
Int. Cl.[4] G01S *7/44*
U.S. Cl. 342—185 **6 Claims**



1. A system for high speed coversion of polar coordinates of radar returns from radially speced apart radar pulses into cartesian coordinates for storage in a digital memory comprising means for determining an initial X_i,Y_j address corresponding to where a radar pulse crosses a raster display at an angle θ_j means for determining subsequent addresses X_{i+1} and Y_{j+1} for said pulse by adding constant values sin θ_j and cosθ_j to X_i and Y_j means for storing data representative of said radar returns at said addresses X_i and Y_j and means for filling said display between adjacent radar pulses at ranges where spoking tends to occur with data related to the data stored at each address X_i, Y_j.

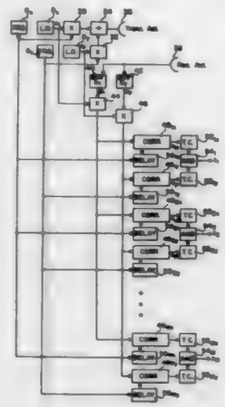
4,697,186

VELOCITY DISCRIMINATION RADAR

Robert G. Rock, Coronado, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 574,169
Int. Cl.[4] G01S *13/04*
U.S. Cl. 342—189 **15 Claims**

1. A radar system compriaing:
a radar signal transmitting means for outputting a radar signal having first and second signal components comprising first and second frequency generating means for producing, respectively, a first frequency generator signal at a first predetermined frequency and a second frequency generator signal at a second predetermined frequency different from said first predetermined frequency;
said radar signal transmitting means further comprising a first Pseudo-Random generator means for generating a first Pseudo-Random sequence for modulating said first frequency generator signal and a second Pseudo-Random generator means for generating a second Pseudo-Random sequence for modulating said second frequency generator signal, the period of said first Pseudo-Random sequence being different from the period of said second Pseudo-Random sequence, whereby the moduiated first frequency generator signal comprises said first signal component and the modulated second frequency signal comprises said second signal component; and
a radar return signal receiving means for receiving a return



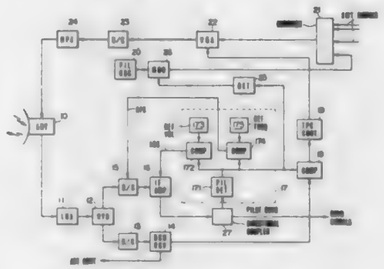
radar signal and for providing an output only upon the simultaneous presence of a main Doppler peak resulting from said first signal component and a main Doppler peak resulting from said second signal component.

4,697,187

PRECIPITATION LOSS COMPENSATION AND DISABLEMENT FOR AVOIDANCE OF SATELLITE TRANSPONDER OVERLOADING

Satoru Ohno, and Yasuhisa Shimada, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Mar. 4, 1985, Ser. No. 707,746
Claims priority, application Japan, Mar. 9, 1984, 59-45260
Int. Cl.[4] H04R *7/185*; H04B *7/185*; G01S *13/00*
U.S. Cl. 342—358 **3 Claims**



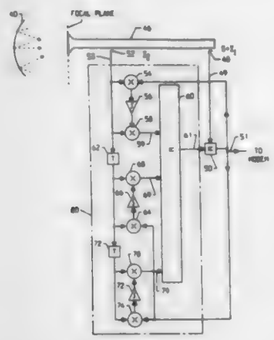
1. A transmitting power control system for a satellite communication network, the network comprising a satellite transponder for transmitting a beacon signal and for receiving and retransmitting a pilot signal from a master earth station having uplinks and downlinks connected through said satellite transponder to respective downlinks and uplinks of a plurality of slave earth stations, wherein:
said master earth station comprises means for generating a pilot signal to be transmitted to said satellite transponder, means for receiving said beacon signal and said retransmitted pilot signal from said transponder, said beacon and pilot signals being received through said downlinks of the master earth station, means for comparing the received beacon signal with the received pilot signal, first variable gain amplifier means for providing amplification of uplink information signals and the generated pilot signal with a variable gain in accordance with the result of the comparison by said comparing means so that the effective isotropically radiated power of the retransmitted pilot signal is maintained constant, means for disabling said pilot signal generating means when said received pilot signal decreases below a prescribed value corresponding to a predetermined amount of precipitation, and means for transmitting the amplified uplink information and pilot signals on said uplinks of the master earth station to said transponder; and
each of said slave earth station comprises means for receiving the retransmitted pilot signal and a downlink information signal on the downlink of each slave earth station from said transponder, second variable gain amplifier means for providing amplification of an uplink information signal, means for controlling the gain of said second variable gain amplifier means in accordance with the pilot signal received by each slave earth station, and means responsive to the disablement of said pilot signal generating means of said master earth station for disabling said controlling means to prevent said satellite transponder from being overloaded by the uplink information signals transmitted from said slave earth stations on the uplinks thereof.

4,697,188

INTERFERENCE CANCELER WITH DIFFERENCE BEAM

Heng-Cheng Lin, North Andover, Mass., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 13, 1985, Ser. No. 701,351
Int. Cl.[4] G01S *3/16*; H04R *7/185*
U.S. Cl. 342—383 **14 Claims**



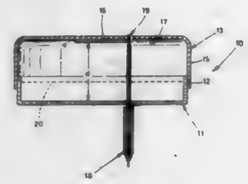
1. Apparatus for separating desired signals from a target satellite from undesired signals from interfering satellites said apparatus comprising
an antenna for reflecting to its focus said desired signals and said undesired signals,
a waveguide with one of its ends located at the focus of said antenna, a first coupler for extracting the fundamental mode signals from said waveguide and delivering said signals to a first summing circuit,
a second coupler for extracting higher order mode signals from said waveguide and delivering said higher order mode signals to a delay line network, the output from said delay line network being delivered to said first summing circuit, and said first summing circuit adding said fundamental mode signals from said first coupler and said higher order mode signals from said second coupler to derive said desired signals which are substantially free from said undesired signals.

4,697,189

MICROSTRIP ANTENNA

John B. Ness, Pullenvale, Australia, assignor to University of Queensland and Commonwealth of Australia, both of Queensland, Australia

Filed Apr. 24, 1986, Ser. No. 855,488
Claims priority, application Australia, Apr. 26, 1985, PH0328
Int. Cl.[4] H01Q *1/38, 1/42*
U.S. Cl. 343—700 MS **5 Claims**



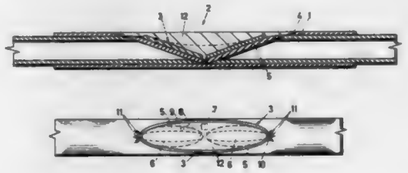
1. A microwave antenna including:
a ground plate;
a substanially planar support means spaced from the ground plate to provide an air gap therebetween;
a metal patch on the support means, said metal patch being provided on a face of the support means which is directed towards the ground plate;
an electrical conductor means connected to the metal patch and ground plate; and
the support means and the ground plate being provided with complementary peripheral flanges which are adjustably slidably engaged together to hold the support means over the ground plate at a selected spacing therefrom, with the variation of the spacing effecting adjustment of the thickness of the air gap.

4,697,190

BOREHOLE LOCATED DIRECTIONAL ANTENNAE MEANS FOR ELECTROMAGNETIC SENSING SYSTEMS

Gordon K. A. Oswald, Huntingdon, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 23, 1985, Ser. No. 778,915
Claims priority, application United Kingdom, Nov. 2, 1984, 8427792
Int. Cl.[4] H01Q *1/04, 9/20*
U.S. Cl. 343—719 **12 Claims**



1. A directional antenna for locating in a borehole formed in strata, and adapted to form a component of an electromagnetic sensing system, comprising a generally cylindrical tube of electrically conductive material, a portion of the circumference of the tube cut away to define a window, the none cut away portion of the circumference of the tube providing a backing shield for the window, a generally 'V' shaped support of electrically insulating material located in the tube adjacent to the window with the central base portion of the 'V' shape adjacent to the none cut away backing shield, a pair of antenna

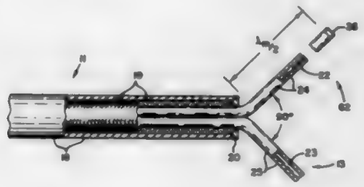
elements mounted on, and extending along, the inclined limbs of the generally 'V' shaped support, respectively, and a cover arranged over the antenna elements.

4,697,191

OMNIAZIMUTHAL ANTENNA

Marshall W. Cross, Stow, Mass., assignor to Science Applications International Corporation, La Jolla, Calif.

Filed May 8, 1985, Ser. No. 732,233
Int. Cl.[4] H01Q *9/44, 1/40, 1/04*
U.S. Cl. 343—809 **9 Claims**



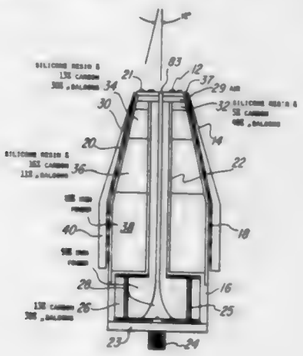
1. An antennna adapted for burial, comprising:
(a) a pair of antenna elements aligned along a substantially horizontal plane in substantially mutually orthogonal longitudinal alignment;
(b) the longitudinal dimension of said antenna elements corresponding to about ¼ the in-medium wavelength of a preselected frequency; and
(c) electrically balanced, shielded, transmission line means comprising a pair of dielectrically insulated conductors for establishing electrical communication between said antenna elements and an RF receiver/transmitter;
(d) said antenna elements being unshielded, integral, dielectrically insulated end-portions of said conductors, and extending beyond the shielding of said transmission line means.

4,697,192

TWO ARM PLANAR/CONICAL/HELIX ANTENNA

Dean A. Hofer, Richardson; Daniel J. Carlson, and Matthew L. Pecak, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1985, Ser. No. 723,789
Int. Cl.[4] H01Q *1/36*
U.S. Cl. 343—895 **14 Claims**



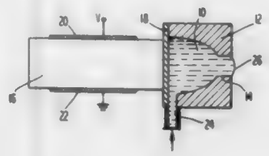
1. A broadband antenna comprising:
an RF input;
a support means;
an antenna radiation element means mounted on said support means and electrically connected to the RF input and includes an Archimedes' planar spiral antenna electrically connected to the RF input, a conical spiral antenna electrically connected to the Archimedes' planar spiral antenna and a helix antenna electrically connected to the conical spiral antenna; and
internal and external load absorbers internal of and external to the antenna radiation element means whereby said antenna radiation element means and the internal and external load absorbers coact for effectively reducing the size of the broadband antenna.

4,697,193

METHOD OF OPERATING AN INK JET HAVING HIGH FREQUENCY STABLE OPERATION

Stuart D. Hawkins, Ridgefield, Conn., assignor to Exxon Printing Systems, Inc., Florham Park, N.J.

Continuation of Ser. No. 576,582, Feb. 3, 1984, Pat. No. 4,646,106, which is a continuation-in-part of Ser. No. 336,603, Jan. 4, 1982, Pat. No. 4,459,601, which is a continuation-in-part of Ser. No. 229,994, Jan. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 304,131, Jun. 1, 1982, Pat. No. 4,509,059. This application Mar. 21, 1986, Ser. No. 842,455
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **4 Claims**



1. A method of operating a demand ink jet comprising an ink jet chamber and an orifice adapted to be filled with ink so as to form a meniscus in the orifice and eject droplets of ink from said meniscus, said jet being characterized by at least one resonant frequency in excess of 10 kHz creating an upper limit for a frequency of stable operation, said method comprising the following steps:
initiating filling by decreasing the pressure within the chamber;
retracting the meniscus as the pressure is decreased;
initiating firing of a first droplet by increasing the pressure within the chamber when the meniscus is retracted to a predetermined position;
moving the meniscus forward through the orifice while the pressure is increased so as to first form and then project a droplet outwardly from the orifice;
repeating the foregoing steps at various operating frequencies in a range from zero to a frequency in excess of 5 kHz while always initiating firing from substantially the same said predetermined position for said various operating frequencies in said range; and
projecting droplets at substantially equal velocity for said various operating frequencies in said range.

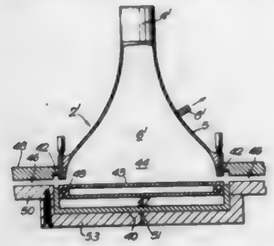
4,697,194

LAMINA RECORDING APPARATUS

Harry A. H. Spence-Bate, Morley, Australia, assignor to Joyce Florence Spence-bate, Morley, Australia

Filed Feb. 21, 1986, Ser. No. 831,545
Claims priority, application Australia, Feb. 21, 1985, PG9394
Int. Cl.[4] G03B *27/32;* **G01D** *15/28*
U.S. Cl. 346—110 V **4 Claims**

1. In an apparatus for moving sheet material, said apparatus comprising two generally parallel plates spaced apart to define a chamber within which chamber said sheet material is supported on a cushion of gas and moveable in X and Y defineable directions generally parallel to said plates by currents of said gas, the improvement comprising:
a data recording station comprising:
emitter means for imparting data to a recordable sheet of film;
means for holding said film at said station;
a tube having opened and closed ends and means for drawing a vacuum, said emitter means being situated generally at said closed end, and said open end being communicable with said gas cushion chamber through an opening in at least one of said plates;
a platen spaced opposite of and across said gas cushion from said tube open end so as to present a platen surface over which said film is positioned for reception of said data; and
closure means, structurally separate from said film, for sealingly isolating said tube and platen surface from said gas cushion so as to define an envelope evacuatable by said vacuum drawing means of said tube.

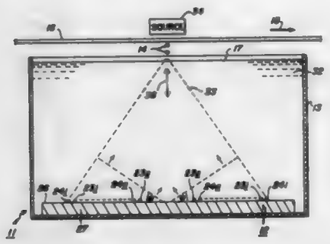


4,697,195

NOZZLELESS LIQUID DROPLET EJECTORS

Calvin F. Quate, Stanford, Conn., and Butrus T. Khuri-Yakub, Palo Alto, Calif., assignors to Xerox Corporation, Stanford, Conn.

Continuation of Ser. No. 776,291, Sep. 16, 1985, abandoned. This application Jan. 5, 1987, Ser. No. 946,682
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **19 Claims**



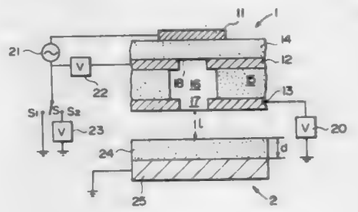
1. A nozzleless droplet ejector for ejecting droplets of liquid from a surface of a liquid filled reservoir, said ejector comprising
a planar surface acoustic wave transducer which is submerged at a predetermined depth in said reservoir;
drive means coupled to said transducer for energizing said transducer to launch a cone of acoustic waves into said liquid at an angle selected to cause said acoustic waves to come to a focus of predetermined waist diameter approximately at the surface of said reservoir, whereby said focused acoustic waves impinge upon and acoustically excite liquid near the surface of said reservoir to an elevated energy level within a limited area determined by said waist diameter;
said focused acoustic waves having an intensity selected to cause said elevated energy level to be an incipient energy level for droplet formation; and
external means for coupling additional energy into the acoustically excited liquid for extracting droplets from said reservoir on demand.

4,697,196

ELECTROSTATIC RECORDING METHOD AND APPARATUS

Yutaka Inaba, Kawaguchi; Hiroshi Satomura, Hatogaya; Yukio Nagase; Tatsuo Takeuchi, both of Tokyo; Hidemi Egami, Zama, and Akihito Hosaka, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,431
Claims priority, application Japan, Feb. 13, 1985, 60-25852; Feb. 13, 1985, 60-25853; Jun. 7, 1985, 60-122542
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 **48 Claims**



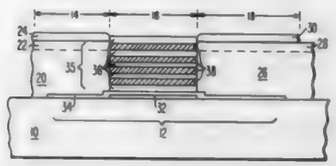
1. An electrostatic recording apparatus, comprising:
a recording member having a surface on which an electrostatic latent image is formed;
a recording head, opposed to the recording surface of said recording member, for forming the electrostatic latent image thereon, said recording head comprising a plurality of first electodes extending in a first direction, a plurality of second electrodes extending in a second direction crossing with said first direction to form a matrix with said first electrodes, a third electrode disposed across said second electrodes from said first electrodes and having first apertures of allowing ions to pass, a first dielectric member between said first electrodes and said second electrodes and a second dielectric member disposed between said second electrodes and said third electrode and having second apertures for allowing the ions to pass;
alternating voltage applying means for applying an alternating voltage between said first electrodes and said second electrodes to effect discharging to produce the ions;
first bias voltage applying means for applying a bias voltage to said second electrode; and
second bias voltage applying means for applying to said third electrode a bias voltage having the same polarity as that of the bias voltage applied to said second electrodes and having an absolute voltage which is smaller than that of the bias voltage applied to said second electrode;
wherein parameters of said means are so determined that the ions produced by said recording head and moved to the recording surface are controlled so as to provide a high resolution image.

4,697,197

TRANSISTOR HAVING A SUPERLATTICE

Joseph Dresner, Princeton Township, Mercer County, N.J., assignor to RCA Corp., Princeton, N.J.

Filed Oct. 11, 1985, Ser. No. 786,888
Int. Cl.⁴ H01L *27/12*
U.S. Cl. 357—4 **18 Claims**



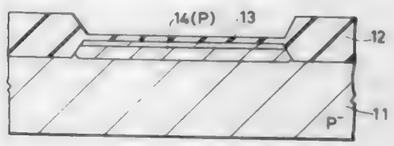
1. A transistor comprising:
spaced source and drain regions with a channel region therebetween;
said channel region comprising a gate electrode, and a superlattice spaced apart by a gate insulator, said superlattice having a plurality of undoped interleaved wide and narrow bandgap layers, said layers extending between the source and drain regions.

4,697,198

MOSFET WHICH REDUCES THE SHORT-CHANNEL EFFECT

Kazuhiro Komori, Kodaira; Kenichi Kuroda, Tachikawa, and Kousuke Okuyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,612
Claims priority, application Japan, Aug. 22, 1984, 59-173239; Jun. 21, 1985, 60-134040
Int. Cl.⁴ H01L *29/78*
U.S. Cl. 357—23.3 **18 Claims**



17. A semiconductor device having an MIS-type field-effect transistor which is formed in a first semiconductor region of a first type of conductivity in a semiconductor substrate, and which comprises:
a gate electrode formed on a gate insulating film on a surface of said semiconductor substrate;
a source region and a drain region of a second type of conductivity formed in said first semiconductor region, one on each side of said gate electrode, each of said source and drain regions having a bottom surface, said bottom surface being the surface farthest from the semiconductor substrate surface having the gate insulating film thereon; and
a second semiconductor region which is formed in said first semiconductor region under said gate electrode, said second semiconductor region being separated from the surface of said semiconductor substrate having the gate insulating film thereon and from the bottom surface of said source and drain regions, and being contacted at one end to said source region and at the other end to said drain region, said second semiconductor region further having the same type of conductivity as said first semiconductor region and an impurity concentration higher than that of said first semiconductor region, wherein a part of said second semiconductor region extends deeper than the bottom surface of said source and said drain regions.

18. A semiconductor device according to claim 17, wherein said second semiconductor region is a region formed by a first implantation implanting impurities of first type conductivity using said field insulating film and said gate electrode as a mask, and by a second implantation implanting impurities of second type conductivity using said field insulating film and said gate electrode as a mask such that the impurities of second conductivity compensate an upper portion of said impurities of first type conductivity, wherein a portion of said second semiconductor region extends below the bottom surface of said source region and said drain region and is separated from the bottom region of said source region and said drain region by a compensated portion of said second semiconductor region, said compensated portion being a portion formed by said second implantation.

4,697,199

SEMICONDUCTOR PROTECTION DEVICE HAVING A BIPOLAR TRANSISTOR AND AN AUXILIARY FIELD EFFECT TRANSISTOR

Hendrik C. De Graaff, Eindhoven, Netherlands, and Wilhelmus G. Voncken, Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 765,615, Aug. 13, 1985, abandoned, which is a continuation of Ser. No. 625,183, Jun. 27, 1984, abandoned, which is a continuation of Ser. No. 332,895, Dec. 21, 1981, abandoned. This application Jul. 22, 1986, Ser. No. 859,288
Claims priority, application Netherlands, Jan. 26, 1981, 8100347
Int. Cl.⁴ H01L *29/78, 27/06, 29/72*
U.S. Cl. 357—23.13 **9 Claims**



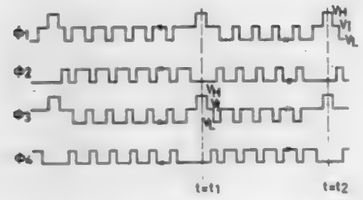
1. A semiconductor device comprising at least one circuit element and having a semiconductor body with a major surface, in which said semiconductor body comprises at least a first and a second electrode, which first electrode is connected to said circuit element, and in which a safety device is provided between said first and second elecrodes to protect the first electrode from excess voltages above a previously-determined value with respect to the voltage of the second electrode, said safety device comprising a lateral bipolar transistor having an emitter zone and a collector zone of a first conductivity type which adjoin said surface of the semiconductor body and are laterally separated, and having an adjoining base region of a second conductivity type which forms a first and a second p-n junction with said emitter zone and collector zone, respectively, an insulating layer on said surface of the semiconductor body, the base region being located between the emitter zone and collector zone and adjoining the insulating layer, first, second and third conductive layers on said insulating layer and separated thereby from said semiconductor body, the first electrode comprising said first conductive layer which is connected to the collector zone, the zone electrode comprising the second conductive layer which is connected to the emitter zone, and the third conductive layer extending above the base region between the emitter zone and collector zone, and the second junction having a breakdown voltage which is higher than the collector-emitter voltage of the lateral bipolar transistor in the conductive state, the first and third conductive layers being connectively connected together and forming parts of said first electrode, the third conductive layer also forming a gate electrode of an auxiliary field effect transistor structure which further comprises the emitter zone of said bipolar transistor as its source region and the collector zone of said bipolar transistor as its drain region, and the auxiliary field effect transistor structure having a threshold voltage which is lower than the breakdown voltage of the second junction and which is at least about equal to said collector-emitter voltage, said safety device comprising means including said bipolar transistor for providing a current-versus-voltage characteristic measured between the first and second electrodes having a first and a second part, the first part corresponding to a first state of relatively low current conduction of the device, which first part, with increasing voltage, extends up to a first voltage value which is higher than said collector-emitter voltage of the lateal transistor in the conductive state of said transistor, and the second part corresponding to a second state of relatively high current conduction by said bipolar transistor of the device, which second state occurs only after said first voltage value has been reached, said second part, with decreasing current, extending down to a voltage below said first voltage level, and further comprising a first zone of the second conductivity type which is located in said semiconductor body adjoining the insulating layer, is present at least locally below said layer, and is located outside the area occupied by the circuit element and outside the area occupied by the safety device, and a second surface-adjoining zone of the second conductivity type located in said semiconductor body between said emitter zone and said collector zone, said first and second zones being more highly doped than the adjoining part of the semiconductor body.

4,697,200

FIELD STORAGE DRIVE IN INTERLINE TRANSFER CCD IMAGE SENSOR

Shigehiro Miyatake, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 3, 1985, Ser. No. 688,661
Claims priority, application Japan, Jan. 10, 1984, 59-3792
Int. Cl.⁴ H01L *29/78, 27/14*
U.S. Cl. 357—24 **5 Claims**



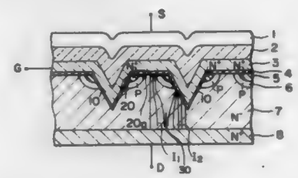
1. A drive method for a charge coupled device (CCD) image sensor which includes a substrate, a plurality of PN junction photodiodes formed in said substrate and aligned in a matrix fashion, a plurality of CCD vertical shift registers formed in said substrate and associated with said plurality of PN junction photodiodes, lower electrode means formed on said CCD vertical shift registers, the lower electrode means being extended to portions provided between adjacent two photodiodes, and upper electrode means formed on said CCD vertical shift registers, the upper electrode means overlapping a portion of said lower electrode means and being extended to said portions provided between adjacent two photodiodes, the drive method comprising the steps of:
applying clock pulses having two levels V_L and V_I to both of said lower and upper electrode means in order to conduct shift operation in said plurality of CCD vertical shift registers while achieving electrical isolation between said plurality of PN junction photodiodes; and
applying clock pulses having three levels V_L, V_I and V_H to said lower electrode means at a time at which charges stored in said plurality of PN junction photodiodes are transferred to said plurality of CCD vertical shift registers.

4,697,201

POWER MOS FET WITH DECREASED RESISTANCE IN THE CONDUCTING STATE

Teruyoshi Mihara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 437,357, Oct. 28, 1982, abandoned. This application May 2, 1985, Ser. No. 729,094
Claims priority, application Japan, Dec. 18, 1981, 56-204718
Int. Cl.⁴ H01L *29/78, 27/02, 29/06*
U.S. Cl. 357—41 **16 Claims**



9. A power MOS FET comprising:
a semiconductor substrate having a substantially planar upper surface;
a drain region exposed along portions of said upper surface;
a channel forming region formed in said drain region and having an area exposed along portions of said upper surface;
a source region formed in said channel forming region and exposed along said upper surface;
a groove having inclined surfaces extending downwardly through said upper surface, said source region, said channel forming region, and said drain region, wherein said source region, said channel forming region, and said drain region are exposed along the inclined surfaces of said groove;
a gate insulating area disposed above said groove and said upper surface;
a gate electrode layer disposed above said gate insulating area, said gate electrode layer covering said area of said channel forming region exposed along portions of said upper surface.

4,697,202

INTEGRATED CIRCUIT HAVING DISLOCATION FREE SUBSTRATE

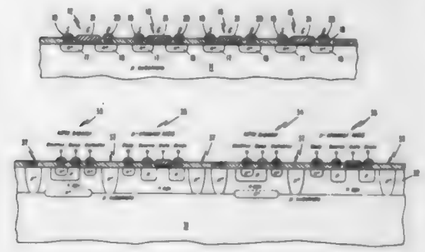
Arden Sher, Belmont, Calif., assignor to SRI International, Menlo, Calif.

Filed Feb. 2, 1984, Ser. No. 576,728
Int. Cl.⁴ H01L *29/167, 29/207, 29/227*
U.S. Cl. 357—63 **114 Claims**

1. A semiconductor circuit structure comprising a bulk substrate formed of a tetrahedral structured crystalline host semiconductor material consisting essentially of bonded host atoms bonded at least by covalent and metallic forces, the bonded atoms of the host semiconductor material nearest to each other having a known bond length, the host semiconductor material being alloyed with alloy atoms that replace some of the atoms of the host semiconductor material so that the alloy atoms and host atoms are bonded at least by covalent and metallic forces, the alloy atoms having a bond length with the nearest neighboring host atoms that is less than the known host bond length, the number of bonded alloy atoms being small compared to the number of bonded host atoms so as not to substantially affect electron conduction properties of the host material, the number of bonded alloy atoms being sufficient to virtually eliminate dislocations over a large surface area and

volume of the host material so that there is at least one atomic percent of the bonded alloy atoms in the bulk substrate, the large surface and volume of the host semiconductor material being sufficient to accommodate at least several active semiconductor devices, and at least several active semiconductor devices located on said large surface area and volume of the host semiconductor material, each of said devices having: spaced semiconductor regions forming junctions with the host material and an electrically responsive control electrode for controlling electric conduction between an adjacent pair of said spaced regions.

41. A semiconductor circuit structure comprising a bulk substrate formed of a tetrahedral structured crystalline host semiconductor material consisting essentially of bonded host atoms bonded at least by covalent and metallic forces, the bonded atoms of the host semiconductor material nearest to each other having a known bond length, the host semiconductor material being alloyed with alloy atoms that replace some of the atoms of the host semiconductor material so that the alloy atoms and host atoms are bonded at least by covalent and metallic forces, the alloy atoms having a bond length with the nearest neighboring host atoms that is less than the known host bond length, the number of bonded alloy atoms being small compared to the number of bonded host atoms so as not to substantially affect electron conduction properties of the host material, the number of bonded alloy atoms being sufficient to



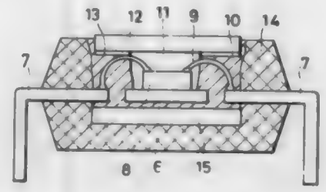
virtually eliminate dislocations over a large surface area and volume of the host material, the host semiconductor material being a pseudo binary compound of first and second types of atoms between which subsist the host material bonds having the known bond length, the alloy including third atoms of the second atom type that replace some of the atoms of the second type to form bonds with the first types of atoms having the bond length that is less than bond lengths of the atoms of the host material, the alloy being pseudo binary semiconductor compound of the first type of atom and of the third atoms, the alloy having a bond length between the first type of atoms and the third atoms less than the bond lengths of the host material between the first and second types of atoms, the host semiconductor material and the alloy semiconductor compound being different III-V compounds, the bond length of the alloyed compound being less than the bond length of the host compound, the host compound being InSb and the alloyed compound being selected from the group consisting essentially of GaSb, InP, InN and BSb, the large surface and volume of the host semiconductor material being sufficient to accommodate at least several active semiconductor devices, and at least several active semiconductor devices located on said large surface area and volume of the host semiconductor material, each of said devices having: spaced semiconductor regions forming junctions with the host material and an electrically responsive control electrode for controlling electric conduction between an adjacent pair of said spaced regions.

4,697,203

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREFOR

Kunito Sakai; Sadamu Matsuda, and Takashi Takahama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan

Filed Jun. 4, 1985, Ser. No. 741,051
Claims priority, application Japan, Jun. 4, 1984, 59-115871
Int. Cl.⁴ H01L *23/06, 23/30*
U.S. Cl. 357—72 **7 Claims**



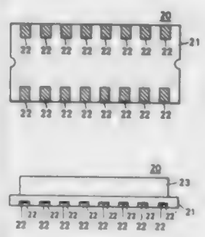
1. A semiconductor device comprising: a die pad (6) having a semiconductor chip (8) mounted on a first surface of the die pad; leads (7) separated by a gap from said die pad and connected through lead wires (9) to respective electrodes formed on a top surface of said semiconductor chip; a first, inner package number (10) of resin, said first package member forming an opening (11) above the first surface of said die pad, said resin filling the gaps between said leads and said die pad and covering a second, opposite surface of said die pad so that said semiconductor chip on said first surface of said die pad is peripherally surrounded by, but not in contact with, said first package member; an inert gas filling said opening; a second, outer package member (14) of a resin having a thermal expansion coefficient different from that of said resin forming said first package member, said second package member extending below and peripherally surrounding said first package member; and a cover member (12) sealingly closing said opening of said first package member.

4,697,204

LEADLESS CHIP CARRIER AND PROCESS FOR FABRICATION OF SAME

Tsunemasa Mita; Ryoki Katoh; Soichi Sekimoto; Yoshiyuki Shiratsuki, and Hiroshi Arisawa, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Toyko, Japan

Filed Jul. 22, 1983, Ser. No. 516,451
Claims priority, application Japan, Jul. 27, 1982, 57-131013
Int. Cl.⁴ H01L *23/02*
U.S. Cl. 357—74 **3 Claims**



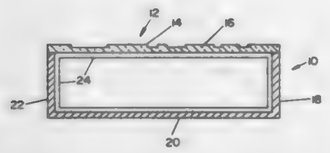
1. In a leadless chip carrier for carrying a chip comprising:
an insulation layer having a top surface on which said chip is mounted, and a bottom surface opposing said top surface, and
a plurality of terminals spaced next to each other, said terminals being disposed on said bottom surface of said insulation layer;
the improvement wherein said insulation layer has a plurality of recesses on said bottom surface, each of said terminals being disposed in each of said recesses.

4,697,205

HEAT PIPE

George Y. Eastman, Lancaster, Pa., assignor to Thermacore, Inc., Lancaster, Pa.

Filed Mar. 13, 1986, Ser. No. 839,087
Int. Cl.⁴ H01L *23/46, 23/36, 23/14*
U.S. Cl. 357—82 **1 Claim**



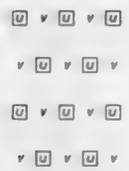
1. A combined semiconductor electronic circuit device and heat pipe comprising:
a semiconductor circuit element constructed upon an outside surface of semiconductors material, the semiconductor material also forming a wall which is part of a heat pipe casing enclosed and sealed by additional walls;
a sintered semiconductor wick structure within heat pipe casing and adjacent to the inside of the wall of semiconductor material wherein the wick structure is comprised of a sintered mixture of the same semiconductor material as the wall to which it is adjacent and up to twenty percent by weight of glass frit; and
a vaporizable liquid within the sealed heat pipe to act as the heat conducting medium.

4,697,206

METHOD AND APPARATUS FOR ENHANCING VERTICAL CHROMINANCE RESOLUTION

Gary J. Tonge, Winchester, United Kingdom, assignor to Independent Broadcasting Authority, United Kingdom

PCT No. PCT/GB84/00245, § 371 Date Feb. 27, 1985, § 102(e) Date Feb. 27, 1085, PCT Pub. No. WO85/00493, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 9, 1984, Ser. No. 708,958
Claims priority, application United Kingdom, Jul. 8, 1983, 8318602
Int. Cl.⁴ H04N *11/08*
U.S. Cl. 358—14 **4 Claims**



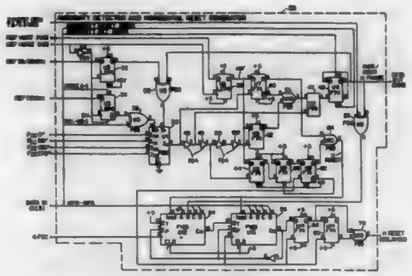
1. A method of producing a color television signal in component form, comprising the steps of:
scanning a scene;
generating luminance and two types of color difference component signals representing the scene such that each luminance or color difference component signal relates to a line in one of a plurality of fields of a television display of the scene, the luminance component signals relate to every other line in one field of each frame and to every other line in the other field of each frame of the television display of the scene, said every other line in one field being interlaced with said every other line in the other field, the color difference component signals relate to every other line in each field of the television display of the scene, the color difference component signals relating to each every other line in each field alternate in type, the color difference component signals relating to lines in said one field of each frame relate to the same lines as the luminance component signals relating to said one field of each frame of the television display of the scene, the color difference component signal relating to the first line in said one field of each frame is of a different type from the color difference component signal relating to the first line of said other field of each frame of the television display, and the color difference component signals relating to the first of said every other lines in each frame are controlled to be of the same type:
time multiplexing luminance and color difference component signals to form a color television signal in component form; and
the generated color difference component signals relating to said other field of each frame of the television display relate to different lines from the luminance components relating to said other field of each frame.

4,697,207

SYSTEM FOR GENERATING A SYNCHRONIZING SIGNAL IN RESPONSE TO TWO TIMING REFERENCE SIGNALS

Martin A. Lilley, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 781,545, Sep. 30, 1985, abandoned. This application Jan. 23, 1986, Ser. No. 821,630
Int. Cl.⁴ H04N *9/44*
U.S. Cl. 358—17 **22 Claims**



1. A system for generating a synchronizing signal in response to two timing reference signals each related to a different one of a plurality of timing references in a data signal wherein one of the two timing reference signals can be shifted in phase relative to the other of the two timing signals, the system comprising:
means for generating a synchronizing signal in response to coincidence between predetermined parts of the two timing reference signals;
means for detecting a condition of possible coincidence ambiguity between the two timing reference signals which can cause a significant phase change in the generated synchronizing signals;
means responsive to said ambiguity detecting means for shifting the phase of one of the reference signals by substantially 180 degreees to eliminate the coincidence ambiguity between the two signals; and
means for shifting the phase of the generated synchronizing

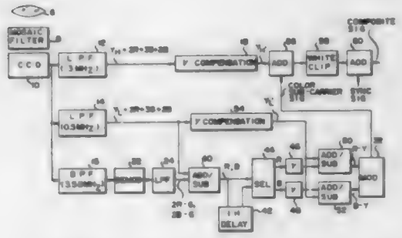
signal one-half cycle of the one of the reference signals in a direction to compensate for the phase shift of the one of the reference signals.

4,697,208

COLOR IMAGE PICKUP DEVICE WITH COMPLEMENTARY COLOR TYPE MOSAIC FILTER AND GAMMA COMPENSATION MEANS

Teruo Eino, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 28, 1986, Ser. No. 868,092
Claims priority, application Japan, Jun. 13, 1985, 60-128987; Jun. 13, 1985, 60-128989; Jun. 13, 1985, 60-128990
Int. Cl.[4] H04N *9/07, 9/69, 9/73*
U.S. Cl. 358—44 **8 Claims**



1. A color image pickup device comprising:
a solid-state image sensing element having a complementary color type mosaic filter;
means for extracting a luminance signal and a first color-difference signal from an output signal of said solid-state image sensing element;
first compensation means for compensating for a gamma characteristic of the luminance signal extracted by said extracting means and for outputting a gamma-compensated luminance signal;
means for generating a first color signal on the basis of the luminance signal and the first color-difference signal extracted by said extracting means;
second compensation means for compensating for a gamma characteristic of said first color signal and for outputting a gamma-compensated first color signal; and
means for generating a second color-difference signal on the basis of the gamma-compensated luminance signal and the gamma-compensated first color signal.

4,697,209

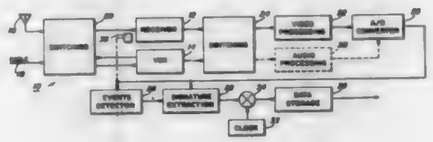
METHODS AND APPARATUS FOR AUTOMATICALLY IDENTIFYING PROGRAMS VIEWED OR RECORDED

David A. Kiewit, Palm Harbor, and Daozheng Lu, Dunedin, both of Fla., assignors to A. C. Nielsen Company, Northbrook, Ill.

Filed Apr. 26, 1984, Ser. No. 604,367
Int. Cl.[4] H04H *9/00;* **H04N** *17/04, 17/06*
U.S. Cl. 358—84 **108 Claims**

1. A method of identifying a signal received by an audience member's television receiver for determining audience ratings comprising the steps of:
detecting the occurence of a first event in the functional operations of he audience namber's televison receiver;
detecting the occurence of a second event after the detected first event in the signal to be identified;
extracting a signature from a single frame of the video signal to be identified after the occurrence of the second event;
storing the signature and the time of occurence thereof; and
comparing the stored signature with reference signatures that occurred at approximately the same time as the stored signature.

28. A method for identifying signals for determining audience ratings comprising the steps of operating on the signal to be identified in order to extract a feature string, comparing the feature string with various feature strings corresponding to known signals and identifying the signal when the feature string of the signal to be identified correlates with one of the feature strings corresponding to a known signal within a predetermined tolerence, wherein the step of extracting the feature string from the signal to be identified comprises the steps of:
monitoring predetermined changes in a predetermined parameter of the signal to be identified;
determining the time intervals between the predetermined changes in the predetermined parameter; and
utilizing the time intervals between successive predetermined changes to generate the feature string, the feature string being a digital representation of a predefined number of said time intervals.



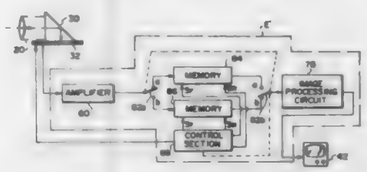
72. A method of identifying a television signal received from either a television receiver or a video recorder for determining audience viewing habits comprising the steps of:
detecting predetermined operational modes of the audience member's television receiver and the video recorder;
detecting the occurence of a first event in one of the operational modes;
detecting the occurence of a second event in the signal to be identified;
extracting a signature from a single frame of the video signal to be identified after the occurence of the second event; and
storing the extracted signature, the time of the signature extraction and the detected operational mode.

4,697,210

ENDOSCOPE FOR DISPLAYING A NORMAL IMAGE

Makoto Toyota; Fumitaka Takeshita, and Satoshi Arakawa, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Japan

Filed Aug. 16, 1985, Ser. No. 766,298
Claims priority, application Japan, Aug. 20, 1984, 59-172796
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 **9 Claims**



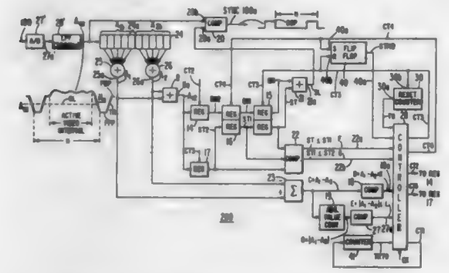
1. An endoscope wherein an insertion section provided at the forward end portion thereof with an objective optical system including a reflecting surface and a solid state imaging device is inserted into a portion of an object of interest and said portion of the object of interest is displayed on a screen of a display unit in response to a video signal outputted from said solid state imaging device in the forward end of said insertion section, characterized in that said endoscope comprises:
a plurality of memories, into which image information obtainable from said solid state imaging device is written;
first switching means provided on the input sides of said plurality of memories for successively switching said memories with every horizontal scanning time duration;
second switching means provided on the output sides of said plurality of memories for switching said memories with every horizontal scanning time duration such that image information is read out successively from the memory, in which the write-in is completed; and
control means for writing image information into said plurality of memories in a predetermined order and for outputting a control signal to read out image information from the plurality of memories in an order opposite to the predetermined order.

4,697,211

SYNC SEPARATOR WITH PERIODIC UPDATING

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1986, Ser. No. 857,320
Int. Cl.[4] H04N *5/08, 5/10*
U.S. Cl. 358—153 **9 Claims**



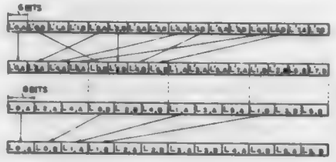
1. A sync separator apparatus responsive to a video signal having pulses that contain synchronizing information for generating from said video signal an output signal that contains the synchronizing information, comprising:
means responsive to said video signal for generating a first signal when a given pulse occurs in said video signal that is similar in characteristic to a sync signal of said video signal, said first signal being indicative of a given level of said pulse;
means responsive to said first signal for generating a second signal that is updated upon generation of an update control signal to contain information of said level of said pulse;
means responsive to said first signal for generating said update control signal in accordance with different values of corresponding given levels of at least two occurring ones of said pulses of said video signal, said updata control signal being generated at an instant that is associated with the occurrence of said given pulse;
a timer responsive to said update control signal for generating a time-out control signal, provided a predetermined interval has elapsed from a time when said second signal has been updated, said second signal generating means being responsive to said time-out control signal for updating said second signal upon the occurrence thereof; and
means responsive to said video signal and to said second signal for generating said output signal.

4,697,212

METHOD AND APPARATUS FOR RECORDING A DIGITAL INFORMATION SIGNAL

Eiichi Osawa; Masato Tanaka; Mamoru Yoshizawa; Jun Nakai, and Yuichi Kojima, all of Shinigawa, Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP84/00313, § 371 Date Feb. 15, 1985, § 102(e) Date Feb. 15, 1985, PCT Pub. No. WO85/00068, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 15, 1984, Ser. No. 705,331
Claims priority, application Japan, Jun. 18, 1983, 58-109577
Int. Cl.[4] G11B *5/09, 5/00*
U.S. Cl. 360—48 **6 Claims**



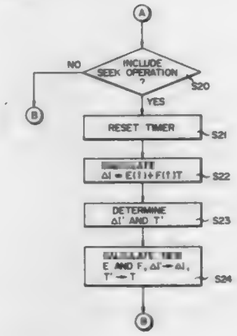
1. A method of recording a digital information signal in which a digital information signal is recorded on a plurality of parallel tracks which are formed in the longitudinal direction of a recording medium, comprising the steps of:
separating a time series of said digital information signal into a plurality of even-numbered words and a plurality of odd-numbered words; specifying in a manner such that said plurality of even-numbered and said plurality of odd-numbered words are respectively recorded on a first track group and a second track group which are separated with respect to the widthwise direction of said recording medium; and performing an error correction coding process with regard to each of said plurality of even-numbered words and said plurality of odd-numbered words.

4,697,213

INDEX SERVO TYPE MAGNETIC HEAD POSITIONING CONTROL APPARATUS AND METHOD THEREOF

Shunji Kitamura, Hanno, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1986, Ser. No. 878,696
Claims priority, application Japan, Jun. 28, 1985, 60-142153
Int. Cl.[4] G11B *5/55, 5/56*
U.S. Cl. 360—78 **16 Claims**



10. A magnetic head positioning control method using servo index data, comprising:
performing a first displacement of a magnetic head according to a first calculation of a correction current value in a designated data track position by an input seek instruction using a relation between a final correction current value and the track position;

performing a first determination of a final correction current value at the designated data track position by further displacing the magnetic head in response to a presence of a thermal off track; and

performing a second determination of the relation based on the final correction current values.

4,697,214

TAPE LOADING DEVICE

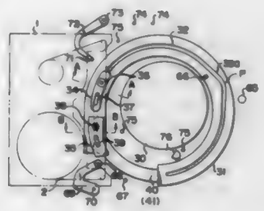
Hirotaka Sasakawa, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,252

Claims priority, application Japan, Dec. 18, 1984, 59-191662[U]; Dec. 18, 1984, 59-191666[U]

Int. Cl.⁴ G11B *5/027*

U.S. Cl. 360—85 **14 Claims**



1. A tape loading device in which a tape is drawn from a tape cassette and wound on a rotary head cylinder, said device comprising:

a guide rail member formed substantially in an arcuate shape along an outer periphery of said rotary head cylinder and having a guide slot, said guide slot extending substantially along the entire length of said guide rail member and having an intermediate portion between a mounting-position end and a loading-finished end, said intermediate portion of the guide slot having an extended portion positioned obliquely outwardly relative to an outer edge of said arcuate guide rail member;

first and second movable members each having at least one engaging portion guided to the guide slot of said guide rail member and movably supported at, respectively, front and rear positions relative to each other in the guide slot of said guide rail member to move from respective initial positions to respective loading-finished positions;

first and second tape guide members aligned correspondingly to said first and second movable members and introduced into the inside of the exposed tape of said tape cassette when said tape cassette is mounted into the tape loading device;

first drive mechanism coupled by said first movable member for transmitting a drive power for moving the first movable member from its initial loading position opposed to a mounting position of said tape cassette to said loading-finished end of said guide slot to reach its loading-finished position; and

a second drive mechanism coupled with said second movable member for transmitting drive power for moving the second movable member from its initial loading position at the mounting-position end of the guide slot opposite to the mounting position of said tape cassette to the intermediate portion of said guide slot to reach its loading-finished position.

4,697,215

TAPE DRAW-OUT MECHANISM

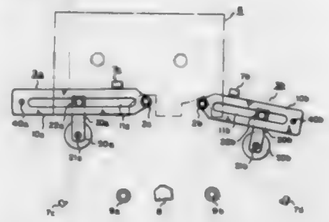
Yujiro Hata, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 19, 1985, Ser. No. 810,634

Claims priority, application Japan, Dec. 21, 1984, 59-269893

Int. Cl.⁴ G11B *15/665*

U.S. Cl. 360—95 **15 Claims**



1. A tape draw-out mechanism comprising a tape drawout member for engaging a tape in a cassette between a pair of reels and for drawing said tape out of said cassette into a recording-playback position and for returning said tape to said cassette, driving means for driving said tape draw-out member between an initial position in said cassette in engagement with said tape to a tape drawn-out position for recording-playback and for returning said tape to said cassette, said driving means including motor means and linkage means between said motor means and said tape draw-out member, said linkage means including means for returning said tape draw-out member to the initial position in said cassette from said tape recording-playback position in a time shorter than the time required for moving said tape from said position in said cassette to said recording-playback position.

4,697,216

DISK DRIVE APPARATUS WITH AUTOMATIC CENTERING ARRANGEMENT

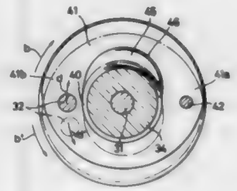
Nobuhiko Tsukahara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 1, 1985, Ser. No. 697,236

Claims priority, application Japan, Feb. 6, 1984, 59-19648

Int. Cl.⁴ G11B *5/010, 25/04*

U.S. Cl. 360—97 **11 Claims**



1. A rotary drive apparatus for a disk having a central hole and a drive hole spaced radially from said central hole, said apparatus comprising a turntable rotatable in a predetermined forward direction, a central pin on said turntable arranged concentrically with the latter and engageable in said central hole of a disk positioned on the turntable, a drive pin engageable in said drive hole of the disk positioned on said turntable for acting against an edge of the drive hole and thereby driving the disk in said forward direction upon rotation of the turntable, means mounting said drive pin on said turntable for limited movement relative the latter in a path extending from an initial position in a direction opposed to said predetermined forward direction, of rotation, said path being increasingly distant from the center of said turntable in said direction opposed to said predetermined forward direction, and yieldable means acting on said means mounting the drive pin for urging the latter along said path in said forward direction to said initial position, said yieldable means exerting a force on said drive pin that is less than the reaction force of said edge of the drive hole against said drive pin when the latter drives the disk so that the drive pin is displaced along said peth from said initial position by said reaction force and acts radially outward against an edge of said drive hole with a force proportional to said reaction force for reliably holding the edge of said central hole against said central pin.

4,697,217

MAGNETIC HEAD HAVING A MAIN CORE OF SHEET AMORPHOUS MAGNETIC MATERIAL

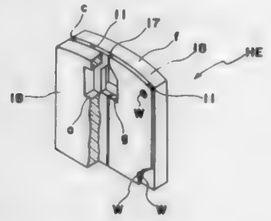
Kotaro Matsuura, Kyoto, and Kenji Oyamada, Yahata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 13, 1983, Ser. No. 541,809

Claims priority, application Japan, Oct. 13, 1982, 57-180476; Nov. 12, 1982, 57-199266

Int. Cl.⁴ G11B *5/127*

U.S. Cl. 360—125 **3 Claims**



1. An amorphous magnetic head, comprising:

a main core including a pair of abutted core halves of similar shape, each formed of a non-laminated thin sheet of amorphous magnetic material and having a coil winding opening;

a non-magnetic spacer forming a head gap and being disposed in the abutted portion of said core halves ranging from a front edge of said main core to said coil winding opening;

a set of reinforcing cores fixed to opposite sides of said main core to hold said core halves therebetween, wherein each of said reinforcing cores is made of a laser beam transmitting glass material, each of said reinforcing cores has a coil winding opening generally corresponding to the coil winding opening in said main core, and each of said reinforcing cores has a continuous construction, such that there are no junctions therein; and

a combining means for combining said reinforcing cores and said core halves into one unit, wherein said combining means includes means for partially fusing said core halves at predetermined welding spots so as to be bonded to said reinforcing cores thereat, and wherein said amorphous magnetic head is several millimeters in length and width and several hundred microns in thickness.

4,697,218

OVERCURRENT PROTECTION DEVICE

Bernard Nicolas, Avon, France, assignor to Service National Electricite de France, Clamart, France

Filed Jul. 24, 1984, Ser. No. 633,882

Claims priority, application France, Jul. 25, 1983, 8312264

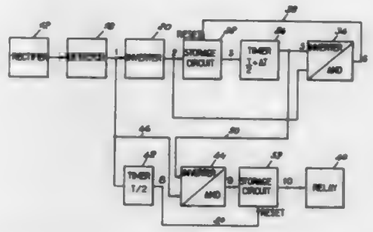
Int. Cl.⁴ H02H *3/093*

U.S. Cl. 361—87 **5 Claims**

1. Selective overcurrent protection device for AC operation, comprising:

means for rectifying the two half waves;

means for comparing the instantaneous value of the rectified current and a threshold value (s) and means for making, in the case of overshoot, a new comparison at the end of a time equal to ΔT after overahoot, T being the nominal period of the AC current and ΔT a fraction of T of the order of a tenth, said means for making a new comparison comprising memory means for storing occurrence of the overshoot, a timer of a duration equal to (½)T+ΔT connected to the output of the memory means and a circuit,



comprising an inverter for each of two inputs thereof and an AND circuit driven by those two inverted inputs, whose output is connected to a reset input of the memory means and whose inputs receive, one, a signal in case of overshoot and, the other, an output signal from the timer; and,

actuating means for tripping the device if overshoot is detected during the comparison.

4,697,219

SNUBBER CIRCUIT FOR GATE TURNOFF THYRISTOR

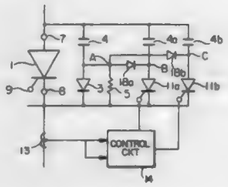
Hiroshi Mitsuoka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,835

Claims priority, application Japan, Mar. 25, 1985, 60-62485

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 361—93 **5 Claims**



1. A semiconductor element having an anode, a cathode, and a control electrode which is controlled by signals applied to said control electrode, and a snubber circuit suppressing an abnormal rise in the anode-cathode voltage of said semiconductor element, said snubber circuit comprising:

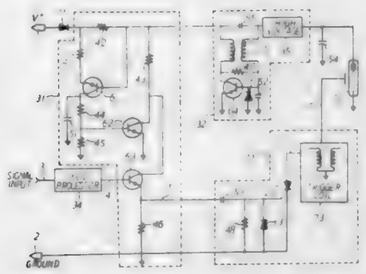
a main snubber circuit having a first series connected circuit comprising a first capacitor in series with a first diode connected between the anode and the cathode of said semiconductor element in the same polarity as that of said semiconductor element and a resistor connected in parallel with said first diode for discharging said capacitor;

a sub snubber circuit having a second series circuit comprisng a second capacitor in series with a switching element and a second diode having an anode connected to a node between said first capacitor and said first diode of said first series connected circuit, and a cathode connected to a node between said second capacitor and said switching element of said second series connected circuit to discharge said second capacitor; and

a control circuit which switching said switching element of

said sub snubber circuit in accordance with the amount of main current flowing through said anode and said cathode of said semiconductor element.

4,697,220
PROTECTIVE DEVICE FOR AUTO ILLUMINATION SYSTEM
Sza-Chi Chung, Taipei, Taiwan, assignor to Equus Inc., Taipei, Taiwan
Filed Mar. 18, 1986, Ser. No. 840,678
Int. Cl.⁴ H02H *3/093*; H05B *41/26*
U.S. Cl. 361—100 **2 Claims**



1. A protective device in an automotive illumination system including an illumination element, said device having as inputs a voltage source for supplying power and a timing signal of variable frequency, said device comprising

an overcurrent limit circuit receiving as inputs said voltage source and said timing signal, and providing a charging current output for supplying power for providing a discharge through said illumination element and a trigger signal output for controlling when said illumination element is discharged,

a high-voltage oscillator for receiving said charging current output from said overcurrent limit circuit and for outputting a respective output,

a capacitor having one terminal connected to said output from said high-voltage oscillator and to said illumination element, for storing power for said discharging thereof,

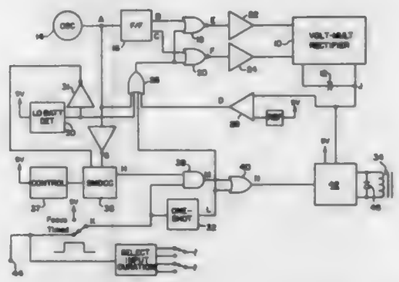
a trigger control circuit for receiving as an input said trigger signal output from said overcurrent limit circuit and providing a trigger output to cause said illumination element to be discharged as a result of power stored in said capacitor,

said overcurrent limit circuit including first means for outputting said circuit trigger signal in correspondence to said timing signal, and second means for generating a curbing signal,

said first means including a first transistor having its base connected to receive a signal corresponding to said timing signal, said trigger signal being taken from the emitter of said first transistor, said second means including a first resistor connected between the input of said voltage source and the output of said charging current, second and third resistors connected at respective ends of said first resistor, a second transistor connected at its emitter to a second end of said second resistor and at its base connected to the same end of the first resistor as the third resistor, said second transistor having its collector connected in common to a series circuit of two further resistors and to a capacitor, said capacitor and said series circuit of two further resistors being grounded at their other end, and a third transistor having its base connected between said two further resistors, its collector connected to the second end of said third resistor, and its emitter grounded, wherein the collector of said third transistor is connected in common with the collector of said first said transistor, and

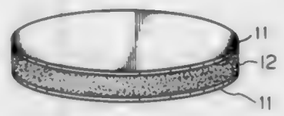
wherein said discharge occurs with a frequency equal to that of said timing signal except when said charging current becomes excessive for higher values of said frequency of said timing signal, and said curbing signal acts on said first means to interrupt the correspondence of the trigger signal with said timing signal for said excessive charging current at said higher frequency of said timing signal.

4,697,221
PORTABLE ACTUATOR FOR INDUCTIVE LOAD
Stephen T. Pasquarella, Rochester, N.Y., assignor to VA Inc., Rochester, N.Y.
Division of Ser. No. 783,156, Oct. 2, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,644
Int. Cl.⁴ H01H *47/32*
U.S. Cl. 361—156 **3 Claims**



1. Method of energizing an inductive load from a battery comprising connecting a unidirectional current device across the load, and applyng timed-spaced pulses of current from the battery to the load, the sum of the pulses during any selected period being substantially less than the integrated value of the nominal holding current requirement of the load during the selected period, the inductive nature of the load causing current to continue to flow through it and the unidirectional device during the intervals between the applied pulses, the continuing current being adequate to maintain the load in its fully energized condition during the intervals, continuously sensing the output voltage of the battery, and causing the individual pulses of current to increase in duration in accordance with the extent of the drop in the output voltage of the battery from its initial value whereby the pulses become longer as the output voltage of the battery dwindles.

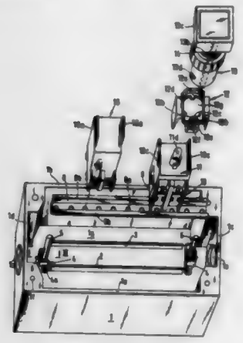
4,697,222
COMPOSITION FOR DIELECTRIC PORCELAIN AND DIELECTRIC PORCELAIN AND CAPACITOR BY USE OF SAID COMPOSITION
Norio Kaneko, Kashiwa, and Masahito Niibe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 9, 1986, Ser. No. 849,825
Claims priority, application Japan, Apr. 12, 1985, 60-78771; Apr. 12, 1985, 60-78772
Int. Cl.⁴ C04B *35/46*
U.S. Cl. 361—321 **12 Claims**



1. A composition for dielectric porcelain comprising

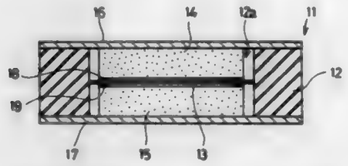
$BaTiO_3$ and 1 to 5 mole % of a compound with a molar ratio of $Bi_2O_3:RuO_2 = 1:2$ based on said $BaTiO_3$.

4,697,223
ELECTRICAL APPARATUS, PARTICULARLY APPARATUS FOR INSTALLATION
Heinz Grunst, Hubertusweg 24, and Heinz Kleine, Neue Strasse 4, both of Marienheide, Fed. Rep. of Germany
Continuation of Ser. No. 133,129, Mar. 24, 1980, abandoned. This application Jan. 8, 1987, Ser. No. 5,612
Int. Cl.⁴ H02B *1/04*
U.S. Cl. 361—393 **4 Claims**



1. An electrical component container assembly for installation of electrical components, such as signal lights, switching devices, transformers and the like, comprising a container housing; a common rail detachably mounted in said housing and being formed with a series of mounting bores; a plurality of separate mounting components each having a central part and two opposite lateral legs, said lateral legs being formed with detents and detent recesses; at least one of said mounting components having its central part provided with split dowels fitting said mounting bores in the rail, another mounting component having lateral legs of elastic material; the detents and detent recesses of the two mounting components locking into one another; the central part of said other mounting component supporting at least one of said electrical components; and arresting means secured to said housing and releasably engaging said common rail.

4,697,224
ELECTRIC DOUBLE LAYER CAPACITOR
Koichi Watanabe, and Michinobu Maesaka, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Oct. 23, 1986, Ser. No. 922,278
Claims priority, application Japan, Nov. 1, 1985, 60-245347
Int. Cl.⁴ H01G *9/02*
U.S. Cl. 361—433 **13 Claims**



12. An electric double layer capacitor comprising:

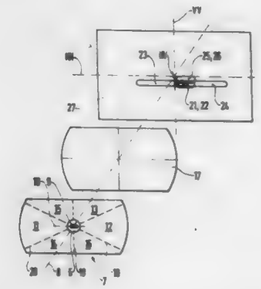
a separator of electrically insulative material having ion permeability;

a pair of polarizable electrodes of solid carbonacenous material which are opposite to each other on opposite sides of said separator;

means for attaching said separator to a region of at least one of said polarizable electrodes in which said polarizable electrode faces said separator; and

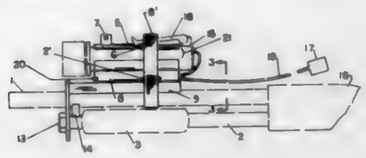
a case for sealingly receiving said separator and said polarizable electrodes.

4,697,225
HEADLAMP, PARTICULARLY OF RECTANGULAR CONFIGURATION, FOR USE AS ANTIDAZZLE LAMP ON MOTOR VEHICLES
Gerhard Lindae, Leonberg; Peter Perthus, Stuttgart, and Heinz Rein, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jul. 29, 1986, Ser. No. 893,895
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531223
Int. Cl.⁴ B60Q *1/00*
U.S. Cl. 362—61 **4 Claims**



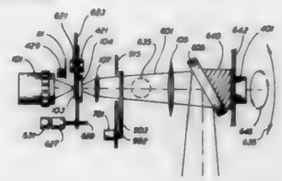
1. A headlamp of a rectangular configuration for use as an antidazzle headlamp in motor vehicles, comprising a rectangular reflector defining a vertical plane and diagonal planes of symmetry, an optical axis and focal point; an incandescent filament in the form of a cylindrical coil whose cylinder axis extends horizontally at right angles to the optical axis and whose center of gravity is located at said focal point; optical means for distributing light emitted by the incandescent filament; said reflector being divided into three pairs of diametrically opposed surface portions, the portions of a first pair extending horizontally and being delimited by intersection lines of the reflectior with the diagonal planes of symmetry, said first pair of surface portions having the shape of a sector of a first paraboloid; the surface portions of a second pair when viewed in the direction of said optical axis corresponding to upper right-hand and lower left-hand areas delimited by intersection lines of the reflector with the vertical plane and one diagonal plane, said second pair of surface portions forming together a sector of composite eliposoid-paraboloid whose vertical sections are parabolas nad horizontal sections are elipses; and the surface porions of the third pair corresponding to upper left-hand and lower right-hand areas delimited by intersection lines of the reflector with the vertical plane and the other diagonal plane, and said third pair of surface portions having the shape of a sector of a second paraboloid whose center axis is inclined upwardly relative to a center axis of said first paraboloid.

4,697,226
LIGHT MOUNTING FOR FIREARMS
Joe L. Verdin, 9203 Glen Shadow, Houston, Tex. 77088
Filed Jul. 11, 1986, Ser. No. 884,735
Int. Cl.[4] F41G *1/34*
U.S. Cl. 362—110 4 Claims



4. A light attachment for a firearm having the usual barrel and magazine in vertical parallel relation, a housing adapted to receive a flashlight, a conduit having a touch switch selectively positioned on the firearm for operation of the light, a support having ports to receive the barrel and magazine and a strap adapted to aid in maintaining the light in place, said support is secured to the housing and said housing is maintained on the top of said barrel.

4,697,227
CONTROL SYSTEM FOR VARIABLE PARAMETER FIXTURES
Michael Callahan, 201 West 85th St., New York, N.Y. 10024
Continuation-in-part of Ser. No. 443,127, Nov. 19, 1982, Pat. No. 4,527,198. This application Jul. 1, 1985, Ser. No. 750,873
Int. Cl.[4] F21V *21/00*
U.S. Cl. 362—233 48 Claims



1. A control system for a lighting system, said lighting system including: a plurality of light projectors, said projectors each generating a beam suitable for entertainment lighting and each of a plurality of said plurality of projectors provided with: means to vary a plurality of parameters of said beam, including the azimuth and elevation of said beam; and means to conform, said means to confrom operable from a remote location, having an input, having an output coupled to said means to vary, and cooperating with said means to vary to produce a desired adjustment of said azimuth and elevation of said beam in response to the presence of a corresponding first value set at said input, said control system comprising:
(a) at least one means for selecting a desired lighting effect to be reproduced, said means for selecting disposed at a location rerote from said projectors, having at least a first output, and capable of producing a plurality of second values at said first output, each of said second values identifying a desired lighting effect;
(b) at least one means for entering at least one of said first value sets corresponding to a desired azimuth and elevation adjustment for at least one of said projectors, said means for entering disposed at a location remote from said projector and having at least one output;
(c) a plurality of local control systems capable of operation at spaced apart locations, each of said local control systems:
i. having at least one input, said input coupled to at least said first output of said means for selecting;
ii. having at least one output for said first value sets each corresponding to a desired azimuth and elevation adjustment for at least one of said projectors, said output of said local control system coupled to said input of said means to conform o said at least one light projector;
iii. including a local short-term memory capable of storing at least five of said first value sets, each of said first value sets corresponding to the desired azimuth and elevation adjustment of said beam of at least one of said projectors in at least one desired lighting effect, each of said first value sets associated with at least one of said second values identifying a desired lighting effect;
iv. including means coupled to said at least one output of said means for entering and said local short term memory cooperating with said means for entering to store said first value set entered by said means for entering in said local short-term memory, and further for associating said first value set with at least one of said second values identifying a desired lighting effect;
v. including means for causing said local control system to produce said first value set stored in said local short-term memory at said output of said local control system in response to the presence of an associated second value identifying a desired lighting effect at said input of said local control system;
(d) at least a first means for data transmission for coupling at least said first output of said means for selecting and said inputs of said local control systems.

4,697,228
COLLAPSIBLE LIGHT WAND
Paul Y. H. Mui, and Rosa Y. M. Tao, both of 3218 Quintara St., San Francisco, Calif. 94116
Filed Sep. 15, 1986, Ser. No. 907,435
Int. Cl.[4] F21V *1/06*
U.S. Cl. 362—352 7 Claims

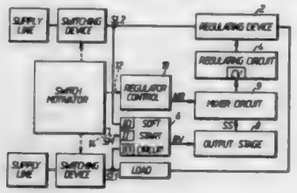


1. A collapsible light wand for attachment to a flashlight comprising:
a telescopic tube assembly comprised of a plurality of overlapping translucent cylindrical tube sections, the outermost such tube section being removably mountable to the light source end of said flashlight; and
a bar pivotally mounted to said outermost tube section to retain said tube assembly when retracted.

4,697,229
ELECTRONIC CONTROL EQUIPMENT
Peter G. Davy, Stroud, and Brian G. Cuthbertson, London, both of England, assignors to Neon 2000 Limited, London, England
Filed Feb. 5, 1986, Ser. No. 826,282
Claims priority, application United Kingdom, Feb. 8, 1985, 8503339
Int. Cl.[4] G05F *1/569*
U.S. Cl. 363—49 10 Claims

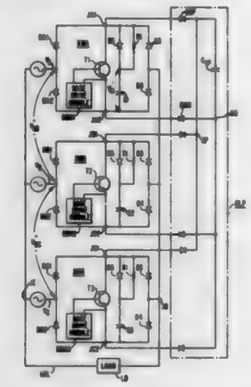
1. A circuit for automatically controlling an electrical system including a regulating element so as to avoid abrupt increases in output when the power supply is reconnected after an interruption, comprising:
means for detecting a voltage on a supply rail and for producing an output when the voltage is greater than a predetermined value;
reservoir means whose output is connected to the output of said detecting means;
level detection means whose input is connected to the output of said reservoir means and which produces an output if the reservoir level falls below a predetermined value;

and control voltage generating means having an input connected to the output of said level detection means, said control voltage generating means being adapted to generate a control voltage for the regulating element which decreases abruptly when the generating means receives an



inhibiting input and increases progressively at a predetermined rate from a low level, when the inhibiting input is removed;
whereby the occurrance of an interruption of the supply rail voltage causes an output from the level detection means which inhibits the control voltage generating means.

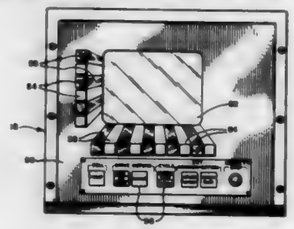
4,697,230
AC POWER SUPPLIED STATIC SWITCHING APPARATUS HAVING ENERGY RECOVERY CAPABILITY
Charles L. Neft, Murrysville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 23, 1986, Ser. No. 877,605
Int. Cl.[4] H02M *5/275*
U.S. Cl. 363—163 5 Claims



1. In a matrix converter for directly converting AC power from an AC supply to an AC load including a plurality of bilateral switches connected on respective AC phase lines, the combination of:
a common capacitor connected between opposite pole ends of each of said bilateral switches through corresponding diode means, for deriving from said pole ends current under substantially constant DC voltage; and
means connected across said common capacitor for dissipating energy accumulated in said common capacitor.

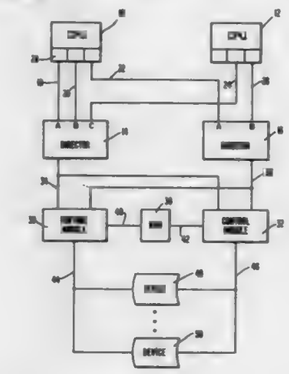
4,697,231
MACHINE CONTROL SYSTEM
Samuel G. Boytor, Elgin, and Jeffry W. Jurs, Bloomingdale, both of Ill., assignors to F. J. Littell Machine Company, Chicago, Ill.
Filed Jun. 21, 1985, Ser. No. 747,661
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—188 14 Claims

7. In a machine control system of the type comprising a programmable controller, a display screen, and means for displaying any selected one of a plurality of separate screen images on the screen, the improvement comprising:
means for providing a positive check that the screen and the displaying means are operating to display the selected screen image, said check providing means comprising:
means for generating a plurality of screen image codes, each included in a respective one of the screen images such that



both the screen image and the respective one of the codes are displayed on the display screen together;
means for sensing the screen image codes and for generating a code signal in response thereto; and
means for comparing the code signal with the screen image code for a displayed one of the screen images and for indicating any disparity therebetween to provide a positive check of the screen and the displaying means.

4,697,232
I/O DEVICE RECONNECTION IN A MULTIPLE-CPU, DYNAMIC PATH ALLOCATION ENVIRONMENT
Philip E. Brunelle, and Bob R. Southerland, both of Boulder County, Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Nov. 30, 1984, Ser. No. 676,707
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 5 Claims



2. A method of connecting a selected one of a plurality of I/O devices to a CPU through a selected path, said selected path including one of a plurality of channels originating at said CPU, a selected one of a plurality of directors connected to respective channels, a selected one of a plurality of control modules coupled to one of said directors through a control module interface, there being individual control module interfaces for coupling each director to each of a plurality of said control modules, and a device interface that connects the selected I/O device to said selected control module, said method comprising the steps of:
(1) storing in said control modules a status indication that includes a device connect ready signal from all I/O devices coupled thereto ready for connection to the CPU;
(2) simultaneously polling all control modules from one of said directors to determine if any control modules have I/O devices ready for connection;

(3) simultaneously receiving at said director a response to the poll of step (2) to identify which channels are needed to reconnect I/O devices ready for connection, and, in response thereto, polling said control modules from said one director to identify which of said control modules are connected to I/O devices that need to be reconnected via a given channel identified in this step (3);

(4) responding to said polling of step (3) by said control modules to identify control modules connected to I/O devices to be connected via said given channel, then individually interrogating each of said identified control modules identified in this step (4) to identify a specific device address to which a connection is to be made via said given channel, said interrogation being carried out under control of said one director; and

(5) connecting the device at said specific device address to said CPU through said given channel, said connection being carried out under control of said one director.

4,697,233

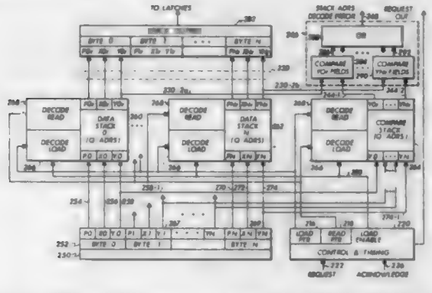
PARTIAL DUPLICATION OF PIPELINED STACK WITH DATA INTEGRITY CHECKING

James H. Scheuneman, St. Paul; Joseph H. Meyer, Lake Elmo, and Donald W. Mackenthun, Fridley, all of Minn., assignors to Unisys Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,864

Int. Cl.[4] G06F *11/08, 11/16, 12/00*

U.S. Cl. 364—200 **9 Claims**



1. In a digital data processing system, an improved partially duplicated virtual pipelined stack structure wherein the stack structure is partially duplicated such that a predetermined number of bits of each data word are stored in a compare stack comprising:

a plurality of stack means each having a plurality of stack register means for temporarily storing a segment of a plurality of pipelined data words, said plurality of stack means positioned such that, taken together, the correspondingly located stack register means of each of said stack means each stores a segment of a total data word;

compare stack means having a corresponding plurality of compare stack register means, each temporarily storing predetermined selected bit grouping of each of the segments of a total data word stored in corresponding registers of said plurality of stack register means;

addressing means for said stack means and for said compare stack means for addressing corresponding ones of said pluralities of said stack register means and said compare stack register means as locations;

data input means for receiving data words to be loaded;

requested receiving means for receiving request signals indicative that data words are available at said data input receiving means;

load pointer means coupled to said stack means and to said compare stack means for providing load addressing signals indicative of the selective one of said stack register means and the corresponding one of said compare stack register means at which loading is to take place;

read pointer means coupled to said stack means and coupled to said compare stack means for providing read addressing signals at which reading is to take place;

first control means coupled to said request receiving means for causing the data word stored in said data input means to be loaded in said plurality of stack means simultaneously, each at the location indicated by said load addressing signals coupled to said addressing means from said loader pointer means, and for causing the loading of a predetermined selection bit groupings of said data word in said compare stack means at the location indicated by said load addressing signals from said load pointer means, and thereafter for causing said load pointer means to be advanced;

second control means for enabling reading of data word from said plurality of stack means simultaneously, each at the location indicated by said read addressing signals, and for enabling reading of said predetermined bit groupings of said data word stored in said compare stack means from said compare stack means at the location indicated by said read addressing signals from said read pointer means, and thereafter advancing said read pointer means;

comparison means coupled to said stack means and to said compare stack means for comparing said predetermined bit groupings of said data word read from said compare stack means to corresponding bit groupings of said data word read from said plurality of data stack means for providing a first comparison signal when a first comparison condition indicative that no error condition has been detected, is detected, and for providing a second comparison signal when a second comparison condition indicative of a detected malfunction in said stack means is detected.

4,697,234

DATA PROCESSING MODULE WITH SERIAL TEST DATA PATHS

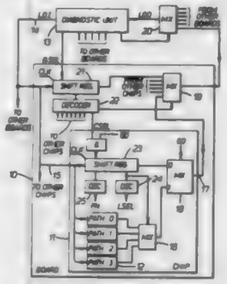
Alan Spillar, Bolton, and Peter L. L. Desyllas, Wilmslow, both of England, assignors to International Computers, Ltd., London, England

Continuation of Ser. No. 498,535, May 26, 1983, abandoned. This application Jun. 30, 1986, Ser. No. 880,302

Claims priority, application United Kingdom, Jun. 11, 1982, 8217006

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **5 Claims**



1. A data processing module comprising:

(a) a plurality of serial shift register paths each having a serial input and a serial output,

(b) a serial input terminal connection in common to the serial inputs of all the shift register paths,

(c) a control shift register having an enable input and a serial input connected to the serial input terminal,

(d) means responsive to a select signal for generating an enabling signal to said enable input of said control shift register for enabling the control shift register to serially shift a control message, specifying one of the shift register paths, into the control shift register from the serial input terminal,

(e) a serial output terminal,

(f) multiplexing means, connected to said serial output terminal and responsive to said control message in the control shift register, for connecting the serial output of a selected one of the shift register paths to the serial output terminal, and

(g) control means, responsive to said control message in the control shift register, for selecting one of the shift register paths, and to allow test data received from said serial input terminal to be shifted serially through the selected shift register path to the serial output terminal via said multiplex means.

4,697,235

LIST VECTOR CONTROL APPARATUS

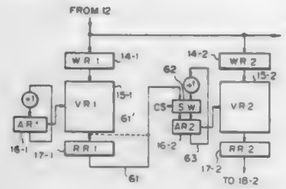
Masanori Motegi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1984, Ser. No. 591,543

Claims priority, application Japan, Mar. 22, 1983, 58-047408; Mar. 28, 1983, 58-051887

Int. Cl.[4] G06F *15/347*

U.S. Cl. 364—200 **15 Claims**



1. A list vector control apparatus incorporated into a vector processor system comprising, at least a main memory segmented into N (where N is a positive integer equal to or larger than 2) number of banks to be accessed under an N-way interleave method, a plurality of vector registers for loading, from the main memory, successive vector elements therein, a plurality of address registers each connected to one of said vector registers, for accessing said vector elements located therein sequentially using address increment means, and a vector arithmetic unit receiving list vector data sequentially supplied from said vector registers to produce resultant data therefrom, said apparatus comprising:

one of said vector registers acting as a list vector register and storing therein a set of list vector elements supplied from said main memory;

at least one other of said vector registers acting as a list data vector register and storing therein, from said main memory, a set of vector data elements each corresponding to individual ones of said list vector elements, where said list vector elements indicate the order of the vector data elements; and

at least one list vector transfer line, connected between the address register of said list data vector register and said list vector register, the list vector elements being sequentially transferred to and momentarily stored in the address register of said list data vector register, via said list vector transfer line, and used for accessing the vector data elements in said list data vector register specified thereby, to produce the list vector data.

4,697,236

DENSITOMETER WITH AUTOMATIC GAIN AND REFERENCE VALUE ADJUSTMENT OF ANALOG WAVEFORM

Gene A. Butts; Charles D. Kelley, both of Beaumont; Henry A. Garsee, Kountze; Bruce R. Petty, Beaumont, all of Tex., and James L. Pauley, Salt Lake City, Utah, assignors to Helena Laboratories Corporation, Beaumont, Tex.

Filed Mar. 11, 1985, Ser. No. 710,741

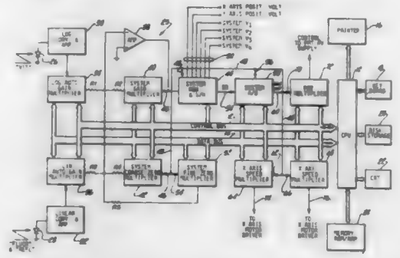
Int. Cl.[4] G06F *15/42;* **G01N** *33/49*

U.S. Cl. 364—416 **14 Claims**

1. In a densitometer for graphically displaying any of a plurality of different types of optical density patterns of a blood sample and of the type including the combination of means for optically scanning the sample and generating an electrical analog signal which is a function of the optical density of the scanned sample, means for amplifying the electrical analog signal, means for converting the electrical analog signal into digital sample data, means for storing the digital sample data, means for reconstructing an analog waveform representing the relevant optical density patterns of the sample using the stored digital sample data, and means for graphically displaying the analog waveform for visual inspection, the improvement comprising:

automatic adjustment means coupled to said amplifying means and to said converting means for sensing the magnitude of the generated analog signal prior to scanning and during a first scan and for automatically altering the amplification characteristics of said amplifying means in accordance with the type of optical density pattern being scanned, whereby to adjust the gain and reference level of said analog signal.

7. A method of graphically displaying any of a plurality of



different types of optical density patterns of a blood sample, comprising the steps of:

(A) Selecting the type of pattern to be displayed;

(B) Optically scanning the sample to generate a time varying, analog signal representing the optical density of the scanned sample;

(C) Storing a plurality of sets of digital data in a memory, each of said data sets being associated with one of said plurality of patterns types;

(D) Reading one of the sets of data stored in step (C) which is associated with the pattern type selected in step (A);

(E) Altering the amplitude characteristics of the analog waveform signal in accordance with the data read in step (D);

(F) Digitizing the altered analog waveform signal after performing step (E) to generate digital sample data; and,

(G) Generating a graphic display of the selected type of optical density pattern using said digital sample data.

4,697,237

VEHICLE SUSPENSION APPARATUS

Tadao Tanaka; Mitsuhiko Harara, both of Okazaki; Yasutaka Taniguchi; Masanaga Suzumura, both of Nagoya; Minoru Tatemoto, Okazaki, and Naotake Kumagai, Aichi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,232

Claims priority, application Japan, Nov. 21, 1984, 59-244667; Nov. 21, 1984, 59-244668; Nov. 21, 1984, 59-244669; Dec. 25, 1984, 59-278447

Int. Cl.[4] B60G *21/06*

U.S. Cl. 364—424 **13 Claims**

1. A vehicle suspension appartus comprising:

fluid spring chambers arranged as suspension units for supporting respective vehicle wheels;

fluid supply means for supplying a fluid from each of said fluid spring chambers through exhaust control valve means;

fluid exhaust means for exhausting the fluid from each of said fluid spring chambers through exhaust control valve means;

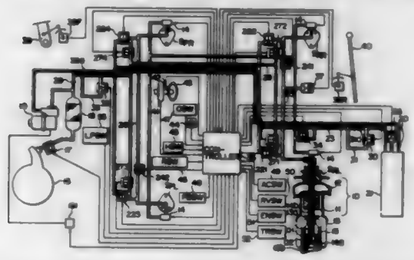
communicating means for communicating each of said fluid spring chambers of the left suspension units with each of

said fluid spring chambers of the right suspension units through communication control valve means;

steering state detecting means for detecting the steering state of a steering wheel;

roll control means for producing a second control signal for opening the desired one of said supply control valve means for a first preset time so as to supply a preset amount of a fluid to said fluid spring chambers of the contracted suspension units and opening the desired one of said exhaust control valve means for said first preset time so as to exhaust a preset amount of the fluid from said fluid spring chambers of the stretched suspension units when said steering state detecting means and vehicle velocity detecting means detect a factor with causes rolling of a vehicle body; and

communication control means for supplying a first control signal to said communicating means so as to open said communication control valve means when said steering



state detecting means detects that the steering angle falls within a preset neutral range and to close said communication control valve means when said steering state detecting means detects that the steering angle falls outside the neutral range, said communication control means supplying a third control signal to said communicating means so as to open said communication control valve means when said steering state detecting means detects, after control by said roll control means, that the steering direction of said steering wheel is in a return direction toward a neutral direction and the steering angularly velocity is higher than a first preset steering angular velocity, and said communication control means supplying a fourth control signal to close said communication control valve means for a fourth preset time when said steering state detection means detect, during a third preset time period after a second preset time from production of the third control signal, that the steering angle falls within the neutral range.

4,697,238

INTEGRATED FUEL MANAGEMENT SYSTEM

Dennis E. Barbeau, Temperance, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 226,632, Jan. 21, 1981, Pat. No. 4,441,156. This application Feb. 10, 1984, Ser. No. 578,995

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—431.02 **9 Claims**

1. An aircraft fuel management system to regulate fuel from an airframe reservoir, said system comprising:

an aircraft turbine engine having a combustor providing propulsion for the aircraft;

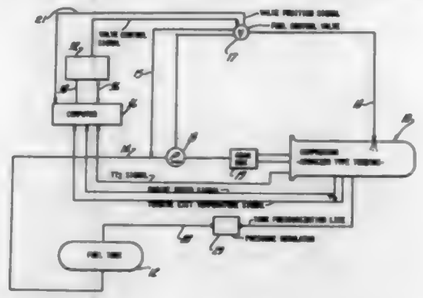
a fuel pump receiving fuel from the reservoir and supplying fuel to the turbine engine;

a motor controlling said pump so as to provide fuel to said turbine engine;

means for sensing at least one engine condition;

means responsive to said sensing means for controlling fuel flow to said turbine engine, and

wherein said pump and said motor are of the constant speed type and further comprising valve means for controlling



the fuel flow rate to said turbine engine and wherein said controlling means modulates the position of said valve means.

4,697,239

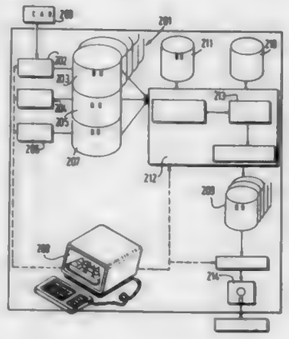
AUTOMATED INSTALLATION FOR PROCESSING LARGE OBJECTS

Claude Sicard, Saint Nazaire; Patrice Krocynski, Vitry; Herve Gallard, Sollies-Pont; Denis Mars, Le Chesnay, and Michel Devos, Dunkerque, all of France, assignors to Institut de Recherches de la Construction Navale, Paris, France

Filed Jan. 4, 1985, Ser. No. 688,890

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—468 **16 Claims**



1. An automated mobile workshop comprising:

(a) a workstation equipped with at least one tool for performing work;

(b) means for transporting said workstation from one location to another location operably connected to said workstation;

(c) means for sensing the environment of said workstation in operable communication with said workstation for detecting the location of said workstation;

(d) a programming center for receiving and storing information relating to objects on which work is to be performed and descriptions of the capabilities of tools available to perform the work, said programming center being in electronic communication with said workstation and including:

(i) a database for receiving and storing data relating to objects on which work is to be performed;

(ii) a database provided with technical specifications for said at least one tool; and

(iii) a database containing standards for work to be performed;

(e) a supervisory station electronically connected to said programming center, said means for transporting, and said means for sensing for receiving programmed information from said programming center, detecting the presence of said at least one tool, and for communicating instructions to said means for transporting based on said programmed information;

(f) a work preparation station electronically connected to said programming center for preparing a work sequence corresponding to data relating to objects on which work is to be performed, said work preparation station including:

(i) visual simulation facilities for depicting said objects; and

(ii) a database for receiving and storing data regarding said work sequence;

(g) a database electronically connected to said supervisory station and said database for receiving and storing data regarding said work sequence for receiving and transmitting said data regarding said work sequence to said supervisory station;

(h) a statistical control database electronically connected to said database for receiving and storing data regarding said work sequence and to said work preparation station.

4,697,240

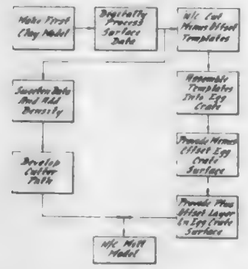
METHOD FOR MAKING MODELS USING SIMULTANEOUS CONSTRUCTION AND CAD/CAM TECHNIQUES

Dennis A. Cedar, Troy, and Ralph L. Miller, Bloomfield Hills, both of Mich., assignors to Modern Engineering Service Company, Warren, Mich.

Filed May 28, 1985, Ser. No. 738,604

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—474 **16 Claims**



1. A method for constructing a three-dimensional master model using computer assisted design and numerical control machine tool cutter techniques, said method comprising the steps of digitally processing relatively low density surface data to obtain male template contour lines; producing a set of male templates from said contour lines, the edges of said templates being offset a first dimension below a surface on an axis normal thereto; assembling said templates into an egg crate type structure comprising spaced templates with edges generally defining a desired master model but offset below a final desired surface on an axis normal thereto; filling in spaces between said templates edges to provide a substantially continuous surface; providing a layer of millable material on said surface, said layer being of a thickness greater than said first dimension to thereby provide a rough model having a surface offset above said final desired surface on an axis normal thereto; sweetening said relatively low density surface data to provide relatively higher density surface data and then N/C milling said surface of said rough model to a desired surface using said relatively higher density surface data.

4,697,241

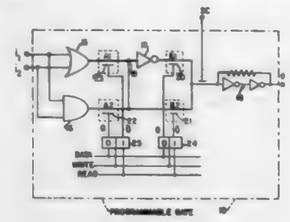
HARDWARE LOGIC SIMULATOR

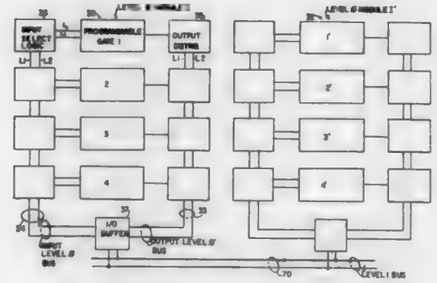
Yoav Lavi, Ramana, Israel, assigner to Simulog, Inc., Santa Clara, Calif.

Filed Mar. 1, 1985, Ser. No. 707,040

Int. Cl.⁴ G06F *15/20, 15/60*; H03K *19/088*

U.S. Cl. 364—488 **39 Claims**





1. Apparatus for verifying the design of a logic circuit composed of a plurality of interconnected logic elements comprising:

(a) a plurality of harware gates, each of which corresponds to and emulates a logic element in said circuit, each hardware gate having an output and at least two inputs;

(b) interconnnection means selectively operable for establishing a connection between the output of a given hardware gate and an input of any other hardware gate including said given gate; and

(c) multiplex means for operating said interconnection means and determining which, and when, each connection is made.

4,697,242

ADAPTIVE COMPUTING SYSTEM CAPABLE OF LEARNING AND DISCOVERY

John H. Holland, 3900 W. Huron River Dr., Ann Arbor, Mich. 48103, and Arthur W. Burks, 3445 Vintage Valley Rd., Ann Arbor, Mich. 48105

Filed Jun. 11, 1984, Ser. No. 619,349

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—513 **40 Claims**

1. A computing system comprising, in combination,

a source of input data comprising k-bit binary message words,

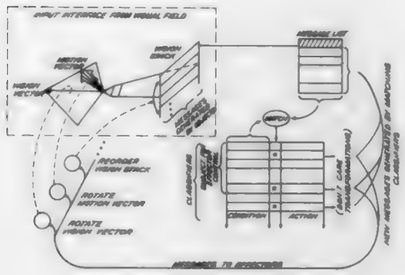
a message memory for storing said input data and additional k-bit binary message words,

a classifier memory for storing a plurality of classifiers, each of said classifiers being composed of a condition part, an action part, and a strength value,

said condition part comprising one or more k-position ternary words each of which specifies a subset of the possible k-bit binary message words, and

said action part comprising at least one k-position ternary word which at least partially specifies the content of a new message word,

matching means for comparing each message word in said message memory with the condition part of each classifier in said classifier memory,



means responsive to said matching means for generating new message word whenever each of the ternary words in the condition part of a classifier is satisfied by at least one message in said message memory, and

means for increasing the strength value associated with a particular classifier whenever said particular classifier generates a new message word to which a further classifier responds by generating a message word.

4,697,243

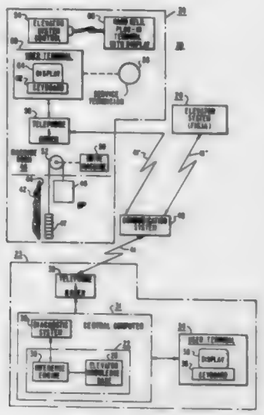
METHODS OF SERVICING AN ELEVATOR SYSTEM

William H. Moore, Bridgewater; Charles M. Gutowski, Paramus, both of N.J.; William J. Trosky, Wilkinsburg, and Thomas A. Butler, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 25, 1985, Ser. No. 758,984

Int. Cl.[4] G06F *11/00*; B66B *3/00*

U.S. Cl. 364—513 **7 Claims**



1. A method in which an expert system having a knowledge base of elevator trouble-shooting information may be used interactively, as a consultant, by any number of remotely located elevator service personnel without requiring special training in the use of expert systems, and without compromising the security of the knowledge base, comprising the steps of:

providing a knowledge base of elevator trouble-shooting information, including a rule network having rules in evidence-hypothesis format,

enabling contact to be made with said knowledge base from any number of remote elevator system locations via communication means,

limiting access to said knowledge base to authorized users,

establishing a communication link between an authorized user located at a remote elevator system and the knowledge base via the communication means,

initiating an interactive exchange session between the user and knowledge base via the communication link,

said interactive session including the steps of:

displaying an elevator system malfunction menu, selecting a symptom from the menu, and running an inference engine using the selected symptom to traverse the rule network,

asking the user to provide evidence unavailable to the knowledge base which is required to propagate belief through the rule network in an effort to determine a probable cause of the selected symptom,

said asking step including the step of providing the user with a specific code related to the evidence required by the knowledge base,

accessing the elevator system for evidence via a programmable terminal,

said accessing step including the step of entering the specific code provided to the user by the knowledge base,

said accessing step further including the step of obtaining a plurality of evidence bits from the elevator system in response to the coded entry, some of which may be immediately utilized by the knowledge base to propagate belief through the rule network and some of which may be subsequently utilized during subsequent belief propagations through the rule network,

computing the age of each of such bit of evidence before it is used by the knowledge base,

comparing the computed age with a predetermined value,

and asking the user if the evidence should be updated when the age exceeds the predetermined value.

4,697,244

COORDINATE INPUT DEVICE WITH DISPLAY AND PRINTER

Azuma Murakami, Tokyo; Yoshinori Taguchi, and Tsuguya Yamanami, both of Ageo, all of Japan, assignors to Wacom Co., Ltd., Saitama, Japan

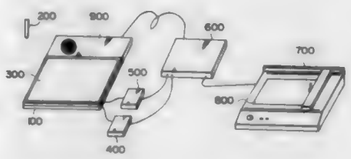
Filed Jan. 22, 1985, Ser. No. 693,429

Claims priority, application Japan, Jan. 20, 1984, 59-8920

The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.

Int. Cl.[4] G08C *21/00*; G06F *15/62*

U.S. Cl. 364—520 **6 Claims**



1. A coordinate input device with display comprising:

a tablet having a plurality of X-direction magnetostrictive transmission mediums arranged in parallel, a plurality of Y-direction magnetostrictive transmission mediums arranged in parallel and superposed on said X-direction transmission mediums substantially orthogonal thereto, and first and second electromagnetic converters wound around said X and Y-direction magnetostrictive transmission mediums;

a tubular display superposed on said tablet and having a display area substantially equal to the position detection area on said tablet;

a position appointing magnetism of generator capable of producing a magnetism just enough for causing a local increase of electro-mechanical coupling coefficient in said magnetostrictive transmission mediums in said tablet;

a position detecting circuit adapted to supply a pulse current to one of said first and second electromagnetic converters so as to generate magnetostrictive vibration wave in a reference position on each magnetostrictive transmission medium or a position appointed by said position appointing magnetism generator, said position detecting circuit being further adapted to measure the time duration between the moment at which said magnetostrictive vibration wave is generated and a moment at which said magnetostrictive vibration wave has reached the appointed position or said reference position, thereby detecting the coordinate values of the position appointed by said position appointing magnetism generator;

a display control circuit adapted for driving said display in such a manner that the position corresponding to said coordinate values is displayed on said display; and

a hard copy producing means for recording the data corresponding to said coordinate values.

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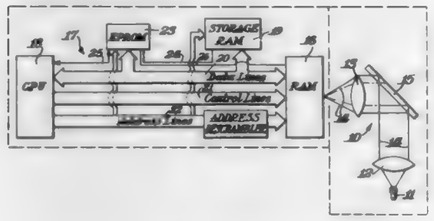
INSPECTION AND MEASURING APPARATUS AND METHOD

Gerald F. Kara, Gravette, Ark., and William H. Sawyer, Chester Springs, Pa., assignors to CBIT Corporation, Malvern, Pa.

Filed Nov. 29, 1984, Ser. No. 676,102

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—552 **9 Claims**



1. A method for controlling dimensions of articles as conveyance is in progress by setting dimension parameters under data processor control

said method comprising

viewing a plurality of articles in an optical system and successively forming images of each article,

repetitively measuring the dimensions of the articles,

entering data of the dimensions of each article

creating and storing in a memory data of the dimension of each article,

providing a data processor with the data of the dimensions of the articles,

repetitively comparing the dimensions of the articles to create an average of the dimensions,

storing data of the average of the dimensions in said memory

monitoring conveyed articles by viewing said conveyed articles in said optical system,

ascertaining on the basis of the monitoring of the conveyed articles whether the dimensions of said articles is in accordance with said average of the dimensions,

halting the conveyance of an article when the dimensions thereof have failed to correspond to the average of dimensions.

4,697,246

METHOD AND APPARATUS FOR DETECTING THE ENGAGEMENT OF A PROPER NUMBER OF ARTICLES

Edward H. Zemke, deceased, late of Chicago by Anne H. Zemke, legal representative; Gary L. Vandersyde, Naperville; K. George Rabindran, Morton Grove, and Kenneth L. Guenther, Park Ridge, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sep. 7, 1984, Ser. No. 648,399

Int. Cl.[4] B25J *15/02*; G01B *5/02*; B65H *5/10, 3/32, 7/06*

U.S. Cl. 364—563 **26 Claims**



1. A gripper arm for selectively engaging and retrieving articles from a station proximate the gripper arm, said gripper arm comprising:

a gripper arm housing having a first end and a second end, said gripper arm housing having two parallel panels which define a space therebetween;

means at the second end of said housing for securing said gripper arm to oscillating drive means;

a first jaw member proximate said first end of said gripper arm housing;

a second jaw member proximate said first end of said gripper arm housing, said second jaw member being selectively movable with respect to said first jaw member for the engagement of articles therebetween;

actuation means for selectively moving said second jaw member with respect to said first jaw member whereby articles are selectively engaged between said jaw members; and,

means for detecting whether a proper number of articles are engaged between said first jaw member and said second jaw member of said gripper arm, said detecting means comprising:

means for creating a magnetic field, said magnetic field-creating means being mounted on one of saw jaw members;

Hall Effect sensor means for sensing the flux density of said magnetic field and for generating an output signal proportional thereto, said sensor means being mounted with respect to the other of said jaw members; and,

biasing means for biasing said magnetic field-creating means relative to said sensor means whereby a first plane including an essentially planar surface of said magnetic field-creating means remains in a predetermined relationship with respect to a second plane including an essentially planar surface of said sensor means in a manner whereby slidable displacement occurs between said field-creating means and said sensor means as said second jaw member is moved with respect to said first jaw member, said field-creating means and said sensor means being positioned in said space defined by said gripper arm housing panels and mounted relative to said jaw members in a manner whereby said

output signal of said sensor means is related to the distance separating said first and second jaw members as said slidable displacement occurs.

4,697,247

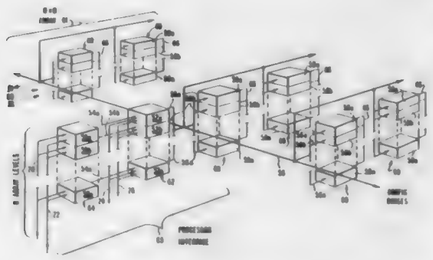
METHOD OF PERFORMING MATRIX BY MATRIX MULTIPLICATION

Jan Grinberg, Los Angeles, and Frederick G. Yamagishi, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Del.

Continuation of Ser. No. 502,981, Jun. 10, 1983, abandoned. This application Jul. 14, 1986, Ser. No. 883,437

Int. Cl.⁴ G06F *7/56, 7/52;* **G06G** *7/16*

U.S. Cl. 364—713 **2 Claims**



1. A method of multiplying a first N×N matrix by a second N×N matrix in a parallel array digital processor, comprising the steps of:

(a) providing N^2 parallel elemental processors logically organized as a multi-level processor matrix, each one of said N^2 parallel elemental processors including a plurality of modules logically distributed over the multiple levels of said processor matrix so that each one of aid levels includes no more than one module from each processor;

(b) providing ona first level of the processor matrix a first array of N^2 memory modules, each for storing an element of the first matrix;

(c) providing on a second level of the processor matrix a second array of N^2 memory modules, each for storing an element of the second matrix;

(d) providing on a third level of the processor matrix a third array of row memory modules organized as N rows of modules, each row containing N modules intnerconnected so that all modules in the row may store in common a designated column element of the first matrix;

(e) providing a fourth level of the processor matrix a fourth array of column memory modules organized as N columns of modules, each column containing n modules interconnected so that all modules in that column may store in common a deisgnated row element of the second matrix;

(f) providing an array of N×N arithmetic modules, each for multiplying the contents of a corresponding row module from the third array of modules by the contents of a corresponding column module from the fourth array of modules;

(g) providing an array of N×N accumulator modules, each for successively summing and storing resultant multiplications from a corresponding arithmetic module;

(h) storing the elements of the first matrix in the first array of memory modules;

(i) storing the elements of the second matrix in the second array of memory modules;

(j) providing in parallel the N elments of the first column of the first matrix to the N row memory modules, whereby all of the row modules in a common row have stored therein a common element from the corresponding row of the first column of the first matrix;

(k) providing in parallel the N elements of the first row of the second matrix to the N column memory modules, whereby all of the column modules in a common column have stored therein a common element from the corresponding column of the first row of the second matrix;

(l) multiplying, in parallel, the contents of each row module by the contents of a corresponding column module to provide N×N matrix element products;

(m) accumulating, in parallel, each of the products in a corresponding accumulator module; and

(n) repeating steps (j)–(m) above for each successive column of the first matrix and correspondly successive row of the second matrix, whereby the desired matrix product is provided in the array of accumulator modules.

4,697,248

ARITHMETIC CIRCUIT FOR OBTAINING THE VECTOR PRODUCT OF TWO VECTORS

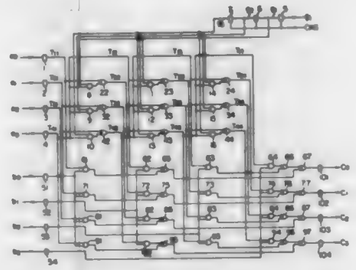
Norihisa Shirota, Kanagawa, Japan, assigner to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,125

Claims priority, application Japan, Dec. 30, 1983, 58-248204

Int. Cl.⁴ G06F *7/52*

U.S. Cl. 364—754 **5 Claims**



1. An arithmetic circuit comprising:

means for generating as a first input a first set of m bits representing a first vector of a finite field GF(2m) and for generating as a second input a second set of m bits representing a second vector of said finite field;

means for converting said first set of m bits into components of a matrix corresponding to said first vector; and

means for multiplying each of said components by said second set of m bits, thereby to obtain as an output a vector product of said first and second inputs.

4,697,249

METHOD AND APPARATUS FOR CREATING PART PROGRAM DATA USING A TABLET

Hajimu Kishi, Hino; Masaki Seki, Takaidonishi, and Kunio Tanaka, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Feb. 28, 1983, Ser. No. 470,482

Claims priority, application Japan, Feb. 27, 1982, 57-31617

Int. Cl.⁴ G06F *9/06;* **G05B** *19/42*

U.S. Cl. 364—900 **4 Claims**

2. An apparatus for creating part program data statements by entering points from a drawing placed on a tablet which produces coordinate values, comprising:

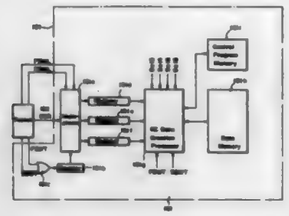
coordinate designating means, movable on the tablet, for designating the coordinate values and including switches for providing switch signals;

an OR gate connected to the switches of said coordinate designating means for taking the OR of the switch signals produced by each of the switches provided on said coordinate designating means;

a counter connected to said OR gate, for counting output pulses produced by said OR gate, the status of said counter changing with each counter output pulse;

a plurality of registers for storing coordinate values successively;

a multiplexer, connected to said counter and to the tablet, for applying coordinate values, produced by the tablet, to a predetermined one of said plurality of registers in accordance with the value of the count in said counter; and



means, connected to said plurality of registers and which receives the coordinate values stored in said plurality of registers as well as information specifying part program data to be created, for creating the part program data statements using said information and said coordinate values, where the part program data statements include one of point/point sequence connection statements, point sequence connection statements, straight line definition statements and circular definition statements.

4,697,250

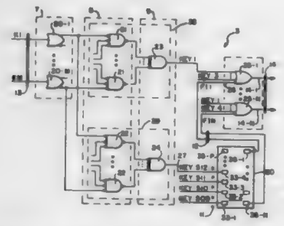
FLEXIBLE COMPUTER CONTROL UNIT

Hsiao-Peng S. Lee, Sunnyvale, and Ulrich Spannagel, Los Altos, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 790,270, Oct. 22, 1985, abandoned, which is a continuation of Ser. No. 525,745, Aug. 22, 1983, abandoned. This application Jun. 18, 1986, Ser. No. 876,302

Int. Cl.⁴ G06F *9/02*

U.S. Cl. 364—900 **6 Claims**



1. In an integrated circuit, an apparatus connected to receive a sequence of multi-bit keys, for generating control patterns consisting of a plurality of control signals, comprising:

primary means, connected to receive the sequence of multi-bit keys, for detecting a primary set of the multi-bit keys, and for generating primary key decode signals corresponding to each of the multi-bit keys in the primary set;

alternate means, connected to receive the sequence of miltibit keys, for detecting an alternate set of multi-bit keys, the alternate set having multi-bit keys not included in the primary set, and for generating alternate key decode signals corresponding to each of the multi-bit keys in the alternate set;

output means, connected to receive the alternate key decode signals from the alternate means, for supplying the alternate key code decode signals externally from the integrated circuit as output signals;

input means, connected to receive input signals externally supplied to the integrated circuit, for supplying the input signals internally to the integrated circuit; and

a plurality of output gates for supplying the control signals, each output gate having a primary input connected to receive one of the primary key decode signals, an alternate input connected to receive one of the input signals from the input means and an output supplying one of the control signals;

the input means and output means being adapted for communication with connection means, external to the integrated circuit and responsive to the output signals, for supplying the input signals.

4,697,251

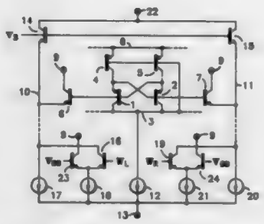
BIPOLAR RAM CELL

Mark S. Birrittella, Phoenix, and James J. Stipanuk, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1985, Ser. No. 809,551

Int. Cl.⁴ G11C *11/00*

U.S. Cl. 365—154 **4 Claims**



1. A memory cell having a first bit line, a second bit line, a first word line, and a second word line, comprising:

a voltage terminal;

a first load;

a second load;

a pair of latchable cross-coupled transistors having their emitters coupled to said second word line, their collectors coupled to said first word line by said first and second loads, respectively, and their bases coupled to each other's collector;

first means coupled between said voltage terminal and said first bit line and coupled to said base of one of said pair of latchable cross-coupled transistors for sinking current from said base of said one of said pair of latchable cross-coupled transistors, wherein a voltage on said voltage terminal is greater in magnitude than the voltage on said first bit line; and

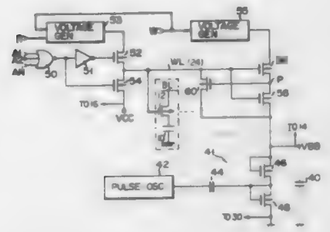
second means coupled between said voltage terminal and said second bit line and coupled to said base of the other of said pair of latchable crosscoupled transistors for sinking current from said base of said other of said pair of latchable cross-coupled transistors, wherein a voltage on said voltage terminal is greater in magnitude than the voltage on said second bit line.

4,697,252

DYNAMIC TYPE SEMICONDUCTOR MEMORY DEVICE

Tohru Furuyama, Ithaca, N.Y., and Yukimasa Uchida, Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 9, 1984, Ser. No. 587,975
Claims priority, application Japan, Mar. 10, 1983, 58-39550
Int. Cl.⁴ G11C *7/00, 11/24*
U.S. Cl. 365—189 **14 Claims**



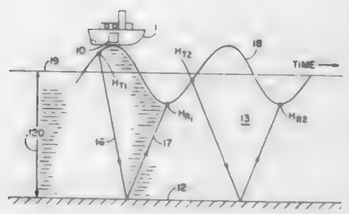
1. A dynamic type semiconductor memory device comprising:
- a semiconductor substrate of a first conductivity type having a charge associated therewith;
- a well region of a second conductivity type formed in the surface area of said semiconductor substrate;
- charge pumping means for selectively varying the charge in said semiconductor substrate so as to reverse-bias said semiconductor substrate with respect to said well region;
- a plurality of word lines;
- a plurality of memory cells each including a MOS transistor and a capacitor, said MOS transistor of each of said cells being of a first conductivity type which has a gate electrode connected to one of said word lines and a current path formed in the surface area of said well region, with said capacitor of each of said cells storing data corresponding to a voltage supplied through the current path of said MOS transistor of the cell; and
- driving means for selecting one of said word lines and for applying the charge in said semiconductor substrate to the selected word line to turn on each MOS transistor connected to the selected word line.

4,697,253

SONAR HEAVE COMPENSATION SYSTEM

Earl R. Lind, Portsmouth, and Ronald A. Franklin, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 3, 1986, Ser. No. 816,036
Int. Cl.⁴ H04B *17/00*; **G01S** *9/68*
U.S. Cl. 367—12 **18 Claims**



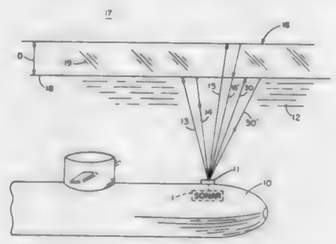
1. In combination:
- means transmitting sonic energy at a predetermined time toward an energy reflecting surface which provides energy reflected from said surface;
- means responsive to the energy reflected at a later time from said surface for measuring the round-trip distance between said transmitting means and said reflecting surface and between said responsive means and said reflecting surface;
- said transmitting means and said responsive means moving transversely to and maintaining an average distance to said reflecting surface;
- said transmitting means and said responsive means undergoing translation relative to the average distance to said reflecting surface along the direction between said reflecting surface and said transmitting means and said responsive means;
- means measuring the translation of said transmitting means from said average distance at the predetermined time of transmission and for measuring the translation of said responsive means from said average distance at the later time of reception of said reflected energy; and
- means modifying the measured round-trip distance in accordance with said translations to provide the average distance of said transmitting means and said responsive means to said reflecting surface.

4,697,254

SYSTEM AND METHOD FOR MEASURING ICE THICKNESS

Roger G. Pridham, Providence, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 2, 1986, Ser. No. 869,644
Int. Cl.⁴ G01S *9/66, 9/68*
U.S. Cl. 367—92 **11 Claims**



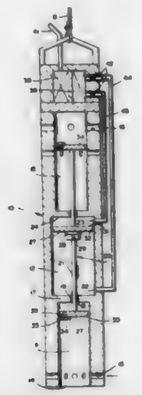
1. A method for measuring ice thickness comprising:
- generating in water an amplitude modulated sonic signal having a first carrier frequency and a modulating frequency;
- generating in water an unmodulated continuous wave transmission sonic signal at a second carrier frequency at the termination of said amplitude modulated sonic signal;
- said amplitude modulated signal nonlinearly interacting with said water to generated sonic energy at said modulating frequency, said modulating frequency propagating through an ice cap of said water and being reflected from an air-ice interface;
- detecting the reflected first carrier frequency with its modulating frequency reflected from the ice cap-water interface;
- said second carrier frequency signal also being reflected from the ice cap-water interface;
- said reflected modulating frequency and said reflected second carrier frequency nonlinearly interacting in said water to generate sidebands at said modulating frequency on each side of the second carrier to provide a frequency modulated second carrier frequency;
- detecting said frequency modulated second carrier frequency to detect the reflected modulating frequency from said air-ice interface; and
- measuring a time difference between reception of said detected first carrier frequency and said second carrier frequency thereby providing the thickness of said ice.

4,697,255

IMPLOSION TYPE ENERGY SOURCE FOR SEISMIC EXPLORATION

Donald L. Howlett, Kingwood, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,830
Int. Cl.⁴ H04R *23/00*
U.S. Cl. 367—146 **7 Claims**



1. An acoustic energy source for use in an aqueous environment to create implosion triggered seismic impulses in a body of water which comprises
- a casing having a wall defining at least two spaced apart elongated implosion chambers and a power chamber therebetween,
- means forming an implosion port in a wall of said at least two implosion chambers communicating each of the latter with the surrounding body of water,
- a piston rod assembly including a bead **27** slidably received in said power chamber, having first and second piston heads **30** and **34** reciprocally positioned in said first and second implosion chambers for sequentially displacing water respective first and second chambers when a piston head is moved toward said implosion port to evacuate water from the implosion chamber and to permit rapid entry of water into the evacuated implosion chamber when said piston head has traversed the implosion port in said implosion chamber whereby to create a hydraulic shock, and
- fluid power means communicated with said power chamber for sequentially impacting against said piston rod assembly to impart said reciprocatory movement thereto in a direction axially of the elongated implosion chambers during successive water displacing and water entry stages of the latter's operation.

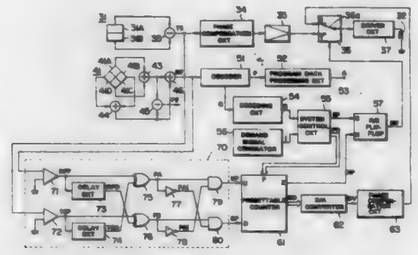
4,697,256

OPTICAL DISC PLAYER WITH IMPROVED INITIAL POSITIONING OPERATION

Mitsutoshi Shinkai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 24, 1985, Ser. No. 758,335
Claims priority, application Japan, Jul. 28, 1984, 59-158344
Int. Cl.⁴ G11B *7/085, 7/095, 21/08*
U.S. Cl. 369—32 **11 Claims**

7. In an optical disc player for playing an optical disc having a plurality of tracks and including optical means for transmitting an optical beam toward said optical disc and receiving a reflected light beam from said optical disc, a tracking system associated with said optical means for radially shifting said optical means to a track position at which said optical beam impinges on one of said tracks on which said data is to be recorded, and producing first and second output signals indicative of a position of said beam on said surface and varying cyclically between respective maximum and minimum values as said optical means is moved from one track position to an adjacent track position in which a method for tracking control of said optical means comprises the steps of;
- detecting an initial track position of said optical means and producing an initial track position indicative signal;
- receiving an input representative of a desired track position to produce a desired position indicative signal;
- deriving a difference corresponsing to 4 times the number of tracks between the track position indicated by said initial track position indicative signal and the track position indicated by said desired position indicative signal and



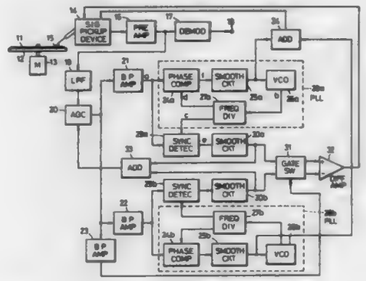
setting an initial counter value corresponding to said difference;
- driving said tracking system to continuously radially shift said optical means toward said desired position from said initial position;
- detecting each time each of said first and second output signals has a predetermined value intermediate said respective maximum and minimum values;
- reducing said counter value in response to each said detection as said optical means shifts between said initial track position and said desired track position; and
- stopping radial shifting of said optical means when said counter value becomes zero.

4,697,257

JITTER COMPENSATION SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 396,552, Jul. 9, 1982, abandoned. This application Jul. 26, 1985, Ser. No. 757,922
Claims priority, application Japan, Jul. 14, 1981, 56-109564
Int. Cl.⁴ G11B *21/02*
U.S. Cl. 369—43 **3 Claims**



1. A jitter compensation system in a rotary recording me-

dium reproducing apparatus having a reproducing transducer including a reproducing element for reproducing recorded signals from a rotary recording medium, said rotary recording medium being recorded with an information signal on a track thereof and also recorded with first and second reference signals for tracking control respectively having predetermined frequencies which are mutually different, said first and second reference signals being switched over and alternately recorded between track turns for every information signal recording track turn on said rotary recording medium, and a third reference signal for indicating switching over positions of said first and second reference signals; said first and second reference signals being recorded in a burst manner with a specific repetition frequency, said jitter compensation system comprising:

separating means for separating said first, second and third reference signals from a signal reproduced by said reproducing transducer, said reproduced first and second reference signals each including a frequency deviation component within a burst period thereof, said frequency deviation component being a frequency deviation from the respective predetermined frequencies of said first and second reference signals and corresponding to a jitter component in the signal reproduced by said reproducing transducer;

detecting means directly responsive to the separated first and second reference signals from said separating means for frequency-detecting frequencies of said separated first and second reference signals and for producing a jitter compensation signal, said detecting means comprising first detecting means for detecting the frequency of said first reference signal and second detecting means for detecting the frequency of said second reference signal, said first detecting means comprising a first phase locked loop including first phase comparing means supplied with said separated first reference signal, and first oscillator means controlled of its oscillation frequency according to an output signal of said first phase comparing means for supplying a frequency substantially equal to the frequency of said first reference signal to said first phase comparing means, said second detecting means comprising a second phase locked loop including second phase comparing means supplied with said separated second reference signal, and second oscillator means controlled in its oscillation frequency according to an output signal of said second phase comparing means for supplying a frequency substantially equal to the frequency of said second reference signal to said second phase comparing means, said first and second oscillator means respectively comprising first and second voltage controlled oscillators for producing frequencies n (n is an integer) times the frequencies of said respective first and second reference signals, and first and second frequency dividers for frequency-dividing respective outputs of said first and second voltage controlled oscillators into 1/n the original frequencies and supplying frequency-divided output to said first and second phase comparing means;

displacing means responsive to the output jitter compensation signal of said detecting means for displacing the reproducing element of said reproducing transducer along a relative scanning direction with respect to said rotary recording medium;

adding means for adding output signals of said first and second phase comparing means and applying the added signal to said displacing means as the jitter compensation signal;

first and second synchronous detecting means respectively supplied with said separated first and second reference signals for subjecting these first and second reference signals to synchronous detection by respective signals from said first and second frequency dividers;

means for switching outputs of said first and second synchronous detecting means by said separated third reference signal to obtain a tracking control signal; and

means supplied with said tracking control signal for controlling the reproducing element of said reproducing transducer so as to scan over the tracks on said rotary recording medium.

4,697,258

APPARATUS FOR ENABLING AN AUTOTRACK CIRCUIT OF AN OPTICAL DISC READING APPARATUS DURING THE POSITIONING OF A READ BEAM

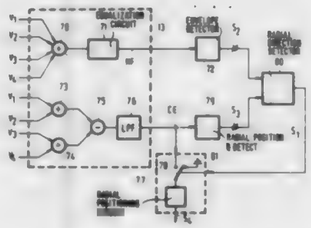
Hilde M. A. Overath, and Martinus P. M. Bierhoff, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1985, Ser. No. 719,610

Claims priority, application Netherlands, Nov. 21, 1984, 8403534

Int. Cl.[4] G11B *21/10, 7/095*

U.S. Cl. 369—44 **7 Claims**



1. An apparatus for reading a disc-shaped record carrier in which information is stored in the form of a track of optically detectable areas comprising:

a light source for producing a read beam;

an objective system for focusing the read beam to form a light spot on the record carrier;

a detection system for detecting the information present in the read beam received from the record carrier;

radial positioning means for controlling the radial position of the light spot on the information track; and,

a lock-in system for switching on the radial positioning means at an instant at which the light spot at least substantially coincides with the information track comprising means for detecting a direction of the relative radial movement between the light spot and the information track, and for supplying a first control signal to the lock-in system at substantially the instant during which when the radial positioning means is inoperative, said relative radial movement changes from an outward movement of the light spot over the track to an inward movement of the light spot over the track, whereby the radial positioning means is enabled by the first control signal.

4,697,259

DISC AUTOMATICALLY SETTING DEVICE OF A DISC PLAYER

Hiroyoshi Takanashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1984, Ser. No. 658,226

Claims priority, application Japan, Oct. 11, 1983, 58-156944[U]; Oct. 11, 1983, 58-189601; Oct. 11, 1983, 58-189600; Oct. 11, 1983, 58-156943[U]

Int. Cl.[4] G11B *17/04*

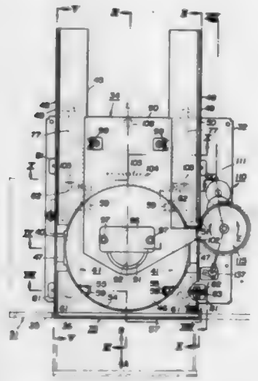
U.S. Cl. 369—75.2 **7 Claims**

1. An automatic setting device of a disc player, comprising:

means for loading an information carrier disc, wherein the disc loading means includes a tray assembly having a disc support portion and is supported on a disc player body to be horizontally movable between an open position at which the information carrier disc is placed on the disc support portion and a shut position at which the information carrier disc is positioned on a turntable and rotated for playback by rotating the turntable;

a clamping assembly movable between an upper limit position and a lower limit position to clamp the information carrier disc against the turntable when the tray assembly is in the shut position;

single drive means, mounted on the disc player body, for both driving the loading means and actuating the clamping assembly, wherein the drive means includes a cam member, supported in a stationary position with respect to the disc player body and having a cam portion and a first toothed portion;



a toothed member on the tray assembly and meshing with the first toothed portion of the cam member for driving the tray assembly to move between the open position and the shut position; and

a cam follower member on the clamping assembly and following the cam portion of the cam member, whereby the tray assembly and the clamping assembly are actuated by the cam member via the first toothed portion and the toothed member and via the cam portion and the cam follower member, respectively.

4,697,260

METHOD OF AND ARRANGEMENT FOR TRANSMITTING MESSAGES IN A DIGITAL RADIO TRANSMISSION SYSTEM

Christoph Grauel, Feucht; Ludwig Kittel, Heroldsberg; Werner Schmidt, Lauf-Ödenberg, and Ulrich Wellens, Heroldsberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

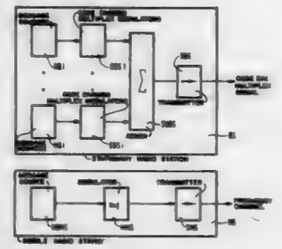
Filed Dec. 17, 1985, Ser. No. 810,439

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447107

Int. Cl.[4] H04J *9/00, 13/00;* **H04Q** *7/00*

U.S. Cl. 370—18 **13 Claims**

1. A method of transmitting messages in a digital radio transmission system comprising a plurality of stationary radio stations (BS) arranged in a cellular network and a plurality of mutually independent mobile radio stations (MS) assigned thereto, transmission of messages between a stationary radio station and its assigned mobile stations being effected over a plurality of message channels; characterized in that: transmission of messages from a stationary radio station (BS) to the respective mobile radio stations (MS) assigned thereto is effected over message channels formed by code-division multiplex modulation of such messages; the resulting code-division multiplexed messages are combined to form a wideband sum signal which is transmitted in a common frequency band; and transmission of messages from respective mobile radio stations (MS) to a stationary radio station (BS) to which they are assigned is effected in respective narrw-band frequency channels.



4,697,261

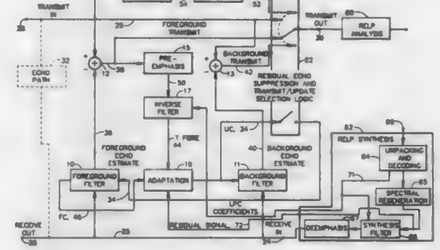
LINEAR PREDICTIVE ECHO CANCELLER INTEGRATED WITH RELP VOCODER

David T. K. Wang, and Philip J. Wilson, both of San Diego, Calif., assignors to M/A-COM Government Systems, Inc., San Diego, Calif.

Filed Sep. 5, 1986, Ser. No. 904,551

Int. Cl.[4] H04B *3/20*

U.S. Cl. 370—32.1 **28 Claims**



8. In a two-way communications network, in which a received digitized speech signal synthesized by a RELP vocoder from a residual signal received with linear prediction coefficients is echoed onto a transmit channel and combined with a transmitted digitized speech input signal that is to be analyzed by a RELP vocoder for transmission, a system for cancelling the echoed signal from the transmit channel, comprising

means for generating a foreground transmit signal by subtracting a foreground estimate of the echoed signal from the combined signal;

means for prewhitening the foreground transmit signal;

means for filtering the received digitized speech signal with adaptation coefficients to generate the foreground estimate of the echoed signal;

means for generating the adaptation coefficients by cross correlating the received residual signal with the prewhitened foreground transmit signal and adding the product of said cross correlation to the adaptation coefficients used for generating the foreground estimate of the echoed signal; and

means for providing the foreground transmit signal on the transmit channel for RELP analysis.

4,697,262

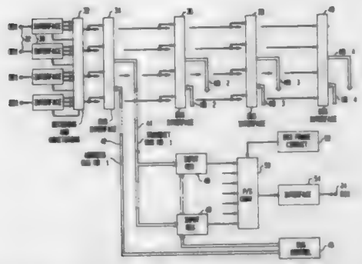
DIGITAL CARRIER CHANNEL BUS INTERFACE MODULE FOR A MULTIPLEXER HAVING A CROSS-CONNECT BUS SYSTEM

Henry P. Segal, Ridgefield, Conn., and Carl A. DeWilde, Stony Brook, N.Y., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 683,901, Dec. 20, 1984. This application Jul. 25, 1985, Ser. No. 758,990

Int. Cl.[4] H04J *3/22, 3/12*

U.S. Cl. 370—84 **4 Claims**



1. A low speed digital carrier line terminal module for interfacing a cross-connect apparatus for cross connecting low speed digital carrier lines to either low or high speed digital carrier lines wherein said high speed digital carrier lines include data rates that are non-multiples of data rates on said low speed lines and are asynchronous to each other; including

a serial-to-parallel converter in the transmit direction toward the cross-connect apparatus for loading a random access memory, the cross-connect apparatus being a bus system over which bus system pulse code modulated carrier DSO channel data is transmitted in parallel, the random access memory for temporary, elastic storage of data corresponding to a plurality of pulse code modulated DSO channels prior to parallel data transmission through the cross-connect apparatus along with data transmitted by other low and high speed digital carrier line terminal modules, the capacity of the random access memory being related to the number of pulse code modulated carrier DSO channels terminated by the low speed digital carrier line terminal module, and an address bus receiver for addressing the random access memory, actuating the parallel data transmission of the plurality of pulse code modulated DSO channels through the cross connect apparatus; and a parallel-to-serial converter in the receive direction from the cross-connect apparatus, the parallel-to-serial converter for removing the pulse code modulated carrier DSO channel data from a random access memory and providing a serial data stream to a multiplexer for transmission over an associated digital carrier line.

4,697,263

TIME SLOT ARRANGEMENTS FOR LOCAL AREA NETWORK SYSTEMS

Raymond Beaufoy, Maidenhead, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Jul. 29, 1983, Ser. No. 518,476

Claims priority, application United Kingdom, Aug. 4, 1982, 8222529

Int. Cl.[4] H04J *3/02, 3/06;* **H04L** *7/00*

U.S. Cl. 370—85 **13 Claims**

1. A communication system comprising:

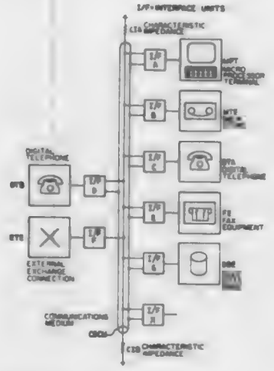
a common communication medium being arranged to carry information on a time division multiplex basis in which each time slot includes an active period for the transmission of a burst of information signals and a transit period, the communication medium having no master clocking arrangement;

a plurality of subscribers interface units each connected to the common communication medium, each interface unit includes:

a data transmission arrangement for transmitting information signals on to the communication medium;

a data reception arrangement for receiving information signals from the communication medium;

an internal timing means arranged to produce timing signals on a time division multiplex basis with each time slot including said active period and said transit period with a time slot marker at the midpoint of the transit period of each internal time slot;



means for monitoring the timing of traffic data bursts on the communication medium and generating a time slot marker relevant to the communication medium time slot for detecting a predetermined descrepancy between the transit period produced by said internal timing means and the transit period of each of the time slots on the communication medium; and

means for adjusting the internal timing means within each interface unit responsive to said means for monitoring so that the time slot timing cycle within the interface unit corresponds with that of the data signals on the communication medium.

4,697,264

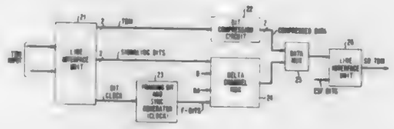
BIT COMPRESSION MULTIPLEXING

Duane Galensky, Holmdel, and Warren G. Hammett, Middletown, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 496,199, May 19, 1983, abandoned. This application Oct. 10, 1985, Ser. No. 786,292

Int. Cl.[4] H04J *3/06, 3/12*

U.S. Cl. 370—111 **7 Claims**



1. A bit compression multiplexing system for a pair of time division multiplexed digital bit streams each of which includes a plurality of PCM encoded signals in separate and distinct

channels of a repetitive frame and signaling bits multiplexed therewith comprising:

means (22) for bit-rate compressing the PCM encoded signals into differential PCM signals;

means (25) for multiplexing the compressed differential PCm signals and grouping the same into clusters, each of the clusters including predetermined number of compressed signal channels and each of the compressed differential PCM signals occupying a separate and distinct channel of a repetitive frame that includes a plurality of said clusters and a corresponding plurality of additional channels each one of which is associated with a given cluster and is proximate thereto, wherein a predetermined number of said repetitive frames forms a repetitive superframe;

means (21, 24, 25) for extracting and reformatting the signaling bits of said time division multiplexed digital bit streams and placing the same in predetermined ones of said plurality of additional channels in the repetitive frames of said superframe, the signaling bits in a given additional channel being associated with the compressed differential PCM signals of a cluster proximate thereto; and

means (23, 24) for developing a framing bit pattern for each of said plurality of clusters and for inserting the bits of the same into a predetermined bit position of the additional channel associated with an proximate to each of said clusters in the reptitive frames of said superframe.

4,697,265

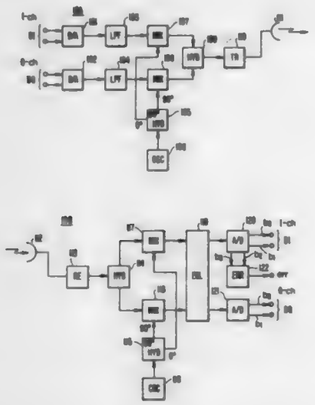
ERROR MONITOR CIRCUIT

Yoshihiro Nozue, Tochigi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 3, 1985, Ser. No. 740,326

Int. Cl.[4] G08C *25/00;* **G06F** *11/00*

U.S. Cl. 371—5 **16 Claims**



4. A multi-value signal error monitoring circuit for a transmitting and receiving system where data is transmitted from the transmitting side after it is converted to a multi-value signal from a specified number of bits and the data is regenerated through conversion of the multi-value signal in the receiving side, said circuit comprising:

an analog-to-digital converter for converting the multi-value signal into first bits and second bits and the first bits having a first number of bit greater than or equal to a second number of bits, the second bits corresponding to the data; and

a pseudo error rate detection and measuring circuit, operatively connected to said analog-to-digital converter, for measuring a frequency that the first bits fall in a specified range different from quantization levels of the multi-value signal.

4,697,266

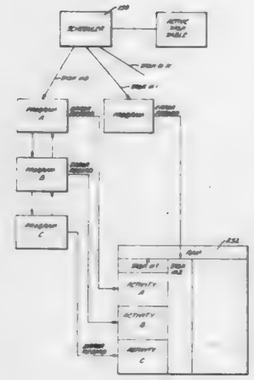
ASYNCHRONOUS CHECKPOINTING SYSTEM FOR ERROR RECOVERY

Rufus E. Finley, Yorba Linda, Calif., assignor to Unisys Corp., Detroit, Mich.

Filed Mar. 14, 1983, Ser. No. 475,154

Int. Cl.[4] G06F *11/14*

U.S. Cl. 371—12 **9 Claims**



1. In a data base management system having a plurality of application programs capable of concurrently executing a plurality of tasks with respect to a data base located in a non-volatile bulk memory, a method of providing said system with the capability of recovering from an unexpected interruption in system operation without corrupting the data base, said method comprising:

allocating a task recovery area in a random access memory during the initial processing of each task which may modify the data base;

independently recording task recovery data during the execution of each such task in its respective task recovery area to the extent required to provide recovery for the task without data base corruption in the event of an unexpected interruption in system operation while the task is executing, said independently recording task recovery data occuring in response to instructions embedded in the application programs used for executing the task;

de-allocating each task recovery area in response to deactivation of the task as a result of its successful completion;

transferring recovery data in said recovery areas to said bulk memory in response to the occurenoe of an unexpected interruption in system operation while a task is executing;

during system recovery operations, returning the recovery data transferred to said bulk memory in response to said interruption back to said task recovery areas in said random access memory; and

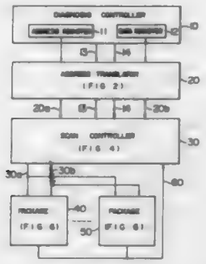
then independently performing task recovery operations for each task which was active when the unexpected interruption occured using the recovery data returned to its respective task recovery area, said task recovery operations being performed in a manner such that the integrity of the data base is maintained, said independently performing task recovery operations occuring in response to instructions embedded in the application programs used for executing the task.

4,697,267

SCAN CONTROL APPARATUS AND METHOD FOR DATA PROCESSING APPARATUS

Katsuro Wakai, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 799,973
Claims priority, application Japan, Nov. 21, 1984, 59-244419
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—25 **6 Claims**



1. A scan-in control apparatus for scanning-in data to data storage elements constituting, respectively, bits of a data unit including a plurality of bits, comprising:

generating means for outputting a trigger signal for initiating the scan-in operation and generating a scan address and scan-in data, said scan address being composed of a first address section indicating the data unit to be scanned-in and a second address section designating a bit in said data unit;

scan control means connected to said generating means for responding to said trigger signal to thereby output a control signal for controlling the scan-in sequence;

register means for holding data;

scan-in means connected to said scan control means for responding to said control signal to thereby connect selectively a plurality of the data storage elements constituting the data unit designated by said first address section of said scan address to said register means for effecting the scan-out of data to said register means from said plurality of the data storage elements and the scan-in of data to said plurality of the data storage elements from said register means;

reset means connected to said scan control means for responding to said control signal to reset the plurality of data storage elements for the data unit designated by said first address section of said scan address; and

set means connected to said scan control means for responding to said control signal to set said scan-in data at the bit position of said register means designated by said scan address.

4,697,268

DATA PROCESSING APPARATUS WITH MESSAGE ACCEPTANCE MONITORING

Peter L. L. Desyllas, Wilmslow; Nicholas P. Holt, Hadfield, and Finbar Naven, Cheadle, all of England, assignors to International Computers Limited, London, England

Filed Aug. 29, 1985, Ser. No. 770,745
Claims priority, application United Kingdom, Sep. 4, 1984, 8422328
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—67 **9 Claims**

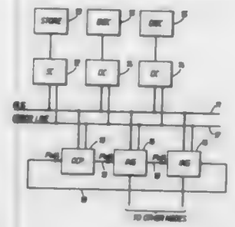
1. Data processing apparatus comprising:

(a) a plurality of data processing units, and

(b) a bus interconnecting the units for broadcasting public write messages from any one of the units to the other units parallel, wherein the improvement comprises

(i) a plurality of acceptance lines connecting the units together in a loop,

(ii) means in each said unit for detecting a public write message on the bus and sending an acceptance signal over the acceptance line to the next unit in said loop, and



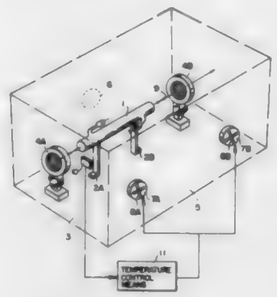
(iii) means in each said unit for monitoring the acceptance line from the preceding unit in said loop and for producing an error signal whenever a public write message detected but no corresponding acceptance signal is received, and whenever an acceptance signal is received without any corresponding public write message.

4,697,269

LASER APPARATUS

Yuji Ohara, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 31, 1983, Ser. No. 528,250
Claims priority, application Japan, Sep. 3, 1982, 57-153539
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.⁴ H01S *3/04*
U.S. Cl. 372—34 **6 Claims**



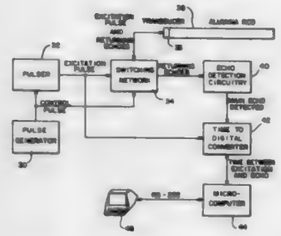
1. A laser apparatus for generating a laser beam comprising a hollow case having sidewalls, a laser beam generating means including a laser tube having an axis, a pair of external mirrors positioned along said laser tube axis and a support plate, said laser tube and said pair of external mirrors being connected to and supported by said support plate, said laser beam generating means being positioned within said case, and said apparatus further including temperature detecting means and temperature control means for controlling the temperature of the atmosphere within said case, a cooling fan disposed at a position corresponding to each external mirror at an end portion of said laser tube, and an air inlet formed in said case at a position substantially corresponding to a middle portion of said laser tube.

4,697,270

COPPER VAPOR LASER ACOUSTIC THERMOMETRY SYSTEM

Joseph J. Galkowski, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 27, 1986, Ser. No. 900,860
Int. Cl.⁴ H01S *3/04*
U.S. Cl. 372—34 **12 Claims**



1. A thermometry system for a laser comprising:

alumina rod means for axially coupling an acoustic pulse a predetermined distance from a coupling point into the interior of said laser such that an echo pulse corresponding to said acoustic pulse is reflected from the interior of said laser to said coupling point without affecting operation of said laser,

means for measuring a period of time between the coupling of said acoustic pulse and the return of said echo pulse to said coupling point, and

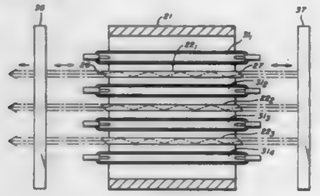
means for processing the measured time difference to provide a temperature indication at the predetermined interior point within said laser.

4,697,271

SOLID-STATE LASER DEVICE CAPABLE OF EFFECTIVELY EXCITING A PLURALITY OF SLAB-SHAPED LASER MEDIA

Satoru Amano, Tokyo, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 782,065
Claims priority, application Japan, Sep. 29, 1984, 59-203002
Int. Cl.⁴ H01S *3/14*
U.S. Cl. 372—68 **7 Claims**



1. A solid-state laser device, comprising:

a reflector member having an internal reflection surface which defines an internal prismal space, and a pair of partial reflection surfaces opposite to each other;

a plurality of slab-shaped laser media arranged from a first endmost laser medium to a second endmost laser medium in said internal prismal space, with at least one internal gap left between two adjacent ones of said plurality of slab-shaped laser media and with two additional gaps left between one of said partial reflection surfaces and said first endmost laser medium, and between the other of said partial reflection surfaces and said second endmost laser medium; and

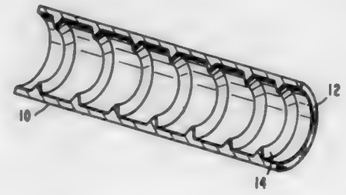
exciting members disposed in each of said at least one internal gap and in said two additional gaps for directly optically exciting said two adjacent ones of the slab-shaped laser medin together with said first and said second endmost laser media.

4,697,272

CORRUGATED REFLECTOR APPARATUS AND METHOD FOR FREE ELECTRON LASERS

Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 9, 1986, Ser. No. 861,764
Int. Cl.⁴ H01S *3/08*
U.S. Cl. 372—99 **16 Claims**



1. A corrugated reflector apparatus for coherent reflection of the power in a wave, comprising;

a hollow cylindrical member having a longitudinal axis, and

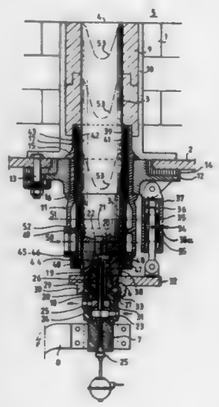
a plurality of blazed vane means, coaxially disposed internally within said member along said axis, for coherently reflecting power of said wave at a specified wavelength.

4,697,273

ELECTRODE STRUCTURE FOR A BATH OF MOLTEN METAL

Jean Cordier, Saint-Saulve, France, assignor to Union Siderurgique du Nord et de l'Est de la France (USINOR), Puteaux, France

Filed Sep. 30, 1985, Ser. No. 781,550
Claims priority, application France, Oct. 1, 1984, 84 15065
Int. Cl.⁴ H05B *7/00*
U.S. Cl. 373—72 **15 Claims**



1. An electrode structure in combination with a vessel having a wall and an inner refractory lining lining said wall, for a bath of molten metal, the electrode structure being embedded

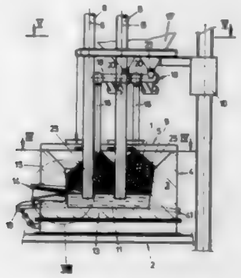
in the refractory lining, flush at one end of the electrode structure with an inner surface of said refractory lining and projecting adjacent an opposite end out of the vessel, said electrode structure comprising a central electrically conductive core extending through said wall of the vessel and a cooling jacket disposed around said central core and in close contact therewith, and an electric supply terminal directly connected to the end of the central core outside the vessel, the improvement comprising said central core having electrical insulating means arranged between said central core and said cooling jacket in a zone adjacent to the outer end of said central core connected to the electric supply terminal.

4,697,274

ELECTRIC MELTING FURNACE ARRANGEMENT AS WELL AS A METHOD OF INFLUENCING THE COMPOSITION OF A MINERAL MELT FOR PRODUCING WOOL

Bernhard Enkner; Leopold Amon, both of Linz; Alfred Kübelböck, Zwettl/Rodl; Wolfgang Trimmel, Leoben; Paul Nalepka, Niklasdorf; Leopold Schropp, Linz; Helmut Schwaighofer, Neumarkt; Reinhard Pum, Linz; Manfred Traxler, Hart, and Franz Tasch, Bad Mitterndorf, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 13, 1985, Ser. No. 775,537
Claims priority, application Austria, Sep. 18, 1984, 2964/84
Int. Cl.[4] F27D *3/00*
U.S. Cl. 373—79 **9 Claims**



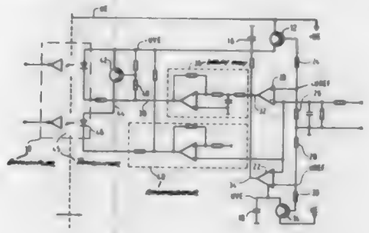
1. In an electric furnace arrangement for continuously melting mineral fine-particle or granular materials capable of being spun from melt thereof, said arrangement including a refractory lined vessel having an opening covered by a lid, a side wall and a bottom, a plurality of vertically movable electrodes extending into said furnace from above through openings in said lid, said electrodes being spaced from each other along a partial circle, said arrangement also including means for charging said materials into said furnace to be melted and tapping means extending through the side wall thereof for discharging molten material from said furnace, the improvement wherein:
said charging means includes a plurality of spaced dosing pipes extending from above into said furnace,
each of said pipes having a material-receiving opening at its top end and a material discharge opening at its bottom end extending through the lid of said furnace,
said spaced dosing pipes being each disposed closely adjacent said partial circle and between two of each of said electrodes,
each of said dosing pipes having cooperatively associated therewith material transporting means in the form of a channel, each having a material discharge end disposed above the material-receiving opening of each of said dosing pipes,
whereby during charging of said furnace, said dosing pipes are maintained filled, the material-receiving opening of each of said dosing pipes being characterized in that when full, the material forms an upwardly directed conical pile which used as an indication for interrupting the further discharge of material to the pipes.

4,697,275

RECEIVING CIRCUIT FOR SIGNAL TRANSMISSION SYSTEMS

Hans-Bodo Laue, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Aug. 13, 1985, Ser. No. 765,285
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430339
Int. Cl.[4] H04B *9/00*
U.S. Cl. 375—4 **7 Claims**



1. A receiving circuit for an electrical signal transmission system employed to regenerate a level control electrical signal from an input bipolar electrical signal, comprising:
an operating side for delivering the regenerated electrical data signal and a receiving level electrical control signal;
a line side having an input for receiving said bipolar signal;
an optocoupler device (**10**) for electrically isolating said line side from said operating side and for transferring said data signal and said level control signal from said line side to said operating side;
a pair of comparators (**20,22**) on said line side for respectively establishing positive and negative receiving thresholds for said bipolar input signal, including a pair of outputs (**32,34**) for generating said level control signal;
regenerating means (**48**) on said line side for regenerating said data signal, said regenerating means including an input for receiving said received data signal and an output for outputting the regenerated data signal;
delay means (**36**) on said line side and coupled with the outputs (**32,34**) of said comparators (**20,22**) for delaying the delivery of said level control signal from said line side to said operating side for a preselected length of time; and
switch means (**42**) on said line side and responsive to said delay means for selectively connecting the output of said regenerating means (**48**) with said optocoupler device (**10**), whereby the transfer of said regenerated data signal from said line side to said operating side is controlled by said level control signal.

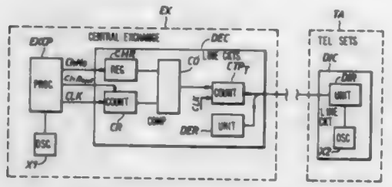
4,697,276

APPARATUS FOR SYNCHRONIZING PULSE TRAINS IN A DIGITAL TELEPHONE SYSTEM

Karl I. L. Skoog, Farsta, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE85/00010, § 371 Date Sep. 10, 1985, § 102(e) Date Sep. 10, 1985, PCT Pub. No. WO85/03181, PCT Pub. Date Jul. 18, 1985
PCT Filed Jan. 11, 1985, Ser. No. 777,695
Claims priority, application Sweden, Jan. 13, 1984, 8400170-0
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—114 **9 Claims**

1. A method for synchronizing pulse trains in a digital telephone system including an exchange (EX) and a plurality of telephone sets (TA) connected to the exchange via lines, the exchange including a central processor (EXCP) and a plurality of line circuits (DEC), each of the telephone sets including a separate line circuit (DIC), each of said line circuits (DEC) and (DIC) having reception and transmission directions and including a primary counter, a time position counter, and a synchronizing detector (SD) which detects, in the reception direction of the line circuits, the reception of a synchronizing window containing at least two consecutive synchronizing bits of opposing polarity preceded by a plurality of logical Zeros, said method comprising generating and transmitting to the synchronizing detector a synchronizing signal consisting of said consecutive synchronizing bits of opposite polarity pre-



ceded by said plurality of logical Zeros, transmitting during the duration of the first of the synchronizing bits a zero resetting signal to said primary counter (CTR), feeding a high frequency signal to the primary counter and in the primary counter dividing the high frequency signal down and sending a resulting control signal of lower frequency to the time position counter (CTP), sending the zero resetting signal also to said counter (CTP), and utilizing the change between said first and said second synchronizing bits to cause the zero resetting of the counters (CTR) and (CTP) to take place rapidly due to the steep derivative of the transition between the synchronizing bits, whereupon the counters resume counting in a precisely defined manner enhancing synchronization.

4,697,277

SYNCHRONIZATION RECOVERY IN A COMMUNICATIONS SYSTEM

William F. van Rassel, Ontario, Canada, assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Feb. 21, 1985, Ser. No. 704,024
Int. Cl.[4] H04L *7/00*; H04N *7/00*
U.S. Cl. 375—116 **13 Claims**



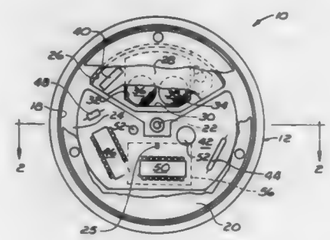
1. A method of detecting a synchronizing signal encoded as m identical first code patterns (P) followed by n identical second code patterns (Q), each of the first and second code patterns being of the same predetermined duration as, and in phase with, each other, the first code pattern (P) being different from the second code pattern (Q), where m and n are positive real numbers and m is greater than one, said method comprising the steps of:
receiving the encoded synchronizing signal;
identifying an occurence of the first code pattern (P) in the received signal;
locally generating, in a predetermined phase relationship with the identified occurence of the first code pattern, a plurality of representations of either the first code pattern or the second code pattern;
comparing the received signal with the locally generated representations; and
detecting a change in the comparison as the synchronizing signal.

4,697,278

ELECTRONIC HUB ODOMETER

Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Mar. 1, 1985, Ser. No. 707,073
Int. Cl.[4] G01C *22/00*
U.S. Cl. 377—24 **20 Claims**



1. An electronic hub odometer comprising:
a housing adapted to be mounted for rotation with a vehicle wheel;
a magnet mounted in fixed position relative to said housing and rotatable therewith;
magnetic sensor means responsive to said magnet to detect a revolution of said wheel and produce a revolution signal indicative thereof;
clock means to generate clocking signals;
data means responsive to said revolution and clocking signals to produce data indicative of distance of travel of said wheel for a series of pre-established time intervals;
memory means to store said data;
transmitter means selectively actuable to transmit said data in electromagnetic waveform from said memory means for remote readout; and
mounting means pivotally suspended within said housing to mount said magnetic sensor means, said clock means, said data means, said memory means and said transmitter means.

4,697,279

TEST/MASTER/SLAVE TRIPLE LATCH FLIP-FLOP

James J. Baratti, Los Angeles; Mike McCollough, Inglewood, and Glenn P. Gouzoules, El Segundo, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 4, 1985, Ser. No. 794,931
Int. Cl.[4] G11C *19/00*
U.S. Cl. 377—73 **32 Claims**

1. A shift register stage for large-scale integrated and very large-scale integrated circuits, comprising:
first latching means responsive to a first clock signal and a data input for providing a first data output;
control means responsive to a control signal, said first data output and a second data input for providing as a controlled data output a replica of said first data output or a replica of said second data input as a function of the control signal;
second latching means responsive to a second clock signal and said controlled data output for providing a second data output; and
third latching means responsive to a third clock signal and said second data output for providing a third data output.

19. An integrated circuit structure comprising:

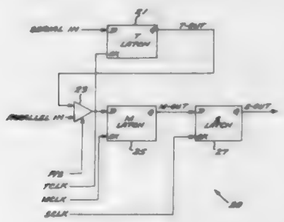
a first shift register having a plurality of cascaded shift register stages, including a first stage and a last stage, for receiving respective parallel inputs and for providing said parallel inputs as respective parallel outputs;

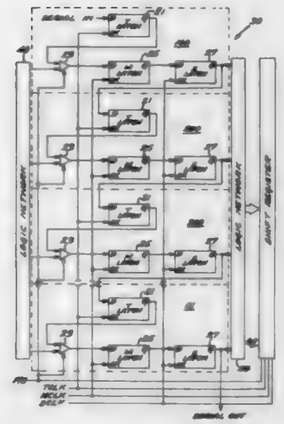
a logic network for receiving said parallel outputs of said first shift register and for providing logic network outputs in response thereto;

a second shift register having a plurality of cascaded shift register stages, including a first stage and a last stage,

for receiving said logic network outputs as respective parallel inputs and for providing said parallel inputs as respective parallel outputs;

respective first latching means for each shift register stage responsive to serial data and for providing respective first data outputs, said first latching means of the respective first stages selectively responsive to respective serial data inputs to the respective shift registers,





respective control means for each shift register stage responsive to said respective first data outputs and to respectively associated shift register parallel inputs and for providing as respective controlled data outputs (a) replicas of said respective first data outputs or (b) replicas of said respectively associated shift register parallel inputs, as a function of a control signal;

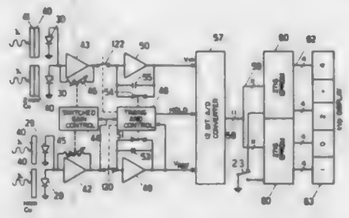
respective second latching means responsive to said respective controlled data outputs and for providing respective second data outputs; and respective third latching means responsive to said respective second data outputs and for providing respective third data outputs, said respective third data outputs being selectively provided (a) in parallel as respective shift register parallel outputs, or (b) as respective serial data to any subsequent respective first latching means in the shift register, whereby the third data output of the last shift register stage selectively provides a serial data output of the shift register.

4,697,280

METHOD AND APPARATUS FOR THE MEASUREMENT OF X-RAY SOURCES

William C. Zarnstorff, and Frank N. Ranallo, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 6, 1984, Ser. No. 648,020
Int. Cl.[4] G01D *18/00*
U.S. Cl. 378—207 26 Claims



1. Apparatus for the measurement of the characteristics of an X-ray beam from an X-ray machine comprising:

(a) first detector unit means for providing an output signal related to the intensity of the X-ray radiation incident on it which passes through an X-ray filter of a first attenuation characteristic;

(b) second detector unit means, adjacent to the first detector unit means, for providing an output signal related to intensity of the X-ray radiation incident on it which passes through an X-ray filter of a second attenuation characteristic different than that of the X-ray filter for the first detector unit means;

(c) first integrator means for integrating the signal from the first detector means and providing an output signal indicative thereof;

(d) second integrator means for integrating the signal from the second detector means and providing an output signal indicative thereof;

(e) conversion means for determining the ratio of the integrated first detector signal and the integrated second detector signal and providing a multi-bit digital output signal on parallel lines;

(f) memory means, having address input lines connected to the parallel output lines from the conversion means, for providing an output of data stored at an address location corresponding to the multi-bit input signal on the address lines such that the output data from the memory means is indicative of a selected characteristic of the X-ray beam received by the first and second detector unit means;

(g) display means for receiving the output data signal from the memory means and for providing a display to an operator which corresponds to the data from the memory means; and

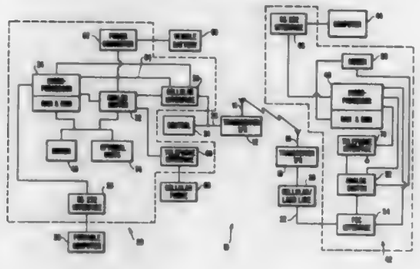
(h) timing and control means for determining when the magnitude of the output signal of the first integrator means exceeds a predetermined level and thereafter holding the output signal levels of the first and second integrator means constant to allow such levels to be readily compared by the conversion means to determine a ratio output signal which remains substantially constant.

4,697,281

CELLULAR TELEPHONE DATA COMMUNICATION SYSTEM AND METHOD

Harry M. O'Sullivan, Red Oak, Tex., assignor to Spectrum Cellular Communications Corporation, Inc., Dallas, Tex.

Filed Mar. 14, 1986, Ser. No. 839,564
Int. Cl.[4] H04M *7/04*
U.S. Cl. 379—59 25 Claims
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 75 Pages)



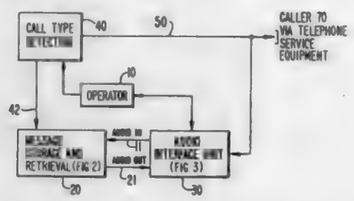
1. A method for transmitting data from a transmitting station over a cellular telephone system to a receiving station by means of a modem connected to said cellular telephone system which is operative in an activated state to modulate a carrier signal for said cellular telephone system with a data signal, said method including the steps of placing said modem in the activated state, providing a data signal to said activated modem, maintaining said modem in the activated state for a predetermined time period after a loss of said carrier signal before permitting said modem to deactivate, and causing said modem to remain in said activated state after the loss of said carrier signal if said carrier signal resumes within said predetermined time period.

4,697,282

TELEPHONE OPERATOR VOICE STORAGE AND RETRIEVAL SYSTEM

Walter W. Winter, Melbourne; Steven E. Gothard, Palm Bay, and John H. Drew, Indialantic, all of Fla., assignors to Golden Enterprises, Inc., Melbourne, Fla.

Continuation of Ser. No. 601,711, Apr. 18, 1984, Pat. No. 4,623,761. This application Jun. 20, 1986, Ser. No. 876,394
The portion of the term of this patent subsequent to Nov. 8, 2003, has been disclaimed.
Int. Cl.[4] H04M *3/50*
U.S. Cl. 379—67 23 Claims



1. For use with an operator-assisted telephone service facility in which on-line participation by an on-line operator is required for effectively enabling an incoming caller to reach a called destination, an arrangement for providing a response message to said incoming caller accessing said facility comprising:

first operational means for storing at least one prescribed response message, which, when played back, effectively corresponds to the voice of the operator who is on-line with and services incoming calls; and

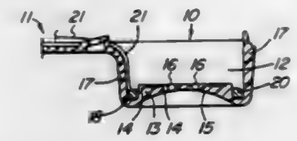
second operational means, coupled to said first operational means and operable in conjunction with the on-line operator's servicing of an incoming call, for accessing a response message from said first operational means in dependence upon information contained within said incoming call being serviced by said on-line operator and which is representative of the type of call to which said incoming call corresponds, and causing said accessed response message to be played back to said incoming caller.

4,697,283

TELEPHONE HANDSET WITH INTEGRATED FLUX COIL

Conrad D. Lafrance, Aylmer, and Peter Fatovic, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 8, 1985, Ser. No. 785,374
Int. Cl.[4] H04M *11/00, 1/03*
U.S. Cl. 379—443 4 Claims



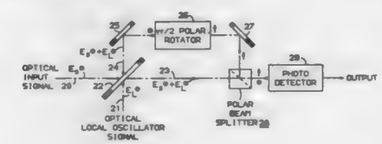
1. A telephone handset having a tubular housing extending forward at one end for reception of a receiver therein; said tubular housing having a peripheral wall and a front wall closing a front end of the tubular housing; a seating formed on an inner surface of said front wall and an annular recess extending around said seating between said seating and said peripheral wall; a receiver positioned in said tubular housing and having a front surface positioned on said seating; and a flux coil positioned in said recess, said flux coil being positioned adjacent said peripheral wall and forward of said front surface of said receiver, and connected electrically to said receiver.

4,697,284

SINGLE-PHOTODIODE OPTICAL HETERODYNE MIXERS

Bernard, Glance, Colts Neck, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 8, 1986, Ser. No. 860,822
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—619 8 Claims



1. An optical heterodyne mixer comprising:

a first and a second input terminal for receiving an optical signal and an optical local oscillator signal, respectively, each optical signal comprising a same direction of polarization;

means for both (a) combining the signals received at the first

and second input terminals and (b) directing first and second substantially equal portions of the combined signals along first and second output paths, respectively;

means disposed in one of the output paths from the combining and directing means for rotating the direction of polarization of the portion of the combined signals propagating in the one output path by $\pi/2$ radians;

a polarizing beam-splitter disposed to receive the combined signals propagating in the first and second output paths from the combining and directing means for coaxially aligning both (a) the first combined signal portion with a first polarization direction propagating in the first output path and (b) the second combined signal portion with a second polarization direction propagating in the second output path into an output beam directed along a predetermined path; and

a photo detector disposed to receive the coaxially aligned signals in the output beam from the polarizing beam-splitter for independently detecting each of the first and second combined signal portions and generating an output current which is the sum of the two combined signal portions at an output of the mixer.

DESIGNS

SEPTEMBER 29, 1987

292,040
SHOE UPPER
James K. Tong, and Brenda C. Kelley, both of Beaverton, Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.
Filed Jan. 29, 1987, Ser. No. 8,419
Term of patent 14 years
U.S. Cl. D2—314





292,042
UMBRELLA HANDLE
Julie A. Selig, New York, N.Y., assignor to 'totes' incorporated, Loveland, Ohio
Filed Jun. 6, 1985, Ser. No. 742,025
Term of patent 14 years
U.S. Cl. D3—10



292,041
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Aug. 22, 1986, Ser. No. 899,125
Term of patent 14 years
U.S. Cl. D2—320

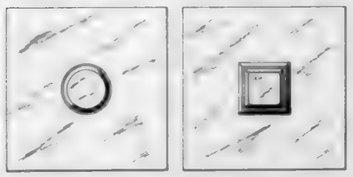


292,043
WALL MIRROR
Frank Billiet, Kortrijk, Belgium, assignor to Mirodan, Etn. L. D'Haene & Zonen, Kortrijk-Heule, Belgium
Division of Ser. No. 484,211, Apr. 12, 1983, Pat. No. Des. 285,505. This application Mar. 3, 1986, Ser. No. 840,729
Term of patent 14 years
U.S. Cl. D6—300





292,044
WALL MIRROR
Frank Billiet, Kortrijk, Belgium, assignor to Mirodan, Etn. L. D'Haene & Zonen, Kortrijk-Heule, Belgium
Division of Ser. No. 484,211, Apr. 12, 1983, Pat. No. Des. 285,505. This application Mar. 3, 1986, Ser. No. 840,730
Term of patent 14 years
U.S. Cl. D6—300



292,045
EASEL DESIGN
Gordon E. McDowell, 16 N. Garfield, Lombard, Ill.
Filed Jan. 23, 1985, Ser. No. 694,288
Term of patent 14 years
U.S. Cl. D6—311





292,046
CHAIR
Kenneth H. Walker, New York, N.Y., assignor to The Gunlocke Company, Wayland, N.Y.
Filed Mar. 7, 1985, Ser. No. 708,973
The portion of the term of this patent subsequent to Jul. 30, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—370



292,047
OFFICE CHAIR
Ullrich H. Bitsch, Duesseldorf, Fed. Rep. of Germany, assignor to Drabert Sohne GmbH & Co., Minden, Fed. Rep. of Germany
Filed Feb. 25, 1985, Ser. No. 704,845
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1984, 6A AR 333/84
Term of patent 14 years
U.S. Cl. D6—365



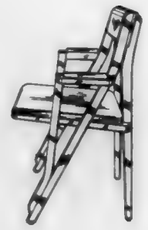
292,048
CHAIR
Kathryn M. Shaffer, 1735 General Pershing Apt. B., New Orleans, La. 70115
Filed Nov. 16, 1984, Ser. No. 671,971
Term of patent 14 years
U.S. Cl. D6—363



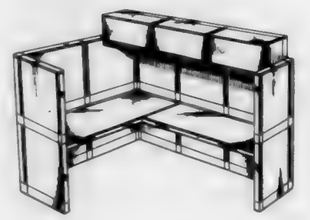
292,049
CHAIR
Paul R. Goldman, Andover, Mass., assignor to Plycraft Inc., Lawrence, Mass.
Filed Apr. 19, 1985, Ser. No. 724,975
Term of patent 14 years
U.S. Cl. D6—379



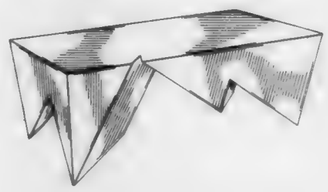
292,050
CHAIR
John M. Giordano, 200 Pine Hollow Rd., Norfolk, Va. 23502
Filed Dec. 31, 1984, Ser. No. 688,171
Term of patent 14 years
U.S. Cl. D6—380



292,051
MODULAR OFFICE WORK STATION
Thomas J. Martin, Arnprior, Canada, assignor to Tetrad Marketing/Sales Ltd., Canada
Filed Jun. 27, 1985, Ser. No. 749,284
Term of patent 14 years
U.S. Cl. D6—421



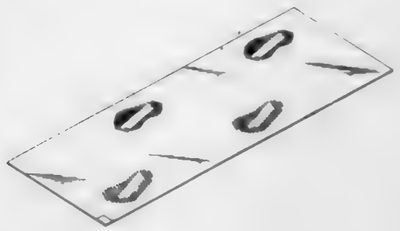
292,052
TABLE
Edward F. Lorio, 1207 Nathan Hunt Rd., Greensboro, N.C. 27410
Filed May 6, 1985, Ser. No. 730,496
Term of patent 14 years
U.S. Cl. D6—482



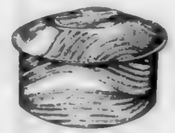
292,053
PLANT HOLDER
Cathy L. Spurling, and Kerry L. Spurling, both of R.F.D. 2, Box 391, Gardiner, Me. 04345
Filed Mar. 4, 1985, Ser. No. 707,734
Term of patent 14 years
U.S. Cl. D6—514



292,054
TACKY FLOOR MAT
Marcel Lussier, Enfield, Conn., assignor to Markel Industries, Inc., Somersville, Conn.
Filed Mar. 13, 1985, Ser. No. 711,389
Term of patent 14 years
U.S. Cl. D6—588

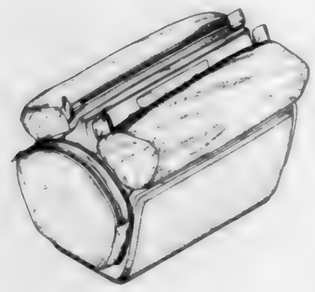


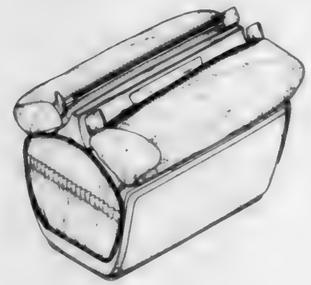
292,055
DESIGN FOR A COVERED DISH
Johan van Loon, Haagweg, Fed. Rep. of Germany, assignor to Rosenthal Aktiengesellschaft Rechtsabteilung, Fed. Rep. of Germany
Filed Aug. 23, 1984, Ser. No. 643,660
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 7368
Term of patent 14 years
U.S. Cl. D7—16



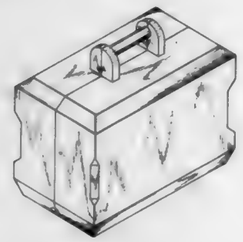


292,056
CONTAINER HAVING AN ACCESSORY BAG THEREON
Joseph A. Decker, Jr., Katy; Joseph F. Fiore, Jr., and Stanley A. Katz, both of Houston, all of Tex., assignors to Igloo Corporation, Houston, Tex.
Filed May 8, 1985, Ser. No. 732,347
Term of patent 14 years
U.S. Cl. D7—77

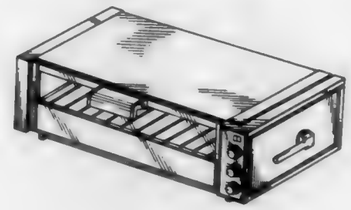


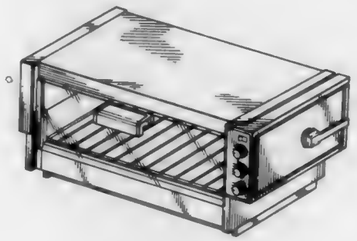


292,057
SIX PACK BEVERAGE COOLER
John R. Beal, R.R. #3, Box 314, Cannon Falls, Minn. 55009
Filed Sep. 26, 1984, Ser. No. 654,553
Term of patent 14 years
U.S. Cl. D7—77



292,058
TOASTER OVEN
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Sep. 23, 1985, Ser. No. 781,851
Term of patent 14 years
U.S. Cl. D7—350

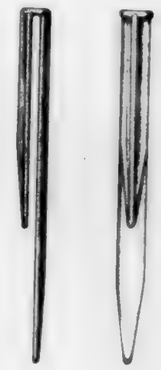




292,059
TURF LIFTING TOOL OR THE LIKE
John E. Heitfield, 4521 Howards Creek Rd., Harrison, Ohio 45030
Filed Jan. 2, 1985, Ser. No. 688,240
Term of patent 14 years
U.S. Cl. D8—1



292,060
GROUND STAKE
Stanley M. Kerber, 743 Bolsana Dr., Laguna Beach, Calif. 92651
Filed Jan. 2, 1987, Ser. No. 934
Term of patent 14 years
U.S. Cl. D8—1



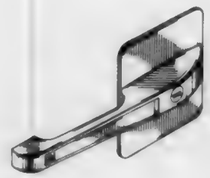
292,061
HEAD FOR A SHOVEL
Robert A. Germain, Anderson, S.C., assignor to USM Corporation, Farmington, Conn.
Filed Nov. 29, 1984, Ser. No. 676,369
Term of patent 14 years
U.S. Cl. D8—10



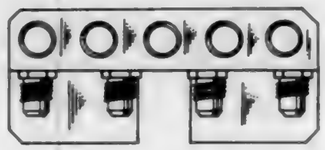
292,062
ADJUSTABLE WRENCH
Donald W. Doman, Janesville, and Frank Mikic, Kenosha, both of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.
Filed Mar. 5, 1984, Ser. No. 586,037
Term of patent 14 years
U.S. Cl. D8—22



292,063
COMBINED AUTOMOBILE DOOR HANDLE AND COVER PLATE
Mark L. Hill, 3920 E. River Rd., Tucson, Ariz. 85718
Filed Aug. 23, 1984, Ser. No. 643,846
Term of patent 14 years
U.S. Cl. D8—302



292,064
REFRIGERATION GAUGE MANIFOLD BRACKET
John A. Kotz, Box 310, Lions Bay, British Columbia, Canada (V0N 2E0), and Rodney W. Mitchell, 14376 66th A Avenue, Surrey, British Columbia, Canada (V3W 7K3)
Filed Feb. 22, 1985, Ser. No. 704,551
Term of patent 14 years
U.S. Cl. D8—373





292,065
CHAIN LINK
Goran Abbestam, Goteborg, and Leif Lachonius, Surte, both of Sweden, assignors to Aktieboiaget SKF, Goteborg, Sweden
Filed Mar. 15, 1985, Ser. No. 712,347
Term of patent 14 years
U.S. Cl. D8—499



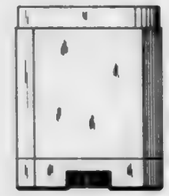
292,066
SPRAY DISPENSER
Francisco Rodríguez Gazulla, Palau de Plegamans, Spain, assignor to Monturas y Forniturss, S.A. (MYFSA), Barcelona, Spain
Filed Apr. 2, 1985, Ser. No. 719,155
Claims priority, application Spain, Dec. 22, 1984, 107,386
Term of patent 14 years
U.S. Cl. D9—300



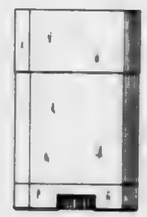
292,067
CARTON
Chogoroh Ohotani, Kobe, Japan, assignor to Kabushiki Kaisha Shinwa, Kobe, Japan
Continuation-in-part of Ser. No. 610,813, May 14, 1984. This application Jun. 14, 1984, Ser. No. 620,796
Term of patent 14 years
U.S. Cl. D9—332



292,068
DISPENSING CONTAINER FOR A SOLID STICK PRODUCT
James M. Keeler, Ridgewood, and John A. Grip, Wayne, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Nov. 14, 1984, Ser. No. 671,650
Term of patent 14 years
U.S. Cl. D9—370



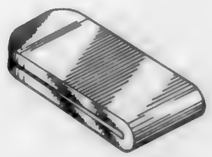
292,069
COMBINED DISPENSING CONTAINER AND CAP
James M. Keeler, Ridgewood, and John A. Grip, Wayne, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Nov. 14, 1984, Ser. No. 671,655
Term of patent 14 years
U.S. Cl. D9—370



292,070
BOTTLE
Ali Kassamali, Cincinnati, Ohio, and Robert H. Kordenbrock, Verona, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 8, 1985, Ser. No. 731,820
Term of patent 14 years
U.S. Cl. D9—404



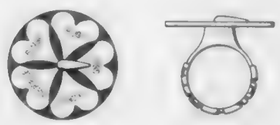
292,071
TUBE SQUEEZER
William J. M. Weir, 407 Lanipuao St., Honolulu, Hi. 96825
Filed Dec. 14, 1984, Ser. No. 682,058
Term of patent 14 years
U.S. Cl. D9—442



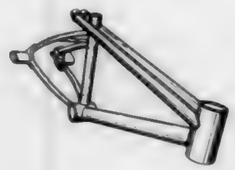
292,072
COMBINED LIQUID LEVEL GUAGE AND THERMOMETER
Alberto Bertani, Milan, Italy, assignor to Elesa S.p.A., Milan, Italy
Filed Sep. 10, 1984, Ser. No. 649,126
Claims priority, application Italy, Mar. 26, 1984, 2135B/84
Term of patent 14 years
U.S. Cl. D10—53



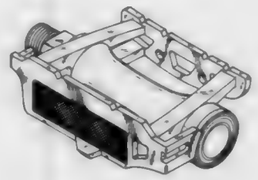
292,073
FINGER RING
Dominic T. DiPasquale, 24 W. 5th St., Oswego, N.Y. 13126
Filed Feb. 15, 1985, Ser. No. 702,249
Term of patent 14 years
U.S. Cl. D11—30



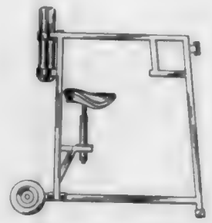
292,074
BICYCLE FRAME
Frederick C. Schilplin, Annandale, Minn., assignor to American Bicycle Manufacturing Company, St. Cloud, Minn.
Filed Mar. 4, 1985, Ser. No. 708,021
Term of patent 14 years
U.S. Cl. D12—111



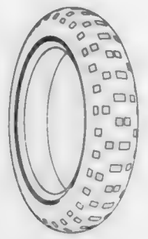
292,075
BICYCLE PEDAL
Hiroyuki Kiyota, 3-11, Rokucho 2-Chome, Adachi-Ku, Tokyo, Japan
Filed May 1, 1985, Ser. No. 729,550
Term of patent 14 years
U.S. Cl. D12—125



292,076
WALKER
Gilbert E. Peters, Ladysmith, Wis., assignor to Theraped, Inc., Ladysmith, Wis.
Filed Mar. 6, 1985, Ser. No. 707,891
Term of patent 14 years
U.S. Cl. D12—130



292,077
MOTORCYCLE TIRE
Kiyoshi Funahara, Hyogo, Japan, assignor to Sumimoto Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 22, 1985, Ser. No. 714,944
Claims priority, application Japan, Jan. 16, 1985, 60-1028
Term of patent 14 years
U.S. Cl. D12—140



292,078
AUTOMOBILE TIRE
Akihiro Takeuchi, Hyogo, Japan, assignor to Sumimoto Rubber Industries, Ltd., Hyogo, Japan
Filed Apr. 19, 1985, Ser. No. 725,329
Claims priority, application Japan, Feb. 4, 1985, 60-4125
Term of patent 14 years
U.S. Cl. D12—141



292,079
MOTORCYCLE TIRE
Kazushige Ikeda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed Aug. 13, 1985, Ser. No. 765,108
Claims priority, application Japan, Jun. 21, 1985, 60-26553
Term of patent 14 years
U.S. Cl. D12—145



292,080
AUTOMOBILE TIRE
Toshio Hayakawa, and Tetsuro Kobayashi, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 6, 1985, Ser. No. 741,994
Claims priority, application Japan, Dec. 11, 1984, 59-50575
Term of patent 14 years
U.S. Cl. D12—146



292,081
AUTOMOBILE TIRE
Yutaka Kuroda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed Jul. 26, 1985, Ser. No. 759,362
Claims priority, application Japan, Apr. 27, 1985, 60-17564
Term of patent 14 years
U.S. Cl. D12—146



292,082
MOTORCYCLE TIRE
Toshio Hayakawa, and Shinichiro Ohkuni, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 3, 1984, Ser. No. 677,440
Claims priority, application Japan, Jun. 1, 1984, 59-22296
Term of patent 14 years
U.S. Cl. D12—147



292,083
AUTOMOBILE TIRE
Mitsuo Ozawa, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed Apr. 5, 1985, Ser. No. 720,404
Claims priority, application Japan, Jan. 30, 1985, 60-3343
Term of patent 14 years
U.S. Cl. D12—147



292,084
AUTOMOBILE TIRE
Toshiaki Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed Apr. 5, 1985, Ser. No. 720,366
Claims priority, application Japan, Jan. 30, 1985, 60-3345
Term of patent 14 years
U.S. Cl. D12—147



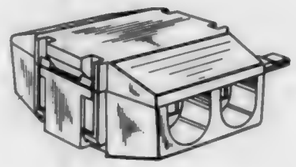
292,085
AUTOMOBILE TIRE
Kenji Hatakenaka, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed May 2, 1985, Ser. No. 729,664
Claims priority, application Japan, Feb. 20, 1985, 60-6413
Term of patent 14 years
U.S. Cl. D12—147



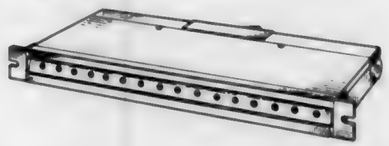
292,086
MOTORCYCLE TIRE
Shigehiko Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan
Filed May 2, 1985, Ser. No. 729,870
Claims priority, application Japan, Feb. 14, 1985, 60-5493
Term of patent 14 years
U.S. Cl. D12—147



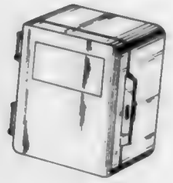
292,087
WIRE TAP CONNECTOR
Sydney Bryant, Taree, Australia, assignor to Sydney, Bryant Manufacturing Pty. Ltd., New South Wales, Australia
Filed Dec. 20, 1984, Ser. No. 684,142
Term of patent 14 years
U.S. Cl. D13—24



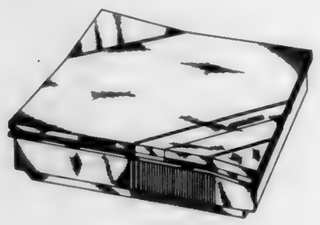
292,088
FIBER OPTICAL DISTRIBUTION BOX
Nore Eriksson, Rönninge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Aug. 6, 1984, Ser. No. 638,360
Claims priority, application Sweden, Feb. 9, 1984, 840415
Term of patent 14 years
U.S. Cl. D13—40



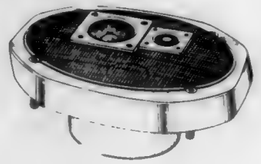
292,089
PROTECTION HOUSING FOR TELECOMMUNICATION EQUIPMENT OR THE LIKE
Thomas J. Smith, Bay Shore, and Ronald C. Urban, Bellerose, both of N.Y., assignors to TII Industries, Inc., Copiague, N.Y.
Filed Jan. 28, 1985, Ser. No. 695,612
Term of patent 14 years
U.S. Cl. D13—61



292,090
TELEPHONE ANSWERING MACHINE
Masahiro Shintomi, Gunma, Japan, assignor to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan
Filed Oct. 23, 1984, Ser. No. 663,874
Claims priority, application Japan, Apr. 27, 1984, 59-17702
Term of patent 14 years
U.S. Cl. D14—4



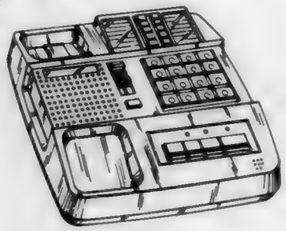
292,091
SPEAKER
Noboru Keitoku, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed May 15, 1985, Ser. No. 734,229
Claims priority, application Japan, Dec. 28, 1984, 59-53745
Term of patent 14 years
U.S. Cl. D14—30



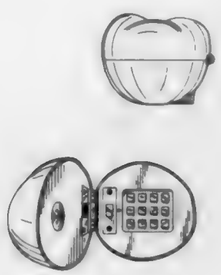
292,092
TELEPHONE BASE
James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Aug. 23, 1985, Ser. No. 768,800
The portion of the term of this patent subsequent to Sep. 29, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—62



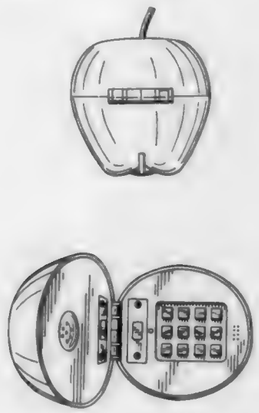
292,093
TELEPHONE BASE
James M. Rittenhouse, Watchung; Barry M. Haber, Manalapan, and Ting W. Wong, Oceanport, all of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Aug. 28, 1985, Ser. No. 768,801
The portion of the term of this patent subsequent to Sep. 29, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—62



292,094
HANDSET TELEPHONE
Takei Yoshiharu, New Territories, Hong Kong, assignor to Tasca International Ltd., Kowloon, Hong Kong
Filed Mar. 5, 1986, Ser. No. 841,732
Claims priority, application United Kingdom, Oct. 15, 1985, 1029858
Term of patent 14 years
U.S. Cl. D14—64



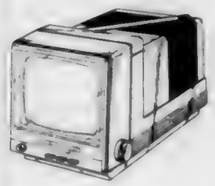
292,095
HANDSET TELEPHONE
Takei Yoshiharu, New Territories, Hong Kong, assignor to Tasca International Ltd, Kowloon, Hong Kong
Filed Mar. 5, 1986, Ser. No. 841,733
Claims priority, application United Kingdom, Oct. 14, 1985, 1029834
Term of patent 14 years
U.S. Cl. D14—64



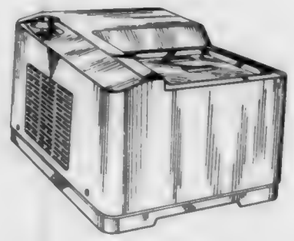
292,096
PORTABLE RADIO PAGER
Peter B. Carr, Hertfordshire, England, assignor to Standard Telephones and Cables, Plc, London, England
Filed Feb. 28, 1985, Ser. No. 706,671
Claims priority, application United Kingdom, Aug. 29, 1984, 1021772
Term of patent 14 years
U.S. Cl. D14—68



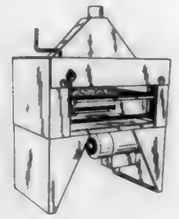
292,097
COMBINED RADIO AND TELEVISION RECEIVER
Tsugio Akita; Toyoyuki Uematsu, both of Osaka; Masaki Yamamoto, Nara; Hiroyuki Tsubaki, Osaka, and Yoshiaki Kawata, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co, Osaka, Japan
Filed Nov. 13, 1984, Ser. No. 670,191
Claims priority, application Japan, May 15, 1984, 59-19397
Term of patent 14 years
U.S. Cl. D14—72



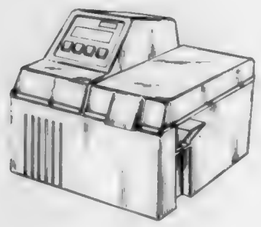
292,098
ICE CREAM MAKER
Alberto Pandolfi, Milan, Italy, assignor to Brevetti Gaggia S.p.A., Milan, Italy
Filed Aug. 7, 1985, Ser. No. 763,404
Claims priority, application Italy, Mar. 18, 1985, 53140/85[U]
Term of patent 14 years
U.S. Cl. D15—82



292,099
SANDING MACHINE
John E. Miller, Jr., Kansas City, Mo., assignor to Woodmaster Tools, Inc., Kansas City, Mo.
Filed Jul. 8, 1985, Ser. No. 752,665
Term of patent 14 years
U.S. Cl. D15—124



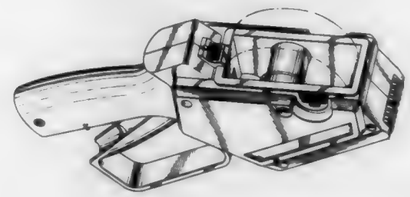
292,100
AUTOMATIC WIRE CUTTING MACHINE
Arthur Goldsmith, Lafayette, and Thomas Carpenter, Manlius, both of N.Y., assignors to Carpenter Manufacturing Co., Manlius, N.Y.
Filed Sep. 12, 1983, Ser. No. 531,136
Term of patent 14 years
U.S. Cl. D15—127



292,101
PAIR OF EYE GLASSES
Trevor I. Baptiste, 383 Grand Ave., Brooklyn, N.Y. 11238
Filed Nov. 5, 1984, Ser. No. 668,472
Term of patent 14 years
U.S. Cl. D16—104



292,102
COMBINED LABELER AND REPLACEABLE TAPE CARTRIDGE THEREFOR
Shoji Takahashi, Kawaguchishi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan
Filed Feb. 19, 1985, Ser. No. 702,903
Claims priority, application Japan, Aug. 21, 1984, 59-34705
Term of patent 14 years
U.S. Cl. D18—19



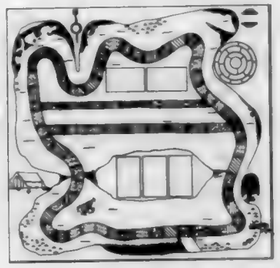
292,103
FONT OF TYPE
Lawrence E. Boliek, 3342 Kristy Dr., Memphis, Tenn. 38118
Filed Sep. 9, 1985, Ser. No. 774,009
Term of patent 14 years
U.S. Cl. D18—27



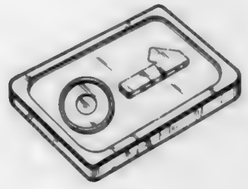
292,104
HANDLE FOR A WRITING INSTRUMENT OR THE LIKE
Fred Keller, Jr., 1410 Winston Cir., Bethelem, Pa. 18017
Filed Jul. 14, 1983, Ser. No. 513,638
Term of patent 14 years
U.S. Cl. D19—55



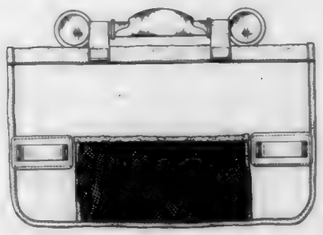
292,105
FISHING GAME BOARD
Joseph C. Aguirre, 2220 Conway St., St. Paul, Minn. 55119
Filed Apr. 24, 1985, Ser. No. 726,513
Term of patent 14 years
U.S. Cl. D21—25



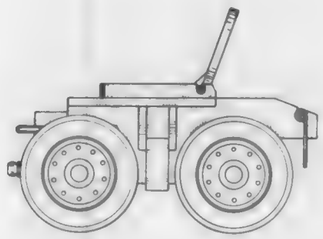
292,106
PLAYING PIECE
Micha Hertzano, 53 Drezner Street, Tel-Aviv, Israel
Filed Jan. 2, 1985, Ser. No. 688,350
Claims priority, application Israel, Jul. 6, 1984, 9963
Term of patent 14 years
U.S. Cl. D21—51



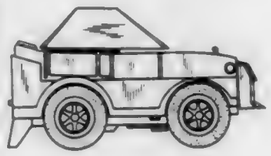
292,107
BATH TOY
Christine M. Zinter-Chahin, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 10, 1985, Ser. No. 786,295
Term of patent 14 years
U.S. Cl. D21—59



292,108
TOY VEHICLE
Howard N. Bollinger; Robert E. Cordrey; Charles E. Ligon, and David A. Myers, all of Cincinnati, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.
Filed Feb. 14, 1985, Ser. No. 701,582
Term of patent 14 years
U.S. Cl. D21—137



292,109
RECONFIGURABLE TOY VEHICLE
Sang-Kwon Lim, Busan, Rep. of Korea
Filed Jan. 16, 1985, Ser. No. 691,920
Claims priority, application Rep. of Korea, Jul. 21, 1984, Des. 87,80
Term of patent 14 years
U.S. Cl. D21—150





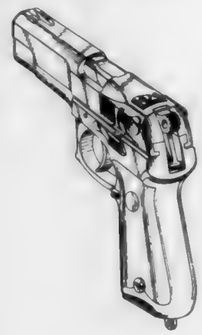
292,110
WALKING ROBOT
Shin Tamakoshi, Tokyo, Japan, assignor to Kabushiki Kaisha Taito, Tokyo, Japan
Filed Apr. 30, 1985, Ser. No. 729,108
Claims priority, application Japan, Oct. 31, 1984, 59-45034
Term of patent 14 years
U.S. Cl. D21—150



292,111
BATTERY OPERATED BIRD FIGURES TOY
Selichi Kijima, and Yoshihiro Miura, both of Tokyo, Japan, assignors to Masudaya Corporation, Tokyo, Japan
Filed Feb. 6, 1985, Ser. No. 698,247
Term of patent 14 years
U.S. Cl. D21—160



292,112
PISTOL
William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.
Filed Jun. 25, 1984, Ser. No. 624,186
Term of patent 14 years
U.S. Cl. D22—104



292,113
DEFENSIVE ELECTRIC PROD WEAPON OR SIMILAR ARTICLE
Shin L. Hsu, No. 25, Lane 152, Kun Yang St., Nan Kand, Taipei, Taiwan
Filed Jun. 27, 1985, Ser. No. 750,430
Term of patent 14 years
U.S. Cl. D22—117



292,114
FISHING LURE
John A. Varaney, 23 Overton Ave., Milford, Conn. 06460
Filed May 15, 1985, Ser. No. 734,073
Term of patent 14 years
U.S. Cl. D22—129



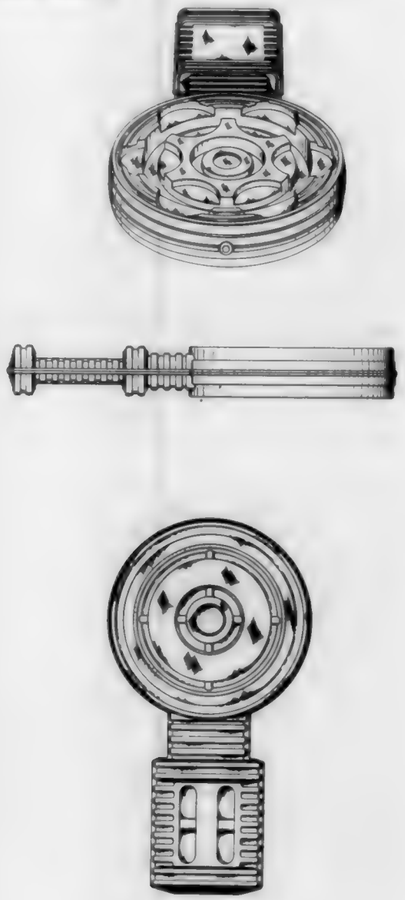
292,115
ROLLER GUIDE FOR A FISHING ROD
Herbert Ziemelis, Wallingford, Conn., assignor to Mildrum Manufacturing Co., East Berlin, Conn.
Filed Jul. 25, 1984, Ser. No. 634,305
Term of patent 14 years
U.S. Cl. D22—143



292,116
ROLLER GUIDE FOR A FISHING ROD
Herbert Ziemelis, Wallingford, Conn., assignor to Mildrum Manufacturing Co., East Berlin, Conn.
Filed Jul. 25, 1984, Ser. No. 634,306
Term of patent 14 years
U.S. Cl. D22—143



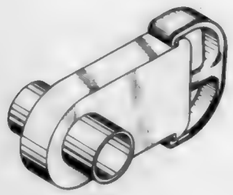
292,117
SUPPORT STAND FOR SWIMMING POOL FILTRATION UNITS
George F. Arp, Fairport, N.Y., assignor to Ampro-Diaclear, Inc., Bronx, N.Y.
Filed Oct. 15, 1985, Ser. No. 787,314
Term of patent 14 years
U.S. Cl. D23—1



292,118
COMBINED IRRIGATING AND DIGGING TOOL
Edward H. Hill, 1825 Kuehler Ave., New Braunfels, Tex. 78130
Filed Aug. 22, 1985, Ser. No. 768,209
Term of patent 14 years
U.S. Cl. D23—17



292,119
GATE VALVE
Eldon Hostetler, Middlebury, Ind., assignor to Ziggity Systems, Inc., Middlebury, Ind.
Filed Jan. 24, 1985, Ser. No. 694,228
Term of patent 14 years
U.S. Cl. D23—19



292,120
COMBINED BALL COCK AND FLOAT
R. Frank Nestich, Glenmont, Ohio, assignor to Clevepak Corporation, Purchase, N.Y.
Filed May 20, 1985, Ser. No. 735,585
Term of patent 14 years
U.S. Cl. D23—19



292,121
SOLID FUEL BURNING STOVE
Gerald W. Lee, Kirkland, Wash., assignor to Woodcutters Manufacturing, Inc., Walla Walla, Wash.
Filed Apr. 30, 1985, Ser. No. 729,131
Term of patent 14 years
U.S. Cl. D23—97



292,122
KEROSENE STOVE
Koichi Sakai, Moriguchi, Japan, assignor to Imanishi Kinzoku Kogyo Kasbushiki Kaisha, Japan
Filed Sep. 4, 1985, Ser. No. 772,349
Term of patent 14 years
U.S. Cl. D23—121



292,123
ORTHODONTIC APPLIANCE ACCESSORY
Maclay M. Armstrong, Seattle; Steven A. Houser, Edmonds, and Jeffrey A. Armstrong, Mercer Island, all of Wash., assignors to Unitek Corporation, Monrovia, Calif.
Division of Ser. No. 859,874, May 2, 1986, Pat. No. Des. 289,328, which is a continuation of Ser. No. 834,288, Feb. 27, 1986, which is a continuation-in-part of Ser. No. 609,409, May 11, 1984, abandoned. This application Jan. 7, 1987, Ser. No. 1,278
Term of patent 14 years
U.S. Cl. D24—10



292,124
COMBINED PIN AND GUIDE FOR POSITIONING AN ARTIFICIAL TOOTH
Mack L. Roden, 3705 Midway Dr., and Steven D. Adams, 3980 Midway Dr., both of Baker, Oreg. 97814
Filed Jun. 17, 1985, Ser. No. 745,482
Term of patent 14 years
U.S. Cl. D24—16



292,125
DENTAL POSITIONING PIN
Mack L. Rodes, 3705 Midway Dr., and Steven D. Adams, 3980 Midway Dr., both of Baker, Oreg. 97814
Filed Jun. 17, 1985, Ser. No. 745,483
Term of patent 14 years
U.S. Cl. D24—16



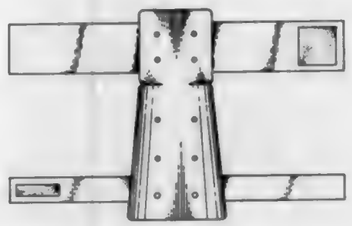
292,126
TONGUE PRESS
Miyako Inoue, Tokyo, Japan, assignor to Inoue Attachment Co., Ltd., Tokyo, Japan
Filed Feb. 7, 1985, Ser. No. 699,340
Claims priority, application Japan, Nov. 1, 1984, 59-044875
Term of patent 14 years
U.S. Cl. D24—19



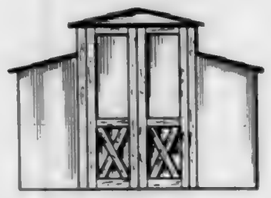
292,127
COMBINED LV. CONTAINER HOLDING BAG AND STRAP
Ruby F. Aiello, 5339 Steuben Dr., Memphis, Tenn. 38134
Filed Aug. 16, 1984, Ser. No. 641,297
Term of patent 14 years
U.S. Cl. D24—58



292,128
SPLINT FOR USE ON FINGERS, THUMBS AND WRISTS
Calvin Thibodo, Jr., 301 N. 70th Ter. #421, Kansas City, Kans. 66112
Filed Apr. 1, 1985, Ser. No. 718,442
Term of patent 14 years
U.S. Cl. D24—64



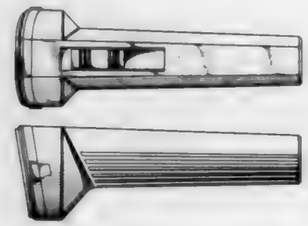
292,129
BUILDING OR SIMILAR ARTICLE
Owen H. Park, Carmel, Ind., assignor to Heartland Industries, Inc., Carmel, Ind.
Filed Jan. 9, 1985, Ser. No. 690,060
Term of patent 14 years
U.S. Cl. D25—22



292,130
FLUORESCENT LAMP
Kazuhiko Kubo, Akishima; Masanori Tsuda, Machida; Taisuke Hirota, Hachioji; Katsuyuki Hosoya, Oume; Ichirou Torii, Tokyo, and Atsushi Suzuki, Oume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 1, 1985, Ser. No. 697,467
Term of patent 14 years
U.S. Cl. D26—3



292,131
FLASHLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Mar. 11, 1985, Ser. No. 710,403
Term of patent 14 years
U.S. Cl. D26—43



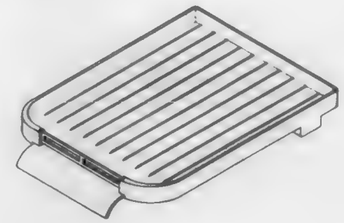
292,132
LIGHTER WITH CIGARETTE HOLDER STORING CHAMBER
Masahiro Terasaki, 43 Okimiya-cho, Edogawa-ku, Tokyo, Japan
Filed Oct. 30, 1985, Ser. No. 792,917
Term of patent 14 years
U.S. Cl. D27—42



292,133
PRESSURE SPRAY WASHER OR THE LIKE
Rudy R. Proctor, Costa Mesa, and Fred M. Reinstein, Encino, both of Calif., assignors to Turbo Tek Enterprises, Inc., Los Angeles, Calif.
Filed Mar. 21, 1985, Ser. No. 714,159
Term of patent 14 years
U.S. Cl. D32—1



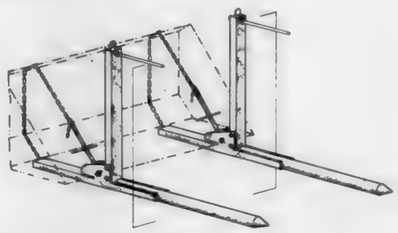
292,134
SINK DRAINBOARD
Walter C. McDaniel, Sr., Rte. 5, Box 92, Eufaula, Ala. 36027
Filed Jan. 23, 1986, Ser. No. 821,770
Term of patent 14 years
U.S. Cl. D32—56



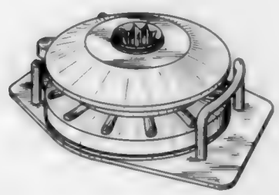
292,135
COLLAPSIBLE CART
John W. Grube, and Robert E. Burridge, both of Santa Barbara, Calif., assignors to Avitare, Santa Barbara, Calif.
Filed Dec. 4, 1984, Ser. No. 678,751
Term of patent 14 years
U.S. Cl. D34—24



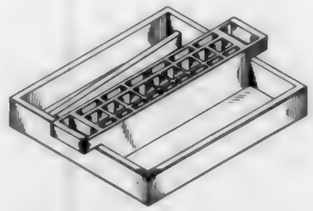
292,136
PAIR OF FRONT LOADER BUCKET TINES
Thomas I. Burenga, Montgomery County, Ill., assignor to Worksaver, Inc., Litchfield, Ill.
Filed Jan. 11, 1984, Ser. No. 570,021
Term of patent 14 years
U.S. Cl. D34—35



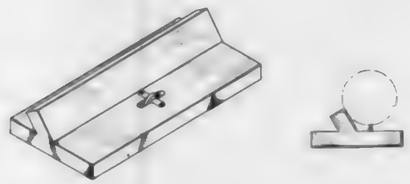
292,137
WINCH
Frode Andersen, Jaegervaenget 36, DK-7100 Vejle, Denmark
Filed Jan. 15, 1985, Ser. No. 691,695
Term of patent 14 years
U.S. Cl. D34—33



292,138
TOOL TRAY
Charles D. Gatlin, Jr., 1168 Sycamore, Collierville, Tenn. 38017
Filed Jun. 4, 1984, Ser. No. 617,257
Term of patent 14 years
U.S. Cl. D34—45



292,139
COIN ROLL OPENER
James A. Beal, 6221 Tishimingo Ct., Citrus Heights, Calif. 95610
Filed Feb. 5, 1985, Ser. No. 698,463
Term of patent 14 years
U.S. Cl. D99—34





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TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Kiewit, David A.; and Lu, Daozheng, 4,697,209, Cl. 358-84.000.
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, to Ricoh Co., Ltd. Optical information recording medium. 4,696,892, Cl. 430-495.000.
Abe, Yoshinobu: *See*—
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Abegglen, Martin: *See*—
Renker, Hansjoerg; and Abegglen, Martin, 4,696,839, Cl. 428-15.000.
Abend, Phillip G.: *See*—
Novakovic, Mario; and Abend, Phillip G., 4,696,767, Cl. 252-557.000.
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Billingsley, Robert H., Jr.; Jantzen, Steven L.; O'Leary, Walter E.; and Krug, John A., 4,696,238, Cl. 105-248.000.
Acock, George W., Jr.: *See*—
Wren, Michael; Lantz, Paul W.; Acock, George W., Jr.; and Rhodes, James A., 4,696,133, Cl. 52-80.000.
Acqua-Tronics, Inc.: *See*—
Haddon, Merrill; and Moulton, Clifford H., 4,697,137, Cl. 324-512.000.
AcroMed Corporation: *See*—
Steffee, Arthur D., 4,696,290, Cl. 128-69.000.
Adams, Don L.: *See*—
Wright, Stuart C.; Stiles, Lorren, Jr.; and Adams, Don L., 4,696,445, Cl. 244-229.000.
Adams, Graham L.; and Durrant, Richard C. E., to STC, plc. Optical fibre connector having particular utility for underwater use. 4,696,540, Cl. 350-96.210.
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Adeney, Hilary E.; and Hall, Derrard M., to Dulux Australia Ltd. Multi-component coating compositions. 4,696,957, Cl. 523-406.000.
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Mehra, Yuv R., 4,696,688, Cl. 62-17.000.
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Yen, Yung-Chau, 4,696,098, Cl. 437-187.000.
AEG Kabel Aktiengesellschaft: *See*—
Haag, Helmut; and Nothofer, Klaus, 4,696,541, Cl. 350-96.230.
AEPLC: *See*—
Eastwood, Barry J., 4,696,867, Cl. 428-650.000.
Aerospatiale Societe Nationale Industrielle: *See*—
Bost, Michel, 4,696,623, Cl. 416-230.000.
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Koyama, Shuntaro; Miyadera, Hiroshi; and Miyamoto, Tomohiko, 4,696,678, Cl. 48-201.000.
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Farel, Alain; Agobian, Manuel; and Le, Sinh, 4,697,050, Cl. 178-18.000.
Ahiko, Nobuo: *See*—
Okada, Yoshio; Ahiko, Nobuo; and Igarashi, Yuriko, 4,696,856, Cl. 428-321.500.
Ahlf, Heinz-Jurgen; Guhne, Wieland; Simm, Hans-Peter; and Wulf, Peter, to Vorwerk & Co. Interholding GmbH. Vacuum cleaner nozzle. 4,696,076, Cl. 15-415.00R.
Ahmad, Shamoon. Electronic assembly toy. 4,696,647, Cl. 434-224.000.
Aho, Richard. Front wheel hub clutch. 4,696,382, Cl. 192-67.00R.
Ahrens, Kurt H.: *See*—
Kisielowski, Lothar; Grafe, Ingomar; Liebenow, Walter; and Ahrens, Kurt H., 4,697,035, Cl. 558-344.000.
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Graf, Hans-Juergen; and Randke, Peter T., 4,696,411, Cl. 220-281.000.
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Kim, Hyun S., 4,696,077, Cl. 16-125.000.
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Albares, Donald J.; and Reedy, Ronald E., to United States of America, Navy. Integrated optical wavelength demultiplexer. 4,696,536, Cl. 350-96.190.
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Ishikawa, Keisuke, 4,697,044, Cl. 174-35.00R.
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Walter, Jean-Jacques; Petit, Daniel; Marzocca, Joseph; Amalric, Jean; and Bernard, Georges, 4,697,055, Cl. 200-148.00B.
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Amerace Corporation: *See*—
Smorzaniuk, Adam; and Siebens, Larry N., 4,696,649, Cl. 439-98.000.
American Colloid Company: *See*—
Harriett, Todd D., 4,696,698, Cl. 106-74.000.
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Chan, Peter S., 4,696,940, Cl. 514-400.000.
Child, Ralph G.; Fields, Thomas L.; Wilkinson, Raymond G.; and Lin, Yang-I, 4,696,936, Cl. 514-297.000.
Dauplaise, David L.; and Trzaskos, William J., 4,696,770, Cl. 252-700.000.
Murdock, Keith C.; Damiani, Martin R.; and Durr, Frederick E., 4,696,935, Cl. 514-297.000.
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Blank, Robert G.; and Mody, Dhiraj S., 4,696,757, Cl. 252-186.290.
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Macdonald, John B., 4,697,175, Cl. 340-707.000.
Myers, Daryl L., 4,696,438, Cl. 242-118.410.

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Esch, Friedrich D.; and Price, John G., 4,696,146, Cl. 53-529.000.

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McMahon, Patrick E., 4,697,010, Cl. 540-536.000.

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Colier, James R.; and Goodman, Joseph R., 4,696,525, Cl. 439-69.000.
Gutter, David H.; and Shatto, Walter C., Jr., 4,696,908, Cl. 439-98.000.
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An-Tech International Livestock Products, Inc.: *See*—
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Cole, Stephen C., 4,696,609, Cl. 410-69.000.

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Ando Electric Co., Ltd.: *See*—
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Angevine, Philip J.; Chu, Yung F.; Mitchell, Kenneth M.; Oleck, Stephen M.; Shih, Stuart S.; and Wilson, Robert C., Jr., deceased (by Wilson, Lillian S., executrix), to Mobil Oil Corporation. Simultaneous hydrotreating and dewaxing of petroleum feedstocks. 4,696,732, Cl. 208-111.000.

Angewandte Digital Elektronik: *See*—
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Stromquist, Michael E., 4,696,078, Cl. 16-301.000.

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Anzini, David J.: *See*—
Shedd, Charles D.; and Anzini, David J., 4,696,967, Cl. 524-437.000.

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Miyoshi, Takahito; Aoki, Nobuo; Yoneyama, Takashi; Kasuga, Akira; Okuta, Toshimitu; Fujiyama, Masaaki; and Okuzawa, Yasutoshi, 4,696,859, Cl. 428-323.000.

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Aoki, Yuji; Horiuchi, Hidenaga; Umemoto, Akio; and Miura, Norio, to Kasei Optonix, Ltd. Intensifying screens. 4,696,868, Cl. 428-690.000.

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Aoyama, Masaaki; Itabashi, Mitsuharu; Miura, Mariko; and Kohno, Masahiro, to Special Reference Laboratories, Inc.; and JEOL Ltd. Method for diagnosing cancer using ESR. 4,696,905, Cl. 436-64.000.

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Pedneault, John A., 4,696,739, Cl. 210-121.000.

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Arima, Itsuo: *See*—
Ochiai, Kumi; Horie, Hironichi; Arima, Itsuo; Morita, Mikio; and Kamohara, Hisato, 4,696,725, Cl. 252-62.540.

Arimitsu, Hiroshi; Hatano, Kiyoshi; Nakanishi, Teruyuki; Yoshimura, Yoshio; Urabe, Masaki; and Honda, Tsurakazu, to Kawasaki Steel Corporation; and Kabushiki Kaisha Toshibe. Inductive radio control system for vehicles. 4,697,179, Cl. 340-825.720.

Arisawa, Hiroshi: *See*—
Mita, Tsunemasa; Katoh, Ryoki; Sekimoto, Soichi; Shiratsuki, Yoshiyuki; and Arisawa, Hiroshi, 4,697,204, Cl. 357-74.000.

Armstrong, Gregory J.: *See*—
Doering, Robert R.; and Armstrong, Gregory J., 4,696,092, Cl. 437-5.000.

Armstrong World Industries, Inc.: *See*—
Hoffer, Roy D., 4,697,122, Cl. 315-158.000.

Arnold, Werner: *See*—
Ding, Wolfgang; and Arnold, Werner, 4,696,527, Cl. 439-53.000.

Arrhenius, Gustaf O.: *See*—
Jensen, Eric A.; Hitchin, James; Tsai, Albert G.; and Arrhenius, Gustaf O., 4,696,338, Cl. 165-1.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kondo, Shigeru, 4,696,559, Cl. 354-403.000.

Asahi Medical Co., Ltd.: *See*—
Nitadori, Yoshiaki; and Nakano, Toru, 4,696,748, Cl. 210-636.000.

Asahi, Takeoki; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Acoustic output device for personal computer. 4,696,216, Cl. 84-1.130.

Asano, Hideharu; and Senda, Hisakazu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Production of water-insoluble alkali metal salts of carboxyalkyl cellulose. 4,697,008, Cl. 536-89.000.

Asano, Hideo; Makida, Kazuhisa; and Fujiwara, Kenichi, to Nippondenso Co., Ltd. Scroll compressor. 4,696,627, Cl. 418-15.000.

Asano, Masamichi: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, 4,697,101, Cl. 307-452.000.

Asano, Michio: *See*—
Masuda, Noboru; Asano, Michio; Hayashi, Takehisa; Tanaka, Hirotoshi; and Masaki, Akira, 4,697,110, Cl. 307-475.000.

Asari, Akira; and Tabuchi, Takahisa, to Kabushiki Kaisha Kobe Seiko Sho. Pullback type double-acting indirect extrusion press. 4,696,176, Cl. 72-273.500.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,696,992, Cl. 528-90.000.

AT&T Technologies Inc., AT&T Bell Laboratories: *See*—
Beggs, Richard D.; Friesen, Harold W.; and Nutt, Wendell G., 4,697,051, Cl. 178-63.00D.

Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme: *See*—
Verstraete, Willy; and De Ley, Jozef, 4,696,747, Cl. 210-605.000.

Atlantic Richfield Company: *See*—
Bourland, Larry G., 4,696,972, Cl. 525-67.000.
Dean, Barry D., 4,696,978, Cl. 525-205.000.

Atlas Copco Aktiebolag: *See*—
Herron, Lorne R., 4,696,606, Cl. 405-259.000.

Atsugi Motor Parts Company, Limited: *See*—
Komatsu, Shinichi, 4,696,198, Cl. 74-388.0PS.

Aune, Jan A. J.; and Evensen, Knut K., to Elkem a/s. Means for charging liquid slag to a closed smelting furnace. 4,696,457, Cl. 266-207.000.

Austel, Volkhard: *See*—
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; and Diederen, Willi, 4,696,931, Cl. 514-261.000.

Automated Semiconductor, Inc.: *See*—
Mukhtar, Saad; and Husain, Syed A., 4,696,727, Cl. 204-206.000.

Automation Development Corporation: *See*—
Cloyd, William C., 4,696,524, Cl. 439-197.000.

Avey, Kenneth F. C., to W & C Pantin Ltd. Apparatus for unloading cylindrical articles from pallets. 4,696,616, Cl. 414-417.000.

Awano, Yoshiro; Suzuki, Hiroshi; Mizuno, Takaji; Ueguri, Shigeo; and Higashida, Kenji, to Mitsubishi Denki K.K.; and Toyota Jidosha K.K. Pulse arc welding machine disabled during short-circuits. 4,697,062, Cl. 219-130.510.

B. F. Goodrich Company, The: *See*—
Cohen, Louis, 4,696,983, Cl. 526-62.000.

Babe, Takashi: *See*—
Kitano, Hirohito; Oowaki, Toshiki; and Babe, Takashi, 4,696,697, Cl. 106-3.000.

Babuin, Piero, to Zanussi Elettrodomestici SPA. Laundry washing machine. 4,696,171, Cl. 68-207.000.

Bactex, Inc.: *See*—
Brinton, Charles C.; and McMichael, John C., 4,696,896, Cl. 435-7.000.

Baggett, David: *See*—
Billiet, Colin T.; Baggett, David; and Fielding, Robert M., 4,696,687, Cl. 55-316.000.

Bahr, Melford J., to MGS Machine Corporation. Pick-and-place glue applicator. 4,696,715, Cl. 156-568.000.

Bailey, Joe B., Jr., to Shakespeare Company. Reel mount for a fishing rod. 4,696,123, Cl. 43-22.000.

Baker, Alan J. Angle transducer storing an integral number of revolutions' worth of rotor-pole transition data in memory. 4,697,168, Cl. 340-347.00P.

Baker, Geoffrey, to U.S. Philips Corp. Infra-red radiation detector devices. 4,697,081, Cl. 250-338.000.

Baker, Robert C.; and Dishner, Bryan W., to Sundstrand Corporation. Starting system for an electrically-compensated constant speed drive. 4,697,090, Cl. 290-4.00R.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Sync separator with periodic updating. 4,697,211, Cl. 358-153.000.

Baldoni, J. Gary: *See*—
Buljan, Sergej-Tomislav; and Baldoni, J. Gary, 4,696,352, Cl. 175-57.000.

Bale, Christopher R.: *See*—
Chard, Brian C.; Hooper, John D.; and Bale, Christopher R., 4,696,311, Cl. 131-109.100.

Ball Corporation: *See*—
Evely, William W., 4,696,636, Cl. 425-526.000.

Ball, Joyce A.; and McKettrick, Glen W. Heated coat liner. 4,696,066, Cl. 2-272.000.

Ballard Medical Products: *See*—
Palmer, Darrel, 4,696,296, Cl. 128-207.160.

Bankuty, Geza E.; and Byron, LeRoy F., to New England Machinery, Inc. Container capper and torque tester. 4,696,144, Cl. 53-331.500.

Barabe, David J. Wound closing method. 4,696,301, Cl. 128-335.500.

Barabino, William A.: *See*—
Cross, Robert J.; and Barabino, William A., 4,696,106, Cl. 30-41.000.

Baratti, James J.; McCollough, Mike; and Gouzoules, Glenn P., to Hughes Aircraft Company. Test/master/slave triple latch flip-flop. 4,697,279, Cl. 377-73.000.

Barbeau, Dennis E., to Teledyne Industries, Inc. Integrated fuel management system. 4,697,238, Cl. 364-431.020.

Barber, Patrick G.; and Simpson, Norman R., to United States of America, National Aeronautics and Space Administration. Procedure to prepare transparent silica gels. 4,696,808, Cl. 423-338.000.

Barbier, Gerard Y. G.; Leboure, Gerald J. P. B.; Desaulty, Michel A. A.; Martinez, Rodolphe; and Perigne, Jerome, to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.-M.A.". Fuel and air injection system for a turbojet engine. 4,696,157, Cl. 60-39.230.

Barkley Corporation: *See*—
Barkley, George J., 4,696,230, Cl. 101-181.000.

Barkley, George J., to Barkley Corporation. Adjustable bustle-forming apparatus for maintaining registration of multicolor images on printing webs. 4,696,230, Cl. 101-181.000.

Barmag AG: *See*—
Lenk, Erich; and Feth, Max, 4,696,633, Cl. 425-192.00S.

Bartelsen, Lutz, to Flachglas Aktiengesellschaft. Process and apparatus for testing transparent material webs, particularly plate glass ribbons. 4,697,082, Cl. 250-341.000.

BASF Aktiengesellschaft: *See*—
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.
Habermann, Wolfgang; Hammes, Peter; Engelhardt, Hubert; Geiger, Wolfgang; Haltrich, Walter; and Simmler, Werner, 4,696,749, Cl. 210-721.000.

Bass, Harold E.; and Bass, Richard E., to Bassco, Inc. Casing pump. 4,696,624, Cl. 417-56.000.

Bass, Richard E.: *See*—
Bass, Harold E.; and Bass, Richard E., 4,696,624, Cl. 417-56.000.

Bassco, Inc.: *See*—
Bass, Harold E.; and Bass, Richard E., 4,696,624, Cl. 417-56.000.

Batori, Sandor: *See*—
Mesmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.

Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, to Allied Corporation. Connector for fiber optic cables. 4,696,537, Cl. 350-96.200.

Bauer Bros. Co., The: *See*—
Bouchillon, Charles W., 4,696,737, Cl. 209-210.000.

Bauer, Jurgen: *See*—
Glemser, Oskar; Buss, Dieter H.; and Bauer, Jurgen, 4,696,875, Cl. 479-206.000.

Bauman, Jack: *See*—
Wallace, Robert S., 4,696,401, Cl. 206-594.000.

Baumgartner, Josef: *See*—
Stalder, Herbert; Wurmli, Arthur; Baumgartner, Josef; and Briner, Emil, 4,696,155, Cl. 57-401.000.

Bayer Aktiengesellschaft: *See*—
Spies, Manfred; Strohriegl, Peter; and Heitz, Walter, 4,696,999, Cl. 528-319.000.

Bayless, James D. Car washing mitt. 4,696,593, Cl. 401-7.000.

Beal, Daniel: *See*—
Joliot, A. Pierre; and Beal, Daniel, 4,696,570, Cl. 356-319.000.

Beatty, Marguerite R. Electrically insulative staple. 4,697,045, Cl. 174-159.000.

Beaufoy, Raymond, to Plessey Overseas Limited. Time slot arrangements for local area network systems. 4,697,263, Cl. 370-85.000.

Beckman Instruments, Inc.: *See*—
Gurske, William A., 4,696,958, Cl. 524-21.000.

Beckstein, Hellmut, to Mahlo GmbH + Co. KG. Method and apparatus for controlling the dye receptivity of textiles. 4,696,185, Cl. 73-37.700.

Bedell, Stephen A., to Dow Chemical Company, The. Drilling geothermal wells with removal of H_2S. 4,696,802, Cl. 423-226.000.

Bedford, John A.; Elsohly, Hala N.; Wilson, Marvin C.; and Turner, Carlton E., to University of Mississippi. Anorexic material extracted from coca leaves and method of preparing. 4,696,819, Cl. 424-195.100.

Beecham Group p.l.c.: *See*—
King, Francis D., 4,697,019, Cl. 546-112.000.

Beehler, David E.; Drake, Timothy E.; and Hawk, Timothy E., to Renold, Inc. Packer/weigh-scale. 4,696,357, Cl. 177-145.000.

Beggs, Richard D.; Friesen, Harold W.; and Nutt, Wendell G., to AT&T Technologies Inc., AT&T Bell Laboratories. Data transmission system. 4,697,051, Cl. 178-63.00D.

Behl, Wishvender K.; and Chin, Der-Tau, to United States of America, Army. Method of making a rotating disk electrode. 4,696,103, Cl. 29-825.000.

Beladi, Ilona: *See*—
Toth, Miklos; Endresz, Valeria; Beladi, Ilona; and Toth, Sandor, 4,696,899, Cl. 435-68.000.

Bell, Frank A.: *See*—
Harwood, J. Richard; and Bell, Frank A., 4,696,349, Cl. 172-323.000.

Bell & Howell Company: *See*—
Zemke, Edward H., deceased; Vandersyde, Gary L.; Rabindran, K. George; and Guenther, Kenneth L., 4,697,246, Cl. 364-563.000.

Belsole, Susan C., to Warner-Lambert Company. Transdermal delivery system for administration of nitroglycerin. 4,696,821, Cl. 424-448.000.

Belthle, Heinz, to Schaudt Maschinenbau GmbH. Method of profiling and dressing grinding wheels. 4,696,130, Cl. 51-293.000.

Beltronics, Inc.: *See*—
Bishop, Robert, 4,697,088, Cl. 250-561.000.

Bendix Limited: *See*—
Oliver, Patrick R., 4,696,495, Cl. 285-86.000.

Benko, Pal: *See*—
Mesmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.

Bentley, Robert L.; Hoyle, William; and Jack, James, to CIBA-GEIGY Corporation. Compositions containing heterocyclic corrosion inhibitors. 4,696,763, Cl. 252-391.000.

Bentzen, Craig L.; Guyon-Gellin, Yves; Kalathakis, Kyriacos; Phan, Hieu T.; Nguyen Mong, Lan; Niesor, Eric; and Rossier, Jean-Robert, to Symphar S.A. Certain 2-substituted 1,3-propylidenediphosphonate derivatives, pharmaceutical compositions containing them and their use as antihypertensive agents. 4,696,920, Cl. 514-89.000.

Berkline Corporation: *See*—
Burnett, William; Houghton, James R.; Walker, David A.; and Key, Larry, 4,696,512, Cl. 297-68.000.

Bernard, Georges: *See*—
Walter, Jean-Jacques; Petit, Daniel; Marzocca, Joseph; Amalric, Jean; and Bernard, Georges, 4,697,055, Cl. 200-148.00B.

Bernardini, Ronald J., to Litman, Michael, a part interest. Portable heat treatment system. 4,696,303, Cl. 128-402.000.

Berthold, Hans: *See*—
Schauer, Friedrich; and Berthold, Hans, 4,696,523, Cl. 439-11.000.

Bertrand, Jean-Jacques, to Pomagalski S.A. Device for detecting and localizing a fault in an aerial rope-way transport installation. 4,697,169, Cl. 340-540.000.

Better Life International, Inc.: *See*—
Summers, John K., 4,696,315, Cl. 131-359.000.

Beuzard, Yves: *See*—
Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,696,937, Cl. 514-314.000.

Bezler, Wilhelm; and Kobler, Ingo, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary offset printing press equipped for flying plate change. 4,696,229, Cl. 101-177.000.

BICC Public Limited Company: *See*—
Saha, Sanjiv, 4,696,534, Cl. 350-96.150.
Saha, Sanjiv, 4,696,535, Cl. 350-96.150.

Bierhoff, Martinus P. M.: *See*—
Overath, Hilde M. A.; and Bierhoff, Martinus P. M., 4,697,258, Cl. 369-44.000.

Bierhoff, Waltherus C. J.; Schuitmaker, Pieter D.; Ouwerkerk, Cornelis; and Verhoeven, Robertus J. M., to U.S. Philips Corporation. Printer having a guide for an insertable cassette which can hold data and transfer strips. 4,696,590, Cl. 400-613.000.

Bihler, Otto; and Bruller, Eduard, to Bihler, Otto. Wire and band processing machine. 4,696,178, Cl. 72-384.000.

Billiet, Colin T.; Baggett, David; and Fielding, Robert M., to Domnick Hunter Filters Limited. Filters. 4,696,687, Cl. 55-316.000.

Billingsley, Robert H., Jr.; Jantzen, Steven L.; O'Leary, Walter E.; and Krug, John A., to ACF Industries, Incorporated. End structure for railway car. 4,696,238, Cl. 105-248.000.

Billington, Donald G.: *See*—
Gordon, Alan J.; and Billington, Donald G., 4,696,743, Cl. 210-361.000.

Billmann, Gerhard: *See*—
Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, 4,696,537, Cl. 350-96.200.

Biochemical Diagnostics, Inc.: *See*—
Kopp, Reiner H.; and Panetz, Allen I., 4,696,187, Cl. 73-61.10C.

Birkle, Siegfried; and Gehring, Johann, to Siemens Aktiengesellschaft. Apparatus for mass electroplating of bulk goods. 4,696,728, Cl. 204-213.000.

Birrittella, Mark S.; and Stipanuk, James J., to Motorola, Inc. Bipolar RAM cell. 4,697,251, Cl. 365-154.000.

Bischoff, Gregg C., to Spectrum Control, Inc. Monomer atomizer for vaporization. 4,696,719, Cl. 202-205.000.

Bisconte, Jean-Claude, to Institut National de la Sante et de la Recherche Medicale (INSERM). Modular apparatus for cell culture. 4,696,902, Cl. 435-300.000.

Bishop, Robert, to Beltronics, Inc. Method of and apparatus for discriminating sharp edge transitions produced during optical scanning of differently reflective regions. 4,697,088, Cl. 250-561.000.

Bissinger, Werner D., to International Business Machines Corporation. Process for automatically regenerating copper chloride etch solutions. 4,696,717, Cl. 156-642.000.

Bitzel, Hubert, to Trumpf GmbH & Co. Method and apparatus for nibbling cutouts with rectilinear and curvilinear contours by rotation of tooling with cutting surfaces of rectilinear and curvilinear contours and novel tooling therefor. 4,696,211, Cl. 83-49.000.

Blackburn, Donald, to Oak Ridge Systems, Inc. Device for improving the ignition of fuel-air mixtures in internal combustion engines. 4,696,269, Cl. 123-256.000.

Blanchart, Alain P. O.; and Van Der Poorten, Christian J. E. C., to Electrochemische Energieconversie N.V. (Elenco N.V.). Process for producing a catalytic layer for a fuel cell electrode. 4,696,872, Cl. 429-42.000.

Blanco, Guillermo L.: *See*—
Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Sunduiqst, Hannu K., 4,696,949, Cl. 514-648.000.

Blank, Robert G.; and Mody, Dhiraj S., to American Home Products Corporation. Stable hydrogen peroxide gels. 4,696,757, Cl. 252-186.290.

Blaw Knox Corporation: *See*—
Royzman, Semyon E., 4,696,458, Cl. 266-212.000.

Bleckmann, Ingo. Tubular heater with an overload safety means. 4,697,069, Cl. 219-517.000.

Bleh, Klaus. Device for washing out organic loam-like impurities from continuously fed large and fine granular solids. 4,696,736, Cl. 209-173.000.

Blendax-Werke R. Schneider GmbH & Co.: *See*—
Kuhlmann, Werner, 4,696,955, Cl. 522-77.000.

Blickenderfer, Jack L.: *See*—
Tolino, Ralph W.; King, William E.; Blickenderfer, Jack L.; and Roth, Charles H., Jr., 4,696,784, Cl. 376-245.000.

Blohm & Voss AG: *See*—
Wagemann, Harry, 4,696,651, Cl. 440-88.000.

Bloom, Stanley: *See*—
Alig, Roger C.; Bloom, Stanley; and Hockings, Eric F., 4,697,120, Cl. 313-412.000.

Blytas, George C.; Grimsby, F. Norman; and Scamehorn, John F., to Shell Oil Company. Process for the production of dichlorohydrin. 4,696,726, Cl. 204-182.400.

Boains, Maurice, Jr. Lawn mower blade safety assembly. 4,696,153, Cl. 56-295.000.

Board of Governors of Ryerson Polytechnical Institute, The: *See*—
Woo, Kenneth; and Mamak, Z., 4,696,449, Cl. 248-553.000.

Boboli, Inc.: *See*—
DeChristopher, Eugene L., 4,696,823, Cl. 426-496.000.

BOC Group, Inc., The: *See*—
LLoyd-Williams, Andrew, 4,696,681, Cl. 55-28.000.

Bode-Panzer: *See*—
Maxeiner, Heinz, 4,696,240, Cl. 109-82.000.

Boden, Eugene P.: *See*—
Brunelle, Daniel J.; Guggenheim, Thomas L.; Boden, Eugene P.; Shannon, Thomas G.; and Guiles, Joseph W., 4,696,998, Cl. 528-272.000.

Bodson, Guy: *See*—
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,942, Cl. 514-424.000.
Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,943, Cl. 514-424.000.

Boehringer Mannheim GmbH: *See*—
Leinert, Herbert, 4,697,022, Cl. 548-444.000.

Boeing Company, The: *See*—
Gorges, Frederick J., 4,696,583, Cl. 384-49.000.
Mazzitelli, Frederick, 4,696,442, Cl. 244-53.00B.

Boerma, Hiepke; de Jongh, Rudolph O.; and Van Dijk, Cornelis, to Unilever Patent Holdings B.V. Nickel boride-polymer catalyst. 4,696,911, Cl. 502-159.000.

Boesger, Leonard E.: *See*—
Elmquist, Steven A.; and Boesger, Leonard E., 4,696,353, Cl. 175-206.000.

Bogsch, Erik: *See*—
Megyeri, Gabor; Keve, Tibor; Galamboa, Janos; Kovacs, Lajos, Jr.; Stefko, Bela; Bogsch, Erik; and Trischler, Ferenc, 4,697,017, Cl. 544-346.000.

Bohan, John E., Jr., to Honeywell Inc. Self-energizing burner control system for a fuel burner. 4,696,639, Cl. 431-59.000.

Bohme, Helmut; Lobl, Helmut; and Grossmann, Steffen, to VEB "Otto-Buchwitz" Starkstrom-Anlagebau Dresden. Plug-in type contact arrangement. 4,696,531, Cl. 439-851.000.

Bolmstedt, Ulf; and Johansson, Bjorn-Olow, to Alfa-Laval Food and Dairy Engineering AB. Device for changing the number of part streams of a flowing medium. 4,696,341, Cl. 165-101.000.

Bolzan, Louis F., to Stauffer Chemical Company. Process for producing a disulfide dimer of EPTD. 4,697,028, Cl. 558-89.000.

Bolze, Rudolf: *See*—
Russe, Meinhard W.; Bolze, Rudolf; and Koch, Friedhelm, 4,696,914, Cl. 514-19.000.

Bonaccio, Anthony R., to International Business Machines Corporation. Open line detector circuit. 4,697,099, Cl. 307-355.000.

Bosquet, Herman; and Ulens, Stanislas F., to N.V. Verenigde Energiebedrijven Van Het Scheldeland Mechelseteenweg. Process for repairing the tubes of a steam generator. 4,696,723, Cl. 204-16.000.

Bossanszky, Ferenc: *See*—
Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, 4,696,643, Cl. 432-120.000.

Bost, Michel, to Aerospatiale Societe Nationale Industrielle. Helicopter rotor blade made from a multispar composite material with torsion compartments and a process for manufacturing same. 4,696,623, Cl. 416-230.000.

Bouchillon, Charles W., to Bauer Bros. Co., The. Fiber recovery elutriating hydrocyclone. 4,696,737, Cl. 209-210.000.

Boulanger, Henry: *See*—
De Filippis, Pietro; Calenda, Ciro; Notaro, Giuseppe; and Boulanger, Henry, 4,696,579, Cl. 374-187.000.

Boulton, David A.; Kopka, Ihor E.; Moore, Vernon L.; and Pessolano, Arsenio A., to Merck & Co., Inc. Morpholino pyridyl thiazole compound. 4,697,012, Cl. 544-124.000.

Boumendil, Jean-Paul: *See*—
Cousin, Stephane; and Boumendil, Jean-Paul, 4,696,847, Cl. 428-76.000.

Bourland, Larry G., to Atlantic Richfield Company. Polymeric molding composition containing styrenic copolymer, polycarbonate and MBS polymer. 4,696,972, Cl. 525-67.000.

Bourque, Robert F., to GA Technologies Inc. Composite first wall for fusion device. 4,696,781, Cl. 376-136.000.

Boyadjieff, George I., to Varco International, Inc. Well pipe handling machine. 4,696,207, Cl. 81-57.340.

Boyden, Robert W. Fan folded printer output collector. 4,696,591, Cl. 400-613.100.

Boyesen, Eyvind, to Performance Industries, Inc. Reed valves for internal combustion engines. 4,696,263, Cl. 123-65.00V.

Boytor, Samuel G.; and Jurs, Jeffry W., to F. J. Littell Machine Company. Machine control system. 4,697,231, Cl. 364-188.000.

BP Performance Polymers Inc.: *See*—
Shedd, Charles D.; and Anzini, David J., 4,696,967, Cl. 524-437.000.

Brace, R. Lyle. Hydraulic power transmission system. 4,696,148, Cl. 60-489.000.

Brammer, Norman, to Vetco-Gray Inc. Subsea wellhead tieback system. 4,696,493, Cl. 285-3.000.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Hetterich, Hermann; and Kunkel, Heinrich, 4,696,083, Cl. 29-148.40C.

Brandon, George M., to Textron, Inc. Electronic voltage regulator. 4,697,135, Cl. 322-24.000.

Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, to BASF Aktiengesellschaft. Preparation of polyphenylene ethers, and an apparatus for this purpose. 4,696,996, Cl. 528-214.000.

Brautigam, Peter F., to Deere & Company. Device holding seat in raised position. 4,696,508, Cl. 296-65.00R.

Brehm, Norbert O.: *See*—
Richardson, Eugene M.; Brehm, Norbert O.; and Null, Larry G., 4,696,377, Cl. 188-170.000.

Breil, Daniela: *See*—
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McLaughlin, Kevin L.; and Bushey, Thomas P., 4,696,097, Cl. 437-193.000.

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Horvah, Laszlo S., 4,696,351, Cl. 173-32.000.

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Callahan, Michael. Control system for variable parameter fixtures. 4,697,227, Cl. 362-233.000.

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Schmitz, Thomas R.; and Taylor, William M., 4,696,494, Cl. 285-18.000.

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Inaba, Yutaka; Satomura, Hiroshi; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Hosaka, Akihito, 4,697,196, Cl. 346-159.000.
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Anderson, Richard V.; and Carnes, Wendall D., 4,696,343, Cl. 166-164.000.

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Paul, Gary E.; Carr, Ronald H.; and Stern, Lee W., 4,696,793, Cl. 376-447.000.

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Casey, Robert, to Dover Corporation. Dolly for towing vehicles. 4,696,484, Cl. 280-43.160.

Casio Computer Co., Ltd.: *See*—
Hara, Kazuya, 4,697,073, Cl. 235-487.000.
Kawana, Shigeyuki, 4,697,072, Cl. 235-380.000.
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Caterpillar Inc.: *See*—
Vize, Robert M., 4,696,409, Cl. 220-203.000.

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Kara, Gerald F.; and Sawyer, William H., 4,697,245, Cl. 364-552.000.

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Miyata, Seizo; Nakahama, Hidenari; and Kasuga, Takeshi, 4,696,838, Cl. 427-407.200.

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Vialaron, Andre ; Olalde, Gabriel; and Gauthier, Daniel, 4,696,809, Cl. 423-579.000.

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Joliot, A. Pierre; and Beal, Daniel, 4,696,570, Cl. 356-319.000.

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Regipa, Robert, 4,696,444, Cl. 244-127.000.

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Chan, Peter S., to American Cyanamid Company. Method for treating hypertension using 3-(4-imidazolylmethylene)-carbazic and dithiocarbazic acid esters. 4,696,940, Cl. 514-400.000.

Chang, Clarence D.: *See*—
Chu, Cynthia T-W; and Chang, Clarence D., 4,696,807, Cl. 423-305.000.

Chang, Wen-Hsuan; Chau, Michael M.; and Piccirilli, Robert, to PPG Industries, Inc. Modified piperidines as ultraviolet light stabilizers. 4,696,959, Cl. 524-91.000.

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Chard, Brian C.; Hooper, John D.; and Bale, Christopher R., to Imperial Group Public Limited Company. Forming a rod of smokable material. 4,696,311, Cl. 131-109.100.

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Cheal, James; Fitzsimmons, James R.; and Foley, Edward J., to Southwest Microwave. Intrusion detection radar system with amplitude and frequency carrier modulation to eliminate targets at short and long ranges. 4,697,184, Cl. 342-28.000.

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Campbell, Curtis B., 4,696,755, Cl. 252-515.00R.
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Williamson, Roger C.; and Harrison, James J., 4,697,040, Cl. 585-666.000.

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Cain, Charles E.; and Cain, Gary L., 4,696,210, Cl. 83-33.000.

Child, Ralph G.; Fields, Thomas L.; Wilkinson, Raymond G.; and Lin, Yang-I, to American Cyanamid Company. 3,6-bis (substituted) acridine N-oxides and N,N-dioxides and methods of restoring, stimulating or enhancing the immune system with them. 4,696,936, Cl. 514-297.000.

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Behl, Wishvender K.; and Chin, Der-Tau, 4,696,103, Cl. 29.425.000.

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Goff, Jerry K.; and Chizever, Gary E., 4,697,125, Cl. 318-254.000.

Chou, Shine K., to Monsanto Company. Amine oxidation using carbon catalyst having oxides removed from surface. 4,696,772, Cl. 260-501.50P.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 6-[1-hydroxyethyl]-2-SR[1]-1-methyl-1-carbadethiapen-2-em-3-carboxylic acids. 4,696,923, Cl. 514-210.000.

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Hinohara, Yoshikazu; Kaifu, Rokuro; and Matsunaga, Isao, 4,696,919, Cl. 514-62.000.

Chung, Szu-Chi, to Equus Inc. Protective device for auto illumination system. 4,697,220, Cl. 361-100.000.

Church, Kristy L., to Quanex Corporation. Tubular connection. 4,696,498, Cl. 285-334.000.

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Bentley, Robert L.; Hoyle, William; and Jack, James, 4,696,763, Cl. 252-391.000.
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Frei, Bruno; and O'Sullivan, Anthony C., 4,696,945, Cl. 514-450.000.
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Pfeifer, Josef, 4,696,890, Cl. 430-325.000.
Ravichandran, Ramanathan, 4,696,964, Cl. 524-236.000.
Roloff, Achim; and Gschwend, Heinz W., 4,697,016, Cl. 544-344.000.
Storni, Angelo; and Meisels, Alex, 4,697,020, Cl. 548-184.000.
Sturm, Elmar; and Maienfisch, Peter, 4,696,922, Cl. 514-185.000.

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Reese, James R.; and Yelich, William, 4,696,321, Cl. 137-202.000.

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Colegrove, George T.; and Clare, Kenneth, 4,696,677, Cl. 44-51.000.

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Mitsutsuka, Syuichi, 4,697,115, Cl. 310-313.00R.

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Germond, Jean-Claude; and Clement, Gilles, 4,696,612, Cl. 414-8.000.

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Cleveland Clinic Foundation, The: *See*—
Meller, Bruce T.; Manley, Michael T.; and Stulberg, Bernard N., 4,696,308, Cl. 128-754.000.

Cloke, Robert L., to Priam Corporation. Composite gate generator circuit for detecting valid data signals. 4,697,098, Cl. 307-354.000.

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Ortwein, Hermann, 4,696,429, Cl. 238-2.000.

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Oswald, Gordon K. A., 4,697,190, Cl. 343-719.000.

Coan, Michael H., to Miles Laboratories, Inc. Method of preparing alpha-1-proteinase inhibitor. 4,697,003, Cl. 530-380.000.

Cochrum, Kent C., to University of California, The Regents of the. Coated transplants and method for making same. 4,696,286, Cl. 128-1.00R.

Cohen, Louis, to B. F. Goodrich Company, The. Polymerization reactor coatings and use thereof. 4,696,983, Cl. 526-62.000.

Cole, Stephen C., to Ancra Corporation. Pallet restraint mechanism for cargo loading system. 4,696,609, Cl. 410-69.000.

Colegrove, George T.; and Clare, Kenneth, to Merck & Co., Inc. Quaternary ammonium salts of anionic gums. 4,696,677, Cl. 44-51.000.

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Nedoluha, Heinz F., 4,696,248, Cl. 114-39.000.

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Snipes, Carl E.; and Coleman, John S., 4,696,817, Cl. 424-123.000.

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Lindberg, John E., 4,696,279, Cl. 123-570.000.

Combustion Engineering, Inc.: *See*—
Overbay, Mark A., 4,696,102, Cl. 29-726.000.

COMER S.p.A.: *See*—
Fabbri, Fabrizio, 4,696,199, Cl. 74-417.000.

Commissariat a l'Energie Atomique: *See*—
Germond, Jean-Claude; and Clement, Gilles, 4,696,612, Cl. 414-8.000.

Commonwealth Edison Company: *See*—
Burkum, Merlin E.; and Gabriel, Charles M., 4,697,134, Cl. 320-44.000.

Commonwealth of Australia: *See*—
Ness, John B., 4,697,189, Cl. 343-700.0MS.

Compagnie Europeenne de Composants Electroniques LCC: *See*—
Fonfria, Robert; Risbet, Marie P.; and Zattara, Jean L., 4,696,082, Cl. 29-25.420.

Compat Aktiengesellschaft, Firma: *See*—
Sauder, Karl, 4,696,085, Cl. 29-237.000.

Computer Optical Products, Inc.: *See*—
Weber, Otto K.; and Rhee, Sang S., 4,697,077, Cl. 250-231.0SE.

Condor Pacific Industries, Inc.: *See*—
Hoffman, George J., 4,696,112, Cl. 33-304.000.

Conneally, Martin L., to Sears, Roebuck & Co. Tool fine adjustment mechanism. 4,696,213, Cl. 83-438.000.

Connolly, John D., Jr.: *See*—
Larson, Richard I.; Ringle, Richard P.; Connolly, John D., Jr.; and Gallivan, Timothy J., 4,696,769, Cl. 252-638.000.

Conrad, George M.; and Smalley, Kenneth M., to Raytheon Company. High voltage solid state switch. 4,697,096, Cl. 307-246.000.

Conroy, Gary M.; and Wursthorn, Karl R., to Morton Thiokol, Inc. Lubricant-stabilizer compositions for halogen-containing organic polymers and polymer compositions thereof. 4,696,754, Cl. 252-40.500.

Consolidated Ceramic Products, Inc.: *See*—
Johnson, Howard B., 4,696,455, Cl. 266-44.000.

Constance-Hughes, Trevor, to Siebe Gorman & Company Limited. Breathing apparatus. 4,696,295, Cl. 128-202.260.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Rach, Heinz-Dieter; and Frerichs, Udo, 4,696,333, Cl. 152-379.300.
Umland, Henning; and Fricke, Gerhard, 4,696,753, Cl. 252-26.000.

Control Data Canada, Ltd.: *See*—
Thomas, David M.; and Tubb, Leonard J., 4,697,185, Cl. 342-185.000.

Cook, Bruce M.; and Gutman, Jerzy, to Westinghouse Electric Corp. Testable voted logic power circuit and method of testing the same. 4,696,785, Cl. 376-245.000.

Cook, Douglas R.: *See*—
Sander, Eugene H.; and Cook, Douglas R., 4,696,762, Cl. 252-311.000.

Cook, Steven T.; and Wynn, David K., to Dayton Reliable Tool & Mfg. Co. Air assist means for use in transferring relatively flat objects. 4,696,179, Cl. 72-405.000.

Cooper Industries, Inc.: *See*—
Harnois, Carey D., 4,696,528, Cl. 439-160.000.

Cordier, Jean, to Union Siderurgique du Nord et de l'Est de la France (USINOR). Electrode structure for a bath of molten metal. 4,697,273, Cl. 373-72.000.

Corella, Arthur P. Heat sealed package with perforated compartment seal. 4,696,404, Cl. 206-604.000.

Cormack, Owen R.; and Keane, James H. Spatter guard for paint rollers. 4,696,072, Cl. 15-248.00A.

Corning Glass Works: *See*—
Schmitt, Paul S., 4,696,692, Cl. 65-102.000.

Cosco, Inc.: *See*—
Maloney, Kevin, 4,696,514, Cl. 297-284.000.

Costella, James G., to Olympus Corporation. Fiberscopic device for inspection of internal sections of construction, and method for using same. 4,696,544, Cl. 350-96.260.

Courtesy Mold & Tool Corporation: *See*—
Kreiseder, Walter J., 4,696,410, Cl. 220-267.000.

Cousin, Stephane; and Boumendil, Jean-Paul, to Isover Saint-Gobain. Insulating and impervious roofing panels. 4,696,847, Cl. 428-76.000.

Cox, Harold S., to Roboserve Limited. Substantially static-free, cellular expanded or foamed thermoplastic articles, including cups and containers, and processes for the manufacture of these articles including the manufacture of intermediate materials suitable for use in such manufacture. 4,696,950, Cl. 521-57.000.

Coyne, Henry: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniya, George, 4,696,671, Cl. 604-67.000.

Crenshaw, Michael E.: *See*—
Daigle, Richard A., Sr.; Stanfield, William G.; and Crenshaw, Michael E., 4,696,602, Cl. 405-205.000.

Cross, Carroll N. Desk calendar. 4,696,118, Cl. 40-120.000.

Cross, Marshall W., to Science Applications International Corporation. Omniazimuthal antenna. 4,697,191, Cl. 343-809.000.

Cross, Robert J.; and Barabino, William A., to Barabino, William A. Single use disposable medical razor. 4,696,106, Cl. 30-41.000.

Crosthwaite, Robert P., to Ducan Steel Benders Ltd. Sofa bed. 4,696,069, Cl. 5-37.00R.

Cunningham, Kirkwood M.: *See*—
Goldberg, Marvin C.; Cunningham, Kirkwood M.; and Weiner, Eugene R., 4,696,571, Cl. 356-336.000.

Cunningham, Robert E.: *See*—
Halasa, Adel F.; and Cunningham, Robert E., 4,696,986, Cl. 526-181.000.

Curran Company, The: *See*—
Sims, Richard E., 4,696,547, Cl. 350-319.000.

Curtis, Marland. Bulk conveyor. 4,696,390, Cl. 198-823.000.

Custodis-Cottrell, Inc.: *See*—
Kallinger, Franz; and Killion, Mark E., 4,696,135, Cl. 52-121.000.

Custom Tool & Mfg. Co.: *See*—
Cloyd, William C., 4,696,524, Cl. 439-197.000.

Cuthbertson, Brian G.: *See*—
Davy, Peter G.; and Cuthbertson, Brian G., 4,697,229, Cl. 363-49.000.

D. W. Electrochemicals Ltd.: *See*—
Wright, William M. D., 4,696,832, Cl. 427-58.000.

Dadpey, Habib; Merlino, Paul J.; and Shero, David J., to Westinghouse Electric Corp. Induction motor regenerative brake control apparatus and method. 4,697,130, Cl. 318-760.000.

DAE-AH Human Engineering Inc.: *See*—
Yeum, Hee-Sung, 4,696,516, Cl. 297-458.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Asano, Hideharu; and Senda, Hisakazu, 4,697,008, Cl. 536-89.000.

Daigle, Richard A., Sr.; Stanfield, William G.; and Crenshaw, Michael E., to LTV Energy Products Company. Apparatus and system for flooding submerged structures. 4,696,602, Cl. 405-205.000.

Daikin Industries, Ltd.: *See*—
Oka, Masahiko; Ueta, Yutaka; Kano, Hideo; Tomoda, Masayasu; and Kawachi, Shoji, 4,696,989, Cl. 526-254.000.

Daimler-Benz Aktiengesellschaft: *See*—
Weller, Karl-Heinz R., 4,696,225, Cl. 98-2.110.

Dainippon Ink and Chemicals, Inc.: *See*—
Ooka, Masataka; Okuda, Yaeko; and Kunugiza, Motoyasu, 4,696,975, Cl. 525-113.000.

Daly, John W.: *See*—
Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., 4,696,932, Cl. 514-263.000.

Damiani, Martin R.: *See*—
Murdock, Keith C.; Damiani, Martin R.; and Durr, Frederick E., 4,696,935, Cl. 514-297.000.

Danaczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., to Exxon Production Research Company. Compliant offshore platform. 4,696,603, Cl. 405-227.000.

D'Andrade, Bruce M.; and Marino, Joseph A. Toy vehicle with adjustable suspension system. 4,696,655, Cl. 446-330.000.

Danfoss A/S: *See*—
Rasmussen, Ivar; and Pedersen, Poul H. H., 4,696,161, Cl. 60-384.000.

Danilowicz, Paul S.: *See*—
Burr, Donald N.; Danilowicz, Paul S.; Franz, Thomas C.; Mortimer, Thomas P.; and Pero, Edward B., 4,696,156, Cl. 60-39.080.

Danner, Bernard; and Ruynon, James R., to Sandoz Ltd. Hydrophilic cationic copolymers of acrylamide or methacrylamide. 4,696,962, Cl. 524-140.000.

Dappert, Thomas O.: *See*—
Magrath, Joseph M.; Tice, Thomas R.; Meyers, William E.; and Dappert, Thomas O., 4,696,258, Cl. 119-1.000.

Dauernheim, Hans: *See*—
Saupe, Martin; Dauernheim, Hans; and Markl, Maximillian, 4,696,645, Cl. 433-125.000.

Dauplaise, David L.; and Trzaskos, William J., to American Cyanamid Company. Method for the synthesis of sulfonated rubrene, 4,696,770, Cl. 252-700.000.

Davenport, George F., to Exxon Production Research Company. Articulated compliant offshore structure. 4,696,601, Cl. 405-202.000.

David, Bernard; and Tetard, Roger. Screen process printing machine. 4,696,228, Cl. 101-123.000.

David, Peggy F. M., to Kartell SpA. Device for producing a gas-and-liquid mixture. 4,696,775, Cl. 261-1.000.

Davies, Ronald C., to Digital Products Corporation. Electronic coin detection apparatus. 4,696,385, Cl. 194-319.000.
Davis, Charles G.: *See—*
Pettit, Harold W., Jr; Davis, Charles G.; and Walden, Frederick C., 4,696,855, Cl. 428-312.800.
Davy, Peter G.; and Cuthbertson, Brian G., to Neon 2000 Limited. Electronic control equipment. 4,697,229, Cl. 363-49.000.
Dayco Products, Inc.: *See—*
Wilson, Leslie B., 4,696,664, Cl. 474-138.000.
Dayton Reliable Tool & Mfg. Co.: *See—*
Cook, Steven T.; and Wynn, David K., 4,696,179, Cl. 72-405.000.
de Ahna, Dieter: *See—*
Fischer, Robert; and de Ahna, Dieter, 4,696,700, Cl. 106-291.000.
Dean, Barry D., to Atlantic Richfield Company. Modified acrylic polymers. 4,696,978, Cl. 525-205.000.
DeChristopher, Eugene L., to Boboli, Inc. Method of making a pizza-type product of dough. 4,696,823, Cl. 426-496.000.
Decker, Dale D.; and Stanhope, Mary E., to International Business Machines Corporation. Document reading envelope depository. 4,696,426, Cl. 232-43.100.
Deere & Company: *See—*
Brautigam, Peter F., 4,696,508, Cl. 296-65.00R.
Delfs, Larry M., 4,696,367, Cl. 180-306.000.
Durchenwald, Larry D., 4,696,387, Cl. 198-394.000.
Marks, Jeffrey C., 4,696,205, Cl. 74-767.000.
Murphy, Kenneth E.; Martin, Ronald A.; and Nies, Gary M., 4,696,660, Cl. 464-170.000.
Ruhter, Martin L.; Brimeyer, Dennis A.; and Stubben, David W., 4,696,350, Cl. 172-793.000.
Ruhter, Martin L., 4,696,486, Cl. 280-400.000.
Russ, Roger A.; and Hennen, John J., 4,696,432, Cl. 241-101.700.
De Filippis, Pietro; Calenda, Ciro; Notaro, Giuseppe; and Boulanger, Henry, to Texas Instruments Incorporated. Thermostat. 4,696,579, Cl. 374-187.000.
DeFrancisco, Roberto F. Internal combustion engine of positive displacement expansion chambers with multiple separate combustion chambers of variable volume, separate compressor of variable capacity and pneumatic accumulator. 4,696,158, Cl. 60-39.620.
Degeilh, Robert, to Saint Gobain Vitrage. Process for the preparation of polyvinyl butyral having improved properties. 4,696,971, Cl. 525-61.000.
Degen, Hugo, to Marpal AG. Undermattress for reclining furniture. 4,696,070, Cl. 5-238.000.
De Graaff, Hendrik C.; and Voncken, Wilhelmus G., to U.S. Philips Corporation. Semiconductor protection device having a bipolar transistor and an auxiliary field effect transistor. 4,697,199, Cl. 357-23.130.
Deguchi, Naoyasu; Kojima, Tstsuro; Ohno, Shigeru; Nakamura, Koki; and Miyazaki, Hideo, to Fuji Photo Film Co., Ltd. Silver halide photographic materials containing 1,3,4-thiadiazole derivatives having a polar substituent. 4,696,894, Cl. 430-551.000.
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhashi, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, to Nisshin Steel Co., Ltd. Surface treatment of high-nickel/iron alloy steel plate for LNG or LPG tanks. 4,696,724, Cl. 204-27.000.
de Guelis, Hubert V.; and Doute, Pascal, to Societe Nationale Industrielle Aerospatiale. System for putting two contiguous enclosures into individual communication with the outside. 4,696,496, Cl. 285-137.100.
Degussa Aktiengesellschaft: *See—*
Deschler, Ulrich; Kleinschmit, Peter; and Michel, Rudolf, 4,697,009, Cl. 540-487.000.
Fischer, Robert; and de Ahna, Dieter, 4,696,700, Cl. 106-291.000.
Russe, Meinhard W.; Bolze, Rudolf; and Koch, Friedhelm, 4,696,914, Cl. 514-19.000.
de Jongh, Rudolph O.: *See—*
Boerma, Hiepke; de Jongh, Rudolph O.; and Van Dijk, Cornelis, 4,696,911, Cl. 502-159.000.
Delahoy, Alan E.: *See—*
Ellis, Frank B., Jr.; and Delahoy, Alan E., 4,696,702, Cl. 437-88.000.
De Ley, Jozef: *See—*
Verstraete, Willy; and De Ley, Jozef, 4,696,747, Cl. 210-605.000.
Delfs, Larry M., to Deere & Company. Auxiliary hydrostatic drive system. 4,696,367, Cl. 180-306.000.
Demarne, Henri: *See—*
Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,696,937, Cl. 514-314.000.
Demizu, Hiromi: *See—*
Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, 4,696,255, Cl. 118-653.000.
Den norske stats oljeselskap a.s.: *See—*
Furuholt, Edgar; and Liaaen, Anders M., 4,696,453, Cl. 251-149.600.
DenHerder, Marvin J. Oil fuel combustion. 4,696,638, Cl. 431-4.000.
Denier, Guy; and Henrion, Romain, to Institut de Recherches de la Siderurgie Francaise; and Arbed S/A. Method of improving permeability of metallurgical vessels, and material for implementing the same. 4,696,456, Cl. 266-44.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Nabeta, Takeshi; and Hanahara, Isamu, 4,696,956, Cl. 523-137.000.
Dennison Manufacturing Company: *See—*
Anderson, Gary, 4,696,300, Cl. 128-334.00R.
Desai, Praful C., to Smith International. Dual string packer mill. 4,696,502, Cl. 294-86.170.
Desaulty, Michel A. A.: *See—*
Barbier, Gerard Y. G.; Leboure, Gerald J. P. B.; Desaulty, Michel A. A.; Martinez, Rodolphe; and Perigne, Jerome, 4,696,157, Cl. 60-39.230.
Deschler, Ulrich; Kleinschmit, Peter; and Michel, Rudolf, to Degussa Aktiengesellschaft. N-silylpropyl-N'-acyl-ureas and process for their production. 4,697,009, Cl. 540-487.000.
DeSimone, Daniel J.: *See—*
Ferris, David A.; and DeSimone, Daniel J., 4,697,103, Cl. 307-430.000.
DesMarteau, Darryl D., to Research Corporation. N-fluoro-N-perfluoromethyl sulfonamides. 4,697,011, Cl. 540-544.000.
Despouys, Jean-Bernard, to Radiall Industrie. Optical fiber connector and method of mechanically centering an interior element in an outer body. 4,696,538, Cl. 350-96.200.
Desyllas, Peter L. L.; Holt, Nicholas P.; and Naven, Finbar, to International Computers Limited. Data processing apparatus with message acceptance monitoring. 4,697,268, Cl. 371-67.000.
Desyllas, Peter L. L.: *See—*
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Devoke Co.: *See—*
Lowe, Gary M., 4,696,522, Cl. 312-297.000.
Devonald, David P.; Nelson, Anthony J.; Quan, Peter M.; and Stewart, David, to Imperial Chemical Industries PLC. Process for the extraction of metal values with bisimidazole metal extractants. 4,696,801, Cl. 423-24.000.
Devos, Michel: *See—*
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Diamond Shamrock Chemicals Company: *See—*
Harada, Kaoru; Shimoyama, Akira; and Mizumoto, Hiroji, 4,696,981, Cl. 525-328.200.
Dickerson, John W. Die set apparatus for badges. 4,696,086, Cl. 29-243.520.
Diederen, Willi: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; and Diederen, Willi, 4,696,931, Cl. 514-261.000.
Diefenbach, Jean-Jacques: *See—*
le Chatelier, Robert; Sinic, Andre ; and Diefenbach, Jean-Jacques, 4,696,334, Cl. 152-417.000.
Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, to Henkel Kommanditgesellschaft auf Aktien. Hand stamp method for applying adhesives. 4,696,836, Cl. 427-208.400.
Diesel Kiki Co., Ltd.: *See—*
Nagao, Teruyuki; Kawamura, Yuji; and Kashima, Koichi, 4,696,340, Cl. 165-58.000.
Digital Products Corporation: *See—*
Davies, Ronald C., 4,696,385, Cl. 194-319.000.
DiMartino, Stephen P.: *See—*
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Disco Abrasive Systems, Ltd.: *See—*
Nonaka, Yuzo, 4,696,712, Cl. 156-351.000.
Dishner, Bryan W.: *See—*
Baker, Robert C.; and Dishner, Bryan W., 4,697,090, Cl. 290-4.00R.
Disko, Harry: *See—*
Welch, Bennie R.; Rasmussen, Russell G.; and Disko, Harry, 4,696,654, Cl. 446-268.000.
Dixon, John A. Vertical blinds chain. 4,696,336, Cl. 160-178.00R.
Dobbs, Nathan F. Container for capturing insects. 4,696,127, Cl. 43-121.000.
Doboy Packaging Machinery, Inc.: *See—*
Sampson, Mark E.; and Rosen, Marvin E., 4,696,244, Cl. 112-262.100.
Dr. Karl Thomae GmbH: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; and Diederen, Willi, 4,696,931, Cl. 514-261.000.
Dodrill, Gregg W. Speaker and baffle system for a vehicle storage well and method of installing same. 4,696,369, Cl. 181-141.000.
Doering, Robert R.; and Armstrong, Gregory J., to Texas Instruments Incorporated. Method of making field-plate isolated CMOS devices. 4,696,092, Cl. 437-5.000.
Doerman, Eryk S.; Turner, William J.; Homer, David A.; Stewart, Andrew D. G.; and Clarke, Ian. Weighing a number of objects in succession. 4,696,358, Cl. 177-145.000.
Dohnomoto, Tadashi: *See—*
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Dollison, William M., to Otis Engineering Corporation. Dual valve control for double action hydraulic cylinder. 4,696,221, Cl. 91-51.000.
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Billiet, Colin T.; Baggett, David; and Fielding, Robert M., 4,696,687, Cl. 55-316.000.
Donald, Jay, to Exxon Research and Engineering Company. Flocculation of particles by polymers that precipitate out of solution. 4,696,750, Cl. 210-727.000.
Donaldson, Richard E.; and Hoops, John F., to Merrell Dow Pharmaceuticals Inc. Medroxalol intermediates. 4,697,024, Cl. 549-444.000.
Donn Incorporated: *See—*
Mieyal, David F.; and Koski, Gerald L., 4,696,142, Cl. 52-762.000.

Doriath, Gerard; Hartemann, Pierre; and Jacobelli, Alain, to Thomson-CSF. Measuring system and measuring cell for making magnetic field measurements. 4,697,145, Cl. 324-244.000.
Dostoomian, Ashod S.: *See—*
Vanzetti, Riccardo; and Dostoomian, Ashod S., 4,696,101, Cl. 29-740.000.
Vanzetti, Riccardo; and Dostoomian, Ashod S., 4,696,104, Cl. 29-840.000.
Doubt, Ruxton C. Custom moldable hand grip. 4,696,842, Cl. 425-40.000.
Douglas, James A.: *See—*
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Doumani, Robert S.: *See—*
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Doute, Pascal: *See—*
de Guelis, Hubert V.; and Doute, Pascal, 4,696,496, Cl. 285-137.100.
Dover Corporation: *See—*
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Dow Chemical Company, The: *See—*
Bedell, Stephen A., 4,696,802, Cl. 423-226.000.
Ellerbe, Gilbert B., III; and Parrish, Donald B., 4,696,976, Cl. 525-126.000.
Mobley, Larry W.; and Kelley, Don H., 4,696,849, Cl. 428-95.000.
Neil, Lawrence E., 4,696,982, Cl. 525-507.000.
Pritchard, James R.; and Regelman, Dale F., 4,696,954, Cl. 521-167.000.
Snipes, Carl E.; and Coleman, John S., 4,696,817, Cl. 424-123.000.
Stevens, Timothy S.; and Small, Hamish, 4,696,904, Cl. 436-39.000.
Dow Corning Corporation: *See—*
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Varaprath, Sudarsanan, 4,696,834, Cl. 437-223.000.
Drage, David J., to Tegal Corporation. Dual wavelength sensor which employs object as part of a corner reflector. 4,697,089, Cl. 250-561.000.
Drake, Timothy E.: *See—*
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Dresner, Joseph, to RCA Corporation. Transistor having a superlattice. 4,697,197, Cl. 357-4.000.
Dresser Industries, Inc.: *See—*
Eifling, Dennis R., 4,696,751, Cl. 210-780.000.
Drew, John H.: *See—*
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Garner, Albert Y.; Gabbert, James D.; and Hedrick, Ross M., 4,696,977, Cl. 525-184.000.
Dsung Precision Company: *See—*
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Dubach, Werner F., to Alfatechnic AG. Plastic closure with safety band. 4,696,408, Cl. 215-237.000.
Dube, Brian J. Juggling club. 4,696,468, Cl. 272-124.000.
Ducan Steel Benders Ltd.: *See—*
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Dulaney, Clarence L.: *See—*
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Dulux Australia Ltd.: *See—*
Adeney, Hilary E.; and Hall, Derrard M., 4,696,957, Cl. 523-406.000.
Dunajcsik, Peter: *See—*
Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, 4,696,643, Cl. 432-120.000.
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Verhoeven, Laurentius M.; and van Nes, Cornelis G. J., 4,696,529, Cl. 439-267.000.
Durchenwald, Larry D., to Deere & Company. Workpiece rollover apparatus. 4,696,387, Cl. 198-394.000.
Durr, Dieter, to Linde AG. Method of deburring or deflashing articles. 4,696,421, Cl. 225-1.000.
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Durrant, Richard C. E.: *See—*
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Dursch, Walter; Herwig, Walter; and Engelhardt, Friedrich, to Hoechst Aktiengesellschaft. Process for the preparation of polymers of vinylphosphonic acid in protic solvents. 4,696,987, Cl. 526-216.000.
Duval, Leonard A. Method and apparatus for the drying of solid materials by displacement. 4,696,114, Cl. 34-9.000.
Dybus, Herbert: *See—*
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Dynatech/U-Z, Inc.: *See—*
Hoffman, Jerzy, 4,697,056, Cl. 200-153.00S.
Dyneer Corporation: *See—*
Thomey, Henry W.; and Heuninck, John B., 4,696,663, Cl. 474-133.000.
E.G.O. Elektro Gerate Blanc u. Fischer: *See—*
Schreder, Felix, 4,697,068, Cl. 219-449.000.
Easley, James C.: *See—*
Higgins, Daniel E.; and Easley, James C., 4,696,298, Cl. 126-305.000.
Eastman, George Y., to Thermacore, Inc. Heat pipe. 4,697,205, Cl. 357-82.000.
Eastman Kodak Company: *See—*
Ettischer, Helmut; Ebner, Arno; Munz, Rolf; and Pollak, Raimund, 4,696,615, Cl. 414-114.000.
Noonan, John M.; and Caccamo, Anthony F., 4,696,990, Cl. 526-304.000.
Eastwood, Barry J., to AEPLC. Aluminum based bearing alloys. 4,696,867, Cl. 428-650.000.
Eaton Corporation: *See—*
Giere, David W., 4,696,164, Cl. 60-485.000.
Ebara Corporation: *See—*
Miyagawa, Teiji; Iwamura, Yoshio; and Hayakawa, Masao, 4,696,452, Cl. 251-25.000.
Ebner, Arno: *See—*
Ettischer, Helmut; Ebner, Arno; Munz, Rolf; and Pollak, Raimund, 4,696,615, Cl. 414-114.000.
Echte, Adolf: *See—*
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.
Egami, Hidemi: *See—*
Inaba, Yutaka; Satomura, Hiroshi; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Hosaka, Akihito, 4,697,196, Cl. 346-159.000.
Egashira, Yoshinori: *See—*
Tomita, Seisuke; and Egashira, Yoshinori, 4,696,475, Cl. 273-227.000.
Egyt Gyogyszervegyeszeti Gyar: *See—*
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.
Toth, Miklos; Endresz, Valeria; Beladi, Ilona; and Toth, Sandor, 4,696,899, Cl. 435-68.000.
Eidenschink, Rudolf: *See—*
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidenschink, Rudolf; and Romer, Michael, 4,696,549, Cl. 350-350.00R.
Eifling, Dennis R., to Dresser Industries, Inc. Vibratory screening apparatus and method for removing suspended solids from liquid. 4,696,751, Cl. 210-780.000.
Eilertsen, John L. Incrementally indexing linear actuator. 4,697,164, Cl. 335-253.000.
Eimerl, David, to United States of America, Energy. Deuterated L-arginine phosphate monohydrate. 4,697,100, Cl. 307-427.000.
Eino, Tadao, to Olympus Optical Co., Ltd. Color image pickup device with complementary color type mosaic filter and gamma compensation means. 4,697,208, Cl. 358-44.000.
Ekholm, Pertti: *See—*
Savonlahti, Jukka; Ekholm, Pertti; and Harjunmaa, Hannu, 4,696,195, Cl. 73-864.840.
Elder, Michael G. Hamstring muscle exerciser. 4,696,469, Cl. 272-134.000.
Electricite de France: *See—*
Pichot, Jacky; and Oddou, Jacques, 4,696,427, Cl. 236-1.00E.
Electro Adapter: *See—*
Wolcott, Wayne B., 4,696,327, Cl. 140-150.000.
Electro-Biology, Inc.: *See—*
Gardner, Arthur M. N.; and Fox, Roger H., 4,696,289, Cl. 128-64.000.
Electro Cell AB: *See—*
Gustafsson, Hans; Schwartz, Stephan; and Widen, Karl-Bertil, 4,696,910, Cl. 502-159.000.
Electrochemische Energiecoaversie N.V. (Elenco N.V.): *See—*
Blanchart, Alain P. O.; and Van Der Poorten, Christian J. E. C., 4,696,872, Cl. 429-42.000.
Electromagnetic Sciences, Inc.: *See—*
Hoover, John C.; and Giese, David E., 4,697,158, Cl. 333-1.100.
Elenteny, Barbara. Peel away multi-layer gloves. 4,696,065, Cl. 2-168.000.
Elkem a/s: *See—*
Aune, Jan A. J.; and Evensen, Knut K., 4,696,457, Cl. 266-207.000.
Ellames, George J.; and Jaxa-Chamiec, Albert A., to G. D. Searle & Co. Substituted dihydroimidazo[1,2-a]quinoxalines. 4,696,928, Cl. 514-250.000.
Ellerbe, Gilbert B., III; and Parrish, Donald B., to Dow Chemical Company, The. Vinyl urethane composite polymer containing dispersed soft copolymer particles. 4,696,976, Cl. 525-126.000.
Ellion, Dolores D.; and Ellion, Max E. Gun powder dispensing and measuring apparatus. 4,696,356, Cl. 177-123.000.

Ellion, Max E.: *See*—
Ellion, Dolores D.; and Ellion, Max E., 4,696,356, Cl. 177-123.000.

Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., to National Research Development Corporation. Pesticidal cyclopropane carboxylic acid esters, their compositions and use. 4,696,944, Cl. 514-531.000.

Ellis, Frank B., Jr.; and Delahoy, Alan E., to Chronar Corp. Method of depositing wide bandgap amorphous semiconductor materials. 4,696,702, Cl. 437-88.000.

Ellwood, Derek C.; Evans, Charles G. T.; and Yeo, Richard G., to Secretary of State for Defence in Her Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, The. Production of bacterial polysaccharides. 4,696,900, Cl. 435-104.000.

Elmec Corporation: *See*—
Kameya, Kazuo, 4,697,162, Cl. 333-161.000.

Elmquist, Steven A.; and Boesger, Leonard E., to W. S. Tyler, Incorporated. Drilling mud cleaning system. 4,696,353, Cl. 175-206.000.

Elsohly, Hala N.: *See*—
Bedford, John A.; Elsohly, Hala N.; Wilson, Marvin C.; and Turner, Carlton E., 4,696,819, Cl. 424-195.100.

Elter, Claus; and Schoesing, Josef, to Hochtemperatur-Reaktorbau GmbH. Prestressed concrete pressure vessel, in particular for a nuclear reactor installation. 4,696,790, Cl. 376-296.000.

Eltro GmbH: *See*—
Ruger, James; and Welz, Wolfgang, 4,696,567, Cl. 356-28.000.

Emda Fabrik Elektro-Medizinischer und Dentaler Apparate Georg Hartmann GmbH & Co. KG: *See*—
Saupe, Martin; Dauernheim, Hans; and Markl, Maximillian, 4,696,645, Cl. 433-125.000.

Enami, Katsuya; Tsuyuguchi, Hiroshi; and Sakaguchi, Takahiro, to Teac Corporation. Stepping motor drive system and method capable of stopping the rotor in a required angular position. 4,697,129, Cl. 318-696.000.

Enda, Ryuichi, to Yamaha. Motorcycle frame. 4,696,363, Cl. 180-219.000.

Endo, Isao: *See*—
Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-422.000.

Endo, Masayuki: *See*—
Sasaki, Toshihiko; Sunayama, Yooji; Yoshida, Isao; and Endo, Masayuki, 4,696,800, Cl. 422-186.180.

Endo, Mitsuharu: *See*—
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, 4,696,589, Cl. 400-119.000.

Endresz, Valeria: *See*—
Toth, Miklos; Endresz, Valeria; Beladi, Ilona; and Toth, Sandor, 4,696,899, Cl. 435-68.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, 4,696,758, Cl. 252-188.310.
Vijan, Meera, 4,696,885, Cl. 430-311.000.

Engelhardt, Friedrich: *See*—
Dursch, Walter; Herwig, Walter; and Engelhardt, Friedrich, 4,696,987, Cl. 526-216.000.

Engelhardt, Hubert: *See*—
Habermann, Wolfgang; Hammes, Peter; Engelhardt, Hubert; Geiger, Wolfgang; Haltrich, Walter; and Simmler, Werner, 4,696,749, Cl. 210-721.000.

Enichem Elastomeri, S.p.A.: *See*—
Carbonaro, Antonio; and Ferraro, Domenico, 4,696,984, Cl. 526-98.000.

Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, to Voest-Alpine Aktiengesellschaft. Electric melting furnace arrangement as well as a method of influencing the composition of a mineral melt for producing wool. 4,697,274, Cl. 373-79.000.

Enoki, Shigenaga; Yoshio, Kazuya; and Yamaguchi, Nobuo, to Honda Giken Kogyo Kabushiki Kaisha. Power-unit support structure of motorcycle. 4,696,364, Cl. 180-228.000.

Enomoto, Masao, to Ichikoh Industries Limited. Electric remote control mirror apparatus. 4,696,555, Cl. 350-634.000.

Enviro-Spray Systems Incorporated: *See*—
Schmidt, Richard; and Pizzo, Joseph A., 4,696,145, Cl. 53-436.000.

Environmental Diagnostics, Inc.: *See*—
Kelton, Arden A., 4,696,797, Cl. 422-101.000.

Eplett, Gene W. Multi-stepped gameboard apparatus. 4,696,476, Cl. 273-241.000.

Epperson, David L., to John Fluke Mfg. Co., Inc. Particulate spacers for inhibiting Newton rings in touch sensitive overlays. 4,696,860, Cl. 428-325.000.

Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniya, George, to Omni-Flow, Inc. Infusion system having plural fluid input ports and at least one patient output port. 4,696,671, Cl. 604-67.000.

Equus Inc.: *See*—
Chung, Szu-Chi, 4,697,220, Cl. 361-100.000.

Esch, Friedrich D.; and Price, John G., to AMF Incorporated. Packaging machines. 4,696,146, Cl. 53-529.000.

Etablissements les Fils d'Auguste Chomarat & Cie: *See*—
Fourezon, Andre , 4,696,853, Cl. 428-257.000.

Estkowski, Christopher G.: *See*—
Estkowski, Michael H.; Doumani, Robert S.; and Estkowski, Christopher G., 4,696,394, Cl. 206-303.000.

Estkowski, Michael H.; Doumani, Robert S.; and Estkowski, Christopher G., to Shepherd Products U.S., Inc. Easily removable protective covering for annular objects. 4,696,394, Cl. 206-303.000.

ETA S.A. Fabriques d'Ebauches: *See*—
Muller, Jacques; and Triponez, Andre , 4,696,577, Cl. 368-276.000.

Etablissements Farnier & Penin: *See*—
Laville, Bernard; and Prouteau, Philippe, 4,696,511, Cl. 296-216.000.

Ethier, Dolores O., to Lectec Corporation. Bilayer substrate. 4,696,854, Cl. 428-287.000.

Ettischer, Helmut; Ebner, Arno; Munz, Rolf; and Pollak, Raimund, to Eastman Kodak Company. Copying machine. 4,696,615, Cl. 414-114.000.

Evans, Charles G. T.: *See*—
Ellwood, Derek C.; Evans, Charles G. T.; and Yeo, Richard G., 4,696,900, Cl. 435-104.000.

Evans, Robert T.: *See*—
Scott, Theron A.; and Evans, Robert T., 4,696,344, Cl. 166-182.000.

Evely, William W., to Ball Corporation. Thermoplastic container forming apparatus. 4,696,636, Cl. 425-526.000.

Evensen, Knut K.: *See*—
Aune, Jan A. J.; and Evensen, Knut K., 4,696,457, Cl. 266-207.000.

Everett, Charles J.: *See*—
Ochsner, Rolf H.; and Everett, Charles J., 4,697,054, Cl. 200-33.000.

Excello Specialty Company, The: *See*—
Jones, Wallace R.; and Isaksen, Robert A., 4,696,848, Cl. 428-40.000.

Extance, Philip; and Jones, Roger E., to STC, plc. Spherical shell fibre optic magnetic field sensors and magnetometers and magnetic gradient detectors incorporating them. 4,697,146, Cl. 324-244.000.

Extance, Philip: *See*—
Pitt, Gilles D.; Extance, Philip; and Jones, Roger E., 4,696,543, Cl. 350-96.230.

Exxon Printing Systems, Inc.: *See*—
Howkins, Stuart D., 4,697,193, Cl. 346-1.100.

Exxon Production Research Company: *See*—
Danaczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., 4,696,603, Cl. 405-227.000.
Davenport, George F., 4,696,601, Cl. 405-202.000.
Finn, Lyle D.; and Steele, Kenneth M., 4,696,604, Cl. 405-227.000.

Exxon Research and Engineering Company: *See*—
Donald, Jay, 4,696,750, Cl. 210-727.000.

F. J. Littell Machine Company: *See*—
Boytor, Samuel G.; and Jura, Jeffry W., 4,697,231, Cl. 364-188.000.

Fabbri, Fabrizio, to COMER S.p.A. Angle drive transmission unit particularly for agricultural machinery. 4,696,199, Cl. 74-417.000.

Fairchild, Jeffery; Heitz, Steven A.; and Symington, John, to Sundstrand Corporation. High temperature seal and turbine mount. 4,696,618, Cl. 415-119.000.

Fanuc Ltd.: *See*—
Amemiya, Yoichi; Sogabe, Masatoyo; and Tagami, Kiyoshi, 4,697,114, Cl. 310-156.000.
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,697,249, Cl. 364-900.000.

Fanuc Ltd: *See*—
Inaba, Yoshiharu, 4,696,632, Cl. 425-150.000.

Farco-Pharma GmbH: *See*—
Pleines, Peter; and Wolf, Erich, 4,696,297, Cl. 128-303.100.

Farel, Alain; Agobian, Manuel; and Le, Sinh, to Farel, Alain. Device for digitalizing graphical data. 4,697,050, Cl. 178-18.000.

Farley, James R.: *See*—
Grunert, Kurt A.; and Farley, James R., 4,697,163, Cl. 335-174.000.

Farmos Group Ltd.: *See*—
Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Sunduqst, Hannu K., 4,696,949, Cl. 514-648.000.

Farrell, Robert F. Neutral zone, piece-capture game. 4,696,478, Cl. 273-261.000.

Farrow, Robert T. Anti-theft device for road vehicles. 4,696,172, Cl. 70-238.000.

Fatovic, Peter: *See*—
Lafrance, Conrad D.; and Fatovic, Peter, 4,697,283, Cl. 379-443.000.

Fawzi, Mahdi B.: *See*—
Silbering, Steven B.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,696,812, Cl. 424-445.000.

Fekkes, Wilhelmus F.: *See*—
Geerings, Michael P. W.; Christis, Wilhelmus J.; Fekkes, Wilhelmus F.; and Schmitz, Herman J. R., 4,697,046, Cl. 178-1.000.

Feldman, Paul H., to Hazeltine Corporation. Testing of RF diode phase shifters. 4,697,141, Cl. 324-158.00R.

Felten, Klaus; Honroth, Walter; Kuhn, Siegfried; Schulten, Hermann; and Zeller, Bruno, to Oerlikon-Boehringer GmbH. Lathe having an integrated chuck. 4,696,209, Cl. 82-40.00R.

Fenner, Edwin H. Portable platform assembly for dancers and the like. 4,696,470, Cl. 272-144.000.

Fenner, Hans: *See*—
Hortmann, Guenther; Kunick, Klaus; and Fenner, Hans, 4,696,287, Cl. 128-1.00R.

Ferraro, Domenico: *See*—
Carbonaro, Antonio; and Ferraro, Domenico, 4,696,984, Cl. 526-98.000.

Ferris, David A.; and DeSimone, Daniel J., to Quadic Systems, Inc. Low power high current sinking TTL circuit. 4,697,103, Cl. 307-456.000.

Feth, Max: *See*—
Lenk, Erich; and Feth, Max, 4,696,633, Cl. 425-192.00S.

FEV Forschungsgesellschaft fur Energietechnik und Verbrennungsmotoren mbH: *See*—
Pischinger, Franz, 4,696,270, Cl. 123-274.000.

Fewox, Cary M., to C&M Custom and Portable Kennels, Inc. Enclosure and housing facility for an animal. 4,696,259, Cl. 119-19.000.

Fiat Auto S.p.A.: *See*—
Palazzetti, Mario, 4,697,094, Cl. 307-40.000.

Fielding, Robert M.: *See*—
Billiet, Colin T.; Baggett, David; and Fielding, Robert M., 4,696,687, Cl. 55-316.000.

Fields, Thomas L.: *See*—
Child, Ralph G.; Fields, Thomas L.; Wilkinson, Raymond G.; and Lin, Yang-I, 4,696,936, Cl. 514-297.000.

Fields, Tom R. Portable step and carrying device for stud walls. 4,696,372, Cl. 182-92.000.

Figore, Timothy: *See*—
Ward, Thomas A.; Petracca, Victor G.; and Figore, Timothy, 4,696,864, Cl. 428-413.000.

Figueroa, Luis: *See*—
Slayman, Charles W.; and Figueroa, Luis, 4,696,648, Cl. 437-5.000.

Finetex, Inc.: *See*—
Novakovic, Mario; and Abend, Phillip G., 4,696,767, Cl. 252-557.000.

Finic, B.V.: *See*—
Ressi di Cervia, Arturo L., 4,696,607, Cl. 405-267.000.

Finley, Rufus E., to Unisys Corp. Asynchronous checkpointing system for error recovery. 4,697,266, Cl. 371-12.000.

Finn, Lyle D.; and Steele, Kenneth M., to Exxon Production Research Company. Pile assembly for an offshore structure. 4,696,604, Cl. 405-227.000.

Finn, Lyle D.: *See*—
Danaczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., 4,696,603, Cl. 405-227.000.

Firestone Tire & Rubber Company, The: *See*—
Koch, Russell W., 4,696,332, Cl. 152-367.000.

Fischer, Hermann: *See*—
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

Fischer, Robert; and de Ahna, Dieter, to Degussa Aktiengesellschaft. Inorganic pigments and process for their production. 4,696,700, Cl. 106-291.000.

Fitts, Renee A.; Hsiung, Nancy; and Hamer, Dean H., to Integrated Genetics, Inc. Vector encoding hepatitis B surface antigen. 4,696,898, Cl. 435-68.000.

Fitzsimmons, James R.: *See*—
Cheal, James; Fitzsimmons, James R.; and Foley, Edward J., 4,697,184, Cl. 342-28.000.

Flachglas Aktiengesellschaft: *See*—
Barteisen, Lutz, 4,697,082, Cl. 250-341.000.

Flaig, Ulrich; and Sieber, Albrecht, to Robert Bosch GmbH. Method for influencing the metering of fuel to an internal combustion engine. 4,696,276, Cl. 123-478.000.

Fleischer, Donald W., to Veeder Industries Inc. Electronic hub odometer. 4,697,278, Cl. 377-24.000.

Fletcher Sutcliffe Wild Ltd.: *See*—
Pentith, Gerald R. O., 4,696,391, Cl. 198-833.000.

Floyd, Don E., to Henkel Corporation. Aminopolyols and polyurethanes prepared therefrom. 4,696,771, Cl. 260-404.000.

Fogarty, Thomas J.: *See*—
Chin, Albert K., 4,696,304, Cl. 128-673.000.

Foley, Edward J.: *See*—
Cheal, James; Fitzsimmons, James R.; and Foley, Edward J., 4,697,184, Cl. 342-28.000.

Fonfria, Robert; Risbet, Marie P.; and Zattara, Jean L., to Compagnie Europeenne de Composants Electroniques LCC. Method for manufacturing electrolytic capacitors and capacitors thus obtained. 4,696,082, Cl. 29-25.420.

Forsheda AB: *See*—
Jornhagen, Lennart, 4,696,480, Cl. 277-53.000.

Foss, Robert M.: *See*—
Hooker, James R.; and Foss, Robert M., 4,696,776, Cl. 264-46.400.

Foster, Terry L.: *See*—
Brewer, John H.; and Foster, Terry L., 4,696,907, Cl. 436-513.000.

Foster Wheeler USA Corporation: *See*—
Albulescu, Marilena; and McMahon, Joseph F., 4,696,679, Cl. 48-203.000.

Foundation: The Research Institute for Special Inorganic Materials, The: *See*—
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,696,827, Cl. 427-36.000.

Fourezon, Andre , to Etablissements les Fils d'Auguste Chomarat & Cie. Textile reinforcement adapted to be used for making laminated complexes and process for obtaining same. 4,696,853, Cl. 428-257.000.

Fournier, Jeffrey: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, 4,696,758, Cl. 252-188.310.

Fowler, Daniel L., to Robertshaw Controls Company. Electrically operated control device and system for a microwave oven and method of making the same. 4,697,057, Cl. 219-10.55B.

Fox, Richard J., to United States of America, Energy. Fiber-type dosimeter with improved illuminator. 4,697,084, Cl. 250-376.000.

Fox, Roger H.: *See*—
Gardner, Arthur M. N.; and Fox, Roger H., 4,696,289, Cl. 128-64.000.

Foy, Michael W. Apparatus for attaching sail-board boom to mast. 4,696,249, Cl. 114-99.000.

Framatome: *See*—
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, 4,696,786, Cl. 376-245.000.
Lesauliner, Guy; and Savary, Fernand, 4,696,783, Cl. 376-228.000.

Framatome et Cogema "Fragema" : *See*—
Seli, Michel, 4,696,788, Cl. 376-253.000.

Frankl & Kirchner GmbH: *See*—
Rohr, Gustav; and Nohl, Gerd, 4,696,246, Cl. 112-272.000.

Franklin, Robert P., to Trans-World Manufacturing Corporation. Amphitheater display. 4,696,407, Cl. 211-183.000.

Franklin, Ronald A.: *See*—
Lind, Earl R.; and Franklin, Ronald A., 4,697,253, Cl. 367-12.000.

Franz, Thomas C.: *See*—
Burr, Donald N.; Danilowicz, Paul S.; Franz, Thomas C.; Mortimer, Thomas P.; and Pero, Edward B., 4,696,156, Cl. 60-39.080.

Frei, Bruno; and O'Sullivan, Anthony C., to Ciba-Geigy Corporation. 13β-milbemycin derivatives for controlling ecto- and endoparasites of plants and animals. 4,696,945, Cl. 514-450.000.

Frei, Siegfried; and Hohl, Ernst, to Siegfried Frei. Apparatus for applying a strip-shaped powder layer onto a weld seam of containers. 4,696,253, Cl. 118-308.000.

French, James C.: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; and Willmer, Neil E., 4,696,794, Cl. 424-118.000.

Frerichs, Udo: *See*—
Rach, Heinz-Dieter; and Frerichs, Udo, 4,696,333, Cl. 152-379.300.

Fricke, Gerhard: *See*—
Umland, Henning; and Fricke, Gerhard, 4,696,753, Cl. 252-26.000.

Friesen, Harold W.: *See*—
Beggs, Richard D.; Friesen, Harold W.; and Nutt, Wendell G., 4,697,051, Cl. 178-63.00D.

Frito-Lay, Inc: *See*—
Cipar, Martin S., 4,696,674, Cl. 800-1.000.

Fritz Studer AG: *See*—
Renker, Hansjoerg; and Abegglen, Martin, 4,696,839, Cl. 428-15.000.

Frizot, Alain; Cadaureille, Gerard; Lalere, Jean-Christophe; and Machuron, Jean-Yves, to Framatome. Process and device for adapting new upper internal equipment to the vessel of a pressurized water nuclear reactor. 4,696,786, Cl. 376-245.000.

Frolich, Heinrich: *See*—
Hertel, Hasso; Hunger, Klaus; and Frolich, Heinrich, 4,696,675, Cl. 8.669.000.

Frushour, James E., to International Business Machines Corporation. Printed circuit conductor test system. 4,697,142, Cl. 324-158.00R.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Harada, Mitsuyoshi, 4,696,266, Cl. 123-182.000.

Fuji Photo Film Co., Ltd.: *See*—
Deguchi, Naoyasu; Kojima, Tstsuro; Ohno, Shigeru; Nakamura, Koki; and Miyazaki, Hideo, 4,696,894, Cl. 430-551.000.
Kato, Mikihiko; Komine, Shigeo; Morita, Kazuhiko; and Okuzawa, Yasutoshi, 4,696,846, Cl. 428-65.000.
Miyoshi, Takahito; Aoki, Nobuo; Yoneyama, Takashi; Kasuga, Akira; Okutu, Toshimitu; Fujiyama, Masaaki; and Okuzawa, Yasutoshi, 4,696,859, Cl. 428-323.000.
Mizuta, Akira, 4,696,087, Cl. 29-434.000.
Ohara, Yuji, 4,697,269, Cl. 372-34.000.
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,696,858, Cl. 428-323.000.
Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; Tsukase, Masaaki; and Kato, Masatoshi, 4,696,887, Cl. 430-203.000.
Umemoto, Makoto; Nakamura, Kotaro; and Furutachi, Nobuo, 4,696,893, Cl. 430-543.000.

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Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, 4,697,210, Cl. 358-98.000.

Fuji Xerox Co., Ltd.: *See*—
Mita, Tsunemasa; Katoh, Ryoki; Sekimoto, Soichi; Shiratsuki, Yoshiyuki; and Arisawa, Hiroshi, 4,697,204, Cl. 357-74.000.

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Fujimi Kenmazai Kogyo Kabushiki Kaisha: *See*—
Kitano, Hirohito; Oowaki, Toshiki; and Baba, Takashi, 4,696,697, Cl. 106-3.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Yamashita, Tatsuo; Terada, Masafumi; and Suzuki, Koji, 4,696,895, Cl. 435-7.000.

Fujishiro, Takeshi; Takahashi, Sadahiro; and Kaneko, Takanobu, to Nissan Motor Company, Limited. Automotive suspension system with variable damping characteristics. 4,696,489, Cl. 280-707.000.

Fujita, Shinichiro: *See*—
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Okajima, Yoshinori, 4,697,104, Cl. 307-463.000.
Saito, Tadahiro; and Gotoh, Kunihiko, 4,697,140, Cl. 324-73.00R.
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Asano, Hideo; Makida, Kazuhisa; and Fujiwara, Kenichi, 4,696,627, Cl. 418-15.000.

Fujiyama, Masaaki: *See*—
Miyoshi, Takahito; Aoki, Nobuo; Yoseyama, Takashi; Kasuga, Akira; Okutu, Toshimitu; Fujiyama, Masaaki; and Okuzawa, Yasutoshi, 4,696,859, Cl. 428-323.000.

Fukami, Shoji: *See*—
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Mochizuki, Tadao; Nakajima, Akira; and Fukushima, Reizo, 4,696,740, Cl. 210-151.000.

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Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; and Miyake, Akira, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,696,869, Cl. 428-695.000.

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Furukawa, Toshihiko, to Sodick Co., Ltd. Apparatus for pattern controlled electrode movement for E.D.M. 4,697,059, Cl. 219-69.00W.

Furumura, Akio: *See*—
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,696,483, Cl. 280-6.00H.

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Kawai, Keiichi; Yasuda, Setsuo; and Sakaime, Zenichiro, 4,696,079, Cl. 17-33.000.

G. D. Searle & Co.: *See*—
Ellames, George J.; and Jaxa-Chamiec, Albert A., 4,696,928, Cl. 514-250.000.

GA Technologies Inc.: *See*—
Bourque, Robert F., 4,696,781, Cl. 376-136.000.

Gabbert, James D.: *See*—
Garner, Albert Y.; Gabbert, James D.; and Hedrick, Ross M., 4,696,977, Cl. 525-184.000.

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Gal, Laszlo V., to Unisys Corporation. Logic circuit having testability for defective via contacts. 4,697,139, Cl. 324-73.00R.

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Galensky, Duane; and Hammett, Warren G., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Bit compression multiplexing. 4,697,264, Cl. 370-111.000.

Galkowski, Joseph J., to United States of America, Energy. Copper vapor laser acoustic thermometry system. 4,697,270, Cl. 372-34.000.

Gallard, Herve: *See*—
Sicard, Claude; Kroczynski, Patrice; Gallard, Herve; Mars, Denis; and Devos, Michel, 4,697,239, Cl. 364-468.000.

Gallivan, Timothy J.: *See*—
Larson, Richard I.; Ringle, Richard P.; Connolly, John D., Jr.; and Gallivan, Timothy J., 4,696,769, Cl. 252-638.000.

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Gardner, Arthur M. N.; and Fox, Roger H., to Electro-Biology, Inc. Method of promoting venous pump action. 4,696,289, Cl. 128-64.000.

Gardner, Orian R. Device for assessing inclination. 4,696,111, Cl. 33-262.000.

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Garsee, Henry A.: *See*—
Butts, Gene A.; Kelley, Charles D.; Garsee, Henry A.; Petty, Bruce R.; and Pauley, James L., 4,697,236, Cl. 364-416.000.

Gat, Nahum, to TRW Inc. Pressure pump and injector valve system for liquid-propellant engines. 4,696,160, Cl. 60-258.000.

Gausepohl, Hermann: *See*—
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

Gauthier, Daniel: *See*—
Vialaron, Andre ; Olalde, Gabriel; and Gauthier, Daniel, 4,696,809, Cl. 423-579.000.

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Gebr. Happich GmbH: *See*—
Zwirner, Gerhard, 4,696,510, Cl. 296-97.00K.

Geeck, Joseph S., III. Power mower with blade-brake clutch. 4,696,150, Cl. 56-11.300.

Geerings, Michael P. W.; Christis, Wilhelmus J.; Fekkes, Wilhelmus F.; and Schmitz, Herman J. R., to U.S. Philips Corporation. Teletext signal processing circuit for a teletext receiver. 4,697,046, Cl. 178-1.000.

Geerts, Jean-Pierre: *See*—
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,942, Cl. 514-424.000.
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Gehring, Johann: *See*—
Birkle, Siegfried; and Gehring, Johann, 4,696,728, Cl. 204-213.000.

Geiger, Rolf; Gerhards, Hermann; and Kruse, Hansjorg, to Hoechst Aktiengesellschaft. Novel peptides which are active on the central nervous system and have an action on the cholinergic system. 4,696,913, Cl. 514-15.000.

Geiger, Wolfgang: *See*—
Habermann, Wolfgang; Hammes, Peter; Eagelhardt, Hubert; Geiger, Wolfgang; Haltrich, Walter; and Simmler, Werner, 4,696,749, Cl. 210-721.000.

Gemert, Barry V., to PPG Industries, Inc. Sulfamoyl urea derivatives. 4,696,695, Cl. 71-92.000.

General Coatings: *See*—
Sonck, Willy, 4,696,597, Cl. 405-12.000.

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Brunelle, Daniel J.; Guggenheim, Thomas L.; Boden, Eugene P.; Shannon, Thomas G.; and Guiles, Joseph W., 4,696,998, Cl. 528-272.000.
Harnden, John D., Jr.; Kornrumpf, William P.; Kohl, James E.; and Adler, Michael S., 4,697,118, Cl. 310-331.000.
Hobson, Robert R., 4,696,792, Cl. 376-377.000.
Janatpour, Mojtaba; and Shafer, Sheldon J., 4,697,034, Cl. 558-274.000.
Jarvinen, W. Bruce; and Lukas, Stephen J., 4,697,126, Cl. 318-331.000.
Larson, Richard I.; Ringle, Richard P.; Connolly, John D., Jr.; and Gallivan, Timothy J., 4,696,769, Cl. 252-638.000.
Penney, Carl M., 4,696,574, Cl. 356-375.000.
Peters, Edward N., 4,696,995, Cl. 528-206.000.
Roos, Hartog J.; and Schilling, Edward F., 4,697,075, Cl. 250-213.0VT.
Rosenquist, Niles R., 4,696,997, Cl. 528-271.000.
Thimineur, Raymond J.; and Raleigh, William J., 4,696,969, Cl. 524-762.000.
Towlson, Howard E., 4,696,722, Cl. 204-6.000.

General Foods Corporation: *See*—
Leusner, Steven J.; Raphael, Barbara C.; and Swanhart, William G., Jr., 4,696,826, Cl. 426-565.000.
Meczkowski, Frank J.; and Triani, Ronald J., 4,696,824, Cl. 426-102.000.

Genereaux, Eugene P.; Jameson, Samuel M.; and Brooks, Timothy K. Clamping apparatus. 4,696,460, Cl. 269-6.000.

Gentry, Cecil C., to Phillips Petroleum Company. Method for gas treatment of a bed of particles. 4,696,734, Cl. 208-407.000.

George Koch Sons, Inc.: *See*—
Spindler, Irvin, 4,696,254, Cl. 118-610.000.

Georgia Tech Research Corporation: *See*—
Legg, Keith O., 4,696,829, Cl. 427-38.000.

Gerhards, Hermann: *See*—
Geiger, Rolf; Gerhards, Hermann; and Kruse, Hansjorg, 4,696,913, Cl. 514-15.000.

Geri Engineering GmbH: *See*—
Wagner, Peter, 4,696,235, Cl. 104-124.000.

Gerin, Merlin: *See*—
Walter, Jean-Jacques; Petit, Daniel; Marzocca, Joseph; Amalric, Jean; and Bernard, Georges, 4,697,055, Cl. 200-148.00B.

Germond, Jean-Claude; and Clement, Gilles, to Commissariat a l'Energie Atomique. Tool holder robot for intervening in an enclosure having an access opening. 4,696,612, Cl. 414-8.000.

Germundson, Lars, to L G Innovations AB. Electric heating element. 4,697,063, Cl. 219-213.000.

Ghate, Madhav R.; and Yang, Ralph T., to United States of America, Energy. Method and apparatus for the selective separation of gaseous coal gasification products by pressure swing adsorption. 4,696,680, Cl. 55-25.000.

Ghosh, Sambhunath; Chynoweth, David P.; and Tarman, Paul B., to Institute of Gas Technology. Two phase anaerobic digestion. 4,696,746, Cl. 210-603.000.

Giere, David W., to Eaton Corporation. Hydrostatic transaxle and locking differential and brake therefor. 4,696,164, Cl. 60-485.000.

Gierenz, Gerhard: *See*—
Dierichs, Wolfgang; Gierenz, Gerhard; and Kraus, Gabriella, 4,696,836, Cl. 427-208.400.

Giese, David E.: *See*—
Hoover, John C.; and Giese, David E., 4,697,158, Cl. 333-1.100.

Giesselmann, Jurgen: *See*—
Ruetz, Georg; and Giesselmann, Jurgen, 4,696,620, Cl. 415-164.000.

Gillen, Gerard J., Jr. Composite reinforced concrete and timber pile section and method of installation. 4,696,605, Cl. 405-251.000.

Gilman, David J.: *See*—
Yellin, Tobias O.; and Gilman, David J., 4,696,933, Cl. 514-275.000.

Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, to Zambon S.p.A. Process for the preparation of optically active alpha-arylalkanoic acids and novel intermediates thereof. 4,697,036, Cl. 562-418.000.

Girard, Donald A. Ski which is stiff in torsion and relatively weak in beam. 4,696,487, Cl. 280-602.000.

Gist Brocades N.V.: *See*—
Robertson, Brian W.; and Phillips, Gareth T., 4,696,901, Cl. 435-180.000.

Gittos, Maurice W.; and Hibert, Marcel, to Merrell Dow Pharmaceuticals Inc. 4-(2-pyrimidinyl)-1-piperazinyl heterocyclic carbonyl derivatives. 4,696,927, Cl. 514-236.000.

Giurgea, Corneliu: *See*—
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,942, Cl. 514-424.000.

Givaudan Corporation: *See*—
Naipawer, Richard E., 4,696,766, Cl. 512-8.000.

Gjesdal, Harvey J., to Tektronix, Inc. Method for applying elastomeric support pads to rigid casings. 4,696,089, Cl. 29-451.000.

Glance, Bernard, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Single-photodiode optical heterodyne mixers. 4,697,284, Cl. 455-619.000.

Glasbau Hahn GmbH & Co.Kg.: *See*—
Hahn, Thomas O., 4,696,613, Cl. 414-11.000.

Glasscock, M. Sidney: *See*—
Danaczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., 4,696,603, Cl. 405-227.000.

Gleason, Kimberly R.: *See*—
Lockwood, Larry R.; Gleason, Kimberly R.; and Strid, Eric W., 4,697,143, Cl. 324-158.00P.

Glemser, Oskar; Buss, Dieter H.; and Bauer, Jurgen, to Varta Batterie Aktiengesellschaft. Positive electrode for alkaline storage cells. 4,696,875, Cl. 429-206.000.

Glibbery, Albert W., to National Transducer Corporation. Electronic weighing apparatus. 4,696,359, Cl. 177-211.000.

Glomeau, J. Robert, to REXA Corporation. Control valve and hydraulic system employing same. 4,696,163, Cl. 60-476.000.

Glory Kogyo Kabushiki Kaisha: *See*—
Hiraoka, Shigeaki; and Seo, Takamasa, 4,697,071, Cl. 235-379.000.

Glucksman, Dov Z. Electric hair curling waved with improved heating element arrangement. 4,697,066, Cl. 219-225.000.

Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, to UCB Societe Anonyme. Treatment of memory impairment using (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide. 4,696,942, Cl. 514-424.000.

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Goel, Anil B., to Ashland Oil, Inc. Thiol carbamates as latent accelerators for curing epoxy resins. 4,696,992, Cl. 528-90.000.

Goetz, Michael A.: *See*—
Houck, David R.; Inamine, Edward S.; and Goetz, Michael A., 4,696,925, Cl. 514-219.000.

Goetze AG: *See*—
Johnen, Rolf; Kirch, Hans; and Otto, Volkmar, 4,696,657, Cl. 464-93.000.

Goff, Jerry K.; and Chizever, Gary E., to Performance Controls, Inc. Method and apparatus for determining shaft position and for providing commutation signals. 4,697,125, Cl. 318-254.000.

Goldberg, Marvin C.; Cunningham, Kirkwood M.; and Weiner, Eugene R., to United States of America, Interior. Suspended sediment sensor. 4,696,571, Cl. 356-336.000.

Golden Enterprises, Inc.: *See*—
Winter, Walter W.; Gothard, Steven E.; and Drew, John H., 4,697,282, Cl. 379-67.000.

Gonczy, John D.: *See*—
Niemann, Ralph C.; Gonczy, John D.; and Nicol, Thomas H., 4,696,169, Cl. 62-514.00R.

Gonzalez, Wayne H.: *See*—
Lawhon, Robert A.; Heithoff, Robert B.; and Gonzalez, Wayne H., 4,696,691, Cl. 65-27.000.

Goodman, Joseph R.: *See*—
Coller, James R.; and Goodman, Joseph R., 4,696,525, Cl. 439-69.000.

Goodyear Tire & Rubber Company, The: *See*—
Halasa, Adel F.; and Cunningham, Robert E., 4,696,986, Cl. 526-181.000.

Goof, Sven K. L. Tooth cleaning instrumeat. 4,696,644, Cl. 433-88.000.

Gordon, Alan J.; and Billington, Donald G., to Shandon Southern Products Limited. Centrifugation. 4,696,743, Cl. 210-361.000.

Gorges, Frederick J., to Boeing Company, The. Ball support assembly. 4,696,583, Cl. 384-49.000.

Gothard, Steven E.: *See*—
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Goto, Tukasa: *See*—
Nanba, Sinzi; Matsui, Kazuma; Mizuno, Toru; and Goto, Tukasa, 4,696,193, Cl. 73-861.220.

Gotoh, Kunihiko: *See*—
Kousaka, Kunimitsu; and Gotoh, Kunihiko, 4,697,154, Cl. 330-277.000.
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Gouzoules, Glenn P.: *See*—
Baratti, James J.; McCollough, Mike; and Gouzoules, Glenn P., 4,697,279, Cl. 377-73.000.

Graba, James M.: *See*—
O'Keeffe, Michael J.; Graba, James M.; and Noyes, George I., 4,697,167, Cl. 340-347.0DD.

Graf, Hans-Juergen; and Randke, Peter T., to Air Products and Chemicals, Inc. Large breakseal actuator with built-in valve. 4,696,411, Cl. 220-281.000.

Grafe, Ingomar: *See*—
Kisielowski, Lothar; Grafe, Ingomar; Liebenow, Walter; and Ahrens, Kurt H., 4,697,035, Cl. 558-344.000.

Graham, Robert F., Jr.: *See*—
Buddecke, Charles L.; and Graham, Robert F., Jr., 4,697,157, Cl. 331-78.000.

Graham-Troll, Dennis, to Molins PLC. Paper feed for cigarette making machines. 4,696,310, Cl. 131-105.000.

Grain Processing Corporation: *See*—
Kiser, Donald L., 4,696,720, Cl. 203-19.000.

Grasselli, Robert K.: *See*—
Henderson, Richard S.; Tenhover, Michael A.; and Grasselli, Robert K., 4,696,703, Cl. 148-403.000.

Grasser Katalin: *See*—
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.

Grauel, Christoph; Kittel, Ludwig; Schmidt, Werner; and Wellens, Ulrich, to U.S. Philips Corporation. Method of and arrangement for transmitting messages in a digital radio transmission system. 4,697,260, Cl. 370-18.000.

Grave, Dale L. Filter structure. 4,696,075, Cl. 15-321.000.

Gray, Bennie M.: *See*—
Link, Charles T.; Gray, Bennie M.; and Shumaker, Harold L., 4,696,223, Cl. 92-86.500.

Gray, George W.: *See*—
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidenschink, Rudolf; and Romer, Michael, 4,696,549, Cl. 350-350.00R.

Great Lakes Chemical Corporation: *See*—
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Green, LaVerne M.; Vannoni, Adrio L.; and Pummell, Ivan K., to Micro Electronic Systems, Inc. Reworking methods and apparatus for surface mounted technology circuit boards. 4,696,096, Cl. 29-829.000.

Green, Michael J.; and Saksena, Anil K., to Schering Corporation. Topical Treatment of hyperproliferative skin diseases. 4,696,946, Cl. 514-574.000.

Greenberg, Dan. Ejector and method of fabrication. 4,696,625, Cl. 417-174.000.

Greenwood, Walter L., to Allen Organ Company. Manually controlled performance apparatus for electronic musical instrument. 4,696,215, Cl. 84-1.030.

Gregory, Ted W., to Arens Controls, Inc. Push-pull vernier control and method of manufacture thereof. 4,696,203, Cl. 74-501.00R.

Gregson, Donald L.; and McGuigan, John J., to Harris Corporation. Removable blade assembly. 4,696,090, Cl. 29-566.400.

Greischel, Andreas: *See*—
Schepky, Gottfried; Brickl, Rolf; Rupprecht, Eckhard; and Greischel, Andreas, 4,696,815, Cl. 424-80.000.
Greszczuk, Longin B., to McDonnell Douglas Corporation. Method for forming holes in composites. 4,696,711, Cl. 156-173.000.
Grewe, Ronald E., to Marketing Displays, Inc. Simulated pipe construction. 4,696,136, Cl. 52-222.000.
Griffin, Kevin W.; and Mallette, Robert P. Method of using logic design adhesive symbols. 4,696,706, Cl. 156-62.000.
Grill, Edward. Signalling device. 4,696,252, Cl. 116-210.000.
Grimsby, F. Norman: *See*—
Blytas, George C.; Grimsby, F. Norman; and Scamehorn, John F., 4,696,726, Cl. 204-182.400.
Grinberg, Jan; and Yamagishi, Frederick G., to Hughes Aircraft Company. Method of performing matrix by matrix multiplication. 4,697,247, Cl. 364-713.000.
Grochal, Tadeusz; Rygielski, Roman; and Wierzchowski, Wojciech, to Instytut Odlewnictwa. Apparatus for anticipation of structure of casting alloys and particularly the degree of spheroidization of cast iron. 4,696,337, Cl. 164-150.000.
Grossmann, Steffen: *See*—
Bohme, Helmut; Lobl, Helmut; and Grossmann, Steffen, 4,696,531, Cl. 439-851.000.
Grothaus, Roger H.; and Hildebrandt, Donald W., to S. C. Johnson & Son, Inc. Method of trapping flying insects. 4,696,126, Cl. 43-112.000.
Groupement d'Interet Economique dit: Centre International 'de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; Lang, Gerard; and Maignan, Jean, 4,696,941, Cl. 514-423.000.
Grunert, Kurt A.; and Farley, James R., to Westinghouse Electric Corp. Circuit breaker with impact trip delay. 4,697,163, Cl. 335-174.000.
Grunst, Heinz; and Kleine, Heinz. Electrical apparatus, particularly apparatus for installation. 4,697,223, Cl. 361-393.000.
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Obayashi, Tsutomo; Watanabe, Shinobu; and Ino, Kazuhide, 4,696,830, Cl. 427-41.000.
Hiraoka, Shigeaki; and Seo, Takamasa, to Glory Kogyo Kabushiki Kaisha. Circulation type automatic money receiving and paying machine with note side identifying and note turning-over sections. 4,697,071, Cl. 235-379.000.
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Hiratsuka, Seiichiro: *See—*
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,696,880, Cl. 430-42.000.
Hirose, Ichiro: *See—*
Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-422.000.
Hiroshima, Kazuo: *See—*
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,696,483, Cl. 280-5.00H.
Hitachi Computer Engineering Co., Ltd.: *See—*
Hirai, Masato; Kurata, Masami; and Yoshino, Ryozo, 4,697,047, Cl. 178-2.00C.
Hitachi, Ltd.: *See—*
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Honma, Noriyuki; Kitsukawa, Goro; and Suzuki, Makoto, 4,697,109, Cl. 307-475.000.
Ishitani, Tohru; Tamura, Hifumi; and Umemura, Kaoru, 4,697,086, Cl. 250-492.200.
Jinriki, Tatenori; and Kozawa, Fusaaki, 4,696,202, Cl. 74-479.000.
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,697,121, Cl. 313-595.000.
Komori, Kazuhiro; Kuroda, Kenichi; and Okuyama, Kousuke, 4,697,198, Cl. 357-23.300.
Masuda, Noboru; Asano, Michio; Hayashi, Takehisa; Tanaka, Hirotoshi; and Masaki, Akira, 4,697,110, Cl. 307-475.000.
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; and Sugaya, Toyomi, 4,697,128, Cl. 318-607.000.
Mitsumaki, Hiroshi; Ono, Naoya; Shindo, Isao; and Takano, Nobuyoshi, 4,696,183, Cl. 73-19.000.
Mori, Hideharu; Koyama, Shozi; and Yamazaki, Masahiro, 4,696,689, Cl. 62-32.000.
Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.
Sakaguchi, Isao; and Kawaide, Tatsuo, 4,696,831, Cl. 427-48.000.
Shiibayashi, Masao; and Murayama, Akira, 4,696,629, Cl. 418-55.000.
Wakai, Katsuro, 4,697,267, Cl. 371-25.000.
Hitachi Maxell, Ltd.: *See—*
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Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.
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Hobbs-Adams Engineering Company: *See—*
Hobbs, Oliver K., 4,696,151, Cl. 56-14.600.
Hobbs, Oliver K., to Hobbs-Adams Engineering Company. Separator system for peanut combine. 4,696,151, Cl. 56-14.600.
Hobson, Robert R., to General Electric Company. Nuclear reactor coolant recirculation. 4,696,792, Cl. 376-377.000.
Hochreuther, Karl, to Brown, Boveri & Cie AG. Housing for a measuring device. 4,696,189, Cl. 73-431.000.
Hochtemperatur-Reaktorbau GmbH: *See—*
Elter, Claus; and Schoening, Josef, 4,696,790, Cl. 376-296.000.
Hockings, Eric F.: *See—*
Alig, Roger C.; Bloom, Stanley; and Hockings, Eric F., 4,697,120, Cl. 313-412.000.
Hodges, Daryl H. Examining apparatus. 4,696,546, Cl. 350-235.000.
Hodogaya Chemical Co., Ltd.: *See—*
Kurosu, Yasuhisa; Kawada, Hiroshi; Kanasugi, Haruki; and Hosokawa, Akio, 4,696,947, Cl. 514-478.000.
Hoechst Aktiengesellschaft: *See—*
Buhr, Gerhard, 4,696,888, Cl. 430-270.000.
Dursch, Walter; Herwig, Walter; and Engelhardt, Friedrich, 4,696,987, Cl. 526-216.000.
Geiger, Rolf; Gerhards, Hermann; and Kruse, Hansjorg, 4,696,913, Cl. 514-15.000.
Guzzi, Alberto, 4,696,891, Cl. 430-325.000.
Hertel, Hasso; Hunger, Klaus; and Frolich, Heinrich, 4,696,675, Cl. 8-669.000.

Hoekman, Earl B., to Minnesota Mining and Manufacturing Company. Method for minimizing false alarms and electronic noise in electronic article surveillance systems. 4,697,170, Cl. 340-551.000.
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Henke, Klaus; and Wozniak, Johannes, 4,696,520, Cl. 301-63.0DS.
Krug, Ulrich, 4,696,586, Cl. 384-500.000.
Hofer, Dean A.; Carlson, Daniel J.; and Pecak, Matthew L., to Texas Instruments Incorporated. Two arm planar/conical/helix antenna. 4,697,192, Cl. 343-895.000.
Hoffer, Roy D., to Armstrong World Industries, Inc. Slow acting photo lamp control. 4,697,122, Cl. 315-158.000.
Hoffman, George J., to Condor Pacific Industries, Inc. Bore hole navigator. 4,696,112, Cl. 33-304.000.
Hoffman, Jerzy, to Dynatech/U-Z, Inc. Multiposition microwave switch with extended operational frequency range. 4,697,056, Cl. 200-153.00S.
Hoffmann-La Roche Inc.: *See—*
Horecker, Bernard L., 4,696,915, Cl. 514-21.000.
Merkli, Bernhard, 4,696,921, Cl. 514-157.000.
Mullin, John G., Jr.; Nakamura, Keiji; Tilley, Jefferson W.; and Watanabe, Hiroshi, 4,696,930, Cl. 514-256.000.
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Hokoku Chain Co., Ltd.: *See—*
Kanayama, Hitoshi, 4,696,236, Cl. 104-165.000.
Holland, John H.; and Burks, Arthur W. Adaptive computing system capable of learning and discovery. 4,697,242, Cl. 364-513.000.
Hollingsworth (UK) Limited: *See—*
Whiteley, John, 4,696,436, Cl. 242-35.50R.
Holt, Nicholas P.: *See—*
Desyllas, Peter L. L.; Holt, Nicholas P.; and Naven, Finbar, 4,697,268, Cl. 371-67.000.
Holtzclaw, James O., Jr.; and Novotny, Marvin A., to Hunter Company, Inc., The. Holster. 4,696,419, Cl. 224-243.000.
Homen, Manny. Weighing apparatus and method for use in weighing live fish. 4,696,360, Cl. 177-262.000.
Homer, David A.: *See—*
Doerman, Eryk S.; Turner, William J.; Homer, David A.; Stewart, Andrew D. G.; and Clarke, Ian, 4,696,358, Cl. 177-145.000.
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Aoki, Takashi; Fukuda, Yukihiro; and Nishikawa, Masao, 4,696,383, Cl. 192-70.120.
Otobe, Yutaka; Suzuki, Yoshio; Kimura, Shigehiro; and Ohsawa, Naoki, 4,696,273, Cl. 123-417.000.
Yagasaki, Akio; and Marishima, Kazuo, 4,696,509, Cl. 296-84.00A.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Kato, Akira; Otobe, Yutaka; and Kimura, Shigehiro, 4,696,272, Cl. 123-339.000.
Mishima, Yoshibumi, 4,696,224, Cl. 92-187.000.
Mitobe, Keiichi; and Kubo, Kanji, 4,696,488, Cl. 280-690.000.
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Arimitsu, Hiroshi; Hatano, Kiyoshi; Nakanishi, Teruyuki; Yoshimura, Yoshio; Urabe, Masaki; and Honda, Tsurakazu, 4,697,179, Cl. 340-825.720.
Honeywell Inc.: *See—*
Bohan, John E., Jr., 4,696,639, Cl. 431-59.000.
Higashi, Robert E., 4,696,188, Cl. 73-204.000.
Webb, Winston S., 4,696,501, Cl. 294-86.400.
Honig, Richard E.: *See—*
Magee, Charles W.; and Honig, Richard E., 4,697,085, Cl. 250-426.000.
Honma, Noriyuki; Kitsukawa, Goro; and Suzuki, Makoto, to Hitachi, Ltd. Level converter circuit. 4,697,109, Cl. 307-475.000.
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Honroth, Walter: *See—*
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Hooker, James R.; and Foss, Robert M., to Motorola, Inc. Method of producing polyurethane foams for low stress encapsulation. 4,696,776, Cl. 264-46.400.
Hooper, John D.: *See—*
Chard, Brian C.; Hooper, John D.; and Bale, Christopher R., 4,696,311, Cl. 131-109.100.
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Donaldson, Richard E.; and Hoops, John F., 4,697,024, Cl. 549-444.000.
Hoover, Gregory A., to Sonoco Products Company. Bottle bag. 4,696,403, Cl. 206-602.000.
Hoover, John C.; and Giese, David E., to Electromagnetic Sciences, Inc. Reduced height waveguide circulator. 4,697,158, Cl. 333-1.100.
Hordonneau, Alain: *See—*
Minjolle, Louis; Drouet, Claudette; Hordonneau, Alain; and Capdepuy, Bernard, 4,696,710, Cl. 156-89.000.
Horecker, Bernard L., to Hoffmann-La Roche Inc. Parathymosin alpha. 4,696,915, Cl. 514-21.000.
Horgan, John J., to United Technologies Corporation. Gas turbine outlet arrangement. 4,696,159, Cl. 60-226.100.
Horie, Fujio, to Brother Kogyo Kabushiki Kaisha. Feed device for a sewing machine. 4,696,247, Cl. 112-315.000.
Horie, Hiromichi: *See—*
Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; Morita, Mikio; and Kamohara, Hisato, 4,696,725, Cl. 252-62.540.
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Horiuchi, Shigenori: *See—*
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HORTMANN GmbH: *See—*
Hortmann, Guenther; Kunick, Klaus; and Fenner, Hans, 4,696,287, Cl. 128-1.00R.
Hortmann, Guenther; Kunick, Klaus; and Fenner, Hans, to HORTMANN GmbH. Transmission system for implanted hearing aids. 4,696,287, Cl. 128-1.00R.
Horvah, Laszlo S., to C O D Inter Techniques SA. Assembly robot with reaction absorbing platform. 4,696,351, Cl. 173-32.000.
Hosaka, Akihito: *See—*
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Hoshino, Yoshihiro; and Matsui, Kazuhiro, to Hoshino Gakki Co., Ltd. Fastening means for guitar strings. 4,696,218, Cl. 84-297.00R.
Hosokawa, Akio: *See—*
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Houck, David R.; Inamine, Edward S.; and Goetz, Michael A., to Merck & Co., Inc. Cholecystokinin antagonist compounds. 4,696,925, Cl. 514-219.000.
Houghton, James R.: *See—*
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Brooks, Edward, 4,696,378, Cl. 188-170.000.
Howbrook, Ernest, to Verify Electronics Limited. Position sensing apparatus. 4,697,144, Cl. 324-207.000.
Howe, Phillip D.: *See—*
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Howe, Steven R.; and Howe, Phillip D., to An-Tech International Livestock Products, Inc. Animal identification device and applicator therefor. 4,696,119, Cl. 40-301.000.
Howell, Larry: *See—*
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Howkins, Stuart D., to Exxon Printing Systems, Inc. Method of operating an ink jet having high frequency stable operation. 4,697,193, Cl. 346-1.100.
Howlett, Donald L., to Texaco Inc. Implosion type energy source for seismic exploration. 4,697,255, Cl. 367-146.000.
Hoya Corporation: *See—*
Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, 4,696,551, Cl. 350-358.000.
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Matsui, Shigekazu; Kagaya, Kenichi; Ushida, Masao; and Maruyama, Kouichi, 4,696,877, Cl. 430-5.000.
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Hoyt, Robert E.: *See—*
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Hsiung, Nancy: *See—*
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Hsueh, Limin, to Chevron Research Company. Hasdrive with multiple offset producers. 4,696,345, Cl. 166-245.000.
Huang, Kuo C. Fan motor assembly support frame. 4,696,450, Cl. 248-661.000.
Huat, Mok K. Discharge assembly. 4,696,414, Cl. 222-67.000.
Huber, Alain, to Valeo. Clutch cover assembly and clutch incorporating same. 4,696,384, Cl. 192-70.270.
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Hughes Aircraft Company: *See—*
Baratti, James J.; McCollough, Mike; and Gouzoules, Glenn P., 4,697,279, Cl. 377-73.000.
Buddecke, Charles L.; and Graham, Robert F., Jr., 4,697,157, Cl. 331-78.000.
Clark, Robert T., 4,697,160, Cl. 333-103.000.
Grinberg, Jan; and Yamagishi, Frederick G., 4,697,247, Cl. 364-713.000.
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Slayman, Charles W.; and Figueroa, Luis, 4,696,648, Cl. 437-5.000.
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Humco, Inc.: *See—*
Hummel, Gene S.; and Hummel, Mark L., 4,696,368, Cl. 180-309.000.
Hummel, Gene S.; and Hummel, Mark L., to Humco, Inc. Method of protecting vehicle exhaust system. 4,696,368, Cl. 180-309.000.
Hummel, Mark L.: *See—*
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Hunter Company, Inc., The: *See—*
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Hunter, Richard G.: *See—*
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Hurtz, Georg; Steufmehl, Willi; and Krappen, Wolfgang, to Wirth Maschinen- und Bohrgerate-Fabrik GmbH. Method and apparatus for modifying the cross-sectional profile of an adit, tunnel or the like. 4,696,600, Cl. 405-138.000.
Husain, Syed A.: *See—*
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I.G. Bauerhin GmbH Electro-Technische Fabrik: *See—*
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Ichiki, Tetsuji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,696,214, Cl. 84-1.010.
Ichikoh Industries Limited: *See—*
Enomoto, Masao, 4,696,555, Cl. 350-634.000.
ICI Americas Inc.: *See—*
Yellin, Tobias O.; and Gilman, David J., 4,696,933, Cl. 514-275.000.
Iff, Rene, to Neotecha AG. Plastic lined rotatable valve. 4,696,323, Cl. 137-375.000.
Igarashi, Yuriko: *See—*
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Ikai, Takasi: *See—*
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Ikenaka, Tokuji; and Omichi, Kaoru, to Wako Pure Chemical Industries, Ltd. Modified oligosaccharides used as substrate for measuring α-amylase activity. 4,697,006, Cl. 536-17.200.
Ikita, Takao: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhashi, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,696,724, Cl. 204-27.000.
Ikushima, Kazuo: *See—*
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Imanaka, Yoshiaki, to Sharp Kabushiki Kaisha. Cleaning device for a monochromatic copying machine. 4,696,565, Cl. 355-15.000.
Imperial Chemical Industries PLC: *See—*
Devonald, David P.; Nelson, Anthony J.; Quan, Peter M.; and Stewart, David, 4,696,801, Cl. 423-24.000.
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Imperial Group Public Limited Company: *See—*
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Inaba, Tsutomu: *See—*
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Inaba, Yoshiharu, to Fanuc Ltd. Mold opening/closing speed control device. 4,696,632, Cl. 425-150.000.
Inaba, Yutaka; Satomura, Hiroshi; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Hosaka, Akihito, to Canon Kabushiki Kaisha. Electrostatic recording method and apparatus. 4,697,196, Cl. 346-159.000.
Inamine, Edward S.: *See—*
Houck, David R.; Inamine, Edward S.; and Goetz, Michael A., 4,696,925, Cl. 514-219.000.
Incitti, Corkey. Camp stove. 4,696,282, Cl. 126-9.00R.
Independent Broadcasting Authority: *See—*
Tonge, Gary J., 4,697,206, Cl. 358-14.000.
Industrial Innovations, Inc.: *See—*
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Ingersoll Milling Machine Company, The: *See—*
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Ino, Kazuhide: *See—*
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Inoue, Kenichi: *See—*
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Institut de Recherches de la Construction Navale: *See—*
Sicard, Claude; Kroczynski, Patrice; Gallard, Herve; Mars, Denis; and Devos, Michel, 4,697,239, Cl. 364-468.000.
Institut de Recherches de la Siderurgie Francaise: *See—*
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Institut National de la Sante et de la Recherche Medicale (INSERM): *See—*
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Instytut Odlewnictwa: *See—*
Grochal, Tadeusz; Ryglicki, Roman; and Wierzchowski, Wojciech, 4,696,337, Cl. 164-150.000.
Integrated Genetics, Inc.: *See—*
Fitts, Renee A.; Hsiung, Nancy; and Hamer, Dean H., 4,696,898, Cl. 435-68.000.
Intel Corporation: *See—*
Newton, Edward L.; and Swendrowski, Steven D., 4,696,526, Cl. 439-68.000.
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Santini, Hugo A. A., 4,696,729, Cl. 204-224.00R.
International Business Machines Corporation: *See—*
Bissinger, Werner D., 4,696,717, Cl. 156-642.000.
Bonaccio, Anthony R., 4,697,099, Cl. 307-355.000.
Chappell, Barbara A.; and Schuster, Stanley E., 4,697,108, Cl. 307-475.000.
Decker, Dale D.; and Stanhope, Mary E., 4,696,426, Cl. 232-43.100.
Frushour, James E., 4,697,142, Cl. 324-158.00R.
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Mueller, Wolfgang F., 4,697,058, Cl. 219-56.210.
Stich, Michael C.; Resman, John B.; Ottesen, Hjalmar H.; and Anderson, Todd B., 4,697,127, Cl. 318-561.000.
International Computers Limited: *See—*
Desyllas, Peter L. L.; Holt, Nicholas P.; and Naven, Finbar, 4,697,268, Cl. 371-67.000.
Spillar, Alan; and Desyllas, Peter L. L., 4,697,234, Cl. 364-200.000.
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Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,696,676, Cl. 44-7.500.
Irland, Thomas E. Fixture for a router. 4,696,331, Cl. 144-134.00D.
Isaksen, Robert A.: *See—*
Jones, Wallace R.; and Isaksen, Robert A., 4,696,848, Cl. 428-40.000.
Ishida, Mikio: *See—*
Ishimori, Shozo; Ishida, Mikio; Miki, Hiroyuki; Ishiizumi, Seiichi; and Hirata, Kazuo, 4,696,365, Cl. 180-233.000.
Ishiguro, Fujio; and Maeda, Hideo, to NGK Insulators, Ltd. Ceramic heater and a method of manufacturing the same. 4,697,165, Cl. 338-34.000.
Ishii, Taira: *See—*
Misawa, Yoshihiko; Ishii, Taira; and Maeda, Yoshinobu, 4,696,424, Cl. 227-84.000.

Ishiizumi, Seiichi: *See—*
Ishimori, Shozo; Ishida, Mikio; Miki, Hiroyuki; Ishiizumi, Seiichi; and Hirata, Kazuo, 4,696,365, Cl. 180-233.000.
Ishikawa, Fumihiko, to Shikoku Denryoku Kabushiki Kaisha. Inverter system for inputting alternating current and direct current in combination. 4,697,136, Cl. 323-267.000.
Ishikawa, Keisuke, to Alps Electric Co., Ltd. Casing for electronic devices. 4,697,044, Cl. 174-35.00R.
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Isobe, Mitsuo: *See—*
Ohtani, Takayuki; Isobe, Mitsuo; Aono, Akira; and Urakawa, Nobuaki, 4,697,112, Cl. 307-530.000.
Isoport Verbandbauteile Ges. m.b.H.: *See—*
Woltron, Herbert; and Huber, Christian, 4,696,459, Cl. 267-36.100.
Isover Saint-Gobain: *See—*
Cousin, Stephane; and Boumendil, Jean-Paul, 4,696,847, Cl. 428-76.000.
Isoyama, Toyoshiro; Yasuyuki, Goto; Ogawa, Tetsuya; and Sugimori, Shigeru, to Chisso Corporation. Ester compound. 4,696,759, Cl. 252-299.620.
Itabashi, Mitsuharu: *See—*
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Itagaki, Takaharu; Kusano, Hiroshi; Miyata, Eiji; and Kubota, Hirohisa, to Mitsubishi Chemical Industries Ltd. Separating agent with fluoroalkyl group. 4,696,745, Cl. 210-502.100.
Itek Corporation: *See—*
Hutchin, Richard A., 4,696,573, Cl. 356-353.000.
Ito, Kazuo; Kudo, Toshiyuki; and Hama, Ritsuo, to Sanyo Electric Co., Ltd. Thermally improved photodetector having a roughened, recessed, raised or inclined light receiving surface. 4,697,074, Cl. 250-211.00R.
Ito, Shigenori, to NGK Insulators, Ltd. Composite ceramic structure and method for manufacturing the same. 4,696,777, Cl. 264-60.000.
Ito, Toshimitsu; and Murata, Chigaku, to Toyota Jidosha Kabushiki Kaisha. Method and device for control of internal combustion engine at end of fuel cut off. 4,696,278, Cl. 123-493.000.
Ito, Toshinobu: *See—*
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,696,267, Cl. 123-192.00B.
Ito, Yukio: *See—*
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Itoh, Takuyuki: *See—*
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ITT Corporation: *See—*
Heesch, Max O., 4,696,515, Cl. 297-374.000.
Iversen, Arthur H. Liquid cooled ferrofluid-type rotating seals. 4,696,481, Cl. 277-80.000.
Iwadachi, Takaharu: *See—*
Takeuchi, Kazumasa; Iwadachi, Takaharu; and Ikushima, Kazuo, 4,696,704, Cl. 148-412.000.
Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, to Kabushiki Kaisha Toshiba; Toshiba Micro-Computer Engineering Corp.; and Tosbac Computer System Co., Ltd. Read/write control circuit. 4,697,101, Cl. 307-452.000.
Iwamura, Yoshio: *See—*
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Izuo, Takashi: *See—*
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Izuwa, Akio; and Yamaguchi, Tadanobu, to Mitsubishi Jukogyo Kabushiki Kaisha. Electronic beam welding method for screen cylinder. 4,697,060, Cl. 219-121.0ED.
Izzi, Anthony J., to Mateer Burt Co., Inc. Feedback control for automatic filling machine. 4,696,329, Cl. 141-1.000.
J. I. Case Company: *See—*
Harwood, J. Richard; and Bell, Frank A., 4,696,349, Cl. 172-323.000.
Jack, James: *See—*
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Jacobelli, Alain: *See—*
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Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., to United States of America, Health and Human Services. Biologically-active xanthine derivatives. 4,696,932, Cl. 514-263.000.
James A. Rhodes & Associates: *See—*
Wren, Michael; Lantz, Paul W.; Acock, George W., Jr.; and Rhodes, James A., 4,696,133, Cl. 52-80.000.
Jameson, Samuel M.: *See—*
Genereaux, Eugene P.; Jameson, Samuel M.; and Brooks, Timothy K., 4,696,460, Cl. 269-6.000.
Janatpour, Mojtaba; and Shafer, Sheldon J., to General Electric Company. Process for making diaryl carbonates. 4,697,034, Cl. 558-274.000.
Janes, Norman F.: *See—*
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,696,944, Cl. 514-531.000.
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Japan Tobacco, Inc.: *See—*
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Jarvinen, W. Bruce; and Lukas, Stephen J., to General Electric Company. Control method for direct current motor. 4,697,126, Cl. 318-331.000.
Jaxa-Chamiec, Albert A.: *See—*
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Jenning, Michael; and Mackenthun, Holger, to Angewandte Digital Elektronik. Means for non-contacting signal and energy transmission. 4,697,183, Cl. 340-870.250.
Jensen, Eric A.; Hitchin, James; Tsai, Albert G.; and Arrhenius, Gustaf O., to Thermal Energy Stroage, Inc. Latent heat storage and transfer system and method. 4,696,338, Cl. 165-1.000.
JEOL Ltd.: *See—*
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Jige, Masanobu: *See—*
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Jinriki, Tatenori; and Kozawa, Fusaaki, to Hitachi, Ltd. Wrist mechanism for industrial robot. 4,696,202, Cl. 74-479.000.
Johansson, Bjorn-Olow: *See—*
Bolmstedt, Ulf; and Johansson, Bjorn-Olow, 4,696,341, Cl. 165-101.000.
John Fluke Mfg. Co., Inc.: *See—*
Epperson, David L., 4,696,860, Cl. 428-325.000.
Johnen, Rolf; Kirch, Hans; and Otto, Volkmar, to Goetze AG. Elastic shaft coupling for transmission of torque between shafts. 4,696,657, Cl. 464-93.000.
Johnson, Howard B., to Consolidated Ceramic Products, Inc. Zircon and MgO preheatable insulating refractory liners and methods of use thereof. 4,696,455, Cl. 266-44.000.
Johnson & Johnson Baby Products Company: *See—*
Lukenbach, Elvin R.; Naik-Satam, Prakash; and Schwartz, Anthony M., 4,696,773, Cl. 260-513.00R.
Johnson, Lee A., Sr. Clutch and brake apparatus. 4,696,381, Cl. 192-17.00R.
Johnson Matthey Public Limited Company: *See—*
Stoddart, James F.; and Alston, David R., 4,696,918, Cl. 514-58.000.
Joliot, A. Pierre; and Beal, Daniel, to Centre National de la Recherche Scientifique (C.N.R.S.). Spectrophotometer with statistically balanced light for very high resolution. 4,696,570, Cl. 356-319.000.
Jones, Howard: *See—*
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,696,939, Cl. 514-361.000.
Jones, Michael M.; Miller, Walter E., Jr.; and Mitchell, Robert R., to United States of America, Army. Missile referenced beamrider. 4,696,441, Cl. 244-3.130.
Jones, Roger E.: *See—*
Extance, Philip; and Jones, Roger E., 4,697,146, Cl. 324-244.000.
Pitt, Gilles D.; Extance, Philip; and Jones, Roger E., 4,696,543, Cl. 350-96.230.
Jones, Wallace R.; and Isaksen, Robert A., to Excello Specialty Company, The. Surface protector with expansible pocket. 4,696,848, Cl. 428-40.000.
Jornhagen, Lennart, to Forsheda AB. Device for removing dirt from a surface, especially a brush sealing device. 4,696,480, Cl. 277-53.000.
Jost, Manfred; Knoke, Jurgen; Yoshida, Zenji; Ohta, Noburo; and Nakanishi, Terumo, to Carl Freudenberg, Firma. Iron-on interlining composite of knit layer and nonwoven layer of similar structure. 4,696,850, Cl. 428-197.000.
Jurs, Jeffry W.: *See—*
Boytor, Samuel G.; and Jurs, Jeffry W., 4,697,231, Cl. 364-188.000.
Kabelmetal Electro Gesellschaft mit beschrankter Haftung: *See—*
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Higashino, Hiroyuki; and Ohkawa, Hideki, 4,696,721, Cl. 204-3.000.

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Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, 4,697,101, Cl. 307-452.000.

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Ono, Akira, 4,696,572, Cl. 356-348.000.

Sakata, Hirotsuga; Nagatomo, Shigemi; Hayano, Makoto; and Hatori, Mitsuo, 4,696,630, Cl. 418-55.000.

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Kagaya, Kenichi: *See*—
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Kai, Isao, to Omron Tateisi Electronics Co. Contact lens sterilization device. 4,697,070, Cl. 219-521.000.

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Kakizaki, Tetsuji; Mizutani, Toshikazu; and Yui, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. Semiconductive resin composition. 4,696,765, Cl. 252-511.000.

Kako, Hiroyoshi: *See*—
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Kaleskas, Edward: *See*—
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Kallianos, Andrew G.; and Kounnas, Christopher N., to Philip Morris Incorporated. Filter cigarette. 4,696,314, Cl. 131-336.000.

Kallinger, Franz; and Killion, Mark E., to Custodis-Cottrell, Inc. Method and apparatus for constructing towers. 4,696,135, Cl. 52-121.000.

Kalokitis, David: *See*—
Sechi, Franco N.; and Kalokitis, David, 4,697,159, Cl. 333-24.00C.

Kaltmann, Hans-Joachim; and Schaper, Hermann, to Rheinmetall GmbH. Device for destroying water mines and mine-sweeping method. 4,696,234, Cl. 102-308.000.

Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidenschink, Rudolf; and Romer, Michael, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Compounds containing a fluorobiphenylyl group and their use in liquid crystal material and devices. 4,696,349, Cl. 350-350.00R.

Kamata, Kazumasa; Ueda, Kazuo; and Kitai, Kiyokazu, to Mitsubishi Rayon Co., Ltd. Impact modifier and thermoplastic resin composition using the same. 4,696,973, Cl. 525-71.000.

Kameda, Toshinori, to National Can Corporation. Method for detecting sterilization. 4,696,580, Cl. 374-162.000.

Kamewa AB: *See*—
Haglund, Kjell, 4,696,650, Cl. 440-49.000.

Kameya, Kazuo, to Elmec Corporation. Variable delay line system. 4,697,162, Cl. 333-161.000.

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Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,696,882, Cl. 430-57.000.
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Kanasugi, Haruki: *See*—
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Kanayama, Hitoshi, to Hokoku Chain Co., Ltd. Conveyor apparatus. 4,696,236, Cl. 104-165.000.

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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kaneko, Norio; and Nitbe, Masahito, to Canon Kabushiki Kaisha. Composition for dielectric porcelain and dielectric porcelain and capacitor by use of said composition. 4,697,222, Cl. 361-321.000.

Kaneko, Takanobu: *See*—
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Kano, Mitsuru; and Nakanowatari, Jun, to Alps Electric Co., Ltd. Liquid crystalline pyrimidinyl phenyl carboxylic acid ester derivatives. 4,697,015, Cl. 544-335.000.

Kao, Shui-Hsi; Kay, Allen I.; and Sampson, Karla, to Warner-Lambert Company. Parenteral phenytoin compositions. 4,696,814, Cl. 424-80.000.

Kara, Gerald F.; and Sawyer, William H., to CBIT Corporation. Inspection and measuring apparatus and method. 4,697,245, Cl. 364-552.000.

Karasaki, Toshihiko; Matsui, Toru; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Focus condition detecting arrangement. 4,696,558, Cl. 354-406.000.

Karashima, Masashi. Rack board. 4,696,406, Cl. 211-153.000.

Karcher, Merrill, to Triseal Corporation. Unitized shaft seal assembly. 4,696,479, Cl. 277-37.000.

Kariya, Shigeo: *See*—
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Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Sunduqst, Hannu K., 4,696,949, Cl. 514-648.000.

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Kasei Optonix, Ltd.: *See*—
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Kashima, Koichi: *See*—
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Kasten, Donald A., to Standard precision, Inc. Three member drawer slide with sequential movement. 4,696,582, Cl. 384-18.000.

Kasuga, Akira: *See*—
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Katayama, Takeshi, to Nippondenso Co., Ltd. Engine alarm system. 4,696,277, Cl. 123-479.000.

Kato, Akira; Otobe, Yutaka; and Kimura, Shigehiro, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control method for internal combustion engines at idle. 4,696,272, Cl. 123-339.000.

Kato, Kazuo: *See*—
Hattori, Kyo; Kato, Kazuo; and Morita, Shuji, 4,696,201, Cl. 74-467.000.

Kato, Kenji; and Sano, Yasuro, to Janome Sewing Machine, Co. Ltd. Method of automatic buttonhole stitching with a computerized sewing machine. 4,696,245, Cl. 112-264.100.

Kato, Masatoshi: *See*—
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Kato, Mikihiko; Komine, Shigeo; Morita, Kazuhiko; and Okuzawa, Yasutoshi, to Fuji Photo Film Co., Ltd. Method for forming protective layer on a flexible magnetic disc sheet. 4,696,846, Cl. 428-65.000.

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Kautz, Rudolf: *See*—
Hargarten, Werner; and Kautz, Rudolf, 4,696,709, Cl. 156-79.000.

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Oka, Masahiko; Ueta, Yutaka; Kano, Hideo; Tomoda, Masayasu; and Kawachi, Shoji, 4,696,989, Cl. 526-254.000.

Kawada, Hiroshi: *See*—
Kurosu, Yasuhisa; Kawada, Hiroshi; Kanasugi, Haruki; and Hosokawa, Akio, 4,696,947, Cl. 514-478.000.

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Matsui, Katsumasa; Ohba, Masahiro; Kakehi, Tohru; and Kawai, Takayoshi, 4,696,167, Cl. 62-180.000.

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Sakaguchi, Isao; and Kawaide, Tatsuo, 4,696,831, Cl. 427-48.000.

Kawakami, Kiyotada, to Sanyo Electric Co., Ltd. Video superimposition system with chroma keying. 4,697,176, Cl. 340-723.000.

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Arimitsu, Hiroshi; Hatano, Kiyoshi; Nakanishi, Teruyuki; Yoshimura, Yoshio; Urabe, Masaki; and Honda, Tsurakazu, 4,697,179, Cl. 340-825.720.
Funahashi, Yoshiko; Kamino, Yoshikazu; Matsumura, Yasuharu; and Harimaya, Senichi, 4,696,795, Cl. 422-56.000.
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Ohtani, Teruo; Tamura, Toshihisa; Ikeda, Yuji; Araikawa, Mutsuya; and Kywata, Kazuyoshi, 4,696,635, Cl. 425-330.000.

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Kao, Shui-Hsi; Kay, Allen I.; and Sampson, Karla, 4,696,814, Cl. 424-80.000.

Kay, Ian T.: *See*—
Turnbull, Michael D.; and Kay, Ian T., 4,696,926, Cl. 514-230.000.

Keane, James H.: *See*—
Cormack, Owen R.; and Keane, James H., 4,696,072, Cl. 15-248.00A.

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Kelley, Don H.: *See*—
Mobley, Larry W.; and Kelley, Don H., 4,696,849, Cl. 428-95.000.

Kelton, Arden A., to Environmental Diagnostics, Inc. Suspension liquid separator. 4,696,797, Cl. 422-101.000.

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Kenny, John: *See*—
Kohlmetz, Charles W.; Urban, James J.; and Kenny, John, 4,696,283, Cl. 126-247.000.

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Ali, Sameh A. H.; and Haag, Juergen, 4,696,768, Cl. 252-628.000.

Keve, Tibor: *See*—
Megyeri, Gabor; Keve, Tibor; Galambos, Janos; Kovacs, Lajos, Jr.; Stefko, Bela; Bogsch, Erik; and Trischler, Ferenc, 4,697,017, Cl. 544-346.000.

Key, Larry: *See*—
Burnett, William; Houghton, James R.; Walker, David A.; and Key, Larry, 4,696,512, Cl. 297-68.000.

Khambay, Bhupinder P. S.: *See*—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,696,944, Cl. 514-531.000.

Khuri-Yakub, Butrus T.: *See*—
Quate, Calvin F.; and Khuri-Yakub, Butrus T., 4,697,195, Cl. 346-140.00R.

Kiewit, David A.; and Lu, Daozheng, to A. C. Nielsen Company. Methods and apparatus for automatically identifying programs viewed or recorded. 4,697,209, Cl. 358-84.000.

Killion, Mark E.: *See*—
Kallinger, Franz; and Killion, Mark E., 4,696,135, Cl. 52-121.000.

Kim, Hyun S., to Airway Industries, Inc. Handle assembly for luggage case. 4,696,077, Cl. 16-125.000.

Kim, Tuk M. Method of treatment during withdrawl from drug dependency. 4,696,818, Cl. 424-195.100.

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Wideman, Ronald H., 4,696,779, Cl. 264-211.130.

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Kato, Akira; Otobe, Yutaka; and Kimura, Shigehiro, 4,696,272, Cl. 123-339.000.
Otobe, Yutaka; Suzuki, Yoshio; Kimura, Shigehiro; and Ohsawa, Naoki, 4,696,273, Cl. 123-417.000.

Kimura, Tadashi; Sugihara, Masahiro; and Inaba, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Scroll-type fluid transferring machine with intake port and second intake passage. 4,696,628, Cl. 418-15.000.

Kimura, Tetsuo, to Nittan Company, Limited. Fire alarm system. 4,697,172, Cl. 340-587.000.

King, Francis D., to Beecham Group p.l.c. Azabicyclo compounds, useful as intermediates. 4,697,019, Cl. 546-112.000.

King, Wayne E., to United States of America, Energy. Analysis with electron microscope of multielement samples using pure element standards. 4,697,080, Cl. 250-307.000.

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King, William W.; and Houle, Edmund C., Jr., to Hughes Tool Company - USA. Drilling bit with full release void areas. 4,696,354, Cl. 175-329.000.

Kingston, Robert H.; and Leonberger, Frederick J., to Massachusetts Institute of Technology. Spatial light modulator. 4,696,533, Cl. 350-96.140.

Kinzenbaw, Jon E. Apparatus for leveling a combine. 4,696,152, Cl. 56-209.000.

Kirch, Hans: *See*—
Johnen, Rolf; Kirch, Hans; and Otto, Volkmar, 4,696,657, Cl. 464-93.000.

Kirk, Kenneth L.: *See*—
Jacobson, Kenneth A.; Daly, John W.; and Kirk, Kenneth L., 4,696,932, Cl. 514-263.000.

Kiselewski, Donald L. Modular structure, stud therefor, and method of construction. 4,696,139, Cl. 52-426.000.

Kiser, Donald L., to Grain Processing Corporation. Removal of water from aqueous alcohol mixtures. 4,696,720, Cl. 203-19.000.

Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, to Fanuc Ltd. Method and apparatus for creating part program data using a tablet. 4,697,249, Cl. 364-900.000.

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Yoshitake, Makoto; and Kishimoto, Keiichi, 4,696,756, Cl. 252-78.300.

Kisielowski, Lothar; Grafe, Ingomar; Liebenow, Walter; and Ahrens, Kurt H., to Ludwig Heumann & Co., GmbH. Process for the preparation of basically substituted phenylacetonitriles. 4,697,035, Cl. 558-344.000.

Kiss, Ferenc: *See*—
Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, 4,696,643, Cl. 432-120.000.

Kita, Yasuo, to Shimadzu Corporation. Deceleration control system for automobiles. 4,696,380, Cl. 192-4.00A.

Kitaguchi, Hiroshi: *See*—
Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; Tsukase, Masaaki; and Kato, Masatoshi, 4,696,887, Cl. 430-203.000.

Kitai, Kiyokazu: *See*—
Kamata, Kazumasa; Ueda, Kazuo; and Kitai, Kiyokazu, 4,696,973, Cl. 525-71.000.

Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Automatic tool changer. 4,696,091, Cl. 29-568.000.

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Kitamura, Koichiro, 4,696,091, Cl. 29-568.000.

Kitamura, Shunji, to Kabushiki Kaisha Toshiba. Index servo type magnetic head positioning control apparatus and method thereof. 4,697,213, Cl. 360-78.000.

Kitano, Hirohito; Oowaki, Toshiki; and Baba, Takashi, to Fujimi Kenmazai Kogyo Kabushiki Kaisha. Polishing composition. 4,696,697, Cl. 106-3.000.

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Honma, Noriyuki; Kitsukawa, Goro; and Suzuki, Makoto, 4,697,109, Cl. 307-475.000.

Kittel, Ludwig: *See*—
Grauel, Christoph; Kittel, Ludwig; Schmidt, Werner; and Wellens, Ulrich, 4,697,260, Cl. 370-18.000.

Kleine, Heinz: *See*—
Grunst, Heinz; and Kleine, Heinz, 4,697,223, Cl. 361-393.000.

Kleinschmit, Peter: *See*—
Deschler, Ulrich; Kleinschmit, Peter; and Michel, Rudolf, 4,697,009, Cl. 540-487.000.

Klinner, Wilfred E., to National Research Development Corporation. Crop engaging device and method. 4,696,154, Cl. 56-364.000.

Kloeckner-Humboldt-Deutz AG: *See*—
Roggendorff, Martin, 4,696,262, Cl. 123-41.690.

Knapp, Alfons; Roland, Robert D.; and Hutto, Joe D., to Masco Corporation. Faucet valve with anti-siphon back flow preventer. 4,696,322, Cl. 137-218.000.

Knebel, Joachim: *See*—
Ude, Werner; Knebel, Joachim; and Schroeder, Guenter, 4,696,993, Cl. 528-167.000.

Knoke, Jurgen: *See*—
Jost, Manfred; Knoke, Jurgen; Yoshida, Zenji; Ohta, Noburo; and Nakanishi, Terumo, 4,696,850, Cl. 428-197.000.

Knowles, Robert G., to Western Geophysical Company of America. Fiber optic cable connector. 4,696,539, Cl. 350-96.210.

Kobayashi, Junya: *See*—
Oka, Syotaro; Tahara, Shu; and Kobayashi, Junya, 4,696,796, Cl. 422-88.000.

Kobayashi, Nobuyuki: *See*—
Kushi, Naoto; Okano, Hiroshi; Kobayashi, Nobuyuki; and Sugita, Naoki, 4,696,275, Cl. 123-478.000.

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Kobler, Ingo: *See*—
Bezler, Wilhelm; and Kobler, Ingo, 4,696,229, Cl. 101-177.000.

Koch, Friedhelm: *See*—
Russe, Meinhard W.; Bolze, Rudolf; and Koch, Friedhelm, 4,696,914, Cl. 514-19.000.

Koch, Russell W., to Firestone Tire & Rubber Company, The. Elastomer free grid reinforcement of pressurable elastomer repaired articles. 4,696,332, Cl. 152-367.000.

Kochs Adler Aktiengesellschaft: *See*—
Scholl, Hans; Thiele, Horst; and Hagemann, Eckhard, 4,696,242, Cl. 112-121.140.

Kohl, James E.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; Kohl, James E.; and Adler, Michael S., 4,697,118, Cl. 310-331.000.

Kohlmetz, Charles W.; Urban, James J.; and Kenny, John. Kinetic heater. 4,696,283, Cl. 126-247.000.

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Kohno, Masahiro: *See*—
Aoyama, Masaaki; Itabashi, Mitsuharu; Miura, Mariko; and Kohno, Masahiro, 4,696,905, Cl. 436-64.000.

Kojima, Kunio: *See*—
Sekimoto, Yoshihiro; Terashima, Shigeo; and Kojima, Kunio, 4,696,566, Cl. 350-255.000.

Kojima, Tstsuro: *See*—
Deguchi, Naoyasu; Kojima, Tstsuro; Ohno, Shigeru; Nakamura, Koki; and Miyazaki, Hideo, 4,696,894, Cl. 430-551.000.

Kojima, Yuichi: *See*—
Osawa, Eiichi; Tanaka, Masato; Yoshizawa, Mamoru; Nakai, Jun; and Kojima, Yuichi, 4,697,212, Cl. 360-48.000.

Komai, Atsushi: *See*—
Morimoto, Yutaka; Saotome, Minoru; and Komai, Atsushi, 4,696,760, Cl. 252-314.000.

Komatsu, Shinichi, to Atsugi Motor Parts Company, Limited. Power assist device for automotive steering system. 4,696,198, Cl. 74-388.0PS.

Komine, Shigeo: *See*—
Kato, Mikihiko; Komine, Shigeo; Morita, Kazuhiko; and Okuzawa, Yasutoshi, 4,696,846, Cl. 428-65.000.

Komiyama, Makoto: *See*—
Hirai, Hidefumi; Komiyama, Makoto; Hara, Susumu; and Wada, Keiichiro, 4,696,682, Cl. 55-68.000.

Komori, Kazuhiro; Kuroda, Kenichi; and Okuyama, Kousuke, to Hitachi, Ltd. MOSFET which reduces the short-channel effect. 4,697,198, Cl. 357-23.300.

Kondo, Shigeru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Variable focal length, automatic focusing camera with a single motor. 4,696,559, Cl. 354-403.000.

Kondo, Shizuo: *See*—
Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, 4,696,880, Cl. 430-42.000.

Kopka, Ihor E.: *See*—
Boulton, David A.; Kopka, Ihor E.; Moore, Vernon L.; and Pesolano, Arsenio A., 4,697,012, Cl. 544-124.000.

Kopp, Reiner H.; and Panetz, Allen I., to Biochemical Diagnostics, Inc. Chromatography method. 4,696,187, Cl. 73-61.10C.

Kornrumpf, William P.: *See*—
Harnden, John D., Jr.; Kornrumpf, William P.; Kohl, James E.; and Adler, Michael S., 4,697,118, Cl. 310-331.000.

Kosha, Hideaki: *See*—
Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,696,858, Cl. 428-323.000.

Koski, Gerald L.: *See*—
Mieyal, David F.; and Koski, Gerald L., 4,696,142, Cl. 52-762.000.

Kosoczky, Ibolya: *See*—
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lajza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.

Kotani, Matahira: *See*—
Tanaka, Hironori; Matsumoto, Masafumi; and Kotani, Matahira, 4,696,462, Cl. 271-10.000.

Kotliar, Abraham M.: *See*—
Sibilia, John P.; Kotliar, Abraham M.; Murthy, Narasimhaiah S.; and Sacks, William, 4,696,857, Cl. 428-323.000.

Kouketsu, Shigeaki: *See*—
Shimomura, Kenji; Kouketsu, Shigeaki; Okuyama, Toru; and Sato, Take, 4,696,952, Cl. 521-107.000.

Kounnas, Christopher N.: *See*—
Kallianos, Andrew G.; and Kounnas, Christopher N., 4,696,314, Cl. 131-336.000.

Kousaka, Kunimitsu; and Gotoh, Kunihiko, to Fujitsu Limited. Semiconductor integrated circuit having improved load drive characteristics. 4,697,154, Cl. 330-277.000.

Kovacs, Lajos, Jr.: *See*—
Megyeri, Gabor; Keve, Tibor; Galambos, Janos; Kovacs, Lajos, Jr.; Stefko, Bela; Bogsch, Erik; and Trischler, Ferenc, 4,697,017, Cl. 544-346.000.

Koyama, Shozi: *See*—
Mori, Hideharu; Koyama, Shozi; and Yamazaki, Masahiro, 4,696,689, Cl. 62-32.000.

Koyama, Shuntaro; Miyadera, Hiroshi; and Miyamoto, Tomohiko, to Agency of Industrial Science and Technology. Method and equipment for gasification of coal. 4,696,678, Cl. 48-201.000.

Kozawa, Fusaaki: *See*—
Jinriki, Tatenori; and Kozawa, Fusaaki, 4,696,202, Cl. 74-479.000.

Kozima, Junpei: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Kozima, Junpei; and Wakatsuki, Kizuku, 4,696,979, Cl. 525-247.000.

Kramer & Grebe GmbH & Co. KG: *See*—
Vomhof, Paul; Schmidt, Karlheinz; and Oster, Peter, 4,696,434, Cl. 241-282.200.

Krappen, Wolfgang: *See*—
Hurtz, Georg; Steufmehl, Willi; and Krappen, Wolfgang, 4,696,600, Cl. 405-138.000.

Kraus, Gabriella: *See*—
Dierichs, Wolfgang; Gieresz, Gerhard; and Kraus, Gabriella, 4,696,836, Cl. 427-208.400.

Kreiseder, Walter J., to Courtesy Mold & Tool Corporation. Closure with side cut tamper evident feature. 4,696,410, Cl. 220-267.000.

Kroczynski, Patrice: *See*—
Sicard, Claude; Kroczynski, Patrice; Gallard, Herve; Mars, Denis; and Devos, Michel, 4,697,239, Cl. 364-468.000.

Krug, John A.: *See*—
Billingsley, Robert H., Jr.; Jantzen, Steven L.; O'Leary, Walter E.; and Krug, John A., 4,696,238, Cl. 105-248.000.

Krug, Ulrich, to Hoesch Aktiengesellschaft. Wire roll bearing. 4,696,586, Cl. 384-500.000.

Kruse, Hansjorg: *See*—
Geiger, Rolf; Gerhards, Hermann; and Kruse, Hansjorg, 4,696,913, Cl. 514-15.000.

Kubelbock, Alfred: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Kubo, Kanji: *See*—
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Kubota, Hirohisa: *See*—
Itagaki, Takaharu; Kusano, Hiroshi; Miyata, Eiji; and Kubota, Hirohisa, 4,696,745, Cl. 210-502.100.

Kubota, Ltd.: *See*—
Ishimori, Shozo; Ishida, Mikio; Miki, Hiroyuki; Ishiizumi, Seiichi; and Hirata, Kazuo, 4,696,365, Cl. 180-233.000.

Kubota, Masato: *See*—
Sasaki, Torahiko; Sato, Kazuo; Ohkawa, Masahiro; Suzuki, Yoshihiro; Kubota, Masato; Nakao, Hatsuo; and Tange, Kyoichi, 4,696,870, Cl. 429-14.000.

Kudo, Toshiyuki: *See*—
Ito, Kazuo; Kudo, Toshiyuki; and Hama, Ritsuo, 4,697,074, Cl. 250-211.00R.

Kuhlmann, Werner, to Blendax-Werke R. Schneider GmbH & Co. X-ray opaque dental filling composition-brominated aromatic dimethacrylic ester polymerizable component. 4,696,955, Cl. 522-77.000.

Kuhn, Siegfried: *See*—
Felten, Klaus; Hoaroth, Walter; Kuhn, Siegfried; Schulten, Hermann; and Zeller, Bruno, 4,696,209, Cl. 82-40.00R.

Kulik, Helmut. Oxygen carrier. 4,696,420, Cl. 224-275.000.

Kulman, James: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, 4,696,758, Cl. 252-188.310.

Kumagai, Naotake: *See*—
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,697,237, Cl. 364-424.000.

Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, to Tokyo Automatic Machinery Works, Ltd.; and Japan Tobacco, Inc. Apparatus for feeding bar-like materials. 4,696,617, Cl. 414-422.000.

Kunick, Klaus: *See*—
Hortmann, Guenther; Kunick, Klaus; and Fenner, Hans, 4,696,287, Cl. 128-1.00R.

Kunikane, Makoto: *See*—
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Brandenstein, Manfred; Hetterich, Hermann; and Kunkel, Heinrich, 4,696,083, Cl. 29-148.40C.

Kunugiza, Motoyasu: *See*—
Ooka, Masataka; Okuda, Yaeko; and Kunugiza, Motoyasu, 4,696,975, Cl. 525-113.000.

Kurata, Masami: *See*—
Hirai, Masato; Kurata, Masami; and Yoshino, Ryozo, 4,697,047, Cl. 178-2.00C.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio; Ahiko, Nobuo; and Igarashi, Yuriko, 4,696,856, Cl. 428-321.500.

Kurkela, Kauko O. A.: *See*—
Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Suduiqst, Hannu K., 4,696,949, Cl. 514-648.000.

Kuroda, Kenichi: *See*—
Komori, Kazuhiro; Kuroda, Kenichi; and Okuyama, Kousuke, 4,697,198, Cl. 357-23.300.

Kuroki, Yoshihiro: *See*—
Nobukawa, Akira; Sawaguchi, Tatsue; and Kuroki, Yoshihiro, 4,696,513, Cl. 279-121.000.

Kuroo, Yoshiyasu: *See*—
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,696,827, Cl. 427-36.000.

Kurosu, Yasuhisa; Kawada, Hiroshi; Kanasugi, Haruki; and Hosokawa, Akio, to Hodogaya Chemical Co., Ltd. Nematocide. 4,696,947, Cl. 514-478.000.

Kurotaka, Sigeo; and Tukano, Moriyosi, to Ricoh Company, Ltd. Developer container for dry-process development. 4,696,418, Cl. 222-167.000.

Kusano, Hiroshi: *See*—
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Wren, Michael; Lantz, Paul W.; Acock, George W., Jr.; and Rhodes, James A., 4,696,133, Cl. 52-80.000.

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Ethier, Dolores O., 4,696,854, Cl. 428-287.000.

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Lenz, August: *See*—
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Furuholt, Edgar; and Liaaen, Anders M., 4,696,453, Cl. 251-149.600.

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Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, 4,696,643, Cl. 432-120.000.

Liebenow, Walter: *See*—
Kisielowski, Lothar; Grafe, Ingomar; Liebenow, Walter; and Ahrens, Kurt H., 4,697,035, Cl. 558-344.000.

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Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, to Robert Bosch GmbH. Headlamp, particularly of rectangular configuration, for use as antidazzle lamp on motor vehicles. 4,697,225, Cl. 362-61.000.

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Durr, Dieter, 4,696,421, Cl. 225-1.000.

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Link, Charles T.; Gray, Bennie M.; and Shumaker, Harold L., to American Standard Inc. Pneumatic pressure actuator. 4,696,223, Cl. 92-86.500.

Lish, Charles A., to Standard Microsystems Corp. Cascode auto bias circuit. 4,697,153, Cl. 330-277.000.

Litman, Michael: *See*—
Bernardini, Ronald J., 4,696,303, Cl. 128-402.000.

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Hamblett, Martin; and Livsey, Duncan J., 4,696,621, Cl. 415-191.000.

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Buckshaw, Thomas M.; and Llewellyn, David T., 4,696,204, Cl. 74-567.000.

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Bohme, Helmut; Lobl, Helmut; and Grossmann, Steffen, 4,696,531, Cl. 439-851.000.

Lockard, Joseph L., to AMP Incorporated. Rocker switch. 4,697,053, Cl. 200-68.200.

Lockheed Corporation: *See*—
Hannel, Clifford L., 4,696,197, Cl. 74-89.150.

Lockwood, Larry R.; Gleason, Kimberly R.; and Strid, Eric W., to Cascade Microtech, Inc. Wafer probe. 4,697,143, Cl. 324-158.00P.

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Keller, Joseph R.; and Longenecker, Bruce C., 4,696,708, Cl. 156-64.000.

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Sulc, Jiri ; Vondracek, Petr; and Lopour, Petr, 4,696,974, Cl. 525-92.000.

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Reynolds, Daniel S., 4,696,376, Cl. 188-71.500.

Lowe, Gary M., to Devoke Co. Cabinet for microcomputer components. 4,696,522, Cl. 312-297.000.

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Daigle, Richard A., Sr.; Stanfield, William G.; and Crenshaw, Michael E., 4,696,602, Cl. 405-205.000.
Richardson, Eugene M.; Brehm, Norbert O.; and Null, Larry G., 4,696,377, Cl. 188-170.000.

Lu, Daozheng: *See*—
Kiewit, David A.; and Lu, Daozheng, 4,697,209, Cl. 358-84.000.

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McCann, Denis J.; and Ross, Colin F., 4,696,521, Cl. 303-92.000.

Luczak, Jean P.: *See*—
Riviere, Guy; and Luczak, Jean P., 4,696,637, Cl. 425-589.000.

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Jarvinen, W. Bruce; and Lukas, Stephen J., 4,697,126, Cl. 318-331.000.

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Lee, Chi-long; and Lutz, Michael A., 4,697,026, Cl. 556-418.000.

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Wang, David T. K.; and Wilson, Philip J., 4,697,261, Cl. 370-32.100.

M.A.N.-B&W Diesel GmbH: *See*—
Bucher, Jakob, 4,696,165, Cl. 60-609.000.

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Bezler, Wilhelm; and Kobler, Ingo, 4,696,229, Cl. 101-177.000.

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Lindner, Goerg H., 4,696,837, Cl. 427-255.300.

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Noe, Stephen A., 4,696,799, Cl. 422-148.000.

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Macdonald, John B., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Lightpen control circuit. 4,697,175, Cl. 340-707.000.

Machuron, Jean-Yves: *See*—
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Mackenthun, Donald W.: *See*—
Scheuneman, James H.; Meyer, Joseph H.; and Mackenthun, Donald W., 4,697,233, Cl. 364-200.000.

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Jenning, Michael; and Mackenthun, Holger, 4,697,183, Cl. 340-870.250.

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Maeda, Hideo: *See*—
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Misawa, Yoshihiko; Ishii, Taira; and Maeda, Yoshinobu, 4,696,424, Cl. 227-84.000.

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Magee, Anthony J. Sensing of fire installation water valves being closed. 4,696,325, Cl. 137-552.000.

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Mahlo GmbH + Co. KG.: *See*—
Beckstein, Hellmut, 4,696,185, Cl. 73-37.700.

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Sturm, Elmar; and Maienfisch, Peter, 4,696,922, Cl. 514-185.000.

Maier, Wilfried: *See*—
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Asano, Hideo; Makida, Kazuhisa; and Fujiwara, Kenichi, 4,696,627, Cl. 418-15.000.

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Tsukagoshi, Tetsuhito; Matsunuma, Tamotsu; and Makino, Shigeo, 4,696,335, Cl. 152-535.000.

Malfroot, Thierry; Piteau, Marc; and Senet, Jean-Pierre, to Societe Nationale des Poudres et Explosifs. Process for the preparation of 1-bromoethyl hydrocarbonyl carbonates and new 1-bromoethyl hydrocarbonyl carbonates. 4,697,032, Cl. 558-270.000.

Mallette, Robert P.: *See*—
Griffin, Kevin W.; and Mallette, Robert P., 4,696,706, Cl. 156-62.000.

Maloney, Kevin, to Cosco, Inc. High chair with adjustable back. 4,696,514, Cl. 297-284.000.

Mamak, Z.: *See*—
Woo, Kenneth; and Mamak, Z., 4,696,449, Cl. 248-553.000.

Manley, Michael T.: *See*—
Meller, Bruce T.; Manley, Michael T.; and Stulberg, Bernard N., 4,696,308, Cl. 128-754.000.

Mansfield, Peter W. Grid system and method for cast forming monolithic concrete roof covering. 4,696,451, Cl. 249-16.000.

Mansuria, Mohanlal S.; Meinert, Rolf G.; Oktay, Sevgin; and Ostergren, Carl D., to International Business Machines Corporation. Single chip thermal tester. 4,696,578, Cl. 374-45.000.

Marcelli, Ezio: *See*—
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Marconi International Marine Company Limited: *See*—
Vucevic, Svet O., 4,696,196, Cl. 74-5.220.

Marcoux, Frank W., to Warner-Lambert Company. Method for using diltiazem for treating stroke. 4,696,924, Cl. 514-211.000.

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Marino, Joseph A.: *See*—
D'Andrade, Bruce M.; and Marino, Joseph A., 4,696,655, Cl. 446-330.000.

Marishima, Kazuo: *See*—
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Grewe, Ronald E., 4,696,136, Cl. 52-222.000.

Markl, Maximillian: *See*—
Saupe, Martin; Dauernheim, Hans; and Markl, Maximillian, 4,696,645, Cl. 433-125.000.

Markow, Margaret. Ridable recreation device. 4,696,467, Cl. 272-114.000.

Marks, George R. Reversible mortise lockset. 4,696,174, Cl. 70-451.000.

Marks, Jeffrey C., to Deere & Company. Three-speed planetary transmission. 4,696,205, Cl. 74-767.000.

Marpal AG: *See*—
Degen, Hugo, 4,696,070, Cl. 5-238.000.

Marquis, Gerald L., to Western Atlas International, Inc. Two electrode well logging system for measuring resistivity of subsurface formations. 4,697,150, Cl. 324-373.000.

Mars, Denis: *See*—
Sicard, Claude; Kroczynski, Patrice; Gallard, Herve; Mars, Denis; and Devos, Michel, 4,697,239, Cl. 364-468.000.

Marshall, Robert H. Connector guide system for construction walls. 4,696,140, Cl. 52-442.000.

Martin, Andrea E., to Hercules Incorporated. Catalyst composition for polymerization of cycloolefins. 4,696,985, Cl. 526-119.000.

Martin, Ronald A.: *See*—
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Maruhashi, Shigeaki: *See*—
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhashi, Shigeaki; Hoshino, Kazuo; and Ooaki, Keiji, 4,696,724, Cl. 204-27.000.

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Maruyama, Ichiro: *See*—
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Marvin Glass & Associates: *See*—
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Marzocca, Joseph: *See*—
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Masaki, Akira: *See*—
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Masch, Helmut. Intravascular catheter and method. 4,696,667, Cl. 604-22.000.

Maschinenfabrik Rieter AG: *See*—
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Maschinenfabrik Rieter A.G.: *See*—
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Massachusetts Institute of Technology: *See*—
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Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-422.000.

Matsuda, Sadamu: *See*—
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Matsuda, Shin-ichi: *See*—
Shirasaki, Shin-ichi; Hotta, Yasunari; Yamamura, Hiroshi; Matsuda, Shin-ichi; Kakegawa, Kazuyuki; Moriyoshi, Yusuke; Takahashi, Koichiro; and Haneda, Hajime, 4,696,810, Cl. 423-593.000.

Matsui, Katsumasa; Ohba, Masahiro; Kakehi, Tohru; and Kawai, Takayoshi, to Nippondenso Co., Ltd. Air conditioner for automobiles. 4,696,167, Cl. 62-180.000.

Matsui, Kazuhiro: *See*—
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Matsui, Shigekazu; Kagaya, Kenichi; Ushida, Masao; and Maruyama, Kouichi, to Hoya Corporation. Photo-mask blank comprising a shading layer having a variable etch rate. 4,696,877, Cl. 430-5.000.

Matsui, Toru: *See*—
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Matsumoto, Ikuo: *See*—
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Matsumoto, Masafumi: *See*—
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Moore, William H.; Gutowski, Charles M.; Trosky, William J.; and Butler, Thomas A., to Westinghouse Electric Corp. Methods of servicing an elevator system. 4,697,243, Cl. 364-513.000.
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Oka, Yukihiko; and Morimoto, Toyohiko, 4,696,592, Cl. 400-636.000.

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Morita, Kazuhiko: *See*—
Kato, Mikihiko; Komine, Shigeo; Morita, Kazuhiko; and Okuzawa, Yasutoshi, 4,696,846, Cl. 428-65.000.

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Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; Morita, Mikio; and Kamohara, Hisato, 4,696,725, Cl. 252-62.540.

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Matsunaga, Hiroshi; and Morita, Shinichi, 4,696,099, Cl. 29-603.000.

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Hattori, Kyo; Kato, Kazuo; and Morita, Shuji, 4,696,201, Cl. 74-467.000.

Moriyoshi, Yusuke: *See*—
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Swenton, John S.; Morrow, Gary W.; and Priebe, Waldemar, 4,697,005, Cl. 536-6.400.

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Burr, Donald N.; Danilowicz, Paul S.; Franz, Thomas C.; Mortimer, Thomas P.; and Pero, Edward B., 4,696,156, Cl. 60-39.080.

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Conroy, Gary M.; and Wursthorn, Karl R., 4,696,754, Cl. 252-40.500.
Paxton, Ronald B., 4,696,233, Cl. 102-287.000.

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Birrittella, Mark S.; and Stipanuk, James J., 4,697,251, Cl. 365-154.000.
Hooker, James R.; and Foss, Robert M., 4,696,776, Cl. 264-46.400.
Lehning, Heinz, 4,697,155, Cl. 330-297.000.
McLaughlin, Kevin L.; and Bushey, Thomas P., 4,696,097, Cl. 437-193.000.
Rusznyak, Andreas, 4,697,097, Cl. 307-296.00R.
Sullivan, Daniel J., 4,696,701, Cl. 148-33.500.
Westwick, Alan L., 4,697,152, Cl. 330-9.000.

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Haddon, Merrill; and Moulton, Clifford H., 4,697,137, Cl. 324-512.000.

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Ruetz, Georg; and Giesselmann, Jurgen, 4,696,620, Cl. 415-164.000.

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Mueller, Wolfgang F., to International Business Machines Corporation. Microweld apparatus with an improved electrode tip design and tip support. 4,697,058, Cl. 219-56.210.

Mui, Paul Y. H.; and Tso, Rosa Y. M. Collapsible light wand. 4,697,228, Cl. 362-352.000.

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Hirano, Takahisa; Fukami, Shoji; Maruiwa, Yasuharu; Itoh, Takuyuki; Sugimoto, Tamio; Ono, Tetsuo; and Mukai, Masatoshi, 4,696,084, Cl. 29-156.40R.

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Muller, Beat, to Ciba-Geigy Corporation. Photosensitive elements containing polymer of imidylcompounds. 4,696,820, Cl. 430-271.000.

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Ito, Toshimitsu; and Murata, Chigaku, 4,696,278, Cl. 123-493.000.

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Nakamura, Takeshi; Nishiyama, Hiroshi; and Matsumoto, Ikuo, 4,697,116, Cl. 310-322.000.
Watanabe, Koichi; and Maesaka, Michinobu, 4,697,224, Cl. 361-433.000.

Murayama, Akira: *See*—
Shiibayashi, Masao; and Murayama, Akira, 4,696,629, Cl. 418-55.000.

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Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,697,121, Cl. 313-595.000.

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Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,696,787, Cl. 376-247.000.

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Sibilia, John P.; Kotliar, Abraham M.; Murthy, Narasimhaiah S.; and Sacks, William, 4,696,857, Cl. 428-323.000.

Myers, Daryl L., to American Telephone and Telegraph Company AT&T Technologies, Inc. Spool for holding optical fiber. 4,696,438, Cl. 242-118.410.

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Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

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Leibfred, Kevin J., 4,696,825, Cl. 426-283.000.
Spadafora, Paul F., 4,696,115, Cl. 34-43.000.

Nagano, Toshiaki, to Shinsei Kogyo Co., Ltd. Dumping mechanism for a dumping toy truck. 4,696,517, Cl. 298-1.00T.

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Nagase, Yukio: *See*—
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Nagatomo, Shigemi: *See*—
Sakata, Hirotsugu; Nagatomo, Shigemi; Hayano, Makoto; and Hatori, Mitsuo, 4,696,630, Cl. 418-55.000.

Nagayama, Sekio: *See*—
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Lukenbach, Elvin R.; Naik-Satam, Prakash; and Schwartz, Anthony M., 4,696,773, Cl. 260-513.00R.

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Miyata, Seizo; Nakahama, Hidenari; and Kasuga, Takeshi, 4,696,838, Cl. 427-407.200.

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Osawa, Eiichi; Tanaka, Masato; Yoshizawa, Mamoru; Nakai, Jun; and Kojima, Yuichi, 4,697,212, Cl. 360-48.000.

Nakajima, Akira: *See*—
Mochizuki, Tadao; Nakajima, Akira; and Fukushima, Reizo, 4,696,740, Cl. 210-151.000.

Nakajima, Hirokazu: *See*—
Tsushima, Noriyuki; and Nakajima, Hirokazu, 4,696,581, Cl. 384-565.000.

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Nakamats, Yoshiro. Container for floppy disks and the like. 4,696,397, Cl. 206-444.000.

Nakamura, Keiji: *See*—
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Nakamura, Koki: *See*—
wire for spinning machinery and the method of manufacturing the same. 4,696,080, Cl. 19-114.000.

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Nakanishi, Terumo: *See*—
Jost, Manfred; Knoke, Jurgen; Yoshida, Zenji; Ohta, Noburo; and Nakanishi, Terumo, 4,696,850, Cl. 428-197.000.

Nakanishi, Teruyuki: *See*—
Arimitsu, Hiroshi; Hatano, Kiyoshi; Nakanishi, Teruyuki; Yoshimura, Yoshio; Urabe, Masaki; and Honda, Tsurakazu, 4,697,179, Cl. 340-825.720.

Nakano, Toru: *See*—
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Nakanowatari, Jun: *See*—
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Nakao, Hatsuo: *See*—
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Nakatani, Kenji: *See*—
Okaniwa, Hiroshi; Nakatani, Kenji; and Sato, Tetsuo, 4,697,041, Cl. 136-244.000.

Nakayama, Tetsuroh: *See*—
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, 4,696,589, Cl. 400-119.000.

Nakazato, Yukitaka; Hashimoto, Kenji; and Taruki, Takashi, to Ricoh Company, Ltd. Automatic original sheet feeding apparatus. 4,696,463, Cl. 271-176.000.

Nalepka, Paul: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Nanba, Sinzi; Matsui, Kazuma; Mizuno, Toru; and Goto, Tukasa, to Nippondenso Co., Ltd. Airflow rate measuring apparatus of Karman vortex type. 4,696,193, Cl. 73-861.220.

Narita, Akira: *See*—
Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, 4,697,101, Cl. 307-452.000.

Nassof, Martin, to Simplex Ceiling Corp. Suspended ceiling having a concealed suspension grid and lay-in metal panels supported thereon. 4,696,141, Cl. 52-484.000.

Nath, Prem: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, 4,696,758, Cl. 252-188.310.

National Can Corporation: *See*—
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National Institute for Researches in Inorganic Materials: *See*—
Shirasaki, Shin-ichi; Hotta, Yasunari; Yamamura, Hiroshi; Matsuda, Shin-ichi; Kakegawa, Kazuyuki; Moriyoshi, Yusuke; Takahashi, Koichiro; and Haneda, Hajime, 4,696,810, Cl. 423-593.000.

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Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, 4,696,787, Cl. 376-247.000.

National Research Development Corporation: *See*—
Elliott, Michael; Janes, Norman F.; and Khambay, Bhupinder P. S., 4,696,944, Cl. 514-531.000.
Klinner, Wilfred E., 4,696,154, Cl. 56-364.000.

National Semiconductor Corporation: *See*—
Haines, Ralph W., 4,697,107, Cl. 307-474.000.

National Starch and Chemical Corporation: *See*—
Lunsford, David; and Walker, James L., 4,696,951, Cl. 521-65.000.

National Transducer Corporation: *See*—
Glibbery, Albert W., 4,696,359, Cl. 177-211.000.

Naven, Finbar: *See*—
Desyllas, Peter L. L.; Holt, Nicholas P.; and Naven, Finbar, 4,697,268, Cl. 371-67.000.

Nawamaki, Tsutomu: *See*—
Numata, Tatsuo; Hatanaka, Masataka; Watanabe, Junichi; Ikai, Takasi; Nawamaki, Tsutomu; and Hattori, Kenji, 4,696,694, Cl. 71-86.000.

Neary, John F.; Peddy, John T.; and Willis, David H., to Neary, John F. Self drying pet litter box. 4,696,257, Cl. 119-1.000.

Neaume, Robert. Device for marking out land. 4,696,134, Cl. 52-103.000.

NEC Corporation: *See*—
Ohno, Satoru; and Shimada, Yasuhisa, 4,697,187, Cl. 342-358.000.
Watanabe, Takeshi, 4,697,106, Cl. 307-463.000.
Yanagisawa, Masahiro, 4,696,845, Cl. 428-64.000.

Nedoluha, Heinz F., to Coleman Company, Inc., The. Outhaul boom end part for sailboard boom assembly. 4,696,248, Cl. 114-39.000.

Neft, Charles L., to Westinghouse Electric Corp. AC power supplied static switching apparatus having energy recovery capability. 4,697,230, Cl. 363-161.000.
Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,696,939, Cl. 514-361.000.

Nelson, Anthony J.: *See*—
Devonald, David P.; Nelson, Anthony J.; Quan, Peter M.; and Stewart, David, 4,696,801, Cl. 423-24.000.

Nelson, Steve: *See*—
Torres, Ronald; Mayer, Edward; and Nelson, Steve, 4,696,656, Cl. 446-376.000.

Neoa 2000 Limited: *See*—
Davy, Peter G.; and Cuthbertson, Brian G., 4,697,229, Cl. 363-49.000.

Neotecha AG: *See*—
Iff, Rene, 4,696,323, Cl. 137-375.000.

Nesbitt, Russell U.: *See*—
Silbering, Steven B.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,696,812, Cl. 424-445.000.

Ness, John B., to University of Queensland; and Commonwealth of Australia. Microstrip antenna. 4,697,189, Cl. 343-700.0MS.

New England Machinery, Inc.: *See*—
Bankuty, Geza E.; and Byron, LeRoy F., 4,696,144, Cl. 53-331.500.

Newton, Edward L.; and Swendrowski, Steven D., to Intel Corporation. Carrier for tape automated bonded semiconductor device. 4,696,526, Cl. 439-68.000.

NGK Insulators, Ltd.: *See*—
Ishiguro, Fujio; and Maeda, Hideo, 4,697,165, Cl. 338-34.000.
Ito, Shigenori, 4,696,777, Cl. 264-60.000.
Takeuchi, Kazumasa; Iwadachi, Takaharu; and Ikushima, Kazuo, 4,696,704, Cl. 148-412.000.

Nguyen Mong, Lan: *See*—
Bentzen, Craig L.; Guyon-Gellin, Yves; Kalathakis, Kyriacos; Phan, Hieu T.; Nguyen Mong, Lan; Niesor, Eric; and Rossier, Jean-Robert, 4,696,920, Cl. 514-89.000.

Nickel, Hans: *See*—
Vondernau, Werner; Weber, Jurgen; Nickel, Hans; Wissmann, Michael; and Schliemann, Harald, 4,696,264, Cl. 123-73.00V.

Nicol, Thomas H.: *See*—
Niemann, Ralph C.; Gonczy, John D.; and Nicol, Thomas H., 4,696,169, Cl. 62-514.00R.

Nicolas, Bernard, to Service National Electricite de France. Overcurrent protection device. 4,697,218, Cl. 361-87.000.

Nicollet, Andre: *See*—
Yves, Henry; Nicollet, Andre; and Villard, Michel, 4,696,094, Cl. 437-23.000.

Nieh, Edward C. Y., to Texaco Inc. Treatment of gas streams for removal of acid gases. 4,696,803, Cl. 423-228.000.

Niemann, Ralph C.; Gonczy, John D.; and Nicol, Thomas H., to United States of America, Energy. Cryogenic support member. 4,696,169, Cl. 62-514.00R.

Nies, Gary M.: *See*—
Murphy, Kenneth E.; Martin, Ronald A.; and Nies, Gary M., 4,696,660, Cl. 464-170.000.

Niesor, Eric: *See*—
Bentzen, Craig L.; Guyon-Gellin, Yves; Kalathakis, Kyriacos; Phan, Hieu T.; Nguyen Mong, Lan; Niesor, Eric; and Rossier, Jean-Robert, 4,696,920, Cl. 514-89.000.

Nifco, Inc.: *See*—
Fukuhara, Kunihiro, 4,696,128, Cl. 49-492.000.

Niggemeyer, Gert G. High-tension capacitor-discharge ignition apparatus for internal combustion engines. 4,696,280, Cl. 123-598.000.

Niibe, Masahito: *See*—
Kaneko, Norio; and Niibe, Masahito, 4,697,222, Cl. 361-321.000.

Niikura, Akio: *See*—
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Nikles, Albert: *See*—
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

Nippon Air Brake Co., Ltd.: *See*—
Hata, Yasuhisa; Hatimaki, Takeshi; and Ogura, Satoshi, 4,696,626, Cl. 417-312.000.

Nippon Colin Co., Ltd.: *See*—
Warnagiris, Thomas J.; and McGinnis, William H., 4,697,166, Cl. 340-310.00R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Hamanaga, Shinji, 4,696,454, Cl. 251-321.000.
Ichiki, Tetsuji, 4,696,214, Cl. 84-1.010.
Takanashi, Hiroyoshi, 4,697,259, Cl. 369-75.200.

Nippon Piston Ring Co., Ltd.: *See*—
Fujita, Yoshiaki; and Kawai, Satoshi, 4,696,696, Cl. 75-246.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Nishida, Soji; and Miyake, Nobuhiko, 4,696,587, Cl. 384-536.000.
Tanaka, Yasuo; and Niikura, Akio, 4,696,588, Cl. 384-615.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, 4,696,713, Cl. 156-358.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Morimoto, Yutaka; Saotome, Minoru; and Komai, Atsushi, 4,696,760, Cl. 252-314.000.

Nippondenso Co., Ltd.: *See*—
Asano, Hideo; Makida, Kazuhisa; and Fujiwara, Kenichi, 4,696,627, Cl. 418-15.000.
Katayama, Takeshi, 4,696,277, Cl. 123-479.000.
Matsui, Katsumasa; Ohba, Masahiro; Kakehi, Tohru; and Kawai, Takayoshi, 4,696,167, Cl. 62-180.000.

Nanba, Sinzi; Matsui, Kazuma; Mizuno, Toru; and Goto, Takasa, 4,696,193, Cl. 73-861.220.
Senda, Eiichi, 4,696,658, Cl. 464-112.000.
Usami, Kyohei; and Watanabe, Katsuhiko, 4,696,686, Cl. 55-158.000.
Yamauchi, Yoshiyuki; Ohara, Toshio; and Takahashi, Toshio, 4,696,342, Cl. 165-152.000.
Nishida, Soji; and Miyake, Nobuhiko, to Nippon Seiko Kabushiki Kaisha. Expansion compensating bearing. 4,696,587, Cl. 384-536.000.
Nishikawa, Masao: *See*—
Aoki, Takashi; Fukuda, Yukihiro; and Nishikawa, Masao, 4,696,383, Cl. 192-70.120.
Nishio, Kazuaki: *See*—
Nakajima, Kohei; Nishio, Kazuaki; and Watanabe, Hiroshi, 4,696,994, Cl. 528-176.000.
Nishioka, Jim Z. Projectile shooting guide for bows. 4,696,281, Cl. 124-25.000.
Nishiyama, Hiroshi: *See*—
Nakamura, Takeshi; Nishiyama, Hiroshi; and Matsumoto, Ikuo, 4,697,116, Cl. 310-322.000.
Nissan Chemical Industries Ltd.: *See*—
Numata, Tatsuo; Hatanaka, Masataka; Watanabe, Junichi; Ikai, Takasi; Nawamaki, Tsutomu; and Hattori, Kenji, 4,696,694, Cl. 71-86.000.
Nissan Motor Company, Limited: *See*—
Fujishiro, Takeshi; Takahashi, Sadahiro; and Kaneko, Takanobu, 4,696,489, Cl. 280-707.000.
Hayashi, Yoshimasa, 4,696,261, Cl. 123-41.210.
Ishitsubo, Kenji; and Abe, Yoshinobu, 4,697,065, Cl. 219-219.000.
Mihara, Teruyoshi, 4,697,201, Cl. 357-41.000.
Nisshin Steel Co., Ltd.: *See*—
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,696,724, Cl. 204-27.000.
Nitadori, Yoshiaki; and Nakano, Toru, to Asahi Medical Co., Ltd. Plasma separator and a process for preparing the same. 4,696,748, Cl. 210-636.000.
Nitt, Karl-Heinz, to Siemens Aktiengesellschaft. Apparatus for compression molding of coil end turns. 4,696,631, Cl. 425-117.000.
Nittan Company, Limited: *See*—
Kimura, Tetsuo, 4,697,172, Cl. 340-587.000.
Nixdorf Computer AG: *See*—
Laue, Hans-Bodo, 4,697,275, Cl. 375-4.000.
Nobukawa, Akira; Sawaguchi, Tatsue; and Kuroki, Yoshihiro. Chucking device for machine tools. 4,696,513, Cl. 279-121.000.
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Noguchi, Junichi: *See*—
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Nohira, Hidetaka, to Toyota Jidosha Kabushiki Kaisha. Device for varying a valve timing and lift for an internal combustion engine. 4,696,265, Cl. 123-90.160.
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Rohr, Gustav; and Nohl, Gerd, 4,696,246, Cl. 112-272.000.
Nonaka, Yuzo, to Disco Abrasive Systems, Ltd. Semiconductor wafer mounting and cutting system. 4,696,712, Cl. 156-351.000.
Noonan, John M.; and Caccamo, Anthony F., to Eastman Kodak Company. Novel photocrosslinkable liquid crystalline polymers. 4,696,990, Cl. 526-304.000.
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Northrop Corporation: *See*—
Rivoli, Mark S., 4,696,395, Cl. 206-334.000.
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Novakovic, Mario; and Abend, Phillip G., to Finetex, Inc. Surfactant compositions. 4,696,767, Cl. 252-557.000.
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Holtzclaw, James O., Jr.; and Novotny, Marvin A., 4,696,419, Cl. 224-243.000.
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Shene, William R.; Nowacki, Christopher; and Brisson, Alfred G., 4,696,299, Cl. 128-328.000.
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Nozue, Yoshihiro, to Fujitsu Limited. Error monitor circuit. 4,697,265, Cl. 371-5.000.
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Tsushima, Noriyuki; and Nakajima, Hirokazu, 4,696,581, Cl. 384-565.000.
Null, Larry G.: *See*—
Richardson, Eugene M.; Brehm, Norbert O.; and Null, Larry G., 4,696,377, Cl. 188-170.000.
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Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-422.000.
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N.V. Verenigde Energiebedrijven Van Het Scheldeland Mechelse-teenweg: *See*—
Bosquet, Herman; and Ulens, Stanislas F., 4,696,723, Cl. 204-16.000.
Oak Ridge Systems, Inc.: *See*—
Blackburn, Donald, 4,696,269, Cl. 123-256.000.
Oba, Hideaki: *See*—
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.
Oba, Kunio: *See*—
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Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, 4,696,255, Cl. 118-653.000.
Occidental Chemical Corporation: *See*—
Schwartz, Willis T.; and Pawlak, Joseph A., 4,697,023, Cl. 549-241.000.
Occidental Electrochemical Corporation: *See*—
Rowe, Edward A., Jr., 4,697,043, Cl. 174-17.0LF.
Ochi, Yoshinori: *See*—
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Ochiai, Kumi; Horie, Hiromichi; Arima, Itsuo; Morita, Mikio; and Kamohara, Hisato, to Kabushiki Kaisha Toshiba. Magnetic core and preparation thereof. 4,696,725, Cl. 252-62.540.
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Ockert, Carl E.: *See*—
Claytor, Thomas N.; Ockert, Carl E.; and Randall, Richard, 4,696,191, Cl. 73-600.000.
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Rakoczynski, Randolph W.; Odojewski, Stephen S.; and Rolfe, John I., 4,696,599, Cl. 405-129.000.
Oerlikon-Boehringer GmbH: *See*—
Felten, Klaus; Honroth, Walter; Kuhn, Siegfried; Schulten, Hermann; and Zeller, Bruno, 4,696,209, Cl. 82-40.00R.
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Yamawaki, Ichiro; Ogawa, Kazuo; Ono, Naohiko; Honna, Takaji; Nagayama, Sekio; and Yasumoto, Mitsugi, 4,696,929, Cl. 514-253.000.
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Isoyama, Toyoshiro; Yasuyuki, Goto; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,696,759, Cl. 252-299.620.
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, to Seikosha Co., Ltd. Camera shutter. 4,696,560, Cl. 354-439.000.
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Hata, Yasuhisa; Hatimaki, Takeshi; and Ogura, Satoshi, 4,696,626, Cl. 417-312.000.
Ogura, Setsuo: *See*—
Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.
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Yamauchi, Yoshiyuki; Ohara, Toshio; and Takahashi, Toshio, 4,696,342, Cl. 165-152.000.
Ohara, Yuji, to Fuji Photo Film Co., Ltd. Laser apparatus. 4,697,269, Cl. 372-34.000.
Ohba, Masahiro: *See*—
Matsui, Katsumasa; Ohba, Masahiro; Kakehi, Tohru; and Kawai, Takayoshi, 4,696,167, Cl. 62-180.000.
Ohio State University Research Foundation: *See*—
Swenton, John S.; Morrow, Gary W.; and Priebe, Waldemar, 4,697,005, Cl. 536-6.400.
Ohkawa, Hideki: *See*—
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Ohkawa, Masahiro: *See*—
Sasaki, Torahiko; Sato, Kazuo; Ohkawa, Masahiro; Suzuki, Yoshihiro; Kubota, Masato; Nakao, Hatsuo; and Tange, Kyoichi, 4,696,870, Cl. 429-14.000.
Ohmori, Toshiaki: *See*—
Fukumoto, Takaaki; and Ohmori, Toshiaki, 4,696,184, Cl. 73-31.00R.
Ohnishi, Michikazu; and Tani, Nobutaka, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for treating blood constituents. 4,696,670, Cl. 604-49.000.
Ohno, Satoru; and Shimada, Yasuhisa, to NEC Corporation. Precipitation loss compensation and disablement for avoidance of satellite transponder overloading. 4,697,187, Cl. 342-358.000.
Ohno, Shigeru: *See*—
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Ohsawa, Naoki: *See*—
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Jost, Manfred; Knoke, Jurgen; Yoshida, Zenji; Ohta, Noburo; and Nakanishi, Terumo, 4,696,850, Cl. 428-197.000.
Ohtani, Takayuki; Isobe, Mitsuo; Aono, Akira; and Urakawa, Nobuaki, to Kabushiki Kaisha Toshiba. Current-mirror type sense amplifier. 4,697,112, Cl. 307-530.000.
Ohtani, Teruo; Tamura, Toshihisa; Ikeda, Yuji; Araikawa, Mutsuya; and Kywata, Kazuyoshi, to Kawasaki Steel Corporation. Apparatus for forming unevenness on an outer surface of a synthetic resin-coated steel pipe. 4,696,635, Cl. 425-330.000.
Oka, Masahiko; Ueta, Yutaka; Kano, Hideo; Tomoda, Masayasu; and Kawachi, Shoji, to Daikin Industries, Ltd. Fluorine-containing elastomeric copolymer. 4,696,989, Cl. 526-254.000.
Oka, Syotaro; Tahara, Shu; and Kobayashi, Junya, to Shimadzu Corporation. Moisture sensor. 4,696,796, Cl. 422-88.000.
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Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, to Hitachi Microcomputer Engineering Co., Ltd.; and Hitachi, Ltd. Bipolar logic circuit having two multi-emitter transistors with an emitter of one connected to the collector of the other to prevent saturation. 4,697,102, Cl. 307-454.000.
Okada, Yoshio; Ahiko, Nobuo; and Igarashi, Yuriko, to Kureha Kagaku Kogyo Kabushiki Ksisha. Pressure-sensitive recording material. 4,696,856, Cl. 428-321.500.
Okafuji, Masaharu; Ochi, Yoshinori; Miyake, Atsushi; Noguchi, Junichi; and Matsuo, Ichiro, to Nippon Sheet Glass Co., Ltd. Method and apparatus for pressing laminated glass. 4,696,713, Cl. 156-358.000.
Okajima, Yoshinori, to Fujitsu Limited. Two stage decoder circuit using threshold logic to decode high-order bits and diode-matrix logic to decode low-order bits. 4,697,104, Cl. 307-463.000.
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, to Sony Corporation; and Foundation: The Research Institute for Special Inorganic Materials, The. Silicon carbide-carbon composite molded product and process for manufacturing the same. 4,696,827, Cl. 427-36.000.
Okaniwa, Hiroshi; Nakatani, Kenji; and Sato, Tetsuo, to Teijin Limited. Integrated solar cells. 4,697,041, Cl. 136-244.000.
Okano, Hiroshi: *See*—
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O'Keeffe, Michael J.; Graba, James M.; and Noyes, George I., to Storage Technology Corporation. Sync pattern encoding system for data sectors written on a storage medium. 4,697,167, Cl. 340-347.0DD.
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Okuda, Yaeko: *See*—
Ooka, Masataka; Okuda, Yaeko; and Kunugiza, Motoyasu, 4,696,975, Cl. 525-113.000.
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, to Tokyo Electric Co., Ltd. Ink-dot printer. 4,696,589, Cl. 400-119.000.
Okutu, Toshimitu: *See*—
Miyoshi, Takahito; Aoki, Nobuo; Yoneyama, Takashi; Kasuga, Akira; Okutu, Toshimitu; Fujiyama, Masaaki; and Okuzawa, Yasutoshi, 4,696,859, Cl. 428-323.000.
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Okuyama, Toru: *See*—
Shimomura, Kenji; Kouketsu, Shigeaki; Okuyama, Toru; and Sato, Take, 4,696,952, Cl. 521-107.000.
Okuzawa, Yasutoshi: *See*—
Kato, Mikihiko; Komine, Shigeo; Morita, Kazuhiko; and Okuzawa, Yasutoshi, 4,696,846, Cl. 428-65.000.
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Billingsley, Robert H., Jr.; Jantzen, Steven L.; O'Leary, Walter E.; and Krug, John A., 4,696,238, Cl. 105-248.000.
Oleck, Stephen M.: *See*—
Angevine, Philip J.; Chu, Yung F.; Mitchell, Kenneth M.; Oleck, Stephen M.; Shih, Stuart S.; and Wilson, Robert C., Jr., deceased, 4,696,732, Cl. 208-111.000.
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Pryor, Michael J., 4,696,851, Cl. 428-210.000.
Oliver, Patrick R., to Bendix Limited. Pipe fitting assembly. 4,696,495, Cl. 285-86.000.
Olschewski, Armin; Brandenstein, Manfred; Hetterich, Hermann; and Kunkel, Heinrich, to SKF GmbH. Schweinfurt. Method for making machine parts and machine parts produced thereby. 4,696,083, Cl. 29-148.40C.
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Costella, James G., 4,696,544, Cl. 350-96.260.
Olympus Optical Co., Ltd.: *See*—
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Omichi, Kaoru: *See*—
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Omni-Flow, Inc.: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniya, George, 4,696,671, Cl. 604-67.000.
Omron Tateisi Electronics Co.: *See*—
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Ono, Akira, to Kabushiki Kaisha Toshiba. Surface inspection apparatus. 4,696,572, Cl. 356-348.000.
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Yamawaki, Ichiro; Ogawa, Kazuo; Ono, Naohiko; Honna, Takaji; Nagayama, Sekio; and Yasumoto, Mitsugi, 4,696,929, Cl. 514-253.000.
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Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,697,121, Cl. 313-595.000.
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Yamazaki, Taro, 4,696,764, Cl. 252-503.000.
Osawa, Eiichi; Tanaka, Masato; Yoshizawa, Mamoru; Nakai, Jun; and Kojima, Yuichi, to Sony Corporation. Method and apparatus for recording a digital information signal. 4,697,212, Cl. 360-48.000.
Oster, Peter: *See*—
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Frei, Bruno; and O'Sullivan, Anthony C., 4,696,945, Cl. 514-450.000.
O'Sullivan, Harry M., to Spectrum Cellular Communications Corporation, Inc. Cellular telephone data communication system and method. 4,697,281, Cl. 379-59.000.
Oswald, Gordon K. A., to Coal Industry (Patents) Limited. Borehole located directional antennae means for electromagnetic sensing systems. 4,697,190, Cl. 343-719.000.
Otis Engineering Corporation: *See*—
Dollison, William M., 4,696,221, Cl. 91-51.000.
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Kato, Akira; Otobe, Yutaka; and Kimura, Shigehiro, 4,696,272, Cl. 123-339.000.

Ottesen, Hjalmar H.: *See—*
Stich, Michael C.; Resman, John B.; Ottesen, Hjalmar H.; and Anderson, Todd B., 4,697,127, Cl. 318-561.000.
Ottieri, Marco T. Spring structure for ski boot. 4,696,117, Cl. 36-117.000.
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Bierhoff, Waltherus C. J.; Schuitmaker, Pieter D.; Ouwerkerk, Cornelis; and Verhoeven, Robertus J. M., 4,696,590, Cl. 400-613.000.
Overath, Hilde M. A.; and Bierhoff, Martinus P. M., to U.S. Philips Corporation. Apparatus for enabling an autotrack circuit of an optical disc reading apparatus during the positioning of a read beam. 4,697,258, Cl. 369-44.000.
Overbay, Mark A., to Combustion Engineering, Inc. Collet type gripper. 4,696,102, Cl. 29-726.000.
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, to Energy Conversion Devices, Inc. Gas mixtures for the vapor deposition of semiconductor material. 4,696,758, Cl. 252-188.310.
Owatonna Manufacturing Company: *See—*
Clark, Brian C.; and Jines, Michael D., 4,696,361, Cl. 180-68.400.
Owen, Muri, to Lalos & Keegan. Method and apparatus for examining earth formations. 4,696,903, Cl. 436-28.000.
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Weaver, Edward A., 4,696,909, Cl. 501-75.000.
Oyamada, Kenji: *See—*
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Ozawa, Kira: *See—*
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Page, Gerald R. Two-position ladder platform. 4,696,373, Cl. 182-121.000.
Pagliaro, Michael J. Violin student sizing device. 4,696,220, Cl. 84-453.000.
Palazzetti, Mario, to Fiat Auto S.p.A. System for interconnecting sensor and actuating devices. 4,697,094, Cl. 307-40.000.
Pallos, Laszlo : *See—*
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.
Palmer, Darrel, to Ballard Medical Products. Aspirating/ventilating apparatus. 4,696,296, Cl. 128-207.160.
Panessidi, Joseph. Animal shelter. 4,696,260, Cl. 119-19.000.
Panetz, Allen I.: *See—*
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Parrish, Donald B.: *See—*
Ellerbe, Gilbert B., III; and Parrish, Donald B., 4,696,976, Cl. 525-126.000.
Pasquarella, Stephen T., to VA Inc. Portable actuator for inductive load. 4,697,221, Cl. 361-156.000.
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Pauley, James L.: *See—*
Butts, Gene A.; Kelley, Charles D.; Garsee, Henry A.; Petty, Bruce R.; and Pauley, James L., 4,697,236, Cl. 364-416.000.
Pawlak, Joseph A.: *See—*
Schwartz, Willis T.; and Pawlak, Joseph A., 4,697,023, Cl. 549-241.000.
Paxton, Ronald B., to Morton Thiokol, Inc. High propellant mass fraction highly stress relieved end-burning grain structure. 4,696,233, Cl. 102-287.000.
Pecak, Matthew L.: *See—*
Hofer, Dean A.; Carlson, Daniel J.; and Pecak, Matthew L., 4,697,192, Cl. 343-895.000.
Peddy, John T.: *See—*
Neary, John F.; Peddy, John T.; and Willis, David H., 4,696,257, Cl. 119-1.000.
Pedersen, Poul H. H.: *See—*
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Pedneault, John A., to Aqua Strip Corporation. Water purification apparatus. 4,696,739, Cl. 210-121.000.
Peemoller, Horst; and Svensson, Heino, to U.S. Philips Corporation. Device for producing x-y coordinate addresses for a picture screen. 4,697,049, Cl. 178-18.000.
Pendleton, Eric; Roberts, Karl A.; and Murray, Alan, to National Nuclear Corporation Limited. Monitoring pressure within a vessel. 4,696,787, Cl. 376-247.000.
Penney, Carl M., to General Electric Company. Precision remote location of a movable point employing light interference fringes. 4,696,574, Cl. 356-375.000.
Pentith, Gerald R. O., to Fletcher Sutcliffe Wild Ltd. Conveying apparatus. 4,696,391, Cl. 198-833.000.
Performance Controls, Inc.: *See—*
Goff, Jerry K.; and Chizever, Gary E., 4,697,125, Cl. 318-254.000.
Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,696,263, Cl. 123-65.00V.
Pergandis, Grigorios. Rechargeable battery powered toy. 4,697,133, Cl. 320-2.000.
Perigne, Jerome: *See—*
Barbier, Gerard Y. G.; Leboure, Gerald J. P. B.; Desaulty, Michel A. A.; Martinez, Rodolphe; and Perigne, Jerome, 4,696,157, Cl. 60-39.290.
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Timgren, Carl J., 4,696,798, Cl. 422-102.000.
Pero, Edward B.: *See—*
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Perry, Charles D., III. Eyeglass retainer. 4,696,556, Cl. 351-157.000.
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Boulton, David A.; Kopka, Ihor E.; Moore, Vernon L.; and Pessolano, Arsenio A., 4,697,012, Cl. 544-124.000.
Peter von Berg Extrakorporale Systems-Medizintechnik GmbH: *See—*
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Peters, Edward N., to General Electric Company. Poly(ester-carbonates) and blends based on 3-methyl-4-hydroxy-benzoic acid. 4,696,995, Cl. 528-206.000.
Peterson, Janice C.; and DiMartino, Stephen P., to Air Products and Chemicals, Inc. Metal hydride adsorption process for hydrogen purification. 4,696,806, Cl. 423-248.000.
Peterson, Phillip R.: *See—*
Geary, Joseph M.; and Peterson, Phillip R., 4,696,569, Cl. 356-124.000.
Petit, Daniel: *See—*
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Petocz, Lujza: *See—*
Messmer, Andras; Batori, Sandor; Hajos, Gyorgy; Benko, Pal; Pallos, Laszlo ; Petocz, Lujza; Grasser Katalin; and Kosoczky, Ibolya, 4,697,013, Cl. 544-183.000.
Petracca, Victor G.: *See—*
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Petronko, Dennis A. Heat foam insulation jacket. 4,696,324, Cl. 137-375.000.
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Pettit, Harold W., Jr; Davis, Charles G.; and Walden, Frederick C., to United Technologies Corporation. Multiple port plasma spray apparatus and method for providing sprayed abradable coatings. 4,696,855, Cl. 428-312.800.
Petty, Bruce R.: *See—*
Butts, Gene A.; Kelley, Charles D.; Garsee, Henry A.; Petty, Bruce R.; and Pauley, James L., 4,697,236, Cl. 364-416.000.
Petzoldt, Karl, to Schering Aktiengesellschaft. Indanyl derivatives and process for their preparation. 4,696,948, Cl. 514-605.000.
Pezzoli, Luigi, to Vamatex S.p.A. Composite gearwheel structure for the control of gripper-carrying straps in weaving looms. 4,696,200, Cl. 74-434.000.
Pfeifer, Josef, to Ciba-Geigy Corporation. Processes for preparing protective coatings and relief structures. 4,696,890, Cl. 430-325.000.
Pfennings, Leonardus C. M. G.: *See—*
Van Zanten, Adrianus T.; Veendrick, Hendrikus J. M.; Pfennings, Leonardus C. M. G.; and Gubbels, Wilhelmus C. H., 4,697,111, Cl. 307-482.000.
Pham, Ninh G.: *See—*
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Bentzen, Craig L.; Guyon-Gellin, Yves; Kalathakis, Kyriacos; Phan, Hieu T.; Nguyen Mong, Lan; Niesor, Eric; and Rossier, Jean-Robert, 4,696,920, Cl. 514-89.000.
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Turano, Louis R.; Callaham, William T.; Sherwood, John F.; and Thatcher, Richard E., 4,696,312, Cl. 131-109.100.
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Robertson, Brian W.; and Phillips, Gareth T., 4,696,901, Cl. 435-180.000.
Phillips Petroleum Company: *See—*
Gentry, Cecil C., 4,696,734, Cl. 208-407.000.
Rahlwes, William C., 4,696,741, Cl. 210-232.000.
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Piazza, Michael P.: *See—*
Danaczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., 4,696,603, Cl. 405-227.000.
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Pichot, Jacky; and Oddou, Jacques, to Electricite de France. Method of transforming a pre-existing heat installation, and control device for implementing the method. 4,696,427, Cl. 236-1.00E.

Pinkney, James, to South Park Sales & Mfg., Inc. Loose leaf binder lift lock. 4,696,595, Cl. 402-54.000.
Pinto, Alwyn, to Imperial Chemical Industries PLC. Electricity production. 4,696,871, Cl. 429-17.000.
Pioneer Electronic Corporation: *See—*
Tokumo, Akio; Takagi, Kazunori; and Mori, Shuichi, 4,696,370, Cl. 181-141.000.
Pirelli Transmissioni Industriali S.p.A.: *See—*
Macchiarulo, Vincenzo; and Marcelli, Ezio, 4,696,665, Cl. 474-153.000.
Pischinger, Franz, to FEV Forschungsgesellschaft fur Energietechnik und Verbrennungsmotoren mbH. Combustion process for internal combustion engine. 4,696,270, Cl. 123-274.000.
Pitchford, Thomas E. Fortune candle. 4,696,640, Cl. 431-289.000.
Piteau, Marc: *See—*
Malfroot, Thierry; Piteau, Marc; and Senet, Jean-Pierre, 4,697,032, Cl. 558-270.000.
Pitt, Gilles D.; Extance, Philip; and Jones, Roger E., to Standard Telephone and Cables, Plc. Optical fiber cable having a low permeability to hydrogen. 4,696,543, Cl. 350-96.230.
Piwinski, John J.: *See—*
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Pizzo, Joseph A.: *See—*
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Pleines, Peter; and Wolf, Erich, to Farco-Pharma GmbH. Process for collecting fragments which are obtained on shattering stones in body cavities of living humans and other mammals. 4,696,297, Cl. 128-303.100.
Plescia, Ralphael. Nut for stringed instruments. 4,696,219, Cl. 84-314.00N.
Plessey Overseas Limited: *See—*
Beaufoy, Raymond, 4,697,263, Cl. 370-85.000.
Polaroid Corporation: *See—*
Casel, John J., 4,696,876, Cl. 430-1.000.
Pollak, Raimund: *See—*
Ettischer, Helmut; Ebner, Arno; Munz, Rolf; and Pollak, Raimund, 4,696,615, Cl. 414-114.000.
Pollock, Richard A.: *See—*
Wilson, Aaron W.; and Pollock, Richard A., 4,696,413, Cl. 221-13.000.
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Porath, Jerker. Sulfone activated thioether adsorbents for the separation of proteins and the like. 4,696,980, Cl. 525-326.100.
Powers, Ronald J. Cosmetic pencil having advanceable cosmetic mass. 4,696,594, Cl. 401-65.000.
PPG Industries, Inc.: *See—*
Chang, Wen-Hsuan; Chau, Michael M.; and Piccirilli, Robert, 4,696,959, Cl. 524-91.000.
Gemert, Barry V., 4,696,695, Cl. 71-92.000.
Lawhon, Robert A.; Heithoff, Robert B.; and Gonzalez, Wayne H., 4,696,691, Cl. 65-27.000.
Ward, Thomas A.; Petracca, Victor G.; and Figore, Timothy, 4,696,864, Cl. 428-413.000.
Precision Mecanique Labinal: *See—*
le Chatelier, Robert; Sinic, Andre ; and Diefenbach, Jean-Jacques, 4,696,334, Cl. 152-417.000.
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Vandame, Bertrand, 4,696,530, Cl. 439-266.000.
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Zandel, Adam, 4,696,180, Cl. 72-456.000.
Priam Corporation: *See—*
Cloke, Robert L., 4,697,098, Cl. 307-354.000.
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Esch, Friedrich D.; and Price, John G., 4,696,146, Cl. 53-529.000.
Pridham, Roger G., to Raytheon Company. System and method for measuring ice thickness. 4,697,254, Cl. 367-92.000.
Priebe, Waldemar: *See—*
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Pritchard, James R.; and Regelman, Dale F., to Dow Chemical Company, The. Thermally stable and high impact resistant structural polyurethane foam. 4,696,954, Cl. 521-167.000.
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McCullough, Michael J.; McKibben, Gary E.; and Skidmore, John E., 4,696,840, Cl. 220-462.000.
Muckenfuhs, Delmar R.; and Van Coney, Robert H., 4,696,416, Cl. 222-109.000.
Prouteau, Philippe: *See—*
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Pryor, Michael J., to Olin Corporation. Hybrid and multi-layer circuitry. 4,696,851, Cl. 428-210.000.
Pullman Rail Leasing Corporation: *See—*
Miller, Roy W., 4,696,088, Cl. 29-401.100.
Pullman Rail Leasing Incorporated: *See—*
Miller, Roy W., 4,696,237, Cl. 105-248.000.
Pum, Reinhard: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.
Pummell, Ivan K.: *See—*
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Puski, Gabor; Hartman, Grant H., Jr.; and Talbott, Robert D., to Bristol-Myers Company. Process for preparing low phytate soy protein isolate. 4,697,004, Cl. 530-378.000.
Quadic Systems, Inc.: *See—*
Ferris, David A.; and DeSimone, Daniel J., 4,697,103, Cl. 307-456.000.
Quan, Peter M.: *See—*
Devonald, David P.; Nelson, Anthony J.; Quan, Peter M.; and Stewart, David, 4,696,801, Cl. 423-24.000.
Quanex Corporation: *See—*
Church, Kristy L., 4,696,498, Cl. 285-334.000.
Quate, Calvin F.; and Khuri-Yakub, Butrus T., to Xerox Corporation. Nozzleless liquid droplet ejectors. 4,697,195, Cl. 346-140.00R.
Quint, David W.: *See—*
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Rabindran, K. George: *See—*
Zemke, Edward H., deceased; Vandersyde, Gary L.; Rabindran, K. George; and Guenther, Kenneth L., 4,697,246, Cl. 364-563.000.
Raccah, Paul M.: *See—*
Schachter, Rozalie; Viscogliosi, Marcello; Bunz, Lewis A.; Olego, Diego J.; Serreze, Harvey B.; and Raccah, Paul M., 4,696,828, Cl. 427-38.000.
Rach, Heinz-Dieter; and Frerichs, Udo, to Continental Gummi-Werke Aktiengesellschaft. Rim for a pneumatic vehicle tire. 4,696,333, Cl. 152-379.300.
Radiall Industrie: *See—*
Despouys, Jean-Bernard, 4,696,538, Cl. 350-96.200.
Rahlwes, William C., to Phillips Petroleum Company. Vortex breaker for use in a liquid-liquid separator or the like. 4,696,741, Cl. 210-232.000.
Rakoczynski, Randolph W.; Odojewski, Stephen S.; and Rolfe, John I., to Waste Resource Associates, Inc. Secure landfill and method of operating a landfill for hazardous waste. 4,696,599, Cl. 405-129.000.
Raleigh, William J.: *See—*
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Ranallo, Frank N.: *See—*
Zarnstorff, William C.; and Ranallo, Frank N., 4,697,280, Cl. 378-207.000.
Randall, Richard: *See—*
Claytor, Thomas N.; Ockert, Carl E.; and Randall, Richard, 4,696,191, Cl. 73-600.000.
Randall, Russel R., to Western Atlas International, Inc. Method for quality control of counting logs. 4,697,078, Cl. 250-256.000.
Randke, Peter T.: *See—*
Graf, Hans-Juergen; and Randke, Peter T., 4,696,411, Cl. 220-281.000.
Raphael, Barbara C.: *See—*
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Rasmussen, Ivar; and Pedersen, Poul H. H., to Danfoss A/S. Control device for hydrostatic steering means. 4,696,161, Cl. 60-384.000.
Rasmussen, Jerald K., to Minnesota Mining and Manufacturing Company. Polyamide-acrylic blends. 4,696,965, Cl. 524-380.000.
Rasmussen, Russell G.: *See—*
Welch, Bennie R.; Rasmussen, Russell G.; and Disko, Harry, 4,696,654, Cl. 446-268.000.
Ratcliff, Perry A. Method and composition for prevention and treatment of oral disease. 4,696,811, Cl. 424-53.000.
Rathke, Jorg: *See—*
Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, 4,696,537, Cl. 350-96.200.
Ratzel, Dieter: *See—*
Strobel, Bernhard; and Ratzel, Dieter, 4,697,148, Cl. 324-309.000.
Raudman, Charles J.; and Smith, Philip E. Spill collector assembly for liquid storage vessels. 4,696,330, Cl. 141-86.000.
Ravichandran, Ramanathan, to Ciba-Geigy Corporation. Compositions stabilized with ethers of di- and tri-substituted hydroxylamines. 4,696,964, Cl. 524-236.000.
Rayburn, Walter. Casting float with line stop. 4,696,125, Cl. 43-43.140.
Raychem Corp.: *See—*
Mattis, John S., 4,696,532, Cl. 439-863.000.
Vidakovits, Lajos J., 4,696,841, Cl. 428-36.000.
Rayovac Corporation: *See—*
Harmon, Charles H.; Ward, Thomas F.; and Zimmermann, Robert W., 4,696,402, Cl. 206-602.000.
Raytheon Company: *See—*
Conrad, George M.; and Smalley, Kenneth M., 4,697,096, Cl. 307-246.000.
Lind, Earl R.; and Franklin, Ronald A., 4,697,253, Cl. 367-12.000.
Pridham, Roger G., 4,697,254, Cl. 367-92.000.
RCA Corporation: *See—*
Alig, Roger C.; Bloom, Stanley; and Hockings, Eric F., 4,697,120, Cl. 313-412.000.
Balaban, Alvin R.; and Steckler, Steven A., 4,697,211, Cl. 358-153.000.
Dresner, Joseph, 4,697,197, Cl. 357-4.000.
Magee, Charles W.; and Honig, Richard E., 4,697,085, Cl. 250-426.000.

Sechi, Franco N.; and Kalokitis, David, 4,697,159, Cl. 333-24.00C.

Redicon Corporation: *See*—
Bulso, Joseph D., Jr.; and McClung, James A., 4,696,177, Cl. 72-379.000.

Reeder, James A.; and Reeder, Joanne E. Portable, foldable replica of a facade of commercial establishments. 4,696,652, Cl. 446-75.000.

Reeder, Joanne E.: *See*—
Reeder, James A.; and Reeder, Joanne E., 4,696,652, Cl. 446-75.000.

Reedy, Ronald E.: *See*—
Albares, Donald J.; and Reedy, Ronald E., 4,696,536, Cl. 350-96.190.

Reese, James R.; and Yelich, William, to Cla-Val Company. Air release and vacuum breaker valve system. 4,696,321, Cl. 137-202.000.

Regelman, Dale F.: *See*—
Pritchard, James R.; and Regelman, Dale F., 4,696,954, Cl. 521-167.000.

Regipa, Robert, to Centre National d'Etudes Spatiales (C.N.E.S.). Device for coupling a balloon envelope with an element external to the envelope. 4,696,444, Cl. 244-127.000.

Rehlander, Weber. Forward-reverse belt transmission. 4,696,661, Cl. 474-5.000.

Reiffen, Manfred: *See*—
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; and Diederen, Willi, 4,696,931, Cl. 514-261.000.

Rein, Heinz: *See*—
Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,697,225, Cl. 362-61.000.

Renfro, James G., to Hughes Tool Company. Torque wrench. 4,696,206, Cl. 81-57.340.

Rengo Co., Ltd.: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,696,212, Cl. 83-343.000.

Renker, Hansjoerg; and Abegglen, Martin, to Fritz Studer AG. Polymer concrete articles and process for manufacturing same. 4,696,839, Cl. 428-15.000.

Renold, Inc.: *See*—
Beehler, David E.; Drake, Timothy E.; and Hawk, Timothy E., 4,696,357, Cl. 177-145.000.

Research Corporation: *See*—
DesMarteau, Darryl D., 4,697,011, Cl. 540-544.000.

Resman, John B.: *See*—
Stich, Michael C.; Resman, John B.; Ottesen, Hjalmar H.; and Anderson, Todd B., 4,697,127, Cl. 318-561.000.

Ressi di Cervia, Arturo L., to Finic, B.V. Slurry trench method and apparatus for constructing underground walls. 4,696,607, Cl. 405-267.000.

REXA Corporation: *See*—
Glomeau, J. Robert, 4,696,163, Cl. 60-476.000.

Reyner, Franklin C. Contraceptive device and related method. 4,696,294, Cl. 128-131.000.

Reynolds, Daniel S., to Loral Corporation. Configuration for a disk brake torque tube. 4,696,376, Cl. 188-71.500.

Rhee, Sang S.: *See*—
Weber, Otto K.; and Rhee, Sang S., 4,697,077, Cl. 250-231.0SE.

Rheinmetall GmbH: *See*—
Kaltmann, Hans-Joachim; and Schaper, Hermann, 4,696,234, Cl. 102-309.000.

Rhodes, Harold B., Jr. Spillage prevention. 4,696,328, Cl. 141-1.000.

Rhodes, James A.: *See*—
Wren, Michael; Lantz, Paul W.; Acock, George W., Jr.; and Rhodes, James A., 4,696,133, Cl. 52-80.000.

Rhone-Poulenc Specialites Chimiques: *See*—
Robin, Jean, 4,697,014, Cl. 544-193.000.

Rice, George. Apparatus for locating the outline of an accessory in dry wall or a decorative panel. 4,696,113, Cl. 33-562.000.

Rice, Richard D., Jr. Centrifuge machine and rotor. 4,696,666, Cl. 494-16.000.

Richardson, Eugene M.; Brehm, Norbert O.; and Null, Larry G., to LTV Energy Products Company. Brake system for drawworks. 4,696,377, Cl. 188-170.000.

Richardson, John C.; and Salame, Morris, to Monsanto Company. Hollow copolyamide article. 4,696,865, Cl. 428-474.400.

Richter Gedeon Vegyeszeti Gyar RT: *See*—
Megyeri, Gabor; Keve, Tibor; Galambos, Janos; Kovacs, Lajos, Jr.; Stefko, Bela; Bogsch, Erik; and Trischler, Ferenc, 4,697,017, Cl. 544-346.000.

Richwood Industries, Inc.: *See*—
Stoll, Donald L., 4,696,388, Cl. 198-493.000.

Ricoh Co., Ltd.: *See*—
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.
Kurotaka, Sigeo; and Tukano, Moriyosi, 4,696,418, Cl. 222-167.000.
Nakazato, Yukitaka; Hashimoto, Kenji; and Taruki, Takashi, 4,696,463, Cl. 271-176.000.
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Tomizuka, Mitsuo, 4,696,557, Cl. 353-66.000.
Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, 4,696,255, Cl. 118-653.000.

Ringle, Richard P.: *See*—
Larson, Richard I.; Ringle, Richard P.; Connolly, John D., Jr.; and Gallivan, Timothy J., 4,696,769, Cl. 252-638.000.

Risbet, Marie P.: *See*—
Fonfria, Robert; Risbet, Marie P.; and Zattara, Jean L., 4,696,082, Cl. 29-25.420.

Ritley, Charles N. Material separating surface. 4,696,738, Cl. 209-352.000.

Riviere, Guy; and Luczak, Jean P. Traction type press. 4,696,637, Cl. 425-589.000.

Rivoli, Mark S., to Northrop Corporation. Substrate container. 4,696,395, Cl. 206-334.000.

Robert Bosch GmbH: *See*—
Flaig, Ulrich; and Sieber, Albrecht, 4,696,276, Cl. 123-478.000.
LeBlanc, Jean, 4,696,271, Cl. 123-299.000.
Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,697,225, Cl. 362-61.000.

Roberts, Karl A.: *See*—
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Roberts, Roland Q., Jr. Boot carrier. 4,696,504, Cl. 294-148.000.

Roberts, Timothy A. Honing device. 4,696,129, Cl. 51-214.000.

Robertshaw Controls Company: *See*—
Buckshaw, Thomas M.; and Llewellyn, David T., 4,696,204, Cl. 74-567.000.
Fowler, Daniel L., 4,697,057, Cl. 219-10.55B.
Ochsner, Rolf H.; and Everett, Charles J., 4,697,054, Cl. 200-11.00K.

Robertson, Brian W.; and Phillips, Gareth T., to Shell Internationale Research Maatschappij B.V.; and Gist Brocades N.V. Immobilization of microorganisms on a plastic carrier. 4,696,901, Cl. 435-180.000.

Robin, Jean, to Rhone-Poulenc Specialites Chimiques. Catalytic partial cyclotrimerization of polyisocyanates and product thereof. 4,697,014, Cl. 544-193.000.

Roboserve Limited: *See*—
Cox, Harold S., 4,696,950, Cl. 521-57.000.

Rock, Robert G., to United States of America, Navy. Velocity discrimination radar. 4,697,186, Cl. 342-189.000.

Rockwell International Corporation: *See*—
Maus, Louis; Witucki, Edward F.; and Warren, Leslie F., 4,696,835, Cl. 427-121.000.
Walker, John A.; Witucki, Edward F.; and Warren, Leslie F., 4,697,001, Cl. 528-423.000.
Witucki, Edward F.; and Warren, Leslie F., 4,697,000, Cl. 528-423.000.

Roggendorf, Peter; and Buchmann, Rainer, to Petri AG. Control system for electrically operated components of an automotive vehicle. 4,697,092, Cl. 307-10.00R.

Roggendorff, Martin, to Kloeckner-Humboldt-Deutz AG. Air-cooled internal combustion engine. 4,696,262, Cl. 123-41.690.

Rogic, Milorad M.: *See*—
Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., 4,696,693, Cl. 71-28.000.

Rohm GmbH: *See*—
Ude, Werner; Knebel, Joachim; and Schroeder, Guenter, 4,696,993, Cl. 528-167.000.

Rohm and Haas Company: *See*—
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Rohr, Gustav; and Nohl, Gerd, to Frankl & Kirchner GmbH. Device for detecting an overlapping edge of material on a sewing machine. 4,696,246, Cl. 112-272.000.

Roland, Robert D.: *See*—
Knapp, Alfons; Roland, Robert D.; and Hutto, Joe D., 4,696,322, Cl. 137-218.000.

Rolfe, John I.: *See*—
Rakoczynski, Randolph W.; Odojewski, Stephen S.; and Rolfe, John I., 4,696,599, Cl. 405-129.000.

Rolls-Royce: *See*—
Hamblett, Martin; and Livsey, Duncan J., 4,696,621, Cl. 415-191.000.

Rolls-Royce plc: *See*—
Stewart, Peter A. E.; Hawkesworth, Michael R.; and Witcomb, Roger C., 4,697,079, Cl. 250-303.000.

Roloff, Achim; and Gschwend, Heinz W., to Ciba-Geigy Corporation. Intermediates for the preparation of a carboxylic acid. 4,697,016, Cl. 544-344.000.

Roloff, Helmut, to Himly, Holscher GmbH & Co. Method and device for preheating raw materials for glass production, particularly a cullet mixture. 4,696,690, Cl. 65-27.000.

Romano, Antonino. Pneumatic action accessory holder specifically for sewing machines. 4,696,243, Cl. 112-257.000.

Romer, Michael: *See*—
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidenschink, Rudolf; and Romer, Michael, 4,696,549, Cl. 350-350.00R.

Romero, Jorge E.: *See*—
Lewis, Henry W.; and Romero, Jorge E., 4,696,707, Cl. 156-64.000.

Ronk Electrical Industries, Inc.: *See*—
Ronk, Leroy B.; and Hertz, Claude M., 4,697,132, Cl. 318-795.000.
Ronk, Leroy B.; and Hertz, Claude M., to Ronk Electrical Industries, Inc. Reduction of voltage drop in power distribution systems and of loss of motor torque. 4,697,132, Cl. 318-795.000.

Roos, Hartog J.; and Schilling, Edward F., to General Electric Company. X-ray imaging system calibration using projection means. 4,697,075, Cl. 250-213.0VT.

Rosen, Marvin E.: *See*—
Sampson, Mark E.; and Rosen, Marvin E., 4,696,244, Cl. 112-262.100.

Rosenquist, Niles R., to General Electric Company. Cyclic carbonate oligomer composition. 4,696,997, Cl. 528-271.000.

Ross, Colin F.: *See*—
McCann, Denis J.; and Ross, Colin F., 4,696,521, Cl. 303-92.000.

Rosset, Roger; and Mayeur, Jacques, to SEB S.A. Steam-generating device and a cooking oven equipped with said device. 4,697,067, Cl. 219-401.000.

Rossier, Jean-Robert: *See*—
Bentzen, Craig L.; Guyon-Gellin, Yves; Kalathakis, Kyriacos; Phan, Hieu T.; Nguyen Mong, Lan; Niesor, Eric; and Rossier, Jean-Robert, 4,696,920, Cl. 514-89.000.

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Tolino, Ralph W.; King, William E.; Blickenderfer, Jack L.; and Roth, Charles H., Jr., 4,696,784, Cl. 376-245.000.

Rowe, Edward A., Jr., to Occidental Electrochemical Corporation. Perchloroethylene dielectric fluid containing aliphatic hydrocarbons. 4,697,043, Cl. 174-17.0LF.

Royzman, Semyon E., to Blaw Knox Corporation. Method and plant for fully continuous production of steel strip from ore. 4,696,458, Cl. 266-212.000.

Ruaud, Xavier, to La Telemecanique Electrique. Emergency switching apparatus. 4,697,052, Cl. 200-43.070.

Rudolph, Georg, to Wandel u. Goltermann GmbH & Co. Digitally controlled variable frequency synthesizer. 4,697,156, Cl. 331-1.00A.

Ruetz, Georg; and Giesselmann, Jurgen, to MTU Friedrichshafen GmbH. Fluid flow machine. 4,696,620, Cl. 415-164.000.

Ruger, James; and Welz, Wolfgang, to Eltro GmbH. Radiation detection method. 4,696,567, Cl. 356-28.000.

Ruhrkohle Aktiengesellschaft: *See*—
Wolowski, Eckard; Mirtsch, Frank; and Dybus, Herbert, 4,696,735, Cl. 208-400.000.

Ruhter, Martin L.; Brimeyer, Dennis A.; and Stubben, David W., to Deere & Company. Motor grader with saddle mounted to transverse pin on main frame. 4,696,350, Cl. 172-793.000.

Ruhter, Martin L., to Deere & Company. Rear steer angle indicator for articulating vehicle. 4,696,486, Cl. 280-400.000.

Rupprecht, Eckhard: *See*—
Schepky, Gottfried; Brickl, Rolf; Rupprecht, Eckhard; and Greischel, Andreas, 4,696,815, Cl. 424-80.000.

Rupprecht, Georg; and Hassel, David R., to Rupprecht & Patashnick Co., Inc. Decoupling suspension system for an oscillating element microbalance. 4,696,181, Cl. 73-580.000.

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Rupprecht, Georg; and Hassel, David R., 4,696,181, Cl. 73-580.000.

Rush, Lynn: *See*—
Walker, Don W.; and Rush, Lynn, 4,696,110, Cl. 33-137.00R.

Russ, Roger A.; and Hennen, John J., to Deere & Company. Forage harvester blower. 4,696,432, Cl. 241-101.700.

Russe, Meinhard W.; Bolze, Rudolf; and Koch, Friedhelm, to Degussa Aktiengesellschaft. Material for improving the fertility of mammals and process for its production. 4,696,914, Cl. 514-19.000.

Russell, Lionel V. F., to W. Vinten Limited. Equipment mounting mechanism. 4,696,596, Cl. 403-321.000.

Ruszczyk, Andreas, to Motorola, Inc. CMOS power-on detection circuit. 4,697,097, Cl. 307-296.00R.

Ruynon, James R.: *See*—
Danner, Bernard; and Ruynon, James R., 4,696,962, Cl. 524-140.000.

Ryan, John L. High capacity shear fastener. 4,696,423, Cl. 227-55.000.

Ryan, Michael K. Farrier's tool. 4,696,346, Cl. 168-45.000.

Ryglicki, Roman: *See*—
Grochal, Tadeusz; Ryglicki, Roman; and Wierzchowski, Wojciech, 4,696,337, Cl. 164-150.000.

Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,696,858, Cl. 428-323.000.

S. C. Johnson & Son, Inc.: *See*—
Grothaus, Roger H.; and Hildebrandt, Donald W., 4,696,126, Cl. 43-112.000.

S.I.E., Inc.: *See*—
Anderson, Richard V.; and Carnes, Wendall D., 4,696,343, Cl. 166-164.000.

Sacks, William: *See*—
Sibilia, John P.; Kotliar, Abraham M.; Murthy, Narasimhaiah S.; and Sacks, William, 4,696,857, Cl. 428-323.000.

Sagawa, Takayoshi: *See*—
Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-422.000.

Saha, Sanjiv, to BICC Public Limited Company. Apparatus for extracting light from the core of an optical fibre through the cladding and buffer coating thereof and its use in optical fibre splicing. 4,696,534, Cl. 350-96.150.

Saha, Sanjiv, to BICC Public Limited Company. Apparatus for injecting light through a buffer-coated optical fibre into the core thereof and its use in optical fibre splicing. 4,696,535, Cl. 350-96.150.

Saiko, Alfons: *See*—
Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, 4,696,251, Cl. 114-346.000.

Saint Gobain Vitrage: *See*—
Degeilh, Robert, 4,696,971, Cl. 525-61.000.
Lenhardt, Karl, 4,696,256, Cl. 118-680.000.

Saito, Noriaki: *See*—
Higashimura, Toshinobu; Sawamoto, Mitsuo; Toyoshima, Yoshiki; Kanagawa, Shuuichi; Takahashi, Tsutomu; and Saito, Noriaki, 4,696,988, Cl. 526-220.000.

Saito, Tadahiro; and Gotoh, Kunihiko, to Fujitsu Limited. Semiconductor integrated circuit having a test circuit for testing an internal circuit. 4,697,140, Cl. 324-73.00R.

Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having light receiving layer with smoothly connected interfaces. 4,696,881, Cl. 430-57.000.

Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having light receiving layer with smoothly interconnecting nonparallel interfaces. 4,696,882, Cl. 430-57.000.

Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having light receiving layer with smoothly connected nonparallel interfaces and surface reflective layer. 4,696,883, Cl. 430-57.000.

Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having photosensitive layer with series of smoothly continuous non-parallel interfaces. 4,696,884, Cl. 430-58.000.

Sakaguchi, Isao; and Kawaide, Tatsuo, to Hitachi, Ltd. Method of orienting magnetic disc by magnetic field. 4,696,831, Cl. 427-48.000.

Sakaguchi, Takahiro: *See*—
Enami, Katsuya; Tsuyuguchi, Hiroshi; and Sakaguchi, Takahiro, 4,697,129, Cl. 318-696.000.

Sakai, Kunito; Matsuda, Sadamu; and Takahama, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and manufacturing method therefor. 4,697,203, Cl. 357-72.000.

Sakaime, Zenichiro: *See*—
Kawai, Keiichi; Yasuda, Setsuo; and Sakaime, Zenichiro, 4,696,079, Cl. 17-33.000.

Sakata, Hirotsugu; Nagatomo, Shigemi; Hayano, Makoto; and Hatori, Mitsuo, to Kabushiki Kaisha Toshiba. Scroll compressor with a thrust reduction mechanism. 4,696,630, Cl. 418-55.000.

Saksena, Anil K.: *See*—
Green, Michael J.; and Saksena, Anil K., 4,696,946, Cl. 514-574.000.

Salame, Morris: *See*—
Richardson, John C.; and Salame, Morris, 4,696,865, Cl. 428-474.400.

Sampson, Karla: *See*—
Kao, Shui-Hsi; Kay, Allen I.; and Sampson, Karla, 4,696,814, Cl. 424-80.000.

Sampson, Mark E.; and Rosen, Marvin E., to Doboy Packaging Machinery, Inc. Thread chaining detector. 4,696,244, Cl. 112-262.100.

Samuels, Peter B. Hemostatic clip cartridge. 4,696,396, Cl. 206-339.000.

Sanden Corporation: *See*—
Tamura, Yasuji, 4,697,091, Cl. 290-45.000.

Sander, Eugene H.; and Cook, Douglas R., to Zumbro Enterprises, Inc. Hydroxypropylmethylcellulose. 4,696,762, Cl. 252-311.000.

Sandoz Ltd.: *See*—
Danner, Bernard; and Ruynon, James R., 4,696,962, Cl. 524-140.000.
Henrick, Clive A., 4,697,033, Cl. 558-233.000.

Sangamo Weston, Inc.: *See*—
Swanson, Scott C., 4,697,180, Cl. 340-870.020.
Swanson, Scott C., 4,697,181, Cl. 340-870.020.
Swanson, Scott C., 4,697,182, Cl. 340-870.020.

Sano, Yasuro: *See*—
Kato, Kenji; and Sano, Yasuro, 4,696,245, Cl. 112-264.100.

Sanofi: *See*—
Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, 4,696,937, Cl. 514-314.000.

Sansho Seiyaku Co., Ltd.: *See*—
Higa, Yoshitaka, 4,696,813, Cl. 424-59.000.

Santini, Hugo A. A., to International Business Machines. Electroplating cell. 4,696,729, Cl. 204-224.00R.

Santo, Philip J. Deck for supporting a floatation sleep system bladder. 4,696,071, Cl. 5-451.000.

Sanyo Electric Co., Ltd.: *See*—
Ito, Kazuo; Kudo, Toshiyuki; and Hama, Ritsuo, 4,697,074, Cl. 250-211.00R.
Kawakami, Kiyotada, 4,697,176, Cl. 340-723.000.
Matsuura, Kotaro; and Oyamada, Kenji, 4,697,217, Cl. 360-125.000.

Saotome, Minoru: *See*—
Morimoto, Yutaka; Saotome, Minoru; and Komai, Atsushi, 4,696,760, Cl. 252-314.000.

Sasakawa, Hirotaka, to Casio Computer Co., Ltd. Tape loading device. 4,697,214, Cl. 360-85.000.

Sasaki, Torahiko; Sato, Kazuo; Ohkawa, Masahiro; Suzuki, Yoshihiro; Kubota, Masato; Nakao, Hatsuo; and Tange, Kyoichi, to Toyota Jidosha Kabushiki Kaisha. Solution circulation type metal-halogen battery. 4,696,870, Cl. 429-14.000.

Sasaki, Toshiharu: *See*—
Urata, Yoshihito; Tatekawa, Masaichiro; and Sasaki, Toshiharu, 4,696,562, Cl. 355-3.00R.

Sasaki, Toshihiko; Sunayama, Yooji; Yoshida, Isao; and Endo, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Ozone generating apparatus. 4,696,800, Cl. 422-186.180.

Sato, Kazuo: *See*—
Sasaki, Torahiko; Sato, Kazuo; Ohkawa, Masahiro; Suzuki, Yoshihiro; Kubota, Masato; Nakao, Hatsuo; and Tange, Kyoichi, 4,696,870, Cl. 429-14.000.

Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; Tsukase, Masaaki; and Kato, Masatoshi, to Fuji Photo Film Co., Ltd. Method for formation of an image comprising a heating step. 4,696,887, Cl. 430-203.000.

Sato, Kunihiko, to Toyota Jidosha Kabushiki Kaisha. Fuel injection control for internal combustion engine. 4,696,274, Cl. 123-440.000.

Sato, Take: *See*—
Shimomura, Kenji; Kouketsu, Shigeaki; Okuyama, Toru; and Sato, Take, 4,696,952, Cl. 521-107.000.

Sato, Tetsuo: *See*—
Okaniwa, Hiroshi; Nakatani, Kenji; and Sato, Tetsuo, 4,697,041, Cl. 136-244.000.

Sato, Tsutomu: *See*—
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.

Sato, Yuji: *See*—
Yagasaki, Eriko; Kanda, Motoya; Mitsuyasu, Kiyoshi; and Sato, Yuji, 4,696,873, Cl. 429-59.000.

Satomura, Hiroshi: *See*—
Inaba, Yutaka; Satomura, Hiroshi; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Hosaka, Akihito, 4,697,196, Cl. 346-159.000.

Sauder, Karl, to Compat Aktiengesellschaft, Firma. Apparatus for pressing tubular parts. 4,696,085, Cl. 29-237.000.

Saupe, Martin; Dauernheim, Hans; and Markl, Maximillian, to Emda Fabrik Elektro-Medizinischer und Dentaler Apparate Georg Hartmann GmbH & Co. KG. Apparatus for removing plaque and stains from the surfaces of teeth. 4,696,645, Cl. 433-125.000.

Savary, Fernand: *See*—
Lesauliner, Guy; and Savary, Fernand, 4,696,783, Cl. 376-228.000.

Savonlahti, Jukka; Ekholm, Pertti; and Harjunmaa, Hannu, to Labsystems Oy. Valve device. 4,696,195, Cl. 73-864.840.

Sawada, Tetsuya: *See*—
Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, 4,696,212, Cl. 83-343.000.

Sawaguchi, Tatsue: *See*—
Nobukawa, Akira; Sawaguchi, Tatsue; and Kuroki, Yoshihiro, 4,696,513, Cl. 279-121.000.

Sawamoto, Mitsuo: *See*—
Higashimura, Toshinobu; Sawamoto, Mitsuo; Toyoshima, Yoshiki; Kanagawa, Shuuichi; Takahashi, Tsutomu; and Saito, Noriaki, 4,696,988, Cl. 526-220.000.

Sawyer, William H.: *See*—
Kara, Gerald F.; and Sawyer, William H., 4,697,245, Cl. 364-552.000.

Scamehorn, John F.: *See*—
Blytas, George C.; Grimsby, F. Norman; and Scamehorn, John F., 4,696,726, Cl. 204-182.400.

Schachter, Rozalie; Viscoglioni, Marcello; Bunz, Lewis A.; Olego, Diego J.; Serreze, Harvey B.; and Raccah, Paul M., to Stauffer Chemical Company. Passivation of InP by plasma deposited phosphorus. 4,696,828, Cl. 427-38.000.

Schaper, Hermann: *See*—
Kaltmann, Hans-Joachim; and Schaper, Hermann, 4,696,234, Cl. 102 308.000.

Schauder, Colin D.; and Heinrich, Theodore M., to Westinghouse Electric Corp. Voltage source inverter and variable frequency, constant voltage AC motor drive embodying the same. 4,697,131, Cl. 318-762.000.

Schaudt Maschinenbau GmbH: *See*—
Belthle, Heinz, 4,696,130, Cl. 51-293.000.

Schauer, Friedrich; and Berthold, Hans, to Kabelmetal Electro Gesellschaft mit beschrankter Haftung. Device for transferring current between two contact points which are movable relative to each other. 4,696,523, Cl. 439-11.000.

Schepky, Gottfried; Brickl, Rolf; Rupprecht, Eckhard; and Greischel, Andreas. Anti-diabetic pharmaceutical forms and the preparation thereof. 4,696,815, Cl. 424-80.000.

Schering Aktiengesellschaft: *See*—
Petzoldt, Karl, 4,696,948, Cl. 514-605.000.

Schering Corporation: *See*—
Green, Michael J.; and Saksena, Anil K., 4,696,946, Cl. 514-574.000.

Scheuneman, James H.; Meyer, Joseph H.; and Mackenthun, Donald W., to Unisys Corporation. Partial duplication of pipelined stack with data integrity checking. 4,697,233, Cl. 364-200.000.

Schilling, Edward F.: *See*—
Roos, Hartog J.; and Schilling, Edward F., 4,697,075, Cl. 250-213.0VT.

Schilling, Roland, to Telefunken Electronic GmbH. Solar generator. 4,697,042, Cl. 136-244.000.

Schimanek, Hans-Joachim: *See*—
Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, 4,696,537, Cl. 350-96.200.

Schine, Jonathan M., to High Resolution Television, Inc. High resolution dot-matrix character display. 4,697,177, Cl. 340-728.000.

Schleich, Jean-Baptiste, to Arbed S.A. Beam-column junction. 4,696,137, Cl. 52-251.000.

Schliemann, Harald: *See*—
Vondernan, Werner; Weber, Jurgen; Nickel, Hans; Wissmann, Michael; and Schliemann, Harald, 4,696,264, Cl. 123-73.00V.

Schmidt, Eric R., to Uarco Incorporated. Differential pressure sensitive adhesive joined business form. 4,696,843, Cl. 428-41.000.

Schmidt, Karlheinz: *See*—
Vomhof, Paul; Schmidt, Karlheinz; and Oster, Peter, 4,696,434, Cl. 241-282.200.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. 9-julolidinyl derivatives and process of preparing them. 4,697,018, Cl. 546-94.000.

Schmidt, Richard; and Pizzo, Joseph A., to Enviro-Spray Systems Incorporated. Automatic container stuffing apparatus and method. 4,696,145, Cl. 53-436.000.

Schmidt, Robert J., to UOP Inc. Xylene producing process having staged catalytic conversion of ethylbenzene. 4,697,039, Cl. 585-477.000.

Schmidt, Werner: *See*—
Grauel, Christoph; Kittel, Ludwig; Schmidt, Werner; and Wellens, Ulrich, 4,697,260, Cl. 370-18.000.

Schmitt, Paul S., to Corning Glass Works. Kinematically determinate glass pressing mold assembly and method of use. 4,696,692, Cl. 65-102 000.

Schmitz, Herman J. R.: *See*—
Geerings, Michael P. W.; Christis, Wilhelmus J.; Fekkes, Wilhelmus F.; and Schmitz, Herman J. R., 4,697,046, Cl. 178-1.000.

Schmitz, Thomas R.; and Taylor, William M., to Cameron Iron Works, Inc. Flowline adjustable joint. 4,696,494, Cl. 285-18.000.

Schmitz, William E., to Westinghouse Electric Corp. Integral series parallel and power brake controller for a transit vehicle. 4,697,124, Cl. 318-63.000.

Schoening, Josef: *See*—
Elter, Claus; and Schoening, Josef, 4,696,790, Cl. 376-296.000.

Scholl, Hans; Thiele, Horst; and Hagemann, Eckhard, to Kochs Adler Aktiengesellschaft. Sewing machine. 4,696,242, Cl. 112-121.140.

Schrankel, Kenneth R.: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,696,676, Cl. 44-7.500.

Schreder, Felix, to E.G.O. Elektro Gerate Blanc u. Fischer. Electric cooker heating unit. 4,697,068, Cl. 219-449.000.

Schreffler, Robert Z. Eaves rain gutter. 4,696,131, Cl. 52-11.000.

Schroeder, Donald R. Fishline snap connector. 4,696,120, Cl. 43-44.830.

Schroeder, Guenter: *See*—
Ude, Werner; Knebel, Joachim; and Schroeder, Guenter, 4,696,993, Cl. 528-167.000.

Schropp, Leopold: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Schrott, Georg W.: *See*—
Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, 4,696,537, Cl. 350-96.200.

Schuitmaker, Pieter D.: *See*—
Bierhoff, Waltherus C. J.; Schuitmaker, Pieter D.; Ouwerkerk, Cornelis; and Verhoeven, Robertus J. M., 4,696,590, Cl. 400-613.000.

Schulten, Hermann: *See*—
Felten, Klaus; Honroth, Walter; Kuhn, Siegfried; Schulten, Hermann; and Zeller, Bruno, 4,696,209, Cl. 82-40.00R.

Schuster, Stanley E.: *See*—
Chappell, Barbara A.; and Schuster, Stanley E., 4,697,108, Cl. 307-475.000.

Schwaighofer, Helmut: *See*—
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Schwartz, Anthony M.: *See*—
Lukenbach, Elvin R.; Naik-Satam, Prakash; and Schwartz, Anthony M., 4,696,773, Cl. 260-513.00R.

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Gustafsson, Hans; Schwartz, Stephan; and Widen, Karl-Bertil, 4,696,910, Cl. 502-159.000.

Schwartz, Willis T.; and Pawlak, Joseph A., to Occidental Chemical Corporation. Process for the preparation of oxy-diphthalic anhydrides. 4,697,023, Cl. 549-241.000.

Schwarz, Gebhard, to Suddeutsche Kuhlerfabrik Julius Fr. Behr, GmbH & Co. KG. Oil cooler. 4,696,339, Cl. 165-51.000.

Schwarze, Hans-Otto, to Hoech-Fordertechnik GmbH. Mounting for a conveyer belt scraper assembly. 4,696,389, Cl. 198-499.000.

Schwarzensteiner, Hermann. Quick connector. 4,696,497, Cl. 285-307.000.

Schwoebel, Gerd: *See*—
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

Science Applications International Corporation: *See*—
Cross, Marshall W., 4,697,191, Cl. 343-809.000.

Science Research Center, Inc.: *See*—
Brewer, John H.; and Foster, Terry L., 4,696,907, Cl. 436-513.000.

Scientific Atlanta, Inc.: *See*—
van Rassel, William F., 4,697,277, Cl. 375-116.000.

Scott, Theron A.; and Evans, Robert T., to Halliburton Company. Annulus pressure operated ratchet device. 4,696,344, Cl. 166-182.000.

Sears, Roebuck & Co.: *See*—
Conneally, Martin L., 4,696,213, Cl. 83-438.000.

Seawright, James. Method and apparatus for providing a variable multiple image visual effect. 4,696,554, Cl. 350-613.000.

SEB S.A.: *See*—
Rosset, Roger; and Mayeur, Jacques, 4,697,067, Cl. 219-401.000.

Sebille, Bernard; Beuzard, Yves; and Demarne, Henri, to Sanofi; and Institut National de la Sante et de la Recherche Medicale (Inserm). Thiosulfonate derivatives for inhibiting malformation or destruction of red blood corpuscules. 4,696,937, Cl. 514-314.000.

Sechi, Franco N.; and Kalokitis, David, to RCA Corporation. Tuning capacitors with selectable capacitance configurations for coupling between microwave circuits. 4,697,159, Cl. 333-24.00C.

Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The: *See*—
Ellwood, Derek C.; Evans, Charles G. T.; and Yeo, Richard G., 4,696,900, Cl. 435-104.000.

Sedlacek, Raymond. Coffee filters and dispenser container therefor. 4,696,744, Cl. 210-387.000.

Segal, Henry P.; and DeWilde, Carl A., to Siemens Aktiengesellschaft. Digital carrier channel bus interface module for a multiplexer having a cross-connect bus system. 4,697,262, Cl. 370-84.000.

Sei, Hideo: *See*—
Shinoda, Tsutae; Miyashita, Yoshinori; Sugimoto, Yoshimi; Sei, Hideo; and Andoh, Shizuo, 4,697,123, Cl. 315-169.400.

Seikosha Co., Ltd.: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,696,560, Cl. 354-439.000.

Seimiya, Ryubun: *See*—
Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, 4,696,255, Cl. 118-653.000.

Seitz, Georg; and Wernicke, Rainer, to Merck Patent Gesellschaft mit beschrankter Haftung. Preparation of microcrystalline triacetylcellulose. 4,697,007, Cl. 536-83.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Tanaka, Kunio, 4,697,249, Cl. 364-900.000.

Seki, Yoichi: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,696,560, Cl. 354-439.000.

Sekimoto, Soichi: *See*—
Mita, Tsunemasa; Katoh, Ryoki; Sekimoto, Soichi; Shiratsuki, Yoshiyuki; and Arisawa, Hiroshi, 4,697,204, Cl. 357-74.000.

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Matsushita, Toshihiko; Morishita, Sadao; Sekine, Mikiya; and Hiraishi, Shigetoshi, 4,696,863, Cl. 428-402.200.

Seli, Michel, to Framatome et Cogema "Fragema". Process and device for detecting defective cladding sheaths in a nuclear fuel assembly. 4,696,788, Cl. 376-253.000.

Senda, Eiichi, to Nippondenso Co., Ltd. Shaft coupler for coupling a rotary shaft of an ignition distributor to an engine camshaft. 4,696,658, Cl. 464-112.000.

Senda, Hisakazu: *See*—
Asano, Hideharu; and Senda, Hisakazu, 4,697,008, Cl. 536-89.000.

Sendor, Bernard T.; and Sendor, Mortimer S., to Sendor Bindery, Inc. Book pocket assembly and blank therefor. 4,696,490, Cl. 281-15.00R.

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Sendor, Bernard T.; and Sendor, Mortimer S., 4,696,490, Cl. 281-15.00R.

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Sendor, Bernard T.; and Sendor, Mortimer S., 4,696,490, Cl. 281-15.00R.

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Malfroot, Thierry; Piteau, Marc; and Senet, Jean-Pierre, 4,697,032, Cl. 558-270.000.

Seo, Takamasa: *See*—
Hiraoka, Shigeaki; and Seo, Takamasa, 4,697,071, Cl. 235-379.000.

Serreze, Harvey B.: *See*—
Schachter, Rozalie; Viscogliosi, Marcello; Bunz, Lewis A.; Olego, Diego J.; Serreze, Harvey B.; and Raccah, Paul M., 4,696,828, Cl. 427-38.000.

Service National Electricite de France: *See*—
Nicolas, Bernard, 4,697,218, Cl. 361-87.000.

Seti Inc.: *See*—
Meir, Avraham A., 4,696,182, Cl. 73-12.000.

Shadoan, Ralph E. Handle and strap apparatus for hand-carrying articles. 4,696,505, Cl. 294-153.000.

Shafer, Sheldon J.: *See*—
Janatpour, Mojtaba; and Shafer, Sheldon J., 4,697,034, Cl. 558-274.000.

Shaffer, John W.; and Sindlinger, Ronald E., to GTE Products Corporation. Primer material and photoflash lamp. 4,696,641, Cl. 431-362.000.

Shakalis, Paul. Electronic fluid temperature flow control system. 4,696,428, Cl. 236-12.120.

Shakespeare Company: *See*—
Bailey, Joe B., Jr., 4,696,123, Cl. 43-22.000.

Shandon Southern Products Limited: *See*—
Gordon, Alan J.; and Billington, Donald G., 4,696,743, Cl. 210-361.000.

Shannon, Thomas G.: *See*—
Brunelle, Daniel J.; Guggenheim, Thomas L.; Boden, Eugene P.; Shannon, Thomas G.; and Guiles, Joseph W., 4,696,998, Cl. 528-272.000.

Sharp, Bruce R. Storage tanks having secondary containment means. 4,696,186, Cl. 73-49.200.

Sharp Kabushiki Kaisha: *See*—
Asahi, Takeoki; and Yoshida, Toshihiko, 4,696,216, Cl. 84-1.130.
Imanaka, Yoshiaki, 4,696,565, Cl. 355-15.000.
Katoh, Tutomu; and Yamamoto, Hiranaga, 4,696,561, Cl. 355-3.0FU.
Miyatake, Shigehiro, 4,697,200, Cl. 357-24.000.

Oka, Yukihiko; and Morimoto, Toyohiko, 4,696,592, Cl. 400-61e.000.
Sekimoto, Yoshihiro; Terashima, Shigeo; and Kojima, Kunio, 4,696,566, Cl. 350-255.000.
Tanaka, Hironori; Matsumoto, Masafumi; and Kotani, Matahira, 4,696,462, Cl. 271-10.000.
Yamasaki, Kimihito; and Yoshiura, Shoichiro, 4,696,466, Cl. 271-288.000.

Shatto, Walter C., Jr.: *See*—
Gutter, David H.; and Shatto, Walter C., Jr., 4,696,908, Cl. 439-98.000.

Shedd, Charles D.; and Anzini, David J., to BP Performance Polymers Inc. Thermoplastic elastomer compositions. 4,696,967, Cl. 524-437.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Robertson, Brian W.; and Phillips, Gareth T., 4,696,901, Cl. 435-180.000.

Shell Oil Company: *See*—
Blytas, George C.; Grimsby, F. Norman; and Scamehorn, John F., 4,696,726, Cl. 204-182.400.

Shen, Hanshi. Method and apparatus for eliminating cavitation in hydraulic systems. 4,696,684, Cl. 55-89.000.

Shene, William R.; Nowacki, Christopher; and Brisson, Alfred G., to Truiek Research, Inc. Non-invasive destruction of kidney stones. 4,696,299, Cl. 128-328.000.

Shepherd Products U.S., Inc.: *See*—
Estkowski, Michael H.; Doumani, Robert S.; and Estkowski, Christopher G., 4,696,394, Cl. 206-303.000.

Sher, Arden, to SRI International. Integrated circuit having dislocation free substrate. 4,697,202, Cl. 357-63.000.

Shero, David J.: *See*—
Dadpey, Habib; Merlino, Paul J.; and Shero, David J., 4,697,130, Cl. 318-760.000.

Sherwood, John F.: *See*—
Turano, Louis R.; Callaham, William T.; Sherwood, John F.; and Thatcher, Richard E., 4,696,312, Cl. 131-109.100.

Shibata, Takuo: *See*—
Yamamoto, Toshiaki; Kako, Hiroyoshi; Shibata, Takuo; Izuo, Takashi; Kamimae, Hajime; and Takegawa, Hiroaki, 4,696,379, Cl. 188-299.000.

Shibusawa, Mitsuo, to Ricoh Company, Ltd. Split scanning copier. 4,696,563, Cl. 355-8.000.

Shida, Sankichi: *See*—
Yamamoto, Hiromasa; Shida, Sankichi; and Todoroki, Tsunehiko, 4,696,100, Cl. 29-605.000.

Shiga, Akinobu; Kakugo, Masahiro; Kozima, Junpei; and Wakatsuki, Kizuku, to Sumitomo Chemical Company, Limited. Process for producing propylene copolymer. 4,696,979, Cl. 525-247.000.

Shih, David H.: *See*—
Christensen, Burton G.; and Shih, David H., 4,696,923, Cl. 514-210.000.

Shih, Stuart S.: *See*—
Angevine, Philip J.; Chu, Yung F.; Mitchell, Kenneth M.; Oleck, Stephen M.; Shih, Stuart S.; and Wilson, Robert C., Jr., deceased, 4,696,732, Cl. 208-111.000.

Shiibayashi, Masao; and Murayama, Akira, to Hitachi, Ltd. Hermetic scroll compressor with welded casing section. 4,696,629, Cl. 418-55.000.

Shikoku Denryoku Kabushiki Kaisha: *See*—
Ishikawa, Fumihiko, 4,697,136, Cl. 323-267.000.

Shimada, Yasuhisa: *See*—
Ohno, Satoru; and Shimada, Yasuhisa, 4,697,187, Cl. 342-358.000.

Shimadzu Corporation: *See*—
Kita, Yasuo, 4,696,380, Cl. 192-4.00A.
Oka, Syotaro; Tahara, Shu; and Kobayashi, Junya, 4,696,796, Cl. 422-88.000.

Shimano Industrial Company Limited: *See*—
Yoshikawa, Osamu, 4,696,437, Cl. 242-84.50A.

Shimazaki, Kenji, to Toho Beslon Co., Ltd. Active carbon fibers and filter adsorption unit for water purification comprising said fibers. 4,696,742, Cl. 210-287.000.

Shimizu, Taku: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, 4,696,804, Cl. 423-242.000.
Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, 4,696,805, Cl. 423-242.000.

Shimkunas, Alexander R., to Micronix Corporation. Additive process for manufacturing a mask for ute in X-ray photolithography and the resulting mask. 4,696,878, Cl. 430-5.000.

Shimomura, Kenji; Kouketsu, Shigeaki; Okuyama, Toru; and Sato, Take, to Ikeda Bussan Co., Ltd.; and Bridgestone Corp. Production of polyurethane foam. 4,696,952, Cl. 521-107.000.

Shimosato, Masashi: *See*—
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, 4,696,589, Cl. 400-119.000.

Shimoyama, Akira: *See*—
Harada, Kaoru; Shimoyama, Akira; and Mizumoto, Hiroji, 4,696,981, Cl. 525-328.200.

Shindo, Isao: *See*—
Mitsumaki, Hiroshi; Ono, Naoya; Shindo, Isao; and Takano, Nobuyoshi, 4,696,183, Cl. 73-19.000.

Shinkai, Mitsutoshi, to Sony Corporation. Optical disc player with improved initial positioning operation. 4,697,256, Cl. 369-32.000.

Shinko Electric Co. Ltd.: *See—*
Mochizuki, Asahi; Ozawa, Kira; Fujita, Shinichiro; and Yamada, Kuniaki, 4,696,446, Cl. 246-169.00S.

Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for treating SO_2, SO_3 and dust simultaneously. 4,696,804, Cl. 423-242.000.

Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for desulfurizing exhaust gas. 4,696,805, Cl. 423-242.000.

Shinoda, Tsutae; Miyashita, Yoshinori; Sugimoto, Yoshimi; Sei, Hideo; and Andoh, Shizuo, to Fujitsu Limited. Gas discharge panel. 4,697,123, Cl. 315-169.400.

Shinohara, Takeru: *See—*
Amano, Satoru; Horiuchi, Shigenori; and Shinohara, Takeru, 4,696,551, Cl. 350-358.000.

Shinsei Kogyo Co., Ltd.: *See—*
Nagano, Toshiaki, 4,696,517, Cl. 298-1.00T.

Shioi, Yuji; and Yuhara, Yukitomo, to Yoshida Industry Co., Ltd. Vanity case. 4,696,317, Cl. 132-82.00R.

Shionogi & Co., Ltd.: *See—*
Sonoyama, Takayasu; Yagi, Shigeo; and Kageyama, Bunji, 4,696,897, Cl. 435-42.000.

Shionoya, Toshio, to Sony Corporation. Intensity control of excitation means of thermally addressed display. 4,696,550, Cl. 350-351.000.

Shiozaki, Yoshihiko, to Aksi Electric Co., Ltd. Electrocardiogram playback system and method. 4,696,306, Cl. 128-711.000.

Shirasaki, Shin-ichi; Hotta, Yasunari; Yamamura, Hiroshi; Matsuda, Shin-ichi; Kakegawa, Kazuyuki; Moriyoshi, Yusuke; Takahashi, Koichiro; and Haneda, Hajime, to National Institute for Researches in Inorganic Materials. Wet process for the production of a readily sinterable powder material of perovskite or its solid solution. 4,696,810, Cl. 423-593.000.

Shiratsuki, Yoshiyuki: *See—*
Mita, Tsunemasa; Katoh, Ryoki; Sekimoto, Soichi; Shiratsuki, Yoshiyuki; and Arisawa, Hiroshi, 4,697,204, Cl. 357-74.000.

Shirota, Norihisa, to Sony Corporation. Arithmetic circuit for obtaining the vector product of two vectors. 4,697,248, Cl. 364-754.000.

Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for reproducing multi-color image and photoreceptor thereof. 4,696,880, Cl. 430-42.000.

Shroot, Braham; Lang, Gerard; and Maignan, Jean, to Groupement d'Interet Economique dit: Centre International 'de Recherches Dermatologiques C.I.R.D. 1,8-diacyloxy-10-acylanthrones. 4,696,941, Cl. 514-423.000.

Shumaker, Harold L.: *See—*
Link, Charles T.; Gray, Bennie M.; and Shumaker, Harold L., 4,696,223, Cl. 92-86.500.

Sibilia, John P.; Kotliar, Abraham M.; Murthy, Narasimhaiah S.; and Sacks, William, to Allied Corporation. Annealed thin walled polymer articles and method to anneal. 4,696,857, Cl. 428-323.000.

Sicard, Claude; Kroczynski, Patrice; Gallard, Herve; Mars, Denis; and Devos, Michel, to Institut de Recherches de la Construction Navale. Automated intallation for processing large objects. 4,697,239, Cl. 364-468.000.

Siebe Gorman & Company Limited: *See—*
Constance-Hughes, Trevor, 4,696,295, Cl. 128-202.260.

Siebel, Peter: *See—*
Brandt, Hermann; Fischer, Hermann; Dreher, Hermann; Heil, Eduard; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; Gausepohl, Hermann; Siebel, Peter; Swoboda, Johann; Schwoebel, Gerd; and Nikles, Albert, 4,696,996, Cl. 528-214.000.

Siebens, Larry N.: *See—*
Smorzaniuk, Adam; and Siebens, Larry N., 4,696,649, Cl. 439-98.000.

Sieber, Albrecht: *See—*
Flaig, Ulrich; and Sieber, Albrecht, 4,696,276, Cl. 123-478.000.

Siegfried Frei: *See—*
Frei, Siegfried; and Hohl, Ernst, 4,696,253, Cl. 118-308.000.

Siemens Aktiengesellschaft: *See—*
Birkle, Siegfried; and Gehring, Johann, 4,696,728, Cl. 204-213.000.
Keller, Wolfgang, 4,696,716, Cl. 156-605.000.
Nitt, Karl-Heinz, 4,696,631, Cl. 425-117.000.
Segal, Henry P.; and DeWilde, Carl A., 4,697,262, Cl. 370-84.000.
Spater, Lothar; and Prussas, Herbert, 4,697,061, Cl. 219-121.0LD.

Silbering, Steven B.; Nesbitt, Russell U.; and Fawzi, Mahdi B., to Warner-Lambert Company. Thrombin preparations. 4,696,812, Cl. 424-445.000.

Simm, Hans-Peter: *See—*
Ahlf, Heinz-Jurgen; Guhne, Wieland; Simm, Hans-Peter; and Wulf, Peter, 4,696,076, Cl. 15-415.00R.

Simmler, Werner: *See—*
Habermann, Wolfgang; Hammes, Peter; Engelhardt, Hubert; Geiger, Wolfgang; Haltrich, Walter; and Simmler, Werner, 4,696,749, Cl. 210-721.000.

Simplex Ceiling Corp.: *See—*
Nassof, Martin, 4,696,141, Cl. 52-484.000.

Simpson, Norman R.: *See—*
Barber, Patrick G.; and Simpson, Norman R., 4,696,808, Cl. 423-338.000.

Sims, Richard E., to Curran Company, The. Window for shielded enclosure. 4,696,547, Cl. 350-319.000.

Simulog, Inc.: *See—*
Lavi, Yoav, 4,697,241, Cl. 364-488.000.

Sindlinger, Ronald E.: *See—*
Shaffer, John W.; and Sindlinger, Ronald E., 4,696,641, Cl. 431-362.000.

Singer Company, The: *See—*
Collodel, Zarino P., 4,696,503, Cl. 294-88.000.

Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,697,021, Cl. 546-288.000.

Sinic, Andre : *See—*
le Chatelier, Robert; Sinic, Andre ; and Diefenbach, Jean-Jacques, 4,696,334, Cl. 152-417.000.

Siteg Siebtechnik GmbH: *See—*
Lefferts, Johannes, 4,696,852, Cl. 428-222.000.

Skelnik, Debra L.: *See—*
Lindstrom, Richard L.; and Skelnik, Debra L., 4,696,917, Cl. 514-54.000.

SKF GmbH, Schweinfurt: *See—*
Olschewski, Armin; Brandenstein, Manfred; Hetterich, Hermann; and Kunkel, Heinrich, 4,696,083, Cl. 29-148.40C.

Skidmore, John E.: *See—*
McCullough, Michael J.; McKibben, Gary E.; and Skidmore, John E., 4,696,840, Cl. 220-462.000.

Skoog, Karl I. L., to Telefonaktiebolaget LM Ericsson. Apparatus for synchronizing pulse trains in a digital telephone system. 4,697,276, Cl. 375-114.000.

Skupien, Eugene M. Clutch apparatus for spring making machine. 4,696,175, Cl. 72-135.000.

Slayman, Charles W.; and Figueroa, Luis, to Hughes Aircraft Company. Heterostructure interdigital high speed photoconductive detector. 4,696,648, Cl. 437-5.000.

Slickbar Products Corp.: *See—*
Smith, Millard F., 4,696,318, Cl. 134-73.000.

Small, Hamish: *See—*
Stevens, Timothy S.; and Small, Hamish, 4,696,904, Cl. 436-39.000.

Smalley, Kenneth M.: *See—*
Conrad, George M.; and Smalley, Kenneth M., 4,697,096, Cl. 307-246.000.

Smith International: *See—*
Desai, Praful C., 4,696,502, Cl. 294-86.170.

Smith, Millard F., to Slickbar Products Corp. Washing methods and apparatus for heat exchanger tube cleaning plugs. 4,696,318, Cl. 134-73.000.

Smith, Philip E.: *See—*
Raudman, Charles J.; and Smith, Philip E., 4,696,330, Cl. 141-86.000.

Smith, Timothy D.: *See—*
Wilson, Fred W.; and Smith, Timothy D., 4,696,362, Cl. 180-116.000.

Smolik, Jiri : *See—*
Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri , 4,696,683, Cl. 55-82.000.

Smorzaniuk, Adam; and Siebens, Larry N., to Amerace Corporation. In-line connector. 4,696,649, Cl. 439-98.000.

Snipes, Carl E.; and Coleman, John S., to Dow Chemical Company, The. Extraction of teichomycin A_2 from whole culture fermentation broth. 4,696,817, Cl. 424-123.000.

Societe Nationale des Poudres et Explosifs: *See—*
Malfroot, Thierry; Piteau, Marc; and Senet, Jean-Pierre, 4,697,032, Cl. 558-270.000.

Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.": *See—*
Barbier, Gerard Y. G.; Leboure, Gerald J. P. B.; Desaulty, Michel A. A.; Martinez, Rodolphe; and Perigne, Jerome, 4,696,157, Cl. 60-39.230.
Lardellier, Alain M. J., 4,696,619, Cl. 415-138.000.

Societe Nationale Industrielle Aerospatiale: *See—*
de Guelis, Hubert V.; and Doute, Pascal, 4,696,496, Cl. 285-137.100.

Soderwall, Marja-Liisa: *See—*
Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Sunduqst, Hannu K., 4,696,949, Cl. 514-648.000.

Sodick Co., Ltd.: *See—*
Furukawa, Toshihiko, 4,697,059, Cl. 219-69.00W.

Sogabe, Masatoyo: *See—*
Amemiya, Yoichi; Sogabe, Masatoyo; and Tagami, Kiyoshi, 4,697,114, Cl. 310-156.000.

Solvay & Cie. (Societe Anonyme): *See—*
Collin, Andre; and Wautier, Henri, 4,697,029, Cl. 558-92.000.

Sonck, Willy, to General Coatings. Equipment for carrying out work, under dry conditions, on an underwater structure. 4,696,597, Cl. 405-12.000.

Sonoco Products Company: *See—*
Hoover, Gregory A., 4,696,403, Cl. 206-602.000.

Sonoyama, Takayasu; Yagi, Shigeo; and Kageyama, Bunji, to Shionogi & Co., Ltd. Process for preparing 2-keto-L-gulonic acid. 4,696,897, Cl. 435-42.000.

Sony Corporation: *See—*
Kawana, Takahiro; and Yokoyama, Norio, 4,696,862, Cl. 428-336.000.
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,696,827, Cl. 427-36.000.
Osawa, Eiichi; Tanaka, Masato; Yoshizawa, Mamoru; Nakai, Jun; and Kojima, Yuichi, 4,697,212, Cl. 360-48.000.
Shinkai, Mitsutoshi, 4,697,256, Cl. 369-32.000.
Shionoya, Toshio, 4,696,550, Cl. 350-351.000.
Shirota, Norihisa, 4,697,248, Cl. 364-754.000.

Tsukahara, Nobuhiko, 4,697,216, Cl. 360-97.000.
Yamazaki, Jun; and Ito, Yukio, 4,696,879, Cl. 430-24.000.

South Park Sales & Mfg., Inc.: *See—*
Pinkney, James, 4,696,595, Cl. 402-54.000.

Southerland, Bob R.: *See—*
Brunelle, Philip E.; and Southerland, Bob R., 4,697,232, Cl. 364-200.000.

Southwest Microwave: *See—*
Cheal, James; Fitzsimmons, James R.; and Foley, Edward J., 4,697,184, Cl. 342-28.000.

Spackman, Ramon: *See—*
Clayton, Colin G.; and Spackman, Ramon, 4,696,782, Cl. 376-159.000.

Spadafora, Paul F., to Nabisco Brands, Inc. Method and apparatus for drying wet particulate material to a predetermined uniform moisture content. 4,696,115, Cl. 34-43.000.

Spannagel, Ulrich: *See—*
Lee, Hsiao-Peng S.; and Spannagel, Ulrich, 4,697,250, Cl. 164-900.000.

Spater, Lothar; and Prussas, Herbert, to Siemens Aktiengesellschaft. Method for welding by means of laser light. 4,697,061, Cl. 219-121.0LD.

Special Reference Laboratories, Inc.: *See—*
Aoyama, Masaaki; Itabashi, Mitsuharu; Miura, Mariko; and Kohno, Masahiro, 4,696,905, Cl. 436-64.000.

Specialty Equipment Corporation: *See—*
Chisholm, Donald P., Jr., 4,696,392, Cl. 198-836.000.

Spector, Donald. Film type air freshener. 4,696,844, Cl. 428-46.000.

Spectrum Cellular Communications Corporation, Inc.: *See—*
O'Sullivan, Harry M., 4,697,281, Cl. 379-59.000.

Spectrum Control, Inc.: *See—*
Bischoff, Gregg C., 4,696,719, Cl. 202-205.000.

Spence-Bate, Harry A. H., to Spence-bate, Joyce Florence. Lamina recording apparatus. 4,697,194, Cl. 346-110.00V.

Spence-bate, Joyce Florence: *See—*
Spence-Bate, Harry A. H., 4,697,194, Cl. 346-110.00V.

Spieldiener, Reinhold: *See—*
Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons, 4,696,251, Cl. 114-346.000.

Spieldiener, Robert; Spieldiener, Reinhold; and Saiko, Alfons. Rapid river ride boat. 4,696,251, Cl. 114-346.000.

Spies, Manfred; Strohriegl, Peter; and Heitz, Walter, to Bayer Aktiengesellschaft. Process for the production of polybenzamide with halide catalyst. 4,696,999, Cl. 528-319.000.

Spillar, Alan; and Desyllas, Peter L. L., to International Computers, Ltd. Data processing module with serial test data paths. 4,697,234, Cl. 364-200.000.

Spindler, Irvin, to George Koch Sons, Inc. Fluid wash spray paint system. 4,696,254, Cl. 118-610.000.

Spratte, Werner: *See—*
Haubennestel, Karlheinz; Breil, Daniela; Bubat, Alfred; and Spratte, Werner, 4,696,761, Cl. 252-358.000.

SRI International: *See—*
Sher, Arden, 4,697,202, Cl. 357-63.000.

Stabeli, Paul, to Maschinenfabrik Rieter A.G. Transport duct for fiber flocks. 4,696,608, Cl. 406-155.000.

Stalder, Herbert; Wurmli, Arthur; Baumgartner, Josef; and Briner, Emil, to Maschinenfabrik Rieter AG. Friction spinning device containing a friction spinning means and method of use of the friction spinning device. 4,696,155, Cl. 57-401.000.

Stamicarbon B.V.: *See—*
Verheijen, Egidius J. M., 4,696,960, Cl. 524-100.000.

Standard Microsystems Corp.: *See—*
Lish, Charles A., 4,697,153, Cl. 330-277.000.

Standard Oil Company, The: *See—*
Henderson, Richard S.; Tenhover, Michael A.; and Grasselli, Robert K., 4,696,703, Cl. 148-403.000.
Lysandrou, Michael C.; and Dulaney, Clarence L., 4,696,752, Cl. 252-8.553.
Tenhover, Michael A., 4,696,731, Cl. 204-290.00R.

Standard precision, Inc.: *See—*
Kasten, Donald A., 4,696,582, Cl. 384-18.000.

Standard Telephone and Cables, Plc: *See—*
Pitt, Gilles D.; Extance, Philip; and Jones, Roger E., 4,696,543, Cl. 350-96.230.

Stanfield, William G.: *See—*
Daigle, Richard A., Sr.; Stanfield, William G.; and Crenshaw, Michael E., 4,696,602, Cl. 405-205.000.

Stanhope, Mary E.: *See—*
Decker, Dale D.; and Stanhope, Mary E., 4,696,426, Cl. 232-43.100.

Stanley, Sandra M. Stand for polishing artificial fingernails. 4,696,316, Cl. 132-73.000.

Stauffer Chemical Company: *See—*
Bolzan, Louis F., 4,697,028, Cl. 558-89.000.
Hardy, Thomas A.; and Walsh, Edward N., 4,697,030, Cl. 558-163.000.
Schachter, Rozalie; Viscoglioni, Marcello; Bunz, Lewis A.; Olego, Diego J.; Serreze, Harvey B.; and Raccah, Paul M., 4,696,828, Cl. 427-38.000.
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Adams, Graham L.; and Durrant, Richard C. E., 4,696,540, Cl. 350-96.210.
Extance, Philip; and Jones, Roger E., 4,697,146, Cl. 324-244.000.

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Stenger, Barbara J. Information reference book and indexing system. 4,696,491, Cl. 283-37.000.

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Paul, Gary E.; Carr, Ronald H.; and Stern, Lee W., 4,696,793, Cl. 376-447.000.

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Zerrer, Gerhard; and Mayer, Gunter, 4,696,108, Cl. 30-276.000.

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Brunelle, Philip E.; and Southerland, Bob R., 4,697,232, Cl. 364-200.000.
O'Keeffe, Michael J.; Graba, James M.; and Noyes, George L., 4,697,167, Cl. 340-347.0DD.

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Higgins, Daniel E.; and Essley, James C., 4,696,298, Cl. 128-305.000.

Stowell, Dennis E. Solar heated canteen. 4,696,284, Cl. 126-437.000.

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Strecker, Dennis. Blow dryer holding device. 4,696,447, Cl. 248-206.300.

Strid, Eric W.: *See—*
Lockwood, Larry R.; Gleason, Kimberly R.; and Strid, Eric W., 4,697,143, Cl. 324-158.00P.

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Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniya, George. 4,696,671, Cl. 604-67.000.

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Stromquist, Michael E., to Anthony's Manufacturing Company, Inc. Combined adjustable door hinge pin socket and adjustable torque rod anchor device. 4,696,078, Cl. 16-301.000.

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Sturgis, James L. Anti-mismatch system. 4,696,326, Cl. 137-614.040.

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Sugihara, Junpei; Imai, Takeshi; Toida, Shuzo; and Takahashi, Ikuzo, to Toray Silicon Co., Ltd. Method for purifying alkoxysilane. 4,697,027, Cl. 556-466.000.

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Sugimori, Shigeru: *See—*
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Sugimoto, Tamio: *See—*
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Sugimoto, Yoshimi: *See—*
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Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., to USV Pharmaceutical Corporation. Benzothiadiazole compounds for treating hypertension. 4,696,939, Cl. 514-361.000.

Suh, Kyung S., to Dsung Precision Company. Electronic lock and key. 4,697,171, Cl. 340-543.000.

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Sullivan, Daniel J., to Motorola, Inc. Epitaxial front seal for a wafer. 4,696,701, Cl. 148-33.500.

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Sumitomo Chemical Company, Limited: *See—*
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Higashimura, Toshinobu; Sawamoto, Mitsuo; Toyoshima, Yoshiki; Kanagawa, Shuuichi; Takahashi, Tsutomu; and Saito, Noriaki, 4,696,988, Cl. 526-220.000.
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Summers, John K., to Better Life International, Inc. Herbal snuff composition. 4,696,315, Cl. 131-359.000.

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Fairchild, Jeffery; Heitz, Steven A.; and Symington, John, 4,696,618, Cl. 415-119.000.
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Sutherland, James F.; and Miller, William L., to Westinghouse Electric Corp. Testable, fault-tolerant power interface circuit for controlling plant process equipment. 4,697,093, Cl. 307-38.000.

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Suzuki, Kazuto: *See—*
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Swanson, Scott C., to Sangamo Weston, Inc. System for accumulating verifiable energy demand data from remote electricity meters. 4,697,181, Cl. 340-870.020.

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Swearingen, Judson S. Bearing support system with controllable spring rate. 4,696,585, Cl. 384-399.000.

Swendrowski, Steven D.: *See—*
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Swenton, John S.; Morrow, Gary W.; and Priebe, Waldemar, to Ohio State University Research Foundation. 1-fluoro, 4-fluoro, and 1,4-difluoro anthracycline anticancer antibiotics. 4,697,005, Cl. 536-6.400.

Swerdloff, Michael D.; Rogic, Milorad M.; and Hendrickson, Larry L., to Allied Corporation. Oxidized sulfur derivatives of diaminophosphinyl compounds as urease inhibitors and urease inhibited urea based fertilizer compositions. 4,696,693, Cl. 71-28.000.

Swoboda, Johann: *See—*
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Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, to Budapest Muszaki Egyetem. Process and apparatus for heating of pasty materials. 4,696,643, Cl. 432-120.000.

Tabuchi, Takahisa: *See—*
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Tadiello, Mario, to La Batteria di M. Tadiello S.r.l. Plug for cells of electrical storage batteries. 4,696,874, Cl. 429-64.000.

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Tahara, Shu: *See—*
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Taiho Pharmaceutical Company, Limited: *See—*
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Takagi, Michiyuki: *See—*
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Takahashi, Sadatoshi: *See—*
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Takahashi, Tsutomu: *See—*
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Takanashi, Hiroyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Disc automatically setting device of a disc player. 4,697,259, Cl. 369-75.200.

Takano, Nobuyoshi: *See—*
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Takeuchi, Kazumasa; Iwadachi, Takaharu; and Ikushima, Kazuo, to NGK Insulators, Ltd. Material for lead frames. 4,696,704, Cl. 148-412.000.

Takeuchi, Masashi: *See—*
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Takeuchi, Tatsuo: *See—*
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Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, to Mitsubishi Jidosha Kogyo K.K. Vehicle suspension apparatus. 4,696,483, Cl. 280-6.00H.

Takubo, Hiroichi: *See—*
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Takuma, Hiroshi: *See—*
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Tamura, Hifumi: *See—*
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Tamura, Toshihisa: *See—*
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Tamura, Yasuji, to Sanden Corporation. Slip detecting device for a prime mover. 4,697,091, Cl. 290-45.000.

Tanaka, Atsuo; and Dohnomoto, Tadashi, to Toyota Jidosha Kabushiki Kaisha. Fiber reinforced metal composite material. 4,696,866, Cl. 428-614.000.

Tanaka, Hironori; Matsumoto, Masafumi; and Kotani, Matahira, to Sharp Kabushiki Kaisha. Paper supplying device. 4,696,462, Cl. 271-10.000.

Tanaka, Hirotoshi: *See—*
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Tanaka, Kunihiko: *See—*
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Tanaka, Kunio: *See—*
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Tanaka, Masato: *See—*
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Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Vehicle suspension apparatus. 4,697,237, Cl. 364-424.000.

Tanaka, Yasuo; and Niikura, Akio, to Nippon Seiko Kabushiki Kaisha. Non-separable thrust rolling bearing. 4,696,588, Cl. 384-615.000.

Tange, Kyoichi: *See—*
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Ghosh, Sambhunath; Chynoweth, David P.; and Tarman, Paul B., 4,696,746, Cl. 210-603.000.

Taruki, Takashi: *See—*
Nakazato, Yukitaka; Hashimoto, Kenji; and Taruki, Takashi, 4,696,463, Cl. 271-176.000.

Tarumi, Noriyoshi: *See—*
Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, 4,696,255, Cl. 118-653.000.

Tasch, Franz: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Tatani, Atsushi: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, 4,696,804, Cl. 423-242.000.
Shinoda, Naoharu; Tatani, Atsushi; Onizuka, Masakazu; Okino, Susumu; and Shimizu, Taku, 4,696,805, Cl. 423-242.000.

Tatekawa, Masaichiro: *See—*
Urata, Yoshihito; Tatekawa, Masaichiro; and Sasaki, Toshiharu, 4,696,562, Cl. 355-3.00R.

Tatematsu, Hiromu; and Miyabayashi, Takeshi, to Brother Kogyo Kabushiki Kaisha. Substrate processed for electroless plating for printed wiring pattern and process for manufacturing the processed substrate. 4,696,861, Cl. 428-328.000.

Tatemoto, Minoru: *See—*
Takizawa, Shozo; Tatemoto, Minoru; Furumura, Akio; Sugawara, Tadashi; Kariya, Shigeo; and Hiroshima, Kazuo, 4,696,483, Cl. 280-6.00H.
Tanaka, Tadao; Harara, Mitsuhiko; Taniguchi, Yasutaka; Suzumura, Masanaga; Tatemoto, Minoru; and Kumagai, Naotake, 4,697,237, Cl. 364-424.000.

Taurus Controls Limited: *See—*
Taylor, James C., 4,696,194, Cl. 73-861.660.

Taylor, James C., to Taurus Controls Limited. Fluid flow measurement. 4,696,194, Cl. 73-861.660.

Taylor, William M.: *See—*
Schmitz, Thomas R.; and Taylor, William M., 4,696,494, Cl. 285-18.000.

Tazawa, Akira: *See—*
Sumimura, Shin-ichi; and Tazawa, Akira, 4,696,970, Cl. 524-860.000.

Teac Corporation: *See—*
Enami, Katsuya; Tsuyuguchi, Hiroshi; and Sakaguchi, Takahiro, 4,697,129, Cl. 318-696.000.
Matsunaga, Hiroshi; and Morita, Shinichi, 4,696,099, Cl. 29-603.000.
Sukigara, Motoyuki; and Yasuda, Kazuhiko, 4,696,439, Cl. 242-186.000.

Tebbe, Frederick N., to Du Pont de Nemours, E. I., and Company. Melt-formable organoaluminum polymer. 4,696,968, Cl. 524-610.000.

Tegal Corporation: *See—*
Drage, David J., 4,697,089, Cl. 250-561.000.

Tegart, Harold G. Golf course. 4,696,474, Cl. 273-176.00A.

Teijin Limited: *See—*
Okaniwa, Hiroshi; Nakatani, Kenji; and Sato, Tetsuo, 4,697,041, Cl. 136-244.000.

Tektronix, Inc.: *See—*
Breya, Edward F., 4,696,105, Cl. 29-840.000.
Gjesdal, Harvey J., 4,696,089, Cl. 29-451.000.

Teledyne Industries, Inc.: *See—*
Barbeau, Dennis E., 4,697,238, Cl. 364-431.020.

Telefonaktiebolaget LM Ericsson: *See—*
Skoog, Karl I. L., 4,697,276, Cl. 375-114.000.

Telefunken Electronic GmbH: *See—*
Schilling, Roland, 4,697,042, Cl. 136-244.000.

Telschow, Jeffrey E., to Stauffer Chemical Company. Decolorizing arylsulfonyl halides. 4,696,774, Cl. 260-543.00R.

Tenhover, Michael A., to Standard Oil Company, The. Amorphous metal-based composite oxygen anodes. 4,696,731, Cl. 204-290.00R.

Tenhover, Michael A.: *See—*
Henderson, Richard S.; Tenhover, Michael A.; and Grasselli, Robert K., 4,696,703, Cl. 148-403.000.

Terada, Masafumi: *See—*
Yamashita, Tatsuo; Terada, Masafumi; and Suzuki, Koji, 4,696,895, Cl. 435-7.000.

Terashima, Shigeo: *See—*
Sekimoto, Yoshihiro; Terashima, Shigeo; and Kojima, Kunio, 4,696,566, Cl. 350-255.000.

Tetard, Roger: *See—*
David, Bernard; and Tetard, Roger, 4,696,228, Cl. 101-123.000.

Texaco Inc.: *See—*
Howlett, Donald L., 4,697,255, Cl. 367-146.000.
Nieh, Edward C. Y., 4,696,803, Cl. 423-228.000.

Texas Instruments Incorporated: *See—*
De Filippis, Pietro; Calenda, Ciro; Notaro, Giuseppe; and Boulanger, Henry, 4,696,579, Cl. 374-187.000.
Doering, Robert R.; and Armstrong, Gregory J., 4,696,092, Cl. 437-5.000.
Hofer, Dean A.; Carlson, Daniel J.; and Pecak, Matthew L., 4,697,192, Cl. 343-895.000.
Landes, James L., 4,696,425, Cl. 228-1.100.

Textron, Inc.: *See—*
Brandon, George M., 4,697,135, Cl. 322-24.000.

Thatcher, Richard E.: *See—*
Turano, Louis R.; Callaham, William T.; Sherwood, John F.; and Thatcher, Richard E., 4,696,312, Cl. 131-109.100.

Thermacore, Inc.: *See—*
Eastman, George Y., 4,697,205, Cl. 357-82.000.

Thermal Energy Stroage, Inc.: *See—*
Jensen, Eric A.; Hitchin, James; Tsai, Albert G.; and Arrhenius, Gustaf O., 4,696,338, Cl. 165-1.000.

Thiele, Horst: *See—*
Scholl, Hans; Thiele, Horst; and Hagemann, Eckhard, 4,696,242, Cl. 112-121.140.

Thimineur, Raymond J.; and Raleigh, William J., to General Electric Company. Emulsion polymerized silicone emulsions having siloxane-bonded UV absorbers. 4,696,969, Cl. 524-762.000.

Thomas, David M.; and Tubb, Leonard J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence; and Control Data Canada, Ltd. Algorithm for radar coordinate conversion in digital scan converters. 4,697,185, Cl. 342-185.000.

Thomas, Mammen, to Advanced Micro Devices, Inc. Process for isolation using self-aligned diffusion process. 4,696,095, Cl. 437-78.000.

Thomey, Henry W.; and Heuninck, John B., to Dyneer Corporation. Belt tensioner. 4,696,663, Cl. 474-133.000.

Thompson, Robert E., to Chevron Research Company. Armored optical fiber cable. 4,696,542, Cl. 350-96.230.

Thomson-CSF: *See—*
Doriath, Gerard; Hartemann, Pierre; and Jacobelli, Alain, 4,697,145, Cl. 324-244.000.
Yves, Henry; Nicollet, Andre; and Villard, Michel, 4,696,094, Cl. 437-23.000.

Tibbals, E. C., Jr. Compound knitting needle. 4,696,170, Cl. 66-120.000.

Tice, Thomas R.: *See—*
Magrath, Joseph M.; Tice, Thomas R.; Meyers, William E.; and Dappert, Thomas O., 4,696,258, Cl. 119-1.000.

Tielemans, Leonardus P. M., to U.S. Philips Corporation. Self-cleaning air bearing comprising a flow equalizing groove at the bearing periphery. 4,696,584, Cl. 384-107.000.

Tilley, Jefferson W.: *See—*
Mullin, John G., Jr.; Nakamura, Keiji; Tilley, Jefferson W.; and Watanabe, Hiroshi, 4,696,930, Cl. 514-256.000.

Timgren, Carl J., to Perlos Oy. Cuvette set for blood analysis. 4,696,798, Cl. 422-102.000.

Todoroki, Tsunehiko: *See—*
Yamamoto, Hiromasa; Shida, Sankichi; and Todoroki, Tsunehiko, 4,696,100, Cl. 29-605.000.

Toho Beslon Co., Ltd.: *See—*
Shimazaki, Kenji, 4,696,742, Cl. 210-287.000.

Toida, Shuzo: *See—*
Sugihara, Junpei; Imai, Takeshi; Toida, Shuzo; and Takahashi, Ikuzo, 4,697,027, Cl. 556-466.000.

Toivola, Reijo J.; Karjalainen, Arto J.; Kurkela, Kauko O. A.; Soderwall, Marja-Liisa; Kangas, Lauri V. M.; Blanco, Guillermo L.; and Sunduiqst, Hannu K., to Farmos Group Ltd. Novel tri-phenyl alkane and alkene derivatives and their preparation and use. 4,696,949, Cl. 514-648.000.

Tokiwa Kogyo Co., Ltd.: *See—*
Noh, Chuji, 4,696,147, Cl. 53-550.000.

Tokumo, Akio; Takagi, Kazunori; and Mori, Shuichi, to Pioneer Electronic Corporation. Headrest-mounted acoustic device. 4,696,370, Cl. 181-141.000.

Tokuno, Masateru; Sawada, Tetsuya; and Mori, Yasuharu, to Rengo Co., Ltd. Rotary cutter. 4,696,212, Cl. 83-343.000.

Tokuono, Shinya: *See—*
Yamashita, Ichiro; Wakamiya, Masayuki; Hase, Hiroyuki; and Tokuono, Shinya, 4,696,192, Cl. 73-728.000.

Tokyo Automatic Machinery Works, Ltd.: *See—*
Kumata, Katsuhiko; Endo, Isao; Numa, Syozi; Hirose, Ichiro; Sagawa, Takayoshi; and Matono, Katsuyoshi, 4,696,617, Cl. 414-472.000.

Tokyo Electric Co., Ltd.: *See—*
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, 4,696,589, Cl. 400-119.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Furuyama, Tohru; and Uchida, Yukimasa, 4,697,252, Cl. 365-189.000.

Tolino, Ralph W.; King, William E.; Blickenderfer, Jack L.; and Roth, Charles H., Jr., to Westinghouse Electric Corp. System for manipulating radioactive fuel rods within a nuclear fuel assembly. 4,696,784, Cl. 376-245.000.

Tom, Glenn M., to Hercules Incorporated. Scavengers for the removal of impurities from arsine and phosphine. 4,696,953, Cl. 521-146.000.

Tomita, Seisuke; and Egashira, Yoshinori, to Bridgestone Corporation. Thread-wound golf ball. 4,696,475, Cl. 273-227.000.

Tomizuka, Mitsuo, to Ricoh Company, Ltd. Collapsible overhead projector. 4,696,557, Cl. 353-66.000.

Tomoda, Masayasu: *See—*
Oka, Masahiko; Ueta, Yutaka; Kano, Hideo; Tomoda, Masayasu; and Kawachi, Shoji, 4,696,989, Cl. 526-254.000.

Tomy Kogyo Co., Inc.: *See—*
Tsuzuki, Akio, 4,696,477, Cl. 273-241.000.

Tonge, Gary J., to Independent Broadcasting Authority. Method and apparatus for enhancing vertical chrominance resolution. 4,697,206, Cl. 358-14.000.

Toray Silicon Co., Ltd.: *See—*
Sugihara, Junpei; Imai, Takeshi; Toida, Shuzo; and Takahashi, Ikuzo, 4,697,027, Cl. 556-466.000.

Toray Silicone Company, Ltd.: *See—*
Sumimura, Shin-ichi; and Tazawa, Akira, 4,696,970, Cl. 524-860.000.
Yoshitake, Makoto; and Kishimoto, Keiichi, 4,696,756, Cl. 252-78.300.

Torisawa, Yoshihiro: *See—*
Okuno, Shigeru; Torisawa, Yoshihiro; Endo, Mitsuharu; Nakayama, Tetsuroh; Shimosato, Masashi; and Fukushima, Takafumi, 4,696,589, Cl. 400-119.000.

Torres, Ronald; Mayer, Edward; and Nelson, Steve, to Mattel, Inc. Reconfigurable toy. 4,696,656, Cl. 446-376.000.

Tosbec Computer System Co., Ltd.: *See—*
Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, 4,697,101, Cl. 307-452.000.

Toshiba Micro-Computer Engineering Corp.: *See—*
Iwahashi, Hiroshi; Asano, Masamichi; Momodomi, Masaki; Minagawa, Hidenobu; Suzuki, Kazuto; and Narita, Akira, 4,697,101, Cl. 307-452.000.

Toth, Miklos; Endresz, Valeria; Beladi, Ilona; and Toth, Sandor, to EGYT Gyogyszervegyeszeti Gyar. Process for the preparation of human leukocyte and human gamma interferon. 4,696,899, Cl. 435-68.000.

Toth, Sandor: *See—*
Toth, Miklos; Endresz, Valeria; Beladi, Ilona; and Toth, Sandor, 4,696,899, Cl. 435-68.000.

Towlson, Howard E., to General Electric Company. Low cost tooling replication technique. 4,696,722, Cl. 204-6.000.

Toyne, Kenneth J.: *See—*
Kam Ming Chan, Lawrence; Gray, George W.; Toyne, Kenneth J.; Lacey, David; Eidenschink, Rudolf; and Romer, Michael, 4,696,549, Cl. 350-350.00R.

Toyo Jozo Company, Ltd.: *See—*
Matsumura, Takafumi; and Morishita, Masataka, 4,696,822, Cl. 424-490.000.

Toyoshima, Yoshiki: *See—*
Higashimura, Toshinobu; Sawamoto, Mitsuo; Toyoshima, Yoshiki; Kanagawa, Shuuichi; Takahashi, Tsutomu; and Saito, Noriaki, 4,696,988, Cl. 526-220.000.

Toyota Jidosha K.K.: *See—*
Awano, Yoshiro; Suzuki, Hiroshi; Mizuno, Takaji; Ueguri, Shigeo; and Higashida, Kenji, 4,697,062, Cl. 219-130.510.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hattori, Kyo; Kato, Kazuo; and Morita, Shuji, 4,696,201, Cl. 74-467.000.
Ito, Toshimitsu; and Murata, Chigaku, 4,696,278, Cl. 123-493.000.
Kushi, Naoto; Okano, Hiroshi; Kobayashi, Nobuyuki; and Sugita, Naoki, 4,696,275, Cl. 123-478.000.
Nohira, Hidetaka, 4,696,265, Cl. 123-90.160.
Sasaki, Torahiko; Sato, Kazuo; Ohkawa, Masahiro; Suzuki, Yoshihiro; Kubota, Masato; Nakao, Hatsuo; and Tange, Kyoichi, 4,696,870, Cl. 429-14.000.
Sato, Kunihiko, 4,696,274, Cl. 123-440.000.

Tanaka, Atsuo; and Dohnomoto, Tadashi, 4,696,866, Cl. 428-614.000.
Yamamoto, Toshiaki; Kako, Hiroyoshi; Shibata, Takuo; Izuo, Takashi; Kamimae, Hajime; and Takegawa, Hiroaki, 4,696,379, Cl. 188-298.000.

Toyota, Makoto; Takeshita, Fumitaka; and Arakawa, Satoshi, to Fuji Photo Optical Co., Ltd. Endoscope for displaying a normal image. 4,697,210, Cl. 358-98.000.

Traczyk, Jan; Brejnak, Jacek; and Kawalec, Krzysztof, to Instytut Lotnictwa. Ultrasonic channel diffuser. 4,696,622, Cl. 415-211.000.

Trans-World Manufacturing Corporation: *See—*
Franklin, Robert P., 4,696,407, Cl. 211-183.000.

Traxler, Manfred: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Triani, Ronald J.: *See—*
Meczkowski, Frank J.; and Triani, Ronald J., 4,696,824, Cl. 376-DIG.000.

Trimmel, Wolfgang: *See—*
Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.

Triple "F", Inc.: *See—*
Zeller, Zellis C., 4,696,634, Cl. 425-237.000.

Triponez, Andre : *See—*
Muller, Jacques; and Triponez, Andre , 4,696,577, Cl. 368-276.000.

Trischler, Ferenc: *See—*
Megyeri, Gabor; Keve, Tibor; Galambos, Janos; Kovacs, Lajos, Jr.; Stefko, Bela; Bogach, Erik; and Trischler, Ferenc, 4,697,017, Cl. 544-346.000.

Triseal Corporation: *See—*
Karcher, Merrill, 4,696,479, Cl. 277-37.000.

Trosky, William J.: *See—*
Moore, William H.; Gutowski, Charles M.; Trosky, William J.; and Butler, Thomas A., 4,697,243, Cl. 364-513.000.

Trucksess, A. William. Security enclosure for transaction machine. 4,696,239, Cl. 109-24.100.

Trumpf GmbH & Co.: *See—*
Bitzel, Hubert, 4,696,211, Cl. 83-49.000.

Trutek Research, Inc.: *See—*
Shene, William R.; Nowacki, Christopher; and Brisson, Alfred G., 4,696,299, Cl. 128-328.000.

TRW Automotive Products, Inc.: *See—*
Hamilton, Brian K., 4,696,705, Cl. 149-21.000.

TRW Inc.: *See—*
Gat, Nahum, 4,696,160, Cl. 60-258.000.

Trzaskos, William J.: *See—*
Dauplaise, David L.; and Trzaskos, William J., 4,696,770, Cl. 252-700.000.

Tsai, Albert G.: *See—*
Jensen, Eric A.; Hitchin, James; Tsai, Albert G.; and Arrhenius, Gustaf O., 4,696,338, Cl. 165-1.000.

Tso, Ying-Yen P., to Mobil Oil Corporation. Process for selectively hydrogenating polycondensed aromatics. 4,696,733, Cl. 208-144.000.

Tso, Rosa Y. M.: *See—*
Mui, Paul Y. H.; and Tso, Rosa Y. M., 4,697,228, Cl. 362-352.000.

Tsuezuki, Yoshio: *See—*
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,696,881, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,696,882, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,696,883, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,696,884, Cl. 430-58.000.

Tsuji, Sadahiko; Takahashi, Sadatoshi; and Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Zoom lens having a large zoom ratio. 4,696,553, Cl. 350-427.000.

Tsuji, Yoshiomi; Maruyama, Ichiro; and Takuma, Hiroshi, to Sumitomo Electric Industries, Ltd. Erecting/lying-down dam or sluice gate made of flexible sheet. 4,696,598, Cl. 405-115.000.

Tsukagoshi, Tetsuhito; Matsunuma, Tamotsu; and Makino, Shigeo, to Bridgestone Corporation. Pneumatic radial tire. 4,696,335, Cl. 152-535.000.

Tsukahara, Nobuhiko, to Sony Corporation. Disk drive apparatus with automatic centering arrangement. 4,697,216, Cl. 360-97.000.

Tsukase, Masaaki: *See—*
Sato, Kozo; Kitaguchi, Hiroshi; Takeuchi, Masashi; Tsukase, Masaaki; and Kato, Masatoshi, 4,696,887, Cl. 430-203.000.

Tsushima, Noriyuki; and Nakajima, Hirokazu, to NTN Toyo Bearing Co., Ltd. Rolling bearing. 4,696,581, Cl. 384-565.000.

Tsuyuguchi, Hiroshi: *See—*
Enami, Katsuya; Tsuyuguchi, Hiroshi; and Sakaguchi, Takahiro, 4,697,129, Cl. 318-696.000.

Tsuzuki, Akio, to Tomy Kogyo Co., Inc. Game apparatus. 4,696,477, Cl. 273-241.000.

Tubb, Leonard J.: *See—*
Thomas, David M.; and Tubb, Leonard J., 4,697,185, Cl. 342-185.000.

Tucel Industries Inc.: *See—*
Lewis Jr., John C., 4,696,519, Cl. 300-7.000.

Tukano, Moriyosi: *See—*
Kurotaka, Sigeo; and Tukano, Moriyosi, 4,696,418, Cl. 222-167.000.

Tullis, Andrew M., to United States of America, Energy. Ion detector. 4,697,083, Cl. 250-374.000.

Turano, Louis R.; Callaham, William T.; Sherwood, John F.; and Thatcher, Richard E., to Philip Morris Incorporated. Method and apparatus for producing cigarette filler. 4,696,312, Cl. 131-109.100.

Turnbull, Michael D.; and Kay, Ian T., to Imperial Chemical Industries plc. Spiro morpholine compounds, compositions and insecticidal and nematocidal use. 4,696,926, Cl. 514-230.000.

Turner, Carlton E.: *See—*
Bedford, John A.; Elsohly, Hala N.; Wilson, Marvin C.; and Turner, Carlton E., 4,696,819, Cl. 424-195.100.

Turner, William J.: *See—*
Doerman, Eryk S.; Turner, William J.; Homer, David A.; Stewart, Andrew D. G.; and Clarke, Ian, 4,696,358, Cl. 177-145.000.

Tyman, John H. P., to 501 Brunel University. Metal extraction using a novel group of compounds and chemical purification method. 4,697,038, Cl. 564-265.000.

Tyo, James H. Pelvic stabilization device. 4,696,291, Cl. 128-78.000.

U C B Societe Anonyme: *See—*
Gobert, Jean; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,943, Cl. 514-424.000.

Uarco Incorporated: *See—*
Schmidt, Eric R., 4,696,843, Cl. 428-41.000.

Ube Industries, Ltd.: *See—*
Nakajima, Kohei; Nishio, Kazuaki; and Watanabe, Hiroshi, 4,696,994, Cl. 528-176.000.

UCB Societe Anonyme: *See—*
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,696,942, Cl. 514-424.000.

Uchida, Kazuko: *See—*
Deguchi, Takenori; Uchida, Kazuko; Ikita, Takao; Maruhaski, Shigeaki; Hoshino, Kazuo; and Oosaki, Keiji, 4,696,724, Cl. 204-27.000.

Uchida, Yukimasa: *See—*
Furuyama, Tohru; and Uchida, Yukimasa, 4,697,252, Cl. 365-189.000.

Ude, Werner; Knebel, Joachim; and Schroeder, Guenter, to Rohm GmbH. Phosphorus-containing polyarlene ether. 4,696,993, Cl. 528-167.000.

Ueda, Hiroshi: *See—*
Karasaki, Toshihiko; Matsui, Toru; and Ueda, Hiroshi, 4,696,558, Cl. 354-406.000.

Ueda, Kazuo: *See—*
Kamata, Kazumasa; Ueda, Kazuo; and Kitai, Kiyokazu, 4,696,973, Cl. 525-71.000.

Ueda, Yutaka: *See—*
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.

Ueguri, Shigeo: *See—*
Awano, Yoshiro; Suzuki, Hiroshi; Mizuno, Takaji; Ueguri, Shigeo; and Higashida, Kenji, 4,697,062, Cl. 219-130.510.

Ueno, Yoshiki; Taguchi, Takasi; and Hattori, Tadashi, to Nippon Soken, Inc. Antiglare mirror for an automobile. 4,696,548, Cl. 350-338.000.

Ueta, Yutaka: *See—*
Oka, Masahiko; Ueta, Yutaka; Kano, Hideo; Tomoda, Masayasu; and Kawachi, Shoji, 4,696,989, Cl. 526-254.000.

Ugaji, Masana: *See—*
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,696,827, Cl. 427-36.000.

Uggeri, Fulvio: *See—*
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,697,036, Cl. 562-418.000.

Ugolini, Giancarlo, to Ugolini S.p.A. Refrigerated beverage dispenser, with whipper device. 4,696,417, Cl. 222-146.600.

Ugolini S.p.A.: *See—*
Ugolini, Giancarlo, 4,696,417, Cl. 222-146.600.

Ulens, Stanislas F.: *See—*
Bosquet, Herman; and Ulens, Stanislas F., 4,696,723, Cl. 204-16.000.

Umehara, Masaakira: *See—*
Abe, Michiharu; Umehara, Masaakira; Sato, Tsutomu; Oba, Hideaki; Ueda, Yutaka; and Kunikane, Makoto, 4,696,892, Cl. 430-495.000.

Umemoto, Akio: *See—*
Aoki, Yuji; Horiuchi, Hidenaga; Umemoto, Akio; and Miura, Norio, 4,696,868, Cl. 428-690.000.

Umemoto, Makoto; Nakamura, Kotaro; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic material containing certain combinations of cyan and magenta couplers. 4,696,893, Cl. 430-543.000.

Umemura, Kaoru: *See—*
Ishitani, Tohru; Tamura, Hifumi; and Umemura, Kaoru, 4,697,086, Cl. 250-492.200.

Umemura, Yoshihiro: *See—*
Mochizuki, Masatsugu; Jige, Masanobu; and Umemura, Yoshihiro, 4,696,672, Cl. 604-128.000.

Umland, Henning; and Fricke, Gerhard, to Continental Gummi-Werke Aktiengesellschaft. Lubricant for a tire and wheel assembly. 4,696,753, Cl. 252-26.000.

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Gal, Laszlo V., 4,697,139, Cl. 324-73.00R.
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Fox, Richard J., 4,697,084, Cl. 250-376.000.
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Goldberg, Marvin C.; Cunningham, Kirkwood M.; and Weiner, Eugene R., 4,696,571, Cl. 356-336.000.

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Rock, Robert G., 4,697,186, Cl. 342-189.000.
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Buxe, Paul M., 4,696,431, Cl. 239-265.150.
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Yabushita, Yasunori; and Takagi, Kunihiko, 4,696,916, Cl. 514-25.000.

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Cochrum, Kent C., 4,696,286, Cl. 128-1.00R.

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Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,696,676, Cl. 44-7.500.

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Bedford, John A.; Elsohly, Hala N.; Wilson, Marvin C.; and Turner, Carlton E., 4,696,819, Cl. 424-195.100.

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Ohtani, Takayuki; Isobe, Mitsuo; Aoso, Akira; and Urakawa, Nobuaki, 4,697,112, Cl. 307-530.000.

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Kohlmetz, Charles W.; Urban, James J.; and Kenny, John, 4,696,283, Cl. 126-247.000.

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Suh, John T.; Piwinski, John J.; Jones, Howard; and Neiss, Edward S., 4,696,939, Cl. 514-361.000.

Uttner, Alfred: *See*—
Leo, Rolf; Meusel, Karl-Heinz; and Uttner, Alfred, 4,696,506, Cl. 295-38.000.

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Pasquarella, Stephen T., 4,697,221, Cl. 361-156.000.

Valeo: *See*—
Huber, Alain, 4,696,384, Cl. 192-70.270.

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Pezzoli, Luigi, 4,696,200, Cl. 74-434.000.

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Muckenfuhs, Delmar R.; and Van Coney, Robert H., 4,696,416, Cl. 222-109.000.

Vandame, Bertrand, to Precision Mechanique Labinal. Female electrical contact element. 4,696,530, Cl. 439-266.000.

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Blanchart, Alain P. O.; and Van Der Poorten, Christian J. E. C., 4,696,872, Cl. 429-42.000.

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Zemke, Edward H., deceased; Vandersyde, Gary L.; Rabindran, K. George; and Guenther, Kenneth L., 4,697,246, Cl. 364-563.000.

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van Nes, Cornelis G. J.: *See*—
Verhoeven, Laurentius M.; and van Nes, Cornelis G. J., 4,696,529, Cl. 439-267.000.

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Green, LaVerne M.; Vannoni, Adrio L.; and Pummell, Ivan K., 4,696,096, Cl. 29-829.000.

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Boyadjieff, George I., 4,696,207, Cl. 81-57.340.

Varta Batterie Aktiengesellschaft: *See*—
Glemser, Oskar; Buss, Dieter H.; and Bauer, Jurgen, 4,696,875, Cl. 429-209.000.

VEB "Otto-Buchwitz" Starkstrom-Anlagebau Dresden: *See*—
Bohme, Helmut; Lobl, Helmut; and Grossmann, Steffen, 4,696,531, Cl. 439-851.000.

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Fleischer, Donald W., 4,697,278, Cl. 377-24.000.

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Wilson, Aaron W.; and Pollock, Richard A., 4,696,413, Cl. 221-13.000.

Verdin, Joe L. Light mounting for firearms. 4,697,226, Cl. 362-110.000.

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Bierhoff, Waltherus C. J.; Schuitmaker, Pieter D.; Ouwerkerk, Cornelis; and Verhoeven, Robertus J. M., 4,696,590, Cl. 400-613.000.

Verhoeven, Thomas R., to Merck & Co., Inc. Preparation of dibenzo[b,f]thiepin compounds. 4,697,037, Cl. 562-432.000.

Verify Electronics Limited: *See*—
Howbrook, Ernest, 4,697,144, Cl. 324-207.000.

Verstraete, Willy; and De Ley, Jozef, to Ateliers de Constructions Electriques de Charleroi (ACEC) Societe Anonyme. Process for the elimination of nitrates by means of a microbiological conversion in the presence of hydrogen gas. 4,696,747, Cl. 210-605.000.

Vetco-Gray Inc.: *See*—
Brammer, Norman, 4,696,493, Cl. 285-3.000.

Vialaron, Andre ; Olalde, Gabriel; and Gauthier, Daniel, to Centre National de la Recherche Scientifique. Process and apparatus for thermolytically dissociating water. 4,696,809, Cl. 423-579.000.

Viator, John R., Sr. Ball actuated alarm device. 4,697,174, Cl. 340-689.000.

Victor Company of Japan, Ltd.: *See*—
Sugiyama, Hiroyuki, 4,697,257, Cl. 369-43.000.

Vidakovits, Lajos J., to Raychem Corp. Heat recoverable termination device. 4,696,841, Cl. 428-36.000.

Vijan, Meera, to Energy Conversion Devices, Inc. Method of forming a large surface area integrated circuit. 4,696,885, Cl. 430-311.000.

Villanyi, Miklos: *See*—
Szody, Peter; Dunajcsik, Peter; Villanyi, Miklos; Bossanszky, Ferenc; Libor, Endre; and Kiss, Ferenc, 4,696,643, Cl. 432-120.000.

Villard, Michel: *See*—
Yves, Henry; Nicollet, Andre; and Villard, Michel, 4,696,094, Cl. 437-23.000.

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Schachter, Rozalie; Viscogliosi, Marcello; Bunz, Lewis A.; Olego, Diego J.; Serreze, Harvey B.; and Raccah, Paul M., 4,696,828, Cl. 427-38.000.

Vitovec, Jaroslav; Cermak, Jan; and Smolik, Jiri , to Ceskoslovenska akademie ved. Method and equipment for separation of solids from gaseous mixtures. 4,696,683, Cl. 55-82.000.

Vize, Robert M., to Caterpillar Inc. Vented fuel tank cap assembly. 4,696,409, Cl. 220-203.000.

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Enkner, Bernhard; Amon, Leopold; Kubelbock, Alfred; Trimmel, Wolfgang; Nalepka, Paul; Schropp, Leopold; Schwaighofer, Helmut; Pum, Reinhard; Traxler, Manfred; and Tasch, Franz, 4,697,274, Cl. 373-79.000.
Zitz, Alfred; and Maier, Wilfried, 4,696,518, Cl. 299-75.000.

Vomhof, Paul; Schmidt, Karlheinz; and Oster, Peter, to Kramer & Grebe GmbH & Co. KG. Cutter head for meat cutter. 4,696,434, Cl. 241-282.200.

von Berg, Peter, to Peter von Berg Extrakorporale Systems-Medizintechnik GmbH. Flow controller. 4,696,305, Cl. 128-673.000.

Voncken, Wilhelmus G.: *See*—
De Graaff, Hendrik C.; and Voncken, Wilhelmus G., 4,697,199, Cl. 357-23.130.

Vondernau, Werner; Weber, Jurgen; Nickel, Hans; Wissmann, Michael; and Schliemann, Harald, to Stihl, Andreas. Two-stroke engine. 4,696,264, Cl. 123-73.00V.

Vondracek, Petr: *See*—
Sulc, Jiri ; Vondracek, Petr; and Lopour, Petr, 4,696,974, Cl. 525-92.000.

Voorhees, Theodore. Foil applicator. 4,696,714, Cl. 156-468.000.

Vorwerk & Co. Interholding GmbH: *See*—
Ahlf, Heinz-Jurgen; Guhne, Wieland; Simm, Hans-Peter; and Wulf, Peter, 4,696,076, Cl. 15-415.00R.

Vucevic, Svet O., to Marconi International Marine Company Limited. Stabilized platform arrangement. 4,696,196, Cl. 74-5.220.

W & C Pantin Ltd.: *See*—
Avey, Kenneth F. C., 4,696,616, Cl. 414-417.000.

W. S. Tyler, Incorporated: *See*—
Elmquist, Steven A.; and Boesger, Leonard E., 4,696,353, Cl. 175-206.000.

W. Schlafhorst & Co.: *See*—
Hermanns, Ferdinand-Josef, 4,696,435, Cl. 242-18.100.

W. Vinten Limited: *See*—
Russell, Lionel V. F., 4,696,596, Cl. 403-321.000.

Wacom Co., Ltd.: *See*—
Murakami, Azuma; Taguchi, Yoshinori; and Yamanami, Tsuguya, 4,697,244, Cl. 364-520.000.

Wada, Keiichiro: *See*—
Hirai, Hidefumi; Komiyama, Makoto; Hara, Susumu; and Wada, Keiichiro, 4,696,682, Cl. 55-68.000.

Wagemann, Harry, to Blohm & Voss AG. Apparatus for a ship's propeller. 4,696,651, Cl. 440-88.000.

Wagner, Peter, to Geri Engineering GmbH. Steel roadway for magnetic tracks. 4,696,235, Cl. 104-124.000.

Wakai, Katsuro, to Hitachi, Ltd. Scan control apparatus and method for data processing apparatus. 4,697,267, Cl. 371-25.000.

Wakamiya, Masayuki: *See*—
Yamashita, Ichiro; Wakamiya, Masayuki; Hase, Hiroyuki; and Tokuomo, Shinya, 4,696,192, Cl. 73-728.000.

Wakatsuki, Kizuku: *See*—
Shiga, Akinobu; Kakugo, Masahiro; Kozima, Junpei; and Wakatsuki, Kizuku, 4,696,979, Cl. 525-247.000.

Wako Pure Chemical Industries, Ltd.: *See*—
Ikenaka, Tokuji; and Omichi, Kaoru, 4,697,006, Cl. 536-17.200.

Walden, Frederick C.: *See*—
Pettit, Harold W., Jr; Davis, Charles G.; and Walden, Frederick C., 4,696,855, Cl. 428-312.800.

Walker, David A.: *See*—
Burnett, William; Houghton, James R.; Walker, David A.; and Key, Larry, 4,696,512, Cl. 297-68.000.

Walker, Don W.; and Rush, Lynn, to Hawkins, Billy J., Sr., a part interest. Pipefitters tape measure. 4,696,110, Cl. 33-137.00R.

Walker, James L.: *See*—
Lunsford, David; and Walker, James L., 4,696,951, Cl. 521-65.000.

Walker, John A.; Witucki, Edward F.; and Warren, Leslie F., to Rockwell International Corporation. Chemical synthesis of conducting polypyrrole. 4,697,001, Cl. 528-423.000.

Wallace, Robert S., to Wallace, Robert S.; and Bauman, Jack, a part interest. Cushioning packaging media. 4,696,401, Cl. 206-594.000.

Walsh, Edward N.: *See*—
Hardy, Thomas A.; and Walsh, Edward N., 4,697,030, Cl. 558-163.000.

Walter, Jean-Jacques; Petit, Daniel; Marzocca, Joseph; Amalric, Jean; and Bernard, Georges, to Gerin, Merlin. Arc extinction device for gas insulation electrical switchgear. 4,697,055, Cl. 200-148.00B.

Wandel u. Goltermann GmbH & Co.: *See*—
Rudolph, Georg, 4,697,156, Cl. 331-1.00A.

Wang, David T. K.; and Wilson, Philip J., to M/A-COM Government Systems, Inc. Linear predictive echo canceller integrated with RELP vocoder. 4,697,261, Cl. 370-32.100.

Ward, Thomas A.; Petracca, Victor G.; and Figore, Timothy, to PPG Industries, Inc. Method of providing structural support for compositions. 4,696,864, Cl. 428-413.000.

Ward, Thomas F.: *See*—
Harmon, Charles H.; Ward, Thomas F.; and Zimmermann, Robert W., 4,696,402, Cl. 206-602.000.

Waring, Patrick M. Gun rack. 4,696,405, Cl. 211-4.000.

Warman, Leigh. Kit for creating wall murals. 4,696,400, Cl. 206-575.000.

Warnagiris, Thomas J.; and McGinnis, William H., to Nippon Colin Co., Ltd. Method and apparatus for coupling transceiver to power line carrier system. 4,697,166, Cl. 340-310.00R.

Warner-Lambert Company: *See*—
Belsole, Susan C., 4,696,821, Cl. 424-448.000.
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; and Willmer, Neil E., 4,696,794, Cl. 424-118.000.
Kao, Shui-Hsi; Kay, Allen I.; and Sampson, Karla, 4,696,814, Cl. 424-80.000.
Kay, Allen I.; and Hokanson, Gerard C., 4,696,912, Cl. 514-7.000.
Marcoux, Frank W., 4,696,924, Cl. 514-211.000.
Marcoux, Frank W., 4,696,934, Cl. 514-277.000.
Silbering, Steven B.; Nesbitt, Russell U.; and Fawzi, Mahdi B., 4,696,812, Cl. 424-445.000.

Warren, Leslie F.: *See*—
Maus, Louis; Witucki, Edward F.; and Warren, Leslie F., 4,696,835, Cl. 427-121.000.
Walker, John A.; Witucki, Edward F.; and Warren, Leslie F., 4,697,001, Cl. 528-423.000.
Witucki, Edward F.; and Warren, Leslie F., 4,697,000, Cl. 528-423.000.

Washio, Katsuyoshi: *See*—
Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.

Waste Resource Associates, Inc.: *See*—
Rakoczynski, Randolph W.; Odojewski, Stephen S.; and Rolfe, John I., 4,696,599, Cl. 405-129.000.

Watanabe, Hiroshi: *See*—
Mullin, John G., Jr.; Nakamura, Keiji; Tilley, Jefferson W.; and Watanabe, Hiroshi, 4,696,930, Cl. 514-256.000.
Nakajima, Kohei; Nishio, Kazuaki; and Watanabe, Hiroshi, 4,696,994, Cl. 528-176.000.

Watanabe, Junichi: *See*—
Numata, Tatsuo; Hatanaka, Masataka; Watanabe, Junichi; Ikai, Takasi; Nawamaki, Tsutomu; and Hattori, Kenji, 4,696,694, Cl. 71-86.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,696,564, Cl. 355-14.00R.

Watanabe, Katsuhiko: *See*—
Usami, Kyohei; and Watanabe, Katsuhiko, 4,696,686, Cl. 55-158.000.

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Watanabe, Shinobu: *See*—
Obayashi, Tsutomo; Watanabe, Shinobu; and Ino, Kazuhide, 4,696,830, Cl. 427-41.000.

Watanabe, Takeshi, to NEC Corporation. Programmable memory circuit. 4,697,106, Cl. 307-463.000.

Watanabe, Tomoyuki: *See*—
Okabe, Takahiro; Hayashi, Makoto; Morisuye, Katuhiro; Watanabe, Tomoyuki; Washio, Katsuyoshi; Ogura, Setsuo; Furihata, Makoto; and Kondo, Shizuo, 4,697,102, Cl. 307-454.000.

Watanabe, Yoshio: *See*—
Kato, Yasuo; Ono, Tetsuo; Watanabe, Yoshio; Murayama, Seiichi; Mikoshiba, Shigeo; and Matsuno, Hiromitsu, 4,697,121, Cl. 313-595.000.

Wautier, Henri: *See*—
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Weaver, Edward A., to Owens-Illinois Television Products Inc. Platinum corrosion reducing premelted oxide compositions for lead containing solder glasses. 4,696,909, Cl. 501-75.000.

Weaver, Timothy O.: *See*—
Danszczko, Mark A.; Finn, Lyle D.; Glasscock, M. Sidney; Piazza, Michael P.; Steele, Kenneth M.; and Weaver, Timothy O., 4,696,603, Cl. 405-227.000.

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Vondernau, Werner; Weber, Jurgen; Nickel, Hans; Wissmann, Michael; and Schliemann, Harald, 4,696,264, Cl. 123-73.00V.

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Goldberg, Marvin C.; Cunningham, Kirkwood M.; and Weiner, Eugene R., 4,696,571, Cl. 356-336.000.

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Wellens, Ulrich: *See*—
Grauel, Christoph; Kittel, Ludwig; Schmidt, Werner; and Wellens, Ulrich, 4,697,260, Cl. 370-18.000.

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Ruger, James; and Welz, Wolfgang, 4,696,567, Cl. 356-28.000.

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Seitz, Georg; and Wernicke, Rainer, 4,697,007, Cl. 536-83.000.

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Marquis, Gerald L., 4,697,150, Cl. 324-373.000.
Randall, Russel R., 4,697,078, Cl. 250-256.000.

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Bucher, George D.; Catanese, John A.; and Clawson, William D., 4,696,190, Cl. 73-865.800.
Cook, Bruce M.; and Gutman, Jerzy, 4,696,785, Cl. 376-245.000.
Dadpey, Habib; Merlino, Paul J.; and Shero, David J., 4,697,130, Cl. 318-760.000.
Grunert, Kurt A.; and Farley, James R., 4,697,163, Cl. 335-174.000.
Moore, William H.; Gutowski, Charles M.; Trosky, William J.; and Butler, Thomas A., 4,697,243, Cl. 364-513.000.
Neft, Charles L., 4,697,230, Cl. 363-163.000.
Paul, Gary E.; Carr, Ronald H.; and Stern, Lee W., 4,696,793, Cl. 376-447.000.
Schauder, Colin D.; and Heinrich, Theodore M., 4,697,131, Cl. 318-762.000.
Schmitz, William E., 4,697,124, Cl. 318-63.000.
Sutherland, James F.; and Miller, William L., 4,697,093, Cl. 307-38.000.
Tolino, Ralph W.; King, William E.; Blickenderfer, Jack L.; and Roth, Charles H., Jr., 4,696,784, Cl. 376-245.000.

Westwick, Alan L., to Motorola, Inc. Fully differential switched capacitor amplifier having autozeroed common-mode feedback. 4,697,152, Cl. 330-9.000.

Whaley, John H., Jr. Satellite locator. 4,696,109, Cl. 33-1.00B.

Whiteley, John, to Hollingsworth (UK) Limited. Multi-position yarn spinning/winding apparatus. 4,696,436, Cl. 242-35.50R.

Wideman, Ronald H., to Kimberly-Clark Corporation. Method and apparatus for forming an isotropic self-adhering elastomeric ribbon. 4,696,779, Cl. 264-211.130.

Widen, Karl-Bertil: *See*—
Gustafsson, Hans; Schwartz, Stephan; and Widen, Karl-Bertil, 4,696,910, Cl. 502-159.000.

Wierzchowski, Wojciech: *See*—
Grochal, Tadeusz; Ryglicki, Roman; and Wierzchowski, Wojciech, 4,696,337, Cl. 164-150.000.

Wilcox, Gilbert M. Double balloon nasobiliary occlusion catheter for treating gallstones and method of using the same. 4,696,668, Cl. 604-28.000.

Wilkerson Corporation: *See*—
Bull, Walter E., 4,696,320, Cl. 137-116.500.

Wilkinson, Raymond G.: *See*—
Child, Ralph O.; Fields, Thomas L.; Wilkinson, Raymond G.; and Lin, Yang-I, 4,696,936, Cl. 514-297.000.

Wilkinson, Theodore C.: *See*—
Albright, James A.; and Wilkinson, Theodore C., 4,696,963, Cl. 524-144.000.

Wille, Mark E. Downrigger fishing line release apparatus. 4,696,124, Cl. 43-43.120.

Willi, Jeschke, to Heidelberger Druckmaschinen AG. Method and device for aligning sheets. 4,696,465, Cl. 271-237.000.

William P. Young Co.: *See*—
Young, William P., 4,696,143, Cl. 53-289.000.

Williams, Ian G., to Imperial Chemical Industries PLC. Flame retardant, impact resistant polyamide compositions. 4,696,966, Cl. 524-412.000.

Williams, Keith R., to Sundstrand Corporation. Multi-function valve. 4,696,162, Cl. 60-433.000.

Williamson, Roger C.; and Harrison, James J., to Chevron Research Company. Isomerization of vinylidene olefins. 4,697,040, Cl. 585-668.000.

Willis, David H.: *See*—
Neary, John F.; Peddy, John T.; and Willis, David H., 4,696,257, Cl. 119-1.000.

Willmer, Neil E.: *See*—
Bunge, Richard H.; French, James C.; Hurley, Timothy R.; and Willmer, Neil E., 4,696,794, Cl. 424-118.000.

Wilson, Aaron W.; and Pollock, Richard A., to Vendo Company, The. Vending system and method for preveating multiple product vends. 4,696,413, Cl. 221-13.000.

Wilson, Fred W.; and Smith, Timothy D., to United States of America, Navy. Retractable, lever action, scroll seal for a surface effect ship. 4,696,362, Cl. 180-116.000.

Wilson, Leslie B., to Dayco Products, Inc. Belt tensioning means. 4,696,664, Cl. 474-138.000.

Wilson, Lillian S., executrix: *See*—
Angevine, Philip J.; Chu, Yung F.; Mitchell, Kenneth M.; Oleck, Stephen M.; Shih, Stuart S.; and Wilson, Robert C., Jr., deceased, 4,696,732, Cl. 208-111.000.

Wilson, Marvin C.: *See*—
Bedford, John A.; Elsohly, Hala N.; Wilson, Marvin C.; and Turner, Carlton E., 4,696,819, Cl. 424-195.100.

Wilson, Philip J.: *See*—
Wang, David T. K.; and Wilson, Philip J., 4,697,261, Cl. 370-32.100.

Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., to International Flavors & Fragrances Inc.; and University of Florida, The. Use of 1-nonen-3-ol for repelling insects. 4,696,676, Cl. 44-7.500.

Wilson, Robert C., Jr., deceased: *See*—
Angevine, Philip J.; Chu, Yung F.; Mitchell, Kenneth M.; Oleck, Stephen M.; Shih, Stuart S.; and Wilson, Robert C., Jr., deceased, 4,696,732, Cl. 208-111.000.

Windmoller & Holscher: *See*—
Upmeier, Hartmut, 4,696,575, Cl. 366-80.000.

Windorski, David C., to Minnesota Mining and Manufacturing Company. Notepaper dispensing tray. 4,696,399, Cl. 206-565.000.

Winter, Walter W.; Gothard, Steven E.; and Drew, John H., to Golden Enterprises, Inc. Telephone operator voice storage and retrieval system. 4,697,282, Cl. 379-67.000.

Wirth Maschinen- und Bohrgerate-Fabrik GmbH: *See*—
Hurtz, Georg; Steufmehl, Willi; and Krappen, Wolfgang, 4,696,600, Cl. 405-138.000.

Wisconsin Alumni Research Foundation: *See*—
Moran, Paul R., 4,697,149, Cl. 324-309.000.
Zarnstorff, William C.; and Ranallo, Frank N., 4,697,280, Cl. 378-207.000.

Wissmann, Michael: *See*—
Vondernau, Werner; Weber, Jurgen; Nickel, Hans; Wissmann, Michael; and Schliemann, Harald, 4,696,264, Cl. 123-73.00V.

Wissner, Allan; and Sum, Phaik-Eng, to American Cyanamid Company. Antihypertensive phosphate derivatives. 4,697,031, Cl. 558-169.000.

Witcomb, Roger C.: *See*—
Stewart, Peter A. E.; Hawkesworth, Michael R.; and Witcomb, Roger C., 4,697,079, Cl. 250-303.000.

Withycombe, Donald: *See*—
Wilson, Richard A.; Butler, Jerry F.; Withycombe, Donald; Mookherjee, Braja D.; Katz, Ira; and Schrankel, Kenneth R., 4,696,676, Cl. 44-7.500.

Witmer, Warner H. Fluid barrier curtain system. 4,696,226, Cl. 98-36.000.

Witucki, Edward F.; and Warren, Leslie F., to Rockwell International Corporation. Process for producing polypyrrole powder and the material so produced. 4,697,000, Cl. 528-423.000.

Witucki, Edward F.: *See*—
Maus, Louis; Witucki, Edward F.; and Warren, Leslie F., 4,696,835, Cl. 427-121.000.
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Wodok, Hans: *See*—
Bauer, Anton E.; Billmann, Gerhard; Rathke, Jorg; Schimanek, Hans-Joachim; Schrott, Georg W.; and Wodok, Hans, 4,696,537, Cl. 350-96.200.

Wolcott, Wayne B., to Electro Adapter. Band finishing tool. 4,696,327, Cl. 140-150.000.

Wolf, Erich: *See*—
Pleines, Peter; and Wolf, Erich, 4,696,297, Cl. 128-303.100.

Wolf-Gerate GmbH: *See*—
Held, Peter, 4,696,107, Cl. 30-246.000.

Wolowski, Eckard; Mirtsch, Frank; and Dybus, Herbert, to Ruhrkohle Aktiengesellschaft. Method and apparatus for multiphase coal hydrogenation reactors with exothermal heat of reaction having gas cooling in sump-phase reactors. 4,696,735, Cl. 208-408.000.

Woltron, Herbert; and Huber, Christian, to Isoport Verbundbauteile Ges. m.b.H. Plastic leaf spring with at least one spring-eye body or spring-eye section. 4,696,459, Cl. 267-36.100.

Woo, Kenneth; and Mamak, Z., to Board of Governors of Ryerson Polytechnical Institute, The. Security device for electronic equipment. 4,696,449, Cl. 248-553.000.

Wood, James Q., to Phillips Petroleum Company. Filter bag preparation. 4,696,685, Cl. 55-97.000.

Woods, Donald R.; and Woods, Helga S., to Rasbech, Roger. Refrigerant subcooler for air conditioning systems. 4,696,168, Cl. 62-200.000.

Woods, Helga S.: *See*—
Woods, Donald R.; and Woods, Helga S., 4,696,168, Cl. 62-200.000.

Woodward, Marylou. Women's urinal for use in erect position. 4,696,067, Cl. 4-144.100.

Worlds of Wonder, Inc.: *See*—
McKeefery, James, 4,696,653, Cl. 446-175.000.

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Wren, Michael; Lantz, Paul W.; Acock, George W., Jr.; and Rhodes, James A., to James A. Rhodes & Associates. Building with covered interior open space. 4,696,133, Cl. 52-80.000.

Wright, Jewel L. Blind fastener. 4,696,610, Cl. 411-38.000.

Wright, Stuart C.; Stiles, Lorren, Jr.; and Adams, Don L., to United Technologies Corporation. Collective control system for a helicopter. 4,696,445, Cl. 244-229.000.

Wright, William M. D., to D. W. Electrochemicals Ltd. Contact stabilization coating material for electrical contact surfaces and method. 4,696,832, Cl. 427-58.000.

Wu, Frederick Y., to Perkin-Elmer Corporation, The. Reverse dark field alignment system for scanning lithographic aligner. 4,697,087, Cl. 250-548.000.

Wulf, Peter: *See*—
Ahlf, Heinz-Jurgen; Guhne, Wieland; Simm, Hans-Peter; and Wulf, Peter, 4,696,076, Cl. 15-415.00R.

Wurmli, Arthur: *See*—
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Wynn, David K.: *See*—
Cook, Steven T.; and Wynn, David K., 4,696,179, Cl. 72-405.000.

Wyzykowski, Casmere J. Game package for confections. 4,696,473, Cl. 273-153.00R.

Xerox Corporation: *See*—
Lama, William L.; and Harrigan, Michael E., 4,696,545, Cl. 350-167.000.
Quate, Calvin F.; and Khuri-Yakub, Butrus T., 4,697,195, Cl. 346-140.00R.

Yabushita, Yasunori; and Takagi, Kunihiko, to Unitika Ltd. Intravenous nutrient. 4,696,916, Cl. 514-25.000.

Yagasaki, Akio; and Marishima, Kazuo, to Honda Giken Kogyo KK. Windshield adjustment device. 4,696,509, Cl. 296-84.00A.

Yagasaki, Eriko; Kanda, Motoya; Mitsuyasu, Kiyoshi; and Sato, Yuji, to Kabushiki Kaisha Toshiba. Rechargeable electrochemical cell with a negative electrode comprising a hydrogen absorbing alloy including rare earth component. 4,696,873, Cl. 429-59.000.

Yagi, Shigeo: *See*—
Sonoyama, Takayasu; Yagi, Shigeo; and Kageyama, Bunji, 4,696,897, Cl. 435-42.000.

Yamada, Kuniaki: *See*—
Mochizuki, Asahi; Ozawa, Kira; Fujita, Shinichiro; and Yamada, Kuniaki, 4,696,446, Cl. 246-169.00S.

Yamagishi, Frederick G.: *See*—
Grinberg, Jan; and Yamagishi, Frederick G., 4,697,247, Cl. 364-713.000.

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Ryoke, Katsumi; Yamaguchi, Nobutaka; Takahashi, Masatoshi; Hanai, Kazuko; Kosha, Hideaki; and Tadokoro, Eiichi, 4,696,858, Cl. 428-323.000.

Yamaguchi, Tadanobu: *See*—
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Yamaha: *See*—
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Yamamoto, Hiranaga: *See*—
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Yamamoto, Hiromasa; Shida, Sankichi; and Todoroki, Tsunehiko, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing a chip coil. 4,696,100, Cl. 29-605.000.

Yamamoto, Toshiaki; Kako, Hiroyoshi; Shibata, Takuo; Izuo, Takashi; Kamimae, Hajime; and Takegawa, Hiroaki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic buffer. 4,696,379, Cl. 188-299.000.

Yamamura, Hiroshi: *See*—
Shirasaki, Shin-ichi; Hotta, Yasunari; Yamamura, Hiroshi; Matsuda, Shin-ichi; Kakegawa, Kazuyuki; Moriyoshi, Yusuke; Takahashi, Koichiro; and Haneda, Hajime, 4,696,810, Cl. 423-593.000.

Yamanami, Tsuguya: *See*—
Murakami, Azuma; Taguchi, Yoshinori; and Yamanemi, Tsuguya, 4,697,244, Cl. 364-520.000.

Yamasaki, Kimihito; and Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Sorter for electrophotographic copying machine. 4,696,466, Cl. 271-288.000.

Yamashita, Ichiro; Wakamiya, Masayuki; Hase, Hiroyuki; and Tokuono, Shinya, to Matsushita Electric Industrial Co., Ltd. Fluid pressure sensor. 4,696,192, Cl. 73-728.000.

Yamashita, Tatsuo; Terada, Masafumi; and Suzuki, Koji, to Fujisawa Pharmaceutical Co., Ltd. Monoclonal anti-protein C antibody, its preparation and use thereof. 4,696,895, Cl. 435-7.000.

Yamauchi, Yoshiyuki; Ohara, Toshio; and Takahashi, Toshio, to Nippondenso Co., Ltd. Plate-type heat exchanger. 4,696,342, Cl. 165-152.000.

Yamawaki, Ichiro; Ogawa, Kazuo; Ono, Naohiko; Honna, Takaji; Nagayama, Sekio; and Yasumoto, Mitsugi, to Taiho Pharmaceutical Company, Limited. Derivative of piperazine having anti-allergic and anti-inflammatory action. 4,696,929, Cl. 514-253.000.

Yamazaki, Hidetoshi: *See*—
Inoue, Masatsugu; and Yamazaki, Hidetoshi, 4,697,119, Cl. 313-408.000.

Yamazaki, Hiroshi: *See*—
Ogihara, Masuo; Oda, Hajime; Seki, Yoichi; and Yamazaki, Hiroshi, 4,696,560, Cl. 354-439.000.

Yamazaki, Jun; and Ito, Yukio, to Sony Corporation. Method for exposng a color tri-cathode ray tube panel to form three separate color phosphor stripe patterns by exposure from three separate light source positions using combination of corrective lenses. 4,696,879, Cl. 430-24.000.

Yamazaki, Masahiro: *See*—
Mori, Hideharu; Koyama, Shozi; and Yamazaki, Masahiro, 4,696,689, Cl. 62-32.000.

Yamazaki, Taro, to Osaka Soda Co., Ltd. Electrically conductive adhesive composition. 4,696,764, Cl. 252-503.000.

Yanagisawa, Masahiro, to NEC Corporation. Magnetic storage medium with lubricating coating. 4,696,845, Cl. 428-64.000.

Yang, Chi Chung: *See*—
Ovshinsky, Stanford R.; Guha, Subhendu; Nath, Prem; Yang, Chi Chung; Fournier, Jeffrey; and Kulman, James, 4,696,758, Cl. 252-188.310.

Yang, Ralph T.: *See*—
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Yano, Hidetoshi; Seimiya, Ryubun; Tarumi, Noriyoshi; Demizu, Hiromi; and Obu, Makoto, to Ricoh Company, Ltd. Developing apparatus. 4,696,255, Cl. 118-653.000.

Yasuda, Kazuhiko: *See*—
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Yasui, Seimei: *See*—
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Isoyama, Toyoshiro; Yasuyuki, Goto; Ogawa, Tetsuya; and Sugimori, Shigeru, 4,696,759, Cl. 252-299.620.

Yelich, William: *See*—
Reese, James R.; and Yelich, William, 4,696,321, Cl. 137-202.000.

Yellin, Tobias O.; and Gilman, David J., to ICI Americas Inc.; and Imperial Chemical Industries PLC. Guanidine compounds useful as histamine H2-antagonists. 4,696,933, Cl. 514-275.000.

Yen, Down W. Clip resiliant. 4,696,081, Cl. 24-558.000.

Yen, Yung-Chau, to Advanced Micro Devices, Inc. Metallization technique for integrated circuit structures. 4,696,098, Cl. 437-187.000.

Yeo, Richard G.: *See*—
Ellwood, Derek C.; Evans, Charles G. T.; and Yeo, Richard G., 4,696,900, Cl. 435-104.000.

Yeum, Hee-Sung, to DAE-AH Human Engineering Inc. Contoured aircraft and car seat. 4,696,516, Cl. 297-458.000.

Yevick, George J. Method of photoforming optical patterns for VLSI devices. 4,696,889, Cl. 430-311.000.

Yokoyama, Norio: *See*—
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Yoneyama, Mitsuho: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; and Sugaya, Toyomi, 4,697,128, Cl. 318-607.000.

Yoneyama, Takashi: *See*—
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Yoshida, Hajime, to Hajime Industries, Ltd. Lighting device for inspecting objects for flaws. 4,697,076, Cl. 250-223.00B.

Yoshida Industry Co., Ltd.: *See*—
Shioi, Yuji; and Yuhara, Yukitomo, 4,696,317, Cl. 132-82.00R.

Yoshida, Isao: *See*—
Sasaki, Toshihiko; Sunayama, Yooji; Yoshida, Isao; and Endo, Masayuki, 4,696,800, Cl. 422-186.180.
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Yoshida, Toshihiko: *See*—
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Yoshikawa, Osamu, to Shimano Industrial Company Limited. Drag adjusting device for a closed-face type fishing reel. 4,696,437, Cl. 242-84.50A.
Yoshimura, Yoshio: *See*—
Arimitsu, Hiroshi; Hatano, Kiyoshi; Nakanishi, Teruyuki; Yoshimura, Yoshio; Urabe, Masaki; and Honda, Tsurakazu, 4,697,179, Cl. 340-825.720.
Yoshino, Ryozo: *See*—
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Yoshio, Kazuya: *See*—
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Yoshitake, Makoto; and Kishimoto, Keiichi, to Toray Silicone Co., Ltd. Organopolysiloxane composition for viscous fluid coupling. 4,696,756, Cl. 252-78.300.
Yoshiura, Shoichiro: *See*—
Yamasaki, Kimihito; and Yoshiura, Shoichiro, 4,696,466, Cl. 271-288.000.
Yoshizawa, Mamoru: *See*—
Osawa, Eiichi; Tanaka, Masato; Yoshizawa, Mamoru; Nakai, Jun; and Kojima, Yuichi, 4,697,212, Cl. 360-48.000.
Young, Niels O., to Helix Technology Corporation. Magnetically balanced and centered electromagnetic machine and cryogenic refrigerator employing same. 4,697,113, Cl. 310-15.000.
Young, William P., to William P. Young Co. Container capping apparatus. 4,696,143, Cl. 53-289.000.
Yuhara, Yukitomo: *See*—
Shioi, Yuji; and Yuhara, Yukitomo, 4,696,317, Cl. 132-82.00R.
Yui, Hiroshi: *See*—
Kakizaki, Tetsuji; Mizutani, Toshikazu; and Yui, Hiroshi, 4,696,765, Cl. 252-511.000.
Yves, Henry; Nicollet, Andre; and Villard, Michel, to Thomson - CSF. Process of manufactoring an indium antimonide photodiode. 4,696,094, Cl. 437-23.000.
Zacharia, Alexey T. Scatterable ram air decelerator. 4,696,443, Cl. 244-113.000.
Zambon S.p.A.: *See*—
Giordano, Claudio; Castaldi, Graziano; Uggeri, Fulvio; and Cavicchioli, Silvia, 4,697,036, Cl. 562-418.000.
Zandel, Adam, to Press Technology Corporation. Guiding arrangement for forging press columns assembled of flat tie-rod layers. 4,696,180, Cl. 72-456.000.
Zanussi Elettrodomestici SPA: *See*—
Babuin, Piero, 4,696,171, Cl. 68-207.000.
Zarnstorff, William C.; and Ranallo, Frank N., to Wisconsin Alumni Research Foundation. Method and apparatus for the measurement of X-ray sources. 4,697,280, Cl. 378-207.000.
Zattara, Jean L.: *See*—
Fonfria, Robert; Risbet, Marie P.; and Zattara, Jean L., 4,696,082, Cl. 29-25.420.
Zelinski, Roger M. Portable, collapsible stand for use in cleaning a muzzle loading rifle or a muzzle loading shotgun. 4,696,461, Cl. 269-16.000.
Zeller, Bruno: *See*—
Felten, Klaus; Honroth, Walter; Kuhn, Siegfried; Schulten, Hermann; and Zeller, Bruno, 4,696,209, Cl. 82-40.00R.
Zeller, Zellis C., to Triple "F", Inc. Apparatus for particulating an oleaginous product. 4,696,634, Cl. 425-237.000.
Zemke, Anne H., legal representative: *See*—
Zemke, Edward H., deceased; Vandersyde, Gary L.; Rabindran, K. George; and Guenther, Kenneth L., 4,697,246, Cl. 364-563.000.
Zemke, Edward H., deceased (by Zemke, Anne H., legal representative); Vandersyde, Gary L.; Rabindran, K. George; and Guenther, Kenneth L., to Bell & Howell Company. Method and apparatus for detecting the engagement of a proper number of articles. 4,697,246, Cl. 364-563.000.
Zerrer, Gerhard; and Mayer, Gunter, to Stihl, Andreas. Pruning apparatus. 4,696,108, Cl. 30-276.000.
Zimmermann, Otto. Rotary piston internal combustion engine with water injection. 4,696,268, Cl. 123-203.000.
Zimmermann, Robert W.: *See*—
Harmon, Charles H.; Ward, Thomas F.; and Zimmermann, Robert W., 4,696,402, Cl. 206-602.000.
Zitz, Alfred; and Maier, Wilfried, to Voest-Alpine Aktiengesellschaft. Cutting machine. 4,696,518, Cl. 299-75.000.
Zumbro Enterprises, Inc.: *See*—
Sander, Eugene H.; and Cook, Douglas R., 4,696,762, Cl. 252-311.000.
Zunkel, Richard L. Doorholder assembly for a pocket door. 4,696,500, Cl. 292-251.500.
Zwach, David M. Solar cooker. 4,696,285, Cl. 126-451.000.
Zwirner, Gerhard, to Gebr. Happich GmbH. Swivel bearing for automobile sun visors. 4,696,510, Cl. 296-97.00K.
501 Brunel University: *See*—
Tyman, John H. P., 4,697,038, Cl. 564-265.000.
501 GTE Telecomunicazioni S.p.A.: *See*—
Buoli, Carlo, 4,697,161, Cl. 333-116.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Engel, Stephen A.; and Fuhrhop, Ronald E., to L-TEC Company. Method and apparatus for making instantaneous scarfing cuts. Re. 32,511, Cl. 148-9.500.
Fuhrhop, Ronald E.: *See*—
Engel, Stephen A.; and Fuhrhop, Ronald E., Re. 32,511, Cl. 148-9.500.
Heggeland, Bruce: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, Re. 32,510, Cl. 137-355.270.
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, to Matsushita Electric Industrial Co., Ltd. Method for producing foil electrodes for electrolytic capacitor. Re. 32,512, Cl. 204-58.000.
Kudo, Fumio: *See*—
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, Re. 32,512, Cl. 204-58.000.
L-TEC Company: *See*—
Engel, Stephen A.; and Fuhrhop, Ronald E., Re. 32,511, Cl. 148-9.500.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, Re. 32,512, Cl. 204-58.000.
Nakano, Katsutoshi: *See*—
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, Re. 32,512, Cl. 204-58.000.
Nu Lease Corporation: *See*—
Werner, David G., Re. 32,509, Cl. 52-202.000.
Recker, Richard D.: *See*—
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Shimatani, Ryoichi: *See*—
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Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, Re. 32,510, Cl. 137-355.270.
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Tisbo, Thomas A.: *See*—
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Werner, David G., to Nu Lease Corporation. Insulating storm window attachment. Re. 32,509, Cl. 52-202.000.

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Forehand, Sherman D.: *See*—
Giblin, John P.; Semancik, Andrew E.; and Forehand, Sherman D., B1 4,575,123, Cl. 281-48.000.
Giblin, John P.; Semancik, Andrew E.; and Forehand, Sherman D., to Champion International. Report cover. B1 4,575,123, 9-29-87, Cl. 281-48.000.
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Adams, Steven D.: *See*—
Roden, Mack L.; and Adams, Steven D., 292,124, Cl. D24-16.000.
Roden, Mack L.; and Adams, Steven D., 292,125, Cl. D24-16.000.
Aguirre, Joseph C. Fishing game board. 292,105, 9-29-87, Cl. D21-25.000.
Aiello, Ruby F. Combined I.V. container holding bag and strap. 292,127, 9-29-87, Cl. D24-58.000.
Akita, Tsugio; Uematsu, Toyoyuki; Yamamoto, Masaki; Tsubaki, Hiroyuki; and Kawata, Yoshiaki, to Matsushita Electric Industrial Co. Combined radio and television receiver. 292,097, 9-29-87, Cl. D14-72.000.
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Keeler, James M.; and Grip, John A., 292,069, Cl. D9-370.000.
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Andersen, Frode. Winch. 292,137, 9-29-87, Cl. D34-33.000.
Armstrong, Jeffrey A.: *See*—
Armstrong, Maclay M.; Houser, Steven A.; and Armstrong, Jeffrey A., 292,123, Cl. D24-10.000.
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Tong, James K.; and Kelley, Brenda C., 292,040, Cl. D2-314.000.
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Grube, John W.; and Burridge, Robert E., 292,135, Cl. D34-24.000.
Baptiste, Trevor I. Pair of eye glasses. 292,101, 9-29-87, Cl. D16-104.000.
Beal, James A. Coin roll opener. 292,139, 9-29-87, Cl. D99-34.000.
Beal, John R. Six pack beverage cooler. 292,057, 9-29-87, Cl. D7-77.000.
Bertani, Alberto, to Elesa S.p.A. Combined liquid level guage and thermometer. 292,072, 9-29-87, Cl. D10-53.000.
Billiet, Frank, to Mirodan, Etn. L. D'Haene & Zonen. Wall mirror. 292,043, 9-29-87, Cl. D6-300.000.

Billiet, Frank, to Mirodan, Etn. L. D'Haene & Zonen. Wall mirror. 292,044, 9-29-87, Cl. D6-300.000.

Bitsch, Ullrich H., to Drabert Sohne GmbH & Co. Office chair. 292,047, 9-29-87, Cl. D6-365.000.

Bolick, Lawrence E. Font of type. 292,103, 9-29-87, Cl. D18-27.000.

Bollinger, Howard N.; Cordrey, Robert E.; Ligon, Charles E.; and Myers, David A., to Kenner Parker Toys Inc. Toy vehicle. 292,108, 9-29-87, Cl. D21-137.000.

Brevetti Gaggia S.p.A.: *See*—
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Bridgestone Corporation: *See*—
Hayakawa, Toshio; and Kobayashi, Tetsuro, 292,080, Cl. D12-146.000.
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Bryant, Sydney, to Sydney, Bryant Manufacturing Pty. Ltd. Wire tap connector. 292,087, 9-29-87, Cl. D13-24.000.

Burenga, Thomas L, to Worksaver, Inc. Pair of front loader bucket tines. 292,136, 9-29-87, Cl. D34-35.000.

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Carpenter, Thomas: *See*—
Goldsmith, Arthur; and Carpenter, Thomas, 292,100, Cl. D15-127.000.

Carr, Peter B., to Standard Telephones and Cables, Plc. Portable radio pager. 292,096, 9-29-87, Cl. D14-68.000.

Cesaroni, William C., to Dart Industries Inc. Toaster oven. 292,058, 9-29-87, Cl. D7-350.000.

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Cordrey, Robert E.: *See*—
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Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., to Igloo Corporation. Container having an accessory bag thereon. 292,056, 9-29-87, Cl. D7-77.000.

DiPasquale, Dominic T. Finger ring. 292,073, 9-29-87, Cl. D11-30.000.

Doman, Donald W.; and Mikic, Frank, to Snap-on Tools Corporatine. Adjustable wrench. 292,062, 9-29-87, Cl. D8-22.000.

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Eriksson, Nore, to Telefonaktiebolaget LM Ericsson. Fiber optical distribution box. 292,088, 9-29-87, Cl. D13-40.000.

Fenne, Kenneth R., to Pittway Corporation. Flashlight. 292,131, 9-29-87, Cl. D26-43.000.

Fiore, Joseph F., Jr.: *See*—
Decker, Joseph A., Jr.; Fiore, Joseph F., Jr.; and Katz, Stanley A., 292,056, Cl. D7-77.000.

Funahara, Kiyoshi, to Sumimoto Rubber Industries, Ltd. Motorcycle tire. 292,077, 9-29-87, Cl. D12-140.000.

Gatlin, Charles D., Jr. Tool tray. 292,138, 9-29-87, Cl. D34-45.000.

Germain, Robert A., to USM Corporation. Head for a shovel. 292,061, 9-29-87, Cl. D8-10.000.

Giordano, John M. Chair. 292,050, 9-29-87, Cl. D6-380.000.

Goldman, Paul R., to Plycraft Inc. Chair. 292,049, 9-29-87, Cl. D6-379.000.

Goldsmith, Arthur; and Carpenter, Thomas, to Carpenter Manufacturing Co. Automatic wire cutting machine. 292,100, 9-29-87, Cl. D15-127.000.

Grip, John A.: *See*—
Keeler, James M.; and Grip, John A., 292,068, Cl. D9-370.000.
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Grube, John W.; and Burridge, Robert E., to Avitare. Collapsible cart. 292,135, 9-29-87, Cl. D34-24.000.

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Hatakenaka, Kenji, to Sumitomo Rubber Industries, Ltd. Automobile tire. 292,085, 9-29-87, Cl. D12-147.000.

Hayakawa, Toshio; and Kobayashi, Tetsuro, to Bridgestone Corporation. Automobile tire. 292,080, 9-29-87, Cl. D12-146.000.

Hayakawa, Toshio; and Ohkuni, Shinichiro, to Bridgestone Corporation. Motorcycle tire. 292,082, 9-29-87, Cl. D12-147.000.

Heartland Industries, Inc.: *See*—
Park, Owen H., 292,129, Cl. D25-22.000.

Heitfield, John E. Turf lifting tool or the like. 292,059, 9-29-87, Cl. D8-1.000.

Hertzano, Micha. Playing piece. 292,106, 9-29-87, Cl. D21-51.000.

Hill, Edward H. Combined irrigating and digging tool. 292,118, 9-29-87, Cl. D23-17.000.

Hill, Mark L. Combined automobile door handle and cover plate. 292,063, 9-29-87, Cl. D8-302.000.

Hirota, Taisuke: *See*—
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Hosoya, Katsuyuki: *See*—
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Houser, Steven A.: *See*—
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Kassamali, Ali; and Kordenbrock, Robert H., to Procter & Gamble Company, The. Bottle. 292,070, 9-29-87, Cl. D9-404.000.

Katz, Stanley A.: *See*—
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Kawata, Yoshiaki: *See*—
Akita, Tsugio; Uematsu, Toyoyuki; Yamamoto, Masaki; Tsubaki, Hiroyuki; and Kawata, Yoshiaki, 292,097, Cl. D14-72.000.

Keeler, James M.; and Grip, John A., to American Cyanamid Company. Dispensing container for a solid stick product. 292,068, 9-29-87, Cl. D9-370.000.

Keeler, James M.; and Grip, John A., to American Cyanamid Company. Combined dispensing container and cap. 292,069, 9-29-87, Cl. D9-370.000.

Keitoku, Noboru, to Pioneer Electronic Corporation. Speaker. 292,091, 9-29-87, Cl. D14-30.000.

Keller, Fred, Jr. Handle for a writing instrument or the like. 292,104, 9-29-87, Cl. D19-55.000.

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Kerber, Stanley M. Ground stake. 292,060, 9-29-87, Cl. D8-1.000.

Kijima, Seiichi; and Miura, Yoshihiro, to Masudaya Corporation. Battery operated bird figures toy. 292,111, 9-29-87, Cl. D21-160.000.

Kiyota, Hiroyuki. Bicycle pedal. 292,075, 9-29-87, Cl. D12-125.000.

Kobayashi, Tetsuro: *See*—
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Kordenbrock, Robert H.: *See*—
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Kotz, John A.; and Mitchell, Rodney W. Refrigeration gauge manifold bracket. 292,064, 9-29-87, Cl. D8-373.000.

Kubo, Kazuhiko; Tsuda, Masanori; Hirota, Taisuke; Hosoya, Katsuyuki; Torii, Ichirou; and Suzuki, Atsushi, to Hitachi, Ltd. Fluorescent lamp. 292,130, 9-29-87, Cl. D26-3.000.

Kuroda, Yutaka, to Sumitomo Rubber Industries, Ltd. Automobile tire. 292,081, 9-29-87, Cl. D12-146.000.

Lachonius, Leif: *See*—
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Lee, Gerald W., to Woodcutters Manufacturing, Inc. Solid fuel burning stove. 292,121, 9-29-87, Cl. D23-97.000.

Lien, Hsu S. Defensive electric prod weapon or similar article. 292,113, 9-29-87, Cl. D22-117.000.

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Lim, Sang-Kwon. Recoafigurable toy vehicle. 292,109, 9-29-87, Cl. D21-150.000.

Lorio, Edward F. Table. 292,052, 9-29-87, Cl. D6-482.000.

Lussier, Marcel, to Markel Industries, Inc. Tacky floor mat. 292,054, 9-29-87, Cl. D6-588.000.

Markel Industries, Inc.: *See*—
Lussier, Marcel, 292,054, Cl. D6-588.000.

Martin, Thomas J., to Tetrad Marketing/Sales Ltd. Modular office work station. 292,051, 9-29-87, Cl. D6-421.000.

Masudaya Corporation: *See*—
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Matsushita Electric Industrial Co: *See*—
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McDaniel, Walter C., Sr. Sink drainboard. 292,134, 9-29-87, Cl. D32-16.000.

McDowell, Gordon E. Easel design. 292,045, 9-29-87, Cl. D6-311.000.

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Miller, John E., Jr., to Woodmaster Tools, Inc. Sanding machine. 292,099, 9-29-87, Cl. D15-124.000.

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Ozawa, Mitsuo, to Sumitomo Rubber Industries, Ltd. Automobile tire. 292,083, 9-29-87, Cl. D12-147.000.

Pandolfi, Alberto, to Brevetti Gaggia S.p.A. Ice cream maker. 292,098, 9-29-87, Cl. D15-82.000.

Park, Owen H., to Heartland Industries, Inc. Building or similar article. 292,129, 9-29-87, Cl. D25-22.000.

Pensa, Inc.: *See*—
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Plycraft Inc.: *See*—
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Procter & Gamble Company, The: *See*—
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Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., to Conair Corporation. Telephone base. 292,092, 9-29-87, Cl. D14-62.000.

Rittenhouse, James M.; Haber, Barry M.; and Wong, Ting W., to Conair Corporation. Telephone base. 292,093, 9-29-87, Cl. D14-62.000.

Roden, Mack L.; and Adams, Steven D. Combined pin and guide for positioning an artificial tooth. 292,124, 9-29-87, Cl. D24-16.000.

Roden, Mack L.; and Adams, Steven D. Dental positioning pin. 292,125, 9-29-87, Cl. D24-16.000.

Rodriguez Gazulla, Francisco, to Monturas y Forniturас, S.A. (MYFSA). Spray dispenser. 292,066, 9-29-87, Cl. D9-300.000.

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Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Pistol. 292,112, 9-29-87, Cl. D22-104.000.

Sakai, Koichi, to Imanishi Kinzoku Kogyo Kasbushiki Kaisha. Kerosene stove. 292,122, 9-29-87, Cl. D23-121.000.

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Schilplin, Frederick C., to American Bicycle Manufacturing Company. Bicycle frame. 292,074, 9-29-87, Cl. D12-111.000.

Selig, Julie A., to 'totes' incorporated. Umbrella handle. 292,042, 9-29-87, Cl. D3-10.000.

Shaffer, Kathryn M. Chair. 292,048, 9-29-87, Cl. D6-363.000.

Shintomi, Masahiro, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Telephone answering machine. 292,090, 9-29-87, Cl. D14-4.000.

Smith, Thomas J.; and Urban, Ronald C., to TII Industries, Inc. Protection housing for telecommunication equipment or the like. 292,089, 9-29-87, Cl. D13-41.000.

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Suzuki, Atsushi: *See*—
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Takahashi, Shoji, to Kabushiki Kaisha Shinsei Industries. Combined labeler and replaceable tape cartridge therefor. 292,102, 9-29-87, Cl. D18-19.000.

Takeuchi, Akihiro, to Sumimoto Rubber Industries, Ltd. Automobile tire. 292,078, 9-29-87, Cl. D12-141.000.

Tamakoshi, Shin, to Kabushiki Kaisha Taito. Walking robot. 292,110, 9-29-87, Cl. D21-150.000.

Tasca International Ltd.: *See*—
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Tasca International Ltd: *See*—
Yoshiharu, Takei, 292,095, Cl. D14-64.000.

Telefonaktiebolaget LM Ericsson: *See*—
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Terasaki, Masahiro. Lighter with cigarette holder storing chamber. 292,132, 9-29-87, Cl. D27-42.000.

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Shintomi, Masahiro, 292,090, Cl. D14-4.000.

Tong, James K.; and Kelley, Brenda C., to AVIA Group International, Inc. Shoe upper. 292,040, 9-29-87, Cl. D2-314.000.

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Kubo, Kazuhiko; Tsuda, Masanori; Hirota, Taisuke; Hosoya, Katsuyuki; Torii, Ichirou; and Suzuki, Atsushi, 292,130, Cl. D26-3.000.

'totes' incorporated: *See*—
Selig, Julie A., 292,042, Cl. D3-10.000.

Tsubaki, Hiroyuki: *See*—
Akita, Tsugio; Uematsu, Toyoyuki; Yamamoto, Masaki; Tsubaki, Hiroyuki; and Kawata, Yoshiaki, 292,097, Cl. D14-72.000.

Tsuda, Masanori: *See*—
Kubo, Kazuhiko; Tsuda, Masanori; Hirota, Taisuke; Hosoya, Katsuyuki; Torii, Ichirou; and Suzuki, Atsushi, 292,130, Cl. D26-3.000.

Turbo Tek Enterprises. Inc.: *See*—
Proctor, Rudy R.; and Reinstein, Fred M., 292,133, Cl. D32-1.000.

Uematsu, Toyoyuki: *See*—
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Armstrong, Maclay M.; Houser, Steven A.; and Armstrong, Jeffrey A., 292,123, Cl. D24-10.000.

Urban, Ronald C.: *See*—
Smith, Thomas J.; and Urban, Ronald C., 292,089, Cl. D13-41.000.

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Germain, Robert A., 292,061, Cl. D8-10.000.

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Lee, Gerald W., 292,121, Cl. D23-97.000.
Woodmaster Tools, Inc.: *See*—
Miller, John E., Jr., 292,099, Cl. D15-124.000.
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Yamamoto, Masaki: *See*—
Akita, Tsugio; Uematsu, Toyoyuki; Yamamoto, Masaki; Tsubaki, Hiroyuki; and Kawata, Yoshiaki, 292,097, Cl. D14-72.000.
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Yoshiharu, Takei, to Tasca International Ltd. Handset telephone. 292,095, 9-29-87, Cl. D14-64.000.
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Ziemelis, Herbert, to Mildrum Manufacturing Co. Roller guide for a fishing rod. 292,116, 9-29-87, Cl. D22-143.000.
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Hostetler, Eldon, 292,119, Cl. D23-19.000.
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Kirmann, Wolfgang, 6,029, Cl. 68.000.
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 29, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
144 4,696,064
168 4,696,065
272 4,696,066

CLASS 4
144.1 4,696,067
606 4,696,068

CLASS 5
37 R 4,696,069
238 4,696,070
451 4,696,071

CLASS 8
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CLASS 15
248 A 4,696,072
312 4,696,073
321 4,696,074
4,696,075
415 R 4,696,076

CLASS 16
125 4,696,077
301 4,696,078

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CLASS 19
114 4,696,080

CLASS 24
558 4,696,081

CLASS 29
25.42 4,696,082
148.4 C 4,696,083
156.4 R 4,696,084
237 4,696,085
243.52 4,696,086
401.1 4,696,088
434 4,696,087
451 4,696,089
566.4 4,696,090
568 4,696,091
603 4,696,099
605 4,696,100
726 4,696,102
740 4,696,101
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137 R 4,696,110
262 4,696,111
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58 4,696,208

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438 4,696,213

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1.03 4,696,215
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74 4,696,698
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291 4,696,700

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274 4,696,270
299 4,696,271
339 4,696,272
417 4,696,273
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479 4,696,277
493 4,696,278
570 4,696,279
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92 V 4,696,292
92 ZK 4,696,293
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202.26 4,696,295
207.16 4,696,296
303.1 4,696,297
305 4,696,298
328 4,696,299
334 R 4,696,300
335.5 4,696,301
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CLASS 136
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4,696,324
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89 4,696,710
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358 4,696,713
448 4,696,714
568 4,696,715
605 4,696,716
642 4,696,717

CLASS 160
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CLASS 164
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CLASS 163
1 4,696,338
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58 4,696,340
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152 4,696,342

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245 4,696,345

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CLASS 174
17 LF 4,697,043
35 R 4,697,044
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211 4,696,360
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2 C 4,697,047
18 4,697,048
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63 D 4,697,051

CLASS 180
68.4 4,696,361
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228 4,696,364
233 4,696,365
296 4,696,366
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67 R 4,696,382
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68.2 4,697,053
82 R 4,697,054
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153 S 4,697,056

CLASS 202

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205 4,696,719

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3 4,696,721
6 4,696,722
16 4,696,723
27 4,696,724
58 Re.32,512
182.4 4,696,726
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224 R 4,696,729
243 M 4,696,730
290 R 4,696,731

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303 4,696,394
334 4,696,395
339 4,696,396
444 4,696,397
521 4,696,398
565 4,696,399
575 4,696,400
594 4,696,401
602 4,696,402
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CLASS 208

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144 4,696,733
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CLASS 209

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151 4,696,740
232 4,696,741
287 4,696,742
361 4,696,743
387 4,696,744
502.1 4,696,745
603 4,696,746
605 4,696,747
636 4,696,748
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727 4,696,750
780 4,696,751

CLASS 211

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69 W 4,697,059
121 ED 4,697,060
121 LD 4,697,061
130.51 4,697,062
213 4,697,063
217 4,697,064
219 4,697,065
225 4,697,066
401 4,697,067
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521 4,697,070

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267 4,696,410
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335 4,696,412
462 4,696,840

CLASS 221

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CLASS 222

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82 4,696,415
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CLASS 227

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55 4,696,423
84 4,696,424

CLASS 228

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CLASS 232

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CLASS 235

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380 4,697,072
487 4,697,073

CLASS 236

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191 4,696,440

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231 SE 4,697,077
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303 4,697,079
307 4,697,080
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341 4,697,082
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376 4,697,084
426 4,697,085
492.2 4,697,086
548 4,697,087
561 4,697,088
4,697,089

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149.6 4,696,453
321 4,696,454

CLASS 252

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26 4,696,753
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62.54 4,696,725
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186.29 4,696,757
188.31 4,696,758
299.62 4,696,759
311 4,696,762
314 4,696,760
358 4,696,761
391 4,696,763
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511 4,696,765
515 R 4,696,755
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502.5 F 4,696,772
513 R 4,696,773
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CLASS 261

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CLASS 264

46.4 4,696,776
60 4,696,777
65 4,696,778
211.13 4,696,779
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CLASS 266

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212 4,696,458

CLASS 267

36.1 4,696,459

CLASS 269

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347 DD 4,697,167
347 P 4,697,168
540 4,697,169
543 4,697,171
551 4,697,170
587 4,697,172
684 4,697,173
689 4,697,174
707 4,697,175
723 4,697,176
728 4,697,177
729 4,697,178
825.72 4,697,179
870.02 4,697,180
4,697,181
4,697,182
870.25 4,697,183

CLASS 342

28 4,697,184
185 4,697,185
189 4,697,186
358 4,697,187
383 4,697,188

CLASS 343

700 MS 4,697,189
719 4,697,190
809 4,697,191
895 4,697,192

CLASS 346

1.1 4,697,193
110 V 4,697,194
140 R 4,697,195
159 4,697,196

CLASS 350

96.14 4,696,533
96.15 4,696,534
4,696,535
96.19 4,696,536
96.20 4,696,537
4,696,538
96.21 4,696,539
4,696,540
96.23 4,696,541
4,696,542
4,696,543
96.26 4,696,544
167 4,696,545
235 4,696,546
255 4,696,566
319 4,696,547
338 4,696,548
350 R 4,696,549
351 4,696,550
358 4,696,551
413 4,696,552
427 4,696,553
613 4,696,554
634 4,696,555

CLASS 351

157 4,696,556

CLASS 353

66 4,696,557

CLASS 354

403 4,696,559
406 4,696,558
439 4,696,560

CLASS 355

3 FU 4,696,561
3 R 4,696,562
8 4,696,563
14 R 4,696,564
15 4,696,565

CLASS 356

28 4,696,567
28.5 4,696,568
124 4,696,569
319 4,696,570
336 4,696,571
348 4,696,572
353 4,696,573
375 4,696,574

CLASS 357

4 4,697,197
23.13 4,697,199
23.3 4,697,198
24 4,697,200
41 4,697,201
63 4,697,202
72 4,697,203
74 4,697,204
82 4,697,205

CLASS 358

14 4,697,206
17 4,697,207
44 4,697,208
84 4,697,209
98 4,697,210
153 4,697,211

CLASS 360

48 4,697,212
78 4,697,213
85 4,697,214
95 4,697,215
97 4,697,216
125 4,697,217

CLASS 361

87 4,697,218
93 4,697,219
100 4,697,220
156 4,697,221
321 4,697,222
393 4,697,223
433 4,697,224

CLASS 362

61 4,697,225
110 4,697,226
233 4,697,227
352 4,697,228

CLASS 363

49 4,697,229
163 4,697,230

CLASS 364

188 4,697,231
200 4,697,232
4,697,233
4,697,234
4,697,235
416 4,697,236
424 4,697,237
431.02 4,697,238
468 4,697,239
474 4,697,240
488 4,697,241
513 4,697,242
4,697,243
520 4,697,244
552 4,697,245
563 4,697,246
713 4,697,247
754 4,697,248
900 4,697,249
4,697,250

CLASS 365

154 4,697,251
189 4,697,252

CLASS 366

80 4,696,575

CLASS 367

12 4,697,253
92 4,697,254
146 4,697,255

CLASS 368

10 4,696,576
276 4,696,577

CLASS 369

32 4,697,256
43 4,697,257
44 4,697,258
75.2 4,697,259

CLASS 370

18 4,697,260
32.1 4,697,261
84 4,697,262
85 4,697,263
111 4,697,264

CLASS 371

5 4,697,265
12 4,697,266
25 4,697,267
67 4,697,268

CLASS 372

34 4,697,269
4,697,270
68 4,697,271
99 4,697,272

CLASS 373

72 4,697,273
79 4,697,274

CLASS 374

45 4,696,578
162 4,696,580
187 4,696,579

CLASS 375

4 4,697,275
114 4,697,276
116 4,697,277

CLASS 376

136 4,696,781
159 4,696,782
228 4,696,783
245 4,696,784
4,696,785
4,696,786
247 4,696,787
253 4,696,788
254 4,696,789
296 4,696,790
299 4,696,791
377 4,696,792
447 4,696,793

CLASS 377

24 4,697,278
73 4,697,279

CLASS 378

207 4,697,280

CLASS 379

59 4,697,281
67 4,697,282
443 4,697,283

CLASS 384

18 4,696,582
49 4,696,583
107 4,696,584
399 4,696,585
500 4,696,586
536 4,696,587
565 4,696,581
615 4,696,588

CLASS 400

119 4,696,589
613 4,696,590
613.2 4,696,591
636 4,696,592

CLASS 401

7 4,696,593
65 4,696,594

CLASS 402

54 4,696,595

CLASS 403

321 4,696,596

CLASS 405

12 4,696,597
115 4,696,598
129 4,696,599
138 4,696,600
202 4,696,601
205 4,696,602
227 4,696,603
4,696,604
251 4,696,605
259 4,696,606
267 4,696,607

CLASS 406

155 4,696,608

CLASS 410

69 4,696,609

CLASS 411

38 4,696,610
103 4,696,611

CLASS 414

8 4,696,612
11 4,696,613
28 4,696,614
114 4,696,615
417 4,696,616
422 4,696,617

CLASS 415

119 4,696,618
138 4,696,619
164 4,696,620
191 4,696,621
211 4,696,622

CLASS 416

230 4,696,623

CLASS 417

56 4,696,624
174 4,696,625
312 4,696,626

CLASS 418

15 4,696,627
4,696,628
55 4,696,629
4,696,630

CLASS 422

56 4,696,795
88 4,696,796
101 4,696,797
102 4,696,798
148 4,696,799
186.18 4,696,800

CLASS 423

24 4,696,801
226 4,696,802
228 4,696,803
242 4,696,804
4,696,805
248 4,696,806
305 4,696,807
338 4,696,808
579 4,696,809
593 4,696,810

CLASS 424

53 4,696,811
59 4,696,813
80 4,696,814
4,696,815
94 4,696,816
118 4,696,794
123 4,696,817
195.1 4,696,818
4,696,819
445 4,696,812
448 4,696,821
490 4,696,822

CLASS 425

117 4,696,631
150 4,696,632
192 S 4,696,633
237 4,696,634
330 4,696,635
526 4,696,636
589 4,696,637

CLASS 426

102 4,696,824
283 4,696,825
496 4,696,823
565 4,696,826

CLASS 427

36 4,696,827
38 4,696,828
4,696,829
41 4,696,830
48 4,696,831
58 4,696,832
121 4,696,835
208.4 4,696,836
255.3 4,696,837
407.2 4,696,838

CLASS 428

15 4,696,839
36 4,696,841
40 4,696,842
41 4,696,843
46 4,696,844
64 4,696,845
65 4,696,846
76 4,696,847
80 4,696,848
95 4,696,849
197 4,696,850
210 4,696,851
222 4,696,852
257 4,696,853
287 4,696,854
312.8 4,696,855
321.5 4,696,856
323 4,696,857
4,696,858
4,696,859
325 4,696,860
328 4,696,861
336 4,696,862
402.2 4,696,863
413 4,696,864
474.4 4,696,865
614 4,696,866
650 4,696,867
690 4,696,868
695 4,696,869

CLASS 429

14 4,696,870
17 4,696,871
42 4,696,872
59 4,696,873
64 4,696,874
206 4,696,875

CLASS 430

1 4,696,876
5 4,696,877
4,696,878
24 4,696,879
42 4,696,880
57 4,696,881
4,696,882
4,696,883
58 4,696,884
192 4,696,886
203 4,696,887
270 4,696,888
271 4,696,820
311 4,696,885
4,696,889
325 4,696,890
4,696,891
495 4,696,892
543 4,696,893
551 4,696,894

CLASS 431

4 4,696,638
59 4,696,639
289 4,696,640
362 4,696,641

CLASS 432

59 4,696,642
120 4,696,643

CLASS 433

88 4,696,644
125 4,696,645
149 4,696,646

CLASS 434

224 4,696,647

CLASS 435

7 4,696,895
4,696,896
42 4,696,897
68 4,696,898
4,696,899
104 4,696,900
180 4,696,901
300 4,696,902

CLASS 436

28 4,696,903
39 4,696,904
64 4,696,905
78 4,696,906
513 4,696,907

CLASS 437

5 4,696,092
4,696,648
23 4,696,094
78 4,696,095
88 4,696,702
176 4,696,093
187 4,696,098
193 4,696,097
223 4,696,834
225 4,696,833

CLASS 439

11 4,696,523
53 4,696,527
68 4,696,526
69 4,696,525
98 4,696,649
4,696,908
160 4,696,528
197 4,696,524
266 4,696,530
267 4,696,529
851 4,696,531
863 4,696,532

CLASS 440

49 4,696,650
88 4,696,651

CLASS 446

75 4,696,652
175 4,696,653
268 4,696,654
330 4,696,655
376 4,696,656

CLASS 455

619 4,697,284

CLASS 464

93 4,696,657
112 4,696,658
148 4,696,659
170 4,696,660

CLASS 474

5 4,696,661
49 4,696,662
133 4,696,663
138 4,696,664
153 4,696,665

CLASS 494

16 4,696,666

CLASS 501

75 4,696,909

CLASS 502

159 4,696,910
4,696,911

CLASS 512

8 4,696,766

CLASS 514

7 4,696,912
15 4,696,913
19 4,696,914
21 4,696,915
25 4,696,916
54 4,696,917
58 4,696,918
62 4,696,919
89 4,696,920
157 4,696,921
185 4,696,922
210 4,696,923
211 4,696,924
219 4,696,925
230 4,696,926
236 4,696,927
250 4,696,928
253 4,696,929
256 4,696,930
261 4,696,931
263 4,696,932
275 4,696,933
277 4,696,934
297 4,696,935
4,696,936
314 4,696,937
343 4,696,938
361 4,696,939
400 4,696,940
423 4,696,941
424 4,696,942
4,696,943
450 4,696,945
478 4,696,947
531 4,696,944
574 4,696,946
605 4,696,948
648 4,696,949

CLASS 521

57 4,696,950
65 4,696,951
107 4,696,952
146 4,696,953
167 4,696,954

CLASS 522

77 4,696,955

CLASS 523

137 4,696,956
406 4,696,957

CLASS 524

21 4,696,958
91 4,696,959
100 4,696,960
4,696,961
140 4,696,962
144 4,696,963
236 4,696,964
380 4,696,965
412 4,696,966
437 4,696,967
610 4,696,968
762 4,696,969
860 4,696,970

CLASS 525

61 4,696,971
67 4,696,972
71 4,696,973
92 4,696,974
113 4,696,975
126 4,696,976
184 4,696,977
205 4,696,978
247 4,696,979
326.1 4,696,980
328.2 4,696,981
507 4,696,982

CLASS 526

62 4,696,983
98 4,696,984
119 4,696,985
181 4,696,986
216 4,696,987
220 4,696,988
254 4,696,989
304 4,696,990

CLASS 528

45 4,696,991
90 4,696,992
167 4,696,993
176 4,696,994
206 4,696,995
214 4,696,996
271 4,696,997
272 4,696,998
319 4,696,999
423 4,697,000
4,697,001

CLASS 530

324 4,697,002
378 4,697,004
380 4,697,003

CLASS 536

6.4 4,697,005
17.2 4,697,006
83 4,697,007
89 4,697,008

CLASS 540

487 4,697,009
536 4,697,010
544 4,697,011

CLASS 544

124 4,697,012
183 4,697,013
193 4,697,014
335 4,697,015
344 4,697,016
346 4,697,017

CLASS 546

94 4,697,018
112 4,697,019
288 4,697,021

CLASS 548

184 4,697,020
444 4,697,022

CLASS 549

241 4,697,023
444 4,697,024

CLASS 556

183 4,697,025
418 4,697,026
466 4,697,027

CLASS 558

89 4,697,028
92 4,697,029
163 4,697,030
169 4,697,031
233 4,697,033
270 4,697,032
274 4,697,034
344 4,697,035

CLASS 562

418 4,697,036
432 4,697,037

CLASS 564

265 4,697,038

CLASS 585

477 4,697,039
666 4,697,040

CLASS 604

22 4,696,667
28 4,696,668
34 4,696,669
49 4,696,670
67 4,696,671
128 4,696,672
150 4,696,673

CLASS 800

1 4,696,674

D2—	314	292,040			292,057	D12—	111	292,074		30	292,091		137	292,108		16	292,124
	320	292,041		350	292,058		125	292,075		62	292,092		150	292,109			292,125
D3—	10	292,042	D8—	1	292,059		130	292,076			292,093			292,110		19	292,126
D6—	300	292,043			292,060		140	292,077		64	292,094		160	292,111		58	292,127
		292,044		10	292,061		141	292,078			292,095	D22—	104	292,112		64	292,128
	311	292,045		22	292,062		145	292,079		68	292,096		117	292,113	D25—	22	292,129
	363	292,048		302	292,063		146	292,080		72	292,097		129	292,114	D26—	3	292,130
	365	292,047		373	292,064			292,081	D15—	87	292,098		143	292,115		43	292,131
	370	292,046		499	292,065		147	292,082		124	292,099			292,116	D27—	42	292,132
	379	292,049	D9—	300	292,066			292,083		127	292,100	D23—	1	292,117	D32—	1	292,133
	380	292,050		332	292,067			292,084	D16—	104	292,101		17	292,118		56	292,134
	421	292,051		570	292,068			292,085	D18—	19	292,102		19	292,119	D34—	24	292,135
	482	292,052			292,069			292,086		27	292,103			292,120		33	292,137
	514	292,053		404	292,070	D13—	24	292,087	D19—	55	292,104		97	292,121		35	292,136
	588	292,054		442	292,071		40	292,088	D21—	25	292,105		121	292,122		45	292,138
D7—	16	292,055	D10—	53	292,072		41	292,089		51	292,106				D99—	34	292,139
	77	292,056	D11—	30	292,073	D14—	4	292,090		59	292,107	D24—	10	292,123			

CLASSIFICATION OF PLANTS

P.—	41	6,024										
	43	6,025	57	6,026	58	6,027	6,028		6,029		6,030	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
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Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
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Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
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Iowa	19	Ohio	39	U.S. Navy	59
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,696,441	4,696,591		4,697,270		4,696,855	19 :	4,696,064		4,697,088
04 :	4,696,097	4,696,594		4,697,272		4,697,209		4,696,122		4,697,096
	4,696,250	4,696,609		4,697,279		4,697,282		4,696,152		4,697,151
	4,696,360	4,696,610	08 :	4,696,119	13 :	4,696,438		4,696,162		4,697,188
	4,696,526	4,696,611		4,696,125		4,696,576		4,696,205		4,697,191
	4,696,701	4,696,614		4,696,282		4,696,829		4,696,350	26 :	4,696,113
	4,696,776	4,696,648		4,696,320		4,697,051		4,696,367		4,696,121
	4,696,811	4,696,653		4,696,331		4,697,130		4,696,387		4,696,136
	4,697,184	4,696,656		4,696,419		4,697,158		4,696,409		4,696,143
	4,697,251	4,696,667		4,696,460		4,697,180		4,696,432		4,696,173
05 :	4,696,374	4,696,677		4,696,571		4,697,181		4,696,486		4,696,260
	4,697,245	4,696,711		4,696,666		4,697,182		4,696,634		4,696,293
06 :	4,696,065	4,696,714		4,696,705	16 :	4,696,413		4,696,660		4,696,394
	4,696,073	4,696,727		4,697,048		4,697,113		4,696,720		4,696,515
	4,696,078	4,696,729		4,697,167	17 :	Re.32,510	20 :	4,696,116		4,696,595
	4,696,090	4,696,755		4,697,232		4,696,169		4,696,326		4,696,758
	4,696,095	4,696,781	09 :	4,696,096		4,696,175		4,696,469		4,696,794
	4,696,098	4,696,792		4,696,135		4,696,191		4,696,669		4,696,817
	4,696,111	4,696,797		4,696,144		4,696,203		4,696,903		4,696,824
	4,696,112	4,696,818		4,696,153		4,696,213	21 :	4,696,524		4,696,834
	4,696,160	4,696,823		4,696,156		4,696,217		4,696,840		4,696,885
	4,696,197	4,696,833		4,696,159		4,696,230	22 :	4,696,132		4,696,904
	4,696,207	4,696,835		4,696,318		4,696,375		4,696,138		4,696,924
	4,696,279	4,696,841		4,696,445		4,696,410		4,696,150		4,696,934
	4,696,286	4,696,878		4,696,539		4,696,484		4,696,447		4,697,024
	4,696,302	4,696,933		4,696,770		4,696,491		4,696,602		4,697,026
	4,696,316	4,696,958		4,696,851		4,696,547		4,696,605		4,697,057
	4,696,321	4,696,963		4,696,939		4,696,618		4,697,174		4,697,164
	4,696,328	4,697,000		4,696,954		4,696,638	23 :	4,697,103		4,697,238
	4,696,330	4,697,001		4,697,054		4,696,654	24 :	4,696,222		4,697,240
	4,696,345	4,697,003		4,697,087		4,696,698		4,696,362		4,697,242
	4,696,346	4,697,030		4,697,193		4,696,699		4,696,368	27 :	4,696,075
	4,696,356	4,697,033		4,697,195		4,696,707		4,696,932		4,696,164
	4,696,359	4,697,045		4,697,262		4,696,746		4,697,178		4,696,188
	4,696,372	4,697,056		4,697,278		4,696,843	25 :	4,696,101		4,696,244
	4,696,395	4,697,077	10 :	4,696,953		4,697,010		4,696,104		4,696,285
	4,696,396	4,697,083		4,696,968		4,697,039		4,696,106		4,696,361
	4,696,401	4,697,089	12 :	4,696,066		4,697,080		4,696,117		4,696,378
	4,696,404	4,697,098		4,696,118		4,697,090		4,696,163		4,696,399
	4,696,411	4,697,100		4,696,127		4,697,132		4,696,300		4,696,639
	4,696,471	4,697,107		4,696,139		4,697,134		4,696,352		4,696,715
	4,696,474	4,697,139		4,696,257		4,697,231		4,696,373		4,696,762
	4,696,481	4,697,157		4,696,259		4,697,246		4,696,478		4,696,771
	4,696,485	4,697,160		4,696,382	18 :	4,696,088		4,696,533		4,696,854
	4,696,487	4,697,177		4,696,415		4,696,129		4,696,573		4,696,917
	4,696,493	4,697,186		4,696,431		4,696,237		4,696,668		4,696,965
	4,696,500	4,697,202		4,696,451		4,696,254		4,696,671		4,697,002
	4,696,522	4,697,207		4,696,501		4,696,315		4,696,778		4,697,127
	4,696,532	4,697,228		4,696,504		4,696,514		4,696,876		4,697,170
	4,696,536	4,697,247		4,696,578		4,696,661		4,696,898		4,697,233
	4,696,556	4,697,250		4,696,706		4,696,997		4,696,977	28 :	4,696,148
	4,696,582	4,697,261		4,696,744		4,697,004		4,696,995		4,696,381
	4,696,585	4,697,266		4,696,816		4,697,034		4,697,066		4,696,492

	4,696,737		4,697,085		4,696,969		4,696,992		4,697,131		4,697,078
	4,696,819		4,697,120		4,696,990		4,697,005		4,697,163		4,697,150
29 :	4,696,298		4,697,159		4,696,998		4,697,018		4,697,205		4,697,152
	4,696,593		4,697,175		4,697,021		4,697,043		4,697,230		4,697,166
	4,696,664		4,697,197		4,697,023	40 :	4,696,109	44 :	4,697,253		4,697,192
	4,696,772		4,697,211		4,697,028		4,696,505		4,697,254		4,697,226
	4,696,865		4,697,243		4,697,031		4,696,624	45 :	4,696,123		4,697,236
30 :	4,696,252		4,697,264		4,697,058		4,696,685		4,696,403		4,697,255
	4,696,546		4,697,284		4,697,108		4,696,734		4,696,448		4,697,281
31 :	4,696,093		4,575,123		4,697,118	41 :	4,696,089		4,696,951	49 :	4,696,219
	4,696,258	35 :	4,696,227		4,697,141		4,696,105		4,697,011		4,696,233
33 :	4,696,392		4,696,569		4,697,142		4,696,281	47 :	4,696,102		4,696,284
34 :	4,696,103		4,696,718		4,697,153		4,696,472		4,696,269		4,696,296
	4,696,141	36 :	Re.32,511		4,697,221		4,696,738		4,696,512		4,696,338
	4,696,231		4,696,067		4,697,227		4,697,137		4,697,084	50 :	4,696,519
	4,696,239		4,696,071		4,697,252		4,697,143	48 :	4,696,092		4,697,099
	4,696,288		4,696,115	37 :	4,696,170	42 :	4,696,077		4,696,110	51 :	4,696,068
	4,696,386		4,696,174		4,696,301		4,696,145		4,696,168		4,696,131
	4,696,407		4,696,180		4,696,426		4,696,182		4,696,172		4,696,151
	4,696,420		4,696,181		4,696,525		4,696,190		4,696,206		4,696,312
	4,696,443		4,696,187		4,696,769		4,696,204		4,696,221		4,696,314
	4,696,503		4,696,220		4,697,135		4,696,215		4,696,304		4,696,528
	4,696,647		4,696,283		4,697,147		4,696,223		4,696,343		4,696,542
	4,696,649		4,696,294		4,697,149		4,696,226		4,696,344		4,696,808
	4,696,652		4,696,299	38 :	4,696,640		4,696,238		4,696,354		4,697,126
	4,696,655		4,696,348	39 :	4,696,114		4,696,263		4,696,369	53 :	4,696,140
	4,696,676		4,696,357		4,696,133		4,696,303		4,696,377		4,696,149
	4,696,679		4,696,428		4,696,142		4,696,324		4,696,405		4,696,249
	4,696,681		4,696,461		4,696,177		4,696,329		4,696,412		4,696,390
	4,696,693		4,696,467		4,696,179		4,696,398		4,696,425		4,696,423
	4,696,702		4,696,468		4,696,186		4,696,458		4,696,470		4,696,442
	4,696,732		4,696,476		4,696,210		4,696,482		4,696,473		4,696,583
	4,696,750		4,696,490		4,696,290		4,696,641		4,696,494		4,696,662
	4,696,757		4,696,544		4,696,292		4,696,708		4,696,498		4,696,691
	4,696,766		4,696,545		4,696,308		4,696,733		4,696,499		4,696,842
	4,696,773		4,696,554		4,696,327		4,696,784		4,696,502		4,696,860
	4,696,807		4,696,574		4,696,332		4,696,785		4,696,507		4,697,168
	4,696,814		4,696,599		4,696,336		4,696,793		4,696,601	54 :	4,696,388
	4,696,821		4,696,607		4,696,353		4,696,806		4,696,603		4,696,680
	4,696,825		4,696,646		4,696,376		4,696,864		4,696,604	55 :	Re.32,509
	4,696,826		4,696,692		4,696,393		4,696,896		4,696,688		4,696,086
	4,696,844		4,696,719		4,696,416		4,696,908		4,696,726		4,696,120
	4,696,857		4,696,722		4,696,422		4,696,938		4,696,741		4,696,124
	4,696,889		4,696,739		4,696,455		4,696,959		4,696,751		4,696,126
	4,696,912		4,696,767		4,696,636		4,696,972		4,696,752		4,696,291
	4,696,923		4,696,774		4,696,695		4,696,978		4,696,799		4,696,402
	4,696,925		4,696,812		4,696,703		4,696,985		4,696,802		4,696,479
	4,696,930		4,696,828		4,696,731		4,697,053		4,696,803		4,696,508
	4,696,946		4,696,915		4,696,754		4,697,093		4,696,849		4,696,674
	4,696,967		4,696,935		4,696,848		4,697,105		4,696,907		4,696,779
	4,697,012		4,696,936		4,696,909		4,697,122		4,696,976		4,697,075
	4,697,025		4,696,940		4,696,983		4,697,124		4,696,982		4,697,280
	4,697,037		4,696,964		4,696,986		4,697,125		4,697,040		

DESIGN PATENTS

01 :	292,134	12 :	292,052	23 :	292,053		292,093		292,070		292,103
04 :	292,063	15 :	292,071	25 :	292,049	36 :	292,046		292,108		292,127
06 :	292,060	17 :	292,045	27 :	292,057		292,073		292,120		292,138
	292,133		292,058		292,074		292,089	41 :	292,040	48 :	292,118
	292,135		292,131		292,105		292,100		292,041	51 :	292,050
	292,139		292,136	29 :	292,099		292,101		292,124	53 :	292,121
09 :	292,054	18 :	292,119	33 :	292,112		292,107		292,125		292,123
	292,114		292,129	34 :	292,068		292,117	42 :	292,104	55 :	292,062
	292,115	20 :	292,128		292,069	39 :	292,042	45 :	292,061		292,076
	292,116	22 :	292,048		292,092		292,059	47 :	292,056		

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06 :	6,024		6,025								

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